

**LONG-TERM STORMWATER POLLUTION PREVENTION AND
OPERATION & MAINTENANCE PLAN TO COMPLY WITH
STORMWATER STANDARDS 4, 6, & 9**

APPLICABILITY

This document identifies constituents of concern that have the potential to contaminate stormwater from the proposed residential site improvements at 347 Main Street and provides a framework of Best Management Practices (BMPs) to ensure that stormwater discharge exposure to nearby wetland resource areas. It also outlines an inspection and maintenance program to ensure continued effectiveness of the proposed stormwater management system. The proposed BMP's are shown on the plans prepared by CHA, 101 Accord Park Drive, Norwell, Massachusetts.

PROJECT OVERVIEW:

The proposed project, Oxford School Residences, includes renovation of the existing Oxford School as well as a building addition. The proposed development will be served by parking accommodations in the front, side, and rear of the buildings. It is proposed to utilize underground infiltration/detention systems consisting of plastic stormwater chambers. A closed-conveyance pipe system will collect and convey stormwater runoff to subsurface infiltration/detention systems. It is proposed to treat all stormwater runoff from impervious areas as required by the 2008 Massachusetts Stormwater Handbook. The proposed improvements are shown on the plans CHA. The project has been designed to improve stormwater management by reducing the peak runoff rates below existing peak rates of runoff.

Appended to this document is a sample maintenance form and a chart describing the anticipated frequency of tasks.

OWNER AND RESPONSIBLE PARTY:

Owner:

Stratford Capital
100 Corporate Place, Suite 404
Peabody, MA 01960

Day-to-day Operation and Maintenance:

TBD

Day-to-day Operation and Maintenance:

Maintenance Company hired by Owner.

ON-GOING MAINTENANCE CONTRACT

The non-structural and structural approaches recommended below, as well as the required BMP maintenance, will be completed by Oxford School Residences Limited Partnership staff or an appropriate contractor. In either case, adequate personnel with appropriate training and access to proper equipment will be available to complete the tasks. Future responsible parties must be notified of their responsibility to operate and maintain the system in perpetuity.

LIVING DOCUMENT PROVISIONS

Due to the difficulty of identifying all sources of potential stormwater contamination and maintenance activities, this document should be updated as necessary to reflect new procedures, technologies or requirements.

MAINTENANCE LOG

The Responsible Party shall develop and maintain a log of inspections, maintenance, repairs, and disposal (including location of disposal) during the life of the project. Records will be maintained for at least 3 years and be made available to the Massachusetts Department of Environmental Protection or the Town of Fairhaven in accordance with the provisions of the Massachusetts Stormwater Handbook.

MINIMIZING EXPOSURE

The Responsible Party will minimize exposure of potential pollutant sources, including debris, from coming into contact with precipitation and being picked up by stormwater and carried into drains and surface waters using the following steps:

- Storing all containerized materials in a protected, secure location away from drains and plainly labeled.
- Containing all activities that can generate sources of contaminants from reaching the receiving water or the stormwater management system.
- Securing any equipment or supplies so that they are not transported during storm events into receiving waters or stormwater management system.

BEST MANAGEMENT PRACTICES (BMP) MAINTENANCE

The proposed stormwater management system has been designed with appropriate BMPs aimed at reducing the pollutants discharge based upon the intended use of the Oxford School Residences site.

All BMPs require regular maintenance to function as intended. Some management measures have simple maintenance requirements; others are more involved. The Responsible Party must have all BMPs regularly inspected to ensure they are operating properly on an as needed basis, including during runoff events exceeding 0.5 inches of rainfall.

A description of the non-structural and structural approaches to be incorporated is indicated below. The following best management practices are proposed to be incorporated into the stormwater management design to reduce source runoff and improve stormwater runoff discharge quality. The Responsible Party will regularly inspect all BMPs to ensure they are operating properly. If any

deficiencies are identified during these inspections, action to resolve it will be initiated and documented on the maintenance log.

NON-STRUCTURAL BEST MANAGEMENT PRACTICES (BMPs)

PARKING LOT/DRIVEWAY SWEEPING

As street sweeping is a BMP under DEP guidelines, this non-structural BMP is an effective removal of Total Suspended Solids (TSS) in a comprehensive stormwater management program. At the property owner's discretion a maintenance program of parking lot/driveway street sweeping with a High Efficiency Vacuum Sweeper or a Regenerative Air Sweeper to reduce sediment accumulation in the deep sump catch basins and subsurface systems. Sweeping can be conducted on a quarterly basis (primarily in the spring and fall) to keep low impact BMPs operating effectively.

GRADING

The impervious areas of the site shall be graded as gently as possible, generally not more than 4% or 5% slopes to reduce runoff velocities. Steep slopes will be permanently vegetated to dissipate energy and reduce potential erosion. No constructed vegetated slopes should exceed 3H:1V without providing additional reinforcement. Steep slopes may require soil reinforcement and additional vegetation.

FLOW OVER VEGETATED AREAS

Wherever possible, runoff from paved areas and snowmelt shall be directed over vegetated areas to promote settlement of suspended solids before entering a wetland or resource area.

SNOW STORAGE AND DEICING

Designated snow storage will be provided at locations throughout the site and are shown on the plan included with this document. The snow storage areas are away from building, pedestrian, and vehicular access areas that would impinge upon safe circulation. Snow storage will be provided adjacent to parking and drive areas.

In the interest of reducing the volume of dissolved salt that enters the watershed, the operator of the development will rely on sand alone where traction on snowy surfaces is the primary objective. However, parking areas, driveways, and sidewalks which require deicing for safety during winter months will typically be treated with a mixture of 90% sand and 10% road salt (NaCl). The applicant is open to suggestions for alternative to the use of road salt, although a cursory review of the literature indicates that many of the more familiar alternative (CMA, KA) have their own potential environmental drawbacks.

FERTILIZER:

Slow release organic fertilizers will be used in landscape areas to limit nutrient transport to groundwater and the wetland area. Application will be limited to 3 lbs. per 1000 square feet

of lawn area.

WASTE MANAGEMENT:

Solid waste will be contained within dumpsters in the loading area. Waste deposition in these receptacles will be consistent with state and local permits. The covers and doors of the dumpsters will be kept closed to limit rainwater/wildlife intrusion.

STRUCTURAL BEST MANAGEMENT PRACTICES:

Prior to final completion and full occupancy of the development, it is recommended that a representative of the Contractor, Manufacturer, and/or Engineer either designing or building the facility for the owner properly instruct the Responsible Party as to the maintenance practices required to responsibly maintain the effectiveness of the drainage system. These frequencies and requirements are recommendations to maintain minimum effectiveness in most typical environments. Ultimately, the Responsible Party will implement the procedures and frequencies as they see fit under their current plan and inspect the systems as needed to maintain minimum effectiveness as recommended by the manufacturer. The following maintenance of structural BMPs will be implemented:

DEEP SUMP CATCH BASINS AND MANHOLE STRUCTURES

Catch basins shall be cleaned, in dry weather, when half of the sump capacity is filled or at a minimum quarterly or as required through periodic inspection. Cleaning will take place at the completion of construction and in early spring after sanding of roadways has ceased or as needed depending on the frequency of major storm events (greater than 1-inch of rainfall). All manholes shall be inspected at least once annually or as dictated by the Responsible Party. Any obstructions, sediment, and debris that could potentially cause clogs shall be removed within the conveyance system as necessary. Inverts, grates, and hoods shall be checked and replaced as necessary to maintain hydraulic effectiveness.

SUBSURFACE INFILTRATION SYSTEM / UNDERGROUND DETENTION SYSTEMS

The subsurface systems have been designed with riser structures at grade to aid the removal of sediment and debris accumulating in the structure. The detention facilities contain multi-stage outlet structures to meet storm events above the 2-yr event. Once the system goes online, inspections should occur after each storm event for the first few months to ensure proper stabilization, function, and to ensure that the outlets remain free of obstructions. Preventative maintenance shall be performed at least twice per year and after every major storm event (> 1.5" of rainfall) and shall include removal of accumulated sediment, inspection of the detention structure, and monitoring of groundwater to ensure proper operation of the system. Important items to check for include differential settlement, cracking, breakout, clogging of outlets and vents, and root infestation. Water levels should be checked and recorded against rainfall amounts to verify that the drainage system is working properly and draining within 72 hours. If they do not drain within 72 hours, corrective action should be taken.

HYDRODYNAMIC SEPARATORS

Hydrodynamic Separators shall be inspected twice per year and cleaned at least once per year and in accordance with the manufacturer's recommendations. Periodic inspections performed by the responsible party may dictate cleaning on a more frequent basis depending on the suspended solids loading. During construction accumulated sediment may need to be removed more frequently. Usually a vacuum truck removes accumulated sediment and oil most efficiently. See maintenance documentation from the manufacturer.

ISOLATOR ROW

The Isolator Row in UG-5 shall be inspected twice per year and cleaned at least once per year and in accordance with the manufacturer's recommendations. Periodic inspections performed by the responsible party may dictate cleaning on a more frequent basis depending on the suspended solids loading. During construction accumulated sediment may need to be removed more frequently. Conduct jetting and vactoring annually or when inspection shows that maintenance is necessary. See attached maintenance documentation from the manufacturer.

OUTLET CONTROL STRUCTURES

The outlet control structures (OCS) detain the water utilizing orifices to control the outlet flow and are below grade with access via covers to grade. Although the outlet control structures should not have much debris, they should be inspected to make sure there are not concrete issues or residual debris. Sand accumulation within the OCS is a sign there is an issue with the upstream stormwater treatment device. The OCS shall be inspected once per year. It may be necessary to clean the structure and the use of a vacuum truck may be necessary.

SPILL CONTROL:

Since the site is a residential development, it is unlikely there will be a spill other than petroleum products from a vehicle fuel tank or small refueling tank for a snowblower or lawn mower. Thus, it is only a recommendation that a contingency plan to address the spillage/release of petroleum products and any hazardous material be implemented for the facility. The recommendation includes that the property manager have all DEP emergency spill response information posted on-site at all times. It is also recommended an emergency spill response kit including absorbent pillows be stored on-site along with instructions for the kit, a copy of applicable regulations regarding spills, and a list of individuals to contact (local and state officials) in the event of a spill.

Spills or leaks will be treated properly according to material type, volume of spillage and location of spill. Mitigation will include preventing further spillage, containing the spilled material in the smallest practical area, removing spilled material in a safe and environmentally friendly manner, and remediating any damage to the environment.

LONG-TERM OPERATION AND MAINTENANCE BUDGET:

Consistent with Standard 9 of the Massachusetts Department of Environmental Protection Stormwater Handbook (February 2008) the approximate cost of inspections and maintenance based on the abovementioned post-construction activities and frequencies is as follows:

- Pavement Sweeping - \$5,000 per year based on annual sweepings.
- Deep Sump Catch Basins - inspection/cleaning - \$250 per year/per catch basin based on quarterly inspections and sediment removal of both single and double grate deep sump catch basins.
- Stormwater Quality Units - inspection/cleaning - \$1,000 per year based on quarterly inspections (or per manufacturer's guidelines) and sediment removal.
- Underground Infiltration/Detention Systems - inspection - \$1,000 per year based on semi-annual inspections. Cleaning/debris removal - \$1,000 per year for accumulated sediment and trash removal.

Additional costs may be incurred if it is determined during routine inspections of the BMP's that further corrective actions are necessary.

LONG TERM STRUCTURAL BEST MANAGEMENT PRACTICE INSPECTION & MAINTENANCE MATRIX AFTER CONSTRUCTION

Note: BMP's shall be visually inspected and repaired by a qualified party in accordance with the following chart. Note these are minimum inspection criteria/frequencies and should be adjusted throughout the project lifespan as required to maintain effectiveness. Refer to maintenance standards for drainage facilities and structural best management practices in the "Recommended Long-Term Stormwater Pollution Prevention Plan."

<i>Conventional & LID Best Management Practices</i>	<i>Recommended Minimum Inspection & Maintenance Frequency</i>	<i>Erosion/Scouring</i>	<i>Tree Growth Hazards</i>	<i>Differential Settlement/Seepage</i>	<i>Structural Damage/Obstructions</i>	<i>Trash & Debris</i>	<i>Removal of Accumulated Sediment</i>	<i>Slope Integrity</i>	<i>*Mow Vegetation/Poor Vegetation Coverage</i>	<i>Remove/Reset Filter Fabric & Stone As Required</i>	<i>Remove & Replace Hardwood mulch/media</i>	<i>Vac Truck Sediment & Contaminants</i>	<i>Remove/Reset Riprap as Required</i>
Catch Basin	Annually		☒	☒	☒	☒	☒					☒	
Drainage Swales	Semi-Annual	☒				☒		☒	☒				☒
Outlet Structure	Semi-Annual	☒		☒	☒	☒	☒			☒			☒
Water Quality Inlet	Semi-Annual			☒	☒	☒						☒	
Isolator Row	Semi-Annual			☒	☒	☒						☒	
Detention/Infiltration	Semi-Annual	☒	☒	☒	☒	☒	☒						
CB Filters	Quarterly					☒	☒					☒	
Level Spreader	Annually	☒	☒			☒			☒	☒			☒
Plunge Pool	Annually	☒				☒	☒		☒	☒			☒

Stormwater BMP Inspection and Maintenance Log

Facility Name	
Address	
Begin Date	End Date

Date	BMP ID#	BMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary.

- BMP ID# — Always use ID# from the Operation and Maintenance Manual or Approved Plans.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up.