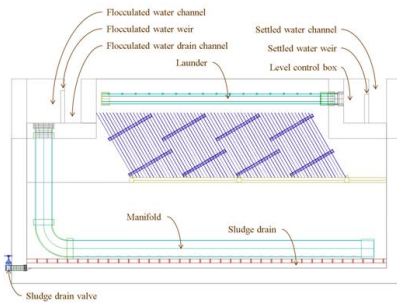


Sedimentation Tank Hydraulics

Sedimentation Tank Hydraulics

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Introduction

A floc blanket is a dense, fluidized bed of particles that forms in the sedimentation tank below the plate settlers. A floc blanket works like a mesh to trap small flocs, thereby reducing effluent turbidity. As flocs are continually resuspended in the blanket, sludge build up on the tank bottom is reduced. The sedimentation needs to be drained and cleaned less frequently, reducing the amount of clean water wasted.

The latest working design of the AguaClara sedimentation tank consists of an inlet manifold with vertical diffusers to channel water into the tank as a line source. A semi-circular half-pipe beneath the diffusers serve as a jet reverser to resuspend flocs. Plate settlers placed above the inlet manifold that catch flocs while allowing water to flow past the settlers into exit launders. The flocs that settle out at the bottom of the sedimentation tank are removed regularly by a sludge drain. Implementing a floc blanket and a floc hopper in the sedimentation tank provide an additional method of filtration and will reduce sludge build up, instead allowing flocs to be wasted at a constant rate from the floc hopper.

Current and Future Research

One of our main goals of the semester was switching our coagulant to PACI instead of alum and see how the change affects performance. The PACI seemed to be much stickier than alum and we had problems with it sticking to the glass and insides of the flocculator. We also conducted experiments switching energy dissipation rates in the jet reverser. We were expecting to find a point where the energy dissipation rate is too high and performance decreased. We didn't find a point where the floc breakup caused a decrease in performance. During these tests we actually found that momentum can play a large role in floc blanket failure because if the momentum of the floc sliding down the incline gets too large it can overpower the jet reverser and cause it to fill up. We also looked at sludge consolidation depending on the depth of the floc hopper. We found that the depth can make a large difference in consolidation.

More Information

[Sedimentation Team Research Rationale](#)
[Sedimentation Team Research Rationale2](#)
[Sedimentation Team Research Report 1](#)

Members

[Casey Garland](#)
[Sedimentation Tank Hydraulics Documents](#)

	Challenges	Tasks	Teach in	Final Presentation
S pri ng '13		? Unknown Attachment	? Unknown Attachment	? Unknown Atta
F all '12	? Unknown Attachment	? Unknown Attachment	? Unknown Attachment	? Unknown Atta
S u m m er '12	? Unknown Attachment	? Unknown Attachment	? Unknown Attachment	? Unknown Atta
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F all '11		? Unknown Attachment	? Unknown Attachment	? Unknown Atta
S u m m er '11			? Unknown Attachment	? Unknown Atta
S pri ng '11	? Unknown Attachment	? Unknown Attachment	? Unknown Attachment	? Unknown Atta

Past Research

[Fall 2010 Inlet Manifold Team](#)
[Spring 2010 Inlet Manifold Research Team](#)