

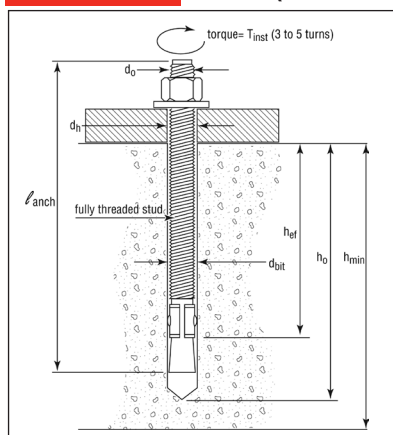
# APPENDIX B: Performance values in accordance to 2006 IBC

## TRUBOLT WEDGE ANCHOR DESIGN INFORMATION

DESIGN INFORMATION	Symbol	Units	Nominal Anchor Diameter					
			1/4		3/8		1/2	
Anchor O.D.	$d_o$	in (mm)	0.250 (6.4)		0.375 (9.5)		0.500 (12.7)	
Effective min. embedment	$h_{ef}$	in (mm)	1-1/2 (38)	2 (51)	1-3/4 (44)	2-5/8 (67)	1-7/8 (48)	3-3/8 (86)
Minimum slab thickness	$h_{min}$	in (mm)	4 (102)	4 (102)	4 (102)	5 (127)	5 (127)	6 (152)
Maximum installation torque	$T_{inst}$	ft-lb (N-m)	4 (5)		25 (34)		55 (75)	
Critical edge distance	$c_{cr}$	in (mm)	2-5/8 (67)	3 (76)	2-5/8 (67)	5-1/4 (133)	3-3/4 (95)	6-3/4 (171)
Minimum edge distance	$c_{min}$	in (mm)	1-1/2 (38)	1-1/2 (38)	1-1/2 (38)	1-1/2 (38)	3-3/4 (95)	3-3/4 (95)
Minimum anchor spacing	$s_{min}$	in (mm)	1-1/2 (38)	1-1/2 (38)	1-1/2 (38)	1-1/2 (38)	3-3/4 (95)	3-3/4 (95)
Min. hole depth in concrete	$h_o$	in (mm)	2 (51)	2-1/2 (64)	2-1/2 (64)	3-3/8 (86)	2-3/4 (70)	4-1/4 (108)
Min. Specified Yield Strength	$f_y$	lb/in <sup>2</sup> (N/mm <sup>2</sup> )	55,000 (379)					
Min. Specified Ultimate Strength	$f_u$	lb/in <sup>2</sup> (N/mm <sup>2</sup> )	75,000 (517)					
Effective tensile stress area	$A_{se}$	in <sup>2</sup> (mm <sup>2</sup> )	0.032 (20.5)		0.078 (50.0)		0.142 (91.5)	
Effective shear stress area	$A_{se}$	in <sup>2</sup> (mm <sup>2</sup> )	0.032 (20.5)		0.078 (50.0)		0.142 (91.5)	
Steel strength in tension	$N_s$	lb (kN)	2,385 (10.6)		5,815 (25.9)		10,645 (47.3)	
Steel strength in shear	$V_s$	lb (kN)	1,430 (6.4)		2,975 (13.2)	3,490 (15.5)	4,450 (19.8)	6,385 (28.4)
Pullout strength, uncracked concrete	$N_{p,uncr}$	lb (kN)	1,392 (6.2)	1,706 (7.6)	2,198 (9.8)	3,469 (15.4)	2,400 (10.7)	4,168 (18.5)
Anchor Category (All anchors are ductile)			1					
Effectiveness factor $k_{uncr}$ uncracked concrete			24					
Axial stiffness in service load range	$\beta$	lb/in (kN/mm)	14,651 (2.6)	9,385 (1.6)	17,515 (3.1)	26,424 (4.6)	32,483 (5.7)	26,136 (4.6)
Coefficient for variation for axial stiffness in service load range			34	47	28	45	17	33
Strength reduction factor $\phi$ for tension, steel failure modes			0.75					
Strength reduction factor $\phi$ for shear, steel failure modes			0.65					
Strength reduction factor $\phi$ for tension, concrete failure modes, Condition B			0.65					
Strength reduction factor $\phi$ for shear, concrete failure modes, Condition B			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 inches  
All anchors are classified as ductile in accordance with D1 of ACI 318.

## TRUBOLT WEDGE ANCHOR (INSTALLED)



## TRUBOLT WEDGE INSTALLATION INFORMATION

	Symbol	Units	Nominal Anchor Diameter (in.)					
			1/4		3/8		1/2	
Anchor outer diameter	$d_o$	in (mm)	0.25 (6.4)		0.375 (9.5)		0.5 (12.7)	
Nominal carbide bit diameter	$d_{bit}$	in (mm)	1/4		3/8		1/2	
Effective embedment depth	$h_{ef}$	in (mm)	1-1/2 (38)	2 (51)	1-3/4 (44)	2-5/8 (67)	1-7/8 (48)	3-3/8 (86)
Min hole depth	$h_o$	in (mm)	2 (50.8)	2-1/2 (63.5)	2-1/2 (63.5)	3-3/8 (85.7)	2-3/4 (69.9)	4-1/4 (108.0)
Min slab thickness	$h_{min}$	in (mm)	4 (102)		4 (102)	5 (127)	5 (127)	6 (152)
Installation torque	$T_{inst}$	ft-lb (N-m)	4 (5)		25 (34)		55 (75)	
Min hole diameter	$d_h$	in (mm)	5/16 (7.9)		7/16 (11.1)		9/16 (14.3)	

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## TRUBOLT WEDGE PULLOUT STRENGTH ( $N_p, unc$ ) (POUNDS) <sup>1</sup>

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
1/4	1-1/2	1,392	1,525	1,610	1,822
	2	1,706	1,869	1,947	2,151
3/8	1-3/4	2,198	2,408	2,621	3,153
	2-5/8	3,469	3,800	3,936	4,275
1/2	1-7/8	2,400	2,629	3,172	4,520
	3-3/8	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

<sup>1</sup> Values are for single anchors with no edge distance or spacing reduction.

## TRUBOLT WEDGE ANCHOR ALLOWABLE STATIC TENSION (ASD), NORMAL-WEIGHT UNCRACKED CONCRETE <sup>1-6</sup>

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
1/4	1-1/2	611	670	707	800
	2	749	821	855	945
3/8	1-3/4	965	1,058	1,151	1,385
	2-5/8	1,524	1,669	1,729	1,878
1/2	1-7/8	1,054	1,155	1,393	1,985
	3-3/8	1,831	1,985	1,985	1,985

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

Design Assumptions:

- <sup>1</sup> Single anchor with static tension load only.
- <sup>2</sup> Concrete determined to remain uncracked for the life of the anchorage.
- <sup>3</sup> Load combinations from 2006 IBC, Sections 1605.2.1 and 1605.3.1 (no seismic loading).
- <sup>4</sup> Thirty percent dead load and 70 percent live load, controlling load combination 1.2D + 1.6L
- <sup>5</sup> Calculation of weighted average: 1.2D + 1.6L = 1.2 (0.3) + 1.6 (0.7) = 1.48
- <sup>6</sup> Values do not include edge distance or spacing reductions.

## TRUBOLT WEDGE ANCHOR ALLOWABLE STATIC SHEAR (ASD), STEEL (POUNDS)<sup>1-5</sup>

Nominal Anchor Diameter (in.)	Effective Embedment Depth (in.)	Allowable Steel Capacity, Static Shear
1/4	1-1/2	628
	2	
3/8	1-3/4	1,307
	2-5/8	1,533
1/2	1-7/8	1,954
	3-3/8	2,804

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

Design Assumptions:

- <sup>1</sup> Single anchor with static shear load only.
- <sup>3</sup> Load combinations from 2006 IBC, Sections 1605.2.1 and 1605.3.1 (no seismic loading).
- <sup>3</sup> Thirty percent dead load and 70 percent live load, controlling load combination 1.2D + 1.6L
- <sup>4</sup> Calculation of weighted average: 1.2D + 1.6L = 1.2 (0.3) + 1.6 (0.7) = 1.48
- <sup>5</sup> Values do not include edge distance or spacing reductions.