

STEEL STRONG-WALL®: Cold-Formed Steel Two-Story Stacked on Concrete Foundations



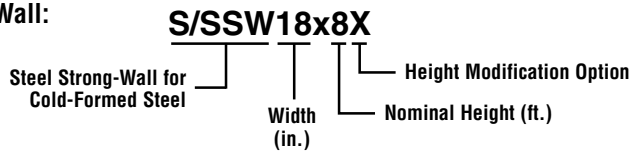
A complete stacked-wall solution for two-story applications. Now there is a Steel Strong-Wall® option for two-story cold-formed steel installations that combines simplified installation with superior performance.

- Some of the highest loads in the industry, and design procedures that account for cumulative overturning.
- Complete concrete anchorage designs for two-story applications (*foundation design by Designer*).
- No bearing plates to install. Walls can be placed flush against a corner.
- Same anchor bolt template as single-story installation.
- Compression loads transferred by nut/rod.

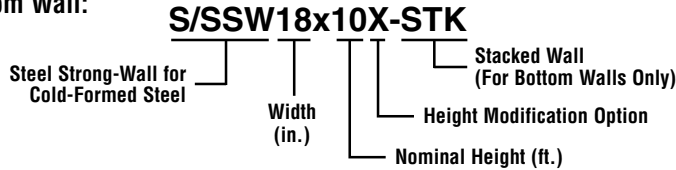
MATERIAL & FINISH: See page 40.

NAMING SCHEME

Top Wall:



Bottom Wall:



COLD-FORMED STEEL TWO-STORY STACKED-WALL PRODUCT DATA - BOTTOM WALL

Model No.	W	MAX H ¹	T	Anchor Bolts		Number of Screws in Top of Wall
	(in)	(in)	(in)	Qty.	Dia.	
S/SSW15x8X-STK	15"	97	3½"	2	1"	6
S/SSW18x8X-STK	18"	97	3½"	2	1"	9
S/SSW21x8X-STK	21"	97	3½"	2	1"	12
S/SSW24x8X-STK	24"	97	3½"	2	1"	14
S/SSW15x9X-STK	15"	109	3½"	2	1"	6
S/SSW18x9X-STK	18"	109	3½"	2	1"	9
S/SSW21x9X-STK	21"	109	3½"	2	1"	12
S/SSW24x9X-STK	24"	109	3½"	2	1"	14
S/SSW15x10X-STK	15"	121	3½"	2	1"	6
S/SSW18x10X-STK	18"	121	3½"	2	1"	9
S/SSW21x10X-STK	21"	121	3½"	2	1"	12
S/SSW24x10X-STK	24"	121	3½"	2	1"	14

1. Specify height when ordering "X-STK" models
2. See page 40 for product data on top wall.

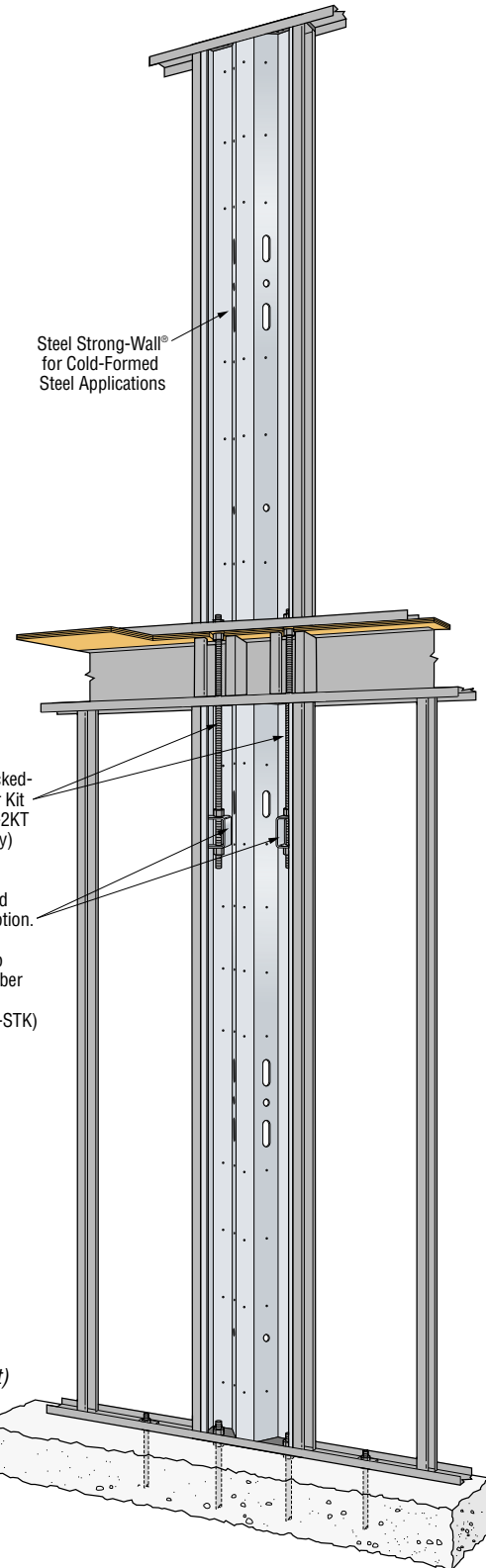
Two-Story Stacked-Wall Connection Kit

Wall Width (in)	Model No.	Contents
15	SSW15-2KT	(1) Shear-Transfer Plate (with #14 self-drilling screws, included) (2) 1"x48" Threaded Rods F1554 Grade 36 (6) Heavy Hex Nuts Installation Instructions
18	SSW18-2KT	
21	SSW21-2KT	
24	SSW24-2KT	

1. Two heavy hex nuts included with each wall.



For a complete set of wall profile drawings, see page 40.



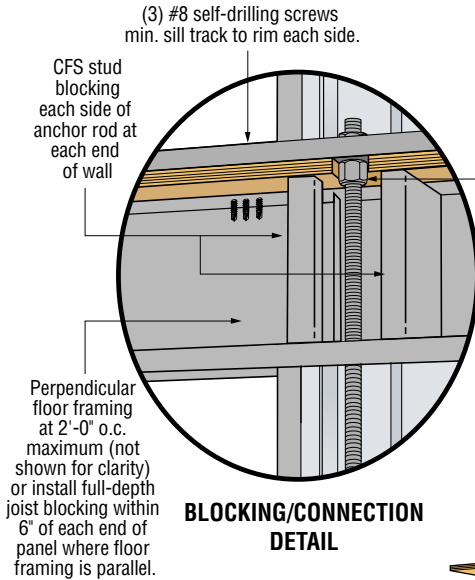
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INSTALLATION

- Do not cut the Steel Strong-Wall® or enlarge existing holes. Doing so will compromise the performance of the wall.
- Do not use an impact wrench to tighten nuts on the anchor bolts.
- Drill or notch the subfloor to allow the compression nut to sit flush with the underside of the 2nd-story wall (notching of the rim will be required).

Shear-Transfer Plate Fasteners

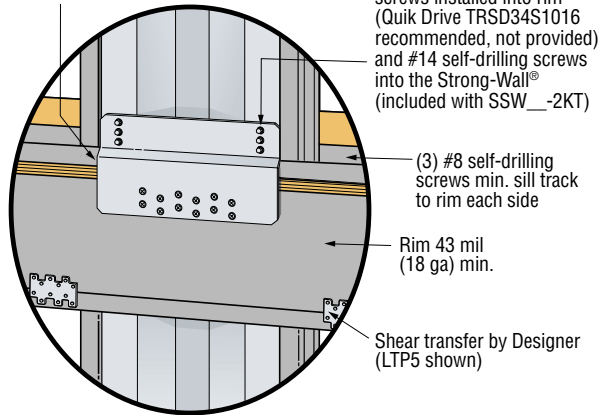
Strong-Wall Width	Fastener Quantity	
	#14 Screws	#10 Screws
12" Wall	4	6
15" Wall	4	10
18" Wall	6	12
21" Wall	6	16
24" Wall	7	18



Attach to top track with 1/4" or #14 self-drilling screws (not provided)

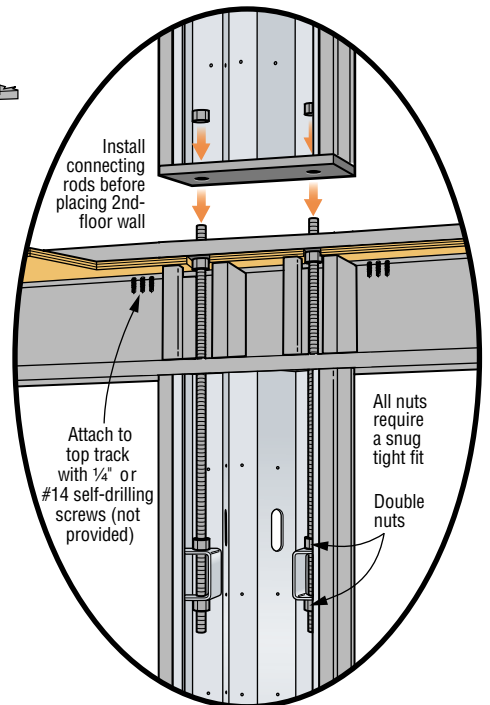
Drill/notch subfloor to allow nut to sit flush with underside of wall. (Notching of rim will be required)

Clip sill track as required to install shear-transfer plate



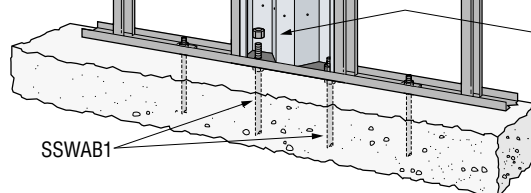
SSW Shear-Transfer Plate installs with #10 self-drilling screws installed into rim (Quik Drive TRSD34S1016 recommended, not provided) and #14 self-drilling screws into the Strong-Wall® (included with SSW_-2KT)

Use SSW_-2KT connection kit to attach standard wall above to "X-STK" model below



ALTERNATE 1ST-FLOOR INSTALLATION

Specify taller wall model to allow for floor framing and use load values for installation on concrete pages 41.



Place Steel Strong-Wall® panel over the anchor bolts and secure with heavy hex nuts (provided). Snug tight fit required. Do not use an impact wrench.

- 1 5/8" wrench/socket required for 1" nut.

STEEL STRONG-WALL®: Cold-Formed Steel Two-Story Stacked on Concrete Foundations**Second-Story Walls^{6, 8} – 2006 International Building Code**

Second-Story Wall Models	Seismic ²		Wind	
	Allowable ASD Shear Load V (lbs)	Drift at Allowable Shear (in)	Allowable ASD Shear Load V (lbs)	Drift at Allowable Shear (in)
S/SSW15x7	600	0.21	600	0.21
S/SSW18x7	1080	0.21	1390	0.27
S/SSW21x7	1650	0.21	1815	0.23
S/SSW24x7	2295	0.21	2330	0.21
S/SSW15x8X	550	0.29	550	0.29
S/SSW18x8X	995	0.31	1275	0.39
S/SSW21x8X	1515	0.30	1650	0.33
S/SSW24x8X	1970	0.27	1970	0.27
S/SSW15x9X	510	0.35	510	0.35
S/SSW18x9X	940	0.38	1180	0.47
S/SSW21x9X	1435	0.37	1465	0.38
S/SSW24x9X	1755	0.31	1755	0.31
S/SSW15x10X	475	0.41	475	0.41
S/SSW18x10X	890	0.45	1060	0.54
S/SSW21x10X	1300	0.42	1300	0.42
S/SSW24x10X	1580	0.36	1580	0.36

- Allowable base moment and anchor uplifts are applicable to installation on concrete foundations with minimum $f'c = 2,500$ psi using the ASD basic (Section 1605.3.1) or the alternative basic (Section 1605.3.2) load combinations. Load values include evaluation of anchor rod compression at second story and bearing stresses at foundation.
- For seismic designs based on the 2006 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.
- Two-Story Stacked-Wall installations may consist of any height combination of equal width wall models listed in these tables.
- Loads are based on a 1000 lbs. maximum uniformly distributed total axial load acting on the second-story panel and a 2000 lbs. maximum uniformly distributed total axial load acting on the first-story panel in combination with the tabulated shear load and base moment.
- The designer must verify that the cumulative overturning moment at the base of the first-story Steel Strong-Wall does not exceed the allowable base moment capacity. See design example on page 49 for procedure.
- The allowable second-story shear loads assume a maximum floor joist depth of 14".
- Allowable shear, drift, and base moment values may be interpolated for intermediate heights.
- Minimum ASTM F 1554 Grade 36 threaded rods are required at the second-story wall anchorage.
- High-strength anchor bolts are required at the first-story wall for anchor tension (uplift) forces exceeding the allowable load for standard strength bolts tabulated on pages 50–51. See pages 50–54 for SSWAB anchor bolt information and anchorage solutions.
- Tabulated anchor tension (uplift) loads assume no resisting axial load. For anchor tension loads at design shear values and including the effect of axial load, refer to the Strong-Wall Selector software or use the equations on page 43. Drifts at lower design shear or base moment may be linearly reduced.
- Top-of-wall screws for the S/SSW shall be approved ¼" or #14 self-drilling screws with a minimum nominal shear strength (P_{ss}) of 2000 lbs. Top of panel shall be connected to a minimum 43 mil (18 ga) thick steel member typical. First-Story S/SSW 24x8X-STK requires connection to a minimum 54 mil (16 ga) thick steel member where the total applied shear load exceeds 4230 lbs.

FIRST-STORY WALLS ON CONCRETE FOUNDATIONS^{5, 9, 11} – 2006 INTERNATIONAL BUILDING CODE

First-Story Wall Models	Seismic ²			Wind		
	Allowable ASD Base Moment (ft-lbs)	Drift at Allowable Base Moment (in)	Uplift at Allowable Base Moment ¹⁰ (lbs)	Allowable ASD Base Moment (ft-lbs)	Drift at Allowable Base Moment (in)	Uplift at Allowable Base Moment ¹⁰ (lbs)
S/SSW15x8X-STK	10130	0.41	12065	10130	0.41	12065
S/SSW18x8X-STK	17300	0.41	16895	22230	0.53	24075
S/SSW21x8X-STK	26390	0.41	21905	31000	0.48	27545
S/SSW24x8X-STK	36700	0.39	26335	40040	0.43	29770
S/SSW15x9X-STK	9705	0.47	11440	9945	0.48	11790
S/SSW18x9X-STK	16670	0.47	16110	21480	0.61	22835
S/SSW21x9X-STK	25435	0.46	20855	28990	0.53	24950
S/SSW24x9X-STK	36210	0.45	25860	37515	0.47	27145
S/SSW15x10X-STK	9160	0.51	10665	9460	0.53	11090
S/SSW18x10X-STK	16185	0.53	15515	20335	0.66	21060
S/SSW21x10X-STK	24485	0.52	19845	25895	0.55	21355
S/SSW24x10X-STK	33645	0.49	23460	33645	0.49	23460

STEEL STRONG-WALL® TWO-STORY DESIGN EXAMPLE**Example: Cold-Formed Steel Two-Story Wall Design****Given:**2006 IBC, Wind, $f'_c = 2500$ psi $V_{2\text{nd-story wall}} = 650$ lbs. $V_{1\text{st-story wall}} = 650$ lbs. $V_{\text{total}} = 650 \text{ lbs.} + 650 \text{ lbs.} = 1,300$ lbs. M_{allow} = Allowable ASD Base Moment (ft-lbs.)
(See Cold-Formed Steel Two-Story Stacked Tables) V_{allow} = Allowable ASD Shear Load V (lbs.)
(See Cold-Formed Steel Two-Story Stacked Tables)**STEP 1 – Select First-Story Wall** (See tables on page 48) $M_{\text{base}} = (650 \text{ lbs.} \times 18 \text{ ft.}) + (650 \text{ lbs.} \times 9 \text{ ft.}) = 17,550$ ft-lbs.Using First-Story Wall Table, select a 9-foot wall with $M_{\text{allow}} \geq M_{\text{base}}$

Select S/SSW18x9X-STK

 $M_{\text{allow}} = 21,480$ ft-lbs. > 17,550 ft-lbs. **OK****STEP 2 – Check Second-Story Wall**

Using the Second-Story Wall Table on page 48, check the capacity of an 8-foot wall with the same width as the First-Story Wall selected in Step 1:

Select S/SSW18x8X

 $V_{\text{allow}} = 1,275$ lbs. > 650 lbs. **OK****>>> Use S/SSW18x8X over S/SSW18x9X-STK**

Specify height when ordering “X” and “X-STK” models

