

HR-160

Feasibility Study on Dynamic and Ultimate Static Load Tests on Highway Bridges

Key Words: Bridges, load testing

ABSTRACT

As a result of the construction of the Saylorville Dam and Reservoir on the Des Moines River, six highway bridges were scheduled for removal. Five of these were old high-truss single-lane bridges, each bridge having several simple spans. The remaining bridge was a fairly modern (1955) double 4-span continuous beam-and-slab composite highway bridge. The availability of these bridges afforded an unusual opportunity for study of the load behavior of full-scale bridges.

Because of the magnitude of the potential testing program, a feasibility study was initiated and the results are presented in this two-part final report. Part I summarizes the findings and Part II presents the supporting detailed information.

In brief, the following conclusions can be drawn from the study:

(a) for the beam-and-slab bridge:

1. testing to failure is not feasible,
2. dynamic testing at design load and overload levels will provide useful data, and
3. testing of deck components under static and fatigue loads should be conducted.

(b) for the high-truss bridges:

1. ultimate load tests should be conducted on three selected spans,
2. fatigue tests should be undertaken on complete component members selected from all truss bridges, and
3. tests should be conducted on in-place timber decks and timber stringers.

Study results show that significant information on the behavior of bridges designed for normal service can be obtained from a wide variety of tests. An outline of these tests is presented.