



BlueLinX Engineered Products

PRODUCT GUIDE

Wall Systems

3rd Edition

ADVANCED FRAMING LUMBER



When it's built right, it's onCENTER!

QUALITY • SERVICE • VALUE

Product Guide At A Glance

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Visit www.buildonCENTER.com for additional onCENTER product information including laminated flooring.

BlueLinX

Advantages of onCENTER Advanced Framing Lumber (AFL)

AFL vs. Dimension Lumber

- **100% Usability** - Wane-free edges, significant defects removed
- **Dimensionally Stable** - Less twisting, cracking, and warping
- **Reduced Moisture Content** - Less shrinkage and a more stable product
- **Straighter** - Easier installation and attachment of wall finishes and cabinets
- **Longer Lengths** - Up to 32', fewer members to handle
- **Lifetime Limited Warranty** - Provides peace of mind

AFL vs. Composite Lumber

- **Easier to Cut & Nail** - Quicker installation, less tool wear, fewer bent nails
- **Lighter** - Easier to handle

onCENTER AFL is similar to dimension lumber, but with higher design values (shown below). Additionally, performance is more consistent – AFL's patented manufacturing process, combined with comprehensive quality control audited by an independent third party, ensures product reliability.

Design Properties^a (psi)

	onCENTER 1.6E AFL			onCENTER 1.7E AFL			onCENTER 1.9E AFL			onCENTER 2.1E AFL		
E (Modulus of Elasticity) ^{b, c}	1.6 x 10 ⁶			1.7 x 10 ⁶			1.9 x 10 ⁶			2.1 x 10 ⁶		
E _{min} (For beam/column stability calcs) ^c	0.793 x 10 ⁶			0.862 x 10 ⁶			0.968 x 10 ⁶			1.039 x 10 ⁶		
F _b (Flexural Stress) ^{d, e}	3½"	5½"	7¼"	3½"	5½"	7¼"	3½"	5½"	7¼"	3½"	5½"	7¼"
	1825	1565	1425	2450	2190	2040	2455	2455	2455	2795	2795	2610
F _v (Horizontal Shear) ^d	135			180			205			250		
F _{cl} (Compression Parallel to Grain)	1600			1925			2190			2660		
F _{c⊥} (Compression Perpendicular to Grain) ^c	425			595			675			675		
F _t (Tension Parallel to Grain) ^f	900			1350			1540			1880		
Weight (pcf)	30.1			30.1			33.0			35.9		

a. Stud width is 1.47".

b. Deflection (inches) = $\frac{270 wL^4}{Ebd^3} + \frac{28.8 wL^2}{Ebd}$

w = uniform load (plf)
L = span (feet)

E = modulus of elasticity (psi)
b = stud width (inches)

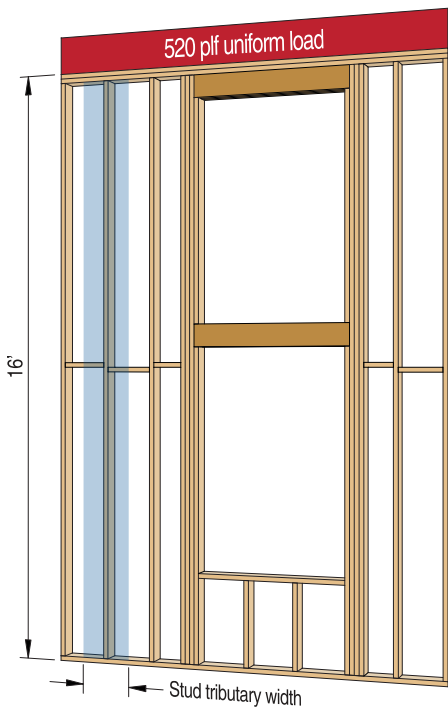
d = stud depth (inches)

c. No increase is allowed to E, E_{min} or F_{c⊥} for duration of load.

d. Values are for loads applied to narrow face of studs.

e. Values for F_b have been adjusted for size effect. A factor of 1.04 may be applied for repetitive members as defined in the National Design Specification for Wood Construction (NDS).

f. F_t is appropriate for lengths up to 24 feet.

**Parameters:**

Wall height = **16'**
 Stud spacing = **16" o.c.**
 Importance Factor = **1.0** (Residence)
 Exposure Category = **C**
 Basic wind speed = **100 mph**
 Vertical load on wall = **520 plf**
 Wall type = **Exterior with flexible finish**

Note: Wind speed and exposure category are a function of the building location.

This example only applies to studs that support a tributary width equal to the nominal stud spacing. For studs that support windows, see *Wall Column Design Example*, page 8.

Step 1 Determine design wind pressure

Refer to *Wall Design Wind Pressure* table on page 14 and locate tabular value for Exposure C, 16' wall height, and 100 mph basic wind speed. Tabular value is **27.3 psf**.

Step 2 Calculate loading on stud

Vertical load:

For studs spaced 16" o.c., $520 \text{ plf} \times 16"/12" = \mathbf{693 \text{ lbs}}$

Lateral wind load:

$27.3 \text{ psf} \times 16"/12" = \mathbf{36.4 \text{ plf}}$

Step 3 Select appropriate studs

Stud tables on pages 4-7 are based on stud height rather than wall height. For this example, the actual stud height would be 15' 7½". We could use this height in our example calculation, but have chosen to simplify by using 16', which will be conservative.

Since the wall finish is flexible, the code-required deflection limit is L/120 (see *Code Minimum Wall Deflection Criteria* table, page 15).

Refer to *Studs - Vertical Load* tables, pages 4 - 7. In this example, refer to *onCENTER® 1.6E AFL Studs* table, page 4.

Note that lateral wind loads are shown as column headers at the top of the table. With a calculated wind load of 36.4 plf, round up to the next highest lateral wind load and use the 40 plf columns. Find 16' in the left column and scan to the right until a tabular value in a 40 plf column meets a vertical load capacity of 693 lbs and an L/120 deflection ratio. **onCENTER 1.6E AFL 1½" x 5½" studs work (855 lbs, L/142).**

Step 4 Design stud connection

Convert 36.4 plf into a lateral reaction (lateral load x length/2):

$36.4 \text{ plf} \times 16'/2 = \mathbf{291 \text{ lbs}}$

Refer to *Lateral Connection Capacities*, page 12. In this example, assume an end grain nailing value of 96 lbs to determine the number of nails required for two different nail sizes.

$291/96 = \mathbf{3}$ nails, thus use either **(3) 12d sinker or (3) 16d box nails** from the plate into the end of the stud (both top and bottom).

Alternatively, a framing angle can be selected that has a tabular value exceeding 291 lbs (e.g., the **USP A3** clip has a capacity of 495 lbs).

onCENTER® 1.6E AFL Studs

Stud Height	Load & Deflection	1½" x 3½"			1½" x 5½"					1½" x 7¼"				
		Lateral Wind Load (plf)			Lateral Wind Load (plf)					Lateral Wind Load (plf)				
		15	20	30	15	20	30	40	50	15	20	30	40	50
8'	Vert. (lbs)	2744	2744	2467	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/781	L/586	L/390	L/3032	L/2274	L/1516	L/1137	L/909	L/6946	L/5210	L/3473	L/2605	L/2084
9'	Vert. (lbs)	2398	2206	1828	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/548	L/411	L/274	L/2130	L/1597	L/1065	L/798	L/639	L/4878	L/3659	L/2439	L/1829	L/1463
10'	Vert. (lbs)	1916	1714	1320	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/400	L/300	L/200	L/1552	L/1164	L/776	L/582	L/465	L/3556	L/2667	L/1778	L/1333	L/1067
11'	Vert. (lbs)	1528	1321	913	4312	4312	4312	4108	3541	5684	5684	5684	5684	5684
	Defl. Ratio	L/300	L/225	L/150	L/1166	L/875	L/583	L/437	L/350	L/2672	L/2004	L/1336	L/1002	L/801
12'	Vert. (lbs)	1215	1005		4312	4312	3875	3273	2664	5684	5684	5684	5684	5684
	Defl. Ratio	L/231	L/173		L/898	L/673	L/449	L/336	L/269	L/2058	L/1543	L/1029	L/771	L/617
13'	Vert. (lbs)	961	746		4135	3815	3181	2545	1895	5684	5684	5684	5684	5645
	Defl. Ratio	L/182	L/136		L/706	L/530	L/353	L/265	L/212	L/1618	L/1214	L/809	L/607	L/485
14'	Vert. (lbs)	751			3573	3239	2577	1909	1215	5684	5684	5684	5417	4640
	Defl. Ratio	L/145			L/565	L/424	L/282	L/212	L/169	L/1296	L/972	L/648	L/486	L/388
15'	Vert. (lbs)				3083	2738	2052	1352	601	5684	5684	5363	4547	3720
	Defl. Ratio				L/460	L/345	L/230	L/172	L/138	L/1053	L/790	L/526	L/395	L/316
16'	Vert. (lbs)				2657	2301	1594	855		5684	5468	4615	3757	2880
	Defl. Ratio				L/379	L/284	L/189	L/142		L/868	L/651	L/434	L/325	L/260
17'	Vert. (lbs)				2284	1921	1191			5275	4829	3940	3041	2113
	Defl. Ratio				L/316	L/237	L/158			L/723	L/542	L/361	L/271	L/217
18'	Vert. (lbs)				1957	1587	832			4714	4252	3330	2391	1407
	Defl. Ratio				L/266	L/199	L/133			L/609	L/457	L/304	L/228	L/182
19'	Vert. (lbs)				1670	1294				4208	3731	2779	1799	746
	Defl. Ratio				L/226	L/169				L/518	L/388	L/259	L/194	L/155
20'	Vert. (lbs)				1418	1034				3751	3261	2280	1255	109
	Defl. Ratio				L/194	L/145				L/444	L/333	L/222	L/166	L/133
21'	Vert. (lbs)				1194	803				3338	2837	1827	748	
	Defl. Ratio				L/167	L/125				L/384	L/288	L/192	L/144	
22'	Vert. (lbs)				995					2964	2453	1414	264	
	Defl. Ratio				L/145					L/334	L/250	L/167	L/125	
23'	Vert. (lbs)				818					2626	2105	1033		
	Defl. Ratio				L/127					L/292	L/219	L/146		
24'	Vert. (lbs)									2319	1789	679		
	Defl. Ratio									L/257	L/192	L/128		
25'	Vert. (lbs)									2040	1501			
	Defl. Ratio									L/227	L/170			
26'	Vert. (lbs)									1786	1238			
	Defl. Ratio									L/202	L/151			
28'	Vert. (lbs)									1342	770			
	Defl. Ratio									L/162	L/121			
30'	Vert. (lbs)									967				
	Defl. Ratio									L/131				

NOTES:

1. Based on design provisions of the NDS. Load duration factor = 1.6, $K_D = 0.85$.
2. Table assumes structural sheathing on one side of wall, gypsum wallboard on other.
3. Full width blocking at 8' on-center maximum is assumed.
4. Deflection limits are based on Components & Cladding loads multiplied by 0.7 (2009 IRC, Table R301.7 and 2009 IBC, Table 1604.3).
5. Axial loads are applied eccentrically at a distance of 1/6 the stud depth, measured from stud centerline.
6. Compression stress perpendicular to grain of 425 psi (adjusted per the NDS) is assumed.
7. Maximum lateral connection capacity at stud ends is limited to 972 lbs (2 Simpson A23 clips).
8. A repetitive member stress increase factor of 4% is used.
9. For stud heights in between those shown, use the next greater stud height or interpolate. For lateral wind loads in between those shown, use the next larger wind load or interpolate.

onCENTER® 1.7E AFL Studs

Stud Height	Load & Deflection	1½" x 3½"			1½" x 5½"					1½" x 7¼"				
		Lateral Wind Load (plf)			Lateral Wind Load (plf)					Lateral Wind Load (plf)				
		15	20	30	15	20	30	40	50	15	20	30	40	50
8'	Vert. (lbs)	2744	2744	2744	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/849	L/637	L/424	L/3296	L/2472	L/1648	L/1236	L/988	L/7549	L/5662	L/3774	L/2831	L/2264
9'	Vert. (lbs)	2744	2727	2398	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/596	L/447	L/298	L/2314	L/1736	L/1157	L/868	L/694	L/5302	L/3976	L/2651	L/1988	L/1590
10'	Vert. (lbs)	2340	2164	1824	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/434	L/326	L/217	L/1687	L/1265	L/843	L/632	L/506	L/3865	L/2899	L/1932	L/1449	L/1159
11'	Vert. (lbs)	1897	1717	1371	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/326	L/245	L/163	L/1267	L/950	L/633	L/475	L/380	L/2904	L/2178	L/1452	L/1089	L/871
12'	Vert. (lbs)	1542	1360	1010	4312	4312	4312	4312	4102	5684	5684	5684	5684	5684
	Defl. Ratio	L/251	L/188	L/125	L/976	L/732	L/488	L/366	L/292	L/2236	L/1677	L/1118	L/838	L/671
13'	Vert. (lbs)	1255	1072		4312	4312	4301	3773	3248	5684	5684	5684	5684	5684
	Defl. Ratio	L/197	L/148		L/768	L/576	L/384	L/288	L/230	L/1759	L/1319	L/879	L/659	L/527
14'	Vert. (lbs)	1020			4312	4163	3606	3060	2515	5684	5684	5684	5684	5684
	Defl. Ratio	L/158			L/615	L/461	L/307	L/230	L/184	L/1408	L/1056	L/704	L/528	L/422
15'	Vert. (lbs)	826			3874	3580	3009	2448	1883	5684	5684	5684	5684	5684
	Defl. Ratio	L/128			L/500	L/375	L/250	L/187	L/150	L/1145	L/858	L/572	L/429	L/343
16'	Vert. (lbs)				3378	3078	2496	1920	1334	5684	5684	5684	5626	4924
	Defl. Ratio				L/412	L/309	L/206	L/154	L/123	L/943	L/707	L/471	L/353	L/283
17'	Vert. (lbs)				2947	2643	2051	1462		5684	5684	5539	4810	4082
	Defl. Ratio				L/343	L/257	L/171	L/128		L/786	L/590	L/393	L/295	L/236
18'	Vert. (lbs)				2573	2265	1665			5684	5594	4833	4083	3331
	Defl. Ratio				L/289	L/217	L/144			L/662	L/497	L/331	L/248	L/198
19'	Vert. (lbs)				2246	1935	1328			5381	4982	4203	3434	2659
	Defl. Ratio				L/246	L/184	L/123			L/563	L/422	L/281	L/211	L/169
20'	Vert. (lbs)				1959	1647				4842	4435	3641	2854	2054
	Defl. Ratio				L/210	L/158				L/483	L/362	L/241	L/181	L/144
21'	Vert. (lbs)				1707	1394				4359	3945	3137	2334	1505
	Defl. Ratio				L/182	L/136				L/417	L/313	L/208	L/156	L/125
22'	Vert. (lbs)				1485					3924	3505	2686	1864	
	Defl. Ratio				L/158					L/363	L/272	L/181	L/136	
23'	Vert. (lbs)				1288					3533	3109	2279		
	Defl. Ratio				L/138					L/317	L/238	L/158		
24'	Vert. (lbs)				1113					3180	2752	1913		
	Defl. Ratio				L/122					L/279	L/209	L/139		
25'	Vert. (lbs)									2861	2431	1580		
	Defl. Ratio									L/247	L/185	L/123		
26'	Vert. (lbs)									2573	2140			
	Defl. Ratio									L/219	L/164			
28'	Vert. (lbs)									2073	1635			
	Defl. Ratio									L/176	L/132			
30'	Vert. (lbs)									1658				
	Defl. Ratio									L/143				

NOTES:

- Based on design provisions of the NDS. Load duration factor = 1.6, $K_c = 0.85$.
- Table assumes structural sheathing on one side of wall, gypsum wallboard on other.
- Full width blocking at 8' on-center maximum is assumed.
- Deflection limits are based on Components & Cladding loads multiplied by 0.7 (2009 IRC, Table R301.7 and 2009 IBC, Table 1604.3).
- Axial loads are applied eccentrically at a distance of 1/6 the stud depth, measured from stud centerline.
- Compression stress perpendicular to grain of 425 psi (adjusted per the NDS) is assumed.
- Maximum lateral connection capacity at stud ends is limited to 972 lbs (2 Simpson A23 clips).
- A repetitive member stress increase factor of 4% is used.
- For stud heights in between those shown, use the next greater stud height or interpolate. For lateral wind loads in between those shown, use the next larger wind load or interpolate.

onCENTER® 1.9E AFL Studs

Stud Height	Load & Deflection	1½" x 3½"			1½" x 5½"					1½" x 7¼"				
		Lateral Wind Load (plf)			Lateral Wind Load (plf)					Lateral Wind Load (plf)				
		15	20	30	15	20	30	40	50	15	20	30	40	50
8'	Vert. (lbs)	2744	2744	2744	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/954	L/715	L/477	L/3702	L/2776	L/1851	L/1388	L/1110	L/8480	L/6360	L/4240	L/3180	L/2544
9'	Vert. (lbs)	2744	2744	2642	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/670	L/502	L/335	L/2600	L/1950	L/1300	L/975	L/780	L/5955	L/4466	L/2977	L/2233	L/1786
10'	Vert. (lbs)	2581	2389	2017	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/488	L/366	L/244	L/1895	L/1421	L/947	L/710	L/568	L/4341	L/3256	L/2170	L/1628	L/1302
11'	Vert. (lbs)	2099	1902	1521	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/367	L/275	L/183	L/1424	L/1068	L/712	L/534	L/427	L/3262	L/2446	L/1631	L/1223	L/978
12'	Vert. (lbs)	1710	1510	1123	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/282	L/212	L/141	L/1097	L/822	L/548	L/411	L/329	L/2512	L/1884	L/1256	L/942	L/753
13'	Vert. (lbs)	1395	1193		4312	4312	4312	4312	3969	5684	5684	5684	5684	5684
	Defl. Ratio	L/222	L/166		L/862	L/647	L/431	L/323	L/258	L/1976	L/1482	L/988	L/741	L/592
14'	Vert. (lbs)	1136	933		4312	4312	4253	3703	3158	5684	5684	5684	5684	5684
	Defl. Ratio	L/178	L/133		L/690	L/518	L/345	L/259	L/207	L/1582	L/1186	L/791	L/593	L/474
15'	Vert. (lbs)	922			4312	4164	3587	3024	2462	5684	5684	5684	5684	5684
	Defl. Ratio	L/144			L/561	L/421	L/280	L/210	L/168	L/1286	L/964	L/643	L/482	L/385
16'	Vert. (lbs)				3906	3602	3014	2438	1860	5684	5684	5684	5684	5684
	Defl. Ratio				L/462	L/347	L/231	L/173	L/138	L/1060	L/795	L/530	L/397	L/318
17'	Vert. (lbs)				3425	3116	2519	1932		5684	5684	5684	5684	5352
	Defl. Ratio				L/385	L/289	L/192	L/144		L/883	L/662	L/441	L/331	L/265
18'	Vert. (lbs)				3005	2693	2089	1490		5684	5684	5684	5224	4513
	Defl. Ratio				L/325	L/243	L/162	L/121		L/744	L/558	L/372	L/279	L/223
19'	Vert. (lbs)				2639	2324	1714			5684	5684	5227	4495	3767
	Defl. Ratio				L/276	L/207	L/138			L/633	L/474	L/316	L/237	L/189
20'	Vert. (lbs)				2317	2001				5684	5353	4591	3845	3100
	Defl. Ratio				L/236	L/177				L/542	L/407	L/271	L/203	L/162
21'	Vert. (lbs)				2035	1718				5196	4796	4022	3264	2503
	Defl. Ratio				L/204	L/153				L/468	L/351	L/234	L/175	L/140
22'	Vert. (lbs)				1785	1467				4702	4297	3514	2744	1964
	Defl. Ratio				L/178	L/133				L/407	L/305	L/203	L/152	L/122
23'	Vert. (lbs)				1564					4257	3848	3057	2276	
	Defl. Ratio				L/155					L/356	L/267	L/178	L/133	
24'	Vert. (lbs)				1367					3856	3444	2646		
	Defl. Ratio				L/137					L/314	L/235	L/157		
25'	Vert. (lbs)									3494	3079	2276		
	Defl. Ratio									L/277	L/208	L/138		
26'	Vert. (lbs)									3166	2750	1941		
	Defl. Ratio									L/247	L/185	L/123		
28'	Vert. (lbs)									2599	2181			
	Defl. Ratio									L/197	L/148			
30'	Vert. (lbs)									2129	1709			
	Defl. Ratio									L/160	L/120			

NOTES:

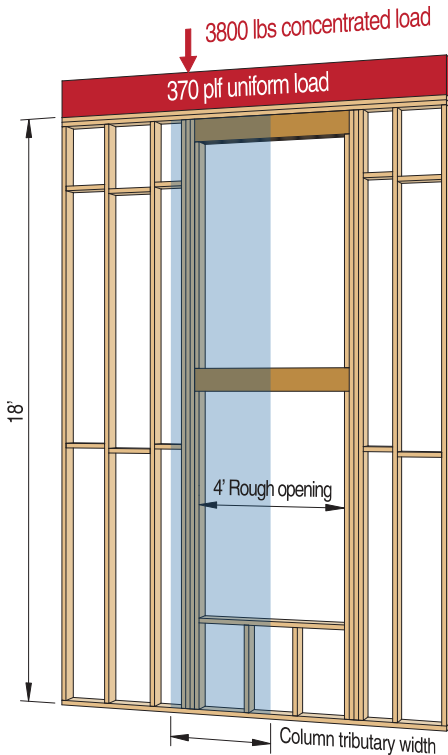
1. Based on design provisions of the NDS. Load duration factor = 1.6, $K_c = 0.85$.
2. Table assumes structural sheathing on one side of wall, gypsum wallboard on other.
3. Full width blocking at 8' on-center maximum is assumed.
4. Deflection limits are based on Components & Cladding loads multiplied by 0.7 (2009 IRC, Table R301.7 and 2009 IBC, Table 1604.3).
5. Axial loads are applied eccentrically at a distance of 1/6 the stud depth, measured from stud centerline.
6. Compression stress perpendicular to grain of 425 psi (adjusted per the NDS) is assumed.
7. Maximum lateral connection capacity at stud ends is limited to 972 lbs (2 Simpson A23 clips).
8. A repetitive member stress increase factor of 4% is used.
9. For stud heights in between those shown, use the next greater stud height or interpolate. For lateral wind loads in between those shown, use the next larger wind load or interpolate.

onCENTER® 2.1E AFL Studs

Stud Height	Load & Deflection	1½" x 3½"			1½" x 5½"					1½" x 7¼"				
		Lateral Wind Load (plf)			Lateral Wind Load (plf)					Lateral Wind Load (plf)				
		15	20	30	15	20	30	40	50	15	20	30	40	50
8'	Vert. (lbs)	2744	2744	2744	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/1023	L/767	L/511	L/3973	L/2980	L/1986	L/1490	L/1192	L/9101	L/6825	L/4550	L/3412	L/2730
9'	Vert. (lbs)	2744	2744	2744	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/719	L/539	L/359	L/2790	L/2093	L/1395	L/1046	L/837	L/6391	L/4793	L/3195	L/2396	L/1917
10'	Vert. (lbs)	2744	2694	2334	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/524	L/393	L/262	L/2034	L/1525	L/1017	L/762	L/610	L/4659	L/3494	L/2329	L/1747	L/1397
11'	Vert. (lbs)	2355	2164	1796	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/393	L/295	L/196	L/1528	L/1146	L/764	L/573	L/458	L/3500	L/2625	L/1750	L/1312	L/1050
12'	Vert. (lbs)	1933	1739	1366	4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/303	L/227	L/151	L/1177	L/882	L/588	L/441	L/353	L/2696	L/2022	L/1348	L/1011	L/808
13'	Vert. (lbs)	1589	1394		4312	4312	4312	4312	4312	5684	5684	5684	5684	5684
	Defl. Ratio	L/238	L/178		L/925	L/694	L/462	L/347	L/277	L/2120	L/1590	L/1060	L/795	L/636
14'	Vert. (lbs)	1308	1113		4312	4312	4312	4312	3794	5684	5684	5684	5684	5684
	Defl. Ratio	L/191	L/143		L/741	L/556	L/370	L/278	L/222	L/1698	L/1273	L/849	L/636	L/509
15'	Vert. (lbs)	1076			4312	4312	4123	3580	3043	5684	5684	5684	5684	5684
	Defl. Ratio	L/155			L/602	L/452	L/301	L/226	L/180	L/1380	L/1035	L/690	L/517	L/414
16'	Vert. (lbs)	883			4312	4068	3500	2947	2399	5684	5684	5684	5684	5684
	Defl. Ratio	L/127			L/496	L/372	L/248	L/186	L/149	L/1137	L/853	L/568	L/426	L/341
17'	Vert. (lbs)				3839	3539	2963	2402	1840	5684	5684	5684	5684	5684
	Defl. Ratio				L/414	L/310	L/207	L/155	L/124	L/948	L/711	L/474	L/355	L/284
18'	Vert. (lbs)				3382	3079	2497	1929		5684	5684	5684	5684	5071
	Defl. Ratio				L/348	L/261	L/174	L/130		L/798	L/599	L/399	L/299	L/239
19'	Vert. (lbs)				2983	2678	2093			5684	5684	5684	5010	4274
	Defl. Ratio				L/296	L/222	L/148			L/679	L/509	L/339	L/254	L/203
20'	Vert. (lbs)				2634	2328	1739			5684	5684	5071	4315	3564
	Defl. Ratio				L/254	L/190	L/127			L/582	L/436	L/291	L/218	L/174
21'	Vert. (lbs)				2327	2021				5654	5248	4462	3695	2928
	Defl. Ratio				L/219	L/164				L/503	L/377	L/251	L/188	L/150
22'	Vert. (lbs)				2056	1750				5125	4713	3918	3139	2356
	Defl. Ratio				L/191	L/143				L/437	L/328	L/218	L/164	L/131
23'	Vert. (lbs)				1816	1510				4648	4232	3429	2641	
	Defl. Ratio				L/167	L/125				L/382	L/287	L/191	L/143	
24'	Vert. (lbs)				1603					4219	3799	2990	2190	
	Defl. Ratio				L/147					L/337	L/252	L/168	L/126	
25'	Vert. (lbs)									3830	3408	2594		
	Defl. Ratio									L/298	L/223	L/149		
26'	Vert. (lbs)									3479	3055	2236		
	Defl. Ratio									L/265	L/198	L/132		
28'	Vert. (lbs)									2870	2445			
	Defl. Ratio									L/212	L/159			
30'	Vert. (lbs)									2365	1939			
	Defl. Ratio									L/172	L/129			

NOTES:

- Based on design provisions of the NDS. Load duration factor = 1.6, $K_c = 0.85$.
- Table assumes structural sheathing on one side of wall, gypsum wallboard on other.
- Full width blocking at 8' on-center maximum is assumed.
- Deflection limits are based on Components & Cladding loads multiplied by 0.7 (2009 IRC, Table R301.7 and 2009 IBC, Table 1604.3).
- Axial loads are applied eccentrically at a distance of 1/6 the stud depth, measured from stud centerline.
- Compression stress perpendicular to grain of 425 psi (adjusted per the NDS) is assumed.
- Maximum lateral connection capacity at stud ends is limited to 972 lbs (2 Simpson A23 clips).
- A repetitive member stress increase factor of 4% is used.
- For stud heights in between those shown, use the next greater stud height or interpolate. For lateral wind loads in between those shown, use the next larger wind load or interpolate.



**Info
Corner**

Make easy work of selecting the optimum product for your specific needs. Doma Sizer™ now includes the ability to size wall studs and columns with wind and axial loads.

Parameters:

Wall height = **18'**
 Stud spacing = **16" o.c.**
 Importance Factor = **1.0** (Residence)
 Exposure Category = **C**
 Basic wind speed = **100 mph**
 Vertical load on wall = **370 plf, 3800 lbs concentrated load**
 Wall type = **Exterior with interior gypsum board finish**

Note: Header reaction presumed to transfer directly to jack studs.

Step 1 Determine design wind pressure

Refer to *Wall Design Wind Pressure* table on page 14 and locate tabular value for Exposure C, 18' wall height, and 100 mph basic wind speed. Tabular value is **26.5 psf**.

Step 2 Calculate loading on column

Vertical load:

Add one-half of the stud spacing (8") with the estimated column width (6") for a total length of 14" (or 1.17').

Column load = 1.17' x 370 plf = 433 lbs + applied concentrated load of 3800 lbs = **4233 lbs**.

Lateral wind load:

Determine tributary width. Assuming a worst case scenario, add one-half of the stud spacing (8") with one-half of the rough opening width (24") plus the estimated column and jack stud thickness (6"): 8" + 24" + 6" = 38" (or 3.17'). 26.5 psf x 3.17' = **84 plf**.

Step 3 Select appropriate column

Since the wall is exterior with gypsum board on the interior, the code-required deflection limit is L/180 (see *Code Minimum Wall Deflection Criteria*, page 15). Refer to this deflection ratio section among the *Lateral Loads / Vertical Loads* tables for columns, pages 10 - 11. In this example, a **quadruple 1.6E AFL 1½" x 5½"** (capacity of 88 plf and 5641 lbs) or **triple 1.7E AFL 1½" x 7¼"** (capacity of 165 plf and 8570 lbs) will support the applied loads.

Step 4 Verify jack stud

Refer to *AFL Jack Stud Capacity* table, page 15. The tabular value for a 1½" x 5½" jack stud adjacent to a 4' opening is **1522 plf**. 1522 plf > 370 plf (actual); thus one jack stud is adequate.

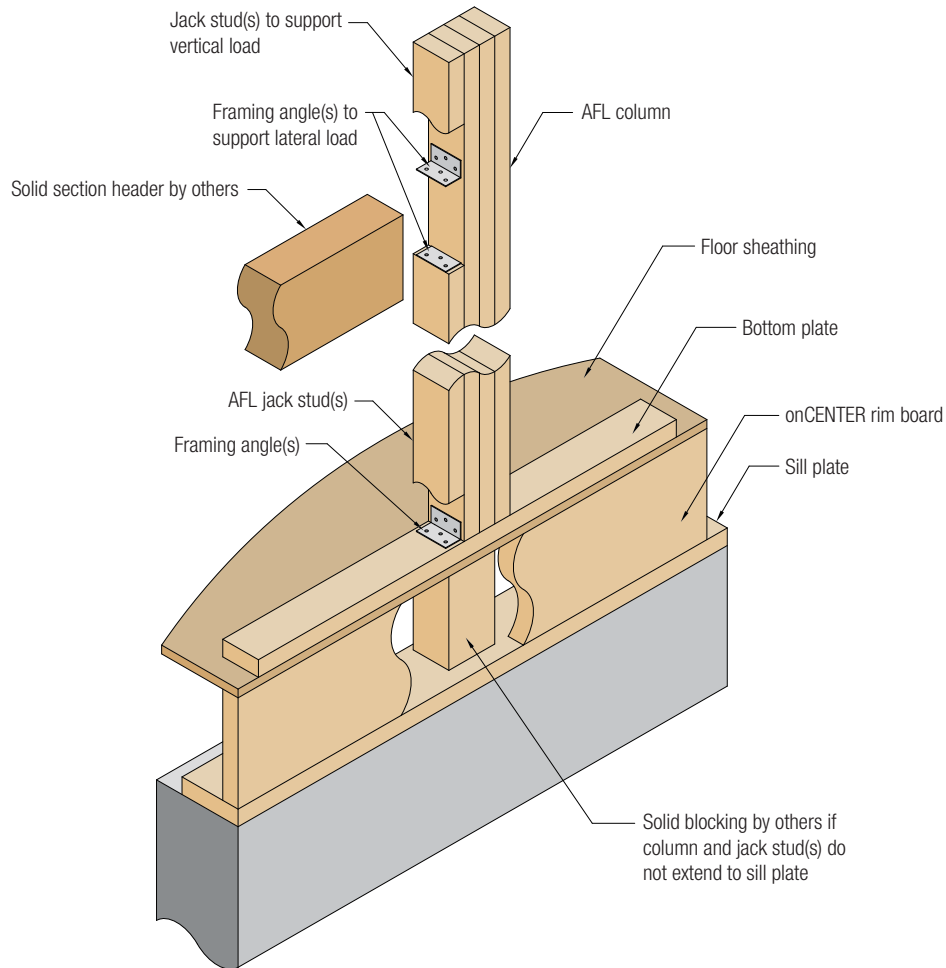
Step 5 Design column connection

Convert 84 plf into a lateral reaction (lateral load x length/2):

84 plf x 18'/2 = **756 lbs**

Refer to *Lateral Connection Capacities*, page 12. **Two (2) USP AC5** clips will work (one each column face, top and bottom) with a capacity of 908 lbs.

1. Design per the NDS. Load duration factor = 1.6, $K_e = 0.85$.
2. Table assumes structural sheathing on one side of wall, gypsum wallboard on other.
3. Full width blocking at 8' on-center maximum is assumed.
4. Deflection limits are based on Components & Cladding loads multiplied by 0.7 (2009 IRC Table R301.7 and 2009 IBC Table 1604.3).
5. Axial loads are applied eccentrically at a distance 1/6 the wall thickness dimension of the column, measured from column centerline.
6. Compression stress perpendicular to grain of 425 psi is assumed.
7. Tributary width of wind loading must not exceed 1/3 of column height.
8. For column heights in between those shown, check that both the next shorter column and the next longer column have adequate lateral and vertical capacity.



MULTIPLE-PLY AFL FASTENING REQUIREMENTS

Plies	AFL Stud Depth	Rows of Nailing ^{a, b}	Sides to Nail from	Offset Rows?	Edge Distance
2	3½" 5½" 7¼"	2 @ 8" o.c. staggered	One side	N/A	See note c
3	3½"	2 @ 8" o.c. staggered	Both sides	Optional	1"
	5½" 7¼"	3 @ 5" o.c. staggered	Both sides	Optional	1"
4	3½"	2 @ 5" o.c. staggered	Both sides (1st 2 plies) ^d	By 2" on each additional ply	1"
	5½" 7¼"	3 @ 5" o.c. staggered	Both sides (1st 2 plies) ^d	By 2" on each additional ply	1"

- a. Use 0.131" x 3¼" nails.
- b. End distance for nails = 2".
- c. Edge distance for 3½" depth, 1"; for 5½" depth, 1½"; for 7¼" depth, 2½".
- d. Nail each ply in turn with the tabulated nailing schedule.

onCENTER® 1.6E AFL Columns

Deflection Ratio	Column Height	Max Deflection	3½" Wall Thickness (3½" AFL)			5½" Wall Thickness (5½" AFL)			7¼" Wall Thickness (7¼" AFL)		
			(2) Studs	(3) Studs	(4) Studs	(2) Studs	(3) Studs	(4) Studs	(2) Studs	(3) Studs	(4) Studs
L/360	8'	0.27"	65 / 2428	97 / 6535	130 / 8713	252 / 2706	300 / 9152	300 / 13692	300 / 4607	300 / 13537	300 / 18049
	10'	0.33"	33 / 2452	50 / 5514	66 / 7379	129 / 3203	194 / 8341	258 / 13679	296 / 2739	300 / 12049	300 / 18032
	12'	0.40"		28 / 4353	38 / 5774	74 / 3456	112 / 10192	149 / 13666	171 / 3537	257 / 9297	300 / 18015
	14'	0.47"			24 / 4586	47 / 3538	70 / 8949	94 / 11939	108 / 3958	162 / 10086	216 / 17090
	16'	0.53"				31 / 3565	47 / 7723	63 / 10310	72 / 4219	108 / 12102	144 / 16201
	18'	0.60"				22 / 4329	33 / 6668	44 / 8917	50 / 4377	76 / 11089	101 / 14865
	20'	0.67"					24 / 5780	32 / 7728	37 / 4390	55 / 10085	74 / 13419
	22'	0.73"						24 / 6730	27 / 4433	41 / 9116	55 / 12151
	24'	0.80"							21 / 5301	32 / 8152	42 / 10966
	26'	0.87"								25 / 7360	33 / 9871
	28'	0.93"								20 / 6640	27 / 8830
30'	1.00"									21 / 8100	
L/180	8'	0.53"	130 / 1352	195 / 3627	260 / 4837	300 / 2004	300 / 9152	300 / 13692	300 / 4607	300 / 13537	300 / 18049
	10'	0.67"	66 / 1638	100 / 3536	133 / 4728	215 / 1225	300 / 4323	300 / 12770	300 / 2655	300 / 12049	300 / 18032
	12'	0.80"	38 / 1980	57 / 3103	77 / 4096	149 / 1107	224 / 3072	265 / 6473	236 / 1586	300 / 7316	300 / 18015
	14'	0.93"	24 / 1679	36 / 2607	48 / 3476	94 / 1737	141 / 4154	188 / 5621	173 / 1481	266 / 3567	300 / 10249
	16'	1.07"		24 / 2195	32 / 2927	63 / 2043	94 / 4374	126 / 5842	128 / 1628	217 / 2006	256 / 6114
	18'	1.20"				44 / 2620	66 / 4199	88 / 5641	101 / 1496	152 / 3767	203 / 5073
	20'	1.33"				32 / 2467	48 / 3904	64 / 5237	74 / 1980	111 / 4485	148 / 6043
	22'	1.47"				24 / 2274	36 / 3568	48 / 4782	55 / 2332	83 / 4768	111 / 6370
	24'	1.60"					28 / 3212	37 / 4329	42 / 2955	64 / 4727	85 / 6377
	26'	1.73"					22 / 2907	29 / 3920	33 / 2886	50 / 4598	67 / 6126
	28'	1.87"							27 / 2691	40 / 4363	54 / 5769
30'	2.00"							21 / 2665	32 / 4157	43 / 5526	

onCENTER® 1.7E AFL Columns

Deflection Ratio	Column Height	Max Deflection	3½" Wall Thickness (3½" AFL)			5½" Wall Thickness (5½" AFL)			7¼" Wall Thickness (7¼" AFL)		
			(2) Studs	(3) Studs	(4) Studs	(2) Studs	(3) Studs	(4) Studs	(2) Studs	(3) Studs	(4) Studs
L/360	8'	0.27"	70 / 2900	106 / 6535	141 / 8713	274 / 3774	300 / 10269	300 / 13692	300 / 6002	300 / 13537	300 / 18049
	10'	0.33"	36 / 2888	54 / 6529	72 / 8705	140 / 4129	210 / 10259	281 / 13679	300 / 4737	300 / 13524	300 / 18032
	12'	0.40"	20 / 3380	31 / 5124	41 / 6845	81 / 4293	122 / 10250	162 / 13666	186 / 4985	279 / 13511	300 / 18015
	14'	0.47"			26 / 5365	51 / 4345	76 / 10240	102 / 13653	117 / 5276	176 / 13498	234 / 17998
	16'	0.53"				34 / 4320	51 / 9656	68 / 12925	78 / 5446	117 / 13486	157 / 17981
	18'	0.60"				24 / 5328	36 / 8176	48 / 10939	55 / 5506	82 / 13473	110 / 17964
	20'	0.67"					26 / 7007	35 / 9349	40 / 5511	60 / 13093	80 / 17513
	22'	0.73"						26 / 8079	30 / 5456	45 / 11566	60 / 15465
	24'	0.80"							20 / 7018	23 / 6651	34 / 10306
	26'	0.87"								27 / 9138	36 / 12212
	28'	0.93"								22 / 8122	29 / 10886
30'	1.00"									23 / 9820	
L/180	8'	0.53"	141 / 1996	212 / 5677	283 / 7559	300 / 3534	300 / 10269	300 / 13692	300 / 6002	300 / 13537	300 / 18049
	10'	0.67"	72 / 2165	108 / 4845	144 / 6460	281 / 1809	300 / 8769	300 / 13679	300 / 4737	300 / 13524	300 / 18032
	12'	0.80"	41 / 2571	62 / 3974	83 / 5287	162 / 2552	244 / 7344	300 / 11264	300 / 2754	300 / 13126	300 / 18015
	14'	0.93"	26 / 2101	39 / 3242	52 / 4323	102 / 2895	153 / 7233	205 / 9696	234 / 2125	300 / 8517	300 / 17998
	16'	1.07"		26 / 2674	35 / 3552	68 / 3063	103 / 6606	137 / 8903	157 / 2890	235 / 8343	300 / 12261
	18'	1.20"				48 / 3782	72 / 5944	96 / 7980	110 / 3340	165 / 8570	220 / 11536
	20'	1.33"				35 / 3382	52 / 5310	70 / 7080	80 / 3600	120 / 8308	161 / 11081
	22'	1.47"				26 / 3034	39 / 4709	52 / 6311	60 / 3734	90 / 7818	121 / 10407
	24'	1.60"				20 / 2703	30 / 4180	40 / 5599	46 / 4564	69 / 7268	93 / 9658
	26'	1.73"					24 / 3690	32 / 4941	36 / 4244	54 / 6706	73 / 8896
	28'	1.87"							29 / 3893	44 / 6076	58 / 8195
30'	2.00"							23 / 3636	35 / 5638	47 / 7515	

Refer to page 9 for table notes and multiple-ply fastening recommendations.

onCENTER® 1.9E AFL Columns

Deflection Ratio	Column Height	Max Deflection	3½" Wall Thickness (3½" AFL)			5½" Wall Thickness (5½" AFL)			7¼" Wall Thickness (7¼" AFL)		
			(2) Studs	(3) Studs	(4) Studs	(2) Studs	(3) Studs	(4) Studs	(2) Studs	(3) Studs	(4) Studs
L/360	8'	0.27"	79 / 3110	119 / 6535	159 / 8713	300 / 4297	300 / 10269	300 / 13692	300 / 7119	300 / 13537	300 / 18049
	10'	0.33"	40 / 3125	61 / 6529	81 / 8705	157 / 4633	236 / 10259	300 / 13679	300 / 5982	300 / 13524	300 / 18032
	12'	0.40"	23 / 3610	35 / 5510	47 / 7332	91 / 4816	137 / 10250	182 / 13666	209 / 5837	300 / 13511	300 / 18015
	14'	0.47"		22 / 4358	29 / 5826	57 / 4884	86 / 10240	115 / 13653	131 / 6144	197 / 13498	263 / 17998
	16'	0.53"				38 / 4857	57 / 10230	77 / 13641	88 / 6296	132 / 13486	176 / 17981
	18'	0.60"				27 / 5975	40 / 9213	54 / 12290	62 / 6355	93 / 13473	124 / 17964
	20'	0.67"					29 / 7890	39 / 10534	45 / 6356	67 / 13460	90 / 17947
	22'	0.73"					22 / 6787	29 / 9103	33 / 6328	50 / 13447	67 / 17930
	24'	0.80"						22 / 7934	26 / 7679	39 / 11857	52 / 15854
	26'	0.87"							20 / 6875	30 / 10586	41 / 14061
	28'	0.93"								24 / 9439	32 / 12615
30'	1.00"								20 / 8405	26 / 11298	
L/180	8'	0.53"	159 / 1933	238 / 5376	300 / 7752	300 / 4297	300 / 10269	300 / 13692	300 / 7119	300 / 13537	300 / 18049
	10'	0.67"	81 / 2201	122 / 4855	162 / 6497	300 / 2332	300 / 10259	300 / 13679	300 / 5982	300 / 13524	300 / 18032
	12'	0.80"	47 / 2609	70 / 4104	94 / 5447	182 / 2845	274 / 8224	300 / 13666	300 / 4314	300 / 13511	300 / 18015
	14'	0.93"	29 / 2209	44 / 3406	59 / 4528	115 / 3225	172 / 8101	230 / 10903	263 / 2944	300 / 12396	300 / 17998
	16'	1.07"		29 / 2855	39 / 3792	77 / 3407	115 / 7453	154 / 9997	176 / 3680	265 / 10739	300 / 17981
	18'	1.20"				54 / 4229	81 / 6666	108 / 8960	124 / 4082	186 / 10646	248 / 14335
	20'	1.33"				39 / 3812	59 / 5929	78 / 8002	90 / 4340	135 / 10132	180 / 13615
	22'	1.47"				29 / 3418	44 / 5282	59 / 7063	67 / 4488	101 / 9428	135 / 12628
	24'	1.60"				22 / 3068	34 / 4683	45 / 6300	52 / 5425	78 / 8636	104 / 11581
	26'	1.73"					26 / 4221	35 / 5632	41 / 4984	61 / 7922	82 / 10562
	28'	1.87"							32 / 4648	49 / 7214	65 / 9690
30'	2.00"							26 / 4256	40 / 6568	53 / 8824	

onCENTER® 2.1E AFL Columns

Deflection Ratio	Column Height	Max Deflection	3½" Wall Thickness (3½" AFL)			5½" Wall Thickness (5½" AFL)			7¼" Wall Thickness (7¼" AFL)		
			(2) Studs	(3) Studs	(4) Studs	(2) Studs	(3) Studs	(4) Studs	(2) Studs	(3) Studs	(4) Studs
L/360	8'	0.27"	85 / 3429	127 / 6535	170 / 8713	300 / 5003	300 / 10269	300 / 13692	300 / 7781	300 / 13537	300 / 18049
	10'	0.33"	43 / 3438	65 / 6529	87 / 8705	169 / 5145	254 / 10259	300 / 13679	300 / 6649	300 / 13524	300 / 18032
	12'	0.40"	25 / 3962	37 / 6083	50 / 8083	98 / 5320	147 / 10250	196 / 13666	224 / 6271	300 / 13511	300 / 18015
	14'	0.47"		23 / 4803	31 / 6390	61 / 5392	92 / 10240	123 / 13653	141 / 6591	212 / 13498	283 / 17998
	16'	0.53"			21 / 5128	41 / 5342	62 / 10230	82 / 13641	94 / 6777	142 / 13486	189 / 17981
	18'	0.60"				29 / 6597	43 / 10149	58 / 13537	66 / 6848	99 / 13473	133 / 17964
	20'	0.67"				21 / 5651	31 / 8679	42 / 11564	48 / 6844	72 / 13460	97 / 17947
	22'	0.73"					23 / 7489	31 / 9989	36 / 6770	54 / 13447	72 / 17930
	24'	0.80"						24 / 8657	28 / 8231	42 / 12693	56 / 16968
	26'	0.87"							22 / 7328	33 / 11274	44 / 15068
	28'	0.93"								26 / 10098	35 / 13462
30'	1.00"								21 / 9061	28 / 12107	
L/180	8'	0.53"	170 / 2266	255 / 6374	300 / 8713	300 / 5003	300 / 10269	300 / 13692	300 / 7781	300 / 13537	300 / 18049
	10'	0.67"	87 / 2500	131 / 5541	174 / 7411	300 / 3285	300 / 10259	300 / 13679	300 / 6649	300 / 13524	300 / 18032
	12'	0.80"	50 / 2962	75 / 4616	101 / 6118	196 / 3356	294 / 9893	300 / 13666	300 / 5015	300 / 13511	300 / 18015
	14'	0.93"	31 / 2472	47 / 3803	63 / 5057	123 / 3732	185 / 9390	247 / 12635	283 / 3098	300 / 13498	300 / 17998
	16'	1.07"	21 / 2043	31 / 3167	42 / 4195	82 / 3903	124 / 8475	165 / 11412	189 / 3922	284 / 11391	300 / 17981
	18'	1.20"				58 / 4802	87 / 7526	116 / 10104	133 / 4369	199 / 11356	266 / 15229
	20'	1.33"				42 / 4284	63 / 6670	84 / 8945	97 / 4628	145 / 10780	194 / 14428
	22'	1.47"				31 / 3834	47 / 5907	63 / 7896	72 / 4804	109 / 10008	145 / 13452
	24'	1.60"				24 / 3392	36 / 5238	49 / 6952	56 / 5790	84 / 9198	112 / 12329
	26'	1.73"					28 / 4670	38 / 6209	44 / 5339	66 / 8423	88 / 11283
	28'	1.87"							35 / 4922	53 / 7680	70 / 10341
30'	2.00"							28 / 4555	43 / 7024	57 / 9431	

Refer to page 9 for table notes and multiple-ply fastening recommendations.

Nails

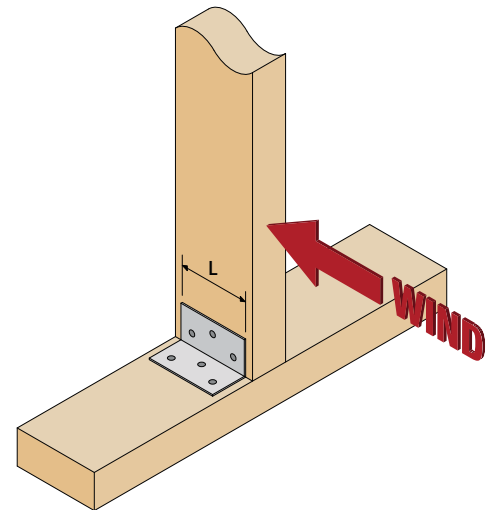
Nail Diameter & Length	Common Name	End Grain (lbs)	Toe-nail (lbs)
0.120" x 3¼"	12d Box (pneumatic)	76	94
0.128" x 3"	10d Box	86	107
0.131" x 3"	10d Framer (pneumatic)	90	112
0.131" x 3¼"	16d Short (pneumatic)	90	112
0.131" x 3½"	16d Box (pneumatic)	90	112
0.135" x 3⅝"	12d Sinker	96	119
0.135" x 3½"	16d Box	96	119
0.148" x 3¼"	12d Common, 16d Sinker	109	135

Framing Angles - USP Structural Connectors™

Model No.	Length (L)	Nails	Allowable Load (lbs)
A3	2¾"	(8) 10d x 1½" (0.148" diameter)	495
AC5	4⅞"	(6) 10d x 1½" (0.148" diameter)	454
AC7	6⅝"	(8) 10d x 1½" (0.148" diameter)	609
MP3	3⅝"	(6) 10d x 1½" (0.148" diameter)	407
MP5	4⅝"	(8) 10d x 1½" (0.148" diameter)	613
MP7	5⅞"	(10) 10d x 1½" (0.148" diameter)	764

Framing Angles - Simpson Strong-Tie®

Model No.	Length (L)	Nails	Allowable Load (lbs)
A21	1⅜"	(4) 10d x 1½" (0.148" diameter)	151
A23	2¾"	(8) 10d x 1½" (0.148" diameter)	486
A34	2½"	(8) 8d x 1½" (0.131" diameter)	445
A35	4½"	(12) 8d x 1½" (0.131" diameter)	600
LS30	3⅝"	(6) 10d x 1½" (0.148" diameter)	258
LS50	4⅞"	(8) 10d x 1½" (0.148" diameter)	485
LS70	6⅝"	(10) 10d x 1½" (0.148" diameter)	604



NOTES:

1. Nail values per the NDS.
2. Values take into account 160% LDF for wind and may not be increased further.
3. Nails listed for framing angles are total quantity per piece.
4. Nail and framing angle capacity based on SG (specific gravity) equal to 0.44 for studs and 0.42 for plates.
5. For studs, use only one angle per end. If higher capacity is required double the studs and double the angles (one angle per face).
6. For multiple-ply columns, use two angles per end, one to each face.
7. USP MP and Simpson LS angles may be bent only once.

Prescriptive Design

onCENTER AFL studs may be used for wall framing in conventional light-frame construction (2009 IBC Section 2308, and 2009 IRC Chapter 6). This is known as prescriptive design, since the codes determine the limitations and permissible design elements without requiring a specific design. When a member is designed for use in structures outside of the code-prescribed conventional light-frame construction parameters, the design is considered engineered.

Some of the limitations for consideration as conventional light-frame construction are:

- Residential use, maximum 3 stories
- Maximum design floor live load of 40 psf
- Maximum ground snow load of 70 psf
- Maximum roof span, including overhangs, of 40'
- Basic wind speeds less than 100 mph in hurricane-prone regions or 110 mph elsewhere
- Maximum loadbearing stud height of 10', and spacings shown below

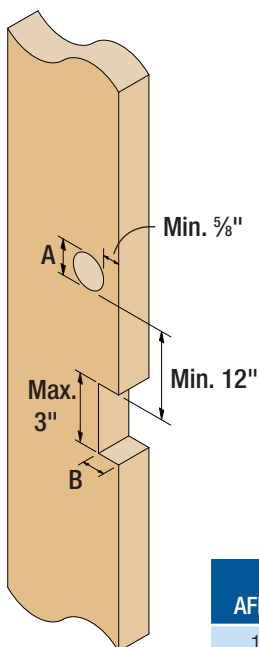
Prescriptive Wall Stud Limits for Conventional Construction per IRC R602.3.1

Stud Size	Bearing Walls					Non-Bearing Walls	
	Stud Height	Maximum Stud Spacing when Supporting:				Stud Height	Max. Stud Spacing
		Roof and Ceiling Only	One Floor Only	One Floor, Roof, and Ceiling	Two Floors, Roof, and Ceiling		
1½" x 3½"	10'	24"	24"	16"	-	14'	24"
1½" x 5½"	10'	24"	24"	24"	16"	20'	24"

See the afore-mentioned building codes for further information. The building code official and/or building designer of record will determine if the structure may be designed with code prescriptive design.

HOLES & NOTCHES

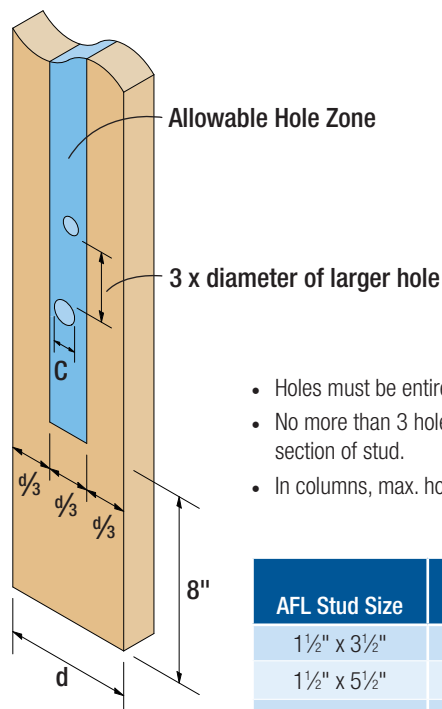
Prescriptive Provisions



- Only one hole and one notch, or two holes and no notches, may be in any one stud.
- No notch or hole may be closer than 12" clear to the end of a stud.
- A hole may not be within 12" clear of a notch or another hole.
- Valid only for studs within prescriptive design (see Conventional Construction above). If outside the parameters of prescriptive design, use the Engineered Design Provisions at right.

AFL Stud Size	Max. Hole Dia. (A)	Max. Notch Depth (B)
1½" x 3½"	1⅝"	⅞"
1½" x 5½"	2⅞"	1⅜"
1½" x 7¼"	2⅞"	1¾"

Engineered Design Provisions



- Holes must be entirely within the Hole Zone.
- No more than 3 holes are allowed in any 4' section of stud.
- In columns, max. hole diameter = ¾".

AFL Stud Size	Max. Hole Dia. (C)
1½" x 3½"	¾"
1½" x 5½"	1"
1½" x 7¼"	1¼"

Exposure Category	Nominal Wall Height	Basic Wind Speed (mph)							
		85	90	100	110	120	130	140	150
B	8'	16.6	18.6	22.9	27.7	33.0	38.8	44.9	51.6
	10'	15.8	17.7	21.9	26.4	31.5	36.9	42.8	49.2
	12'	15.2	17.0	21.0	25.4	30.2	35.5	41.1	47.2
	14'	14.6	16.4	20.2	24.5	29.1	34.2	39.7	45.5
	16'	14.2	15.9	19.6	23.7	28.2	33.1	38.4	44.1
	18'	13.8	15.4	19.0	23.0	27.4	32.2	37.3	42.8
	20'	13.4	15.0	18.5	22.4	26.7	31.3	36.3	41.7
	22'	13.1	14.6	18.1	21.9	26.0	30.5	35.4	40.7
	24'	12.8	14.3	17.7	21.4	25.4	29.8	34.6	39.7
	26'	12.5	14.0	17.3	20.9	24.9	29.2	33.8	38.9
	28'	12.2	13.7	16.9	20.5	24.4	28.6	33.1	38.1
30'	12.0	13.4	16.6	20.1	23.9	28.0	32.5	37.3	
C	8'	23.1	25.9	31.9	38.6	46.0	53.9	62.6	71.8
	10'	22.0	24.6	30.4	36.8	43.8	51.4	59.6	68.5
	12'	21.1	23.7	29.2	35.3	42.1	49.4	57.2	65.7
	14'	20.4	22.8	28.2	34.1	40.6	47.6	55.2	63.4
	16'	19.7	22.1	27.3	33.0	39.3	46.1	53.5	61.4
	18'	19.1	21.5	26.5	32.1	38.2	44.8	51.9	59.6
	20'	18.6	20.9	25.8	31.2	37.1	43.6	50.6	58.0
	22'	18.2	20.4	25.2	30.4	36.2	42.5	49.3	56.6
	24'	17.8	19.9	24.6	29.7	35.4	41.5	48.2	55.3
	26'	17.4	19.5	24.0	29.1	34.6	40.6	47.1	54.1
	28'	17.0	19.1	23.5	28.5	33.9	39.8	46.1	53.0
30'	16.7	18.7	23.1	27.9	33.2	39.0	45.2	51.9	
D	8'	27.2	30.5	37.6	45.5	54.2	63.6	73.8	84.7
	10'	25.9	29.1	35.9	43.4	51.7	60.6	70.3	80.7
	12'	24.9	27.9	34.4	41.7	49.6	58.2	67.5	77.5
	14'	24.0	26.9	33.2	40.2	47.8	56.1	65.1	74.8
	16'	23.2	26.1	32.2	38.9	46.3	54.4	63.1	72.4
	18'	22.6	25.3	31.2	37.8	45.0	52.8	61.2	70.3
	20'	22.0	24.6	30.4	36.8	43.8	51.4	59.6	68.4
	22'	21.4	24.0	29.7	35.9	42.7	50.1	58.1	66.7
	24'	20.9	23.5	29.0	35.1	41.7	49.0	56.8	65.2
	26'	20.5	23.0	28.3	34.3	40.8	47.9	55.5	63.8
	28'	20.1	22.5	27.8	33.6	40.0	46.9	54.4	62.5
30'	19.7	22.0	27.2	32.9	39.2	46.0	53.3	61.2	

Notes:

- Tabulated pressures are based on the Analytical Procedure of ASCE 7-05 (3-second gust). Values assume a Components & Cladding member in the end zone (Zone 5) of an enclosed structure, with the following factors:

Importance Factor = 1.0, Topographic Factor = 1.0, Mean roof height = 33 ft.

For Components & Cladding members in the interior zone, Zone 4, (i.e., those not located within distance 'a' from corners), tabulated pressures may be multiplied by the following adjustment factors:

Wall Height (ft)	8	10	12	14	16	18	20	22	24	26	28	30
Adjustment Factor	0.835	0.851	0.866	0.879	0.892	0.903	0.914	0.925	0.935	0.945	0.954	0.963

'a' (see ASCE 7-05) is 10% of the building's least horizontal dimension, but not less than 3 feet.

- Exposure Categories are summarized as follows (see ASCE 7-05, Section 6.5.6 for complete definitions):
 - B = Urban and suburban areas, wooded areas.
 - C = Open terrain with scattered obstructions having heights generally less than 30 ft.
 - D = Flat, unobstructed areas and water surfaces outside hurricane prone regions.
- For wall heights in between those shown above, use the next shorter wall height or interpolate.
- Check local codes for any mandated wind pressures.
- For equivalent literature using ASCE 7-10 for wind pressure calculations, visit www.buildonCENTER.com.

Code Minimum Wall Deflection Criteria (Wind)

Wall Type	Allowable Deflection
Exterior walls with plaster or stucco finish ¹	L/360
Exterior walls with other brittle finishes ^{1,2}	L/240
Exterior walls with flexible finishes ^{1,2}	L/120
Ext. walls w/ flexible finishes & interior gypsum board finish ¹	L/180
Members supporting windows (mullions) ³	L/175

1. 2009 IRC, Table R301.7
2. 2009 IBC, Table 1604.3
3. 2009 IRC, Section R612.11.2

AFL Jack Stud Capacity

Maximum Uniform Load (plf) on Header with Single Jack Studs

Rough Opening	Header Width		
	3½"	5¼"	7"
3'	1332	1998	2665
4'	1015	1522	2030
5'	818	1227	1637
6'	685	1027	1370
7'	588	882	1176
8'	515	772	1030
9'	457	686	915
10'	411	617	823
12'	341	512	683

- Header series and depth to be determined based on actual applied loads.
- Tabulated values are based on one 1½" AFL jack stud supporting each header end.
- Nail jack stud to column with two rows of 0.131" x 3¼" nails @ 8" o.c.
- Offset rows 4" from column nailing.
- Double the jack studs to double jack stud capacity.

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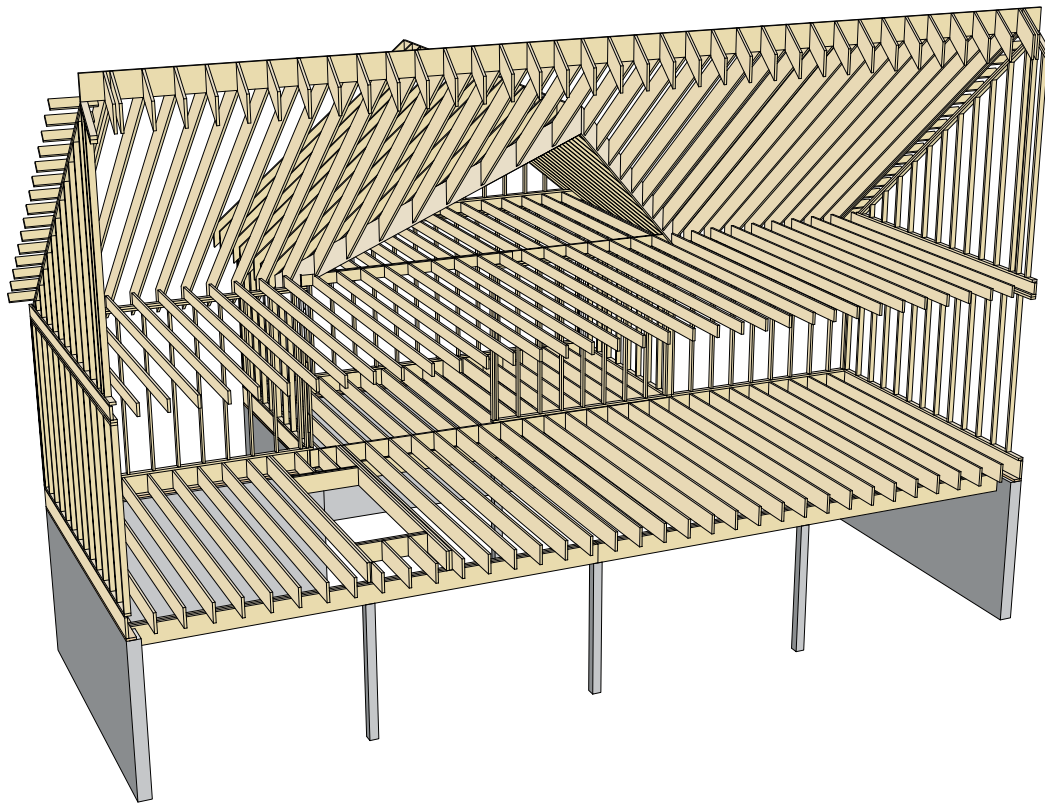
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BlueLinX Corporation
4300 Wildwood Parkway
Atlanta, GA 30339
1-877-914-7770
www.buildonCENTER.com

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