

# steel quiz

**LOOKING FOR A CHALLENGE?** *Modern Steel Construction's* monthly Steel Quiz tests your knowledge of steel design and construction. Most answers can be found in the 2005 *Specification for Structural Steel Buildings*, available as a free download from AISC's web site, [www.aisc.org/2005spec](http://www.aisc.org/2005spec). Where appropriate, other industry standards are also referenced.

This month's Steel Quiz was developed by AISC's Steel Solutions Center. Sharpen your pencils and go!

- 1 What does the abbreviation "CB" mean when applied to a steel structural member? Hint: this question relates to historical shapes.
- 2 Which section of the 2005 AISC Specification relates most directly to the evaluation of existing structures?
- 3 What material specification was most commonly used for structural steel in 1901?
- 4 True or False: If relevant and up-to-date design documents are not available during a rehabilitation project and testing is not carried out on the structural bolts, the EOR can assume that the bolts are ASTM A307.
- 5 Where can one find historical AISC allowable stresses for A307 bolts?
- 6 What is the threshold stress range as used in Appendix 3 in the AISC 2005 Specification?
- 7 When specifying E70\_ \_ SMAW welding, what do the last two digits specify?
- 8 Does the effective throat thickness change when fillet welding a skewed shear plate, as opposed to a shear plate that is attached perpendicular to the support?
- 9 Is it common to ship bolts, nuts, and other components in a fastener assembly to the construction site in separate containers?
- 10 What percentage of structural steel in U.S. buildings is reclaimed and recycled at the end of its useful life?

TURN PAGE FOR ANSWERS

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## ANSWERS

- 1 CB stands for Carnegie Beam. Broadly speaking, these shapes have a cross-section that is similar to a W-shape.
- 2 Appendix 5 of the 2005 AISC Specification (available at [www.aisc.org/2005spec](http://www.aisc.org/2005spec)) covers evaluation and repair of existing structures.
- 3 ASTM A9 was the most commonly used structural steel specification in building design and construction in 1901. More information on this grade and the history of steel grades used can be found in AISC Design Guide 15 (available at [www.aisc.org/epubs](http://www.aisc.org/epubs)).
- 4 **True.** According to Section 5.2.6 of the 2005 AISC Specification, the EOR can either test an unidentified bolt or assume that it is an ASEM A307.
- 5 Table 1.4.1a of AISC Design Guide 15 includes historical AISC allowable stresses for unfinished carbon steel bolts or A307 bolts from 1936 to 1989.
- 6 The threshold stress range is the live load stress range provided in Table A-3.1 of Appendix 3 of the 2005 Specification. This identifies the range below which no evaluation of fatigue resistance is required.
- 7 The first of the two last digits indicates the position in which the electrode may be used, while the last digit is the designator to describe the coating type, welding current, and CVN properties. This specification can be found in AWS A5.1 and AISC *Design Guide 21* (available at [www.aisc.org/epubs](http://www.aisc.org/epubs)).
- 8 Yes, the effective throat thickness changes when welding shear plates at a skew. The engineer should specify a weld size that corresponds to the altered throat thickness when specifying the weld. See Table 8-2 on page 8-36 of the 13th Edition AISC *Steel Construction Manual* for prequalified fillet weld connections for skewed plate attachments.
- 9 Yes, it is common to ship bolts, nuts, and other components in a fastener assembly to the construction site in separate containers. However, this is not permitted for twist-off type tension-control bolt assemblies and galvanized bolt assemblies. See the Commentary to Section 6.6.2 of the *Code of Standard Practice for Steel Buildings and Bridges* (available at [www.aisc.org/code](http://www.aisc.org/code)).
- 10 96% of beams and plates are reclaimed and recycled at the end of their life. 88% of all steel products in the building are reclaimed and recycled. For more information refer to [www.aisc.org/sustainability](http://www.aisc.org/sustainability) or [www.recycle.steel.org](http://www.recycle.steel.org).

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](mailto:solutions@aisc.org).



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