

Steel Quiz, a monthly feature in *Modern Steel Construction*, allows you to test your knowledge of steel design and construction. All references to LRFD specifications pertain to the 1999 LRFD Specification for Structural Steel Buildings, available as a free download at

www.aisc.org/lrfdspec.html

ASD references pertain to the 1989 ASD Specification for Structural Steel Buildings. Where appropriate, other industry standards are also referenced.

If you or your firm are interested in submitting a *Steel Quiz* question or column, contact:

The logo for Steel SolutionsCenter features the word "Steel" in a small blue font above "SolutionsCenter" in a larger, bold blue font. A blue swoosh underline is positioned above the "SolutionsCenter" text.

One E. Wacker Dr., Suite 3100
Chicago, IL 60601
tel: 312.670.2400
fax: 312.423.4651

solutions@aisc.org

AISC's **Safety Task Group** contributed to this month's *Steel Quiz*. The questions relate to the new OSHA regulations in the steel industry. The reader is encouraged to visit AISC's web site, www.aisc.org, or OSHA's web site, www.osha.gov, for additional information.

QUESTIONS

1. Can the "controlling contractor" rely on cure time instead of an appropriate ASTM test to determine that concrete samples have attained 75% of the intended compressive strength?
2. Repairs of anchor rods are prohibited without the project structural engineer's approval. Does one need written permission on file to straighten anchor rods with a hammer?
3. Are column splices designed for moment of 300 lb at 18" adequate?
4. The slab edge is 12" from the centerline of the W16×31 and has 4½" studs on the inside of the vertical leg. Can the curb plate and studs be installed in the shop?
5. Is tying off to perimeter guard cable adequate fall protection for working outside of the guard cable?
6. There is a joist 1' away from a column but no joist on the column. Does the joist need to be stabilized?
7. Perimeter columns have
 - a. Splices at least 48" above the top of steel
 - b. Holes or other devices to attach perimeter cable 42-45" above the top of steel
 - c. Both
 - d. Neither
8. True or False? Beams framing opposite the web of a carrying beam must have offset holes to permit keeping at least one hole in the connection of the first beam when the second is placed.
9. True or False? A competent person shall determine if more than two bolts are necessary to ensure the stability of cantilevered members.
10. How big is a decking hole?

TURN PAGE FOR ANSWERS

STEEL QUIZ

ANSWERS

1. No. Because of the many factors that influence cure rates, cure time is an unreliable means of assessing how much the concrete has cured.
2. No. Since hitting an anchor rod with a hammer to align it with base plate holes would not be considered a modification, approval does not have to be maintained on file but the erector should be notified of the adjustment. (Note if the anchor rod was bent to a large extent and in a curve less than the recommended cold bending radius it might be prudent to visually inspect the straightened anchor rod for damage.)
3. Trick question. The moment listed is the minimum required by the regulation but the *Code of Standard Practice* (www.aisc.org/code.html) requires that the erector maintain stability appropriate design loads. This will frequently require column splice designs to be higher than that required by the regulation.
4. Yes, but you may choose not to. The studs will not project over the beam flange and therefore do not constitute a tripping hazard. On the other hand, if the location of the slab edge is critical, you may choose to have the plates installed in the field in order to be able to adjust for plumbing tolerances.
5. No! Guard cable is not designed as a fall arrest system and will not provide protection against falls.
6. Yes. 29 CFR 1926 .757 (a) (2) (i) requires an alternate means of stabilizing the joist on both sides near the column. The stabilizing must provide stability equivalent to the 6x6 plate typical at columns, be designed by a qualified person, and be included in erection drawings.
7. Caught you! They have both but they are measured from the top of the finished floor, not the top of steel.
8. The regulation says one bolt must remain in place for connections thru column webs or thru beams webs over columns. Further, the regulation permits seats or other devices that would prevent instability of the column when the second beam is erected. Loose seats would not suffice, nor would column stiffeners that had no provisions for bolts. On the other hand, a temporary angle bolted to the top flange and extending over a cap plate with holes for bolts may provide a method without interfering with other connection details. Note that while SENRAC does not refer to beams that are not near columns, erecting beams with shared holes can be done safely but may not be the most desirable method. Single angles, single plates, offset clips or some other means to assemble the connection may improve the overall job performance.
9. True.
10. Any gap with the least dimension over 2" and less than 12" in its greatest dimension. (Bigger than 12" is an opening.)

