

SUMMARY

This report is a well illustrated and practical Guide intended to aid engineers and engineering technicians in monitoring, maintaining, and protecting bridge waterways so as to mitigate or prevent scour from adversely affecting the structural performance of bridge abutments, piers, and approach road embankments. Described and illustrated here are the scour processes affecting the stability of these components of bridge waterways. Also described and illustrated are methods for monitoring waterways, and the various methods for repairing scour damage and protecting bridge waterways against scour.

The Guide focuses on smaller bridges, especially those in Iowa. Scour processes at small bridges are complicated by the close proximity of abutments, piers, and waterway banks, such that scour processes interact in ways difficult to predict and for which reliable design relationships do not exist. Additionally, blockage by woody debris or by ice, along with changes in approach channel alignment, can have greater effects on pier and abutment scour for smaller bridges. These considerations tend to cause greater reliance on monitoring for smaller bridges.

The Guide is intended to augment and support, as a source of information, existing procedures for monitoring bridge waterways. It also may prompt some adjustments of existing forms and reports used for bridge monitoring. In accord with increasing emphasis on effective management of public facilities like bridges, the Guide ventures to include an example report format for quantitative risk assessment applied to bridge waterways. Quantitative risk assessment is useful when many bridges have to be evaluated for scour risk and damage, and priorities need to be determined for repair and protection work. Such risk assessment aids comparison of bridges at risk.

It is expected that bridge inspectors will implement the Guide as a concise, handy reference available back at the office. The Guide also likely may be implemented as an educational primer for new inspectors who have yet to become acquainted with waterway scour. Additionally, the Guide may be implemented as a part of process to check whether existing bridge-inspection forms or reports adequately encompass bridge-waterway scour.