

**SHEARWALL DESIGN SUMMARY - FLEXIBLE DIAPHRAGM ASSUMPTIONS
 2007 CBC SHEAR WALL CRITERIA
 2295 FRANCISCO STREET, SAN FRANCISCO - SEISMIC RETROFIT**

Table 4.3.4 Maximum Shear Wall Aspect Ratios

Shear Wall Sheathing Type	Maximum h/b, Ratio
Wood structural panels, all edges nailed	3-1/2:1 ¹
Particleboard, all edges nailed	2:1
Diagonal sheathing, conventional	2:1
Gypsum wallboard	2:1 ²
Portland cement plaster	2:1 ²
Fiberboard	1-1/2:1

1. For design to resist seismic forces, the shear wall aspect ratio shall not exceed 2:1 unless the nominal unit shear capacity is multiplied by 2b_v/h.
 2. Walls having aspect ratios exceeding 1-1/2:1 shall be blocked.

**** Note:** Value reduced by 2w/h for EQ loads for walls with 2.0 <= h/b <= 3.5 per NDS SDPWS-2005 Table 4.3.4.

Note: Collector Loads in areas of discontinuities will be amplified by 1.25 as per ASCE 7-05 12.3.3.4 (in Blue), if applicable.

Connector Capacities:

Z = 174 lbs (nail shear capacity)

A34 = 412 lbs (Framing angle capacity - Reduced by 1.25 per ASCE 7-05 12.3.3.4)
 SDS Screw = 340 lbs (SDS 1/4 x 3 1/2 Screw)

Fanchor = 1,516 lbs (Foundation Anchor capacity)

Assumed for (N) design, modified for (E) conditions later.

Sources: 2012 California Building Code, Table 2306.4.1, Page 324.
 Simpson Catalog C-2014.

Loading Direction	Gridline Wall Location	Normal Gridline	F _{MAX} (kips)	Wall Dimensions		Service Load (lb/ft)	Collector Force (lbs)	Shearwall Chord Force (lbs)
				Height (feet)	Width (feet)			
N-S	2	A - C	10.58	9.00	20.50	516	3,724	4,644
		D - E	3.61	9.00	7.00	516	3,724	4,644
		E.5 - F	3.35	9.00	6.50	516	3,724	4,644
	5	B - C.5	7.67	9.00	16.50	465	2,645	4,185
		C - F	12.56	9.00	27.00	465	2,645	4,185
	6	B - D	9.66	9.00	20.50	471	4,128	4,239
D - F		9.42	9.00	20.00	471	4,128	4,239	
10	B - C	6.85	9.00	10.00	685	4,787	6,165	
	D - F	13.36	9.00	19.50	685	4,787	6,165	

Panel Data		Nail Data			Allowable Wall Shear		
No. Panels	Thickness (inches)	Size	Edge (inches)	Field (inches)	Tabular Value (lb/ft)	Modified** (lb/ft)	Check
1	0.47	10d	3	12	665	665	ok
1	0.47	10d	3	12	665	665	ok
1	0.47	10d	3	12	665	665	ok
1	0.47	10d	3	12	665	665	ok
1	0.47	10d	3	12	665	665	ok
1	0.47	10d	3	12	665	665	ok
Simpson SMFX1012-97x93-L					-	-	-
1	0.47	10d	2	12	870	870	ok

Required Hardware									
Shear Walls				Shearwall to Floor			Mudsill Anchors		
Shearwall Chords	Holdown	Anchor Diameter	Required Coiled Strap Perpendicular to Framing	No. Framing Angles/ Wall	Framing Angle Spacing (inches)	SDS Screw Spacing (inches)	No. Anchors	Anchor Spacing (inches)	
3 - 2x6	HDU8 w/ 3-2x	5/8" w/ 10.00" Embed	Use CMST14 Strap w/ 16d	26 - A34" Angle	9.11	7.45	8 - 5/8" Bolts	32	
3 - 2x6	HDU8 w/ 3-2x	5/8" w/ 10.00" Embed	Use CMST14 Strap w/ 16d	9 - A34" Angle	8.40	7.00	3 - 5/8" Bolts	28	
3 - 2x6	HDU8 w/ 3-2x	5/8" w/ 10.00" Embed	Use CMST14 Strap w/ 16d	9 - A34" Angle	7.80	7.09	3 - 5/8" Bolts	26	
3 - 2x6	HDU5 w/ 2-2x	5/8" w/ 10.00" Embed	Use CMSTC16 Strap w/ 16d	19 - A34" Angle	9.90	8.25	7 - 5/8" Bolts	32	
3 - 2x6	HDU5 w/ 2-2x	5/8" w/ 10.00" Embed	Use CMSTC16 Strap w/ 16d	31 - A34" Angle	10.13	8.53	11 - 5/8" Bolts	32	
3 - 2x6	HDU8 w/ 2-2x	5/8" w/ 10.00" Embed	Use CMST14 Strap w/ 16d	24 - A34" Angle	9.84	8.20	8 - 5/8" Bolts	32	
3 - 2x6	HDU8 w/ 2-2x	5/8" w/ 10.00" Embed	Use CMST14 Strap w/ 16d	23 - A34" Angle	10.00	8.28	8 - 5/8" Bolts	32	
-	-	-	Use CMST14 Strap w/ 16d	-	-	-	-	-	
3 - 2x6	HDU8 w/ 3-2x	3/4" w/ 10.50" Embed	Use CMST14 Strap w/ 16d	33 - A34" Angle	6.88	5.71	9 - 5/8" Bolts	26	

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2007 CBC SHEAR WALL CRITERIA
2295 FRANCISCO STREET, SAN FRANCISCO - SEISMIC RETROFIT

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Shear Wall Sheathing Type	Maximum h/b, Ratio
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Gypsum wallboard	2:1 ²
Portland cement plaster	2:1 ²
Fiberboard	1-1/2:1

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Connector Capacities:

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A34 = 412 lbs (Framing angle capacity - Reduced by 1.25 per ASCE 7-05 12.3.3.4)
 SDS Screw = 340 lbs (SDS 1/4 x 3 1/2 Screw)

Fanchor = 1,516 lbs (Foundation Anchor capacity)

Assumed for (N) design, modified for (E) conditions later.

Loading Direction	Gridline Wall Location	Normal Gridline	F _{MAX} (kips)	Wall Dimensions		Service Load (lb/ft)	Collector Force (lbs)	Shearwall Chord Force (lbs)
				Height (feet)	Width (feet)			
W-E	A	2 - 5	11.35	9.00	33.00	344	5,984	3,096
		6 - 9	9.80	9.00	28.50	344	5,984	3,096
	D	4 - 5	12.42	9.00	11.50	1,080	11,245	9,720
		8 - 10	18.36	9.00	17.00	1,080	11,245	9,720
	F	2 - 4	11.67	9.00	19.00	614	6,448	5,526
		7 - 9	11.05	9.00	18.00	614	6,448	5,526

Panel Data		Nail Data			Allowable Wall Shear		
No. Panels	Thickness (inches)	Size	Edge (inches)	Field (inches)	Tabular Value (lb/ft)	Modified** (lb/ft)	Check
1	0.47	10d	4	12	530	530	ok
1	0.47	10d	4	12	530	530	ok
2	0.47	10d	3	12	1330	1,330	ok
2	0.47	10d	3	12	1330	1,330	ok
Simpson 2-Bay 1-Story SMRF Frame 1					-	-	-
Simpson 2-Bay 1-Story SMRF Frame 2					-	-	-

Required Hardware									
Shear Walls				Shearwall to Floor			Mudsill Anchors		
Shearwall Chords	Holddown	Anchor Diameter	Required Coiled Strap Perpendicular to Framing	No. Framing Angles/ Wall	Framing Angle Spacing (inches)	SDS Screw Spacing (inches)	No. Anchors	Anchor Spacing (inches)	
2 - 2x6	HDU4 w/ 2-2x	5/8" w/ 8.50" Embed	Use CMST12 Strap w/ 16d	28 - A34" Angle	13.66	11.31	13 - 5/8" Bolts	32	
2 - 2x6	HDU4 w/ 2-2x	5/8" w/ 8.50" Embed	Use CMST12 Strap w/ 16d	24 - A34" Angle	13.68	11.40	11 - 5/8" Bolts	32	
3 - 2x6	HDU14 w/ 6x	7/8" w/ 14.00" Embe	Use 2 CMSTC16 Straps w/ 16d	31 - A34" Angle	4.31	3.63	9 - 5/8" Bolts	15	
3 - 2x6	HDU14 w/ 6x	7/8" w/ 14.00" Embe	Use 2 CMSTC16 Straps w/ 16d	45 - A34" Angle	4.43	3.71	13 - 5/8" Bolts	16	
-	-	-	Use CMST14 Strap w/ 16d	-	-	-	-	-	
-	-	-	Use CMST14 Strap w/ 16d	-	-	-	-	-	