

Strong-Wall® High-Strength Wood Shearwall

A versatile and field-trimmable solution.

The Strong-Wall high-strength wood shearwall (WSWH®) is a prefabricated, engineered wood panel that adds lateral bracing and resistance to structures in seismic and high-wind areas. Suitable for residential, multifamily and light-frame commercial construction, the code-listed WSWH is easy to specify. For optimal design flexibility and efficient installation, this field-trimmable shearwall can be adjusted onsite to accommodate varying heights or rake walls. The WSWH features patented wood fuse technology and predictable behavior that delivers superior strength, stiffness, ductility and design values.

Patented, reusable anchor bolt templates from Simpson Strong-Tie help ensure accurate anchor bolt placement in our Strong-Wall high-strength shearwalls. The same templates are used for steel shearwalls and wood shearwalls, which simplifies specification and installation. They're available in multiple sizes and configurations to accommodate common concrete foundation types.



Standard and Balloon Framing on Concrete Foundations

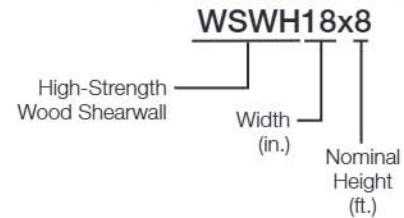
Simpson Strong-Tie® Strong-Wall high-strength wood shearwalls (WSWH™) combine design flexibility with performance. Field trimmable, they can be customized to accommodate varying heights or rake walls. They are evaluated to the 2024 IRC/IBC and are listed by ICC-ES.

Installation

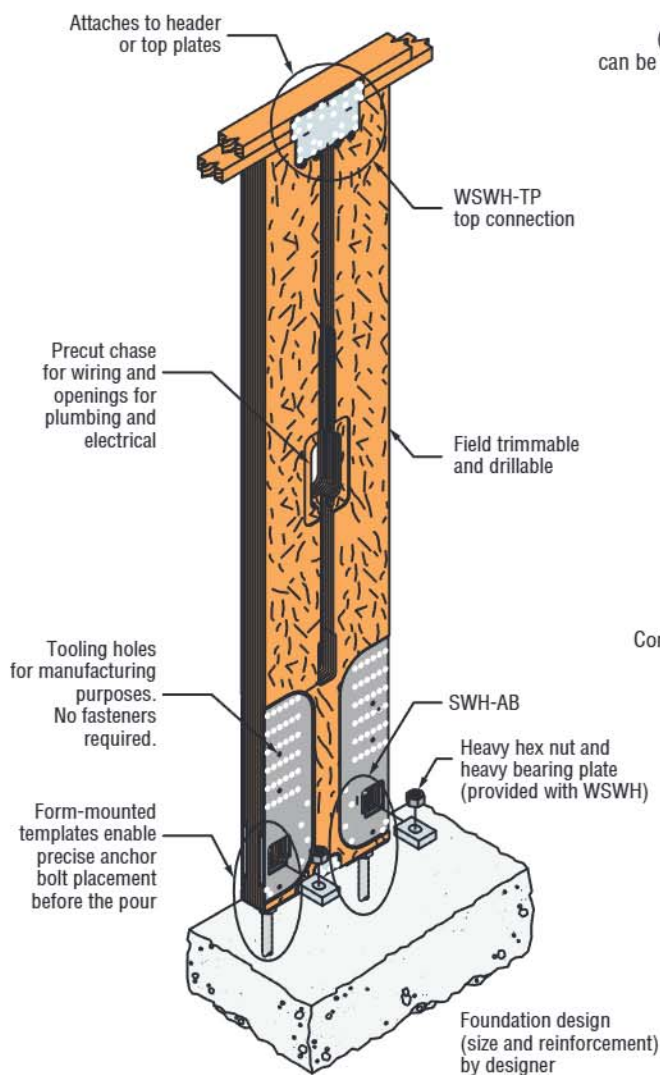
- All panels may be field trimmed to a minimum of 74½". Trim height from top of panel only, do not trim from sides or bottom. Drilling holes in the Strong-Wall high-strength wood shearwalls is not allowed except as shown on p. 69.
- Anchor bolt nuts should be finger tight plus ½ turn.
- Maximum shim thickness between the shearwall and top plates or header is 7⁄8". For additional shim thicknesses, see detail 9/WSWH2 on p. 68.
- Walls may be used in 2x6 and 2x8 wall framing. Install panel flush to one face of the framing and add furring to the opposite side as required to accommodate finish material. See detail 6/WSWH2 on p. 66.
- Top connection installs with a combination of SDS25600 Heavy-Duty Connector screws and SWS16150 Strong-Wall screws.

Codes: ICC-ES ESR-2652; City of LA Building Code Supplement; State of Florida FL5113

Strong-Wall High-Strength Wood Shearwall Naming Legend



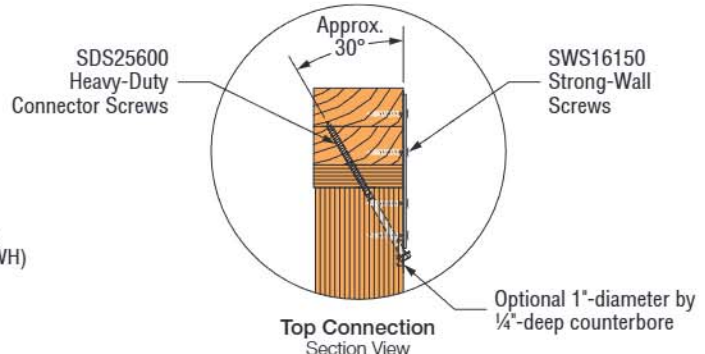
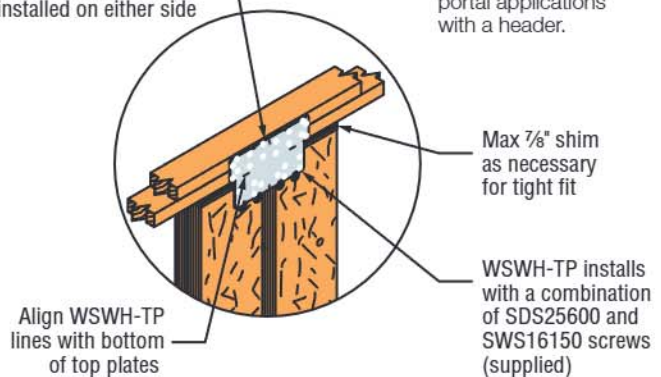
Note: WSWH not available where pressure treatment of wood are required by local jurisdiction.



WSWH-TP (provided with WSWH) can be installed on either side

Top Connection

Also applicable for portal applications with a header.



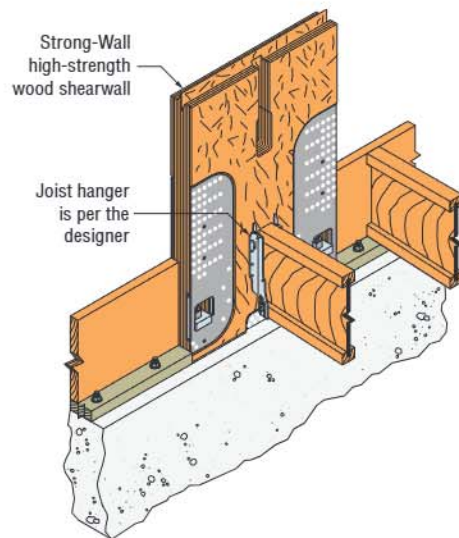
WSWH Standard Installation
US Patent, strongtie.com/patents.

Standard and Balloon Framing on Concrete Foundations

Strong-Wall High-Strength Wood Shearwall Product Data

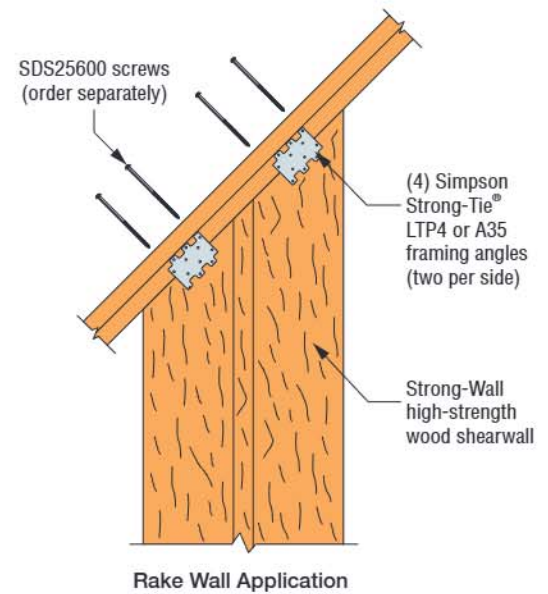
Model No.	Panel Information			Anchor Bolts	
	Width (in.)	Height (in.)	Weight (lb.)	Quantity	Diameter (in.)
WSWH12x7	12	84	105	2	1
WSWH18x7	18	84	155	2	1
WSWH12x8	12	96	120	2	1
WSWH18x8	18	96	175	2	1
WSWH24x8	24	96	225	2	1
WSWH12x9	12	108	130	2	1
WSWH18x9	18	108	195	2	1
WSWH24x9	24	108	250	2	1
WSWH12x10	12	120	145	2	1
WSWH18x10	18	120	210	2	1
WSWH24x10	24	120	275	2	1
WSWH12x12	12	144	165	2	1
WSWH18x12	18	144	245	2	1
WSWH24x12	24	144	325	2	1
WSWH18x14	18	168	285	2	1
WSWH24x14	24	168	370	2	1
WSWH24x16	24	192	420	2	1
WSWH18x20	18	240	390	2	1
WSWH24x20	24	240	520	2	1

1. To achieve evaluated panel heights listed in the allowable load table or for those not listed, order the next tallest panel and trim to fit. Minimum trimmed height for all panels is 74½".
2. All panels are supplied with preattached holdowns, two heavy hex nuts, two heavy bearing plates, one WSWH-TP top connection plate (width based on panel model), required fasteners and installation instructions. Replacement parts can be ordered separately.
3. All panels are 3½" thick.

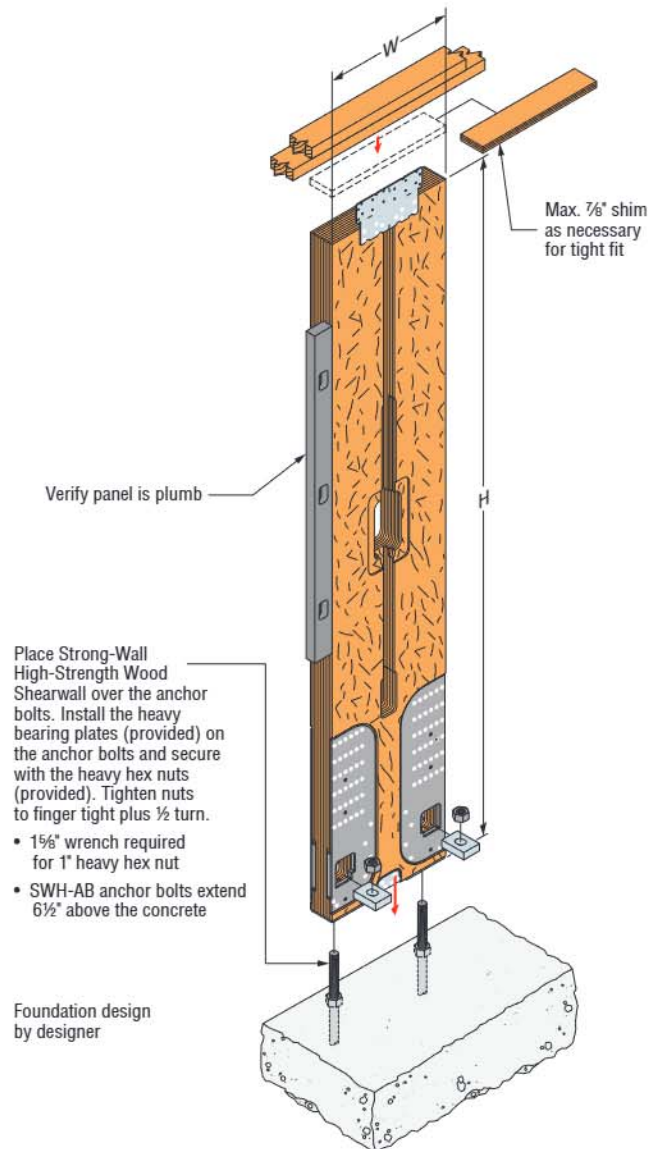


WSWH™ First-Story Installation with Wood Floor System

Specify panel height from top of foundation to underside of the top plates or beam.



Rake Wall Application



WSWH Standard Installation on Concrete

Standard and Balloon Framing on Concrete Foundations

Strong-Wall High-Strength Wood Shearwall Model No. ⁶	Panel Evaluation Height, H _e (in.) ⁶	Allow. Vertical Load, P (lb.) ⁴	2,500 psi Concrete						3,000 psi Concrete					
			Seismic ³			Wind			Seismic ³			Wind		
			Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹
WSWH12x7	78	1,000	1,300	0.32	13,295	1,670	0.43	17,075	1,300	0.32	13,295	1,670	0.43	17,075
		4,000	1,300	0.32	13,295	1,670	0.43	17,075	1,300	0.32	13,295	1,670	0.43	17,075
		7,500	1,300	0.32	13,295	1,670	0.43	17,075	1,300	0.32	13,295	1,670	0.43	17,075
WSWH18x7	78	1,000	3,795	0.32	23,680	4,470	0.39	27,890	3,795	0.32	23,680	4,470	0.39	27,890
		4,000	3,795	0.32	23,680	4,365	0.38	27,245	3,795	0.32	23,680	4,470	0.39	27,890
		7,500	3,795	0.32	23,680	4,050	0.36	25,285	3,795	0.32	23,680	4,470	0.39	27,890
WSWH24x7	78	1,000	7,450	0.30	33,210	7,795	0.34	34,755	7,450	0.30	33,210	7,795	0.34	34,755
		4,000	7,450	0.30	33,210	7,565	0.33	33,715	7,450	0.30	33,210	7,795	0.34	34,755
		7,500	7,115	0.28	31,715	7,115	0.31	31,715	7,450	0.30	33,210	7,795	0.34	34,755
WSWH12x8	93 ¼	1,000	1,030	0.40	12,580	1,325	0.53	16,195	1,030	0.40	12,580	1,325	0.53	16,195
		4,000	1,030	0.40	12,580	1,325	0.53	16,195	1,030	0.40	12,580	1,325	0.53	16,195
		7,500	1,030	0.40	12,580	1,325	0.53	16,195	1,030	0.40	12,580	1,325	0.53	16,195
WSWH18x8	93 ¼	1,000	3,060	0.39	22,835	3,880	0.52	28,925	3,060	0.39	22,835	3,955	0.53	29,490
		4,000	3,060	0.39	22,835	3,650	0.49	27,245	3,060	0.39	22,835	3,955	0.53	29,490
		7,500	3,060	0.39	22,835	3,390	0.46	25,285	3,060	0.39	22,835	3,955	0.53	29,490
WSWH24x8	93 ¼	1,000	6,240	0.37	33,240	6,650	0.43	35,430	6,240	0.37	33,240	6,910	0.45	36,815
		4,000	6,240	0.37	33,240	6,330	0.41	33,715	6,240	0.37	33,240	6,910	0.45	36,815
		7,500	5,950	0.35	31,715	5,950	0.38	31,715	6,240	0.37	33,240	6,910	0.45	36,815
WSWH12x9	105 ¼	1,000	850	0.45	11,750	1,095	0.60	15,145	850	0.45	11,750	1,095	0.60	15,145
		4,000	850	0.45	11,750	1,095	0.60	15,145	850	0.45	11,750	1,095	0.60	15,145
		7,500	850	0.45	11,750	1,095	0.60	15,145	850	0.45	11,750	1,095	0.60	15,145
WSWH18x9	105 ¼	1,000	2,575	0.45	21,680	3,325	0.60	27,975	2,575	0.45	21,680	3,325	0.60	27,975
		4,000	2,575	0.45	21,680	3,235	0.58	27,245	2,575	0.45	21,680	3,325	0.60	27,975
		7,500	2,575	0.45	21,680	3,005	0.54	25,285	2,575	0.45	21,680	3,325	0.60	27,975
WSWH24x9	105 ¼	1,000	5,150	0.43	30,975	5,890	0.52	35,430	5,150	0.43	30,975	6,120	0.54	36,815
		4,000	5,150	0.43	30,975	5,605	0.50	33,715	5,150	0.43	30,975	6,120	0.54	36,815
		7,500	5,150	0.43	30,975	5,275	0.47	31,715	5,150	0.43	30,975	6,120	0.54	36,815
WSWH12x10	117 ¼	1,000	700	0.50	10,750	900	0.67	13,855	700	0.50	10,750	900	0.67	13,855
		4,000	700	0.50	10,750	900	0.67	13,855	700	0.50	10,750	900	0.67	13,855
		7,500	700	0.50	10,750	900	0.67	13,855	700	0.50	10,750	900	0.67	13,855
WSWH18x10	117 ¼	1,000	2,140	0.50	20,055	2,755	0.67	25,840	2,140	0.50	20,055	2,755	0.67	25,840
		4,000	2,140	0.50	20,055	2,755	0.67	25,840	2,140	0.50	20,055	2,755	0.67	25,840
		7,500	2,140	0.50	20,055	2,695	0.65	25,285	2,140	0.50	20,055	2,755	0.67	25,840
WSWH24x10	117 ¼	1,000	4,010	0.48	26,860	5,215	0.67	34,935	4,010	0.48	26,860	5,215	0.67	34,935
		4,000	4,010	0.48	26,860	5,030	0.64	33,715	4,010	0.48	26,860	5,215	0.67	34,935
		7,500	4,010	0.48	26,860	4,735	0.61	31,715	4,010	0.48	26,860	5,215	0.67	34,935
WSWH12x11	129 ¼	1,000	595	0.56	10,055	765	0.73	12,930	595	0.56	10,055	765	0.73	12,930
		4,000	595	0.56	10,055	765	0.73	12,930	595	0.56	10,055	765	0.73	12,930
		7,500	595	0.56	10,055	765	0.73	12,930	595	0.56	10,055	765	0.73	12,930
WSWH18x11	129 ¼	1,000	1,960	0.55	20,240	2,520	0.73	26,060	1,960	0.55	20,240	2,520	0.73	26,060
		4,000	1,960	0.55	20,240	2,520	0.73	26,060	1,960	0.55	20,240	2,520	0.73	26,060
		7,500	1,960	0.55	20,240	2,445	0.71	25,285	1,960	0.55	20,240	2,520	0.73	26,060
WSWH24x11	129 ¼	1,000	4,000	0.54	29,550	4,795	0.68	35,430	4,000	0.54	29,550	4,985	0.70	36,815
		4,000	4,000	0.54	29,550	4,565	0.64	33,715	4,000	0.54	29,550	4,985	0.70	36,815
		7,500	4,000	0.54	29,550	4,295	0.60	31,715	4,000	0.54	29,550	4,985	0.70	36,815

See footnotes on p. 41.

Standard and Balloon Framing on Concrete Foundations

Allowable Out-of-Plane Loads for Single-Story Walls on Concrete Foundations (psf)

Panel Attachment	WSWH-TP Top Connection Fastening ⁴	Strong-Wall High-Strength Wood Shearwall Model No.	Nominal Height of Shearwall (ft.)										
			7	8	9	10	11	12	13	14	16	18	20
Top Plates	Angled SDS Screws Omitted	WSWH12	N/A	N/A	85	75	70	35	N/A	N/A	N/A	N/A	N/A
		WSWH18	N/A	N/A	125	115	105	80	65	50	35	25	15
		WSWH24	N/A	N/A	120	110	100	80	65	50	35	25	15
	Angled SDS Screws Installed	WSWH12	420	290	205	145	95	35	N/A	N/A	N/A	N/A	N/A
		WSWH18	395	290	205	145	110	80	65	50	35	25	15
		WSWH24	370	290	205	145	110	80	65	50	35	25	15
Header ^{5,6}	Angled SDS Screws Installed	WSWH12	330	205	150	110	85	45	N/A	N/A	N/A	N/A	N/A
		WSWH18	285	205	150	110	85	65	N/A	N/A	N/A	N/A	N/A
		WSWH24	215	180	150	110	85	65	N/A	N/A	N/A	N/A	N/A

1. Loads shown are at ASD level in pounds per square foot with no further increase allowed.

2. Loads consider a maximum deflection limit of H/240.

3. Allowable out-of-plane loads can be applied in combination with the allowable vertical loads shown on pp. 40–41.

4. Angled SDS screws may be omitted for WSWH™ panels taller than 100" in standard applications; however, SWS16150 screws must be installed for all fastening conditions. When angled SDS screws are omitted, a reduced allowable out-of-plane load may apply. See table for reduced loads.

5. Allowable values for header panel attachment assume a maximum header depth of 12". Use a load reduction factor of 0.94, 0.88 and 0.82 for 14", 16" and 18" deep headers respectively.

6. Allowable values shown for header panel attachment require the use of the portal straps to resist header rotation.

7. N/A = Not Applicable.

Allowable Axial Loads for Single-Story Walls on Concrete Foundations (lb.)

Strong-Wall High-Strength Wood Shearwall Model No.	Nominal Height of Shearwall (ft.)										
	7	8	9	10	11	12	13	14	16	18	20
WSWH12	30,700	22,400	17,900	14,600	12,100	9,800	N/A	N/A	N/A	N/A	N/A
WSWH18	53,500	39,100	31,200	25,400	21,000	17,000	14,500	12,600	9,600	7,600	6,200
WSWH24	72,000	56,100	44,700	36,400	30,200	24,400	20,900	18,000	13,900	11,000	8,900

1. Allowable ASD vertical load is the lesser of the WSWH panel buckling capacity and concrete bearing capacity beneath the holdowns assuming a minimum specified concrete compressive strength $f'_c = 2,500$ psi.

2. Allowable vertical loads assume concentric point load or uniformly distributed load without lateral loads present. For combined lateral and vertical loads, see pp. 40–41.

3. Tabulated loads apply to single-story panels on concrete foundations.

4. N/A = Not Applicable.



Full House Framing

Garage Portal Systems on Concrete Foundations

The Strong-Wall high-strength wood shearwall garage portal system provides higher allowable shear load with reduced concrete anchorage requirements. Portal walls may be used in single- or double-portal applications and shall be installed with a minimum 3" x 11¼" single- or multi-ply header depending upon loading and span requirements.

Codes: ICC-ES ESR-2652; City of LA Building Code Supplement; State of Florida FL5113

For product data and naming scheme information, see pp. 38–39.

Garage Header Rough Opening Height

Model No.	Trimmed Panel Height (in.)	H Curb (in.)	Rough Opening Height (in.)
WSWH12x7	78	5½	6'-11½" ¹
WSWH18x7		6	7'-0" ¹
WSWH24x7		6	7'-0" ¹
WSWH12x8	85½	0	7'-1½"
WSWH18x8	93¼	5½	8'-2¾" ²
WSWH24x8		6	8'-3¼" ²

1. If required rough opening height exceeds table value, specify next taller panel and trim as necessary. The Strong-Wall high-strength wood shearwalls may be trimmed to a minimum height of 74½".
2. Furring down garage header may be required for correct rough opening height.

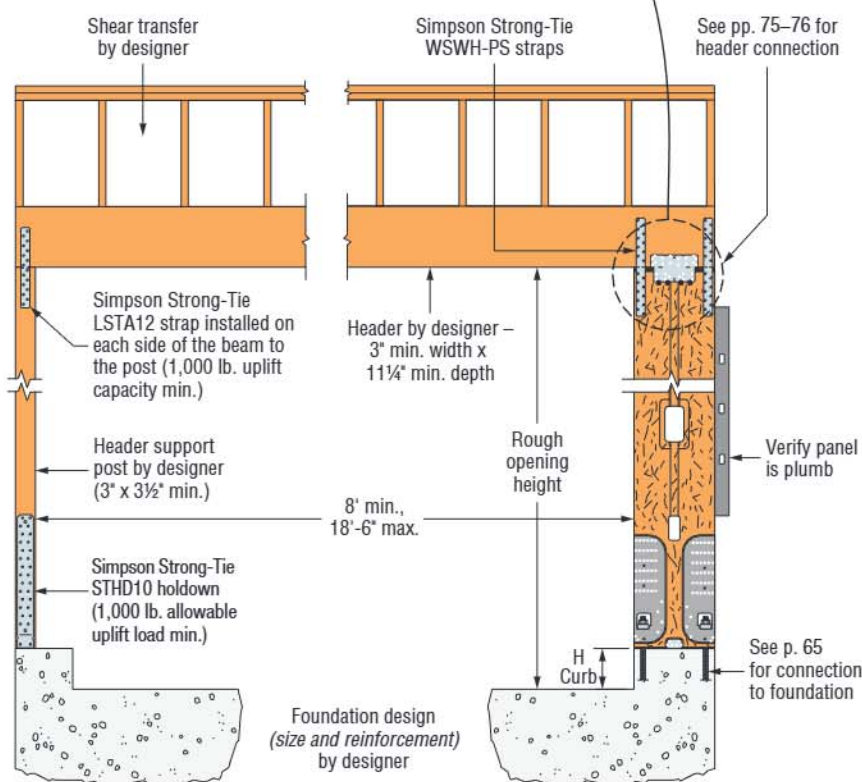
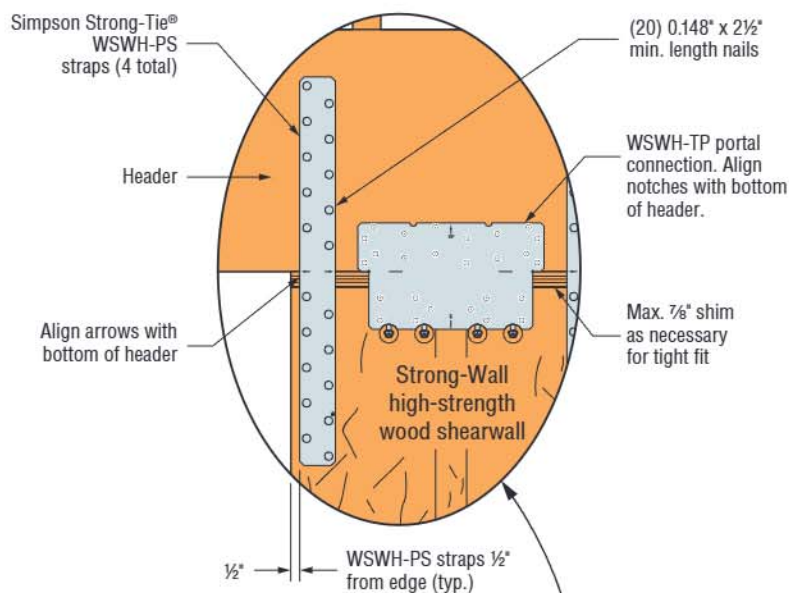
Installation

- Portal-frame connection kit is required for portal-frame applications.
- All panels may be trimmed to a minimum of 74½". Trim height from top of panel only, do not trim from sides or bottom. Drilling holes in the Strong-Wall high-strength wood shearwalls is not allowed except as shown on p. 69.
- Anchor bolt nuts should be finger tight plus ½ turn.
- Maximum shim thickness between Strong-Wall high-strength wood shearwalls and the top plates or header is ⅞".
- Top connection installs with a combination of ¼" x 6" SDS Heavy-Duty Connector screws and SWS16150 Strong-Wall screws.
- Walls may also be used in 2x6 wall framing. Install the panel flush to the outside face of the framing and add furring to the opposite side.
- Walls may be installed with solid or multi-ply headers, see details 3, 4, 5, 6/WSWH4 for fastening and furring requirements on pp. 75–76.

Portal Frame Connection Kit

Model No.	Contents
WSWH-PK	4 (10-gauge) WSWH-PS straps

1. Portal-frame connection kit comes with panels that are 100" or less in height. The kit must be ordered separately for panels over 100" tall.



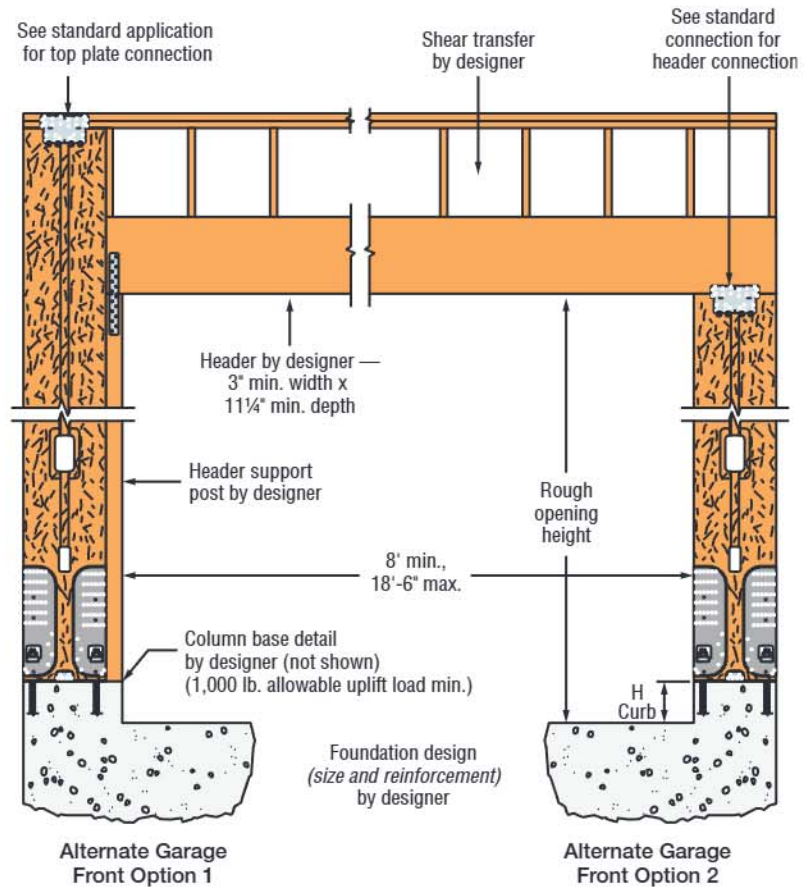
Single Portal Installation
US Patent, strongtie.com/patents.

Garage Portal Systems on Concrete Foundations (continued)

Portal Design Information

A portal frame under lateral loads causes the portal header to experience internal stresses in addition to those created by the primary loads (live, dead and snow). These additional stresses are called induced forces and must be considered when designing portal headers. To account for the induced forces from lateral loads, a concentrated end moment equal to the top-of-panel moment must be placed at the end of the header that is connected to the WSWH™ panel. For the WSWH12, WSWH18 and WSWH24, the moment induced into the portal header must be taken as 20%, 10% and 0%, respectively, of the total lateral moment at the base. The total lateral moment is calculated as the design shear times the panel height. For headers with typical residential uniform loads, the induced moment and shear forces from a portal-frame system do not control the design. This is due to the 1.60 load duration factor (C_D) used in design when wind and seismic loads are included.

The lateral and vertical loads shown on p. 45 for portal frames assume that the header size falls within the portal-frame parameters listed in the table below.



US Patent,
strongtie.com/patents.

Strong-Wall High-Strength Wood Shearwall Portal Header Design Parameters

Header Design Parameter	Allowable Range
Width ¹	3" – 5 1/2"
Depth	11 1/4" – 18"
Clear Span ⁵	8' – 18' 6"
K ⁶	90 lb./in. – 4,000 lb./in.

1. Single- or multi-ply header members may be used.
2. Maximum clear span for multi-ply 2x DF/SP header shall be limited to 16'-4".
3. Secondary moment, shear and axial forces shall be considered in header design.
4. Header design shall be by designer and assume gravity loads only induce simple span moments in beam.
5. Longer header spans can be accommodated if larger headers are used such that equivalent stiffness is equal to or greater than that provided by the minimum header size and maximum length indicated.
6. Header stiffness (K) for use in WSWH portal system may be determined using the following equation:

$K = (E \times b \times d^3) / 12L^3$ where:

E = Header modulus of elasticity (psi)
 b = Header width (in.)
 d = Header depth (in.)
 L = Header clear span (in.)

Alternative Garage Front Options

These alternative garage-front options may be used for applications when the Strong-Wall high-strength wood shearwall is installed at the full height (option 1) or without the additional Portal-Frame Kit (option 2), when higher allowable load or reduced concrete anchorage is not needed. Refer to the Standard Application on Concrete Foundations on pp. 40–41 for product data and allowable load values.

For Alternate Garage Front Option 2, the designer shall design for:

1. Shear transfer
2. Out-of-plane loading effect
3. Increased overturning and drift due to additional height

Garage Portal Systems on Concrete Foundations (continued)

Single-Wall Garage Portal System on Concrete Foundation

Strong-Wall High-Strength Wood Shearwall Model No. ⁷	Panel Evaluation Height, H _e (in.) ⁷	Allowable Vertical Load, P (lb.) ⁵	2,500 psi Concrete						3,000 psi Concrete					
			Seismic ³			Wind			Seismic ³			Wind		
			Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁸	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁸	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁸	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁸	Anchor Tension at Allowable Shear, T (lb.) ¹¹
WSWH12x7	78	1,000	1,780	0.39	14,550	2,285	0.53	18,715	1,780	0.39	14,550	2,285	0.53	18,715
		4,000	1,780	0.39	14,550	2,285	0.53	18,715	1,780	0.39	14,550	2,285	0.53	18,715
		7,500	1,780	0.39	14,550	2,285	0.53	18,715	1,780	0.39	14,550	2,285	0.53	18,715
WSWH18x7	78	1,000	3,980	0.38	22,345	4,580	0.47	25,715	3,980	0.38	22,345	4,580	0.47	25,715
		4,000	3,980	0.38	22,345	4,580	0.47	25,715	3,980	0.38	22,345	4,580	0.47	25,715
		7,500	3,980	0.38	22,345	4,505	0.46	25,285	3,980	0.38	22,345	4,580	0.47	25,715
WSWH24x7	78	1,000	7,450	0.30	33,210	7,950	0.35	35,430	7,450	0.30	33,210	8,260	0.36	36,815
		4,000	7,450	0.30	33,210	7,565	0.33	33,715	7,450	0.30	33,210	8,260	0.36	36,815
		7,500	7,115	0.28	31,715	7,115	0.31	31,715	7,450	0.30	33,210	8,260	0.36	36,815
WSWH12x8	85½	1,000	1,590	0.42	14,280	2,065	0.57	18,520	1,590	0.42	14,280	2,065	0.57	18,520
		4,000	1,590	0.42	14,280	2,065	0.57	18,520	1,590	0.42	14,280	2,065	0.57	18,520
		7,500	1,590	0.42	14,280	2,065	0.57	18,520	1,590	0.42	14,280	2,065	0.57	18,520
WSWH18x8	85½	1,000	3,550	0.41	21,845	4,580	0.56	28,185	3,550	0.41	21,845	4,580	0.56	28,185
		4,000	3,550	0.41	21,845	4,425	0.54	27,245	3,550	0.41	21,845	4,580	0.56	28,185
		7,500	3,550	0.41	21,845	4,110	0.50	25,285	3,550	0.41	21,845	4,580	0.56	28,185
WSWH24x8	85½	1,000	6,425	0.33	31,385	7,250	0.41	35,430	6,425	0.33	31,385	7,535	0.43	36,815
		4,000	6,425	0.33	31,385	6,900	0.39	33,715	6,425	0.33	31,385	7,535	0.43	36,815
		7,500	6,425	0.33	31,385	6,490	0.37	31,715	6,425	0.33	31,385	7,535	0.43	36,815
WSWH12x8	93¼	1,000	1,435	0.45	14,050	1,860	0.60	18,190	1,435	0.45	14,050	1,860	0.60	18,190
		4,000	1,435	0.45	14,050	1,860	0.60	18,190	1,435	0.45	14,050	1,860	0.60	18,190
		7,500	1,435	0.45	14,050	1,860	0.60	18,190	1,435	0.45	14,050	1,860	0.60	18,190
WSWH18x8	93¼	1,000	3,170	0.44	21,290	4,130	0.60	27,735	3,170	0.44	21,290	4,130	0.60	27,735
		4,000	3,170	0.44	21,290	4,060	0.59	27,245	3,170	0.44	21,290	4,130	0.60	27,735
		7,500	3,170	0.44	21,290	3,765	0.55	25,285	3,170	0.44	21,290	4,130	0.60	27,735
WSWH24x8	93¼	1,000	6,240	0.37	33,240	6,650	0.43	35,430	6,240	0.37	33,240	6,910	0.45	36,815
		4,000	6,240	0.37	33,240	6,330	0.41	33,715	6,240	0.37	33,240	6,910	0.45	36,815
		7,500	5,950	0.35	31,715	5,950	0.38	31,715	6,240	0.37	33,240	6,910	0.45	36,815

1. Allowable shear loads are applicable to installations on concrete with specified compressive strengths as listed using the ASD basic (2024 IBC Section 1605.3.1) or the alternative basic (2024 IBC Section 1605.3.2) load combinations.
2. Load values include evaluation of bearing stresses on concrete foundations and do not require further evaluation by the designer. For installations on masonry foundations, bearing capacity shall be evaluated by the designer.
3. Seismic design based on 2024 IBC using R = 6.5. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet-steel panels.
4. Allowable values shown apply to single-wall garage portal systems. The allowable shear load for a double-wall garage portal system, which consists of two walls with a header continuous across both panels, may be taken as twice the table value.
5. Allowable vertical load denotes the total maximum concentric vertical load permitted on the panel acting in combination with the allowable shear loads.
6. Allowable shear, drift and anchor tension values may be interpolated for intermediate height or vertical loads. For panels 74½"-78" tall, use the values for a 78"-tall panel.
7. To achieve required WSWH™ panel evaluation height, trim next tallest full-height panel defined in table on p. 39.
8. Drifts at lower design shear may be linearly reduced.
9. See p. 42 for allowable out-of-plane and axial capacities.
10. High-strength anchor bolts are required for anchor tension forces exceeding the allowable load for standard-strength bolts tabulated on pp. 86–87. See pp. 85–90 for SWH-AB anchor bolt information and anchorage solutions.
11. Tabulated anchor tension values assume no resisting vertical load. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(k \times V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.)

V = Design shear load (lb.)

P = Applied vertical load (lb.)

H = Panel height (in.)

B = Moment arm (in.); 7½" for WSWH12, 12½" for WSWH18 and 17½" for WSWH24

k = Portal factor; 0.80 for WSWH12 panels 93¼" or less in height, 0.90 for WSWH18 panels 93¼" or less in height, 1.00 for all other panels.

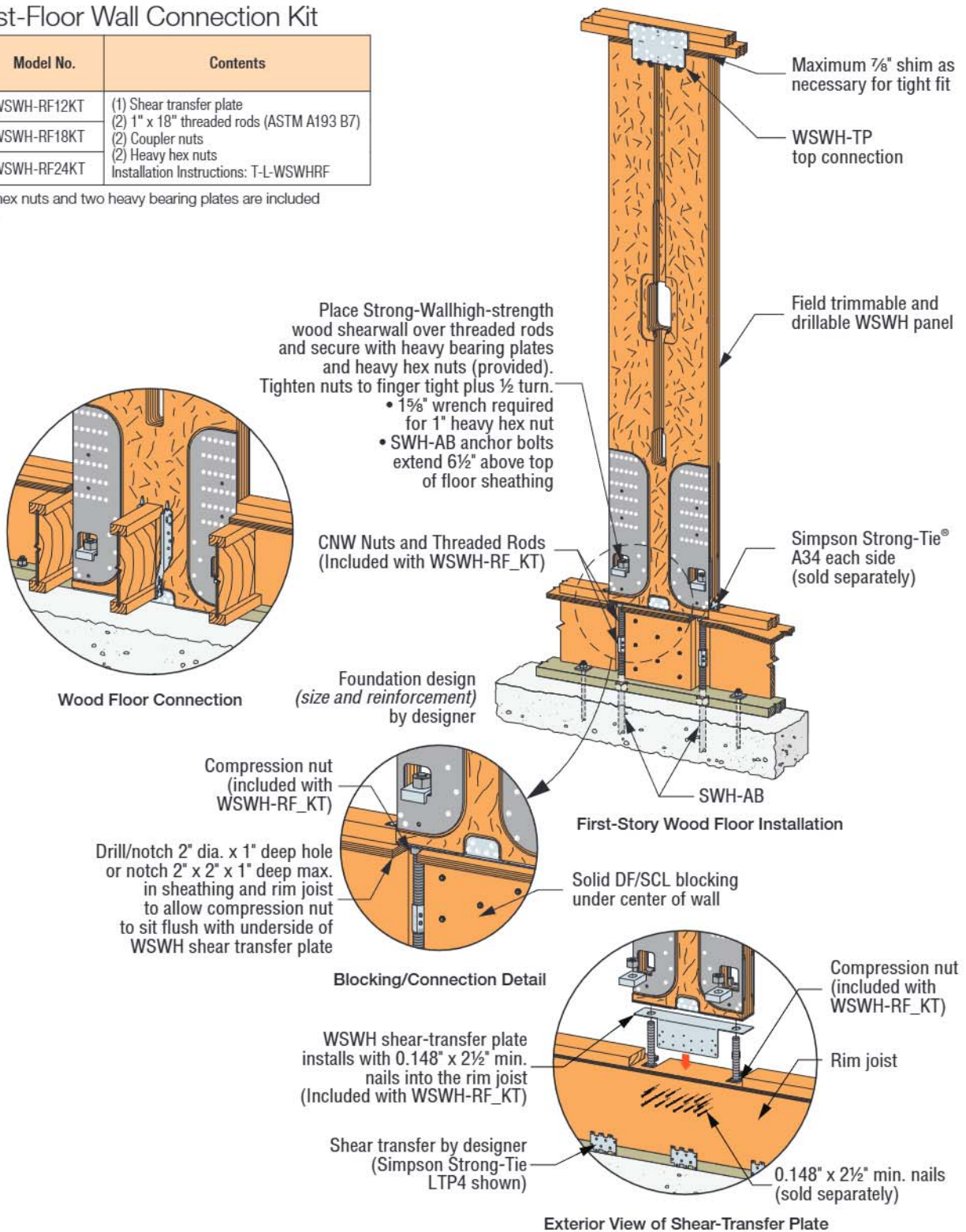
First-Story Raised Foundation

Strong-Wall high-strength wood shearwall (WSWH™), designed for use on concrete foundations, can also be used with wood floor systems by extending the anchor bolts and installing compression nuts and solid blocking below the wall. Width-specific WSWH shear-transfer plates are placed over the anchor bolts and under the walls, and the connection is made with 0.148" x 2½" min. length nails (refer to the exterior view of shear-transfer plate graphic below). Alternatively, the WSWH walls may be installed directly on the foundation using allowable values for standard application on concrete foundation by cutting them into the wood floor system as shown in the first-story installation with wood floor system graphic on p. 65.

Wood First-Floor Wall Connection Kit

Wall Width (in.)	Model No.	Contents
12	WSWH-RF12KT	(1) Shear transfer plate (2) 1" x 18" threaded rods (ASTM A193 B7)
18	WSWH-RF18KT	(2) Coupler nuts (2) Heavy hex nuts
24	WSWH-RF24KT	Installation Instructions: T-L-WSWHRF

1. Two (2) heavy hex nuts and two heavy bearing plates are included with each wall.



First-Story Raised Foundation (continued)

Strong-Wall High-Strength Wood Shearwall Product Data

Model No.	Panel Evaluation Height, H_e (in.)	Seismic ²			Wind		
		Allowable ASD Shear Load, V (lb.) ⁶	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.) ⁸	Allowable ASD Shear, V (lb.) ⁶	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.) ⁸
WSWH12x7	78	820	0.34	7,870	1,045	0.43	10,030
WSWH18x7	78	2,085	0.34	11,615	2,645	0.43	14,735
WSWH24x7	78	3,950	0.30	15,405	4,445	0.33	17,335
WSWH12x8	93¼	665	0.41	7,630	855	0.52	9,815
WSWH18x8	93¼	1,680	0.42	11,190	2,135	0.53	14,220
WSWH24x8	93¼	3,310	0.42	15,435	4,205	0.53	19,605
WSWH12x9	105¼	560	0.47	7,255	710	0.60	9,195
WSWH18x9	105¼	1,475	0.43	11,090	1,935	0.56	14,545
WSWH24x9	105¼	2,830	0.43	14,895	3,700	0.56	19,470
WSWH12x10	117¼	480	0.53	6,925	610	0.67	8,805
WSWH18x10	117¼	1,220	0.53	10,220	1,550	0.67	12,980
WSWH24x10	117¼	2,410	0.53	14,130	3,060	0.67	17,940
WSWH12x11	129¼	420	0.58	6,680	535	0.73	8,510
WSWH18x11	129¼	1,070	0.58	9,880	1,355	0.73	12,510
WSWH24x11	129¼	2,105	0.58	13,605	2,670	0.73	17,255
WSWH12x12	144	355	0.63	6,290	450	0.80	7,975
WSWH18x12	144	900	0.63	9,255	1,145	0.80	11,775
WSWH24x12	144	1,780	0.63	12,815	2,260	0.80	16,270
WSWH18x13	156	810	0.68	9,025	1,025	0.87	11,420
WSWH24x13	156	1,595	0.68	12,440	2,025	0.87	15,795
WSWH18x14	168	730	0.74	8,760	930	0.93	11,160
WSWH24x14	168	1,440	0.74	12,095	1,830	0.93	15,370
WSWH18x16	192	610	0.84	8,365	775	1.07	10,630
WSWH24x16	192	1,200	0.84	11,520	1,525	1.07	14,640
WSWH18x18	216	520	0.95	8,025	660	1.20	10,185
WSWH24x18	216	1,025	0.95	11,070	1,300	1.20	14,040
WSWH18x20	240	430	1.06	7,370	545	1.34	9,345
WSWH24x20	240	910	1.01	10,920	1,170	1.30	14,040

1. Loads are applicable to first-story raised wood floor installations supported on concrete or masonry foundations using the ASD basic (2024 IBC Section 1605.3.1) or the alternative basic (2024 IBC Section 1605.3.2) load combinations. Load values include evaluation of anchor rod compression capacity and do not require further evaluation by the designer.
2. Seismic design based on 2024 IBC using $R = 6.5$. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
3. Allowable shear loads are based on a maximum 2,000 lb. uniformly distributed axial load acting in combination with the allowable shear loads.
4. Allowable shear, drift and anchor tension values may be interpolated for intermediate height or vertical loads. For panels 74½"–78" tall, use the values for a 78" tall panel.
5. High-strength anchor bolts are required unless a lower-strength grade is justified by the registered design professional. See pp. 85–90 for SWH-ABHS anchor bolt information and anchorage solutions.
6. Allowable shear loads assume a maximum first floor joist depth of 12" for allowable shear load with joists up to 16" deep, multiple table values by 0.92.
7. Drifts at lower design shear may be linearly reduced.
8. Tabulated anchor tension values assume no resisting vertical load. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.)

V = Design shear load (lb.)

P = Applied vertical load (lb.)

H = Panel height (in.)

B = Moment arm (in.); 8½" for WSWH12, 14" for WSWH18, 20" for WSWH24

Back-to-Back Installations on Concrete Foundations

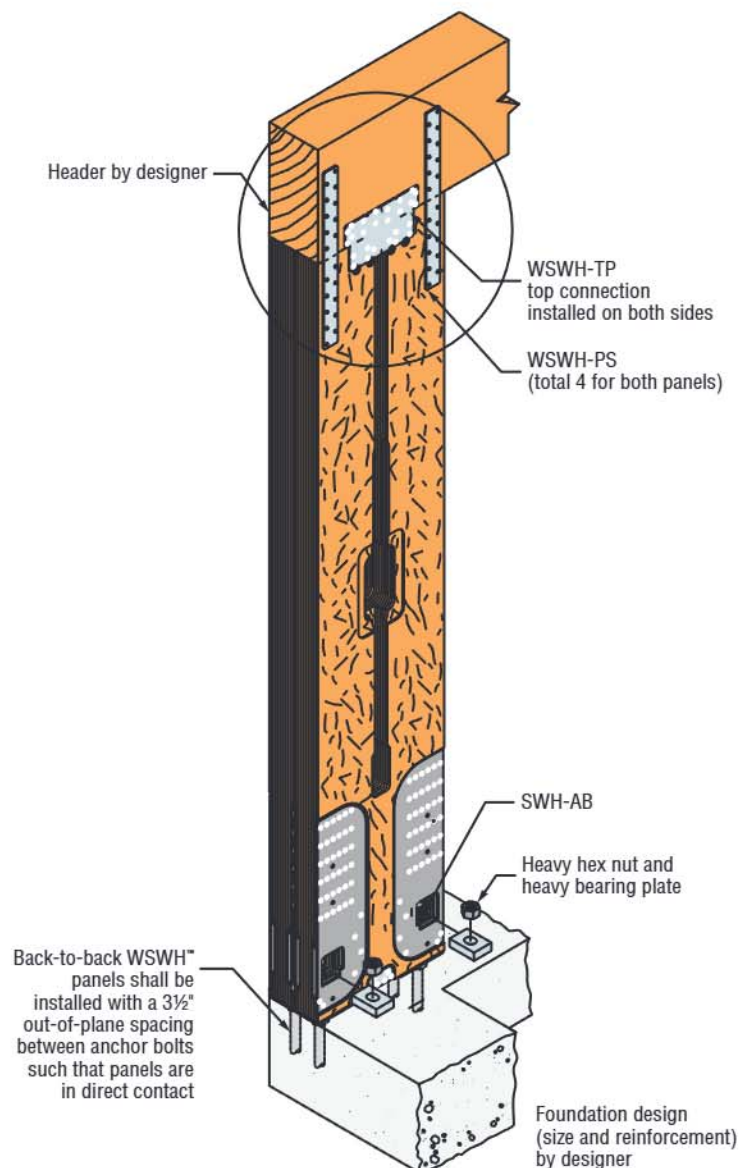
The Strong-Wall high-strength wood shearwall may be installed in a back-to-back orientation in residential, multi-family and light-commercial applications for cases where maximum allowable loads are required and a moment frame might otherwise be specified. The allowable loads for back-to-back installations may be taken as twice those listed for standard applications in the table on pp. 40–41. Double 2x8 or 2x10 top plates are required for standard applications and a minimum 7" x 11¼" header is required for single- or double-portal applications depending upon loading and span requirements. Back-to-back anchorage solutions for spread footings and reinforced grade beam foundations are provided in detail sheets SWH1.2 and SWH1.3, and may be downloaded in PDF, DWG or DXF format at strongtie.com.

Codes: ICC-ES ESR-2652; City of LA Building Code Supplement; State of Florida FL5113

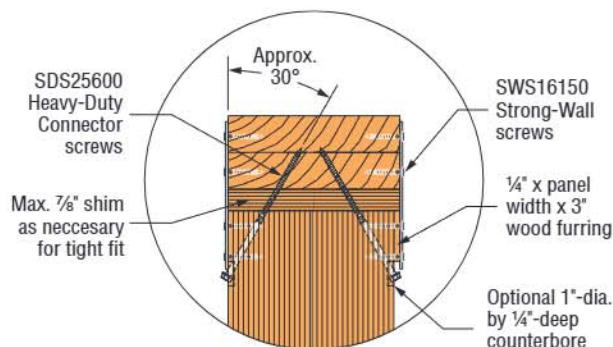
For product data and naming scheme information, see pp. 38–39.

Installation

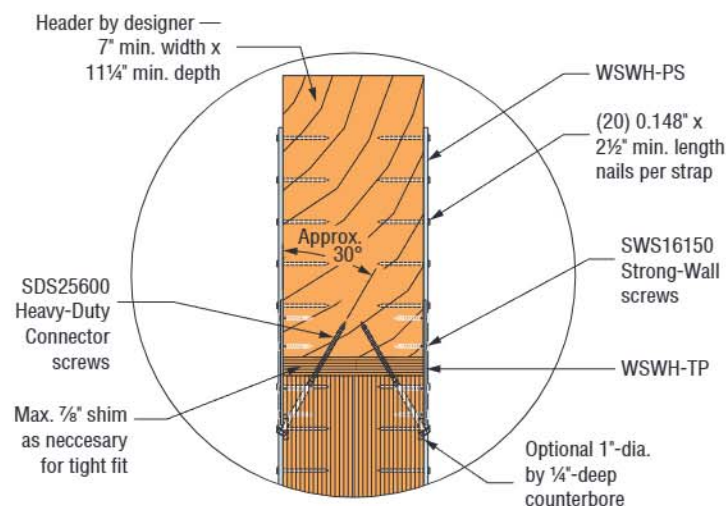
- See p. 93 for back-to-back spacer template.
- Portal-frame connection kit is required for portal frame applications (one WSWH-PK kit required for both panels; straps installed on outside panel faces only).
- Allowable out-of-plane loads listed on p. 42 for single-story walls on concrete foundations shall apply and may not be increased.
- See garage header rough opening height table on p. 43.
- All panels may be field trimmed to a minimum of 74½". Trim height from top of panel only, do not trim from sides or bottom. Drilling holes in the Strong-Wall high-strength wood shearwalls is not permitted except as shown on p. 69.
- Anchor bolt nuts should be finger tight plus ½ turn.
- Maximum shim thickness between the shearwall and top plates or header is ⅞". For additional thicknesses, see detail 9/WSWH2 on p. 68.
- Top connection installs with a combination of ¼" x 6" SDS Heavy-Duty Connector screws and SWS16150 Strong-Wall screws. See details 7/WSWH2 on p. 66 and 3/WSWH4 on p. 75 for standard and portal applications, respectively.



Back-to-Back Portal Installation
(Standard Installation Similar)



Top Connection for Back-to-Back Standard Installation



Top Connection for Back-to-Back Portal Installation

Two-Story Nonstacked Application

Simpson Strong-Tie offers solutions for two-story nonstacked applications with the Strong-Wall high-strength wood shearwall (WSWH®). This solution allows for the installation of WSWH panels on the second floor without requiring a directly stacked panel below based on full scale testing. The first option is WSWH stagger-stack installation with stacking panel below, and the second option is installing the WSWH with two supporting posts below (Lateral shear transfer at the first story is the responsibility of the designer). The second-story panels are the same WSWH18 and WSWH24 models used for standard concrete applications. They are connected to the first-story post or panel using a two-story nonstacked connection kit. Anchor rods span the floor system to facilitate this connection. In addition, WSWH shear-transfer plate (STP), heavy hex compression nuts and solid blocking are installed beneath the second story panel. Width-specific WSWH shear-transfer plate is placed over the anchor rods and under the second story panel, and the connection is made with 0.148" x 2½" min. length nails. A minimum 1.3E TimberStrand LSL wood post measuring 3½" x 5½" is required and is installed into concrete using WSWH-MSKHD holdown and 1" ASTM A193 Grade B7 threaded rods.

ASD In-Plane Shear (lb.) for WSWH Two-Story Nonstacked Application

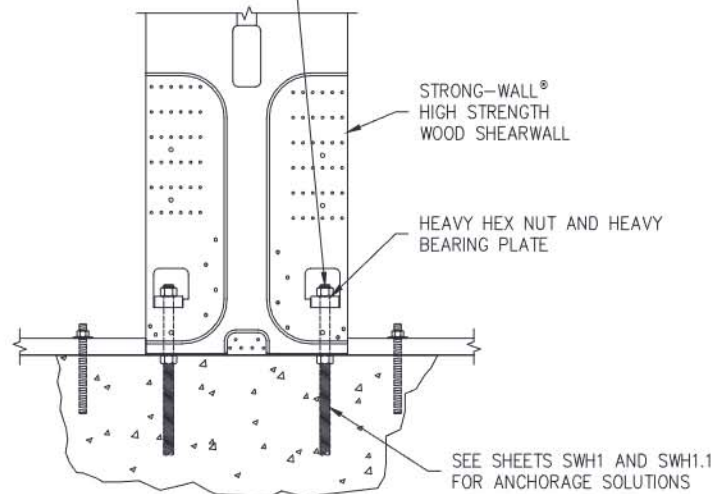
Model No.	Panel Evaluation Height, H_e (in.)	Two-Story Nonstacked Application					
		Seismic ²			Wind		
		Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
WSWH18x7	78	585	0.34	3,260	745	0.43	4,150
WSWH24x7	78	925	0.34	3,610	1,170	0.43	4,565
WSWH18x8	93¼	480	0.42	3,195	610	0.53	4,065
WSWH24x8	93¼	925	0.42	4,315	1,175	0.53	5,480
WSWH18x9	105¼	480	0.42	3,195	610	0.53	4,065
WSWH24x9	105¼	925	0.42	4,315	1,175	0.53	5,480
WSWH18x10	117¼	355	0.53	2,975	450	0.67	3,770
WSWH24x10	117¼	685	0.53	4,015	870	0.67	5,100
WSWH18x11	129¼	315	0.57	2,865	400	0.73	3,625
WSWH24x11	129¼	605	0.57	3,860	770	0.73	4,910
WSWH18x12	144	265	0.63	2,725	335	0.80	3,445
WSWH24x12	144	510	0.63	3,670	650	0.80	4,680
WSWH18x13	156	240	0.68	2,655	305	0.87	3,375
WSWH24x13	156	465	0.68	3,600	590	0.87	4,565
WSWH18x14	168	215	0.74	2,580	275	0.93	3,300
WSWH24x14	168	420	0.74	3,530	530	0.93	4,450

1. Allowable base moment and anchor tension are applicable to installation on concrete foundations with minimum $f'_c = 2,500$ psi using the ASD basic (2024 IBC Section 1605.1) or the alternative basic (2024 IBC Section 1605.2) load combinations. Load values include evaluation of anchor rod compression at second story and bearing stresses at foundation.
2. For seismic design based on 2024 IBC using $R = 6.5$. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
3. Allowable shear, drift, and base moment values may be interpolated for intermediate heights.
4. Loads are based on a 2,000 lb. maximum uniformly distributed total axial load acting on the second-story panel and a 4,000 lb. maximum uniformly distributed total axial load acting on the first-story panel in combination with the tabulated shear load and base moment.
5. The allowable second-story shear loads assume a maximum floor joist depth of 18".
6. A two-story nonstacked connection kit is required to attach the second-story panel to first-story panel or 1.3E TimberStrand LSL wood post 3½" x 5½" min.
7. The designer is responsible for resolving the load path for wall shear to the first story and then foundation.
8. High-strength anchor bolts are required at the second-story wall unless a lower-strength grade is justified by the designer. See pp. 85-87 for SWH-AB anchor bolt information and anchorage solutions.
9. WSWH-MSKD and high-strength anchor rods are required at the first-story posts to be installed into concrete.

Wood Shearwall Structural Details (continued)

PLACE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL OVER THE ANCHOR BOLTS AND SECURE WITH HEAVY BEARING PLATES AND HEAVY HEX NUTS (PROVIDED). DO NOT USE AN IMPACT WRENCH. USE 1½" WRENCH FOR 1" NUT. TIGHTEN ANCHOR NUTS FINGER TIGHT + ½" TURN.

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



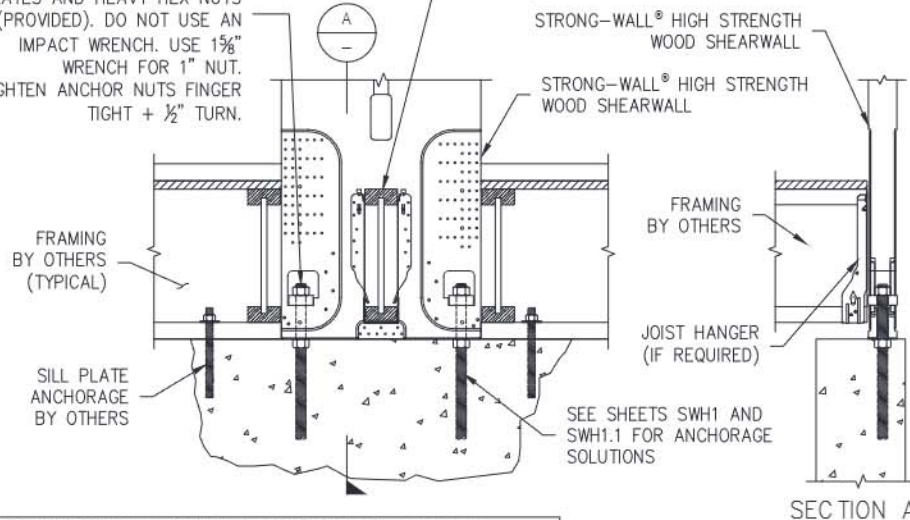
STANDARD INSTALLATION BASE CONNECTION

4/WSWH2

PLACE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL OVER THE ANCHOR BOLTS AND SECURE WITH HEAVY BEARING PLATES AND HEAVY HEX NUTS (PROVIDED). DO NOT USE AN IMPACT WRENCH. USE 1½" WRENCH FOR 1" NUT. TIGHTEN ANCHOR NUTS FINGER TIGHT + ½" TURN.

* FRAMING BY OTHERS (NOT SHOWN FOR CLARITY)

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL HEIGHT TO INCLUDE THE DEPTH OF THE FLOOR SYSTEM AND SHALL BE INSTALLED DIRECTLY ON THE FOUNDATION. SPECIFY PANEL HEIGHT FROM TOP OF FOUNDATION TO UNDERSIDE OF TOP PLATES OR BEAM.

*THIS DETAIL APPLICABLE ONLY FOR WSWH18 & WSWH24. JOISTS MAY NOT FRAME INTO WSWH12 MODELS..

SECTION A

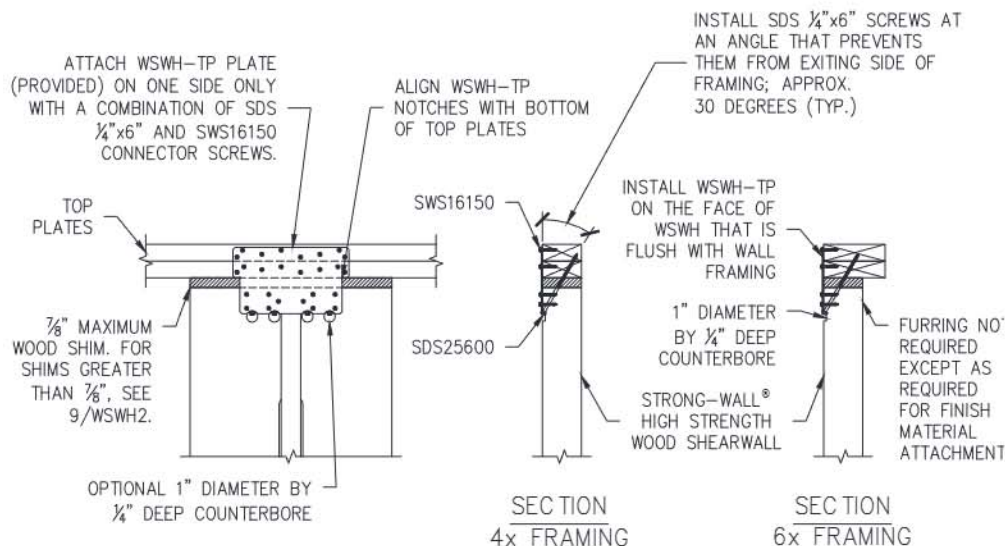
WOOD FLOOR SYSTEM BASE CONNECTION

5/WSWH2

Wood Shearwall Structural Details (continued)

MODEL NO.	FASTENER QUANTITY	
	SWS16150	SDS25600
WSWH-TP12	14	2
WSWH-TP18	26	4
WSWH-TP24	46	8

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

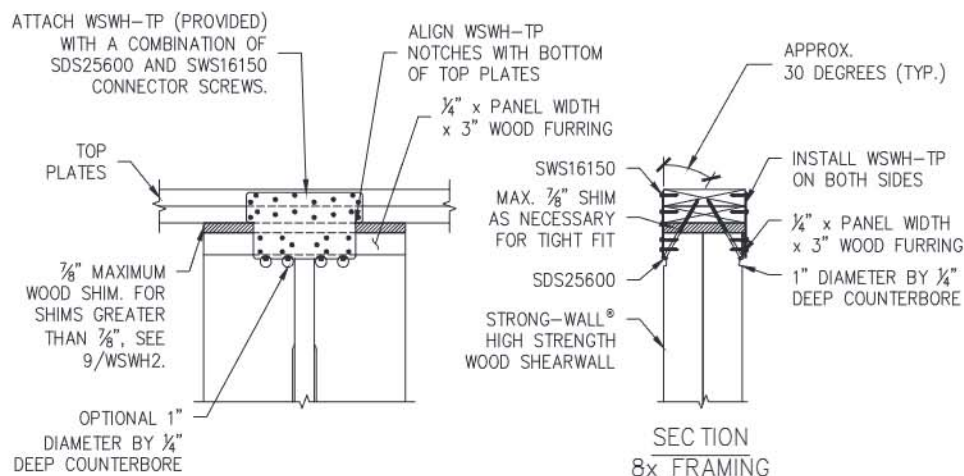


TOP CONNECTION

6/WSWH2

MODEL NO.	FASTENER QUANTITY	
	SWS16150	SDS25600
WSWH-TP12	28	4
WSWH-TP18	52	8
WSWH-TP24	92	16

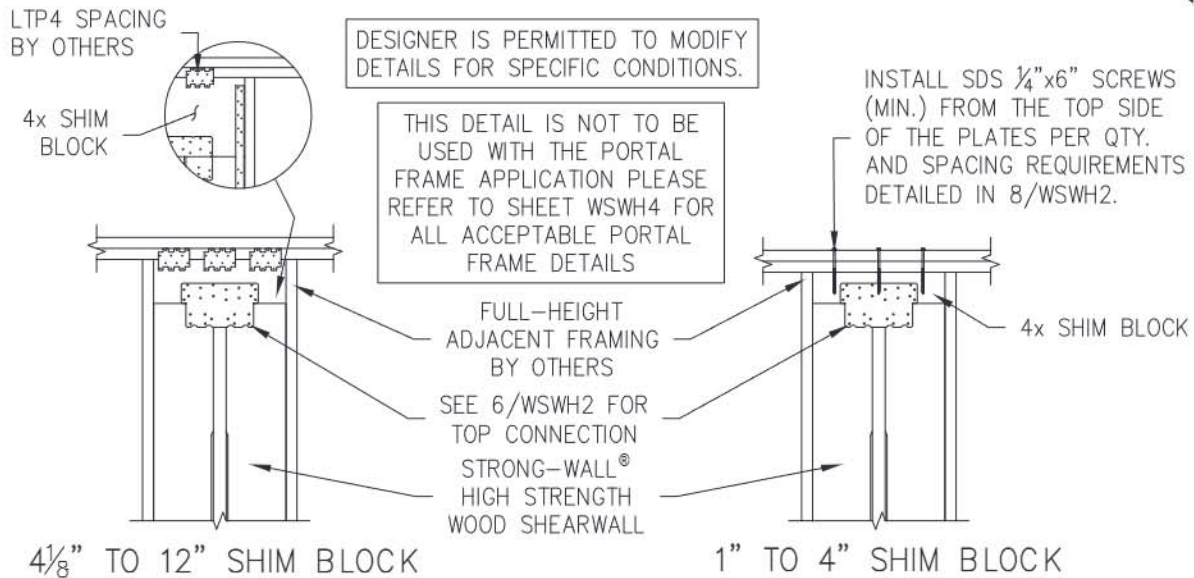
DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



BACK-TO-BACK TOP CONNECTION

7/WSWH2

Wood Shearwall Structural Details (continued)



DESIGNER SHALL DESIGN AND DETAIL FOR:

1. SHEAR TRANSFER
2. OUT-OF-PLANE LOADING EFFECT
3. INCREASED OVERTURNING AND DRIFT DUE TO ADDITIONAL HEIGHT

FOR 8" TO 12" BLOCK DEPTHS:

ATTACH SIMPSON STRONG-TIE® CS16 STRAPS AT EDGE OF WSWH PANEL (EACH SIDE) USING 10d $\times$ 1 $\frac{1}{2}$ " NAILS

SHIM BLOCK HEIGHTS GREATER THAN 8" AND UP TO 10":

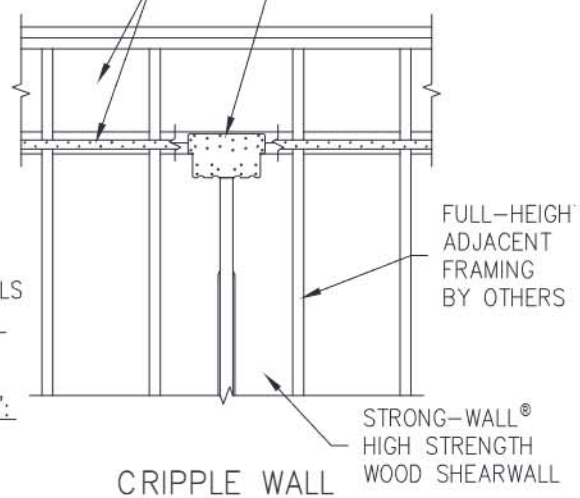
- 8 NAILS INTO BLOCK
- 8 NAILS INTO WSWH PANEL

SHIM BLOCK HEIGHTS GREATER THAN 10" AND UP TO 12":

- 10 NAILS INTO BLOCK
- 10 NAILS INTO WSWH PANEL

CRIPPLE SHEARWALL, BLOCKING AND STRAP BY OTHERS

SEE 6/WSWH2 FOR TOP CONNECTION



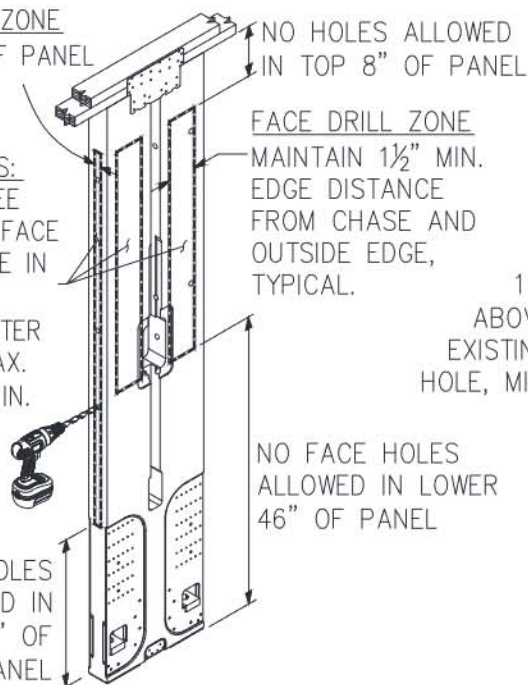
Wood Shearwall Structural Details (continued)

EDGE DRILL ZONE
MIDDLE $\frac{1}{3}$ OF PANEL
THICKNESS

HOLES SPECS:

- MAX. THREE HOLES IN FACE AND THREE IN EDGE.
- $\frac{3}{4}$ "-DIAMETER HOLES, MAX.
- 6" O.C., MIN.

NO EDGE HOLES
ALLOWED IN
LOWER 26" OF
PANEL



NO HOLES ALLOWED
IN TOP 8" OF PANEL

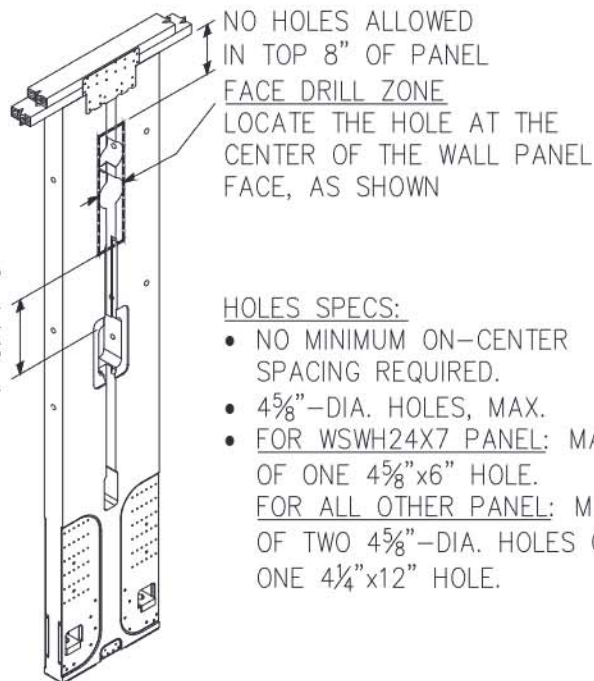
FACE DRILL ZONE
MAINTAIN $1\frac{1}{2}$ " MIN.
EDGE DISTANCE
FROM CHASE AND
OUTSIDE EDGE,
TYPICAL.

NO FACE HOLES
ALLOWED IN LOWER
46" OF PANEL

12"
ABOVE
EXISTING
HOLE, MIN.

SMALL HOLE REQUIREMENTS AND DRILL ZONES

(holes are only allowed in the drill zones specified)



NO HOLES ALLOWED
IN TOP 8" OF PANEL

FACE DRILL ZONE
LOCATE THE HOLE AT THE
CENTER OF THE WALL PANEL
FACE, AS SHOWN

HOLES SPECS:

- NO MINIMUM ON-CENTER SPACING REQUIRED.
- $4\frac{5}{8}$ "-DIA. HOLES, MAX.
- FOR WSWH24X7 PANEL: MAX. OF ONE $4\frac{5}{8}$ "x6" HOLE.
- FOR ALL OTHER PANEL: MAX. OF TWO $4\frac{5}{8}$ "-DIA. HOLES OR ONE $4\frac{1}{4}$ "x12" HOLE.

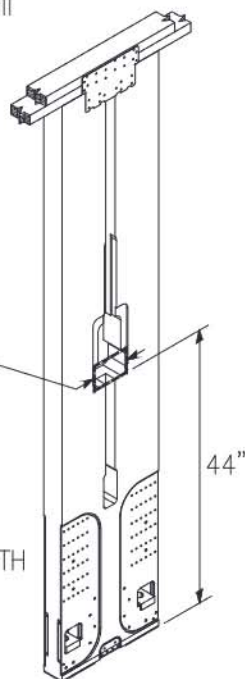
LARGE HOLES REQUIREMENTS AND DRILL ZONES

(holes are only allowed in the drill zones specified)

FACE DRILL ZONE
CENTER 6" OF PANEL
FACE AS SHOWN

HOLES

- 4"-HEIGHT X 6"-WIDTH HOLES, MAX.



MODEL NO.	W (IN.)	REDUCTION FACTORS
WSWH18	18	0.90
WSWH24	24	0.95

NOTES :

1. DO NOT DRILL THE MENTIONED LIGHT SWITCH HOLE IN WSWH12.
2. FOR WSWH18 AND WSWH24, ALLOWABLE SHEAR LOAD MUST BE MULTIPLIED BY THE LOAD REDUCTION FACTOR.

ALLOWABLE LIGHT SWITCH HOLE FACE DRILL ZONE

High-Strength Shearwall Anchorage Solutions

SWH-AB Anchor Bolts

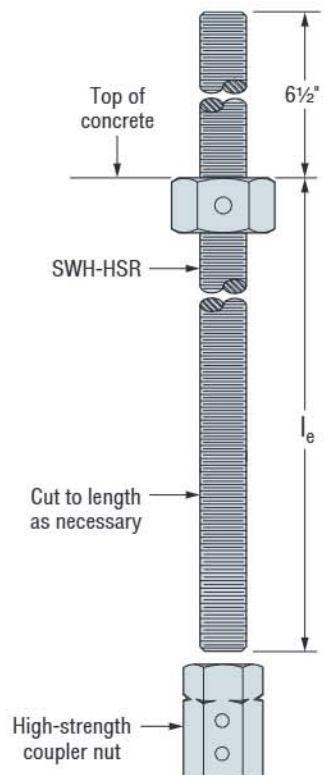
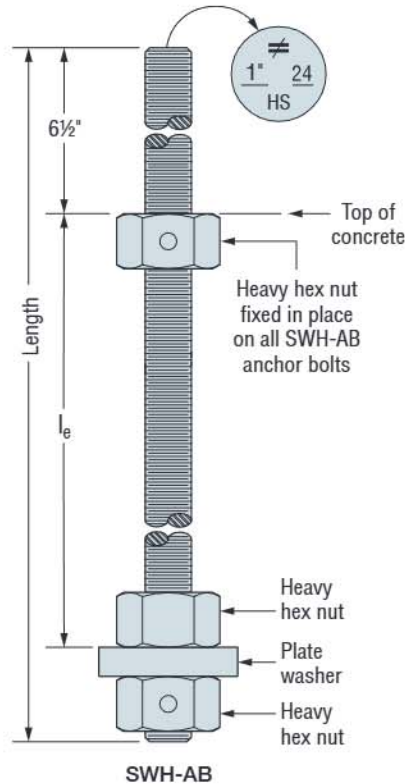
The 1" diameter SWH-AB anchor bolt is compatible to both SSWH™ and WSWH™ Strong-Wall shearwalls, offering flexibility to meet specific project demands. Inspection is easy; the head is stamped with a No-Equal® symbol for identification, bolt length, bolt diameter and "HS" for "High-Strength."

Material: High-Strength (HS) ASTM A193 Grade B7

An additional nut for template installation is provided with each SWH-AB.

Model No.	Diameter (in.)	Total Length (in.)	l_e (in.)
SWH-AB1x24HS	1	24	15½
SWH-AB1x30HS	1	30	21½
SWH-AB1x36HS	1	36	27½
SWH-AB1x42HS	1	42	33½
SWH-AB1x48HS	1	48	39½

1. Anchor models are compatible with all WSWH and SSWH panel models.

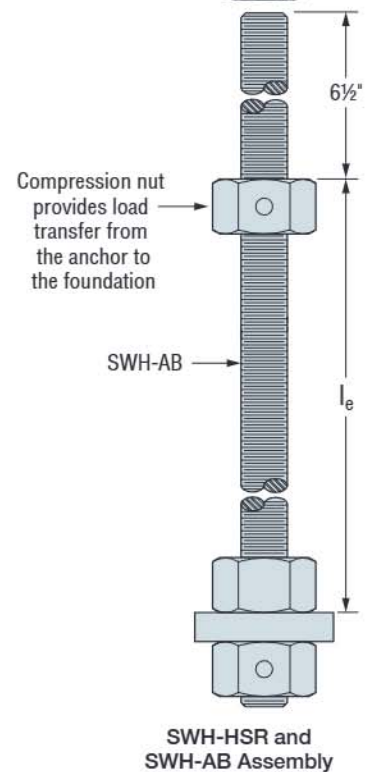
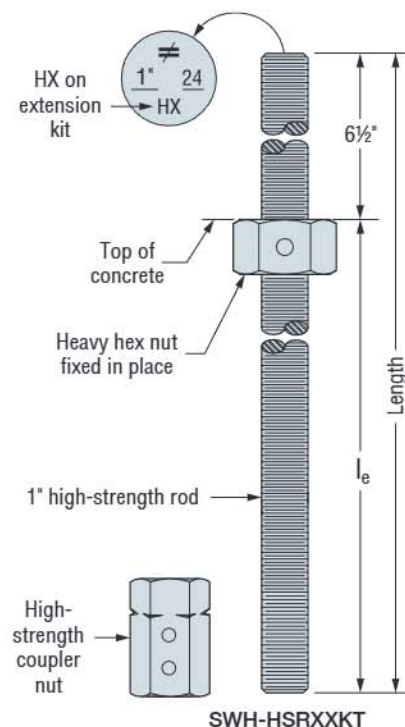


SWH-HSR Extension Kit

SWH-HSR allows for anchorage in tall stemwall applications where full embedment of a SWH-AB into the footing is required. The head is stamped for identification like a SWH-AB. Kit includes ASTM A193 Grade B7 high-strength rod with heavy hex nut fixed in place and high-strength coupler nut.

Model No.	Diameter (in.)	Total Length (in.)	l_e (in.)
SWH-HSR1x24KT	1	24	17½
SWH-HSR1x36KT	1	36	29½

- Do not use in place of SWH-AB.
- When used in combination with SWH-AB, Total l_e = SWH-HSR l_e + SWH-AB l_e + 6½"



High-Strength Shearwall Anchorage Solutions (continued)

Tension Anchorage Solutions — 2,500 psi Concrete^{1,5,6}

Design Criteria	Concrete Condition	Anchor Strength ²	SWH-AB Anchor Bolt		
			ASD Allowable Tension (lb.)	W (in.)	d _e (in.)
Seismic ³	Cracked	Standard	16,000	33	11
			17,100	35	12
		High-Strength	34,100	52	18
			36,800	55	19
	Uncracked	Standard	15,700	28	10
			17,100	30	10
		High-Strength	33,500	45	15
			36,800	48	16
Wind ⁴	Cracked	Standard	6,200	16	6
			11,400	24	8
			17,100	32	11
			21,100	36	12
		High-Strength	27,300	42	14
			34,100	48	16
			36,800	51	17
			36,800	51	17
	Uncracked	Standard	6,400	14	6
			12,500	22	8
			17,100	28	10
			17,100	28	10
		High-Strength	22,900	33	11
			26,400	36	12
			34,200	42	14
			36,800	44	15

See footnotes on p. 87.

Tension Anchorage Solutions — 3,000 psi Concrete^{1,5,6}

Design Criteria	Concrete Condition	Anchor Strength ²	SWH-AB Anchor Bolt		
			ASD Allowable Tension (lb.)	W (in.)	d _e (in.)
Seismic ³	Cracked	Standard	16,000	31	11
			17,100	33	11
		High-Strength	33,900	49	17
			36,800	52	18
	Uncracked	Standard	16,300	27	9
			17,100	28	10
		High-Strength	34,000	43	15
			36,800	46	16
Wind ⁴	Cracked	Standard	5,600	14	6
			10,200	21	7
			17,100	30	10
			17,100	30	10
		High-Strength	20,000	33	11
			26,500	39	13
			33,600	45	15
			36,800	48	16
	Uncracked	Standard	6,200	13	6
			12,800	21	7
			17,100	26	9
			17,100	26	9
		High-Strength	21,800	30	10
			28,900	36	12
			33,100	39	13
			36,800	42	14

See footnotes on p. 87.

High-Strength Shearwall Anchorage Solutions (continued)

Tension Anchorage Solutions — 4,500 psi Concrete^{1,5,6}

Design Criteria	Concrete Condition	Anchor Strength ²	SWH-AB Anchor Bolt		
			ASD Allowable Tension (lb.)	W (in.)	d _e (in.)
Seismic ³	Cracked	Standard	16,000	27	9
			17,100	29	10
		High-Strength	34,700	44	15
			36,800	46	16
	Uncracked	Standard	15,700	23	8
			17,100	25	9
		High-Strength	33,900	38	13
			36,800	40	14
Wind ⁴	Cracked	Standard	6,800	14	6
			11,600	20	7
			17,100	26	9
		High-Strength	21,400	30	10
			28,400	36	12
			32,400	39	13
	Uncracked	Standard	36,800	43	15
			6,800	12	6
			12,400	18	6
			17,100	23	8
		High-Strength	22,800	27	9
			26,700	30	10
			30,700	33	11
			36,800	37	13

1. Anchorage designs conform to ACI 318-14 Chapter 17 and ACI 318-19 with no supplementary reinforcement for cracked and uncracked concrete as noted.
2. Anchor strength indicates required grade of SWH-AB anchor bolt. Standard (ASTM F1554 Grade 36) or high-strength (HS) (ASTM A193 Grade B7).
3. Seismic indicates Seismic Design Categories (SDC) C–F. Detached one- and two-family dwellings in SDC C may use wind anchorage solutions. Seismic anchorage designs conform to ACI 318-14 Section 17.2.3.4.3 and ACI 318-19.
4. Wind includes Seismic Design Categories A&B and detached one- and two-family dwellings in SDC C.
5. Foundation dimensions are for anchorage only. Foundation design (size and reinforcement) by others. The registered design professional may specify alternative embedment, footing size or anchor bolt.
6. Refer to slab on grade, curb, stemwall and interior footing details for W and d_e as shown on pp. 88–90.
7. Standard grade anchor bolts may be used where designers have determined the reduced strength meets the anchorage design requirements. Requirements for standard grade anchor bolts are by designer.

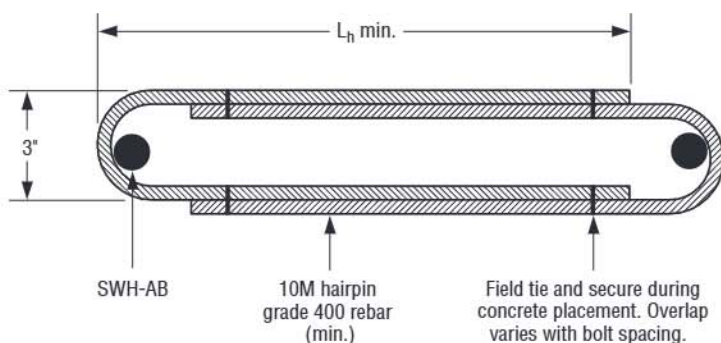
High-Strength Shearwall Anchorage Solutions (continued)

Foundation shear reinforcement to resist shear forces from Strong-Wall high-strength steel shearwall (SSWH™) and high-strength wood shearwall (WSWH™), located at the edge of concrete is shown in the table below. The SSWH12 and WSWH12 used in wind applications do not require shear reinforcement when the panel design shear force is less than the anchorage allowable shear load shown in the table below.

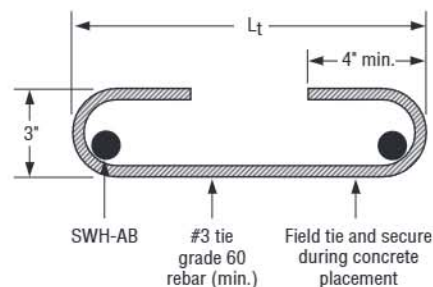
Shear Anchorage Solutions

Strong-Wall High-Strength Steel Shearwall Model No.	Strong-Wall High-Strength Wood Shearwall Model No.	L _t or L _h (in.)	Seismic ³		Wind ⁴			
			Shear Reinforcement	Minimum Curb/Stemwall Width (in.)	Shear Reinforcement	Minimum Curb/Stemwall Width (in.)	ASD Allowable Shear Load, V (lb.) ⁷	
							Uncracked	Cracked
SSWH12	WSWH12	10¼	(1) #3 Tie	6	See Note 7	6	1,080	770
SSWH15	—	12	(1) #3 Tie	6	(1) #3 Hairpin	6	Hairpin reinforcement achieves maximum allowable shear load of the Strong-Wall panels	
SSWH18	WSWH18	15	(2) #3 Hairpins ⁵	6	(1) #3 Hairpin	6		
SSWH21	—	16	(2) #3 Hairpins ⁵	6	(2) #3 Hairpins ⁵	6		
SSWH24	WSWH24	19	(2) #3 Hairpins ⁵	6	(2) #3 Hairpins ⁵	6		

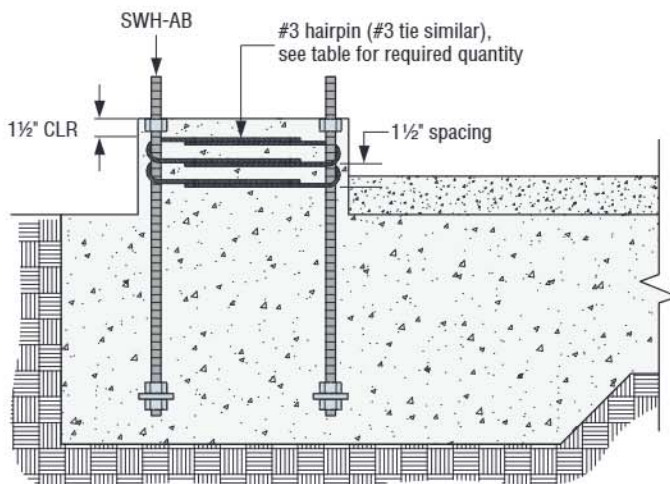
1. Shear anchorage designs conform to ACI 318-19 Chapter 17 and ACI 318-14 Chapter 17, and assume 2,500 psi concrete. See pp. 86–87 for tension anchorage.
2. Shear reinforcement is not required for interior foundation applications (panel installed at 6" or more away from edge of concrete), or braced wall panel applications.
3. Seismic indicates Seismic Design Category (SDC) C-F. Detached one- and two- family dwellings in SDC C may use wind anchorage solutions. Seismic shear reinforcement designs conform to ACI 318-19, Section 17.10.6.2 and 17.10.6.3 and ACI 318-14, Section 17.2.3.5.3.
4. Wind includes Seismic Design Category (SDC) A&B and detached one- and two- family dwellings in SDC C.
5. Additional ties may be required at garage curb or stemwall installations below anchor reinforcement per designer.
6. Use (1) #3 hairpin for SSWH18 and WSWH18 when standard strength anchor is used.
7. Use (1) #3 tie for SSWH12 and WSWH12 when panel design shear force exceeds tabulated anchorage allowable shear load.
8. #4 grade 40 shear reinforcement may be substituted for SWH shear anchorage solutions.
9. Concrete edge distance must comply with ACI 318-19 Section 17.9.2 and 20.5.1.3 (ACI 318-14 Section 17.7.2 and 20.6.1.3). Where the concrete surface is exposed to weather or in contact with ground, consider alternate protection methods if necessary. Anchor templates are available to locate the Strong-Wall at inside face of 2x6 framing. Hot-dip galvanized (HDG) anchor bolts are available. For coating reinforcing, refer to ACI 318-19 Section 20.5.2.
10. The designer may specify alternate shear anchorage.



Hairpin Shear Reinforcement



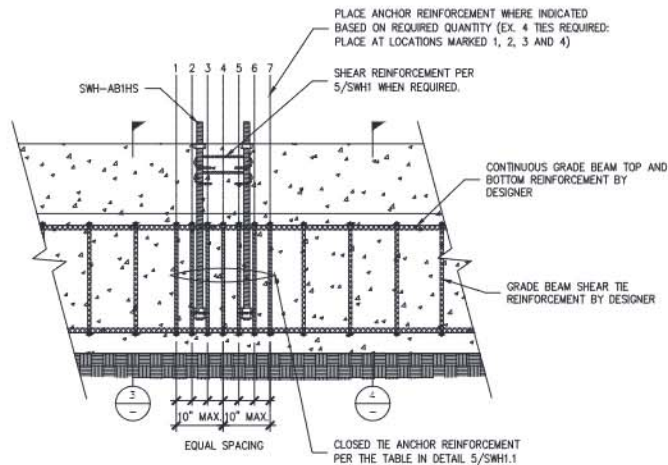
Tie Shear Reinforcement



Hairpin Installation

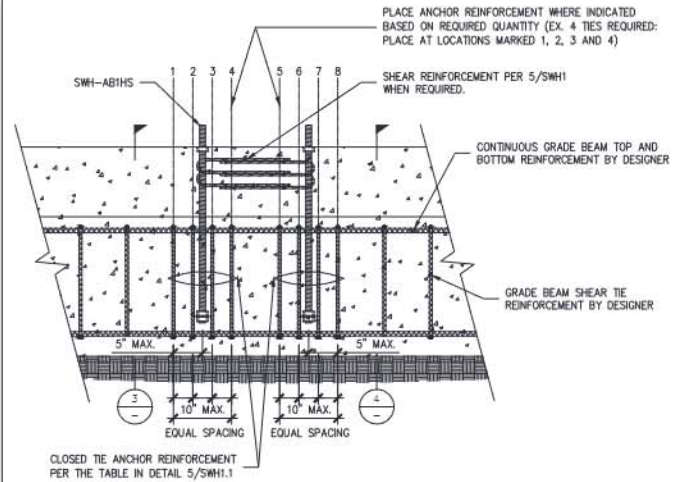
(Garage curb shown, other footing types similar)

Anchor Reinforcement Solutions on Grade Beams (continued)



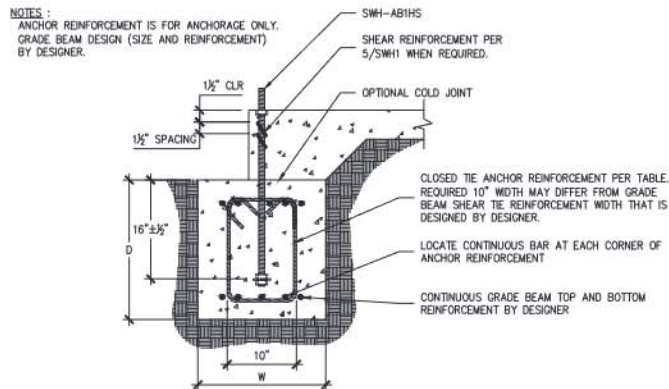
GRADE BEAM ELEVATION AT 12" WALL MODEL

1/SWH1.1



GRADE BEAM ELEVATION AT 15", 18", 21" AND 24" WALL MODELS

2/SWH1.1

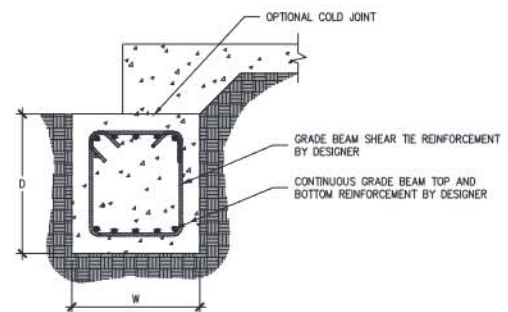


ANCHOR REIN. NOTE:
MINIMUM DISTANCES FROM THE ANCHOR BOLT PLATE WASHER TO TOP AND BOTTOM OF CLOSED TIE REINFORCEMENT ARE 13" AND 5" RESPECTIVELY.

DIMENSIONING NOTES:
D: DEPTH BY DESIGNER (24" MIN.)
W: WIDTH BY DESIGNER (18" MIN.)

GRADE BEAM SECTION AT ANCHOR REINFORCEMENT

3/SWH1.1



DIMENSIONING NOTES:
D: DEPTH BY DESIGNER (24" MIN.)
W: WIDTH BY DESIGNER (18" MIN.)

GRADE BEAM SECTION AWAY FROM ANCHOR REINFORCEMENT

4/SWH1.1