MDT Load Rating Report Requirements

Checklist *(see Additional Information below for details about each report component)*

- ☐ Load Rating Summary Sheet
- ☐ Comments/Assumptions
- ☐ Calculations
- ☐ Bridge Rating Results
- ☐ Rating Results Summary Report
- ☐ Vehicle Analysis Template
- ☐ Measurements/Plans

General Notes:

- All sheets included in the load rating report should be rotated to the appropriate viewing orientation
- Refer to the Additional Load Rating Report Guidance document on MDT's Load Rating Website for details about report modifications for specific structure types
  - *i.e. mixed material deck/superstructure, corrugated metal decks*
- Load rating reports are intended to serve as standalone documents for the structure in its current condition at the time of rating. Comments about BrM corrections that need to be made, or conditions that are not considered in the rating but are recommended for monitoring, should not go on the summary sheet; rather, they should be sent via email or discussed via phone.

Additional Information:

- ☐ **Load Rating Summary Sheet**
  - See MDT's Load Rating Website for up-to-date template
- ☐ **Comments/Assumptions**

  The space on the summary sheet is intended to flag attention to anything unique about the rating, such as the following:
  - Reduced capacity for timber members
  - EV live load factor (if different than default value 1.3)
  - Removal of optional limit state checks
  - Alternate superstructure created in BrR for *xxx* reason
  - BrR limitations/workarounds
  - Mixed materials or corrugated decks (see examples)

  More detailed documentation of engineering judgement and calculations should be attached as additional pages. Reference additional pages on the summary sheet (i.e. Additional assumptions and calculations are detailed within the attached load rating report). Address the following, using the following headings:
  - Analysis References *(include version and interims)*
    - *i.e. MBE, AASHTO LRFD, AASHTO Standard Specifications*
  - Basis for Load Rating
    i.e. field measurements from xxx year, as-built plans/shop drawings/construction plans with MDT drawing numbers, if applicable
    - Please include MDT Drawing Numbers (and label "MDT Drawing Number") on construction/as-built plan references (including rehabs)
    - Please include MDT Construction Project Number (labeled "MDT Construction Project Number") on shop drawing references
    - Plan/Shop drawing references for structures without MDT Drawing Numbers or MDT Construction Project Numbers (*typically County-owned, or structures that are not constructed in accordance with MDT details)* - please include name of designer/fabricator (if available), any other unique identifiers (i.e. date, Job number, Project, etc)
    - If there are multiple references (i.e. multiple years of measurement forms, both plans and measurements) - please include a note to indicate general approach/which document was referenced for which inputs *(this is intended to help with a general understanding, specific references should also be included in calculations section)*
  - Material Properties
  - Assumptions
    - Include what the assumption is, why it's required, and rationale/justification that shows the assumption is reasonable
      - *i.e. Appurtenances, Girders, Decks, Diaphragms*

- Members Rated
  - List all rated members (see below), and include the basis for naming convention (i.e. numbering is based on plans, measurement sheet, etc). Indicate any members that are linked and explain rationale for grouping
  - List rated members by Member Name used in the BrR model, and indicate if they're representative (i.e. typical, include which members are linked with rationale), have deterioration, original vs. widening, etc. Girders that aren't especially unique (e.g. modeled separately due to different spacings) can be named generically (i.e. Interior Girder). These descriptions should correlate with Member Alternative Names in the BrR model. Example is shown below:
    - G1 – Typical exterior girder. G17 is linked due to/based on…. (same material properties/condition/distribution)
    - G2 – Widening girder, G16 is linked due to/based on…
    - G3 – Typical interior girder. G4, G5, G6, G7 are linked due to/based on…
    - G4 – Interior Girder (reduced capacity)

    For multiple spans – please clearly note continuous spans, please note if one span is modeled to represent other spans. If spans are modeled separately, please list out rated members for each span.

    <u>Span 1</u>
    - G1 – Typical exterior girder. G5 is linked due to/based on…. (same material properties/condition/distribution)
    - G2 – Typical interior girder. G2, G3, G4 are linked due to/based on…

    <u>Span 2</u>
    - G1 – Typical exterior girder. G5 is linked due to/based on…
    - G2 – Typical interior girder. G2, G4 are linked due to/based on…
    - G3 – Interior Girder (reduced capacity)

- Live Load Distribution
  - Indicate if live load distribution factors are automatically calculated by BrR, or if limitations require manual calculations

- Defects
  - Address any defects identified in the inspection report that warrant a reduced condition factor or modification to section properties
  - Please address CS3 defects for any rated members in the Defects section, explain reasoning if not determined to affect analysis
  - For defects/deficiencies that are accounted for in analysis – please provide a brief summary in the Defects section, indicate how it's accounted for (i.e. specific reductions/inputs in BrR model) and reference calculations for further details (if applicable)

- Analysis Workarounds
  - Include details about any 'workarounds' (*i.e. alternate rating, check for failed girder condition, JIRA bug/ticket*)
  - If a ticket affects the load rating, include the following documentation:

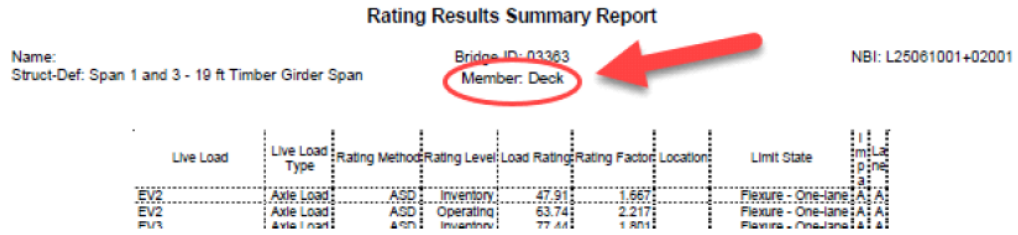
- Reference ID (JIRA ticket number)
- Brief statement of problem and model/rating is affected
- Workaround procedure performed

- Additional comments
  - Specific to the structure being load rated; generally warranted to bring attention to unique considerations
  - Include clear and concise documentation, and rationale if applicable
  - Indicate when additional refinement is performed

☐ **Copies of all calculations (hand or electronic) made outside of software**
- This applies to any calculations not included in the rating program's analysis
  - *i.e. LLDFs for certain structure types, dead loads, section loss, other input*
- Independent calculations are required to verify results for any unexpected low-rating members
- Ensure that calculation sheets contain appropriate references to equations, relevant code articles, and source of information *(i.e. plan sheet number)*.
- Organize calculations in a format with enough detail to easily follow for checking purposes.
  - If excel sheets are utilized, include sample calculations that work through the sheet's functionality in an easily followed and fully referenced format

☐ **Bridge Rating Results**
- PDF printout from BrR Bridge Explorer showing controlling ratings for entire structure
- Scale to fit one page
- "Single rating level per row"

☐ **Rating Results Summary Report for each rated member**
- PDF printout from BrR Bridge Workspace showing ratings for each individual member
- Scale to fit one page
- "Single rating level per row"
- Highlight controlling rating factors
- Most member-specific rating summary reports include the member at the top, except for the deck. If the deck is rated (i.e. timber, corrugated steel), please add to clearly indicate which member the ratings are for *(see example below)*



☐ **Screenshot of BrR Vehicle Analysis Template**
- For LRFR vehicle analysis template, include additional agency-defined vehicle screenshots
- See example on [MDT's Load Rating Website]

- ☐ **PDF copy of measurements or plan sheets used in analysis**
  - Plan sheets are only necessary for structures that do not have an MDT Drawing or Construction Project number (typically non State-owned structures)
  - To keep report sizes reasonable, it's acceptable to include only the relevant sheets used for analysis (i.e. general layout with notes, framing plan, cross-section, beam details, connection details, etc.)
    - If full set is not attached, please indicate under reference in the Basis for Load Rating section and note that full set is available in BrM *(i.e. partial set of plans and/or shop drawings is attached - only sheets with pertinent info to the load rating. The full set of plans/drawings is located in BrM)*