

Steel Quiz

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.

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

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After you finish your Thanksgiving turkey, sit back, relax, and have a go at this month's *Steel Quiz*!

8. What does the abbreviation "SLV" stand for when written next to a single angle on a drawing?
9. For a knifed connection, what is the approximate required erection clearance between the angles?
10. An iron alloy with more than 2% carbon is commonly known as ____? (fill in the blank)

Turn page for answers

Questions

1. What is the coefficient of friction, μ , for a Class A faying surface?
2. What is a "Whitmore section"?
3. Imagine a beam with a large compressive concentrated load on the top flange at midspan. What limit states must be checked in the beam web to determine if you need a stiffener?
4. Name at least two elements that are commonly found in structural steel alloys.
5. Pound for pound, what is the most expensive material in a steel structure?
6. For anchor rods, can the same nut be used on both cut and rolled threads?
7. True or False: Every beam stiffener should be a full-depth stiffener.

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Answers

1. The coefficient of friction is 0.33 for a Class A faying surface—refer to the RCSC *Specification for Structural Joints Using ASTM A325 or A490 Bolts* (1994) section 5 (b).
2. A Whitmore section identifies a theoretically effective cross-sectional area at the end of a connection resisting tension or compression, such as that from a brace-to-gusset-plate connection or similar fitting. As illustrated in

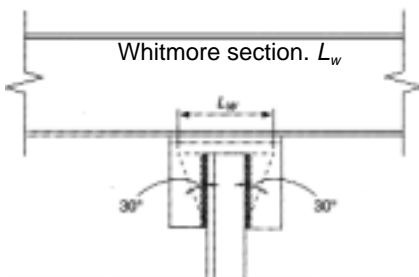


figure (below, left) for a WT hanger connection, the effective length for the Whitmore section L_w is determined using a spread-out angle of 30° along both sides of the connection, beginning at the start of the connection. It is applicable to both welded and bolted connections.

3. Web crippling and web yielding.
4. Carbon, nickel, manganese, molybdenum, and chromium are a few.
5. Weld metal. It pays to take the time to carefully design your welded connections to minimize the volume (size×length) of the required weld deposit.
6. Yes. Both types of threads are produced to the same threading specification.

7. False! In many cases, partial-depth beam stiffeners are the better choice. Partial depth stiffeners eliminate fitting and welding one end of the stiffener. If the purpose of the stiffener is to take a concentrated load (at the fitted end of the stiffener) and distribute the force into the beam web, fitting the other end to the flange does little. Full-depth stiffeners are better, though, when concentrated forces must pass “through” the beam web.
8. SLV = short leg vertical, noting the orientation of a single angle. Similarly, LLV = long leg vertical.
9. An erection clearance of approximately 1/8” is desirable. For gaps over 1/8”, shims are required.
10. Cast iron.