Advanced Design Workshops

GDOT MS4 Post-Construction Stormwater Report

Note: This course is available as online training on ELMS: https://learning.dot.ga.gov
Points of Discussion

- Why is the report required?
- What is the GDOT MS4 Post-Construction Stormwater Report?
- How is it different from standard stormwater reports?
- What elements are included in the report?
- What documentation is required in those elements?
GDOT’s MS4 Permit applies in municipalities and counties designated by EPD as MS4 (Phase I and Phase II)
Stormwater Planning

• Documentation of stormwater planning/management is required at each milestone review

  Concept → PFPR → FFPR

• For detailed information, see Chapter 3 and Chapter 10 of the GDOT Drainage Manual
What is it?

• GDOT’s standardized MS4 design report template
• Organizes all post-construction BMP information
• Summarizes post-construction design for project
How is it different from other stormwater reports?

- Specific to GDOT’s MS4 permit requirements
- Includes exclusions/ infeasibility analysis
- Guides project planning process from beginning
Why do we need it?

- Allows for early identification of permit compliance issues
- Required for MS4 permit compliance for ALL projects in MS4 area
- Ensures all necessary documentation is provided
- Provides step-by-step process for H&H analysis
- Ensures sufficient right-of-way is acquired for BMPs
What is in it?

• Project information
• Planning-level LID/GI stormwater considerations
• Project basin/BMP design information
• Exclusions/Infeasibility justifications
• Downstream analysis
MS4 Post-Construction Stormwater Report

Where can I find it?


### Roadway

<table>
<thead>
<tr>
<th>Title</th>
<th>Revised</th>
<th>Contact</th>
</tr>
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<tbody>
<tr>
<td>Category: Construction Stormwater (Erosion Control)</td>
<td>1/20/2012</td>
<td>Brad McManus</td>
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<tr>
<td>Category: Stormwater Permit (MS4)</td>
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<td>Chief Engineer - Letter 01-20-12</td>
<td>1/20/2012</td>
<td>Brad McManus</td>
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<tr>
<td>Georgia's MS4 Areas Map</td>
<td>3/9/2016</td>
<td>Brad McManus</td>
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<td>MS4 Concept Level Design Spreadsheet</td>
<td>12/30/2016</td>
<td>Brad McManus</td>
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<td>MS4 Concept Report Summary</td>
<td>3/8/2017</td>
<td>Brad McManus</td>
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<td>MS4 Preconstruction PDP Process</td>
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<td>Post-Construction Stormwater Report Attachment B</td>
<td>12/30/2016</td>
<td>Brad McManus</td>
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<td>Post-Construction Stormwater Report Help File</td>
<td>12/30/2016</td>
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<td>Post-Construction Stormwater Report Template</td>
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<td>Habitat stream locator and drainage structure inventory map service</td>
<td>5/1/2018</td>
<td>Brad McManus</td>
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<tr>
<td>Worksheet J-1_Place Phase 1 Screening Assessment of Stormwater Infiltration</td>
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<td>Brad McManus</td>
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</tbody>
</table>
MS4 Post-Construction Stormwater Report

Guidance

All post-construction stormwater BMPs are considered LID/GI with the exception of the site contamination and erosion control BMPs. As part of GDOT’s policy on how to consider LID and G1 practices, the designer must adhere to LID/GI practices when it is both feasible and within an MS4 area. During the planning phase, the designer is responsible for considering the site’s constraints and limitations for the LID/GI practices. The designer is required to complete the LID/GI Checklist to document specific details for each BMP. For more information, refer to Chapter 10 of the GDOT Drainage Design for Highways Manual (Drainage Manual).

PROJECT POST-CONSTRUCTION BMP SUMMARY

Attachment A of the GDOT Post-Construction BMP Summary. This form must be completed as part of all stormwater reports at milestone reviews. The purpose of the document is to inventory new post-construction stormwater BMPs and also assist with the planning and construction of MS4 projects. The BMPs listed in the project post-construction BMP summary are required to be considered by the designer during the stormwater reports.

FEASIBILITY & EXCLUSION OF POST-CONSTRUCTION BMPs

There are exclusions (or certain instances) when GDOT does not require post-construction BMPs. The following list of exclusions includes both “Project Level” and “Outfall Level” exclusions.

- Outfall Level Exclusions (OLE) can only be claimed on a per-outfall basis and are summarized in the overall project area. The MS4 outlet is the most downstream point on an outfall discharge to a stream or to the State’s ocean. OLEs include structures that function only to maintain the natural flow of surface water and drain collects or ditches that have contacted road surfaces for discharge to a stream or into a storm drain system.

Project Level Exclusions requiring the submittal of the MS4 PCS Report cover all areas of the project.

1. Roadways that are not owned or operated (maintained) by the Department (LID/GI) BMPs. Coordination with the local government is necessary.
2. Maintenance areas, and maintenance projects where the sites are not disturbed less than one acre (see page 19 of the Permit for more details).
3. Projects that have their environmental documents approved or reissued June 30, 2012.
4. Road projects that disturb less than one acre or for the development of an impervious area.

Outfall Level Exclusions include the following:

- 1. Areas where the project would require an existing roadway alignment change. A written determination of the safety concern(s) must be included in the report for all cases of this exclusion.
- 2. Areas where the existing alignment or post-construction BMP would be allowed to impact a stream, wetland, or other sensitive area.
- 3. Areas where the project would impact existing vegetation or drainage basins. If the project will impact existing vegetation or drainage basins, the designer is required to consider the project impacts for the drainage basin.
- 4. Areas where stormwater discharges from the project site are designated as non-point source discharge. These flow should be designed in accordance with the requirements of the MS4 CIP.

All post-construction stormwater BMPs are considered LID/GI with the exception of the site contamination and erosion control BMPs. As part of GDOT’s policy on how to consider LID and G1 practices, the designer must adhere to LID/GI practices when it is both feasible and within an MS4 area. During the planning phase, the designer is responsible for considering the site’s constraints and limitations for the LID/GI practices. The designer is required to complete the LID/GI Checklist to document specific details for each BMP.
MS4 Post-Construction Stormwater Report

Help File
MS4 Post-Construction Stormwater Report

Concept Approval

Does PLE still apply?

Yes → Project located in an MS4 area?

No → No further action is needed

Yes → Prepare cover of PCSR to document the PLE

Map showing MS4 areas is provided in Section 10.2.2.1 of the GDOT DDM or by clicking this link

PCSR template and training materials can be found on R.O.A.D.S. Download an editable version by clicking this link

Infiltration BMPs should only be considered if the Web Soil Survey indicates favorable conditions for infiltration (i.e., HS6 A or B soils)

Should be made at least 8 weeks prior to the PFPR request. Include PFPR plans, GDOT-approved Stormwater BMP Infiltration Report (if applicable), and the draft PCSR - all in PDF format. Submit via email to: stormreports@dot.ga.gov

PFPR

Identify location of all outfalls on project

Determine if any basins require detention

Eliminate outfalls where OLE apply

Evaluate feasibility of BMPs

Is project proposing an infiltration BMP?

No → Prepare draft PCSR

Yes → Request Stormwater BMP Infiltration Report - infiltration testing

Detailed descriptions of Outfall Level Exclusions (OLEs) can be found in Section 10.2.2.1 of the GDOT DDM or by clicking this link

Detailed descriptions of feasibility criteria can be found in Section 10.2.2.3 of the GDOT DDM or by clicking this link

Prepare & submit Stormwater BMP Infiltration Report

Will be prepared by Geotechnical Consultant. Acceptable testing methods and additional guidance are provided in Appendix J of the GDOT DDM or by clicking this link. Submit via email to: stormreports@dot.ga.gov, for approval.

Submittal should be made at least 8 weeks prior to the PFPR request. Include PFPR plans, GDOT-approved Stormwater BMP Infiltration Report (if applicable), and the draft PCSR - all in PDF format. Submit via email to: stormreports@dot.ga.gov

MS4 Post-Construction Stormwater Report
Three tiered screening process:

- Project Level Exclusion
- Outfall Level Exclusion
- Infeasibility

MS4 Post-Construction Stormwater Report
Project-Level Exclusions (PLE) remove post-construction BMP requirements for entire project and include:

1. Facility not GDOT-owned
2. Project not within MS4 boundaries
3. Maintenance/safety project (disturbs less than 1 acre)
4. Environmental documents approved before 6/30/12
5. The project is a roadway project that disturbs < 1 acre or a site project that adds < 5,000 ft$^2$ of impervious area
What if...

the project is primarily on a local road, but it crosses a state route and work is being done on the state route?

The portion of the project on the state route would require a MS4 PCS report.
Project Level Exclusions

What if...
an outfall basin is on the state route but the outfall is located along the local road?

GDOT will follow its normal procedure for BMP design and, if determined feasible, will install the BMP on the GDOT right-of-way.
Project Level Exclusions

What if...

an entire outfall basin is on the local road and the outfall is located along the state route?

Further coordination with GDOT and the local government is required and will be determined on a case-by-case basis.
Project Level Exclusions

1. Is there a Project Level Exclusion that applies to this project?
   - Yes: Is the project located in an MS4 area?
     - Yes: Complete only the cover page of the MS4 Post-Construction Stormwater Report.
     - No: No MS4 Post-Construction Stormwater Report documentation is required.
   - No: Complete the cover page of the MS4 Post-Construction Stormwater Report & continue the evaluation.
If you have a Project-Level Exclusion (PLE):

- Complete Stormwater Report Cover Page ONLY
- The PLE must be applicable for the entire project.
- Review and (if required) revise at project milestone submittals
Outfall Level Exclusions (OLE) remove post-construction BMP requirements for a specific outfall’s drainage area and include:

* 1. Change in existing roadway alignment that creates safety concern

* 2. Installation of BMP causes realignment or piping of a stream

* 3. Installation of BMP impacts a stream buffer or wetland

4. Discharges exit R/W as sheet flow

5. Flows that originate offsite

6. Reduction (or negligible increase) in impervious area

*Note: OLE 1, 2 and 3 must be solely due to installation of the BMP*
Infeasibility Criteria

**Infeasibility criteria** make compliance with post-construction requirements for a specific outfall’s drainage area infeasible and include:

1. Cost (BMP cost is greater than 10% project/roadway segment cost in BMP basin)
2. Schedule delay (> 90 days)
3. Impact to endangered/threatened species
4. Damage to cultural/community resource (historical/ archeological sites, cemetery, park, wildlife refuge, nature trail, school)
5. Residence or business displacement
Infeasibility Criteria

Infeasibility criteria make compliance with post-construction requirements for a specific outfall’s drainage area infeasible and include:

6. Violation of a federal or state law or regulation

7. Shallow bedrock, contaminated soils, high groundwater, utilities/other underground facilities

8. Limited soil infiltration capacity

9. Site too small to infiltrate significant volume

10. Site does not allow for gravity flow to BMP
**Remember**, the MS4 Permit Requires

- Stormwater runoff treatment to the maximum extent practicable

- Infeasibility determined individually:
  - For each design requirement ($WQ_v$, $CP_v$, $Q_{p25}$, $Q_f$)
  - Per outfall basin within the project limits

- Does not remove the requirement for stormwater quantity assessment to check for adverse impacts downstream of the project.
OLEs and Infeasibilities

If you have an OLE or Infeasibility:

- Complete Cover Page
- Complete Attachment A
- Complete for all basins:
  - Attachment B
  - Attachment C
- Complete Attachment D at milestone reviews

<table>
<thead>
<tr>
<th>PI Number</th>
<th>00091900</th>
<th>Submission Date</th>
<th>12/13/15</th>
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<tbody>
<tr>
<td>Project Name</td>
<td>SR1 Widening</td>
<td>Consultant</td>
<td>XYZ Engineering</td>
</tr>
<tr>
<td>City/County</td>
<td>Macon/Bibb</td>
<td>Let Date</td>
<td>5/1/17</td>
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<td>District</td>
<td>3</td>
<td>Contact Phone</td>
<td>555-555-5555</td>
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</table>

Milestone Submittal: [ ] FP FR [ ] FP FR [ ] Addendum

General Project Information:

- Is there a Project Level Exclusion that applies to this project?: [ ] Yes [ ] No
- If yes, please indicate which of the following exclusions apply:
  - [ ] Roadway not owned or operated by GDOT
  - [ ] Maintenance or safety project (multiple unconnected sites disturbing < 1 acre)
  - [ ] Project with environmental documents approved or R/W plans submitted on or before June 30, 2012
  - [ ] Road project disturbing < 1 acre or site development project adding < 5,000 ft of impervious area
- Is there an Outfall Level Exclusion that applies to this project?: [ ] Yes [ ] No
- If yes, please indicate in Attachments B and C

Disturbed Area of Site: 15.2 acres
Impervious Area Added: 12.6 acres
Net Length of Project: 2.6 miles

Submittal Requirements:

- [ ] GDOT UD / GI Checklist (Attachment A)
- [ ] GDOT Post-Construction BMP Summary (Attachment B)
- [ ] Post-Construction Stormwater BMP Documentation (Attachment C)
- [ ] Milestone Plan Submittal Checklist (Attachment D)
OLEs and Infeasibilities

If you have an **OLE or Infeasibility:**

- Complete Cover Page
- **Complete Attachment A**
- Complete for all basins:
  - Attachment B
  - Attachment C
- Complete Attachment D at milestone reviews
OLEs and Infeasibilities

If you have an OLE or Infeasibility:

- Complete Cover Page
- Complete Attachment A
- Complete for all basins:
  - Attachment B
OLEs and Infeasibilities

If you have an **OLE or Infeasibility**:

- Complete Cover Page
- Complete Attachment A
- Complete for all basins:
  - Attachment B
  - **Attachment C**
- Complete Attachment D at milestone reviews
OLEs and Infeasibilities

If you have an **OLE or Infeasibility:**

- Complete Cover Page
- Complete Attachment A
- Complete for all basins:
  - Attachment B
  - Attachment C
- **Complete Attachment D** at milestone reviews
MS4 Post-Construction Stormwater Report

Cover Sheet (Required for ALL projects in a MS4 area)

Georgia Department of Transportation

MS4 POST-CONSTRUCTION STORMWATER REPORT

PI Number: 00091900
Project Name: SR1 Widening
City/County: Fayetteville/Fayette
District: 3

Submittal Date: 12/13/16
Consultant: XYZ Engineering
Let Date: 5/1/18
Contact Phone: 555-555-5555

Milestone Submittal: [ ] PFPR [ ] FFPR [ ] Addendum

General Project Information:

Is there a Project Level Exclusion that applies to this project: [ ] Yes [x] No
If yes, please indicate which of the following exclusions apply:
[ ] Roadway not owned or operated by GDOT
[ ] Maintenance or safety project (multiple unconnected sites disturbing < 1 acre)
[ ] Project with environmental documents approved or R/W plans submitted on or before June 30th, 2012
[ ] Road project disturbing < 1 acre or site development project adding < 5,000 ft² of impervious area
### MS4 Post-Construction Stormwater Report

**Cover Sheet (Required for ALL projects in a MS4 area)**

<table>
<thead>
<tr>
<th>Disturbed Area of Site:</th>
<th>15.2 acres</th>
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<tbody>
<tr>
<td>Impervious Area Added:</td>
<td>12.6 acres</td>
</tr>
<tr>
<td>Net Length of Project:</td>
<td>2.6 miles</td>
</tr>
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<td>Existing Cross-Section:</td>
<td>Rural 2-lane</td>
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<tr>
<td>Proposed Cross-Section:</td>
<td>Urban 4-lane</td>
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<tr>
<td>AADT (Design Year):</td>
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#### Submittal Requirements:

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<tr>
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<th>Yes / No</th>
<th>Milestone Plan Submittal Checklist (Attachment D)</th>
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<tr>
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</table>

**Project Design Information**

Reports not prepared by GDOT must be sealed by Professional Engineer.

**Required Attachments**

Note: Not required if report is prepared by GDOT.
Attachment A: Low Impact Development/Green Infrastructure Checklist (Required for All MS4 projects without PLE)

Design Considerations

☐ The following site considerations were considered, where applicable, and incorporated into an LID/GI approach: safety, ease of maintenance, available right-of-way, soils, terrain slope, pollutants of concern, existing utilities and other infrastructure details.

☐ Where applicable, the following site-specific environmental components have been clearly identified on the project site: wetlands, impaired waters, environmentally sensitive areas, applicable buffers.

Design Documentation

List any site-specific limitations or constraints that will have an effect on the utilization of feasible post-construction stormwater LID and/or GI practices.

---

Document planning-level stormwater considerations

Identify soil issues, wetlands, high groundwater table, ESAs, etc.
**Attachment A: Low Impact Development/Green Infrastructure Checklist** *(Required for ALL MS4 projects without PLE)*

- The following LID/GI practices were used. For those that were not used, explain why it was infeasible for this project.
  - Yes
  - No

<table>
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<th>Practice</th>
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<tr>
<td>Avoidance (Planning around environmentally sensitive areas): ESAs avoided</td>
<td>Project impacts minimized where possible</td>
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<td>Minimization:</td>
<td>Project minimizes pavement</td>
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<td>Footprint reduction:</td>
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<tr>
<td>Incorporating WQ early in planning process by: Conceptual planning</td>
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<tr>
<td>Rural road section in place of urban:</td>
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<td>Landscaping areas outside of clear-zone w/ trees:</td>
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<td>Adjusting the design to natural terrain:</td>
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<td>Porous Pavements (OGFC): Pavement design committee did not approve use</td>
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<tr>
<td>Post-construction BMPs that allow for: infiltration, evapotranspiration, and stormwater reuse</td>
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<tr>
<td>Using recycled materials such as asphalt and concrete:</td>
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</table>

- The LID/GI practices shown on the plans address all GDOT and MS4 permit requirements.
- A cost estimate has been provided to GDOT at the milestone review (preliminary estimate for PFPR and a detailed estimate for FFPR).

**Inspection and Maintenance Responsibility (select all that apply)**

- Dedicated to City or County (indicate which) of: 
- Private Entity Responsibility: name responsible entity here: 
- GDOT Responsibility

- If not used, concisely explain conditions & issues preventing each LID/GI practice
- If used, can explain how
- Document cost/permit compliance needs for milestone review
- Identify maintenance responsibility
Attachment B: GDOT Post-Construction BMP Summary
(Required for ALL MS4 projects without PLE)
GDOT has also developed a TMDL Tool which is a MicroStation file of the GA EPD shape file:
GDOT has also developed a TMDL Tool which is a MicroStation file of the GA EPD shape file:
### Water Quality Volume

*WQ_v*

- An Outfall Level Exclusion is applicable for the basin

### Channel Protection Volume

*CP_v*

- An Outfall Level Exclusion is applicable for the basin
- The basin discharges to a waterbody that has a drainage area larger than 5 square miles
- The proposed 1-year discharge is less than 2 cfs

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<tr>
<th>Applicable MS4 Requirements</th>
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<tr>
<td>WQ_v (✓ or X)</td>
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<tr>
<td>CP_v (✓ or X)</td>
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<tr>
<td>Q_p25 (✓ or X)</td>
</tr>
<tr>
<td>Q_f (✓ or X)</td>
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<tr>
<td>Outfall Level Exclusion (Yes/No) (If yes, see Note 1)</td>
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<tr>
<td>-----------------------------</td>
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</table>
Overbank Flood Protection should be applicable unless:

- The basin discharges to a waterbody that has a drainage area larger than 5 square miles
- The analysis showed an insignificant flow increase for the basin

Extreme Flood Protection should be applicable unless:

- The basin discharges to a waterbody that has a drainage area larger than 5 square miles
- The analysis showed an insignificant flow increase for the basin.
MS4 Post-Construction Stormwater Report

- Specify the BMP(s) that was found to be appropriate for the drainage basin and was carried forward to the infeasibility assessment stage OR the BMP that was determined to be feasible
- Infiltration testing required only for infiltration BMPs
- Guidance on the Stormwater BMP Infiltration Report is in Appendix J of the GDOT Drainage Manual
Infeasibility:

- Each criteria ($WQ_v$, $CP_v$, $Q_{p25}$, $Q_f$) is evaluated individually
- Meet as many of the criteria as feasible
- A BMP is feasible only if you can meet all requirements of at least one criteria
MS4 Post-Construction Stormwater Report

- Include a set of construction plan sheets in Attachment C as an appendix

- GDOT will usually have maintenance responsibility for BMPs within their right-of-way
- Maintenance responsibility can be shared among multiple entities
## MS4 Post-Construction Stormwater Report

### Attachment B: GDOT Post-Construction BMP Summary

(Required for ALL MS4 projects without PLE)

<table>
<thead>
<tr>
<th>Drainage Area Characteristics</th>
<th>Applicable MS4 Requirements</th>
<th>Planning Considerations</th>
<th>Location and Identification</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td>Outfall Area (Drainage Basin)</td>
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<tr>
<td>Basin 1</td>
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<td>Enhanced Dry Swale</td>
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<tr>
<td>Basin 2</td>
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<td>Dry Detention</td>
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<td>Basin 3</td>
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<td>Infiltration Trench</td>
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<td>Basin 4</td>
<td></td>
<td>Bioretention</td>
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<tr>
<td>Basin 5</td>
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<td>GC + Dry Detention</td>
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<td></td>
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<tr>
<td>Basin 6</td>
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<td>Basin 7</td>
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</tbody>
</table>

### Note 1:
If an Outfall Level Exclusion is claimed, include the exclusion number (as listed in the Post-Construction Stormwater Guidance) and provide supporting evidence in Attachment C.

### Note 2:

### Note 3:
If a BMP is identified as infeasible, include the infeasibility number (as listed in the Post-Construction Stormwater Guidance) and provide supporting evidence in Attachment C.
MS4 Post-Construction Stormwater Report

Attachment C: Post-Construction Stormwater BMP Documentation (Required for ALL MS4 projects without a PLE)

Contents:

1. Cover Sheet
2. Executive Summary
3. Project Description
4. Maintenance Discussion at PFPR
5. Basin Evaluations
   - Physical Parameters
   - Water Quality and Channel Protection
   - Downstream Analysis
   - BMP Selection
   - Feasibility

Appendices:

A. Site Location and Drainage Basin Maps
B. NOAA Precipitation Table
C. Soils Map
D. Environmental Resource Impact Table
E. Water Quality Calculations
F. Channel Protection Calculations
G. Hydrologic Model Output
H. Downstream Analysis Documentation
I. Outfall Level Exclusion Documentation
J. Infeasibility Documentation
K. Stormwater BMP Infiltration Report
L. BMP Design Calculations
M. Feasible BMP Cost Calculations
N. Construction Plan Sheets
Attachment C: Post-Construction Stormwater BMP Documentation

Contents:

1. Cover Sheet
2. Executive Summary
3. Project Description
4. Maintenance Discussion at PFPR
5. Basin Evaluations
   - Physical Parameters
   - Water Quality and Channel Protection
   - Downstream Analysis
   - BMP Selection
   - Feasibility

NOTE:
In general, GDOT is looking for concise summaries for each basin evaluation. Discussion of which basins have an OLE, which BMPs were feasible, which BMPs were infeasible, why the BMPs were selected, and documentation supporting the determination with calculations and/or drawings should be included in this attachment. Please refer to the remainder of this template and the MS4 PCS Report Help File for additional guidance.
Attachment C: Post-Construction Stormwater BMP Documentation

Contents:

1. Cover Sheet
2. Executive Summary
3. Project Description
4. Maintenance Discussion at PFPR
5. Basin Evaluations
   • Physical Parameters
   • Water Quality and Channel Protection
   • Downstream Analysis
   • BMP Selection
   • Feasibility

Executive Summary

In general, the Executive Summary should state background information. It should summarize the evaluation process and the results of the evaluation.

In January 2012, the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources issued the Georgia Department of Transportation's (GDOT's) first Municipal Separate Storm Sewer System (MS4) Permit (General NPDES Permit No. GAR041000) (Permit) for discharges from its MS4 designated areas.

The Permit regulates new and existing point source discharges of stormwater from roadways owned and operated by GDOT to waters of the State of Georgia. The [Interstate 85 (I-85) North Managed Lanes Project] (Project) must meet the requirements of the Permit, which include incorporating permanent water quality control and detention measures (best management practices [BMPs]) into the design where appropriate, where those BMPs have not been determined to be infeasible based on the exclusion and infeasibility criteria identified in Chapter 10 of the GDOT Drainage Design for Highway Manual.

To assist with the development of final design for the project and meet Permit requirements, [firm name] performed an analysis of the project in accordance with the guidance and criteria discussed above and below to identify and size feasible post-construction stormwater BMPs that must be implemented and those that may be eliminated.

This report documents the applicable guidance and criteria, analysis performed, and results and conclusions. The analysis is based on current design and cost of the improvements. Feasibility of the post-construction BMPs will need to be revisited during the final design and revised based on the revised project design or refined cost estimates.
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Project Description

[Provide the project description from the Concept Report. It should include a general overview of the project and unique site conditions.]

GDOT proposes to [widen I-85 to add one managed lane in each direction from just north of Old Peachtree Road to Hamilton Mill Road. To minimize impacts to traffic, two new auxiliary lanes will be constructed where required. The added managed lanes will be tolled to create reliable travel time savings through the use of variable priced tolling to manage lane volume while maintaining a minimum average speed.

South of I-985, the project proposes to widen I-85 outside of the existing eight-lane mainline. North of I-985, widening will be on the inside median along the four-lane I-85 section. Both auxiliary lanes will be constructed with additional inside widening. The proposed design speeds for the project will match the current posted speed limits along the interstate mainlines.] Refer to the location map in Appendix A which illustrates the approximate project limits.

This project is divided into [56] proposed drainage basins. Refer to Appendix A for drainage basin delineations.]
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Maintenance Discussion at PFPR

Per Section 6.4.10 MS4 and Maintenance Office Coordination of GDOT’s Plan Development Process Manual, “The Design Phase Leader should discuss the maintenance plan, accessibility, and schedule with GDOT Maintenance/District Maintenance for a selected BMP. The consideration and use of local municipal maintenance forces and required agreements should also be discussed. Documentation of the results of this discussion should be included in the Post-Construction Stormwater Report.” This section is used to document this discussion. Ensure the Inspection and Maintenance Responsibility information in the LID/GI Checklist and Attachment B accurately represent the outcome of the discussion. Complete this section after PFPR but prior to submittal of the MS4 PCS Report to EPD for review.
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Basin Evaluations

This section is used to discuss the evaluation process and conclusions for each drainage basin. Two example basins are shown: Drainage Basin 1 requires an infeasibility assessment and Drainage Basin 2 has an outfall level exclusion.

**Drainage Basin 1** (Note: change basin name/number to correspond with Attachment B)

Include a brief description of the drainage basin location and where it discharges.

Drainage Basin 1 is located along [road name] between station [0+00] and station [0+00]. This drainage basin discharges [directly into an existing drop inlet and 15-inch reinforced concrete pipe that discharges outside of the right-of-way].
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   - BMP Selection
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**Downstream Analysis**

GDOT requires that downstream properties and receiving waters be evaluated for damages from increased flows. The need for detention facilities should be determined on a case-by-case basis based on the downstream conveyance capacity, increased volume of runoff, and altered timing of discharge. If a downstream analysis indicates that detention is required to mitigate adverse downstream impacts, detention must be provided, regardless of MS4 exclusions or infeasibilities.

Discuss the downstream analysis of the applicable basin.

A downstream analysis was performed for Drainage Basin 1. The downstream study point establishes a basin that is approximately 10 times as large as the on-site basin. See Appendix G for a map showing the drainage basins and downstream study point.
Attachment C: Post-Construction Stormwater BMP Documentation – Downstream Analysis

Discuss methodology for completing the downstream analysis. Provide basin characteristics used to perform the analysis.

The USGS StreamStats website was used to determine the downstream analysis drainage basin along with the land use present in the basin. The following table shows the physical parameters of the downstream analysis basin, not including the on-site basin. As the on-site basin is not included, the physical parameters will be the same for pre- and post-developed conditions.

<table>
<thead>
<tr>
<th>Drainage Basin 1 Downstream Analysis (Minus On-site)</th>
<th>Area (ac)</th>
<th>CN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial and business (Soil Group B)</td>
<td>17.22</td>
<td>92</td>
</tr>
<tr>
<td>Woods - grass combination - Good condition (Soil Group B)</td>
<td>3.96</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>21.18</td>
<td>86</td>
</tr>
</tbody>
</table>

The longest flow path and the average basin slope were obtained from the USGS topographic map and used to determine the time of concentration using the lag method.

<table>
<thead>
<tr>
<th>Drainage Basin 1 Downstream Analysis</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>1486.3</td>
</tr>
<tr>
<td>CN</td>
<td>86</td>
</tr>
<tr>
<td>Y</td>
<td>9.8</td>
</tr>
<tr>
<td>S</td>
<td>1.63</td>
</tr>
<tr>
<td>Tc</td>
<td>0.19</td>
</tr>
<tr>
<td>Tc</td>
<td>11.4</td>
</tr>
<tr>
<td>Flow Length (ft)</td>
<td></td>
</tr>
<tr>
<td>Watershed Slope (%)</td>
<td></td>
</tr>
<tr>
<td>Maximum Retention (in)</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td></td>
</tr>
<tr>
<td>Minutes</td>
<td></td>
</tr>
</tbody>
</table>
MS4 Post-Construction Stormwater Report

Attachment C: Post-Construction Stormwater BMP Documentation – Downstream Analysis

If there is an increase in flows from the 25-year, 24-hour and 100-year, 24-hour storms, either detention is required or the engineer of record needs to state that the receiving system has sufficient capacity to handle the increased flows without causing adverse impacts. If detention is required, model the timing of the hydrographs with and without the detention BMP. Due to peak flow timing and runoff volume effects, some structural practices fail to reduce discharge peaks to pre-development levels downstream from the development site and in certain cases may actually exacerbate flooding problems. A downstream peak flow analysis shall be provided to the point in the watershed downstream of the site or the stormwater management system where the area of the site comprises approximately 10% of the total drainage area. This is to help ensure that there are minimal downstream impacts from the developed site. The downstream analysis may result in the need to resize BMPs, or may allow the waiving of some peak flow controls altogether.

The channel routing function in Hydraflow Hydrographs was then used to model the timing of the hydrographs. See Appendix G for copies of the hydrographs.

<table>
<thead>
<tr>
<th></th>
<th>25-Year (cfs) with BMP</th>
<th>25-Year (cfs) without BMP</th>
<th>100-Year (cfs) with BMP</th>
<th>100-Year (cfs) without BMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Development</td>
<td>118.78</td>
<td>N/A</td>
<td>154.58</td>
<td>N/A</td>
</tr>
<tr>
<td>Post-Development</td>
<td>121.56</td>
<td>N/A</td>
<td>157.70</td>
<td>N/A</td>
</tr>
<tr>
<td>Change (Post - Pre)</td>
<td>2.78</td>
<td>N/A</td>
<td>3.12</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent Change</td>
<td>2.34%</td>
<td>N/A</td>
<td>2.02%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

There is not a significant increase in flow rates at the downstream analysis study point between pre- and post-development conditions. The existing drainage system has enough capacity to handle the small increase in flow rates. Therefore, no detention is required for overbank or extreme flood protection for Drainage Basin 1.
MS4 Post-Construction Stormwater Report

Attachment C: Post-Construction Stormwater BMP Documentation – Downstream Analysis

Downstream Analysis

GDOT requires that downstream properties and receiving waters be evaluated for damages from increased flows. The need for detention facilities should be determined on a case-by-case basis based on the downstream conveyance capacity, increased volume of runoff, and altered timing of discharge. If a downstream analysis indicates that detention is required to mitigate adverse downstream impacts, detention must be provided, regardless of MS4 exclusions or infeasibilities.

Discuss the downstream analysis of the applicable basin.

Because the post-developed flows were not increased, a downstream analysis was not performed for Drainage Basin 2. Flows, however, are included in the downstream analysis for Drainage Basin 4. The downstream study point establishes a basin that is approximately 10 times as large as the on-site basin, and includes the outfall from Drainage Basins 2, 3 and 4.
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Filter Strip – The typical section for this section of the project is an interstate section with guardrail or side barriers. No sheet flow from impervious areas is present within the drainage limits. Therefore, the filter strip is not an appropriate BMP for this basin.

Grass Channel – The grass channel in combination with open graded friction course (OGFC) will provide only 75% total suspended solids removal. A third BMP will be necessary to meet the required 80% total suspended solids (TSS) removal. Therefore, the grass channel will not be considered for this basin.

Infiltration Trench – The infiltration trench is an appropriate BMP for this basin. However, due to the fact that the enhanced swale and OGFC will provide the required TSS removal at a lower cost, the infiltration trench will not be considered for this basin.

Sand Filter – The sand filter is an appropriate BMP for this basin.

Bioretention Area – The bioretention area is an appropriate BMP for this basin. However, due to the fact that the dry detention basin and OGFC will provide the required TSS removal at a lower cost, the bioretention area will not be considered for this basin.

Dry Detention Basin – The dry detention basin is an appropriate BMP for this basin.

Wet Detention Pond – The drainage area is less than 10 acres. Therefore, the wet detention pond is not an appropriate BMP for this basin.

Stormwater Wetland – The drainage basin is less than 5 acres. Therefore, the stormwater wetland is not an appropriate BMP for this basin.

Bioslope – The typical section for this section of the project is an interstate section with guardrail or side barriers. No sheet flow from impervious areas is present within the drainage limits. Therefore, the bioslope is not an appropriate BMP for this basin.

Enhanced Swale – The dry enhanced swale is an appropriate BMP for this basin.

Open Graded Friction Course – OGFC is present throughout the project.
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**Feasibility**

For each BMP that was deemed appropriate for the drainage basin based on meeting design constraints and requirements, assess the infeasibility per GDOT's ten Infeasibility Criteria. Provide BMP sizing calculations, Infeasibility Criterion #1 cost breakdowns, infeasibility displays, etc. in the appendices of the report to justify the infeasibility claim(s).

**Sand Filter** – The sand filter and sedimentation basin will be constructed using cast in place walls. The cost of the sand filter and minor earthwork required for construction was found to be 16.1% the cost of the roadway construction in this drainage basin. This BMP is infeasible under Infeasibility Criterion #1. The cost of the BMP will exceed 10% of the roadway construction cost in the drainage basin, the threshold established in the permit. See Appendix I for cost calculations.

**Dry Detention Basin** – The dry detention basin will be constructed using cast in place walls and would require a basin 39 feet by 20 feet by 5 feet in order to provide adequate channel protection and water quality volume. The cost to construct the dry detention basin was found to be 18.6% the cost of roadway construction in the drainage basin. This BMP is infeasible under Infeasibility Criterion #1. The cost of the BMP will exceed 10% of the roadway construction cost in the drainage basin, the threshold established in the permit. See Appendix I for cost calculations.

**Enhanced Swale** – 2:1 slopes begin at the shoulder breakpoint and continue to the right-of-way. Any attempt to construct the dry enhanced swale over the required 295-foot length will result in construction outside of the right-of-way. This BMP is infeasible under Infeasibility Criterion #2. Construction of the BMP would result in a delay to the project schedule greater than 90 days since no other right-of-way will be acquired for the project. See Appendix I for backup documentation.

Drainage Basin 1 was found to be infeasible for all BMPs to be used in combination with OGFC. No additional BMP will be constructed.

For a BMP that was deemed feasible, provide BMP sizing calculations, cost breakdown, and construction plan sheets in the appendices of the report.
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#### PF tabular

<table>
<thead>
<tr>
<th>Duration</th>
<th>PDS-based point precipitation frequency estimates with 90% confidence</th>
<th>Average recurrence interval (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-hour</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Refer to Help Files & ADW #3 Post-Construction BMP Exclusions and Infeasibilities.

Example documentation includes:

- Roadway exhibits showing BMP causing OLE/infeasibility
- Applicable sections of Ecology Resources Survey Report, Protected Species Survey Report, Historical and Archeological Resources Survey Report, Environmental Site Assessment Report, etc.

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- In-situ testing to verify feasibility of infiltration
  - Double-Ring Infiltrometer Test
  - Single-Ring Infiltrometer Test
  - Borehole Infiltration Test
  - Percolation Test
- See Appendix J of the Drainage Manual

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Template Guidance for Phase 2/Phase 3 Stormwater BMP Infiltration Report
Worksheet J-2

A. Project Description: Provide a description for stormwater infiltration BMPs.
B. Objective of This Study: Provide a succinct statement of the purpose of the study.
C. Summary of Existing Data/Previous Studies: Review the previous phases of study.

Worksheet J-2 Page 2 of 3

Subsurface Exploration and Laboratory Testing

Worksheet J-2 Page 3 of 3

Infiltration/Percolation Testing

Guidance being developed and will be included as appendix to Drainage Manual.
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<table>
<thead>
<tr>
<th>Item</th>
<th>Proposed Roadway Cost</th>
<th>Additional BMP Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subtotal</td>
<td>Subtotal</td>
</tr>
<tr>
<td>Right-of-way</td>
<td>$5,000</td>
<td>$0</td>
</tr>
<tr>
<td>Utilities</td>
<td>$5,000</td>
<td>$0</td>
</tr>
<tr>
<td>Grading/Misc.</td>
<td>$13,500</td>
<td>$4,500</td>
</tr>
<tr>
<td>Paving &amp; Roadwork</td>
<td>$155,000</td>
<td>$0</td>
</tr>
<tr>
<td>Concrete/Walls/etc.</td>
<td>$10,000</td>
<td>$0</td>
</tr>
<tr>
<td>Erosion Control</td>
<td>$5,000</td>
<td>$1,000</td>
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<tr>
<td>BMP components</td>
<td>$0</td>
<td>$6,250</td>
</tr>
<tr>
<td>Signage/ Marking</td>
<td>$3,500</td>
<td>$0</td>
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<tr>
<td>Guardrail</td>
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<td>$0</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$197,000</strong></td>
<td><strong>$11,750</strong></td>
</tr>
<tr>
<td>As a percentage of the Total Roadway Cost</td>
<td>6%</td>
<td></td>
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</tbody>
</table>

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Verify all necessary information is included in the Report
How do I submit the PCSR?

1. Initial submittal for ODPS review should be in PDF format
2. GDOT PM needs to upload to Email to ProjectWise at least 8 weeks prior to PFPR Request
3. Notification of the upload should be emailed to stormreports@dot.ga.gov
4. Once accepted by GDOT, submit one hard copy of the report to ODPS as well as a CD containing a PDF version and supporting documentation
5. PE certification on cover is only necessary for consultant reports after the report has been accepted by GDOT
EPD has 60 days to comment on the MS4 PCSR.
An addendum may be required if there are project changes after the MS4 PCS Report has been submitted to EPD and considered final:

- An outfall not previously considered has been identified
- An outfall previously considered infeasible becomes feasible, and/or
- An outfall previously considered feasible is now infeasible
**PCSR Addendum process (see Note 1 below)**

- The addendum only needs to address the drainage basins that have changed along with Attachment B of the PCSR.
- This submittal should include current construction plans, Stormwater BMP Infiltration Report (if applicable), and the draft addendum (all in PDF format).

1. **If project changes affect PLE, OLEs or infeasibility determination**
   - Prepare draft addendum

2. **Submit draft addendum to ODPS for review**
   - ODPS accept addendum?
     - Yes
       - Submit addendum to EPD for review
       - Disapproval of PCSR received from EPD within 60 days?
         - Yes
           - Addendum can be considered final
         - No
           - ODPS accept addendum?
             - Yes
               - Submit addendum to EPD for review
             - No
               - Address EPD comments

3. **Address ODPS comments**
   - No
     - Address EPD comments

**Notes:**

1. An addendum to a final PCSR may be required where, either: 1) an outfall not previously considered has been identified, 2) an outfall previously considered infeasible becomes feasible, or 3) an outfall previously considered feasible is now infeasible. This may occur any time after the original PCSR has been submitted to EPD and considered to be final.
MS4 Post-Construction Stormwater Report
Addendum Process

If required, the addendum only needs to address the drainage basins that have changed.

GDOT PM should upload the following for review to ProjectWise in PDF format and notify ODPS of the upload by email to stormreports@dot.ga.gov:

• Cover letter outlining the changes
• Revised PCSR cover
• Revised Attachment B
• Revised sections and associated documentation in Attachment C
• Current construction plans
• Stormwater BMP Infiltration Report (if applicable)
When ODPS accepts the addendum, submit one hard copy of the addendum including a new PE certification (PE certification not required if prepared by GDOT designers) on the MS4 PCS Report cover to ODPS. Backup documentation can be placed on a CD.
MS4 Post-Construction Stormwater Report

MS4 Plan Development Process – FFPR

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**Final Field Plan Review (FFPR), Final Plans, and Use-on-Construction Milestone**

Yes / No

- □ □ Has the detailed hydrology study (submitted in PFPR) been altered?
- □ □ There have been changes that warrant a revision to the previous study.
- □ □ Have the BMP outlet control structures been designed?
- □ □ Have the BMP details and specifications been submitted?

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**FFPR**

**ODPS provides comments for inclusion in FFPR report**

- Address comments and resubmit Details to ODPS

**ODPS accepts Details?**

- Yes
- No

**Include accepted MS4 BMP design in the final plans**

**Project Letting**

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This submittal should be made as part of the FFPR request. Include FFPR plans, Stormwater BMP Infiltration Report and any PCSR Addendums (if applicable), and the accepted PCSR - all in PDF format. Submit via email to: stormreports@dct.ga.gov

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**Match line (see above)**

- Complete Post-Construction Stormwater BMP design
- Submit Post-construction Stormwater BMP Details for review

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Post-construction stormwater BMP detailed design should be completed and submitted as early as practical in the Final Design Phase.

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MS4 Plan Development Process – FFPR
Important things to remember when preparing your MS4 PCS Report:

• This is a stand-alone document – ensure plans, documentation, etc. are included in submittal to facilitate GDOT review

• Include discussion of stormwater design process for all basins in Attachment C, not just those deemed infeasible

• A complete submittal with thorough backup data and clear explanation will streamline the MS4 PCS Report approval process
Questions

Brad McManus, PE
MS4 Program Manager
Office of Design Policy and Support
bmcmanus@dot.ga.gov