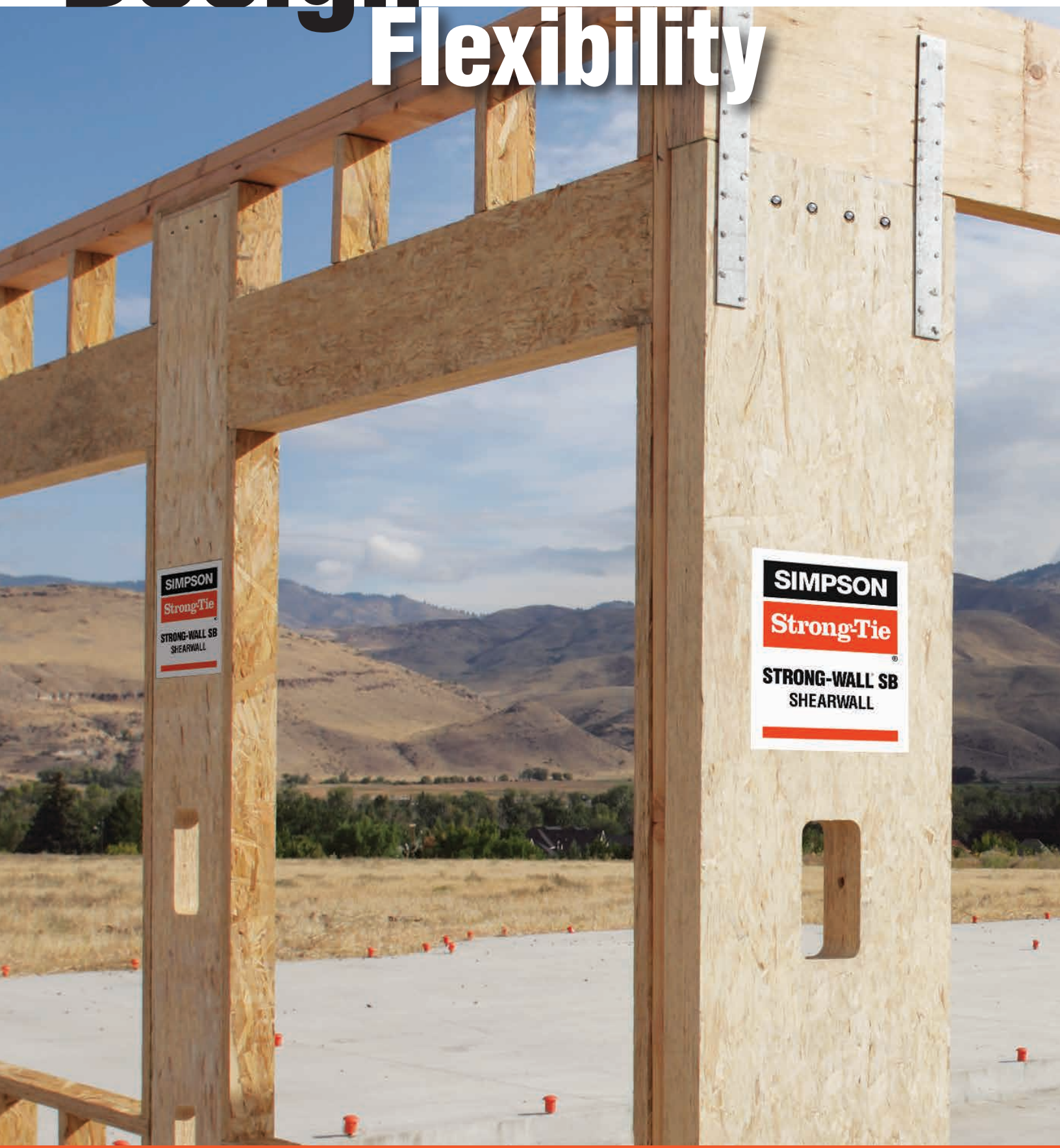
SIMPSON Strong-Tie®

STRONG-WALL® SB SHEARWALL

C-L-SWSB13

(800) 999-5099
www.strongtie.com

Design Flexibility



Delivering Customization to Factory-Built Shearwalls

Pre-fabricated shearwalls from Simpson Strong-Tie are synonymous with high quality and performance. Over the years, we have worked diligently to ensure our Strong-Wall® line of code-listed shearwalls provide enhanced structural support, design flexibility and help lower labor costs through easier installation.

With technology acquired from Weyerhaeuser Co., Simpson Strong-Tie has introduced a customizable option to its Strong-Wall product line. The Strong-Wall SB shearwall delivers greater lateral-force-resistance performance than most comparable wood shearwalls while providing installers the ability to field trim the panel for customized heights and rake walls.

Simpson Strong-Tie maintains the largest group of dedicated engineers and field representatives to support your efforts – because we know you only have one chance to build a strong building.

Introduction

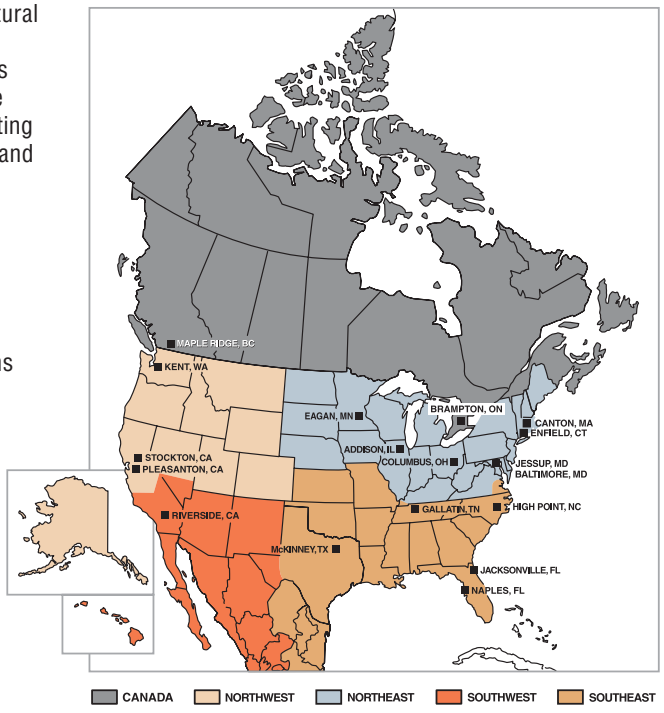
For more than 50 years, Simpson Strong-Tie has focused on creating structural products that help people build safer and stronger homes and buildings. A leader in structural systems research and technology, Simpson Strong-Tie is one of the largest suppliers of structural building products in the world. The Simpson Strong-Tie commitment to product development, engineering, testing and training is evident in the consistent quality and delivery of its products and services. Simpson Strong-Tie® product lines include:

- Structural connectors for wood and cold-formed-steel construction
- Strong-Wall® prefabricated shearwalls
- Strong Frame® moment frames
- Rod systems for multi-story buildings
- Fastening systems including Quik Drive® auto-feed screw driving systems
- Simpson Strong-Tie® anchors and fasteners for concrete and masonry

For more information, visit the company's Web site at ***www.strongtie.com***.

The Simpson Strong-Tie Company Inc. "No Equal" pledge includes:

- Quality products value-engineered for the lowest installed cost at the highest rated performance levels
- Most thoroughly tested and evaluated products in the industry
- Strategically located manufacturing and warehouse facilities
- National code agency listings
- Largest number of patented connectors in the industry
- European locations with an international sales team
- In-house R&D and tool and die professionals
- In-house product testing and quality control engineers
- Member of AITC, ASTM, ASCE, AWPA, ACI, AISC, CSI, ICFA, NBMDA, NLBMDA, SETMA, STAFDA, SREA, NFBA, WTCA and local engineering groups.



THE SIMPSON STRONG-TIE QUALITY POLICY

We help people build safer structures economically. We do this by designing, engineering and manufacturing "No Equal" structural connectors and other related products that meet or exceed our customers' needs and expectations. Everyone is responsible for product quality and is committed to ensuring the effectiveness of the Quality Management System.

Karen Colonias
Chief Executive Officer

Terry Kingsfather
President

GETTING FAST TECHNICAL SUPPORT

When you call for engineering technical support, we can help you quickly if you have the following information at hand. This will help us to serve you promptly and efficiently.

- Which Simpson Strong-Tie® catalog are you using? *(See the front cover for the catalog number)*
- Which Simpson Strong-Tie product are you using?
- What is your design code and building jurisdiction?
- Is your structure residential or commercial?
- What is your application?
- What is your load requirement?

WE ARE ISO 9001-2008 REGISTERED

Simpson Strong-Tie is an ISO 9001-2008 registered company. ISO 9001-2008 is an internationally-recognized quality assurance system which lets our domestic and international customers know that they can count on the consistent quality of Simpson Strong-Tie® products and services.

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General Notes and Table of Contents

General Notes

These General Notes are provided to ensure proper design, use and installation of the Simpson Strong-Tie® Strong-Wall® SB shearwall and must be followed fully.

a. Install products according to this catalog. Changes in installation methods or modifications to the product and associated systems *(other than those indicated in this document)* should only be made by a design professional of record. Altered installation procedures and the performance of modified products are the sole responsibility of the design professional of record.

b. The building shall be designed in accordance with the appropriate building code and meet local, state, and federal requirements. Verify design requirements with the local building official. Concrete foundation design remains the responsibility of the design professional of record.

c. Strong-Wall® SB shearwalls are part of the overall lateral-force-resisting system of the structure. The design of this system, including a complete load path to transfer lateral forces from thestructure to the ground, is the responsibility of the design professional of record.

d. In addition to the information and instructions found in this catalog, all warnings, general notes and instructions, warranty information and terms and conditions of sale contained within the *Strong-Wall® Shearwall* catalog applies.

Table Of Contents

Strong-Wall® SB Shearwall Features and Benefits

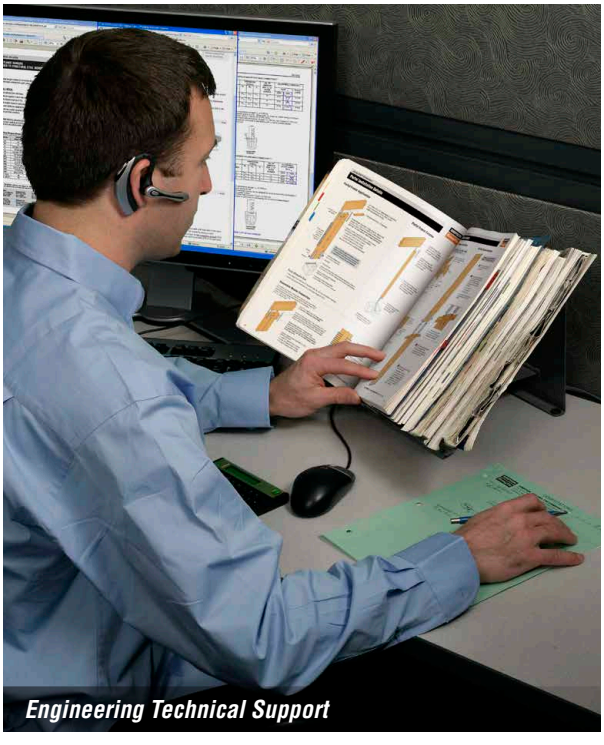
Code Listed

Delivering Easy-To-Install, Code-Listed Solutions

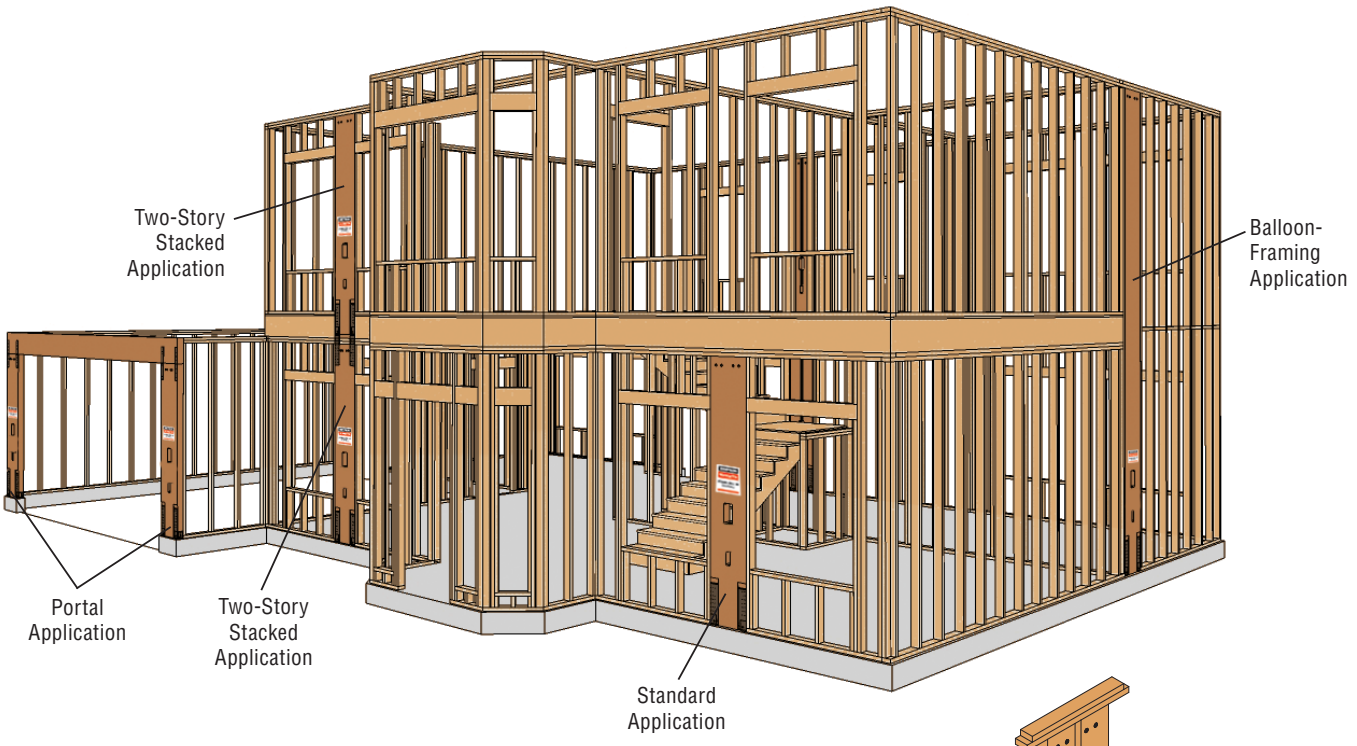
The Simpson Strong-Tie Strong-Wall® SB shearwall is a specially designed, prefabricated, engineered-wood panel that helps structures resist lateral forces such as those created by earthquakes and high winds. The Strong-Wall® SB shearwall has been evaluated to the 2012 International Building Code (IBC) and can help you resist these forces efficiently and confidently with the following features:

- Field adjustable – can be trimmed and drilled
- Suitable for residential, multi-family, and light-frame commercial construction
- Narrow panel widths have high allowable loads
- Works in tall wall and multi-story applications
- Code Listed: ICC-ES ESR-2652, City of L.A. RR-25730
- Simpson Strong-Tie provides unmatched engineering technical support for any issue

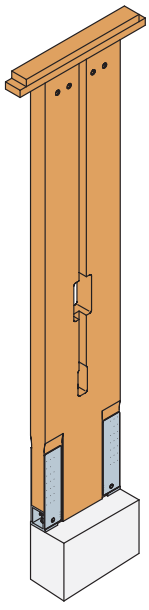

Field Adjustable


Engineering Technical Support

Strong-Wall® SB Shearwall Applications



Strong-Wall® SB shearwall may be trimmed in all applications.
See pages 18, 20, and 22 for details.



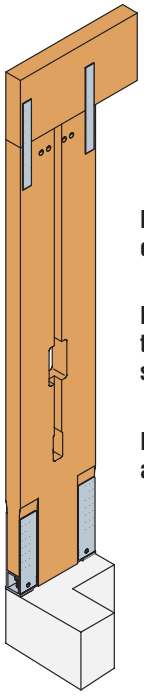
Convenient chase for wiring

Field drillable and trimmable

Simple connection to foundation for all applications

Standard and Balloon-Framing Applications

- Narrow wall spaces
- Wall heights up to 20'



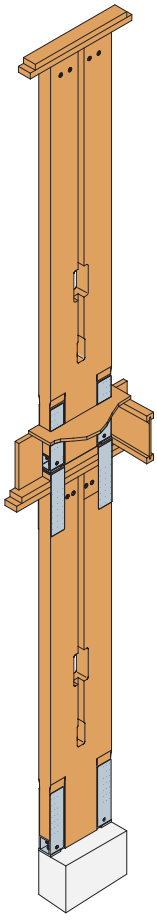
Easy header connections

Resists bowing, twisting, and shrinking

Field drillable and trimmable

Portal Applications

- Narrow wall spaces
- Garages
- Large windows and doors
- Increased capacities when used in a portal



MSK for two-story stacked applications, includes upper holdowns

Field drillable and trimmable

Two-Story Stacked Application

- Narrow wall spaces
- Multi-story installation kit (MSK) required *(order separately)*
- Total assembled heights up to 24'

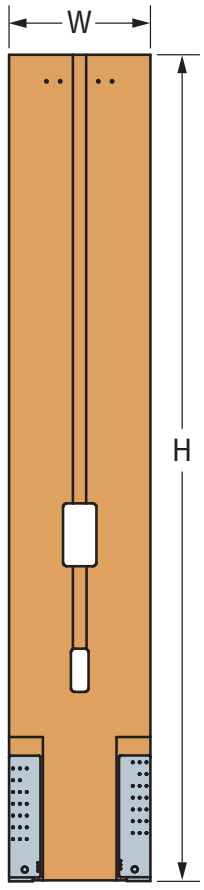
Strong-Wall® SB Shearwall Product Data

The products in this catalog are readily available through our nationwide network of distributors and dealers. For more information on other applications or other Strong-Wall® shearwall products, please contact your Simpson Strong-Tie® representative.

Strong-Wall® SB Shearwall Product Data

Model No.	W (in.)	H (in.)	Anchor Bolts		Number of Screws in Top of Wall	Total Wall Weight (lbs.)
			Quantity	Dia. (in.)		
SWSB12x7	12	78	2	⅞	6	100
SWSB18x7	18	78	2	⅞	8	145
SWSB12x7.5	12	85½	2	⅞	6	110
SWSB18x7.5	18	85½	2	⅞	8	155
SWSB12x8	12	93¼	2	⅞	6	115
SWSB18x8	18	93¼	2	⅞	8	165
SWSB24x8	24	93¼	2	1	12	220
SWSB12x9	12	105¼	2	⅞	6	125
SWSB18x9	18	105¼	2	⅞	8	180
SWSB24x9	24	105¼	2	1	12	240
SWSB12x10	12	117¼	2	⅞	6	135
SWSB18x10	18	117¼	2	⅞	8	200
SWSB24x10	24	117¼	2	1	12	265
SWSB12x11	12	129¼	2	⅞	6	150
SWSB18x11	18	129¼	2	⅞	8	215
SWSB24x11	24	129¼	2	1	12	290
SWSB12x12	12	141¼	2	⅞	6	160
SWSB18x12	18	141¼	2	⅞	8	235
SWSB24x12	24	141¼	2	1	12	315
SWSB18x13	18	153¼	2	⅞	8	250
SWSB24x13	24	153¼	2	1	12	340
SWSB18x20	18	240	2	⅞	8	385
SWSB24x20	24	240	2	1	12	515

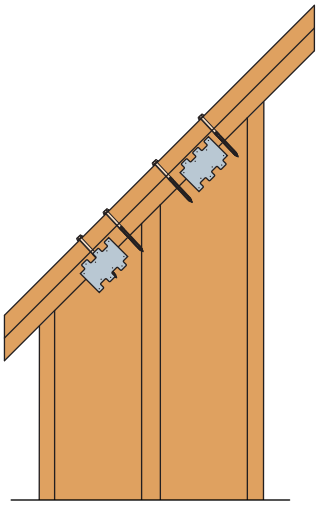
1. For heights not listed, order the next tallest panel and trim to fit. Minimum trimmed height for all panels is 74½".
2. All panels come with two pre-attached holdowns, two slotted hex nuts, two flat washers, SDS ¼" x 6¾" screws *(in quantities indicated in Table)*, and installation instructions.
3. All panels are 3½" thick.



Panel Naming Legend

SWSB18x8-93.25

- **SWSB** — Strong-Wall SB Shearwall
- **18** — Width (in.)
- **8** — Nominal Height (ft.)
- **93.25** — Actual Height (in.)

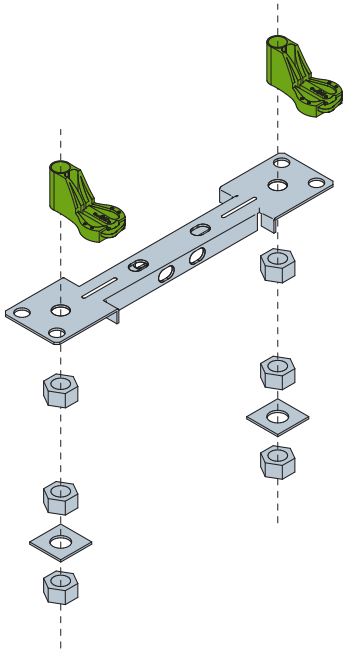


Rake Wall Application

Kit and Accessory Descriptions

Anchor Kits
(Sold separately)

Required for all panels, except the top panels in two-story stacked applications.



Anchor Kit Specifications

Strong-Wall SB Model No.	Anchor Kit Model No.	Contents
SWSB12	SWSB-AK12	(1) Anchor Reinforcement Template (2) Bolt Collar (2) Plate Washer (6) Heavy Hex Nuts Installation Instructions
SWSB18	SWSB-AK18	
SWSB24	SWSB-AK24	

1. Flat anchor reinforcement templates are available in 12", 18" and 24" lengths for CMU and adhesive anchor applications.
2. Order threaded rod separately. Rod should be high strength (HS) grade A449 or A193 B7 unless noted otherwise.

Anchor Kit Naming Legend

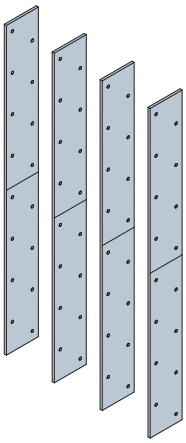
SWSB-AK 18

Kit Name — **Panel Width (in.)**

Portal Kits
(Included with all panels 100" or less in height)

Required for portal frame applications. Kit includes four portal straps and comes standard with all panels that are 100" or less in height. Order the kit separately if using panels that are more than 100" tall in a portal application.

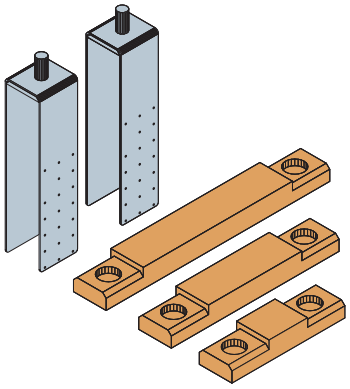
Model No.: SWSB-PS



Multi-Story Kits (MSK)

Required for two-story stacked applications. One universal MSK fits all panel widths and includes two holdowns with pre-attached bolts and 12", 18", and 24" bearing blocks. Use the bearing block that matches the width of the top panel. See page 21, two-story stacked installation details.

Model No.: SWSB-MSK



Accessories *(Sold separately)*

Concrete Bearing Plates (Model No.: SWSB-CBP4, SWSB-CBP6)

Supplemental steel bearing plates (⅜" x 3½" x 4¼" for 12" and 18" wide panels, and ⅜" x 3½" x 6½" for 24" wide panels) are available to increase allowable design values. Use in engineered-design applications when specified by the design professional. The allowable design load tables in ICC-ES ESR-2652 indicate when bearing plates are required.

Flat Anchor-Reinforcement Template (Model No.: SWSB-FT12, SWSB-FT18, SWSB-FT24)

The flat anchor reinforcement template is a steel plate that is required when placing the panel on concrete masonry unit (CMU) walls. This plate transfers the lateral shear force from the Strong-Wall® SB shearwall to the CMU wall.

C-Shims (Model No.: SWSB-CS1)

⅛"-thick metal c-shims are used to level panels on uneven concrete. They slip around the anchor bolts, under the Strong-Wall SB shearwall.

Standard and Balloon-Framing Applications on Concrete Foundation

SIMPSON Strong-Tie®

Strong-Wall® SB Shearwall Standard Application on Concrete Foundation

Model No.	Allow. Vertical Load, P (lbs.)	2,500 psi Concrete						3,000 psi Concrete					
		Seismic			Wind			Seismic			Wind		
		Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)
SWSB24x7	4000	5150	0.29	20800	5200	0.30	21000	5150	0.29	20800	5200	0.30	21000
	6000	5150	0.29	20800	5182	0.29	20930	5150	0.29	20800	5200	0.30	21000
	8000	5150	0.29	20800	4935	0.28	19930	5150	0.29	20800	5200	0.30	21000
SWSB12x8	4500	905	0.38	9715	995	0.43	10680	905	0.38	9715	995	0.43	10680
SWSB18x8	0	2215	0.37	14185	2293	0.41	14685	2215	0.37	14185	2435	0.44	15590
	2000	2215	0.37	14185	2137	0.39	13685	2215	0.37	14185	2435	0.44	15590
	4000	2215	0.37	14185	1981	0.36	12685	2215	0.37	14185	2338	0.42	14970
	6000	2152	0.36	13780	1825	0.33	11685	2215	0.37	14185	2182	0.39	13970
	8000	1996	0.33	12780	1669	0.30	10685	2215	0.37	14185	2025	0.37	12965
SWSB24x8	0	4435	0.37	21415	4880	0.42	23565	4435	0.37	21415	4880	0.42	23565
	2000	4435	0.37	21415	4749	0.41	22930	4435	0.37	21415	4880	0.42	23565
	4000	4435	0.37	21415	4542	0.39	21930	4435	0.37	21415	4880	0.42	23565
	6000	4435	0.37	21415	4335	0.37	20930	4435	0.37	21415	4880	0.42	23565
	8000	4435	0.37	21415	4128	0.35	19930	4435	0.37	21415	4880	0.42	23565
SWSB12x9	4500	790	0.43	9570	890	0.48	10780	790	0.43	9570	890	0.48	10780
SWSB18x9	0	1905	0.43	13770	2032	0.50	14685	1905	0.43	13770	2090	0.51	15105
	1000	1905	0.43	13770	1963	0.48	14190	1905	0.43	13770	2090	0.51	15105
	2000	1905	0.43	13770	1893	0.46	13680	1905	0.43	13770	2090	0.51	15105
	4000	1905	0.43	13770	1755	0.43	12685	1905	0.43	13770	2071	0.51	14970
	6000	1905	0.43	13770	1617	0.39	11685	1905	0.43	13770	1933	0.47	13970
	8000	1769	0.40	12785	1478	0.36	10680	1905	0.43	13770	1794	0.44	12965
SWSB24x9	0	3905	0.42	21280	4295	0.47	23405	3905	0.42	21280	4295	0.47	23405
	2000	3905	0.42	21280	4208	0.46	22935	3905	0.42	21280	4295	0.47	23405
	4000	3905	0.42	21280	4024	0.44	21930	3905	0.42	21280	4295	0.47	23405
	6000	3905	0.42	21280	3841	0.42	20935	3905	0.42	21280	4295	0.47	23405
	8000	3905	0.42	21280	3657	0.40	19930	3905	0.42	21280	4295	0.47	23405
SWSB12x10	4500	605	0.49	8165	665	0.54	8975	605	0.49	8165	665	0.54	8975
SWSB18x10	0	1725	0.48	13890	1824	0.55	14685	1725	0.48	13890	1895	0.57	15260
	1000	1725	0.48	13890	1762	0.53	14185	1725	0.48	13890	1895	0.57	15260
	2000	1725	0.48	13890	1700	0.51	13690	1725	0.48	13890	1895	0.57	15260
	4000	1725	0.48	13890	1575	0.47	12680	1725	0.48	13890	1859	0.56	14970
	6000	1712	0.48	13785	1451	0.44	11685	1725	0.48	13890	1735	0.52	13970
	8000	1588	0.44	12785	1327	0.40	10685	1725	0.48	13890	1611	0.48	12970
SWSB24x10	0	3325	0.47	20185	3660	0.53	22220	3325	0.47	20185	3660	0.53	22220
	2000	3325	0.47	20185	3660	0.53	22220	3325	0.47	20185	3660	0.53	22220
	4000	3325	0.47	20185	3612	0.52	21930	3325	0.47	20185	3660	0.53	22220
	6000	3325	0.47	20185	3448	0.50	20935	3325	0.47	20185	3660	0.53	22220
	8000	3325	0.47	20185	3283	0.48	19930	3325	0.47	20185	3660	0.53	22220
SWSB12x11	4500	545	0.54	8110	600	0.60	8925	545	0.54	8110	600	0.60	8925
SWSB18x11	0	1530	0.53	13580	1654	0.63	14680	1530	0.53	13580	1685	0.64	14955
	1000	1530	0.53	13580	1598	0.61	14185	1530	0.53	13580	1685	0.64	14955
	2000	1530	0.53	13580	1542	0.59	13685	1530	0.53	13580	1685	0.64	14955
	4000	1530	0.53	13580	1429	0.54	12685	1530	0.53	13580	1685	0.64	14955
	6000	1530	0.53	13580	1316	0.50	11680	1530	0.53	13580	1574	0.60	13970
	8000	1440	0.50	12780	1204	0.46	10685	1530	0.53	13580	1461	0.56	12965

See footnotes on page 11.

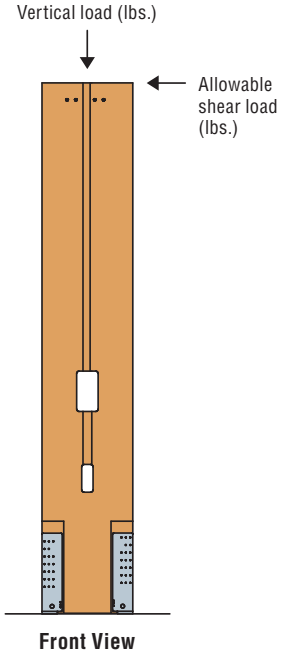
Standard and Balloon-Framing Applications on Concrete Foundation

SIMPSON Strong-Tie®

Strong-Wall® SB Shearwall Standard Application on Concrete Foundation *(cont.)*

Model No.	Allow. Vertical Load, P (lbs.)	2500 psi Concrete						3000 psi Concrete					
		Seismic			Wind			Seismic			Wind		
		Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)
SWSB24x11	2000	3010	0.52	20145	3315	0.59	22185	3010	0.52	20145	3315	0.59	22185
	4000	3010	0.52	20145	3277	0.58	21930	3010	0.52	20145	3315	0.59	22185
	6000	3010	0.52	20145	3127	0.55	20930	3010	0.52	20145	3315	0.59	22185
	8000	3010	0.52	20145	2978	0.53	19930	3010	0.52	20145	3315	0.59	22185
SWSB12x12	4500	485	0.59	7885	535	0.65	8700	485	0.59	7885	535	0.65	8700
SWSB18x12	0	1340	0.59	12995	1475	0.70	14305	1340	0.59	12995	1475	0.70	14305
	2000	1340	0.59	12995	1411	0.67	13685	1340	0.59	12995	1475	0.70	14305
	4000	1340	0.59	12995	1308	0.62	12685	1340	0.59	12995	1475	0.70	14305
	6000	1340	0.59	12995	1205	0.57	11690	1340	0.59	12995	1440	0.68	13965
	8000	1318	0.58	12785	1102	0.52	10690	1340	0.59	12995	1337	0.63	12970
SWSB24x12	4000	2695	0.57	19710	2965	0.64	21685	2695	0.57	19710	2965	0.64	21685
	6000	2695	0.57	19710	2862	0.62	20930	2695	0.57	19710	2965	0.64	21685
	8000	2695	0.57	19710	2725	0.59	19930	2695	0.57	19710	2965	0.64	21685
SWSB18x13	1000	1200	0.64	12630	1320	0.74	13890	1200	0.64	12630	1320	0.74	13890
	2000	1200	0.64	12630	1300	0.73	13680	1200	0.64	12630	1320	0.74	13890
	3010	1200	0.64	12630	1252	0.70	13175	1200	0.64	12630	1320	0.74	13890
SWSB24x13	2000	2440	0.63	19360	2685	0.70	21305	2440	0.63	19360	2685	0.70	21305
	4000	2440	0.63	19360	2685	0.70	21305	2440	0.63	19360	2685	0.70	21305
	4850	2440	0.63	19360	2685	0.70	21305	2440	0.63	19360	2685	0.70	21305
SWSB18x14	3010	1030	0.69	11885	1130	0.78	13035	1030	0.69	11885	1130	0.78	13035
SWSB24x14	4850	2130	0.69	18530	2340	0.77	20355	2130	0.69	18530	2340	0.77	20355
SWSB18x16	3010	770	0.77	10150	845	0.86	11140	770	0.77	10150	845	0.86	11140
SWSB24x16	4850	1650	0.80	16405	1815	0.89	18045	1650	0.80	16405	1815	0.89	18045
SWSB18x18	3010	660	0.87	9790	725	0.97	10755	660	0.87	9790	725	0.97	10755
SWSB24x18	4850	1400	0.90	15660	1540	1.00	17225	1400	0.90	15660	1540	1.00	17225
SWSB18x20	3010	550	0.97	9065	605	1.08	9970	550	0.97	9065	605	1.08	9970
SWSB24x20	4850	1150	1.00	14290	1265	1.11	15720	1150	1.00	14290	1265	1.11	15720

1. Load values include evaluation of bearing stresses on concrete foundation with compressive strengths (f'_c) as listed and do not require further evaluation by the Designer. For higher load values *(on certain models)*, specify bearing plates on page 9 and refer to ICC-ES ESR-2652 for loads. For installations on masonry foundations, bearing capacity shall be evaluated by the Designer.
2. Seismic design based on 2012 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. The applied vertical load shall be point load applied at center of SWSB or uniformly distributed load not exceeding the allowable vertical load. If eccentric vertical load is applied, the allowable vertical load shall be divided by two.
4. Anchor tension based on design shear may be determined using equation on page 24.
5. Allowable shear, drift, and anchor tension values may be interpolated for intermediate height or vertical loads. For panels trimmed to less than 93¼" tall, use the values for a 93¼" panel.
6. All panels taller than 18' require a 2x6 minimum full-height stud attached to each side. Attach using 10d common nails at 16" o.c.
7. SWSB24x7 must be trimmed from a SWSB24x8 panel; 14', 16', and 18' tall panels are trimmed from a 20' tall panel.



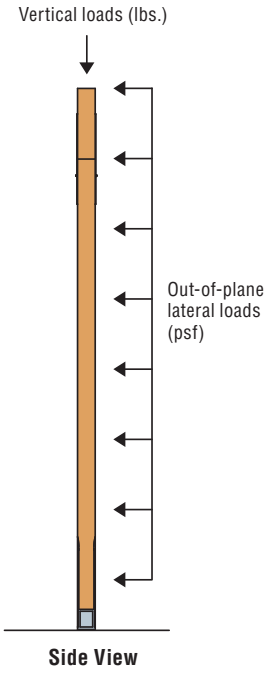
Front View

Out-Of-Plane Lateral Loads

Strong-Wall® SB Shearwall Allowable Out-of-Plane Lateral Loads (PSF)

Nominal SWSB Height, h (ft.)	Attached to Double Top Plate			Attached to Header[2]		
	SWSB Width, W (in.)			SWSB Width, W (in.)		
	12	18	24	12	18	24
7	—	—	—	275	185	140
7½	—	—	—	255	170	125
8	305	300	300	230	155	115
9	210	210	210	205	135	105
10	150	150	150	150	125	90
11	110	110	110	110	110	85
12	85	85	85	85	85	75
13	—	65	65	—	—	—
14	—	50	50	—	—	—
16	—	35	35	—	—	—
18	—	25	25	—	—	—
20	—	15	15	—	—	—

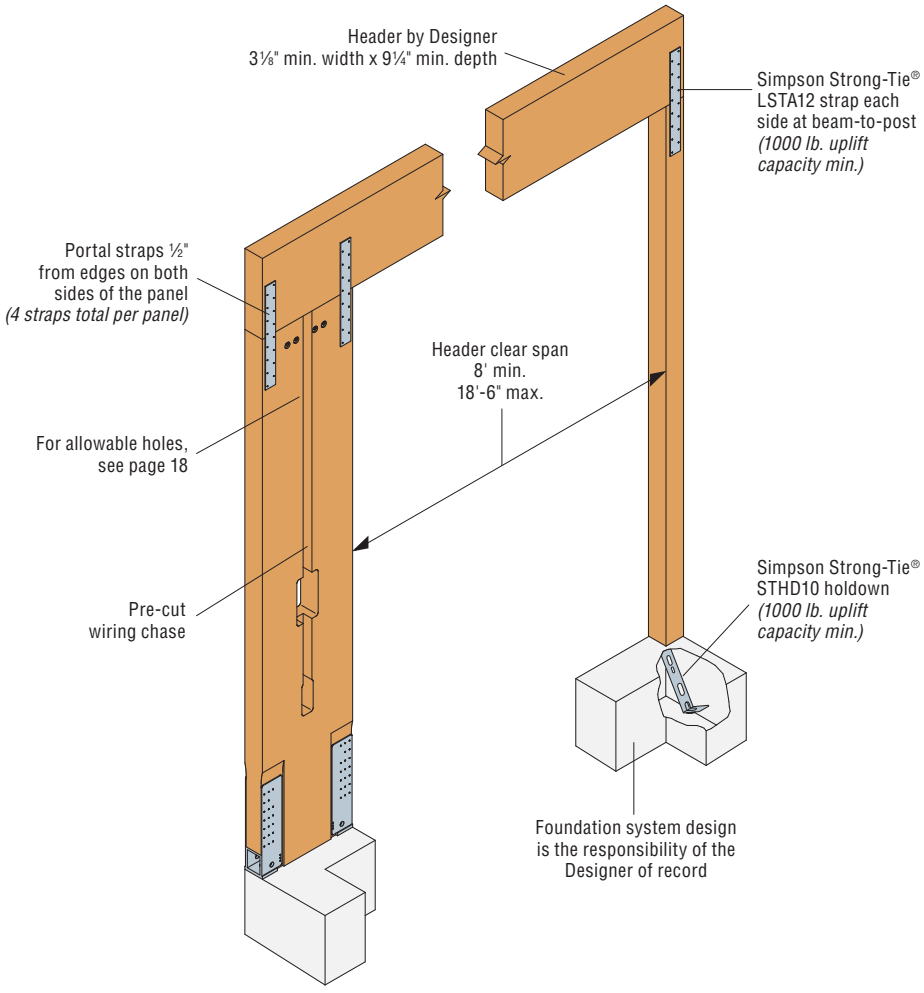
1. Loads shown are at ASD level in pounds per square foot (PSF) of wall with no further increase allowed.
2. Loads shown for portal applications require use of portal kit to resist header rotation.
3. Table loads assume a max header depth of 14". Use a load reduction factor of 0.88 and 0.78 for 16" and 18" deep headers, respectively.
4. Loads consider a deflection limit of h/240.
5. Out-of-plane loads act in combination with total vertical load.



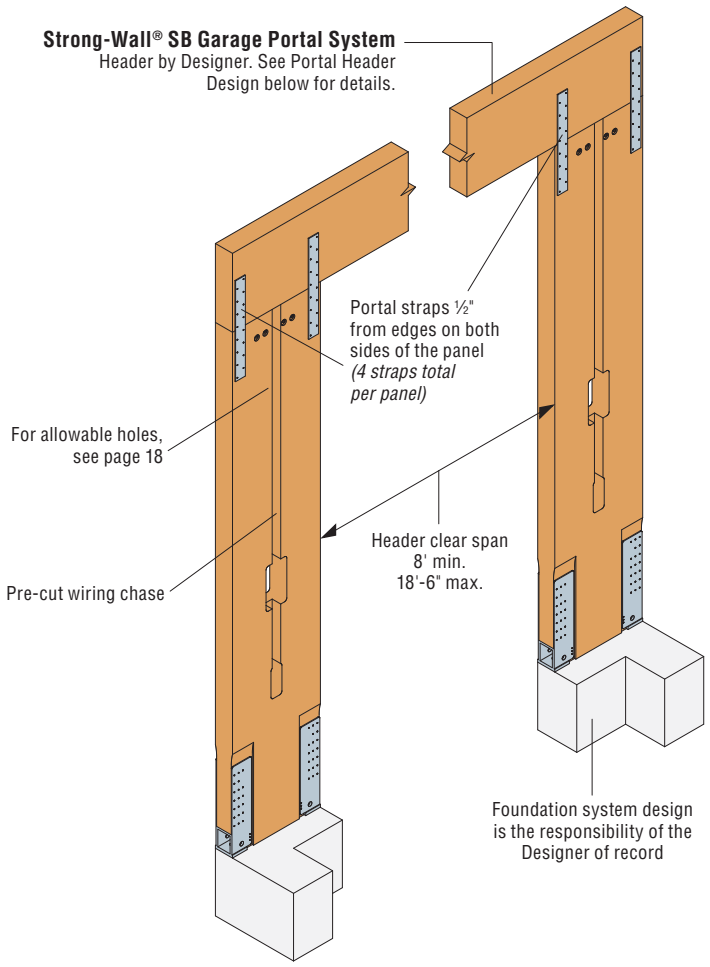
Single-Portal Design

Installation Notes

- Portal frame assemblies must be connected directly to a concrete foundation or footing.
- Panels may be trimmed to a minimum height of 74½".
- For shimming and furring requirements, see details on pages 20-22.
- Panels may be used in 2x4 or 2x6 wall framing. See details on pages 20-22 for header framing options.
- For exact panel heights, see product table on page 8.
- The portal kit must be ordered separately for panels over 100" tall.



Double-Portal Design



Portal Design information

Using Strong-Wall® SB in Portal-Frame Assemblies

Portal applications in this section require the panel-to-header connection details shown throughout this catalog. Increased shear capacity due to the portal acting as a system has been accounted for in the **Allowable Shear and Tension** values, where applicable.

- For portal installation details, see pages 20-22.
- For drilling and trimming information, see page 18.

Induced Forces

A portal frame under lateral loads causes the portal header to experience internal stresses in addition to those created by the primary loads *(like live, dead and snow)*. These additional stresses are called induced forces and must be considered when designing portal headers.

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 and the induced stresses from wind and seismic loads. See ICC-ES ESR-2652 for more information.

Portal Header Design

Both lateral and vertical allowable design loads shown in this catalog for portal frames assume that the header size falls within the portal frame parameters listed below, and that the header and panels are connected per details on pages 20-22.

Strong-Wall® SB Shearwall
Portal Header Allowable Design Parameters

Header Design Parameter	Allowable Range
Width	3⅛" - 5½"
Depth	9¼" - 18"
Clear Span	8' - 18'-6"
K	90 lb./in. - 4000 lb./in.

1. Single or multiple-ply header members may be used.
2. Secondary moment, shear, and axial force shall be considered in header design. See ICC-ES ESR-2652 for induced forces.
3. Header design shall be by designer and assume gravity loads only induce simple span moments in beam.
4. Header stiffness for use in SWSB 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.)

Garage Single-Portal System on Concrete Foundation

SIMPSON Strong-Tie®

Strong-Wall® SB Shearwall Single-Portal Application on Concrete Foundation

Model No.	Allow. Vertical Load, P (lbs.)	2,500 psi Concrete						3,000 psi Concrete					
		Seismic			Wind			Seismic			Wind		
		Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)
SWSB12x7	8000	1300	0.27	9340	1430	0.33	10270	1300	0.27	9340	1430	0.33	10270
SWSB18x7	0	2800	0.31	13500	3046	0.36	14685	2800	0.31	13500	3080	0.36	14845
	2000	2800	0.31	13500	2839	0.33	13685	2800	0.31	13500	3080	0.36	14845
	4000	2800	0.31	13500	2631	0.31	12685	2800	0.31	13500	3080	0.36	14845
	6000	2800	0.31	13500	2424	0.28	11685	2800	0.31	13500	2898	0.34	13970
	8000	2652	0.29	12785	2216	0.26	10680	2800	0.31	13500	2690	0.31	12965
SWSB24x7	4000	5150	0.29	20800	5200	0.30	21000	5150	0.29	20800	5200	0.30	21000
	6000	5150	0.29	20800	5182	0.30	20930	5150	0.29	20800	5200	0.30	21000
	8000	5150	0.29	20800	4935	0.28	19930	5150	0.29	20800	5200	0.30	21000
SWSB12x7.5	8000	1200	0.31	9450	1320	0.38	10395	1200	0.31	9450	1320	0.38	10395
SWSB18x7.5	0	2625	0.33	13870	2779	0.39	14685	2625	0.33	13870	2885	0.40	15245
	2000	2625	0.33	13870	2590	0.36	13685	2625	0.33	13870	2885	0.40	15245
	4000	2625	0.33	13870	2400	0.33	12680	2625	0.33	13870	2833	0.39	14970
	6000	2608	0.33	13780	2211	0.31	11685	2625	0.33	13870	2644	0.37	13970
	8000	2419	0.30	12780	2022	0.28	10685	2625	0.33	13870	2454	0.34	12965
SWSB12x8	8000	1100	0.35	9445	1210	0.42	10390	1100	0.35	9445	1210	0.42	10390
SWSB18x8	0	2450	0.36	14120	2548	0.41	14685	2450	0.36	14120	2695	0.43	15530
	2000	2450	0.36	14120	2375	0.38	13685	2450	0.36	14120	2695	0.43	15530
	4000	2450	0.36	14120	2201	0.35	12685	2450	0.36	14120	2597	0.41	14965
	6000	2392	0.35	13785	2027	0.32	11680	2450	0.36	14120	2424	0.39	13970
	8000	2218	0.33	12785	1854	0.30	10685	2450	0.36	14120	2250	0.36	12965
SWSB24x8	0	4435	0.37	21415	4880	0.42	23565	4435	0.37	21415	4880	0.42	23565
	2000	4435	0.37	21415	4749	0.41	22930	4435	0.37	21415	4880	0.42	23565
	4000	4435	0.37	21415	4542	0.39	21930	4435	0.37	21415	4880	0.42	23565
	6000	4435	0.37	21415	4335	0.37	20930	4435	0.37	21415	4880	0.42	23565
	8000	4435	0.37	21415	4128	0.36	19930	4435	0.37	21415	4880	0.42	23565
SWSB12x9	8000	790	0.43	9570	882	0.48	10685	790	0.43	9570	890	0.48	10780
SWSB18x9	0	1905	0.43	13770	2032	0.50	14685	1905	0.43	13770	2090	0.51	15105
	2000	1905	0.43	13770	1893	0.46	13680	1905	0.43	13770	2090	0.51	15105
	4000	1905	0.43	13770	1755	0.43	12685	1905	0.43	13770	2071	0.51	14970
	6000	1905	0.43	13770	1617	0.39	11685	1905	0.43	13770	1933	0.47	13970
	8000	1769	0.40	12785	1478	0.36	10680	1905	0.43	13770	1794	0.44	12965
SWSB24x9	0	3905	0.42	21280	4295	0.47	23405	3905	0.42	21280	4295	0.47	23405
	2000	3905	0.42	21280	4208	0.46	22935	3905	0.42	21280	4295	0.47	23405
	4000	3905	0.42	21280	4024	0.44	21930	3905	0.42	21280	4295	0.47	23405
	6000	3905	0.42	21280	3841	0.42	20935	3905	0.42	21280	4295	0.47	23405
	8000	3905	0.42	21280	3657	0.40	19930	3905	0.42	21280	4295	0.47	23405

1. Load values include evaluation of bearing stresses on concrete foundation with compressive strengths (f'_c) as listed and do not require further evaluation by the Designer. For higher load values *(on certain models)*, specify bearing plates on page 9 and refer to ICC-ES ESR-2652 for loads. For installations on masonry foundations, bearing capacity shall be evaluated by the Designer.
2. Seismic design based on 2012 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. The applied vertical load shall be point load applied at center of SWSB or uniformly distributed load not exceeding the allowable vertical load. If eccentric vertical load is applied, the allowable vertical load shall be divided by two.
4. Anchor tension based on design shear may be determined using equation on page 24.
5. Allowable shear, drift, and anchor tension values may be interpolated for intermediate height or vertical loads. For panels trimmed to less than 78" tall, use the values for a 78" panel.
6. SWSB24x7 must be trimmed from a SWSB24x8 panel.

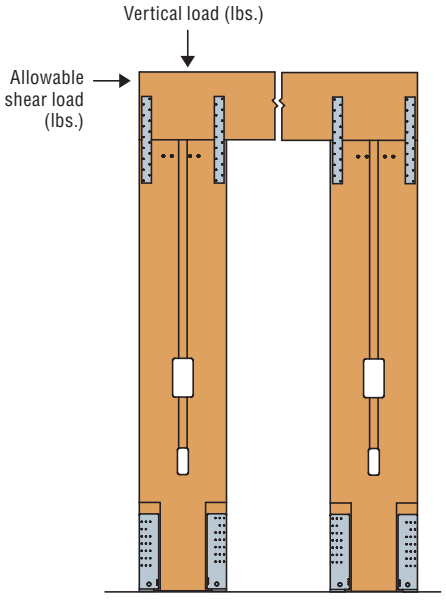
Garage Double-Portal System on Concrete Foundation

SIMPSON Strong-Tie®

Strong-Wall® SB Shearwall Double-Portal Application on Concrete Foundation

Model No.	Allow. Vertical Load, P (lbs.)	2,500 psi Concrete						3,000 psi Concrete					
		Seismic			Wind			Seismic			Wind		
		Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lbs.)
SWSB12x7	6000	2730	0.29	9805	3000	0.31	10775	2730	0.29	9805	3000	0.31	10775
	8000	2730	0.29	9805	2975	0.31	10685	2730	0.29	9805	3000	0.31	10775
SWSB18x7	0	5600	0.30	13500	6092	0.33	14685	5600	0.30	13500	6160	0.33	14845
	2000	5600	0.30	13500	5677	0.30	13685	5600	0.30	13500	6160	0.33	14845
	4000	5600	0.30	13500	5263	0.28	12685	5600	0.30	13500	6160	0.33	14845
	6000	5600	0.30	13500	4848	0.26	11685	5600	0.30	13500	5796	0.31	13970
	8000	5303	0.28	12780	4433	0.24	10685	5600	0.30	13500	5381	0.29	12970
SWSB24x7	8000	10300	0.29	20800	10400	0.30	21000	10300	0.29	20800	10400	0.30	21000
SWSB12x7.5	6000	2520	0.32	9920	2770	0.35	10905	2520	0.32	9920	2770	0.35	10905
	8000	2520	0.32	9920	2714	0.34	10685	2520	0.32	9920	2770	0.35	10905
SWSB18x7.5	0	5380	0.34	14215	5558	0.35	14685	5380	0.34	14215	5910	0.37	15615
	2000	5380	0.34	14215	5179	0.32	13685	5380	0.34	14215	5910	0.37	15615
	4000	5380	0.34	14215	4801	0.30	12685	5380	0.34	14215	5666	0.35	14970
	6000	5217	0.33	13785	4422	0.28	11685	5380	0.34	14215	5287	0.33	13970
	8000	4838	0.31	12780	4044	0.25	10685	5380	0.34	14215	4909	0.31	12970
SWSB12x8	6000	2310	0.35	9920	2540	0.39	10905	2310	0.35	9920	2540	0.39	10905
	8000	2310	0.35	9920	2489	0.38	10685	2310	0.35	9920	2540	0.39	10905
SWSB18x8	0	5150	0.37	14840	5096	0.36	14685	5150	0.37	14840	5665	0.40	16325
	2000	5150	0.37	14840	4749	0.34	13685	5150	0.37	14840	5542	0.39	15970
	4000	5130	0.37	14780	4402	0.31	12685	5150	0.37	14840	5195	0.37	14970
	6000	4783	0.34	13780	4055	0.29	11685	5150	0.37	14840	4848	0.34	13970
	8000	4436	0.32	12785	3708	0.26	10685	5150	0.37	14840	4501	0.32	12970
SWSB24x8	2000	8870	0.37	21415	9760	0.42	23565	8870	0.37	21415	9760	0.42	23565
	4000	8870	0.37	21415	9672	0.42	23350	8870	0.37	21415	9760	0.42	23565
	6000	8870	0.37	21415	9231	0.40	22285	8870	0.37	21415	9760	0.42	23565
	8000	8870	0.37	21415	8790	0.38	21220	8870	0.37	21415	9760	0.42	23565
SWSB12x9	6000	1580	0.43	9570	1780	0.48	10780	1580	0.43	9570	1780	0.48	10780
	8000	1580	0.43	9570	1764	0.48	10685	1580	0.43	9570	1780	0.48	10780
SWSB18x9	0	3810	0.43	13770	4064	0.50	14685	3810	0.43	13770	4180	0.51	15105
	2000	3810	0.43	13770	3787	0.46	13685	3810	0.43	13770	4180	0.51	15105
	4000	3810	0.43	13770	3510	0.43	12685	3810	0.43	13770	4142	0.51	14970
	6000	3810	0.43	13770	3233	0.39	11685	3810	0.43	13770	3866	0.47	13970
	8000	3537	0.40	12780	2957	0.36	10685	3810	0.43	13770	3589	0.44	12970
SWSB24x9	2000	7810	0.42	21280	8590	0.47	23405	7810	0.42	21280	8590	0.47	23405
	4000	7810	0.42	21280	8569	0.47	23350	7810	0.42	21280	8590	0.47	23405
	6000	7810	0.42	21280	8178	0.45	22285	7810	0.42	21280	8590	0.47	23405
	8000	7810	0.42	21280	7788	0.43	21220	7810	0.42	21280	8590	0.47	23405

1. Load values include evaluation of bearing stresses on concrete foundation with compressive strengths (f'_c) as listed and do not require further evaluation by the Designer. For higher load values *(on certain models)*, specify bearing plates on page 9 and refer to ICC-ES ESR-2652 for loads. For installations on masonry foundations, bearing capacity shall be evaluated by the Designer.
2. Seismic design based on 2012 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. The applied vertical load shall be point load applied at center of SWSB or uniformly distributed load not exceeding the allowable vertical load. If eccentric vertical load is applied, the allowable vertical load shall be divided by two.
4. Anchor tension based on design shear may be determined using equation on page 24.
5. Allowable shear, drift, and anchor tension values may be interpolated for intermediate height or vertical loads. For panels trimmed to less than 78" tall, use the values for a 78" panel.
6. SWSB24x7 must be trimmed from a SWSB24x8 panel.
7. Allowable shear and drift values are for the double-wall portal assembly. Allowable axial and anchor tension values are per panel.



Front View

Two-Story Stacked on Concrete Foundation

Strong-Wall® SB Shearwall Second-Story Walls – Stacked Application on Concrete Foundation

Model No.	W (in.)	H (in.)	Allow. Vertical Load, P (lbs.)	Seismic		Wind	
				Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)	Allowable ASD Shear Load, V (lbs.)	Drift at Allowable Shear, Δ (in.)
SWSB12x9	12	105¼	2000	500	0.44	550	0.50
SWSB18x9	18	105¼	2000	1225	0.42	1345	0.48
SWSB24x9	24	105¼	2000	2165	0.41	2380	0.46
SWSB18x10	18	117¼	2000	1125	0.47	1235	0.53
SWSB24x10	24	117¼	2000	1990	0.46	2190	0.52
SWSB18x11	18	129¼	2000	1020	0.52	1120	0.59
SWSB24x11	24	129¼	2000	1815	0.51	1995	0.59
SWSB18x12	18	141¼	2000	920	0.57	1010	0.64
SWSB24x12	24	141¼	2000	1640	0.57	1805	0.65

1. Seismic design based on 2012 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.
2. Allowable shear and drift values may be interpolated for intermediate heights. Minimum second-story SWSB height is 105¼".
3. The applied vertical load shall be point load applied at center of SWSB or uniformly distributed load not exceeding the allowable vertical load. If eccentric vertical load is applied, the allowable vertical load shall be divided by two.

Strong-Wall® SB Shearwall First-Story Walls – Stacked Application on Concrete Foundation

Model No.	W (in.)	H (in.)	Allow. Vertical Load, P (lbs.)	$Kx10^9$ (lb-in.^{2})	Seismic	Wind
					Allowable ASD Shear Load, V (lbs.)	Allowable ASD Shear Load, V (lbs.)
SWSB18x8	18	93¼	4000	9.7	2215	2435
SWSB24x8	24	93¼	4000	19.4	4435	4880
SWSB18x9	18	105¼	4000	10.3	1905	2090
SWSB24x9	24	105¼	4000	21.5	3905	4295
SWSB18x10	18	117¼	4000	11.6	1725	1895
SWSB24x10	24	117¼	4000	22.6	3325	3660
SWSB18x11	18	129¼	4000	12.5	1530	1685
SWSB24x11	24	129¼	4000	24.8	3010	3315
SWSB18x12	18	141¼	4000	12.8	1340	1475
SWSB24x12	24	141¼	4000	26.5	2695	2965

1. Allowable shear values may be interpolated for intermediate heights. Minimum first-story SWSB height is 93¼".
2. The maximum allowable vertical load is 2,000 lbs. for the second-story panel and 4,000 for the first-story panel for a total vertical load of 6,000 lbs. in combination with the allowable shear.
3. The applied vertical load shall be point load applied at center of SWSB or uniformly distributed load not exceeding the allowable vertical load. If eccentric vertical load is applied, the allowable vertical load shall be divided by two.
4. First-floor panel drift must comply with code drift limits. Calculate the drift using the equation shown below.

Strong-Wall® SB Shearwall Maximum Allowable Overturning Base Moment

First-Floor SWSB Width (in.)	Allow. Vertical Load, P (lbs.)	2,500 psi Concrete				3,000 psi Concrete			
		Seismic		Wind		Seismic		Wind	
		Allowable ASD Base Moment (lb.-in.)	Anchor Tension at Allow. Base Mom. (lbs.)	Allowable ASD Base Moment (lb.-in.)	Anchor Tension at Allow. Base Mom. (lbs.)	Allowable ASD Base Moment (lb.-in.)	Anchor Tension at Allow. Base Mom. (lbs.)	Allowable ASD Base Moment (lb.-in.)	Anchor Tension at Allow. Base Mom. (lbs.)
18	0	216115	14840	213845	14685	216115	14840	237740	16325
	2000	216115	14840	199280	13685	216115	14840	232555	15970
	4000	215270	14780	184715	12685	216115	14840	217995	14970
	6000	200705	13780	170155	11685	216115	14840	203430	13970
24	0	413590	11190	455015	11075	413590	11190	455015	12310
	2000	413590	11190	442845	10320	413590	11190	455015	12040
	4000	413590	11145	423535	9565	413590	11190	455015	11290
	6000	413590	10390	404220	8810	413590	11190	455015	10535

1. Load values include evaluation of bearing stresses on concrete foundation with compressive strengths (f'_C) as listed and do not require further evaluation by the Designer. For higher load values *(on certain models)*, specify bearing plates on page 9 and refer to ICC-ES ESR-2652 for loads. For installations on masonry foundations, bearing capacity shall be evaluated by the Designer.
2. Seismic design based on 2012 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. Anchor tension based on overturning moment may be determined using equation on page 24.
4. Values in this table may not be interpolated.

Drift Equation for First Floor Panels

$$\Delta = \frac{h_1^2}{K}(3V_2h_3 + 2V_{base}h_1)$$ where:

Δ = deflection at the top of the first-floor panel (in.)

h_1 = first-floor panel height: Top of concrete to the bottom of the second-floor top plates (in.)

h_2 = total assembly height: Top of concrete to the bottom of the second-floor top plates (in.)

h_3 = second-floor panel height (h_4 minus 2"): Top of the LSL bearing block to the bottom of the second-floor top plates (in.)

h_4 = top of first-floor top plates to the bottom of the second-floor top plates (in.)

V_1 = applied shear load on first-floor panel (lbs.)

V_2 = applied shear load on second-floor panel (lbs.)

$V_{base} = V_1 + V_2$ (lbs.)

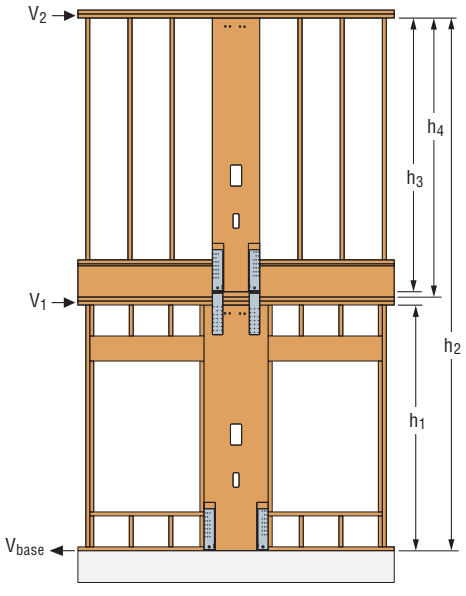
K = from table (lb-in^2)

Installation Notes

- The second-story panel must be the same width or narrower than the first-floor panel.
- When specifing the height of second-floor panels, add the total floor height, including sheathing, to the wall height, then subtract 2"; see h_3 at right. Maximum height for second-floor panels is 141¼".

Shear capacities shown are for individual panels only. To resist forces at both upper and lower floors in a two-story application, check the shear at each floor against the maximum capacity for EACH panel. Check the overturning moment (OM) against the maximum capacity for the system. See page 17 for an example.

OM = $(V_2h_2) + (V_1h_1)$

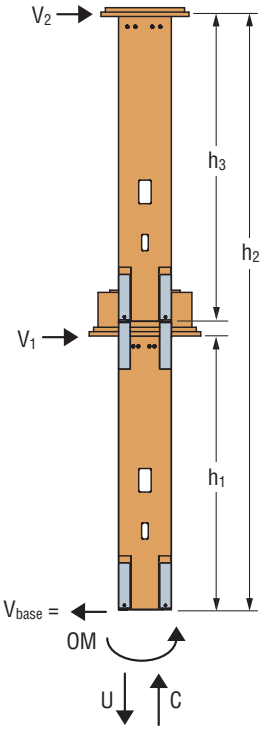


Two-Story Stacked on Concrete Foundation

Designing For Cumulative Overturning Forces

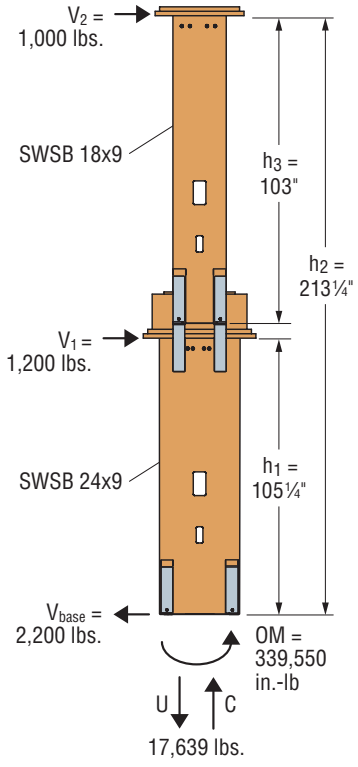
When specifying two-story stacked applications, it is important to consider cumulative overturning. Analysis should be performed by following these steps:

1. Analyze the structure to determine the shear forces at each floor. The detail at right illustrates the forces developed in a two-story stacked application.
2. Select a Strong-Wall® SB shearwall for each floor and verify that the shear capacity of the panel meets or exceeds what is required. See below for more information.
3. Calculate the system's overturning moment and shear.
4. Compare the required forces to the Strong-Wall SB shearwall allowable base moment.



Elevation of stacked panels and the structural forces developed during lateral events

Design Example



Given

- Seismic, f'_c = 2,500 psi
- First-story wall height = 9'; shearwall choice = SWSB 24x9
- Second-story wall height = 8'; joist height = 11⅞"; h_3 = 103"; shearwall choice = SWSB 18x9
- Second-story panel shear, V_2 = 1,000 lbs.
  First-story panel shear, V_1 = 1,200 lbs.
  Shear at footing, V_{base} = 2,200 lbs.

Solution

1. From the **Maximum Allowable Overturning Base Moment** table on page 16, the maximum overturning base moment (OM_{max}) is 413,590 in.-lb.
2. Compare the shear at each panel to the maximum allowable shear for each panel shown in the tables on page 16.

   Second-story panel: Allowable shear for an SWSB 18x9 = 1,225 lbs > 1,000 lbs required. **OK**.

   First-story panel: Allowable shear for an SWSB 24x9 = 3,905 lbs > 2,200 lbs (1,200 + 1,000 lbs) required. **OK**.
3. Calculate the required overturning moment (OM) using the shear at each floor and the floor heights:
   $OM = (V_2h_2) + (V_1h_1)$
   $OM = (1{,}000 \times 213.25) + (1{,}200 \times 105.25) = 339{,}550$ in.-lb.
4. Compare the allowed maximum overturning base moment *(from step 1)* to the required overturning moment. If the capacity is exceeded, consider adding an additional panel to the first floor. 413,590 in.-lb > 339,550 in.-lb required. **OK**.
5. Verify the drift requirements for the first-story panel. Calculate the drift from the equation on page 16, and compare it to the maximum allowable seismic drift limit.

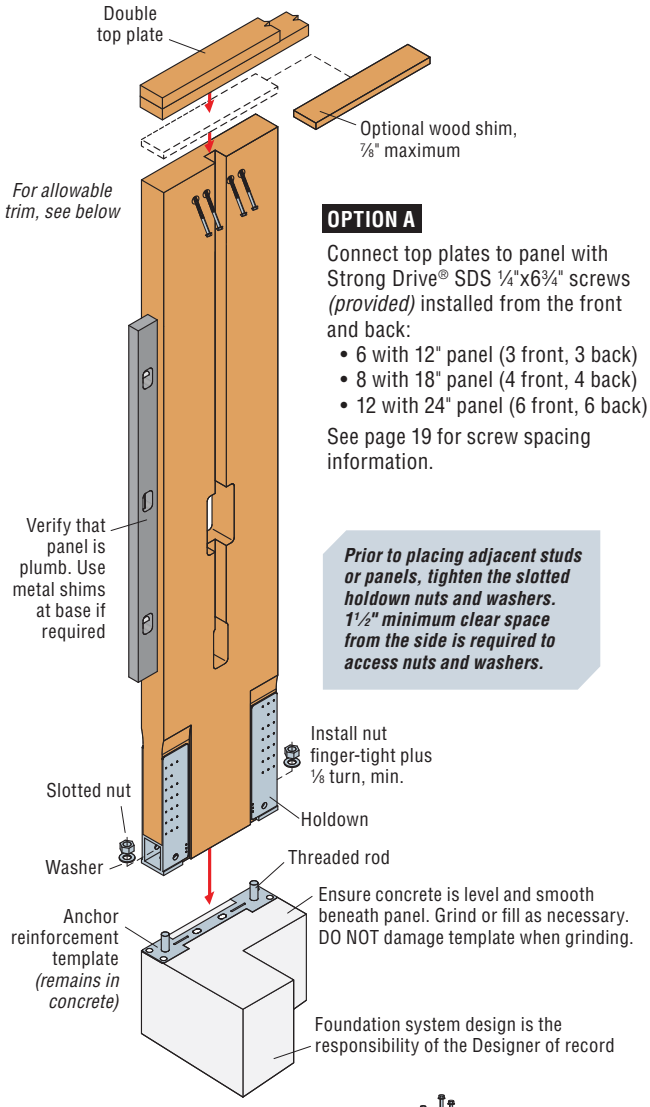
$$\text{Maximum allowable drift} = \frac{h}{228.6} = \frac{105.25"}{228.6} = 0.46"$$

$$\Delta = \frac{(105.25")^2}{21.5 \times 10^9}\,[3(1{,}000 \times 105.25") + 2(2{,}200 \times 105.25")]$$

$\Delta = 0.41" < 0.46"$ **OK**

Installation Details, Trim Zones and Allowable Holes

Standard Panel Installation



OPTION A

Connect top plates to panel with Strong Drive® SDS ¼"x6¾" screws *(provided)* installed from the front and back:

- 6 with 12" panel (3 front, 3 back)
- 8 with 18" panel (4 front, 4 back)
- 12 with 24" panel (6 front, 6 back)

See page 19 for screw spacing information.

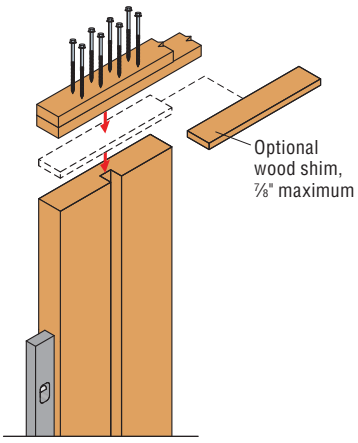
Prior to placing adjacent studs or panels, tighten the slotted holdown nuts and washers. 1½" minimum clear space from the side is required to access nuts and washers.

OPTION B

SDS ¼"x6¾" screws *(provided)* installed from the top:

- 6 with 12" panel
- 8 with 18" panel
- 12 with 24" panel

See page 19 for screw spacing information.

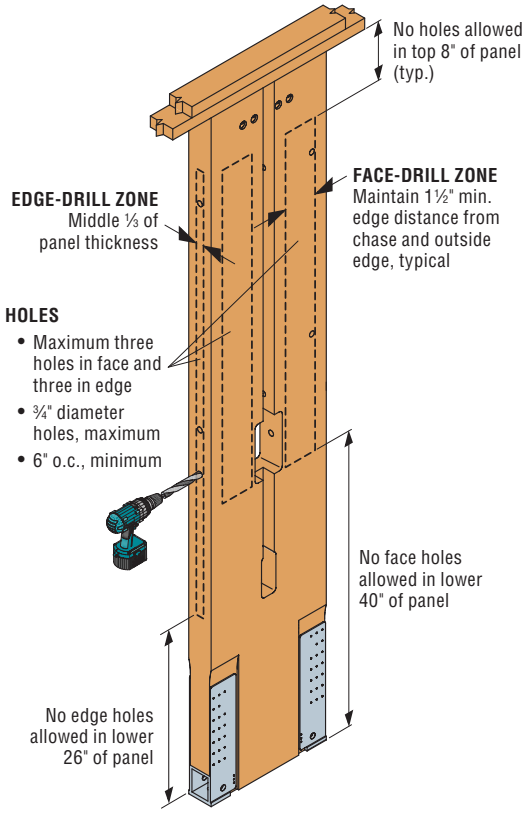


Allowable Trim

- Trim height from the top of the panel only. Do not trim the sides or bottom.
- Panels may be trimmed down to a minimum height of 74½".

***WARNING:** Drilling, sawing, sanding or machining wood products generates wood dust, a substance known to the State of California to cause cancer. For more information on Proposition 65, visit **www.oehha.ca.gov**.*

Allowable Small Holes – All Panels



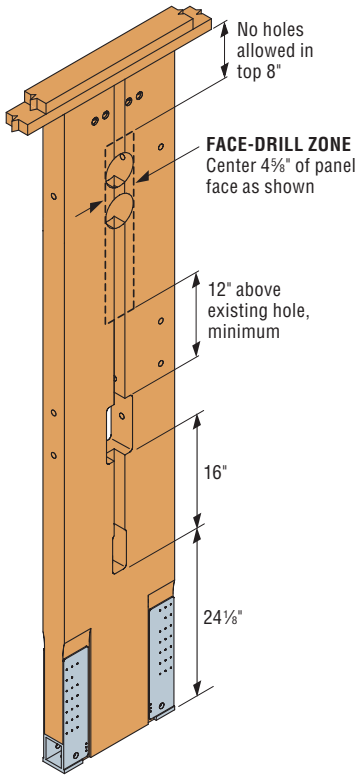
Allowable Large Holes – All Panels
(In addition to allowable small holes above)

HOLES

- 4⅝" diameter holes, maximum
- Maximum two 4⅝" holes or one 4¼" x 12" hole
- No minimum on-center spacing required

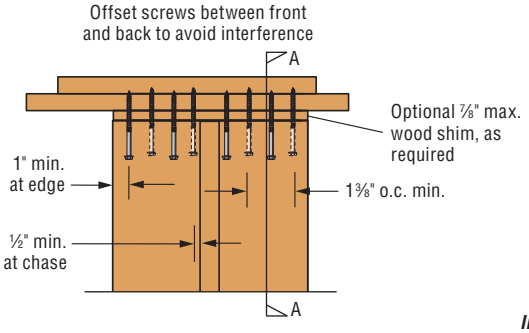
HOLES for SWSB24x7 PANEL ONLY

- Maximum one 4⅝" x 6" diameter hole
- 8" from top of panel, minimum



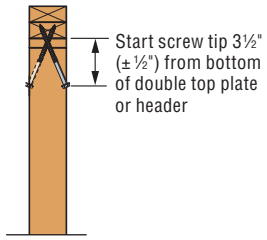
Installation Details – Screw Spacing Options

Standard Application – Screw Option A

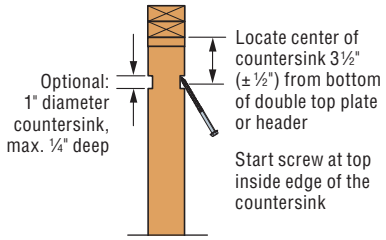


DO NOT install screws in center electrical chase

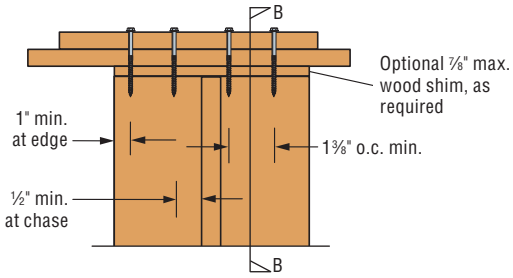
Section A-A



Install at an angle that prevents screws from exiting sides of top plates or header

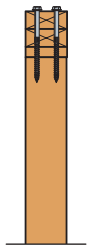


Standard Application – Screw Option B

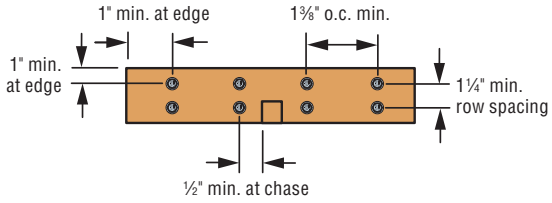


DO NOT install screws in center electrical chase

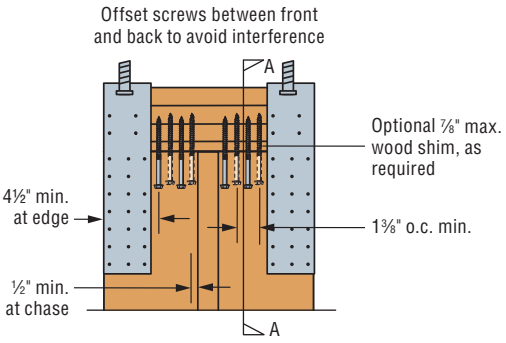
Section B-B



Plan View

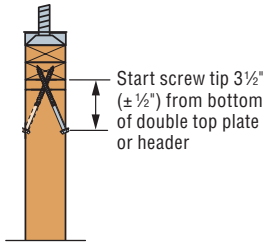


Two-Story Stacked Application – Screw Option A

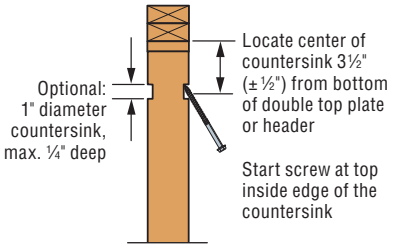


DO NOT install screws in center electrical chase

Section A-A

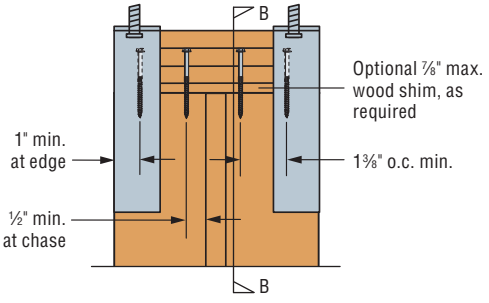


Install at an angle that prevents screws from exiting sides of top plates or header



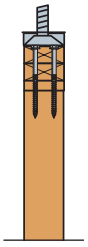
When first-story panel is wider than second-story panel, countersink screw heads to avoid interference with MSK holdown straps and coordinate screw locations to avoid driven nails.

Two-Story Stacked Application – Screw Option B



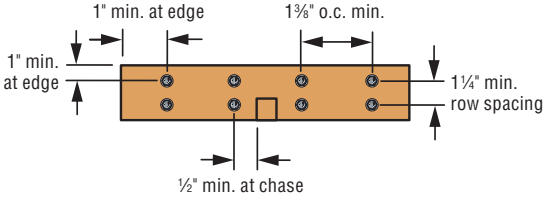
DO NOT install screws in center electrical chase. If a code inspection is required for the connection, have it performed prior to installing the bearing block on top.

Section B-B



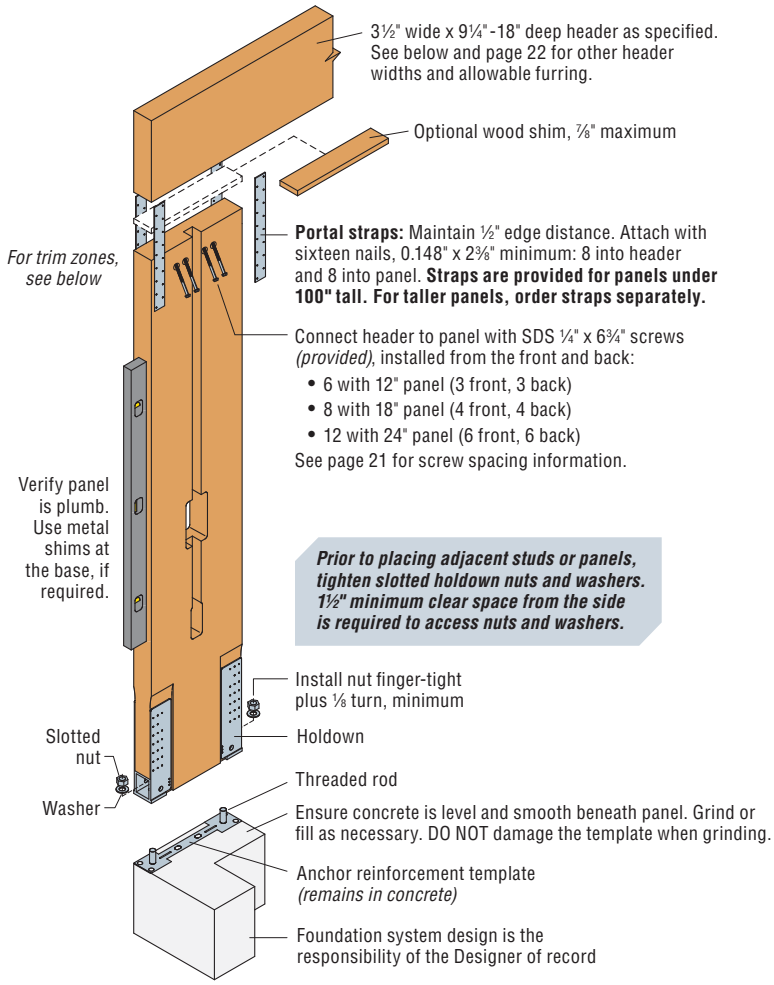
Install screws before installing bearing block. Countersink (½" max.) screw heads into the top plate to allow bearing block to sit flat. If a code inspection is required for the connection, have it performed prior to installing the bearing block on top.

Plan View



Portal Installation Details

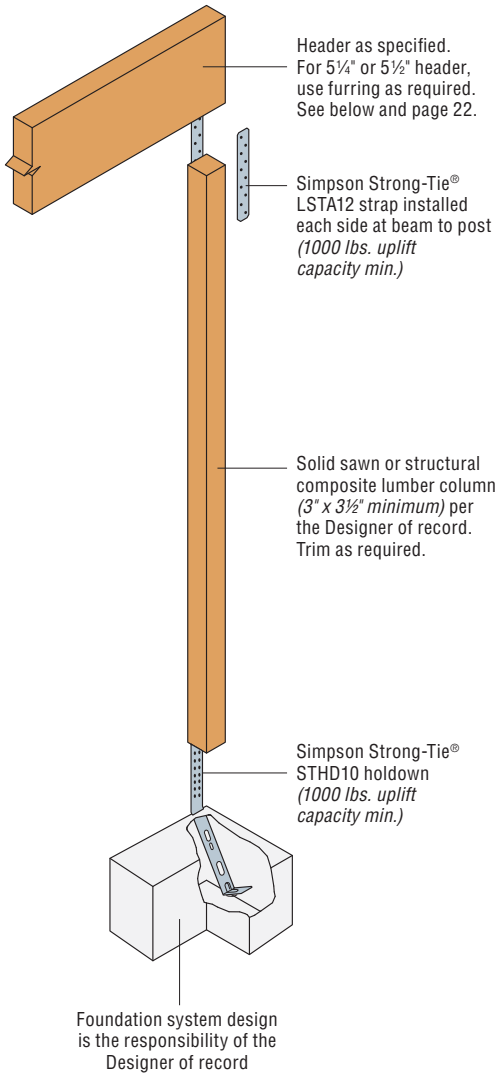
Portal Frame Application



Portal Allowable Trim

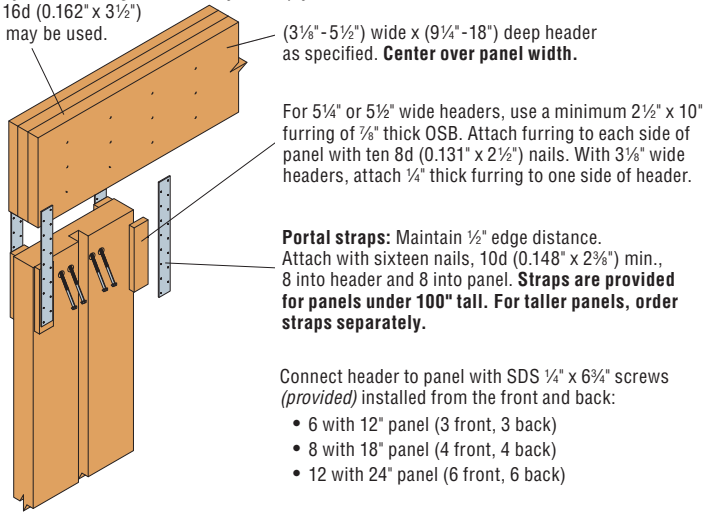
- Trim height from the top of the panel only. Do not trim the sides or bottom.
- Panels may be trimmed down to a minimum height of 74½".

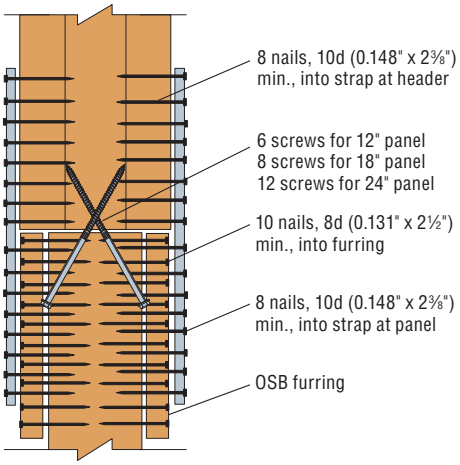
Portal Frame Column



Concentric Header Connection

For multiple-ply headers, connect plies using Strong-Drive® SDW or SDS structural wood screws. Refer to current Simpson Strong-Tie® *Fastening Systems* catalog. Alternatively, for 2-ply headers, 2 rows of 16d (0.162" x 3½") at 16" o.c. may be used.



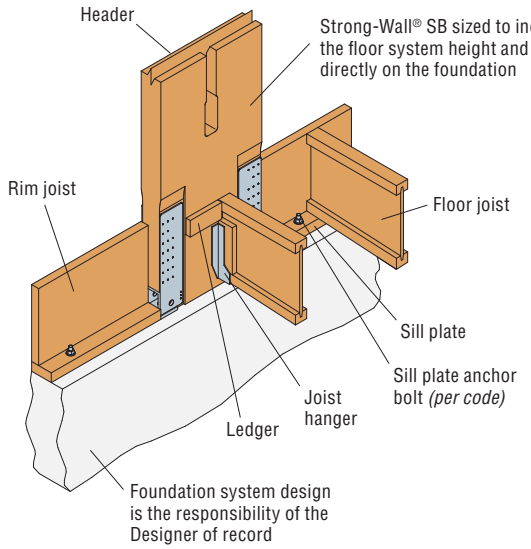


Furring strips may also be attached as shown in page 22.

Installation Details

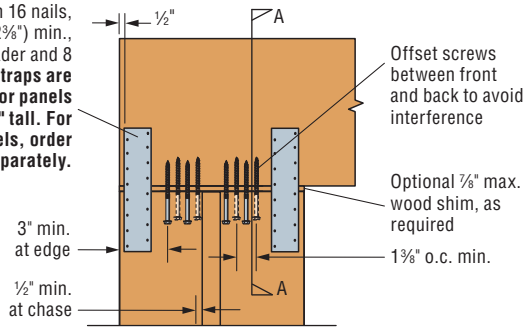
Wood-Floor System Installation

Specify panel height from the top of the foundation to the bottom of the top plate or beam. See dimension h_1 on page 16.



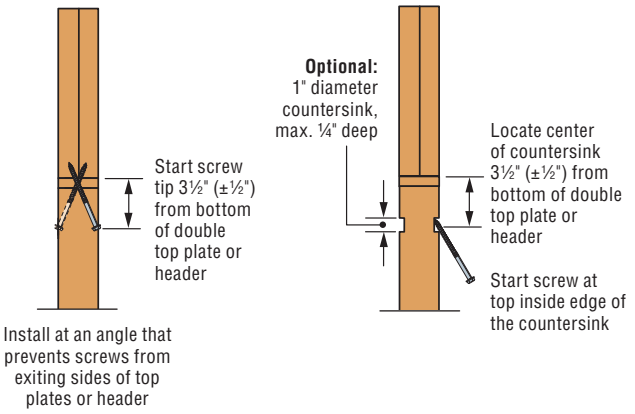
Portal Screw Detail

Portal straps: Maintain ½" edge distance. Attach with 16 nails, 10d (0.148" x 2⅜") min., 8 into header and 8 into panel. **Straps are provided for panels under 100" tall. For taller panels, order straps separately.**



DO NOT install screws in center electrical chase

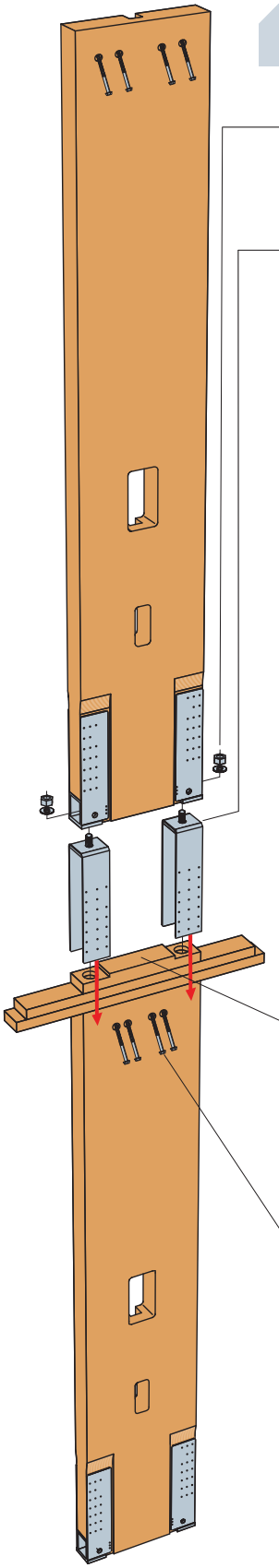
Section A-A



DO NOT use Option B screw installation with portal applications

Two-Story Stacked Installation

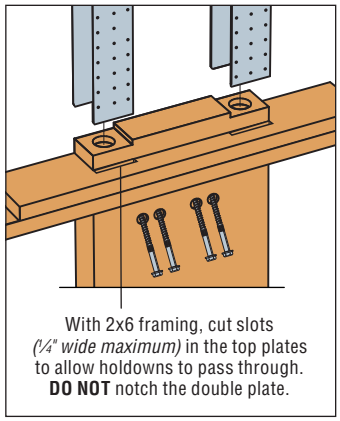
Second-story panel height includes wall height plus total floor height; see page 16.



4. Install second-story panel using the nuts and washers provided with the panel.

3. Install holdowns over the bearing block and slide down the face of the Strong-Wall SB. To ensure easy installation of second-story panel, verify the following center-to-center bolt spacings:
   - 8⅛" for 12" panels
   - 14" for 18" panels
   - 20" for 24" panels

   Nail holdowns to the first-story panel using 10d nails, (0.148" x 2⅜"). Fill all holes.



With 2x6 framing, cut slots *(¼" wide maximum)* in the top plates to allow holdowns to pass through. **DO NOT** notch the double plate.

2. Align 2" tall bearing block *(provided)* over first-story panel. To help secure the block while installing the holdowns, attach block to plates with one nail in each recessed hole.

1. Install first-story panel and framing per detail on page 19.

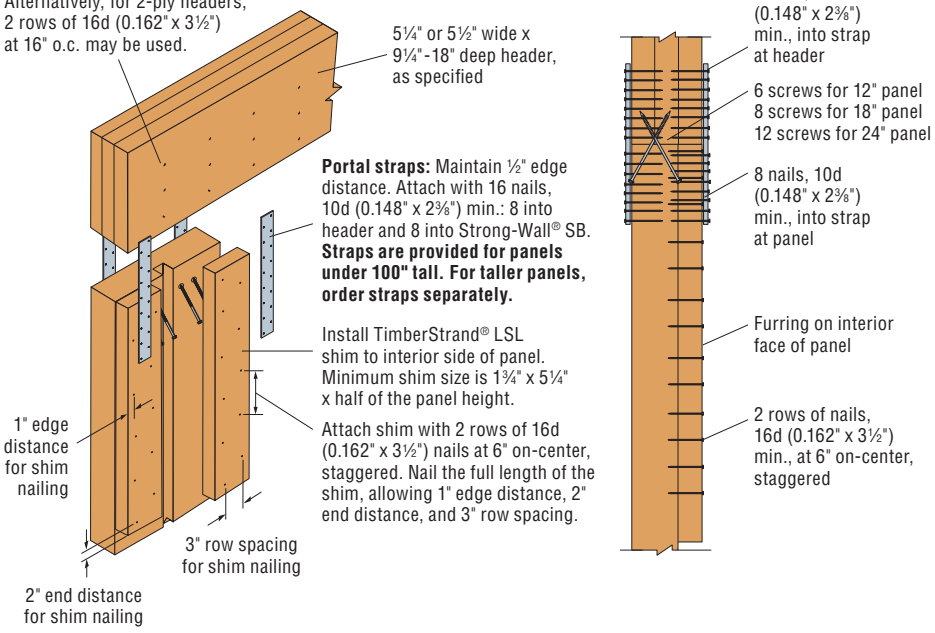
   If using **Option B**, countersink (½" maximum) screws into the top plate to avoid interference with the bearing block. **DO NOT modify the bearing block.** If a code inspection is required for the connection, have it performed prior to installing the bearing block on top.

Ledgers and joist hangers may be attached directly to the panel. See above.

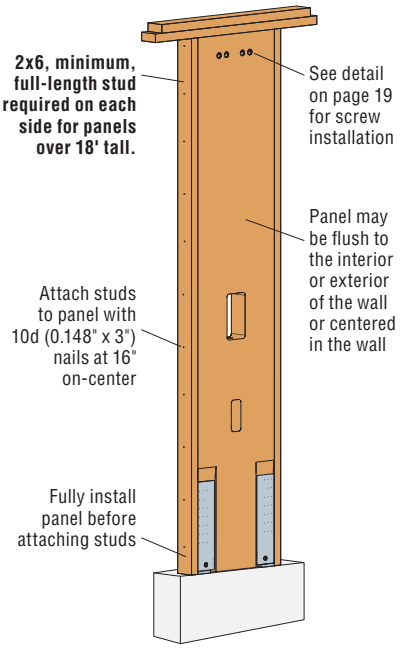
Installation Details

Offset Header

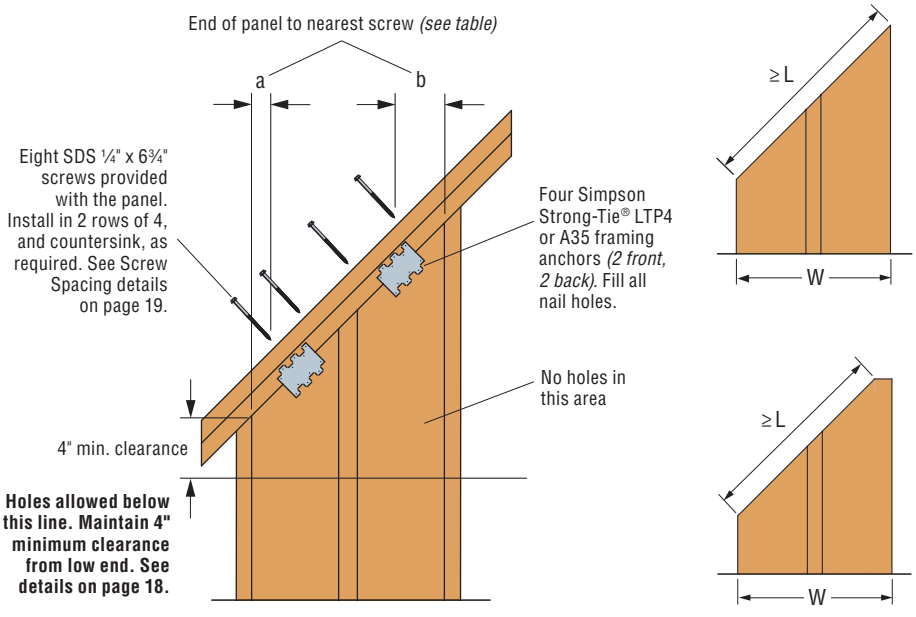
For multiple-ply headers, connect plies using Strong-Drive® SDW or SDS structural wood screws. Refer to current Simpson Strong-Tie® *Fastening Systems* catalog. Alternatively, for 2-ply headers, 2 rows of 16d (0.162" x 3½") at 16" o.c. may be used.



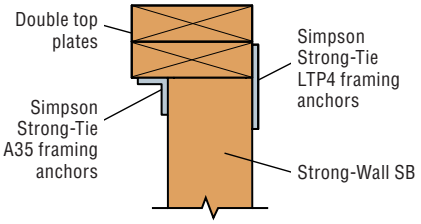
Balloon Framing
(Panels over 18' tall)



Rake Wall



Section View for 2x6 or Wider Wall



End Distance for Screws

Slope	Distance a	Distance b
0:12 – 4:12	2"	3"
5:12 – 8:12	1½"	4½"
9:12 – 12:12	½"	5½"

1. Maintain end distances to prevent screws from penetrating through the outer edges.
2. Install screws perpendicular to the top plate.
3. End distances assume double top plate.

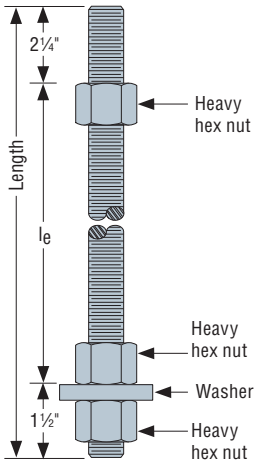
Installation Notes

- Actual cut length (L) must be greater than or equal to the panel's width (W).
- For slopes up to 12:12.
- Panels taller than 12' must be designed for the application.

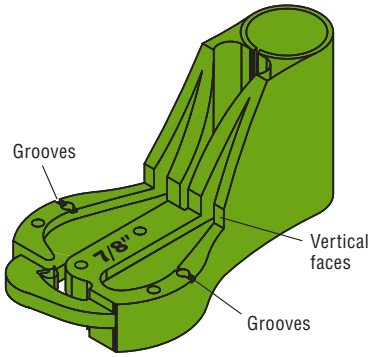
Installation Details

Anchor Bolt Installation

- See page 24 for anchorage solutions.
- On the bottom end of each rod, create a double nut and washer assembly by installing the plate washer between the two heavy hex nuts *(provided)*, leaving two threads showing at the bottom.
- On the top end of each rod, install heavy hex nut roughly 2¼" clear from the top. Set the reinforcement template on the heavy hex nuts.
- Slide the anchor bolt holder over the threads, flush with the end of the threaded rod and snap it shut *(invert the anchor bolt holder depending on concrete form layout)*.
- Hand-tighten the nut to the underside of the reinforcement template.
- Nail the anchor bolt assembly to the form edge using three nails *(alignment depends on panel placement in the wall)*.
- To better secure the assembly during concrete placement, tie the threaded rods to footing reinforcement.



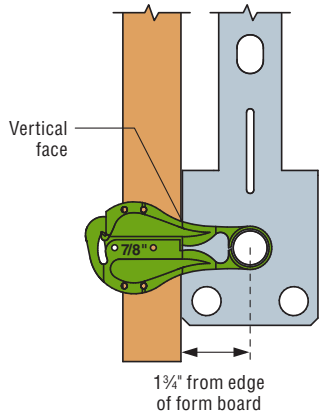
Anchor Rod Assembly



Anchor Bolt Holder

Bolt Placement 1¾" from Concrete Edge

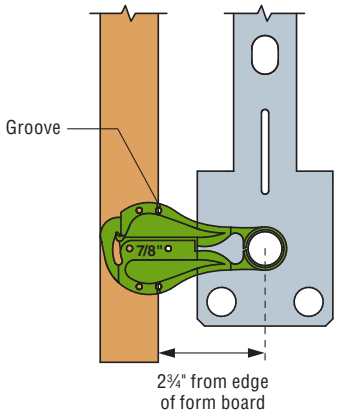
(For use with 4x portal headers, or when centering in 2x4 walls or placing flush to the outside of wider walls)



To install Strong-Wall SB flush to the outside face of wall, align anchor bolt holder's vertical faces with inside face of formwork

Bolt Placement 2¾" from Concrete Edge

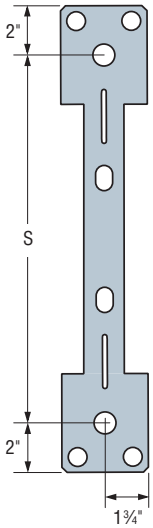
(For use when centering in 2x6 walls)



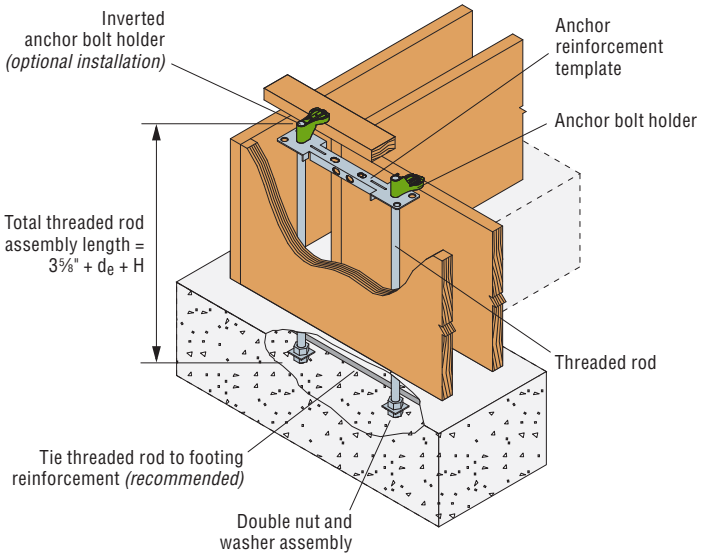
To install Strong-Wall SB centered under 5½" header or beam, align anchor bolt holder's grooves with inside face of formwork

Anchor Reinforcement Template

SWSB	Bolt Spacing, S
SWSB 12x	8⅛"
SWSB 18x	14"
SWSB 24x	20"



Bolt and Form-Work Installation



Anchorage Solutions

Strong-Wall® SB Shearwall Tension Anchorage Solutions for 2,500 psi concrete

Design Criteria	Concrete Condition	Anchor Strength	SWSB12 – ⅞" Anchor Bolt			SWSB18 – ⅞" Anchor Bolt			SWSB24 – 1" Anchor Bolt		
			ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)	ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)	ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)
Seismic	Cracked	High Strength	12600	28	10	23000	41	14	28800	47	16
	Uncracked	High Strength	12500	24	8	23100	36	12	28700	41	14
Wind	Cracked	Standard	5100	14	6	6200	16	6	6200	16	6
			8700	20	7	10000	22	8	11400	24	8
			11400	24	8	13100	27	9	17100	32	11
		High Strength	8700	20	7	14400	28	10	21100	36	12
			11400	24	8	16700	31	11	24100	39	13
	Uncracked	Standard	5000	12	6	6400	14	6	6400	14	6
			9300	18	6	10800	20	7	12500	22	8
			11700	21	7	13100	23	8	17100	28	10
		High Strength	9300	18	6	14300	24	8	21900	32	11
			11700	21	7	17000	27	9	24000	34	12

Strong-Wall® SB Shearwall Tension Anchorage Solutions for 3,000 psi concrete

Design Criteria	Concrete Condition	Anchor Strength	SWSB12 – ⅞" Anchor Bolt			SWSB18 – ⅞" Anchor Bolt			SWSB24 – 1" Anchor Bolt		
			ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)	ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)	ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)
Seismic	Cracked	High Strength	12300	26	9	23100	39	13	27900	44	15
	Uncracked	High Strength	12800	23	8	22700	34	12	28900	39	13
Wind	Cracked	Standard	5600	14	6	5600	14	6	6800	16	6
			8100	18	6	9500	20	7	12500	24	8
			11000	22	8	13100	25	9	17100	30	10
		High Strength	8100	18	6	14900	27	9	21000	34	12
			11000	22	8	16600	29	10	24200	37	13
	Uncracked	Standard	5500	12	6	5500	12	6	7000	14	6
			8500	16	6	9300	17	6	11900	20	8
			11000	19	7	13100	22	8	17100	26	9
		High Strength	8500	16	6	15600	24	8	21800	30	10
			11000	19	7	16600	25	9	24000	32	11

Strong-Wall® SB Shearwall Tension Anchorage Solutions for 4,500 psi concrete

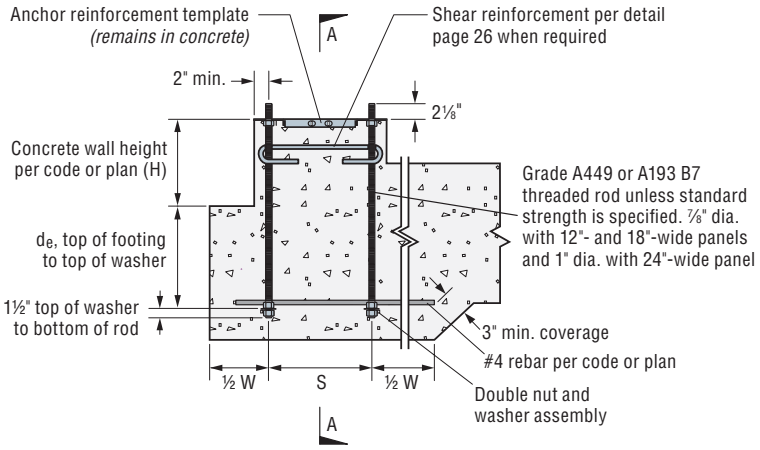
Design Criteria	Concrete Condition	Anchor Strength	SWSB12 – ⅞" Anchor Bolt			SWSB18 – ⅞" Anchor Bolt			SWSB24 – 1" Anchor Bolt		
			ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)	ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)	ASD Allowable Uplift (lbs.)	W (in.)	d_e (in.)
Seismic	Cracked	High Strength	12600	23	8	23700	35	12	28400	39	13
	Uncracked	High Strength	12700	20	7	23400	30	10	28200	34	12
Wind	Cracked	Standard	5400	12	6	5400	12	6	6800	14	6
			8300	16	6	9900	18	6	11600	20	7
			11600	20	7	13100	22	8	17100	26	9
		High Strength	8300	16	6	15300	24	8	21400	30	10
			11600	20	7	17300	26	9	23600	32	11
	Uncracked	Standard	6800	12	6	6800	12	6	6800	12	6
			8500	14	6	10400	16	6	12400	18	6
			11400	17	6	13100	19	7	17100	23	8
		High Strength	8500	14	6	14500	20	7	21600	26	9
			11400	17	6	16800	22	8	24100	28	10

1. Anchorage designs conform to ACI 318-11 Appendix D with no supplementary reinforcement for cracked and uncracked concrete as noted.
2. Anchor strength indicates required grade of anchor bolt. Standard (ASTM F1554 grade 36) or High Strength (HS) (ASTM A449 or A193 B7).
3. Seismic indicates Seismic Design Categories C through F. Detached one and two-family dwellings in SDC C may use wind anchorage solutions. Seismic anchorage designs conform to ACI 318-11 D.3.3.4.3.
4. Wind includes Seismic Design Categories A and 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 alternate embedment, footing size or anchor bolt.
6. Refer to slab on grade, curb, stemwall and interior footing details for W and d_e.
7. High-strength anchor bolts are required for seismic applications and where the tension force at wind design shear exceeds the allowable load for standard strength anchor bolts.
8. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation.

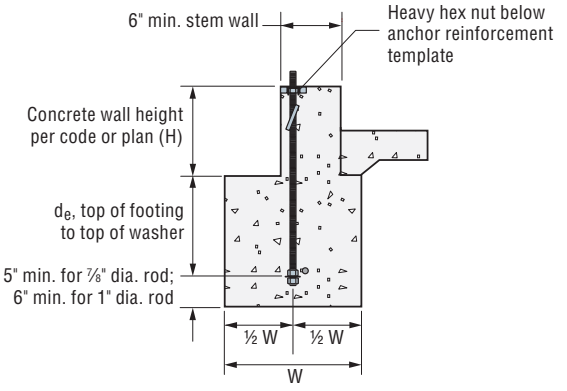
   T = [(k x V x h) / B] – P/2, where:
   - T = Anchor tension load (lbs.)
   - V = Design shear load (lbs.)
   - P = Applied vertical load (lbs.)
   - h = Panel height (in.)
   - B = Moment arm (in.)
     - Without bearing plate: 8 1/16" for SWSB12, 14 9/16" for SWSB18, 19 5/16" for SWSB24
     - With bearing plate: 8 1/16" for SWSB12, 13 15/16" for SWSB18, 18 13/16" for SWSB24
   - k = stiffness coefficient
     - 0.8 for SWSB12 portal walls with h ≤ 93 1/4", 0.90 for SWSB18 portal walls with h ≤ 93 1/4", and 1.0 for all other walls and applications.
   - OM = Base Moment (lb.-in.)
     - Use in place of k x V x h for two-story stacked applications

Anchorage Solutions

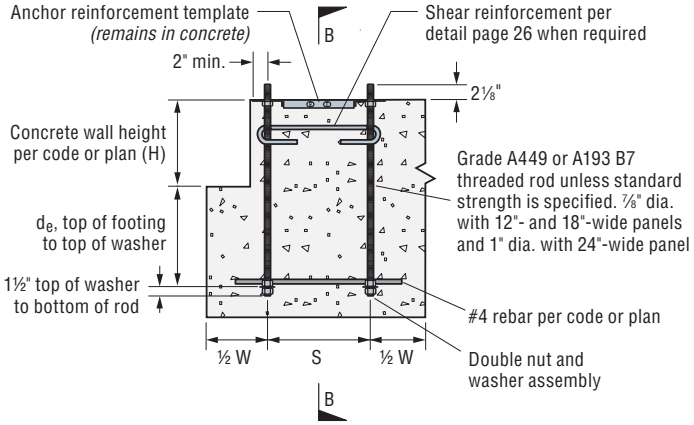
Garage Curb Installation



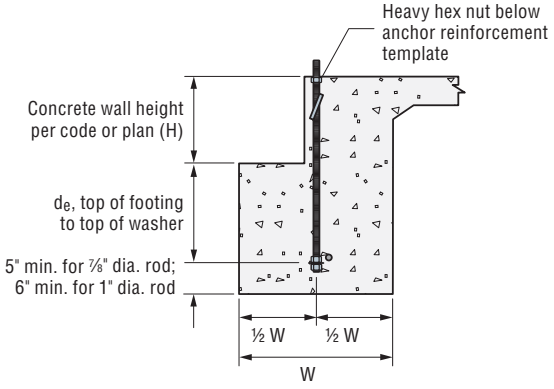
Section A-A



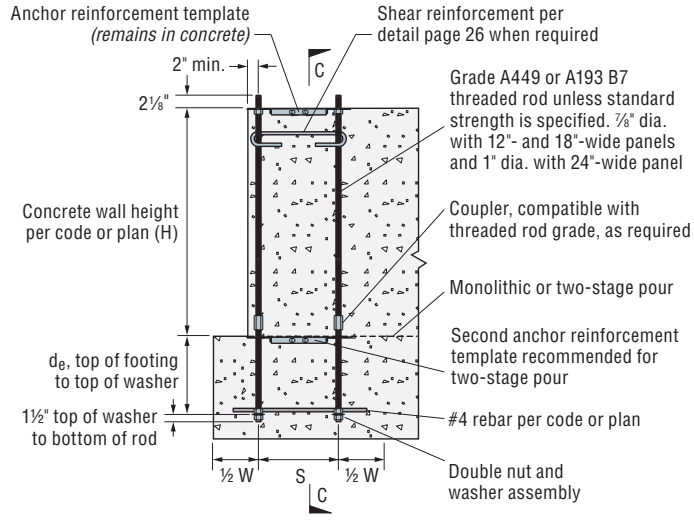
Slab-on-Grade Installation



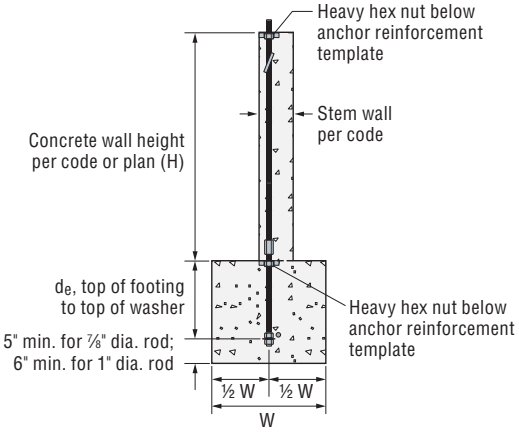
Section B-B



Stemwall or Basement Installation



Section C-C

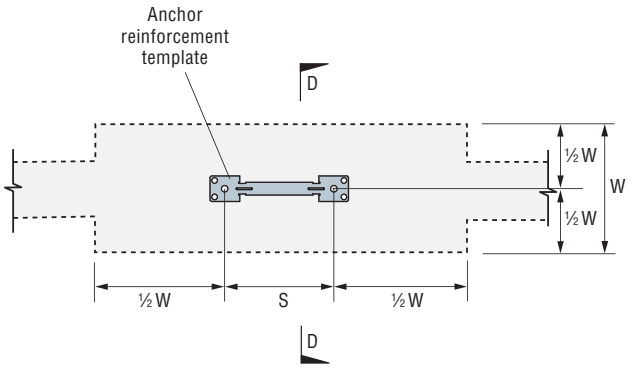


Anchorage Solutions General Notes

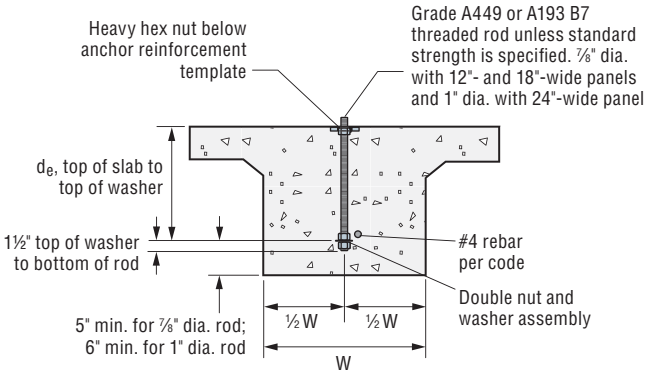
- Refer to page 23 for S dimension and page 24 for W and d_e dimensions.
- The Designer may specify alternate embedment, footing size or bolt grade.
- Footing dimensions and rebar requirements are for anchorage only.

Anchorage Solutions

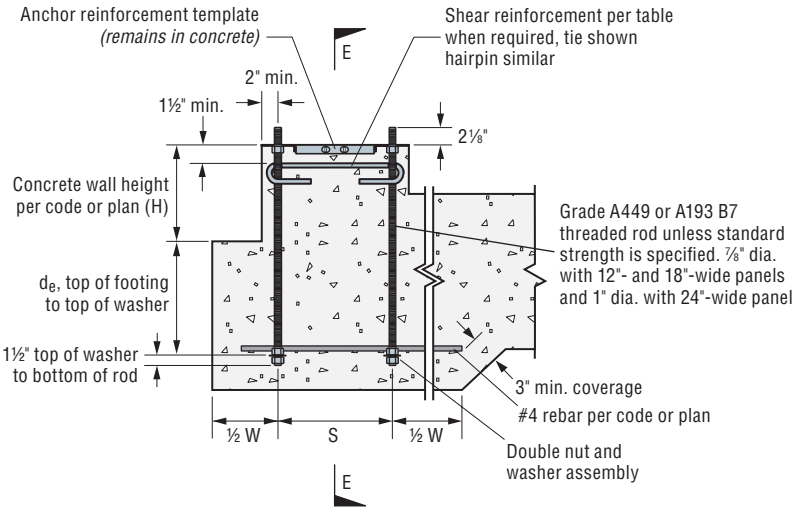
Interior Slab-on-Grade



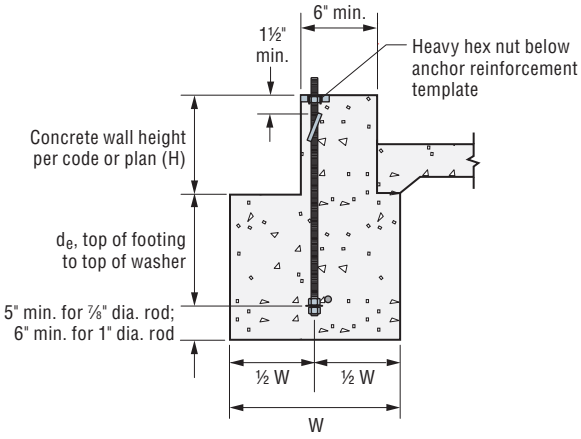
Section D-D



Anchorage Shear Reinforcement



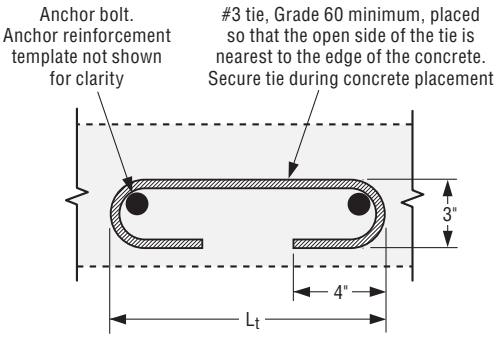
Section E-E



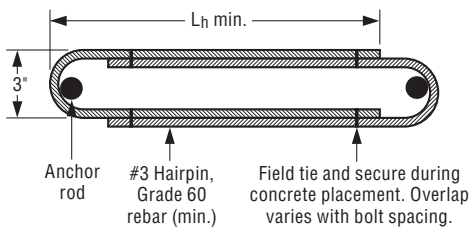
Strong-Wall® SB Shearwall Shear Anchorage Solutions

Model No.	L_t or L_h (in.)	Seismic and Wind	
		Shear Reinforcement	Minimum Curb/Stemwall Width (in.)
SWSB12	—	Template Only	6
SWSB18	16¼	(1) #3 Tie and Template	6
SWSB24	19	(1) #3 Hairpin and Template	6

1. Shear Anchorage designs conform to ACI 318-11 and assume minimum 2,500 psi concrete.
2. Template indicates Anchor Reinforcement Template, see page 23.
3. Seismic indicates Seismic Design Categories C through F. Detached one and two-family dwellings in SDC C may use wind anchorage solutions.
4. Wind includes Seismic Design Categories A and B and detached one and two-family dwellings in SDC C.
5. Tie or hairpin reinforcement is not required for interior foundation applications *(panel installed away from edge of concrete)*, or braced wall panel applications.



Tie Shear Reinforcement



Hairpin Shear Reinforcement

Anchorage Solutions General Notes

- Refer to page 23 for S dimension and page 24 for W and d_e dimensions.
- The Designer may specify alternate embedment, footing size or bolt grade.
- Footing dimensions and rebar requirements are for anchorage only.

Product Storage

Protect product from sun and water

CAUTION:
Wrap is slippery when wet or icy

Use support blocks at 10' on-center to keep bundles out of mud and water

Notes

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