

BRIDGE ADVISORY NUMBER: **BA-2018-01**

DATE: April 30, 2018

SUBJECT: **Load Posting Guidance**

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LOAD POSTING VERIFICATION

Recent National Bridge Inspection Program (NBIP) reviews conducted by the Federal Highway Administration (FHWA) have identified that load posting signs may not be properly implemented. To ensure the posting signs follow appropriate standards and reflect the information reported in the most recent load rating, MDOT Load Rating policy **now requires that photographs of weight limit signs be taken during each routine inspection and stored electronically in the Michigan Bridge Management and Inspection System (MiBRIDGE)**. This requirement applies to the weight limit signs at each end of the bridge, as well as any advanced warning signs placed a suitable distance from each end of the bridge to enable vehicles to take a different route. If a posting sign is found to be missing, damaged, or vandalized, the sign should be replaced or repaired quickly once the issue is discovered. This change will improve compliance with the National Bridge Inspection Standards (NBIS) and reduce risk through verification of proper posting procedures.

INSTRUCTIONS FOR SAVING DOCUMENTS

The process of saving the necessary documents to MiBRIDGE is simple; however, additional time must be allocated as each applicable bridge must be accessed individually. Access the application at www.michigan.gov/bridgeinspect. If you do not have a username or profile, please select the "Help with Access to MiBRIDGE" link located on the webpage.

Upon logging in to MiBRIDGE the default screen will display the Structure Condition Dashboard. Select the appropriate structure by clicking on the bridge number in blue numerals displayed in the Structure Number column.

After selecting the bridge, the next screen will display the Inspections / Reports tab. Select the Documents tab, click the View Photos radio button, then click Add Photos.

A second browser window will appear after selecting Add Photos. Next, click on Choose File and navigate to the folder where the photo of the weight limit sign is saved on your computer. Choose the file and briefly wait for the data to upload. Select Posting from the Category dropdown field, enter the location of the sign under Description, and then press save. Return to the Documents Tab screen to verify that the file(s) were saved to the application.

SUPPORTING IMAGES

Upload images

Choose Files



File Name	Posting sign.jpg
Category	Posting ▼
Span	▼
Description	Westbound sign

remove

Save

LOAD POSTING ANALYSIS

Per the National Bridge Inspection Standards (NBIS), all bridges must be rated for their safe load carrying capacity for all State legal vehicles. Chapter 2 of the MDOT Bridge Analysis Guide ([BAG](#)) lists the 28 legal vehicle configurations that must be evaluated in Michigan. If the load rating analysis finds the Michigan Operating Rating Factor (MDOT Item 64MB) to be less than 1.0 for any of these vehicles, the load carrying capacity of the bridge is insufficient for legal loads and the bridge must be posted for weight limits.

When posting is required, the following items must be recorded in MiBRIDGE:

- NBI Item 41 – Structure Open, Posted, or Closed to Traffic: This item must be coded as “B – Posting Recommended” until all weight limit signs are in place. Once all signs have been erected, NBI Item 41 must be changed to “P – Posted for Load” to maintain compliance with the NBIS.
- NBI Item 70 – Bridge Posting: This item evaluates the load capacity of the bridge in comparison to State legal loads and must be coded as 4 or less when MDOT Item 64MB is less than 1.0.
- MDOT Item 141 – Posted Loading: This item represents the weight limits signed on the structure using six digits, as detailed below.

The weight limit, found using the equation below, must be calculated for each vehicle with a Michigan Operating Rating less than 1.0 and should always be rounded down to the nearest whole number. Due to the varying gross vehicle weight (GVW) of each truck, it is important to note that the lowest rating factor does not always correspond to the minimum weight limit allowed.

$$\text{Weight Limit} = \text{MI Operating Rating Factor} * \text{Gross Vehicle Weight}$$

If the weight limit of a structure is found to be less than 3 tons, it must be closed to traffic and NBI Item 41 must be coded “K – Closed to All Traffic”.

Bridges can be posted based on truck type, gross vehicle weight (GVW), or axle weight. When posting by truck type, Michigan’s 28 legal vehicles are categorized into 1-unit, 2-unit and 3-unit configurations. The first two digits of MDOT Item 141 – Posted Loading reflect the 1-unit weight limit, the middle two digits reflect the 2-unit weight limit and the last two digits reflect the 3-unit weight limit.

The 1-unit configuration consists of a power unit and trailer that form one vehicle, where the power unit and trailer are not designed to be detachable. This configuration is represented by Trucks 1 – 5 and Truck 26 in the MDOT BAG. The maximum allowable legal load for 1-unit vehicles is 42 tons.

The 2-unit configuration consists of a power unit or single unit truck that is detachable from the trailer. This configuration is represented by Trucks 6 – 18 and Truck 27 in the MDOT BAG. The maximum allowable legal load for 2-unit vehicles is 77 tons.

The 3-unit configuration consists of three units that are detachable from one another, including any power unit with two trailers. This configuration is represented by Trucks 19 – 25 and Truck 28 in the MDOT BAG. The maximum allowable legal load for 3-unit vehicles is 82 tons.

If all vehicles within a particular unit category (1-unit, 2-unit or 3-unit) have a rating factor greater than 1.0, the posting load will be the maximum allowable legal load for that category and MDOT Item 141 should be coded as such.

When posting by GVW, the maximum allowable weight limit must not exceed 42 tons, the minimum legal weight of the 1-unit, 2-unit and 3-unit categories. The first two digits of MDOT Item 141 reflect the GVW weight limit. The last four digits shall be coded as “NNNN”. If load rating analysis permits vehicles heavier than 42 tons to cross the bridge, it is recommended to post by truck type.

When posting by axle weight, the maximum posted axle weight must not exceed 10 tons, the maximum legal axle weight in Michigan. The first two digits of MDOT Item 141 shall be coded as “NN,” the middle two digits shall be coded with the axle weight limit, and the last two digits shall be coded as “NN”.

If the Michigan Operating Rating indicates that the bridge can carry all legal loads, or the rating factor is greater than 1.0, posting is not required. However, a bridge owner may elect to post a bridge for a lower weight limit than determined by calculations, as lower weight limits may extend the life of the bridge.

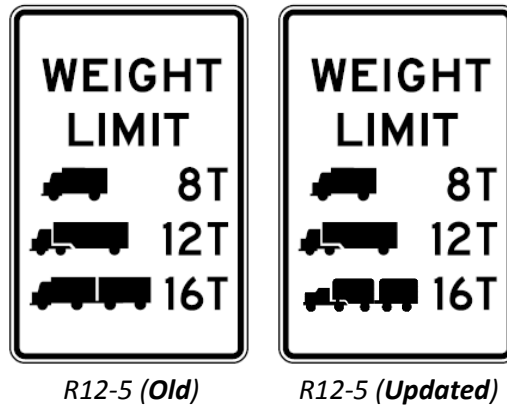
Per the NBIS, State or Federal agencies must update the inventory within 90 days and local agencies must update the inventory within 180 days. However, in cases where known existing loads significantly exceed the recommended weight limit, or the route is of significant importance (bus routes, emergency vehicle routes, etc.), the weight limits sign must be erected as quickly as possible to ensure public safety.

WEIGHT LIMIT SIGNS

The Michigan Vehicle Code (Section 257.631) states that should analysis find that a structure cannot safely withstand all legal loads, weight limit signs shall be erected and maintained not more than 50 feet from each end of the structure, as well as at a suitable distance from each end of the bridge to enable vehicles to take a different route.

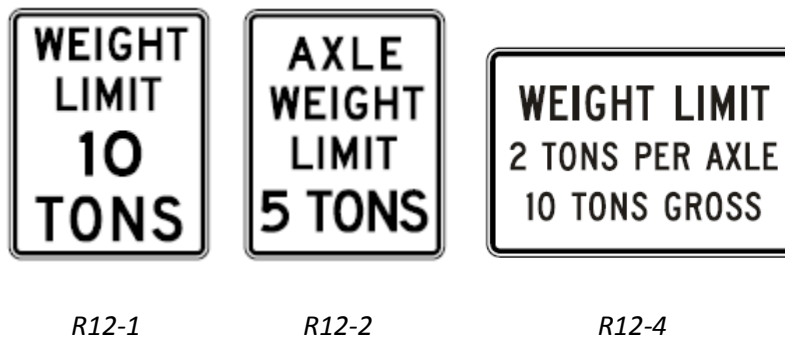
The Michigan Manual on Uniform Traffic Control Devices ([MMUTCD](#)) prescribes the signs that can be used, as well as the information shown on those signs, such as symbols and text.

Sign type R12-5, shown below, is used to post weight limits based on truck type. The sign uses typical configurations to show easily recognizable vehicles, as it is not possible to represent every vehicle configuration. The top silhouette represents a 1- unit truck, the middle silhouette represents a 2-unit truck and the bottom silhouette represents a 3-unit truck. It is important to note that the number of axles shown on each silhouette is a representative example only and actual axle configuration may differ.



As of January 2017, R12-5 has been updated in the MMUTCD. The 3-unit truck silhouette has been revised to better represent a truck with multiple trailers. Moving forward, all new weight limit signs should reflect the updated silhouette.

Sign types R12-1, R12-2 and R12-4, shown below, may be useful in situations where severe load restrictions apply. Sign R12-1 is used to post by gross vehicle weight, sign R12-2 is used to post by axle weight, and sign R12-4 can be used to combine the load posting information from both R12-1 and R12-2. The GVW or axle weight for any vehicle is limited regardless of the number of axles or axle configuration of the vehicle.



Additional load posting guidance can be found at http://www.michigan.gov/documents/mdot/MDOT_Load_Posting_Guidance_547901_7.pdf