Additional Load Rating Report Guidance

This document is a supplement to MDT Load Rating Report Requirements, which can be found on MDT's Load Rating Website. It is intended to address report modifications associated with a few specific structure types, in addition to general modification guidance for other unique rating scenarios.

General

In general, do not include the Bridge Rating Results from BrR Bridge Explorer if the rating process is such that the overall summary does not reflect controlling values for the structure. Documentation is key – make sure to include rationale behind limitations/alternate rating process.

Corrugated Metal Deck

*Background – BrR analyzes corrugated metal decks as both a simple and continuous span. In past practice, MDT has determined that both methods of analysis are conservative. For this reason, the higher of the two ratings are reported. **Note - in some cases, the deck no longer controls when using the higher ratings.*

- Two common scenarios - s*ee examples on MDT's Load Rating Website for additional ideas on wording/level of detail*
    - **Scenario 1:** Initial Bridge Rating Results indicate that girders control the rating
        - Non-issue – report modification is not necessary
    - **Scenario 2:** Initial Bridge Rating Results indicate that the corrugated deck controls the rating
        - Include note in comments/assumptions
            - *i.e. "Per MDT guidance, both deck analysis methods are considered conservative. The least conservative deck results were considered in determining controlling rating factors."*
        - Don't include overall rating results from Explorer
        - Include rating results for each member
            - *MDT preference is to highlight the member name at the top of each sheet, in addition to highlighting the overall controlling rating factors*
            - *Add 'Deck' to deck results*
            - *Make note on deck member rating result summary - see example*
        - Include calculations/additional assumptions/measurement sheets/plans as usual
        - Include vehicle template as usual

Mixed Materials

Background – BrR is currently limited to ASR for timber members. This introduces some challenges in rating mixed material structures, because ASR and LRFR ratings are based on different design codes, and the results aren't truly a 'like-for-like' comparison. The following details MDT's current practice in dealing with these structures.

- Model correctly in BrR for future use (when timber LRFR capability is available)
- Compare *legal* load rating factors (ASR operating, LRFR) to determine controlling values, controlling methodology
    - Note - design-load levels are different for LRFR and ASR, and there's not a direct comparison between HL-93 and HS20. Report the design load associated with controlling methodology (i.e. HS20 for ASR, HL-93 for LRFR)
- Two common categories - s*ee examples on MDT's Load Rating Website for additional ideas on wording/level of detail*

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- **Category 1:** One rating methodology controls for all live loads
  (i.e. timber deck controls ASR, or steel girders control LRFR for all legal vehicles)
    - Use summary sheet for the controlling methodology, document rating process in the comments/assumptions
        - *i.e. "Due to BrR limitations, ASR analysis was used for the timber deck and LRFR analysis was used for steel girders. Controlling values (based on ASR Operating and LRFR rating factors) are reported"*
    - Don't include overall rating results from Explorer
    - Include rating results for each member
        - *MDT preference is to highlight the member name at the top of each sheet, in addition to highlighting the overall controlling rating factors*
        - *Add 'Deck' to deck results*
    - Include calculations/additional assumptions/measurement sheets/plans as usual
    - Include both vehicle templates

- **Category 2:** Multiple rating methodologies control
  (i.e. timber deck controls ASR for EV2, steel girders control LRFR for all other legal vehicles)
    - For the following reasons, all ratings in this category will default to LRFR (and use an LRFR summary sheet)
        - MDT wants to avoid multi-code ratings, in large part because they introduce a number of posting/reporting complications.
        - FHWA does not allow rating of steel structures ASR
            - *Reference: https://www.fhwa.dot.gov/bridge/nbis/103006.cfm*, (*see footnotes 3 and 4)*
    - Use an alternate means to perform an LRFR timber analysis for all legal vehicles.
        - Because this is a stop-gap until LRFR analysis is available in BrR, there are no requirements associated with analysis program or standardized template. Calculation sheets need be organized in a clear and concise format with enough detail (i.e. equation references, relevant code articles) to easily follow for checking purposes.