

# CSI Haunched steel girder bridge

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## Tutorial

Name:	Haunched steel girder bridge
Description:	Simple tutorial to create haunched steel girder bridge.
Program:	SAP2000
Version:	12.0.2
Status:	Done
Id:	ok/test_problems/brim - haunched i girder bridge

This tutorial describes how to model a composite bridge, with a concrete slab over steel girders for which the girder height varies between the pier sections and midspan sections.

## Modeling Steps

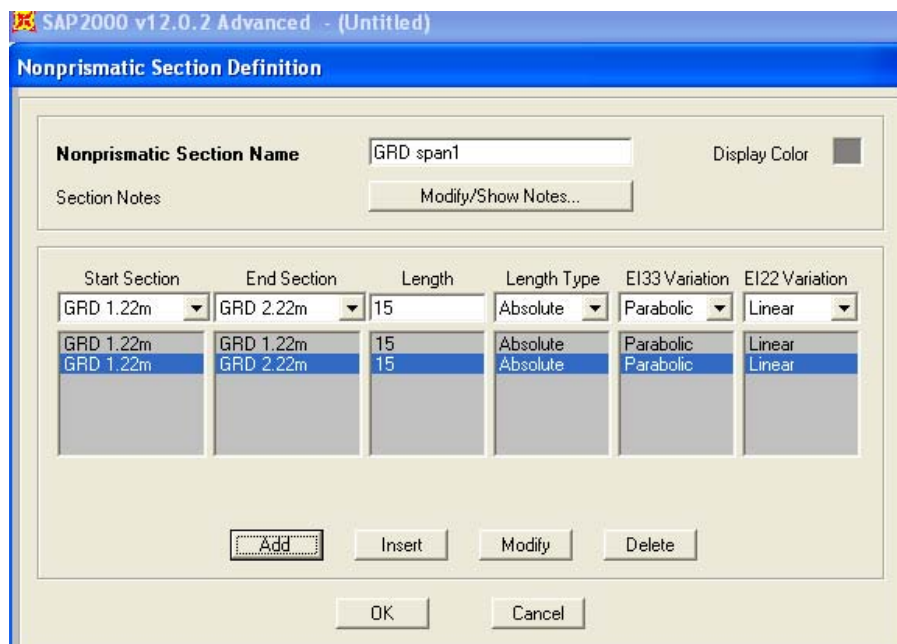
The key idea is to assign nonprismatic girder section to the bridge deck section to obtain the desired variation.

## Create New Model from Template

- Use "File > New Model", select "KN, m, C" units and Quick BrIM template.
- Set span lengths to "30; 30" and select bridge deck section type "Steel Girder"

## Define Nonprismatic Steel Girder Sections

- "Define > Section Properties > Frame Sections"
  - rename the default girder section "FSEC1" to "GRD 1.22m"
  - create copy of "GRD 1.22m" section, change the overall height to 2.22m and save the section as "GRD 2.22m"
  - create nonprismatic sections "GRD span1" and "GRD span2" (via "Add New Property" button, frame section property Other and **nonprismatic section**) to specify 1.22m deep girder for the first 15m of the length and variation from 1.22m deep girder to 2.22 deep girder for the remaining 15m of the girder length using the previously defined sections "GRD 1.22m" and "GRD 2.22m". For "GRD span1" section, the depth will increase, while for "GRD span2" section, the depth will decrease:

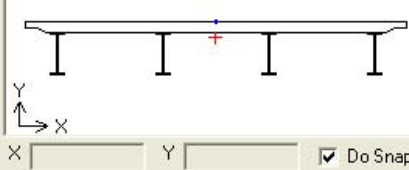
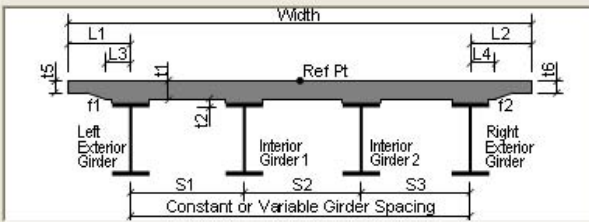


## Create Bridge Deck Sections

- Use "BrIM > Deck Section > Add Copy of Section" menu command to create bridge sections to be assigned to the first and the second spans of the bridge object. These sections will be named "SPAN1" and "SPAN2" and will utilize the previously defined nonprismatic girder sections "GRD span1" and GRD span2" as shown below:

SAP2000 v12.0.2 Advanced - (Untitled)

### Define Bridge Section Data - Steel Girder



Section is Legal Show Section Details...

Girder Output Modify/Show Girder Force Output Locations...

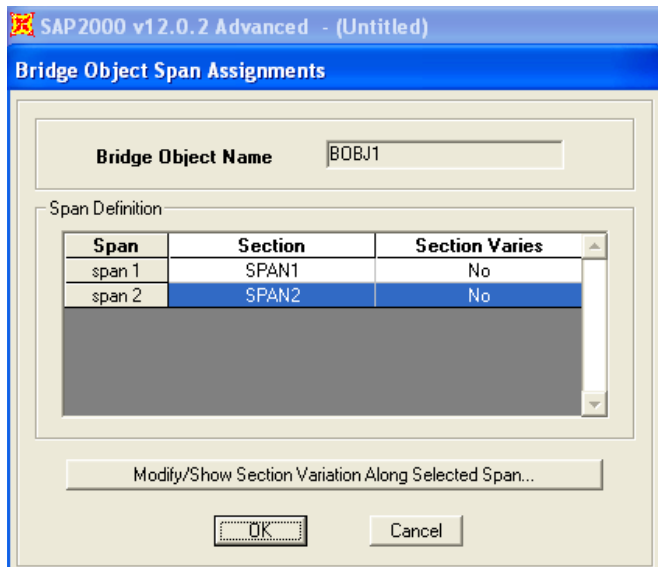
Modify/Show Properties Materials... Frame Sects... Units: KN, m, C

Item	Value
<b>General Data</b>	
Bridge Section Name	SPAN1
Slab Material Property	4000Psi
Number of Interior Girders	2
Total Width	10.98
Girder Longitudinal Layout	Along Layout Line
Constant Girder Spacing	Yes
Constant Girder Haunch Thickness (t2)	Yes
Constant Girder Frame Section	Yes
<b>Slab Thickness</b>	
Top Slab Thickness (t1)	0.305
Concrete Haunch + Steel Flange Thickness (t2)	0.075
<b>Girder Section Properties</b>	
Girder Section	GRD span1
<b>Girder Modeling In Area Object Models</b>	
Model Girders Using Area Objects	No
<b>Fillet Horizontal Dimension Data</b>	
f1 Horizontal Dimension	0.305

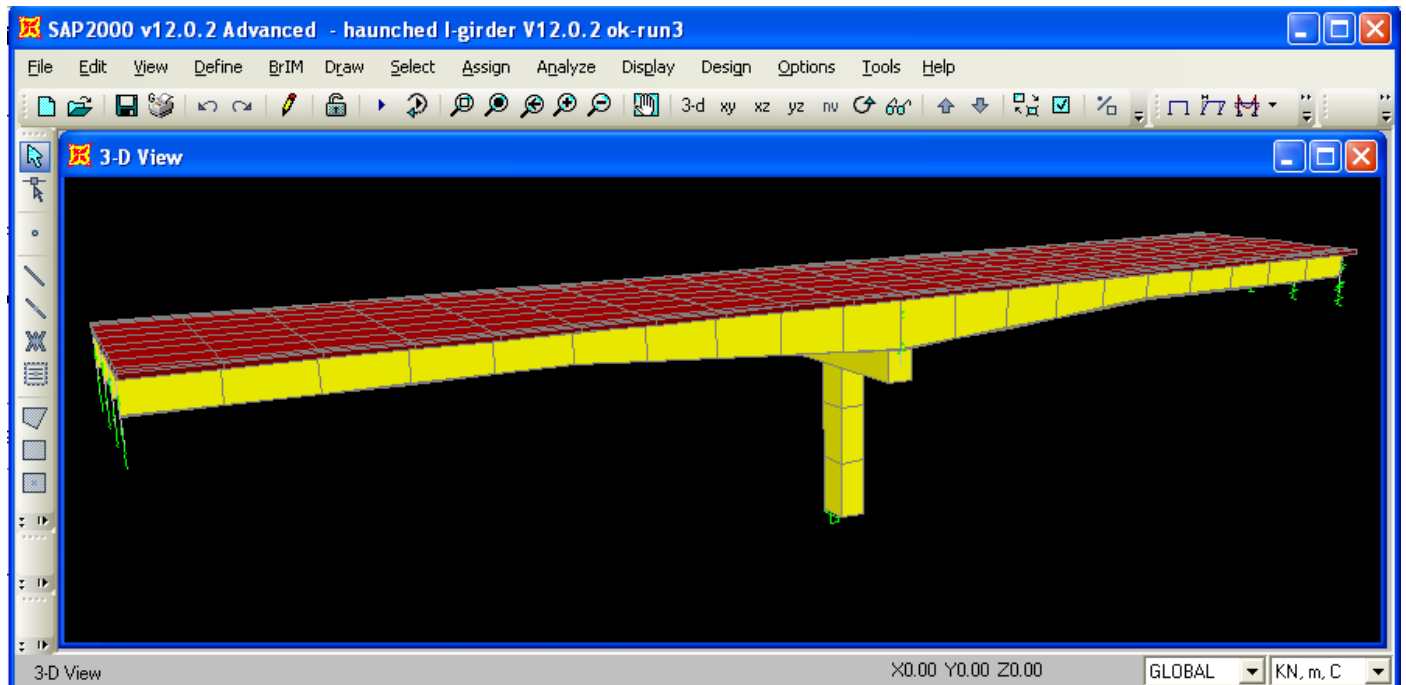
OK Cancel

## Assign Bridge Deck Sections to the Bridge Object

- Use "Bridge > Bridge Objects > Modify/Show Bridge Object > Modify/Show Assignments, Spans" menu command to assign the previously defined bridge deck sections "SPAN1" and "SPAN2" to the bridge object spans 1 and 2:



- Go to "View > Set Display Options > Show Extruded Shape" to display the extruded shape of the bridge:



## Labels

[status-ready-for-review](#) [bridge](#) [bridge-modeler](#) [steel-girder](#) [haunch](#)