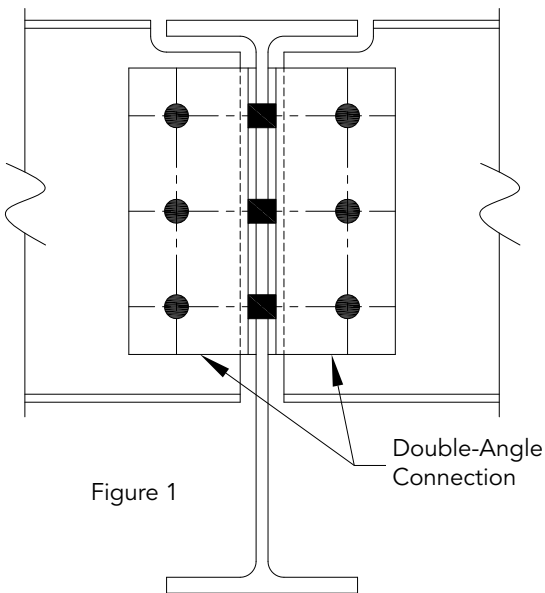


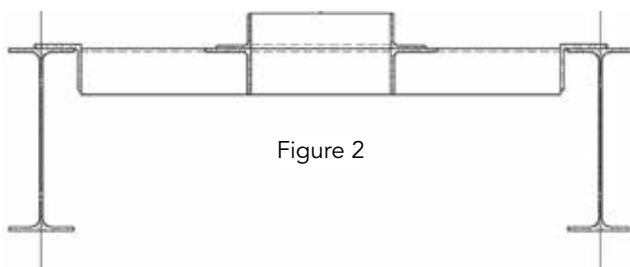
steel quiz

This month's Steel Quiz focuses on job-site safety and Occupational Safety and Health Administration (OSHA) regulations.

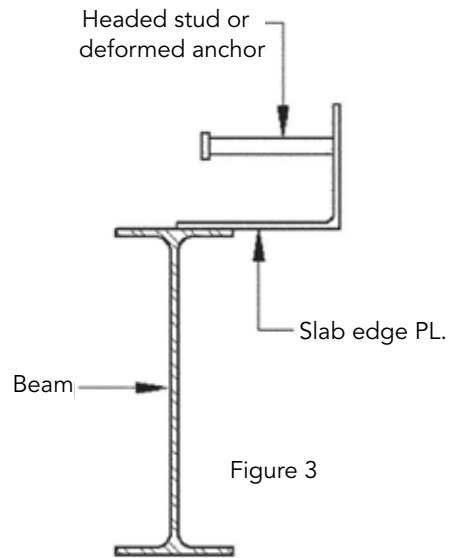
- 1 Per the OSHA safety regulations, columns are required to have a minimum of ____ anchor rods. (Choose one.)
 - a) One, for gravity columns only
 - b) Two
 - c) Four
 - d) This is not a requirement, only a recommendation
- 2 True or False: The following beam-to-girder connection does not meet OSHA safety requirements. (See Figure 1.)



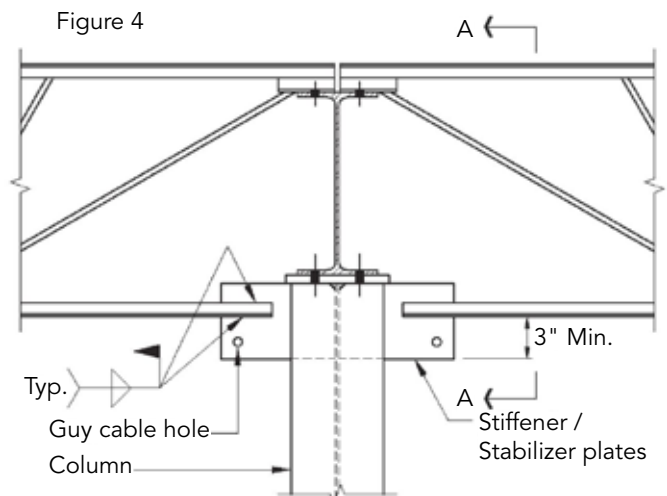
- 3 True or False: It is typically more efficient to splice columns every three floors.
- 4 Do OSHA safety regulations create any concern with the proposed floor opening detail? (See Figure 2.)



- 5 True or False: Per OSHA safety regulations, the headed stud and slab edge plate in Figure 3 is not permitted to be shop attached.



- 6 True or False: For the connection of the gravity framing joist members shown in Figure 4, the joist bottom chord should be welded to the stiffener/stabilizer plate.



TURN PAGE FOR ANSWERS

- 1 c) Four. Per Section 1926.755(a)(1) of Standard 29 CFR, OSHA requires that “all columns be anchored by a minimum of 4 anchor rods (anchor bolts).” Note that posts (which OSHA defines as weighing less than 300 lb) are distinguished from columns and excluded from the four-anchor-rod requirement.
- 2 True. Section 1926.756(a)(1) states: “During the final placing of solid web structural members, the load shall not be released from the hoisting line until the members are secured with at least two bolts per connection.” The issue with this connection is that an ironworker will need to temporarily support the first beam without bolts (or remove the bolts from the first beam that is connected) in order to connect the second beam. Yet the first beam cannot be released from the hoisting line until it has two bolts in each connection that cannot subsequently be removed to permit erection of the second beam, per OSHA requirement. There are many solutions available, and all eliminate the sharing of all bolts in a common field connection.
- 3 False. Connectors are required to tie off when the fall distance exceeds 30 ft. To work within this height when a column splice occurs every three floors, the erector would erect two floors, deck the second level first and then deck the first level second; thereafter, the third level must be erected and decked before starting the process again in the next tier. The first two levels were efficient because the decking at the bottom and erection at the top can occur simultaneously, but the efficiency is lost in the third level because it has to be erected and decked before erection of the next tier can proceed. Thus, for construction speed and economy, placing column splices every two floors (or in some cases, every four floors) is better than three because it allows continuous nesting of erection and decking activities.
- 4 Yes. As stated in Part 2 of the 14th Edition AISC *Manual*, “Framed metal deck openings must have structural members configured with projecting elements turned down to allow continuous decking, except where not allowed by design constraints or constructability. The openings in the metal deck are not to be cut until the hole is needed.” Thus, the concern is the interference of the upturned angle shown, which will prevent the placement of deck over the opening to eliminate a fall hazard until the opening must be cut later in construction.
- 5 True. Section 1926.754(c)(1) states: “Shear connectors (such as headed steel studs, steel bars or steel lugs), reinforcing bars, deformed anchors or threaded studs shall not be attached to the top flanges of beams, joists or beam attachments so that they project vertically from or horizontally across the top flange of the member until after the metal decking, or other walking/working surface, has been installed. This stud isn’t permitted because it protrudes into the width of the beam flange (walking surface).”
- 6 True. AISC’s *Detailing for Steel Construction* states: “There is no stiffener over the column, and stability of the column top is provided by welding the extended bottom chords to the stabilizer plates. These welded connections create continuity in the joists.” Similar guidance for this and other common cases of column-top stability is provided in Part 2 of the AISC *Steel Construction Manual*.



Steel
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Everyone 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.