

Bridge deck section FAQ



This page is devoted to **frequently asked questions** (FAQ) related to [bridge deck sections](#).

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How can I model a steel-girder bridge with variable flange thickness?

Answer: Users may model variable flange thickness using the Non-prismatic Frame Section feature. The [Steel girder bridge with variable flange thickness](#) and [Haunched steel girder bridge](#) tutorials demonstrate this application.

Alternatively, users may define separate bridge-deck sections for each girder segment of constant flange thickness as follows:

- Define a deck section for each bridge segment of constant flange thickness.
- Use the Bridge Object Data menu to modify the bridge objects in the following ways:
 - Define span segments to span not only between the bridge supports (abutments and bents), but also between flange transitions.
 - Select Spans > Modify/Show to assign a bridge-deck section to each segment.
 - Where no [bent](#) is present, select Bents > Modify/Show to set the bent property to *None* for each flange-thickness-transition location.

How is the torsional constant J calculated for bridge deck sections?

Answer: Torsional constant J is calculated through [finite-element](#) analysis using the St. Venant torsion equations.

What purpose does the live-load curb location serve?

Answer: As documented in section 3.2 of the *Bridge Superstructure Design* manual, available through Help > Documentation > Bridge > Superstructure Design, the roadway width is dependent upon live-load curb location. Roadway width then relates to the live-load distribution factors of AASHTO LRFD 4.6.2.2.

How are steel-box-girder bridges modeled using the bridge modeler?

Answer: Users may model a steel-box-girder bridge using the Precast-Concrete U-Girder option for the bridge-deck section. Users should then assign steel material to the [frame](#) section, as shown in Figure 1:

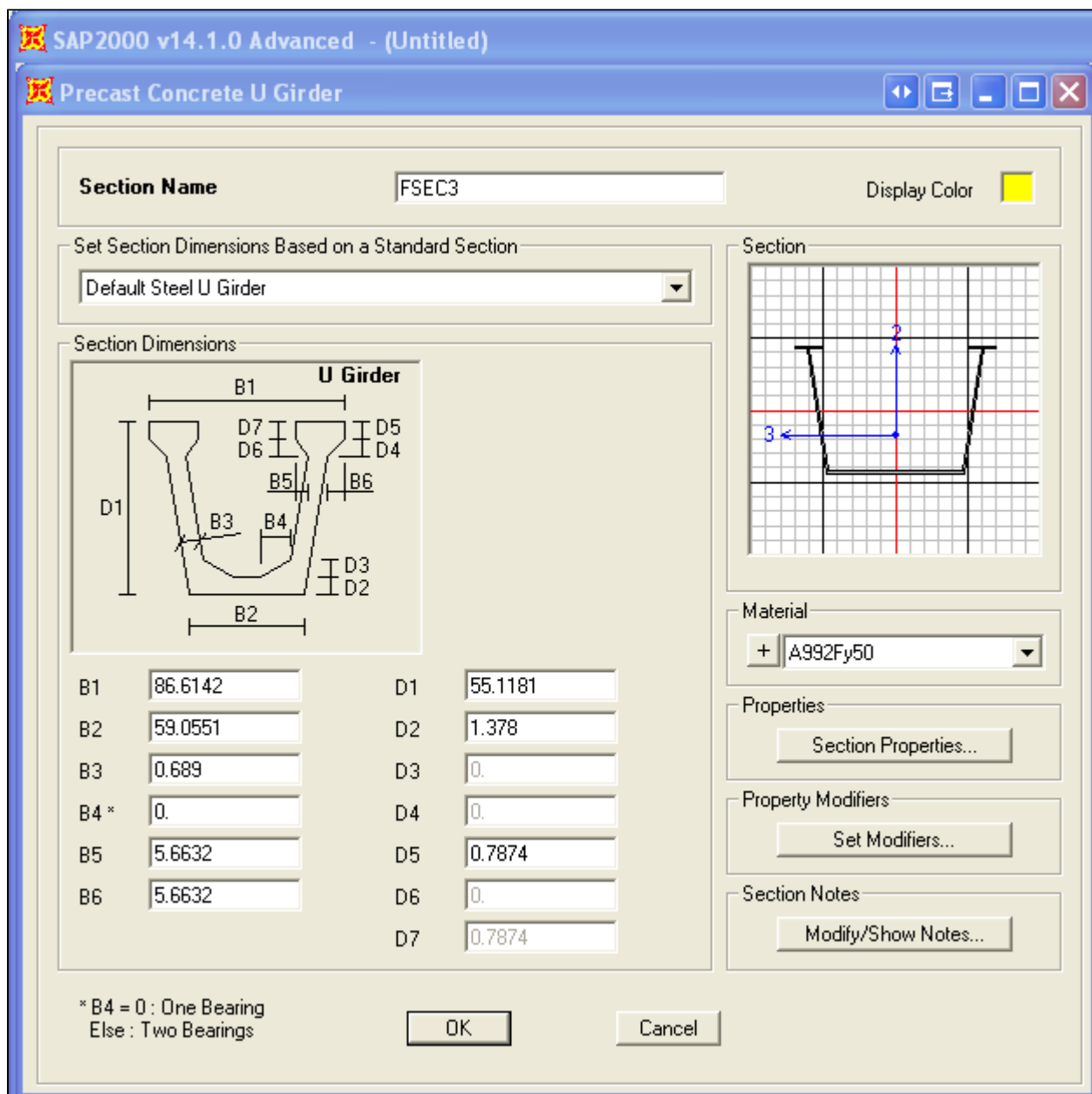


Figure 1 - Steel U girder assignment

Can I model a bridge with prestressed box beams and a cast-in-place deck?

Answer: Users may directly model a bridge-deck section with prestressed box beams and a cast-in-place deck as follows:

- In the [bridge modeler](#), create the bridge-deck-section geometry using either the Precast I Girder or the Precast U Girder option. Use property modifiers to define girder-section properties as those desired of the box girder.
- Update the linked-bridge model and then replace the selected girder section (I or U) with the desired box-girder section. Please note that each subsequent update requires another assignment to box girder section.

Can I use the bridge modeler to model bridges of fish-belly cross section?

Answer: Please see the [Modeling decks not available through the bridge modeler](#) article for instructions on direct modeling of a fish-belly cross section.

Why do bridge-girder axial forces exist without there being bridge-section axial forces?

Answer: The bridge-deck section is a [composite cross section](#). Stresses acting local to each bridge component will produce an axial force those elements, such as with the girder. When the bridge is not longitudinally restrained, an equilibrium condition results from the net axial force in all components being zero. Users may notice that a significant bridge-girder axial force is balanced by an equal and opposite longitudinal force in the slab.