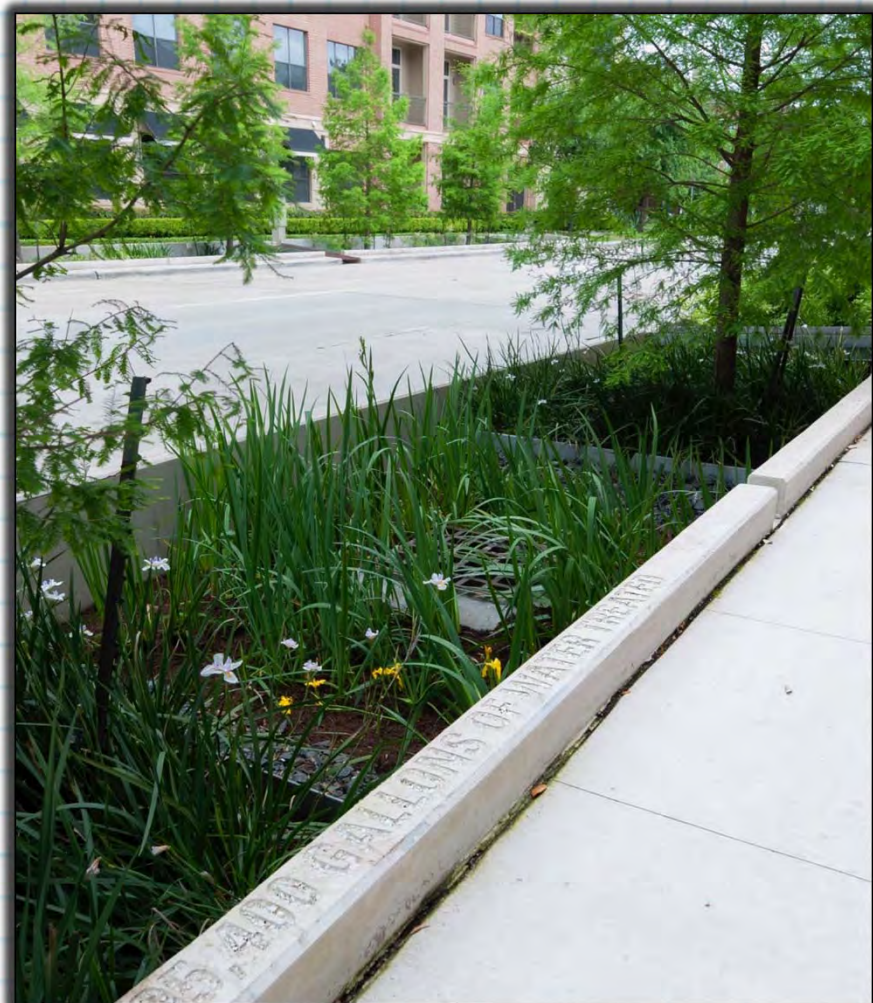


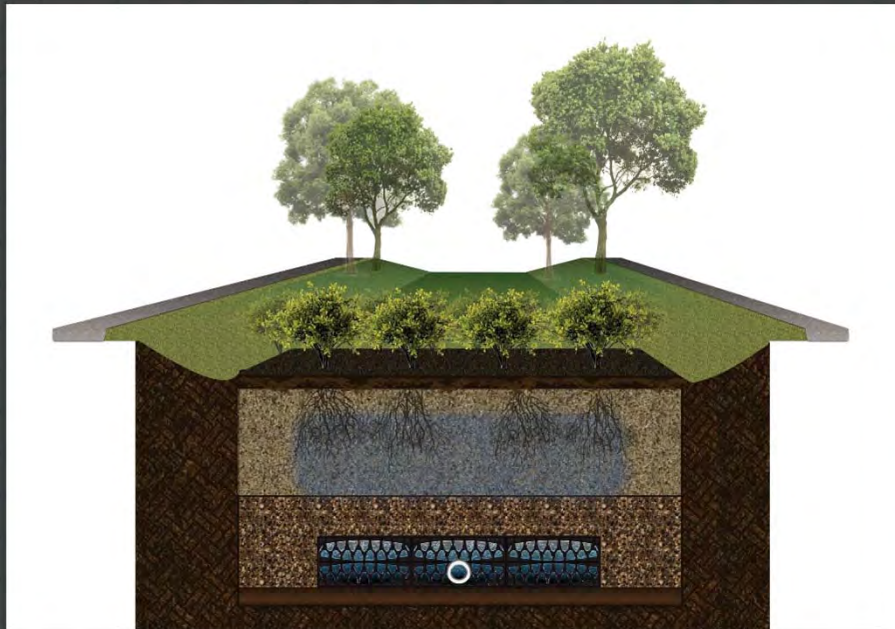
Next Generation Bioretention High Performance Modular System



- **Reduced Infrastructure Cost**
- **Reduced Overall Maintenance Cost**

FocalPoint Scalable Biofiltration System Application Concepts:

- ***Traditional SWM***
- ***Green Infrastructure***
- ***Low Impact Development***

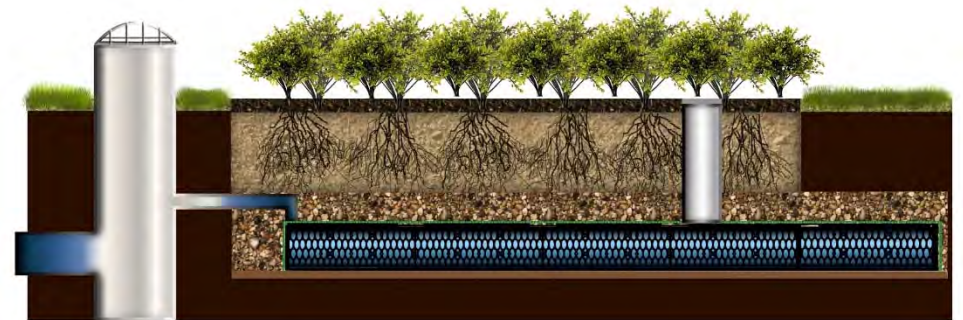




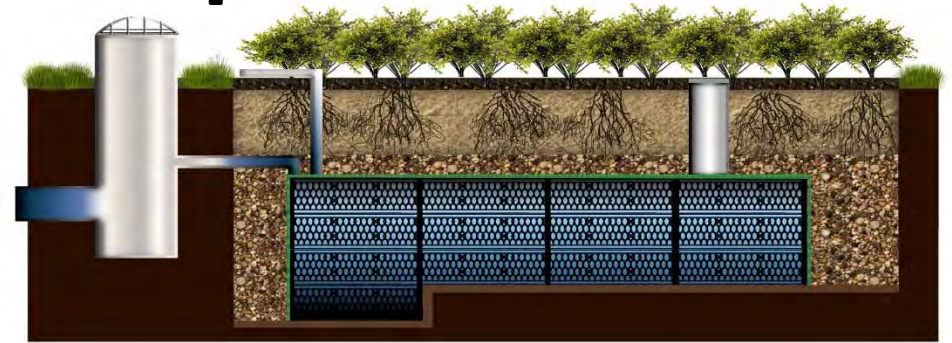
**FocalPoint
HPMBS gives
designers
maximum
flexibility in
meeting both
water quality and
water volume
requirements!**



Expanded Detention



Expanded Infiltration



Rain Water Harvesting



3" Layer of Shredded Hardwood Mulch:

- **Acts as pre-treatment mechanism to capture silt, sediment and certain pollutants.**
- **Removal and replacement of mulch represents the bulk of system maintenance!**



18" High Performance Media:

- Flows at 100" Per Hour!
- Flows Faster With Age as Root System Grows
- Resistant to Clogging

Pollutant Removal:

- TSS = 91%
- Nitrogen = 48%
- Phosphorus = 66%



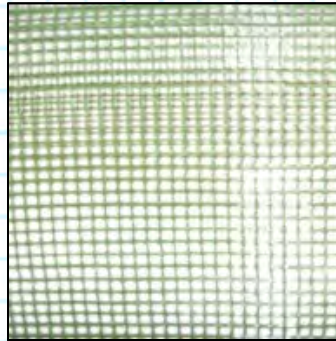


Quality Assurance/ Quality Control (QA/QC):

- **All Components of the FocalPoint System are sold as a bundle to provide raw material quality control.**
- **Media Certification**
- **Performance Guarantee backed with In-Situ Testing at Time of Install and One Year Later!**



6" Bridging Stone & Separation Layer:



**Clean Stone & Micro-Mesh
Replace Traditional Geotextile
Layer**

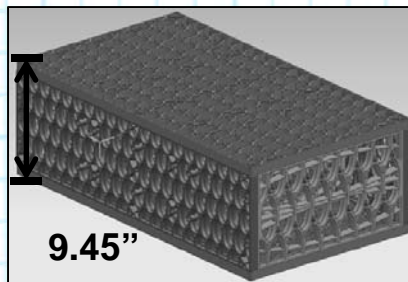


**No Geotextile
= No Clogging**



High Performance Underdrain:

9.45" Modular Tank, or
"Flat Pipe" w/95% Open
Surface Collects
Water Efficiently.



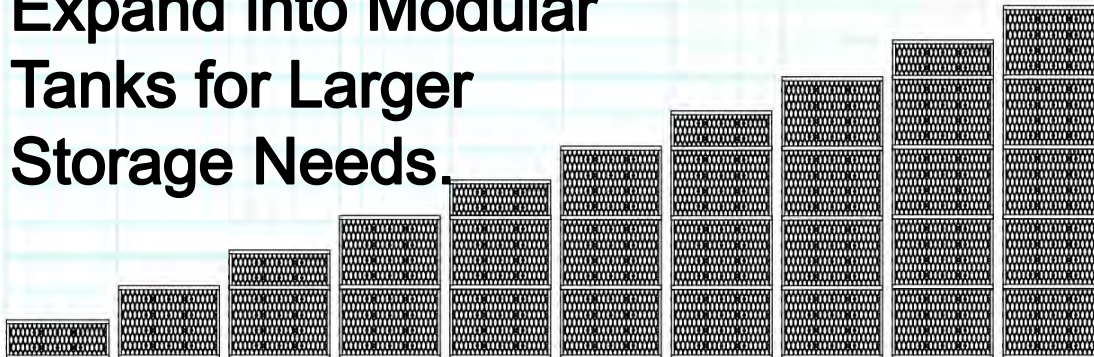
System Depth 36

2" Low-Profile Panel
Addresses Shallow
Applications.



System Depth 29

Expand into Modular
Tanks for Larger
Storage Needs.



FocalPoint Maintenance Manual: Provides Comprehensive Guidance & Record Keeping Tools.

*1st Year of
Maintenance Included!*



Pick Up Trash

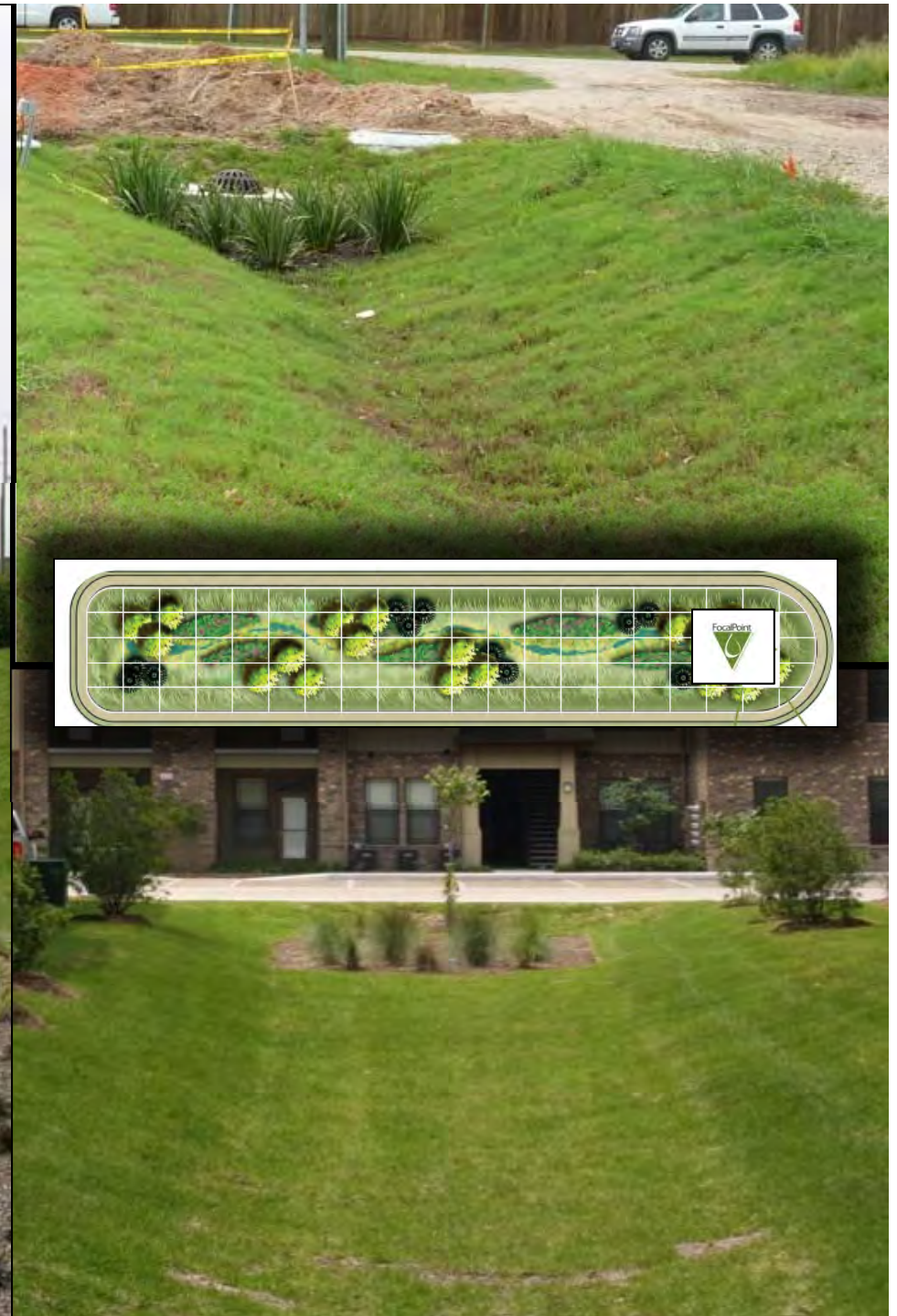
Remove & Replace Mulch



Clean Sediment Entry Points



Design With A Low Cost and Easy to Maintain Surface Depression to Implement Low Impact Development:



Example Applications:



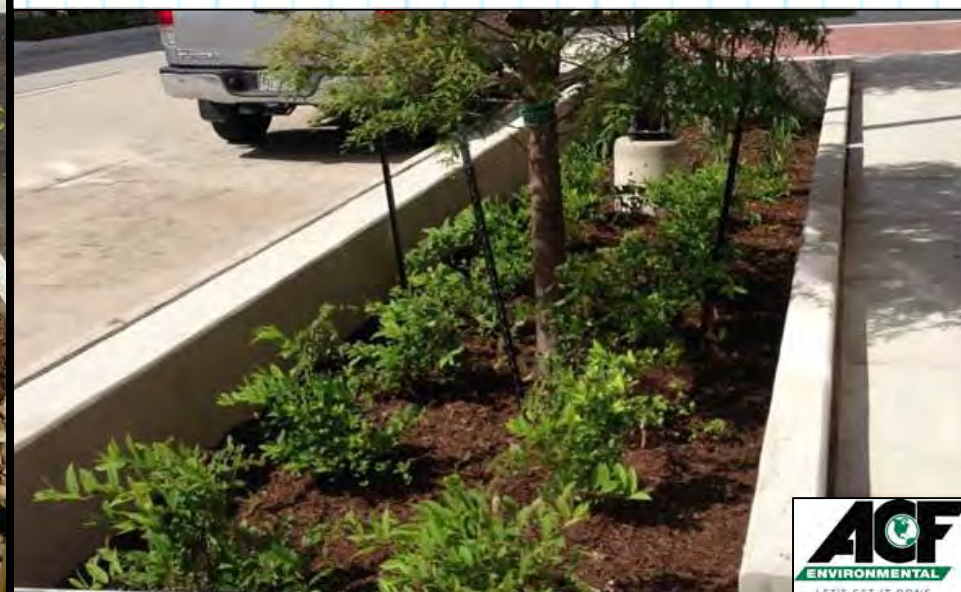
Parking Lots



Highway



Urban retrofit



ACF's Engineering team can provide project specific support or you can access the tools below:

FocalPoint **Check List**

Project Name: _____ Location: _____

HPMBS TR-55 Calculator

HydroCAD®

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM (HPMBS)
Material, Performance and Installation Specification

CAD Details

FocalPoint **Tech Note**
Plant Selection

FocalPoint **FocalPoint Facts**
Pollutant Removal Rate

75% **73%** **43%** **85%** **93%**

Treatment Unit Processes	Rate	Description
IMPORTANT PARTICLES CAPTURING MECHANISMS		
Sedimentation	Fast	Particles settle on surface of media by gravity.
Physical Straining (Filtering)	Fast	Larger particles cannot pass the media pores.
Inertial Impaction	Fast	Particles adhere to filter media as they collide.
Interception	Fast	Particles in close proximity attach to one another.
Adsorption	Fast	Accumulation of material onto filter media surface.
Absorption	Fast	Incorporation of material into the filter media.
Bacterial Adsorption	Fast	Particles stick or adhere to bacteria cell wall slime.
Plant Adsorption	Fast	Particles adhere on plant roots.
Chemical/Biological Capturing Mechanisms		
Precipitation	Fast - Medium	Important in P, N and heavy metal removal. For example P may react with AL or Fe to form insoluble compounds.
Cation & Anion Exchange	Fast - Medium	Compounds with exchangeable positive and negative ions are bound soil particles and organic material in the media.
Plant & Microbe Ion Exchange	Fast - Medium	Plant roots, mycorrhizal fungi and microbe cell walls all have the ability to actively exchange ions with nutrients such as P, N and heavy metals.
Physical Adsorption	Fast	Electrostatic forces, electrokinetic forces and Vander Waals forces.
Volatilization	Medium	Volatile compounds are removed from the media through evaporation or actively removed through transpiration.
Plant / Microbial Degradation / Transformation / Growth	Slow	Mediated decay of organic material, uptake of nutrients and transformations of complex compounds for growth and energy.

- **Specifications**
- **Calculator**
- **CAD Details**
- **Flow Rate & Pollutant Removal Documentation**
- **Media Certification**
- **Installation & Maintenance Manuals**
- **Performance Guarantee**
- **And More!**

MARYLAND DEPARTMENT OF THE ENVIRONMENT
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FOCAL POINT **TECH SHEET**
Planting Instructions

Media Certification

Focal Point: Performance Guarantee & In-Situ Testing

While biofiltration & biosorption systems provide unmatched ability to treat wastewater runoff, they also have a history of problems. Two of the primary reasons for these problems are that the media used in the systems don't flow as they're supposed to, or that the systems are contaminated during the construction process.

Performance

FocalPoint
BIOFILTRATION SYSTEM
Operations & Maintenance

ACF ENVIRONMENTAL
LET'S GET IT DONE