عنوان مقاله:

Determination of hydraulic characteristics of flow over a triangular sectioned weir by using experimental and numerical .modeling

محل انتشار:

مجله مکانیک کاربردی محاسباتی, دوره 52, شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 18

نویسندگان:

Ali Yildiz - *Civil Engineering Department, Engineering and Natural Science Faculty, Konya Technical University, Konya, Turkey*

Ali Marti - *Civil Engineering Department, Engineering and Natural Science Faculty, Konya Technical University, Konya, Turkey*

Mustafa Gogus - *Civil Engineering Department, Faculty of Engineering, Cankaya University, Ankara, Turkey*

خلاصه مقاله:

The spillways of hydraulic structures transfer excessive water from dam reservoir to the downstream in a safe and controlled manner. A labyrinth or triangular weir is a flat spillway folded in plain view. The labyrinth weirs provide an increase in crest length for a given channel width and increase the flow capacity for a given weir load. As a result of the increased flow capacity, the labyrinth and triangular weirs require less space in the dam body than the flat weirs. In this study, experiments were carried out on the labyrinth weirs containing triangles of different heights and numbers by using ۳ different weir heights (P=۲۰cm, ۳۰cm, and ۴۰ cm) and ۴ different weir shapes. Each experiment was repeated for ۳۰ different discharge values. The effects of weir height and weir shape on the total head over the weir (HT) and discharge (Q) were investigated. In addition, the numerical models of all experimental setups were created by ANSYS-Fluent program using Computational Fluid Dynamics (CFD). By comparing the results obtained from the numerical models with the physical models, the accuracy of the numerical models was tested. According to the results, as the number of the triangles (N) of the weir increases, the discharge coefficient (Cd) decreases. The weir height (P) does .not have a major effect on the discharge

کلمات کلیدی:

ANSYS-FLUENT, CFD, Labyrinth weirs, Triangular sectioned weirs, Spillways