

# Main Input Ditch

## A Volume, Velocity, Maintenance, and Design-Build Problem

Anyone who has viewed the new Golden Hills home development site since December 2020 can clearly see there has been a big improvement in sediment control. All of the pavement is completed, storm drains are properly installed, grass has covered about all of the unstable areas, and more.



This is great news, but there is another stage coming to our silt problem - with the development of around 50 new homes, this will reopen acres of soil that will be loose and ready for erosion.

This would not be a problem if all contractors fully comply with all the erosion control methods required; however, anyone familiar with construction sites knows there will be many erosion problems left unprotected.

The bad news is that this would not be much of a problem if the storm drainage system was properly designed, constructed, and inspected. Unfortunately for us, this is not the case.

Due to poor engineering, construction, maintenance, and governmental (State, County and Town) oversight, we have what is a Volume, Velocity, and Maintenance Problem. Simply put we have a lot of water coming from a very large area, moving fast into a small area deficient in size and needed silt protection.



What we have are the following problems:

#1: **Volume:** Two development areas encompassing over 20 acres of land with nearly 100% of its stormwater going to one inadequate ditch system not designed, built, or maintained to handle this volume.

#2: **Velocity:** The water is coming fast and furious from a 70 foot drop from the top of the development to the

bottom, with most of the drop-down over a 5% to 6% grade.

#3 **Design, Build, and Maintenance:** All of the water coming at a high velocity hits a single ditch that is undersized and poorly designed for volume, velocity, and silt control.

It does not require an engineer to look at this ditch to reasonably know that it will not be able to handle a half-inch of rain over an hour, or less, where up to 271,524 gallons of water comes into this ditch within a period of time of about an hour and one half. This is enough water to fill just short of thirty 21 foot wide by 4 foot deep pools. Which is

also around 3,016 gallons of water per minute, which is enough water to overflow a 12 foot wide by 4 foot deep pool every minute. Again, it does not require an engineer to know that this ditch in its present condition will generally not stop 80% of the silt required by DHEC stormwater regulations for anything other than small amounts of rain.





#4 **System Note:** I am told that this problem was recognized by DHEC a few years ago. In response to silting problems experienced with the build of Raymond Circle development area of Golden Hills, they required the ditch that runs along the #6 fairway to be a silt catch basin. It is hard to tell today, but there were rock silt check dams



installed about every thirty feet or so to catch the silt. The areas between these dams were maybe 2 to 3 feet deep to catch the silt. However, as outlined in DHEC's silt educational material, **the best management practices part of any silt control feature is "required regular maintenance"**. When these voids between the dams are filled with silt, that silt has to be maintained by digging the accumulated silt out and carried to an area not affected by erosion. When looking at this ditch today, you will find it difficult to surmise if this area was ever a ditch. Presently you can only see some of the tops of the rock silt dams.



# Silt Rock Check Dam Education

SCDHEC has a flyer providing best management practices associated with Rock Check Dams at <https://scdhec.gov/sites/default/files/docs/Environment/docs/sedim-Dams.pdf>.

Here are a few important points to know about Rock Check Dams:

**How The Dams Work:** In the picture to the right, you can see how the check dams are elevated but have a lower area in the middle of the dam to allow the water to flow over the top easily. As the water flows down, some amount of silt is caught behind each dam,



and whatever silt gets through or over the first dam has to continue through or over the others. This entire process slows down the water flow and filters out 80% or more of the silt as it flows through all dams.

**Important Design Requirements According to DHEC:** 1) "Maximum Drainage Area is 5 acres", 2) "Spacing varies with the bed slope of the ditch. Space rock checks such that the toe of the upstream check is at the same elevation as the top of the downstream check", 3) "If the rock check dam is not properly sized, the flow will overtop the structure and the Trapping Efficiency is assumed to be 0 percent when this failure takes place"



## Attempted Rock Check Dam

These pictures are of an attempted silt rock check dam for this project. We believe this an insufficient attempt for the volume and velocity of water on this site. Some areas of concern include:

- \* Rock Check Dams not built to DHEC BMP's
- \* Insufficient sediment collection areas
- \* The use of sediment tubes here and the poor installation of them
- \* And more...

