

Inspection and Maintenance Requirements for Permeable Pavement



Maintenance Checklist

Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course					
Permeable Pavements, all	<ul style="list-style-type: none"> Runoff from adjacent pervious areas deposits soil, mulch or sediment on paving 	<ul style="list-style-type: none"> Clean deposited soil or other materials from permeable pavement or other adjacent surfacing Check if surface elevation of planted area is too high, or slopes towards pavement, and can be regraded (prior to regrading, protect permeable pavement by covering with temporary plastic and secure covering in place) Mulch and/or plant all exposed soils that may erode to pavement surface 			

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Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course (cont.)					
Porous asphalt or pervious concrete	<ul style="list-style-type: none"> • Routine maintenance 	<p>Clean surface debris from pavement surface using one or a combination of the following methods:</p> <ul style="list-style-type: none"> • Remove sediment, debris, trash, vegetation, and other debris deposited onto pavement (rakes and leaf blowers can be used for removing leaves) • Vacuum/sweep permeable paving installation using: <ul style="list-style-type: none"> ◇ Walk-behind vacuum (sidewalks) ◇ High efficiency regenerative air or vacuum sweeper (roadways, parking lots) ◇ ShopVac or brush brooms (small areas) • Hand held pressure washer or power washer with rotating brushes Follow equipment manufacturer guidelines for when equipment is most effective for cleaning permeable pavement. Dry weather is more effective for some equipment. 			

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Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course (cont.)					
Porous asphalt or pervious concrete (cont.)	<ul style="list-style-type: none"> Surface is clogged: Ponding on surface or water flows off the permeable pavement surface during a rain event (does not infiltrate) 	<ul style="list-style-type: none"> Review the overall performance of the facility (note that small clogged areas may not reduce overall performance of facility) Test the surface infiltration rate using ASTM C1701 as a corrective maintenance indicator. Perform one test per installation, up to 2,500 square feet. Perform an additional test for each additional 2,500 square feet up to 15,000 square feet total. Above 15,000 square feet, add one test for every 10,000 square feet. If the results indicate an infiltration rate of 10 inches per hour or less, then perform corrective maintenance to restore permeability. To clean clogged pavement surfaces, use one or combination of the following methods: <ul style="list-style-type: none"> ◇ Combined pressure wash and vacuum system calibrated to not dislodge wearing course aggregate. ◇ Hand held pressure washer or power washer with rotating brushes ◇ Pure vacuum sweepers Note: If the annual/biannual routine maintenance standard to clean the pavement surface is conducted using equipment from the list above, corrective maintenance may not be needed. 			

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Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course (cont.)					
Porous asphalt or pervious concrete (cont.)	<ul style="list-style-type: none"> Sediment present at the surface of the pavement 	<ul style="list-style-type: none"> Assess the overall performance of the pavement system during a rain event. If water runs off the pavement and/or there is ponding then see above. Determine source of sediment loading and evaluate whether or not the source can be reduced/eliminated. If the source cannot be addressed, consider increasing frequency of routine cleaning (e.g., twice per year instead of once per year). 			
	<ul style="list-style-type: none"> Moss growth inhibits infiltration or poses slip safety hazard 	<ul style="list-style-type: none"> Sidewalks: Use a stiff broom to remove moss in the summer when it is dry Parking lots and roadways: Pressure wash, vacuum sweep, or use a combination of the two for cleaning moss from pavement surface. May require stiff broom or power brush in areas of heavy moss. 			
	<ul style="list-style-type: none"> Major cracks or trip hazards and concrete spalling and raveling 	<ul style="list-style-type: none"> Fill potholes or small cracks with patching mixes Large cracks and settlement may require cutting and replacing the pavement section. Replace in-kind where feasible. Replacing porous asphalt with conventional asphalt is acceptable if it is a small percentage of the total facility area and does not impact the overall facility function. Take appropriate precautions during pavement repair and replacement efforts to prevent clogging of adjacent porous materials 			

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Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course (cont.)					
Interlocking concrete paver blocks and aggregate pavers	<ul style="list-style-type: none"> • Routine maintenance 	<p>Clean pavement surface using one or a combination of the following methods:</p> <ul style="list-style-type: none"> • Remove sediment, debris, trash, vegetation, and other debris deposited onto pavement (rakes and leaf blowers can be used for removing leaves) • Vacuum/sweep permeable paving installation using: <ul style="list-style-type: none"> ◇ Walk-behind vacuum (sidewalks) ◇ High efficiency regenerative air or vacuum sweeper (roadways, parking lots) ◇ ShopVac or brush brooms (small areas) <p><i>Note: Vacuum settings may have to be adjusted to prevent excess uptake of aggregate from paver openings or joints. Vacuum surface openings in dry weather to remove dry, encrusted sediment.</i></p>			

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Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course (cont.)					
Interlocking concrete paver blocks and aggregate pavers (cont.)	<ul style="list-style-type: none"> Surface is clogged: Ponding on surface or water flows off the permeable pavement surface during a rain event (does not infiltrate) 	<ul style="list-style-type: none"> Review the overall performance of the facility (note that small clogged areas may not reduce overall performance of facility) Test the surface infiltration rate using ASTM C1701 as a corrective maintenance indicator. Perform one test per installation, up to 2,500 square feet. Perform an additional test for each additional 2,500 square feet up to 15,000 square feet total. Above 15,000 square feet, add one test for every 10,000 square feet. If the results indicate an infiltration rate of 10 inches per hour or less, then perform corrective maintenance to restore permeability. Clogging is usually an issue in the upper 2 to 3 centimeters of aggregate. Remove the upper layer of encrusted sediment, and fines, and/or vegetation from openings and joints between the pavers by mechanical means and/or suction equipment (e.g., pure vacuum sweeper). Replace aggregate in paver cells, joints, or openings per manufacturer's recommendations 			

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Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course (cont.)					
Interlocking concrete paver blocks and aggregate pavers (cont.)	<ul style="list-style-type: none"> Sediment present at the surface of the pavement 	<ul style="list-style-type: none"> Assess the overall performance of the pavement system during a rain event. If water runs off the pavement and/or there is ponding, then see above. Determine source of sediment loading and evaluate whether or not the source can be reduced/eliminated. If the source cannot be addressed, consider increasing frequency of routine cleaning (e.g., twice per year instead of once per year). 			
	<ul style="list-style-type: none"> Moss growth inhibits infiltration or poses slip safety hazard 	<ul style="list-style-type: none"> Sidewalks: Use a stiff broom to remove moss in the summer when it is dry Parking lots and roadways: Vacuum sweep or stiff broom/power brush for cleaning moss from pavement surface 			
	<ul style="list-style-type: none"> Paver block missing or damaged 	<ul style="list-style-type: none"> Remove individual damaged paver blocks by hand and replace or repair per manufacturer's recommendations 			
	<ul style="list-style-type: none"> Loss of aggregate material between paver blocks 	<ul style="list-style-type: none"> Refill per manufacturer's recommendations for interlocking paver sections 			
	<ul style="list-style-type: none"> Settlement of surface 	<ul style="list-style-type: none"> May require resetting 			

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Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course (cont.)					
Open-celled paving grid with gravel	<ul style="list-style-type: none"> Routine maintenance 	<ul style="list-style-type: none"> Remove sediment, debris, trash, vegetation, and other debris deposited onto pavement (rakes and leaf blowers can be used for removing leaves) Follow equipment manufacturer guidelines for cleaning surface. 			
	<ul style="list-style-type: none"> Aggregate is clogged: Ponding on surface or water flows off the permeable pavement surface during a rain event (does not infiltrate) 	<ul style="list-style-type: none"> Use vacuum truck to remove and replace top course aggregate Replace aggregate in paving grid per manufacturer's recommendations 			
	<ul style="list-style-type: none"> Paving grid missing or damaged 	<ul style="list-style-type: none"> Remove pins, pry up grid segments, and replace gravel Replace grid segments where three or more adjacent rings are broken or damaged Follow manufacturer guidelines for repairing surface. 			
	<ul style="list-style-type: none"> Settlement of surface 	<ul style="list-style-type: none"> May require resetting 			
	<ul style="list-style-type: none"> Loss of aggregate material in paving grid 	<ul style="list-style-type: none"> Replenish aggregate material by spreading gravel with a rake (gravel level should be maintained at the same level as the plastic rings or no more than 1/4 inch above the top of rings). See manufacturer's recommendations. 			
	<ul style="list-style-type: none"> Weeds present 	<ul style="list-style-type: none"> Manually remove weeds Presence of weeds may indicate that too many fines are present (refer to Actions Needed under "Aggregate is clogged" to address this issue) 			

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Surface/Wearing Course (cont.)					
Open-celled paving grid with grass	<ul style="list-style-type: none"> Routine maintenance 	<ul style="list-style-type: none"> Remove sediment, debris, trash, vegetation, and other debris deposited onto pavement (rakes and leaf blowers can be used for removing leaves) Follow equipment manufacturer guidelines for cleaning surface. Use a mulch mower to mow grass Sprinkle a thin layer of compost on top of grass surface (1/2" top dressing) and sweep it in Do not use fertilizer 			
	<ul style="list-style-type: none"> Aggregate is clogged: Ponding on surface or water flows off the permeable pavement surface during a rain event (does not infiltrate) 	<ul style="list-style-type: none"> Rehabilitate per manufacturer's recommendations. 			
	<ul style="list-style-type: none"> Paving grid missing or damaged 	<ul style="list-style-type: none"> Remove pins, pry up grid segments, and replace grass Replace grid segments where three or more adjacent rings are broken or damaged Follow manufacturer guidelines for repairing surface. 			
	<ul style="list-style-type: none"> Poor grass coverage in paving grid 	<ul style="list-style-type: none"> Restore growing medium, reseed or plant, aerate, and/or amend vegetated area as needed Traffic loading may be inhibiting grass growth; reconsider traffic loading if feasible 			

Maintenance Checklist

Maintenance Component	Conditions When Maintenance is Needed	Action Needed	Satisfactory	Unsatisfactory	Comments
Surface/Wearing Course (cont.)					
Open-celled paving grid with grass	• Settlement of surface	• May require resetting			
	• Weeds present	• Manually remove weeds • Mow, torch, or inoculate and replace with preferred vegetation			
Inlets/Outlets/Pipes					
Inlet/outlet pipe	• Pipe is damaged	• Repair/replace			
	• Pipe is clogged	• Remove roots or debris			
Underdrain pipe	• Plant roots, sediment or debris reducing capacity of underdrain (may cause prolonged drawdown period)	• Jet clean or rotary cut debris/roots from underdrain(s) • If underdrains are equipped with a flow restrictor (e.g., orifice) to attenuate flows, the orifice must be cleaned regularly			
Raised subsurface overflow pipe	• Plant roots, sediment or debris reducing capacity of underdrain (may cause prolonged drawdown period)	• Jet clean or rotary cut debris/roots from underdrain(s) • If underdrains are equipped with a flow restrictor (e.g., orifice) to attenuate flows, the orifice must be cleaned regularly			
Outlet structure	• Sediment, vegetation, or debris reducing capacity of outlet structure	• Clear the blockage • Identify the source of the blockage and take actions to prevent future blockages			
Overflow	• Native soil is exposed or other signs of erosion damage are present at discharge point	• Repair erosion and stabilize surface			

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Aggregate Storage Reservoir					
Observation port	<ul style="list-style-type: none"> Water remains in the storage aggregate longer than anticipated by design after the end of a storm 	<ul style="list-style-type: none"> If immediate cause of extended ponding is not identified, schedule investigation of subsurface materials or other potential causes of system failure. 			
Vegetation					
Adjacent large shrubs or trees	<ul style="list-style-type: none"> Vegetation related fallout clogs or will potentially clog voids 	<ul style="list-style-type: none"> Sweep leaf litter and sediment to prevent surface clogging and ponding Prevent large root systems from damaging subsurface structural components 			
	<ul style="list-style-type: none"> Vegetation growing beyond facility edge onto sidewalks, paths, and street edge 	<ul style="list-style-type: none"> Edging and trimming of planted areas to control groundcovers and shrubs from overreaching the sidewalks, paths and street edge improves appearance and reduces clogging of permeable pavements by leaf litter, mulch and soil. 			
Leaves, needles, and organic debris	<ul style="list-style-type: none"> Accumulation of organic debris and leaf litter 	<ul style="list-style-type: none"> Use leaf blower or vacuum to blow or remove leaves, evergreen needles, and debris (i.e., flowers, blossoms) off of and away from permeable pavement 			