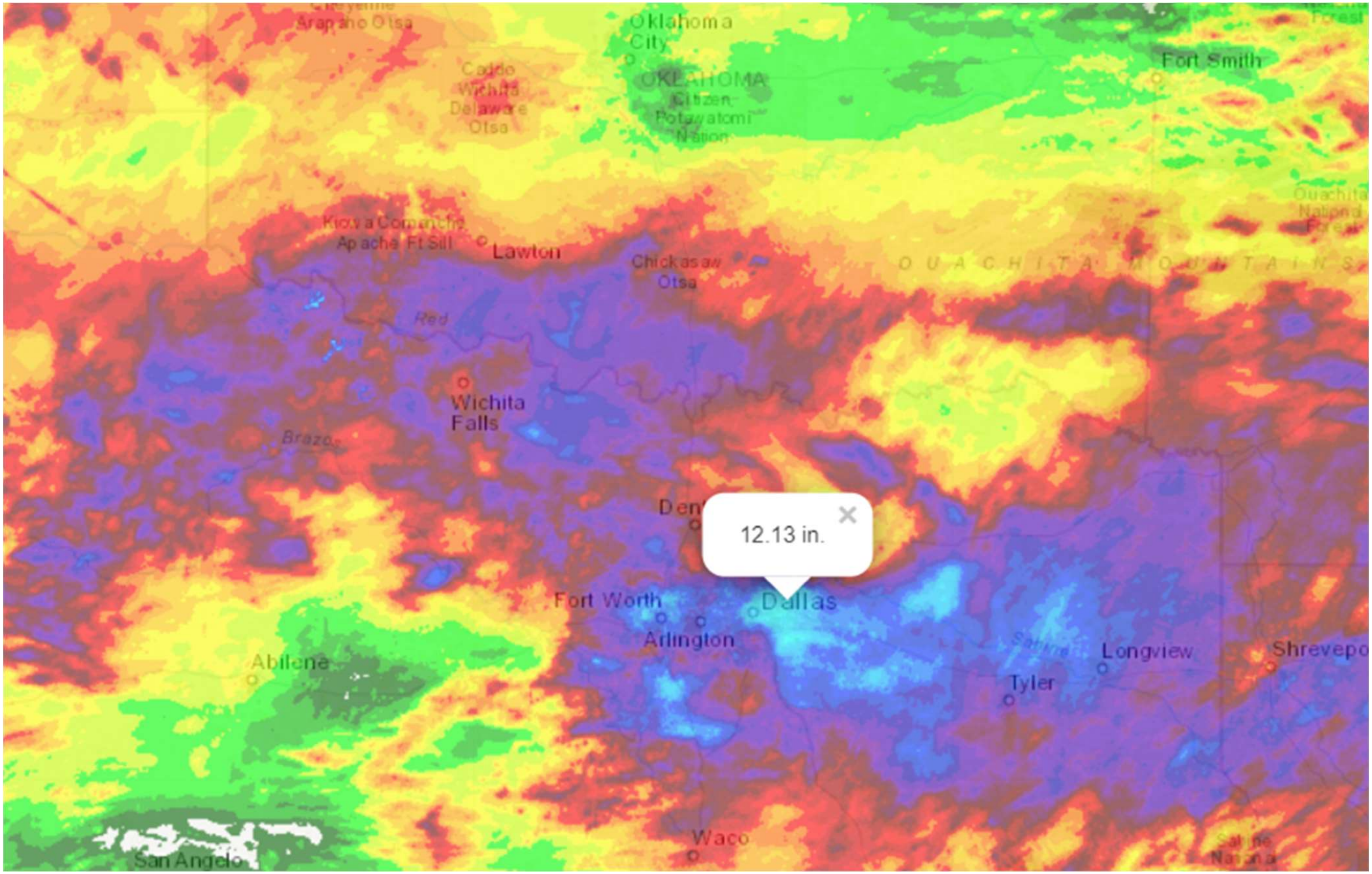
August 21-22, 2022



A police car is swamped by floodwaters in Dallas early Monday, August 22, 2022. (Image credit: Dallas Police Department)

Urban Stormwater Management

ADS
Mark Joersz
Regional Manager – Engineered Products

TEXAS REGIONAL STORMWATER CONFERENCE

Reducing Impact of Urban Stormwater Runoff

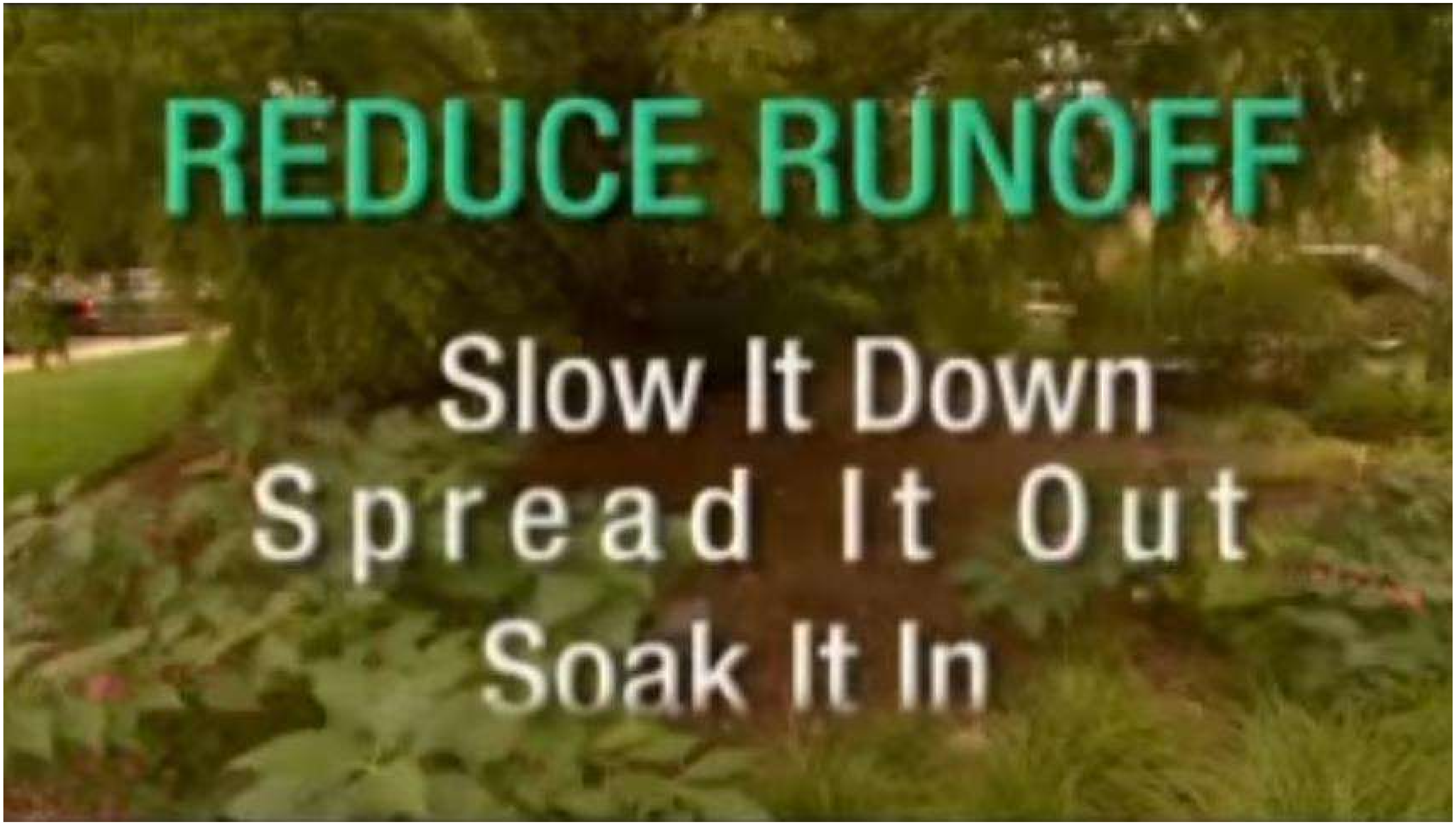
Why?

- Safety
- Longevity ($)
- Environment

What?

- Concept
- Design
- Performance

USEPA Runoff Reduction



https://www.youtube.com/watch?v=huO_NRn34GI

Green Infrastructure Volume Reduction

Urban Design Considerations

Land Use

Value of Land

Linear Constraints

Safety Concerns

Construction Timing

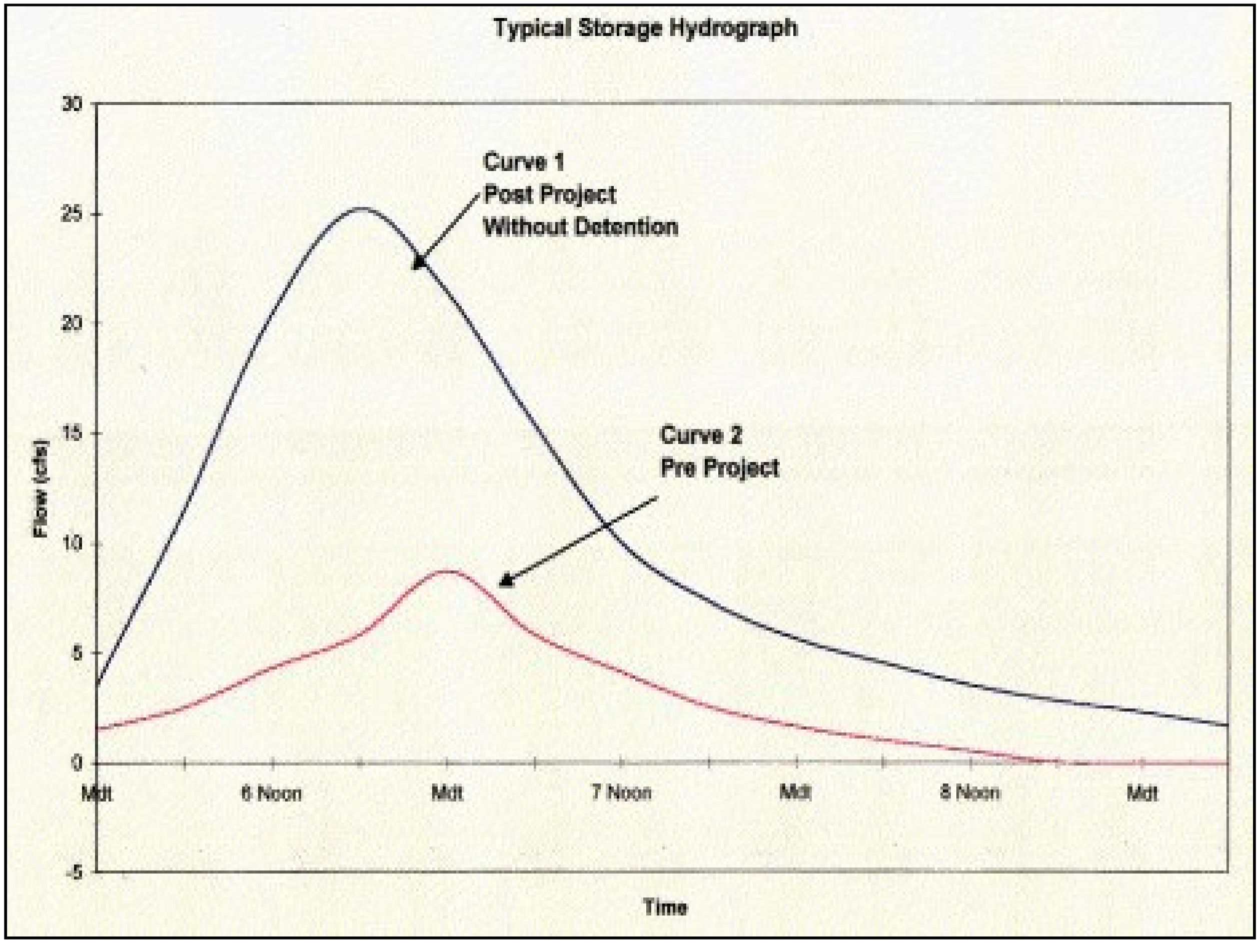
Maintenance

Aesthetics

Detention

Local Regulations

- Critical Storm
- Flood Protection

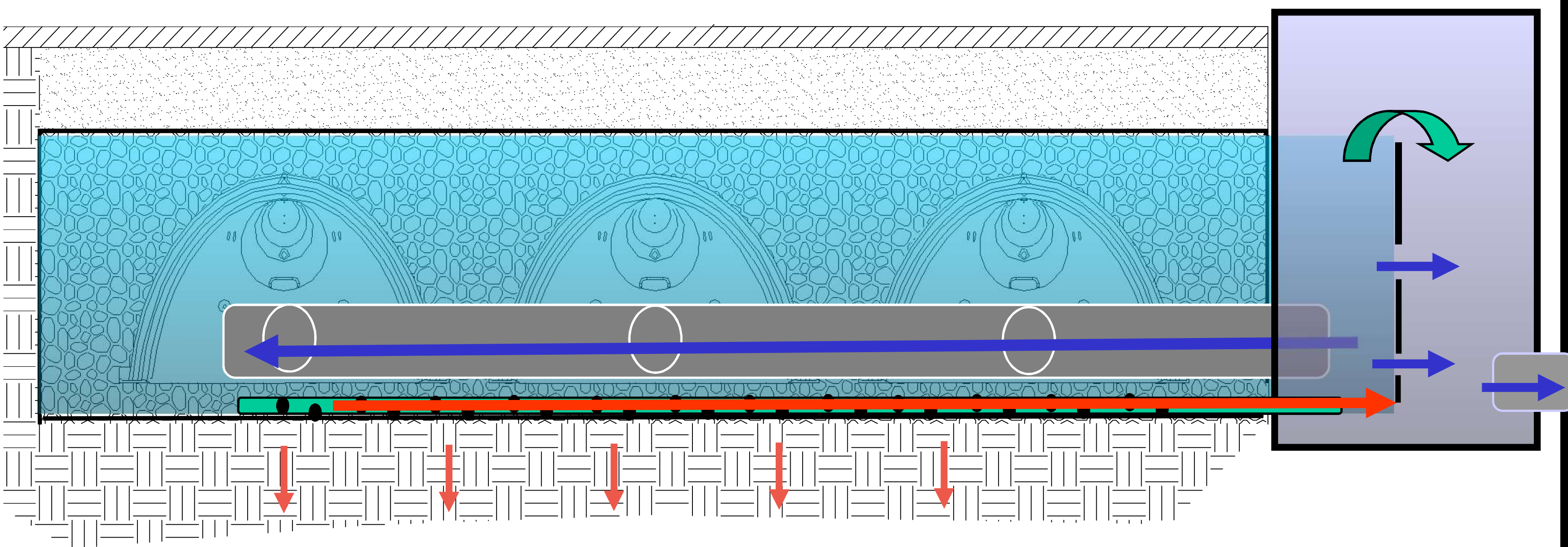


STORMWATER CHAMBERS

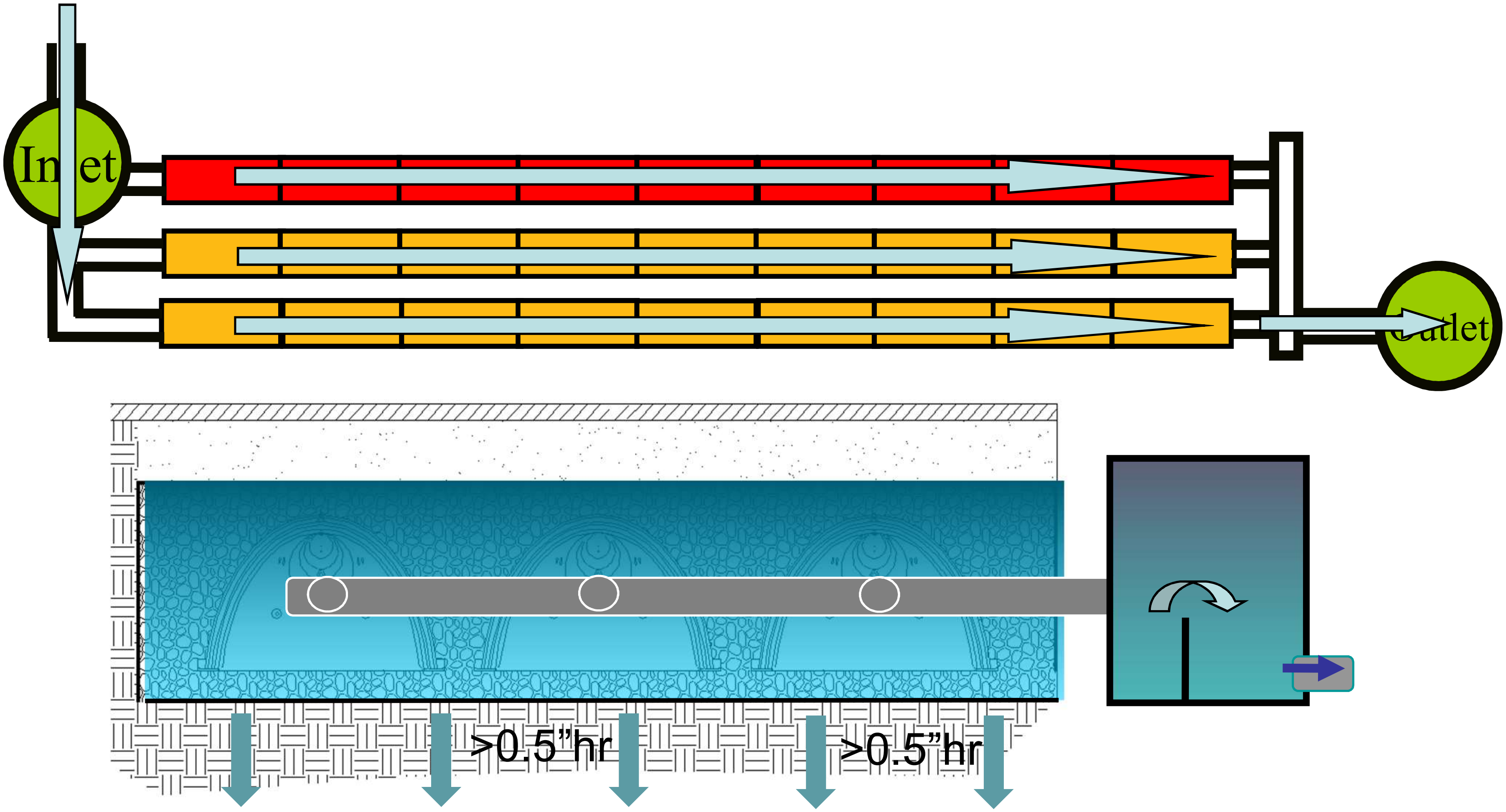
Chamber Operation

Discharge to downstream conveyance & some infiltration

<u>Orifice control of post-development release</u>



Volumetric Reduction



Water Quality Volume (WQv)

Do These Systems Work?

Evaluation of Underground Stormwater Infiltration Systems

Toronto Conservation and Region Authority 2010

Inflow, overflow and infiltration summary

Parameter	Monitoring Period	
	Jun. to Dec. 2008 [1]	Jan. to Dec. 2009 [2]
Total Precipitation [3] (mm)	333	790
Total Inflow Volume [4] (m^3)	8,137.099	17,802.563
Total Overflow Volume (m^3)	963.540	3,012.101
Total Infiltrated Volume [5] (m^3)	7,173.559	14,790.462
Runoff Reduction Ratio [6]	0.88	0.83
	33 events	44 events

Capital Oaks Volume/Peak Flow Reduction

Capital Oaks, Raleigh, NC.

Characteristic	Median	Mean	Median Percent Reduction	Total	Total Percent Reduction
Rainfall	0.47 in.	0.73 (± 0.68) in.		52.9 in.	
Volume In	3,256 cf	5,406 (± 7,114) cf	74%	335,186 cf	43%
Volume Out	675 cf	3,104 (± 5,764) cf		192,478 cf	
Peak Flow In	0.42 cfs	1.28 (± 3.69) cfs	84%		
Peak Flow Out	0.02 cfs	0.30 (± 0.99) cfs			

Source:

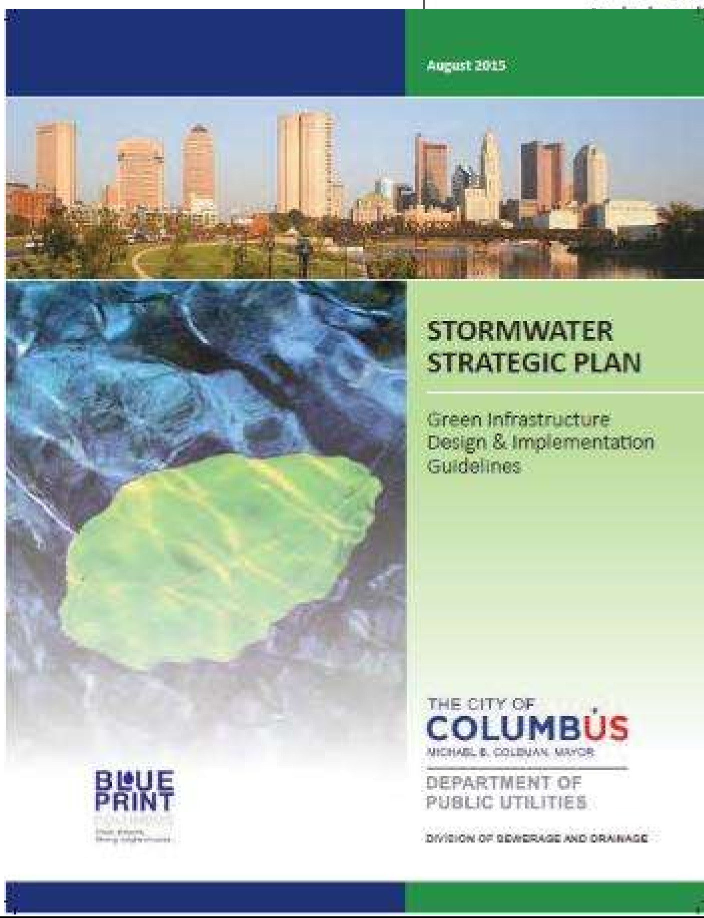
An Evaluation of the StormTech Isolator Row and Subsurface Stormwater Management System at Capital Oaks Retirement Resort - North Carolina State University

DESIGN COMPONENTS

BLUE PRINT COLUMBUS

6.3—PREFABRICATED BURIED INFILTRATION STRUCTURES

DESCRIPTION: Prefabricated buried infiltration structures can be used to provide void space for water storage. These structures may be installed as stand-alone storage or in combination with bioretention basins, permeable pavements and other green infrastructure practices. Systems vary greatly by manufacturer, but generally can be open bottom arch shapes or rectangular shapes and made of plastic or concrete material. Systems should be designed to promote infiltration where underlying soils allow. This specification does not
…d wall storage structures such as pipes and box culverts. Buried infiltration structures are generally
…ered injection wells if the length of the system exceeds the depth.



…D USE: May be applied in parking lots, parks or other private property settings with the permission
…erty owner, but are not permitted for use within the ROW. Use for greater water storage capacity
…provided by stone aggregate. Void space in prefabricated materials can often be greater than 90%.
…son, the void space available in stone aggregate ranges from 30 to 40%. Can be used under
…pavement as a mechanism to transfer water from the stone storage bed to an outlet structure and
…of perforated underdrains. These types of systems have been approved by Ohio EPA as an
…stand-alone BMP when standard BMPs are not feasible due to various constraints. Ohio EPA
…proven pretreatment mechanism and maintenance plan to protect the long term function of the

…ATIONS:

…fications and details related to
…rials, aggregate, geotextiles, sizing,
…lation and maintenance are
…ufacturer specific. Follow all
…ufacturer specifications, details and
…mmendations for use.

…the ASTM requirements of F 2787,
…dard Practice for Structural Design of
…moplastic Corrugated Wall Stormwater
…ction Chambers

Prefabricated Buried Infiltration Structures (Source: CDM Smith)

…the ASTM requirements of F 2418
…propylene chambers) and F 2922 (polyethylene chambers) Meet the soil-structure interaction design
…dards of the AASHTO LRFD Bridge Design Specification, Section 3 and Section 12.

Metropolitan
St. Louis Sewer
District

2350 Market Street
St. Louis, MO 63103-2555
(314) 768-6200

September 20, 2016

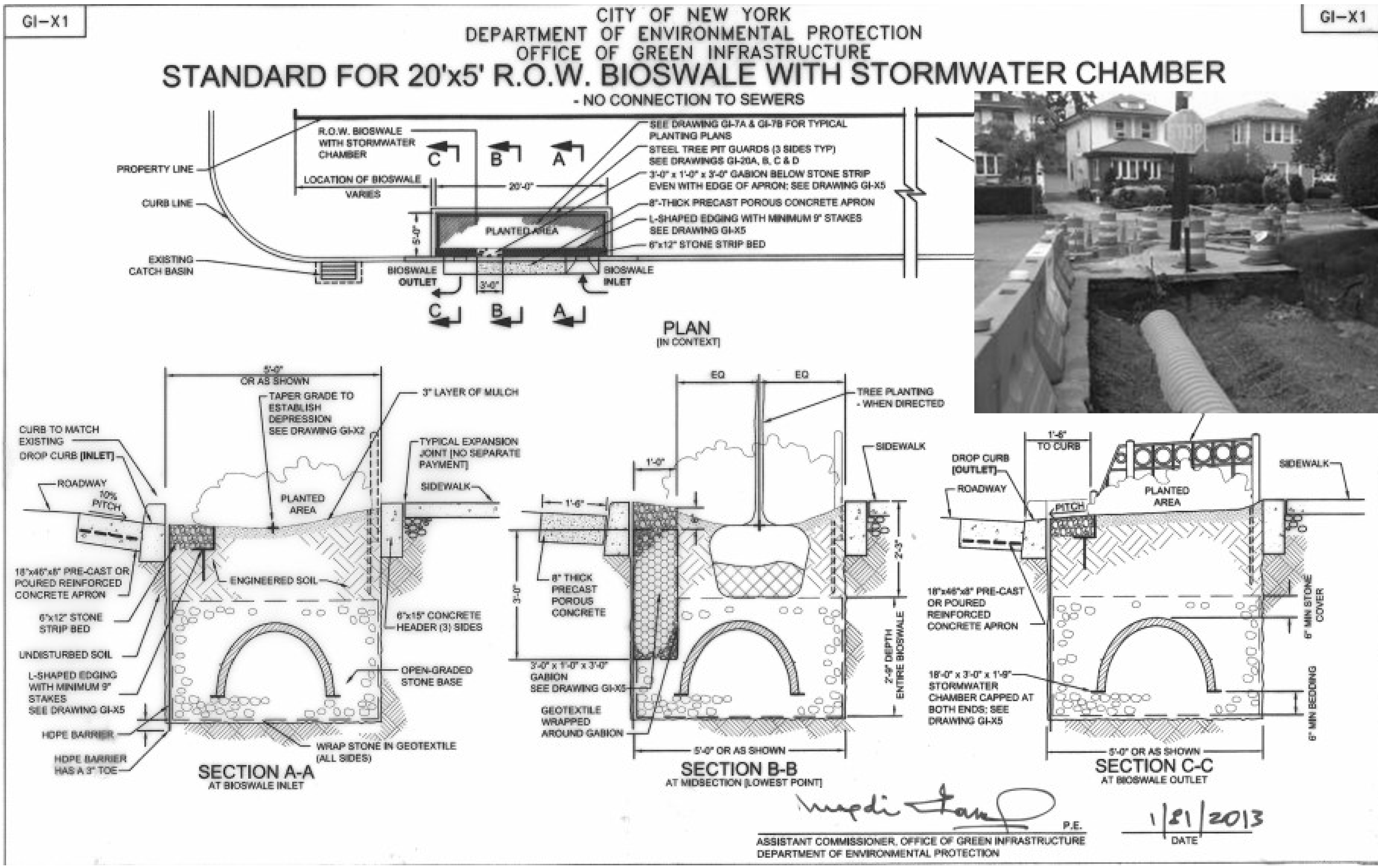
ADS
Attn: Mr. Mark Joersz
605 Dartmouth Crest Dr.
St. Louis, MO 63011

RE: Stormtech and Isolator Row

Dear Mr. Joersz,

The Metropolitan St. Louis Sewer District (MSD) has reviewed your July 5, 2016 analysis of the ADS Stormtech/Isolator Row system as a standalone post-construction stormwater Best Management Practice. MSD hereby grants approval of the Stormtech/Isolator Row system for use on new development, redevelopment and highway/roadway improvement projects of any size under the following conditions:

New York City



Washington DOT Highway Runoff Manual 2014

IN.04 – Infiltration Vault

Infiltration Vault along SR 303 in Kitsap County

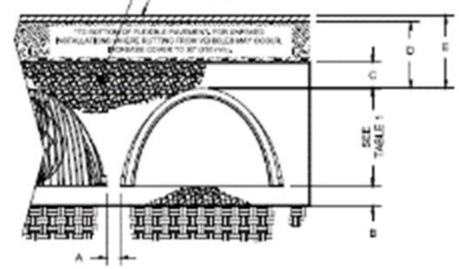
Description: Bottomless underground structures used for temporary storage and infiltration of stormwater runoff to groundwater. May be modified for runoff treatment.

Geometry Limitations

Limit to sites where infiltration ponds cannot be located due to site constraints.

BMP Function

- ☑ LID
- ☑ Flow Control
- ☑ Runoff Treatment*
  - ☐ Oil Control
  - ☑ Phosphorus
  - ☑ TSS - Basic
  - ☑ Dissolved Metals - Enhanced



NOTES:

1. CHAMBER DESIGN SHALL BE IN ACCORDANCE WITH ASTM F2787.
2. CHAMBER FOOT MUST BE DESIGNED TO DEVELOP A STRUCTURAL STONE COLUMN BETWEEN ROWS.
3. THE CHAMBER MANUFACTURES CUMULATIVE STORAGE SHALL BE USED AND INCLUDED IN THE DESIGN DOCUMENTATION.
4. THE CHAMBER ROW SPACING, BASE STONE, COVER STONE, MINIMUM COVER, AND MAXIMUM COVER SHALL BE PER THE CHAMBER MANUFACTURES SPECIFICATIONS.

CITY OF GIG HARBOR ENGINEERING DIVISION	
STORMWATER CHAMBER DETAIL	DETAIL NO. 3-06
APPROVED FOR PUBLICATION CITY ENGINEER	DATE MAY 16, 2016

Pretreatment

- Swale or other surface BMP
- Filters
- Hydrodynamic Separators
- Catch basin inserts
- Baffle box
- Pretreatment chamber row

Pretreatment Row

Pre-Treatment Row
Pollutant Removal Research

University of New Hampshire[1]

Pollutant	Efficiency
TSS	83%
TPH-D	91%
TZn	67%
TP	52%
Avg Peak Flow Reduction	75%
Avg Annual Lag Time	235 min.

North Carolina

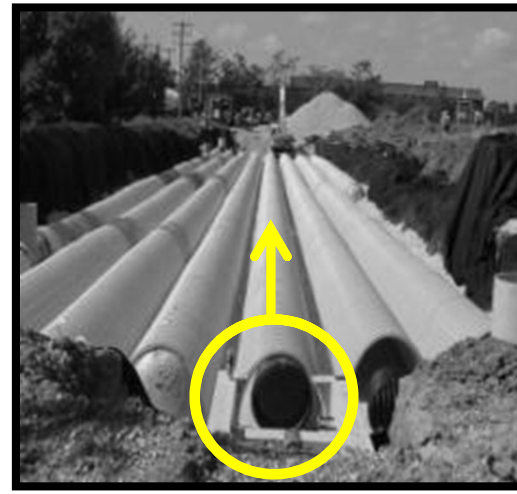
	NCSU % Reduction[2]	Charlotte NC % Reduction[3]
TSS	91	90
TP	82	68
TN	65	37
Metals	Not tested	76

Sources:

1. University of New Hampshire Stormwater Center Biennual Report, 2012.
2. An Evaluation of the StormTech Isolator Row and Subsurface Stormwater Management System at Capital Oaks Retirement Resort - North Carolina State University
3. City of Charlotte Pilot SCM Monitoring Program - Cherry Gardens, Charlotte North Carolina, July 2013.

Real Sustainability Example – St. Louis

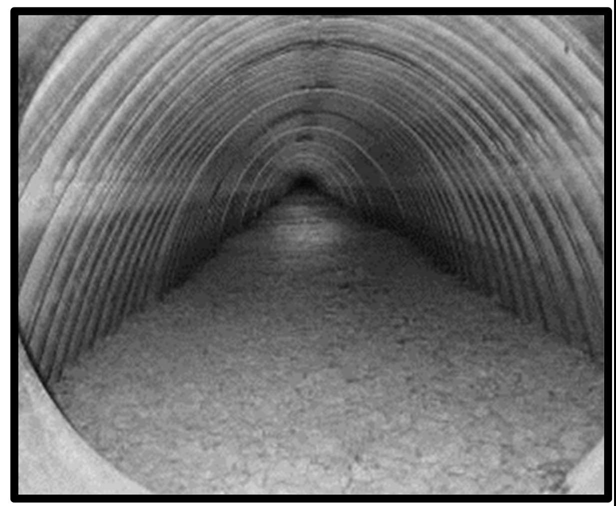
Daily Truck Traffic



September 2005

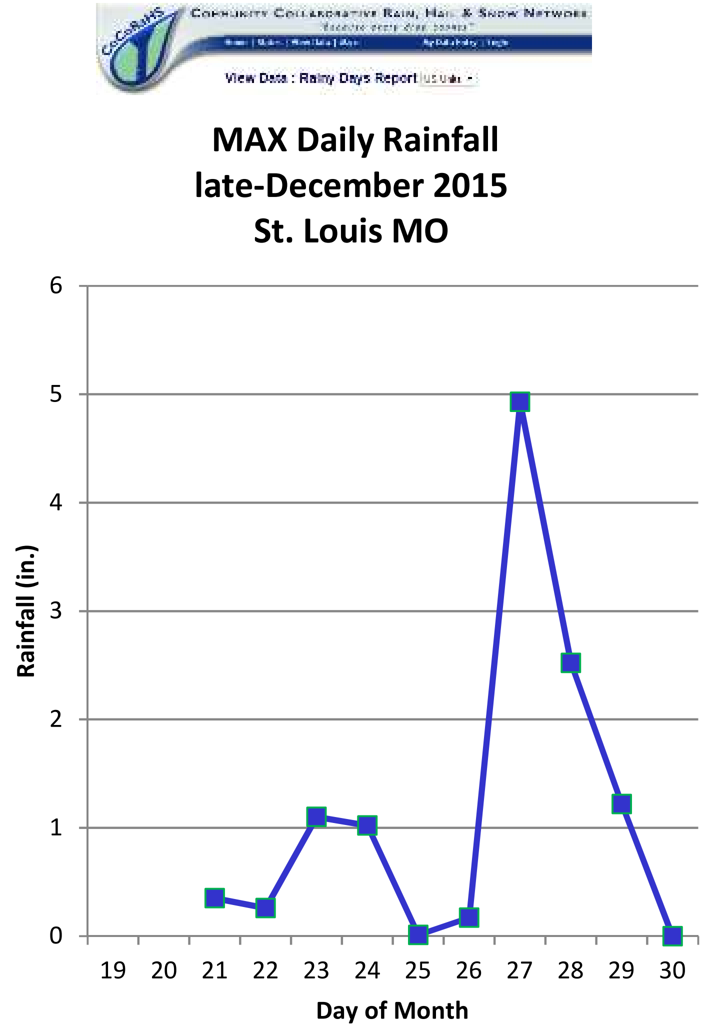
March 2007

April 2013



September 2020

Other Observations



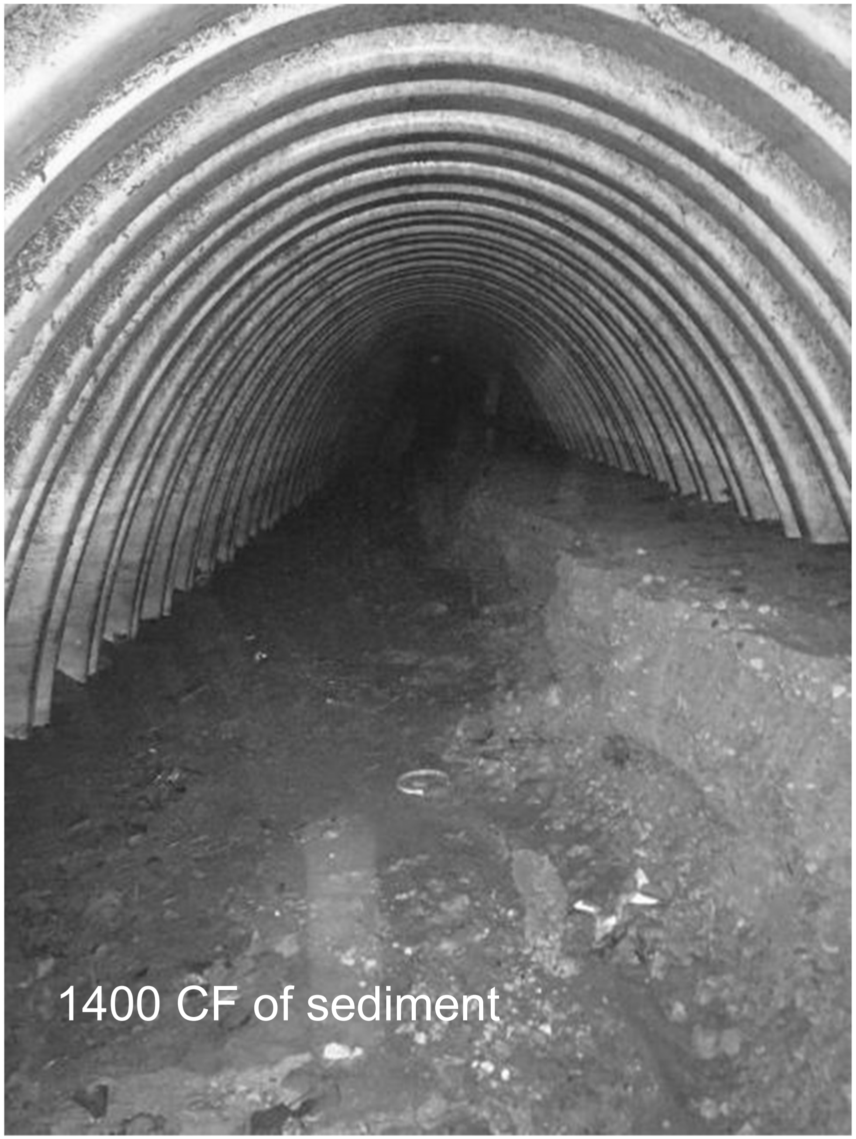
11.58”

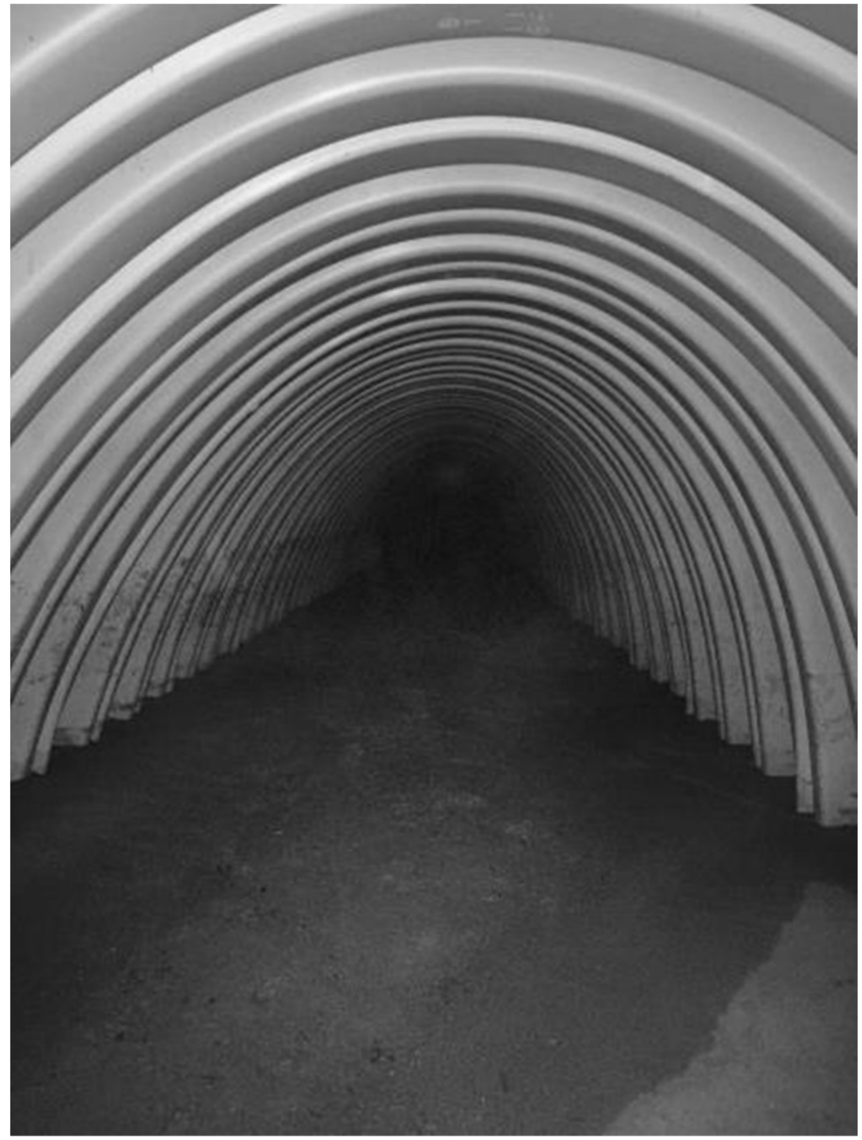
Houston 15+ year-old




Maintenance

Pretreatment chamber SWPPP protection





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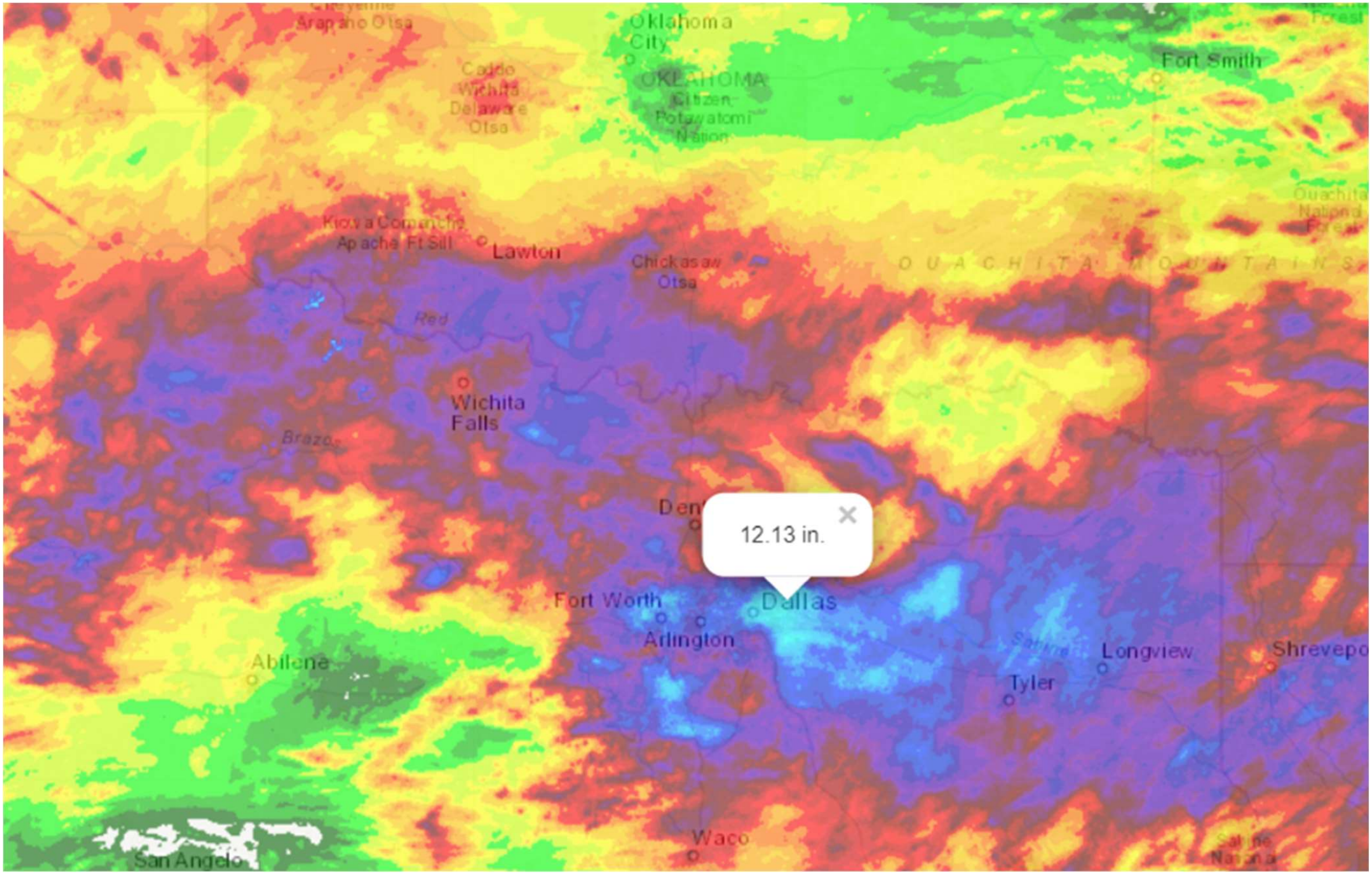

Innovative, Durable & Cost-Effective

QUESTIONS?

Mark Joersz
Regional Manager - Engineered Products
ADS
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636-346-6139