

DETERMINATION OF RELATION BETWEEN CAVITATION INDEX AND DIMENSIONLESS PARAMETERS AFFECTING IT

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Abstract

This study is about cavitation of spillway which occurs due to negative pressure. This is done by simulating model of spillway using Froude's model law. Ogee shaped spillway model made from Perspex sheets is used in a tilting flume. Comparison of this method with cavitation index and different equations obtained from dimensional analysis for obtaining dimensionless parameters with the help of observed readings is carried out. In all, five dimensionless parameters are identified which give the functional relation between cavitation index, discharge, pressure and velocity of flow. The transition points from positive to negative pressure can be identified by varying the discharge. The results of these experiments are tabulated according to the flow conditions, i.e. free flow and gated flow for various discharges. Some equations are established between cavitation index and measurable parameters and threshold conditions after which cavitation is most likely to appear are identified. These equations and the conditions will be of use in design of spillway [1] [2] [4]

Keywords : Dam, prototype observation, solution of flow field, spillway, cavitation.