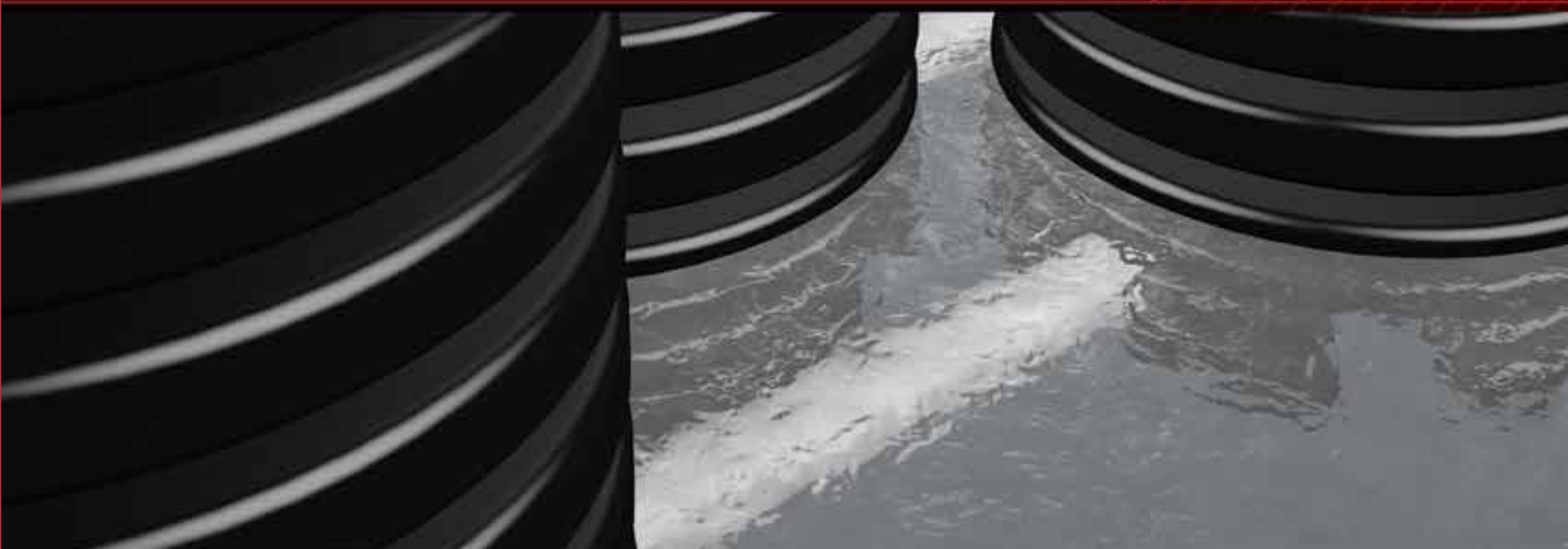
LANE

STORMKLEENER™

CARTRIDGE FILTER SYSTEM



THE STORMKLEENER™

The Lane StormKleener Filter Cartridge System is a storm water treatment device consisting of one or multiple cylindrical media filled cartridges housed in a containment or carrier vessel. The containment vessel can be constructed from any appropriate material including: corrugated metal pipe, plastic pipe, or a reinforced concrete vault. The Lane StormKleener Filter Cartridge System is a passive flow-through filtration system that filters and cleans storm water to provide exceptional pollutant removal during storm events, while providing a naturally occurring backwash to enhance and extend the life of the cartridge.

Because the filter cartridges are modular, they can be configured for any site to provide storm water treatment required by local regulations. In addition, the filtration material can be altered to target specific problem pollutants when needed.

The Lane StormKleener Filter Cartridge System has been extensively tested and has completed the New Jersey Corporation for Advanced Technology (NJCAT) testing protocol for filters passing the requirement for over 80% suspended solid removal.

For more information, visit: lane-enterprises.com/StormKleener.

ABOUT LANE

As a full-line manufacturer of corrugated metal and plastic drainage products, Lane Enterprises, Inc. operates plants throughout the Northeastern, Mid-Atlantic, and South-Central states producing various types of buried structures for the construction industry.

For nearly 90 years, Lane has partnered with contractors, engineers, and municipalities to supply reliable products that provide the highest levels of service life, strength, versatility, and economy. Our focus on quality products, responsive customer service, and technical expertise has established a long, proven history of successful partnerships within the industries we serve.

SYSTEM OPERATION

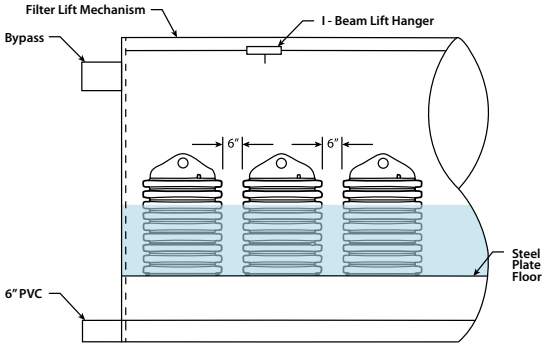
The Lane StormKleener Filter Cartridge System removes contaminants through the use of media filtration. Media filtration, and in particular sand filtration, is a long-standing method of treating drinking water, storm water, and swimming pools. It is a proven technology which provides excellent results. Sand filters have proven success at removing sediments, nutrients, heavy metals, and organic contaminants.

The Lane StormKleener Filter Cartridge System is designed to allow the up-flow of water filtration through the cartridge filters. It does this by entering the filter through the mesh tubing that is open at the bottom of the filter then flowing through the filter media into mesh tubing that is open at the top of the filter. Once the water has been cleaned, it exits the filter through the center down-drain and leaves the vault through the floor piping. The contaminants remain trapped in the containment vessel of the filter.

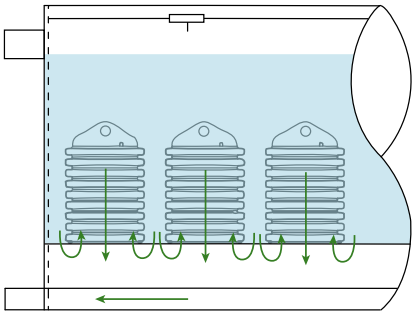
There are four phases of flow:

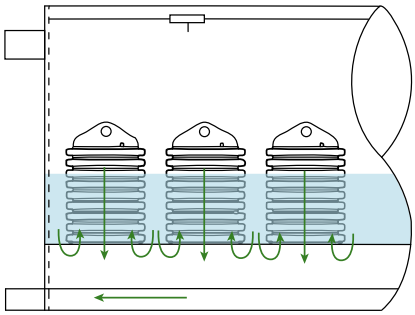
- Charging/Filling Operation
- Traditional Flow Under Head
- Siphon Flow
- Siphon Break and Backwash

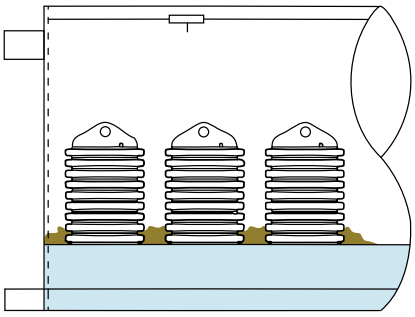
Due to the backwash operation of the filter, contaminants are left on the vault floor and clean water exits the system. The life of the filter and the performance of the filter are extended due to the backwash cycle occurring after every storm.



Charging/Filling Operation


Traditional Flow Under Head


Siphon Flow


Siphon Break and Backwash

SYSTEM DESIGN

The StormKleener Filter Cartridge System has been tested for online use, but is designed as an offline system. It can be designed for treatment of the water quality flow or volume based on local jurisdiction requirements and site parameters.

If the water quality flow rate is used to design the system, it will be less than that of the peak flow discharge from the site. Utilization of either an external or internal bypass will allow the system to be designed for the water quality flow only to extend the life of the filters and prevent early clogging. Use of pretreatment devices can extend the life of the filters and the associated maintenance cycle by removing larger pollutants prior to treatment by the StormKleener cartridges.

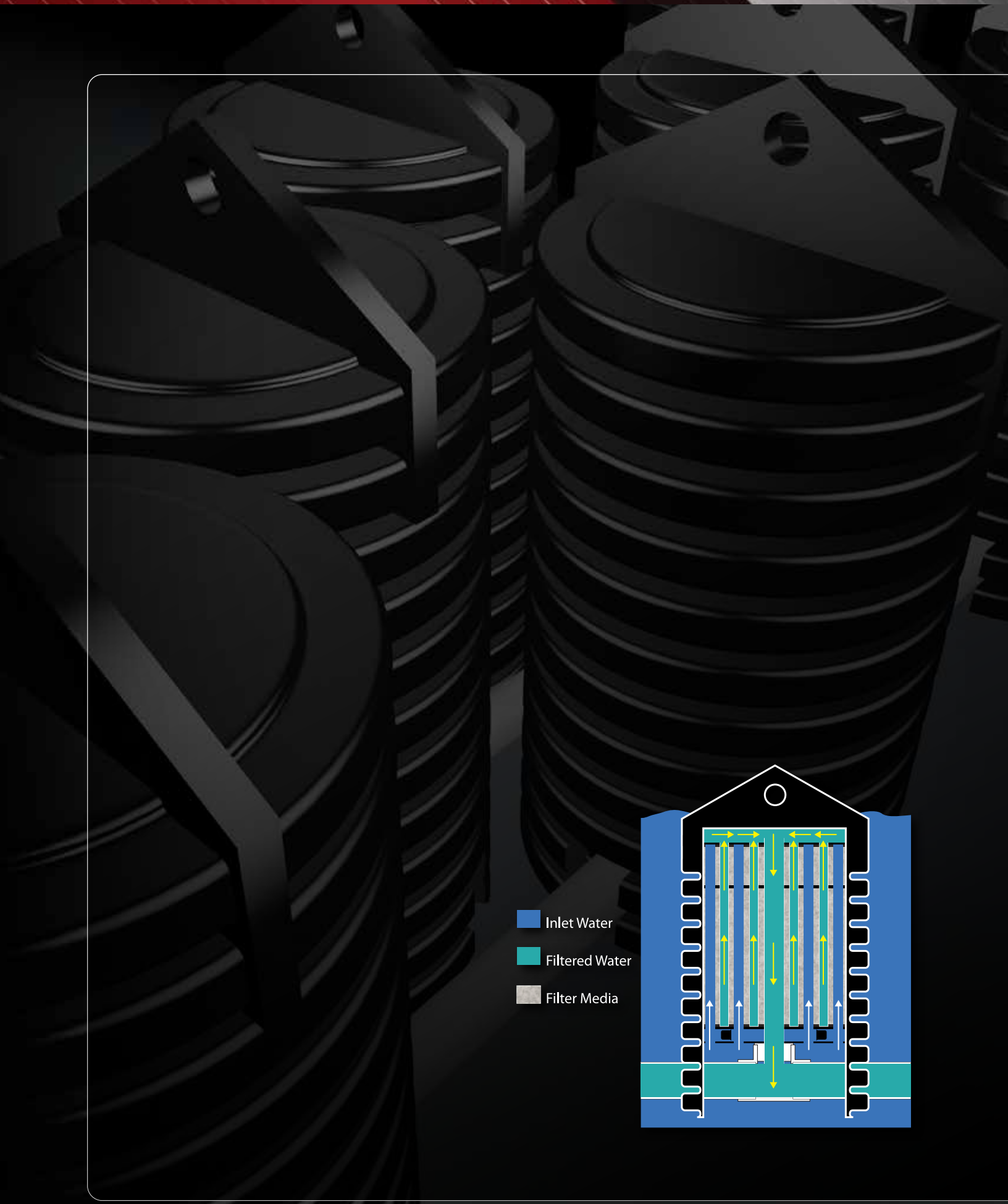
In general, the StormKleener Filter Cartridge System should be placed prior to the detention system to reduce the number of solids introduced into the system.

For a volume-based design, the cartridge system should be placed on the outlet side of the detention system. This will reduce the number of cartridges required and corresponding size of the vault holding the cartridges. The volume contained in the detention system can help extend the life of the cartridges and reduce maintenance cycles.

SELECTING THE REQUIRED NUMBER OF CARTRIDGES NEEDED

The StormKleener Filter Cartridge System treats storm water independently and can be combined within vaults or other carrier structures to treat larger quantities of storm water runoff. There is a balance between the number of cartridges needed for treatment, maintenance, and jurisdictional requirements. More cartridges would mean longer maintenance cycles, but the initial cost can be prohibitive. Fewer cartridges can mean lower installed cost, but the maintenance cycle could be shortened. Finally, jurisdictional regulations will play a role in the decision as well.

The StormKleener Filter Cartridge System is designed to treat the storm water quality flow at 30 gpm. This, combined with jurisdictional requirement, can help determine the minimum number of cartridges needed. For more information on designing with StormKleener, refer to the StormKleener design manual or call your Lane representative.


Inlet Water
Filtered Water
Filter Media

CONTAINMENT VESSELS

Multiple options are available for the containment vessels for the filter system including precast manholes, concrete vaults, CMP (Corrugated Metal Pipe) structures, and others. The treatment capacity is determined by the number of filters installed in the vault which is fully customizable. Contact your Lane representative for vault sizing and options.

INSTALLATION

Installation of the system is a simple process and it can be installed by a typical pipe installation contractor. The containment system is set in place at the grade and elevations determined by the engineer. The filter cartridges are placed inside the vault and connected to the interior piping. The installation will include the drainage manifold and filter cartridges in most instances. The filters are modular and installed individually making the process quick and easy. The filter cartridges should be installed after the site has been stabilized so that excess sediment leading to early maintenance is avoided.

MAINTENANCE

The StormKleener Filter Cartridge System requires maintenance to continue performing within the specifications for which it was designed. The system is maintained by removing and replacing each cartridge and removing the sediment and pollutants deposited on the vault floor. Removal of sediment and pollutants is accomplished with a vacuum truck.

The required maintenance cycle will be determined by the number of solids treated and removed by the filters, by site conditions, and local rainfall. The system should be monitored periodically to make sure that the system is operating within the required specifications. For complete maintenance instructions, contact your Lane representative.

STORMKLEENER™ SPECIFICATIONS

COMPONENTS

- Precast Concrete Vault: Shall be manufactured in accordance with ASTM C478, C858, and C1433. Concrete vault shall be provided by Lane Enterprises or Lane approved supplier.
- CMP Vault: Shall be manufactured in accordance with ASTM A760, A762, or B745. CMP vaults shall be provided by Lane Enterprises.
- If PVC manifold piping is required in the structure, all pipe and fittings will meet ASTM D1785. Piping shall be provided to the contractor precut and partially assembled. Instructions and marking for pipe connections will be included.
- Filter Cartridges: The cartridge shell shall be manufactured from Lane Enterprises' Corrugated Dual wall HDPE pipe and other HDPE components. Each filter cartridge is capable of a flow capacity of 30 gpm.
- Filter Media: Filter media shall be Lane Enterprises' Filter media and shall consist of effective particle size of no more than 0.42 mm, a hardness of 7, and be 99% silica; with no leaching of nutrients. Media blends may also include perlite, charred wood, activated alumina, and other media as required.

PERFORMANCE

- The Lane StormKleener Filter Cartridge System is capable of offline or online treatment and should be designed to treat 100% of the required treatment flow.
- The filter shall have no moving parts.
- The StormKleener Filter Cartridge System shall be designed to remove at least 80% of total suspended solids based on testing completed in compliance with the NJCAT Filter testing protocol.
- The StormKleener Filter Cartridge System shall be capable of backwashing after storm events to extend the filter life and increase performance. Flow through the filters shall be up flow.

INSTALLATION

Installation of the StormKleener Filter Cartridge System shall be in accordance with Lane Enterprises' installation instructions.

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Shippensburg	717.532.5959

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Dublin	540.674.4645
Wytheville	276.223.1051

NEW YORK

Ballston Spa	518.885.4385
Bath	607.776.3366

NORTH CAROLINA

Statesville	704.872.2471

TEXAS

Temple	254.727.3346

CORPORATE HEADQUARTERS

Camp Hill	717.761.8175

LANE Products

Corrugated Metal Pipe
Spiral Rib Pipe
Corrugated HDPE Pipe
Corrugated Polypropylene Pipe
Structural Plate Pipe and Arches
Structural Plate Box Culverts
Storm Water Collection Chambers
Storm Water Management Systems
Storm Water Filters
CFT (HDPE) Water Quality Unit
CMP Sandfilter
Open Top Slotted Drain
Welded Wire Mesh Gabions
Structural Plate Headwall-Culvert Systems
Custom Fabrications (Pond Kits, Trash Racks, etc.)
Long Span Bridge & Culvert Services
Rebar and Custom Powder Coatings

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