JM Sorge, Inc.
environmental consultants

57 Fourth Street, Somerville, NJ 08876-3235
(908) 218-0066 • Fax (908) 218-9185
www.jmsorge.com

May 6, 2019

Via e-mail: Michael.Kilmer@dec.ny.gov

Mr. Michael Kilmer
Project Manager
NYSDEC, Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, NY 12561

Re: Addendum to Remedial Action Work Plan
70 Nardozzi Place
New Rochelle, New York
Section 2, Block 564, Lot 2
JMS Project # 2015.191

Dear Mr. Kilmer:

JM Sorge (JMS), on behalf of 70 Nardozzi LLC (c/o Simone Development Companies), is submitting this slightly modified capping plan for the 70 Nardozzi Place site (Site) (Figure 1). The Site is under the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) and is subject to Brownfield Cleanup Agreement Index No. C360159-09-17.

Since the original Remedial Work Plan ("RWP") was approved by the Department in October 2018, additional details have been finalized regarding the proposed site remediation and updated figures have been prepared, as discussed below. In addition, a modification to a portion of the cap design is proposed for NYSDEC approval. The modification is required to reduce the future risk of cap erosion on certain steep sloped areas of the site. We have also provided additional clarification regarding the specifications for the clean fill for the vegetated areas of the site to ensure that any soil imported meets NYSDEC specifications.

The Property is being developed as a public works storage and maintenance yard on the first level, with retail and associated parking on the second floor. The Property consists of approximately 3.4 acres that is undeveloped within a commercial area of New Rochelle, NY. Remedial investigation results confirm that the Site is impacted with metals and polyaromatic hydrocarbons from historical filling operations. The approved RWP includes a remedy consisting of a site wide cap and sub-slab depressurization system with institutional controls.

Initial site grading and site (slope) stabilization activities are underway at the site. Due to the steepness of the slope in one area, several engineering designs were evaluated to install the soil/vegetated cap approved for that portion of the site. Given the excessive slope, the current cap design would result in a high risk of erosion and cap failure. An alternative design which is

equally or more protective than the original design is proposed. Further, the current design is more stable and hence less prone to slope stability failure. Therefore, this RWP modification proposal has been prepared using the alternate design for the excessive slope area.

Existing Approved Cap Design

The approved RWP called for the entire site will be capped with at least 12 inches of capping material. The majority of the Site will be capped with crushed stone and asphalt or concrete to construct the parking areas and roads or crushed stone and a concrete slab to serve as the building footprint. The remainder of the Site, a small portion of the southern portion of the Property and a narrow area along the western property boundary, are designed to be capped with clean fill and landscaped. The original proposed capping plan from the RWP is illustrated on Figures 2 and 3.

To facilitate the capping of the impacted material, the Site is being cleared and graded. As noted in the RAWP, site soil/fill material will be "cut and filled" to balance the Site to the design grades.

The cap in the southern portion of the site was designed to:

- Prevent direct contact with contaminated soil
- Prevent migration of soil contamination via surface water runoff and sedimentation.

Cap Design Alternatives

As currently designed and approved, site engineers have determined that, due to the excessive slope, the current design will be prone to erosion failure and therefore represent a risk of exposure to the impacted soils below. Since the stream is located near the base of this area any sloughing of underlying impacted soil could result in an adverse impact to the stream. As indicated, the proposed alternate cap would be more stable and thus be more protective of site users and the stream.

The Clean Soil Cap Areas are illustrated on Figure 4. The southern portion of the site where the 1-foot clean soil cap was proposed and approved is a 0.38 Acre area as shown on Figure 2. The area of most concern is the 0.14 acre in the farthest southwest corner of the site, as shown in green (Area A) on Figure 4.

Any alternate cap design will need to allow for infiltration, erosion protection, as well as constitute a physical barrier to prevent contact with the impacted site soil. Several options were evaluated to determine an approach that would be effective and substantially equally protective.

Option 1: Modify the degree of the slope to less than the current 1:1 slope

This would require grading the slope; however, there is insufficient area to extend the toe of the slope. In addition, access to this area of the site is limited and precludes access with the equipment necessary to regrade the slope.

Option 2: Installing stepped retaining walls

This option would require significant disturbance to the existing slope and, as above, access to this area with the equipment needed for this significant construction effort is not feasible/practical. The construction of a large physical barrier will add significant additional cost and time to complete the project and would reduce the areal extent of permeable area for infiltration of precipitation, increasing run-off into the stream.

Option 3: Alternate slope stabilization engineering cap construction

Several slope stabilization pre-manufactured materials are available for slope stabilization, which would meet the requirements in this portion of the site. The alternative evaluated would utilize an engineered Geo-Cell system to stabilize and prevent erosion. Further details and specifications are provided in the next section. This approach is well documented, proven effective, and provides a more protective barrier than a soil cap along. Additional details regarding the specific alternative proposed are provided in the next section.

Alternative Cap Selection

Based on the above engineering evaluation, Nardozzi is recommending use of an engineered system as discussed under Option 3. The proposed system is a more robust slope stabilization approach using an engineered geo-cell system on the slope. The system includes a geo-cell system network of 3D interconnected cells where infill is confined and resistant to movement. The cells are 6 inches thick and are constructed of High-Density Polyethylene (HDPE) to be filled with gravel or soil (depending on site requirements). In the case of the Nardozzi site, the engineers have recommended that the grids are filled with 6 inches of clean topsoil and then hydroseeded. The system allows for vertical infiltration of precipitation as well as down slope water migration. The system is secured at the top of the slope and at several locations across the slope (dependent of specific site soil conditions).

Specifications and installation information are included in Attachment A.

The proposed alternate cap would cover approximately 0.14 acres of the site as shown in green (Area A) on Figure 4. The net cap thickness would be reduced from 1 foot to geo-cells with an installed depth of a minimum of 6 inches. Give the greater resistance to sloughing and erosion, the integrity of the alternate cap would be more sustainable and, therefore, this cap would be more protective of site users and the adjacent stream.

Demarcation Layer

Per the DER-10 Section 4.1, a demarcation layer will generally be provided for soil covers and NYSDEC approval is required to dispense with this demarcation layer. As all of the topsoil

comprising the cap in Soil Cap Area A, is installed within the Geo-Cell material, this material provides a clear demarcation between the topsoil cap and the site soils. Therefore, the proposed cap construction in this area does not include the installation of a demarcation layer.

No demarcation layer is proposed for Areas B and C.

Clean Fill Specifications

The specifications for the clean fill to be used to construct the cap in the vegetated areas of the site was not clearly defined within the original RWP. Therefore, the following is proposed in accordance with the DER-10.

Clean stone fill, as subbase for asphalt and concrete areas, will be virgin quarry derived material/stone. The particular stone type will be determined by engineering/structural requirements. The imported material will be approved by the site engineer. Imported fill source information and a ***Request to Import/Reuse Fill or Soil form*** will be forwarded to DEC for review and approval. Copies of manifests documenting the source and volume of the imported material will be included in the Final Engineering Report.

Clean soil/topsoil to construct the cap in the southern portion of the site (Areas A and B), as well as the limited additional areas along the top of the western slope (Area C), as shown on Figure 4, will be approved by the engineer and DEC prior to import to the site. A ***Request to Import/Reuse Fill or Soil form*** will be completed and provided to DEC prior to import to the site.

To document the quality of the clean soil, representative samples will be collected and analyzed at a frequency in accordance with Table 5.4(e)10 of DER-10 (copy included in Attachment B). The approximate volume of soil anticipated to be required to cap the western and southern portions (Areas B and C) to 1 foot and the far south (Area A) to 6-inch thickness, approximately 750 to 800 CY of soil will be required. Based on the anticipated soil import volume, 6 grab samples for VOC and 2 composites (3-5 discrete samples per composite) for SVOC, PCBs, pesticides, and metals analysis will be required.

Samples will be analyzed by a NYSDEC certified laboratory / ELAP-accredited laboratory. The specific compound list will be, at a minimum, from DER-10 Appendix 5 Allowable Constituent Levels for Imported Fill or Soil Subdivision 5.4(e) (copy included in Attachment B). The results will be compared to the DER-10 Appendix 5 Allowable Constituent Levels for Imported Fill or Soil Subdivision 5.4(e) for Commercial Use.

Sampling results will be provided to DEC for review and approval prior to use on the site. Copies of manifests documenting the source and volume of the imported material will be included in the Final Engineering Report.

If you have any questions regarding the investigations or details included herein, please call me at (908) 218-0066 ext. 119 or via email at akokorsky@jmsorge.com.

Sincerely,

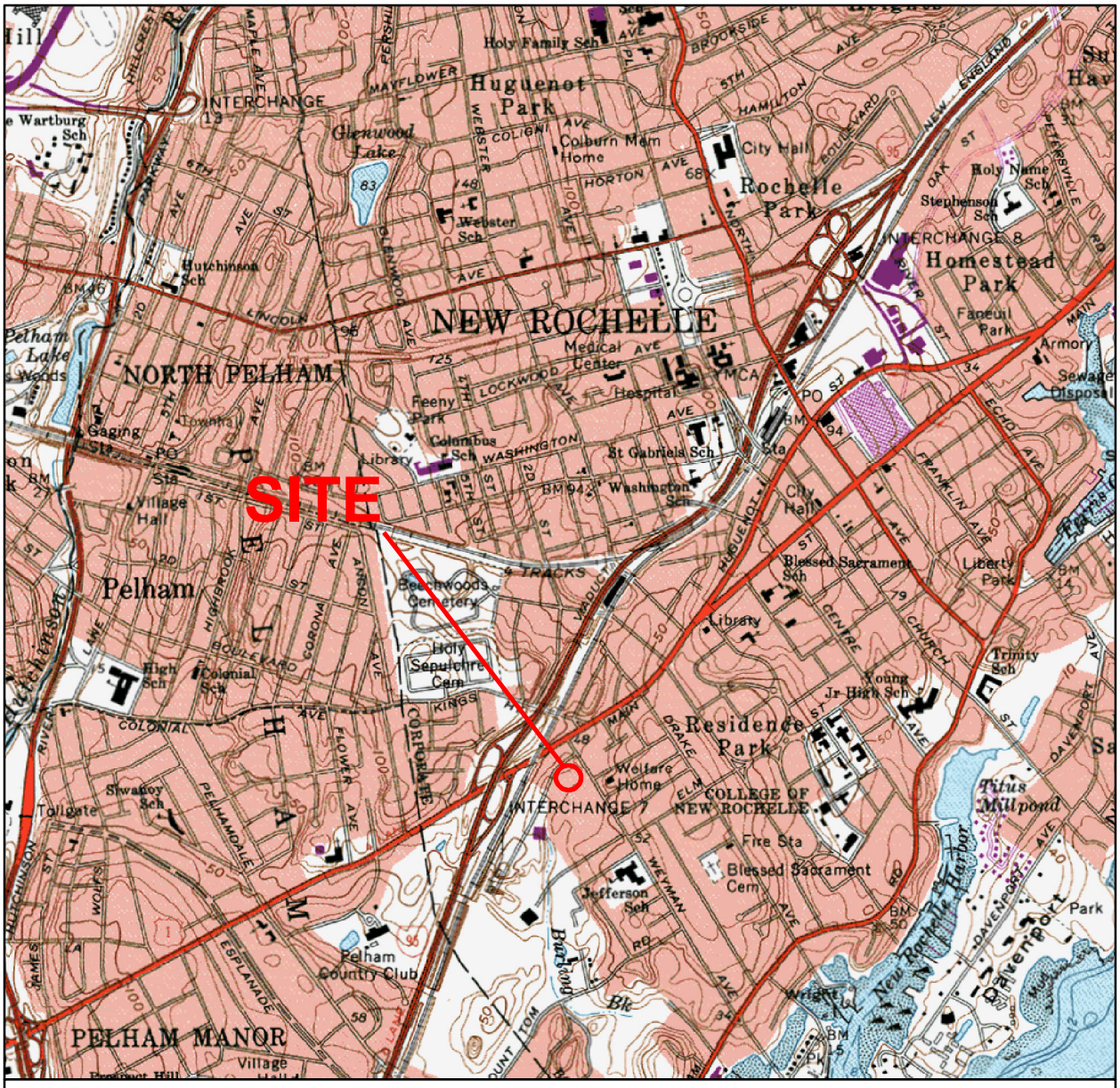
Alison Kokorsky
Senior Project Manager

Cc (via email)

John Faltings (70 Nardozzi LLC / G&S Investors)
Steve Klaiman (70 Nardozzi LLC / G&S Investors)
Mark A. Chertok (Sive, Paget & Riesel P. C.)
Jennifer Coghlan, Esq. (Sive, Paget & Riesel P. C.)
Joseph Sorge, JMS
Timothy Lavin, Dresdner Robin

Enclosure(s): Figure 1- Site Location Map
Figure 2- Original approved cap plan
Figure 3 - Original approved cap section
Figure 4 - Proposed cap map - location and cross-section
Attachment A - Material specifications for GeoWeb
Attachment B – Clean Material Import Specifications

FIGURES



SOURCE:
U.S.G.S 7.5
MINUTE SERIES
MOUNT VERNON
QUADRANGLE, NJ

N

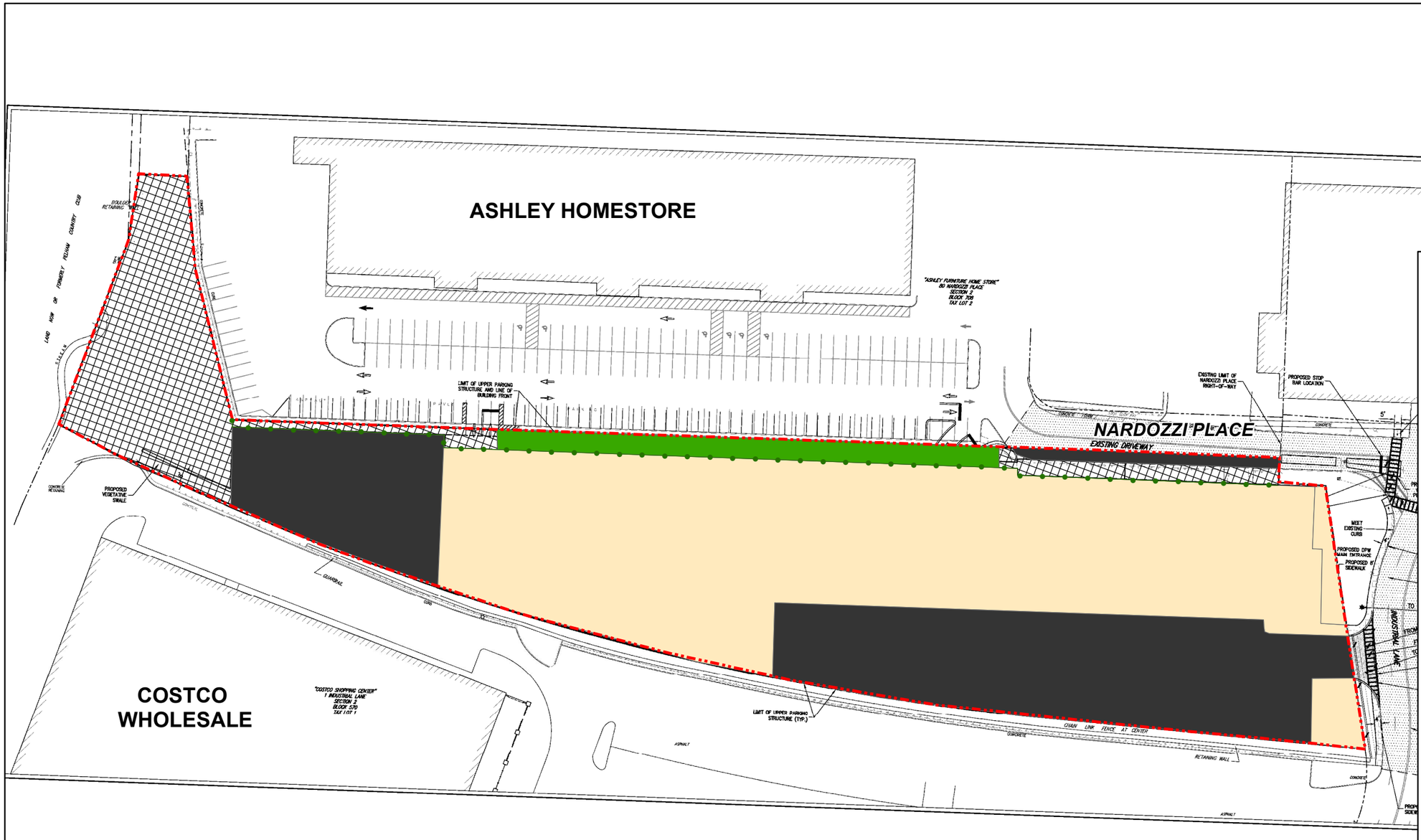
scale = 1 : 24,000

SITE LOCATION MAP

GSI NEW ROCHELLE
BLOCK 564, LOT 2
80 NARDOZZI PLACE
NEW ROCHELLE, NEW YORK

PREPARED FOR
G & S INVESTORS

Date: 12/8/2016	JMS # 2015.191.001
JM SORGE, INC.	FIGURE 1



Legend

Site Boundary

Proposed Capping Description

- Minimum 12 inches Clean Fill
- Minimum 12 inches Asphalt & Subbase
- Minimum 12 inches Concrete & Subbase
- Bioretention Area
- Steel Sheet Pile Wall

NOTES:
1. This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by the NJDEP and is not State-authorized.

2. Property Boundaries are approximate. The borders are based on tax maps provided by NJGIN.

N

0 40 80 160
Feet

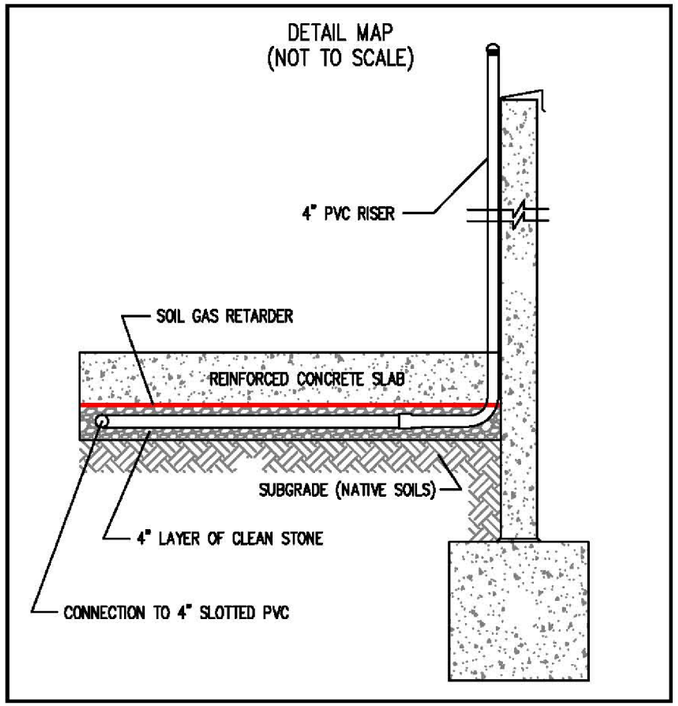
PROPOSED CAPPING PLAN

70 NARDOZZI LLC C/O SIMONE DEVELOPMENT COMPANIES
SECTION 2, BLOCK 564, LOT 2
70 NARDOZZI PLACE
NEW ROCHELLE, NEW YORK

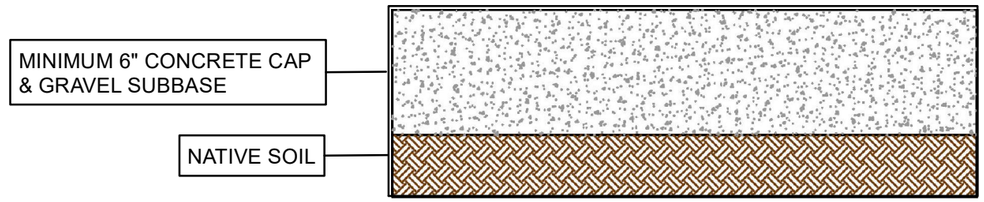
PREPARED FOR
G & S INVESTORS

Date: 8/8/2018	JMS # 2015.191.012
JM SORGE, INC.	FIGURE 2

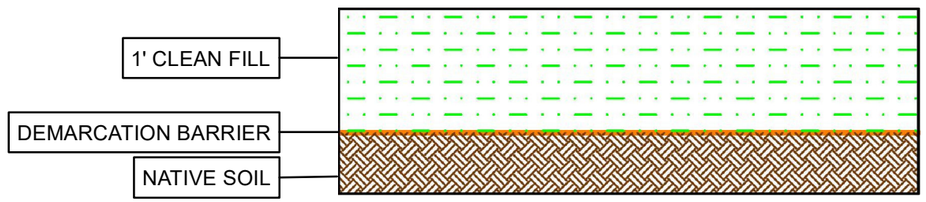
CONCRETE VENTING SYSTEM



CONCRETE CAP



LANDSCAPED CAP WITH DEMARCATION BARRIER

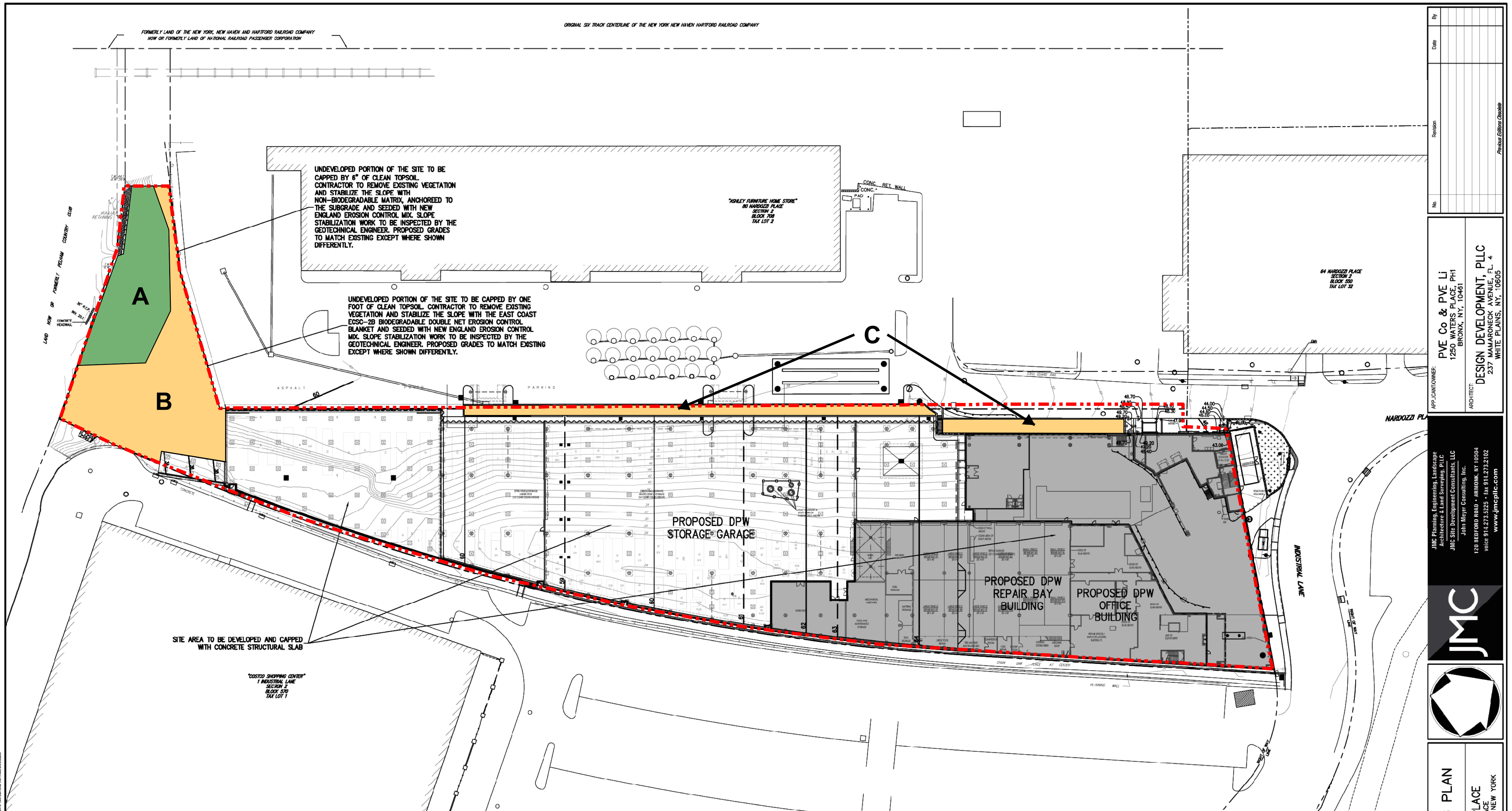


PLANS AND DETAILS

GSI NEW ROCHELLE
70 NARDOZZI PLACE
NEW ROCHELLE, NEW YORK

PREPARED FOR:
G & S INVESTORS

Date: 4/24/2017	JMS # 2015.191.009
JM SORGE, INC.	FIGURE 3


UNDEVELOPED PORTION OF THE SITE TO BE CAPPED BY 6" OF CLEAN TOPSOIL. CONTRACTOR TO REMOVE EXISTING VEGETATION AND STABILIZE THE SLOPE WITH NON-BIODEGRADABLE MATRIX, ANCHORED TO THE SUBGRADE AND SEEDED WITH NEW ENGLAND EROSION CONTROL MIX. SLOPE STABILIZATION WORK TO BE INSPECTED BY THE GEOTECHNICAL ENGINEER. PROPOSED GRADES TO MATCH EXISTING EXCEPT WHERE SHOWN DIFFERENTLY.
UNDEVELOPED PORTION OF THE SITE TO BE CAPPED BY ONE FOOT OF CLEAN TOPSOIL. CONTRACTOR TO REMOVE EXISTING VEGETATION AND STABILIZE THE SLOPE WITH THE EAST COAST ECSC-2B BIODEGRADABLE DOUBLE NET EROSION CONTROL BLANKET AND SEEDED WITH NEW ENGLAND EROSION CONTROL MIX. SLOPE STABILIZATION WORK TO BE INSPECTED BY THE GEOTECHNICAL ENGINEER. PROPOSED GRADES TO MATCH EXISTING EXCEPT WHERE SHOWN DIFFERENTLY.
A
B
C
PROPOSED DPW STORAGE GARAGE
PROPOSED DPW REPAIR BAY BUILDING
PROPOSED DPW OFFICE BUILDING
SITE AREA TO BE DEVELOPED AND CAPPED WITH CONCRETE STRUCTURAL SLAB
INDUSTRIAL LANE
SOIL CAPPING PLAN
70 NARDOZZI PLACE
CITY OF NEW ROCHELLE, NEW YORK
DESIGN DEVELOPMENT, PLLC
PVE Co & PVE Li
JMC

SYMBOL	DESCRIPTION	CAPPED AREA (ACRES)	PERCENT OF TOTAL SITE	LEGEND
A	6" SOIL CAP	0.14	4.13	
B	12" SOIL CAP	0.24	6.94	
C	12" SOIL CAP			
	CONCRETE SLAB	3.08	88.93	

Table: SOIL CAPPING AREA TABLE

A

6" CLEAN SOIL WITH GEOWEB CONTAINMENT (STABILIZED WITH VEGETATION)

NATIVE SOIL

B & C

1' CLEAN FILL/TOPSOIL (STABILIZED WITH VEGETATION)

NATIVE SOIL

CONCRETE SLAB

MINIMUM 6" CONCRETE CAP & GRAVEL SUBBASE

NATIVE SOIL

PROGRESS PLOTTING

SCP-1

NOT FOR CONSTRUCTION

Legend

Property Boundary

NOTES:
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2. Property Boundaries are approximate. The borders are based on tax maps provided by NJGIN.

N

0 50 100 200 Feet

PROPOSED CAPPING PLAN

70 NARDOZZI LLC C/O SIMONE DEVELOPMENT COMPANIES
SECTION 2, BLOCK 564, LOT 2
70 NARDOZZI PLACE
NEW ROCHELLE, NEW YORK

PREPARED FOR
G & S INVESTORS

Date: 5/1/2019	JMS # 2015.191.012B
JM SORGE, INC.	FIGURE 4

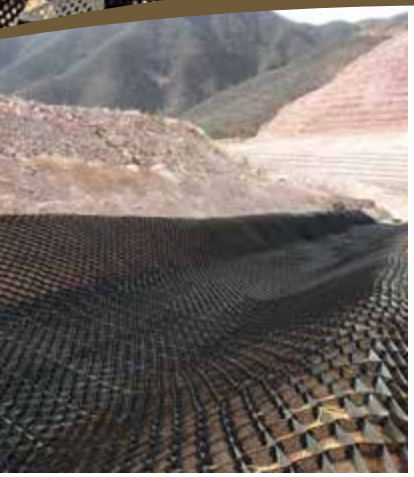
ATTACHMENT A

PRESTO | GEOSYSTEMS®

GLOBAL LEADER • GLOBAL PARTNER

GEOWEB®

Soil Stabilization System



The Most Complete Geocell System

HDPE GEOWEB®

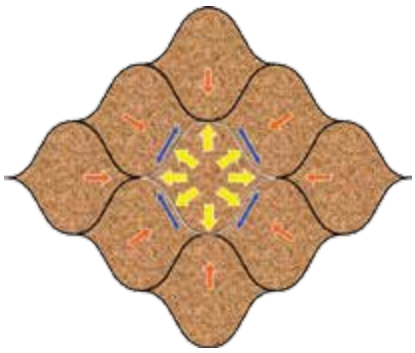
STRENGTH AND FLEXIBILITY PERFECTED.

For the most advanced soil stabilization technology today, rely on the world's most proven and strong HDPE geocell system—GEOWEB®—for solving challenging soil stability problems.

GENUINE GEOWEB®

ADVANCING GEOCELL TECHNOLOGY

Presto Geosystems® introduced the 'geocell' soil confinement technology to the civil market in the late 1980s and continues to develop more applications and features to solve soil stability challenges in load support, slope & channel protection, and wall solutions.



GEOWEB® WORKS

HIGH DENSITY GIVES HIGH PERFORMANCE

The technology of cellular confinement is powerful, yet simple. Through a network of 3D interconnected cells, infill is confined and resistant to movement. The GEOWEB® system 'transforms' infill through confinement—providing strength and stabilization to cohesionless soils for a host of applications—from roadways to steep embankments.

PRESTO GEOWEB®
WHAT SETS US APART

FOCUSED ON INNOVATION

We respond to the industry's need for stronger designs and faster installations through ongoing testing and research. The result is product advancements and innovative, integral system accessories that offer completely engineered solutions. **The GEOWEB® system is the only geocell to offer a complete design and construction solution.**

WE KNOW GEOCELLS

Product performance and reliability have been the foundation of the GEOWEB® product's success since inception in the early 1980s. Engineers across the globe have collaborated with us on thousands of design solutions. The experience gained from so many installations in challenging applications and soil environments translates to value on each and every project. **We simply offer experience that no other manufacturer can provide.**

VIRGIN HDPE IS BEST

Presto's GEOWEB® system is only made with the best quality virgin High Density Polyethylene (HDPE) material. Why HDPE? HDPE delivers a **perfect balance of strength and flexibility**—as well as consistent performance characteristics allowing it to withstand the most demanding project applications. GEOWEB® 3D HDPE geocells offer assurance that can only come with a 35-year proven track record simply not offered by other fabric-based or blended and recycled polymer materials. HDPE is the most accepted and proven cellular confinement material for a reason—**HDPE GEOWEB® geocells are proven to work.**

PROVEN & ACCREDITED QUALITY

To ensure our customers receive the highest, consistent quality each and every time, we manufacture the GEOWEB® system to ISO and CE quality standards. Consistent weld strength and maximum seam strength are critically important to system performance.

We are committed to our quality programs.

- ISO 9001:2015 International/Standards
- CE marking based on conformance with EU harmonized standards

RESEARCH-BACKED DESIGN METHODOLOGY

With design modeling tools developed from our research, and product-leading advancements, we offer engineers unique design options to solve site challenges not available with other systems.

Our **free project evaluation** is a value service offered to ensure projects are designed to perform. We offer certainty—backed by performance testing.

LARGEST NETWORK OF LOCAL SUPPORT

Our knowledgeable distributors and representatives are well trained and ready to support each project. They provide general and technical presentations to engineers. They support local contractors at pre-construction meetings and with training—even on-site installation support. **Our network is the largest and most knowledgeable in the industry.**

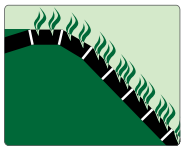
GEOWEB® APPLICATIONS

The 3D GEOWEB® system is suitable for a variety of applications to solve soil stability problems and to deliver more economic solutions than conventional materials.

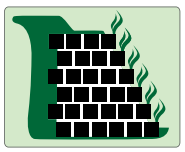
FOUR KEY GEOWEB® APPLICATIONS

The GEOWEB® system is a versatile solution for a wide range of site applications:

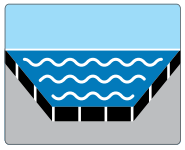
LOAD SUPPORT



SLOPE PROTECTION



RETAINING WALLS



CHANNEL SUPPORT

ECO-FRIENDLY & ECONOMICAL

Presto's GEOWEB® system minimizes environmental impact and offers cost-effective means for creating sustainable, long-term solutions that hold up over time.

- Reduced life-cycle costs
- Sustainability
- Environmentally friendly
- Aesthetically pleasing

INFILL OPTIONS

Infill type varies from vegetation to aggregate and hard-armored concrete.

MARKETS & INDUSTRIES

We partner with engineers, architects, contractors and owners around the globe. Our solutions solve soil challenges in diverse areas of site construction.

INFRASTRUCTURE
General Site Construction

MINING
Site Access/Haul Roads
Slope Reclamation
Channel Armoring
Basin Containment
Tailings Containment

OIL & GAS
Site Access Roads
Oil Pads / Work Platforms

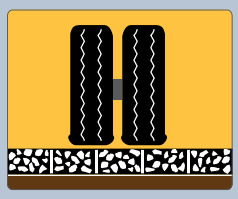
RAILROAD & INTERMODAL
Ballast Reinforcement
Bridge Approaches, Crossings, Diamonds
Intermodal & Port Stabilization
Embankment & Channel Protection

STORMWATER & WASTEWATER
Stormwater Conveyance Channels
Basin Containment
Geomembrane Protection

TRANSPORTATION
Unpaved Access Roads
Roadbase & Shoulder Stabilization
Embankment Stabilization
Stormwater Channels

UTILITIES & ELECTRICAL TRANSMISSION
Maintenance Roads
Transmission Substations

WIND ENERGY
Access Roads
Staging Areas



System Components

ATRA® Key Connection

APPLICATIONS:

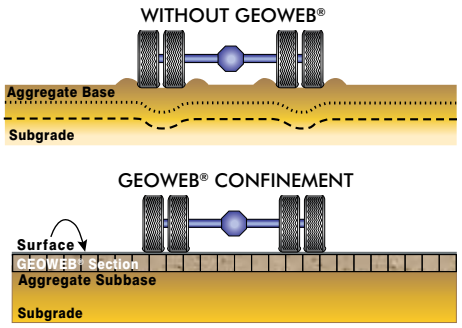
Site Access Roads
Oil Platforms
Mine Haul Roads
Road Shoulders
Intermodal Yards
Port Facilities
Permeable Parking Areas

UNPAVED GEOWEB® LOAD SUPPORT

ROADS, SHOULDERS & PERMEABLE PAVEMENTS

Unstable surface problems for access roads, road shoulders and pavement areas can be restored with the GEOWEB® system. The 3D structural system with confined infill creates a stable pavement layer designed to support frequent and heavy traffic. Maximum benefit can be gained where soft soils are present, where inexpensive quality infill is unavailable or where traditional reinforcement methods are difficult to construct.

With permeable infill, the system becomes a low-environmental impact porous pavement that reduces stormwater runoff, and performs like a stormwater 'basin' storing stormwater for natural infiltration.



STABILIZING FILL MATERIALS WITHIN THE 3D GEOWEB® SYSTEM:

- controls shear, lateral and vertical movement.
- increases the effective structural number, reducing fill requirements and costs by 50%.
- allows lower-quality, less costly on-site infill materials.
- significantly minimizes surface rutting and maintenance requirements.

COMPARED TO PLANAR GEOGRID SYSTEMS:

The GEOWEB® system delivers advantages compared to geogrids, especially in soft-soil areas. The benefit with the 3D GEOWEB® system is immediate and works on the principal of hoop strength. Geogrids require tension to activate, initiated by partial deformation.

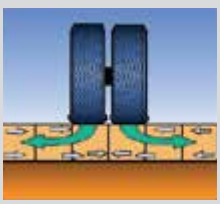
GEOWEB® OUT-PERFORMS GEOGRIDS:

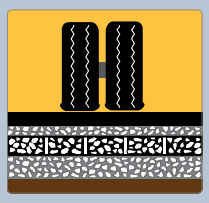
- requires less aggregate depth
- uses locally-available fill (even sand)
- protects from rutting
- offers faster cycle times
- stabilizes the whole pavement layer
- creates a load-bearing porous pavement

RESULTS SUPPORTED BY RESEARCH

Test results from numerous research initiatives confirm the benefits of confined aggregate within the GEOWEB® system vs. unconfined aggregate.

- Reduces thickness and weight of structural support elements by **50 percent or more.**
- Allows subgrade materials to **withstand more than 10 times** the number of cyclic-load applications before accumulating the same amount of permanent deflection.
- Provides **over 30% stress reduction** when supporting aggregate under pavement.





System Components

ATRA® Key Connection

APPLICATIONS:

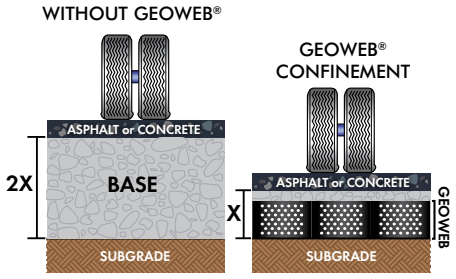
Pavement Base Stabilization
Drainage Layer
Rail Ballast Reinforcement

PAVED GEOWEB® LOAD SUPPORT

STABILIZATION UNDER ASPHALT OR CONCRETE SURFACES

A stabilized load-supporting base layer under asphalt, concrete or modular block pavements is created with the GEOWEB® system that holds up under heavy, repeated traffic. Infill material type and depth is determined by anticipated load characteristics and overall performance requirements.

Base stabilization with the GEOWEB® system is especially effective in soft-soil areas with chronic pavement problems and regular maintenance costs.

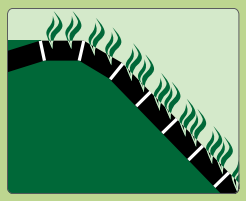


STABILIZING BASE MATERIALS WITHIN THE 3D GEOWEB® SYSTEM:

- reduces base materials by 50% or more.
- minimizes load-related deformation and settlement, and reduces pavement degradation and cracking common with soft subgrades.
- allows the use of lower quality granular infill, even over soft subgrades.

OVER-EXCAVATION ALTERNATIVE

When faced with unsuitable soils requiring full depth removal, the GEOWEB® system is also an over-excavation alternative—significantly reducing excavation.



System Components

ATRA® Key Connection

If Required: Anchors, Tendons & ATRA® Tendon Clip Load Transfer Support System

APPLICATIONS:

Cut or Fill Embankment Slopes
Shoreline Revetments
Abutment Protection
Landfill Linings & Covers
Stormwater Basins
Wastewater Lagoons
Dikes and Levees
Dam Faces & Spillways

GEOWEB® SLOPE PROTECTION

SLOPE & SHORELINE EROSION CONTROL & ARMORING

A stable environment for embankment materials is created by the 3D GEOWEB® system. The 3D structure prevents severe erosion problems and offers deep earth solutions not delivered by 2D surface treatments. Benefits of 3D GEOWEB® confinement include long-term sustainability, reinforcement of the upper soil layer and resistance to erosive conditions and sliding forces.

Soil confinement allows embankments to be designed steeper than when material is unconfined, reducing use of valuable land space.

SUSTAINABLE VEGETATION:

The system reinforces vegetation and increases the resistance to erosive forces with deep in-soil protection.

PERMEABLE AGGREGATE:

Confinement in the GEOWEB® structure allows smaller, less-expensive aggregate to be used on steeper slopes than when unconfined.

HARD-ARMORED CONCRETE:

With concrete infill, the GEOWEB® system is a less costly, flexible alternative to articulating block systems or bag systems.

GEOMEMBRANE PROTECTION:

The system offers effective cover protection for impervious geomembranes. A tendoned-anchoring system offers structural support and protects the integrity of the liner.

Designed for additional stability by integrating tendons on steeper slopes or when a geomembrane or hard soil/rock surface prevents anchoring with stakes.

System Components
ATRA® Key Connection

If Required:
Anchors, Tendons & ATRA® Tendon Clip Load Transfer Support System

APPLICATIONS:
Swales & Drainage Ditches
Stormwater Diversion or Containment
Process Water Channels
Containment Spillways

GEOWEB® CHANNEL PROTECTION
CHANNEL EROSION CONTROL & ARMORING STORMWATER CONVEYANCE; RIP RAP REPLACEMENT

Channels exposed to erosive conditions can be designed with the GEOWEB® system and appropriate infill to withstand even the highest velocities. Designed to resist hydraulic stresses of intermittent or continuous high-flow channels.

VEGETATED CHANNELS:

Replaces costly rip-rap with more attractive, more economical, and lower-maintenance single or tiered vegetated systems. Effective in low-flow and low-to-high intermittent channels.

With a TRM, the vegetated GEOWEB® system can withstand velocities as high as **30 ft/sec (9 m/sec)** and 16 psf shear stresses. Ideal for drainage ditches, swales and stormwater channels.

GEOWEB® CHANNEL RESEARCH RESULTS

- The GEOWEB®/TRM system withstands 30 ft/sec (9 m/sec) velocity flow.
- Doubles resistance to shear stress and velocity for TRMs and ECBs.
- Reduces rip rap sizing by up to 10 times.

HARD-ARMORED CHANNELS:

Aggregate Protection

Aggregate confined in the GEOWEB® system is far more stable than when unconfined. Compared to larger rip rap that is expensive and difficult to handle, GEOWEB® channels allow smaller, more economical rock fill—even waste rock—to be used in low-to-challenging flow conditions.

Concrete Protection

Concrete-filled GEOWEB® channels are ideal where conditions create severe hydraulic stresses. Concrete is poured into the GEOWEB® system onsite, creating an easy-to install, flexible—yet hard-armored system more economical than pre-formed concrete systems. Exact concrete depths are assured with no chances for "over pours" or "under pours".

System Components
ATRA® Key Connection

APPLICATIONS:
Reinforced Slopes
Gravity Walls
Reinforced Retaining Walls
Multi-Layered Channel Systems

GEOWEB® RETAINING WALLS
NATURALLY-VEGETATED EARTH RETENTION STRUCTURES

GEOWEB® Retaining Walls create natural aesthetics through vegetation in the outer fascia. The system's inherent flexibility benefits projects with challenging site conditions such as soft subgrades, difficult access and space constraints. GEOWEB® walls may be designed as either gravity or reinforced retaining walls.

STRUCTURAL BENEFITS

The GEOWEB® system creates economical and structurally sound retaining walls that perform well when exposed to differential settlement in soft-soil environments. GEOWEB® retaining walls have been exposed to severe earthquakes without sustaining damage.

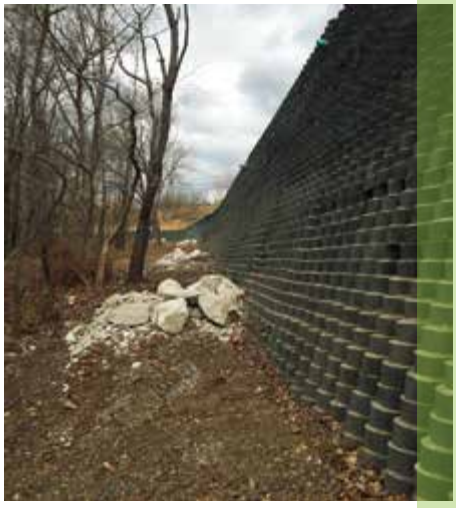
ECONOMIC BENEFITS

- Allows use of less expensive on-site infill materials.
- Faster installation than MSE block walls speeds project completion timeline.
- Compact sections are easier to handle, transport and construct—even in difficult access or remote locations.

FREE DESIGN SOFTWARE
Presto offers licensed MSE software to design GEOWEB® retaining walls and reinforced slopes.

ENVIRONMENTAL BENEFITS

Open-celled horizontal terraces create a natural environment for sustainable vegetation, allow rainwater to collect through the wall fascia and minimize runoff. The highly-permeable wall surface is a natural Low Impact Development (LID)/Best Management Practice (BMP) for reducing runoff and managing stormwater on site.



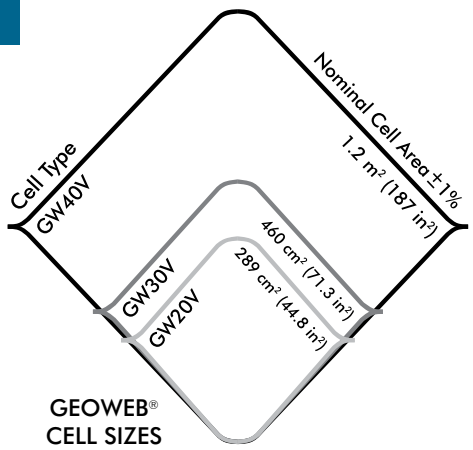
Where vegetation is not desired, GEOWEB® walls support aggregate infill or concrete grout.

GEOWEB® SYSTEM STANDARD SIZES

GEOWEB® sections are available in various cell types and depths, and section lengths to most economically meet project requirements.

Cell Type	Section Width	Section Length Range Cells Long: 18, 21, 25, 29, 34	
	Variable	Minimum	Maximum
GW20V	7.7 ft–9.2 ft (2.3 m–2.8 m)	12.0 ft (3.7 m)	27.3 ft (8.3 m)
GW30V		15.4 ft (4.7 m)	35.1 ft (10.7 m)
GW40V		25.4 ft (7.7 m)	58.2 ft (17.8 m)
Available cell depths	3 in (75 mm), 4 in (100 mm), 6 in (150 mm), 8 in (200 mm)		

Cell size and depth are determined by the details of the application, problem or desired solution. Refer to the GEOWEB® material specification for more information.



GEOWEB® CELL SIZES

DESIGN & CONSTRUCTION ACCESSORIES

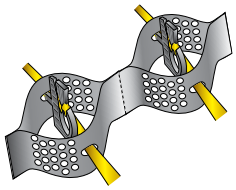
GEOWEB® solutions are designed and installed with our integral components for increased strength, long-term performance, and speed of installation.

Our customers receive the industry's **'most complete geocell system'**.

ATRA® KEY CONNECTION DEVICE

Designed for quicker connection of GEOWEB® sections, the weather and corrosion-resistant ATRA® key device reduces installation costs and provides 3X stronger and 3X faster connections than staples.

ATRA® Keys are inserted through adjoining GEOWEB® cell walls, turned and locked for the most secure connections.



ATRA® TENDON CLIPS & TENDONS

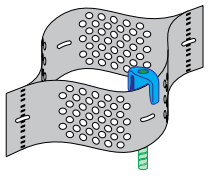
ATRA® Tendon Clips are efficient load-transfer devices to transfer loads from the GEOWEB® cell wall to the tendon. Fully engaged clips allow preassembly.

Tendons suspend the GEOWEB® material over geomembranes, hard surfaces, or steep slopes without anchors. Presto uses industry-leading tendons, as tendon type and density are critical to design strength.

ATRA® ANCHORS & DRIVERS

Contractor-friendly ATRA® Anchors reduce time and material costs during installation of the GEOWEB® system.

- Three styles are available, including corrosion-resistant.
- The ATRA® Driver makes driving anchors easy and fast, and causes less stress on workers.



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March 26, 2019

Doug McCluskey
EJ PRESCOTT
198 Ushers Rd
Round Lake, NY 12151

RE: PR19173 – NEW ROCHELLE (REV 1)
Slope Protection System

Dear Doug:

Presto Geosystems has completed the revision 1 evaluation for the New Rochelle Slope Protection System project, located in New Rochelle, NY. 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 Genuine Geoweb® system. Any use of this evaluation for any product other than that manufactured by Presto Products makes this evaluation invalid.

The objective of this evaluation is to propose a Geoweb cellular confinement system for stabilization of the slope. This evaluation is not applicable to the stability of the slope against a deep-seated failure. It is assumed herein that the slope is stable against failure except for the problem of surface erosion.

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

- Manufacturer Certificate of Analysis. Presto Geosystems manufactures Geoweb, ATRA keys ATRA Stake Clips and ATRA tendon clips in accordance with stringent ISO and CE quality standards. Our quality management system allows Presto 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.

- Design Calculations. The attached calculations are based specifically on Geoweb material characteristics, research/testing and accessories. Our design 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 tendon

clip load transfer device. 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 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, or the local distributor, are available to be be on-site at the beginning of construction to ensure that the Geoweb panels and accessories are installed as the design intended. We are committed to train the Contractor based on our in-depth product knowledge and installation experience. Our past project successes will minimize installation time and issues. As with any material, there are advantageous techniques of installation, which we can offer during our visit.

Design and Materials

It is our understanding that the relevant dimensions of the slope, for the purpose of this analysis, are as follows:

Parameters:

Maximum Slope Angle, degrees	1:1 (45°)
Vertical Height, ft	50 (25 foot lifts)
Slope Length, ft	70
Friction Angle ϕ, degree	28
Infill Type	Topsoil
Infill Weight γ, lbs/ft^3	100
Sub Grade Type	Native
Cohesion, lbs/ft^2	0

GEOSYSTEMS

Based on the evaluation, the following materials are recommended for the Geoweb application.

1. Presto Products Co. Geoweb GW30V6 (6-inch) panels.
2. If required, provide a non-woven geotextile separation layer over the prepared sub grade. Install in accordance with Manufacturer recommendations including overlaps.
3. Connect the Geoweb sections with ATRA® Keys at each interleaf and end to end connection.
4. Provide three, TP-225 tendons per Geoweb section, in rows 1, 4 & 7.
5. Provide an ATRA® Tendon Clip tied to each tendon every 4th cell down the slope.
6. At the midslope point (25 feet above the toe), provide earth anchors with a minimum tension of 3,100 lbs (1,085 lbs/ft x 8.5 ft/panel ÷ 3 tendons/panel) plus the recommended Manufacturer's factor of safety tied to each tendon.
    a. Earth anchor pullout strength shall be determined by the Engineer of Record based on recommended Manufacturer's factor of safety and site soil conditions.
7. At the crest, provide earth anchors with a minimum tension of 3,100 lbs (1,085 lbs/ft x 8.5 ft/panel ÷ 3 tendons/panel) plus the recommended Manufacturer's factor of safety tied to each tendon.
    a. Earth anchor pullout strength shall be determined by the Engineer of Record based on recommended Manufacturer's factor of safety and site soil conditions.
8. Pre-shape the Geoweb system before infill placement.
9. Limit the drop of the infill into the Geoweb panels to prevent distortion.
10. Provide surface protection (hydroseed, erosion control blanket or turf reinforcement mat) over the Geoweb sized for hydraulic conditions to prevent soil washout prior to establishment of vegetation.

Please refer to our website at https://www.prestogeo.com/create-a-spec/ to create a customized specification using SPECMaker® specification development tool. SPECMaker is a quick and easy-to-use online program that lets you develop a customized specification tailored to your specific project application and details. Answer a few questions and you'll create a customized specification within minutes. Then, just save the new CSI-format specification in Word or html format for easy modification. If you have any questions or need any additional information, please call.

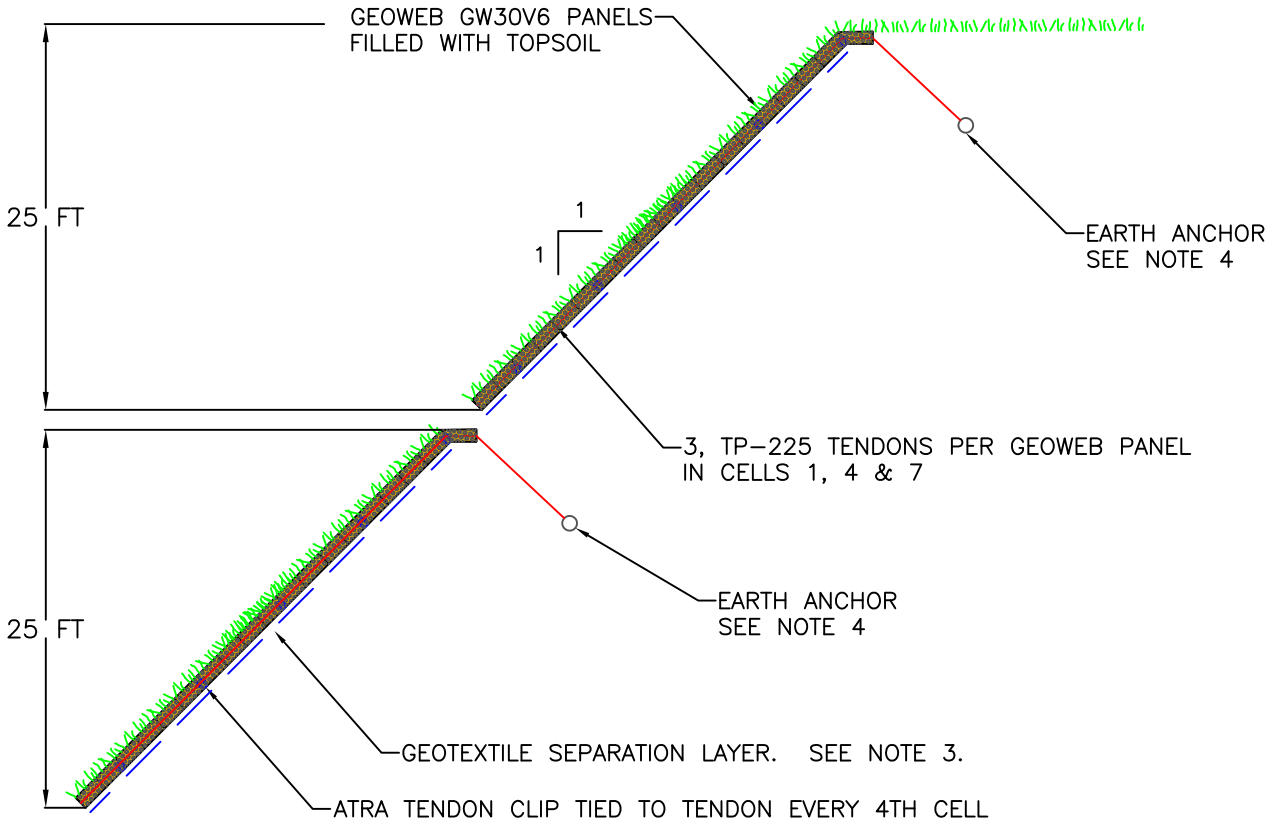
Sincerely,

Sam Justice

Sam Justice, P.E.
Civil Design Engineer
Presto Geosystems

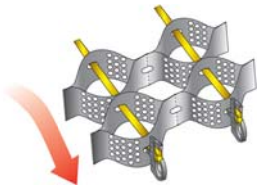
Notes:

1. This evaluation is copyrighted and is based on the use of products manufactured by Presto Products Co. All rights reserved. Any use of this evaluation for any product other than that manufactured by Presto makes this evaluation invalid.
2. The evaluation assumes that the slope is globally stable.
3. If required, provide a non–woven geotextile separation layer and install in accordance with Manufacturer instructions including overlaps.
4. At the midslope point, tie earth anchor to each tendon with a min pull–out resistance of 3,100 lbs (1,085 lbs/ft x 8.5 ft/panel ÷ 3 tendons/panel) plus Manufacturer recommended factor of safety based on site soil conditions, as determined by the Engineer.
5. The Geoweb panels shall be connected with ATRA keys at each interleaf and end to end connection.
6. Limit the drop of infill to prevent distortion of the cell walls.
7. Provide surface protection (hydroseed, ECB or TRM) sized for hydraulic conditions to prevent soil wash–out prior to establishment of vegetation.



ATRA KEY

ATRA TENDON CLIP



INSTALLATION

GEOSYSTEMS

PRESTO® PRODUCTS CO.
670 NORTH PERKINS STREET
APPLETON, WI 54914
920–738–1342
WWW.PRESTOGEO.COM

PR19173 – NEW ROCHELLE (REV 1)
GEOWEB SLOPE PROTECTION

DATE	MARCH 26, 2019	FILE NAME	SHEET 1
SCALE	NTS	SHEET	1 OF 2

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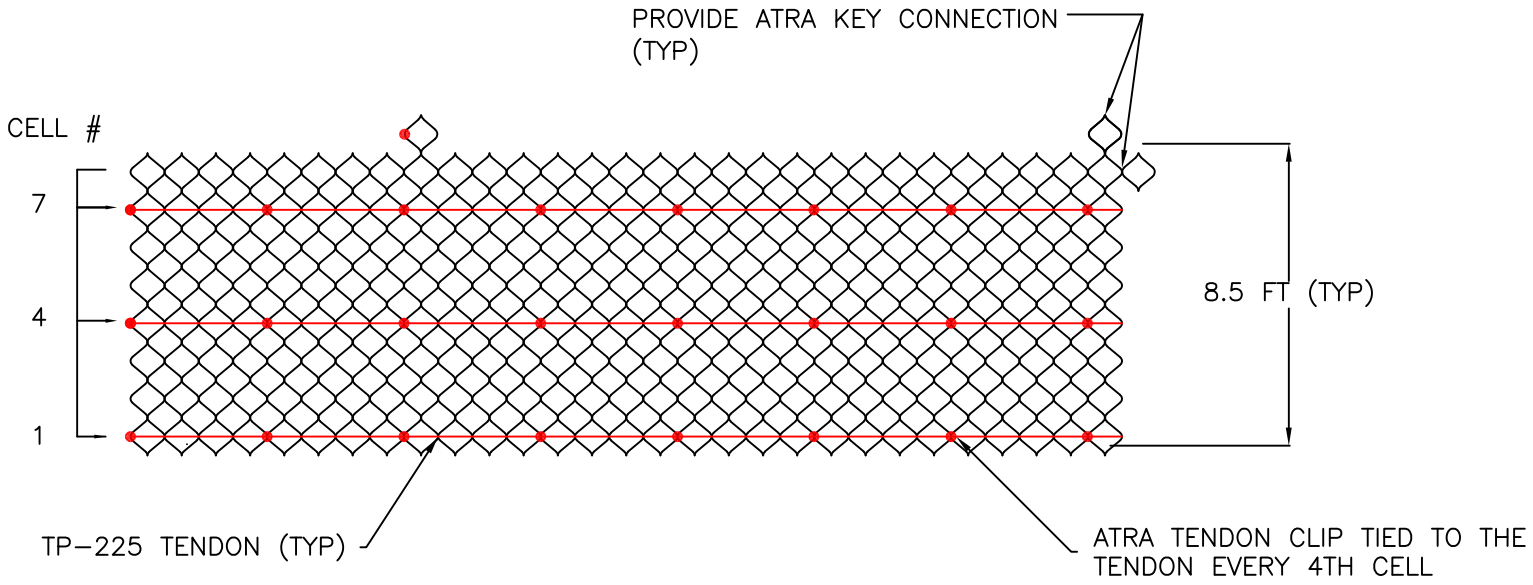
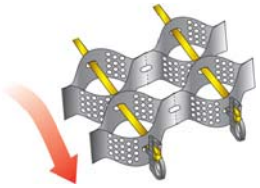


ATRA KEY

ATRA TENDON CLIP



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PR19173 – NEW ROCHELLE (REV 1)
GEOWEB SLOPE PROTECTION

DATE MARCH 26, 2019	FILE NAME SHEET 2
SCALE NTS	SHEET 2 OF 2

PRESTO GEOSYSTEMS

SLOPE PROTECTION SYSTEM
GENUINE GEOWEB®

Project Name: NEW ROCHELLE (REV 1)
Presto Project Number: PR 19173
Date: 3/26/2019

INPUT PARAMETERS

English or Metric (E or M)	E	
Slope Angle	45	Slope (H:V)
Slope Length (ft)	35.36	1.00
Vertical Height (ft)	25	
Minimum Interface Friction Angle (degrees)	28	Between Different Surfaces
Geoweb Cell Type	GW30V	
Web Thickness (in)	6	
Infill type	Topsoil	Infill Weight (lb/ft)
Infill Unit Weight (lb/ft3)	100	1767.8
Additional Cover (in.)	0	Cover Weight (lb/ft)
Cover Unit Weight (lb/ft3)	0	0.0
Design Factor of Safety	1.4	Total Weight (lb/ft)
Toe Load (lb/ft)	0	1767.8
Passive Resistance at toe (Y or N)	No	
Angle of internal friction of soil at toe	0	
Unit weight of soil at toe (lb/ft3)	0	

Calculations

Driving Force (lb/ft)	1,250.00	Weight+Toe Load (Gravity)
Factored Driving Force (lb/ft)	1,750.00	Weight Only
Factored Driving Force (lb/ft)	1,750.00	Weight+Toe Load
Resisting Force (lb/ft)	664.64	Shear Only (Min Between Surfaces)
Passive Earth Force (lb/ft)	0.00	
Available Resistance (lb/ft)	0.00	Geoweb
Factor of Safety	0.53	Shear Only
Maximum Available F.S.	0.81	Shear and Geoweb Seam Strength

ATRA® KEY

Connection Strength	275 lbs/ft

Note: Anchorage pattern is based on the use of ATRA keys for panel to panel connection. If staples or zip ties are used, the anchorage pattern will increase.

ATRA Key
Clickable Spec

ATRA® ANCHOR DETAILS

Net Driving (lb/sqft)	30.70	Factored
Max. Unrestrained GW length (ft)	11.5	Unrestrained

Input Parameters

Length (in)	No Stakes	ATRA Anchor	Spacing (in)
Diameter or Width (in)	0.50		
Downslope spacing (# of cells)	0		0.0
Horizontal spacing (# of cells)	0		0.0
Soil Friction Angle (degrees)	30		
Soil Cohesion (lb/ft2)	0		
Slope Soil Type	Native		
Unit Weight (lb/ft3)	120		
Kp (Coefficient)	0.00		
Buried Anchor Length (ft)	0.00		
Anchor Resistance (lb)	0.00	Single Anchor	
Number of Rows of Anchors	0		
Anchor Resistance (lb/ft)	0.0	Resultant	
Anchor Resistance (lb/ft2)	0.00	Net Resultant	
Resisting Force (lb/ft)	665	Shear plus Anchors	
Anchor density (anchors/ft2)	0.00		
Anchors per Geoweb Section Width	0		
Factor of Safety	No Anchors	Shear and ATRA Anchored Geoweb	

Note: Anchorage pattern is based on the use of ATRA keys for panel to panel connection. If staples or zip ties are used, the anchorage pattern will increase.

ATRA Anchors
Clickable Spec

PRESTO GEOSYSTEMS

SLOPE PROTECTION SYSTEM
GENUINE GEOWEB®

TENDONS

Required Tension (lb/ft)	733	Tendons and Geoweb Tensile	
Required Tension (lb/ft)	1,085	Tendons only	

Input Parameters

Tendon Type	TP-225	Note: Tendons and load transfer device quantity and spacing is based on the use of only ATRA Tendon Clips for load transfer. If substitute devices are used, this analysis is void.	 ATRA Tendon Clip *Clickable Spec*
Ultimate Strength (lb)	5100		
F.S. (Creep)	1.10		
F.S. (Knots)	1.10		
F.S. (Construction damage)	1.10		
F.S. (Chemical/Biological Durability)	1.10		
F.S. (Overall Uncertainties)	1.25	Overall Factor of Safety	1.83
Number of Tendons/GW Section	3		
ATRA Tendon Clip Spacing (no. of cells downslope)	4	Maximum Allowable	4
Tendon Hole Spacing (in)	12.6		
Available Tension/tendon (lb)	2,787		
Average No. of Tendons/slot	0.375		
Available Tension/slot (lb)	1045.0		
Available Tension (lb/ft)	995	OK	
Tendon density (ft/ft2)	0.509	Includes 15% extra for knots and wastage	
Tendon Length per 8.5' Geoweb Section	151	and deadman bury length.	
Atra Tendon Clips/8.5' Geoweb Section	33	Atra Tendon Clip Density (#/ft2)	0.111
Factor of Safety	1.33	Shear and Tendon Anchorage	
Factor of Safety	No Anchors	Atra Anchors and Tendon Anchorage	

CREST/SLOPE ANCHORAGE

Required Anchorage (lb/ft)	1085	

Input Parameters

Horizontal Embedment Length (ft)	0	From Slope Face to Key Trench
Depth Below Crest (in)	0	Crest to Bottom of Geoweb
Slope Angle of Key Trench (degrees)	0	
Depth of Key Trench (in)	0	
Horiz. Length at Bottom of Trench (in)	0	
Soil Unit Weight (lb/ft3)	0	
Soil Friction (degrees)	0	
Available Resisting Force (lb/ft)	0.00	OK
Factor of Safety	0.53	Crest Anchorage and Shear
Factor of Safety	No Anchors	Crest Anchorage and Atra Anchors
Factor of Safety	1.33	Crest Anchorage and Tendons

Limitation of Use:

PRESTO GEOSYSTEMS

GEOWEB® SLOPE PROTECTION SYSTEM
REQUEST FOR PROJECT EVALUATION

For preliminary evaluation, complete this form and email or fax to your Presto Geosystems distributor/representative or Presto Geosystems. Items marked with a * are required to proceed with a preliminary evaluation.

Project Information

*Project Name New Rochelle Slope

*City New Rochelle *State/Province NY *Country USA

Estimated Geoweb® Area 15,000 ☐m² X☐ft²

*Describe problem to be solved by the Geoweb system: 1:1 slope. Contaminated soil needs to be capped with 1' of cover. Also need a visually appealing solution because it borders a golf course

Person Requesting Information

*Relationship with Project (check one)

☐ Consulting Engineer ☐ Contractor ☐ Owner Other X

*Company EJ Prescott *Contact Name Doug McCluskey

*Address 198 Ushers Rd *City Round Lake *State/Province NY *Zip/PC 12151 Country USA

*Phone 518-764-8555 *Fax 518-877-6740 Email doug.mccluskey@ejprescott.com

Presto Geosystems Distributor Information (if known)

Company EJ Prescott Contact Doug McCluskey Office Location Round Lake NY

Design Information

What is the embankment type? Contaminated Soils (Heavy Metals), Stumps

What are the slope dimensions?

*Slope Angle degree OR
Slope Length 300 ☐m X☐ft

1:1 H:V

*Vertical Height 50' +/- ☐m ☐ft

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670 N PERKINS STREET, APPLETON, WISCONSIN, USA 54914
Ph: 920-738-1328 or 800-548-3424 ■ Fax: 920-738-1222
e-mail: INFO@PRESTOGEO.COM WWW.PRESTOGEO.COM/

GEOWEB® SLOPE PROTECTION SYSTEM
REQUEST FOR PROJECT EVALUATION

What are the soil properties?

***Native Soil Description**

Angle of Internal Friction	degree
Cohesion	☐kN/m² ☐lb/ft²
Unit Weight	☐kN/m³ ☐lb/ft³

***Infill Description**

Angle of Internal Friction	degree
Cohesion	☐kN/m² ☐lb/ft²
Unit Weight	☐kN/m³ ☐lb/ft³

What are the hydraulic conditions?

X☐ Surface Sheet Runoff		☐ Wave Action
☐ Concentrated Runoff		☐ Ice Action
☐ Ground Water Seepage		☐ Other

**What is under the Geoweb system? Choose all that apply.*

X☐ Native soil 1' depth m (ft)		☐ Concrete
☐ Gravel depth m (ft)		☐ Other
☐ Geotextile	☐ Woven or	☐ Non-Woven
☐ Geomembrane	☐ Smooth or	☐ Textured

**What Geoweb infill is desired?*

X☐	Topsoil	☐ Concrete
☐ Crushed Aggregate		☐ Other
☐ Gravel		

What Geoweb type is desired (if known)? Choose all that apply.

X☐	12" GW20V Cell	☐ 75 mm (3 in) depth
☐ GW30V Cell		☐ 100 mm (4 in) depth
☐ GW40V Cell		☐ 150 mm (6 in) depth
		☐ 200 mm (8 in) depth

What ground anchoring systems are desired?

☐ ATRA® Anchors	X☐ Tendons and DeadMan Anchor
X☐ Tendons and Earth Anchors	☐ Other

PRESTO GEOSYSTEMS

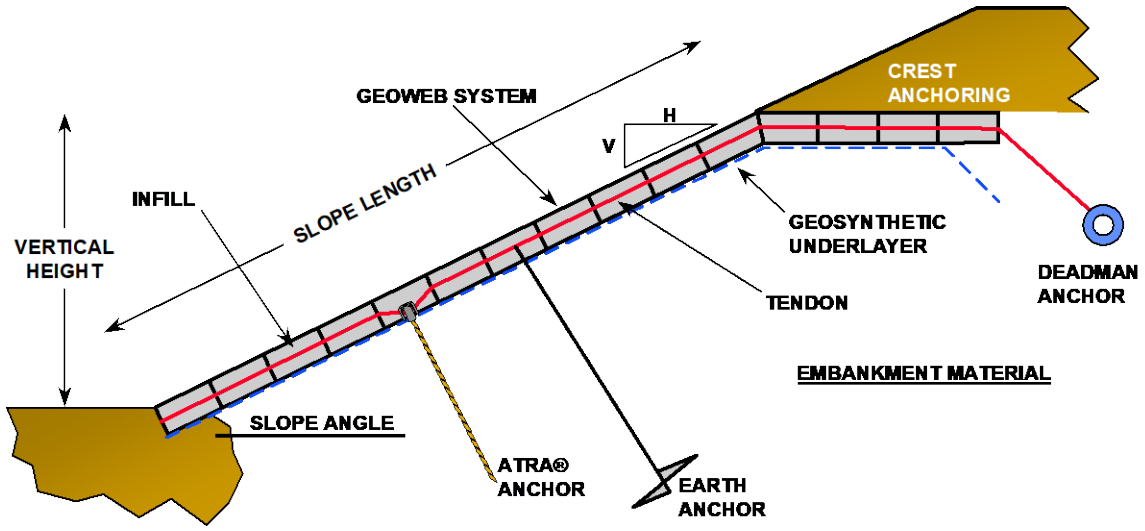
GEOWEB® SLOPE PROTECTION SYSTEM
REQUEST FOR PROJECT EVALUATION

Schedule

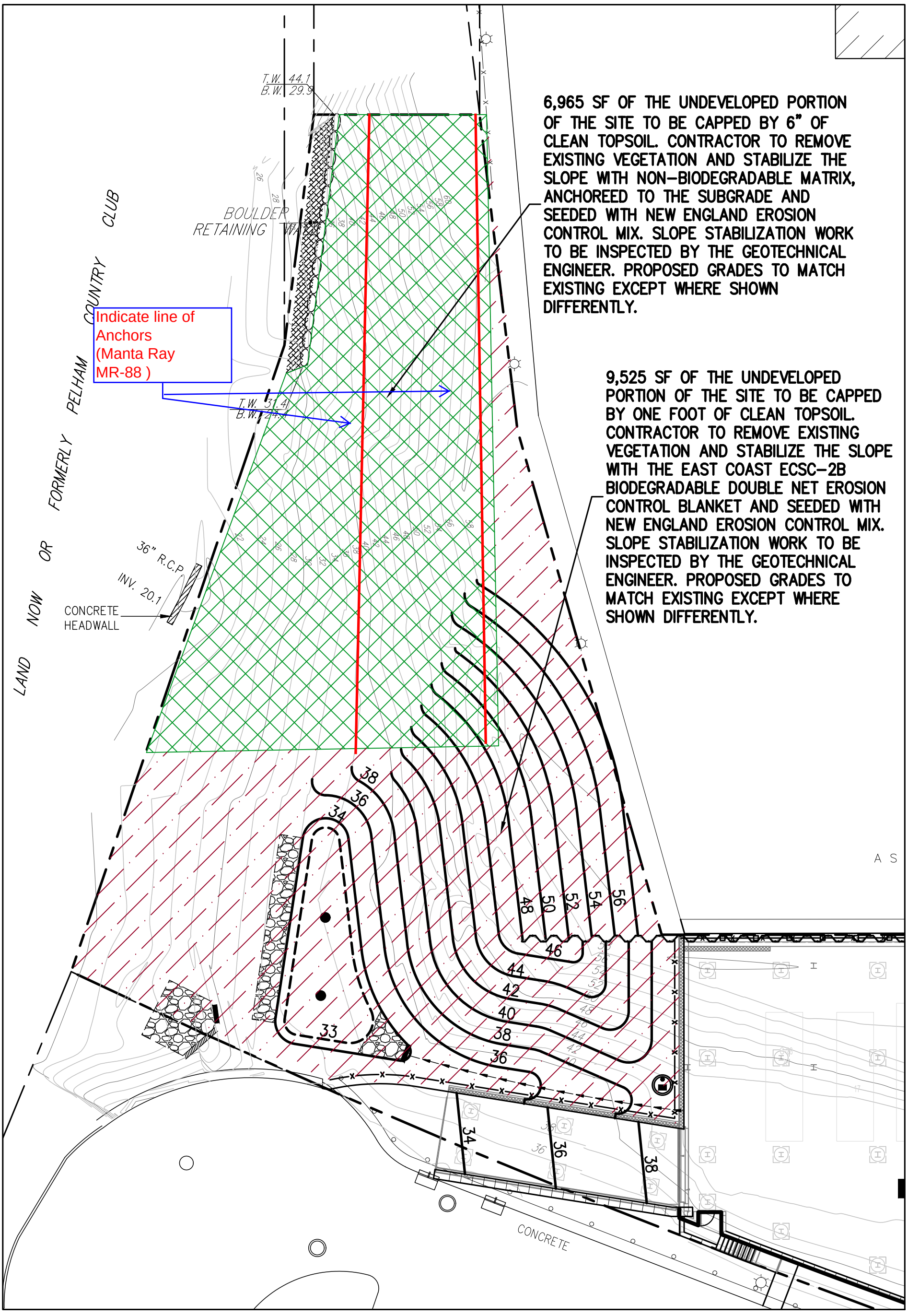
1) **Deadline Dates:** Preliminary Design Needed By 3/20/19

Projected Bid Date Planned Construction Startup Currently under construction

Basic Slope Protection System Definitions



The project evaluation will be performed based on specification characteristics, structural values and limits for the Geoweb® material manufactured under an ISO 9001:2008 Quality Management program. The Evaluation is protected by copyright and any use of this Evaluation with materials manufactured by anyone other than Presto Products Company causes the recommendation and/or drawings to become invalid.



70 NARDOZZI PLACE

70 NARDOZZI PLACE — CITY OF NEW ROCHELLE, NEW YORK

6" DEEP GEO-WEB SLOPE STABILIZATION PLAN

DATE: 04/17/2019 — JMC PROJECT: 14170

FIGURE: SSP-1 — SCALE: 1" = 20'

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14170-SLOPE-STABILIZATION.dwg; GEOWEB.tab

ATTACHMENT B

Appendix 5
Allowable Constituent Levels for Imported Fill or Soil
Subdivision 5.4(e)

Source: This table is derived from soil cleanup objective (SCO) tables in 6 NYCRR 375. Table 375-6.8(a) is the source for unrestricted use and Table 375-6.8(b) is the source for restricted use.

Note: For constituents not included in this table, refer to the contaminant for supplemental soil cleanup objectives (SSCOs) in the Commissioner Policy on *Soil Cleanup Guidance*. If an SSCO is not provided for a constituent, contact the DER PM to determine a site-specific level.

Constituent	Unrestricted Use	Residential Use	Restricted Residential Use	Commercial or Industrial Use	If Ecological Resources are Present
Metals					
Arsenic	13	16	16	16	13
Barium	350	350	400	400	433
Beryllium	7.2	14	47	47	10
Cadmium	2.5	2.5	4.3	7.5	4
Chromium, Hexavalent[1]	1 [3]	19	19	19	1 [3]
Chromium, Trivalent[1]	30	36	180	1500	41
Copper	50	270	270	270	50
Cyanide	27	27	27	27	NS
Lead	63	400	400	450	63
Manganese	1600	2000	2000	2000	1600
Mercury (total)	0.18	0.73	0.73	0.73	0.18
Nickel	30	130	130	130	30
Selenium	3.9	4	4	4	3.9
Silver	2	8.3	8.3	8.3	2
Zinc	109	2200	2480	2480	109
PCBs/Pesticides					
2,4,5-TP Acid (Silvex)	3.8	3.8	3.8	3.8	NS
4,4'-DDE	0.0033 [3]	1.8	8.9	17	0.0033 [3]
4,4'-DDT	0.0033 [3]	1.7	7.9	47	0.0033 [3]
4,4'-DDD	0.0033 [3]	2.6	13	14	0.0033 [3]
Aldrin	0.005	0.019	0.097	0.19	0.14
Alpha-BHC	0.02	0.02	0.02	0.02	0.04 [4]
Beta-BHC	0.036	0.072	0.09	0.09	0.6
Chlordane (alpha)	0.094	0.91	2.9	2.9	1.3
Delta-BHC	0.04	0.25	0.25	0.25	0.04 [4]
Dibenzofuran	7	14	59	210	NS
Dieldrin	0.005	0.039	0.1	0.1	0.006
Endosulfan I	2.4[2]	4.8	24	102	NS
Endosulfan II	2.4[2]	4.8	24	102	NS
Endosulfan sulfate	2.4[2]	4.8	24	200	NS
Endrin	0.014	0.06	0.06	0.06	0.014
Heptachlor	0.042	0.38	0.38	0.38	0.14
Lindane	0.1	0.1	0.1	0.1	6
Polychlorinated biphenyls	0.1	1	1	1	1

Constituent	Unrestricted Use	Residential Use	Restricted Residential Use	Commercial or Industrial Use	If Ecological Resources are Present
Semi-volatile Organic Compounds					
Acenaphthene	20	98	98	98	20
Acenaphthylene	100	100	100	107	NS
Anthracene	100	100	100	500	NS
Benzo(a)anthracene	1	1	1	1	NS
Benzo(a)pyrene	1	1	1	1	2.6
Benzo(b)fluoranthene	1	1	1	1.7	NS
Benzo(g,h,i)perylene	100	100	100	500	NS
Benzo(k)fluoranthene	0.8	1	1.7	1.7	NS
Chrysene	1	1	1	1	NS
Dibenz(a,h)anthracene	0.33 [3]	0.33 [3]	0.33 [3]	0.56	NS
Fluoranthene	100	100	100	500	NS
Fluorene	30	100	100	386	30
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	NS
m-Cresol(s)	0.33 [3]	0.33 [3]	0.33 [3]	0.33 [3]	NS
Naphthalene	12	12	12	12	NS
o-Cresol(s)	0.33 [3]	0.33 [3]	0.33 [3]	0.33 [3]	NS
p-Cresol(s)	0.33	0.33	0.33	0.33	NS
Pentachlorophenol	0.8 [3]	0.8 [3]	0.8 [3]	0.8 [3]	0.8 [3]
Phenanthrene	100	100	100	500	NS
Phenol	0.33 [3]	0.33 [3]	0.33 [3]	0.33 [3]	30
Pyrene	100	100	100	500	NS
Volatile Organic Compounds					
1,1,1-Trichloroethane	0.68	0.68	0.68	0.68	NS
1,1-Dichloroethane	0.27	0.27	0.27	0.27	NS
1,1-Dichloroethene	0.33	0.33	0.33	0.33	NS
1,2-Dichlorobenzene	1.1	1.1	1.1	1.1	NS
1,2-Dichloroethane	0.02	0.02	0.02	0.02	10
1,2-Dichloroethene(cis)	0.25	0.25	0.25	0.25	NS
1,2-Dichloroethene(trans)	0.19	0.19	0.19	0.19	NS
1,3-Dichlorobenzene	2.4	2.4	2.4	2.4	NS
1,4-Dichlorobenzene	1.8	1.8	1.8	1.8	20
1,4-Dioxane	0.1 [3]	0.1 [3]	0.1 [3]	0.1 [3]	0.1
Acetone	0.05	0.05	0.05	0.05	2.2
Benzene	0.06	0.06	0.06	0.06	70
Butylbenzene	12	12	12	12	NS
Carbon tetrachloride	0.76	0.76	0.76	0.76	NS
Chlorobenzene	1.1	1.1	1.1	1.1	40
Chloroform	0.37	0.37	0.37	0.37	12
Ethylbenzene	1	1	1	1	NS
Hexachlorobenzene	0.33 [3]	0.33 [3]	1.2	3.2	NS
Methyl ethyl ketone	0.12	0.12	0.12	0.12	100
Methyl tert-butyl ether	0.93	0.93	0.93	0.93	NS
Methylene chloride	0.05	0.05	0.05	0.05	12

Volatile Organic Compounds (continued)					
Propylbenzene-n	3.9	3.9	3.9	3.9	NS
Sec-Butylbenzene	11	11	11	11	NS
Tert-Butylbenzene	5.9	5.9	5.9	5.9	NS
Tetrachloroethene	1.3	1.3	1.3	1.3	2
Toluene	0.7	0.7	0.7	0.7	36
Trichloroethene	0.47	0.47	0.47	0.47	2
Trimethylbenzene-1,2,4	3.6	3.6	3.6	3.6	NS
Trimethylbenzene-1,3,5	8.4	8.4	8.4	8.4	NS
Vinyl chloride	0.02	0.02	0.02	0.02	NS
Xylene (mixed)	0.26	1.6	1.6	1.6	0.26

All concentrations are in parts per million (ppm)
NS = Not Specified

Footnotes:
[1] The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.
[2] The SCO is the sum of endosulfan I, endosulfan II and endosulfan sulfate.
[3] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.
[4] This SCO is derived from data on mixed isomers of BHC.

Sampling Requirements for Imported Soil
Clean Soil Cap Materials

Table 5.4(e)10 Recommended Number of Soil Samples for Soil Imported To or Exported From a Site			
Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
➢ 1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		