

ITEM 701.3

PRECAST POROUS CONCRETE  
PAVING SLABS

SQUARE YARD

GENERAL

This work shall consist of furnishing and installing Precast Porous Concrete Paving Slabs at locations specified on the Plans and as directed by the Engineer.

References

American Society for Testing and Materials (ASTM) Current Edition:

1. ASTM C 33 Standard Specification for Concrete Aggregates
2. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
3. ASTM C 131 Standard Test Method for Resistance to Degradation of Small- Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
4. ASTM C 136 Testing Method for Sieve Analysis of Fine and Coarse Aggregates
5. ASTM C 1701/1701M Standard Test Method for Infiltration Rate of In Place Pervious Concrete
6. ASTM D 1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils

Quality Assurance

Installation Contractor Qualifications

1. Installation shall include planning the work, horizontal and vertical layout, fine grading of subgrades, installing non-woven geotextile fabric in accordance with the respective manufacture's recommendations, placing and compacting crushed stone filter course (subbase), place and screed crushed stone choker (base), and placing precast porous concrete paving slabs.
2. Installation Contractor shall have documented experience with the successful installation of precast porous concrete paving slabs similar in complexity of this project. In lieu of documented and successful experience with precast porous concrete slabs, Contractor shall provide vendor representation onsite before and during installation to ensure adequate quality assurance and control, and first slab shall be considered a mockup for Engineer's approval prior to proceeding with the remainder of the project.
3. Installation Contractor shall use adequate forces including equipment and skilled workers. Workers shall be trained and experienced in the necessary crafts and completely familiar with the specified methods needed for proper performance of this Specification.
4. All materials, methods of installation, and workmanship shall conform to requirements of ASTM or other applicable Standards.
5. Federal, State and/or Municipal approvals, if required for this project.
6. Precast porous concrete paving slabs shall be visually inspected by the manufacturer for completeness, texture, and consistency with installation drawings. A small amount of "skinning", not to exceed 1% of the top or bottom of slab surface areas, will be allowed.

7. Review the Contractor's installation plan in a pre-construction meeting with manufacturer's representatives, paving slab installation Contractor, general Contractor, project design professional, and owner's representative.

### Weather Considerations

Do not install precast porous concrete slabs, crushed stone base, or crushed stone subbase in rain or snow, or on saturated or frozen subgrade.

### Delivery, Handling and Storage

Coordinate delivery to not interfere with other construction and avoid delays.

Slabs shall be offloaded one-at-a-time by forklift operated by a trained and experienced operator. Forklift must be equipped with 6-foot-long forks to safely offload slabs.

Verify safe load capacity of forklift in accordance with Occupational Safety & Health Administration (OSHA) recommended practices. Only use forklifts with adequate safe load capacity.

Store slabs on level ground and propped with 4-in. by 4-in., minimum, timbers placed parallel to one another located directly beneath imbedded lifting points. Place timbers between each slab.

Slabs shall be stored in stacks not more than 4 slabs high.

Store slabs such that they are kept free from mud, dirt, grass cuttings, accumulation of foliage and debris. Pressure wash with clean water to remove dust within 24 hours prior to placement.

## MATERIALS

### Precast Porous Concrete Paving Slab

Manufacturer:

1. Stormcrete™ Precast Porous Concrete Paving Slab System supplied by Porous Technologies, LLC, 8 Blue Moon Drive, North Yarmouth, ME (telephone 877-271-9055),
2. Or approved equal.

Typical dimensions of full-sized precast porous concrete slabs shall be 5 ft. by 8 ft. in plan; half-sized end slabs shall be 5 ft. by 4 ft. in plan. Precast porous concrete slabs shall be 6 in. thick. Joints between adjacent rows of panels shall be staggered not less than 2 ft.

Minimum compressive strength: 3000 lbs. per sq. in. per ASTM C 42/42M.

Minimum infiltration rate: 250 in. per hr. per ASTM C 1701/1701M.

The precast porous concrete paving slabs shall include 4 permanent lifting points imbedded in the top of the full-sized slabs for ease of installation, maintenance, removal, and reinstallation.

Precast porous concrete slabs shall be cured by the manufacturer's approved methods; slabs shall not be shipped until the porous concrete has achieved 85% of the minimum compressive strength.

### Expansion Joint

Expansion joint material shall be preformed expansion joint filler conforming to AASHTO M153.

### Filter Course and Choker Course

Filter course shall be in accordance with Specifications for Item 156.057 – Washed No. 57 Stone.

Choker course shall be in accordance with Specifications for Item 156.08 – Washed No. 8 Stone.

### Non-Woven Geotextile Fabric

Non-woven geotextile fabric shall be in accordance with Specifications for Item 698.3 – Non-Woven Geotextile Fabric.

### Submittals

Shop drawings: installation plan showing layout and designation number of each full and partial precast porous concrete paving slab complete with lifting points in surface; expansion joint detail(s); and geotextile fabric manufacturer specification sheets. Indicate materials outside perimeter and profiles/sections.

Test results performed by an independent testing laboratory of the following:

1. Particle-size analysis in accordance with ASTM C 136 for the crushed stone filter course and crushed stone choker with source(s) of supply noted.
2. Infiltration rate in accordance with ASTM C 1701/C 1701M and bulk density for the precast porous concrete paving slabs.
3. Compressive strength in accordance with ASTM C 39 of cores obtained from the precast concrete paving slabs.

## CONSTRUCTION METHODS

### Subgrade Preparation

The subgrade under all porous paving areas shall not be compacted.

Prepared subgrades shall not be subject to construction equipment traffic.

Where erosion has caused accumulation of sediment or ponding on the subgrade, remove sediment with light equipment and/or manually. Scarify the subgrade to a minimum depth of 6 inches (or as directed by the Engineer) under all porous paving areas.

Restore any subgrade areas damaged by erosion, ponding, or traffic compaction to design line and grades prior to installation of geotextile and infiltration bed.

### Examination

Acceptance of Site Conditions:

1. Contractor shall inspect, accept, and document in writing to the slab installation subcontractor that site conditions meet Specifications for the following items prior to installation of concrete paving slabs.
2. Verify that subgrade is dry and relative compaction, surface tolerances, and elevations conform to the Plans and specified requirements.
3. Verify location, type, and elevations of utility structures, and manholes.

Do not proceed with installation of precast porous concrete paving system until site conditions are corrected by the Contractor or designated subcontractor.

### Installation

General

1. Any excess thickness of soil placed over the soil subgrade to trap sediment transported by runoff from adjacent construction areas shall be removed before placement of geotextile and infiltration bed.
2. Keep area where precast porous concrete paving slabs are to be installed free of sediment during the entire construction period. Geotextiles and infiltration bed stone contaminated with sediment shall be removed and replaced with clean materials.
3. Do not damage drainpipes, underdrains, observation wells, roadway boxes, manholes or any other utilities during installation. Report any damage immediately to the Engineer. Damage to these items shall be covered at Contractor's expense.

Geotextiles

1. For non-infiltrating systems, place geotextile and/or membrane as specified by the manufacturer and Engineer. For infiltrating systems, place geotextile on prepared subgrade bottom and side slopes. Do not place geotextile under other areas of infiltrating system unless specified by the Engineer. Secure in place to prevent wrinkling from vehicles, equipment, and worker foot traffic.
2. Overlap geotextile edges in accordance with the manufacturer's requirements, and a minimum of 12 in. in the direction of drainage flow.

### Filter Course Layer

1. Place the filter course over the prepared subgrade and spread and level evenly by raking to minimum thickness specified by the Contract Documents, or as directed by the Engineer. Do not disturb prepared subgrade or shift, wrinkle, or fold the geotextile. Place crushed stone to protect geotextile from tearing under equipment tires and tracks.
2. Compact layer, with a minimum of two complete coverages, one pass each in mutually perpendicular directions, with a 3 to 5 ton smooth, double or single, drum roller operated in vibratory mode. Following vibratory compaction, apply two complete coverages, one pass each in mutually perpendicular directions, with the roller operated in static mode. Continue static rolling until there is no visible movement, weaving or deflection in the surface of the filter course layer.
3. The surface tolerance of the filter course layer shall be + 3/4 in. under a 10 ft. straightedge.
4. Filter course layer shall not substantially exceed that which is covered by paving slabs by the end-of-day.

### Choker Course Layer

1. Place and spread the choker course evenly over the filter course and screed rails. Level surface of choker course with screed.
2. Do not compact or disturb screed choker layer.
3. The surface tolerance of the screed choker layer shall be + 1/4 in. under a 10 ft. straightedge.
4. Choker course layer shall not substantially exceed that which is covered by paving slabs by the end-of-day.

### Expansion Joint

1. Install expansion joints per the Plans and manufacturer's recommendations at the indicated locations and elevations.

### Slab Placement

1. Lay slabs in pattern(s) shown on the Plans. Use 4-foot by 5-foot starter slabs as indicated on the Plans to stagger joints for adjacent rows of slabs.
2. Slabs shall only be lifted and placed using swivels and spreader chains. Chains, cables, or slings should never be wrapped around slabs for lifting under any circumstances. Swivels shall be bolted securely but not over-tightened.
3. Place units hand tight without using metal hammers, pry bars or drift pins. Make horizontal adjustments to placement of laid slabs with wood wedges and levers, and rubber mallets as needed.
4. Provide joints between slabs of 1/4 in. width.
5. Joint lines shall not deviate more than  $\pm 1/2$  in. over 50 ft. from string lines.
6. Fill gaps at the edges of the paved area with properly sized end slabs.
7. Cut end slabs to be placed along the edge or corners with a masonry saw. Cut units shall be no shorter than 1/4 of a whole slab.
8. Adjust bond pattern at pavement edges such that cutting of edge slabs is

- minimized. Do not expose cut slabs to vehicular traffic.
9. Keep skid steer and forklift equipment off unrestrained paving slabs.
  10. After the base is completely prepared, set the precast porous concrete slabs onto the choker course layer with light rubber-tired equipment.
  11. Remove and replace any slabs cracked or damaged during installation with new ones. Reset slabs not in conformance with specified installation tolerances.
  12. Check final surface elevations of set slabs for conformance to the Plans. The final surface tolerance from grade elevations shall not deviate more than  $\pm 3/8$  in. under a 10 ft. straightedge.
  13. The surface elevation of set slabs shall be flush with manholes or the top of utility structures.

### Protection

After work in this section is complete, the Contractor shall be responsible for protecting the precast porous paving slab system from damage and/or contamination with mud, dirt, grass cuttings, accumulation of foliage and debris. If the Engineer deems that the porous paving has become contaminated, the Contractor shall pressure wash and vacuum the slabs at their own expense.

### Maintenance

The Contractor shall perform one cleaning of the precast porous paving slab system with a vacuum sweeper after 120 days and before 150 days after date of Substantial Completion/Provisional Acceptance.

### METHOD OF MEASUREMENT

Precast porous concrete paving slabs shall be measured for payment by the square yard, complete in place.

### BASIS OF PAYMENT

Precast porous concrete paving slabs shall be paid for at the Contract unit price per square yard, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for the expansion joints, re-use of any excavated material, furnishing aggregates to backfill any excavation made for the Contractor's convenience, excavations beyond the limits set forth in the Plans, pressure washing, and vacuum sweeping, but all costs in connection therewith shall be included in the Contract unit price bid.

Washed No. 8 Stone will be paid for separately under Item 156.08, Washed No. 8 Stone.

Washed No. 57 Stone will be paid for separately under Item 156.057, Washed No. 57 Stone.

Excavation will be paid for separately under Item 120.1, Excavation.

Non-Woven Geotextile Fabric will be paid for separately under Item 698.3, Non-Woven Geotextile Fabric.