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IMPROVING THE HYDRAULIC PERFORMANCE OF FAYOUMAN TYPE WEIRS USED IN THE EGYPTIAN IRRIGATION CANALS

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Abstract

The present research aims to improve the weir characteristics by changingits geometricconfiguration. Actu purpose is to solve the weir problems by allowing the passage of more water through the weir body in ord reducethe sedimentation problems in upstreamside.The combination between perforated weir and gates w experimentally studied. The experimental studies were done on wooden model of 21cm height and 2cm cr addition, the study was investigated in five stages. The first stage studied the effect of changing the angle back as 90o, 60o, 30o, and 15oon the flow characteristics. In the second stage, six models of aperforated studied with different slot diameters in the center point. In the third and fourth stages, the effect of varyin location of the slot and its number on the flow characteristics was investigated. In the fifth stage, the perfo was combined by a vertical gate on its sill, the effect of combination between perforated weir and gate and the bevelled edge angle of the vertical gate on the flow characteristics was studied.In stage six and seven studied upstream and downstream the referenceFayoum type weir , the weir of 60 ° back angle, which cor slots in the middle of the weir body, and the weir with three slots in the middle of the weir body combined on its sill. The studyproved that the weir of back angle = 60 °, which contains three slots in the middle of t is the optimum one. It gives the optimum discharge coefficient compared to the reference Fayoum type we reduces the erosion process downstream the weir and the rates of sedimentation in the upstream side com reference Fayoum type weir. Statistical model was developed for the prediction of the coefficient of dischar the weir. Moreover, dimensional analysis was used to correlate the flow characteristics.