CODE

10.7.1.3 Along development and lap splice lengths of longitudinal bars with $f_y \geq$ **550 MPa**, transverse reinforcement shall be provided such that K_{tr} shall not be smaller than $0.5d_b$.

10.7.1.4 Bundled bars shall be in accordance with 25.6.

10.7.2 *Reinforcement spacing*

10.7.2.1 Minimum spacing s shall be in accordance with 25.2.

10.7.3 *Longitudinal reinforcement*

10.7.3.1 For nonprestressed columns and for prestressed columns with average $f_{pe} <$ **1.6 MPa**, the minimum number of longitudinal bars shall be (a), (b), or (c):

(a) Three within triangular ties

(b) Four within rectangular or circular ties

(c) Six enclosed by spirals or for columns of special moment frames enclosed by circular hoops

10.7.4 *Offset bent longitudinal reinforcement*

10.7.4.1 The slope of the inclined portion of an offset bent longitudinal bar relative to the longitudinal axis of the column shall not exceed 1 in 6. Portions of bar above and below an offset shall be parallel to axis of column.

10.7.4.2 If the column face is offset 75 mm or more, longitudinal bars shall not be offset bent and separate dowels, lap spliced with the longitudinal bars adjacent to the offset column faces, shall be provided.

10.7.5 *Splices of longitudinal reinforcement*

10.7.5.1 *General*

10.7.5.1.1 Lap splices, mechanical splices, butt-welded splices, and end-bearing splices shall be permitted.

10.7.5.1.2 Splices shall satisfy requirements for all factored load combinations.

10.7.5.1.3 Splices of deformed reinforcement shall be in accordance with 25.5 and, if applicable, shall satisfy the requirements of 10.7.5.2 for lap splices or 10.7.5.3 for end-bearing splices.

COMMENTARY

R10.7.3 *Longitudinal reinforcement*

R10.7.3.1 At least four longitudinal bars are required when bars are enclosed by rectangular or circular ties. For other tie shapes, one bar should be provided at each apex or corner and proper transverse reinforcement provided. For example, tied triangular columns require at least three longitudinal bars, with one at each apex of the triangular ties. For bars enclosed by spirals, at least six bars are required.

If the number of bars in a circular arrangement is less than eight, the orientation of the bars may significantly affect the moment strength of eccentrically loaded columns and should be considered in design.

R10.7.5 *Splices of longitudinal reinforcement*

R10.7.5.1 *General*

R10.7.5.1.2 Frequently, the basic gravity load combination will govern the design of the column itself, but a load combination including wind or earthquake effects may induce greater tension in some column bars. Each bar splice should be designed for the maximum calculated bar tensile force.

R10.7.5.1.3 For the purpose of calculating ℓ_d for tension lap splices in columns with offset bars, Fig. R10.7.5.1.3 illustrates the clear spacing to be used.