



BRIDGE ADVISORY
Construction & Technology Division
Bridge Operations Section

BRIDGE ADVISORY NUMBER: BA-2010-03

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SUBJECT: Load Rating Compliance with NBIS

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PURPOSE

The recent FHWA Program Review of Load Rating and Posting of Michigan Bridges has found that there is a large backlog of local agency bridges that may not be in compliance with load rating requirements and that MDOT's oversight of local agency load ratings is not adequate to assure compliance with the NBIS. To address these findings, MDOT is developing, in partnership with CRAM and MML, an action plan to assure local agency load rating compliance with NBIS.

BACKGROUND AND REFERENCES

The NBIS requires that all bridges be load rated for capacity in accordance with the AASHTO Manual for Bridge Evaluation (formerly the Manual for Condition Evaluation of Bridges). From [CFR § 650.313](#)

Inspection procedures: (c) Rate each bridge as to its safe load-carrying capacity in accordance with the AASHTO Manual (incorporated by reference, see §650.317). Post or restrict the bridge in accordance with the AASHTO Manual or in accordance with State law, when the maximum unrestricted legal loads or State routine permit loads exceed that allowed under the operating rating or equivalent rating factor.

The load ratings should be completely documented. From the AASHTO Manual for Bridge Evaluation, 6A.1.11- Documentation of Load Rating

The load rating should be completely documented, including all background information such as field inspection reports, material and load test data, all supporting computations, and a clear statement of all assumptions used in calculating the load rating. If a computer model was used, the input file should be retained for future use.

The correct load rating methodology must be used. This can vary depending on the design methodology, year built, material, and NHS status of the bridge. The requirements are detailed in the [October 30, 2006 memorandum from FHWA](#). Refer to Table 1 in that document to

determine the proper load rating methodology. The analysis method used is coded in the NBI database as Item 63 (Operating Rating Method) and Item 65 (Inventory Rating Method).

The load rating data must be updated in a timely manner. From [CFR § 650.315](#) :

(c) For existing bridge modifications that alter previously recorded data and for new bridges, enter the SI&A data into the State or Federal agency inventory within 90 days after the completion of the work for State or Federal agency bridges and within 180 days after the completion of the work for all other bridges.

(d) For changes in load restriction or closure status, enter the SI&A data into the State or Federal agency inventory within 90 days after the change in status of the structure for State or Federal agency bridges and within 180 days after the change in status of the structure for all other bridges.

Local agencies have 180 days to enter and/or correct bridge inventory data from the time of construction, reconstruction, or change in load restriction status. However, load posting signage or bridge closure must be implemented immediately if a public safety risk is determined to exist.

COMPLIANCE ISSUES

An agency can be found in non-compliance with the NBIS for the following reasons relating to load rating:

- Load Rating Not Performed, Or Outdated
- Incorrect Load Rating Methodology
- Load Rating Not Documented
- Data Not Updated In A Timely Manner

In some cases, non-compliance can be identified with a database query. These cases include but are not limited to:

Load Rating Not Performed Or Outdated

- Item 63, Operating Rating Method, is code “5”, “No rating analysis performed”
- Item 65, Inventory Rating Method, is code “5”, “No rating analysis performed”
- Item 64F Federal Operating Rating = Item 66 Inventory Rating = 32.7 mT.

Incorrect Load Rating Methodology

- Bridge carries NHS roadway and Item 63 is coded “2”, “Allowable stress”
- Bridge carries NHS roadway and Item 65 is coded “2”, “Allowable stress”
- Bridge built and/or reconstructed 1994 or later and Item 63 is coded “2”, “Allowable stress”
- Bridge built and/or reconstructed 1994 or later and Item 65 is coded “2”, “Allowable stress”

- Bridge designed by Load and Resistance Factor Design (LRFD) and built on or after October 1, 2010 and Item 63 is not coded “3”, “Load and Resistance Factor (LRFR).
- Bridge designed by Load and Resistance Factor Design (LRFD) and built on or after October 1, 2010 and Item 65 is not coded “3”, “Load and Resistance Factor (LRFR).

Note: Timber and masonry bridges are exceptions to the above rules.

Some non-compliance cannot be identified by querying the database. These issues will be addressed in the Quality Assurance (QA) plan for local agency bridges. These include:

- Whether the load rating takes the latest condition data into account
- Whether the bridge was rated according to the latest MDOT Bridge Analysis Guide
- Whether the load rating was properly documented
- Whether the data was updated in a timely manner

MDOT ACTION PLAN

MDOT will take the following steps to assure local agency compliance with the NBIS relative to load rating issues:

- Enhance the Michigan Bridge Inspection System (MBIS) and Michigan Bridge Reporting System (MBRS) to allow for capturing additional load rating data, including:
 - Date of load rating
 - Name of the engineer doing the rating
 - Assumptions, software used, etc.
 - Details of results
 - MBRS reports to assist in management of load ratings
- Update the Bridge Analysis Guide to clarify the controlling vehicle for analysis as well as posting procedures
- Partner with CRAM and MML to prioritize the backlog of local agency load ratings
- Partner with CRAM and MML to develop and implement an action plan to ensure that local agency bridge load ratings are done in accordance with NBIS and the latest Michigan Bridge Analysis Guide (BAG)

NEXT STEPS

Develop Local Agency prioritization/action plan.....	October 1, 2010
Incorporate changes to MBIS and MBRS	December 31, 2010
Issue update to BAG	December 31, 2010
Implement local agency non-compliance criteria.....	December 31, 2010
Completion of local agency tier 1* bridge load ratings.....	December 31, 2012
Completion of local agency tier 2* bridge load ratings.....	December 31, 2014
Substantial completion of local agency load ratings.....	December 31, 2016
Begin enforcement of local agency non-compliance criteria	January 1, 2017

* Definitions of prioritization tiers to be developed in cooperation with CRAM and MML.