AASHTOWare Bridge Rating Training
LRFR Load Rating of Floor System Example (BrR 6.7)

Topics Covered

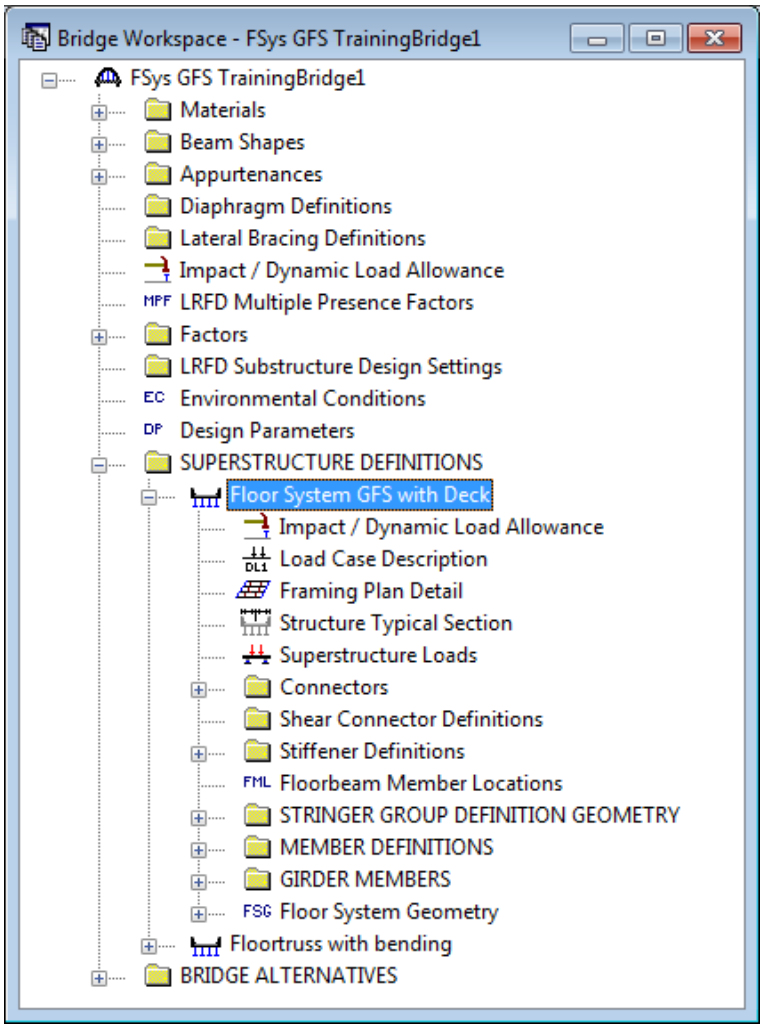
- LRFR analysis and results of floor system

This example describes load rating a girder-floorbeam-stringer (GFS) floor system superstructure using AASHTOWare BrR V670. The superstructure used for this example is the "Floor System GFS with Deck" in the BID 13 "FSys GFS TrainingBridge 1".

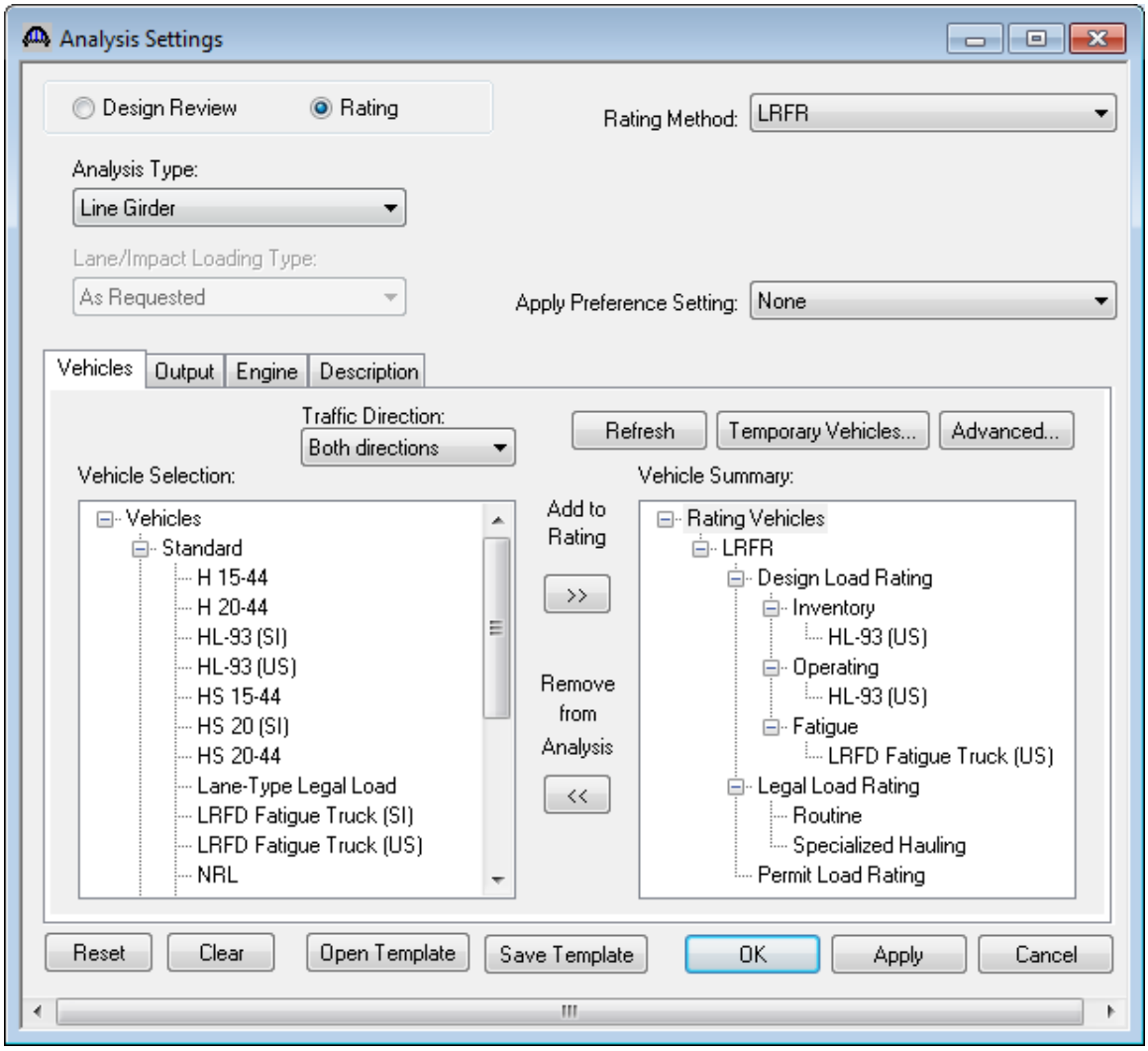
Analysis Methods

Users can perform a LRFR analysis on the floor system superstructures to load rate girders, floorbeams and stringers.

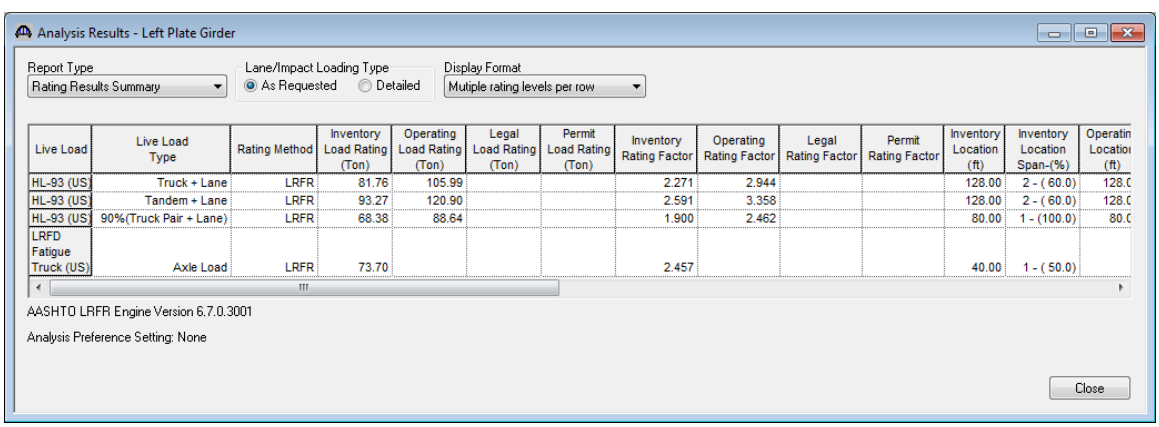
Open the bridge BID 13 "FSys GFS TrainingBridge 1" in the sample database, and highlight the superstructure "Floor System GFS with Deck".



To do LRFR load rating, enter the Analysis Settings window as shown below.

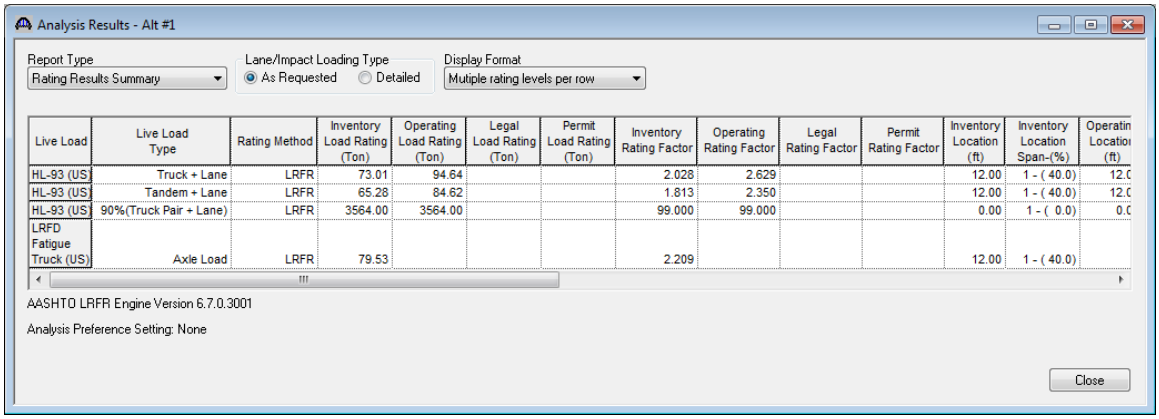


Run the LRFR load rating of the superstructure. The LRFR rating results of the left girder are shown below.



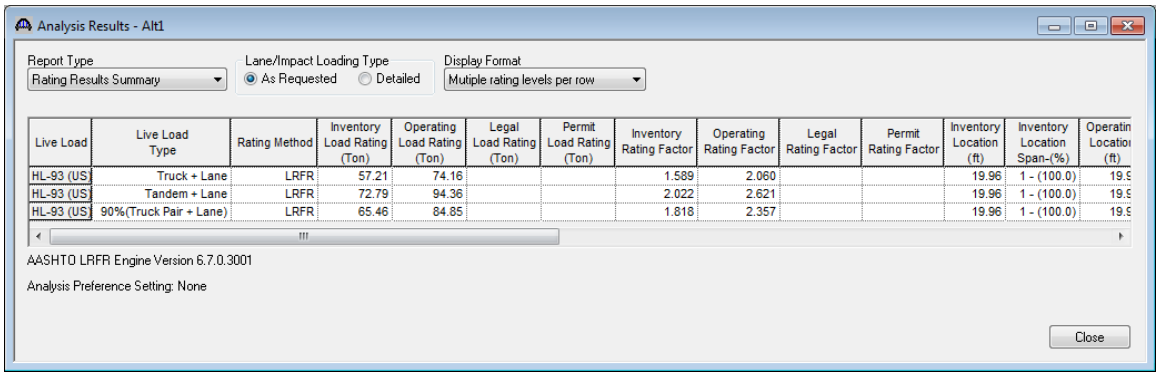
Live Load	Live Load Type	Rating Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Legal Load Rating (Ton)	Permit Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Legal Rating Factor	Permit Rating Factor	Inventory Location (ft)	Inventory Location Span-(%)	Operatin Locatio (ft)
HL-93 (US)	Truck + Lane	LRFR	81.76	105.99			2.271	2.944			128.00	2 - (60.0)	128.0
HL-93 (US)	Tandem + Lane	LRFR	93.27	120.90			2.591	3.358			128.00	2 - (60.0)	128.0
HL-93 (US)	90%(Truck Pair + Lane)	LRFR	68.38	88.64			1.900	2.462			80.00	1 - (100.0)	80.0
LRFD Fatigue Truck (US)	Axle Load	LRFR	73.70				2.457				40.00	1 - (50.0)	

The LRFR rating results of the Floorbeam1 are shown below.



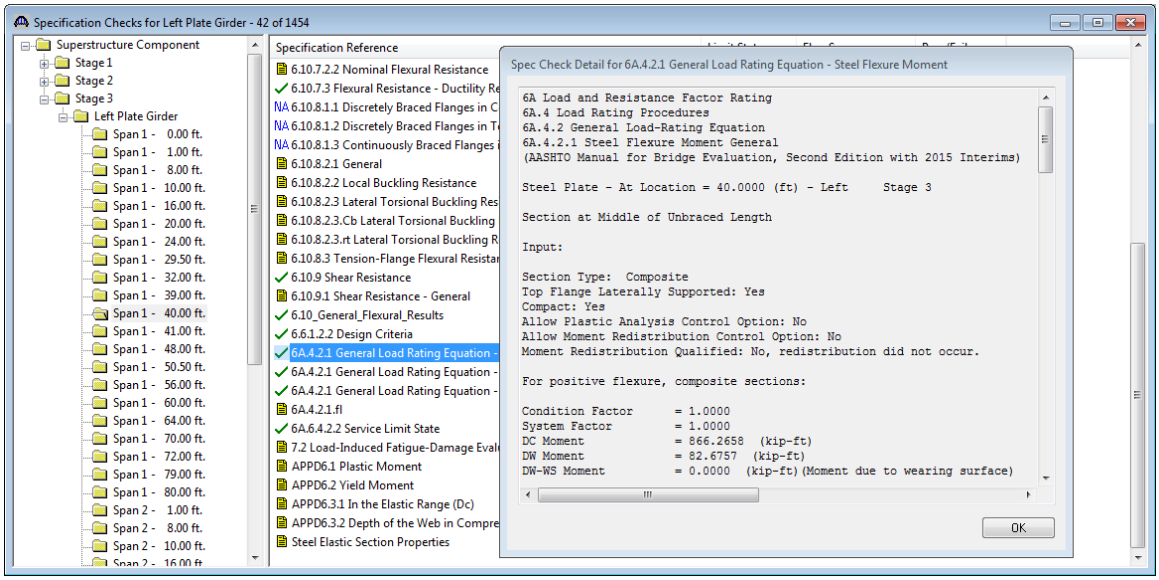
Live Load	Live Load Type	Rating Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Legal Load Rating (Ton)	Permit Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Legal Rating Factor	Permit Rating Factor	Inventory Location (ft)	Inventory Location Span-(%)	Operatin Locatio (ft)
HL-93 (US)	Truck + Lane	LRFR	73.01	94.64			2.028	2.629			12.00	1 - (40.0)	12.0
HL-93 (US)	Tandem + Lane	LRFR	65.28	84.62			1.813	2.350			12.00	1 - (40.0)	12.0
HL-93 (US)	90%(Truck Pair + Lane)	LRFR	3564.00	3564.00			99.000	99.000			0.00	1 - (0.0)	0.0
LRFD Fatigue Truck (US)	Axle Load	LRFR	79.53				2.209				12.00	1 - (40.0)	

The LRFR rating results of the Unit1 Stringer2 are shown below.

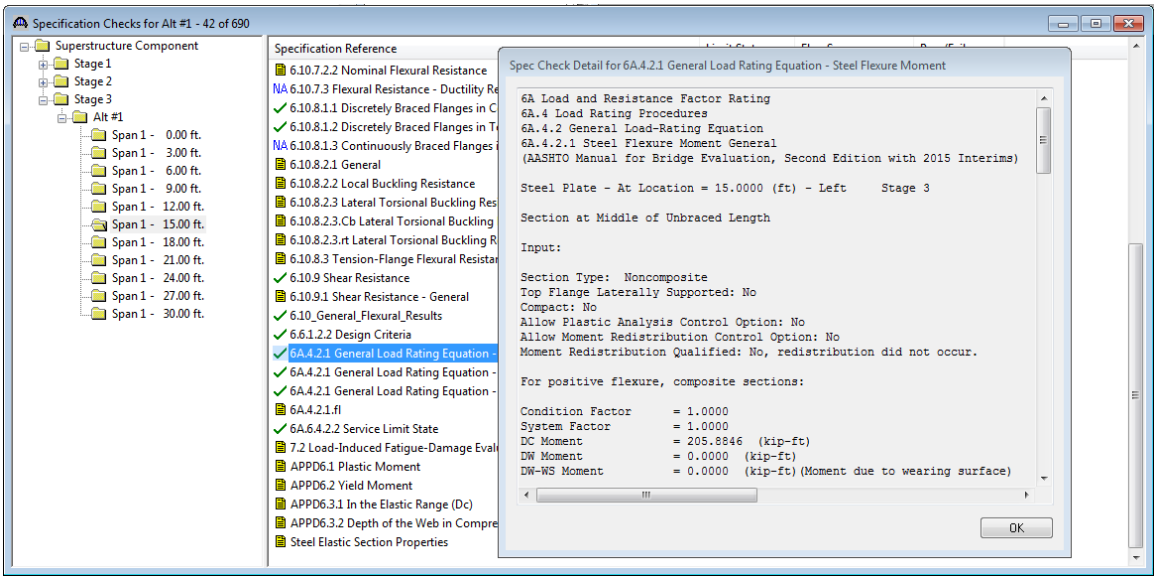


Live Load	Live Load Type	Rating Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Legal Load Rating (Ton)	Permit Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Legal Rating Factor	Permit Rating Factor	Inventory Location (ft)	Inventory Location Span-(%)	Operatin Locatio (ft)
HL-93 (US)	Truck + Lane	LRFR	57.21	74.16			1.589	2.060			19.96	1 - (100.0)	19.9
HL-93 (US)	Tandem + Lane	LRFR	72.79	94.36			2.022	2.621			19.96	1 - (100.0)	19.9
HL-93 (US)	90%(Truck Pair + Lane)	LRFR	65.46	84.85			1.818	2.357			19.96	1 - (100.0)	19.9

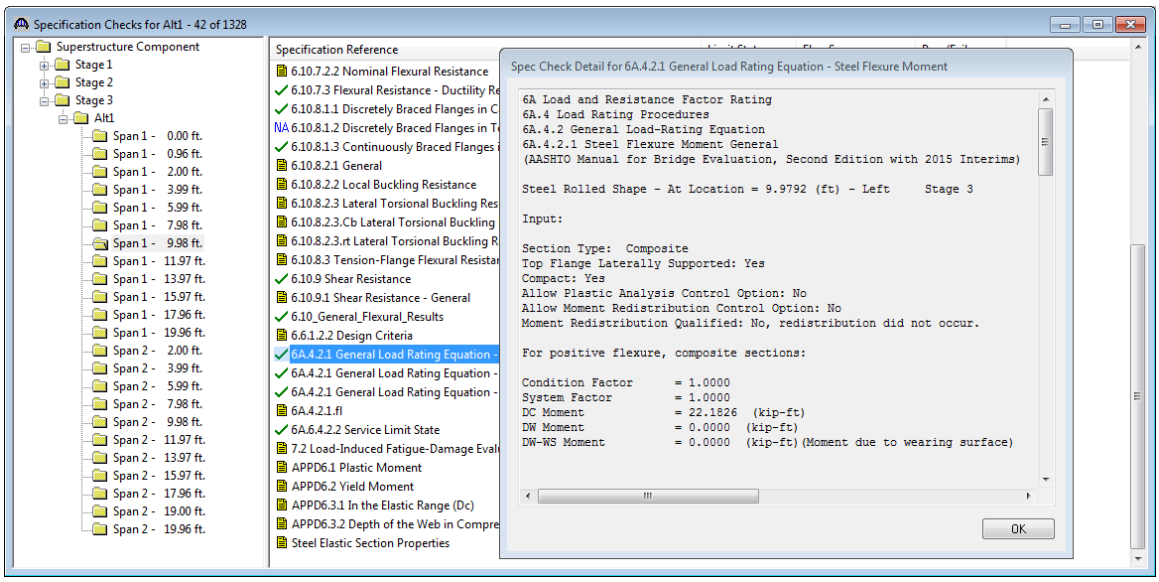
A summary of the specification checks is shown by selecting the View Spec Check button, , from the toolbar. The details for one of the spec checks of the left girder are shown below.



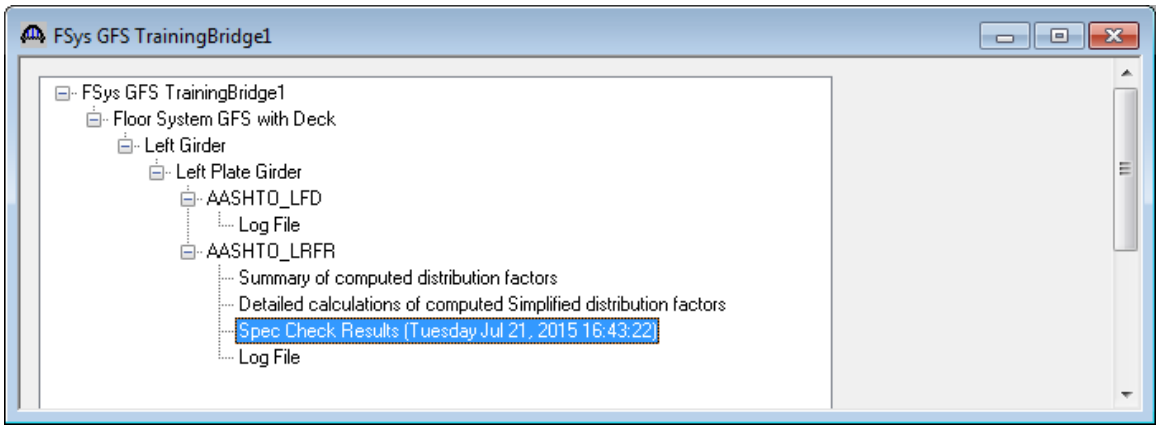
The details for one of the spec checks of the Floorbeam1 are shown below.



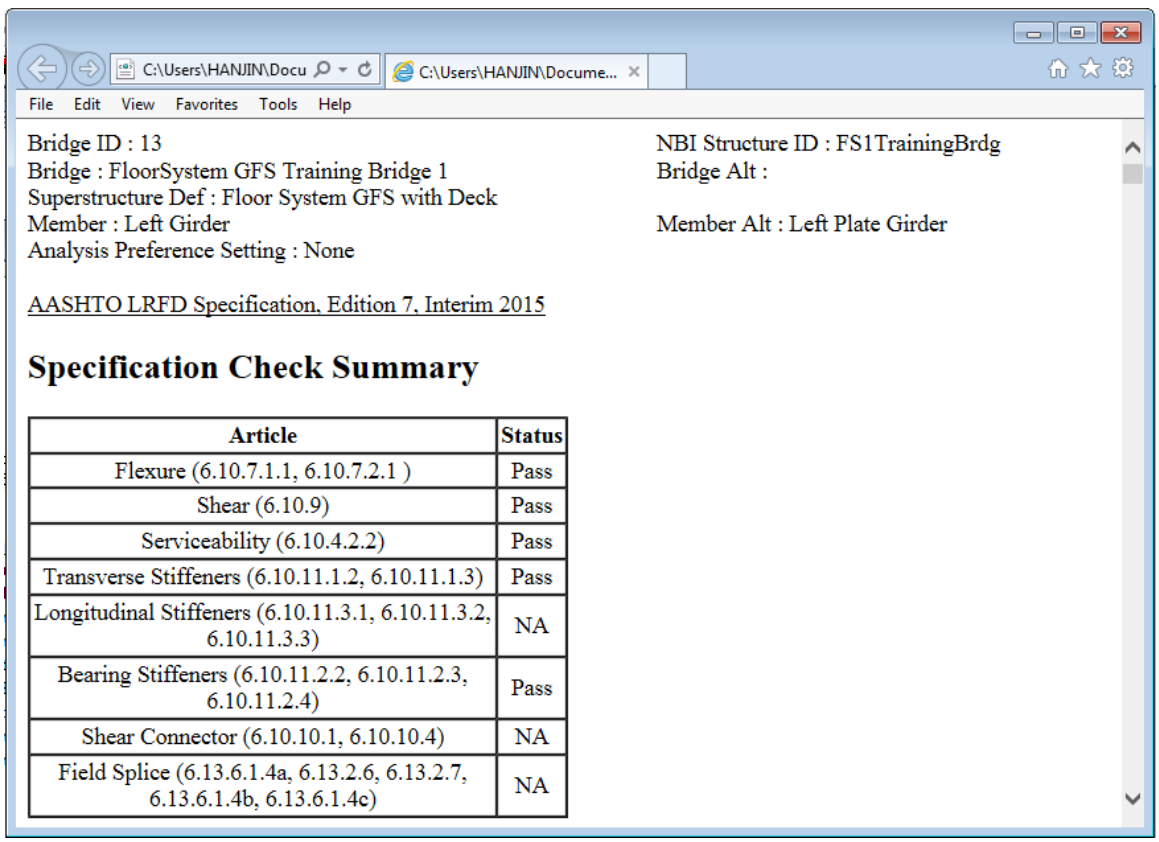
The details for one of the spec checks of the Unit1 Stringer2 are shown below.



AASHTO LRFR analysis will generate a spec check results file. Click on tool bar to open the following window.

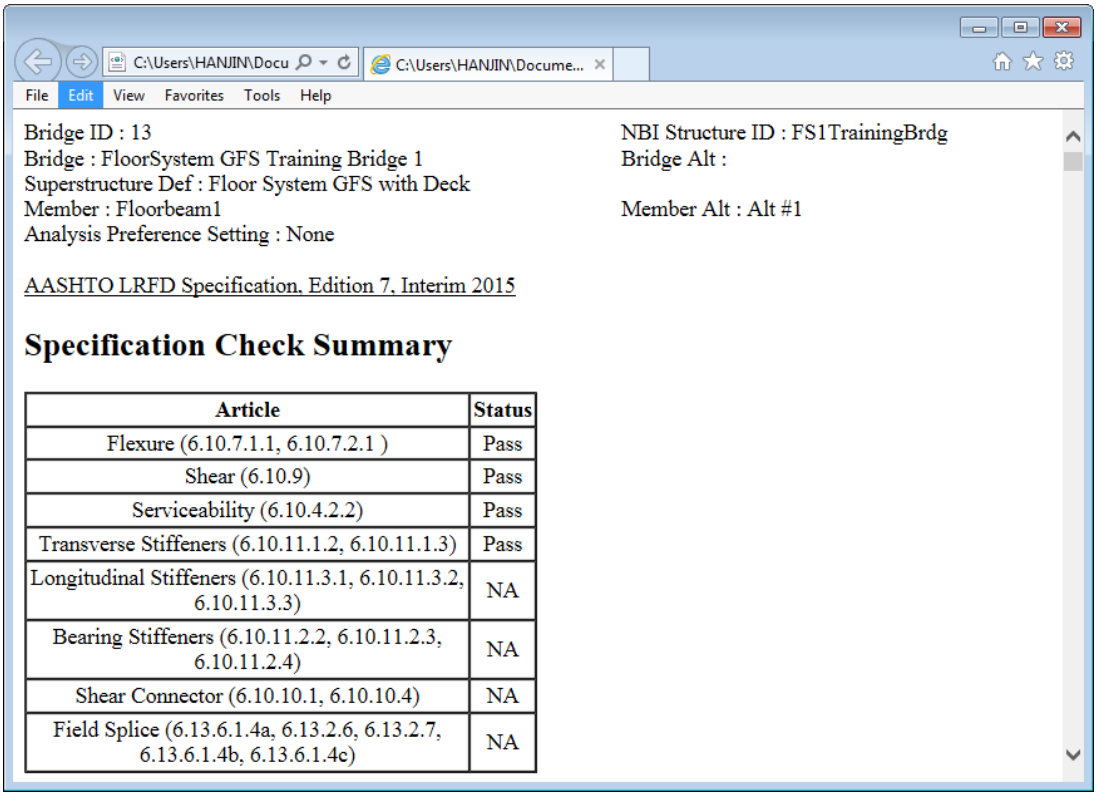


To view the spec check results, double click the Spec Check Results in this window. The Spec Check Results of the left girder are shown below.



Article	Status
Flexure (6.10.7.1.1, 6.10.7.2.1)	Pass
Shear (6.10.9)	Pass
Serviceability (6.10.4.2.2)	Pass
Transverse Stiffeners (6.10.11.1.2, 6.10.11.1.3)	Pass
Longitudinal Stiffeners (6.10.11.3.1, 6.10.11.3.2, 6.10.11.3.3)	NA
Bearing Stiffeners (6.10.11.2.2, 6.10.11.2.3, 6.10.11.2.4)	Pass
Shear Connector (6.10.10.1, 6.10.10.4)	NA
Field Splice (6.13.6.1.4a, 6.13.2.6, 6.13.2.7, 6.13.6.1.4b, 6.13.6.1.4c)	NA

The Spec Check Results of the Floorbeam1 are shown below.



Bridge ID : 13
Bridge : FloorSystem GFS Training Bridge 1
Superstructure Def : Floor System GFS with Deck
Member : Floorbeam1
Analysis Preference Setting : None

NBI Structure ID : FS1TrainingBrdg
Bridge Alt :

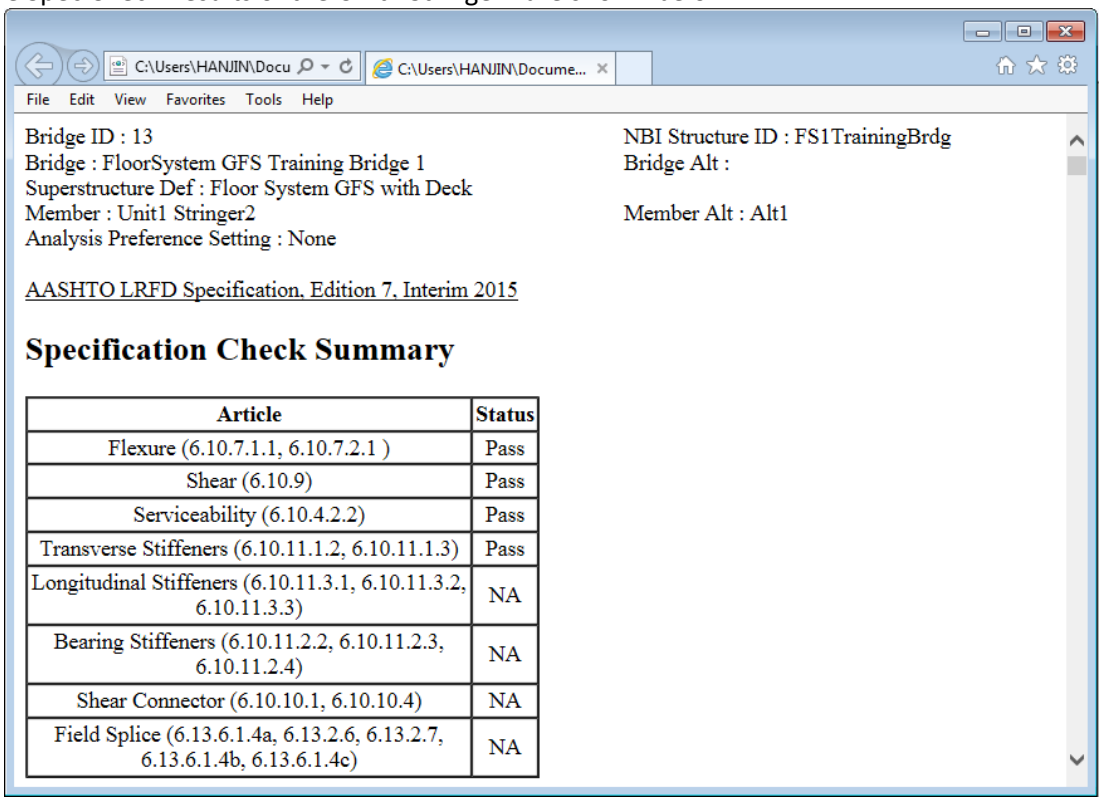
Member Alt : Alt #1

AASHTO LRFD Specification, Edition 7, Interim 2015

Specification Check Summary

Article	Status
Flexure (6.10.7.1.1, 6.10.7.2.1)	Pass
Shear (6.10.9)	Pass
Serviceability (6.10.4.2.2)	Pass
Transverse Stiffeners (6.10.11.1.2, 6.10.11.1.3)	Pass
Longitudinal Stiffeners (6.10.11.3.1, 6.10.11.3.2, 6.10.11.3.3)	NA
Bearing Stiffeners (6.10.11.2.2, 6.10.11.2.3, 6.10.11.2.4)	NA
Shear Connector (6.10.10.1, 6.10.10.4)	NA
Field Splice (6.13.6.1.4a, 6.13.2.6, 6.13.2.7, 6.13.6.1.4b, 6.13.6.1.4c)	NA

The Spec Check Results of the Unit1 Stringer2 are shown below.



Bridge ID : 13
Bridge : FloorSystem GFS Training Bridge 1
Superstructure Def : Floor System GFS with Deck
Member : Unit1 Stringer2
Analysis Preference Setting : None

NBI Structure ID : FS1TrainingBrdg
Bridge Alt :

Member Alt : Alt1

AASHTO LRFD Specification, Edition 7, Interim 2015

Specification Check Summary

Article	Status
Flexure (6.10.7.1.1, 6.10.7.2.1)	Pass
Shear (6.10.9)	Pass
Serviceability (6.10.4.2.2)	Pass
Transverse Stiffeners (6.10.11.1.2, 6.10.11.1.3)	Pass
Longitudinal Stiffeners (6.10.11.3.1, 6.10.11.3.2, 6.10.11.3.3)	NA
Bearing Stiffeners (6.10.11.2.2, 6.10.11.2.3, 6.10.11.2.4)	NA
Shear Connector (6.10.10.1, 6.10.10.4)	NA
Field Splice (6.13.6.1.4a, 6.13.2.6, 6.13.2.7, 6.13.6.1.4b, 6.13.6.1.4c)	NA