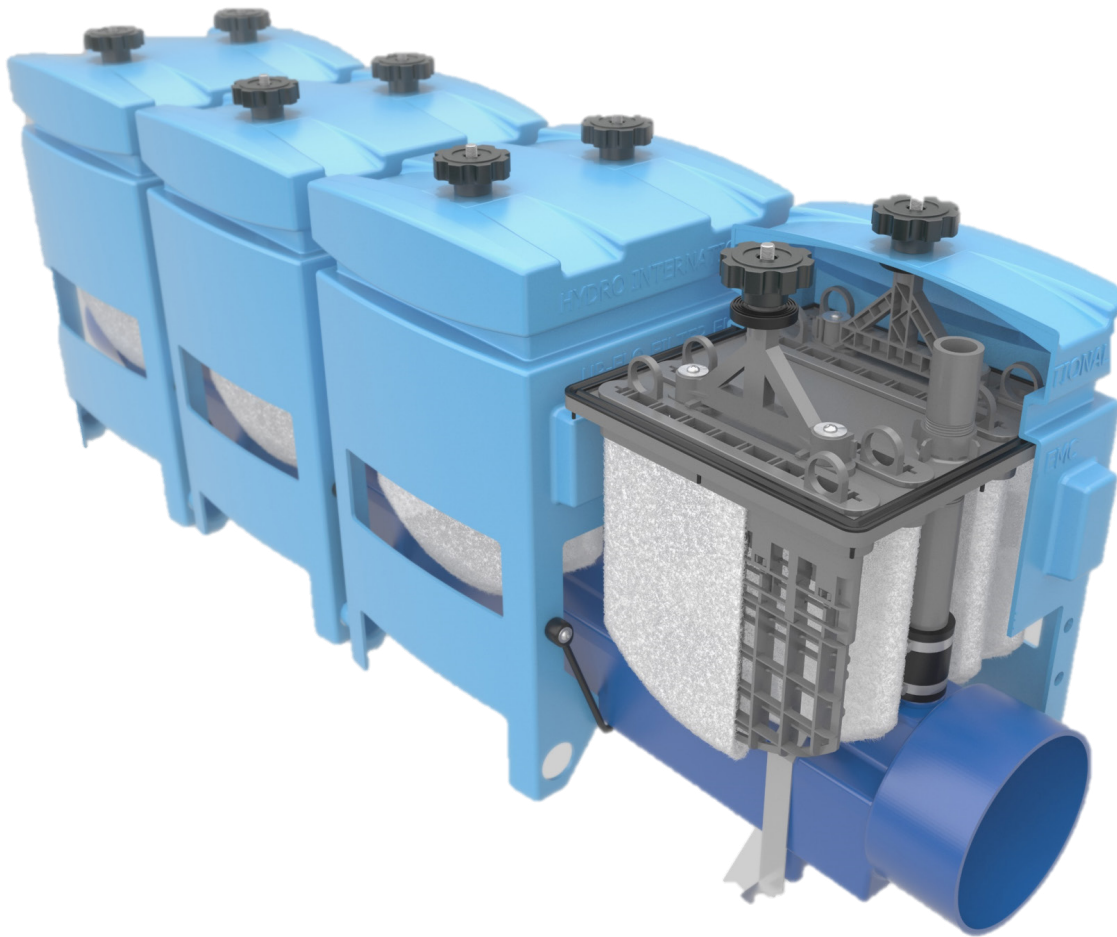


Up-Flo[®] Filter, EMC

Extended Maintenance Cartridge

Inspection and Maintenance Manual

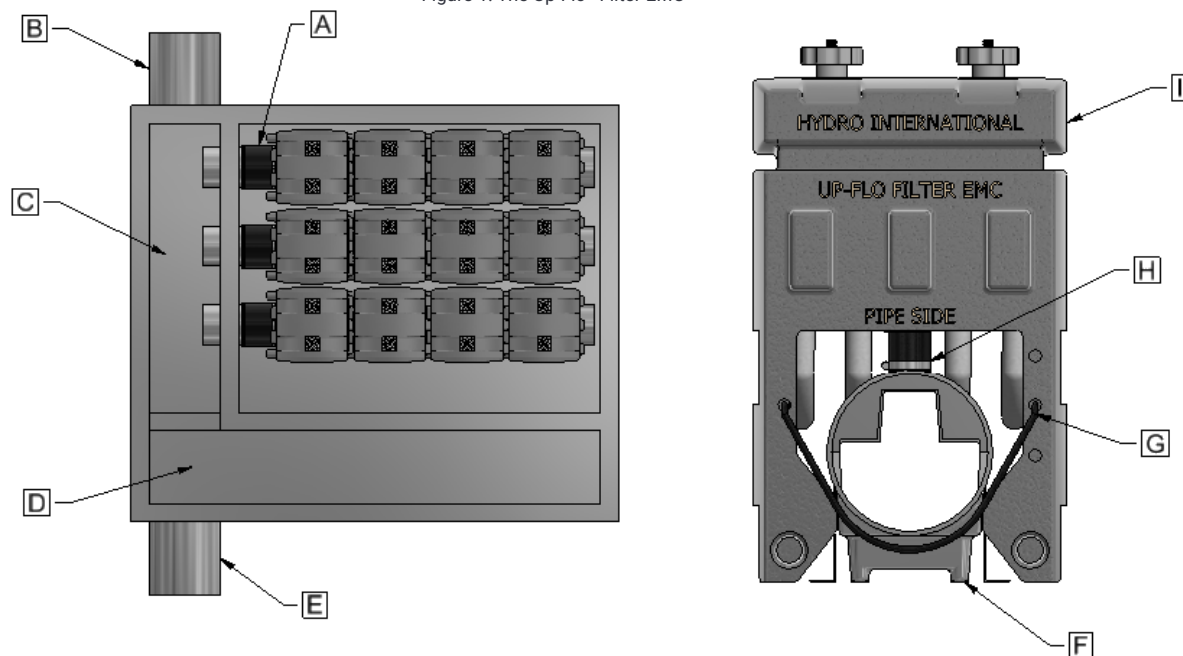


Oldcastle Infrastructure[™]
A CRH COMPANY

Overview & Product Description

The Up-Flo® Filter is a modular high-rate stormwater filtration device designed to capture trash, oil, sediment and remove fine pollutants such as particulate metals and nutrients from stormwater runoff. Designed with efficiency, longevity and upkeep in mind, this high performance, low maintenance filter option offers higher loading rates and longer membrane life for higher quality stormwater for longer periods between servicing. In general, a minimum of two inspections are required per year to monitor sediment and gross pollutant accumulations. In order to achieve an annual TSS removal rate of 80% for the Up-Flo® Filter, the minimum maintenance frequency specified in the maintenance section for replacement of the filter inserts and removal of accumulated sediment from the sump is mandatory.

Figure 1: The Up-Flo® Filter EMC



System Components

- A. Underdrain Coupling
- B. Outlet Pipe
- C. Outlet Bay
- D. Inlet Bay
- E. Inlet Pipe
- F. Underdrain
- G. Cartridge Restraining Cord
- H. Cartridge Connection Boot
- I. Filter Cartridge

Inspection and Maintenance Overview

The Up-Flo® Filter protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the proper functioning of the Up-Flo® Filter.

A vactor truck is required for removal of oils, water, sediment, and to completely pump out the vessel to allow for maintenance inside. If you are not using Oldcastle Infrastructure Service and Maintenance or a trained service provider, you must follow OSHA (or other regional) Confined Space Entry procedures when entering the Up-Flo® vessel.

The typical required frequency for replacement of the filter cartridges is annually, whereas the minimum required frequency for removal of accumulated sediment from the sump is dependent on the Up-Flo® Filter configuration. Configurations with a larger sediment storage volume per module will require less frequent removal of accumulated sediment. Regardless, whenever sediment depth in the sump is found to be greater than 6 inches (15 cm), sediment removal is required.

Routine Inspection

Inspection is a simple process that requires monitoring pollutant accumulations. Maintenance crews should be familiar with the Up-Flo® Filter and its components prior to inspection.

Routine Inspection Procedures

1. Set up any necessary safety equipment (such as traffic cones) to provide access to the UpFlo® Filter. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole or vault.
3. Without entering the vessel, look down into the chamber to inspect the inside and to make note of any irregularities.
4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the chamber.
5. Using a sediment probe, measure the depth of sediment that has collected in the sump of the vessel. Maximum sediment depth is 6 inches (15 cm).
6. On the Maintenance Log provided, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or a high standing water level.
7. Securely replace the grate or lid.
8. Remove safety equipment.
9. Contact Oldcastle Infrastructure at (888) 950-8826, to discuss any irregularities noted during inspection.

Routine Maintenance

The access port located at the top of the manhole or vault provides access to the Up-Flo® vessel for maintenance personnel to enter the vessel and remove and replace filter cartridges. The same access would be used for maintenance personnel working from the surface to vactor out sediment, oil, and water (Figure 2). Unless the Up-Flo® Filter has been installed in a very shallow configuration, it is necessary to have personnel with OSHA Confined Space Entry training performing the maintenance that occurs inside the vessel.

Maintenance intervals are determined from monitoring the Up-Flo® Filter during its first year of operation. Depending on the site, some maintenance activities may have to be performed on a more frequent basis than others.

A vactor truck is normally required for oil removal, removal of sediment from the sump, and to dewater the vessel for replacement of

the filter cartridges. All inspection and maintenance activities would be recorded in an Inspection and Maintenance Log.

The access port located at the top of the manhole provides unobstructed access for a vactor hose and/or skimmer pole to be lowered to the base of the sump.



Figure 2: Sediment is removed from the sump with a vactor hose. Confined space entry is not required for this step.

Maintenance Scheduling

- Call Oldcastle Infrastructure Service and Maintenance to order replacement filter cartridge membranes prior to scheduling maintenance.
- Because filter membrane replacement requires entry into the Up-Flo® chamber, maintenance events should be scheduled during dry weather.
- Filter cartridge membranes replacement should occur immediately after a contaminated spill in the contributing drainage area.

Recommended Equipment

- Safety Equipment (traffic cones, etc.).
- Crow bar to remove grate or lid.
- Vactor truck (flexible hose preferred).
- Pressure nozzle attachment.
- OSHA Confined Space Entry Equipment.
- Replacement Up-Flo® Filter membranes.
- Up-Flo® Filter Maintenance Log.
- Screwdriver (flat head).

Surface Maintenance Procedure

1. Set up any necessary safety equipment (such as traffic cones) around the access of the Up-Flo® Filter. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole or vault.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
4. Once all floatables and oil have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris from the sump floor.

5. Retract the vactor hose from the vessel.
6. On the Maintenance Log provided, record the date, unit location, estimated volume of floatables, oils, and gross debris removed, and the depth of sediment measured. Note any apparent irregularities such as damaged components or blockages.
7. Securely replace the grate or lid. Remove safety equipment.
8. Dispose of sediment and gross debris following local regulations.
9. Dispose of oil and sump water at a licensed water treatment facility or following local regulations.
10. Contact Oldcastle Infrastructure to discuss any irregularities noted during cleanout.

Filter Cartridge Membrane Replacement

1. Following OSHA or region specific Confined Space Entry procedures, enter the Up-Flo® Filter Chamber.
2. Starting at the end of the filter cartridge row furthest from the Outlet Bay (Fig. 1, Item C) remove each Filter Cartridge (Fig. 1, Item I) from the Underdrain (Fig. 1, Item A) as described below:
 - a. Unfasten Cartridge Restraining Cord. (Fig. 1, Item G and Fig. 3)
 - b. Loosen Cartridge Connection Boot (Fig. 1, Item H and Fig. 4) using flathead screwdriver.
 - c. Remove Filter Cartridge and transfer to surface. (Fig. 5)
3. With the cartridge on the surface, remove the internal filter assembly by unscrewing the two black knobs at the top of the cartridge. (See Fig. 6)
4. With the filter assembly unlocked, pullout the entire internal assembly from the bottom of the cartridge housing. (See Fig. 7)
5. With the internal assembly removed, disconnect the filter standoffs. Then remove and replace each filtration membrane. Reinstall the filter inserts into the manifold, and insert the assembly into the cartridge housing. (See Fig. 8)
6. Starting at the end of the Underdrain closest to the Outlet Bay, install newly maintained Filter Cartridges.
7. Orient Filter Cartridge with the labeled "Pipe Side" facing away from the Outlet Bay.
8. Tighten Cartridge Connection Boot using flathead screwdriver.
9. Fasten Cartridge Restraining Cord.
10. Exit the Up-Flo® Filter chamber and securely replace the grate or lid.
11. On the Maintenance Log provided by Oldcastle Infrastructure, record the date, unit location, estimated volume of floatables, oil and gross debris removed, and the depth of sediment measured. Note the number of filter cartridges replaced. Note any irregularities such as damaged components or blockages.
12. Remove safety equipment.
13. Contact Oldcastle Infrastructure to discuss any irregularities noted during annual maintenance.



Fig 3. Unfasten cartridge restraining cord.

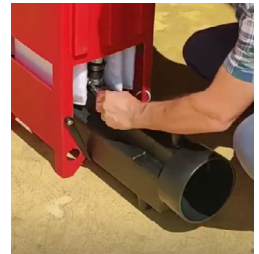


Fig 4. Loosen cartridge connection boot.



Fig 5. Remove filter cartridge.

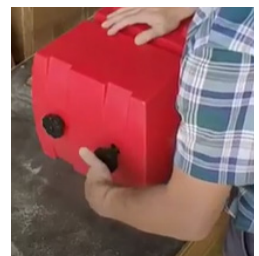


Fig 6. Unscrew filter housing knob.

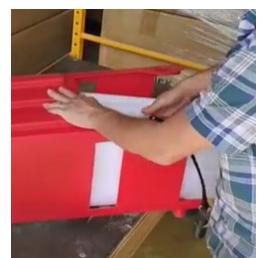
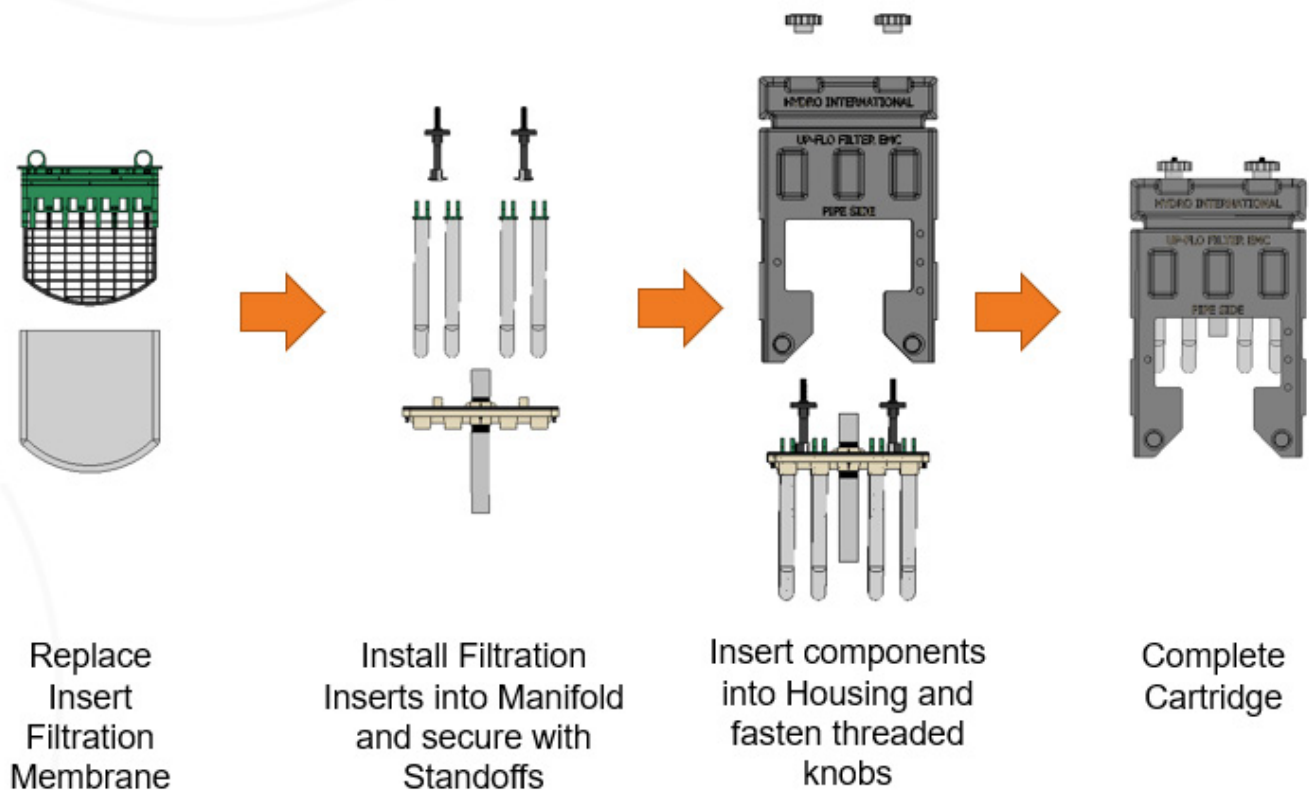


Fig 7. Remove filter internals assembly.

Fig 8. Membrane replacement procedure .



Up-Flo® Filter Installation Log

Site reference name or number for this Up-Flo® filter location:

Site Name:

Site Location:

Owner:

Site Contractor:

Contact Name:

Contact Name:

Company Name:

Company Name:

Address:

Address:

Telephone:

Telephone:

Fax:

Fax:

Installation Date:

Total number of Up-Flo® filter modules:

Up-Flo® Filter Inspection Log

Site Name

Owner change since last inspection?

☐ Yes

☐ No

Location:

Owner Name:

Address:

Phone Number:

Site Status:

Date:

Time:

Site Conditions*: (Stable, Under Construction, Needing Maintenance, etc.)

Up-Flo® Filter Inspection Log

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

Inspection Items	Inspection Frequency	Inspected? Yes / No	Maintenance Needed? Yes / No	Comments / Descriptions
Debris Removal				
Adjacent area free of debris?				
Inlets and Outlets free of debris?				
Facility (internally) free of debris?				
Vegetation				
Surrounding area fully stabilized? (no evidence of eroding material into Up-Flo® Filter)				
Grass mowed?				
Water retention where required				
Water holding chamber(s) at normal pool?				
Evidence of erosion?				
Sediment Deposition				
Filtration Chamber free of sediments?				
Sedimentation sump not more than 50% full?				
Structural Components				
Any evidence of structural deterioration?				
Grates in good condition?				
Spalling or cracking of structural parts?				
Outlet/Overflow Spillway				
Other				
Noticeable odors?				
Any evidence of filter(s) clogging?				
Evidence of flow bypassing facility?				

If any of the above Inspection Items are checked “Yes” for “Maintenance Needed”, list Maintenance actions and their completion dates below or on the Maintenance Log provided on page 15 of the Up-Flo® Filter Operation & Maintenance Manual:

Maintenance Action Needed	Due Date

Inspector Comments

Overall condition of Up-Flo® Filter** ☐ Acceptable ☐ Unacceptable

**“Acceptable” would mean properly functioning; “unacceptable” would mean damaged or required further maintenance.

The next routine inspection is schedule for approximately: (date)

Inspected by: (signature)

Inspected by: (printed)

Up-Flo® Filter Maintenance Log

Site Name

Owner change since last inspection?

☐ Yes

☐ No

Location:

Owner Name:

Address:

Phone Number:

Site Status:

Date:

Time:

Site Conditions*: (Stable, Under Construction, Needing Maintenance, etc.)

Inspector Comments

Overall condition of Up-Flo® Filter**

☐ Acceptable

☐ Unacceptable

**"Acceptable" would mean properly functioning; "unacceptable" would mean damaged or required further maintenance.

Maintained by: (signature)

Maintained by: (printed)

Notes:



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