

Contractor Training for Underground Stormwater Facility Maintenance

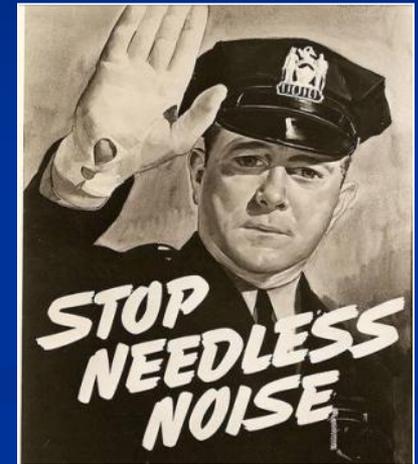
Spring 2017

Presented by:

Francis Flabbi, Brian Gregg & Rick Watson

Contractor Requirements

- Maintain OSHA Confined Space Certification
- Follow Montgomery County Noise Control Ordinance
- Follow Montgomery County and/or Maryland State Highway Administration Work Zone Traffic Control Standards



Belowground Inspection Procedures

Every year an inspection will be performed.

- Annual pre-inspection
 - Pass = no pump-out or cleaning.
 - Fail = maintenance required
- Triennial inspection
 - Requires pump out and cleaning of structure.
 - DEP will not conduct an annual pre-inspection.

Belowground Notification Procedures

- Inspection performed
- MC.DEP sends Maintenance Repair Report/Work Order to the facility owner via e-mail
- Emergency and High Repairs must be completed ASAP.
- Other repairs may be deferred to following year.

For filtration devices, contractors should not prepare bids off the work order alone.



Maintenance Notification and Inspection Report

- **Annual Maintenance:** Follow the cleaning methods and procedures we will review today.
- **Minor Repairs Required:** These minor repairs must be completed at the time of cleaning.
- All repairs must be included in bid.

Repair Work Order

EAM

STORMWATER INSPECTION AND MAINTENANCE WORK ORDERS

infor

Work Order 06171 (DEP) SEPSF Repairs: Hearthstone Village CA
 Status Closed
 Parent Work Order
 Department SWM-RESID-DEP Residential Maintained by DEP
 PM Code
 Cost Code
 Problem Code
 Reported By
 Project
 Standard WO REPWOUJSEPSF SEPSF Repairs:
 Equipment 12632 (DEP) Hearthstone Village CA
 Location INSP-REG01 (DEP) Inspection Region 1
 Equipment Manufacturer
 Equipment Model
 Equipment Serial Number
 Date Started
 Scheduled Start Date 10/09/2014
 WO Type REP
 Class UG
 Priority
 Warranty N
 Safety N
 Equip Criticality
 Assigned To
 Assigned By
 Estimated Hours 2
 Estimated Cost 0.00
 Actual Cost 0.00
 Date Completed 02/12/2015

Equipment User Defined Fields

Sequence Number 210861.02
 Sed Control Permit # 995190007
 Access Street 1936 University Blvd
 Owner Hearthstone Village Condo Assoc
 Property Manager IKO Real Estate, Inc.

Work Order Comments

INSP01 [10/23/2014 11:00]:
 - Minor sediment acculation on filter media. Monitor. Photos 20, 24-26.
 ~ Greg Harless & Gene Fleagle
 MILBER [02/12/2015 12:49]:
 WO closed & maintenance deferred.

Work Order User Defined Fields

Contracted Inspector Harless_G
 QA/QC Reviewer Fleagle_G
 Maintenance Level ROUTINE
 Date Insp Completed 10/07/2014

Activities

Activity	Trade	Est. Hours	People Req.	Task Plan	Description
20	CM/MAINT	1	1	M-UG01	Annual Maint: Sed,Trash, Debris removal, Pump out&pressure wash facility-ROUTINE

BUTLEA [Mar 9, 2016 8:23:34 AM]:

Maintenance Procedures:
 This facility requires all sediment, trash, debris, and liquids removed from the structure.
 Properly dispose of all liquids and material removed from the structure.
 Repair corrosion of all metal components of the facility, including replacement if directed by DEP Inspector.
 The facility must be power washed.

You must contact the assigned Inspector at least 48 hours before beginning the maintenance work.

The Inspector must inspect the cleaning and repair activities while these activities are occurring to ensure these activities are properly performed.

Once all work has been completed, contact the Inspector to schedule a final inspection of your facility.

30
 1
 1 N-MIS10 Monitor Non-Structural Components: Vegetation and Trash - ROUTINE

ODENU [Oct 5, 2012 2:32:51 PM]:

Monitor Non-Structural Components of Stormwater Facility to ensure adequate vegetative cover and excessive trash and debris

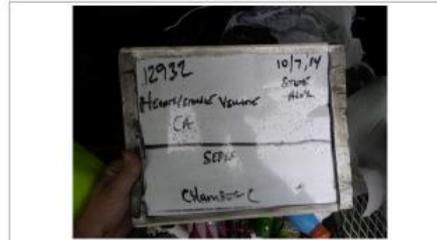
Montgomery County Asset #12932



12932 10072014 025



12932 10072014 026



12932 10072014 027



12932 10072014 028



12932 10072014 029



12932 10072014 030



12932 10072014 031



12932 10072014 032

Maintenance Notifications: NOV

MONTGOMERY COUNTY, MARYLAND

Department of Environmental Protection
255 Rockville Pike, Suite 120
Rockville, Maryland 20850
PHONE: 240-777-7770
FAX: 240-777-7715



STORMWATER MGMT. MAINTENANCE
NOTICE OF VIOLATION

INSPECTION DATE: May 17, 2012

Asset/Sequence No. 12752

ASSET ID/PROPERTY NAME: Washington Science Center @ 6101 Executive Blvd.

NOTICE OF VIOLATION

An inspection of the existing underground stormwater management retention system by this Department and this Department's Inspection Contractor reveal the structural integrity of the existing 72" diameter corrugated metal pipe is threatened.

The property owner shall immediately secure the services of a professional civil engineer licensed in the State of Maryland, to perform a structural analysis of the underground stormwater facility in it's entirety.

Because inspections have revealed the structural integrity of the stormwater facility is in jeopardy of failing and/or collapsing, this Department recommends the following course of actions be exercised immediately:

1. Block/disallow parking over and adjacent to the facility (see attachment aerial photo)
2. Install timber blocking within the existing 72" CMP to prevent collapse of the pipe.

This underground stormwater management facility is considered a 'confined space' and all applicable Maryland Occupational Safety and Health (MOSH) and Occupational Safety and Health Administration (OSHA) laws and regulations must be complied with by persons entering the underground stormwater facility.

Any repairs to the underground stormwater management system must be performed by a contractor approved by this Department. A list of approved contractors may be located on our website at: [Approved SWM Underground Contractors](#)

The property owner must contact the undersigned immediately to schedule a meeting to discuss the condition and repairs to the stormwater management system.

Re-inspection Date(s):

Inspector: Jerry Oden  05/18/2012
Printed Name Signature Phone No. Date

Received By: E-mailed To: Walter Perla, Assistant Chief Building Engineer 05/18/2012
Printed Name Signature Phone No. Date
wperla@writ.com

High Criticality & Emergency Repairs

Scheduling an Inspection

- Call the MC.DEP Inspector at least **48 hours prior** to cleaning and performing repairs
- E-mail a notice of cleaning and repairs to DEP:
SWInspections@montgomerycountymd.gov
- **DAY OF CLEANING:** Contact MC.DEP Inspector the morning of maintenance

Maintenance Coordination

- Failure to coordinate your maintenance with our staff may result in our inability to inspect the completed work.
- If this happens, you may be required to pump out the structure a second time.

**We will make every effort to work with you,
but it is a “two-way” street.**

On Site

- Call the MC.DEP Inspector each day that maintenance is proceeding.
- Call the MC.DEP Inspector if you cannot keep the appointment.
- Contact Oaks Treatment Facility with time of delivery (See handout)
- **Property Owners will not receive credit unless all procedures outlined in the presentation are followed**

Questions, Concerns, Problems?

Call the MC.DEP Inspector



New 2017: Manifest Required

Certification:

- I hereby certify that the information on this MANIFEST is correct and that the materials disposed are from stormwater facilities within Montgomery County, MD.

Montgomery County Oaks Sanitary Landfill Waste Discharge Manifest

Date of Disposal: _____ **Ticket No.: Pre-Printed**

Hauler: _____
Company Name (Waste Generator)

_____ Street Address

_____ City - State - Zip Code _____ Phone

_____ E-Mail Address

_____ Vehicle ID / License Tag Number

Volume of Waste: _____

Nature of Waste: Liquid* Soil / Sand / Gravel Solid Waste
** Stormwater Only: No Septage, Gasoline or other petrochemicals allowed*

Waste Generator: MCDEP Stormwater Facility Asset No(s):

Type of Stormwater Management Facility:

Hydrodynamic (e.g., Oil/Grit Separator, Stormceptor, BaySaver)

Filtration Structure (e.g., Oil/Grit Separator Sand Filter)

Cartridge Filter Structure (e.g., StormFilter, BayFilter, AquaFilter)

Underground Detention Structure (e.g., Storage Pipes)

Flow Splitter

Aboveground Facility (e.g., Sand Filter, Infiltration Trench, Pond)

Other (Specify): _____

Certification:

I hereby certify that the information on this MANIFEST is correct and that the materials disposed are from stormwater facilities within Montgomery County, MD.

_____ Printed Name _____ Signature _____ Date

Disposal Procedures

Shady Grove Transfer Station

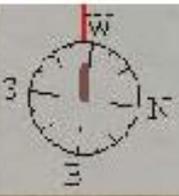


MONTGOMERY COUNTY OAKS LANDFILL



LEACHATE PRETREATMENT FACILITY

DECEMBER, 1994

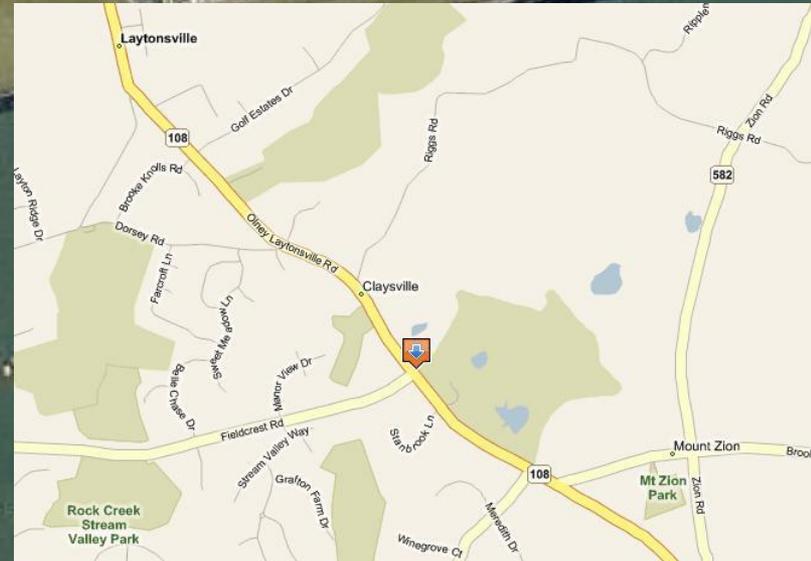


Dump Pit



Mulch Stockpiles

Building Containing Anaerobic
Decomposition Facility



6001 Olney-Laytonsville Road
(near Fieldcrest Road and MD. Rte. 108)
Laytonsville, MD.

Pumping & Disposal of Liquids & Materials from Underground Facilities

WRONG



Correct

Knowledge Check

Repair Procedure Question

- When must you call the MC.DEP Inspector to schedule an inspection?

At least:

- A. 2 hours prior to cleaning and performing repairs.
- B. 48 hours prior to cleaning and performing repairs.
- C. 7 days prior to cleaning and performing repairs.

Repair Procedure Question

You must contact the MC.DEP
Inspector on the morning of
maintenance.

True

or

False

Disposal Procedure Question

Dumping at the Oaks without a **Waste Discharge Manifest** is allowed.

True

or

False

Now you Know

You need to maintain:

- Oil Operations Permit from MDE
- OSHA Confined Space Certification

You need to follow

- Montgomery County Noise Control Ordinance
- Montgomery County Work Zone Traffic Control and/or Maryland State Highway Administration Traffic Control Standards
- Notification and Oaks Disposal Requirements

What happens if you fail to comply with the procedures??

DEP may issue a civil citation to the owner or management company if :

- Inspector is not notified **48 hours** before maintenance is to begin, and
- Inspector is not notified **each morning** maintenance is to begin.
(COMCOR Chapter 19, Section 19-28)



Break



Maintenance Procedures

Know your
scope of
work
BEFORE
you arrive.

Work Order	122158 (DEP) STFIL Repairs: Congressional Country Club	Scheduled Start Date	08/05/2016
Status	Released/Open	WO Type	REP
Parent Work Order		Class	UG
Department	SWM-COMM Commercial Maintained Privately	Priority	
PM Code		Warranty	N
Cost Code		Safety	N
Problem Code		Equip Criticality	
Reported By		Assigned To	GREGGB
Project		Assigned By	
Standard WO	REPWOUGSTFIL STFIL Repairs:		
Equipment	16084 (DEP) Congressional Country Club		
Location	INSP-REG02 (DEP) Inspection Region 2		
Equipment Manufacturer		Estimated Hours	1
Equipment Model		Estimated Cost	0.00
Equipment Serial Number		Actual Cost	0.00
Date Started		Date Completed	

Equipment User Defined Fields

Sequence Number	253435
Sed Control Permit #	231475
Access Street	8500 River Rd

Work Order Comments

INSP01 [05/12/2016 16:24]:

-Two open holes in Chamber B allow untreated water to bypass the facility treatment. Add Cartridges or cap holes. Photos 020 - 023.
Note: If holes are capped, the underdrain must remain remain unblocked to allow upstream cartridges to drain to the outlet chamber

-Kallie Fullem & Gene Fleagle

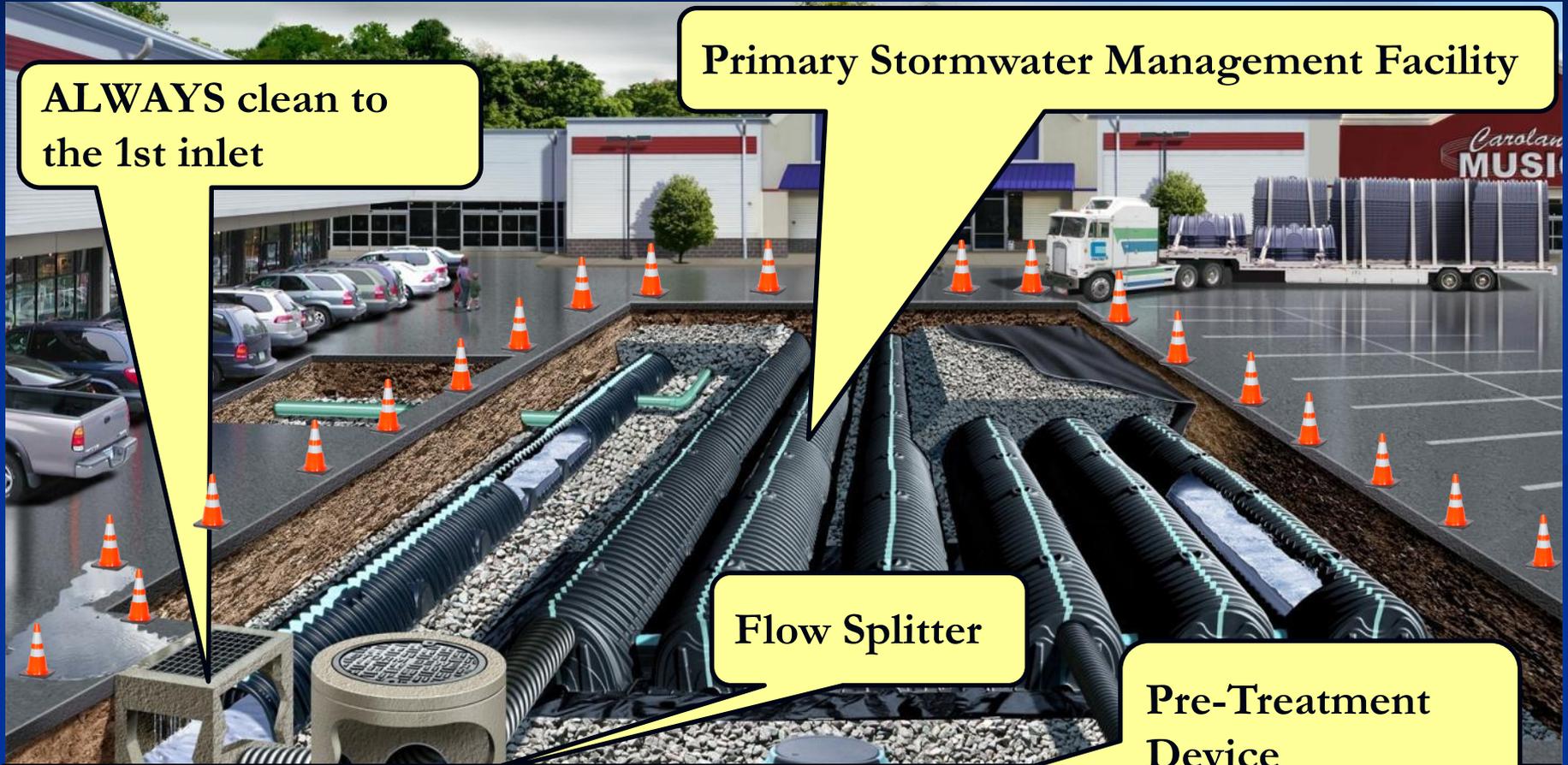
Work Order User Defined Fields

DEP Inspector	GREGGB
Contracted Inspector	Ridolfi_J
QAQC Reviewer	Fleagle_G
Maintenance Level	HIGH
Date Insp Completed	04/18/2016

Activities

Activity	Trade	E.st. Hours	People Req.	Task Plan	Description
20	CMAINT	1	1	M-JG01	Annual Maint: Sed,Trash, Debris removal, Pump out&pressure wash facility-ROUTINE
BUTLEA [Mar 9, 2016 8:23:34 AM]:					
Maintenance Procedures: This facility requires all sediment, trash, debris, and liquids removed from the structure. Properly dispose of all liquids and material removed from the structure. Repair corrosion of all metal components of the facility, including replacement if directed by DEP Inspector. The facility must be power washed. You must contact the assigned Inspector at least 48 hours before beginning the maintenance work. The Inspector must inspect the cleaning and repair activities while these activities are occurring to ensure these activities are properly performed. Once all work has been completed, contact the Inspector to schedule a final inspection of your facility.					
30	CMAINT	0	1	S-RO02	Other Structural Repair (see comments) -
INSP01 [05/12/2016 16:24]:					
-Two open holes in Chamber B allow untreated water to bypass the facility treatment. Add Cartridges or cap holes. Photos 020 - 023. Note: If holes are capped, the underdrain must remain remain unblocked to allow upstream cartridges to drain to the outlet chamber					
40	INSP	0	1	F-JNSP	Final Inspection required by DEP once

Know Your Structures & Scope of Work



Insure Work Area is guarded for the safety of the public and your workers.

Initial Maintenance Procedures

All Structures

1. Install outfall pipe plug



Initial Maintenance Procedures

All Structures

2. Hydrojet the inlet pipe from the 1st inlet structure that flows into the Stormwater Management Structure.



Storm Drain Inlets & Flow Splitters

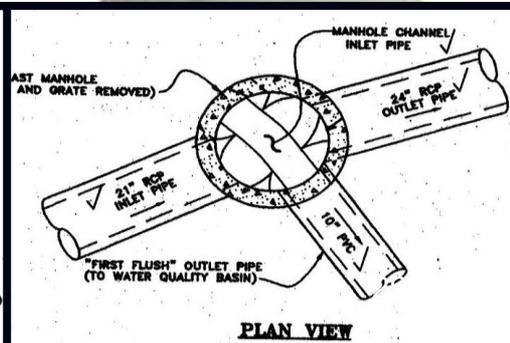
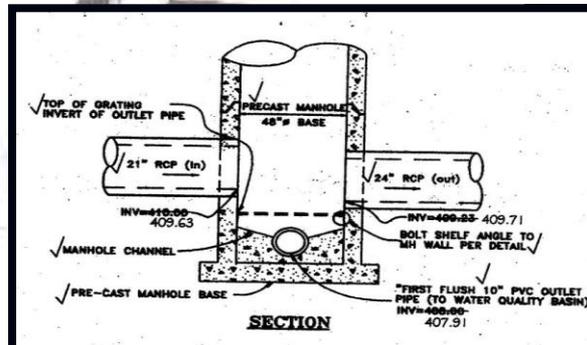


Maintenance Procedures: Non-Proprietary Devices

- Flow-Splitter
- Oil/Grit Separator
- Structural Sand Filter
- Underground Detention Pipe System



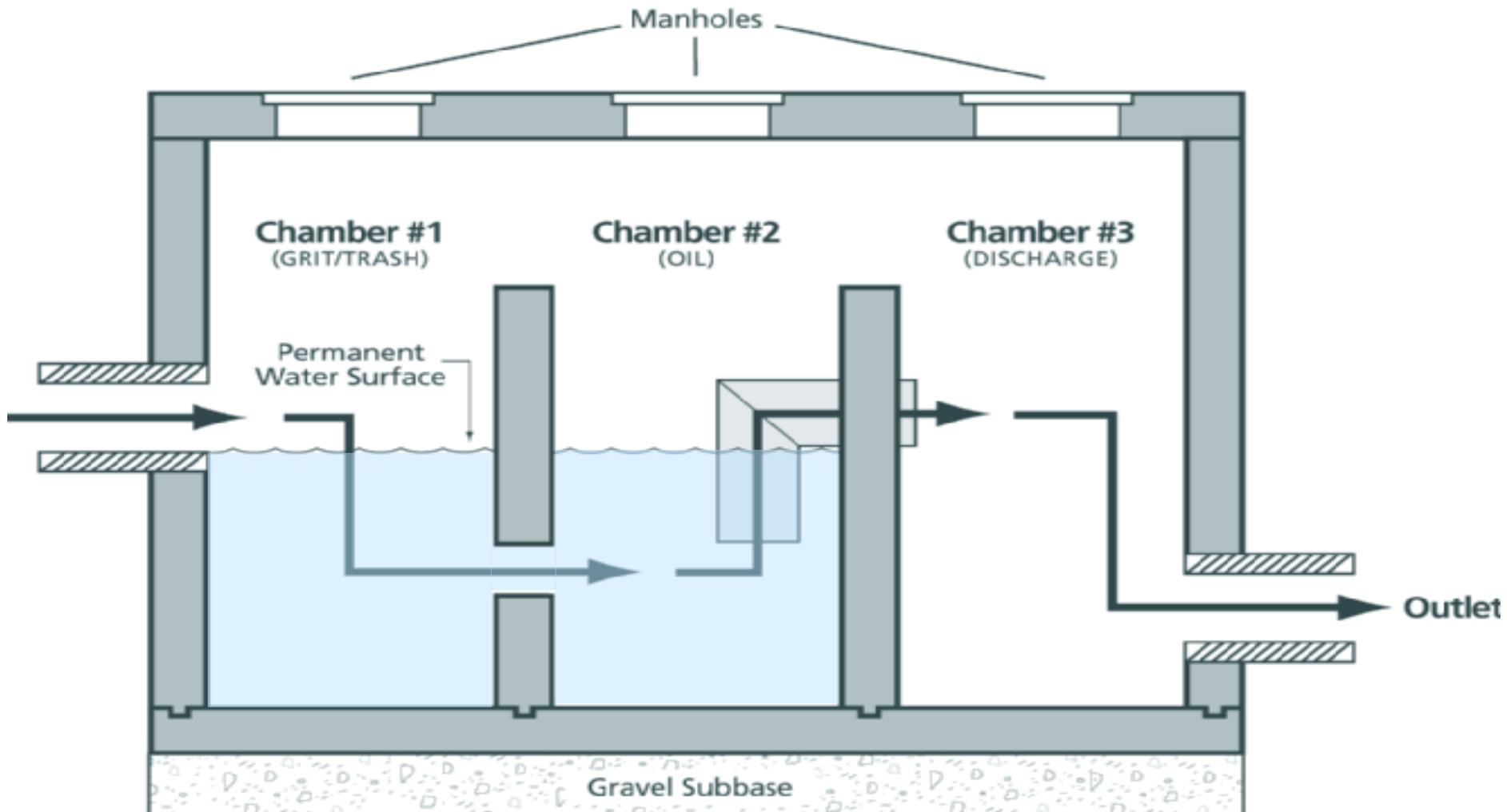
Flow Splitter



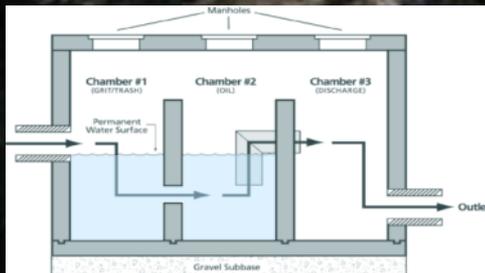


Oil/Grit Separator

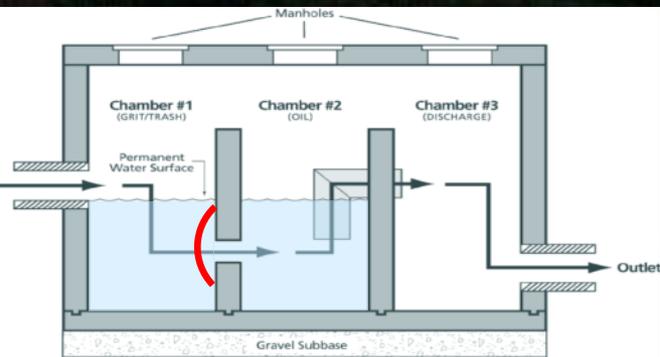
Oil/Grit Separators

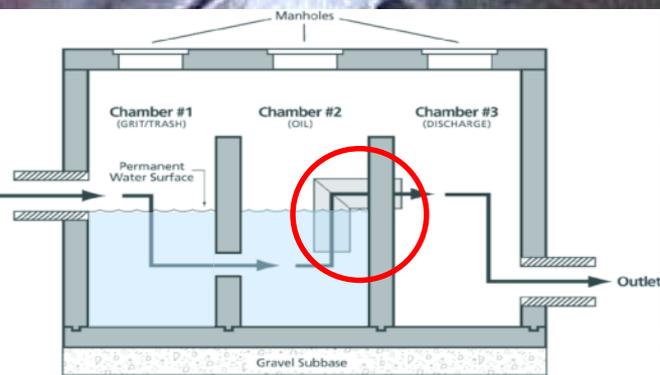


Pressure Washing Interior of All Structures Required



2006 11 7



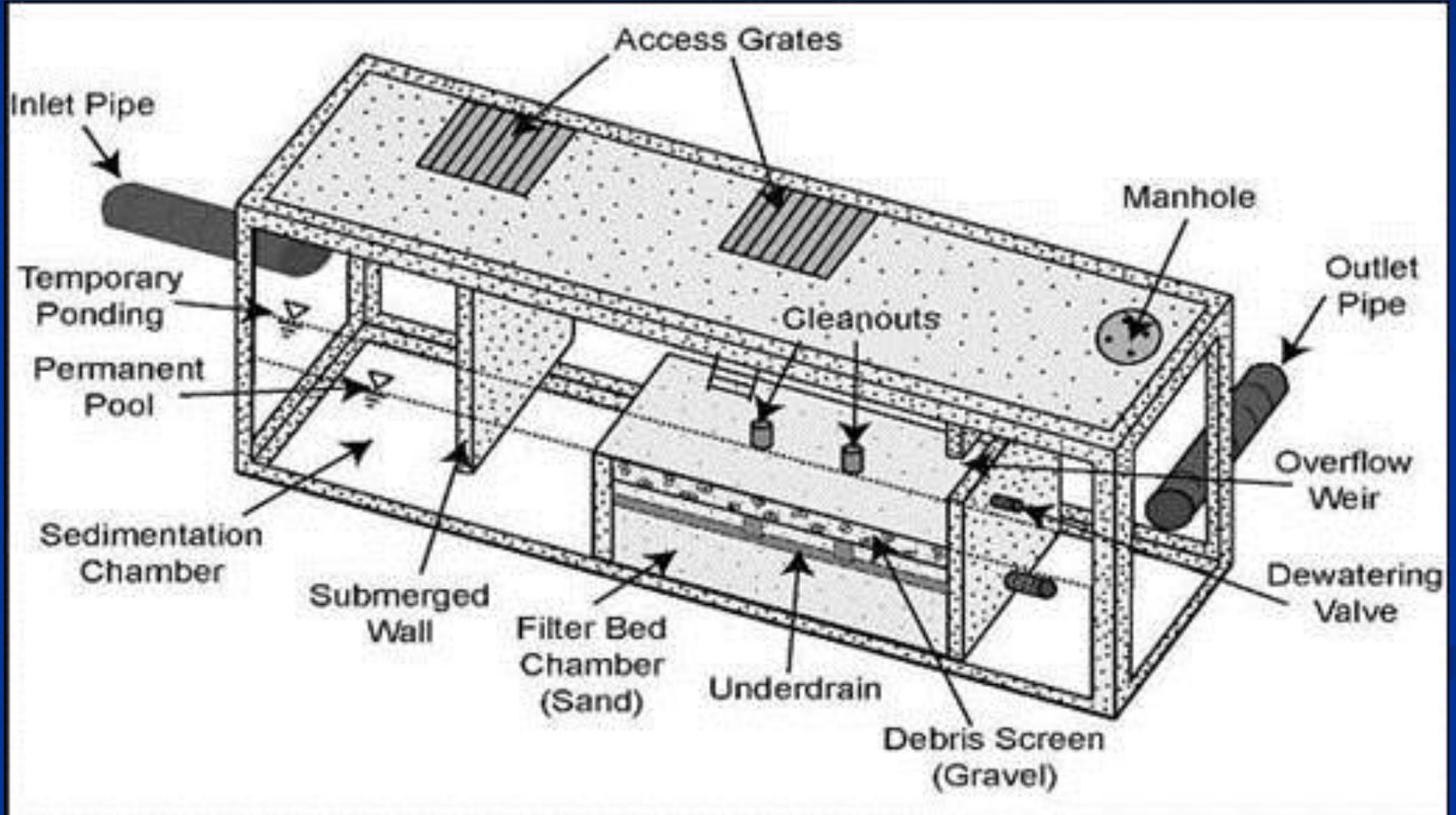


Oil/Grit Separator



Access May Be A Challenge

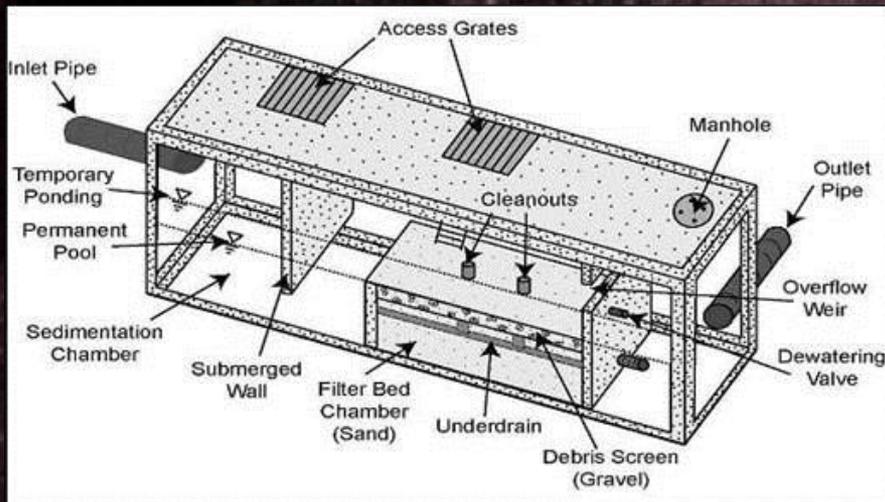
Separator Sand Filter Maintenance Procedures



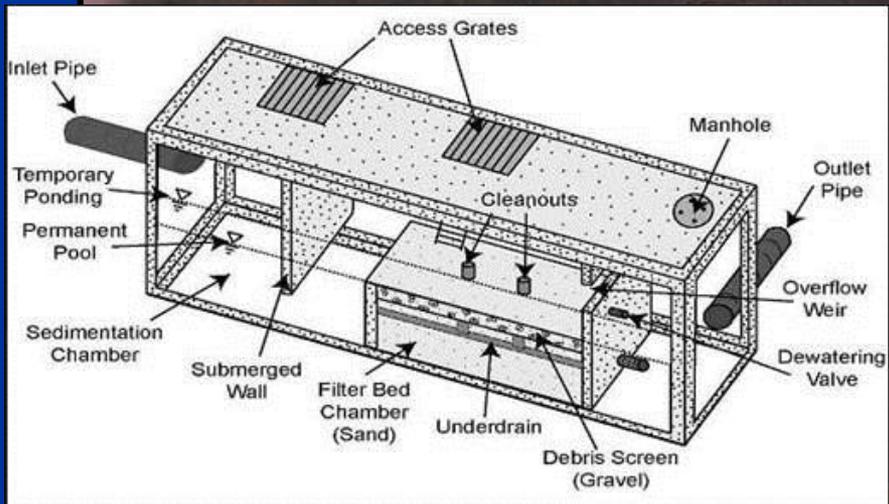
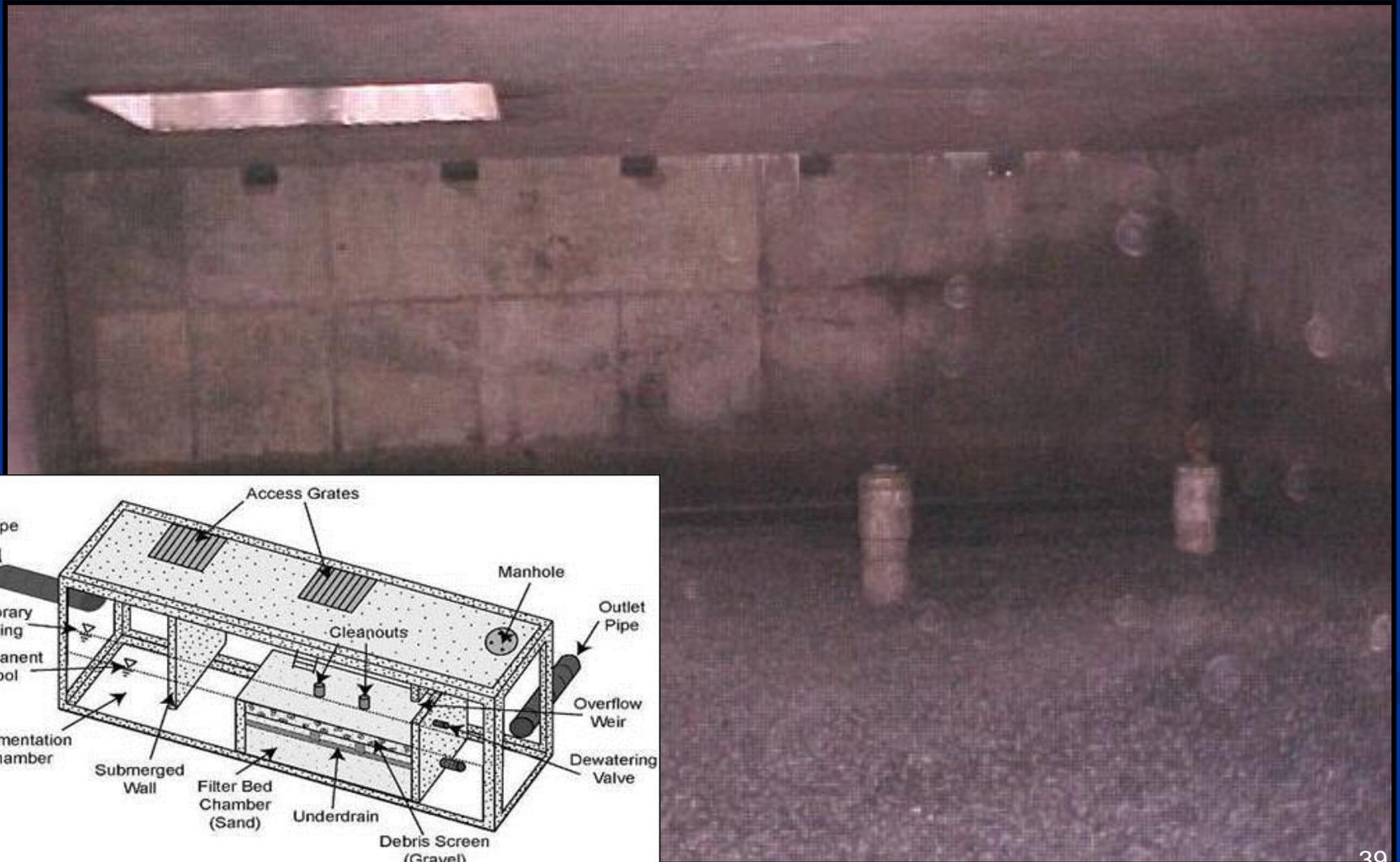
Separator Sand Filter Maintenance Procedures

- Before you bid, contact the MC.DEP Inspector.
- Determine necessary maintenance to bring to As-Built or current County standards.
- Assist with developing the scope of work for your contract.
- ALL repair material must be on job site next to sand filter before replacement work of filter media begins.
- Replacement of filter material may only start with the MC.DEP Inspector's approval.

Separator Sand Filter Maintenance Procedures (cont.)



Separator Sand Filter Maintenance Procedures (cont.)



Sand Filter Contamination

Before Cleaning

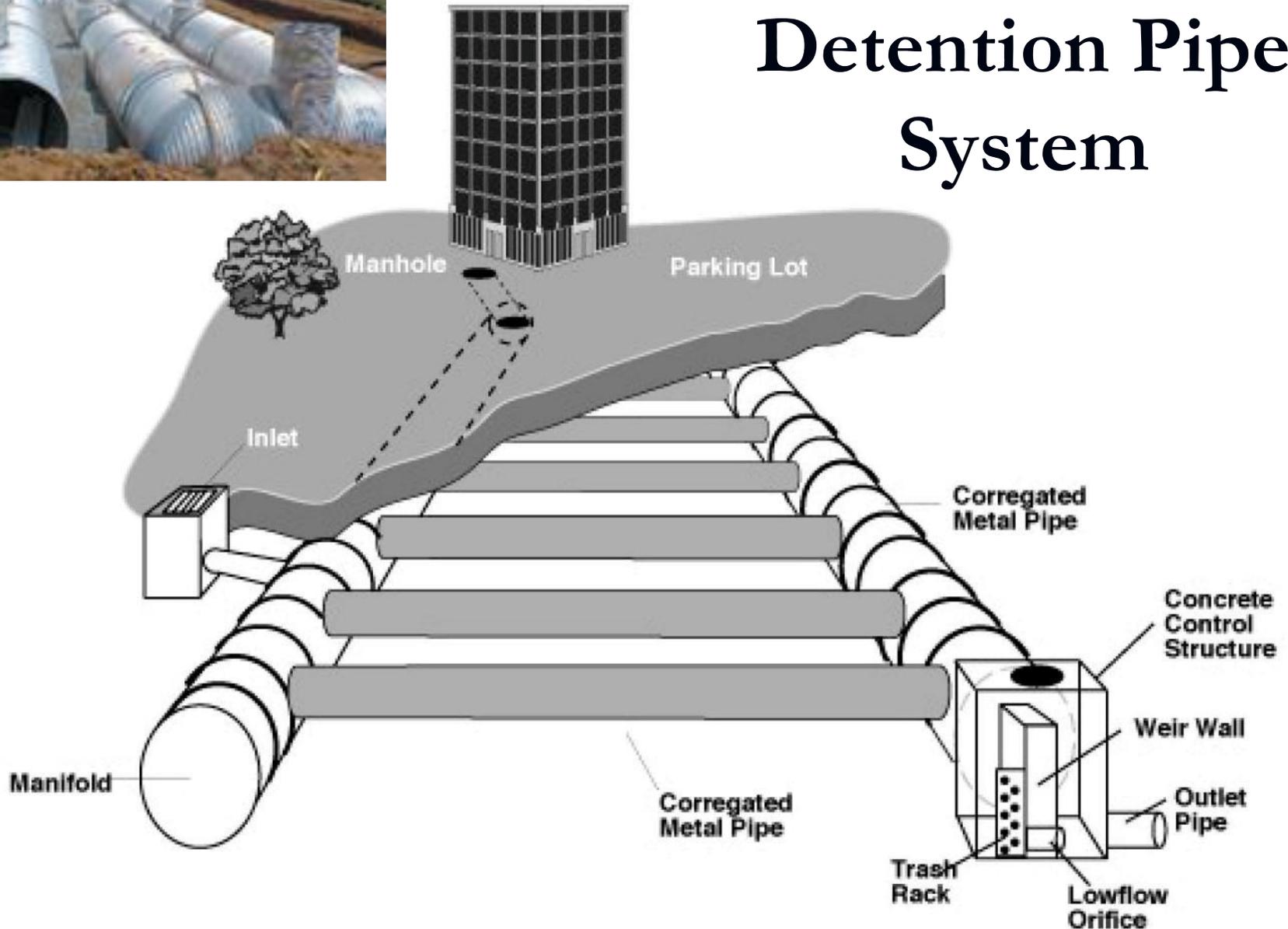
After Cleaning

Excessive Sediment Deposits
Remain In Voids of Stone

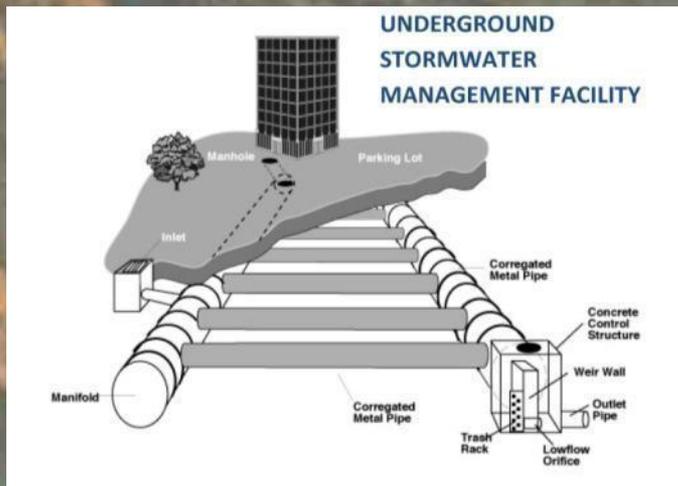
01/11/2012 09:55 AM



Underground Detention Pipe System



Underground Detention System Maintenance Procedures



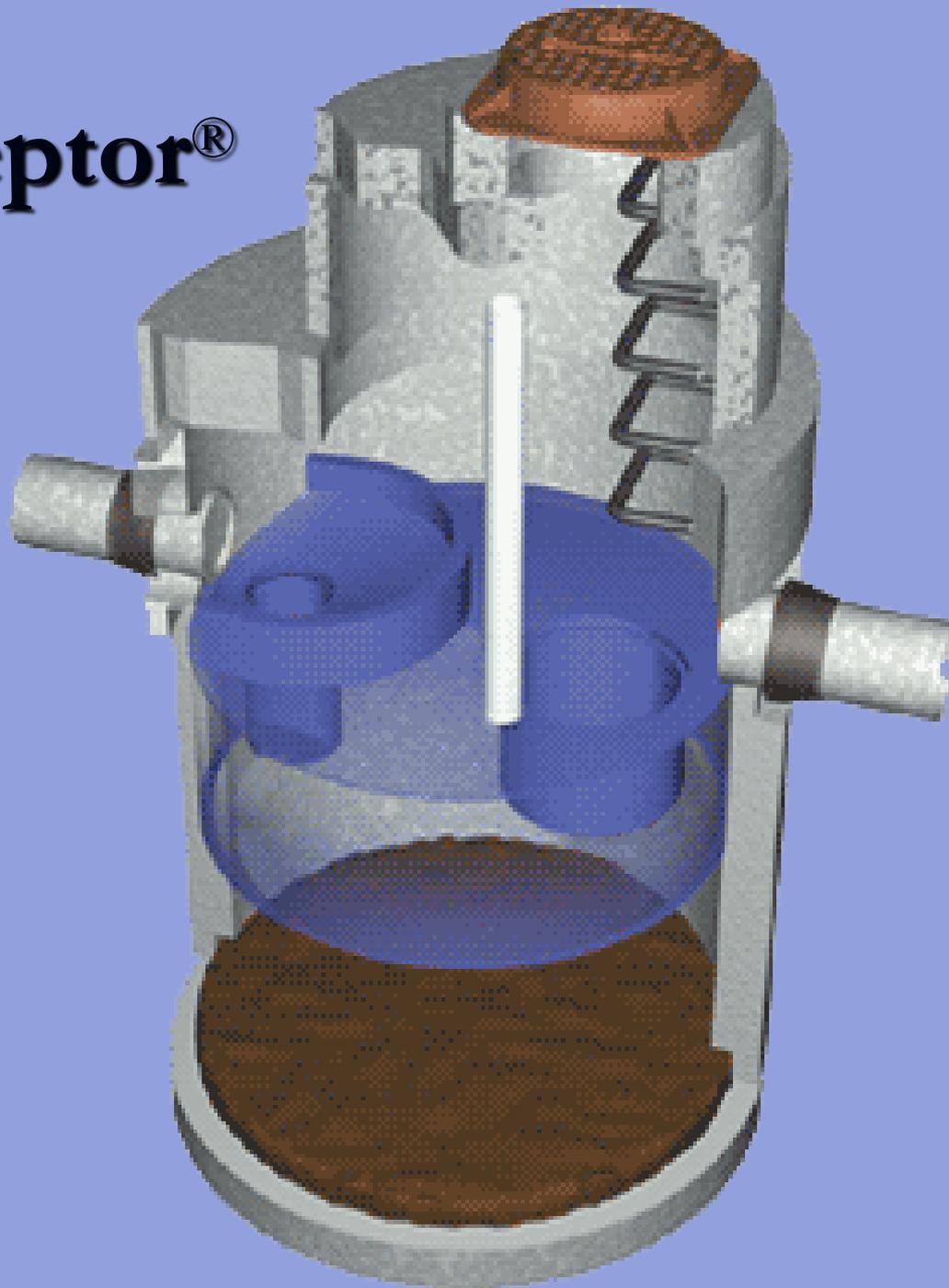


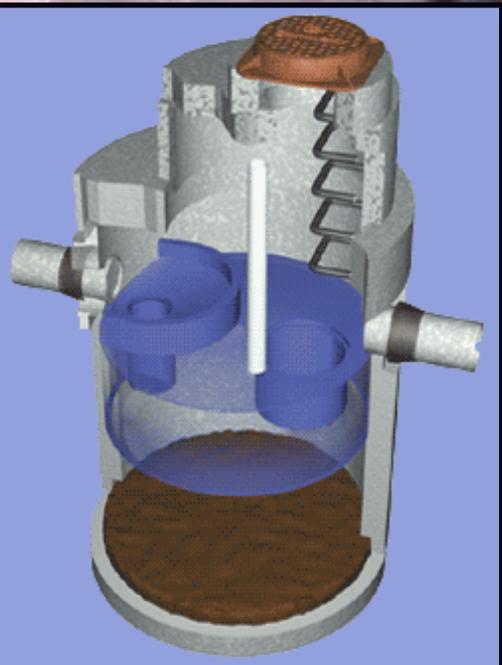
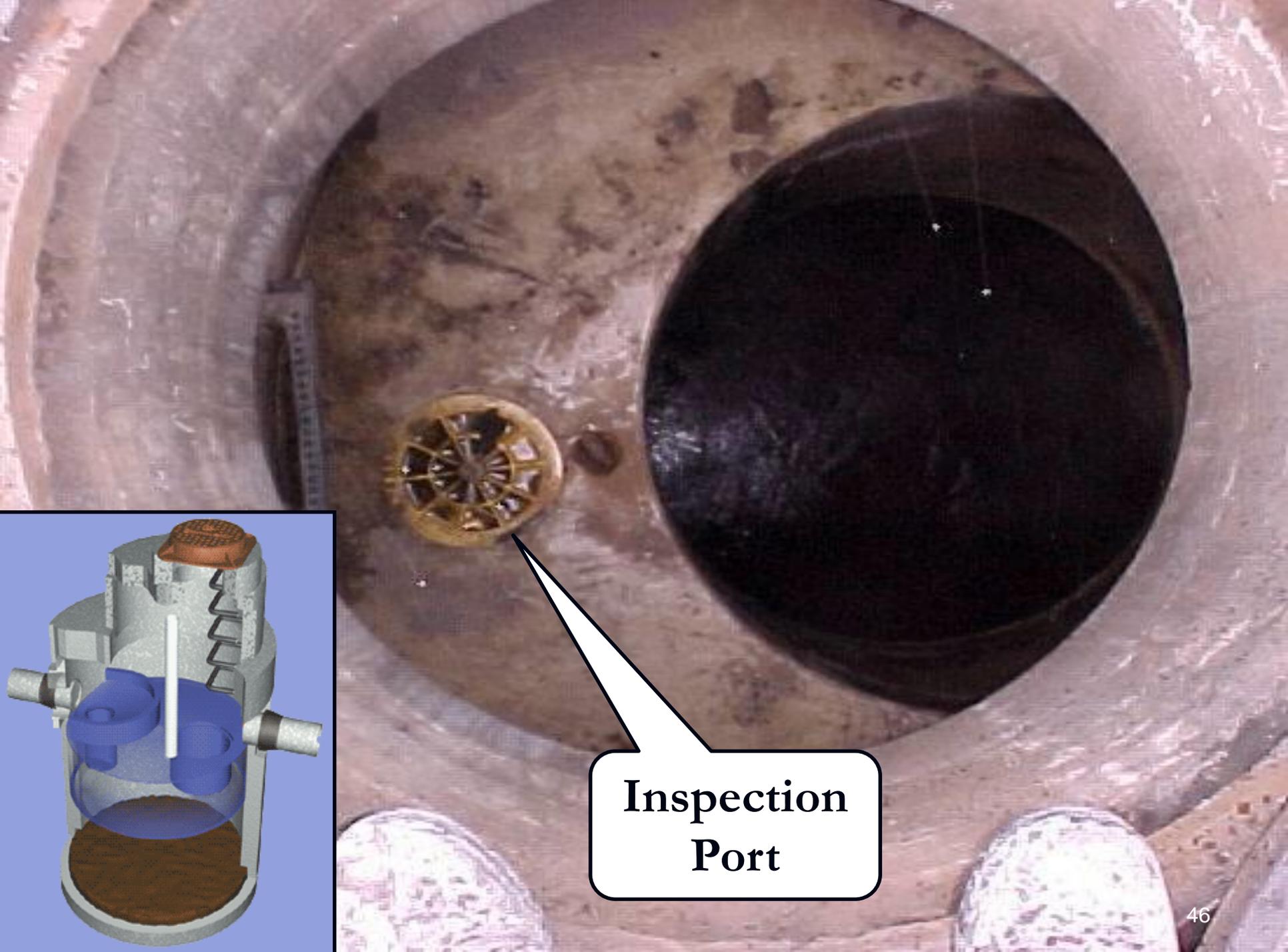
Underground Concrete Vault Detention System

Maintenance Procedures: Proprietary Devices

- Stormceptor[®]
- BaySaver[™]
- AquaFilter[™]
- Aqua-Swirl[™]
- The Snout[®]
- StormFilter[®]
- Environmental 21 V2B1
- Vortechincs[®]
- VortSentry[®]
- VortSentry HS[®]
- CDS[®]
- Jellyfish[®]
- Hydroguard[®]

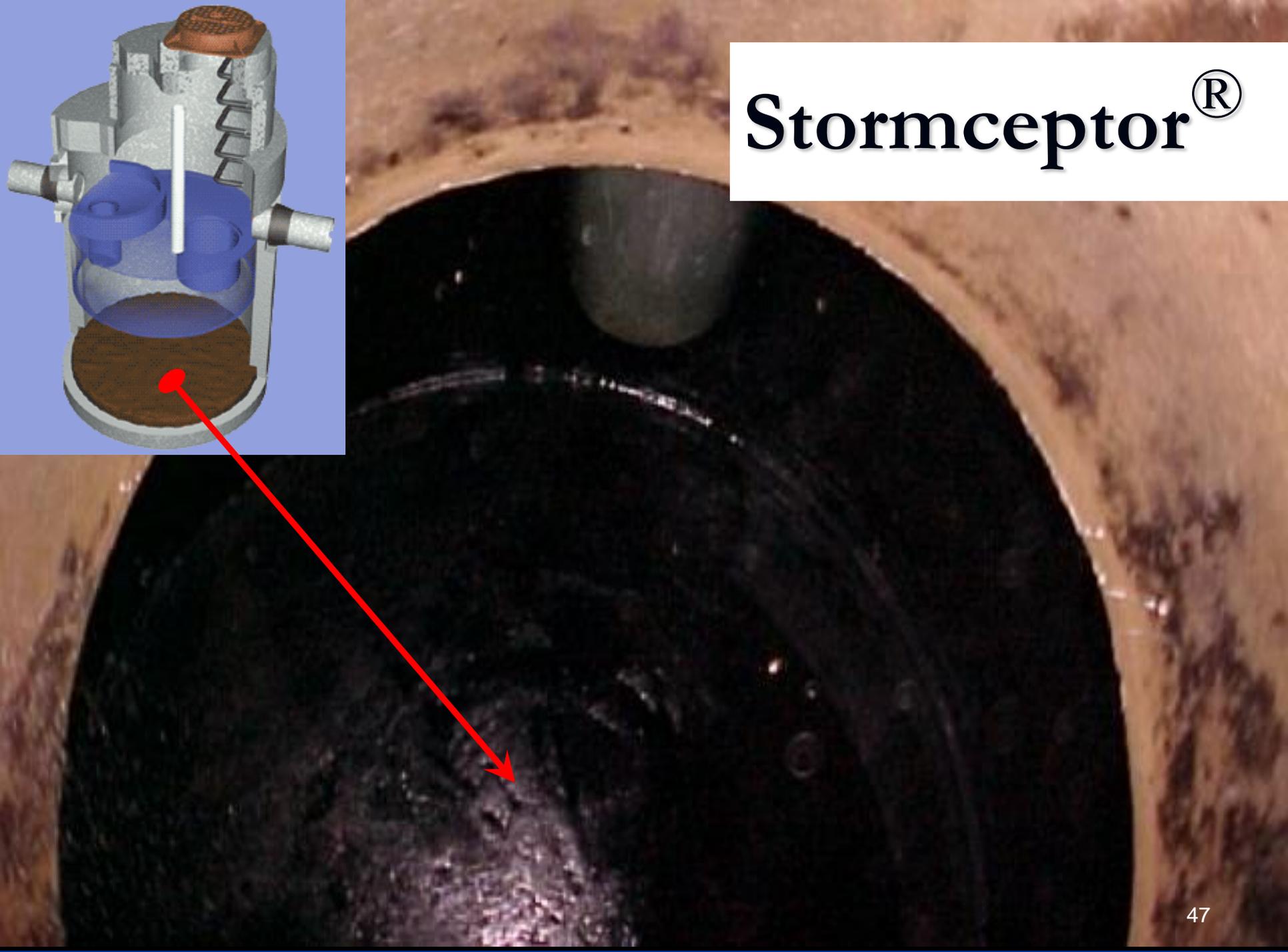
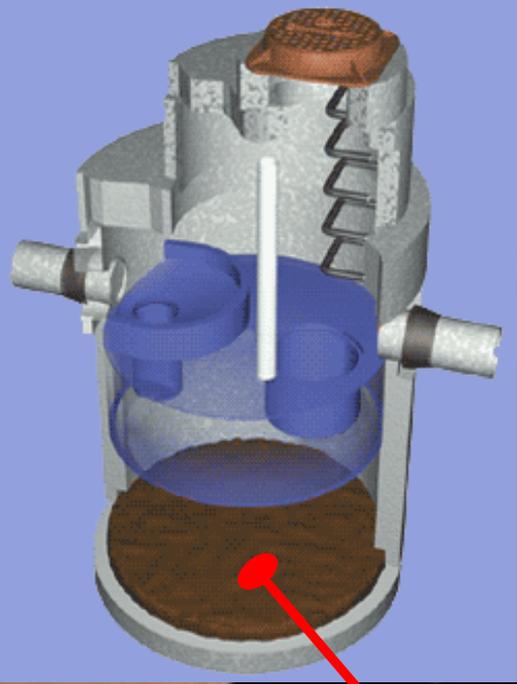
Stormceptor®



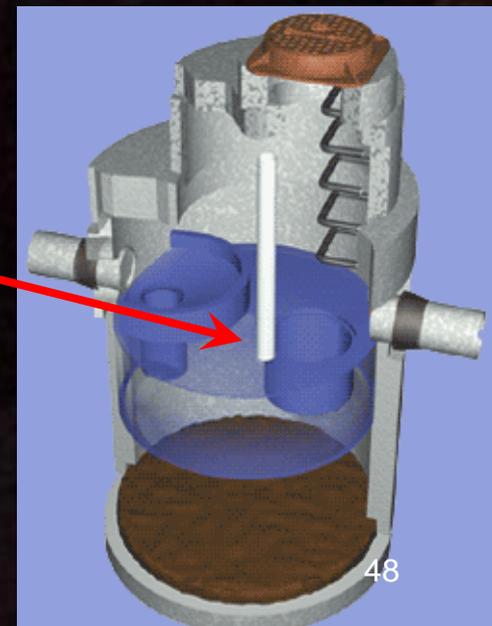
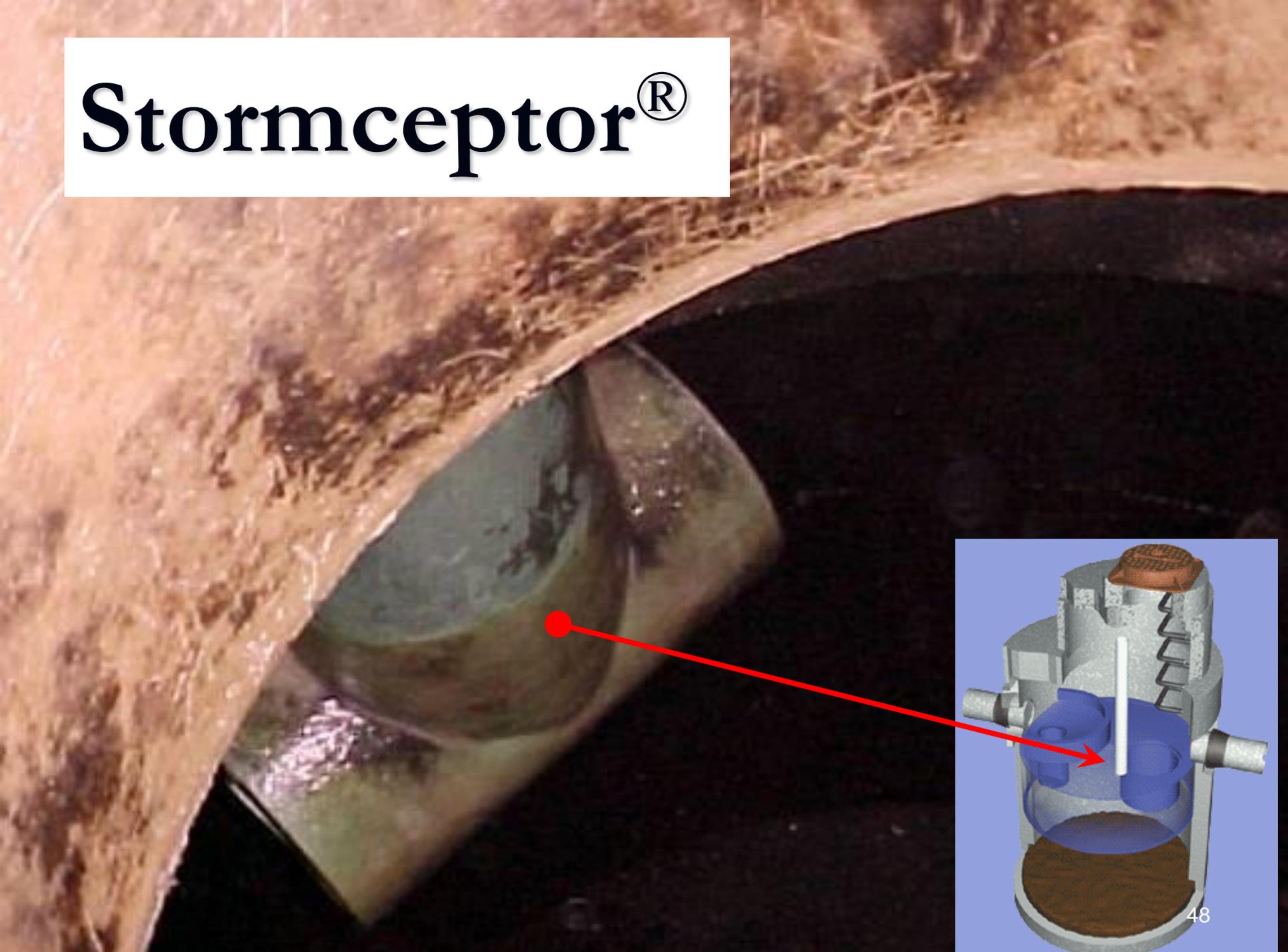


**Inspection
Port**

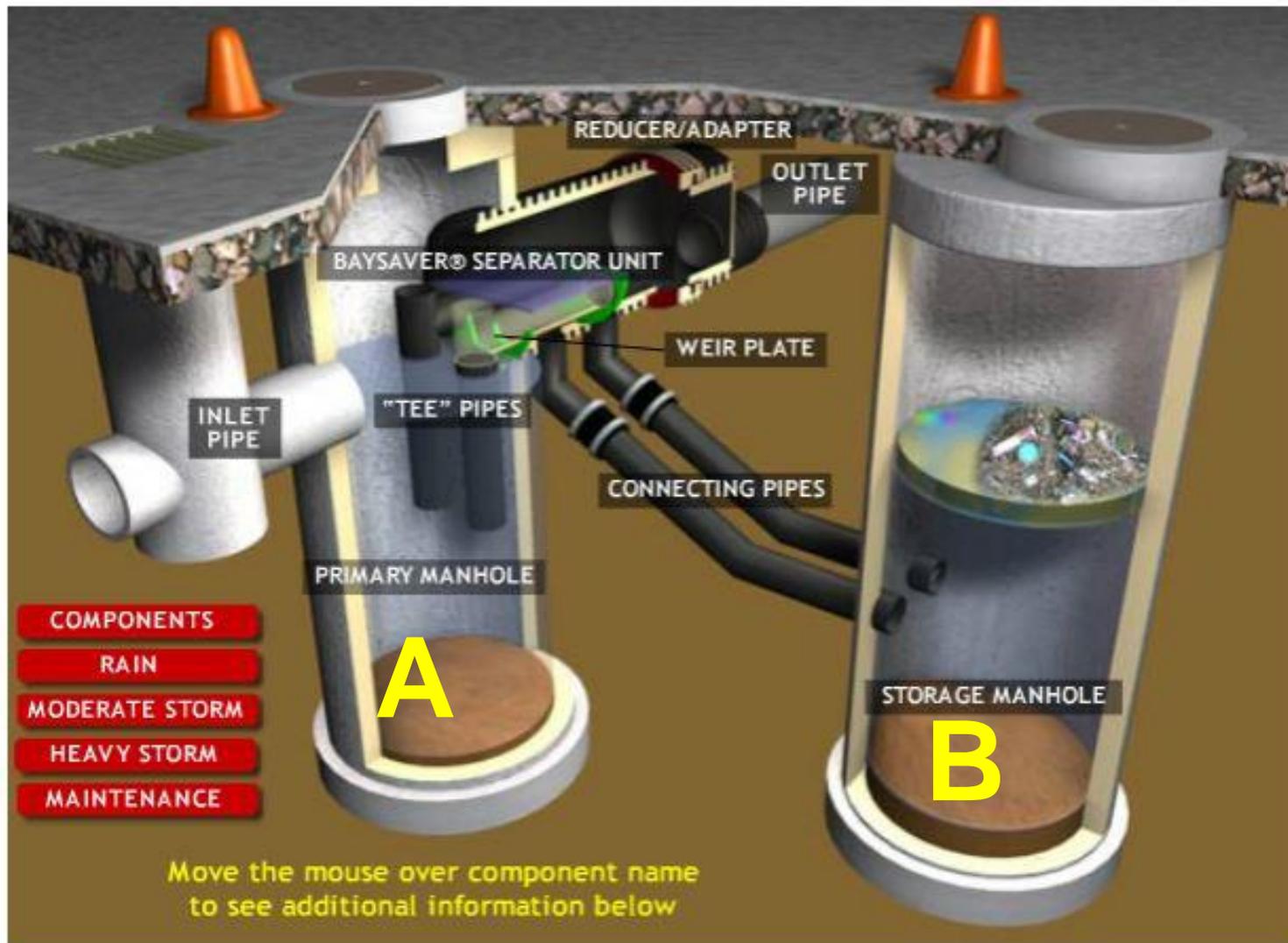
Stormceptor®



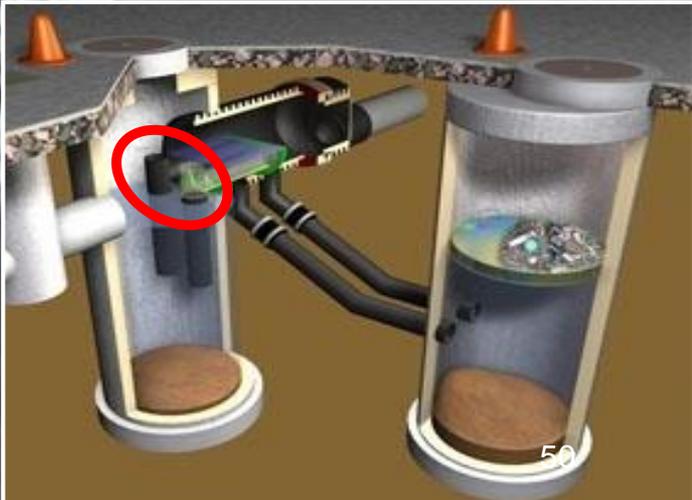
Stormceptor®



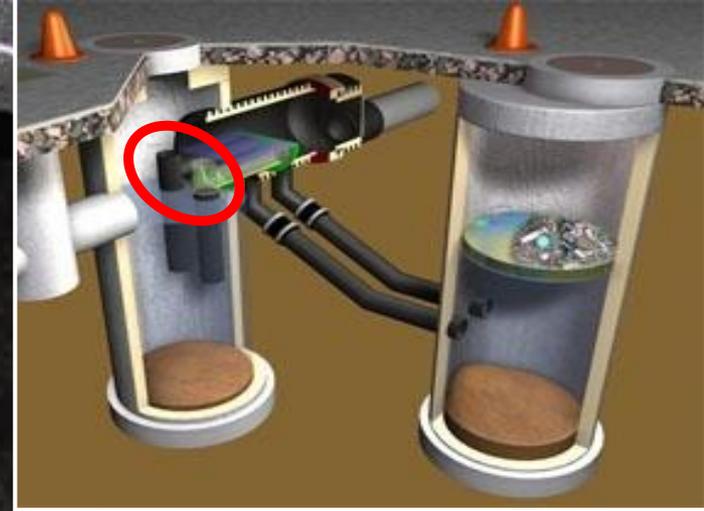
BaySaver™



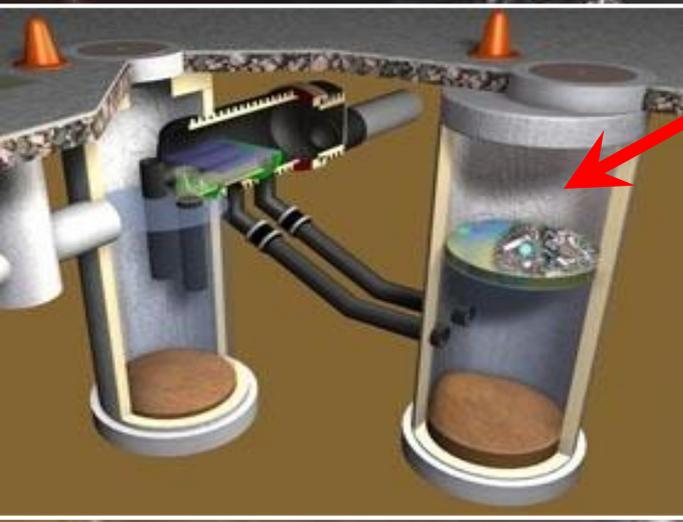
BaySaver™



BaySaver™



BaySaver™



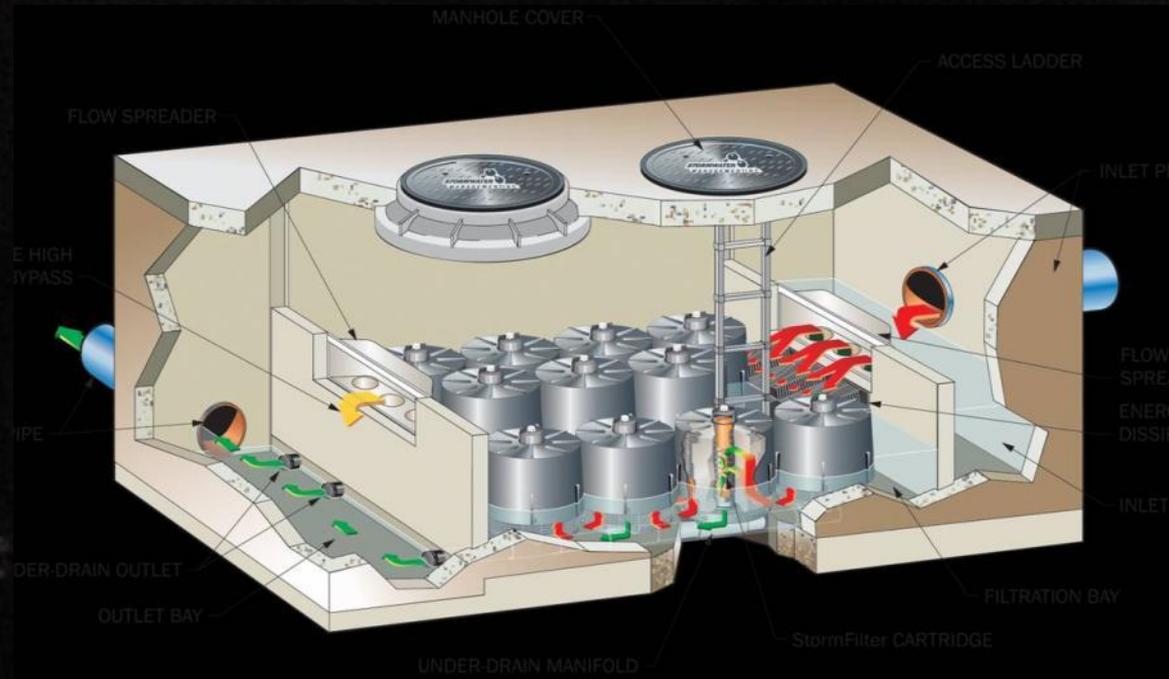
StormFilter[®]



PhosphoSorb[®] Filter Media

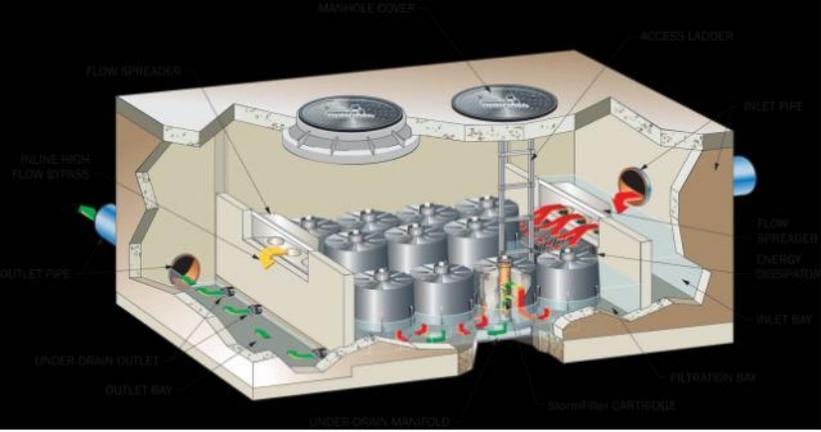
Designed for targeting
high levels of phosphorus

StormFilter[®]



StormFilter[®]





StormFilter®



Class Participation Time

Something is **WRONG**...



Class Participation Time

What's the Problem? How do you fix it?



Class Participation Time

Who's the problem and how do we fix it?



What is the problem?



Spalling

What is the problem?



Loose ladder/
manhole step

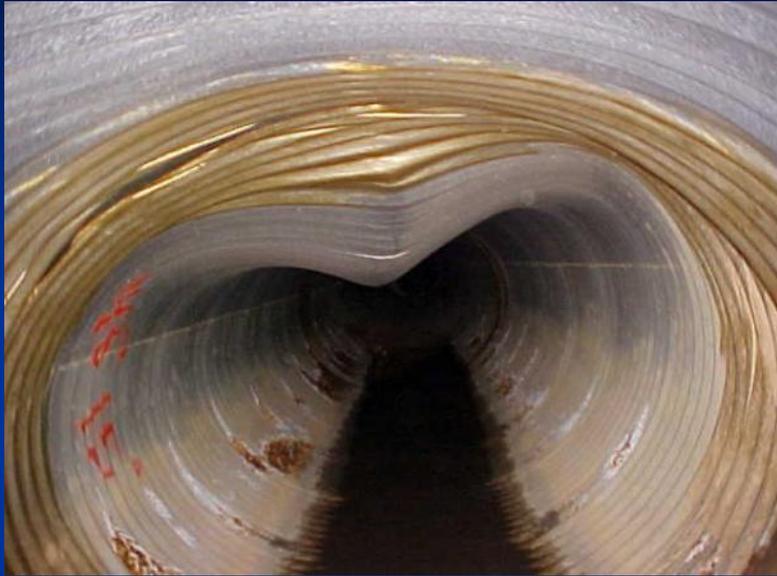


What is the problem?



Trash Rack
needs to be
replaced

Serious Problems Requiring Immediate Attention



**Crushed Pipes,
Pipe Deflections
(Pipes out of Round)**



**Pipe Joint Leaks &
Separations**

Serious Problems Requiring Immediate Attention



**Excessive Soil
Accumulations and Soil
Infiltration to Structures**



**Sediment
Deposits
from Failed
Joints**

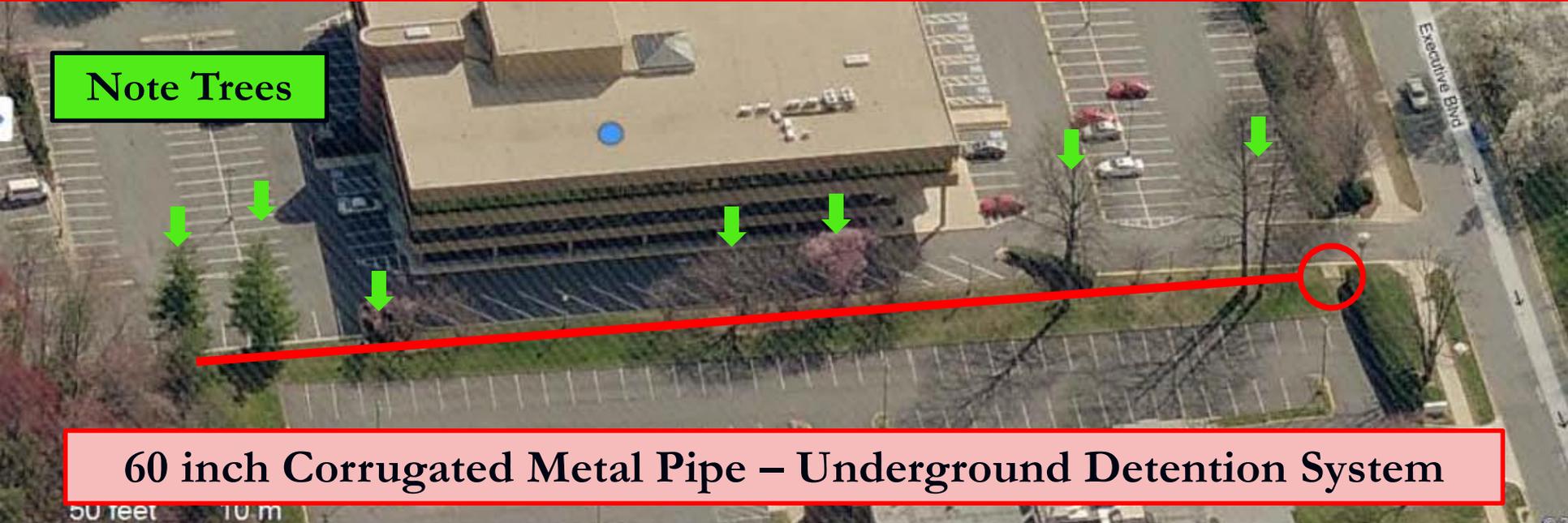
Serious Problems Requiring Immediate Attention

Pavement Cracking,
Pavement Failures Over
Underground Facilities

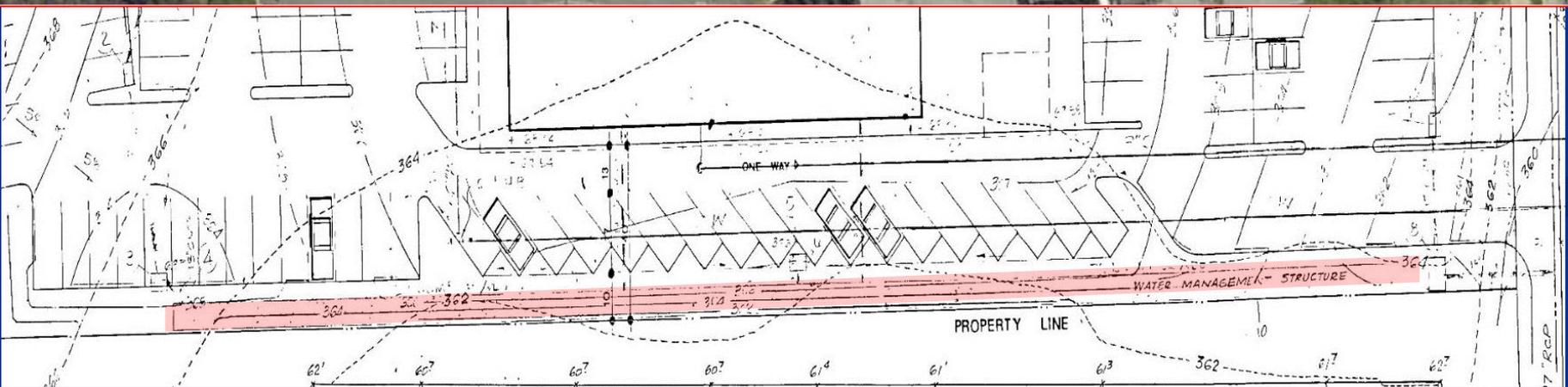


Past Underground Detention Repair

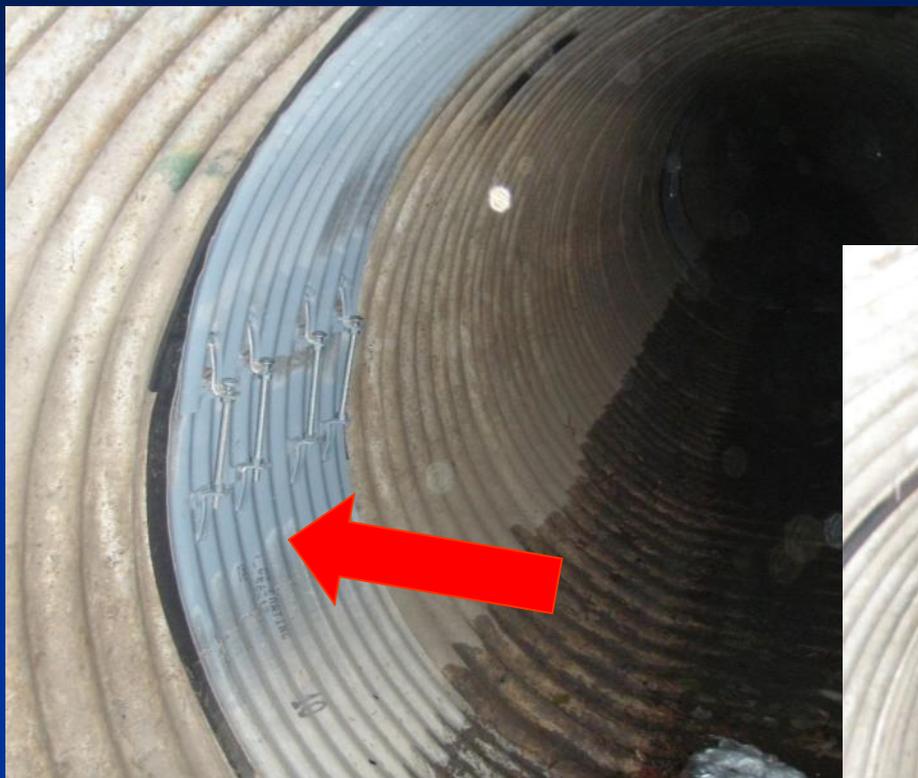
Note Trees



60 inch Corrugated Metal Pipe – Underground Detention System



Past Underground Detention Repair



Most all pipe joints
had failed

New Internal Bands
& Gaskets Installed



Past Underground Detention Repair



The round pipe was 'squashing' or becoming 'egg' shaped



A concrete invert , steel load spreader bar & columns were installed to prevent additional collapsing of the pipe.

Past Underground Detention Repair



These Trees on adjacent property



Remember the trees? The engineer felt it was best to remove the trees because the pipe did not have much 'cover' over it and the weight of the trees were likely contributing to the 'squashing' of the underground pipe.

Past Underground Detention Repair

CPJ Charles P. Johnson & Associates, Inc.
Civil and Environmental Engineers • Planners • Landscape Architects • Surveyors
Associates Silver Spring, MD • Gaithersburg, MD • Frederick, MD • Fairfax, VA

January 30, 2013

Mr. Mike Daugard
Washington Real Estate Investment Trust
6110 Executive Boulevard
Suite 800
Rockville, Maryland 20852

and

Ms. Eileen Frazier
Jewish Federation of Greater Washington, Inc.
6101 Montrose Road
Rockville, Maryland 20852

RE: Final Construction Inspection of 72" C.M.P. Remedial Repairs
Washington Science Center @ 6101 Executive Boulevard
MCDEP Asset #12572 12752

Dear Sir/Ma'am,

On January 30, 2012, Charles P. Johnson & Associates, Inc. (CPJ) completed a final confined space inspection of the remedial repairs constructed in the 72" C.M.P. of the SWM Facility at 6101 Executive Boulevard (MCDEP Asset #12572). The scope of repairs included: cleaning the pipe, installing C.M.P. internal sealing bands at Joints 10 through 18, pouring a reinforced concrete invert slab along the upstream-most 200 LF of pipe, and installing steel supports and a spreader bar along the upstream-most 200 LF of pipe. The CPJ inspectors were Brian Davila, P.E. and Jeff Blass, P.E.. Also present at the site during the inspection were Mr. Kent Campbell of HP Environmental, Inc., Mr. Rick Harbaugh of AAA Stormwater (Contractor) and Mr. Stephen Jensen, P.G. of ECS Mid-Atlantic, L.L.C..

CPJ inspected the entire scope of work and found the work to be completed per plan. In addition, CPJ also completed an inspection of the reinforcement steel for the concrete invert slab prior to the concrete pour and also found the reinforcement steel installed per plan. Inspection photographs from both inspections are provided after this letter.

CPJ appreciates the opportunity to be of service in this matter. Please let us know if you have any questions or concerns.

Sincerely,



Jeff Blass, P.E.
Charles P. Johnson & Associates, Inc.

I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland. License #32457, Expiration: 06/20/14

The preceding repairs were designed and implemented under the supervision of a Professional Engineer.

All such repairs must be reviewed and approved by our Department.

Other Types of Structures Installed in Montgomery County

AquaShield  INNOVATING GOOD CLEAN WATER. 

HOME SOLUTIONS PRODUCTS RESOURCES ABOUT AGENTS QUOTE REQUEST CONTACT NEWS

Maintenance - Aqua-Swirl™ Hydrodynamic Separator



AquaShield™ recommends that periodic system inspections be performed to determine whether the disposal of captured material is needed to ensure proper operation of the Aqua-Swirl™ treatment system. It is important to keep in mind that all BMPs require some degree of maintenance. Maintenance cycles are ultimately dependent on site-specific pollutant loading conditions.

Upon installation and during construction, we recommend that an Aqua-Swirl™ be inspected every three months and cleaned as needed. An Inspection and Maintenance Manual is furnished for each project installation for an end user(s) to track and document system operations. A typical maintenance event for the cleaning of the swirl chamber can be accomplished with a vacuum truck. The unit should be inspected and cleaned at the end of construction regardless of whether it has reached its capacity for sediment or oil storage. During the first year post-construction, the unit should again be inspected every three months and cleaned as needed. It is also recommended that the system be inspected and cleaned once annually regardless of whether it has reached its sediment or floatable pollutant storage capacity. For the second and subsequent years post-construction, the Aqua-Swirl™ can be inspected and cleaned once annually if the system did not reach full sediment or floatable pollutant capacity in the first year post-construction. If the Aqua-Swirl™ reached full sediment or floatable pollutant capacity in less than 12 months in the first year post-construction, the system should be inspected once every six months and cleaned as needed. AquaShield™ further recommends that external bypass (diversion) and convergence structures should be inspected and cleaned when feasible during inspection and maintenance events.

Essential elements of a swirl chamber inspection include observing floating materials and measuring the accumulated sediment at the base of the swirl chamber. These two activities can be performed at the ground surface and there is no need to enter the device. A typical maintenance event includes the vacuuming and disposal of floatable pollutants and sediment from the swirl chamber. Proper health and safety protocols should be followed during all inspection and maintenance events. AquaShield™ recommends that all materials removed during the maintenance process be handled and disposed in accordance with all applicable federal, state and local guidelines. Depending on the influent pollutant characteristics of the system drainage area, it may be appropriate to perform Toxicity Characteristics Leaching Procedure (TCLP) analyses on representative samples of the removed material to ensure that the handling and disposition of materials complies with applicable environmental regulations.



Aqua-Swirl™ captures and retains floatable materials. Periodic maintenance is needed to remove these materials.

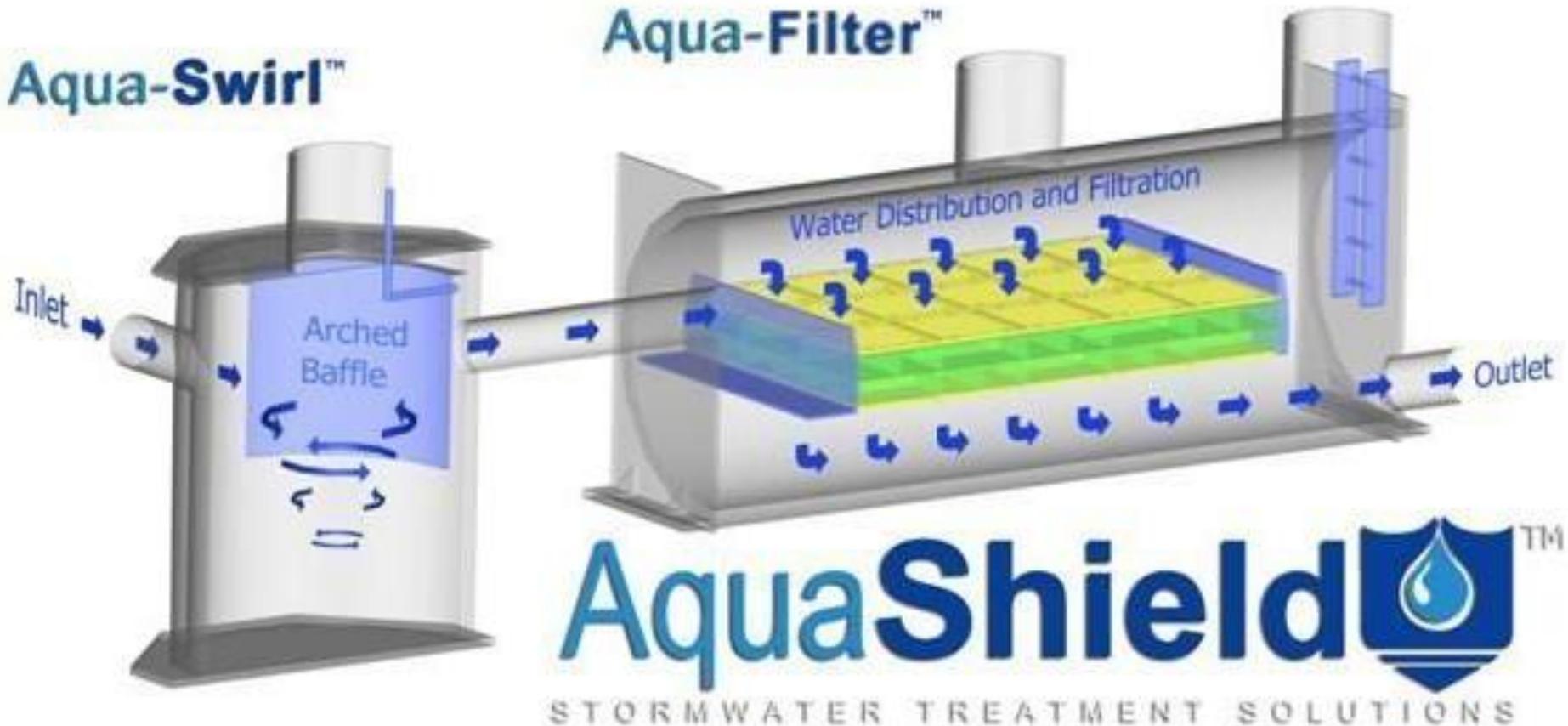
- OVERVIEW
- OPERATION
- INSTALLATION
- BENEFITS
- DOWNLOADS

- Contact Inspector prior to performing maintenance on these so procedures can be discussed.
- Follow manufacturer maintenance process.
- Maintenance procedures will soon be placed on the MC.DEP website.

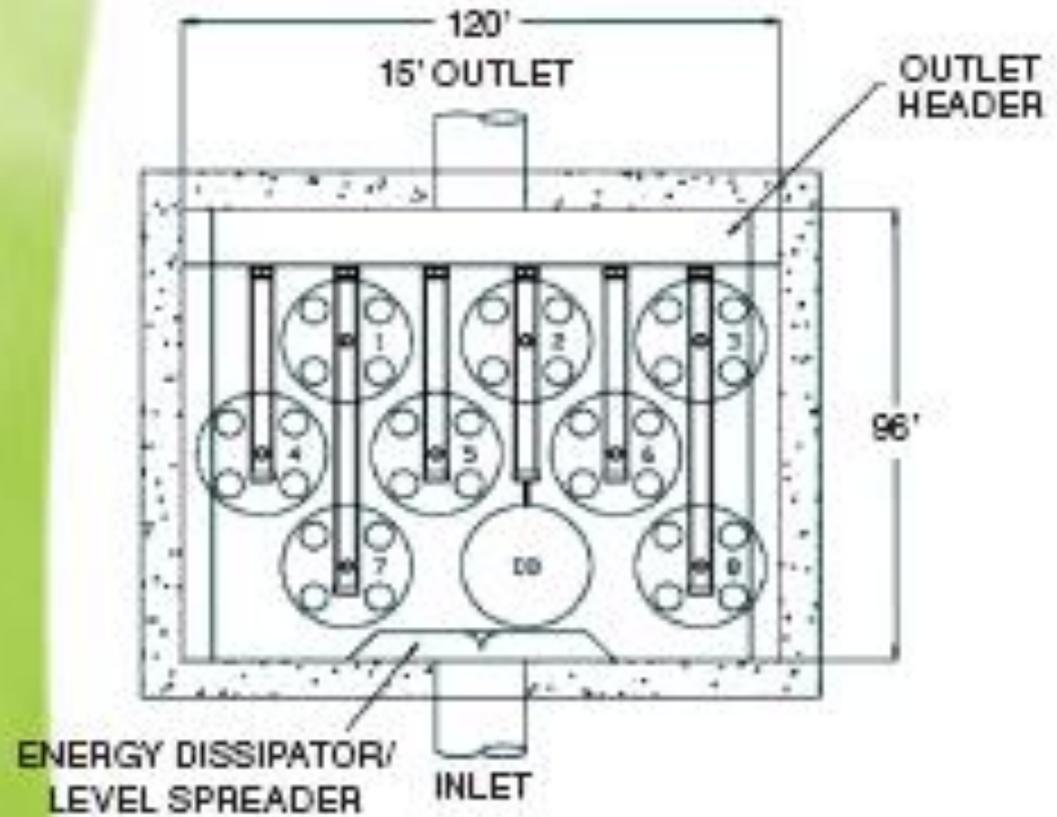
Hydroguard[®]



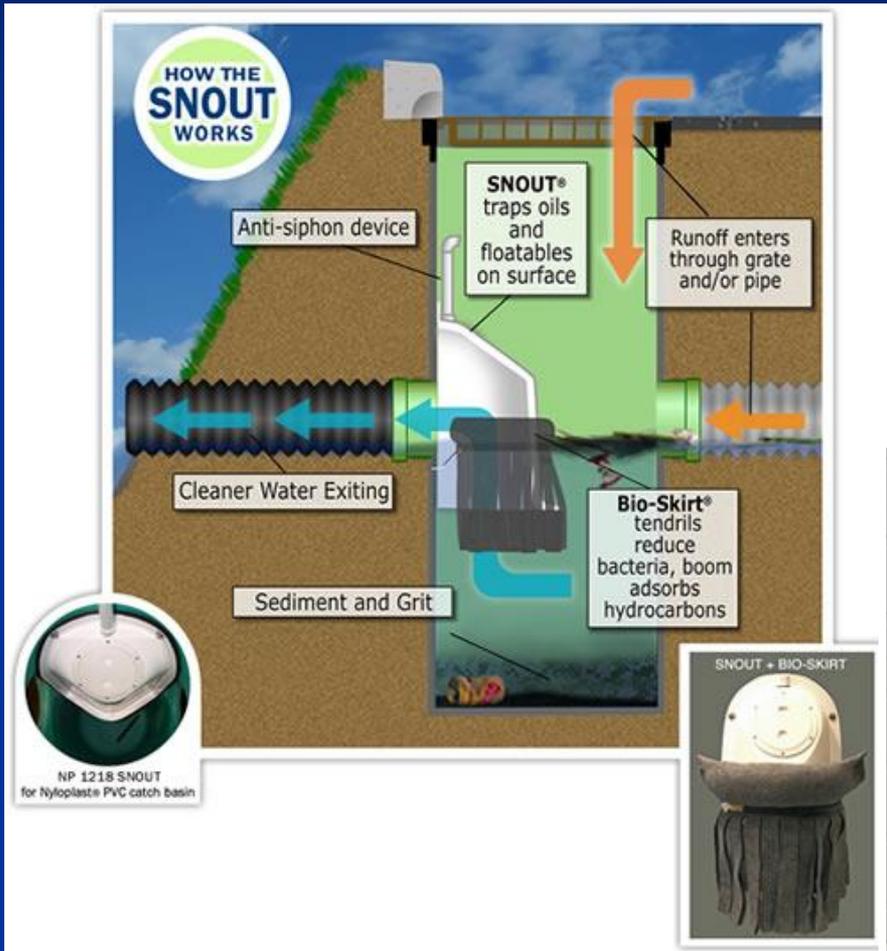
Aqua-Swirl and Aqua-Filter[®]



ADS BAYFILTER™ STORMWATER FILTRATION SYSTEM



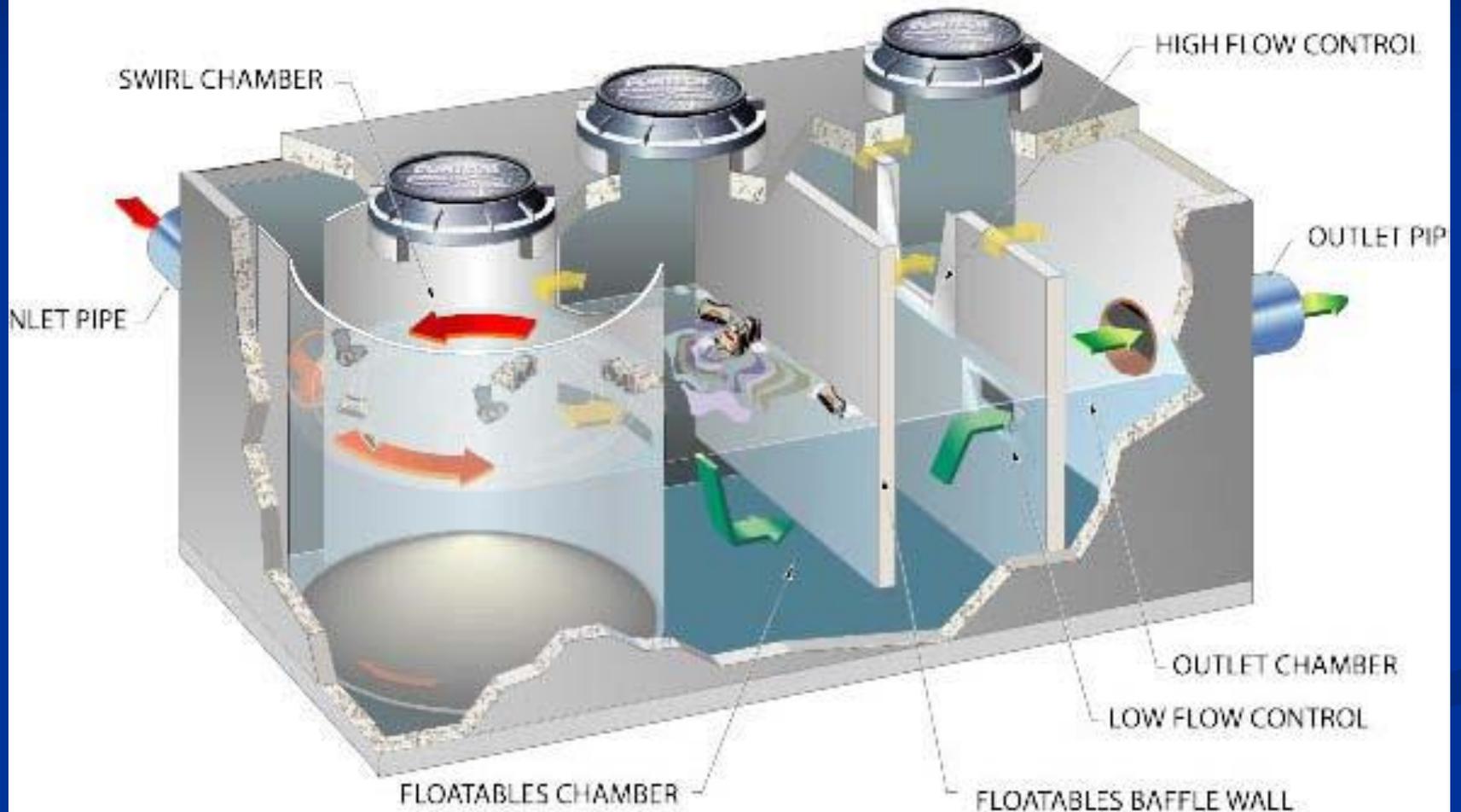
The "Snout"



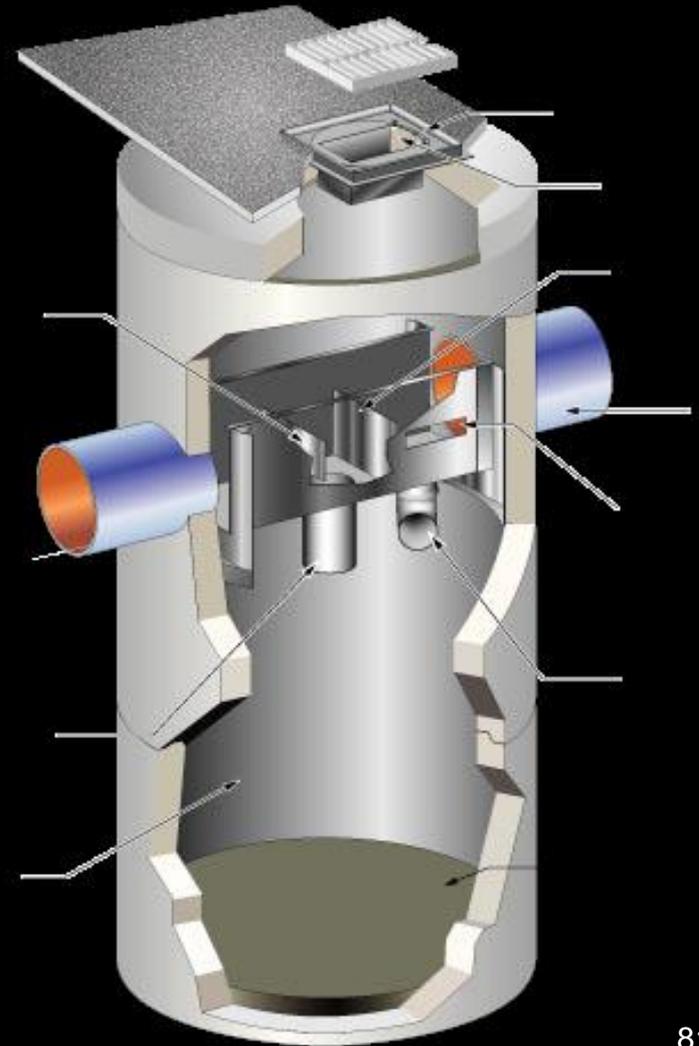
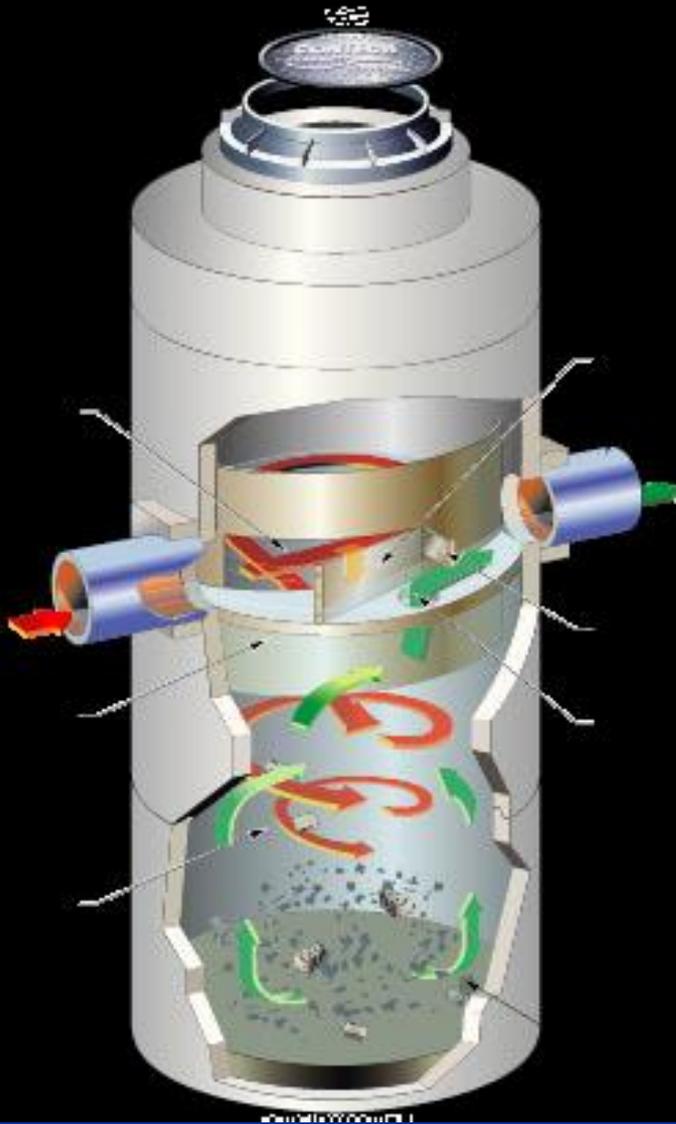
Environmental 21 V2B1



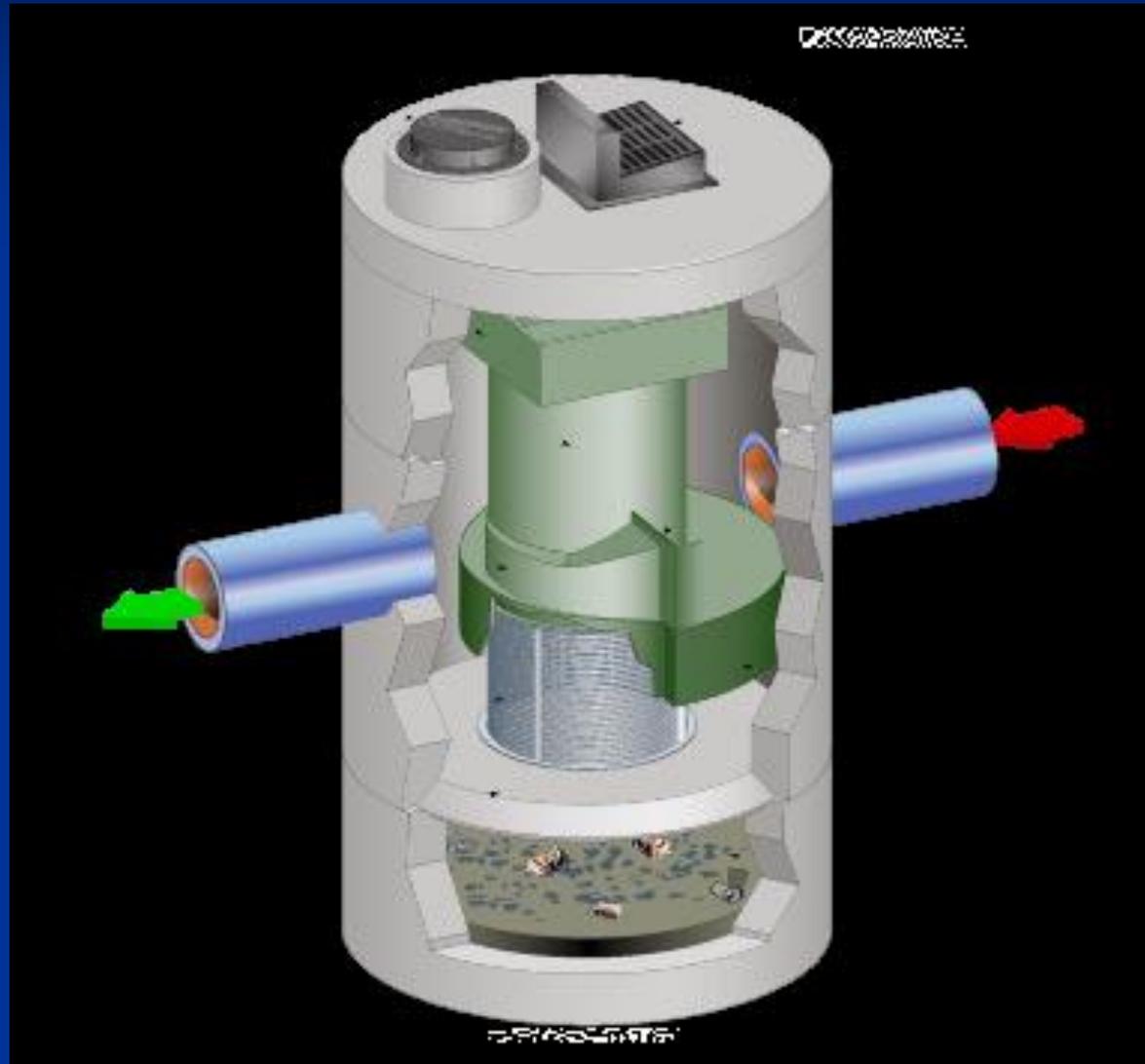
Vortechs®



VortSentry® & VortSentry® HS



CDS Unit



Jellyfish Filter



Sorbtive Filter



Questions



Always Coordinate Cleaning & Maintenance Of Underground Structures With Both The DEP Inspector & The Oaks Landfill In Advance Of Performing Work.