TR-832 Implementation of AASHTOWare BrR Program for Rating Iowa Bridges

Status on Template Completion (12/5/2024)

Research project TR-832 is creating BrR templates for Iowa's standard bridges. Research is expected to complete by January 2026.

The final project will provide the following:

- Rating Booklet – General assumptions made controlling ratings for each standard similar to what was provided previously in Phases 1-6.
- BrR Templates for the following standards up to 2017:
    - H Standards
    - J Standards
    - RS Standards
    - V Standards
    - S, T, U, W, X, Y, and Z Standards
- BrR Example Templates for the following standards.
    - B Standard
    - Triple Reinforced Concrete Box (TTRCB) Standard
    - Twin Reinforced Concrete Box (TWRCB) Standard
    - Single Reinforced Concrete Box (RCB) Standard
    - Corrugated Metal Pipe (CMP)
- Supporting Calculations for all BrR Templates
- Written Guidance on How to Use Templates

In the meantime, we will incrementally upload finalized files and documentation to this folder. The following is the history of what has been uploaded so far.

12/05/2024

- BrR Templates and Supporting Calcs
    - Example_CMP_L48ft_S6ft5.125in.xml & Supporting Calcs (VOID AND REPLACED 4/4/2025)
    - Template_B30-16_70ft.xml & Supporting Calcs(VOID AND REPLACED 4/4/2025)
    - Template_H40-06_226ft4in.xml & Supporting Calcs (VOID AND REPLACED 4/4/2025)
    - Template_J40-06 & J40-14_150ft.xml & Supporting Calcs (VOID AND REPLACED 4/4/2025)
    - Template_TRRCB-12_12ftSX10ftH_24-25ft Earth Fill.xml & Supporting Calcs (VOID AND REPLACED 4/4/2025)
    - Template_V16-70_250ft.xml & Supporting Calcs
- Library and System Files
    - IowaDOT_Library_BrR_V750.brlx (VOID AND REPLACED 7/29/2025)
    - IowaDOT_System_BrR_V750.brsx (VOID AND REPLACED 4/4/2025)
    - Curb and Railing Library.pdf
- TR-832 Written Material (In-Progress)
    - IowaDOT BrR System and Library Data Summary_DRAFT.docx

4/4/2025

- AASHTOWare Bridge Rating Training Material
    - CVT1-Two-Cell-RC-Box-Culvert-Example-With-BrDR-7.5.0.pdf
    - CVT2-Corrugated-Metal-Pipe-Culvert-Example.pdf
    - CVT3-Metal-Box-Culvert-Example.pdf
    - DF2-Distribution-Factor-Analysis-NSG-LFR-Example.pdf
    - Iowa DOT AASHTOWare BrR - Libraries and System Defaults Quick Start Guide - Copy.pdf
    - Iowa DOT AASHTOWare BrR - PS I Beam Template.pdf
    - Iowa DOT AASHTOWare BrR - RC Slab Template.pdf
    - Iowa DOT AASHTOWare BrR - Steel Beam Template.pdf
    - LIB1-Library-Training.pdf
    - LIB2-Library-Export-Import.pdf
    - PS1-Simple-Span-PS-I-Beam.pdf
    - PS15-2-Span-Adj-Box-With-Straight-Strands.pdf
    - RC6-Two-Span-RC-Slab-System.pdf
    - STL2-Two-Span-Plate-Girder.pdf
- BrR Templates and Supporting Calcs
    - Template_J40-06 & J40-14_150ft.xml & Supporting Calcs.pdf
        - Updated LRFR rating results using new “Iowa DOT LRFR” analysis template
        - Control Options changed to consider skew reduction factor.
        - The superstructures modeled with a monolithic pier cap were deleted to avoid confusion. Whether the bridge has monolithic or non-monolithic pier cap, the ratings for all J standards will be modeled.
        - The strip widths were updated.
    - Example_CMP_L48ft_S6ft5.125in.xml & Supporting Calcs.pdf
        - Updated LRFR rating results using new “Iowa DOT LRFR” analysis template
    - Template_B30-16_70ft.xml & Supporting Calcs.pdf
        - Updated LRFR rating results using new “Iowa DOT LRFR” analysis template
    - Template_H40-06_226ft-4in.xml & Supporting Calcs.pdf
        - Updated LRFR rating results using new “Iowa DOT LRFR” analysis template
    - Template_TRRCB-12_12ftSX10ftH_24-25ft Earth Fill.xml & Supporting Calcs.pdf
        - Updated LRFR rating results using new “Iowa DOT LRFR” analysis template
    - V5B 1936 & 1947 templates and supporting calcs
        - 18’ and 20’ roadways
        - 16’, 20’, 24’, 28’, 32’, 36’, and 40’ bridge lengths
    - V7 1939 & 1946 templates and supporting calcs
        - 120’, 150’, 180’, 210’, and 240’ bridge lengths
    - V10 1951 templates and supporting calcs
        - 125’, 150’, 175’, 200’, 250’, and 300’ bridge lengths
    - V10A 1957 templates and supporting calcs
        - 125’, 150’, 175’, 200’, 250’, and 300’ bridge lengths
    - V11 1957 and 1964 templates and supporting calcs
        - 23’ 9”, 30’, 42’ 6”, 55’, 67’ 6”, and 80’ bridge lengths
    - V12 1957 and 1964 templates and supporting calcs

        - 125’, 150’, 175’, 200’, 225’, 250’, 278’, 300’, 347’ 6”, 417’ and 445’ bridge lengths
        - Some V12 bridge lengths and skews were not modeled because no bridges were found in the inventory matching that standard/skew.
    - V13 1960 templates and supporting calcs
        - 23’ 9”, 30’, 42’ 6”, 55’, and 67’ 6” bridge lengths
    - V15 1975 templates and supporting calcs
        - 23’ 9”, 30’, 42’ 6”, 55’, 67’ 6”, and 80’ bridge lengths
    - V16 1970 templates and supporting calcs
        - 125’, 150’, 175’, 200’, 225’, 250’ (previously submitted from Michael Baker), 278’, 313’, 347.5, 223’, 401, and 445’ bridge lengths
        - Some V16 bridge lengths and skews were not modeled because no bridges were found in the inventory matching that standard/skew.
- Library and System Files
    - IowaDOT_System_BrR_V750_12182024.brsx (VOID AND REPLACED 7/29/2025)
        - The 4/4/2025 version contains the following updates:
            - “Iowa DOT LRFR” analysis template – updated permit vehicles’ frequency from single trip to unlimited crossing.
            - Created a new “Iowa DOT LRFR All-Systems OW” Analysis Template. Will rarely be needed but available in case user needs to rate all-systems vehicles for LRFR permit load factors instead of legal load factors.
            - General Preference Templates were added. These are not necessary. If uploaded, they will automatically fill out the Control Options of the bridge to what was used in the standards. (NOTE: Control options will still need to be checked for each bridge to make sure the selected options work for that specific bridge and the load rater’s preferences.)
- TR-832 Written Material (In-Progress)
    - Iowa DOT BrR System File Updates_12182024.docx
        - This file provides the details of the system files updates and instructions for importing them.

7/29/2025

- Library and System Files
    - IowaDOT_Library_BrR_V750_20250722.brlx
        - Added 4 bulb tee beam shapes under Prestress Shaes > I Beams > Wide Top Flange
            - IowaDOT_PPCBT_BeamB_36Hx34TF
            - IowaDOT_PPCBT_BeamC_45Hx34TF
            - IowaDOT_PPCBT_BeamD_54Hx34TF
            - IowaDOT_PPCBT_BeamE_63Hx34TF

        - Added 16 prestress concrete materials under Materials > Concrete
            - PS Concrete (f'c=5.5ksi & f'ci=5ksi)
            - PS Concrete (f'c=6ksi & f'ci=5ksi)

- PS Concrete (f'c=6ksi & f'ci=5.5ksi)
- PS Concrete (f'c=6.5ksi & f'ci=5.5ksi)
- PS Concrete (f'c=7ksi & f'ci=6ksi)
- PS Concrete (f'c=7.5ksi & f'ci=6ksi)
- PS Concrete (f'c=7.5ksi & f'ci=6.5ksi)
- PS Concrete (f'c=8ksi & f'ci=7ksi)
- PS Concrete (f'c=8.5ksi & f'ci=7.5ksi)
- PS Concrete (f'c=9ksi & f'ci=7.5ksi)
- PS Concrete (f'c=9ksi & f'ci=8ksi)
- PS Concrete (f'c=9.5ksi & f'ci=7.5ksi)
- PS Concrete (f'c=9.5ksi & f'ci=8ksi)
- PS Concrete (f'c=10ksi & f'ci=8ksi)
- PS Concrete (f'c=10ksi & f'ci=8.5ksi)
- PS Concrete (f'c=10.5ksi & f'ci=8ksi)

- IowaDOT_System_BrR_V750_20250707.brsx
  - Added 5 new cells under Custom agency fields
    - Standard Template Used (DOT Field Only)
      - This cell will be filled out for each standard template by the DOT and should NOT be changed by the user. It will have the name of the template, and the user can query in the Bridge Explorer for this field to know which bridges were modeled using a particular standard.
    - Version of Template Used (DOT Field Only)
      - This cell will be filled out for each standard template by the DOT and should NOT be changed by the user. It will have a revision date of the template so the user knows what version of the template was used for that bridge. The user can query this field in the Bridge Explorer to see if a bridge was modeled using an outdated template that has since been altered.
    - Date Last Modified (User Field)
      - This field is for the user to fill out if/when a bridge has been modified from the original model (can be used for bridges made from templates or from scratch).
    - Last Modified By (User Field)
      - This field is for the user to fill out who made the modification from the original model (can be used for bridges made from templates or from scratch).
    - Comments on Modifications (User Field)
      - This field is for the user to provide a brief comment on what the modification was (can be used for bridges made from templates or from scratch). Ex “standard modified for 20’ roadway” or “added deterioration to steel girder” or “added overlay” etc.