NCTCOG
Regional Stormwater Management Coordinating Council

Stormwater Quality Solutions
Case Studies

May 13, 2015

Aiza Jose, PhD, PE, LEED AP

BROWN & GAY ENGINEERS, INC.

Outline

- Stormwater Management and iSWM
- Case Studies
  - LID and iSWM
  - Trash Controls
  - Stream Stabilization/Restoration
- Take Away

Timber Creek HS _ Keller ISD

Stormwater Management and iSWM

- 2010 iSWM
  - Outcome oriented
  - Flexible (less prescriptive)
  - Full vs. Partial application
- Case Studies
  - LID and iSWM → Optional Outcome
  - Trash Controls → Recommended Outcome (based on MS4 requirements)
  - Stream Stabilization/Restoration → Mandatory Outcome (stream bank protection)

Eastern Hills – Multi-purpose Detention Pond

3

Case Study: GI/LID
- Optional Outcome -

Charles Baxter HS (EISD)

Case Study – GI/LID

Water Quality Volume

- Water Quality Volume (WQv)
- 85th percentile storm → runoff generated by 1.5 in rain event
- Min 24 h detention

Treatment Level

- TSS volume
- Previous iSWM 70% reduction
- 2010 iSWM permanent pool volume may be 50% WQv
- Alternative methods?

5

Charles Baxter Middle School

Shelby Rd

Rendon Rd

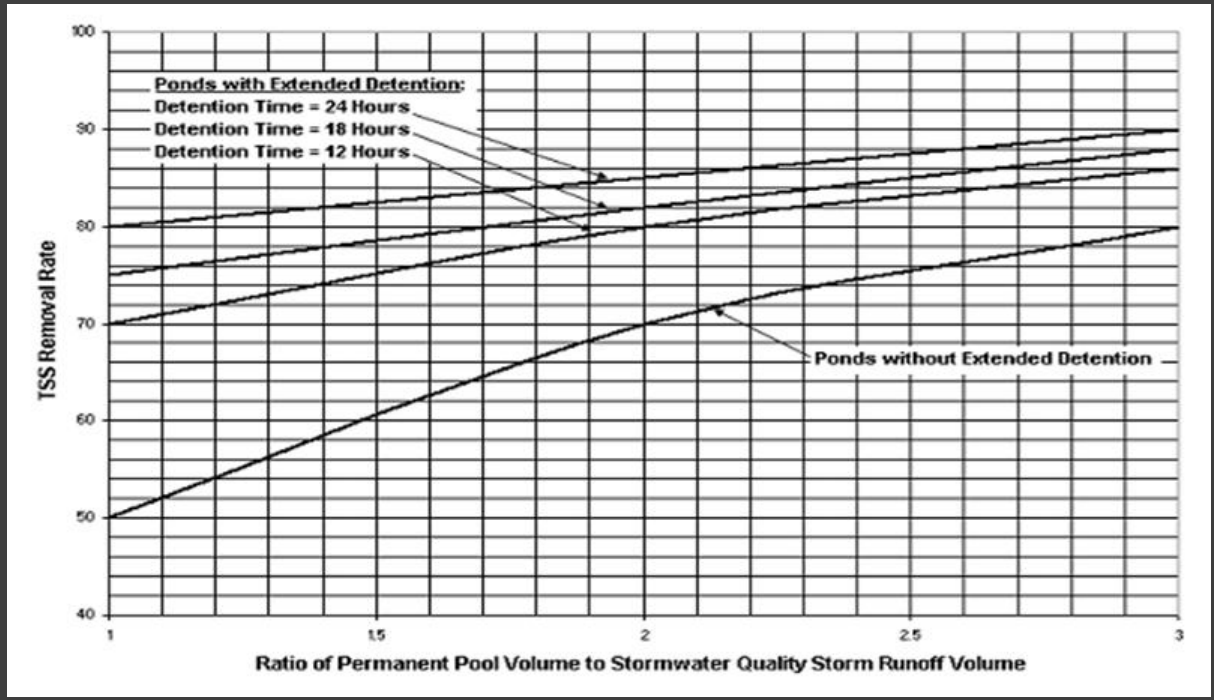
Wet Pond

Total Credits: 25%
Annual Savings: $2,138

Case Study – GI/LID

New Jersey Storm Water Best Management Practice Manual, February 2004

TSS Removal Target		80%
Perm. Pool Vol to WQ Vol Ratio	TSS Removal Rate	% WQ Credit
1.0	50%	63%
1.2	54%	68%
1.4	58%	73%
1.6	62%	78%
1.8	66%	83%
2.0	70%	88%
2.2	73%	91%
2.4	75%	94%
2.6	76%	95%
2.8	78%	98%
3.0	80%	100%
> 3.0	80%	100%



TSS Removal

Case Study: Trash Controls - Recommended Outcome -

Fort Worth and San Antonio BMPs

Case Study: Tash Controls

Trash Controls Requirements

Phase I MS4 Permit

- monitor/reduce floatables
- source and structural controls as required
- flood control projects: additional pollutant removal controls shall be implemented when practical
- at least two monitoring locations
- maintained as needed but at least twice per year

Local/Regional Requirements

- TRWD – trash controls at every outfall Trinity River

Public Concern

Rock Creek – San Antonio

Case Study: Tash Controls

Beginning-of-Pipe BMPs

Connector Pipe Screen (CPS)

Automatic Retractable Screen (ARS)

Street Sweeper

Street Vacuum

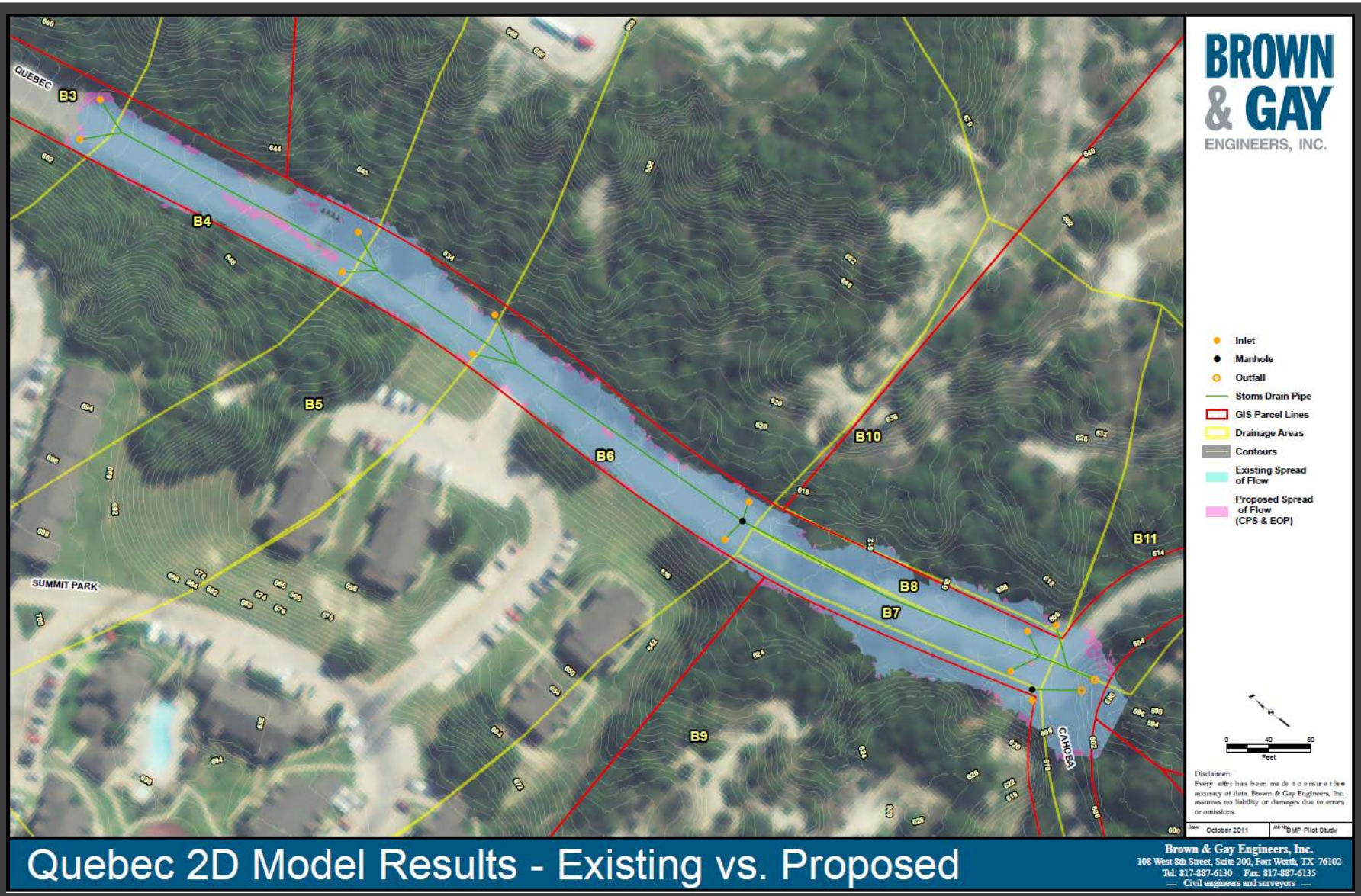
Case Study: Tash Controls

End-of-Pipe BMPs

City of Fort Worth – Eastern Hills Multi-Purpose Detention Basin

City of Fort Worth – Lake Worth

Case Study: Tash Controls

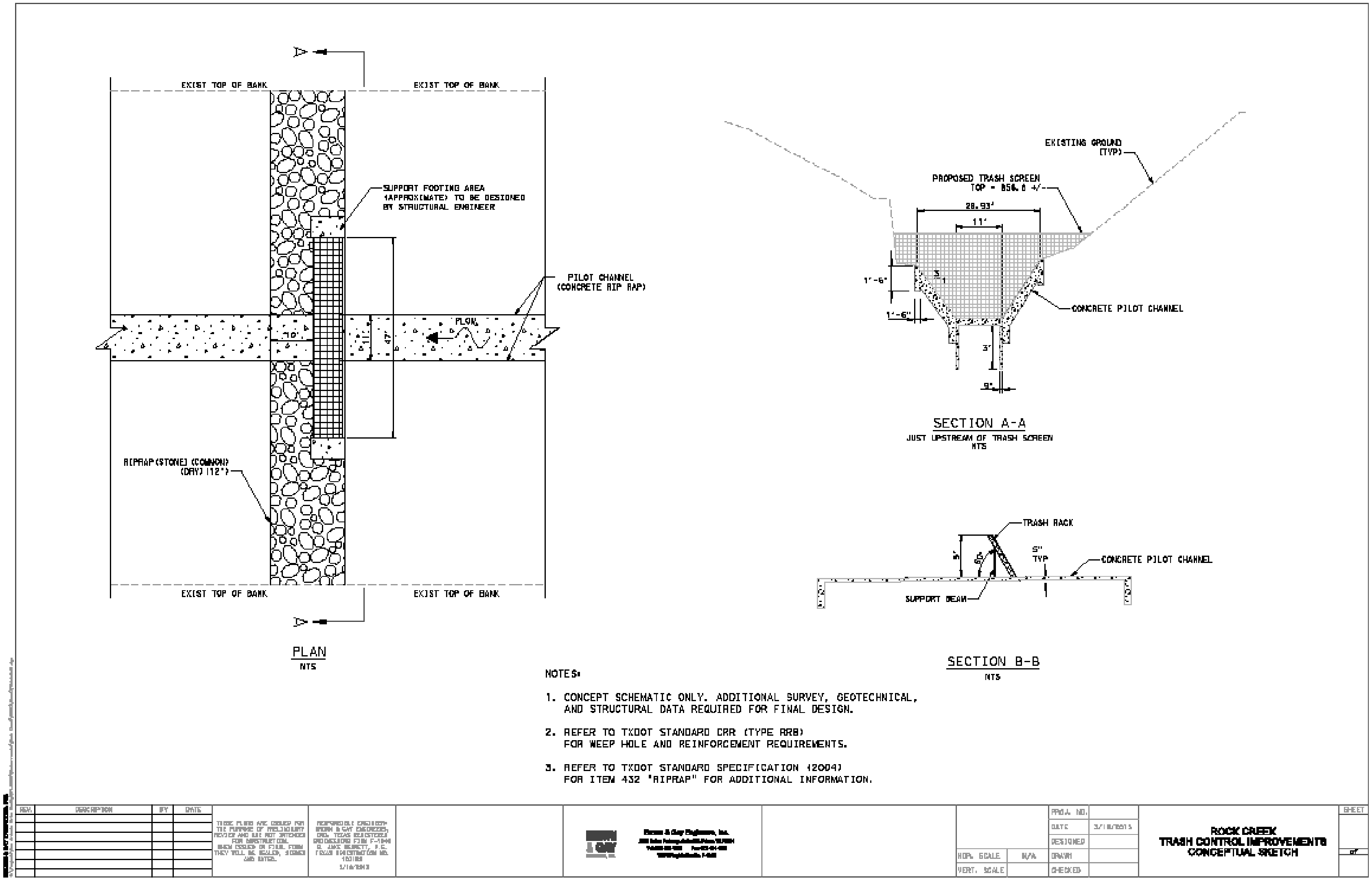


Case Study: Tash Controls

In-Line BMPs

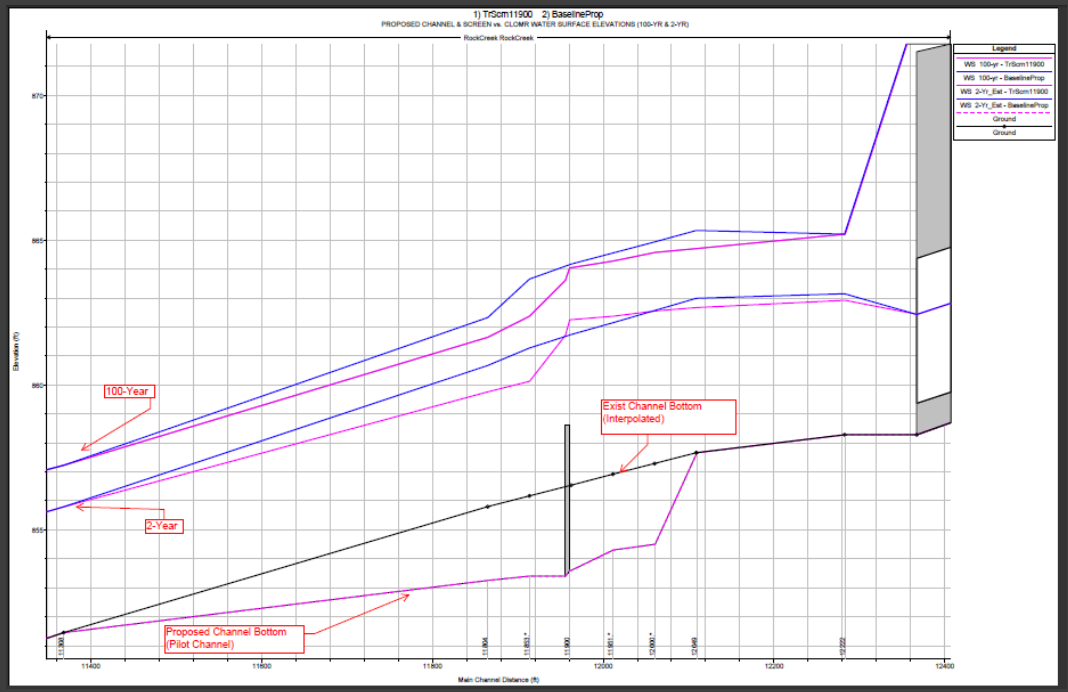
River Sentinel Device

Case Study: Tash Controls



Case Study: Tash Controls

- Hydraulics
  - Velocities
  - Water Surface Elevations
  - Existing projects
- Design conceptualization
  - Physical setting and constrains
  - Environmental conditions
  - Permitting requirements if applicable
- BMP Location
- Preliminary sizing



Rock Creek Hydraulic Profile

Case Study: Stream Stabilization/Restoration
- Mandatory Outcome -

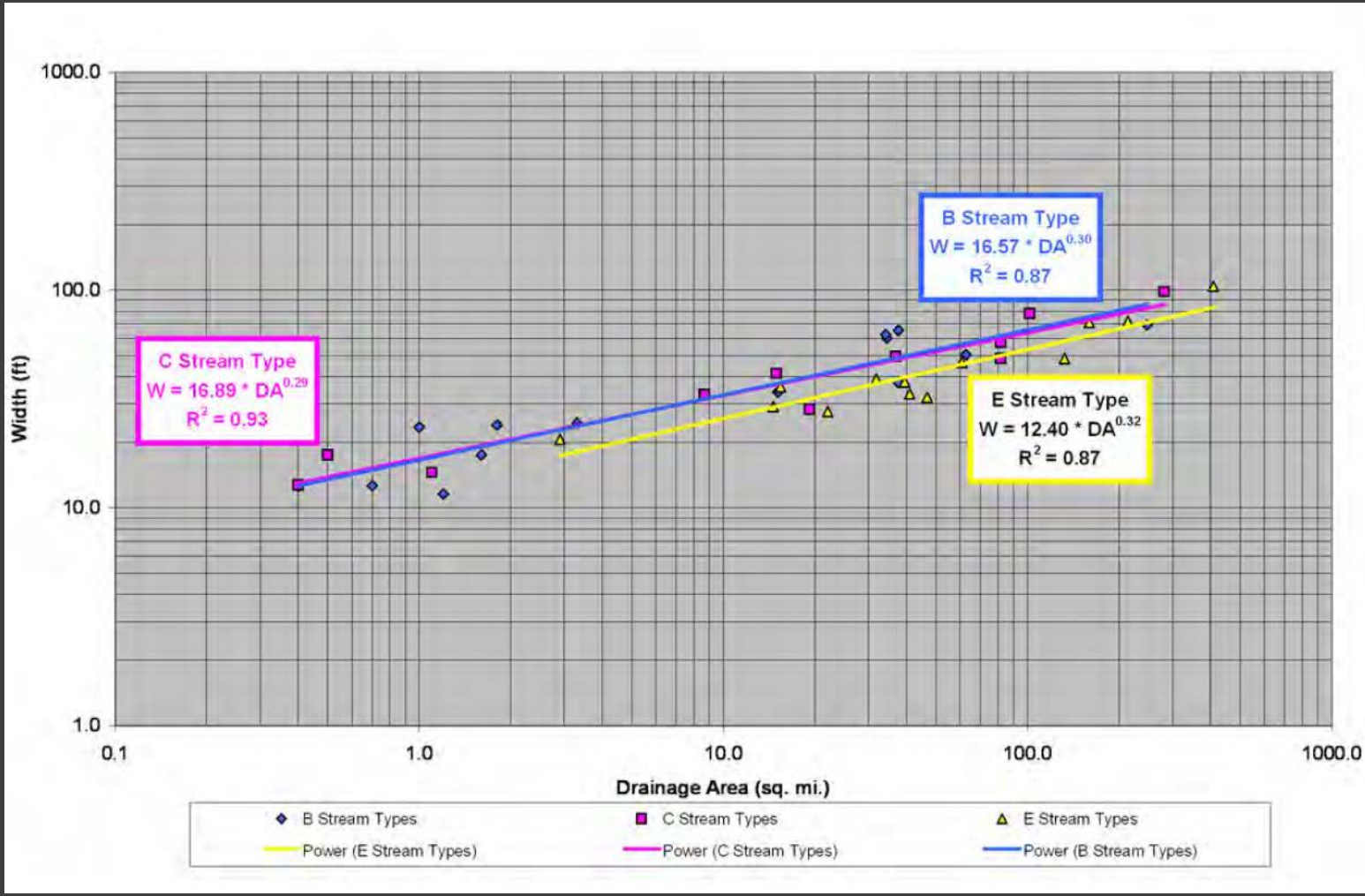
Fall Creek
MUD 96
Humble, Harris County, TX

Case Study: Stream Stabilization/Restoration

17

Case Study: Stream Stabilization/Restoration

Case Study: Stream Restoration/Stabilization



Harris County Flood Control District – Regional Curves

Take Away

- iSWM is allowing a less prescriptive more outcome-oriented type of requirements offering flexibility regarding compliance
- Three examples of each mandatory, recommended and optional outcomes
- Defining achieved compliance may require case-by-case evaluation
- Harris County Flood Control District using regional curves for channel design. Restoration may become a more prevalent practice there and, perhaps other areas of Texas as well.

QUESTIONS

Aiza Jose, PhD, PE, LEED AP
Brown & Gay Engineers, Inc.
ajose@browngay.com