

WALTER P MOORE

# LID Lessons Learned: Implementation and Construction Stage

LID Lessons from Bagby Street and other Projects



# AGENDA

- Introduction
- Bagby Street Corridor Project Overview
- Preconstruction Preparations
- Lessons Learned
- Keeping up with the Maintenance
- Testing and Verification



# ACKNOWLEDGEMENTS

Midtown Redevelopment Authority

City of Houston

Design Workshop

SER Construction Partners, LTD.

Kuo and Associates

Berg Oliver

Charles Gooden

Construction Eco Services





INTRODUCING MIDTOWN





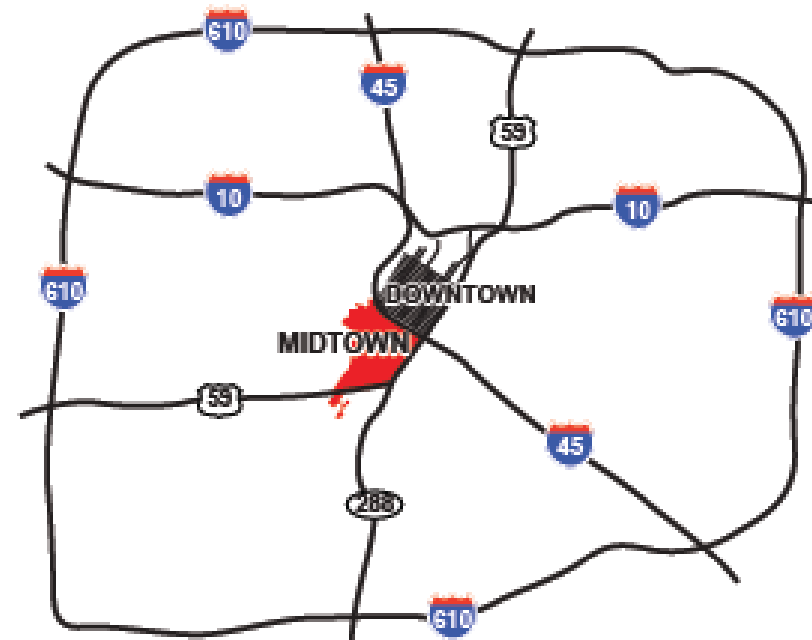
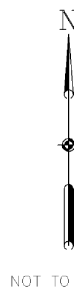
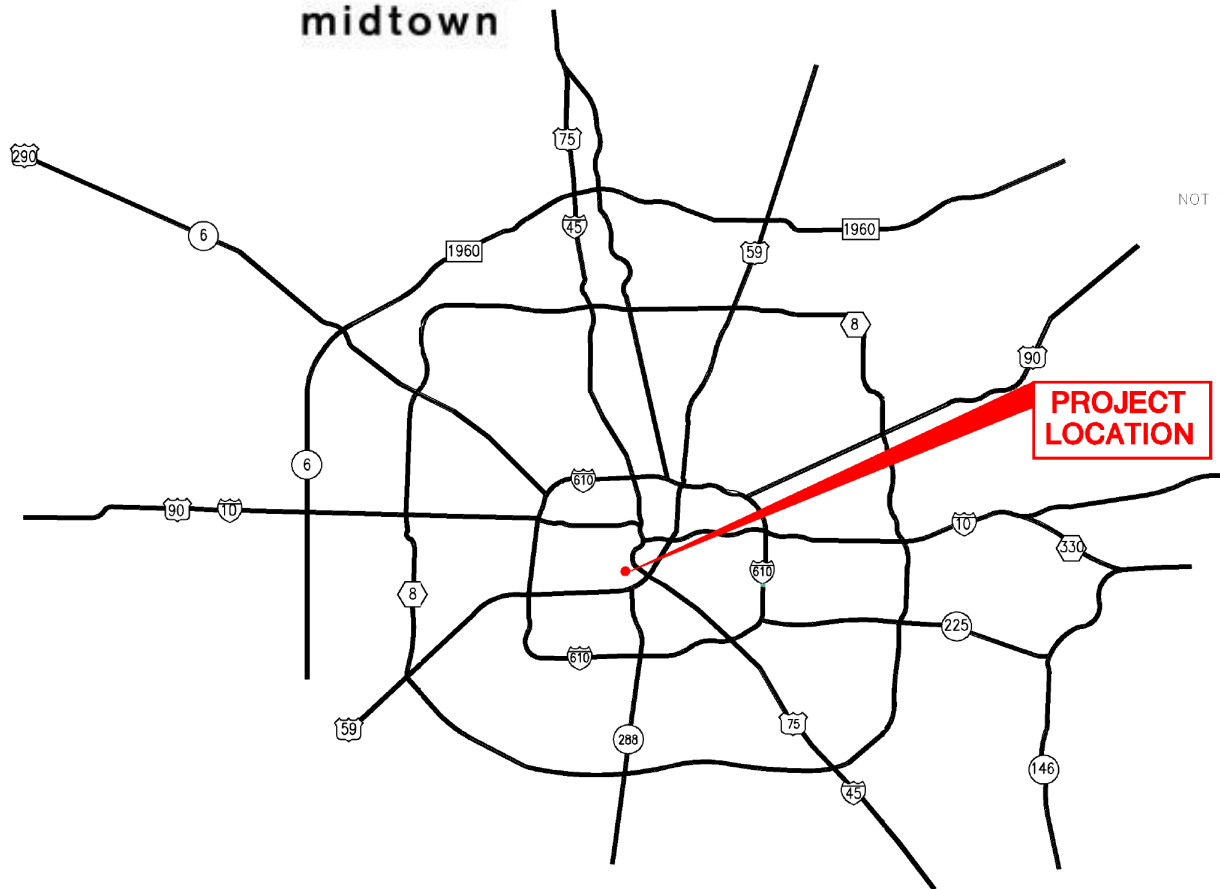
**Midtown Redevelopment Authority  
Lessons in Construction of LID**

**Walter P Moore  
Bagby Street Corridor**

**BAGBY  
AS IT ONCE WAS**

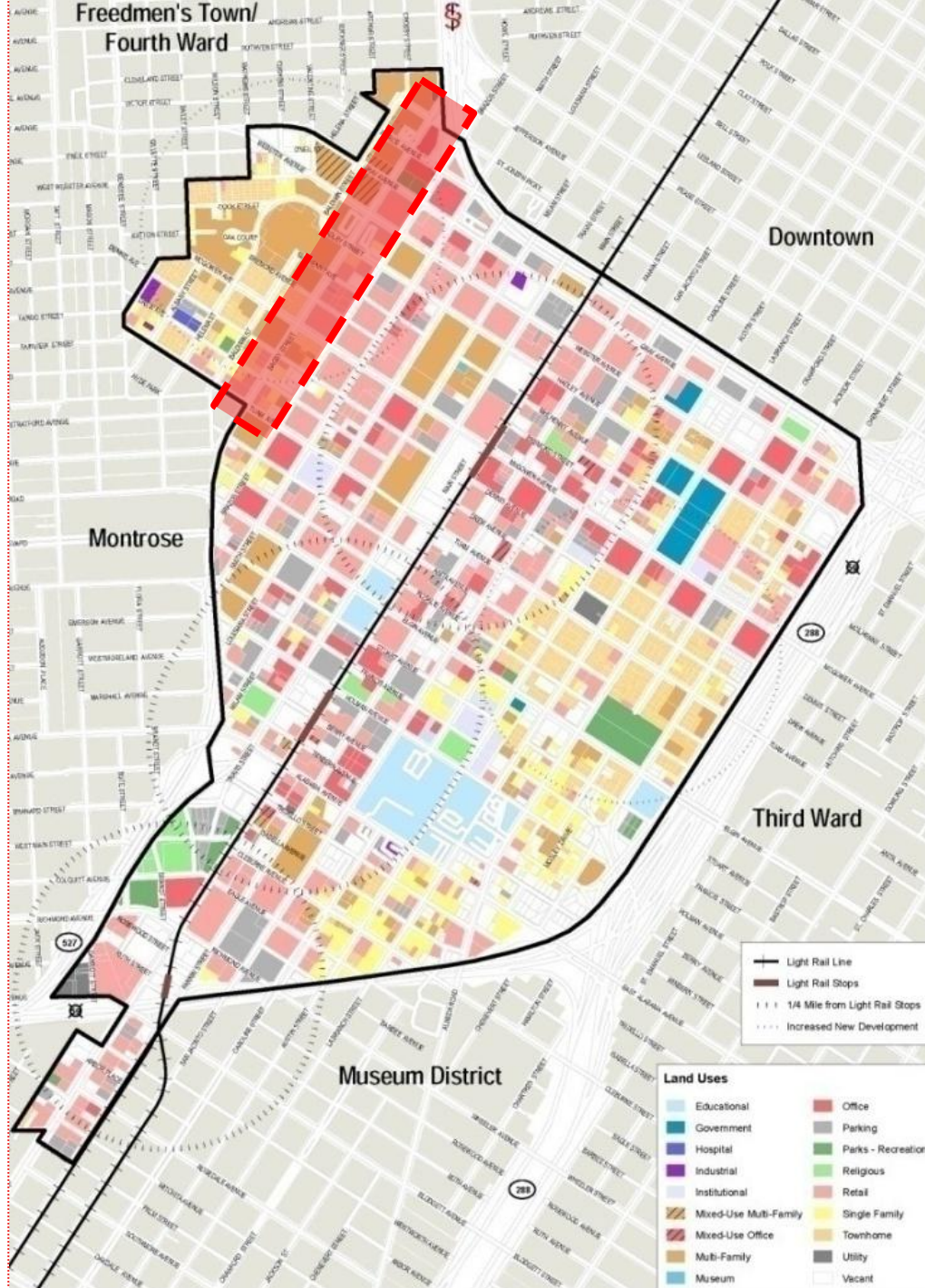


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# Area & Ownership



- Midtown Redevelopment Authority (TIRZ #2)
- Midtown Management District

# Design Vision

- **Reconstruct** street and the sidewalk
- **Replace** old and under capacity **utilities**
- **Encourage** and plan for **redevelopment**
- Improve the **pedestrian experience**
- Incorporate **sustainable design**





# The Greenstreet Solution





# On-Street Parking





# Intersection Design





# Signage





# Utilities





# Drainage





# Rain Gardens





## QUOTES FOR THE DAY

- “By seeking and blundering we learn.”
  - Johann Wolfgang von Goethe
  
- “Failure is instructive. The person who really thinks learns quite as much from his failures as from his successes.”
  - John Dewey
  
- There are only two mistakes one can make along the road to truth; not going all the way, and not starting.
  - Buddha
  
- Experience is simply the name we give our mistakes.
  - Oscar Wilde



# BEFORE YOUR START CONSTRUCTION

- Establish Expectations with Bidders
- Provide Detailed Written Instructions of New Processes
- Establish Mandatory Lines of Communication for Field Issues
- Educate the Contractor on What to Expect and How it Works
- Get Buy In with a Goal of Project Success





CONSTRUCTION



# RAIN GARDEN DESIGN

- Learning From Past Mistakes
- How Engineered Soils Drain
- Understanding “Bridging”
- Flow Dissipation

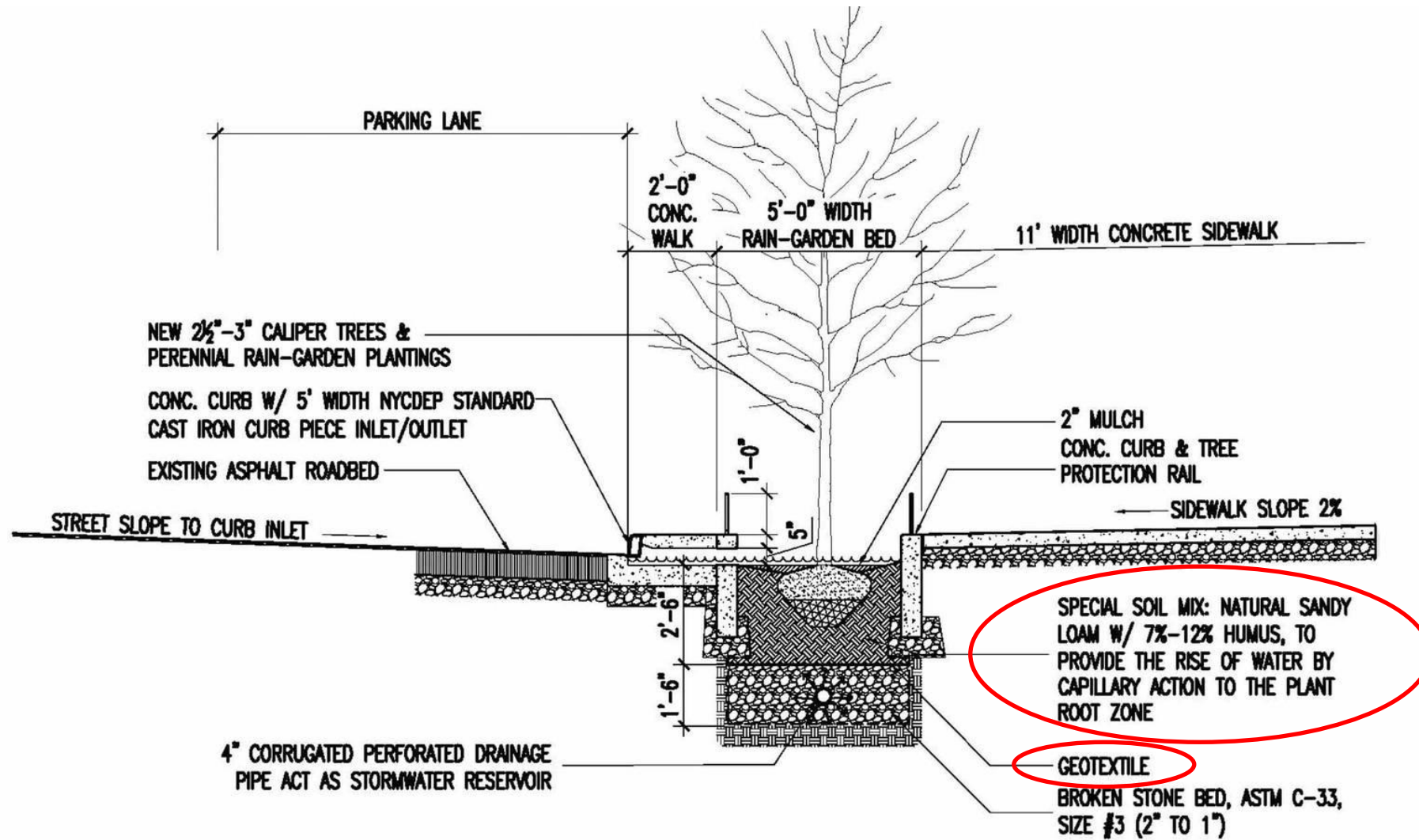






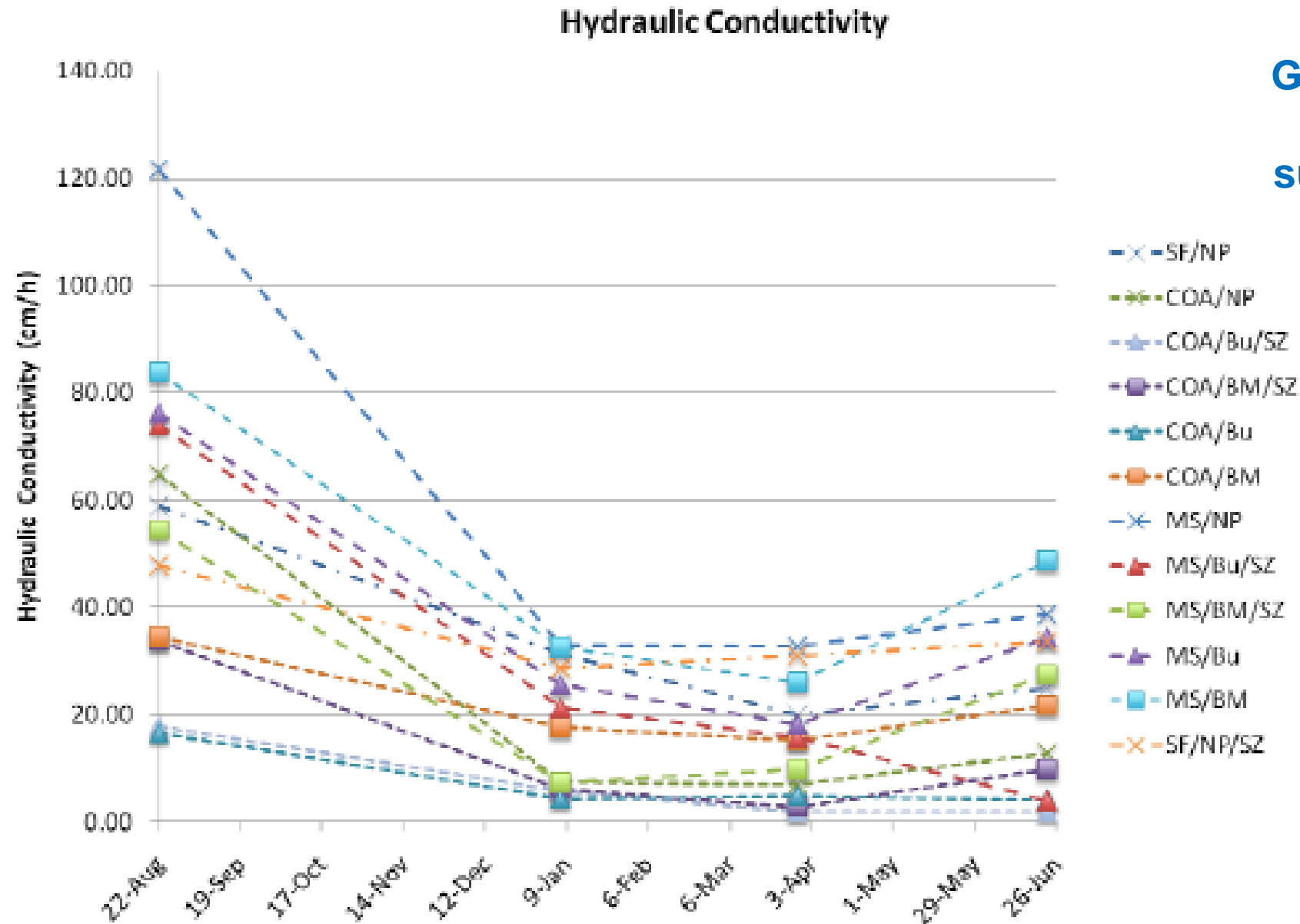


# LEARNING FROM PAST MISTAKES





# UNDERSTANDING ENGINEERED SOILS

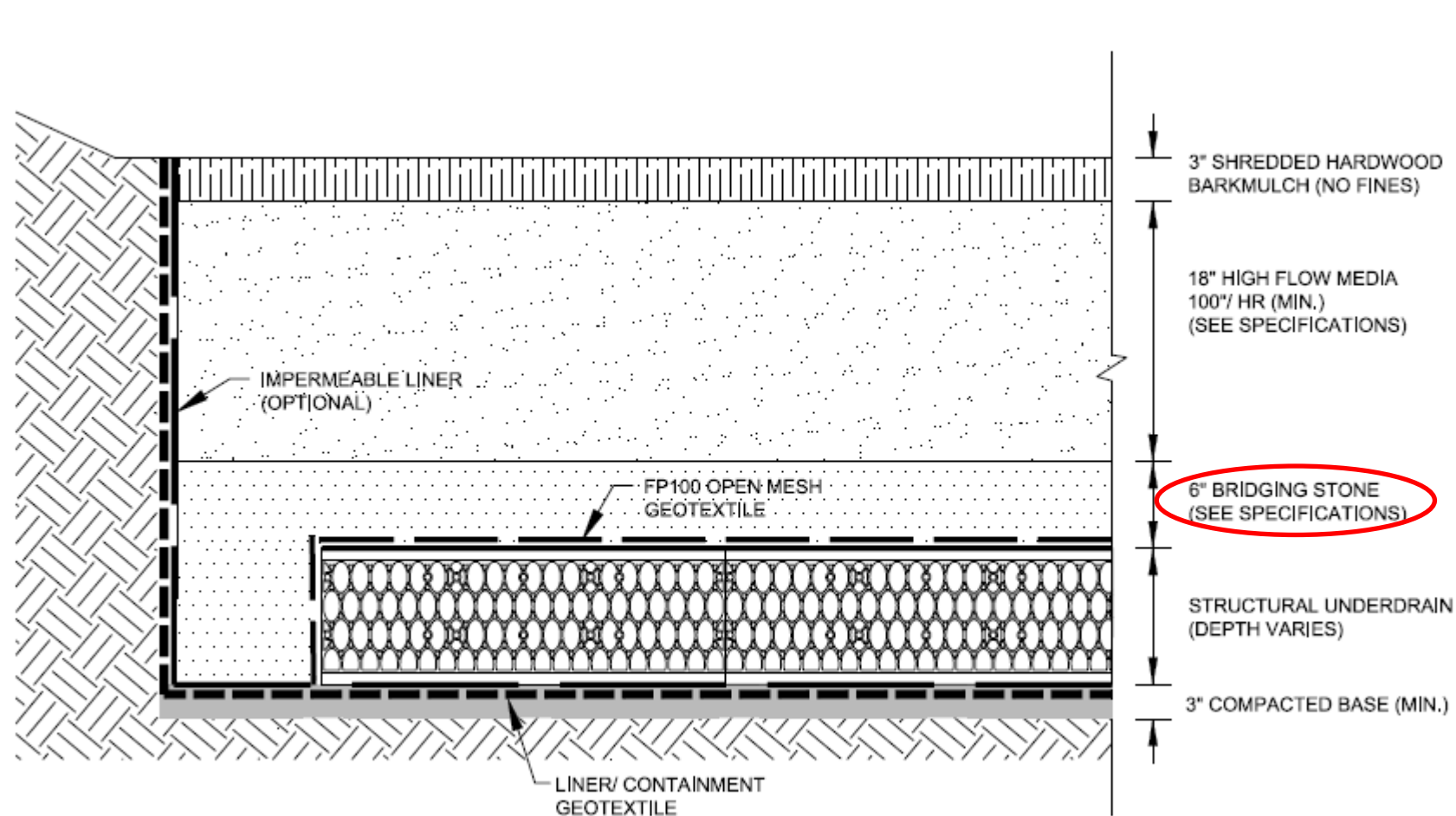


**Getting the Soils Right  
is Critical for the  
success of the system**



# “BRIDGE” AGGREGATES

→ Using Bridging Materials addresses the common problem of clogging of drainage fabric





# “BRIDGE” AGGREGATES





“BRIDGING” PREVENTS CLOGGING





FLOW DISSIPATION IS CRITICAL





# RAIN GARDEN CONSTRUCTION

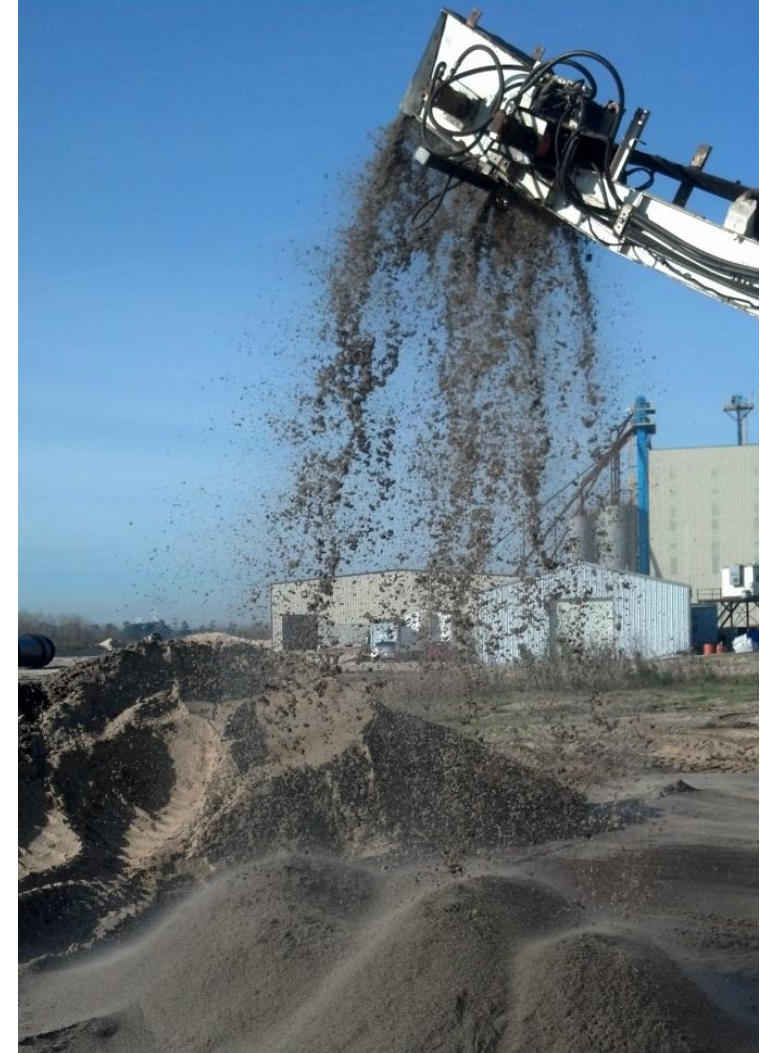
- Quality Assurance / Quality Control
- Working Around Utilities
- Protecting the Systems
- Signage
- Performance Verification





## QUALITY ASSURANCE

- Ensure Materials have been tested prior to placement
- Test for hydraulic conductivity and material specification type
- Do not allow material to be brought to the site that does not have testing certification





# WORKING AROUND UTILITIES

- Modularity Aids in Field Modifications
- Flexibility is Essential to success
- Confirm Dimensions of Pipe Elements





# PROTECTION DURING CONSTRUCTION



Controlling sediment from offsite is imperative in ensuring a functional system



# PROTECTION DURING CONSTRUCTION

- Protecting the System is Imperative
- Prevents Premature Sedimentation
- Simple “Activation” Protocol





# PROTECTION DURING CONSTRUCTION



FOCAL POINT is  
protected from elements  
prior to activation

Easier to clean up than  
replace



# SIGNAGE

- Use Signage When Possible During Construction to Educate Workers
- Communicate Message in English and Spanish
- Action Items Must be Complete Prior to Activation





# MEASURING PERFORMANCE IN THE FIELD

- Hydraulic Conductivity Test
- Pass / Fail
- Manufacturer / Contractor Must Prove It Works





## OPERATIONS AND MAINTENANCE

- Staff training vs. contracted maintenance
- Indicators of system problems/failure
- Like typical planting areas, LID features require regular cleaning
- Plantings should be simple enough to intuitively maintain
- Re-application of mulch
- Keep water entry points clean and clear







# Discussion and Questions

