

Engineering has reviewed the plans for the Cottages at College Acres project submitted May 3, 2019 and have the following comments:

Stormwater Management Permit Application Form

1. I. General Information; #2: There are discrepancies with the addresses of the parcels and the consent letters provided.
 - i. 4738 College Acres Drive is listed as part of the project yet there is not a consent letter from the owner of that parcel (R05508-005-007-000; Owner: Michael and Pamela Bronson).
 - ii. There is a consent letter for 4716 College Acres Drive (R05508-005-012-000; Owner: C&D Real Estate Associates, LLC), but the application doesn't list the address as part of the project.
2. III. Contact Information; #1: Will the multiple property owners remain the property owners? Or is there a purchase pending where College Acres Development, LLC will become the owner of all the parcels? If so, the application can be filled as if CAD, LLC is now the current property owner. If not, carry on.
3. III. Contact Information; #2: The provided consent letters do not provide the required contact information for the property owners.
4. IV. Project Information; #15: Only complete this if there is off-site impervious draining to your SCMs.

Supplement-EZ Form

5. Infiltration System:
 - a. Verify the design volume of the SCM
 - b. General MDC from 02H .1050; #1: The SCM is not sized to treat the SW from all surfaces at build-out. Answer 'no'.
 - c. Infiltration System MDC from 02H .1051:
 - i. #1: Revise the soil infiltration rate.
 - ii. #5: Length is 177 ft.
 - iii. #5: Width is the combination of the two trenches: 20.25 feet.
 - iv. #5: Surface area of the bottom of the infiltration system needs to include both systems.
 - v. Revise estimated dewatering time based on revised infiltration rate.
 - vi. ABC is not an acceptable stone for an infiltration trench. Washed #57 is specified in the plans.
6. Wet Pond:
 - a. General MDC from 02H .1050:
 - i. #1: The SCM is not sized to treat the SW from all surfaces at build-out. Answer 'no'.
 - ii. #3: 1:1 is not an accurate description of the slopes of the SCM. Just list 3:1 for the slopes of the main pond below the permanent pool.
 - iii. #5: The NCDEQ SW Design Manual only recommends an emergency spillway, but the City's technical standards require one in Chapter V, Section D.4.e. Please revise wet pond design to include an emergency spillway and enter 'yes' in the supplement.
 - b. Wet Pond MDC from 02H .1053:
 - i. #1: Enter the provided surface area of the main permanent pool: 3,678sf.
 - ii. #2: Elevation of the bottom of the permanent pool is 30'. Exclude the sediment storage.

- iii. #5: Look at Figure 5 (Forebay Diagram) for the depth of forebay at entrance and exit. 48" works for the entrance depth, but zero (0) doesn't meet the intent for the depth at exit.
- iv. #6: Slope of the vegetated shelf is H:V (6:1).

Stormwater and Erosion Control Narrative

7. Project Narrative, Pre-Developed Drainage Area 1 (Node 1S) and Infiltration Pipe system (Trench Node 1P and Post Dev Node 1S): Use of 'D' (undrained) soils and exfiltration rate of 16in/hr will not be permitted. See explanation in Pond Routing comments.
8. Wet Pond-NCDEQ Wet Retention Basin MDC:
 - a. Elevation of Wet Detention Pond Bottom should be 30'. Exclude the 1 foot of sediment storage.
 - b. Depth of Permanent Pool is 6 feet (36'-30'=6'). Exclude the sediment storage.
 - c. What Impervious cover percentage and average depth of pond did you use to get the 5.20 SA/DA Ratio? Provide the calculation.
9. Infiltration System Design #1:
 - a. The infiltration rate of 16.67 in/hr was found at a depth of 10 inches (elev: 40.17') below the existing grade elevation of 41.00' (location B-2) per the soils report. A second test was done at the same location at a depth of 42 inches (elev: 37.50') below the existing grade and the rate was found to be 0.86 in/hr. The trench bottom is at elevation 38.70' which is approximately halfway between the two depths. You will need to justify the 16 in/hr infiltration rate for design purposes. I strongly suggest revising the infiltration rate being used to design the system to something less than 16 in/hr but greater than 0.86 in/hr.
 - b. Verify where HydroCAD supports the provided storage of 6,171cf.
 - c. Basin width appears to only be for Infiltration system A with a width of 12 feet. Width should be 20.25' (12' (A) + 8.25' (B)).
 - d. Drawdown time should not be based on an infiltration rate of 16 in/hr.
10. Pond Routing:
 - a. Overall Pre-development watershed acreage should match the Overall Post-development watershed acreage. You can just use the total on-site acreage of the project for pre and post watershed areas. It appears that runoff from the College Acres right-of-way runs to the southeast...parallel to the project...Reference sheet DA-1.
 - b. Pre DA Overall: How can you justify the use of D soils for this site and at 56% percent of the pre-development drainage area at that? The soils reports reveal a low water table, sandy profiles to depths greater than 24 inches below the existing grade and at least one high infiltration rate within the first 24 inches (Location B-2) of the soil profile. The use of D soils will not be allowed. Please revise the calculations using only A soils.
 - c. The area from the front of the proposed buildings along College Acres Drive and the property line must be included in the post-development runoff rate to make sure post-development runoff is less than the pre-development runoff. This area may not be excluded from pre/post requirements.
 - d. Summary for Pond 1P: UG Infil:
 - i. Verify the available storage provided, it appears to be approximately 600 cf more than what is actually provided by the system.
 - ii. Again, 16 in/hr Exfiltration over Surface area is not an acceptable rate.
 - e. Summary for Pond 2P:
 - i. Pipe length for 18" Round should be consistent with pipe length in double outlet structure detail.

- ii. If I understand your outlet structure correctly, you can't have 16lf at 39.50' if the two risers are part of the same structure. You can only have 12 feet. 16lf is only achieved at 40' with the emergency riser.
 - iii. The intent of the emergency outlet or overflow technical standard is that the overflow is disconnected from the principal spillway, i.e. an earthen spillway. This design does not meet the intent of the technical standard. If the 18-inch pipe outleting both structures is blocked then water cannot get out of the pond other than to crest its banks. Please address this with all routing scenarios including the "blocked" routing.
11. 10/50-year HGL Calculations:
- a. For clarity purposes, add a line to the calculations for each pipe run that enters the UG-INFIL from DI 100, DI 103 and CI 304.
 - b. Is the invert for DI 103 38.90' or 39.00'? Please verify with the pipe schedule on C-4.0.
 - c. The drainage areas for the 300-level structures are incorrect. The area between the front of the proposed buildings and the curb and gutter is not shown to be collected by the structures. Based on the grading, these areas are collected by them. Revise sheet DA-1.
 - d. Which label is correct, DI 301 or DI 302? Not consistent from calcs to DA-1.
 - e. The outflows from the underground infiltration system and wet pond during the 10- and 50-year storms need to be accounted for in the HGL calculations. Currently, this does not appear to be the case.
 - f. Provide spread calculations for the structures within the public r/w. Can use an intensity of 4 in/hr to determine spread. Spread cannot exceed eight (8) feet or 1/3 of the street width, whichever is less.

Design Documents

- 12. Cover sheet: The site hatching in the Vicinity Map and the Soils Map are not consistent with one another. Verify which parcels make up the project boundary.
- 13. Provide an Existing Conditions Plan to the submittal set.
- 14. Provide a Landscape Plan.
- 15. Provide the Utility Plan.
 - a. No driveway shall be permitted to conflict with any municipal facility such as traffic signals, catch basins, fire hydrants, crosswalks, loading zones, bus stops, utility poles, fire alarm supports, meter boxes and sewer cleanouts or other necessary structures, except with express approval of the appropriate city officials.
 - b. Are the water lines to be installed by open-cutting College Acres Dr.? If so, add appropriate City details to the plan set. Show limits of open cut.
 - c. Can you tap the existing waterline in a different location for the proposed fire line to avoid a conflict with the existing storm pipe on the far side of C.A. Drive?
 - d. The proposed blow-off assembly should be traffic rated or it will surely be damaged.
- 16. C-2.1:
 - a. Flares are only required to be 13-foot wide. They also should be in line with the rear edge of the sidewalk, not the front edge. Please see the Commercial Driveway detail (SD 3-03.3).
 - b. Add curb and gutter from the existing western most driveway to the first proposed commercial driveway along College Acres Drive.
 - c. Add curb and gutter from the eastern flare of the eastern commercial driveway to the property line.

- d. With the addition of curb and gutter, stormdrain pipes and structures along College Acres Drive, the existing driveway pipes and existing stormdrain system should be removed. Add a Demolition Plan to the set to show the demolition that will occur in the public r/w.
 - e. The proposed sidewalk along C.A. Drive appears to have conflicts with existing utilities.
 - f. Add limits of disturbance to the plan sheet.
 - g. Add spot grades to the sidewalk that connects the site to the bus stop.
 - h. Show the 10-foot non-municipal easement along C.A. Drive r/w.
17. C-4.0:
- a. Delete the existing storm system in the C.A. Drive r/w.
 - b. The minimum cover over a storm drainage pipe shall be 2.0 feet. See Chapter V.D.1.f of the technical standards.
 - c. The rim elevations of the structures in the r/w do not appear to agree with the existing eop elevations. Please verify.
 - d. Saw cutting of asphalt, mill and overlay, lap joints, etc. may be required for the installation of the C.A. Drive curb and gutter. Coordinate with Construction Management (Bret Russell; bret.russell@wilmingtonnc.gov; #341-5890).
 - e. Provide spot elevations along the C.A. Drive sidewalk to demonstrate constructability and ADA compliance.
 - f. DI 302 and associated piping will need to be in a public drainage easement since there is conveyance of public water and the system leaves the public r/w. Easement width to be based on the technical standard found in Chapter V.D.1.g.
 - g. Address how roof runoff will get to its permitted SCM. Will the roofs be guttered with the downspouts tied into the systems? Needs to be clearly depicted so there isn't another Lakeside Reserve issue.
 - h. Need an adequately sized energy dissipater at FES 300.
 - i. It would appear that the grading has created a low area with no outlet along the rear property line that could potentially create standing water on the adjacent property. Please address.
 - j. Can the sidewalk between the building and the pond be graded to direct runoff to the forebay via sheet flow or a depression with a yard inlet? Avoid sending runoff to the adjacent property.
 - k. Show the 10-foot maintenance access and the 5-foot landscape zone around the wet pond per the technical standards (Chapter V.D.4.g/h).
 - l. Ditch cleanout downstream of the systems outfall may be required. Cannot negatively impact the downstream conveyance measures and/or downstream properties. The proposed system outfall elevation (35.60') is lower than the next downstream driveway pipe invert (35.76')?
 - m. Is there no way to collect and treat the sidewalk connections from each building along the C.A. Drive frontage? Slope sidewalks to common low areas and collect with yard inlets? That's quite a bit of uncollected runoff.
18. C-6.0/6.1/6.2:
- a. If using multiple details for curbing and sidewalk, etc., then denote what detail applies where somehow in the plans. City infrastructure needs to be built to city standards.
 - b. C-6.1: Asphalt Pavement Section does not specify thicknesses.
19. C-6.3:
- a. The trench widths in the table appear to be mixed up for the two systems.
 - b. Remove the note addressing HDPE outfall pipes in the double outlet structure detail.

- c. Double Outlet Structure Detail does not appear to be drawn correctly based on the structure in plan view on C-4.0.
20. DA-1:
- a. The drainage area coming to DI 101 does not appear to be feasible.
 - b. Where does the 1,566sf drainage area drain to?
 - c. Correct DI 302 label to DI 301 and provide a delineated drainage area.
 - d. DI 201 and DI 201 share the same drainage area?
 - e.

Please submit one complete set of plans, application, supplement, stormwater narrative and calculations and any other supporting documentation to Engineering for additional review. Please call or email if there are any questions. Thank you.