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Open Channel Flow Measurement of Water by Using Width Contraction

Authors : Arun Goel, D. V. S. Verma, Sanjeev Sangwan

Abstract : The present study was aimed to develop a discharge measuring device for irrigation and laboratory channels. Experiments were conducted on a sharp edged constricted flow meters having four types of width constrictions namely 2:1, 1.5:1, 1:1, and 90o in the direction of flow. These devices were made of MS sheets and installed separately in a rectangular flume. All these four devices were tested under free and submerged flow conditions. Eight different discharges varying from 2 lit/sec to 30 lit/sec were passed through each device. In total around 500 observations of upstream and downstream depths were taken in the present work. For each discharge, free submerged and critical submergence under different flow conditions were noted and plotted. Once the upstream and downstream depths of flow over any of the device are known, the discharge can be easily calculated with the help of the curves developed for free and submerged flow conditions. The device having contraction 2:1 is the most efficient one as it allows maximum critical submergence.

Keywords : flowrate, flowmeter, open channels, submergence
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