Owner's Guide for General Inspection & Maintenance Activities

General Inspection and Maintenance

Inspect after major storms: Check for standing water on the pavement after rainfall. If standing water remains 30 minutes after rainfall has ended, cleaning is recommended.

Clean clogged areas: Vacuuming and power washing can be effective.

Remove unwanted vegetation: Weeds should first be sprayed with herbicide and then pulled within the week. If unwanted vegetation persists, it becomes harder to remove the root and removal can be more destructive to the structure of the pavement. Note: Some permeable applications are meant to be grassed, for which mowing may be appropriate. Be sure to catch grass clippings to avoid accumulation.

Repair damage to asphalt: Damaged areas may be repaired using infrared heating and rerolling pavement. Most damage can be repaired using standard asphalt, presuming repairs don't exceed 15% of the total area.

Check adjacent areas: It's important to control erosion and sedimentation in adjacent areas. Vacuuming adjacent non porous asphalt can be effective at minimizing run-on.

Storage uses: Do not store sand, salt, mulch, soil, yard waste, snow, or other stock piles on porous surfaces.

Stain Removal: Stain remover can be applied before power washing. Power washing should only be conducted at a rate that will not damage pavement. Any removed fill aggregate should be replaced.

Post signage: It's recommended to post a sign at the site indicating the presence of porous pavement. Signage should display the design load (i.e., passenger vehicles only, light truck traffic).

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Spring and Summer Months

Keep pavement free of leaves and lawn waste.

Retain sweeping professional to remove fine sediments from paver surface to optimize permeability. At a minimum, pavement should be vacuumed during spring following the last snow to remove accumulated debris.

Fall and Winter Months

Promptly remove snow and ice from the pavement. Be careful to not damage pavement with blade. Rubber tips or lifting blade to avoid scraping pavement is recommended.

Do not use sand for snow or ice treatment.

Retain sweeping professional to remove fine sediments from paver surface to optimize permeability. At a minimum, pavement should be vacuumed during spring following the last snow to remove accumulated debris.

Importance of Regular Maintenance

The best way to keep maintenance costs of the porous pavement low is to follow manufacturer recommendations for regular maintenance. Most manufacturers recommend that the pavement be vacuumed at least twice a year. Some case studies have shown that porous pavement can lose its efficacy in as little as a year if it goes without vacuuming.

Maintenance Costs

A general rule of thumb to estimate annual maintenance costs is to use 3-6% of the construction costs of the post construction stormwater BMP. Ensuring routine preventative maintenance is completed on a routine basis, will help deter higher costs associated with non-routine restorative maintenance. As more post construction stormwater BMPs are installed and operative, more data on maintenance costs will become available locally and nationally.

References

MSD BMP Toolbox
http://www.stlmsd.com/what-we-do/stormwater-management/bmp-toolbox/stormwater-quality/permeable-pavement

United States Environmental Protection Agency
http://water.epa.gov/polwaste/npdes/swbmp/Porous-Asphalt-Pavement.cfm

Concrete Answers Series
http://www.perviouspavement.org/index.html

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Your MSD

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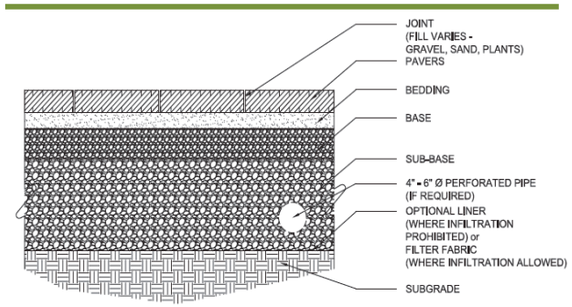
Porous Pavement

Post-Construction Stormwater Best Management Practice (BMP)

- **What is porous pavement?**
- **Types & benefits of porous pavement**
- **Inspection & maintenance**

What is Porous Pavement?

Porous pavement, also known as pervious or permeable pavement, is a pavement surface that is specially designed to mimic the way that natural land absorbs water. Although sometimes nearly indistinguishable in appearance from traditional paving materials, porous pavement contains openings or pores that make it possible for it to soak up stormwater. An underlying stone bed then temporarily stores the water before it infiltrates into the subsoil or released back to the storm sewer through the underdrain. While this BMP can be applied as an automobile and pedestrian traffic surface, it performs best when used on sidewalks, driveways, alleys, parking lots, patios and other low-traffic/low-speed applications to minimize clogging, cracking and rutting of the surface. To enable porous pavements to function as intended, however, inspection and consequent maintenance are imperative.



http://www.crwa.org/projects/bmpfactsheets/crwa_permeable_pavers.pdf

Types of Porous Pavement

Porous Concrete – Porous concrete is composed of the same components as traditional concrete, which are sand, gravel/crushed stone, cement and water. Less sand is used for the porous concrete mixture to increase pore space on the surface. Porous concrete contains stable air pockets that enable water to drain through it. Porous concrete is slightly rougher than conventional concrete on the surface.

Porous Asphalt -- Porous asphalt is typically standard hot-mix asphalt that contains less sand than traditional asphalt. Like porous concrete, it also contains air pockets that allow water to seep through it. Porous asphalt is commonly lighter in color than conventional asphalt and cooler during hot weather.

Types of Porous Pavement

Permeable Pavers -- Permeable pavers are modular systems of interlocking blocks of concrete or other strong structural material that are designed with small, regularly spaced openings. These open spaces typically are filled with soil, grass, or gravel that soak up stormwater before it infiltrates to the aggregate bedding layer that sits below and supports the pavers.

Permeable interlocking concrete pavers (PICP)

Concrete grid pavers (CGP)

Plastic reinforcing grids (PG) filled with gravel

Plastic reinforcing grids (PG) with grass

Porous Pavement Inspection & Maintenance Requirements

Inspections and maintenance by the owner are critical to porous pavement's operation and longevity. Specific maintenance needs may vary depending on storm frequency, season changes, and traffic conditions. As a result, planning for maintenance may differ between types of systems.

Inspection & Maintenance Activities

Inspection

Visual and physical inspections are integral to porous pavement operation and maintenance. The visual inspection includes monitoring pavement to check for water drainage, debris accumulation, and surface deterioration. If a pervious surface is not properly maintained, it will become clogged, diminishing its life expectancy and ability to infiltrate stormwater. Sediment accumulation and vegetative life are the most common causes of clogging.

Maintenance Activities - Street Sweeping

Street sweeping is an important maintenance task associated with porous pavement. Street sweeping can serve one of two purposes: preventative maintenance and restorative maintenance. It is important to note that when street sweeping is conducted for porous paver systems, any fill aggregate removed should be replaced to avoid creating a tripping hazard. Sweeping the pavement 2-4 times per year is sufficient for maintaining permeability. There are three main types of street sweepers:

- **Mechanical**

Mechanical street sweepers employ a multiple brush approach to first move sediment and trash to the middle and then lift the deposits onto a conveyor belt for temporary storage. The brush bristles can penetrate some types of permeable pavements, but not all of them.

- **Regenerative Air**

Regenerative air street sweepers work by shooting air at an angle to the pavement, which effectively loosens dust and particles at and near the surface of the pavement. With this, a minor vacuum is created which lifts loosened particles into a hopper. This system is capable of removing surface-deposited sediments from all pavement types. This type of sweeper is recommended for use for preventative maintenance for all three types of porous pavements.

- **Vacuum**

Vacuum sweepers apply a strong vacuum to a relatively narrow area that lifts particles both at and below the surface of the pavement. They are recommended for use as restorative maintenance considering they have the ability to suction 3 to 4 inches of gravel from pavers.