

## INVESTIGATION OF THE CHARACTERISTICS OF FLOW OVER SPILLWAYS

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### Abstract

To prevent severe scouring of waterway bed and failure of downstream spillway structures as a result of  $h_y$  being swept out of the basin. Experimental studies investigating the flow characteristics for different spillways were carried out. The measurements are focusing on recording of water surface at different sections. The experimental program explores the effect of different baffle blocks composition on the spillway face. In addition, it investigates the effects of the strips walls' relative and the end sill's characteristics. The experiments indicate that the case blocks over sloped spillway gives the smallest flow depth ratio compared to the other baffle blocks compositions. It was found that the stepped spillway structure with end sill is more efficient than the other spillways. The derived equation for relative energy loss gives a good agreement with the experimental data. Prediction equations developed using the multiple linear regression to model the relative energy loss through the spillway structure. An acceptable agreement was obtained between the predicted and the measured values. A model of the relative energy loss is built using Genetic Programming (GP). Many trials were done to reach the optimum model. It was found that the GP model results are more accurate than that obtained by the regression technique. Finally, the conclusion of the study can be recommended in the design procedure and practical applications.