Trus Joist™
Weyerhaeuser

WALL GUIDE: CALIFORNIA, NEVADA, ARIZONA

Featuring Trus Joist® TimberStrand® LSL and Parallam® PSL Wall Framing

- Engineered to meet code requirements for walls up to 30' tall
- Easy-to-use tables adaptable to a variety of wind conditions, surface finishes, and wall layouts
- Out-of-plane wind and vertical load information for designing walls that are stiff, strong, and straight
- Limited product warranty

The products in this guide are readily available through our nationwide network of distributors and dealers. For more information on other applications or other Trus Joist® products, contact your Weyerhaeuser representative.

Code Evaluations:
See ICC-ES ESR-1387

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Choose Trus Joist® wall framing for straight, flush walls that:

- are critical for tile applications.
- allow easy countertop and cabinet installation in kitchens and bathrooms.
- give visual appeal to tall walls in great rooms and entryways.
- have the strength and stiffness to accommodate “window” walls.

Many of today’s homes have design requirements—such as walls over 10 feet tall—that exceed the code provisions for conventional construction. Trus Joist® TimberStrand® laminated strand lumber (LSL) and Parallam® parallel strand lumber (PSL) can help you meet the requirements of these challenging designs. Weyerhaeuser also offers product and design support that includes technical information, design software, and design advice from our team of skilled engineers and sales representatives.

Tall Wall Software Solutions

Forte® software is a single-member sizing solution created by Weyerhaeuser to help estimators, architects, and engineers design walls quickly and efficiently. Forte® software provides the most economical solutions for studs, columns, and headers, and helps you design connections for each member. Professional calculations can be printed out for engineer sign-off or to give to building officials. Ask your Weyerhaeuser representative how you can get Forte® software today.

This guide features the following Trus Joist® wall framing products:

1.3E TimberStrand® LSL

Columns: 3½" x 3½" • 3½" x 5½"
3½" x 7¼"
Headers: 3½" x 5½" • 3½" x 7¼"

1.55E TimberStrand® LSL

Headers: 3½" x 9½" • 3½" x 11⅞"

1.6E TimberStrand® LSL

Studs and Columns: 1½" x 3½" (2x4)
1½" x 5½" (2x6)

1.8E Parallam® PSL

Columns: 3½" x 3½" • 3½" x 5¼"
3½" x 7" • 5¼" x 5¼"
5¼" x 7" • 7" x 7"
Headers: 5¼" x 5¼"

2.0E Parallam® PSL

Columns: 3½" x 9½" • 5¼" x 9½"
7" x 9½"
Headers: 5¼" x 9½"

Other sizes may be available in Weyerhaeuser software; however, not all products are available in all markets. Contact your Weyerhaeuser representative for the sizes available in your area.

***WARNING:** This product can expose you to chemicals including wood dust which are known to the State of California to cause cancer, and methanol, which are known to the State of California to cause birth defects or other reproductive harm. Drilling, sawing, sanding or machining wood products can expose you to wood dust. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to www.P65Warnings.ca.gov and www.P65Warnings.ca.gov/wood.*

Safety data sheets for all Weyerhaeuser wood products can be found on our website at: ***weyerhaeuser.com/sustainability/environment/product-stewardship/safety-data-sheets.***

DEFLECTION REQUIREMENTS

How stiff does a wall need to be?

While model building codes provide required deflection limits based on the type of finish supported by the wall framing, acceptable deflection limits are usually established by the design professional, finish-material provider, and/or building code authority. Typical deflection requirements are shown in the table at right.

Code Minimum Deflection Criteria

Type of Wall	Maximum Deflection
Exterior walls with plaster or stucco finish(1)	L/360(5)
Exterior walls with brittle finishes(1)(2)	L/240
Exterior walls with flexible finishes(1)(2)	L/120
Exterior walls with interior gypsum board finish(3)	L/180
Members supporting windows (mullions)(4)	L/175

(1) 2015 and 2018 International Residential Code (IRC), Table R301.7
(2) 2015 and 2018 International Building Code (IBC), Table 1604.3
(3) 2015 and 2018 IRC, Table R301.7, footnote d
(4) 2015 and 2018 IRC, Section R609.8.2 and 2015 and 2018 IBC, Section 2403.3
(5) For finishes that require a deflection stricter than L/360, contact your Weyerhaeuser representative.

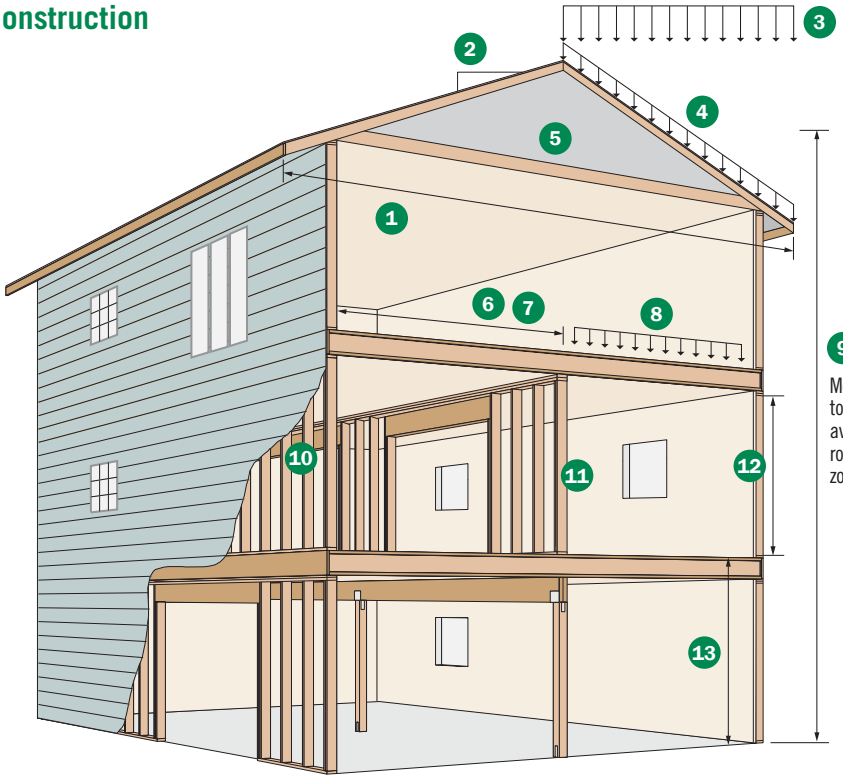
CONVENTIONAL CONSTRUCTION APPLICATIONS

Limitations of Conventional Construction

For walls up to 10' in height, 2x4 and 2x6 1.3E TimberStrand® LSL studs may be conventionally specified per the limitations described on this page. Engineered design for more demanding applications is outlined on the pages that follow.

Wind Limitations
Basic wind speed (2015 IRC): Figure R301.2(4)B

Seismic Design Categories
A, B, C, D_0, D_1, and D_2. Excludes irregular portions of structures as defined by 2015 IRC R301.2.2.2.5 and 2018 IRC 301.2.2.6



9 Mean roof height limited to 33' measured from average grade to average roof elevation, or per local zoning ordinance

Limitation Descriptions and IRC References

Description	2015 and 2018 IRC Reference
1 Maximum roof span, including overhangs, limited to 40'. Maximum tabulated rafter span (horizontal projection) and ceiling joist span of 26'.	R802.10.2.1; footnote *a* to 2015 IRC Tables R802.4(1), R802.4(2) and 2018 IRC Tables R802.5.1(1), R802.5.1(2); footnote *b* to 2015 IRC Tables R802.5.1(1)–R802.5.1(8) and 2018 IRC Tables R802.4.1(1)–R802.4.1(8)
2 Roof pitch: 3:12 minimum, 12:12 maximum	
3 Maximum ground snow load: 70 psf	IRC Section R301.2.3
4 Maximum tabulated roof/ceiling dead load: 20 psf	2015 IRC Tables R802.5.1(1)–R802.5.1(8) and 2018 Tables R802.4.1(1)–R802.4.1(8)
5 Maximum tabulated rafter and ceiling joist spacing: 24" on-center	2015 IRC Tables R802.4(1), R802.4(2), R802.5.1(1)–R802.5.1(8) and 2018 IRC Tables R802.4.1(1)–R802.4.1(8), R802.5.1(1), R802.5.1(2)
6 Maximum tabulated joist span: 26'	IRC Tables R502.3.1(1), R502.3.1(2)
7 Maximum tabulated floor joist spacing: 24" on-center	IRC Tables R502.3.1(1), R502.3.1(2)
8 Maximum uniform floor loads: 40 psf live load, 20 psf dead load	IRC Tables R502.3.1(1), R502.3.1(2)
9 Maximum of 3 stories	IRC Section R101.2
10 Maximum stud spacing: 24" on-center	IRC Table R602.3(5)
11 With TJI® joist floor systems, load-bearing walls must stack directly over bearing walls or beams below. With rectangular joists, walls may be offset a distance equal to the joist depth.	IRC Section R502.4
12 Maximum load-bearing stud length: 10' between points of lateral support	IRC Table R602.3(5)
13 Maximum story height: 10' stud height plus 16" floor framing = 11'-4"	IRC Section R301.3

Stud Specifications for Conventional Applications per IRC Table R602.3(5)

Stud Size	Bearing Walls					Nonbearing Walls	
	Laterally unsupported stud height(1)	Maximum spacing when supporting roof and ceiling only	Maximum spacing when supporting one floor, roof, and ceiling	Maximum spacing when supporting two floors, roof, and ceiling	Maximum spacing when supporting one floor only	Laterally unsupported stud height(1)	Maximum spacing
2x4	10'	24"	16"	–	24"	14'	24"
2x6	10'	24"	24"	16"	24"	20'	24"

(1) Listed heights are distances between points of lateral support placed perpendicular to the plane of the wall.

When used in conventional construction applications, both 2x4 and 2x6 TimberStrand® LSL studs may be drilled or notched in accordance with IRC section R602.6.

DEFINITIONS

Buckling Length—Distance along the length of a member between braced points. This length is used to calculate the buckling stability of the member.

Conventional Construction—Generally, home design based on traditional construction methods and materials that have a history of adequate structural performance for specific building types and sizes. Both conventionally specified and pre-calculated members and connections are prescriptively specified in building codes such as the IRC and IBC, and may be combined to form a structure or structural assemblage.

Design Wind Pressure—The equivalent static wind pressure applied to structures to determine wind loads for buildings.

Effective Wind Area—The area used to determine external wind coefficients. These coefficients are used in the determination of the design wind pressures for components and cladding elements. Generally, the effective wind area is the length of a member's span times the tributary width **or** $L^2/3$, whichever is greater.

Lateral Loads—Loads applied to a structure in the horizontal direction. This includes loads from wind and seismic events.

Main Force Resisting System—Structural elements designated to provide support and stability for the overall structure. The system generally receives wind loading from more than one surface.

Tributary Area—A calculated area of influence surrounding a structural member. Loads within this area are added together to determine the amount of load a member is required to resist. For example, the tributary area for a wall stud is the sum of ½ the distance to the adjacent wall stud on each side of the stud in question. Likewise, the tributary area for a floor joist would be the sum of ½ the distance to the adjacent joist on each side of the joist in question.

ENGINEERED DESIGN ASSUMPTIONS

Design applications are limited to vertical loads, and to lateral wind loads that are perpendicular to the wall framing. Table information is based on the strength calculations and deflection limits of wall framing members, and was generated with the following assumptions:

- Member design and lateral support requirements for bending are based on National Design Specification® (NDS®).
- Stud and column tables assume structural sheathing on one side of the wall, or a combination of gypsum wallboard and non-structural sheathing or siding applied to each side of the wall, or equivalent.
- Blocking required at 8' on-center maximum per code. See page 12.
- Column bracing assumed to be 8' on-center maximum; stud bracing at 1' on-center maximum.
- Beams and columns must remain straight to within $^{5L^2/4608}$ (in.) of true alignment. L is the unrestrained length of the member in feet.
- If stud spacing is 19.2" or 24" on-center, trusses or rafters must be installed within 3" of the stud locations. This does not apply if studs are spaced at 16" on-center or less.
- The Components & Cladding (C&C) pressures shown in the **Wall Design Wind Pressure** table below are used only for strength calculations.
- Deflection limits are based on Main Wind Force Resisting System pressures, which were estimated by multiplying the C&C pressure by 0.70 (2015 and 2018 IRC, Table R301.7; 2015 and 2018 IBC, Table 1604.3).
- $\Delta = \frac{270\ wL^4}{Ebd^3} + \frac{28.8\ wL^2}{Ebd}$

  Δ = deflection
  w = uniform load (plf)
  L = span (ft)
  b = member width (in.)
  d = member depth (in.)
  E = modulus of elasticity (psi)

WIND TABLES

Wall Design Wind Pressure (PSF)(1)(2)

Exposure Category(3)	Effective Wind Area(4) (ft^2)	Basic Wind Speed (mph) 2015 and 2018 IRC/IBC (ASCE 7-10/7-16: 0.6W)												
		90	95	100	105	110	115	120	130	140	150	160	170	180
B	≤ 10	9.7	10.9	12.0	13.3	14.6	15.9	17.3	20.3	23.6	27.1	30.8	34.8	39.0
	50	8.8	9.8	10.9	12.0	13.2	14.4	15.7	18.4	21.3	24.5	27.8	31.4	35.2
	≥ 100	8.4	9.4	10.4	11.4	12.5	13.7	14.9	17.5	20.3	23.3	26.6	30.0	33.6
C	≤ 10	13.6	15.1	16.7	18.5	20.3	22.1	24.1	28.3	32.8	37.7	42.9	48.4	54.3
	50	12.3	13.7	15.1	16.7	18.3	20.0	21.8	25.6	29.7	34.0	38.7	43.7	49.0
	≥ 100	11.7	13.0	14.4	15.9	17.5	19.1	20.8	24.4	28.3	32.5	37.0	41.7	46.8
D	≤ 10	16.0	17.8	19.7	21.8	23.9	26.1	28.4	33.4	38.7	44.4	50.6	57.1	64.0
	50	14.5	16.1	17.8	19.7	21.6	23.6	25.7	30.2	35.0	40.1	45.7	51.6	57.8
	≥ 100	13.8	15.4	17.0	18.8	20.6	22.5	24.5	28.8	33.4	38.3	43.6	49.2	55.2

(1) Tabulated pressures are based on the Analytical Procedure defined in ASCE 7. Values assume a Components and Cladding (C&C) member in the interior zone of an enclosed structure, with the following factors:
– Risk/occupancy category II
– Topographical factor of 1.0
– Mean roof height of 33'
– Elevation factor of 1.0

(2) When designing in accordance with 2015 and 2018 IRC/IBC, the load combinations include a 0.6 factor for wind.

(3) Exposure categories are generally defined as follows (see ASCE 7):
B = Urban and suburban areas, wooded areas
C = Open terrain with scattered obstructions generally less than 30' in height
D = Flat, unobstructed areas

(4) **Effective Wind Area** is the span times the tributary width **or** $L^2/3$, whichever is greater. For values of effective wind areas not listed, interpolation between 10 ft^2 and 100 ft^2 is allowed.

- Check local codes for any special wind pressures.

Effective Wind Area

Wall Height	Stud/Column Effective Wind Area (ft^2)
≥ 18'	100
16'	85
14'	65
12'	48
10'	33

- Values are based on $L^2/3$ with a maximum of 100 ft^2.
- The effective wind area should not be confused with the tributary area, which is used to determine the amount of load applied to an individual member.

DESIGN EXAMPLE

Given

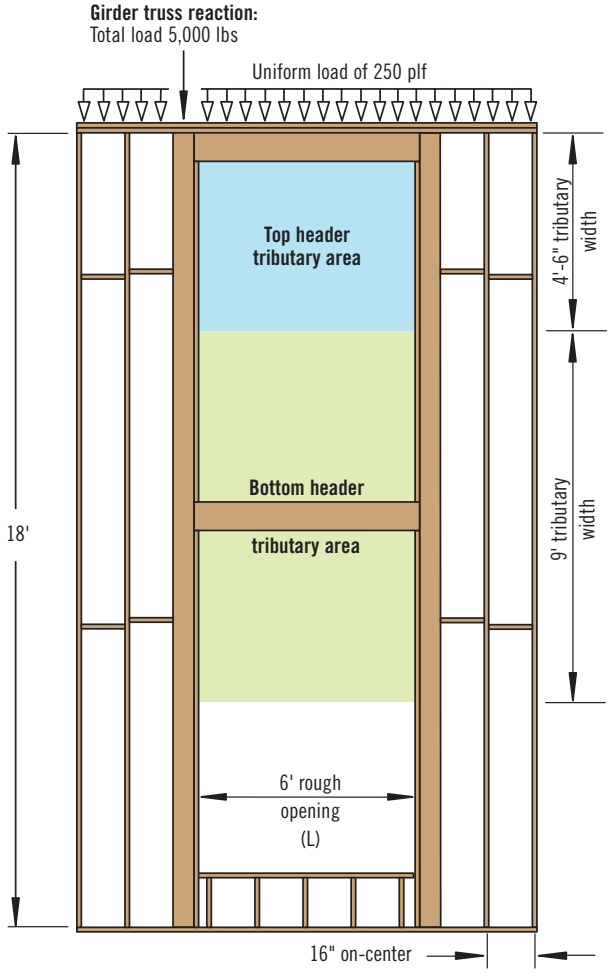
- Wall height = 18'
- Rough opening = 6'
- Exposure Category "B"
- 2015 IRC/IBC
- 110 mph basic wind speed
- Flexible exterior finish with interior gypsum board finish; walls support window mullions
- Maximum column vertical load = 5,000 lbs
- Maximum header vertical load = 250 plf

When designing with C&C pressures, the effective wind area ($L^2/3$) helps determine the wall design wind pressure. A smaller effective wind area results in a higher wind pressure. The effective wind area should not be confused with the tributary area, which is used to determine the amount of load applied to an individual member.

1. **Determine effective wind areas (ft^2):**
   - For the studs and columns, refer to the **Effective Wind Area** table on page 4. An 18' stud or column will have an effective wind area of 100 ft^2.
   - For each header, consult the drawing at right and use the maximum value of the rough opening (L) times the tributary width **or** $L^2/3$, whichever is greater.
     - For the top header in our example wall, use the maximum of either (6' x 4'-6" = 27 ft^2) or ($6^2/3$ = 12 ft^2).
     - For the bottom header in our example wall, use the maximum of either (6' x 9' = 54 ft^2) or ($6^2/3$ = 12 ft^2).

   The effective wind areas calculate to 27 ft^2 for the top header and 54 ft^2 for the bottom header, so interpolation would be required to find exact pressures. For simplicity, we will use an effective wind area of 10 ft^2 for each header. This allows us to skip the interpolation exercise, and provides a more conservative wind pressure.
2. **Determine design wind pressure:** Consult the **Wall Design Wind Pressure** table on page 4, using the example wall's criteria of Exposure B, a 110 mph basic wind speed, and an effective wind area as calculated above:
   - For studs/columns with an effective area of 100 ft^2, the wall design lateral wind pressure is 12.5 psf.
   - For headers with an effective area of 10 ft^2, the wall design wind pressure is 14.6 psf.
3. **Determine appropriate deflection criteria:** Consult the **Code Minimum Deflection Criteria** on page 2. Our example wall contains both windows (minimum L/175) and a flexible finish with interior gypsum board (minimum L/180). Because the L/180 deflection is more restrictive, the wall should be designed using the L/180 deflection values in this guide.

Refer to stud, column, and header tables on pages 6–10 to design the components for this example wall.



A complete wall specification should include permanent bracing, safety bracing, blocking, connections, details, etc. See pages 11–14.

STUD LOAD TABLE

Studs—Maximum Allowable Lateral (Wind) and Vertical Load

Wall Ht.	Load and Deflection	1.6E TimberStrand® LSL									
		1½" x 3½"				1½" x 5½"					
		Lateral Load (plf)				Lateral Load (plf)					
		15	20	26[1]	30	15	20	26[1]	30	40	50
8'	Vertical (lbs)	2,790	2,790	2,790	2,790	4,385	4,385	4,385	4,385	4,385	4,385
	Defl. Ratio	L/834	L/625	L/481	L/417	L/3,143	L/2,357	L/1,813	L/1,571	L/1,178	L/943
9'	Vertical (lbs)	2,790	2,790	2,610	2,490	4,385	4,385	4,385	4,385	4,385	4,385
	Defl. Ratio	L/588	L/441	L/339	L/294	L/2,230	L/1,672	L/1,286	L/1,115	L/836	L/669
10'	Vertical (lbs)	2,375	2,220	2,035	1,915	4,385	4,385	4,385	4,385	4,385	4,385
	Defl. Ratio	L/430	L/322	L/248	L/215	L/1,637	L/1,228	L/945	L/819	L/614	L/491
11'	Vertical (lbs)	1,930	1,770	1,585	1,465	4,385	4,385	4,385	4,385	4,385	4,385
	Defl. Ratio	L/324	L/243	L/187	L/162	L/1,237	L/928	L/714	L/618	L/464	L/371
12'	Vertical (lbs)	1,580	1,415	1,230	1,110	4,385	4,385	4,385	4,385	4,385	4,385
	Defl. Ratio	L/250	L/187	L/144	L/125	L/957	L/717	L/552	L/478	L/359	L/287
13'	Vertical (lbs)	1,290	1,130			4,385	4,385	4,385	4,385	4,195	3,750
	Defl. Ratio	L/197	L/148			L/755	L/566	L/436	L/377	L/283	L/226
14'	Vertical (lbs)	1,060				4,385	4,385	4,115	3,925	3,465	3,010
	Defl. Ratio	L/158				L/606	L/454	L/350	L/303	L/227	L/182
15'	Vertical (lbs)	870				4,055	3,800	3,505	3,315	2,845	2,385
	Defl. Ratio	L/128				L/494	L/370	L/285	L/247	L/185	L/148
16'	Vertical (lbs)					3,545	3,285	2,990	2,795	2,320	1,845
	Defl. Ratio					L/408	L/306	L/235	L/204	L/153	L/122
17'	Vertical (lbs)					3,105	2,845	2,545	2,345	1,865	
	Defl. Ratio					L/340	L/255	L/196	L/170	L/128	
18'	Vertical (lbs)					2,720	2,460	2,160	1,960		
	Defl. Ratio					L/287	L/215	L/166	L/143		
19'	Vertical (lbs)					2,390	2,130	1,825	1,630		
	Defl. Ratio					L/244	L/183	L/141	L/122		
20'	Vertical (lbs)					2,100	1,840	1,540			
	Defl. Ratio					L/210	L/157	L/121			
21'	Vertical (lbs)					1,850	1,590				
	Defl. Ratio					L/181	L/136				
22'	Vertical (lbs)					1,625					
	Defl. Ratio					L/158					
23'	Vertical (lbs)					1,430					
	Defl. Ratio					L/138					
24'	Vertical (lbs)					1,255					
	Defl. Ratio					L/122					
25'	Vertical (lbs)										
	Defl. Ratio										
26'	Vertical (lbs)										
	Defl. Ratio										
27'	Vertical (lbs)										
	Defl. Ratio										
28'	Vertical (lbs)										
	Defl. Ratio										
29'	Vertical (lbs)										
	Defl. Ratio										
30'	Vertical (lbs)										
	Defl. Ratio										

(1) Load based on a wind pressure of 19.1 psf and studs spaced at 16" on-center.

General Notes

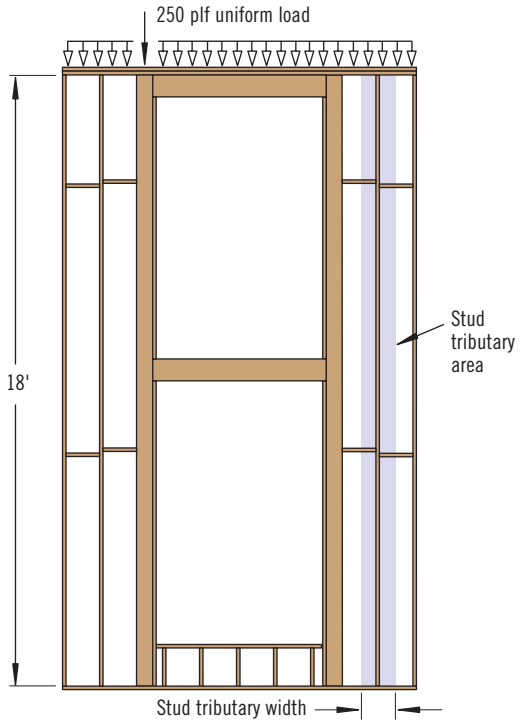
- Table is based on:
  - A load duration factor of 1.60.
  - Stud bracing in **Engineered Design Assumptions** on page 4.
  - Full-width blocking at a maximum vertical spacing of 8' on-center.
  - A buckling length coefficient of $K_e = 0.85$. For deflection, use $K_e = 1.0$.
  - Axial loads applied eccentrically, at a distance of ⅙ of the **wall thickness** dimension of the stud, measured from the stud centerline.
  - A compression perpendicular-to-grain stress of 425 psi, adjusted per NDS® 3.10.4.
  - A code-allowed repetitive-member increase of 4%.
- Maximum allowable loads reflect 0.6W as required by ASD load combinations in ASCE 7.

STUD EXAMPLE

Stud Example

For the **Design Example** on page 5, design 18' studs for lateral wind pressure of 12.5 psf and a maximum vertical load of 250 plf:

- **Determine the maximum stud length:**
  The maximum stud length in this example wall is 18'.
- **Calculate the lateral load in plf:**
  This example uses 16" on-center studs, so calculate the lateral load in plf and the vertical load in lbs as follows:
  12.5 psf x 16/12 = 16.7 plf; 250 plf x 16/12 = 333 lbs.
- **Select the appropriate studs:**
  In the **Stud Load Table,** scan across the 18' row until you find a cell in the 20 plf Lateral Load column that meets the L/180 deflection and the 333 lbs vertical load criteria. According to the table, a 1.6E TimberStrand® LSL 2x6 stud is an option.
- **Design stud connections:**
  Convert 16.7 plf into a reaction (uniform load x length/2): 16.7 (18'/2) = 150 lbs. Use the **Lateral Connections** tables on page 13 to select a nail or angle clip connection that meets or exceeds 150 lbs. For this example, a nailed connection can be calculated as 150/104 = 1.5, so two 16d (0.131" x 3¼") nails (nailed through the plate into the end grain) would work. For an angle clip connection, one Simpson Strong-Tie® A34 angle clip at the top and bottom plate is sufficient.



ONE-HOUR WALL ASSEMBLY WITH TIMBERSTRAND® LSL STUDS

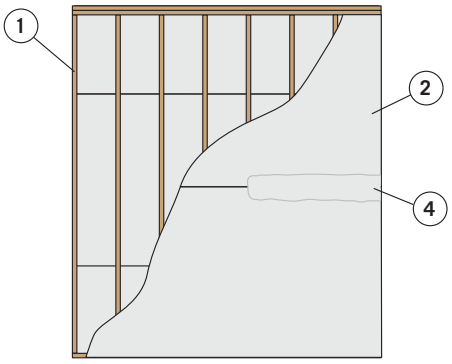
2x6 Wall Application: 2x6 wall made with TimberStrand® LSL studs and gypsum wallboard applied horizontally. *2x6 or larger TimberStrand® LSL is permitted as a substitute in fire-rated assemblies when used in the same or larger dimensions as sawn lumber.*

TimberStrand LSL Wall Assembly

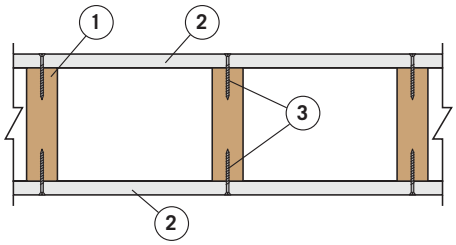
1. 2x6 TimberStrand® LSL studs, spaced 16" on-center, with double top plates and single bottom plate
2. ⅝" Type X gypsum wallboard, 4' wide, applied horizontally. Horizontal joints are unblocked. Horizontal application of wallboard represents the direction of least fire resistance as opposed to vertical application.
3. 2¼" #6 Type S drywall screws, spaced along stud at 7" on-center and covered with joint compound
4. Wallboard joints covered with paper tape and joint compound

- The design axial compressive stress within the TimberStrand® LSL studs must not exceed **the least** of the following:
  - 435 psi
  - F_c x 0.30, where F_c is the compression design value parallel-to-grain for the TimberStrand® LSL, adjusted by all applicable factors (in accordance with the NDS®), including the column stability factor C_p
  - F_c x 0.30, where F_c is caclulated in accordance with the NDS®, assuming a slenderness ratio L_e/d of 21

This assembly has been tested to ASTM E119/NFPA 251 and CAN/ULC-S101 Standards.



Top View (plates not shown)



COLUMN LOAD TABLES

Columns—Maximum Allowable Lateral (Wind) Load (PLF)/Vertical Load (lbs)

Defl. Ratio	Wall Ht.	Max. Defl.	3½" Wall Thickness							5½" Wall Thickness					
			TimberStrand® LSL				Parallam® PSL			TimberStrand® LSL		Parallam® PSL			
			1.6E	1.3E			1.8E			1.6E	1.3E	1.8E			2.0E
			Dbl 2x4[1]	3½" x 3½"	5½" x 3½" (Plank)	7¼" x 3½" (Plank)	3½" x 3½"	5¼" x 3½" (Plank)	7" x 3½" (Plank)	Dbl 2x6[1]	3½" x 5½"	3½" x 5¼"	5¼" x 5¼"	7" x 5¼" (Plank)	9½" x 5¼" (Plank)
L/360	30'	1.00"													
	28'	0.93"													
	26'	0.87"													
	24'	0.80"												23/8,165	34/11,985
	22'	0.73"											22/7,070	30/9,385	45/13,605
	20'	0.67"											29/8,235	39/10,955	60/15,550
	18'	0.60"								23/4,555	22/5,110	27/6,375	40/9,655	54/12,830	82/17,770
	16'	0.53"							23/5,510	33/4,675	32/5,985	38/7,580	58/11,400	77/15,220	117/19,275
	14'	0.47"				25/5,075		25/5,160	34/6,850	50/4,710	47/6,890	57/7,810	86/11,715	115/15,620	174/20,335
	12'	0.40"	20/2,900		31/4,840	40/6,415	27/4,350	40/6,540	54/8,695	79/4,695	75/7,300	91/7,810	136/11,715	182/15,620	274/21,145
	10'	0.33"	35/3,030	33/4,035	53/6,300	70/8,300	47/5,205	70/7,810	94/10,415	136/4,585	129/7,450	156/7,810	234/11,715	300/15,620	300/21,195
	8'	0.27"	69/3,050	65/4,740	103/8,180	136/10,785	91/5,205	136/7,810	182/10,415	261/4,360	248/7,215	300/7,810	300/11,715	300/15,620	300/21,195
L/240	30'	1.50"													
	28'	1.40"													
	26'	1.30"													
	24'	1.20"											26/5,535	34/7,425	52/10,815
	22'	1.10"										22/4,210	33/6,360	45/8,420	67/12,255
	20'	1.00"								26/3,880	24/3,855	29/4,855	44/7,315	59/9,730	90/13,840
	18'	0.90"								35/4,060	34/4,370	40/5,610	61/8,440	81/11,270	123/15,640
	16'	0.80"				25/3,720		26/3,750	34/5,030	50/4,140	48/5,060	58/6,480	87/9,825	116/13,100	175/17,415
	14'	0.70"			29/3,430	38/4,530	25/3,100	38/4,630	51/6,160	75/4,135	71/5,660	86/7,545	129/11,525	173/15,315	261/18,860
	12'	0.60"	31/2,595	29/2,725	46/4,265	61/5,605	40/3,860	61/5,755	81/7,685	119/4,035	113/5,775	136/7,810	205/11,715	273/15,620	300/21,145
	10'	0.50"	53/2,705	50/3,440	80/5,355	105/7,075	70/4,870	105/7,310	141/9,710	204/3,810	194/5,545	234/7,805	300/11,715	300/15,620	300/21,195
	8'	0.40"	104/2,670	98/3,870	155/6,760	204/8,920	136/5,205	205/7,810	273/10,410	300/4,085	300/6,215	300/7,810	300/11,715	300/15,620	300/21,195
L/180	30'	2.00"													
	28'	1.87"													
	26'	1.73"													
	24'	1.60"								20/2,955		23/3,305	34/5,035	46/6,670	69/9,780
	22'	1.47"								26/3,300	24/2,985	30/3,725	45/5,640	60/7,515	90/10,930
	20'	1.33"								34/3,490	33/3,295	39/4,270	59/6,445	79/8,575	120/12,215
	18'	1.20"								47/3,580	45/3,720	54/4,830	81/7,335	109/9,725	164/13,590
	16'	1.07"			26/2,530	34/3,345	23/2,270	34/3,425	46/4,545	67/3,605	64/4,155	77/5,470	116/8,300	155/11,050	234/14,785
	14'	0.93"	26/2,160	24/1,960	39/3,035	51/4,015	34/2,755	51/4,130	68/5,510	100/3,535	95/4,435	115/6,095	173/9,335	230/12,485	300/17,395
	12'	0.80"	41/2,325	39/2,355	62/3,675	81/4,870	54/3,360	81/5,040	109/6,690	159/3,325	151/4,200	182/6,035	273/10,210	300/15,620	300/21,145
	10'	0.67"	71/2,375	67/2,860	106/4,470	140/5,880	94/4,080	141/6,125	188/8,165	272/2,920	258/3,455	300/5,750	300/11,715	300/15,620	300/21,195
	8'	0.53"	138/2,275	131/2,990	206/5,170	272/6,800	182/4,375	273/7,250	282/10,415	300/4,085	300/6,215	300/7,810	300/11,715	300/15,620	300/21,195

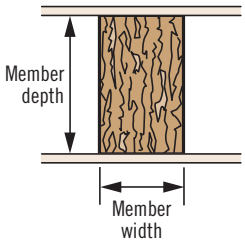
(1) For 3-ply and 4-ply built-up columns, multiply table values by 1.5 and 2.0, respectively. See page 11 for connection requirements.

- Green numbers refer to lateral (wind) load (PLF). Black numbers refer to vertical load (lbs).

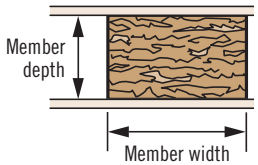
General Notes

- Tables are based on:
  - A load duration factor of 1.60.
  - Full-width blocking at a maximum vertical spacing of 8' on-center.
  - A buckling length coefficient of $K_e = 0.85$. For deflection use $K_e = 1.0$.
  - Axial loads applied eccentrically, at a distance of ⅛ of the **wall thickness** dimension of the column, measured from the column centerline.
  - A compression perpendicular-to-grain stress of 425 psi.
- Solid sections required where specified. Built-up columns require reductions. Contact your Weyerhaeuser representative for assistance.
- Maximum allowable loads reflect 0.6W as required by ASD load combinations in ASCE 7.

Beam Orientation



Plank Orientation



Some columns are listed in both beam and plank orientation. The first dimension is for member width, and the second dimension is for member depth (wall thickness).

TimberStrand® LSL and untreated Parallam® PSL are intended for dry-use applications

Not all products are available in all markets. Contact your Weyerhaeuser representative for information.

COLUMN LOAD TABLES AND EXAMPLE

Columns—Maximum Allowable Lateral (Wind) Load (PLF)/Vertical Load (lbs)

Defl. Ratio	Wall Ht.	Max. Defl.	7¼" Wall Thickness					9½" Wall Thickness		
			TimberStrand® LSL	Parallam® PSL				TimberStrand® LSL	Parallam® PSL	
			1.3E	1.8E			2.0E	1.55E	2.0E	
			3½" x 7¼"	3½" x 7"	5¼" x 7"	7" x 7"	9½" x 7" (Plank)	3½" x 9½"	3½" x 9½"	5¼" x 9½"
L/360	30'	1.00"			21/8,945	28/11,960	42/17,390	30/11,215	38/12,610	58/18,955
	28'	0.93"			25/10,045	34/13,370	52/19,175	36/12,450	47/13,050	71/19,620
	26'	0.87"		21/7,445	32/11,195	43/14,945	64/21,270	46/13,670	59/13,440	89/20,200
	24'	0.80"	21/6,555	27/8,365	40/12,675	54/16,905	82/23,420	58/14,130	75/13,645	112/20,700
	22'	0.73"	28/7,345	35/9,485	53/14,295	70/19,185	106/25,175	75/14,130	97/13,780	146/21,130
	20'	0.67"	37/8,360	47/10,415	70/15,620	94/20,825	141/26,340	100/14,130	129/13,895	193/21,195
	18'	0.60"	51/9,005	64/10,415	96/15,620	128/20,825	193/27,305	136/14,130	176/13,985	251/21,195
	16'	0.53"	73/9,370	91/10,415	136/15,620	182/20,825	274/28,090	193/14,130	249/14,065	282/21,195
	14'	0.47"	108/9,580	135/10,415	202/15,620	270/20,825	300/28,265	284/14,130	300/14,125	300/21,195
	12'	0.40"	170/9,510	212/10,415	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195
	10'	0.33"	289/9,080	300/10,415	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195
	8'	0.27"	300/10,785	300/10,415	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195
L/240	30'	1.50"		21/5,300	31/8,050	42/10,720	63/15,610	45/9,705	58/11,100	87/16,995
	28'	1.40"	20/4,600	25/5,930	38/8,920	51/11,920	78/17,080	55/10,600	71/11,720	107/17,925
	26'	1.30"	25/5,090	32/6,525	48/9,870	64/13,220	97/18,755	69/11,525	89/12,205	133/18,770
	24'	1.20"	32/5,635	40/7,325	61/11,005	81/14,775	123/20,515	87/12,110	112/12,435	169/19,390
	22'	1.10"	42/6,230	53/8,105	79/12,325	106/16,475	160/22,225	113/12,365	146/12,360	205/20,520
	20'	1.00"	56/6,910	70/9,100	105/13,815	141/18,465	212/23,815	150/12,440	193/12,185	226/21,195
	18'	0.90"	77/7,265	96/9,890	144/15,455	192/20,760	251/26,910	204/12,305	251/12,225	251/21,195
	16'	0.80"	109/7,370	136/10,165	205/15,620	273/20,825	282/28,090	282/12,065	282/13,680	282/21,195
	14'	0.70"	162/7,190	202/10,095	300/15,620	300/20,825	300/28,265	300/14,130	300/14,125	300/21,195
	12'	0.60"	255/6,600	300/10,155	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195
	10'	0.50"	300/8,820	300/10,415	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195
	8'	0.40"	300/10,785	300/10,415	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195
L/180	30'	2.00"	22/3,655	28/4,710	42/7,130	56/9,560	84/13,940	60/8,250	77/9,475	116/14,585
	28'	1.87"	27/3,995	34/5,190	51/7,865	68/10,545	104/15,095	73/8,900	95/9,815	142/15,230
	26'	1.73"	34/4,340	43/5,650	64/8,615	86/11,505	129/16,430	92/9,420	118/10,095	173/15,965
	24'	1.60"	43/4,745	54/6,245	81/9,490	109/12,665	164/17,720	116/9,680	150/10,015	188/18,200
	22'	1.47"	56/5,140	70/6,845	106/10,345	141/13,930	205/19,390	151/9,545	194/9,720	205/20,520
	20'	1.33"	75/5,485	94/7,390	141/11,280	188/15,180	226/23,025	200/9,205	226/10,670	226/21,195
	18'	1.20"	103/5,515	128/7,780	192/12,215	251/16,810	251/26,910	251/9,730	251/12,225	251/21,195
	16'	1.07"	146/5,240	182/7,575	273/12,785	282/20,825	282/28,090	282/12,065	282/13,680	282/21,195
	14'	0.93"	216/4,575	270/6,905	300/15,620	300/20,825	300/28,265	300/14,130	300/14,125	300/21,195
	12'	0.80"	300/4,855	300/10,155	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195
	10'	0.67"	300/8,820	300/10,410	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195
	8'	0.53"	300/10,785	300/10,410	300/15,620	300/20,825	300/28,265	300/14,130	300/14,130	300/21,195

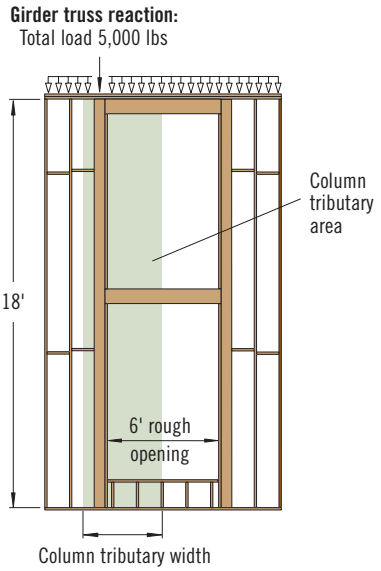
- Green numbers refer to lateral (wind) load (PLF). Black numbers refer to vertical load (lbs).

Column Example

For the **Design Example** wall on page 5, design 18' columns for lateral wind pressure of 12.5 psf and vertical loading of 5,000 lbs:

Note: Vertical load is the load applied to the top of the column, excluding the header reaction. The header reaction is assumed to transfer directly to the trimmers.

- **Calculate the lateral load in plf:**
  The calculated wind pressure in the example is 12.5 psf, so 12.5 x 3.67' tributary width = 45.9 plf.
- **Select an appropriate column:**
  Scan the L/180 section of the **Column Load Tables** to find a 18' column that meets or exceeds the 45.9 plf lateral load and the 5,000 lbs vertical load. For this example, a 5¼" x 5¼" 1.8E Parallam® PSL column (at 81/7,335) will work for a 2x6 wall.
- **Design the column to wall plate connections:**
  Convert 45.9 plf into a reaction (uniform load x length/2): 45.9 (18'/2) = 413 lbs. Use the **Lateral Connections** tables on page 13 to select a connection that meets or exceeds 413 lbs. For this example 413/465 = 0.89; so according to the **Angle Clips** table, one Simpson Strong-Tie® A34 connector is required at top and bottom. Weyerhaeuser recommends using connectors on **each side** at top and bottom of the column (four connectors total) to provide concentric loading.



HEADER LOAD TABLE

Headers—Maximum Allowable Lateral (Wind) Load (PLF)/Vertical Load (PLF)

Lateral Defl. Ratio	Rough Opening	Max. Defl.	3½" Wall Thickness				5½" Wall Thickness			7¼" Wall Thickness
			TimberStrand® LSL				TimberStrand® LSL	Parallam® PSL		TimberStrand® LSL
			1.3E		1.55E		1.3E	1.8E	2.0E	1.3E
			3½" x 5½"	3½" x 7¼"	3½" x 9½"	3½" x 11⅞"	5½" x 3½" (Plank)	5¼" x 5¼"	5¼" x 9½"	7¼" x 3½" (Plank)
L/360	12'	0.41"	30/30	40/80	60/215	75/335		130/60	260/420	
	10'	0.34"	50/70	65/165	***100/435***	***130/535***	120/25	220/130	***440/850***	270/35
	9'	0.31"	65/110	90/250	***140/575***	***175/695***	165/40	295/200	***490/1,265***	365/55
	8'	0.28"	95/175	125/395	***195/765***	***245/925***	225/70	410/320	***500/1,605***	500/90
	7'	0.24"	140/295	***180/650***	***285/1,040***	***310/1,220***	330/120	500/535	***500/1,830***	500/160
	6'	0.21"	215/525	***280/900***	***360/1,420***	***360/1,415***	500/220	500/955	***500/2,125***	500/290
	5'	0.18"	355/690	***430/1,230***	***430/1,690***	***430/1,685***	500/370	***500/1,525***	***500/2,535***	500/485
	4'	0.14"	***500/1,125***	***500/1,995***	***500/2,090***	***500/2,085***	500/685	***500/2,060***	***500/3,135***	500/900
	3'	0.11"	***500/2,020***	***500/2,740***	***500/2,735***	***500/2,735***	500/1,340	***500/2,930***	***500/4,105***	500/1,770
L/240	12'	0.61"	45/30	60/80	90/215	115/295		195/60	370/420	
	10'	0.51"	75/70	100/165	155/380	***190/460***	180/25	325/130	***440/850***	405/35
	9'	0.46"	100/110	135/250	***210/485***	***245/605***	245/40	440/200	***490/1,265***	490/55
	8'	0.41"	140/175	185/395	***275/655***	***275/885***	340/70	500/320	***500/1,605***	500/90
	7'	0.36"	210/295	275/540	***310/1,000***	***310/1,220***	495/95	500/535	***500/1,830***	500/160
	6'	0.31"	320/380	360/750	***360/1,420***	***360/1,415***	500/220	500/955	***500/2,125***	500/290
	5'	0.26"	430/580	***430/1,230***	***430/1,690***	***430/1,685***	500/370	***500/1,525***	***500/2,535***	500/485
	4'	0.21"	***500/1,125***	***500/1,995***	***500/2,090***	***500/2,085***	500/685	***500/2,060***	***500/3,135***	500/900
	3'	0.16"	***500/2,020***	***500/2,740***	***500/2,735***	***500/2,735***	500/1,340	***500/2,930***	***500/4,105***	500/1,770
L/180	12'	0.82"	60/30	75/80	120/210	150/255		255/60	370/420	
	10'	0.68"	100/70	130/165	205/325	***220/430***	240/25	435/130	***440/850***	440/35
	9'	0.62"	135/110	175/250	245/440	***245/605***	325/40	490/200	***490/1,265***	490/55
	8'	0.55"	190/175	250/340	***275/655***	***275/885***	455/20	500/320	***500/1,605***	500/90
	7'	0.48"	275/225	310/470	***310/1,000***	***310/1,220***	500/90	500/535	***500/1,830***	500/160
	6'	0.42"	360/320	***360/750***	***360/1,420***	***360/1,415***	500/220	500/955	***500/2,125***	500/290
	5'	0.35"	430/580	***430/1,230***	***430/1,690***	***430/1,685***	500/370	***500/1,525***	***500/2,535***	500/485
	4'	0.28"	***500/1,125***	***500/1,995***	***500/2,090***	***500/2,085***	500/685	***500/2,060***	***500/3,135***	500/900
	3'	0.22"	***500/2,020***	***500/2,740***	***500/2,735***	***500/2,735***	500/1,340	***500/2,930***	***500/4,105***	500/1,770

- ***Bold italic*** values require two trimmers (3" bearing) at ends. Single trimmers may work for lightly loaded ***bold italic*** sections; see table below.
- Green numbers refer to lateral (wind) load (PLF). Black numbers refer to vertical load (PLF).

General Notes

- Table is based on:
  - A load duration factor of 1.60 for combined lateral and vertical load.
  - A load duration factor of 1.00 for vertical load only.
  - Uniform lateral (wind) and vertical loads (beam weight considered).
  - Vertical deflection, the more restrictive of L/240 or 5/16".
  - A maximum lateral (wind) load of 500 plf.
- Maximum allowable loads reflect 0.6W as required by ASD load combinations in ASCE 7.

Bearing Requirements

- Trimmers must support the full width of the header.
- Minimum header support to be one trimmer (1½") at ends.

Maximum Allowable Vertical Load (PLF) with One Trimmer

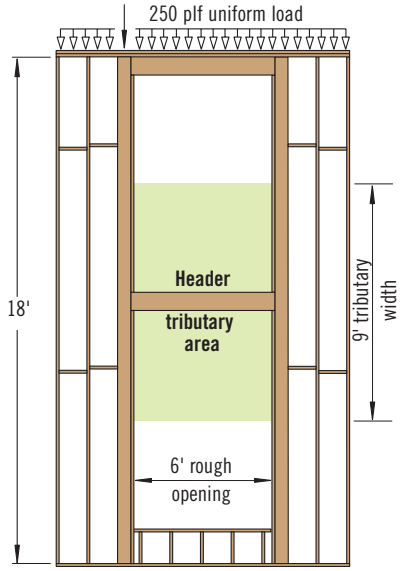
Rough Opening	Wall Thickness	
	3½"	5½"
12'	355	536
10'	428	646
9'	476	718
8'	536	808
7'	613	924
6'	716	1,077
5'	858	1,291
4'	1,069	1,607
3'	1,415	2,126

HEADER EXAMPLE

Header Example

The **Design Example** on page 5 assumes that both headers will be the same size, and considers worst-case loading. Design the headers for lateral wind pressure of 14.6 psf based on the lower header's 6' rough opening and 10' tributary width, and a vertical load based on the upper header's maximum 250 plf.

- **Calculate the lateral load in plf:**
  The calculated wind pressure in the example is 14.6 psf, so 14.6 x 9' tributary width = 132 plf.
- **Select the appropriate header:**
  Scan the L/180 section of the **Header Load Table** to find a header that meets your requirements (132 plf lateral and 250 plf vertical). For this example, a 6' header of 5¼" x 5¼" 1.8E Parallam® PSL (at 500/955) will work for a 2x6 wall. Since the table number for this selection is not bold, only one trimmer stud is required for bearing. Headers that do not match the wall thickness must be directly attached to a plate that matches the wall thickness to provide lateral bracing. See detail L13 on page 12.
- **Design header to column connections:**
  Convert 132 plf into a reaction (uniform load x length/2): 132 (6'/2) = 396 lbs. Use the **Lateral Connections** tables on page 13 to select a connection that meets or exceeds 396 lbs. For this example 396/465 = 0.85; so according to the **Angle Clips** connections table on page 13, one Simpson Strong-Tie® A34 connector is required at each end. Weyerhaeuser recommends using connectors at top and bottom of the header (four connectors total) to provide concentric loading.



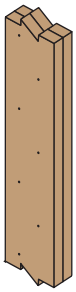
MULTIPLE-MEMBER CONNECTIONS

2-Ply Nailing Recommendations

- **For 2x4 and 2x6:** Minimum of **two rows** of 16d (0.131" x 3¼") pneumatic nails at 10" on-center, staggered.
- Nail from one side.

3-Ply Nailing Recommendations

- **For 2x4:** Minimum of **two rows** of 16d (0.131" x 3¼") pneumatic nails at 8" on-center, staggered.
- **For 2x6:** Minimum of **three rows** of 16d (0.131" x 3¼") pneumatic nails at 5" on-center, staggered.
- Nail from both sides.



4-Ply Fastening Recommendations

- **For 2x4:** Nail each ply to the other with a minimum of **two rows** of 16d (0.131" x 3¼") pneumatic nails at 5" on-center. When connecting each ply, offset nail rows by 2" from the ply below.
- **For 2x6:**
  - Nail each ply to the other with a minimum of **three rows** of 16d (0.131" x 3¼") pneumatic nails at 5" on-center. When connecting each ply, offset nail rows by 2" from the ply below.

    or,
  - Minimum of **two rows** of ½" diameter bolts spaced at 8" on-center.

PRODUCT STORAGE

Protect product from sun and water

CAUTION:
Wrap is slippery when wet or icy

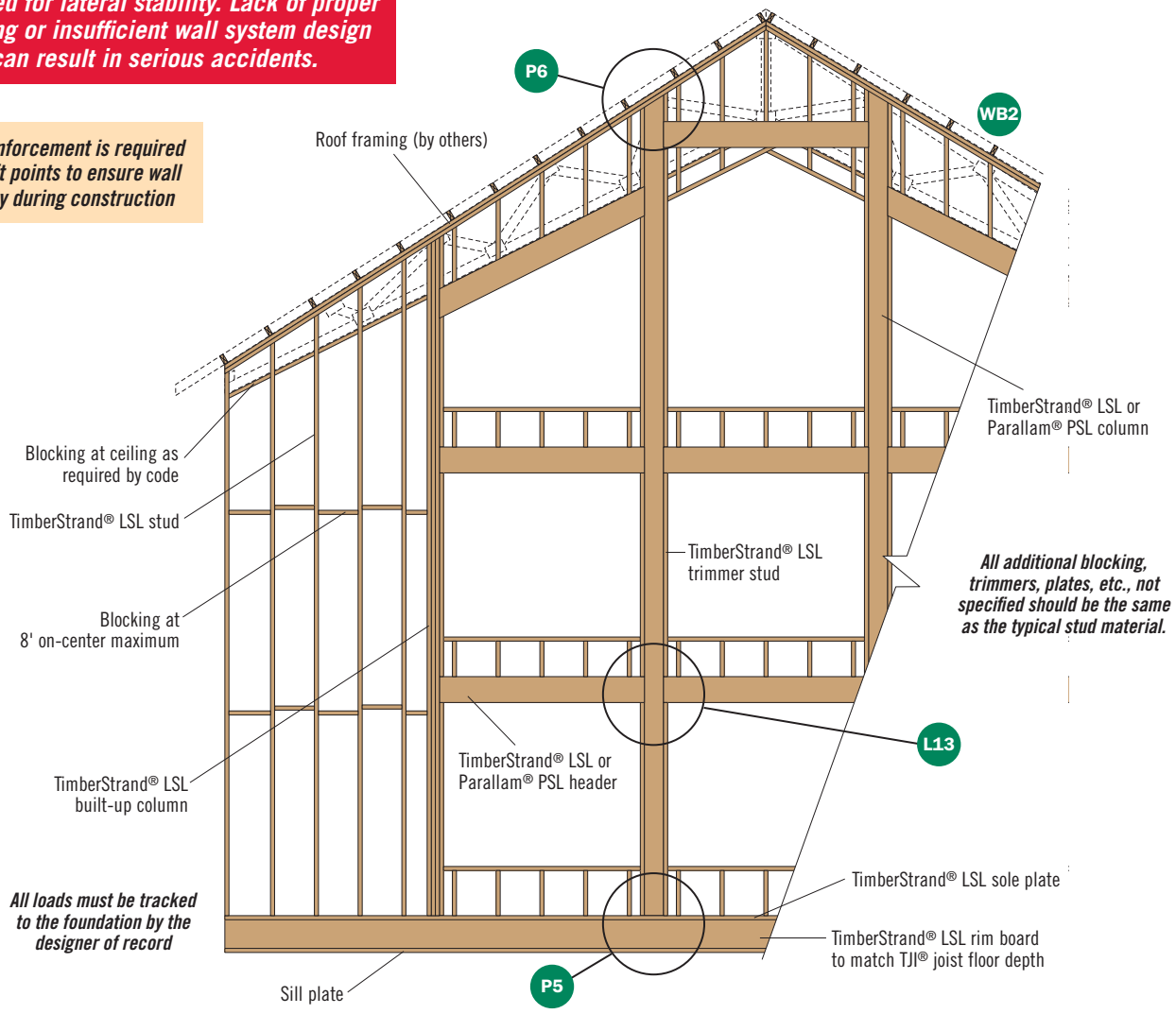
Align stickers (2x3 or larger) directly over support blocks

Use support blocks (6x6 or larger) at 10' on-center to keep bundles out of mud and water

TYPICAL TALL WALL FRAMING

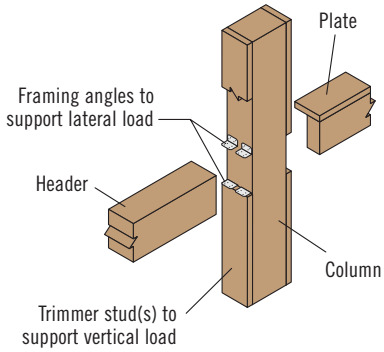
WARNING
Safety bracing during construction is required for lateral stability. Lack of proper bracing or insufficient wall system design can result in serious accidents.

Wall reinforcement is required at all lift points to ensure wall stability during construction



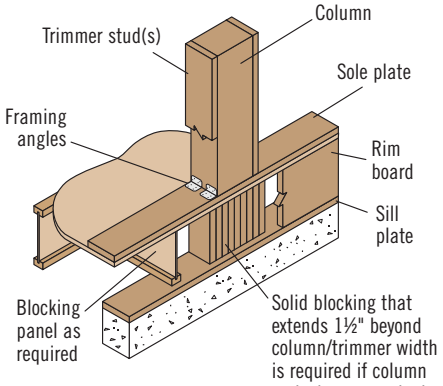
WALL DETAILS

Header to Column



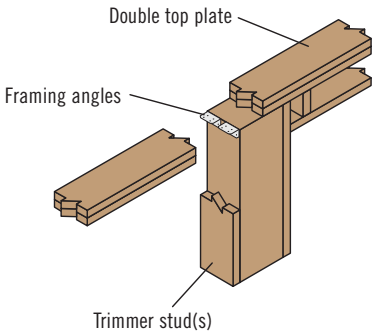
L13 ***Plate width must equal the wall thickness to provide lateral bracing. (Plate not required if header width equals the wall thickness.)***

Column or Stud to Bottom Plate



P5

Column or Stud to Top Plate

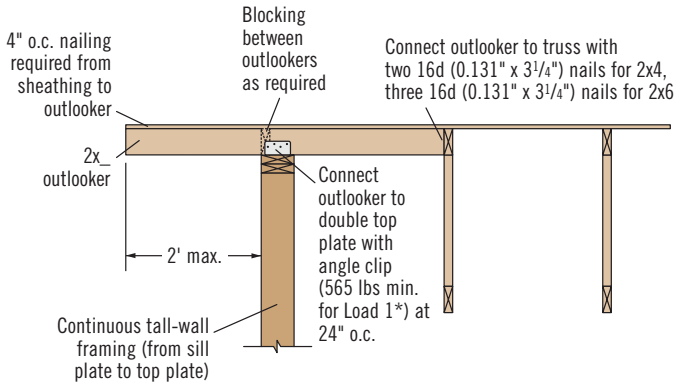


P6

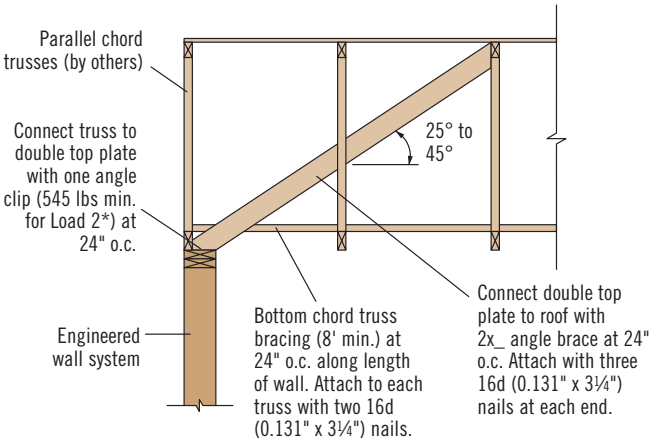
WALL DETAILS

Wind Brace

Details shown are applicable for 115 mph basic wind speeds and the exposure categories and maximum wall heights shown in the table below. For other conditions, contact your Weyerhaeuser representative.



WB2 ** Load 1 value from* **Lateral Connections—Angle Clips** *table below.*



WB3 ** Load 2 value from* **Lateral Connections—Angle Clips** *table below.*

Wind Brace Detail Applicability

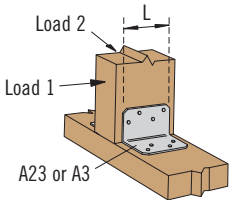
Detail	Exposure	Max. Wall Height
WB2	D	25'
	B, C	29'
WB3	B, C	20'(1)

(1) Maximum wall height shown includes depth of truss.

FRAMING CONNECTORS

Lateral Connections—Nails

Nail Size	End Grain	Toe Nail
8d (0.113" x 2½")	77 lbs	96 lbs
10d (0.128" x 3")	99 lbs	123 lbs
12d (0.128" x 3¼")	99 lbs	123 lbs
16d (0.135" x 3½")	110 lbs	137 lbs
16d (0.131" x 3¼")	104 lbs	129 lbs

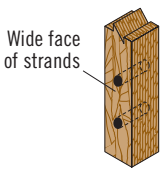


General Notes

- Tables are based on a load duration factor of 1.60.
- Connection values based on a specific gravity of 0.50.
- For end-grain connections, a 0.67 factor was used (based on NDS®).
- For toenail connections, a 0.83 factor was used (based on NDS®).

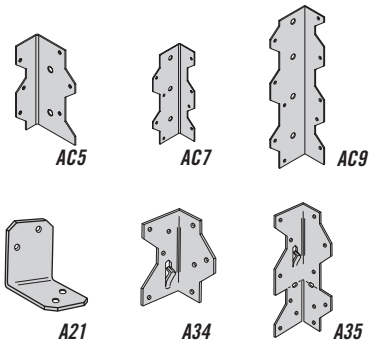
Lateral Connections—Angle Clips

Type	Nails	Length of Connector (L)	Load 1: Allowable Load (lbs)	Load 2: Allowable Load (lbs)
Simpson Strong-Tie®				
A21	Four 10d (0.148" x 1½")	1⅜"	150	330
A34	Eight 8d (0.131" x 1½")	2½"	465	430
A35	Twelve 8d (0.131" x 1½")	4½"	650	670
A23	Eight 10d (0.148" x 1½")	2¾"	535	680
USP Structural Connectors®				
AC5	Six 10d (0.148" x 1½")	4⅞"	554	554
A3	Eight 10d (0.148" x 1½")	2¾"	740	610
AC7	Eight 10d (0.148" x 1½")	6$^{15}/_{16}$"	740	740
AC9	Ten 10d (0.148" x 1½")	8⅞"	926	882



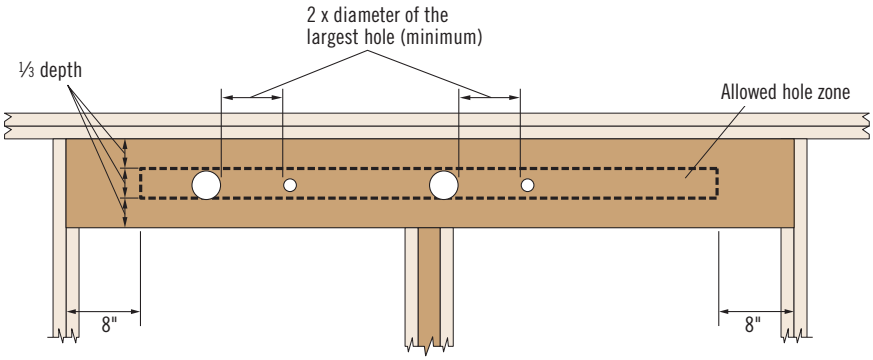
In order to use the manufacturer's published capacities when designing column caps, bases, or holdowns for uplift, the bolts or screws must be installed perpendicular to the wide face of strands as shown at left.

DO NOT install bolts or screws into the narrow face of strands



ALLOWABLE HOLES

1.55E TimberStrand® LSL Headers and Beams



General Notes

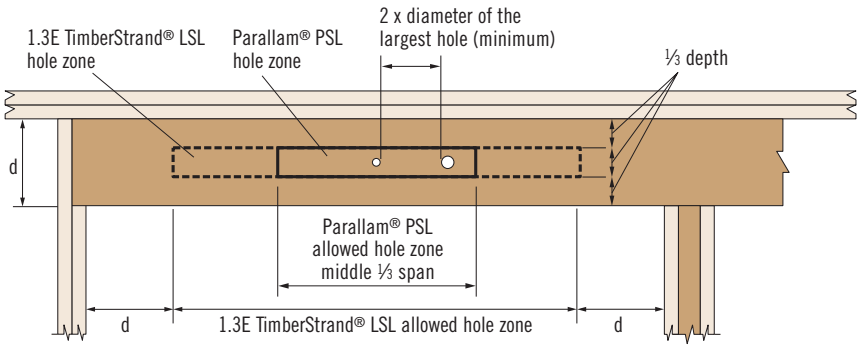
- Allowed hole zone suitable for headers and beams with **uniform and/or concentrated loads** anywhere along the member.
- Round holes only.
- No holes in headers or beams in plank orientation.

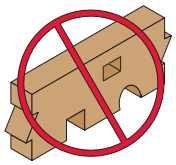
1.55E TimberStrand® LSL

Header or Beam Depth	Maximum Round Hole Size
9½"	3"
11⅞"	3⅝"
14"–16"	4⅝"

- See illustration for allowed hole zone.

Other Trus Joist® Headers and Beams





DO NOT cut, notch, or drill holes in headers or beams except as indicated in the illustrations and tables above

General Notes

- Allowed hole zone suitable for headers and beams with **uniform loads only**.
- Round holes only.
- No holes in cantilevers.
- No holes in headers or beams in plank orientation.

Other Trus Joist® Beams

Header or Beam Depth	Maximum Round Hole Size
5½"	1¾"
7¼"–20"	2"

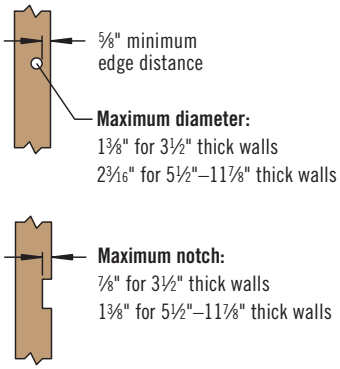
- See illustration for allowed hole zone.

WARNING: This product can expose you to chemicals including wood dust which are known to the State of California to cause cancer, and methanol, which are known to the State of California to cause birth defects or other reproductive harm. Drilling, sawing, sanding or machining wood products can expose you to wood dust. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to www.P65Warnings.ca.gov and www.P65Warnings.ca.gov/wood.

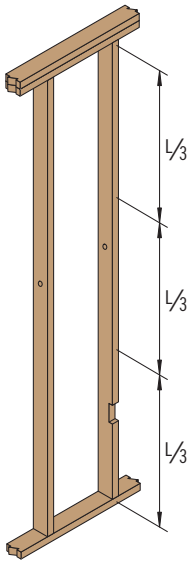
Safety data sheets for all Weyerhaeuser wood products can be found on our website at: ***weyerhaeuser.com/sustainability/environment/product-stewardship/safety-data-sheets.***

Allowable Holes and Notches* for TimberStrand® LSL Studs

Per ICC ES ESR-1387, holes may be drilled anywhere along the length of the stud but must be at least ⅝" from the edge



* For applications other than 2x4 and 2x6 studs in conventional construction as shown on page 3.



One notch may be cut anywhere except the middle ⅓ of the length of the stud

DO NOT cut a notch and a hole in the same cross section

DESIGN PROPERTIES

Allowable Design Stresses (100% Load Duration)

Grade MOE (x10⁶) (psi)	E_{min} (1) (psi)	Axial		Joist/Beam			Plank			Equivalent Specific Gravity for Connections		
		$F_{c\perp}$ (psi)	F_t (2) (psi)	F_b (3) (psi)	F_v (psi)	$F_{c\perp}$ (4) (psi)	F_b (psi)	F_v (psi)	$F_{c\perp}$ (4) (psi)	Shear Walls (5)	Lateral	Withdrawal
TimberStrand® LSL												
1.3	660,750	1,835	1,300	1,700 (6)	425	710	1,900	150	670	0.42 (7)	0.50	0.42
1.55	787,815	2,170	1,290 (8)	2,325 (6)	310 (8)	900	2,615	150	775	0.42		0.42
1.6	813,230	2,235	2,060	2,425 (6)	545	935	2,700	150	900	0.50		0.55
Parallam® PSL												
1.8	914,880	2,500	1,995	2,500 (9)	230	545	2,400 (9)	190	545	N.A.	0.50	0.50
2.0	1,016,535	2,900 (10)	2,300	2,900 (9)	290	625	2,650 (9)	210	635			

(1) Reference modulus of elasticity for beam and column stability calculations per NDS®.

(2) Referenced tension design values are based on a standard 4 foot length. For lengths longer than 4 foot, multiply F_t by the following adjustment (where L is length in feet):
– TimberStrand® LSL $(4/L)^{0.083}$ – Parallam® PSL: $(4/L)^{0.056}$

(3) When structural members qualify as repetitive members in accordance with the applicable building code, a 4% increase is permitted for F_b in addition to the increases permitted in Footnotes 6 and 8.

(4) $F_{c\perp}$ may not be increased for duration of load.

(5) Design shear wall applications per AWC SDPWS. When using StrandGuard® TimberStrand® LSL sill plate, see the *Trus Joist® Treated Sill Plates, Columns, and Studs Technical Brief*, TJ-8100.

(6) For 12" depth. For depths < 3½", use the 3½" factor; for other depths, multiply by $\left[\frac{12}{d}\right]^{0.092}$.

(7) Do not use AWC SDPWS with nail spacings less than 6" on-center. (Studs at boundary locations, where two panels abut, are allowed two rows at 6" on-center.)

(8) Value accounts for large hole capabilities. See **Allowable Holes** on page 14.

(9) For 12" depth. For depths < 3½", use the 3½" factor; for other depths, multiply by $\left[\frac{12}{d}\right]^{0.111}$.

(10) For column and stud applications, use $F_{c\perp}$ of 500 psi. Alternatively, refer to ESR-1387, Table 1, footnote 15.

Allowable Design Properties (100% Load Duration)

1½" TimberStrand® LSL Studs

Design Property	Beam Orientation	
	1.6E	
	3½"	5½"
Moment (ft-lbs)	695	1,640
Shear (lbs)	1,910	3,000
Moment of Inertia (in.⁴)	5	21
Weight (plf)	1.6	2.6

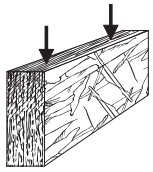
3½" TimberStrand® LSL Columns and Headers

Design Property	1.3E					1.55E	
	Beam Orientation			Plank Orientation		Beam Orientation	
	3½"	5½"	7¼"	5½"	7¼"	9½"	11⅞"
Moment (ft-lbs)	1,135	2,685	4,550	1,780	2,345	10,420	15,955
Shear (lbs)	1,225	5,455	7,190	1,925	2,540	6,870	8,590
Moment of Inertia (in.⁴)	13	49	111	20	26	250	488
Weight (plf)	3.6	5.6	7.4	5.6	7.4	10.4	13.0

3½" Parallam® PSL Columns

Design Property	1.8E					2.0E
	Beam Orientation			Plank Orientation		Beam Orientation
	3½"	5¼"	7"	5¼"	7"	9½"
Moment (ft-lbs)	1,640	3,670	6,320	2,460	3,275	13,055
Shear (lbs)	1,550	2,820	3,755	2,330	3,105	6,430
Moment of Inertia (in.⁴)	13	42	100	19	25	250
Weight (plf)	3.8	5.7	7.7	5.7	7.7	10.4

Beam Orientation



5¼" Parallam® PSL Columns and Headers

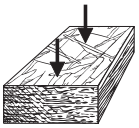
Design Property	1.8E			2.0E	
	Beam Orientation		Plank Orientation	Beam Orientation	Plank Orientation
	5¼"	7"	7"	9½"	9½"
Moment (ft-lbs)	5,285	9,485	7,050	19,585	10,565
Shear (lbs)	3,490	5,635	4,655	9,645	6,985
Moment of Inertia (in.⁴)	63	150	84	375	115
Weight (plf)	8.6	11.5	11.5	15.6	15.6

Column Orientation

7" Parallam® PSL Columns

Design Property	1.8E	2.0E
	Beam Orientation	Plank Orientation
	7"	9½"
Moment (ft-lbs)	12,140	18,190
Shear (lbs)	6,205	9,310
Moment of Inertia (in.⁴)	200	272
Weight (plf)	15.3	20.8

Plank Orientation



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