

TABLE 2—ITW RED HEAD TRUBOLT WEDGE ANCHOR INSTALLATION INFORMATION

	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (in.)					
			$\frac{1}{4}$		$\frac{3}{8}$		$\frac{1}{2}$	
Anchor outer diameter	d_a	in. (mm)	0.25 (6.4)		0.375 (9.5)		0.5 (12.7)	
Nominal carbide bit diameter	d_{bit}	in. (mm)	$\frac{1}{4}$		$\frac{3}{8}$		$\frac{1}{2}$	
Effective embedment depth	h_{ef}	in. (mm)	$1\frac{1}{2}$ (38)	2 (51)	$1\frac{3}{4}$ (44)	$2\frac{5}{8}$ (67)	$1\frac{7}{8}$ (48)	$3\frac{3}{8}$ (86)
Nominal Embedment depth	h_{nom}	in. (mm)	$1\frac{3}{4}$ (44)	$2\frac{1}{4}$ (57)	$2\frac{1}{4}$ (57)	$3\frac{1}{8}$ (79)	$2\frac{1}{2}$ (64)	4 (102)
Minimum hole depth	h_o	in. (mm)	2 (51)	$2\frac{1}{2}$ (64)	$2\frac{1}{2}$ (64)	$3\frac{3}{8}$ (86)	$2\frac{3}{4}$ (70)	$4\frac{1}{4}$ (108)
Minimum concrete member thickness	h_{min}	in. (mm)	4 (102)		4 (102)	5 (127)	5 (127)	6 (152)
Critical edge distance	c_{ac}	in. (mm)	$2\frac{5}{8}$ (67)	3 (76)	$2\frac{5}{8}$ (67)	$5\frac{1}{4}$ (133)	$3\frac{3}{4}$ (95)	$6\frac{3}{4}$ (171)
Minimum edge distance	c_{min}	in. (mm)	$1\frac{3}{4}$ (44)	$1\frac{1}{2}$ (38)	$2\frac{1}{4}$ (57)	2 (51)	$3\frac{3}{4}$ (95)	$3\frac{3}{4}$ (95)
Minimum anchor spacing	s_{min}	in. (mm)	$1\frac{3}{4}$ (44)	$1\frac{1}{2}$ (38)	$2\frac{1}{4}$ (57)	2 (51)	$3\frac{3}{4}$ (95)	$3\frac{3}{4}$ (95)
Installation torque	T_{inst}	ft-lb (N-m)	4 (5)		25 (34)		55 (75)	
Reference (attachment) hole diameter	d_h	in. (mm)	$\frac{5}{16}$ (7.9)		$\frac{7}{16}$ (11.1)		$\frac{9}{16}$ (14.3)	

TABLE 3—ITW TRUBOLT WEDGE ANCHOR DESIGN INFORMATION^{2,3}

DESIGN INFORMATION	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER					
			$\frac{1}{4}$		$\frac{3}{8}$		$\frac{1}{2}$	
Anchor O.D.	d_s	in mm	0.250 6.4		0.375 9.5		0.500 12.7	
Effective min. embedment	h_{ef}	in mm	$1\frac{1}{2}$ 38	2 51	$1\frac{3}{4}$ 44	$2\frac{5}{8}$ 67	$1\frac{7}{8}$ 48	$3\frac{3}{8}$ 86
Minimum member thickness	h_{min}	in mm	4 102	4 102	4 102	5 127	5 127	6 152
Installation Torque	T_{inst}	ft-lb N-m	4 5		25 34		55 75	
Critical edge distance	c_{ac}	in mm	$2\frac{5}{8}$ 67	3 76	$2\frac{5}{8}$ 67	$5\frac{1}{4}$ 133	$3\frac{3}{4}$ 95	$6\frac{3}{4}$ 171
Minimum edge distance	c_{min}	in mm	$1\frac{3}{4}$ 44	$1\frac{1}{2}$ 38	$2\frac{1}{4}$ 57	2 51	$3\frac{3}{4}$ 95	$3\frac{3}{4}$ 95
Minimum anchor spacing	s_{min}	in mm	$1\frac{3}{4}$ 44	$1\frac{1}{2}$ 38	$2\frac{1}{4}$ 57	2 51	$3\frac{3}{4}$ 95	$3\frac{3}{4}$ 95
Min. hole depth in concrete	h_o	in mm	2 51	$2\frac{1}{2}$ 64	$2\frac{1}{2}$ 64	$3\frac{3}{8}$ 86	$2\frac{3}{4}$ 70	$4\frac{1}{4}$ 108
Min. Specified Yield Strength	f_y	lb/in ² N/mm ²	55,000 379					
Min. Specified Ultimate Strength	f_u	lb/in ² N/mm ²	75,000 517					
Effective tensile stress area	$A_{st,N}$	in ² mm ²	0.032 20.5	0.078 50.0	0.078 50.0	0.142 91.5	0.142 91.5	0.142 91.5
Effective shear stress area	$A_{st,V}$	in ² mm ²	0.032 20.5	0.078 50.0	0.078 50.0	0.142 91.5	0.142 91.5	0.142 91.5
Steel strength in tension	N_{st}	lb kN	2385 10.6	5815 25.9	5815 25.9	10645 47.3	10645 47.3	10645 47.3
Steel strength in shear	V_{st}	lb kN	1430 6.4	2975 13.2	3490 15.5	4450 19.8	6385 28.4	6385 28.4
Pullout strength, uncracked concrete	$N_{u,uncr}$	lb kN	See Table 4					

TABLE 3—ITW TRUBOLT WEDGE ANCHOR DESIGN INFORMATION^{2,3}

DESIGN INFORMATION	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER					
			$\frac{1}{4}$		$\frac{3}{8}$		$\frac{1}{2}$	
Anchor O.D.	d_s	in mm	0.250 6.4		0.375 9.5		0.500 12.7	
Anchor Category			1					
Effectiveness factor K_{con} , uncracked concrete ³			24					
Coefficient for pryout strength	K_{cp}	-	1.0	1.0	1.0	2.0	1.0	2.0
Axial stiffness in service load range	β	lb/in	14,651	9,385	17,515	26,424	32,483	26,136
		kN/mm	2.6	1.6	3.1	4.6	5.7	4.6
Coefficient of variation for axial stiffness in service load range			34	47	28	45	17	33
Strength reduction factor for tension, steel failure modes	ϕ	—	0.75					
Strength reduction factor for shear, steel failure modes	ϕ	—	0.65					
Strength reduction factor for tension, concrete failure modes, Condition B ¹	ϕ	—	0.65					
Strength reduction factor for shear, concrete failure modes, Condition B ¹	ϕ	—	0.70					

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 0.006895 Mpa. For pound-inch units: 1 mm = 0.03937 inch.

TABLE 4—ITW TRUBOLT WEDGE ANCHOR PULLOUT STRENGTH, $N_{u,uncr}$ ^{1,2}

NOMINAL ANCHOR DIAMETER (in.)	EFFECTIVE EMBEDMENT DEPTH (in.)	CONCRETE COMPRESSIVE STRENGTH			
		$f'_c = 2,500$ psi	$f'_c = 3,000$ psi	$f'_c = 4,000$ psi	$f'_c = 6,500$ psi
$\frac{1}{4}$	$1\frac{1}{2}$	1,392	1,525	1,610	1,822
	2	1,706	1,869	1,947	2,151
$\frac{3}{8}$	$1\frac{1}{4}$	2,198	2,408	2,621	3,153
	$2\frac{1}{8}$	3,469	3,800	3,936	4,275
$\frac{1}{2}$	$1\frac{1}{8}$	2,400	2,629	3,172	4,520
	$3\frac{1}{8}$	4,168	4,520	4,520	4,520

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 0.006895 Mpa.

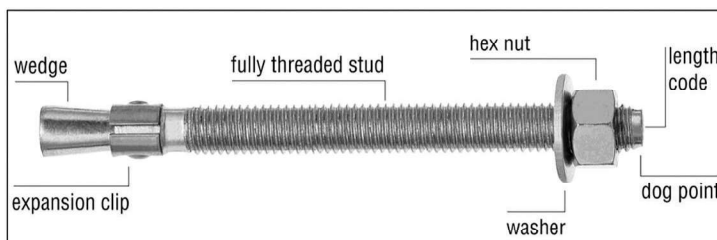


FIGURE 1—ITW RED HEAD TRUBOLT WEDGE ANCHOR

