

**IART-057**  
**Formula for Flange Bending Stresses of Horizontally Curved I-Beams for Bridge**

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**Abstract**

Currently there is a revised AASHTO guide specification for curved steel girder highway bridges (2003) of which the background information is from studies of the 1960's. Stresses are calculated using first order theory of mathematical derivation. In the new, 2004 LRFD bridge design specification, it is indicated that the lateral bending stresses in compression flanges must be included in the design of I-beams. A project was established at ATLSS for the mathematical formulation of equations considering higher order terms in order to examine the behavior and stresses of horizontally curved I-Beams. Results show that the lateral deflection of such beams under load is generally larger than that from current analysis which consider only first order effects. This project is to formulate a formula for the compression flange stresses of such beams through a parametric study using the newly developed procedure from the previous project.