

COVER SHEET FOR VOLUNTARY SEISMIC UPGRADE

SHEET S1: FOUNDATION AND STRUCTURAL PLAN

DETAIL ① SHEET S2 : FRAMING,PLYWOOD,BOLT, AND FRAMING ANCHOR DETAIL
PARALLEL TO FOUNDATION

DETAIL ② SHEET S2 : FRAMING,PLYWOOD,BOLT, AND FRAMING ANCHOR DETAIL
PERPENDICULAR TO FOUNDATION

REFERENCE: SHEET S3 TABLE 4.3A SPECIAL DESIGN PROVISIONS FOR WIND AND SEISMIC

REFERENCE: SHEET S4 HILTI KWIK BOLT TZ SIZE SHEET

REFERENCE: SHEET S5 HILTI KWIK BOLT TX DESIGN STRENGTH SHEET

DETAIL ③ SHEET S6 SIMPSON L90 AND SPECS FROM SIMPSON CATALOG.

DETAIL ④ SHEET S7: SIMPSON H10 AR AND SPEC. SHEET FROM SIMPSON CATALOG.

REFERENCE: SHEET S8: SIMPSON URFP SPEC SHEET FROM SIMPSON CATALOG

DETAIL ⑤ SHEET S9: SIMPSON URFP AND L90 PARALLEL TO FOUNDATION

DETAIL ⑥ SHEET S10: SIMPSON URFP AND L90 PERPENDICULAR TO FOUNDATION

DETAIL ⑦ SHEET S11: SIMPSON HDU2 HOLD DOWN DETAIL

DETAIL 8 SHEET S12: SIMPSON HDU2 ELEVATION DETAIL

DETAIL ⑨ SHEET S13: SIMPSON SDS SCREW TOP PLATE TO JOIST CONNECTION DETAIL DETAIL

DETAIL 10, SHEET 14 SIMPSON MST STRAP DETAIL.

REFERENCE: SHEET S15: SIMPSON MST STRAP SPEC. SHEET.

DETAIL 11, SHEET S16: SHEAR TRANSFER DETAIL.

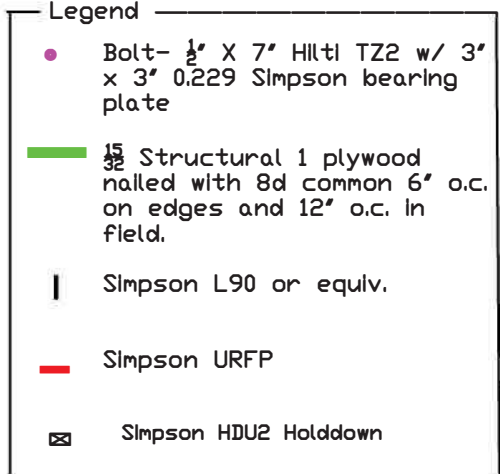
DETAIL 12, SHEET S17: ANGLE IRON DETAIL

All work shall take place in the crawlspace and the envelope shall not be disturbed so as to impact setbacks and clearances.

1-Story, R-3, Type V Construction

:

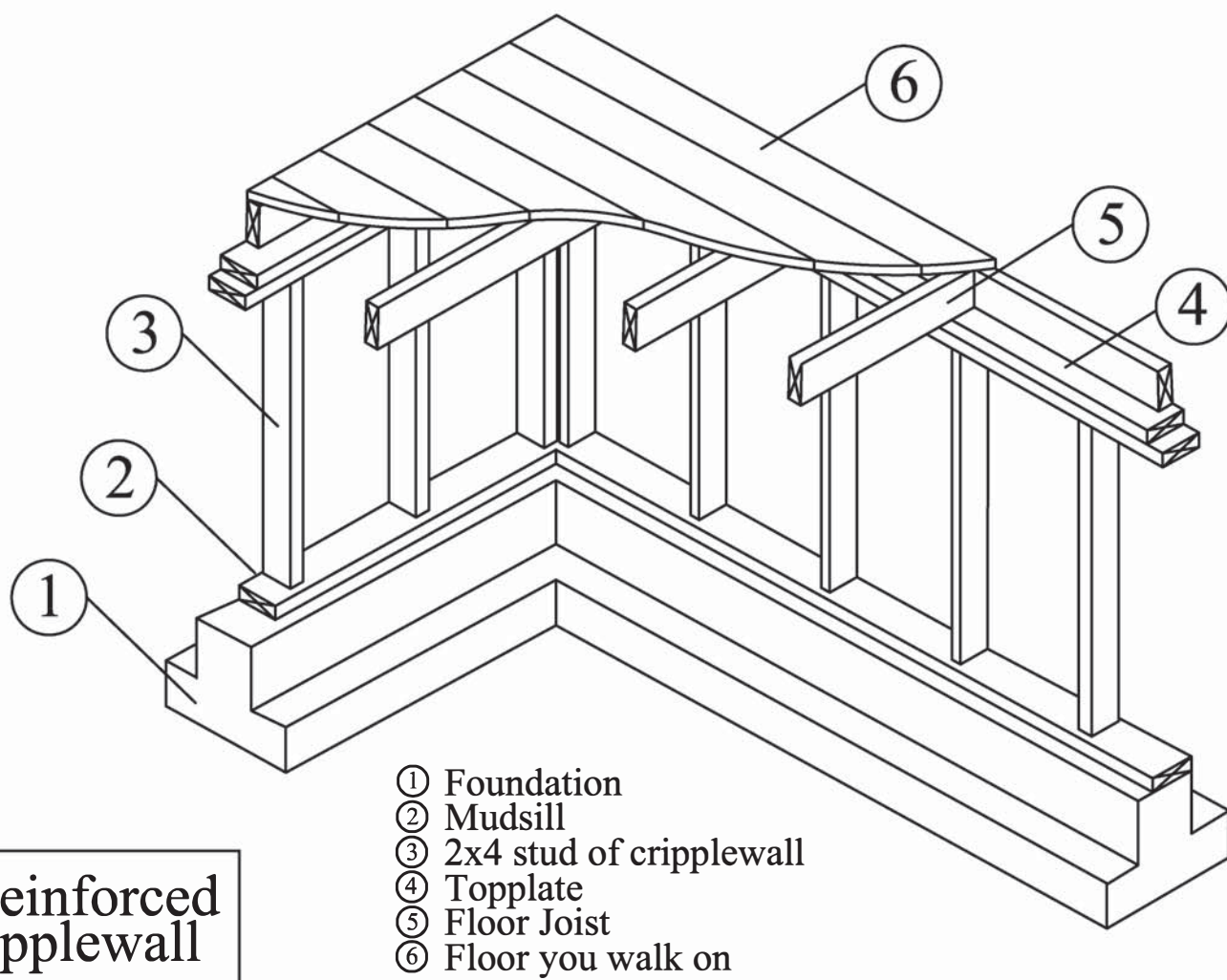
Voluntary Seismic Upgrade Not EBB, Standard Plan A, or CEBC 6064 MCBRIDE AVE. RICHMOND



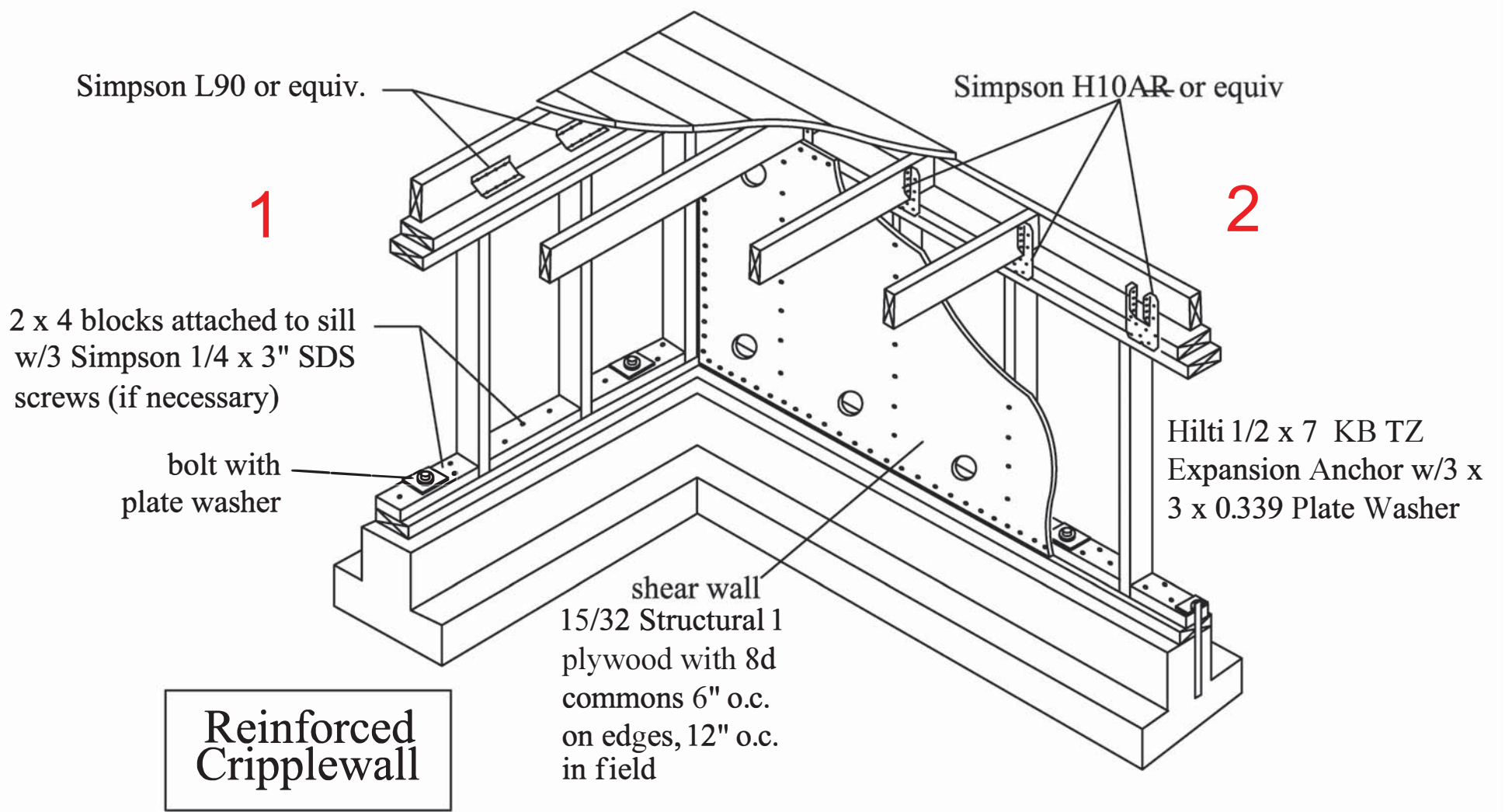
All work shall take place in the crawlspace and the envelope shall not be disturbed so as to impact setbacks and clearances.

- a. Occupancy group (R-3)
- b. Stories (1)
- c. Dwelling units (1)
- d. Type of construction (V)

S1



Unreinforced
Cripplewall



Reinforced
Cripplewall

S2

unreinforced and reinforced cripple walls defined

Table 4.3A Nominal Unit Shear Capacities for Sheathed Wood-Frame Shear Walls ^{1,3,6}

Wood-based Panels ⁴															
Sheathing Material	Minimum Nominal Panel Thickness (in.)	Minimum Nail Bearing Length in Framing Member or Blocking, ℓ _m (in.)	Nail Type & Size ⁹ Length (in.) x Shank diameter (in.) x Head diameter (in.)	Panel Edge Nail Spacing (in.)											
				6			4			3			2		
				v _n (plf)	G _a (kips/in.)		v _n (plf)	G _a (kips/in.)		v _n (plf)	G _a (kips/in.)		v _n (plf)	G _a (kips/in.)	
				OSB	PLY		OSB	PLY		OSB	PLY		OSB	PLY	
Wood Structural Panels - Structural I ^{4,5}	5/16	1-1/4	6d common nail (2 x 0.113 x 0.266) ⁸	560	13	10	840	18	13	1090	23	16	1430	35	22
	3/8 ²	1-3/8	8d common nail (2-1/2 x 0.131 x 0.281) ⁸	645	19	14	1010	24	17	1290	30	20	1710	43	24
	7/16 ²			715	16	13	1105	21	16	1415	27	19	1875	40	24
	15/32			785	14	11	1205	18	14	1540	24	17	2045	37	23
	15/32	1-1/2	10d common nail (3 x 0.148 x 0.312) ^{8,10}	950	22	16	1430	29	20	1860	36	22	2435	51	28
Wood Structural Panels - Sheathing ^{4,5}	5/16	1-1/4	6d common nail (2 x 0.113 x 0.266) ⁸	505	13	9.5	755	18	12	980	24	14	1260	37	18
	3/8			560	11	8.5	840	15	11	1090	20	13	1430	32	17
	3/8 ²	1-3/8	8d common nail (2-1/2 x 0.131 x 0.281) ⁸	615	17	12	895	25	15	1150	31	17	1485	45	20
	7/16 ²			670	15	11	980	22	14	1260	28	17	1640	42	21
	15/32			730	13	10	1065	19	13	1370	25	15	1790	39	20
	15/32	1-1/2	10d common nail (3 x 0.148 x 0.312) ^{8,10}	870	22	14	1290	30	17	1680	37	19	2155	52	23
	19/32			950	19	13	1430	26	16	1860	33	18	2435	48	22

2021 Special Design Provisions For Wind And Seismic

Reference

KWIK Bolt TZ
Expansion Anchor



All KWIK Bolt TZ Expansion Anchors are marked on the head of the anchor with a length identification mark. See page 235 for the complete Length Identification System chart!

Features and Applications

- Especially suited for seismic and cracked concrete (**t**ension **z**one) applications
- Seismic qualification tested in accordance with ACI 355.2 and ICC-ES AC193
- Small minimum edge distance and spacing for maximum design flexibility
- Nuts and washers pre-assembled
- Rounded end for easy installation
- Meets ductility requirements of ACI318 D.3.3
- Product and length identification mark facilitates quality control and inspection
- Periodic special inspections

2006 IBC
Compliant Anchor

2009 IBC
Compliant Anchor

2012 IBC
Compliant Anchor



Technical Data	KB-TZ
Base material	- Lightweight Concrete - Cracked and uncracked concrete - Light to medium weight concrete over metal deck
Anchor material	- Carbon steel, electroplated zinc min 5 microns - Stainless steel AISI 304 - Stainless steel AISI 316
Listings/Approvals - ICC-ES (International Code Council) - ESR-1917 - COLA (City of Los Angeles) - RR 25701 - FM (Factory Mutual) - UL (Underwriter Laboratories) - Qualified under an NQA-1 nuclear quality program	

KWIK Bolt TZ Carbon Steel

Description	Hole Dia	Anchor Length	Thread Length	Emb Depth (h _{nom})	Box Only Item No.	Qty	Master Carton Item No.	Qty	Allowable Static Loads ^{1,2} ≥ 4000 psi Concrete	
									Tension (lb)	Shear (lb)
KB-TZ 3/8" x 3"	3/8"	3"	7/8"	2-1/4"	00387509	50	03437370	400	1477	1925
KB-TZ 3/8" x 3-3/4"	3/8"	3-3/4"	1-5/8"	2-1/4"	00387510	50	03437371	400	1477	1925
KB-TZ 3/8" x 5"	3/8"	5"	2-7/8"	2-1/4"	00387511	50	03437372	300	1477	1925
KB-TZ 1/2" x 3-3/4"	1/2"	3-3/4"	1-5/8"	2-3/8"	00387512	20	03435802	160	1993	2945
KB-TZ 1/2" x 4-1/2"	1/2"	4-1/2"	2-3/8"	3-5/8"	00387513	20	03436003	160	3239	2945
KB-TZ 1/2" x 5-1/2"	1/2"	5-1/2"	3-3/8"	3-5/8"	00387514	20	03436004	160	3239	2945
KB-TZ 1/2" x 7"	1/2"	7"	4-7/8"	3-5/8"	00387515	20	03436005	120	3239	2945
KB-TZ 5/8" x 4-3/4"	5/8"	4-3/4"	1-1/2"	3-5/8"	00387516	15	03437493	90	3893	4335
KB-TZ 5/8" x 6"	5/8"	6"	2-3/4"	4-1/2"	00387517	15	03437494	90	5371	4335
KB-TZ 5/8" x 8-1/2"	5/8"	8-1/2"	5-1/4"	4-1/2"	00387518	15	03437495	60	5371	4335
KB-TZ 5/8" x 10"	5/8"	10"	6-3/4"	4-1/2"	00387519	15	03437496	60	5371	4335
KB-TZ 3/4" x 5-1/2"	3/4"	5-1/2"	1-1/2"	4-3/8"	00387520	10	03437497	80	4863	7325
KB-TZ 3/4" x 8"	3/4"	8"	4"	5-3/8"	00387521	10	-	-	6272	7325
KB-TZ 3/4" x 10"	3/4"	10"	6"	5-3/8"	00387522	10	03437499	40	6272	7325

1 Always refer to Hilti Product Technical Guide for complete details on anchor specifications, limitations, safety factors, explanation of data, information on other base materials and embedments, and other technical data
2 Refer to ESR-1917 for complete details

Reference

KWIK Bolt TZ 316 Stainless Steel

Description	Hole Dia	Anchor Length	Thread Length	Emb Depth (h _{nom})	Box Qty	Item No.	Qty	Master Carton Item No.	Allowable Static Loads ^{1,2} ≥ 4000 psi Concrete	
									Tension (lb)	Shear (lb)
KB-TZ SS316 3/8" x 3"	3/8"	3"	7/8"	2-1/4"	50	00411727	400	03457632	1545	2530
KB-TZ SS316 3/8" x 3-3/4"	3/8"	3-3/4"	1-5/8"	2-1/4"	50	00411731	400	03457874	1545	2530
KB-TZ SS316 1/2" x 3-3/4"	1/2"	3-3/4"	1-5/8"	2-3/8"	20	00411733	160	03457875	1993	3685
KB-TZ SS316 1/2" x 4-1/2"	1/2"	4-1/2"	2-3/8"	3-5/8"	20	00411734	160	03457876	3383	3685
KB-TZ SS316 1/2" x 5-1/2"	1/2"	5-1/2"	3-3/8"	3-5/8"	20	00411736	160	03457877	3383	3685
KB-TZ SS316 5/8" x 4-3/4"	5/8"	4-3/4"	1-1/2"	3-5/8"	15	00411737	90	03457878	3893	5290
KB-TZ SS316 5/8" x 6"	5/8"	6"	2-3/4"	4-1/2"	15	00411739	90	03457879	5638	5290
KB-TZ SS316 3/4" x 5-1/2"	3/4"	5-1/2"	1-1/2"	4-3/8"	10	00411740	60	03457880	5118	8415
KB-TZ SS316 3/4" x 10"	3/4"	10"	6"	5-3/8"	10	00411741	40	03457881	7071	8415

1 Always refer to Hilti Product Technical Guide for complete details on anchor specifications, limitations, safety factors, explanation of data, information on other base materials and embedments, and other technical data
2 Refer to ESR-1917 for complete details

S4
Hilti. Outperform. Outlast.

Table 3 — Hilti Carbon Steel KB-TZ2 design strength based on concrete failure modes in cracked concrete per ACI 318 Ch. 17, applicable for both hammer and core drilled installations ^{1,2,3,4,5}

Nominal anchor diameter in.	Effective embedment in. (mm)	Nominal embedment in. (mm)	Tension (lesser of concrete breakout / pullout) - ΦN_n				Shear (lesser of concrete breakout or pryout) - ΦV_n			
			$f'_c = 2,500$ psi (17.2 MPa) lb (kN)	$f'_c = 3,000$ psi (20.7 MPa) lb (kN)	$f'_c = 4,000$ psi (27.6 MPa) lb (kN)	$f'_c = 6,000$ psi (41.1 MPa) lb (kN)	$f'_c = 2,500$ psi (17.2 MPa) lb (kN)	$f'_c = 3,000$ psi (20.7 MPa) lb (kN)	$f'_c = 4,000$ psi (27.6 MPa) lb (kN)	$f'_c = 6,000$ psi (41.1 MPa) lb (kN)
1/4	1-1/2 (38)	1 3/4 (44)	280 (1.2)	300 (1.3)	340 (1.5)	395 (1.8)	1,095 (4.9)	1,195 (5.3)	1,385 (6.2)	1,695 (7.5)
3/8	1-1/2 (38)	1 7/8 (48)	1,255 (5.6)	1,375 (6.1)	1,585 (7.1)	1,940 (8.6)	1,350 (6.0)	1,480 (6.6)	1,710 (7.6)	2,090 (9.3)
	2 (51)	2 1/2 (64)	1,930 (8.6)	2,115 (9.4)	2,440 (10.9)	2,990 (13.3)	2,080 (9.3)	2,275 (10.1)	2,630 (11.7)	3,220 (14.3)
	2-1/2 (64)	3 (76)	2,185 (9.7)	2,390 (10.6)	2,765 (12.3)	3,385 (15.1)	4,705 (20.9)	5,155 (22.9)	5,950 (26.5)	7,285 (32.4)
1/2	1-1/2 (38)	2 (51)	1,435 (6.4)	1,570 (7.0)	1,815 (8.1)	2,220 (9.9)	1,545 (6.9)	1,690 (7.5)	1,950 (8.7)	2,390 (10.6)
	2 (51)	2 1/2 (64)	1,930 (8.6)	2,115 (9.4)	2,440 (10.9)	2,990 (13.3)	2,080 (9.3)	2,275 (10.1)	2,630 (11.7)	3,220 (14.3)
	2-1/2 (64)	3 (76)	2,700 (12.0)	2,955 (13.1)	3,415 (15.2)	4,180 (18.6)	5,810 (25.8)	6,365 (28.3)	7,350 (32.7)	9,000 (40.0)
	3-1/4 (83)	3 3/4 (95)	3,235 (14.4)	3,545 (15.8)	4,095 (18.2)	5,015 (22.3)	6,970 (31.0)	7,640 (34.0)	8,820 (39.2)	10,800 (48.0)
5/8	2-3/4 (70)	3 1/4 (83)	3,110 (13.8)	3,410 (15.2)	3,935 (17.5)	4,820 (21.4)	6,705 (29.8)	7,345 (32.7)	8,480 (37.7)	10,385 (46.2)
	3-1/4 (83)	3 3/4 (95)	4,000 (17.8)	4,380 (19.5)	5,060 (22.5)	6,195 (27.6)	8,615 (38.3)	9,435 (42.0)	10,895 (48.5)	13,345 (59.4)
	4 (102)	4 1/2 (114)	4,420 (19.7)	4,840 (21.5)	5,590 (24.9)	6,845 (30.4)	9,520 (42.3)	10,430 (46.4)	12,040 (53.6)	14,750 (65.6)
3/4	3-1/4 (83)	4 (102)	4,000 (17.8)	4,380 (19.5)	5,060 (22.5)	6,195 (27.6)	8,615 (38.3)	9,435 (42.0)	10,895 (48.5)	13,345 (59.4)
	3-3/4 (95)	4 1/2 (114)	4,955 (22.0)	5,430 (24.2)	6,270 (27.9)	7,680 (34.2)	10,675 (47.5)	11,695 (52.0)	13,505 (60.1)	16,540 (73.6)
	4-3/4 (121)	5 1/2 (140)	5,745 (25.6)	6,055 (26.9)	6,580 (29.3)	7,405 (32.9)	15,220 (67.7)	16,670 (74.2)	19,250 (85.6)	23,575 (104.9)
1	4 (102)	4 5/8 (117)	5,460 (24.3)	5,980 (26.6)	6,905 (30.7)	8,460 (37.6)	11,760 (52.3)	12,880 (57.3)	14,875 (66.2)	18,220 (81.0)
	5-3/4 (146)	6 3/8 (162)	7,675 (34.1)	8,410 (37.4)	9,710 (43.2)	11,890 (52.9)	20,270 (90.2)	22,205 (98.8)	25,640 (114.1)	31,400 (139.7)

1 See Section 3.1.8 to convert design strength value to ASD value.
2 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.
3 Apply spacing, edge distance, and concrete thickness factors in tables 6 to 17 as necessary. Compare to the steel values in table 4. The lesser of the values is to be used for the design.
4 Tabular values are for normal weight concrete only. For lightweight concrete multiply design strength by λ_a as follows: For sand-lightweight, $\lambda_a = 0.68$; for all-lightweight, $\lambda_a = 0.60$.
5 Tabular values are for static loads only. Seismic design is not permitted for uncracked concrete. For seismic tension loads, multiply cracked concrete tabular values in tension only by $\alpha_{N,seis} = 0.75$, except for 3/4 x 4-3/4 h_{ef} where $\alpha_{N,seis} = 0.73$. No reduction needed for seismic shear. See Section 3.1.8 for additional information on seismic applications.

L/LS/GA

Reinforcing and Skewable Angles

L — Staggered nail pattern reduces the possibility for splitting.
LS — Field-adjustable 0° to 135° angles.
GA — Gusset angles' embossed bend section provides added strength.

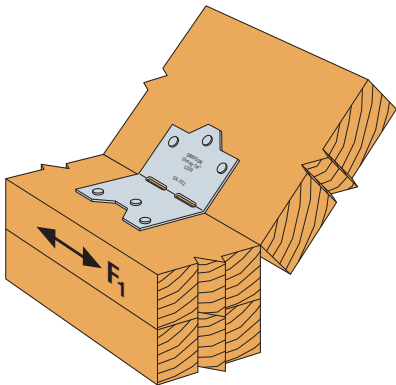
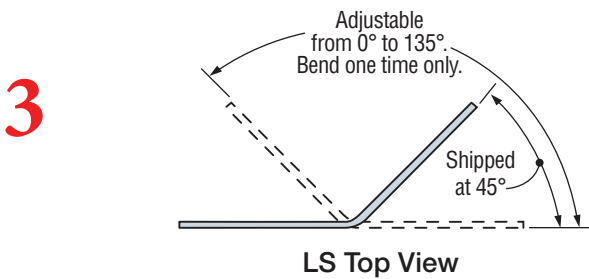
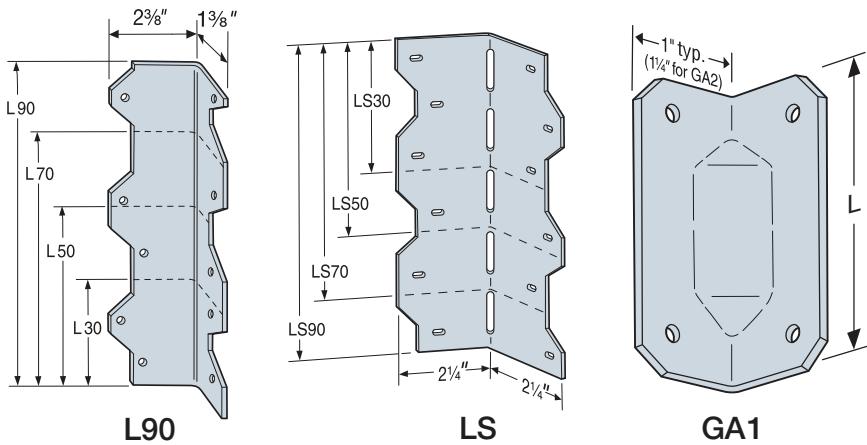
Material: L — 16 gauge; GA and LS — 18 gauge

Finish: Galvanized. Some products available in stainless steel or ZMAX® coating. See Corrosion Information, pp. 12–15.

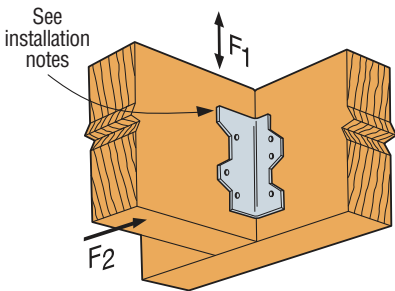
Installation:

- Use all specified fasteners; see General Notes
- LS — Field skewable; bend one time only
- Joist must be constrained against rotation (for example, with solid blocking) when using a single LS per connection
- Nail the L angle's wider leg into the joist to ensure table loads and allow correct nailing

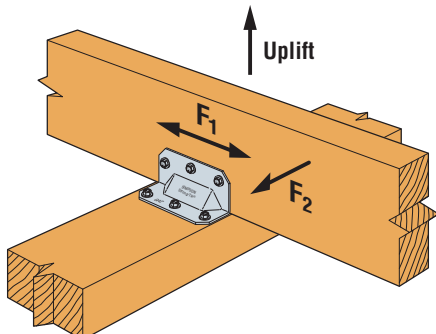
Codes: See p. 11 for Code Reference Key Chart



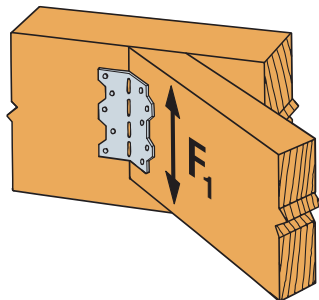
Typical LS30 Installation



Typical L50 Installation



Typical GA Installation



Typical LS70 Installation

These products are available with additional corrosion protection. For more information, see p. 14.

SS For stainless-steel fasteners, see p. 21.

SD Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 348–352 for more information.

Model No.	Fasteners (in.)	L (in.)	Load Direction	DF/SP Allowable Loads				SPF/HF Allowable Loads				Code Ref.
				Floor (100)	Snow (115)	Roof (125)	Wind/ Seismic (160)	Floor (100)	Snow (115)	Roof (125)	Wind/ Seismic (160)	
GA1	(4) 0.148 x 1 1/2	2 3/4	F ₁ , F ₂	235	270	290	350	200	230	250	300	IBC, FL, LA
	(4) #9 x 1 1/2" SD		F ₁	340	375	375	375	225	260	280	325	IBC, LA
	(4) #9 x 1 1/2" SD		F ₂	340	395	430	435	225	260	280	360	IBC, LA
GA2	(6) 0.148 x 1 1/2	3 1/4	F ₁ , F ₂	355	405	435	550	305	350	375	475	IBC, FL, LA
	(6) #9 x 1 1/2" SD		F ₁	515	590	640	695	335	385	420	540	IBC, LA
	(6) #9 x 1 1/2" SD		F ₂	515	590	640	820	335	385	420	540	IBC, LA
L30	(4) 0.148 x 1 1/2	3	F ₁	245	250	250	250	210	215	215	215	IBC, FL, LA
			F ₂	245	275	295	370	210	235	255	320	
L50	(6) 0.148 x 1 1/2	5	F ₁	365	415	445	525	315	355	385	450	
			F ₂	365	415	445	555	315	355	385	475	
L70	(8) 0.148 x 1 1/2	7	F ₁ , F ₂	485	550	595	740	415	475	510	635	
L90	(10) 0.148 x 1 1/2	9	F ₁ , F ₂	610	690	740	925	525	595	635	795	
LS30	(6) 0.148 x 1 1/2	3 3/8	F ₁	320	320	320	320	275	275	275	275	
	(6) 0.148 x 3		F ₁	355	395	395	395	305	340	340	340	
SS LS50	(8) 0.148 x 1 1/2	4 7/8	F ₁	475	540	560	560	410	465	480	480	
	(8) 0.148 x 3		F ₁	475	540	580	730	410	465	500	630	
LS70	(10) 0.148 x 1 1/2	6 3/8	F ₁	590	645	645	645	510	555	555	555	
	(10) 0.148 x 3		F ₁	590	675	725	915	510	580	625	785	
LS90	(12) 0.148 x 1 1/2	7 7/8	F ₁	710	805	870	890	610	690	750	765	
	(12) 0.148 x 3		F ₁	710	805	870	1,040	610	690	750	895	

1. GA angles may be installed with 0.148" x 3" nails.
2. GA1 uplift is 425 lb. for DF and 300 lb. for SPF when installed with Strong-Tie® SD Connector screws.
3. GA2 uplift is 370 lb. for DF and 260 lb. for SPF when installed with Strong-Tie® SD Connector screws.
4. **Fasteners:** Nail dimensions are listed diameter by length. SD screws are Simpson Strong-Tie® Strong-Drive SD Connector screws. See pp. 21–22 for fastener information.

Seismic and Hurricane Ties (cont.)

These products are available with additional corrosion protection. For more information, see p. 14.

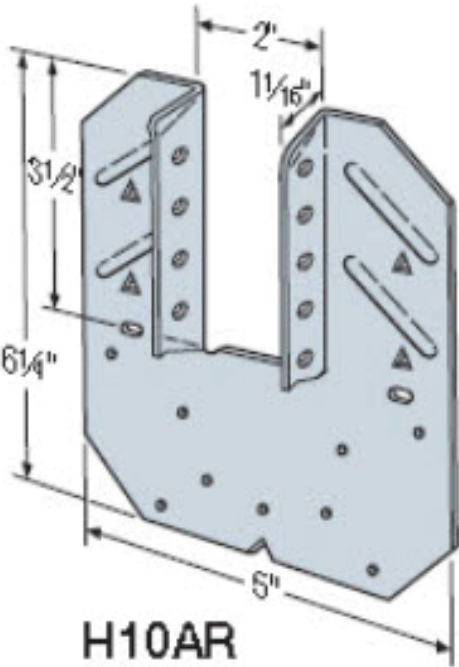
SS

For stainless-steel fasteners, see p. 21.

SD

Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 348–352 for more information.

Model No.	Ga.	Fasteners (in.)			DF/SP Allowable Loads			Uplift with 0.131" x 1 1/2" Nails (160)	SPF/HF Allowable Loads			Uplift with 0.131" x 1 1/2" Nails (160)	Code Ref.
		To Rafters/Truss	To Plates	To Studs	Uplift (100)	Lateral (160)			Uplift (160)	Lateral (160)			
						F ₁	F ₂			F ₁	F ₂		
H10A Field Bent	18	(Ø) 0.148 x 1 1/2	(Ø) 0.148 x 1 1/2	—	760	590	285	—	760	505	285	—	IBC, FL, LA
H10A	18	(Ø) 0.148 x 1 1/2	(Ø) 0.148 x 1 1/2	—	1,040	565	285	—	1,015	485	285	—	
H10ASS	18	(Ø) 0.148 x 1 1/2	(Ø) 0.148 x 1 1/2	—	970	565	170	—	835	485	170	—	—
H10AR	18	(Ø) 0.148 x 1 1/2	(Ø) 0.148 x 1 1/2	—	1,050	490	285	—	905	420	285	—	—



H10AR

Reference

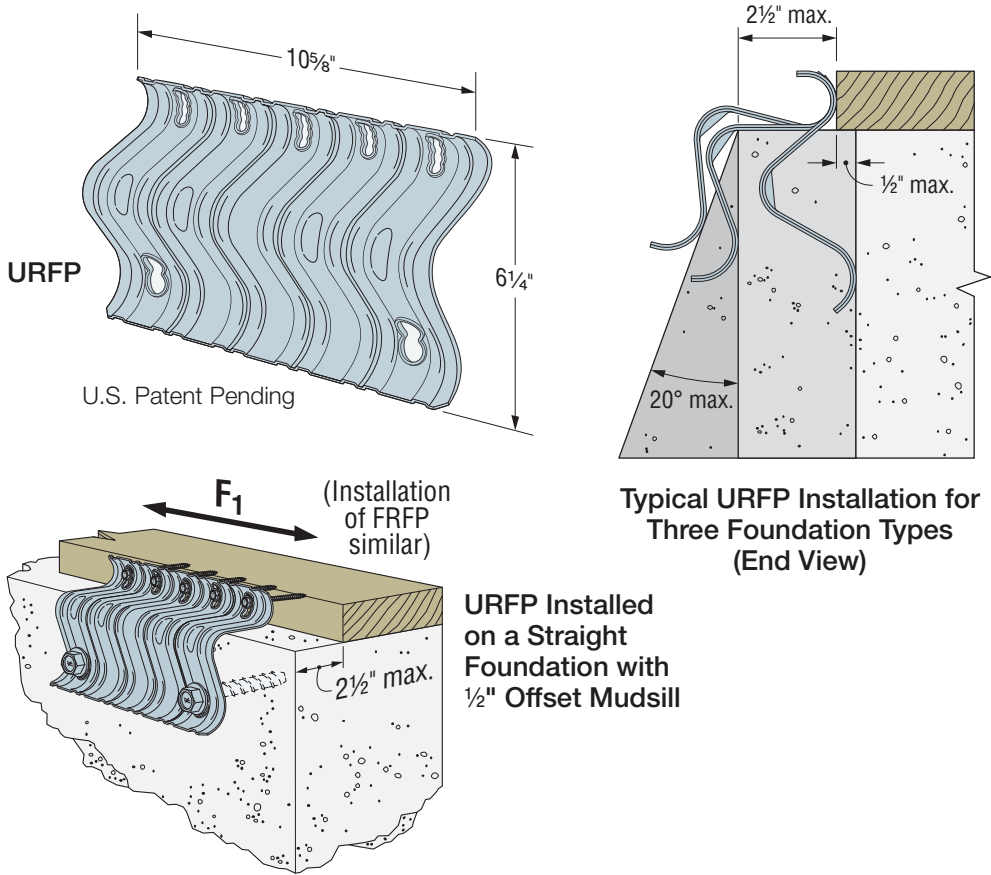
S7



URFP/

Retrofit Foundation Plates

Ideal where there is minimum vertical clearance, the URFP universal retrofit foundation plate provides a retrofit method to secure the mudsill to the foundation. This design allows installation flexibility when the mudsill is offset or inset from the foundation edge. With its combination of longitudinal embossments, stiffening darts and scalloped slotted holes, the URFP allows for a one-for-one replacement of 1/2" or 5/8" mudsill anchors as well as fixity to both the SDS screws and required concrete anchorage.



Installation:

- Use all specified fasteners; see General Notes.
- Loads are based on test results using 1/4" x 3" Strong-Drive® SDS Heavy-Duty Connector screws, which are supplied with the URFP.
- For URFP, alternate lag screws will not achieve published loads.
- FRFP shall use a minimum Strong-Drive SDS Heavy-Duty Connector screw length of 2 1/2" plus the shim thickness. FRFP may be installed with 1/4" HDG lag screws. Follow code requirements for predrilling.
- For additional retrofit information, see [strongtie.com](https://www.strongtie.com).

Codes: See p. 12 for Code Reference Key Chart

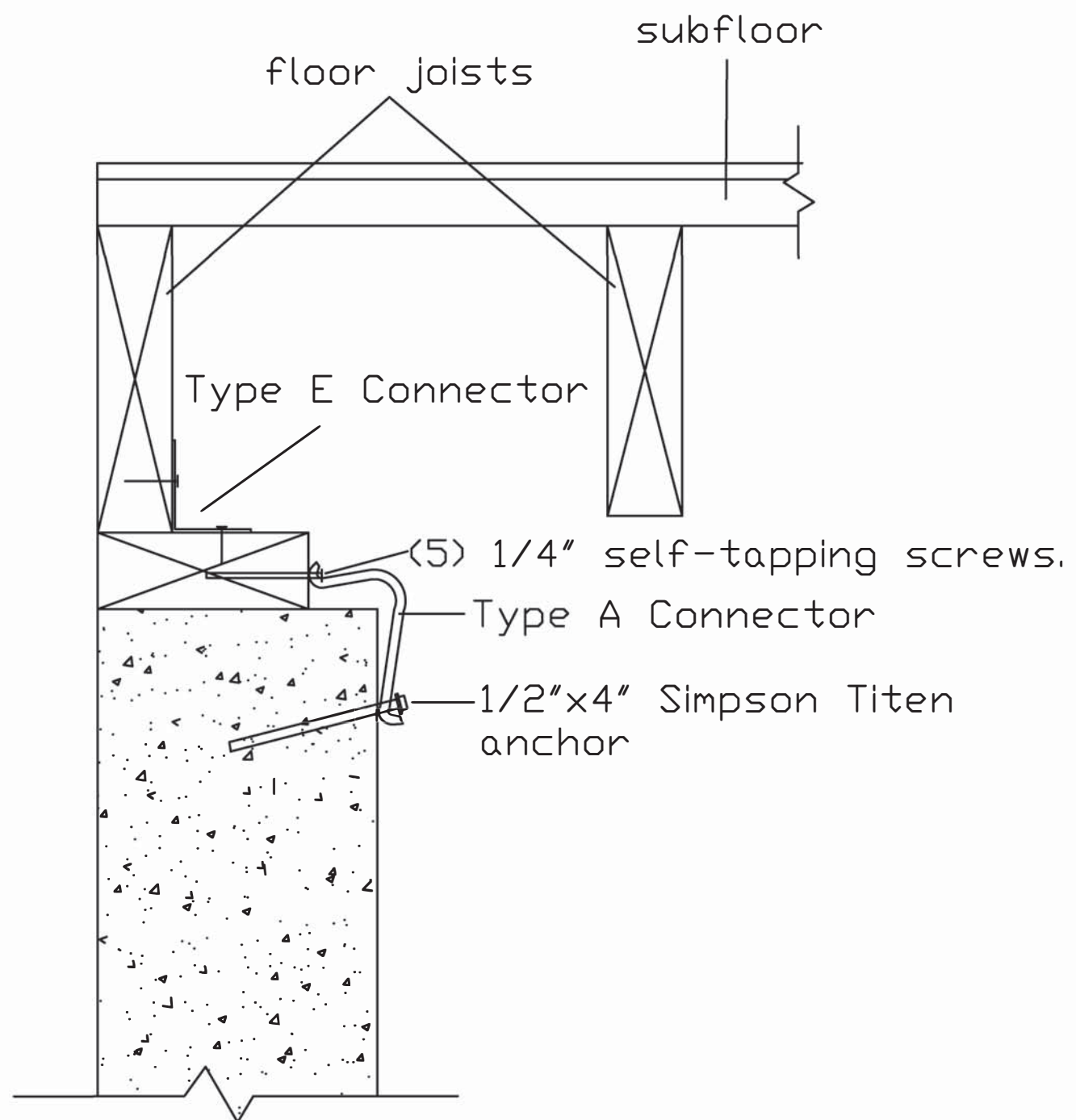
Reference

These products are available with additional corrosion protection. For more information, see p. 15.

Model No.	Fasteners			Allowable Loads DF/SP (160)		Code Ref.
	Anchor Bolt		Sill Plate	F ₁	F ₂	
	Qty.	Dia.				
URFP	2	½	(5) ¼" x 3" SDS	1,530	—	IBC, FL
FRFP	2	½	(3) ¼" x 2½" SDS + shim thickness	1,065	365	
	2	½	(5) ¼" x 2½" SDS + shim thickness	1,810	365	

1. Allowable loads have been increased for wind or earthquake loading with no further increase allowed. Reduce where other loads govern.
2. Each anchor bolt requires a standard-cut washer. The Simpson Strong-Tie® Titen HD® heavy-duty screw anchor does not require a washer.
3. Nominal embedment depth for post-installed anchors must be 4" for SET-3G or AT-XP, or use THD50400H Titen HD® screw anchors.
4. For redwood mudsills, reduce F₁ on FRFP to 820 lb. (1,395 lb. for five screws) and on URFP to 1,180 lb.
5. For installation on SPF/HF sill plates, use 0.86 x DF/SF allowable load.

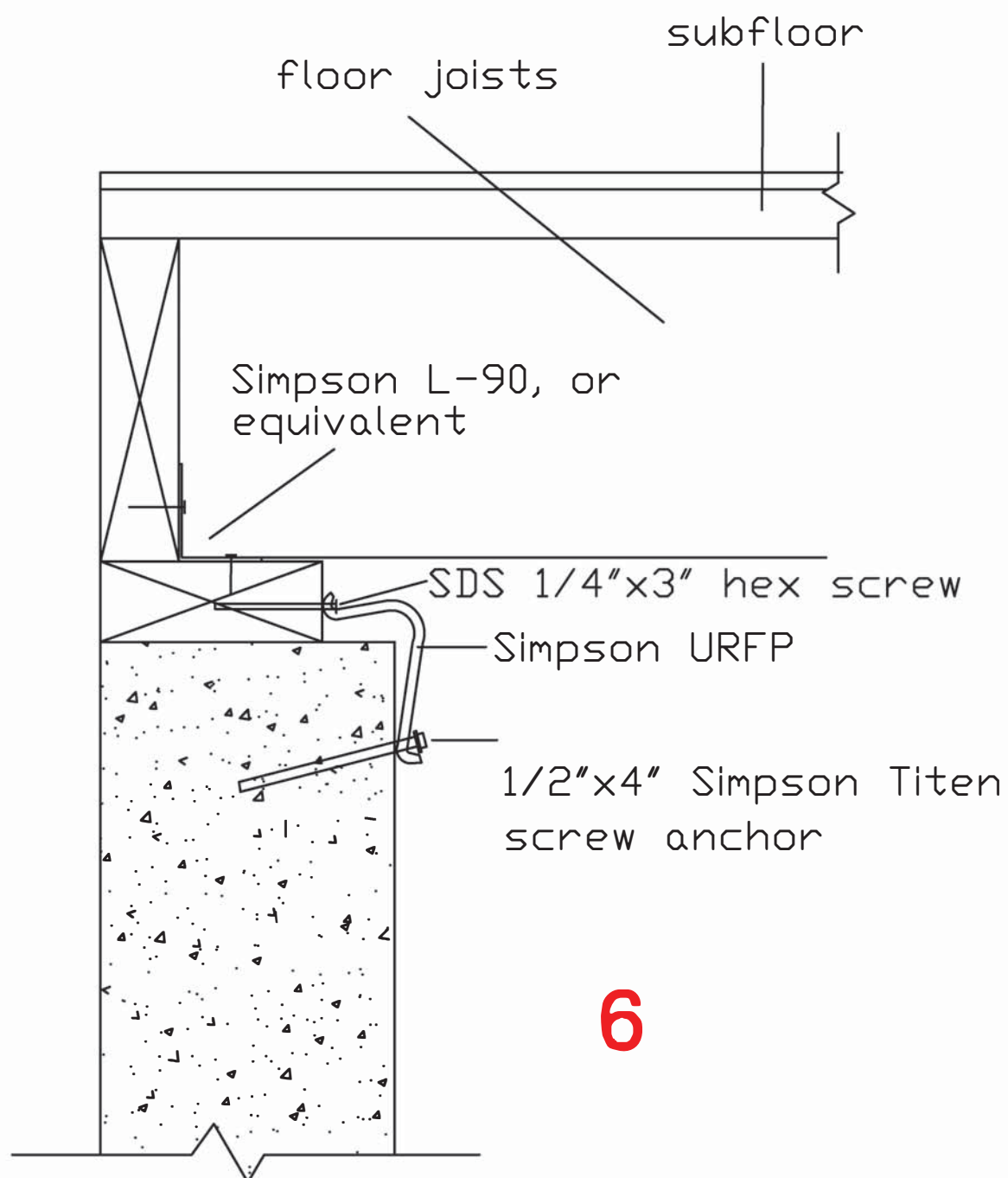
S8



Used when joists are parallel to foundation.

5

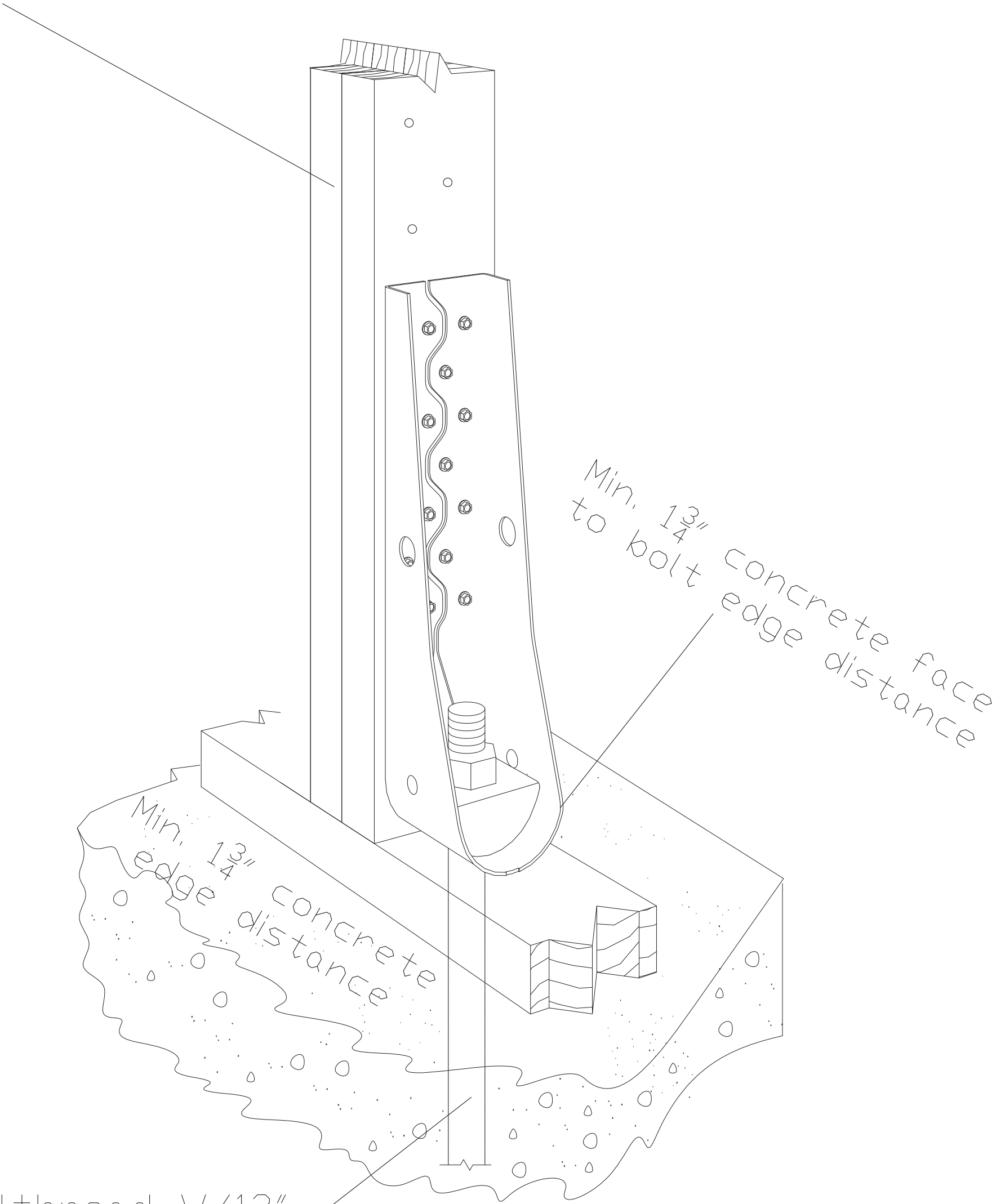
S9



S10

Bolting of floor to foundation when
a clearance is too low to install a
anchor bolt from above

2x sistered w/16d
common nails 4" o.c.



7

5/8" allthread w/12"
concrete embedment
w/Simpson-3G Epoxy
Adhesive

SIMPSON HDU

S11

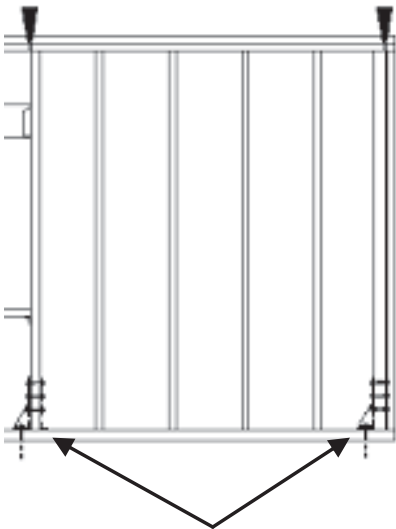
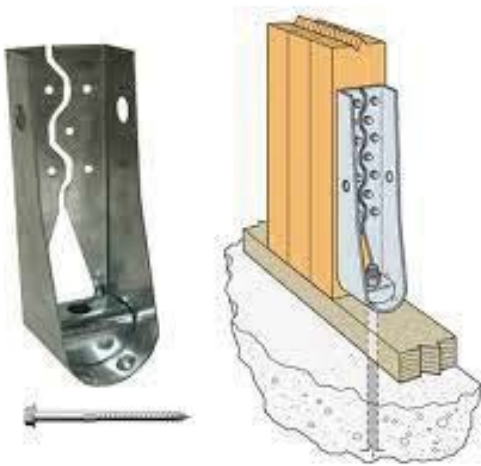
Holdowns (cont.)

These products are available with additional corrosion protection. For more information, see p. 15.

For stainless-steel fasteners, see p. 21.

Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 335-337 for more information.

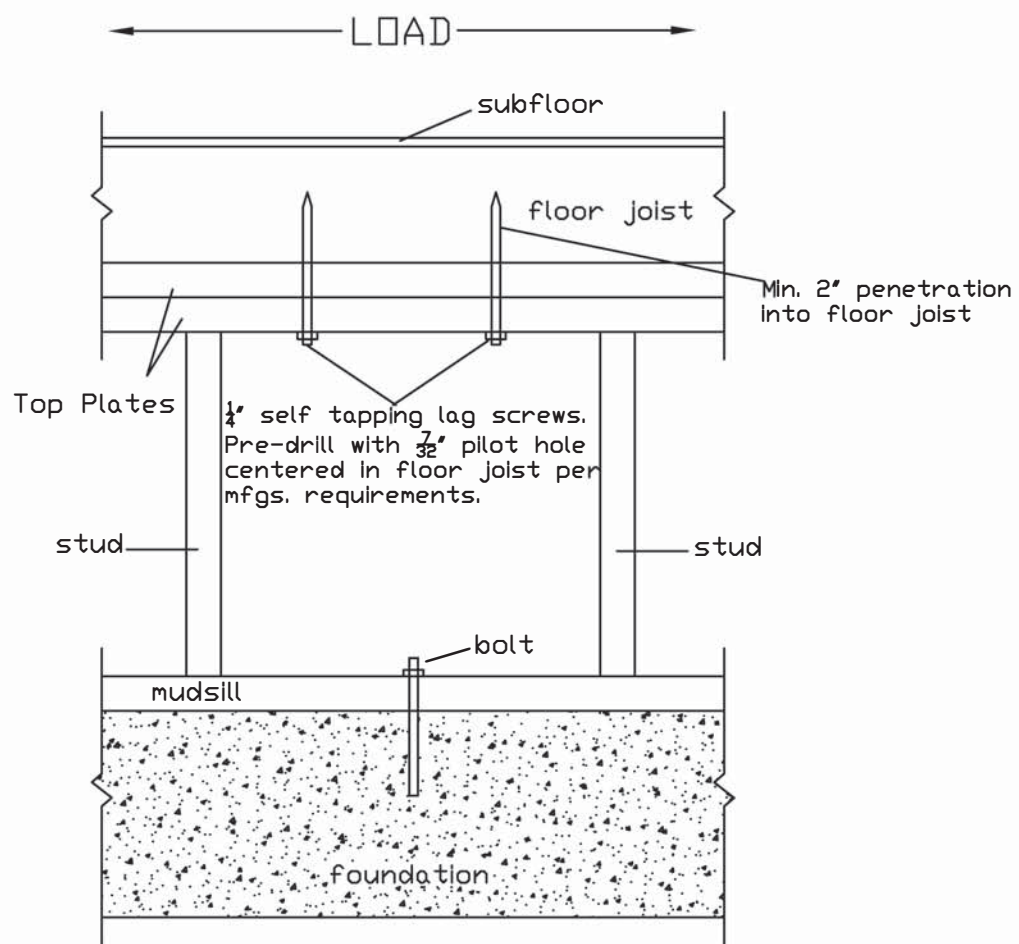
HDU2-SDS2.5	14	3	8 11⁄16	3 1⁄4	1 5⁄16	1 3⁄8	5⁄8	(6) 1⁄4 x 2 1⁄2 SDS	3 x 3 1⁄2	3,075	2,215	0.088	IBC,
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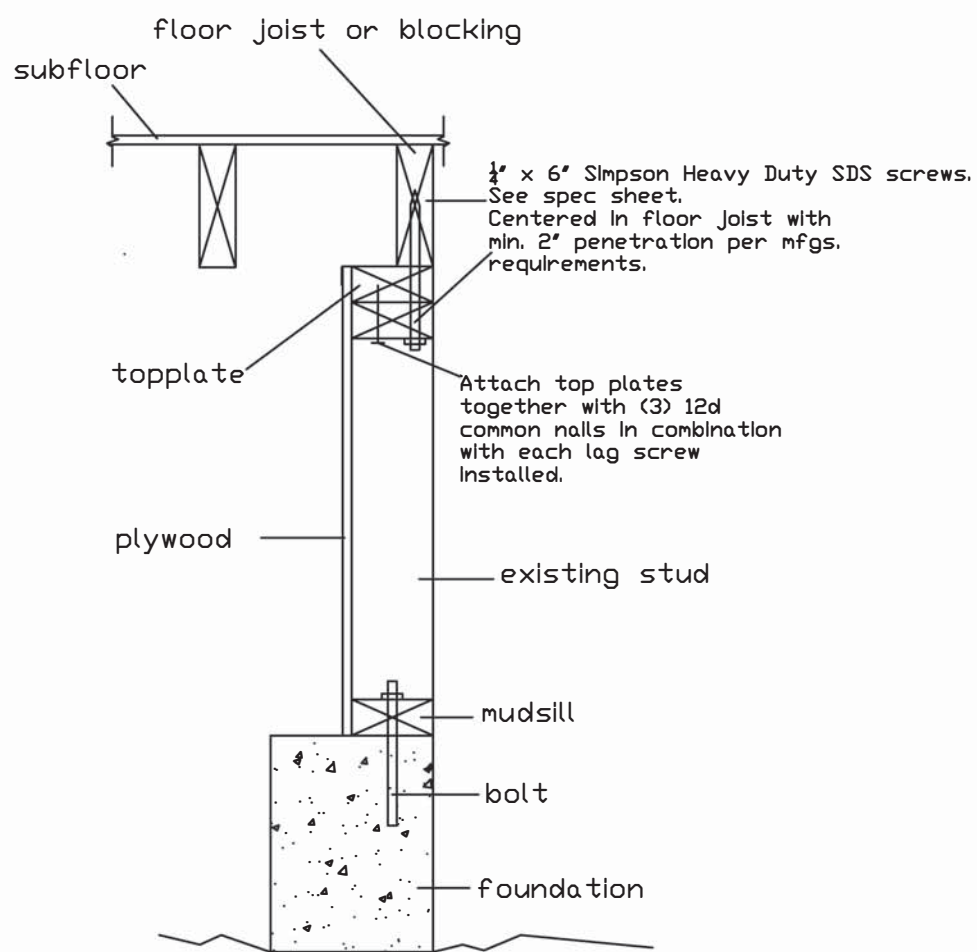
Simpson HDU2s. One each side

7

HDU2s With 18"x 5/8" Allthread
Embedded 12" Into Foundation



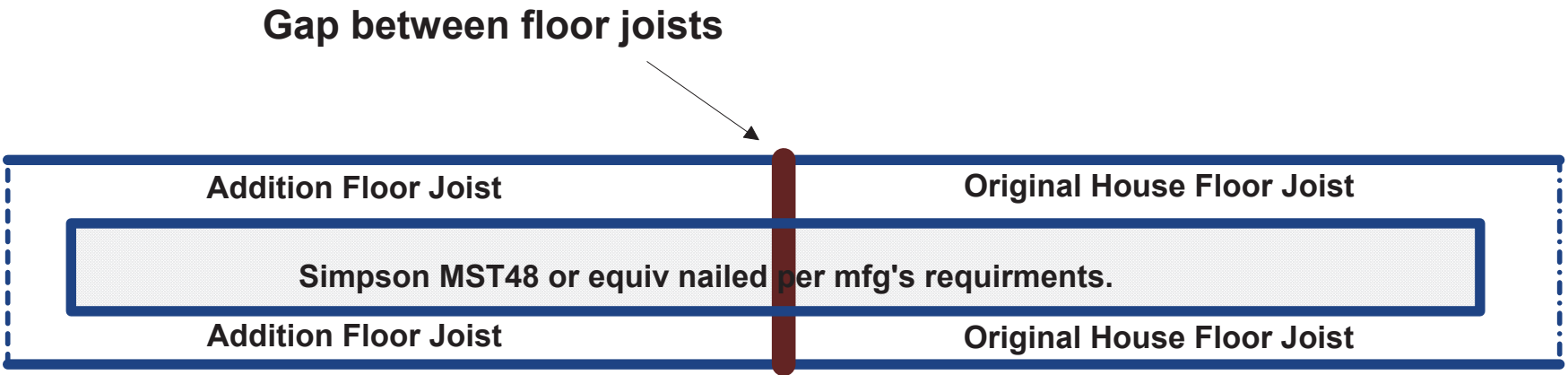
1/4"x6" Simpson Heavy Duty SDS Screw



Simpson Lag Screw Top Plate To Floor Connection
ALTERNATE TO SIMPSON L90 OR SIMPSON H10AR

S13

BUILDING SKETCH



MST strap installed to keep addition from separating from original house

3

S14

Straps & Ties

HRS/ST/PS/HST/HTP/LSTA/LSTI/MST/MSTA/MSTC/MSTI Strap Ties



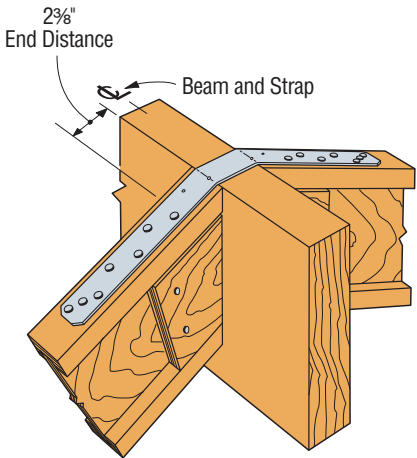
CODES: See page 12 for Code Reference Key Chart.

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

These products are approved for installation with the Strong-Drive® SD Connector screw. See page 27 for more information.

Model No.	Ga	Dimensions		Fasteners (Total)	Allowable Tension Loads (DF/SP)	Allowable Tension Loads (SPF/HF)	Code Ref.
		W	L		(160)	(160)	
LSTA9	20	1¼	9	8-10d	740	635	I4, L3, L5, F2
LSTA12		1¼	12	10-10d	925	795	
LSTA15		1¼	15	12-10d	1110	950	
LSTA18		1¼	18	14-10d	1235	1110	
LSTA21		1¼	21	16-10d	1235	1235	
LSTA24		1¼	24	18-10d	1235	1235	
ST292		2⅞	9⅞	12-16d	1265	1120	
ST2122		2⅞	12⅜	16-16d	1530	1505	
ST2115		¾	16⅞	10-16d	660	660	
ST2215		2⅞	16⅞	20-16d	1875	1875	
LSTA30	18	1¼	30	22-10d	1640	1640	I4, L3, L5, F2
LSTA36		1¼	36	24-10d	1640	1640	
LSTI49		3¾	49	32-10dx1½	2975	2555	
LSTI73		3¾	73	48-10dx1½	4205	3830	
MSTA9		1¼	9	8-10d	750	645	
MSTA12		1¼	12	10-10d	940	810	
MSTA15		1¼	15	12-10d	1130	970	
MSTA18		1¼	18	14-10d	1315	1130	
MSTA21		1¼	21	16-10d	1505	1290	
MSTA24		1¼	24	18-10d	1640	1455	
MSTA30	16	1¼	30	22-10d	2050	1820	I4, L3, L5, F2
MSTA36		1¼	36	26-10d	2050	2050	
MSTA49		1¼	49	26-10d	2020	2020	
ST6215		2⅞	16⅞	20-16d	2095	1900	
ST6224		2⅞	23⅞	28-16d	2540	2540	
ST9		1¼	9	8-16d	885	760	
ST12		1¼	11⅞	10-16d	1105	950	
ST18		1¼	17¾	14-16d	1420	1330	
ST22		1¼	21⅞	18-16d	1420	1420	
MSTC28		3	28¾	36-16d sinkers	3455	2980	
MSTC40	14	3	40¾	52-16d sinkers	4745	4305	I4, L3, L5, F2
MSTC52		3	52¾	62-16d sinkers	4745	4745	
HTP37Z		3	7	20-10dx1½	1850	1600	
MSTC66		3	65¾	76-16d sinkers	5860	5860	
MSTC78		3	77¾	76-16d sinkers	5860	5860	
ST6236		2⅞	33⅜	40-16d	3845	3845	
HRS6		1⅜	6	6-10d	605	525	
HRS8		1⅜	8	10-10d	1010	880	
HRS12		1⅜	12	14-10d	1415	1230	
MSTI26		2⅞	26	26-10dx1½	2745	2325	
MSTI36	12	2⅞	36	36-10dx1½	3800	3220	I4, L3, L5, F2
MSTI48		2⅞	48	48-10dx1½	5065	4290	
MSTI60		2⅞	60	60-10dx1½	5080	5080	
MSTI72		2⅞	72	72-10dx1½	5080	5080	
HRS416Z		3¼	16	16-SDS ¼"x1½"	2835	2305	

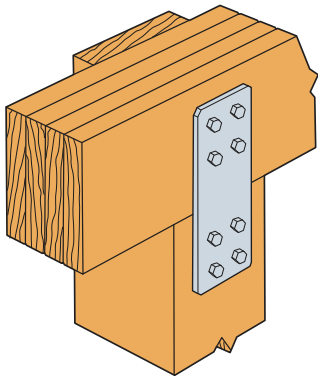
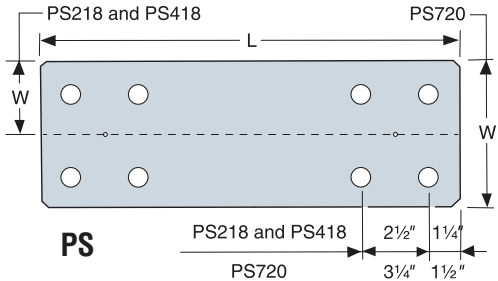
1. Loads include a 60% load duration increase on the fasteners for wind or earthquake loading.
2. 10dx1½" nails may be substituted where 16d sinkers or 10d are specified at 100% of the table loads except where straps are installed over sheathing.
3. 10d commons may be substituted where 16d sinkers are specified at 100% of table loads.
4. 16d sinkers (0.148" dia. x 3¼" long) or 10d commons may be substituted where 16d commons are specified at 0.84 of the table loads.
5. Use half of the nails in each member being connected to achieve the listed loads.
6. Tension loads apply for uplift when installed vertically.
7. **NAILS:** 16d = 0.162" dia. x 3½" long, 16d Sinker = 0.148" dia. x 3¼" long, 10d = 0.148" dia. x 3" long. 10dx1½ = 0.148" dia. x 1½" long. See pages 22-23 for other nail sizes and information.



Typical LSTA Installation
(Hanger not shown)
Bend strap one time only,
max 12/12 joist pitch.

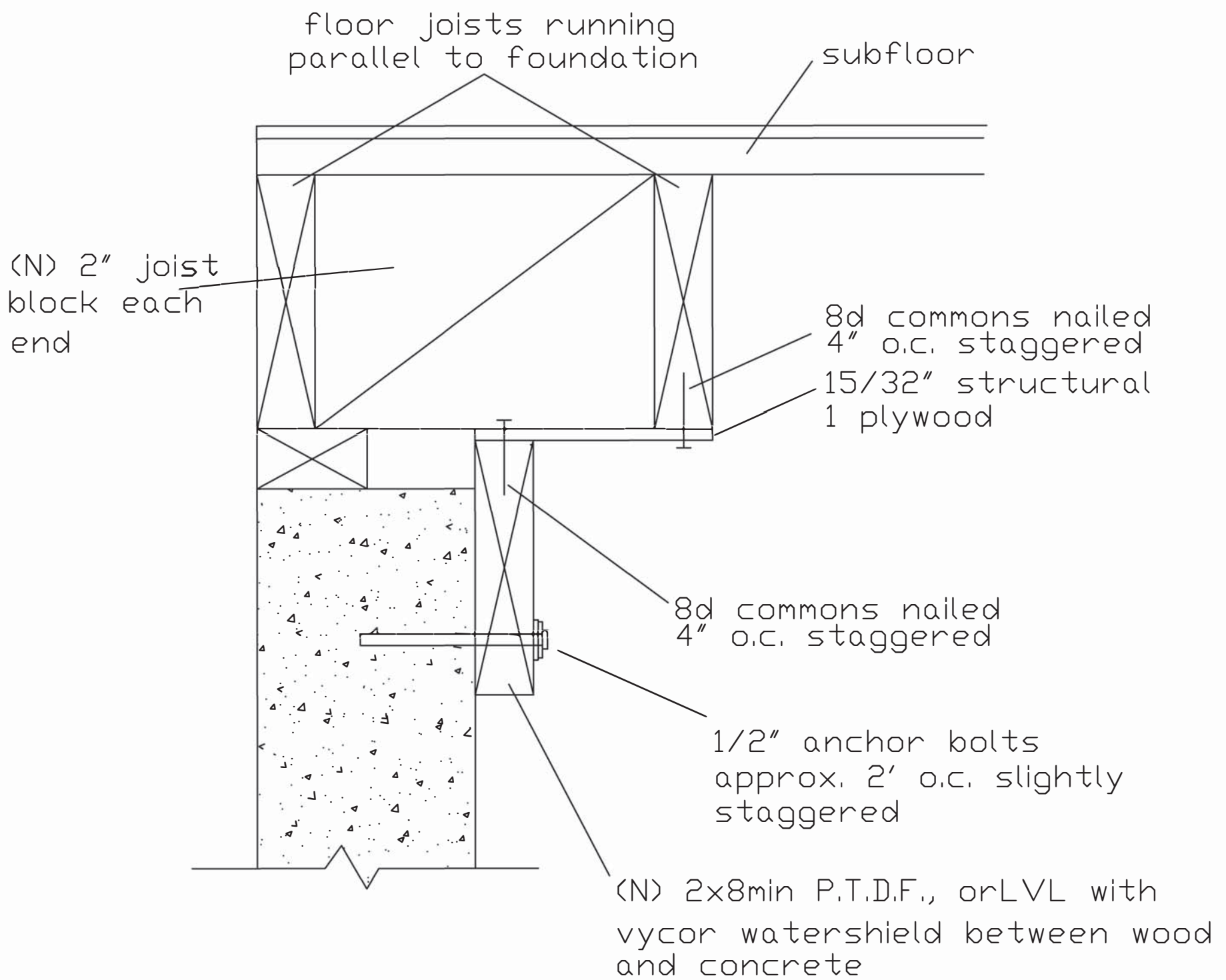
Model No.	Material Thickness Gauge	Dim.		Bolts		Code Ref.
		W	L	Qty	Dia	
PS218	7 ga	2	18	4	¾	180
PS418		4	18	4	¾	
PS720		6¾	20	8	½	

1. PS strap design loads must be determined by the Designer for each installation. Bolts are installed both perpendicular and parallel-to-grain. Hole diameter in the part may be oversized to accommodate the HDG. Designer must determine if the oversize creates an unacceptable installation.
2. For allowable tension loads, see page 230.



Typical PS720 Installation

S15



11

SHEAR TRANSFER DIAPHRAGM

Bolting of floor to foundation when gap between edge of concrete and edge of mudsill exceeds 2-1/2" or when mudsill is not accessible such that Simpson URFPs cannot be used.

S16

Sidebolt-2x8, plywood to next joist

