



City of Snellville
2342 Oak Road
Snellville, GA 30078

VIA EMAIL

RE:
Review of Submittal

Dear Mr. Thompson:

We have reviewed the above referenced project submittal and have the following comments:

Flood Study Comments:

1. If encroachment is proposed in a special flood hazard area, Flood Study shall contain the following: (FPMO 1.4.4a-e)
 - a. Grading Plan clearly defining floodplain encroachments.
 - b. HEC-RAS runs of duplicate effective model, corrected effective model, post-project model, and spreadsheet comparing results of each.
 - c. If changes to the future flood elevation, Base Flood Elevation, or Floodway elevation are proposed, submit profiles of the channel showing existing and proposed base flood elevations.
 - d. If encroaching in the floodplain, provide floodplain storage (end area) calculations based on maximum 100' cross sections (include cross sections in report) showing that flood storage capacity will not be reduced by the proposed grading.
2. No construction or structures, including grading, filling, cutting or displacement of earth is allowed within the base flood or future conditions floodplain that could result in raising the base flood or future conditions flood elevation equal to or more than 0.01 foot.
3. Show minimum finished floor elevations on residential lots to be the higher of the future conditions floodplain elevation or 3 feet plus the base flood elevation.
4. Provide additional documentation supporting your choice of Manning 'n' values for channel and overbank.

Site and/or Grading Plan Comments:

5. Indicate FIRM Panel map number and delineate that portion of the project that is within the floodplain.
6. Refer to the Zoning Resolution for permitted floodplain uses. is not a permitted use.
7. Since project is a residential subdivision, show the minimum finished floor elevations on all floodplain lots to be the greater of the regulatory flood elevation OR the base flood elevation plus 3 feet.



8. Number all pipes and structures on plan.
9. Number all open channels on plan.
10. Provide transition channels from inlet and outlet ends of all pipes to natural drainage swales.
11. Indicate source of topography and the reference datum
12. Boundary lines must be expressed to 1/100 foot and nearest second.
13. Show all driveways and rights-of-way on the same side of the street and on the opposite side of the street adjacent to the project. Show the centerline to centerline offset. Refer to Article 9.7.5 of the Development Regulations. If no driveways exist, note as such on the plans.
14. Sight distance (vertical and/or horizontal) at the proposed driveway is not shown and/or insufficient information is given on plans to review for adequate sight distance. The engineer should certify, in writing, that adequate horizontal and vertical sight distance exists in accordance with the provisions contained in Section 9.7.4 of the Development Regulations. Sight distance may be certified by a signed and sealed statement on the plat or a certification, signed and sealed, on letterhead. Statement must be specific to the project.
15. Driveway on _____ is unacceptable as shown.
16. Provide apron and curb detail for entrances. Apron must conform to Gwinnett County Standard Drawing # 313.
17. Provide complete details of retaining walls, including all wall envelopes. Retaining walls not conforming to the Gwinnett County Standard shall be designed, signed and sealed by a professional engineer.
18. Gwinnett County retaining wall standard design not applicable to detention pond walls. Provide design by a professional engineer.
19. Show typical paving section for parking areas and drives. Minimum section shall be 4" GAB and 2" E or F.
20. Street design exceeds maximum cul-de-sac length of 2000 feet.
21. Street design exceeds maximum stub street length. Provide permanent cul-de-sac or alternate design.
22. Show cul-de-sac right-of-way and pavement radii, and cul-de-sac slope. Cul-de-sacs shall not exceed a 6% slope.
23. Show all roadway grades and vertical curves. Add note: **“12% to 15% street grades require an “As Graded” survey before installation of the curb.”**
24. Provide topography at minimum 2' contour intervals. (DR 8.1.2)
25. Show drainage easement on pipes _____ consistent with table 7-A of the Development Regulations. (DR 7.4.2)



26. Provide easement agreement for offsite work, common use of driveways, and work in utility easements.
27. Show 100-year floodplain contour, elevation and floodway limits and indicate information source. (DR 10.2.5l)
28. Provide floodplain lot chart indicating lot square footage and area inside and outside the 100 year floodplain. (DR 10.2.5l)
29. Provide the following notes on the plan: (DR 10.6.9)

NOTE: CITY OF SNELLVILLE ASSUMES NO RESPONSIBILITY FOR OVERFLOW OR EROSION OF NATURAL OR ARTIFICIAL DRAINS BEYOND THE EXTENT OF THE STREET RIGHT-OF-WAY, OR FOR THE EXTENSION OF CULVERTS BEYOND THE POINT SHOWN ON THE APPROVED AND RECORDED PLAN. THE CITY OF SNELLVILLE DOES NOT ASSUME THE RESPONSIBILITY FOR THE MAINTENANCE OF PIPES IN DRAINAGE EASEMENTS BEYOND THE CITY RIGHT-OF-WAY.

NOTE: STREAM BUFFER EASEMENTS ARE TO REMAIN IN A NATURAL AND UNDISTURBED CONDITION.

NOTE: STRUCTURES ARE NOT ALLOWED IN DRAINAGE EASEMENTS.

MAXIMUM CUT OR FILL SLOPES IS 2H:1V

APPROVAL OF THESE PLANS DOES NOT RELIEVE THE OWNER, DEVELOPER, AND/OR CONTRACTOR FROM COMPLYING WITH ALL APPLICABLE RULES, REGULATIONS, AND ORDINANCES.

30. Show finished floor elevation of building on plan. (FPMO 1.5.1c)
31. Storm sewer pipe must extend at least 50 feet past the front building setback line. (DR 8.3.8b)
32. Provide note on plan: **DETENTION POND, DETENTION OUTLET STRUCTURES AND TEMPORARY SEDIMENT POND FEATURES ARE TO BE CONSTRUCTED AND FULLY OPERATIONAL PRIOR TO ANY OTHER CONSTRUCTION OR GRADING.**
33. Provide note on plan: **DEVELOPER TO CLEAN OUT ACCUMULATED SILT IN DETENTION POND AT END OF CONSTRUCTION WHEN DISTURBED AREAS HAVE BEEN STABILIZED.**
34. Add note on plan: **PROVIDE DETENTION POND POST-CONSTRUCTION (RECORD) DRAWINGS WITH THE SUBMITTAL OF THE FINAL PLAT OR ONE WEEK PRIOR TO REQUESTING A CERTIFICATE OF OCCUPANCY SO THAT THE POST-CONSTRUCTION CONDITIONS MAY BE VERIFIED AND APPROVED. CERTIFIED RECORD DRAWINGS SHALL INCLUDE TOPO OF POND AND OUTLET STRUCTURE DETAIL USING POST-CONSTRUCTION SURVEY DATA. USING RECORD DRAWINGS, PROVIDE A CERTIFIED HYDROLOGY REPORT VERIFYING POND VOLUMES AND PEAK OUTFLOWS FROM**



REGULATED STORM EVENTS.

35. Provide a 10-foot drainage easement around detention pond outside the 100-year ponding limit. Provide a cleared 20-foot access easement to detention pond for commercial projects, and a 30-foot access easement for residential projects. Pond walls, toe of slope can be no closer than 10 feet to adjoining property line. (DR 8.2.5 a&b)
36. Provide the following note with an arrow pointing to the access easement: **ACCESS EASEMENT TO BE CLEARED AND GRUBBED.**
37. Within the access easement, a 15-foot wide road shall be graded at a maximum 20% grade to provide access to the facility. Show grading on plans. The road shall be grassed or paved. The road shall extend to the bottom of the pond when the pond is greater than 10 feet deep or 50 feet wide.
38. Show the detention pond 100-year ponding contour and elevation on plan.
39. Detention pond must be located on a parcel owned by a property owner's association. (DR 8.2.4h)
40. Discharge pipe must be no closer than six times its diameter to an adjoining property line. (DR 9.9.3a)
41. Minimum top width of detention pond, earthen dam must be 8'-0". (DR 9.8.2d(5))
42. Provide additional spot elevations in paved area to clarify drainage and ADA accessibility at the handicap parking spaces.
43. Show grading associated with widened section. All shoulders to extend to right-of-way. Extend storm sewer cross drains, as necessary.
44. Provide flume and riprap at end of widened section. Provide flume detail.

Pipe & Open Channel Profile Sheet Comments:

45. All pipes within drainage easements or right-of-way are to be reinforced concrete pipe. Aluminized steel coated, aluminum alloy, polyethylene pipe, galvanized CMP and bituminous-coated CMP are not authorized. (DR 8.3.2).
46. If using HDPE pipe, add following note to plans: **HDPE pipe shall conform to the requirements of AASHTO M-294 and AASHTO MP7, Type S & D. Connections shall use a rubber gasket which conforms to ASTM F-477. Installation shall be in accordance with ASTM Recommended Practice D-2321, AASHTO Section 30, or with Section 550 of the Georgia DOT Standard Specifications, Construction of Roads Bridges.**
47. If using Aluminum coated Type 2 steel pipe or aluminum alloy pipe, add following note to plans: **All aluminum coated Type 2 steel pipe or aluminum alloy pipe, which will carry a live stream, shall have paved inverts in accordance with AASHTO M-190, type C, except that the pipe need not be fully coated. Installation shall be in accordance with Section 550 of the Georgia DOT Standard Specifications, Construction of Roads and Bridges.**



48. If using RCP pipe, add following note to plans: **All RCP pipe joints shall be bell & spigot type with a rubber gasket conforming to ASTM C-443. The pipe shall be manufactured in accordance with AASHTO M-170 and/or ASTM C-76. Class of pipe and wall thickness shall be in accordance with 1030-D, Georgia DOT specification, Table No. 1. Installation shall be in accordance with Section 550 of the Georgia DOT Standard Specifications, Construction of Roads and Bridges.**
49. All pipes carrying a live stream must have paved inverts. (DR 8.3.7)
50. Provide pipe profiles. Show existing and proposed contours, pipe lengths, slopes, inverts, and 25 year hydraulic grade lines. (DR 10.2.7c)
51. Provide channel profiles. Show existing and proposed contours, channel lengths, 25-year normal flow depth and slopes. Minimum freeboard to be 20% of the flow depth. (DR 8.4.1b)
52. 25 year hydraulic grade line must be at least 1 foot below the gutter line or top of grate. (DR 8.3.5a)
53. Specify gage and corrugation for all pipes. Refer to sheet 701 of the standard drawings. (DR 8.3.7(2))
54. Minimum pipe size shall be 15" diameter for public piped collection systems. Refer to pipe # . (DR 8.3.5d)
55. Minimum culvert size shall be 18" diameter. (DR 8.3.4c)
56. Channel velocities for the fully developed 25 year flow shall not exceed the non-erosive velocity as shown in 5.2.3 of the *Gwinnett County Storm Water Design Manual*. (DR 8.3.6a)
57. Bed storm drain pipes Using Gwinnett County Standard Detail 710: *Standard Pipe Bedding Details*
58. Velocity in pipes may not exceed 15 fps.
59. Slope of ACMP or HDPE pipe may not exceed 14%. (DR 9.9.2c)
60. Slope of RCP pipe may not exceed 10%. (DR 9.9.2c)
61. Show minimum ground cover of 1'-0" for pipes.
62. Specify Gwinnett County detail number 611, manhole casting – non-traffic areas, for all non-traffic bearing manholes. Include detail on plans. Material suppliers include East Jordan Iron Works and US Foundry.
63. Use anchor collars on pipes exceeding 10% slope. (DR 9.9.2c)
64. Show 100-year ponding limits above pipes. (DR 8.3.4b)
65. Show 100-year hydraulic grade line in all culverts. (DR 8.2.3j)
66. Provide transition channel profiles from inlet and outlet ends of all pipes to natural drainage swales. (DR 8.4.1b)



67. Provide complete pipe chart indicating the following: (DR 10.6.7c2)
- a. Pipe numbers
 - b. Pipe size
 - c. Pipe length
 - d. Pipe slope
 - e. Contributing drainage area
 - f. Design discharge (Q_{25} for piped drainage; Q_{100} for culverts)
 - g. Design storm frequency (25 year for piped drainage; 100 year for culverts)
 - h. Runoff coefficient (per future land use plan and assuming no detention - DR 8.3.4a)
 - i. Pipe material/coating
 - j. Velocity (V_{25} may not exceed non-erosive velocity at outlet headwall)
68. Provide complete channel chart indicating the following: (DR 10.6.7c2)
- a. Open channel numbers
 - b. Contributing drainage area
 - c. Runoff coefficient (per future land use plan and assuming no detention - DR 8.3.4a)
 - d. Conveyance size
 - e. Lining material (riprap, vegetative, etc. – see SWDM)
 - f. Channel length
 - g. Channel slope (for min and max values – see SWDM)
 - h. Velocity (V_{25} may not exceed non-erosive velocity - DR 8.3.6a)
 - i. Design storm frequency (25 year)
 - j. Design discharge (25 year)
 - k. Normal flow depth (25 year)

Erosion Control Notes Comments:

69. Provide note on erosion control plan: (ESCO 5.3.2f)

THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENTATION CONTROL MEASURES AND PRACTICES SHALL PRIOR TO OR CONCURRENT WITH LAND DISTURBING ACTIVITIES.

70. Provide note on erosion control plan: (ESCO 5.3.2j)

EROSION AND SEDIMENTATION CONTROL MEASURES AND PRACTICES SHALL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE. ADDITIONAL EROSION AND SEDIMENTATION CONTROL MEASURES AND PRACTICES SHALL BE INSTALLED IF DEEMED NECESSARY BY ON-SITE INSPECTION.

71. Provide note on erosion control plan:



SEDIMENT STORAGE MAINTENANCE INDICATORS MUST BE INSTALLED IN SEDIMENT STORAGE STRUCTURES, INDICATING THE 1/3 FULL VOLUME.

72. Provide note on erosion control plan: (ESCO 5.3.4)

MAINTENANCE OF ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AND PRACTICES, WHETHER TEMPORARY OR PERMANENT SHALL BE AT ALL TIMES THE RESPONSIBILITY OF THE PROPERTY OWNER.

73. Provide note on erosion control plan:

THE SOIL EROSION AND SEDIMENT CONTROL ORDINANCE REQUIRES THAT A 25 FOOT BUFFER ADJACENT TO ALL STATE WATERS BE MAINTAINED (ARTICLE 4 SECTION 4.3 PARAGRAPH 15). AN EXCEPTION IS GRANTED TO HOMEOWNERS WHO PERFORM MINOR LAND DISTURBING ACTIVITIES SUCH AS HOME LANDSCAPING, HOME GARDENS, REPAIRS AND MAINTENANCE WORK (ARTICLE 3, SECTION 3.1, PARAGRAPH 3).

Erosion Control Plan Comments¹:

74. Show Graphic scale and north arrow on each sheet.

75. Show existing and proposed contour lines with contour lines drawn at an interval in accordance with the following:

Map Scale	Ground slope	Contour interval (ft)
1"=100', or larger	Flat: 0-2%	0.5 or 1
	Rolling: 2-8%	1 or 2
	Steep: 8%+	2, 5, or 10

76. Delineate and list acreage of contributing drainage basins on the project site.

77. Delineate on-site wetlands and all state waters located on and within 200 feet of the project site.

78. Delineate 25-foot undisturbed buffers on state waters. Clearly note and delineate all areas of impact.

79. Obtain a variance from EPD for encroachment into the state waters buffer.

80. Obtain a variance from the City for encroachment into the 75'/50' City stream buffer.

¹ (duplicate of GSWCC "EROSION, SEDIMENTATION & POLLUTION CONTROL PLAN CHECKLIST for COMMON DEVELOPMENTS" last revised July 2007)



81. Show soil series and their delineation.
82. Show all revision and drawing creation dates.
83. Delineate Limits of Disturbance for each phase of construction.
84. The qualified design professional must sign, seal and list GSWCC Level II certification number on all Erosion, Sedimentation and Pollution Control plans
85. Show storm-drain pipe and weir velocities and appropriate outlet protection to accommodate discharges without erosion.
86. Provide a minimum of 67 cubic yards of sediment storage per acre drained using a temporary sediment basin, retrofitted detention pond, and/or excavated inlet sediment traps for each common drainage location. Sediment storage volume must be in place prior to and during all land disturbance activities until final stabilization of the site has been achieved. A written rationale explaining the decision not to use a sediment basin must be included in the plan for each common drainage location in which a sediment basin is not provided.
87. Location of Best Management Practices that are consistent with and no less stringent than the Manual for Erosion and Sediment Control in Georgia. Phase plan into initial sediment storage and perimeter control BMP's, intermediate grading and drainage BMP's and final BMP's. Use uniform coding symbols from the Manual, Chapter 6, with legend.
88. Show Name and phone number of 24-hour local contact responsible for erosion, sedimentation and pollution controls.
89. List Best Management Practices to minimize off-site vehicle tracking of sediments and the generation of dust.
90. Delineate sampling locations, perennial and intermittent streams and other water bodies into which storm water is discharged.
91. Identify/Delineate all storm water discharge points.
92. Provide hydrology study and maps of drainage basins for both the pre- and post-developed conditions.
93. Provide vicinity map showing site's relation to surrounding areas. Include designation of specific phase, if necessary.
94. Identify the project receiving waters and describe all adjacent areas including streams, lakes, residential areas, wetlands, etc. which may be affected.
95. Plan must address BMP's for all phases of common development including individual building lots and out-parcels, etc. regardless of who owns or operates the individual sites. Include a typical and any situational lots as applicable.



96. Design professional's certification statement and signature that the permittee's ES&PC Plan provides for an appropriate and comprehensive system of BMP's and sampling to meet permit requirements as stated on page 15 of permit.
97. Design professional's certification statement and signature that the site was visited prior to development of the ES&PC Plan.
98. Indication that non-exempt activities shall not be conducted within the 25 or 50-foot undisturbed stream buffers as measured from the point of wrested vegetation without first acquiring the necessary variances and permits.
99. Plan must describe practices used to reduce the pollutants in storm water discharges.
100. Indicate that the applicable portion of ES&PC Plan is to be provided to each secondary permittee prior to the secondary conducting any construction activity and that each secondary shall sign the Plan or portion of the Plan applicable to their site. List the names and addresses of all secondary permittees.
101. Indicate that the design professional who prepared the ES&PC Plan is to inspect the installation of BMP's within 7 days after initial construction activity begins.
102. Include certification and signature in accordance with section V.G.d. of the permit.
103. Indicate that amendments/revisions to the ES&PC Plan which have a significant effect on BMP's with a hydraulic component must be certified by the design professional.
104. Describe the nature of the construction activity.
105. Create a chart or timeline of the intended sequence of major activities which disturb soils for the major portions of the site (i.e., initial perimeter and sediment storage BMP's, clearing and grubbing activities, excavation activities, utility activities, temporary and final stabilization).
106. Provide an estimate of the runoff coefficient or peak discharge flows of the site prior to and after construction activities are completed.
107. Describe the measures that will be installed during the construction process to control pollutants in storm water that will occur after construction operations have been completed.
108. Indicate that waste materials shall not be discharged to waters of the State, except as authorized by a Section 404 permit.
109. Document that the ES&PC Plan is in compliance with waste disposal, sanitary sewer, or septic tank regulations.
110. Add BMP's for the remediation of all petroleum spills and leaks.
111. Add details of required inspections and record keeping by the primary permittee, secondary permittees and tertiary permittees.



112. Describe the analytical methods to be used to collect and analyze the samples from each location.
113. Indicate the Appendix B rationale for outfall sampling points where applicable.
114. Provide information on sampling frequency and reporting requirements.
115. Provide land lot and district numbers for site location. Describe critical areas and any additional measures that will be utilized for these areas.
116. Provide name, address and phone number of primary permittee.
117. Note total and disturbed acreage (the disturbed area shall be the total estimated disturbed area of the primary and secondary permittees) of the project or phase under construction.
118. Clearly note statement in bold letters- **"The escape of sediment from the site shall be prevented by the installation of erosion and sediment control measures and practices prior to, or concurrent with, land disturbing activities."**
119. Clearly note maintenance statement in bold letters - **"Erosion control measures will be maintained at all times. If full implementation of the approved plan does not provide for effective erosion control, additional erosion and sediment control measures shall be implemented to control or treat the sediment source."**
120. Clearly note the statement in bold letters - **"Any disturbed area left exposed for a period greater than 14 days shall be stabilized with mulch or temporary seeding."**
121. Provide detailed drawings for all structural practices. Specifications must, at a minimum, meet the guidelines set forth in the Manual for Erosion and Sediment Control in Georgia.
122. Provide vegetative plan, noting all temporary and permanent vegetative practices. Include species, planting dates and seeding, fertilizer, lime and mulching rates. Vegetative plan shall be site specific for appropriate time of year that seeding will take place and for the appropriate geographic region of Georgia.

Storm Water Management Report Comments:

123. Provide a storm water management report certified by a Professional Engineer for review and comment. (DR 8.2.1a)
124. Provide a narrative in the storm water management report explaining the purpose of the report.
125. Provide an executive summary of the report's findings, including pre-developed and post developed flow comparisons, energy dissipation summary, times of concentration summary, curve number summary, and gutter spread summary.
126. Provide a map showing drainage areas used for pipe design. (DR 8.2.1b)
127. Provide a map showing drainage areas for all hydrographs. Preferably county GIS. (DR 8.2.1b)



128. Provide a map showing all on-site drainage areas, off-site drainage areas, and all pond bypass areas considered in detention calculations. (DR 8.2.1b)
129. Provide gutter spread calculations in report. Maximum spread shall be 10', 16' combined from both sides of the street, during 10-year storm event. (DR 8.3.5e)
130. Provide calculations verifying the adequacy of existing pipe to carry the proposed discharges. (DR 8.2.1c.1b)
131. Provide calculations showing discharge of concentrated flows into the streets do not exceed the flow rates in table 9-G of the Development Regulations. (DR 9.9.5a)
132. Provide calculations showing outlet pipe for detention ponds will accommodate 125% of Q_{100} routed, if no earthen embankment emergency spillway is proposed. (DR 9.8.4b)
133. Provide runoff coefficient calculations (for pipe and channel design only) showing offsite upstream areas as fully developed per the current land use plan. Follow the procedures set forth in the *Gwinnett County Storm Water Design Manual*. (DR 8.3.4a & DR 8.4.1h)
134. Provide Time of concentration calculations for all hydrographs. Follow the procedures set forth in the *Gwinnett County Storm Water Design Manual*. (DR 8.2.3h)
135. Provide Curve Number calculations for both pre-developed and post-developed conditions for all hydrographs. Follow the procedures set forth in the *Gwinnett County Storm Water Design Manual*. (DR 8.2.3h)
136. Provide detention pond computer output for the 2, 5, 10, 25 and 100-year storms in basins where detention becomes necessary. (DR 8.2.3i)
137. Provide Water Quality BMP calculations. BMP's should be designed using the calculation sheets in Chapter 8, Appendix A of the Storm Water Design Manual. (DR 8.9.1)
138. Provide storm water detention in Basin(s) for the 2, 5, 10, and 25-year storms. Route the 100-year storm through the pond so that the earth embankment will not overflow. (DR 8.2.3b)
139. The Rational Method may not be used for detention pond design. (DR 8.2.3f & SWDM 2.1)
140. Provide an analysis of downstream conditions. Analysis of downstream conditions shall include the following: (DR 8.2.1c)
 - a. Describe in combination with a topographic map, 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 conveyance to ensure channel velocities do not exceed values recommended in the Storm Water Design Manual.
 - c. Analyze existing pipe systems and culverts for compliance with current development regulation design criteria. Culverts should pass Q_{100} .



- d. Provide Hydrograph comparisons for the 1, 2, 5, 10, 25, 50 and 100 year storms for both the downstream property line study point and the point where the drainage basin equals 10 times the project area.
141. All hydrographs shall be based on a 24-hour storm. (DR 8.2.1c.2c)
 142. Provide a cross-section of detention pond embankment including outlet pipe, emergency spillway, embankment slopes, minimum embankment top width, outlet control structures, headwalls, and riprap. Verify that minimum 1'-6" freeboard above maximum water surface elevation is provided for earthen dams.
 143. Provide Energy dissipation calculations/designs for outlet headwalls of pipes and detention ponds.
 144. No orifices less than 3" in diameter are permitted that are not part of a water quality BMP. A trash rack with a surface area of at least 10 square feet shall protect all orifices less than 15" diameter. Provide detail.
 145. For the site, use pre-developed CN less than or equal to 55 unless approved by this office.
 146. Post-developed flows in every basin must be less than or equal to pre-developed flows.
 147. Inlet and outlets of detention pond should be at opposite ends of the pond to maximize flow length. Baffles or islands may be installed to increase the flow path length and to minimize short-circuiting.
 148. Provide calculations showing emergency spillway is designed to pass the 100-year storm event and that freeboard for earthen dams is at least 1.5 feet above 100-year ponding elevation and 0.5 feet for non-earthen dams.
 149. Show calculations for Water Quality Volume (WQ_v). Use the equations from page 2-30 of the GCSWDM.
 150. Show Calculations for Channel Protection Volume. Use the equation from the Gwinnett County SWDM.
 151. Outlet orifices shall be protected from clogging. Recommend perforated double "Y", surrounded by a 48" perforated 1/2 round (if outlet control structure is flat) or a 48" perforated 3/4 round (if outlet control structure is round). This 48" perforated pipe will then be surrounded by #4 stone or smaller. See standard details.
 152. Provide a forebay equaling 10% of the water quality volume must be provided for each inlet to the pond. Provide calculations within report and show grading details on plans.
 153. Treat the runoff from the first one inch of rainfall on the project site as outlined in chapter 8 of the *Gwinnett County Storm Water Design Manual*. An area equivalent to the entire project site must be treated. (DR 8.9.1)
 154. Off-site runoff that flows to the BMP must be treated along with on-site runoff. Off-site runoff may bypass the BMP. (DR 8.9.1)
 155. Use the Storm Water Quality Performance Review form to perform the TSS analysis for the project site.



The form can be downloaded at www.gwinnettstormwater.com under *Documents* and then *Planning and Development Storm Water Plan Review Forms and Documents*.

156. The modeled TSS load shall not exceed 850 lbs./acre/yr. (DR 8.9.1)
157. Provide a map delineating the different land use types for water quality analysis purposes. (i.e. Impervious Area, Disturbed Pervious Area, Undisturbed Upland Area, Undisturbed Stream Buffer Area)
158. Do not model off-site areas. The analysis should only consider areas included in the property being developed.
159. Portions of this project may encroach on waters of the U.S. It is the responsibility of the applicant to speak with the United States Army Corps of Engineers about acquiring appropriate permits for this activity. Submit attached *Environmental Permits Affidavit* that is signed and notarized by the owner.

Please call us if you have any questions.

Sincerely,

CLARK PATTERSON LEE

S/Richard J. Edinger

Richard J. Edinger, P.E.
Principal Associate