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## Pervious Concrete Pavement Maintenance Guidelines



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Pervious concrete pavement is a permeable pavement surface, typically with an underlying stone reservoir, that temporarily stores surface runoff before it infiltrates into the subsoil. As such, a pervious concrete pavement is an intricate part of a designed storm water management system. Therefore, pervious concrete pavement requires specific maintenance compared with other practices. In addition to owners not being aware of pervious pavement on a site, not performing these maintenance activities is the chief reason for failure of the pervious pavement/storm water system.

When maintenance requirements are realized by the owners, the longevity of this pavement option is very viable. Keeping the pavement clean, and within design specifications, is the owner's responsibility. The best maintenance practice appears to be prevention. Maintenance of pervious concrete pavement consists primarily of prevention of clogging of the void structure. Proper design and construction of pervious concrete, taking into consideration the drainage of surrounding areas to prevent the flow of potentially clogging materials onto the pavement surface, can minimize maintenance concerns.

### **Cleaning**

The majority of pervious concrete pavements will function very well with little or no maintenance. However, there may be instances where sand, dirt, leaves and other debris may infiltrate the void structure of the pervious concrete and inhibit its permeability. In most cases, the clogging is limited to the first 1" to 1 ½" of the pavement thickness. Routine cleaning can help avoid this situation and restore the pervious concrete's permeability.

### **Replacing Pavement Sections**

As with any pavement material, a pervious concrete pavement will not last forever. Replacing a section of pavement is usually done by cutting the pavement at an existing control joint or construction joint. The section of pavement should be cut full depth, removed, and replaced with new pervious concrete. The new section should be finished to match the elevation of the surrounding pavement, after it has been compacted. The new section must be covered and moist cured the same as when constructing a new pervious concrete pavement. These repairs are normally done years after original construction, and are the owner's responsibility.

### **References:**

American Concrete Institute (ACI), 2006. *Pervious Concrete (522R-06)*, Farmington Hills, MI.

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Watershed Management Institute (WMI). 1997. *Operation, Maintenance, and Management of Stormwater Management Systems*. Prepared for U.S. Environmental Protection Agency, Office of Water, Washington, DC.

drain onto the pavement, suspended materials may wash into the concrete’s voids and eventually reduce the porosity and compromise its service life. At the outset, proper design and construction, including installation of curbs where appropriate, can ensure a controlled flow path of storm water during a storm event and minimize the flow of debris onto the surface of the pervious concrete pavement.

Materials that may impact the porosity of pervious concrete pavement such as sand, leaves, and mud, may be conveyed by wind, automobile traffic, or other means. Periodic cleaning of the pavement will minimize the effect of this debris and help maintain the necessary permeability adequate for the pavement/storm water system’s designed function. Additionally, landscaping materials such as mulch and topsoil should not be stored on the pavement, even temporarily.



Cleaning of clogged pervious concrete (upper left) can restore 90% or more of the original permeability (lower right).

A recent study by the University of Central Florida looked at three standard maintenance practices for cleaning pervious concrete. The cleaning techniques investigated were Pressure Washing, Vacuum Sweeping, and a Combination of these two methods. Pressure Washing dislodges the clogging particles, washing a portion offsite and flushing the remaining portion through the pavement surface. Vacuum sweeping with a regenerative air sweeper dislodges the dirt and debris by means of the sweeping action and removes them via the vacuum. Results of the UCF study show that utilizing these cleaning practices, either individually or in combination, can improve the infiltration rate of a clogged pervious concrete pavement by 90% or more.

Periodic cleaning and checking of the pavement’s porosity and rate of water percolation will help maintain the pavement/storm water system to ensure it will remain functional as designed. The following chart can serve as a minimal recommendation for scheduled maintenance.

Activity	Schedule
<ul style="list-style-type: none"> <li>• Avoid sealing or repaving with impervious materials.</li> </ul>	N/A
<ul style="list-style-type: none"> <li>• Inspect pervious pavement area to ensure that it;                             <ul style="list-style-type: none"> <li>• is clean of debris</li> <li>• dewater between storms</li> <li>• is clean of sediments</li> </ul> </li> </ul>	Monthly
<ul style="list-style-type: none"> <li>• Mow upland and adjacent areas, and seed bare areas.</li> <li>• Vacuum/sweep to keep the surface free of sediment.</li> </ul>	As needed
<ul style="list-style-type: none"> <li>• Inspect the surface for deterioration or spalling.</li> </ul>	Annually

Table 1. Typical maintenance activities for pervious concrete pavement (Adapted from Watershed Management Institute, 1997)

The use of chemicals to clean pervious concrete pavements is not recommended. Even if the manufacturer's suggested directions are followed, the impact on other components of the pavement/storm water system may not be known. It is suggested that only water be used to flush the pervious pavement voids.

### Cold Weather Maintenance

Experience has shown that pervious concrete pavements in cold weather climates tend to have an inherent ability to withstand freeze-thaw cycles. Freeze-thaw resistance of pervious concrete appears to depend on the saturation level of the voids in the concrete at the time of freezing. Field observations have shown that the rapid draining characteristics of pervious concrete prevent saturation from occurring.

It is important to understand that the porosity of pervious concrete from the large voids is distinctly different from the microscopic air voids that provide protection to the paste in conventional concrete in a freeze-thaw environment. When the large voids are saturated, complete freezing can cause severe damage to the pervious concrete pavement. Thus, it is critical to protect and maintain the void structure of pervious concrete in order to ensure cold weather durability.



Anecdotal evidence also suggests that snow covered pervious concrete clears quicker, possibly because its voids allow the snow to melt more quickly than it would on

conventional pavements. Mechanical removal of ice and snow can be accomplished using snow blowers or snow plows. Because of its rigid nature, pervious concrete pavement is actually less susceptible than other flexible paving materials to damage from snow plowing.

The void structure of pervious concrete pavement facilitates a faster thawing of ice and snow on the pavement surface compared with impervious pavements at temperatures modestly below freezing. Therefore, deicing chemicals and anti-skid materials are rarely needed and, as such, are not recommended for pervious concrete pavements. However, if necessary, deicing chemicals and anti-skid materials can be used sparingly. In particular, deicing chemicals should never be applied to concrete that is less than one year old. Deicing agents containing Sodium Chloride or Calcium Chloride may be used on mature concrete surfaces. At no time should deicing agents be used that contain fertilizer ingredients such as Ammonium Sulfate and Ammonium Nitrate. In the event that anti-skid materials are used, a thorough cleaning of the surface should be completed following the cold weather season.



### Maintenance of Surrounding Areas

Drainage of all unpaved areas should be directed away from the pervious concrete pavement. If areas are allowed to