

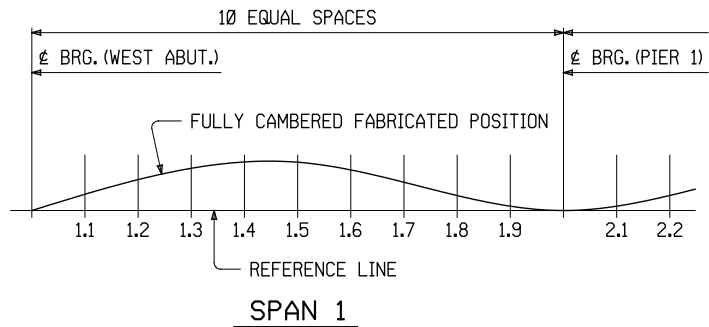
SHOWING CAMBER

BY RONNIE MEDLOCK, P.E., AND STEVE WALSH

What's the best way to show camber in a bridge design?

IN BUILDING STEEL GIRDER BRIDGES, fabricators use design camber to cut girder webs and to properly orient girders to cross frames.

Girder webs are cut to curves representing the fully cambered (or no-load) condition plus, at the fabricator's discretion, some tolerance. Cross frames are set using the curve associated with the desired fit condition—final fit (total dead load fit) or erected fit (steel dead load fit). Hence, camber information is essential to fabrication. Most fabricators (or their detailers) input all bridge camber information into programs that in turn provide data for shop drawings and computer numerically controlled (CNC) cutting.



		Ordinates									Pier 1	
		1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9		
SPAN 1	LINES 1 & 5	STL. DEFL.	9	15	18	19	18	16	12	7	2	—
		COMC. DEFL.	13	32	40	42	40	34	25	14	4	—
		Super DL DEFL.	7	12	14	15	14	12	9	5	2	—
		Total DL DEFL.	35	59	72	76	72	62	45	26	8	—
		Geometric Camber	See notes	1 & 2								
		Total Camber	See notes	1 & 2								
	LINES 2, 3 & 4	STL. DEFL.	10	17	21	21	21	18	13	8	3	—
		COMC. DEFL.	21	36	44	46	44	38	28	15	4	—
		Super DL DEFL.	8	13	15	17	15	13	10	6	2	—
		Total DL DEFL.	33	66	80	84	80	69	51	29	9	—
		Geometric Camber	See notes	1 & 2								
		Total Camber	See notes	1 & 2								

All dimensions are given in millimeters.

▲ Show camber using a total camber curve and reference line in association with tabular data.

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The AASHTO/NSBA Steel Bridge Collaboration (www.steelbridges.org/collaboration) standard *Design Drawing Presentation Guidelines*, Section 6 describes the most effective and efficient way to show bridge camber. The key points:

- Distribute ordinates between bearings
- Use an ordinate spacing between 5 ft and 20 ft depending upon the span length and variations in camber; the preferred spacing is 10 ft
- For each ordinate, provide:
 - geometric
 - dead load
 - super-imposed dead load
 - total camber
- Provide camber values in tabular format
- Provide total deadload camber to the nearest $\frac{1}{16}$ in.
- Label span number and bearing in the same order that they appear on the plans

For illustration purposes, simply show a curve representing the fully cambered web position and a reference line, as shown on the previous page.

Including web cutting diagrams was once common, but fabricators generally no longer use them. If you still use web cutting diagrams, it might be worth checking with local steel companies to see if anyone is also still using them. If they're not, consider stopping this practice in order to save unneeded time and effort. ■