Steel Quiz, a monthly feature in *Modern Steel Construction*, allows you to test your knowledge of steel design and construction. All references to LRFD specifications pertain to the 1999 *LRFD Specification for Structural Steel Buildings*, available as a free download at www.aisc.org/lrfdspec.html. ASD references pertain to the 1989 *ASD Specification for Structural Steel Buildings*. Where appropriate, other industry standards are also referenced.

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

Steel SolutionsCenter

One E. Wacker Dr., Suite 3100
Chicago, IL 60601
tel: 312.670.2400
fax: 312.423.4651
solutions@aisc.org

This month's *Steel Quiz* was contributed by **Victor Shneur**, of Lejeune Steel, Minneapolis, MN.

QUESTIONS

1. Which of the following statements is correct? Steel joists can be field modified only with the approval of:
   a. the structural engineer of record
   b. the joist supplier if his/her calculations show that modification is acceptable
   c. the architect if calculations from the joist supplier show that modification is acceptable
   d. the local building official
   e. the inspector
2. Where should camber for beam and shop assembled trusses be measured?
3. Which of the following statements is correct? Visual weld inspection performed by the fabricator/erector:
   a. shall be done for all welds only if it is specified in contract documents
   b. shall be done for all welds
   c. shall be done only for 50% of welds if it is not specified in contract documents
   d. shall be done only after welding
   e. is not required if ultrasonic inspection is specified.
4. True or False? WPS is not required for repair welding of mill material.
5. What is the maximum permissible carbon equivalent value for a W14x233 (A992)?
6. Which of the following statements is correct? The reduction coefficient U for shear lag is applied:
   a. to the net area of all bolted members and to the gross area of all welded members
   b. to the net area of bolted tension members and to the gross area of welded tension members except for HSS members with slots for gusset plates
   c. to the net area of all bolted members
   d. to the net area of bolted tension members
   e. to the gross area of bolted and welded tension members.
7. What is the minimum required preheat temperature for thermally cutting beam copes and weld access holes in ASTM A6/A6M Group 4 and 5 shapes?
8. Where can one find equivalent 90° fillet weld leg size factors for skewed T-joints?
9. Is it acceptable to use wet ceramic ferrule for stud welding?
10. According to AWS D1.1-2000, what is the minimum distance from the stud to the edge of the beam flange?

TURN PAGE FOR ANSWERS

STEEL QUIZ

ANSWERS

1. a. Note: Modification without approval of joist manufacturer voids warrantee. Also, joist manufacturer is the joist designer.

2. Per Sections 6.4.4 and 6.4.5 of the *Code of Standard Practice for Steel Buildings and Bridges*, "camber shall be measured in the Fabricator's shop in the unstressed condition." Refer to the commentary on these sections for a more detailed explanation.

3. b.

4. False. From Standard A6/A6M Section 9.5.1.7: "Repair welding of materials shall be in accordance with a welding procedure specification (WPS) that is in accordance with the requirements of ANSI/AWS D1.1 or ASME Section IX..."

5. 0.47%. See Section 5.4 of Standard A992/A992M for reference. Note: carbon equivalent values are used to evaluate weldability.

6. b.

7. The minimum temperature is +150 °F (+66 C). According to AISC LRFD *Specification* Commentary Section M2.2, preheat "tends to minimize the hard surface layer and the initiation of cracks."

8. AWS D1.1 - 2000, Annex II "Effective Throats of Fillet Welds in Skewed T-Joints" provides these factors in Table II-1.

9. No. From Section 7.4.4, AWS D1.1 - 2000: "The arc shields or ferrules shall be kept dry. Any arc shields which show signs of surface moisture from dew or rain shall be oven dried at 250 °F (120 C) for two hours before use."

10. From Section 7.4.5: "The minimum distance from the edge of a stud base to the edge of a flange shall be the diameter of the stud plus 1/8 in. (3 mm), but preferably not less than 1 1/2 in. (38 mm)."