AASHTOWare Bridge Design Training - (BrD 6.4)

Substructure Results Report – Table of Contents

Topics Covered

• Table of Contents feature in substructure results report.

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

Fig 1. Bridge Explorer

From the Bridge Explorer (Fig 1) select LRFD Substructure Example 4 (BID23) and double click (or right click and select open) to open it.

Once Bridge Workspace tree shows up expand "PIERS" at the end of tree by clicking on "+". Then expand "pier 1" and select Pier 1 Hammerhead (E) (C) in the pier alternative. Expand pier alternative (Pier 1 Hammerhead) by clicking on "+". Then Bridge Workspace tree will be as shown in Fig 2.

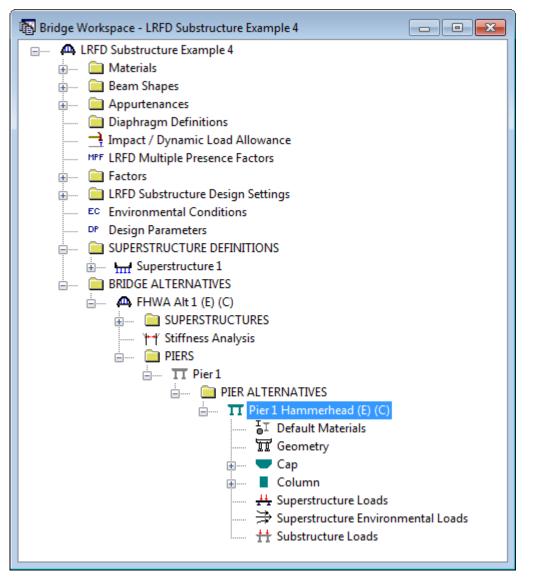


Fig 2. Pier Alternative in Bridge Tree

Run spec check analysis for Pier Alternative (Pier1 Hammerhead (E) (C)) by selecting the alternative and clicking "Spec Check" button (Fig 3) on toolbar.



Fig 3. Spec Check Button

After spec check is initialized bridge validation window will pop up. Once bridge validation is completed, click on "Continue Spec Check" button to perform spec check analysis. After "Continue Spec Check" button is clicked Substructure Analysis Progress window will be populated (Fig 4).

Substructure Analysis Progress	
Using existing substructure analysis results!	*
Using existing substructure load combination results	!
Substructure specification check started! Building Spec Check Domain objects.	
- Component 1 of 3 - Cap	
- Component 2 of 3 - Column1	
- Component 3 of 3 - Column1:Pile footing	
Computing pile forces for Column1:Pile footing	
Performing Specification Check.	
-Component 1 of 3-Cap	
- Location - 15.5000 (ft)	
- Location - 31.0000 (ft)	
- Location - 0.0000 (ft)	
- Location - 2.7325 (ft)	
- Location - 2.9688 (ft)	
- Location - 3.7500 (ft)	
- Location - 13.5000 (ft)	
- Location - 23.2500 (ft)	
- Location - 33.0000 (ft)	
- Location - 42.7500 (ft) - Location - 43.5312 (ft)	
- Location - 43.7675 (ft)	
- Location - 46.5000 (ft)	
- Location - 5.3397 (ft)	
- Location - 41.1042 (ft)	
- Component 2 of 3 - Column1	
- Location - 0.0000 (ft)	
- Location - 15.0000 (ft)	
 Component 3 of 3 - Column1:Pile footing 	
- Location - Pile Footing	
- Location - Footing Longitudinal Moment Section	
- Location - Footing Transverse Moment Section	
- Location - Footing Longitudinal Shear Section	
- Location - Footing Transverse Shear Section	
- Location - Column Punching Shear Section - Location - Pile Punching Shear Section	
Completed Specification Check.	
Writing Specification Check results.	
Completed.	
Substructure specification check successfully comple	ted!
	-
	Print OK

Fig4. Substructure Analysis Progress Window

After substructure specification check is completed click on "OK" to close window. Then click on "Substructure Tabular Results" button (Fig.5) on Toolbar. Once Substructure Tabular Results button is clicked, Tabular Results window will pop up.



Fig 5. Substructure Tabular Results Button

A Tabular Results - New Tabular Report	- • •
Report New Open Save Save As Advanced	Generate
Model Loads Reactions Displacements Forces Envelope Spec Check Results Options	
V Nodes Ø Beams Ø Section propetties Ø Materials Ø Supports Ø Member releases Ø Load cases	
	Close

Fig 6. Tabular Results – New Tabular Report window.

On Tabular Results window click "New" button to open up a new report definition (Fig 6). Now on "Loads" tab select Strength-I limit state (Fig 7). Click on "Generate" button to generate report .

A Tabular Results - New Tabular Report	
Report	
New Open Save Save Advanced	Generate
Mode Loads Reactions Displacements Forces Envelope Spec Check Results Options	
Select	
Limit states	
Load cases	
Coad combinations	
Select All	
Clear All	
	Close

Fig 7. New Tabular Report – Loads Tab

<u>→</u> (→)		-		ools + @+ 🔊 🔊	\LRFDSubstructureExample4\FHW クマ C × (G) C:\Users\SThogaru\Docum×
idge II idge : I er : Pier er : Bri ASHTC	e ID :LRFD Substructure Example 4 e : LRFD Substructure Example 4 (NHI Hammer Head) Pier 1 : Bridgeware <u>HTO LRFD Specification, Edition 5, Interim 2010</u>			II Hammer Head)	NBI Structure ID :LRFD_EX4_sub Bridge Alt : FHWA Alt 1 Pier Alt. : Pier 1 Hammerhead Date : Tuesday, July 17, 2012 15:46:37
Node	X (ft)	Y (ft)	Z (ft)	Node Type	
1	0.000	30.500	-19.500	Generated	
2	0.000	24.000	-19.500	Generated	
3	0.000	30.500	-19.300	Generated	
4	0.000	24.000	-9.750	Generated	
4	0.000	30.500	0.000	Generated	
6	0.000	24.000	0.000	Generated	
7	0.000	30.500	9.750	Generated	
8	0.000	24.000	9.750	Generated	
8 9	0.000	30.500	9.730 19.500	Generated	
10	0.000	24.000	19.500	Generated	
10	0.000	24.000	-23.250	Generated	
11	0.000	24.000	-23.230	Generated	
12	0.000	24.000	-20.318	Generated	
15	0.000	24.000	-20.281	Generated	
14	0.000	24.000	7.750	Generated	
15	0.000	24.000	20.281	Generated	
17 18	0.000	24.000 24.000	20.518 23.250	Generated	
18	0.000	3.500	0.000	Generated	
20	0.000	3.500	0.000	Generated	
	0.000	28.387	-15.274	Non-structural	
21 22		28.387		Non-structural Non-structural	
	0.000		-3.637		
23 24	0.000	27.250 27.444	6.500 15.863	Non-structural Non-structural	
24 25	0.000	27.444	23.726	Non-structural Non-structural	
25 26	0.000	28.587	0.000	Non-structural	
26 27		11.000	-15.000		
	0.000	<u> </u>	-13.000	Non-structural	
Beam E	Element	Start Node	End Node	Reference Node	
1		1	2	21	
2	2	3	4	22	
3		5	6	23	

Fig 8. Substructure Tabular Report

Linked table of contents report is generated by checking "Generate linked table of contents" check box on "Options" tab (Fig 9). Click on the "Generate" button to generate report. Generated linked table of contents report is as shown in Fig 10.

			ew Tabular Report	Tabular Results - Ne
Generate		ave As Advanced	Open Save Sa	Report New
	It In	Units: US Custom Input Section properties: Strength: Spring constant: Loads/Results Force: Moments: Displacement:	actions Displacements Forces E	General Report Heading V User name Description:

Fig 9. New Tabular Report – Options Tab

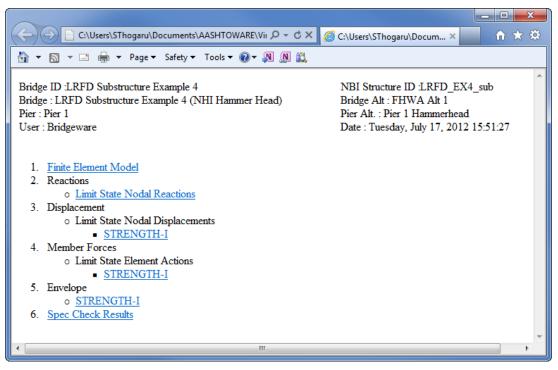


Fig 10. Substructures Tabular Report – Linked Table of Contents

Click on Finite Element Model link to view Finite Element Model report (Fig. 11) which would open on a new tab. Similarly all other reports can be viewed by clicking on corresponding links, which would open reports on new tabs.

		1071 10			
	_	-		ools 🕶 🔞 👻 🔊 🔊	LRFDSubstructureExample4\FHWAA 🔎 🕆 🖒 🗙 🌈 C:\Users\SThogaru\Documen 🦉 C:\Users\SThogaru\Docu
ridge ID :L ridge : LRF er : Pier 1 ser : Bridge	RFD Subs	ubstructure l	Example 4	Hammer Head)	NBI Structure ID LRFD_EX4_sub Bridge Alt : FHWA Alt 1 Pier Alt : Pier 1 Hammerhead Date : Tuesday, July 17, 2012 15:50:43
Node					
Node 2	X (ft)	Y (ft)	Z (ft)	Node Type	
1	0.000	30.500	-19.500	Generated	
	0.000	24.000	-19.500	Generated	
	0.000	30.500	-9.750	Generated	
	0.000	24.000	-9.750	Generated	
	0.000	30.500	0.000	Generated	
	0.000	24.000	0.000	Generated	
	0.000	30.500	9.750	Generated	
	0.000	24.000	9.750	Generated	
	0.000	30.500	19.500	Generated	
	0.000	24.000	19.500	Generated	
	0.000	24.000	-23.250	Generated	
	0.000	24.000	-20.518	Generated	
	0.000	24.000	-20.281	Generated	
	0.000	24.000	-7.750	Generated	
	0.000	24.000	7.750	Generated	
	0.000	24.000	20.281	Generated	
	0.000	24.000	20.518	Generated	
	0.000	24.000	23.250	Generated	
	0.000	3.500 18.500	0.000	Generated	
	0.000	28.387	-15.274	Non-structural	
	0.000	28.387	-13.274	Non-structural	
	0.000	27.444	6.500	Non-structural	
	0.000	27.230	15.863	Non-structural	
	0.000	28.387	23.726	Non-structural	
	0.000	70.500	0.000	Non-structural	
	0.000	11.000	-15.000	Non-structural	

Fig 11. Substructures Tabular Report – Finite Element Model