

Stormwater Management Local Design Manual

EXLEY TRACT NORTH & SOUTH Effingham County, Georgia



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1. FORWARD

This manual is meant to serve as a comprehensive guide to implementing stormwater management systems within Exley Tract PD – I. Additionally, the manual is designed to supplement the Georgia Stormwater Management Manual (GSMM) First Edition, which shall serve as the technical manual for design and specification of individual components within the system.

2. GENERAL LEVEL OF SERVICE STANDARDS

2.1. Detention Requirements

2.1.1. Discharge Rates from New Development Projects

Development plans including site grading and drainage plans should be developed to minimize disruption of natural drainage patterns on properties. Additionally, no increases in stormwater runoff rates shall be allowed at any discharge point on the site. The baseline conditions shall be a wooded undisturbed site regardless of whether any clearing has occurred in the past and shall model any depression storage and/or detention storage. The development shall be analyzed for the following storm events:

- 2-year 24-hour Design Storm
- 10-year 24-hour Design Storm
- 25-year 24-hour Design Storm
- 50-year 24-hour Design Storm (Collector Road and Associated Lagoons Only)
- 100-year 24-hour Design Storm (Habitable Structures Only)

If the total area of the site (i.e. total property area) and the drainage area to each stormwater management facility is less than one acre, then a rainfall intensity based analysis (i.e. rational method) may be performed. If detention facilities are to be designed and constructed in series, the 24-hour storm criteria will apply regardless of the drainage area.

2.1.2. Discharge Rates from Redevelopment Projects

Development plans including site grading and drainage plans should be developed to minimize disruption of natural drainage patterns on properties. Additionally, no increases in stormwater runoff rates shall be allowed at any discharge point on the site. The baseline conditions shall be based on an analysis of the stormwater discharge rates from the site in its existing condition and shall model any depression storage and/or detention storage. The development shall be analyzed for the following storm events:

- 2-year 24-hour Design Storm
- 10-year 24-hour Design Storm
- 25-year 24-hour Design Storm



50-year 24-hour Design Storm (Collector Road and Lagoon Design Only)
 100-year 24-hour Design Storm (Habitable Structures Only)

If the total area of the site (i.e. total property area) and the drainage area to each stormwater management facility is less than one acre, then a rainfall intensity based analysis (i.e. rational method) may be performed. If detention facilities are to be designed and constructed in series, the 24-hour storm criteria will apply regardless of the drainage area.

2.2. Conveyance Systems

2.2.1. Bridges

All bridges shall be designed to accommodate the 100-year 24-hour design storm with no over topping.

2.2.2. Culverts & Pipe Systems

Roadway Classification / Use	Design Storm
Collector Roads	50-Year
Neighborhood Roads	25-Year
Parking Lots / Material Storage Areas / Landscape Areas	10-Year

Culverts with contributing drainage areas greater than 10 acres shall be designed to the 24-hour storm. For example, if a cross drain is to be designed to convey stormwater runoff from a 20 acre drainage basin under a neighborhood road, then the design storm shall be a 25-year 24-hour storm.

If a culvert is designed to connect to an existing system of a differing design level of service, then the system with the greater design requirement will be used to size the proposed system.

2.2.3. Inlets (Catch Basins, Yard Inlets, Drop Inlets, Hooded Grate Inlets and Flumes)

Inlets collecting stormwater runoff from street surfaces and area inlets shall be sized to capture the storm event specified for the pipe system to which it drains and a maximum flooding depth as determined by the following table:

Roadway Classification / Use	Flooding Depth
Collector Roads	Maximum 0.1 Depth at Crown
Neighborhood Roads	Maximum 0.1 ft Depth at Crown
Parking Lots (if not used for Detention)	Maximum 0.5 ft Depth



Detention Areas utilized for other purposes (i.e. parking lot detention, etc.) with flood warning sign	Maximum 1.5 ft Depth
Material Storage Areas / Landscape Areas	Maximum 2.0 ft Depth

Inlets and grading adjacent to habitable structures shall be designed to prevent stormwater runoff from entering the structure during the 100-year design storm.

2.2.4. Inlets (Headwalls, Flared End Sections, etc.)

Inlets that utilize the opening of the pipe as the inlet (i.e. headwalls, flared end sections, etc.) shall be sized to capture the storm event specified for the pipe system to which it drains and a maximum flooding depth that will not result in bypass of the inlet or cause structural / nuisance flooding.

2.2.5. Roadside Ditches

Roads constructed without curb and gutter shall incorporate ditches that are designed to the specific design storms as shown in the following table: 2.2.6. Drainage Channels

Roadway Classification / Use	Design Storm
Collector Roads	50-Year
Neighborhood Roads	25-Year

For drainage channels designed to convey stormwater runoff either from or to a culvert, the channel should be sized to accommodate the same storm event specified for the pipe system. Channels designed to convey stormwater runoff to detention ponds shall be sized to accommodate the 25-year design storm.

2.3. Water Quality Treatment

2.3.1. Water Quality in New Development

All stormwater runoff generated from a site shall be adequately treated before discharge. Stormwater management systems must be designed to remove 80% of the average annual post-development total suspended solids (TSS) load and be able to meet any other additional watershed or site-specific water quality requirements. It is presumed that a stormwater management system complies with this performance standard if:

- It is sized to capture and treat the prescribed water quality treatment volume, which is defined as the runoff volume resulting from the first 1.2 inches of rainfall from a site.
- Appropriate structural controls are selected, designed, constructed, and maintained according to the specific criteria in this manual and the GSMM.



Additional, water quality requirements may be specified for hotspot land uses and activities.

2.3.2. Water Quality in Redevelopment

All stormwater runoff generated from the disturbed area of the site shall be adequately treated before discharge. Stormwater management systems must be designed to remove 80% of the average annual post-development total suspended solids (TSS) load and be able to meet any other additional watershed or site-specific water quality requirements. It is presumed that a stormwater management system complies with this performance standard if:

- It is sized to capture and treat the prescribed water quality treatment volume, which is defined as the runoff volume resulting from the first 1.2 inches of rainfall from a site.
- Appropriate structural controls are selected, designed, constructed, and maintained according to the specific criteria in this manual and the GSMM.

Additional, water quality requirements may be specified for hotspot land uses and activities.

2.4. **Channel Protection**

2.4.1. Channel Protection for New Development Projects

Channel protection shall be provided for each site by providing extended detention of the 1-year storm event released over a period of 24-hours to reduce bankfull.

2.4.2. Channel Protection for Redevelopment Projects

Channel protection shall be provided for the disturbed portion of each site by providing extended detention of the 1-year storm event released over a period of 24-hours to reduce bankfull.

2.5. **Energy Dissipation**

Energy dissipation shall be employed whenever the velocity of flows leaving a new stormwater facility exceeds the erosion velocity of the downstream area channel area or five feet per second (fps) whichever is less.

3. **APPROVED CONSTRUCTION MATERIALS & BMPs**

3.1. **Conveyance Structures**

3.1.1. Pipes Under Roads and Pavement

All pipes under roadways, parking lots and other surfaces designed for vehicular traffic shall be



constructed of reinforced concrete pipe (RCP) meeting Georgia Department of Transportation Standards. Any pipe that originates or terminates within or immediately adjacent (twice the depth of the pipe section adjacent to the roadway) to a pavement surface as defined above shall be continued to the next structure (i.e. manhole, inlet, headwall, etc.). Longitudinal pipes with diameters of 30-inches or smaller may utilize High Density Polyethylene (HDPE) Pipe if the depth of the pipe is four feet or less. Bedding standards for HDPE pipe shall be such that stone bedding, or equivalent, shall be placed to half of the pipe diameter for all depths greater than four feet and/or in accordance with manufacturers specifications whichever are greater. HDPE pipes must have a minimum of 24-inches of cover from the crown of the pipe unless prior approval of the County or its Agent has been obtained.



3.1.2. Pipes Not Under Roads and Pavement

Pipes not under roadways, parking lots and other surfaces meant for vehicular traffic shall be constructed of RCP or HDPE meeting Georgia Department of Transportation Standards and approved by the County or its Agent. Bedding standards for HDPE pipe shall be such that stone bedding, or equivalent, shall be placed to half of the pipe diameter for all depths greater than four feet and/or in accordance with manufacturers specifications whichever are greater. HDPE pipes must have a minimum of 24-inches of cover from the crown of the pipe unless prior approval of the County or its Agent has been obtained.

3.1.3. Channels

All channels must be protected from erosion through the use of rip-rap, concrete, erosion control matting or similar method acceptable to the County or its Agent. All channel side slopes shall have a 3-foot horizontal to 1-foot vertical (3:1) slope or less.

3.1.4. Inlets

All inlets shall be constructed of materials and methods approved by the Georgia Department of Transportation unless approved by the County or its Agent.

3.2. Detention Ponds

3.2.1. Dry Earthen Detention Ponds

Dry detention ponds shall be designed to provide for positive drainage on the pond floor to the outlet of the pond. Side slopes shall be designed to have a maximum of 3-foot horizontal to 1-foot vertical (3:1) slopes. If the 100-year maximum water surface depth is equal to or greater than four feet, then a standard four foot chain link fence shall be constructed around the detention pond with a 20-foot gate provided to allow access.

3.2.2. Dry Underground Detention Ponds

No underground detention pond shall be constructed on residential development projects. Underground detention ponds may be considered on non-residential development projects after the Engineer has shown that construction of an aboveground detention pond is infeasible.

3.2.3. Wet Detention Ponds

Wet detention ponds may be constructed if the facilities are designed to the criteria outlined in Section 3.2.1.5 of the GSMM (Volume 2).



3.3. Water Quality Best Management Practices

3.3.1. General Application Structural Stormwater Controls

The following general application structural stormwater controls shall be acceptable to meet the water quality requirements for the contributing drainage areas. For design, construction and maintenance specifications for each control, the reader is directed to Section 3.2 of the GSMM (Volume 2).

Stormwater Ponds
Stormwater Wetlands
Bioretention Areas
Sand Filters (hotspot/commercial developments only)
Enhanced Swales

3.3.2. Limited Application Structural Controls

The following limited application structural stormwater controls shall be acceptable to meet the water quality requirements for the contributing drainage areas. For design, construction and maintenance specifications for each control, the reader is directed to Section 3.3 of the GSMM (Volume 2).

Filter Strip
Grass Channel
Organic Filter (hotspot/commercial developments only)
Underground Sand Filter (hotspot/commercial developments only)
Submerged Gravel Wetlands (hotspot/commercial developments only)

3.3.3. Proprietary Structural Controls

The County or its Agent may at their discretion allow proprietary structural controls. Prior to specification of such a device, the designer shall consult the County or its Agent to determine if the control will be acceptable.

3.4 Channel Protection Design

Outlets to provide for meeting channel protection criteria shall be designed to meet the standards outlined in Section 2.3.3 and Section 2.3.5 of the GSMM (Volume 2).



APPROVED HYDROLOGIC & HYDRAULIC METHODS

4.1. Hydrologic Methods

4.1.1. Rational Method

The rational method may be used with the approval of the County or its Agent to develop peak runoff flows for culverts and/or detention ponds with contributing drainage areas less than 10 acres in size. All computations shall be in accordance with Section 2.1.4 of the GSMM (Volume 2). Rainfall intensities shall be derived from Table A-13 (Savannah) of Appendix A of the GSMM (Volume 2).

As specified above, the rational method may be used to size detention facilities. If the rational method is utilized, the DeKalb Method, Baumgardner / Morris Method (Terramodel) or Advanced Interconnected Channel and Pond Routing (AdICPR) Software must be utilized to develop runoff hydrographs. Triangular rational method runoff hydrographs may not be utilized in the design of detention facilities.

4.1.2. SCS Method

In most cases, the Soil Conservation Service (SCS) method must be utilized to size detention ponds and culverts with contributing drainage areas greater than 10 acres. All computations shall be in accordance with Section 2.1.5 of the GSMM (Volume 2). Rainfall depths shall be derived from Table A-13 (Savannah Rainfall Data) of Appendix A of the GSMM (Volume 2). The following table provides the rainfall depths for use in Effingham County:

Design Storm	Rainfall Depth
1-Year 24-Hour	3.60"
2-Year 24-Hour	4.80"
5-Year 24-Hour	6.00"
10-Year 24-Hour	6.72"
25-Year 24-Hour	7.92"
50-Year 24-Hour	8.88"
100-Year 24-Hour	9.84"

4.2. Hydraulic Methods

All hydraulic calculations shall be made in accordance with Chapter 4 of the GSMM (Volume 2).



5. SPECIAL DISTRICTS

This project is not located within a Special District..

6. HYDROLOGIC & HYDRAULIC REPORT REQUIREMENTS

All development projects must submit a hydrologic and hydraulic report or Site Specific Stormwater Management Plan outlining the impacts of the site on the stormwater system and drainage basin.

At a minimum, this report must include the following sections:

- ↑ Statement by Registered Professional
- ↑ Existing Conditions Hydrologic Analysis
- ↑ Post-Development Hydrologic Analysis
- ↑ Stormwater Management System Design
- ↑ Downstream Analysis
- ↑ Erosion & Sedimentation Control Plan
- ↑ Operations & Maintenance Plan
- ↑ Reference to Any Existing County Developed Drainage Master Plans*

- * The designer should consult with the County or its Agent regarding the existence and /or applicability of any existing County developed drainage master plans prior to initiating work on the Site Specific Stormwater Management Plan.

The following subsections outline the requirements for each of the elements outlined above.

6.1. Professional Certification

Each report should begin with the following statement and be signed and sealed by the professional who prepared the report and analysis:

“ To the Best of my information, knowledge and belief, I, (Name of Professional), a Registered (Professional Engineer / Land Surveyor) in the State of Georgia, hereby agree that the grading and drainage plans for the project known as (Project Name), lying in Land Lot (XXX), of the (XX) District, Effingham County, Georgia, have been prepared under my supervision, and, state that in my opinion, the construction of said project will not produce storm drainage conditions that will cause damage or adversely affect the surrounding properties for the required design storms. This (day) day of (Month), (Year).”

6.2. Existing Conditions Hydrologic Analysis



The existing conditions hydrologic analysis should provide the reader with a comprehensive evaluation of the site conditions prior to development of the project. The designer should provide the following information with this element of the report:

6.2.1. Existing Conditions Map

- Topography (2-ft. or less contour interval) of existing site conditions
- Perennial / intermittent streams, wetlands, lakes and other surface water features
- Drainage basin delineations showing the location of each drainage sub-basin
- Drainage basin delineations for the basin upstream of the project site on an appropriate map (USGS Quadrangle, County LIDAR, etc.)
- Existing stormwater conveyances and structural control facilities
- Direction of flow and discharge points from the site including sheet flow areas
- Reference any existing County developed drainage master plans
- Any area of significant depression storage

6.2.2. Existing Conditions Tables

- A table listing the acreage, soil types and land cover characteristics for each sub-basin
- A table listing the peak runoff rates from each outfall location
- A table listing the peak runoff rates and total runoff volumes for the drainage area upstream of the project site
- A table listing the peak runoff rates and maximum water surface elevations for all detention facilities studied as part of the existing conditions analysis

6.2.3. Narratives

- Written description of the existing conditions found on the site
- Analysis of runoff provided by off-site areas upstream of the project site
- Methodologies, assumptions, site parameters and supporting design calculations used in the analyzing the existing conditions site hydrology

6.3. **Post-Development Hydrologic Analysis**

The post-development hydrologic analysis should provide the reader with a comprehensive evaluation of the anticipated site conditions following development of the project. The designer should provide the following information with this element of the report:

6.3.1. Post Development Conditions Map

- Topography (2-ft or less contour interval) of proposed site conditions
- Perennial/intermittent streams, wetlands, lakes and other surface water features



Drainage basin delineations showing the location of each drainage sub-basin
Proposed stormwater conveyances and structural control facilities
Direction of flow and discharge points from the site including sheet flow areas
Reference any existing County developed drainage master plans
Location and boundaries of proposed natural feature protection areas



6.3.2. Post Development Conditions Tables

A table listing the acreage, soil types, impervious surface area and land cover characteristics for each sub-basin

A table listing the peak runoff rates from each Outfall.

A table listing the peak runoff rates for the drainage area upstream of the project site

A table listing the peak discharge rates and peak elevations for all detention ponds studied

6.3.3. Narratives

Written description of the existing conditions found on the site

Stormwater calculations for water quality, channel protection and post construction detention for each sub-basin affected by the project

Documentation and calculations for any applicable site design credits that are being utilized

Methodologies, assumptions, site parameters and supporting design calculations used in the analyzing the post development conditions site hydrology

6.4. **Stormwater Management System Design**

The stormwater management system design should provide the reader with a comprehensive description of the proposed stormwater management system components on site. The designer should provide the following information with this element of the report:

6.4.1. Stormwater Management System Map

Location of all non-structural stormwater controls

Location of all existing stormwater controls to remain after development

Location of all proposed stormwater controls

Location of all proposed impoundment type controls (i.e. detention ponds, stormwater ponds, regional detention ponds, stormwater wetlands, etc.)

Location of all conveyance structures

All impoundment type controls should be labeled with the following information: maximum water surface elevation for the 50 and 25 year storm event, top of bank elevation, normal water elevation and bottom elevation

All inlets to conveyance structures should be labeled with the following information: maximum design water surface and maximum potential water surface

All pipes should be labeled with length, material and slope

Calculations shall be provided to show the hydraulic grade line for the storm drainage pipes and structures for the required storm event.



6.4.2. Narratives

Narrative describing that appropriate and effective structural stormwater controls have been selected

Design calculations and elevations for all existing and proposed stormwater conveyance elements including stormwater drains, pipes culverts catch basins, channels, swales and areas of overland flow

Design calculations and elevations for all structural water quality BMPs to be utilized for water quality improvement

Design calculations showing that the design meets the requirements of the water quality improvements as outlined in the ordinance and local design manual

6.5. **Downstream Analysis**

The downstream analysis should provide the reader with a comprehensive picture of the downstream areas and their capacity to accommodate stormwater runoff from the proposed development.

6.5.1. Maps

Drainage basin delineations showing the point at which the contributing area of the project represents 10% of the total drainage basin area as defined in Section 2.1.9.2 of the GSMM

Identify culverts, channels and other structural stormwater controls that the stormwater runoff must pass through prior to the 10% point identified previously

6.5.2. Narratives

- Supporting calculations for a downstream peak flow analysis using the 10% rule necessary to show safe passage of the post-development design flows downstream

6.6. **Erosion & Sedimentation Control Plan**

The erosion and sedimentation control plan should be included in the report demonstrating the plan to effectively mitigate stormwater impacts during construction. The following elements should be included in this section of the report.

All elements specified in the Georgia Erosion and Sediment Control Act and local ordinances and regulations

Sequence/phasing of construction and temporary stabilization measures

Temporary structures that will be converted into permanent stormwater controls

6.8. **Omitted**



6.8. Operations & Maintenance Plan

A narrative of what maintenance tasks will be required for the stormwater controls specified for the site as well as the responsible parties. Additionally, the report will need to identify access and safety issues for the site. Maintenance issues for various BMPs and other stormwater controls can be found in the GSMM.



MODEL STORMWATER REPORT CHECK LIST

Section 1. REPORT FORMAT

1.1 Does the Hydrologic & Hydraulic Report contain the following information:

<u>Provided</u>	<u>Missing</u>	
↑	↑	Name of the Development
↑	↑	Name of the Developer
↑	↑	Location Map of the Site referencing the nearest major road
↑	↑	Stormwater Impact Certification
↑	↑	Seal of the Professional having prepared the Report

1.2 Does the Hydrologic & Hydraulic Report contain the following sections:

<u>Provided</u>	<u>Missing</u>	<u>N/A</u>	
	↑	↑	Existing Conditions Hydrologic Analysis
↑	↑	↑	Post Development Hydrologic Analysis
↑	↑	↑	Stormwater Management System Design
↑	↑	↑	Downstream Analysis
↑	↑	↑	Erosion & Sedimentation Control Plan
			Operations & Maintenance Plan

Section 2. EXISTING CONDITIONS HYDROLOGIC ANALYSIS

- 2.1 This section should provide the reader with a comprehensive evaluation of the site conditions prior to development of the project.
- 2.2 Narratives – A narrative and supporting calculations of the pre-development conditions of the site as related to stormwater management should be provided to determine the current characteristics of the site.
 - ↑ Written description of the existing conditions found on the site
 - ↑ Name of the receiving waters from which runoff drains to after leaving the site
 - ↑ Analysis of runoff provided by off-site areas upstream of the project site
 - ↑ Methodologies, assumptions, site parameters and supporting design calculations used in the analyzing the existing conditions site hydrology
- 2.3 Existing Conditions Map – A map documenting the following elements should be provided with the following information if applicable.
 - ↑ Topography (2-ft. or less contour interval) of existing site conditions
 - ↑ Perennial / intermittent streams, wetlands, lakes and other surface water features
 - ↑ Drainage basin delineations showing the location of each drainage sub-basin
 - ↑ Drainage basin delineation for the basin upstream of the project site on an appropriate map (USGS Quadrangle, etc.)
 - ↑ Existing stormwater conveyances and structural control facilities
 - ↑ Soil types including hydrologic soil groups
 - ↑ Direction of flow and discharge points from the site including sheet flow areas
- 2.4 Existing Conditions Tables – Tables documenting the following information should be provided if applicable.
 - ↑ A table listing the acreage, soil types and land cover characteristics for each sub-basin
 - ↑ A table listing the peak runoff rates from each outfall
 - ↑ A table listing the peak runoff rates for the drainage area upstream of the project site

Section 3. POST-DEVELOPMENT HYDROLOGIC ANALYSIS

- 3.1 The post-development hydrologic analysis should provide the reader with a comprehensive evaluation of the anticipated site conditions following development of the project. The designer should provide the following information with this element of the report:
 - 3.2 Narratives – A narrative and supporting calculations of the post-development conditions of the site as related to stormwater management should be provided to determine the future stormwater characteristics of the site.
 - ↑ Written description of the existing conditions found on the site
 - ↑ Stormwater calculations for water quality, channel protection and post construction detention for each sub-basin affected by the project
 - ↑ Documentation and calculations for any applicable site design credits that are being utilized
 - ↑ Methodologies, assumptions, site parameters and supporting design calculations used in the analyzing the post development conditions site hydrology
 - 3.3 Post Development Conditions Map – A map documenting the following elements should be provided with the following information if applicable.
 - ↑ Topography (2-ft or less contour interval) of proposed site conditions
 - ↑ Perennial / intermittent streams, wetlands, lakes and other surface water features
 - ↑ Drainage basin delineations showing the location of each drainage sub-basin
 - ↑ Proposed stormwater conveyances and structural control facilities
 - ↑ Direction of flow and discharge points from the site including sheet flow areas
 - ↑ Location and boundaries of proposed natural feature protection areas
 - 3.4 Post Development Conditions Tables – Tables documenting the following information should be provided if applicable.
 - ↑ A table listing the acreage, soil types, impervious surface area and land cover characteristics for each sub-basin
 - ↑ A table listing the peak runoff rates from each outfall
 - ↑ A table listing the peak runoff rates for the drainage area upstream of the project site
 - ↑ A table listing the peak discharge rates, and peak elevations for all detention ponds studied.

Section 4. STORMWATER MANAGEMENT SYSTEM

- 4.1 The stormwater management system section should provide the reader with a comprehensive description of the proposed stormwater management system components on site. The designer should provide the following information with this element of the report:
- 4.2 Narratives – A narrative and supporting calculations describing the on-site stormwater management controls to be utilized. This narrative should include appropriate narratives / tables demonstrating compliance with the various stormwater management requirements outlined in the post-development article of the stormwater ordinance and local design manual.
- ↑ Narrative describing that appropriate and effective structural stormwater controls have been selected
 - ↑ Design calculations and elevations for all existing and proposed stormwater conveyance elements including stormwater drains, pipes culverts catch basins, channels, swales and areas of overland flow
- 4.3 Stormwater Management System Map(s) – A map(s) illustrating the location, type and specifications of all stormwater management components to provide stormwater management for the proposed site.
- ↑ Location of all non-structural stormwater controls
 - ↑ Location of all existing stormwater controls to remain after development
 - ↑ Location of all proposed stormwater controls
 - ↑ Location of all proposed impoundment type controls (i.e. detention ponds, stormwater ponds, stormwater wetlands, etc.)
 - ↑ Location of all conveyance structures
 - ↑ All impoundment type controls should be labeled with the following information: maximum water surface elevation for the 50 and 25 year storm event, top of bank elevation, normal water elevation and bottom elevation
 - ↑ All inlets to conveyance structures should be labeled with the following information: maximum design water surface and maximum potential water surface
 - ↑ All pipes should be labeled with length, material and slope
 - ↑ All pipes should be profiled and labeled with length, material, slope and hydraulic grade line

Section 5. DOWNSTREAM ANALYSIS

- 5.1 The downstream analysis should provide the reader with a comprehensive picture of the downstream areas and their capacity to accommodate stormwater runoff from the proposed development.
- 5.2 Narratives – A narrative and supporting calculations for a downstream peak flow analysis using the ten-percent rule necessary to show safe passage of the post-development design flows downstream. This narrative should include appropriate descriptions / tables for points of interest such as culverts and channel constrictions downstream of the project where increases in stormwater runoff rates could be of concern.
- 5.3 A map(s) illustrating the location, type and specifications of all stormwater management components to provide stormwater management for the proposed site.
 - ↑ Drainage basin delineations showing the point at which the contributing area of the project represents 10% of the total drainage basin area
 - ↑ Identify culverts, channels and other structural stormwater controls that the stormwater runoff must pass through prior to the 10% point identified previously

Section 6. EROSION & SEDIMENTATION CONTROL PLAN

- 6.1 The erosion and sedimentation control plan should be included in the report demonstrating the plan to effectively mitigate stormwater impacts during construction. The following elements should be included in the section of the report.
 - ↑ All elements specified in the Georgia Erosion and Sediment Control Act and local ordinances and regulations
 - ↑ Sequence / phasing of construction and temporary stabilization measures
 - ↑ Temporary structures that will be converted into permanent stormwater controls

Section 8. Operations & Maintenance Plan

- 8.1 A narrative of what maintenance tasks will be required for the stormwater controls specified for the site as well as the responsible parties. Additionally, the report will need to identify access and safety issues for the site.