

**MICHIGAN STRUCTURE INSPECTION MANUAL
BRIDGE INSPECTION**

CHAPTER 4

BRIDGE FILES

4.01 Purpose

The National Bridge Inspection Standards (NBIS) require bridge owners to maintain comprehensive current records of each bridge in their inventory. The information pertaining to each bridge must be readily available for the bridge inspector, bridge owner, bridge program manager, or FHWA to review and must be maintained throughout the life of the structure. Michigan has a decentralized bridge inspection program and delegates inspection responsibilities to the regions and local agencies throughout the state. However, for MDOT owned bridges many of the technical aspects such as program management and load rating are performed at the central office for improved accuracy. Local agency bridge owners are responsible to perform inspections, load ratings, and hydraulic analyses using qualified staff or consultants. This chapter describes MDOT's policy of bridge file record keeping as it applies to both state and local agency owned bridges.

4.02 Responsibilities

Each bridge owner is required to keep a minimum of three types of bridge files; quality control procedures, qualifications, and individual bridge files. The bridge owner's quality control procedures and findings must be stored in one file. If the bridge owner delegates the quality control activities to a consultant they must maintain a copy of the consultant's quality control procedures and documentation. A second file is essential to record the qualifications of the personnel performing the inspections and load ratings. Separating these two files will aid efficiency during internal quality control, MDOT quality assurance, and FHWA bridge inspection program reviews.

A third file is to be maintained for each bridge under jurisdiction of the bridge owner. The bridge file should contain the necessary components that are identified in Section 2 of the *AASHTO Manual for Bridge Evaluation (MBE)*. At a minimum, the bridge file must contain current records of all that apply:

- Plan drawings
- Photos
- Bridge Safety Inspection Report
- Structure Inventory & Appraisal
- Load rating documentation
- Channel cross sections
- Level 1, Level 2, or scour depth calculations
- Scour Assessment and Plan of Action
- Flood Data and Waterway Adequacy
- Significant correspondence
- Critical Findings

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MDOT regions and local agencies must work diligently to maintain and store all bridge information such as original construction documents, work history, photos, and other pertinent data so it may be evaluated when needed. Region and local agency bridge owners are required to utilize the MiB^{RIDGE} web based application to effectively improve public safety, manage infrastructure assets, and retain inventory data. Specifically, the MiB^{RIDGE} web application allows the user to update SI&A coding, inspection reports, load rating information, scour action plans, work recommendations, and Request for Action reports. In addition, the MiB^{RIDGE} document storage feature allows plan drawings, scour evaluations, stream bed cross-sections, photos and other relevant files to be saved within the application.

4.03 Inspection Reports

All of the following types of inspection reports shall be retained as applicable for each bridge:

- Bridge Safety Inspection Report
- Culvert Safety Inspection Report
- Fracture Critical Safety Inspection Report
- Fatigue Sensitive Inspection Report
- Bridge Diving Inspection Report
- Other Special Inspection Report
- Damage Inspection Report

4.04 Construction and Maintenance Documents

For MDOT bridges, the plans and specifications used to construct or rehabilitate a bridge are located at the TSC that administered the project until the Financial Operations Division final accounting date. Afterward, the information is stored at the Michigan Department of History, Arts, and Libraries and accessible by contacting the MDOT's Records Management Coordinator. Due to the space requirements for construction files it is impractical to house them with each bridge owner. As built drawings for MDOT owned bridges, including any modifications to a bridge initiated under contract, are located in the ProjectWise database. Important structural details such as fatigue prone details should be included in the bridge file. The bridge owner is required to understand where the information is located in the database. Local agencies are required to retain all bridge records in the file. Plans for each structure may be stored electronically, a copy of the disc or other storage media may be kept with the inspection reports, but a backup copy off site is suggested. In the event that plans do not exist the agency must prepare sketches that includes general characteristics and dimensions for the structure with detailed information provided for load path members.

For MDOT Bridges the documents available at the Records Management Office encompass pertinent information that was collected during the construction stage which includes:

- Concrete mix designs, test results, and quality control plan
- Tested stock reports
- Pile charts provided by the Geotechnical Section

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- Contract work orders initiated by the Construction Engineer
- Shop inspection of structural steel
- Structure foundation inspection
- Coating information and federal color documentation
- As-built files documenting changes to the original contract drawings

The information is organized according to the construction project records list and retained as specified in Bureau of Highway Instructional Memorandum 2008-09. MDOT is beginning to store all construction documentation in the ProjectWise database which will aid organization, improve access, and assist the bridge inspector during future inspections.

General and specific routine and preventive maintenance actions should be collected by each bridge owner to varying degrees of detail. The MiB^{RIDGE} application has been modified to collect maintenance activities such as the work performed, materials utilized, and effort expended. Bridge owners should track maintenance activities for each bridge and be able to report the work during quality assurance reviews.

4.05 Significant Correspondence

All important correspondence since the inventory inspection is to be retained in the bridge file. The bridge inspector must have access to relevant correspondence to aid the inspection and understand any previous concerns so they may be reviewed in the field. At a minimum, correspondence should be included anytime there are requests for:

- Load analysis
- Critical Findings
- Emergency repairs
- Other Special Inspections
- Damage Inspections
- In-Depth Inspections
- Structural monitoring
- Scour evaluations
- Requests for Action
- Maintenance work requests

4.06 Photographs

The photographs recorded during an inspection are to be stored in the bridge file or electronically. A description should be provided beneath each photo, or a photo log must be included in the file. Photographs allow those unfamiliar with a structure to determine the rate of deterioration and any follow-up maintenance actions that may be needed. Each bridge file must contain photographs that include:

- A transverse view of the deck
- An elevation that includes any under clearance signs

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- Any utilities that are attached to the structure
- Deterioration of structural and safety elements
- All load posting and advance warning signs

4.07 Accident Records

The bridge owner must maintain information collected from an accident that damaged a bridge which includes the following:

- Crash report
- Completed Request for Action reports
- Damage Inspection Report
- Costs for any necessary repairs

4.08 Rating Records, Posting, and Permit Loads

The bridge inspector is responsible for verifying if the bridge must be posted and the required load posting by reviewing Items 41 and 141 during each inspection. The Load Rating Unit is responsible for performing the load rating and retaining the calculations for MDOT owned bridges. The MDOT Commercial Vehicle Transport Section issues permits for oversize and/or overweight vehicles on federal and state roadways.

The local agency bridge owner is responsible for assigning the load rating and ensuring the information is in the bridge file. When a consultant is hired to perform the load rating the bridge owner shall verify that the bridge analysis assumption and summary forms are complete and retain copies of all data used for the rating. Each county or city is responsible for issuing overweight permits on local streets. The following must be retained in the bridge file:

- Bridge Analysis Assumption form
- Bridge Analysis Summary form
- Calculations
- Computer files
- Any additional information necessary to perform the rating

4.09 Waterway Data

All structures over water require a level one scour analysis, level two scour analysis, or scour depth calculations to determine the scour susceptibility of the foundations. For MDOT structures, the Hydraulics Section prepares the worksheets in Appendix 6 of the Drainage Manual and retains the information. Local agency bridge owners must perform the analysis or secure a consultant to provide the information and ensure the results are in the bridge file. The level one scour analysis, level two scour analysis, or scour depth calculations must be uploaded to MiBRIDGE for each structure over water.

The bridge owner is also responsible for accurate coding of Item 113 and developing a complete plan of action for all scour critical bridges that is recorded in the bridge file. Stream bed cross-sections should be

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recorded at the minimum rate specified in the MDOT [Guidelines for Bridge Inspection Frequencies](#) for all MDOT owned and scour critical local agency owned bridges. For local agency owned bridges that are not scour critical a minimum of one cross-section shall be in the file and additional measurements shall be recorded as-needed through applied engineering judgment.

4.10 Traffic Data

For MDOT Bridges, Average daily traffic volume data is provided to MDOT bridge owners by the Transportation Planning Section. Local agency route information may be obtained from a local planning commission or consultant. These values should be periodically updated and used to accurately code SI&A Item 29 and 115 in MiB^{RIDGE}.

4.11 Electronic Bridge Files

All bridge file information is recommended to be stored in electronic format. The files must be readily available for review to respond to unplanned events and for regularly scheduled inspections. National Bridge Inspection Program (NBIP) reviews conducted by FHWA have identified several documents that are often missing or have been misplaced from the bridge file. The lacking information has triggered MDOT to provide FHWA with multiple plans of corrective action concerning documents that are required to be in each bridge file. To resolve this deficiency each bridge owner will be required to upload the following documentation to MiBRIDGE for each structure included in the NBI:

- Bridge and culvert plans
- Level 1, Level 2 or scour depth calculations
- Stream bed cross-sections
- Highlighted drawings of Fracture Critical Members (FCMs) for non-redundant structures
- Routine inspection procedures if they vary from BIRM and MiSIM procedures
- Complex bridge inspection procedures
- Underwater inspection procedures
- Load rating documentation including AASHTOWare Bridge Rating (BrR) load rating models and/or calculations

If plans do not exist for the structure the agency must prepare sketches that include general characteristics and dimensions for the structure with detailed information provided for load path