

## Wall Tension Ties

### PAI/MPAI Purlin Anchors

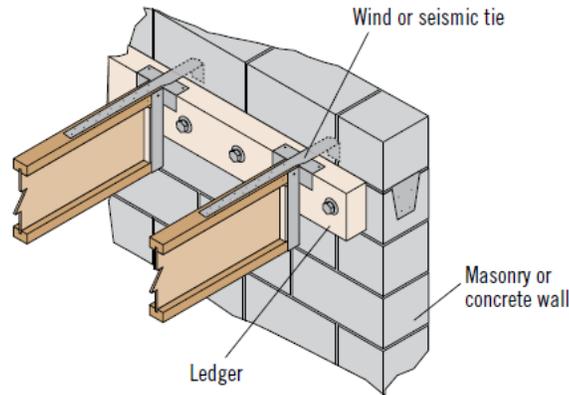
Model No.	Strap Length (in.)	Embed Length, $l_e$ (in.)		Uncracked Concrete		Cracked Concrete		GFCMU Wall		Max. Allowable Strap Tension (lb)	Deflection at Allowable Load (in.)	Code Ref.
		Concrete	GFCMU	Required Number of Nails	Tension (lb)	Required Number of Nails	Tension (lb)	Required Number of Nails	Tension (lb)			
<b>Wind and SDC A&amp;B - Allowable Tension Loads (160)</b>												
PAI18	18	4	6	10	2025	10	2025	9	1055	NA	0.1	IBC, FL
PAI23	23	4	6	15	3035	12	2260	14	1805	NA	0.158	
PAI28	29	4	6	16	3230	12	2260	16	2705	NA	0.167	
PAI35	35	4	6	16	3230	12	2260	18	2815	NA	0.13	
MPAI32	33½	5½		16	2885	16	2885	16	2355	NA	0.167	
MPAI44	45½	5½		16	2885	16	2885	24	2865	NA	0.167	
<b>SDC C-F - Allowable Tension Loads (160)</b>												
PAI18	18	4	6	10	2025	10	1980	9	1055	4180	0.1	IBC, FL
PAI23	23	4	6	14	2830	10	1980	14	1805	4180	0.158	
PAI28	29	4	6	14	2830	10	1980	16	2705	5070	0.167	
PAI35	35	4	6	14	2830	10	1980	18	2815	5070	0.13	
MPAI32	33½	5½		16	2885	16	2885	16	2355	3205	0.167	
MPAI44	45½	5½		16	2885	16	2885	24	2865	3205	0.167	

### General Notes

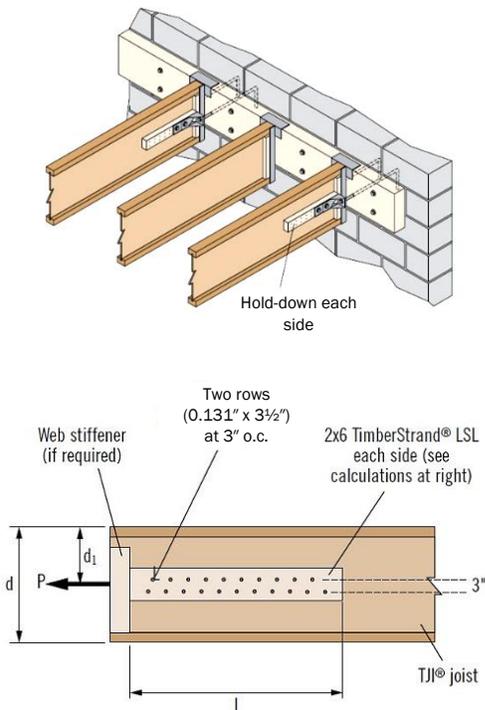
- Allowable loads have been increased for wind or earthquake loading with no further increase allowed. Reduce where other loads govern.
- Deflection listed is at the highest allowable load.
- Multiply Seismic and Wind ASD load values by 1.43 or 1.67, respectively, to obtain LRFD capacities.
- Nail quantities 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), nail quantities shall be increased by 1.15 to achieve loads listed.
- 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.
- Minimum center-to-center spacing is 3x the required embedment – i.e., standard installation is based on a minimum 5" end distance.
- Structural composite lumber beams have sides that show either the wide face or the lumber strands/veneers. Values in the table reflect installation into the wide face.
- Concrete shall have a minimum compressive strength of  $f'_c = 3,000$  psi.
- Grout-filled CMU (GFCMU) shall have a minimum compressive strength of  $f'_m = 1,500$  psi.
- For PAI/MPAI models, 0.148" x 1½" nails shall be used directly onto framing member. For installation over sheathing, use 2⅝"-long nails minimum.
- MPAI straps require 3½" minimum wide flanges, PAI straps require 2⅝" minimum wide flanges.
- Maximum 4x ledger size.
- **Fasteners:** Nail dimensions are listed diameter by length.

\*Table and general notes adopted from Simpson Strong-Tie® *Wood Construction Connectors 2024-2025* (C-C-2024), page 65. Reference manufacturer's catalog for installation information.

**Wall Tension Tie With Straps**



**Alternative Option – Connection Tie to Web of TJI® Joist (HD and TT straps)**



To calculate the length of the TimberStrand® LSL block (to transfer shear to joist flange):

1. Find:  $L_1 = \frac{0.75(PK)d_1}{C_D V_A - [V_{DL} + (0.75V_{LL})]}$
2. Find:  $L_2 = \frac{3}{2}n + 3$  where  $n = \frac{PK}{V_n C_D}$
3. Length of TimberStrand® LSL Block:  $L = \text{Max}(L_1, L_2)$

Where:

$L_1, L_2$  = Length of block [in.]

$P$  = Axial load [lb]

$K$  = 0.6 for wind; 0.7 for seismic. (Values account for ASD load combinations).

$n$  = Number of nails

$d_1$  = Distance to axial load from top of joist [in.]

$C_D$  = Load duration factor

$V_A$  = Allowable shear load for TJI® joist [lb]

$V_{DL}$  = Shear load due to gravity dead load [lb]

$V_{LL}$  = Shear load due to gravity live load [lb]

$V_n$  = (0.131" x 3 1/2") nail shear capacity (see table below)

TJI® Web Thickness	$V_n$ (100%) (lb)
3/8"	104
7/16"	121

**If you have any questions, please contact your Weyerhaeuser representative.**

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