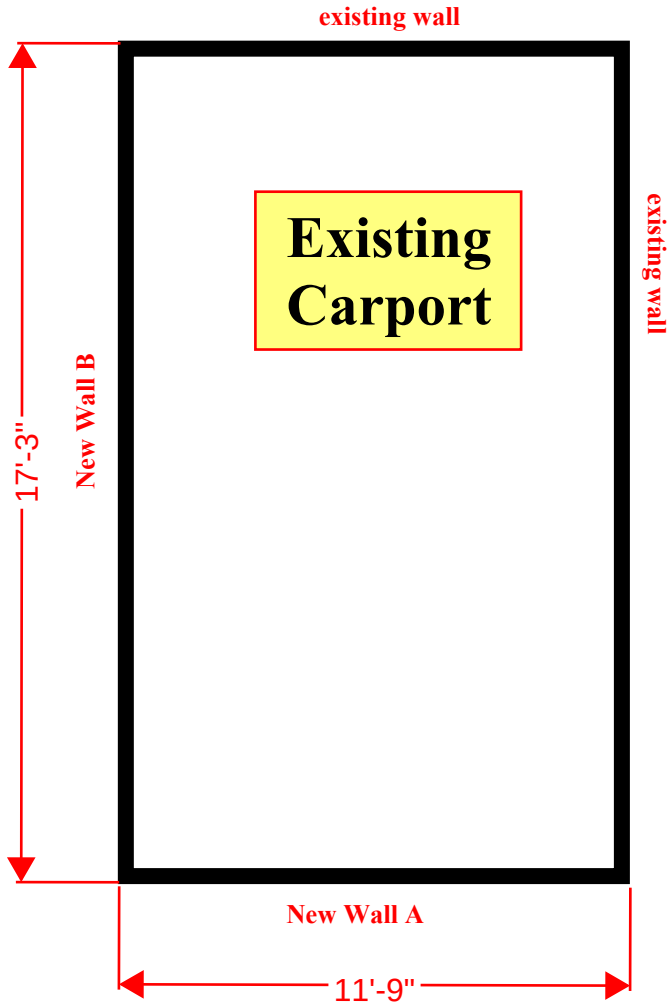
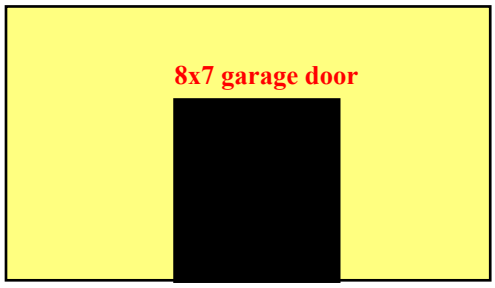
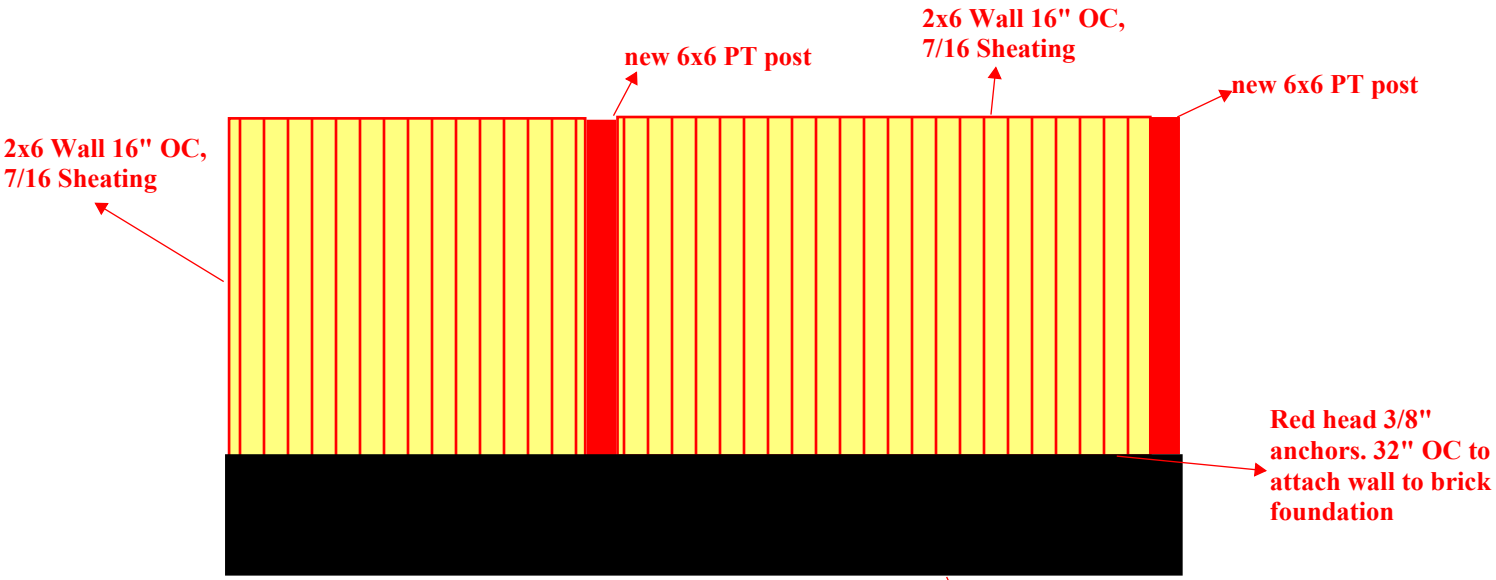
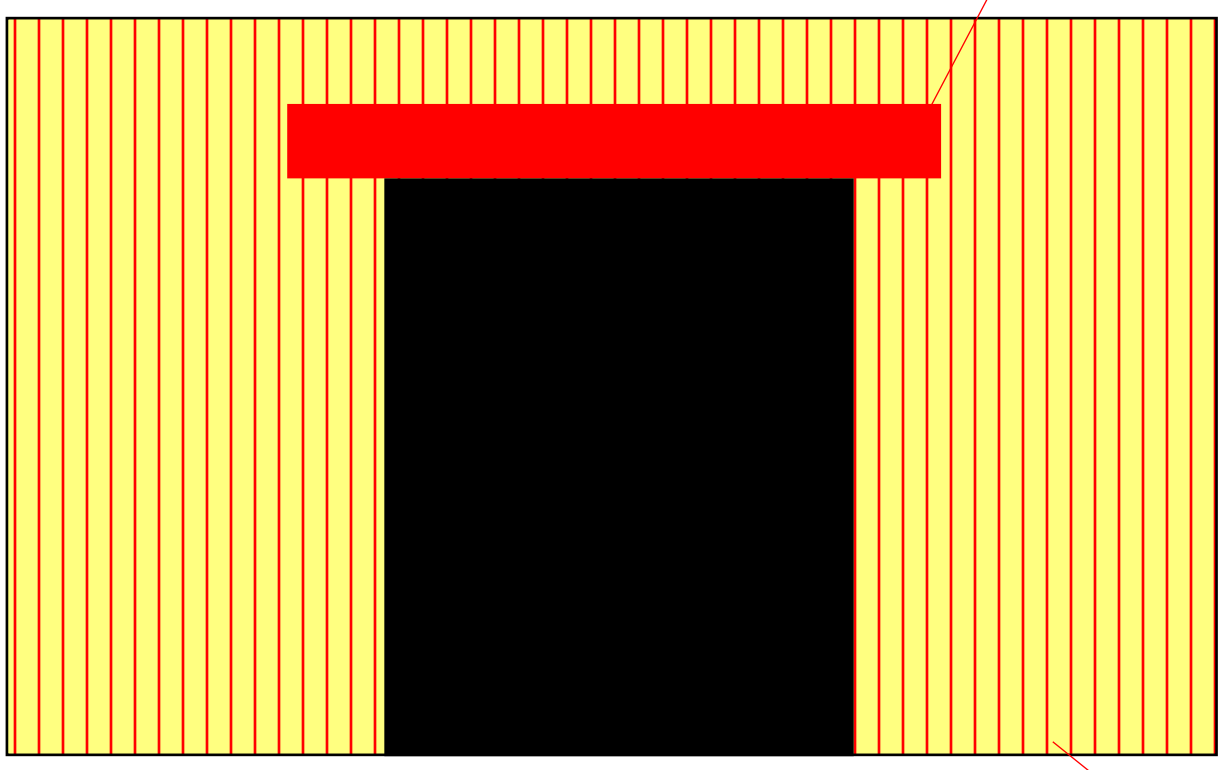




New Wall A with garage door



New wall B



New Wall A with garage door

TABLE 2—ITW RED HEAD TRUBOLT WEDGE ANCHOR INSTALLATION INFORMATION

	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER (in.)					
			1/4		3/8		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)	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)
Nominal Embedment depth	h_{nom}	in. (mm)	1 3/4 (44)	2 1/4 (57)	2 1/4 (57)	3 1/8 (79)	2 1/2 (64)	4 (102)
Minimum hole depth	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)
Minimum concrete member thickness	h_{min}	in. (mm)	4 (102)		4 (102)	5 (127)	5 (127)	6 (152)
Critcial edge distance	c_{ac}	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 3/4 (44)	1 1/2 (38)	2 1/4 (57)	2 (51)	3 3/4 (95)	3 3/4 (95)
Minimum anchor spacing	s_{min}	in. (mm)	1 3/4 (44)	1 1/2 (38)	2 1/4 (57)	2 (51)	3 3/4 (95)	3 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)	5/16 (7.9)		7/16 (11.1)		9/16 (14.3)	

TABLE 3—ITW TRUBOLT WEDGE ANCHOR DESIGN INFORMATION[1,2,3]

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

TABLE 3—ITW TRUBOLT WEDGE ANCHOR DESIGN INFORMATION[1,2,3]

DESIGN INFORMATION	SYMBOL	UNITS	NOMINAL ANCHOR DIAMETER					
			1/4		3/8		1/2	
Anchor O.D.	d_o	in	0.250		0.375		0.500	
		mm	6.4		9.5		12.7	
Anchor Category			1					
Effectiveness factor k_{uncr} uncracked concrete[5]			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[4]	ϕ	—	0.65					
Strength reduction factor for shear, concrete failure modes, Condition B[4]	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, $N_{p,uncr}$[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
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.

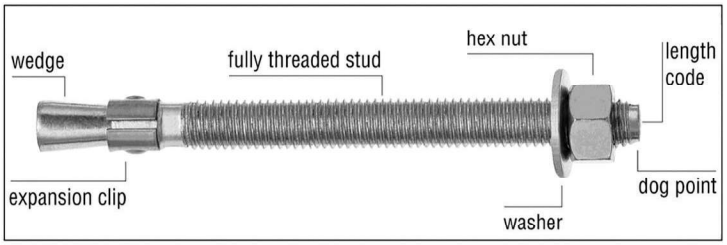


FIGURE 1—ITW RED HEAD TRUBOLT WEDGE ANCHOR