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Saied Khan's Individual Contribution Page

Fall 2011 Contributions

I am currently working on the Sedimentation Tank Hydraulics Team. We test and analyze various bottom geometry to optimize sediment removal through floc blanket formation. We are also discussing floc weir designs to maintain constant height of the floc blanket.

The bulk of our work at the beginning of this semester had been testing our hypothesis that the primary mechanism of floc particle resuspension is the counteraction of hydrostatic pressure of the returning solids with hydrodynamic pressure of the jet at their respective interaction point. We believe that we can design the most appropriate sedimentation tank bottom geometry that will maximize hydrodynamic pressure and therefore optimize floc resuspension. We have designed jet reverser geometries with varying lip configurations, as well as asymmetrical geometries. To test the effectiveness of each design, we have run dye test, with and without flocs, in our laboratory reactor. In doing so, we analyze the flow characteristics of the jet stream and determine the flow at which the geometry fails to maintain a functioning floc blanket. We also ran experiments that tested each bottom geometry's tolerance to asymmetry and found that the single trench design was found adaptable.

As the semester progressed, we explored the design objectives that help to create a floc blanket in a sedimentation tank. This forced us to understand the important design variables and the relationships between them. Once we created a wider knowledge base, we began running performance studies with lamellar sedimentation (tube settlers), where we sampled turbidity at varying stages of treatment.

Spring 2012 Contributions

The direction of this semester's research has been to simulate real life performance of AguaClara tanks. We began by constructing a bottom geometry that represented the retrofit of the Marcala facility over winter break. After testing, we concluded that under the appropriate conditions, the retrofit can produce a reliable floc blanket. The next set of experiments focused on floc hopper design; where the width, height and angle of incline were all varied. We also have interest in seeding our sedimentation tanks in order to decrease floc blanket formation time. This would conceivably have a tremendous impact on facilities that have a relatively low influent turbidities.