

CODE

25.5.1.5 For bars with $f_y \geq 550$ MPa spaced closer than 150 mm on center, transverse reinforcement shall be provided such that K_{tr} shall not be smaller than $0.5d_b$.

25.5.1.6 Non-contact lap splices for reinforcement in shotcrete shall have clear spacing in accordance with (a) or (b):

- (a) For No. 19 and smaller bars, the clear spacing between bars shall be at least greater of $6d_b$ and 65 mm.
- (b) For No. 22 and larger bars, the clear spacing shall be established using a shotcrete mockup panel to demonstrate that the reinforcement is properly encased.

25.5.1.7 Contact lap splices for reinforcement in shotcrete shall be oriented with the plane of the spliced bars perpendicular to the surface of the shotcrete and approved by the licensed design professional based on a shotcrete mockup panel to demonstrate that the reinforcement is properly encased.

25.5.1.8 Lap splices of bundled bars shall be in accordance with 25.6.1.7.

25.5.2 *Lap splice lengths of deformed bars and deformed wires in tension*

25.5.2.1 Tension lap splice length ℓ_{st} for deformed bars and deformed wires in tension shall be in accordance with Table 25.5.2.1, where ℓ_d shall be in accordance with 25.4.2.1(a).

Table 25.5.2.1—Lap splice lengths of deformed bars and deformed wires in tension

$A_{s,provided}/A_{s,required}^{[1]}$ over length of splice	Maximum percent of A_s spliced within required lap length	Splice type	ℓ_{st}	
≥ 2.0	50	Class A	Greater of:	$1.0\ell_d$ and 300 mm
	100	Class B	Greater of:	$1.3\ell_d$ and 300 mm
< 2.0	All cases	Class B		

^[1]Ratio of area of reinforcement provided to area of reinforcement required by analysis at splice location.

25.5.2.2 If bars of different size are lap spliced in tension, ℓ_{st} shall be the greater of ℓ_d of the larger bar and ℓ_{st} of the smaller bar.

COMMENTARY

R25.5.1.6 and R25.5.1.7 Information on shotcrete mockup panels is provided in **ACI 506R**, and information on evaluating shotcrete is provided in **ACI 506.4R**.

R25.5.2 *Lap splice lengths of deformed bars and deformed wires in tension*

R25.5.2.1 Lap splices in tension are classified as Class A or B, with length of lap a multiple of the tensile development length ℓ_d calculated in accordance with 25.4.2.3 or 25.4.2.4. The two-level lap splice requirements encourage splicing bars at points of minimum stress and staggering splices to improve behavior of critical details. For the purpose of calculating ℓ_d for staggered splices, the clear spacing is taken as the minimum distance between adjacent splices, as illustrated in Fig. R25.5.2.1.

The tension lap splice requirements encourage the location of splices away from regions of high tensile stress to locations where the area of steel provided is at least twice that required by analysis.

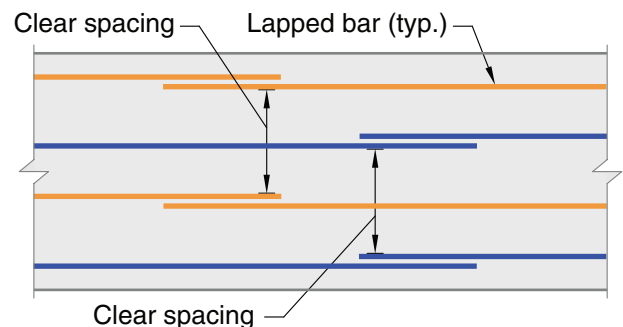


Fig. R25.5.2.1—Clear spacing of lap-spliced bars for determination of ℓ_d for staggered splices.