

steel quiz

Many of the answers to this month's steel quiz can be found in the AISC *Specification*, *Seismic Provisions* and *Prequalified Connections*, all of which are available as free downloads at www.aisc.org/epubs.

- 1 What slip coefficients for Class A and Class B surfaces, respectively, are recognized by the 2010 AISC *Specification*?
a) 0.20 and 0.40 b) 0.30 and 0.50
c) 0.33 and 0.50 d) 0.35 and 0.50
- 2 True/False: The minimum radius for bent plates differs depending on whether the bend is perpendicular to or parallel to the direction of final rolling.
- 3 True/False: When determining the torsional capacity of a weld around the perimeter of a round HSS, an "Mc over I" approach can be used.
- 4 True/False: All moment frame connections in seismic lateral force resisting systems must be prequalified per ANSI/AISC 341-10, *Seismic Provisions for Structural Steel Buildings*.
- 5 True/False: Castellated and cellular beams are proprietary systems within the United States.
- 6 What is the maximum thickness of fillers that is permitted in bolted connections without having to address the presence of the fillers?
a) $\frac{1}{8}$ in. b) $\frac{3}{16}$ in.
c) $\frac{1}{16}$ in. d) $\frac{1}{4}$ in.
- 7 True/False. A bracing member must have both sufficient strength and stiffness in order to provide a braced point to a column, beam or beam-column.
- 8 True/False: The only applicable limit state for rods with threaded ends that are subjected only to tension is the tensile strength of the threaded end as given in AISC *Specification* Section J3.6.
- 9 The 14th Edition AISC *Steel Construction Manual* is available in which of the following formats?
a) Electronic format
b) Print format
c) On a DVD
d) Both A and B
- 10 True/False: AISC 360-10 Chapter N, "Quality Control and Quality Assurance," includes inspector qualifications, responsibilities, inspection tasks and frequencies.

TURN TO NEXT PAGE FOR ANSWERS

- 1 (b) Two surface classes, Class A and Class B, are recognized by the AISC *Specification*, ANSI/AISC 360-10, and correspond to slip coefficients of 0.30 and 0.50 respectively. This is discussed in Section J3.8 of the *Specification*. The slip coefficient for Class A surfaces has been reduced from that found in the 2005 *Specification* based on recent research that shows a greater variation than previously considered in the performance of mill-scale surfaces.
- 2 True. Table 10-13 in the 14th Edition AISC *Steel Construction Manual* provides this information. The values shown in the table are based on bend lines perpendicular to the final rolling direction. However, footnote 1 states that when bend lines are parallel to the final rolling direction, the values in the table should be multiplied by 1.5. The principle is that you can achieve a tighter bend when the bend line is perpendicular to the final rolling direction.
- 3 True. The 14th Edition *Manual* gives guidance on this matter on pages 8-12 and 8-13. If the torque is represented by the symbol M_t and the radius of the weld group is R , the shear per linear inch of weld, r_m , is given by $r_m = M_t R / I_p$, where $I_p = I_{x_o} + I_{y_o} = 2\pi R^3$. With this formulation, r_m is the shear per linear inch of weld around the complete perimeter.
- 4 False. $R=3$ moment connections and those in Ordinary Moment Frames do not need to be prequalified. Intermediate and Special Moment Frames are permitted using either connections prequalified in accordance with ANSI/AISC 358-10, *Prequalified Connections*, or ANSI/AISC 341-10, *Seismic Provisions*, Section K1, or connections qualified in accordance with Section K2 of the *Seismic Provisions*. For more information see ANSI/AISC 341-10, Sections E2.6 and E3.6.
- 5 False. These types of members are no longer proprietary in the U.S.
- 6 (d) AISC *Specification* Section J5.2 allows for fillers (or shims) up to ¼-in. thick without any reduction in bolt strength. Otherwise, one of the four requirements given in Section J5.2(a) through (d) must be satisfied to address the presence of thicker fillers.
- 7 True. Appendix 6 of the AISC *Specification* defines the requirements for bracing that is provided to stabilize individual columns, beams and beam-columns.
- 8 False. AISC *Specification* Section J3.6 is the appropriate section for determining the rupture strength of the threaded section of the rod. However, the unthreaded length of the rod also must be checked for yielding per AISC *Specification* Section D2.
- 9 (d) AISC has augmented its classic *Steel Construction Manual* with a Digital Edition. This Digital Edition is a secured PDF file of the entire *Manual*. To learn more about the 14th Edition *Manual*, or to purchase a copy of the *Manual* in either print or digital format (or both), go to www.aisc.org/manual14.
- 10 True. Chapter N provides a template to follow for inspection criteria for steel structures.



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Anyone is welcome to submit questions and answers for Steel Quiz. If you are interested in submitting one question or an entire quiz, contact AISC's Steel Solutions Center at 866.ASK.AISC or at solutions@aisc.org.