CHAPTER 10—COLUMNS

CODE

10.1—Scope

10.1.1 This chapter shall apply to the design of nonprestressed and prestressed columns, including reinforced concrete pedestals.

10.1.2 Design of plain concrete pedestals shall be in accordance with Chapter 14.

10.2—General

10.2.1 *Materials*

10.2.1.1 Design properties for concrete shall be selected to be in accordance with Chapter 19.

10.2.1.2 Design properties for steel reinforcement shall be selected to be in accordance with Chapter 20.

10.2.1.3 Materials, design, and detailing requirements for embedments in concrete shall be in accordance with 20.6.

10.2.2 *Connection to other members*

10.2.2.1 For cast-in-place construction, beam-column and slab-column joints shall satisfy Chapter 15.

10.2.2.2 For precast construction, connections shall satisfy the force transfer requirements of 16.2.

10.2.2.3 Connections of columns to foundations shall satisfy 16.3.

10.3—Design limits

10.3.1 *Dimensional limits*

10.3.1.1 For columns with a square, octagonal, or other shaped cross section, it shall be permitted to base gross area considered, required reinforcement, and design strength on a circular section with a diameter equal to the least lateral dimension of the actual shape.

10.3.1.2 For columns with cross sections larger than required by considerations of loading, it shall be permitted to base gross area considered, required reinforcement, and design strength on a reduced effective area, not less than one-half the total area. This provision shall not apply to columns in special moment frames or columns not part of the seismic-force-resisting system required to be designed in accordance with Chapter 18.

10.3.1.3 For columns built monolithically with a concrete wall, the outer limits of the effective cross section of the

COMMENTARY

R10.1—Scope

R10.1.1 Composite structural steel-concrete columns are not covered in this chapter. Composite columns include both structural steel sections encased in reinforced concrete and hollow structural steel sections filled with concrete. Design provisions for such composite columns are covered in AISC 360.

R10.3—Design limits

R10.3.1 *Dimensional limits*

Explicit minimum sizes for columns are not specified to permit the use of reinforced concrete columns with small cross sections in lightly loaded structures, such as low-rise residential and light office buildings. If small cross sections are used, there is a greater need for careful workmanship, and shrinkage stresses have increased significance.

R10.3.1.2 In some cases, the gross area of a column is larger than necessary to resist the factored load. In those cases, the minimum reinforcement percentage may be calculated on the basis of the required area rather than the provided area, but the area of reinforcement cannot be less than 0.5 percent of the actual cross-sectional area.