

Ministers Estates

Sunset Rock Road, Andover, MA

OPERATION & MAINTENANCE PLAN

RESPONSIBILITY

The party initially responsible for the operation and maintenance of the stormwater elements on the site, as listed below, shall be the owner/development, Greg Alexandris. These responsibilities will be transferred to the Homeowners Association once it is established and turned over to the property owners. A sketch is provided at the end of this document indicating the location of the stormwater element.

INFILTRATION BASIN

The infiltration basin shall be inspected at least once per year to ensure that the basin is operating as intended. Inspections conducted at intervals during and after a storm will help to determine if the basin is meeting the expected detention times. The outlet structure shall be inspected for evidence of clogging or outflow release velocities that are greater than design flow. Potential problems that shall be checked include subsidence, erosion, cracking, or tree growth on the embankment; damage to the emergency spillway; sediment accumulation around the outlet; inadequacy of the inlet/outlet channel erosion control measures; changes in the condition of the pilot channel; and erosion within the basin and banks. Any necessary repairs shall be made immediately. During inspections, changes to the Infiltration basin or the contributing watershed shall be noted, as these may affect basin performance.

The upper-stage, side slopes, embankment, and emergency spillway shall be mowed at least twice per year. Trash and debris shall also be removed at this time.

Sediment shall be removed from the basin as necessary, and at least once every ten (10) years. Providing an on-site sediment disposal area will reduce the overall sediment removal costs.

Maintenance Criteria

- Infiltration basin shall be inspected at least once per year to ensure that the basin is operating as intended. Inspections shall be conducted during wet weather to determine if the basin is meeting the targeted detention times.
- At least twice during the growing season the upper-stage, side slopes, embankment, and emergency spillway shall be mowed, and accumulated trash and debris removed.
- Remove sediment from the infiltration basin as necessary, but at least once every ten (10) years.

Ministers Estates

Sunset Rock Road, Andover, MA

INFILTRATION TRENCH

Infiltration trenches must be sized to provide storage and exfiltration of the required water quality volume. Full exfiltration systems also provide control of peak discharges and water quality treatment for all storm events equal to or less than the design storm selected. In selecting the design storm, the minimum peak rate attenuation storm event must include the 2- and 10-year 24-hour storm events and may include the 100-year 24-hour storm event, if the runoff from that storm will increase flooding up- or downstream of the site.

Maintenance Criteria

- Inspect inlets at least twice a year.
- Inspect and clean pretreatment BMPs every six months.
- Check inlet and outlet pipes to determine if they are clogged.
- Remove any debris that might clog the system.

DEEP SUMP CATCH BASINS

The actual removal of sediments and associated pollutants and trash occurs only when inlets or sumps are cleaned out; therefore, regular maintenance is required. Most studies have linked the failure of inlets to the lack of regular maintenance. The more frequent the cleaning, the less likely sediments will be re-suspended and subsequently discharged. In addition, frequent cleaning also results in more volume available for future storms and enhances the overall performance. Ideally, in areas of high sediment loading, inlets shall be inspected, and cleaned, after every major storm event. At a minimum, water quality inlets and deep sumps shall be cleaned four times per year and inspected monthly. Disposal of the accumulated sediment and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

Maintenance Criteria

- Inlets shall be cleaned a minimum of four (4) times per year and inspected monthly.
- All sediments and hydrocarbons shall be properly handled and disposed of, in accordance with local, state, and federal guidelines and regulations.

SEDIMENT FOREBAY

The actual removal of sediments and associated pollutants occurs only when sediment traps and forebays are cleaned; therefore, regular maintenance is required. Frequently the removal of accumulated sediments will make it less likely that sediments will be re-suspended. At a minimum, sediment traps shall be cleaned four (4) times per year and inspected monthly.

Ministers Estates

Sunset Rock Road, Andover, MA

Maintenance Criteria

- Traps shall be cleaned four (4) times per year and inspected monthly.
- All sediments and hydrocarbons shall be handled properly and disposed of in accordance with local, state, and federal guidelines and regulations.

DRAINAGE SWALE

A maintenance and inspection schedule shall be incorporated into the design to ensure the effectiveness of the swale. The swale shall be inspected on a semi-annual basis; additional inspections shall be scheduled during the first few months to make sure that the vegetation in the swale becomes adequately established. The swale shall be inspected for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding, and sedimentation.

Regular maintenance tasks include mowing, fertilizing, liming, watering, pruning, and weed and pest control. The swale shall be mowed at least once per year. The grass must not be cut shorter than four (4) inches because the effectiveness of the vegetation in reducing flow velocity and pollutant removal may be reduced.

Sediment and debris shall be removed manually, at least once per year, and periodic reseeded may be required to maintain the dense growth of vegetation. Care shall be taken to protect the swales from snow removal and disposal practices and off street parking

Maintenance Criteria

- The swale shall be inspected at least semi-annually, and maintenance and repairs made as necessary. Additional inspections shall be scheduled during the first few months to make sure the vegetation becomes adequately established. Repairs and reseeded shall be done as required.
- The swale shall be mowed at least once per year. Grass clippings shall be removed. The grass must not be cut too often or shorter than four (4) inches, in order to maintain the effectiveness of the swale.
- Sediment and debris shall be removed manually, at least once per year, before the vegetation is adversely impacted.
- Care shall be taken to protect water quality swales from snow removal and disposal practices and off-street parking.

GRASSED CHANNEL

Grassed Channel (formerly known as Biofilter swale) are treatment systems with a longer hydraulic residence time than drainage channels. The removal mechanisms are sedimentation and gravity separation, rather than filtration.

Ministers Estates

Sunset Rock Road, Andover, MA

Maintenance

- **Mowing**: Set the mower blades no lower than three (3) to four (4) inches above the ground. Mow on an as-needed basis during the growing season so that the grass height does not exceed six (6) inches.
- **Inspection**: Inspect semi-annually the first year, and at least once a year thereafter. Inspect the grass for growth and the side slopes for signs of erosion and formation of rills and gullies. Plant an alternative grass species if the original grass cover is not successfully established.
- **Trash/Debris Removal**: Remove accumulated trash and debris prior to mowing.
- **Sediment Removal**: Check on a yearly basis and clean as needed. Use hand methods (i.e., a person with a shovel) when cleaning to minimize disturbance to vegetation and underlying soils. Sediment build-up in the grass channel reduces its capacity to treat and convey the water quality event, 2-year, and 10-year 24-hour storm.

MINISTERS ESTATES

