

## Rating Q&A

1. Does IDOT allow linked members for girder bridges, or would they prefer that each girder is modeled separately for the purpose of modeling future deterioration?

*Linked members are allowed. However, each individual member must be modeled completely before linking. Once this is completed, determine which members have the same rating factors and link accordingly.*

2. What output does IDOT want submitted in PDF form along with the file? Does this vary based on the structure type? Some of the report types that the program creates for girder bridges are not produced for truss bridges.

*For AASHTOWare, the output to be submitted is the Rating Results Summary under the Tabular Results icon. Each individual member Rating Summary is to be included in a single pdf. Example: for a Single-Span Steel Beam superstructure, a Rating Summary for the Exterior Beam and Interior Beam are to be included. The naming convention is: XXXXXXX-YYYYMMDD-ANALYSIS.pdf, where XXXXXXX is the structure number and YYYYMMDD is the date of the analysis. Do not include all output or input from AASHTOWare.*

*All other computations, spreadsheets, computer program input files, and any other materials related to the Load Rating of the structure must be submitted as well.*

3. Looking for additional guidance on Analysis Settings, specifically rating vehicles and adjacent vehicles. Can an Analysis Settings “template” be made available in addition to the vehicle definitions IDOT currently provides?

*Added LFR and LRFR templates to website.*

4. Does IDOT prefer to leave non-governing default points of interest specified or should non-governing points of interest be deleted?

*We prefer that all default points of interest be left in the model unless directed otherwise.*

5. Are there any General Preferences settings or other settings that need to be modified from the default installation settings to conform to IDOT preferences?

*IDOT AASHTOWare default Control Options for each specific material and General Preferences are attached at the end of this document.*

6. Does IDOT have preferred naming conventions for superstructure definitions, member names, etc.?

*Superstructure Definitions: Based on superstructure type. Examples: 1) Single-Span PPC Deck Beams/PC Channel Beams; 2) 3-Span Continuous Steel Beams/Welded Plate Girders; 3) 2-Span Continuous RC Slab; 4) 3-Cell Continuous RC Rigid Frame Box Culvert; etc.*

*Members: Based on specific member. Examples: 1) 27"x48" PPC Deck Beam; 2) 21"x45" PC Channel Beam; 3) 30WF108; 4) 0.5"x44" Web Girder; 5) 12.0" RC Slab; 6) Edge of Roadway or Centerline of Roadway for Culvert Segments.; etc.*

7. Moment Redistribution option: Are we now potentially rating bridges differently than designed – particularly in the way of moment redistribution which used to be more common in design before computers eased the calculations, etc. – then rated without moment redistribution?

*Yes. Moment Redistribution is not allowed per IDOT Design and Load Rating policy. Every structure designed ASD is now being evaluated LFR, except timber and masonry members, which is a deviation from the original design.*

8. Regarding Rating Factors for 12-IL-PD6-40 (LFR or LRFR):

*The IL-PD6-40 is intended for negative moments and interior reactions of multi-span continuous structures. For Single Spans or a series of Simple Spans, this vehicle is Not Applicable.*

9. For PPC Deck Beams with no or bituminous wearing surface, should the AASHTO Refined or the Simplified method be used for calculation of prestress losses?

*Either method can be used, but the default setting in AASHTOWare should be set to AASHTO Approximate. The IDOT Prestress Manuals, from the 1964 version to current, are based on the Simplified Method and therefore Load Ratings of prestressed concrete members in the State of Illinois are done in the same manner.*

10. Is there a way to share/link bridges and analysis files between databases on different computers? Best practice to do so?

*You can use the export/import feature to transfer bridge models between databases in different locations.*

11. When submitting an xml design file, does the receiver need to be given any libraries (e.g. vehicle library) used or will they be incorporated with the xml file?

*Send the xml file only. Do not send libraries. The materials, beam shapes and appurtenances used will be transferred with the model.*

12. What is the difference between the AASHTOWareBr71 and AASHTOWareBr71s Data Sources? Will this affect ratings at all?

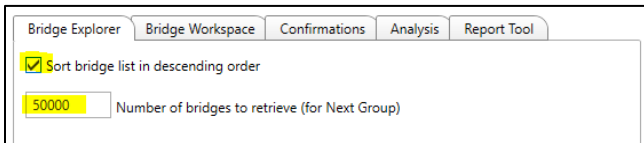
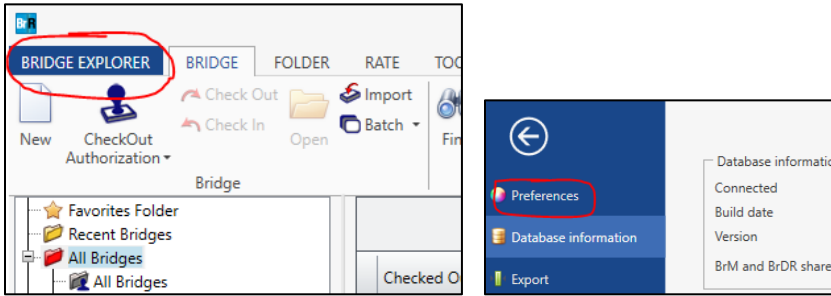
*There's no difference between the two databases, both can be used for ratings. You can create your own database with the assistance of your IT staff and the AASHTOWare Bridge Startup Guide.*

13. Is there a way to correctly model trussed floorbeams (including having the top chord loaded between nodal points by stringers framing in) including appropriate support/boundary conditions? And with and without cantilever brackets outside of the truss?

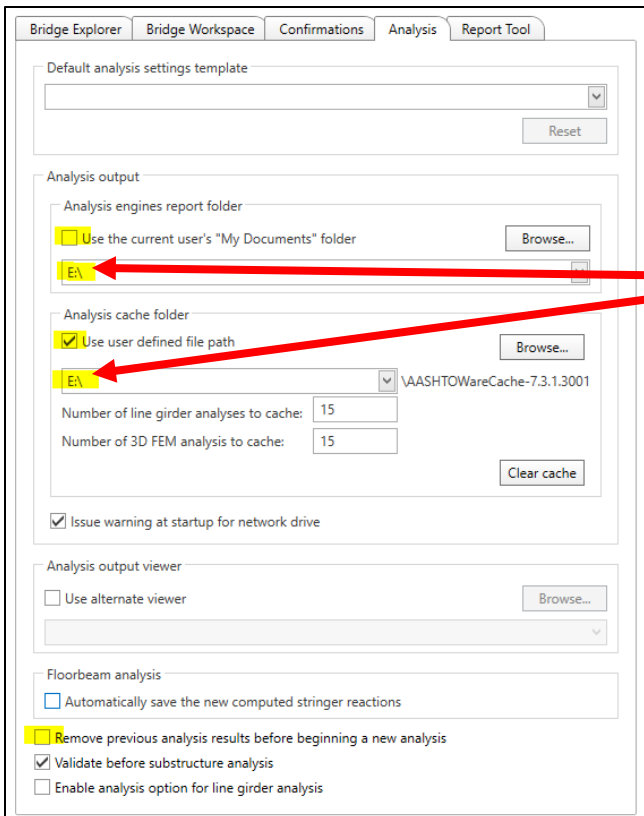
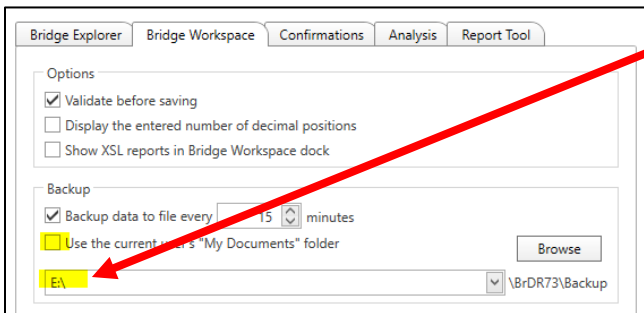
*For stringers loaded between nodal points, select the "Model truss member as beam element" option in the Truss Member Properties window. The Truss Floorbeam Supports window allows users to modify the support/boundary conditions.*



## PREFERENCES:



Local Solid-State Drive




Local Solid-State Drive

**STEEL**


(updated 4/4/2023)

**LRFD**

 Points of Interest


- Generate at tenth points
- Generate at section change points
- Generate at user-defined points
- Generate at stiffeners

- Allow moment redistribution
- Use Appendix A6 for flexural resistance
- Allow plastic analysis
- Ignore long. reinf in negative moment capacity
- Consider deck reinf. development length<sup>1</sup>
- Must consider lateral bending stress for line girder<sup>2</sup>

 Distribution Factor Application Method


- By axle
- By POI

**LFD**

 Points of Interest


- Generate at tenth points
- Generate at section change points
- Generate at user-defined points

- Allow moment redistribution
- Allow plastic analysis of cover plates<sup>4</sup>
- Include field splices in rating<sup>2</sup>
- Include bearing stiffeners in rating<sup>3</sup>
- Allow plastic analysis<sup>4</sup>
- Ignore long. reinf in negative moment capacity
- Ignore overload operating rating
- Ignore shear
- Consider deck reinf. development length<sup>1</sup>
- Consider tension-field action in stiffened web end<sup>3</sup>

 Distribution Factor Application Method


- By axle
- By POI

**LRFR**

 Points of Interest


- Generate at tenth points
- Generate at section change points
- Generate at user-defined points
- Generate at stiffeners

- Allow moment redistribution
- Use Appendix A6 for flexural resistance
- Allow plastic analysis<sup>4</sup>
- Evaluate remaining fatigue life
- Ignore long. reinf in negative moment capacity
- Include field splices in rating<sup>2</sup>
- Consider deck reinf. development length<sup>1</sup>
- Consider tension-field action in stiffened web end<sup>3</sup>
- Must consider lateral bending stress for line girder<sup>2</sup>

 Distribution Factor Application Method

- By axle
- By POI

**ASD**

 Points of Interest

- Generate at tenth points
- Generate at section change points
- Generate at user-defined points

- Ignore long. reinf in negative moment capacity
- Consider deck reinf. development length<sup>1</sup>
- Consider tension-field action in stiffened web end<sup>3</sup>

<sup>1</sup>Not used for Built-Up Members.

<sup>2</sup>Not used for Floorbeams & Stringers.




<sup>3</sup>Not used for Floorbeams.

<sup>4</sup>Unchecked for riveted members, or when plans are missing, or when  $F_y > 70$  ksi.



**NORMALLY REINFORCED CONCRETE**

(updated 4/4/2023)




**LRFD**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at support points<sup>1</sup>
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
-  Shear Computation Method
  - Ignore
  - General Procedure
  - General Procedure - Appendix B5
  - Simplified Procedure
  - Simplified Procedure - Vci, Vcw
- Consider inclined flexural forces
-  Distribution Factor Application Method
  - By Axle
  - By POI
- Consider skew reduction factor<sup>2</sup>
- Allow negative epsilon in general shear method
- Consider sloped portion of bent long. reinf.<sup>3</sup>



**LFD**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at support points
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
- Ignore shear<sup>4</sup>
-  Distribution Factor Application Method
  - By Axle
  - By POI
- Consider sloped portion of bent long. reinf.<sup>3</sup>

**LRFR**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at support points<sup>1</sup>
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
-  Shear Computation Method
  - Ignore
  - General Procedure
  - General Procedure - Appendix B5
  - Simplified Procedure
  - Simplified Procedure - Vci, Vcw
- Ignore design & legal load shear
- Ignore permit load shear
- Consider permit load tensile steel stress
- Ignore long. reinf. in rating
- Consider inclined flexural forces
-  Distribution Factor Application Method
  - By Axle
  - By POI
- Consider skew reduction factor<sup>2</sup>
- Allow negative epsilon in general shear method
- Consider sloped portion of bent long. reinf.<sup>3</sup>

**ASD**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at support points
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
-  Shear Computation Method
  - Ignore<sup>4</sup>
  - Use AASHTO 1973 or earlier code
  - Use AASHTO 1974 interim
  - Use current AASHTO
- Consider sloped portion of bent long. reinf.<sup>3</sup>

<sup>1</sup>May be turned off for non-continuous superstructures.

<sup>2</sup>Not used for I-Beams & T-Beams.

<sup>3</sup>Not used for I-Beams.

<sup>4</sup>Ignore Shear for Slabs when using LFD or ASD.

**PRESTRESSED CONCRETE**

(updated 4/4/2023)

**LRFD**

- Points of Interest
  - Generate at tenth points except supports
  - Generate at support points<sup>1</sup>
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
- Shear Computation Method
  - Ignore
  - General Procedure
  - General Procedure - Appendix B5
  - Simplified Procedure
  - Simplified Procedure - Vci, Vcw
- Loss & Stress Calculations
  - Use gross section properties
  - Use transformed section properties
- Multi-span analysis
  - Continuous
  - Continuous and Simple
- Consider splitting resistance article
- Consider deck reinf. development length
- Distribution Factor Application Method
  - By Axle
  - By POI
- Allow negative epsilon in general shear method

**LFD**

- Points of Interest
  - Generate at tenth points except supports
  - Generate at support points
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
- Shear Computation Method
  - Ignore
  - Use AASHTO 1979 Interim code<sup>2</sup>
  - Use current AASHTO
- Distribution Factor Application Method
  - By Axle
  - By POI
- Consider moment capacity reduction
- Consider deck reinf. development length

**LRFR**

- Points of Interest
  - Generate at tenth points except supports
  - Generate at support points<sup>1</sup>
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
- Shear Computation Method
  - Ignore
  - General Procedure
  - General Procedure - Appendix B5
  - Simplified Procedure
  - Simplified Procedure - Vci, Vcw
- Loss & Stress Calculations
  - Use gross section properties
  - Use transformed section properties
- Multi-span analysis
  - Continuous
  - Continuous and Simple
- Ignore design & legal load shear
- Ignore permit load shear
- Consider legal load tensile concrete stress
- Consider splitting resistance article
- Ignore tensile rating in top of beam
- Consider deck reinf. development length
- Consider permit load tensile steel stress
- Ignore long. reinf. in rating
- Distribution Factor Application Method
  - By Axle
  - By POI
- Allow negative epsilon in general shear method

<sup>1</sup>May be turned off for non-continuous superstructures, e.g. simple span PPC deck beams.




<sup>2</sup>1979 Interim may be used for load rating purposes only, it must be turned off for special/limited crossing permit analysis.






**CULVERT**

(updated 4/4/2023)


**LRFD**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at section change points
  - Generate at user-defined points
-  Shear Computation Method
  - Ignore
  - General Procedure
  - Simplified Procedure
- Exclude bottom slab
- Include haunch stiffness in FE model
-  Strength Design Method
  - RC Box
  - RC Pipe

**LRFR**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at section change points
  - Generate at user-defined points
-  Shear Computation Method
  - Ignore
  - General Procedure
  - Simplified Procedure
- Exclude bottom slab
- Include haunch stiffness in FE model
-  Strength Design Method
  - RC Box
  - RC Pipe
- Consider modified shear strain capacity
- Ignore effects from negligible LL

**LFD**




-  Points of Interest
  - Generate at tenth points except supports
  - Generate at section change points
  - Generate at user-defined points
- Ignore shear<sup>1</sup>
- Exclude bottom slab
- Include haunch stiffness in FE model
- Ignore effects from negligible LL

<sup>1</sup>Ignore Shear when using LFD and fill height < 2.0'



**MULTI-CELL BOX CULVERT**

(updated 4/4/2023)




**LRFD**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at section change points
  - Generate at user-defined points
  - Generate at support points
  - Generate at support face and critical shear points
-  Shear Computation Method
  - Ignore
  - General Procedure
  - General Procedure - Appendix B5
  - Simplified Procedure
  - Simplified Procedure - Vci, Vcw
- Consider inclined flexural forces
- Ignore moment skew reduction factor
-  Distribution Factor Application Method
  - By axle
  - By POI
- Allow negative epsilon in general shear method
- Ignore flexure



**LFD**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at section change points
  - Generate at user-defined points
  - Generate at support points
  - Generate at support face and critical shear points
- Ignore shear<sup>1</sup>
-  Distribution Factor Application Method
  - By axle
  - By POI
- Ignore flexure

**LRFR**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at section change points
  - Generate at user-defined points
  - Generate at support points
  - Generate at support face and critical shear points
-  Shear Computation Method
  - Ignore
  - General Procedure
  - General Procedure - Appendix B5
  - Simplified Procedure
  - Simplified Procedure - Vci, Vcw
- Ignore design and legal load shear
- Ignore permit load shear
- Consider permit load tensile steel stress
- Ignore long. reinf in rating
- Consider inclined flexural forces
- Ignore moment skew reduction factor
-  Distribution Factor Application Method
  - By axle
  - By POI
- Allow negative epsilon in general shear method
- Ignore flexure

**ASD**

-  Points of Interest
  - Generate at tenth points except supports
  - Generate at section change points
  - Generate at user-defined points
  - Generate at support points
  - Generate at support face and critical shear points
-  Shear Computation Method<sup>1</sup>
  - Ignore
  - Use AASHTO 1973 or earlier code
  - Use AASHTO 1974 interim
  - Use current AASHTO
- Ignore flexure

<sup>1</sup>Ignore Shear when using LFD or ASD and fill height < 2.0'