
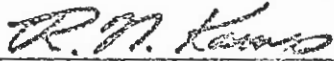


TO: George W. McAlpin Chief Engineer Bldg. 5 Room 401 SUPERSEDED BY EI 76-034 EFFECTIVE 5/4/1976	 ENGINEERING INSTRUCTION NEW YORK STATE DEPARTMENT OF TRANSPORTATION
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APPROVED:  <u>Deputy Chief Engineer (Structures)</u>	Date: <u>3/21/73</u> Supersedes:

Attached is a copy of a new page 135A of the Standard Specifications for Highway Bridges.

It has come to our attention that fabricators have encountered problems during erection of some of our continuous girders, due to the tendency of narrow compression flanges to buckle under erection loads. These requirements supplement Article 1.7.70, and their implementation should minimize these problems. This criteria is automatically included in our Simple Girders Design Program, and we have been experiencing no similar problems with our simple girders.

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The unsupported compression flanges for straight plate girders shall be checked for lateral buckling during erection.

The equation to check buckling stress is:

$$* f_{cr} = \frac{E}{L} \sqrt{\left(\frac{.65 A_f}{D}\right)^2 + \left(\frac{5 W_t^2}{\left(\frac{A_w}{A_f} + 6\right)L}\right)^2}$$

Where f_{cr} = Critical Buckling Stress (kips/sq.in.)
 E = Modulus of Elasticity of Steel (kips/sq.in.)
 L = Unsupported Length of Compression Flange (inches)
 W_t = Width of Compression Flange (inches)
 D = Total Depth of Girder (inches)
 A_w = Area of Web (sq in.)
 A_f = Area of Compression Flange (sq.in.)

A factor of safety shall be provided against buckling of 1.1.

$$F.S. = 1.1 = \frac{f_{cr}}{F_b}$$

Where F_b = Compression stress due to bending (kips/sq.in.)

When it is necessary to increase the width and/or thickness of the compression flange because of potential buckling, it may also be desirable to decrease the web depth to obtain the most economical stringer section.

* A.S.C.E. Journal of the Structural Division, August 1961, paper entitled "Strength of Plate Girders in Bending."

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