PA/HPA/PAI/MPAI

Purlin Anchors

Embedded purlin anchors offer solutions for wood-to-concrete and concrete-block connections which satisfy code requirements. The HPA offers the highest capacity in concrete. The PA's dual-embedment line allows installation in concrete or concrete block.

Material: PA/PAI — 12 gauge; HPA — 10 gauge; MPAI — 14 gauge

Finish: Galvanized; PAs available HDG or ZMAX® coating

Installation:

- Use all specified fasteners; some models have extra fastener holes. See General Notes.
- Purlin anchor must hook around rebar.
- Allowable loads are for a horizontal installation into the side of a concrete or masonry wall.
- For vertical installation in the top of GFCMU, refer to engineering letter L-C-PAGFCMUUP on **strongtie.com**.
- Strap may be bent one full cycle. (Bent vertical 90° then bent horizontal.)

Edge Distance — Minimum concrete edge distance is 5". Minimum concrete block left-to-right edge distance is 20".

Concrete Block Wall — The minimum wall specifications are:

A One #4 vertical rebar, 32" long, 16" each side of anchor

B Two courses of grout-filled block above and below the anchor (no cold joints allowed)

C A horizontal bond beam with two #4 rebars, 40" long, a maximum of two courses above or below the anchor

D Minimum masonry compressive strength, f'_m = 1,500 psi

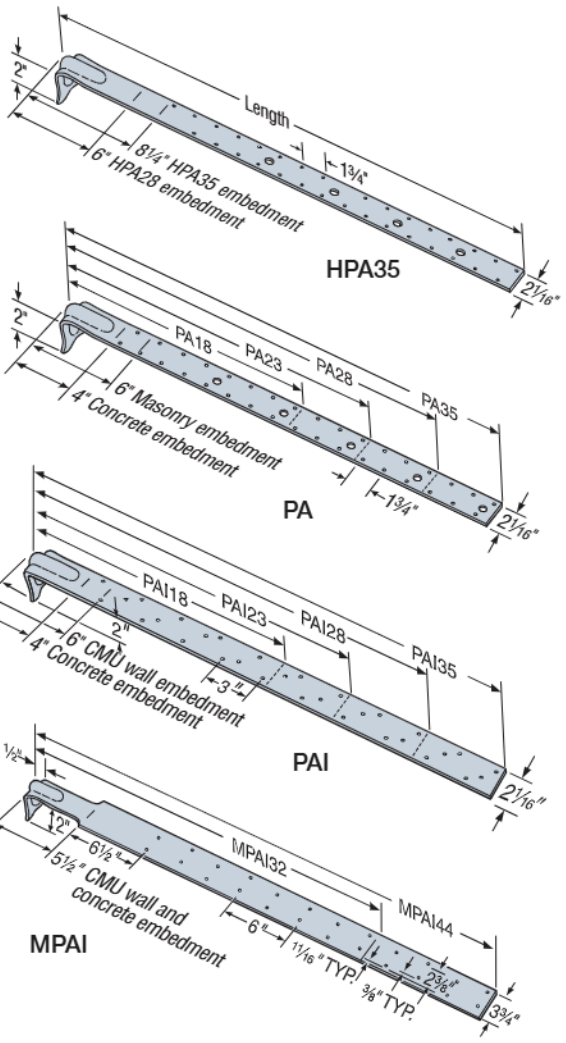
Options: See LTT and HTT tension ties for alternate retrofit solutions

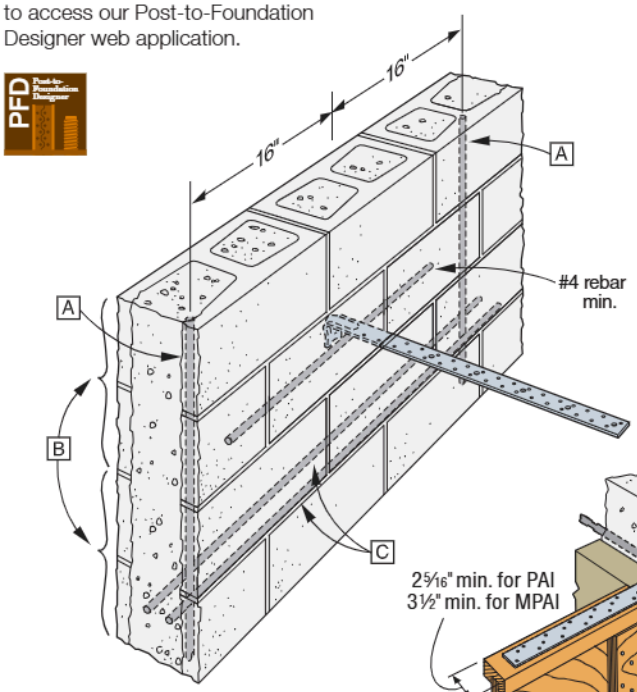
Codes: See p. 12 for Code Reference Key Chart

Web Applications: Visit **app.strongtie.com/pfd** to access our Post-to-Foundation Designer web application.

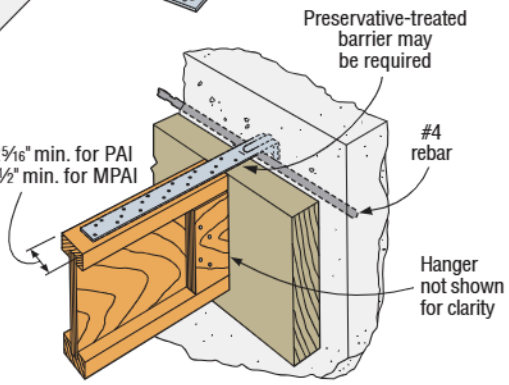
ASCE7 12.11.2.2.5 States:

... Diaphragm to structural wall anchorage using embedded straps shall have the straps attached to or hooked around the reinforcing steel, or otherwise terminated to effectively transfer forces to the reinforcing steel.

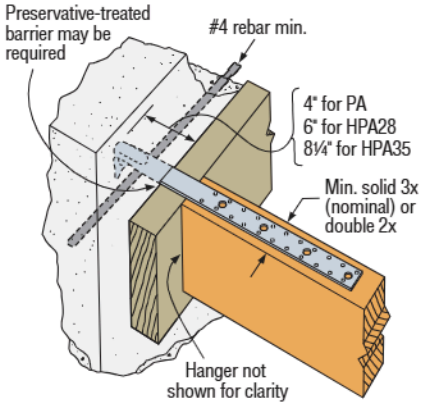




PA/PAI/MPAI Purlin to Grout-Filled Concrete-Block Wall
(refer to installation notes above)



PAI Purlin to Concrete Wall
(MPAI similar)



PA/HPA Purlin to Concrete Wall
PAI/MPAI for I-joist applications

Purlin Anchors (cont.)

These products are available with additional corrosion protection. For more information, see pp. 13–19.

Wind and SDC A&B — Allowable Tension Loads (160)														
Max Ledger Size	Model No.	Strap Length, L (in.)	Embed Length, l_e (in.)		Uncracked Concrete		Cracked Concrete		GFCMU Wall		Max. Allowable Strap Tension	Deflection at Allowable Load (in.)	Code Ref.
			Concrete	GFCMU	Required Nails (in.)	Tension	Required Nails (in.)	Tension	Required Nails (in.)	Tension			
4x Ledger	PA18	18½	4	6	(12) 0.148 x 3	2,430	(12) 0.148 x 3	2,260	(12) 0.148 x 3	1,890	NA	0.087	IBC, FL
	PAI18	18	4	6	(10) 0.148 x 1½	2,025	(10) 0.148 x 1½	2,025	(9) 0.148 x 1½	1,055	NA	0.1	
	PA23	23¾	4	6	(16) 0.148 x 3	3,220	(12) 0.148 x 3	2,260	(16) 0.148 x 3	2,815	NA	0.118	
	PAI23	23	4	6	(15) 0.148 x 1½	3,035	(12) 0.148 x 1½	2,260	(14) 0.148 x 1½	1,805	NA	0.158	
	PA28	29	4	6	(16) 0.148 x 3	3,230	(12) 0.148 x 3	2,260	(16) 0.148 x 3	2,815	NA	0.085	
	PAI28	29	4	6	(16) 0.148 x 1½	3,230	(12) 0.148 x 1½	2,260	(16) 0.148 x 1½	2,705	NA	0.167	
	PA35	35	4	6	(16) 0.148 x 3	3,230	(12) 0.148 x 3	2,260	(16) 0.148 x 3	2,815	NA	0.085	
	PAI35	35	4	6	(16) 0.148 x 1½	3,230	(12) 0.148 x 1½	2,260	(18) 0.148 x 1½	2,815	NA	0.13	
	MPAI32	33½	5½		(16) 0.148 x 1½	2,885	(16) 0.148 x 1½	2,885	(16) 0.148 x 1½	2,355	NA	0.167	
	MPAI44	45½	5½		(16) 0.148 x 1½	2,885	(16) 0.148 x 1½	2,885	(24) 0.148 x 1½	2,865	NA	0.167	
	HPA28	32½	6	6	(22) 0.148 x 3	5,145	(20) 0.148 x 3	4,675	—	—	NA	0.133	
	HPA35	38½	8¼	8¼	(22) 0.148 x 3	5,145	(22) 0.148 x 3	5,145	—	—	NA	0.132	

SDC C–F — Allowable Tension Loads (160)														
Max Ledger Size	Model No.	Strap Length, L (in.)	Embed Length, l_e (in.)		Uncracked Concrete		Cracked Concrete		GFCMU Wall		Max. Allowable Strap Tension	Deflection at Allowable Load (in.)	Code Ref.
			Concrete	GFCMU	Required Nails (in.)	Tension	Required Nails (in.)	Tension	Required Nails (in.)	Tension			
4x Ledger	PA18	18½	4	6	(12) 0.148 x 3	2,430	(10) 0.148 x 3	1,980	(12) 0.148 x 3	1,890	3,220	0.087	IBC, FL
	PAI18	18	4	6	(10) 0.148 x 1½	2,025	(10) 0.148 x 1½	1,980	(9) 0.148 x 1½	1,055	4,180	0.1	
	PA23	23¾	4	6	(14) 0.148 x 3	2,830	(10) 0.148 x 3	1,980	(16) 0.148 x 3	2,815	3,220	0.118	
	PAI23	23	4	6	(14) 0.148 x 1½	2,830	(10) 0.148 x 1½	1,980	(14) 0.148 x 1½	1,805	4,180	0.158	
	PA28	29	4	6	(14) 0.148 x 3	2,830	(10) 0.148 x 3	1,980	(16) 0.148 x 3	2,815	3,935	0.085	
	PAI28	29	4	6	(14) 0.148 x 1½	2,830	(10) 0.148 x 1½	1,980	(16) 0.148 x 1½	2,705	5,070	0.167	
	PA35	35	4	6	(14) 0.148 x 3	2,830	(10) 0.148 x 3	1,980	(16) 0.148 x 3	2,815	3,935	0.085	
	PAI35	35	4	6	(14) 0.148 x 1½	2,830	(10) 0.148 x 1½	1,980	(18) 0.148 x 1½	2,815	5,070	0.13	
	MPAI32	33½	5½		(16) 0.148 x 1½	2,885	(16) 0.148 x 1½	2,885	(16) 0.148 x 1½	2,355	3,205	0.167	
	MPAI44	45½	5½		(16) 0.148 x 1½	2,885	(16) 0.148 x 1½	2,885	(24) 0.148 x 1½	2,865	3,205	0.167	
	HPA28	32½	6	6	(22) 0.148 x 3	5,145	(18) 0.148 x 3	4,090	—	—	5,145	0.133	
	HPA35	38½	8¼	8¼	(22) 0.148 x 3	5,145	(22) 0.148 x 3	5,145	—	—	5,145	0.132	

1. Allowable loads have been increased for wind or earthquake loading with no further increase allowed. Reduce where other loads govern.
2. Deflection listed is at the highest allowable load.
3. Multiply seismic and wind ASD load values by 1.43 or 1.67, respectively, to obtain LRFD capacities.
4. Nail quantities are based on Douglas fir (DF) or equivalent specific gravity of 0.50 or better. For use in spruce-pine-fir (SPF) or hem-fir (HF), nails quantities shall be increased by 1.15 to achieve loads listed.
5. For wall anchorage systems in SDC C-F, the maximum strap allowable load shall not be less than 1.4 times the ASD anchor design load.
6. Minimum center-to-center spacing is 3x the required embedment — i.e., standard installation is based on a minimum 5" end distance.
7. Structural composite lumber beams have sides that show either the wide face or the lumber strands/veneers. Values in the tables reflect installation into the wide face.
8. Concrete shall have a minimum compressive strength of f'_c = 3,000 psi.
9. Grout-filled CMU (GFCMU) shall have a minimum compressive strength of f'_m = 1,500 psi.
10. PA models installed vertically in the top of a grouted masonry wall with 6" embedment and (12) 0.148" x 3" nails achieve an allowable uplift load of 1,890 lb.
11. For PA models, 0.148" x 1½" nails may be substituted for 0.148" x 3" nails at 100% of listed load and with a 15% increase in deflection. For installation over sheathing, use 3"-long nails minimum.
12. For PAI/MPAI models, 0.148" x 1½" nails shall be used directly onto framing member. For installation over sheathing, use 2⅛"-long nails minimum.
13. **Fasteners:** Nail dimensions are listed diameter by length. See pp. 25–26 for fastener information.