
AASHTOWare BrDR 7.5.0
Substructure Tutorial
Pier Supports Two Superstructures

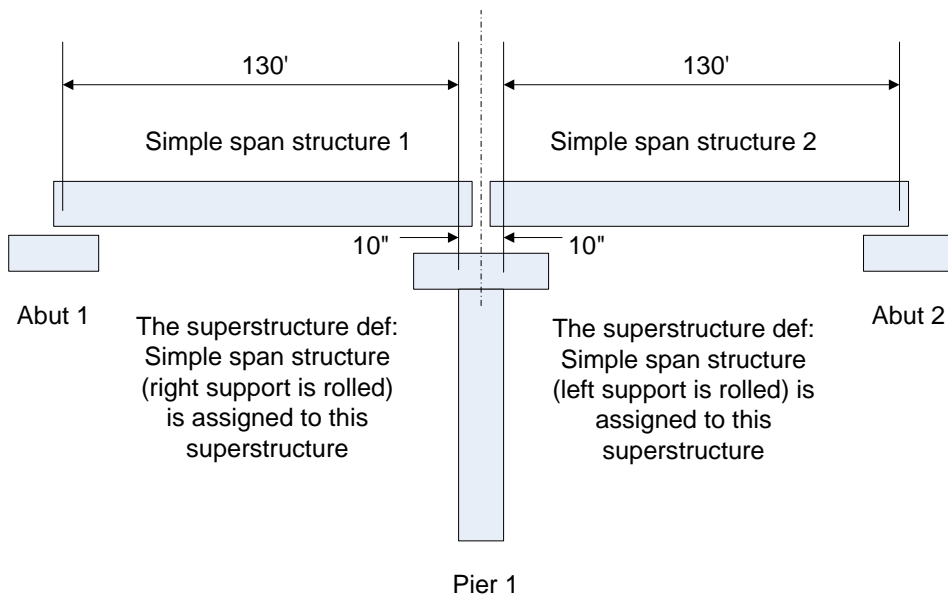
Pier Supports Two Superstructures

How to Describe a Pier that Supports 2 Independent Superstructures

This example illustrates the description of a pier in BrDR that supports 2 independent superstructures. In this example, 2 prestressed simple spans that are **not** made continuous for live load are defined. Therefore the pier supports 2 independent superstructures. If the prestress spans were made continuous for live load, the pier would be supporting only one superstructure.

Open the Bridge workspace for **BID20, LRFD Substructure Example 1**. This bridge contains an example of a pier supporting 2 independent superstructures.

The following sketch illustrates the Bridge Alternative named **2 span bridge**.



Pier Supports Two Superstructures

Open the Bridge Alternative – **2 span bridge**

This bridge alternative contains 2 abutments and 1 pier:

[Bridge Alternative Description tab](#)

Bridge Alternative

Alternative name:

Description Substructures

Description:

Horizontal curvature

Reference line length: ft

Start bearing End bearing

Starting station: ft

Bearing:

Global positioning

Distance: ft

Offset: ft

Elevation:

Start tangent length: ft

Curve length: ft

Radius: ft

Direction:

End tangent length: ft

Abutment 1 CL Brg Sta

Length between abutment CL bearings

Superstructure wizard... Culvert wizard...

OK Apply Cancel

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Bridge Alternative Substructures tab

Bridge Alternative

Alternative name: 2 span bridge

Description Substructures

	Substructure unit name	Station (ft)	Offset (ft)	Unit type	
>	Abutment 1	0	0	Abutment	CL Abut Brg
	Pier 1	130.83333	0	Pier	CL Pier Sta
	Abutment 2	261.6667	0	Abutment	CL Abut Brg

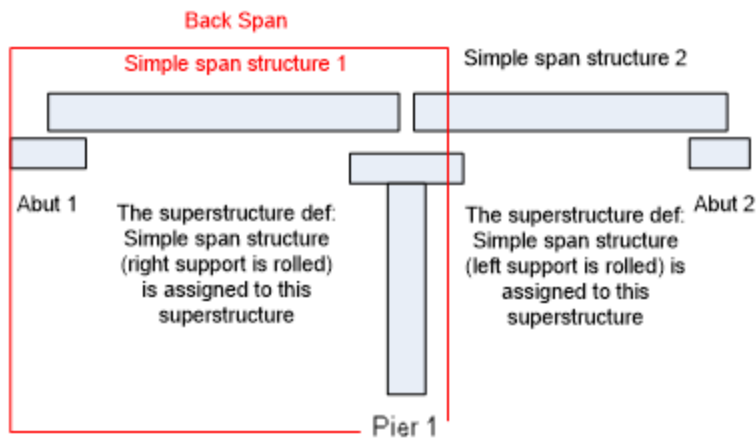
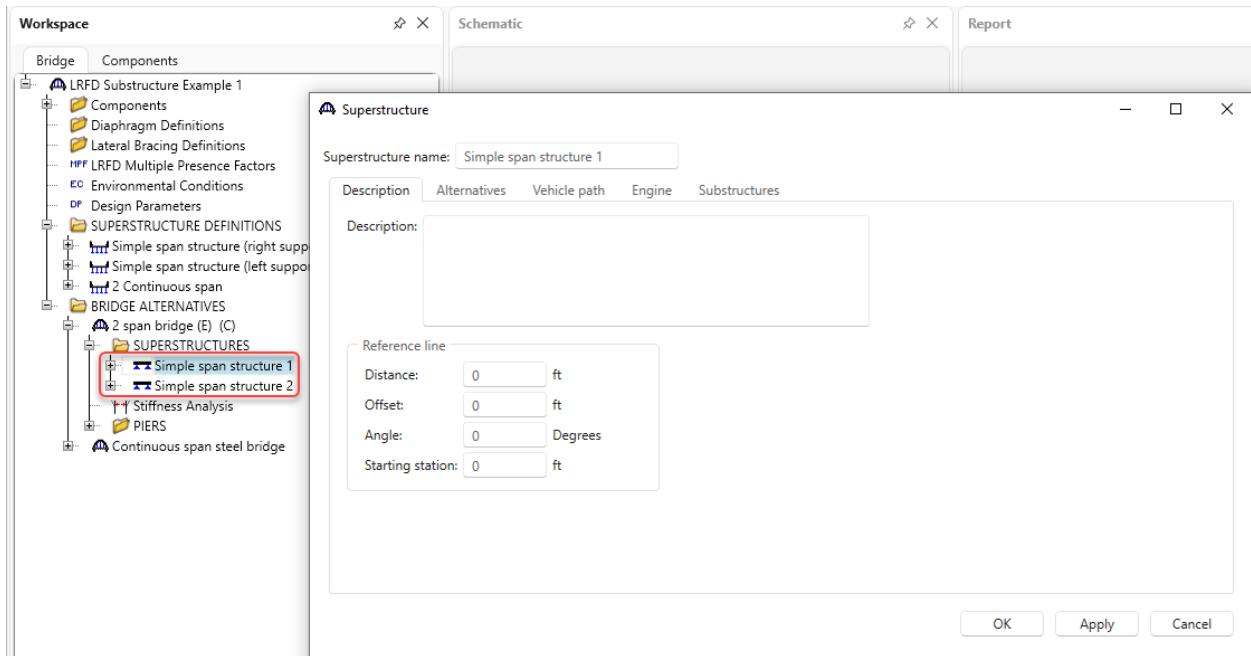
New Duplicate Delete

OK Apply Cancel

Pier Supports Two Superstructures

The bridge alternative contains 2 superstructures, one for the back span structure and one for the ahead span structure. The following is the window for the back span structure. It is supported by Abut 1 and Pier 1.

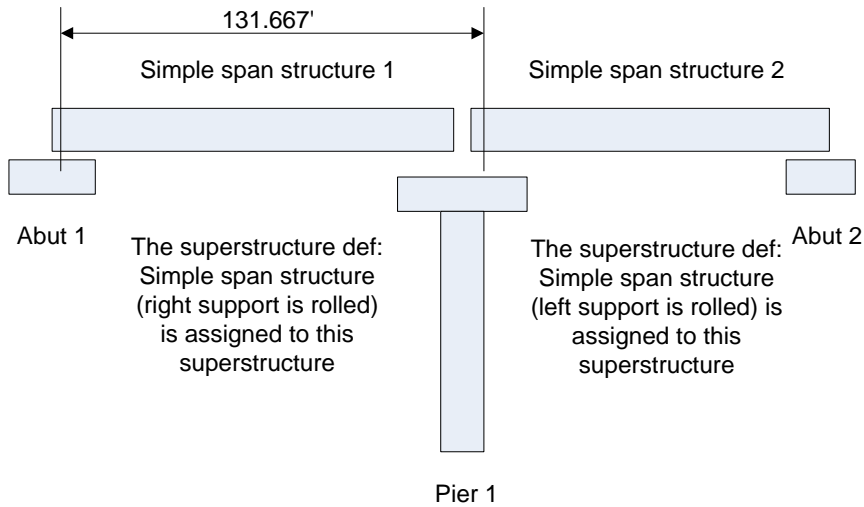
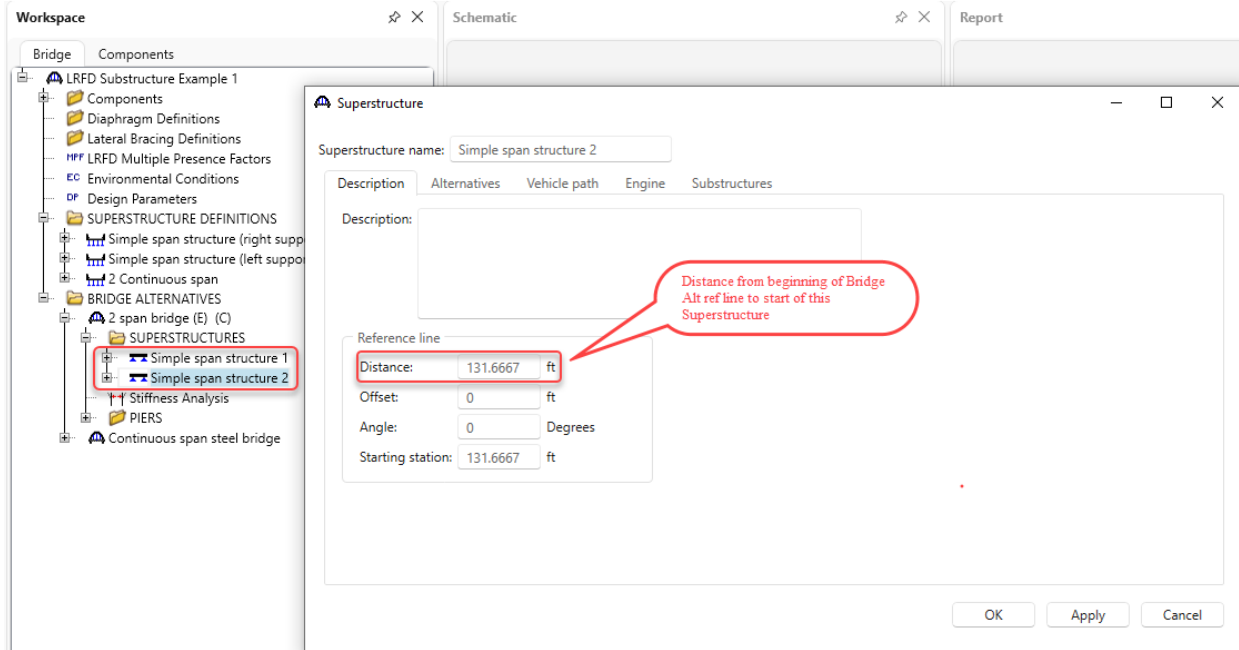
Back Span Superstructure Description tab



Pier Supports Two Superstructures

Similar windows exist for the ahead span superstructure which is supported by Pier 1 and Abut 2.

Ahead Span Superstructure Description tab

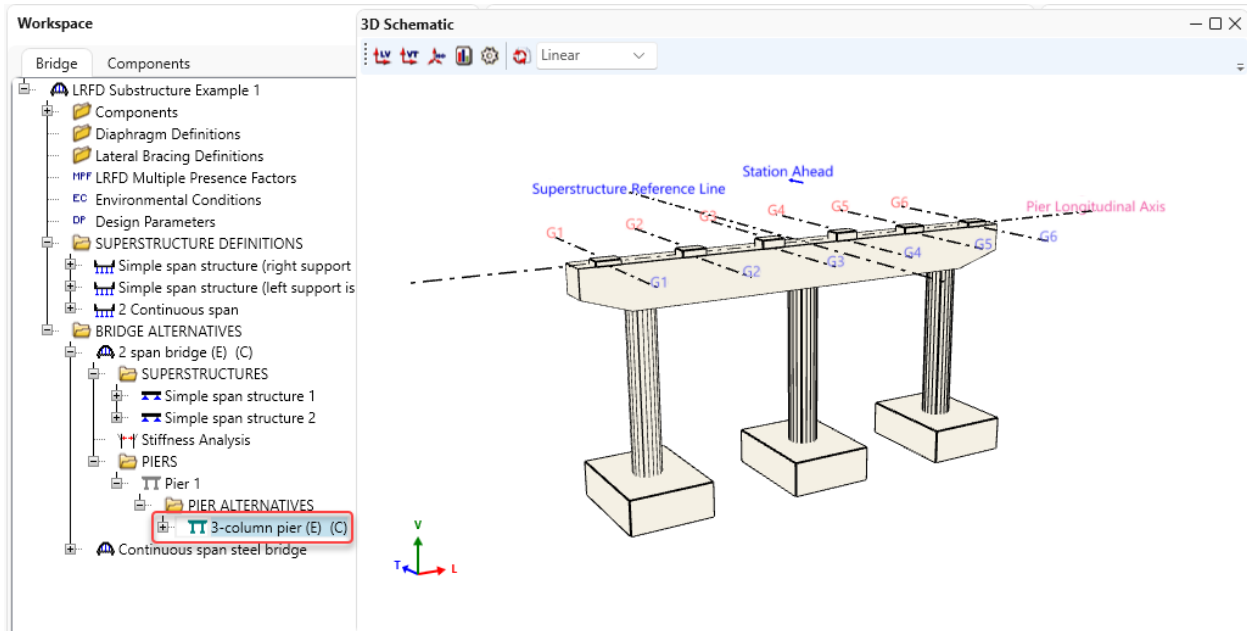


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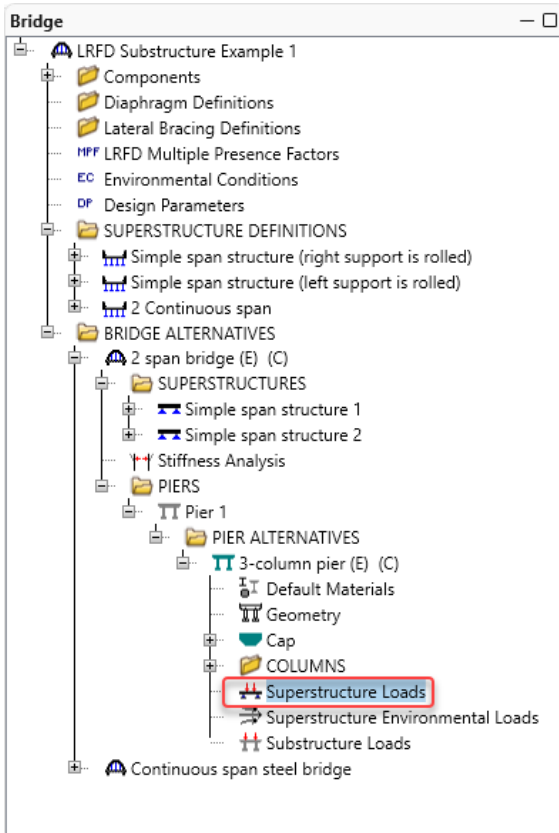
Right click on **3-column pier** and select **3D Schematic**

The 3D schematic shows 2 bearing lines:

Pier 1 3-column pier 3D Schematic



From **Superstructure Loads** in the tree



Pier Supports Two Superstructures

The loads are generated producing the **Superstructure Loads** window below. Using the **Compute DL reaction** button the below table is completed that shows the girders for the back and ahead spans:

Superstructure Loads - Pier 1-3 – column pier DL tab

Back span

Span no.:

Superstructure definition:

Ahead span

Span no.:

Superstructure definition:

Pier skew: Degrees

DL
FR
LL settings
LL-reaction
LL distribution back
LL distribution ahead
LL distribution back ahead
BR

Computed reactions

Result up to date

Results timestamp:

Back span

Computed reactions (kip)

DC load	G1	G2	G3	G4	G5	G6
> Non-composite (Stage 1)	125.0416666	134.6510416	134.6510416	134.6510416	134.6510416	125.0416666
Composite (long term) (Stage 2)	10.9461806	10.9461806	10.9461806	10.9461806	10.9461806	10.9461806
Total	135.9878472	145.5972222	145.5972222	145.5972222	145.5972222	135.9878472

Ahead span

Computed reactions (kip)

DW load	G1	G2	G3	G4	G5	G6
> Non-composite (Stage 1)	125.0416666	134.6510416	134.6510416	134.6510416	134.6510416	125.0416666
Composite (long term) (Stage 2)	10.9461806	10.9461806	10.9461806	10.9461806	10.9461806	10.9461806
Total	135.9878472	145.5972222	145.5972222	145.5972222	145.5972222	135.9878472

Override reactions

Use override values

Back span

Override reactions (kip)

	G1	G2	G3	G4	G5	G6
> DC						
DW						

Ahead span

Override reactions (kip)

	G1	G2	G3	G4	G5	G6
> DC						
DW						

Compute DL reactions
Compute LL reactions

OK
Apply
Cancel