



# BrDR 7.5 and 7.6 Adoption

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2025 Rating and Design Bridge User Group Meeting  
Boise, ID | August 12-13, 2025

## 7.5 and 7.5.1 Features

- WiX Installer – Phase 2
- License Mechanism
- Azure Connection
- Database Maintenance and Encryption
- Report Tool – Phase 1
- Grid Copy and Paste
- ARC Tool Usability
- Precomputed Data Window Filter
- MBE 2022 COBS Approved Ballot Update
- LRFR Concrete Moment Redistribution
- Square Rebars
- Truss and Gusset Plate Adjacent Vehicle Analysis
- Use Concurrent Moment for Cb Calculations
- Truss and Gusset Plate Adjacent Vehicle Analysis
- Truss Gusset Plate Shear Analysis
- LFR of curved girder > 300' radius
- Culvert Design Tool Final Iteration
- Rating Method Rename
- 3D Mesh Generation
- LRFD Maximum Aggregate Size Input
- LRFD Modulus of Rupture
- Variable Axle Spacing for Permit Truck
- Net Area Deduction for Truss LRFR
- General Preference Additions
- Advanced Multi-Cell Box

## 7.6 and 7.6.1 Features

- Installer updates and desktop license service
- Migration to .NET 8
- ARC Tool 2.0
- Help Ribbon
- LRFD spec updates
- MBE spec updates
- Evaluate all LRT scenarios
- Sunset Madero engine
- Persist print settings
- Auto calculate effective flange width
- Bottom flange lateral support
- Culvert bent bars
- Cover plate development length
- Alternate Cb
- MCB Web POI

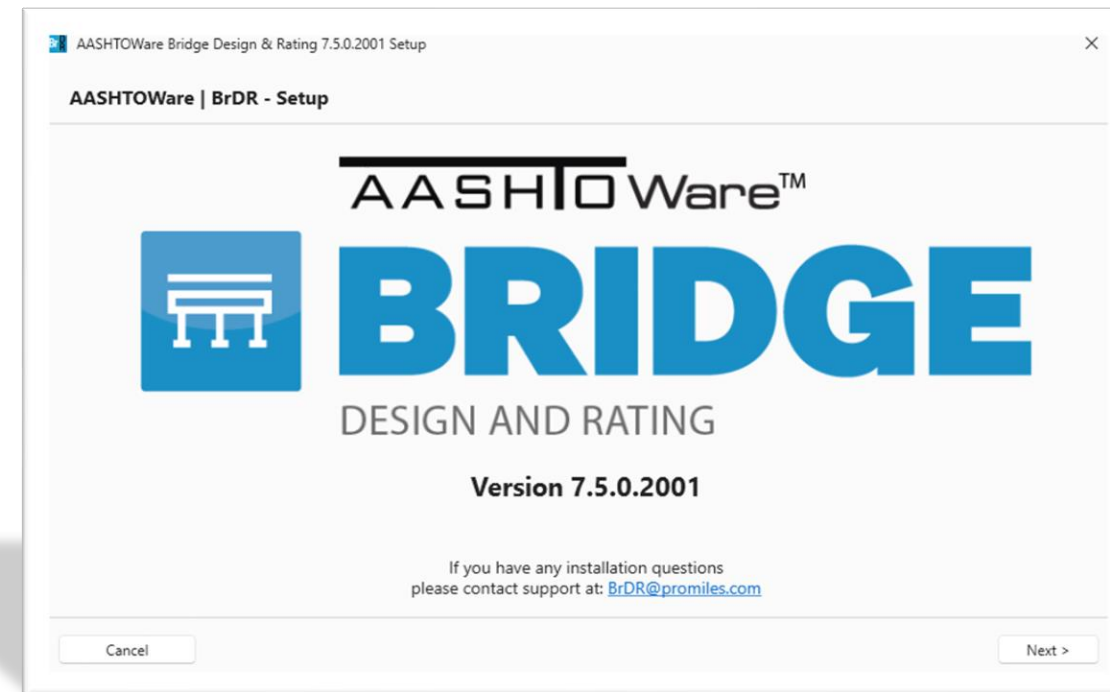


# BrDR 7.5

2025 Rating and Design Bridge User Group Meeting  
Boise, ID | August 12-13, 2025

## 7.5 Installation and Access

- WiX Installer – Phase 2
  - New UI, error logs for troubleshooting
  - ***Modify installation***
- License Mechanism
  - ***Same license for BrDR and Design Tools***
  - Export model with cryptographic signature
  - Offline mode
- Azure Connection
  - Azure Multi-Factor Authentication
- Database Maintenance and Encryption
  - Encrypt database connection
  - Database reconnection



# 7.5 Reporting and User Interface

- Report Tool Phase 1
  - BWS tree driven reporting
  - Report Tool Template Editor
  - Report Tool Viewer
  - **Only for prestressed members**
  - **Other girder types will be in v7.8**

File

New Open Save Save As Generate Report Print Duplicate Delete Duplicate Delete Restore Layout

Document Print Template Tree Section Contents Tree Dock Management

Template

Search

BWS Detailed Report Bridge Section Bridge Window Components Appurtenances Generic Windc Median Windc

Section Contents

Report

Summary Report

BWS Detailed Report

Bridge Window

Summary

Bridge ID: Example7  
NBI structure ID (8): Example7

Description

Name: Example 7 PS (LFR)  
Description: This is PCI design example 9.9.3, which uses the Load Factor R.  
Location:  
Facility carried (7):  
Feat. Intersected (6):  
Default units: US Customary  
Year built:  
Length:  
Route number: -1  
Mi. post:  
District:  
County:  
Owner:  
Maintainer:  
Administrative Area: Unknown  
National Highway System Indicator:  
Functional Class: Unknown

Styles

Styles

Default Column Font  
Default Data Header Font  
Default Header Font  
Default List Block

Properties

Bridge Workspace - Example7

ANALYSIS REPORTS  
DESIGN/RATE REPORTING

Check Out Check In Validate Save Restore Revert Close Export Refresh Open New Copy Paste Duplicate Delete Schematic

Bridge Manage

Schematic Analysis

Workspace

Bridge Components

Example7

Components

Diaphragm Definitions

Lateral Bracing Definitions

SUPERSTRUCTURE DEFINITIONS

6-girder system

Impact/Dynamic Load Allowance

Load Case Description

Framing Plan Detail

Bracing Deterioration

BSC Bracing Spec Check Selection

Structure Typical Section

Superstructure Loads

Concrete Stress Limits

Prestress Properties

Shear Reinforcement Definitions

MEMBERS

G1

Member Loads

Supports

MEMBER ALTERNATIVES

Exterior Member (E) (C)

Expand Branch  
Collapse Branch

Open  
Copy  
Duplicate  
Delete  
Analyze  
Validate  
View Summary Report  
View Detailed Report  
Schematic  
Export to PS Design Tool  
General Preferences

Report

Detailed Report - Exterior Member  
Summary Report - Exterior Member

BWS Detailed Report

Member Alternative Section  
Member Alternative Window

Description

Name: Exterior Member  
Description:  
Material type: Prestressed (Pretensioned) Concrete  
Girder type: PS Precast I  
Modeling type: Multi Girder System  
Default units: US Customary  
Girder property input method: Schedule based  
Sustained modular ratio factor: 2.000  
Self load case: Engine Assigned  
Additional self load:  
Additional self load percentage:  
Default rating method: LFR  
Crack control parameter (Z) top of beam:  
Crack control parameter (Z) bottom of beam:  
Exposure factor top of beam:  
Exposure factor bottom of beam:  
Use creep: False

Analysis method type  
ASR  
AASHTO ASR  
System Default  
MBE 3rd 2024i, Std 17th  
N/A

LFR  
AASHTO LFR  
System Default  
MBE 3rd 2024i, Std 17th  
2002 AASHTO Std. Specifications

LRFD  
AASHTO LRFD  
System Default  
LRFD 10th  
2024 AASHTO LRFD Specifications

LRFR  
AASHTO LRFR  
System Default  
MBE 3rd 2024i, LRFD 10th  
2018 (2024 Interim) AASHTO LRFR Spec.

LRFR condition factor: Good or Satisfactory  
LRFR field measured section properties: False  
LRFR system factor: All Other Girder/Slab Bridges



# 7.5 Reporting and User Interface

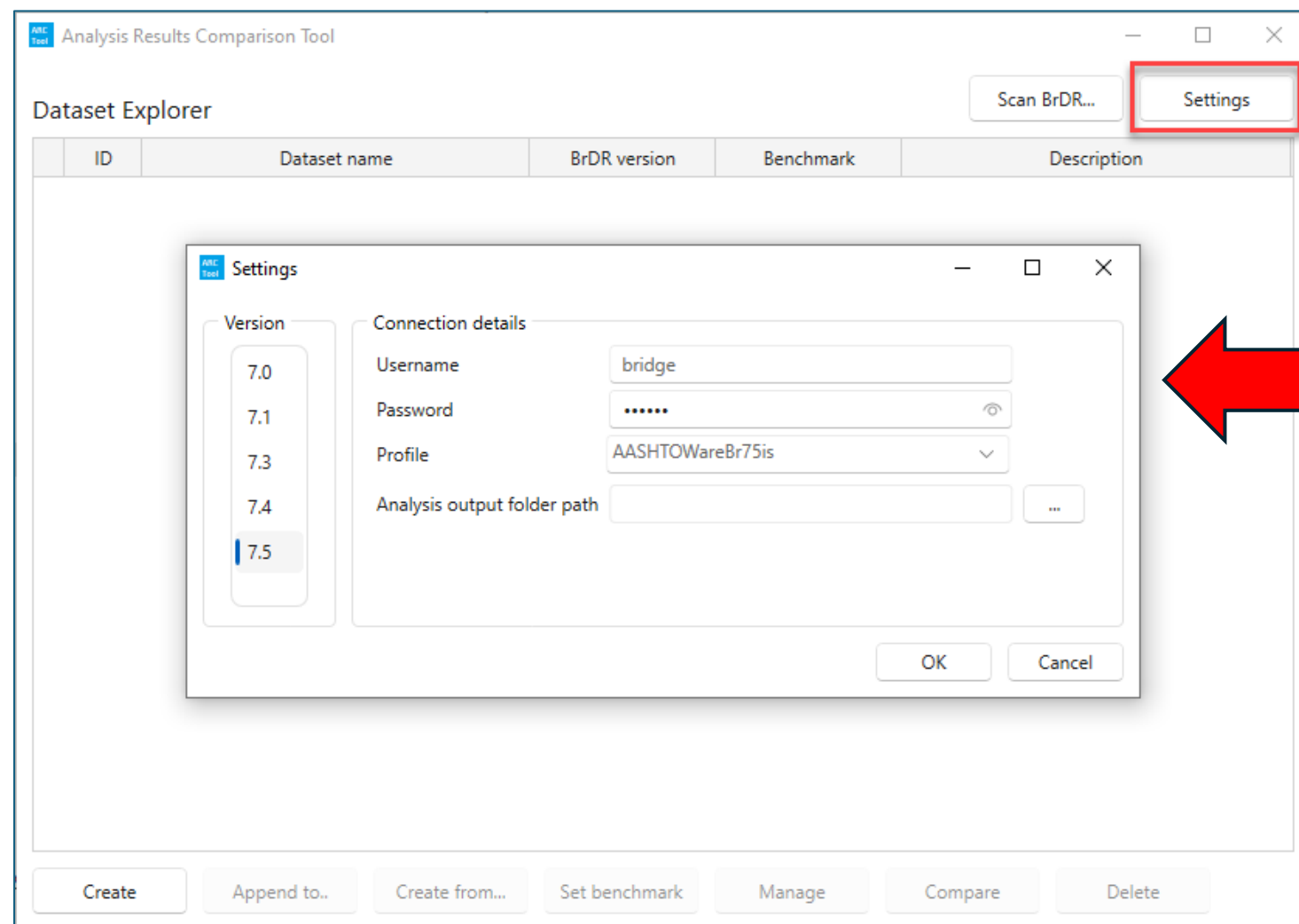
- Excel Like Grid Copy and Paste
  - BrDR and Design Tools
  - Single click select, double click edit
  - Click and drag selection

The screenshot displays the 'Stiffener Ranges' software window on the left and an Excel spreadsheet on the right. A red double-headed arrow indicates the data transfer between the two. The software window shows a diagram of a bridge deck with stiffeners and a table of stiffener ranges. The Excel spreadsheet shows a table with the same data, with columns for Name, Support number, Start distance (ft), Number of spaces, Spacing (in), Length (ft), and End distance (ft).

| Name                | Support number | Start distance (ft) | Number of spaces | Spacing (in) | Length (ft) | End distance (ft) |
|---------------------|----------------|---------------------|------------------|--------------|-------------|-------------------|
| Stiffener           | 1              | 0                   | 1                | 58           | 4.833333    | 4.833333          |
| Stiffener           | 1              | 4.83333             | 1                | 135          | 11.25       | 16.08333          |
| 1 Sided Dia Conn PL | 1              | 27.31               | 1                | 0            | 0           | 27.31             |
| Stiffener           | 1              | 27.31               | 1                | 207          | 17.25       | 44.56             |
| 1 Sided Dia Conn PL | 1              | 54.14               | 1                | 0            | 0           | 54.14             |
| 1 Sided Dia Conn PL | 1              | 54.14               | 2                | 322          | 53.66667    | 107.806667        |
| Stiffener           | 1              | 107.806667          | 1                | 161          | 13.41667    | 121.223334        |
| 1 Sided Dia Conn PL | 1              | 107.80667           | 1                | 322          | 26.83333    | 134.640003        |
| Stiffener           | 1              | 134.640003          | 1                | 130          | 10.83333    | 145.473336        |
| Stiffener           | 1              | 134.64              | 1                | 258.32       | 21.52667    | 156.166667        |

## 7.5 Reporting and User Interface

- ARC Tool Usability
  - **Settings window for connection detail**
  - Display more details





## 7.5 Reporting and User Interface

- Precomputed Data window Maintain tab filter
  - Filter options for all columns

The screenshot shows the 'Precomputed Data' window with the 'Maintain' tab selected. The window displays two tables: 'Precomputed data' and 'Bridge database'. The 'Precomputed data' table has columns: BID, Bridge ID, NBI structure ID, Date generated, and Generated by. The 'Bridge database' table has columns: Bridge ID, NBI structure ID, and Date last modified. A filter dialog is open for the 'Date last modified' column, showing a search bar and a list of filter values: '(All) (1)' and '6/17/2021 (1)'. The dialog also has a 'Clear Filter' button. Below the tables, there is a filter rule summary: 'Bridge ID = Example7'. At the bottom, there are buttons for 'Select All', 'Select Outdated', 'Select Not Found', 'Clear Selected', 'Update Selected', and 'Delete Selected'.

| Precomputed data |           |                  |                |               | Bridge database |                  |                    |
|------------------|-----------|------------------|----------------|---------------|-----------------|------------------|--------------------|
| BID              | Bridge ID | NBI structure ID | Date generated | Generated by  | Bridge ID       | NBI structure ID | Date last modified |
| > 10             | Example7  | Example7         | 7/31/2025      | Bridge Bridge | Example7        | Example7         | 6/17/2021          |

Filter Rules | Filter Values

Search

- ☐ (All) (1)
- ☐ 6/17/2021 (1)

Clear Filter

☒ Bridge ID = Example7

Select All | Select Outdated | Select Not Found | Clear Selected | Update Selected | Delete Selected

## 7.5 Analysis Engine

- MBE 2022 approved ballot items
  - **Concurrent actions for shear evaluation**
  - Control options for optional consideration of
    - **Iterative shear rating**
    - Modify MCFT Theta
    - Modify size effect

For the purposes of load rating and application of MCFT it is permissible to modify the LRFD Article 5.7.3.4.2 as follows:

1. In areas of low strain where the section remains uncracked, that is  $M_u < M_{cr}$ , the strain  $\epsilon_s$  may be assumed to be zero regardless of values of  $M_u$  and  $V_u$ ; therefore,  $\theta$  can be taken as 29 degrees.

2. For reinforced concrete members with web reinforcement  $A_v < A_{v,min}$ , the beta should be adjusted by applying the size effect. For prestressed concrete beams, if  $f_{pc}/f_c$  is greater than or equal to 0.02, regardless of the amount of shear reinforcement, the size effect may be neglected.

$\beta$  can be taken as shown below-

$$\beta = \frac{4.8}{(1 + 750\epsilon_s)}$$

## 7.5 Analysis Engine

- Concrete moment redistribution for LRFR
  - Considered only if control option is checked
  - Adjust percent of moment redistribution at each pier (up to 20%)
  - Evaluate controlling rating factor to achieve
    - Critical positive flexure RF = Critical negative flexure RF

### 5.6.3.4—Moment Redistribution

In lieu of more refined analysis, where bonded reinforcement that satisfies the provisions of [Article 5.10.8](#) is provided at the internal supports of continuous spans, negative moments determined by elastic theory at strength limit states may be increased or decreased by not more than  $1000\varepsilon_r$  percent, with a maximum of 20 percent. Redistribution of negative moments shall be made only where  $\varepsilon_r$  is equal to or greater than  $1.5\varepsilon_{rl}$  at the section at which moment is reduced, where  $\varepsilon_{rl}$  is the tension-controlled strain limit specified in [Article 5.6.2.1](#).

Positive moments shall be adjusted to account for the changes in negative moments to maintain equilibrium of loads and force effects.

## 7.5 Analysis Engine

- Square Rebars

**Bar Mark Definition**

Name:

Material:

Bar size:

Bar type:

A:

Bar types:

Type: Straight

Type: 1

Type: 2

Type: 3

## 7.5 Analysis Engine

- Concurrent moment for  $C_b$  computation
  - Control option needs to be checked
    - LRFD
    - LRFR
- Truss and Gusset Plate Adjacent Vehicle Analysis
  - LFR
  - LRFR

Strict application of the  $C_b$  provisions would require the consideration of the concurrent moments along the unbraced length. This would necessitate the calculation of:

(1) the maximum possible value of  $f_2$  at the brace point with the higher compressive stress using the critical moment envelope value, along with calculation of  $f_{mid}$  and  $f_0$  using the concurrent moments, and

(2) the maximum possible compressive value of  $f_{mid}$  using the critical moment envelope value, along with the calculation of  $f_0$  and  $f_2$  using the concurrent moments.



# 7.5 Analysis Engine

- Gusset plate shear analysis overrides
  - Override for shear plane force contribution
  - Override for shear plane inclination
  - Override for partial shear plane along non-truss member

DescriptionPanel pointFastenersPlate tensionPlate compressionChord splicePlate shearPlate partial shearLoad transfer

Shear reduction factor: 0.88

Left plate

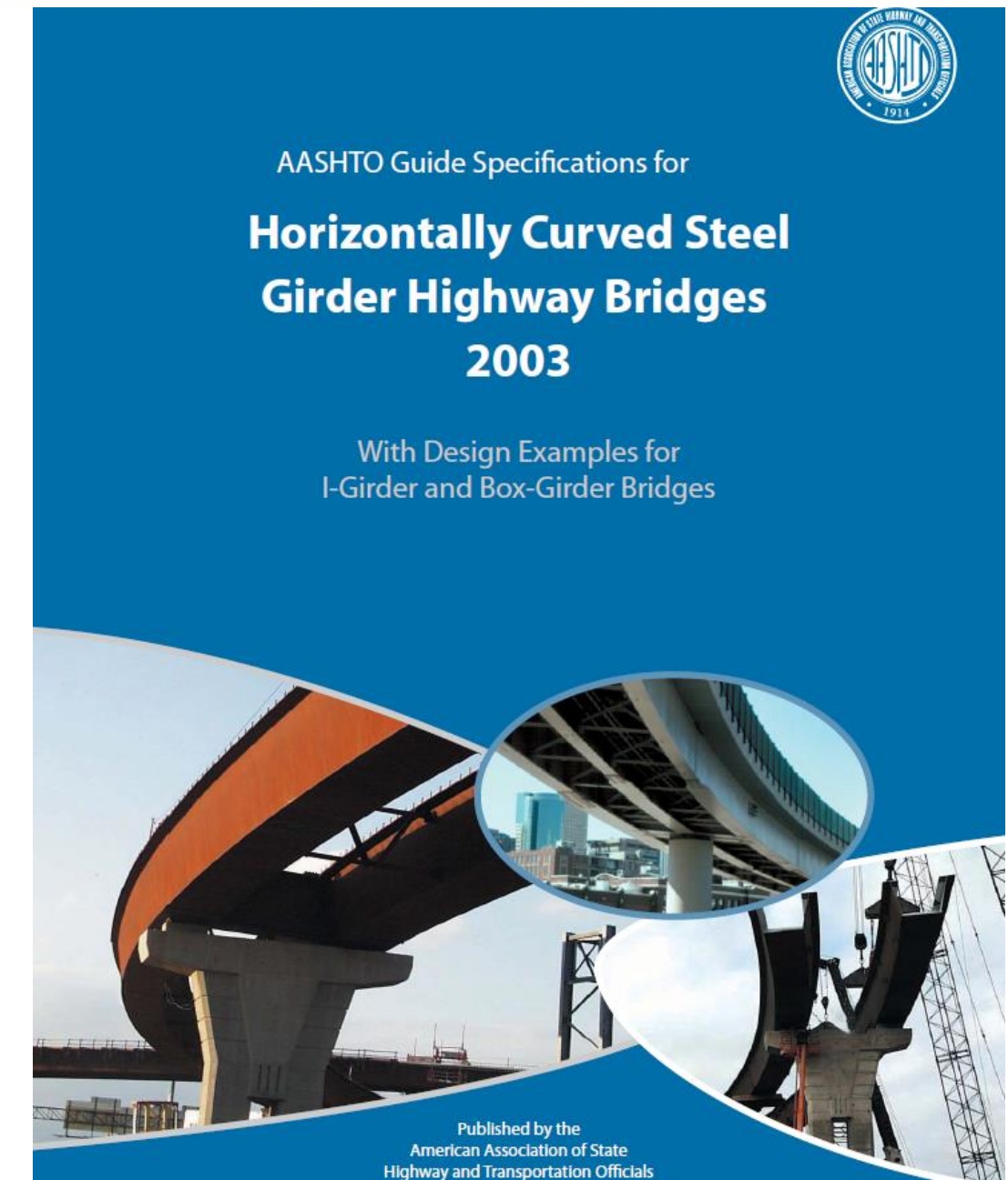
|   | Shear plane | Length (in) | Thickness (in) | Number holes | Hole diameter (in) | Override angle           | Override angle (Degrees) | Override member selection | Member Selection         |                          |                          |                          |                          |                          |                          |                          |  |
|---|-------------|-------------|----------------|--------------|--------------------|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
|   |             |             |                |              |                    |                          |                          |                           | 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | 8                        |  |
| > | Vertical    | 12.00       |                | 4.00         | 0.81               | <input type="checkbox"/> |                          | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   | Horizontal  | 22.50       |                | 8.00         | 0.81               | <input type="checkbox"/> |                          | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

Left plate partial shear planes

|   | Member   | Shear plane direction | Length (in) | Thickness (in) | Advanced options         | Override Angle (Degrees) |
|---|----------|-----------------------|-------------|----------------|--------------------------|--------------------------|
| > | Member 8 | Horizontal            | 10.500      |                | <input type="checkbox"/> |                          |
|   | Member 8 | Vertical              | 10.625      |                | <input type="checkbox"/> |                          |
|   | Member 2 | Horizontal            | 12.000      |                | <input type="checkbox"/> |                          |
|   | Member 2 | Vertical              | 10.625      |                | <input type="checkbox"/> |                          |

## 7.5 Analysis Engine

- Ignore curved girder span limit for LFR
  - **AASHTO Guide Specifications** for Horizontally Curved Steel Girder Highway Bridges 2003 applies to spans up to 300'
  - History of construction problems with spans > 300'
  - Ignore span limit for rating with warning



## 7.5 Analysis Engine

- Culvert Design Tool improvements
  - Consider cutoff bars for final design
  - Consider horizontal joint for design
  - Consider horizontal leg of interior wall reinforcement in top slab
- Rating method rename
  - Rename LFD to LFR
  - Rename ASD to ASR
- 3D Mesh generation improvements
  - Limit small elements
  - **Improve results and speed**

Girder System Superstructure Definition

Definition Analysis Specs Engine

Structural slab thickness

- ☒ Consider structural slab thickness for rating
- ☒ Consider structural slab thickness for design

Number of shell elements

- ☒ In the deck between girders
- ☐ In the web between flanges

Slower accurate Faster

Vehicle increment: 1.000 ft

Transverse loading

Vehicle increment in lane: 2.000 ft

Lane increment: 4.000 ft

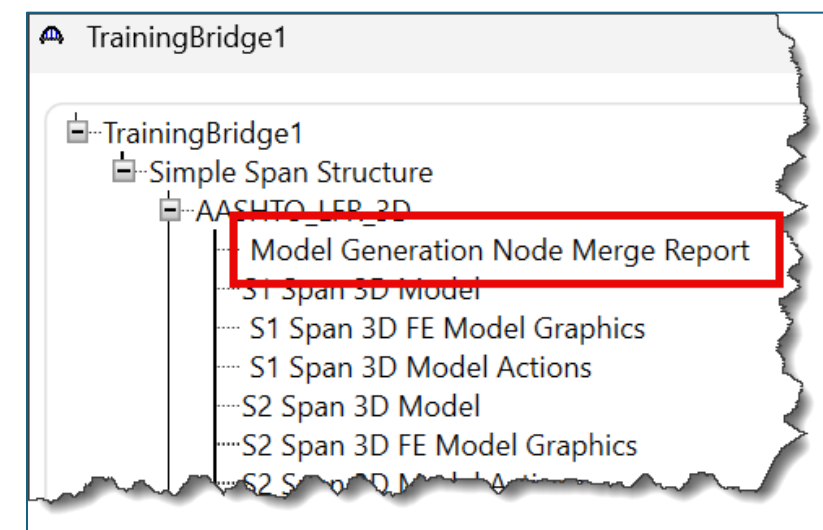
3D analysis control options

- ☒ LFR: Model non-composite regions as non-composite
- ☐ LRFD: Model non-composite regions as non-composite
- ☐ LRFR: Model non-composite regions as non-composite

3D FE node generation tolerance

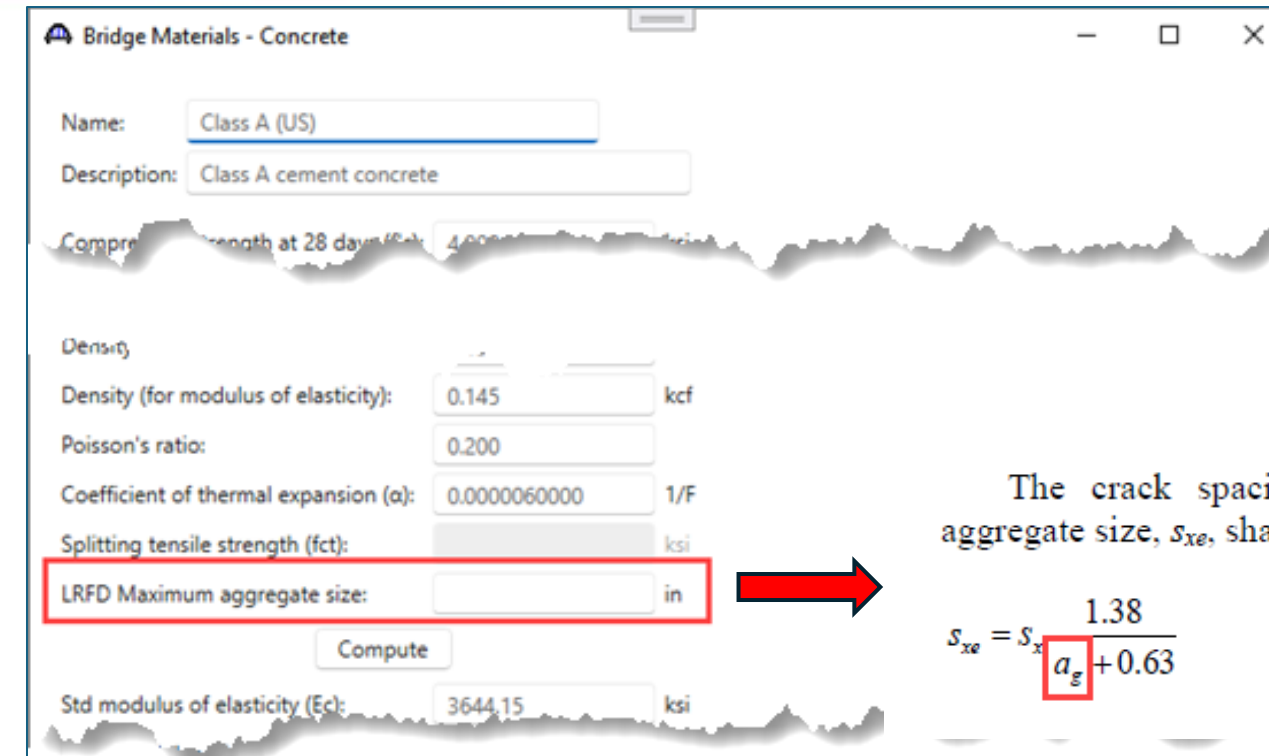
- ☒ Percentage
- ☐ Length

|   | Span | Length (ft) | Tolerance (%) |
|---|------|-------------|---------------|
| > | 1    | 130.00      | 0.100         |
|   | 2    | 130.00      | 0.100         |



## 7.5 Analysis Engine

- LRFD maximum aggregate size input
  - Default value is 1.0
- Split modulus of rupture input
  - LRFD and Standard Specification
- Allow variable axle spacing
  - **For permit trucks**
  - LFR and LRFR
  - LRFR permit LL factor based on maximum axle spacing
  - Facilitates envelope permitting
- Net area deduction input
  - Truss LRFR



The crack spacing parameter as influenced by aggregate size,  $s_{xe}$ , shall be determined as:

$$s_{xe} = s_x \frac{1.38}{a_g + 0.63} \quad (5.7.3.4.2-7)$$



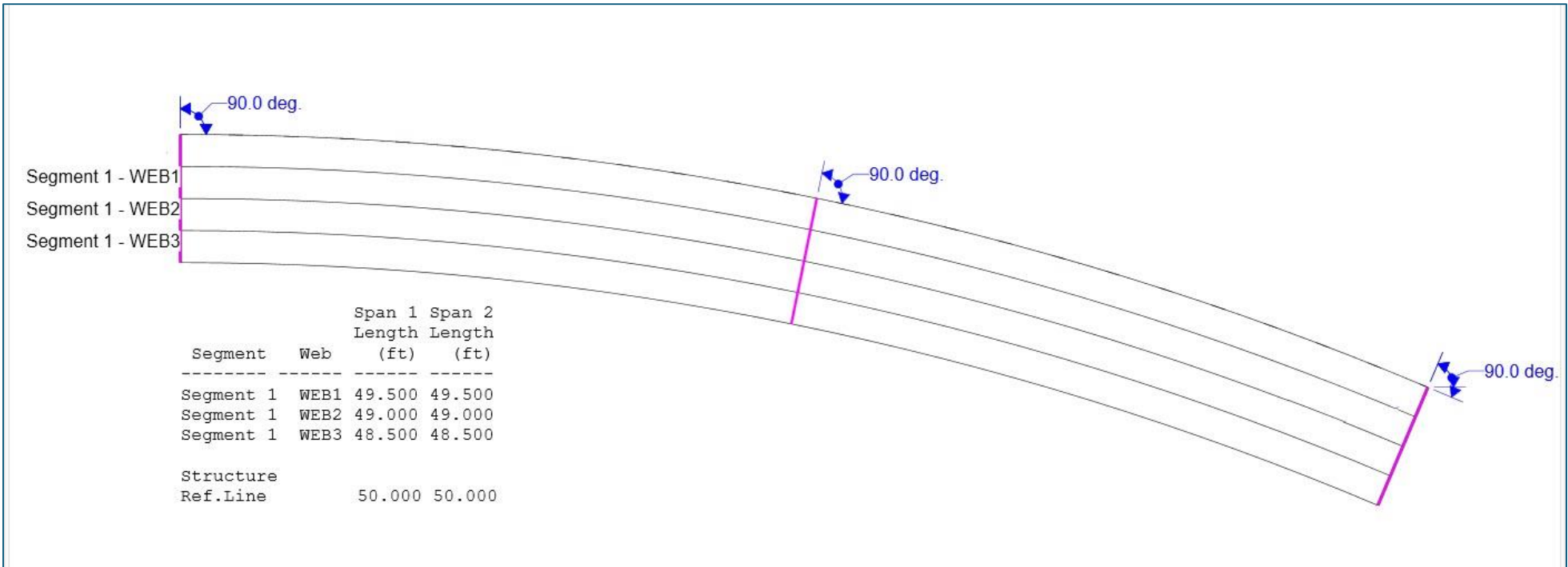
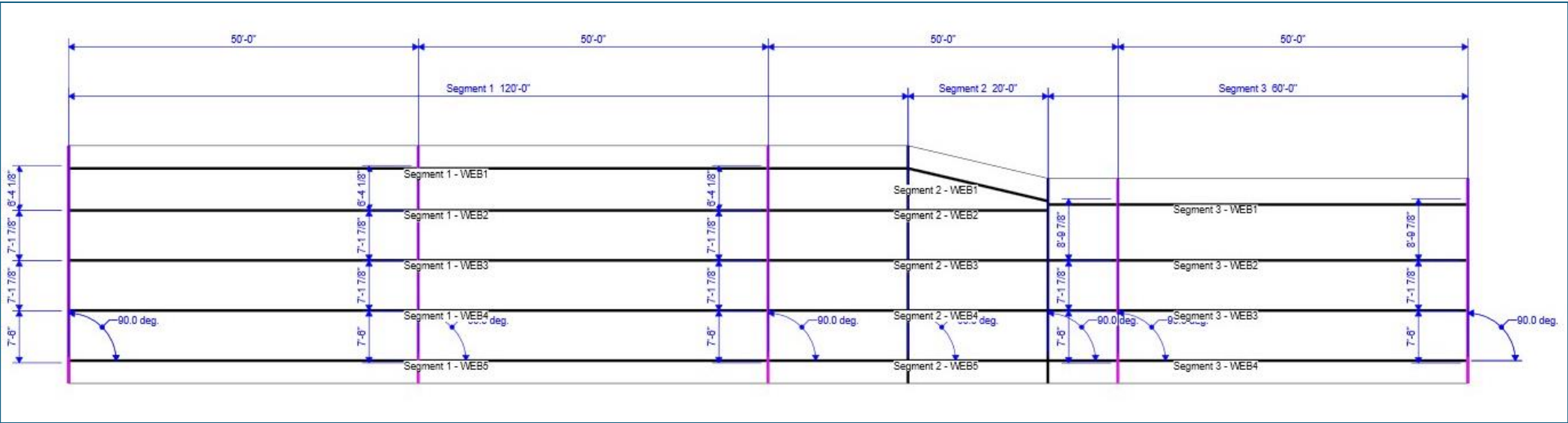
# BrDR 7.5.1

2025 Rating and Design Bridge User Group Meeting  
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# 7.5.1 Analysis Engine

- Advanced concrete multicell box
  - Define multicell box in multiple segments
  - Each segment can have different number of cells
  - Define horizontal curvature
  - Line girder only – LFR and LRFR
  - Integral pier modeling



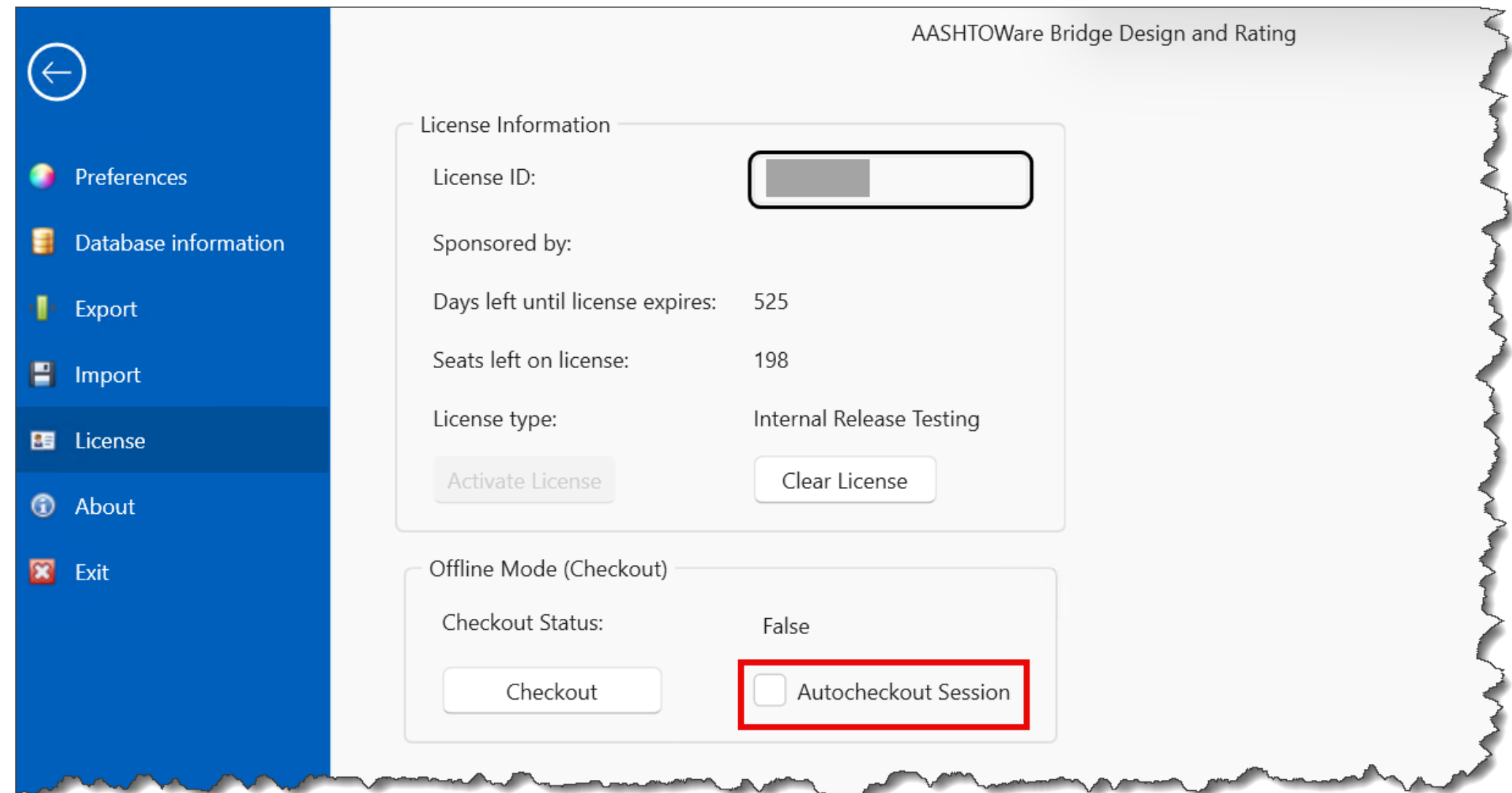


# BrDR 7.6

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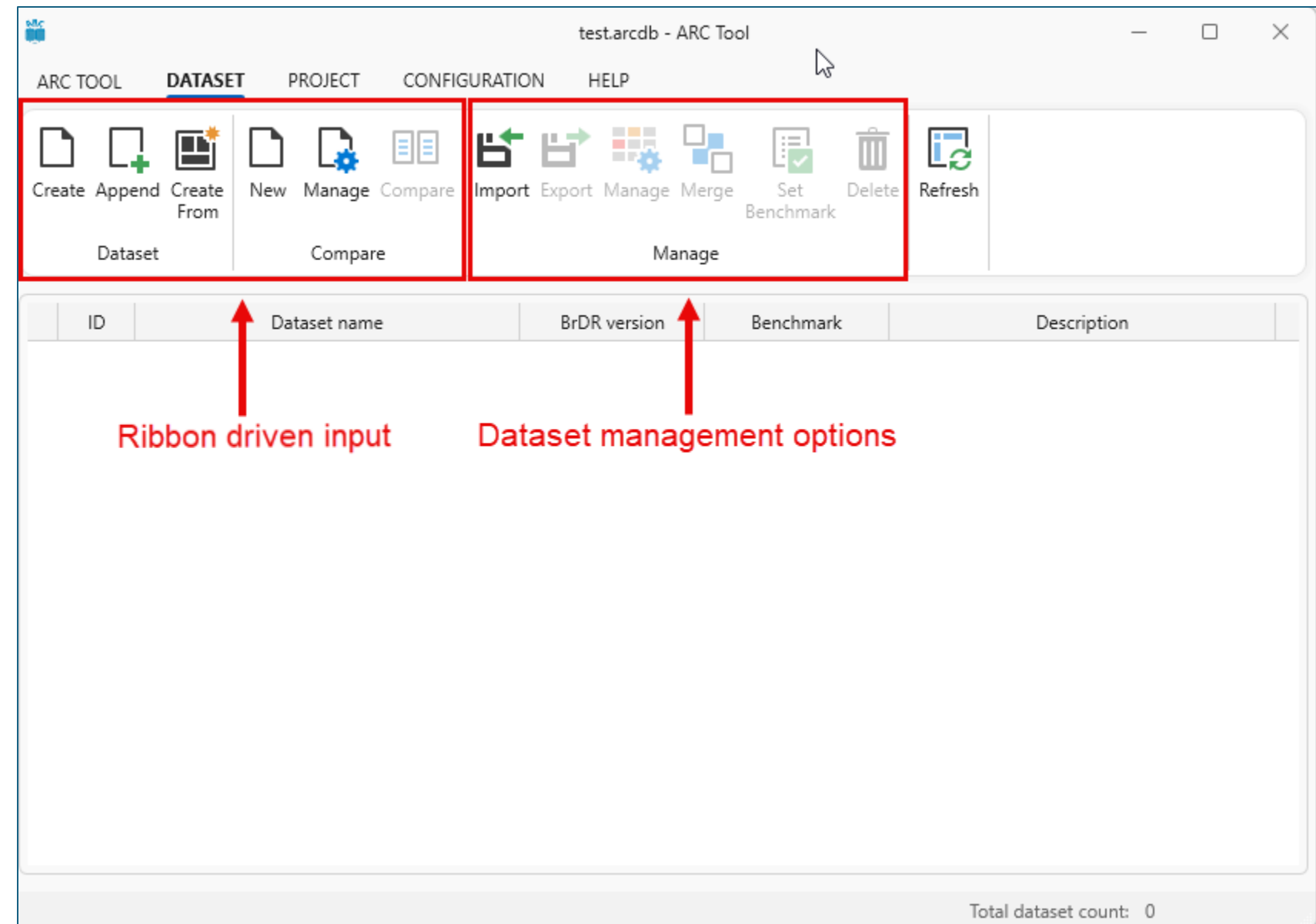
## 7.6 Usability Improvements

- Installer and desktop service
  - Better logging and error reporting
  - Auto-checkout license (for offline mode)



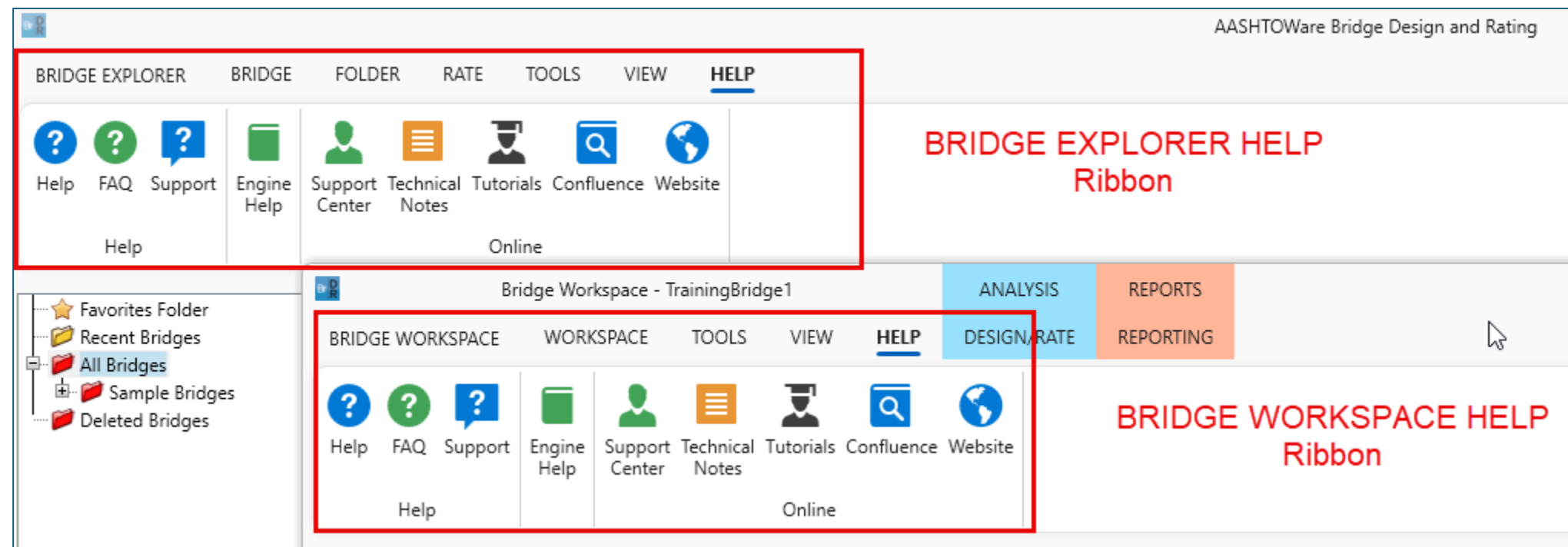
## 7.6 Usability Improvements

- ARC Tool 2.0
  - Import, export, and merge datasets
  - Customizable dataset comparison option
  - Auto analysis timeout and file clean up options
  - Datasets based on file explorer folders



## 7.6 Usability Improvements

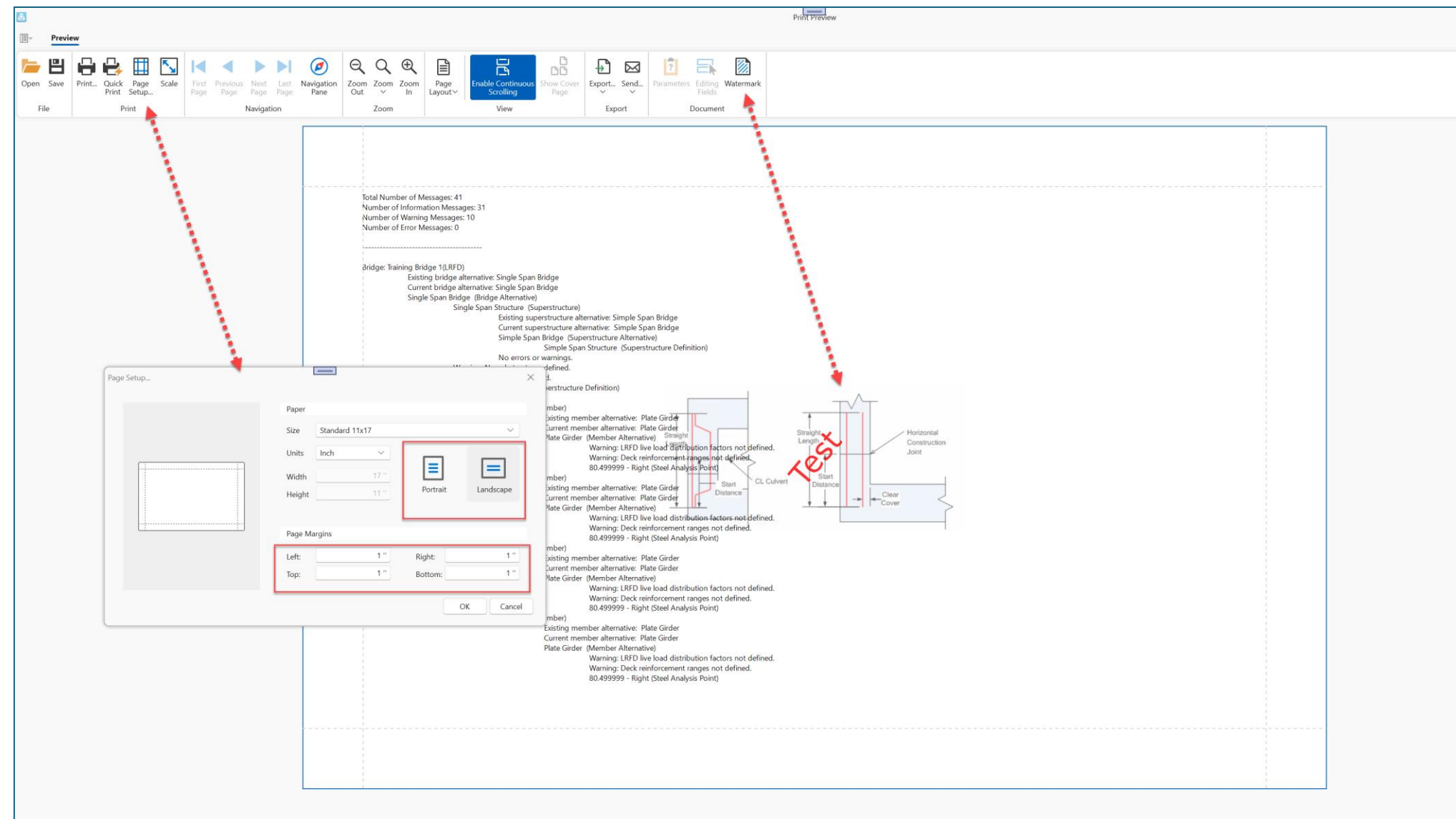
- Help ribbon
  - Bridge Explorer and Bridge Workspace





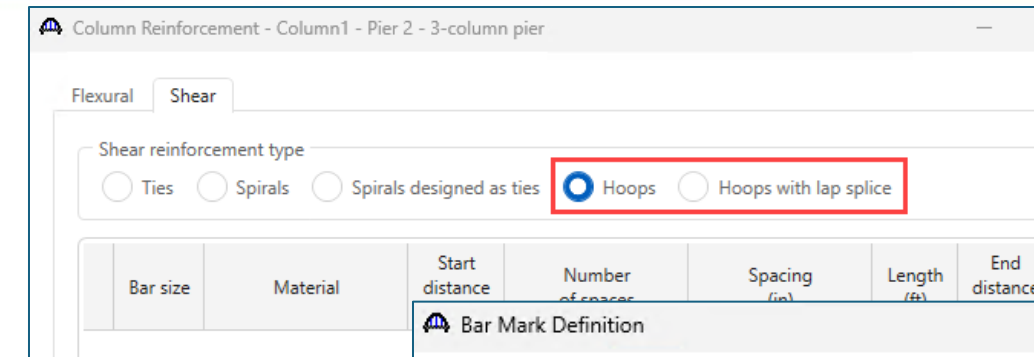
## 7.6 Usability Improvements

- Persists print settings –Saves print settings



## 7.6 Analysis Engine

- LRFD 10<sup>th</sup> Edition Specification Updates (PS and RC)
  - Instantaneous and time dependent deflections
  - Reinforcement development length computation
  - Reinforcement for tensile stress in concrete
  - Beam continuity connection simplification
    - Allow limited cracking at girder ends
  - Horizontal transfer tension tie reinforcement requirement
- LRFD 10<sup>th</sup> Edition Specification Updates (Culvert)
  - Structural plate box moment
  - Reinforced concrete culvert live load
  - Replace LS with AW



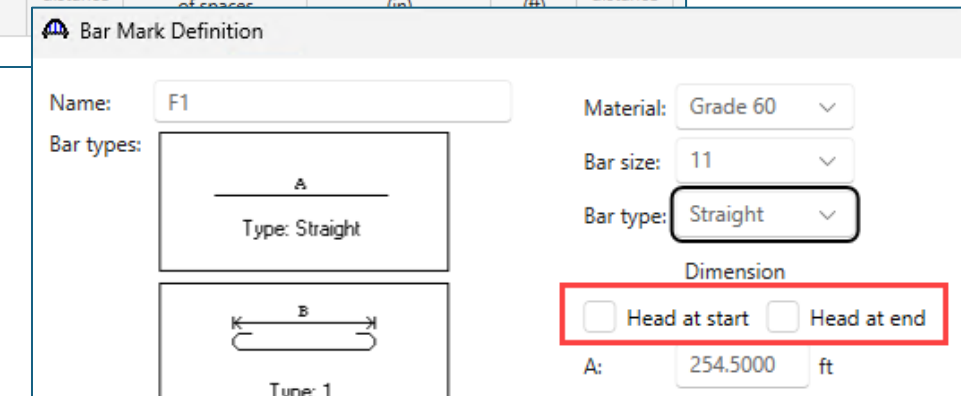
Column Reinforcement - Column1 - Pier 2 - 3-column pier

Flexural Shear

Shear reinforcement type

☐ Ties ☐ Spirals ☐ Spirals designed as ties ☒ Hoops ☐ Hoops with lap splice

| Bar size | Material | Start distance | Number of spaces | Spacing (in) | Length (#) | End distance |
|----------|----------|----------------|------------------|--------------|------------|--------------|
|----------|----------|----------------|------------------|--------------|------------|--------------|



Bar Mark Definition

Name: F1

Material: Grade 60

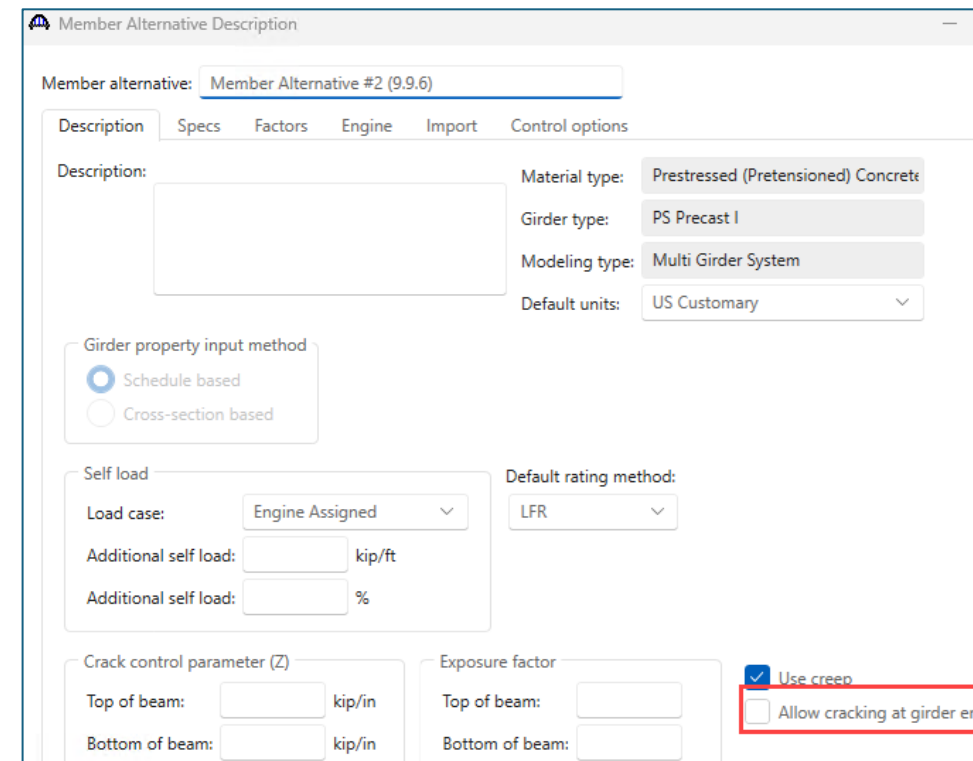
Bar size: 11

Bar type: Straight

Dimension

☐ Head at start ☐ Head at end

A: 254.5000 ft



Member Alternative Description

Member alternative: Member Alternative #2 (9.9.6)

Description Specs Factors Engine Import Control options

Description:

Material type: Prestressed (Pretensioned) Concrete

Girder type: PS Precast I

Modeling type: Multi Girder System

Default units: US Customary

Girder property input method

☒ Schedule based ☐ Cross-section based

Self load

Load case: Engine Assigned

Additional self load: kip/ft

Additional self load: %

Default rating method: LFR

Crack control parameter (Z)

Top of beam: kip/in

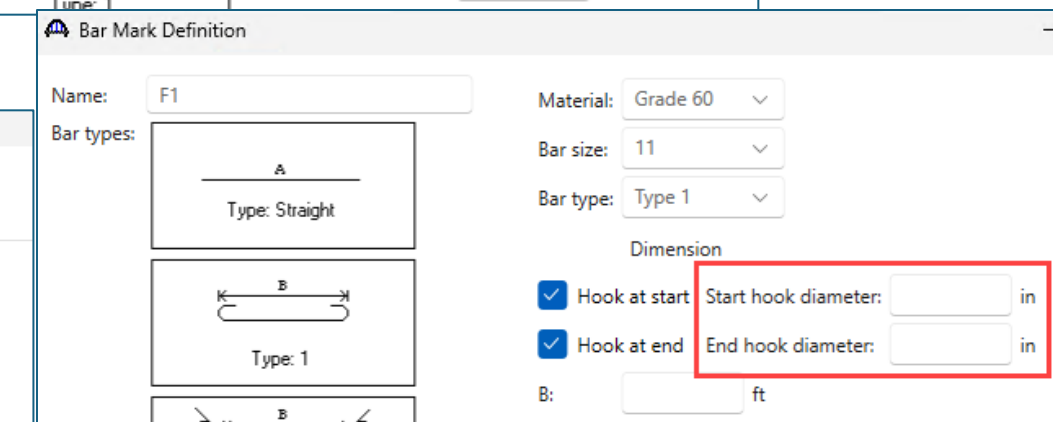
Bottom of beam: kip/in

Exposure factor

Top of beam:

Bottom of beam:

☒ Use creep ☐ Allow cracking at girder ends



Bar Mark Definition

Name: F1

Material: Grade 60

Bar size: 11

Bar type: Type 1

Dimension

☒ Hook at start ☒ Hook at end

Start hook diameter: in

End hook diameter: in

B: ft

# 7.6 Analysis Engine

- LRFD 10<sup>th</sup> Edition Specification Updates (Steel)

- Cross Frame

- NCHRP 12-113 - Axial rigidity reduction factor
- Stability check

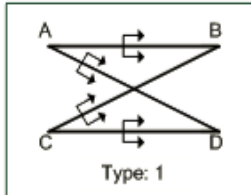
- Girder/Floorbeam/Stringer

- Lateral Torsional Buckling
- Splice negative moment resistance
- Splice both thread included for shear plane in transition length
- Stitch bolts of built-up I girder
- Shear connector cluster
- Flexural resistance of tee and double-angle
- New ASTM F3148 bolt

☐ Tension-only diagonal system

Members Connections

Diaphragm types:



| Member | Shape        | Section orientation | Section location | Material | LRFD/LRFR axial rigidity coefficients |                       |                        |
|--------|--------------|---------------------|------------------|----------|---------------------------------------|-----------------------|------------------------|
|        |              |                     |                  |          | Non-composite                         | Composite (long term) | Composite (short term) |
| AB     | L 6x6x0.4375 | Vertical            | Top Left         | Grade 50 |                                       |                       |                        |
| CD     | L 6x6x0.4375 | Vertical            | Top Left         | Grade 50 |                                       |                       |                        |
| AD     | L 6x6x0.4375 | Vertical            | Top Left         | Grade 50 |                                       |                       |                        |
| CB     | L 6x6x0.4375 | Vertical            | Top Left         | Grade 50 |                                       |                       |                        |

Splice Location

Support number: 2 Direction: ☒ Left ☐ Right Distance: 36.00 ft

Girder Top flange Bottom flange Web

ICL Splice

0.6250" x 14.000" 1.2500" x 14.000"

Splice gap: 0.3750 in

☐ Filler plates extended

LRFR

Condition factor: Good or Satisfactory

☐ Field measured section properties

☐ Consider long. reinf. for negative moment capacity

Description Specs Factors Engine Import Control options

LRFD

☐ Ignore long. reinf. in negative moment capacity

☐ Consider deck reinf. development length

☐ Must consider user input lateral bending stress

☐ Consider concurrent moments in Cb calculation

☒ LTB GammaE Method

☒ Method A

☐ Method B

☒ Distribution factor application method

☐ By axle

☒ By POI

LRFR

☐ Must consider user input lateral bending stress

☐ Consider concurrent moments in Cb calculation

☐ Use compact web alternate Cb calculation

☒ LTB GammaE Method

☒ Method A

☐ Method B

☒ Distribution factor application method

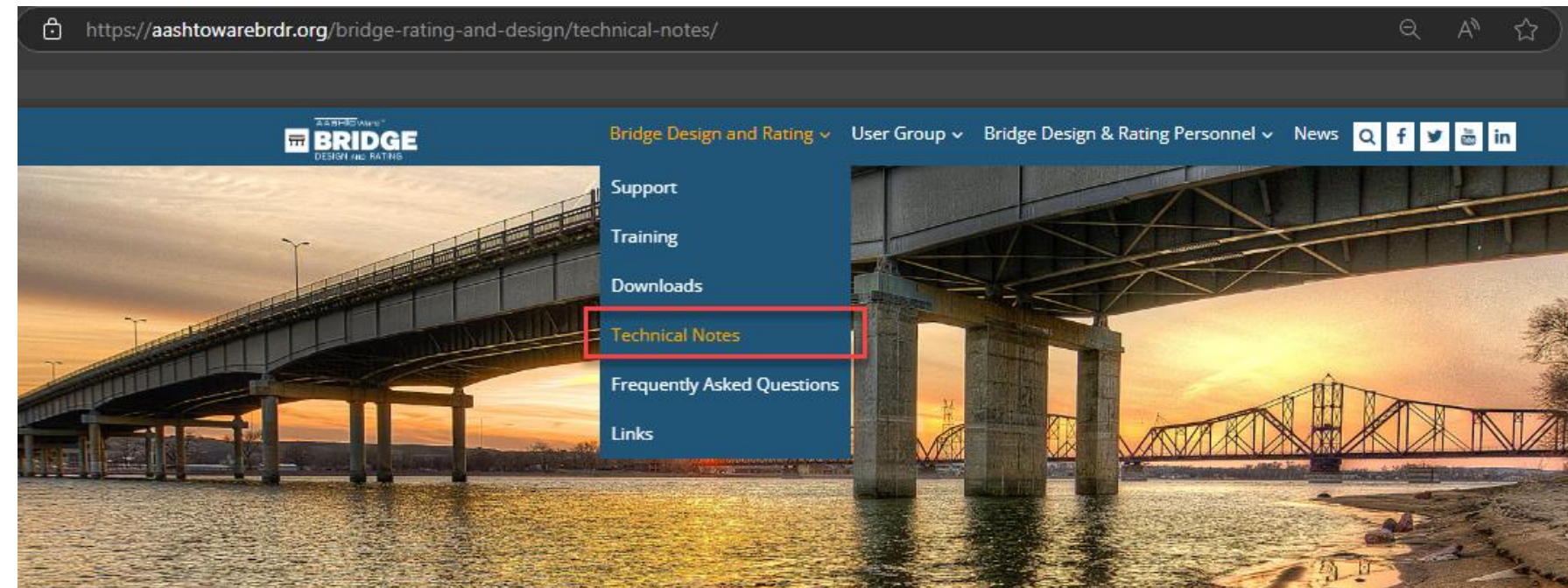
☐ By axle

☒ By POI



## 7.6 Analysis Engine

- MBE 2024 Interim Specification Updates
  - **AASHTO has not published MBE Spec Updates since 2022.**
  - **Refer to Technical Note 80 for additional information**



**AASHTO Ware™**  
**BRIDGE** Technical Note 80  
DESIGN AND RATING

### Clarification on the MBE 3rd 2023i Spec Version

Applies to the following products:

- BrDR/BrR version 7.5.x and 7.6

#### Description

The ballots voted on and approved during the 2022 AASHTO Committee on Bridges & Structures (COBS) Annual Meeting are going to be combined with the approved ballots in the 2023 AASHTO COBS Annual Meeting and published as the *Manual for Bridge Evaluation, 3rd Edition, 2024 Interim Revisions*.

The **MBE 3rd 2023i** Spec version (see below) delivered with version 7.5.x implements the approved ballots from the 2022 COBS Annual Meeting. When version 7.6 is released later this year, the **MBE 3rd 2023i** Spec version will be migrated to **MBE 3rd 2024i**. The **MBE 3rd 2024i** Spec version will implement both the 2022 and 2023 approved ballots. The **MBE 3rd 2023i** Spec version will no longer be available in version 7.6.

System Defaults

| General         | Bridge workspace     | Superstructure analysis | Specifications | Substructure analysis | Tolerance | Custom agency fields |
|-----------------|----------------------|-------------------------|----------------|-----------------------|-----------|----------------------|
|                 |                      |                         |                |                       |           |                      |
| Analysis module | Analysis method type | Spec version            | Factors        |                       |           |                      |
| > AASHTO ASR    | ASR                  | MBE 3rd 2023i Std 17th  | N/A            |                       |           |                      |

## 7.6 Analysis Engine

- MBE 2024 Interim Specification Updates
  - Permit Vehicle considered Notional
    - For ADTT > 500
      - All span lengths:
        - 0.2 klf lane load for negative moment and shear in contraflexure zone
      - Spans between 200' and 300'
        - 0.2 klf for all actions
- Gusset plate compression resistance
  - Whitmore section and partial shear
  - Truncated Whitmore section
  - Basic corner check

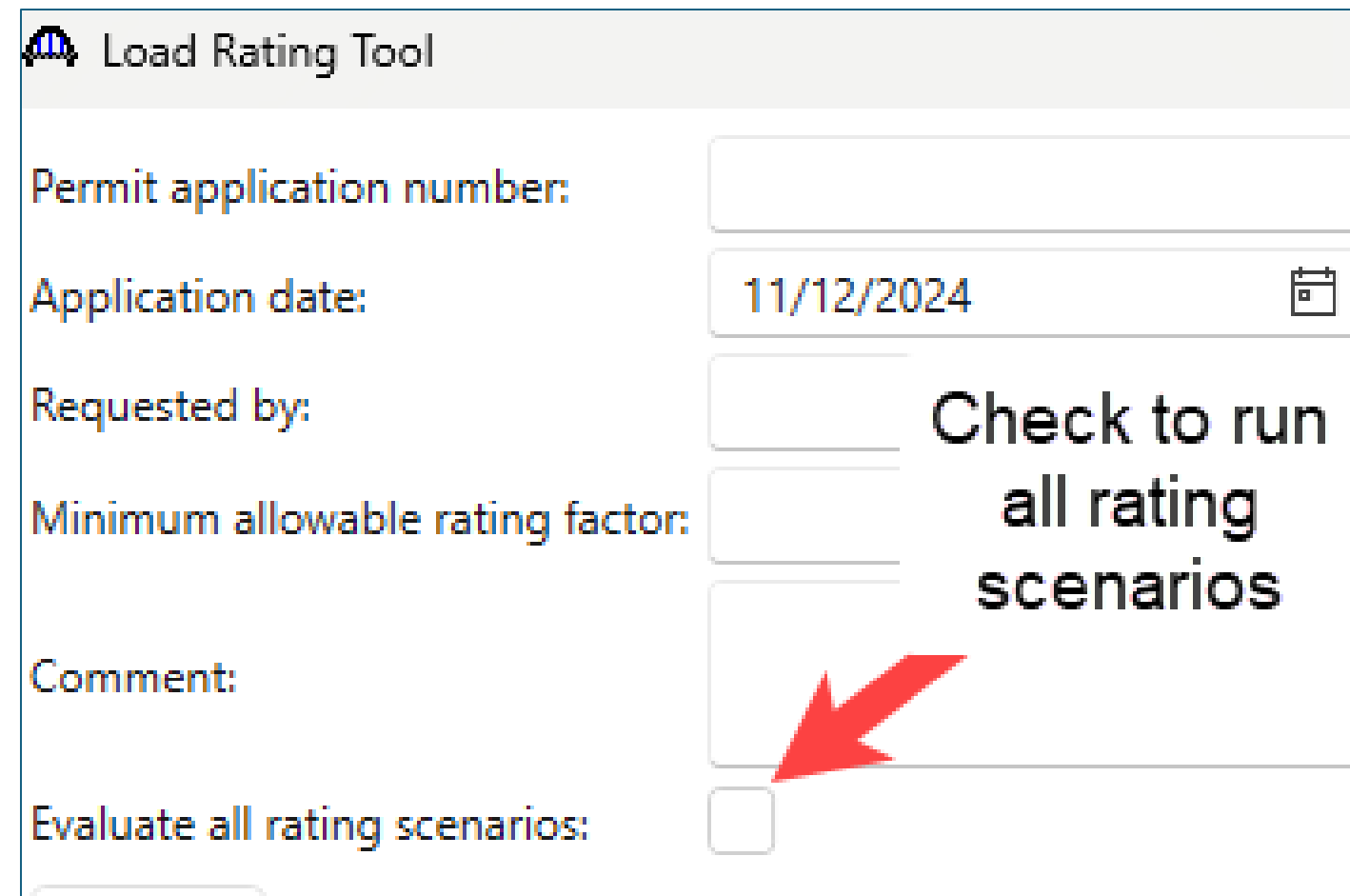
The screenshot displays two overlapping windows from the 'Gusset Plate Definition' software. The top window, titled 'Gusset Plate Definition' with the name 'L1 GP (L2 Mathcad)', has tabs for 'Plate compression - partial shear', 'Chord splice', 'Plate shear', 'Load transfer', and 'Control options'. The 'Plate compression - partial shear' tab is active, showing a table for the 'Left plate' with columns for 'Whitmore section' and 'Truncated whitmore section (in)'. The bottom window, titled 'Gusset Plate Definition' with the name 'LO GP', has tabs for 'Description', 'Panel point', 'Fasteners', 'Plate tension', 'Plate compression - whitmore section', 'Plate compression - basic corner check', 'Plate compression - partial shear', 'Chord splice', 'Plate shear', 'Load transfer', and 'Control options'. The 'Plate compression - partial shear' tab is active, showing the 'LRFR' section with radio buttons for 'Whitmore section and partial shear' (selected), 'Truncated whitmore section', 'Warren truss with vertical member framing into the joint', and 'Basic corner check'.

|            | Whitmore section    |        |           |         | Truncated whitmore section (in) |                |                |                |                |                |                |                |                |
|------------|---------------------|--------|-----------|---------|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|            | Whitmore width (in) | T (in) | Lmid (in) | K (LFR) | T <sub>M</sub>                  | L <sub>M</sub> | W <sub>M</sub> | T <sub>R</sub> | L <sub>R</sub> | W <sub>R</sub> | T <sub>L</sub> | L <sub>L</sub> | W <sub>L</sub> |
| > Member 1 | 10.104              |        | 3.750     | 0.500   |                                 |                |                |                |                |                |                |                |                |
| Member 2   | 8.125               |        | 5.375     | 0.500   |                                 |                |                |                |                |                |                |                |                |
| Member 3   |                     |        |           |         |                                 |                |                |                |                |                |                |                |                |
| Member 7   |                     |        |           |         |                                 |                |                |                |                |                |                |                |                |
| Member 8   |                     |        |           |         |                                 |                |                |                |                |                |                |                |                |



## 7.6 Analysis Engine

- Rating Tool API
  - Scenarios defined in System Defaults
  - ***Passing scenario does not end analysis***
  - Evaluate all scenarios
  - RF reported for all scenarios



Load Rating Tool

Permit application number:

Application date: 11/12/2024

Requested by:

Minimum allowable rating factor:

Comment:

Evaluate all rating scenarios: ☐

Check to run all rating scenarios

## 7.6 Analysis Engine

- Automatically calculate effective flange width if missing for
  - Steel girder
  - PS girder
  - **No update required for LRFR (for LFR model)**

The screenshot displays the AASHTO Bridge software interface. On the left is a project tree with categories like 'Components', 'PERSTRUCTURE DEFINITIONS', and 'MEMBERS'. The 'Deck Profile' window is open, showing a table with columns for Material, Support number, Start distance, Length, End distance, Structural thickness, and various effective flange widths. A red arrow points to the 'Start effective flange width (LRFD)' column, which is currently empty. Below the table, a text box states: 'Computes the missing value during analysis and produces a report'. In the bottom right, a report preview for 'TrainingBridge1' is shown, with a red box highlighting the 'Effective Flange Widths Computation' report item.

| Material          | Support number | Start distance (ft) | Length (ft) | End distance (ft) | Structural thickness (in) | Start effective flange width (Std) (in) | End effective flange width (Std) (in) | Start effective flange width (LRFD) (in) | End effective flange width (LRFD) (in) | n     |
|-------------------|----------------|---------------------|-------------|-------------------|---------------------------|---|---------------------------------------|--|--|-------|
| 4500 psi Concrete | 1              | 0.00                | 161.00      | 161.00            | 9.5000                    | 125.0000                                | 125.0000                              |  |  | 8.000 |

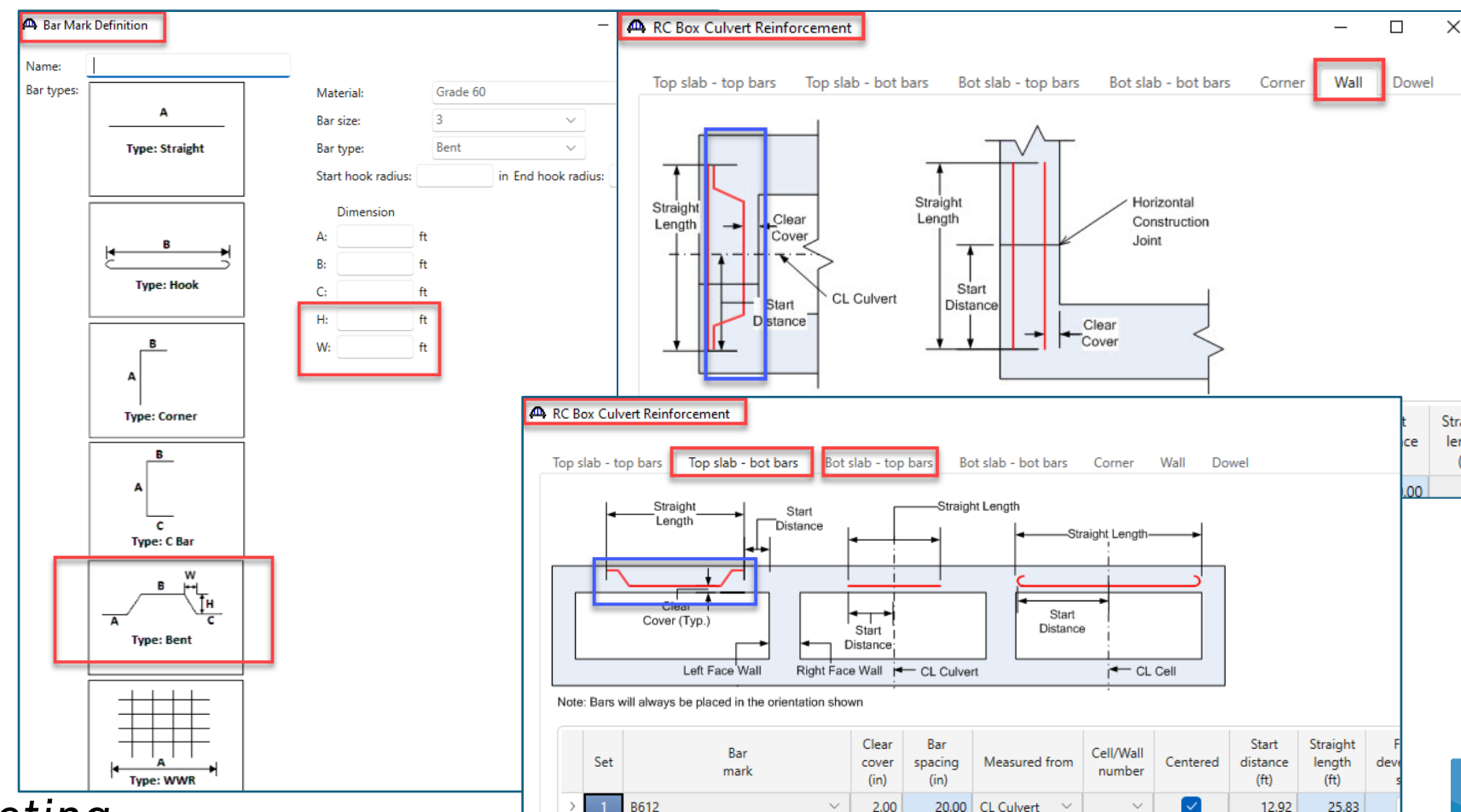
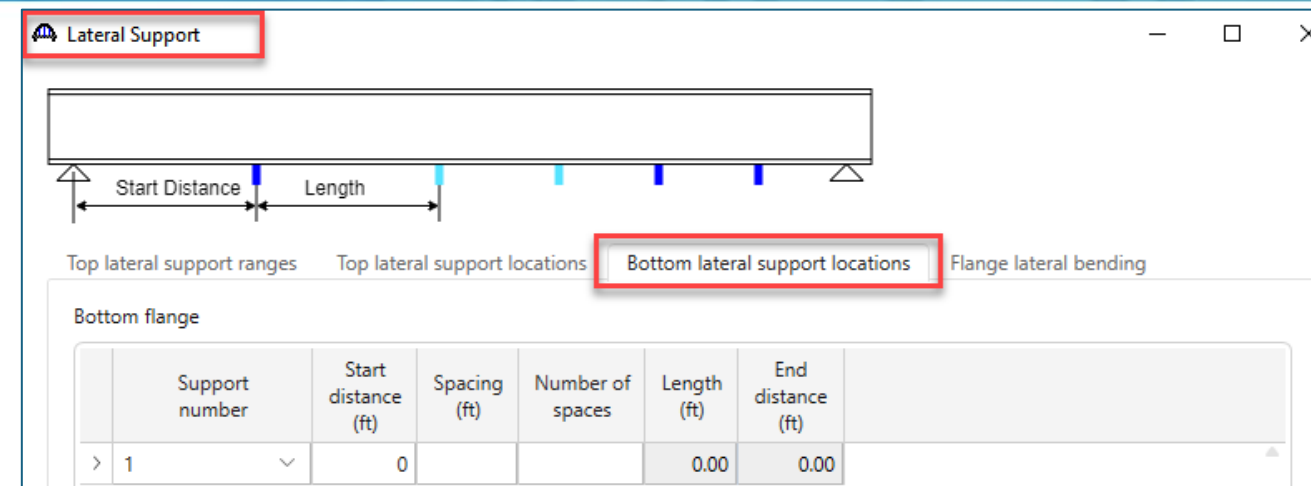
Computes the missing value during analysis and produces a report

TrainingBridge1

- Simple Span Structure
  - G1
    - Plate Girder
      - AASHTO LRFR**
        - Effective Flange Widths Computation (Tuesday Jul. 30, 2024 11:08:19)**
        - Stage 3 Infil Lines Span Model
        - Live Load Distribution Factors Calculations
        - Live Load Distribution Factors Calculations Summary
        - Stage 3 Spec Check Results
        - Stage 3 Service II Stress Ranges
        - Stage 3 Fatigue Stress Ranges
        - Stage 1 Span Model

## 7.6 Analysis Engine

- Bottom flange lateral support
  - Girder, floorbeam and stringer
- Bent reinforcement bars for culvert
  - Top and bottom slab for positive moment
  - Wall
  - Custom bar slope



## 7.6 Analysis Engine

- Cover plate development length
  - Girder, floorbeam and stringer
  - Control option to consider only fully developed cover plate
- Alternate Cb computation method
  - **Based on AISC Equation C-F1-5**
  - Compact web section only
  - Both envelope and concurrent moment analysis

**Girder Profile**

Type: Rolled Shape

Shape: Top cover plate Bottom cover plate

☒ Welded ☐ Bolted

| Relative position | Begin width (in) | End width (in) | Thickness (in) | Support number | Start distance (ft) | Length (ft) | End distance (ft) | Material | Side weld | End weld at right | Development length at start (in) | % Developed at start | Development length at end (in) | % Developed at end |
|-------------------|------------------|----------------|----------------|----------------|---------------------|-------------|-------------------|----------|-----------|-------------------|----------------------------------|----------------------|--------------------------------|--------------------|
| >                 |                  |                |                | 1              | 0.00                |             | 0.00              | Grad     | -- Nor    | -- No             | 0.0000                           | 100.00               | 0.0000                         | 100.00             |

**Control options**

LRFR

☐ Must consider user input lateral bending stress

☐ Consider concurrent moments in Cb calculation

☒ Use compact web alternate Cb calculation

☒ LTB GammaE Method

☒ Method A

☐ Method B

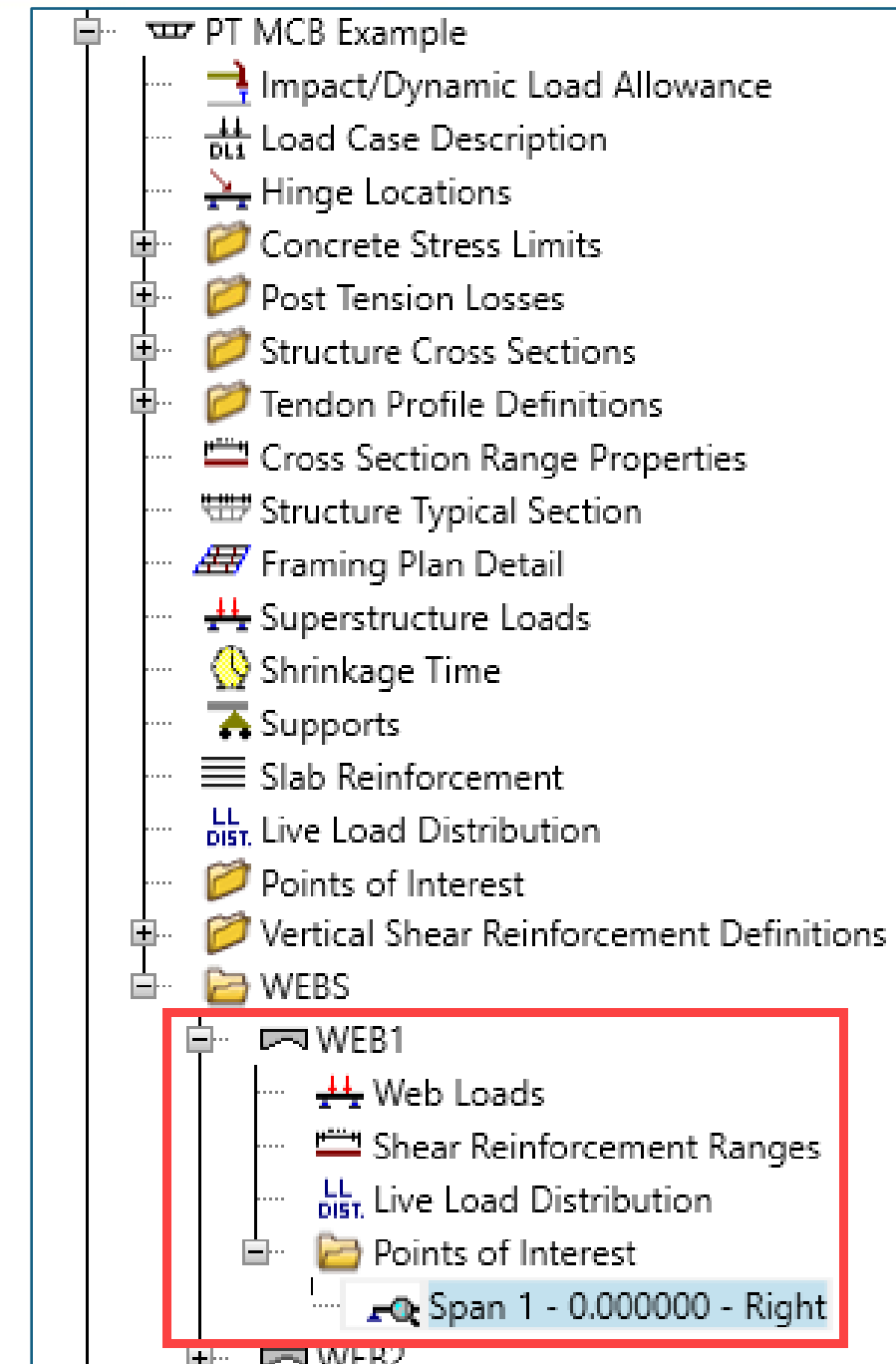
☒ Distribution factor application method

☐ By axle

☒ By POI

## 7.6 Analysis Engine

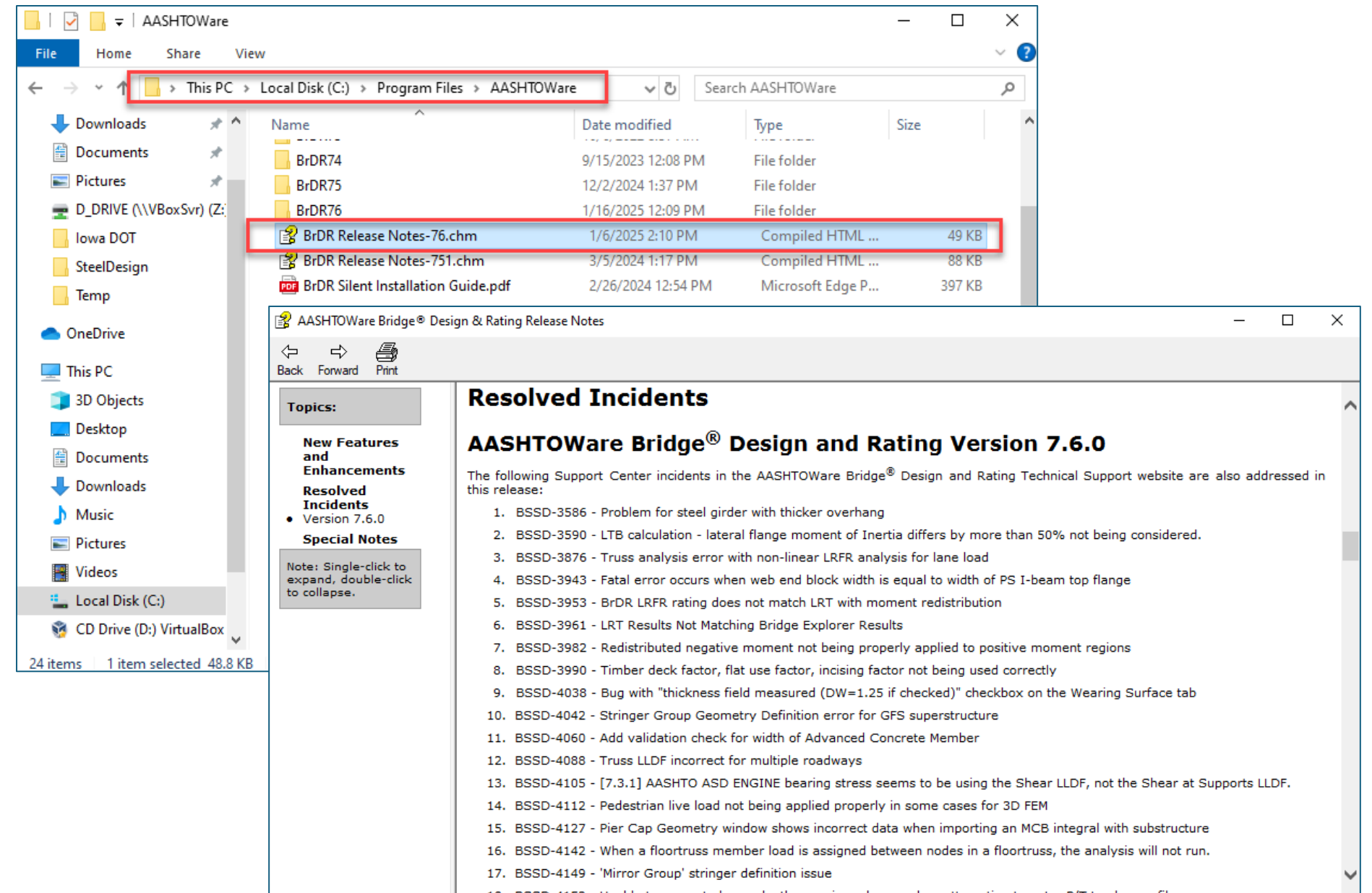
- Multi-cell box web points of interest
  - Standard multi-cell box
  - Advanced multi-cell box





# 7.6 Maintenance

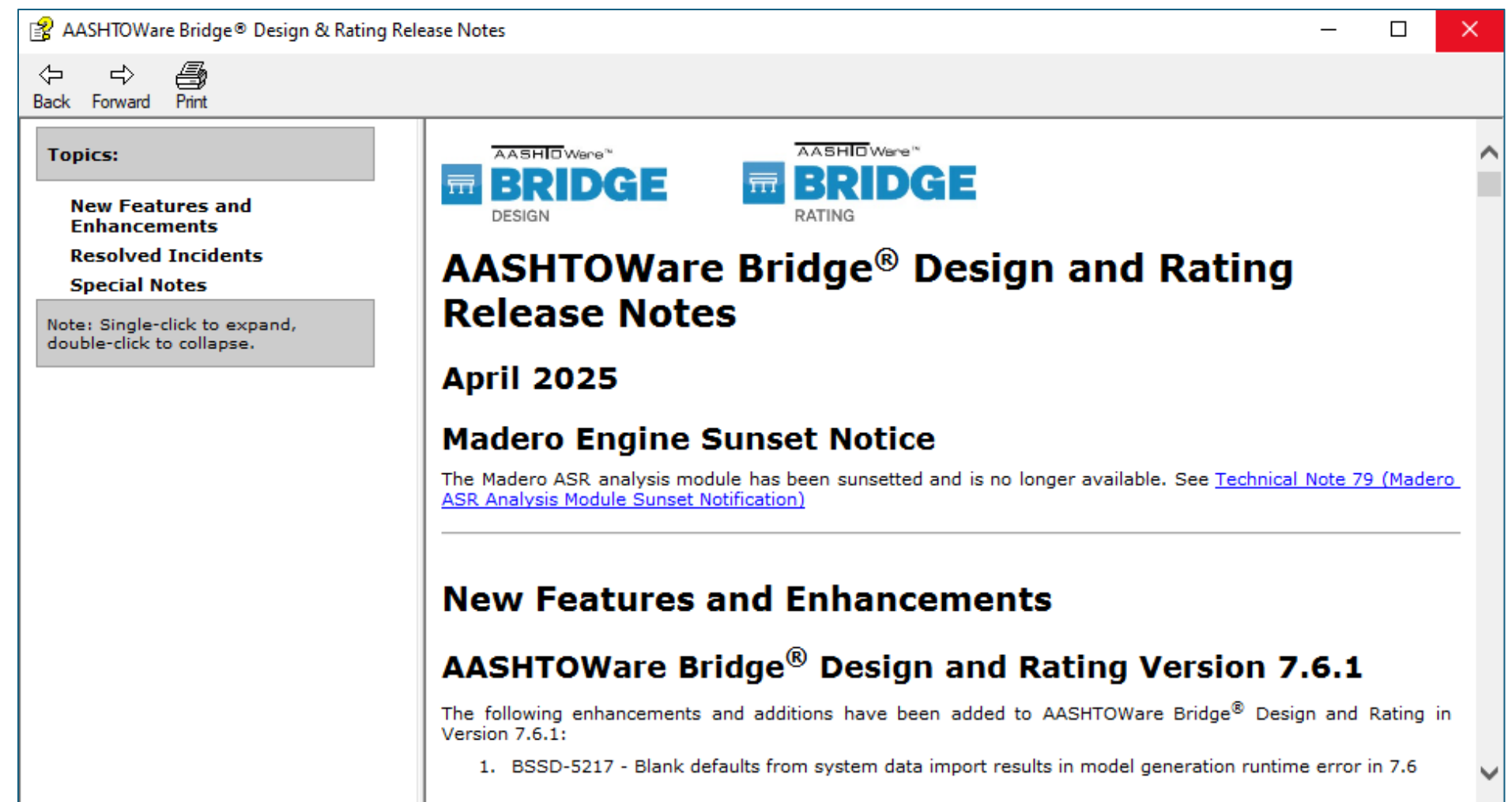
- Sunset Madero engine
- Maintenance items
  - BSSD-1457, 1765, 3693, 3732, 3976, 4224, 4539, 4554, 4694, 4695, 4741, 4769, 4832, 4865, 4877
- Refer to release notes for release bug fixes





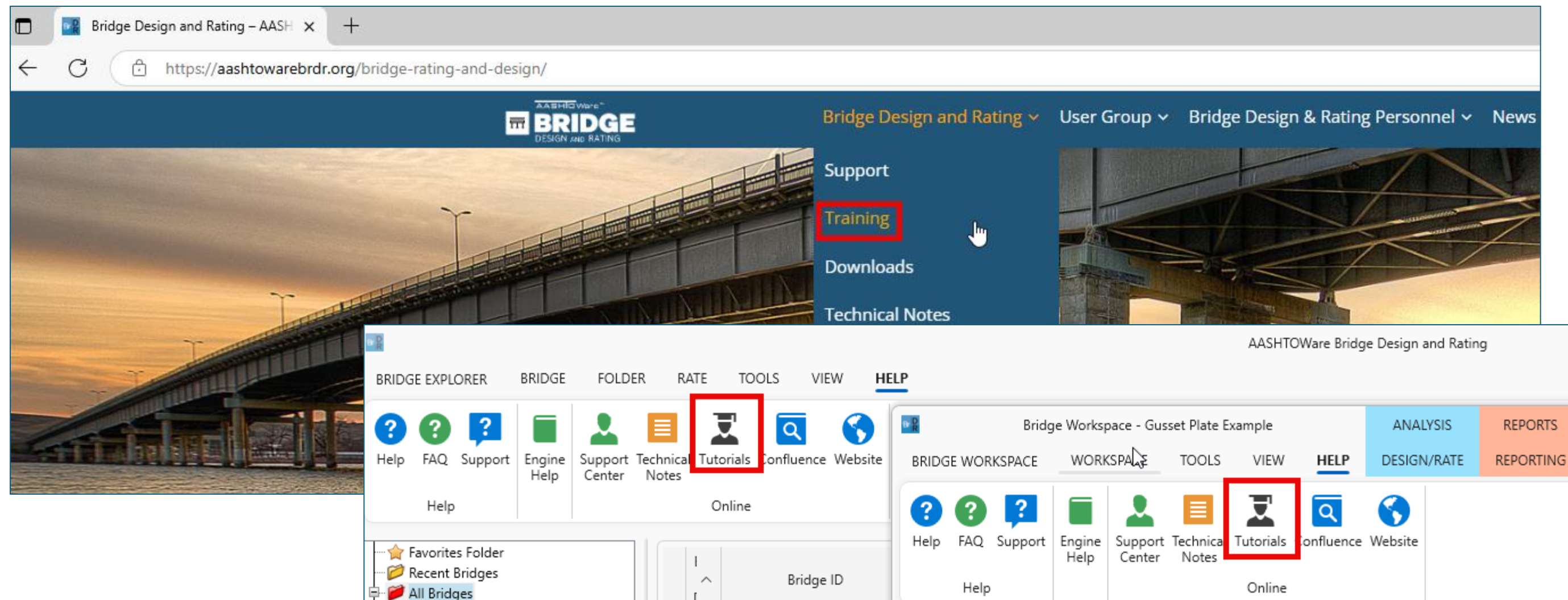
# 7.6 Maintenance Update (7.6.1)

- V7.6.1 released on 4/28/2025
- Issues addressed
  - 1 maintenance
  - 6 urgent or critical bugs
  - 30 additional bugs
  - No database migration required from 7.6

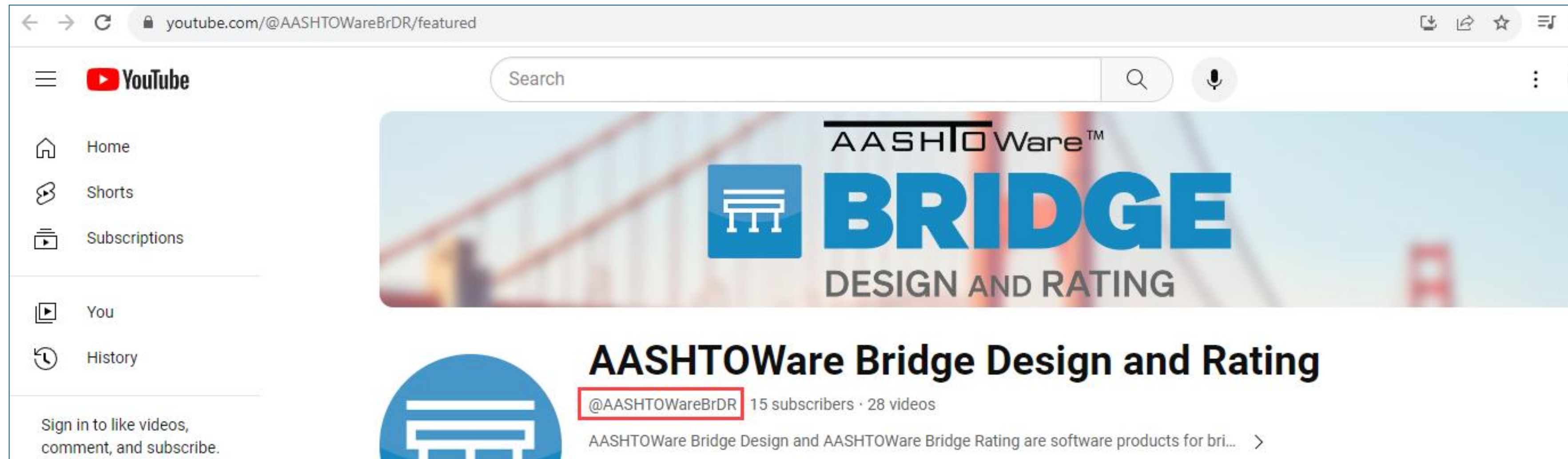


# Training Resources - Website

- AASHTOWare Bridge Design and Rating Training page
- Directly accessible from BE and BWS ribbon



# Training Resource – YouTube Channel





# Latest Training Resources: Updates and New Manuals

- Update all existing training manuals to 7.5 and later
- New training manuals
  - Getting started with Steel Design Tool
  - Getting started with Active Directory in BrDR
  - Getting started with the Bridge Copy Utility
  - Getting started with BrDR BrM Integration
  - RPT – Report Tool 2.0
  - Efficient Data Transfer: Copying and Pasting Between BrDR and Excel  
(<https://www.youtube.com/@AASHTOWareBrDR>)
  - ARC2 – Arc Tool 2.0
  - T7 - Truss LRFD Net Area Deduction In LRFR Truss Rating with BrDR 7.5.0
  - STL14 – LRFD Cb Calculation using Concurrent Moments in LRFR Rating with BrDR 7.5.1
  - 3DFEM5 – Mesh Generation and Dead Load Analysis Example
  - LRFR Concrete Moment Redistribution (“Feature” section)
  - LRFR Concrete Moment Redistribution with BrDR 7.5.1
  - MCB5 – Advanced MCB Example
  - Permit Rating with BrDR 7.6.0
  - 3DFEM6 – Axial Rigidity Coefficient Example with BrDR 7.6.0
  - STL16 – Lateral Torsional Buckling Resistance with BrDR 7.6.0
  - TGP1 – Truss Gusset Plate Example with BrDR 7.6.0

Questions?