

# Index 20199 Build-Up and Deflection Data for Prestressed I-Beams (Rev. 07/15)

## Design Criteria

**AASHTO LRFD Bridge Design Specifications; Structures Detailing Manual (SDM); Structures Design Guidelines (SDG)**

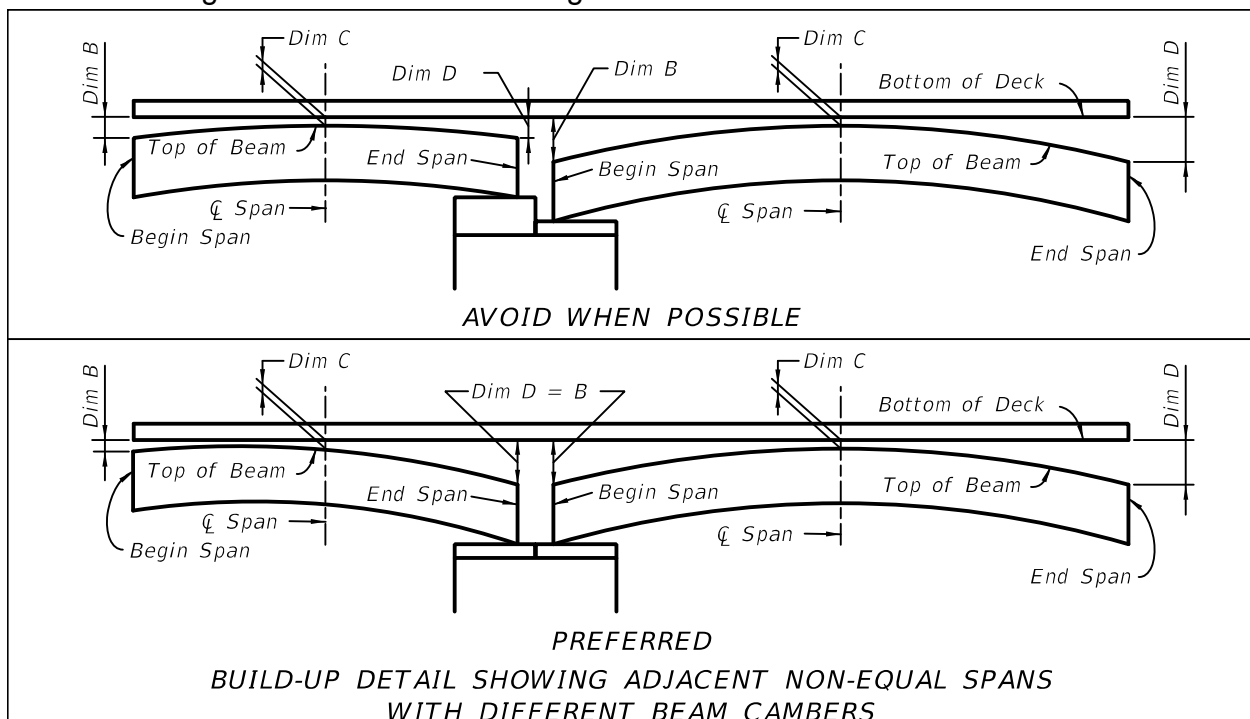
## Design Assumptions and Limitations

Use this standard in conjunction with Indexes 20010, 20036, 20045, 20054, 20063, 20072, 20078, 20084, 20096 and 20120.

Unless otherwise required as a design parameter, beam camber for computing the theoretical build-up must be based on 120-day old beam concrete.

Consider the effects of horizontal curvature with bridge deck cross slope when determining the minimum theoretical build-up over the tip of the inside flange. Consider that the vertical curve geometry is along the effective alignment along a chord at the centerline of the beam, which may be different from the alignment parallel to the Profile Grade Line.

For a given size and type of beam, beam camber and associated Dim B and Dim D will vary due to span lengths and beam spacings. Dim B and Dim D will also vary from span to span along the length of a bridge due to deck geometry. To provide for better aesthetics and potentially easier detailing of the supporting pedestals, where possible adjust the values of Dim B and Dim D over equal height beams in adjacent spans so as to allow the beam bottom flanges to line up. Dim B and Dim D do not necessarily have to be the same value for a single beam. See the following sketch:



## Plan Content Requirements

Complete the following "Build-Up and Deflection Data Table for AASHTO Type II and Florida-I Beams" and include it on the superstructure detail sheets. See [Introduction I.3](#) for more information regarding use of Data Tables.

<i>BUILD-UP &amp; DEFLECTION DATA TABLE FOR PRESTRESSED I-BEAMS</i>						<i>Table Date 07/01/13</i>	
<i>LOCATION</i>		<i>REQUIRED THEORETICAL BUILD-UP OVER <math>\bar{C}</math> BEAM</i>			<i>NET BEAM CAMBER (PRESTRESS - DEAD LOAD OF BEAM) @ 120 DAYS</i>	<i>DEAD LOAD DEFLECTION DURING DECK POUR @ 120 DAYS DIM A</i>	<i>BUILD-UP CASE NO.</i>
<i>SPAN NO.</i>	<i>BEAM NO.</i>	<i>AT BEGIN SPAN DIM B</i>	<i>AT <math>\bar{C}</math> SPAN DIM C</i>	<i>AT END SPAN DIM D</i>			

*NOTES: Work this sheet with Design Standard  
Index No. 20199.*

## Payment

Include estimated build-up concrete quantities with the estimated deck concrete quantities. Do not break out estimated build-up concrete quantities.

In the absence of more refined calculations, the following method to calculate estimated concrete build-up quantities may be used:

$$\text{For Case 1, 2 \& 3: } V = \frac{LW \left[ C + \left( \frac{B + D - 2C}{6} \right) \right]}{27}$$

$$\text{For Case 4: } V = \frac{LW \left[ \left( \frac{B + D}{2} \right) + \left( \frac{2}{3} \left( C - \frac{B + D}{2} \right) \right) \right]}{27}$$

Where:

V = Total Volume of build-up per beam (CY)

L = Beam Length (ft)

W = Width of beam top flange (ft)

B; C; D = Build-up Thickness (ft)