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# POROUS PAVEMENT PARKING LOTS

GUIDE SPECIFICATIONS

**PAIKY**

PLANTMIX ASPHALT INDUSTRY OF KENTUCKY

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## WHAT IS A POROUS PAVEMENT?

As cities and counties across Kentucky continue to develop, storm water management is a challenge facing all our communities. The use of porous asphalt pavement systems offer an opportunity to address this challenge within the parking lot and other paved area applications. With proper design and installation, the system will allow infiltration of storm water into the pavement structure. Over time, the water will be released, allowing the treated water to infiltrate into the soils below, eliminating the need for detention basins that often require additional land.

The system is comprised of a porous (open-grade) hot mix asphalt surface placed over a granular working platform on top of a reservoir of large stone. The reservoir layer is designed to have the storage capacity to hold water from storm events. With proper design, traditional dense graded asphalt may be used as the surface material in heavy traffic areas. In this scenario, the system must be designed to allow storm water to infiltrate into the reservoir layer through open aggregate edges, drain tiles and pipes, or must sheet flow into porous areas.

## GUIDE SPECIFICATIONS

This guide specification provides mixture design, quality control and acceptance testing requirements for use on porous asphalt mixtures for parking lots.

## MATERIALS

The porous asphalt pavement structure shall meet the following requirements:

### SITE GRADING

The existing soil subgrade under the porous asphalt pavement structure shall not be compacted or subject to excessive construction equipment traffic prior to geotextile and stone bed placement. The bottom of the recharge bed shall remain flat and where elevation changes exist, consider a terrace approach rather than constructing steep slopes.

### GEOTEXTILE (FILTER FABRIC)

A non-woven geotextile fabric shall be placed as the separation later between the soil subgrade and the stone reservoir layer. (In accordance with: KYTC Section 843, Table IV)

### STONE RECHARGE BED

The aggregate reservoir layer shall be placed at a thickness as determined by the designer and utilize single-sized stone that has been washed and does not contain excessive dust or fine materials. A table of

recommended thickness is provided on the following page. Aggregates shall meet the gradation and material property requirements set forth in Section 805 of the KYTC Standard Specifications and shall consist of either Gradation –Size No. 2 or Size No. 3 stone. The intent is to provide a single-size crushed large stone with about 40 percent voids.

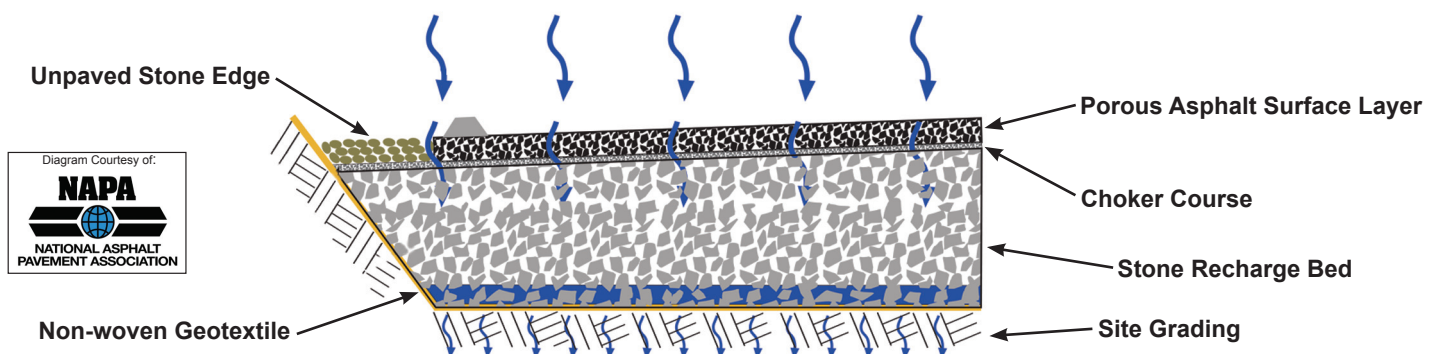
### CHOKER COURSE

The working platform placed over the reservoir layer shall also meet the requirements set forth in Section 805 of the KYTC Standard Specifications and shall consist of a washed single-sized stone (typically a Size No. 57, Size No. 9, or Size No. 11 stone). Dense Graded Aggregate (or any other impermeable material) shall NOT be used within the pavement structure.

### POROUS ASPHALT SURFACE LAYER

The hot mix asphalt layers shall be at least four (4) inches thick and placed in two separate lifts. The asphalt mixture shall utilize a gradation consistent with an Open-Graded Friction Course (OGFC) as described in Section 404 of the KYTC Standard Specifications. The National Asphalt Pavement Association (NAPA) publication Information Series 131 (entitled: Porous Asphalt Pavements for Stormwater Management) also provides guidance on the gradation for this asphalt mixture.

## TYPICAL POROUS PAVEMENT CROSS SECTION



## ASPHALT MIXTURE REQUIREMENTS

PAIKY recommends utilizing PG 76-22 liquid asphalt binder in these porous pavement applications. PAIKY recommends utilizing an open graded friction course mixture in accordance with KYTC Section 404 or NAPA IS 131 with a type "D" aggregate (type "A" aggregates are not necessary in this application). Laboratory air voids should be 16 percent or greater to assure permeability in the mix. The asphalt content shall be 6.0% or greater to provide the necessary coating of the aggregates for long term durability.

## MEASUREMENT AND PAYMENT

Payment for porous asphalt pavement includes all materials, equipment, labor for furnishing and placing the porous asphalt mixture and complying with all requirements. Payment for aggregates and porous asphalt shall be on a per ton basis. Payment includes the placement of materials at a depth as specified in the plans.

## CONSTRUCTION CONSIDERATIONS

Porous Asphalt Mixtures require some special construction considerations which are unique and different from convention asphalt paving practices:

**Temperature Limitations:** The KYTC Standard Specifications require a minimum ambient air temperature of 60 degrees Fahrenheit for placement of Open-Graded Friction Course. Since drain-down of the liquid asphalt can occur with these types of mixtures, consider lowering the plant temperatures as much as 50 degrees in the hot summer months to avoid this problem.

**Mixture Placement:** Utilize conventional paving equipment for placement of the porous asphalt layer. In order to seat the aggregates within the mixture, make two or three passes with a small roller immediately after placement. More frequent rolling tends to reduce the infiltration capabilities of the porous mixture. After final rolling, traffic should be restricted for the first 24 hours when the pavement tends to be tender. Care must be taken so that the porosity of the pavement is not compromised.

## Porous Asphalt Pavement = Stone Bed Depth Table

Table: Recommended Base Depth for Zero Discharge, Given Infiltration (Assuming 40% Porosity in Base Layer)

Rainfall	Soil Type	Sands, Silts & Loams	Sandy Clay Loam	Clay Loam	Silty Clay Loam	Sandy Clay	Silty Clay	Clay
	Infiltration Rate {In/Hr}	0.27	0.17	0.09	0.06	0.05	0.04	0.02
	Hydrologic Soil Group	C	C	D	D	D	D	D
Depth (In)	Base Depth (Inches) for Zero Discharge							
Up to 3"	<i>Average 1-year storm</i>	10	10	10	10	10	10	10
3.5"	<i>Average 2-year storm</i>	10	10	10	10	10	10	10
4"	<i>Average 5-year storm</i>	10	10	10	10	10	10	10
4.5"	<i>Average 10-year storm</i>	10	10	10	10	10	10	12
5"		10	10	10	10	10	12	12
5.5"	<i>Average 25-year storm</i>	10	10	10	12	12	12	14
6"	<i>Average 50-year storm</i>	10	10	10	12	12	14	14
6.5"	<i>Average 100-year storm</i>	10	10	12	14	14	14	16
7"		10	10	14	14	16	16	18

NOTES: The recommended minimum stone bed thickness is 10" for structural purposes. Check structural analysis. Cells highlighted in blue will not drain in the recommended 72 hours and require additional outlet piping.

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