
Indiana Association for Floodplain and Stormwater Management
INAFSM
Indiana Association for
Floodplain and Stormwater Management
Promoting sustainable floodplain and stormwater management
Next Generation Innovative GI Technologies
High Performance Modular Biofiltration Systems:
A 2nd Generation Solution to Stormwater Management
LET'S GET IT DONE

# Queenston Manor Apartments – Academy Development Corp.


## WHY LOW IMPACT DEVELOPMENT?

- Economics
- Aesthetics
- Maintenance

# Queenston Manor Apartments – Economics Conventional Design

# Queenston Manor Apartments – Economics
# Low Impact Developmet/GI Design

- Pervious pavement (parking)
- Biofiltration/Swales
- Underground storage

# Queenston Manor Apartments - Economics

Design

- 7 Acres @ .35 ACFT/AC = 106,000 CF

Integrated Design Approach

- 43,560 SF Porous Pavers @ $12 SF = $522,720 (-$217,800) = $304,920
- 21,000CF UG Detention / Drainage @ $6 = $126,000 (-$50,000)= $76,000
- 600 SF Biofiltration System @ $100 SF = $60.000
- 50,000 CF @ $.50 CF (Bioswale Excavation & Haul off) = $25,000
- 2,500 SY Sod @ $1.30SY = $3,250

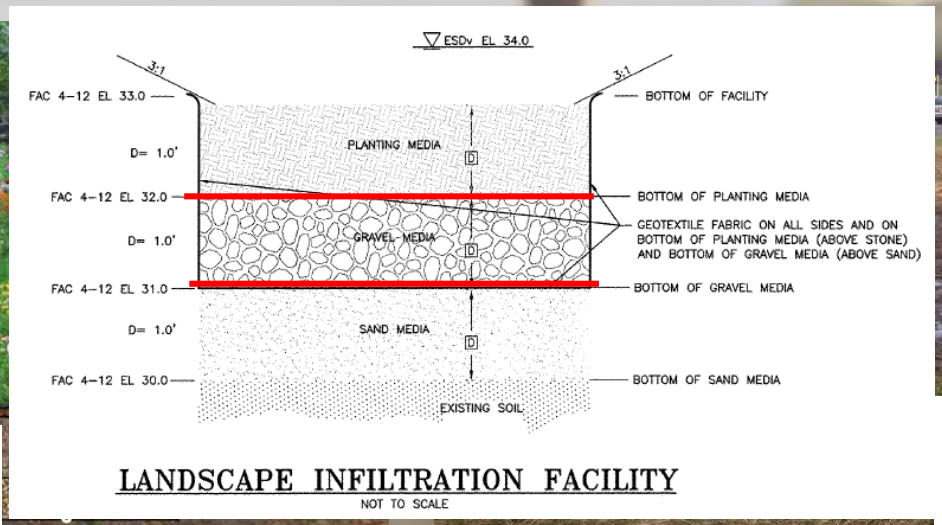
Total Hard Cost = $469,170

**Opportunity Seized – ROI = 10 Months**

# Queenston Manor Apartments - Economics

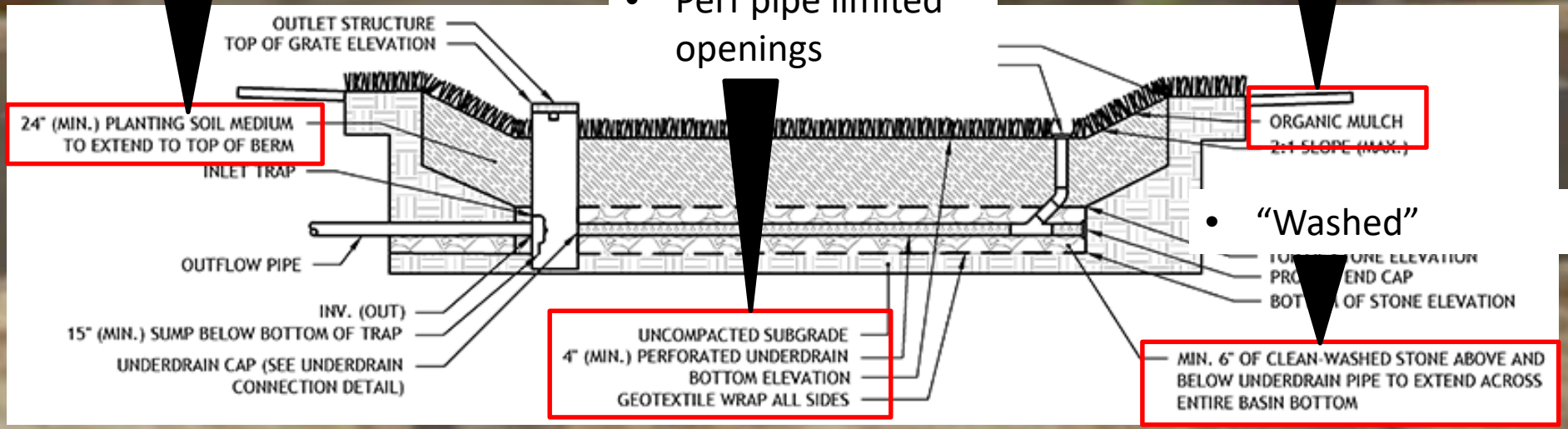
# FIRST GENERATION DESIGN – TRADITIONAL BIORETENTION

- Poor QC
- Mixed in Field
- Unreliable WQ




- Poor spec
- Too many fines
- softwood

- Generic fabric..
- Perf pipe limited openings

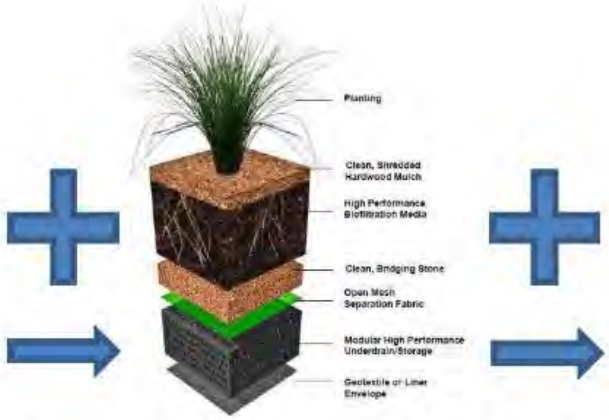



- "Washed"

# Treatment Trains

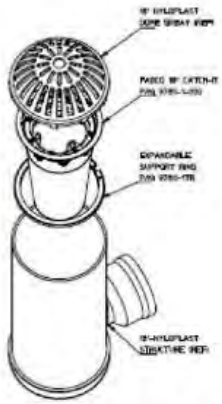

**PRETREATMENT:**

**RAIN GUARDIAN TURRET**




**PRIMARY TREATMENT:**

**FOCALPOINT**



**OVERFLOW BYPASS:**

**BEEHIVE OVERFLOW FILTER**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# Maximize Capacity & Extend Effective Bioretention Cell Life


Rain Guardian: Provides stable inlet & pretreatment, drains and dries between storm events.

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RAIN GUARDIAN


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# PRETX – BIOFILTER INLET

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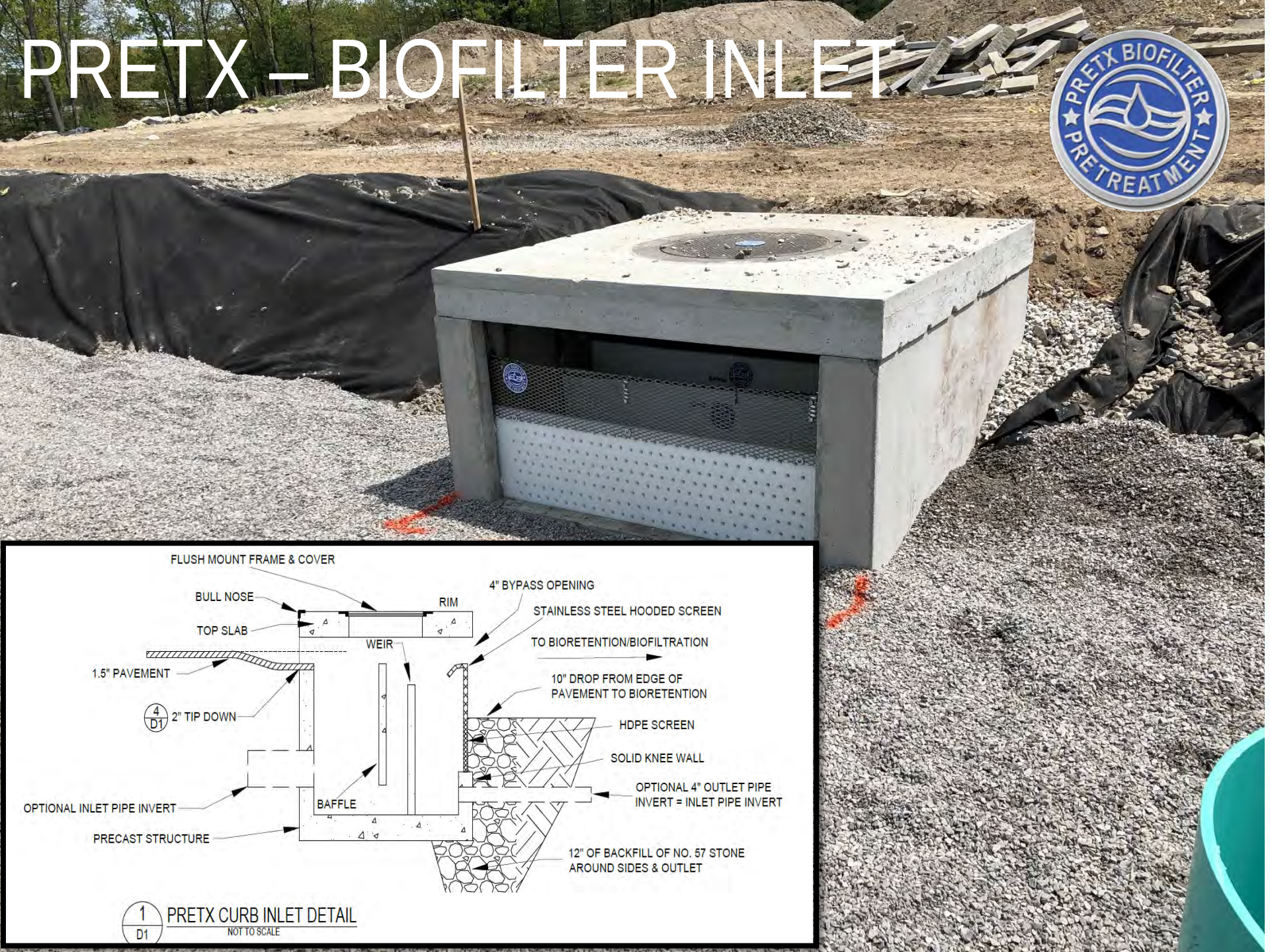
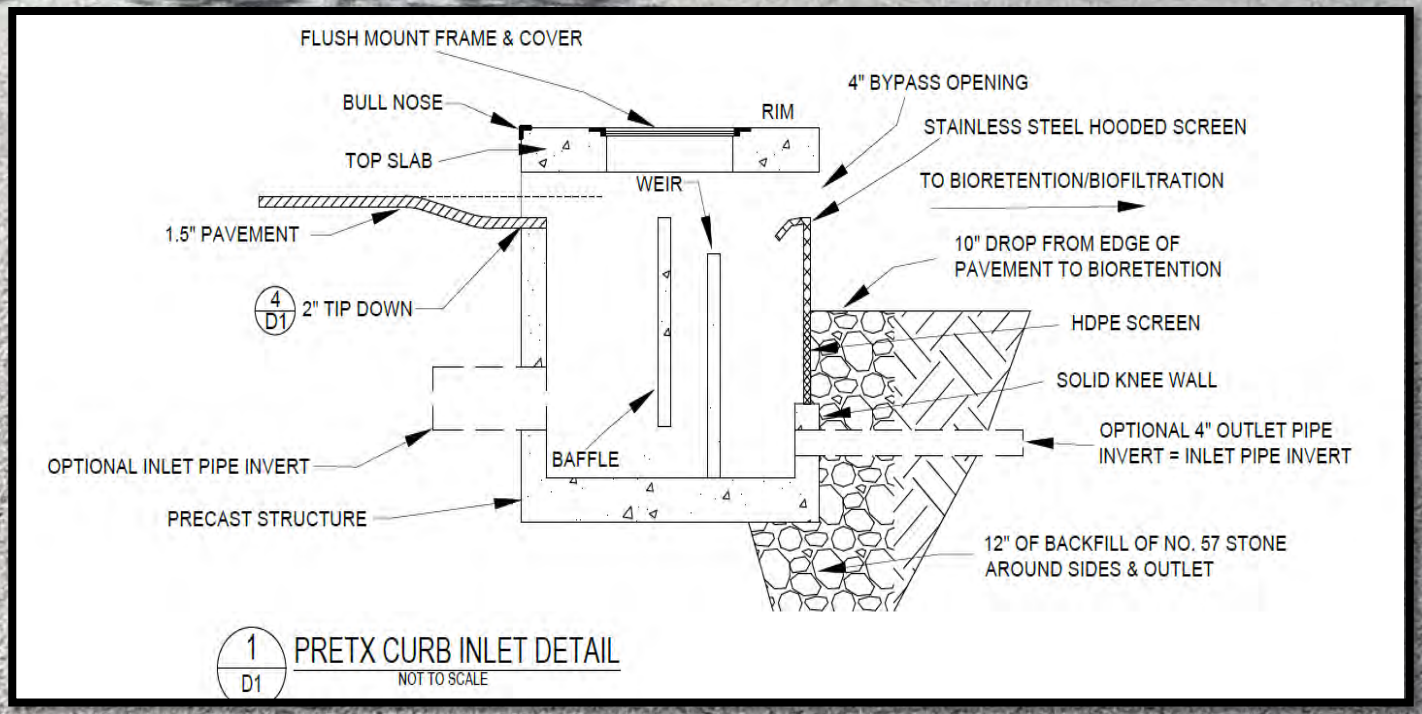


# PRETX – BIOFILTER INLET



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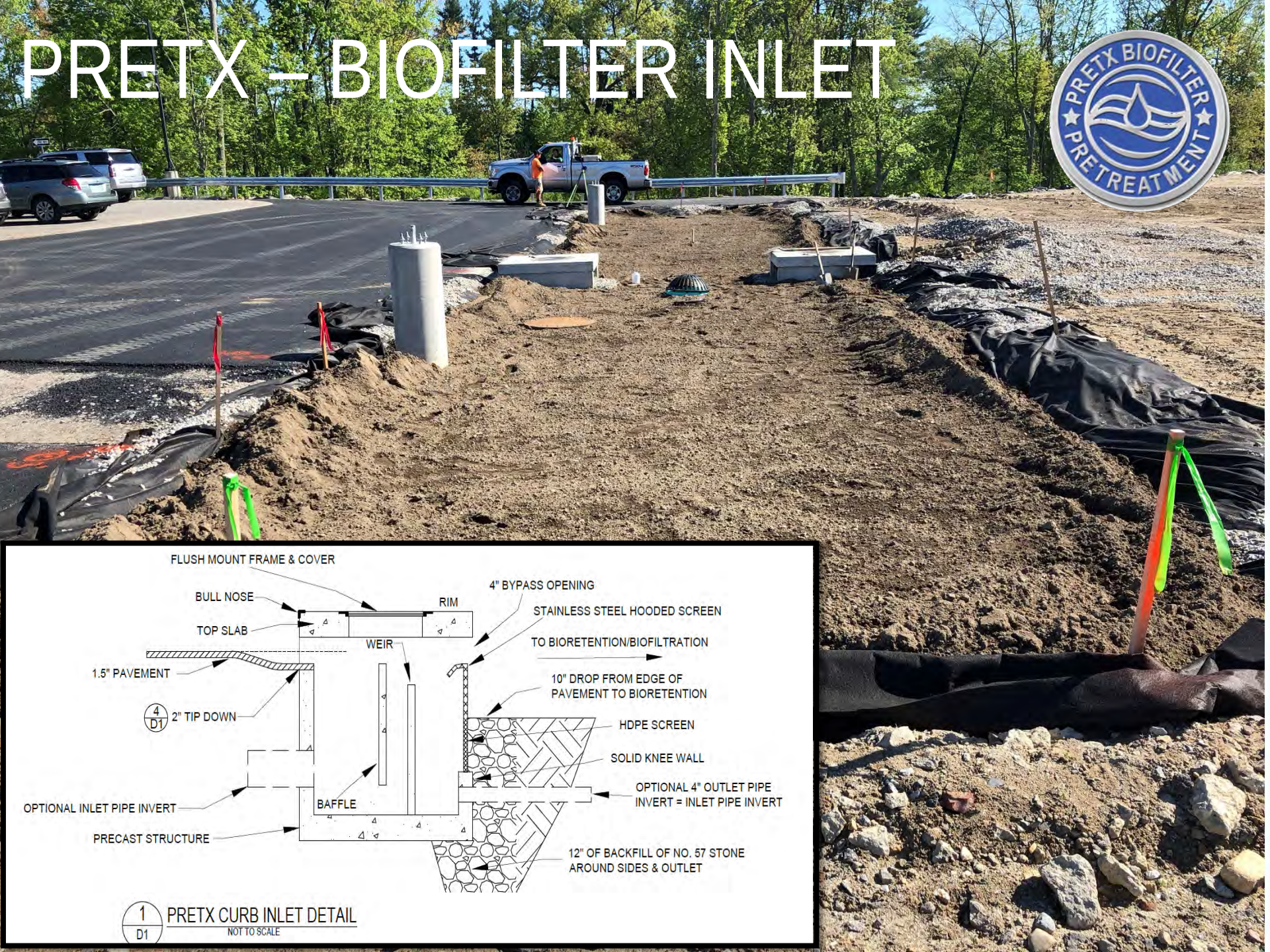
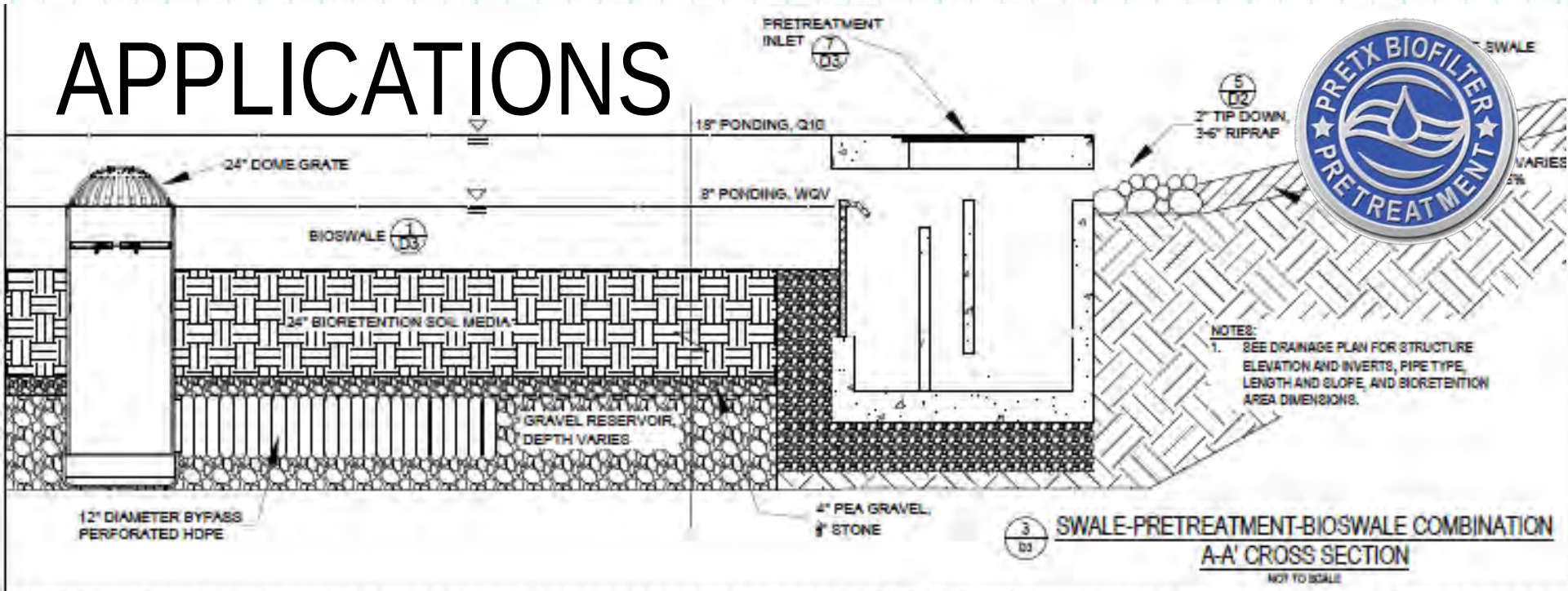
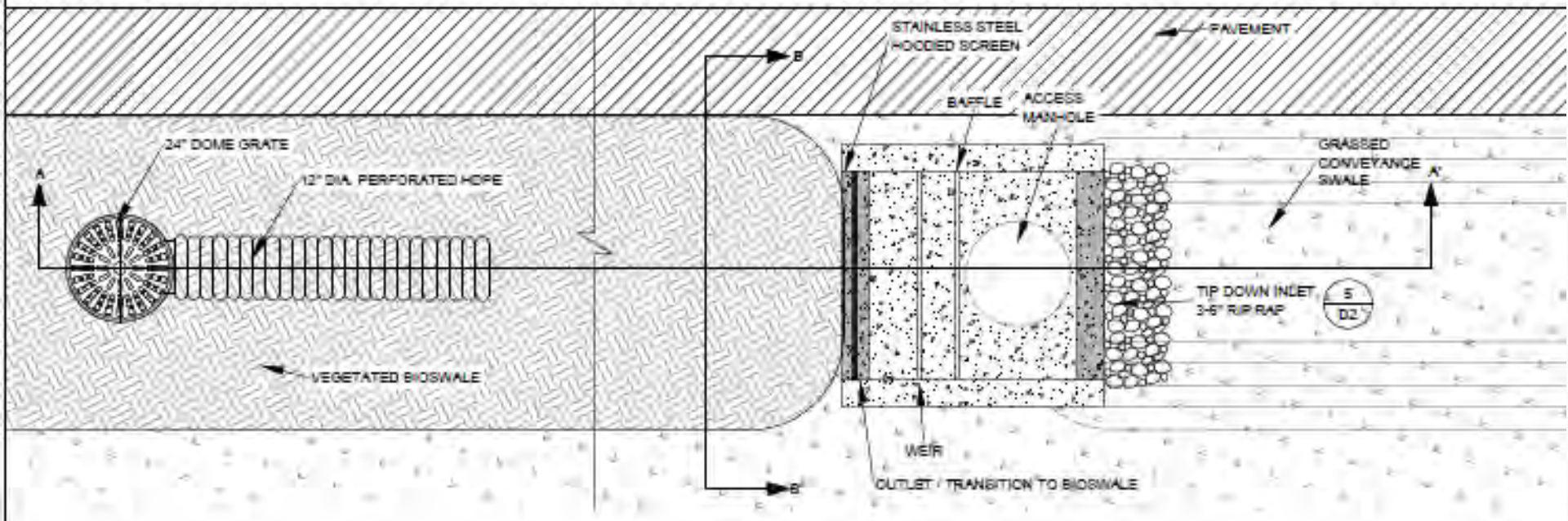


# APPLICATIONS



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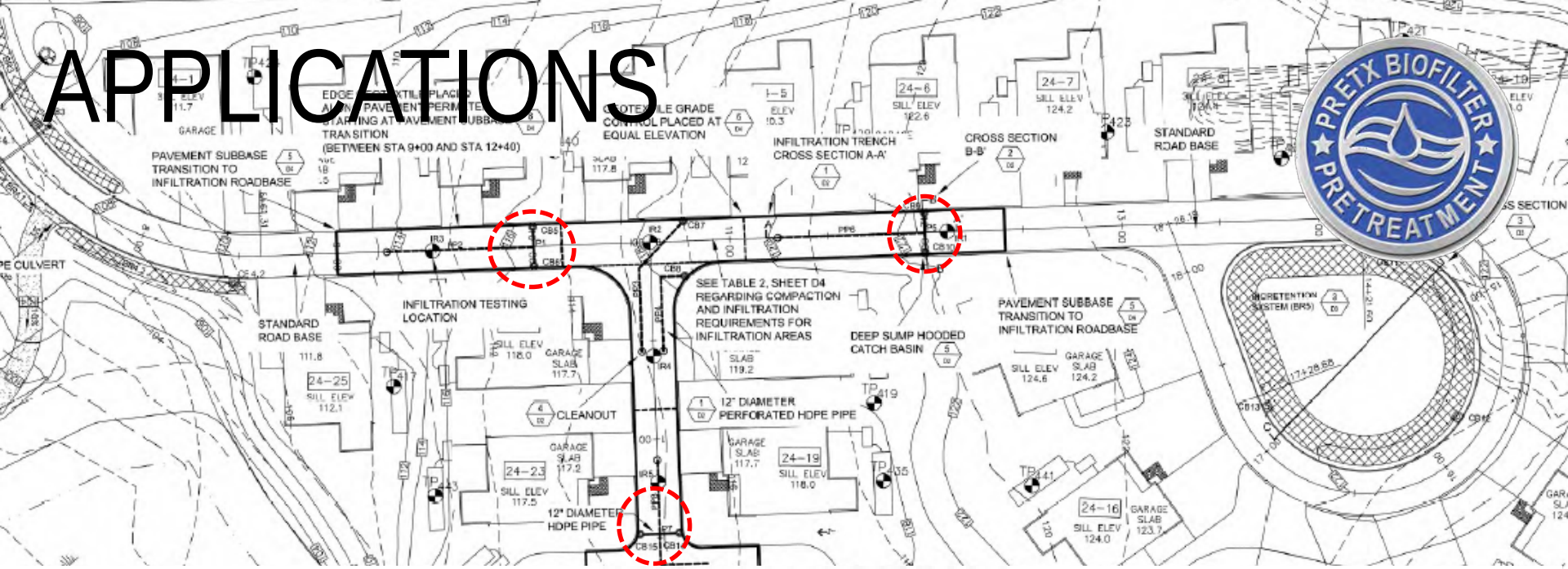
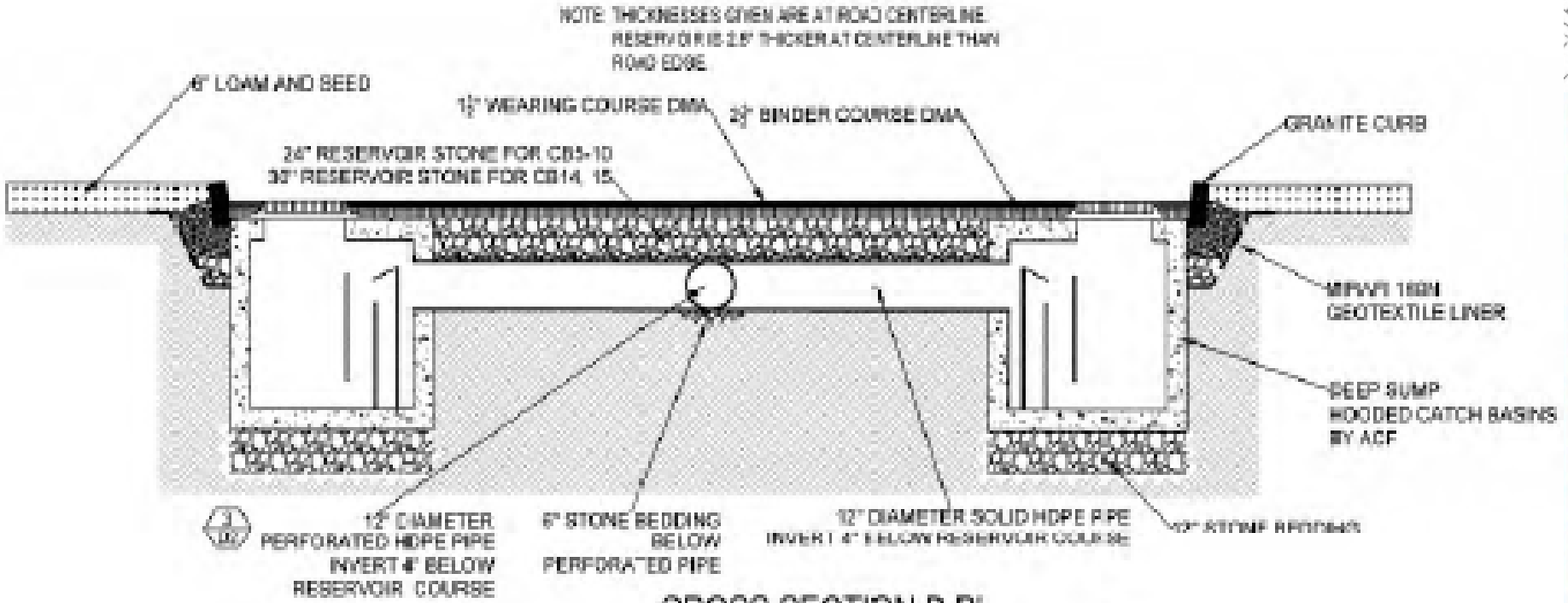



CROSS SECTION B-B'

# FOCALPOINT BIOFILTRATION SYSTEM PROFILE

**Vegetated System:**
Plants process pollutants removed from run-off and root system maintains drainage and aeration of media.

**3” Layer of Shredded Hardwood Mulch:**

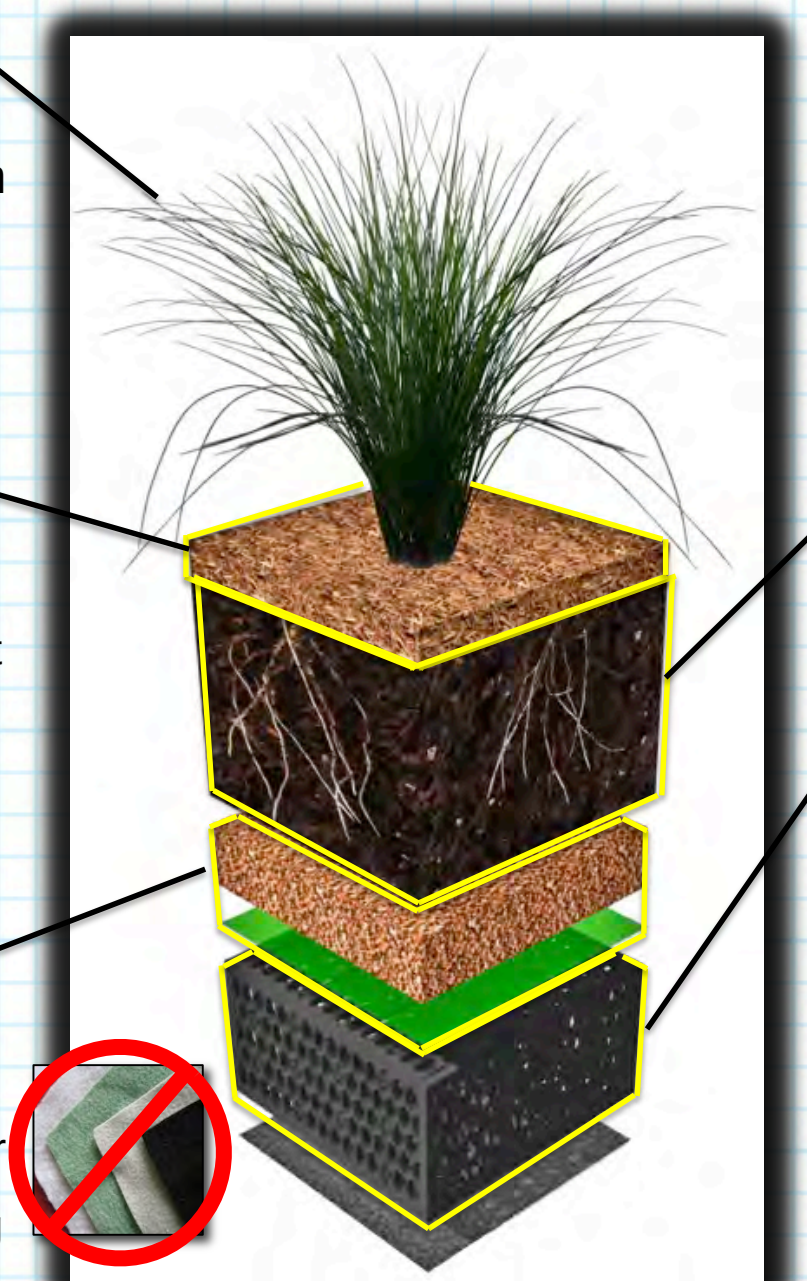
Pre-treatment mechanism.

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



**18” High Performance Media:**

Flows at 100” Per Hour / 200 ft per day
Resistant to Clogging

**3rd Party Field and Lab Test – for TSS, P and N – PWD APPROVED MEDIA FILTER**

**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.


BRIDGING

# FocalPoint components delivered in easy to handle super sacks:

**QA/QC:** All components bundled for quality control


**Plants:** Provide pollutant uptake and media sustainability.

**Mulch:** Pre-treatment mechanism and primary maintenance component.

**6" Separation Layer**


No Geotextile = No Clogging

**High Performance Media:** High Flow Rate (100 in-hr/200 ft day) and Pollutant Removal Efficiency

TSS = 91%

Nitrogen = 48%

Phosphorous = 66%

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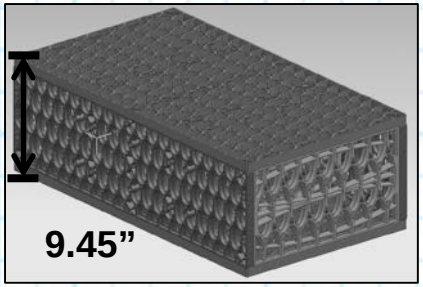
# Quality Assurance/ Quality Control (QA/QC):

- **All Components of the FocalPoint System are sold as a bundle to provide raw material quality control.**
- **Laboratory Ksat batch testing**
- **Post activation/in-situ field testing of flow rate**

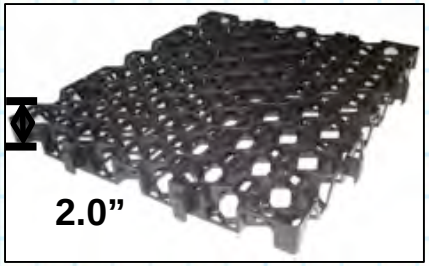
# High Performance Underdrain:

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



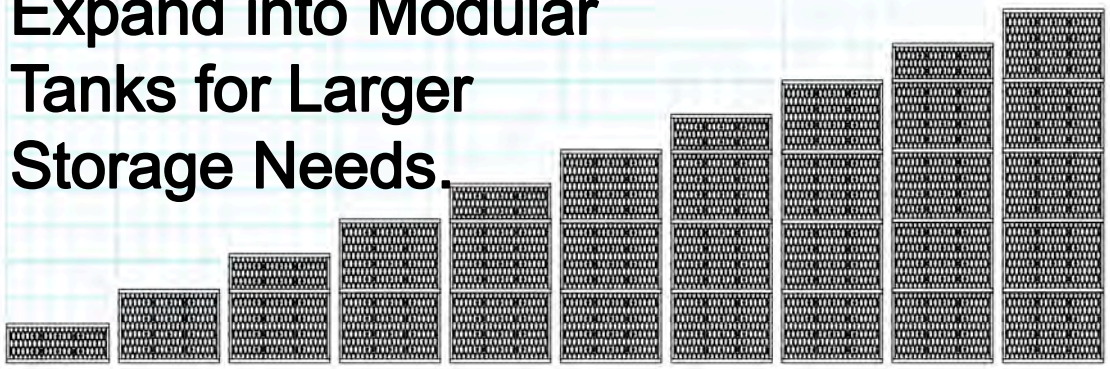

System Depth 36

2” Low-Profile Panel Addresses Shallow Applications.



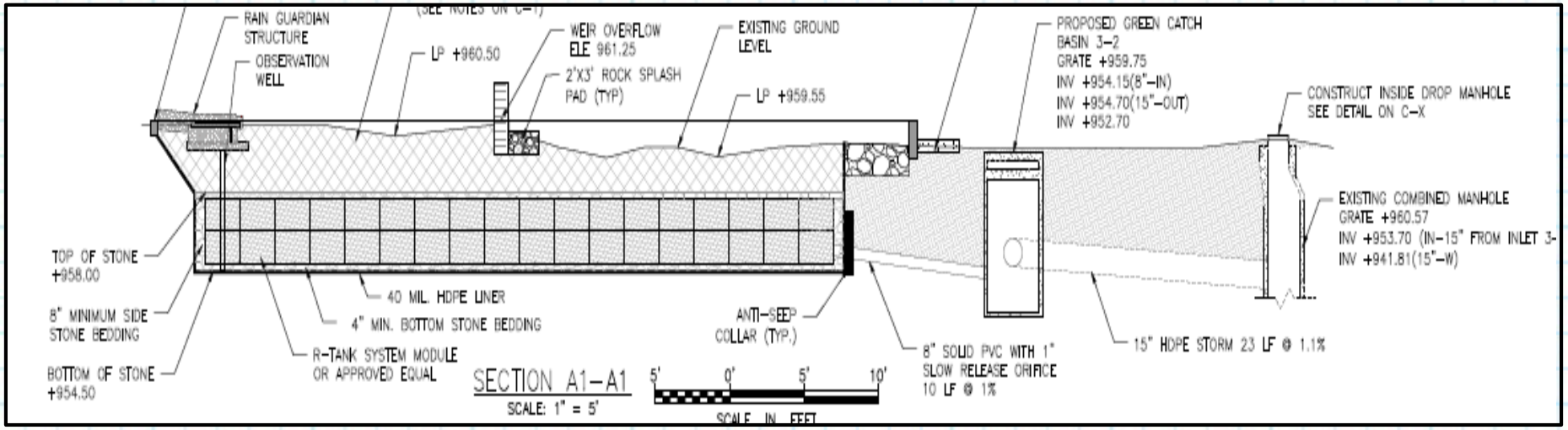

System Depth 29

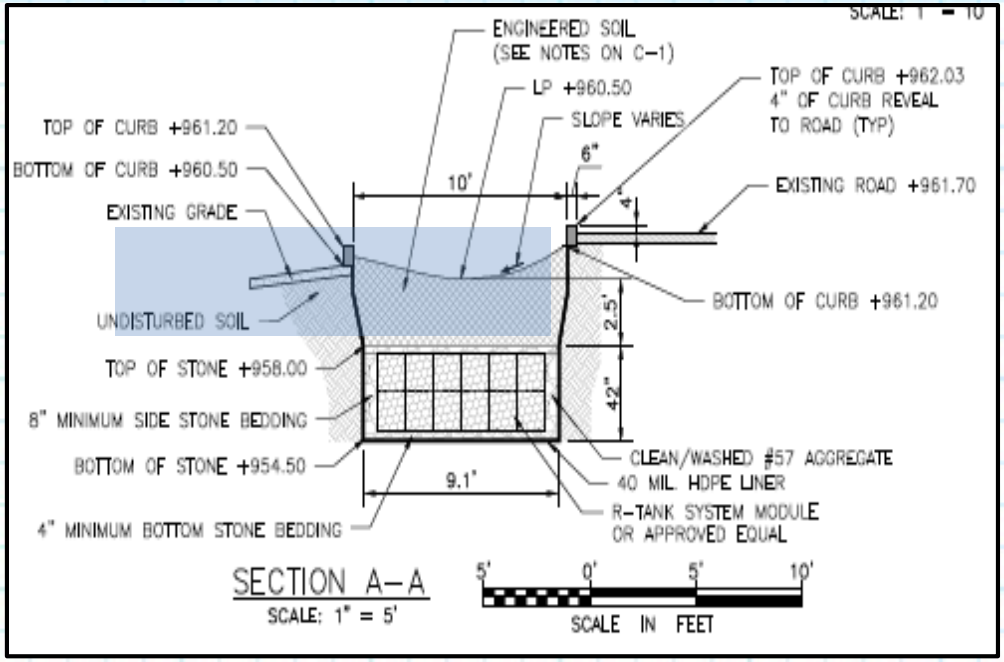
Expand into Modular Tanks for Larger Storage Needs.

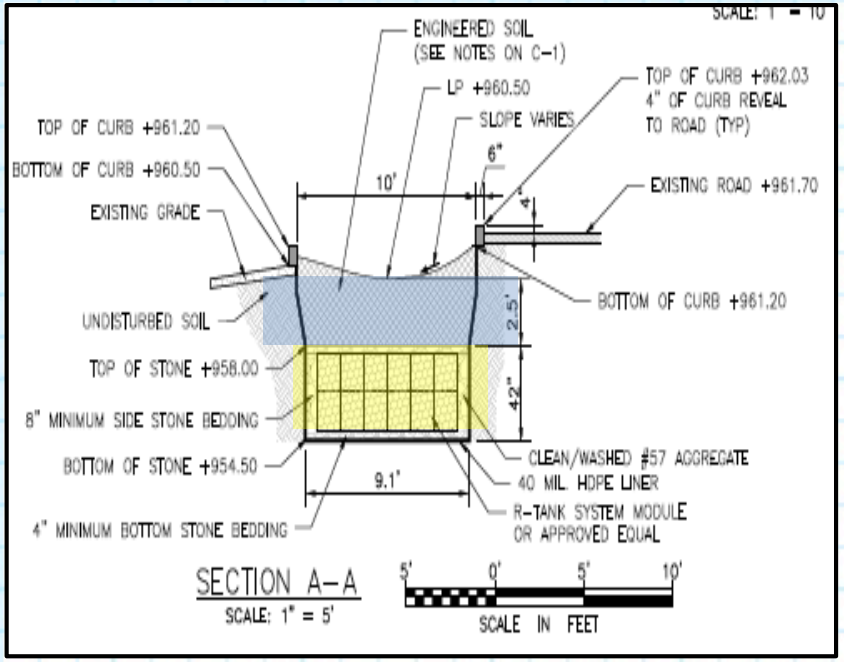


# Municipal Stormwater

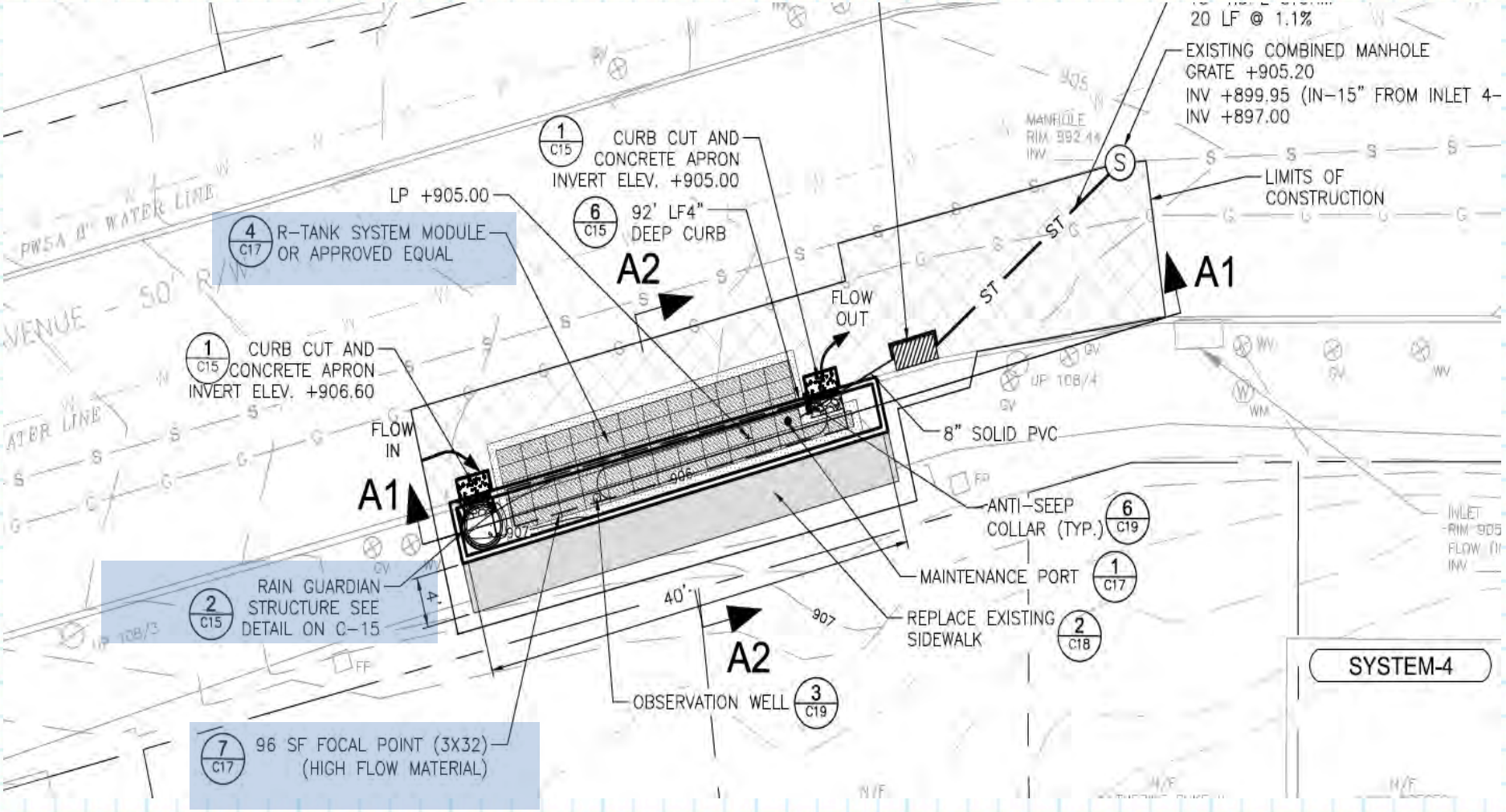
# OPTIMIZING BIORETENTION WITH R-TANK



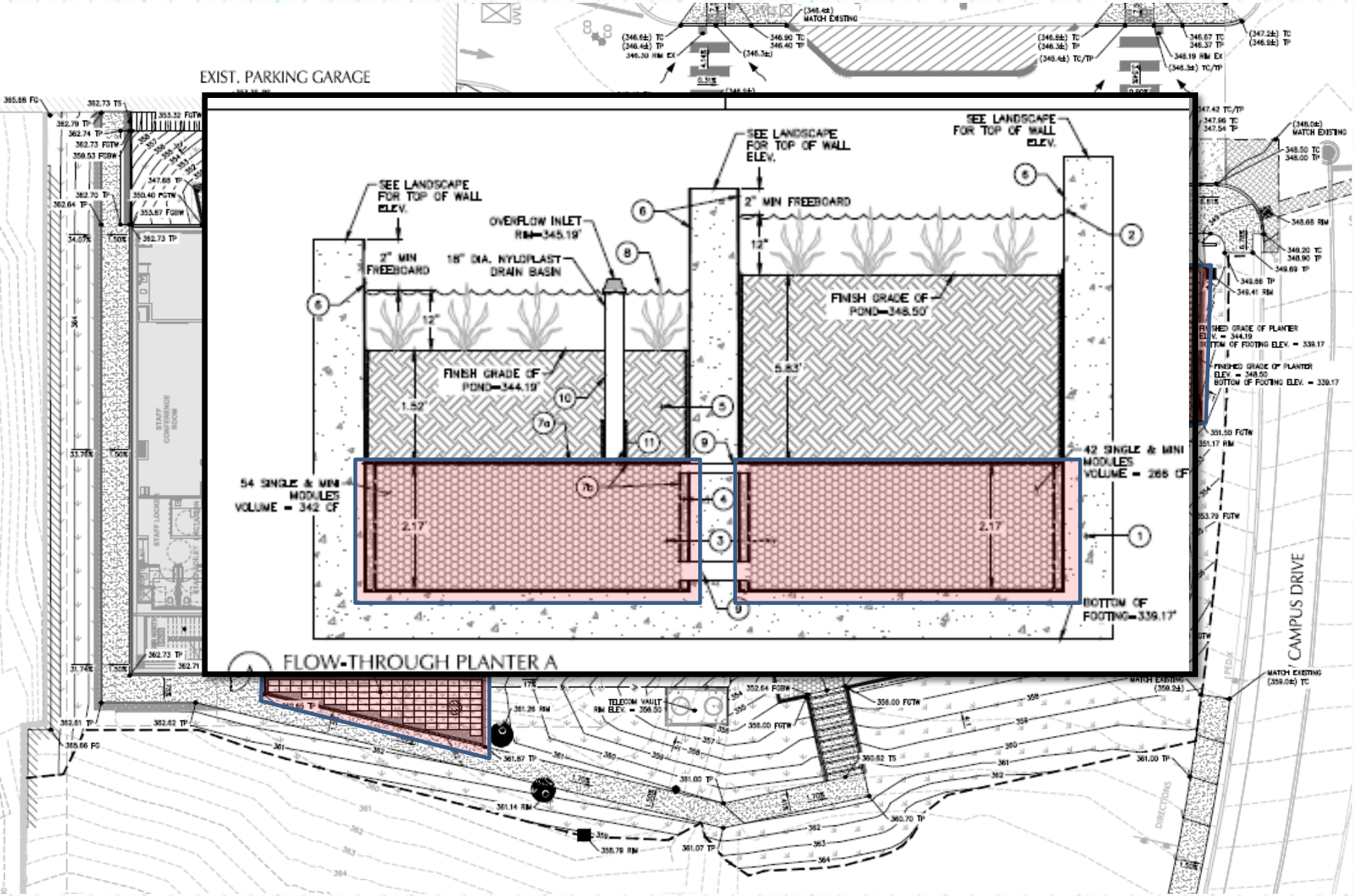



# LINEAR BIOFILTRATION PLANTERS



# BIORETENTION CELLS



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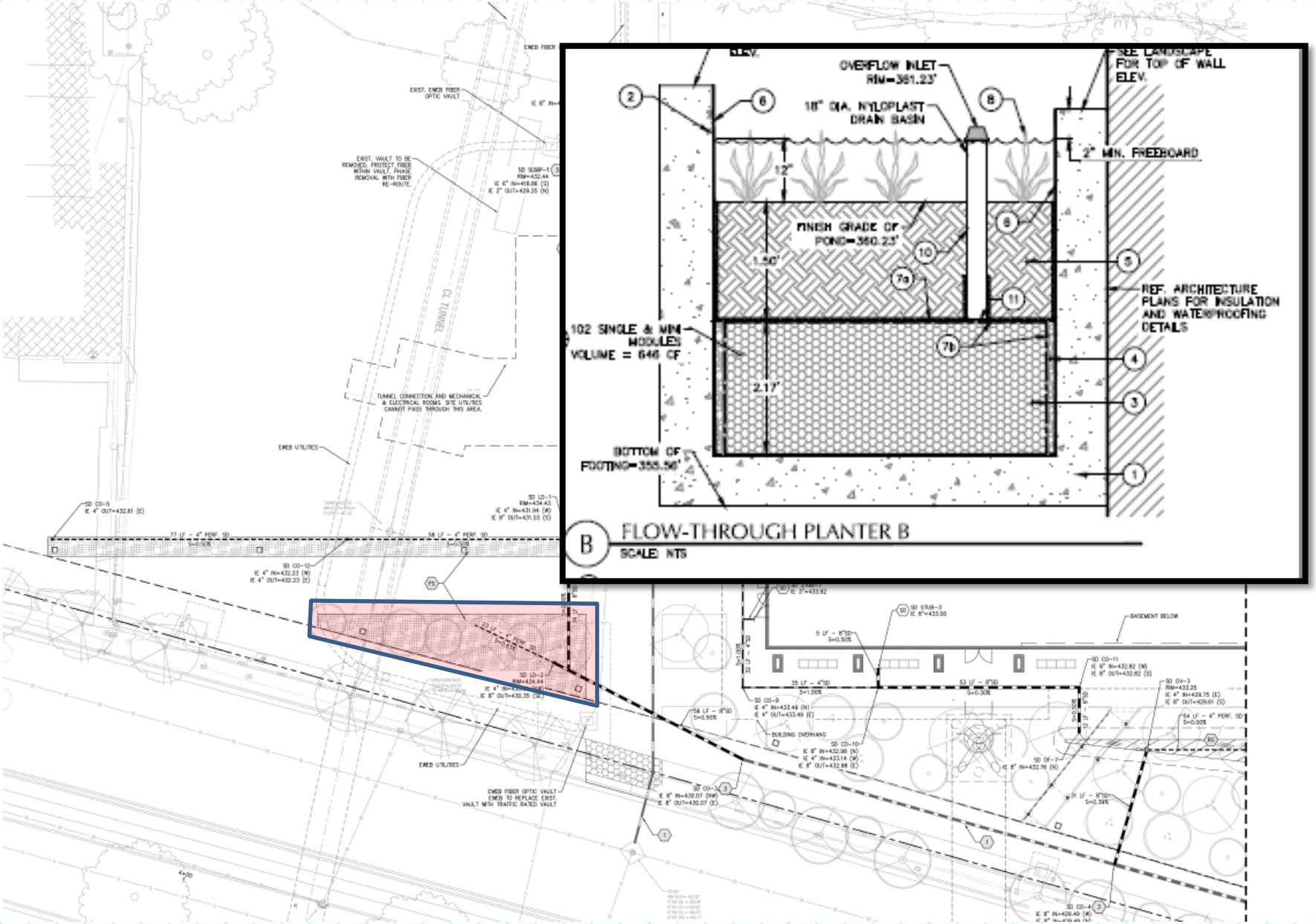
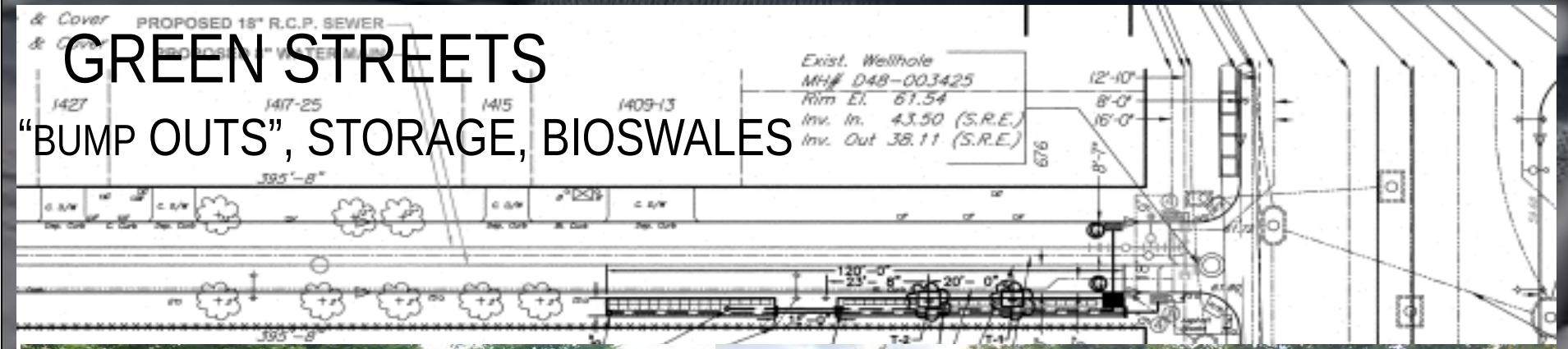
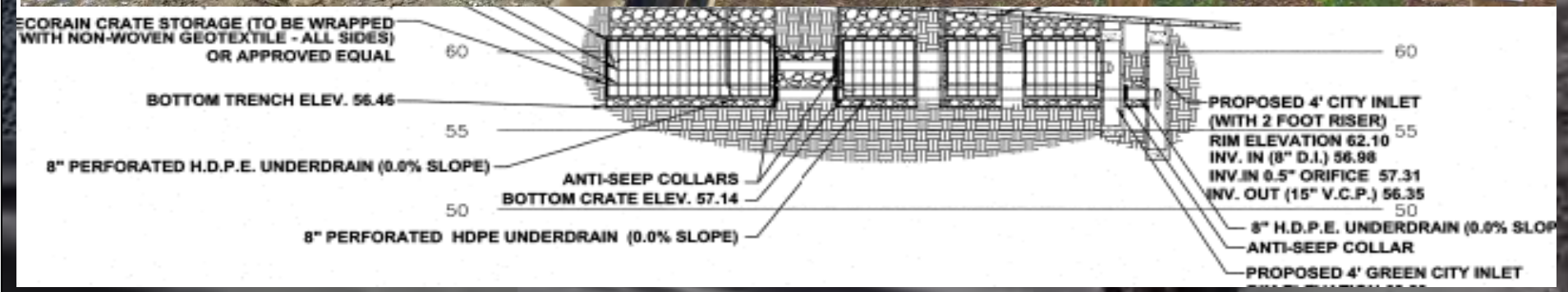


# GREEN STREETS

## "BUMP OUTS", STORAGE, BIOSWALES

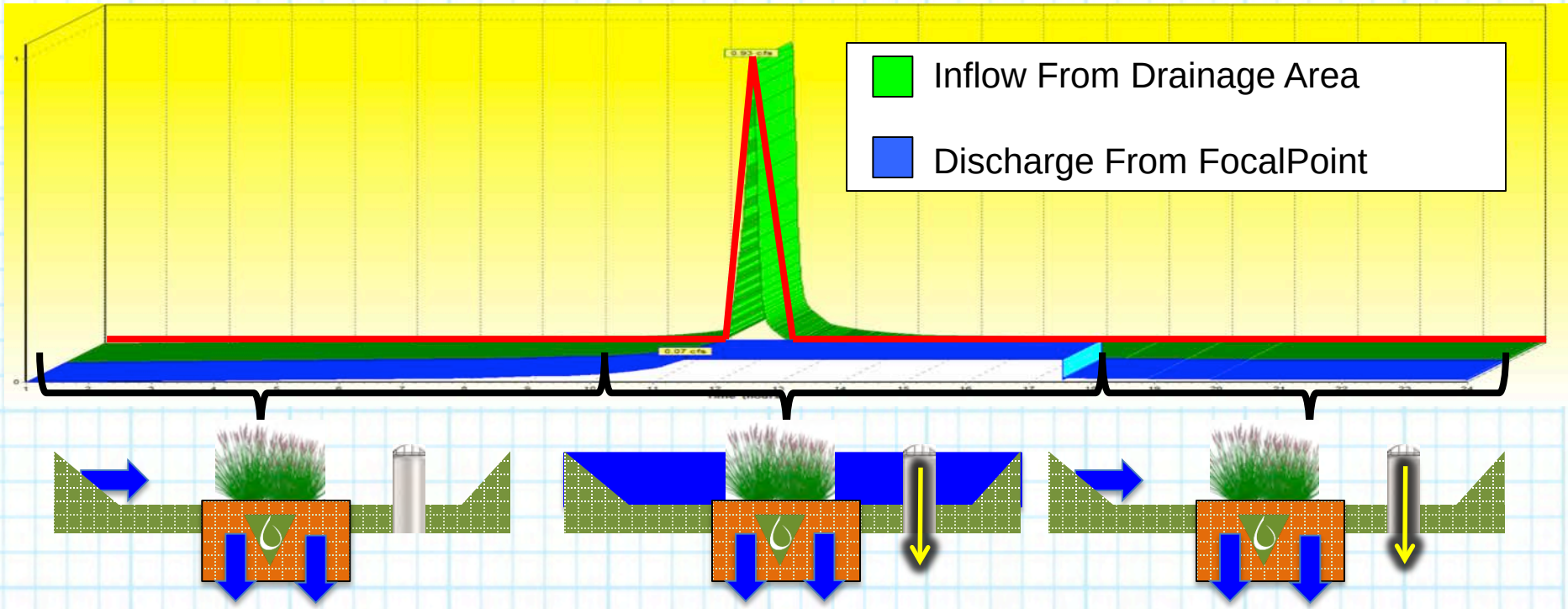






# FocalPoint TR-55 Rainfall and Distribution Based Sizing: New Construction (Full Event) Design

= Water Quality Volume = FocalPoint Treatment = Volume > WQv to bypass




During run-up to peak
= Flow thru device.

Peak volume is stored in the surface depression.

After peak = Flow thru device.
Excess runoff goes to bypass

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# GREEN ROADWAY PROJECTS

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**LOW IMPACT DEVELOPMENT SOLUTIONS**


Construction Issues: Erosion Control


Construction Issues: Communication

FocalPoint in the Divided Highway Median – Birnamwood Drive, Harris County, TX

High Performance Modular Biofiltration System: Merritt Road, Rowlett, TX


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PARKING LOT
APPLICATIONS
ACF
ENVIRONMENTAL
LET'S GET IT DONE
LOW IMPACT
DEVELOPMENT
SOLUTIONS


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StateFarm
Mark Emslick
American Energy

# FOCALPOINT BIOFILTRATION SYSTEM
## Water Quality and Flood Storage

# KITTERY TRADING POST – FOCALPOINT BIOFILTRATION SYSTEM

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**LOW IMPACT DEVELOPMENT SOLUTIONS**

# HIGH PROFILE RETAIL–
# FOCALPOINT BIOFILTRATION SYSTEM

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**LOW IMPACT DEVELOPMENT SOLUTIONS**

# FOCALPOINT BIOFILTRATION SYSTEM

## 3-year Time Lapse

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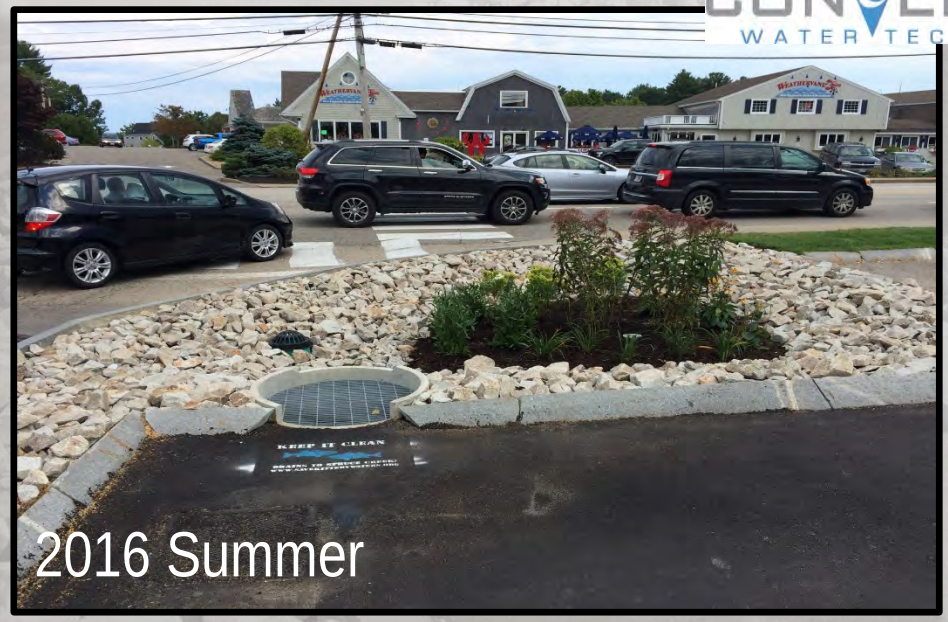
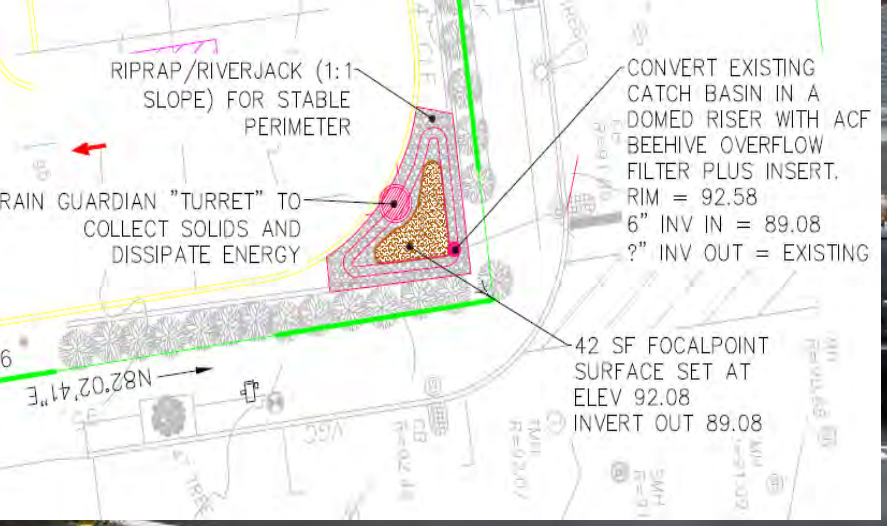
CONVERGENT
WATER TECHNOLOGIES

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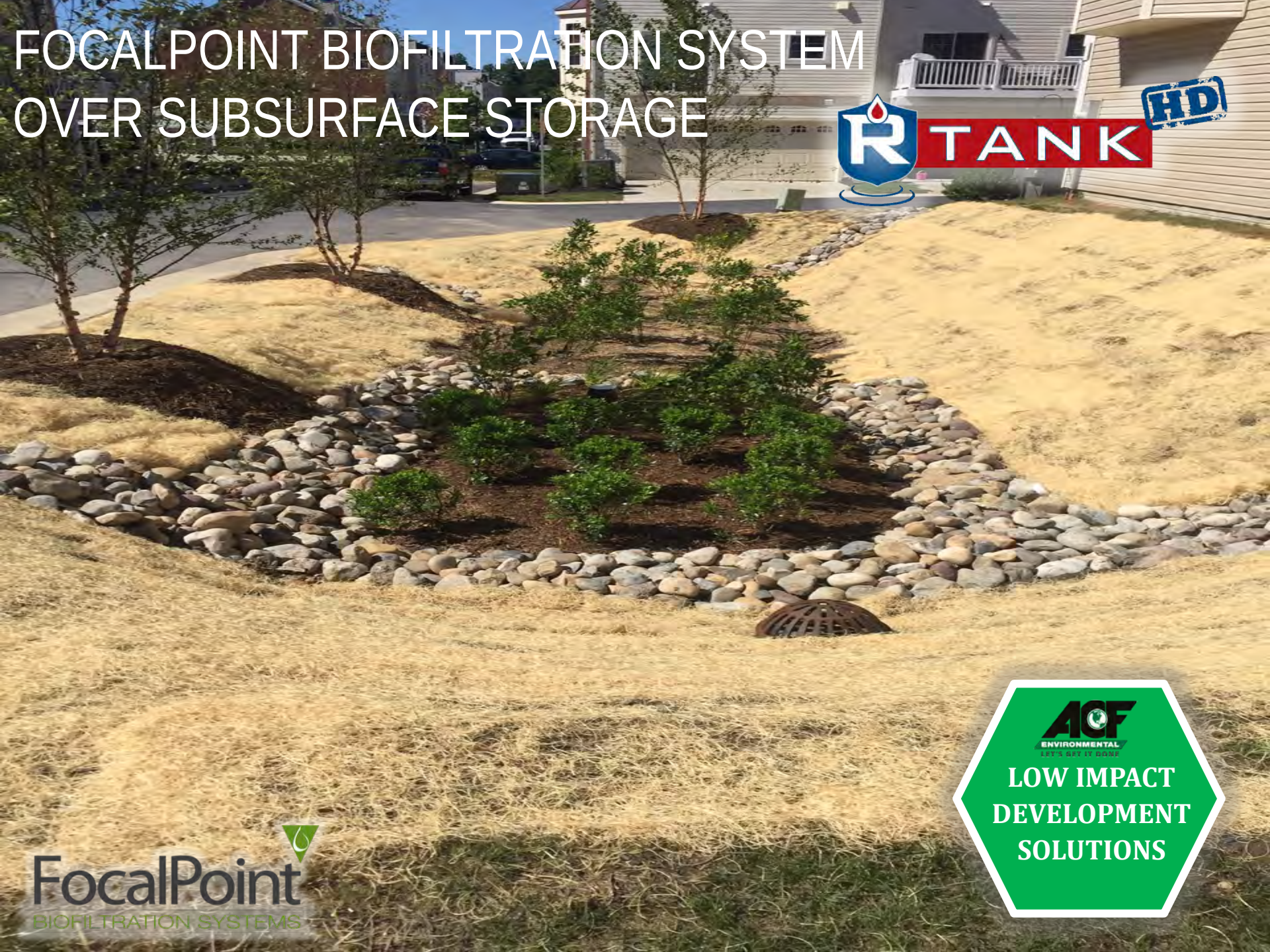
LET'S GET IT DONE

LOW IMPACT DEVELOPMENT SOLUTIONS

# FOCALPOINT BIOFILTRATION SYSTEM OVER SUBSURFACE STORAGE



- ✓ Green Infrastructure
- ✓ Low Impact Development
- ✓ Treatment Train
- ✓ Infiltration Based
- ✓ At least 80% TSS Removal
- ✓ At least 65% TP Removal
- ✓ At least 50% Bacteria Removal

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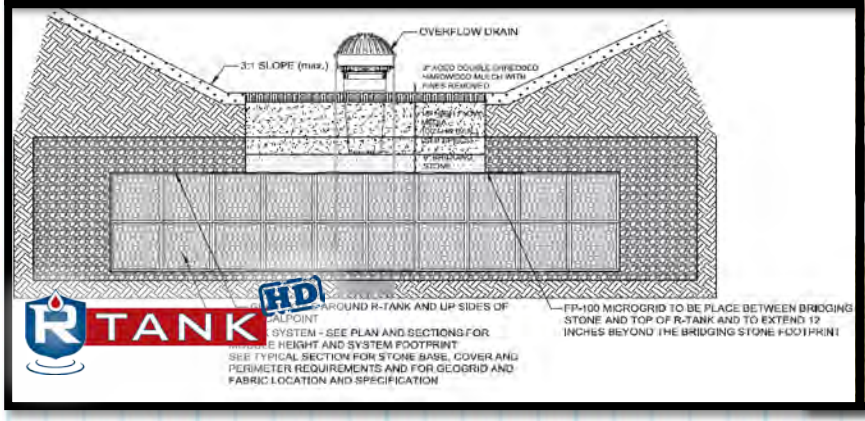
LET'S GET IT RIGHT

**LOW IMPACT DEVELOPMENT SOLUTIONS**

## Infiltration Tanks




## Filtration Over Infiltration Tanks

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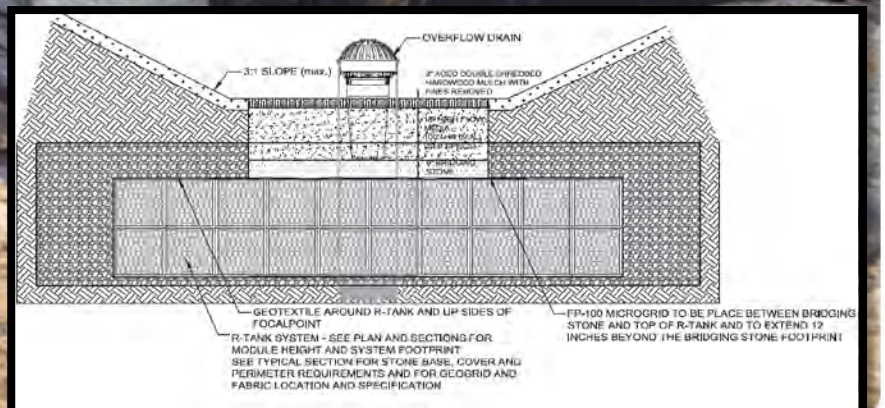
# LOW IMPACT DEVELOPMENT SOLUTIONS




SOUTHEAST TENNIS
&
LEARNING CENTER
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ENVIRONMENTAL
LET'S GET IT DONE
Thank You
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