

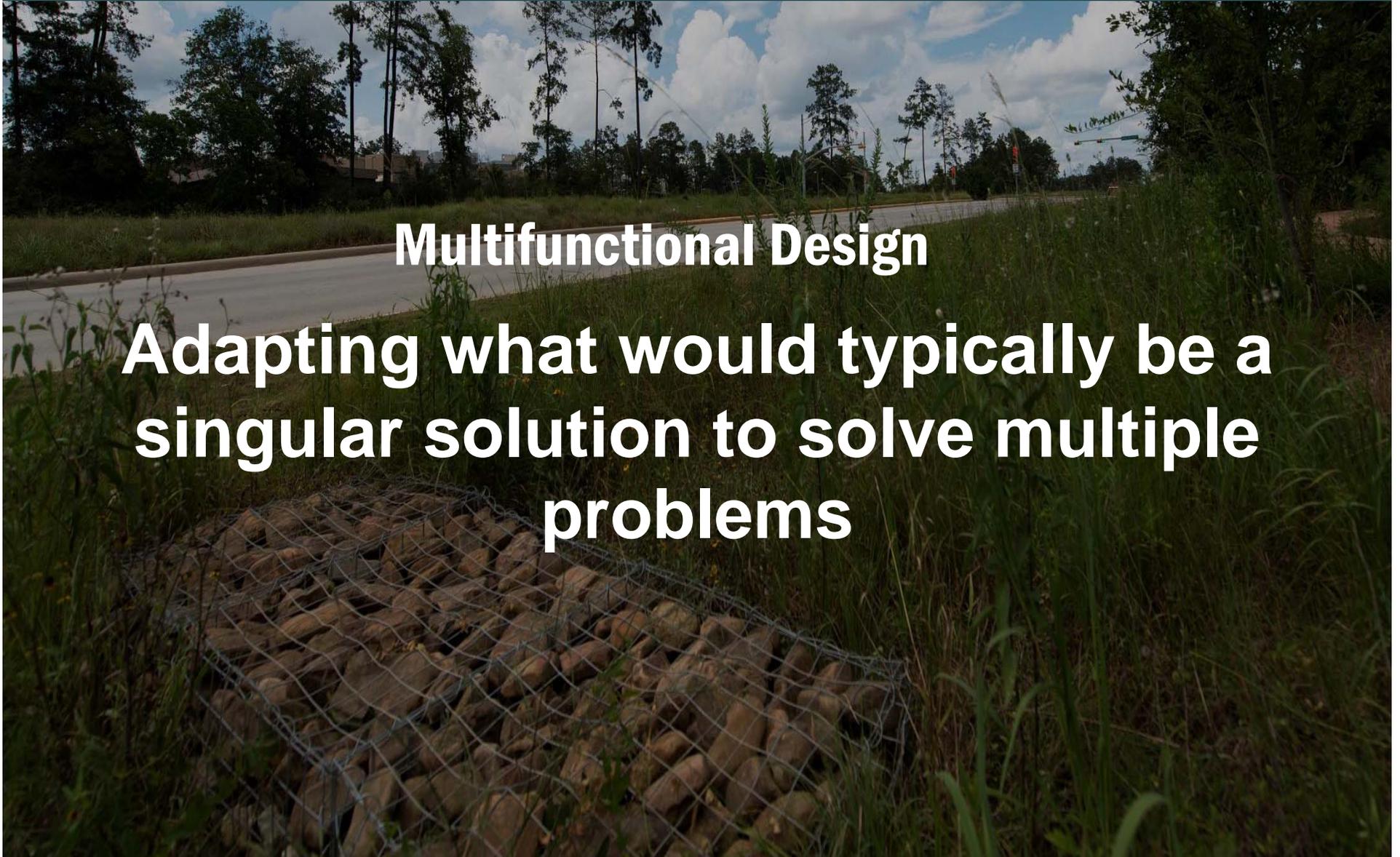
New Technologies for Operator Compliance

The more things change....

Green Infrastructure

Multifunctional Design

Adapting what would typically be a singular solution to solve multiple problems



Green Infrastructure

Green Infrastructure used to be the Norm



Conveyance
Water Quality
Flood Mitigation

Conveyance

Multifunctional Design

Green Infrastructure increasingly utilized by cities, counties and states across the country

WHY?

ECONOMICS

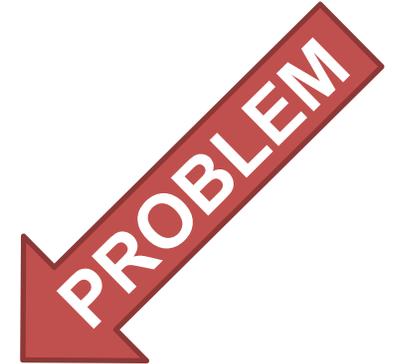
700+ CSO cities driving development of low cost, sustainable solutions. It's too expensive the old way



Pavement
Drainage
Detention

Green Infrastructure

HOW?



PRESCRIPTIVE REGULATION

Regulations across the country hinder GI use and make it more expensive. Typically, because they were created without benefit of experience.

Green Infrastructure

Harris County
performance
incorporation

developed
infrastructure
planning,

Harris County Low Impact Development & Green Infrastructure Design Criteria for Storm Water Management



Submitted by: Arthur L. Storey, Jr., P.E.
Executive Director, Public Infrastructure Department
John Blount, P.E.
Director, Architecture & Engineering Division
Michael D. Talbott, P.E.
Director, Harris County Flood Control District

Adopted by Harris County Commissioners Court

Ed Emmett
County Judge

El Franco Lee
Commissioner, Precinct 1

Steve Radack
Commissioner, Precinct 3

Jack Morman
Commissioner, Precinct 2

Jerry Eversole
Commissioner, Precinct 4

Adopted April 2011

Why Green Infrastructure?

- INCREASES DEVELOP-ABLE LAND (LOT YIELD)
- IMPROVES AESTHETICS
- LOWERS CONSTRUCTION COSTS
- IMPROVES WATER QUALITY
- REDUCES FLASH FLOODING
- ALLOWS FOR CREATIVITY / THOUGHT / ENGINEERING



Begin with the End in Mind > Maintenance



Remove sediment
& clogged mulch



Expose engineered
soil



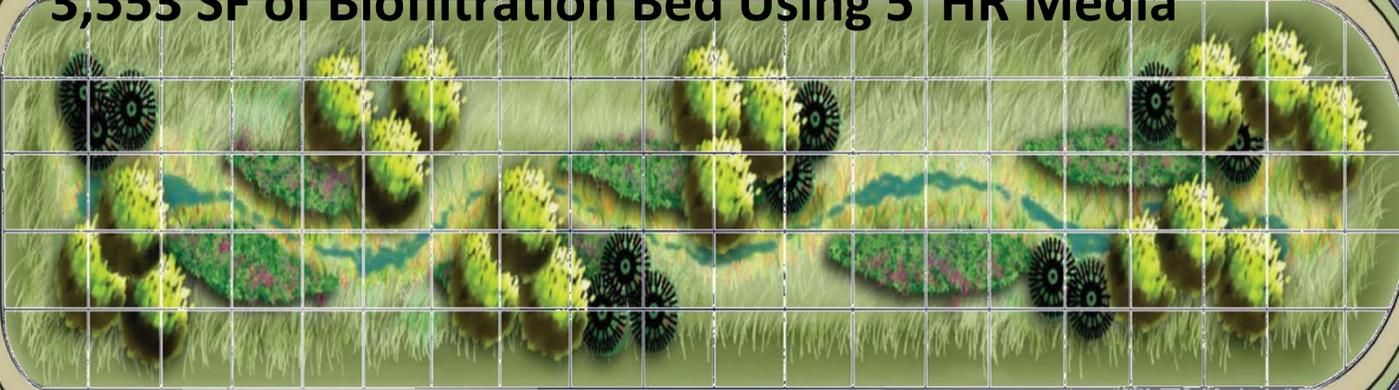
Replace with new
mulch



Finished!

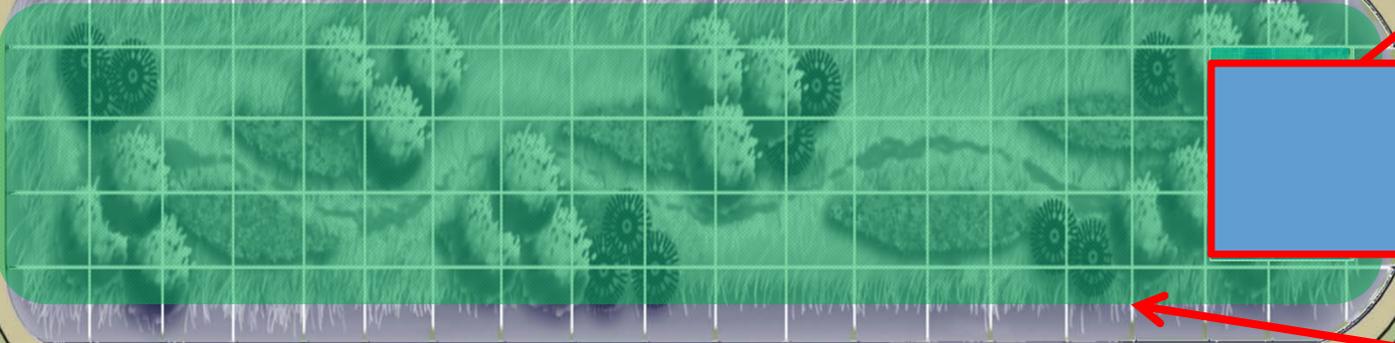
Maintenance > Engineered Soil Choice

3,553 SF of Biofiltration Bed Using 5"HR Media



FILTRATION

108 SF of Biofiltration Bed Using 100"HR Media



STORAGE

Maintenance > Planting Plan



Maintenance > What's a Weed?



Maintenance > Who Do You Hire?



Maintenance > Controlling the Outcome

City of Austin
Thinking
1. f
2. Le
4.

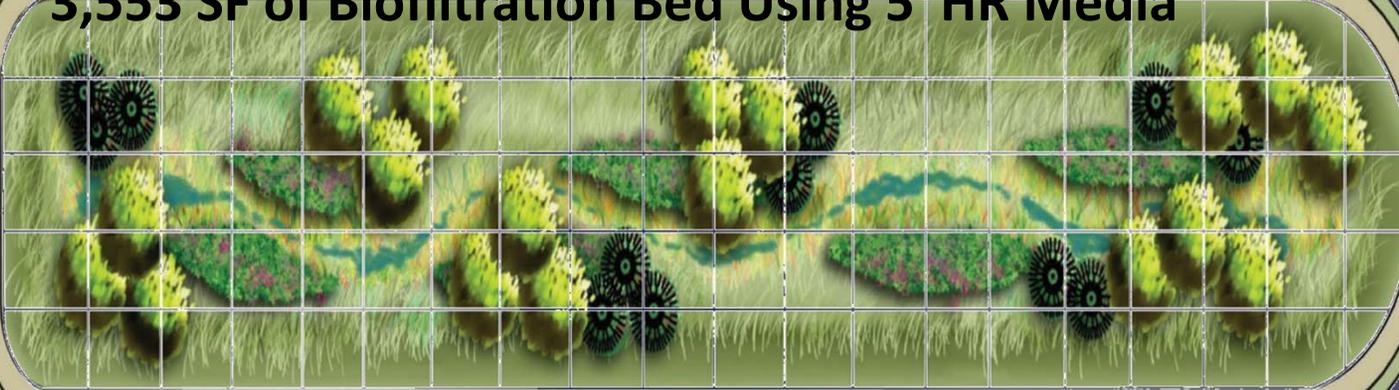
SWQMP INSPECTION REPORT		MONTHLY CYCLE
Project Name: Maple Court subdivision	Date of inspection:	Date of inspection:
Project Address:	Owner & Address: PALT, Inc. 401 Studewood #312, Houston, 77007	
Observations & Comments		Maintenance/Repairs Required?
NON-STRUCTURAL CONTROLS		
ARE LITTER CONTROL PRACTICES PRODUCING DESIRED RESULTS?	Y	N
ARE STREET SWEEPING PRACTICES PRODUCING DESIRED RESULTS?	Y	N
ARE LANDSCAPING PRACTICES EFFECTIVE?	Y	N
OTHER PRACTICES UTILIZED? IF SO DESCRIBE:	Y	N
STRUCTURAL CONTROLS		
DRY DETENTION POND		
IS STANDING WATER EVIDENT?	Y	N
IF YES, HOW MUCH?		
EXCESSIVE SEDIMENT ACCUMULATION EVIDENT?	Y	N
IF YES, HOW MUCH?		
EXCESSIVE TRASH ACCUMULATION EVIDENT?	Y	N
ARE SLOPES STABLE AND VEGETATED?	Y	N
ARE THERE ANY OTHER STRUCTURAL ISSUES EVIDENT?	Y	N
BIORETENTION SYSTEMS		
IS STANDING WATER EVIDENT?	Y	N
IF YES, HOW MUCH? (AFTER 24 HRS. RAIN)		
EXCESSIVE SEDIMENT EVIDENT IN SLUMP OR ENGINEERED MEDIA?	Y	N
IF YES, HOW MUCH?		
EXCESSIVE TRASH ACCUMULATION EVIDENT?	Y	N
ARE SLOPES STABLE AND VEGETATED?	Y	N
ARE THERE ANY OTHER STRUCTURAL ISSUES EVIDENT?	Y	N
DO THE PLANTS LOOK HEALTHY? IF NOT, EXPLAIN:	Y	N
MAINTENANCE		
REPAIRS/MAINTENANCE BEEN PERFORMED SINCE LAST INSPECTION?	Y	N
IF "YES," WHEN WHAT AND WHEN? (MM, DD, YYYY)	Y	N
NOTES		
INSPECTOR QUALIFICATIONS		
CONSTRUCTION ECO SERVICES INTERNAL TRAINING COURSE; ASSOCIATION OF GULF BAY CONTRACTORS COURSE; 100HR (HWS) WITH CT500M WATER REGULATORS; INTERNATIONAL EROSION CONTROL ASSOCIATION "HOW TO SELECT, INSTALL AND INSPECT CONSTRUCTION SITE EROSION CONTROL BMP'S"; FOUR WEEK STORMWATER SITE INSPECTION TRAINING APPRENTICESHIP PROGRAM.		
CERTIFICATION: CERTIFY UNDER THE PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PERFORMED AND EVALUATED THE INFORMATION SUBMITTED. I SHALL BE RESPONSIBLE FOR THE PERSON OR PERSONS WHO MANAGED THE SYSTEM. MY OFFICE SHALL BE RESPONSIBLE FOR ARCHIVING THE INFORMATION IN THE BEST OF MY PROFESSIONAL AND REASONABLE JUDGMENT AND SHALL, UPON REQUEST, FURNISH A COPY OF THIS DOCUMENT TO THE BEST OF MY ABILITY. I AM AWARE THAT THERE ARE SEVERAL FEDERAL, STATE AND LOCAL REGULATIONS AND STANDARDS THAT APPLY TO THIS PROJECT AND I AM AWARE THAT THERE ARE SEVERAL FEDERAL, STATE AND LOCAL REGULATIONS AND STANDARDS THAT APPLY TO THIS PROJECT AND I AM AWARE THAT THERE ARE SEVERAL FEDERAL, STATE AND LOCAL REGULATIONS AND STANDARDS THAT APPLY TO THIS PROJECT.		
SIGNATURE:	DATE:	
ORIGINAL <input type="checkbox"/> COPY <input type="checkbox"/> INITIAL INSPECTION <input type="checkbox"/>	© Constructuri Eco Services 2011	

Performance > Verification



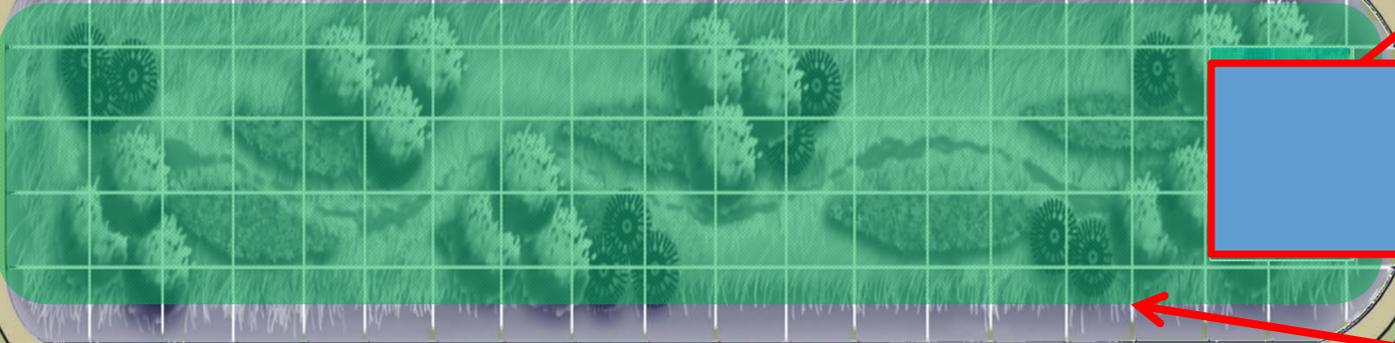
Performance > Engineered Soil Choice

3,553 SF of Biofiltration Bed Using 5"HR Media



FILTRATION

108 SF of Biofiltration Bed Using 100"HR Media



STORAGE

Keys to Success

- **Verify Functionality Post-Construction**
- **Require Robust, High Performance Designs**
- **Protect Systems During Construction**
- **Require Lump Sum System Rather Than Line Item Bids**
- **Require Performance Verification**
- **Require Maintenance Commitments**

Questions?

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Steering Committee Chair
Houston Land/Water Sustainability Forum

