



PROJECT NAME: _____
DISTRICT/LAND LOT/PARCEL: _____
ENGINEER: _____
EMAIL: _____
REVIEW: _____
DATE: _____
SWM CASE #: _____

Abbreviations: UDO – Unified Development Ordinance | GCSMM – Gwinnett County Stormwater Management Manual | GCSSPS – Gwinnett County Storm Sewer Pipe Standards

Initial submittals and re-submittals shall be made digitally by using the following link:
<https://eddspermits.gwinnettcountry.com/citizenaccess/>.

Provide a set of plans for review by the Gwinnett County Department of Planning & Development – Stormwater Plan Review Section, signed and sealed by a Registered Professional Engineer in the State of Georgia. The plan set shall include the following:

- a. Cover Sheet
- b. Storm Drainage Profiles, including sheet(s) with Pipe and Channel Charts.
- c. Special Construction Details (Water Quality BMP’s, Stormwater Management Facility Grading Plan, Outlet Control Structure, etc.).
- d. One (1) copy of the Stormwater Management Report.
- e. Annotated checklist stating where requirements are located. (sheet and location –UL (upper left), LR (lower right))

➤ Provide applicable Water Quality BMP Checklist.

GENERAL PLAN REQUIREMENTS

- 1. Show acreage of the project, including total acreage and disturbed acreage.
- 2. Indicate project scope of work in title or narrative on plans.
- 3. Number all proposed pipes, existing pipes, and storm structures on plan.
- 4. Number all proposed engineered channels on plan.
- 5. Indicate source of topographic and reference datum (i.e. NGVD 1929, MSL, etc.).
- 6. Show existing and proposed topography at a 2’ contour interval or less.
- 7. Label 100-year floodplain contour, elevation, floodway and source of information.
- 8. Provide stormwater note(s) indicated below in a notes section on grading/drainage plan.

- Floodplain Note(s). Either select Note (a) or (b) and select Notes (c) and (d) as applicable.
 - a. There is no floodplain on this project from a watercourse with a drainage area exceeding 100 acres or floodplain per FIRM Panel _____ dated _____.
 - b. Floodplain on this property from all watercourses with a drainage area exceeding 100 acres is shown.
 - c. Floodplain shown is from FIRM Panel _____ dated _____.
 - d. Floodplain shown is from Floodplain Study titled _____ by _____ dated _____. Study was prepared as part of project named _____ with case number _____.

- Wetlands Note(s). **Select either (a) or (b).** If wetlands are being disturbed on the site, select Note (c).
 - a. There are no wetlands being disturbed on this site.
 - b. All wetlands to be disturbed are delineated on this site.
 - c. The wetlands are being disturbed in accordance with permit _____ dated _____.

- Stormwater Management note (if project meets exempt criteria, use note a).
 - a. Stormwater Management for this project is provided on-site.
 - b. Stormwater Management for this project is provided off-site in project named _____ with case number _____.
 - c. All wetlands to be disturbed are delineated on this site.

- State Waters note(s). Select either Note (a) or (b). **If a State Waters Buffer is being disturbed on the project, select Note (c).**
 - a. There are no stream buffers on this project.
 - b. A 50-foot undisturbed buffer and a 75-foot impervious setback shall be maintained adjacent to all streams.
 - c. Stream Buffer Variance Number _____ was obtained for work within the buffer located _____.

- 9. Provide the following note: **MAXIMUM SLOPE FOR CUT OR FILL IS 2H:1V EXCEPT EARTHEN DAM EMBANKMENTS SHALL BE 3H:1V.**
- 10. Provide the following note: **ALL BUFFERS AND TREE SAVE AREAS ARE TO BE CLEARLY IDENTIFIED WITH TREE PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF ANY LAND DISTURBANCE.**
- 11. Provide the following note: **ALL CONSTRUCTION TO COMPLY WITH GWINNETT COUNTY STANDARDS.**
- 12. Provide the following note with an arrow pointing to the access easement, if applicable: **STORM WATER MANAGEMENT FACILITY ACCESS EASEMENT TO BE CLEARED AND GRUBBED.**
- 13. Provide a drainage easement located a minimum of 10-feet outside the 100-year ponding limits of any proposed storm water management facilities.
- 14. Provide a cleared access easement 20' wide to the storm water management facility from a public street.
- 15. Within the access easement, a 15-foot wide road shall be graded at a maximum 20% grade to provide access to the facility.
- 16. Show the stormwater management facility's 100-year ponding contour and elevation on plan.

- 17. The proposed stormwater BMP shall meet the design requirements in the GCSMM.
- 18. Provide all applicable stormwater BMP details.

PIPE & OPEN CHANNEL PROFILE SHEET(S)

- 19. Provide pipe profiles. Show existing and proposed ground surface profiles, pipe lengths, slopes, inverts, and 25-year (minimum) or design year hydraulic grade lines.
- 20. Provide channel profiles. Show existing and proposed ground surface profiles, channel lengths, 25-year normal flow depth and slopes. Minimum freeboard to be 20% of the flow depth.
- 21. 25-year hydraulic grade line must be at least 1 foot below the gutter line or top of grate.
- 22. Channel velocities for the fully developed 25-year flow shall not exceed the non- erosive velocity.
- 23. Velocity in corrugated metal pipe system not to exceed 5 fps manufacturer's maximum.
- 24. Anchor collars may be required on CMP and RCP pipes exceeding 10% slope. Provide anchors per manufacturers recommendations.
- 25. Minimum ground cover over all pipes of 1 foot.
- 26. Maximum spacing of structures shall be 300' with a maximum drop of 10' within a storm structure.
- 27. Show 10-year design gutter spread for road inlets and 100-year ponding limits above yard inlet storm structures (including headwalls).
- 28. Provide transition channel profiles from inlet and outlet ends of all pipes to natural drainage swales.
- 29. Provide complete pipe chart indicating the following (include outlet control structure outlet pipe also):
 - a. Upstream Structure Type (SWCB, DWCB, DI, etc.).
 - b. Pipe Numbers/Pipe Structures
 - c. Pipe size
 - d. Pipe length
 - e. Pipe slope
 - f. Contributing drainage area
 - g. Design discharge (Q25 for piped drainage; Q100 for culverts)
 - h. Design storm frequency (25 year for piped drainage; 100 year for culverts)
 - i. Runoff coefficient (per future land use plan and assuming no detention)
 - j. Pipe material/coating
 - k. Velocity (V_{25} may not exceed non-erosive velocity at outlet headwall, unless energy dissipation is provided.)
- 30. Provide complete channel chart indicating the following:
 - a. Open channel numbers
 - b. Contributing drainage area
 - c. Runoff coefficient (per future land use plan and assuming no detention)
 - d. Conveyance size
 - e. Lining material
 - f. Channel length
 - g. Channel slope (for minimum and maximum values – Maximum 10%)

- h. Velocity (V_{25} may not exceed non-erosive velocity – Maximum 4 fps for sod)
- i. Design storm frequency (25-year)
- j. Design discharge (25-year)
- k. Normal Flow Depth

HYDROLOGY REPORT REQUIREMENTS:

Provide a table of contents and either provide page numbers or tabs referencing sections for the following:

- Executive Summary
- Hydrology
- Runoff Reduction/Water Quality
- Environmental Permits

- 1. Professional Engineer seal, signature and date.
- 2. Narrative explaining the purpose of the report
- 3. Summary of the report’s findings organized similar to these sample tables:

Flow Summary:

Basin (as shown on drainage area map)	Return Frequency	Drainage Area to receiving structure (ac)	Receiving Structure Type	Pre-Developed Flow (cfs)	Post-Developed Flow (cfs)	Calculated percent increase (%)
A	2					
	5					
	10					
	25					
	50					
	100					

Energy Dissipation Summary:

Pipe Outlet/ Detention pond outlet	25-year post-developed flow velocity at outlet headwall	Non-erosive velocity	Froude Number	Type of Energy Dissipation Measures proposed
A				
B				

Downstream receiving conveyance velocity summary:

Study Point/ Hydraulic structure/ Basin	25-year Pre-Developed Flow Velocity	25-year Post-Developed Flow Velocity	Non-erosive velocity	Current Condition of the channel	Adverse impact expected from proposed project (Y/N)	Detention Necessary? (Y/N)

Time of Concentration Summary:

Sub-Area	Pre/Post Overland Flow (min)	Pre/Post Shallow Concentrated Flow (min)	Pre/Post Open Channel Flow (min)	Pre-Developed T _c (min)	Post-Developed T _c (min)

Curve Number:

Sub-Area	Existing Curve Number (CN-pre)	Post-Developed Curve Number (CN-post)

Gutter Spread Calculations Summary:

Catch Basin (CB)	Max spread (ft)

4. A map showing drainage areas used for pipe design
5. A map showing drainage areas for all hydrographs. Preferably County GIS for basins less than 100-acres.
6. A map showing all on-site drainage areas, off-site drainage areas, & all pond bypass areas considered in detention calculations.
7. Calculations determining the capacity of existing pipe to carry the proposed discharges.
8. Calculations showing discharge of concentrated flows into the streets do not exceed the maximum flow rates.

MAXIMUM FLOWS INTO STREETS

STREET CLASSIFICATION	ALLOWABLE PEAK FLOW RATE FOR A 2-YEAR STORM (CFS)
LOCAL	2.0
MINOR COLLECTOR	1.0
OTHER	0.5

9. Time of concentration for all hydrographs.
10. Curve Number calculations for both existing and post-developed conditions for all hydrographs.
11. Analysis of downstream condition shall include the following:
 - a. Describe in combination with a topographic, all culverts, obstructions, existing and potential erosion problems, elevations of existing improvements, and existing drainage complaints, between the downstream property line and the 10% point.
 - b. Analyze downstream watercourses and receiving conveyances to determine 25-yr flow channel velocities.
 - c. Analyze existing pipe systems and culverts for compliance with current development regulation design criteria. Culverts should pass Q100. If existing pipes are not adequate for increased 100-yr flow, detention may be required.

- d. Hydrograph comparisons for the 1, 2, 5, 10, 25, 50, and 100-yr storms for both the downstream property line study point and the point where the drainage basin equals 10 times the project area.
 - e. A detailed written description of the first 500 feet off-site with at least one photograph looking downstream with some object included in the photograph for reference.
 - f. Method to perform the hydrograph analysis is as follows for each study point:
 1. Pre-developed on-site hydrograph
 2. Basin area at study point excluding on-site area hydrograph
 3. Combine 1 & 2
 4. Post-developed on-site hydrograph
 5. Combine 4 & 2
 6. Compare 3 to 5
12. Downstream analysis indicates adverse impacts may be expected, provide stormwater detention for 2- through 25-year storms in basins where post developed flow exceeds the existing conditions flow by more than 5%.
 13. Detain the runoff from the 1-year storm for 24 hours (Channel Protection) if water quality storage is required. Refer to UDO to confirm channel protection will be necessary and see the GCSMM for calculations.
 14. All hydrographs shall be based on a 24-hr storm.
 15. Time interval used in routing must be set to 20% of Time to Peak or smaller. This is imperative for Hydraflow software so storm volumes are calculated properly.

TSS SPREADSHEET:

1. Use the latest version of the Stormwater Quality Site Development Review Tool from the Georgia Stormwater Management Manual (<https://atlantaregional.org/natural-resources/water/georgia-stormwater-management-manual/>) if runoff reduction/water quality is required.
2. If runoff reduction cannot be met, then use the Practicability Policy to request a waiver.
3. Provide a map delineating the different land use types and acreage for water quality analysis purposes (i.e. Impervious Area, Disturbed Pervious Area, Undisturbed Upland Area, Undisturbed Stream Buffer Area, etc..)
4. Do not model off-site areas.