

The Major Problems

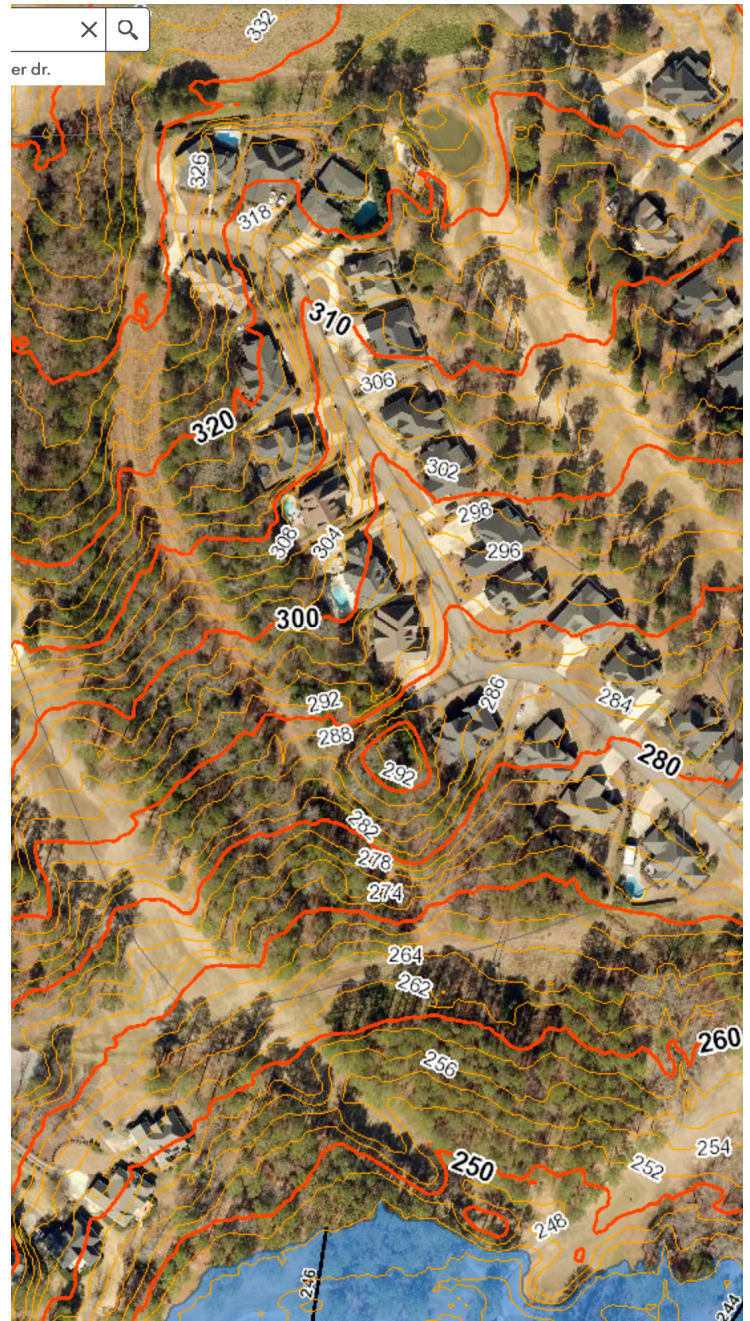
Volume and Velocity Engineering Problem

When taking the information provided by DHEC's reports on how to control silt it is evident that the planning and engineering was flawed from the start. The design of the project was contrary to nearly everything DHEC says about the issue of Volume and Velocity.

In this case we have the following conditions:

- Volume
 - A dirt road base run of over 1050 feet, and about 50' wide,
 - This equals 52,500 sq. ft. of unprotected dirt, which is over 1.2 acres,
 - On top of this the area, the sides of the road contain another 10 feet, or so, of mixed dirt and disturbed ground,
 - All of these areas are funneled into a lower roadbed, to create a flume for silt headed to a cul-de-sac area.
- Velocity
 - All of this water volume is being pulled down by gravity by a 1050 foot run sloping down 68 feet in elevation. This is a slope of about 1 foot drop for every 15.4 feet.

All of this Volume and Velocity is being met by one cul-de-sac area that is supposed to be designed to stop 80%, or more, of the silt carried by the watershed. After two tries there has not been a success yet, I don't know if it is possible with the Volume and Velocity problem.



THE FUNNEL TO DIRECT ALL SILT TO THE POND

According to DHEC and EPA information and regulations about Sediment Control, the basic suggestions and standards for design indicates some of the following points:

- "Sediment Basins are a Best Management Practice (BMP) used to collect and impound stormwater runoff from disturbed areas (typically 5 acres or more) at construction sites to restrict sediments and other pollutants from being discharged off-site. These basins may also be used to control the volume and velocity of the runoff through a timed release by utilizing multiple spillways. It is through this attenuation of runoff that sediment basins may be capable of meeting South Carolina's Design Requirements, specifically the Total Suspended Solids (TSS) removal efficiency of 80%."² The definition of a BMP is "Methods or techniques found to be the most effective and practical means in achieving an objective." Was this considered, and if so, why was the decision made to not use this BMP?
- "Segment the site into manageable sediment storage areas for using multiple silt fence runs. The drainage area above any fence should usually not exceed a quarter of an acre."¹ This indicates that the flow down the hill should have required at least four control segments to slow the flow of water and sediment before hitting the final area in the cul-de-sac area.
- "Water flowing around the ends of a silt fence will cause additional erosion and defeat its purpose. The bottom of each end of the fence should be higher than the top of the middle of the fence. This insures that during an unusually heavy rain, water will flow over the top rather than around either end of the fence. Only fine suspended material will spill over the top, which is not as harmful as having erosion at the ends."¹ Most of the sediment fences I have seen have water flowing around the ends and do not have the ends elevated over the middle.

Inspection, Maintenance, and Corrections

I believe this problem is compounding the engineering problems. When I finally got fed up with the silt going into the pond, I went to take pictures and view what the site looked like after a rain on July 20, 2020. I knew there was a problem, but what I found was clearly a construction site that had no interest in inspecting and maintaining the silt control of the site. The pictures speak for themselves.

Then when I was met with the basic opinion of the county, "The engineering was deficient, but the county approved them, and the contractor built to the plans. Therefore, there is nothing that can be done." In an email 10 days later I was told, "Bear in mind we can't stop discolored water which is 20% sediment or less. That is allowed in DHEC regulations, 20% and under."

My response to this remains what I believe still today, "I just found the regulations you speak about, but what we have is a 100% problem, since the fences were either non-existent, poorly engineered, not maintained, or all of the above."

There were many failures, but I know that Inspection and Maintenance has caused just as much, or more, damage than poor engineering. I believe the pictures I took prove this point and I need to say no more.

Here are what the regulations say. (This was taken from reference #3):

Also there are these regulations:

- "As a construction site's dynamics change, the silt fence layout should be adjusted when necessary to maintain its effectiveness. It is evident that inspections, if done, were never followed up on.
- Silt fences should be inspected routinely and after runoff events to determine whether they need maintenance because they are full or damaged by construction equipment. The ASTM silt fence specification (ASTM 2003) recommends removing sediment deposits from behind the fence when they reach half the height of the fence or installing a second fence."¹

References

- 1 - <https://www3.epa.gov/npdes/pubs/siltfences.pdf> "EPA's Stormwater Best Practices"
- 2 - <https://www.scdhec.gov/sites/default/files/docs/Environment/docs/sedim-Basin.pdf>
- 3 - https://www.scdhec.gov/sites/default/files/docs/Environment/docs/Appendix_H.pdf
"Appendix H, Sediment Control and Standard Details"