

steel quiz

LOOKING FOR A CHALLENGE? *Modern Steel Construction's* monthly Steel Quiz tests your knowledge of steel design and construction. The answers for most of the questions this month can be found in the 13th Edition AISC *Steel Construction Manual*. Good luck!

- 1 Why are k_{des} and k_{det} dimensions different in Table 1-1 of the 13th Edition AISC *Manual*?
- 2 True/False: Flat rolled carbon steel 4 in. wide and $\frac{1}{4}$ in. thick is called a strip.
- 3 To which ASTM manufacturing standard are crane rails typically specified?
- 4 Which resistance factor and safety factor are appropriate for the design of forged steel structural hardware products that are statically loaded?
 - a) $\phi = 0.9, \Omega = 1.67$
 - b) $\phi = 0.85, \Omega = 1.76$
 - c) $\phi = 0.75, \Omega = 2.0$
 - d) $\phi = 0.5, \Omega = 3.0$
- 5 True/False: The AISC *Code of Standard Practice* requires that the Engineer of Record include a description of the lateral load resisting system in the contract documents.
- 6 To what ASTM material standard are shear stud connectors typically specified?
- 7 When a W24x84 is cold cambered, what minimum radius range is recommended in the AISC *Manual*?
 - a) Between 240 in. and 336 in.
 - b) Between 192 in. and 240 in.
 - c) Between 144 in. and 240 in.
 - d) Between 144 in. and 192 in.
- 8 True/False: Using stainless steel fasteners with carbon steel base metal may cause an increase in the corrosion rate of the carbon steel.
- 9 What is the minimum amount of cleaning of the steel that the fabricator is expected to carry out if no specific requirements are made in the contract documents?
 - a) SSPC-SP1
 - b) SSPC-SP2
 - c) SSPC-SP3
 - d) SSPC-SP4
- 10 True/False: Mills use heat straightening to bring structural shapes to meet ASTM A6 tolerances for straightness.

- 1 Steel producers use a range of fillet radii in the production of W-shapes. The smallest radius is of interest for design; k_{des} reflects this so design properties are not overstated. The largest radius is of interest for detailing; k_{det} reflects this so that the available flat dimension in the web is not overstated.
- 2 False. According to AISI standard nomenclature this is called a bar. Please see Table 2-2 of the 13th Edition *AISC Manual*.
- 3 ASTM A759.
- 4 (d) Please see page 2-21 of the 13th Edition *AISC Manual* for a discussion of resistance and allowable factors for forged steel structural hardware.
- 5 True. Section 7.10.1 in the *AISC Code of Standard Practice* requires that a description of the lateral load resisting system be provided. Examples are provided in the Commentary.
- 6 Shear stud connectors are covered by ASTM A108, as required in AWS D1.1.
- 7 (a) The minimum recommended radius for cold cambering beams that have a nominal depth of up to 30 in. is between 10 and 14 times the depth. See page 2-29 of the 13th Edition *AISC Manual*.
- 8 True. Please see Table 2-6 of the 13th Edition *AISC Manual*.
- 9 (b) According to Section 6.5.2 of the *AISC Code of Standard Practice*, the fabricator shall, at a minimum, clean the steel to meet the requirements of SSPC-SP2.
- 10 False. Mills typically straighten structural shapes after rolling by utilizing either rotary straightening or gag straightening. Either approach is performed after the shape has cooled.

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.

