



Chester County Stormwater BMP Tour Guide

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BMP: Porous Pavement Parking Lot and Subsurface Recharge Bed

Site Name: East Whiteland Township Building
See *Tour Guidelines* below prior to touring this site

Location: East Whiteland Township Building. ADC Map 22, Coordinates H7
Directions: 209 Conestoga Road (Route 401), Frazer. From Route 202, exit onto Rt 401 toward Frazer (easterly), township building less than ½ mile on right.

Watershed: Valley Creek

Land Use: Government Building

Description: Porous pavement is a permeable surface paving material comprised of bituminous concrete mixtures that permits stormwater to infiltrate down through the pavement's tiny interstitial spaces. Below the porous pavement is a subsurface storage structure called a recharge bed constructed to temporarily store infiltrating stormwater prior its seepage into the underlying ground and water table. This recharge bed stores stormwater in a network of perforated PVC pipes and in the void space of the crushed stone bed that surrounds the piping. The recharge bed is lined with geotextile filter fabric to prevent clogging by small particles. Soils under the recharge bed must remain moderately permeable with depth to permit the infiltration of stormwater into water table and groundwater below. When the recharge bed exceeds its storage capacity stormwater overflows through an outfall pipe into the nearby stormwater basin.

Porous pavement can be used for patios, walkways, driveways, and parking lots. Generally, heavy vehicle traffic should be limited on porous pavement to prevent compaction that would limit infiltration. This porous pavement lot is used for employee parking and, with the exception of township dump trucks loading mulch, has limited through traffic.

Function: Porous pavement with subsurface infiltration beds promotes the on-site infiltration of stormwater. Porous pavement helps recharge local groundwater supplies and maintain base flow in nearby streams, two important functions in this highly developed watershed. Porous pavement reduces peak surface runoff rates and can limit erosion in downslope areas. Porous pavement with its excellent drainage capacity should minimize puddling problems and ice formation in cold weather. Properly installed and maintained pavement can be expected to function effectively for 20 years or more.

Porous pavement has limited pollutant-removal capacity, as such, it should not be used independently in areas with significant sources of pollution (i.e. industrial areas and hotspots). To prevent contamination of drinking water supplies, this infiltration structure should not be installed in highly permeable sand and gravel seams that are directly connected to aquifers. Functioning as designed, the system of porous pavement and subsurface infiltration beds can have the following pollutant removal efficiencies:

- Total Suspended Solids (TSS): 95 %
- Total Phosphorus: 42 %
- Total Nitrogen: 51 %
- Metals (copper and zinc): 99 %
- Bacteria: No Data

Operation and Maintenance: The Chester County Conservation District considers the operation and of porous pavement and subsurface recharge beds to be moderate to high. Maintaining porous pavement requires special attention to ensure it functions over the long term.

- Routinely clean surface of debris, leaves, brush, grass clippings, accumulated mud or sediment, which could impede infiltration.
- The Pennsylvania Handbook (Reference 3) recommends at least semi-annual vacuum sweeping to preserve surface infiltration capacity.
- Routine asphalt surface coatings cannot be used on the porous surface since they clog its pores.
- Porous pavement lots should be inspected regularly to ensure the pavement is infiltrating properly including visual inspections seasonally and after major storm events.
- Cold weather maintenance: limit sanding porous pavement since particles can prematurely clog pores; limit the extent to which snow is piled on porous pavement since it could hinder infiltration due to potential for ice formation and ice-damming (with its excellent drainage porous pavement should have minimal icing problems).

Cost Factors: The cost of this BMP is initially higher compared to the cost of conventional pavement; however, it becomes cost comparable considering that it provides an opportunity to eliminate the need for a traditional basin and associated storm piping. It can be more cost effective depending upon how and where it is installed on a site, especially with consideration to the value of the land that would otherwise be required for a traditional basin. This structure may have higher up-front costs; however, the long-term value of recharging groundwater can offset short-term monetary costs. Site management reports that maintenance costs for the pavement have not been significant.

Tour Guidelines:

Tour participants should park in upper parking lot, inform the receptionist (at the desk inside the front entrance) of your presence, and walk down to the lower parking lot. The porous pavement lot is the small lower lot adjacent to the police car lot.

For more Information

Owner: East Whiteland Twp, 612-648-0600 (William Steele, Director, Public Works)

Designers: Cahill Associates Environmental Consultants

References

1. Cahill Associates Environmental Consultants. Report: *Porous Pavement Parking Lot With Infiltration*.
2. Center for Watershed Protection. *A Review of Stormwater Treatment Practices* (published presentation).
3. *Pennsylvania Handbook of Best Management Practices for Developing Areas*. Spring 1998. CH2MHILL.

Site 9 - East Whiteland Township Porous Pavement Parking Lot



Pictured above and below is the porous pavement lot. Underneath the pavement is a subsurface recharge bed comprised of stone and perforated PVC pipe where stormwater accumulates prior to infiltration into the ground below. Above: the darker lot in the background is paved with porous pavement. Below: the shallow stormwater basin that receives any overflow is located on the other side of the curb.

