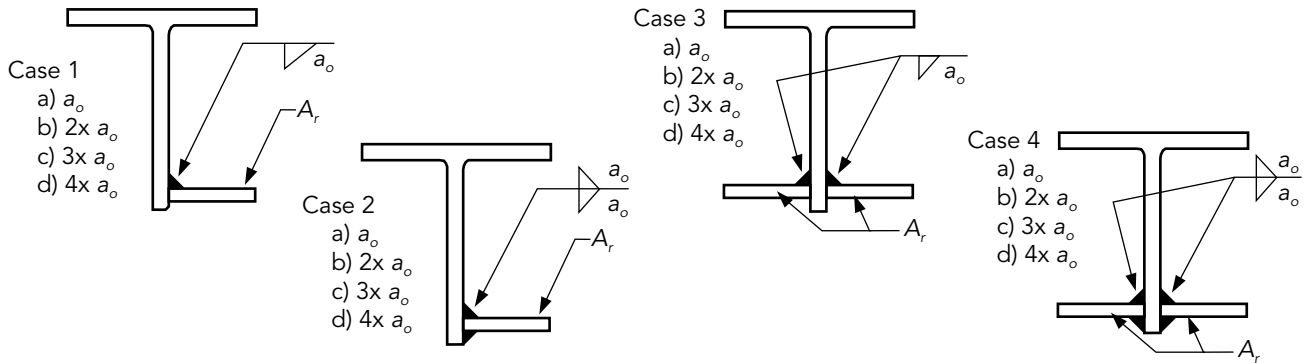


steel quiz

The answers to this month's Steel Quiz (there are only six questions this time) can be found in the AISC *Specification*, *Steel Manual* and *Design Guides* as well as on the AISC and *Modern Steel Construction* websites at www.aisc.org and www.modernsteel.com.

- 1 When designing reinforcing at a web opening in a wide-flange shape using AISC *Design Guide 2*, what is the appropriate weld length to use in the calculation of the weld capacity for the weld between the reinforcement and the beam web within the length of the opening, a_o , for each case illustrated below?

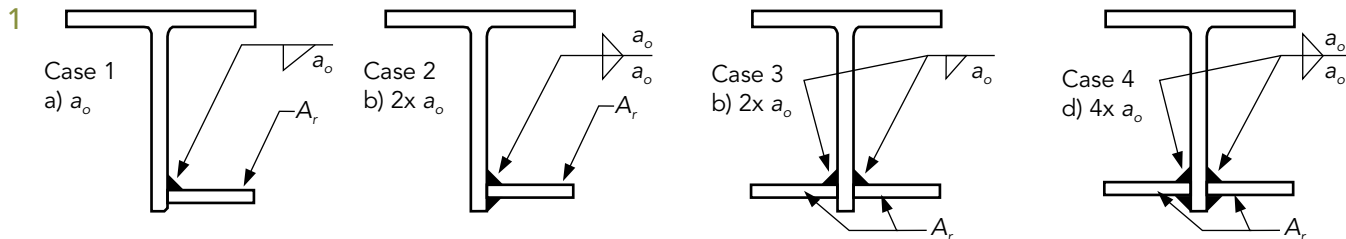


- 2 In the figures from Question 1, what does " A_r " represent?
- 3 True/False: AISC *Design Guide 2* assumes that the reinforcement and the steel beam have the same yield strength.
- 4 True/False: The performance of single-plate connections with short-slotted holes and standard holes is the same.
- 5 True/False: Bolts to be used in a snug-tightened joint are not required to be tested in a tension calibrating device.
- 6 What is the maximum number of F436 washers permitted for use with A325 bolts in a snug-tightened joint?
a) 2 b) 3 c) 4 d) No Limit

TURN PAGE FOR ANSWERS

steel quiz

ANSWERS



- 2 A_r is the cross-sectional area of reinforcement above or below the opening.
- 3 True. Reinforcement with a higher yield strength than that of the beam could be used, but the interaction of beams and stiffeners of differing yield strengths is beyond the scope of the design guide.
- 4 False. Much of the rotational demand on single-plate shear connections results from the accommodation of simple beam end rotation. In testing, connections with short-slotted holes typically have greater strengths than those using standard holes, presumably because the short slots reduce the rotational demand on the bolts.
- 5 True. The Research Council on Structural Connections (RCSC) *Specification* Section 7.1 states: "A tension calibrator shall be used when bolts are to be installed in pretensioned joints and slip-critical joints..." Note

- 6 d) The RCSC *Bolt Specification* (a free download from www.boltcouncil.org) does not limit the number of washers that can be used. The use of multiple washers is mentioned in the Commentary to Section 2.3, which states: "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." This applies equally to slip-critical and bearing joints.