

Long Term Pollution Prevention & Stormwater System Operation and Maintenance Plan

***Hager Homestead
336 King Street
Littleton, MA***

April 2020

Revised June 2020
July 2020

**Submitted to:
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Conservation Commission
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**Project No:
191096**



LONG TERM POLLUTION PREVENTION AND STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Preface:

The goal of this manual is to improve water quality by initiating performance standards for the operation and maintenance of stormwater management structures, facilities, and recognized practices. The stormwater performance standards are set up to meet the statutory and regulatory authorities of the Department of Environmental Protection, including the Wetland Protection Act, surface water discharge permits under the Clean Waters Act, the 401 certification program for fill in wetlands, and the 401 certification of federal permits based on the water quality standards.

The local Conservation Commission and the Department of Environmental Protection are responsible for ensuring the protection of wetlands through the issuance of permits for activities in flood plains and in or near wetlands, as per the Wetlands Protection Act, MGL c.131 s. 40. Proposed work within a resource area or a one hundred (100') foot buffer zone requires an order of conditions.

Resource areas include freshwater and coastal wetlands, banks, beaches, and dunes bordering on estuaries, streams, riverfront, ponds, lakes, or the ocean; lands under any of these bodies of water; land subject to tidal action, coastal storm flowage, or flooding.

The discharge of pollutants to water of the Commonwealth without a permit is prohibited under the state Clean Waters Act, MGL c. 21, ss 26-53. Stormwater discharges are subject to regulations when two criteria are met under 314 CMR 3.04(2). First, there must be "conveyance or system of conveyances (including pipes, ditches, and channels) primarily used for collecting and conveying stormwater runoff." 314 CMR 3.04(2)(a). Second, the stormwater runoff must be "contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, or oil and grease," or, be designated on a case-by-case basis. Such designations must be made when the "stormwater discharge" is subject to effluent or toxic pollutant limitations, is located in an industrial plant area, or may be a significant contributor of pollutants to waters of the Commonwealth. Any activity resulting in a discharge to waters of the United States must comply with Section 401 of the Federal Clean Water Act and comply with state water quality standards. All stormwater discharges must be set back from the receiving waters or wetlands and best management practices (BMP) must be implemented. A permit is required for any stormwater discharge to an Outstanding Resource Water (ORW) which meets the regulatory definition in 314 CMR 3.04(2). Outstanding Resource Waters are defined under Surface Water Quality Standards 314 CMR 4.06 and include public surface water supplies, coastal and some inland Areas of Critical Environmental Concern (ACECs), and certified vernal pools.

This manual is set up to explain how to operate and maintain Best Management Practices that control erosion and minimize delivery of sediment and other pollutants to surrounding water and air.

Chapter 1 is an introduction to the site and describes the Best Management

Practices used on this site.

- Chapter 2 outlines the inspection and maintenance schedules for the site.
- Chapter 3 shows the location of the Best Management Practices used on-site.
- Chapter 4 outlines the operation and function of the Best Management Practices.
- Chapter 5 describes how and when the Best Management Practices should be inspected and how frequently they must be maintained and cleaned.

1. Introduction:

The proposed project is a senior residential development located off King Street in Littleton. The project area is comprised of two parcels with a total area of 15.16± Ac. designated as U19-38-0 and U19-38-1 by the Town of Littleton Assessor. The project site consists primarily woods and grass ground cover with wetlands covering the northwest portion of the size. There are three existing building on the project site shown on the Existing Conditions Plan. The three existing buildings are shown as #336, #338 and an existing storage building. The limit of disturbance will be limited within the southeast portion of the project site up to outside of the 50-ft wetland buffer limit.

The purpose of this project is to create a senior residential development known as Hager Homestead. The proposed project will construct a total of 24 residential dwelling units and provide 42 parking spaces for the residents and guests. The proposed project will construct 3 two-family dwelling units, 3 townhouse dwelling units and 15 independent living units. The existing building shown as #336 on the east portion of the project area will be partially demolished, renovated and used as a base for the construction of a common area for the proposed 15 independent living units. The existing building shown as #338 located on the north portion of the project area will also be renovated and incorporated as part of the senior residential development as a two-family dwelling unit. The existing barn building will be renovated and moved northwest outside of the 50' wetland buffer limit. 3 new residential buildings will be constructed west of the existing #336 building that will provide 7 dwelling units.

The 42 parking spaces will be constructed to serve the proposed development, which will include 2 handicap accessible parking spaces. 14 of the 42 total parking spaces are under a car port as required by the Town of Littleton Zoning bylaw. The 42 parking spaces are spread out in 3 separate parking areas. 17 parking spaces will be located on the parking lot shown on the south portion of the project area with new curb cut access on King Street. A second proposed curb cut access on king street will be located approximately 180 feet north of the south parking area. The north side curb cut access will provide access for the 21 spaces parking area located on the north east portion of the project area, and the 4 spaces parking area located adjacent to the main entrance.

To control erosion and minimize delivery of sediment and other pollutants into the atmosphere

and adjacent wetlands, Best Management Practice (BMP) has been provided within the site's stormwater management system. These practices include but are not limited to:

- Deep Sump Silt Prison Catch Basins
- Sediment Forebay
- Infiltration Basin
- Water Quality Swale
- Infiltration Chambers

This manual is designed to help responsible parties become aware of urban non-point pollution problems and to provide detailed information about operating and maintaining stormwater management practices. The success of the Best Management Practices is dependent on their continued operations and maintenance.

2. Maintenance Requirements:

BMP's Owners:

- The OWNERS of the BMP's shall be the person, persons, trust, corporation, etc., or their successors who have title to the land on which the BMP is located. It is anticipated that all BMP's will be owned and maintained by the Town of Littleton once accepted by the Town. Should the title of land upon which they are located is transferred the purchaser of the property, at that time, will assume all responsibilities set forth within this document.

Operation and Maintenance Responsibilities:

- The party or parties responsible for the funding, operation and maintenance of the BMP's shall be the OWNER or their designees.
- BMP's each have specific maintenance requirements to ensure long-term effectiveness. These stormwater management systems will be operated, inspected and maintained on a regular basis **by a qualified professional with expertise in inspecting drainage system components**. All of the stormwater BMP's shall be kept in good working order at all times.
- A maintenance agreement providing for the funding, operation and maintenance of all the stormwater management BMP's shall be provided.

Source of Funding for Operation and Maintenance:

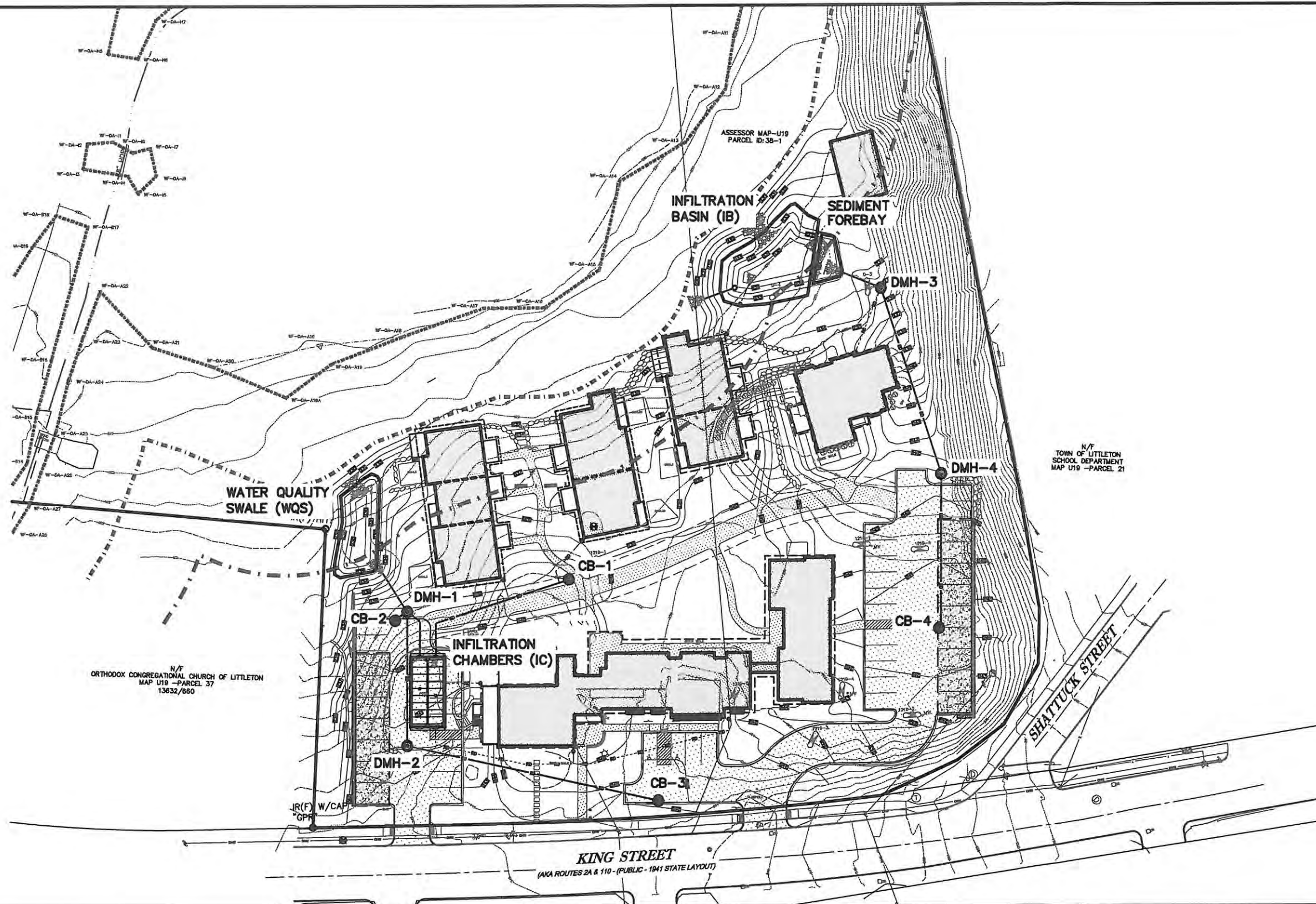
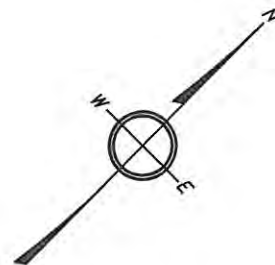
- The party or parties responsible for the funding, operation and maintenance of the BMP's shall be the OWNER or their designees.
- A maintenance agreement providing for the funding, operation and maintenance of all the stormwater management BMP's shall be provided.
- Approximate estimated annual maintenance costs for the site are:

-	Deep Sump Hooded & Silt Prison Catch Basins	\$250
-	Sediment Forebay	\$150
-	Infiltration Basin	\$300
-	Water Quality Swale	\$300

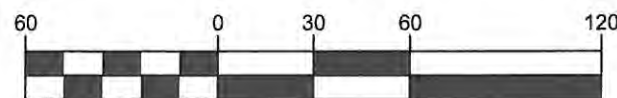
- Infiltration Chambers

Schedule for Inspection and Maintenance:

- * BMP's each have specific maintenance requirements to ensure long-term effectiveness. These stormwater management systems will be operated, inspected and maintained on a regular basis in accordance with this manual. All of the stormwater BMP's shall be kept in good working order at all times.
- * As a minimum, the OWNER shall follow the general guidelines outlined herein for the BMP's provided on this site.
- * An Operation and Maintenance log must be maintained for the last three years, outlining inspections, repairs, replacement and disposal for each Best Management Practice (BMP). In the case of disposal, the log shall indicate the type and material and the disposal location. This rolling log shall be made available to the Mass DEP and/or the Littleton Conservation Commission upon request.



GRAPHIC SCALE



(IN FEET)
1 INCH = 60 FEET

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DES'D BY: LT

CHK'D BY: NMP

DATE: JULY 2020

**BEST MANAGEMENT
PRACTICES (BMP) LOCUS**

336-338 KING STREET
LITTLETON, MA

PROJECT: 191096

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4. Operation of Best Management Practices:

Silt Prison Catch Basin Insert – are similar to the hooded deep sump catch basin outlined above with a treatment skirt (tent filter) replacing the hood over the structures outlet. The insert combines a removable strainer to collect trash and floatable, with a staged membrane filter attached to the structures inlet and internal wall below the outlet pipe. The removable strainer provides preliminary screening prior to stormwater diffusing through the tent membrane. The membrane has multiple regions with each region having a nominal flow rate that is higher than the adjacent relatively lower region. The lower regions with a relatively lower flow rate provide a high degree of filtration for the runoff from small storm event. For larger storm events, as the rate of runoff entering the structure exceeds the rate at which water is filtered through the lower regions, the level of water on the inlet side of the membrane increases bringing the higher regions into operation, allowing the full height of the structure to function similar to the deep sump area. The functions of the Silt Prison Catch Basin insert include;

- A grate and/or vertical notch found in the curbing, that allow stormwater to enter the structure while filtering out larger objects such as trash and leaves;
- A four foot (minimum) sump below the invert of the storm sewer pipe provides an area for detention time which allows sands and other sediments to settle out of the runoff prior to discharge;
- Provide greater stormwater treatment than that of the standard deep sump hooded catch basin within the same footprint.

Sediment Forebay – is a post-construction practice consisting of an excavated pit, bermed area or cast (in-place or pre-) structure combined with a weir, designed to slow incoming stormwater runoff and facilitating the gravity separation of suspended solids prior to flowing to a subsequent BMP or system discharge. The functions of the sediment forebays include:

- Filter out sediments within the stormwater runoff
- Reduce runoff velocities.
- Reduce peak discharge flows.

Infiltration Basin – is a stormwater runoff impoundment that is constructed over permeable soils which allow for the recharge of treated runoff into the groundwater. The functions of an infiltration basin include:

- Provide groundwater recharge;
- Reduce local flooding;
- Preserve the natural water balance of the site

Water Quality Swale – is a post-construction practice consisting of an excavated pit combined with a weir, designed to slow incoming stormwater runoff and facilitating the gravity separation of suspended solids prior to flowing to a subsequent BMP or system discharge. The functions of the sediment forebays include:

- Filter out sediments within the stormwater runoff
- Reduce runoff velocities.
- Provide stormwater attenuation.

5. Inspection and Maintenance of Best Management Practices:

Deep Sump Hooded Catch Basins and Drain Manholes - at a minimum, deep sump hooded catch basins and drain manholes shall be inspected four times per year. Ideally, inspection should be conducted at the end of the foliage and snow removal seasons, with remaining inspections at regular intervals between these times. Each structure should be cleaned whenever the depth of sediment deposits is greater than or equal to one half the depth of the sump from the bottom of the structure to the bottom of the lowest pipe invert, or at a minimum once per year. Structures shall be inspected for a buildup of sediments, oils and debris, cracks, breaks, or deformations. Any function of the catch basin and drain manhole that is not in working order will be replaced with similar materials, as per the detail, to prevent the storm sewer system from failing.

The catch basins and drain manholes shall be cleaned by means of hand held shovels, scallop shovel and/or vactor truck. The grate opening shall be clear of any foreign or lodged object. Sands and salts used in the winter will be removed from the catch basin sumps in the early spring. Leaves, pine needles, and branches brought down by autumn winds, rain, and cold weather will be removed from the catch basin and drain manhole sumps in the late fall.

Collected sediment and debris will be properly disposed of per local, state and federal requirements. Any sediment and debris removed from a catch basin deemed to be contaminated must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

Silt Prison Catch Basin Insert - at a minimum, the Silt Prison catch basin insert shall be inspected four times per year. Ideally, inspection should be conducted at the end of the foliage and snow removal seasons, with remaining inspections at regular intervals between these times. Each structure should be cleaned whenever the depth of sediment deposits is greater than or equal to one half the depth of the sump from the bottom of the structure to the bottom of the lowest pipe invert, or at a minimum once per year. Structures shall be inspected for a buildup of sediments, oils and debris, cracks, breaks, or deformations. Any function of the insert that is not in working order will be replaced with similar materials, as per the detail, to prevent the storm sewer system from failing.

The trash strainer shall be removed and emptied during each inspection. From street level, the condition of the membrane and strainer as well as the depth of collected sediment within the structure sump shall also be noted at the time of each inspection.

The Silt Prison insert shall be cleaned by means of hand held shovels, scallop shovel and/or vactor truck. Prior to the removal of collected sediment, the membrane shall be brushed or hosed off into the sump. The grate opening shall be cleared of any foreign or lodged object. Sands and salts used in the winter will be removed from the sumps in the early spring. Leaves, pine needles, and branches brought down by autumn winds, rain, and cold weather will be removed from the sump in the late fall.

Collected sediment and debris will be properly disposed of per local, state and federal

requirements. Any sediment and debris removed from a catch basin deemed to be contaminated must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

Sediment Forebays / Water Quality Swale - at a minimum, the sediment forebay / Water Quality Swale shall be inspected after every major storm event (1-inch of rain or greater) for the first six (6) months, then monthly thereafter. Sediment and debris should be removed a minimum of four (4) times per year, starting in the spring and spaced at even time increments until the late fall season, thereafter. If standing water is present during inspections, the filter stone within the check dam may need to be cleaned or replaced so that the sediment forebay / Water Quality Swale drains within 72 hours after a storm.

Grass vegetation within the sediment forebay / Water Quality Swale shall be mowed, at a minimum of twice a year, keeping the height of the grass between three (3) and six (6) inches. Inspections should identify areas of rilling and gullyng or other areas which need to be reestablished. Replace any vegetation damaged during cleaning by reseeding or resodding. When reseeding, incorporate practices such as hydroseeding with a tackifier, blanket or similar practice to ensure that no scour occurs in the sediment forebay, while the seeds germinate and develop roots. Remove any woody vegetation (trees or shrubs) from the sediment forebay immediately upon detection.

Collected sediment and debris will be properly disposed of per local, state and federal requirements. Any sediment and debris removed from the sediment forebay / Water Quality Swale deemed to be contaminated must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

Infiltration Basin – At a minimum shall be inspected after every major storm event (1-inch of rain or greater) for the first six (6) months, then in the spring and fall of every year, thereafter. Note how long water remains standing in basin after a storm; standing water within the basin >72 hours after storm events suggests potential clogging and should be immediately addressed. Also, check for signs of differential settlement, cracking, erosion, leakage in embankments, tree growth in embankments, condition of riprap, sediment accumulation and the health of the turf.

Infiltration basins shall be mowed a minimum of twice per year. Grass clippings and accumulated organic matter should be removed to a non-sensitive area. Repairs and reseeding should be done as required. Sediment and debris should be removed manually when infiltration basin is thoroughly dry, a minimum of once per year or when the sediment level reaches a depth of 3”.

Collected sediment and debris will be properly disposed of per local, state and federal requirements. Any sediment and debris removed from the infiltration basin deemed to be contaminated must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

9.0 Inspection and Maintenance

9.1 ISOLATOR ROW INSPECTION

Regular inspection and maintenance are essential to assure a properly functioning stormwater system. Inspection is easily accomplished through the manhole or optional inspection ports of an Isolator Row. Please follow local and OSHA rules for a confined space entry.

Inspection ports can allow inspection to be accomplished completely from the surface without the need for a confined space entry. Inspection ports provide visual access to the system with the use of a flashlight. A stadia rod may be inserted to determine the depth of sediment. If upon visual inspection it is found that sediment has accumulated to an average depth exceeding 3" (76 mm), cleanout is required.

A StormTech Isolator Row should initially be inspected immediately after completion of the site's construction. While every effort should be made to prevent sediment from entering the system during construction, it is during this time that excess amounts of sediments are most likely to enter any stormwater system. Inspection and maintenance, if necessary, should be performed prior to passing responsibility over to the site's owner. Once in normal service, a StormTech Isolator Row should be inspected bi-annually until an understanding of the sites characteristics is developed. The site's maintenance manager can then revise the inspection schedule based on experience or local requirements.

9.2 ISOLATOR ROW MAINTENANCE

JetVac maintenance is recommended if sediment has been collected to an average depth of 3" (76 mm) inside the Isolator Row. More frequent maintenance may be required to maintain minimum flow rates through the Isolator Row. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, a wave of suspended sediments is flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/ JetVac combination vehicles. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" (1143 mm) are best. The JetVac process shall only be performed on StormTech Rows that have AASHTO class 1 woven geotextile over their foundation stone (ADS 315WTM or equal).



Looking down the Isolator Row



A typical JetVac truck (This is not a StormTech product.)



Examples of culvert cleaning nozzles appropriate for Isolator Row maintenance. (These are not StormTech products).

SiltPrison — Stormwater Treatment Systems

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Product Operation and Maintenance

Take a look at our stormwater quality units designed to address various challenges in runoff treatment. Feel free to examine our .dwg and .pdf plan files of our models.

Silt Prison 160D



Click the image to
learn more about
our TSS and
sedimentation
treatment unit.

Silt Prison 160R



Click the image to
learn more about
our water reuse
treatment unit.

Silt Prison 160DP



Click the image to learn more about our phosphorus treatment unit.

The Storm Water Buffer Zone's SiltPrison is composed of composite woven thread. With a crafted with [Trelleborg's](#) superior monofilament polypropylene thread coupled with a low adhesion weave, the Silt Prison is able to stand up to high pressure flows during the heaviest of rain events.

Installation Requirements:

SBZ units are set by drainage contractor in conjunction with other drainage manholes and piping in accordance with city or state specifications with regard to base and backfill materials, compaction, and other tolerances. Stormwater quality internal parts are installed by precaster prior to delivery. The SBZ system will operate as a high capacity construction phase BMP immediately after included frame and grate are installed.

Maintenance Requirements:

Stormwater Buffer Zone is cleaned by removing the street level inlet grate, removing and emptying the StormBrake gross pollutant trash strainer, and then removing material from the manhole sump using the same method and equipment that is used to clean standard catch basins. It is recommended that every maintenance procedure be recorded in the maintenance log for the site regardless of whether the unit is in construction period or post construction period use. Construction Period: Monthly visual inspection, and brushing off, or hosing off of treatment skirt from street level if needed, plus emptying the strainer of leaf litter, etc while removing it to see skirt. Removal of sediment from the manhole by vacuum is not needed unless sediment level reaches treatment skirt, but recommended to be annually otherwise during construction period, or

at the end of the construction period. Post Construction Period or Permanent Use: Annual inspection, Biannual cleanout(vactoring): Annual Maintenance; (but every four or six months during the first year): to include visual inspection of strainer and treatment skirt, emptying the strainer of leaf litter, trash, etc (all considered solid waste) while removing it to treat skirt, spraying off or brushing off underside of the treatment skirt, inspecting and recording sediment depth in manhole (if inspection is between cleanouts, or the depth prior to cleanout if unit is being vactored).

Design Methodology:

The treatment skirts (tent filters) has multiple regions with each region having a nominal flow rate that is higher than an adjacent relatively lower region. The lower regions with a relatively lower nominal flow rate can provide a high degree of filtration for the runoff from small storm events. For larger storm events, as the rate of runoff entering a storm drain catch basin exceeds the rate at which water is filtered through the lower regions with a lower nominal flow rate, the level of water on the inlet side of the filters increases bringing the higher regions with a relatively higher nominal flow rate into operation. These higher regions with a higher nominal flow rate provide less filtration but greater flow capacity than the lower regions with a lower nominal flow rate. As the surface level of the water is rising, the distance between the more turbulent surface level and the volatile silt on the bottom of the catch basin increases and can provide an increasing buffer zone as flow through the overall system increases.

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Best Management Practices (BMP) Inspection Log

General Information			
Project Name	Hager Homestead		
Location	336-338 King Street, Littleton, MA		
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Type of Inspection: ☐ Regular ☐ Emergency			
Weather Information			
Weather at time of this inspection? ☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snowing ☐ High Winds ☐ Other: _____ Temperature: _____			
Are there any discharges at the time of inspection? ☐ Yes ☐ No If yes, describe:			

Site-specific BMPs

- The structural BMPs are identified on the BEST MANAGEMENT PRACTICES LOCUS included within the LONG TERM POLLUTION PREVENTION & STORMWATER SYSTEM OPERATION & MAINTENANCE PLAN. Carry a copy of the Locus map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.
- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		☐ Yes ☐ No	☐ Yes ☐ No	
2		☐ Yes ☐ No	☐ Yes ☐ No	
3		☐ Yes ☐ No	☐ Yes ☐ No	
4		☐ Yes ☐ No	☐ Yes ☐ No	
5		☐ Yes ☐ No	☐ Yes ☐ No	
6		☐ Yes ☐ No	☐ Yes ☐ No	
7		☐ Yes ☐ No	☐ Yes ☐ No	
8		☐ Yes ☐ No	☐ Yes ☐ No	
9		☐ Yes ☐ No	☐ Yes ☐ No	
10		☐ Yes ☐ No	☐ Yes ☐ No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are discharge points and receiving waters free of any sediment deposits?	☐ Yes ☐ No	☐ Yes ☐ No	
2	Are storm drain inlets properly working?	☐ Yes ☐ No	☐ Yes ☐ No	
3	Is trash/litter from site areas collected and placed in covered dumpsters?	☐ Yes ☐ No	☐ Yes ☐ No	
4	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	☐ Yes ☐ No	☐ Yes ☐ No	
5	Are materials that are potential stormwater contaminants stored inside or under cover?	☐ Yes ☐ No	☐ Yes ☐ No	
5	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ Yes ☐ No	☐ Yes ☐ No	
6	(Other)	☐ Yes ☐ No	☐ Yes ☐ No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Print name and title: _____

Signature:_____ **Date:**_____