



# Assigned Rating

ITEM 63 & 65 METHOD OF RATING



# Memorandum

Subject: **ACTION:** Assigned Load Ratings

Date: September 29, 2011

*/s/ Original Signed by*  
From: M. Myint Lwin, P.E., S.E.  
Director, Office of Bridge Technology

In Reply Refer To:  
HIBT-30

To: Division Administrators

The purpose of this memorandum is to clarify FHWA's position on the use of assigned load ratings as a means of complying with the requirements of the National Bridge Inspection Standards (NBIS). Section 650.313 of the NBIS stipulates each bridge is to be load rated in accordance with the AASHTO Manual for Bridge Evaluation (MBE), First Edition/2008, which is incorporated into the regulation by reference. The recently published MBE, Second Edition/2011, introduced changes in the load rating section, specifically the concept of assigning ratings for certain bridges based on the design loading. As a result, some confusion exists over the applicability of the second edition of the MBE and the acceptability of the assigned load rating method under the current NBIS regulation.

The intent of the load rating provisions of the NBIS is to insure that all bridges are appropriately evaluated for their safe load carrying capacity. An established bridge analysis and rating model can be an important element of the bridge records, allowing bridge owners to make quick management decisions regarding the safe load carrying capacity when emergencies arise. FHWA recognizes that certain bridges currently in service with benign condition deterioration, designed and checked by modern methods for modern bridge loadings, and with no changes to dead loads and State legal and routine permit vehicular loads since the design was completed may adequately have those capacities already calculated.

Although the second edition of the MBE is not currently part of the NBIS regulation, FHWA has determined that the inventory or operating level ratings may be assigned based on the design loading, at the discretion of the bridge owner, provided the following conditions, outlined in the commentary to the MBE Second Edition/2011, sections C6A.1.1 and C6B.1 are all met:

- (1) The bridge was designed and checked using either the AASHTO Load and Resistance Factor Design (LRFD) or Load Factor Design (LFD) methods to at least HL-93 or HS-20 live loads, respectively; and
- (2) The bridge was built in accordance with the design plans; and

- (3) No changes to the loading conditions or the structure condition have occurred that could reduce the inventory rating below the design load level; and
- (4) An evaluation has been completed and documented, determining that the force effects from State legal loads or permit loads do not exceed those from the design load; and
- (5) The checked design calculations, and relevant computer input and output information, must be accessible and referenced or included in the individual bridge records.

A summary of the assigned load rating, which demonstrates these five conditions are met, is to be included in the bridge records and approved by the individual charged with the overall responsibility for load rating bridges, or by an individual meeting 23 CFR 650.309(c) qualifications and delegated, in writing, this approval authority. If any of these conditions cannot be met for a bridge at any point during its service life, load ratings cannot be assigned and must be determined by other methods defined in the MBE.

If complete design files have not been retained for existing bridges, design plans that clearly identify the loading as at least HL-93 or HS-20 and bear the stamp of a licensed professional engineer may be used by the individual responsible for load rating under 23 CFR 650.309(c) as the basis for an assigned load rating. The approval needs to be documented as the basis for the assigned rating and become part of the official bridge records. This information demonstrates satisfaction of conditions (1) and (5) above. Conditions (2), (3), and (4) still need to be met.

Please contact Lubin Gao of our office with any questions regarding this interpretation.

# ASSIGNED RATING

- ▶ Item 63 AND 65 Method of Rating
- ▶ Assigned Load Rating codes D and F
- ▶ D – Assigned Load Factor Rating (LFR) reported by Rating Factor using HS-20 Loading
- ▶ F – Assigned Load & Resistance Factor Rating (LRFR) reported by Rating Factor using HL-93 Loadings.

## LOAD RATING

(31) Design Load:

5 - HS20

(703) Inventory Rating Load GVW:

(63) Operating Rating Method:

6 - Load Factor (LF) rating r

(704) Load Rating Date:

(64) Operating Rating Factor:

0 - Field evaluation and documented engineering judgment in tons

First Name:

(700) Operating Rating Load:

4 - Load Testing reported in tons

Last Name:

(701) Operating Rating Load GVW:

5 - No rating analysis or evaluation performed reported in tons (Default)

Ohio PE Number:

(65) Inventory Rating Method:

**6 - Load Factor (LF) rating reported by RF using HS20 loading**

g Software:

(66) Inventory Rating Factor:

7 - Allowable Stress (AS) rating reported by RF using HS20 loading

ce:

(702) Inventory Rating Load:

8 - Load & Resistance Factor Rating (LRFR) reported by rating factor (RF) using HL-93

response:

(41) Open Posted or Closed:

D - Assigned Load Factor Rating (LFR) reported by rating factor (RF) using HS20 loading

F - Assigned Load & Resistance Factor rating (LRFR) reported by rating factor (RF) using HL93 loadings

(715) Ohio Legal Load 1:

Load 4:

(716) Ohio Legal Load 1 GVW:


15.000


tons

(725) Ohio Legal Load 4 GVW:



- ▶ **(1)** The bridge was designed and checked using either the AASHTO Load and Resistance Factor Design (LRFD) or Load Factor Design (LFD) methods to at least HL-93 or HS-20 live loads, respectively; and
- ▶ **(2)** The bridge was built in accordance with the design plans; and
- ▶ **(3)** No changes to the loading conditions or the structure condition have occurred that could reduce the inventory rating below the design load level; and
- ▶ **(4)** An evaluation has been completed and documented, determining that the force effects from State legal loads or permit loads do not exceed those from the design load; and
- ▶ **(5)** The checked design calculations, and relevant computer input and output information, must be accessible and referenced or included in the individual bridge records.

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- ▶ To satisfy #2,3,&4, you need to document those statements in the bridge file.
  - ▶ (2) The bridge was built in accordance with the design plans; and
  - ▶ (3) No changes to the loading conditions or the structure condition have occurred that could reduce the inventory rating below the design load level; and
  - ▶ (4) An evaluation has been completed and documented, determining that the force effects from State legal loads or permit loads do not exceed those from the design load;

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- ▶ To satisfy # 1 & 5, you need either calculations or plans as follows:
  - ▶ A) design "calculations" showing the bridge was designed and checked using either the AASHTO Load and Resistance Factor Design (LRFD) or Load Factor Design (LFD) methods to at least HL-93 or HS-20 live loads, respectively.
  - ▶
  - ▶ B) design "plans" (or shop drawings) that clearly identify the loading as at least HL-93 or HS-20 and bear the stamp of a licensed professional engineer.
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## OHIO LEGAL LOADS

(715) Ohio Legal Load 1:	<input type="text" value="2F1"/>		(724) Ohio Legal Load 4:	<input type="text"/>	
(716) Ohio Legal Load 1 GVW:	<input type="text" value="15.000"/>	tons	(725) Ohio Legal Load 4 GVW:	<input type="text" value="40.000"/>	tons
(717) Ohio Legal Load 1, Rating Factor:	<input type="text"/>		(726) Ohio Legal Load 4, Rating Factor:	<input type="text"/>	
(718) Ohio Legal Load 2:	<input type="text" value="3F1"/>		(727) Ohio Legal Load 5:	<input type="text"/>	
(719) Ohio Legal Load 2 GVW:	<input type="text" value="23.000"/>	tons	(728) Ohio Legal Load 5 GVW:	<input type="text"/>	tons
(720) Ohio Legal Load 2, Rating Factor:	<input type="text"/>		(729) Ohio Legal Load 5, Rating Factor:	<input type="text"/>	
(721) Ohio Legal Load 3:	<input type="text" value="4F1"/>		(730) Ohio Legal Load 6:	<input type="text"/>	
(722) Ohio Legal Load 3, GVW:	<input type="text" value="27.000"/>	tons	(731) Ohio Legal Load 6, GVW:	<input type="text"/>	
(723) Ohio Legal Load 3, Rating Factor:	<input type="text"/>		(732) Ohio Legal Load 6 Rating Factor:	<input type="text"/>	
(70) Bridge Posting:	<input type="text" value="5 - Equal to or above legal I"/>		(733) Posting Required by Rating:	<input type="text"/>	
			(734) Ohio Percent Legal:	<input type="text" value="130"/>	%