Modern Steel Construction's monthly *Steel Quiz* allows you to test your knowledge of steel design and construction. All references to LRFD specifications pertain to the 1999 *LRFD Specification for Structural Steel Buildings*, available as a free download from AISC's web site:

www.aisc.org/lrfdspec

ASD references pertain to the 1989 *ASD Specification for Structural Steel Buildings*. Where appropriate, other industry standards are also referenced.

Anyone is welcome to submit questions for *Steel Quiz*—one question or 10! If you or your firm are interested in submitting a *Steel Quiz* question or column, contact ▶

Steel SolutionsCenter
One E. Wacker Dr., Suite 3100
Chicago, IL 60601
tel: 866.ASK.AISC
fax: 312.670.9032
solutions@aisc.org

This month's *Steel Quiz* was contributed in part by Lutfur R. Khandaker, P.E., of KBK Structural Design, LLC.

Get ready, get set, go!

1. True or False: When camber is specified, it is required in the AISC *Specification* that the amount of camber be specified in the design documents.

2. What is the AISC requirement for the KL/r ratio limitations for the components of built-up compression members?

3. How is the effective throat of fillet welds measured per AWS D1.1?

4. What minimum connection depth is recommended for shear connections in the AISC *Manual*?

5. Why does the *Manual* procedure for single-plate connections use 1½" edge distances on the plate?

6. What is the minimum center-to-center spacing of plug welds per the AISC *Specification*?

7. What is the minimum strength of connections?

8. True or False: A shape bent about its weak axis must be checked for lateral-torsional buckling.

9. True or False: It is required to install a hardened washer over oversized holes in an outer ply.

10. What is the ASTM designation for hardened washers?

Turn page for answers

Answers

1. True. See *LRFD Specification* Section L1.

2. According to *LRFD Specification* Section E4, compression members composed of two or more rolled shapes separated by intermittent fillers shall be connected at these fillers at intervals such that the slenderness ration KL/r of either shape, between the fasteners, does not exceed ¾ times the governing slenderness ratio of the built-up member.

3. The effective throat is measured as the shortest distance from the joint root to the weld face of the diagrammatic weld. See AWS D1.1 Section 2.4.1 and Annex-I.

4. Generally, a minimum connection depth is recommended such that the connection covers one-half the T-dimension of the supported beam. This is indicated in the *Manual* as a good practice to provide for stability during erection.

5. The *Manual* procedure for single-plate connections is predicated upon a high level of rotational ductility provided primarily by bearing deformations of the plate. The edge distances assumed have been shown to accommodate this level of rotational ductility.

6. The minimum center-to-center spacing of plug welds is four times the diameter of the holes. See *LRFD Specification* Section J3.3b.

7. Connections providing design strength shall be designed to support a factored load not less then 10 kips (not less than 6 kips for ASD methods), except lacing, sag rods or girts. Refer to *LRFD Specification* Section J1.7.

8. False: Lateral-torsional buckling is a phenomenon that occurs only when rotation would produce a lower energy position for that shape. A shape bent about its weak axis is already in its lowest energy position.

9. True. Hardened washers shall be installed over oversized holes in an outer ply. Refer to *LRFD Specification* Section J3.2 and RCSC Specification Section 6.

10. ASTM F436. Refer to *LRFD Specification* Section A3.3.