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November 3, 2021

To: Michael Flynn – Chair Reading Conservation Commission
Reading Conservation Commission
16 Lowell Street
Reading, MA 01867

RE: REVISED SUBMITTAL
PROPOSED SINGLE-FAMILY HOUSE
MAIN STREET – LOT A
READING, MA 01867

To Mr. Flynn and all Commissioners,

Fodera Engineering has prepared this submittal for the proposed project at the subject site, as a summary of design changes since this original plan submission, dated June 14, 2021, that was first presented to the Commission at the public hearing held on July 28, 2021.

The site was delineated for Bordering Vegetated Wetlands (BVW) by Norse Environmental (NES) in September 2020 and has since been reviewed and altered by LEC Environmental during a site visit on August 31, 2021. The altered BVW were moved up-gradient and has been agreed by the applicant to proceed the proposed project using the LEC delineation. LEC prepared a summary of their environmental findings in a report dated September 20, 2021. In addition to determining a larger presence of BVW, standing water was observed about twenty (20) to fifty (50) feet south of the delineation completed by NES, and may be a "potential vernal pool" (PVP). In an email from Tom Peragallo of LEC, sent on September 2, 2021 at 8:56am, Mr. Peragallo defines a more precise location of the PVP as south of WF-10A. A copy of this email is attached as herein. The revised site plans dated November 3, 2021 displays the new BVW boundary and the location of the observed PVP. Changes to the site design are summarized below:

- Driveway was reconfigured and placed further from the BVW.
- Driveway material proposed to be pervious pavement.
- A stormwater infiltration basin has been added east of the house for roof runoff.
- Added catch basin between the proposed driveway and northern abutter.
- Thirty-seven (33) healthy trees and two (2) dead trees to be removed.
- Proposed plantings to be 48 shrubs and 14 trees. Total qualifying tree count = 38 trees.
- Hedge planting boundary to be placed at the 25ft Zone of Natural Vegetation.
- 421 square-feet (sf) of BVW to be impacted, and 850 sf to be replicated as BVW.
- All grading near wetlands is no steeper than 3:1.

The Town of Reading's Wetlands Protection Regulations (Bylaw), dated November 2012, contains performance standards for proposed work within resource areas. The follow is Section 3 from the Bylaw.

SECTION 3 – PERFORMANCE STANDARDS FOR RESOURCE AREAS

§3.C – FRESH WATER WETLANDS

3.C.1. Because of the history, geography, geology and hydrology of Reading some wetlands may not qualify for state protection under 310 CMR 10.55 due to being isolated or disconnected from water bodies. These will be protected under the local By-Law provided that: (1.) they are 500 or more square feet in area, and, (2.) they meet all of the other criteria of 310 CMR 10.55 with the exception of connection to water bodies.

3.C.2. It is the Commission's policy that there shall be no net loss of fresh water wetlands, including marshes, wet meadows, bogs, and swamps.

There is no net loss of wetlands.

3.C.3. Any proposed work that may alter a fresh water wetland shall not destroy or otherwise impair any portion of the area. However, the Commission may issue an Order of Conditions permitting work that results in the alteration of less than 5000 square feet of fresh water wetland, provided the following requirements are met:

a. There is no reasonable alternative to a proposed crossing, utility easement, or roadway drainage structure;

Alternative layouts have been analyzed to try to minimize wetland impact. Placement the dwelling closer to Main Street caused significant increased impact. The least impact was by placing the structure in its proposed location. The house was not placed further east due to the proximity of the estimated vernal pool boundary.

b. All design mitigations, including the utilization of structures such as headwalls, have been utilized to minimize the alteration of wetlands;

c. A revegetation plan addressing issues of interspersion and diversity of vegetation has been submitted, describing the construction and the amount of recreated fresh water wetland necessary to compensate for that portion that is proposed to be destroyed;

This is provided on Sheet C-3 on the revised plan set.

d. The replacement fresh water wetland area must adequately replicate the wetland functions to be lost, and shall be at a 2:1 ratio to the area lost. The replacement freshwater wetland shall have an unrestricted hydraulic connection to the same fresh water wetland, waterbody, or waterway associated with the lost area;

Wetland replication to impact is at a 2:1 ratio. Monitoring of the replication area will be performed by a qualified restoration ecologist or wetland scientist to ensure hydraulic connection is matched with the BVW.

e. The replacement area shall be located in the same general area of the fresh water wetland, water body, or reach of the waterway as the lost area;

f. All surface vegetation and contours of the replacement area shall be substantially restored within two growing seasons; and

g. Excavation and soil preparation: Timing of any preparation of any replacement area shall be specified in the Order of Conditions.

§3.D – ZONE OF NATURAL VEGETATION

The proposed dwelling structure is located outside the thirty-five (35) foot wetland buffer in the proposed conditions. A hedge boundary at the ZNV boundary is proposed as a protection barrier. A portion of the proposed driveway does enter the twenty-five (25) foot Zone of Natural Vegetation (ZNV) at the closest distance of 21.6'. The driveway is proposed to be pervious pavement to minimize adverse effects of surface runoff.

§3.E – LAND SUBJECT TO FLOODING

The site is not located within the 100-year flood zone.

§3.F – LAND UNDER WATER

No work is proposed within land under water.

§3.G – RIVERFRONT AREA

No work is within any riverfront area.

§3.H – PUBLIC AND PRIVATE WATER SUPPLY

The site is not within an area of protected public or private water supply.

§3.I – SIDE SLOPE GRADES NEAR WETLANDS

3.I.1. Side slopes within 100 feet of a wetland shall have a finished grade according to the following:

a. No steeper than a 3:1 (horizontal:vertical) slope for grassed and mulched slopes;

All proposed slopes will be no steeper than 3:1.

§3.J – VERNAL POOLS

Any proposed alteration that will change surface type in the proposed conditions are limited to the proposed dwelling structure, and driveway, and are located just over 100' from the estimated boundary of the potential vernal pool. No alteration is proposed within the vernal pool habitat. Proposed work that will be within the vernal pool habitat is limited to restoration and wetland replication areas.

§3.K – WILDLIFE HABITAT

The subject site is not within an area of Natural Heritage of Endangered Species Programs areas associated to protection of wildlife.

§3.L – EROSION CONTROL

A 12" straw wattle silt sock and silt fence will protect the limit of work from erosion. All erosion barriers will be maintained.

§3.M – CROSSING OF WETLANDS

Structures associated to crossing wetlands are not proposed and would not render improved conditions to wetlands.

§3.N – STORMWATER RUNOFF

Stormwater controls are proposed on-site to reduce runoff from the added impervious area. All roof runoff will be directed to a subsurface recharge system that is designed to be a minimum of two (2) feet above the Estimated Seasonal High Water Table (ESHWT). Soil testing to determine the soil types and ESHWT was performed by a certified soil evaluator. Soils were determined to be well drained with a ESHWT of elevation 198.83.

The driveway is proposed to be pervious pavement surface. Application of sand and other fine materials shall be prohibited for use on the driveway to maintain permeability. All additional site work will restore area to natural vegetation and the site as a whole will demonstrate controlled stormwater and will not adversely effect the wetlands.

§3.O – DISCHARGE OF RUNOFF INTO RESOURCE AREAS

There is no proposed area on site that will discharge stormwater into wetlands with untreated runoff. All on-site runoff will be treated by infiltration and natural vegetated surfaces. There is a proposed catch basin on-site that will capture runoff from the north abutter to mitigate potential puddling. Runoff associated to potential puddling is not caused by the proposed project, however, it is treated by overland sheet flow on vegetated surface prior to discharge.

INVASIVE SPECIES

A field visit was conducted by the Town of Reading Conservation Administrator Chuck Tirone, members of the commission, and I, Giovanni Fodera, on August 9, 2021. A presence of invasive species was observed throughout the site during the visit. Invasive species can most likely be a problem in wetland areas and its buffer zone. Removal of existing invasive species shall be performed prior to site grading. The area of wetland replication shall remove all topsoil with invasive species and shall not be reused on-site. Dispose of topsoil shall be performed at an approved off-site facility. Areas of restoration shall also remove all invasive species by manual removal and shall be disposed of at an off-site facility. During construction and for the first two (2) years of stabilization, monitoring of the site for invasive species will be performed. Monitoring shall be conducted by an environmental monitor and/ or wetland scientist. A fact sheet shall be prepared by the environmental monitor and/ or wetland scientist. Estimates of invasive

species cover will be conducted through visual inspection and reported to the Conservation Commission. Any indication of invasive species becoming established throughout the first two (2) years will be removed and disposed of.

CONCLUSION

The site was analyzed for placement of the dwelling structure that would have minimal impact to the on-site bordering vegetated wetlands. It is evident that a pocket of upland surface, outside the 35-ft buffer, is present on-site and located approximately 150' into the site. We utilized this upland area for the proposed site however, it was limited to how far back the house could go due to proximity of the potential vernal pool. Finding the right balance between potential impact to vernal pool habitat and to wetlands, we determined that impacting 421 sf of wetlands while remaining approximately over 100' from the potential vernal pool would yield the least impact and have no adverse effects to the resource areas.

Please accept this revised application and to be scheduled for the next conservation board meeting. Do not hesitate to call or email me shall you have any questions, comments, or concerns.

Sincerely yours,

Giovanni Fodera, P.E.
Principal Engineer
FODERA Engineering

Giovanni Fodera

From: Thomas Peragallo <TPeragallo@lecenvironmental.com>
Sent: Thursday, September 2, 2021 8:56 AM
To: Giovanni Fodera
Cc: Tirone, Charles; Ann Marton
Subject: Lot A Main St., Reading
Attachments: Hand Sketch of Flag Adjustments.pdf

Hi Giovanni
I'm attaching a hand sketch showing the adjustments we will be recommending to the Reading Conservation Commission. These are approximate locations from paced measurements. This will be included in our report. The adjustments range from about 10' to 35' up-gradient from the Norse Environmental (NEC) delineation. The LEC flags are marked "C-1" through "C-12" on the BVW boundary and one flag, "8-B-1", on the northern IVW boundary. I also observed a "potential vernal pool" about 20 feet south of NEC WF-A-10 and running easterly.

If your surveyors are on the site and find a pair of glasses, please pick them up. I lost a good pair somewhere near NEC flags 3A and 5A, after I was attacked by bees from a ground nest that I hit near NEC flag 3A/4A. Beware of the bees and Thanks.

Tom

Thomas A. Peragallo
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NEW ENGLAND WETLAND PLANTS, INC

820 WEST STREET, AMHERST, MA 01002

PHONE: 413-548-8000 FAX 413-549-4000

EMAIL: INFO@NEWP.COM WEB ADDRESS: WWW.NEWP.COM

New England Wetmix (Wetland Seed Mix)

Botanical Name	Common Name	Indicator
Carex vulpinoidea	Fox Sedge	OBL
Carex scoparia	Blunt Broom Sedge	FACW
Carex lurida	Lurid Sedge	OBL
Carex lupulina	Hop Sedge	OBL
Poa palustris	Fowl Bluegrass	FACW
Bidens frondosa	Beggar Ticks	FACW
Scirpus atrovirens	Green Bulrush	OBL
Asclepias incarnata	Swamp Milkweed	OBL
Carex crinita	Fringed Sedge	OBL
Vernonia noveboracensis	New York Ironweed	FACW+
Juncus effusus	Soft Rush	FACW+
Aster lateriflorus (Symphyotrichum lateriflorum)	Starved/Calico Aster	FACW
Iris versicolor	Blue Flag	OBL
Glyceria grandis	American Mannagrass	OBL
Mimulus ringens	Square Stemmed Monkey Flower	OBL
Eupatorium maculatum (Eutrochium maculatum)	Spotted Joe Pye Weed	OBL

PRICE PER LB. $135.00 MIN. QUANITY 1 LBS. **TOTAL:** $135.00 APPLY: 18 LBS/ACRE :2500 sq ft/lb

The New England Wetmix (Wetland Seed Mix) contains a wide variety of native seeds that are suitable for most wetland restoration sites that are not permanently flooded. All species are best suited to moist ground as found in most wet meadows, scrub shrub, or forested wetland restoration areas. The mix is well suited for detention basin borders and the bottom of detention basins not generally under standing water. The seeds will not germinate under inundated conditions. If planted during the fall months the seed mix will germinate the following spring. During the first season of growth several species will produce seeds while other species will produce seeds after the second growing season. Not all species will grow in all wetland situations. This mix is comprised of the wetland species most likely to grow in created/restored wetlands and should produce more than 75% ground cover in two full growing seasons.

The wetland seeds in this mix can be sown by hand, with a hand-held spreader, or hydro-seeded on large or hard to reach sites. Lightly rake to insure good seed-to-soil contact. Seeding can take place on frozen soil, as the freezing and thawing weather of late fall and late winter will work the seed into the soil. If spring conditions are drier than usual watering may be required. If sowing during the summer months supplemental watering will likely be required until germination. A light mulch of clean, weed free straw is recommended.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.

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New England Erosion Control/Restoration Mix for Dry Sites

Botanical Name	Common Name	Indicator
Elymus canadensis	Canada Wild Rye	FACU+
Festuca rubra	Red Fescue	FACU
Lolium multiflorum	Annual Ryegrass	
Lolium perenne	Perrenial Ryegrass	
Schizachyrium scoparium	Little Bluestem	FACU
Panicum virgatum	Switch Grass	FAC
Sorghastrum nutans	Indian Grass	UPL

PRICE PER LB. $18.00 MIN. QUANITY 5 LBS. **TOTAL:** $90.00 APPLY: 35 LBS/ACRE :1250 sq ft/lb

The New England Erosion Control/Restoration Mix For Dry Sites provides an appropriate selection of native and naturalized grasses to ensure that dry and recently disturbed sites will be quickly revegetated and the soil surface stabilized. It is an appropriate seed mix for road cuts, pipelines, steeper slopes, and areas requiring quick cover during the ecological restoration process. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper soil-seed contact. Best results are obtained with a Spring or late Summer seeding. Late Spring through Mid-Summer seeding will benefit from a light mulching of weed-free straw to conserve moisture. If conditions are drier than usual, watering will be required. Fertilization is not required unless the soils are particularly infertile. Preparation of a clean weed free seed bed is necessary for optimal results.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.

Pond R: Recharge - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

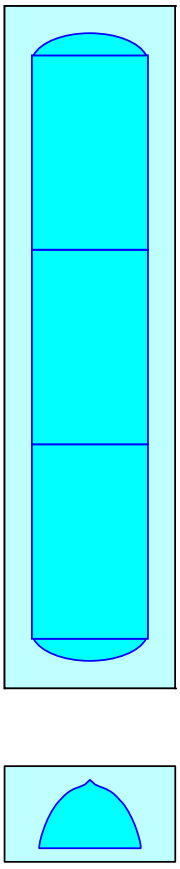
3 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 22.98' Row Length +12.0" End Stone x 2 = 24.98' Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

3 Chambers x 45.9 cf = 137.8 cf Chamber Storage

546.4 cf Field - 137.8 cf Chambers = 408.5 cf Stone x 40.0% Voids = 163.4 cf Stone Storage

Chamber Storage + Stone Storage = 301.2 cf = 0.007 af
Overall Storage Efficiency = 55.1%
Overall System Size = 24.98' x 6.25' x 3.50'

3 Chambers
20.2 cy Field
15.1 cy Stone



StormTech®
Detention • Retention • Water Quality
An ADS company

Isolator® Row O&M Manual


SC-740


MC-3500


MC-4500

THE MOST **ADVANCED** NAME IN WATER MANAGEMENT SOLUTIONS™

ADS®

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) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160, 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.

A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains 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-160, 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 provides access to the Isolator Row and typically includes a high flow weir. When flow rates or volumes exceed the Isolator Row weir capacity the water will flow over the weir and discharge through a manifold to the other chambers.

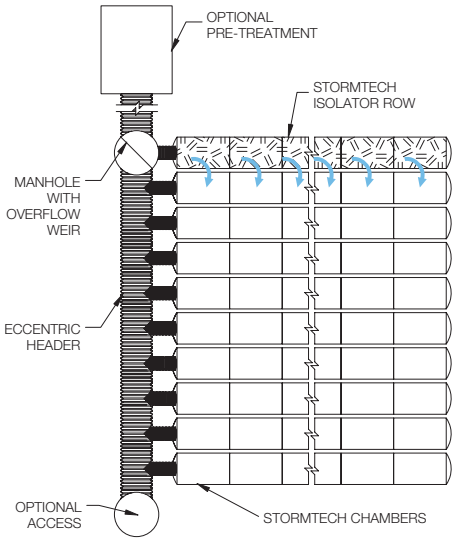
Another acceptable design uses one open grate inlet structure. Using a “high/low” design (low invert elevation on the Isolator Row and a higher invert elevation on the manifold) an open grate structure can provide the advantages of the Isolator Row by creating a differential between the Isolator Row and manifold thus allowing for settlement in the Isolator Row.

The Isolator Row may be part of a treatment train system. 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.

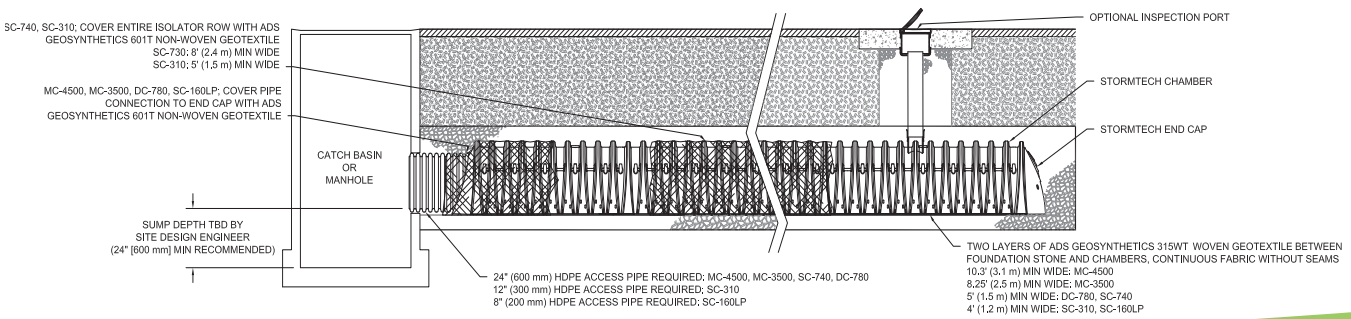
MAINTENANCE

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.

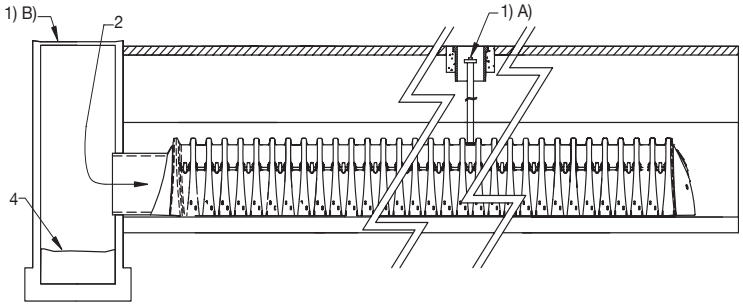
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

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

StormTech Detention • Retention • Water Quality
An ADS company

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