Lab 5: Open Channel Flow – Experimental Design

BACKGROUND
This laboratory session is structured such that you will design an experiment, not simply run one. Using the knowledge obtained during lecture on Monday, October 5, 2015 and additional information from your textbook, you are to design and subsequently run an experiment to measure the discharge in an open channel. Keep in mind that it is difficult and expensive to measure the velocity in an open channel, so the proposed method should instead be based on use of sharp-crested weirs.

LAB OBJECTIVE
Design and run an experiment to measure open channel discharge

EXPERIMENTAL PROCEDURE
Instead of the procedure listed here for you to follow, you are to develop an experimental procedure to measure the discharge in an open channel using a sharp-crested weir. You cannot simply use the Mag Meter on the hydraulic bench to measure the discharge, but you can record the value provided for purposes of comparison. Please note that your lab group should devise a plan for your experiment and discuss it with your TA before beginning!

AVAILABLE EQUIPMENT
1. Hydraulic bench with pump to re-circulate flow and a discharge meter.
2. An open channel that can be run using the hydraulic bench.
3. Weir plates with various shapes that can be installed in the channel.
4. Point gage to measure water surface elevation.

REPORT
1. Introduction (background/importance)
2. Experimental method & equipment used
3. Sample data
4. Analysis of results, equations used
5. Comparison with theory, discussion
6. Conclusions