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# Porous Asphalt

## For parking lots, light-traffic roads, and more

## Description

Porous asphalt is very similar to its conventional counterpart, but it is mixed without the fine particles to allow for the passage of stormwater through the surface. After the water passes through the porous surface, it is temporarily stored in a crushed rock storage reservoir and slowly released into the underlying soils. The sloping sides of the system excavation may be stabilized with nonwoven geotextile filter fabric. Geotextile filter fabric should not be used on the bottom of the system unless structurally required.[4]

*Conventional asphalt on the left, porous asphalt on the right. Photo courtesy of National Asphalt Pavement Association (www.asphaltpavement.org).*

## Design Criteria

Porous asphalt systems must be installed by a contractor. The soils underlying the structure are uncompacted. Soil drainage capacity and depth to seasonal high water table must be tested and porous paved areas protected from construction-related sediment runoff. A typical porous asphalt system is composed of side-slope geotextiles (when necessary), a reservoir course of crushed stones, a filter blanket of pea gravel, a filter course bed of coarse aggregate, a choker base course bed of finer aggregate, and finally the porous asphalt mixture, generally about 4-6".[4]

*Above, see the base course of stone during the construction of Stillwater Mill auxiliary parking lot in Burrillville. Photo by URI NEMO.*

## Recommended Use

Porous asphalt is only recommended for sites that meet the following criteria:

- Low traffic
- Sufficiently permeable underlying soils
- Areas where runoff from adjacent structures is directed away from the porous pavement, either by grading the landscape away from the site or by installing trenches to collect the runoff, especially during construction[1]

*The URI porous asphalt lot in foreground allows rainwater to infiltrate to recharge bed below. The access road beyond is sloped away from the porous asphalt lot and is constructed from conventional asphalt, which will not clog when sediment is deposited by vehicle traffic. Photo by URI NEMO.*

## Uses & Benefits

Porous asphalt is best suited to use for:

- Passenger vehicle parking lots
- Overflow or event parking areas
- Roadways with light traffic
- Bike paths

Porous pavement projects require less stormwater pipes than conventional pavement, and detention basins are not necessary. Porous asphalt recharges groundwater to underlying aquifers and is suited to use in cold climates. Excellent drainage results in no standing water during a rainstorm nor black ice in the winter. [5,6]

## Limitations

The load bearing capacity of porous pavement is less than that of conventional pavements. Therefore, large commercial vehicles should not be permitted to park in lots paved with permeable materials. In groundwater recharge areas, prohibit use of porous asphalt areas by trucks and large commercial vehicles to reduce risks of spills.

*Porous asphalt (bottom of photo) is mixed without fine particles, which allows for the passage of stormwater through the surface. It has a distinct texture when compared to conventional asphalt (top of photo). Photo courtesy of University of Connecticut Cooperative Extension.*

*Infiltration tests can be performed to determine the rate at which an area is draining. Image courtesy of URI NEMO.*

# Maintenance

Porous asphalt requires the following care:

- Vacuum sweep quarterly with a vac-assisted dry sweeper only.
- Do not apply sand in winter months, as sand increases need for vacuum sweeping
- In groundwater recharge areas avoid or reduce the use of deicing salt.
- Plow with special plow blades to avoid scarring, but this is not necessary. Raising plow blades is not recommended. [4]
- Monitor to ensure that paving surface is draining properly and conduct routine inspections of the surface for deterioration.
- Remove leaves during fall months and avoid piling snow in corners of lots during winter months to avoid clogging. [2]
- Post signage indicating porous asphalt and the intended design load (i.e. passenger vehicles only). [3]

*Compare conventional asphalt (left) to porous asphalt (right) during a rainstorm. Photo by Jonathan Ford from Cottages on the Greene in East Greenwich.*

# Estimating Cost

Porous asphalt always requires a prepared subbase which can increase cost over traditional asphalt. A current estimate from William Anthony Excavating in North Kingston, RI is about $6.90 per square foot (includes price of prepared subbase).

*Photo of permeable pavement parking spots at Cottages on the Greene in East Greenwich.*

## Sources


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3 UNH Stormwater Center (UNHSC). "Regular Inspection and Maintenance Guidance for Porous Pavements." University of New Hampshire, 2017. Web.

4 University of New Hampshire Stormwater Center (UNHSC). "UNHSC Design Specifications for Porous Asphalt Pavement and Infiltration Beds." University of New Hampshire. September 2016.

5 Ballestero, Tom & Rob Roseen (5 Jan 2012). Porous Pavement Performance in Cold Climates. Water Environment Federation. Web.

6 Minnesota DOT 2012-12  Lebens, Matthew & Brett Troyer. "Porous Asphalt Pavement Performance in Cold Regions." Minnesota Department of Transportation Research Services: Office of Policy Analysis, Research & Innovation. April 2012.


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