CODE

COMMENTARY

13.3—Shallow foundations

13.3.1 *General*

13.3.1.1 Minimum base area of foundation shall be proportioned to not exceed the permissible bearing pressure when subjected to forces and moments applied to the foundation. Permissible bearing pressures shall be determined through principles of soil or rock mechanics in accordance with the general building code, or other requirements as determined by the building official.

13.3.1.2 Overall depth of foundation shall be selected such that the effective depth of bottom reinforcement is at least 150 mm.

13.3.1.3 In sloped, stepped, or tapered foundations, depth and location of steps or angle of slope shall be such that design requirements are satisfied at every section.

13.3.2 *One-way shallow foundations*

13.3.2.1 The design and detailing of one-way shallow foundations, including strip footings, combined footings, and grade beams, shall be in accordance with this section and the applicable provisions of Chapter 7 and Chapter 9.

13.3.2.2 Reinforcement shall be distributed uniformly across entire width of one-way footings.

13.3.3 *Two-way isolated footings*

13.3.3.1 The design and detailing of two-way isolated footings shall be in accordance with this section and the applicable provisions of Chapter 7 and Chapter 8.

13.3.3.2 In square two-way footings, reinforcement shall be distributed uniformly across entire width of footing in both directions.

13.3.3.3 In rectangular footings, reinforcement shall be distributed in accordance with (a) and (b):

(a) Reinforcement in the long direction shall be distributed uniformly across entire width of footing.
(b) For reinforcement in the short direction, a portion of the total reinforcement, $\gamma_s A_s$, shall be distributed uniformly over a band width equal to the length of short side of footing, centered on centerline of column or pedestal. Remainder of reinforcement required in the short direction, $(1 - \gamma_s)A_s$, shall be distributed uniformly outside the center band width of footing, where γ_s is calculated by:

$$\gamma_s = \frac{2}{(\beta + 1)} \qquad (13.3.3.3)$$

where β is the ratio of long to short side of footing.

R13.3—Shallow foundations

R13.3.1 *General*

R13.3.1.1 General discussion on the sizing of shallow foundations is provided in R13.2.6.1.

R13.3.1.3 Anchorage of reinforcement in sloped, stepped, or tapered foundations is addressed in 13.2.8.4.

R13.3.3 *Two-way isolated footings*

R13.3.3.3 To minimize potential construction errors in placing bars, a common practice is to increase the amount of reinforcement in the short direction by $2\beta/(\beta + 1)$ and space it uniformly along the long dimension of the footing (CRSI Handbook 1984; Fling 1987).