Steel Quiz, a monthly feature in *Modern Steel Construction*, allows you to test your knowledge of steel design and construction. All references to LRFD specifications are referring to the 1999 *LRFD Specification for Structural Steel Buildings*, available as a free download at www.aisc.org. ASD references are refer to the 1989 *ASD Specification for Structural Steel Buildings*. Where appropriate, other industry standards are also referenced.

If you or your firm are interested in submitting a *Steel Quiz* question or column, please contact AISC's Steel Solutions Center at:

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Questions and answers for this month's *Steel Quiz* were provided by **Lutfur R. Khandaker** of Computerized Structural Design, Englewood, CO.

Questions

1. How is a partial joint penetration weld indicated on design drawings?
2. What is the latest version of the high strength bolt specification? Of the Code of Standard Practice?
3. What is the minimum load a connection should be designed for per the LRFD Specifications?
4. What is the maximum allowable edge distance for a bolt or rivet per AISC Specifications?
5. What is the maximum allowable spacing for a bolt or rivet per AISC specifications?
6. True or False: Multiple hardened washers with combined thickness equal to or greater than 5/16 inch can be used in substitution for a single 5/16" minimum thickness hardened washer, when A490 bolts over 1 inch diameter are to be installed in an oversize or short slotted hole.
7. True or False: In new work, A307 bolts or high-strength bolts proportioned as bearing-type connections shall not be considered as sharing the stress in combination with welds.
8. True or False: The ASD and LRFD Specifications require that the minimum length of connection angle for the framed beam connections be at least one-half the T-dimension.
9. True or False: For single angle connections eccentricity must be considered for the leg attached to the supported member.
10. What is the primary AISC document covering dimensional fabrication and erection tolerances?

Turn page for answers

Steel Quiz

Answers

1. The partial penetration weld symbol is the same as that of the full penetration weld, except that the weld size must be shown on the symbol as well.

2. The latest RCSC *Specification for Structural Joints Using ASTM A325 or A490 Bolts* is dated June 23, 2000, and is available as a free download at www.boltcouncil.org. The latest *Code of Standard Practice for Steel Buildings and Bridges* is dated March 7, 2000, and is available as a free download at www.aisc.org.

3. Connections shall be designed to support a factored load not less than 10 kips. Refer to LRFD *Specification* section J1.7.

4. The maximum distance from the center of any bolt or rivet to the nearest edge of parts in contact shall be 12 times the thickness of the connected part under consideration, but shall not exceed six inches. See LRFD *Specification* section J3.5 or ASD *Specification* section J3.10.

5. The longitudinal spacing of connectors between elements in continuous contact consisting of a plate and a shape or two plates shall be as follows:

   (a) For painted members or unpainted members not subjected to corrosion, the spacing shall not exceed 24 times the thickness of the thinner plate or 12 inches.

   (b) For unpainted members of weathering steel subjected to atmospheric corrosion, the spacing shall not exceed 14 times the thickness of the thinner plate or seven inches.

   See LRFD *Specification* section J3.5 or ASD *Specification* section J3.10.

6. False. Refer to Table 6.1 of the 2000 *RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts*. See Answer #2.

7. True. Refer to ASD *Specification* section J1.10 and LRFD *Specification* section J1.9.

8. False (trick question). Neither the ASD *Specification* nor the LRFD *Specification* include requirements for minimum length of the framed beam connections. It is recommended that the minimum length of the connection angle be at least one-half the *T*-dimension of the beam to be supported, to provide stability during erection. See page 4-12 of the green ASD manual or page 9-12 of Volume-II of the silver LRFD manual.

9. False. Refer to Figure 9-17 in Volume-II of the silver LRFD manual. Eccentricity need not be considered in the leg attached to the supported member if one line of bolts is used.

10. Code of Standard Practice. See Answer #2.