

Filter Constrictions

Current/Future Research

As a continuation of last semester's work, this semester's team will continue to work on improving the imaging and modeling. This will include the addition of a flow accumulator and a head loss element between the tap water pump and the clay and coagulant in order to eliminate flow pulsation. As previous videos showed, the streamlines after the constriction are curved, thus the goal now is to understand the reasoning behind this flow. Moving forward, an increase in raw water turbidity should be considered for the acceleration of the particle deposition process. Though the videos thus far have been able to show floc attachment at the constriction, it would be optimal to be able to capture the specific part of the constriction where the floc is captured. These goals may require the adjustment of the flow cell and other equipment involved in the video capturing process.

Past Research

The goal of the Filter Constrictions Team was to test the hypothesis that particles are captured preferentially at flow restrictions in sand filters. There was evidence for this hypothesis from work done by the Milli-Sedimentation Team of Fall 2016 and the Stacked Rapid Sand (StaRS) Filter Theory Team. The goal of the team was to create a flow constriction in a small, ~0.5 mm, channel in a flow cell reactor, and take a video of the particles at the constriction. The video was taken using the camera system designed by AguaClara PhD students, and provided evidence for or against the hypothesis that flow constrictions serve as particle collection sites. The team built the reactor and showed that flocs indeed were removed at constrictions. More research is needed to show the exact mechanism for this removal to confirm our hypothesis.

Team Members

Thomas Bradford (tsb49)

Jacqueline Dokko (jmd475)

Jonathan Harris (jdh345)

Team Documents

	Challenges	Tasks	Symposium	Presentation	Final Report
Spring '17					
Fall '17					

