

Structural Calculations

Project Title: Lot 70 White Cloud #2

Location: Valley County, Idaho

Job #: 2026-12139



Disclaimer:

1. Calculations are not to be used for determining lengths of structural members.
2. Calculations are single use and location specific to property listed above.
3. Calculations shall not to be reproduced, reused, or altered in any way.
4. Calculations based on drawings received prior to stamp date. Any changes made after stamp date must be reviewed and approved by Engineer of Record prior to construction.
5. All work to conform to all local, state, and national codes.

Prepared in accordance with 2018 IBC. Calculations expire by: 5/25/2027

SITE SPECIFIC DESIGN CRITERIA:

Snow Criteria:

Roof Load (P_f)	150 psf	
Ground Load (P_g)	150 psf	
Exposure Factor (C_e)	1.0	Partially
Thermal Factor (C_t)	1.0	Typical
Importance (I_s)	1.0	

Wind Criteria:

Wind Speed (V_3)	115 mph	
Wind Exposure	B	Urban / wooded
Wind Importance (I_w)	1.0	
Building Category	II	

Seismic Criteria:

Site Class	D	Stiff Soil
S_s	0.39	F_a 1.39
S_1	0.11	F_v 2.19
S_{D1}	0.37	S_{D1} 0.20
Risk Category	II	Other
Seismic Importance (I_E)	1.0	
Seismic Design Category (SDC)	D	

Seismic Criteria (continued):

Wall Material	Design Base Shear	Response Coeff., R	
OSB	.07Wp	6.5	Typ @ Ext
GYP	.22Wp	2	Typ @ Int
Cant. Col.	.30Wp	1.5	

Soil Criteria:

Brg. Strength	1500 psf
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STRUCTURE SPECIFIC DESIGN CRITERIA:

Live Loads:

Typ Residential	40 psf
Garage (P.V.)	50 psf
Sleeping Area's	30 psf

Roof Dead Loads:

Deck	1.5
Insulation	2.0
Roofing	3.0
Joist	2.5
Ceiling	3.0
Misc	4.5
TOTAL	17 psf

Roof not engineered for Tile, Slate or Concrete.

Exterior Wall Dead Loads:

Studs	2.0
Siding	2.5
Insulation	0.5
Gyp. Board	2.5
Sheathing	1.5
Misc	3.0
TOTAL	12 psf

Floor Dead Loads:

Deck	2.5
Joist	2.0
Ceiling	2.0
Flooring	2.5
Misc	3.0
TOTAL	12 psf

Floor joists not engineered for concrete overlay.

Interior Wall Dead Loads:

Studs	2.0
Gyp. Board	2.5
Misc	3.0
TOTAL	8 psf

Deck Dead Load

Decking	4.4
Joist	2.0
	0.0
Misc	3.0
TOTAL	10 psf

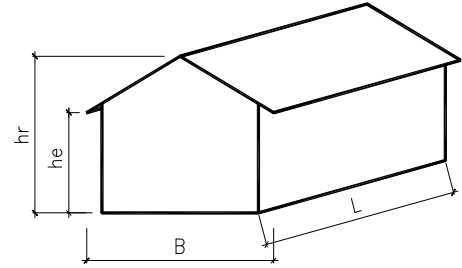
Deck not engineered for hot tub loading.

Deck not engineered for concrete overlay.

WIND ANALYSIS: Low-rise Building - Based on IBC / ASCE 7

INPUT DATA

Exposure category (B, C or D, ASCE 7-16 26.7.3)		B	
Importance factor (ASCE 7-16 Table 1.5-2)	$I_w =$	1.00	for all Category
Basic wind speed (ASCE 7-16 26.5.1 or 2018 IBC)	$V =$	115	mph
Topographic factor (ASCE 7-16 26.8 & Table 26.8-1)	$K_{zt} =$	1.00	Flat
Building height to ridge	$h_r =$	25.34 ft	ft
Building height to eave	$h_e =$	10.00 ft	ft
Building width	$B =$	72.00 ft	ft
Building length	$L =$	94.00 ft	ft
Overhang sloped width	$O_h =$	3.00 ft	ft
Effective area of components (or Solar Panel area)	$A =$	33.3 ft ²	ft ² , <== Overhang? (Yes or No): Yes
Enclosed? (Y/N)		y	



ANALYSIS

Velocity pressure

$q_h = 0.00256 K_z K_{zt} K_d K_e V^2 = 20.16$ psf

where: q_h = velocity pressure at mean roof height, h. (Eq. 26.10-1 page 268)

K_z = velocity pressure exposure coefficient evaluated at height, h, (Tab. 26.10-1, pg. 268) = **0.70**

K_d = wind directionality factor. (Tab. 26.6-1, for building, page 266) = **0.85**

h = mean roof height = **17.67** ft

K_e = ground elevation factor. (**1.0** per Sec. 26.9, page 268) **< 60 ft, [Satisfactory]** (ASCE 7-16 26.2.1)

< Min (L, B), [Satisfactory] (ASCE 7-16 26.2.2)

Design pressures for MWFRS

$p = q_h [(G C_{pf}) - (G C_{pi})]$

where: p = pressure in appropriate zone. (Eq. 28.3-1, page 311).

$p_{min} = 16$ psf (ASCE 7-16 28.3.4)

$G C_{pf}$ = product of gust effect factor and external pressure coefficient, see table below. (Fig. 28.3-1, page 312 & 313)

$G C_{pi}$ = product of gust effect factor and internal pressure coefficient. (Tab. 26.13-1, Enclosed Building, page 271)

= **0.18** or **-0.18**

a = width of edge strips, Fig 28.3-1, page 312, $MAX[MIN(0.1B, 0.1L, 0.4h), MIN(0.04B, 0.04L), 3]$ = **7.07** ft

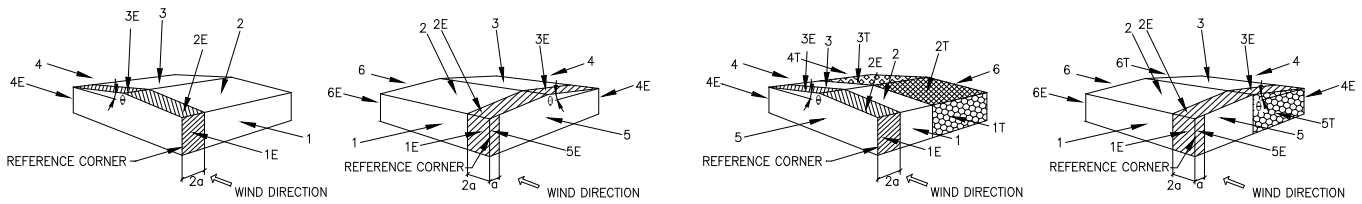
Net Pressures (psf), Basic Load Cases

Surface	Roof angle $q = 18.43$			Roof angle $q = 18.43$		
	$G C_{pf}$	Net Press. W/		$G C_{pf}$	Net Press. W/	
		(+ $G C_{pi}$)	(- $G C_{pi}$)		(+ $G C_{pi}$)	(- $G C_{pi}$)
1	0.52	6.78	14.04	-0.45	-12.70	-5.44
2	-0.69	-17.54	-10.28	-0.69	-17.54	-10.28
3	-0.47	-13.08	-5.82	-0.37	-11.09	-3.83
4	-0.42	-12.00	-4.75	-0.45	-12.70	-5.44
5				0.40	4.44	11.69
6				-0.29	-9.48	-2.22
1E	0.78	12.10	19.36	-0.48	-13.31	-6.05
2E	-1.07	-25.20	-17.94	-1.07	-25.20	-17.94
3E	-0.67	-17.20	-9.95	-0.53	-14.31	-7.06
4E	-0.62	-16.09	-8.83	-0.48	-13.31	-6.05
5E				0.61	8.67	15.93
6E				-0.42	-12.20	-5.04

Net Pressures (psf), Torsional Load Cases

Surface	Roof angle $q = 18.43$		
	$G C_{pf}$	Net Press. W/	
		(+ $G C_{pi}$)	(- $G C_{pi}$)
1T	0.52	1.70	3.51
2T	-0.69	-4.39	-2.57
3T	-0.47	-3.27	-1.45
4T	0.00	-3.00	-1.19
Surface	Roof angle $q = 0.00$		
	$G C_{pf}$	Net Press. W/	
		(+ $G C_{pi}$)	(- $G C_{pi}$)
5T	0.40	1.11	2.92
6T	-0.29	-2.37	-0.55

+ / - Wind Pressure 64%



Load Case A (Transverse) Load Case B (Longitudinal)
Basic Load Cases

Load Case A (Transverse) Load Case B (Longitudinal)
Torsional Load Cases

Design pressures for components and cladding

$p = q_h [(G C_p) - (G C_{pi})]$

where: p = pressure on component. (Eq. 30.3-1, pg 33)

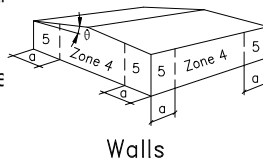
$p_{min} = 16.00$ psf (ASCE 7-16 30.2.2)

$G C_p = 1.00$ external pressure coefficient
see table below. (ASCE 7-16 30.3.2)

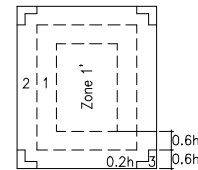
$q = 18.43$ °

$p_{overhang} = -69.56$ psf

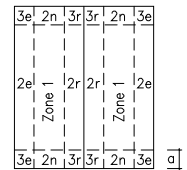
(ASCE 7-16 28.3.3)



Walls



Roof $\theta \leq 7^\circ$



Roof $\theta > 7^\circ$

Comp. & Cladding Coeffs.	Effective Area (ft ²)	Zone 1		Zone 1'		Zone 2		Zone 2e		Zone 2n		Zone 2r	
		GC _p	-GC _p	GC _p	-GC _p	GC _p	-GC _p	GC _p	-GC _p	GC _p	-GC _p	GC _p	-GC _p
	1728	0.30	-0.80	0.30	-0.80	0.30	-2.20	0.30	-0.80	0.30	-1.00	0.30	-1.00
Effective Area (ft ²)	Zone 3		Zone 3e		Zone 3r		Zone 4		Zone 5				
	GC _p	-GC _p	GC _p	-GC _p	GC _p	-GC _p	GC _p	-GC _p	GC _p	-GC _p			
33	0.30	-2.50	0.30	-2.50	0.30	-1.80	0.99	-1.09	0.99	-1.37			

Comp. & Cladding Pressures	Zone 1		Zone 1'		Zone 2		Zone 2e		Zone 2n		Zone 2r	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
	9.68	-19.76	9.68	-19.76	9.68	-47.98	9.68	-19.76	9.68	-23.79	9.68	-23.79
	Zone 3		Zone 3e		Zone 3r		Zone 4		Zone 5		(Max Pressure 54.03 psf)	
Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative			
9.68	-54.03	9.68	-54.03	9.68	-39.92	23.50	-25.52	23.50	-31.28			

LOAD CASE 'A' FACTORED LOADS	
$0.6 * W_r = (Z_2 + Z_3) * 0.6 =$	2.7 psf
$0.6 * W_{rE} = (Z_{2E} + Z_{3E}) * 0.6 =$	4.8 psf
$0.6 * W_w = (Z_1 + Z_4) * 0.6 =$	11.3 psf
$0.6 * W_{wE} = (Z_{1E} + Z_{4E}) * 0.6 =$	16.9 psf

LOAD CASE 'B' FACTORED LOADS	
$0.6 * W_r = (Z_2 + Z_3) * 0.6 =$	3.9 psf
$0.6 * W_{rE} = (Z_{2E} + Z_{3E}) * 0.6 =$	6.5 psf
$0.6 * W_w = (Z_5 + Z_6) * 0.6 =$	8.3 psf
$0.6 * W_{wE} = (Z_{5E} + Z_{6E}) * 0.6 =$	12.6 psf

ROOF COMPONENTS FACTORED LOAD	
$0.6 * Z_{r,c\&c} =$	14.3 psf

WALL COMPONENTS FACTORED LOAD	
$0.6 * Z_{w,c\&c} =$	15.3 psf

OSB SEISMIC LOADING ANALYSIS

IBC / ASCE 7: Equivalent Lateral Force (ELF) Procedure:

INPUT DATA**DESIGN SUMMARY**

Typical floor height:	$h = 10$ ft	$C_s = 1.2 * S_{DS} / (R / I_e) = 0.0683$	<= Applicable
Typical floor weight:	$w_x = 115.1$ kips	Period Parameter, $x = 0.75$, ASCE Tab 12.8-2
Number of floors:	$n = 1$	Period: $T_a = C_t (h_n)^x = 0.23$	sec, ASCE 12.8.2.1
Importance factor (ASCE 11.5.1):	$I_e = 1.00$	$C_s < S_{D1} / [(R / I_e) T_a] = 0.1362$, ASCE Tab 12.8.1.1 <= Not Applicable
Design spectral response:	$S_{DS} = 0.37$ g	$C_s > 0.044 S_{DS} I_e = 0.0163$, ASCE Tab 12.8.1.1 <= Not Applicable
	$S_{D1} = 0.20$ g	$C_s > 0.5 S_1 / (R / I_e) = 0.0085$, ASCE Tab 12.8.1.1 <= Not Applicable
Mapped spectral resp.:	$S_1 = 0.11$ g	$k = 1.94$, (ASCE 12.8.3, page 91)
Period Parameter, C_t :	(ASCE Tab 12.8-2): $C_t = 0.020$	$V = C_s W = 0.0683$ W	
Resp. coefficient: (ASCE Tab. 12.2.1):	$R = 6.5$	$0.7 * V = 0.0478$ W	
Seismic design category: SDC = D	$h_n = 25.3$ ft	$W = 115$ kips, total	

SEISMIC COMPONENT & ANCHORING ANALYSIS

Out-of-plane seismic force for wall design (ASCE 7, Sec.12.11.1)

$$k_a = 1.0 + \frac{L_f}{100} \quad (12.11-2)$$

$$L_f: 10 \text{ ft} \quad k_a: 1.1$$

$$F_p = 0.4 S_{DS} k_a I_e W_p \quad (12.11-1) = 2.0 \text{ psf} \quad \leq \text{USE FOR O.O.P. WALL}$$

$$\text{Where: } W_p = 12.0 \text{ psf, } I_e = 1.00$$

For seismic design category C and above, flexible diaphragm (ASCE 7)

$$F_{px} = 0.4 S_{DS} I_e W_{px} \quad (12.10-3) = 2.52 \text{ psf} \quad \leq \text{USE FOR ROOF FRAMING UPLIFT}$$

$$\text{Where: } W_{px} = 17.0 \text{ psf,}$$

WIND / SEISMIC SHEAR FORCE CALCULATIONS:

From ASCE 7-16 Wind & Seismic Loading Analysis

Wall Line	Roof / Floor						Wall					Load above		*C _s (W/p)	=	Loading		
	Wind Force (psf)	Diaph. Weight	Wr, We truss trib (ft)	Area W (ft)	Area L (ft)	Wind Force (psf)	Wall DL (psf)	Wall ht (ft)	wall line dist (ft)	Upr. Flr Wall ht (ft)	Wind (#)	Seismic (#)	Wind Force (kips)			Seismic Force (kips)	Lateral Control	
X1-1	9.6	55	15.3	72.0	94.0	12.4	12.0	10.0	72.0				0.05	=	7.53	9.23	Seismic	
X2-1	9.6	55	15.3	72.0	94.0	12.4	12.0	10.0	72.0				0.05	=	7.53	9.23	Seismic	
														=				
														=				
Y1-1	9.6	55	12.0	33.0	72.0	13.7	12.0	10.0	33.0				0.05	=	3.03	3.29	Seismic	
Y2-1	9.6	55	12.0	33.0	72.0	13.7	12.0	10.0	33.0				0.05	=	6.69	5.56	Wind	
	9.6	55	15.3	34.0	47.0	13.6	12.0	10.0	34.0				0.05	=				
Y3-1	9.6	55	15.3	34.0	47.0	13.6	12.0	10.0	34.0				0.05	=	6.61	4.19	Wind	
	9.6	55	15.3	27.0	50.0	14.2	12.0	10.0	27.0				0.05	=				
Y4-1	9.6	55	15.3	27.0	50.0	14.2	12.0	10.0	27.0				0.05	=	2.95	1.91	Wind	

TALL WALL CALCULATIONS:

This spreadsheet is used for designing a stud wall according to the NDS.

Description: GARAGE	10' Tall Wall	King Stud (12' Max Opening)	10' Trimmer	10' Tall Wall	King Stud (6.25' Max Opening)	10' Trimmer
	Type:	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")
Species:	DF-L	DF-L	DF-L	DF-L	DF-L	DF-L
Grade:	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2
Nominal width, t =	(1) 2	(2) 2	(4) 2	(1) 2	(1) 2	(1) 2
Actual width =	1.50 in	3.00 in	6.00 in	1.50 in	1.50 in	1.50 in
Nominal depth, d =	6	6	6	6	6	6
Actual depth =	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in
Span, L =	10.000 ft	10.000 ft	10.000 ft	10.000 ft	10.000 ft	10.000 ft
w/o Plates	9.750 ft	9.750 ft	9.750 ft	9.750 ft	9.750 ft	9.750 ft
Stud spacing, s =	16 in	82 in	16 in	16 in	48 in	16 in
Lat. Pressure, w _{wind} =	15.31 psf	15.31 psf	5.00 psf	15.31 psf	15.31 psf	5.00 psf
Axial load, P =	4342 lbs	50 lbs	19539 lbs	891 lbs	50 lbs	2088 lbs
Eccentricity, e =	0 in	0 in	0 in	0 in	0 in	0 in
K _{cE} =	0.3	0.3	0.3	0.3	0.3	0.3
c =	0.8	0.8	0.8	0.8	0.8	0.8
w =	20.4 plf	104.9 plf	6.7 plf	20.4 plf	60.9 plf	6.7 plf
F _b	900 psi	900 psi	900 psi	900 psi	900 psi	900 psi
F _v	180 psi	180 psi	180 psi	180 psi	180 psi	180 psi
F _{c-prll}	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi
F _{c-perp}	625 psi	625 psi	625 psi	625 psi	625 psi	625 psi
C _d	1.60	1.60	1.15	1.60	1.60	1.15
C _{F,Fb}	1.30	1.30	1.30	1.30	1.30	1.30
C _{F,Fcprll}	1.10	1.10	1.10	1.10	1.10	1.10
C _r	1.15	1.00	1.00	1.15	1.00	1.00
C _p	0.39	0.39	0.51	0.39	0.39	0.51
C _H	1.00	1.00	1.00	1.00	1.00	6.00
C _b	1.07	1.07	1.07	1.07	1.07	1.07
E	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi
E _{min}	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi
Allowable Stress:						
F' _b = F _b C _d C _F C _r	2153 psi	1872 psi	1346 psi	2153 psi	1872 psi	1346 psi
F' _v = F _v C _d C _H	288 psi	288 psi	207 psi	288 psi	288 psi	1242 psi
F' _c = F _c C _d C _F	2376 psi	2376 psi	1708 psi	2376 psi	2376 psi	1708 psi
F' _{cE} = (K _{cE} E')/(l/d)2	1061 psi	1061 psi	1061 psi	1061 psi	1061 psi	1061 psi
F' _c = F _c C _d C _F C _p	938 psi	938 psi	876 psi	938 psi	938 psi	876 psi
F' _{c-perp} = F _{c-perp} C _b	668 psi	668 psi	668 psi	668 psi	668 psi	668 psi
E' = E	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi
F _{bE}	2434 psi	9734 psi	38937 psi	2434 psi	2434 psi	2434 psi
Slenderness Ratio:	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK
R _g	17	8	4	17	17	17
Bending:	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK
M = w L ² /8 + P e/12	243 ft-lbs	1247 ft-lbs	79 ft-lbs	243 ft-lbs	724 ft-lbs	79 ft-lbs
f _b = M/S	385 psi	989 psi	31 psi	385 psi	1149 psi	126 psi
S =	8 in ³	15 in ³	30 in ³	8 in ³	8 in ³	8 in ³
Shear:	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK
V = w L/2	100 lbs	512 lbs	33 lbs	100 lbs	297 lbs	24 lbs
f _v = 1.5 V/A	18 psi	47 psi	1 psi	18 psi	54 psi	4 psi
A =	8 in ²	17 in ²	33 in ²	8 in ²	8 in ²	8 in ²
Compression:	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK
f _c = P/A	526 psi	3 psi	592 psi	108 psi	6 psi	253 psi
Compression (perp.):	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK
f _{c-perp} = P/A	526 psi	3 psi	592 psi	108 psi	6 psi	253 psi
Combined:	< 1.0 OK			< 1.0 OK		
((f _c /F _c)2 + ((f _b /F _b)(1-(f _c /F _c E))) =	0.67			0.21		
Deflection:	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK
D = 22.5 w L ⁴ /E' I =	0.12 in	0.32 in	0.01 in	0.12 in	0.37 in	0.04 in
I =	21 in ⁴	42 in ⁴	83 in ⁴	21 in ⁴	21 in ⁴	21 in ⁴
SPAN /	938	365	11488	938	314	2872

TALL WALL CALCULATIONS:

This spreadsheet is used for designing a stud wall according to the NDS.

Description: MASTER & BATH	11.34' Tall Wall	King Stud (9.5' Max Opening)	11.34' Trimmer	10' Tall Wall	King Stud (4.25' Max Opening)	10' Trimmer
	Type:	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")
Species:	DF-L	DF-L	DF-L	DF-L	DF-L	DF-L
Grade:	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2
Nominal width, t =	(1) 2	(2) 2	(1) 2	(1) 2	(1) 2	(1) 2
Actual width =	1.50 in	3.00 in	1.50 in	1.50 in	1.50 in	1.50 in
Nominal depth, d =	6	6	6	6	6	6
Actual depth =	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in
Span, L =	11.340 ft	11.340 ft	11.340 ft	10.000 ft	10.000 ft	10.000 ft
w/o Plates	11.090 ft	11.090 ft	11.090 ft	9.750 ft	9.750 ft	9.750 ft
Stud spacing, s =	16 in	67 in	16 in	16 in	36 in	16 in
Lat. Pressure, w _{wind} =	15.31 psf	15.31 psf	5.00 psf	15.31 psf	15.31 psf	5.00 psf
Axial load, P =	891 lbs	50 lbs	3173 lbs	2561 lbs	50 lbs	4081 lbs
Eccentricity, e =	0 in	0 in	0 in	0 in	0 in	0 in
K _{cE} =	0.3	0.3	0.3	0.3	0.3	0.3
c =	0.8	0.8	0.8	0.8	0.8	0.8
w =	20.4 plf	85.8 plf	6.7 plf	20.4 plf	45.6 plf	6.7 plf
F _b	900 psi	900 psi	900 psi	900 psi	900 psi	900 psi
F _v	180 psi	180 psi	180 psi	180 psi	180 psi	180 psi
F _{c-prll}	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi
F _{c-perp}	625 psi	625 psi	625 psi	625 psi	625 psi	625 psi
C _d	1.60	1.60	1.15	1.60	1.60	1.15
C _{F,Fb}	1.30	1.30	1.30	1.30	1.30	1.30
C _{F,Fcprll}	1.10	1.10	1.10	1.10	1.10	1.10
C _r	1.15	1.00	1.00	1.15	1.00	1.00
C _p	0.32	0.32	0.42	0.39	0.39	0.51
C _H	1.00	1.00	1.00	1.00	1.00	6.00
C _b	1.07	1.07	1.07	1.07	1.07	1.07
E	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi
E _{min}	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi
Allowable Stress:						
F' _b = F _b C _d C _F C _r	2153 psi	1872 psi	1346 psi	2153 psi	1872 psi	1346 psi
F' _v = F _v C _d C _H	288 psi	288 psi	207 psi	288 psi	288 psi	1242 psi
F' _c = F _c C _d C _F	2376 psi	2376 psi	1708 psi	2376 psi	2376 psi	1708 psi
F' _{cE} = (K _{cE} E')/(l/d) ²	820 psi	820 psi	820 psi	1061 psi	1061 psi	1061 psi
F' _c = F _c C _d C _F C _p	751 psi	751 psi	716 psi	938 psi	938 psi	876 psi
F' _{c-perp} = F _{c-perp} C _b	668 psi	668 psi	668 psi	668 psi	668 psi	668 psi
E'	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi
F _{bE}	2140 psi	8558 psi	2140 psi	2434 psi	2434 psi	2434 psi
Slenderness Ratio:	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK
R _g	18	9	18	17	17	17
Bending:	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK
M = w L ² /8 + P e/12	314 ft-lbs	1319 ft-lbs	102 ft-lbs	243 ft-lbs	542 ft-lbs	79 ft-lbs
f _b = M/S	498 psi	1047 psi	163 psi	385 psi	860 psi	126 psi
S	8 in ³	15 in ³	8 in ³	8 in ³	8 in ³	8 in ³
Shear:	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK
V = w L/2	113 lbs	476 lbs	37 lbs	100 lbs	222 lbs	24 lbs
f _v = 1.5 V/A	21 psi	43 psi	7 psi	18 psi	40 psi	4 psi
A	8 in ²	17 in ²	8 in ²	8 in ²	8 in ²	8 in ²
Compression:	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK
f _c = P/A	108 psi	3 psi	385 psi	310 psi	6 psi	495 psi
Compression (perp.):	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK
f _{c-perp} = P/A	108 psi	3 psi	385 psi	310 psi	6 psi	495 psi
Combined:	< 1.0 OK			< 1.0 OK		
((f _c /F _c) ² + (f _b /F _b (1-(f _c /F _c E)))	0.29			0.36		
Deflection:	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK
D = 22.5 w L ⁴ /E'I =	0.21 in	0.44 in	0.07 in	0.12 in	0.28 in	0.04 in
I	21 in ⁴	42 in ⁴	21 in ⁴	21 in ⁴	21 in ⁴	21 in ⁴
SPAN /	637	303	1952	938	420	2872

TALL WALL CALCULATIONS:

This spreadsheet is used for designing a stud wall according to the NDS.

Description: DINING	11.75' Tall Wall	King Stud (9.5' Max Opening)	11.75' Trimmer	10' Tall Wall	King Stud (6' Max Opening)	10' Trimmer
	Type:	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")
Species:	DF-L	DF-L	DF-L	DF-L	DF-L	DF-L
Grade:	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2
Nominal width, t =	(1) 2	(2) 2	(1) 2	(1) 2	(1) 2	(1) 2
Actual width =	1.50 in	3.00 in	1.50 in	1.50 in	1.50 in	1.50 in
Nominal depth, d =	6	6	6	6	6	6
Actual depth =	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in
Span, L =	11.750 ft	11.750 ft	11.750 ft	10.000 ft	10.000 ft	10.000 ft
w/o Plates	11.500 ft	11.500 ft	11.500 ft	9.750 ft	9.750 ft	9.750 ft
Stud spacing, s =	16 in	67 in	16 in	16 in	46 in	16 in
Lat. Pressure, w _{wind} =	15.31 psf	15.31 psf	5.00 psf	15.31 psf	15.31 psf	5.00 psf
Axial load, P =	891 lbs	50 lbs	3173 lbs	891 lbs	50 lbs	2004 lbs
Eccentricity, e =	0 in	0 in	0 in	0 in	0 in	0 in
K _{cE} =	0.3	0.3	0.3	0.3	0.3	0.3
c =	0.8	0.8	0.8	0.8	0.8	0.8
w =	20.4 plf	85.8 plf	6.7 plf	20.4 plf	59.0 plf	6.7 plf
F _b	900 psi	900 psi	900 psi	900 psi	900 psi	900 psi
F _v	180 psi	180 psi	180 psi	180 psi	180 psi	180 psi
F _{c-prll}	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi
F _{c-perp}	625 psi	625 psi	625 psi	625 psi	625 psi	625 psi
C _d	1.60	1.60	1.15	1.60	1.60	1.15
C _{F,Fb}	1.30	1.30	1.30	1.30	1.30	1.30
C _{F,Fcprll}	1.10	1.10	1.10	1.10	1.10	1.10
C _r	1.15	1.00	1.00	1.15	1.00	1.00
C _p	0.30	0.30	0.39	0.39	0.39	0.51
C _H	1.00	1.00	1.00	1.00	1.00	6.00
C _b	1.07	1.07	1.07	1.07	1.07	1.07
E	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi
E _{min}	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi
Allowable Stress:						
F' _b = F _b C _d C _F C _r	2153 psi	1872 psi	1346 psi	2153 psi	1872 psi	1346 psi
F' _v = F _v C _d C _H	288 psi	288 psi	207 psi	288 psi	288 psi	1242 psi
F' _c = F _c C _d C _F	2376 psi	2376 psi	1708 psi	2376 psi	2376 psi	1708 psi
F' _{cE} = (K _{cE} E')/(l/d) ²	762 psi	762 psi	762 psi	1061 psi	1061 psi	1061 psi
F' _c = F _c C _d C _F C _p	703 psi	703 psi	674 psi	938 psi	938 psi	876 psi
F' _{c-perp} = F _{c-perp} C _b	668 psi	668 psi	668 psi	668 psi	668 psi	668 psi
E'	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi
F _{bE}	2063 psi	8253 psi	2063 psi	2434 psi	2434 psi	2434 psi
Slenderness Ratio:	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK
R _g	18	9	18	17	17	17
Bending:	< F' _b OK	< F' _b OK	< F' _b OK	< F' _b OK	< F' _b OK	< F' _b OK
M = w L ² /8 + P e/l ²	337 ft-lbs	1418 ft-lbs	110 ft-lbs	243 ft-lbs	701 ft-lbs	79 ft-lbs
f _b = M/S	536 psi	1125 psi	175 psi	385 psi	1113 psi	126 psi
S =	8 in ³	15 in ³	8 in ³	8 in ³	8 in ³	8 in ³
Shear:	< F' _v OK	< F' _v OK	< F' _v OK	< F' _v OK	< F' _v OK	< F' _v OK
V = w L/2	117 lbs	493 lbs	38 lbs	100 lbs	288 lbs	24 lbs
f _v = 1.5 V/A	21 psi	45 psi	7 psi	18 psi	52 psi	4 psi
A =	8 in ²	17 in ²	8 in ²	8 in ²	8 in ²	8 in ²
Compression:	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK
f _c = P/A	108 psi	3 psi	385 psi	108 psi	6 psi	243 psi
Compression (perp.):	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK
f _{c-perp} = P/A	108 psi	3 psi	385 psi	108 psi	6 psi	243 psi
Combined:	< 1.0 OK			< 1.0 OK		
((f _c /F _c) ² + ((f _b /F _b)(1-(f _c /F _c E)))	0.31			0.21		
Deflection:	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK
D = 22.5 w L ⁴ /E'I =	0.24 in	0.51 in	0.08 in	0.12 in	0.36 in	0.04 in
I =	21 in ⁴	42 in ⁴	21 in ⁴	21 in ⁴	21 in ⁴	21 in ⁴
SPAN /	572	272	1750	938	324	2872

TALL WALL CALCULATIONS:

This spreadsheet is used for designing a stud wall according to the NDS.

Description: LIVING 2x8	10' Tall Wall	King Stud (12' Max Opening)	10' Trimmer	King Stud (2.5' Max Opening)	10' Trimmer	
	Type:	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")
Species:	DF-L	DF-L	DF-L	DF-L	DF-L	
Grade:	No. 2	No. 2	No. 2	No. 2	No. 2	
Nominal width, t =	(1) 2	(1) 2	(4) 2	(1) 2	(1) 2	
Actual width =	1.50 in	1.50 in	6.00 in	1.50 in	1.50 in	
Nominal depth, d =	8	8	8	8	8	
Actual depth =	7.25 in	7.25 in	7.25 in	7.25 in	7.25 in	
Span, L =	10.000 ft	10.000 ft	10.000 ft	10.000 ft	10.000 ft	
w/o Plates	9.750 ft	9.750 ft	9.750 ft	9.750 ft	9.750 ft	
Stud spacing, s =	16 in	82 in	16 in	25 in	16 in	
Lat. Pressure, w _{wind} =	15.31 psf	15.31 psf	5.00 psf	15.31 psf	5.00 psf	
Axial load, P =	5010 lbs	50 lbs	22545 lbs	50 lbs	4697 lbs	
Eccentricity, e =	0 in	0 in	0 in	0 in	0 in	
K _{cE} =	0.3	0.3	0.3	0.3	0.3	
c =	0.8	0.8	0.8	0.8	0.8	
w =	20.4 plf	104.9 plf	6.7 plf	32.2 plf	6.7 plf	
F _b	900 psi	900 psi	900 psi	900 psi	900 psi	
F _v	180 psi	180 psi	180 psi	180 psi	180 psi	
F _{c-prll}	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi	
F _{c-perp}	625 psi	625 psi	625 psi	625 psi	625 psi	
C _d	1.60	1.60	1.15	1.60	1.15	
C _{F,Fb}	1.20	1.20	1.20	1.20	1.20	
C _{F,Fcprll}	1.05	1.05	1.05	1.05	1.05	
C _r	1.15	1.00	1.00	1.00	1.00	
C _p	0.62	0.62	0.73	0.62	0.73	
C _H	1.00	1.00	1.00	1.00	1.00	
C _b	1.00	1.00	1.00	1.00	1.00	
E	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	
E _{min}	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi	
Allowable Stress:						
F' _b = F _b C _d C _F C _r	1987 psi	1728 psi	1242 psi	1728 psi	1242 psi	
F' _v = F _v C _d C _H	288 psi	288 psi	207 psi	288 psi	207 psi	
F' _c = F _c C _d C _F	2268 psi	2268 psi	1630 psi	2268 psi	1630 psi	
F' _{cE} = (K _{cE} E')/(l/d) ²	1843 psi	1843 psi	1843 psi	1843 psi	1843 psi	
F' _c = F _c C _d C _F C _p	1396 psi	1396 psi	1193 psi	1396 psi	1193 psi	
F' _{c-perp} = F _{c-perp} C _b	625 psi	625 psi	625 psi	625 psi	625 psi	
E'	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi	
F _{bE}	1846 psi	1846 psi	29538 psi	1846 psi	1846 psi	
Slenderness Ratio:	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK	
R _g	19	19	5	19	19	
Bending:	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK	
M = w L ² /8 + P e/12	243 ft-lbs	1247 ft-lbs	79 ft-lbs	383 ft-lbs	79 ft-lbs	
f _b = M/S	222 psi	1139 psi	18 psi	350 psi	72 psi	
S =	13 in ³	13 in ³	53 in ³	13 in ³	13 in ³	
Shear:	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK	
V = w L/2	100 lbs	512 lbs	33 lbs	157 lbs	33 lbs	
f _v = 1.5 V/A	14 psi	71 psi	1 psi	22 psi	4 psi	
A =	11 in ²	11 in ²	44 in ²	11 in ²	11 in ²	
Compression:	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	
f _c = P/A	461 psi	5 psi	518 psi	5 psi	432 psi	
Compression (perp.):	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	
f _{c-perp} = P/A	461 psi	5 psi	518 psi	5 psi	432 psi	
Combined:	< 1.0 OK					
((f _c /F' _c) ² + (f _b /F' _b (1-(f _c /F' _c E))) =	0.26					
Deflection:	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	
D = 22.5 w L ⁴ /E' I =	0.05 in	0.28 in	0.00 in	0.09 in	0.02 in	
I =	48 in ⁴	48 in ⁴	191 in ⁴	48 in ⁴	48 in ⁴	
SPAN /	2148	418	26314	1361	6578	

TALL WALL CALCULATIONS:

This spreadsheet is used for designing a stud wall according to the NDS.

Description: Bed 2/ Bonus	11.5' Tall Wall	King Stud (6.25' Max Opening)	11.5' Trimmer	11' Tall Wall	King Stud (9.42' Max Opening)	11' Trimmer
	Type:	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")
Species:	DF-L	DF-L	DF-L	DF-L	DF-L	DF-L
Grade:	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2
Nominal width, t =	(1) 2	(1) 2	(1) 2	(1) 2	(2) 2	(1) 2
Actual width =	1.50 in	1.50 in	1.50 in	1.50 in	3.00 in	1.50 in
Nominal depth, d =	6	6	6	6	6	6
Actual depth =	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in
Span, L =	11.500 ft	11.500 ft	11.500 ft	11.000 ft	11.000 ft	11.000 ft
w/o Plates	11.250 ft	11.250 ft	11.250 ft	10.750 ft	10.750 ft	10.750 ft
Stud spacing, s =	16 in	48 in	16 in	16 in	67 in	16 in
Lat. Pressure, w _{wind} =	15.31 psf	15.31 psf	5.00 psf	15.31 psf	15.31 psf	5.00 psf
Axial load, P =	891 lbs	50 lbs	1002 lbs	891 lbs	50 lbs	1002 lbs
Eccentricity, e =	0 in	0 in	0 in	0 in	0 in	0 in
K _{cE} =	0.3	0.3	0.3	0.3	0.3	0.3
c =	0.8	0.8	0.8	0.8	0.8	0.8
w =	20.4 plf	60.9 plf	6.7 plf	20.4 plf	85.2 plf	6.7 plf
F _b	900 psi	900 psi	900 psi	900 psi	900 psi	900 psi
F _v	180 psi	180 psi	180 psi	180 psi	180 psi	180 psi
F _{c-prll}	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi
F _{c-perp}	625 psi	625 psi	625 psi	625 psi	625 psi	625 psi
C _d	1.60	1.60	1.15	1.60	1.60	1.15
C _{F,Fb}	1.30	1.30	1.30	1.30	1.30	1.30
C _{F,Fcprll}	1.10	1.10	1.10	1.10	1.10	1.10
C _r	1.15	1.00	1.00	1.15	1.00	1.00
C _p	0.31	0.31	0.41	0.33	0.33	0.44
C _H	1.00	1.00	1.00	1.00	1.00	6.00
C _b	1.07	1.07	1.07	1.07	1.07	1.07
E	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi
E _{min}	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi
Allowable Stress:						
F' _b = F _b C _d C _F C _r	2153 psi	1872 psi	1346 psi	2153 psi	1872 psi	1346 psi
F' _v = F _v C _d C _H	288 psi	288 psi	207 psi	288 psi	288 psi	1242 psi
F' _c = F _c C _d C _F	2376 psi	2376 psi	1708 psi	2376 psi	2376 psi	1708 psi
F' _{cE} = (K _{cE} E')/(l/d)2	797 psi	797 psi	797 psi	873 psi	873 psi	873 psi
F' _c = F _c C _d C _F C _p	732 psi	732 psi	700 psi	793 psi	793 psi	754 psi
F' _{c-perp} = F _{c-perp} C _b	668 psi	668 psi	668 psi	668 psi	668 psi	668 psi
E'	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi
F _{bE}	2109 psi	2109 psi	2109 psi	2207 psi	8829 psi	2207 psi
Slenderness Ratio:	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK
R _g	18	18	18	18	9	18
Bending:	< F' _b OK	< F' _b OK	< F' _b OK	< F' _b OK	< F' _b OK	< F' _b OK
M = w L ² /8 + P e/12	323 ft-lbs	964 ft-lbs	105 ft-lbs	295 ft-lbs	1231 ft-lbs	96 ft-lbs
f _b = M/S	512 psi	1529 psi	167 psi	468 psi	976 psi	153 psi
S	8 in ³	8 in ³	8 in ³	8 in ³	15 in ³	8 in ³
Shear:	< F' _v OK	< F' _v OK	< F' _v OK	< F' _v OK	< F' _v OK	< F' _v OK
V = w L/2	115 lbs	343 lbs	38 lbs	110 lbs	458 lbs	27 lbs
f _v = 1.5 V/A	21 psi	62 psi	7 psi	20 psi	42 psi	5 psi
A	8 in ²	8 in ²	8 in ²	8 in ²	17 in ²	8 in ²
Compression:	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK
f _c = P/A	108 psi	6 psi	121 psi	108 psi	3 psi	121 psi
Compression (perp.):	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK	< F' _c OK
f _{c-perp} = P/A	108 psi	6 psi	121 psi	108 psi	3 psi	121 psi
Combined:	< 1.0 OK			< 1.0 OK		
((f _c /F _c)2 + (f _b /F _b (1-(f _c /F _c E)))	0.30			0.27		
Deflection:	> 180 OK	> 180 OK	> 180 OK	> 180 OK	> 180 OK	> 180 OK
D = 22.5 w L ⁴ /E'I =	0.22 in	0.66 in	0.07 in	0.18 in	0.38 in	0.06 in
I =	21 in ⁴	21 in ⁴	21 in ⁴	21 in ⁴	42 in ⁴	21 in ⁴
SPAN /	611	205	1870	700	335	2143

TALL WALL CALCULATIONS:

This spreadsheet is used for designing a stud wall according to the NDS.

Description: Bed 4/ Pantry	11.5' Tall Wall	King Stud (6.25' Max Opening)	11.5' Trimmer	12.5' Tall Wall	King Stud (6.25' Max Opening)	12.5' Trimmer
	Type:	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")
Species:	DF-L	DF-L	DF-L	DF-L	DF-L	DF-L
Grade:	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2
Nominal width, t =	(1) 2	(1) 2	(1) 2	(1) 2	(2) 2	(1) 2
Actual width =	1.50 in	1.50 in	1.50 in	1.50 in	3.00 in	1.50 in
Nominal depth, d =	6	6	6	6	6	6
Actual depth =	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in
Span, L =	11.500 ft	11.500 ft	11.500 ft	12.500 ft	12.500 ft	12.500 ft
w/o Plates	11.250 ft	11.250 ft	11.250 ft	12.250 ft	12.250 ft	12.250 ft
Stud spacing, s =	16 in	48 in	16 in	16 in	48 in	16 in
Lat. Pressure, w _{wind} =	15.31 psf	15.31 psf	5.00 psf	15.31 psf	15.31 psf	5.00 psf
Axial load, P =	891 lbs	50 lbs	2088 lbs	891 lbs	50 lbs	2088 lbs
Eccentricity, e =	0 in	0 in	0 in	0 in	0 in	0 in
K _{cE} =	0.3	0.3	0.3	0.3	0.3	0.3
c =	0.8	0.8	0.8	0.8	0.8	0.8
w =	20.4 plf	60.9 plf	6.7 plf	20.4 plf	60.9 plf	6.7 plf
F _b	900 psi	900 psi	900 psi	900 psi	900 psi	900 psi
F _v	180 psi	180 psi	180 psi	180 psi	180 psi	180 psi
F _{c-prll}	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi
F _{c-perp}	625 psi	625 psi	625 psi	625 psi	625 psi	625 psi
C _d	1.60	1.60	1.15	1.60	1.60	1.15
C _{F,Fb}	1.30	1.30	1.30	1.30	1.30	1.30
C _{F,Fcprll}	1.10	1.10	1.10	1.10	1.10	1.10
C _r	1.15	1.00	1.00	1.15	1.00	1.00
C _p	0.31	0.31	0.41	0.26	0.26	0.35
C _H	1.00	1.00	1.00	1.00	1.00	6.00
C _b	1.07	1.07	1.07	1.07	1.07	1.07
E	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi
E _{min}	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi	580,000 psi
Allowable Stress:						
F' _b = F _b C _d C _F C _r	2153 psi	1872 psi	1346 psi	2153 psi	1872 psi	1346 psi
F' _v = F _v C _d C _H	288 psi	288 psi	207 psi	288 psi	288 psi	1242 psi
F' _c = F _c C _d C _F	2376 psi	2376 psi	1708 psi	2376 psi	2376 psi	1708 psi
F' _{cE} = (K _{cE} E')/(l/d)2	797 psi	797 psi	797 psi	672 psi	672 psi	672 psi
F' _c = F _c C _d C _F C _p	732 psi	732 psi	700 psi	627 psi	627 psi	605 psi
F' _{c-perp} = F _{c-perp} C _b	668 psi	668 psi	668 psi	668 psi	668 psi	668 psi
E'	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi	1600000 psi
F _{bE}	2109 psi	2109 psi	2109 psi	1937 psi	7748 psi	1937 psi
Slenderness Ratio:	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK	< 50 OK
R _g	18	18	18	19	9	19
Bending:	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK
M = w L ² /8 + P e/12	323 ft-lbs	964 ft-lbs	105 ft-lbs	383 ft-lbs	1143 ft-lbs	125 ft-lbs
f _b = M/S	512 psi	1529 psi	167 psi	608 psi	907 psi	198 psi
S =	8 in ³	8 in ³	8 in ³	8 in ³	15 in ³	8 in ³
Shear:	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK
V = w L/2	115 lbs	343 lbs	38 lbs	125 lbs	373 lbs	31 lbs
f _v = 1.5 V/A	21 psi	62 psi	7 psi	23 psi	34 psi	6 psi
A =	8 in ²	8 in ²	8 in ²	8 in ²	17 in ²	8 in ²
Compression:	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK
f _c = P/A	108 psi	6 psi	253 psi	108 psi	3 psi	253 psi
Compression (perp.):	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK
f _{c-perp} = P/A	108 psi	6 psi	253 psi	108 psi	3 psi	253 psi
Combined:	< 1.0 OK			< 1.0 OK		
((f _c /F _c)2 + (f _b /F _b (1-(f _c /F _c E)))	0.30			0.37		
Deflection:	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK
D = 22.5 w L ⁴ /E' I =	0.22 in	0.66 in	0.07 in	0.31 in	0.46 in	0.10 in
I =	21 in ⁴	21 in ⁴	21 in ⁴	21 in ⁴	42 in ⁴	21 in ⁴
SPAN /	611	205	1870	473	317	1448

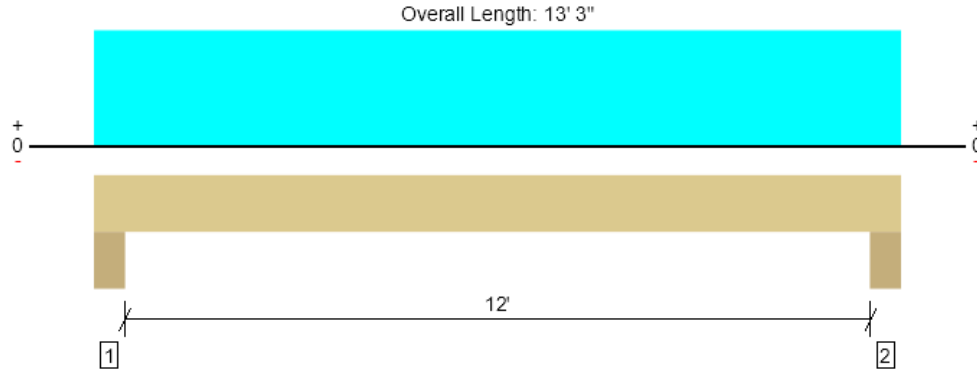
TALL WALL CALCULATIONS:

This spreadsheet is used for designing a stud wall according to the NDS.

Description: ENTRY	10' Tall Wall	10' Trimmer	10' Trimmer	King Stud (13' Max Opening)		
	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")	2x Lumber (2"-4")		
Type:	DF-L	DF-L	DF-L	DF-L		
Species:	No. 2	No. 2	No. 2	No. 2		
Grade:						
Nominal width, t =	(1) 2	(3) 2	(2) 2	(2) 2		
Actual width =	1.50 in	4.50 in	3.00 in	3.00 in		
Nominal depth, d =	6	6	6	6		
Actual depth =	5.50 in	5.50 in	5.50 in	5.50 in		
Span, L =	10.000 ft	10.000 ft	10.000 ft	10.000 ft		
w/o Plates	9.750 ft	9.750 ft	9.750 ft	9.750 ft		
Stud spacing, s =	16 in	16 in	16 in	88 in		
Lat. Pressure, w _{wind} =	15.31 psf	5.00 psf	5.00 psf	15.31 psf		
Axial load, P =	4899 lbs	11022 lbs	5511 lbs	50 lbs		
Eccentricity, e =	0 in	0 in	0 in	0 in		
K _{cE} =	0.3	0.3	0.3	0.3		
c =	0.8	0.8	0.8	0.8		
w =	20.4 plf	6.7 plf	6.7 plf	112.6 plf		
F _b	900 psi	900 psi	900 psi	900 psi		
F _v	180 psi	180 psi	180 psi	180 psi		
F _{c-prll}	1,350 psi	1,350 psi	1,350 psi	1,350 psi		
F _{c-perp}	625 psi	625 psi	625 psi	625 psi		
C _d	1.60	1.15	1.15	1.60		
C _{F,Fb}	1.30	1.30	1.30	1.30		
C _{F,Fcprll}	1.10	1.10	1.10	1.10		
C _r	1.15	1.00	1.00	1.00		
C _p	0.39	0.51	0.51	0.39		
C _H	1.00	1.00	1.00	1.00		
C _b	1.07	1.07	1.07	1.07		
E	1,600,000 psi	1,600,000 psi	1,600,000 psi	1,600,000 psi		
E _{min}	580,000 psi	580,000 psi	580,000 psi	580,000 psi		
Allowable Stress:						
F' _b = F _b C _d C _F C _r	2153 psi	1346 psi	1346 psi	1872 psi		
F' _v = F _v C _d C _H	288 psi	207 psi	207 psi	288 psi		
F' _c = F _c C _d C _F	2376 psi	1708 psi	1708 psi	2376 psi		
F' _{cE} = (K _{cE} E')/(l/d)2	1061 psi	1061 psi	1061 psi	1061 psi		
F' _c = F _c C _d C _F C _p	938 psi	876 psi	876 psi	938 psi		
F' _{c-perp} = F _{c-perp} C _b	668 psi	668 psi	668 psi	668 psi		
E'	1600000 psi	1600000 psi	1600000 psi	1600000 psi		
F _{bE}	2434 psi	21902 psi	9734 psi	9734 psi		
Slenderness Ratio:	< 50 OK	< 50 OK	< 50 OK	< 50 OK		
R _g	17	6	8	8		
Bending:	< F'_b OK	< F'_b OK	< F'_b OK	< F'_b OK		
M = w L ² /8 + P e/12	243 ft-lbs	79 ft-lbs	79 ft-lbs	1338 ft-lbs		
f _b = M/S	385 psi	42 psi	63 psi	1062 psi		
S	8 in ³	23 in ³	15 in ³	15 in ³		
Shear:	< F'_v OK	< F'_v OK	< F'_v OK	< F'_v OK		
V = w L/2	100 lbs	33 lbs	33 lbs	549 lbs		
f _v = 1.5 V/A	18 psi	2 psi	3 psi	50 psi		
A	8 in ²	25 in ²	17 in ²	17 in ²		
Compression:	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK		
f _c = P/A	594 psi	445 psi	334 psi	3 psi		
Compression (perp.):	< F'_c OK	< F'_c OK	< F'_c OK	< F'_c OK		
f _{c-perp} = P/A	594 psi	445 psi	334 psi	3 psi		
Combined:	< 1.0 OK					
((f _c /F _c)2 + (f _b /[F _b (1-(f _c /F _c E))]) =	0.81					
Deflection:	≥ 180 OK	≥ 180 OK	≥ 180 OK	≥ 180 OK		
D = 22.5 w L ⁴ /E'I =	0.12 in	0.01 in	0.02 in	0.34 in		
I =	21 in ⁴	62 in ⁴	42 in ⁴	42 in ⁴		
SPAN /	938	8616	5744	340		

Roof, H1

3 piece(s) 1 3/4" x 18" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	21757 @ 6"	29531 (7.50")	Passed (74%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	14778 @ 2' 1 1/2"	20648	Passed (72%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	61602 @ 6' 7 1/2"	66849	Passed (92%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.357 @ 6' 7 1/2"	0.408	Passed (L/411)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.401 @ 6' 7 1/2"	0.613	Passed (L/366)	--	1.0 D + 1.0 S (All Spans)

Member Length : 13' 3"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	7.50"	7.50"	5.53"	2379	19378	21757	None
2 - Trimmer - DF	7.50"	7.50"	5.53"	2379	19378	21757	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' o/c	
Bottom Edge (Lu)	13' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 3"	N/A	27.6	--	
1 - Uniform (PSF)	0 to 13' 3"	19' 6"	17.0	150.0	Roof

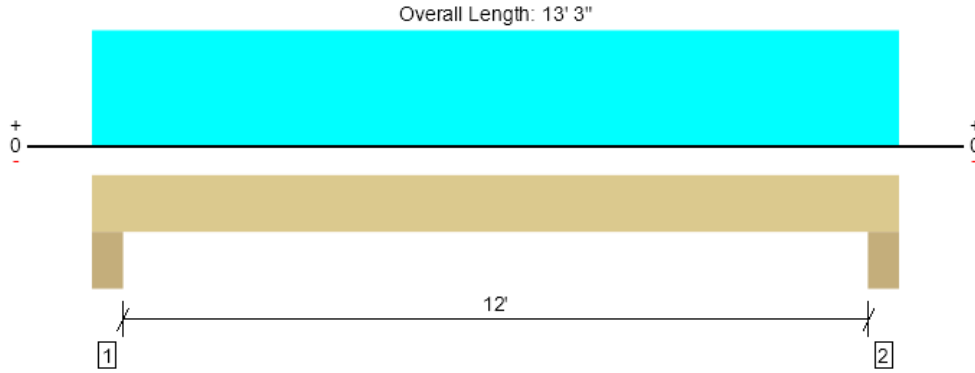
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, Copy of H1

1 piece(s) 5 1/8" x 18" 24F-V4 DF Glulam



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	21723 @ 6"	24984 (7.50")	Passed (87%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	14755 @ 2' 1 1/2"	18742	Passed (79%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	61505 @ 6' 7 1/2"	63653	Passed (97%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.331 @ 6' 7 1/2"	0.408	Passed (L/445)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.371 @ 6' 7 1/2"	0.613	Passed (L/397)	--	1.0 D + 1.0 S (All Spans)

Member Length : 13' 3"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 12' 3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	7.50"	7.50"	6.52"	2345	19378	21723	None
2 - Trimmer - DF	7.50"	7.50"	6.52"	2345	19378	21723	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 3" o/c	
Bottom Edge (Lu)	13' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 3"	N/A	22.4	--	
1 - Uniform (PSF)	0 to 13' 3"	19' 6"	17.0	150.0	Roof

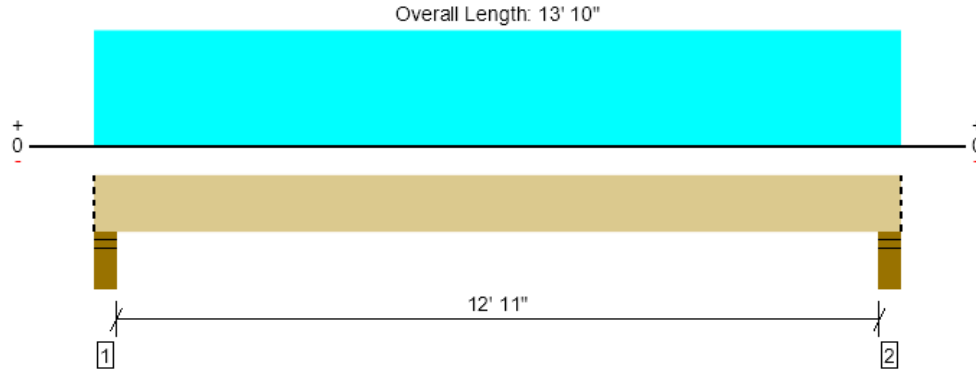
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, B01

3 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5901 @ 4"	18047 (5.50")	Passed (33%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4666 @ 1' 5 3/8"	13622	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	18489 @ 6' 11"	30788	Passed (60%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.376 @ 6' 11"	0.658	Passed (L/420)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.428 @ 6' 11"	0.878	Passed (L/369)	--	1.0 D + 1.0 S (All Spans)

Member Length : 13' 10"
 System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.80"	714	5187	5901	Blocking
2 - Stud wall - DF	5.50"	5.50"	1.80"	714	5187	5901	Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 10" o/c	
Bottom Edge (Lu)	13' 10" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 10"	N/A	18.2	--	
1 - Uniform (PSF)	0 to 13' 10" (Front)	5'	17.0	150.0	Roof

- Side loads are assumed to not induce cross-grain tension.

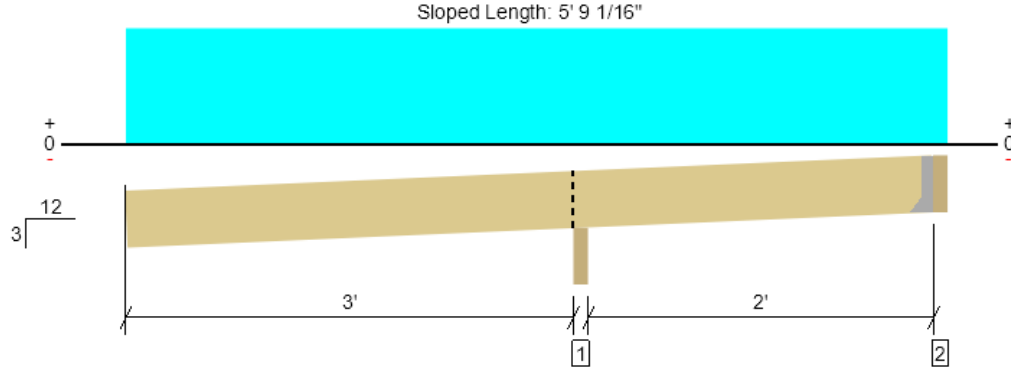
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Roof, Roof: Joist

1 piece(s) 2 x 6 DF No.2 @ 12" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1093 @ 3' 1 3/4"	2300 (3.50")	Passed (48%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	467 @ 3' 8 13/16"	1139	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-829 @ 3' 1 3/4"	975	Passed (85%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.188 @ 0	0.324	Passed (2L/414)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.209 @ 0	0.432	Passed (2L/372)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 5' 6 13/16"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 3/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- -238 lbs uplift at support located at 5' 3 1/2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - SPF	3.50"	3.50"	1.66"	114	979	1093	Blocking
2 - Hanger on 5 1/2" SPF beam	3.50"	Hanger ¹	1.50"	-17	32/-222	15/-238	See note ¹

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 5" o/c	
Bottom Edge (Lu)	5' 5" o/c	

- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LRU26Z	1.94"	N/A	4-10dx1.5	5-10d	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 7"	12"	17.0	150.0	Default Load

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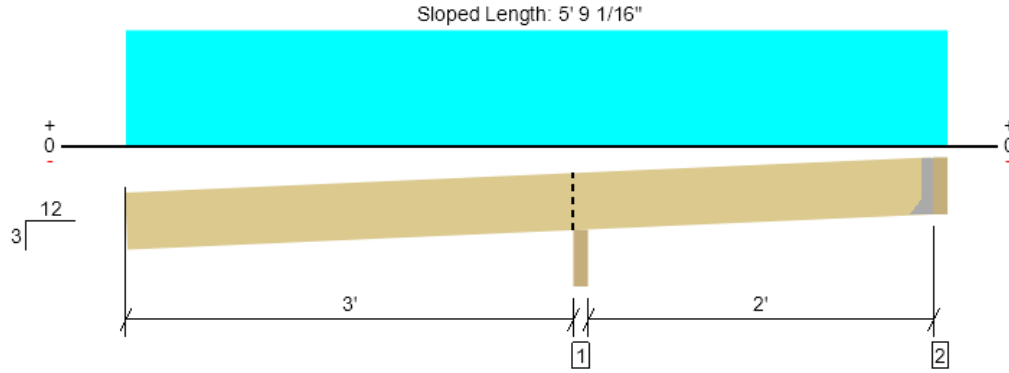
Completed by: ASF
 Review/Check: KKJ
 05/25/2026

524 CLEVELAND BLVD. #230, CALDWELL, IDAHO 83605
(208) 453-6512 | info@snakeriverengineering.com

Project City/County: Valley
 Project State: Idaho
 20 of 56

Roof, Copy of Roof: Joist

1 piece(s) 2 x 8 DF No.2 @ 16" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1457 @ 3' 1 3/4"	2300 (3.50")	Passed (63%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	591 @ 3' 10 9/16"	1501	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1105 @ 3' 1 3/4"	1564	Passed (71%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.110 @ 0	0.324	Passed (2L/710)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.122 @ 0	0.432	Passed (2L/638)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 5' 7 1/4"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 3/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- -318 lbs uplift at support located at 5' 3 1/2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - SPF	3.50"	3.50"	2.22"	152	1305	1457	Blocking
2 - Hanger on 7 1/4" SPF beam	3.50"	Hanger ¹	1.50"	-22	42/-296	20/-318	See note ¹

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 5" o/c	
Bottom Edge (Lu)	5' 5" o/c	

- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LRU26Z	1.94"	N/A	4-10dx1.5	5-10d	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 7"	16"	17.0	150.0	Default Load

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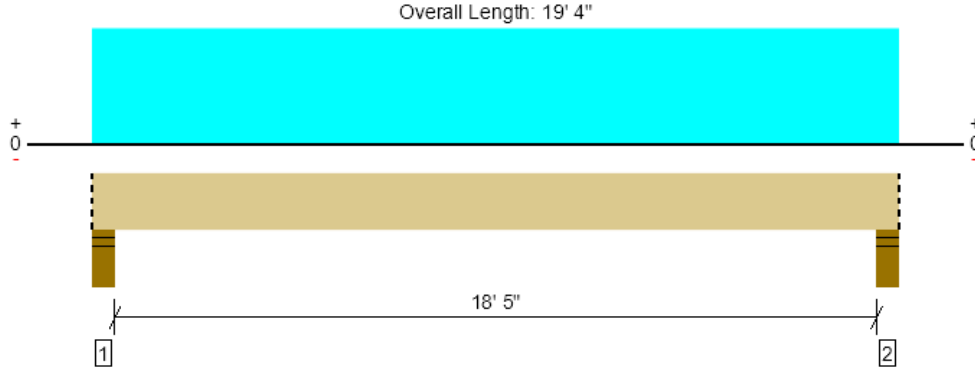
Completed by: ASF
 Review/Check: KKJ
 05/25/2026

524 CLEVELAND BLVD. #230, CALDWELL, IDAHO 83605
(208) 453-6512 | info@snakeriverengineering.com

Project City/County: Valley
 Project State: Idaho
 21 of 56

Roof, B02

1 piece(s) 8 3/4" x 21" 24F-V4 DF Glulam



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	25454 @ 4"	30078 (5.50")	Passed (85%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	19639 @ 2' 2 1/2"	37332	Passed (53%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	114689 @ 9' 8"	134154	Passed (85%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.523 @ 9' 8"	0.933	Passed (L/429)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.592 @ 9' 8"	1.244	Passed (L/379)	--	1.0 D + 1.0 S (All Spans)

Member Length : 19' 4"
 System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 0.91 was calculated for positive bending using length L = 18' 8".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	4.65"	2979	22475	25454	Blocking
2 - Stud wall - DF	5.50"	5.50"	4.65"	2979	22475	25454	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	19' 4" o/c	
Bottom Edge (Lu)	19' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 4"	N/A	44.7	--	
1 - Uniform (PSF)	0 to 19' 4" (Front)	15' 6"	17.0	150.0	Roof

• Side loads are assumed to not induce cross-grain tension.

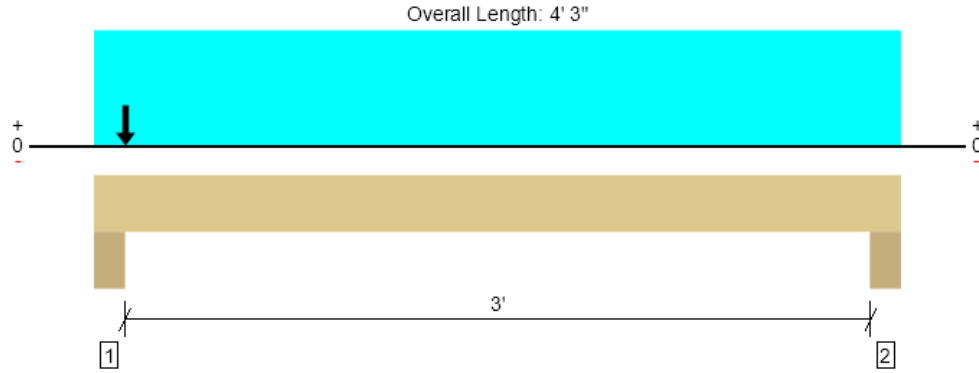
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Roof, H2

4 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	32406 @ 6"	39375 (7.50")	Passed (82%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2931 @ 1' 2 3/4"	11089	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4319 @ 2' 1 1/2"	16363	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.025 @ 2' 1 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.028 @ 2' 1 1/2"	0.162	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4' 3"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	7.50"	7.50"	6.17"	3715	28691	32406	None
2 - Trimmer - DF	7.50"	7.50"	1.50"	736	6216	6952	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 3" o/c	
Bottom Edge (Lu)	4' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 3"	N/A	14.8	--	
1 - Uniform (PSF)	0 to 4' 3"	19' 6"	17.0	150.0	Roof
2 - Point (lb)	2"	N/A	2979	22475	Linked from: B02, Support 1

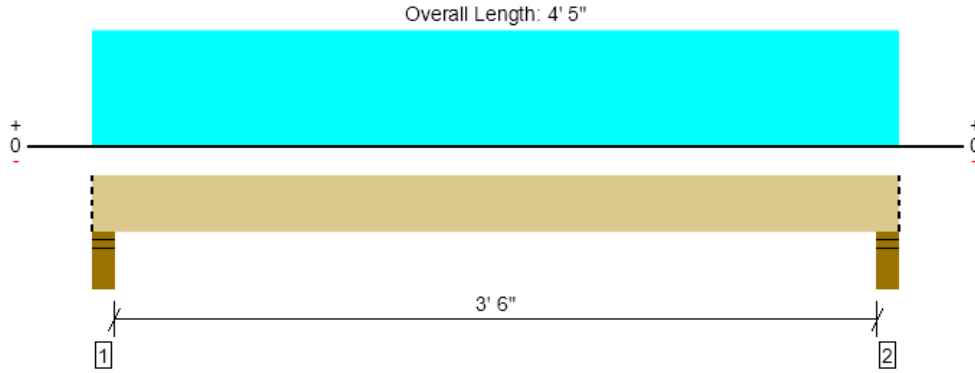
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Roof, B03

1 piece(s) 4 x 8 DF No.2



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3149 @ 4"	12031 (5.50")	Passed (26%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1634 @ 1' 3/4"	3502	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2507 @ 2' 2 1/2"	3438	Passed (73%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.032 @ 2' 2 1/2"	0.188	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.036 @ 2' 2 1/2"	0.250	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4' 5"
 System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.50"	333	2816	3149	Blocking
2 - Stud wall - DF	5.50"	5.50"	1.50"	333	2816	3149	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 5" o/c	
Bottom Edge (Lu)	4' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 5"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 4' 5" (Front)	8' 6"	17.0	150.0	Roof

• Side loads are assumed to not induce cross-grain tension.

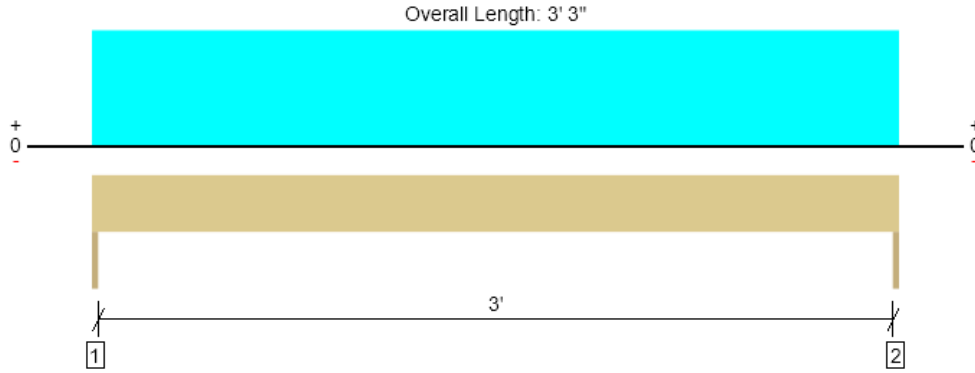
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Roof, H3

1 piece(s) 6 x 10 DF No.2



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4364 @ 0	5156 (1.50")	Passed (85%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1902 @ 11"	6810	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3545 @ 1' 7 1/2"	6937	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.012 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.013 @ 1' 7 1/2"	0.162	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 3' 3"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	1.50"	1.50"	1.50"	464	3900	4364	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	464	3900	4364	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 3" o/c	
Bottom Edge (Lu)	3' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 3' 3"	16'	17.0	150.0	Roof

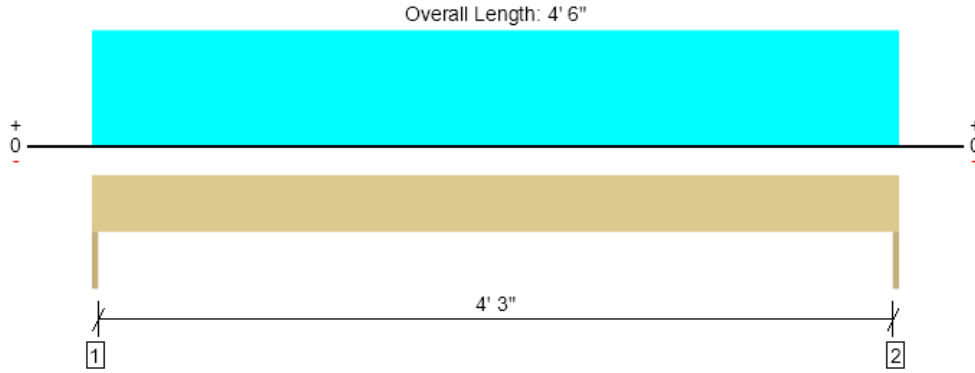
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Roof, H4

1 piece(s) 6 x 10 DF No.2



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4163 @ 0	5156 (1.50")	Passed (81%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2467 @ 11"	6810	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4683 @ 2' 3"	6937	Passed (68%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.030 @ 2' 3"	0.150	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.033 @ 2' 3"	0.225	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4' 6"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	1.50"	1.50"	1.50"	451	3713	4163	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	451	3713	4163	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 6" o/c	
Bottom Edge (Lu)	4' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 6"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 4' 6"	11'	17.0	150.0	Roof

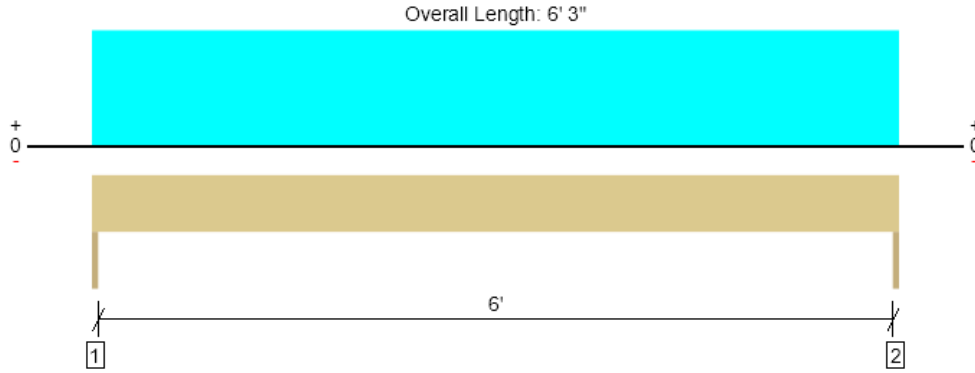
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Roof, H5

1 piece(s) 6 x 12 DF No.2



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5008 @ 0	5156 (1.50")	Passed (97%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3272 @ 1' 1"	8244	Passed (40%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	7825 @ 3' 1 1/2"	10166	Passed (77%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.054 @ 3' 1 1/2"	0.208	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.061 @ 3' 1 1/2"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 6' 3"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	1.50"	1.50"	1.50"	555	4453	5008	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	555	4453	5008	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 3" o/c	
Bottom Edge (Lu)	6' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 3"	N/A	16.0	--	
1 - Uniform (PSF)	0 to 6' 3"	9' 6"	17.0	150.0	Roof

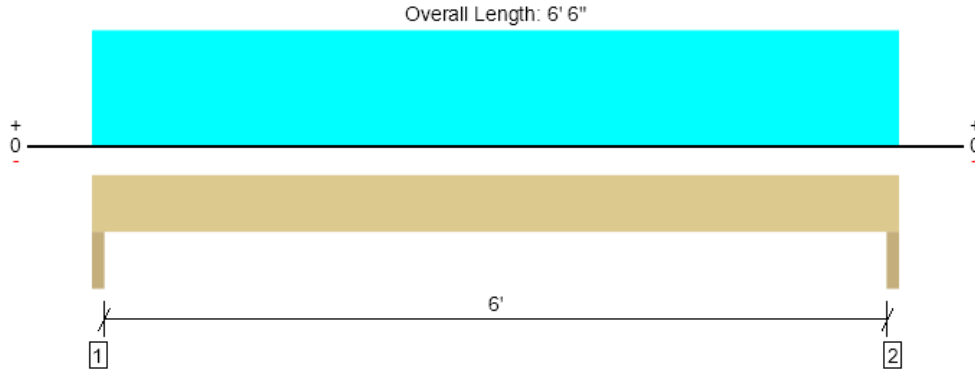
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Roof, Copy of H5

2 piece(s) 1 3/4" x 9 1/2" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5188 @ 1 1/2"	7875 (3.00")	Passed (66%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3525 @ 1' 1/2"	7265	Passed (49%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	7794 @ 3' 3"	13541	Passed (58%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.122 @ 3' 3"	0.208	Passed (L/615)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.137 @ 3' 3"	0.313	Passed (L/549)	--	1.0 D + 1.0 S (All Spans)

Member Length : 6' 6"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	3.00"	3.00"	1.98"	556	4631	5188	None
2 - Trimmer - DF	3.00"	3.00"	1.98"	556	4631	5188	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 6" o/c	
Bottom Edge (Lu)	6' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 6"	N/A	9.7	--	
1 - Uniform (PSF)	0 to 6' 6"	9' 6"	17.0	150.0	Roof

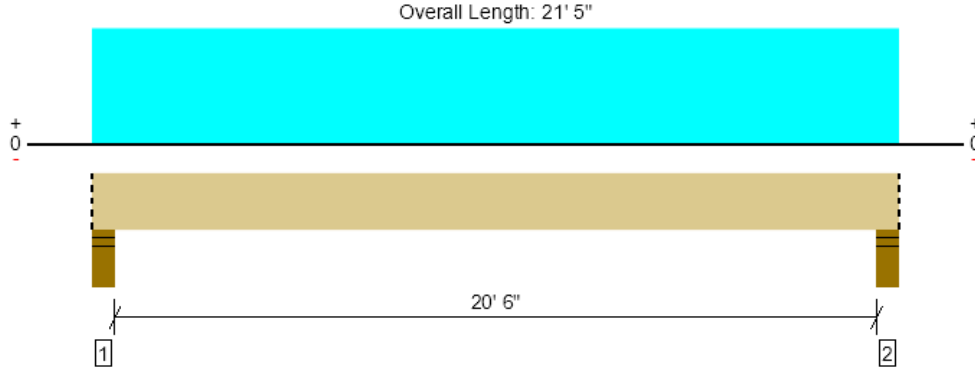
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, B04

1 piece(s) 5 1/2" x 24" 24F-V4 DF Glulam



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	19121 @ 4"	18906 (5.50")	Passed (101%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	14731 @ 2' 5 1/2"	26818	Passed (55%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	96101 @ 10' 8 1/2"	112645	Passed (85%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.576 @ 10' 8 1/2"	1.038	Passed (L/432)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.653 @ 10' 8 1/2"	1.383	Passed (L/381)	--	1.0 D + 1.0 S (All Spans)

Member Length : 21' 5"
 System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 0.93 was calculated for positive bending using length L = 20' 9".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	5.50"	2255	16866	19121	Blocking
2 - Stud wall - DF	5.50"	5.50"	5.50"	2255	16866	19121	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	17' 11" o/c	
Bottom Edge (Lu)	21' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 21' 5"	N/A	32.1	--	
1 - Uniform (PSF)	0 to 21' 5" (Front)	10' 6"	17.0	150.0	Roof

• Side loads are assumed to not induce cross-grain tension.

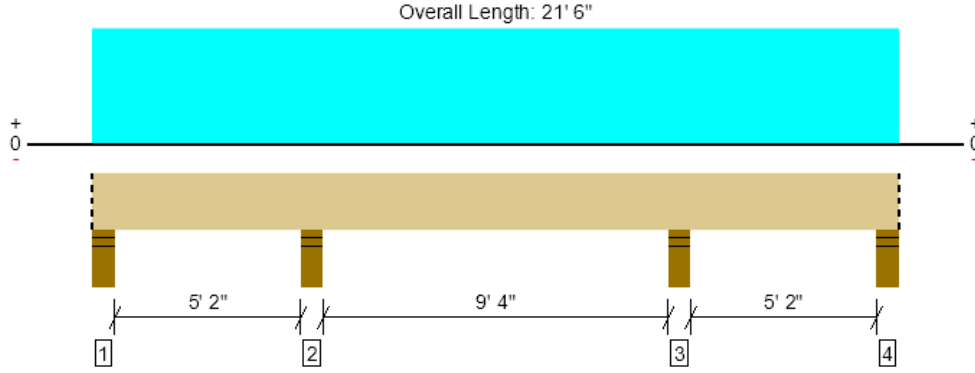
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, B05

1 piece(s) 6 3/4" x 9" 24F-V4 DF Glulam



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12948 @ 5' 10 1/4"	23203 (5.50")	Passed (56%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	5749 @ 6' 10"	12342	Passed (47%)	1.15	1.0 D + 1.0 S (Adj Spans)
Pos Moment (Ft-lbs)	8031 @ 10' 9"	20959	Passed (38%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-10133 @ 5' 10 1/4"	16156	Passed (63%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.131 @ 10' 9"	0.490	Passed (L/897)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.145 @ 10' 9"	0.653	Passed (L/811)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 21' 6"
 System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 6' 8 5/16".
- Volume factor of 1.00 was calculated for negative bending using length L = 4' 3 1/4".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.50"	295	3034	3329	Blocking
2 - Stud wall - DF	5.50"	5.50"	3.07"	1417	11531	12948	None
3 - Stud wall - DF	5.50"	5.50"	3.07"	1417	11531	12948	None
4 - Stud wall - DF	5.50"	5.50"	1.50"	295	3034	3329	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	21' 6" o/c	
Bottom Edge (Lu)	21' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 21' 6"	N/A	14.8	--	
1 - Uniform (PSF)	0 to 21' 6" (Front)	8' 6"	17.0	150.0	Roof

• Side loads are assumed to not induce cross-grain tension.

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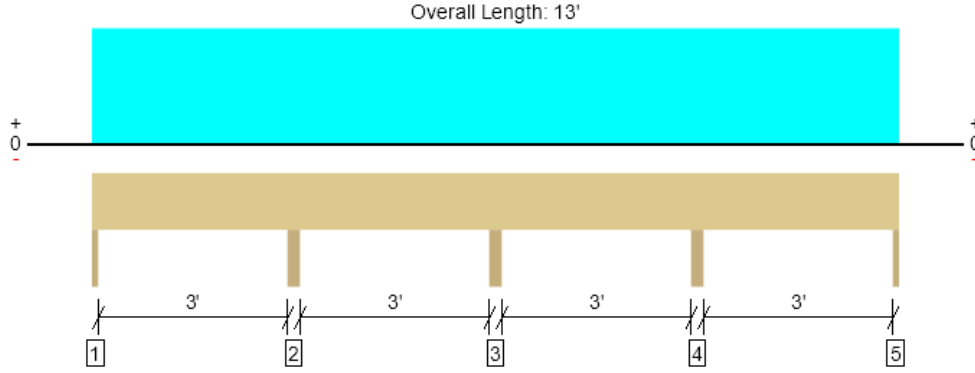
Completed by: ASF
 Review/Check: KKJ
 05/25/2026

524 CLEVELAND BLVD. #230, CALDWELL, IDAHO 83605
 (208) 453-6512 | info@snakeriverengineering.com

Project City/County: Valley
 Project State: Idaho
 30 of 56

Roof, H6

3 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	10599 @ 3' 3"	11813 (3.00")	Passed (90%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	3496 @ 10' 5 3/4"	8317	Passed (42%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	-3306 @ 9' 9"	12273	Passed (27%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.021 @ 1' 6 7/16"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.024 @ 1' 6 3/8"	0.162	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 13'
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	1.50"	1.50"	1.50"	372	3376	3748	None
2 - Trimmer - DF	3.00"	3.00"	2.69"	1083	9516	10599	None
3 - Trimmer - DF	3.00"	3.00"	2.34"	880	8331	9211	None
4 - Trimmer - DF	3.00"	3.00"	2.69"	1083	9516	10599	None
5 - Trimmer - DF	1.50"	1.50"	1.50"	372	3376	3748	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' o/c	
Bottom Edge (Lu)	13' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13'	N/A	11.1	--	
1 - Uniform (PSF)	0 to 13'	16' 6"	17.0	150.0	Roof

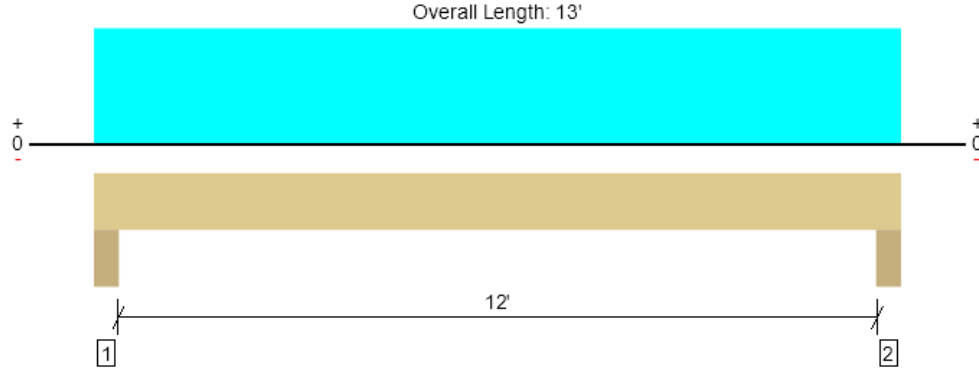
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Roof, H7

1 piece(s) 6 3/4" x 18" 24F-V4 DF Glulam



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	24616 @ 4 1/2"	26325 (6.00")	Passed (94%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	17042 @ 2'	24685	Passed (69%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	71036 @ 6' 6"	82654	Passed (86%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.290 @ 6' 6"	0.408	Passed (L/508)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.325 @ 6' 6"	0.613	Passed (L/452)	--	1.0 D + 1.0 S (All Spans)

Member Length : 13'
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 0.99 was calculated for positive bending using length L = 12' 3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	6.00"	6.00"	5.61"	2678	21938	24616	None
2 - Trimmer - DF	6.00"	6.00"	5.61"	2678	21938	24616	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' o/c	
Bottom Edge (Lu)	13' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13'	N/A	29.5	--	
1 - Uniform (PSF)	0 to 13'	22' 6"	17.0	150.0	Roof

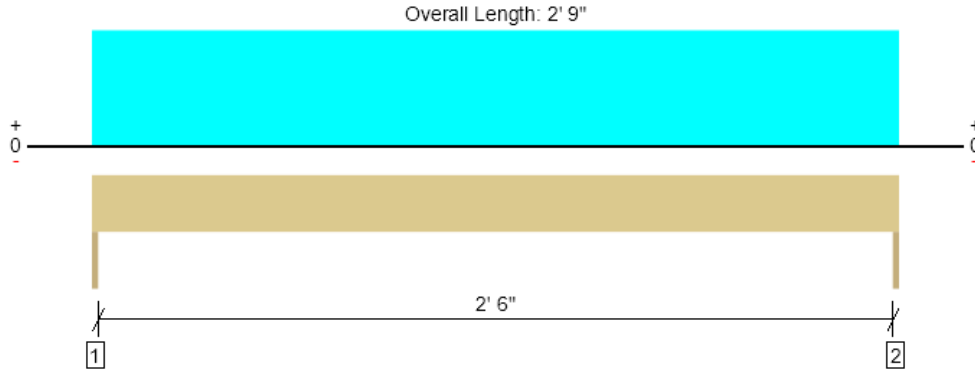
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Roof, H8

1 piece(s) 6 x 10 DF No.2



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5185 @ 0	5156 (1.50")	Passed (101%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1728 @ 11"	6810	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3565 @ 1' 4 1/2"	6937	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.009 @ 1' 4 1/2"	0.092	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.009 @ 1' 4 1/2"	0.138	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 2' 9"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	1.50"	1.50"	1.50"	544	4641	5185	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	544	4641	5185	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	2' 9" o/c	
Bottom Edge (Lu)	2' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 2' 9"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 2' 9"	22' 6"	17.0	150.0	Roof

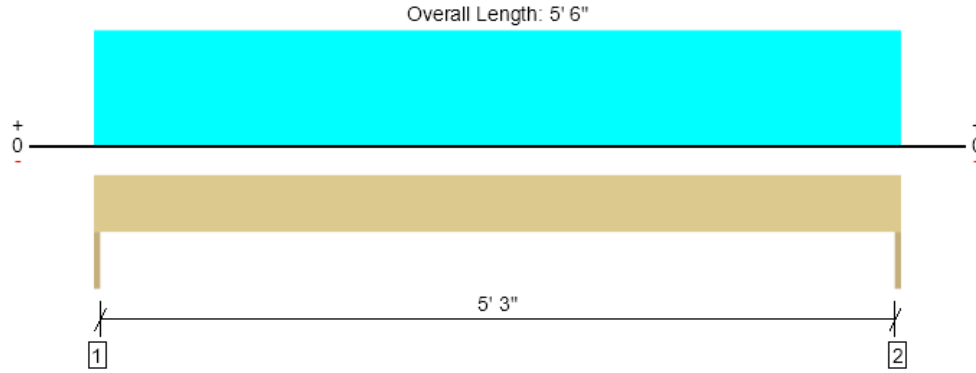
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Roof, H9

3 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5771 @ 0	5906 (1.50")	Passed (98%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4241 @ 8 3/4"	8317	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	7935 @ 2' 9"	12273	Passed (65%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.137 @ 2' 9"	0.183	Passed (L/481)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.154 @ 2' 9"	0.275	Passed (L/430)	--	1.0 D + 1.0 S (All Spans)

Member Length : 5' 6"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	1.50"	1.50"	1.50"	615	5156	5771	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	615	5156	5771	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 6" o/c	
Bottom Edge (Lu)	5' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	11.1	--	
1 - Uniform (PSF)	0 to 5' 6"	12' 6"	17.0	150.0	Roof

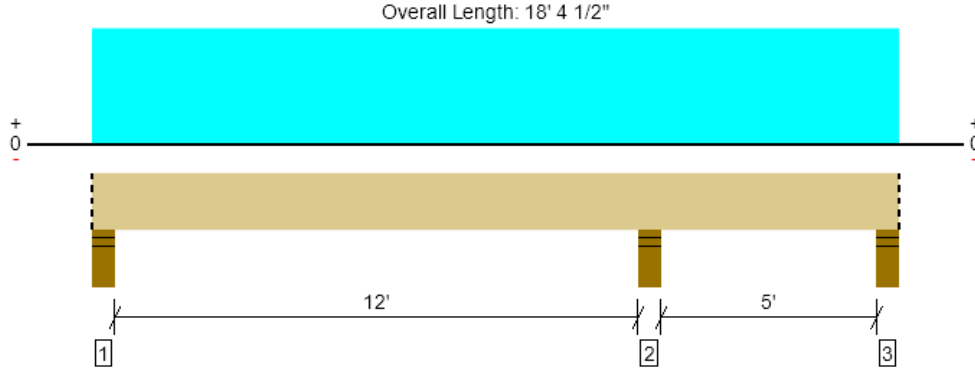
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Roof, B07

3 piece(s) 1 3/4" x 9 1/2" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	10796 @ 12' 8 1/4"	18047 (5.50")	Passed (60%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	5370 @ 11' 8"	10898	Passed (49%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-12228 @ 12' 8 1/4"	20312	Passed (60%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.332 @ 5' 11 7/16"	0.618	Passed (L/446)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.375 @ 5' 11 3/8"	0.824	Passed (L/395)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 18' 4 1/2"
 System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -779 lbs uplift at support located at 18' 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.50"	532	4042	4574	Blocking
2 - Stud wall - DF	5.50"	5.50"	3.29"	1265	9531	10796	None
3 - Stud wall - DF	5.50"	5.50"	1.50"	32	1174/-811	1206/-779	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 5" o/c	
Bottom Edge (Lu)	18' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 4 1/2"	N/A	14.5	--	
1 - Uniform (PSF)	0 to 18' 4 1/2" (Front)	5'	17.0	150.0	Roof

• Side loads are assumed to not induce cross-grain tension.

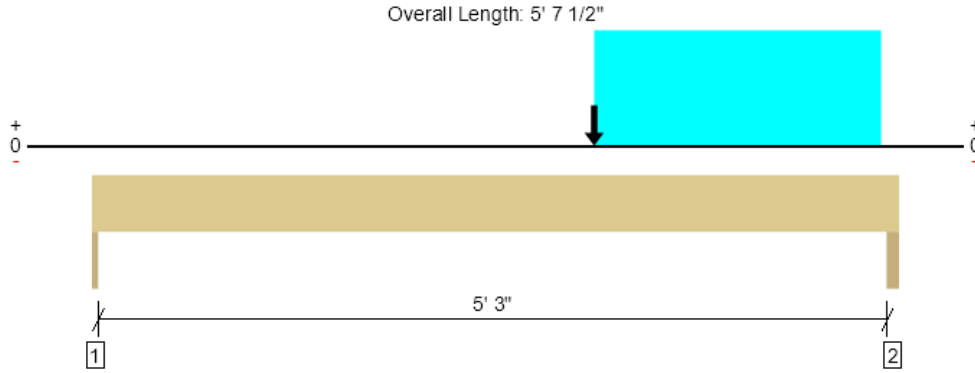
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Roof, H10

3 piece(s) 1 3/4" x 9 1/2" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	9508 @ 5' 6"	11813 (3.00")	Passed (80%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	8039 @ 4' 7"	10898	Passed (74%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	15810 @ 3' 6"	20312	Passed (78%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.109 @ 3' 6"	0.183	Passed (L/608)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.123 @ 3' 6"	0.275	Passed (L/536)	--	1.0 D + 1.0 S (All Spans)

Member Length : 5' 7 1/2"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	1.50"	1.50"	1.50"	559	3984	4543	None
2 - Trimmer - DF	3.00"	3.00"	2.41"	1111	8397	9508	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 8" o/c	
Bottom Edge (Lu)	5' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 7 1/2"	N/A	14.5	--	
1 - Point (lb)	3' 6"	N/A	1265	9531	Linked from: B07, Support 2
2 - Uniform (PSF)	3' 6" to 5' 6"	9' 6"	17.0	150.0	Roof

Weyerhaeuser Notes

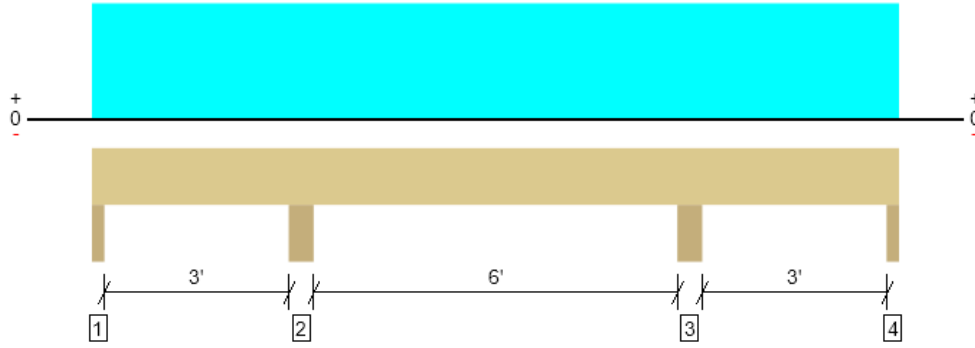
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, H11

3 piece(s) 1 3/4" x 9 1/4" 2.0E Microllam® LVL

Overall Length: 13' 6"



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	21248 @ 3' 6"	23625 (6.00")	Passed (90%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	8215 @ 4' 6 1/4"	10611	Passed (77%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	-11037 @ 3' 6"	19327	Passed (57%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.109 @ 6' 9"	0.217	Passed (L/719)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.120 @ 6' 9"	0.325	Passed (L/648)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 13' 6"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	3.00"	3.00"	1.50"	353	4246	4599	None
2 - Trimmer - DF	6.00"	6.00"	5.40"	2210	19038	21248	None
3 - Trimmer - DF	6.00"	6.00"	5.40"	2210	19038	21248	None
4 - Trimmer - DF	3.00"	3.00"	1.50"	353	4246	4599	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 6" o/c	
Bottom Edge (Lu)	13' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 6"	N/A	14.2	--	
1 - Uniform (PSF)	0 to 13' 6"	21' 6"	17.0	150.0	Roof

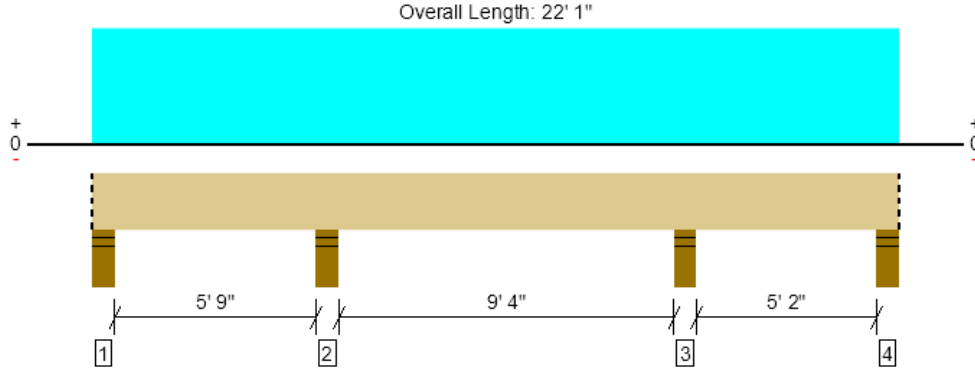
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, B06

1 piece(s) 6 3/4" x 9" 24F-V4 DF Glulam



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12515 @ 6' 5 1/4"	23203 (5.50")	Passed (54%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	5456 @ 7' 5"	12342	Passed (44%)	1.15	1.0 D + 1.0 S (Adj Spans)
Pos Moment (Ft-lbs)	7551 @ 11' 4 1/16"	20959	Passed (36%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-9852 @ 6' 5 1/4"	16156	Passed (61%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.123 @ 11' 4"	0.490	Passed (L/954)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.136 @ 11' 4 1/16"	0.653	Passed (L/863)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 22' 1"
 System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Volume factor of 1.00 was calculated for positive bending using length L = 6' 8 1/4".
- Volume factor of 1.00 was calculated for negative bending using length L = 4' 1 13/16".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.50"	335	3217	3553	Blocking
2 - Stud wall - DF	5.50"	5.50"	2.97"	1378	11137	12515	None
3 - Stud wall - DF	5.50"	5.50"	2.89"	1334	10850	12185	None
4 - Stud wall - DF	5.50"	5.50"	1.50"	282	2880	3161	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	22' 1" o/c	
Bottom Edge (Lu)	22' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 22' 1"	N/A	14.8	--	
1 - Uniform (PSF)	0 to 22' 1" (Front)	8'	17.0	150.0	Roof

• Side loads are assumed to not induce cross-grain tension.

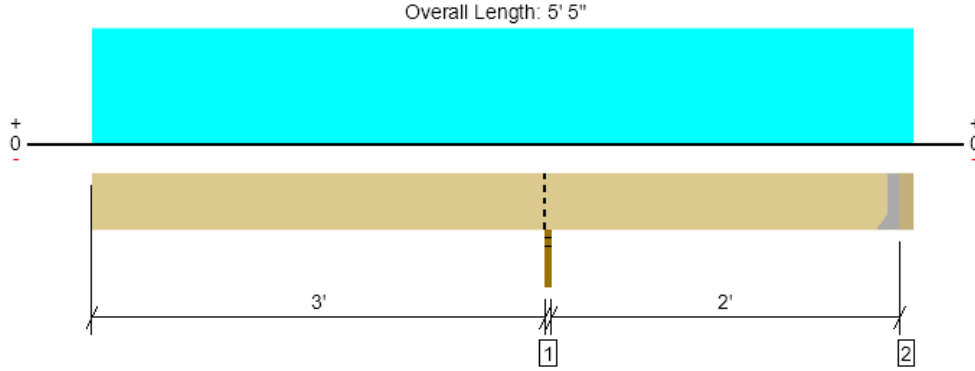
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, Outlooker

1 piece(s) 2 x 6 DF No.2 @ 12" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1063 @ 3' 3/4"	1406 (1.50")	Passed (76%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	465 @ 3' 7"	1139	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-783 @ 3' 3/4"	975	Passed (80%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.158 @ 0	0.306	Passed (2L/464)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.176 @ 0	0.408	Passed (2L/418)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 5' 1 1/2"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- -236 lbs uplift at support located at 5' 1 1/2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	1.50"	1.50"	1.50"	108	955	1063	Blocking
2 - Hanger on 5 1/2" DF beam	3.50"	Hanger ¹	1.50"	-16	28/-220	12/-236	See note ¹

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 2" o/c	
Bottom Edge (Lu)	5' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 5"	12"	17.0	150.0	Default Load

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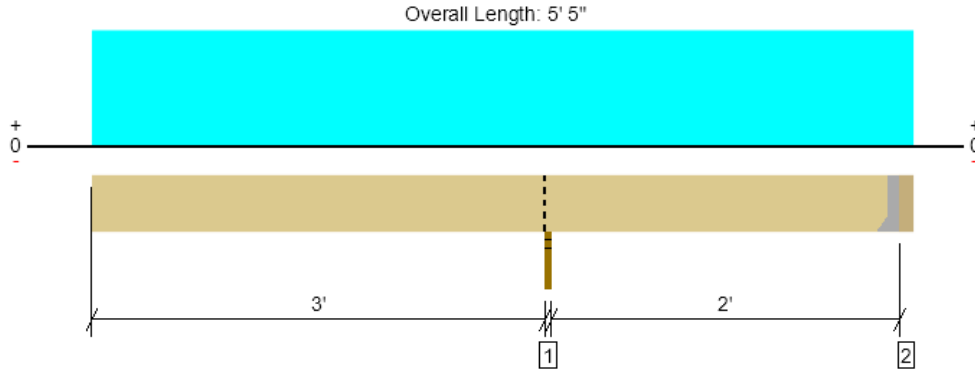
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 Review/Check: KKJ
 05/25/2026

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(208) 453-6512 | info@snakeriverengineering.com

Project City/County: Valley
 Project State: Idaho
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Roof, Copy of Outlooker

1 piece(s) 2 x 8 DF No.2 @ 16" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1418 @ 3' 3/4"	1406 (1.50")	Passed (101%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	587 @ 3' 8 3/4"	1501	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1044 @ 3' 3/4"	1564	Passed (67%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.092 @ 0	0.306	Passed (2L/798)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.102 @ 0	0.408	Passed (2L/718)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 5' 1 1/2"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- -315 lbs uplift at support located at 5' 1 1/2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	1.50"	1.50"	1.50"	144	1273	1418	Blocking
2 - Hanger on 7 1/4" DF beam	3.50"	Hanger ¹	1.50"	-22	37/-293	16/-315	See note ¹

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 2" o/c	
Bottom Edge (Lu)	5' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 5"	16"	17.0	150.0	Default Load

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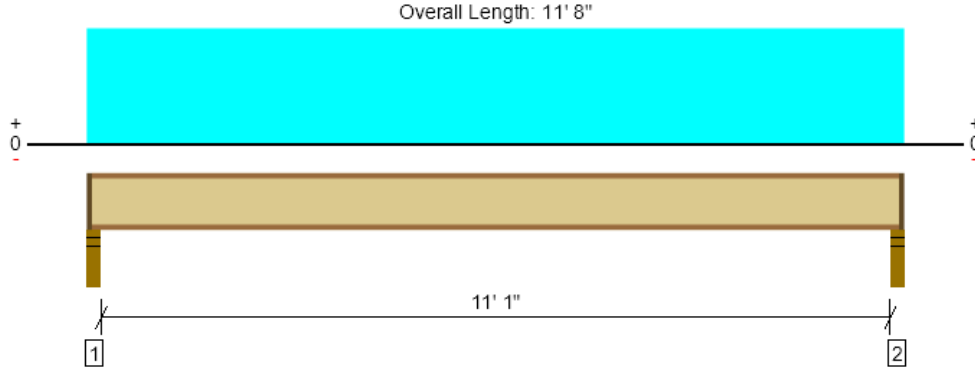
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Project City/County: Valley
 Project State: Idaho
 40 of 56

Floor, Floor: Joist

1 piece(s) 9 1/2" TJI® 110 @ 24" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	596 @ 2 1/2"	1041 (2.25")	Passed (57%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	576 @ 3 1/2"	1220	Passed (47%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1645 @ 5' 10"	2500	Passed (66%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.164 @ 5' 10"	0.281	Passed (L/825)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.213 @ 5' 10"	0.563	Passed (L/634)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	43	40	Passed	--	--

Member Length : 11' 5 1/2"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories	Details
	Total	Available	Required	Dead	Floor Live	Factored		
1 - Stud wall - SPF	3.50"	2.25"	1.75"	140	467	607	1 1/4" Rim Board	A3
2 - Stud wall - SPF	3.50"	2.25"	1.75"	140	467	607	1 1/4" Rim Board	A3

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 10" o/c	
Bottom Edge (Lu)	11' 6" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

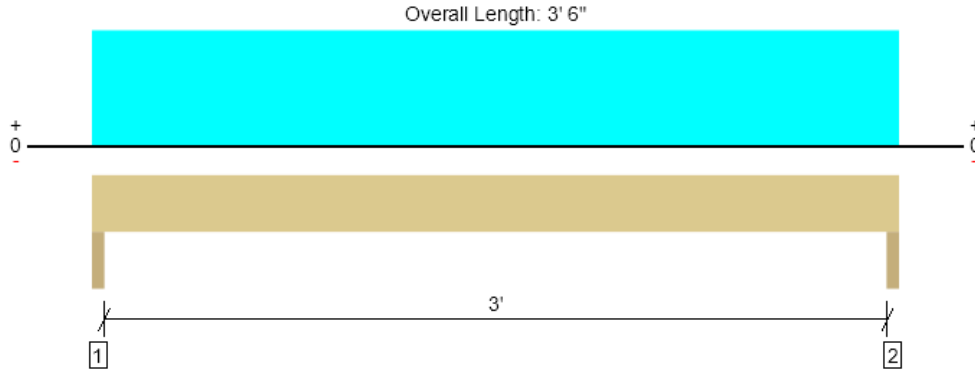
Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 11' 8"	24"	12.0	40.0	Default Load

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Floor, H12
1 piece(s) 4 x 10 DF No.2



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3721 @ 1' 1/2"	6563 (3.00")	Passed (57%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1550 @ 1' 1/4"	4468	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2807 @ 1' 9"	5166	Passed (54%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.012 @ 1' 9"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.014 @ 1' 9"	0.162	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 3' 6"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - DF	3.00"	3.00"	1.70"	571	665	3150	3721	None
2 - Trimmer - DF	3.00"	3.00"	1.70"	571	665	3150	3721	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 6" o/c	
Bottom Edge (Lu)	3' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 6"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 3' 6"	12'	17.0	--	150.0	Roof
2 - Uniform (PSF)	0 to 3' 6"	9' 6"	12.0	40.0	--	Floor

Weyerhaeuser Notes

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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Beam Calculations (1 (1))

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	4	0	0	3.33		
Dead Load	-	68.0	0.0	0.0	40.0	108.0 plf	708.0 plf
Live / Snow Load	0	600.0	0.0	0.0	-	600.0 plf	

Description:	3.0 ft Opening	6.5 ft Opening	9.5 ft Opening				
Header Callout	(2)2x6 DF-L No. 2	(2)2x10 DF-L No. 2	(2)9.5 LVL 2.0E				
Trimmers	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2	(2) 2x6 DF-L No. 2				
King Studs							

Wood Design							
Species	DF-L	DF-L	LVL				
Grade	No. 2	No. 2	2.0E				
Width	3.00 in	3.00 in	3.50 in				
Depth	5.50 in	9.25 in	9.50 in				

Reaction							
Dead Load	162 lbs	351 lbs	513 lbs				
Live Load	900 lbs	1,950 lbs	2,850 lbs				

Load							
lu	3.0 ft	6.5 ft	9.5 ft				
le	6.2 ft	12.9 ft	17.9 ft				

Adjustment Factors							
Cd	1.15	1.15	1.15				
CF	1.3	1.1	1.1				

Material Properties							
Fb	900 psi	900 psi	2,900 psi				
Fv	180 psi	180 psi	285 psi				
E	1,600,000 psi	1,600,000 psi	2,000,000 psi				
Emin	580,000 psi	580,000 psi	1,016,535 psi				

Calculated Prop.							
A	16.50 in^2	27.75 in^2	33.25 in^2				
I	41.59 in^4	197.86 in^4	250.07 in^4				
S	15.13 in^3	42.78 in^3	52.65 in^3				
RB	6.73	12.62	12.89				
Emin'	580,000 psi	580,000 psi	1,016,535 psi				
FbE	15,357 psi	4,372 psi	7,339 psi				
Fb*	1,346 psi	1,139 psi	3,669 psi				
CL	1	1	1				

Shear and Moment							
M	9,557 lb-in	44,867 lb-in	95,840 lb-in				
V	1,062 lbs	2,301 lbs	3,363 lbs				

Stress							
fb	632 psi	1,049 psi	1,820 psi				
Fb'	1,339 psi	1,119 psi	3,508 psi				
fb/Fb'	0.47	0.94	0.52				
fv	97 psi	124 psi	152 psi				
Fv'	207 psi	207 psi	328 psi				
fv/Fv'	0.47	0.60	0.46				
Max Ratio	0.47	0.94	0.52				
	Pass	Pass	Pass				

Deflection							
Δ _L	0.02 in	0.09 in	0.26 in				
	L/1,857	L/868	L/439				
Δ _{LL}	0.02 in	0.08 in	0.22 in				
	L/2,191	L/1,025	L/519				
	Pass	Pass	Pass				

Beam Calculations (1 (2))

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	10.5	0	0	3.33		
Dead Load	-	178.5	0.0	0.0	40.0	218.5 plf	1,793.5 plf
Live / Snow Load	0	1575.0	0.0	0.0	-	1,575.0 plf	

Description:	3.0 ft Opening						
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Header Callout	(2)2x8 DF-L No. 2						
Trimmers	(1) 2x6 DF-L No. 2						
King Studs							

Wood Design							
Species	DF-L						
Grade	No. 2						
Width	3.00 in						
Depth	7.25 in						

Reaction							
Dead Load	328 lbs						
Live Load	2,363 lbs						

Load							
l _u	3.0 ft						
l _e	6.2 ft						

Adjustment Factors							
C _d	1.15						
C _F	1.2						

Material Properties							
F _b	900 psi						
F _v	180 psi						
E	1,600,000 psi						
E _{min}	580,000 psi						

Calculated Prop.							
A	21.75 in ²						
I	95.27 in ⁴						
S	26.28 in ³						
RB	7.73						
E _{min'}	580,000 psi						
F _{bE}	11,650 psi						
F _{b*}	1,242 psi						
C _L	1						

Shear and Moment							
M	24,212 lb-in						
V	2,690 lbs						

Stress							
f _b	921 psi						
F _{b'}	1,235 psi						
f _b /F _{b'}	0.75						
f _v	186 psi						
F _{v'}	207 psi						
f _v /F _{v'}	0.90						
Max Ratio	0.90						
	Pass						

Deflection							
Δ _L	0.02 in						
	L/1,679						
Δ _{LL}	0.02 in						
	L/1,912						
	Pass						

CF (1) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(17.5ft)	=	298plf
Snow Live	(150psf)	(17.5ft)	=	2625plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	(3 x .7ft)	=	291plf
Misc Load:	(.0ft)	(.0ft) (.0ft)	=	plf

3334plf

Use Footing Width:	30	x	10	in
W/	(3)	#4	Cont.	

CF (2) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(4.0ft)	=	68plf
Snow Live	(150psf)	(4.0ft)	=	600plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(2.0ft)	=	24plf
Floor Live	(40psf)	(2.0ft)	=	80plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	(3 x .7ft)	=	291plf
Misc Load:	(.0ft)	(.0ft)	(.0ft)	= plf

1103plf

Use Footing Width:	12	x	8	in
W/		(2)	#4	Cont.

CF (3) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(11.0ft)	=	187plf
Snow Live	(150psf)	(11.0ft)	=	1650plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(10.0ft)	=	120plf
Floor Live	(40psf)	(10.0ft)	=	400plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	.7ft)	=	plf
Misc Load:	(.0ft)	(.0ft)	(.0ft)	= plf

2077plf

Use Footing Width:	18	x	8	in
	W/	(2)	#4	Cont.

CF (4) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(12.0ft)	=	204plf
Snow Live	(150psf)	(12.0ft)	=	1800plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(2.0ft)	=	24plf
Floor Live	(40psf)	(2.0ft)	=	80plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	(3 x .7ft)	=	291plf
Misc Load:	(.0ft)	(.0ft)	(.0ft)	= plf

2439plf

Use Footing Width:	24	x	8	in
W/		(2)	#4	Cont.

CF (5) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(11.0ft)	=	187plf
Snow Live	(150psf)	(11.0ft)	=	1650plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(1.0ft)	=	12plf
Floor Live	(40psf)	(1.0ft)	=	40plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	(3 x .7ft)	=	291plf
Misc Load:	(.0ft)	(.0ft)	=	plf

2260plf

Use Footing Width:	24	x	8	in
W/		(2)	#4	Cont.

CF (6) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(16.0ft)	=	272plf
Snow Live	(150psf)	(16.0ft)	=	2400plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(2.0ft)	=	24plf
Floor Live	(40psf)	(2.0ft)	=	80plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	(x .7ft)	=	plf
Misc Load:	(.0ft)	(.0ft)	=	plf

2816plf

Use Footing Width:	30	x	10	in
W/		(3)	#4	Cont.

CF (7) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(10.0ft)	=	170plf
Snow Live	(150psf)	(10.0ft)	=	1500plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(1.0ft)	=	12plf
Floor Live	(40psf)	(1.0ft)	=	40plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	(3 x .7ft)	=	291plf
Misc Load:	(.0ft)	(.0ft)	(.0ft)	= plf

2093plf

Use Footing Width:	18	x	8	in
	W/	(2)	#4	Cont.

CF (8) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(8.0ft)	=	136plf
Snow Live	(150psf)	(8.0ft)	=	1200plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(2.0ft)	=	24plf
Floor Live	(40psf)	(2.0ft)	=	80plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	(x .7ft)	=	plf
Misc Load:	(.0ft)	(.0ft)	=	plf

1480plf

Use Footing Width:	16	x	8	in
W/		(2)	#4	Cont.

CF (9) Individual Footing Design

Program: Continuous Footing

Soil Bearing Pressure: 1500psf

Roof				
Roof Dead	(17psf)	(22.5ft)	=	383plf
Snow Live	(150psf)	(22.5ft)	=	3375plf

Upper Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Floor Live	(40psf)	(.0ft)	=	plf

Main Floor				
Floor Dead	(12psf)	(3.5ft)	=	42plf
Floor Live	(40psf)	(3.5ft)	=	140plf

Deck Cover				
Roof Dead	(17psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Deck Floor				
Floor Dead	(12psf)	(.0ft)	=	plf
Snow Live	(150psf)	(.0ft)	=	plf

Misc				
Wall Load:	(12psf)	(10.0ft)	=	120plf
Conc Stem:	(145pcf)	(3 x .7ft)	=	291plf
Misc Load:	(.0ft)	(.0ft) (.0ft)	=	plf

4211plf

Use Footing Width:	42	x	10	in
W/		(4)	#4	Cont.

Pad Footing Design Capacities

Soil Bearing (1500 psf)					Min. Column Size		
Dimensions (Inches)			Capacity	# of Bars			
168	x	168	x	20	238,000 lbs	21	17. sq.
156	x	156	x	18	208,000 lbs	19	17. sq.
144	x	144	x	18	178,000 lbs	18	16. sq.
132	x	132	x	16	152,000 lbs	14	15. sq.
120	x	120	x	16	126,000 lbs	12	12. sq.
108	x	108	x	14	104,000 lbs	14	12. sq.
102	x	102	x	14	92,000 lbs	14	9. sq.
96	x	96	x	14	76,400 lbs	13	6. sq.
90	x	90	x	12	73,800 lbs	11	10.5 sq.
84	x	84	x	12	63,200 lbs	10	7.5 sq.
78	x	78	x	12	55,000 lbs	9	6. sq.
72	x	72	x	12	47,000 lbs	8	6. sq.
66	x	66	x	10	39,750 lbs	6	6.5 sq.
60	x	60	x	10	33,250 lbs	6	5.5 sq.
54	x	54	x	10	27,000 lbs	5	5.5 sq.
48	x	48	x	8	21,500 lbs	4	5.5 sq.
42	x	42	x	8	16,500 lbs	4	3.5 sq.
36	x	36	x	8	12,000 lbs	4	3.5 sq.
30	x	30	x	8	8,350 lbs	3	3.5 sq.
24	x	24	x	8	5,300 lbs	2	3.5 sq.
18	x	18	x	8	2,900 lbs	2	3.5 sq.

Bars to be 3 1/2" from bottom of pad. Evenly space in both directions.

OSB SHEAR WALL SCHEDULE:

MARK	SHEATHING	SIDES OF WALL	SHEET NAILING PERIMETER / FIELD		SHEET STAPLING PERIMETER / FIELD	BLKG	NAILING (UNO) BOTTOM PLATE INTO RIM
SW1	7/16" APA RATED	1	8d @ 6 / 12	OR	16ga x 1-1/2" @ 3 / 12 (NOT FOR WALLS >10')	YES	(2) 16d NAILS PER 16" BAY
SW2	7/16" APA RATED	1	8d @ 4 / 12	OR	16ga x 1-1/2" @ 2 / 12 (NOT FOR WALLS >10')	YES	(3) 16d NAILS PER 16" BAY
SW3	7/16" APA RATED	1	8d @ 3 / 12			YES	(4) 16d NAILS PER 16" BAY

TYP. NOTES:

- 1 WALL SHEATHING CAN BE APPLIED TO EITHER SIDE OF THE WALL. (UNLESS NOTED OTHERWISE)
- 2 PROVIDE SAME NAILING PATTERN ABOVE AND BELOW OPENINGS AS ADJACENT SHEAR PANEL.
- 3 ALL EXTERIOR WALLS SHALL BE SHEARWALL "SW1" WITHOUT BLKG UNO
- 4 FASTEN GABLE/RIM TO SHEAR WALLS BELOW W/ 10d TOENAILS @ 12" O.C. UNO
- 5 FASTEN TRUSS HEELS TO SHEAR WALLS W/ H2.5A AND (2) 10d TOENAILS @ EACH
- 6 GYP BOARD SHEAR WALLS MAY BE SUBSTITUTED WITH AN SW1 SHEAR WALL @ CONTRACTOR'S OPTION

HOLDOWN SCHEDULE:

MARK	STRAP TYPE	STRAP FASTENERS	# OF STUDS		ANCHOR BOLT TYPE	# OF STUDS	ANCHOR BOLT FASTENERS
HD1	LSTHD8 OR LSTHD8RJ W/ RIM	(20) 16d SINKERS	2	OR	DTT2Z W/1/2"Øx10"	2	(8) 1/4"x1-1/2" SDS
HD2	STHD10 OR STHD10RJ W/ RIM	(24) 16d SINKERS	2	OR	HDU2- SDS2.5 W/ SB5/8x24 OR PAB5 @ INT. PONY WALLS	2	(6) 1/4"x2-1/2" SDS
HD3	STHD14 OR STHD14RJ W/ RIM	(30) 16d SINKERS	2	OR	HDU5-SDS2.5 W/ SB5/8x24 OR PAB5 @ INT. PONY WALLS	2	(14) 1/4"x2-1/2" SDS

Note:

ALL HDU HOLDOWNS CAN BE SUBSTITUTED FOR THEIR HDUE COUNTERPART AT THE CONTRACTORS OPTION .

BLOCKING KEY NOTES:

MARK		DESCRIPTION
B1	-	FULL HEIGHT BLOCKING BETWEEN EVERY OTHER FRAMING BAY W/ (6)10d TOENAILS FROM BLOCKING TO TOP PLATE, NAIL SHEATHING TO BLOCKING 3" O.C.
TYP. NOTES:		
1 FASTEN GABLE/RIM TO SHEAR WALLS BELOW W/ 10d TOENAILS @ 12" O.C. UNO		
2 FASTEN TRUSS HEELS TO SHEAR WALLS W/ H2.5A AND (2) 10d TOENAILS @ EACH		

GABLE / DRAG TRUSS OR RIM KEY NOTES:

T1	-	ATTACH GABLE / DRAG TRUSS OR RIM TO TOP PLATE W/ 10d TOENAILS @ 6" O.C., EDGE NAIL SHEATHING ABOVE TO TRUSS OR RIM
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ANCHOR BOLT KEY NOTES:

A3	-	1/2"Ø ANCHOR BOLTS @ 36" O.C.
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