

September 12, 2018

Mr. Patrick Byker  
Morningstar Law Group  
112 W. Main Street, 2<sup>nd</sup> Floor  
Durham, NC 27701

**RE: Sanderway  
Carrboro, North Carolina  
SPEC-18092**

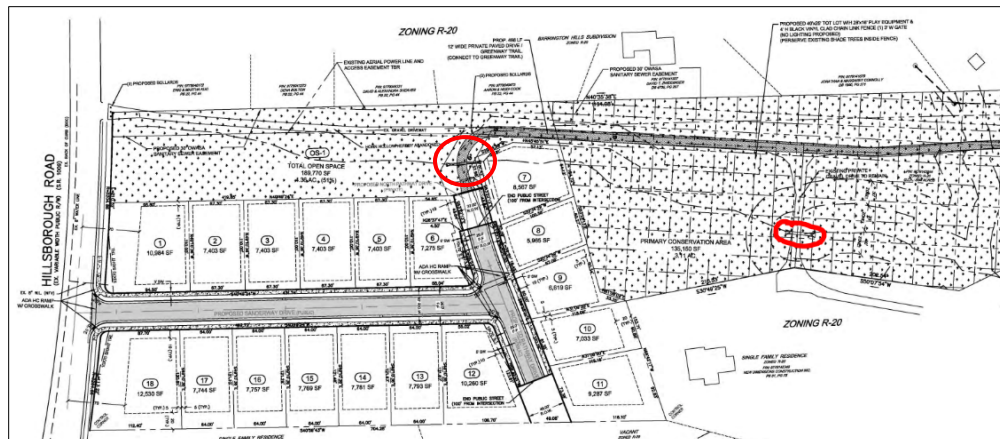
Dear Mr. Byker,

*McAdams was tasked with reviewing the stormwater design calculations and construction drawings provided to us by Jeff Kleaveland from the Town of Carrboro on August 30<sup>th</sup>, 2018. The purpose of this review was to determine how/if the Sanderway development meets the Town of Carrboro stormwater rules and to determine what analyses were performed to ensure the downstream neighbors will not be adversely impacted by the proposed Sanderway development. The following questions/comments were generated from the review and require additional information to ensure all applicable requirements are being met for the proposed development:*

*Additional Items may be added to this list following the receipt of additional information.*

### Detention Analysis

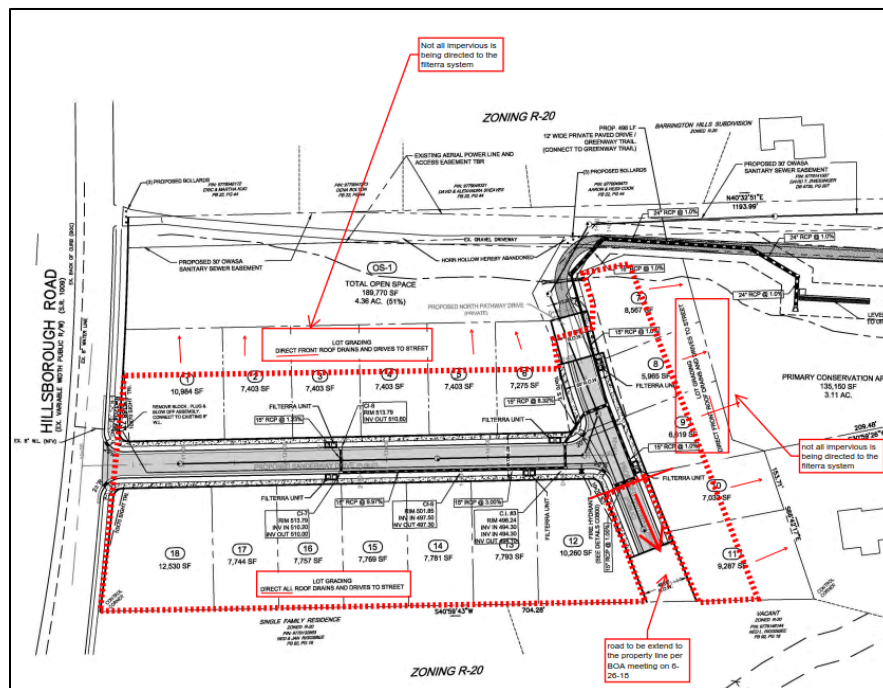
- Is there a detention exemption for the site that gets the proposed development out of 1-, 2-, 5-, 10-, and 25-year storm peak flow detention? No hydrograph analysis has been presented for review to back up the detention requirements of the ordinance.
- No information was provided to support a peak flow analysis was completed at the locations circled below and where runoff leaves the Sanderway property.



### Water Quality Calculations

- No calculations are provided to support 85% average annual removal rate for Total Suspended Solids (TSS)
- No bypass impervious is shown in the SNAP tool, although the utility plan (sheet C0300) mentions that some areas will only take the front roof drains to the system (impervious areas on site are bypassed and do not enter the stormwater treatment system).

| Total Land Use Area Treated By All SCMs (ft <sup>2</sup> ) | Allowable Total Land Use Area to be Treated Based on Post-Project Areas (ft <sup>2</sup> ) | Post-Project Untreated Land Area (ft <sup>2</sup> ) |
|--|--|---|
| 36,900   | 36,900   | 0   |
| 34,478   | 34,478   | 0   |
| 14,002   | 14,002   | 0   |
| 0  | 189,702  | 189,702   |
| 96,468   | 96,468   | 0   |
| 0  | 0  | 0   |
| 0  | 0  | 0   |
| 0  | 0  | 0   |
| 432  | 432  | 0   |
| <b>182,280</b>   | <b>371,982</b>   | <b>189,702</b>                                      |



### Volume Control

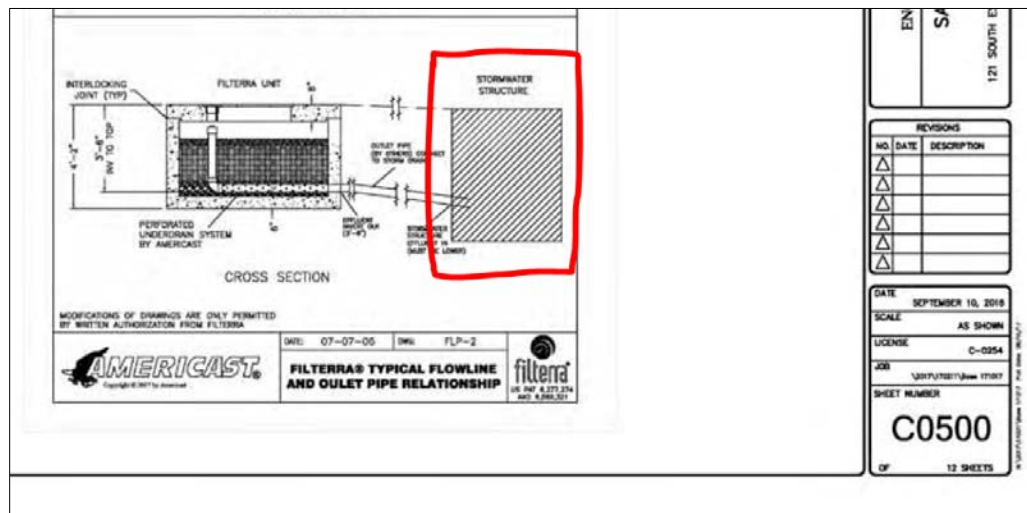
- No calculations were provided to show the “preexisting Composite Curve Number” that was used to determine the “Maximum allowable increase in annual stormwater runoff volume.”

A composite curve number shall be assigned to the development site in the pre-development stage using the runoff curve number method described in USDA NRCS Technical Release 55, Urban Hydrology for Small Watersheds (June, 1986). See also Chapters 4 through 10 of NEH-4, SCS (1985).

| Preexisting Composite Curve Number* | Maximum allowable increase in annual stormwater runoff volume |
|-------------------------------------|---|
| > 78                                | 50%   |
| >70-78                              | 100%  |
| > 64-70                             | 200%  |
| <=64                                | 400%  |

### Stormwater Control Measure Design

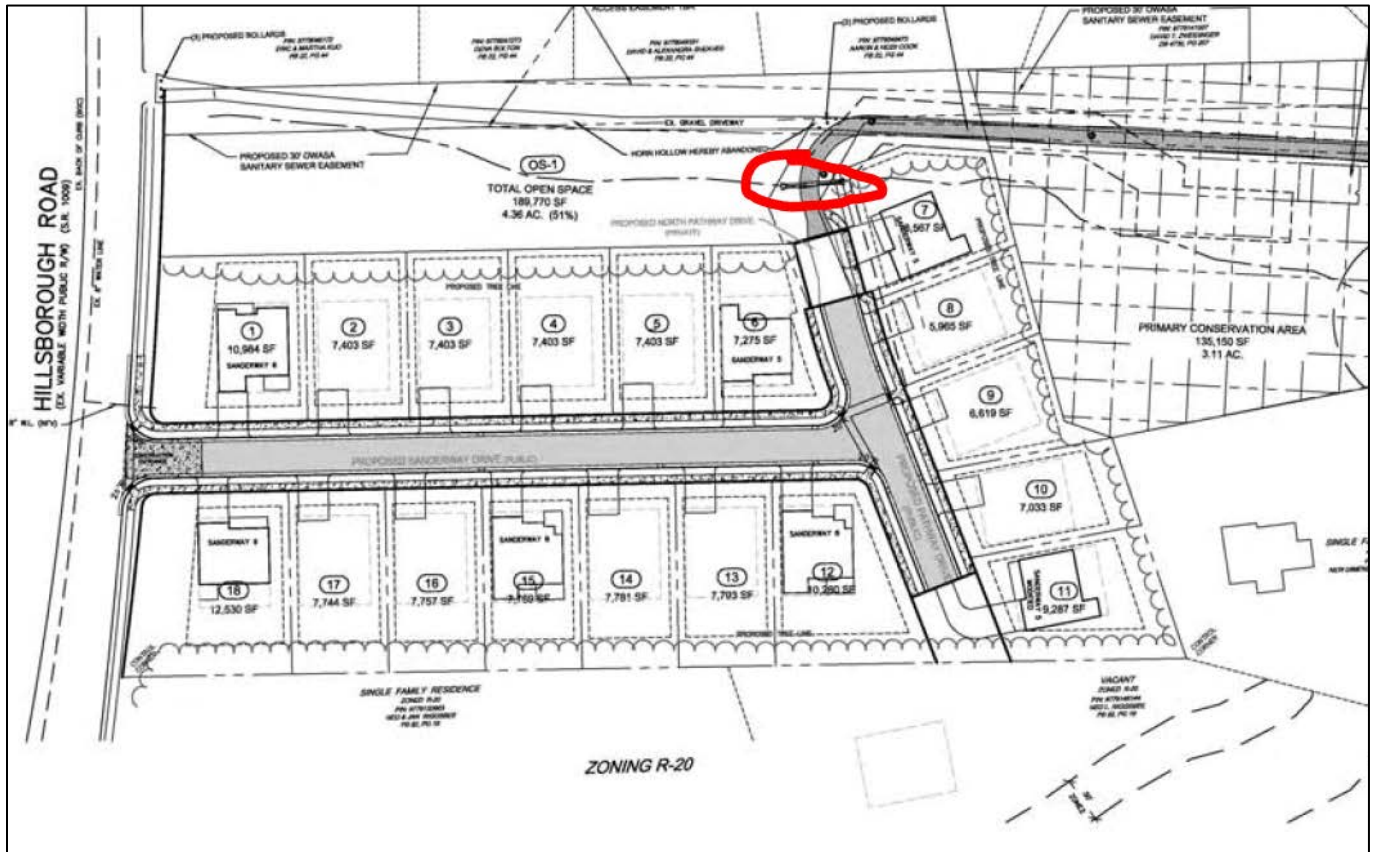
- No calculations were provided to show how detention is being provided in the “Stormwater Structure” located on sheet C0500
- What measures are taken to prevent backflow from the site drainage system to the stormwater Filtterra system?



- No splitter box calculations are provided for the level spreader
- No level spreader sizing calculations are provided
- No riprap velocity dissipator calculations are provided or shown on the construction drawings.

### Construction Drawing review

- Is the existing 12" culvert where Sanderway connects to the greenway being replaced? Not labeled on plans



- No outlet structure detail is provided for the “Stormwater Structure” that is supposed to be providing detention
- No level spreader details are provided
- No splitter box details are provided.
- No riprap is specified on the plans at the outfall.

Sincerely,

**MCADAMS**

Amos Clark, PE  
Division Director, Engineering + Environmental

Daniel Perry, PE  
Project Manager, Water Resources