

## TECHNICAL REPORT TITLE PAGE

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**2. REPORT DATE**

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**3. TITLE AND SUBTITLE**

Investigation of the Modified Beam-in-Slab  
Bridge System  
Volume 1 - Technical Report  
Volume 2 - Design Manual  
Volume 3 - Design Guide

**4. TYPE OF REPORT & PERIOD COVERED**

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**7. ACKNOWLEDGMENT OF COOPERATING ORGANIZATIONS/INDIVIDUALS**

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**8. ABSTRACT**

This project (Phase 3 of the Investigation of Two Bridge Alternatives for Low Volume Roads) is a continuation of research which addresses some of the numerous bridge problems on Iowa's secondary road system. In the previous phases, Iowa DOT projects HR-382 (Phase 1) and TR-410 (Phase 2), alternative designs for replacing bridges on low volume roads (LVRs) were investigated.

Results from the first two phases of investigation supported the continued refinement of the Modified Beam-in-Slab Bridge (MBISB) design. This final phase of the investigation was undertaken to develop a competitive alternative bridge replacement for longer spans (i.e. greater than 50 ft) that is lower in cost than conventional systems and relatively easy to construct.

The demonstration bridges were field tested to determine the structural behavior; instrumentation was installed at critical sections to measure strains and deflections. The resulting data confirmed compliance with strength and serviceability requirements. Based on the field data and subsequent analysis, the demonstration bridges were found to exceed design requirements and possess considerable reserve capacity.

The Design Guide, (Volume 3) is a complement to the Design Manual (Volume 2) and provides background information on the development of the MBISB design criteria. The design guide presents an overview of the laboratory and field tests that were completed. An explanation of the resulting MBISB design methodology and criteria are also presented.

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**9. KEY WORDS**

structures, bridges, PCC, Portland cement concrete,  
beam in slab, low volume roads

**10. NO. OF PAGES**

Volume 1 - 135  
Volume 2 - 177  
Volume 3 - 93