



**BRIDGE ADVISORY**  
**Construction & Technology Division**  
**Bridge Operations Section**

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**BRIDGE ADVISORY NUMBER:** BA-2011-02

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**SUBJECT:** Local Agency Load Rating Prioritization and Coding

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**PURPOSE**

This purpose of this advisory is to provide more detail and guidance to address the issues described in [Bridge Advisory 2010-03](#). The purpose of prioritization is to ensure that those bridges with unknown load capacities are load rated before bridges with issues of lesser importance. This advisory also explains how to resolve the load rating issues and how to use the new load rating screens in the Michigan Bridge Inspection System (MBIS) so that load rating progress can be monitored by MDOT.

**LOAD RATING PRIORITIZATION**

The prioritization is a three tiered system as follows:

*Tier One: Bridges With No Load Rating*

These can be identified with simple database queries. The following data conditions indicate bridges with no load rating:

- Either NBI Item 63 (Operating Load Rating Method) or NBI Item 65 (Inventory Load Rating Method) is coded as "5" (No load rating performed)
- NBI Item 64F (Federal Operating Rating) = NBI Item 66 (Inventory Rating) = 32.7 metric tons.
- Any of NBI Items 63, 64F, 65, or 66 is null

*Tier Two: Bridges in Poor Condition*

While many of these bridges may have valid load computations, it is necessary to validate whether the assumptions used in those computations are appropriate and adequately consider the deterioration of the bridge. Bridges with any major element (deck, superstructure, substructure, or

culvert) rated as “poor” (4 or lower) should have the assumptions reviewed to determine if the assumptions used in the load rating should be revised to reflect these poor conditions.

NOTE: Some Tier Two bridges also have data irregularities which would also place them in Tier Three. Those bridges are identified as Tier 2A. Those bridges in Tier Two without those irregularities are identified as Tier 2B.

### *Tier Three: Bridges Load Rated With Incorrect Methodology Or Having Load Rating Data Irregularities*

This covers a variety of coding issues and may indicate that the load rating was either done improperly or the results were incorrectly recorded in the inventory. These can be identified with a simple database query and the following conditions indicate bridges with these issues and irregularities.

- Wrong Methodology- Built or rebuilt between 1993 and 2010 and rated by Allowable Stress (except for timber bridges)
- Wrong Methodology- Built after 2010 and not rated by LRFR
- Wrong Methodology- Carries NHS traffic and rated by ASR (except for timber bridges)
- Coding Incompatibility: Item 70 (Bridge Posting) < 5 and Item 41 (Open Posted Closed = A)
- Should be closed, can't carry 3 US Tons: Item 64F < 2.7 metric tons and Item 41 ≠ K (except where Item 103 =T)
- Federal ratings not in proper proportion (Item 64F more than 3x Item 66)

## **RESOLUTION OF LOAD RATING ISSUES**

It cannot be overemphasized that the first step for any of the tiers should be to review the bridge file and examine the load rating calculations. It is possible that the calculations are valid but the data was not entered into the inventory correctly.


*Tier One* If there are no load calculations in the bridge file or they are no longer applicable due to reconstruction or deterioration, then a new or revised load rating must be performed and the results entered in the inventory. If there are load rating calculations and they are correct, then the results must be entered in the inventory.

*Tier Two* The assumptions used in the load rating must be reviewed and revised if necessary to reflect the deteriorated condition of the bridge. If the engineering judgment is that the rating must be recalculated, the new results must be entered in the inventory. In either case, a statement that the rating reflects the deteriorated condition must be entered in the Load Rating Assumption Screen in MBIS.

*Tier Three* If the load rating was done using the incorrect methodology, then the load rating must be redone using the correct methodology. If the load rating is correct and there are inconsistencies in the inventory data, then the data must be corrected.

## LOAD RATING SCREENS IN MBIS

There are two new screens in MBIS to capture load rating data. These can be accessed when entering an inspection or at any time by the bridge owner. To access these screens, click on the "Other Reports" button and select "Rating Assumption" or "Rating Summary". Several items on the Assumption Screen, shown below, are of particular importance in documenting that bridges in poor condition (Tier Two) have load ratings that take deterioration into account.

Brkey	Structure#	Facility	Feature
This load rating is based on a field inspection dated		<input type="text"/>	
Is deterioration accounted for in load rating		<input type="text"/>	<input type="text"/>
Describe any deterioration			
<input style="width: 100%; height: 25px;" type="text"/>			
Year Constructed/Reconstructed		<input type="text"/>	
Describe construction/reconstruction			
<input style="width: 100%; height: 25px;" type="text"/>			
Superstructure Component	Super fy	Super f'c	
<input type="text"/>	<input type="text"/> ksi	<input type="text"/> ksi	
Size of Beams and Number of Spans			
<input style="width: 100%; height: 25px;" type="text"/>			
Composite?	# of Beams	Shop Drawings Verified?	Deck Design > H15?
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Deck thickness	Deck Reinf. Fy	Deck Conc. f'c	
<input type="text"/>	<input type="text"/> ksi	<input type="text"/> ksi	
Barriers			
Left Type & Weight	Center Type & Weight	Right Type & Weight	
<input type="text"/> / <input type="text"/> plf	<input type="text"/> / <input type="text"/> plf	<input type="text"/> / <input type="text"/> plf	
Sidewalks			
Left Width & Thick	Center Width & Thick	Right Width & Thick	
<input type="text"/> in <input type="text"/> in	<input type="text"/> in <input type="text"/> in	<input type="text"/> in <input type="text"/> in	
Wearing Surface			
Type	Weight	Thickness	
<input type="text"/>	<input type="text"/> pcf	<input type="text"/> in	
Clear Roadway			
<input type="text"/> ft			
Additional Loads			
<input style="width: 100%; height: 25px;" type="text"/>			
Unique Factors That Affect Capacity			
<input style="width: 100%; height: 25px;" type="text"/>			

*This Load Rating Is Based On A Field Inspection Dated:* Enter the date of the latest inspection that is reflected in the load rating.

*Is Deterioration Accounted For In Load Rating:* A Yes/No field? Unless section losses were accounted for in the load rating, enter "No".

*Describe Any Deterioration:* A general description of the deterioration, if any, that affects the load rating. If the bridge is in poor condition but section losses are negligible, this can be documented here.

*Unique Factors That Affect Capacity:* Anything else that might affect capacity (unique loads or design features, shoring, etc.)

Use of the Assumption Screen is strongly encouraged, whether when entering new load ratings or documenting that old ratings are still valid.

## **SCHEDULE**

Each local agency will be sent a listing of their bridges that all into each of the three tiers described above. In addition, the Michigan Bridge Reporting System (MBRS) will be enhanced to show this information.

Completion of Tier One Bridges	December 31, 2012
Completion of Tier Two Bridges	December 31, 2014
Completion of Tier Three Bridges	December 31, 2016

## **FAQs**

*Do all bridges need new load ratings?*

No. A load rating need not be done if the existing load rating is of the correct methodology, correctly reflects current bridge conditions, and is accurately coded in the inventory.

*My bridge has an old Allowable Stress rating. Must it be re-rated?*

No necessarily. It may be retained if:

- 1) It does NOT carry NHS traffic
- 2) It was NOT built or reconstructed on or after 1994
- 3) The load rating is still appropriate for the physical condition of the bridge

Timber bridges are exempt from the requirements for LFR and LRFR ratings.

*My bridge is in poor condition but the rating in the inventory is correct. What do I need to do?*

Completing the "Describe any deterioration" field in the Assumption Screen will enable MDOT to verify that the condition of the bridge was accounted for in the rating.