Structural Calculations

Project Title: Hons Residence
Address: Boulder Lake Est. Lot #2
Location: Valley County, Idaho

Job #: 2024-7378

SNAKE RIVER
ENGINEERING

Prepared in accordance with 2018 IBC. Calculations expire by: 5/13/2025

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	**C**	Open Terrain
Wind Importance (I_w)	**1.0**	
Building Category	**II**	

Seismic Criteria:

Site Class	**D**		Stiff Soil
Ss	**0.51**	Fa	**1.39**
S1	**0.15**	Fv	**2.19**
S_{DS}	**0.47**	S_{D1}	**0.22**
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	**.09Wp**	**6.5**	Typ @ Ext
GYP	**.28Wp**	**2**	Typ @ Int
Cant. Col.	**.38Wp**	**1.5**	

Soil Criteria:

Brg. Strength	**1500 psf**

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**	

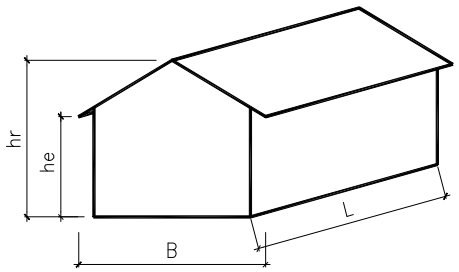
Deck Dead Load

Decking	4.4	
Joist	2.0	
	0.0	
Misc	3.0	
TOTAL	**10 psf**	*Deck not engineered for 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)		C	
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 =	*25.58 ft*	*ft*
Building height to eave	h_e =	*9.00 ft*	*ft*
Building width	B =	*68.00 ft*	*ft*
Building length	L =	*81.00 ft*	*ft*
Overhang sloped width	O_h =	*3.00 ft*	*ft*
Effective area of components (or Solar Panel area)	A =	*27.0 ft²*	ft^2, <== Overhang? (Yes or No): Yes
Enclosed? (Y/N)		y	



ANALYSIS

Velocity pressure

$q_h = 0.00256\ K_z\ K_{zt}\ K_d\ K_e\ V^2$ = **25.17** 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 2 = **0.87**

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

h = mean roof height = **17.29** 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] = **6.80** **ft**

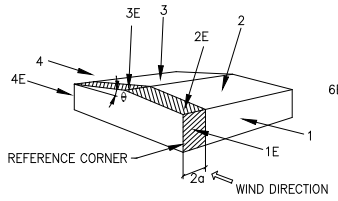
Net Pressures (psf), Basic Load Cases

Surface	Roof angle q = 18.43			Roof angle q = 18.43		
	$G\ C_{pf}$	Net Press. W/		$G\ C_{pf}$	Net Press. W/	
		$(+GC_{pi})$	$(-GC_{pi})$		$(+GC_{pi})$	$(-GC_{pi})$
1	0.52	8.47	17.53	-0.45	-15.86	-6.80
2	-0.69	-21.90	-12.84	-0.69	-21.90	-12.84
3	-0.47	-16.32	-7.26	-0.37	-13.84	-4.78
4	-0.42	-14.99	-5.92	-0.45	-15.86	-6.80
5				0.40	5.54	14.60
6				-0.29	-11.83	-2.77
1E	0.78	15.11	24.17	-0.48	-16.61	-7.55
2E	-1.07	-31.46	-22.40	-1.07	-31.46	-22.40
3E	-0.67	-21.48	-12.42	-0.53	-17.87	-8.81
4E	-0.62	-20.09	-11.03	-0.48	-16.61	-7.55
5E				0.61	10.82	19.88
6E				-0.43	-15.35	-6.29

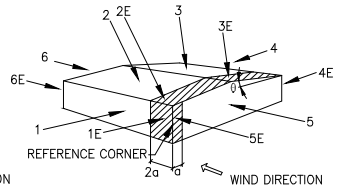
Net Pressures (psf), Torsional Load Cases

Surface	Roof angle q = 18.43		
	$G\ C_{pf}$	Net Press. W/	
		$(+GC_{pi})$	$(-GC_{pi})$
1T	0.52	2.12	4.38
2T	-0.69	-5.47	-3.21
3T	-0.47	-4.08	-1.82
4T	0.00	-3.75	-1.48
Surface	Roof angle q = 0.00		
	$G\ C_{pf}$	Net Press. W/	
		$(+GC_{pi})$	$(-GC_{pi})$
5T	0.40	1.38	3.65
6T	-0.29	-2.96	-0.69

+ / - Wind Pressure	64%

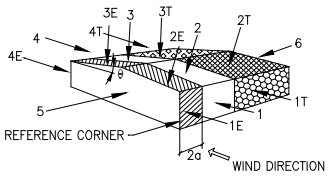


Load Case A (Transverse)

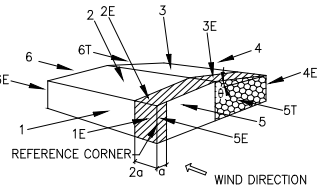


Load Case B (Longitudinal)

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)

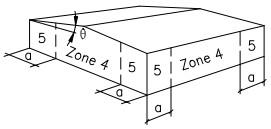
G C_p = 1.00 external pressure coefficie

see table below. (ASCE 7-16 30.3.2)

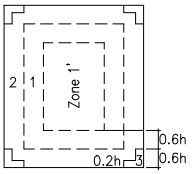
q = 18.43 °

$p_{overhang}$ = **-86.84** psf

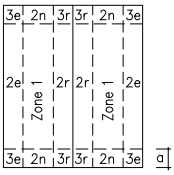
(ASCE 7-16 28.3.3)



Walls



Roof θ≤7°



Roof θ>7°

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
	1541	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		
	27	0.30	-2.50	0.30	-2.50	0.30	-1.80	0.99	-1.09	0.99	-1.38		

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*
	3.02	-15.61	3.02	-15.61	3.02	-50.84	3.02	-15.61	3.02	-20.64	3.02	-20.64
	Zone 3		Zone 3e		Zone 3r		Zone 4		Zone 5			
	Positive	*Negative*	*Positive*	*Negative*	*Positive*	*Negative*	*Positive*	*Negative*	*Positive*	*Negative*		
	3.02	-58.40	3.02	-58.40	3.02	-40.78	20.38	-22.89	20.38	-30.18		

*(Max Pressure **58.40** psf)*

LOAD CASE 'A' FACTORED LOADS	
$0.6*W_r = (Z_2 + Z_3) * 0.6 =$	**3.3 psf**
$0.6*W_{rE} = (Z_{2E} + Z_{3E}) * 0.6 =$	**6.0 psf**
$0.6*W_w = (Z_1 + Z_4) * 0.6 =$	**14.1 psf**
$0.6*W_{wE} = (Z_{1E} + Z4E) * 0.6 =$	**21.1 psf**

LOAD CASE 'B' FACTORED LOADS	
$0.6*W_r = (Z_2 + Z_3) * 0.6 =$	**4.8 psf**
$0.6*W_{rE} = (Z_{2E} + Z_{3E}) * 0.6 =$	**8.2 psf**
$0.6*W_w = (Z_5 + Z_6) * 0.6 =$	**10.4 psf**
$0.6*W_{wE} = (Z_{5E} + Z_{6E}) * 0.6 =$	**15.7 psf**

ROOF COMPONENTS FACTORED LOAD	
$0.6*Z_{r,c\&c} =$	**12.4 psf**

WALL COMPONENTS FACTORED LOAD	
$0.6*Z_{w,c\&c} =$	**13.7 psf**

OSB SEISMIC LOADING ANALYSIS

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

INPUT DATA

Typical floor height:	h =	**9**	*ft*
Typical floor weight:	w_x =	**93.6**	*kips*
Number of floors:	n =	**1**	
Importance factor (ASCE 11.5.1):	I_e =	1.00	
Design spectral response:	S_{DS} =	0.47	g
	S_{D1} =	0.22	g
Mapped spectral resp.:	S_1 =	0.15	g
Period Parameter, C_t: (ASCE Tab 12.8-2):	C_t =	**0.020**	
Resp. coefficient: (ASCE Tab. 12.2.1):	R =	6.5	
Seismic design category:	SDC =	D	
	h_n =	25.6	*ft*

DESIGN SUMMARY

$C_s = 1.2 * S_{DS} / (R / I_e)$ =	0.0870			**<= Applicable**
Period Parameter, x =	*0.75*	, ASCE Tab 12.8-2		
Period: $T_a = C_t (h_n)^x$ =	*0.23*	sec, ASCE 12.8.2.1		
$C_s < S_{D1} / [(R / I_e) T_a]$ =	*0.1502*	, ASCE Tab 12.8.1.1		**<= Not Applicable**
$C_s > 0.044 S_{DS} I_e$ =	*0.0207*	, ASCE Tab 12.8.1.1		**<= Not Applicable**
$C_s > 0.5 S_1 / (R / I_e)$ =	*0.0117*	, ASCE Tab 12.8.1.1		**<= Not Applicable**
k =	*1.81*	, (ASCE 12.8.3, page 91)		
V = C_s W =	***0.0870***	W		
0.7 * V =	***0.0609***	W		
W =	***94***	*kips, total*		

SEISMIC COMPONENT & ANCHORING ANALYSIS

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

$$w_{1,seismic} = MAX\left(0.4 I S_{DS} W_p \;, 0.1 W_p\right)$$ = ***0.2*** W_p = ***0.2*** psf ***<= USE FOR DIAPHRAGMS***

Where : W_p = **1.0** psf , I_e = 1.00

(CBC / IBC Tab. 1604.5 & ASCE 7 Tab. 1.5-2)

Out-of-plane seismic force for anchorage design

For seismic design category A & B, any diaphragm (ASCE 7 Sec. 12.11.2)

$$F_{anch,seismic} = MAX\left[0.4 S_{DS} I W_p \frac{\left(h+h_p\right)^2}{2h} \;,\; 0.1 W_p \frac{\left(h+h_p\right)^2}{2h} \;,\; 400 S_{DS} I \;,\; F_{\min}\right] =$$

Where : F_{min} = ***0.17*** plf, ***1.77*** W_p = ***188*** plf (Horizontal) ***<= Not Applicable***

(ASCE 7 Sec. 12.11.2 & 11.7.3)

For seismic design category C and above, flexible diaphragm (ASCE 7 Sec. 12.11.2.1)

$$F_{anch,seismic} = MAX\left[0.8 S_{DS} I W_p \frac{\left(h+h_p\right)^2}{2h} \;,\; 0.1 W_p \frac{\left(h+h_p\right)^2}{2h} \;,\; 400 S_{DS} I \;,\; F_{\min}\right] =$$

= ***3.54*** W_p = ***188*** plf (Horizontal) ***<= Applicable***

For connections (ASCE 7 Sec. 12.11.2.1)

$F_{conn,seismic}$ = *MAX [0.133 S_{DS} w_p , 0.5 w_p]* = ***0.5*** W_p = ***0.5*** plf (Horizontal)

GYP SEISMIC LOADING ANALYSIS

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

INPUT DATA

Typical floor height:	h =	9	*ft*
Typical floor weight:	w_x =	93.6	*kips*
Number of floors:	n =	1	
Importance factor (ASCE 11.5.1):	I_e =	1.00	
Design spectral response:	S_{DS} =	0.47	g
	S_{D1} =	0.22	g
Mapped spectral resp.:	S_1 =	0.15	g
Period Parameter, C_t: (ASCE Tab 12.8-2):	C_t =	0.020	
Resp. coefficient: (ASCE Tab. 12.2.1):	R =	2	
Seismic design category:	SDC =	D	
	h_n =	25.6	*ft*

DESIGN SUMMARY

$C_s = 1.2 * S_{DS} / (R / I_e)$ =	0.2827		**<= Applicable**
Period Parameter, x =	*0.75*	, ASCE Tab 12.8-2	
Period: $T_a = C_t (h_n)^x$ =	*0.23*	sec, ASCE 12.8.2.1	
$C_s < S_{D1} / [(R / I_e) T_a]$ =	*0.4882*	, ASCE Tab 12.8.1.1	**<= Not Applicable**
$C_s > 0.044 S_{DS} I_e$ =	*0.0207*	, ASCE Tab 12.8.1.1	**<= Not Applicable**
$C_s > 0.5 S_1 / (R / I_e)$ =	*0.0380*	, ASCE Tab 12.8.1.1	**<= Not Applicable**
k =	*1.81*	, (ASCE 12.8.3, page 91)	
$V = C_s W$ =	***0.2827***	W	
0.7 * V =	***0.1979***	W	
W =	***94***	*kips, total*	

SEISMIC COMPONENT & ANCHORING ANALYSIS

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

$$w_{1,seismic} = MAX\left(0.4 I S_{DS} W_p \;, 0.1 W_p\right)$$ = ***0.2*** W_p = ***0.2*** psf ***<= USE FOR DIAPHRAGMS***

Where : W_p = **1.0** psf , I_e = 1.00

(CBC / IBC Tab. 1604.5 & ASCE 7 Tab. 1.5-2)

Out-of-plane seismic force for anchorage design

For seismic design category A & B, any diaphragm (ASCE 7 Sec. 12.11.2)

$$F_{anch,seismic} = MAX\left[0.4 S_{DS} I W_p \frac{\left(h+h_p\right)^2}{2h} \;,\; 0.1 W_p \frac{\left(h+h_p\right)^2}{2h} \;,\; 400 S_{DS} I \;,\; F_{\min}\right] =$$

Where : F_{min} = ***0.17*** plf, ***1.77*** W_p = ***188*** plf (Horizontal) ***<= Not Applicable***

(ASCE 7 Sec. 12.11.2 & 11.7.3)

For seismic design category C and above, flexible diaphragm (ASCE 7 Sec. 12.11.2.1)

$$F_{anch,seismic} = MAX\left[0.8 S_{DS} I W_p \frac{\left(h+h_p\right)^2}{2h} \;,\; 0.1 W_p \frac{\left(h+h_p\right)^2}{2h} \;,\; 400 S_{DS} I \;,\; F_{\min}\right] =$$

= ***3.54*** W_p = ***188*** plf (Horizontal) ***<= Applicable***

For connections (ASCE 7 Sec. 12.11.2.1)

$F_{conn,seismic}$ = *MAX [0.133 S_{DS} w_p , 0.5 w_p]* = ***0.5*** W_p = ***0.5*** plf (Horizontal)

WIND / SEISMIC SHEAR FORCE CALCULATIONS:

From ASCE 7-16 Wind & Seismic Loading Analysis

Wall Line	Roof / Floor					Wall					Load above				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 (#)	$*C_s$ (Wp)	=	**Wind Force (kips)**	**Seismic Force (kips)**	**Lateral Control**
X1-1	9.6	55	4.3	16.0	26.0	20.1	12.0	9.0	16.0				0.06	=	**1.05**	**0.80**	**Wind**
X2-1	9.6	55	4.3	16.0	79.0	20.1	12.0	9.0	16.0				0.06	=	**4.38**	**6.06**	**Seismic**
	9.6	55	16.6	28.0	79.0	17.5	12.0	9.0	28.0				0.06	=			
X3-1	9.6	55	16.6	28.0	79.0	17.5	12.0	9.0	28.0				0.06	=	**6.19**	**7.21**	**Seismic**
	9.6	55	13.5	24.0	79.0	18.1	12.0	12.0	24.0				0.06	=			
X4-1	9.6	55	13.5	24.0	24.0	18.1	12.0	12.0	24.0				0.06	=	**2.86**	**1.17**	**Wind**
Y1-1	9.6	55	12.5	23.0	28.0	18.2	12.0	9.0	23.0				0.06	=	**2.32**	**1.22**	**Wind**
Y2-1	9.6	55	12.5	23.0	68.0	18.2	12.0	9.0	23.0				0.06	=	**4.97**	**5.61**	**Seismic**
	9.6	55	14.5	24.0	68.0	18.1	12.0	9.0	24.0				0.06	=			
Y3-1	9.6	55	14.5	24.0	68.0	18.1	12.0	9.0	24.0				0.06	=	**6.40**	**6.96**	**Seismic**
	9.6	55	13.8	34.0	68.0	16.9	12.0	10.5	34.0				0.06	=			
Y4-1	9.6	55	13.8	34.0	28.0	16.9	12.0	10.5	34.0				0.06	=	**3.75**	**1.84**	**Wind**
X1-S	9.6	55	11.0	22.0	50.0	18.4	12.0	16.4	22.0	0.0	0	0	0.06	=	**2.83**	**2.09**	**Wind**
X2-S	9.6	55	11.0	22.0	50.0	18.4	12.0	16.4	22.0	0.0	0	0	0.06	=	**2.83**	**2.09**	**Wind**
Y1-S	9.6	55	11.0	50.0	22.0	16.0	12.0	16.4	50.0	0	0	0	0.06	=	**5.92**	**2.43**	**Wind**
Y2-S	9.6	55	11.0	50.0	22.0	16.0	12.0	16.4	50.0	0	0	0	0.06	=	**5.92**	**2.43**	**Wind**

SHEAR WALL CALCULATIONS:

		X1-1	X2-1	X2-1	X3-1	X3-1	X4-1
Shear Wall Forces							
Number of Panels		1	1	1	1	1	2
Total length of wall		26.00 ft	25.00 ft	53.50 ft	24.00 ft	23.00 ft	24.00 ft
Total length of shear wall	L =	26.00 ft	25.00 ft	13.83 ft	24.00 ft	11.25 ft	3.50 ft
Total length of full ht seg.	L_w =	8.00 ft	19.08 ft	13.83 ft	21.00 ft	11.25 ft	3.50 ft
height of shear wall	H =	9.00 ft	10.50 ft	9.00 ft	10.50 ft	9.00 ft	11.83 ft
Maximum opening height	H' =	5.00 ft	5.00 ft	0.00 ft	5.00 ft	0.00 ft	0.00 ft
Total force at top of wall	V_1 =	1049 lbs	3512 lbs	2545 lbs	4695 lbs	2515 lbs	1428 lbs
Self weight	$w_{DL\ self}$ =	108 plf	126 plf	108 plf	126 plf	108 plf	142 plf
Applied dead load	$w_{DL\ above}$ =	51 plf	51 plf	272 plf	272 plf	272 plf	51 plf
Prefered OSB thickness	in	7/16	7/16	7/16	7/16	7/16	7/16
Prefered Gyp thickness	in	1/2	1/2	1/2	1/2	1/2	1/2
Wall Connected to Concrete	y/n =	Y	Y	Y	Y	Y	Y
Shear Wall Segments							
		4.00	6.75	13.83	6.75	11.25	3.50
		4.00	6.00		14.25		
			6.33				
Shear Transfer to Concrete							
	T =	Not Req'd	389 lbs	80 lbs	Not Req'd	730 lbs	4624 lbs
	1/2 Anchor Bolts @	72 '' O.C.	72 '' O.C.	72 '' O.C.	72 '' O.C.	60 '' O.C.	72 '' O.C.
	Provide:	Code Min.	Code Min.	Code Min.	Code Min.	A5	Code Min.
	Min # of 1/2 Anchor Bolts	(2) Min	(4) Min	(3) Min	(5) Min	(3) Min	(2) Min
	Load From Above	0.00	0.00	0.00	0.00	0.00	0.00
			Perp. Wall	**Perp. Wall**		**HD1**	**HD3**
Shear Resisting System							
Force Calculated		191.57	202.72	184.04	235.57	223.59	407.98
		OSB	**OSB**	**OSB**	**OSB**	**OSB**	**OSB**
	Min Shear Wall Segment:	2.57 ft	3.00 ft	2.57 ft	3.00 ft	2.57 ft	3.38 ft
	Provide: Va=	**SW1**	**SW1**	**SW1**	**SW1**	**SW1**	**SW2**
	Min Shear Wall Segment:						
	Provide: Va=						
Blocking / Nailing Framing Attachment							
Blocking Unit Shear		40 plf	140 plf	48 plf	196 plf	109 plf	119 plf
Blocking		**NONE**	**NONE**	**NONE**	**B1**	**NONE**	**NONE**
Nailing		**See SCHED**	**See SCHED**	**See SCHED**	**T1**	**See SCHED**	**See SCHED**
Unit Base Shear							
% of full height segments	%fh = L_w/L =	0.308	0.763	1.000	0.875	1.000	1.000
% of maximum opening height	%oh = H'/H =	0.556	0.476	0.000	0.476	0.000	0.000
Shear cap adj factor	SCAF =	0.68	0.91	1.00	0.95	1.00	1.00
Unit base shear	vbase V_1/L_w =	131 plf	184 plf	184 plf	224 plf	224 plf	408 plf
Effective unit base shear	vreq=v_{base}/SCAF=	192 plf	203 plf	184 plf	236 plf	224 plf	408 plf
Ovrtrn. mo. Ttl. length of wall	OTM =	13.8 k-ft	40.6 k-ft	22.9 k-ft	51.9 k-ft	22.6 k-ft	16.9 k-ft
Shear wall adjustment factor							
Resist moment total L. of wall	RM =	53.7 k-ft	55.3 k-ft	36.3 k-ft	114.6 k-ft	24.0 k-ft	1.2 k-ft
	r=	0.4444	0.8713	1.0000	0.9363	1.0000	1.0000
	C_O=	0.6842	0.9079	1.0000	0.9492	1.0000	1.0000

SHEAR WALL CALCULATIONS:

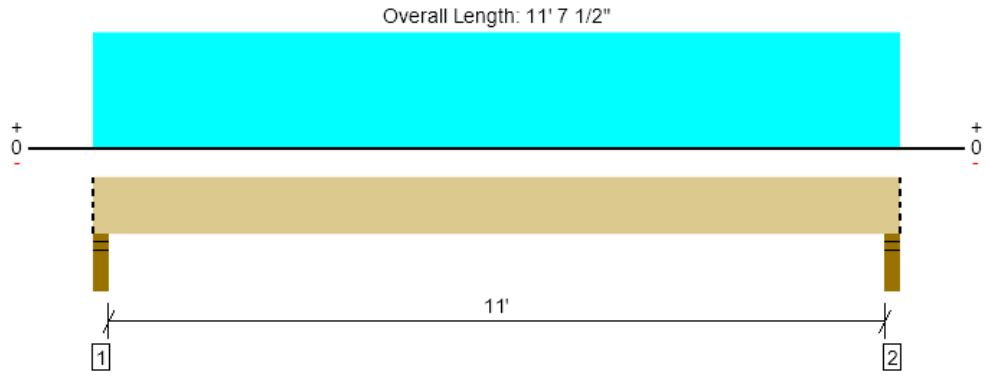
		Y1-1	Y2-1	Y2-1	Y3-1	Y3-1	Y4-1
Shear Wall Forces							
Number of Panels		1	1	1	1	1	2
Total length of wall		28.00 ft	40.33 ft	27.00 ft	40.50 ft	16.00 ft	28.00 ft
Total length of shear wall	L =	24.00 ft	19.75 ft	27.00 ft	40.50 ft	16.00 ft	3.00 ft
Total length of full ht seg.	L_w =	14.50 ft	19.75 ft	9.49 ft	25.80 ft	9.58 ft	3.00 ft
height of shear wall	H =	9.00 ft	12.00 ft	9.00 ft	12.00 ft	9.00 ft	9.00 ft
Maximum opening height	H' =	9.00 ft	0.00 ft	2.00 ft	8.00 ft	2.00 ft	0.00 ft
Total force at top of wall	V_1 =	2324 lbs	3791 lbs	1821 lbs	5077 lbs	1885 lbs	1876 lbs
Self weight	$w_{DL\ self}$ =	108 plf	144 plf	108 plf	144 plf	108 plf	108 plf
Applied dead load	$w_{DL\ above}$ =	51 plf	357 plf	51 plf	51 plf	51 plf	51 plf
Prefered OSB thickness	in	7/16	7/16	7/16	7/16	7/16	7/16
Prefered Gyp thickness	in	1/2	1/2	1/2	1/2	1/2	1/2
Wall Connected to Concrete	y/n =	Y	Y	Y	Y	Y	Y
Shear Wall Segments							
		3.25	19.75	3.16	3.90	3.25	3.00
		3.25		6.33	3.90	6.33	
		8.00			18.00		
Shear Transfer to Concrete							
	T =	689 lbs	Not Req'd	Not Req'd	Not Req'd	497 lbs	3500 lbs
	1/2 Anchor Bolts @	72 '' O.C.	72 '' O.C.	72 '' O.C.	72 '' O.C.	72 '' O.C.	
	Provide:	Code Min.	Code Min.	Code Min.	Code Min.	Code Min.	
	Min # of 1/2 Anchor Bolts	(3) Min	(4) Min	(2) Min	(5) Min	(2) Min	
	Load From Above	0.00	0.00	0.00	0.00	0.00	0.00
	Holdown	**HD1**				**Perp. Wall**	**HD3**
Shear Resisting System							
Force Calculated		287.14	191.93	191.93	268.23	196.80	625.25
		OSB	**OSB**	**OSB**	**OSB**	**OSB**	**P.F.**
	Min Shear Wall Segment:	2.57 ft	3.43 ft	2.57 ft	3.43 ft	2.57 ft	1.33 ft
	Provide: Va=	**SW1**	**SW1**	**SW1**	**SW1**	**SW1**	**3853**
	Min Shear Wall Segment:						
	Provide: Va=						
Blocking / Nailing Framing Attachment							
Blocking Unit Shear		83 plf	94 plf	67 plf	125 plf	118 plf	134 plf
Blocking		**NONE**	**NONE**	**NONE**	**NONE**	**NONE**	**NONE**
Nailing		**See SCHED**	**See SCHED**	**See SCHED**	**See SCHED**	**See SCHED**	**See SCHED**
Unit Base Shear							
% of full height segments	%fh = L_w/L =	0.604	1.000	0.351	0.637	0.599	1.000
% of maximum opening height	%oh = H'/H =	1.000	0.000	0.222	0.667	0.222	0.000
Shear cap adj factor	SCAF =	0.56	1.00	1.00	0.73	1.00	1.00
Unit base shear	vbase V_1/L_w =	160 plf	192 plf	192 plf	197 plf	197 plf	625 plf
Effective unit base shear	vreq=v_{base}/SCAF=	287 plf	192 plf	192 plf	268 plf	197 plf	625 plf
Ovrtrn. mo. Ttl. length of wall	OTM =	37.5 k-ft	45.5 k-ft	16.4 k-ft	83.0 k-ft	17.0 k-ft	16.9 k-ft
Shear wall adjustment factor							
Resist moment total L. of wall	RM =	45.8 k-ft	97.7 k-ft	58.0 k-ft	159.9 k-ft	20.4 k-ft	0.7 k-ft
	r=	0.6042	1.0000	0.7092	0.7247	0.8704	1.0000
	C_O=	0.5581	1.0000	1.2758	0.7337	1.1544	1.0000

SHEAR WALL CALCULATIONS:

		X1-S	X2-S	Y1-S	Y2-S		
Shear Wall Forces							
Number of Panels		1	1	2	1		
Total length of wall		50.00 ft	50.00 ft	22.00 ft	22.00 ft		
Total length of shear wall	L =	43.00 ft	50.00 ft	5.00 ft	22.00 ft		
Total length of full ht seg.	L_w =	16.00 ft	16.00 ft	5.00 ft	12.00 ft		
height of shear wall	H =	16.42 ft	16.42 ft	16.42 ft	16.42 ft		
Maximum opening height	H' =	0.00 ft	5.00 ft	0.00 ft	5.00 ft		
Total force at top of wall	V_1 =	2826 lbs	2826 lbs	2961 lbs	5922 lbs		
Self weight	$w_{DL\ self}$ =	197 plf	197 plf	197 plf	197 plf		
Applied dead load	$w_{DL\ above}$ =	51 plf	51 plf	51 plf	51 plf		
Prefered OSB thickness	in	7/16	7/16	7/16	7/16		
Prefered Gyp thickness	in	1/2	1/2	1/2	1/2		
Wall Connected to Concrete	y/n =	Y	Y	Y	Y		
Shear Wall Segments							
		8.00	8.00	5.00	6.00		
		8.00	8.00		6.00		
Shear Transfer to Concrete							
	T =	Not Req'd	Not Req'd	9351 lbs	5102 lbs		
	1/2 Anchor Bolts @	72 '' O.C.	72 '' O.C.	72 '' O.C.	48 '' O.C.		
	Provide:	Code Min.	Code Min.	Code Min.	A4		
	Min # of 1/2 Anchor Bolts	(3) Min	(3) Min	(3) Min	(6) Min		
	Load From Above	0.00	0.00	0.00	0.00		
				HD6	**HD3**		
Shear Resisting System							
Force Calculated		176.61	176.61	592.17	493.48		
		OSB	**OSB**	**OSB**	**OSB**		
	Min Shear Wall Segment:	4.69 ft	4.69 ft	4.69 ft	4.69 ft		
	Provide: Va=	**SW1**	**SW1**	**SW3**	**SW2**		
	Min Shear Wall Segment:						
	Provide: Va=						
Blocking / Nailing Framing Attachment							
Blocking Unit Shear		57 plf	57 plf	269 plf	269 plf		
Blocking		**NONE**	**NONE**	**B1**	**B1**		
Nailing		**See SCHED**	**See SCHED**	**T1**	**T1**		
Unit Base Shear							
% of full height segments	%fh = L_w/L =	0.372	0.320	1.000	0.545		
% of maximum opening height	%oh = H'/H =	0.000	0.305	0.000	0.305		
Shear cap adj factor	SCAF =	1.00	1.00	1.00	1.00		
Unit base shear	vbase V_1/L_w =	177 plf	177 plf	592 plf	493 plf		
Effective unit base shear	vreq=v_{base}/SCAF=	177 plf	177 plf	592 plf	493 plf		
Ovrtrn. mo. Ttl. length of wall	OTM =	46.4 k-ft	46.4 k-ft	48.6 k-ft	97.2 k-ft		
Shear wall adjustment factor							
Resist moment total L. of wall	RM =	229.3 k-ft	310.1 k-ft	3.1 k-ft	60.0 k-ft		
	r=	0.9999	0.6071	1.0000	0.7976		
	C_O=	2.6867	1.0625	1.0000	1.0409		

Shop, RB1

1 piece(s) 6 3/4" x 10 1/2" 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8027 @ 2 1/4"	15820 (3.75")	Passed (51%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	6387 @ 1' 2 1/4"	14399	Passed (44%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	21849 @ 5' 9 3/4"	28527	Passed (77%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.377 @ 5' 9 3/4"	0.563	Passed (L/358)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.425 @ 5' 9 3/4"	0.750	Passed (L/318)	--	1.0 D + 1.0 S (All Spans)

Member Length : 11' 7 1/2"
System : Roof
Member Type : Drop 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.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 11' 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 - Stud wall - DF	3.75"	3.75"	1.90"	907	7120	8027	Blocking
2 - Stud wall - DF	3.75"	3.75"	1.90"	907	7120	8027	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)	11' 8" o/c	
Bottom Edge (Lu)	11' 8" 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 11' 7 1/2"	N/A	17.2	--	
1 - Uniform (PSF)	0 to 11' 7 1/2" (Front)	8' 2"	17.0	150.0	Default Load

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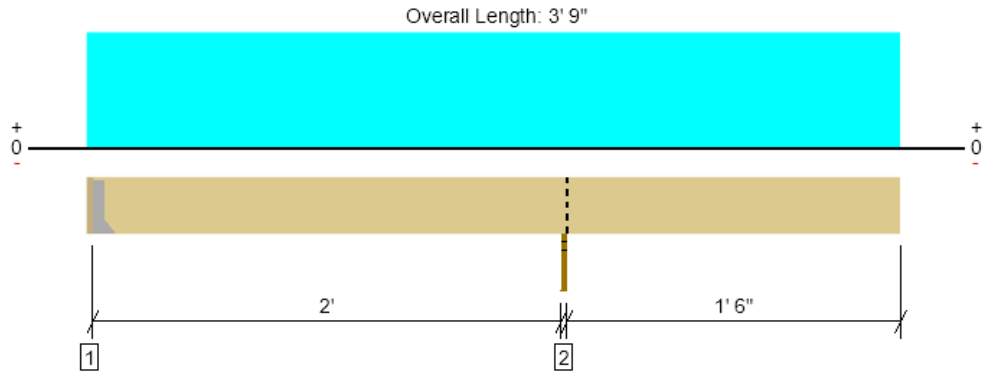
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Shop, OUTLOOKERS

1 piece(s) 2 x 6 DF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1064 @ 2' 2 1/4"	1406 (1.50")	Passed (76%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	368 @ 1' 8"	1139	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-408 @ 2' 2 1/4"	975	Passed (42%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.028 @ 3' 9"	0.200	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.030 @ 3' 9"	0.208	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 3' 7 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 (0.2") and TL (2L/180).
- Right 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.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Hanger on 5 1/2" DF beam	1.50"	Hanger[1]	1.50"	19	258	277	See note [1]
2 - Stud wall - DF	1.50"	1.50"	1.50"	108	956	1064	Blocking

- 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)	3' 8" o/c	
Bottom Edge (Lu)	3' 8" 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
1 - 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 3' 9"	24"	17.0	150.0	Default Load

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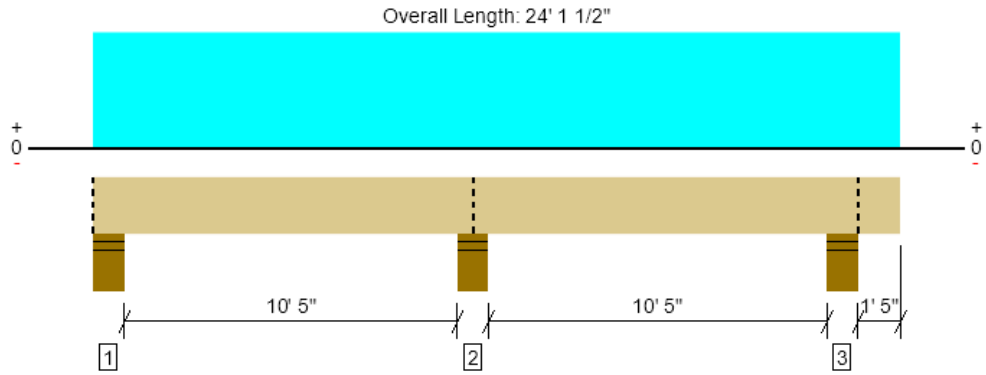
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, RB2

1 piece(s) 6 3/4" x 10 1/2" 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	20633 @ 11' 4 1/4"	31641 (7.50")	Passed (65%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	8515 @ 10' 2"	14399	Passed (59%)	1.15	1.0 D + 1.0 S (Adj Spans)
Pos Moment (Ft-lbs)	14686 @ 4' 10 3/4"	28527	Passed (51%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-22463 @ 11' 4 1/4"	21990	Passed (102%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.204 @ 5' 5 1/8"	0.543	Passed (L/637)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.223 @ 5' 4 3/4"	0.724	Passed (L/583)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 24' 1 1/2"
System : Roof
Member Type : Drop Beam
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).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 8' 9 1/2".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 5' 5 3/8".
- 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	7.50"	7.50"	1.76"	780	6663	7442	Blocking
2 - Stud wall - DF	7.50"	7.50"	4.89"	2295	18338	20633	Blocking
3 - Stud wall - DF	7.50"	7.50"	2.29"	1032	8630	9662	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)	24' 2" o/c	
Bottom Edge (Lu)	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 24' 1 1/2"	N/A	17.2	--	
1 - Uniform (PSF)	0 to 24' 1 1/2" (Front)	9'	17.0	150.0	Default Load

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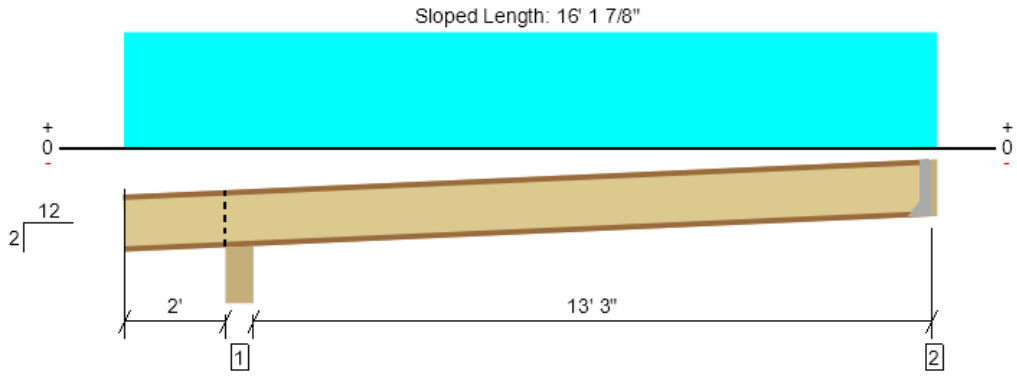
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, Roof: Joist RIGHT DECK
1 piece(s) 11 7/8" TJI® 360 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1485 @ 15' 9 3/4"	1485 (2.62")	Passed (100%)	1.15	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	1485 @ 15' 9 3/4"	1961	Passed (76%)	1.15	1.0 D + 1.0 S (Alt Spans)
Moment (Ft-lbs)	4945 @ 9' 1 13/16"	7107	Passed (70%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.440 @ 9' 15/16"	0.686	Passed (L/374)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.489 @ 9' 1"	0.915	Passed (L/337)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 16' 2 3/8"
System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 2/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/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 - Beveled Plate - DF	6.75"	6.75"	3.50"	212	1848	2060	Blocking
2 - Hanger on 11 7/8" DF beam	1.50"	Hanger[1]	2.62" / - [2]	154	1359	1513	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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 1" o/c	
Bottom Edge (Lu)	9' 7" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- 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	Connector not found	N/A	N/A	N/A	N/A	

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

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 15' 11 1/4"	16"	17.0	150.0	Default Load

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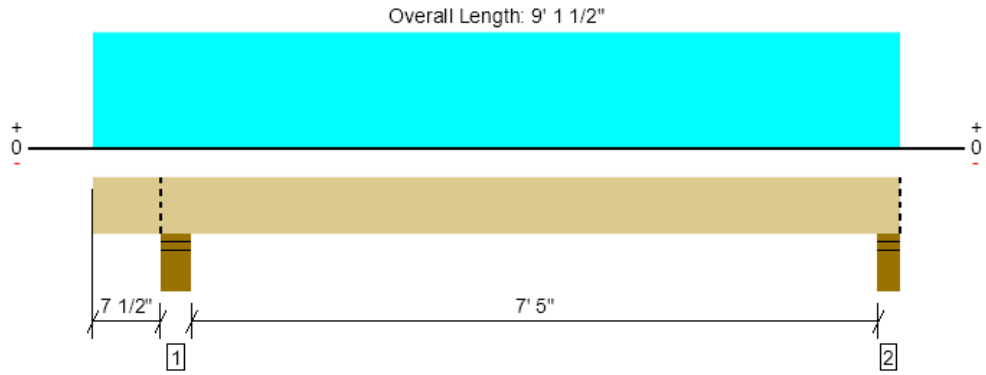
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, RB3

1 piece(s) 5 1/8" x 7 1/2" 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4984 @ 8' 9 1/2"	17617 (5.50")	Passed (28%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	3707 @ 8' 1/2"	7809	Passed (47%)	1.15	1.0 D + 1.0 S (Alt Spans)
Pos Moment (Ft-lbs)	8943 @ 4' 10 3/4"	11051	Passed (81%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-518 @ 11 1/4"	8518	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.272 @ 4' 10 1/2"	0.393	Passed (L/346)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.305 @ 4' 10 1/2"	0.524	Passed (L/309)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 9' 1 1/2"
System : Roof
Member Type : Drop Beam
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).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 7' 9 1/2".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 1' 9/16".
- 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	7.50"	7.50"	1.81"	632	5167	5798	Blocking
2 - Stud wall - DF	5.50"	5.50"	1.56"	540	4444	4984	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)	9' 2" o/c	
Bottom Edge (Lu)	9' 2" 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 9' 1 1/2"	N/A	9.3	--	
1 - Uniform (PSF)	0 to 9' 1 1/2" (Front)	7'	17.0	150.0	Default Load

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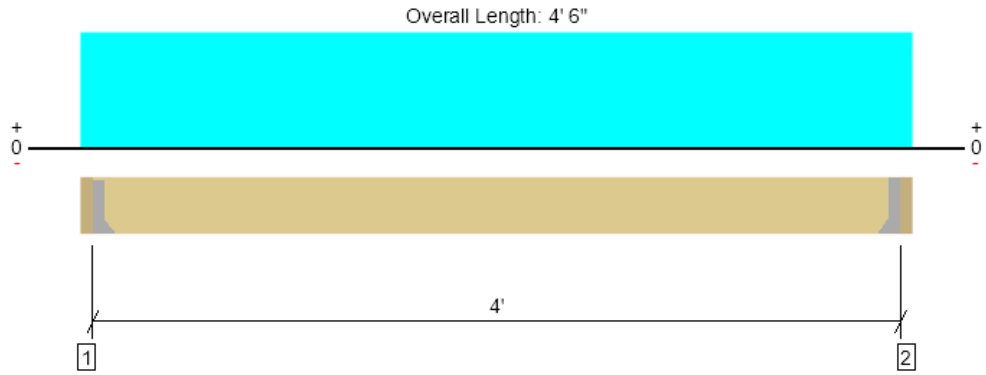
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

RESIDENCE, LADDER FRAMING

1 piece(s) 2 x 6 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	445 @ 3"	1406 (1.50")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	343 @ 8 1/2"	1139	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	445 @ 2' 3"	975	Passed (46%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.035 @ 2' 3"	0.200	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.039 @ 2' 3"	0.267	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4'
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).
- 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.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Hanger on 5 1/2" DF beam	3.00"	Hanger[1]	1.50"	51	450	501	See note [1]
2 - Hanger on 5 1/2" DF beam	3.00"	Hanger[1]	1.50"	51	450	501	See note [1]

- 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)	4' o/c	
Bottom Edge (Lu)	4' 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
1 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	
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 4' 6"	16"	17.0	150.0	Default Load

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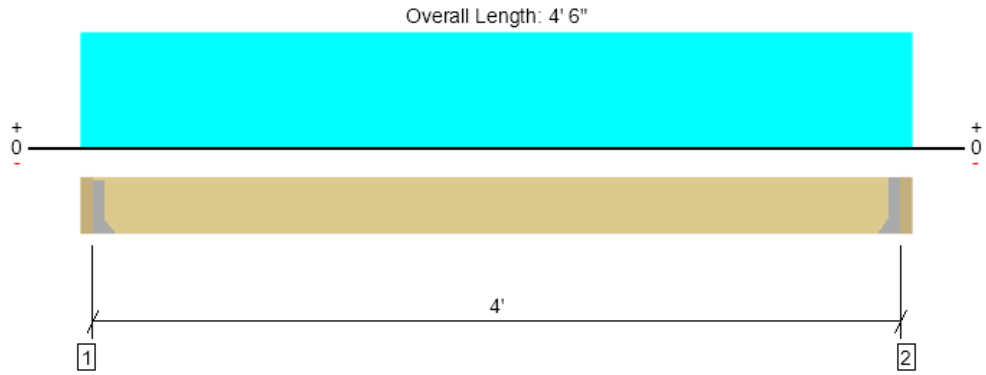
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, FB1

2 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	804 @ 3"	3938 (1.50")	Passed (20%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	406 @ 1' 2 7/8"	7897	Passed (5%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	804 @ 2' 3"	17848	Passed (5%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.003 @ 2' 3"	0.100	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.005 @ 2' 3"	0.200	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 4'
System : Floor
Member Type : Drop Beam
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.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 11 7/8" DF beam	3.00"	Hanger[1]	1.50"	227	675	902	See note [1]
2 - Hanger on 11 7/8" DF beam	3.00"	Hanger[1]	1.50"	227	675	902	See note [1]

- 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)	4' o/c	
Bottom Edge (Lu)	4' 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
1 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d	
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	3" to 4' 3"	N/A	12.1	--	
1 - Uniform (PSF)	0 to 4' 6" (Front)	7' 6"	12.0	40.0	Default Load

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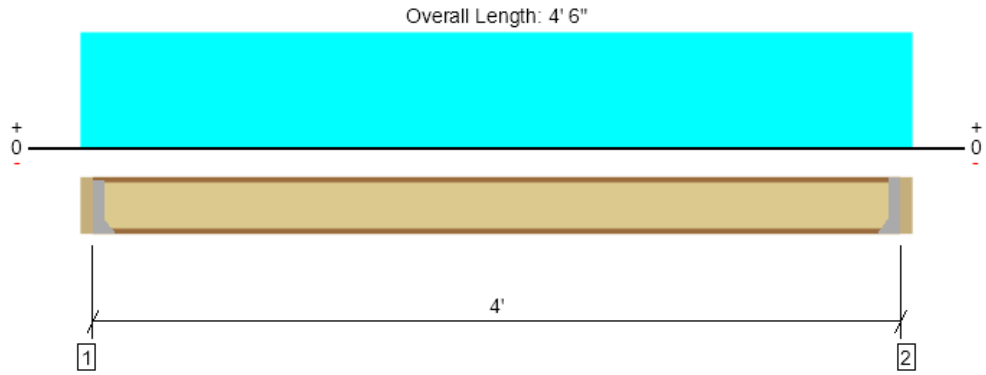
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, Floor: Joist UPPER

1 piece(s) 11 7/8" 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	208 @ 3"	910 (1.75")	Passed (23%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	208 @ 3"	1560	Passed (13%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	208 @ 2' 3"	3160	Passed (7%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.004 @ 2' 3"	0.100	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.005 @ 2' 3"	0.200	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	69	40	Passed	--	--

Member Length : 4'
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
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 11 7/8" DF beam	3.00"	Hanger[1]	1.75" / - [2]	54	180	234	See note [1]
2 - Hanger on 11 7/8" DF beam	3.00"	Hanger[1]	1.75" / - [2]	54	180	234	See note [1]

- 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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

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

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

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	IUS1.81/11.88	2.00"	N/A	10-10dx1.5	2-Strong-Grip	
2 - Face Mount Hanger	IUS1.81/11.88	2.00"	N/A	10-10dx1.5	2-Strong-Grip	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 4' 6"	24"	12.0	40.0	Default Load

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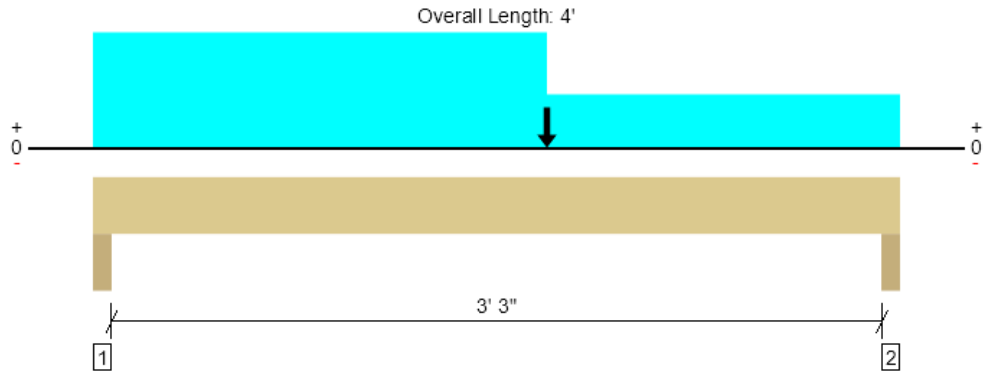
ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, HDR1

2 piece(s) 1 3/4" x 9 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8096 @ 3"	11813 (4.50")	Passed (69%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4230 @ 2' 10 1/4"	7074	Passed (60%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6779 @ 2' 1 3/4"	12884	Passed (53%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.049 @ 1' 11 3/4"	0.117	Passed (L/864)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.055 @ 1' 11 11/16"	0.175	Passed (L/765)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4'
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	Floor Live	Snow	Factored	
1 - Trimmer - DF	4.50"	4.50"	3.08"	977	688	7119	8096	None
2 - Trimmer - DF	4.50"	4.50"	2.44"	714	417	5679	6394	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' o/c	
Bottom Edge (Lu)	4' 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 4'	N/A	9.4	--	--	
1 - Uniform (PSF)	0 to 2' 3"	22'	17.0	-	150.0	Default Load
2 - Point (lb)	2' 3"	N/A	275	430	2420	
3 - Uniform (PSF)	2' 3" to 4'	11' 3"	17.0	-	150.0	Default Load
4 - Uniform (PSF)	0 to 2' 3"	7' 6"	12.0	40.0	-	Default Load

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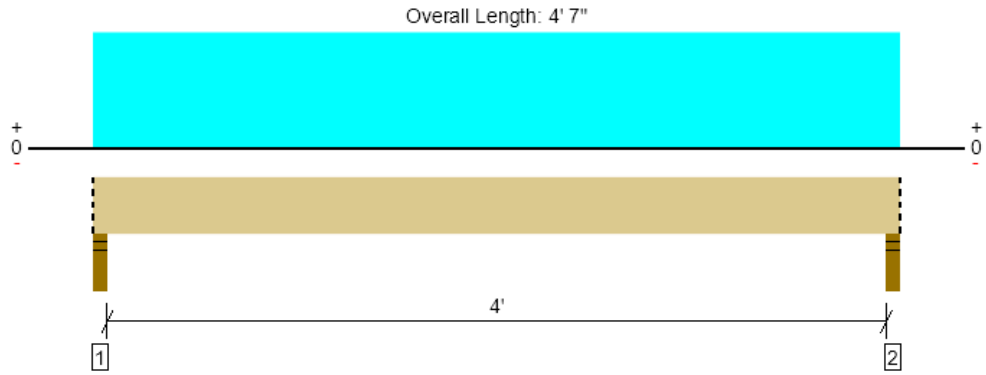
ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, RB4

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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2318 @ 2"	7656 (3.50")	Passed (30%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1222 @ 1' 1"	7265	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2284 @ 2' 3 1/2"	13541	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.020 @ 2' 3 1/2"	0.213	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.023 @ 2' 3 1/2"	0.283	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4' 7"
System : Roof
Member Type : Drop 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	3.50"	3.50"	1.50"	256	2063	2318	Blocking
2 - Stud wall - DF	3.50"	3.50"	1.50"	256	2063	2318	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' 7" o/c	
Bottom Edge (Lu)	4' 7" 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' 7"	N/A	9.7	--	
1 - Uniform (PSF)	0 to 4' 7" (Front)	6'	17.0	150.0	Default Load

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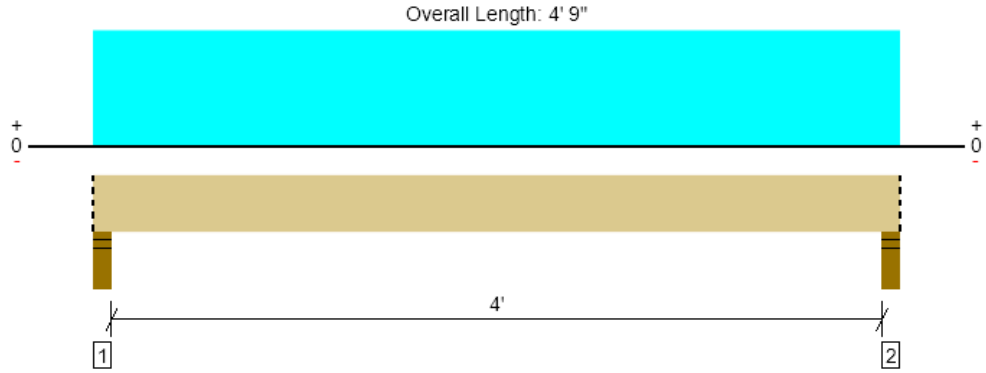
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

RESIDENCE, RB5

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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4196 @ 3"	15469 (4.50")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2135 @ 1' 2"	6810	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3989 @ 2' 4 1/2"	6937	Passed (58%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.023 @ 2' 4 1/2"	0.213	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.025 @ 2' 4 1/2"	0.283	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4' 9"
System : Roof
Member Type : Drop 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.
- 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 - Stud wall - DF	4.50"	4.50"	1.50"	455	3741	4196	Blocking
2 - Stud wall - DF	4.50"	4.50"	1.50"	455	3741	4196	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' 9" o/c	
Bottom Edge (Lu)	4' 9" 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' 9"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 4' 9" (Front)	10' 6"	17.0	150.0	Default Load

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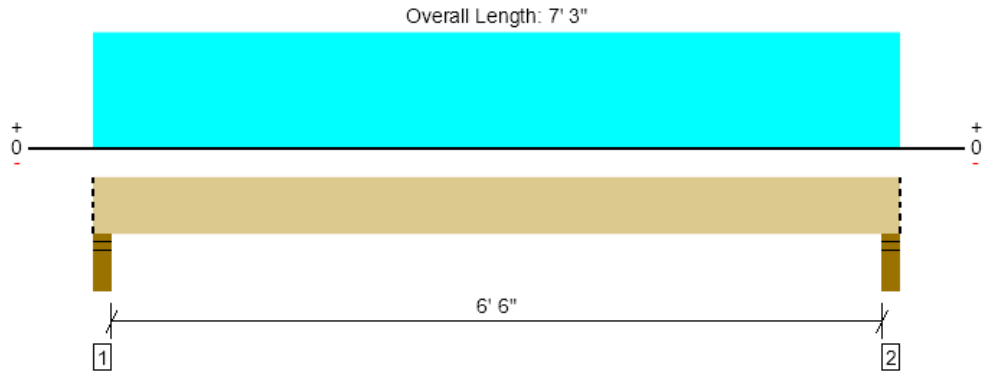
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

RESIDENCE, RB6

2 piece(s) 1 3/4" x 9 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6391 @ 3"	9844 (4.50")	Passed (65%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4371 @ 1' 1 3/4"	7074	Passed (62%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	10041 @ 3' 7 1/2"	12884	Passed (78%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.191 @ 3' 7 1/2"	0.338	Passed (L/424)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.214 @ 3' 7 1/2"	0.450	Passed (L/378)	--	1.0 D + 1.0 S (All Spans)

Member Length : 7' 3"
System : Roof
Member Type : Drop 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	4.50"	4.50"	2.92"	681	5709	6391	Blocking
2 - Stud wall - DF	4.50"	4.50"	2.92"	681	5709	6391	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)	7' 3" o/c	
Bottom Edge (Lu)	7' 3" 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 7' 3"	N/A	9.4	--	
1 - Uniform (PSF)	0 to 7' 3" (Front)	10' 6"	17.0	150.0	Default Load

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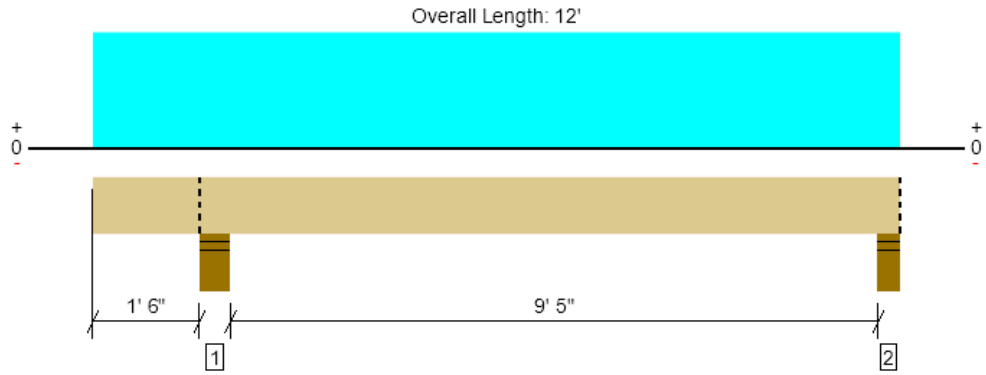
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

RESIDENCE, RB7

1 piece(s) 5 1/8" x 10 1/2" 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8698 @ 11' 8"	17617 (5.50")	Passed (49%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	6575 @ 3'	10933	Passed (60%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	19670 @ 6' 10"	21660	Passed (91%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-2765 @ 1' 9 3/4"	16696	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.343 @ 6' 9 1/4"	0.493	Passed (L/345)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.383 @ 6' 9 1/4"	0.657	Passed (L/309)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 12'
System : Roof
Member Type : Drop Beam
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).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 9' 8 1/16".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 2' 1 3/4".
- 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	7.50"	7.50"	3.63"	1264	10359	11624	Blocking
2 - Stud wall - DF	5.50"	5.50"	2.72"	933	7766	8698	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)	12' o/c	
Bottom Edge (Lu)	12' 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 12'	N/A	13.1	--	
1 - Uniform (PSF)	0 to 12' (Front)	10'	17.0	150.0	Default Load

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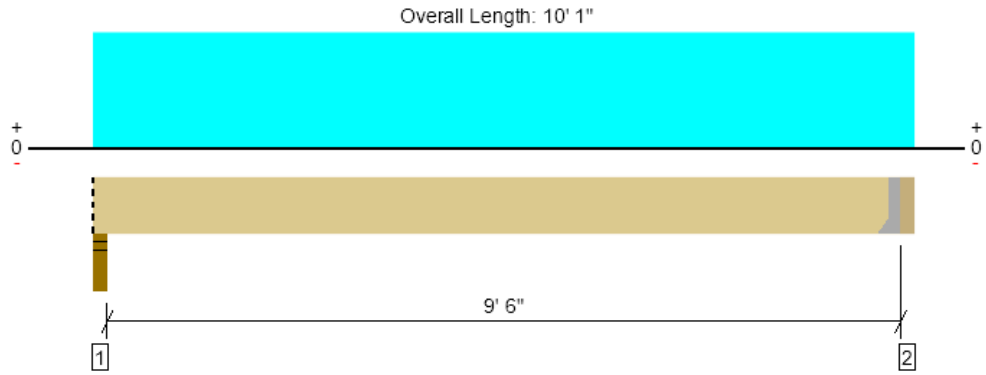
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, FB2

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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1738 @ 9' 9 1/2"	5156 (1.50")	Passed (34%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1452 @ 9'	6810	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4183 @ 4' 11 3/4"	6937	Passed (60%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.113 @ 4' 11 3/4"	0.241	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.137 @ 4' 11 3/4"	0.481	Passed (L/846)	--	1.0 D + 1.0 S (All Spans)

Member Length : 9' 9 1/2"
System : Floor
Member Type : Drop Beam
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.
- 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 - Stud wall - DF	3.50"	3.50"	1.50"	305	1494	1799	Blocking
2 - Hanger on 9 1/2" DF beam	3.50"	Hanger[1]	1.50"	309	1531	1840	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)	9' 10" o/c	
Bottom Edge (Lu)	9' 10" 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	HU68	2.50"	N/A	14-10d	6-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 9 1/2"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 10' 1" (Front)	4'	12.0	75.0	Default Load

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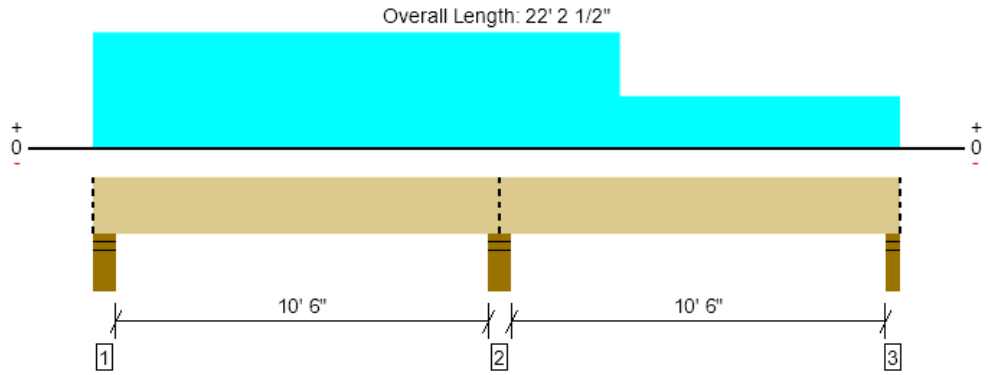
ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, FB3

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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7262 @ 11' 2 1/4"	12856 (5.50")	Passed (56%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3330 @ 10'	8244	Passed (40%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-7386 @ 11' 2 1/4"	10166	Passed (73%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.111 @ 5' 4 1/16"	0.271	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.129 @ 5' 3 3/4"	0.543	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 22' 2 1/2"
System : Floor
Member Type : Drop Beam
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.
- 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 - Stud wall - DF	5.50"	5.50"	1.50"	464	2562	3026	Blocking
2 - Stud wall - SPF	5.50"	5.50"	3.11"	1189	6073	7262	Blocking
3 - Stud wall - DF	3.50"	3.50"	1.50"	210	1068	1278	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' 3" o/c	
Bottom Edge (Lu)	22' 3" 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' 2 1/2"	N/A	16.0	--	
1 - Uniform (PSF)	0 to 14' 6" (Front)	7'	12.0	75.0	Default Load
2 - Uniform (PSF)	14' 6" to 22' 2 1/2" (Front)	3' 1 1/2"	12.0	75.0	Default Load

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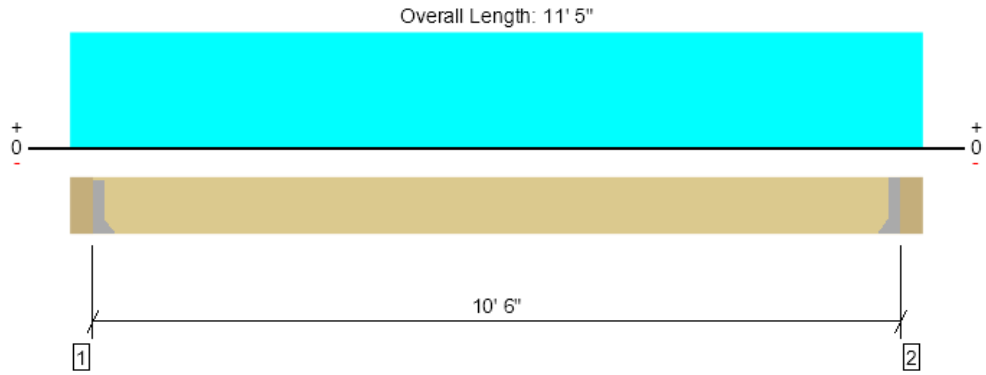
ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, FB4

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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2011 @ 5 1/2"	5156 (1.50")	Passed (39%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1707 @ 1' 3"	6810	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	5278 @ 5' 8 1/2"	6937	Passed (76%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.171 @ 5' 8 1/2"	0.262	Passed (L/738)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.205 @ 5' 8 1/2"	0.525	Passed (L/615)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 6"
System : Floor
Member Type : Drop Beam
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.
- 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 - Hanger on 9 1/2" DF beam	5.50"	Hanger[1]	1.50"	361	1820	2180	See note [1]
2 - Hanger on 9 1/2" DF beam	5.50"	Hanger[1]	1.50"	361	1820	2180	See note [1]

- 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)	10' 6" o/c	
Bottom Edge (Lu)	10' 6" 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
1 - Face Mount Hanger	HU610	2.50"	N/A	18-10dx1.5	8-10d	
2 - Face Mount Hanger	HU68	2.50"	N/A	14-16d	6-16d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	5 1/2" to 10' 11 1/2"	N/A	13.2	--	
1 - Uniform (PSF)	0 to 11' 5" (Front)	4' 3"	12.0	75.0	Default Load

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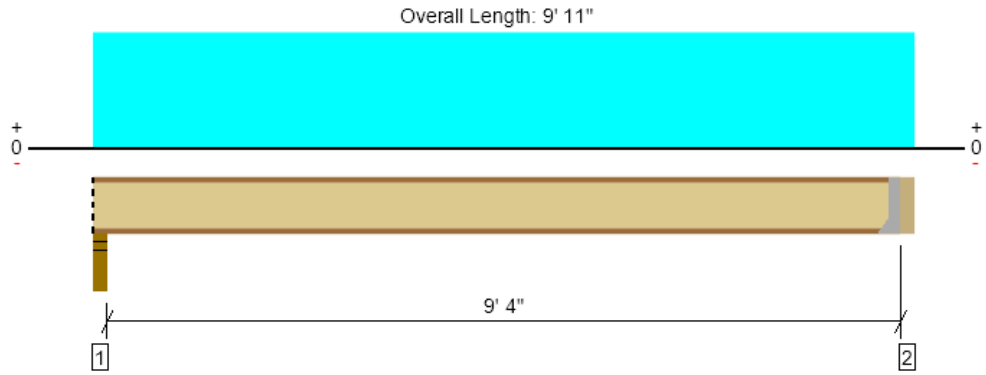
ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, Floor: Joist MAIN

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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	490 @ 9' 7 1/2"	910 (1.75")	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	490 @ 9' 7 1/2"	1220	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1153 @ 4' 11"	2500	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.086 @ 4' 11"	0.235	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.112 @ 4' 11"	0.471	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	47	40	Passed	--	--

Member Length : 9' 7 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
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - DF	3.50"	3.50"	1.75"	118	393	511	Blocking
2 - Hanger on 9 1/2" DF beam	3.50"	Hanger[1]	1.75" / - [2]	120	400	520	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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 8" o/c	
Bottom Edge (Lu)	9' 8" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- 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	IUS1.81/9.5	2.00"	N/A	8-10dx1.5	2-Strong-Grip	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 9' 11"	24"	12.0	40.0	Default Load

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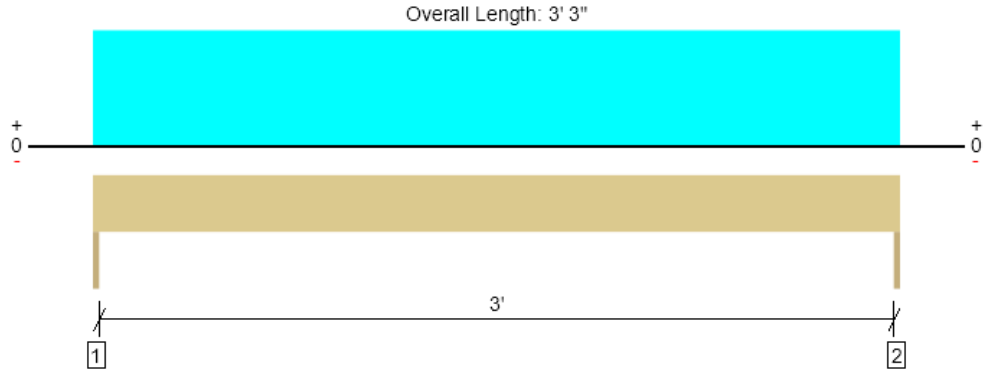
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, CRAWL HDR

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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	802 @ 0	3281 (1.50")	Passed (24%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	360 @ 10 3/4"	3885	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	652 @ 1' 7 1/2"	4492	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.003 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.003 @ 1' 7 1/2"	0.162	Passed (L/999+)	--	1.0 D + 1.0 L (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.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Trimmer - DF	1.50"	1.50"	1.50"	195	607	802	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	195	607	802	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)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 3' 3"	9' 4"	12.0	40.0	Default Load

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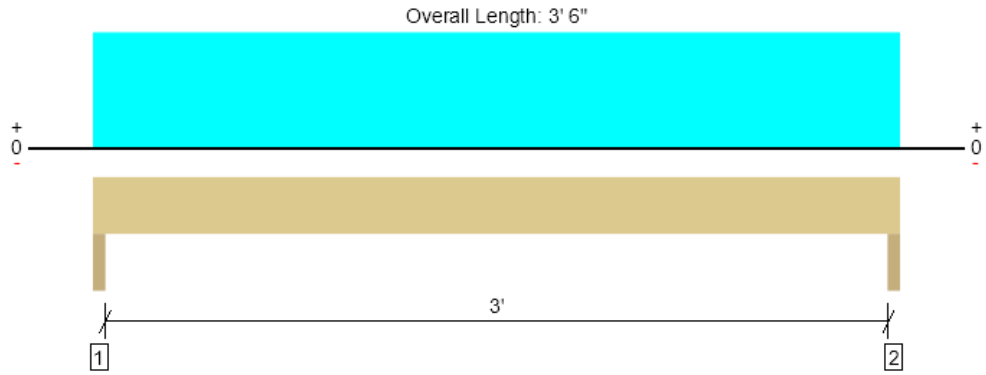
RESIDENCE, CRAWL HDR BRG. WALL

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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4302 @ 1 1/2"	6563 (3.00")	Passed (66%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1792 @ 1' 1/4"	4468	Passed (40%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3246 @ 1' 9"	5166	Passed (63%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.014 @ 1' 9"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.017 @ 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"	1.97"	627	653	3675	4302	None
2 - Trimmer - DF	3.00"	3.00"	1.97"	627	653	3675	4302	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"	9' 4"	12.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 3' 6"	14'	17.0	-	150.0	Default Load

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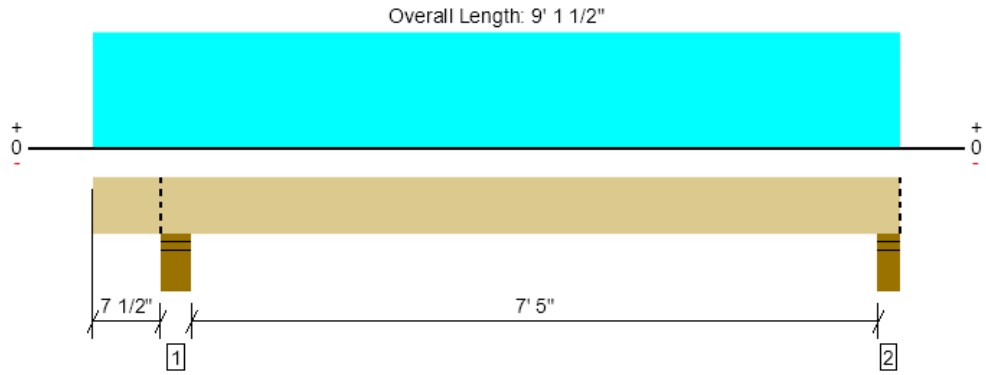
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

RESIDENCE, RB3 DF

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



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5012 @ 8' 9 1/2"	18906 (5.50")	Passed (27%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	3333 @ 7' 8 1/2"	8244	Passed (40%)	1.15	1.0 D + 1.0 S (Alt Spans)
Moment (Ft-lbs)	8993 @ 4' 10 3/4"	10166	Passed (88%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.098 @ 4' 10 1/2"	0.393	Passed (L/967)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.110 @ 4' 10 1/2"	0.524	Passed (L/858)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 9' 1 1/2"
System : Roof
Member Type : Drop Beam
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).
- 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 - Stud wall - DF	7.50"	7.50"	1.70"	664	5167	5831	Blocking
2 - Stud wall - DF	5.50"	5.50"	1.50"	568	4444	5012	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)	9' 2" o/c	
Bottom Edge (Lu)	9' 2" 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 9' 1 1/2"	N/A	16.0	--	
1 - Uniform (PSF)	0 to 9' 1 1/2" (Front)	7'	17.0	150.0	Default Load

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Trevor Steelsmith 05/16/24 Snake River Engineering (208) 453-6512 trevor@snakeriverengineering.com	

Weyerhaeuser

WOOD HEADER ALLOWABLE LOADS (kips/ft)

Load Duration Factor: 1.15
LVL Grade: 2.0E
Top Chord Bracing: 2'-0" O.C.
Max TL Deflection: L/240, 0.75in
Repetitive Stress Increase: No

	Header Span										
Header Type	**2'**	**3'**	**4'**	**5'**	**6'**	**8'**	**10'**	**12'**	**14'**	**16'**	**18'**
(2) 2x4 DF Stud	1.15	0.69	0.29	0.22	0.12	NA	NA	NA	NA	NA	NA
(3) 2x4 DF Stud	1.84	1.04	0.46	0.35	0.18	NA	NA	NA	NA	NA	NA
(2) 2x6 DF #2	3.34	1.44	0.83	0.48	0.36	0.20	0.12	NA	NA	NA	NA
(3) 2x6 DF #2	5.06	2.19	1.27	0.72	0.55	0.30	0.18	0.13	NA	NA	NA
(2) 2x8 DF #2	5.41	2.30	1.27	0.80	0.59	0.32	0.20	0.14	0.09	NA	NA
(3) 2x8 DF #2	8.74	3.39	2.19	1.18	0.97	0.53	0.33	0.23	0.16	0.12	NA
(2) 2x10 DF #2	8.05	3.39	1.96	1.18	0.89	0.48	0.31	0.21	0.15	0.10	NA
(3) 2x10 DF #2	13.23	5.18	3.22	1.80	1.38	0.82	0.52	0.36	0.25	0.20	0.15
(2) 2x12 DF #2	10.81	4.83	2.65	1.60	1.15	0.67	0.41	0.29	0.21	0.15	0.12
(3) 2x12 DF #2	17.94	7.02	4.49	2.40	1.96	1.10	0.70	0.48	0.35	0.26	0.21
(2) 1-3/4x7-1/4 LVL	13.80	6.79	3.80	2.40	1.61	0.94	0.52	0.30	0.18	0.12	NA
(3) 1-3/4x7-1/4 LVL	20.70	10.47	5.64	3.50	2.53	1.38	0.79	0.45	0.28	0.17	NA
(2) 1-3/4x9-1/2 LVL	24.73	10.47	5.64	3.75	2.65	1.50	0.92	0.63	0.39	0.24	0.15
(3) 1-3/4x9-1/2 LVL	37.15	17.25	8.51	6.00	4.03	2.30	1.38	0.95	0.60	0.37	0.22
(2) 1-3/4x11-7/8 LVL	40.71	17.25	8.86	6.00	4.49	2.53	1.61	1.12	0.82	0.53	0.32
(3) 1-3/4x11-7/8 LVL	61.30	24.15	13.23	8.75	6.67	3.80	2.42	1.61	1.15	0.79	0.48
(2) 1-3/4x14 LVL	56.47	24.15	12.54	8.00	5.75	3.45	2.19	1.50	1.13	0.86	0.54
(3) 1-3/4x14 LVL	85.10	28.75	18.86	12.00	8.63	5.29	3.34	2.30	1.61	1.27	0.81

Header Calculations (H10)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	10	0	0	2.83		
							1,704.0 plf
Dead Load	-	*170.0*	0.0	0.0	34.0	*204.0 plf*	
Live / Snow Load	0	*1500.0*	0.0	0.0	-	*1,500.0 plf*	

Description:	*3.0 ft Opening*							
Header Callout	(2)2x8 DF-L No. 2							
Trimmers	(1) 2x6 DF-L No. 2							
King Studs	(1) 2x6 DF-L No. 2							
Wood Design								
Species	*DF-L*							
Grade	*No. 2*							
Width	*3.00 in*							
Depth	*7.25 in*							
Reaction								
Dead Load	306 lbs							
Live Load	2,250 lbs							
Load								
l_u	*3.0 ft*							
l_e	*6.2 ft*							
Adjustment Factors								
Cd	1.15							
CF	1.2							
Material Properties								
Fb	900 psi							
Fv	180 psi							
E	1,600,000 psi							
Emin	580,000 psi							
Calculated Prop.								
A	21.75 in^2							
I	95.27 in^4							
S	26.28 in^3							
RB	7.73							
Emin'	580,000 psi							
FbE	11,650 psi							
Fb*	1,242 psi							
CL	1							
Shear and Moment								
M	23,003 lb-in							
V	2,556 lbs							
Stress								
fb	875 psi							
Fb'	1,235 psi							
fb/Fb'	0.71							
fv	176 psi							
Fv'	207 psi							
fv/Fv'	0.85							
Max Ratio	0.85							
	Pass							
Deflection								
Δ_{TL}	0.02 in							
	L/1,767							
Δ_{LL}	0.02 in							
	L/2,007							
	Pass							

Header Calculations (H9)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	11	0	0	2.83		
							1,871.0 plf
Dead Load	-	*187.0*	0.0	0.0	34.0	*221.0 plf*	
Live / Snow Load	0	*1650.0*	0.0	0.0	-	*1,650.0 plf*	

Description:	*2.3 ft Opening*							
Header Callout	(2)2x6 DF-L No. 2							
Trimmers	(1) 2x6 DF-L No. 2							
King Studs	(1) 2x6 DF-L No. 2							
Wood Design								
Species	*DF-L*							
Grade	*No. 2*							
Width	*3.00 in*							
Depth	*5.50 in*							
Reaction								
Dead Load	257 lbs							
Live Load	1,922 lbs							
Load								
l_u	*2.3 ft*							
l_e	*4.8 ft*							
Adjustment Factors								
Cd	1.15							
CF	1.3							
Material Properties								
Fb	900 psi							
Fv	180 psi							
E	1,600,000 psi							
Emin	580,000 psi							
Calculated Prop.								
A	16.50 in^2							
I	41.59 in^4							
S	15.13 in^3							
RB	5.93							
Emin'	580,000 psi							
FbE	19,774 psi							
Fb*	1,346 psi							
CL	1							
Shear and Moment								
M	15,236 lb-in							
V	2,180 lbs							
Stress								
fb	1,007 psi							
Fb'	1,341 psi							
fb/Fb'	0.75							
fv	198 psi							
Fv'	207 psi							
fv/Fv'	0.96							
Max Ratio	0.96							
	Pass							
Deflection								
Δ_{TL}	0.02 in							
	L/1,500							
Δ_{LL}	0.02 in							
	L/1,701							
	Pass							

Header Calculations (H8)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	19	7.5	0	2.83		
							3,597.0 plf
Dead Load	-	*323.0*	90.0	0.0	34.0	*447.0 plf*	
Live / Snow Load	0	*2850.0*	300.0	0.0	-	*3,150.0 plf*	

Description:	*3.3 ft Opening*								
Header Callout	(2)9.5 LVL 2.0E								
Trimmers	(2) 2x6 DF-L No. 2								
King Studs	(1) 2x6 DF-L No. 2								
Wood Design									
Species	*LVL*								
Grade	*2.0E*								
Width	*3.50 in*								
Depth	*9.50 in*								
Reaction									
Dead Load	726 lbs								
Live Load	5,119 lbs								
Load									
l_u	*3.3 ft*								
l_e	*6.7 ft*								
Adjustment Factors									
Cd	1.15								
CF	1.1								
Material Properties									
Fb	2,900 psi								
Fv	285 psi								
E	2,000,000 psi								
Emin	1,016,535 psi								
Calculated Prop.									
A	33.25 in^2								
I	250.07 in^4								
S	52.65 in^3								
RB	7.89								
Emin'	1,016,535 psi								
FbE	19,579 psi								
Fb*	3,669 psi								
CL	1								
Shear and Moment									
M	56,989 lb-in								
V	5,845 lbs								
Stress									
fb	1,083 psi								
Fb'	3,627 psi								
fb/Fb'	0.30								
fv	264 psi								
Fv'	328 psi								
fv/Fv'	0.80								
Max Ratio	0.80								
	Pass								
Deflection									
Δ_{TL}	0.02 in								
	L/2,160								
Δ_{LL}	0.02 in								
	L/2,467								
	Pass								

Header Calculations (H7)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	2.5	1	0	2.83		*503.5 plf*
Dead Load	-	*42.5*	12.0	0.0	34.0	*88.5 plf*	
Live / Snow Load	0	*375.0*	40.0	0.0	-	*415.0 plf*	

Description:	*10.0 ft Opening*								
Header Callout	(2)9.5 LVL 2.0E								
Trimmers	(1) 2x6 DF-L No. 2								
King Studs	(2) 2x6 DF-L No. 2								
Wood Design									
Species	*LVL*								
Grade	*2.0E*								
Width	*3.50 in*								
Depth	*9.50 in*								
Reaction									
Dead Load	442 lbs								
Live Load	2,075 lbs								
Load									
l_u	*10.0 ft*								
l_e	*18.7 ft*								
Adjustment Factors									
Cd	1.15								
CF	1.1								
Material Properties									
Fb	2,900 psi								
Fv	285 psi								
E	2,000,000 psi								
Emin	1,016,535 psi								
Calculated Prop.									
A	33.25 in^2								
I	250.07 in^4								
S	52.65 in^3								
RB	13.18								
Emin'	1,016,535 psi								
FbE	7,019 psi								
Fb*	3,669 psi								
CL	1								
Shear and Moment									
M	75,519 lb-in								
V	2,517 lbs								
Stress									
fb	1,434 psi								
Fb'	3,495 psi								
fb/Fb'	0.41								
fv	114 psi								
Fv'	328 psi								
fv/Fv'	0.35								
Max Ratio	0.41								
	Pass								
Deflection									
Δ_{TL}	0.23 in								
	L/530								
Δ_{LL}	0.19 in								
	L/643								
	Pass								

Header Calculations (H6)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	16	7.335	0	2.83		
							3,087.4 plf
Dead Load	-	*272.0*	88.0	0.0	34.0	*394.0 plf*	
Live / Snow Load	0	*2400.0*	293.4	0.0	-	*2,693.4 plf*	

Description:	*3.0 ft Opening*								
Header Callout	(2)9.5 LVL 2.0E								
Trimmers	(2) 2x6 DF-L No. 2								
King Studs	(1) 2x6 DF-L No. 2								
Wood Design									
Species	*LVL*								
Grade	*2.0E*								
Width	*3.50 in*								
Depth	*9.50 in*								
Reaction									
Dead Load	591 lbs								
Live Load	4,040 lbs								
Load									
l_u	*3.0 ft*								
l_e	*6.2 ft*								
Adjustment Factors									
Cd	1.15								
CF	1.1								
Material Properties									
Fb	2,900 psi								
Fv	285 psi								
E	2,000,000 psi								
Emin	1,016,535 psi								
Calculated Prop.									
A	33.25 in^2								
I	250.07 in^4								
S	52.65 in^3								
RB	7.58								
Emin'	1,016,535 psi								
FbE	21,210 psi								
Fb*	3,669 psi								
CL	1								
Shear and Moment									
M	41,680 lb-in								
V	4,631 lbs								
Stress									
fb	792 psi								
Fb'	3,631 psi								
fb/Fb'	0.22								
fv	209 psi								
Fv'	328 psi								
fv/Fv'	0.64								
Max Ratio	0.64								
	Pass								
Deflection									
Δ_{TL}	0.01 in								
	L/3,200								
Δ_{LL}	0.01 in								
	L/3,668								
	Pass								

Header Calculations (H5)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	7	0	0	1.33		*1,185.0 plf*
Dead Load	-	*119.0*	0.0	0.0	16.0	*135.0 plf*	
Live / Snow Load	0	*1050.0*	0.0	0.0	-	*1,050.0 plf*	

Description:	*5.3 ft Opening*							
Header Callout	(2)9.5 LVL 2.0E							
Trimmers	(1) 2x6 DF-L No. 2							
King Studs	(1) 2x6 DF-L No. 2							

Wood Design								
Species	*LVL*							
Grade	*2.0E*							
Width	*3.50 in*							
Depth	*9.50 in*							
Reaction								
Dead Load	354 lbs							
Live Load	2,756 lbs							
Load								
l_u	*5.3 ft*							
l_e	*10.8 ft*							
Adjustment Factors								
Cd	1.15							
CF	1.1							
Material Properties								
Fb	2,900 psi							
Fv	285 psi							
E	2,000,000 psi							
Emin	1,016,535 psi							
Calculated Prop.								
A	33.25 in^2							
I	250.07 in^4							
S	52.65 in^3							
RB	10.03							
Emin'	1,016,535 psi							
FbE	12,120 psi							
Fb*	3,669 psi							
CL	1							
Shear and Moment								
M	48,991 lb-in							
V	3,111 lbs							
Stress								
fb	931 psi							
Fb'	3,593 psi							
fb/Fb'	0.26							
fv	140 psi							
Fv'	328 psi							
fv/Fv'	0.43							
Max Ratio	0.43							
	Pass							
Deflection								
Δ_{TL}	0.04 in							
	L/1,556							
Δ_{LL}	0.04 in							
	L/1,756							
	Pass							

Header Calculations (H4)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	21	0	0	1.33		*3,523.0 plf*
Dead Load	-	*357.0*	0.0	0.0	16.0	*373.0 plf*	
Live / Snow Load	0	*3150.0*	0.0	0.0	-	*3,150.0 plf*	

Description:	*3.0 ft Opening*	*3.5 ft Opening*						
Header Callout	(3)9.5 LVL 2.0E	(3)9.5 LVL 2.0E						
Trimmers	(2) 2x6 DF-L No. 2	(2) 2x6 DF-L No. 2						
King Studs	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2						
Wood Design								
Species	*LVL*	*LVL*						
Grade	*2.0E*	*2.0E*						
Width	*5.25 in*	*5.25 in*						
Depth	*9.50 in*	*9.50 in*						
Reaction								
Dead Load	559 lbs	653 lbs						
Live Load	4,725 lbs	5,513 lbs						
Load								
l_u	*3.0 ft*	*3.5 ft*						
l_e	*6.2 ft*	*7.2 ft*						
Adjustment Factors								
Cd	1.15	1.15						
CF	1.1	1.1						
Material Properties								
Fb	2,900 psi	2,900 psi						
Fv	285 psi	285 psi						
E	2,000,000 psi	2,000,000 psi						
Emin	1,016,535 psi	1,016,535 psi						
Calculated Prop.								
A	49.88 in^2	49.88 in^2						
I	375.10 in^4	375.10 in^4						
S	78.97 in^3	78.97 in^3						
RB	5.06	5.46						
Emin'	1,016,535 psi	1,016,535 psi						
FbE	47,723 psi	40,906 psi						
Fb*	3,669 psi	3,669 psi						
CL	1	1						
Shear and Moment								
M	47,560 lb-in	64,734 lb-in						
V	5,284 lbs	6,165 lbs						
Stress								
fb	602 psi	820 psi						
Fb'	3,653 psi	3,651 psi						
fb/Fb'	0.16	0.22						
fv	159 psi	185 psi						
Fv'	328 psi	328 psi						
fv/Fv'	0.48	0.57						
Max Ratio	0.48	0.57						
	Pass	Pass						
Deflection								
Δ_{TL}	0.01 in	0.02 in						
	L/4,206	L/2,649						
Δ_{LL}	0.01 in	0.01 in						
	L/4,704	L/2,963						
	Pass	Pass						

Header Calculations (H3)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	14	0	0	1.33		*2,354.0 plf*
Dead Load	-	*238.0*	0.0	0.0	16.0	*254.0 plf*	
Live / Snow Load	0	*2100.0*	0.0	0.0	-	*2,100.0 plf*	

Description:	*3.0 ft Opening*	*6.3 ft Opening*						
Header Callout	(2)2x10 DF-L No. 2	(3)9.5 LVL 2.0E						
Trimmers	(2) 2x6 DF-L No. 2	(2) 2x6 DF-L No. 2						
King Studs	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2						
Wood Design								
Species	*DF-L*	*LVL*						
Grade	*No. 2*	*2.0E*						
Width	*3.00 in*	*5.25 in*						
Depth	*9.25 in*	*9.50 in*						
Reaction								
Dead Load	381 lbs	794 lbs						
Live Load	3,150 lbs	6,563 lbs						
Load								
l_u	*3.0 ft*	*6.3 ft*						
l_e	*6.2 ft*	*12.6 ft*						
Adjustment Factors								
Cd	1.15	1.15						
CF	1.1	1.1						
Material Properties								
Fb	900 psi	2,900 psi						
Fv	180 psi	285 psi						
E	1,600,000 psi	2,000,000 psi						
Emin	580,000 psi	1,016,535 psi						
Calculated Prop.								
A	27.75 in^2	49.88 in^2						
I	197.86 in^4	375.10 in^4						
S	42.78 in^3	78.97 in^3						
RB	8.73	7.21						
Emin'	580,000 psi	1,016,535 psi						
FbE	9,131 psi	23,477 psi						
Fb*	1,139 psi	3,669 psi						
CL	1	1						
Shear and Moment								
M	31,778 lb-in	137,927 lb-in						
V	3,531 lbs	7,356 lbs						
Stress								
fb	743 psi	1,747 psi						
Fb'	1,131 psi	3,635 psi						
fb/Fb'	0.66	0.48						
fv	191 psi	221 psi						
Fv'	207 psi	328 psi						
fv/Fv'	0.92	0.68						
Max Ratio	0.92	0.68						
	Pass	Pass						
Deflection								
Δ_{TL}	0.01 in	0.11 in						
	L/2,657	L/696						
Δ_{LL}	0.01 in	0.10 in						
	L/2,978	L/780						
	Pass	Pass						

Header Calculations (H2)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	15.5	0	0	1.33		
							2,604.5 plf
Dead Load	-	*263.5*	0.0	0.0	16.0	*279.5 plf*	
Live / Snow Load	0	*2325.0*	0.0	0.0	-	*2,325.0 plf*	

Description:	*6.3 ft Opening*	*3.0 ft Opening*						
Header Callout	(3)9.5 LVL 2.0E	(2)2x12 DF-L No. 2						
Trimmers	(2) 2x6 DF-L No. 2	(2) 2x6 DF-L No. 2						
King Studs	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2						
Wood Design								
Species	*LVL*	*DF-L*						
Grade	*2.0E*	*No. 2*						
Width	*5.25 in*	*3.00 in*						
Depth	*9.50 in*	*11.25 in*						
Reaction								
Dead Load	873 lbs	419 lbs						
Live Load	7,266 lbs	3,488 lbs						
Load								
l_u	*6.3 ft*	*3.0 ft*						
l_e	*12.6 ft*	*6.2 ft*						
Adjustment Factors								
Cd	1.15	1.15						
CF	1.1	1						
Material Properties								
Fb	2,900 psi	900 psi						
Fv	285 psi	180 psi						
E	2,000,000 psi	1,600,000 psi						
Emin	1,016,535 psi	580,000 psi						
Calculated Prop.								
A	49.88 in^2	33.75 in^2						
I	375.10 in^4	355.96 in^4						
S	78.97 in^3	63.28 in^3						
RB	7.21	9.63						
Emin'	1,016,535 psi	580,000 psi						
FbE	23,477 psi	7,508 psi						
Fb*	3,669 psi	1,035 psi						
CL	1	1						
Shear and Moment								
M	152,605 lb-in	35,160 lb-in						
V	8,139 lbs	3,907 lbs						
Stress								
fb	1,932 psi	556 psi						
Fb'	3,635 psi	1,027 psi						
fb/Fb'	0.53	0.54						
fv	245 psi	174 psi						
Fv'	328 psi	207 psi						
fv/Fv'	0.75	0.84						
Max Ratio	0.75	0.84						
	Pass	Pass						
Deflection								
Δ_{TL}	0.12 in	0.01 in						
	L/629	L/4,320						
Δ_{LL}	0.11 in	0.01 in						
	L/705	L/4,839						
	Pass	Pass						

Header Calculations (H1)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	2.5	0	0	1.33		
							433.5 plf
Dead Load	-	*42.5*	0.0	0.0	16.0	*58.5 plf*	
Live / Snow Load	0	*375.0*	0.0	0.0	-	*375.0 plf*	

Description:	*3.0 ft Opening*	*6.5 ft Opening*	*9.5 ft Opening*	*10.0 ft Opening*				
Header Callout	(2)2x6 DF-L No. 2	(2)2x8 DF-L No. 2	(2)2x12 DF-L No. 2	(2)9.5 LVL 2.0E				
Trimmers	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2				
King Studs	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2	(1) 2x6 DF-L No. 2				
Wood Design								
Species	*DF-L*	*DF-L*	*DF-L*	*LVL*				
Grade	*No. 2*	*No. 2*	*No. 2*	*2.0E*				
Width	*3.00 in*	*3.00 in*	*3.00 in*	*3.50 in*				
Depth	*5.50 in*	*7.25 in*	*11.25 in*	*9.50 in*				
Reaction								
Dead Load	88 lbs	190 lbs	278 lbs	292 lbs				
Live Load	563 lbs	1,219 lbs	1,781 lbs	1,875 lbs				
Load								
l_u	*3.0 ft*	*6.5 ft*	*9.5 ft*	*10.0 ft*				
l_e	*6.2 ft*	*12.4 ft*	*18.3 ft*	*18.7 ft*				
Adjustment Factors								
Cd	1.15	1.15	1.15	1.15				
CF	1.3	1.2	1	1.1				
Material Properties								
Fb	900 psi	900 psi	900 psi	2,900 psi				
Fv	180 psi	180 psi	180 psi	285 psi				
E	1,600,000 psi	1,600,000 psi	1,600,000 psi	2,000,000 psi				
Emin	580,000 psi	580,000 psi	580,000 psi	1,016,535 psi				
Calculated Prop.								
A	16.50 in^2	21.75 in^2	33.75 in^2	33.25 in^2				
I	41.59 in^4	95.27 in^4	355.96 in^4	250.07 in^4				
S	15.13 in^3	26.28 in^3	63.28 in^3	52.65 in^3				
RB	6.73	10.95	16.57	13.18				
Emin'	580,000 psi	580,000 psi	580,000 psi	1,016,535 psi				
FbE	15,357 psi	5,803 psi	2,536 psi	7,019 psi				
Fb*	1,346 psi	1,242 psi	1,035 psi	3,669 psi				
CL	1	1	1	1				
Shear and Moment								
M	5,852 lb-in	27,471 lb-in	58,680 lb-in	65,019 lb-in				
V	650 lbs	1,409 lbs	2,059 lbs	2,167 lbs				
Stress								
fb	387 psi	1,045 psi	927 psi	1,235 psi				
Fb'	1,339 psi	1,226 psi	1,002 psi	3,495 psi				
fb/Fb'	0.29	0.85	0.93	0.35				
fv	59 psi	97 psi	92 psi	98 psi				
Fv'	207 psi	207 psi	207 psi	328 psi				
fv/Fv'	0.29	0.47	0.44	0.30				
Max Ratio	0.29	0.85	0.93	0.35				
	Pass	Pass	Pass	Pass				
Deflection								
Δ_{TL}	0.01 in	0.11 in	0.14 in	0.20 in				
	L/3,033	L/683	L/817	L/615				
Δ_{LL}	0.01 in	0.10 in	0.12 in	0.17 in				
	L/3,506	L/789	L/945	L/711				
	Pass	Pass	Pass	Pass				

Beam Calculations (SHOP (3))

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	19.25	0	0	9.75		*3,331.8 plf*
Dead Load	-	*327.3*	0.0	0.0	117.0	*444.3 plf*	
Live / Snow Load	0	*2887.5*	0.0	0.0	-	*2,887.5 plf*	

Description:	*3.0 ft Opening*							
Header Callout	(3)2x10 DF-L No. 2							
Trimmers	(2) 2x6 DF-L No. 2							
King Studs	(2) 2x6 DF-L No. 2							
Wood Design								
Species	*DF-L*							
Grade	*No. 2*							
Width	*4.50 in*							
Depth	*9.25 in*							
Reaction								
Dead Load	666 lbs							
Live Load	4,331 lbs							
Load								
l_u	*3.0 ft*							
l_e	*6.2 ft*							
Adjustment Factors								
Cd	1.15							
CF	1.1							
Material Properties								
Fb	900 psi							
Fv	180 psi							
E	1,600,000 psi							
Emin	580,000 psi							
Calculated Prop.								
A	41.63 in^2							
I	296.79 in^4							
S	64.17 in^3							
RB	5.82							
Emin'	580,000 psi							
FbE	20,546 psi							
Fb*	1,139 psi							
CL	1							
Shear and Moment								
M	44,979 lb-in							
V	4,998 lbs							
Stress								
fb	701 psi							
Fb'	1,135 psi							
fb/Fb'	0.62							
fv	180 psi							
Fv'	207 psi							
fv/Fv'	0.87							
Max Ratio	0.87							
	Pass							
Deflection								
Δ_{TL}	0.01 in							
	L/2,815							
Δ_{LL}	0.01 in							
	L/3,249							
	Pass							

Beam Calculations (SHOP (2))

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	13	0	0	9.75		
							2,288.0 plf
Dead Load	-	*221.0*	0.0	0.0	117.0	*338.0 plf*	
Live / Snow Load	0	*1950.0*	0.0	0.0	-	*1,950.0 plf*	

Description:	*3.0 ft Opening*							
Header Callout	(2)2x10 DF-L No. 2							
Trimmers	(2) 2x6 DF-L No. 2							
King Studs	(2) 2x6 DF-L No. 2							
Wood Design								
Species	*DF-L*							
Grade	*No. 2*							
Width	*3.00 in*							
Depth	*9.25 in*							
Reaction								
Dead Load	507 lbs							
Live Load	2,925 lbs							
Load								
l_u	*3.0 ft*							
l_e	*6.2 ft*							
Adjustment Factors								
Cd	1.15							
CF	1.1							
Material Properties								
Fb	900 psi							
Fv	180 psi							
E	1,600,000 psi							
Emin	580,000 psi							
Calculated Prop.								
A	27.75 in^2							
I	197.86 in^4							
S	42.78 in^3							
RB	8.73							
Emin'	580,000 psi							
FbE	9,131 psi							
Fb*	1,139 psi							
CL	1							
Shear and Moment								
M	30,888 lb-in							
V	3,432 lbs							
Stress								
fb	722 psi							
Fb'	1,131 psi							
fb/Fb'	0.64							
fv	186 psi							
Fv'	207 psi							
fv/Fv'	0.90							
Max Ratio	0.90							
	Pass							
Deflection								
Δ_{TL}	0.01 in							
	L/2,733							
Δ_{LL}	0.01 in							
	L/3,207							
	Pass							

Beam Calculations (SHOP)

	Additional Drift	Roof	Floor	Deck	Wall	Total Load	Total Load
Trib	0.0	3	0	0	9.75		
Dead Load	-	*51.0*	0.0	0.0	117.0	*168.0 plf*	*618.0 plf*
Live / Snow Load	0	*450.0*	0.0	0.0	-	*450.0 plf*	

Description:	*3.0 ft Opening*	*12.0 ft Opening*						
Header Callout	(2)2x6 DF-L No. 2	(2)11.875 LVL 2.0E						
Trimmers	(1) 2x6 DF-L No. 2	(2) 2x6 DF-L No. 2						
King Studs	(2) 2x6 DF-L No. 2	(5) 2x6 DF-L No. 2						
Wood Design								
Species	*DF-L*	*LVL*						
Grade	*No. 2*	*2.0E*						
Width	*3.00 in*	*3.50 in*						
Depth	*5.50 in*	*11.88 in*						
Reaction								
Dead Load	252 lbs	1,008 lbs						
Live Load	675 lbs	2,700 lbs						
Load								
l_u	*3.0 ft*	*12.0 ft*						
l_e	*6.2 ft*	*22.5 ft*						
Adjustment Factors								
Cd	1.15	1.15						
CF	1.3	1						
Material Properties								
Fb	900 psi	2,900 psi						
Fv	180 psi	285 psi						
E	1,600,000 psi	2,000,000 psi						
Emin	580,000 psi	1,016,535 psi						
Calculated Prop.								
A	16.50 in^2	41.56 in^2						
I	41.59 in^4	488.41 in^4						
S	15.13 in^3	82.26 in^3						
RB	6.73	16.19						
Emin'	580,000 psi	1,016,535 psi						
FbE	15,357 psi	4,655 psi						
Fb*	1,346 psi	3,335 psi						
CL	1	1						
Shear and Moment								
M	8,343 lb-in	133,488 lb-in						
V	927 lbs	3,708 lbs						
Stress								
fb	552 psi	1,623 psi						
Fb'	1,339 psi	3,046 psi						
fb/Fb'	0.41	0.53						
fv	84 psi	134 psi						
Fv'	207 psi	328 psi						
fv/Fv'	0.41	0.41						
Max Ratio	0.41	0.53						
	Pass	Pass						
Deflection								
Δ_{TL}	0.02 in	0.30 in						
	L/2,127	L/488						
Δ_{LL}	0.01 in	0.21 in						
	L/2,921	L/670						
	Pass	Pass						

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 05 Beams.ec6

LIC# : KW-06013353, Build:20.23.08.30 SNAKE RIVER ENGINEERING (c) ENERCALC INC 1983-2023

DESCRIPTION: WIND BEAM

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2018

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2018

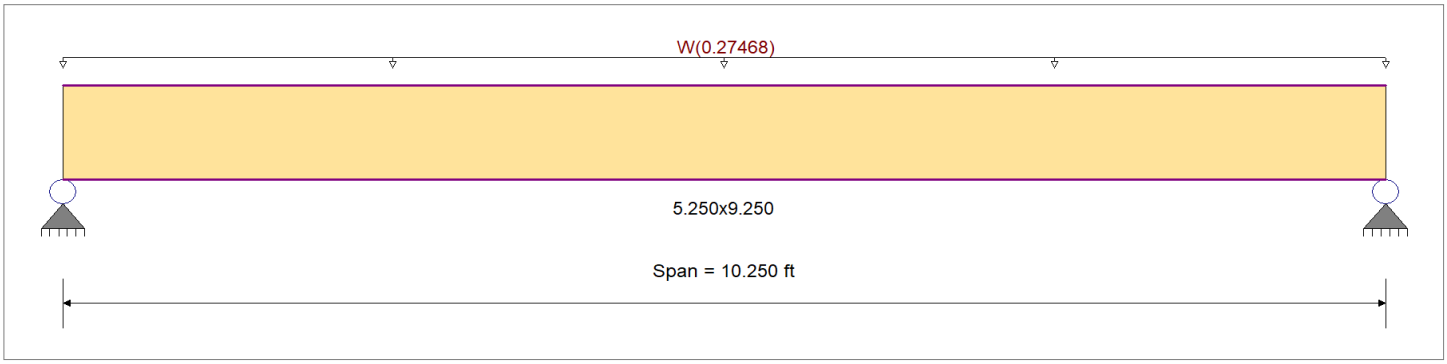
Wood Species : iLevel Truss Joist
Wood Grade : MicroLam LVL 1.9 E

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,600.0 psi
Fb -	2,600.0 psi
Fc - Prll	2,510.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	1,555.0 psi

E : Modulus of Elasticity

Ebend- xx	1,900.0 ksi
Eminbend - xx	965.71 ksi
Density	42.010 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Uniform Load : W = 0.02289 ksf, Tributary Width = 12.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.143 : 1	Maximum Shear Stress Ratio	=	0.049 : 1
Section used for this span		5.250x9.250	Section used for this span		5.250x9.250
fb: Actual	=	611.23 psi	fv: Actual	=	22.28 psi
F'b	=	4,282.07 psi	F'v	=	456.00 psi
Load Combination		+0.60W	Load Combination		+0.60W
Location of maximum on span	=	5.125 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.324 in	Ratio =	379	>=360	Span: 1 : W Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.194 in	Ratio =	633	>=240	Span: 1 : +0.60W
Max Upward Total Deflection	0 in	Ratio =	0	<240	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
														0.0	0.00	0.0	0.0
Length = 10.250 ft	1			0.90	1.00	1.00	1.00	1.029	1.00	1.00	1.00			2,408.7	0.00	0.0	256.5
+0.60W					1.00	1.00	1.00	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.250 ft	1	0.143	0.049	1.60	1.00	1.00	1.00	1.029	1.00	1.00	1.00	2.16	611.2	4,282.1	0.72	22.3	456.0
+0.450W					1.00	1.00	1.00	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.250 ft	1	0.107	0.037	1.60	1.00	1.00	1.00	1.029	1.00	1.00	1.00	1.62	458.4	4,282.1	0.54	16.7	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.3238	5.162		0.0000	0.000

Wood Beam

DESCRIPTION: WIND BEAM

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.408	1.408
Max Upward from Load Combinations	0.845	0.845
Max Upward from Load Cases	1.408	1.408
+0.60W	0.845	0.845
+0.450W	0.633	0.633
W Only	1.408	1.408

WOOD TALL WALL & KING STUD ALLOWABLE LOADS (plf):

Load Duration Factor: *1.6* Max Deflection: *L/180*
Max Vert. Load: *50 lbs*

	Height						
King Stud	***12'***	***14'***	***16'***	***18'***	***20'***	***22'***	***24'***
(1) 2x4 Stud	12.8	NA	NA	NA	NA	NA	NA
(2) 2x4 Stud	25.6	NA	NA	NA	NA	NA	NA
(3) 2x4 Stud	38.4	NA	NA	NA	NA	NA	NA
(1) 2x6 DF #2	57.0	35.8	*24.1*	16.9	NA	NA	NA
(2) 2x6 DF #2	114.0	*71.6*	*48.2*	33.8	NA	NA	NA
(3) 2x6 DF #2	171.0	*107.4*	*72.3*	50.7	NA	NA	NA
(1) 2x8 DF #2	130.0	81.7	55.0	38.7	28.2	21.2	16.3
(2) 2x8 DF #2	260.0	163.4	110.0	77.4	56.4	42.4	32.6
(3) 2x8 DF #2	390.0	245.1	165.0	116.1	84.6	63.6	48.9
(1) 2x6 LSL	67.8	42.7	28.5	20.0	14.7	NA	NA
(2) 2x6 LSL	135.6	85.4	57.0	40.0	29.4	NA	NA
(3) 2x6 LSL	203.4	128.1	85.5	60.0	44.1	NA	NA
(1) 2x8 LSL	155.0	98.3	65.5	46.0	33.5	25.2	19.5
(2) 2x8 LSL	310.0	196.6	131.0	92.0	67.0	50.4	39.0
(3) 2x8 LSL	465.0	294.9	196.5	138.0	100.5	75.6	58.5

***NOTE 1: this table combined with trimmer table to determine combined stress on each common wall stud.**
***NOTE 2: allowable loads are interpolated at heights not in 2' increments.**

WOOD TRIMMER ALLOWABLE LOADS (kips):

Load Duration Factor: *1.0* Weak Axis Braced: *Y*
Eccentricity: *0"*

	Height						
Trimmer Type	***8'***	***10'***	***12'***	***14'***	***16'***	***18'***	***20'***
(1) 2x4 Stud	2.4	1.7	1.2	NA	NA	NA	NA
(2) 2x4 Stud	4.9	3.4	2.4	NA	NA	NA	NA
(3) 2x4 Stud	7.1	5.0	3.6	NA	NA	NA	NA
(1) 2x6 DF #2	5.1	5.1	5.0	3.8	3.0	NA	NA
(2) 2x6 DF #2	10.3	10.3	10.1	*7.7*	*6.0*	NA	NA
(3) 2x6 DF #2	15.4	15.4	15.1	*11.6*	*9.1*	NA	NA
(1) 2x8 DF #2	6.7	6.7	6.7	6.7	6.4	5.3	4.4
(2) 2x8 DF #2	13.5	13.5	13.5	13.5	12.9	10.6	8.8
(3) 2x8 DF #2	20.3	20.3	20.3	20.3	19.4	15.9	13.2

***NOTE 1: this table combined with king stud table to determine combined stress on each common wall stud.**
***NOTE 2: allowable loads are interpolated at heights not in 2' increments.**

TALL WALL CALCULATIONS:

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

Description:	**10.5' Tall Wall**	**9' Tall Wall**				
Type:	*2x Lumber (2"-4")*	*2x Lumber (2"-4")*				
Species:	*DF-L*	*DF-L*				
Grade:	*No. 2*	*No. 2*				
Nominal width, t =	*(1) 2*	*(1) 2*				
Actual width =	1.50 in	1.50 in				
Nominal depth, d =	*6*	*6*				
Actual depth =	5.50 in	5.50 in				
Span, L =	*10.500 ft*	*9.000 ft*				
w/o Plates	10.250 ft	8.750 ft				
Stud spacing, s =	*16 in*	*16 in*				
Lat. Pressure, w_{wind} =	13.74 psf	13.74 psf				
Axial load, P =	*4751 lbs*	*3563 lbs*				
Eccentricity, e =	*0 in*	*0 in*				
K_{cE} =	*0.3*	*0.3*				
c =	*0.8*	*0.8*				
w =	18.3 plf	18.3 plf				
Fb	900 psi	900 psi				
Fv	180 psi	180 psi				
Fc-prll	1,350 psi	1,350 psi				
Fc-perp	625 psi	625 psi				
C_d	*1.60*	*1.60*				
$C_{F,Fb}$	*1.30*	*1.30*				
$C_{F,Fcprll}$	*1.10*	*1.10*				
C_r	*1.15*	*1.15*				
C_p	0.36	0.47				
C_H	*1.00*	*1.00*				
C_b	*1.07*	*1.07*				
E	1,600,000 psi	1,600,000 psi				
Emin	580,000 psi	580,000 psi				
Allowable Stress:						
F'_b = $F_b C_d C_F C_r$ =	**2153 psi**	**2153 psi**				
F'_v = $F'_v C_d C_H$ =	**288 psi**	**288 psi**				
F^*_c = $F_c C_d C_F$ =	2376 psi	2376 psi				
F_{cE} = $(K_{cE} E')/(l_e/d)2$ =	960 psi	1317 psi				
F'_c = $F_c C_d C_F C_p$ =	**862 psi**	**1118 psi**				
$F'_{c\,perp}$ = $F_{c\,perp} Cb$ =	**668 psi**	**668 psi**				
E' = E =	**1600000 psi**	**1600000 psi**				
F_{bE} =	**2315 psi**	**2712 psi**				
Slenderness Ratio:	**≤ 50 OK**	**≤ 50 OK**				
R_B =	**17**	**16**				
Bending:	**≤ F'b OK**	**≤ F'b OK**				
M = $w L^2/8 + P e/12$ =	241 ft-lbs	175 ft-lbs				
f_b = M/S =	**382 psi**	**278 psi**				
S =	8 in^3	8 in^3				
Shear:	**≤ F'v OK**	**≤ F'v OK**				
V = w L/2 =	94 lbs	80 lbs				
f_v = 1.5 V/A =	**17 psi**	**15 psi**				
A =	8 in^2	8 in^2				
Compression:	**≤ F'c OK**	**≤ F'c OK**				
f_c = P/A =	**576 psi**	**432 psi**				
Compression (perp.):	**≤ F'c OK**	**≤ F'c OK**				
$f_{c\,perp}$ = P/A =	**576 psi**	**432 psi**				
Combined:	**≤ 1.0 OK**	**≤ 1.0 OK**				
(fc/Fc)2 + {fb/[Fb(1-(fc/FcE))]} =	0.89	0.34				
Deflection:	**≥ 180 OK**	**≥ 180 OK**				
D = 22.5 w L^4/E' I =	**0.14 in**	**0.07 in**				
I =	21 in^4	21 in^4				
SPAN /	**900**	**1446**				

TALL WALL CALCULATIONS:

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

Description:	**14.5' Tall Wall**	**King Stud (8.5' Max Opening)**	**King Stud (10' Max Opening)**	**12' Tall Wall**	**12' Tall Wall**	**10.5' Tall Wall**
Type:	*2x Lumber (2"-4")*	*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 =	*14.500 ft*	*14.500 ft*	*10.500 ft*	*12.000 ft*	*12.000 ft*	*10.500 ft*
w/o Plates	14.250 ft	14.250 ft	10.250 ft	11.750 ft	11.750 ft	10.250 ft
Stud spacing, s =	*16 in*	*53 in*	*62 in*	*12 in*	*16 in*	*12 in*
Lat. Pressure, w_{wind} =	13.74 psf	13.74 psf	13.74 psf	13.74 psf	13.74 psf	13.74 psf
Axial load, P =	*557 lbs*	*50 lbs*	*50 lbs*	*3424 lbs*	*3229 lbs*	*4064 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 =	18.3 plf	61.0 plf	71.3 plf	13.7 plf	18.3 plf	13.7 plf
Fb	900 psi	900 psi	900 psi	900 psi	900 psi	900 psi
Fv	180 psi	180 psi	180 psi	180 psi	180 psi	180 psi
Fc-prll	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi
Fc-perp	625 psi	625 psi	625 psi	625 psi	625 psi	625 psi
C_d	*1.60*	*1.60*	*1.60*	*1.60*	*1.60*	*1.60*
$C_{F,Fb}$	*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*	*1.15*	*1.15*
C_p	0.20	0.20	0.36	0.28	0.28	0.36
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
Emin	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**	**1872 psi**	**2153 psi**	**2153 psi**	**2153 psi**
F'_v = $F'_v C_d C_H$ =	**288 psi**	**288 psi**	**288 psi**	**288 psi**	**288 psi**	**1728 psi**
F^*_c = $F_c C_d C_F$ =	2376 psi	2376 psi	2376 psi	2376 psi	2376 psi	2376 psi
F_{cE} = $(K_{cE} E')/(l_e/d)2$ =	497 psi	497 psi	960 psi	730 psi	730 psi	960 psi
F'_c = $F_c C_d C_F C_p$ =	**473 psi**	**473 psi**	**862 psi**	**676 psi**	**676 psi**	**862 psi**
$F'_{c\,perp}$ = $F_{c\,perp} Cb$ =	**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} =	**1665 psi**	**6660 psi**	**2315 psi**	**2019 psi**	**2019 psi**	**2315 psi**
Slenderness Ratio:	**≤ 50 OK**	**≤ 50 OK**	**≤ 50 OK**	**≤ 50 OK**	**≤ 50 OK**	**≤ 50 OK**
R_B =	**20**	**10**	**17**	**19**	**19**	**17**
Bending:	**≤ F'b OK**	**≤ F'b OK**	**≤ F'b OK**	**≤ F'b OK**	**≤ F'b OK**	**≤ F'b OK**
M = $w L^2/8 + P e/12$ =	465 ft-lbs	1547 ft-lbs	936 ft-lbs	237 ft-lbs	316 ft-lbs	180 ft-lbs
f_b = M/S =	**738 psi**	**1228 psi**	**1485 psi**	**376 psi**	**502 psi**	**286 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 =	131 lbs	434 lbs	365 lbs	81 lbs	108 lbs	70 lbs
f_v = 1.5 V/A =	**24 psi**	**39 psi**	**66 psi**	**15 psi**	**20 psi**	**13 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 =	**67 psi**	**3 psi**	**6 psi**	**415 psi**	**391 psi**	**493 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 =	**67 psi**	**3 psi**	**6 psi**	**415 psi**	**391 psi**	**493 psi**
Combined:	**≤ 1.0 OK**			**≤ 1.0 OK**	**≤ 1.0 OK**	**≤ 1.0 OK**
$(fc/Fc)2 + \{fb/[Fb(1-(fc/FcE)]\}$ =	0.42			0.78	0.84	0.60
Deflection:	**≥ 180 OK**	**≥ 180 OK**	**≥ 180 OK**	**≥ 180 OK**	**≥ 180 OK**	**≥ 180 OK**
D = 22.5 w $L^4/E' I$ =	**0.51 in**	**0.85 in**	**0.53 in**	**0.18 in**	**0.24 in**	**0.10 in**
I =	21 in^4	42 in^4	21 in^4	21 in^4	21 in^4	21 in^4
SPAN /	**335**	**201**	**231**	**796**	**597**	**1200**

TALL WALL CALCULATIONS:

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

Description:	**16.42' Tall Wall**	**King Stud (3' Max Opening)**	**16.42' Tall Wall**	**King Stud (12' Max Opening)**	**9' Tall Wall**	
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*	*(2) 2*	*(1) 2*	*(5) 2*	*(1) 2*	
Actual width =	1.50 in	3.00 in	1.50 in	7.50 in	1.50 in	
Nominal depth, d =	*6*	*6*	*6*	*6*	*6*	
Actual depth =	5.50 in	5.50 in	5.50 in	5.50 in	5.50 in	
Span, L =	*16.420 ft*	*16.420 ft*	*16.420 ft*	*16.420 ft*	*9.000 ft*	
w/o Plates	16.170 ft	16.170 ft	16.170 ft	16.170 ft	8.750 ft	
Stud spacing, s =	*8 in*	*24 in*	*16 in*	*82 in*	*16 in*	
Lat. Pressure, w_{wind} =	13.74 psf	13.74 psf	13.74 psf	13.74 psf	13.74 psf	
Axial load, P =	*1392 lbs*	*50 lbs*	*557 lbs*	*50 lbs*	*4175 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 =	9.2 plf	27.8 plf	18.3 plf	94.2 plf	18.3 plf	
Fb	900 psi	900 psi	900 psi	900 psi	900 psi	
Fv	180 psi	180 psi	180 psi	180 psi	180 psi	
Fc-prll	1,350 psi	1,350 psi	1,350 psi	1,350 psi	1,350 psi	
Fc-perp	625 psi	625 psi	625 psi	625 psi	625 psi	
C_d	*1.60*	*1.60*	*1.60*	*1.60*	*1.60*	
$C_{F,Fb}$	*1.30*	*1.30*	*1.30*	*1.30*	*1.30*	
$C_{F,Fcprll}$	*1.10*	*1.10*	*1.10*	*1.10*	*1.10*	
C_r	*1.15*	*1.00*	*1.15*	*1.00*	*1.15*	
C_p	0.16	0.16	0.16	0.16	0.47	
C_H	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	
C_b	*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	
Emin	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**	**2153 psi**	**1872 psi**	**2153 psi**	
F'_v = $F'_v C_d C_H$ =	**288 psi**	**288 psi**	**288 psi**	**288 psi**	**288 psi**	
F^*_c = $F_c C_d C_F$ =	2376 psi	2376 psi	2376 psi	2376 psi	2376 psi	
F_{cE} = $(K_{cE} E')/(l_e/d)2$ =	386 psi	386 psi	386 psi	386 psi	1317 psi	
F'_c = $F_c C_d C_F C_p$ =	**372 psi**	**372 psi**	**372 psi**	**372 psi**	**1118 psi**	
$F'_{c\,perp}$ = $F_{c\,perp}$ Cb =	**668 psi**	**668 psi**	**668 psi**	**668 psi**	**668 psi**	
E' = E =	**1600000 psi**	**1600000 psi**	**1600000 psi**	**1600000 psi**	**1600000 psi**	
F_{bE} =	**1467 psi**	**5869 psi**	**1467 psi**	**36684 psi**	**2712 psi**	
Slenderness Ratio:	**≤ 50 OK**	**≤ 50 OK**	**≤ 50 OK**	**≤ 50 OK**	**≤ 50 OK**	
R_B =	**22**	**11**	**22**	**4**	**16**	
Bending:	**≤ F'b OK**	**≤ F'b OK**	**≤ F'b OK**	**≤ F'b OK**	**≤ F'b OK**	
M = $w L^2/8 + P e/12$ =	299 ft-lbs	907 ft-lbs	599 ft-lbs	3077 ft-lbs	175 ft-lbs	
f_b = M/S =	**475 psi**	**720 psi**	**950 psi**	**977 psi**	**278 psi**	
S =	8 in^3	15 in^3	8 in^3	38 in^3	8 in^3	
Shear:	**≤ F'v OK**	**≤ F'v OK**	**≤ F'v OK**	**≤ F'v OK**	**≤ F'v OK**	
V = w L/2 =	74 lbs	224 lbs	148 lbs	761 lbs	80 lbs	
f_v = 1.5 V/A =	**13 psi**	**20 psi**	**27 psi**	**28 psi**	**15 psi**	
A =	8 in^2	17 in^2	8 in^2	41 in^2	8 in^2	
Compression:	**≤ F'c OK**	**≤ F'c OK**	**≤ F'c OK**	**≤ F'c OK**	**≤ F'c OK**	
f_c = P/A =	**169 psi**	**3 psi**	**67 psi**	**1 psi**	**506 psi**	
Compression (perp.):	**≤ F'c OK**	**≤ F'c OK**	**≤ F'c OK**	**≤ F'c OK**	**≤ F'c OK**	
$f_{c\,perp}$ = P/A =	**169 psi**	**3 psi**	**67 psi**	**1 psi**	**506 psi**	
Combined:	**≤ 1.0 OK**		**≤ 1.0 OK**		**≤ 1.0 OK**	
$(fc/Fc)2 + \{fb/[Fb(1-(fc/FcE)]\}$ =	0.60		0.57		0.41	
Deflection:	**≥ 180 OK**	**≥ 180 OK**	**≥ 180 OK**	**≥ 180 OK**	**≥ 180 OK**	
D = 22.5 w $L^4/E' I$ =	**0.42 in**	**0.64 in**	**0.85 in**	**0.87 in**	**0.07 in**	
I =	21 in^4	42 in^4	21 in^4	104 in^4	21 in^4	
SPAN /	**458**	**302**	**229**	**223**	**1446**	

UNBRACED WOOD COLUMN ALLOWABLE LOADS (kips)

	Unbraced Height							*Compression Perp. To Grain*
Column Type	***8'***	***10'***	***12'***	***14'***	***16'***	***18'***	***20'***	
(2) 2x4 DF #2	4.50	3.00	2.10	SR	SR	SR	SR	6.50
(3) 2x4 DF #2	8.80	5.90	4.20	3.20	SR	SR	SR	9.80
4x4 DF #2	7.00	4.60	3.30	2.40	SR	SR	SR	7.60
(2) 2x6 DF #2	7.20	4.70	3.30	SR	SR	SR	SR	10.30
(3) 2x6 DF #2	20.40	14.70	10.70	8.00	6.20	4.90	SR	15.40
6x6 DF #2	18.00	15.70	13.00	10.50	8.50	6.90	5.70	18.90
6x8 DF #2	24.50	21.40	17.80	14.30	11.60	9.40	7.80	25.70
6x10 DF #2	31.40	27.10	22.50	18.20	14.70	12.00	9.90	32.60
8x8 DF #2	36.60	34.60	31.90	28.50	24.90	21.30	18.20	35.20
8x10 DF #2	46.30	43.90	40.40	36.20	31.50	27.00	23.10	44.50
8x12 DF #2	56.20	53.10	49.00	43.80	38.10	32.70	28.00	53.40
10x10 DF #2	60.50	58.80	56.50	53.40	49.60	45.20	40.50	56.40

Wood Column

Project File: 05 Beams.ec6

DESCRIPTION: RB1 BRG.

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2018

General Information

Analysis Method	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	9 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir-Larch		
Wood Grade	No.2		
Fb +	750 psi	Fv	170 psi
Fb -	750 psi	Ft	475 psi
Fc - Prll	700 psi	Density	31.21 pcf
Fc - Perp	625 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1300	1300	1300 ksi
Minimum	470	470	

Wood Section Name	**8x8**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**7.50** in	Allow Stress Modification Factors	
Exact Depth	**7.50** in	Cf or Cv for Bending	1.0
Area	56.250 in^2	Cf or Cv for Compressio	1.0
Ix	263.672 in^4	Cf or Cv for Tension	1.0
Iy	263.672 in^4	Cm : Wet Use Factor	1.0
		Ct : Temperature Fact	1.0
		Cfu : Flat Use Factor	1.0
		Kf : Built-up columns	1.0
		Use Cr : Repetitive ?	No

Column Buckling Condition:
ABOUT X-X Axis: Lux = 9 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 9 ft, Ky = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 109.723 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 9.0 ft, D = 16.10 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.4986 : 1**

Load Combination	D Only
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	16.210 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	578.01 psi

PASS Maximum Shear Stress Ratio = **0.0 : 1**

Load Combination	+0.60D
Location of max.above base	9.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	272.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.0 in at 0.0 ft above base
for load combination : n/a

Along X-X 0.0 in at 0.0 ft above base
for load combination : n/a

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.917	0.4986	PASS	0.0 ft	0.0	PASS	9.0 ft
+0.60D	1.600	0.833	0.1853	PASS	0.0 ft	0.0	PASS	9.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments k-ft @ Base	@ Top	Mx - End Moments @ Base	@ Top
D Only					16.210				
+0.60D					9.726				

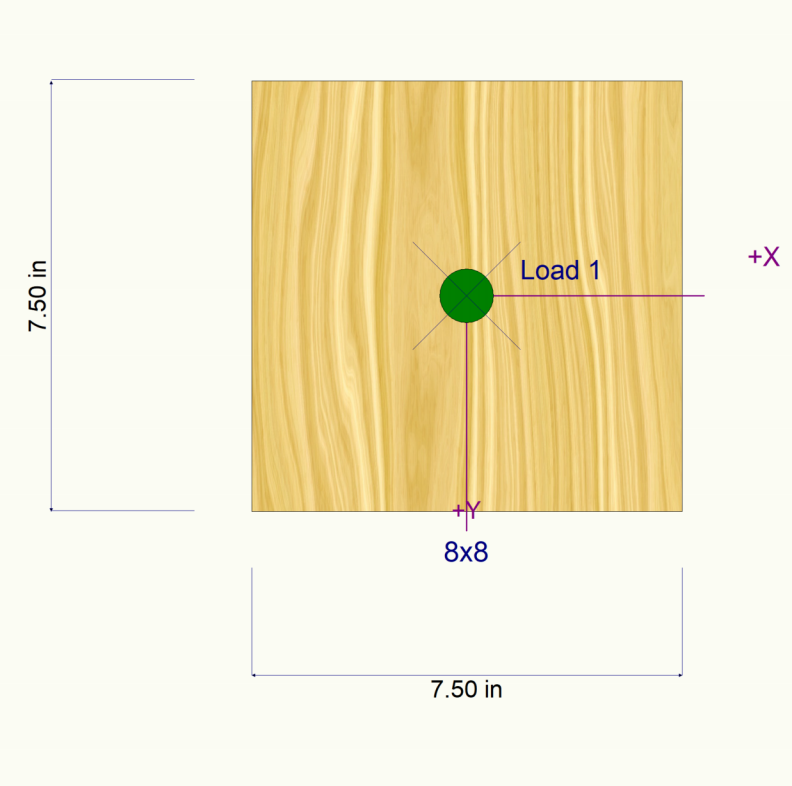
Wood Column

DESCRIPTION: RB1 BRG.

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000 ft

Sketches



Wood Column

DESCRIPTION: RB2 BRG.

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2018

General Information

Analysis Method	Allowable Stress Design	Wood Section Name	**8x8**
End Fixities	Top & Bottom Pinned	Wood Grading/Manuf.	Graded Lumber
Overall Column Height	8 ft	Wood Member Type	Sawn
(Used for non-slender calculations)			
Wood Species	Douglas Fir-Larch	Exact Width	**7.50** in
Wood Grade	No.2	Exact Depth	**7.50** in
Fb +	750.0 psi	Fv	170.0 psi
Fb -	750.0 psi	Ft	475.0 psi
Fc - Prll	700.0 psi	Density	31.210 pcf
Fc - Perp	625.0 psi		

Area	56.250 in^2	Allow Stress Modification Factors	
Ix	263.672 in^4	Cf or Cv for Bending	1.0
Iy	263.672 in^4	Cf or Cv for Compressio	1.0
		Cf or Cv for Tension	1.0
		Cm : Wet Use Factor	1.0
		Ct : Temperature Fact	1.0
		Cfu : Flat Use Factor	1.0
		Kf : Built-up columns	1.0
		Use Cr : Repetitive ?	No

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1,300.0	1,300.0	1,300.0 ksi
Minimum	470.0	470.0	

Column Buckling Condition:
ABOUT X-X Axis: Lux = 8 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 8 ft, Ky = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 97.531 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 8.0 ft, D = 20.633 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.6241 : 1**

Load Combination	D Only
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	20.731 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	590.54 psi

PASS Maximum Shear Stress Ratio = **0.0 : 1**

Load Combination	+0.60D
Location of max.above base	8.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	272.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.0 in at 0.0 ft above base
for load combination : n/a

Along X-X 0.0 in at 0.0 ft above base
for load combination : n/a

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.937	0.6241	PASS	0.0 ft	0.0	PASS	8.0 ft
+0.60D	1.600	0.875	0.2255	PASS	0.0 ft	0.0	PASS	8.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments k-ft @ Base	@ Top	Mx - End Moments @ Base	@ Top
D Only					20.731				
+0.60D					12.438				

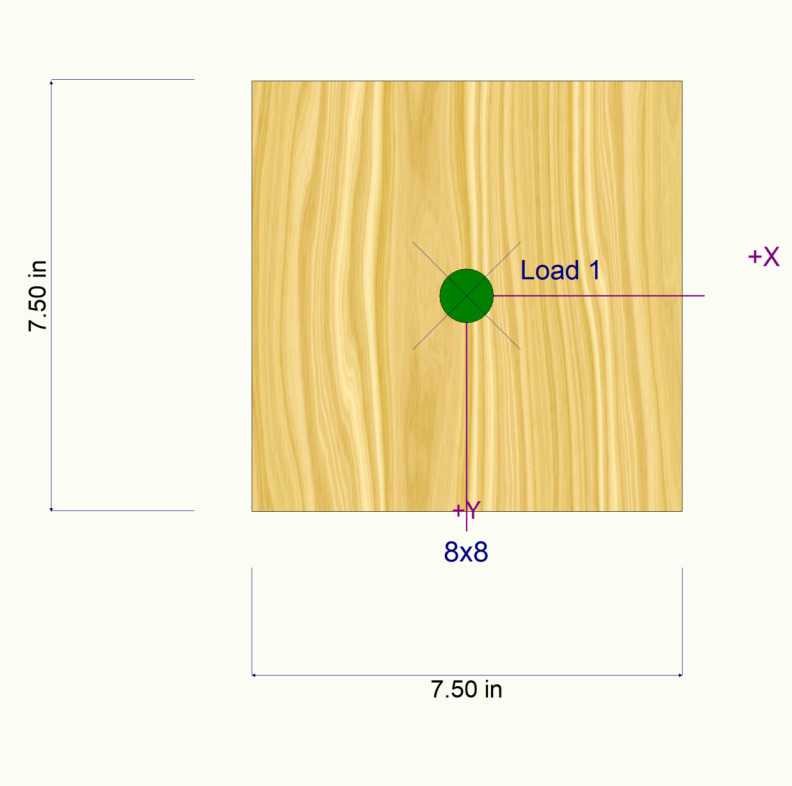
Wood Column

DESCRIPTION: RB2 BRG.

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000 ft

Sketches



Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: 05 Beams.ec6

LIC# : KW-06013353, Build:20.23.08.30 SNAKE RIVER ENGINEERING (c) ENERCALC INC 1983-2023

DESCRIPTION: LIVING MIDDLE KING STUD

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2018

General Information

Analysis Method	Allowable Stress Design	Wood Section Name	**6x6**
End Fixities	Top & Bottom Pinned	Wood Grading/Manuf.	Graded Lumber
Overall Column Height	20.67 ft	Wood Member Type	Sawn
(Used for non-slender calculations)		Exact Width	**5.50** in
Wood Species	Douglas Fir-Larch	Exact Depth	**5.50** in
Wood Grade	No.2	Area	30.250 in^2
Fb +	750 psi	Fv	170 psi	Ix	76.255 in^4
Fb -	750 psi	Ft	475 psi	Iy	76.255 in^4
Fc - Prll	700 psi	Density	31.21 pcf		
Fc - Perp	625 psi				

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1300	1300	1300 ksi
Minimum	470	470	

Allow Stress Modification Factors

Cf or Cv for Bending	1.0
Cf or Cv for Compressio	1.0
Cf or Cv for Tension	1.0
Cm : Wet Use Factor	1.0
Ct : Temperature Fact	1.0
Cfu : Flat Use Factor	1.0
Kf : Built-up columns	1.0
Use Cr : Repetitive ?	No

Column Buckling Condition:
Fully braced against buckling ABOUT X-X Axis
ABOUT Y-Y Axis: Luy = 19.0 ft, Ky = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 135.518 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 20.670 ft, D = 0.5840, S = 3.750 k
BENDING LOADS . . .
Lat. Point Load at 19.0 ft creating Mx-x, W = 2.0 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.7926 : 1**

Load Combination	+D+0.750S+0.450W
Governing NDS Forumla	Comp + Mxx, NDS Eq. 3.9-3
Location of max.above base	19.005 ft
At maximum location values are .	
Applied Axial	3.532 k
Applied Mx	1.377 k-ft
Applied My	0.0 k-ft
Fc : Allowable	214.638 psi

PASS Maximum Shear Stress Ratio = **0.2011 : 1**

Load Combination	+D+0.60W
Location of max.above base	20.670 ft
Applied Design Shear	82.045 psi
Allowable Shear	272.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	1.838 k	Bottom along Y-Y	0.1616 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 1.594 in at 11.930 ft above base
for load combination : W Only

Along X-X 0.0 in at 0.0 ft above base
for load combination : n/a

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.325	0.1160	PASS	0.0 ft	0.0	PASS	20.670 ft
+D+S	1.150	0.261	0.7036	PASS	0.0 ft	0.0	PASS	20.670 ft
+D+0.750S	1.150	0.261	0.5560	PASS	0.0 ft	0.0	PASS	20.670 ft
+D+0.60W	1.600	0.192	0.6745	PASS	19.005 ft	0.2011	PASS	20.670 ft
+D+0.450W	1.600	0.192	0.5089	PASS	19.005 ft	0.1508	PASS	20.670 ft
+D+0.750S+0.450W	1.600	0.192	0.7926	PASS	19.005 ft	0.1508	PASS	20.670 ft
+0.60D+0.60W	1.600	0.192	0.6666	PASS	19.005 ft	0.2011	PASS	20.670 ft
+0.60D	1.600	0.192	0.06649	PASS	0.0 ft	0.0	PASS	20.670 ft

Wood Column

DESCRIPTION: LIVING MIDDLE KING STUD

Maximum Reactions

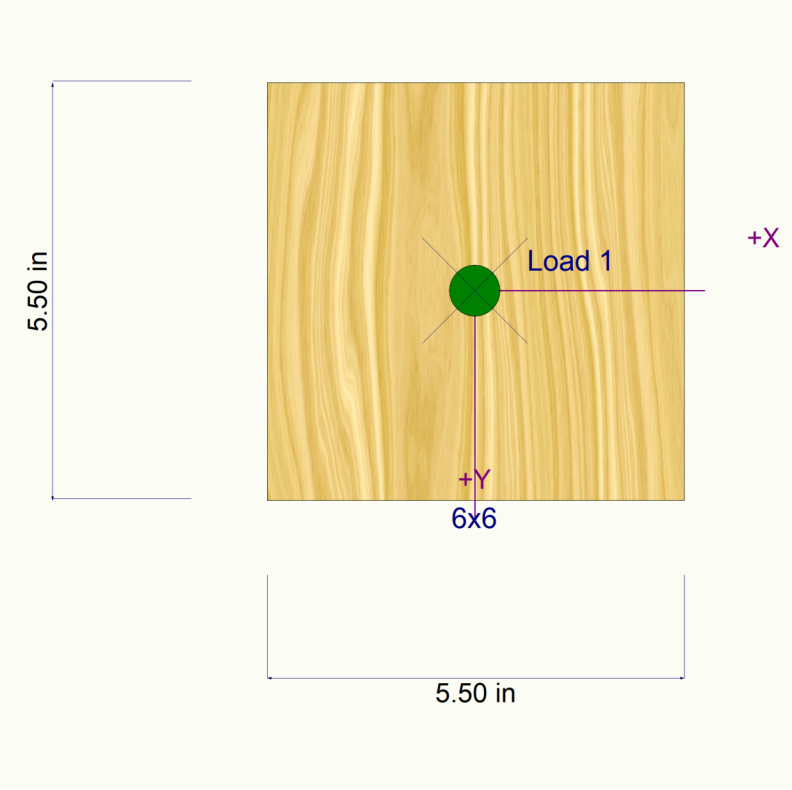
Note: Only non-zero reactions are listed.

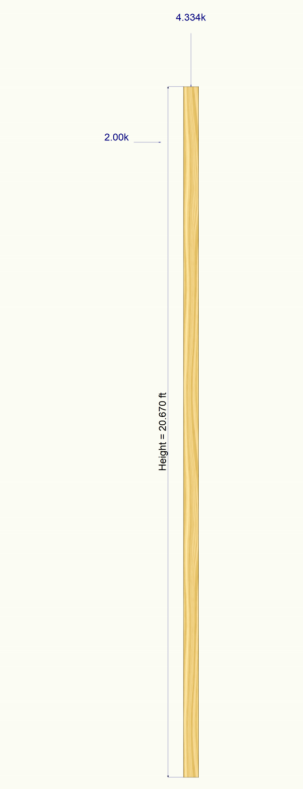
Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments @ Base	@ Top	k-ft	Mx - End Moments @ Base	@ Top
D Only						0.720					
+D+S						4.470					
+D+0.750S						3.532					
+D+0.60W				0.097	1.103	0.720					
+D+0.450W				0.073	0.827	0.720					
+D+0.750S+0.450W				0.073	0.827	3.532					
+0.60D+0.60W				0.097	1.103	0.432					
+0.60D						0.432					
S Only						3.750					
W Only				0.162	1.838						

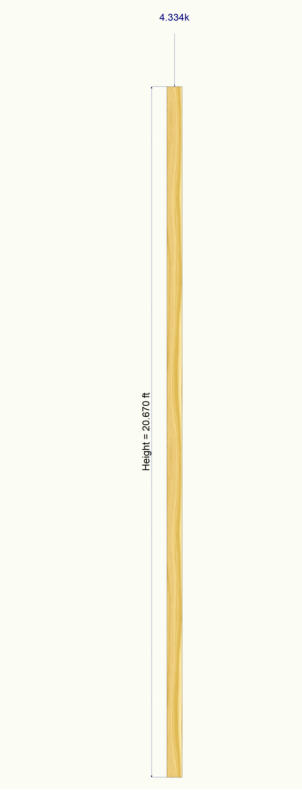
Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000ft	0.956 in	11.930 ft
+D+0.450W	0.0000 in	0.000ft	0.717 in	11.930 ft
+D+0.750S+0.450W	0.0000 in	0.000ft	0.717 in	11.930 ft
+0.60D+0.60W	0.0000 in	0.000ft	0.956 in	11.930 ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000ft	1.594 in	11.930 ft

Sketches







RES (9) Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

Roof				
Roof Dead	*(17psf)*	*(20.5ft)*	=	**349plf**
Snow Live	*(150psf)*	*(20.5ft)*	=	**3075plf**

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

Main Floor				
Floor Dead	*(12psf)*	*(4.0ft)*	=	**48plf**
Floor Live	*(40psf)*	*(4.0ft)*	=	**160plf**

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

Deck Floor				
Floor Dead	*(12psf)*	*(3.0ft)*	=	**36plf**
Snow Live	*(75psf)*	*(3.0ft)*	=	**225plf**

Misc				
Wall Load:	*(12psf)*	*(12.0ft)*	=	**144plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

4071plf

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

RES (7) 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)*	*(7.5ft)*	=	**90plf**
Floor Live	*(40psf)*	*(7.5ft)*	=	**300plf**

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)*	*(12.0ft)*	=	**144plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

3100plf

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

RES (6) Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

Roof				
Roof Dead	*(17psf)*	*(22.0ft)*	=	**374plf**
Snow Live	*(150psf)*	*(22.0ft)*	=	**3300plf**

Upper Floor				
Floor Dead	*(12psf)*	*(7.5ft)*	=	**90plf**
Floor Live	*(40psf)*	*(7.5ft)*	=	**300plf**

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)*	*(12.0ft)*	=	**144plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

4102plf

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

RES (5) Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

Roof				
Roof Dead	*(17psf)*	*(19.0ft)*	=	**323plf**
Snow Live	*(150psf)*	*(19.0ft)*	=	**2850plf**

Upper Floor				
Floor Dead	*(12psf)*	*(7.5ft)*	=	**90plf**
Floor Live	*(40psf)*	*(7.5ft)*	=	**300plf**

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)*	*(12.0ft)*	=	**144plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

3601plf

Use Footing Width:	**36**	**x**	**10**	**in**
W/		**(3)**	**#4**	**Cont.**

RES (4) 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)*	*(12.0ft)*	=	**144plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

2020plf

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

RES (3) Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

Roof				
Roof Dead	*(17psf)*	*(7.0ft)*	=	**119plf**
Snow Live	*(150psf)*	*(7.0ft)*	=	**1050plf**

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

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)*	*(12.0ft)*	=	**144plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

1531plf

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

RES (2) Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

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

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

Main Floor				
Floor Dead	*(12psf)*	*(9.3ft)*	=	**112plf**
Floor Live	*(40psf)*	*(9.3ft)*	=	**373plf**

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)*	*(12.0ft)*	=	**144plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

823plf

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

RES Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

Roof				
Roof Dead	*(17psf)*	*(2.5ft)*	=	**43plf**
Snow Live	*(150psf)*	*(2.5ft)*	=	**375plf**

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

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)*	*(12.0ft)*	=	**144plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

780plf

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

SHOP (3) Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

Roof				
Roof Dead	*(17psf)*	*(18.8ft)*	=	**319plf**
Snow Live	*(150psf)*	*(18.8ft)*	=	**2813plf**

Misc				
Wall Load:	*(12psf)*	*(16.4ft)*	=	**197plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

3522plf

Use Footing Width:	**36**	**x**	**10**	**in**
W/		**(3)**	**#4**	**Cont.**

SHOP (2) Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

Roof				
Roof Dead	*(17psf)*	*(12.5ft)*	=	**213plf**
Snow Live	*(150psf)*	*(12.5ft)*	=	**1875plf**

Misc				
Wall Load:	*(12psf)*	*(16.4ft)*	=	**197plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

2479plf

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

SHOP Individual Footing Design

Program: ***Continuous Footing***

Soil Bearing Pressure: *1500psf*

Roof				
Roof Dead	*(17psf)*	*(3.5ft)*	=	**60plf**
Snow Live	*(150psf)*	*(3.5ft)*	=	**525plf**

Misc				
Wall Load:	*(12psf)*	*(16.4ft)*	=	**197plf**
Conc Stem:	*(145pcf)*	*(2 x .7ft)*	=	**194plf**
Misc Load:	*(.0ft)*	*(.0ft)* *(.0ft)*	=	**plf**

976plf

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

PAD FOOTING DESIGN CAPACITIES:

Soil Bearing (1500 psf)			
Dimensions (Inches)	Capacity	# of Bars	Min. Col. Size
72 x 72 x 12	47,500 lbs	10	3.5 sq.
66 x 66 x 12	39,750 lbs	8	3.5 sq.
60 x 60 x 10	33,450 lbs	6	3.5 sq.
54 x 54 x 10	27,000 lbs	5	3.5 sq.
48 x 48 x 8	21,500 lbs	4	3.5 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.

CONT. FOOTING DESIGN CAPACITIES:

Soil Bearing (1500 psf)				
Dimensions (Inches)			Capacity	# of Bars
60	x	10	6,850 plf	6
54	x	10	6,200 plf	5
48	x	10	5,500 plf	4
42	x	10	4,750 plf	4
36	x	10	4,000 plf	3
30	x	10	3,400 plf	3
24	x	8	2,800 plf	2
18	x	8	2,100 plf	2
16	x	8	1,850 plf	2
12	x	8	1,350 plf	2

Bars to be 3 1/2" from bottom of footing.