Bio Clean
A Forterra Company

SYSTEM ADVANTAGES

WetlandMod™

Horizontal Flow Bioretention

Bioretention has become a key component to a successful low impact development implementation. However, while bioretention offers many treatment, volume control, and volume reduction benefits, they are very large and inconvenient.

Typically bioretention systems take up 2% to 5% of the buildable area of a project. On many high-density, mixed use, commercial, and infill projects it can become infeasible to implement bioretention without sacrificing essential buildable space. WetlandMod™ is a LID version of our flagship Modular Wetlands® System. By combining our patented horizontal flow process and standard bioretention media we have reduced the footprint of bioretenion from 25% to 65%, thus reducing overall cost and freeing up precious land.

In the winter of 2019 we completed an in-depth independent comparative analysis of traditional downward flow bioretention to the horiztonal flow WetlandMod™. The results were impressive, showing bioretention can maintain a greater than 90% TSS removal performance at a moderate hydraulic conductivity over an extended sediment load. More impressively, the WetlandMod™ horizontal flow set up was able to maintain above 90% TSS removal at a higher hydraulic conductivity and handle 50% more water volume, and 35% more sediment load than traditional bioretention. Proving WetlandMod™ is a viable option and performance improvement over traditional bioretention configurations.

	WetlandMod™	Bioretention (Downward Flow)
TSS Performance Above 90%	✓ **97.8%**	✓ **99.6%**
Water Volume Treated (Gallons Per 1306 sq.ft.)	✓ **1.595 Million Gallons** **33% More Volume Capacity**	✗ **1.074 Million Gallons**
Sediment Load Treated (Pounds Per 1306 sq.ft.)	✓ **11,460 Pounds** **28% Greater Sediment Load Capacity**	✗ **8,224 Pounds**
Average Infiltration Rate (Inches Per Hour)	✓ **21.7 Inches Per Hour** **27% High Sustained Infiltration Rate**	✗ **15.8 Inches Per Hour**

Updated 4/1/2019

Horizontal flow testing.

Downward flow testing.

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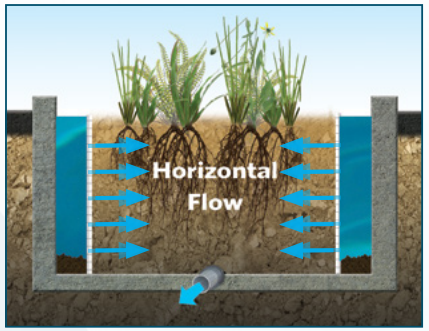
OVERVIEW

The Bio Clean WetlandMod™ provides groundbreaking stormwater treatment and volume reduction/control technology. This modular system provides the same treatment train concept as the industry leading Modular Wetlands System™ Linear. The WetlandMod™ combines screening, separation, and biofiltration, combined with the capacity to reduce and control water volume in a more efficient way when compared to traditional downward flow bioretention systems.

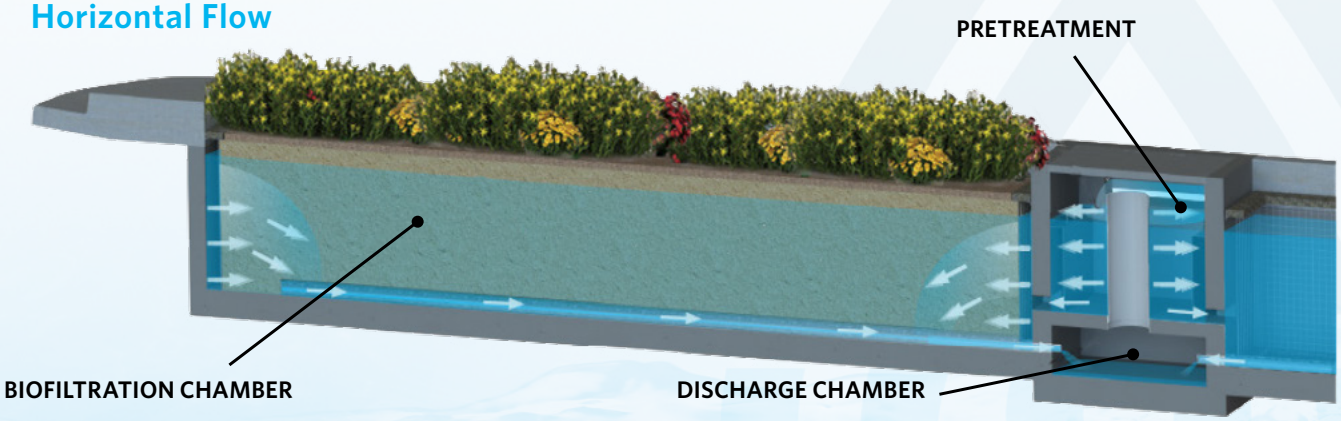
The WetlandMod™ is built on the concept of horizontal flow biofiltration, which was first introduced in 2007 by the Modular Wetlands. Horizontal flow works with gravity, not against it, to prevent clogging, standing water, and other problems associated with traditional downward flow bioretention systems.

Bioretention systems have an inherent flaw — the force of gravity. As stormwater runoff carries pollutants into the system, including sediments and hydrocarbons, they are deposited on top of the bioretention media where it accumulates and quickly clogs the filter media.



Sediments accumulate adjacent to vertical media surface reducing clogging.

Horizontal Flow

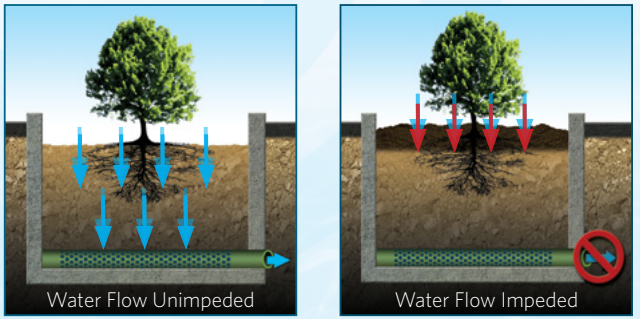


OPERATION

It has been documented that sediment accumulation from just a few storm events can completely clog a bioretention system. This leads to drastically reduced infiltration rates, expensive maintenance burdens, and safety issues associated with standing water, depressed landscaping, and vector control.

The WetlandMod™ overcomes these challenges by utilizing pretreatment, a horizontal flow biofiltration bed, and orifice flow control. The initial surface of the media bed in the WetlandMod™ is oriented on a vertical plane, as opposed to horizontally, therefore running parallel with the force of gravity as opposed to perpendicular. This simple concept increases surface area, reduces BMP footprint, prevents clogging, and leads to an enhanced overall system with lower maintenance costs. The WetlandMod™ can utilize various blends to meet local stormwater bioretention media specifications. The system is also available with an organic-free WetlandMEDIA™ to prevent nutrient leaching and maximize pollutant removal.

Downward Flow



Sediments accumulate on top of the media leading to clogging.

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