

Investigating the Effect of Slot Dimensions in Bridge Abutments on the Scour Hole's Depth

M. Sehat, A. Bordbar*, A. R. Masjedi and M. Heidarnejad¹

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Abstract

Today, abutments disrupt the normal flow of rivers and cause scouring and erosion of sedimentary materials around them, creating holes and resulting in much damage every year. Researchers have proposed various methods to reduce the power of water erosion. One of the essential methods in this regard is creating slots in abutments. Since the expansion of the scour hole endangers the stability of the bridge structure, this study examined the effect of slot dimensions in the support on the scour hole dimensions. The findings demonstrated that the presence of slots in abutments effectively reduces the dimensions of scour holes. With the slot, the volume of the scour hole can be reduced by up to 50%. Furthermore, as the relative speed of scouring increases by 75%, the depth of the scour hole also increased up to 140%. An increase in slot depth leads to a decrease in scour hole depth of up to 85%.

Keywords: Scour, Abutment, Slot dimensions, Scour hole's depth

1. Department of Water Science Engineering, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran.

*: Corresponding author, Email: Asefmn@yahoo.com