Stormwater & Highway Construction

Presented to:
2016 Waukesha County Stormwater Workshop

Case Studies
Silver Spring Drive (CTH VV) – Menomonee Falls
  Median Bioretention
  Lessons Learned

W. Lake Drive – Town of Oconomowoc
  Wet Detention Basin
  Lake Outfalls

Construction Minded | Value Sensitive | Civil Engineers
Craig Donze, PE

One Source Consulting - Principal in Charge

- 18 Years Highway Design & Construction Experience
  (15+ years experience on WisDOT Projects)
- Sr. Highway Project Manger
- Hydrology & Hydraulic Modeling
- Water Quality Modeling
- Storm Sewer Plan & Profiles
- Construction Details
- Special Provisions & Bidding Documents
- Construction Cost Estimating

In the last 5 years:
- Designed $15M of Waukesha County highway improvements
- Project leader for $7M in highway improvements
Storm Water Experience

• Highway BMP Toolbox
  – Infiltration, Detention & Velocity Control in Swales
  – Wet & Dry Pond Design
  – Inline Storage
  – Median Bio-retention
  – Underground Detention
  – Porous Concrete Pavers

• Areas of Expertise
  – Storm Sewer Hydraulic Modeling
  – Water Quality Modeling
  – Hydrology Modeling for Peak Flow Reduction
  – Automated Design & Plan Production

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Silver Spring Drive (CTH VV)

WisDOT Local Roads Project
Waukesha County DPW
5.5 miles of 2-lane to 4-lane Capacity Expansion

Construct in 2 Segments by WisDOT in 2011 & 2013

Storm Water Management Goals:
- Volume Reduction: Post-developed < Pre-developed
- Water Quality: 40% TSS Reduction

- Segment 1: Marcy Road to Pilgrim Road
  - Tributary to Fox River & Butler Ditch
  - Added 8.22 Acres of Impervious Surface

- Segment 2: Lannon Road to Marcy Road
  - Tributary to Fox River
  - Added 6.63 Acres of Impervious Surface
Median Bio-retention Details
Median Bio-retention Details

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Bio-retention Standard Parts
Construction Sequence
Treatment Areas:

Crown to Crown is tributary to bioswales. (50% TSS Removal)
Outside lanes treated with Catch basins and rural side slopes. (60% TSS Removal)
CTH VV Bio-retention

Lessons Learned
• Construction Oversight
• Filter Media Type
• Establishment Period & Care Cycles
• Weeding & Rootstock Maintenance

Cost Effectiveness
• Reduced R/W Costs
• Reduces Storm Sewer Trunk Costs
• Increases Highway Maintenance Costs
W. Lake Drive

Town of Oconomowoc
1.0 miles of Pavement Replacement

Constructed in 2015
Storm Water Management Goals:
  • Volume Reduction: Post-developed < Pre-developed
  • Water Quality: 40% TSS Reduction
  • Eliminate untreated discharges to Okauchee Lake

Brown Street (CTH P) to Okauchee Bridge
  • Added 0.45 Acres of Impervious Surface

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Wet Detention

Rough Excavation & Clay Liner

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Wet Detention

Spillway TRM & Inlet Riprap
Wet Detention

Berm Restoration
& Safety Shelf

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## Summary & Questions

### Highway Storm Water BMP Toolbox

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<th>Water Quality</th>
<th>Volume Control</th>
<th>Velocity Control</th>
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Use in series as stormwater treatment trains to minimize lateral footprint and r/w impacts.

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