

steel quiz

Most of the answers to this month's steel quiz can be found in the AISC *Specification* and AISC *Steel Construction Manual*, as well as on the AISC and *Modern Steel Construction* websites.

- 1 True/False: The AISC *Specification* contains requirements for developing erection procedures.
- 2 Which section of the 2010 AISC *Specification* addresses thermally cut bolt holes?
a) B2.5 b) F2.5
c) M2.5 d) None of the above
- 3 True/False: Historical AISC standards are available online.
- 4 Why is the NSBA bridge software called "Simon?"
a) Named after the software developer
b) Named after singer/songwriter Paul Simon
c) Named after a prominent bridge
d) None of the above
- 5 True/False: Welds of headed shear studs can also serve the function of a metal deck weld in recognition that duplication of structural attachments is not necessary.
- 6 Which of the following analysis methods applies to the design of bolt groups with eccentricity in the plane of the faying surface?
a) The Elastic Method
b) The Uniform Force Method
c) The Instantaneous Center of Rotation Method
d) Both A and C
- 7 True/False: AISC does not offer a bridge-related design handbook.
- 8 True/False: Headed shear studs are allowed to be fillet welded to the base metal in lieu of using automatic welding with a stud welding gun.
- 9 How many installation methods are allowed by the RCSC *Specification* for pretensioned fasteners?
a) 3 b) 4 c) 5 d) 6
- 10 True/False: High-strength bolts can be ordered with characteristics similar to weathering steel.

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- 1 False. Erection procedures and safety requirements are typically developed by the individual erector based on their experience and for conformance with OSHA regulations.
- 2 (c) Section M2.5 of the AISC *Specification* (a free download from www.aisc.org) provides surface roughness requirements for thermally cut holes. The use of numerically controlled or mechanically guided equipment is anticipated for the forming of thermally cut holes.
- 3 True. Historical standards are available through AISC's ePubs webpage (www.aisc.org/epubs) and are free downloads for AISC members.
- 4 (b) At the time of its original creation, the Simon and Garfunkel song "Bridge over Troubled Water" was atop the charts. Naming it "Garfunkel" was judged too obvious.
- 5 True. Section 3.8 of AISC *Steel Design Guide No. 21* (a free download for members from www.aisc.org) states, "Arc stud welding, frequently referred to simply as stud welding, is used to attach headed shear stud connectors to beams to facilitate composite action. Studs can be applied through decking, accomplishing the dual purpose of attaching the decking and the stud in one operation."
- 6 (d) Both the elastic method and instantaneous center of rotation method apply to the design of bolted joints with eccentricity in the plane of the faying surface. Both methods are illustrated in Part 7 of the AISC *Steel Construction Manual*.
- 7 False. With funding provided by FHWA, AISC's National Steel Bridge Alliance (NSBA) and HDR Engineering are working to develop the *Steel Bridge Design Handbook*. The initial chapters and design examples in this publication are available in the Resources section of www.steelbridges.org. Chapters and design examples are current with the AASHTO *Bridge Design Specification*, Third Edition.
- 8 True. AWS D1.1 Clause 7.5.5 permits using fillet welds to attach headed studs. This clause has additional design, surface preparation and inspection requirements if the fillet welded option is chosen.
- 9 We'll accept B or D as correct answers. A traditionalist will say there are four methods: turn-of-nut, calibrated wrench, twist-off tension control bolt and direct tension indicator. The trick aspect to this question is found in RCSC *Specification* Sections 2.6.2 and 2.8, which cover alternative washer indicating devices and alternative design fasteners, respectively. Because these alternative options are necessarily open to allow for other approaches, their use requires the approval of the EOR.
- 10 True. ASTM A325, A490, F1852 and F2280 all contain provisions for "Type 3" fasteners with improved atmospheric corrosion resistance and weathering characteristics. Availability of these fasteners in the required diameters and lengths should be confirmed prior to their specification.



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