



PRESTO **GEO**SYSTEMS

FILTERPAVE™

POROUS PAVEMENT SYSTEM

SPECIFICATION



FILTERPAVE™

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FP-00 - 1 SEPT 2009

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FOREWARD

This suggested Specification for **FilterPave™ Porous Pavement System (FPPS)** is provided as a guideline only. Each project is site specific and will require information related to local soil conditions, existing and proposed drainage parameters, and regional precipitation patterns. We recommend design services be performed by a licensed professional engineer.

FPPS has continued to gain popularity as an ecologically-friendly method to effectively treat, control and retain or detain stormwater runoff. When properly utilized, FPPS systems can reduce or eliminate the need for detention ponds while providing significant water quality benefits through natural filtration. FPPS is predominantly used as a medium-duty pavement, such as those found in driveways, trails and parking area applications.

FPPS does not look or behave like asphalt or concrete pavements. While the finished surface is smoother and more aesthetically pleasing than other porous pavements, the surface is not as tight and uniform as traditional dense asphalt or concrete. In order to allow sufficient infiltration, the surface is open and varied with moderate amounts of surface raveling normal during the first few months of service. Such loose particles must be swept vigilantly to reduce additional scoring of the pavement. Owners, Engineers and Architects are encouraged to visit locations where FPPS has been installed before making the decision to specify and utilize the product.

Traditional pavement testing methods are not applicable to this type of pavement material. FPPS is bound by an elastomeric binder and as such the pavement has characteristics of a flexible pavement. However, unlike asphalt, FPPS also has a fairly high compressive strength and has positive flexural modulus characteristics. As continued testing of this product yields test methods that are reproducible in the field and laboratory, recommended specifications will be modified.

POROUS PAVEMENT SPECIFICATION

PART 1

1. GENERAL

A. General Description

1. The scope of this section includes subgrade preparation and installation of FPPS paths, driveways, parking lots and other areas requiring a firm and porous surface.

B. Scope of Work

1. The work to be completed under this contract includes the furnishing of all labor, materials and equipment necessary for construction of the proposed improvements in conformance with plans and specifications.

C. Submittals

Mix Design

1. Contractor shall provide Owners agent with proposed design mix gradation. All glass will be 1/4 in or less and shall conform to the percentages of particle diameter size indicated by Glass Gradation chart illustration shown below.

Glass Gradation			
US Std Sieve Size (in)	Sieve Opening (in)	¼ in Crushed Granite	Glass with Fines
3/8	.375	0	0
4	.187	8	9
5	.157	15	13
8	.0937	57	46
10	.0787	8	11
12	.0661	6	12
20	.0331	8	11
pan	0	2	2

2. Pigment color shall be chosen from the standard palette selection as available from Presto Products.
3. MSDS information on proposed elastomeric binder material as well as ratio of binder to glass content will be required.

D. Quality Assurance

1. Prior to the awarding of the contract, the contractor shall furnish owner or owners agent a statement of qualifications, experience, and a project listing of successfully installed FPPS projects, including site addresses and references.
2. If the FPPS placing Contractor has no previous experience with the product, the Contractor will retain a manufacturer approved site engineer to supervise base preparation, material production, placement, finishing and curing. Expense for the approved site professional will be the Contractor's responsibility.
3. Test Panels: If so required by the contract, the FPPS contractor may be required to prepare test panels. Cost of creating and, if necessary, removing test panels shall be paid as a separate line item in the contract proposal. Test panels will be of the same depth and shall be placed upon the same sub-base as the project slab and will be accompanied by a test cylinder.

PART 2

2. MATERIALS

A. General

1. Proven locally available materials having a track record of satisfactory performance shall be used. However, recycled glass and elastomeric binder must be only as approved by the manufacturer of the PPS system and may not be locally produced.

B. Base Aggregate

1. Base layer aggregate, crusher run limestone or equivalent of good structural quality, 3/8 in – 3/4 in clear stone. The base aggregate shall have less than 5% fines.

C. Binder

1. High strength Filterpave elastomeric binder specifically formulated for FPPS applications shall be provided by the approved manufacturer. The elastomeric binder components will be shipped in sealed and water-tight containers as specified by the manufacturer. Once unsealed, the elastomeric binder packaging shall use manufacturer-approved desiccant caps to assure that moisture is not introduced to either of the two-part components of the binder. .

D. Recycled Glass

1. Recycled glass shall be post consumer recycled glass, crushed and tumbled to a consistent 1/4 in diameter with no more than 2% - fine particulate passing #200 sieve screen. Glass shall be only supplied by a certified FilterPave supplier and shall be tested to specification. Important Note: Improperly processed recycled glass aggregate will not perform properly and will present potential damage/injury to vehicles and pedestrians. All glass shall be shipped in commercial-grade, moisture-proof super sack bags with lifting straps, and shall be shipped upon wooden pallets to allow for safe loading, unloading and repositioning at the site.

E. Pigment

1. Pigmentation of resin shall be added via only Presto-approved disseminator system. Colors shall only be chosen from the Presto Products standard palette made available to the certified contractor.

F. Geotextiles

1. The geotextile shall be non-woven, 6-8 ounce per yard density minimum average value or approved equivalent as required by design.

G. Surface Overcoat

1. Surface overcoating to be applied with rollers. Material to be only authorized Presto Products topcoat.

H. Proportions

1. **Elastomeric Binder Ratio:** For all FPPS projects, contractor will be required to meet manufacturer's specification for proposed binder ratio (typically expressed as a percentage by weight of glass/granite) and shall maintain this ratio within +/-5% tolerance.
2. **Recycled Glass Content:** The recycled glass content will be derived from 100% post-consumer food and beverage containers cleaned, crushed, rounded and processed to meet Presto's approval criteria. General qualities at a minimum shall be 1/4 in

maximum particle size with less than 2% passing the #200 sieve size with no more than 1% deleterious material including ceramics, plastic and metal to be present.

3. **Admixtures:** Admixture ratios to be dictated by site-specific weather conditions and approved by binder supplier. Contractor to take specific precautions to accurately and thoroughly combine admixtures to avoid early cure FPPS mix.

PART 3

3. EXECUTION:

A. Subgrade Permeability, Base Preparation and Form-Work:

1. **Subgrade Permeability:** Prior to placement of FPPS, the sub-grade permeability shall be tested by double ring infiltrometer, or other suitable test for sub-grade permeability. Sub-grade permeability shall meet a minimum infiltration rate of 1 in per hour unless otherwise approved by project engineer.
2. **Sub-grade Support:** Sub-grade shall have adequate support to carry the weight of low ground pressure (LGP) equipment. If borrow material is required to bring subgrade to final project elevation, it shall be clean and free of deleterious materials. It shall be placed in 8 in lifts and compacted to a minimum density of 92% as established by ASTM D1557 or AASHTO T180.
3. **Groundwater:** Depth to groundwater is recommended to be a minimum of three feet from bottom of base at time of high groundwater interval to be confirmed at time of excavation.
4. **Base Material:** Base depth to be determined by site specific conditions and project goals. Place 3/8 in- 3/4 in clear stone with a maximum of 5% fines passing the #200 mesh using LGP equipment over separator geotextile (if required) with care taken to keep geotextile seams in place. Base shall be leveled to within 1/2 in of designed top-of-base elevation as determined by project drawings. Alternate base foundation layer of 3/8 in-1/2 in cleaned, crushed, screened rough glass may be used if overtopped by a minimum of 2 in of 1/2 in minus crushed stone.
5. **Formwork:** When forms are required, forming for FPPS projects is very similar to that of traditional concrete pavement. Forms of wood or steel shall be the full depth of the pavement. Forms shall be sufficient strength and stability to support mechanical screeding equipment without deformation of plan profiles following spreading and strike-off operations. Form release agent shall be applied to both wood and steel forms. Forms shall not have stakes or spikes protruding above the top of the forms to assure even screeding of the newly poured material.

B. Mixing, Hauling, Placing and Finishing:

1. **Mix Time:** Volumetric mixers specifically designed for producing FPPS shall be operated at minimum 300 RPM and shall be instantaneously produced and discharged into the conveyance equipment and/or directly to the forms to maintain maximum working time. The mixer and each component of the mix used will be kept dry until the binder can be introduced. Calibration of the binding agent content shall be completed upon the mixer and the percentage will be in conformance with the manufacturer's design formulation.
2. **Transportation:** All FPPS projects will utilize on-site produced materials to reduce waste and impact to adjacent roadways.
3. **Discharge:** Discharge shall be a continuous operation and shall be completed as quickly and efficiently as possible. Material shall be discharged into conveyance

equipment as close to its final position as practical and such that fresh mix enters the mass of previously placed material. In the event of material shortage or mechanical delays in mixing, a construction joint equivalent to project forms will be utilized.

4. Placing and Finishing:

- a. The FPPS will be placed to the required cross section and shall not deviate more than 3/16 in +/- in 10 feet from profile grade.
- b. Strike off shall be performed using mechanical power-screed, vibrastrike type device or manual method as dictated by project parameters. Extreme care should be taken to strike off the material as flat and uniformly as possible. Filling and cutting imperfections can be completed with fresno or other hand trowels immediately after strike off. Any apparent low spots must be filled only immediately (<5 minutes) after strike off and floated in using hand or mechanical trowels.
- c. Finishing shall be accomplished with Fresno and hand trowels within 10 minutes of screeding.
- d. Edging shall commence immediately after final finish and can be completed with conventional concrete edging tools. Care should be taken to immediately (<5 minutes) fill low spots along the edge created by strike off operations.
- e. Curing: Unless otherwise approved by project Engineer, a minimum of three days shall be allowed for curing prior to vehicular traffic.
- f. Jointing (optional): Spacing of and determination between tooled edge construction joints or mechanically cut in compression joints to be determined by project specifications.

5. Surface Overcoat:

- a. An overcoating of no less than 5 mil of Presto Products approved surface binder material shall be applied to the FilterPave installation as soon as practical. Recommended application time is no sooner than 24 hours after placement..
- b. If traffic is allowed to access the FilterPave installation, the area shall be cleaned and allowed to dry one day before application. The contractor shall follow all recommendations for prep, placement and cure and shall assure that application allows a minimum of four hours to dry before rain or snow falls.

C. Testing and Acceptance:

A minimum of one test for each days placement of FPPS material will be provided to Presto Geosystems for testing to confirm binder content and unit weights. Test cylinders provided by Presto Geosystems shall be filled completely, with contents struck off flush with the top of supplied cylinder. Binder content and material unit weights shall meet project specification with +/- 2% as tested by independent lab of Presto Geosystems choice.

D. USGBC LEED™ Credit Contributions:

The FilterPave system contributes to USGBC LEED™ green building credits in the following categories:

1. **Reduced Site Disturbance:** through creation of permeable surfaces and reduction of stormwater detention facilities, resulting in less construction impact on an area basis and resulting in less potential particulate runoff and impact to the surrounding land and watercourses.
2. **Stormwater Management:** through use of permeable surfaces that provide stormwater infiltration and reduce stormwater runoff.
3. **Reduced Heat Island Effect:** through creation of a cooler surface.



4. **Recycled Material Content:** through use of materials with recycled content to reduce impacts from extraction and processing of new virgin materials.
5. **Regional Materials:** by using material within 500-mile radius of source (when applicable).

E. Measurement and Payment

1. Measurement and payment of the RPP layer shall be by the installed square foot area unless otherwise prescribed by the project specifications or purchasing contract.
2. Measurement and payment for the geotextile portion of the system shall be by the square yard measure unless otherwise agreed upon in the purchasing contract.
3. Measurement and payment of the aggregate base layer material will be by the ton, and may include the material and the placement, compaction and final surface preparation unless this labor portion is otherwise separately identified in the purchasing contract

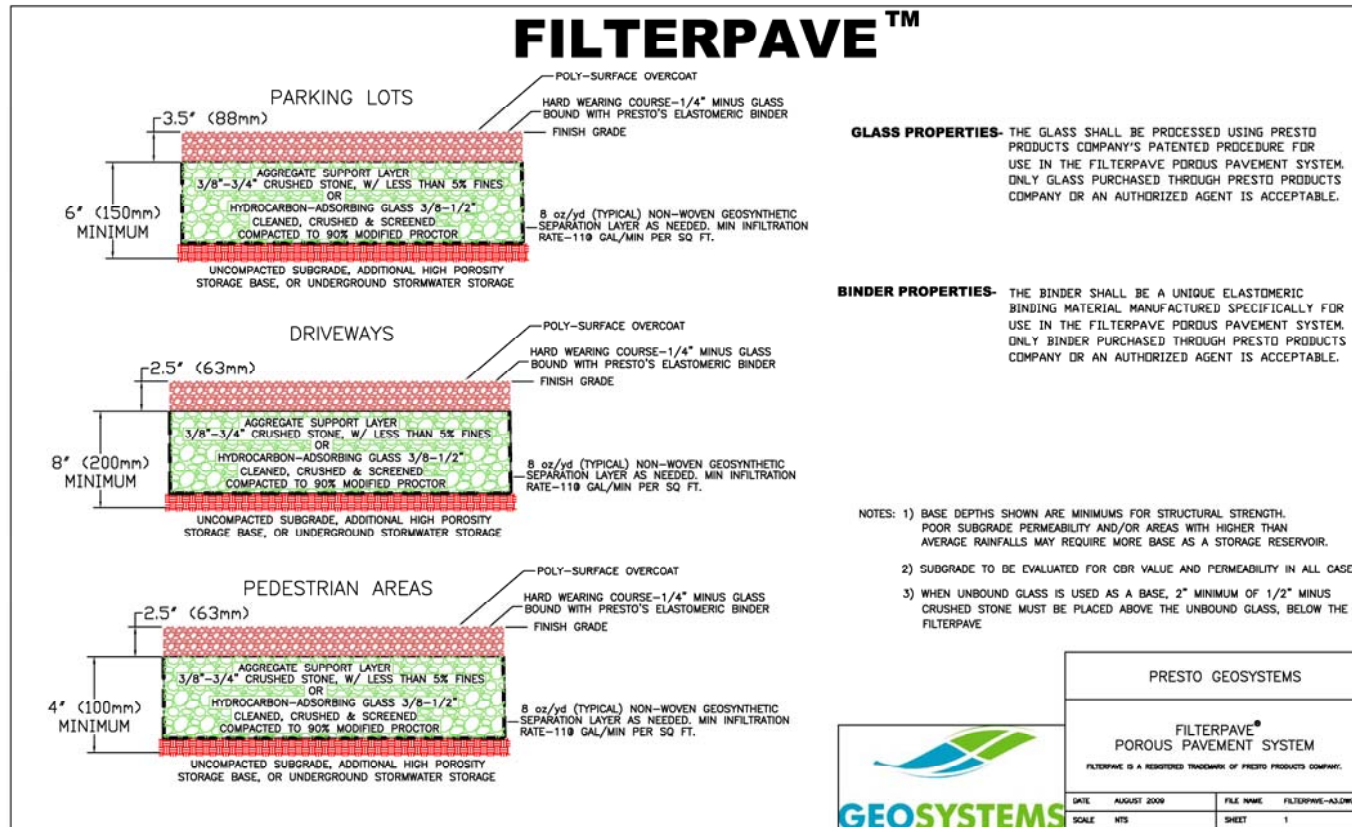


Figure 1: Typical FilterPave Cross-Sections