Strong-Drive® SDWF FLOOR-TO-FLOOR Screw

Wind-Uplift Restraint Connections with Shrinkage Compensation

Features:

- The take-up washer (TUW) allows for shrinkage compensation ensuring a tight connection even after initial shrinkage and settlement occur
- One screw length can be used for multiple floor depths (refer to chart to select appropriate screw size), reducing the need for many screw lengths

Codes/Standards: ICC-ES ESR-3046 (SDWF), ICC-ES ESR-2320 (TUW), State of Florida FL9589, FL10007 (TUW)

US Patents 8,656,650, 8,844,244 and 8,276,323

For more information, see p. 106, C-F-2023 *Fastening Systems* catalog

Additional Installation Considerations:

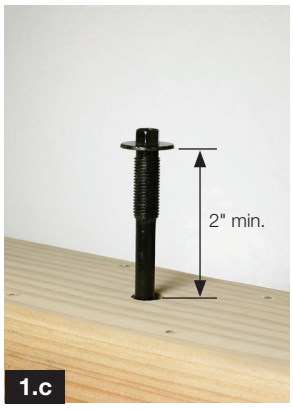
- To choose the appropriate SDWF screw length, see top table on next page
- The SDWF screw installs best with a high torque, ½" variable speed drill (at least 18V if cordless) with a 5⁄16" hex-head driver (hex driver provided)
- See details for minimum edge/end fastener distances

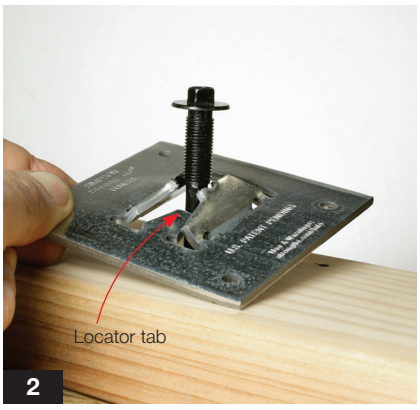
Installation Instructions for the Strong-Drive SDWF Floor-to-Floor Screw and Take-Up Washer (TUW)

To Install:

1. a) Drive the SDWF screw vertically (90°±2°) into the center of the upper-wall bottom plate.
   b) Once the SDWF screw has passed through upper-wall bottom plate and floor sheathing, make sure the screw is still vertical (90°±2°) prior to driving it into lower-wall double top plate. Adjust if necessary.
   c) Continue driving the SDWF screw until the head is a minimum of 2" above the upper-wall bottom plate.

2. Slide the TUW (provided) over the SDWF screw head and center using locator tab as a reference. Orient locator tab so that it points toward the outside of the wall.





3. Secure the TUW to the upper-wall bottom plate with (4) #9 x 2½" Simpson Strong-Tie® Strong-Drive SD screws (provided).

4. Continue driving the SDWF screw until the washer head contacts the threaded TUW tabs and bends them until they engage the shank of the SDWF screw directly under the head. Do not overdrive.

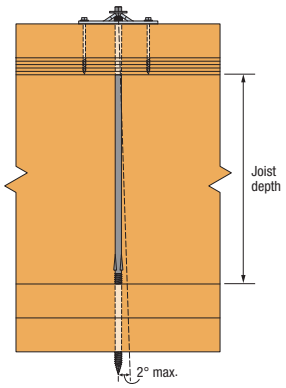
5. Check to ensure the proper engagement of the TUW tabs to the SDWF screw shank using the screw depth guide (provided). The measured gap shall be no greater than 9⁄32" and no less than 5⁄32".

Strong-Drive® SDWF FLOOR-TO-FLOOR Screw Installation Conditions

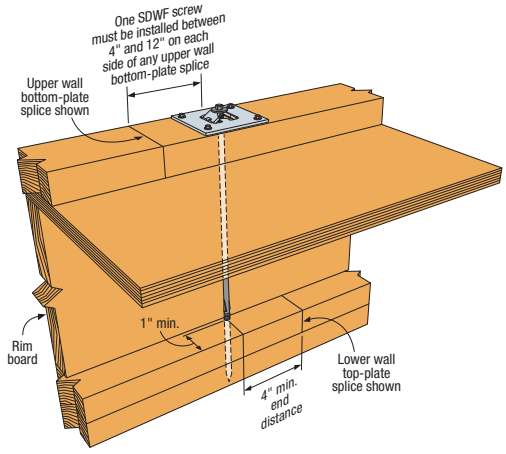
Product Information and Withdrawal Loads

Length (in.)	Model No.	Thread Length (in.)	Joist Depth Below (in.)				Reference Allowable Withdrawal Loads per Thread Penetration (lb./in.)		
			Single Bottom Plate		Double Bottom Plate				
			Min.	Max.	Min.	Max.	SP	DFL	SPF
16	SDWF2716-TUW	5	8½	10½	6⅞	9	295	250	180
20	SDWF2720-TUW	5	12½	14½	10⅞	13			
24	SDWF2724-TUW	5	16½	18½	14⅞	17			
26	SDWF2726-TUW	5	18½	20½	16⅞	19			
30	SDWF2730-TUW	5	22½	24½	20⅞	23			

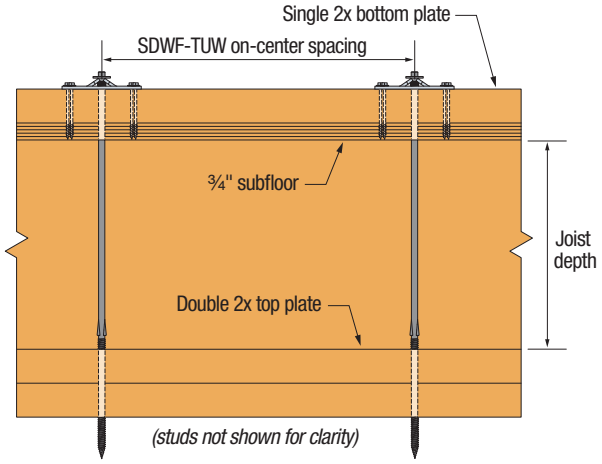
1. Allowable loads are for C_D = 1.0 and may be increased for load duration up to C_D = 1.6.
2. Joist depth listed based on the ¾" subfloor and 3" of thread penetration into double top plates.



Typical SDWF Angle Limit Installation



Typical SDWF and TUW Installation



SDWF-TUW Assembly

SDWF-TUW Floor-to-Floor Screw — On-Center Spacing for Uniform Uplift Loads

Maximum SDWF Screw Spacing (in.) Along Wall Bottom Plate for Wind Uplift											
Bottom Plate	Interstory Unit Wind Uplift, Pounds per Lineal Foot (plf)										
Single 2x4	100 plf	150 plf	200 plf	250 plf	300 plf	350 plf	400 plf	450 plf	500 plf	550 plf	600 plf
SP	46	40	36	34	30	28	26	24	24	22	22
DFL	48	42	38	34	32	30	30	26	24	22	20
SPF	46	40	36	34	32	30	26	22	20	18	16
Single 2x6	**100 plf**	**150 plf**	**200 plf**	**250 plf**	**300 plf**	**350 plf**	**400 plf**	**450 plf**	**500 plf**	**550 plf**	**600 plf**
SP	56	48	44	40	38	36	34	34	32	30	28
DFL	56	48	44	40	38	34	30	26	24	22	20
SPF	52	46	42	38	34	30	26	22	20	18	16

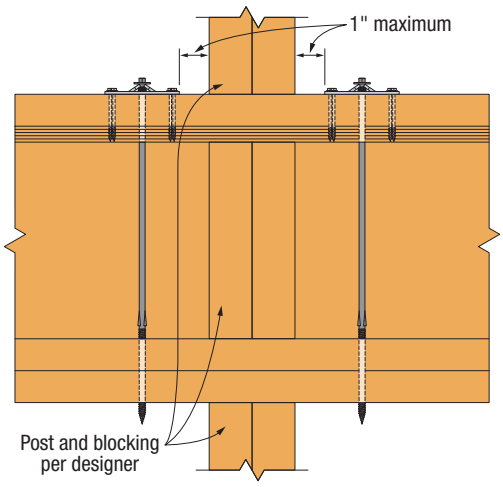
1. Spacing listed based on lesser of: single bottom plate bending allowable load, single bottom plate deflection limited to spacing/240 and ¼" maximum for No. 2 grade lumber, screw allowable withdrawal load, and take-up washer allowable load.
2. Withdrawal load is based on a C_D = 1.6 and minimum 3" penetration into lower wall double top plates.
3. Stud-to-plate connections are required to complete the load path. These connections shall not exceed the lesser of 48" o.c. or SDWF spacing.

Strong-Drive® SDWF FLOOR-TO-FLOOR Screw Installation Conditions (cont.)

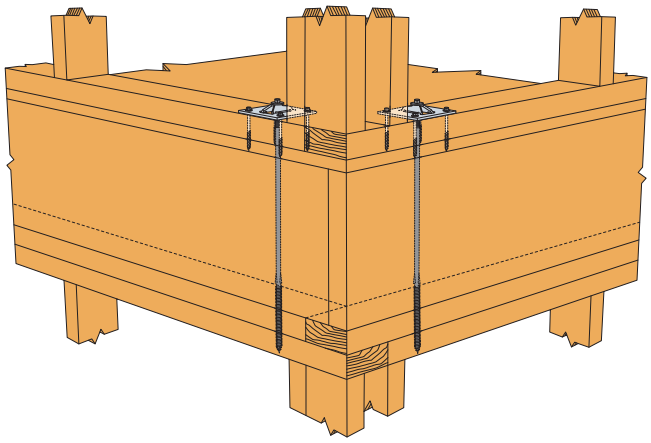
Concentrated Uplift Loads

Model No.	Single SDWF-TUW				Double SDWF-TUW			
	Allowable Tension Loads (lb.)			Deflection at Highest Allowable Loads (in.)	Allowable Tension Loads (lb.)			Deflection at Highest Allowable Loads (in.)
	SP	DFL	SPF		SP	DFL	SPF	
SDWF2716-TUW	1,410	1,200	865	0.095	2,270	2,125	1,730	0.142
SDWF2720-TUW								
SDWF2724-TUW								
SDWF2726-TUW								
SDWF2730-TUW								

1. Allowable loads listed include a wood load duration factor of C_D = 1.6 for wind or earthquake loading with no further increase allowed; reduce when other loads govern.
2. Single and double SDWF-TUW applications listed are for concentrated load uplift restraint conditions (i.e., end of header, at girders, or at the end of shearwalls).



Double SDWF-TUW Concentrated Load Restraint Detail at Continuous Wall
(single SDWF-TUW similar)



Perspective View of Corner Conditions with Double SDWF-TUW
(single SDWF-TUW similar)

Note: Stud-to-plate connections are required to complete the load path and are the responsibility of the designer. SDWF not to replace holdowns in shearwall applications.

SIMPSON Strong-Tie

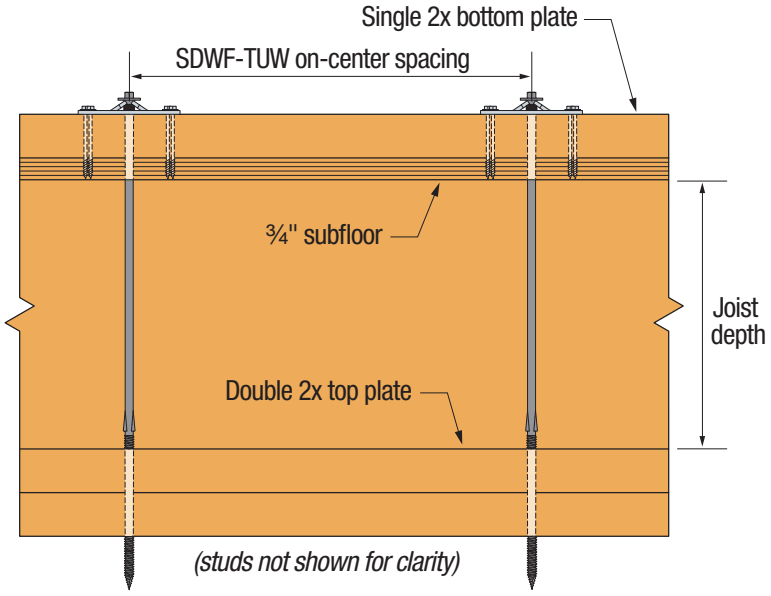
Web App Enables Designers to Calculate Wood Shrinkage Easier

The Simpson Strong-Tie® Wood Shrinkage Calculator is a quick and easy web app to estimate the amount of shrinkage the structure may experience as the wood member loses moisture content after it is framed and in service. The calculator estimates the shrinkage of each wood member in the wall and floor framing assembly and provides a graphical summary to help understand the global impact of shrinkage of individual elements in the wall system. To access this free application, visit **strongtie.com/shrinkcalc**.

Strong-Drive® SDWF **FLOOR-TO-FLOOR** Screw Installation Conditions (cont.)

Alternate Floor Joist Depths

The SDWF Floor-to-Floor screw is available in lengths of 16", 20", 24", 26" and 30". These lengths allow for full 3" thread penetration into the double top plates to accommodate a wide range of floor depths. The tables below and on the following page provide allowable withdrawal loads and SDWF spacing for common floor depths which results in reduced thread penetration and additional on-center spacing to resist uniform uplift loads.



SDWF-TUW Assembly

SDWF FLOOR-TO-FLOOR Screw — On-Center Spacing for Uniform Uplift Loads with SINGLE Bottom Plates

Joist Depth (in.)	Model No.	Wall Plate Species	Withdrawal[2] per SDWF (lb.)	Maximum SDWF Screw Spacing (in.) Along Wall Bottom Plate for Wind Uplift — Interstory Unit Wind Uplift Loads (lb. per Lineal Foot)										
				100	150	200	250	300	350	400	450	500	550	600
11¼[4]	SDWF2716-TUW	**Single 2x4 Bottom Plate**												
		SP	740	46	40	36	34	30	25	22	20	18	16	15
		DF	630	48	42	38	30	25	22	19	17	15	14	13
		SPF	450	46	36	27	22	18	16	14	12	11	10	9
		Single 2x6 Bottom Plate												
		SP	740	56	48	44	36	30	25	22	20	18	16	15
		DF	630	56	48	38	30	25	22	19	17	15	14	13
		SPF	450	52	36	27	22	18	16	14	12	11	10	9

See footnotes on p. 118.

Strong-Drive® SDWF **FLOOR-TO-FLOOR** Screw Installation Conditions (cont.)

SDWF FLOOR-TO-FLOOR Screw — On-Center Spacing for Uniform Uplift Loads with SINGLE Bottom Plates (cont.)

Joist Depth (in.)	Model No.	Wall Plate Species	Withdrawal[2] per SDWF (lb.)	Maximum SDWF Screw Spacing (in.) Along Wall Bottom Plate for Wind Uplift										
				Interstory Unit Wind Uplift (lb. per Lineal Foot)										
				100	150	200	250	300	350	400	450	500	550	600
11⅞	SDWF2720-TUW	**Single 2x4 Bottom Plate**												
		SP	1,410	46	40	36	34	30	30	26	24	24	22	22
		DF	965	48	42	38	34	32	30	29	26	23	21	19
		SPF	695	46	40	36	33	28	24	21	19	17	15	14
		Single 2x6 Bottom Plate												
		SP	1,140	56	48	44	40	38	36	34	30	27	25	23
		DF	965	56	48	44	40	38	33	29	26	23	21	19
		SPF	695	52	46	42	33	28	24	21	19	17	15	14
16	SDWF2724-TUW	**Single 2x4 Bottom Plate**												
		SP	1,195	46	40	36	34	30	30	26	24	24	22	22
		DF	1,015	48	42	38	34	32	30	30	26	24	22	20
		SPF	730	46	40	36	34	29	25	22	19	18	16	15
		Single 2x6 Bottom Plate												
		SP	1,195	56	48	44	40	38	36	34	32	29	26	24
		DF	1,015	56	48	44	40	38	34	30	26	24	22	20
		SPF	730	52	46	42	35	29	25	22	19	18	16	15
22	SDWF2730-TUW	**Single 2x4 Bottom Plate**												
		SP	1,195	46	40	36	34	32	30	28	26	24	24	22
		DF	1,015	48	42	38	36	34	32	30	26	24	22	20
		SPF	730	46	40	36	34	28	24	22	18	18	16	14
		Single 2x6 Bottom Plate												
		SP	1,195	54	46	42	40	36	36	34	32	28	26	24
		DF	1,015	56	48	44	42	38	34	30	26	24	22	20
		SPF	730	54	46	42	34	28	24	22	18	18	16	14
24	SDWF2730-TUW	**Single 2x4 Bottom Plate**												
		SP	1,410	46	40	36	34	32	30	28	26	24	24	22
		DF	1,200	48	42	38	36	34	32	30	28	26	26	24
		SPF	865	46	40	36	34	32	30	26	22	20	18	16
		Single 2x6 Bottom Plate												
		SP	1,410	54	46	42	40	36	36	34	32	30	28	28
		DF	1,200	56	48	44	42	38	36	36	32	28	26	24
		SPF	865	54	46	42	40	34	30	26	22	20	18	16

See footnotes on next page.

Strong-Drive® SDWF FLOOR-TO-FLOOR Screw Installation Conditions (cont.)

SDWF FLOOR-TO-FLOOR Screw — On-Center Spacing for Uniform Uplift Loads with DOUBLE Bottom Plates and Reduced Thread Penetration

Joist Depth (in.)	Model No.	Wall Plate Species	Withdrawal per SDWF (lb.)	Maximum SDWF Screw Spacing (in.) Along Wall Bottom Plate for Wind Uplift Loads										
				Interstory Unit Wind Uplift Loads (Pounds per Lineal Foot)										
				100	150	200	250	300	350	400	450	500	550	600
22	SDWF2730-TUW	Double 2x4 Bottom Plate												
		SP	1,410	58	50	46	42	40	38	36	34	34	30	28
		DFL	1,200	60	52	48	44	42	40	36	32	28	26	24
		SPF	865	58	50	46	40	34	30	26	22	20	18	16
		Double 2x6 Bottom Plate												
		SP	1,410	66	58	54	50	46	44	42	38	34	30	28
		DFL	1,200	68	62	56	52	48	40	36	32	28	26	24
		SPF	865	66	58	52	40	34	30	26	22	20	18	16
24[4]	SDWF2730-TUW	Double 2x4 Bottom Plate												
		SP	850	58	50	46	40	34	28	24	22	20	18	16
		DFL	720	60	52	42	34	28	24	22	18	16	16	14
		SPF	515	58	40	30	24	20	18	16	14	12	10	10
		Double 2x6 Bottom Plate												
		SP	850	66	58	50	40	34	28	24	22	20	18	16
		DFL	720	68	56	42	34	28	24	22	18	16	16	14
		SPF	515	62	40	30	24	20	18	16	14	12	10	10

1. Spacing listed based on lesser of single bottom plate ending allowable load, single bottom plate deflection limited to spacing/240 and ¼" maximum for No. 2 grade lumber, screw allowable withdrawal load, and take-up washer allowable load.
2. Withdrawal load is based on a C_D =1.6; no further increase is permitted.
3. Stud-to-plate connections are required to complete the load path. These connections shall not exceed the lesser of 48" o.c. or SDWF spacing.
4. Applications with 11¼" or 24" joist depths with single or double bottom plates primarily connect to the upper 2x of the double top plate; connections securing the double top plate to the framing below must engage the upper 2x plate in order to provide a complete load path.

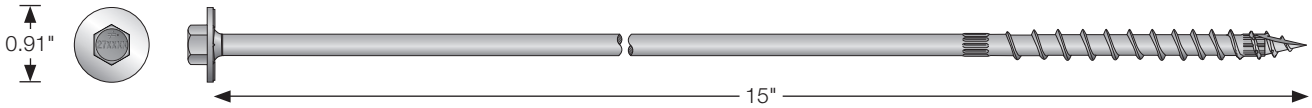
Strong-Drive®
SDWS **TIMBER** Screw (Interior Grade) and SDWH **TIMBER-HEX HDG** Screw

Floor-to-Floor

The SDWS Timber screw (Interior Grade) (SDWS221500) and SDWH Timber-Hex HDG screw (SDWH271500G) have been evaluated as alternatives for uplift connection between floors that do not require shrinkage compensation. The application is specific to framing that consists of a single wall bottom plate, joist depth of 9.25 to 9.5 inches, and double 2x wall top plate. These screws are recognized in IAPMO UES ER-192. Typical installation and corresponding load tables for floor systems is shown in the following pages.

For more information, see p. 102 (SDWS TIMBER Screw (Interior Grade) and p. 63 (SDWH TIMBER-HEX HDG Screw), C-F-2023 *Fastening Systems* catalog.

SDWS Timber Screw (Interior Grade) (SDWS221500)

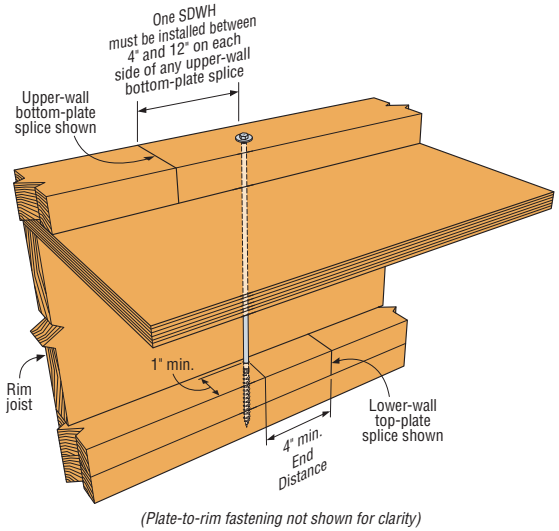


SDWH Timber-Hex HDG Screw (SDWH271500G)

Product Information and Withdrawal/Pull-Through Loads

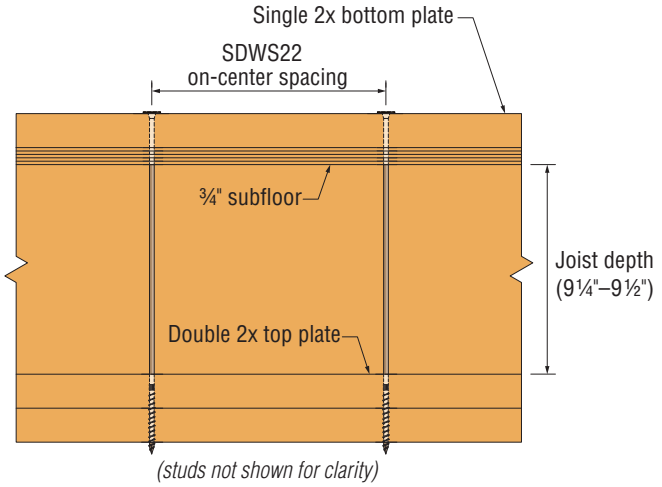
Length (in.)	Model No.	Thread Length (in.)	Reference Allowable Withdrawal Loads per Inch of Thread Penetration (lb./in.)[1]			Reference Allowable Pull-Through Loads for 2x Plate (lb.)[1]		
			SP	DFL	SPF	SP	DFL	SPF
15	SDWS221500	3	260	215	185	800	695	495
15	SDWH271500G	3	285	255	210	880	875	695

1. Allowable loads are shown at the wood load duration factor of C_D = 1.0. Loads may be increased for load duration up to a C_D = 1.6.



(Plate-to-rim fastening not shown for clarity)

Typical SDWH271500G Installation
(SDWS221500 Similar)



(studs not shown for clarity)

Typical SDWS221500 Spacing
(SDWH271500G Similar)

Strong-Drive®
SDWS **TIMBER** Screw (Interior Grade) and SDWH **TIMBER-HEX HDG** Screw (cont.)

SDWS TIMBER Screw (Interior Grade) and SDWH TIMBER-HEX HDG Screw — On-Center Spacing for Uniform Uplift Loads

Joist Depth (in.)	Model No.	Wall Plate Species	Withdrawal per Screw (lb.)[2]	Maximum Screw Spacing (in.) Along Wall Bottom Plate for Wind Uplift — Interstory Unit Wind Uplift (Pounds per Lineal Foot)[2]										
				100 plf	150 plf	200 plf	250 plf	300 plf	350 plf	400 plf	450 plf	500 plf	550 plf	600 plf
9¼ to 9½	SDWS221500	Single 2x4 Bottom Plate												
		SP	930	46	40	36	34	32	30	28	24	22	20	18
		DFL	770	48	42	38	36	30	26	22	20	18	16	14
		SPF	675	46	40	36	32	26	22	20	18	16	14	12
		Single 2x6 Bottom Plate												
		SP	930	54	46	42	40	36	32	28	24	22	20	18
		DFL	770	56	48	44	36	30	26	22	20	18	16	14
		SPF	675	54	46	40	32	26	22	20	18	16	14	12
9¼ to 9½	SDWH271500G	Single 2x4 Bottom Plate												
		SP	1,150	46	40	36	34	32	30	28	26	24	24	22
		DFL	1,020	48	42	38	36	34	32	30	26	24	22	20
		SPF	850	46	40	36	34	32	28	24	22	20	18	16
		Single 2x6 Bottom Plate												
		SP	1,150	54	46	42	40	36	36	34	30	28	24	22
		DFL	1,020	56	48	44	42	38	34	30	26	24	22	20
		SPF	850	54	46	42	40	34	28	24	22	20	18	16

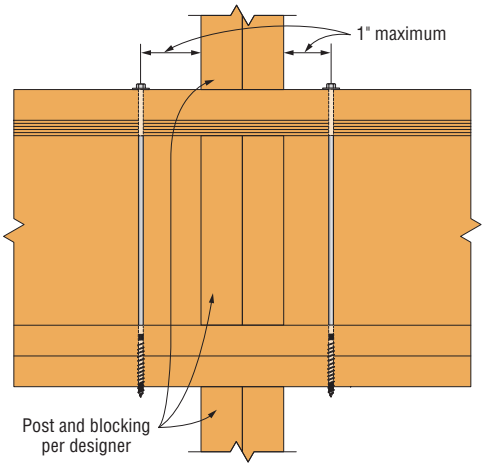
1. Spacing listed based on lesser of: single bottom plate bending allowable load, single bottom plate deflection limited to spacing/240 and ¼" maximum for No. 2 grade lumber, screw allowable withdrawal and pull-through loads.
2. Withdrawal and uplift loads are based on C_D = 1.6; no further increase is permitted.
3. Stud-to-plate connections and plate-to-rim connections are required to complete the load path.
4. Tabulated loads are applicable to the following minimum thread embedment length into double top plate: SDWS221500 = 2¼", SDWH271500G = 2½".

Strong-Drive® SDWS **TIMBER** Screw (Interior Grade) and SDWH **TIMBER-HEX HDG** Screw (cont.)

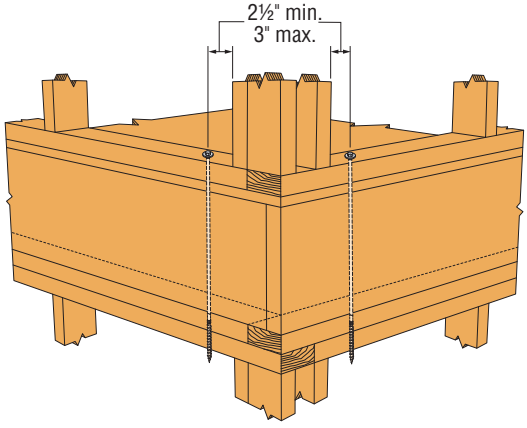
SDWS TIMBER (Interior Grade) Screw and SDWH TIMBER-HEX HDG Screw — Allowable Concentrated Uplift Loads

Length (in.)	Model No.	Thread Length (in.)	Single Fastener			Double Fastener		
			Allowable Tension Loads (lb.)			Allowable Tension Loads (lb.)		
			SP	DFL	SPF	SP	DFL	SPF
15	SDWS221500	3	930	770	675	1,860	1,540	1,350
15	SDWH271500G	3	1,150	1,020	850	2,240	2,040	1,700

1. Allowable loads include a wood load duration factor of C_D = 1.6 for wind and earthquake loading with no further increase allowed; reduce when other loads govern.
2. Single and double fastener applications are for concentrated-load uplift restraint conditions (i.e., end of header, at girders, or at the end of shearwalls).
3. Tabulated loads are applicable to the following minimum thread embedment into the double top plate: SDWS221500 = 2¼", SDWH271500G = 2½".



Typical Double SDWH27G or SDWS22 (similar) Concentrated Load Restraint Detail at Compression Blocking



Typical Double SDWH27G or SDWS22 (similar) Concentrated Load Restraint Detail at Wall Corner

Note: Stud-to-plate connections and rim-to-plate connections are required to complete the load path and are in the responsibility of the designer. SDWS22 and SDWH27G do not replace holdowns in shearwall applications.