# Load Rating Requirements for Bridge Design Contracts

General

- Load rate bridges in accordance with:
  - the most current version of Chapter 8 (Load Rating and Posting) of the *MDT Bridge Inspection and Rating Manual*
  - additional or interim MDT guidance located on MDT's Load Rating Website
  - the latest version of the *AASHTO Manual for Bridge Evaluation*
  - *AASHTO Standard Specifications for Highway Bridges 17th Edition (2002)*
  - the latest version of the *AASHTO LRFD Bridge Design Specifications*
- Load ratings must be stamped by a Montana Registered Professional Engineer who has performed the load rating or is in responsible charge of the work.
- BrR licenses that are not identifiable to a single cost objective are indirect costs and should be included in overhead.

Rating Software

- Use AASHTOWARE BrR for all bridges that BrR has the capability to rate. Use the same version as MDT's current version *(can be found on MDT's Load Rating Website)*
- Coordinate with MDT's Load Rating Engineer for approval prior to using other software for structures

Rating Methodology

- Use LRFR to rate for HL-93, AASHTO legal loads (Type 3, Type 3s2, Type 3-3, SU4, SU5, SU6, SU7), and both Emergency Vehicles (EVs)
- If LRFR is not possible due to BrR limitations, coordinate with MDT's Load Rating Engineer

Elements to Load Rate

- Load rate deck and superstructure elements per Chapter 8 of the *MDT Bridge Inspection and Rating Manual*

MDT Templates *(use most current version, located on MDT's Load Rating Website)*

- Load Rating Summary Sheet
  - Overwrite/update information as necessary for in-service bridges
  - Contact MDT's Load Rating Engineer for information on new bridges
- BrR LRFR Analysis Vehicle Template

Deliverables

- Load Rating Report (assembled, stamped pdf)
  - See MDT's Load Rating Website for most current version of *Load Rating Report Requirements*
  - File Name: <MDT ID> Load Rating Report
- BrR .xml file
  - File Name: <MDT ID>

Common Assumptions to Include in Load Rating

- Use Condition Factors in LRFR analysis to account for member deterioration per MBE section 6A.4.2.3. Engineering judgement may be used in the basis of condition factors (i.e. element level vs. NBI condition ratings) and must be documented in the load rating report accordingly.
- Per Bridge Memo 09-02, assume that concrete deck includes ½" sacrificial wearing surface

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- Per *MDT Bridge Inspection and Rating Manual* 8.2.6.4, use transformed section properties, include elastic gains, and use AASHTO refined method for calculating prestress losses when rating prestressed concrete girders.

<u>BrR Modeling</u>

- Use naming conventions and MDT preferences as outlined in *MDT Bridge Inspection and Rating Manual* section 8.2.7, with the following modifications:
  - In Description, note the following:
    - Simple Bridge Description
    - Input by *"Consultant Name"*
    - Contract/project load rating is associated with
    - Anything unique about the model or process of rating the structure (i.e. additional superstructure definition for alternate rating, process to check for failed girder condition)
  - See below for Bridge ID and NBI Structure ID Input

***8.2.7.1 Naming Convention***

*8.2.7.1.1 Bridge Definition*
Bridge ID: MDT Bridge ID
NBI Structure ID: NBI Structure ID (item 8)
See figure 8.2.7.1-1.

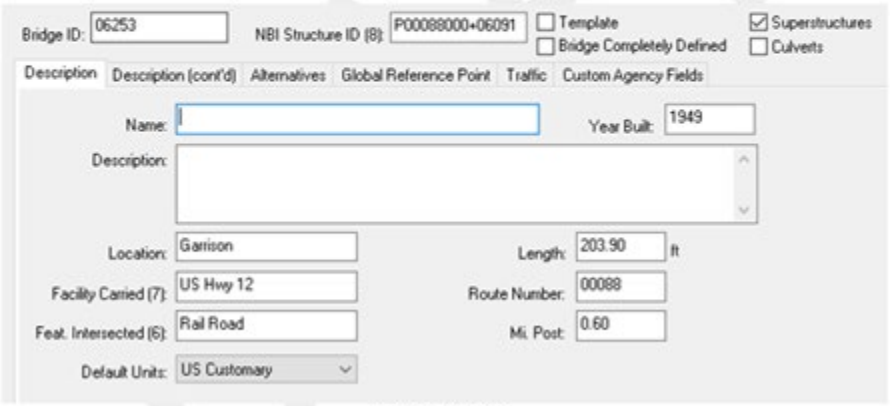



**Figure 8.2.7.1-1**

  - Bridge Definition - input all fields in both 'Description' Tabs
    - Information for existing bridges can be found in SMS (MDT's Structure Management System)
    - Contact MDT's Load Rating Engineer for new bridges that don't have an SMS asset record
  - Program Tolerances (*Configuration Browser > System Defaults > Tolerance)*

| Units | Tolerance |
|---|---|
| ft | 0.01 |
| in | 0.10 |
| mi | 0.01 |

- As best practice, purge all unused material properties/factors/definitions