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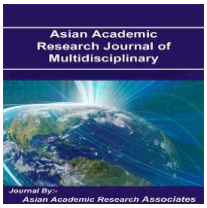

CORRELATION BETWEEN CRITICAL OVERFLOW, DEPTH RATIO AND FROUDE NUMBER IN BROAD-CRESTED WEIR

J. G. EGBE[1]; E. E. NYAH[2]; S. E. UBI[3]; O. O. EWA[4]; E. E. OKON[5]

[1,2,3,4,5] Civil Engineering Department, Cross River University of Technology, Calabar, Nigeria

Abstract

Experiments were carried out in order to investigate the correlation between broad-crested weir overflow discharge, depth ratio and Froude number. The experiments were carried out on the horizontal open channel provided in the fluid mechanics/hydraulic laboratory of the Cross River University of Technology, Calabar- Nigeria. The experiment results show that the overflow depth above the weir crest or critical depth y_c increases as discharge increases. y_c, $y_{c,cal}$ and $y_{c,theory}$ are in very close agreement. Irrespective of overflow discharge rate, depth ratio and Froude number remain constant with values of 1.50 and 1.0 respectively. The overflow Froude number of unity (F_{rc}=1) shows that the flows were critical. For this weir, the relationship between Critical overflow and Critical Depth as

Q_c = -1.7968 + 417.68y_c with $R^2 = 0.9994$.

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