

Design

Frisco Luxury Auto Frisco, TX

Bioswale with High Performance Biofiltration Systems (HPBMS)

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Construction

- Four biofiltration systems were installed in December 2016.

- HPBMS Footprint = 276 SF
Bioswale Area = 7,400 SF

- Target Pollutants = TSS, Metals, and Hydrocarbons



- An 8oz non-woven geotextile is lined on the bottom and walls of the excavation.

- A geo grid wraps the top and sides of the undrain, then pea gravel is backfilled 6" above the top of the underdrain.

- 18" of engineered soil is placed on top of the bridging stone. A "cap & seal" is used after installation to protect the system from sedimentation.

- A hydraulic conductivity test is performed after the system is activated, demonstrating that the performance of the drainage media meets the specified infiltration rate.



Maintenance



- Heavy rains during the winter and spring eroded away the slope of the bioswale, washing sediment into the biofiltration systems.

-The mulch layer was clogged, preventing the engineered soils from being polluted.

- The clogged layer of mulch is removed and replaced it with a new layer during the 1st year's maintenance plan specified during design.

- The work requires the use of common gardening tools such as a wheel barrow, rake, and shovel.

- Other maintenance tasks include evaluating plant health and removing trash and debris in the upstream



Keys to Successful Design and Implementation

*Use high flow rate engineered soils

*Specify maintenance for the 1st year

*Turnkey installation

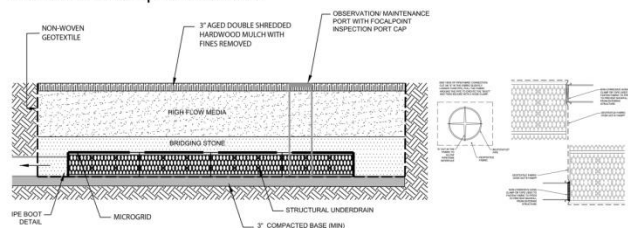
*Post-construction verification.

**"Cap & Seal" Erosion Protection

- The local development ordinances required that 7,000 ft² footprint of the property must be a bioretention or permeable pavement. High Flow Biofiltration was the most cost-effective solution.

-Stormwater runoff from a 5-acre drainage area sheet flows into a bioswale, designed to treat and manage the first 1.5" of runoff using 4 High Performance Biofiltration Systems (HPBMS).

- High flow biofiltration was advantageous to the designers because of its reduced footprint, lower maintenance costs, and performance-based specifications.



- The HPBMS is a scalable system that allows the designer to leverage available storage area to better facilitate site development.

- The unique scalability can be utilized in traditional site development, Green Infrastructure (GI), or Low Impact Development (LID).

FocalPoint TR-55 Rainfall and Distribution Based Sizing:
New Construction (Full Event) Design

- Water Quality Volume
- Peak Flow
- Peak Flow Duration
- Peak Flow Rate
- Peak Flow Volume

FocalPoint TR-55 Volume Distribution Implications

High flow rate engineered soils provide a high infiltration rate, allowing for a smaller footprint and lower cost. The system is designed to handle high flow rates, ensuring that the water is infiltrated quickly and efficiently.

FocalPoint FOCALPOINT BIOFILTRATION SYSTEM PROFILE

18" High Performance Media:
Flows at 100" Per Hour / 200 ft per day
Resistant to Clogging

Pollutant Removal:
TSS = 91%
Nitrogen = 48%
Phosphorus = 66%

High Performance Underdrain:
9.45" Modular Tank, or Flat Pipe w/95% Open Surface
Collects Water Efficiently,
Optional 2" Low-Profile Panel Addresses Shallow Applications.
Expand into Modular Tanks for Larger Storage Needs

3" Layer of Shredded Hardwood Mulch:
Pre-treatment mechanism. Removal and Replacement of Mulch Represents the Bulk of System Maintenance!
6" Bridging Stone & Separation Layer:
Clog-Proof Clean Stone & Micro-Mesh Replace Traditional Geotextile Layer
No geotextile = no clogging