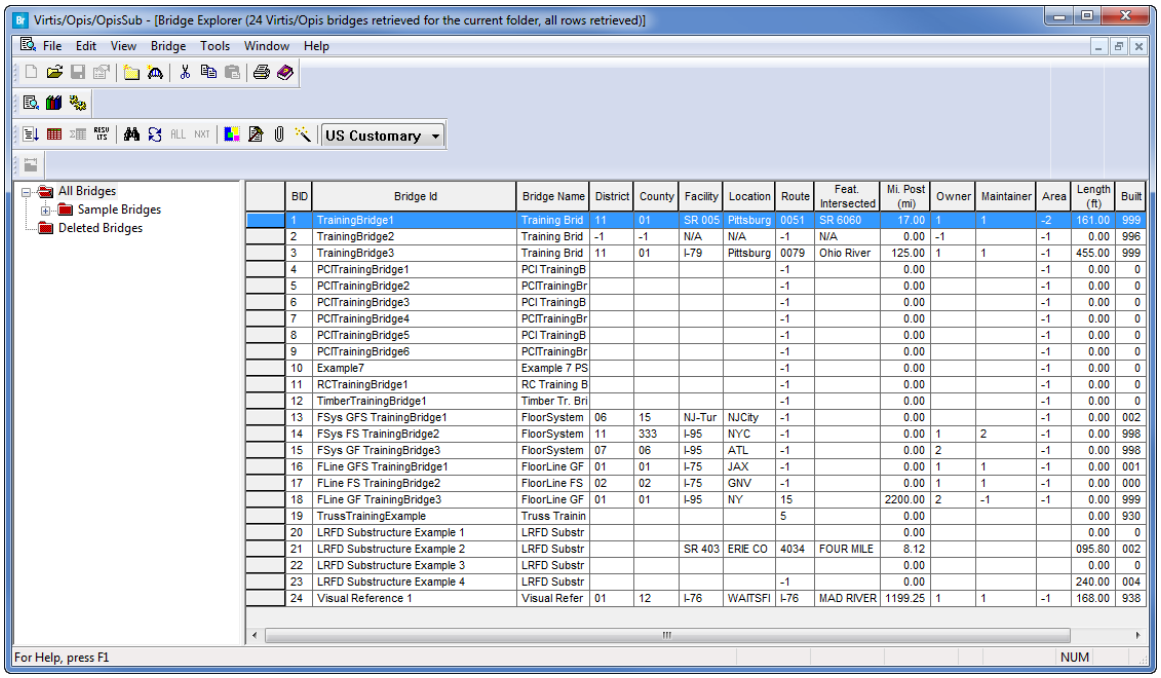
AASHTOWare Bridge Rating Training - (BrR 6.4)

LFR/ LRFR Detailed Rating Results Report

Topics Covered

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



BID	Bridge Id	Bridge Name	District	County	Facility	Location	Route	Feat. Intersected	Mi. Post (mi)	Owner	Maintainer	Area	Length (ft)	Built
1	TrainingBridge1	Training Brid	11	01	SR 005	Pittsburg	0051	SR 6060	17.00	1	1	-2	161.00	999
2	TrainingBridge2	Training Brid	-1	-1	N/A	N/A	-1	N/A	0.00	-1		-1	0.00	996
3	TrainingBridge3	Training Brid	11	01	I-79	Pittsburg	0079	Ohio River	125.00	1	1	-1	455.00	999
4	PCITrainingBridge1	PCI TrainingB					-1		0.00			-1	0.00	0
5	PCITrainingBridge2	PCITrainingBr					-1		0.00			-1	0.00	0
6	PCITrainingBridge3	PCI TrainingB					-1		0.00			-1	0.00	0
7	PCITrainingBridge4	PCITrainingBr					-1		0.00			-1	0.00	0
8	PCITrainingBridge5	PCI TrainingB					-1		0.00			-1	0.00	0
9	PCITrainingBridge6	PCITrainingBr					-1		0.00			-1	0.00	0
10	Example7	Example 7 PS					-1		0.00			-1	0.00	0
11	RCTrainingBridge1	RC Training B					-1		0.00			-1	0.00	0
12	TimberTrainingBridge1	Timber Tr. Bri					-1		0.00			-1	0.00	0
13	FSys GFS TrainingBridge1	FloorSystem	06	15	NJ-Tur	NJCity	-1		0.00			-1	0.00	002
14	FSys FS TrainingBridge2	FloorSystem	11	333	I-95	NYC	-1		0.00	1	2	-1	0.00	998
15	FSys GF TrainingBridge3	FloorSystem	07	06	I-95	ATL	-1		0.00	2		-1	0.00	998
16	FLine GFS TrainingBridge1	FloorLine GF	01	01	I-75	JAX	-1		0.00	1	1	-1	0.00	001
17	FLine FS TrainingBridge2	FloorLine FS	02	02	I-75	GNV	-1		0.00	1	1	-1	0.00	000
18	FLine GF TrainingBridge3	FloorLine GF	01	01	I-95	NY	15		2200.00	2	-1	-1	0.00	999
19	TrussTrainingExample	Truss Trainin					5		0.00				0.00	930
20	LRFD Substructure Example 1	LRFD Substr							0.00				0.00	0
21	LRFD Substructure Example 2	LRFD Substr			SR 403	ERIE CO	4034	FOUR MILE	8.12				095.80	002
22	LRFD Substructure Example 3	LRFD Substr							0.00				0.00	0
23	LRFD Substructure Example 4	LRFD Substr					-1		0.00				240.00	004
24	Visual Reference 1	Visual Refer	01	12	I-76	WAITSFI	I-76	MAD RIVER	1199.25	1	1	-1	168.00	938

Fig 1. Bridge Explorer

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

Once Bridge Workspace tree shows up, 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 “+”. Then the Bridge Workspace tree will be as shown in Fig 2.

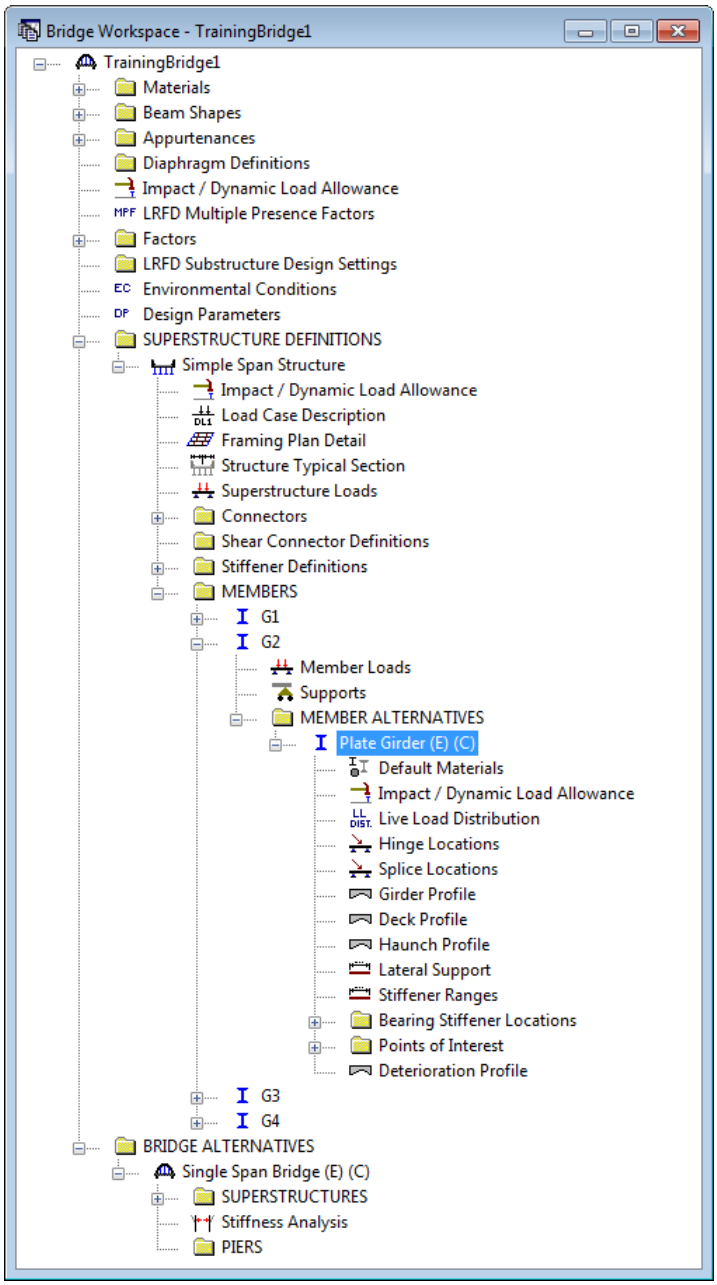


Fig 2. G2 - Girder Member Alternative Bridge Tree

After selecting the member alternative "Plate Girder (E) (C)", go to toolbar and click on the "View Analysis Setting" button (Fig 3). Once Analysis Setting button is clicked Analysis Setting window will pop up (Fig 4).

Fig 3. View Analysis Setting Button

On Analysis Setting window select Rating Method as LFD. Go to Vehicles Selection column and select "HS 20-44" vehicle and click on "Add to Rating" button. Now Analysis Settings window will be as shown in Fig 4.

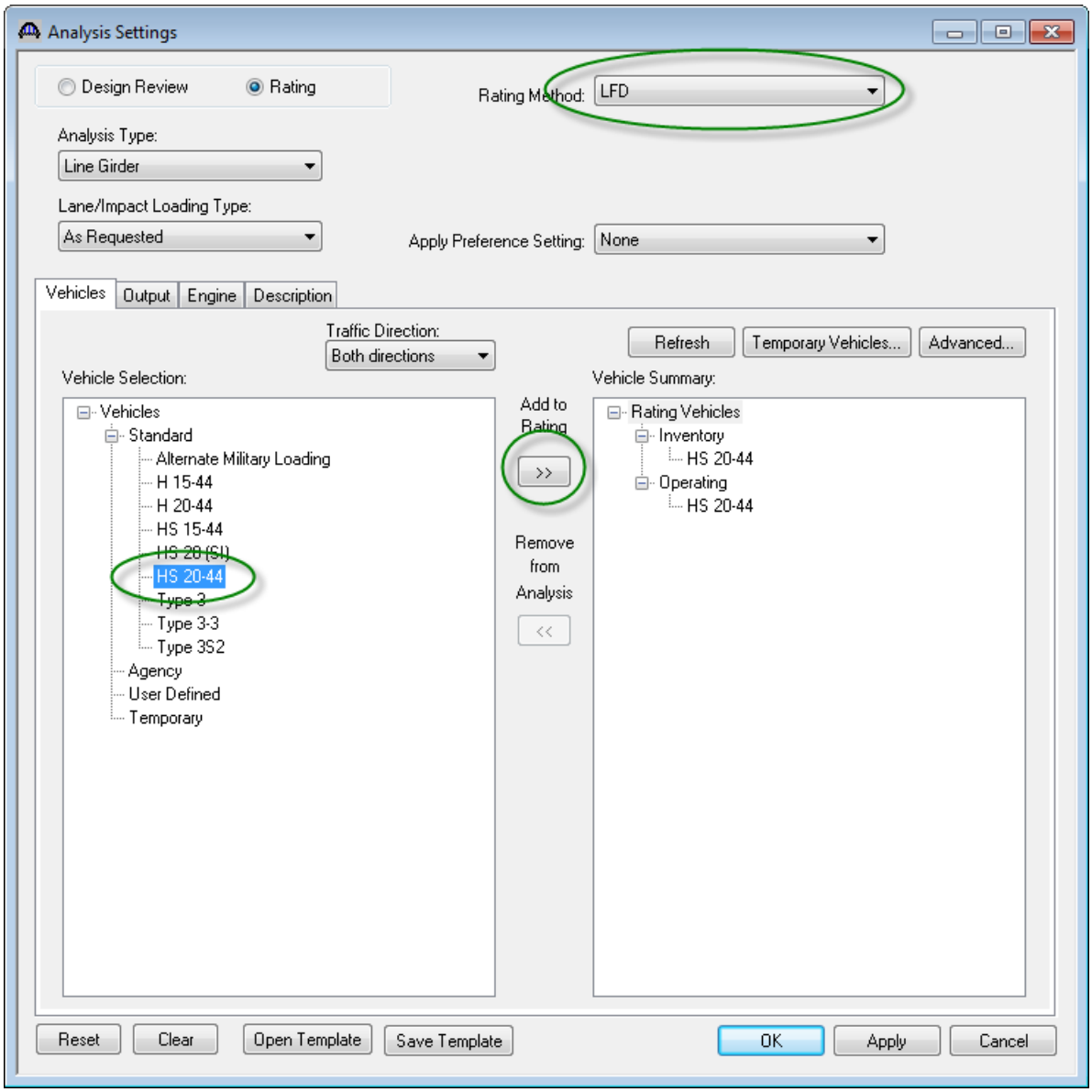


Fig 4. Analysis Settings Window

Click on "OK" button to save and close the window. Select G2-Plate Girder (E) (C) and click on "Analyze" button (Fig 5) on toolbar to run the analysis.

Fig 5. Analyze Button

Once Analyze button is clicked “Analysis Progress” window (Fig 6) pops up. After analysis is completed click on “OK” button to close Analysis Progress window.

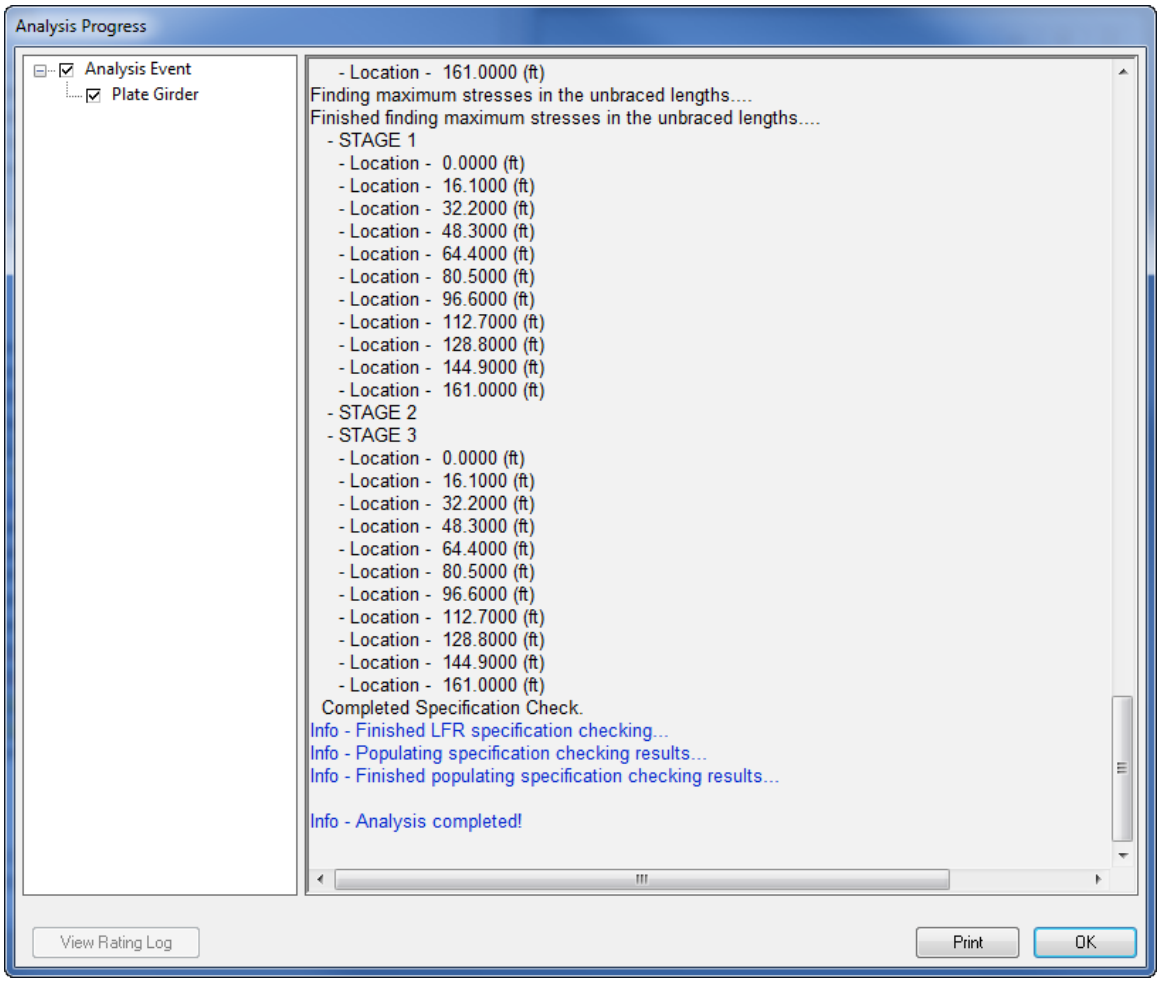


Fig 6. Analysis Progress Window.

Click on “Report Tool” button (Fig 7) on toolbar to open Report Tool window.

Fig 7. Report Tool Button

Select report Type as “LFD Analysis Output” in Report Tool window (Fig 8). List of options to generate various reports for LFD/LFR analysis will be populated.

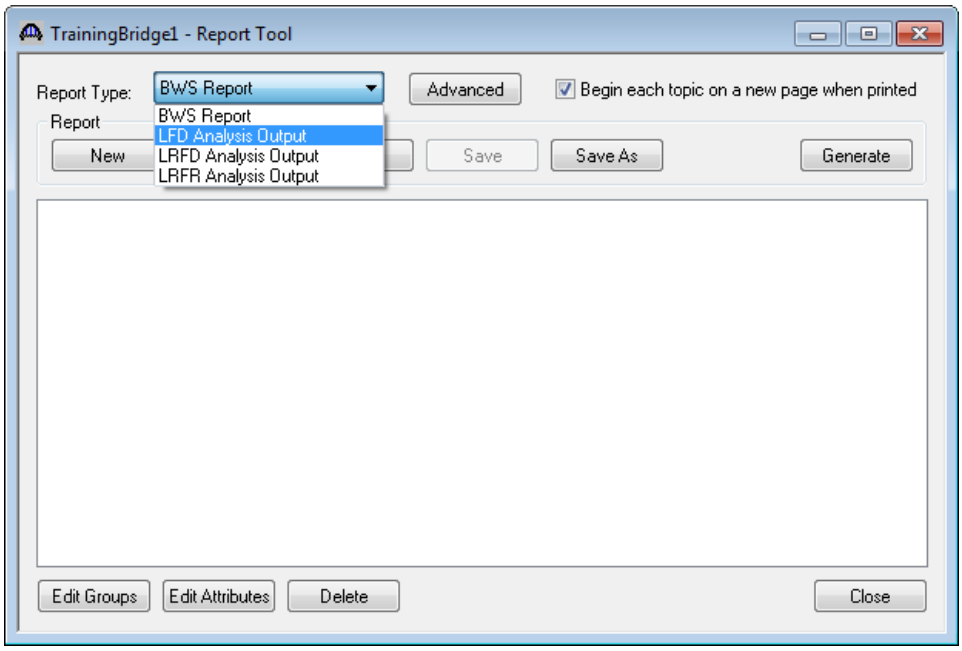


Fig 8. Report Tool Window.

Uncheck all the options except Detailed Rating Results. Now click on “Generate” button to generate LFR Detailed Rating Results report (Fig 10).

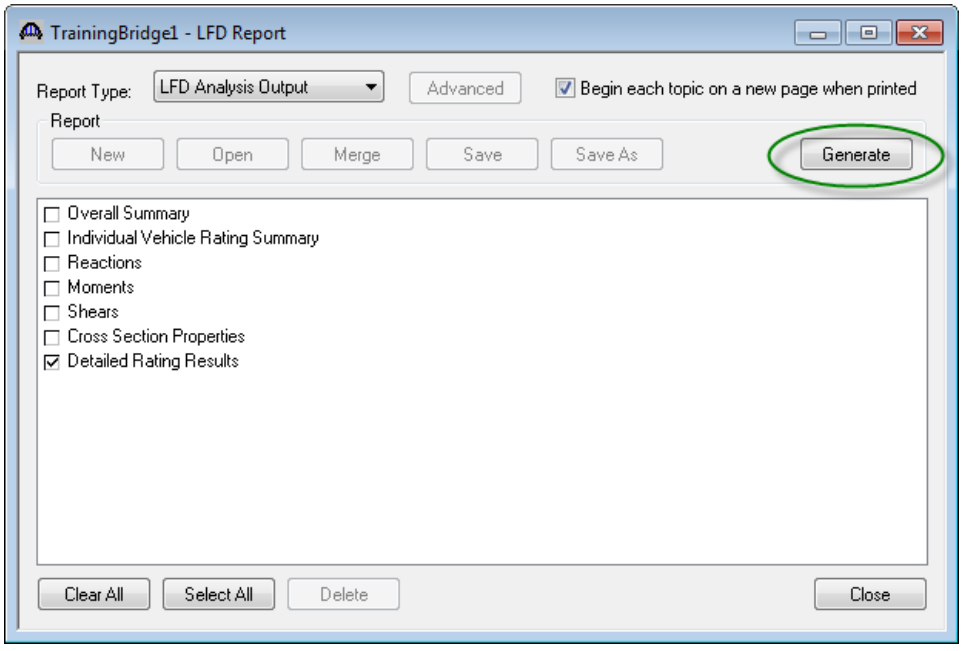
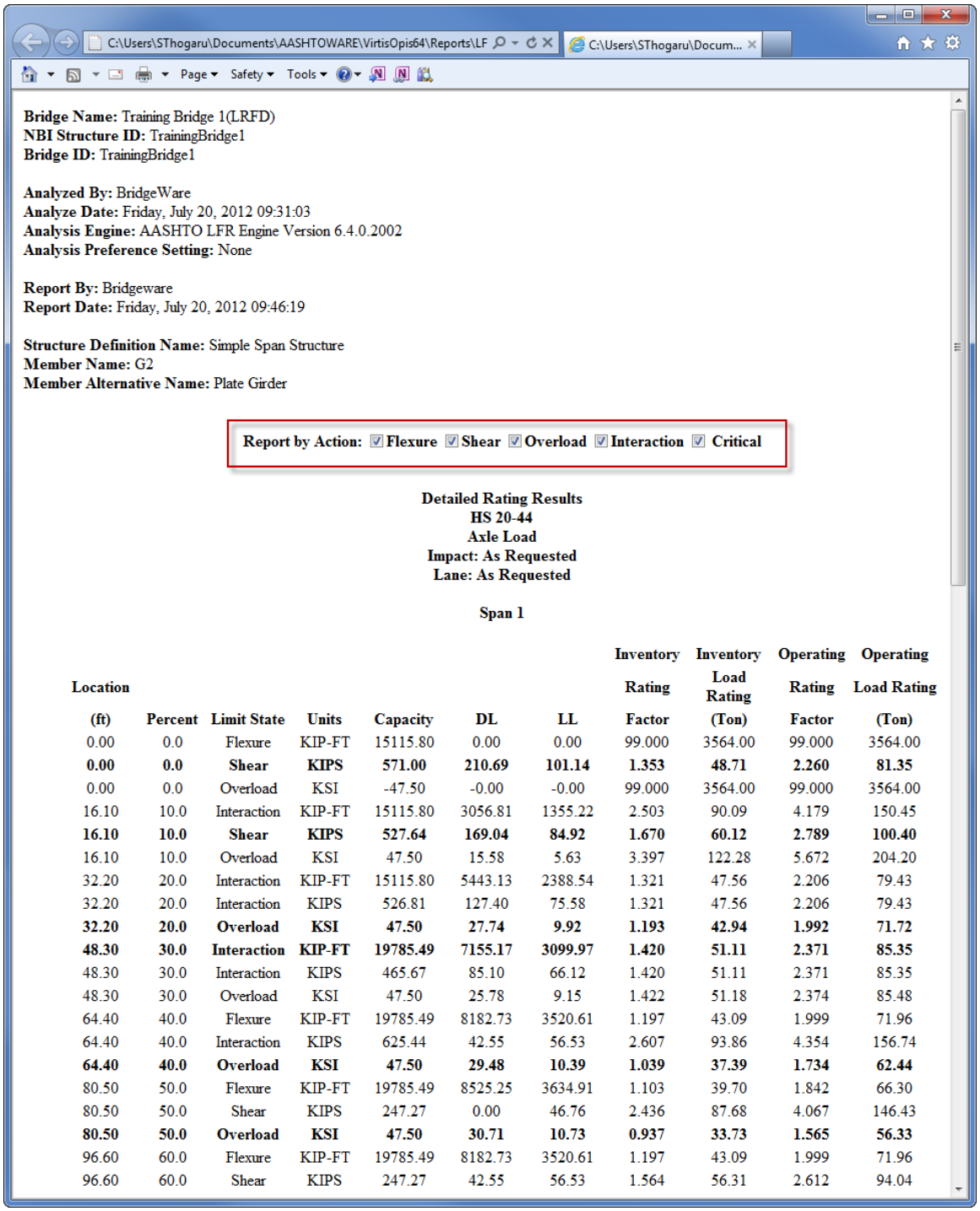


Fig 9. Report Tool Window for LFD Analysis Output.



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

Analyzed By: BridgeWare
Analyze Date: Friday, July 20, 2012 09:31:03
Analysis Engine: AASHTO LFR Engine Version 6.4.0.2002
Analysis Preference Setting: None

Report By: Bridgeware
Report Date: Friday, July 20, 2012 09:46:19

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

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

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

Span 1

Location (ft)	Percent	Limit State	Units	Capacity	DL	LL	Inventory Rating Factor	Inventory Load Rating (Ton)	Operating Rating Factor	Operating Load Rating (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**	**KIPS**	**571.00**	**210.69**	**101.14**	**1.353**	**48.71**	**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	Interaction	KIP-FT	15115.80	3056.81	1355.22	2.503	90.09	4.179	150.45
16.10	**10.0**	**Shear**	**KIPS**	**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	204.20
32.20	20.0	Interaction	KIP-FT	15115.80	5443.13	2388.54	1.321	47.56	2.206	79.43
32.20	20.0	Interaction	KIPS	526.81	127.40	75.58	1.321	47.56	2.206	79.43
32.20	**20.0**	**Overload**	**KSI**	**47.50**	**27.74**	**9.92**	**1.193**	**42.94**	**1.992**	**71.72**
48.30	**30.0**	**Interaction**	**KIP-FT**	**19785.49**	**7155.17**	**3099.97**	**1.420**	**51.11**	**2.371**	**85.35**
48.30	30.0	Interaction	KIPS	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	8182.73	3520.61	1.197	43.09	1.999	71.96
64.40	40.0	Interaction	KIPS	625.44	42.55	56.53	2.607	93.86	4.354	156.74
64.40	**40.0**	**Overload**	**KSI**	**47.50**	**29.48**	**10.39**	**1.039**	**37.39**	**1.734**	**62.44**
80.50	50.0	Flexure	KIP-FT	19785.49	8525.25	3634.91	1.103	39.70	1.842	66.30
80.50	50.0	Shear	KIPS	247.27	0.00	46.76	2.436	87.68	4.067	146.43
80.50	**50.0**	**Overload**	**KSI**	**47.50**	**30.71**	**10.73**	**0.937**	**33.73**	**1.565**	**56.33**
96.60	60.0	Flexure	KIP-FT	19785.49	8182.73	3520.61	1.197	43.09	1.999	71.96
96.60	60.0	Shear	KIPS	247.27	42.55	56.53	1.564	56.31	2.612	94.04

Fig 10. LFR Detailed rating results report

Above report would display details of critical rating factors at each location for Flexure, Shear, Overload and Interaction. 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 you can narrow your report for a particular type.

Similar report is available for LRFR analysis. To view LRFR Detailed Rating Results, select G2 - Plate Girder (E) (C) girder member alternative. Go to toolbar and click on View Analysis Setting button (Fig 3) to open Analysis Setting window. Click on Open Template button to open Template Library.

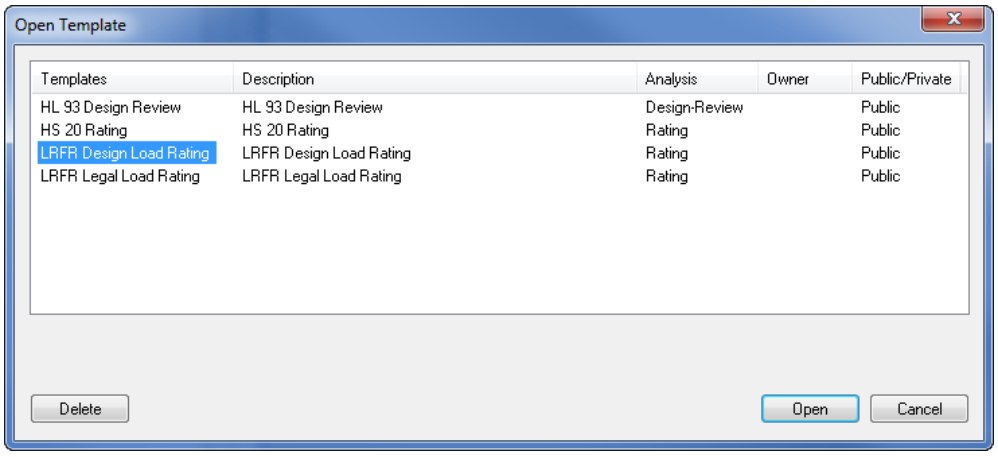


Fig 11. Open Template Window – LRFR Template selection

Select "LRFR Design Load Rating" Template from Template Library (Fig 11). Click on "Open" button to apply it to Analysis Settings. Select G2- Plate Girder (E) (C) and click "Analyze" Button (Fig. 5) on toolbar to run analysis. Once Analyze button is clicked, Analysis Progress window pops up. After analysis is completed click on "OK" button to close Analysis Progress window.

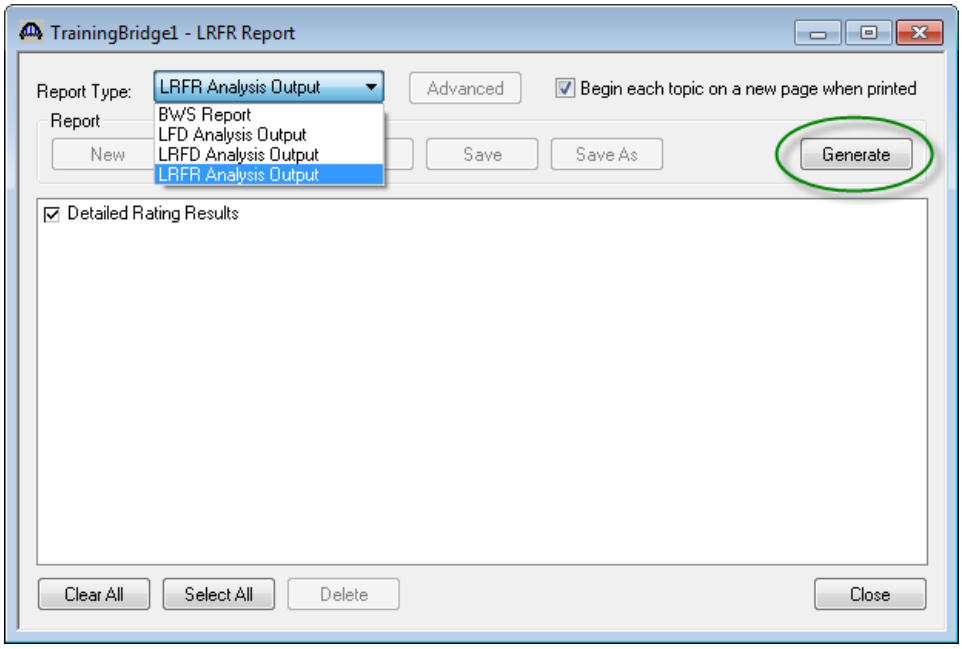
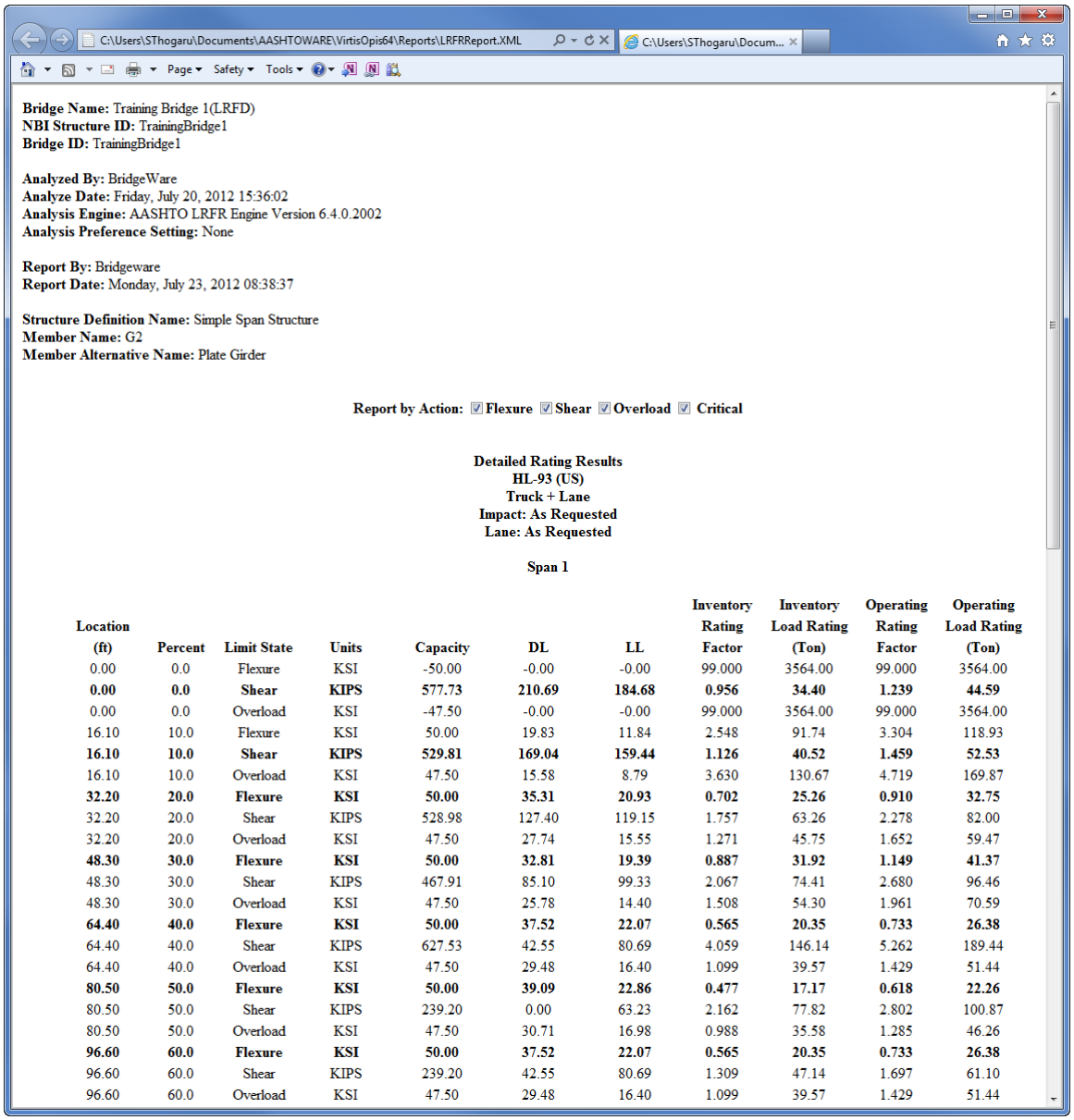


Fig 12. Report Tool Window for LRFR Analysis Output.

Click on Report Tool button (Fig 7) on toolbar to open Report Tool window. Select report Type as "LRFR Analysis Output" (Fig 12). Option to generate LRFR analysis "Detailed Rating Results" report will be populated. Now click on "Generate" button to generate the report (Fig 13).



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

Analyzed By: BridgeWare
Analyze Date: Friday, July 20, 2012 15:36:02
Analysis Engine: AASHTO LRFR Engine Version 6.4.0.2002
Analysis Preference Setting: None

Report By: Bridgeware
Report Date: Monday, July 23, 2012 08:38:37

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

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

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

Span 1

Location (ft)	Percent	Limit State	Units	Capacity	DL	LL	Inventory Rating Factor	Inventory Load Rating (Ton)	Operating Rating Factor	Operating Load Rating (Ton)
0.00	0.0	Flexure	KSI	-50.00	-0.00	-0.00	99.000	3564.00	99.000	3564.00
0.00	**0.0**	**Shear**	**KIPS**	**577.73**	**210.69**	**184.68**	**0.956**	**34.40**	**1.239**	**44.59**
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	KSI	50.00	19.83	11.84	2.548	91.74	3.304	118.93
16.10	**10.0**	**Shear**	**KIPS**	**529.81**	**169.04**	**159.44**	**1.126**	**40.52**	**1.459**	**52.53**
16.10	10.0	Overload	KSI	47.50	15.58	8.79	3.630	130.67	4.719	169.87
32.20	**20.0**	**Flexure**	**KSI**	**50.00**	**35.31**	**20.93**	**0.702**	**25.26**	**0.910**	**32.75**
32.20	20.0	Shear	KIPS	528.98	127.40	119.15	1.757	63.26	2.278	82.00
32.20	20.0	Overload	KSI	47.50	27.74	15.55	1.271	45.75	1.652	59.47
48.30	**30.0**	**Flexure**	**KSI**	**50.00**	**32.81**	**19.39**	**0.887**	**31.92**	**1.149**	**41.37**
48.30	30.0	Shear	KIPS	467.91	85.10	99.33	2.067	74.41	2.680	96.46
48.30	30.0	Overload	KSI	47.50	25.78	14.40	1.508	54.30	1.961	70.59
64.40	**40.0**	**Flexure**	**KSI**	**50.00**	**37.52**	**22.07**	**0.565**	**20.35**	**0.733**	**26.38**
64.40	40.0	Shear	KIPS	627.53	42.55	80.69	4.059	146.14	5.262	189.44
64.40	40.0	Overload	KSI	47.50	29.48	16.40	1.099	39.57	1.429	51.44
80.50	**50.0**	**Flexure**	**KSI**	**50.00**	**39.09**	**22.86**	**0.477**	**17.17**	**0.618**	**22.26**
80.50	50.0	Shear	KIPS	239.20	0.00	63.23	2.162	77.82	2.802	100.87
80.50	50.0	Overload	KSI	47.50	30.71	16.98	0.988	35.58	1.285	46.26
96.60	**60.0**	**Flexure**	**KSI**	**50.00**	**37.52**	**22.07**	**0.565**	**20.35**	**0.733**	**26.38**
96.60	60.0	Shear	KIPS	239.20	42.55	80.69	1.309	47.14	1.697	61.10
96.60	60.0	Overload	KSI	47.50	29.48	16.40	1.099	39.57	1.429	51.44

Fig 13. LRFR Detailed rating results report

Above report would display 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 you can narrow your report for a particular type.