
CLOSURE

A Summary of Changes and Derivation of LRFD Bolt Design Provisions

Paper by CHARLES J. CARTER, RAYMOND H. R. TIDE, and JOSEPH A. YURA
(3rd Quarter, 1997)

Closure by Charles J. Carter, P.E.

The authors thank Messrs. Dumonteil and Biren for their interest and input regarding their preference for the elliptical solution in the design of bolts that are subject to combined shear and tension.

The RCSC elliptical solution is simple, straightforward and has the advantage of being load and strength based. However, it can be an ill-conditioned solution when one load component is dominant over the other. That is, at the extremes (high shear in combination with low tension or vice versa), a small change in one component results in a comparatively large change in the corresponding component. The three-straight-line ap-

proximation eliminates this anomaly, yet maintains excellent agreement with the test data. Furthermore, at small levels of tension, the three-straight-line approximation results in no calculated reduction in the shear strength. Similarly, at small levels of shear, there is no calculated reduction in the tensile strength. In the end, because both alternatives are permitted, implementation can be based upon individual preference.

The authors also thank Mr. Biren for correcting the typesetting error in the right-most term of Equation 4 of the subject paper. The correct form is as given in Mr. Biren's discussion.

Charles J. Carter, P.E., is director of manuals, American Institute of Steel Construction, Inc., Chicago, IL.
