CODE

Table 22.6.6.1—v_c for two-way members with shear reinforcement

Type of shear reinforcement	Critical sections	v_c		
Stirrups	All	$0.17\lambda_s\lambda\sqrt{f'_c}$		(a)
Headed shear stud reinforcement	According to 22.6.4.1	Least of (b), (c), and (d):	$0.25\lambda_s\lambda\sqrt{f'_c}$	(b)
			$0.17\left(1+\frac{2}{\beta}\right)\lambda_s\lambda\sqrt{f'_c}$	(c)
			$0.083\left(2+\frac{\alpha_s d}{b_o}\right)\lambda_s\lambda\sqrt{f'_c}$	(d)
	According to 22.6.4.2		$0.17\lambda_s\lambda\sqrt{f'_c}$	(e)

Notes:

(i) λ_s is the size effect factor given in 22.5.5.1.3.

(ii) β is the ratio of long to short sides of the column, concentrated load, or reaction area.

(iii) α_s is given in 22.6.5.3.

22.6.6.2 It shall be permitted to take λ_s as 1.0 if (a) or (b) is satisfied:

(a) Stirrups are designed and detailed in accordance with 8.7.6 and $A_v/s \geq 0.17\sqrt{f'_c}\, b_o/f_{yt}$.

(b) Smooth headed shear stud reinforcement with stud shaft length not exceeding 250 mm is designed and detailed in accordance with 8.7.7 and $A_v/s \geq 0.17\sqrt{f'_c}\, b_o/f_{yt}$.

COMMENTARY

R22.6.6.2 The size effect in slabs with $d > 250$ mm can be mitigated if a minimum amount of shear reinforcement is provided. The ability of ordinary (smooth) headed shear stud reinforcement to effectively mitigate the size effect on the two-way shear strength of slabs may be compromised if studs longer than 250 mm are used. Until experimental evidence becomes available, it is not permitted to use λ_s equal to 1.0 for slabs with $d > 250$ mm without headed shear stud reinforcement with stud shaft length not exceeding 250 mm. Stacking or "piggybacking" of headed shear studs, as shown in Fig. R22.6.6.2, introduces an intermediate head that contributes to further anchor the stacked stud.

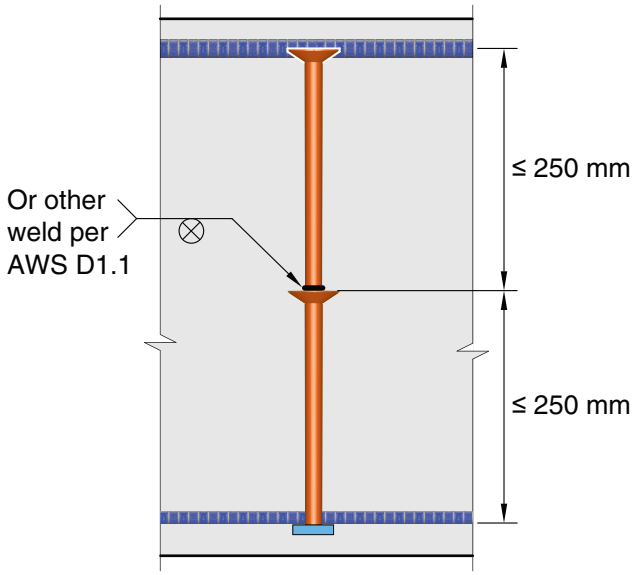

Fig. R22.6.6.2—Stacking (piggybacking) of headed shear stud reinforcement.