

A Parametric Study on the Backwater Level Due to a Bridge Constriction

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Abstract : This paper presents the results and findings from a parametric study on the water surface elevation at upstream of bridge constriction for subcritical flow. In this study, the influence of Manning's Roughness Coefficient of main channel (nmc) and of floodplain (nfp), and bridge opening (b) flow rate (Q), contraction (kcon), and expansion coefficients (kexp) were investigated on backwater level. The DECK bridge models with different span widths and without any pier were investigated within the two stage channel having various roughness conditions. One of the most commonly used commercial one-dimensional HEC-RAS model was used in this parametric study. This study showed that the effects of main channel roughness (nmc) and flow rate (Q) on the backwater level are much higher than those of the floodplain roughness (nfp). Bridge opening (b) with contraction (kcon) and expansion coefficients (kexp) have very little effect on the backwater level within this range of parameters.

Keywords : bridge backwater, parametric study, waterways, HEC-RAS model

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