Effect of Size and Surface Roughness of Cylindrical Weirs on Over Flow Characteristics

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Abstract

weirs are the most commonly used device in channels for flow measurement and flow regulation due to its simplicity. Conventional rectangular, triangular and trapezoidal weirs are among the most common oldest types of weirs, progress ogee crest weir and cylindrical weirs are started to use in hydraulic engineering. The advantages of the circular weir shape are the stable overflow pattern compared to sharp-crested weirs, the ease to pass floating debris and the simplicity of design. The concern of this paper is to study the effect of size and surface roughness of cylindrical weirs on discharge coefficients (Cd) under different flow conditions. The work was conducted in experimental flume by using three sizes of cylinders and three types of surface roughness. The obtained results show that Cd values will increase with increasing flow rate as well as with decreasing in cylinder diameter; an increase in surface roughness of weir can makes great reduction in Cd value. The h/R effect on Cd values increase with increase in cylinder diameter. An empirical relation was obtained to estimate the coefficient of discharge Cd under different size and surface roughness of cylindrical weirs.

Key Words: Cylindrical weir, Discharge coefficient, Experimental study, surface roughness