

Operation & Maintenance Plan

Buildings 1 & 1A

Alexandria Real Estate Equities, Inc.

3000 Minuteman Road

Andover, MA

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Prepared by

SMMA

1000 Massachusetts Avenue

Cambridge, Massachusetts

Operation and Maintenance Plan

This Operation and Maintenance (O&M) Plan has been developed in accordance with Massachusetts DEP Stormwater Management Guidelines Standard No. 9 to ensure that the proposed stormwater management system functions as designed.

Owner and Responsible Party

The Applicant/Owner (ARE – MA Region 93 Holding, LLC, 26 North Euclid Avenue, Pasadena, CA) shall be the party responsible for adherence to the DEP Stormwater Management Policy after completion of construction. The Applicant/Owner shall designate a Site Supervisor who shall assume responsibility for this post construction maintenance plan, after a CoC has been issued. The Applicant/Owner shall be responsible for financing maintenance activities and both anticipated and emergency repairs of the system.

If the property owner changes, it shall be the responsibility of Applicant/Owner to notify the future owner of the stormwater management system and its components as well as the requirements for operation and maintenance.

Members of the Town of Andover Department of Community Development and Planning shall be allowed to enter the property at reasonable times and in a reasonable manner for the purposes of inspection of the systems.

Stormwater Management Maintenance

The following site maintenance activities are required to maintain the optimal pollutant attenuation by the drainage system. A maintenance schedule follows in this plan.

Catch Basins and Manholes

Proper maintenance includes inspection of all grates, sumps, and outlets. Any debris or obstructions should be removed. Structural damage should be recorded and reported. The amount of sediment in each catch basin should be recorded. The catch basin sumps shall be cleaned when they are half full of sediment or debris (approximately two feet below outlet pipe.)

Water Quality Units

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument.

The water quality system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the

pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine whether the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning of the systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole cover and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be cleaned to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Polluted water or sediments removed from the CDS is to be disposed of in accordance with all applicable local, state and federal laws and regulations including M.G.L.c. 21C and 310 CMR 30.00.

Subsurface Detention & Infiltration Systems

The inlet and outlet of each system should be inspected and cleared of any debris that might clog the system. The system should be checked to ensure functionality after installation. The area above and immediately adjacent to the system should be checked for depressions. The area above and adjacent to the system should also be inspected to ensure that no unauthorized modifications have been made.

Porous Pavement

In most porous pavement designs, the pavement itself acts as pretreatment to the stone reservoir below. Consequently, frequent cleaning and maintenance of the pavement surface is critical to prevent clogging. To keep the surface clean, frequent vacuum sweeping along with jet washing of asphalt and concrete pavement is required. No winter sanding shall be conducted on the porous surface. As discussed, designs that include an “overflow edge” provide a backup in case the surface clogs. If the surface clogs, stormwater will flow over the surface and into the trench, where some infiltration and treatment will occur. For proper maintenance:

- Post signs identifying porous pavement areas.
- Minimize salt use during winter months. If drinking water sources are located nearby, porous pavements may not be allowed.
- No winter sanding is allowed.
- Keep landscaped areas well maintained to prevent soil from being transported onto the pavement.
- Clean the surface using vacuum sweeping machines monthly. For paving stones, periodically add joint material (sand) to replace material that has been transported.
- Regularly monitor the paving surface to make sure it drains properly after storms.
- Never reseal or repave with impermeable materials.
- Inspect the surface annually for deterioration or spalling.
- Periodically reseed grass pavers to fill in bare spots.

- Attach rollers to the bottoms of snowplows to prevent them from catching on the edges of grass pavers and some paving stones.

Other Site Maintenance

Pavement and Grass Areas

The pavement areas should be swept to remove solids and reduce the amount of suspended solids in the runoff. All accumulated trash and litter throughout the site should be collected and discarded.

Snow Removal

Maintenance activities during the winter months are primarily limited to snow removal activities and removal of debris and trash throughout the site.

Snow removal operations will adhere to *the Massachusetts Department of Environmental Protection – Bureau of Resource Protection Guidelines (dated March 8, 2001)*. Snow will be stockpiled as far away from resource areas as possible and removed as necessary under larger snow events. Stockpiling snow in this manner will allow meltwater to enter the drainage system and thereby receive pretreatment prior to discharging to receiving resource areas. Snow and ice that has accumulated around catch basin grates will be removed.

Winter Salt and Sand Use

For concrete walkways and plaza areas, no binary chloride compounds shall be applied, i.e. sodium chloride, calcium chloride or magnesium chloride, for a minimum of 6 months after concrete installation is complete. This allows the concrete to cure to its optimal strength. For the first year, an aggressive snow removal process through mechanical means or hand shoveling followed by the use of sand or fine gravel mixtures optimal for the life of the sidewalks and plaza systems.

Maintenance Schedule

Required Action	Frequency
Catch Basins and Manholes	
Inspect for depth of sediment, obstructions, structural damage, or other malfunction	Quarterly in the first year; at least twice per year after
Clean sumps of accumulated sediment	When structures are ½ full of sediment/debris (approximately two feet below outlet pipe) once per year minimum
Pavement and Grass Areas	
Sweep pavement areas	At least twice per year: after final snow melt and after final leaf fall and as necessary in summer months
Remove accumulated litter, debris, and discarded materials throughout the site	Once per week

Subsurface Detention & Infiltration Systems	
Inspect inlets and outlet and remove any debris	Quarterly in first year; at least twice per year after
Inspect system for functionality	After first major rainfall following installation
Check for depressions in areas above and surrounding the system	Once per year
Confirm that no unauthorized modifications have been performed to the site around (including over) the system	Once per year
Inspect interior of system	Once per year
Water Quality Units	
Inspect for depth of sediment, obstructions, structural damage, and other malfunction	Twice per year in spring and fall
Remove sediment and pollutants	When level of sediment in structure's sump reaches 75% of capacity or when appreciable level of hydrocarbons and debris has accumulated; at a minimum of once per year
Porous Pavement	
Monitor to ensure that the paving surface drains properly after storms	As needed
For porous asphalts and concretes, clean the surface using power washer to dislodge trapped particles and then vacuum sweep the area. For paving stones, add joint material (sand) to replace material that has been transported.	As needed
Inspect the surface annually for deterioration	Annually
Assess exfiltration capability at least once a year. When exfiltration capacity is found to decline, implement measures from the Operation and Maintenance Plan to restore original exfiltration capacity.	As needed, but at least once a year
Reseed grass pavers to fill in bare spots.	As needed

Reporting and Documentation

The Site Supervisor for the Applicant/Owner shall be responsible for maintaining an accurate Site Maintenance Log. The Site Maintenance Log shall be located on site and made available to the Town of Andover Department of Community Development and Planning. The Site Supervisor shall be responsible for submitting an Annual Report to the Planning Board, issued every September 1st, with the most recent Site Maintenance Log appended.

Site Maintenance Log

The Site Maintenance Log shall, at a minimum:

- Include a completed Inspection Checklist, inclusive of the following:
 - Date and description of specific maintenance tasks performed
 - Structural components maintained, as identified on the O&M Plan
 - Descriptions of the condition of the components identified in the O&M Plan
 - Staff person or contractor performing maintenance activities
 - Supervisor verification of maintenance activity
- Identify any outstanding problem, malfunction, or inconsistency identified during the course of routine maintenance

The Site Supervisor shall be responsible for ensuring that the scheduled tasks area appropriately completed as described in this plan and the Site Maintenance Log accurately represents activities carried out as described in this plan.

Public Safety Features

The following on-site public safety features are included in this O&M Plan:

- Covers and grates on all manholes and catch basins are designed to withstand H2O loading
- Peak stormwater runoff rates are maintained or reduced from existing to proposed conditions
- This O&M Plan must be implemented to ensure the ability of the stormwater management system to continue to operate as designed

Estimated Annual Budget

The estimated annual budget to complete this Operation and Maintenance Plan is \$15,000.

Inspection Checklist

Date of Inspection _____

Checklist Completed By _____

Reviewed by Supervisor _____

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