



The Stormwater Management Stormfilter®





Stormwater Filtration



selecting the right stormater solution just got easier...

It's simple to choose the right low impact development (LID) solution to achieve your runoff reduction goals with the Contech UrbanGreen Staircase. First, select the runoff reduction practices that are most appropriate for your site, paying

particular attention to pretreatment needs. If the entire design storm cannot be retained, select a treatment best management practice (BMP) for the balance. Finally, select a detention system to address any outstanding downstream erosion.



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Highly Effective Pollutant Removal

Stormwater quality standards are becoming increasingly complex, especially with the advent of total maximum daily load (TMDL) requirements. Meeting pollutant reduction goals typically requires a technology that is highly effective at removing solids and associated pollutants from stormwater. In some cases, the technology must also be capable of removing dissolved pollutants such as metals and phosphorus. Using a variety of media, filtration systems can meet that need.

For almost two decades the Stormwater Management StormFilter® has helped you meet the most stringent stormwater requirements. The system has been continually tested and refined to ensure maximum reliability and performance.

Learn more about filtration at www.ContechES.com/stormfilter



The Stormwater Management StormFilter helps you meet the most stringent stormwater requirements ***

Choosing the Right System

The Fundamentals of Filtration

The performance and longevity of media filtration systems is governed by a number of variables that must be carefully considered when evaluating systems, including media type, media gradation, hydraulic loading rate. Understanding these variables requires careful testing and development of performance and longevity data to support proper filter design.

Media Surface Area

Filtration flow rates are typically expressed as a surface area specific operating rate such as gallons per minute per square foot (gpm/ft²) of surface area. Lower specific operating rates translate to better performance and longer maintenance cycles. Specific operating rates higher than 2 gpm/ft² of media surface area negatively impact performance and longevity.

Surface vs. Radial Cartridge Filtration

When assessing filtration systems, it is important to consider whether filtration occurs primarily at the media surface or throughout a bed of media like in radial-cartridge filters. All else equal, radial-cartridge filters are longer lasting, since pollutants are captured and stored throughout the bed, as opposed to predominantly on the media surface. Radial cartridge filters capture more mass of pollutants per unit area of filter surface. Surface filters, such as membranes, are prone to rapid failure due to clogging, as pollutants occlude the media surface which requires frequent backwashing.

Media Hydraulic Conductivity and Flow Control

Filtration media is able to pass more flow per unit of media when it is new versus when it has been in operation for a while. With time, pollutants accumulate in the media bed and reduce its hydraulic capacity. It is critical that filtration devices are designed with excess hydraulic capacity to account for this loss. Also, finer media gradations remove finer particles, but have lower hydraulic capacity and occlude more rapidly. High performance and superior longevity can be achieved by controlling the flow through a more coarse media bed.

Performance: Laboratory Testing

Laboratory testing provides a means to generate hydraulic and basic performance data, but should be complimented with longterm field data. Laboratory performance trials should be executed with a fine sediment gradation such as Sil-Co-Sil 106 which has a median particle size of 22 microns. Testing with coarser gradations is not likely to be representative of field conditions.

Performance: Field Testing

Long-term field evaluations should be conducted on all filtration devices. Field studies should comply with the Technology Acceptance Reciprocity Partnership (TARP), Environmental Technology Verification (ETV) or the Technology Assessment Protocol – Ecology (TAPE) protocols. Testing should be overseen by a reputable third-party to be considered valid.

Longevity

It is essential that loading trials be conducted to evaluate the longevity of a media filter. These trials must be executed with "real" stormwater solids and not silica particles. Reliance on silica particles to assess longevity grossly overstates the loading capacity of the media and the results of such trials should not be relied on. Knowing how much mass a media filter can capture before failure allows it to be sized for a desired maintenance interval by estimating the pollutant load that will be delivered to the filter.



The Stormwater Management StormFilter®

A best management practice (BMP) designed to meet stringent regulatory requirements; the Stormwater Management StormFilter removes the most challenging target pollutants – including fine solids, soluble heavy metals, oil, and total nutrients – using a variety of media. For more than two decades, StormFilter has helped clients meet their regulatory needs and through product enhancements the design continues to be refined for ease of use.

Here's Why StormFilter is the Best Filter Available:

Superior Hydraulics

- External bypass Protects treatment chamber from high flows and ensures captured pollutants are not lost during low frequency, high intensity storm events
- Multiple cartridge heights Minimize head loss to fit within the hydraulic grade line and shrink system size, reducing install costs
- Over 30 StormFilter configurations in use across the country

Reliable Longevity

- One-of-a-kind self-cleaning hood Prevents surface blinding, ensures use of all media, and prolongs cartridge life
- One to two-year maintenance cycles Fewer maintenance events compared to similar products reduces costs over the lifetime of the system
- 15-years of maintenance experience Predictable long-term performance comes standard

Proven Performance

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- Only proven filter on the market Performance verified by the WA Ecology and NJ DEP, and system approved for use with numerous local agencies
 - Qualifies for LEED[®] Sustainable Site Credit
 6.2 Stormwater Quality Control
- Achieve water quality goals with confidence Easy approval speeds permitting
- 8th Generation Product Design refined and perfected over two decades of research and experience
- Full-scale testing at more than 10 sites around the United States



Underground System Maximizes Land Use and Development Profitability

- Save land space, allow denser development and reduce sprawl
- Add parking, increase building size, develop outparcels by eliminating aboveground systems
- Compact design reduces construction and installation costs by limiting excavation

Patented Siphon-Actuated Filtration

During a storm, runoff passes through the filtration media and starts filling the cartridge center tube. Air below the hood is purged through a one-way check valve as the water rises. When water reaches the top of the float, buoyant forces pull the float free and allow filtered water to drain.

After the storm, the water level in the structure starts falling. A hanging water column remains under the cartridge hood until the water level reaches the scrubbing regulators at the bottom of the hood. Air then rushes through the regulators releasing water and creating air bubbles that agitate the surface of the filter media, causing accumulated sediment to drop to the vault floor. This patented surface-cleaning mechanism helps restore the filter's permeability between storm events.

See the StormFilter in action at www.ContechES.com/stormfilter





Self-cleaning hood prevents surface blinding, ensures use of all media, and prolongs cartridge life ***

The StormFilter cartridges can also be utilized in our UrbanGreen BioFilter to expand the system's capacity and extend maintenance intervals. Find out more at www.ContechES.com/biofilter

Configurations and Applications

The StormFilter technology can be configured to meet your unique site requirements. Here are a few of the most common configurations, however many other configurations are available. Please contact your Contech Project Consultant to evaluate the best options for your site or find out more in the **StormFilter Configuration Guide available on www.ContechES.com/stormfilter**.

Upstream Treatment Configurations

The following suite of StormFilter configurations are easily incorporated on sites where LID site design is recommended. These low-cost, low-drop, point-of-entry systems also work well when you have a compact drainage area.

CatchBasin StormFilter

- Combines a catch basin, a high flow bypass device, and a StormFilter cartridge in one shallow structure
- Treats sheet flow
- Uses drop from the inlet grate to the conveyance pipe to drive the passive filtration cartridge
- No confined space required for maintenance

Curb Inlet

- Accommodates curb inlet openings from 3 to 10 feet long
- Uses drop from the curb inlet to the conveyance pipe to drive the passive filtration cartridges

Linear Grate

- Can be designed to meet volume based sizing requirements
- Can be installed in place of and similar to a typical catch basin
- No confined space entry required for maintenance
- Accommodates up to 29 StormFilter cartridges

Infiltration/Retrofit Configuration

Infiltration

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- Provides treatment and infiltration in one structure
- Available for new construction and retrofit applications
- Easy installation









Linear Grate

Dufiltration

Roof Runoff Treatment Configuration

DownSpout

- Easily integrated into existing gutter systems to treat pollution from rooftop runoff
- Fits most downspout configurations and sizes; single or dual-cartridge models available
- Treats up to 14,000 square feet of rooftop area per dual-cartridge system

Downstream Treatment Configurations

Conventional stormwater treatment involves collecting, conveying and treating stormwater runoff with an end of pipe treatment system before discharging off-site. StormFilter configurations suitable for these applications are listed below and can be engineered to treat a wide range of flows.

Vault / Manhole

- Treats small to medium sized sites
- Simple installation arrives on-site fully assembled
- May require off-line bypass structure

High Flow

- Treats flows from large sites
- Consists of large, precast components designed for easy assembly on-site
- Several configurations available, including: CON/SPAN[®], Panel Vault, Box Culvert, or Cast-In-Place

Volume

- Meets volume-based stormwater treatment regulations
- Captures and treats specific water quality volume (WQv)
- Provides treatment and controls the discharge rate
- Can be designed to capture all, or a portion, of the WQv

Peak Diversion

- Provides off-line bypass and treatment in one structure
- Eliminates material and installation cost of additional structures to bypass peak flows
- Reduces the overall footprint of the treatment system, avoiding utility and right-of-way conflicts
- Internal weir allows high peak flows with low hydraulic head losses
- Accommodates large inlet and outlet pipes (up to 36") for high flow applications











Media Options

Our filtration products can be customized using different filter media to target site-specific pollutants. A combination of media is often recommended to maximize pollutant removal effectiveness.



PhosphoSorb[™] is a lightweight media built from a Perlite-base that removes total phosphorus (TP) by adsorbing dissolved-P and filtering particulate-P simultaneously.



Perlite is naturally occurring puffed volcanic ash. Effective for removing TSS, oil and grease.



CSF[®] Leaf Media and MetalRx[™] are created from deciduous leaves processed into granular, organic media. CSF is most effective for removing soluble metals, TSS, oil and grease, and buffering acid rain. MetalRx, a finer gradation, is used for higher levels of metal removal.



Zeolite is a naturally occurring mineral used to remove soluble metals, ammonium and some organics.



GAC (Granular Activated Carbon) has a micro-porous structure with an extensive surface area to provide high levels of adsorption. It is primarily used to remove oil and grease and organics such as PAHs and phthalates.

	PhosphoSorb	Perlite	CSF	MetalRx	Zeolite	GAC
Sediments	•	•	•			
Oil and Grease	•	•	•	•		
Soluble Metals	•		•	•	•	
Organics			•	•		•
Nutrients	•	٠	•	•	•	
Total Phosphorus	•	2	Y			

Note: Indicated media are most effective for associated pollutant type. Other media may treat pollutants, but to a lesser degree.

ZPG™ media, a proprietary blend of zeolite, perlite, and GAC, is also available and provides an alternative where leaf media cannot be used.

Focus on Phosphorous

Stormwater runoff with elevated phosphorus concentration can significantly impair water quality. More stringent stormwater regulations calling for higher levels of phosphorus removal are currently being implemented. To meet these requirements, more than just the physical separation of particulate P is needed. That's where the PhosphoSorb media can help.

A cost-effective, lightweight, adsorptive filtration media, PhosphoSorb offers the effective adsorption capacity of dissolved phosphorus and retention capacity of particulate phosphorus. Initial field results suggest removal of greater than 65% of the total phosphorus load can be expected when influent concentrations exceed 0.1 mg/l, and the media can remain in operation for more than 1 year without requiring maintenance due to media occlusion.



Cartridge Options

With multiple cartridge heights available, you have a choice when fitting a StormFilter system onto your site.

The 27" cartridge provides 50% more treatment per square foot of system than the 18" cartridge. So, you are meeting the same treatment standards with fewer cartridges, which means a smaller system.

If you are limited by hydraulic constraints, choose our low drop cartridge, which provide filtration treatment with only 1.8 feet of headloss.



27″



12″

ates	Cartridge Type	Hydraulic Drop	Treatment Capacity (gpm)		
Ž			1 gpm/ft2	2 gpm/ft2	
S S	StormFilter 27"	3.05 feet	11.25	22.5	
	StormFilter 18″	2.3 feet.	7.5	15	
lge	StormFilter Low Drop	1.8 feet	5	10	
Ĕ	MFS 22"	2.3 feet	9	18	
G	MFS 12"	1.4 feet	5	10	
$\mathbf{\mathcal{I}}$					

18"



footprint/system size

Multiple cartridge heights are available to meet your hydraulics needs ***

StormFilter Accessories

Drain-Down

 Provides complete dewatering of the StormFilter vault by gradually removing residual water in the sump after the storm event



- Aids in vector control by eliminating mosquito-breeding habitat
- Eliminates putrefaction and leaching of collected pollutants
- Lowers maintenance cost by reducing decanting and disposal volume

Sorbent Hood Cover

- Absorbs free surface oil and grease on contact
- Will not release captured oil, even when saturated
- Made from recycled synthetic fiber

Cartridge Lifting Hook

• Specially designed to help you easily lift cartridges during maintenance





Maintenance

Longevity is a function of applying existing filtration physics to the maximum extent possible in order to decrease maintenance frequency without sacrificing performance. Maintenance is an integral part of ensuring long term effectiveness of a filter system. The quality of treatment can only be guaranteed by a well maintained structure, whether it is proprietary or nonproprietary. The notion that some BMPs, including low impact development (LID) structures, have no maintenance cost burden is a misconception.

Longer Maintenance Intervals Reduce Life Cycle Costs

Maintenance intervals can be a large unseen cost for developers and owners. Including a maintenance interval in the product specification will ensure that no one is surprised with high long term costs.

The Stormwater Management StormFilter can be designed with up to a 2 year maintenance interval, proven by over a decade of installations, which can greatly reduce costs. Our filter cartridges are made with 60% of recyclable material.

Ease of Maintenance Matters

The StormFilter has been optimized over time to make maintenance easy. Cartridges feature a 1/4 turn connector, so they can be quickly removed and installed. A removable hood allows for effortless access to spent media, especially compared to sealed systems that require cutting the cartridge hood. Finally, all StormFilter structures can be accessed without restriction for inspection, media replacement, and washing of structure.

Experience Counts

Contech has over 120,000 StormFilter cartridges in use throughout the country. We have a plant dedicated to the production of filtration cartridges based in Portland, OR, that supports maintenance events with exchange of full cartridge and maintenance contracts. All cartridge components go through a QA/QC review at the refilling point to ensure that the correct media gradation is supplied and that it is packed properly which provides reliable operation and performance.

Not All Stormwater Filtration Systems are the Same

When you choose the Stormwater Management StormFilter, you are choosing the industry leading technology. Our experienced design engineers can help you design the system that will work for your site and your budget.

View a StormFilter maintenance event at www.contech-cpi.com/ stormfilter





Greater than 4" of sediment is on the structure floor



Greater than ¼" of sediment is on the top of the cartridges



Great than 4" of standing water in vault for more than 24 hours after a storm

Annual StormFilter vault inspection is recommended and it doesn't require confined space entry ***



Pollutants must be removed to restore the stormFilter to its full efficiency and effectiveness.

Spent filter media can be dumped directly onto the structure floor, so the emptied lightweight cartridges can be easily removed, thus eliminating the need for handling heavy units.



StormFilter structures can be accessed without confined space for inspection.



Easy to access treatment system can make a difference in maintenance expenses.

The quality of treatment can only be guaranteed by a well maintained structure ***



Learn more

Read our white paper, Evaluation of Stormwater Filtration Systems, to learn more. You'll receive free PDH credits for completing a quick quiz.

Available at www.ContechES.com/stormfilter

Connect with us

We're always available to make your job easier. Search for your local rep a **www.ContechES.com.** While you're there, be sure to check out our upcoming seminar schedule or request an in-house technical presentation.

start a Project

If you are ready to begin a project, visit us at www.ContechES.com/designtoolbox



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