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.

Virtis/Opis/UpisSub - [Bridge Explorer (24 Virtis/Opis bridges retrieved for the current folder, all rows retrieved)]										x						
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										Feat	Mi Post				Length	
Air Bridges		BID	Bridge Id	Bridge Name	District	County	Facility	Location	Route	Intersected	(mi)	Owner	Maintainer	Area	(ft)	Built
Deleted Bridges	1		TrainingBridge1	Training Brid	11	01	SR 005	Pittsburg	0051	SR 6060	17.00	1	1	-2	161.00	999
Deleted Bridges	1	2	TrainingBridge2	Training Brid	-1	-1	N/A	N/A	-1	N/A	0.00	-1		-1	0.00	996
	1	3	TrainingBridge3	Training Brid	11	01	⊢79	Pittsburg	0079	Ohio River	125.00	1	1	-1	455.00	999
	4	ŧ.	PCITrainingBridge1	PCI TrainingB					-1		0.00			-1	0.00	0
	4	5	PCITrainingBridge2	PCITrainingBr					-1		0.00			-1	0.00	0
	6	6	PCITrainingBridge3	PCI TrainingB					-1		0.00			-1	0.00	0
	7	7	PCITrainingBridge4	PCITrainingBr					-1		0.00			-1	0.00	0
	8	3	PCITrainingBridge5	PCI TrainingB					-1		0.00			-1	0.00	0
	9)	PCITrainingBridge6	PCITrainingBr					-1		0.00			-1	0.00	0
	1	0	Example7	Example 7 PS					-1		0.00			-1	0.00	0
	1	1	RCTrainingBridge1	RC Training B					-1		0.00			-1	0.00	0
	1	2	TimberTrainingBridge1	Timber Tr. Bri					-1		0.00			-1	0.00	0
	1	3	FSys GFS TrainingBridge1	FloorSystem	06	15	NJ-Tur	NJCity	-1		0.00			-1	0.00	002
	1	4	FSys FS TrainingBridge2	FloorSystem	11	333	I-95	NYC	-1		0.00	1	2	-1	0.00	998
I [1	5	FSys GF TrainingBridge3	FloorSystem	07	06	1-95	ATL	-1		0.00	2		-1	0.00	998
I [1	6	FLine GFS TrainingBridge1	FloorLine GF	01	01	I-75	JAX	-1		0.00	1	1	-1	0.00	001
	1	7	FLine FS TrainingBridge2	FloorLine FS	02	02	I-75	GNV	-1		0.00	1	1	-1	0.00	000
I [1	8	FLine GF TrainingBridge3	FloorLine GF	01	01	I-95	NY	15		2200.00	2	-1	-1	0.00	999
	1	9	TrussTrainingExample	Truss Trainin					5		0.00				0.00	930
	1	20	LRFD Substructure Example 1	LRFD Substr							0.00				0.00	0
	1	21	LRFD Substructure Example 2	LRFD Substr			SR 403	ERIE CO	4034	FOUR MILE	8.12				095.80	002
		2	LRFD Substructure Example 3	LRFD Substr							0.00				0.00	0
	1	23	LRFD Substructure Example 4	LRFD Substr					-1		0.00				240.00	004
l [1	24	Visual Reference 1	Visual Refer	01	12	I-76	WAITSFI	I-76	MAD RIVER	1199.25	1	1	-1	168.00	938
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For Help, press F1														N	ЛМ	

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.

Analysis Settings
Design Review Rating Rating Method: LFD
Analysis Type:
Lane/Impact Loading Type:
As Requested Apply Preference Setting: None
Vehicles Output Engine Description
Vehicle Selection: Traffic Direction: Refresh Temporary Vehicles Advanced
Vericle Steatont Vericles Standard Alternate Military Loading H 15:44 H 20:44 H 20:44
Reset Clear Open Template Save Template OK Apply Cancel

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.

Analysis Progress		
□ · ☑ Analysis Event □ · ☑ Plate Girder	 Location - 161.0000 (ft) Finding maximum stresses in the unbraced lengths STAGE 1 Location - 0.0000 (ft) Location - 16.1000 (ft) Location - 32.2000 (ft) Location - 48.3000 (ft) Location - 64.4000 (ft) Location - 80.5000 (ft) Location - 128.8000 (ft) Location - 128.8000 (ft) Location - 144.9000 (ft) Location - 161.0000 (ft) Location - 161.0000 (ft) Location - 161.0000 (ft) Location - 161.0000 (ft) Location - 112.7000 (ft) Location - 112.7000 (ft) Location - 161.0000 (ft) Location - 80.5000 (ft) Location - 48.3000 (ft) Location - 96.6000 (ft) Location - 128.8000 (ft) Location - 144.9000 (ft) Location - 161.0000 (ft) Completed Specification Check. Info - Finished LFR specification checking results Info - Finished populating specification checking results Info - Analysis completed! 	
View Rating Log	Print OK	

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.

🗛 TrainingBrid	lge1 - Report Tool	- • ×
Report Type:	BWS Report Advanced I Begin each topic on a new	page when printed
New	LRFR Analysis Output Save Save As LRFR Analysis Output	Generate
Edit Groups	Edit Attributes Delete	Close

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).

🗛 TrainingBridge1 - LFD Report		- • •
Report Type: LFD Analysis Output	 Advanced Ø Begin each topic on 	a new page when printed
New Open	Merge Save Save As	Generate
 Overall Summary Individual Vehicle Rating Summar Reactions Moments Shears Cross Section Properties Ø Detailed Rating Results 	y	
Clear All Select All	Delete	Close

Fig 9. Report Tool Window for LFD Analysis Output.

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Bridge Name: Tr NBI Structure II Bridge ID: Trainin	aining Bridg): TrainingE ngBridge1	ge 1(LRFD) Bridge1								
Analyzed By: Bri Analyze Date: Fr Analysis Engine: Analysis Prefere	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: Bridg Report Date: Frid	eware day, July 20), 2012 09:46:	19							
Structure Definit Member Name: Member Alterna	Structure Definition Name: Simple Span Structure Member Name: G2 Member Alternative Name: Plate Girder									
		Report	by Action:	▼ Flexure	🛛 Shear 🔽	Overload 🗵	Interaction	Critical		
				Det	ailed Rating HS 20-4 Axle Loa pact: As Re	g Results 4 1d quested				
				L	ane: As Req	uested				
					Span 1					
							Inventory	Inventory	Operating	Operating
Location							Rating	Load	Rating	Load Rating
(ft)	Percent	Limit State	Units	Capacity	DL	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	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	3099.9 7	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.

Femplates	Description	Analysis O	wner Public/Private
HL 93 Design Review	HL 93 Design Review	Design-Review	Public
IS 20 Rating	HS 20 Rating	Rating	Public
RFR Design Load Rating	LRFR Design Load Rating	Rating	Public
RFR Legal Load Rating	LRFR Legal Load Rating	Rating	Public

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.

🗛 TrainingBri	dge1 - LRFR Report		- • •
Report Type: Report New	LRFR Analysis Output BWS Report LFD Analysis Output LRFD Analysis Output LRFR Analysis Output	Advanced Begin each topic on	a new page when printed
☑ Detailed F	ating Results		
Clear All	Select All Delete		Close

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).

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Bridge Name: Train NBI Structure ID: Bridge ID: TrainingI	iing Bridge 1(TrainingBridg Bridge1	LRFD) e1									*
Analyzed By: Bridg Analyze Date: Frida Analysis Engine: A Analysis Preference	eWare ay, July 20, 24 ASHTO LRH e Setting: N	012 15:36:02 FR Engine Versio one	n 6.4.0.2002								
Report By: Bridgew Report Date: Mond	vare lay, July 23, 2	2012 08:38:37									
Structure Definition Member Name: G2 Member Alternativ	n Name: Sim 2 re Name: Pla	ple Span Structu ite Girder	re								E
			Repo	rt by Action: 👿 I	Flexure 🔽 Shea	ar 👿 Overload	Critical				
				De In I	etailed Rating F HL-93 (US) Truck + Lan npact: As Requ Lane: As Reque	Results e ested ested					
					Span 1						
Location							Inventory	Inventory	Operating Poting	Operating	
(ft)	Percent	Limit State	Units	Capacity	DL	LL	Factor	(Ton)	Factor	(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	Snear Original	KIPS VCI	439.20	0.00	05.25	2.102	25 50	2.802	100.87	
80.50	50.0	Florence	KSI KSI	47.50	30.71	10.98	0.988	20.28 20.25	0.722	40.20	
90.00	60.0	Shear	KIDS	230.00	37.32 42.55	22.07 80.69	1 300	47.14	1.607	20.30 61 10	
96.60	60.0	Overload	KSI	47.50	29.48	16.40	1.099	39.57	1.429	51.44	-



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.