

CODE

COMMENTARY

Table 25.2.4—Minimum center-to-center spacing of pretensioned strands at ends of members

f_{ci} , MPa	Nominal strand diameter, mm	Minimum s
< 28	All	$4d_b$
≥ 28	< 12.7 mm	$4d_b$
	12.7 mm	45 mm
	15.2 mm	50 mm

25.2.5 For pretensioned wire at ends of a member, minimum center-to-center spacing, s , shall be the greater of $5d_b$ and $[(4/3)d_{agg} + d_b]$.

25.2.6 Reduced vertical spacing including bundling of prestressed reinforcement shall be permitted in the middle portion of a span.

25.2.7 For parallel nonprestressed reinforcement in shotcrete members, the clear spacing shall be in accordance with (a) or (b):

- (a) The clear spacing between bars shall be at least the greater of $6d_b$ and 65 mm.
- (b) If two curtains of reinforcement are provided, the clear spacing between bars in the curtain nearer the nozzle shall be at least $12d_b$. The clear spacing between bars in the remaining curtain shall conform to (a).

25.2.7.1 It shall be permitted to use a clear spacing that does not meet 25.2.7(a) or 25.2.7(b) provided shotcrete mockup panels are used to demonstrate proper reinforcement encasement in accordance with (a) and (b):

- (a) The shotcrete mockup panels shall be representative of the most complex reinforcement configurations to be encountered.
- (b) The licensed design professional shall specify the shotcrete mock-up panel quantity, frequency of shooting per nozzle man and member type, and panel thickness to verify reinforcement encasement.

25.2.8 For prestressed strands in shotcrete members, minimum center-to-center spacing, s , shall satisfy 25.2.4, except as permitted in 25.2.6.

25.2.9 For prestressed wire in shotcrete members, minimum center-to-center spacing, s , shall satisfy the requirements for wire in 25.2.5, except as permitted in and 25.2.6

25.2.10 For ties, hoops, and spiral reinforcement in columns to be placed with shotcrete, minimum clear spacing shall be 75 mm.

R25.2.7.1 Information on shotcrete mockup panels is provided in [ACI 506R](#), and information on evaluating shotcrete is provided in [ACI 506.4R](#).

R25.2.10 Shotcrete is usually not used in new construction for columns because the close spacing between ties, hoops, or spiral reinforcement makes it difficult to achieve adequate encasement of the column longitudinal reinforcement. Spacing closer than required in 25.2.10 requires approval by