



B03-51021, M55 over Pine River

The Michigan Department of Transportation (MDOT) presently has in its inventory of structures several bridges that are **non-redundant** and **fracture-critical** (definitions are in the body of the report). These structures are commonly called the Big 12 bridges. Responsibility for inspection and maintenance of these structures has moved from the Lansing Maintenance Division, Bridge Section, to the various Regional Offices where the bridges are located.

Along with that relocation of responsibility, the MDOT wishes to create a manual that explains the special nature of this type of structure, discusses the unique features of each bridge, and is instructive regarding inspection and maintenance practices. This manual is intended for use by Region staff to enable them to plan for inspections and maintenance activities and to anticipate items that may need either routine or periodic attention.

The MDOT places a high priority on the maintenance and inspection of these bridges. These structures have unique configurations. Failure of certain members is a potentially catastrophic occurrence. Historically, the MDOT has successfully maintained these bridges. It is recommended that the practices traditionally employed by Lansing Maintenance be continued by the Regions.

The Big 12 bridges are both non-redundant *and* fracture-critical. Bridges that are solely non-redundant or fracture-critical are not a part of this manual. Non-redundant fracture-critical bridges, like all bridges, have other elements, such as joints and bearings, that are essential to the proper performance of the structural system. It is important to carefully inspect these bridge elements as well; the inspections should be performed in accordance with guidelines set forth in the Federal Highway Administration (FHWA) Bridge Inspector's Training Manual. This manual is intended to serve as a supplement to other references commonly used by bridge inspectors. These references should continue to be used as the guiding documents for the inspection of these structures.

The information contained in this manual was gathered and coalesced into a concise format by URS Greiner Woodward Clyde. The work was divided into three phases: Data Collection, Site Visits/Interviews, and Manual Preparation. Specific tasks involved with each of these phases are discussed in the Introduction Section of the manual. Recommendations contained in this manual are based on careful consideration of the inspection and maintenance histories of each bridge and the experience and engineering judgement of URS Greiner Woodward Clyde.