

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 2005 *Specification for Structural Steel Buildings*, available as a free download from AISC's web site:

www.aisc.org/2005spec

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 700

Chicago, IL 60601

tel: 866.ASK.AISC

fax: 312.670.9032

solutions@aisc.org

1. Where can one find the latest HSS and single-angle member design requirements?
2. **True/False:** The minimum capacity required of connections is 6 kips (ASD) or 10 kips (LRFD), except for lacing, sag rods, or girts.
3. Are drain holes in HSS or box members addressed by the 2005 AISC specification?
4. **True/False:** In the 2005 specification, the minimum size of fillet welds is a function of the thickness of the thinner part joined.
5. Which of the following is not addressed in the 2005 specification?
 - a. properties of steel at elevated temperatures
 - b. properties of concrete at elevated temperatures
 - c. thermal elongation
 - d. hourly fire ratings
6. **True/False:** ASTM A449 bolts are permitted to be used in connections requiring bolt diameters greater than 1½".
7. Are ASTM A449 bolts prohibited from use in slip-critical connections?
8. **True/False:** A limit state is the condition in which a structure or component becomes unfit for service and is judged either to be no longer useful for its intended function or to have reached its ultimate load-carrying capacity.
9. What is a leaning column?
 - a. A column designed to carry gravity loads only, with connections that are intended to provide resistance to lateral loads.
 - b. A column designed to carry gravity loads only, with connections that are not intended to provide resistance to lateral loads.
 - c. A column designed to carry lateral loads only, with connections that are intended to provide resistance to gravity loads.
 - d. A column designed to carry lateral loads only, with connections that are not intended to provide resistance to gravity loads.
10. **True/False:** The design slip resistance (or allowable slip resistance) for Class A slip-critical bolted joints was revised in the 2005 specification as compared to previous specifications.

Turn page for answers

Answers

- 1.** In the **2005 AISC specification**. In the past, AISC released the stand-alone 2000 LRFD HSS and 2000 LRFD single-angle specifications. However, these previously stand-alone documents were updated and integrated into the main specification document in a combined ASD/LRFD approach.
- 2.** **False.** While this used to be a requirement in previous versions, the 2005 AISC specification eliminated the requirement that connections be designed for a minimum prescribed load.
- 3.** **Yes.** The 2005 AISC specification now addresses drain holes in Section M2.10. When water can collect inside HSS or box members, either during construction or during service, the member shall be sealed, provided with a drain hole at the base, or protected by other suitable means.
- 4.** **True.** Refer to Table J2.4 of the 2005 AISC specification. Past AISC specifications based the minimum size of fillet welds on the thickness of the thicker part joined.
- 5.** The correct answer is **d**, hourly fire ratings. Answers a, b, and c are all addressed in Appendix 4 on structural design for fire conditions of the 2005 AISC specification. For hourly fire ratings, see *AISC Design Guide 19: Fire Resistance of Structural Steel Framing*. There are also several sources of additional information outlined in AISC FAQ 11.4.5 at www.aisc.org/faq.
- 6.** **True.** The 2005 AISC specification Section J3.1 allows the use of ASTM A449 when bolting requirements cannot be provided by A325/A490/F1852 bolts, such as when lengths exceed 12 diameters, or diameters exceed 1 1/2".
- 7.** **No.** The 2005 AISC specification now allows the use of ASTM A449 bolts in slip-critical joints if the bolt geometry, including that of the head, is equal to or proportional to that provided by ASTM A325/A490. Refer to Section J3.1 for specific requirements.
- 8.** **True.** Refer to the glossary definition for limit state in the 2005 AISC specification (a free download from www.aisc.org/2005spec.)
- 9.** The correct answer is **b**, a column designed to carry gravity loads only, with connections that are not intended to provide resistance to lateral loads. Refer to the glossary definition of leaning column in the 2005 AISC specification.
- 10.** **True.** The 2005 AISC specification includes an increased mean slip coefficient of 0.35 for Class A surfaces, compared to 0.33 found in the 2004 RCSC bolt specification and the 1999 AISC LRFD specification. This change was made for simplicity—two previously separate categories (A and C) with essentially similar slip coefficients (0.33 and 0.35 respectively) were combined. A review of the literature was made to justify the use of 0.35 for all covered cases.