

---

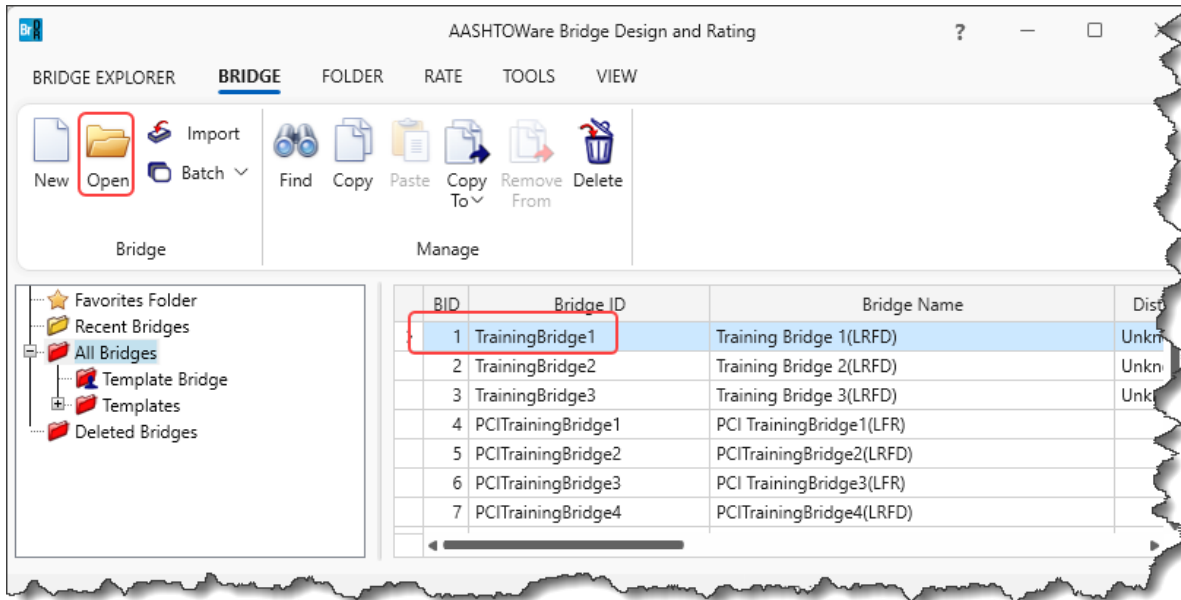
*AASHTOWare BrDR 7.5.0*  
*Feature Tutorial*  
*LS1 – Limit State Selection*

## LS1 – Limit State Selection

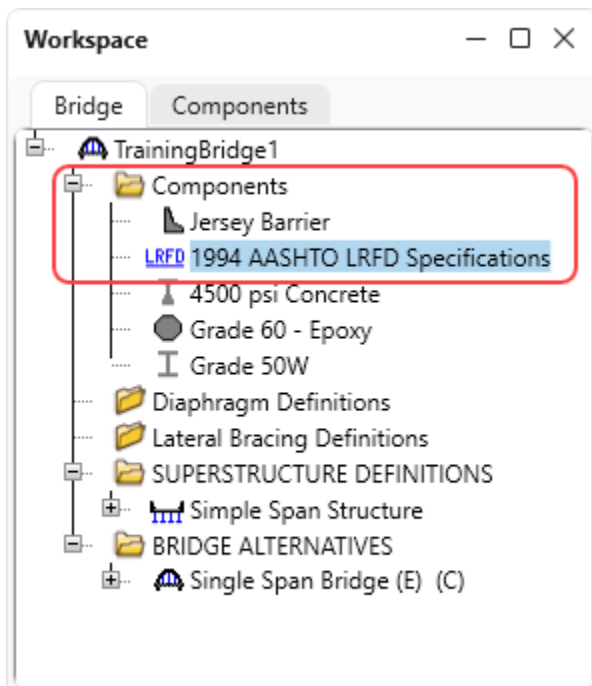
This example describes the selection of limit states for an LRFD spec check analysis. This example assumes you have access to **TrainingBridge1 (BID1)** provided in the sample database included with the software installation.

### Select limit states for LRFD spec check analysis

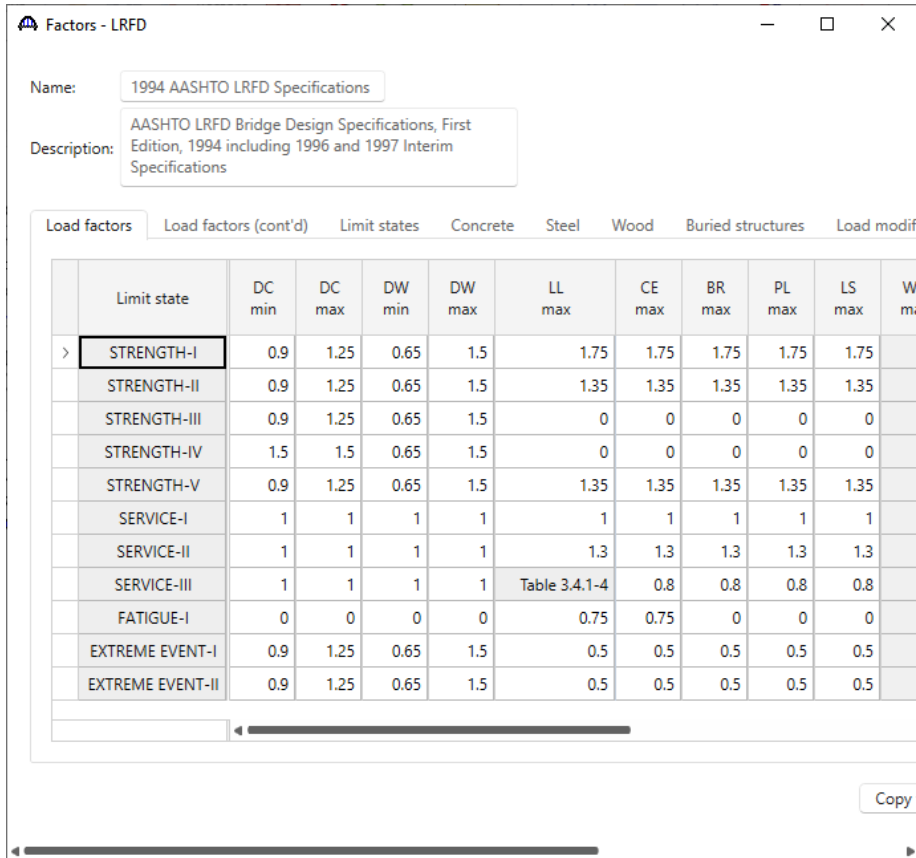
From the **Bridge Explorer**, double click on **BID1 - TrainingBridge1** (or select and click **Open** from the **Bridge** group of the **BRIDGE** ribbon ) to open the bridge.



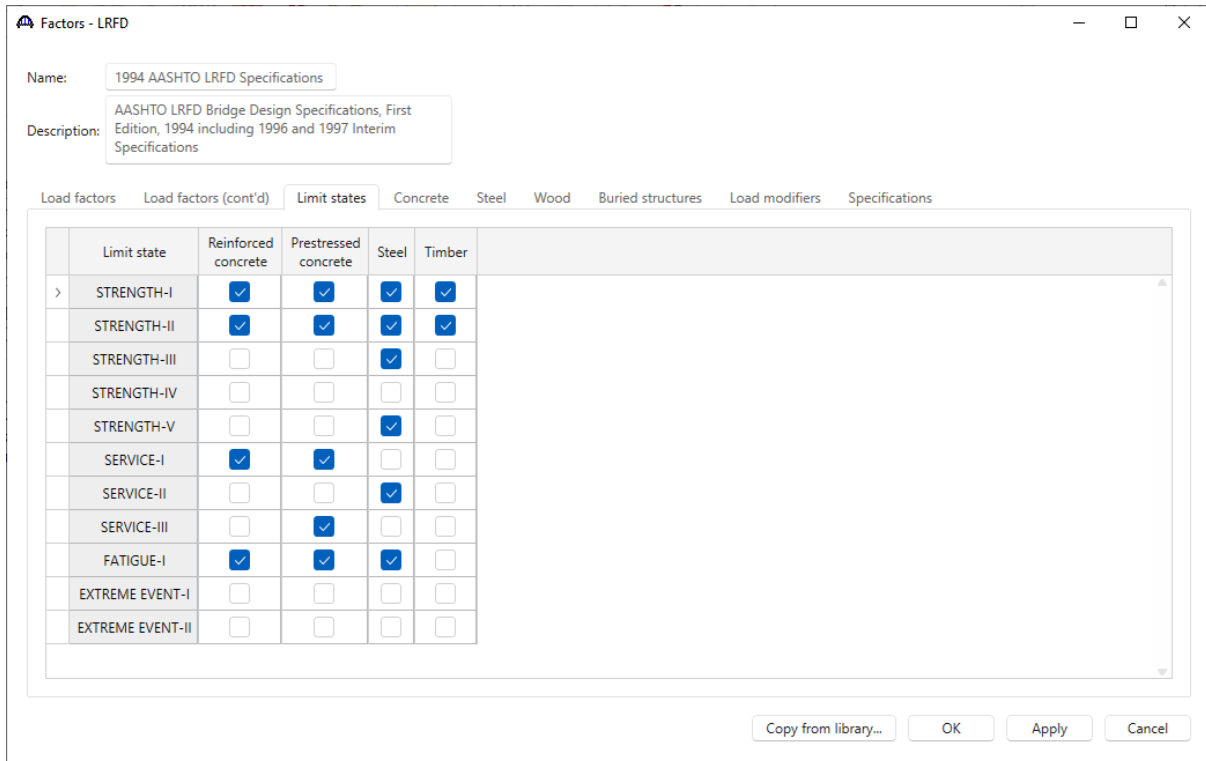
From the **Bridge Workspace** tree, expand the **Components** folder and double click on the **LRFD** factors window – **1994 AASHTO LRFD Specifications** as shown below.



# LS1 – Limit State Selection

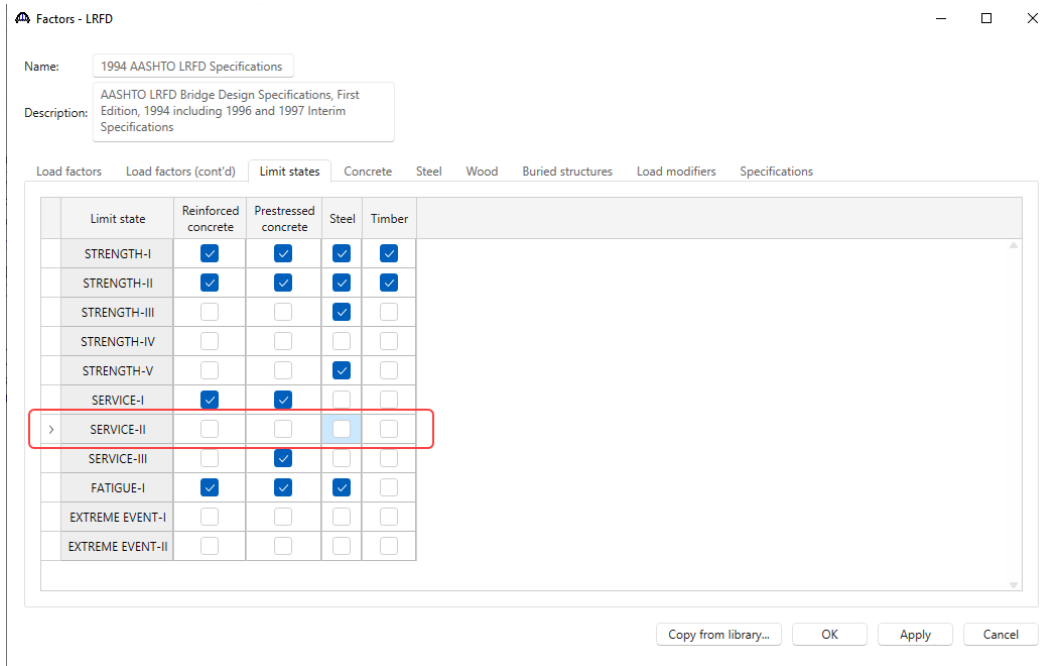


Navigate to the **Limit States** tab. Default limit state selections are as shown below.



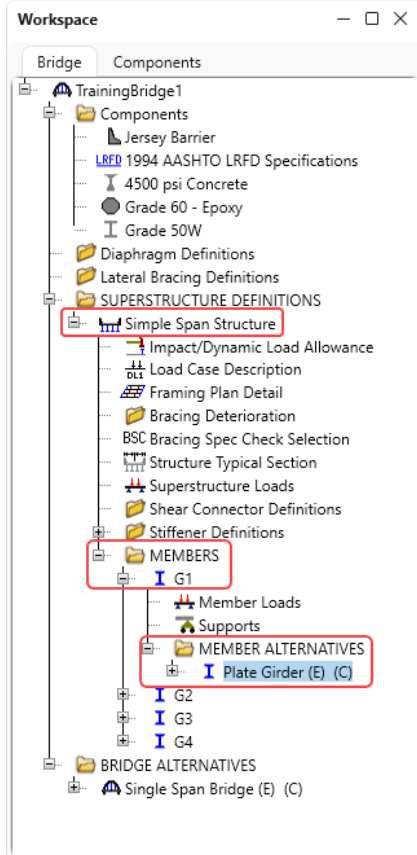
# LS1 – Limit State Selection

Uncheck **SERVICE-II** limit state in the **Steel** column.

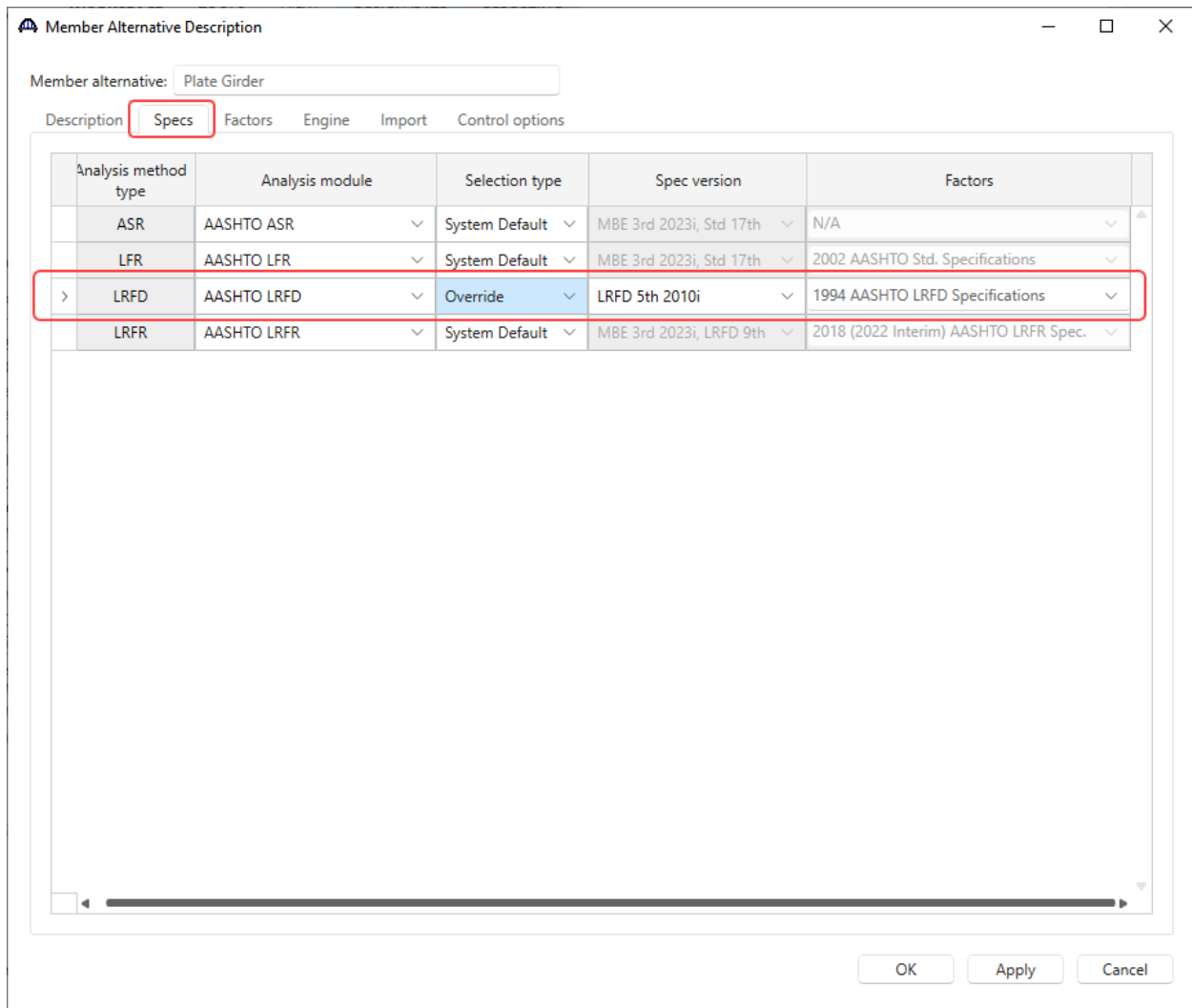


Click **OK** to apply the data and close the window.

Open the member alternative window of **Simple Span Structure/G1/Plate Girder**, select the **Spec** tab, and change the LRFD spec selections as shown in the following windows.

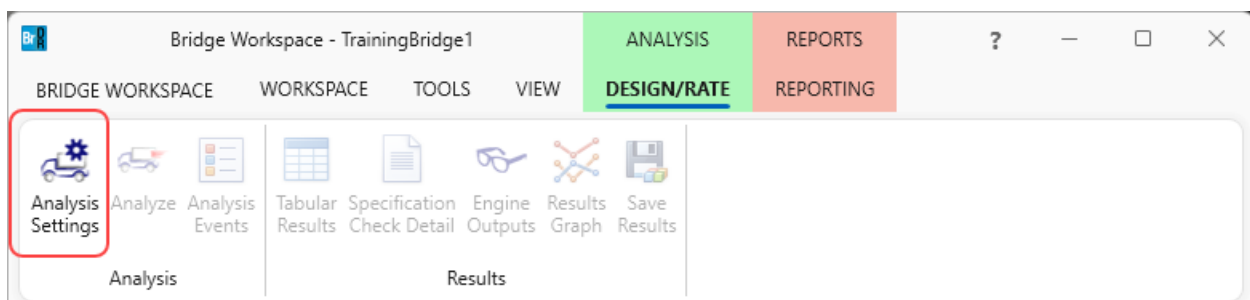


## LS1 – Limit State Selection



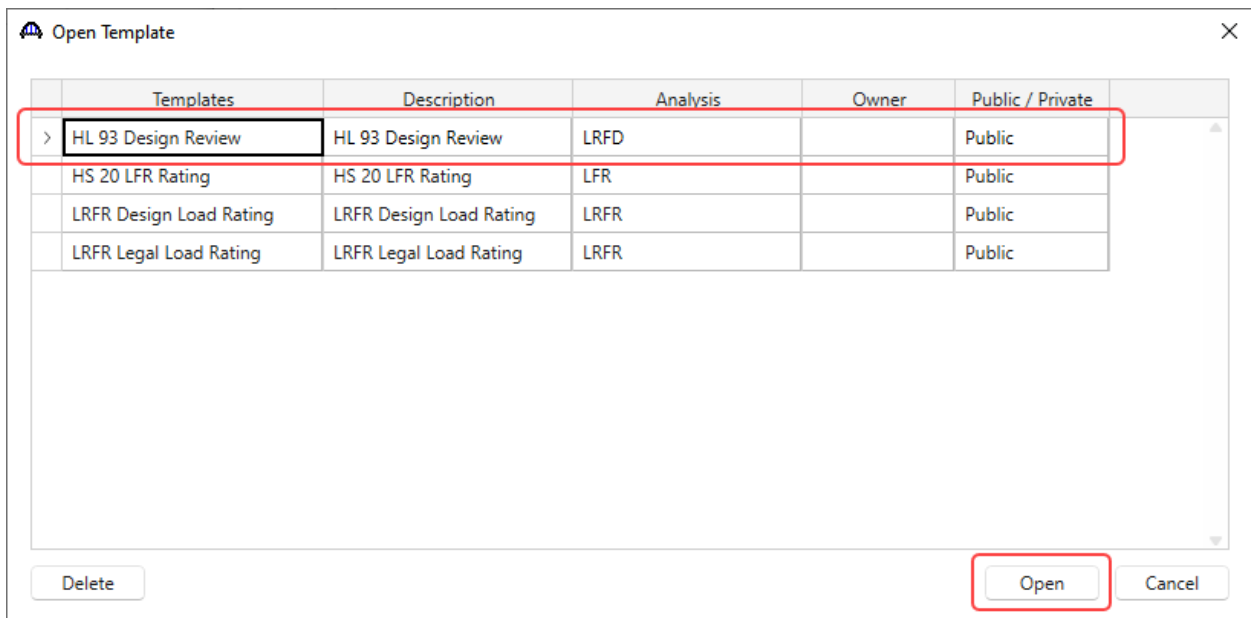
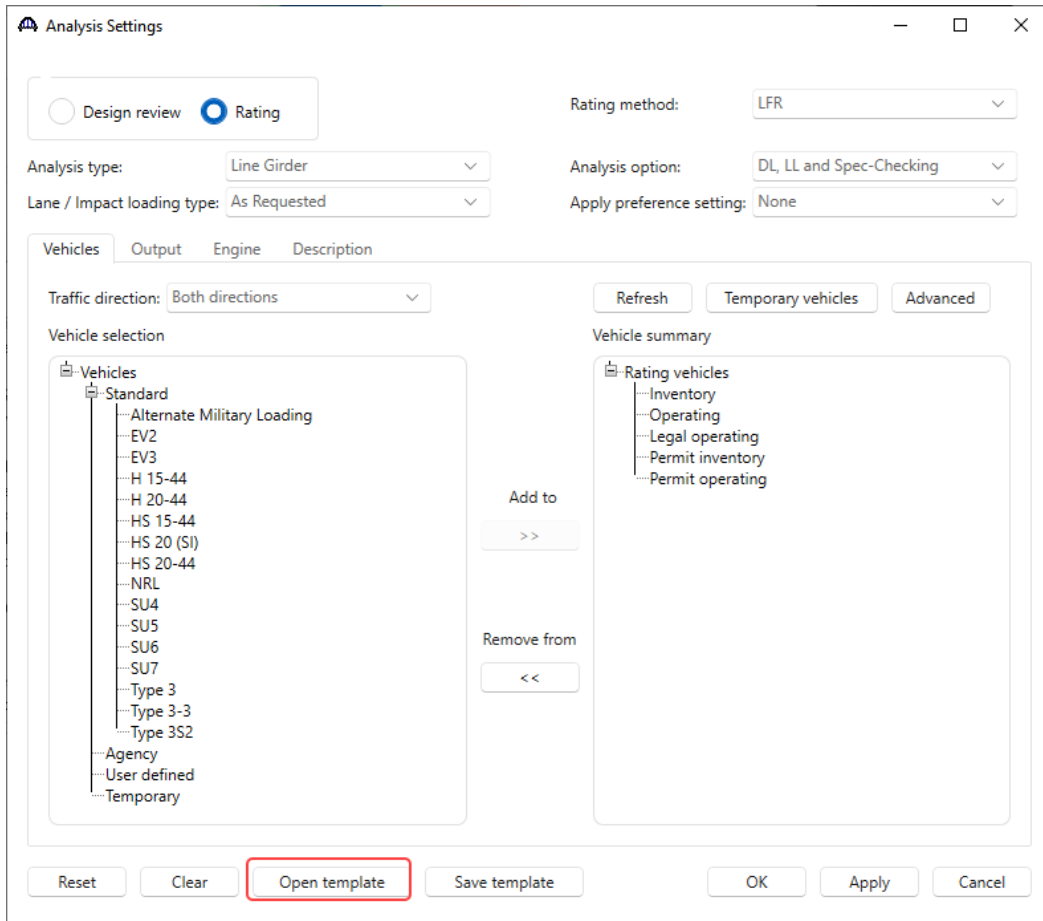
Click **OK** to apply the changes and close the window.

From the **Analysis** group of the **DESIGN/RATE** ribbon, click on the **Analysis Settings** button as shown below.

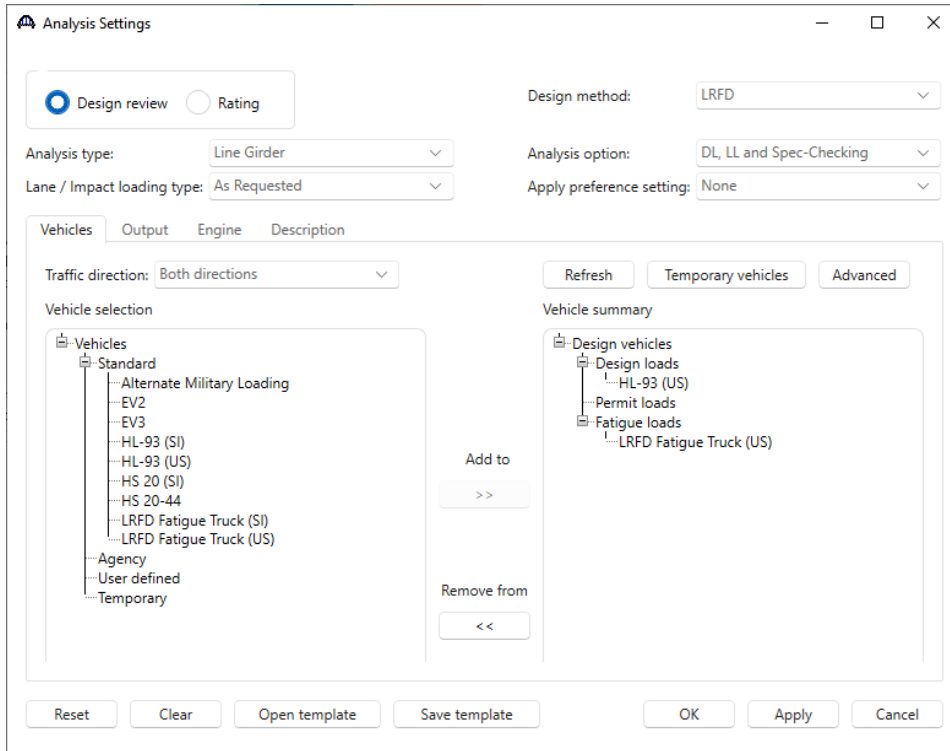


# LS1 – Limit State Selection

Click on the **Open template** button in the **Analysis Settings** window. Select the **HL 93 Design Review** template. The updated **Analysis Settings** window is shown below.

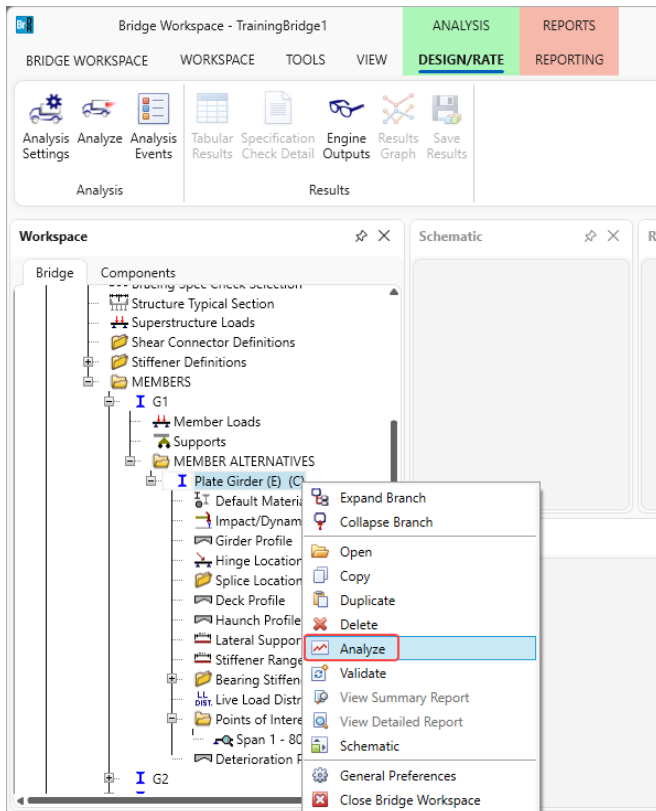


## LS1 – Limit State Selection



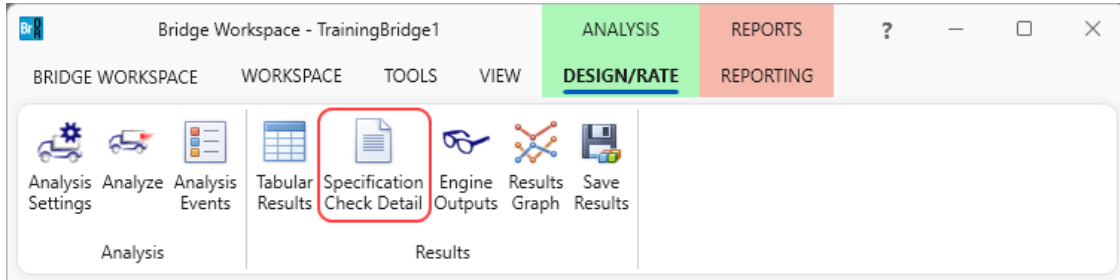
Click **OK** to apply the settings and close the window.

To analyze, right click on **Plate Girder** and select **Analyze**.



# LS1 – Limit State Selection

After the LRFD analysis is completed, click on the **Specification Check Detail** button from the **Results** group of the **DESIGN/RATE** ribbon and navigate to **Stage 3->Plate Girder->Span 1 96.60 ft. -> 6.10.4.2.2 Flexure**.



Specification Checks for Plate Girder - 42 of 932

Articles: All articles  
Format: Bullet list

Specification filter: Superstructure Component

- Stage 1
- Stage 2
- Stage 3
  - Plate Girder
    - Span 1 - 0.00 ft.
    - Span 1 - 13.66 ft.
    - Span 1 - 16.10 ft.
    - Span 1 - 27.31 ft.
    - Span 1 - 32.20 ft.
    - Span 1 - 40.73 ft.
    - Span 1 - 48.30 ft.
    - Span 1 - 54.14 ft.
    - Span 1 - 64.40 ft.
    - Span 1 - 67.56 ft.
    - Span 1 - 80.50 ft.
    - Span 1 - 80.98 ft.
    - Span 1 - 94.39 ft.
    - Span 1 - 96.60 ft.
    - Span 1 - 107.81 ft.
    - Span 1 - 112.70 ft.
    - Span 1 - 121.23 ft.
    - Span 1 - 128.80 ft.
    - Span 1 - 134.64 ft.
    - Span 1 - 144.90 ft.
    - Span 1 - 147.82 ft.
    - Span 1 - 161.00 ft.

Specification reference	Limit State	Flex. Sense	Pass/Fail
1.3.2.1 Design Philosophy - Limit State - General		N/A	General Comp.
✓ 2.5.2.6.2 Criteria for Deflection		N/A	Passed
4.6.2.7.1 I-Sections - Lateral Wind Load Distribution in Multibeam Brid		N/A	General Comp.
5.4.2.6 Modulus of Rupture		N/A	General Comp.
6.10.1.1.1b Stresses for Sections in Positive Flexure		N/A	General Comp.
6.10.1.10.1 Hybrid Factor, Rh		N/A	General Comp.
6.10.1.10.2 Web Load-Shedding Factor, Rb		N/A	General Comp.
✓ 6.10.1.6 Flange Stress and Member Bending Moments		N/A	Passed
✓ 6.10.1.7 Minimum Negative Flexure Concrete Deck Reinforcement		N/A	Passed
6.10.1.9.1 Webs without Longitudinal Stiffeners		N/A	General Comp.
✓ 6.10.11.1.2 Transverse Stiffeners - Projecting Width		N/A	Passed
✓ 6.10.11.1.3 Transverse Stiffeners - Moment of Inertia		N/A	Passed
✓ 6.10.2 Cross-Section Proportion Limits		N/A	Passed
NA 6.10.4.2.2 Flexure		N/A	Not Applicable
NA 6.10.5.3 Special Fatigue Requirement for Webs		N/A	Not Applicable
6.10.6.2.2 Composite Sections in Positive Flexure		N/A	General Comp.
6.10.6.2.3 Composite Sections in Negative Flexure and Noncomposite		N/A	General Comp.
NA 6.10.7.1.1 General		N/A	Not Applicable
NA 6.10.7.1.2 Nominal Flexural Resistance		N/A	Not Applicable
✗ 6.10.7.2.1 General		N/A	Failed
6.10.7.2.2 Nominal Flexural Resistance		N/A	General Comp.
✓ 6.10.7.3 Flexural Resistance - Ductility Requirement		N/A	Passed
NA 6.10.8.1.1 Discretely Braced Flanges in Compression		N/A	Not Applicable
NA 6.10.8.1.2 Discretely Braced Flanges in Tension		N/A	Not Applicable
NA 6.10.8.1.3 Continuously Braced Flanges in Tension or Compression		N/A	Not Applicable
6.10.8.2.1 General		N/A	General Comp.



## LS1 – Limit State Selection

Since Service –II limit state is not selected for LRFD spec check, article 6.10.4.2.2 is not applicable.

Spec Check Detail for 6.10.4.2.2 Flexure

Evaluate Equation 4:  
-----  
Except for composite sections in positive flexure where  $D/tw \leq 150$  (6.10.2.2-1)  
 $f_c \leq F_{crw}$  (6.10.4.2.2-4)  
D/tw = 0.000

RESULT:  
Service II limit state was not evaluated. Article is not applicable.

Load Combination Legend:

Code	Vehicle
1	HL-93 (US) - Design Truck + Lane
2	HL-93 (US) - Tandem + Lane
3	LRFD Fatigue Truck (US) - Fatigue Truck

OK