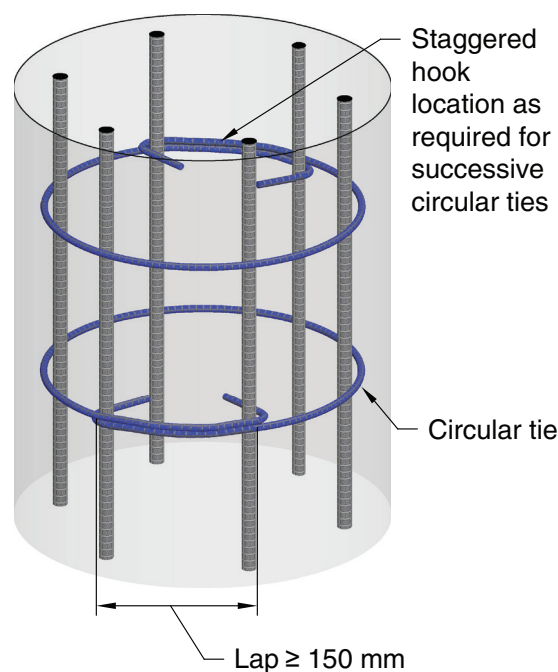


## CODE

## COMMENTARY



**Fig. R25.7.2.4.1**—Circular tie anchorage.

**25.7.2.5** Ties to resist torsion shall be perpendicular to the axis of the member anchored by either (a) or (b):

- (a) Ends shall terminate with 135-degree standard hooks or seismic hooks around a longitudinal bar
- (b) In accordance with 25.7.1.3(a) or (b) or 25.7.1.4, where the concrete surrounding the anchorage is restrained against spalling

**R25.7.2.5** Refer to R25.7.1.6.

### 25.7.3 Spirals

**25.7.3.1** Spirals shall consist of evenly spaced continuous bar or wire with clear spacing conforming to (a) and (b):

- (a) At least the greater of 25 mm and  $(4/3)d_{agg}$
- (b) Not greater than 75 mm

**25.7.3.2** For cast-in-place construction, spiral bar or wire diameter shall be at least 9.5 mm.

**25.7.3.3** Except for transverse reinforcement in deep foundations, the volumetric spiral reinforcement ratio  $\rho_s$  shall satisfy Eq. (25.7.3.3).

$$\rho_s \geq 0.45 \left( \frac{A_g}{A_{ch}} - 1 \right) \frac{f'_c}{f_{yt}} \quad (25.7.3.3)$$

### R25.7.3 Spirals

**R25.7.3.1** Spirals should be held firmly in place, at proper pitch and alignment, to prevent displacement during concrete placement.

**R25.7.3.2** For practical considerations in cast-in-place construction, the minimum diameter of spiral reinforcement is 9.5 mm (No. 10 deformed or plain bar, or MD70 deformed or MW70 plain wire).

Standard spiral sizes are 9.5, 12.7, and 16 mm diameter for hot-rolled or cold-drawn material, plain or deformed.

**R25.7.3.3** The effect of spiral reinforcement in increasing the strength of the concrete within the core is not fully realized until the column has been subjected to a load and deformation sufficient to cause the concrete shell outside the core to spall off. The amount of spiral reinforcement required by Eq. (25.7.3.3) is intended to provide additional strength for concentrically loaded columns equal to or slightly greater than the strength lost when the shell spalls off. The deriva-