

# Influence of the river bed stratification on scour at foundation of the structures

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Unexpected scour at foundation at stratified bed conditions leads to structure damage or failure and considerable environmental and economical losses. A new method for computing depth of scour hole at elliptical guide banks at stratified bed conditions is presented. Tests were made for different hydraulic conditions, contracting rate and local densimetric Froude numbers, grain sizes, thickness and sequence of the layers. It is found that the scour depth depends on the mean grain size, thickness and sequence, of the river bed layers. The most critical conditions for structures occur when a fine-sand layer is under a coarse-sand layer. When the coarse layer is scoured, the depth of scour is rapidly developing in the next fine-sand layer. In this case, the dominant grain size for computing the depth of scour at foundations under stratified bed conditions is the mean diameter of the second layer or of the next one, where the scour stops. The calculation of scour depth near hydraulic structures in flow by using the grain size on the top of the river bed and neglecting the stratification of the river bed can lead to wrong results and finally to considerable damages and losses.