

FACILITY: FILTERS - UNDERGROUND FILTER (F-2)*



GENERAL MAINTENANCE CARD
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Note: Workers must receive confined space entry training in accordance with OSHA standard 29 CFR 1910.146 or other approved standard prior to entering filter.

PURPOSE AND FUNCTION

Multi-chamber structure designed to treat stormwater runoff through filtration, using a wet pool or sedimentation chamber, a primary filter media and, typically, an underdrain collection system.

SHORT-TERM MEASURES (FREQUENCY: AT LEAST ONCE A MONTH)

Drainage Issues:

1. Inspect wet pool chamber (Location C).
 - Open access grates and manholes as needed to vent facility.
 - Remove debris manually and dispose off-site, as required. Follow approved confined space procedures.
2. Inspect filter bed chamber (Location D).
 - Open access grates and manholes as needed to vent facility.
 - Note dewatering time. Filter bed should drain completely within 48 hours of a storm event. If clogging occurs, remove sediment and cleanout underdrain (refer to Item 2 of Long-Term Measures).
 - Relocate rodents and/or provide exclusion devices, as required.

Perimeter Treatment (perimeter boundaries not shown in figures):

3. Inspect overall condition of the perimeter treatment items.
 - Remove vegetative invasives manually, ensuring root removal, to the extent possible. Refer to Appendix 1: New York State Invasive Plants for key species. Note any significant establishment for future removal/maintenance.
 - Remove accumulated litter/debris by hand; dispose off-site.
 - Trim shrubs and cut grass along street frontages, as required. Dispose of clippings off-site.
 - Secure access grates, gates, guiderails, signs, and boulders, as required.

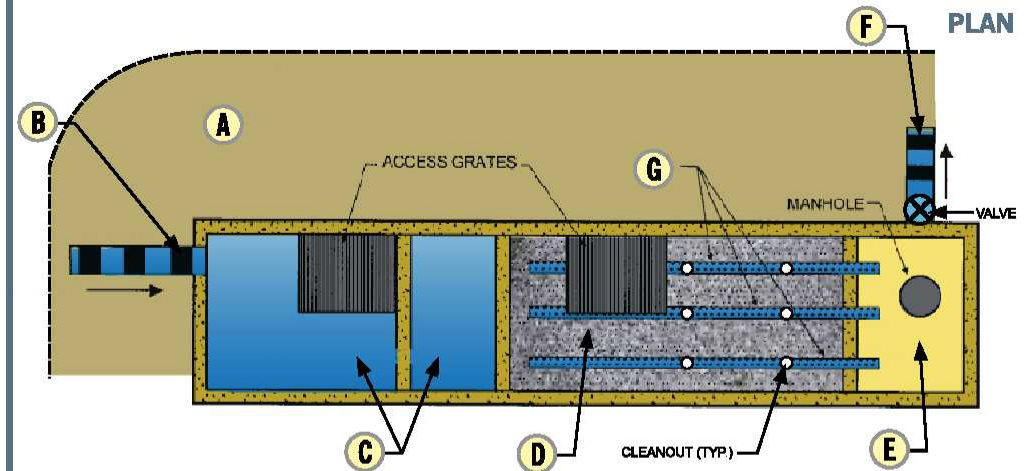
MEDIUM-TERM MEASURES (FREQUENCY: ONCE EVERY SIX MONTHS)

Drainage Issues:

1. Inspect wet pool chamber (Location C).
 - Open access grates and manholes as needed to vent facility.
 - Following approved confined space procedures, measure sediment depth in chamber.
2. Inspect filter bed chamber (Location D).
 - Open access grates and manholes as needed to vent facility.
 - If present, open dewatering valve to drain water from the filter bed chamber. Close valve when water has completed draining.
 - If no dewatering valve is present, remove standing water from the chamber using a vector truck suction hose or other means.
 - Following approved confined space procedures, measure sediment on bed surface.
3. Inspect inlet (Location B) and outlet (Location F) pipes and note any cracks/damage.
 - Remove debris manually and dispose off-site, as required.
4. Note evidence of oil or grease contamination in any of the chambers.

SIDE A

PLAN



MAJOR AREAS OF PRACTICE

- | | | |
|--------------------------|-----------------------|---------------------------------|
| A. Maintenance Accessway | D. Filter Bed Chamber | F. Outlet Pipe |
| B. Inlet Pipe | E. Overflow Chamber | G. Underdrain Collection System |
| C. Wet Pool Chamber | | |

5. Inspect all chambers to ensure that the dewatering valve is closed, outlet pipe is clear, and no tools or materials are left behind.

Perimeter Treatment (perimeter boundaries not shown in figures):

6. Inspect overall condition of the perimeter treatment items.
 - Inspect for significant establishment of invasives and develop an area-wide plan for removal.
 - Lubricate locks and hinges on gates and grates, as required.
 - Refurbish or mow accessway, as required.
 - Inspect and repair damaged locks, access grates, gates, guiderails and signs, as required.

LONG-TERM MEASURES (FREQUENCY: ONCE EVERY YEAR)

Drainage Issues:

1. Remove sediment from wet pool chamber and adjacent catch basins; "vactoring" recommended. Sediment removal should be completed when the chamber is either 50% or six inches full, whichever is less.
2. Remove sediment from filter bed and cleanout underdrains when accumulation exceeds one inch:
 - Refer to steps 1-8 of partial restoration procedure.
 - Remove sediment manually and dispose off-site.
 - Rake bed to restore uniform surface.
3. Inspect all chambers and walls for evidence of structural damage. Repair as necessary.
4. Inspect inlet (Location B) and outlet (Location F) pipes.
 - Repair cracks in pipe, as required.
 - Clear to maintain conveyance, as required.
5. If present, inspect dewatering valve for proper functioning. Repair and replace as necessary.

Albany County	City of Albany	Town of Bethlehem	City of Cohoes	Town of Colonie	Village of Colonie	Village of Green Island	Town of Guilderland	Village of Menands	Town of New Scotland	Village of Voorheesville	City of Watervliet	SUNY Albany
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* Facility abbreviations refer to 2003 NYSDEC Stormwater Design Manual practice labels.

LONG-TERM MEASURES (FREQUENCY: ONCE EVERY THREE TO FIVE YEARS)

Drainage Issues:

1. Perform partial restoration procedure as necessary by removing and replacing top two to three inches of media in the filter bed. Partial restoration should be completed when the filter bed is clogged or continues to hold water more than 48 hours after a storm event.
 - A full restoration procedure, where all of the materials in the filter bed are removed and replaced, may be required when significant oil and grease contamination occurs, or if the filter continues to clog following a partial restoration procedure.

"VACTORING" PROCEDURE AT WET POOL CHAMBER

Methodology:

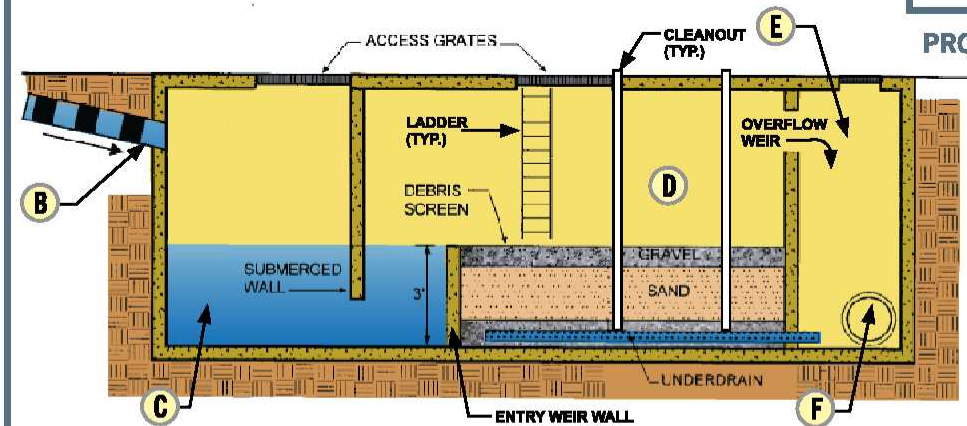
1. Park the "vactor" truck along the maintenance accessway near the wet pool chamber (Location A on Plan Figure). The boom should be extended in the direction of the access grate for the chamber.
2. Connect the "vactor" truck to an approved nearby source of clean water for "vactoring" purposes.
3. Open access grate for the wet pool chamber (Location C).
4. Open additional access grates and manholes as needed to vent facility.
5. Follow approved confined space procedures prior to entering the facility.
6. Place a temporary stop in the outlet pipe (Location F) to prevent loss of water and sediment from the facility. Care should be taken during maintenance to minimize spill/over from the filter bed chamber (Location D) to the overflow chamber (Location E).
7. Extend the flexible suction hose through the access grate into the wet pool chamber (Location C). Use suction arm to remove standing water from the chamber.
8. Extend water jet hose through the access grate into the wet pool chamber (Location C). Use hose to loosen accumulated sediment.
9. Perform "vactoring" operations by simultaneously using the suction arm and water jet hose to remove slurry until the base of the chamber is reached.
10. Continue slurry removal until capacity of "vactor" truck is reached.
11. Stop "vactoring" work. Dispose of slurry off-site.
12. Repeat steps 7-11 until all the sediment has been removed.
13. Proceed with partial or full restoration procedures at the filter bed chamber as necessary.
14. After "vactoring" work is complete, carefully remove the flexible suction hose and the water jet hose from the facility and transport them back to the truck.
15. Before exiting the filter,
 - Inspect all chambers to ensure that no tools or materials are left behind.
 - Pump out any materials that have spilled over into the overflow chamber (Location E).
 - Remove stop from outlet pipe (Location F).
 - If present, confirm that the dewatering valve is in the closed position.
 - Replace manhole covers on all chambers of the sand filter.
16. Close access grates and secure as needed.
17. Inspect the accessway and adjacent area for damage, such as dislodged field stone, wood chips, etc., and refurbish as required.

Note: Secure locks on gates as necessary prior to exiting site.

PARTIAL RESTORATION PROCEDURE AT FILTER BED CHAMBER

Methodology:

1. Open access grate for the filter bed chamber (Location D).
2. Open additional access grates and manholes as needed to vent facility.
3. Follow approved confined space procedures prior to entering the facility.
4. Place a temporary stop in the outlet pipe (Location F) to prevent loss of water and sediment from the facility.
5. If present, open dewatering valve to drain excess water in the filter bed chamber.
6. If no dewatering valve is present, remove standing water from the chamber using a vactor truck suction hose or other means.
7. Attach a standard compressor and fitting to first cleanout and run compressed air through pipe. Repeat for all remaining connections.
8. Perform a visual inspection of the filter bed to determine that it is sufficiently broken up. Repeat step 7 as necessary.
9. Remove compressor hose and fitting.



MAJOR AREAS OF PRACTICE

- B. Inlet Pipe
C. Wet Pool Chamber
D. Filter Bed Chamber
E. Overflow Chamber
F. Outlet Pipe

10. In areas of sediment buildup, use rakes to remove the gravel debris screen and the top two to three inches of sand from the filter bed. Dispose of gravel and sand off-site.
11. Reconstruct filter bed to original specifications or to approved, revised specifications.
 - Replace clean washed sand to one inch below the top of the entry weir wall (see Profile Figure).
 - Replace the 1-inch debris screen with clean gravel to the top of the entry weir wall (see Profile Figure).
12. If present, inspect the dewatering valve for proper functioning and replace as necessary. After inspection, the dewatering valve should be left in the closed position.
13. Perform steps 15-17 of the "vactoring" procedure.

FULL RESTORATION PROCEDURE AT FILTER BED CHAMBER

Methodology:

1. Perform steps 1-8 of the partial restoration procedure.
2. Remove and replace all sand, gravel, and filter fabric in the filter bed chamber. Below the 1-inch, gravel debris screen is a 2-foot sand layer. Removal of the sand will expose a layer of filter fabric, and an 11-inch gravel jacket with several lengths of 6-inch, perforated underdrain pipe. Dispose of all media and filter fabric off-site. Underdrain piping may be reused if in good condition.
3. From the filter bed chamber, inspect underdrains for mechanical damage. Replace as necessary.
4. Reconstruct filter bed to original specifications or to approved, revised specifications.
 - Underdrains should be set in an 11-inch gravel jacket.
 - Place a layer of geotextile filter cloth on the gravel layer, ensuring a three-inch upward U-shaped wrap around the chamber walls. Any overlaps of filter fabric should span a minimum of six inches.
 - Install a two-foot layer of clean washed sand over the fabric, gravel, and underdrains, to 1 inch below the top of the entry weir wall (see Profile Figure).
 - Install a 1-inch, gravel debris screen to the top of the entry weir wall (see Profile Figure).
5. If present, inspect the dewatering valve for proper functioning and replace as necessary. After inspection, the dewatering valve should be left in the closed position.
6. Perform steps 15-17 of the "vactoring" procedure.

Paperwork and Reporting

- 1) Refer to site specific SWPPP and regulated MS4 for reporting requirements related to maintenance
- 2) Report practice failures to owner-operator and relevant regulated MS4

Maintenance Considerations During Design

- Confined Space Training
- Erosion and Sediment Control
 - Inlet/Outlet Protection
 - Sediment Removal
- Underdrains
- Maintenance Access
- Cold Climate Considerations