STEEL QUIZ

STEEL QUIZ, a monthly feature in Modern Steel Construction, allows you to test your knowledge of steel design and construction. Unless otherwise noted, all answers can be found in the LRFD Manual of Steel Construction.

If you or your firm are interested in submitting a Steel Quiz column, please contact Scott Melnick at 312/670-8311 or via email at melnick@aiscmail.com.

Questions and answers for this month’s Steel Quiz were contributed by Victor Shneur, P.E., of the LeJeune Steel Company, Minneapolis, MN. Thanks, Victor!

QUESTIONS

1. What is a non-self supporting steel frame?


3. In bolted connections, what is a minimum thickness for the ply closest to the nut to exclude threads from the shear plane of a ¾ in. bolt if a 5/32 in. thick washer is present?

4. True/False? ASTM A992 steel has good weldability and ductility characteristics.

5. Is it okay to field weld through shop coatings? If so, when is it acceptable?

6. What is the fabrication tolerance for camber for a 40' beam?

7. What limit states of the supported beam web should be checked at a stiffened seated connection?

8. What is the minimum recommended plate length for single-plate shear connections?

9. Why should doubler plates or longitudinal stiffeners be extended at least a distance $d_c$ (depth of cope) beyond the cope at the end of a reinforced coped beam?

10. Refer to brace connection shown in special case 3, fig. 11-10 in LRFD Manual, 2nd ed.: What effective length factor K should be used to check the gusset plate for compression?

Turn page for answers
The fabrication tolerance shall be between minus 0 in. and plus $\frac{1}{2}$ in. Refer to the Code of Standard Practice for Steel Buildings and Bridges (1992) Section 6.4.5.

Local web yielding and web crippling are applicable limit states.

From the LRFD Manual section on “Single-Plate Connections”, p. 9-148: “To provide for stability during erection, it is recommended that the minimum plate length be one-half the $T$-dimension of the beam to be supported.”

Extending the doubler plates or longitudinal stiffeners prevents local crippling of the beam web.

An effective length factor of $K = 1.2$ could be used. The gusset in compression could be envisioned as a column with a fixed base (welded to beam) and a fixed top free to translate laterally. See case (c) in Table C-C2.1 in the LRFD Specification.