

LONG-TERM OPERATION & MAINTENANCE PLAN

**Center & Main
1440 Main Street
Concord, Massachusetts**

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1 | Long Term Operation & Maintenance Plan

This Operation & Maintenance Plan is prepared to comply with provisions set forth in the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards.

Structural Best Management Practices (BMPs) require periodic maintenance to ensure proper function and efficiency in pollutant removal from stormwater discharges that would otherwise reach wetland resource areas untreated. Maintenance schedules found below are as recommended in MassDEP's Massachusetts Stormwater Handbook and as recommended in the manufacturer's specifications.

The stormwater management system owner and the party responsible for maintenance of the stormwater management system shall be Symes Development & Permitting, LLC and its designated employees during construction.

1.1 The following BMPs provide pollutant removal and groundwater recharge

- 1) (CB1 thru CB 14) - Deep Sump Catch Basin with Hood/Trap
- 2) CB15 - Contech StormCeptor Unit;
- 3) CDS Unit Prior to Isolator Row CDS-1P, 4P; 5P; 6P; 7P & 8P - CDS Unit
- 4) Subsurface Infiltration Chambers

Deep-Sump Catch Basin with Hood/Trap - (CB1 thru CB14)

Inspect and/or clean at least four times per year with special consideration given to the end of foliage and snow removal seasons. This shall also be applicable to all drop inlet catch basins located outside of pavement areas (CB13 & CB14) within low areas associated with landscaping features.

Sediments must also be removed once per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the sump or one half the depth of the invert of the outlet pipe.

Clamshell buckets and/or vacuum trucks are typically used to remove sediment in Massachusetts.

Cleanings may be taken to a landfill or other facility permitted by MassDEP to accept solid waste without any prior approval by MassDEP. However, some landfills require catch basin cleanings to be tested before they are accepted. For information on all of the MassDEP requirements pertaining to the disposal of catch basin cleanings go to

<http://www.mass.gov/eea/agencies/massdep/recycle/regulations/management-of-catch-basin-cleanings.html>

Contech CDS System - (CB15 + CDS-1P, 4P, 5P, 6P, 7P & 8P)

The CDS System shall be inspected at regular intervals, in concurrence with catch basins schedule. Inspect and/or clean at least four times per year with special consideration given to the end of foliage and snow removal seasons. Refer to the Contech recommended inspection & maintenance provided in the Appendix.

Sediments must also be removed once per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the sump or one half the depth of the invert of the outlet pipe.

Vacuum trucks are recommended for this type of structure for use in removing sediment in Massachusetts.

Cleanings may be taken to a landfill or other facility permitted by MassDEP to accept solid waste without any prior approval by MassDEP. However, some landfills require catch basin cleanings to be tested before they are accepted. For information on all of the MassDEP requirements pertaining to the disposal of catch basin cleanings go to

<http://www.mass.gov/eea/agencies/massdep/recycle/regulations/management-of-catch-basin-cleanings.html>

Isolator Row - Subsurface Infiltration Chambers - (SWMA-1P, 4P, 5P, 6P, 7P, 8P & 9P)

Each Stormtech detention system accepting runoff from roadway pavement has been provided with an isolator row sized for the water quality volume per local town standards. Access to this isolator row is provided from the diversion manhole (DMH 1P, 4P, 5P, 6P 7P & 8P) located at the entrance to the isolator row. Each diversion manhole is also provided with a two-foot sump which shall also be inspected and cleaned when an inspection reveals accumulated sediment or trash is clogging the 24-inch orifice to the isolator row.

Accumulated sediment and trash can typically be evacuated through the manhole. If maintenance is not performed as recommended, sediment and trash may accumulate. Manhole covers should be securely seated following cleaning activities. Manufacturer suggests that all systems be designed with an access/inspection manhole situated at or near the inlet and the emergency outlet orifice. Should it be necessary to get inside the system to perform maintenance activities, all appropriate precautions regarding confined space entry and OSHA regulations should be followed.

Isolator Rows are to be cleaned per the most recently available manufacturers operation manuals.

Maintaining an underground detention or infiltration system is easiest when there is no flow entering the system. For this reason, it is a good idea to schedule the cleanout during dry weather.

Inspection Ports - Subsurface Infiltration Chambers - (SWMA-1P, 4P, 5P, 6P, 7P, 8P & 9P)

Each Stormtech detention system is also provided with inspection ports for use during scheduled maintenance. Locations are provided on the AsBuilt Plan.

Inspection and Maintenance Form

Refer to Sections above for frequency of inspection

Inspector: _____

Date: _____

Inspector Title: _____

Days since last rainfall: _____

Amount of last rainfall: _____

Structural Controls: Catch Basins / Grates and Drop Inlet Structures

Structure Identification	Location	Catch basin at grade	Hood/trap installed	Sediment buildup (in.)	Overall condition
CB1	South Drive Main Entrance	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CB2	South Drive Main Entrance	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CB3	East Drive at Path	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CB4	East Drive at Path	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CB5	East Edge Community Green	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CB6	East Edge Community Green	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>

Maintenance required

To be performed by: _____

On or before: _____

Inspection and Maintenance Form

Refer to Sections above for frequency of inspection

Inspector: _____ Date: _____

Inspector Title: _____

Days since last rainfall: _____ Amount of last rainfall: _____

Structural Controls: Contech CDS- Unit

Structure Identification	Location	Sediment buildup inlet (in.)	Sediment buildup outlet (in.)	Overall condition
CDS-1	South Drive (CB1 & CB2)			Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CDS-4	Northwest Drive (CB8, CB9, CB10, CB11 & CB12)			Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CDS-5	North Drive (CB7 & CB13)			Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CDS-6	North Drive (CB5 & CB6)			Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CDS-7	East Drive (CB3 & CB4)			Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>
CB15 (Contech)	Northeast Drive (CB15)			Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/>

Maintenance required

To be performed by: _____ On or before: _____

Inspection and Maintenance Form

Refer to Sections above for frequency of inspection

Inspector: _____ Date: _____

Inspector Title: _____

Days since last rainfall: _____ Amount of last rainfall: _____

Structural Controls: Subsurface Infiltration Chambers

Structure Identification	Location	Condition of stone bed	Filter fabric installed	Sediment buildup at inlet (in.)	Sediment buildup at outlet (in.)
SWMA1P	South Drive (CB1 & CB2)		Yes <input type="checkbox"/> No <input type="checkbox"/>		
SWMA2P	West Drive		Yes <input type="checkbox"/> No <input type="checkbox"/>		
SWMA3P	West Drive		Yes <input type="checkbox"/> No <input type="checkbox"/>		
SWMA4P	Northwest Drive		Yes <input type="checkbox"/> No <input type="checkbox"/>		
SWMA5P	North Drive		Yes <input type="checkbox"/> No <input type="checkbox"/>		
SWMA6P	North Drive		Yes <input type="checkbox"/> No <input type="checkbox"/>		
SWMA7P	East Drive		Yes <input type="checkbox"/> No <input type="checkbox"/>		
SWMA8P	Northeast Drive		Yes <input type="checkbox"/> No <input type="checkbox"/>		
SWMA9P	Northeast Drive		Yes <input type="checkbox"/> No <input type="checkbox"/>		

Maintenance required _____

To be performed by: _____ On or before: _____

1.2 The following BMPs are recommended to minimize impacts to wetland resource areas

Private Driveway Sweeping

Pavement sweeping is recommended to be conducted four times annually within the main access driveways. Special attention will be given to the spring (March or April) and late fall (November or December).

Snow Removal - (See Snow Removal Plan)

Snow will be placed along each side of the driveways outside of ANY public right-of-way. Snow from sidewalks will also be placed along shoulder opposite from vehicular travel to maintain additional width for emergency vehicles. Snow from individual dwelling unit driveways will be placed in each respective front and side yard areas as space allows. Designated storage areas (See Snow Removal Plan) have been provided to stockpile excess snow. It may be deemed necessary to have excess snow to be removed from site to maintain safe emergency vehicle access (20'-pavement width) to each dwelling unit. Snow will be stockpiled in the designated "Snow Storage" locations shown on the site plan and Snow Removal Plan. Snow disposal/removal shall be in compliance with MassDEP's Bureau of Water Resources guidelines, effective December 21, 2015. See Section 8 Snow Disposal Guidelines.

Provisions will be made to remove snow from the site when the designated areas have reached their capacity.

2 | Long Term Pollution Prevention Plan

This Long Term Pollution Prevention Plan is prepared to comply with the provisions set forth in the Massachusetts Department of Environmental Protection (DEP) Stormwater Management Standards. Structural Best Management Practices (BMPs) require periodic maintenance to ensure proper function and efficiency in pollutant removal from stormwater discharges that would otherwise reach wetland resource areas untreated.

Maintenance schedules found below are as recommended in Department of Environmental Protection's Massachusetts Stormwater Handbook and as recommended in manufacturer's specifications.

2.1 Pavement Sweeping

Annual sweeping of sediment from parking spaces & access drives is recommended with special attention given to spring (March/April) and late fall (November/December).

2.2 Trash and Litter Cleanup

In addition to pavement sweeping, the condominium association shall perform trash and litter cleanup once per month in and around the site. Trash and litter shall be properly disposed of off-site.

2.3 Ownership and Maintenance Responsibilities

After completion, the condominium association will assume full responsibility of continuing the operation and maintenance of the stormwater management system as well as the long-term pollution prevention plan outlined below. The exception would be if a legal agreement is made with another party to perform such duties for the owner(s).

Requirements for storage and use of fertilizers, herbicides and pesticides

The condominium association will likely contract with a professional company relative to lawn care and maintenance of common areas, while each unit owner will maintain the vegetation near each dwelling unit with each Exclusive Use Area (EUA). All materials shall be stored offsite. Materials utilized shall be minimized and be free of phosphorus.

Fertilizers: Fertilizers are to be applied at the minimum amounts recommended by the manufacturer and once applied any residual shall be swept from the pavement to limit the possibility of entering the storm drains. Storage procedures are to be followed as previously stated and the contents of any partially used bags should be transferred to a sealable container, either bag or bin to avoid spilling.

Herbicides and Pesticides: Storage of these materials are to be as outlined previously and especially out of the reach of pets and children, away from damp areas where their containers may succumb to moisture or rust and should not be stored near food. These materials must not be placed in the trash or washed down the drain. Handle using rubber gloves and use an appropriate mask when using these products for extensive periods of time.

Provisions for maintenance of lawns, gardens, and other landscaped areas

These activities are to be the responsibility of the condominium association to schedule and perform.

Pet waste management provisions

These activities are left to the condominium association to schedule and perform.

Operation and Management of septic system

The condominium association is one Owner, per Title 5, whom shall be responsible for the inspection, maintenance, and upgrade of the one system serving the one Facility (dwelling units). The system shall be inspected at least once every three years per 310 CMR 15.301 System Inspection; the State Environmental Code, Title 5.

Snow disposal and plowing plans relative to Wetland Resource Areas

Snow disposal/removal shall be in compliance with MassDEP's Bureau of Water Resources guidelines, effective December 21, 2015 per requirements outlined on the Snow Removal Plan.

Winter Road Salt and/or Sand Use and Storage restrictions

Road Salt use must be in compliance with the Guidelines on Deicing Chemical (Road Salt) Storage effective date December 19, 1997, Guideline No. DWSG97-1 found in the BRP's Drinking Water Program. Sand Use: Encourage the use of environmentally friendly alternatives such as calcium chloride and/or sand instead of road salt for melting ice whenever possible.

Pavement Sweeping schedules

Pavement sweeping shall be performed by the condominium association. Pavement sweeping is recommended to occur once a year in the spring and fall in order to minimize the amount of Total Suspended Solids load on the deep-sump catch basins and the other Best Management Practices tributary thereto.

Provisions for prevention of illicit discharges to the stormwater management systems

According to Standard 10 in the Massachusetts Stormwater Handbook, Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Notwithstanding the foregoing, an illicit discharge does not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents.

Training for staff or personnel involved with implementing LTPPP

This responsibility lies with the condominium association unless a legally-binding agreement is made with another party to perform such duties for the owner(s).

List of Emergency contacts for implementing Long-Term Pollution Prevention Plan

This responsibility lies with the owner(s) unless a legally-binding agreement is made with another party to perform such duties for the owner(s).

Isolator Row - O & M

Isolator[®] Row O&M Manual



THE ISOLATOR[®] ROW

INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160LP, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC-310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160LP, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the overflow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

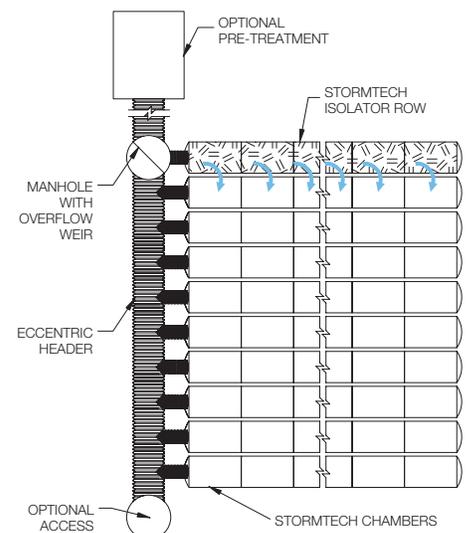
Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.



Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.



StormTech Isolator Row with Overflow Spillway (not to scale)





ISOLATOR ROW INSPECTION/MAINTENANCE

INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

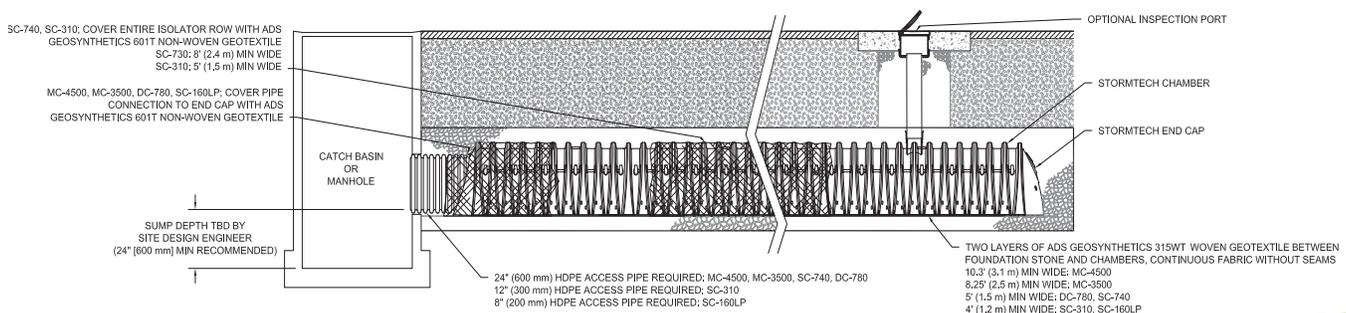
MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. 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, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)

Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.



ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

STEP 1

Inspect Isolator Row for sediment.

- A) Inspection ports (if present)
 - i. Remove lid from floor box frame
 - ii. Remove cap from inspection riser
 - iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.
 - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Rows
 - i. Remove cover from manhole at upstream end of Isolator Row
 - ii. Using a flashlight, inspect down Isolator Row through outlet pipe
 - 1. Mirrors on poles or cameras may be used to avoid a confined space entry
 - 2. Follow OSHA regulations for confined space entry if entering manhole
 - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

STEP 2

Clean out Isolator Row using the JetVac process.

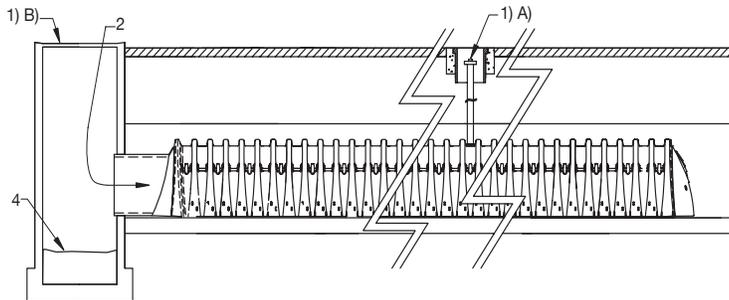
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

STEP 3

Replace all caps, lids and covers, record observations and actions.

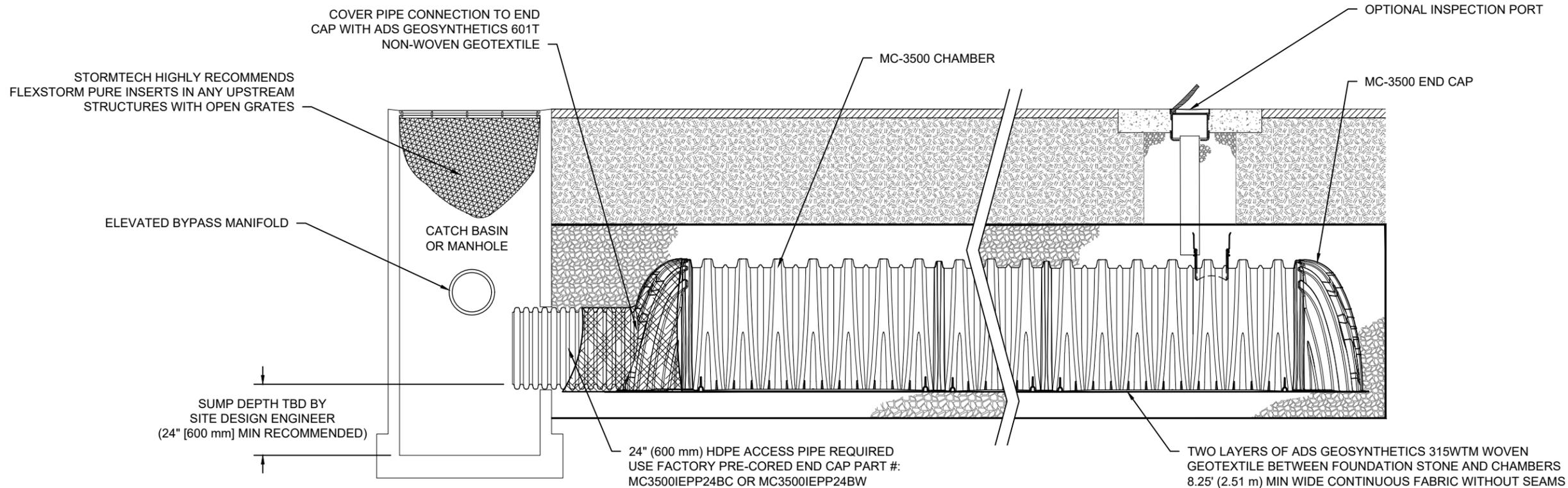
STEP 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)-(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM



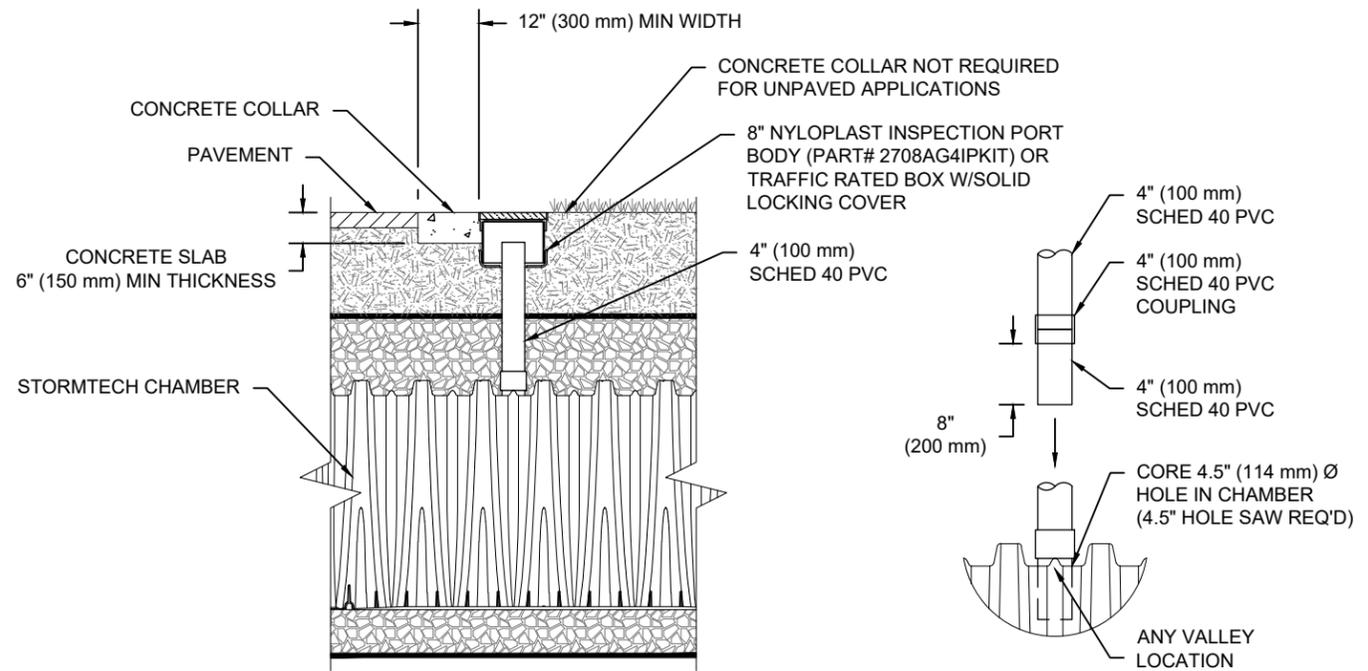
MC-3500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
 - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
 - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - B. ALL ISOLATOR ROWS
 - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
 - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
 - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
 - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
 - C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



CONNECTION DETAIL
NTS

4\"/>

- NOTES:
1. INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.
 2. ALL SCHEDULE 40 FITTINGS TO BE SOLVENT CEMENTED (4\"/>

MC-3500	
ISOLATOR ROW DETAILS	DATE: 05-10-19
DRAWN: KR	CHECKED: KR
PROJECT #:	DESCRIPTION
DATE	DRWN
CHKD	DESCRIPTION
<p style="font-size: small; text-align: center;">70 INWOOD ROAD, SUITE 3 ROCKY HILL CT 06067 860-525-8188 1888-892-2694 WWW.STORMTECH.COM</p>	
<p style="font-size: x-small; text-align: center;">ADVANCED DRAINAGE SYSTEMS, INC.</p>	
<p style="font-size: x-small;">4640 TRUEMAN BLVD HILLIARD, OH 43026</p>	
<p style="font-size: x-small;">THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.</p>	
1	SHEET OF 1

Center & Main

1440 Main Street | Concord, MA
Long-Term Operation & Maintenance Plan

Contech - Manuals

CDS[®] Inspection and Maintenance Guide



Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

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. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allow both sump cleanout and access outside the screen.

The CDS 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. If absorbent material is used, it should be replaced when significant discoloration has occurred. 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

Cleaning of a CDS system 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 covers 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 should be cleaned out immediately. 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 power washed 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. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y ³	m ³
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities



Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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PLAN 597
of 2019



Owner:
Faye Erhard Hayes
1450 Main Street
Concord, MA 01742

Applicant:
Symes Development & Permitting, LLC
50 Dodge Street, Suite 202
Beverly, MA 01915

Designed By: RJH
Drawn By: RJH
Reviewed By: RJH
Project Manager: RJH
Job File Number: CONC-0020
Drawing File Folder: MAIN0020

Drawing Issued for Review Only
 Drawing Issued for Permit
 Drawing Issued for Construction

SEAL

**OPERATION & MAINTENANCE PLAN
CENTER & MAIN**
1440 MAIN STREET, CONCORD, MA

6	REVISED NOVEMBER 12, 2019 (Dwelling Unit Reduction)
5	REVISED OCTOBER 18, 2019 (Planner's Report & GPI Peer Review)
4	REVISED JUNE 14, 2019
3	REVISED MARCH 28, 2019 (1-Cur Units 12, 15, 17, 19, 23 & 36)
2	REVISED MARCH 28, 2019 (1-Cur Units 12, 15, 17, 19, 23 & 36)
1	REVISED MARCH 12, 2019

0' 20' 40' 80'
SCALE: 1"=40'
DECEMBER 6, 2018

DRAWING: 5.1
SHEET 5 OF 12

SNOW REMOVAL NOTES:

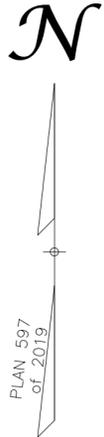
Snow Removal Plan -

- An unobstructed width of 20-feet along all access driveways shall be provided and maintained at all times for emergency response vehicles.
- Snow shall be stored in windrows along the edge of all access driveways and pushed back accordingly to maintain a 20-foot usable width at all times.
- Excess snow may be stockpiled in designated areas indicated on the plan and also within the community green to maintain this requirement.
- Under extreme conditions, excess snow may also be required to be disposed off-site per order of the Town of Concord.
- Sidewalks shall also be kept clear, the parking of vehicles along the sidewalk side of the drive is strictly prohibited to allow use of sidewalk area for emergency vehicles.
- Storage of snow within the public way is strictly prohibited.



Owner:
Faye Erhard Hayes
1450 Main Street
Concord, MA 01742

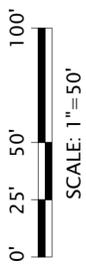
Applicant:
Symes Development & Permitting, LLC
50 Dodge Street, Suite 202
Beverly, MA 01915



SNOW REMOVAL PLAN
CENTER & MAIN
1440 MAIN STREET, CONCORD, MA

DRAWING: FT.1

SHEET 1 OF 1



SEPTEMBER 26, 2019

6	REVISED NOVEMBER 12, 2019 (Dwelling Unit Reduction)
5	REVISED OCTOBER 18, 2019 (Planner's Report & GPI Peer Review)
4	REVISED JUNE 14, 2019
3	REVISED MARCH 28, 2019 (1-Car Units 12, 15, 17, 19, 23 & 36)
2	REVISED MARCH 12, 2019
1	REVISED MARCH 12, 2019