

***Q<sub>n</sub>***

**Table 3-20**  
**Shear Stud Anchor**  
**Nominal Horizontal Shear Strength**  $F_u = 65 \text{ ksi}$   
**for One Steel Headed Stud Anchor,  $Q_n$ , kips**

Deck Condition			Stud Anchor Diameter, in.	Normal Weight Concrete			Lightweight Concrete			
				$w_c = 145 \text{ pcf}$			$w_c = 110 \text{ pcf}$			
				$f'_c = 3 \text{ ksi}$	$f'_c = 3.5 \text{ ksi}$	$f'_c = 4 \text{ ksi}$	$f'_c = 3 \text{ ksi}$	$f'_c = 4 \text{ ksi}$		
No Deck			$\frac{3}{8}$	5.26	5.38	5.38	4.28	5.31		
			$\frac{1}{2}$	9.35	9.57	9.57	7.60	9.43		
			$\frac{5}{8}$	14.6	15.0	15.0	11.9	14.7		
			$\frac{3}{4}$	21.0	21.5	21.5	17.1	21.2		
			$\frac{7}{8}$	28.6	29.3	29.3	23.3	28.9		
			1	37.4	38.3	38.3	30.4	37.7		
Deck Parallel	$\frac{w_r}{h_r} \geq 1.5$		$\frac{3}{8}$	5.26	5.38	5.38	4.28	5.31		
			$\frac{1}{2}$	9.35	9.57	9.57	7.60	9.43		
			$\frac{5}{8}$	14.6	15.0	15.0	11.9	14.7		
			$\frac{3}{4}$	21.0	21.5	21.5	17.1	21.2		
	$\frac{w_r}{h_r} < 1.5$		$\frac{3}{8}$	4.58	4.58	4.58	4.28	4.58		
			$\frac{1}{2}$	8.14	8.14	8.14	7.60	8.14		
			$\frac{5}{8}$	12.7	12.7	12.7	11.9	12.7		
			$\frac{3}{4}$	18.3	18.3	18.3	17.1	18.3		
	Deck Perpendicular	Weak studs per rib ( $R_p = 0.60$ )		1	$\frac{3}{8}$	4.31	4.31	4.31	4.28	4.31
					$\frac{1}{2}$	7.66	7.66	7.66	7.60	7.66
$\frac{5}{8}$					12.0	12.0	12.0	11.9	12.0	
$\frac{3}{4}$					17.2	17.2	17.2	17.1	17.2	
2				$\frac{3}{8}$	3.66	3.66	3.66	3.66	3.66	
				$\frac{1}{2}$	6.51	6.51	6.51	6.51	6.51	
				$\frac{5}{8}$	10.2	10.2	10.2	10.2	10.2	
				$\frac{3}{4}$	14.6	14.6	14.6	14.6	14.6	
3				$\frac{3}{8}$	3.02	3.02	3.02	3.02	3.02	
				$\frac{1}{2}$	5.36	5.36	5.36	5.36	5.36	
				$\frac{5}{8}$	8.38	8.38	8.38	8.38	8.38	
				$\frac{3}{4}$	12.1	12.1	12.1	12.1	12.1	
Strong studs per rib ( $R_p = 0.75$ )		1	$\frac{3}{8}$	5.26	5.38	5.38	4.28	5.31		
			$\frac{1}{2}$	9.35	9.57	9.57	7.60	9.43		
			$\frac{5}{8}$	14.6	15.0	15.0	11.9	14.7		
			$\frac{3}{4}$	21.0	21.5	21.5	17.1	21.2		
		2	$\frac{3}{8}$	4.58	4.58	4.58	4.28	4.58		
			$\frac{1}{2}$	8.14	8.14	8.14	7.60	8.14		
			$\frac{5}{8}$	12.7	12.7	12.7	11.9	12.7		
			$\frac{3}{4}$	18.3	18.3	18.3	17.1	18.3		
		3	$\frac{3}{8}$	3.77	3.77	3.77	3.77	3.77		
			$\frac{1}{2}$	6.70	6.70	6.70	6.70	6.70		
			$\frac{5}{8}$	10.5	10.5	10.5	10.5	10.5		
			$\frac{3}{4}$	15.1	15.1	15.1	15.1	15.1		

Notes:  
1. Tabulated values are applicable only to concrete made with ASTM C33/C33M aggregates for normal weight concrete and ASTM C330/C330M aggregates for lightweight concrete.  
2. After-weld steel headed stud anchor lengths assumed to be  $\geq$  Deck height + 1.5 in.