

HDTT3, HDTT6 and HD22 Installation Instructions

1. Hold Downs (HD) are used to resist uplift forces due to wind or overturning of shear walls. These are available in various sizes to meet the light to heavy load requirements using nails, screws, and bolts as fasteners.
2. Use all specified fasteners in schedule (Tables 1 and 2) to achieve values indicated.
3. *HDTT45 and HDTT6 Hold Downs*: HDTT45 and **HDTT6 Hold Down Connectors** are used to anchor stud walls into concrete. The HDTT45 and **HDTT6** are 10 gauge (minimum thickness with coating is 0.135") steel. HDTT45 is manufactured from *ASTM A653* Structural Steel, Grade 40 ($F_u = 55$ ksi, $F_y = 40$ ksi) steel galvanized with G90 or better zinc coating (see Figure 1). **HDTT6** is manufactured from *ASTM A653* Structural Steel, Grade 50, Class 3 ($F_u = 70$ ksi, $F_y = 50$ ksi) steel galvanized with G90 or better zinc coating (Figure 2). The HDTT45 is attached to the bottom plate with a $\frac{5}{8}$ " threaded rod and is attached to the stud with 16d nails. The **HDTT6** is attached to the bottom plate with a $\frac{5}{8}$ " threaded rod through a 7 gauge steel washer and is attached to the stud with 16dx2- $\frac{1}{2}$ nails (0.162" x 2.50"). See Table 1 for fastener schedules and minimum fastener requirements.

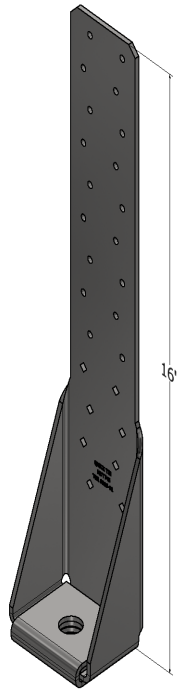


FIGURE 1. HDTT45 HOLD DOWN

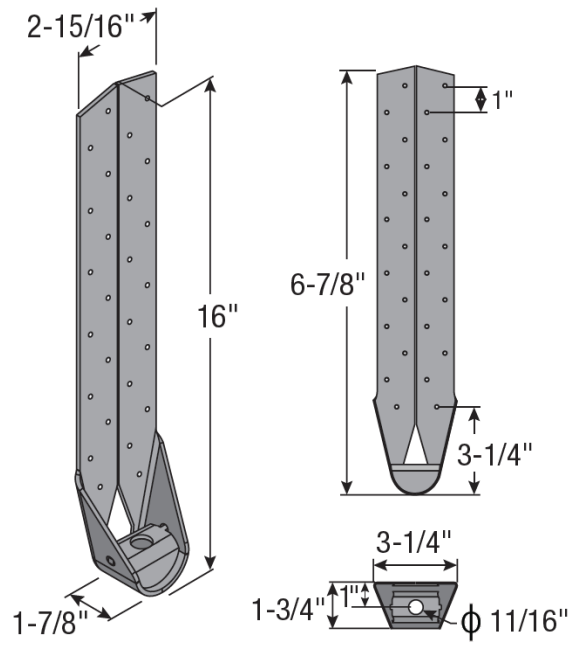


FIGURE 2. **HDTT6** HOLD DOWN

TABLE 1. HDTT45 AND **HDTT6** ALLOWABLE LOADS

Species (Specific Gravity)	Fasteners				Allowable Load ^{1,3} (lbs)			
					HDTT45 ⁵		HDTT6 ²	
	Nail		Rod ⁴		Floor	Roof	Floor	Roof
	Type	Quantity	Type	Quantity	1.0	1.6	1.0	1.6
SP/DF-L (0.50)	16d x 2 1/2 (0.162 x 2.5")	26	5/8" diameter	1	4,480	6,155	4,480	5,730
HF/SPF (0.42)					3,900	5,650	3,900	5,280

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

1. Connector deflection is limited to 0.111" (SP/DF-L).
2. Minimum wood member size is 3" x 3.5" (2x4, 2-ply)
3. The nut on the 5/8" anchor shall be installed finger tight plus approximately two turns to achieve the tabulated loads.
4. Connector deflection is limited to 0.082" (SP/DF-L).

4. *HD*TT, *HD*TT3, *HD*5, *HD*7, *HD*11, *HD*14, *HD*15/20, and *HD*22 Hold Downs: *HD*TT, *HD*TT3, *HD*5, *HD*7, *HD*11, *HD*14, *HD*15/20, and *HD*22 Hold Down Connectors are used to anchor stud walls and/or posts into concrete.
- a. The *HD*TT is 14 gauge (minimum thickness with coating 0.0705") and is manufactured from *ASTM* A653 Structural Steel, Grade 50, Class 3 ($F_u = 70$ ksi, $F_y = 50$ ksi) steel galvanized with G185 or better zinc coating. The *HD*TT3 is 12 gauge (minimum thickness with coating 0.0994") and is manufactured from *ASTM* A653 Structural Steel, Grade 50, Class 3 ($F_u = 70$ ksi, $F_y = 50$ ksi) steel galvanized with G185 (min.). See Figure 3 and Table 2 for fastening schedules and design values.

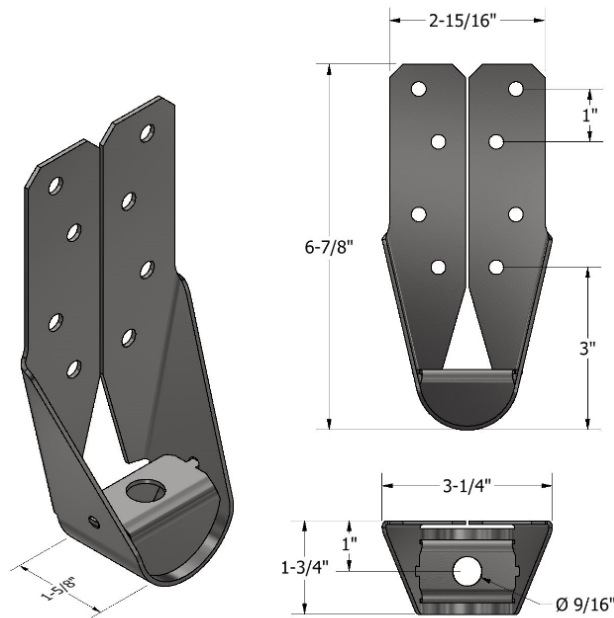


FIGURE 3. *HD*TT AND *HD*TT3 HOLD DOWN

5. The *HD*22 is 7 gauge (minimum thickness with coating is 0.1790") and is manufactured from *ASTM* A1011, Structural Steel, Grade 33 ($F_u = 52$ ksi, $F_y = 33$ ksi) uncoated steel, spray painted after welding the washer ($3/8$ " thick) to the bottom of the bent strap (offset = $3-1/2$ "). See Figure 4 *HD*22 Hold Downs and Table 2 for fastening schedules and design values.

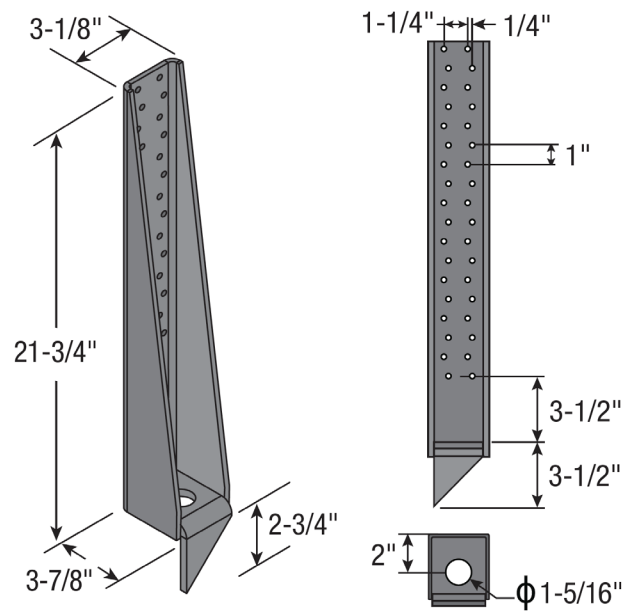


FIGURE 4. HD22 HOLD DOWNS

TABLE 1. HOLD DOWN ALLOWABLE LOADS^{1,2,3}

Part No.	Steel Gauge	Species	Min Wood Size ⁷ (in)	Dimensions (in)				Fasteners				Uplift (lb)		
				Height H	Width W	Depth D	Stud Face to Anchor CL (in)	Screw/Bolt		Anchor Bolt ²		C _D		
								Type	Qty	Size	Qty	1.0	1.6	Δ (1.6)
HDTT	14 ga	SP (0.55)	1.5 x 3.5	6 ⁷ / ₈	3 ³ / ₄	1 ³ / ₄	1	SWH15	8	½"	1	1,715	2,300	0.190
		DF-L (0.50)										1,455	2,055	0.149
		HF/SPF (0.42)										1,080	1,525	0.088
HDTT3	12 ga	SP (0.55)	3 x 3.5	6 ⁷ / ₈	3 ³ / ₄	1 ³ / ₄	1	SWH3	8	½"	1	2,170	3,475	0.074
		DF-L (0.50)										2,005	3,210	0.067
		HF/SPF (0.42)										1,730	2,770	0.055
HD5	14 ga	SP (0.55)	3 x 3.5	10	3	2 ³ / ₈	1 ⁵ / ₁₆	SWH3	10	½"	1	5,240	5,885	0.197
		DF-L (0.50)										5,240	5,445	0.181
		HF/SPF (0.42)										2,080	2,080	0.059
HD7	12 ga	SP (0.55)	3 x 3.5	11 ³ / ₄	3	3	1 ³ / ₈	SWH3	14	7 ⁷ / ₈ "	1	6,750	7,280	0.102
		DF-L (0.50)										6,750	6,980	0.098
		HF/SPF (0.42)										3,025	4,845	0.069
HD11	12 ga	SP (0.55)	3 x 3.5	16 ³ / ₄	3	3	1 ³ / ₈	SWH3	24	7 ⁷ / ₈ "	1	12,120	12,755	0.063
		DF-L (0.50)										12,120	12,755	0.063
		HF/SPF (0.42)										5,195	8,310	0.034
HD14 ⁴	7 ga	SP (0.55)	3.5 x 5.5	18 ³ / ₄	3	3 ¹ / ₂	1 ¹ / ₂	SWH3	30	1"	1	10,500	14,120	0.095
		DF-L (0.50)										10,500	14,060	0.095
		HF/SPF (0.42)										6,980	11,170	0.075
HD15/20 ^{5,6}	3 ga	SP (0.55)	3 x 7.25	25	3 ³ / ₄	3 ¹ / ₂	2 ¹ / ₈	1"	5	1 ¹ / ₄ "	1	10,740	15,895	0.102
		DF-L (0.50)										9,847	15,635	0.100
		HF/SPF (0.42)										8,410	13,460	0.082
HD15/20 ^{5,6}	3 ga	SP (0.55)	5.5 x 5.5	25	3 ³ / ₄	3 ¹ / ₂	2 ¹ / ₈	1"	5	1 ¹ / ₄ "	1	14,845	20,065	0.087
		DF-L (0.50)										14,220	20,065	0.087
		HF/SPF (0.42)										13,125	19,695	0.086
HD22 ⁵	7 ga	SP (0.55)	3.5 x 5.5	24 ¹ / ₂	3 ¹ / ₈	3 ⁷ / ₈	2	SWH3	36	1 ¹ / ₄ "	1	15,660	22,245	0.087
		DF-L (0.50)										15,660	20,115	0.078
		HF/SPF (0.42)										8,925	14,280	0.053

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

1. Anchor bolt installation into any substrates should be designed to resist the allowable uplift loads.
2. Hold downs shall be installed into the wide face of the wood member in order to achieve the tabulated allowable load values.
3. Bend washer (3³/₈") welded to bend strap around perimeter with 1" offset from the base.
4. Bend washer (3³/₈") welded to bend strap around perimeter with 3-1/2" offset from the base.
5. Minimum bolt requirements: bending yield strength = 45,000 psi and dowel bearing strength, F_{es} = 87,000 psi.