Prestress Tutorial

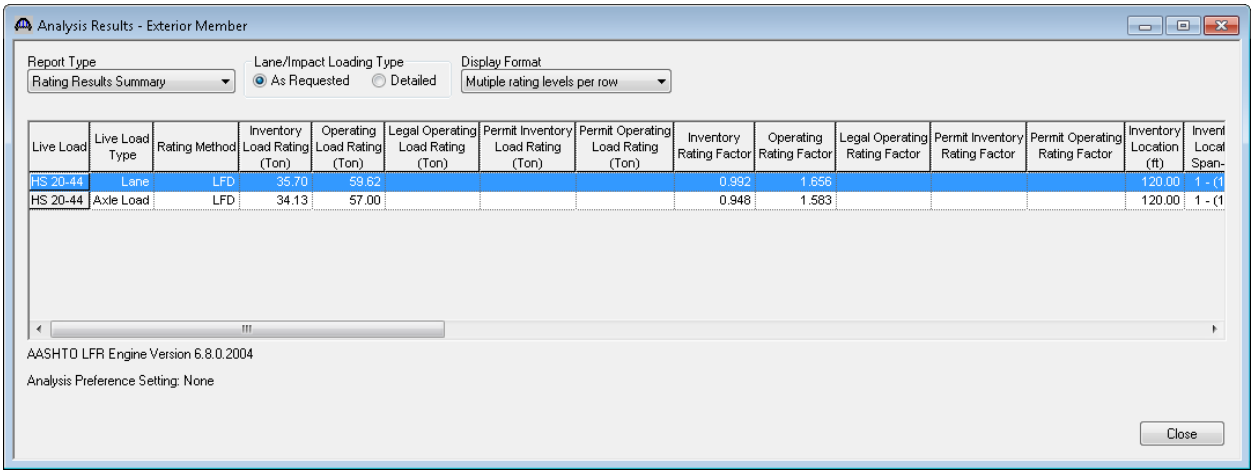
PS8 – Prestressed I Beam Thicker Web

This example describes how to define thicker web of prestressed I girder stem near the support. This example assumes you have access to Example7 (BID10) in the teaching database from the installation.

Topics Covered

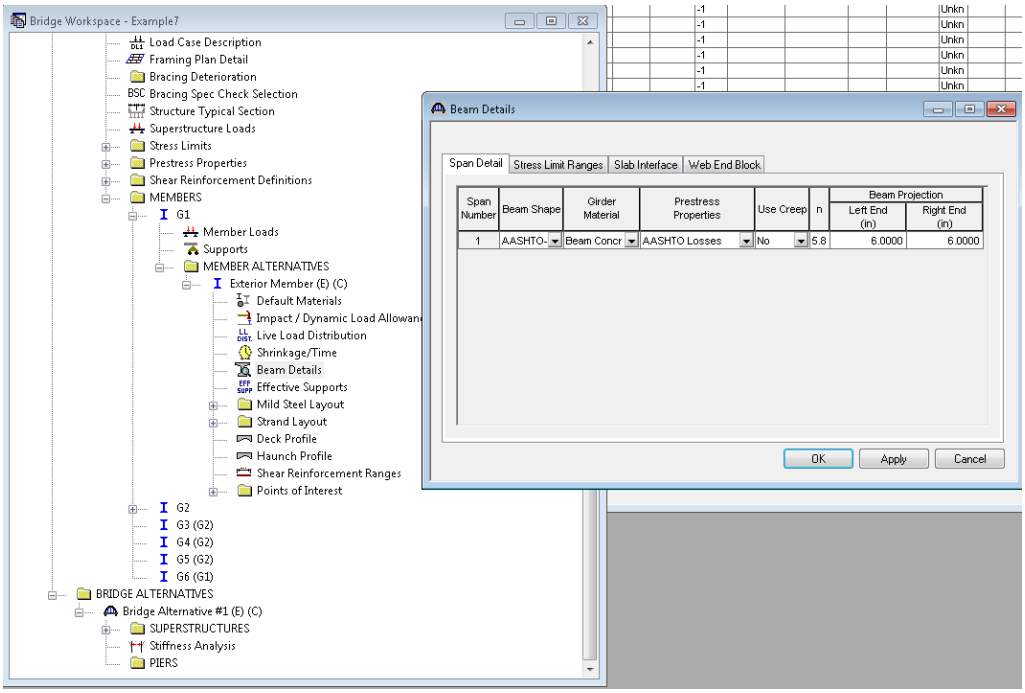
- How to define thicker webs near support for prestressed I girder
- Compare prestressed I girder ratings between with and without thicker web definitions

Open bridge Example7 (BID10), rate girder G1 with an HS20 vehicle using Load Factor Design. Rating results are shown below:

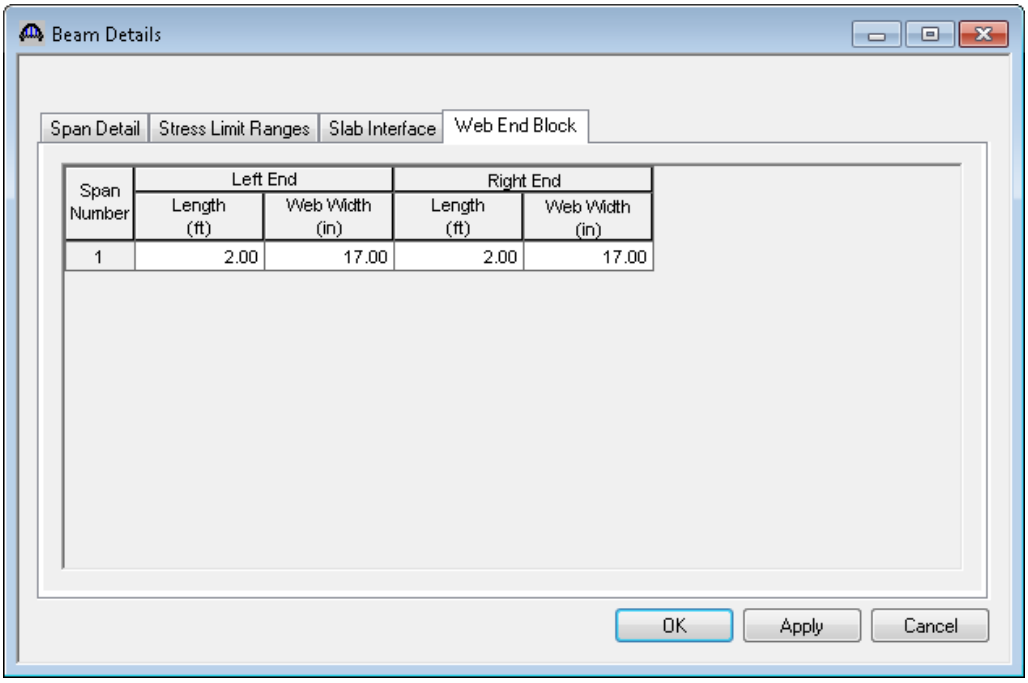


The rating is controlled by concrete design shear at right support.

To define thicker web at the supports, open Beam Details window of Girder G1.

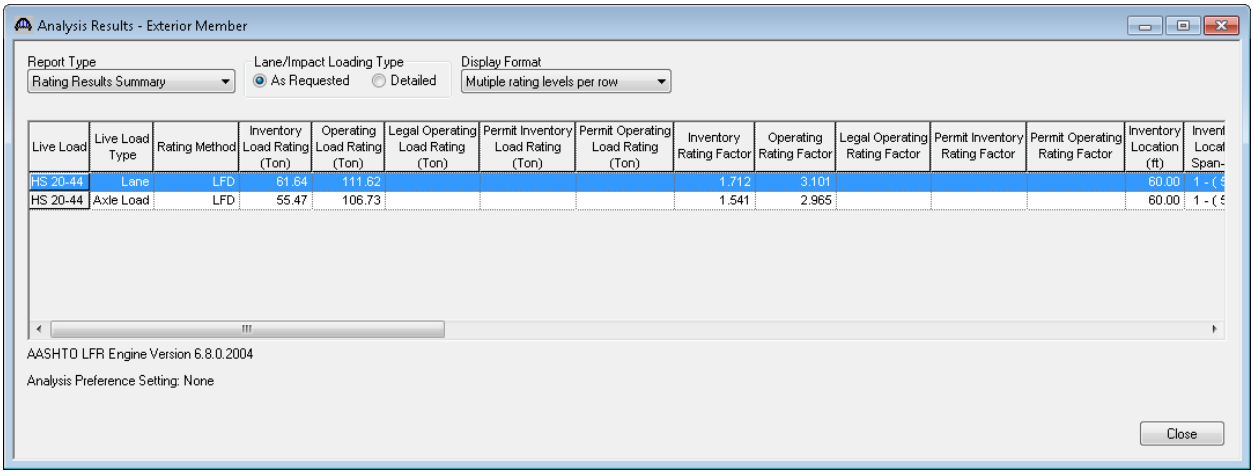


Click Web End Block tab to enter thicker web information as below.



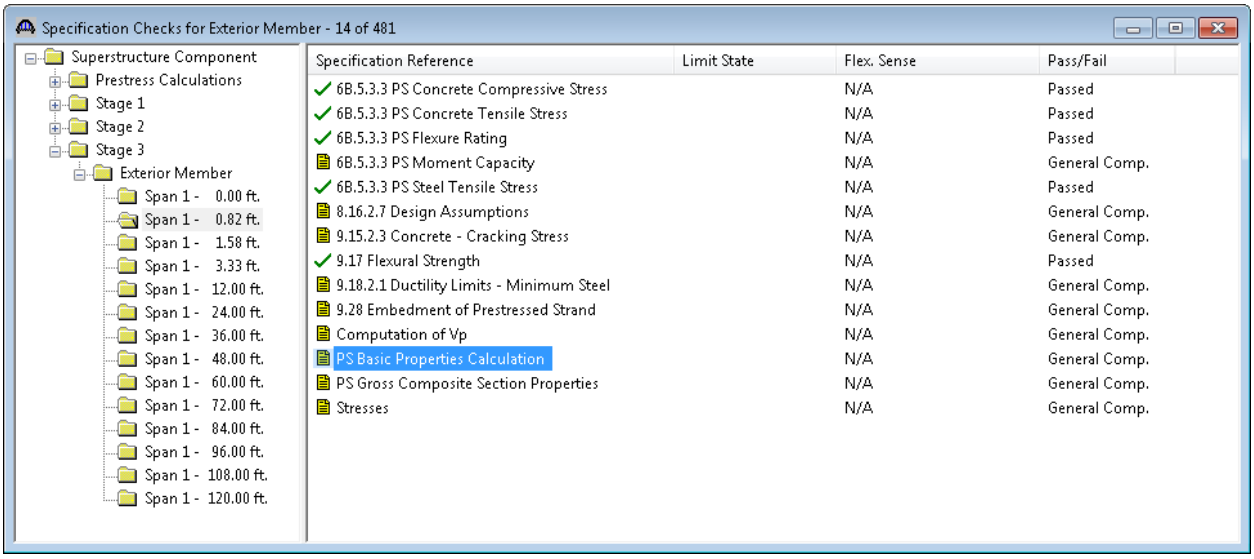
Click OK to save the change to memory and close the window.

The results for rating an HS20 vehicle using Load Factor Design are shown below:

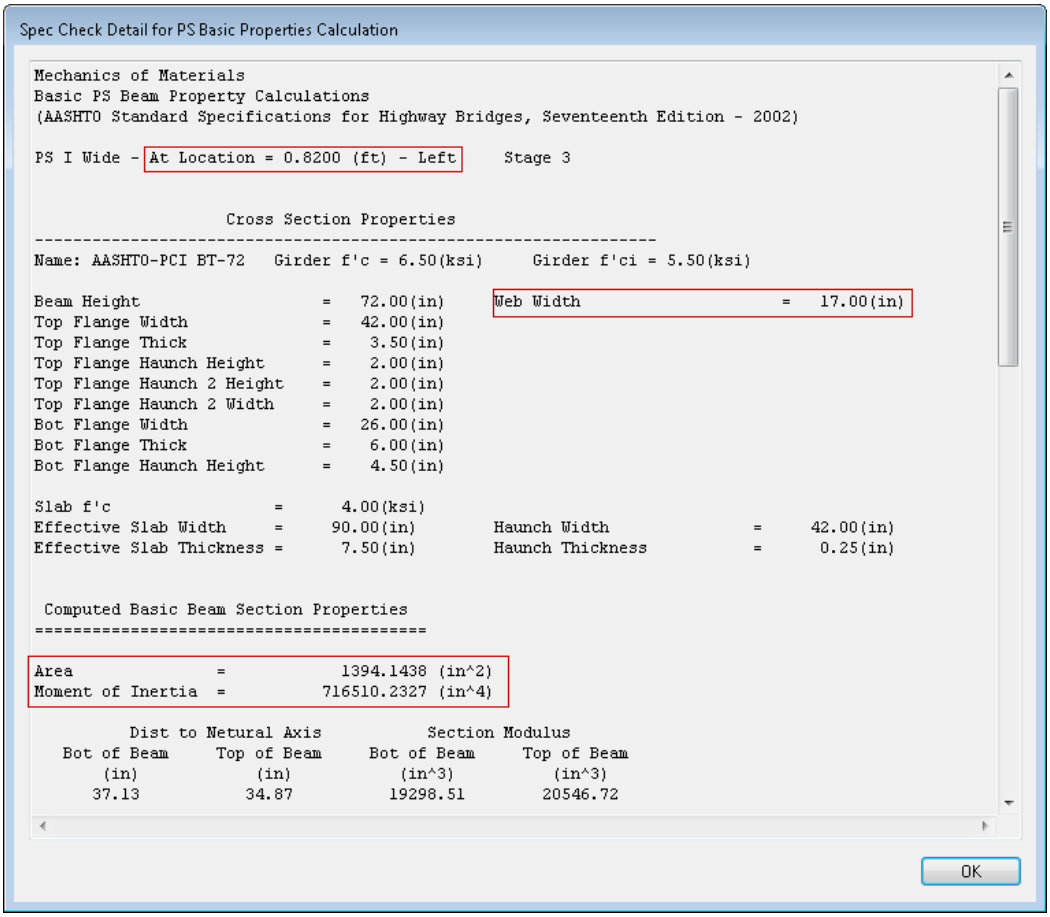


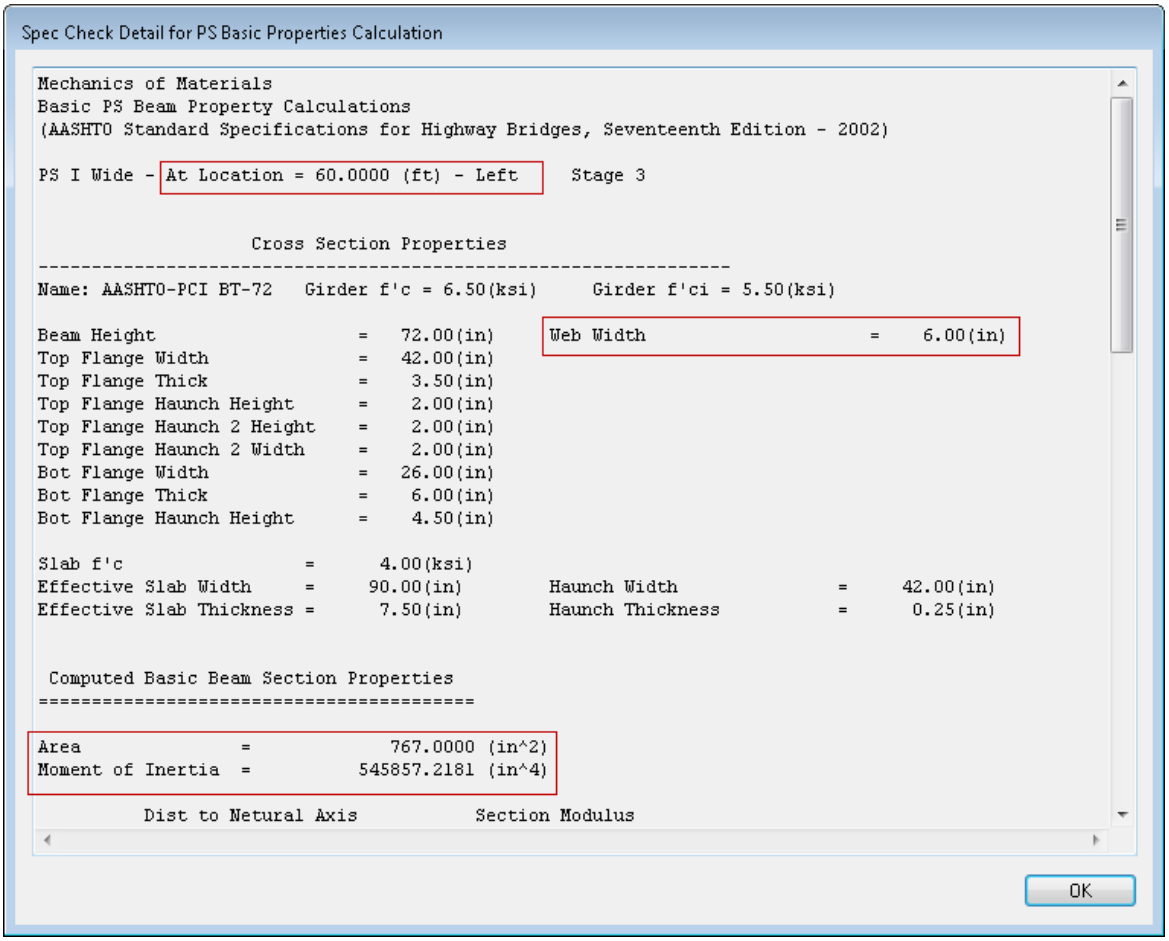
After defining thicker web at supports of G1, rating is controlled by PS tensile stress at mid span.

Click “View Spec Check”  button to view article list.



Compare “PS basic Properties Calculation” between location near support and mid span.




Spec Check Detail for PS Basic Properties Calculation
Mechanics of Materials
Basic PS Beam Property Calculations
(AASHTO Standard Specifications for Highway Bridges, Seventeenth Edition - 2002)
PS I Wide - At Location = 60.0000 (ft) - Left Stage 3
Cross Section Properties
Name: AASHTO-PCI BT-72 Girder f'c = 6.50(ksi) Girder f'ci = 5.50(ksi)
Beam Height = 72.00(in)
Top Flange Width = 42.00(in)
Top Flange Thick = 3.50(in)
Top Flange Haunch Height = 2.00(in)
Top Flange Haunch 2 Height = 2.00(in)
Top Flange Haunch 2 Width = 2.00(in)
Bot Flange Width = 26.00(in)
Bot Flange Thick = 6.00(in)
Bot Flange Haunch Height = 4.50(in)
Web Width = 6.00(in)
Slab f'c = 4.00(ksi)
Effective Slab Width = 90.00(in)
Effective Slab Thickness = 7.50(in)
Haunch Width = 42.00(in)
Haunch Thickness = 0.25(in)
Computed Basic Beam Section Properties
Area = 767.0000 (in^2)
Moment of Inertia = 545857.2181 (in^4)
Dist to Netural Axis
Section Modulus
OK