

AASHTOWare BrDR 7.5.0

Floor System Tutorial

FS4 – Skewed End Panel Floor System Example

FS4 – Skewed End Panel Floor System Example

Topics Covered

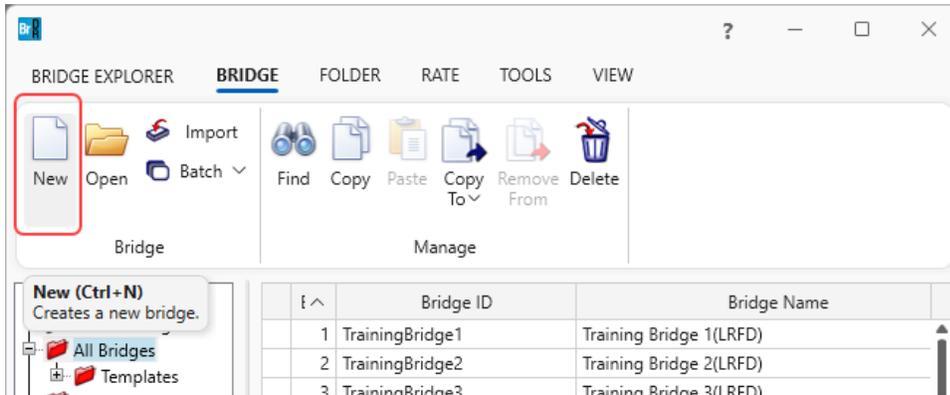
- Superstructure composed of girders, floorbeams and stringers
- System Superstructure Definition
- Skewed end panels
- Mirroring stringer group definitions when they are assigned to stringer units

This example demonstrates entering a Girder-Floorbeam-Stringer superstructure with skewed end panels in BrDR using the system superstructure definition approach. The focus of this example is the skewed end panels and geometry of the system. This is an advanced example and it is assumed that the user is familiar with the basics of BrDR. As such, several of the details of this example such as creating bridge materials, beam shapes, etc., are not presented .

FS4 – Skewed End Panel Floor System Example

Superstructure composed of girders, floorbeams and stringers

From the **Bridge Explorer** create a **New** bridge as shown below.



Enter the following description data.

Bridge ID: Skewed End Panel NBI structure ID (8): Skewed End Panel Template Superstructures
 Bridge completely defined Culverts
 Substructures

Description Description (cont'd) Alternatives Global reference point Traffic Custom agency fields

Name: Skewed End Panel GFS System Year built:

Description:

Location: Length: ft

Facility carried (7): Route number: -1

Feat. intersected (6): Mi. post:

Default units: US Customary

Bridge association... BrR BrD BrM

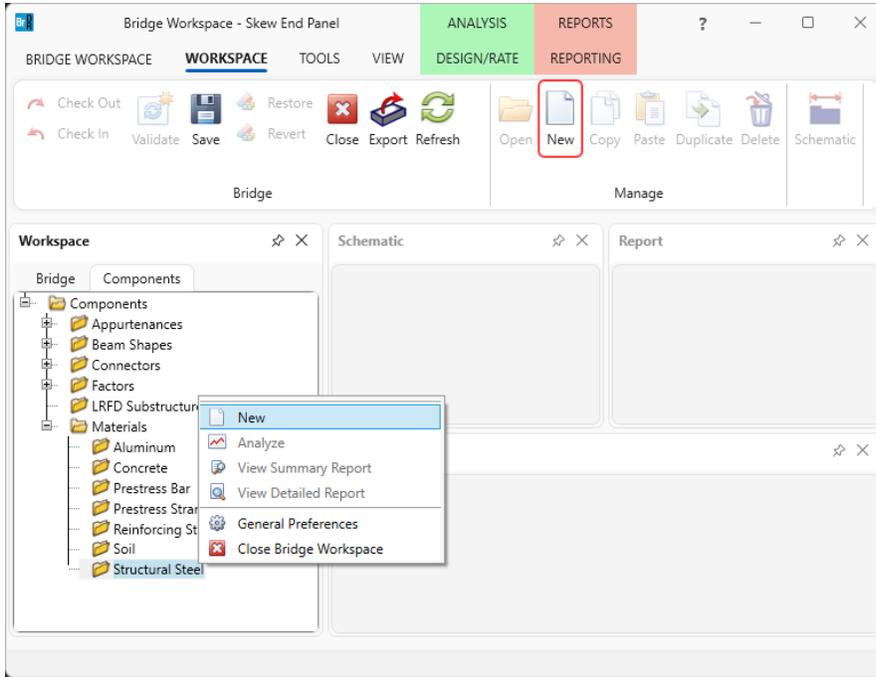
OK Apply Cancel

Click **OK** to apply the data and close the window.

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Bridge Materials

To enter a structural steel material to be used by members of the bridge, in the **Components** tab of the **Bridge Workspace**, expand the **Materials** folder, select **Structural Steel**, and click on the **New** button from the **Manage** group of the **WORKSPACE** ribbon (or right click and select **New**, or double click) as shown below.



Enter data as shown below.

The screenshot shows the Bridge Materials - Structural Steel dialog box. It contains the following fields and values:

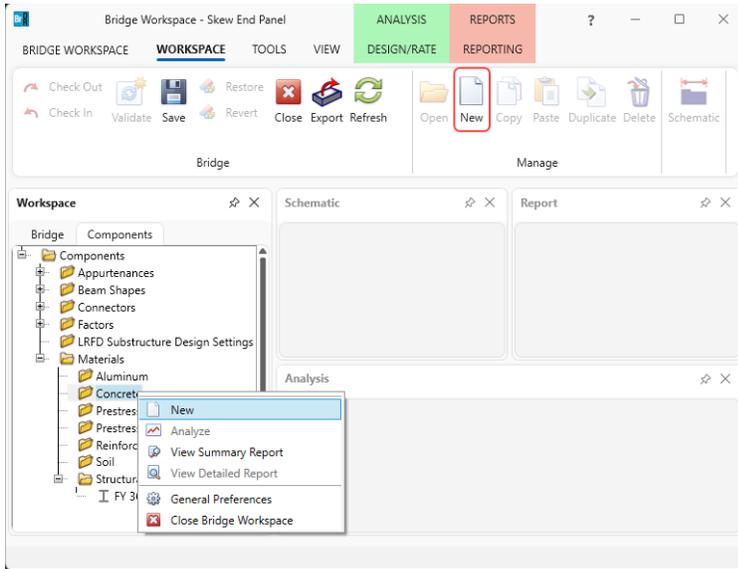
Field	Value	Unit
Name:	FY 36 ksi steel	
Description:	Built after 1963 - 36 ksi steel	
Material properties		
Specified minimum yield strength (Fy):	36	ksi
Specified minimum tensile strength (Fu):		ksi
Coefficient of thermal expansion:	0.000065	1/F
Density:	0.49	kcf
Modulus of elasticity (E):	29000	ksi

At the bottom of the dialog box, there are five buttons: Copy to library..., Copy from library..., OK, Apply, and Cancel.

Click **OK** to apply the data and close the window.

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Similarly, add the following concrete material.



Enter the values shown above the **Compute** button and click the **Compute** button to compute the remaining values below them.

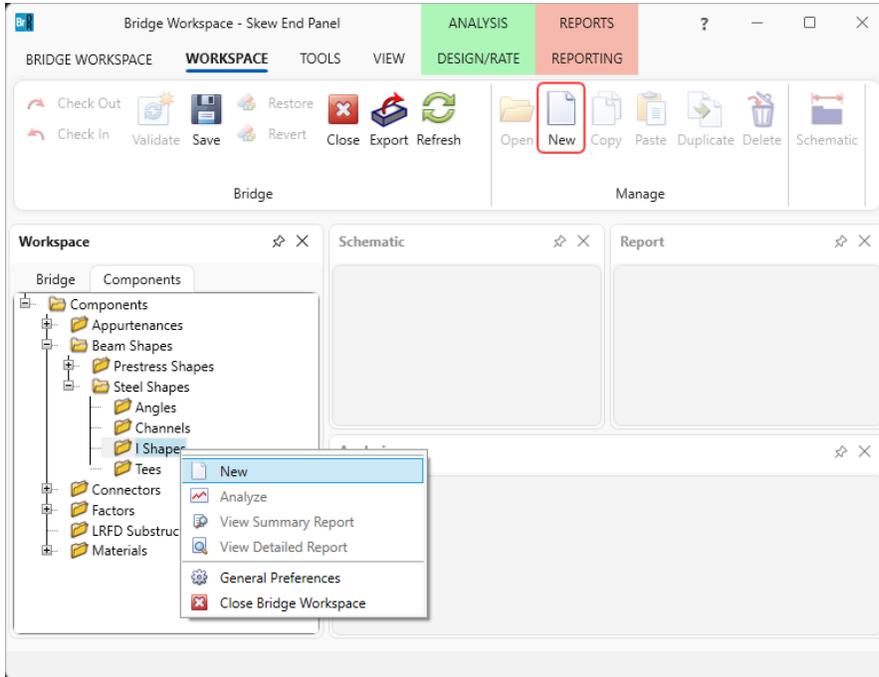
Name:	<input type="text" value="3 ksi cement concrete"/>
Description:	<input type="text" value="class A cement concrete 3 ksi"/>
Compressive strength at 28 days (f'c):	<input type="text" value="3"/> ksi
Initial compressive strength (f'ci):	<input type="text"/> ksi
Composition of concrete:	<input type="text" value="Normal"/>
Density (for dead loads):	<input type="text" value="0.15"/> kcf
Density (for modulus of elasticity):	<input type="text" value="0.145"/> kcf
Poisson's ratio:	<input type="text" value="0.2"/>
Coefficient of thermal expansion (α):	<input type="text" value="0.000006"/> 1/F
Splitting tensile strength (f'ct):	<input type="text"/> ksi
LRFD Maximum aggregate size:	<input type="text"/> in
Compute	
Std modulus of elasticity (Ec):	<input type="text" value="3155.924251"/> ksi
LRFD modulus of elasticity (Ec):	<input type="text" value="3625.494616"/> ksi
Std initial modulus of elasticity:	<input type="text"/> ksi
LRFD initial modulus of elasticity:	<input type="text"/> ksi
Std modulus of rupture:	<input type="text" value="0.410792"/> ksi
LRFD modulus of rupture:	<input type="text" value="0.415692"/> ksi
Shear factor:	<input type="text" value="1"/>

Click **OK** to apply the data and close the window.

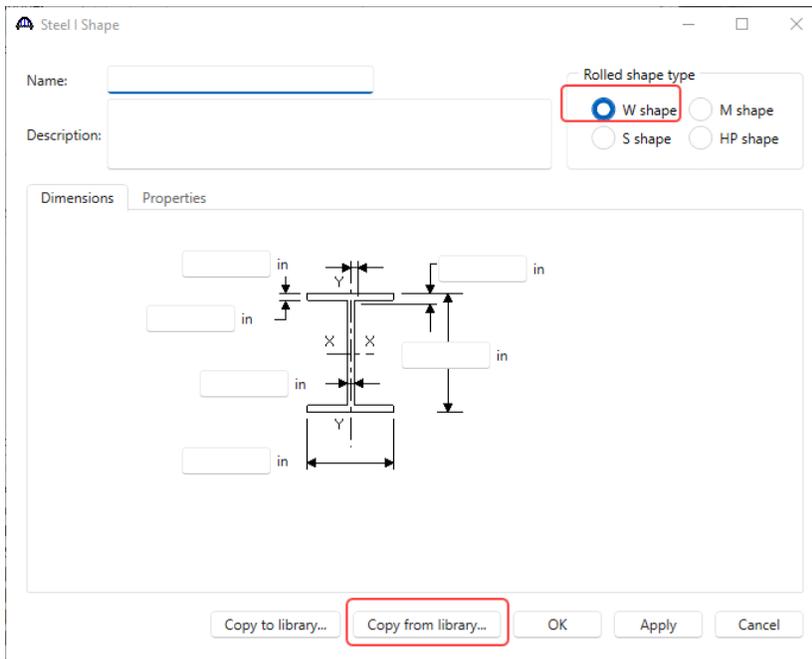
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Beam Shapes

To enter a steel beam shape to be used in this bridge expand the tree labeled **Beam Shapes** and **Steel Shapes**. Click on the **I Shapes** node in the **Components** tree and select **New** from the **Manage** group of the **WORKSPACE** ribbon (or right mouse click on **I Shapes** and select **New** or double click on **I Shapes** in the **Components** tree).



The window shown below will open. Select the **Rolled shape type** as **W shape** and click the **Copy from library...** button.



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The **Steel Shape Selection** window will appear. Copy the following steel beam shape from the library to the bridge. This shape will be used for the stringers in this superstructure.

Steel Shape Selection

Library: Standard, Agency defined

Unit system: SI, US

Shape	Year	Depth (in)	Load (lb/ft)	Sxx (in ³)
W 21x55	2011	20.8	55	109.6153846
W 21x57	2011	21.1	57	110.9004739
W 21x57	1994	21.06	57	111.1111111
> W 21x62	1994	20.99	62	126.7270129
W 21x62	2011	21	62	126.6666667
W 21x68	1994	21.13	68	140.0851869

OK Cancel

The beam properties are copied to the **Steel I Shape** window as shown below.

Steel I Shape

Name: W 21x62

Description: W 21x62 Imported from AISC Tables (1994)

Rolled shape type: W shape, M shape, S shape, HP shape

Dimensions Properties

0.615 in, 0.4 in, 8.24 in, 1.375 in, 20.99 in

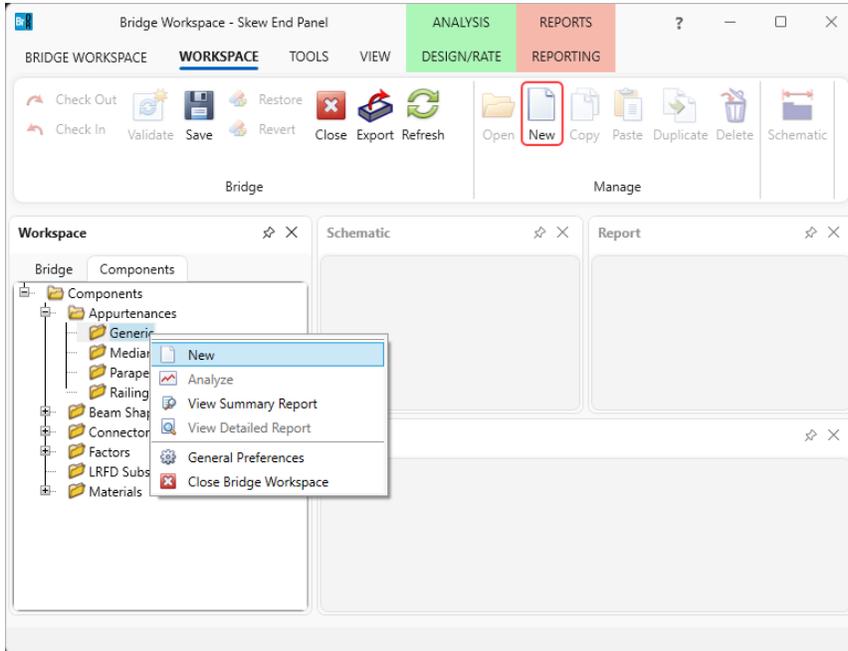
Copy to library... Copy from library... OK Apply Cancel

Click **OK** to apply the data and close the window.

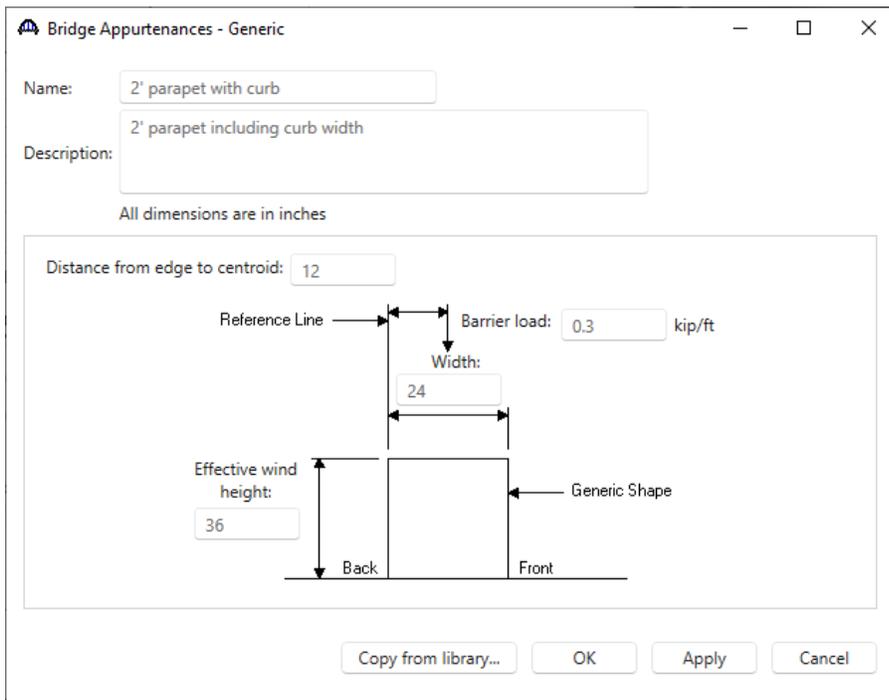
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Bridge Appurtenances - Parapet

To enter the appurtenances to be used within the bridge expand the tree branch labeled **Appurtenances**. Select **Generic** and click on **New** from the **Manage** button on the **WORKSPACE** ribbon (or double click on **Generic** in the **Components** tree).



Add the following appurtenance to the bridge.

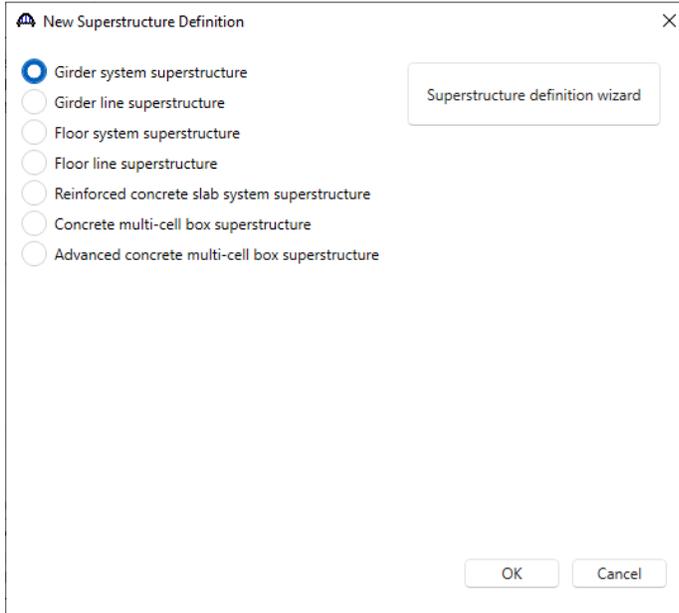


Click **OK** to apply the data and close the window.

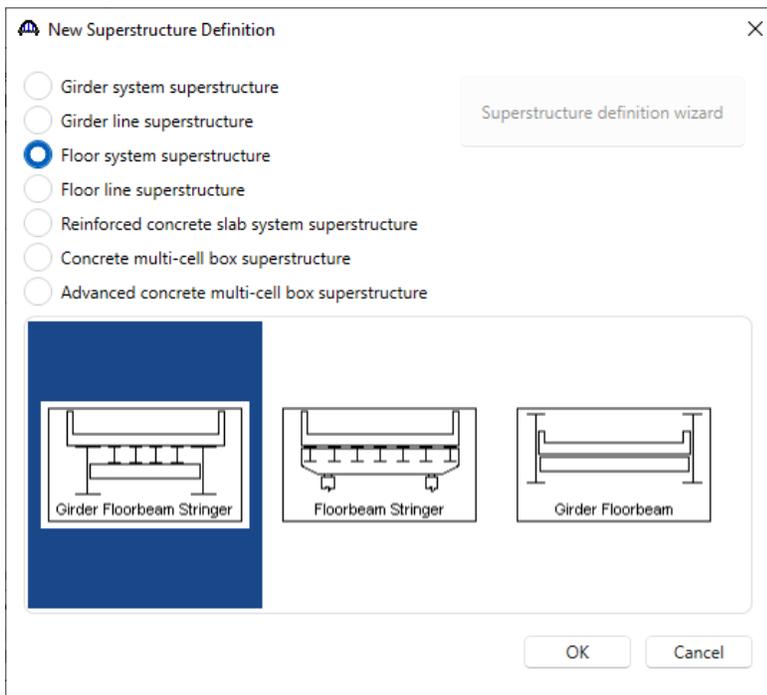
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Superstructure definition

Returning to the **Bridge** tab of the **Bridge Workspace**, double click on **SUPERSTRUCTURE DEFINITIONS** (or click on **SUPERSTRUCTURE DEFINITIONS** and select **New** from the **Manage** group of the **WORKSPACE** ribbon or right mouse click on **SUPERSTRUCTURE DEFINITIONS** and select **New** from the popup menu) to create a new structure definition. The window shown below will appear.



Selecting **Floor system superstructure** displays three types of floor system superstructure definitions. Select the **Girder Floorbeam Stringer** and click **OK**.



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Girder Floorbeam Stringer Floor System Superstructure Definition

The **Girder Floorbeam Stringer Floor System Superstructure Definition** window will open. Enter the data as shown below.

Definition Analysis Engine

Name: Floor system with skewed end panels

Description:

Default units: US Customary

Number of main members: 2

Main member number of spans: 1

Main members support the deck:

Main member configuration: Deck

Number of stringers: 4

Stringers frame into floorbeam:

Number of stringer units: 3

Main member span lengths along the reference line:

Span	Length (ft)
1	70

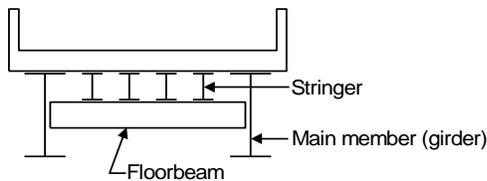
Deck type: Concrete Deck

Member alt. types

- Steel
- P/S
- R/C
- Timber

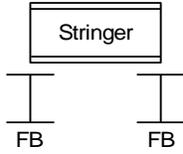
OK Apply Cancel

As shown by the sketch, this structure has 2 main members (girders) and 4 stringers.

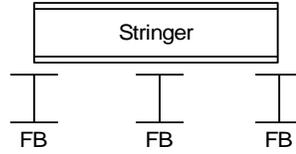


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Stringer Units are the portions of the structure where the stringers are to be analyzed as structurally continuous units. In this structure, the stringers in the skewed end panels are simple span between the floorbeams and the stringers in the interior panels are 2 span continuous.

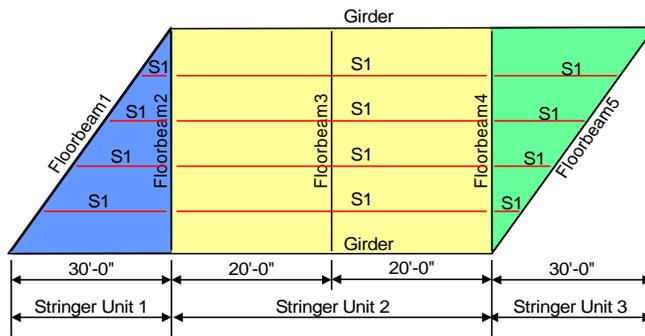


In the skewed end panels, the stringers are 1 simple span over 2 floorbeams.



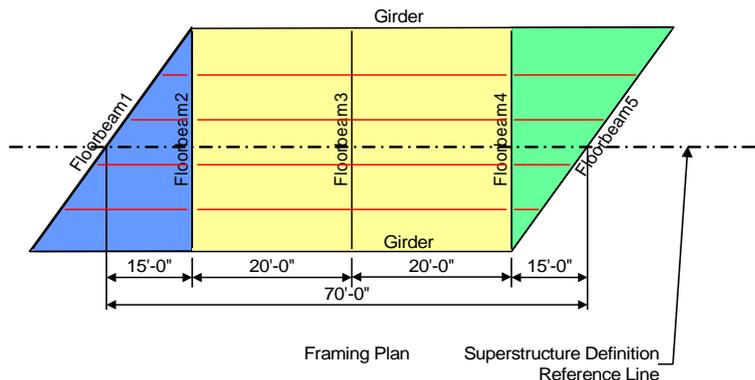
In the interior panels, the stringers are 2 continuous spans over 3 floorbeams.

This superstructure has 3 stringer units. Each stringer unit contains 4 stringer members.



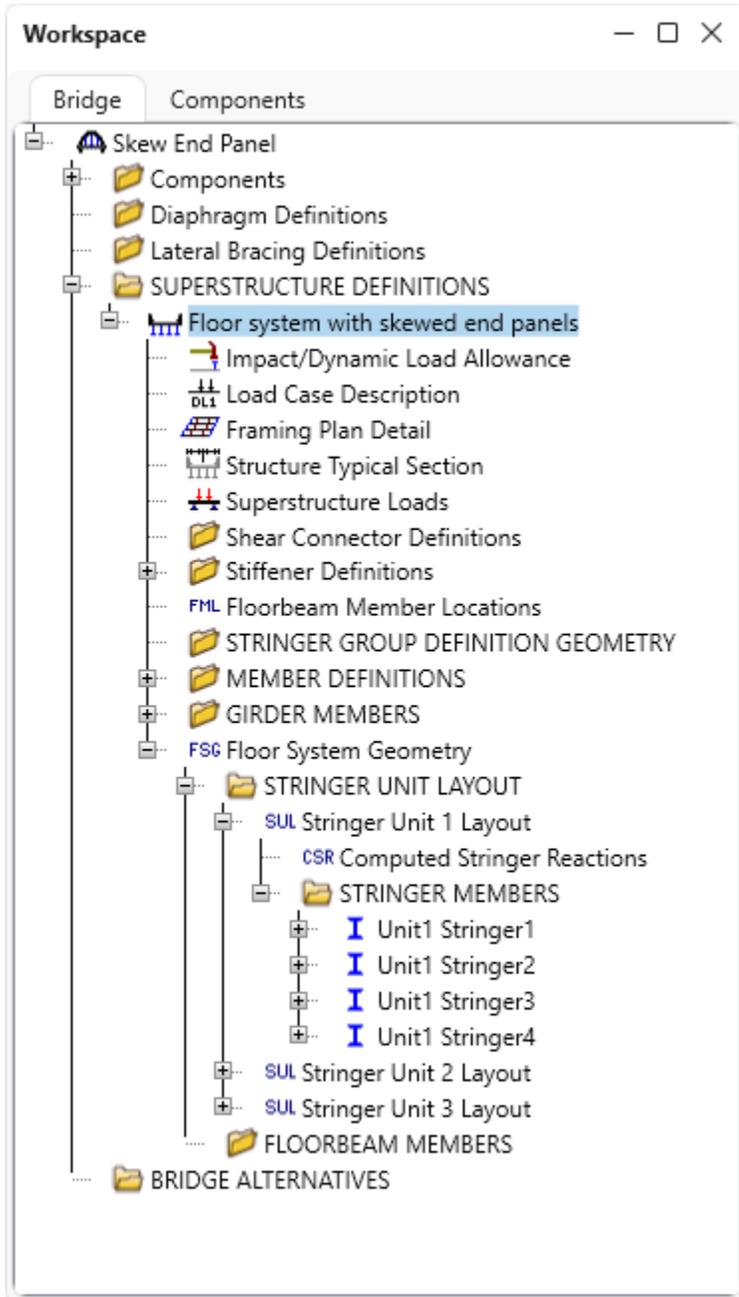
Framing Plan
(Stringers are shown in red)
There are 3 Stringer Units in this superstructure definition

The span lengths for the main members are entered along the superstructure definition reference line. In this example, the superstructure definition reference line is located in the center of the deck. It has the following dimensions. As can be seen by this example, it is important to know where the superstructure definition reference line is located within the structure typical section when the main girder supports are skewed.



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The partially expanded **Bridge Workspace (BWS)** tree is shown below:



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Load Case Description

Double click on the **Load Case Description** node to define the dead load cases. Click on the **Add default load case description** button to create the following load cases.

Load case name	Description	Stage	Type	Time* (days)
DC1	DC acting on non-composite section	Non-composite (Stage 1)	D,DC	
DC2	DC acting on long-term composite section	Composite (long term) (Stage 2)	D,DC	
DW	DW acting on long-term composite section	Composite (long term) (Stage 2)	D,DW	
> SIP Forms	Weight due to stay-in-place forms	Non-composite (Stage 1)	D,DC	

*Prestressed members only

Buttons: New, Duplicate, Delete, OK, Apply, Cancel

Click **OK** to apply the data and close the window.

Structure Framing Plan Detail – Layout

Double-click on **Framing Plan Detail** in the **Bridge Workspace** tree to describe the framing plan in the **Structure Plan Details** window. Enter the data as shown below.

Number of main member spans: 1 Number of main members: 2 Number of stringers: 4

Layout Diaphragms

Main member support skew:

Support	Skew (degrees)
> 1	45
2	45

Member spacing orientation:

Perpendicular to member
 Along support

Main member spacing:

Girder bay	Start of member	End of member
> 1	30	30

Stringer spacing:

Stringer bay	Stringer spacing (ft)	
	Start of stringer	End of stringer
> 1	6	6
2	6	6
3	6	6

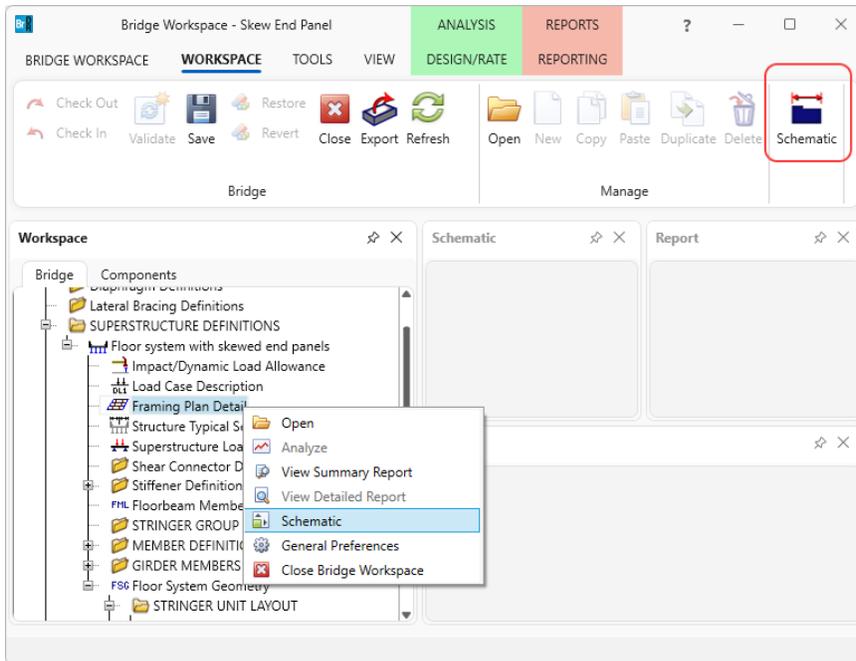
Buttons: OK, Apply, Cancel

This superstructure does not have any lateral bracing between the girders no data will be entered on the **Diaphragms** tab. Click **OK** to apply the data and close the window.

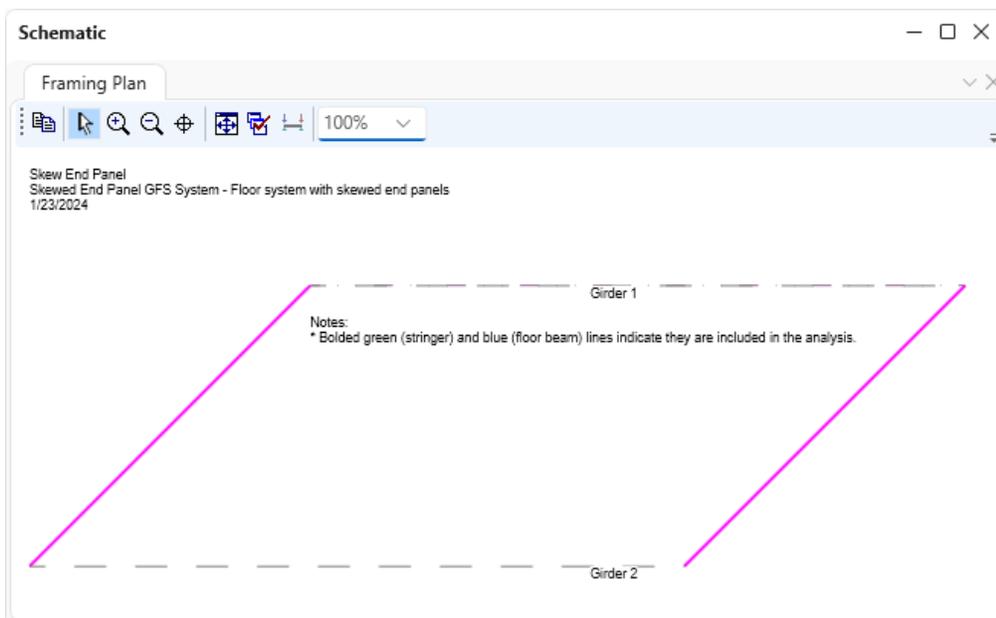
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Schematic – Framing Plan Detail

While the **Framing Plan Detail** node is selected in the **Bridge Workspace** tree, open the schematic for the framing plan by selecting the **Schematic** button on the **WORKSPACE** ribbon (or right click on **Framing Plan Detail** in the Bridge Workspace and select **Schematic** from the menu). The girders appear as dashed lines because no girder member alternatives are defined yet. The stringers do not appear in the framing plan yet because the stringer members are not located along the length of the superstructure yet. The floorbeams do not appear either because information about the number of floorbeams or where they are located are not defined yet.



The **Structure Framing Plan Schematic** appears as follows.



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Structure Typical Section

Next define the structure typical section by double-clicking on **Structure Typical Section** node in the **Bridge Workspace** tree. Input the data describing the typical section in each of the tabs shown below.

Structure Typical Section

Distance from left edge of deck to superstructure definition ref. line: 17 ft

Distance from right edge of deck to superstructure definition ref. line: 17 ft

Superstructure Definition Reference Line

Left edge of deck to first stringer: 8 ft

Left edge of deck to first main member: 2 ft

Deck (cont'd) Parapet Median Railing Generic Sidewalk Lane position Striped lanes Wearing surface

Superstructure definition reference line is within the bridge deck.

Start End

Distance from left edge of deck to superstructure definition reference line: 17 ft 17 ft

Distance from right edge of deck to superstructure definition reference line: 17 ft 17 ft

Left edge of deck to first main member: 2 ft 2 ft

Left edge of deck to first stringer: 8 ft 8 ft

OK Apply Cancel

Structure Typical Section

Distance from left edge of deck to superstructure definition ref. line: 17 ft

Distance from right edge of deck to superstructure definition ref. line: 17 ft

Superstructure Definition Reference Line

Left edge of deck to first stringer: 8 ft

Left edge of deck to first main member: 2 ft

Deck Deck (cont'd) Parapet Median Railing Generic Sidewalk Lane position Striped lanes Wearing surface

Deck concrete: 3 ksi cement concrete

Total deck thickness: 9 in

Load case: Engine Assigned

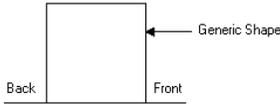
Deck crack control parameter: kip/in

Sustained modular ratio factor:

OK Apply Cancel

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Structure Typical Section



Generic Shape

Back Front

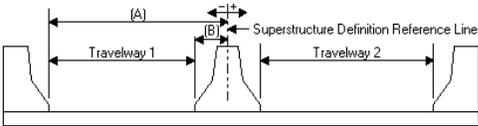
Deck Deck (cont'd) Parapet Median Railing **Generic** Sidewalk Lane position Striped lanes Wearing surface

Name	Load case	Measure to	Edge of deck dist. measured from	Distance at start (ft)	Distance at end (ft)	Front face orientation
> 2' parapet with curb	DC2	Back	Left Edge	0	0	Right
2' parapet with curb	DC2	Back	Right Edge	0	0	Left

New Duplicate Delete

OK Apply Cancel

Structure Typical Section



Travelway 1 Travelway 2 Superstructure Definition Reference Line

Deck Deck (cont'd) Parapet Median Railing Generic Sidewalk **Lane position** Striped lanes Wearing surface

Travelway number	Distance from left edge of travelway to superstructure definition reference line at start (A) (ft)	Distance from right edge of travelway to superstructure definition reference line at start (B) (ft)	Distance from left edge of travelway to superstructure definition reference line at end (A) (ft)	Distance from right edge of travelway to superstructure definition reference line at end (B) (ft)
> 1	-15	15	-15	15

LRFD fatigue

Lanes available to trucks:

Override Truck fraction:

Compute

New Duplicate Delete

OK Apply Cancel

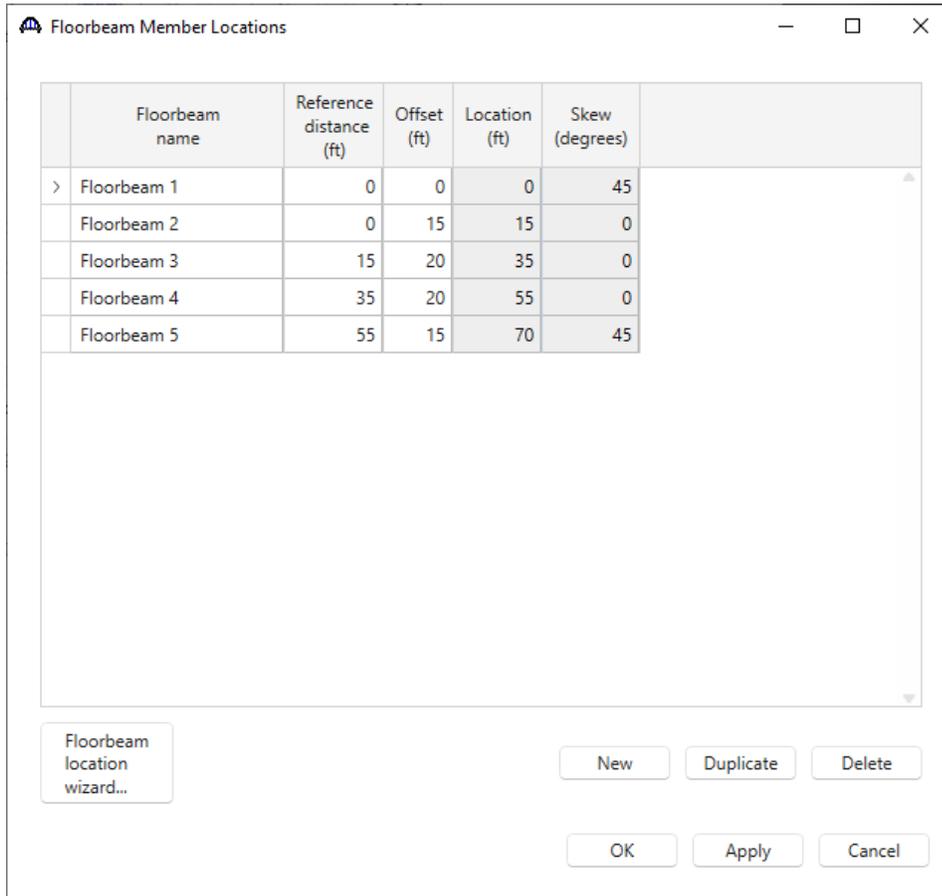
Click **OK** to apply the data and close the window.

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This superstructure does not contain any transverse or bearing stiffeners so no stiffener definitions will be created.

Floorbeam Member Locations

Double click on the **Floorbeam Member Locations** node in the **Bridge Workspace** tree to open the **Floorbeam Member Locations** window and enter the data as shown below.



	Floorbeam name	Reference distance (ft)	Offset (ft)	Location (ft)	Skew (degrees)	
>	Floorbeam 1	0	0	0	45	
	Floorbeam 2	0	15	15	0	
	Floorbeam 3	15	20	35	0	
	Floorbeam 4	35	20	55	0	
	Floorbeam 5	55	15	70	45	

Floorbeam location wizard...

New Duplicate Delete

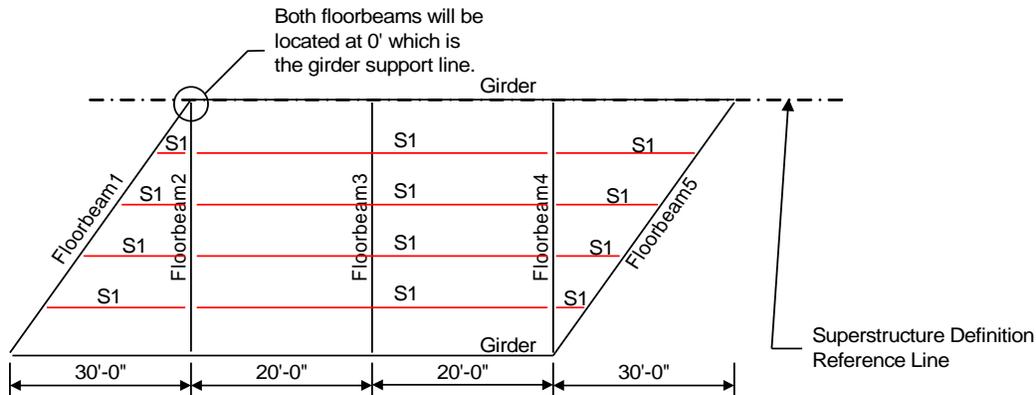
OK Apply Cancel

Click **OK** to apply the data and close the window.

The Skew column displays the skew angle of the floorbeam. Floorbeams that intersect the superstructure definition reference line at the same location as a support line for the main members are assumed to be at the same skew angle as the support line. Otherwise, all floorbeams are assumed to be perpendicular to the superstructure definition reference line. If this superstructure had floorbeams that were skewed and not located at a support line, floor line superstructure definition should be used to describe this superstructure.

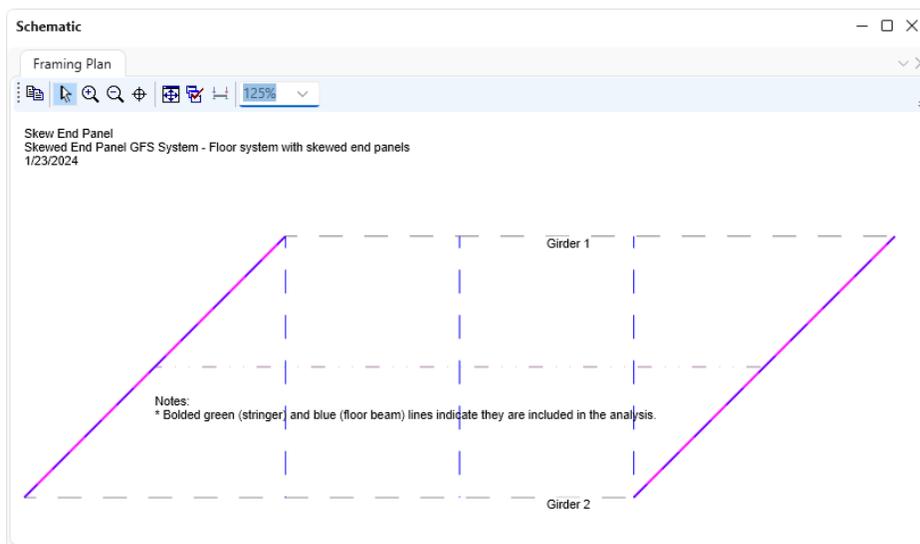
FS4 – Skewed End Panel Floor System Example

An important item to note about a floor system with skewed support lines is that the location of the superstructure definition reference line within the structure typical section is important. Consider the following example where the superstructure definition reference line is located along the left main girder. Floorbeam 1 and 2 will both be located at 0' which is the girder support line. Therefore, both Floorbeam 1 and 2 will display the skew angle as 45 degrees. Shifting the location of the superstructure definition reference line will cause the floorbeams to have different locations and then only Floorbeam 1 will be considered to be along the girder support line and skewed.



Schematic – Framing Plan Detail

While **Framing Plan Detail** is selected in the **Bridge Workspace** tree, open the schematic for the framing plan by selecting the **Schematic** button on the **WORKSPACE** ribbon (or right click on **Framing Plan Detail** in the Bridge Workspace and select **Schematic** from the menu). The framing plan schematic will now show the floorbeam members as dashed locations. The superstructure definition reference line is now displayed in the schematic since it was located in the **Structure Typical Section** window.



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STRINGER GROUP DEFINITION GEOMETRY

Double click on **STRINGER GROUP DEFINITION GEOMETRY** to define the geometry for a stringer group definition. A stringer group definition contains data regarding a portion of the structure where the stringers are structurally continuous. The stringers in this structure have two different types of span data. The skewed end panels are simple span, and the interior panels are 2 span continuous. 2 stringer group definitions will be created and assigned to the appropriate stringer units.

Enter the following data to describe the stringer group definition for end panels.

Stringer Group Definition Geometry

Name: End Panel Group Def Description:

Stringer span lengths Diaphragms

Number of floorbeams that support this stringer group definition: 2

All floorbeams are perpendicular to the structure definition reference line: Yes No

Floorbeam spacings

Select the floorbeam spacings which can be used to define the stringer span lengths in this stringer group definition:

Possible floorbeam spacing (ft)

- 15.0000
- 20.0000

Floorbeam spacing (ft)	Skew angle (degrees)	Stringer support	Offset/cantilever length (ft)
0	45.000	Simple	0
15	0.000	Simple	0

Computed resulting stringer span lengths

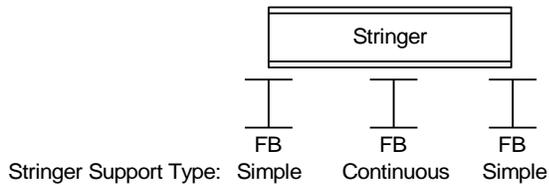
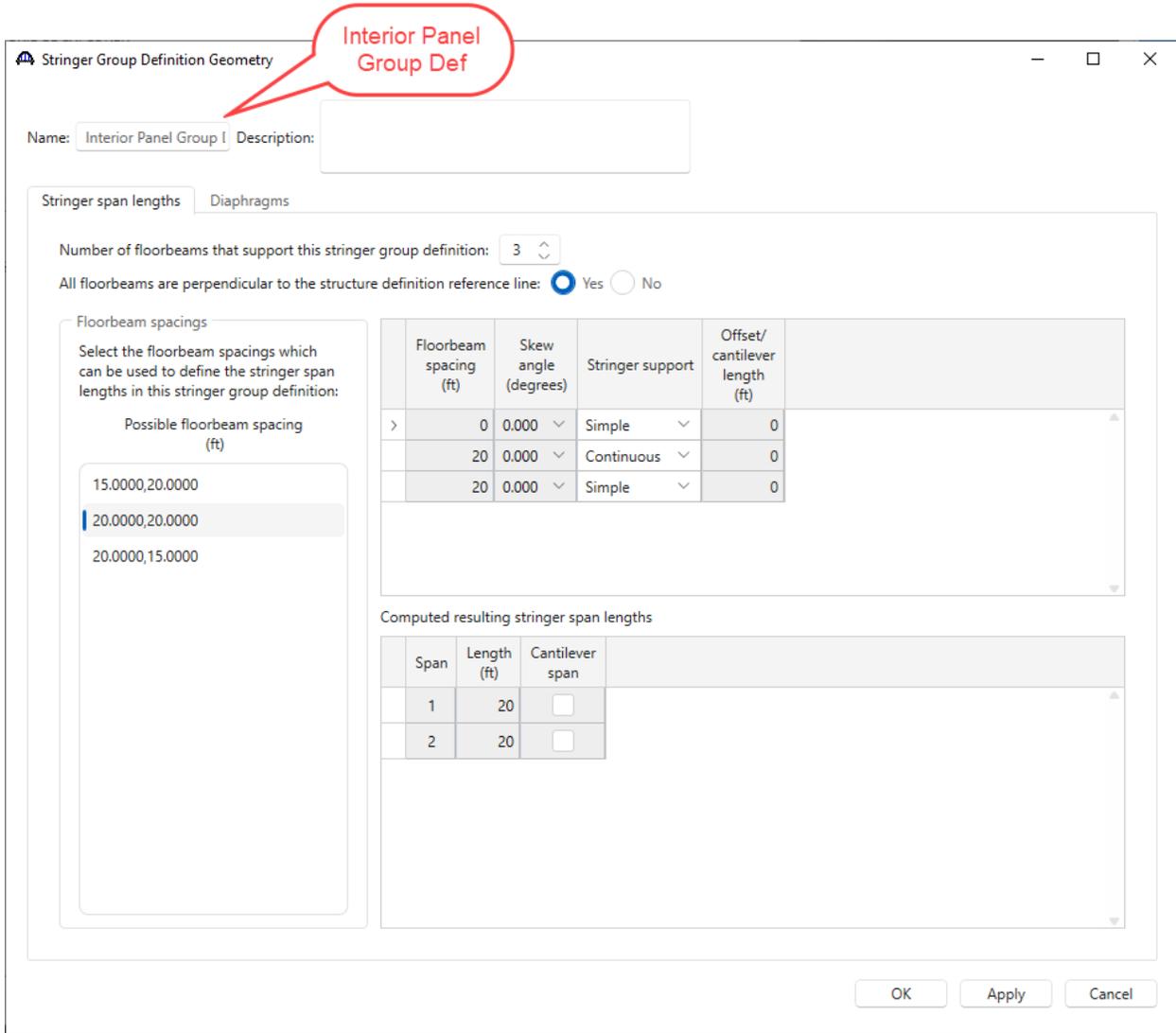
Span	Length (ft)	Cantilever span
1	15	<input type="checkbox"/>

OK Apply Cancel

Click **OK** to apply the data and close the window.

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The stringer group definition that will be applied to the interior panels is defined as follows.



In the interior panels, the stringers are 2 continuous spans over 3 floorbeams.

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Select the **Diaphragms** tab to enter diaphragm spacing for the stringer group definition. The stringers have diaphragms at each end and one at the center of the stringer elevation. Enter the following data for **Diaphragm Bay 1** and use the **Copy bay to...** button to copy the data to the other diaphragm bays.

Stringer Group Definition Geometry

Name: Interior Panel Group 1 Description:

Stringer span lengths Diaphragms

Diaphragm Bay: 1 Copy bay to... Diaphragm wizard

	Start distance (ft)		Diaphragm spacing (ft)	Number of spaces	Length (ft)	End distance (ft)		Load (kip)
	Left	Right				Left	Right	
>	0	0	0	1	0	0	0	0.12
	0	0	20	2	40	40	40	0.12

New Duplicate Delete

OK Apply Cancel

Click the **Copy bay to...** button to copy the diaphragms entered for Bay 1 to the other bays. The following window appears. Select all the bays by holding the **Shift** key and Click **Apply** as shown below.

Copy Diaphragm Bay

Select the new bay(s):

- Bay 2
- Bay 3
- Bay 4

Apply Cancel

The following message appears indicating that the diaphragms have been copied. Click **OK** to close this window and update the diaphragms for each bay.

Diaphragms from bay 1 are successfully copied to bay 2, 3, 4 and 5!

OK

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Assign Stringer Group Definitions to Stringer Units – Floor System Geometry

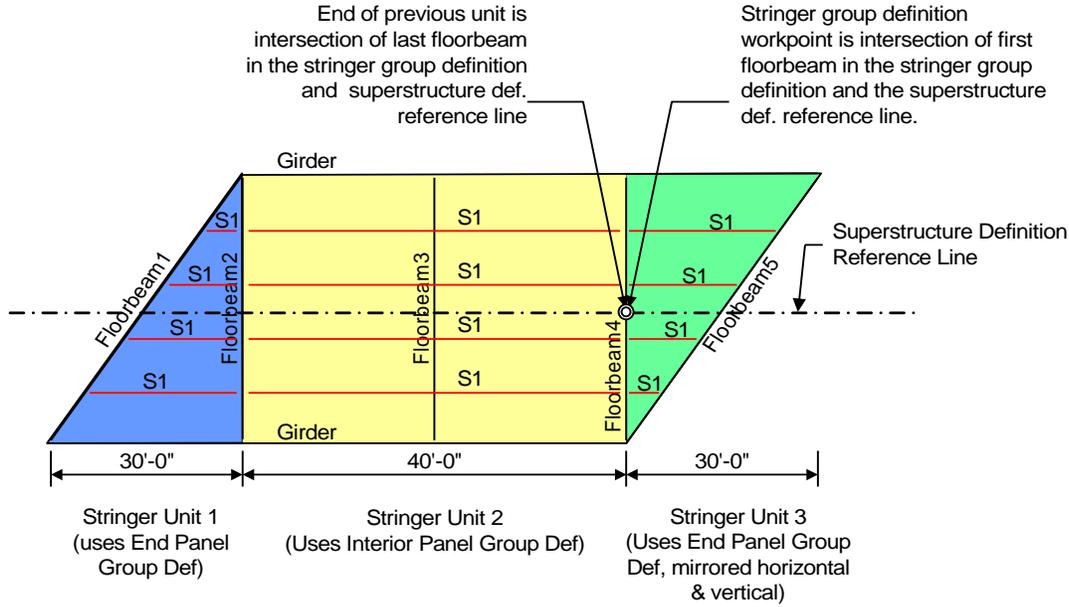
Since this example is focusing on the geometry of the system, skip over defining the floorbeam and stringer member definitions for now and open the **Floor System Geometry** window. Enter the following data to assign the stringer group definitions to the stringer units.

Stringer unit number	Stringer group definition	Unit referenced from left end of superstructure or end of previous unit	Distance to stringer group definition workpoint (ft)	Mirror group definition	Include in analysis
Unit 1	End Panel Group Def	Left end of structure	0	None	<input type="checkbox"/>
Unit 2	Interior Panel Group Def	End of Previous Unit	0	None	<input type="checkbox"/>
> Unit 3	End Panel Group Def	End of Previous Unit	0	Vertical and Horizontal	<input type="checkbox"/>

Click **OK** to apply the data and close the window.

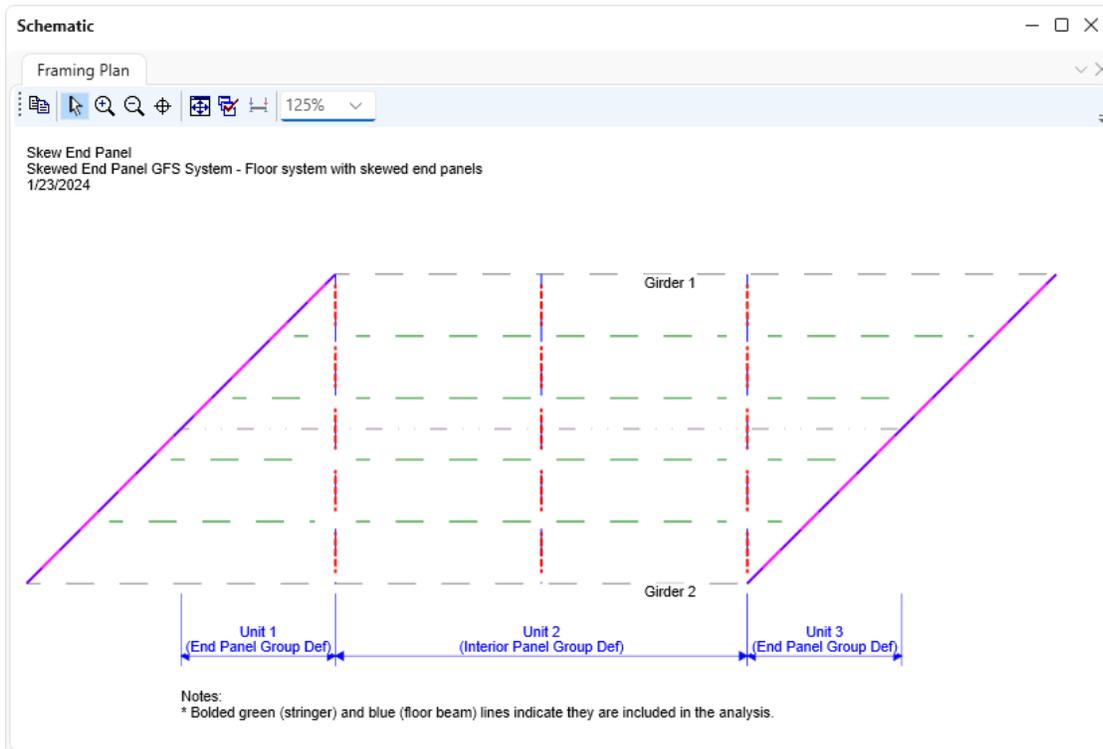
When the **End Panel Group Def** is assigned to **Stringer Unit 3**, it must be mirrored both vertically and horizontally so that the stringer members are properly located.

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Schematic – Framing Plan Detail

While the **Framing Plan Detail** node is selected in the **Bridge Workspace** tree, open the schematic for the framing plan by selecting the **Schematic** button on the **WORKSPACE** ribbon (or right click on **Framing Plan Detail** in the Bridge Workspace and select **Schematic** from the menu). The **Structure Framing Plan** schematic appears as follows. The girder, floorbeam and stringer members all appear as dashed lines because the member alternatives are not defined yet for any members.

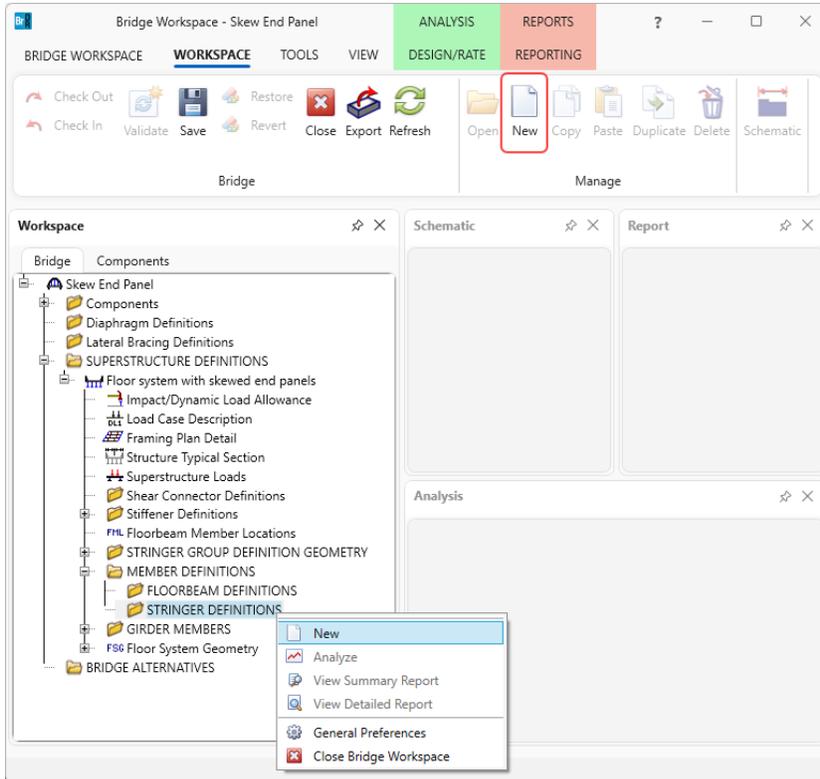


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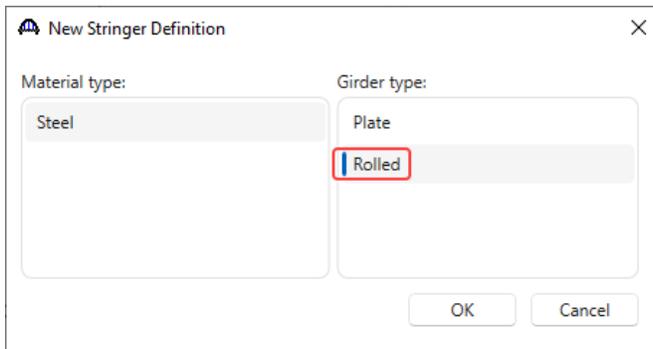
Defining Stringer Member Definitions

Create a stringer member definition for a stringer in the end panel. Since the stringer member lengths vary in this end panel, a stringer member definition will be created for each stringer member in the panel. For this example, a stringer member definition will be created that will be applied to the first stringer in the structure typical section. This stringer member has a length of 6’.

To create the stringer definition, expand the **MEMBER DEFINITION** node in the **Bridge Workspace** tree and double click on the **STRINGER DEFINITIONS** node (or select **STRINGER DEFINITIONS** and click **New** from the **Manage** group of the **WORKSPACE** ribbon). This opens the **New Stringer Definition** window as shown below.



Select **Steel** as the **Material type** and **Rolled** for **Girder type** as shown below. Click **OK**



FS4 – Skewed End Panel Floor System Example

Enter data as shown below.

Stringer Definition

Name: S1 End Panel

Description: [Empty]

Stringer property input method:
 Schedule-based
 Cross-section based

Self load:
Load case: Engine Assigned
Additional self load: [] kip/ft
Additional self load: [] %

Stringer span lengths:
 Associate with stringer group definition: End Panel Group Def
 Enter stringer span lengths

Number of spans: 1

Span	Length (ft)	Cantilever span
> 1	6	<input type="checkbox"/>

Default rating method: LFR

End bearing locations:
Left: [] in
Right: [] in

OK Apply Cancel

Click **OK** to apply the data and close the window.

When the stringer span lengths need to be defined, the **Associate with stringer group definition** option cannot be used. Selecting that button would mean that the stringer definition has a length equal to the stringer group definition as measured along the superstructure definition reference line. If the **Associate with stringer group definition** is selected, the stringer definition would have a length of **15'** not the **6'**. Therefore, select the **Enter stringer span lengths** button and enter the stringer span length in the grid.

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Stringer Profile

Double click on the **Stringer Profile** node and describe the stringer profile as shown below.

Stringer Profile

Type: Rolled Shape

Shape | Top cover plate | Bottom cover plate

Shape	Start distance (ft)	Length (ft)	End distance (ft)	Material
> W 21x62	0	6	6	FY 36 ksi steel

New Duplicate Delete

OK Apply Cancel

Click **OK** to apply the data and close the window.

Deck Profile

Double click on the **Deck Profile** node and enter data as shown below.

Deck Profile

Type: Rolled

Deck concrete | Reinforcement | Shear connectors

Material	Start distance (ft)	Length (ft)	End distance (ft)	Structural thickness (in)	Effective flange width (Std) (in)	Effective flange width (LRFD) (in)	n
> 3 ksi cement concrete	0	6	6	8.5	60	60	

New Duplicate Delete

OK Apply Cancel

FS4 – Skewed End Panel Floor System Example

Navigate to the **Shear connectors** tab and enter the following data.

The screenshot shows the 'Deck Profile' dialog box with the 'Shear connectors' tab selected. The 'Type' is set to 'Rolled'. A table contains one row of data for shear connectors. Below the table are buttons for 'New', 'Duplicate', 'Delete', 'OK', 'Apply', and 'Cancel'.

Start distance (ft)	Length (ft)	End distance (ft)	Connector ID	Number per row	Number of spaces	Transverse spacing (in)
0	6	6	Composite			

Click **OK** to apply the data and close the window.

Haunch Profile

Double click on the **Haunch Profile** node and enter data as shown below.

The screenshot shows the 'Steel Haunch Profile' dialog box. The 'Haunch type' is set to 'Embedded flange'. A diagram shows a haunch profile with dimensions Z1, Z2, Z3, Z4, Y1, and Y2. A table contains one row of data for the haunch profile. Below the table are buttons for 'New', 'Duplicate', 'Delete', 'OK', 'Apply', and 'Cancel'.

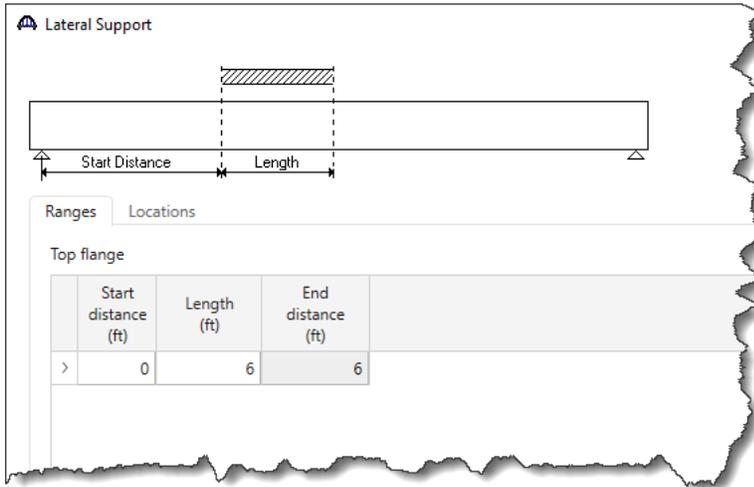
Start distance (ft)	Length (ft)	End distance (ft)	Z1 (in)	Z2 (in)	Z3 (in)	Z4 (in)	Y1 (in)	Y2 (in)
0	6	6	0	0	0	0	1	1

Click **OK** to apply the data and close the window.

FS4 – Skewed End Panel Floor System Example

Lateral Support

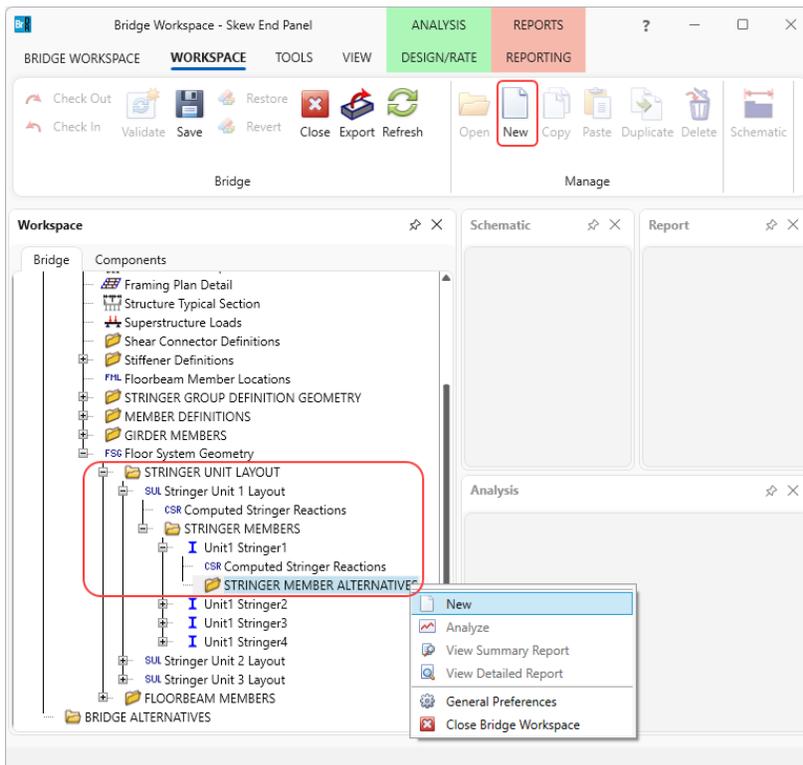
Open the **Lateral Support** window. Enter the following lateral support data for the top flange.



The description of the stringer member definition is complete.

Stringer Member Alternative

Now create a stringer member alternative for stringer member **Unit 1 Stringer 1** and assign this stringer definition to it. Expand the **STRINGER UNIT LAYOUT** -> **Stringer Unit 1 Layout** -> **STRINGER MEMBERS** -> **Unit 1 Stringer 1**. Select the **STRINGER MEMBER ALTERNATIVES** node and click on the **New** button from the **Manage** group of the **WORKSPACE** ribbon (or right click and select **New**, or double click) as shown below.



FS4 – Skewed End Panel Floor System Example

Enter the **Name** of this alternative as shown below.

Stringer Member Alternative

Name: Stringer definition:

Analysis locations | Live load distribution | Web loss | Top flange loss | Bottom flange loss | Top cover plate loss | Bottom cover plate loss

Distance from left end (ft)	Side
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New Duplicate Delete

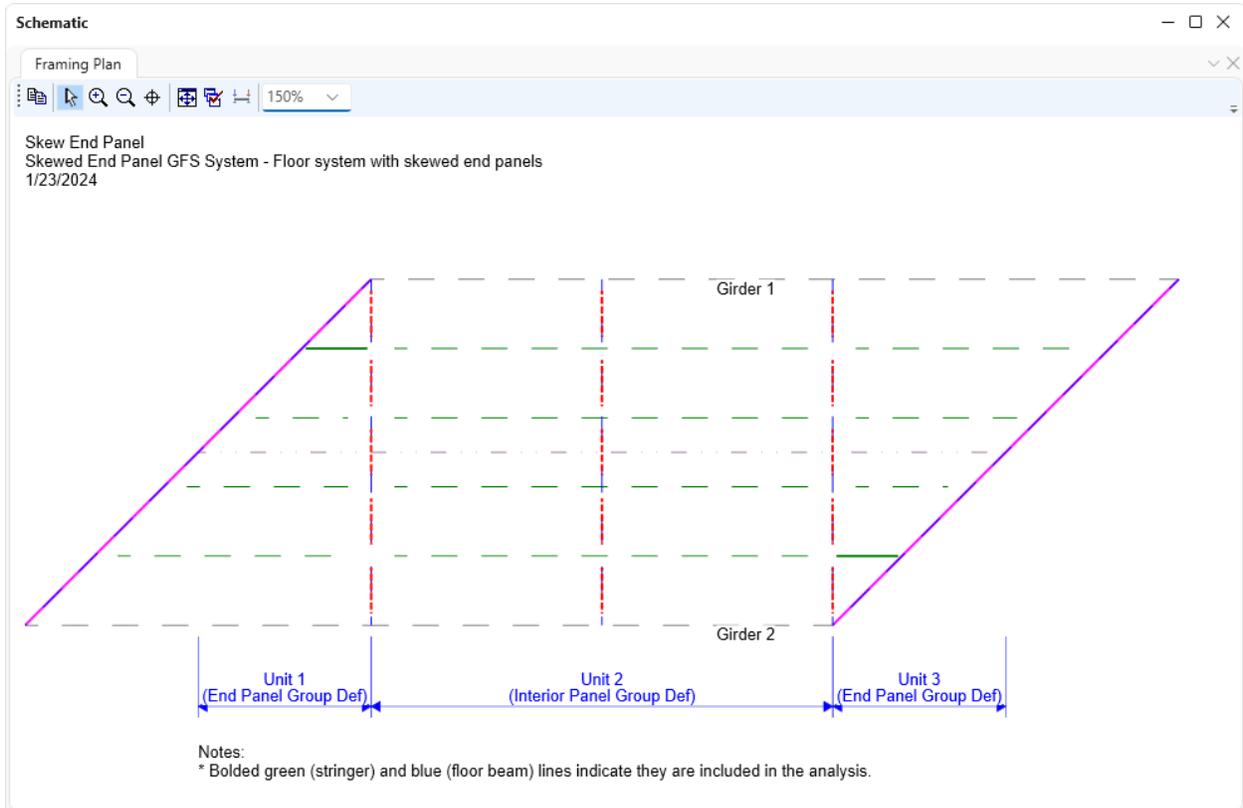
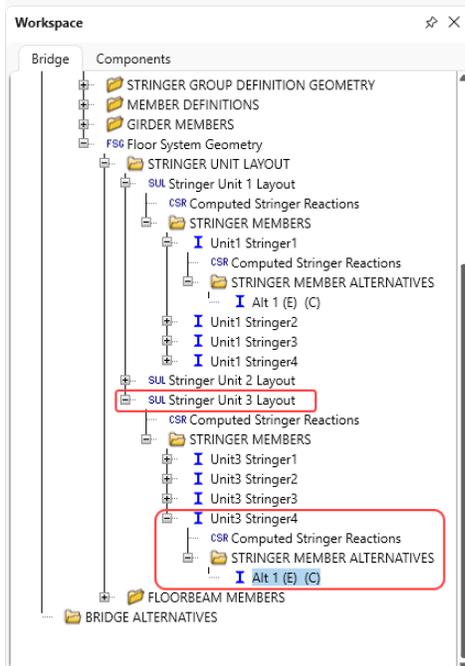
OK Apply Cancel

Click **OK** to create the stringer alternative and close the window.

BrDR checks to ensure that the length of the stringer definition matches the length of the stringer member alternative to which you are assigning it when you hit **OK** or **Apply**.

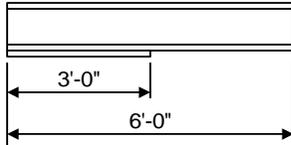
FS4 – Skewed End Panel Floor System Example

This stringer definition can also be applied to a stringer member alternative for stringer member **Unit 3 Stringer 4** since that member is the mirror image of member **Unit 1 Stringer 1**. The following shows the **Structure Framing Plan** schematic after this stringer definition has been applied to these 2 stringer members. These 2 stringer members are displayed as solid lines since they have stringer member alternatives marked as **Existing**.



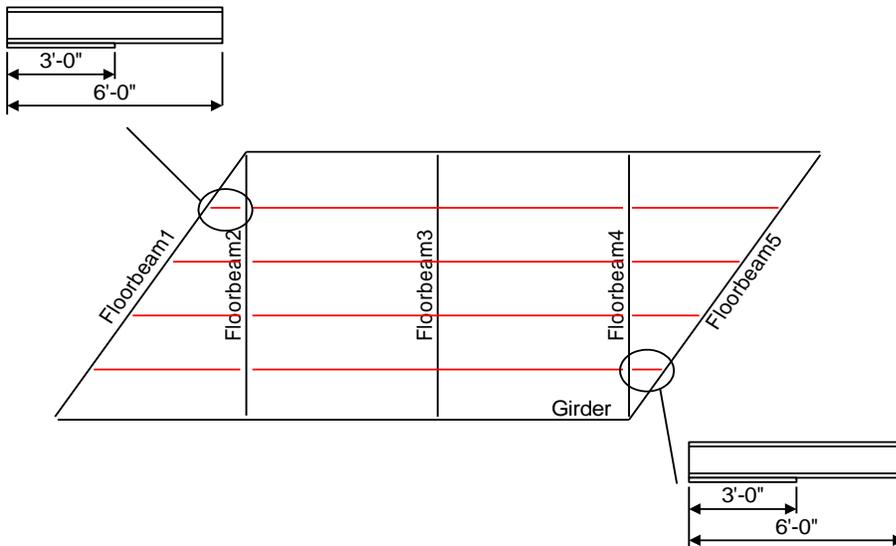
FS4 – Skewed End Panel Floor System Example

An important item to note is that a stringer member definition is not mirrored when it is assigned to a stringer member that belongs to a stringer unit where the stringer group definition is mirrored. The following sketches best explain this.

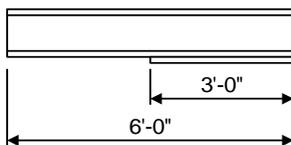


Stringer Member Definition A

Assume Stringer Member Definition A has a cover plate over the first 3' of its length. When this definition is assigned to Unit 1 Stringer 1, the cover plate is located at the left end of the member, adjacent to Floorbeam 1. When this definition is assigned to Unit 3 Stringer 4, the cover plate is still located at the left end of the member, this time adjacent to Floorbeam 4 instead of Floorbeam 5.



In order to have the BrDR model consider the cover plate at the right end of Unit 3 Stringer 4, you must create a new stringer member definition with the cover plate in that location. The following Stringer Member Definition B illustrates this.



Stringer Member Definition B

FS4 – Skewed End Panel Floor System Example

Continue with this example on your own. Create the remaining stringer and floorbeam member definitions and assign them to the member alternatives. Create girder member alternatives for the girder members and rate the member alternatives in this superstructure definition.