

Investigation of Flow Characteristics of Trapezoidal Side Weir in Rectangular Channel for Subcritical Flow

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Abstract : In recent years, the hydraulic behavior of side weirs has been the subject of many investigations. Most of the studies have been in connection with specific problems and have involved models. This is perhaps understandable, since a generalized treatment is made difficult by the large number of possible variables to be used to define the problem. A variety of empirical head discharge relationships have been suggested for side weirs. These empirical approaches failed to adequately consider the actual situation, and produced equations applicable only in circumstances virtually identical to those of the experiment. The present investigation is targeted to study to a greater depth the effect of different trapezium angles of a trapezoidal side weir and study of water surface profile in spatially varied flow with decreasing discharge maintaining the main channel flow subcritical. On the basis of experiment, the relationship between upstream Froude number and coefficient of discharge has been established. All the characteristics of spatially varied flow with decreasing discharge have been studied and subsequently formulated. The scope of the present investigation has been basically limited to a one-dimensional model of flow for the purpose of analysis. A formulation has been derived using the theoretical concept of constant specific energy. Coefficient of discharge has been calculated and experimental results were presented.

Keywords : weirs, subcritical flow, rectangular channel, trapezoidal side weir

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