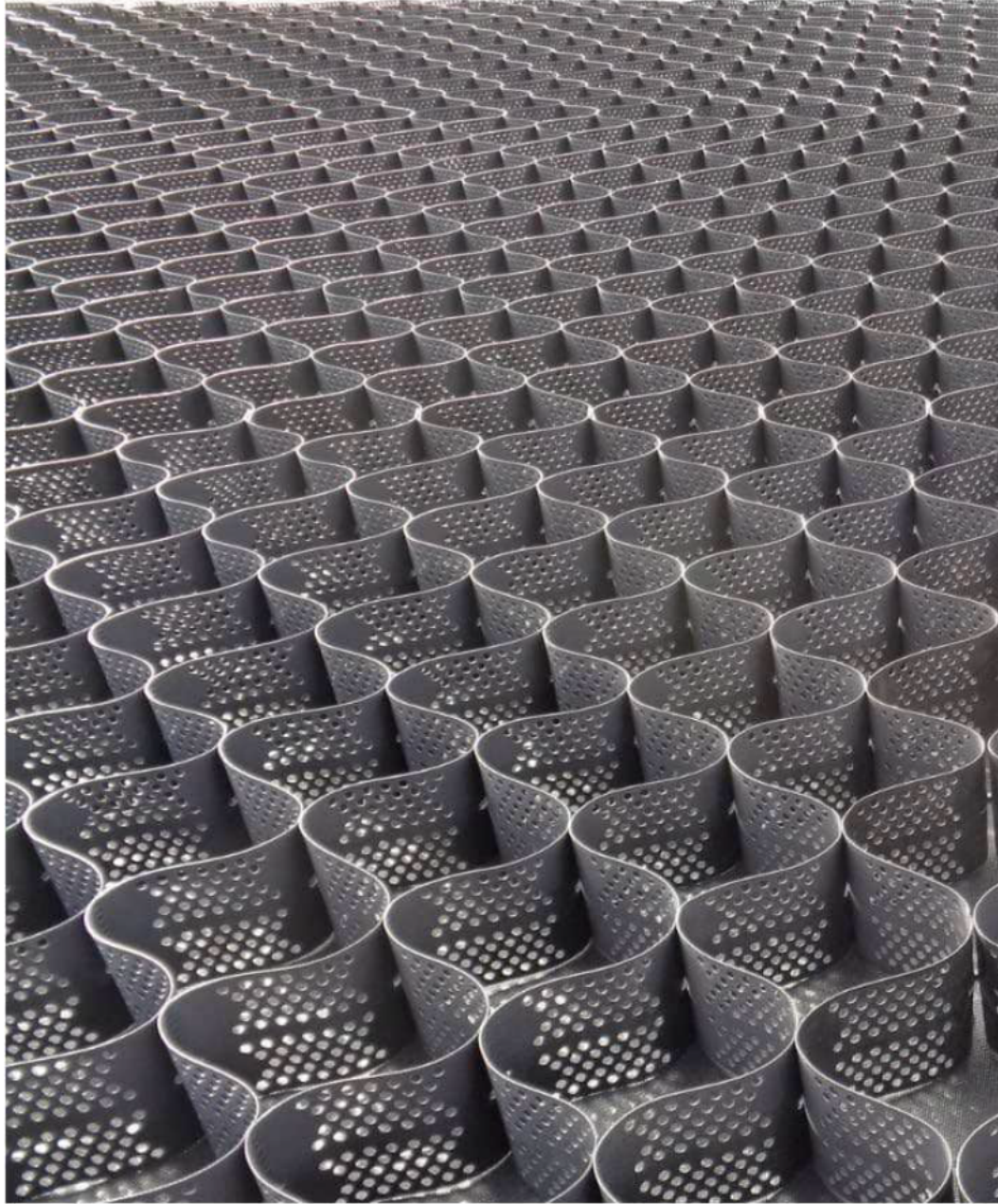




GEOWEB® GEOCELLS

Soil Stabilization System

PROPOSAL FOR THE COPSE

PR#26373

DATE: 7/14/2026

Engineering Submittal



CONTACT:

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PRESTO GEOSYSTEMS

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July 14, 2026

Roy Partington
GREENFIX
Unit B1 North
Willow End Park
Blackmore Park Road
Welland
Malvern
WR13 6NN

RE: PR26373 THE COPSE
Load Support System

Dear Roy:

Presto Geosystems has completed the evaluation for The Copse Load Support System project. Our recommendations are provided and detailed in the attached cross section and calculation. The evaluation is copyrighted and based on the unique engineering properties of GEOWEB® system. Any use of this evaluation for any product other than that manufactured by Reynolds Presto Products, Inc. makes this evaluation invalid.

The objective of this evaluation is to propose a GEOWEB geocell system for stabilization of the base.

As the originator and leader in geocell technology, Presto Geosystems offers the following advantages:

- **Manufacturer Certificate of Analysis.** Presto Geosystems manufactures GEOWEB, ATRA® keys and ATRA Stake Clips in accordance with stringent ISO and CE quality standards. Our quality management system allows Presto Geosystems to provide Certificates of Compliance (COC) and Certificates of Analysis (COA) that allow traceability on all materials produced and supplied for this project. We do not provide geocell materials through private label manufacturers, which is often the case with our competitors. The ability for the Owner to receive COC and COA for geocell is critical to the integrity of the project.
- **Manufacturer Calculations.** The attached calculations are based specifically on GEOWEB material characteristics, research/testing and accessories. Our calculations are based on the site-specific characteristics and information contained in the request for project evaluation. The recommendations are based on GEOWEB panels, ATRA key connection device and ATRA stake



clips. The anchorage recommendations are specific to our product and DO NOT apply to any other geocell manufacturers.

- ATRA Key connection device. ATRA keys provide a permanent and stronger panel connection compared to metal staples or zip ties. ATRA keys are made of high-density polyethylene and are the strongest method available for panel connection. ATRA keys will not corrode or degrade and provide a permanent connection. ATRA keys were used to determine the anchorage recommendations. If a different connection device is proposed, the Presto Geosystems recommendation does not apply. ATRA keys allow multiple panels to be installed concurrently decreasing installation time and preventing panel separation during installation and compaction. Panel separation may occur with metal staples or zip ties during installation, which can lead to long-term maintenance issues.
- Installation Assistance. Representatives of Presto Geosystems, or the local distributor, are available to be on-site at the beginning of construction to ensure that the GEOWEB panels and accessories are installed as intended. We are committed to train the Contractor based on our in-depth product knowledge and installation experience. Our past project success will minimize installation time and issues. As with any material, there are advantageous techniques of installation, which we can offer during our visit.

The project evaluation has been developed using the parameters listed below. Please review the calculations to confirm that the data used reflects site-specific conditions.

Parameters:

CBR, %	1.0
Type of Sub Grade	Native
Vehicle	
Type	Emergency Vehicles
Wheel Loading, kN	88.9
Tire Pressure, kPa	868
Infill Friction Angle ϕ , degree	30
Infill Type	Crushed Aggregate
Infill Weight γ , kN/m ³	18



Based on the evaluation, the following materials are recommended for the GEOWEB application at the site.

1. Prepare sub grade to a minimum CBR of 1.0%.
2. Provide a Greenfix LS40/40 enhanced woven geotextile separation layer on top of the sub grade and install in accordance with Manufacturer instructions including overlaps based on sub grade CBR.
3. Provide 150 mm base layer compacted in accordance to specifications. Wrap the ends of the geotextile around the base to prevent material loss.
4. Provide GEOWEB GW30V6 (150 mm) panels filled with suitable material.
5. Pre-shape the GEOWEB panels before infill placement.
6. Connect the GEOWEB sections with ATRA Keys at each interleaf and end-to-end connection.
7. The base, GEOWEB infill and wear surface shall be hardcore.
8. Limit the drop of infill into the GEOWEB panels to prevent distortion.
9. Overfill GEOWEB panels and compact to provide a minimum 50 mm wear surface and create side slopes to existing grade. Slope angle shall be set low enough to prevent global stability issues. Limit the drop of infill to prevent panel distortion.
10. Refer to the GEOWEB Load Support Installation Guide for installation procedures.

For additional Load Support Resources, click here:

[Load Support Engineering Resource Package](#)
[GEOWEB Load Support Installation Guide](#)

If you have any questions or need any additional information, please call.

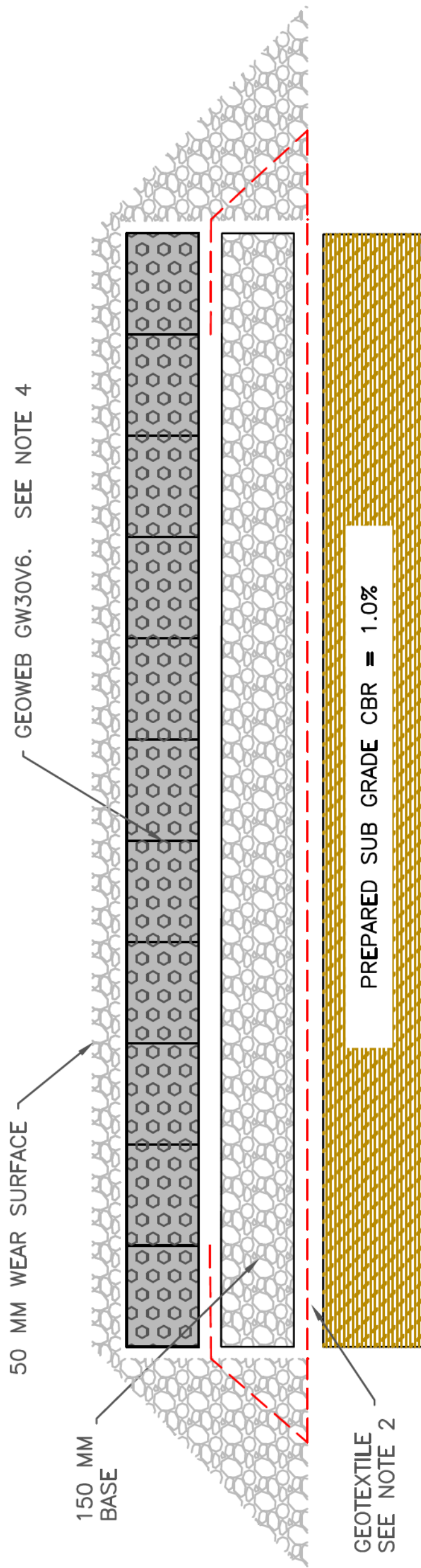
Sincerely,



Sam Justice, P.E.
Civil Engineer
Presto Geosystems

Notes:

1. This evaluation is copyrighted and is based on the use of GEOWEB® manufactured by Reynolds Presto Products, Inc. All rights reserved. Any use of this evaluation for any geocell product other than that manufactured by Reynolds Presto Products, Inc is strictly prohibited and makes this evaluation invalid.
2. Provide Greenfix LS40/40 enhanced woven geotextile separation layer and install per Manufacturer recommendations including overlaps based on sub grade CBR.
3. The GEOWEB panels shall be connected with ATRA® keys at each interleaf and end to end connection.
4. GEOWEB base and infill shall be hardcore. Overfill the GEOWEB panels and compact to provide a minimum 50 mm wear surface, and create side slopes to existing grade. Slope angle shall be set low enough to prevent global stability issues. Limit the drop of infill to prevent panel distortion.
5. Refer to the GEOWEB Load Support [Installation Guide](#) for installation procedures.



ATRA KEY

STRESS REDUCTION USING GEOWEB SYSTEM

PROJECT	PR26373 THE COPSE	DATE
		7/14/26

Layer Type	Layer Thickness (m)	Depth from Surface (m)	Radius of Loaded Area (m)	Stress at Bottom of Layer (kPa)	The GEOWEB System Benefit			
					Vertical Stress (kPa)	Horizontal Stress (kPa)	Stress Reduction (kPa)	New Stress (kPa)
Surface		0.00	0.18	868.00				
Wear Surface	0.05	0.05		851.50				
GEOWEB Layer	0.15	0.20		513.03	682.26	227.42	154.35	358.68
Aggregate	0.15	0.35		104.39				
2nd GEOWEB Layer	0.00	0.35		104.39	104.39	34.80	0.00	104.39
Aggregate	0.00	0.35		104.39				
Geotextile		0.35		104.39				

GEOWEB	Cell Size	Diameter, m	Depth (m)
	GW30	0.24	0.15

GEOWEB Infill	Type	Unit Weight (kg/m3)	Friction Angle	Added Stress (kPa)
Properties	Gravel	1,800	30	6.22

Below GEOWEB	Depth (m)	Unit Weight (kg/m3)	Shear Strength (kPa)	Reduced Stress (kPa)	Other Properties: CBR	Other Properties: R Value
Excavation	0.35	0				
Subgrade			29.9	0.00	1.00%	-3.99

Required Calculation Data	
Wheel Load (kN)	89 Emergency Vehicles
Tire Pressure (kPa)	868
Distribution Angle	45.00 H = 0 V = 0 OR Angle = 45
% Frictional Interaction	95.0%
Geotextile Type	Woven
Bearing Capacity Coefficient (N _c)	6.00
Factor of Safety	1.30

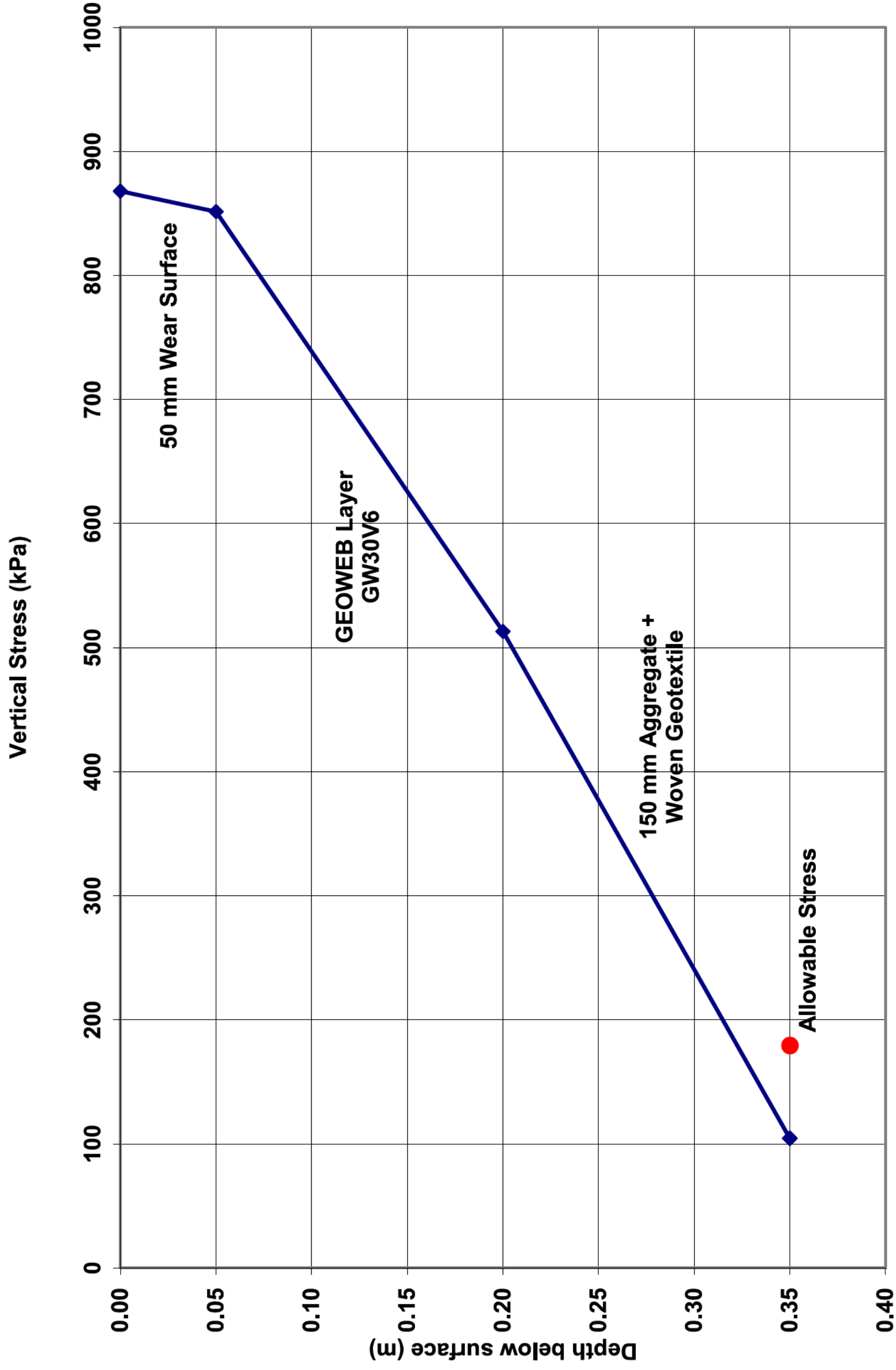
Calculation Results	
Distributed Stress on Subgrade per Calculation, Q _{distributed} (kPa)	110.61
Allowable Subgrade Stress, Q _{allowable} (kPa)	179.10
Calculated Factor of Safety	1.62 Acceptable

Hoop Stress Check (GEOWEB Mechanical Properties)				
Perforated Cell Wall:	9.62	FoS, Cell Wall Rupture	✓	
	12.82	FoS, Resistance to Peel	✓	Hoop Stress (kPa): 716.29
Internal Junctions:	19.24	FoS, Resistance to Shear	✓	Hoop Tension (kN): 0.16
	15.23	FoS, Resistance to Separation	✓	
	4.04	FoS, Resistance to Peel	✓	
Mechanical Junctions (ATRA Key):	6.90	FoS, Resistance to Shear	✓	
	5.25	FoS, Resistance to Separation	✓	
Results:	System Components Meet Project Requirements			

Limitation of Use:

The Evaluation is copyrighted and based on the use of GEOWEB® geocells manufactured by Reynolds Presto Products, Inc. All rights reserved. Any use of the Evaluation for any geocell product other than that manufactured by Reynolds Presto Products, Inc. is strictly prohibited and makes this Evaluation invalid. Reynolds Presto Products, Inc. assumes no liability resulting from the unauthorized use of this Evaluation. The recommendations in this Evaluation are based on the specific characteristics, structural values and specifications of GEOWEB geocells manufactured by Reynolds Presto Products, Inc.

PR26373 THE COPSE
GEOWEB System Stress Reduction



Product Specification - GEOWEB® GW30V6 Geocell

GENERAL

The GEOWEB A1geocell product is manufactured from textured, perforated strips of high density polyethylene that are bonded together to create a network of interconnected cells. The cells can be filled with topsoil, aggregate, concrete, recycled materials, or other infill material for geotechnical applications such as: 1) load support for unpaved and paved roads, railways, ports, heavy-duty pavements, container yard, and pads; 2) gravity and reinforced walls, reinforced slopes and fascia walls; and, 3) slope, channel, and geomembrane protection.

DIMENSIONS

Parameter	Units	Value
Cell Depth	Inches (mm)	6 (150)
Cell Size (Length x Width +/- 10%)	Inches (mm)	11.3 x 12.6 (287 x 320)
Expanded Section Width	Cells	8
	Feet (m)	Varies: 7.7 to 9.2 (2.3 to 2.8)
Expanded Section Length	Cells	18, 21, 25, 29, or 34
	Feet (m)	Varies: 15.4 to 35.1 (4.7 to 10.7)

STRUCTURAL INTEGRITY AND SYSTEM PERFORMANCE

Parameter	Units	Value
Minimum Short-Term Seam Peel Strength	lb (N)	480 (2,130)
Long-Term Seam Peel Strength (standard 4-inch sample width) ¹	lb (N)	160 (710)
Internal Junction Efficiency ²	%	≥ 100
Mechanical Junction Efficiency (ATRA Key Connection) ²	%	≥ 100
Peak Friction Angle Ratio (δ/ϕ) ³	Unitless	0.95

MATERIAL PROPERTIES

Parameter	Test Method	Units	Value
Polymer Density	ASTM D1505 or D792	lbs/ft ³ (g/cm ³)	58.4 - 60.2 (0.935 - 0.965)
Flexural Storage Modulus	ISO 6721	Mpa	≥ 800
Carbon Black Content ⁴	ASTM D1603	%	1.5 - 2.0
Sheet Thickness Prior to Texture	ASTM D5199	mil (mm)	50 (1.27), -5% +10%
Sheet Thickness After Texture	ASTM D5199	mil (mm)	60 (1.52), -5% +10%
Texture Surface Density	--	per/in ² (per/m ²)	140 - 200 (22 - 31)

DURABILITY

Parameter	Test Method	Units	Value
Environmental Stress Crack Resistance	ASTM D1693	hrs	> 5,000
Environmental Stress Crack Resistance (Accelerated Test)	ASTM D5397	hrs	≥ 400
Resistance to Oxidation ⁵	EN ISO 13438	yrs	≥ 100
Resistance to Weathering ⁶	EN 12224	%	100

Notes:

- 1) A 4 in. (100-mm) wide seam sample shall support a 160 lb (72.5 kg) load for a period of 7 days minimum in a temperature-controlled environment undergoing a temperature change on a 10 hour cycle from ambient room to 130° F (54°). Ambient room temperature is per ASTM E 41.
- 2) Junction efficiency determined as a percentage of junction performance (EN ISO 13426-1) to perforated strip performance (EN ISO 10319).
- 3) Typical design value for granular infill material. Consult with manufacturer to confirm value for other types of infill materials.
- 4) Standard black HDPE strips. For tan/green GEOWEB, hindered amine light stabilizer (HALS) content will be 2.0% by weight of carrier.
- 5) Predicted to be durable for a minimum of 100 years in natural soil with a pH between 4 and 9 and at a soil temperature ≤ 25°C.
- 6) 100% of original tensile strength retained following exposure to 370 hours of ultraviolet light and accelerated weathering in accordance with EN 12224.



Description:

The ATRA Key is designed to connect GEOWEB Geocell sections either end-to-end or side-to-side through the GEOWEB material slots (I-slots). The ATRA Key features a structurally reinforced handle and frictional barbs to enhance interlock with the GEOWEB surface texture, providing protection against the three primary modes of mechanical junction failure: shearing, splitting, and peeling. The ATRA Key is inserted through aligned I-slots of two adjoining GEOWEB sections and turned 90 degrees to lock the key in position. If removal is required, turn the ATRA Key 90 degrees from the locked position and remove the ATRA Key from the I-slots.

Material: Polymeric Composite Material

Construction: Injection Molded

Color: Black

Dimensions:

Length: 1.31 in. (33.15 mm)

Width: 2.05 in. (52.07 mm)

Thickness: 0.38 in. (9.65 mm)

Pull-Through Strength: 275 lbs. (1.3 kN)

Mechanical Junction Efficiency (Shear, Peel & Separation): 100%

Chemical Resistance: Comprised of nonreactive, chemically inert material

Other Properties: Mildew Resistant, Non-Corrosive

Conductivity: Non-Conductive



Figure 1 ATRA Key



**Figure 2 ATRA Key Connection
through cell wall I-slot**

Greenfix LS4040 Woven Geotextile

Application and Benefits

Greenfix LS4040 is a woven geotextile, manufactured from polypropylene fibres. LS4040 is used as a separation and filtration layer beneath the Geoweb® Cellular Confinement System in Load Support applications.

Product Characteristics

Mechanical Properties	Test	Units	Values
CBR Puncture Resistance	EN ISO 12236	N	4,500
Tensile Strength – MD	EN ISO 10319	KN/m	40
Tensile Strength – CD	EN ISO 10319	KN/m	40
Elongation at Break - MD	EN ISO 10319	%	18
Elongation at Break - CD	EN ISO 10319	%	8
Dynamic Perforation (Cone Drop Test)	EN ISO 13433	mm	11
Hydraulic Properties	Test	Units	Values
Water Permeability (normal to the plane Vlh50)	EN ISO 11058	l/m ² /s	16
Characteristic Opening Size	EN ISO 12956	µm	180
Physical Properties	Test	Units	Values
Thickness at 2kPa	EN ISO 9863	mm	0.75
Weight	EN ISO 9864	g/m ²	164
Roll Sizes	-	m	2.62m x 50m & 5.25m x 100m
Predicted Minimum Durability	In Natural soils with 4<pH<9 soil temp <250C	Years	25



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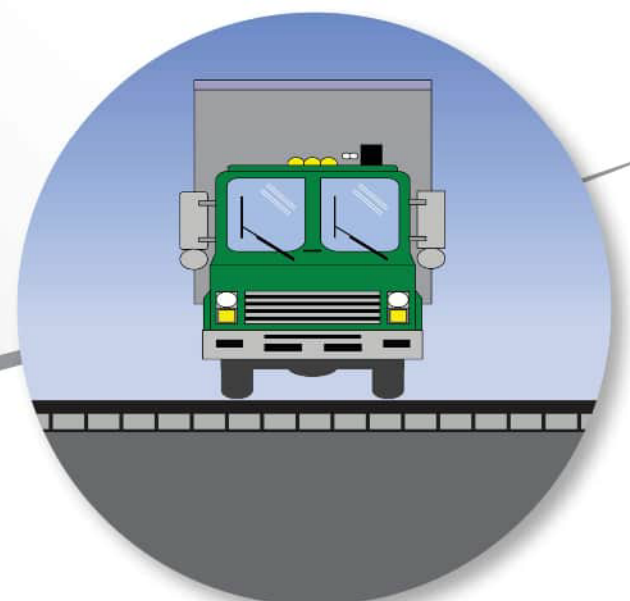
Since 1979

INSTALLATION GUIDE

■ **simplified**



GOWEB® Load Support System



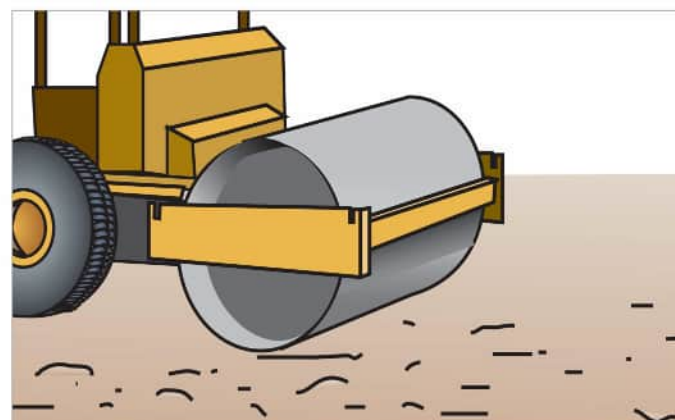


GEOWEB® Load Support System

1 Prepare subgrade as specified. Remove debris and rocks.



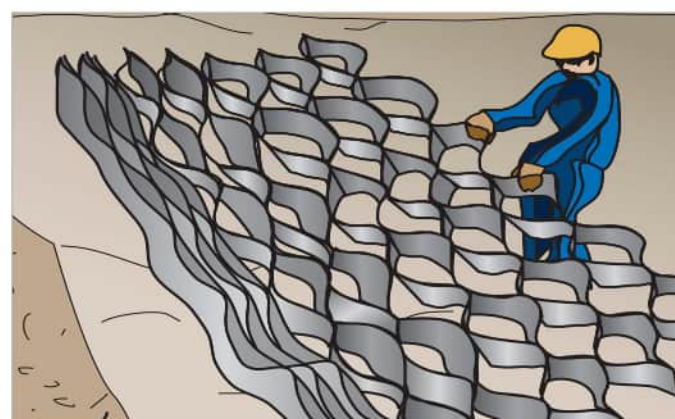
2 Compact subgrade as specified.



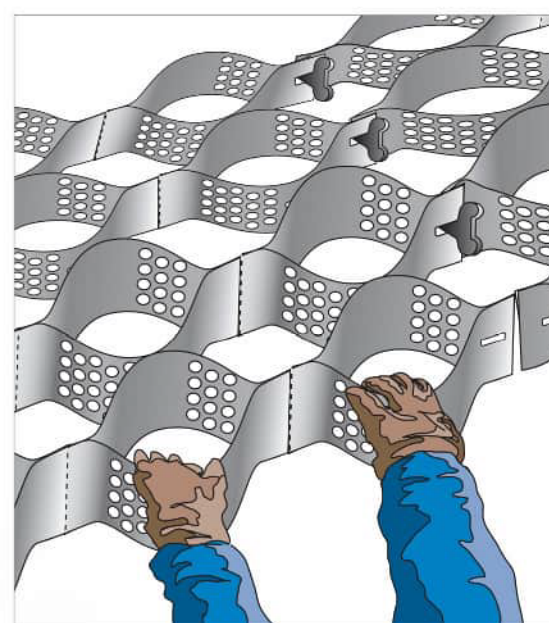
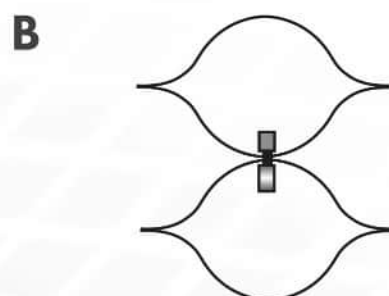
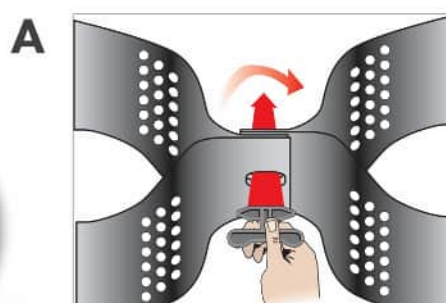
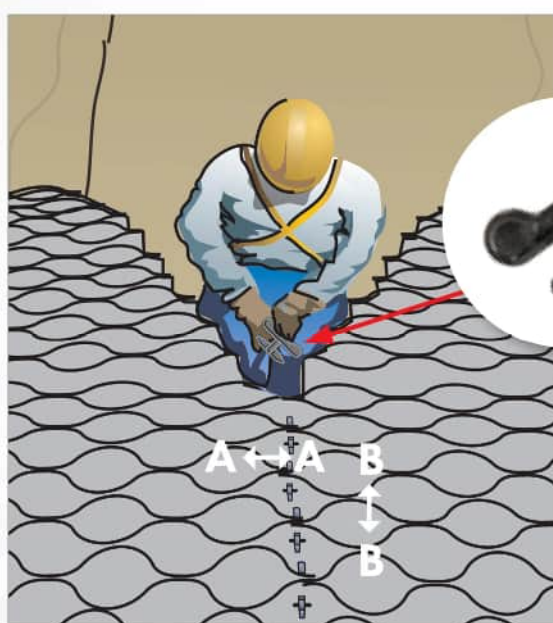
3 Install geotextile (per manufacturer's recommendations including overlaps).



4 Partially expand GEOWEB sections.



5 Connect GEOWEB sections with ATRA® Keys. Connect side-to-side (A) and end-to-end (B).



IMPORTANT NOTE:

The simplified installation guide provided by Presto Geosystems is intended as a general guideline only. The contractor shall follow contract plans and specifications and refer to detailed installation guidelines for more information: See www.prestogeo.com/installation

- 6 Hold sections open. Use Options A, B, C or D.

A T-Bars



B ATRA® Anchors or Speed Stakes



C Wood Stakes



D Infill Select Cells



- 7 Infill GEOWEB® cells. Limit drop of infill to prevent panel distortion.



- 8 Spread infill.



- 9 Compact infill as specified.



Detailed installation guidelines at: www.prestogeo.com/installation

MATERIAL LIST

ATRA® ANCHORS



ATRA KEY



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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