

PSS Past research work - summer '08 thru fall '10

Plate Settler Spacing Summer 2008 through Fall 2010

The evolution of the Plate Settler Spacing Team could be traced back to Summer 2008. Here is the overview of the past research work done by the PSS teams:

Fall 2010

[Exploring the Effects of Velocity Gradients on Settler Performance](#)

This page details the continued approach taken to differentiate the effects of velocity gradients from capture velocity for different tube diameter and lengths.

Spring 2010

[Exploring the Effects of Velocity Gradients on Settler Performance](#)

This page details the approach taken to differentiate the effects of velocity gradients from capture velocity for different tube diameter and lengths. This approach proved successful and subsequent experiments are based on these calculations

[Exploring the Coupled Effects of Capture Velocity and Velocity Gradient on Settler Performance](#)

This page details the initial approach taken by the team to design an experiment that would test floc roll-up. The team held the geometric similarity between tubes of different diameters in order to explore changes in residual turbidity caused by the capture velocity and velocity gradient.

Fall 2009

[Experiments with Saturated Water Influent](#)

This section contains the experiment run in collaboration with the Floating Floc team to test the effect of saturated water in the influent on the plate settler performance.

[Experiments with the Velocity Gradient](#)

This section contains the model derived to estimate floc roll up in relation to particle size and velocity. Also, experiments were run to collect data to support the model.

[Experiments with Natural Organic Matter](#)

This section contains experiments testing the effect of natural organic matter (humic acid) on the plate settler performance.

Summer 2009

[Experiments Varying Alum Concentration](#)

This section contains the experiments in which the alum dose was varied in order to test how well the selected geometry ($d = 15.1\text{mm}$) performed when subjected to non-ideal conditions

[Experiments with the Velocity Gradient](#)

The team has conducted physical modeling of the system to investigate the phenomenon of floc roll-up.

[Filter Foam](#)

In current plant designs, head loss through the entrance ports in the sedimentation tank is much greater than the head loss from flow through the plate settlers. Because head loss through the ports is much greater than head loss through the plate settlers, flow through each of the plate settlers in plants in Honduras is not equal. A geotextile foam was placed on top of the plate settler to create head loss to equalize the flow.

[Summer 2009 Research Plan](#)

[Research Plan](#)

Spring 2009

[Experiments with Flow Rates and Inner Tube Diameters](#)

This section contains two related experiments. The first experiment varies flow rates and the inner diameter of the tube settler. From these results, the ideal L/d ratio is identified and held constant for a certain flow rate and inner diameter by varying the tube length.

[Floc Blanket Formation](#)

Experiments exploring the rate of formation and density of floc blankets.

Fall 2008 Preliminary Testing

[Fall 2008](#)

This section contains preliminary observations and data that preceded the experiments run during spring 2009, above.

Summer 2008 Preliminary Testing

[Experiment Using Straws for Tube Settlers](#)

These early experiments explored the impact of the diameter of tube settlers on effluent turbidity. Tube settlers were modeled using drinking straws.