Report Tutorial
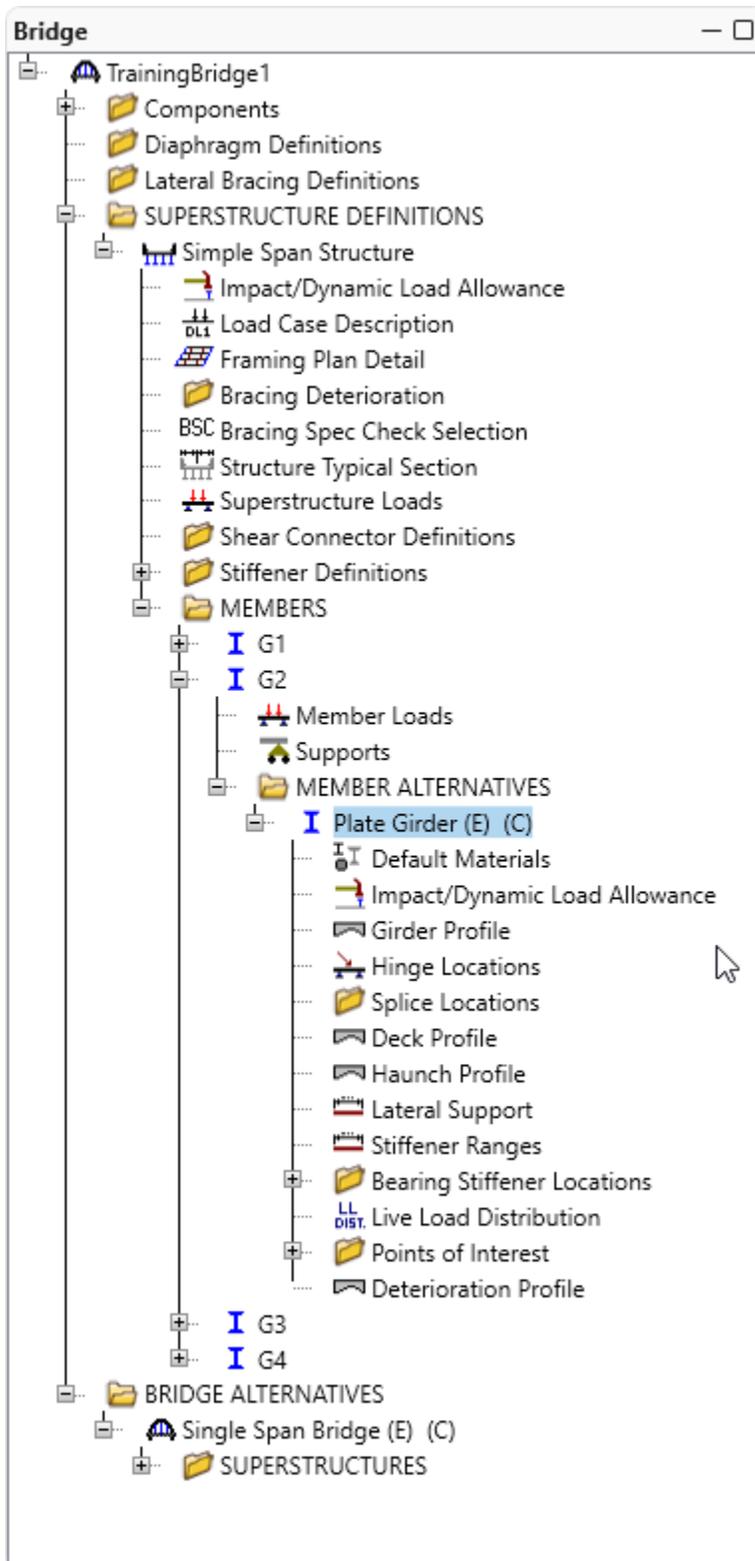
LFR/ LRFR Detailed Rating Results Report

Topics Covered

- LFR Detailed Rating Results Report.
- LRFR Detailed Rating Results Report.

LFR Detailed Rating Results Report

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

Once **Bridge Workspace** tree is populated, expand **Simple Span Structure** under **SUPERSTRUCTURE DEFINITIONS** in the tree by clicking on "+" . Then expand **MEMBERS** and select **G2**. Expand **G2** and select **Plate Girder (E) (C)** under **MEMBER ALTERNATIVES**. Expand **Plate Girder (E) (C)** by clicking on the "+". 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
      - BSC Bracing Spec Check Selection
      - Structure Typical Section
      - Superstructure Loads
      - Shear Connector Definitions
      - Stiffener Definitions
      - MEMBERS
        - I G1
        - I G2
          - Member Loads
          - Supports
          - MEMBER ALTERNATIVES
            - I 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
              - LL DIST. Live Load Distribution
              - Points of Interest
              - Deterioration Profile
        - I G3
        - I 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.
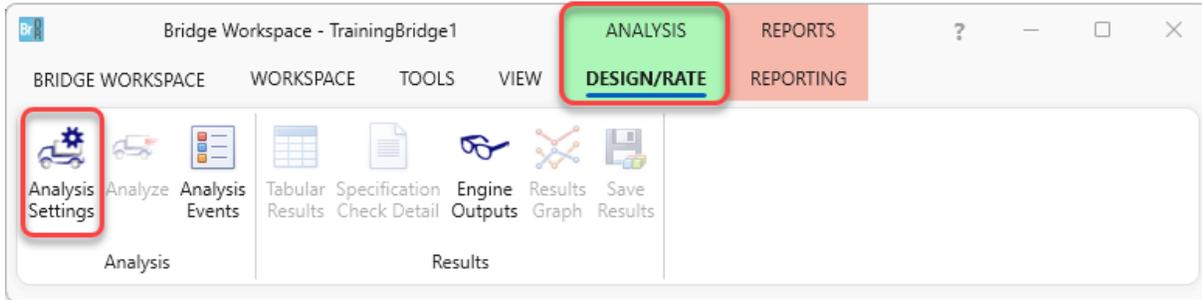
On the **Analysis Settings** window select the **Rating method** as **LFR**. Go to **Vehicle selection** column and select **HS 20-44** vehicle, in the **Vehicle summary** column select **Inventory** and click on the **Add to** button. Repeat for **Operating**. The updated **Analysis Settings** window is shown below.
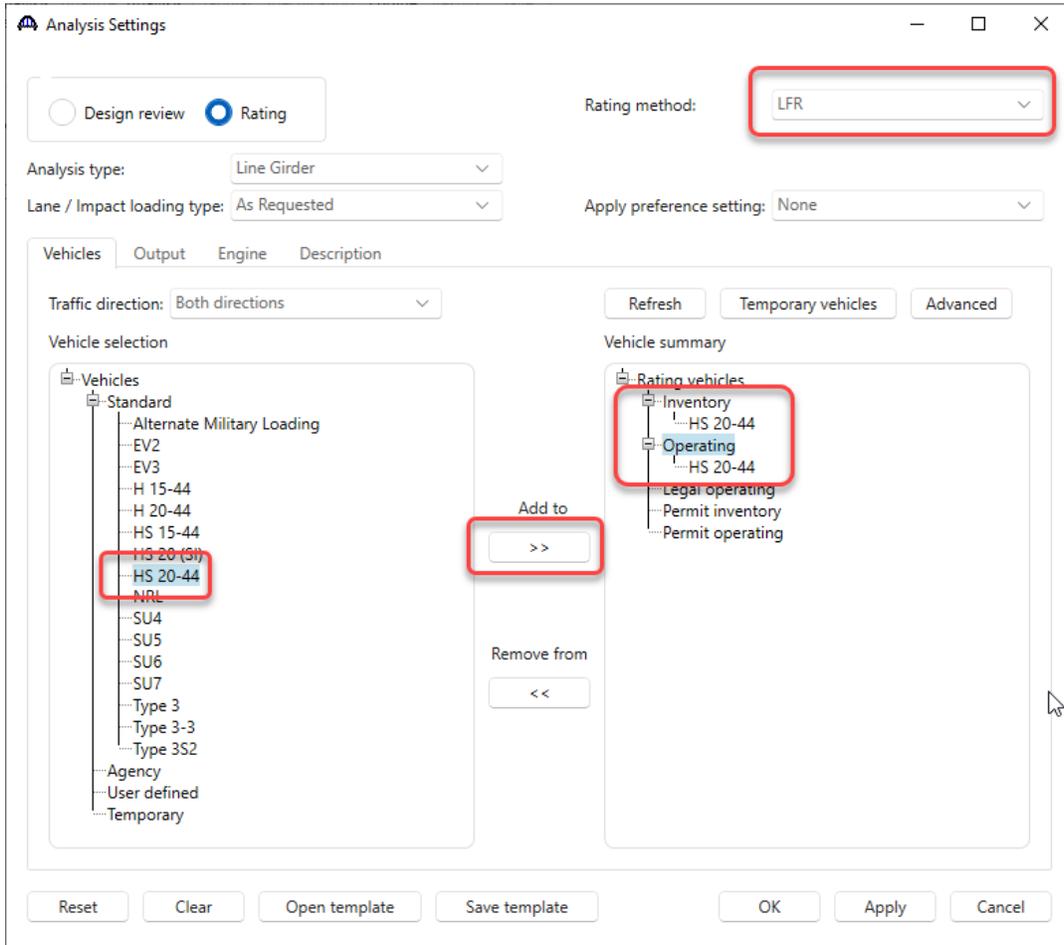
Click on the **OK** button to save and close the window.

With the focus still on the member alternative **Plate Girder (E) (C)** on G2. Click on the **Analyze** button in the **Analysis** Group to run the analysis.
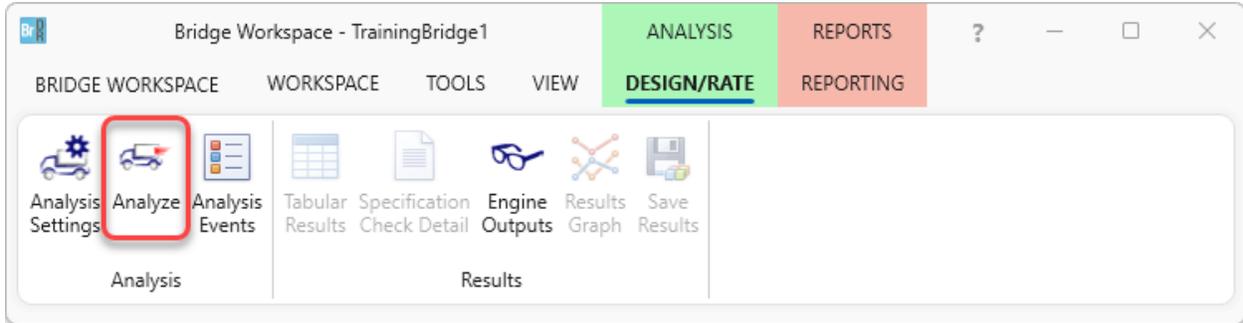
Once the **Analyze** button is clicked the **Analysis Progress** window is populated as shown below.
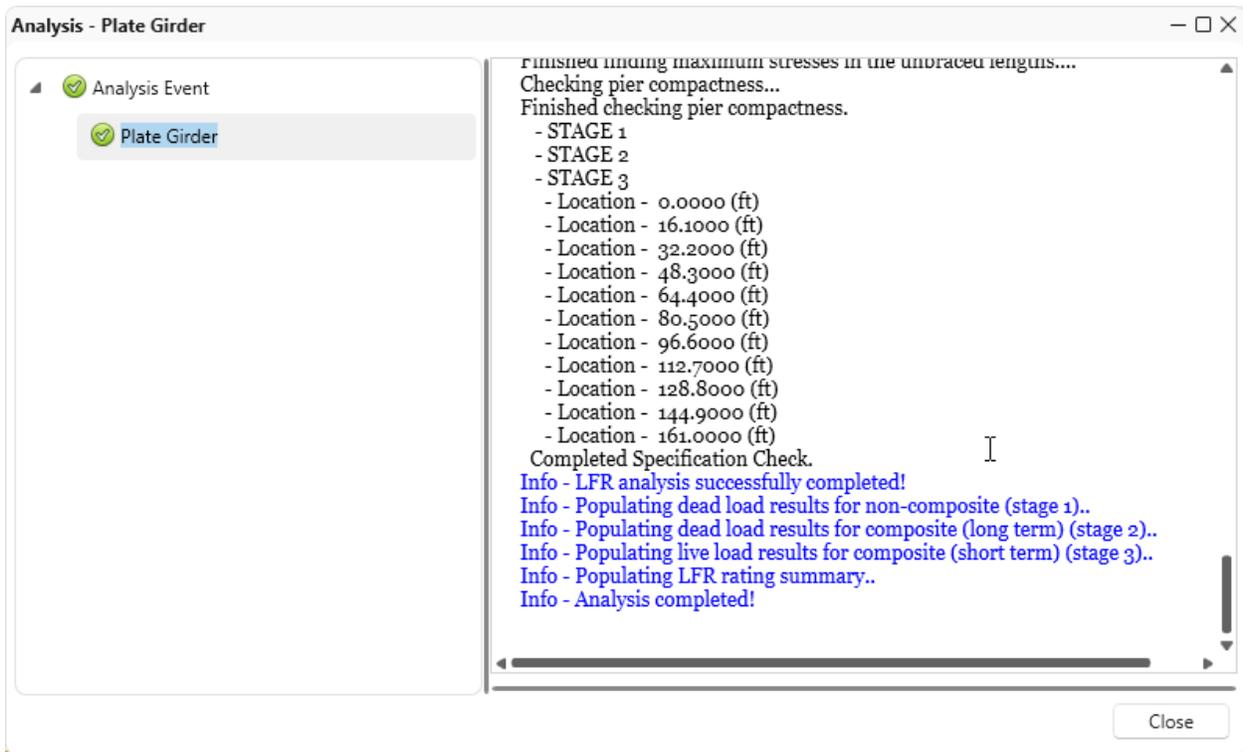
Click on the **TOOLS** ribbon and then the **Report Tool** button in the **Bridge** Group to open the **Report Tool** as shown below.
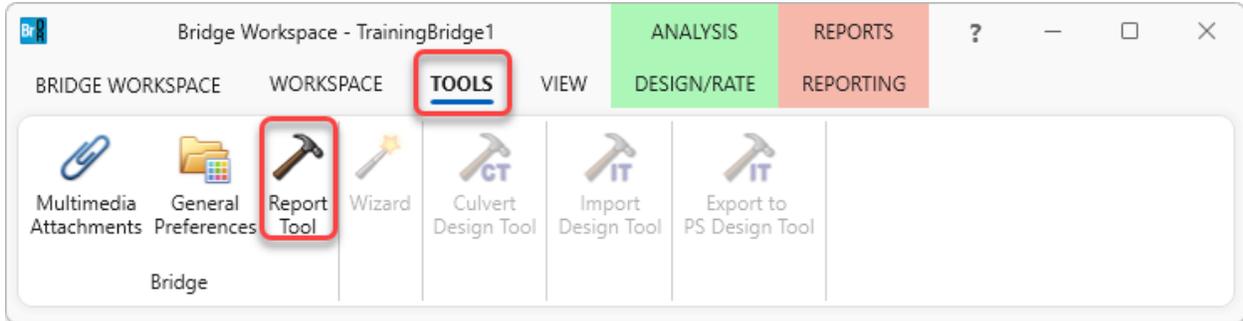
Select **Report type** as **LFR analysis output**. List of options to generate various reports for LFR analysis will be populated.
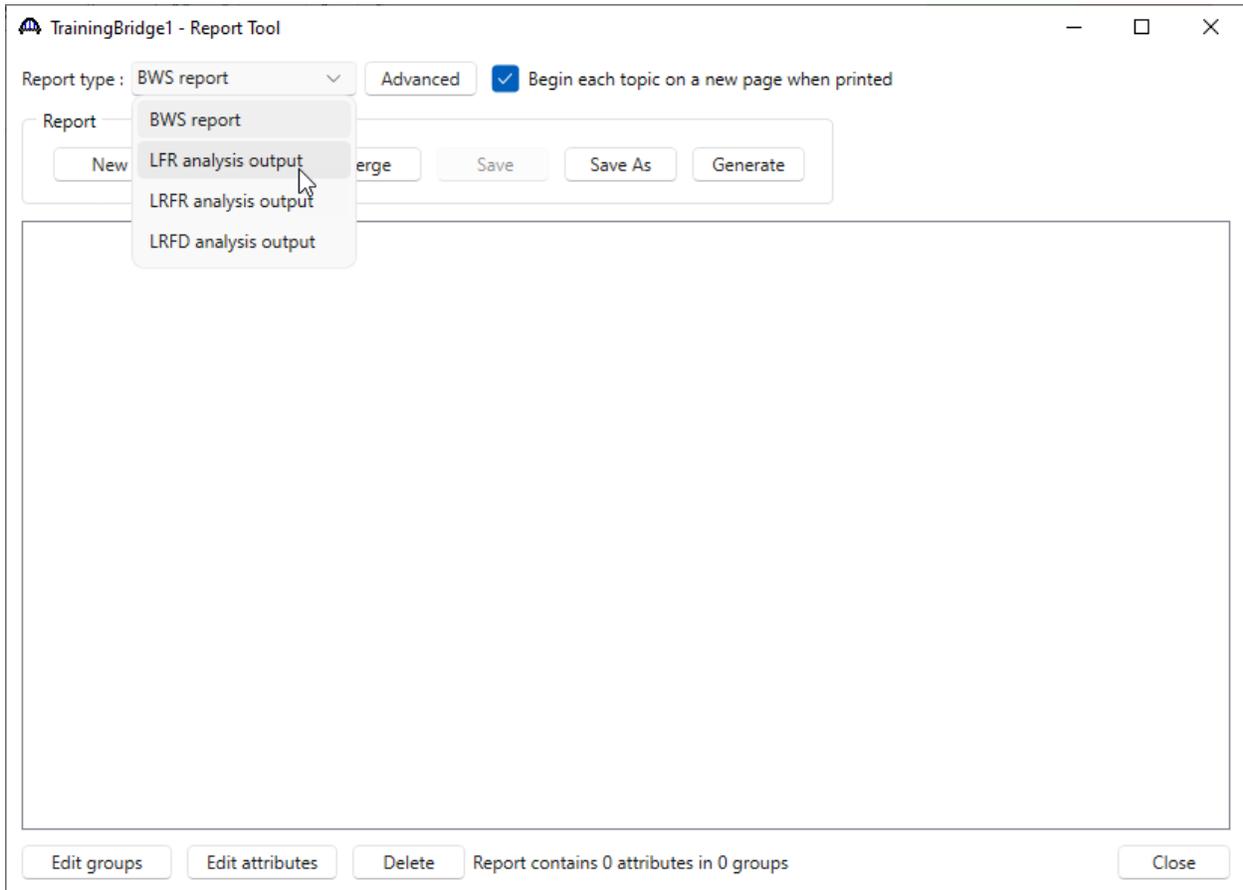
Uncheck all the options except **Detailed rating results**. Now click the **Generate** button to generate **LFR Detailed Rating Results report.**
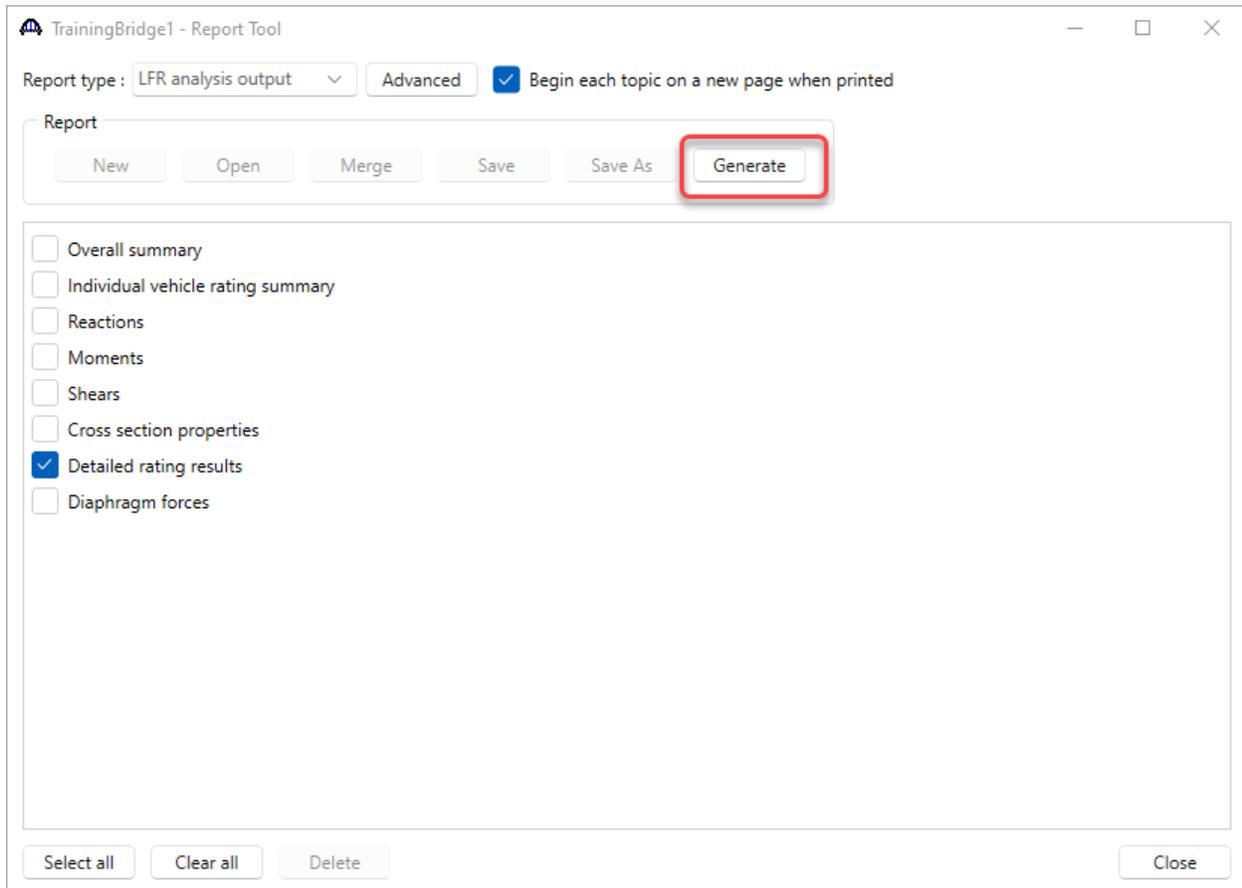
Bridge Name: Training Bridge 1(LRFD)
NBI Structure ID: TrainingBridge1
Bridge ID: TrainingBridge1

Analyzed By: Bridge
Analyze Date: Thursday, November 9, 2023 09:55:20
Analysis Engine: AASHTO LFR Engine Version 7.5.0.3001
Analysis Preference Setting: None

Report By: Bridge
Report Date: Thursday, November 9, 2023 10:41:54

Structure Definition Name: Simple Span Structure
Member Name: G2
Member Alternative Name: Plate Girder

Report by Action: ☑ **Flexure** ☑ **Shear** ☑ **Overload** ☑ **Critical**

Detailed Rating Results
Plate Girder
HS 20-44
Axle Load
Impact: As Requested
Lane: As Requested

Span 1

Location						Inventory Rating	Inventory Load Rating	Operating Rating	Operating Load Rating
(ft)	Percent	Action Type	Units	Capacity	DL + Adj -LL*	LL	Factor	(Ton)	Factor	(Ton)
0.00	0.0	Flexure	kip-ft	15115.80	0.00	0.00	99.000	3564.00	99.000	3564.00
0.00	**0.0**	**Shear**	**kip**	**571.00**	**210.68**	**101.14**	**1.353**	**48.72**	**2.260**	**81.35**
0.00	0.0	Overload	ksi	-47.50	0.00	0.00	99.000	3564.00	99.000	3564.00
16.10	10.0	Flexure	kip-ft	15115.80	3056.70	1355.22	2.503	90.09	4.179	150.46
16.10	**10.0**	**Shear**	**kip**	**527.64**	**169.04**	**84.92**	**1.670**	**60.12**	**2.789**	**100.40**
16.10	10.0	Overload	ksi	47.50	15.58	5.63	3.397	122.28	5.672	204.21
32.20	20.0	Flexure	kip-ft	15115.80	5442.94	2388.54	1.321	47.56	2.206	79.43
32.20	20.0	Shear	kip	526.81	127.39	75.58	1.321	47.56	2.206	79.43
32.20	**20.0**	**Overload**	**ksi**	**47.50**	**27.74**	**9.92**	**1.193**	**42.95**	**1.992**	**71.72**
48.30	**30.0**	**Flexure**	**kip-ft**	**19785.49**	**7154.92**	**3099.97**	**1.420**	**51.11**	**2.371**	**85.35**
48.30	30.0	Shear	kip	465.67	85.10	66.12	1.420	51.11	2.371	85.35
48.30	30.0	Overload	ksi	47.50	25.78	9.15	1.422	51.18	2.374	85.48
64.40	40.0	Flexure	kip-ft	19785.49	8182.45	3520.61	1.197	43.09	1.999	71.96

Above report would display details of critical rating factors at each location for Flexure, Shear and Overload. Critical of four at a location is displayed in bold font. There are also checkboxes provided in the report for each type. By checking and unchecking them report can be narrowed down or detailed for a particular type.

LRFR Detailed Rating Results Report

Similar report is available for an LRFR analysis. To view an **LRFR Detailed Rating Results**, select **G2 - Plate Girder (E) (C)** girder member alternative. Go to **DESIGN/RATE** ribbon and click on the **Analysis Settings** button to open the **Analysis Settings** window. Click on the **Open Template** button to open the template library.
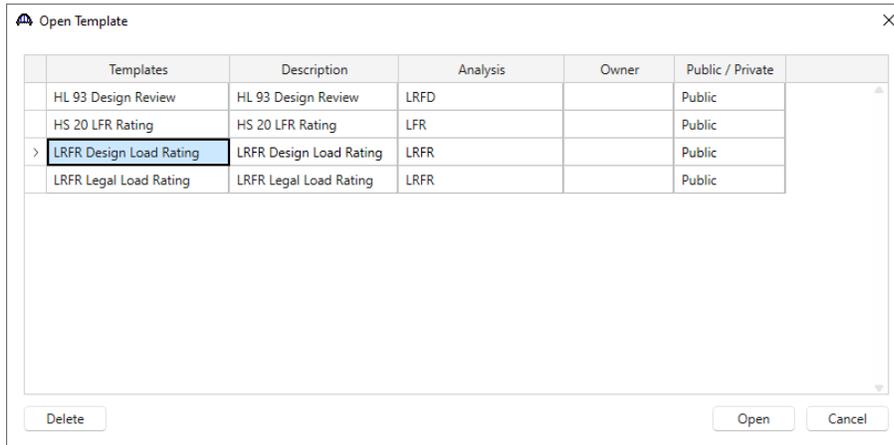

Select **LRFR Design Load Rating** template from template library. Click on the **Open** button to apply it to **Analysis Settings** window. Click **OK** in the **Analysis Settings** window. Select **G2- Plate Girder (E) (C)** and click **Analyze** button in the **Analysis** Group to run the analysis. Once the analysis is complete, open the **Report Tool** window as discussed in previous step. Select **Report type** as **LRFR analysis output**. List of options to generate various reports for LRFR analysis will be populated.
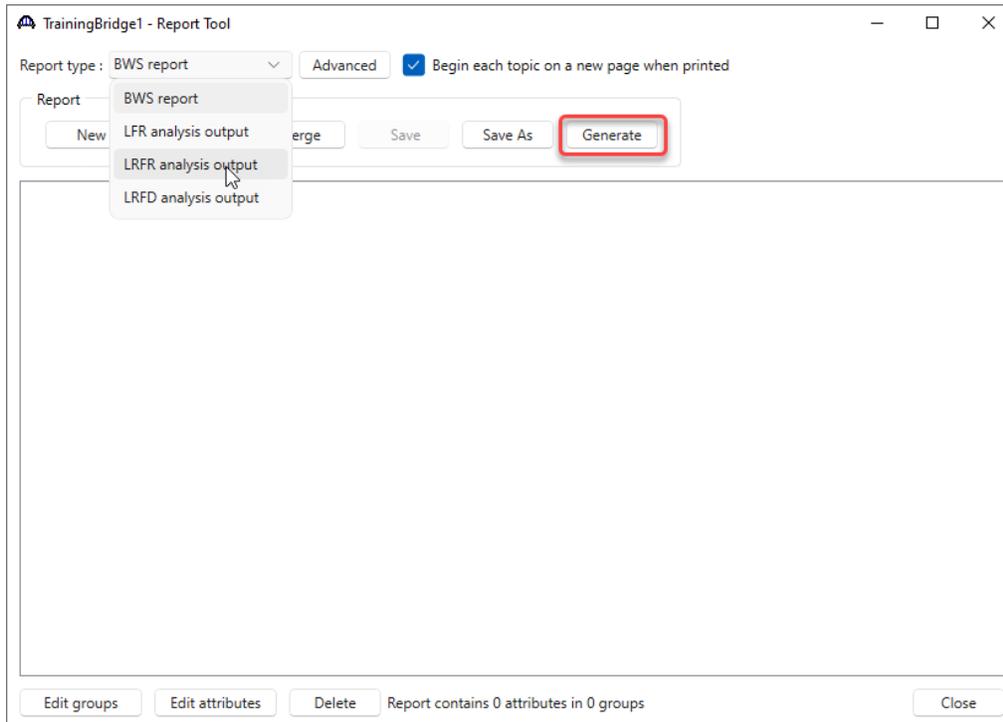
Select option to generate LRFR analysis **Detailed Rating Results** report. Now click on **Generate** button to generate the report.

Bridge Name: Training Bridge 1(LRFD)
NBI Structure ID: TrainingBridge1
Bridge ID: TrainingBridge1

Analyzed By: Bridge
Analyze Date: Thursday, November 9, 2023 10:56:44
Analysis Engine: AASHTO LRFR Engine Version 7.5.0.3001
Analysis Preference Setting: None

Report By: Bridge
Report Date: Thursday, November 9, 2023 11:05:33

Structure Definition Name: Simple Span Structure
Member Name: G2
Member Alternative Name: Plate Girder

Report by Action: ☑ **Shear** ☑ **Flexure** ☑ **Overload** ☑ **Critical**

Detailed Rating Results
Plate Girder
HL-93 (US)
Truck + Lane
Impact: As Requested
Lane: As Requested

Span 1

Location							Inventory Rating	Inventory Load Rating	Operating Rating	Operating Load Rating
(ft)	Percent	Action Type	Units	Capacity	DL + Adj-LL*	LL	Factor	(Ton)	Factor	(Ton)
0.00	**0.0**	**Shear**	**kip**	**577.73**	**210.68**	**162.33**	**1.087**	**39.14**	**1.409**	**50.73**
0.00	0.0	Flexure	ksi	-50.00	0.00	0.00	99.000	3564.00	99.000	3564.00
0.00	0.0	Overload	ksi	-47.50	0.00	0.00	99.000	3564.00	99.000	3564.00
16.10	**10.0**	**Shear**	**kip**	**529.81**	**169.04**	**140.15**	**1.281**	**46.10**	**1.660**	**59.76**
16.10	10.0	Flexure	ksi	50.00	19.83	11.84	2.549	91.75	3.304	118.93
16.10	10.0	Overload	ksi	47.50	15.58	6.76	3.630	130.67	4.719	169.88
32.20	20.0	Shear	kip	528.98	127.39	119.15	1.757	63.26	2.278	82.01
32.20	**20.0**	**Flexure**	**ksi**	**50.00**	**35.31**	**20.93**	**0.702**	**25.27**	**0.910**	**32.75**
32.20	20.0	Overload	ksi	47.50	27.74	11.96	1.271	45.75	1.652	59.47
48.30	30.0	Shear	kip	467.91	85.10	99.33	2.067	74.41	2.680	96.46
48.30	**30.0**	**Flexure**	**ksi**	**50.00**	**32.81**	**19.39**	**0.887**	**31.92**	**1.149**	**41.38**
48.30	30.0	Overload	ksi	47.50	25.78	11.08	1.508	54.30	1.961	70.59
64.40	40.0	Shear	kip	627.53	42.55	80.69	4.059	146.14	5.262	189.44

Above report displays details of critical rating factors at each location for Flexure, Shear and Overload. Critical of three at a location is displayed in bold font. There are also checkboxes provided in report for each type. By checking and unchecking them report can be narrowed down or detailed for a particular type.