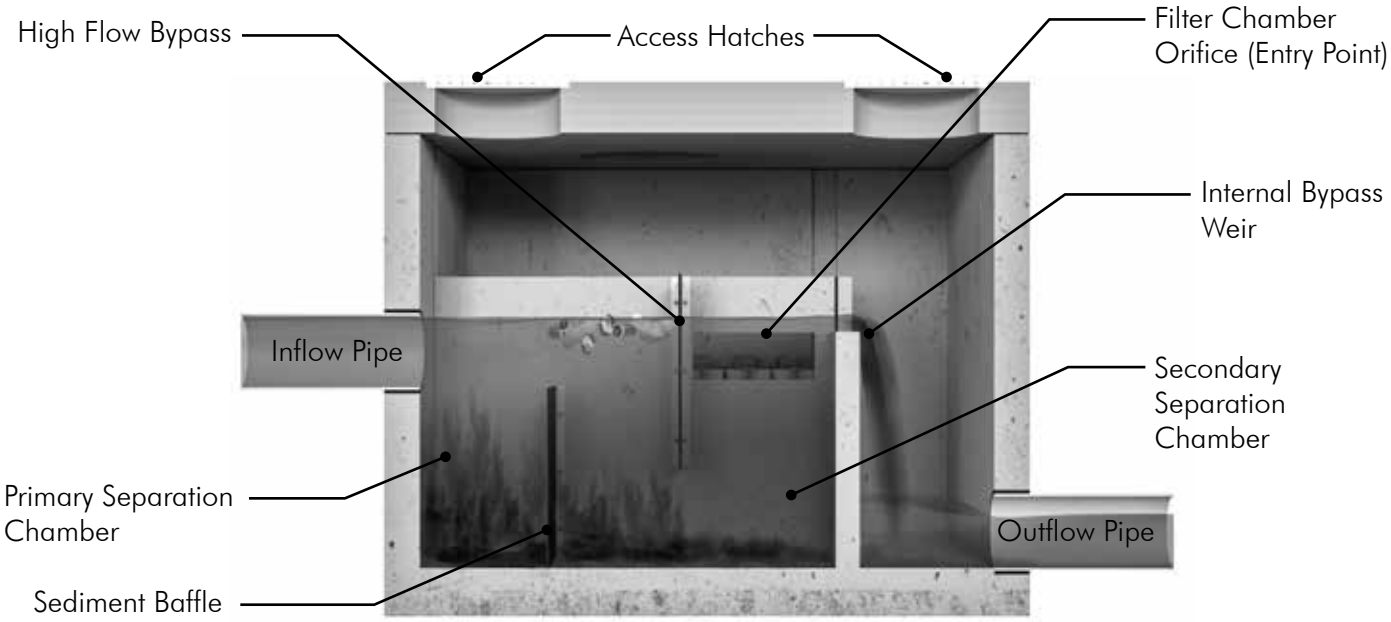
CONTECH®
ENGINEERED SOLUTIONS

HC Kraken® Filter
Operation & Maintenance Manual

Operation & Maintenance

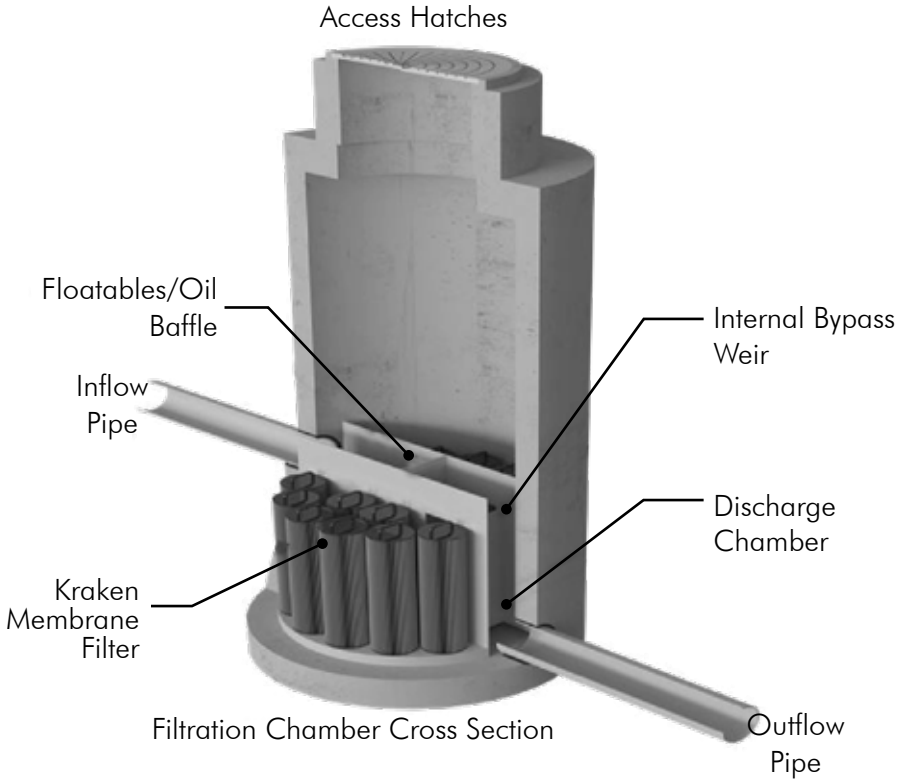
The HC (High Capacity) Kraken® Filter is designed at a minimal loading rate of only 0.10 gpm/sq ft of media surface to maximize longevity and minimize maintenance requirements. This is lower than any other system available. Passive backwash and pretreatment also help to minimize system maintenance requirements. The HC Kraken® Filter has proven to be able to handle up to at least 12 months sediment loading with no maintenance or loss of treatment capacity assuming 600 pounds of sediment per acre of impervious surface annually.

Yet, as with all stormwater BMPs inspection and maintenance on the HC Kraken® Filter is necessary. Stormwater regulations require that all BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site specific loading conditions. This is recommended because pollutant loading and pollutant characteristics can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding on roads, amount of daily traffic and land use can increase pollutant loading on the system. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided. Without appropriate maintenance, a BMP will exceed its storage capacity, which can negatively affect its continued performance in removing and retaining captured pollutants.



Pre-Treatment (optional) Chamber Diagram

Filter Chamber Diagram



Round Configuration - Filter Chamber Diagram

Bio Clean now offers a round configuration of the HC Kraken® Filter available in various standard sizes. Operation and Maintenance procedures for the round configuration is precisely the same as the standard square and rectangular configurations. One benefit of the round configuration is more headroom for easy maintenance access.

Inspection Equipment

Following is a list of equipment to allow for simple and effective inspection of the Kraken® Filter:

- Contech Inspection Form
- Flashlight
- Manhole hook or appropriate tools to access hatches and covers
- Appropriate traffic control signage and procedures
- Measuring pole and/or tape measure
- Protective clothing and eye protection

Inspection Steps

The core to any successful stormwater BMP maintenance program is routine inspections. The inspection steps required on the HC Kraken® Filter are quick and easy. As mentioned above the first year should be seen as the maintenance interval establishment phase. During the first year more frequent inspections should occur in order to gather loading data and maintenance requirements for that specific site. This information can be used to establish a base for long term inspection and maintenance interval requirements.

The HC Kraken® Filter can be inspected though visual observation without entry into the system. All necessary pre-inspection steps must be carried out before inspection occurs, especially traffic control and other safety measures to protect the inspector and near-by pedestrians from any dangers associated with an open access hatch or manhole. Once these access covers have been safely opened the inspection process can proceed:

- Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other info (see inspection form).
- Observe inside of the system through access hatches. If minimal light is available and vision into the unit is impaired utilize a flashlight to see inside the system and all of its chambers.
- Look for any out of the ordinary obstructions in the inflow pipe, pre-treatment chamber (optional), filter chambers, discharge chamber or outflow pipe. Write down any observations on the inspection form.
- Through observation and/or digital photographs estimate the amount of floatable debris accumulated in the pre-treatment or diversion chamber. Record this information on the inspection form. Next utilizing a tape measure or measuring stick estimate the amount of sediment accumulated in the primary and secondary sedimentation chambers (pretreatment configuration only) or diversion chamber. Record this depth on the inspection form. Through visual observation inspect the condition of the filter cartridges. Look for excessive build-up of sediments on the surface and any build-up on the top of the cartridges. Record this information on the inspection form.
- Finalize inspection report for analysis by the maintenance manager to determine if maintenance is required.

Maintenance Indicators

Based upon observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components or cartridges.
- Obstructions in the system or its inlet or outlet.
- Excessive accumulation of floatables in the pre-treatment chambers (optional) in which the length and width of the chamber behind oil/floatables skimmer is fully impacted. Also, applies to the diversion chamber area in some configurations.
- Excessive accumulation of sediment in the primary sedimentation chamber of more than 18" in depth. Also, applies to the diversion chamber area in some configurations.
- Excessive accumulation of sediment in the secondary sedimentation chamber of more than 6" in depth.
- Excessive accumulation of sediment in the filter chambers of more than 3" on average.
- Substantial build-up of sediments on the filter membrane of the filter cartridges which will have a very dark appearance indicating the membrane may be fully saturated with sediment.

Maintenance Equipment

While maintenance can be done fully by hand, it is recommended that a vacuum truck be utilized to minimize time required to maintain the HC Kraken® Filter:

- Contech Maintenance Form
- Flashlight
- Manhole hook or appropriate tools to access hatches and covers
- Appropriate traffic control signage and procedures
- Measuring pole and/or tape measure
- Protective clothing and eye protection
- Vacuum truck
- Trash can
- Pressure washer

Note: Entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections of the system. Entry into the system will be required if it is determined the cartridge filters need washing/cleaning

Maintenance Procedures

It is recommended that maintenance occurs at least three days after the most recent rain event to allow for drain down of the system and any upstream detention systems designed to drain down over an extended period of time. Maintaining the system while flows are still entering it will increase the time and complexity required for maintenance. Cleaning of the pre-treatment chamber can be performed from finish surface without entry into the vault utilizing a vacuum truck. Once all safety measures have been set up, cleaning of the pre-treatment chamber can proceed as follows:

- Using an extension on a boom on the vacuum truck position the hose over the opened access hatch and lower into the center of the primary sedimentation or diversion chamber. Remove debris, standing water, and sediment from the chamber. A power washer can be used to assist if sediments have become hardened and stuck to the walls or the flow of the chamber. Repeat the same procedure for the secondary sedimentation chamber (applies to pre-treatment chamber configuration only).

If maintenance is required on the filter cartridges the following procedure can be followed after maintenance on the pre-treatment or diversion chamber is performed:

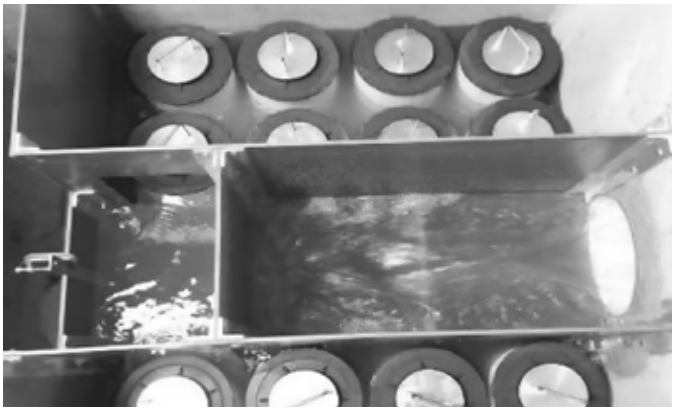
- Following rules for confined space entry use a gas meter to detect the presence of any hazardous gases. If hazardous gases are present do not enter the vault. Following appropriate confined space procedures takes steps, such as utilizing venting system, to address the hazard. Once it is determined to be safe enter utilizing appropriate entry equipment such as a ladder and tripod with harness.
- Once entry into the system has been established the maintenance technician should position themselves to stand in the pre-treatment or diversion chamber. From here the removal of the cartridges can commence.
- Each cartridge is connected in place with a quarter turn coupler and includes a handle for easy removal. To remove a cartridge simply grab the handle and turn counterclockwise 90 degrees and pull up to remove. Removal of the cartridge should be done by hand with minimal effort and requires no tools.
- Once the cartridges are removed, they should be lifted out from the vault and brought up to the finish surface for cleaning. First, fill a larger garbage can or container with water.
- Dunk and spin each cartridge by hand to remove larger sediments and debris. Then move into an empty container and proceed to use a pressure washer to spray off and clean each cartridge thoroughly by spinning in place into all pleats are clean.
- Each filter chamber should be power washed and vacuumed clean before re-inserting the cleaned cartridges. Pay close attention to the couplers.

- After all cartridges have been washed they can be replaced back into the vault. To replace each cartridge simply slide cartridge down into the coupler. Turn clockwise 90 degrees until it hits the stop and locks into place.
- The last step is to close up and replace all access hatch lids and remove all traffic control.
- All removed debris and pollutants shall be disposed of following local and state requirements.

Maintenance Sequence

1. Remove access hatches set up vacuum truck to clean the pretreatment chamber.

2. Insert vacuum hose in the sedimentation chamber and vacuum out all trash, sediment and standing water.



3. Assess the condition of the filter cartridges and determine if cleaning is required.

4. To wash cartridges, remove from vault. Place over trash can and use a garden hose to spray clean.

5. Once cleaned, install back into the vault. This completes maintenance. Ensure access lids are properly replaced.

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Inspection and Maintenance Report
Bio Clean Kraken Filter

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspector Name _____ Date ____/____/____ Time _____AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Vault	Model #	Sediment Accumulation Sedimentation or Diversion Chamber(s) (lbs) & Filter Chambers (lbs)	Condition of Filter Cartridges & Were Filter Cartridges Cleaned	Structural Notes	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:					
	Lat: Long:					
	Lat: Long:					
Comments:						

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SUPPORT

DRAWINGS AND SPECIFICATIONS ARE AVAILABLE AT WWW.CONTECHES.COM

HC Kraken Maintenance Guide 08/22