Emergency Spillway: Vegetated

As an extra precaution against flooding, the E-Town team has decided to add an emergency spillway to the design solution. The emergency spillway will be located at the very end of the sand filter basin built just beyond the base of the triangle, providing enough room without taking away space from the vegetated area. An added note that the land naturally slopes about 5% in the same direction. Figure 1 displays how excess discharge from the sand filter basin would flow directly into an emergency spillway located at the base of the basin. The emergency spillway will be specifically designed to allow for precipitation exceeding the design storm for the sand filter basin to safely convey discharge without jeopardizing the function of the sand filter basin and vegetated area ("Emergency Spillway Definition.").

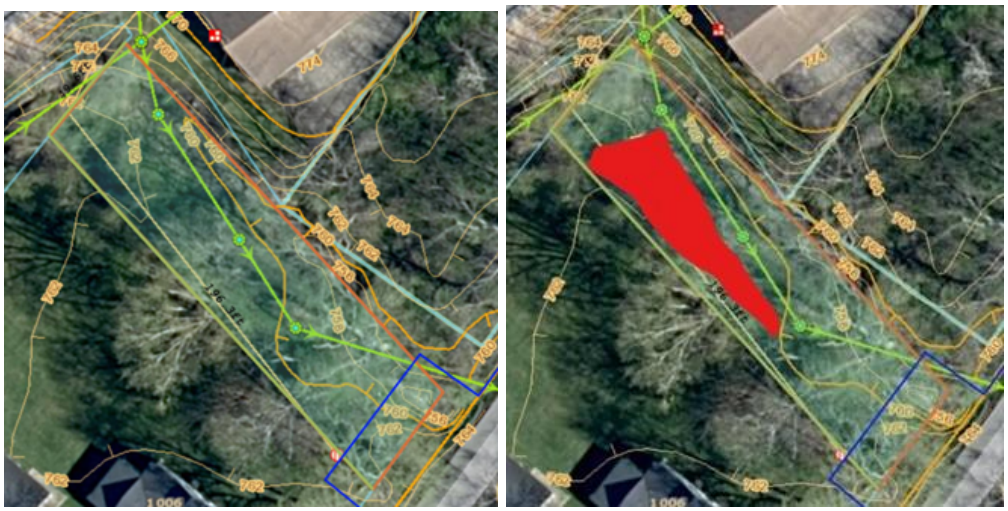


Figure 1: The left image shows the contour lines and the allotted parcel of land for the project. The right image has a rough drawing of where the sand filter basin would be located.

The design of the emergency spillway will have a cut slope design which is similar to a chute spillway design. The emergency spillway will be designed as a vegetated spillway because there is more relevant literature suggesting that a vegetated spillway is better for best management practices (BMPs). The aesthetics of the emergency spillway were taken into consideration with determination that a naturally grassy spillway will match the BMP designs better. There are also a few disadvantages to a spillway made of rip rap that could cause concern for the BMPs. Riprap is more expansive than vegetation, there could be scour at the toe and ends

of the rip rap, and rip rap does not provide the habitat that a vegetated spillway would ("Riprap."). A vegetated spillway would also be a more environmentally friendly solution than concrete considering concrete is already being used to construct the sand filter basin. Concrete has a large carbon footprint with 0.93 pounds of carbon dioxide produced for every pound of concrete (Ramsden). Since concrete is not environmentally friendly, the team wants the project to use as little of it as possible. Thus, meaning that a vegetated spillway would be a better design for this project.

Consideration for the residential area, where the best management practice will be located, is shown by the directed flow of the emergency spillway. The spillway overflow will be directed away from at-risk properties to reduce the chance of flooding in the area (Hunt, William F, and Caleb E Mitchell). A vegetated spillway will also provide a more pleasing view for residents and a safer space for people and animals. The BMP and the emergency spillway will be located on city property which will ensure that the residents of the area are not responsible for performing maintenance on the BMP or the emergency spillway ("Charter and Code of Ordinances Lexington-Fayette Urban County Government.").

Emergency spillways are necessary for almost all basin type BMPs ("Appendix C Vegetated Emergency Spillway - Virginia Tech"). This spillway will be specifically used and designed to take on excess discharge from the sand filter basin in the rare case that a storm exceeds the storm design of the basin. This will technically allow the area to withstand a larger storm event based on the calculations the team does for the size of the spillway. However, it does not expand the original storm design of the sand filter basin and vegetated area.

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