

CODE

8.5.4.2 As an alternative to 8.5.4.1, openings shall be permitted in slab systems without beams in accordance with (a) through (d).

(a) Openings of any size shall be permitted in the area common to intersecting middle strips, but the total quantity of reinforcement in the panel shall be at least that required for the panel without the opening.

(b) At two intersecting column strips, not more than one-eighth the width of column strip in either span shall be interrupted by openings. A quantity of reinforcement at least equal to that interrupted by an opening shall be added on the sides of the opening.

(c) At the intersection of one column strip and one middle strip, not more than one-fourth of the reinforcement in either strip shall be interrupted by openings. A quantity of reinforcement at least equal to that interrupted by an opening shall be added on the sides of the opening.

(d) If an opening is located closer than $4h$ from the periphery of a column, concentrated load or reaction area, **22.6.4.3** shall be satisfied.

8.6—Reinforcement limits**8.6.1** *Minimum flexural reinforcement in nonprestressed slabs*

8.6.1.1 A minimum area of flexural reinforcement, $A_{s,min}$ of **0.0018 A_g** , or as defined in 8.6.1.2, shall be provided near the tension face of the slab in the direction of the span under consideration.

COMMENTARY

R8.6—Reinforcement limits**R8.6.1** *Minimum flexural reinforcement in nonprestressed slabs*

R8.6.1.1 The required area of deformed or welded wire reinforcement used as minimum flexural reinforcement is the same as that required for shrinkage and temperature in **24.4.3.2**. However, whereas shrinkage and temperature reinforcement is permitted to be distributed between the two faces of the slab as deemed appropriate for specific conditions, minimum flexural reinforcement should be placed as close as practicable to the face of the concrete in tension due to applied loads.

Figure R8.6.1.1 illustrates the arrangement of minimum reinforcement required near the top of a two-way slab supporting uniform gravity load. The bar cutoff points are based on the requirements shown in Fig. 8.7.4.1.3.

To improve crack control and to intercept potential punching shear cracks with tension reinforcement, the licensed design professional should consider specifying continuous reinforcement in each direction near both faces of thick two-way slabs, such as transfer slabs, podium slabs, and mat foundations. Also refer to R8.7.4.1.3.