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Cold-formed Steel Z-sections With Sloping Edge Stiffness Under Axial Load

Roger A. LaBoube
Missouri University of Science and Technology, laboube@mst.edu

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COLD-FORMED STEEL Z-SECTIONS WITH SLOPING EDGE STIFFNESS UNDER AXIAL LOAD[a]

Discussion by R. A. LaBoube,[3] Member, ASCE

The authors have developed and presented experimental data that enhance the understanding of compression elements stiffened by sloping edge stiffeners. However, the authors made statements regarding the application of the AISI *Specification* (1986) that merit discussion.

The authors indicate that the criteria for the design of sections with partially stiffened compression flanges was based mostly on research dealing with edge stiffeners perpendicular to the compression flange. This is not the case. Pekoz (1987) summarized the experimental data that served as the basis for the development of the 1986 edition of the AISI *Specification*; these data included both perpendicular and inclined edge stiffeners. Also, Elhouar and Murray (1986) conducted a review of available test results to verify the adequacy of the AISI *Specification*. Based on 119 tests of industry-standard sections having inclined edge stiffeners, they concluded that the 1986 AISI *Specification* provided a good prediction for the moment capacity.

The authors also make the statement that the AISI design provisions for concentrically loaded compression members do not apply to a Z-section. This is not the case, Section C4.3 (AISI: *Specification* 1986) states that for shapes whose cross sections have no symmetry, either about an axis or a point, the shape must be evaluated by a rational analysis. Therefore the design provisions are not applicable. However, a Z-section is considered a point-symmetric section, and, therefore, the load capacity can be evaluated by the equations in the *Specification*. For such load calculations, the principal axis will control the stability of the section. Data to confirm this approach for Z-sections have never been created; therefore, the authors test data and conclusion supporting this design approach is an important contribution.

The author's test results and comments regarding the conservative nature of the design equation for members having unstiffened flanges is well taken, and the writer will bring this to the attention of the AISI Advisory Group for the *Specification*.

Because calculations for the section properties of cold-formed steel members are based on center-line dimensions, the writer believes that (3) should be as follows:

[a]February, 1990, Vol. 116, No. 2, by Dimos Polyzois and Ashoka R. Sudharmapal (Paper 24354).
[3]Assoc. Prof., Dept. of Civ. Engrg., Butler-Carlton Civ. Engrg. Hall, Univ. of Missouri-Rolla, Rolla, MO 65401-0249.

$$D = c + \left[\left(r_2 + \frac{t}{2}\right)\left(\tan\frac{\theta}{2}\right)\right] \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (11)$$

APPENDIX. REFERENCES

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