

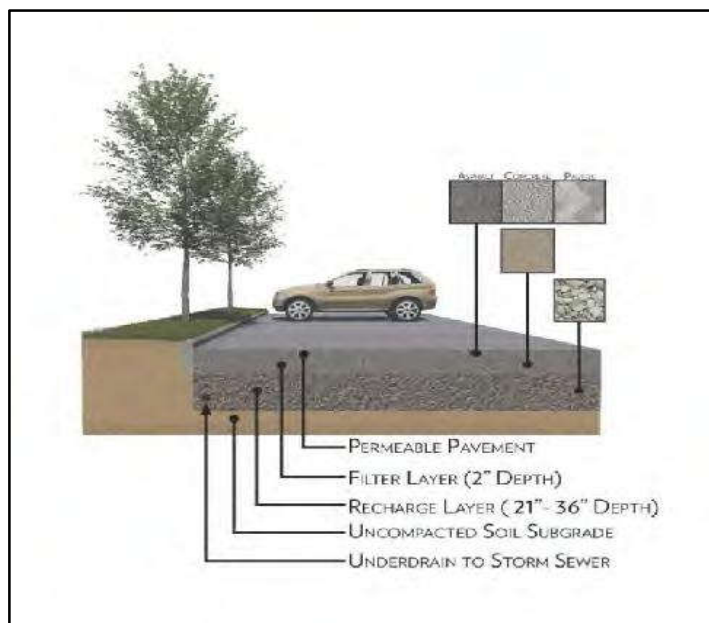
## MAINTAINING STORMWATER CONTROL MEASURES *Guidance for Private Owners & Operators*

### STORMWATER CONTROL MEASURES

#### Permeable Pavement

Permeable pavement materials consist of permeable interlocking concrete pavement (PICP), pervious concrete, porous asphalt or other permeable materials such as geogrids or grass pavement systems that provide structure and stability yet allow water to pass through the pavement and infiltrate into underlying gravel layers and existing soils beneath. Permeable pavements are constructed in place of traditional asphalt or concrete in parking areas, driveways, sidewalks and low traffic vehicular roadways.

All permeable pavements allow infiltration of runoff, but individual designs dictate how much storage of precipitation and stormwater runoff from the heaviest rain events will occur. Regular inspection and periodic removal of accumulated sediments from the surface are required for permeable pavement systems. This is achieved by vacuuming and sweeping the surface of the pavement with a vacuum-sweeper as defined in the SCM's inspection and maintenance agreement. Grass paving systems are cellular in nature and allow for vegetation to grow through them are commonly used in overflow parking areas and used on infrequently traveled access driveways. Regular inspection of grass paving systems to determine the health of vegetation, usually turf grass, is periodically required.



*Typical permeable pavement cross-section view showing how stormwater runoff drains through the pavement system. Diagram also shows different pavement surfaces available. Diagram Credit: Chagrin River Watershed Partners, Inc.*

# MAINTAINING STORMWATER CONTROL MEASURES

## Guidance for Private Owners & Operators

### STORMWATER CONTROL MEASURES



*Permeable interlocking concrete pavement (PICP) with 1/8" joints to allow stormwater runoff to infiltrate below the individual paver units. Credit: Chagrin River Watershed Partners, Inc.*



*Pervious concrete within a parking lot with debris beginning to accumulate on the surface. Credit: Chagrin River Watershed Partners, Inc.*



*Permeable interlocking concrete pavement (PICP) shown with **accumulated sediment** along the curb indicating need for maintenance. Credit: Chagrin River Watershed Partners, Inc.*



*Porous asphalt within a parking lot. Credit: Chagrin River Watershed Partners, Inc.*

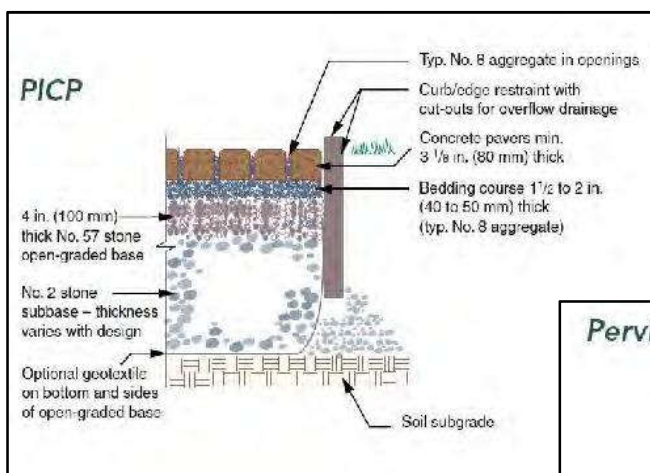


*Surface ponding over PICP indicating **clogged joints** and the need for maintenance. Credit: Chagrin River Watershed Partners, Inc.*

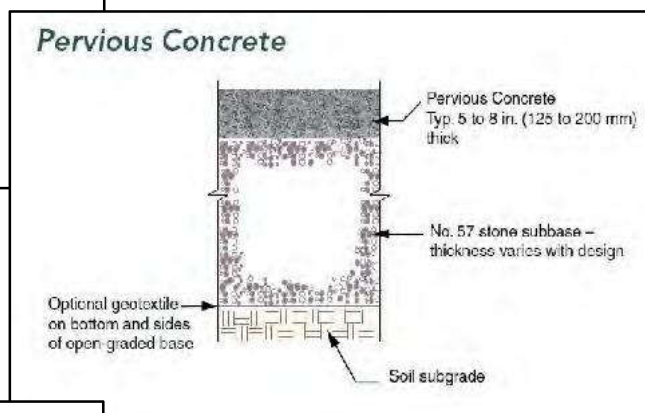
# MAINTAINING STORMWATER CONTROL MEASURES

## Guidance for Private Owners & Operators

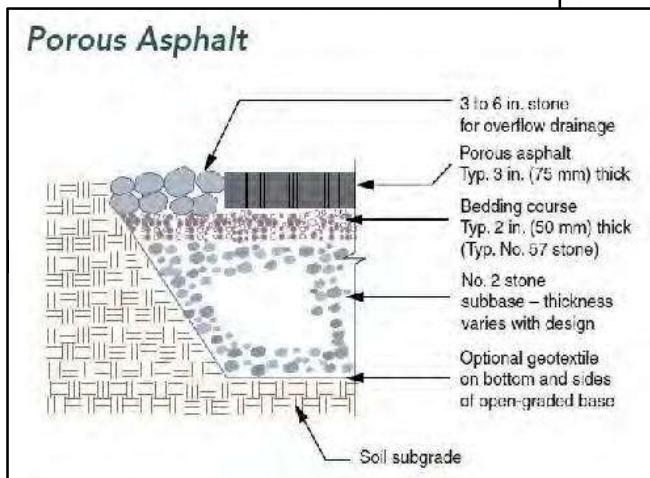
### STORMWATER CONTROL MEASURES



Typical industry standard construction of PICP. Credit: Interlocking Concrete Pavement Institute



Typical industry standard construction of pervious concrete. Credit: Interlocking Concrete Pavement Institute



Typical industry standard construction of porous asphalt. Credit: Interlocking Concrete Pavement Institute

#### MAINTENANCE REQUIRED WHEN:

- Standing water is visible on the surface after a rain event.
- Significant amounts of sediment and/or debris have accumulated on the pavement surface or in PICP joints creating clogging issues.
- Vegetation found growing between PICP joints.
- Deterioration of porous asphalt or pervious concrete pavement surface that generates fine sediments which lead to clogging issues.
- For PICP, gravel between pavers is missing.

## MAINTAINING STORMWATER CONTROL MEASURES

### *Guidance for Private Owners & Operators*

#### ROUTINE AND NON-ROUTINE MAINTENANCE

- **Outlet Structure:** Keep culverts or drains within the vegetated infiltration swale free from blockage by sediment, debris, trash, mulch or plant material.
- **Erosion and Scour:** Repair soil erosion or scouring within the swale area or side slopes leading into the vegetated infiltration swale.
- **Curb Cuts:** Keep curb cuts to the vegetated infiltration swale free from blockage by sediment, debris and trash
- **Weeds:** Remove weeds and invasive plants from the vegetated infiltration swale.
- **Vegetation Management:** Inspect plant health seasonally to ensure vigorous growth. Prune plants, particularly shrubs and trees, during the dormant season (fall to early spring).
- **Snow Removal:** Do not pile or store snow within the vegetated infiltration swale as this will compact the specialized soils and add sediments that may lead to clogging.

#### *Non-Routine Maintenance:*

- **Plant Replacement:** Replace diseased or dying plants.
- **Ponding Water:** If ponding water occurs beyond the precipitation event, contact your local community stormwater manager for further consultation.
- **Specialized Soil Replacement:** Clogging of the specialized soil by fine sediments may require complete replacement of the specialized soil, mulch and plant materials.
- **Underdrain Flushing:** Some vegetated infiltration swales are constructed with perforated underdrain pipes that drain the infiltration swale's specialized soils. If the underdrains become clogged with fine sediments they may need to be flushed with special equipment or replaced.

#### **Permeable Pavement**

#### *Routine Maintenance:*

- **Ponding:** Inspect pavement during rain events to detect ponding and clogging.
- **Sediment and Debris:** Remove accumulated sediment and debris from the pavement surface area.

## MAINTAINING STORMWATER CONTROL MEASURES Guidance for Private Owners & Operators

### ROUTINE AND NON-ROUTINE MAINTENANCE

- Weeds: Remove weeds, grass or any other plant material growing on the surface of the pavement.

#### *Non-Routine Maintenance:*

- Vacuum Sweep: Vacuum sweep entire surface or known clogged areas using a regenerative air street sweeper beginning at 1,500 rpms and increase if needed. More than one pass may be necessary.
- Gravel Replacement: Replace gravel within joints between permeable pavers for PICP, especially after vacuum sweeping.
- Pavement Cleaning: Remove surface stains using a biodegradable detergent.
- Pavement Repair: Replace deteriorated permeable pavers, pervious concrete and porous asphalt following manufacturer guidelines.

### Green Roof

#### *Routine Maintenance:*

- Moisture Level: Check moisture level of growing media daily during growing season to maintain adequate moisture for plant survival.
- Irrigation: Irrigate vegetation during periods of drought per manufacturer's specifications.
- Weeds: Remove weeds and invasive plants.
- Outlets: Keep outlets such as drains and gutters free from blockage by sediment, debris, trash, mulch or plant material.
- Vegetation Management: Inspect plant health seasonally to ensure vigorous growth.
- Leaks or Damage: Inspect system components for leaks and damage based on manufacturer's specifications.

#### *Non-Routine Maintenance:*

- Erosion: Replace eroded or displaced soil or other growing medium materials.
- Trimming Vegetation: Trim vegetation per manufacturer's specifications.
- Plant Replacement: Replace diseased or dying plants.
- Soil Test: Perform annual soil test to check soil fertility and pH.

## Permeable Pavement Inspection and Maintenance Checklist

<b>Facility:</b>			
<b>Location/Address:</b>			
<b>Date:</b>	<b>Time:</b>	<b>Weather Conditions:</b>	<b>Date of Last Inspection:</b>
<b>Inspector:</b>		<b>Title:</b>	
<b>Rain in Last 48 Hours</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>If yes, list amount and timing:</b>			
<b>Pavement Type:</b> <input type="checkbox"/> permeable interlocking concrete pavement (PICP) <input type="checkbox"/> asphalt <input type="checkbox"/> concrete <input type="checkbox"/> other, specify:			
<b>Pretreatment:</b> <input type="checkbox"/> vegetated filter strip <input type="checkbox"/> swale <input type="checkbox"/> turf grass <input type="checkbox"/> forebay <input type="checkbox"/> other, specify: <span style="float: right;"><input type="checkbox"/> none</span>			
<b>Site Plan or As-Built Plan Available:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No			

\*Permeable interlocking concrete pavement (PICP)

Inspection Item	Comment	Action Needed
<b>1. PRETREATMENT</b>		
Sediment has accumulated.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trash and debris have accumulated.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>2. PAVEMENT TRANSITION AREA</b>		
Non-permeable transition area at pavement edges is unstable/deteriorating.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>3. DEWATERING</b>		
Standing water is visible on the surface after a rain event.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>4. PAVEMENT SURFACE AND JOINTS</b>		
Sediment has accumulated on pavement surface.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trash and debris have accumulated on pavement surface or around curbing.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pavement has deteriorated, cracked, settled, or raveled.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
Sediment has accumulated in the joints of PICP.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
Vegetation is growing in the joints of PICP.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
Gravel is insufficient in the joints of PICP.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No

**Additional Notes**

**Wet weather inspection needed**  Yes  No

**Site Sketch:**