AASHTOWare BrDR 7.5.0

Report Tutorial

Fatigue and Service Stress LRFD/LRFR Reports

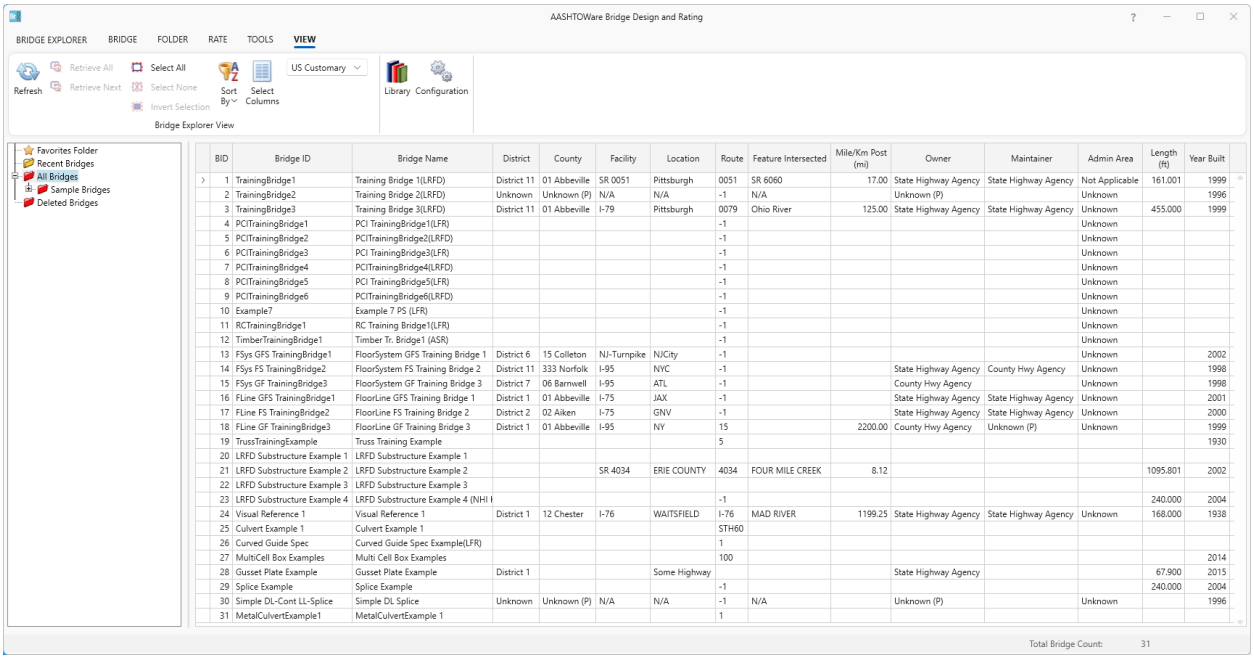
Topics Covered

- Fatigue and Service stress reports for LRFD/LRFR

Note: *Fatigue and Service Stress reports can be generated for Steel Girders LRFD/LRFR analysis only.*

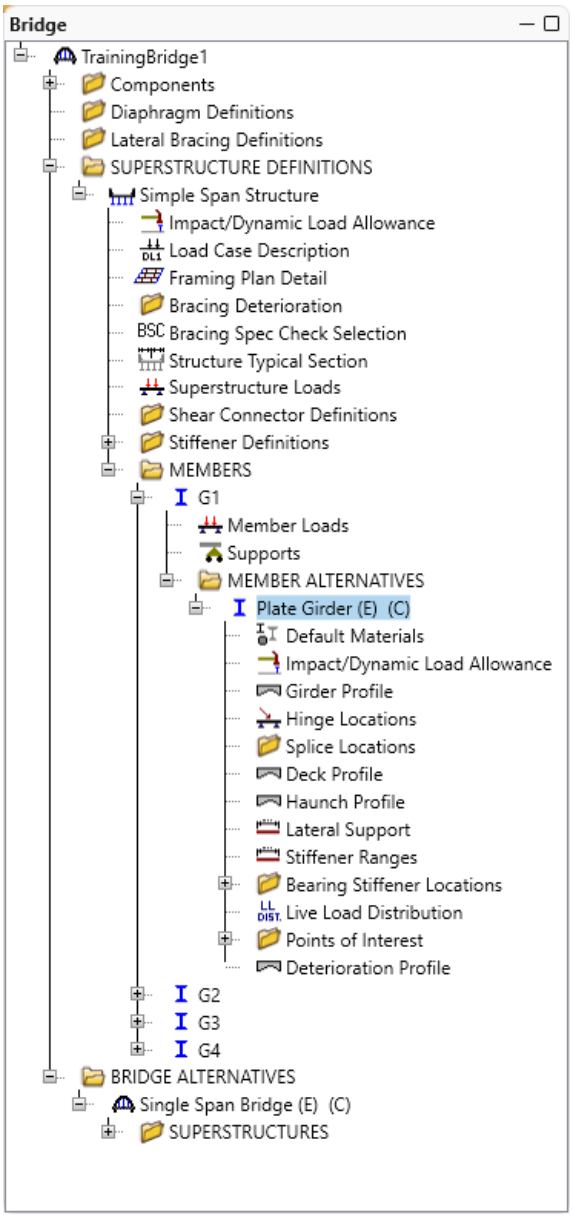
Fatigue and Service stress reports for LRFD/LRFR

From the Bridge Explorer select **TrainingBridge1** (BID 1) and double click (or right click and select **Open**) to open it.

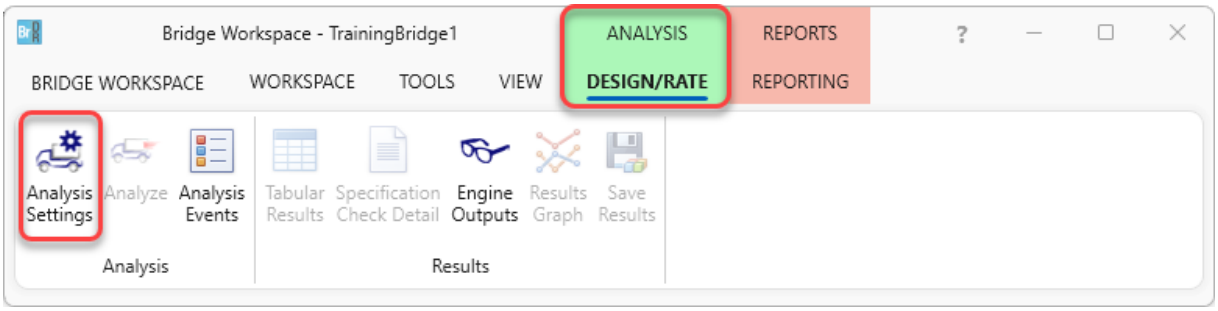


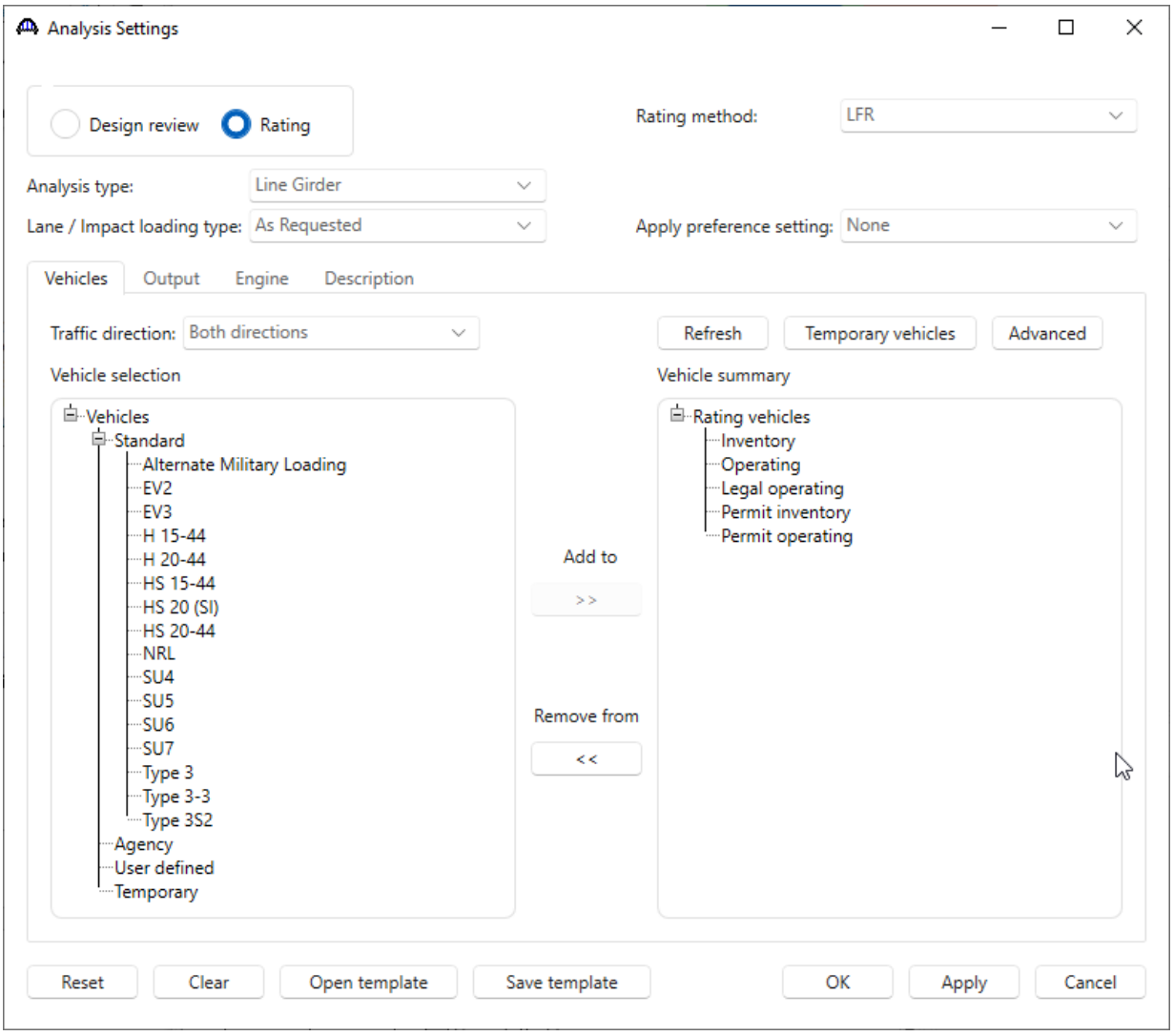
BID	Bridge ID	Bridge Name	District	County	Facility	Location	Route	Feature Intersected	Mile/Km Post (mi)	Owner	Maintainer	Admin Area	Length (ft)	Year Built
1	TrainingBridge1	Training Bridge 1(LRFD)	District 11	01 Abbeville	SR 0051	Pittsburgh	0051	SR 6060	17.00	State Highway Agency	State Highway Agency	Not Applicable	161.001	1999
2	TrainingBridge2	Training Bridge 2(LRFD)	Unknown	Unknown (P)	N/A	N/A	-1	N/A		Unknown (P)		Unknown		1996
3	TrainingBridge3	Training Bridge 3(LRFD)	District 11	01 Abbeville	I-79	Pittsburgh	0079	Ohio River	125.00	State Highway Agency	State Highway Agency	Unknown	455.000	1999
4	PCITrainingBridge1	PCI TrainingBridge1(LFR)					-1					Unknown		
5	PCITrainingBridge2	PCITrainingBridge2(LRFD)					-1					Unknown		
6	PCITrainingBridge3	PCI TrainingBridge3(LFR)					-1					Unknown		
7	PCITrainingBridge4	PCITrainingBridge4(LRFD)					-1					Unknown		
8	PCITrainingBridge5	PCI TrainingBridge5(LFR)					-1					Unknown		
9	PCITrainingBridge6	PCITrainingBridge6(LRFD)					-1					Unknown		
10	Example7	Example 7 PS (LFR)					-1					Unknown		
11	RCTrainingBridge1	RC Training Bridge1(LFR)					-1					Unknown		
12	TimberTrainingBridge1	Timber Tr. Bridge1 (ASR)					-1					Unknown		
13	FSys GFS TrainingBridge1	FloorSystem GFS Training Bridge 1	District 6	15 Colleton	NJ-Turnpike	NJCity	-1					Unknown		2002
14	FSys FS TrainingBridge2	FloorSystem FS Training Bridge 2	District 11	333 Norfolk	I-95	NYC	-1			State Highway Agency	County Hwy Agency	Unknown		1998
15	FSys GF TrainingBridge3	FloorSystem GF Training Bridge 3	District 7	06 Barnwell	I-95	ATL	-1			County Hwy Agency		Unknown		1998
16	FLine GFS TrainingBridge1	FloorLine GFS Training Bridge 1	District 1	01 Abbeville	I-75	JAX	-1			State Highway Agency	State Highway Agency	Unknown		2001
17	FLine FS TrainingBridge2	FloorLine FS Training Bridge 2	District 2	02 Aiken	I-75	GNV	-1			State Highway Agency	State Highway Agency	Unknown		2000
18	FLine GF TrainingBridge3	FloorLine GF Training Bridge 3	District 1	01 Abbeville	I-95	NY	15		2200.00	County Hwy Agency	Unknown (P)	Unknown		1999
19	TrussTrainingExample	Truss Training Example					5							1930
20	LRFD Substructure Example 1	LRFD Substructure Example 1												
21	LRFD Substructure Example 2	LRFD Substructure Example 2			SR 4034	ERIE COUNTY	4034	FOUR MILE CREEK	8.12				1095.801	2002
22	LRFD Substructure Example 3	LRFD Substructure Example 3												
23	LRFD Substructure Example 4	LRFD Substructure Example 4 (NHI					-1						240.000	2004
24	Visual Reference 1	Visual Reference 1	District 1	12 Chester	I-76	WAITSFIELD	I-76	MAD RIVER	1199.25	State Highway Agency	State Highway Agency	Unknown	168.000	1938
25	Culvert Example 1	Culvert Example 1					STH60							
26	Curved Guide Spec	Curved Guide Spec Example(LFR)					1							
27	MultiCell Box Examples	Multi Cell Box Examples					100							2014
28	Gusset Plate Example	Gusset Plate Example	District 1			Some Highway				State Highway Agency			67.900	2015
29	Splice Example	Splice Example					-1						240.000	2004
30	Simple DL-Cont LL-Splice	Simple DL Splice	Unknown	Unknown (P)	N/A	N/A	-1	N/A		Unknown (P)		Unknown		1996
31	MetalCulvertExample1	MetalCulvertExample 1					1							

Once **Bridge Workspace** tree is populated, expand **Simple Span Structure** under **SUPERSTRUCTURE DEFINITIONS** in the tree by clicking on "+". Then expand **MEMBERS** and select **G1**. Expand **G1** and select **Plate Girder (E) (C)** under **MEMBER ALTERNATIVES**. Expand **Plate Girder (E) (C**) by clicking on "+". The partially expanded **Bridge Workspace** tree is shown below.


Bridge
TrainingBridge1
Components
Diaphragm Definitions
Lateral Bracing Definitions
SUPERSTRUCTURE DEFINITIONS
Simple Span Structure
Impact/Dynamic Load Allowance
Load Case Description
Framing Plan Detail
Bracing Deterioration
Bracing Spec Check Selection
Structure Typical Section
Superstructure Loads
Shear Connector Definitions
Stiffener Definitions
MEMBERS
G1
Member Loads
Supports
MEMBER ALTERNATIVES
Plate Girder (E) (C)
Default Materials
Impact/Dynamic Load Allowance
Girder Profile
Hinge Locations
Splice Locations
Deck Profile
Haunch Profile
Lateral Support
Stiffener Ranges
Bearing Stiffener Locations
Live Load Distribution
Points of Interest
Deterioration Profile
G2
G3
G4
BRIDGE ALTERNATIVES
Single Span Bridge (E) (C)
SUPERSTRUCTURES

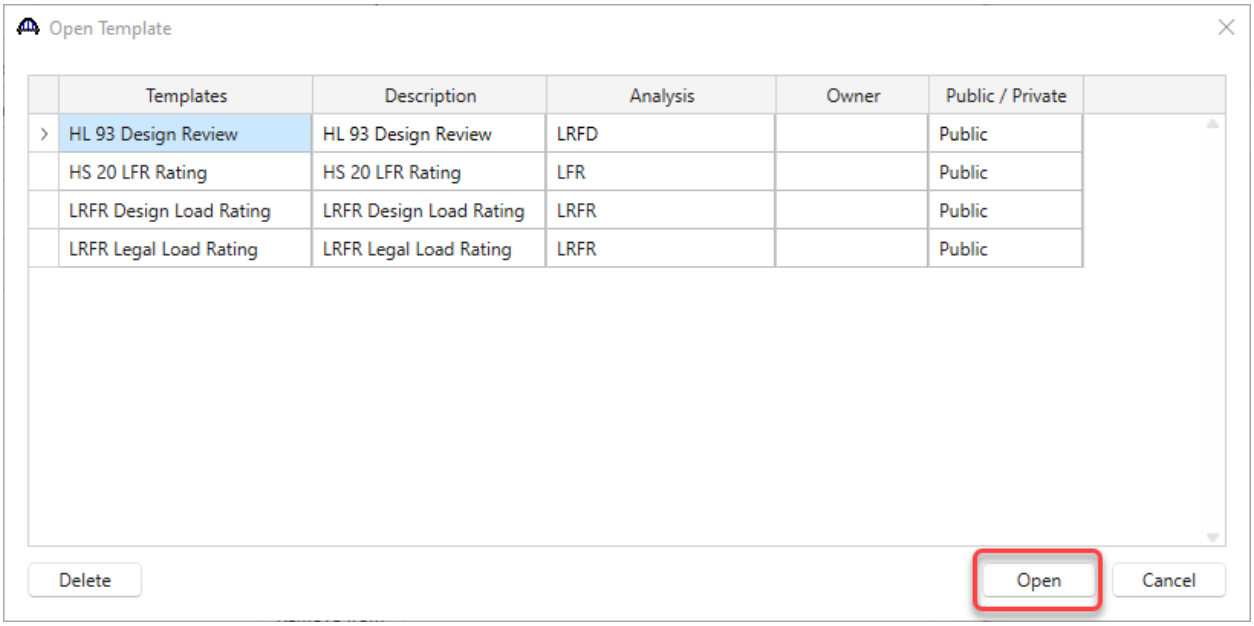
Select member alternative **Plate Girder (E) (C).** From the **Analysis** group of the **DESIGN/RATE** tab on the **Bridge Workspace** ribbon, click on the **Analysis Settings** button to open the **Analysis Settings** window.



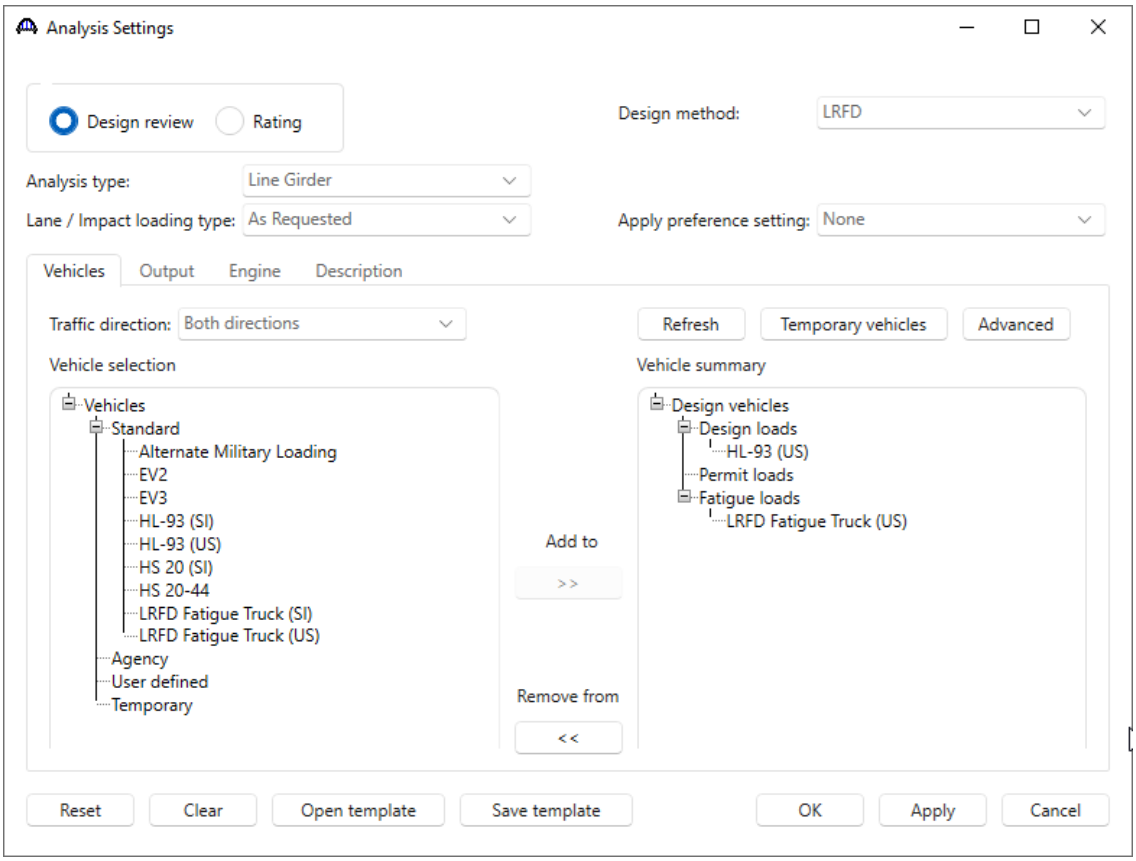


On the **Analysis settings** window click on **Open Template** button to open the template library as shown below.

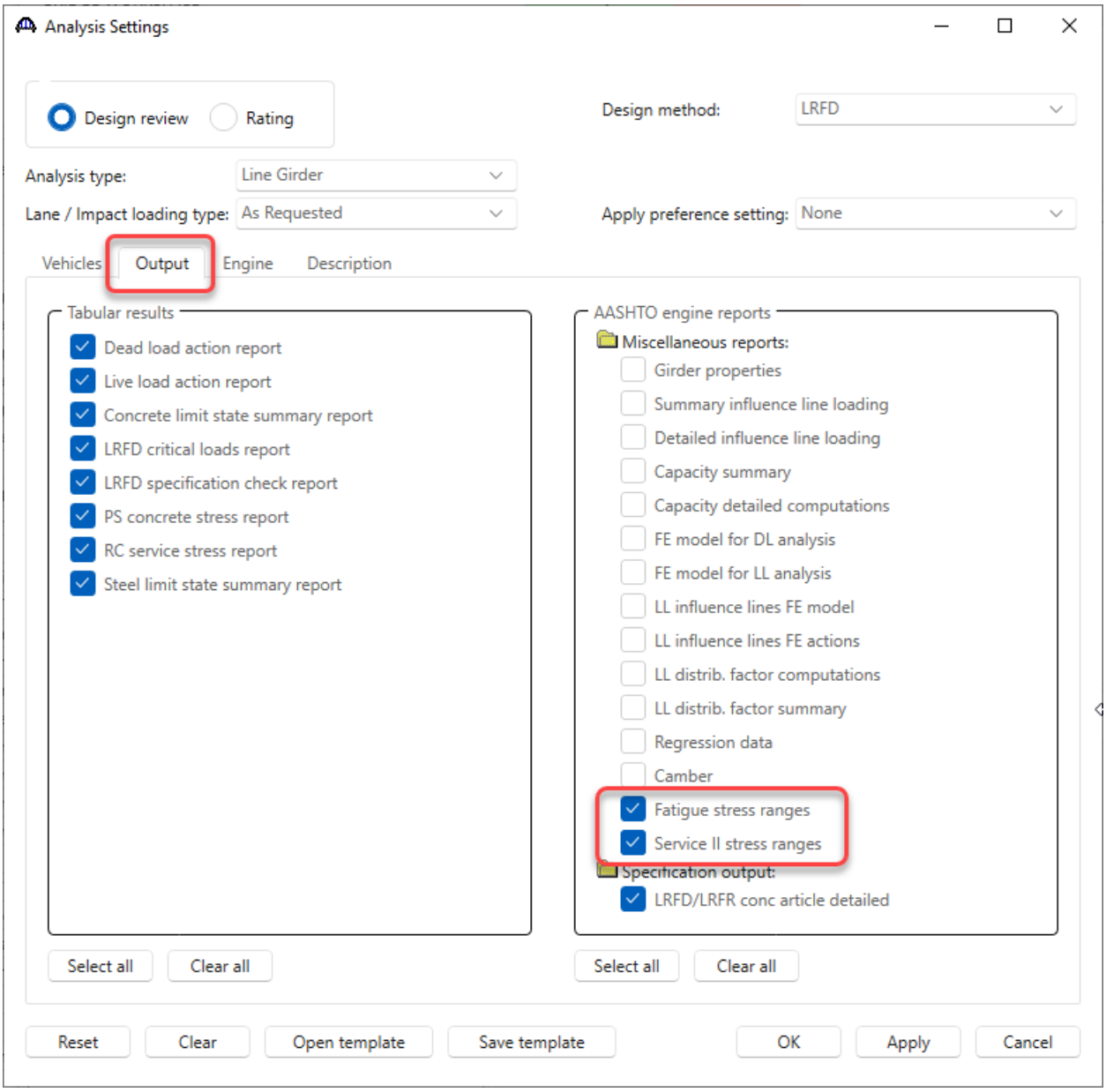
Select **HL93 Design Review** template from Template Library. Click **Open** to apply the selected template and close this window.



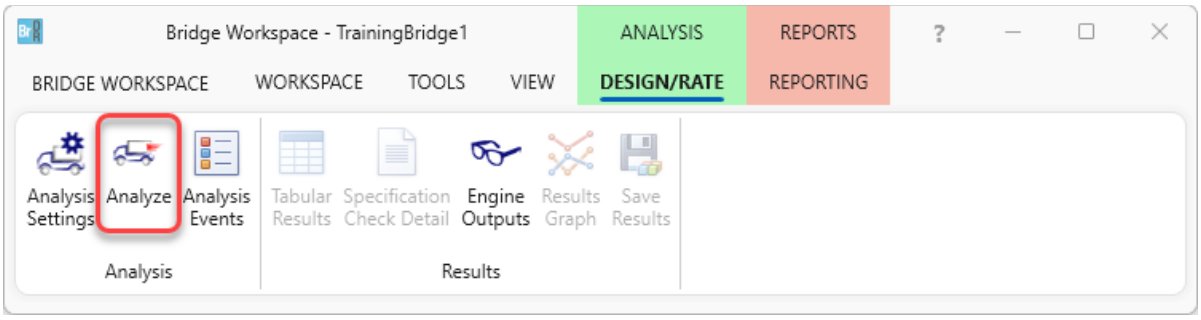
The **Analysis Settings** window is updated as shown below.

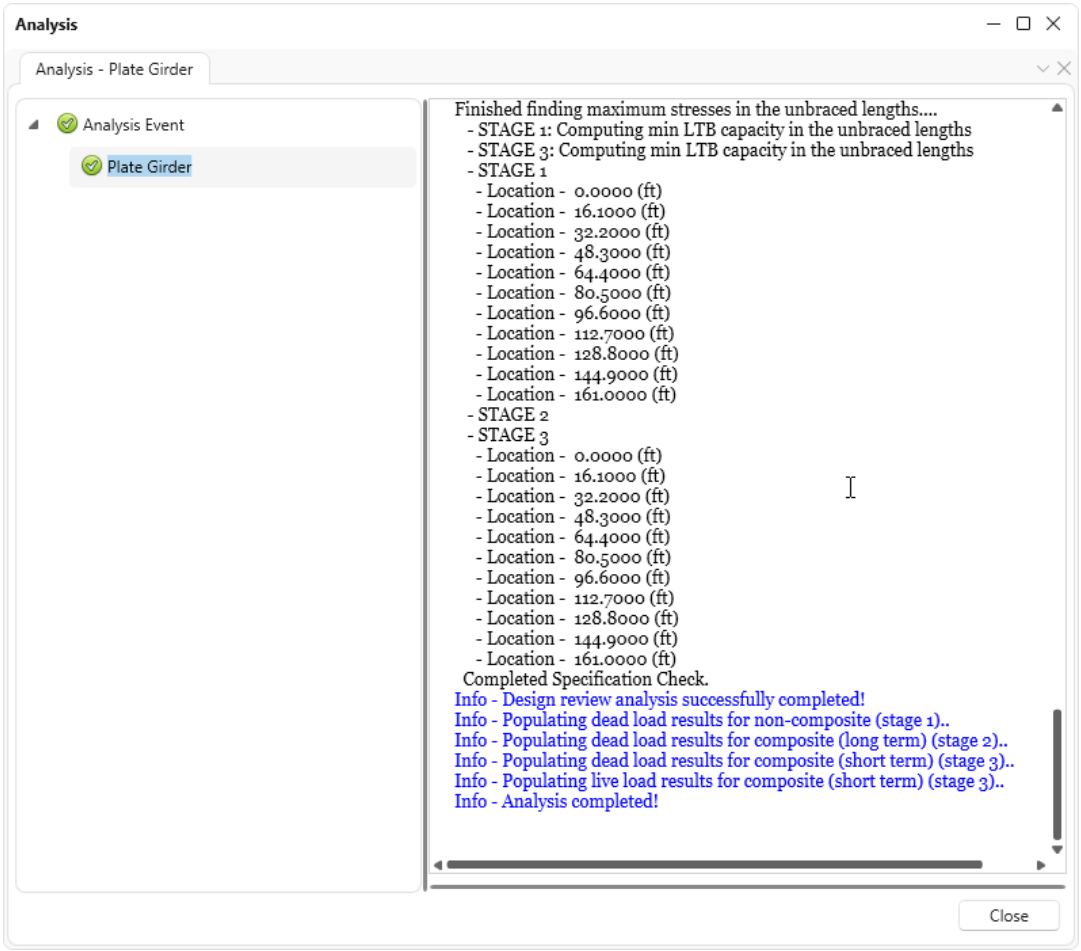


Navigate to the **Output** tab as shown below. Select **Fatigue stress ranges** report and **Service II stresses ranges** report by checking in check box under **AASHTO engines reports**. Click the **OK** button to save and close the **Analysis Settings** window.

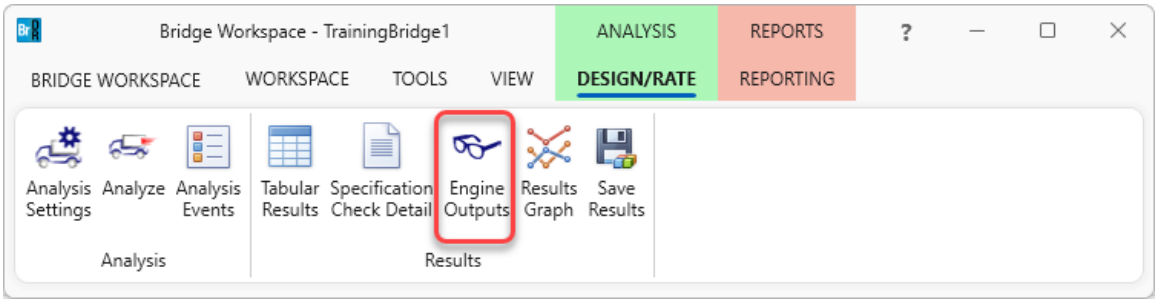


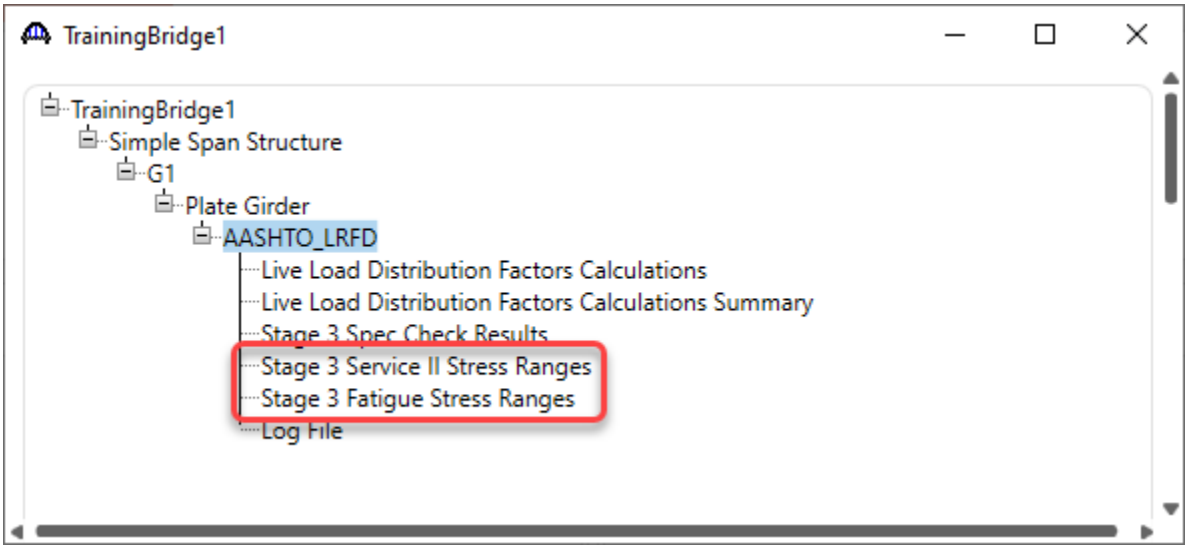
With the focus still on the member alternative **Plate Girder (E) (C)** on G1, click on the **Analyze** button in the **Analysis** Group of the ribbon to run the analysis. Once the **Analyze** button is clicked the **Analysis Progress** window is populated as shown below.





Click **Engine Outputs** button in the **Results** Group to open the Analysis Output List window.





Stage 3 - Fatigue Stress Ranges

Double click on **Stage 3 Fatigue Stress Ranges** link to open LRFD Fatigue Stress Report as shown below.

Bridge ID : TrainingBridge1
Bridge : Training Bridge 1(LRFD)
Superstructure Def : Simple Span Structure
Member : G1
Analysis Preference Setting :

NBI Structure ID : TrainingBridge1
Bridge Alt :

Member Alt : Plate Girder

AASHTO LRFD Specification, Edition 9, Interim 0

Fatigue-I Stress Ranges

Location (ft)	Side	LC	Slab (Ksi)	Top Flange (Ksi)	Web Top (Ksi)	Web Bot (Ksi)	Bot Flange (Ksi)
0.000	Right	3	0.00	0.00	0.00	0.00	0.00
16.100	Both	3	-1.94	-0.96	-0.84	5.75	5.87
32.200	Both	3	-3.38	-1.67	-1.46	10.04	10.25
48.300	Both	3	-3.95	-2.28	-2.08	9.14	9.46
64.400	Both	3	-4.45	-2.57	-2.34	10.30	10.67
80.500	Both	3	-4.51	-2.60	-2.37	10.44	10.81
96.600	Both	3	-4.45	-2.57	-2.34	10.30	10.67
112.700	Both	3	-3.95	-2.28	-2.08	9.14	9.46
128.800	Both	3	-3.38	-1.67	-1.46	10.04	10.25
144.900	Both	3	-1.94	-0.96	-0.84	5.75	5.87
161.000	Left	3	0.00	0.00	0.00	0.00	0.00

Fatigue-II Stress Ranges

Location (ft)	Side	LC	Slab (Ksi)	Top Flange (Ksi)	Web Top (Ksi)	Web Bot (Ksi)	Bot Flange (Ksi)
0.000	Right	3	0.00	0.00	0.00	0.00	0.00
16.100	Both	3	-0.88	-0.44	-0.38	2.63	2.68

Stage 3 - Service II Stress Ranges

Double click on **Stage 3 Service II Stress Ranges** link to open LRFD Service II Stress Report as shown below.

Bridge ID : TrainingBridge1
Bridge : Training Bridge 1(LRFD)
Superstructure Def : Simple Span Structure
Member : G1
Analysis Preference Setting :

NBI Structure ID : TrainingBridge1
Bridge Alt :

Member Alt : Plate Girder

AASHTO LRFD Specification, Edition 9, Interim 0

Service-II Stress Ranges

Location (ft)	Side	LC	Slab (Ksi)	Top Flange (Ksi)	Web Top (Ksi)	Web Bot (Ksi)	Bot Flange (Ksi)
0.000	Right	1	0.00	0.00	0.00	0.00	0.00
0.000	Right	2	0.00	0.00	0.00	0.00	0.00
16.100	Both	1	-3.50	-1.73	-1.51	10.39	10.61
16.100	Both	2	-2.90	-1.43	-1.26	8.63	8.80
32.200	Both	1	-6.18	-3.06	-2.67	18.38	18.76
32.200	Both	2	-5.15	-2.55	-2.23	15.32	15.64
48.300	Both	1	-7.25	-4.19	-3.81	16.78	17.38
48.300	Both	2	-6.08	-3.51	-3.20	14.07	14.57
64.400	Both	1	-8.25	-4.77	-4.34	19.10	19.78
64.400	Both	2	-6.93	-4.00	-3.65	16.05	16.62
80.500	Both	1	-8.54	-4.94	-4.50	19.79	20.49
80.500	Both	2	-7.20	-4.16	-3.79	16.68	17.27
96.600	Both	1	-8.25	-4.77	-4.34	19.10	19.78
96.600	Both	2	-6.93	-4.00	-3.65	16.05	16.62
112.700	Both	1	-7.25	-4.19	-3.81	16.78	17.38
112.700	Both	2	-6.08	-3.51	-3.20	14.07	14.57
128.800	Both	1	-6.18	-3.06	-2.67	18.38	18.76
128.800	Both	2	-5.15	-2.55	-2.23	15.32	15.64

Fatigue and Service stress reports can also be generated for LRFR analysis using similar procedure.