STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN

"THE SUBDIVISION AT MICHAEL ROAD"
MICHAEL ROAD
WAYLAND, MA

Prepared for: ***Barberry Homes***
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Operation and Maintenance Plan
Stormwater Management System
Subdivision at Michael Road
Michael Road, Wayland MA

INTRODUCTION

The subdivision at Michael road is a proposed residential subdivision located off Michael Road in Wayland, Massachusetts. The project site is located easterly side of Michael Road, north of Lee Road and south of Plain View Road. The development provides seven new residential lots that are accessed through a proposed road approximately 320-feet in length.

STORMWATER MANAGEMENT SYSTEM

Stormwater runoff from the proposed road surface will be collected at a rain garden located inside the cul-de-sac. The rain garden will include plantings that are native to the area and are effective in treating direct stormwater runoff from the proposed development.

Roof drains for each house are routed to and discharge into individual subsurface infiltration systems.

The entrance to each individual driveway will be constructed using porous pavement to manage all stormwater runoff associated with the driveway surfaces.

The systems have been designed to fully comply with Massachusetts Department of Environmental Protection (MADEP) requirements for stormwater management.

WETLAND RESOURCE AREAS AND COMPLIANCE REQUIREMENTS

A small amount of overflow from the street drainage system resulting from the 100-year storm discharges toward a wetland located on and off site. The wetland is tributary to an unnamed stream located off site that flows parallel to the southerly property line. Discharges to these waters must comply with the Massachusetts Wetland Protection Act, and the United States Clean Water Act, and all regulations promulgated under those Acts.

MAINTENANCE REQUIREMENTS

General

The project's stormwater collection and treatment system is designed to collect and treat stormwater so that all discharges from the system are in compliance with all local, state and federal environmental regulations. In order to provide the required level of treatment the system will require periodic maintenance activities to ensure that the system continues to perform as designed.

Responsible Party

All residential lots within the Subdivision at Michael Road will be privately owned and maintained. Lot ownership will be subject to membership and covenants of The Michael Road Extension Homeowners Association. The road and storm drainage system within the development will be private and maintained by the Homeowner's association. This association shall be responsible for all maintenance and repair activities relating to the stormwater collection and infiltration system.

Personnel

The Michael Road Extension Homeowners Association shall engage one or more maintenance firms to inspect the property, the drainage system, and to initiate maintenance and repair activities when required. The association shall also engage a Professional Engineer with expertise in stormwater management to perform an annual inspection and to draft an annual report.

Record Keeping

The Homeowners association shall maintain records of all inspection and maintenance activities. These records shall include the following:

1. Street cleaning
2. Rain Garden Maintenance
3. Catch Basin Cleaning
4. Application of pesticides, herbicides and fertilizers
5. Annual Engineer's Report

Maintenance Activities

The following maintenance activities will be performed at the intervals stated herein:

Streets

Streets and driveways shall be vacuum-swept twice per year to remove road sediments. One cleaning shall be performed during the late spring April to May period, and the second cleaning shall be performed in the fall during October to November.

The porous Flexi-Pave portions of the driveway entrances shall be visually inspected annually. Upon inspection, if the system appears to be obstructed with sand or fine dirt, it shall be maintained according to the attached Maintenance Procedures provided by KBI Flexi-Pave. Any sediment removed shall be disposed of in accordance with DEP policy and requirements for the disposal of road sediments. This activity shall be performed by a contractor assigned by the Homeowner's association.

Catch Basin

The sump for the catch basin located within the rain garden shall be inspected twice per year, once in the spring and again in the fall. If any sediment removed shall be disposed of in accordance with DEP policy and requirements for the disposal of road sediments. This activity shall be performed by a contractor assigned by the Homeowner's association.

Grounds

All residential lots will be privately owned and maintained. Areas within the roadway or easements shall be maintained by the Homeowner's association. All slopes shall be inspected and any exposed areas or other locations susceptible to erosion shall be stabilized with mulch, sod, seed, stone or other suitable measures. All grass clippings, leaves, brush and other natural materials will be transported to an approved composting facility. No clippings or leaves will be deposited in wooded areas or within wetland resource areas or wetland buffer zones. This activity shall be performed by a contractor assigned by the Homeowner's association.

Infiltration System

The roof infiltration systems shall be inspected annually to evaluate sediment accumulation and once per year during a storm event. Routine inspection for sediment accumulation shall consist of the inspection of each chamber where an inlet is located. An inspection port cover is located at each point. Any sediment that has entered into the system at the inlet locations shall be removed and disposed of in accordance with MADEP policy. This activity shall be performed by a contractor assigned by the Homeowner's association.

Rain Garden

The rain garden shall be inspected a minimum of once per year to ensure that they are operating as intended and that all components are stable and in working order. An inspection of the plant materials is also critical to the rain garden. The services of a Professional Engineer with experience in drainage and stormwater shall perform the inspections. The engineer shall file a written report which will include a summary of the condition of the rain garden and provide recommendations for maintenance activities. Sediment collecting in the pond's bottom shall be inspected annually, and removal shall commence any time the sediment reaches a depth of six inches anywhere in the pond. Any pond sediments removed shall be disposed of in accordance with the latest DEP guidelines for storm water sediment disposal.

The inspection should take place after at least one inch of rainfall has fallen and prior to the end of storm. Following the inspection, the precipitation volume, based upon the nearest reporting weather station, should be recorded in the inspection log book. This activity shall be performed by a contractor assigned by the Homeowner's association.

Rain garden maintenance is similar to a typical garden with a few additional components. An important consideration in maintenance practices is to minimize compaction of the planting media. Ideally, once the garden is planted, it will not be walked on or otherwise compacted. During the first season after planting, plants will need to be watered regularly so that they are given a good start on growing and getting established, as in a typical garden. Nutrient additions in the form of low nitrogen fertilizer, can be used within the first year of growth to enhance plant establishment.

During the growing season, visually inspect vegetation for disease or pest problems. If treatment is warranted, use the least toxic approach. Remove and replace all dead and diseased vegetation annually. During times of extended drought, look for physical features of stress (unrevived wilting, yellow, spotted or brown leaves, loss of leaves, etc.). If plants show signs of stress, water and fertilizer may be added to promote dense fibrous root growth. Weed and prune excess growth annually or more often, if desired.

Outlet Channel

Overflow from the infiltration system is discharged by an 8-inch diameter drain pipe. A riprap has been provided at the outlet. Flow then is directed towards a natural wetland area. The area between the outlet and the wetland should be inspected on an annual basis by the Professional Engineer. Any erosion or sedimentation that is observed should be repaired at once. Erosion or sedimentation that impacts the wetland must be reported to the Wayland Conservation Commission.

Information Resources

The following agencies, individuals or firms may be contacted for information concerning this specific drainage system, maintenance requirements or permitting obligations.

Design Engineer

Metrowest Engineering, Inc.
75 Franklin Street
Framingham, MA 01702
(508) 626-0063

Wayland Conservation Commission and Planning Board

Town Hall
41 Cochituate Road
Wayland, MA 01778
(508) 358-3669

Massachusetts Department of Environmental Protection

Northeast Regional Office
1 Winter Street
Boston, MA 02108
(617) 654-6500

FLEXI™-PAVE

MAINTENANCE PROCEDURES:

PRODUCT TYPE:

Structural: Rubber and Stone

- **HDX2000**+ (2" – 50mm +)
- **HD2000** (2"- 50 mm)
- **HD1500** (1-1/2" - 37.5 mm)
- **HD1000** (1" – 25 mm)

Non-Structural: Rubber Only

- **PX2000** (2" – 50mm)
- **P3000** (3" – 75mm)
- **P2000** (2" – 50mm)
- **P1000** (1" – 25mm)

OVERVIEW:

Due to KBI Flexi™-Pave's high pervious rating of nearly 4,000 inches of water per hour *(2,000 gallons per square foot, per hour)*, general maintenance is kept to a minimum, unlike other porous pavement systems that constantly ***"Silt Load"***, plus, the inherent benefit of being ****"Dynamic"*** in its construction, adds to the overall performance of **self cleaning.**

* **Silt Load:** This term is generally associated with the amount of fines that will "Clog Up" pervious paving materials.

** **Dynamic:** Unlike other engineered paving surfaces that are inherently "Rigid " in their design and construction, KBI Flexi™-Pave "Flexes" when weighted movement is applied on its surface.

RECOMMENDED CLEANING PROCEDURES:

In the event that the surface of KBI Flexi™-Pave becomes clogged with fine dirt or sand, copious amounts of water should be applied at low pressure using a garden hose or similar hose design. This will wash out/displace the loose fines due to the large void capacity of 19-23% per volume of the KBI Flexi™-Pave.

- On occasions where considerable silt loading may occur, i.e. "Excessive Sand Loading", a common street sweeper/vacuum can be used to extract the excess fines.
- It is recommended that routine street maintenance be carried out in accordance with maintenance best practices. This will ensure continual performance of KBI Flexi™ - Pave.

REPAIR PROCEDURES:

K.B. Industries, Inc. maintains a very high level of quality control from installation to service which is implemented by certified KBI Flexi™-Pave technicians. Repairs can only be carried out by KBI certified technicians to ensure continued warranty and customer satisfaction.

Note: All KBI Certified Installers are issued a Certification number for accountability. If the certification number is not disclosed when requested please contact K.B. Industries, Inc. corporate office at 1 877- KBI-FLEX before carrying out any repair work.

KBI Flexi™-Process products are manufactured by K.B. Industries, Inc. Data is based on facts that we believe to be accurate but all recommendations are made without warranty since conditions of use are beyond K.B. Industries, Inc. control. We do not assume any liability except what is expressly noted in warranty certificate if Certified Technicians install the products. We do not assume any liability from injury resulting from use. Liability, if any, is limited to replacement of products.

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