
AASHTOWare BrD/BrR 6.8

Feature Tutorial

LS1 – Limit State Selection

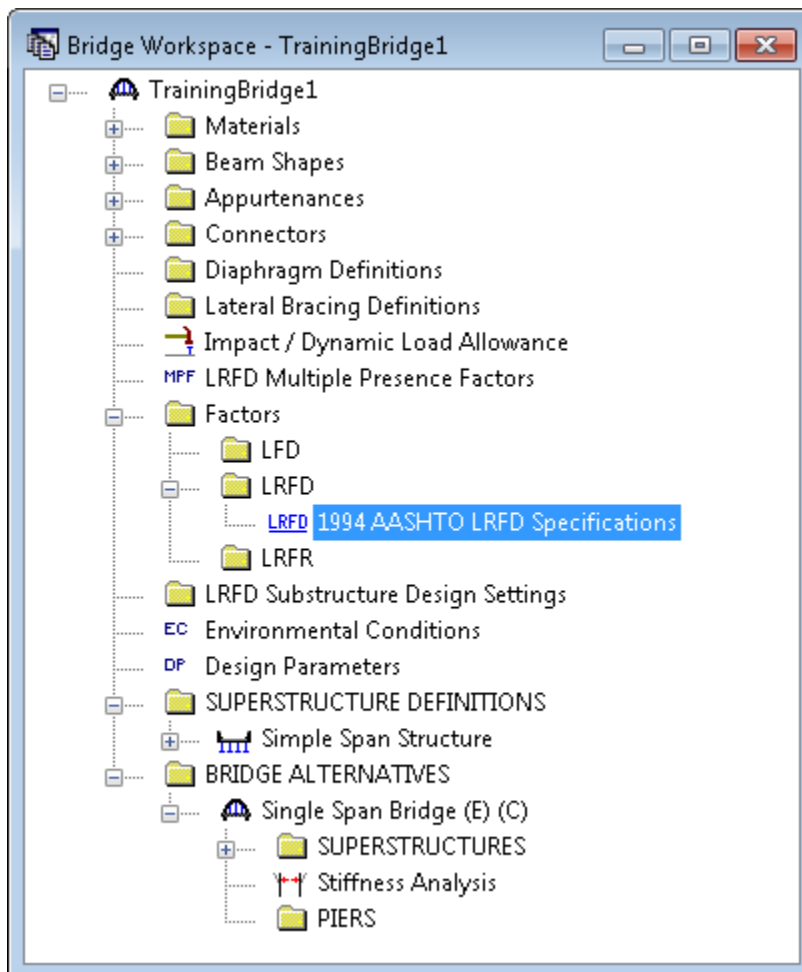
LS1 - Limit State Selection

This example describes how to select limit states for LRFD spec check analysis. This example assumes you have access to TrainingBridge1 (BID1) in the teaching database from the installation.

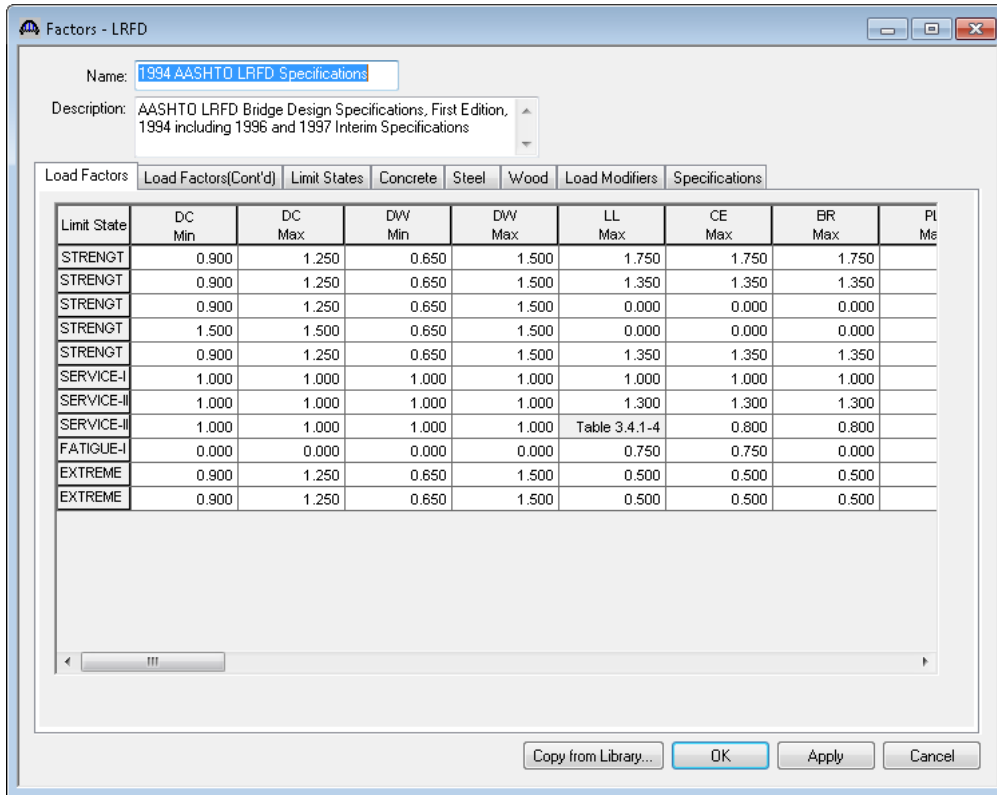
Topics Covered

- Select limit states for LRFD spec check analysis

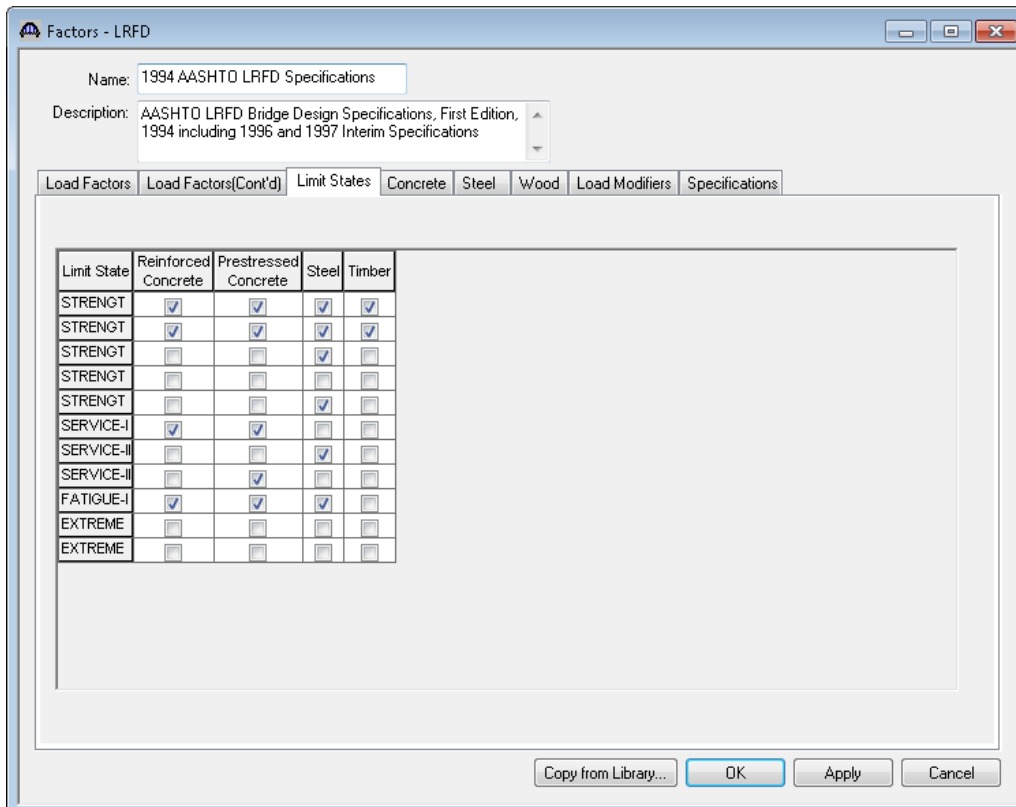
Open TrainingBridge1, open LRFD factors window shown as below.



LS1 - Limit State Selection

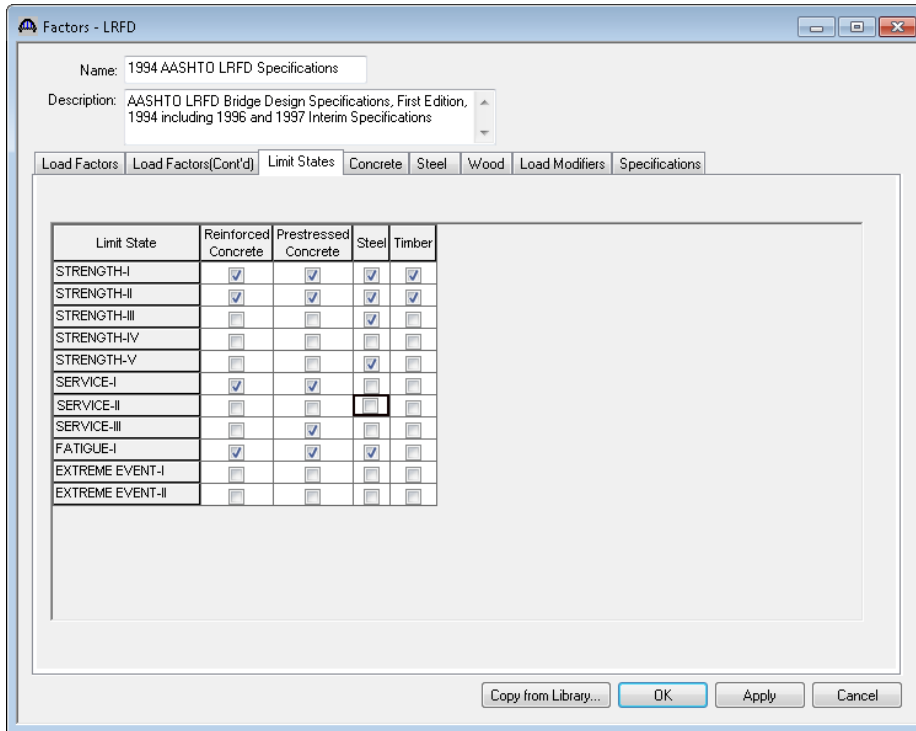


Select "Limit States" tab, default limit states selections are shown as below.



LS1 - Limit State Selection

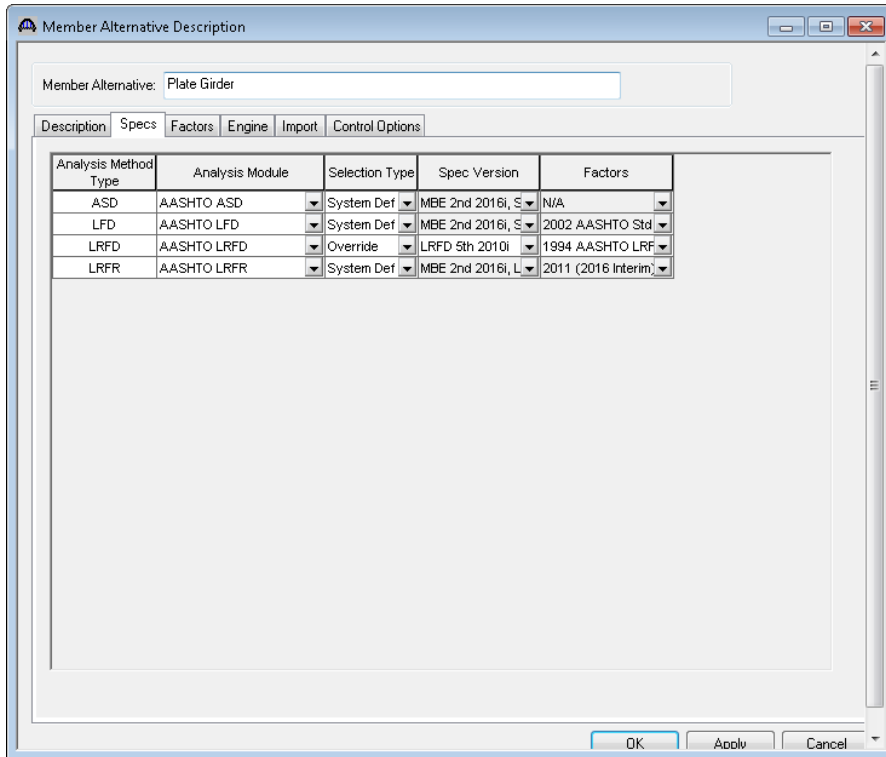
Uncheck Service-II limit state in steel column.



Click OK button to save the change to memory and close the window.

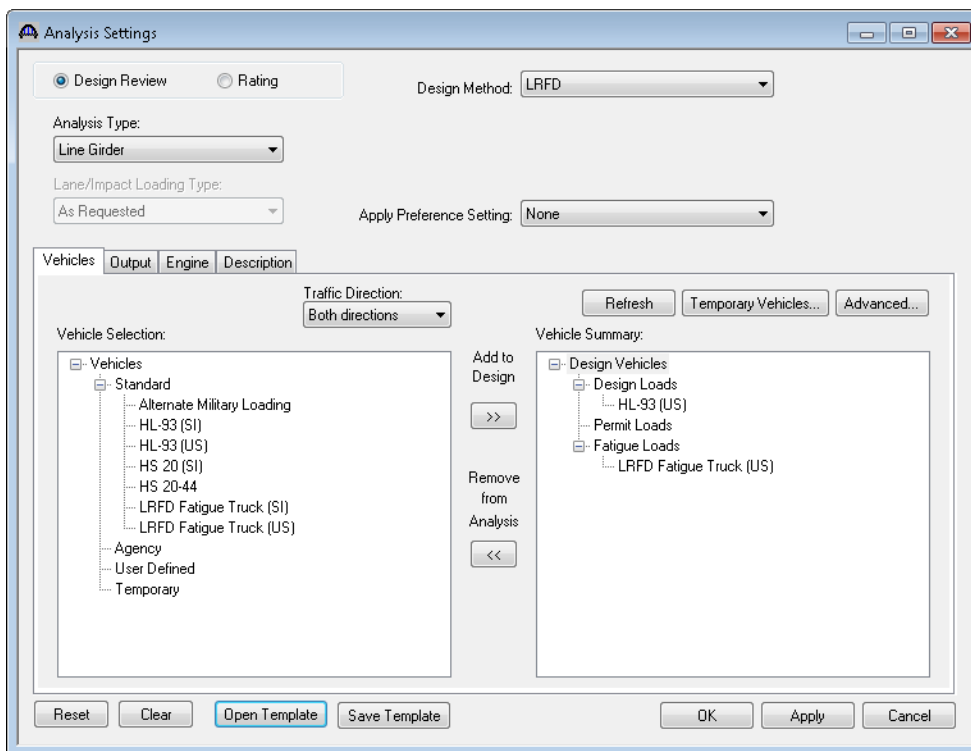
Open member alternative window of "Simple Span Structure/G1/Plate Girder", select "Spec" tab, change LRFD spec selections as the following window.

LS1 - Limit State Selection



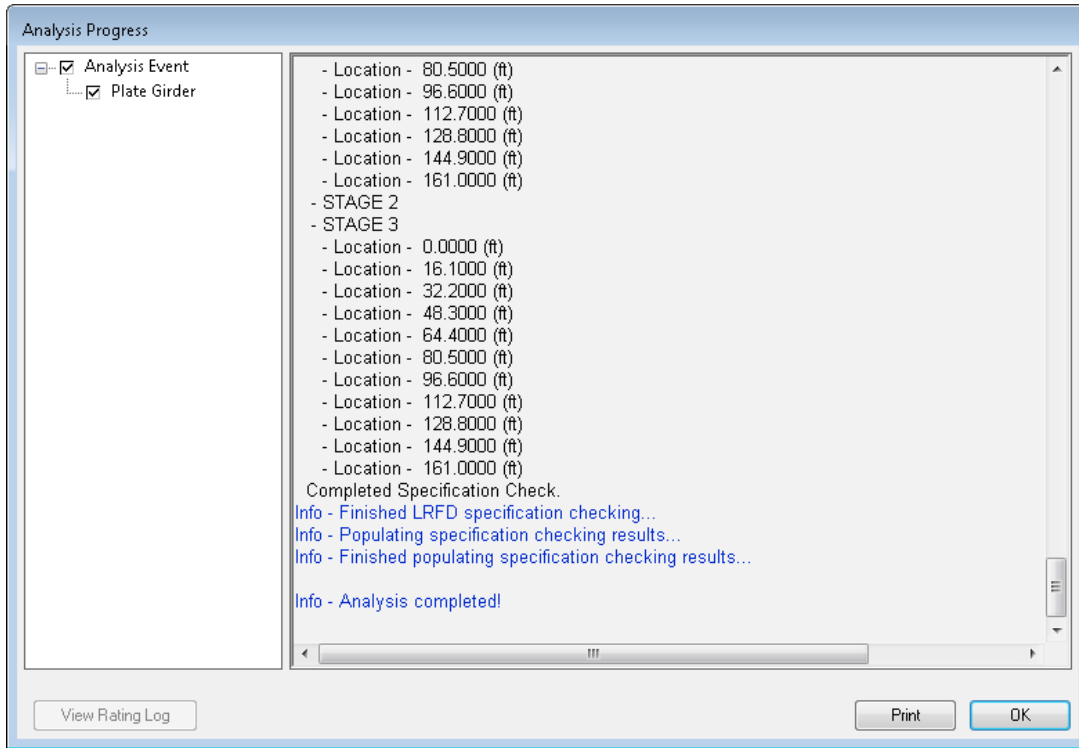
Click OK button to save the change to memory and close the window.

Do design review with HL93 for “Simple Span Structure/G1/Plate Girder”.




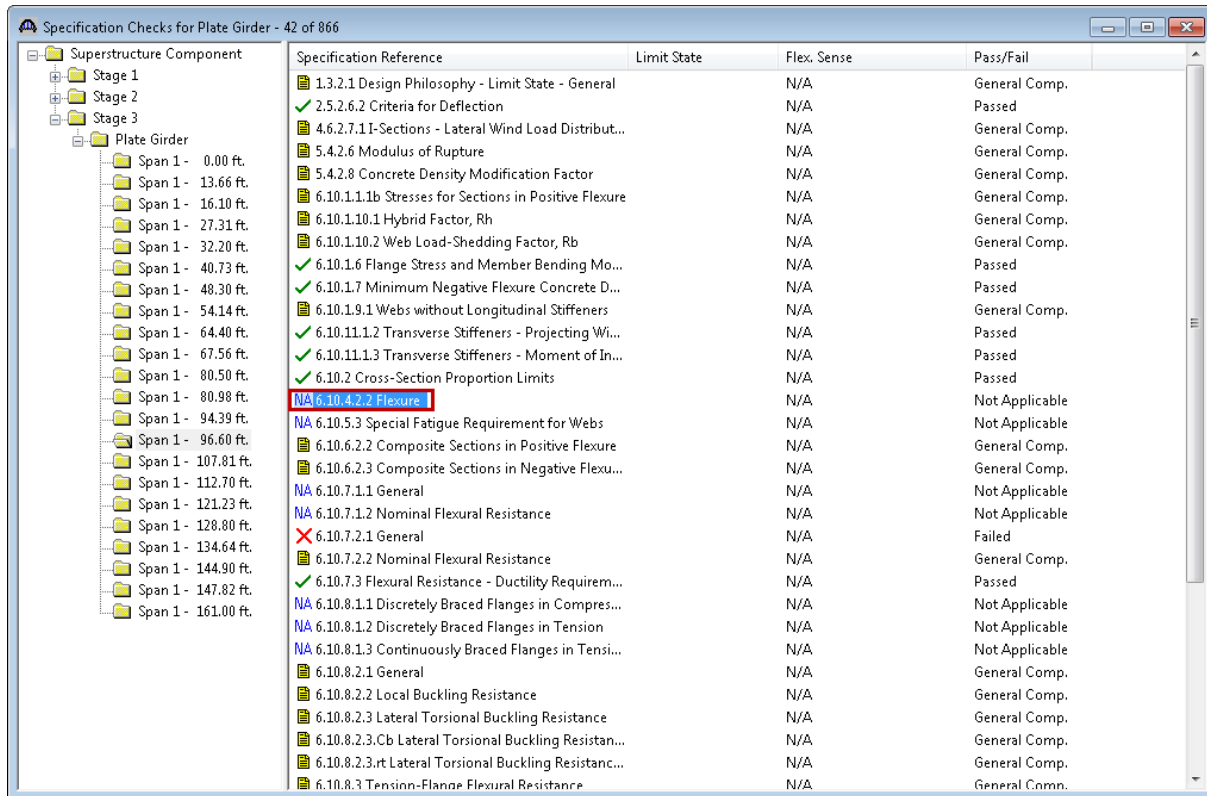
LS1 - Limit State Selection

Click OK in analysis progress window when analysis is complete.



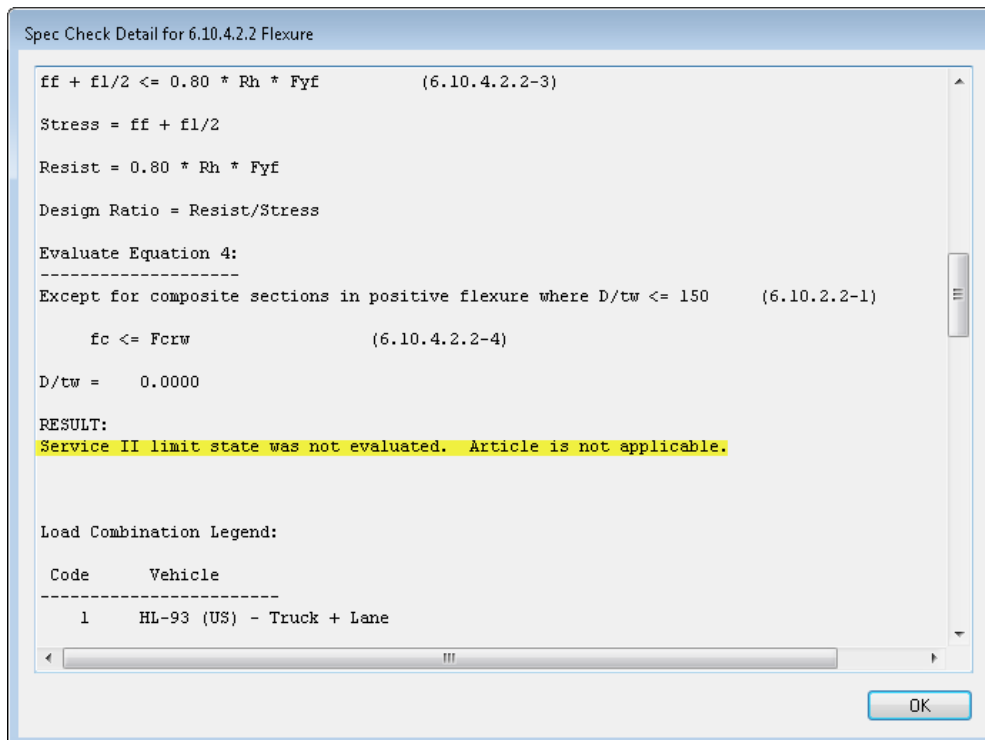
LS1 - Limit State Selection

Click “View Spec Check”  button to view article list.



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 Distribut...		N/A	General Comp.
5.4.2.6 Modulus of Rupture		N/A	General Comp.
5.4.2.8 Concrete Density Modification Factor		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 Mo...		N/A	Passed
6.10.1.7 Minimum Negative Flexure Concrete D...		N/A	Passed
6.10.1.9.1 Webs without Longitudinal Stiffeners		N/A	General Comp.
6.10.11.1.2 Transverse Stiffeners - Projecting Wi...		N/A	Passed
6.10.11.1.3 Transverse Stiffeners - Moment of In...		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 Flexu...		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 Requirem...		N/A	Passed
NA 6.10.8.1.1 Discretely Braced Flanges in Compres...		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 Tensi...		N/A	Not Applicable
6.10.8.2.1 General		N/A	General Comp.
6.10.8.2.2 Local Buckling Resistance		N/A	General Comp.
6.10.8.2.3 Lateral Torsional Buckling Resistance		N/A	General Comp.
6.10.8.2.3.Cb Lateral Torsional Buckling Resistan...		N/A	General Comp.
6.10.8.2.3.rt Lateral Torsional Buckling Resistanc...		N/A	General Comp.
6.10.8.3 Tension-Flange Flexural Resistance		N/A	General Comp.

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

$ff + f_{l/2} \leq 0.80 * Rh * F_{yf}$ (6.10.4.2.2-3)

Stress = $ff + f_{l/2}$

Resist = $0.80 * Rh * F_{yf}$

Design Ratio = Resist/Stress

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)

$D/tw = 0.0000$

RESULT:

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

Load Combination Legend:

Code	Vehicle
1	HL-93 (US) - Truck + Lane

OK