عنوان مقاله:

Experimental Comparison of Bed Shear Stress around Tshaped Spur Dikes Located in a Sharp Bend

محل انتشار:

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خلاصه مقاله:

Investigation of flow patterns around spur dikes is vitally important to better understand the scour phenomenon around them in open channels and the eventual failure prevention. It is important to calculate the Reynolds shear stress around spur dikes in channels with rigid bed as it is considered one of the most important parameters involved in shaping flow patterns. This study applied three T-shaped spur dikes with wing and web lengths of ۱۵, ۲۰, and ۲۵% of the channel width to determine the effect of these on variations in the bed shear stress pattern. These spur dikes were placed at the ۹۰-degree position of a bend channel with a ۱۸۰-degree sharp bend flume. Vectrino velocimetry was utilized for flow velocity data collection. The Reynolds shear stress at the layer near the bed was calculated for every model, and the results were compared with a case where the spur dike was absent. It was found that a ۶۷% increase in the length of the T-shaped spur dikes increased the maximum bed shear stress by approximately ۶۷%. Moreover, placed at the bend apex, the short spur dike boosted the bed shear stress by ۲۲.۸ times that of a channel empty of spur dikes. This could lead to increased probability of scouring at the .upstream wing of the short spur dike and at both wings of the larger spur dikes

کلمات کلیدی:

.Velocity Fluctuations, Spur Dike Length, Velocity Measurement, Rigid Bed, Turbulent Flow