Inspecting Stormwater Projects

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It’s Storytime...

• Setting
• Planning
• Design
• Construction
• Close-out
The Setting

The MCSWMD

- Legal Entity since 2001

• Funding Source
  - User fees
  - Mostly locally funded projects

• Our staff
  - 4 City Staff
  - Program Management
Setting Cont’d…

• **Assets We Manage**
  – 1000’s of miles of pipe and ditches
  – 100,000+ inlets and manholes
  – 2 high hazard dams
  – 35+ miles of levee/floodwall
  – 8 Stormwater Pump Stations
  – 18 Regional Detention Basins
Setting Cont’d…

- Environmental Management
  - EPA Water Quality Permit
Planning
– Complaint Driven
– Screened through Maintenance
### Planning Cont’d

- **IPR Sheet**

<table>
<thead>
<tr>
<th>Type of Solution</th>
<th>Open Channel</th>
<th>Collector</th>
<th>Storm System</th>
<th>Structural Flood Control</th>
<th>Rating</th>
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<td>2 ft to 4 ft</td>
<td>4</td>
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<td>Throughfare/Primary</td>
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<tr>
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**SOLUTION RATING**

- **Public Benefit**: YES  X  NO
- **IPR RATING**: 54
Design Cont’d

- Types of DPW Projects
  - SD (Storm Drainage)
  - LD (Levees/Dams)
  - LS (Lift Stations)
  - CL (Culvert)
  - RS (Resurfacing)
  - ST (Street)
  - BM (Bridge)

= They’re all drainage projects.
Planning Cont’d

• Non-discretionary
  – Capital O&M on levees and dams
  – Safety and regulatory driven
Planning Cont’d

• Discretionary
  – Culvert Replacements
  – Transportation Partnership
  – Neighborhood Drainage Improvements
Design

• Standards
  – Levee Design mirrors USACE Standards
  – 2011 City Design Manual
Design Cont’d

• Review Process
  – 30%, 60%, 90%, 100%
  – Internal Reviews

• Types of Permits
  – BMP Requirements (>0.5 AC Disturbance)
  – Rule 5 (>1 AC Disturbance)
  – 401/404 Permits
  – Bat Restrictions (4/1-9/30)
Construction

• Levee Rehabilitation
  – Tree Clearing
  – Pump Stations
  – Earthwork

• Dam Capital O&M
  – Earthwork
  – Structural
  – Mechanical
  – Electrical
Construction

- Traditional Storm Sewer
  - Water quality BMP’s
- Detention Basins
- Green Infrastructure
  - Stone Infiltration
  - Rain Gardens
  - Pavers
  - Hybrid Ditch
Construction - Storm Sewer

- Piping and grading
- Be mindful of the low-spot
Construction - Storm Sewer
Construction

• Green Infrastructure
  – Stone Infiltration
  – Rain Gardens
  – Pavers
  – Hybrid Ditch
“Geo-Grid” Stone Tray

• No longer recommended
Construction

• Green Infrastructure cont’d
  – Stone Infiltration
  – Rain Gardens
  – Pavers
  – Hybrid Ditch
Construction

Green Infrastructure cont’d

- Stone Infiltration
- Rain Gardens
- Pavers
- Hybrid Ditch
Construction - Permeable Paver

• Important to keep subgrade clean
Construction

Green Infrastructure cont’d

- Stone Infiltration
- Rain Gardens
- Pavers
- Hybrid Ditch
Construction - Hybrid Ditch

- Designed to slow flow of water at outlets
- Designed to “treat” the water
- Design solution in extremely flat areas
Construction – Hybrid Ditch
Construction – Other Tips

• Erosion Control
  – Must maintain throughout construction
  – Check after rain event
  – Swales must have 80% germination before inlet baskets can be removed
Construction – Other Tips

• Customer Service
  – Be ready to encounter all types!
  – You represent DPW, so be respectful
  – Fixing residents’ infrastructure is rewarding
Construction – Other Tips

• Future Project Prevention
  – Question the design, mistakes happen!!!
Construction – Other Tips

• PAY ATTENTION TO PAVEMENT GRADES
Construction - Final Inspection

• Inspect all structures for cleanliness & grade
• Inspect grading on pavement & ditches
  – Check after a rain to ensure no standing water
• May have to re-inspect seeding in the Spring
• Check as-builts for legibility, accuracy, completeness
Close-out

• As-builds **very** important to Storm Staff
  – Crucial for O&M coordination

• Submittals
  – Complete set of pdf as-builds
  – GIS Data Submittal provided to GIS Staff
Questions???