Simplified Method for Estimating Scour at Bridges

A. V. Govindasamy[1], J.-L. Briaud[2], H.-C. Chen[1], J. Delphia[3], K. Elsbury[1],
P. Gardoni[1], G. Herrman[3], D. Kim[1], C.C. Mathewson[1], M. McClelland[3], F. Olivera[1]

[1]Texas A&M University, College Station, Texas 77843-3136 [2]Zachry Dept. of Civil Engineering, Texas A&M University, College Station, Texas, 77843-3136; briaud@tamu.edu [3]Texas Department of Transportation, Austin, Texas

ABSTRACT: Scour at bridges is a major cause of bridge failure in the United States. Current available methods of bridge scour evaluation rely upon two categories of assessment methods. The first category is an initial evaluation process that is based on field observations and is primarily qualitative in nature. This method does not utilize actual measured scour data. The second category involves calculations of maximum scour depth based on flume tests on sand. The first method does not provide realistic results in many cases due to its reliance on a more qualitative form of assessment. The second method is often conservative in the case of clays, which are known to erode at a much slower rate than sand. A simplified method for estimating the scour risk of a bridge has been developed. The proposed method comprises three phases presented in decision tree format. The first phase utilizes measured scour data and observed or estimated flow parameters at a bridge to evaluate the scour risk. The second and third phases involve simple calculations to obtain maximum scour depth and time dependent scour depth, respectively. Phases two and three do not require site specific erosion testing of bridge foundation soils. The proposed method will provide more realistic scour risk estimates due to the fact that it utilizes measured data and accounts for time dependent scour depth for clays. The elimination of site specific erosion testing reduces the effort and cost associated with evaluating a bridge for scour.

Please click here for the full version of this document -
redistribution is subject to ASCE license or copyright.
http://www.ascelibrary.org