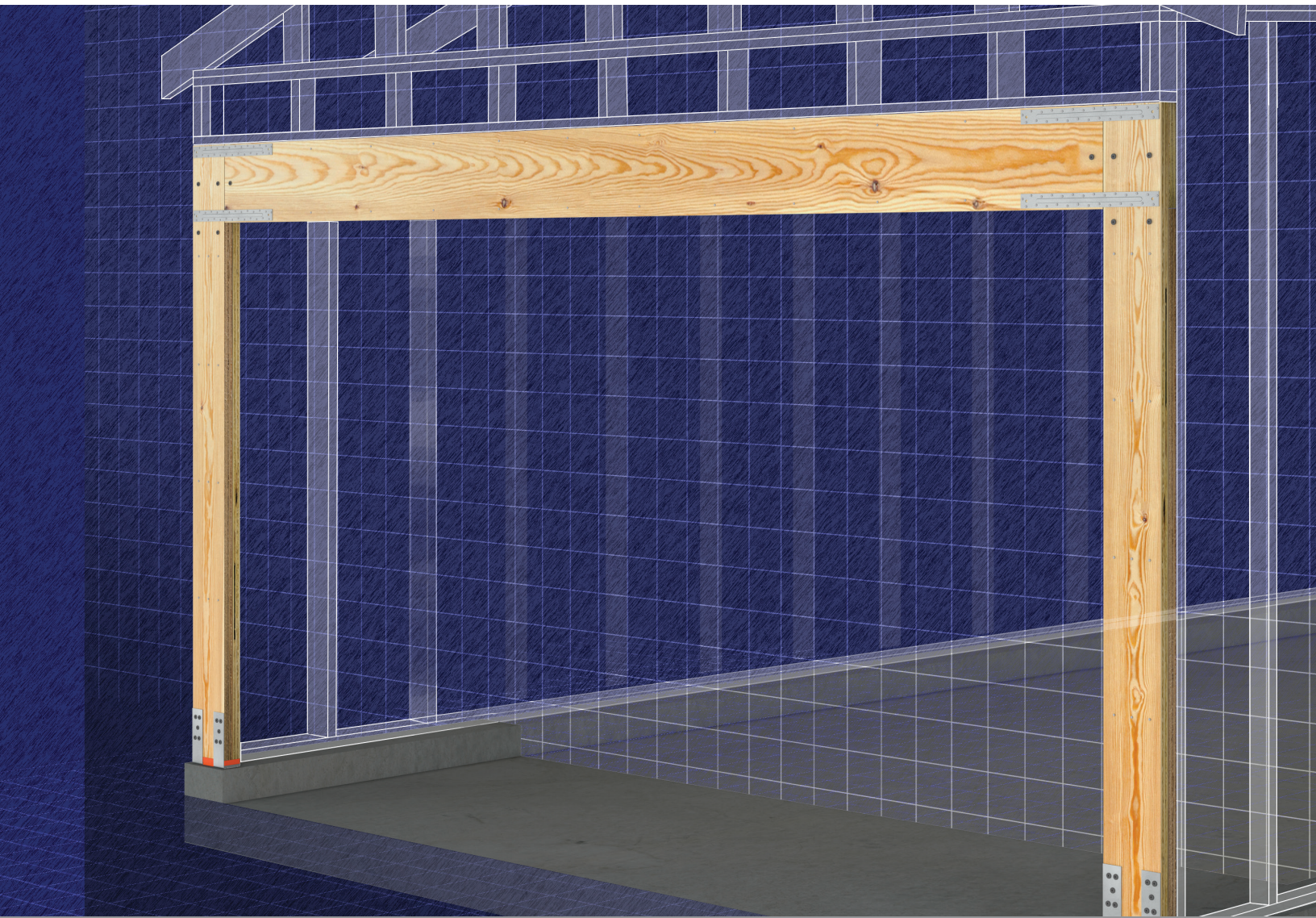
SIMPSON Strong-Tie

Strong-Wall® Site-Built Portal Frame System
for Prescriptive Design



TO BE USED WITH DESIGNS CONFORMING TO THE INTERNATIONAL RESIDENTIAL CODE® (IRC®)

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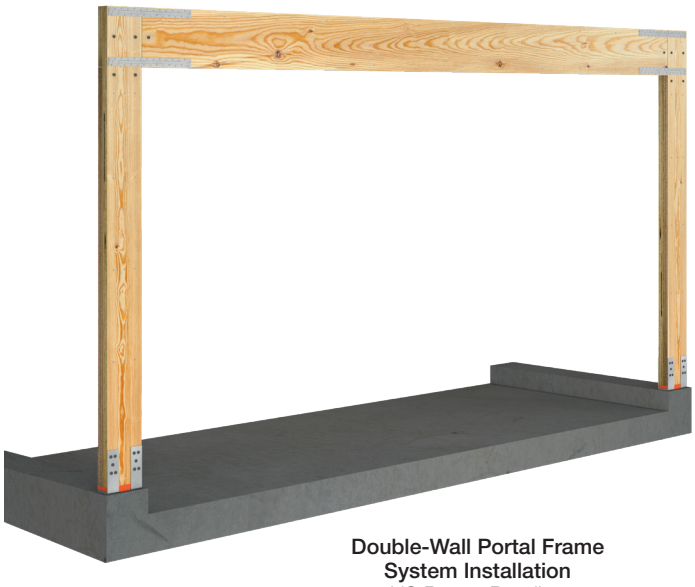
Strong-Wall® Site-Built Portal Frame System

The code-listed Strong-Wall site-built portal frame system (PFS) provides designers, builders and contractors in prescriptive markets with an easy way to meet code-required wall-bracing requirements with narrow wall widths. Simple and quick to install, the PFS is a cost-effective alternative to IRC® braced-wall solutions.

- **Code-Listed** — ICC-ES ESR-4455, evaluated to the 2021, 2018, 2015, 2012 and 2009 International Residential Code® (IRC). Download a copy of the code report at **strongtie.com/pfs**.
- **Narrow wall width** — 10" or 12" nominal column sizes allow builders to maintain narrow return walls at garage openings and allow designers to maximize portal openings in standard wall framing, such as for large picture windows or sliding glass doors.
- **Easy to assemble** — saves time for the installer and increases the confidence of the specifier that it will be installed properly.
- **Cost effective** — site-built portal frames are less expensive than prefabricated shearwalls or moment frames.
- **Equivalent wall length** — designers need as much equivalent wall length as possible to economically design structures.



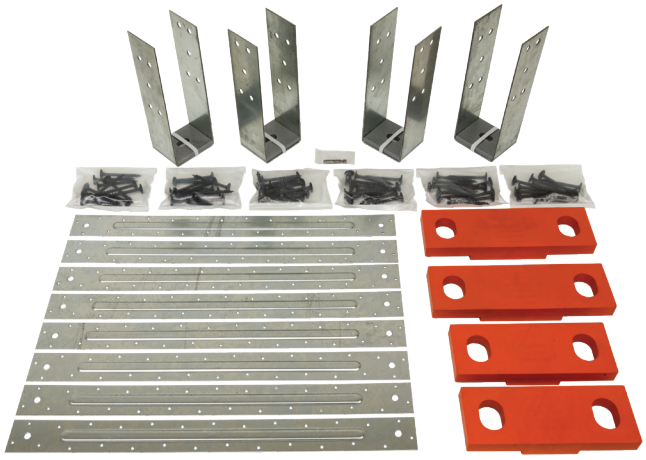
Double-Wall Portal Frame System Installation
US Patent Pending

Single-Wall Portal (PFS-HKS)

Single-Wall Portal Frame Kit

(2) Holdown assemblies
(2) Composite standoff bases*
(5) Moment connection straps
(1) Adjustable post base (ABW44Z)
(33) SDW22300 Truss-Ply screws
(8) SD9112 Connector screws
(1) 6-lobe T40 driver bit
(1) Installation instructions (T-L-PFSHWIN)

Double-Wall Portal (PFS-HKD)



Double-Wall Portal Frame Kit

(4) Holdown assemblies
(4) Composite standoff bases*
(8) Moment connection straps
(66) SDW22300 Truss-Ply screws
(1) 6-lobe T40 driver bit
(1) Installation instructions (T-L-PFSHWIN)

*Extra composite standoff bases included. Use only the base that corresponds to the column width and discard extra base(s).

Strong-Wall® Site-Built Portal Frame System

Portal Frame System Dimensions

Acceptable Beam Materials	Acceptable Column Materials[1]	Column Sizes (in.)		Beam Depths (in.)	Rough Opening Dimensions		Max. Total Height[5] (in.)	Anchor Qty. and Dia.[2] (in.)	
		10 in. Nominal	12 in. Nominal		Max. Height (in.)	Allowable Width (ft.)		Each Column	Post
LVL, Solid Sawn	LVL	(2) 1¾ x 9½	(2) 1¾ x 11⅞	11⅞ min.–18 max.	102–108	2 min.–18 max.	120	(2) ⅝	(1) ½
	Solid Sawn DF/SP/SPF/HF	(2) 1½ x 9¼	(2) 1½ x 11¼	11¼ min.–18 max.					
Glulam[6]	LVL	(2) 1¾ x 9½	(2) 1¾ x 11⅞	12 min. - 18 max					
	Solid Sawn DF/SP/SPF/HF	(2) 1½ x 9¼	(2) 1½ x 11¼						

1. LVL is 2.0E (min.); solid sawn lumber is #2 or better.
2. Anchor bolts are not included in the portal frame system kit. Refer to pp. 5–7 for additional information on anchorage.
3. Refer to foundation details for minimum concrete dimensions.
4. Solid sawn columns require a wood shim at the holdown assemblies.
5. Maximum total height may be increased to 144" with the addition of a pony wall above the header, as shown in the figure on p. 4.
6. Glulam headers may be 3⅛"–3½" wide. For assembly details with solid sawn or LVL columns, refer to detail sheet PFS3 on **strongtie.com**

To specify a portal frame system, include the following:

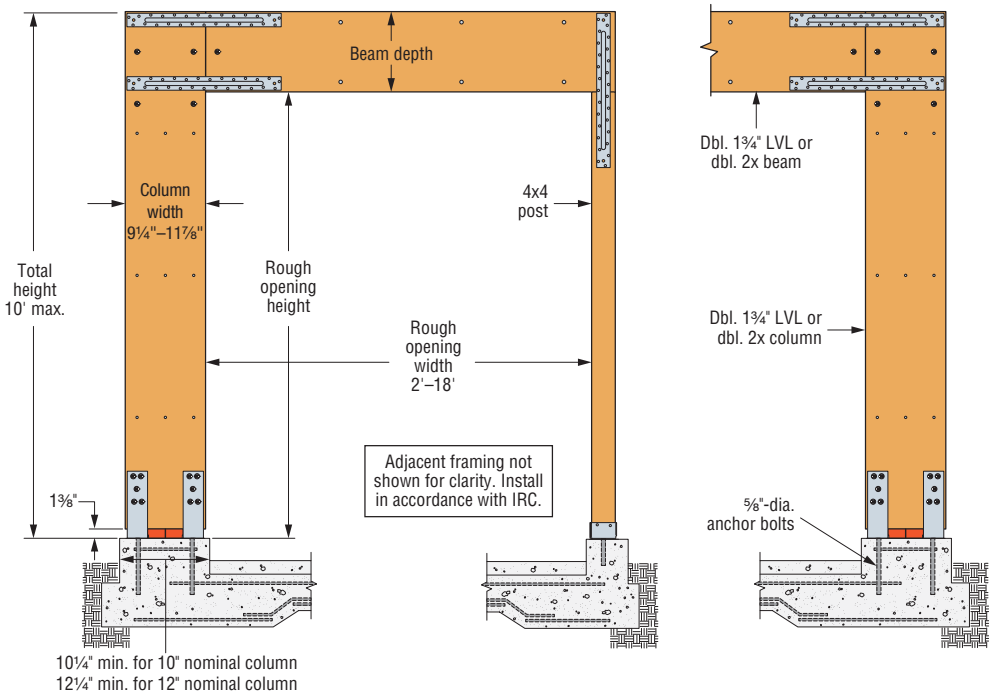
- ☑ Single or double hardware kit
- ☑ Column size and material
- ☑ Beam size and material
- ☑ Anchor diameter, adhesive type and embedment depths
- ☑ Specific reference to any shim blocking or pony wall assembly details, if applicable
- ☑ Include the Simpson Strong-Tie installation detail sheet with your plans and reference the sheet number

Example:

– On framing/wall-bracing sheets specify: Simpson Strong-Tie® PFS-HKD double wall portal with (2) 2x10 SP columns with ½" OSB shim, (2) 1¾" x 11⅞" LVL beams with ¼" shim

– On foundation sheets specify: Simpson Strong-Tie SET-3G™ epoxy, ⅝"-diameter all-thread rod, 12" embedment

See Simpson Strong-Tie PFS installation details on Sheets PFS1, PFS2, and PFS3. Installation sheets can be downloaded at **strongtie.com/pfs**.



Single-Wall Portal Installation

Double-Wall Portal Installation

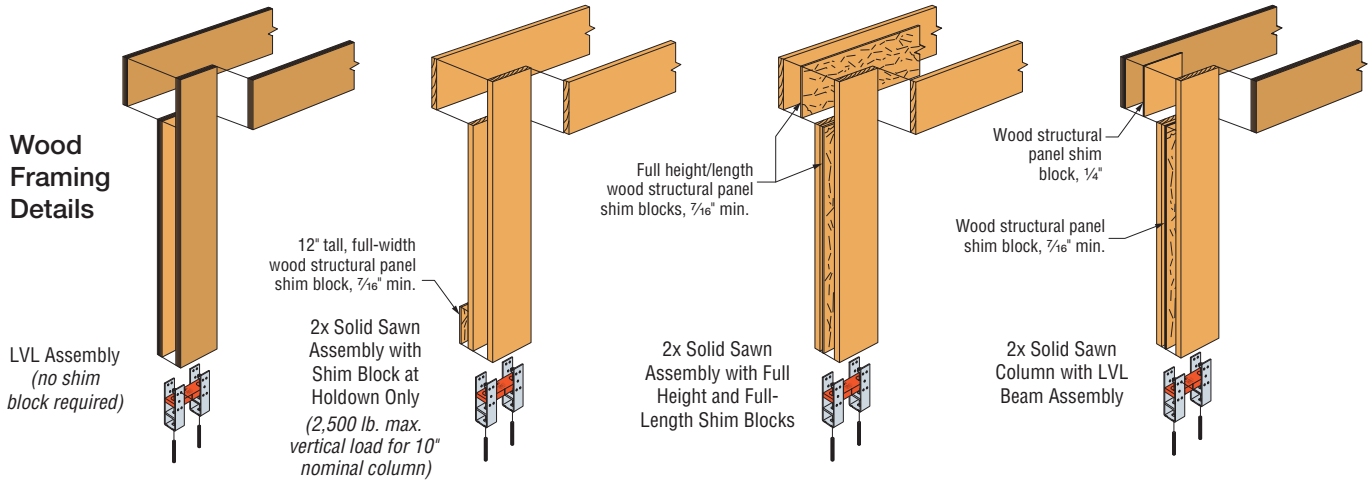
Strong-Wall® Site-Built Portal Frame System

Portal Frame System Bracing Equivalents for Wind and Seismic

Framing Material[7,8]	Concurrent Vertical Load on Column (lb.)[4]	Equivalent Wall-Bracing Length (ft.)				Maximum Allowable Beam End Reaction (lb.)[5,6]		
		10 in. Nominal Column Size		12 in. Nominal Column Size		Number Of Additional Trimmer Studs		
		Single-Wall Portal	Double-Wall Portal	Single-Wall Portal	Double-Wall Portal	No Studs	1 Stud	2 Studs
LVL	7,500	4.00	8.00	4.00	8.00	5,200	7,500	8,000
DF/SP	4,000[9]	3.00	6.00	4.00	8.00	3,600	4,700	—
SPF/HF	4,000[9]	2.75	5.50	3.50	7.00	3,100	3,800	—

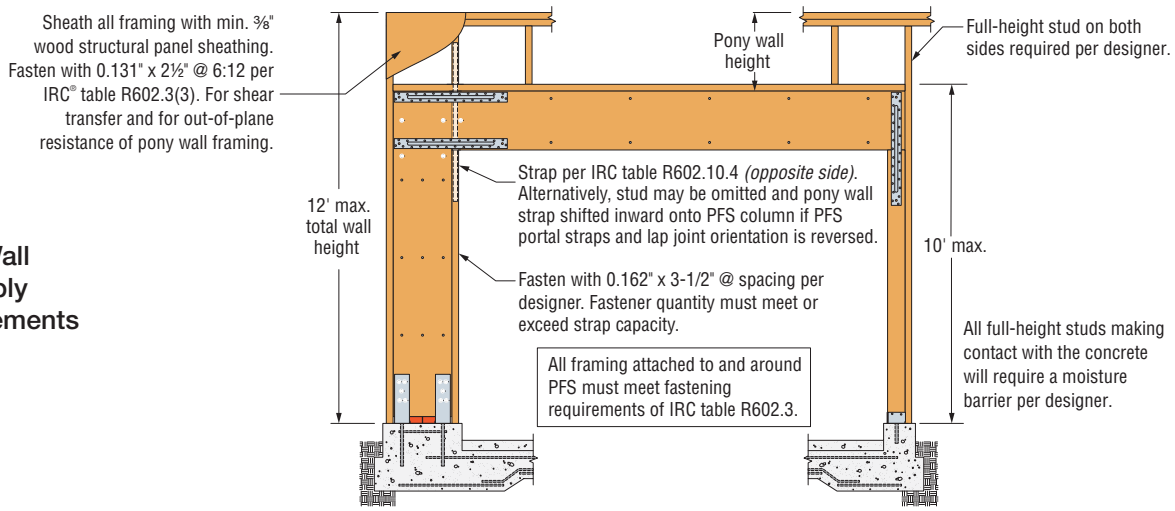
1. The Strong-Wall site-built portal frame system (PFS) is applicable for use up to 10' max. The total wall height is permitted to be increased to 12' with a 2' max. pony wall. For pony wall applications, the equivalent bracing length must be reduced by a 0.80 factor.
2. PFS may be used in single-story and first of two-story applications for detached and one- and two-family dwellings in Wind and SDC A, B and C.
3. Use limited to single-story applications for detached and one- and two-family dwellings in SDC D0–D2.
4. Concurent vertical load denotes the total maximum concentric vertical load permitted on the portal frame column when combined lateral loads are present.
5. The designer is responsible for the beam design. The reaction at beam/column interface shall not exceed the tabulated maximum allowable beam end reaction for each material type. The maximum allowable beam end reaction may not be increased for duration of load.
6. When required, add beam support trimmer stud(s) per designer. Attach to PFS column with 0.162" x 3 ½" nails at 12" on center.
7. Minimum header depths for LVL and solid sawn are 11¼" and 11⅞", respectively.
8. Solid sawn columns may be used in combination with LVL header material. Wall-bracing length is limited to that of the solid sawn material. Shims illustrated in LVL — Solid Sawn detail below must be used for proper framing alignment.
9. For 10" nominal DF/SP and SPF/HF systems constructed with shim at holdown only, vertical load is limited to 2,500 lb.

Wood Framing Details



Note: See **strongtie.com/pfs**, Installation Detail Sheet PFS3 for Alternate Framing Conditions, including Glulam Header Assembly details.

Pony Wall Assembly Requirements



Slab-on-Grade Anchorage

Portal Frame System Anchorage for Wind, Slab on Grade

PFS Column Material	Application	Embedment Depth, d_e (in.)						Minimum Footing Dimensions (in.)	
		2,500 psi Concrete		3,000 psi Concrete		3,500 psi Concrete			
		SET-3G™	AT-3G™	SET-3G	AT-3G	SET-3G	AT-3G	Width W/W1	Length L
LVL	Garage Curb	16	16	13	14	12	13	12/2	24
	Midwall	12	12	12	12	12	12		
DF/SP	Garage Curb	14	14	12	13	12	12		
	Midwall	12	12	12	12	12	12		
SPF/HF	Garage Curb	14	14	12	13	12	12		
	Midwall	12	12	12	12	12	12		

1. Post-installed anchor rods shall be ⅝"-diameter ASTM F1554 Grade 36 or ASTM A36 minimum threaded rods.
2. Post-installed solutions must be installed with Simpson Strong-Tie® SET-3G or AT-3G anchoring adhesives.
3. Tabulated embedment depths are based on 10'-tall portal frame. Visit Strong-Wall Bracing Selector software at **strongtie.com** for anchorage solutions specific to frame, material and use.

Portal Frame System Anchorage for Seismic, Slab on Grade

PFS Column Material	Application	Embedment Depth, d_e (in.)						Minimum Footing Dimensions (in.)	
		2,500 psi Concrete		3,000 psi Concrete		3,500 psi Concrete			
		SET-3G	AT-3G	SET-3G	AT-3G	SET-3G	AT-3G	Width W/W1	Length L
LVL	Garage Curb	20	20	16	17	14	15	12/2	24
	Midwall	13	13	12	12	12	12		
DF/SP	Garage Curb	17	17	14	15	12	14		
	Midwall	12	12	12	12	12	12		
SPF/HF	Garage Curb	17	17	14	15	12	14		
	Midwall	12	12	12	12	12	12		

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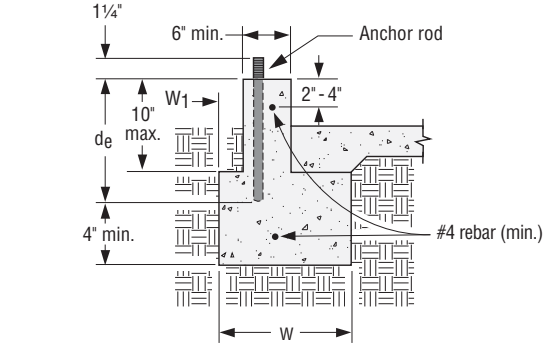
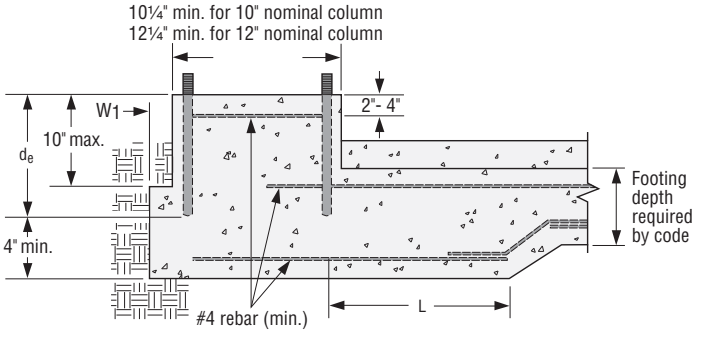
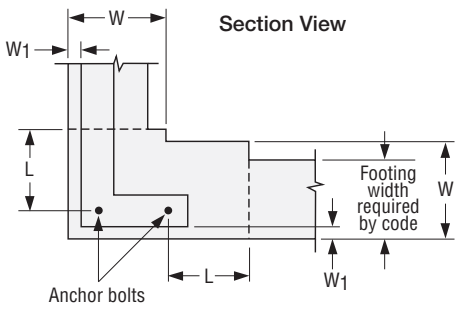


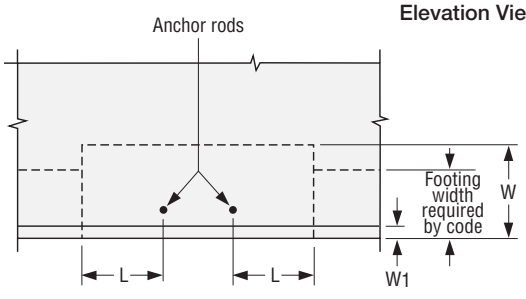
Section View



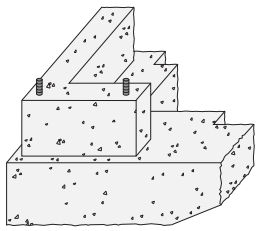
Elevation View



Plan View
Garage Curb



Plan View
Midwall



Perspective View
Garage Curb

Brick Ledge Anchorage

Portal Frame System Anchorage for Wind, Brick Ledge

PFS Column Material	Application	Embedment Depth, d_e (in.)						Minimum Footing Dimensions (in.)	
		2,500 psi Concrete		3,000 psi Concrete		3,500 psi Concrete			
		SET-3G™	AT-3G™	SET-3G	AT-3G	SET-3G	AT-3G	Width W/W1	Length L
LVL	Garage Curb	12	13	12	12	12	12	12/5.5	24
	Midwall	12	12	12	12	12	12		
DF/SP	Garage Curb	12	12	12	12	12	12		
	Midwall	12	12	12	12	12	12		
SPF/HF	Garage Curb	12	12	12	12	12	12		
	Midwall	12	12	12	12	12	12		

1. Post-installed anchor rods shall be ⅝"-diameter ASTM F1554 Grade 36 or ASTM A36 minimum threaded rods.
2. Post-installed solutions must be installed with Simpson Strong-Tie® SET-3G or AT-3G anchoring adhesives.
3. Tabulated embedment depths are based on 10'-tall portal frame. Visit Strong-Wall Bracing Selector software at **strongtie.com** for anchorage solutions specific to frame, material and use.

Portal Frame System Anchorage for Seismic, Brick Ledge

PFS Column Material	Application	Embedment Depth, d_e (in.)						Minimum Footing Dimensions (in.)	
		2,500 psi Concrete		3,000 psi Concrete		3,500 psi Concrete			
		SET-3G	AT-3G	SET-3G	AT-3G	SET-3G	AT-3G	Width W/W1	Length L
LVL	Garage Curb	13	15	12	14	12	13	12/5.5	24
	Midwall	12	12	12	12	12	12		
DF/SP	Garage Curb	12	13	12	13	12	12		
	Midwall	12	12	12	12	12	12		
SPF/HF	Garage Curb	12	13	12	13	12	12		
	Midwall	12	12	12	12	12	12		

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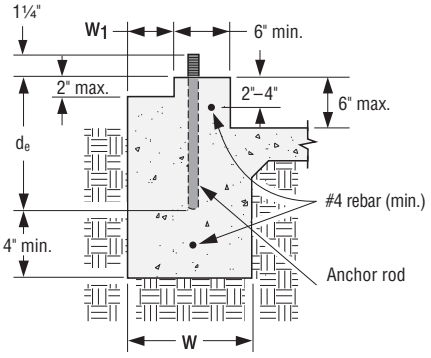
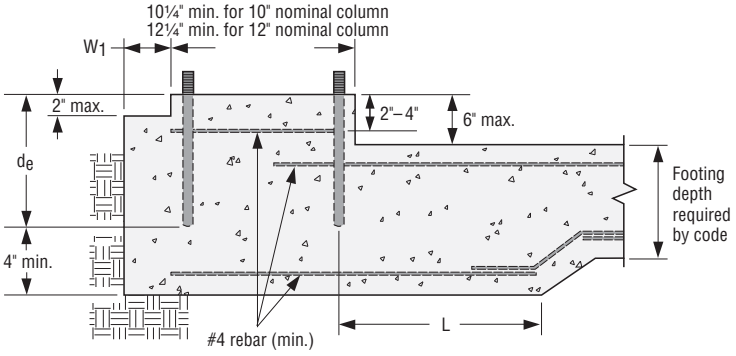
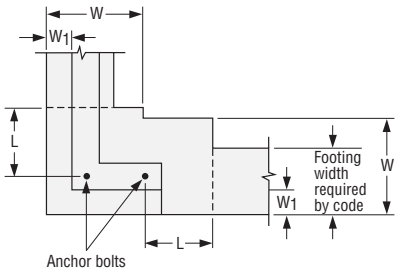


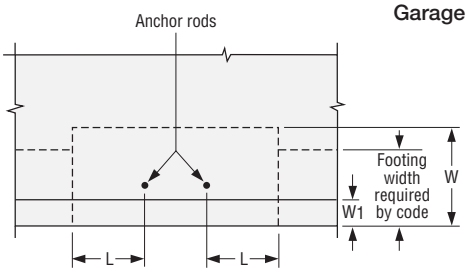
Section View



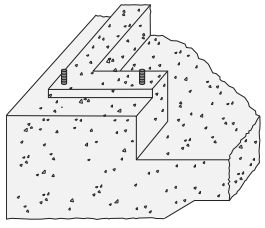
Elevation View
Garage Curb



Plan View
Garage Curb



Plan View
Midwall



Perspective View
Garage Curb

Stemwall Anchorage

Portal Frame System Anchorage for Wind, Stemwall

PFS Column Material	Application	Embedment Depth, d_e (in.)						Minimum Stemwall Dimensions (in.)	
		2,500 psi Concrete		3,000 psi Concrete		3,500 psi Concrete			
		SET-3G™	AT-3G™	SET-3G	AT-3G	SET-3G	AT-3G	Width W	Length L
LVL	Garage Curb	15	18	14	16	13	15	6	24
	Midwall	12	12	12	12	12	12		
DF/SP	Garage Curb	12	14	12	13	12	12		
	Midwall	12	12	12	12	12	12		
SPF/HF	Garage Curb	12	14	12	13	12	12		
	Midwall	12	12	12	12	12	12		

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2. Post-installed solutions must be installed with Simpson Strong-Tie® SET-3G or AT-3G anchoring adhesives.
3. Tabulated embedment depths are based on 10'-tall portal frame. Visit Strong-Wall Bracing Selector software at **strongtie.com** for anchorage solutions specific to frame, material and use.

Portal Frame System Anchorage for Seismic, Stemwall

PFS Column Material	Application	Embedment Depth, d_e (in.)						Minimum Stemwall Dimensions (in.)	
		2,500 psi Concrete		3,000 psi Concrete		3,500 psi Concrete			
		SET-3G	AT-3G	SET-3G	AT-3G	SET-3G	AT-3G	Width W	Length L
LVL	Garage Curb	20	NS	19	NS	18	19	6	24
	Midwall	12	13	12	12	12	12		
DF/SP	Garage Curb	16	19	15	17	14	15		
	Midwall	12	12	12	12	12	12		
SPF/HF	Garage Curb	16	19	15	17	14	16		
	Midwall	12	12	12	12	12	12		

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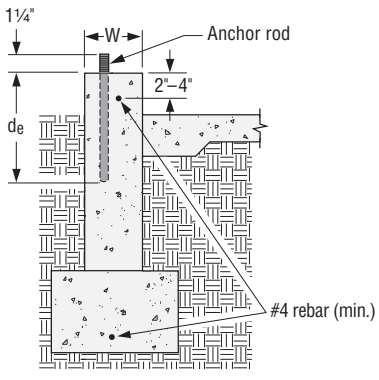
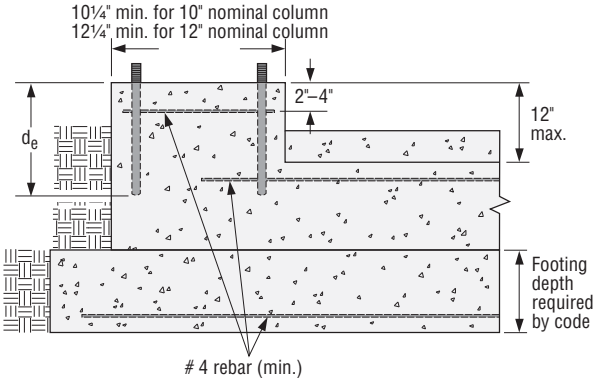
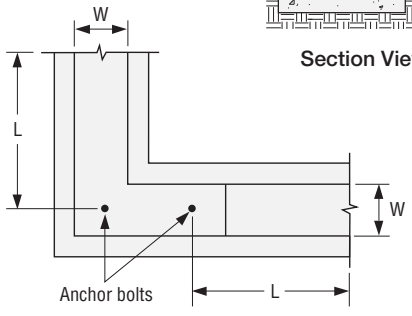
2. Post-installed solutions must be installed with Simpson Strong-Tie SET-3G or AT-3G anchoring adhesives.
3. Tabulated embedment depths are based on 10'-tall portal frame. Visit Strong-Wall Bracing Selector software at **strongtie.com** for anchorage solutions specific to frame, material and use.
4. NS = No solution available.



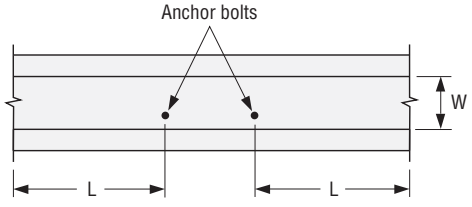
Section View



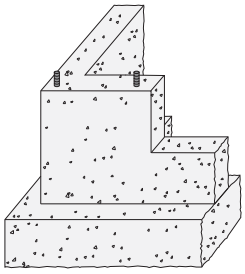
Elevation View
Garage Curb



Plan View
Garage Curb



Plan View
Midwall



Perspective View
Garage Curb

Strong-Wall® Site-Built Portal Frame System

AT-3G™ High-Strength Hybrid Acrylic Adhesive

AT-3G is a hybrid, acrylic-based adhesive for anchoring threaded rod and rebar into cracked and uncracked concrete. Ideal for cold weather and wet concrete applications, AT-3G dispenses easily and offers a fast curing time for same-day bolt up. It can be specified for a wide range of in-service temperatures, and maintains its strong bond strength in extreme environments for ultimate design and jobsite flexibility. Tested and code compliant with the IBC® and IRC®, AT-3G hybrid adhesive is easy to install with the conventional blow-brush-blow hole cleaning method.

Features

- Excellent for use in cold-weather conditions or applications where fast cure is required
- Recognized per ICC-ES AC308 for threaded rod and rebar anchoring, along with post-installed rebar development and splice length design provisions
- Conventional blow-brush-blow hole cleaning technique using a wire brush — no power brushing required

Additional special application testing has been conducted to address:

- Base material installation temperatures down to 0°F (-18°C)
- Use in grout-filled CMU construction
- Use of a vacuum in lieu of compressed air for hole cleaning
- Installation into oversized holes
- Installation in holes drilled with diamond core bits

Software

Visit the Prescriptive Design Center at **strongtie.com/pfs** for FREE tools to help design professionals meet the wall-bracing requirements of the International Residential Code® (IRC).

Wall-Bracing Length Calculator

The Wall-Bracing Length Calculator helps the user navigate the complex wall-bracing requirements in the IRC.

- Easy-to-use interface
- Determines total length of bracing required along a braced wall line
- Includes all adjustment factors for both wind and seismic loading
- Print consolidated output for multiple braced wall lines

Strong-Wall Bracing Selector

In areas where the code-defined bracing methods are not adequate, use the Strong-Wall Bracing Selector to help choose a Wood or Steel Strong-Wall wall-bracing replacement.

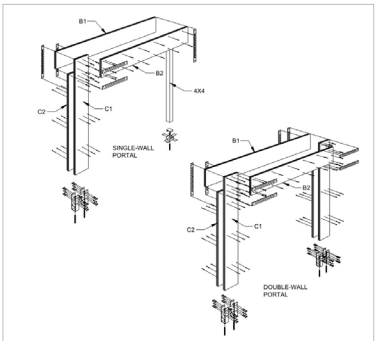
- Step-by-step tutorials guide you through the design process
- Print designs for project submittal
- Save and upload designs

The SWBS has been updated to include prescriptive wall bracing solutions for the Strong-Wall Portal Frame System (PFS) in Seismic Design Categories D0–D2, PFS installations on CMU stemwalls and cast-in-place anchorage solutions.

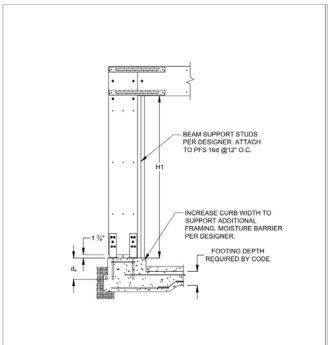
Visit **strongtie.com/pfs** for information and to try these design tools.

Structural Details

Simple-to-download detail sheets are available in .dwg, .dxf and .pdf formats at **strongtie.com/pfs**.



LVL 2.0E FRAMING | 1



BEAM SUPPORT FRAMING | 8

This flier is effective until June 30, 2026, and reflects information available as of April 1, 2024.
This information is updated periodically and should not be relied upon after June 30, 2026.
Contact Simpson Strong-Tie for current information and limited warranty or see strongtie.com.

(800) 999-5099
strongtie.com