

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. 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:



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This month's *Steel Quiz* was created by the Steel Solutions Center at AISC. The theme of this quiz is "Properly Specifying Materials." All answers can be found in Part 2 of the recently released 3rd Edition *LRFD Manual of Steel Construction* (order at

www.aisc.org/lrfd.html or call 800.644.2400). Another excellent resource is "Are You Properly Specifying Materials?", a three-part article that appeared in *Modern Steel Construction* in January, February, and March of 1999 (available at www.aisc.org/modernsteel).

QUESTIONS

1. Where can one find general shape availability listings?
2. What is the preferred material specification for W-Shapes?
3. What material is standard for rolled steel floor plates?
4. What are some common material specifications for structural steel shapes when atmospheric corrosion resistance (weathering) characteristics are desired?
5. What is the proper material specification for steel pipe?
6. What is the most common material specification for hollow structural sections?
7. ASTM A36 is the most common and preferred material specification for structural steel plates. What materials can be specified if higher strength plates are desired?
8. M-, S-, C-, MC-, HP-, MT-, and ST-Shapes all have the same preferred material specification. What is it?
9. ASTM A36 is the preferred material specification for angles. What materials can be specified for angles if a minimum specified yield strength greater than 36 ksi is required?
10. What is the preferred material specification for anchor rods?

TURN PAGE FOR ANSWERS

STEEL QUIZ

ANSWERS

1. The latest availability listings are printed in the January or July issue of *Modern Steel Construction* and can also be viewed online at www.aisc.org.
2. The preferred material specification for W-shapes is ASTM A992. The availability of W-shapes in grades other than ASTM A992 should be confirmed prior to their specification.
3. ASTM A786 is the standard specification for rolled steel floor plates. As floor-plate design is seldom controlled by strength considerations, ASTM A786 "commercial grade" is commonly specified.
4. W-shapes (or WT-shapes) with atmospheric corrosion resistance (weathering) characteristics can be obtained by specifying ASTM A588 (gr. 50) or ASTM A242 (gr. 42, which covers tensile group 4 and 5 shapes only; gr. 46, which covers tensile group 3 shapes only; or gr. 50, which covers tensile group 1 and 2 shapes only). M-, MT-, S-, ST-, C- and MC- shapes with weathering characteristics can be obtained by specifying ASTM A588 (gr. 50) or ASTM A242 (gr. 50). HP-shapes with weathering characteristics can be obtained by specifying ASTM A242 (gr. 46). Angles with weathering characteristics can be obtained by specifying ASTM A588 (gr. 50) or ASTM A242 (gr. 46, which covers tensile group 3 angles only, or gr. 50, which covers tensile group 1 and 2 angles only). Hollow structural sections with weathering characteristics can be obtained by specifying ASTM A847. Availability of each of the above weathering steels should be confirmed prior to specification.
5. The sole material specification for steel pipe is ASTM A53 gr. B.
6. The preferred material specification for round and rectangular (and square) hollow structural sections is ASTM A500 gr. B, although ASTM A500 gr. C is increasingly very common.
7. Structural plates with higher yield and tensile strengths can be obtained by specifying ASTM A572 (gr. 42, 50, 55, 60, and 65), ASTM A529 (gr. 50 and 55), ASTM A514 ($F_y = 90$ and 100 ksi), ASTM A852 ($F_y = 70$ ksi), ASTM A588 (weathering; $F_y = 42, 46,$ and 50 ksi) or ASTM A242 (weathering; $F_y = 42, 46,$ and 50 ksi). As the appropriate material specification and grade is highly dependent on the thickness of the plate, it is recommended that you review Table 2-2 of the 3rd Edition *LRFD Manual* or consult with your plate supplier before specifying higher strength plates. Additionally, the availability of plates in materials other than ASTM A36 should be confirmed prior to their specification.
8. ASTM A36
9. Angles with higher yield and tensile strengths can be obtained by specifying ASTM A572 (gr. 42, 50, 55, 60 or 65), ASTM A529 (gr. 50 or 55, which cover tensile groups 1 and 2 angles only) or ASTM A913 (gr. 50, 60, 65 or 70). The availability of angles in grades other than ASTM A36 should be confirmed prior to their specification.
10. The preferred material specification for anchor rods is ASTM F1554 (gr. 36, 55 and 105), which covers hooked, headed and threaded and nutted anchor rods. ASTM F1554 gr. 36 is most commonly specified, although grades 55 and 105 are normally available, albeit with potentially longer lead times, when higher strength is required.