

**HDA/HD Holdowns**

All HDAs and the HD15 are self-jigging, ensuring code-required minimum 7 bolt diameter spacing from the end of the wood member to the center of the first bolt hole per NDS-2005 Section 11.5.1.

HD6A, HD8A, HD10A and HD14A's seat design allows greater installation adjustability. An overall width of 3 1/4" for the HD6A, HD8A and HD10A, and 3 1/2" for the HD14A provides an easy fit in a standard 2x4 stud wall.

**MATERIAL:** See table on opposite page

**LOADS:** See table on opposite page

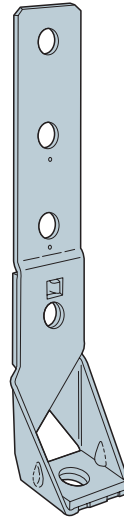
**FINISH:** HD14A and HD15—Simpson gray paint

Other HDA's—galvanized. May be ordered HDG, contact Simpson Strong-Tie.

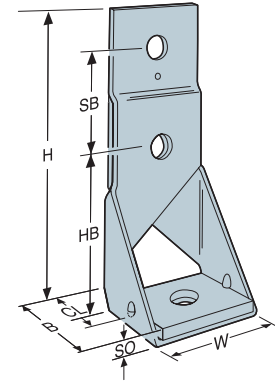
**INSTALLATION:** • Use all specified fasteners. See General Notes.

- Contact engineered wood manufacturers for connections that are not through the wide face.
- For an improved connection, use a steel nylon locking nut or a thread adhesive on the anchor bolt.
- Bolt holes shall be a minimum of 1/32" to a maximum of 1/16" larger than the bolt diameter (per NDS, section 11.1.2).
- With the exception of the HD15, a washer is not required between the base plate of the holdown and the anchor nut. Use a standard washer on the HD15 anchor.
- See SSTB Anchor Bolts, Simpson's Anchoring Systems and Additional Anchorage Designs for anchorage options. The Designer may specify any alternate anchorage calculated to resist the tension load for a specific job.
- Locate on wood member to maintain a minimum distance of seven bolt diameters, distance is automatically maintained when end of wood member is flush with the bottom of the holdown.
- Stud bolts should be snugly tightened.
- To tie multiple 2x members together, the Designer must determine the fasteners required to join members to act as one unit without splitting the wood (see page 20 for SDS values).
- Refer to technical bulletin T-ANCHORSPEC for post-installed anchorage solutions (see page 187 for details).

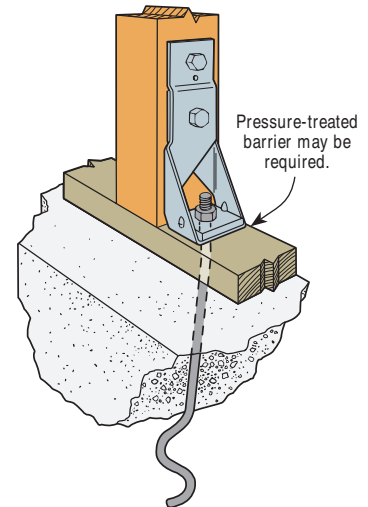
**CODES:** See page 12 for Code Reference Key Chart.



**HD10A**  
(HD6A, HD8A and HD14A similar)

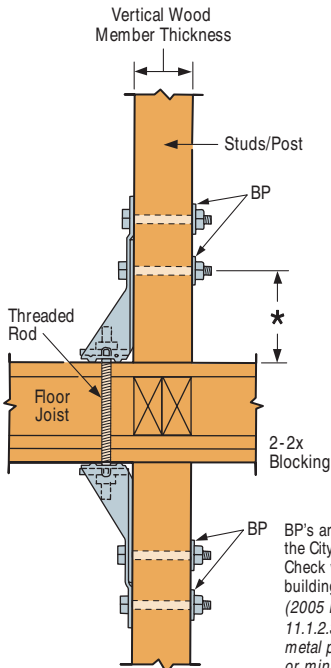


**HD5A**  
(HD2A similar)



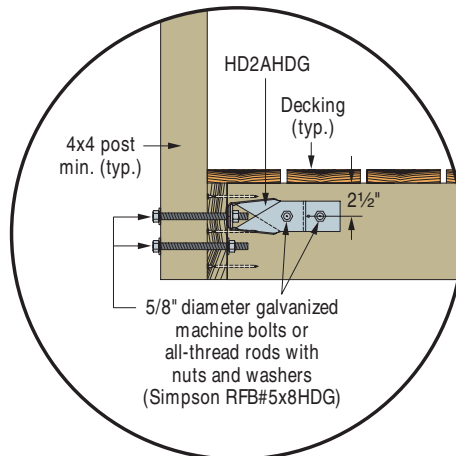
**Vertical HD5A Installation with SSTB anchor bolt.**  
Washers are not required at the base.

For holdowns, per ASTM test standards, anchor bolt nut should be finger-tight plus 1/3 to 1/2 turn with a hand wrench, with consideration given to possible future wood shrinkage. Care should be taken to not over-torque the nut. Impact wrenches should not be used.

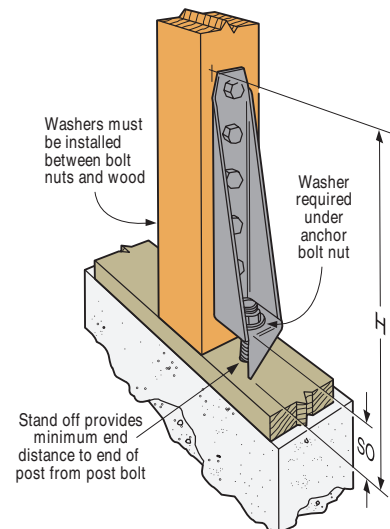


**Typical HD5A Tie Between Floors**

\* To achieve table loads, the minimum bolt end distance is seven bolt diameters. This distance is designed into holdowns.



**HD2A installed as a lateral anchor for a deck guardrail post.**  
Refer to technical bulletin T-HD2AGRDR for more information.  
(See page 187 for details)



**Vertical HD15 Installation**

**HDA/HD** Holdowns

These products are available with additional corrosion protection. Additional products on this page may also be available with this option, check with Simpson for details.

Model No.	Material		Dimensions							Fasteners			
	Base Ga	Body Ga	HB <sup>4</sup>	SB	W	H	B	SO	ϕ	Anchor Dia. <sup>5</sup>	Stud Machine Bolts		
											Qty.	Dia.	
HD2A	7	12	4 <sup>9</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>4</sub>	8	2 <sup>9</sup> / <sub>16</sub>	<sup>3</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>	<sup>5</sup> / <sub>8</sub>	2	<sup>5</sup> / <sub>8</sub>	
HD5A	3	10	5 <sup>1</sup> / <sub>4</sub>	3	3 <sup>1</sup> / <sub>8</sub>	9 <sup>7</sup> / <sub>16</sub>	3 <sup>9</sup> / <sub>16</sub>	<sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>16</sub>	<sup>5</sup> / <sub>8</sub>	2	<sup>3</sup> / <sub>4</sub>	
HD6A	<sup>3</sup> / <sub>8</sub>	7	6 <sup>3</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>16</sub>	<sup>9</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	<sup>7</sup> / <sub>8</sub>	2	<sup>7</sup> / <sub>8</sub>	
HD8A	<sup>3</sup> / <sub>8</sub>	7	6 <sup>3</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub>	14 <sup>9</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>16</sub>	<sup>9</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	<sup>7</sup> / <sub>8</sub>	3	<sup>7</sup> / <sub>8</sub>	
HD10A	<sup>3</sup> / <sub>8</sub>	7	6 <sup>3</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub>	18 <sup>1</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>16</sub>	<sup>9</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	<sup>7</sup> / <sub>8</sub>	4	<sup>7</sup> / <sub>8</sub>	
HD14A	<sup>3</sup> / <sub>8</sub>	3	7	4	3 <sup>1</sup> / <sub>2</sub>	20 <sup>9</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	<sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>16</sub>	1	4	1	
HD15	<sup>3</sup> / <sub>8</sub>	3	7	4	3 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	5	1	

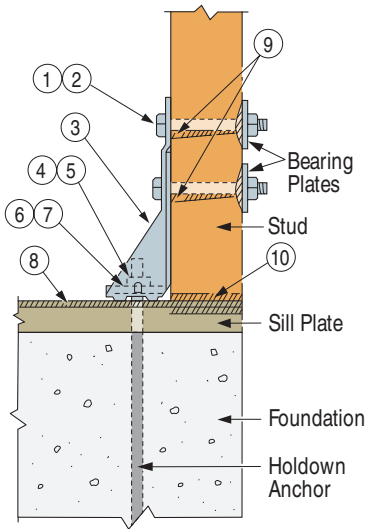
See notes below.

Model No.	Allowable Tension Loads DF/SP (133/160)							Allowable Tension Loads SPF/HF (133/160)							Holdown <sup>9</sup> Deflection at Highest Allowable Design Load Flush	Holdown <sup>9,14</sup> Deflection at Highest Allowable Design Load Raised	Code Ref.
	Wood Member Thickness							Wood Member Thickness									
	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	3 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	3 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>			
HD2A	1555	2055	2565	2775	2775	2775	2760	1320	1740	2165	2570	2565	2565	2550	0.058	0.077	40, 105, 122
HD5A	1870	2485	3095	3705	4010	4010	3980	1585	2110	2625	3130	3645	3700	3680	0.067	0.117	
HD6A	2275	2980	3685	4405	5105	5460	5510	1870	2470	3065	3680	4280	5055	5020	0.041	0.125	
HD8A	3220	4350	5415	6465	7460	8065	7910	2710	3655	4530	5480	6350	7470	7330	0.111	0.121	
HD10A	3945	5540	6935	8310	9540	9900	9900	3275	4600	5745	7045	8160	9500	9195	0.269	0.269	
HD14A	—	—	—	—	11080	13380	13380	—	—	—	—	9495	11950	12485	0.215	0.282	
HD15	—	—	—	—	—	—	15305	—	—	—	—	—	—	13810	0.082	0.082	

- Allowable loads have been increased for earthquake or wind load durations with no further increase allowed; reduce where other load durations govern.
- HD15 requires a minimum 4x8 (in a 3<sup>1</sup>/<sub>2</sub>" wide shearwall) or a 6x6 nominal post to ensure the tension load carrying capacity of the critical net section meets the holdown capacity.
- Use a minimum 4x6 nominal post for the HD14A. Minimum post size is required to ensure the tension load carrying capacity of the critical net section meets the holdown capacity.
- HB is the required minimum distance from the end of the stud to the center of the first stud bolt hole. End distance may be increased as necessary for installation.
- The designer must specify anchor bolt type, length and embedment. See SB and SSTB Anchor Bolts (page 25-27).
- Refer to technical bulletin T-ANCHORSPEC for retrofit anchor solutions (see page 187 for details).
- Lag bolts will not develop the listed loads.
- See page 13-15 for testing and other important information.
- Deflection at Highest Allowable Tension Load includes holdown elongation and anchor bolt elongation (L = 5"). Additional elongation of anchor bolts longer than 5" shall be added to holdown deflection.
- Structural composite lumber columns have sides that show either the wide face or the edges of the lumber strands/veneers. Values in the tables reflect installation into the wide face.
- To achieve published loads, machine bolts shall be installed with the nut on the opposite side of the holdown (see picture below). If reversed, the Designer shall reduce the allowable loads shown per NDS requirements when bolt threads are in the shear plane.
- HDA and HD allowable loads are based on the lower of the 2005 NDS fastener values or the ultimate load on a steel test jig divided by 2.5.
- Post design shall be by Designer.
- Holdowns may be raised off sill plate. Refer to table for increased deflection values (if applicable). Refer to note q, page 14 for installation instructions of raised holdowns.

**SOURCES OF DEFLECTION AT SHEARWALL HOLDOWN CONNECTIONS**

- Bolt slip can occur at holddown stud bolts.
- Increased bolt slip can occur if oversized holes are drilled through the stud for holddown stud bolts (oversized holes are when the hole diameter is greater than the bolt diameter plus <sup>1</sup>/<sub>16</sub>" per 2005 NDS 11.1.2).
- When a holddown is installed on only one side of the stud, an eccentricity exists during loading which can cause more movement in the shearwall system.
- Unrestrained anchor bolt nuts can spin loose during cyclic loading; using steel nylon locking nuts or thread adhesive may prevent nut spin.
- Movement can occur when nuts are not tightened enough. Retightening bolts before covering wall may prevent this.
- Deflection can occur in the holddown under load caused by stresses due to earthquake or high wind.
- Lateral displacement at the top of the wall rotates the stud around its base causing the holddown base plate to displace vertically.
- Wood shrinkage can occur due to drying of the sill plate, rim joist, and/or top plate; nuts may require retightening.
- Uplift forces on the bolts can cause localized wood crushing at bolt bearing locations. Using larger bearing plates may prevent this.
- Wood at the end of the studs (sill plates, rim joists, etc.) may crush under normal dead and live loading; additional compressive forces due to overturning during earthquake and high wind loads add to the deflection.



BP's are required by the City of Los Angeles. Check with your local building code on usage. (NDS Section 11.1.2.3 requires a metal plate, metal strap, or minimum of a standard cut washer.)

① ② and ⑥ do not apply to the PHD and HDQ.