**Pervious Paving System**

**Measure #\_\_\_ on the Location Map**

Development Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Township, County: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Location of System: X: \_\_\_\_\_\_; Y: \_\_\_\_\_\_ (or N: \_\_\_\_\_\_; E :\_\_\_\_\_)

Location Description: e.g., Parking spaces 1-15

Location Map

|  |
| --- |
| N  E  County Route 531  **Discharge**  Grass Swale #1  Basin #1  Drywell #1  Parking Lot  Corporation Road  Building    Vegetative Filter strip #1  Drywell #2  Access  Grass Swale #2 |

Example Map: Use aerial photo, site plan, or other graphics showing the locations of BMPs

**NOTE**

**This Field Manual is intended to be editable and adjustable in accordance with the design of stormwater management measures, the site conditions, and the special needs of responsible party. The Engineer should supplement information and best management practice to assist the responsible party to perform maintenance.**

Blue text indicates information may be deleted and or replaced as necessary.

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# Pervious Pavement System Overview

**Functionality**

Pervious paving systems are paved areas that produce less stormwater runoff than areas paved with conventional paving. This reduction is achieved primarily through the infiltration of a greater portion of the rain falling on the area than would occur with conventional paving. This increased infiltration occurs either through the paving material itself or through void spaces between individual paving blocks known as pavers.

Pervious paving systems are divided into two general types. Each type depends primarily upon the nature of the pervious paving surface course and the presence or absence of a runoff storage bed beneath the surface course. Porous paving and permeable paver with storage bed systems treat the stormwater quality design storm runoff through storage and infiltration. Therefore, these systems have adopted TSS removal rates similar to infiltration structures. The adopted TSS removal rate for each type of pervious paving system is from 80%.

Pervious paving systems are used to reduce runoff rates and volumes from paved, on-grade surfaces such as patios, walkways, driveways, fire lanes, and parking spaces. Pervious paving systems with runoff storage beds achieve these reductions through storage of runoff and eventual infiltration into the subgrade soils. Through this infiltration process, these types of pervious paving systems also achieve stormwater quality requirements.

**Proper care and attention in the long-term maintenance of the stormwater management measure is critically important to the safety and health of the public.**

**Type of BMP – Dry Stormwater Management Measure**

The pervious pavement system shall fully drain within 72 hours of the most recent rainfall. Standing water in excess of 72 hours is a sign of the porous pavement failure. It may also contribute to mosquito breeding and other health and safety issues. At no time shall there be ponding on the surface of the pavement.

# Basic Design Information

This section shall be filled out by the design engineer.

**Hydrology Design Targets**

1. The system is (porous pavement with storage bed / permeable pavers with storage bed / permeable pavers without storage bed).
2. This system is designed with a soil permeability rate of \_\_\_\_\_\_\_\_\_ inches/hour (pre-construction) and \_\_\_\_\_\_\_\_\_\_ inches/hour (post-construction - tested on

(MM) / (DD) / (YYYY) ).

1. The design drain time is \_\_\_\_\_\_\_\_\_\_ hours.
2. The elevation of the seasonal high water table of this pavement area was observed on (MM) / (DD) / (YYYY) and it was \_\_\_\_\_\_\_\_\_ feet below the pavement bottom surface, at EL.\_\_\_\_\_\_\_ feet.
3. The TSS removal rate is \_\_\_\_\_\_%.

**Hydraulic Design Targets**

1. This system is designed to infiltrate the runoff from the (Water Quality Design Storm / groundwater recharge storm), which generates \_\_\_\_\_\_\_\_\_\_ cubic feet of runoff. The peak flow entering the system is \_\_\_\_\_\_\_ cubic feet per second.

(If the system is designed to take runoff from larger storms)

1. The invert elevation of the overflow outlet is at EL. \_\_\_\_\_\_\_\_\_ feet (if an overflow is designed).

**System Configuration Targets**

1. The system (has / has no) pretreatment.
2. The depth of uniformly graded coarse aggregate in the storage bed is \_\_\_\_\_\_\_\_\_\_ inches.
3. The top of the system (is / is not) vegetated (for permeable pavers only).

**Critical Maintenance Features**

1. Avoid sand or silt onto the porous pavement area.
2. Sweep and vacuum the porous pavement area often to prevent clog.
3. Do not apply sealant to cracks or entire surface.
4. (Others to be added by the design engineer, if necessary)

**Attach the following Disturbance Notices, if applicable to the site:**

**Wetland Disturbance Notice**:

Maintenance of this BMP may disturb a wetland area. Contact NJDEP Division of Land Use Regulation for guidance and any required permit(s) before performing maintenance.

**Wildlife Disturbance Notice**:

Maintenance of this BMP may disturb or remove vegetation in an area designated to endangered and/or threatened species. Contact NJDEP Division of Fishing and Wildlife for guidance and any required permit(s) before performing maintenance.

# Visual Aid for Pervious Paving System Inspection

**Currently, no photos are available. Photos will be updated upon availability.**

# Reference Documents

Documents to be placed in this field manual should include the following:

* As-built Drawings with Drainage Plans
* Manufacturer’s Operation and Maintenance Manual
* Soil Boring Logs
* Permeability Test (Pre-construction)
* Permeability Test (Post-construction)
* Landscaping Plan
* Groundwater Mounding Analysis

**Attach Reference Documents Here**

# Inspection Checklist / Maintenance Actions

**Pervious Pavement System**

**Checklist** (circle one)**:** Quarterly / Annual / Monthly / Special Event Inspection

**Checklist No.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Inspection Date:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Date of most recent rain event: \_\_\_\_\_\_\_\_\_\_**

**Rain Condition** (circle one):

Drizzle / Shower / Downpour / Other \_\_\_\_\_\_\_\_\_\_\_\_\_

**Ground Condition** (circle one):

Dry / Moist / Ponding / Submerged / Snow accumulation

**The inspection items and preventative/corrective maintenance actions listed below represent general requirements. The design engineer and/or responsible party shall adjust the items and actions to better meet the conditions of the site, the specific design targets, and the requirements of regulatory authorities.**

|  | **For Inspector** | | | **For Maintenance Crew** |
| --- | --- | --- | --- | --- |
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| A  Pretreatment  (Vegetative Filter Strip) | 1 | Poor quality vegetation, erosion, sedimentation, or debris | Y\_\_  N\_\_ | (See Vegetative Filter Strip Field Manual) |
| B1  Pavement Surface  (Porous Pavement) | 1 | Standing water is present after the design drain time  The observed drain time is approximately \_\_\_\_\_\_\_\_\_ hours.  Excessive sediment or mud accumulation on top of the pavement | Y\_\_  N\_\_ | Recheck to determine if there is standing water after 72 hours  If standing water is present longer than 5 days, report to mosquito commission.  If excessive sediment is present, the system may be clogged  - Sweep the surface  - Power wash (at 45 degree angle to the top)  - Vacuum the surface  - Excavate to inspect the storage bed for clogging, replace the storage bed material if it is severely clogged  - Check the permeability rate of the subsoil  Work Order # \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| B 1  Pavement Surface  (Porous Pavement) | 2 | Cracking, subsidence, spalling, or other damage to the pavement | Y\_\_  N\_\_ | Repair according to the manufacturer’s procedures and material. See Reference Documents section.  Work Order # \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 3 | Weeds or other vegetation on the porous pavement | Y\_\_  N\_\_ | Remove the vegetation |
| Note: | | | | |
| B 2  Pavement Surface  (Permeable Paver) | 1 | Standing water is present after the design drain time  The observed drain time is approximately \_\_\_\_\_\_\_\_\_ hours.. | Y\_\_  N\_\_ | Recheck to determine if there is standing water after 72 hours  If standing water is present longer than 5 days, report to mosquito commission. |
| If excessive sediment is present, the system may be clogged  - Sweep the surface  - Vacuum the surface  - Excavate to inspect the storage bed for clogging, replace the storage bed material if it is severely clogged  - Check the permeability rate of the subsoil  Work Order # \_\_\_\_\_\_\_\_\_\_\_\_\_\_  (Note: Do not power wash a permeable paver system) |
| 2 | Excessive sediment or mud accumulation on the system | Y\_\_  N\_\_ | Sweep and/or vacuum surface  Replenish aggregate in joints  Work Order # \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 3 | Cracking, subsidence, spalling, deformation, uneven settlement, broken unit(s), or other damage to the pavers | Y\_\_  N\_\_ | Repair according to the manufacturer’s procedures and material. See Reference Documents section.  Work Order # \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 4 | Loss of aggregate between joints | Y\_\_  N\_\_ | Replenish aggregate in joint  Work Order # \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Note: | | | | |
| C  Vegetation  (for permeable pavers with vegetation) | 1 | Vegetation is overgrown | Y\_\_  N\_\_ | Remove the vegetation according to the permeable paver manufacturer’s instruction  Work Order # \_\_\_\_\_\_\_ |
| D  Outlet | 1 | Clogged overflow outlet | Y\_\_  N\_\_ | Clear and remove sediment |
| 2 | Discharge pipe apron is eroded or scoured | Y\_\_  N\_\_ | Restabilize the discharge riprap apron  Work Order #\_\_\_\_\_\_\_\_\_\_ |
| Note: | | | | |

**Follow Up Items (Component No. / Inspection Item No.):**

(e.g., B/1, C/2)

**Associated Work Orders: # \_\_\_\_\_\_, # \_\_\_\_\_\_, # \_\_\_\_\_\_, # \_\_\_\_**\_\_**, # \_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Inspector Name Signature Date**

**Report issues to the local authority and mosquito commission as required by local ordinances and regulatory authorities.**

**File this checklist in the Maintenance Log after performing maintenance.**

# Preventative Maintenance Record

Corresponding Checklist No. \_\_\_\_\_\_\_\_

Component No.\_\_\_\_\_\_\_, Inspection Item No.\_\_\_\_\_\_\_\_

**Work Logs**

|  |  |  |
| --- | --- | --- |
| **Activities** | **Components** | **Date Completed** |
| Sediment/debris removal | A – Pretreament (Vegetative Filter Strip) |  |
| B1 – Pavement Surface (Porous Pavement) |  |
| B2 – Pavement Surface (Permeable Paver) |  |
| D – Outlet |  |
|  |  |  |
| Vegetation removal | A – Pretreament (Vegetative Filter Strip) |  |
| B2 – Pavement Surface (Permeable Paver) |  |
| C – Vegetation |  |
|  |  |  |
| (List additional tasks, if applicable) |  |  |

Debris, sediment, and trash are handled (onsite / by \_\_\_\_\_\_\_\_\_\_\_\_ (contractor name) to disposal site \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_). (See Part I: Maintenance Plan – Disposal Plan Section)

**Crew member:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_**

(name/ signature)

**Supervisor:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_**

(name/ signature)

**File this Preventative Maintenance Record in the Maintenance Log after performing maintenance.**

# Corrective Maintenance Record

1. **Work Order #** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date Issued** \_\_\_\_\_\_\_\_\_\_\_\_\_
2. **Issue to be resolved**:

(e.g., clogged surface)

1. The issue was from **Corresponding Checklist No. \_\_\_\_\_\_\_\_, Component No.** (e.g., B – Pavement Surface) **, Inspection Item No.**  (e.g., 2, 3) .
2. **Required Actions**

|  |  |  |
| --- | --- | --- |
| **Actions** | **Planned Date** | **Date Completed** |
| Repair pavers |  |  |
| (If there are additional tasks, list them here.) |  |  |

1. **Responsible person(s):**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Special requirements**
   * Time of the season or weather condition:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   * Tools/equipment:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   * Subcontractor (name or specific type):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Approved by** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date** \_\_\_\_\_\_\_\_\_\_\_\_\_

(name/signature)

**Verification of completion by** \_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_ **Date** \_\_\_\_\_\_\_\_\_\_\_\_\_

(name/signature)

**File this Corrective Maintenance Record in the Maintenance Log after performing maintenance.**