

Include: The requirement for annual inspections (or as described in the inspection schedule) to be performed by a licensed engineer, a licensed landscape architect, or someone who has an active Tennessee Stormwater Management Training SCM Inspection and Maintenance Course certification.

A licensed professional engineer, or a licensed landscape architect shall complete a comprehensive inspection of all SCMs at least once every five years. All related reports, letters, certifications shall be provided to the City with the annual report.

Executive Summary

This Long Term Maintenance Plan (**LTMP** or **Plan**) describes the stormwater management and drainage system for the Sudsy's Car Wash site located at 1451 Murfreesboro Road, Franklin, Tennessee at the intersection of Highway 96 (Murfreesboro Road) and Quail Hollow Circle. It establishes inspection and maintenance schedules to insure the stormwater management and drainage system continues to function as designed and documented in the Stormwater Management Plan and in the Civil Construction drawings prepared for the site. As required by the City of Franklin, a post construction annual inspection report documenting the condition of the stormwater management and drainage system as well as the inspections and maintenance performed on the system is due to the City of Franklin Engineering Department no later than July 1st of each year.

System Description

The site consists of an automatized car wash building, queuing lanes, pay stations, landscaped islands, sidewalks, catch basins, underground stormwater pipe network, and a parking lot. In the parking lot, certain parking spaces have access to permanently installed vacuum cleaners. The site is bounded on the north and west side by a long retaining wall, and to the south and east sides by Quail Hollow Circle, and Highway 96 (Murfreesboro Road) respectively. Beyond the retaining wall to the west are stream buffers that for the pond on the adjacent property.

Stormwater falling on the parking lot, landscape islands, and queuing lanes is detained and treated onsite with Permeable Pavers, and an Underground Detention Pond. Catch basins installed in the curb line collect the stormwater runoff that does not infiltrate through the permeable pavers and conveys it to the underground storm pipe network which in turn conveys it to the underground detention pond. The underground detention pond is an ADS StormTech pond system with an Isolator Row. This Isolator Row is the first row of the pond and it filters stormwater entering the pond through a filter fabric lining the bottom of the row. Below the filter fabric and below the remaining rows of the underground detention pond is a rock layer that can be used to detain stormwater as well as promote infiltration on site. Stormwater infiltrating into the permeable pavers will be filtered by the pavers and detained within the rock layers below the pavers. An underdrain system at the bottom of the rock layers collects the stormwater and conveys it to the underground storm pipe network which in turn conveys it to the underground detention pond. From the detention pond, stormwater is discharged under/through the retaining wall to a Level Spreader that returns concentrated flow to sheet flow as it enters the adjacent Zone 2 stream buffer, and eventually flows to the existing pond on the adjacent property.

Stormwater falling on the automatized car wash building and the grassed area between the building and Highway 96 (Murfreesboro Road) is detained and treated in a Water Quality Swale. At the end of the water quality swale, stormwater flows down a steeper rip-rapped slope to a second Level Spreader that returns concentrated flow to sheet flow as it enters the adjacent Zone 2 stream buffer, and, eventually flows to the existing pond on the adjacent property.

The elements of the stormwater system have been designed based on the City of Franklin's Green Infrastructure Practices (GIPs). Below are the corresponding GIP numbers for each element;

- Permeable Pavers (Level 2): GIP-03
- Dry Pond / Extended Detention: GIP-06
- Water Quality Swale (Level 1): GIP-05
- Level Spreader: GIP-07
- Water Resources Buffers

This location of the drainage system and these elements can be seen on the attached exhibit that highlights the GIPs and components of the system.

Additionally, a large component of the stormwater management system is maintaining the landscaping onsite as shown in the approved site landscape plan.

Copies of the, Site Plan, Grading Plan, Storm water Management Plan, and Landscape Plan prepared for the site are attached.

Inspection and Maintenance:

The overall stormwater system, water resource buffers, and each GIP element of the system are to be inspected quarterly and after every 2-inch or greater rainfall event. An annual inspection report summarizing the quarterly inspections, maintenance performed on the system, and documenting the conditions of the GIPs is required by the City of Franklin. This annual report is due to the cities' engineering department by July 1st of each year.

The quarterly inspections should be performed by staff familiar with the site using the inspection forms attached to this report and walking the site to visually inspect each component of the stormwater management system. Copies of the attached forms should be made and a fresh copy completed during each inspection event. After being completed the inspection forms, and any concerns or recommendations for maintenance or housekeeping noted during the inspection, will be reviewed by Sudsy's management. Upon review of inspection forms, Sudsy's management will take appropriate action to address the concerns and recommendations noted.

Once completed, the inspection forms are to be maintained onsite in an orderly manner and be made available to Sudsy's Management and or the City of Franklin Engineering staff if requested, as well as, be made available when preparing the yearly inspection report.

Annual inspection reports are to be completed by a competent professional knowledgeable of stormwater systems, their function, and their design intent. The annual inspection should include a review of this Long Term Maintenance Plan (LTMP), the completed quarterly inspection report forms, a summary and review of any maintenance performed that year, and a thorough inspection of the site and elements of the stormwater system. Any revisions needed to this plan should be made

Include the statement below in the narrative and plan sheets for all applicable sites:

THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION OF ANY KIND IN THE WATER QUALITY RIPARIAN BUFFER EXCEPT AS PERMITTED BY THE CITY ENGINEER.

and noted as revisions to this LTMP and a copy of the revised plan be submitted to the City of Franklin along with the annual report.

All trash, sediments, and any other pollutants collected in the stormwater system are to be disposed of at an approved landfill or disposal site in accordance with the City of Franklin, and TDEC regulations.

Plan Revisions

This plan shall be updated as necessary to insure that the discharge requirements of the City of Franklin are being met. Revisions are to be recorded in the following places.

| DATE REVISED | ITEMS REVISED |
|---------------------|----------------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

LONG TERM MAINTENANCE PLAN (LTMP) AND AGREEMENT

Susdy's Car Wash
1451 Murfreesboro Road
Franklin, TN 37067

(project name/subdivision/section, lot #)

**CITY OF FRANKLIN
WILLIAMSON COUNTY, TENNESSEE**

MAP & PARCEL #: 079K 004.01

COF #: 6301

LAT/LONG: 35.911994, -86.817071

PREPARED BY & CONTACT INFO:

Lance Wagner, PE
Civil Engineering Services, PC
PO Box 1302
Fairview, TN 37062
phone: 615-289-2047
email: lance@civilengineeringservices.net

OWNER'S CONTACT INFO:

Name & Company: Sudsys Car Wash

Address: 1451 Murfreesboro Road

Phone: 615-479-9905

Email: troy@sudsys.com

Owner shall submit Annual Inspection Reports to the City of Franklin's Engineering Dept. no later than July 1st of each year*STORMWATER SYSTEM FEATURES LOCATED ON SITE:**

| | | |
|--|--|---|
| <input type="checkbox"/> Urban Bioretention/Rain Gardens | <input type="checkbox"/> Infiltration Trenches | <input type="checkbox"/> Dry Ponds |
| <input checked="" type="checkbox"/> Water Quality Swales | <input type="checkbox"/> Grass Swales | <input type="checkbox"/> Wet Ponds |
| <input type="checkbox"/> Oil Grit Separator/Water Quality Unit | <input checked="" type="checkbox"/> Riparian Buffers | <input type="checkbox"/> Wetland |
| <input checked="" type="checkbox"/> Permeable Pavers/Concrete | <input type="checkbox"/> Green Roof | <input checked="" type="checkbox"/> Storm Sewer |
| <input checked="" type="checkbox"/> Underground Detention | <input type="checkbox"/> Other | |

IMPERVIOUS SQ. FT. | 11,300

ALL OF THE FOLLOWING DOCUMENTS SHALL BE ATTACHED AND INCLUDED WITH THIS FORM:

- Location Map
- Stormwater Features Location Sheet: include detailed exhibits of the BMP's and a site map showing the location of all BMP's and stream buffers: CLEARLY LABELED
- Oil Grit Separator/Water Quality Unit 2 year maintenance agreement
- Maintenance narrative & description of each BMP to be inspected
- BMP inspection and maintenance form for each BMP located on site

AS-BUILTS:

Upon completion of the site construction, as-built drawings of the stormwater controls will be provided to the City of Franklin Engineering Department for verification.

MAINTENANCE AGREEMENT

A copy of the inspection and Maintenance Agreement of Private Stormwater Management Facilities shall be completed, notarized and recorded in the Land Records of the County of Williamson, Tennessee with the document.

ACCESS

As agreed to with the Inspection and Maintenance Agreement, the owner shall grant to the City of Franklin or its agent or contractor the right of entry at reasonable times and in a reasonable manner for the purpose of inspecting, operation, installing, constructing, reconstructing, maintain, or repairing the facility.

WASTE DISPOSAL:

Trash and debris collected from the stormwater sewer system shall be properly disposed with a licensed sanitation company. All sediment and debris shall be disposed at a licensed landfill in accordance with all local, state, and federal laws. If any sediment is believed to be contaminate, the Tennessee Department of Environment and Conservation (TDEC)-Division of Water Pollution Control should be contacted at (615)-532-0625.

CERTIFICATION:

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:

SIGNATURE:

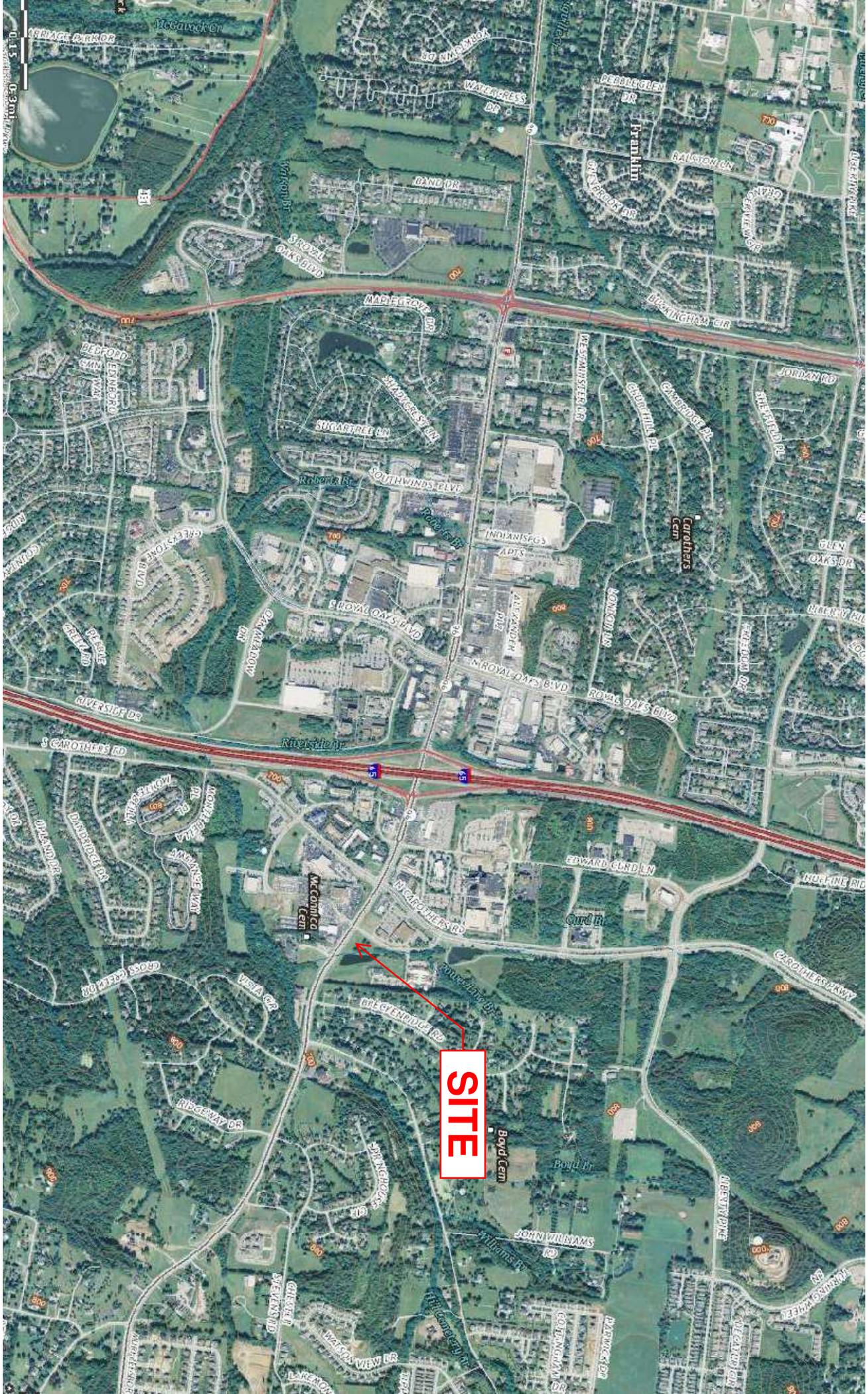
DATE:

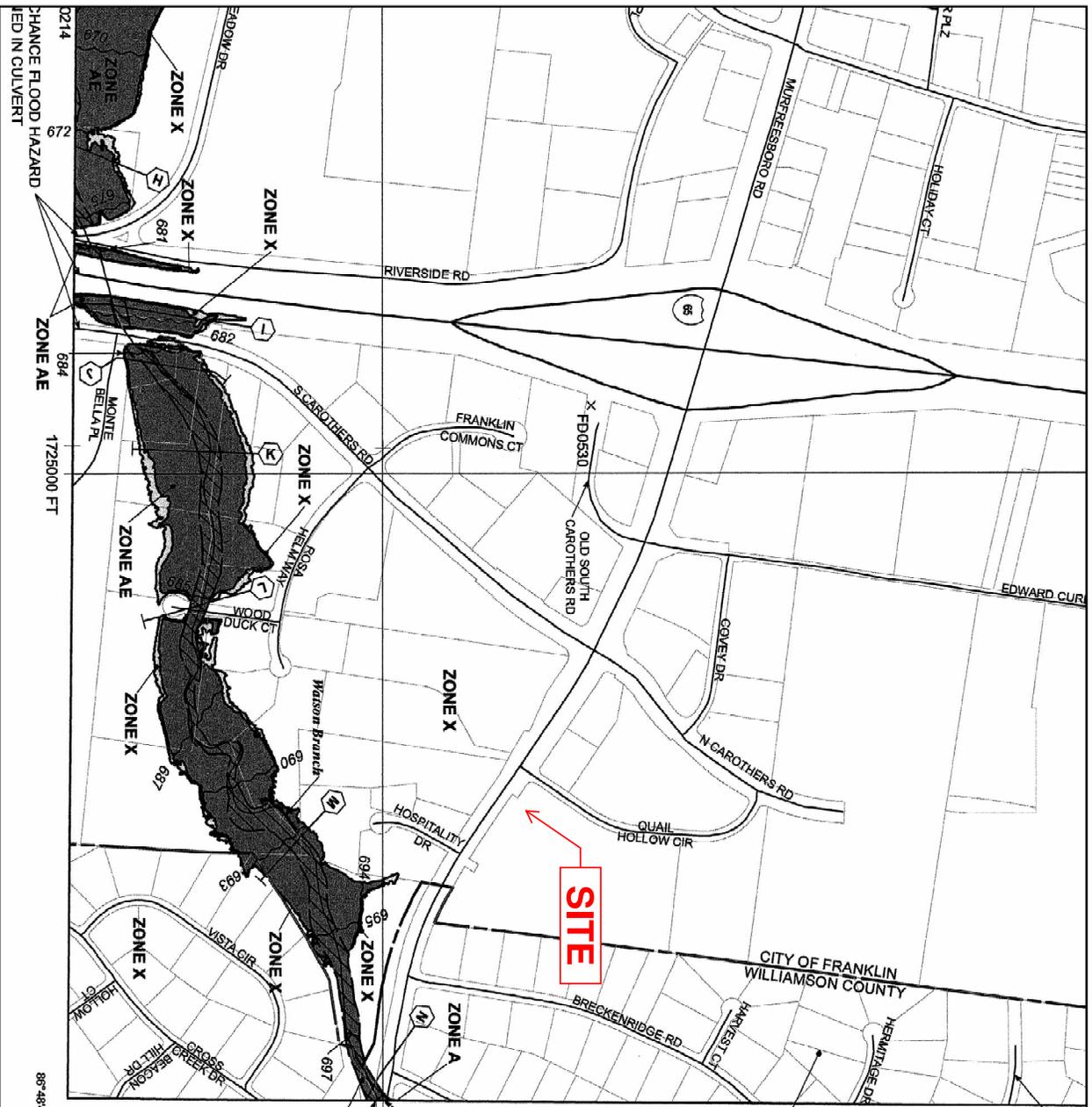
APPENDIX A

LOCATION MAPS AND AND SITE PLANS

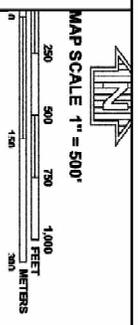
NOTES: Data available from U.S. Geological Survey, National Geospatial Program.

Sudsys - Car Wash - Aerial Map





Williamson County
 Unincorporated Areas
 470204



PANEL 0212F

FIRM
 FLOOD INSURANCE RATE MAP
 WILLIAMSON COUNTY,
 TENNESSEE
 AND INCORPORATED AREAS

PANEL 212 OF 485

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|-------------------|--------|-------|--------|
| FRANKLIN CITY OF | 470206 | 0212 | F |
| WILLIAMSON COUNTY | 470204 | 0212 | F |

BEST AVAILABLE COPY
 AT THIS TIME

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
 47187C0212F

MAP REVISED
 SEPTEMBER 29, 2006



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using FIRM-Cutline. This map does not reflect changes to the flood map since the date of the original map. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX B

GIP EXHIBIT

FINAL EROSION CONTROL MEASURES

1. The contractor shall provide a final erosion control plan to the City of Franklin, Tennessee, for review and approval. The plan shall include a final site plan showing the location of all erosion control measures, a final site plan showing the location of all erosion control measures, and a final site plan showing the location of all erosion control measures.

2. The contractor shall provide a final site plan showing the location of all erosion control measures, a final site plan showing the location of all erosion control measures, and a final site plan showing the location of all erosion control measures.

3. The contractor shall provide a final site plan showing the location of all erosion control measures, a final site plan showing the location of all erosion control measures, and a final site plan showing the location of all erosion control measures.

4. The contractor shall provide a final site plan showing the location of all erosion control measures, a final site plan showing the location of all erosion control measures, and a final site plan showing the location of all erosion control measures.

5. The contractor shall provide a final site plan showing the location of all erosion control measures, a final site plan showing the location of all erosion control measures, and a final site plan showing the location of all erosion control measures.

PREVIOUS CONSTRUCTION CONTRACTOR RESPONSIBILITIES

1. The contractor shall provide a final site plan showing the location of all erosion control measures, a final site plan showing the location of all erosion control measures, and a final site plan showing the location of all erosion control measures.

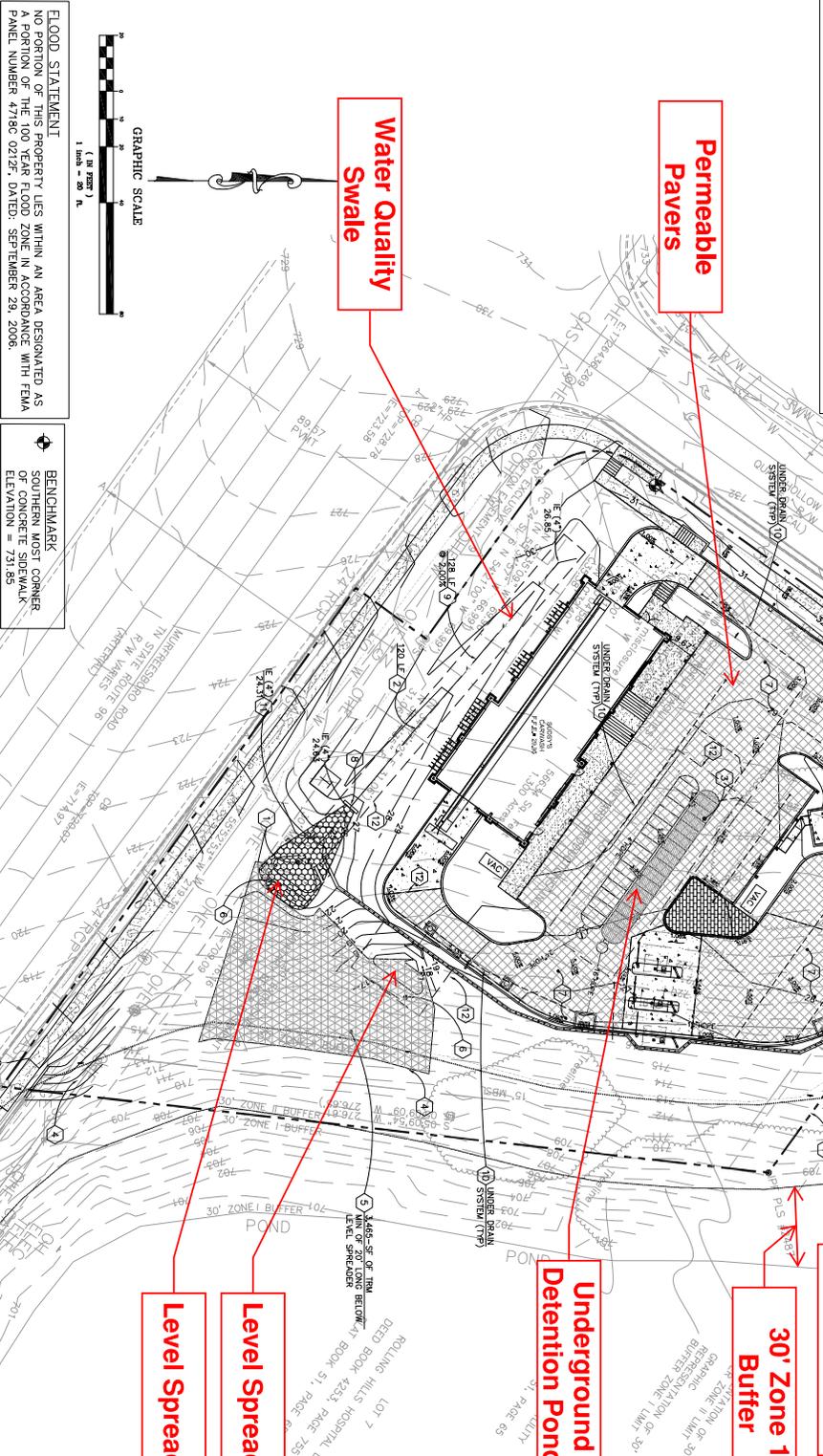
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THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION OF ANY KIND EXCEPT AS PERMITTED BY THE CITY ENGINEER



PROPOSED LEGEND

- RIVER STONE (RIP-400) TO BE 8" THICK.
- PLACEMENT 12" MINIMUM THICK (MIN)
- PERMANENT TURF REINFORCED MATTING
- SOFT CURB (CONCRETE) PERMANENT PAVES PER MANUFACTURER'S SPEC. - SEE ITEM SHEET

GENERAL EROSION CONTROL NOTES

SEE SHEET C3.2 FOR EROSION CONTROL NOTES

EROSION CONTROL BLOCKS

- 1) RIVER STONE PERMANENT PAVES TO BE 8" THICK.
- 2) WATER QUALITY SWALE PER CITY OF FRANKLIN - SEE GRP-06 SPECIFICATIONS - SEE DETAIL SHEET C0.1
- 3) SOFT CURB PERMANENT PAVES PER MANUFACTURER'S SPEC. - SEE ITEM SHEET
- 4) PERMANENT TURF REINFORCED MATTING SHALL BE 12" THICK AND SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1
- 5) PERMANENT TURF REINFORCED MATTING SHALL BE 12" THICK AND SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1
- 6) PERMANENT TURF REINFORCED MATTING SHALL BE 12" THICK AND SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1
- 7) PERMANENT TURF REINFORCED MATTING SHALL BE 12" THICK AND SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1
- 8) PERMANENT TURF REINFORCED MATTING SHALL BE 12" THICK AND SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1
- 9) PERMANENT TURF REINFORCED MATTING SHALL BE 12" THICK AND SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1
- 10) PERMANENT TURF REINFORCED MATTING SHALL BE 12" THICK AND SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1
- 11) UNDERGROUND DETENTION POND PER A/RP-04
- 12) SWALE / WATER QUALITY SWALE

WATER QUALITY AND DETENTION NOTES

1. ALL PERMANENT PAVES SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1

2. PERMANENT TURF REINFORCED MATTING SHALL BE 12" THICK AND SHALL BE PERMANENTLY ATTACHED TO THE UNDERGROUND DETENTION POND. SEE DETAIL SHEET C0.1

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811 CALL BEFORE YOU DIG

FINAL EROSION AND WQ CONTROL PLAN

SUDSY'S CAR WASH

1451 MURFREESBORO ROAD
FRANKLIN, TENNESSEE

DATE: 10/23/2016
DRAWN BY: WJF
CHECKED BY: RGF
COPD: 45301

NO. DATE REVISIONS

Civil Engineering Services

7105 Spicer Farm Lane
Fairview, Tennessee 37062
phone: (615) 533-0401
fax: (615) 523-8665
e-mail: ray@civilingineerservices.net
Engineering, Environmental, Land Planning

SUDSY'S CAR WASH
1451 MURFREESBORO ROAD
FRANKLIN, TN 37062
www.sudsys.com

ISSUED FOR PERMIT

APPENDIX C

STORMWATER MANAGEMENT INSPECTION/MAINTENANCE FORMS



Permeable Pavement Inspection and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

Address: _____ Phone Number: _____

Site Status: _____

Date: _____ Time: _____ Site conditions: _____

*****Conduct maintenance inspection in the spring of each year.

Pavement Type: Pervious Concrete/Asphalt D Modular Pavers D Grass/Gravel Pavers D

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

| Inspection Items | Inspection Frequency | Inspected? (Yes/No) | Maintenance Needed? (Yes/No) | Comments/Description |
|--|----------------------|---------------------|------------------------------|----------------------|
| Pavement Area | | | | |
| Pavement area free of debris? | A/M | | | |
| Staining or sediment? | A/M | | | |
| Inlets and outlets unobstructed and sediment free? | A/M | | | |
| All contributing drainage area free of erosion and sources of sediment? | A/M | | | |
| Water standing after a storm event? | S | | | |
| Any evidence of clogged pores that require vacuum-sweeping? | A/M | | | |
| Has area been vacuum swept in the past 12 months? | A/M | | | |
| Access to pervious pavement (egress and ingress routes) safe and efficient? | A/M | | | |
| Has drawdown rate been measured at observation well and is well capped?* | A | | | |
| Structural integrity of the pavement intact? Look for deterioration such as: slumping, cracking, spalling, or broken pavers. | A/M | | | |
| Grass Pavers | | | | |
| Adjacent area fully stabilized (no evidence | A | | | |



Stormwater Pond Inspections and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

Address: _____ Phone Number: _____

Site Status: _____

Date: _____ Time: _____ Site conditions: _____

Stormwater Pond Type: Wet Pond Wet ED Pond Micropool Pond Multiple Pond System
 Dry Pond

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

| Inspection Items | Inspection Frequency | Inspected? (Yes/No) | Maintenance Needed? (Yes/No) | Comments/Description |
|--|----------------------|---------------------|------------------------------|---|
| Embankment and Emergency Spillway | | | | |
| Vegetation healthy? | A/S | | | |
| Erosion on embankment? | A/S | | | |
| Animal burrows in embankment? | A/S | | | |
| Cracking, sliding, bulging of dam? | A/S | | | |
| Drains blocked or not functioning? | A/S | | | |
| Leaks or seeps on embankment? | A/S | | | |
| Slope protection failure functional? | A/S | | | |
| Emergency spillway obstructed? | A/S | | | |
| Erosion in/around emergency spillway? | A/S | | | |
| Other (describe) | A/S | | | |
| Riser and Principal Spillway | | | | (describe type: concrete pipe, slotted weir, channel, etc.) |
| Low-flow orifice functional? | A/S | | | |
| Trash rack (Debris removal needed? Corrosion noted?) | A/S | | | |
| Sediment buildup in riser? | A | | | |
| Concrete/masonry condition (Cracks or displacement? Spalling?) | A | | | |
| Metal pipe in good condition? | A | | | |
| Control valve operation? | A | | | |
| Pond drain valve operation? | A | | | |
| Outfall channels function, not eroding? | A | | | |
| Other (describe) | A | | | |
| Sediment Forebays | | | | |
| Sedimentation description | | | | |
| Sediment cleanout needed (over 50 | A/S | | | |



| Inspection Items | Inspection Frequency | Inspected? (Yes/No) | Maintenance Needed? (Yes/No) | Comments/Description |
|--|----------------------|---------------------|------------------------------|----------------------|
| percent full)? | | | | |
| Permanent Pool Areas (if applicable) | | | | |
| Undesirable vegetation growth? | A/M | | | |
| Visible pollution? | A/M | | | |
| Shoreline erosion? | A/M | | | |
| Erosion at outfalls into pond? | A/M | | | |
| Headwalls and endwalls in good condition? | A/M | | | |
| Encroachment into pond or easement area by other activities? | A/M | | | |
| Evidence of sediment accumulation? | A | | | |
| Dry Pond Areas (if applicable) | | | | |
| Vegetation adequate? | A/M | | | |
| Undesirable vegetation or woody plant growth? | A/M | | | |
| Excessive sedimentation? | A | | | |
| Hazards | | | | |
| Have there been complaints from residents? | A/M | | | |
| Public hazards noted? | A/M | | | |

Inspector Comments: _____

Overall Condition of Facility: Acceptable Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---------------------------|----------|
| | |
| | |
| | |
| | |

The next routine inspection is scheduled for approximately: _____
 (date)

Inspected by: (signature) _____
 Inspected by: (printed) _____



Storm Sewer Inspections and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

Address: _____ Phone Number: _____

Site Status: _____

Date: _____ Time: _____ Site conditions: _____

Indicate Features Present: Catch Basins Storm Pipe Headwalls Outfalls Catch Basin Inlets

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

| Inspection Items | Inspection Frequency | Inspected? (Yes/No) | Maintenance Needed? (Yes/No) | Comments/Description |
|--|----------------------|---------------------|------------------------------|----------------------|
| Catch Basins | | | | |
| Ensure all are structurally sound and in good condition. Note any deficiencies and repair to proper working condition ensure all are set properly in place over inlets | A/S | | | |
| Check for sediment, leaf, or debris clogging grates and remove | A/S | | | |
| Catch Basin Inlets | | | | |
| Ensure all are structurally sound and in good condition. Note any deficiencies and repair to proper working condition | A/S | | | |
| Inspect for blockage or sediment accumulation and remove when capacity is diminished by 20% or greater | A/S | | | |
| Pipes | | | | |
| Ensure all are structurally sound and in good condition. Note any deficiencies and repair to proper working condition | A/S | | | |
| Inspect for blockage or sediment accumulation and remove when capacity is diminished by 20% or greater. | A/S | | | |
| Concrete/masonry condition of pipes and joints? (Cracks or displacement? Spalling?) | A/S | | | |



| Inspection Items | Inspection Frequency | Inspected? (Yes/No) | Maintenance Needed? (Yes/No) | Comments/Description |
|---|----------------------|---------------------|------------------------------|----------------------|
| Headwalls and Endwalls | | | | |
| Ensure all are structurally sound and in good condition. Note any deficiencies and repair to proper working condition | A/S | | | |
| Inspect for blockage or sediment | A/S | | | |
| Check for erosion or scouring around headwall inlets and repair | A/S | | | |
| Evidence of staining? | A/S | | | |
| If flowing water is present does it appear to contain anything other than stormwater? I.e. Discoloration, odors, sheens, etc? Note location and describe. | A/S | | | |
| Hazards | | | | |
| Have there been complaints from residents? | A/S | | | |

Inspector Comments: _____

Overall Condition of Facility: Acceptable Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---------------------------|----------|
| | |
| | |
| | |
| | |
| | |

The next routine inspection is scheduled for approximately: _____
 (date)

Inspected by: (signature) _____
 Inspected by: (printed) _____



Water Resource Buffers Inspection and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

Address: _____ Phone Number: _____

Site Status: _____

Date: _____ Time: _____ Site conditions: _____

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

| Inspection Items | Inspection Frequency | Inspected? (Yes/No) | Maintenance Needed? (Yes/No) | |
|--|----------------------|---------------------|------------------------------|--|
| Disturbance | | | | |
| Are there any signs of clearing, grading, construction, storage, mowing or other disturbance of vegetation or soil taken place in the buffer?? | A/M | | | |
| Are there any signs of erosion within the buffer or banks of the stream? | A/M | | | |
| Are there any surrounding disturbances that might be threats to the buffer or water quality? | A/M | | | |
| Buffer State | | | | |
| Would the general state of the buffer be described as an undisturbed native successional forest or similar? | A/M | | | |
| Are there any diseased, dying, or endangering trees in the buffer? | A/M | | | |
| Is the buffer contain more than 30% exotic invasive material? | A/M | | | |
| Signs | | | | |
| Are buffer signs still clearly visible and in good legible condition? If not clear back vegetation or replace. | A/M | | | |

City of Franklin, Tn
Stormwater Division
615-791-3218



To be submitted as part of
annual report to City

REV 2/2015

Note: There shall be no clearing, grading, construction, storage or disturbance of vegetation or soil allowed in the Water Resource Buffer except as permitted by the City Engineer. There is to be no mowing of grass or cutting of trees in the buffers except for vegetation that is diseased, dying or in danger of adjacent structures. Report any of this in the comments section below.

Inspector Comments: _____

Overall Condition of Facility: Acceptable Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---------------------------|----------|
| | |
| | |
| | |
| | |
| | |

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____



Water Quality Swale Inspections and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

Address: _____ Phone Number: _____

Site Status: _____

Date: _____ Time: _____ Site conditions: _____

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

| Inspection Items | Inspection Frequency | Inspected? (Yes/No) | Maintenance Needed? (Yes/No) | |
|--|----------------------|---------------------|------------------------------|--|
| Pre-Treatment Area | | | | |
| Area free of debris? | A/M | | | |
| Standing water longer than 24 hours after a storm event? | A/S | | | |
| Bare soil or erosion? | M/S | | | |
| Excessive landscape waste/yard clippings? | A/M | | | |
| Inlet/Outlet Structures | | | | |
| Inlets provide stable conveyance into the facility? | A | | | |
| Evidence of erosion at or around inlet? | A | | | |
| If connected to extended detention, is outlet to pond functioning properly? | A | | | |
| Other | A | | | |
| Basin | | | | |
| Adjacent area fully stabilized (no evidence of eroding material into Bioretention area)? | A | | | |
| Adequate media layer present? | A | | | |
| Plant composition according to approved plan? | A | | | |
| Invasive species/weeds present? | A | | | |



| Inspection Items | Inspection Frequency | Inspected? (Yes/No) | Maintenance Needed? (Yes/No) | |
|--|----------------------|---------------------|------------------------------|--|
| Dead vegetation or exposed soil present? | A | | | |
| Maintenance access to facility? | A | | | |
| Excessive trash/debris/sediment? | A | | | |
| Evidence of erosion? | A | | | |
| Evidence of standing water (Ponding, Noticeable Odors, Water Stains, Algae)? | A/M | | | |
| If underdrain system, is it broken or clogged? | A/M | | | |
| Overflow structure free of blockage and operating properly? | A | | | |
| Other | A | | | |
| Hazards | | | | |
| Have there been complaints from residents? | A/M | | | |
| Public hazards noted? | A/M | | | |
| Mosquito proliferation? | A/M | | | |
| Is there encroachment on pervious area or easement by buildings or other structures? | A/S | | | |

Inspector Comments: _____

Overall Condition of Facility: Acceptable Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---------------------------|----------|
| | |
| | |
| | |
| | |

The next routine inspection is scheduled for approximately: _____
 (date)

Inspected by: (signature) _____

Inspected by: (printed) _____

APPENDIX D

UNDERGROUND DETENTION POND PRODUCT INFORMATION

| PROJECT INFORMATION | |
|-----------------------------|---|
| ENGINEERED PRODUCT MANAGER: | SANDY COLLINS-CAVARO 859-421-6929 SANDY.CAVARO@ADS-PIPE.COM |
| ADS SALES REP: | BRYAN MULLIGAN (615) 330-2307 BRYAN.MULLIGAN@ADS-PIPE.COM |
| PROJECT NO.: | 164760 |



ADVANCED DRAINAGE SYSTEMS, INC.



SUDSY'S CAR WASH

FRANKLIN, TN

STORMWATER CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPERE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE ASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12 ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS BASED ON THE ASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
 - a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD. THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
 - b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE ASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12 ARE MET, THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE ASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
 - c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE.
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - BACKFILL WITH STONE FROM THE SUBGRADE.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 1/2" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE.
2. THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED.
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER Tired LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE.
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE.
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTRACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

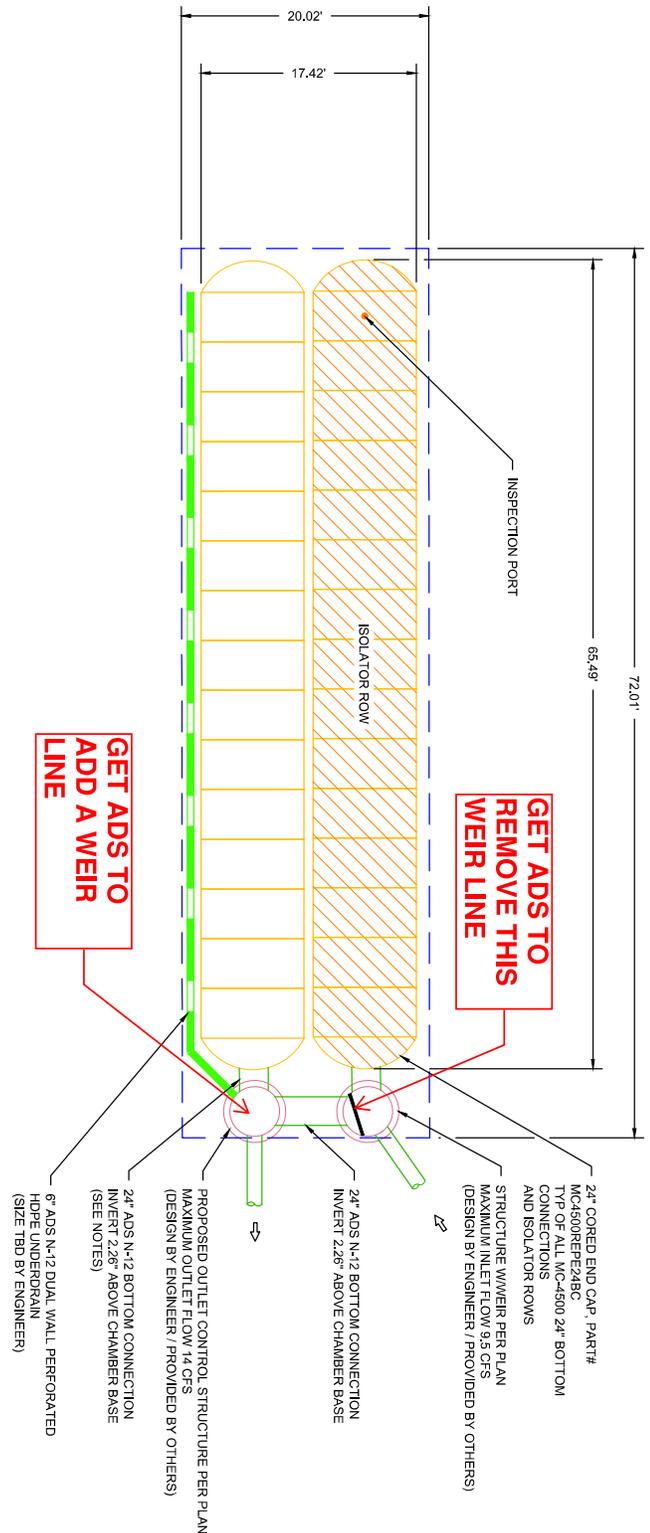
PROPOSED LAYOUT
 (30) STORMTECH MC-4500 CHAMBERS
 (4) STORMTECH MC-4500 END CAPS
 INSTALLED WITH 12" COVER STONE. 9" BASE STONE, 40% STONE VOID
 INSTALLED SYSTEM VOLUME: 5,893 CF PERIMETER STONE INCLUDED)
 AREA OF SYSTEM: 1,441 FT²
 PERIMETER OF SYSTEM: 194 FT

PROPOSED ELEVATIONS

| | |
|--|-------|
| MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED): | 32.65 |
| MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC): | 28.15 |
| MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC): | 27.65 |
| MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT): | 27.65 |
| MINIMUM ALLOWABLE GRADE (BASE OF RIGID CONCRETE PAVEMENT): | 27.65 |
| TOP OF STONE: | 28.65 |
| TOP OF CHAMBER: | 28.65 |
| 24" BOTTOM CONNECTION: | 25.65 |
| 24" ISOLATOR ROW INVERT: | 20.84 |
| BOTTOM OF CHAMBER: | 20.84 |
| UNDERDRAIN INVERT: | 19.90 |
| BOTTOM OF STONE: | 19.90 |

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THE SITE DESIGN ENGINEER MUST REVIEW THE PROXIMITY OF THE CHAMBERS TO THE SLOPE AND CONSIDER EFFECTS OF POSSIBLE SATURATED SOILS ON THE SLOPE'S INTEGRITY.
- THIS PLAN REFLECTS THE CHAMBER SYSTEM DESIGN BY THE SITE DESIGN ENGINEER USING STORMTECH COMPONENTS. THE SUITABILITY OF THE CHAMBER SYSTEM TO MEET ANY FUNCTIONAL REQUIREMENTS ARE THE RESPONSIBILITY OF THE SITE DESIGN ENGINEER. STORMTECH'S SCOPE OF WORK IS LIMITED TO THE ASSEMBLED PRODUCT DIMENSIONS AND SPECIFICATIONS FOR INSTALLATION.



ADS ADVANCED DRAINAGE SYSTEMS, INC.
 4640 TRUEMAN BLVD
 HILLIARD, OH 43026

70 INWOOD ROAD, SUITE 3 | ROCKY HILL, CT | 06867
 860-520-8188 | 888-892-2694 | WWW.STORMTECH.COM

0 10' 20'

| REV | DRW | CHK | DESCRIPTION |
|-----|-----|-----|-------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

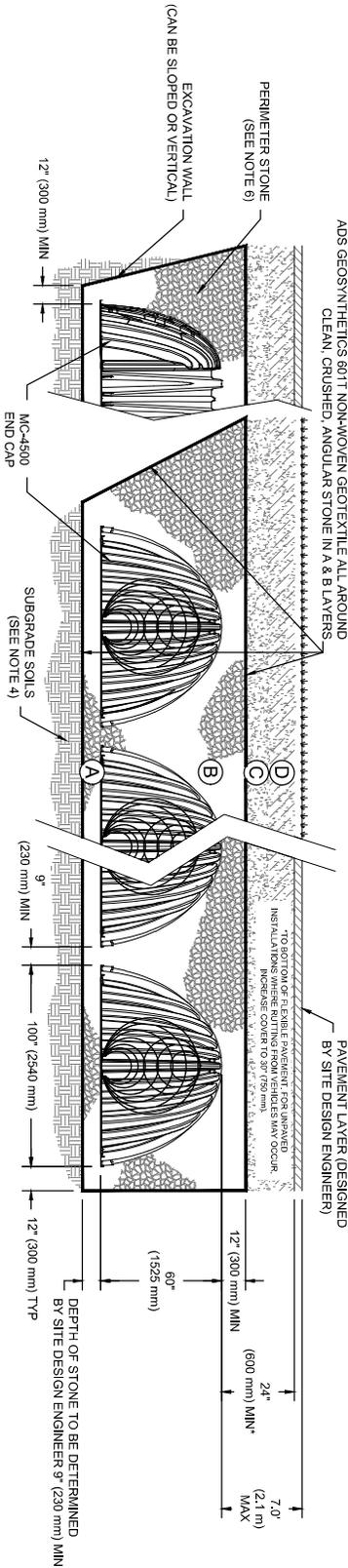
SUDSY'S CAR WASH
FRANKLIN, TN

DATE: 10-18-16 DRAWN: LAH
 PROJECT #: 164760 CHECKED: KMS

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

| MATERIAL LOCATION | DESCRIPTION | ASHTO MATERIAL CLASSIFICATIONS | COMPACTION / DENSITY REQUIREMENT |
|-------------------|---|--|--|
| D | FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF THE 'B' LAYER OR PAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER. | ANY SOIL/ROCK MATERIALS MAY BE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS. | PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE RESTRICTED MATERIAL AND PREPARATION REQUIREMENTS. |
| C | INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER. | GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <3% FINES OR PROCESSED AGGREGATE. ASHTO M43 ¹ 3, 367, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10 | BEGIN COMPACTION AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. |
| B | EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE. | CLEAN CRUSHED, ANGULAR STONE | NO COMPACTION REQUIRED. |
| A | FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER. | CLEAN CRUSHED, ANGULAR STONE | PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3} |

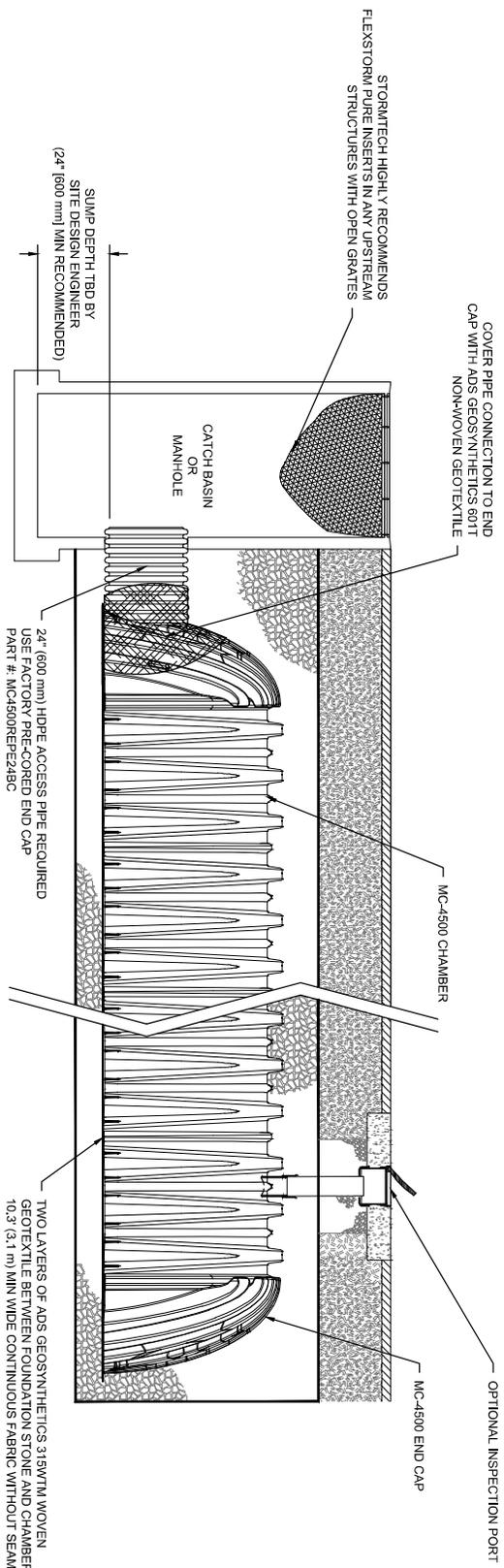
- PLEASE NOTE:
- THE LISTED ASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (ASHTO M43) STONE."
 - STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION.
 - EQUIPMENT, FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

- MC-4500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBGRADE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.

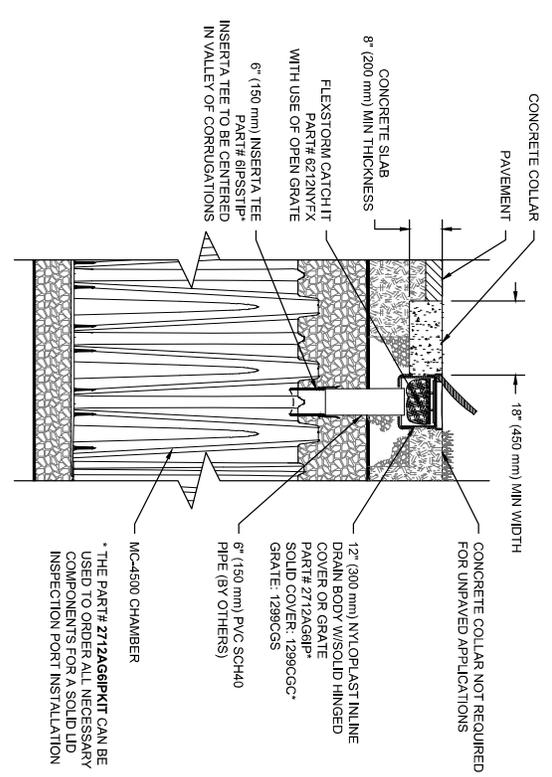
| <p style="font-size: 8px; margin-top: 5px;">4640 TRUAMAN BLVD HILLIARD, OH 43026</p> | <p style="font-size: 8px; margin-top: 5px;">70 INWOOD ROAD, SUITE 3 ROCKY HILL CT 06067 860-520-8188 888-892-2694 WWW.STORMTECH.COM</p> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>REV</th> <th>DRW</th> <th>CHK</th> <th>DESCRIPTION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table> | REV | DRW | CHK | DESCRIPTION | | | | | <p style="font-weight: bold; font-size: 12px;">SUDSY'S CAR WASH FRANKLIN, TN</p> <p>DATE: 10-18-16 DRAWN: LAH</p> <p>PROJECT #: 164760 CHECKED: KMS</p> |
|---|--|---|-------------|-----|-----|-------------|--|--|--|--|---|
| REV | DRW | CHK | DESCRIPTION | | | | | | | | |
| | | | | | | | | | | | |
| <p style="font-weight: bold; font-size: 14px;">3 OF 5</p> <p style="font-size: 8px; margin-top: 5px;">SHEET</p> | <p>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> | | | | | | | | | | |



MC-4500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
 - A.1. REMOVE/OPEN LID ON NYLOP LAST 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
 - i) USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
 - ii) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - iii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - B.2. 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 FIRED 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 SWMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATINGS, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

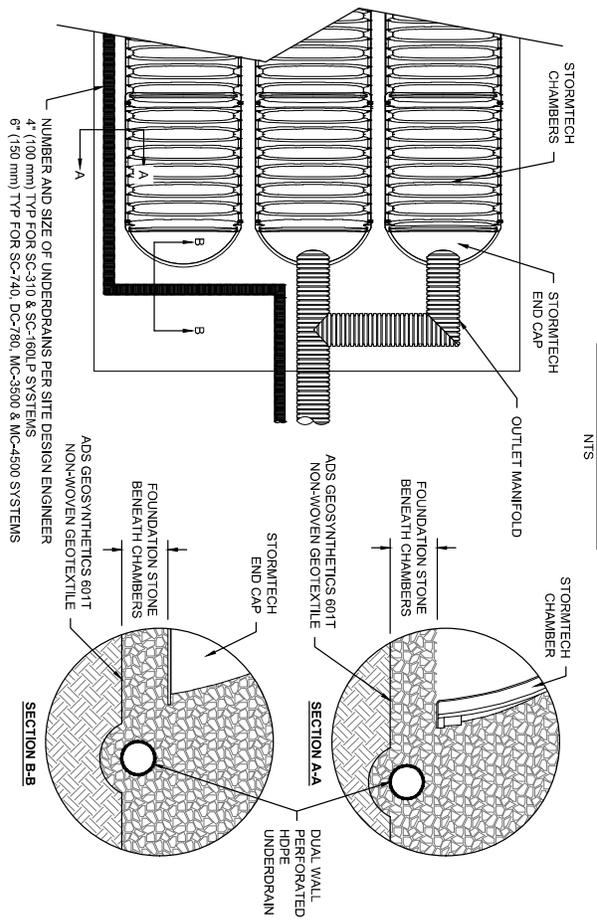


MC-4500 6" INSPECTION PORT DETAIL
NTS

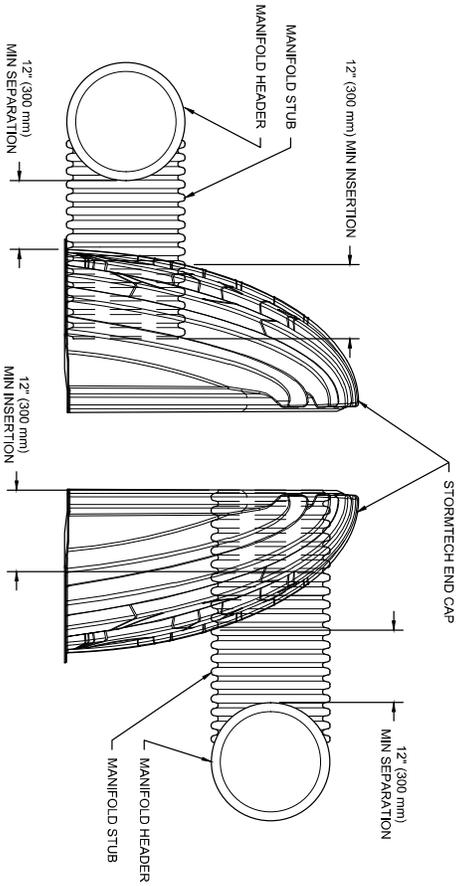
- NOTES**
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION, ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
 2. CONDUCT JETTING AND VACUUMING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

| SHEET 4 OF 5 | 4640 TRUAMAN BLVD HILLIARD, OH 43026 | 70 INWOOD ROAD, SUITE 3 ROCKY HILL CT 06067 860-520-8188 888-892-2694 WWW.STORMTECH.COM | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DRW</th> <th>CHK</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> | REV | DRW | CHK | DESCRIPTION | | | | | | | | | SUDSY'S CAR WASH FRANKLIN, TN |
|---|---|--|--|---|-----|-----|-------------|--|--|--|--|--|--|--|--|--|
| | REV | DRW | CHK | DESCRIPTION | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |
| | | | | DATE: 10-18-16 DRAWN: LAH PROJECT #: 164760 CHECKED: KMS | | | | | | | | | | | | |
| 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. | | | | | | | | | | | | | | | | |

UNDERDRAIN DETAIL

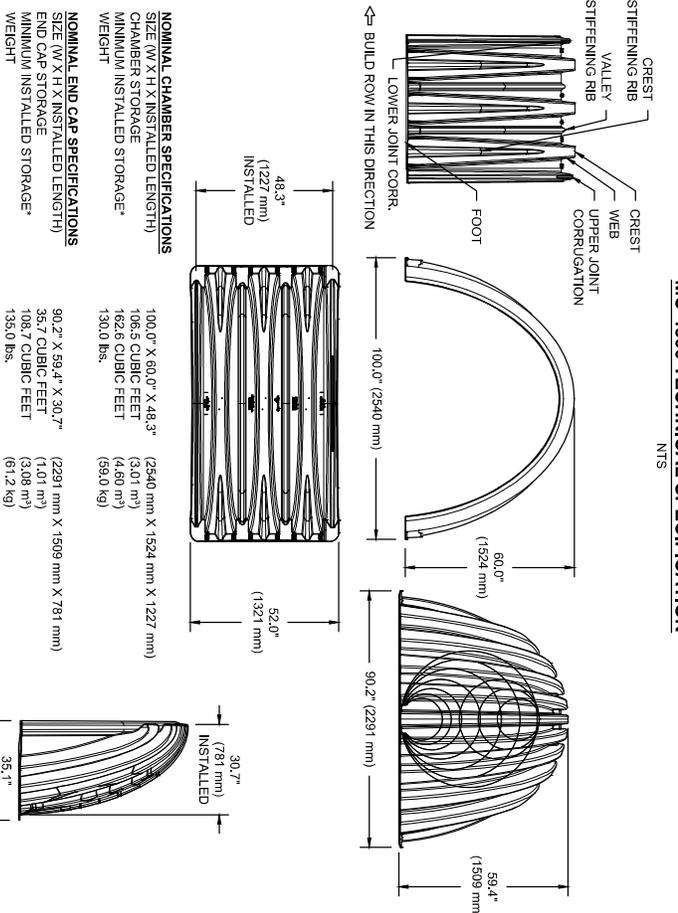


MC-SERIES END CAP INSERTION DETAIL



NOTE: MANIFOLD STUB MUST BE Laid HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-4500 TECHNICAL SPECIFICATION

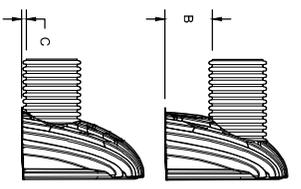


STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

| PART # | STUB | B | C |
|---------------|---------------|-------------------|---------------|
| MC4500REPE06T | 6" (150 mm) | 42.54" (1,081 mm) | 0.88" (22 mm) |
| MC4500REPE06B | 6" (150 mm) | 40.50" (1,029 mm) | --- |
| MC4500REPE08T | 8" (200 mm) | --- | 1.01" (26 mm) |
| MC4500REPE08B | 8" (200 mm) | 38.37" (975 mm) | --- |
| MC4500REPE10T | 10" (250 mm) | --- | 1.33" (34 mm) |
| MC4500REPE10B | 10" (250 mm) | 35.69" (907 mm) | --- |
| MC4500REPE12T | 12" (300 mm) | --- | 1.55" (39 mm) |
| MC4500REPE12B | 12" (300 mm) | 32.72" (831 mm) | --- |
| MC4500REPE15T | 15" (375 mm) | --- | 1.70" (43 mm) |
| MC4500REPE15B | 15" (375 mm) | 29.36" (746 mm) | --- |
| MC4500REPE18T | 18" (450 mm) | --- | 1.97" (50 mm) |
| MC4500REPE18B | 18" (450 mm) | 23.05" (586 mm) | --- |
| MC4500REPE24B | 24" (600 mm) | --- | 2.26" (57 mm) |
| MC4500REPE30B | 30" (750 mm) | --- | 2.95" (75 mm) |
| MC4500REPE36B | 36" (900 mm) | --- | 3.25" (83 mm) |
| MC4500REPE42B | 42" (1050 mm) | --- | 3.55" (90 mm) |

NOTE: ALL DIMENSIONS ARE NOMINAL.

CUSTOM PRECURED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 1224" (306-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.



| | | | | | | | |
|--|---|---------------------|------------|-----|-------------------|--|--|
| <p>4640 TRUAMAN BLVD HILLIARD, OH 43026</p> | <p>70 INWOOD ROAD, SUITE 3 ROCKY HILL, CT 06067 860-520-8188 888-892-2694 WWW.STORMTECH.COM</p> | REV | DRW | CHK | DESCRIPTION | <p>SUDSY'S CAR WASH FRANKLIN, TN</p> | |
| | | DATE: 10-18-16 | DRAWN: LAH | | PROJECT #: 164760 | CHECKED: KMS | |
| <p>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> | | <p>5 OF 5 SHEET</p> | | | | | |

**Save Valuable Land and
Protect Water Resources**



Isolator[®] Row O&M Manual
StormTech[®] Chamber System for Stormwater Management

1.0 The Isolator[®] Row

1.1 INTRODUCTION

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



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

1.2 THE ISOLATOR ROW

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

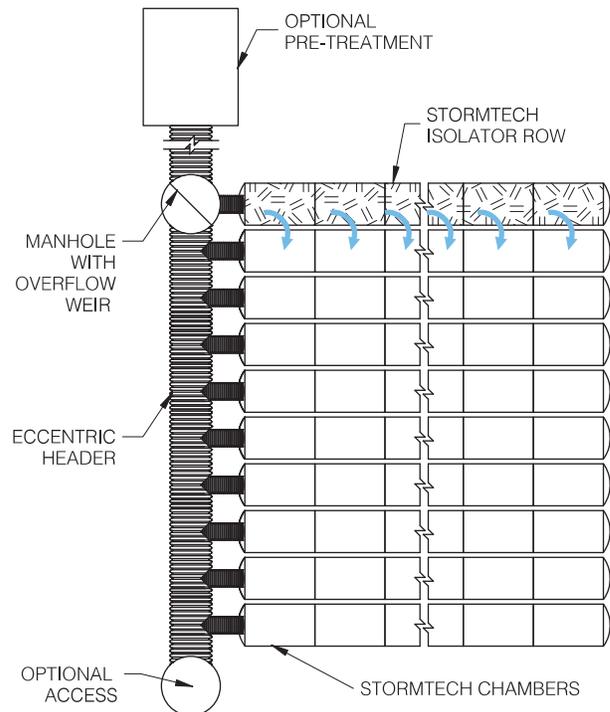
Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of 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 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 over flow 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.

StormTech Isolator Row with Overflow Spillway (not to scale)



2.0 Isolator Row Inspection/Maintenance



2.1 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.

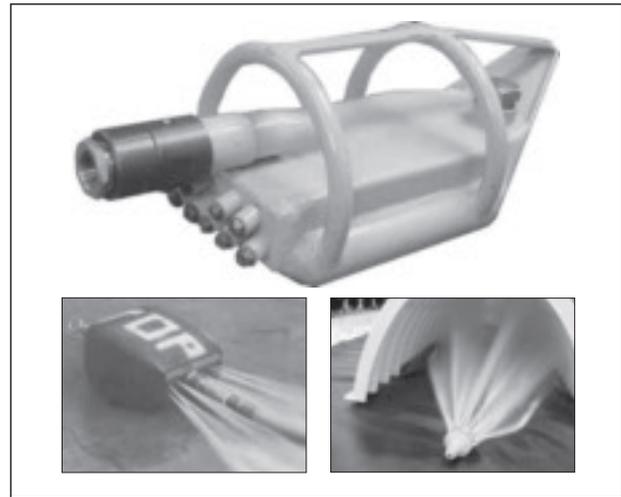
At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

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.

2.2 MAINTENANCE

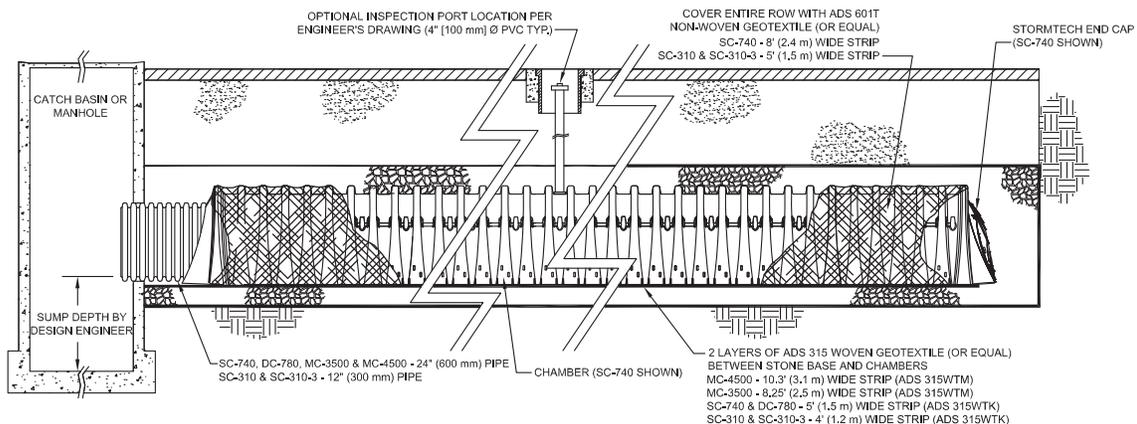
The Isolator Row was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via 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.



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

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 DC-780, MC-3500 AND MC-4500 CHAMBER MODELS AND IS NOT REQUIRED OVER THE ENTIRE ISOLATOR ROW.

3.0 Isolator Row Step By Step Maintenance Procedures

Step 1) Inspect Isolator Row for sediment

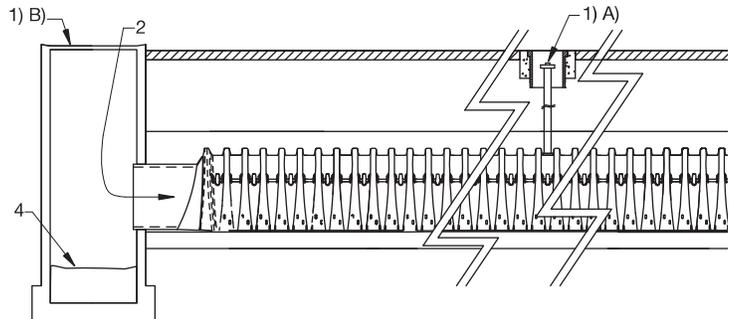
A) Inspection ports (if present)

- 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.

StormTech Isolator Row (not to scale)



Step 2) Clean out Isolator Row using the JetVac process

- A) A fixed culvert 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) | | | |
| 3/15/01 | 6.3 ft. | none | | New installation. Fixed point is CI frame at grade | djm |
| 9/24/01 | | 6.2 | 0.1 ft. | Some grit felt | sm |
| 6/20/03 | | 5.8 | 0.5 ft. | Mucky feel, debris visible in manhole and in Isolator row, maintenance due | rv |
| 7/7/03 | 6.3 ft. | | 0 | System jetted and vacuumed | djm |



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