

TD – Different welded configurations and sizes achieve a great deal of versatility within the TD series.

TDX2-TZ – Features a formed design for economical installation.

All models feature a self-jigging design with code required end distances built in. (End distance = 7 bolt diameters from the top of the sill to the center of the first bolt hole in the studs or post.)

Materials: See chart

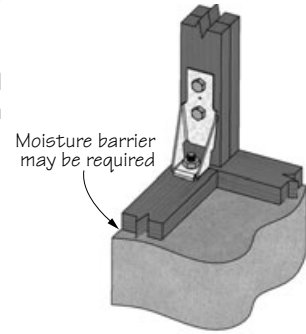
Finish: TDX2-TZ – G-185 galvanizing;
All others – USP primer

Codes: ESR-1575, FL11838, LA City RR 25756

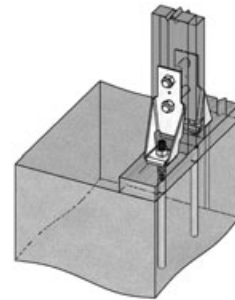
Patents: #5,092,097 — TDX2

Installation:

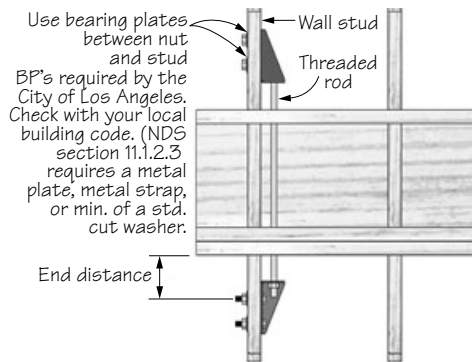
- Use all specified fasteners. See Product Notes, page 11.
- Do not use lagbolts. Washers are not required for anchor bolts or between holdown and bolt hex head, but standard washers should be used against stud or post under the nut. See page 17 for BP/LBP Bearing Plates.
- Bolt holes should be a minimum of 1/32" to a maximum of 1/16" larger than the bolt diameter (per 2005 NDS®, Section 11.1.2).
- See pages 28-29 for STB Anchor Bolt section for anchorage options. A design professional may specify alternate anchorage with conventional anchor bolts.
- A design professional shall determine the adequacy of the stud to resist published loads. When installing to multi-ply 2x studs, the designer must specify the fasteners required to bind the plies together and resist splitting.
- Self-jigging models are designed to provide the required minimum end distance of 7 bolt diameters from the bottom of the stud or post to the centerline of the first bolt hole.
- Tighten anchor bolt nuts to finger tight, plus 1/3 to 1/2 additional turns with a wrench. Wood members may shrink over time; if possible, nut tightness should be checked periodically. To prevent loosening of the anchor bolt nut during critical loading, use a locking nut or tighten a second nut over the first to lock nuts in place.
- If used to anchor a built-up post, such as a double 2 x 4, the post component shall be designed to act as a single unit. Holdown fasteners specified shall not be considered to attach multiple plies together.



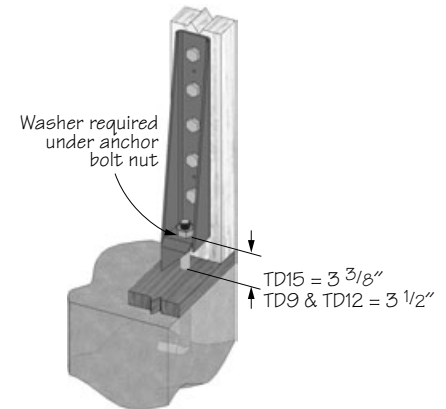
Typical TDX2-TZ installation



Typical TDX2-TZ back-to-back installation



Holdown installation between floors



Typical TD15 installation

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Holdowns

continued on next page

USP Stock No. ¹¹	Ref. No.	Steel Gauge	Dimensions				Fastener Schedule ⁴			Min. Required Bolt End Distance ⁵	Length of Bolt in Vertical Member	Allowable Loads (Lbs.) ^{12,3}		Code Ref.
			W	H	D	CL	Anchor Bolt Dia.	Bolts				DF / SP		
								Qty	Dia.			160%	Δ (in) ^{6,8}	
TDX2-TZ	HD2A	12	2-1/16	8-1/8	2-3/4	1-1/2	5/8	2	5/8	4-1/2	1-1/2"	1910	0.095	3, F21, R11
											3"	3130	0.140	
											3-1/2"	3130	0.140	
											5-1/2"	3130	0.140	
TD5	HD5	7	3	6-3/8	3-3/4	2-1/8	3/4	2	3/4	5-1/4	1-1/2"	2405	0.055	130
											3"	4135	0.090	
											3-1/2"	4135	0.090	
											5-1/2"	4135	0.090	
TD7	HD7	7	3-3/8	11-7/8	3-5/8	2-1/8	1-1/8	3	7/8	6-1/8	1-1/2"	4075	0.040	130
											3"	7805	0.069	
											3-1/2"	9015	0.078	
											5-1/2"	9895	0.084	
TD9	HD9	7	3-3/8	16-1/2	4-1/4	2-1/8	1-1/8	3	1	7	1-1/2"	4625	0.037	130
											3"	8855	0.066	
											3-1/2"	10225	0.074	
											5-1/2"	12785	0.090	
TD12	---	3	3-1/2	20-1/2	4-1/4	2-1/8	1-1/8	4	1	7	1-1/2"	6625	0.018	130
											3"	11995	0.041	
											3-1/2"	13885	0.049	
											5-1/2"	16965	0.061	
TD15	HD15	3	3-1/2	25	4-3/8	2-1/8	1-1/4	5	1	7	1-1/2"	7665	0.065	3, F21, R11
											3"	14315	0.091	
											3-1/2"	16200	0.098	
											5-1/2"	18865	0.106	

- 1) Allowable loads shown are for single shear connections and may be doubled for back-to-back installations. The designer must verify post and anchor bolt capacities.
 - 2) Allowable loads have been increased 60% for wind or seismic loads; no further increase shall be permitted.
 - 3) The designer must specify stud or post to resist published load values.
 - 4) The designer must specify anchor bolt type, length, and embedment.
 - 5) All models may be installed with greater than the required anchor end distance with no chart load reduction.
 - 6) Deflections are derived from static, monotonic load tests of devices connected to DF-L wood members and consider both the deflection of the holdown and cross grain crushing of the wood post.
 - 7) The designer shall consider the effect of compression, bearing, tension, and combined bending due to device eccentricity when applicable.
 - 8) Holdowns raised off of the sill plate may have higher deflection values.
- New products or updated product information are designated in **bold font**.

SOURCES OF DEFLECTION AT THE SHEARWALL HOLDOWN CONNECTIONS

The following are some of the sources of deflection that should be evaluated by the designer. See the illustration, which applies to other holdown configurations.

- A. Improperly-sized stud/post bolt holes** – increased bolt slip can occur if stud/post bolt holes are oversized and exceed the 2005 NDS® recommended bolt hole diameter.
- B. Stud/Post bolt holes** – bolt slip can occur.
- C. Wood crushing at stud/post bolt hole perimeters** – the use of larger washers/bearing plates can reduce stress-induced wood crushing at bolt bearing locations.
- D. Eccentricity in stud/post caused by holdown** – holdowns installed on only one side of a stud or post result in an eccentricity which causes increased stresses and movement in a shearwall system.
- E. Nut spin** – anchor bolt nuts that are not restrained can spin loose during cyclic loading, allowing movement; the use of steel nylon locking nuts or thread adhesive may prevent nut spin.
- F. Loose nuts** – increased movement can occur when nuts are not sufficiently tightened.
- G. Holdown deflection** – holdown deflection can occur when the shearwall system is subjected to cyclic stress from earthquakes or high wind.
- H. Wood Shrinkage** – due to drying, wood may shrink and cause bolted connections to become loose; periodic retightening may be required.
- I. Localized crushing at wood-bearing surfaces** – excessive crushing at wood-bearing surfaces may result from compressive forces due to overturning during high wind or earthquake loading.

