Effect of Bridge Abutment Geometrical Shape on Riprap Stability in River Bend

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Abstract

Riprap is used to control scouring around the bridge abutment. In order to study the stability of riprap around two bridge abutments with two different shapes, experiments were conducted in a laboratory flume made of Plexiglass in 180 degree bend. In this research, several experiments were done by placing the two bridge abutments made of Plexiglas in a series of riprap. Experiments included two different types of riprap with different densities, four different diameters and constant rate of discharge under pure water condition. In each experiment, flow depth was measured in terms of moving threshold, then stability was calculated by using the data obtained. The results showed that in the same conditions chamfered wing-wall is greater than vertical-wall. So, chamfered wing-wall is, on average, 9 percent more stable than the vertical wall.

Keywords: 180 degree bend river, Riprap stability, Bridge abutment, Froud number.

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