Applied Hydraulics – Week 5 – Radial Gate, Artificially Roughened Bed

Reading Assignment: Chin, Ch. 3, pp. 101-114, Sections 3.2.2.1 and 3.2.2.2

Homework Problems: 3.8, 3.11, and 3.19 (Due in class Oct. 8th)

Hands-on Assignment

Complete Experiment P (Characteristics of flow under a Radial Gate) as written in the Armfield Manual. Complete Experiment R (Artificially Roughened Bed) using the Armfield Manual except for the procedural changes described below.

Procedure

Line the bottom of the flume with a single layer of marbles. To place the marbles uniformly on the channel bottom, set the channel slope to 1 % and the flow to 0.5 l/s. To hold the marbles in the channel, place the clear Plexiglas stop log supplied downstream. Carefully place the marbles in the channel upstream and let the channel flow move the marbles downstream to settle in a single layer uniformly distributed across the channel bottom.

Adjust the flow to 1 L/s and measure the parameters in Experiment R using channel slopes of 1.0, 1.5, 2.0 and 2.5 percent. Use the data from this experiment to calculate a Manning's n.

To remove the marbles from the channel bottom. Adjust the flow to 0.5 L/s and place the bucket under the flume discharge orifice and remove the clear Plexiglas stop log. The marbles will flow out of the flume and into the bucket. After all the marbles are in the bucket, strain the bucket to remove the water. Be careful to catch all the marbles and not allow any marbles to drain into the reservoir.

Be careful of marble on the floor!!!

Complete each lab experiment and bring the results to class (Oct. 1st)