

After reviewing the available literature I noticed some differences in the testing protocol. For example, the tests outlined in [APA Research Report 138](#) used 14-gauge staples with 2 inches of penetration into 15/32 structural 1 plywood.

TABE 1 in this report is the same as TABLE 2306.2(2) of the IBC. They achieved values as high as 1795 plf in 19/32 structural 1 plywood using 3 lines of staples in 4x nominal lumber.

TABLE 2306.2(2)
ALLOWABLE SHEAR VALUES (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF STAPLES (HIGH-LOAD DIAPHRAGMS) WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE^a FOR WIND OR SEISMIC LOADING^{b, c, d}

PANEL GRADE ^e	STAPLE GAGE ^f	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM NOMINAL WIDTH OF FRAMING MEMBER AT ADJOINING PANEL EDGES AND BOUNDARIES ^g	LINES OF FASTENERS	BLOCKED DIAPHRAGMS					
						Cases 1 and 2 ^h					
						Fastener Spacing Per Line at Boundaries (inches)					
						4		2 1/2		2	
						Fastener Spacing Per Line at Other Panel Edges (inches)					
						6	4	4	3	3	2
Structural I grades	14 gage staples	2	1 5/16	3	2	600	600	860	960	1,060	1,200
				4	3	860	900	1,160	1,295	1,295	1,400
			1 5/8	3	2	600	600	875	960	1,075	1,200
				4	3	875	900	1,175	1,440	1,475	1,795

Page 12 of ESR 1539 maintains that 14,15, or 16 gauge staples 2" o.c. with 1" penetration all create shear walls with the same low 665plf capacity using nominal 2x framing in 15/32 structural 1 plywood. It makes no sense to me that staples with different gauges would not affect the results.

TABLE 7—ALLOWABLE SHEAR FOR WIND OR SEISMIC LOADING FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE AND STRUCTURAL I SHEATHING (plf)^{1,2,3,4,5,6,7,8,9,10,11}

NOMINAL NAIL DIAMETER (inch) or STAPLE GAGE Nails must be smooth and must be carbon steel (bright or galvanized)	MINIMUM NOMINAL FASTENER LENGTH (inches)		SEISMIC				WIND			
	Panels Applied Directly to Framing	Panels Applied Over 1/2 inch or 5/8 inch Gypsum Sheathing	Fastener Spacing at Panel Edges (inches)				Fastener Spacing at Panel Edges (inches)			
			6	4	3	2	6	4	3	2

15/32-inch Nominal Panel Thickness										
0.148	2	—	340	510	665	870	475	715	930	1215
	—	2 1/2	280	430	550	730	390	600	770	1020
0.135	2	—	305	455	590	775	425	635	825	1080
	—	2 1/2	250	385	490	650	350	535	685	905
0.131	2	—	280	430	550	730	390	600	770	1020
	—	2 1/2	240	365	465	615	330	505	650	860
0.120	2	—	245	375	475	630	340	520	665	880
	—	2 1/2	205	315	400	530	285	435	560	740
0.113	2	—	220	340	430	570	305	470	605	800
	—	2 1/2	185	285	365	480	260	395	510	670
14, 15, 16 Gage	1 1/2	—	185	280	375	475	260	390	525	665
14, 15, 16 Gage	—	2	155	235	300	400	215	330	420	560

In tests done by K.C. Talbot, L.D. Reaveley, and C.P. Pantelides at the University of Utah 16 gauge staples with 1 1/2" penetration space 2.5" o.c. in 7/16 OSB were used in nominal 2x lumber. They tested panels 3,4,8 and 12 feet long. They achieved Average Peak Strength values of ~1250 plf.

Test results on stapled shear walls done by the American Plywood Association can be found TABLE 3 in [APA Research Report 154](#).

TABLE 3.

STAPLED SHEAR WALLS

Staple			Panel		No. of Tests	Ultimate Loads (plf)			Target Design Shear (plf) ^(b)	Load Factor ^(c)
Size	Spacing ^(a) (in.)	Length (in.)	Type	Thickness (in.)		Min.	Max.	Avg.		
STRUCTURAL I										
16 ga	4, 12	1-1/2	Ply	1/2	1			698	280	2.5
	4, 8	1-1/2	Ply	1/2	2	783	888	835	280	3.0
	4, 6	1-1/2	Ply	1/2	1			824	280	2.9
	2, 12	1-1/2	Ply	1/2	1			1290	480	2.7
14 ga	2-5/8, 8	1-1/4	Ply	3/8	1			1345	435	3.1
	1-1/2, 6	2-3/4	Ply	3/8	2	3561	3771	3666	1625 ^(d)	2.3