

# steel quiz

This month's Steel Quiz is all about the 15th edition *AISC Steel Construction Manual* ([www.aisc.org/manual](http://www.aisc.org/manual)). Many thanks to Lutfur R. Khandaker, PE, and Raunac A. Khandaker of KBK Structural Design, LLC, who contributed this month's questions and answers!

- 1 **True or False:** Although the *AISC Specification for Structural Steel Buildings* (ANSI/AISC 360) permits other materials for use as anchor rods, ASTM F1554 is the preferred specification.
- 2 **True or False:** Among three grades of ASTM F1554 materials, Grade 36 is weldable and Grade 105 cannot be welded.
- 3 **True or False:** Per the *AISC Manual*, the main hot-rolled structural shapes are: W-, M-, S-, HP-, C-, MC- and L-.
- 4 **True or False:** The *AISC Code of Standard Practice for Steel Buildings and Bridges* (ANSI/AISC 303) does not include open-web steel joists in its definition of structural steel.
- 5 **True or False:** Per the *Manual*, steel castings are specified as ASTM A27 Grade 65-35 or ASTM A216 Grade 80-35.
- 6 **True or False:** Per the *Manual*, crane rails are furnished to ASTM A759, ASTM A1 and/or manufacturer's specifications and tolerances.
- 7 **True or False:** The mill tolerances are given as follows: For structural shapes and plates (ASTM A6), For HSS shapes (ASTM A500 or other applicable ASTM specification for HSS) and for Pipe (ASTM A53).
- 8 **True or False:** Fabrication tolerances are generally provided in *AISC Specification* Section M2 and *Code* Section 6.4.
- 9 **True or False:** Erection tolerances are generally provided in *Specification* Section M4 and *Code* Section 7.13.
- 10 **True or False:** In building structures, corrosion protection is not required for steel that will be enclosed by a building finish, coated with a contact-type fireproofing or in contact with concrete.
- 11 **True or False:** *Specification* Appendix 5 can be used for the evaluation of existing structures.

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TURN PAGE FOR THE ANSWERS

# steel quiz ANSWERS

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- 1 **True.** Although other materials can be used, ASTM F1554 is the preferred specification, since all anchor rod production requirements are together in this single specification (refer to page 2-22 of the *Manual*).
- 2 **True.** Grade 36 rods are weldable, Grade 55 rods are weldable only when they are made per Supplementary Requirement S1 and project specifications indicate this requirement. As a heat-treated material, Grade 105 rods cannot be welded (refer to page 2-22 of the *Manual*).
- 3 **True.** Three types of structural tees are also covered in the *Manual*. WT-, MT- and ST-shapes are typically split (sheared or thermal-cut) from W-, M- and S- shapes, respectively (refer to pages 1-3, 1-4 and 1-5 of the *Manual*).
- 4 **True.** Steel joists are designed and fabricated per the requirements of specifications published by the Steel Joist Institute (refer to pages 2-23, 16.3-6, 16.3-7 and 16.3-8 of the *Manual*).
- 5 **True.** Steel castings are specified as ASTM A27 Grade 65-35 or ASTM A216 Grade 80-35, and steel forgings are specified as ASTM A668 (refer to page 2-23 of the *Manual*).
- 6 **True.** Crane rails are furnished to ASTM A759, ASTM A1 and/or manufacturer's specifications and tolerances. Also, most manufacturers chamfer the top and sides of the crane-rail head at the ends unless specified otherwise to reduce chipping of the running surface. It is better to consult with the individual manufacturer before ordering (refer to page 2-24 of the *Manual*).
- 7 **True.** Refer to page 2-31.
- 8 **True.** Additional requirements that govern fabrication are as follows:
- Compression joint fit-up, per *Specification* Section M4.4
  - Roughness limits for finished surfaces, per *Code* Section 6.2.2
  - Straightness of projecting elements of connection materials, per *Code* Section 6.3.1
  - Finishing requirements at locations of removal of run-off tabs and similar devices, per *Code* Section 6.3.2. (refer to page 2-31 of the *Manual*)
- 9 **True.** The tolerances specified therein are predicated upon the proper installation of the following items by the owner's designated representative as specified in the *Code* (refer to page 2-31 of the *Manual*):
- Building lines and benchmarks, per *Code* Section 7.4
  - Anchorage devices, per *Code* Section 7.5
  - Bearing devices, per *Code* Section 7.6
  - Grout per *Code* Section 7.7
- 10 **True.** When enclosed, the steel is trapped in a controlled environment and the products required for corrosion are quickly exhausted. The surface condition of unpainted steel framing of longstanding buildings that have been demolished has been found to be unchanged from the time of its erection, except at isolated spots where leakage may have occurred. Even in the presence of leakage, the shop coat is of minor influence as indicated in *Specification* Commentary Section M3. A similar situation exists when steel is fireproofed or in contact with concrete. Accordingly, shop primer or paint is not required unless specified in the contract documents (refer to page 2-36 of the *Manual*).
- 11 **True.** Appendix 5 covers Evaluation of Existing Structures. Note that *Specification* Section B7 provides the charging language for Appendix 5 on the evaluation of existing structures (refer to page 2-36 of the *Manual*).



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