

Steel Quiz, a monthly feature in *Modern Steel Construction*, allows you to test your knowledge of steel design and construction. Answers can generally be found in the *LRFD Manual of Steel Construction*, 2nd edition, but other industry standards are often referenced.

Many thanks to **Victor Shneur, P.E. of LeJeune Steel Company** for contributing the questions and answers for this month's *Steel Quiz*.

If you or your firm are interested in submitting a *Steel Quiz* question or column, please contact Keith Grubb at grubb@blacksquirrel.net

Questions

1. What is the maximum acceptable wind velocity in the vicinity of the weld when the FCAW-G process is used?
2. What is the minimum thickness of a compact 10 in wide A572-50 flange cover plate welded to the top of W24x104 beam?
3. What is not available on the market from list below?
 - a. L 6 x 4 x 1/2 (A36)
 - b. L 6 x 4 x 1/2 (A992-50)
 - c. L 6 x 3 x 1/2 (A36)
 - d. 1-1/2" diameter F1852 bolts
 - e. W 36 x 393 (A992-50)
4. What is the minimum rectangular HSS (A500 Grade B) wall thickness when a 5/16 -in. single-plate connection is used and when the plate is fully loaded?
5. True or False? Written WPSs are required for all prequalified shop and field welds.
6. Which bolts are prohibited for slip-critical connections?
 - a. A325
 - b. A490
 - c. A449
 - d. F1852
 - e. A307
7. How should faying surfaces be prepared for bolted joints in Seismic Force Resisting Systems?
8. Which of the following statements is correct?
 - a. Lamellar tearing is caused only by laminations.
 - b. Positive result of ultrasonic test prior welding is guarantee of eliminating lamellar tearing.
 - c. Lamellar tearing can be only at complete-joint-penetration welds.
 - d. Lamellar tearing is caused by low toughness in "Z" direction with subjected to high strains due to welding.
 - e. Lamellar tearing is a concern only for steel with $F_y = 50$ ksi or less.
9. Which of the listed modes of failure is the result of high compressive force in an anchor rod?
 - a. Rupture of anchor rod
 - b. Anchor rod straightening
 - c. Anchor rod push out
 - d. Anchor rod pull through
 - e. Anchor rod pull out
10. Which of the following statements is not correct?
 - a. Long-slotted holes are permitted in only one of connected parts of a slip-critical connection.
 - b. Long-slotted holes are permitted in only one of connected parts of a bearing connection.
 - c. Long-slotted holes are permitted without regard to direction of loading in slip-critical connection.
 - d. Long-slotted holes shall be normal to the direction of load in bearing connection.
 - e. Long-slotted holes do not affect bolt bearing.

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Steel Quiz

Answers

1. Maximum acceptable velocity is 5 miles per hour. If expected wind velocity is higher, a temporary shelter can be used for protection.
2. $\frac{3}{8}$ - in. See Table B5.1 in *LRFD Specification for Structural Steel Buildings* for limiting width-thickness ratio for compact flange cover plates.
3. b—ASTM A992 applies to W - sections only.
c—there is no L 6 x 3 x $\frac{1}{2}$, unless it is cut from other angle.
d—typically 1-1/8" is the maximum diameter for tension-control bolts.
4. Minimum wall thickness is 0.22 in. Refer to Table 4-9 in *Hollow Structural Sections Connections Manual*.
5. True.
6. c & e.
7. From Section 7.2a of *Seismic Provisions for Structural Steel Buildings* (April 15, 1997): "All faying surfaces shall be prepared as required for Class A or better slip-critical joints."
8. d.
9. c.
10. e. Fill plates are not considered.