

PUBLIC WORKS AND ENVIRONMENTAL: Hydrology Study and Utility Plan Requirements

PROJECT:

Date:

REVIEWER:

The following is the minimum information required in a standard hydrology study submitted to the City of Roswell. Additional information may be required for site specific conditions. It shall be at all times the responsibility of the engineer of record to accurately model and report the conditions on the site. The City of Roswell accepts no responsibility for errors or omissions from this report.

Please submit Hydrology Report and this checklist with page numbers referenced on checklist and provide tabs for each section in the report. Engineering will forward the report and checklist to PW/Environmental for review. Hydrology Reports are considered stand-alone documents. All information pertaining to the hydrology of the site must be included in the report. The report will be reviewed using this checklist .

 X denotes action required

Cover (Section I)

- 1. Cover sheet signed and sealed by a professional engineer licensed in the state of Georgia and qualified in the field of hydrology and water resources
- 2. Provide Tabs for each section of report

Introduction (Section II)

Page #

- 1. Include/Provide proof of Stormwater Concept Plan approval
- 2. Provide a narrative of the project that includes:
 - Location
 - Size of project
 - Scope of project
 - Existing land use
 - Proposed land use
 - Project methodology, including water quality measures proposed
 - Name of receiving water body (name of creek/stream). If unnamed, provide name of sub-watershed project drains to.
- 3. Provide a summary table for each discharge point
 - Storm Event
 - Channel Protection - 1 year-24 hour event

- _____ 2 year - 24 hour event _____
- _____ 5 year - 24 hour event _____
- _____ 10 year - 24 hour event _____
- _____ 25 year-24 hour event _____
- _____ 50 year - 24 hour event _____
- _____ 100 year-24 hour event _____
- _____ Allowable discharge rate (cfs) _____
- _____ Developed discharge rate (cfs) _____
- _____ Peak elevation in each stormwater facility _____
- _____ Overflow or top of bank elevation of each stormwater facility _____
- _____ Allowable discharge velocity (fps) _____
- _____ Developed discharge velocity (fps) _____

Pre-Developed (Existing) Conditions Hydrology and Analysis (Section III)

1. _____ Provide existing conditions drainage basin map with existing topography. Identify all drainage basins on site and offsite. _____
2. _____ Provide weighted curve number calculations for existing conditions (based on GSMM Table 2.1.5-1). Predeveloped CN = 55 unless previously approved _____
3. _____ Provide time of concentration calculations for existing conditions (based on GSMM Section 2.1.5.6) _____
4. _____ Pre-developed flows shall include the effects of existing storage facilities within the basin. _____
5. _____ Provide a downstream sediment assessment for existing conditions. Assessment may be in the form of survey data or photographs. _____

Post-Developed Conditions Hydrology and Analysis (Section IV)

1. _____ Provide developed conditions drainage basin site map with topography. Identify all drainage basins on site and offsite as well as the location of all stormwater management facilities. _____
2. _____ Provide weighted curve number calculations for developed conditions. (based on GSMM Table 2.1.5-1) _____
3. _____ Provide time of concentration calculations for developed conditions using the methodology provided in GSMM .Section 2.1.5.6. _____
4. _____ Detention systems will be designed in accordance with GSMM _____
5. _____ Provide details of all outlet control structures with trash rack. _____
6. _____ Show trash rack details. For grated trash racks, openings should not exceed 50 % of orifice size. (See GSMM Section 2.3.5) _____

7. _____ Provide details of all water quality facilities (including planting plans for bio-retention areas). _____
8. _____ Provide detail of small orifice anti-clogging devices _____
9. _____ Provide downstream analysis to the point at which the site area is equal to or less than 10% of the over all drainage basin. Analysis should include the effects of timing on the overall flow rates for the system. (see GSMM Section 2.1.9) _____
10. _____ Provide detailed analysis of the capacity of structures (pipes/culverts) downstream to demonstrate that the infrastructure is appropriately sized to accommodate the post developed peak flow for the 25-year storm. Analyze the peak flow for the 100-year storm as well and describe the effects on the infrastructure or on adjacent structures, roads, etc. _____
11. _____ Provide calculations to show adequacy of the receiving waters immediately downstream for rate and velocity of flows, including effects of concentrated flows. _____
12. _____ Provide stage-storage relationship for all stormwater facilities. _____
13. _____ Provide details of detention facilities to include construction dimensions. _____
14. _____ Provide energy dissipation details and calculations in report and plans. _____
15. _____ Complete the following tables for the development. This information must also be shown on the grading plan and final plat.

Total Area = _____ Acres = _____ Square Feet

Total Impervious Area = _____ Acres = _____ Square Feet

Common* Area = _____ Acres = _____ Square Feet

Impervious Common* Area= _____ Acres = _____ Square Feet

*Common Area = Any area that is not part of another lot. For example, roads, sidewalks in the right of way, driveways in the right of way, detention ponds, etc.

Note: complete one per proposed lot of the following table

Total Area of Lot Lot # _____ _____ Acres = _____ Square Feet

ImperviousArea of Lot Lot # _____ _____ Acres = _____ Square Feet

Water Quality / Channel Protection Requirements (Section V)

1. _____ Provide design data for each water quality measure as indicated on the Design Procedure Forms provided in the Georgia Stormwater Management Manual. _____
2. _____ Provide water quality enhancements that provide treatment for the runoff from 1.2 inches of rainfall. Design shall be consistent with Georgia Stormwater Management Manual. _____

3. _____ Provide channel protection. Detention of storms less than the 2-year storm must be addressed by providing channel protection. Volume can be calculated directly using equation 2.1.6. Use undetained volume to determine orifice size. _____
4. _____ Provide pretreatment volume (forebay) at each inlet. Sediment forebay should be sized to contain 0.1 inches per impervious acre of contributing drainage and should be 4 to 6 feet deep. _____
5. _____ Provide the water quality drawdown time of all stormwater facilities. Drawdown time shall be a minimum of 24 hours and a maximum of 72 hours. Use average hydraulic head, average discharge method. (GSMM Section 2.3.3.3)
6. _____ Provide TSS removal rate spreadsheet, available at www.northgeorgiawater.org _____

Post-Stormwater Management (Section VI)

1. _____ Provide storm pipe/culvert calculations with an exhibit that clearly identifies all storm structure identification numbers and locations and pipe velocities. _____
 - _____ Minimum flow velocity is 3 fps, based on actual flow
 - _____ Maximum pipe velocity is 20 fps.
 - _____ Outlet protection is required for all outlets. Calculations must be provided.
 - _____ Minimum pipe slope is 0.5% for RCP/HDPE, 1.0% for CMP (these slopes also apply to pipe systems in underground detention)
 - _____ Maximum pipe slope is 10% for RCP, 20% for CMP
 - _____ When storm pipes exit into any type of ponding facility, the tailwater must be based on the peak 25 year elevation in the facility or the elevation in the discharge facility at the time of the peak flow in the system, whichever is higher.
 - _____ Provide gutter spread, sump ponding calculations for inflow inlets.
 - _____ Provide 100-year energy grade line on storm pipe profiles
2. _____ Provide storm pipe/ culvert sizing calculations with an exhibit that clearly identifies all storm structure identification numbers and locations. _____
3. _____ Provide headwater elevations calculations at all culverts, headwalls, and inlets. _____

Hydrographs (Section VII)

1. _____ Provide detailed pre-developed hydrographs or routings. _____
2. _____ Provide detailed developed conditions hydrographs and routings. _____

Appendices (Section VIII)

1. _____ Provide signed **Stormwater Facilities/BMP Covenant**. Documents are available at www.roswellgov.com, under departments select *Community Development* then *Engineering Division*. Documents are available under *Additional Downloads*.

2. _____ Provide **stormwater management systems operation and maintenance plan/schedule** for all stormwater facilities, including name and contact information of the responsible person in the BMP Covenant. _____
3. _____ Provide exhibit in BMP Covenant showing access to and maintenance easement around detention pond. _____
4. _____ Provide **Natural Area Conservation Easement documents**, if applicable. Documents are available at www.roswellgov.com, under departments select *Community Development* then *Engineering Division*. Documents are available under *Additional Downloads*. _____

Stormwater Plans (Section IX)

1. _____ Provide all headwater elevation and flood pool limits at all culvert crossings and all headwater elevations at inlets. _____
2. _____ Provide hydraulic profile on plans. Use routed pond elevations for pipes that discharge into ponds. _____
3. _____ Show floodplain on plans. For Zone X areas, the engineer needs to determine what the floodplain elevations are, ensuring that the floodplain will not be impacted. _____
4. _____ Provide a 20' access easement and a 10' maintenance easement as measured from 100-year water surface elevation around detention pond. Max slope for access easement shall be 15%. Detention pond and outlet control structure must be accessible for maintenance. Owner/Developer must take precautionary measures to deter children and individuals from going near detention ponds. _____
5. _____ Provide fencing for detention ponds if the side slopes of the ponds are steeper than 4:1. 4:1 slope shall extend a minimum of 2 feet below normal water elevation for wet ponds. Fence shall be a minimum of 4 feet high with a 12-foot wide access gate. _____
6. _____ Building finished floor elevations must be a minimum of 4 feet above (residential) or a minimum of 2 feet above (non-residential) the local 100-year high water elevation and/or established regulated floodplain elevation. All structures located on property with floodplain identified shall provide a Certificate of Elevation. _____

Other:

1. _____ Steep Slope Analysis Needed

Additional Comments:

WATER DISTRIBUTION and SANITATION

1. Provide a Grading and Utility Plan. Show locations and sizes of all:
 - _____ Water lines and Backflow preventors (thrust blocks to be provided at all bends);
 - _____ Meters;
 - _____ Vaults;
 - _____ Irrigation systems with backflow;
 - _____ Show the class of water pipe (all water lines dedicated to the City of Roswell shall be Class 50 DIP and min 8").

2. Show Grading and Utility Plan details:
 - _____ Backflow prevention detail;
 - _____ Thrust block detail;
 - _____ Fire hydrant detail;
 - _____ Standard City of Roswell dumpster pad detail (pad shall have a minimum clear opening width of 12 feet).

3. _____ Dumpster Gate Agreement (if gates are required on the dumpster pad).