

# Monitoring and Evaluation of the Iowa River Bridge Launch

**Brent M. Phares, Robert E. Abendroth, Terry J. Wipf, N. McDonald, and S. Abraham**

Bridge Engineering Center  
Iowa State University  
2901 South Loop Drive, Suite 3100  
Ames, IA 50010  
bphares@iastate.edu

## ABSTRACT

Due to the presence of an environmentally sensitive river valley, the U.S. 20 bridge crossing the Iowa River was constructed using a unique superstructure launching procedure. Launching involves pre-constructing the bridge superstructure and then “pushing” the superstructure into place. This is the first example of launching a plate girder highway bridge in the United States. Although not a common construction technique, launching can be a cost-effective alternative. This is especially true when environmental or other constraints limit the environmental impact typically associated with traditional construction.

Monitoring of the Iowa River Bridge consisted of monitoring specific structural behaviors during various stages of construction. The launching operations were monitored such that locations of distress could be identified and so that design assumptions could be verified. Both the bridge superstructure and substructure were monitored at various times. For the substructure, monitoring included measuring strain in the pier columns, rotation of the pier cap, and general displacement of the substructure system. Monitoring of the substructure was performed during four launches. Superstructure monitoring included measuring longitudinal strains at selected cross-sections in the steel girders, longitudinal strains in select cross-frame members, and contact strains in the girder bottom flange and web. In addition, the force required to launch the bridge was monitored.

The monitoring of the Iowa River Bridge was an important effort due to the very limited amount of data available on bridge launching. Engineers need to properly design bridge structures for not only in-service conditions but also for construction load cases which are more complex for a launching method than for conventional construction techniques.

**Key words: environmental sensitivity—monitoring—plate girder highway bridge—superstructure launching procedure**

Note: Preparation of this paper was still in progress at the time of publication; final results will be presented at the symposium.