

# Operation and Maintenance Plan

## Willert Park Green Streets

The Stormwater Management System, which includes the storm sewer system, shall be maintained in fully functional condition. The City of Buffalo shall be responsible for monitoring and conducting inspections of the facilities and removing excess sediment, trash, debris, etc. per the inspection frequencies outlined below. Additional inspections will be required if it becomes apparent that facilities are not functioning properly. Corrective actions will be taken by the City of Buffalo within a reasonable timeframe of discovery of the deficiencies to ensure continuing operation of stormwater facilities. The facilities shall be cleaned, repaired and/or replaced as necessary to meet the original design criteria.

Inspection Frequencies: The Owner shall be responsible for inspecting the entire storm sewer system (including, but not limited to, catch basins, storm sewer pipes, and manholes) at least two (2) times a year; on or before April 1 or after the first snow melt, whichever happens first, and on or before October 1 or after the leaves have fallen, whichever happens first. Additional inspections shall be required if it becomes apparent that the system is not functioning as designed.

Inlets, Manholes, and Storm Sewer Pipes: Inspect the condition of storm sewer pipes and monitor for evidence of damage or accumulated silt, sediment, and debris. Clean or repair as needed per the inspection frequency outlined above. Inspect catch basins and manholes and monitor for evidence of damage or accumulated silt, sediment, and debris. Clean or repair as needed per the inspection frequency outlined above. Accumulated material in drainage structure sumps must be removed and properly disposed of when the sump has reach 50% of its capacity (i.e. 12” for a 24” sump).

General Lawn/Landscape areas (in accordance with Soil Restoration requirements): Reseed to repair bare or eroding areas to assure grass stabilization. Water once every three days for the first month, and then provide a half inch of water per week during the first year. Fertilization may be needed in the fall after the first growing season to increase plant vigor. Maintain the appropriate ground cover with deep roots to maintain the soil structure. Keep the site (pervious areas) free of vehicular and foot traffic or other weight loads. Sometimes it may be necessary to de-thatch the turf every few years.

Bioretention Areas: Sediment shall be cleaned out of stone diaphragm when it accumulates to a depth of more than 3 inches and the bioretention area when it exceeds one inch. Trash and debris shall be removed as necessary. When the filtering capacity of the bioretention area diminished substantially (i.e. when water ponds on the surface for more than 48 hours), the top few inches of discolored material shall be removed and replaced with fresh material. The removed sediments shall be disposed of in a legal manner (i.e. landfill). Areas devoid of mulch shall be re-mulched on an annual basis. Dead or diseased material shall be replaced. The Bioretention Operation, Maintenance and Management Inspection Checklist provided in Appendix H serves as an additional tool that should be used during inspections.

Permeable Pavement: See attached section from the Draft NYSDEC Stormwater Management Practices Manual for maintenance of Permeable Pavement areas.

## GR 2. Overflows and Drains

Description: Green roofs typically drain through a network of underdrains to outlet at roof drainage infrastructure. These drainage structures need to be inspected and cleaned periodically to ensure that the medium drains properly.

Instruction: Review the specific maintenance plan for this practice to determine where inspection ports are. Remove the cover and inspect the port.

**Table 2.8.2 GR Overflows and Drains**

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Inspection port for roof drainage (can be clogged with debris)	<input type="checkbox"/> Remove debris by hand or flush through with a hose. <input type="checkbox"/> Other:
	<input type="checkbox"/> Kick-Out to Level 2 Inspection: Debris cannot be removed, or it appears that debris has accumulated in the underdrains.
<input type="checkbox"/> Damage to other roof drainage structures (e.g., roof scuppers)	<input type="checkbox"/> Call contractor or individual in charge of regular building maintenance. This is a building maintenance issue. <input type="checkbox"/> Other:

## 2.9. Permeable Pavement

### Areas of Permeable Pavement

Key areas to inspect for permeable pavement include the following:

- PP1. Drainage Area
- PP2. Pavement Surface

**Note:** Permeable pavements include several materials, including porous asphalt materials, which appear similar to an asphalt parking lot, permeable concrete, and “interlocking concrete pavers,” which are individual paving blocks. References to removing and replacing individual blocks of pavement refer only to this last category.

### Permeable Pavement Level 1 Inspection

The Level 1 Inspection focuses on the Drainage Area (PP1) and the Pavement Surface (PP2). This inspection should be conducted on a regular basis, with an early spring inspection to ensure that the practice has survived the winter, particularly if there has been a significant amount of snow.

On a routine basis, the Level 1 Inspector should also ensure that the pavement area and its drainage are properly managed. Some key activities to avoid include:

1. Applying sand during winter months
2. Certain types of permeable pavement should not be plowed with steel-bladed plows.
3. Poor management of dumpsters
4. Storing or placing dirt, grit, mulch, sand, or other similar materials on or near the pavement surface






**Figure 2.9.1.** Key Areas for Level 1 Inspection of Permeable Pavement

## PP 1. Drainage Area

Description: The drainage area sends runoff to the Permeable pavement area and is uphill from the Permeable pavement. When it rains, water runs off and flows to the Permeable pavement area, and it may pond there temporarily.

Instruction: Look for areas that are uphill from the Permeable pavement. Consult **Table 2.9.1** below:





Table 2.9.1 PP Drainage Area		
Problem (Check if Present)		Follow-Up Actions
	<input type="checkbox"/> Bare soil, erosion of the ground (rills washing out the dirt)	<input type="checkbox"/> Seed and straw areas of bare soil to establish vegetation. <input type="checkbox"/> Fill in erosion areas with soil, compact, and seed and straw to establish vegetation. <input type="checkbox"/> If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. <input type="checkbox"/> Other:
	<input type="checkbox"/> Piles of grass clippings, mulch, dirt, salt, or other materials	<input type="checkbox"/> Remove or cover piles of grass clippings, mulch, dirt, etc. <input type="checkbox"/> Other:
	<input type="checkbox"/> Open containers of oil, grease, paint, or other substances	<input type="checkbox"/> Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous. <input type="checkbox"/> Other:

## PP 2. Permeable Pavement Surface

Description: The surface of the Permeable pavement should be relatively clean (not a lot of dirt and grit on the surface), free of cracks and broken pavement, and should NOT hold water after a rainstorm for more than a few hours.

Instruction: Examine the entire permeable pavement surface. Consult **Table 2.9.2** below for possible problems.

**Table 2.9.2 PP Surface**

Problem (Check if Present)	Follow-Up Actions
 <ul style="list-style-type: none"> <li><input type="checkbox"/> Dirt and grit accumulating on pavement surface</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> For small areas (e.g., driveways, patios), try a leaf blower or sweep the area to remove the dirt/grit from the Permeable pavement and properly dispose of the material.</li> <li><input type="checkbox"/> If dirt/grit remain in the joint areas between paver blocks, agitate with a rough brush and vacuum the surface with a wet/dry vac.</li> <li><input type="checkbox"/> Remove and replace clogged blocks in segmented pavers.</li> <li><input type="checkbox"/> For larger areas (e.g., parking lots, courtyards), hire a vacuum sweeper to restore the surface to a cleaner condition.</li> <li><input type="checkbox"/> Other:</li> </ul>
 <ul style="list-style-type: none"> <li><input type="checkbox"/> Grass and weeds are growing on the permeable pavement surface (applies only to pavement types that are not intended to be covered in vegetation).</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> If paver type is not intended to be covered in vegetation, remove the grass/weeds either mechanically (pulling, by hand or with a flame weeder) or with a herbicide approved for use in or near water (consult your local Extension Office for suggestions).</li> <li><input type="checkbox"/> Follow the actions listed above for removing dirt/grit from the pavement surface.</li> <li><input type="checkbox"/> Other:</li> </ul>
 <ul style="list-style-type: none"> <li><input type="checkbox"/> Slumping, sinking, cracking, or breaking of the pavement surface <i>(Source: CSN, 2013)</i></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> For small areas (e.g., patios, small driveway), it may be possible to remove the damaged pavers, check and fill in the underlying gravel, and replace with new materials.</li> <li><input type="checkbox"/> Other:</li> </ul>
 <ul style="list-style-type: none"> <li><input type="checkbox"/> Water stands on Permeable pavement for days after a rainstorm; the Permeable pavement is clogged and doesn't let water through. <i>(Source: CSN, 2013)</i></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: This is generally a serious problem, and it will be necessary to activate a Level 2 Inspection.</li> </ul>