AASHTOWare BrDR 7.5.0

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

						AASHTOW	are Bridge Des	ign and Rating						?	_	
BRIDGE EXPLORER BRIDG	E FOLDER	RATE	TOOLS VIEW													
New Open D Batch ~	Find Copy F	Paste Cop To	y Remove Delete													
Bridge		Manage	e													
		BID	Bridge ID	Bridge Name	District	County	Facility	Location	Route	Feature Intersected	Mile/Km Post (mi)	Owner	Maintainer	Admin Area	Length (ft)	Year Built
😑 📁 All Bridges		> 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
🖻 🏓 Sample Bridges		2	TrainingBridge2	Training Bridge 2(LRFD)	Unknown	Unknown (P)	N/A	N/A	-1	N/A		Unknown (P)	,, ·	Unknown		1996
🗁 📁 Deleted Bridges		3	TrainingBridge3	Training Bridge 3(LRFD)	District 11	01 Abbeville	1-79	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(LBED)					-1					Unknown		
		6	PCITrainingBridge3	PCI TrainingBridge3(LFR)					-1					Unknown		
		7	PCITrainingBridge4	PCITrainingBridge4(LBED)					-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	FSvs 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	1-95	NYC	-1			State Highway Agency	County Hwy Agency	Unknown		1998
		15	FSvs GF TrainingBridge3	FloorSystem GF Training Bridge 3	District 7	06 Barnwell	1-95	ATL	-1			County Hwy Agency		Unknown		1998
		16	FLine GFS TrainingBridge1	FloorLine GFS Training Bridge 1	District 1	01 Abbeville	1-75	JAX	-1			State Highway Agency	State Highway Agency	Unknown		2001
		17	FLine FS TrainingBridge2	FloorLine FS Training Bridge 2	District 2	02 Aiken	1-75	GNV	-1			State Highway Agency	State Highway Agency	Unknown		2000
		18	FLine GF TrainingBridge3	FloorLine GF Training Bridge 3	District 1	01 Abbeville	1-95	NY	15		2200.00	County Hwy Agency	Unknown (P)	Unknown		1999
		19	TrussTrainingExample	Truss Training Example					5				3			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	1-76	WAITSFIELD	1-76	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				5	-1			5 , 5			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			~ 1				

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.



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.

Analysis Settings	– 🗆 X
Design review O Rating	Rating method:
Analysis type: Line Girder Lane / Impact loading type: As Requested	 Apply preference setting: None
Traffic direction: Both directions	Refresh Temporary vehicles Advanced
 Vehicles Standard Alternate Military Loading EV2 EV3 H 15-44 H 20-44 HS 15-44 HS 20-44 HS 20-44 SU4 SU4 SU5 SU6 SU7 Type 3 Type 3.3 Type 3.3 Type 3.3 Type 3.2 Agency User defined Temporary 	Add to
Reset Clear Open template	Save template OK Apply Cancel



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.

Bridge Wor	rkspace - Trainir	ngBridge1		ANALYSIS	REPORTS	?	_	×
BRIDGE WORKSPACE	WORKSPACE	TOOLS	VIEW	DESIGN/RATE	REPORTING			
a 🖙 🗄		5	∻ א	E 🖪				
Analysis Analyze Analysis Settings Events	Tabular Spec Results Chec	ification En k Detail Ou	gine Resu tputs Grap	lts Save oh Results				
Analysis		Resul	ts					

Once the Analyze button is clicked the Analysis Progress window is populated as shown below.

Analysis - Plate Girder	- D X
Analysis Event Plate Girder	Finished infining maximum stresses in the unbraced lengths Checking pier compactness. STAGE 1 STAGE 2 STAGE 3 Location - 0.0000 (ft) Location - 16.1000 (ft) Location - 32.2000 (ft) Location - 48.3000 (ft) Location - 64.4000 (ft) Location - 96.6000 (ft) Location - 112.7000 (ft) Location - 128.8000 (ft) Location - 144.9000 (ft) Location - 144.9000 (ft) Location - 144.9000 (ft) Location - 161.0000
	Close

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.

🗛 TrainingBr	dge1 - Report Tool	-	-		×
Report type :	BWS report V Ac	vanced 🧹 Begin each topic on a new page when printed			
Report	BWS report				
New	LFR analysis output erge	Save Save As Generate			
	LRFR analysis output				
	LRFD analysis output				
Edit group	s Edit attributes D	elete Report contains 0 attributes in 0 groups		Close	•

Uncheck all the options except **Detailed rating results**. Now click the **Generate** button to generate **LFR Detailed Rating Results report**.

port type : LFR	analysis output	 Advance 	ed 🔽 Beg	gin each topic or	a new page when printed		
Report							
New	Open	Merge	Save	Save As	Generate		
Overall summ	nary						
Individual ve	hicle rating summ	ary					
Reactions							
Moments							
Cross section	properties						
Detailed ratir	ng results						
Diaphragm f	orces						

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

							Inventory	Inventory	Operating	Operating	
Location							Rating	Load Rating	Rating	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.

remplates	Description	Analysis	Owner	Public / Private	
HL 93 Design Review	HL 93 Design Review	LRFD		Public	
HS 20 LFR Rating	HS 20 LFR Rating	LFR		Public	
LRFR Design Load Rating	LRFR Design Load Rating	LRFR		Public	
LRFR Legal Load Rating	LRFR Legal Load Rating	LRFR		Public	

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.

🗛 TrainingBri	idge1 - Report Tool		-		×
Report type :	BWS report \sim	Advanced Segin each topic on a new page when printed			
Report	BWS report				
New	LFR analysis output	erge Save Save As Generate			
	LRFR analysis output				
	LRFD analysis output				
Edit group	Edit attributes	Delete Report contains 0 attributes in 0 groups		Clos	e

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

							Inventory	Inventory	Operating	Operating	
Location							Rating	Load Rating	Rating	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.