

## CHARACTERISTICS OF FLOW AND SCOUR UNDER THE EFFECT OF CURVED STEEL ROUGHNESS ELEMENTS

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### Abstract

Flow and scour characteristics are investigated experimentally on a modified roughened bed. The water surface elevation is recorded at different sections. The paper investigated the effects of using curved steel sheets as roughness elements for strip and staggered arrangement, on different flow and scour characteristics. It was found that the appropriate staggered roughness length increases the relative energy loss by 17%, reduces the relative jump length by 15.5% and decreases the relative jump depth by 15.5% compared to the smooth bed. Generally, the experiments indicate that the case of staggered roughness elements gives the best relative jump characteristics. Moreover, it plays an important role to control the scour downstream the basin. The derived theoretical equations for relative depth and the relative energy loss give an acceptable agreement with the experimental data. Prediction equations were developed using linear regression (MLR) to model the hydraulic jump characteristics. A good agreement was obtained between predicted and the measured values. Finally, this study yielded conclusions which can be recommended in theoretical procedure and practical applications.