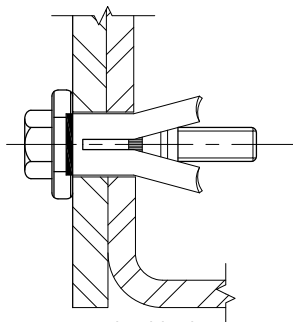


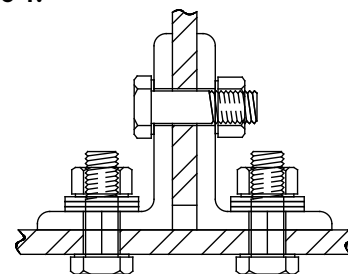
steel quiz

This month's Steel Quiz is all about bolts.

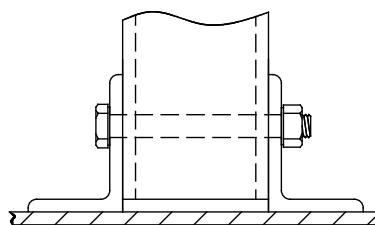
- 1 **True or False:** Per the new ASTM F3125 standard, ASTM A325 high-strength bolts are now specified and ordered as ASTM F3125 Grade A325 high-strength bolts.
- 2 **True or False:** The term "type" is used to differentiate between heavy-hex bolts and tension-control (TC) bolts.
- 3 Tension-control bolts (ASTM F3125 Grade F1852 and Grade F2280) are limited to a maximum diameter of:
 - a. 1 in.
 - b. $1\frac{1}{8}$ in.
 - c. $1\frac{1}{4}$ in.
 - d. $1\frac{1}{2}$ in.
- 4 Which of the following conditions shown in Figure 1 below fall outside the scope of the 2014 RCSC *Specification for Structural Joints Using High-Strength Bolts*?



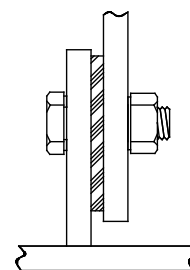
a. Blind bolts



b. Stacking washers



c. Through-bolt connection



d. Thermal insulation within the grip

Figure 1.

TURN TO PAGE 14 FOR THE ANSWERS.

- 1 **True.** Since the new ASTM F3125 standard replaced six standards (ASTM A325, ASTM A325M, ASTM A490, ASTM A490M, ASTM F1852 and ASTM F2280), the term “grade” is used to help identify which specific product is required. It should be noted that the new grade names are the same as the names for the previous standards. This should facilitate a smooth transition. In order to help engineers in specifying bolts, Chapter J Section J3.1 of the 2016 AISC *Specification for Structural Steel Buildings* (ANSI/AISC 360, available at www.aisc.org/standards) establishes Bolt Groups as follows:
- Group A—ASTM F3125/F3125M Grades A325, A325M, F1852 and ASTM A354 Grade BC
 - Group B—ASTM F3125/F3125M Grades A490, A490M, F2280 and ASTM A354 Grade BD
 - Group C—ASTM F3043 and F3111
- So, rather than specifying a bolt as F3125 Grade A325 or F3125 Grade F1852 in your design documents, you would only need to specify a Group A bolt to encompass all bolt styles of the same strength level.
- 2 **False.** The term “style” is used to differentiate between heavy-hex bolts and TC bolts. “Type” refers to different steel compositions.
- 3 **c.** 1¼ in. TC bolts were previously limited to a maximum diameter of 1⅛ in., but this maximum has increased up to 1¼ in. per the new ASTM F3125 standard.
- 4 **a., c. and d.** The RCSC *Specification* (available at www.aisc.org/standards) does permit the use of alternative-design fasteners, but blind bolts would not satisfy all of the requirements in Section 2.8. For the joint with the thermal insulation, Section 3.1 states that compressible materials shall not be placed within the grip of the bolt. The commentary in Section 1.1 states that the provisions of the RCSC *Specification* do not apply when material other than steel is included in the grip. Therefore, the RCSC does not address conditions where a thermal break material is used within in the grip. Similar concerns would be raised if there was essentially air in the grip which would be the case for a through-bolted connection. Use of stacked washers is not prohibited by the RCSC *Specification*. Commentary Section 2.3.3 explains that “if necessary, the next increment of bolt length can be specified with ASTM F436 washers in sufficient number to both exclude the threads from the shear plane and ensure that the assembly can be installed with adequate threads included in the grip for proper installation.”

