JONES&BEACH
ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

# STORMWATER MANAGEMENT OPERATION AND MAINTENANCE MANUAL

**35 Madbury Road**
**Tax Map 106 / Lot 19**
**Durham, NH 03824**

**Prepared for:**

**DWS 35, LLC**
**288 Calef Highway**
**Lee, NH 03861**

**July 2, 2025**
**JBE Project No. 25073**

# Inspection and Maintenance of Facilities and Property

## A. Maintenance of Common Facilities or Property

1. The property owner, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The property owner shall keep receipts and records of all maintenance companies hired throughout the year.

## B. General Inspection and Maintenance Requirements

1. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include, but are not limited to, the following:

    a. Parking Lot and Roadway
    b. Culverts
    c. Vegetation and Landscaping
    d. Riprap Outlet Protection Apron
    e. Porous Pavement

2. Maintenance of permanent measures shall follow the following schedule:

    a. Normal winter roadway and parking lot maintenance including plowing and snow removal. Road and parking lot sweeping at the end of every winter, preferably at the start of the spring rain season.

    b. **Inspection** of culvert inlets and outlets at least **once per month** during the rainy season (March to November). Any debris is to be removed and disposed of properly.

    c. **Annual inspection** of the site for erosion, destabilization, settling, and sloughing. Any needed repairs are to be conducted immediately. **Annual inspection** of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in kind, if they are found to be dead or dying.

d. Rock riprap should be **inspected annually** and after every major storm event in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock should be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation should not be allowed to become established in riprap areas, and/or any debris removed from the void spaces between the rocks. If the riprap is adjacent to a stream or other waterbody, the water should be kept clear of obstructions, debris, and sediment deposits.

e. Porous Asphalt Parking Lots:

The following recommendations will help assure that the pavement is maintained to preserve its hydrologic effectiveness.

**Winter maintenance:**

- Sanding for winter traction is prohibited. Deicing is permitted (NaCl, $MgCl_2$, or equivalent). Reduced salt application is possible and can be a cost savings for winter maintenance. Nontoxic, organic deicers, applied either as blended, magnesium chloride-based liquid products or as pretreated salt, are preferable.
- Plowing is allowed, blade should be set approximately 1" above road surface. Ice and light snow accumulation are generally not as problematic as for standard asphalt. Snow will accumulate during heavier storms and should be plowed. (more than usual, about an inch).

**Routine maintenance:**

- Asphalt seal coating is absolutely forbidden. Surface seal coating is not reversible.
- The pavement surface should be vacuumed 2 or 3 times per year, and at any additional times sediment is spilled, eroded, or tracked onto the surface.
- Planted areas adjacent to pervious pavement should be well maintained to prevent soil washout onto the pavement. If any bare spots or eroded areas are observed within the planted areas, they should be replanted and/or stabilized at once.
- Immediately clean any soil deposited on pavement. Superficial dirt does not necessarily clog the pavement voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, trucks or other heavy vehicles should be prevented from tracking or spilling dirt onto the pavement.
- Do not allow construction staging, soil/mulch storage, etc. on unprotected pavement surface. Contractor to laydown tarps, plywood

or removable item and take care not to track material onto unprotected pavement.

- Repairs: potholes of less than 50 square feet can be patched by any means suitable with standard pavement or a pervious mix is preferred. For areas greater than 50 sq. ft. is in need of repair, approval of patch type should be sought from a qualified engineer. Any required repair of drainage structures should be done promptly to ensure continued proper functioning of the system.
- Written and verbal communication to the porous pavement's future owner should make clear the pavement's special purpose and special maintenance requirements such as those listed here.
- A permanent sign should be added at the entrance and end of the porous asphalt area to inform residents and maintenance staff of the special nature and purpose of the pavement, and its special maintenance requirements.

**Signage should read as follows:**

POROUS ASPHALT PAVEMENT
FOR STORM WATER MANAGEMENT

**MAINTENANCE REQUIREMENTS:**

PLOW WITH SLIGHTLY RAISED BLADE ONLY
SANDING OF SURFACE PROHIBITED
DEICING PERMITTED (NaC1, $MgC1_2$ OR EQUIVALENT)
SEAL-COATING PROHIBITED
CLEANING BY PRESSURIZED AIR OR WATER PROHIBITED
DRY VACUUM SEMIANNUALLY

See attached sample forms as a guideline.

Any inquiries in regards to the design, function, and/or maintenance of any one of the above mentioned facilities or tasks shall be directed to the project engineer:

Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885

T#: (603) 772-4746
F#: (603) 772-0227

**Commitment to maintenance requirements**

I agree to complete and/or observe all of the required maintenance practices and their respective schedules as outlined above.

_____

Signature

_____

Print Name

_____

Title

_____

Date

## Annual Operations and Maintenance Report

The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form. The annual report and certification shall be submitted with three copies to the Town Planner by December 31st of each year.

| **Construction Activity** | **Date of Inspection** | **Who Inspected** | **Findings of Inspector** |
|---|---|---|---|
| Parking Lot and Roadway | | | |
| Culverts | | | |
| Vegetation and Landscaping | | | |
| Rip Rap Outlet Protection Apron | | | |

| | | | |
|---|---|---|---|
| Porous Pavement | | | |

# Regular Inspection and Maintenance Guidance for Porous Pavements

Regular inspection and maintenance is critical to the effective operation of porous pavement. It is the responsibility of the owner to maintain the pavement in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, seasonal changes, and traffic conditions.

## Inspection Activities

Visual inspections are an integral part of system maintenance. This includes monitoring pavement to ensure water drainage, debris accumulation, and surface deterioration.

| ACTIVITY | FREQUENCY |
|---|---|
| Check for standing water on the surface of the pavement after a precipitation event.<br>If standing water remains within 30 minutes after rainfall had ended, cleaning of porous pavement is recommended. | 2 to 4 times per year, more frequently for high use sites or sites with higher potential for run-on |
| Vacuum sweeper shall be used regularly to remove sediment and organic debris on the pavement surface. The sweeper may be fitted with water jets. | |
| Pavement vacuuming should occur during spring cleanup following the last snow event to remove accumulated debris, at minimum. | |
| Pavement vacuuming should occur during fall cleanup to remove dead leaves, at minimum | |
| Power washing can be an effective tool for cleaning clogged areas. This should occur at mid pressure typically less the 500 psi and at an angle of 30 degrees or less. | |
| Check for debris accumulating on pavement, especially debris buildup in winter.<br>For loose debris, a power/leaf blower or gutter broom can be used to remove leaves and trash. | |
| Check for damage to porous pavements from non-design loads.<br>Damaged areas may be repaired by use of infrared heating and rerolling of pavement. Typical costs may be 2,000/ day for approximately 500 ft of trench. | |

## Maintenance Activities

**Routine preventative cleaning is more effective than corrective cleaning.**

| Activity | Frequency |
|---|---|
| Controlling run-on and debris tracking is key to extending the life of porous surfaces.<br>Erosion and sedimentation control of adjacent areas is crucial.<br>Vacuuming adjacent non porous asphalt can be effective at minimizing run-on. | Whenever vacuuming adjacent porous pavements |
| Repairs may be needed from cuts of utilities. Repairs can be made using standard (non-porous) asphalt for most damages. Repairs using standard asphalt should not exceed 15% of total area. | As needed |
| Do not store materials such as sand/salt, mulch, soil, yard waste, and other stock piles on porous surfaces. | |
| Stockpiled snow areas on porous pavements will require additional maintenance and vacuuming. Stockpiling on snow on porous pavements is not recommended and will lead to premature clogging. | |

| | |
|---|---|
| Damage can occur to porous pavement from non-design loads. Precautions such as clearance bars, signage, tight turning radius, high curbs, and video surveillance may be required where there is a risk of non-design loads. | |
| Posting of signage is recommended indicating presence of porous pavement. Signage should display limitation of design load (i.e. passenger vehicles only, light truck traffic, etc. as per pavement durability rating.) | |

# CHECKLIST FOR INSPECTION OF POROUS PAVEMENTS

Location: Inspector:

Date: Time: Site Conditions:

Date Since Last Rain Event:

| Inspection Items | Satisfactory (S) or Unsatisfactory (U) | Comments/Corrective Action |
|---|---|---|
| **1. Salt / Deicing *Note complete winter maintenance guidance is available at UNHSC** | | |
| Use salt only for ice management | S U | |
| Vacuum sweeper shall be used | S U | |
| **2. Debris Cleanup (2-4 times a year minimum, Spring & Fall)** | | |
| Clean porous pavement to remove sediment and organic debris on the pavement surface via vacuum street sweeper. | S U | |
| Adjacent non porous pavement vacuumed | S U | |
| Clean catch basin (if available) | S U | |
| **3. Controlling Run-On (2-4 times a year)** | | |
| Adjacent vegetated areas show no signs of erosion and run-on to porous pavement | S U | |
| **4. Outlet / Catch Basin Inspection (if available) (2 times a year, After large storm events)** | | |
| No evidence of blockage | S U | |
| Good condition, no need for cleaning/repair | S U | |
| **5. Poorly Drainage Pavement (2-4 times a year)** | | |
| Pavement has been pressure washed and vacuumed | S U | |
| **6. Pavement Condition (2-4 times a year minimum, Spring & Fall)** | | |
| No evidence of deterioration | S U | |
| No cuts from utilities visible | S U | |
| No evidence of improper design load applied | S U | |
| **7. Signage / Stockpiling (As Needed)** | | |
| Proper signage posted indicating usage for traffic load | S U | |
| No stockpiling of materials and no seal coating | S U | |

| Corrective Action Needed | Due Date |
|---|---|
| 1. | |
| 2. | |