

REQUEST FOR PROPOSALS

POROUS PAVEMENT SYSTEM FOR GATEHOUSE



**600 SOUTH OCEAN BOULEVARD
MANALAPAN, FL 33462**

Linda A. Stumpf, Town Manager
(561) 383-2540, Direct #
(561) 585-9498, Fax
lstumpf@manalapan.org

TABLE OF CONTENTS

INVITATION TO BID	3
GENERAL TERMS & CONDITIONS	4-10
TECHNICAL SPECIFICATIONS	11-12
REFERENCE/EMERGENCY CONTACT FORM (Attachment A).....	13
EQUAL OPPORTUNITY PLEDGE (Attachment B).....	14
BID CERTIFICATION (Attachment C).....	15-16
BID PROPOSAL WORKSHEET (Attachment D).....	17
DRUG FREE WORKPLACE (Attachment E).....	18
E-FILE VERIFICATION (Attachment F).....	19-20

**TOWN OF MANALAPAN
INVITATION TO BID
POROUS PAVEMENT SYSTEM FOR GATEHOUSE**

The Town of Manalapan is seeking qualified paving firms to provide both vehicular and pedestrian load support over grass areas while protecting the grass from the harmful effects of traffic at the gatehouse entrance and exit to the Town of Manalapan. Bid specifications including scope of work and plans may be obtained after 9:00 a.m. on March 13, 2020 at Manalapan Town Hall, 600 S. Ocean Blvd., Manalapan. Questions should be directed to Lisa Petersen, Town Clerk 561-383-2541 lpetersen@manalapan.org. Sealed bids must be clearly marked "Bid for Porous Pavement System for Gatehouse" and will be accepted until 3:00 p.m., Friday April 03, 2020 at which time all bids/proposals will be publicly opened and read aloud.

The Town reserves the right to reject any and/or all bids and waive technicalities and/or any irregularities therein. The Town further reserves the right to award a contract to that bidder whose proposal best serves the interests of the Town in the sole discretion of the Town.

PUBLISH: March 13, 2020
Palm Beach Post
Town's website www.manalapan.org

GENERAL TERMS & CONDITIONS

The purpose of this Invitation to Bid is to obtain firm pricing for *Porous Pavement System* for the Town of Manalapan for specific locations as outlined in this package (which include plans).

Description of services to be performed are detailed in the pages that follow.

PROJECT TITLE: Porous Pavement System

CONTACT: Linda A. Stumpf, Town Manager or Lisa Petersen, Town Clerk

TELEPHONE NO: (561) 383-2540 or (561)-383-2541

SUBMIT BID TO: Town of Manalapan
600 South Ocean Blvd.
Manalapan, FL 33462

This Invitation to Bid, General Terms & Conditions, Instructions and Information for Bidders and Technical Specifications, Addenda and/or any other pertinent document form a part of this proposal and by reference are made a part thereof.

GENERAL TERMS AND CONDITIONS, INSTRUCTIONS AND INFORMATION FOR BIDDERS:

1. GENERAL INFORMATION

Theses documents constitute the complete set of specification requirements and bid forms. All bidders are instructed to provide one (1) original bid document signed in ink and two (2) complete copies of this original with your submittal. Bid proposals must be completely filled in, signed, envelope sealed and returned to the Town Manager at Manalapan Town Hall on or before **Friday April 3rd at 3:00 pm.**

It is the sole responsibility of the Bidder to ensure that his or her bid reaches the Manalapan Town Hall, on or before the closing date and time. The Town shall in no way be responsible for delays caused by any other occurrence. Offers by telephone, telegram or facsimile shall not be accepted.

The bid time must be and shall be scrupulously observed. Under no circumstances shall bids delivered after the time specified be considered. Such bids will be returned to the Bidder unopened.

Bidders shall not be allowed to modify their bids after the opening time and date. Bid files may be examined during normal working hours, after the bid opening, by appointment only.

The term "day" wherever used in this document refers to calendar day.

For information concerning this bid please contact:

Town of Manalapan
Lisa Petersen, Town Clerk
(561) 383-2541

2. ACCEPTANCE/REJECTION

The Town of Manalapan reserves the right to accept or reject any and/or all bids/quotes and make the award to that Bidder, who in the sole opinion of the Town will be in the best interest of and/or the most advantageous to the Town. The Town of Manalapan also reserves the right to reject the bid of any Contractor who has previously failed in the proper performance of an award or to deliver on time contracts of a similar nature or who is not in a position to perform properly under this award. The Town of Manalapan reserves the right to inspect all facilities of bidders in order to make a determination as to the foregoing. The Town of Manalapan reserves the right to waive technicalities and/or any irregularities and may, at its sole discretion, request a re-bid.

3. NON-COLLUSION

Bidder certifies that this bid is made without prior understanding, agreement or connection with any corporation, firm or person submitting a bid for the same materials, services, supplies or equipment and is in all respects without collusion or fraud.

No premiums, rebates, or gratuities are permitted, either with, prior to or after any delivery of material or provision of services. Any such violation may result in contract cancellation, return of materials or discontinuation of service and the possible removal from the vendor bid list(s).

4. CONFLICT OF INTEREST

The award hereunder is subject to the provision of Florida Statutes and Town Code of Ordinances.

The Proposer, by affixing his signature to the Bid Certification Form, declares that the proposal is made without any previous understanding, agreement, or connections with any Town official or persons, firms, or corporations making a proposal on the same items and without any outside control, collusion or fraud. By signing the Proposal, the Proposer further declares that no Town Commissioner, other Town officer, or Town employee directly or indirectly owns more than five (5) percent of the total assets or capital stock of the proposer entity, nor will directly or indirectly benefit by more than five (5) percent from the profits or emoluments of this contract.

5. LEGAL REQUIREMENTS

Federal, State, County and Town laws, ordinances, rules and regulations that in any manner affect the items covered herein apply. Lack of knowledge by the Bidder shall in no way be cause for relief from responsibility.

Contractors doing business with the Town are prohibited from discriminating against any employee, applicant or client because of race, creed, color, national origin, sex or age with regard to but not limited to the following employment practices, rates of pay or other compensation methods and training selection.

Contractors doing business with the Town must complete and sign an affidavit indicating that all employees of their company are legal to work in the United States. (See Attachment F)

6. MISTAKES

Bidders must check their proposal where applicable, mathematical errors are at the Bidder's risk. Bids having erasures or corrections must be initialed in ink by the Bidder.

7. AVAILABILITY OF FUNDS

The obligations of the Town of Manalapan under this award are subject to the availability of funds lawfully appropriated for its purpose by the Manalapan Town Commission.

8. EEO STATEMENT

It is the policy of the Town to comply with all Federal, State, County and local laws to provide minorities and women equal opportunity for participating in all aspects of the Town's contracting and procurement programs. It is further policy of the Town to comply with all Federal, State, County and local laws to prohibit discrimination against any person or business in pursuit of these opportunities on the basis of race, color, national origin, creed, sex, age, handicap or veteran's status. In connection with work performed under a Town of Manalapan contract, the bidder agrees, upon receipt of a written award or acceptance of a bid, to support and abide by the Town's Equal Opportunity Pledge. (Attachment B)

9. BID FORMS

All bid proposals must be submitted on the Town's standard Bid Certification Form (Attachment C). Bid proposals on Contractor quotation forms will not be accepted.

10. BID CERTIFICATION

Bidders desiring a copy of the Bid Certification Form may request same by enclosing a self-addressed stamped envelope with their bid.

11. CONTRACTUAL AGREEMENT

This Invitation to Bid shall be included and incorporated in the final award and shall constitute a portion of the contract together with the bid response and all specification documents. Any and

all legal action necessary to enforce the award will be held in Palm Beach County with attorney fees awarded to the prevailing party, including all appeals.

12. CONTRACT COORDINATORS

The Town has assigned one (1) Contract Coordinator for the work to be performed: Lisa S. Petersen 561-383-2541. All contractual matters shall be forwarded to her through Town Hall, (561) 585-9477.

13. INFORMATION

Any questions by the prospective bidders concerning this invitation to bid should be addressed to Lisa S. Petersen (561) 383-2541; who is authorized only to direct the attention of prospective bidders to various portions of the bid so they may read and interpret such for themselves. Neither Mrs. Petersen, nor any Town employee, is authorized to interpret any portion of the bid or give information as to the requirements of the bid in addition to that contained in the written bid document. Interpretations of the bid or additional information as to its requirements, where necessary, shall be communicated to bidders by written addendum.

14. PROJECT LOCATION

The project is located at 1200 Lands End Road (The Gatehouse) in Manalapan, Fl. 33462.

15. UTILITIES

It is the Contractor's sole responsibility to locate and protect all existing utilities at the project location. Any damage incurred as a result of the work performed under this bid is the sole responsibility of the Contractor.

16. PAYMENT

The Town will make progress payments and then final payment after services have been received, accepted, and properly invoiced.

17. CERTIFICATION, LICENSES AND PERMITS

Contractor must hold all required Certificates of Competency, Permits, Business Tax Receipts and any other certification necessary to complete this contractual agreement. Copies of these certificates, licenses, and permits must be submitted with bid proposal and must be in the name of the Contractor shown on the Bid Response Form. **A Town of Manalapan Business Tax Receipt shall be obtained and submitted within five (5) business days after Notification of Award is received.**

18. COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH

Bidder certifies that all material, equipment, etc., contained in this bid meets all O.S.H.A. requirements. Bidder further certifies that if he/she is the successful Bidder, and the material, equipment etc. delivered is subsequently found to be deficient in any O.S.H.A. requirement in effect on date of delivery, all costs necessary to bring the material, equipment, etc. into compliance with the aforementioned requirements shall be borne by the Bidder.

19. SAFETY REGULATIONS

Equipment must meet all Federal, State, County and Town safety regulations for grounding of electrical equipment.

All equipment operated on any Town property shall be equipped with guards and/or shields to minimize the possibility of injury to the general public. Machinery not equipped with safety devices shall not be operated at any facility. The Town designee shall inform the contractor when the above conditions are observed. Proper operation of equipment is the contractor's responsibility.

All vehicles shall be maintained in good working order, painted with the name of the company visibly displayed on the vehicle and shall be parked only on pavement when possible, otherwise parked within the Town right of way so as not to obstruct or interfere with pedestrian or vehicular traffic.

20. CODES AND REGULATIONS

The Contractor must strictly comply with all Federal, State, County and Town building and safety codes.

21. INDEMNIFICATION

The Contractor agrees to protect, defend, reimburse, indemnify and hold the Town, it's agents, employees and elected officers and each of them, free and harmless at all times from and against any and all claims, liability, expenses, losses, suits, costs, fines and damages (including attorney fees) and causes of action of every kind and character against or from the Town by reason of any damage to property or the environment, or bodily injury (including death) incurred or sustained by any party hereto, or of any party acquiring any interest hereunder, and any third or other party whomsoever or any governmental agency, arising out of or incident to or in connection with the Contractor's performance under this Agreement. The Contractor's acts, omissions or operations hereunder, or the performance, nonperformance or purported performance of the contractor or any breach of the items of this Agreement; provided, however, the contractor shall not be responsible to the Town for damages resulting out of bodily injury or damages to property which the Contractor can establish as being attributable to the sole negligence of the Town, it's respective agents, servants, employees or officers.

The indemnification shall include, but not be limited to, suits, actions, or claims brought because of any injuries or damages sustained by any person or property on account of the Contractor's

operations in connection with the contract; or in consequence of any neglect in performing the work; or because of any act or omission by the Contractor.

22. CONTRACTOR RESPONSIBILITY

Contractor shall be responsible for ensuring that all employees are in compliance, at all times, with Terms, Conditions and Specifications outlined in this Invitation to Bid. The Contractor shall be responsible for obtaining all necessary permits, licenses, and/or registration cards, in compliance with all applicable Federal, State and Local statutes pertaining to services as specified.

23. EMPLOYEES

Persons employed by the Contractor in the performance of services pursuant to this bid shall not be considered employees of the Town, shall be independent thereof and shall have no claim against the Town as to pension, workers compensation, insurance, salary, wages or other employee rights or privileges granted by operation of law, and shall be 18 years of age or older. Under no circumstances will any employee of the Contractor be permitted to allow minors (under 18 years of age) and/or anyone who is not an employee of the contractor to enter any Town facility at any time for any reason.

24. PROTECTION OF PROPERTY

The Contractor shall at all times guard against damage or loss to the property of the Town of Manalapan or of other vendors or contractors and shall be held responsible for replacing or repairing any such loss or damage. The Town of Manalapan may withhold payment for reimbursement or replacement for loss or damage to property attributed to negligence of the Contractor or his/her agents.

25. INSURANCE REQUIRED

It shall be the responsibility of the successful Bidder to provide evidence of the following minimum amounts of insurance coverage prior to the start of work. Failure to provide this written evidence prior to the commencement date may be grounds for immediate cancellation of this award.

Workers compensation and employer's liability coverage to apply to all employees for statutory limits in compliance with applicable State and Federal laws.

Commercial General Liability shall have minimum limits of \$100,000 Per Occurrence Combined Single Limit for Personal Injury, Bodily Injury and Property Damage Liability. Coverage shall include Premises and/or Operations, Independent Contractors, Products and/or Complete Operations, Contractual Liability and Broad Form Property Damage Endorsements.

Business Auto Liability shall cover any auto for bodily injury and property damage and shall include owned vehicles, hired and non-owner vehicles, and employee non-ownership with

minimum limits of \$100,000, per occurrence combined single limit for bodily injury and property damage.

A signed Certificate or Certificates of Insurance, evidencing that required insurance coverage has been procured by Contractor in the types of amount(s) required hereunder, shall be transmitted to the Town prior to Contractor performing any operations under the terms of the contract.

Except as to Workers Compensation and Employers Liability, said Certificate(s) shall clearly state that coverage required by the contract has been endorsed to include the Town of Manalapan, a municipal corporation of the State of Florida, it's officers, agents and employees as **Additional Insured**. The Certificate of Insurance shall unequivocally provide thirty (30) days written notice to the Town prior to any adverse change, cancellation or non-renewal of coverage thereunder. Said liability insurance must be acceptable to and approved by the Town as to form and types of coverage. In the event that the statutory liability of the Town is amended during the term of this agreement to exceed the above limits, Contractor shall be required, upon thirty (30) days written notice by the Town, to provide coverage of at least equal to the amended statutory limit of liability of the Town.

26. SEVERABILITY

If any section or part of a section of these General Terms and Conditions, Instructions and Information for Bidders and Technical specifications is for any reason held or declared to be inoperative or void by a Florida Court of Jurisdiction, such decision of inoperativeness or act shall not affect the remaining portion(s) of the section(s) involved or any other section of these General Terms and Conditions, Instructions and Information for Bidders and Technical Specifications.

TECHNICAL SPECIFICATIONS

CONTRACT AREAS –

Work is located at 1200 Lands End Road, Manalapan Fl. 33462. The area is the egress portions surrounding the Town of Manalapan Gatehouse.

(See Attached Specifications)



PRESTO GEOSYSTEMS

670 North Perkins Street
Appleton, WI 54914 USA
Tel: 1 920 738 1342
Fax: 1 920 738 1222
Email: bryan.Wedin@prestogeo.com

October 9, 2019

Robert Fairbanks, PE
FAIRBANKS ENGINEERING CORP.
42 Cobblestone Hill Road
Exeter, RI 02822

RE: PR19664 Manalapan
Geoblock® 5150 Porous Pavement System

Dear Robert:

Geoblock 5150 porous pavement units provide the necessary support for heavy and concentrated loads by creating a structural bridge across the infill layer, which maximizes load transfer and distribution. The system's design creates a structural framework, which contains and stabilizes open-graded aggregate to enable permeability and infiltration of rainwater. Geoblock units are designed to handle up to AASHTO H20 and heavy fire truck loadings with vehicle loads of 80,000 lbs and 110-psi tire pressures. The Geoblock unit 35,000-psi flexural modulus provides the ability to resist torsional loading and is extremely high because of the shared and rigid cell walls.

Design Assumptions

We have based on our recommendation on the following design parameters:

Parameters:

CBR, %	3.0
Type of Sub Grade	Native Sand Loam
Vehicle	
Type	Light Trucks
Wheel Loading, lbs	12,000
Tire Pressure, psi	85
Infill Friction Angle ϕ , degree	24
Infill Type	Topsoil
Infill Weight γ , lbs/ft ³	100



PRESTO GEOSYSTEMS

670 North Perkins Street
Appleton, WI 54914 USA
Tel: 1 920 738 1342
Fax: 1 920 738 1222
Email: bryan.Wedin@prestogeo.com

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

1. Prepare sub grade to a minimum CBR of 3.0%.
2. Provide a non-woven geotextile and install in accordance with Manufacturer's instructions including overlaps based on sub grade CBR.
3. Provide 4 inch engineered base.
4. The engineered base is a homogenous mixture consisting of crushed aggregate having an AASHTO # 5 or similar designation blended with pulverized topsoil and void component generally containing air and/or water. This homogenous mixture will promote vegetative growth and provide required structural support. The aggregate portion shall have a particle range from 0.375 to 1.0 in with a D50 of 0.5 in. The percentage void-space of the aggregate portion when compacted shall be at least 30%. The pulverized topsoil portion shall equal 1/3 +/- of the total volume and be added and blended to produce a homogenous mixture prior to placement or washed into the in-place compacted aggregate. Once placed, the mixture shall be compacted.
5. Presto Geoblock 5150 units. For roadway applications, a herringbone pattern is recommended.
6. The topsoil infill should be a good quality and not be compacted within the unit as the infill determines the permeability and controls the rate of water infiltration within the porous pavement system. Use of existing topsoil from the site will allow for vegetation growth that is native to the region and blends with the surrounding vegetated areas.

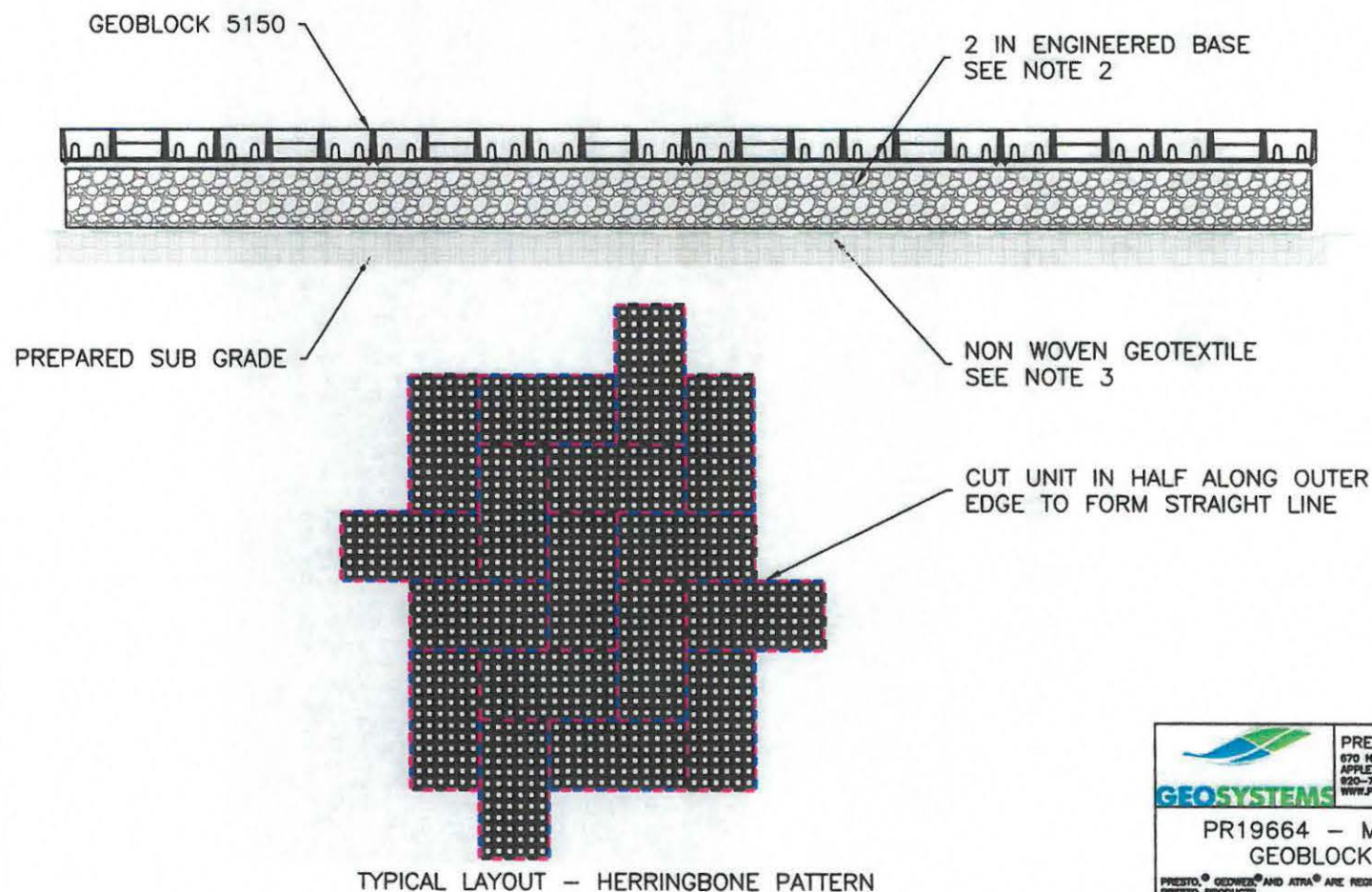
If you have any questions or need any additional information, please do not hesitate to call.


Sincerely,

Bryan Wedin, P.E.
Chief Design Engineer
Presto Geosystems®

Notes:

1. CBR means California Bearing Ratio.
2. Engineered base is a homogenous mixture consisting of crushed rock having an AASHTO # 5 or similar designation blended with pulverized topsoil and void component generally containing air and/or water. This homogenous mixture will promote vegetative growth and provide required structural support. The aggregate portion shall have a particle range from 0.375 to 1.0 in with a D50 of 0.5 in. The percentage void-space of the aggregate portion when compacted shall be at least 30%. The pulverized topsoil portion shall equal $1/3 \pm$ of the total volume and be added and blended to produce a homogenous mixture prior to placement or washed into the in-place compacted aggregate. Once placed, the mixture shall be compacted.
3. Provide non-woven geotextile and install in accordance with Manufacturer's installation instructions including overlaps.
4. Refer to the Geoblock 5150 Design and Construction Overview for a complete description of the design and construction methods.



 PRESTO® PRODUCTS CO. 670 NORTH PERKINS STREET APPLETON, WI 54914 920-738-1342 WWW.PRESTOGEOTEXTILES.COM	
PR19664 – MANALAPAN GEOBLOCK 5150	
<small>PRESTO®, GEOWEB® AND ATRA® ARE REGISTERED TRADEMARKS OF PRESTO PRODUCTS.</small>	
DATE	OCTOBER 9, 2019
FILE NAME	SHEET 1
SCALE	NTS
SHEET	1 OF 1



PRESTO GEOSYSTEMS



GEOBLOCK

GEOBLOCK® 5150

POROUS PAVEMENT SYSTEM

DESIGN & CONSTRUCTION OVERVIEW



PRESTO GEOSYSTEMS

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/

GB5150-00--AUGUST 2015

**Table of Contents**

The Geoblock®5150 Porous Pavement System	1
Figure 1 The Geoblock5150 Porous Pavement System Components.....	1
■ DESIGN Considerations	1
FUNCTION of the Geoblock System Components.....	1
SPECIFICATION Details:	2
Material Properties & Unit Dimensions.....	2
Table 1 SPECIFICATION of the Geoblock® 5150 Porous Pavement Unit.....	2
Engineered BASE Material	3
Table 2 BASE Recommendations for Geoblock® 5150	3
Topsoil Infill	3
Design Considerations for System Structural Integrity.....	4
Elements Important to Structural Integrity	4
Elements Not Important to Structural Integrity	4
Table 3 STRENGTH Characteristics of the Geoblock5150 Unit.....	4
Elements Important to the Vegetation	4
Engineer Specification Checklist.....	5
Figure 4 Geoblock®5150 System Material Specification and Layout	6
Figure 5 Geoblock®5150 System Usage Guideline.....	7
■ INSTALLATION Procedures	8
Prepare the Subgrade.....	8
Install Optional Components (if specified)	8
Geosynthetic Separation Layer (if specified).....	8
Prepare the Engineered Base.....	8
Install Geoblock5150 Units	9
Orientation & Laying Pattern of Units	9
Position the Units.....	9
Figure 7 Herringbone Laying Pattern	9
Figure 8 The Interlocking Tab Joint.....	9
Anchoring Units	9
Figure 9 Anchoring Possibilities	9
Thermal Expansion	9
Infill the Geoblock5150 Unit	10
Figure 10. Sweep out topsoil infill.....	10
Apply Vegetation and Finishing Procedures	10
Seeding	10
Sod Application.....	10
Delineation.....	10
Maintenance	10
Estimate Time and Cost of Installation	11
Typical Crew Size and Responsibilities.....	11
Equipment Needed and Purpose	11
Typical Construction Sequences and Times.....	11
General Notes	11
Total Time and Materials Required.....	11
Total Cost of Time and Materials	12
Limited Warranty	12
Disclaimer.....	12

The Geoblock® 5150 Porous Pavement System

The **Geoblock5150 Porous Pavement System** provides vehicular and pedestrian load support over grass areas while protecting the grass from the harmful effects of the traffic.

The fully developed system has four major components (see Figure 1).

- (1) the Geoblock5150 unit,
- (2) the *engineered base* for support (if required),
- (3) the selected topsoil infill, and
- (4) the selected vegetation.

Both the Geoblock5150 unit and the base support soil work together to support the imposed loading. Both the Geoblock5150 unit and the topsoil contribute to the vegetation support. A review of the four major components follows.

Other components may include a geosynthetic separation / reinforcement layer, sub-drain components, and topsoil additives, which enhance vegetative growth.

Aggregate-filled systems should utilize the Presto GeoPave® porous pavement system.

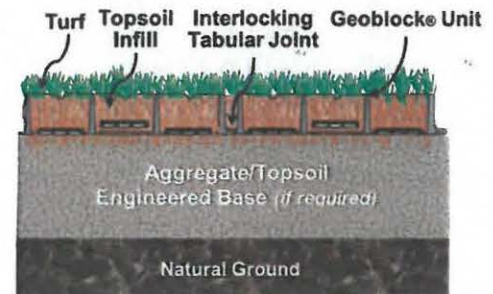


Figure 1 The Geoblock5150 Porous Pavement System Components

■ DESIGN Considerations

FUNCTION of the Geoblock System Components

Function of the Grass Paver Structure

The Geoblock5150 units have three key purposes:

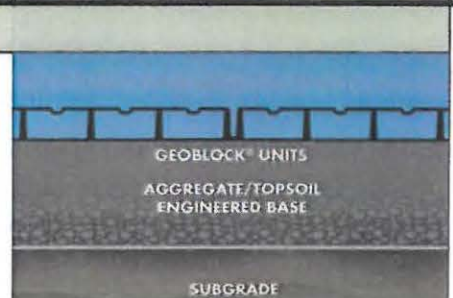
1. to adequately support and dissipate the design loads (up to AASHTO H/HS-20 loading).
2. to provide permeability and infiltration of rain water.
3. to provide a healthy environment for the topsoil infill and vegetative cover.
4. The Geoblock pavers are semi-rigid pavers with interconnected cell walls, and a tabular connection between paver units. This interconnection offers a high load distribution allowing for less supporting base material than many lighter-weight or rolled systems.



Function of the Engineered Base

For a given applied load over an existing sub base soil, both the *engineered base* and the Geoblock5150 unit provide support. The depth of the *engineered base* should be determined using both loading and sub base strength.

The **engineered base** consists of an open-graded aggregate and topsoil. The aggregate portion, once compacted, provides structural support for the load and the topsoil portion provides a healthy growing medium for the vegetation.

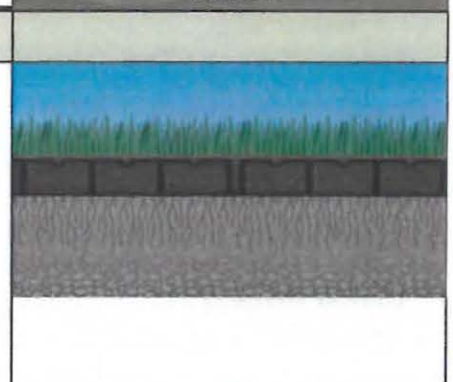


Function of the Topsoil Infill & Vegetation

The topsoil infill placed within the cells of the Geoblock5150 unit provides a nourishing medium for development of a healthy root system for the vegetative cover. The infill determines the permeability and controls the rate of water infiltration within the Geoblock5150 layer, so the topsoil should be a good quality, drainable soil.

If climatic conditions are such where prolonged periods of dryness exist, moisture retention additives within the topsoil may be appropriate.

The completed system should provide a healthy and aesthetically pleasing vegetative cover. Vegetation type should be selected by a qualified agronomist and be resilient enough to withstand anticipated load frequencies. Heat and automotive fluids from excessive traffic can over-stress any vegetative cover resulting in periodic maintenance. In all cases, proper fertilizing, watering, thatch removal, and aeration is a must for healthy vegetation.



**OPTIONAL Components****Geosynthetic Layer (if required)**

Under some conditions, a geosynthetic layer may be a required component between the sub grade and required *engineered base* in the porous pavement system. Generally, the geosynthetic component will serve one or more of the following functions and be one or more of the following materials: 1) Tensile Reinforcement (Woven Geotextiles), 2) Separation (Non-Woven Geotextiles) and 3) Drainage / Separation Geosynthetics (Geonets, piping).

Sub-drain Component (if required)

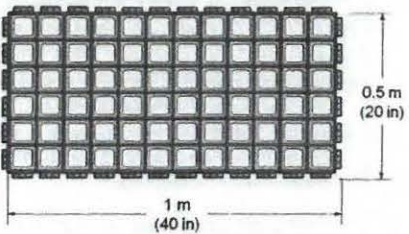
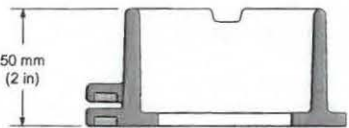
If the Geoblock units are installed over non-porous soils and an excavation is required such that water could be trapped, sub drainage becomes a required component of the system. Sub-drainage will remove harmful water accumulation that will cause degradation of the in-situ soils resulting in loss of support capacity.

SPECIFICATION Details:**Material Properties & Unit Dimensions**

Geoblock5150 units shall be made from materials with physical and chemical characteristics described in Table 1. The manufactured Geoblock5150 units shall have a minimum deflection without breakage of 1.0 in (25 mm) when units are supported at 1.64 ft (0.50 m) centers at 70°F (21°C). The color shall be uniform through all units in any given pallet.

Geoblock5150 units shall have physical dimensions as specified in Table 1 and shown in Figure 2. Geoblock5150 units shall have an interlocking offset tab system on all edges as detailed in both Figures 2 and 3. End-to-end or side-to-side warpage of the Geoblock5150 units shall not be greater than 0.25 in (6 mm).

Table 1 SPECIFICATION of the Geoblock® 5150 Porous Pavement Unit

Item	Specification & Details	Paver Unit Details
Material	Up to 97% Recycled Polyethylene *	 <p>Figure 2 Geoblock5150 Unit Nominal Dimensions</p>
Color	Ranges Dark Shades Gray to Black	
Chemical Resistance	Superior	
Carbon Black for Ultraviolet Light Stabilization	1.5% - 2.0%	
Unit Minimum Crush Strength (Empty) @ 70°F (21°C)	420 psi (2,900 KPa)	
Unit Minimum Crush Strength (Sand-Filled) @ 70°F (21°C)	7,058 psi (48,734 KPa)	
Flexural Modulus @ 70°F (21°C)	35,000 psi (240,000 kPa)	 <p>Figure 3 Geoblock5150 Cell and Interlocking Offset Tab</p>
Nominal Dimensions (width x length)	20 in x 40 in (0.5 m x 1.0 m)	
Nominal Unit Depth	2.0 in (50 mm)	
Nominal Coverage Area	5.3 ft² (0.5 m²)	
Cells per Unit	72	
Cell Size	3.1 in x 3.2 in (79 mm x 81 mm)	
Top Open Area per Unit	87%	
Bottom Open Area per Unit	41%	
Weight per Unit (nominal)	8.7 lb (4.0 kg)	
Runoff Coefficient @ 2.5 in/hr (64 mm/hr) Rainfall	0.15	
Units per Pallet	50	

* The percentage of recycled content may vary depending on availability of recycled materials.

- Dimensions and weight are subject to manufacturing tolerances and are influenced by recycled components.
- End-to-end or side-to-side warp of the Geoblock5150 unit shall not be greater than 0.5 in (6 mm).
- Avoid specifications that state material compressive strength only. Material compressive strength, with applied factors of safety must be sufficient to resist compressive and lateral loads. In addition, ultra-high compressive strength adds little value to a porous pavement system.

**Engineered BASE Material**

The recommended '**engineered base**' is a homogenous mixture consisting of 1) a clear-stone / crushed aggregate having an AASHTO # 5 or similar designation blended with 2) pulverized topsoil and 3) a void component generally containing air and/or water. This homogenous mixture will promote vegetative growth and provide required structural support. See *Function of the Engineered Base* for details.

The aggregate portion shall have a particle range from 9.5 mm to 25 mm (0.375 to 1.0 in) with a D_{50} of 13 mm (0.5 in). The percentage void-space of the aggregate portion when compacted shall be at least 30%. The pulverized topsoil portion shall equal 33% +/- of the total volume and be added and blended to produce a homogenous mixture prior to placement. Once placed, the mixture shall be compacted to 95% Standard Proctor Density.

Under some conditions, a geotextile separation layer may be required between the natural ground and the engineered base.

Table 2 BASE Recommendations for Geoblock® 5150

Load Description¹	Depth of Engineered Base	
	CBR² 2 – 4³	CBR² > 4³
Heavy Fire Truck Access & H/HS-20 loading. Typical 110 psi (758 kPa) maximum tire pressure. Single axle loadings of 32 kips (145 kN), tandem axle loadings of 48 kip (220 kN). Gross vehicle loads of 80,000 lbs (36.3 MT). Infrequent passes ⁴ .	6 in (150 mm)	4 in (100 mm)
Light Fire Truck Access & H/HS-15 loading. Typical 85 psi (586 kPa) maximum tire pressure. Single axle loadings of 24 kips (110 kN). Gross vehicle loads of 60,000 lb (27.2 MT). Infrequent passes ⁴ .	4 in (100 mm)	2 in (50 mm)
Utility & Delivery Truck Access & H/HS-10 loading. Typical 60 psi (414 kPa) maximum tire pressure. Single axle loadings of 16 kips (75 kN). Gross vehicle loads of 40,000 lbs (18.1 MT). Infrequent passes ⁴ .	2 in (50 mm)	2 in (50 mm)
Cars & Pick-up Truck Access. Typical 45 psi (310 kPa) maximum tire pressure. Single axle loadings of 4 kips (18 kN). Gross vehicle loads of 8,000 lbs (3.6 MT). Infrequent passes ⁴ .	None	None
Trail Use. Loading for pedestrian, wheelchair, equestrian, bicycle, motorcycle and ATV traffic.	None	None
¹ The Geoblock5150 system can be applied in areas where loading is greater than those listed above. In these situations, call Presto Geosystems or an authorized Presto Geosystems' representative for specific recommendations. ² CBR is the abbreviation for California Bearing Ratio. Methods for determining CBR vary from more sophisticated laboratory methods to simple field identification methods that use hand manipulation of the soil. Presto does not recommend one method over the other; however, the user must have a high degree of confidence in the results produced by the chosen method. ³ If other-than-CBR soil strength values exist, use available correlation charts to relate the value to CBR. ⁴ Infrequent passes is defined as the number of passes over any period of time that causes no lasting damage to the vegetation. This number will be a function of vegetation type and age, climatic conditions, and maintenance practices. This number is not a function of the Geoblock5150 material.		

Topsoil Infill

The topsoil should be a good quality, drainable soil and not be compacted within the units as infill determines the permeability and controls the rate of water infiltration within the paver system.

If weather conditions are such where prolonged periods of dryness exist, watering or moisture retention additives within the topsoil may be appropriate.

**Design Considerations for System Structural Integrity****Elements Important to Structural Integrity**

The Geoblock5150 unit (or any other similar paver system) must have five primary characteristics to adequately support load as shown below:

- 1) **SUITABLE WALL STRENGTH:** The wall strength must support wheel loading from the heaviest anticipated vehicles that will travel over the porous pavement system. Vehicular loading will create direct wall compression from tires and equipment outriggers as well as lateral forces from vehicle braking and acceleration. The wall should resist vertical and lateral deformations when loaded. **Caution** should be exercised when using systems with thin walls.
- 2) **SUFFICIENT UNIT STIFFNESS:** The unit stiffness must allow deflections without unit breakage or separation when subbase soils yield under loading. When the unit is too flexible, the base soils support the complete load. When the unit is too rigid, it could break under normal loading in low temperature conditions. **Caution** should be exercised when using systems that are either too flexible or too rigid.

- 3) **SIGNIFICANT JOINT STRENGTH:** The strength of the joint must transfer load from unit to unit while staying engaged under normal deflections. Some deflection should be expected due to the physical characteristics of plastics and soils. High joint shear-strength causes greater load dissipation resulting in lower pressure on the base and subbase soils. If the joint has inadequate shear-strength, load support will occur through each unit causing the unit to act independently. **Caution** should be exercised when using systems that have little or no physical material in the joint.
- 4) **SUPPORTING BASE:** The unit support base must have a large enough area-of-contact with the base soil so high wheel loads at the top of the unit are reduced sufficiently when transferred to the base soil. This will provide a system with a greater range of stability. **Caution** should be exercised when using systems that have little contact area between the porous pavement unit and the base soil.
- 5) **LARGE OVERALL AREA:** A large overall area, in conjunction with the other characteristics, ensures maximum load dissipation. If unit separation should occur and any given unit functions independently, larger unit areas will lower the pressure on base and subgrade soils. **Caution** should be exercised when using systems that have smaller contact areas.

Elements Not Important to Structural Integrity

Avoid specifications that state material compressive strength only. Material compressive strength, with applied factors-of-safety, must be sufficient to resist compressive and lateral load application. Beyond that, ultra-high material compressive strengths add little to the porous pavement system. Table 3 provides a listing of strength characteristics of the Geoblock5150 porous pavement system. These values provide a balanced system meeting all criteria important to the integrity and performance of a porous pavement system.

Table 3 STRENGTH Characteristics of the Geoblock5150 Unit

Test	Value
Wall Compressive Strength (simulated tire area loaded) Test Procedure - Circular plate, 6.5 in (165 mm) diameter, loaded to failure	420 psi (2,900 kPa)
Wall Compressive Strength (full Geoblock5150 unit loaded) Test Procedure - Full single unit loaded to failure via flat plate	138,240 lbf (615 kN)
Equivalent Elastic Stiffness Test Procedure - Simply supported Geoblock5150 unit loaded to 1 in (25 mm) deflection	48,000 lb-in ² (140 N-m ²)
Joint Shear Strength Test Procedure - Direct shear of tongue-and-groove using special apparatus (See NOTE)	20,000 lbf (89.0 kN)
NOTE: All tests were conducted by Bathurst, Jarrett and Associates Inc. at the Royal Military College in Kingston, Ontario, Canada on the wall of a different Geoblock5150 unit with an equivalent wall.	

Elements Important to the Vegetation

The Geoblock5150 unit provides an environment for maintaining healthy vegetative cover by preventing loads from excessively damaging the vegetative cover through compaction of the topsoil layer. The wall system has the strength and spacing needed to support any tire loading from influencing the topsoil layer. The open area in the bottom of the Geoblock5150 unit allows water and nutrients to pass through the soil layers. The Geoblock5150 unit alone will not ensure healthy vegetation. Vegetation must grow in un-compacted soil and receive adequate water and nutrients to remain healthy.



Engineer Specification Checklist

The Engineer shall specify the following:

Specification Item	Description
Paver Unit	Specify Geoblock5150 Porous Pavement System
Optional Layers	Specify Geosynthetic Layer or Subdrain Component if required
Paver Unit Orientation	Specify Bricklayer or Herringbone Pattern depending on traffic type & flow.
Connection & Anchorage of Paver Units	Specify connection of paver units with thread-forming tapping screws through the interlocking tabs on the perimeter units. If required for slope applications, specify anchoring with stakes through the perimeter units.
Engineered Base Material	Specify: The recommended ' engineered base ' is a homogenous mixture consisting of 1) a clear-stone / crushed aggregate having an AASHTO # 5 or similar designation blended with 2) pulverized topsoil and 3) a void component generally containing air and/or water. This homogenous mixture will promote vegetative growth and provide required structural support. See <i>Function of the Engineered Base</i> for details. The aggregate portion shall have a particle range from 9.5 mm to 25 mm (0.375 to 1.0 in) with a D ₅₀ of 13 mm (0.5 in). The percentage void-space of the aggregate portion when compacted shall be at least 30%. The pulverized topsoil portion shall equal 33% +/- of the total volume and be added and blended to produce a homogenous mixture prior to placement. Once placed, the mixture shall be compacted to 95% Standard Proctor Density.
Engineered Base Depth	Specify None, 2 in, 4 in, 6 in or greater depending on loading, frequency and sub grade CBR value.
Infill	Specify: The topsoil should be a good quality, drainable soil and not be compacted within the unit as the infill determines the permeability and controls the rate of water infiltration within the porous pavement system. If climatic conditions are such where prolonged periods of dryness exist, moisture retention additives within the topsoil may be appropriate.
Vegetation	Specify Seed or Sod. For both, specify sweeping out the infill to create a meniscus layer within the cells and to follow water and fertilizing procedures for turf establishment and regional practices. For Sod: Specify a young sod free from netting material.
Delineation	Specify a delineation method such as in-ground or above-ground curbing, shrubbery, perimeter lighting or delineation markers.
SPECMaker® Specification Development Tool	Presto's SPECMaker® Tool is a quick, easy online resource to make customizable, 3-part Geoblock specifications. Click for the SPECMaker Program

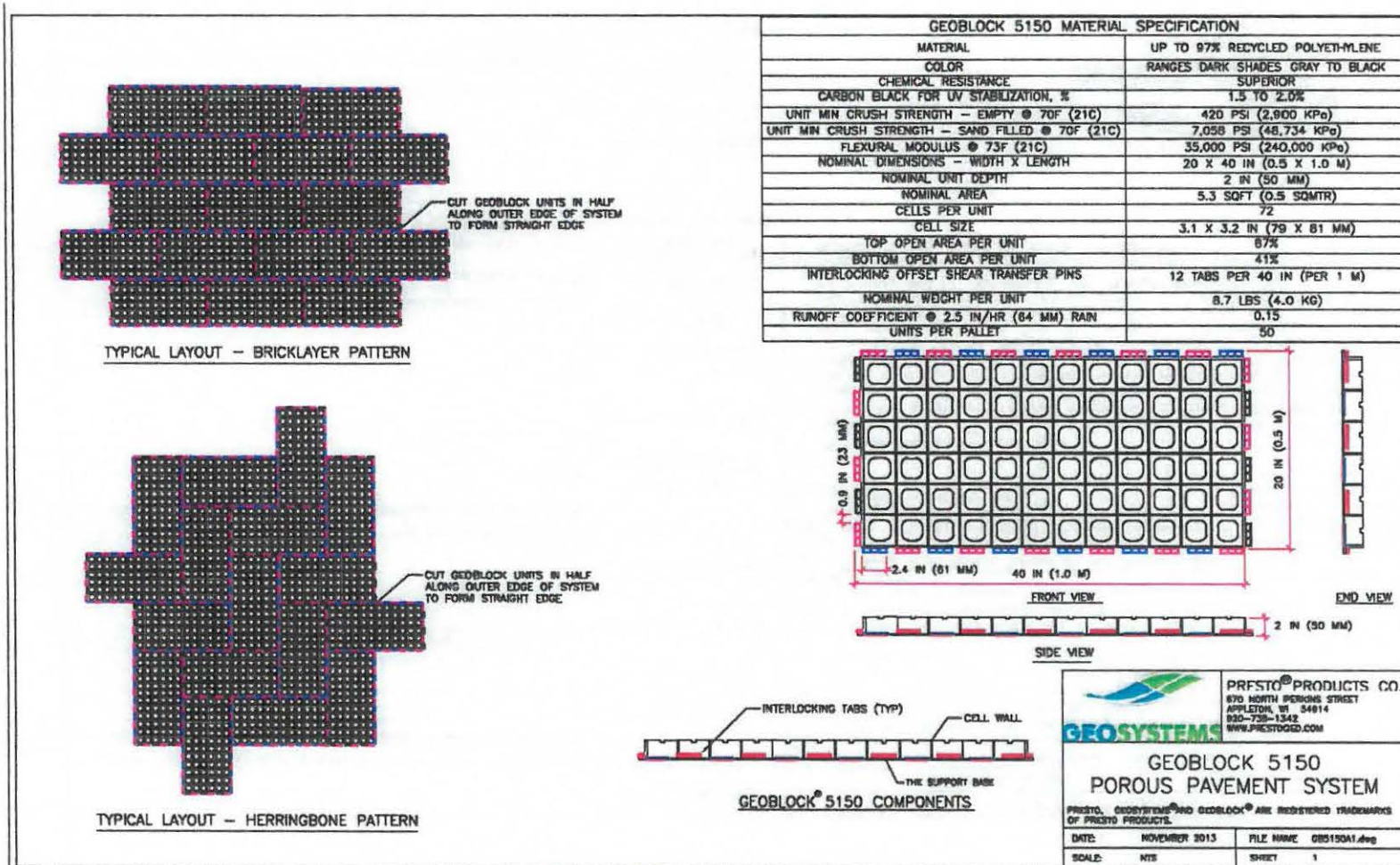


Figure 4 Geoblock® 5150 System Material Specification and Layout

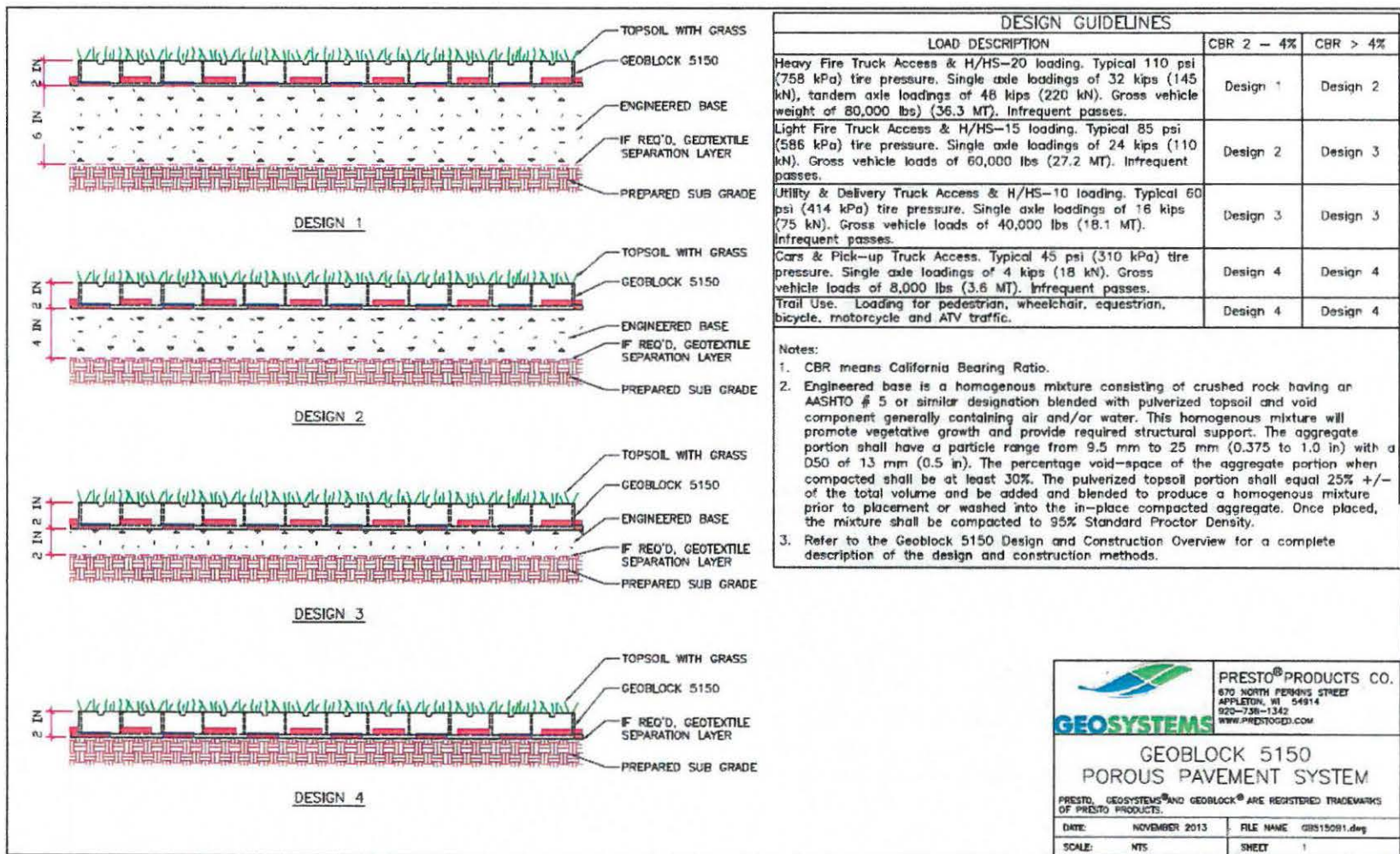


Figure 5 Geoblock®5150 System Usage Guideline



■ INSTALLATION Procedures

Prepare the Subgrade

Excavate the area, allowing for the Geoblock5150 unit thickness and the *engineered base* depth (where the *engineered base* is required).

- When working with a sub grade that has poor permeability, provide adequate drainage from the excavated area if the area has the potential to collect water.
- The sub grade should be relatively dry and free from any standing water.

Finish-grade the surface of the sub grade specifically when the Geoblock5150 unit is to be installed without an *engineered base*.

Level and clear the area of large objects such as rocks, pieces of wood, etc. to enable the Geoblock5150 units to interlock properly and remain stationary after installation.

Install Optional Components (if specified)

Geosynthetic Separation Layer (if specified)

If required and/or specified by the project engineer, the geosynthetic layer shall be rolled out over the prepared subgrade along the alignment in the direction of traffic. The geosynthetic shall be pulled taut to ensure that there are no folds and be installed in accordance with Manufacturer's recommendations including overlaps.

Sub-Drainage Component (if specified)

If required and/or specified by the project engineer, install the specified sub-drain and outlet according to construction drawings. Ensure that a proper slope is maintained throughout the drainage system and that the outlet is free from any obstructions preventing free drainage.

Prepare the Engineered Base

The strength of the Porous Pavement System is determined, in part, by the support required by a stable *engineered base*. The health of the vegetation, however, requires that the *engineered base* be loose to facilitate root penetration. These two requirements seem to be in direct conflict – but they are not. **Use the recommended Engineered Base Material as specified.**

Spread the specified *engineered base* material over the prepared base and compact to 95% Standard Proctor Density. Install the *engineered base* depth as specified, or refer to the *Engineered Base Recommendation Table*.

NOTE: Typical compaction densities and testing do not apply to the *engineered base* since only the aggregate portion of the *engineered base* is compacted. The topsoil portion will remain relatively un-compacted when the mixture is properly placed. Therefore, conventional compaction testing and resulting densities will produce values that are not meaningful.

Install Geoblock5150 Units

Orientation & Laying Pattern of Units

Place the Geoblock5150 units with the square hole to the ground.

BRICKLAYER PATTERN:

When the application is a **one-direction access lane**, stagger the units to produce the bricklayer pattern. The pattern is positioned such that the long direction of the unit is perpendicular to the primary direction of traffic. See Figure 6.

HERRINGBONE PATTERN:

When the application is a **large area with multi-directional traffic**, stagger the units to produce the **herringbone pattern**. This pattern reduces straight seams to one and a half block lengths. See Figure 7.

The staggered pattern is developed by using half Geoblock5150 units made by field cutting a full unit and placing the units as illustrated. Cut the units with a hand or power saw to custom fit both contours and/or around obstructions. These final seam patterns assure maximum load transfer and support.

Other laying patterns are generally not recommended.

Position the Units

If applicable, ensure that all adjacent hard surface paving work is completed before installing Geoblock units.

Place the first row of Geoblock5150 units against a stationary edge when available. If the units are placed between two perpendicular or near-perpendicular stationary edges (i.e. two parallel concrete curbs) allow for potential thermal expansion of the Geoblock5150 units by keeping the units away from the stationary edge. The separation distance can be calculated using the reference value given in the section titled **Thermal Expansion**.

Slide the units together so that the interlocking tab joint is fully engaged as illustrated in Figure 8. Units should be placed such that corners and seams do not protrude above the desired surface elevation. Anchor perimeter units as described below.

Anchoring Units

The Geoblock5150 units can be fixed in-place to prevent the units from shifting during installation with optional wood or metal stakes through the perimeter units, and/or, by placing thread-forming tapping screws (i.e. 1-1.5 in deck screws) through the perimeter interlocking tabs.

Anchoring may be necessary if 1) trafficking / turning of heavier construction vehicles cause movement of the units during the installation process or 2) large temperature changes occur during the installation process. Figure 9 illustrates some of the anchoring possibilities. In both cases, fixing the units in-place should occur after installation of all the units within the defined area.

Thermal Expansion

The Geoblock5150 polyethylene stabilized with carbon black has a relatively high rate of thermal conductivity and thermal expansion. The rate of thermal expansion is approximately 1.7% per 100 °F (55 °C). Based on the temperature of the Geoblock5150 unit exposed to full sunlight for several hours, a temperature gain of 60-70 °F (33-38 °C) is typical. As a result, a compensation of 1.375 in (34 mm) could be applied for each 10 ft (3 m) increment of length. When the installation day(s) is optional, install the Geoblock5150 units on cooler cloudy days as opposed to hot sunny days.



Figure 6 Bricklayer Laying Pattern

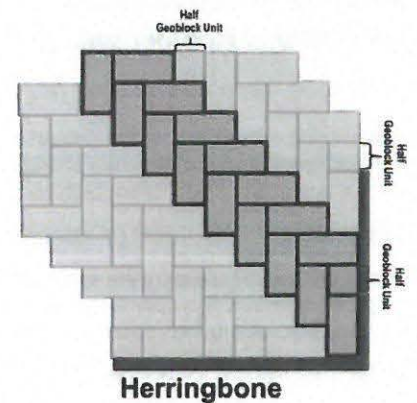


Figure 7 Herringbone Laying Pattern



Figure 8 The Interlocking Tab Joint

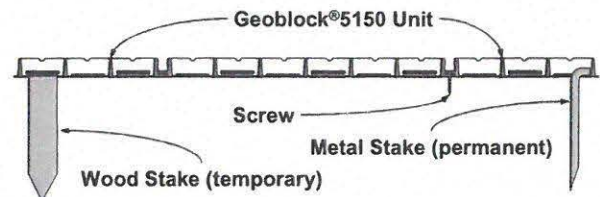


Figure 9 Anchoring Possibilities



Note that joint separation occurring from large temperature fluctuations is normal. Rejoining of the Geoblock5150 units should be considered normal construction practice. Once infilled, thermal expansion is minimized. Once the root system is fully developed, the vegetation provides all necessary anchoring of the system.

Infill the Geoblock5150 Unit

Infill the Geoblock5150 units with a suitable topsoil. The topsoil should be a good quality, drainable soil and not be compacted within the Geoblock5150 unit. Use spreading methods that will leave the cell infill un-compacted

Vigorously broom or rotary sweep the infilled surface to remove the top portion of topsoil infill from the Geoblock cells so it has a meniscus appearance as shown in Figure 10. Final topsoil placement should be slightly below the level of the Geoblock5150 cell wall.

Overfilling the cells is not recommended since vehicular loading will cause undesirable compaction of the topsoil.



Figure 10. Sweep out topsoil infill

Apply Vegetation and Finishing Procedures

Seeding

Follow seeding, fertilizing, and watering procedures for turf establishment based on regional practices. An increase in watering frequency may be necessary when free-draining base materials are used. Use of a free draining base is generally not recommended.

Sod Application

Sod can be used for areas where immediate use is desired. Young sod that is free from netting materials is recommended. Mature sod with a more developed root system and sod with netting may be difficult to press/cut into the Geoblock5150 cells.

When sod is used:

- Aggressively sweep out the topsoil from the Geoblock5150 unit to allow room to seat the sod. **Enough topsoil must be removed so that the crown of the sod is recessed slightly below the top of the cell after pressing the sod in place.** If too much topsoil is removed, the bottom of the sod will not make contact with the topsoil after it is pressed into the cell. Avoid removing too much topsoil.
- Place the sod per normal practices.
- Press the sod into the partially emptied cells using a roller or other suitable equipment.
- Use recommended watering procedures to ensure healthy sod growth.

Delineation

Once healthy turf has been established and good turf maintenance practices are followed, the Geoblock5150 cell wall structure will have minimal visibility.

Delineation may be desirable to create greater visibility and can include the following: in-ground or above-ground curbing, shrubbery, vegetation, perimeter lighting or delineation markers, or other suitable systems.

Maintenance

Lawn Care

Normal turf care procedures should be followed, including de-thatching and aerating. Some equipment may slightly scar or cut the Geoblock5150 wall structure during some operations, but will not affect overall structural integrity of the system.

Snow Removal

If required, snow removal should be done using one of the following basic procedures:

- Keep a metal edged plow blade a minimum of 1 in (25 mm) above the surface during plowing operations, or
- Use a plow blade with a flexible rubber edge, or
- Use a plow blade with skids on the lower outside corners so that the plow blade does not come in direct contact with the porous pavement system.

When deeper ground freeze occurs, the system functions as a typical hard pavement surface. If a sharp metal plow-blade comes in direct contact with the surface during plowing, any portion of the Geoblock5150 system that protrudes above the normal surface level could be removed by the blade. **NOTE:** Damage can occur to the grass and topsoil if plowing abuse is prevalent.

Estimate Time and Cost of Installation

Typical Crew Size and Responsibilities

- 2 People to set the Geoblock5150 units in place.
- 2 People to spread and level the topsoil infill.
- 1 Equipment operator for the front-end loader.

NOTE: Adding or subtracting one or two people to the crew may result in a cost-effective productivity increase depending on local work habits.

Equipment Needed and Purpose

- Saws, screw drivers, hammers, stakes, screws – all of some of these for cutting and securing the Geoblock5150 units as required per the plans or as needed during construction.
- A small front-end loader for infilling of the Geoblock5150 units.
- Rakes and shovels for final leveling of the infill material.

Typical Construction Sequences and Times

Productivity is a variable and the ranges below are typical. Select an installation rate through personal experience or after discussion of project details with Presto or one of its qualified distributors.

1.	Place the Geoblock5150 units on the prepared base.	75 - 100 units/man-hr
2.	Fill the in-place Geoblock5150 units using the small loader to evenly distribute the topsoil infill.	100 - 120 units/man-hr
3.	Level the infill using rakes and shovels so that the topsoil is flush with the top of the cell wall.	75 - 100 units/man-hr
4.	Spread selected grass seed and water.	150 - 180 units/man-hr

NOTE: The above four sequences can be in progress at the same time if workspace is adequate.

Table 4 Approximate Quantities of Infill Material Required for Geoblock5150 Unit

Depth of unit	Volume of Topsoil Required per unit	Volume of Topsoil Required per 100 m ² (1000 ft ²)
2 in (50 mm)	0.0327 yd ³ (0.025 m ³)	6.08 yd ³ (5.00 m ³)

NOTE: The above quantities are based only on the 2 in (50 mm) cell depth Geoblock5150 unit.

General Notes

1. The front-end loader must be sized so it can distribute the fill material per time/productivity requirements.
2. Experience shows that the above installation rates would be considered typical rates of installation.
3. As is with all construction operations, placement of material stockpiles, crew productivity, jobsite conditions, special installation requirements such as cutting and custom fitting of the Geoblock5150 units, etc. significantly affect overall productivity, therefore actual results may be different than the estimates above.

Total Time and Materials Required

Area of Installation = length x width of site				
() ft (m) long	x	() ft (m) wide	=	() ft ² (m ²) Area
Geoblock5150 Units Required = m² (ft²) Area ÷ 0.50 m² (5.3 ft²)/unit [the Geoblock5150 unit is 0.50 m x 1.00 m (20 in x 40 in) nominal]				
() ft ² (m ²) Area	÷	5.3 ft ² (0.50 m ²)/unit	=	() units
Man-Hr Required for Installation of Geoblock5150 Units = Geoblock5150 units ÷ 100 units/man-hr				
() units	÷	100 units/man-hr	=	() man-hr
Infill Material Quantities = Geoblock5150 units x m³ (yd³)/unit (see Table 4)				
() units	x	() yd ³ (m ³)/unit	=	() yd ³ (m ³)
Man-Hr Required for Placing Infill = Geoblock5150 units ÷ 120 units/man-hr				
() units	÷	120 units/man-hr	=	() man-hr
Man-Hr Required for Leveling of Infill = Geoblock5150 units ÷ 100 units/man-hr				
() units	÷	100 units/man-hr	=	() man-hr
Man-Hr Required for Seeding = Geoblock5150 units ÷ 180 units/man-hr				
() units	÷	180 units/man-hr	=	() man-hr

**Total Cost of Time and Materials**

Geoblock5150 unit cost	\$ _____ /unit	x	_____ units	=	\$ _____
Cost of Infill	\$ _____ /yd ³ (m ³)	x	_____ yd ³ (m ³)	=	\$ _____
Cost of Labor	\$ _____ /man-hr	x	_____ man-hr	=	\$ _____
Cost of Equip. Operator	\$ _____ /man-hr	x	_____ man-hr	=	\$ _____
Cost of Front-end Loader	\$ _____ /hr	x	_____ hr	=	\$ _____
APPROXIMATE TOTAL COST					\$ _____

NOTE: The above estimate does not include time and materials associated with initial base preparation. The cost of this item would be similar to other pavement systems regardless of type.

Limited Warranty

Presto Geosystems warrants each Geoblock® 5150 unit 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 unit 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 unit 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 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 Geoblock® 5150 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 Geoblock® 5150 system. Contact Presto Products Company, Ph: 800-548-3424; 920-738-1328 or Email: info@prestogeo.com.

Disclaimer

This document has been prepared for the benefit of customers interested in the Geoblock5150 Porous Pavement System. It was reviewed carefully prior to publication. Presto assumes no liability and makes no guarantee or warranty as to its accuracy or completeness. Final determination of the suitability of any information or material for the use contemplated, or for its manner of use, is the sole responsibility of the user.

Project specifications take precedence over all manufacturers' recommendations.

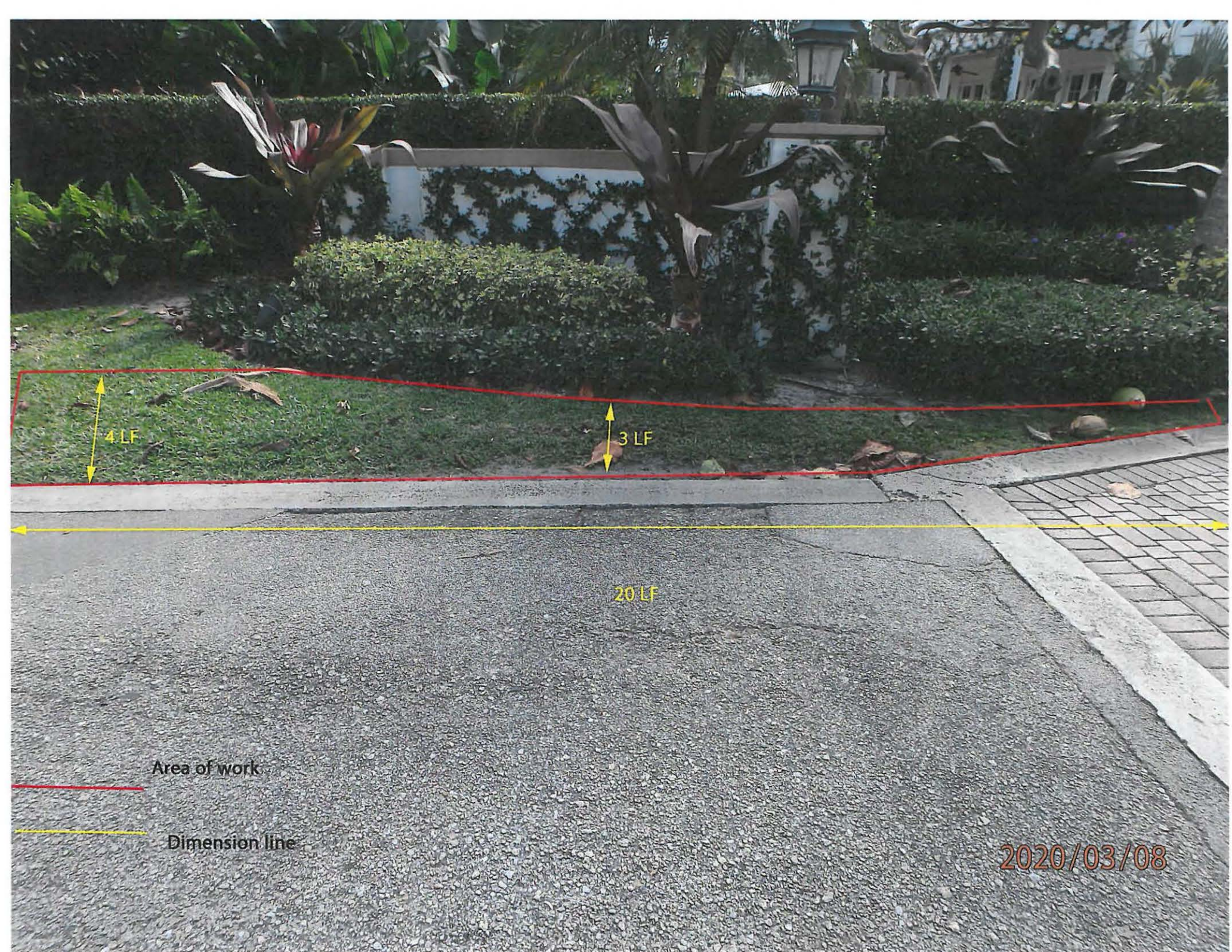
Geosystems® and Geoblock® are registered trademarks of Reynolds Presto Products Inc.



Area of work

Dimension line

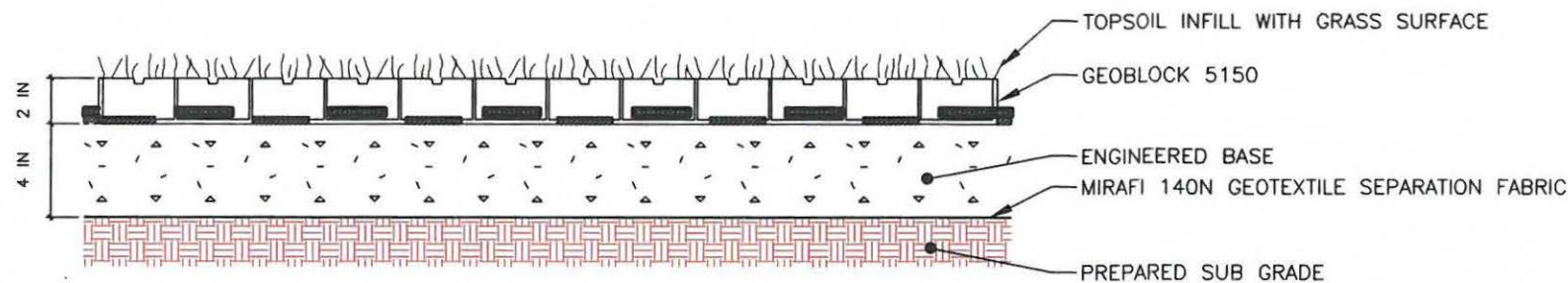
2020/03/08



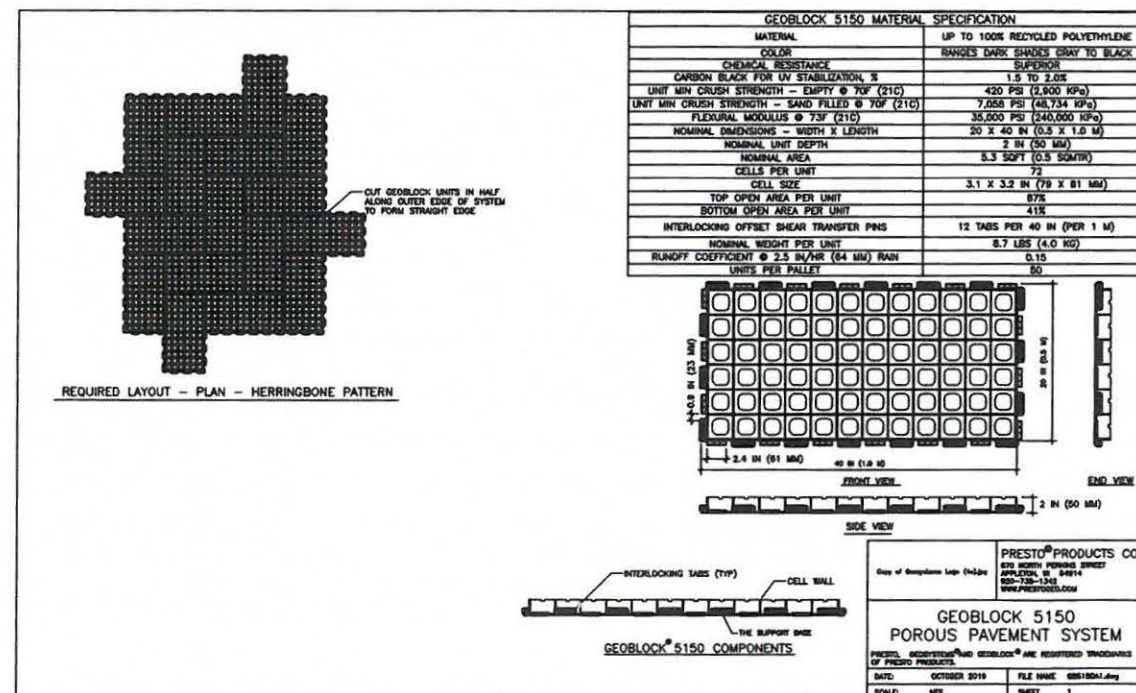
Area of work

Dimension line

2020/03/08



TYPICAL CROSS SECTION
NTS



TYPICAL GEOBLOCK 5150 DETAILS
NTS

DESIGN ASSUMPTIONS:

1. CBR, % = 3.0; THIS IS ANTICIPATED TO BE ACHIEVED BY THE EXISTING SANDY SUBGRADE AFTER ADEQUATE COMPACTION.
2. DESIGN VEHICLE IS A LIGHT TRUCK, WITH 12,000 LB WHEEL LOAD, AND 85 PSI TIRE PRESSURE.
3. INFILL FRICTION ANGLE, PHI, IS 24 DEGREES.
4. INFILL MATERIAL TYPE IS TOPSOIL WITH A UNIT WEIGHT OF 100 PCF.
5. ENGINEERED BASE IS A BLEND OF CRUSHED AGGREGATE AND TOPSOIL.

CONSTRUCTION NOTES:

1. THE PROJECT IS TO REINFORCE THE GRASS SHOULDER AREA ADJACENT TO THE PAVED ROAD NEAR THE SITE ENTRANCE. THIS AREA IS CURRENTLY BEING ADVERSELY IMPACTED BY DELIVERY TRUCKS THAT TRAFFIC/PARK ON THE GRASS ALONG THIS AREA. THE IMPROVED/REINFORCED AREA WILL BE 8.33 FT WIDE STARTING AT THE EDGE OF PAVEMENT. THE LENGTH OF THE IMPROVED/REINFORCED AREA WILL BE AS DIRECTED BY THE OWNER.
2. REMOVE THE EXISTING GRASS AND EXCAVATE THE LOAM AND SANDY SUBGRADE SOIL TO SUBGRADE ELEVATION WHICH IS 6" BELOW FINAL GRADE.
3. VERIFY ALL ORGANICS HAVE BEEN REMOVED FROM SUBGRADE. IF NECESSARY OVEREXCAVATE ORGANICS AS NEEDED AND BACKFILL WITH SIMILAR SANDY SUBGRADE MATERIAL.
4. COMPACT THE SUBGRADE SOIL USING A PLATE COMPACTOR; 6 PASSES MINIMUM ARE REQUIRED. ADD WATER TO THE SANDY SUBGRADE BEFORE COMPACTING. DO NOT COMPACT SUBGRADE UNTIL READY TO PLACE ENGINEERED BASE SOIL TO AVOID SURFACE DRYING. IF THE SUBGRADE DRIES AND THE SAND LOOSENS, WET AND RECOMPACT AS NEEDED.
5. INSTALL MIRAFI 140N, OR EQUIVALENT, GEOTEXTILE FABRIC ON THE SUBGRADE.
6. PROVIDE IMPORTED ENGINEERED BASE MATERIAL. THIS MATERIAL IS COMPRISED OF A HOMOGENOUS MIXTURE OF CRUSHED AGGREGATE HAVING AN AASHTO #5 OR SIMILAR DESIGNATION BLENDED WITH THE EXISTING TOPSOIL EXCAVATED FROM THE SITE...OR SIMILAR IMPORTED TOPSOIL. BLEND THE CRUSHED AGGREGATE WITH THE TOPSOIL AT A $\frac{2}{3}$ (AGGREGATE) TO $\frac{1}{3}$ (TOPSOIL) RATIO. THE CRUSHED AGGREGATE SHALL HAVE A PARTICLE RANGE FROM 0.375 TO 1 INCH WITH A D50 OD 0.5 INCH.
7. PLACE THE ENGINEERED BASE MATERIAL AND COMPACT USING A PLATE COMPACTOR; 6 PASSES MINIMUM ARE REQUIRED. CARE SHALL BE TAKEN WHEN PLACING THE ENGINEERED BASE MATERIAL SO AS TO NOT DAMAGE THE GEOTEXTILE FABRIC; ADD ADDITIONAL LAYERS OF FABRIC IF DAMAGE OCCURS.
8. INSTALL THE PRESTO GEOBLOCK 5150 UNITS IN A HERRINGBONE PATTERN. THE UNITS SHALL BE CONNECTED AND INSTALLED PER THE MANUFACTURERS RECOMMENDATIONS. CONTACT PRESTO GEOSYSTEMS, 670 NORTH PERKINS ST., APPLETON, WI 54914, TELEPHONE 920-738-1342.
9. INFILL THE GEOBLOCK 5150 WITH THE TOPSOIL. THE TOPSOIL SHOULD BE THAT EXCAVATED FROM THE SITE OR A SIMILAR TYPE MATERIAL. DO NOT COMPACT THE TOPSOIL WITHIN THE GEOBLOCK. GRADE THE TOPSOIL TO SLIGHTLY ABOVE THE TOP OF THE GEOBLOCK.
10. PLACE SEED AND MULCH THE AREA AS NEEDED TO PROTECT THE SEED AND HOLD MOISTURE UNTIL THE GRASS IS ESTABLISHED. WATER THE AREA AS NEEDED TO FACILITATE HEALTHY GRASS GROWTH.

DATE: MARCH 5, 2020

GENERAL DETAILS
GRASS SHOULDER REINFORCING
ENTRANCE AREA @ GUARD SHACK

MANALAPAN, FLORIDA

SHT 1 OF 1

PRELIMINARY ISSUED FOR REVIEW

ATTACHMENT A



REFERENCE FORM

REFERENCES	#1	#2	#3
Company Name			
Company Address			
Contact Name			
Contact Title			
Contact Phone			
Contract Date			
Project Description			

Emergency Contact:

Name: _____

Phone Number: _____

Business Hrs. _____

After Hours: _____

ATTACHMENT B



PROCUREMENT SERVICES

EQUAL OPPORTUNITY PLEDGE

All Contractors and Suppliers must agree to the following:

- A. The Contractor/Supplier will not discriminate against any employee or job applicant because of his or her race, creed, color, sex, marital status, or national origin.
- B. The Contractor/Supplier will post in a conspicuous place, available to all employees and job applicants, a copy of this pledge.
- C. The Contractor/Supplier will, in all solicitations or advertisement for job applicants place to cause to be placed, a statement that the Contractor/Supplier is an "Equal Opportunity Employer."

Compliance with this Equal Opportunity Pledge is mandatory of all Contractors/Suppliers. Failure to sign and return this pledge may result in your Contract/order being canceled, voided or suspended in part or whole.

_____ as a Contractor/Supplier, for the Town of Manalapan, Florida pledges itself to support and abide by this Equal Opportunity Pledge.

AUTHORIZED SIGNATURE

ADDRESS

CITY

STATE

ZIP

DATE SIGNED

ATTACHMENT C



BID CERTIFICATION

() Individual () Partnership
() Corporation () Other (Specify)

Name of Company (or Individual): _____

Address: _____

Telephone Number: _____ Fax Number: _____

Email Address: _____

Tax Identification #: _____ Addenda Received: _____

Bidder's Representative: _____

Title: _____

Proposed Total Fee to Provide Requested Service: Area #1 \$_____

Area #2 \$_____

Total \$_____

The undersigned certified under oath the truth and correctness of all statements and of all answers to questions made hereinafter:

IN WITNESS WHEREOF, the Proposer hereto has executed this Bid Certification Form this _____ day of _____, 20____.

(CORPORATE SEAL)

ATTEST:

BIDDER:

Printed Name

Printed Name

Signature

Signature Authorized Officer

Title

Title

Date

Date

State of }

County of }

On this the ____ day of _____, 20____, before me, the undersigned Notary Public of the State of Florida, personally appeared _____ (Name(s) of Individual(s) who appeared before Notary) and whose name(s) is/are subscribed to within instrument, and he/she/they acknowledge that he/she/they executed it.

WITNESS my hand and official seal

NOTARY PUBLIC
STATE OF FLORIDA

Personally known to me: _____

Produced Identification: _____

Type of Identification Produced: _____

ATTACHMENT D

BID PROPOSAL POROUS PAVING SYSTEM:

ATTACHMENT E



DRUG-FREE WORKPLACE FORM

The undersigned firm in accordance with Section 287.087, Florida Statutes,

hereby certifies that _____ DOES/DOES NOT.
(Name of Business) (Circle appropriate response)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace, specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the danger of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, and any available drug counseling.

By: _____
Signature Authorized Officer

Date: _____

ATTACHMENT F



UNITED STATES LAW REQUIRES COMPANIES TO EMPLOY ONLY INDIVIDUALS WHO MAY LEGALLY WORK IN THE UNITED STATES – BOTH U.S. CITIZENS AND FOREIGN CITIZENS WITH THE NECESSARY AUTHORIZATION. OUR DIVERSE WORKFORCE CONTRIBUTES GREATLY TO THE VIBRANCY AND STRENGTH OF OUR ECONOMY, BUT THAT SAME STRENGTH ALSO ATTRACTS UNAUTHORIZED EMPLOYMENT. E-VERIFY IS AN INTERNET BASED SYSTEM THAT ALLOWS BUSINESSES TO DETERMINE ELIGIBILITY OF THEIR EMPLOYEES TO WORK IN THE UNITED STATES. E-VERIFY IS FAST, FREE AND EASY TO USE. IT IS THE BEST WAY FOR EMPLOYERS TO ENSURE THE PROVISION OF A LEGAL WORKFORCE.

VISIT: U.S. CITIZENSHIP AND IMMIGRATION SERVICES ONLINE TO ENROLL IN E-VERIFY.

UPON ACCEPTANCE OF A BID OR PROPOSAL, THE FOLLOWING PROVISION SHALL BE DEEMED PART OF ANY CONTRACT OR AGREEMENT FOR SERVICES AUTHORIZED BY THE TOWN OF MANALAPAN:

“THE CONTRACTOR SHALL BE ENROLLED IN AND SHALL VERIFY THE WORK ELIGIBILITY STATUS OF ALL EMPLOYEES WORKING FOR THE TOWN PURSUANT TO THIS AGREEMENT, INCLUDING SUBCONTRACTORS AND THEIR EMPLOYEES, THROUGH THE E-VERIFY PROGRAM, OPERATED AND MAINTAINED BY THE UNITED STATES DEPARTMENT OF HOMELAND SECURITY AND THE SOCIAL SECURITY ADMINISTRATION.”

AFFIDAVIT OF E-VERIFY COMPLIANCE

COMES NOW _____, who being duly sworn states as follows:

1. I am an adult, over 18 years of age, and legally competent.
2. I have personal knowledge of the information contained in this Affidavit.
3. I hold the position of _____ (your title or position) with _____ (name of company), and I am authorized by said company to make the statements contained in this Affidavit.
4. _____ (name of company) is presently enrolled in and participating in the E-Verify program operated and maintained by the United States Department of Homeland Security and Social Security Administration.
5. _____ (name of company) has screened its employees through E-Verify and has determined that it does not employ unauthorized workers.

SS:

State of Florida

My Commission Expires: