

steel quiz

This month, the SteelQuiz focuses on information that will be presented at this year's NASCC, which takes place April 18-20 in Dallas. (See the program at www.aisc.org/nascc for a list of technical and other sessions.) Questions on coatings are also included.

- 1 True/False: AISC Steel Design Guide 11 *Floor Vibrations Due to Human Activity* contains design recommendations for monumental stairs.
- 2 Structural steel produced in the United States contains what percentage of recycled steel scrap?
a) 72% b) 93%
c) 98% d) 100%
- 3 True/False: According to Appendix 3 of the 2010 AISC *Specification*, fatigue need not be considered if the live load stress range is less than the threshold allowable stress range F_{TH} .
- 4 True/False: There are no minimum AISC or RCSC torque values.
- 5 The AISC *Code of Standard Practice* provides guidance for which of the following?
a) Fabrication Tolerances
b) Erection Tolerances
c) Architecturally Exposed Structural Steel
d) All of the above
- 6 True/False: Lifting lugs (or pad eyes) that meet the dimensional requirements of Section D5.2 in the 2010 AISC *Specification* (i.e., with a hole diameter that is a maximum of $\frac{1}{32}$ in. greater than the pin diameter) can be designed using those provisions.
- 7 True/False: When painting is required, protective coatings for structural steel typically consist of a minimum of a primer and a topcoat.
- 8 The slip class for a coating is provided by which of the following?
a) AISC
b) RCSC
c) The coating manufacturer
d) None of the above
- 9 True/False: The Society for Protective Coatings (SSPC) provides a database of coating contractors.
- 10 True/False: AISC 360 Sections M3.5 and M4.5 and their associated commentaries discuss when coatings on surfaces adjacent to field welds are not permitted.

TURN PAGE FOR ANSWERS

- 1 False. Steel Design Guide 11 pertains to walking excitations but does not cover the topic of monumental stairs. To learn more about this and other types of vibrations, such as footbridge response to groups of walkers, you can attend Session N4, *Floor Vibrations Beyond AISC Design Guide 11*, at NASCC: The Steel Conference.
- 2 (b) The domestic industry average recycled content of hot-rolled structural steel is approximately 93%. The 2012 Steel Conference has 10 sessions on sustainability, including topics on green construction, minimizing thermal bridging and LEED (see sessions G1 through G10 to find sustainability presentations that interest you).
- 3 True. This is stated in Section 3.1 of the Appendix. At low levels of cyclic tensile stress (below the fatigue threshold), fatigue cracking will not initiate, regardless of the number of cycle of loading. If you ever design members or components where fatigue is a consideration, the Steel Conference includes a session (N42) titled *Fatigue of Welded Connections: A Primer*.
- 4 True. Snug-tightened joints must have plies that are in firm contact. Pretensioned joints must have a minimum pretension in the bolts. These conditions can be accomplished using any of the methods given in RCSC *Specification* Section 8, but standard torque values are not provided in any of these methods. The Steel Conference session (N26) *Torque vs. Tension* will describe and demonstrate the proper installation methods outlined in RCSC *Specification* Section 8.
- 5 (d) Unless noted otherwise in the contract documents, the AISC *Code of Standard Practice* (www.aisc.org/code) defines and governs existing trade practices considered to be standard of the steel industry such as fabrication, erection and AESS tolerances. An overview and discussion on the Code will take place at the Steel Conference in Session N18, *AISC Code of Standard Practice—The Latest and Greatest*.
- 6 True. Pin material is governed by Section D5 in the 2010 *Specification*. However, these dimensional requirements are not typically met for spreader beam lifting lugs and similar field cases. However, if pin connections fall outside the limits imposed by Chapter D, the design falls outside the scope of the AISC *Specification* and one will need to use other resources to design the lug. Steel Conference Session (N46) *Tips on Designing Lifting Beams and Hitches* will discuss the various resources available for the design of these elements.
- 7 True. As indicated in the AISC *Code of Standard Practice* Section 6.5.1, the shop coat of paint is the prime coat of the protective system. It is intended as protection for only a short period of exposure in ordinary atmospheric conditions, and is considered a temporary and provisional coating. Long-term protection comes from the topcoat. Conversely, if a topcoat is not going to be used, one should question whether primer is needed.
- 8 (c) There are two slip classes recognized by AISC that correspond to a slip coefficient of either 0.3 or 0.5, as discussed in Section J3.8 of the AISC *Specification* (www.aisc.org/2010spec). However, AISC and RCSC do not maintain a list of coatings that comply with each slip class. Appendix A in the RCSC *Specification* (www.boltcouncil.org) provides the method for determining through testing the slip coefficient for a particular coating. Coating manufacturers test their coatings and provide the corresponding slip coefficient.
- 9 True. Visit their website at <http://www.sspc.org/qp-programs/qp-for-contractors/> and look for "Find a Certified Contractor" (on the right-hand side of page). It will allow you to search by state.
- 10 True. These sections state that materials that would adversely affect weld quality or produce objectionable fumes are required to be removed to within 2 in. of a field weld. Whether the coatings need to be removed or are permitted to be left in place depends upon the coating and its thickness, as well as the joint type. Section 12.2 in AISC *Design Guide 21* (www.aisc.org/epubs) covers coatings and considerations that might require their removal or permit them to remain.



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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.