Stormwater Best Management Practices in Urban Settings
Challenges & Solutions

Presented by: Chad Boyer, PE, CFM | ms consultants, inc.
Discussion Topics

• Background/Key Terms

• Regulatory Agencies

• Urban Challenges and Solutions

• Conclusions / Q&A
Key Terms

• Project EDA

• Water Quality Volume

• Water Quantity Volume

• Treatment Percentage

• Treatment Credit
Regulatory Groups and Agencies

- Ohio Environmental Protection Agency
- Ohio Department of Transportation
- Local Municipalities - City of Columbus
- Federal Aviation Administration
## OEPA Requirements and Permits

<table>
<thead>
<tr>
<th></th>
<th>Construction General Permit</th>
<th>Olentangy River Watershed Permit</th>
<th>Big Darby Creek Watershed Permit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Quality</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Riparian Setback</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Groundwater Recharge</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Ohio Department of Transportation

- Applies for all ODOT projects
- Stream Protection
- Redevelopment
- New construction
- Treatment Percentage
- Water Quality
- Water Quantity
### Project Earth Distributed Area Thresholds

- EDA < 1 acre – BMP and NOI not required
- EDA ≥ 1 - BMP are required
- Routine Maintenance Projects-- i.e. partial depth pavement repair

### Water Quality

- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

### Water Quantity Thresholds

- New impervious area in new right-of-way ≤ 1 acre
- Site is redevelopment in ultra urban setting.
- Sites which discharge directly to a large river or lake

### Water Quantity

- Detention/Retention Basins
- Bioretention Cells/Swales
- Infiltration Trenches/Basins
- Constructed Wetlands
- Depressed Culvert Inverts -breakout
Local Municipalities – City of Columbus

- Requirements and Thresholds
- Quantity
- Quality
- Stream Protection
- Compensatory Flood Storage
Federal Aviation Administration – revise list

• Quantity Controls

• Drain Time Requirements

• Basin Shape
Challenges and Solutions
Challenges and Solutions – Hamilton Road Gahanna
Challenges and Solutions – Hamilton Road Gahanna

**Challenges**
- Quality/Quantity Requirements
- Lack of green space in the Right-of-way
- Self contained stormwater system
- Multiple outlet locations

**Water Quality**
- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

**Water Quantity**
- Detention Features
- Bioretention Cells/Swales
- Infiltration Trenches/Basins
- Constructed Wetlands
- Depressed Culvert Inverts
Challenges and Solutions –
Hamilton Road Gahanna

Water Quality
- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

Water Quantity
- Detention Features
- Bioretention Cells/Swales
- Infiltration Trenches/Basins
- Constructed Wetlands
- Depressed Culvert Inverts
Challenges and Solutions – Hamilton Road Gahanna

Water Quality
- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

Water Quantity
- Detention Features
- Bioretention Cells/Swales
- Infiltration Trenches/Basins
- Constructed Wetlands
- Depressed Culvert Inverts
Challenges and Solutions – Stelzer Road
Challenges and Solutions – Stelzer Road add road names

Water Quality
- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

Water Quantity
- Detention Features
- Bioretention Cells/Swales
- Infiltration Trenches/Basins
- Constructed Wetlands
- Depressed Culvert Inverts
Challenges and Solutions – US-62 Johnstown Road Improvements
Challenges and Solutions – US-62 Johnstown Road Improvements

**Challenges**

- Quality/Quantity Requirements
- Lack of green space in the Right-of-way
- Self contained stormwater system
- Mostly impervious surfaces

**Water Quality**

- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

**Water Quantity**

- Detention/Retention Basins
- Bioretention Cells/Swales
- Infiltration Trenches/Basins
- Constructed Wetlands
- Depressed Culvert Inverts
Challenges and Solutions – US-62 Johnstown Road Improvements
Challenges and Solutions – 70/71 Roadway Improvements Crossroads title

Water Quality
- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

Water Quantity
- Detention Features
- Bioretention Cells/Swales
- Infiltration Trenches/Basins
- Constructed Wetlands
- Depressed Culvert Inverts
Challenges and Solutions – 70/71 Roadway Improvements

Water Quality
- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

Water Quantity
- Detention Features
  - Bioretention Cells/Swales
  - Infiltration Trenches/Basins
  - Constructed Wetlands
  - Depressed Culvert Inverts
Challenges and Solutions – 70/71 Roadway Improvements

Water Quality
- Vegetated Biofilter
- Vegetated Filter Strip
- Manufactured Systems

Water Quantity
- Detention Features
- Bioretention Cells/Swales
- Infiltration Trenches/Basins
- Constructed Wetlands
- Depressed Culvert Inverts
Challenges and Solutions – Southern Ohio Veterans Memorial Highway
Challenges and Solutions – Southern Ohio Veterans Memorial Highway
Challenges and Solutions – Southern Ohio Veterans Memorial Highway
Challenges and Solutions – Southern Ohio Veterans Memorial Highway

October 27, 2015
2015: Ohio Transportation Engineering Conference
Closing Summary

• Unique solutions for unique challenges

• Know your regulations

• Consider multiple solutions

• Maximize credits per location
Questions

Chad Boyer, PE, CFM
ms consultants, inc.
2221 Schrock Road
Columbus, Ohio, 43229
614-898-7100
EMAIL:
cboyer@msconsultants.com