SECTION 32 12 43 – FLEXIBLE POROUS PAVING
(Formerly Section 02795 Porous Pavement)

PART 1 - GENERAL

1.1 SCOPE

A. This specification provides requirements for the construction of flexible porous paving.

B. In case the requirements of this specification conflict with the contract documents, this document shall govern.

1.2 RELATED SECTIONS

1. Subgrade preparation under Section 31 20 00 Earth Moving (02200 – Earthwork).

2. Utilities and subsurface drainage under Section 33 40 00 Storm Drainage Utilities (02700 – Subsurface Drainage and Structures), as needed.

1.3 DEFINITIONS

A. Exposure Condition, Moderate: Exposure to a climate where the paving will not be in a saturated condition when exposed to freezing and will not be exposed to deicing agents or other aggressive chemicals.

B. Exposure Condition, Severe: Exposure to deicing chemicals or other aggressive agents or where the paving can become saturated by continual contact with moisture or free water before freezing.

C. Base Reinforcement: The use of a geosynthetic within the aggregate base course to enhance the performance of a paving

D. Geogrid: Biaxial or triaxial woven polypropylene material for base course reinforcement and confinement, and subgrade stabilization and increased subgrade load capacity

E. Panel: An individual paving slab bordered by joints or slab edges.

F. Porous/Pervious Paving: A paving comprising material with sufficient continuous voids to allow water to pass from the surface to the underlying layers.

G. Porous/Pervious: The property of a material which permits movement of water through it under ordinary hydrostatic pressure.

H. Flexible Porous Paving: Paving system comprised of three components: recycled passenger car tires, aggregate, and urethane binder that provides a strong, pervious, yet flexible paving.

I. Subbase: A layer in a paving system between the subgrade and the base course, or between the subgrade and a flexible pervious paving.

J. Subgrade: The soil prepared and compacted to support a structure or paving system.

1.4 REFERENCED STANDARDS

A. ASTM standards:

1. ASTM C 666/C 666M-03, "Standard Test Method for Resistance of Concrete to Freezing and Thawing, Procedure A - freezing and Thawing in Water." Samples shall indicate only minimal mass change results after 300 nominal freeze-thaw cycles, and visual examination of the test specimens shall indicate no cracks or breaks.
    a. D 3385-03 Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer.
    b. D 3665-06 Standard Practice for Random Sampling of Construction Materials E 329-06a Specification for Agencies Engaged in Construction Inspection and/or Testing.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Flexible Porous Paving installer shall be currently certified by the Manufacturer and have successfully installed a minimum of 10,000 square feet within the Mid-Atlantic region within the last year.
2. Flexible Porous Paving installer shall employ no less than two Manufacturer-certified Flexible Porous Paving technicians on staff who directly oversee or perform the installations during all Flexible Porous Paving placement, unless otherwise specified.

1.6 SUBMITTALS

A. Qualification Data

1. For Porous Paving Installer:

    a. Provide a list of successfully installed Flexible Porous Paving projects, as required herein, including the address, square footage, and photographs for each project.
    b. Manufacturer's Certifications.

B. Proposed Mix Design.

C. Samples for Verification: Provide one 6” diameter sample, full thickness.

1.7 PROJECT CONDITIONS

A. Traffic Control: Maintain access for pedestrian traffic as required for other construction activities.

B. Schedule placements to minimize exposure to wind and heat before curing materials are applied.

C. Avoid placing porous paving if rain, snow, or frost is forecast within 24 hours unless measures are taken as described later. Always protect fresh paving from moisture and freezing.

PART 2 - PRODUCTS

2.1 SUBBASE

A. Coarse aggregates shall meet the durability requirements of ASTM C 33.

2.2 FLEXIBLE POROUS PAVING

A. Bonding: Have the capacity to bind with: wood; steel; concrete; aluminum; compacted aggregate; enamel tile, or; fiberglass

B. Resistance to degradation: Resistant to: chlorine; ozone; bromine; muriatic acid; salt water; oil; transmission oil, and; hydraulic oil.

C. Aggregate:

1. Stone: Triple-washed coarse aggregate, No. 8 coarse aggregate (3/8 to ½ inch) per ASTM C 33. Bagged and labeled as tested and certified by Flexible Porous Paving Manufacturer.

    a. Nominal maximum aggregate size shall not exceed ⅓ of the specified paving thickness.

2. Rubber: Recycled passenger tires ground to ⅜" nominal with the wire remnants removed.

D. Binding agent: urethane liquid prepolymer based upon Diphenylmethane-Diisocyanate.

E. Air Entraining Agents: Prohibited.

F. Mix Design: Using materials acceptable to the Manufacturer design a tentative mix and test for the consistency intended for use on the work and specified.

1. The volume by weight of aggregate per cu. yd. shall be 50% of the total dry mix.
2. The volume by weight of the rubber product per cu. yd. shall be 50% of the total dry mix.
3. Permeability: Pervious infiltration rate of 2,000 gallons/square foot/hour

2.3 FORMS

A. Make forms with steel, wood, or other material that is sufficiently rigid to maintain specified tolerances, and capable of supporting concrete and mechanical concrete placing equipment.

B. Forms shall be clean and free of debris of any kind, rust, and hardened concrete.

C. Form release: Diesel, Bio-diesel or vegetable oil coating.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

A. Prepare subgrade as specified in the contract documents.

B. Construct subgrade to ensure that the required paving thickness is obtained in all locations.

C. Keep all traffic off of the subgrade during construction to the maximum extent practical. Regrade subgrade disturbed by delivery vehicles or other construction traffic, as needed.

D. Compact the material added to obtain final subgrade elevation.

E. Determine subgrade permeability in accordance with ASTM D3385 before porous paving placement. Confirm that subgrade permeability meets requirements of Contract Documents.

3.2 SUBBASE

A. Prepare subbase in accordance with contract documents.

3.3 SETTING FORMWORK

A. Set, align, and brace forms so that the hardened paving meets the tolerances specified herein.

B. Apply form release agent to the form face which will be in contact with porous paving, immediately before placing paving.

C. The vertical face of previously placed concrete may be used as a form.

1. Protect previously placed paving from damage.
2. Do not apply form release agent to previously placed concrete.
3. Apply liquid urethane bonding agent to face of surfaces when adhesion is desired

D. Placement width shall be as specified in Contract Documents.

3.4 BATCHING, MIXING, AND DELIVERY

A. Batch and mix on site in compliance with Manufacturer's written specifications, except that discharge shall be completed within 5 minutes of the introduction of urethane to the dry products .

3.5 PLACING AND FINISHING PAVING

A. Do not place porous paving on frozen or wet subgrade or subbase

B. Deposit porous paving either directly onto the subgrade or subbase by wheelbarrow or by material handler onto the subgrade or subbase, unless otherwise specified.

C. Deposit porous paving between the forms to an approximately uniform height.

D. Spread the porous paving using a come-along, short-handle, square-ended shovel or rake.

E. Use steel trowels to finish to the elevations and thickness specified in Contract Documents.

3.6 FINAL SURFACE TEXTURE

A. Final surface of porous paving shall be smoothed with bull float and magnesium trowels.

3.7 EDGING

A. When forms are not used, bevel the edge of the top surface to a 45° slope

3.8 CURING

A. Begin curing within 20 minutes of paving discharge, unless longer working time is accepted by the Manufacturer.

B. Completely cover the paving surface with a minimum 4 mil thick polyethylene sheet only if rain or sprinklers are imminent within 20 minutes. Cut sheeting to a minimum of a full placement width.

1. Cover all exposed edges of paving with polyethylene sheet.
2. Secure curing cover material without using dirt.

C. Cure paving for a minimum of 24 uninterrupted hours, unless otherwise specified.

3.9 HOT- AND COLD-WEATHER CONSTRUCTION

A. When hot weather is anticipated up to 95 degrees Fahrenheit, no special procedures are necessary.

B. In cold weather when temperatures may fall below freezing just after an installation, utilize a fan to maintain airflow over porous paving during the curing process.

3.10 OPENING TO TRAFFIC

A. Do not open the paving to light vehicular traffic until the porous paving has cured for at least 24 hours during warm weather, and 48 hours during very cold temperatures at or near freezing and not until the porous paving is accepted by the Owner for opening to traffic. Paving should be checked and verified to be sufficiently hardened after the curing period as relative humidity can alter the curing time in some regions.

END OF SECTION 32 12 43