

STUDY OF THE PROTECTION LENGTH DOWNSTREAM OF FAYOUMI TYPE WEIRS WITH OPENINGS

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Abstract

Weirs may be used for flow measurements, energy dissipation, regulation of flow depth etc. Most of the previous studies focus on discharge coefficient of combined flow, Little information is available on local scouring downstream of these structures. So, the aim of this research is to study the influence of using openings in weirs on scour length downstream. A total of 171 experimental runs were carried out in a recirculating rectangular flume, A model type weir with openings was fixed in the flume bed. Two cases of opening arrangements were included, one and three openings. Different diameters of openings, 1.27 cm, 1.9 cm and 2.54 cm, different weir height ratios 0.25 and 0.5 were tested under the same flow conditions. The experiments illustrated that for most of the opening diameters in either case, one opening or three openings, the ratio $h/p = 0.25$ gave smaller values of scour length, while the ratio $h/p = 0.5$ gave higher values. Also, it was noticed that the case of one opening for a considered opening height, the ratio $d/p = 0.149$ gave smaller values of scour length but for case of three openings ratio $d/p = 0.075$ gave smaller values