GDOT’s Approach to MS4

GDOT’s MS4 Permit

- 5-year permit first effective 2012 then reissued in 2017 and again this past January 2022.
- Comply with a number of requirements (temporary = construction, permanent stormwater control structures, inspections)
- Annual report to Georgia EPD
- Permit renews every 5 years
- GDOT is in its third permit cycle

Permit Year 1 (2022)
Permit Year 2 (2023)
Permit Year 3 (2024)
Permit Year 4 (2025)
Permit Year 5 (2026)

Agenda

- GDOT’s MS4 Permit overview of basic parts
- Permit cycle
- Permit areas
- Permit sections
- More in depth with Post Construction BMPs (Stormwater Control Devices)

GDOT’s MS4 Permit Area

- Permitted MS4 areas in blue and gold
- Areas are defined in the census as urbanized areas
- Combined sewer areas not shown

MS4 permit was issued in 2012
First Construction Stormwater Permit 2003

Presented: 03/09/11 – 03/11/11
**GDOT’s Approach to MS4**

**Comprehensive MS4 Permit Requirements**

**Six Minimum Control Measures (MCMs)**

- Public Education and Outreach on Stormwater Impacts
- Public Involvement / Participation
- Illicit Discharge Detection and Elimination (IDDE)
- Construction Site Stormwater Runoff Control
- Post-Construction Stormwater Management
- Pollution Prevention/Good Housekeeping for Municipal type Operations

**Post-Construction Stormwater Design Considerations**

Five major Post-Construction stormwater management requirements (MS4 permit):

- \( Q \): Safely convey the 100-yr storm. Detain and remove 80% TSS.
- \( Q_{f} \): Safely convey the 100-yr storm. Evaluate effects on the storm system and downstream areas.
- \( Q_{p25} \): Provide detention for the 25-yr/24-hr storm (\( Q_{post} < Q_{pre} \))
- \( CP \): Detain the runoff volume from the 1-yr/24-hr event for 24 hours.
- \( WQ \): Treat the first 1.2” of runoff from new impervious area. Detain and remove 80% TSS.
- \( RR \): Retain up to the first 1.0 inch of rainfall on the site

**MS4 Project Screening**

**Step 1:** Project Level Exclusion (PLE)

Project not regulated by GDOT MS4 requirements.

**Step 2:** Outfall Level Exclusion (OLE)

Considered at each individual outfall (drainage basin) that if applicable, removes requirement for post-construction BMPs:

**Step 3:** Infeasibilities

Applied to individual outfall (drainage basin), based on ten characteristics:

**GDOT’s Approved Post-Construction BMPs**

- Filter Strip
- Grass Channel
- Enhanced Dry Swale
- Enhanced Wet Swale
- Infiltration Trench *
- Bioslope
- Sand Filter
- Bioretention Basin
- Dry Detention Pond *
- Wet Detention Pond
- Stormwater Wetland
- Open Graded Friction Course (OGFC) *

These are all in the designer’s “toolbox” to help them meet MS4 and other stormwater requirements.

**Filter Strip**

This BMP at a glance...

- Vegetative Conveyance
- Filtration
- Settling
- Infiltration
- TSS removal = 60%
- Detention
- Runoff Reduction = 25%
This BMP at a glance...

Grass Channel

• Vegetative Conveyance
• Filtration
• Setting
• Infiltration
• TSS Removal = 50%
• Detention
• Runoff Reduction = 25%

Graded Channel

• Requires a 5 minute resident time for the water in the ditch

Filtration Media

• Use an engineered soil mix that meets the requirements herein. Do not use a mixture that contains toxic or pathogenic substances. Obtain the materials from sources approved by the Engineer. Ensure that aggregate retained on No. 10 (2 mm) sieve is of hard, durable particles.

• Remove particles with a diameter greater than 2 in (50 mm) before placing the engineered soil mix. Remove particles with screens or by hand if few oversized pieces exist. Otherwise, crush the oversized pieces to less than 2 in and use them in the proportions shown by the gradation table below.

• Use 5-10% by dry weight composted organic matter as soil components. All components shall be free of heavy metals, pathogens, pesticides, and herbicides.

• Use 90-95% by dry weight inorganic soil components with the following properties:

Critical Elements:

• Permeable Soil
• Underdrain
• Outlet Control Structure

Enhanced Swale (Dry Swale)

Critical Elements:

• Permeable Soil
• Underdrain
• Outlet Control Structure

Check Dams may be required to retain treatment volume
GDOT’s Approach to MS4

Enhanced Swale (Dry Swale)

Bartow County, SR 20 Widening, Please at 175

Bioretention Basin

Typical Basin Configuration

Post-Construction BMPs

Bioretention Basin

Description: Shallow stormwater basin/landscaped area that uses engineered soils and vegetation to treat runoff

Bioslope

Cross Section View
GDOT’s Approach to MS4

65th Annual Alabama Transportation Conference
February 9 – 10, 2022

This BMP at a glance...

<table>
<thead>
<tr>
<th>BMP Type</th>
<th>Vegetative Conveyance</th>
<th>Filtration</th>
<th>Settling</th>
<th>Infiltration</th>
<th>TSS Removal</th>
<th>Detention</th>
<th>Runoff Reduction</th>
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Enhanced Swale (Wet Swale)

This BMP at a glance...

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<tr>
<th>BMP Type</th>
<th>Vegetative Conveyance</th>
<th>Filtration</th>
<th>Settling</th>
<th>Infiltration</th>
<th>TSS Removal</th>
<th>Detention</th>
<th>Runoff Reduction</th>
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</thead>
<tbody>
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<td>Critical Elements:</td>
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<td>• Water Table</td>
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<td>• Wetland Plantings</td>
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<tr>
<td>Structure</td>
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</tbody>
</table>

Source: EPA, Chesapeake Stormwater Network
**GDOT’s Approach to MS4**

**Enhanced Swale (Wet Swale)**  
![Enhanced Swale Image](source: Maryland DOT)

**Stormwater Wetland – Level 2**  
This BMP at a glance...
- Vegetative Conveyance
- Filtration
- Settling
- Infiltration
- TSS Removal = 85%
- Detention
- Runoff Reduction = 0%

**Critical Elements:**
- May include a Flashboard riser design for multiple orifices

**Outlet Control Structure (OCS)**

**Stormwater Wetland**

**Critical Elements:**
- May include a Flashboard riser design for multiple orifices

**Outlet Control Structure (OCS)**

**MS4 Information**

GDOT ROADS (Roadway category)  

GDOT Drainage Manual (Chapter 10):  

Or of course you can just conduct a search online.
Questions

Any Questions?