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*AASHTOWare BrR 6.8*

***Truss Tutorial***

*T4 – Floor Truss Example*

## BrR Training

### T4 – Floor Truss Example

#### Topics Covered

- Floor and truss system/line superstructure definitions overview
- Floor truss description
- Analysis rating results and outputs

BrR/BrD supports modeling of three types of floor system/line superstructure definitions and two types of truss system/line superstructure definitions.

Floor system/line superstructure definition supported configurations:

- Girder-Floorbeam-Stringer
- Girder-Floorbeam
- Floorbeam-Stringer

Truss system/line superstructure definition supported configurations:

- Truss-Floorbeam-Stringer
- Truss-Floorbeam

Modeling capabilities in system superstructure definition:

- Number of main members (girders or trusses) can be more than two.
- Continuous span main member are supported.
- Main members can directly support the deck. This enables entry of composite deck properties for the main members.
- Main member configuration type can be deck or through.
- Stringers can frame into the floor beam or rest on top of the floor beam.
- Support entry of deterioration profile information.

Modeling limitations in system superstructure definition:

- Main member spacings cannot vary along the length of the superstructure.
- Number of stringers and stringer spacings cannot vary in the superstructure.
- Deck width cannot vary along the length of the superstructure.
- Floor beams at support lines are assumed to have the same skew as the support line. All other floor beams are assumed to be perpendicular.

#### T4 – Floor Truss Example

- Cantilevered floor beam spans are only supported for deck main member configuration type.
- Interior floor beams can only be supported by the main members.

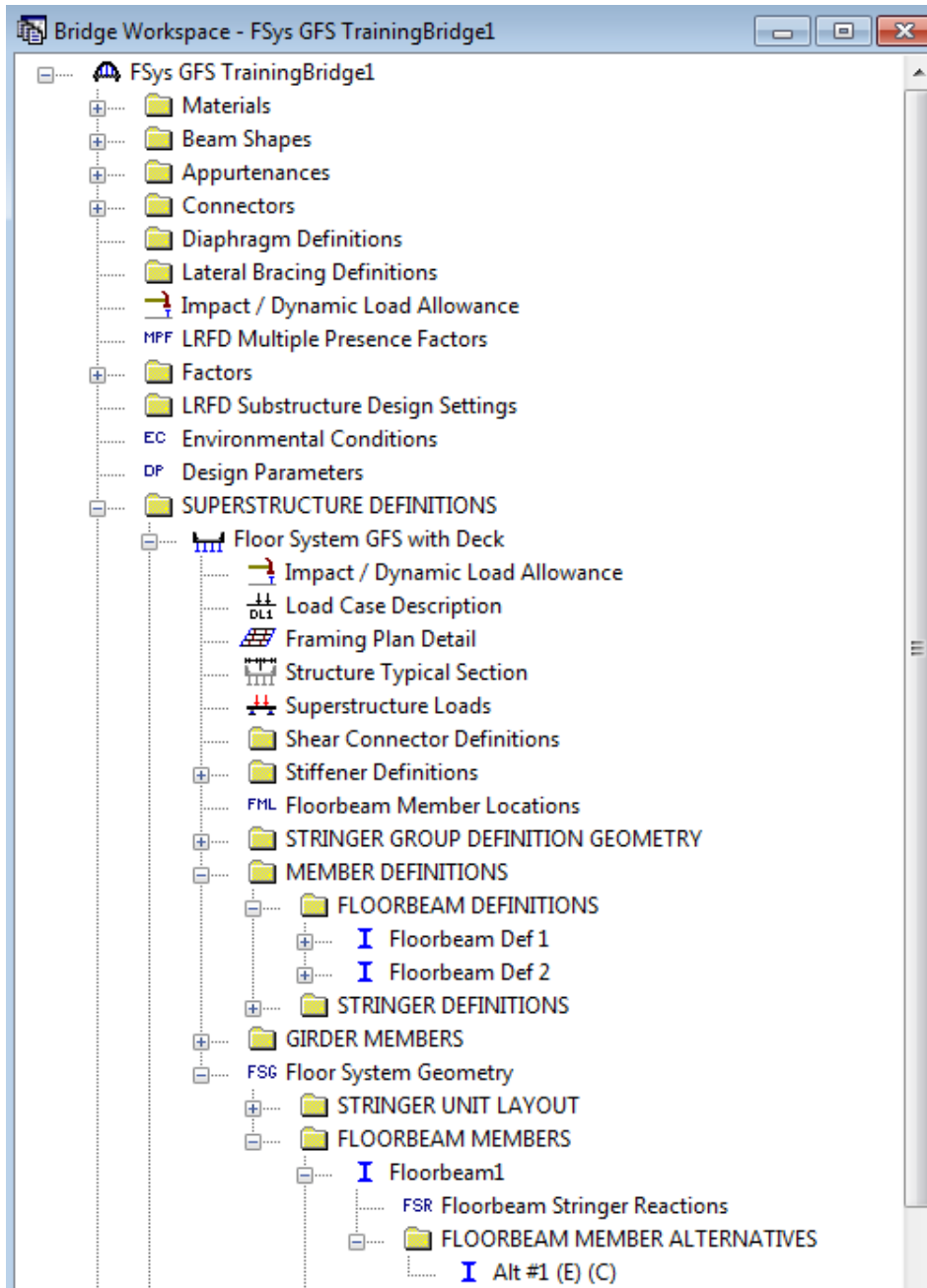
Floor truss is supported in system superstructure definition and implemented as a new type in floorbeam definition. The truss members in floor truss can have rolled and built-up cross sections. BrR Truss LFD Engine is the analysis module for rating floor truss.

## T4 – Floor Truss Example

In this example, we will create a new floor truss definition in BID 13 and replace the floor beam definition assigned to Floorbeam1's Alt #1 floorbeam member alternative with the new floor truss definition.

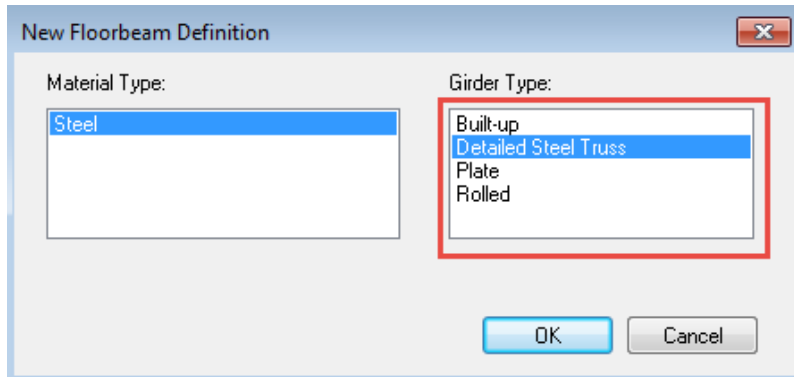
From the Bridge Explorer, double-click BID 13 FSys GFS TrainingBridge1 to open the bridge workspace. Expand the workspace tree until the FLOORBEAM DEFINITIONS and Floorbeam1's FLOORBEAM MEMBER ALTERNATIVES are visible.

The Bridge Workspace of BID 13 FSys GFS TrainingBridge1 is shown below.



## T4 – Floor Truss Example

Double-click FLOORBEAM DEFINITIONS in the tree to create a new floorbeam definition. The New Floorbeam Definition dialog shown below will open. Select Steel for the Material Type and Detail Steel Truss for the Girder Type. Click OK to close the dialog and create a new floorbeam definition.



## T4 – Floor Truss Example

The Floorbeam Definition window will open. Enter the data as shown below. Cross-section based property input method is the only input method for floor truss. The 0.005 kip/ft Additional self load will be applied for each truss member in the floor truss.

Name: Floortruss Def 1

Description: |

Material Type: Steel

Floorbeam Type: Detailed Steel Trus:

Default Units: US Customary

Floorbeam property input method

Schedule-based

Cross-section based

Self Load

Load case: Engine Assigned

Additional self load = 0.005 kip/ft

Additional self load = %

Universal Mill Plate Not Present

Default rating method: LFD

Cantilever

Cantilever Lengths

Left: ft

Right: ft

Floorbeam Length Between Main Members

Span	Length (ft)
1	30.00

OK Apply Cancel

## T4 – Floor Truss Example

Select the Geometry tab and enter the locations of the panel points as shown below. These panel points will be used to define the truss members. Click OK to save the data to memory and close the Floorbeam Definition window.

**Floorbeam Definition**

Name:

Description | **Geometry** | Specs | Factors | Engine

Symmetrical

Number of Panels  
 Even number of panels  
 Odd number of panels

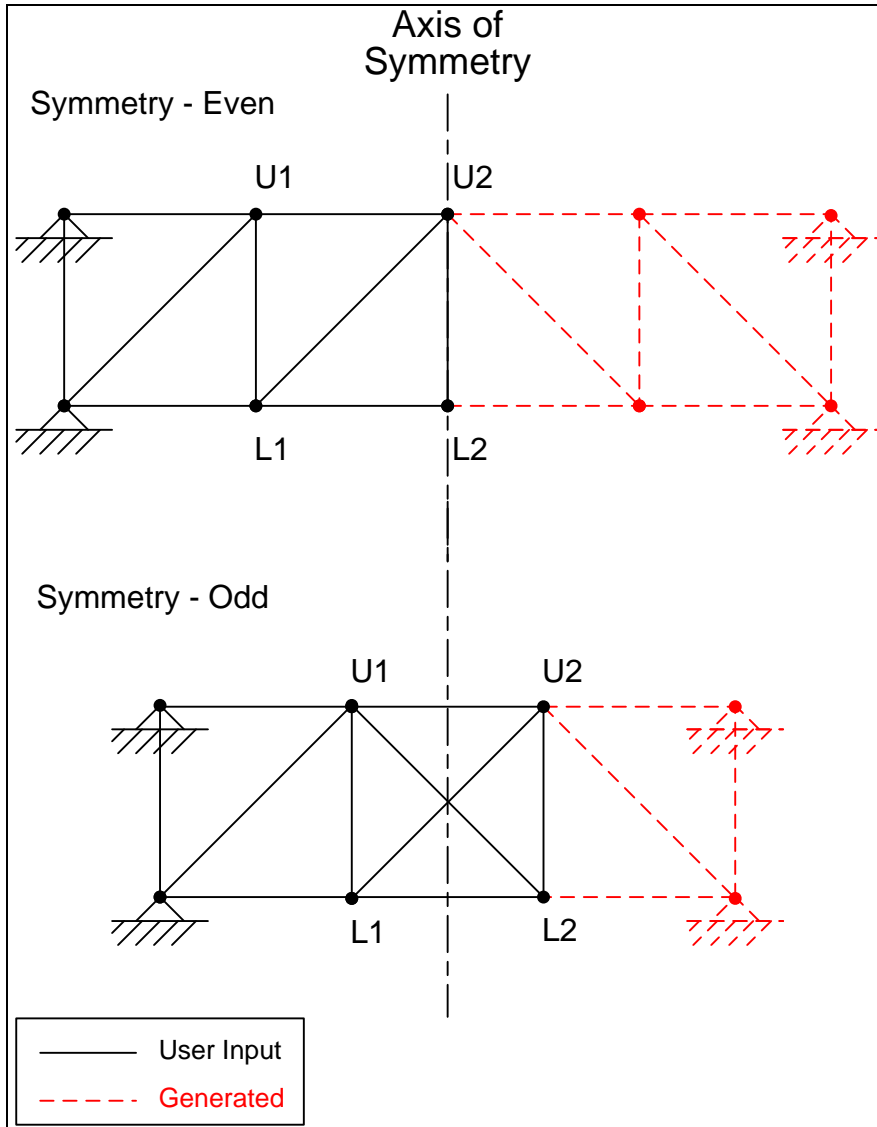
Panel Point	Type	X (ft)	Y (ft)
L1	Lower	0.00	0.00
L2	Lower	6.00	0.00
L3	Lower	12.00	0.00
L4	Lower	18.00	0.00
L5	Lower	24.00	0.00
L6	Lower	30.00	0.00
U1	Upper	0.00	4.00
U2	Upper	6.00	4.00
U3	Upper	12.00	4.00
U4	Upper	18.00	4.00
U5	Upper	24.00	4.00
U6	Upper	30.00	4.00

New Duplicate Delete

OK Apply Cancel

## T4 – Floor Truss Example

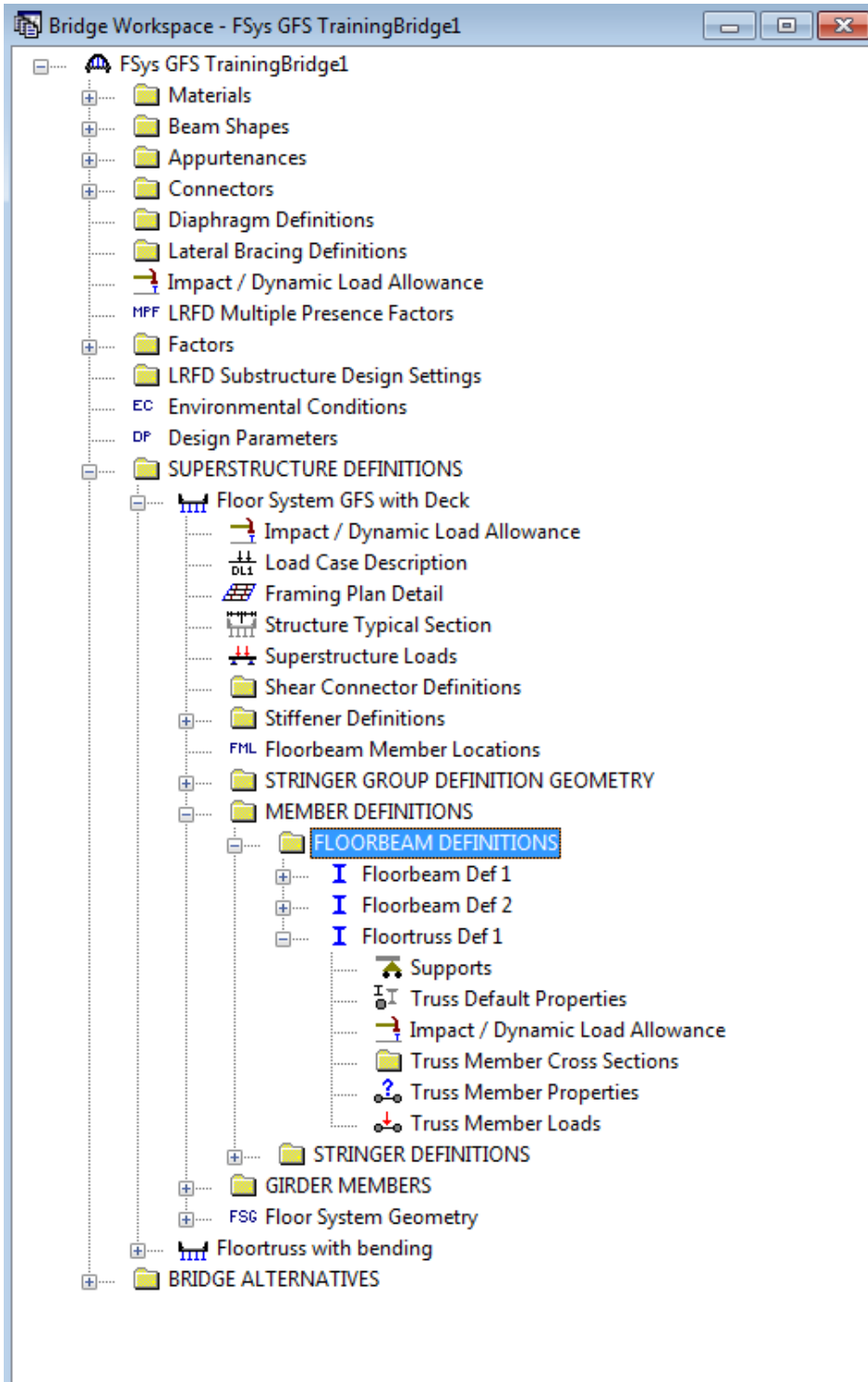
In the Floorbeam Definition window Geometry tab, the Symmetrical option specifies that the entered panel point locations are symmetrical. The Number of Panels will be enabled when Symmetrical is selected. For even number of panels, enter the panel point locations from the left most panel to the central panel points. For odd number of panels, enter the panel point locations from the left most panel to the right end of the central panel. If Symmetrical is selected, symmetrical geometry, supports and user-defined truss member loads will be generated.





## T4 – Floor Truss Example

The workspace tree with the new Floortruss Def 1 is shown below.



## T4 – Floor Truss Example

We will come back to complete Floortruss Def1 after checking the geometry data we just entered.

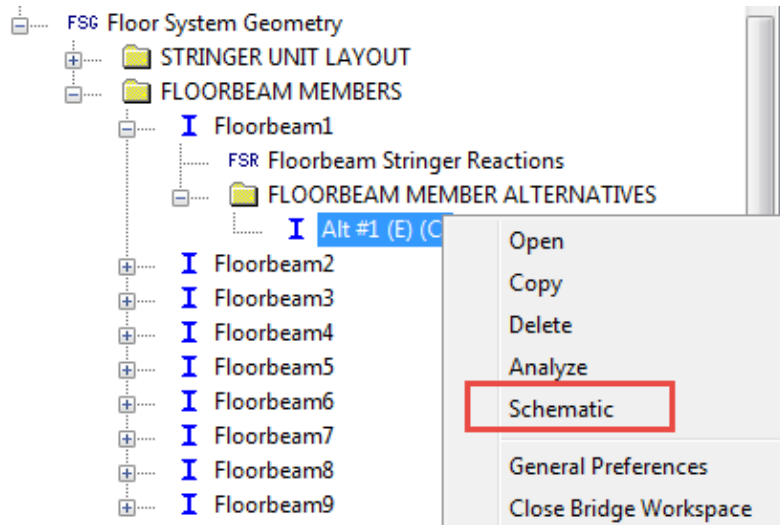
Double-click Floorbeam1's Alt #1 floorbeam member alternative in the tree and change the assigned floorbeam definition to Floortruss Def 1. Click OK to save the data to memory and close the window.

Member	Cross Section Name	Cross Section Type	Capacity (kip)				Allowable Stress (ksi)			Unbraced Length (ft)		
			Override	Tension	Compression	Dead Load Axial Force	Override	Tension	Compression	Override	Z Axis	Y Axis

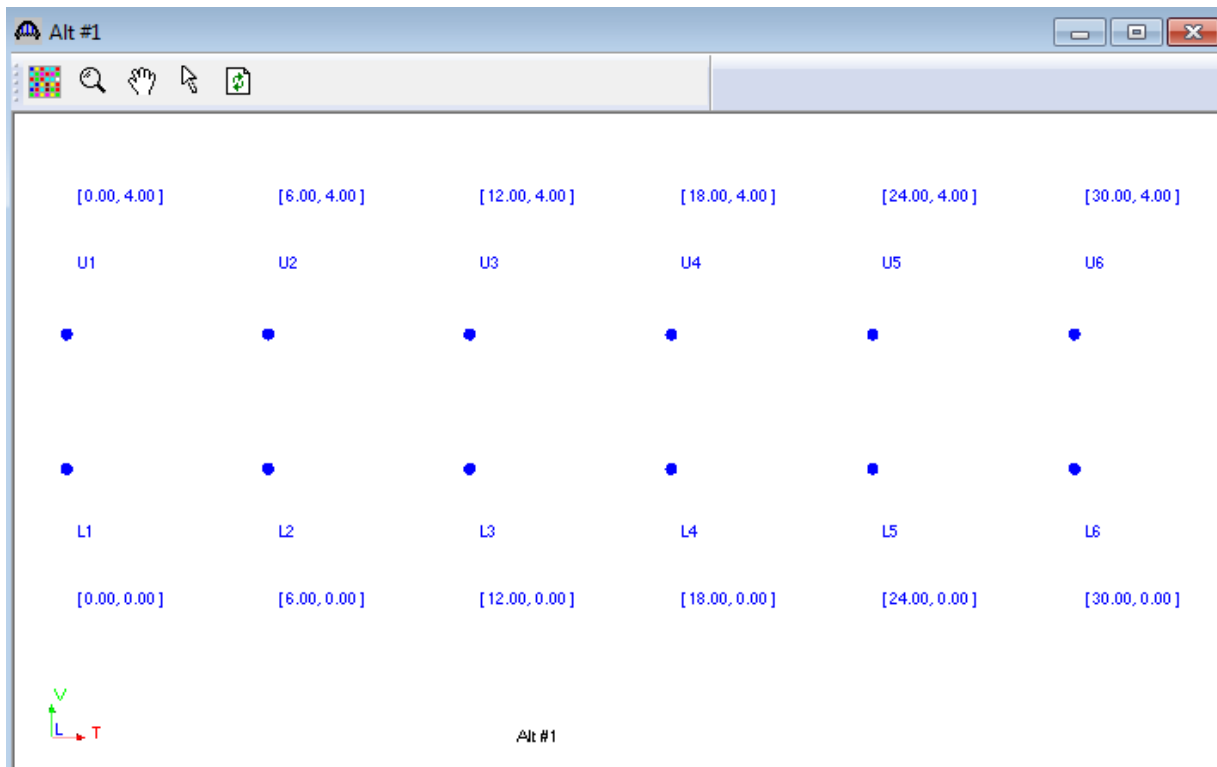
The Floorbeam Member Alternative window will be populated with truss members after Floortruss Def1 is completely defined. The General tab allows you to override the computed capacities, the allowable stresses and the unbraced length defined in Floortruss Def 1.

## T4 – Floor Truss Example

Next right-click Floorbeam1's Alt #1 in the tree and select Schematic.



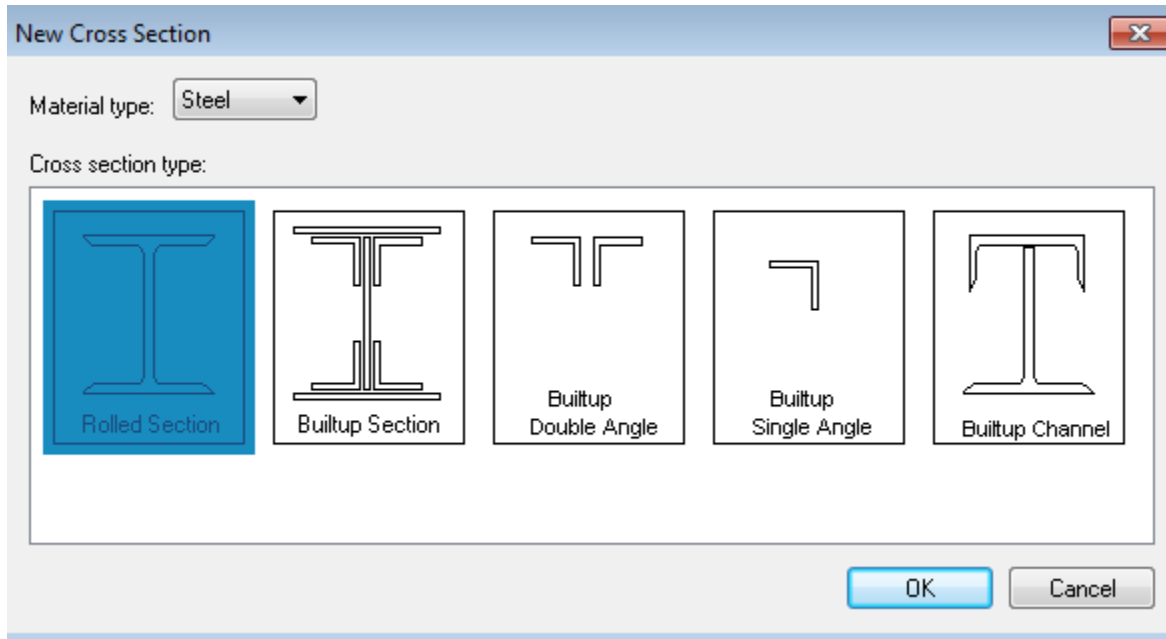
The truss schematic is displayed below. Check the geometry and adjust the panel point locations if necessary.



## T4 – Floor Truss Example

We will now go back to complete Floortruss Def 1 description.

Double-click Truss Member Cross Sections in the tree to create a new rolled section. The New Cross Section dialog shown below will open. Select Rolled Section, click OK to close the dialog and create a new rolled section.



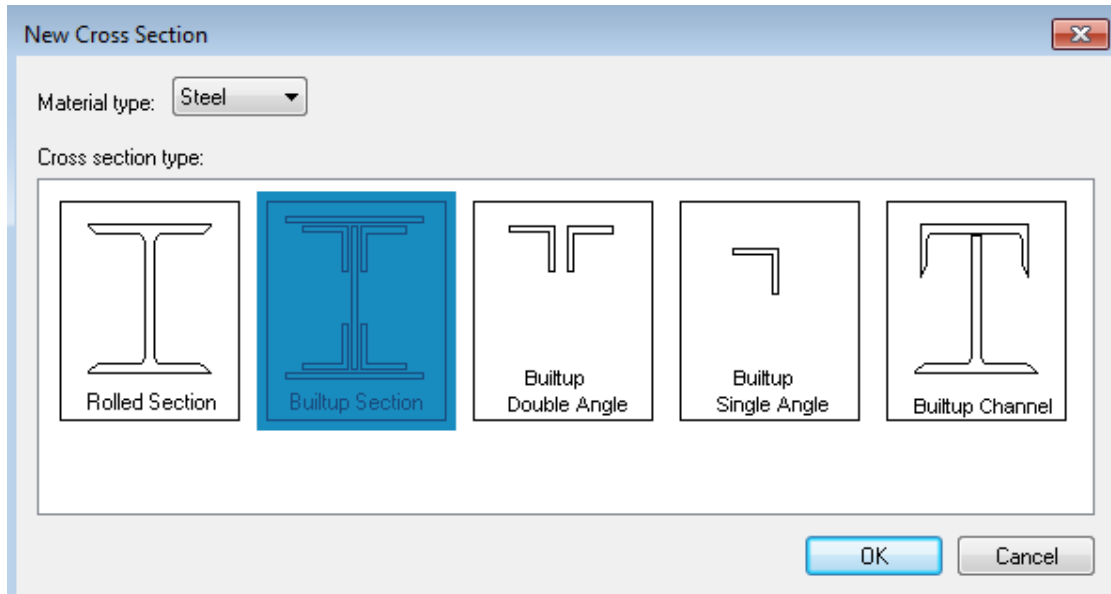
## T4 – Floor Truss Example

Enter the data as shown below for the Rolled Section. Click OK to save the data to memory and close the window.

The image shows a software dialog box titled "Cross Sections". At the top, there are standard window controls (minimize, maximize, close). Below the title bar, the "Name" field contains "Rolled Section" and the "Type" field contains "Rolled Steel Truss Cross Section". There are three tabs: "Dimensions", "Top Cover Plates", and "Bottom Cover Plates", with "Dimensions" being the active tab. In the center of the dialog is a diagram of a rolled steel section, which is an I-beam shape. To the left of the diagram, there are three dropdown menus: "Shape" is set to "W 6x20", "Material" is set to "FY 36ksi Steel", and "Top / Bottom Cover Plates Attachment" is set to "Bolted". At the bottom right of the dialog, there are three buttons: "OK", "Apply", and "Cancel".

## T4 – Floor Truss Example

Double-click Truss Member Cross Sections in the tree to create a new built-up section.



T4 – Floor Truss Example

Enter the data as shown below for the Builtup Section.

**Cross Sections**

Name:  Type:

Dimensions | Top Cover Plates | Bottom Cover Plates

Web lacing

Angle Type

Four angles  
 Double angles  
 Single angle

Materials

Top Angles:   
 Web:   
 Bottom Angles:

Attachment:

Bolts/Rivets

Hole Size:  in  
 Top Number:   
 Bottom Number:   
 Eff. area:  in<sup>2</sup>

Horizontal Leg

Top:  Bottom:

Enter angle descriptions in table

	Horz. Leg (in)	Vert. Leg (in)	Horz. Thick (in)	Vert. Thick (in)
Top Angles	2.0000	2.0000	0.2500	0.2500
Bottom Angles	2.0000	2.0000	0.2500	0.2500

OK Apply Cancel

## T4 – Floor Truss Example

Select the Top Cover Plates tab to enter the top cover plate as shown below. Click Copy to Bottom Cover Plates to copy the cover plate to the Bottom Cover Plates tab. Click OK to save the data to memory and close the window.

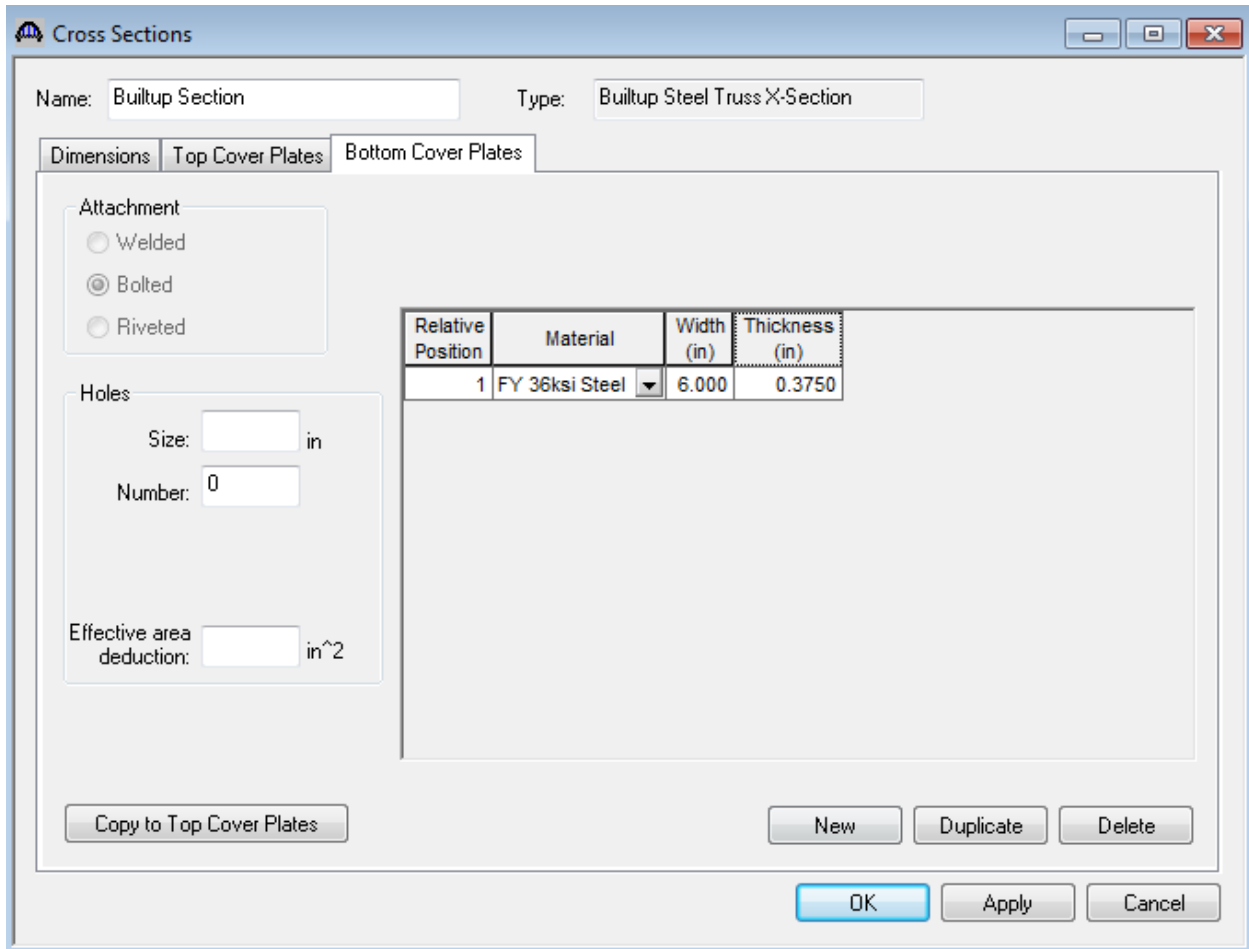
The screenshot shows the 'Cross Sections' dialog box with the 'Top Cover Plates' tab selected. The 'Name' field contains 'Builtup Section' and the 'Type' field contains 'Builtup Steel Truss X-Section'. The 'Attachment' section has 'Bolted' selected. The 'Holes' section has 'Size' and 'Number' fields. The 'Effective area deduction' field is also present. A table lists the cover plate details.

Relative Position	Material	Width (in)	Thickness (in)
1	FY 36ksi Steel	6.000	0.3750

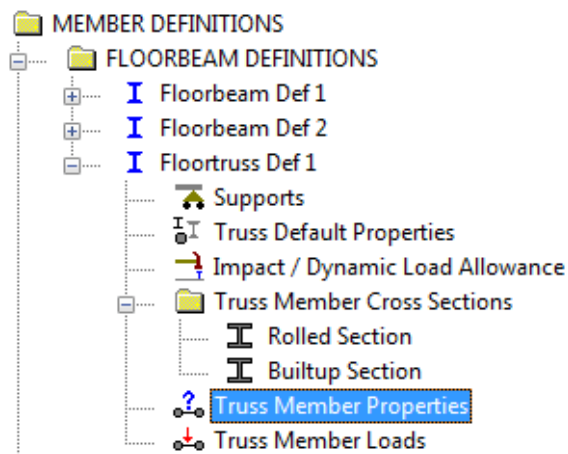
Buttons at the bottom include 'Copy to Bottom Cover Plates', 'New', 'Duplicate', 'Delete', 'OK', 'Apply', and 'Cancel'.



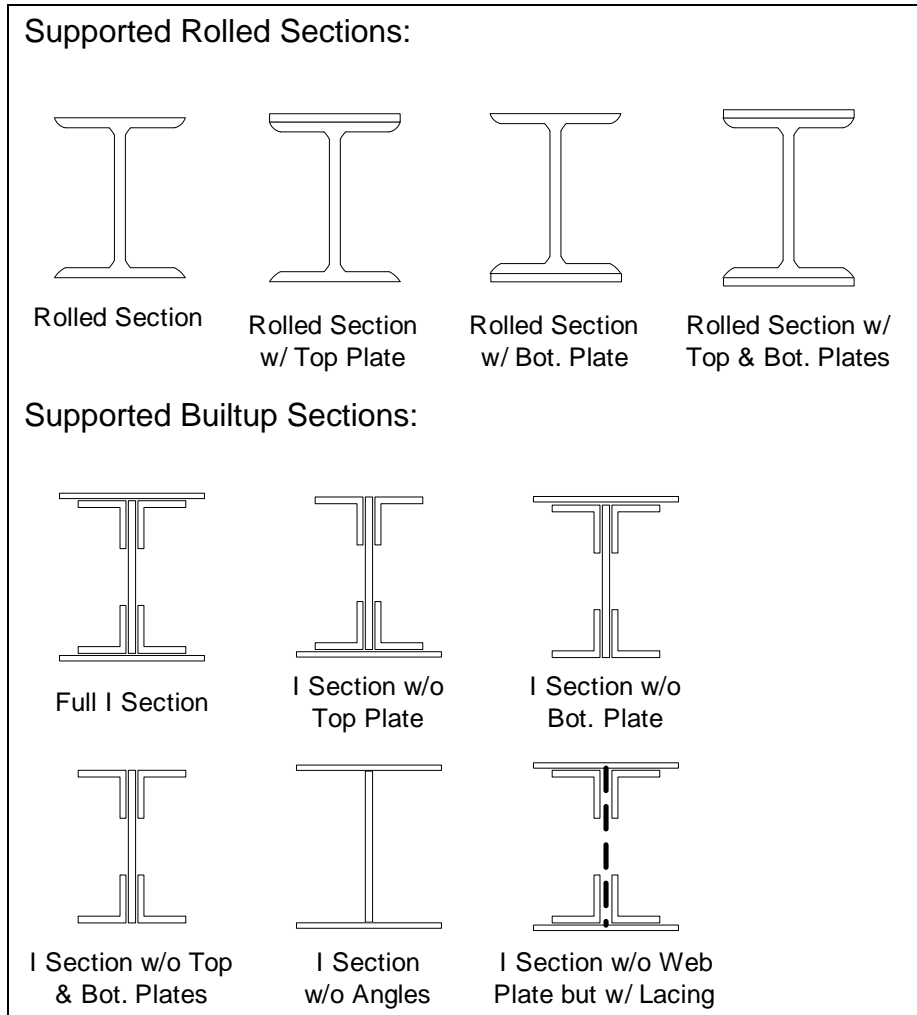
T4 – Floor Truss Example



The partial workspace tree with the new Rolled Section and Bultup Section is shown below.



The configurations of the supported rolled and built-up cross sections are shown below.



Double-click Truss Member Properties in the tree to open the Truss Member Properties window. Click New to create a new row and select Panel Point From and Panel Point To to populate the Member Name and the Z Axis and Y Axis Unbraced Lengths. Enter the data as shown below for the truss members. Click OK to save the data to memory and close the window.

T4 – Floor Truss Example

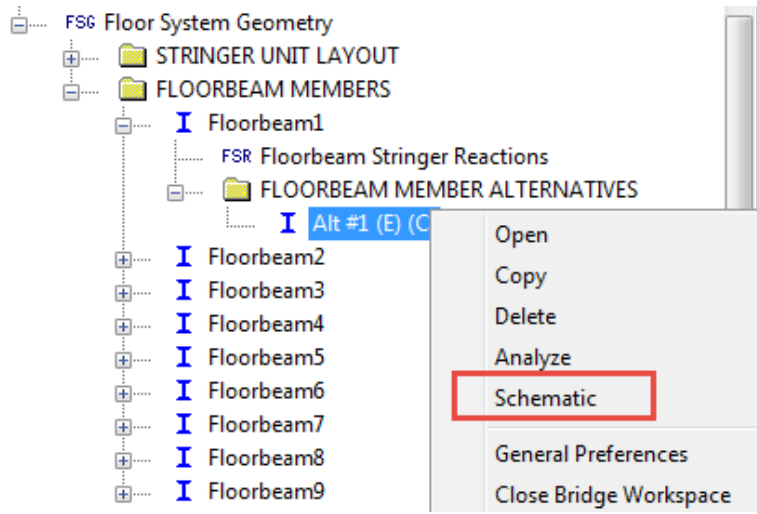
**Truss Member Properties**

Member Name	Panel Point From	Panel Point To	Length (ft)	Z Axis Unbraced Length (ft)	Y Axis Unbraced Length (ft)	Cross Section	End Connection	K
L1L2	L1	L2	6.00	6.00	6.00	Rolled Section	Pinned	0.875
L2L3	L2	L3	6.00	6.00	6.00	Rolled Section	Pinned	0.875
L3L4	L3	L4	6.00	6.00	6.00	Rolled Section	Pinned	0.875
L4L5	L4	L5	6.00	6.00	6.00	Rolled Section	Pinned	0.875
L5L6	L5	L6	6.00	6.00	6.00	Rolled Section	Pinned	0.875
U1U2	U1	U2	6.00	6.00	6.00	Rolled Section	Pinned	0.875
U2U3	U2	U3	6.00	6.00	6.00	Rolled Section	Pinned	0.875
U3U4	U3	U4	6.00	6.00	6.00	Rolled Section	Pinned	0.875
U4U5	U4	U5	6.00	6.00	6.00	Rolled Section	Pinned	0.875
U5U6	U5	U6	6.00	6.00	6.00	Rolled Section	Pinned	0.875
L1U1	L1	U1	4.00	4.00	4.00	Builtup Section	Pinned	0.875
L2U2	L2	U2	4.00	4.00	4.00	Builtup Section	Pinned	0.875
L3U3	L3	U3	4.00	4.00	4.00	Builtup Section	Pinned	0.875
L4U4	L4	U4	4.00	4.00	4.00	Builtup Section	Pinned	0.875
L5U5	L5	U5	4.00	4.00	4.00	Builtup Section	Pinned	0.875
L6U6	L6	U6	4.00	4.00	4.00	Builtup Section	Pinned	0.875
L2U1	L2	U1	7.21	7.21	7.21	Builtup Section	Pinned	0.875
L2U3	L2	U3	7.21	7.21	7.21	Builtup Section	Pinned	0.875
L3U4	L3	U4	7.21	7.21	7.21	Builtup Section	Pinned	0.875
L4U3	L4	U3	7.21	7.21	7.21	Builtup Section	Pinned	0.875
L5U4	L5	U4	7.21	7.21	7.21	Builtup Section	Pinned	0.875
L5U6	L5	U6	7.21	7.21	7.21	Builtup Section	Pinned	0.875

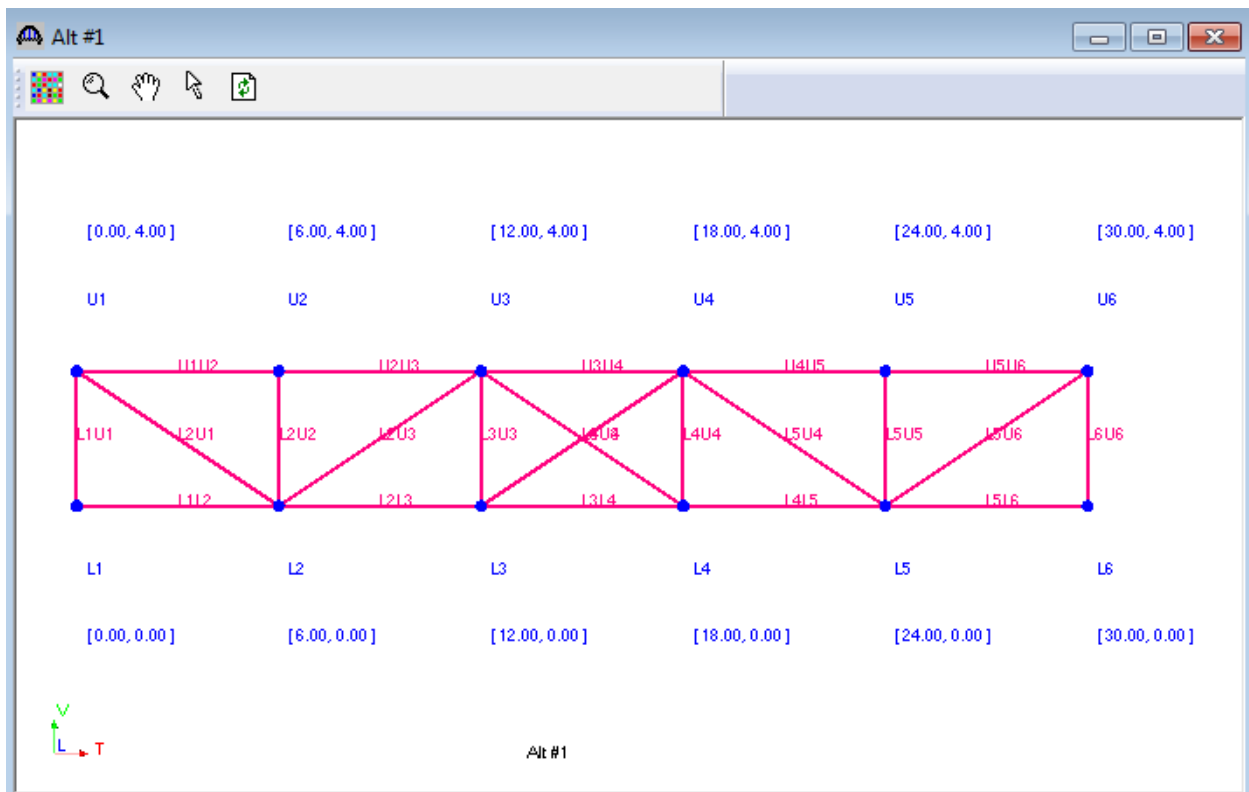
Model truss member as beam element

## T4 – Floor Truss Example

Right-click Floorbeam1's Alt #1 in the tree and select Schematic.



The truss schematic is displayed below. Check the geometry and adjust the truss members if necessary.



## T4 – Floor Truss Example

Double-click Floorbeam1's Alt #1 floorbeam member alternative in the tree.

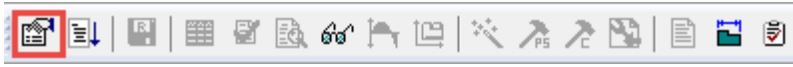
The screenshot shows the 'Floorbeam Member Alternative' dialog box. At the top, it displays 'Name: Alt #1' and 'Floorbeam Definition: Floortruss Def 1'. Below this are several tabs: 'General', 'Web Loss', 'Top Flange Loss', 'Bottom Flange Loss', 'Angle Loss', 'Top Cover Plate Loss', and 'Bottom Cover Plate Loss'. The 'General' tab is active, showing a table with the following columns: Member, Cross Section Name, Cross Section Type, Capacity (kip), Allowable Stress (ksi), and Unbraced Length (ft). The Capacity and Allowable Stress columns are further divided into 'Override', 'Tension', and 'Compression'. The Unbraced Length column is divided into 'Override', 'Z Axis', and 'Y Axis'. Each cell in the table contains a checkbox. The table lists 28 members, including L1L2 through L5U6. At the bottom right of the dialog are 'OK', 'Apply', and 'Cancel' buttons.

Member	Cross Section Name	Cross Section Type	Capacity (kip)				Allowable Stress (ksi)			Unbraced Length (ft)		
			Override	Tension	Compression	Dead Load Axial Force	Override	Tension	Compression	Override	Z Axis	Y Axis
L1L2	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L2L3	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L3L4	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L4L5	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L5L6	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
U1U2	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
U2U3	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
U3U4	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
U4U5	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
U5U6	Rolled Section	Rolled Steel Truss Cross Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L1U1	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L2U2	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L3U3	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L4U4	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L5U5	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L6U6	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L2U1	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L2U3	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L3U4	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L4U3	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L5U4	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		
L5U6	Builtup Section	Builtup Steel Truss X-Section	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>		

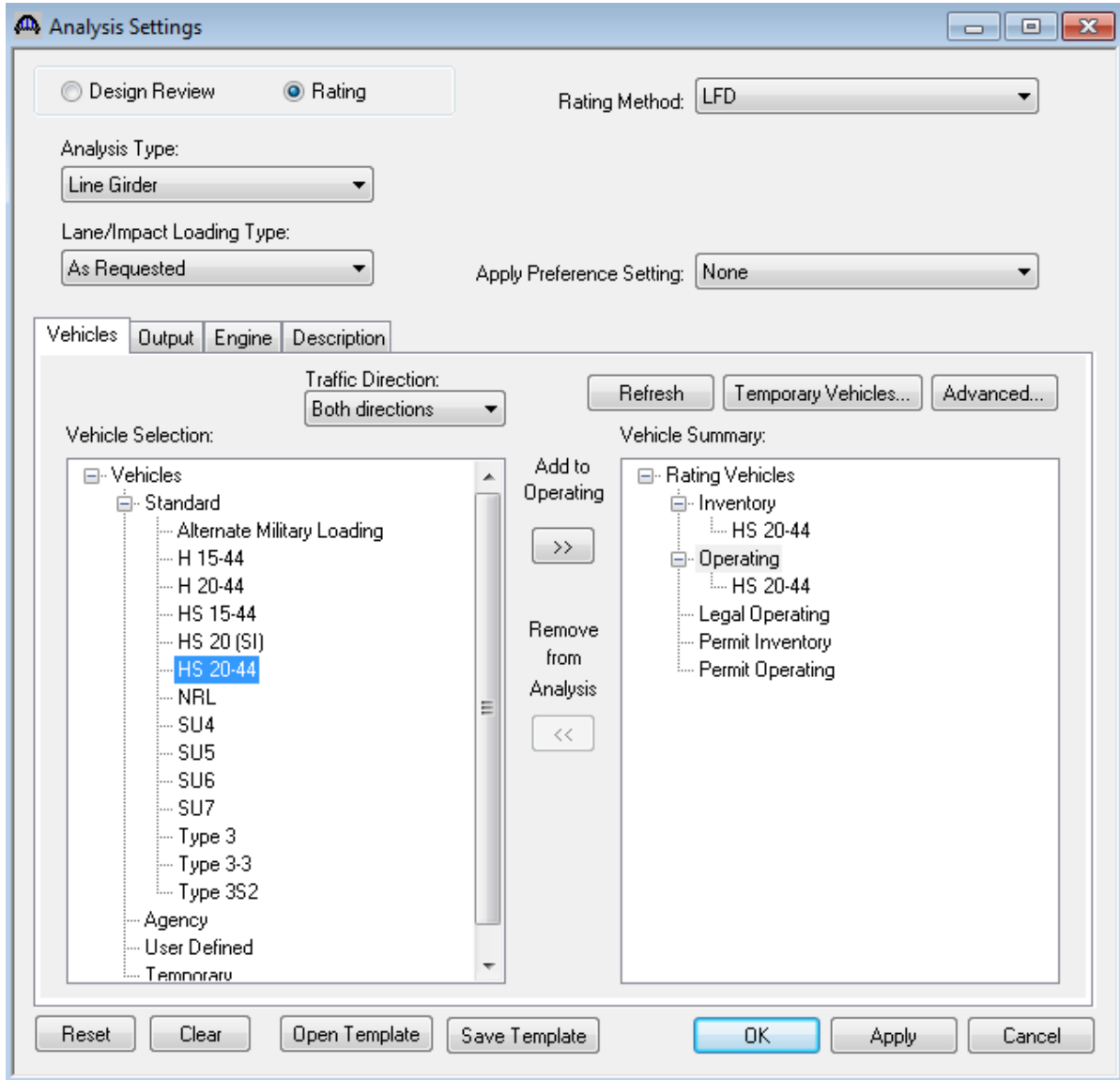
The Loss tabs allow you to describe the deteriorations of the rolled and built-up cross sections. The deterioration is defined for a truss member and described over ranges, with each range being defined by a start distance and a length.

## T4 – Floor Truss Example

Click View Analysis Settings in the Bridge Workspace toolbar to open the Analysis Settings window. Select HS 20-44 as the vehicle to be used in the rating. Click OK to save the analysis settings to memory.

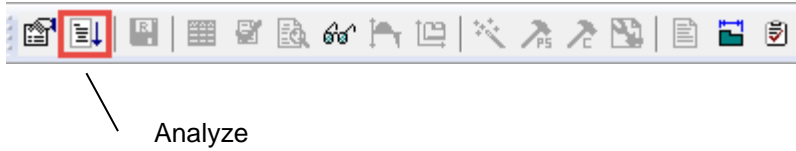


View Analysis Settings



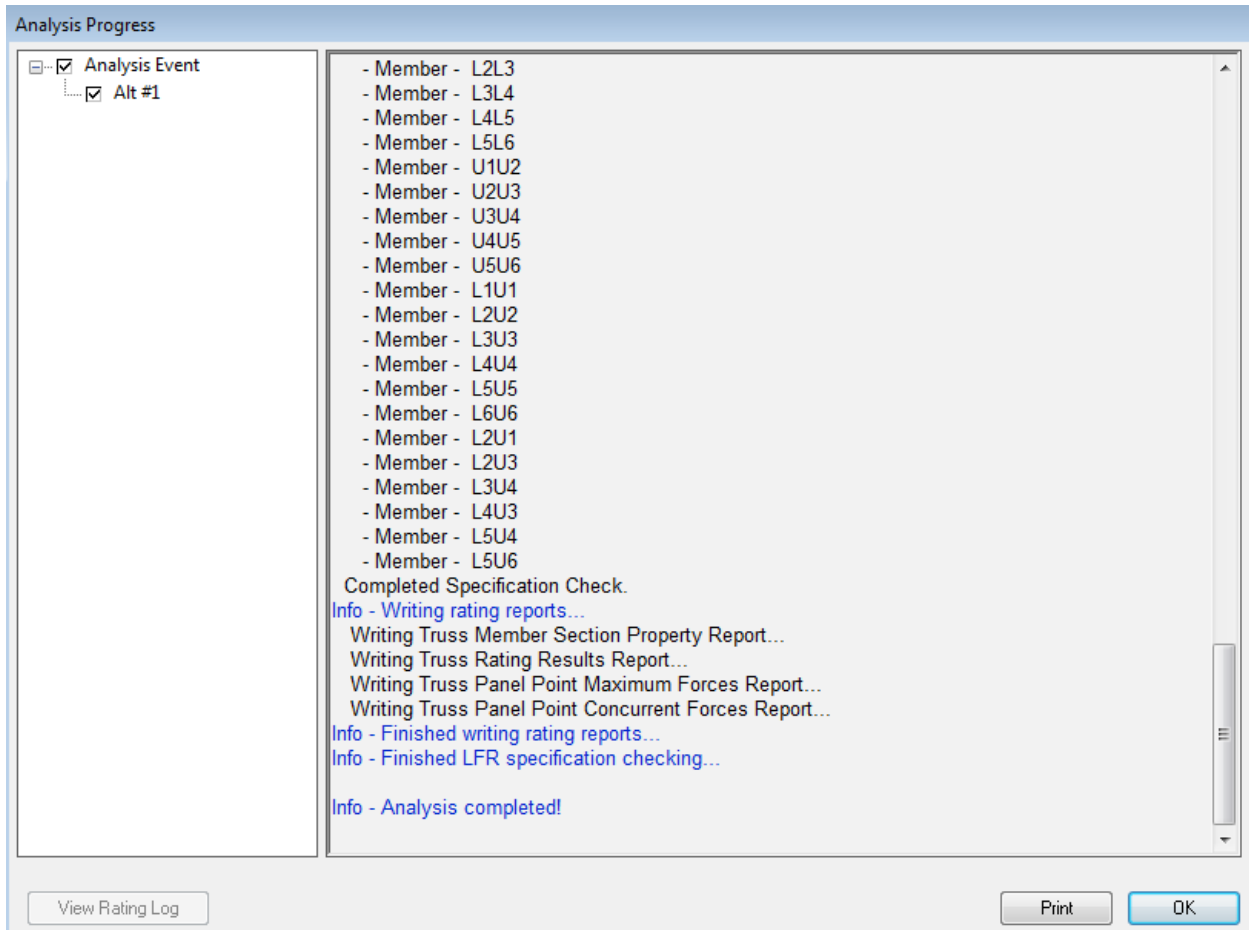
## T4 – Floor Truss Example

Select Floorbeam1's Alt #1 floorbeam member alternative in the Bridge Workspace tree. Click Analyze in the Bridge Workspace toolbar to start the analysis.



The Analysis Progress window will open. Messages in blue color are information messages. Warning messages are in green color and error messages are in red color. The Analysis Progress window indicates the analysis is successfully completed.

Click OK to close the Analysis Progress window.



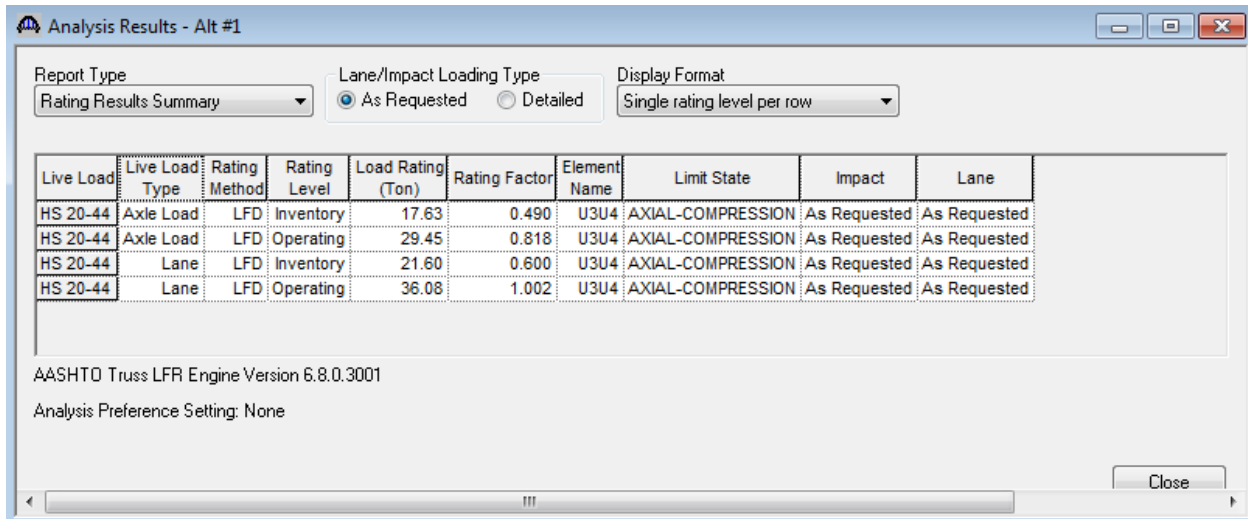
## T4 – Floor Truss Example

Click View analysis report in the Bridge Workspace toolbar to open the Analysis Results window.



View analysis report

The Rating Results Summary of Floorbeam1's Alt #1 floorbeam member alternative is shown below.



Analysis Results - Alt #1

Report Type: Rating Results Summary  
Lane/Impact Loading Type:  As Requested  Detailed  
Display Format: Single rating level per row

Live Load	Live Load Type	Rating Method	Rating Level	Load Rating (Ton)	Rating Factor	Element Name	Limit State	Impact	Lane
HS 20-44	Axle Load	LFD	Inventory	17.63	0.490	U3U4	AXIAL-COMPRESSION	As Requested	As Requested
HS 20-44	Axle Load	LFD	Operating	29.45	0.818	U3U4	AXIAL-COMPRESSION	As Requested	As Requested
HS 20-44	Lane	LFD	Inventory	21.60	0.600	U3U4	AXIAL-COMPRESSION	As Requested	As Requested
HS 20-44	Lane	LFD	Operating	36.08	1.002	U3U4	AXIAL-COMPRESSION	As Requested	As Requested

AASHTO Truss LFR Engine Version 6.8.0.3001  
Analysis Preference Setting: None

Close

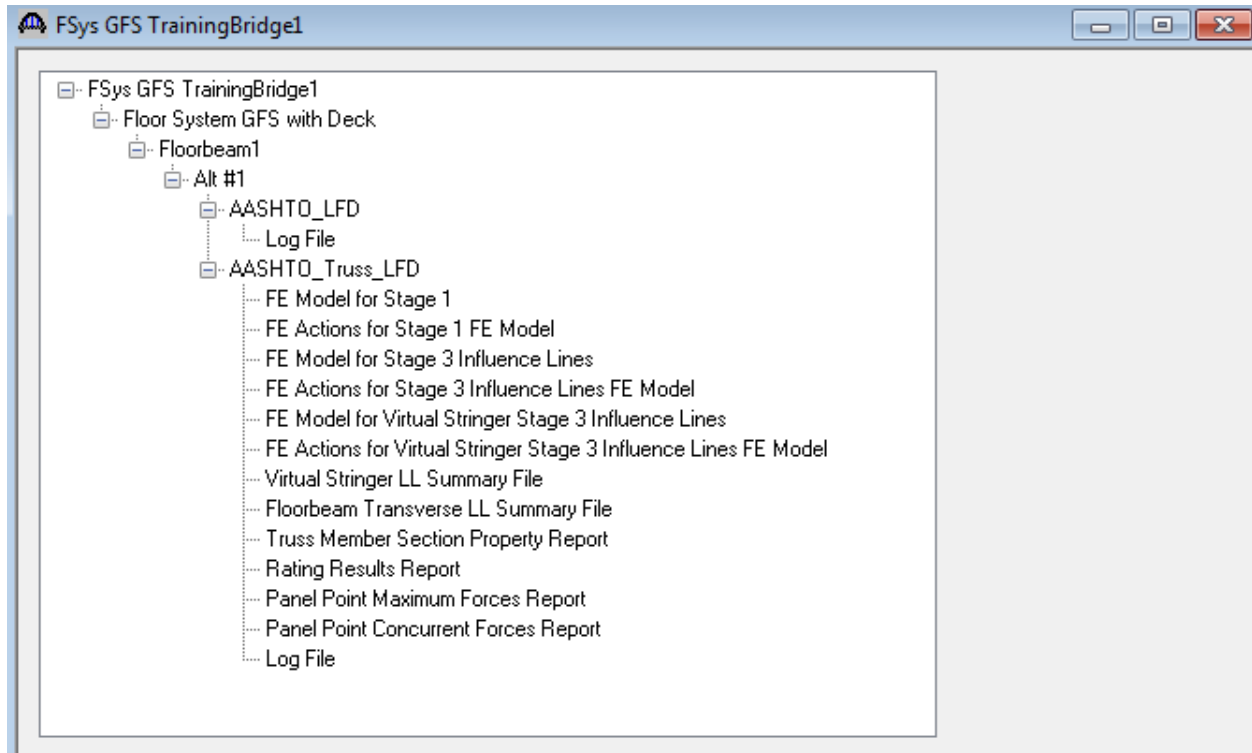


## T4 – Floor Truss Example

Click View analysis output in the Bridge Workspace toolbar to open the Analysis Output window. Double-click the name of an output file to open the file in its own viewer.



View analysis output



Description of the output files:

- FE Model for Stage 1  
The stage 1 finite element model presents the floor truss nodes, truss elements, element properties, support conditions and load cases for the dead load analysis.
- FE Actions for Stage 1 FE Model  
The stage 1 finite element result presents the support reactions, element actions and nodal displacements for each dead load case.
- FE Model for Stage 3 Influence Lines

The stage 3 influence line finite element model presents the floor truss nodes, truss elements, element properties, support conditions and load cases for the influence line analysis. Each load case represents a unit load at a panel point.

- FE Actions for Stage 3 Influence Lines FE Model

The stage 3 influence line finite element result presents the support reactions, element actions and nodal displacements for each influence line load case. The results are used to generate the axial influence lines for the truss elements and the reaction influence lines for the support nodes.

- FE Model for Virtual Stringer Stage 3 Influence Lines

The stage 3 virtual stringer influence line finite element model presents the virtual stringer nodes, beam elements, element properties, support conditions and load cases for the virtual stringer influence line analysis.

- FE Actions for Virtual Stringer Stage 3 Influence Lines FE Model

The stage 3 virtual stringer influence line finite element result presents the support reactions for each influence line load case. The results are used to generate the reaction influence line for the support node located at the floor truss.

- Virtual Stringer LL Summary File

The virtual stringer live load summary presents the reaction influence line for the support node located at the floor truss and the maximum and minimum vertical reactions for each live loading.

- Floorbeam Transverse LL Summary File

The floorbeam transverse live load summary presents the stringer reactions for each vehicle position pattern and the resulting axial force for each truss member.

- Member Section Property Report

The section properties report presents the section properties for each truss member and for each component of a truss member.

- Rating Results Report

The rating result report presents all information required to perform the rating computation.

- Panel Point Maximum Forces Report

The maximum forces report presents the maximum member forces due to dead load and live load for each truss member at each panel point.

## T4 – Floor Truss Example

- Panel Point Concurrent Forces Report

The concurrent forces report presents the concurrent member live load forces for each panel point's member under the critical live load condition.

- Log File

The log file is the analysis log produced when the analysis is run. This file may contain errors and warnings that should be reviewed.

A portion of the Member Section Property Report is shown below.

Bridge ID :FSysGFSTrainingBridge1  
 Bridge : FloorSystem GFS Training Bridge 1  
 StructDef : FloorSystemGFSwithDeck  
 User : Bridge  
 Date : Monday, July 18, 2016 10:05:22  
 File : MemSectionProperties.XML  
 Module Version : 1.1

NBI Structure ID :FS1TrainingBrdg  
 Bridge Alt :  
 Member : Floorbeam1

**Truss Member Section Property Summary**

Member	Gross Area Comp. (in <sup>2</sup> )	Gross Area Tens. (in <sup>2</sup> )	Net Area Tens. (in <sup>2</sup> )	Izz (in <sup>4</sup> )	Cy (in)	Rz (in)	Iyy (in <sup>4</sup> )	Cz (in)	Ry (in)	Actual Length (ft)	Unbraced Length z (ft)	Unbraced Length y (ft)	Fy (ksi)
L1L2	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
L2L3	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
L3L4	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
L4L5	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
L5L6	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
U1U2	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
U2U3	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
U3U4	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
U4U5	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
U5U6	5.87	5.87	5.87	41.40	3.10	2.66	13.30	0.00	1.51	6.00	6.00	6.00	36.00
L1U1	10.13	10.13	9.50	74.55	3.38	2.71	17.01	0.00	1.30	4.00	4.00	4.00	36.00
L2U2	10.13	10.13	9.50	74.55	3.38	2.71	17.01	0.00	1.30	4.00	4.00	4.00	36.00
L3U3	10.13	10.13	9.50	74.55	3.38	2.71	17.01	0.00	1.30	4.00	4.00	4.00	36.00
L4U4	10.13	10.13	9.50	74.55	3.38	2.71	17.01	0.00	1.30	4.00	4.00	4.00	36.00

T4 – Floor Truss Example

A portion of the Rating Results Report is shown below.

Bridge ID :FSysGFSTrainingBridge1  
 Bridge : FloorSystem GFS Training Bridge 1  
 StructDef : FloorSystemGFSwithDeck  
 User : Bridge  
 Date : Monday, July 18, 2016 10:05:22  
 File : RatingResults.XML  
 Analysis Preference Setting : None

NBI Structure ID :FS1TrainingBrdg  
 Bridge Alt :  
 Member : Floorbeam1

**Overall Load Factor Rating Summary**

Live Load	Live Load Type	Inv Element	Inv RF	Inv Capacity (Ton)	Opr Element	Opr RF	Opr Capacity (Ton)	Legal Opr Element	Legal Opr RF	Legal Opr Capacity (Ton)	Permit Inv Element	P
HS 20-44 - Lane	Design Lane	U3U4	0.600	21.60	U3U4	1.002	36.08					
HS 20-44 - Lane	Design Lane	U3U4	0.600	21.60	U3U4	1.002	36.08					
HS 20-44 - Truck	Design Truck	U3U4	0.490	17.63	U3U4	0.818	29.45					
HS 20-44 - Truck	Design Truck	U3U4	0.490	17.63	U3U4	0.818	29.45					

A portion of the Panel Point Maximum Forces Report is shown below.

**Live Load: HS 20-44 - Truck (Design Truck and Design Lane)**

As Requested Impact: With Impact

As Request Lane: Multi-Lane

LL Scale Factor: 1.00

Panel Point (ft)	Member	Theta (Degrees)	DL Force (kip)	LL Force (kip)		
				Compression	Tension	
L1 [0.00, 0.00]	L1L2	0.00	0.00			
	L1U1	90.00	-0.00	-0.00 (T)		
	<b>Net Longitudinal Force:</b>		0.00	0.00		
	<b>Net Vertical Force:</b>		0.00	0.00		
U1 [0.00, 4.00]	U1U2	0.00	-21.77	-80.51 (T)		
	L1U1	270.00	-0.00	-0.00 (T)		
	L2U1	326.31	26.16		96.76 (T)	
	<b>Net Longitudinal Force:</b>		0.00	0.00		
	<b>Net Vertical Force:</b>		14.51	53.67		