ADDENDUM
STRUCTURAL CALCULATIONS

Mithalia Residence
3632 90th Ave SE
Mercer Island, WA - 98040

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ATLAS CONSULTING ENGINEERS INC.

Project:	Mithalia Residence	By:	JDA
Proj No:	210-2022	Date:	04/04/2024

Summary

The previously designed 'conventional' three-story single-family residence will be revised to employ more environmentally responsible and energy efficient construction methods. From a structural perspective, the revision will comprise the following:

-Updated building geometry that will slightly alter vertical and lateral system
-Use of ICF insulated concrete walls, slab-on-grade floor slab/foundation, and studwalls
-Omission of gypcrete topping (i.e. less dead load when designing vertical and lateral system)

See pages 2-3 for lateral design. Site seismic variables are shown on page 4; seismic areas and shearwall lengths are shown on pages 5-7; wall and wind areas on pages 8; and wind load derivation is shown on pages 9 - 15 (Kzt of 1.6 used based on Mercer Island map) . Seismic and wind loads were determined using ASCE 7-16 procedures. As shown on pages 2-3, shearwalls with 10d nails spaced at 6" o.c. (SW-6), 4" o.c. (SW-4), 3" o.c. (SW-3), 2" o.c. (SW-2), 4" o.c. at each side (SW-4), 3" o.c. at each side (SW-33), and 2" o.c. at each side (SW-22) of wall are required. Shearwalls have been detailed to meet the ASD shearwall capacity values as listed in plans. LTP4 and A34 clips have an ASD capacity of 540# and 550# per clip; SDS screws have an ASD capacity of 400# per screws; 5/8" and 3/4" diameter anchor bolts have an ASD capacity of 1485# and 2039# with Doug Fir plates. The required spacing of these connectors is shown in the shearwall table in the plans. Each shearwall will have a different uplift demand, as shown on pages 2 - 3. Simpson holdowns will be used as shown in the plans, sized to ensure ASD uplift capacity. Anchorage of the HDU's into concrete were designed for worst case LRFD load when including the seismic overstrength factor. To preclude breakout, additional reinforcing hairpins are detailed to transfer shear force into new foundation walls. Note that transfer shearwalls (i.e. non-stacking shearwalls that occur atop framing) occur. Per ASCE 7, the supporting members have been designed to consider holdown forces with the 2.5 overstrength factor to ensure sufficient strength is provided...serviceability (i.e. deflection) does not consider overstrength. Strapped shearwalls were used to minimize holdowns and holdown demand where applicable...note that sheathing above and below opening is not considered when sizing shearwalls (only to distribute load across openings and determine strap forces), and that straps have been extended sufficient enough to ensure SW capacity is not exceeded. See pages 16 - 19 for force transfer around opening calculations. Diaphragm will use 3/4" T&G sheathing with 10d @ 6" oc at panel edges.

Gravity system was designed for 25 psf roof snow + 5 psf rain load, 15 psf roof dead load + 10 psf PV roof dead load, 40 psf floor live load, 60 psf roof deck load, and 25 psf floor dead load. See pages 20-22 for framing key; and pages 23 - 87 for member designs. Uplift for each member considering 0.6D+0.6W will be resisted by straps, holdowns, or post caps at headers/beams; and CS22 strap ties at rafters and trusses.

During construction (temporary condition), design walls for 35 psf earth pressure--see page 88 for design. In permanent condition, design walls for 45 psf earth pressure with 8H seismic surcharge load and weight of studwall above--see page 89 for design. Use #6 @ 6" oc bottom reinforcing in the portion of footing that will be used for the retaining wall pressures' and #6 @ 12" oc dowels to account for the higher moment at the base of the wall (gets to #5 @ 12" oc capacity of 8.56 k-ft before 0.5' above footing). Design footings for a 2000 psf bearing pressure, increased by 1/3 (2667 psf) when considering seismic loads. All foundation walls will be cantilevered retaining walls braced from sliding at ground level by slab on grade. Provide minimum reinforcing in footings and walls per ACI.

R	6.5		*ASCE 7-16 Table 12.2-1*
Ω_o	2.5		
C_d	4		
V	52.5	Kips	= CsW ~ ASCE 7-16 (12.8-1)
C_s	0.144		
	0.144		= Sds / (R/Ie) ~ ASCE 7-16 (12.8-2)
	0.330		< Sd1 / T(R/Ie) ~ if T<TL, ASCE 7-16 (12.8-3)
	-		< Sd1TL / T2(R/Ie) ~ if T>TL, ASCE 7-16 (12.8-3)
	0.041		>0.044Sdsle ~ ASCE 7-16 (12.8-5)
	0.01		>0.01 ~ ASCE 7-16 (12.8-5)
	-		>0.5S1 / (R/Ie) ~ if S1>0.6g, ASCE 7-16 (12.8-6)
W	363	Kips	
I_e	1		ATC Hazard
F_v	1.81		Table 11.4-2 and Section 11.4.8 Exception
F_a	1.2		ATC Hazard
S_S	1.408	g	ATC Hazard
S_1	0.49	g	ATC Hazard
S_{mS}	1.408	g	ATC Hazard
S_{m1}	0.8869	g	= $F_v S_1$ ~ ASCE 7-16 (11.4-1)
S_{ds}	0.939	g	ATC Hazard
S_{d1}	0.59126667	g	= 2/3 S_{m1} ~ ASCE 7-16 (11.4-4)
S_{DC}	D		
T_a	0.275	seconds	= Cthnx ~ ASCE 7-16 (12.8-7)
C_t	0.02		*ASCE 7-16 Table 12.8-2*
h_n	33.00	feet	
x	0.75		*ASCE 7-16 Table 12.8-2*
T_L	6	seconds	USGS Seismic Values
T_S	0.630	seconds	= S_{m1} /S_{ds}, ASCE 7-16 (11.4-3)
$1.5T_S$	0.945	seconds	

EXCEPTION: A ground motion hazard analysis is not required for structures other than seismically isolated structures and structures with damping systems where:

1. Structures on Site Class E sites with S_S greater than or equal to 1.0, provided the site coefficient F_a is taken as equal to that of Site Class C.
2. Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient C_s is determined by Eq. (12.8-2) for values of $T \le 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \ge T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$.
3. Structures on Site Class E sites with S_1 greater than or equal to 0.2, provided that T is less than or equal to T_s and the equivalent static force procedure is used for design.

Table 11.4-2 Long-Period Site Coefficient, F_v

Site Class	Mapped Risk-Targeted Maximum Considered Earthquake (MCE$_R$) Spectral Response Acceleration Parameter at 1-s Period					
	$S_1 \le 0.1$	$S_1 = 0.2$	$S_1 = 0.3$	$S_1 = 0.4$	$S_1 = 0.5$	$S_1 \ge 0.6$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	0.8	0.8	0.8	0.8	0.8	0.8
C	1.5	1.5	1.5	1.5	1.5	1.4
D	2.4	2.2[a]	2.0[a]	1.9[a]	1.8[a]	1.7[a]
E	4.2	See Section 11.4.8	See Section 11.4.8	See Section 11.4.8	See Section 11.4.8	See Section 11.4.8
F	See Section 11.4.8	See Section 11.4.8	See Section 11.4.8	See Section 11.4.8	See Section 11.4.8	See Section 11.4.8

Note: Use straight-line interpolation for intermediate values of S_1.
[a]Also, see requirements for site-specific ground motions in Section 11.4.8.

Story	*Weight* (Kips)	*Height* (ft)	*Wh* (Kip-ft)	C_{vx} *(Wh/∑Wh)*	F_{xE}, *Kips* $(C_{vx}V)$	$\sum F_{xE}$, *Kips LRFD*	F_{xE}, *Kips* $(C_{vx}V)$	$\sum F_{xE}$, *Kips ASD*	F_{xW}, *Kips East ASD*	F_{xW}, *Kips North ASD*
Roof	78.13	33.00	2,578	0.39	*20.4*	*20.4*	*14.260*	***14.260***	*3.396*	*4.397*
Upper	92.99	22.00	2,046	0.31	*16.2*	*36.5*	*11.313*	***25.575***	*6.621*	*8.795*
Main	192.11	10.50	2,017	0.30	*15.9*	*52.5*	*11.156*	***36.731***	*6.344*	*7.907*
∑W	363.23									

LEFT-to-RIGHT RUNNING WALLS

Upper - to- Roof

	%	Length (ft)	# in Wall	SEISMIC PLF	Chord F (#)	# in Wall	WIND PLF	Chord F (#)	Wall W (#)	GRAVITY LOADING (plf) Snow	Dead	Live	Uplift	Comp				
N	50.0%	24.29	7,130			1,698									*9*	*ft*		
		34.63	7,130	206	1,853	1,698	49	441	4,674	563	338	0	0	5,392	6	OK	None	OK
	30.3%	7.35	2,159	294		514	70								6	OK		
	27.6%	6.70	1,966	294		468	70								6	OK		
	26.5%	6.45	1,893	294		451	70								6	OK		
	15.6%	3.79	1,113	294		265	70								6	OK		
S	50.0%	8.75	7,130			1,698									*9*	*ft*		
	100.0%	8.75	7,130	815	7,334	1,698	194	1,746	1,181	563	338	0	6,365	8,497	44	OK	(2)MSTC52	OK

Main -to- Upper

	%	Length (ft)	# in Wall	SEISMIC PLF	Chord F (#)	# in Wall	WIND PLF	Chord F (#)	Wall W (#)	GRAVITY LOADING (plf) Snow	Dead	Live	Uplift	Comp	Anchorage				
N	39.3%	31.77	11,576			4,300										*10*	*ft*		
1079	68.4%	21.73	7,917	364	3,644	2,941	135	1,353	3,259	0	0	0	2,880	5,686	11,852	4	OK	MSTC52	OK
	31.6%	15.21	3,659	241	2,406	1,359	89	894	2,281	0	0	0	1,871	3,835	7,780	4	OK	MSTC40	OK
	19.9%	6.33	2,308	364		857	135									4	OK		
	11.7%	3.71	1,351	364		502	135									4	OK		
M	43.9%	31.34	4,965			2,906										*10*	*ft*		
1205	69.3%	21.73	3,442	158	1,584	2,014	93	927	2,608	0	0	0	973	3,218	4,729	6	OK	MSTC28	OK
	30.7%	9.61	1,523	158	1,584	891	93	927	1,154	0	0	0	1,314	2,307	5,247	6	OK	MSTC28	OK
S	16.8%	27.15	9,034			2,812										*10*	*ft*		
462	100.0%	38.17	9,034	237	2,367	2,812	74	737	4,580	0	0	0	1,294	5,237	6,822	4	OK	MSTC28	OK
	12.1%	3.29	1,095	333		341	104									4	OK		
	22.8%	6.19	2,059	333		641	104									4	OK		
	14.7%	4.00	1,331	333		414	104									4	OK		
	50.3%	13.67	4,548	333		1,416	104									4	OK		

Lower -to- Main

	%	Length (ft)	# in Wall	SEISMIC PLF	Chord F (#)	# in Wall	WIND PLF	Chord F (#)	Wall W (#)	GRAVITY LOADING (plf) Snow	Dead	Live	Uplift	Comp	Anchorage				
N	50.0%	42.24	17,154			7,472										*10*	*ft*		
1165	55.0%	23.25	9,442	406	4,061	4,113	177	1,769	3,488	0	0	0	3,244	6,247	13,262	4	OK	HDU4	OK
	15.3%	6.45	2,619	406	4,061	1,141	177	1,769	967	0	0	0	3,835	4,667	14,160	4	OK	HDU4	OK
	9.0%	3.79	1,540	406	4,061	671	177	1,769	569	0	0	0	3,928	4,418	14,302	4	OK	HDU4	OK
	20.7%	8.75	3,553	406	4,061	1,548	177	1,769	1,313	0	0	0	3,754	4,884	14,037	4	OK	HDU4	OK
M	50.0%	43.89	10,543			6,078										*10*	*ft*		
1333	68.1%	29.90	7,182	240	2,402	4,140	138	1,385	3,588	0	0	0	1,562	4,651	7,303	6	OK	HDU2	OK
	31.9%	13.99	3,361	240	2,402	1,937	138	1,385	1,679	0	0	0	2,009	3,455	7,982	6	OK	HDU2	OK
S	50.0%	29.52	14,612			3,513										*10*	*ft*		
614	58.4%	17.24	8,533	495	4,950	2,052	119	1,190	2,069	0	0	0	4,465	6,246	16,940	3	OK	HDU4	OK
	29.2%	8.61	4,264	495	4,950	1,025	119	1,190	1,034	0	0	0	4,707	5,597	17,309	3	OK	HDU5	OK
	12.4%	3.67	1,815	495	4,950	436	119	1,190	440	0	0	0	4,847	5,225	17,520	3	OK	HDU5	OK

UP-to-DOWN RUNNING WALLS

Upper - to- Roof

				SEISMIC			WIND			GRAVITY LOADING (plf)								
	%	Length (ft)	# in Wall	PLF	Chord F (#)	# in Wall	PLF	Chord F (#)	Wall W (#)	Snow	Dead	Live	Uplift	Comp				
W	50.0%	16.75	7,130	426		2,199	131								*9*	*ft*		
		19.42	7,130	367	3,305	2,199	113	1,019	2,621	0	0	0	2,691	4,948	4	OK	MSTC52	OK
	45.3%	7.58	3,228	426		995	131								4	OK		
	54.7%	9.17	3,902	426		1,203	131								4	OK		
E	50.0%	7.42	7,130	961		2,199	296								*9*	*ft*		
	100.0%	7.42	7,130	961	8,652	2,199	296	2,668	1,001	0	0	0	8,417	9,279	33	OK	(2)MSTC66	OK

Main -to- Upper

				SEISMIC			WIND			GRAVITY LOADING (plf)									
	%	Length (ft)	# in Wall	PLF	Chord F (#)	# in Wall	PLF	Chord F (#)	Wall W (#)	Snow	Dead	Live	Uplift	Comp	Anchorage				
W	24.7%	14.65	9,922			4,369										*10*	*ft*		
677	18.6%	2.72	1,842	677	6,774	811	298	2,983	326	0	0	0	6,698	6,979		44	OK	(2)MSTC52	OK
	18.6%	2.72	1,842	677	6,774	811	298	2,983	326	0	0	0	6,698	6,979		44	OK	(2)MSTC52	OK
	30.3%	4.44	3,006	677	6,774	1,324	298	2,983	533	0	0	0	6,650	7,108		44	OK	(2)MSTC52	OK
	32.6%	4.77	3,232	677	6,774	1,423	298	2,983	573	0	0	0	6,640	7,133		44	OK	(2)MSTC52	OK
M1	42.4%	20.88	4,800			3,731										*10*	*ft*		
1164	80.4%	16.78	3,859	230	2,299	3,512	209	2,093	2,014	0	0	0	1,828	3,561		6	OK	MSTC40	OK
	19.6%	4.09	941	230	2,299	857	209	2,093	491	0	0	0	2,184	2,607		6	OK	MSTC40	OK
E	32.9%	8.11	10,853	1,338		5,093	628									*10*	*ft*		
903	100.0%	8.11	10,853	1,338	13,375	5,093	628	6,276	974	0	0	0	13,147	13,986		22	OK	HDU14	OK

Lower -to- Main

				SEISMIC			WIND			GRAVITY LOADING (plf)									
	%	Length (ft)	# in Wall	PLF	Chord F (#)	# in Wall	PLF	Chord F (#)	Wall W (#)	Snow	Dead	Live	Uplift	Comp	Anchorage				
W	15.7%	39.60	11,674			5,611										*10*	*ft*		
441	62.0%	24.57	7,243	295	2,948	3,481	142	1,417	2,949	0	0	0	2,257	4,796		6	OK	HDU2	OK
	38.0%	15.03	4,431	295	2,948	2,129	142	1,417	1,804	0	0	0	2,525	4,078		6	OK	HDU2	OK
M1	43.8%	12.41	9,684			7,192										*10*	*ft*		
1229	100.0%	12.41	9,684	781	7,806	7,192	580	5,797	1,489	0	0	0	7,457	8,739		44	OK	HDU8	OK
E	40.5%	20.63	15,372			8,296										*10*	*ft*		
1137	65.2%	13.44	10,015	745	7,453	5,405	402	4,022	1,613	0	0	0	7,076	8,464		2	OK	HDU8	OK
	34.8%	7.19	5,357	745	7,453	2,891	402	4,022	863	0	0	0	7,251	7,994		2	OK	HDU8	OK

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information

Address:	3632 90th Ave SE
Coordinates:	47.5772184, -122.2181489
Elevation:	263 ft
Timestamp:	2023-04-25T19:12:20.879Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D

Basic Parameters

Name	Value	Description
S_S	1.403	MCE_R ground motion (period=0.2s)
S_1	0.488	MCE_R ground motion (period=1.0s)
S_{MS}	1.403	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	0.935	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

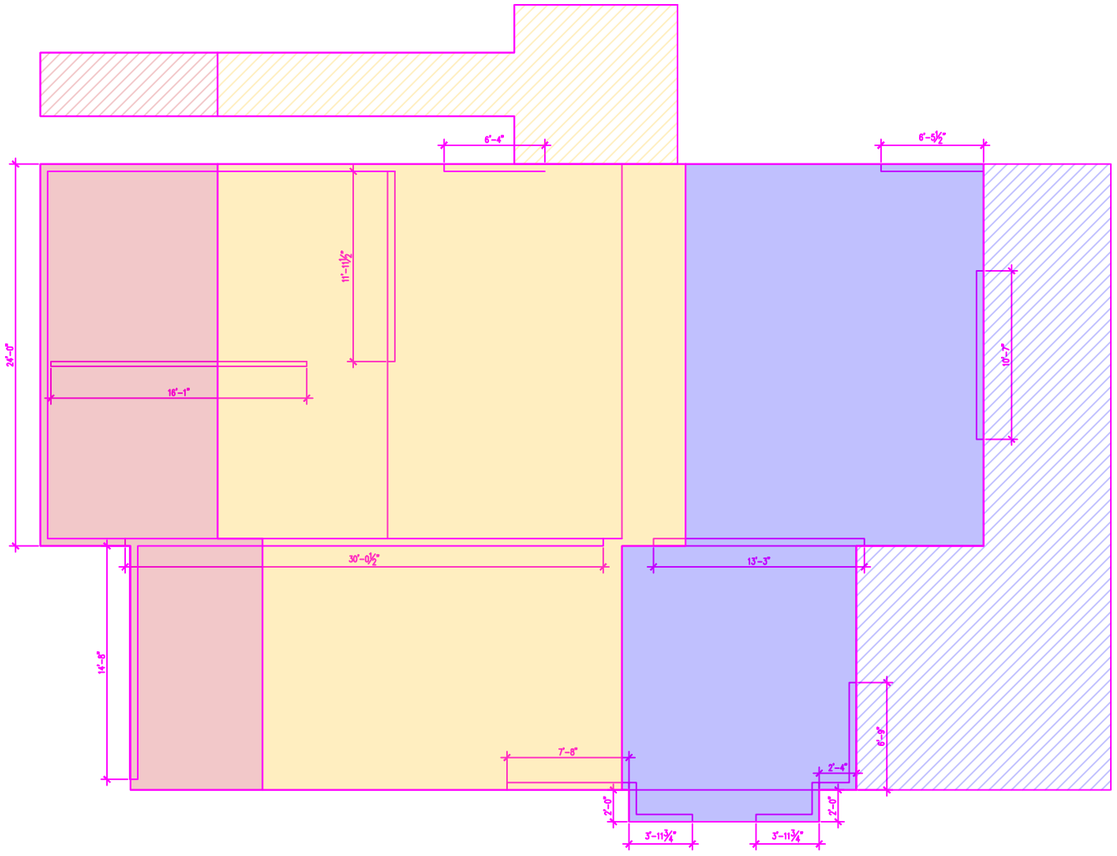
Name	Value	Description
SDC	* null	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.903	Coefficient of risk (0.2s)
CR_1	0.897	Coefficient of risk (1.0s)
PGA	0.6	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.66	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	1.403	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.554	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.533	Factored deterministic acceleration value (0.2s)
S1RT	0.488	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.544	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.42	Factored deterministic acceleration value (1.0s)
PGAd	1.208	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer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16'-1"
18'-7"
30'-0½"
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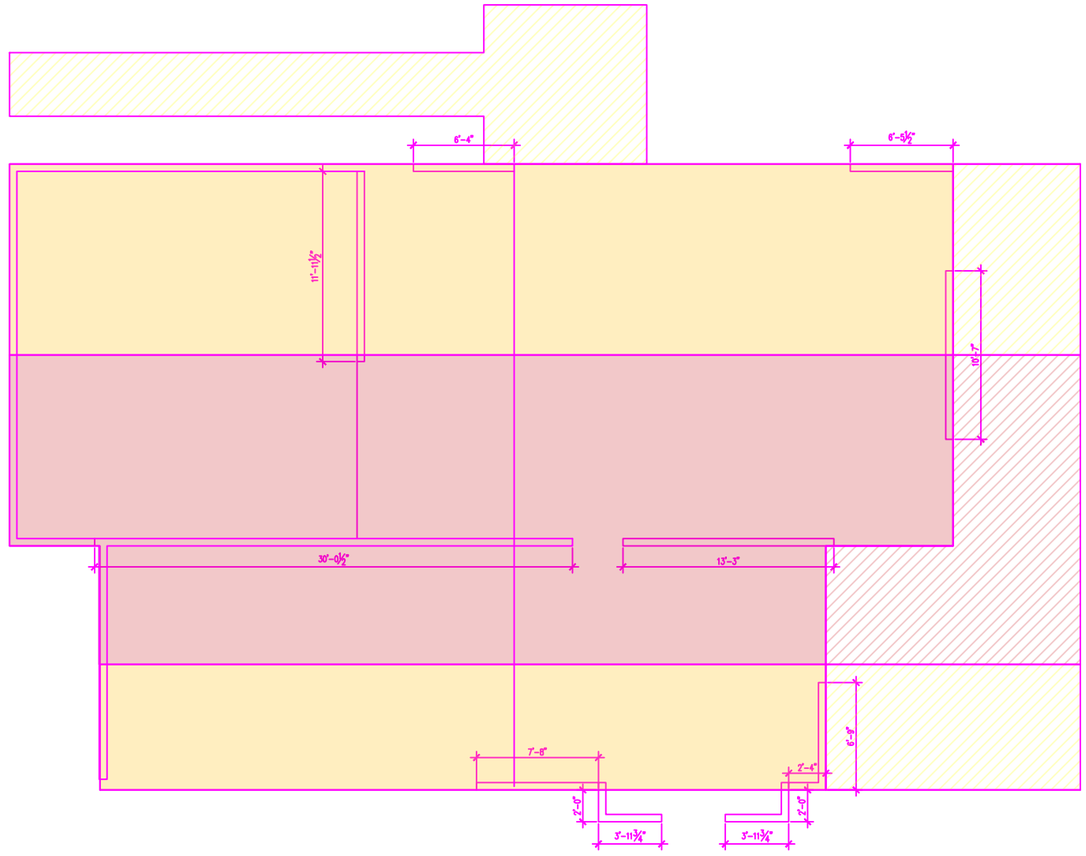
3'-11¾"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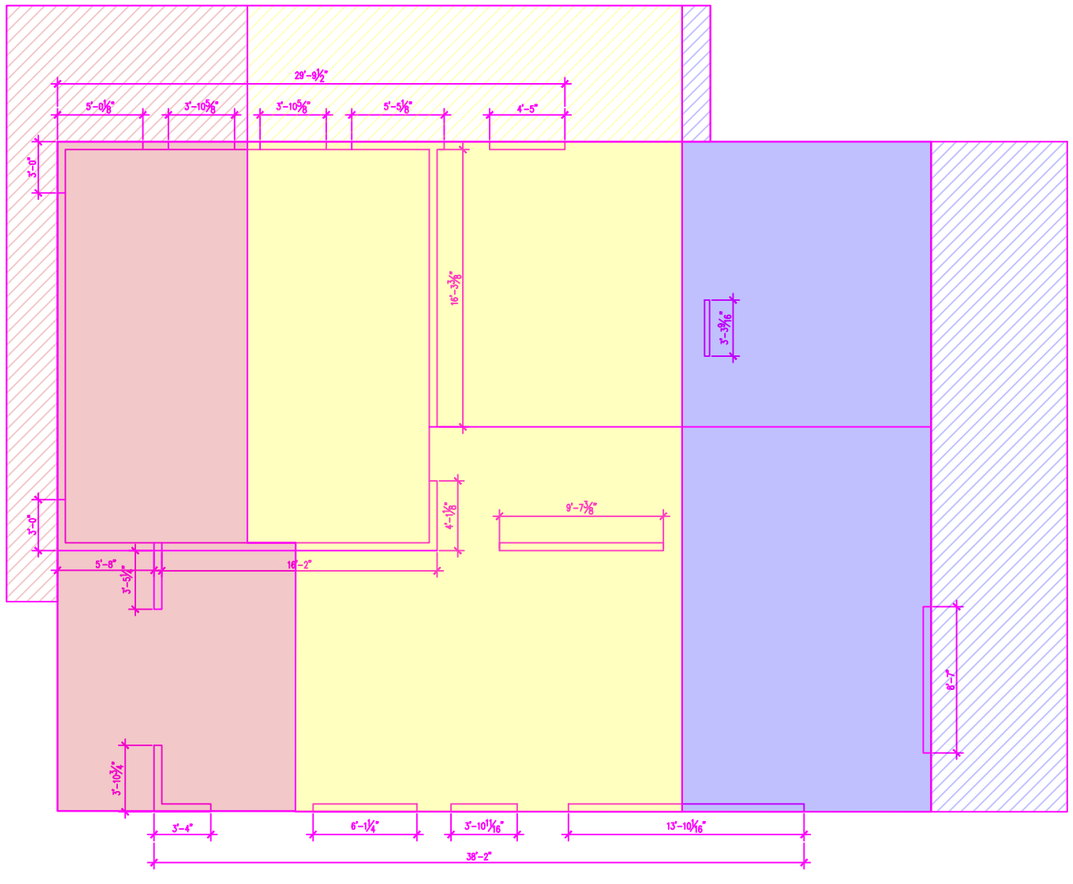
3'-11¾"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3'-5⅞"
3'-0"
4'-1⅛"
9'-7⅞"
5'-8"
16'-2"
3'-5⅞"
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3'-10¹¹⁄₁₆"
13'-10¼"
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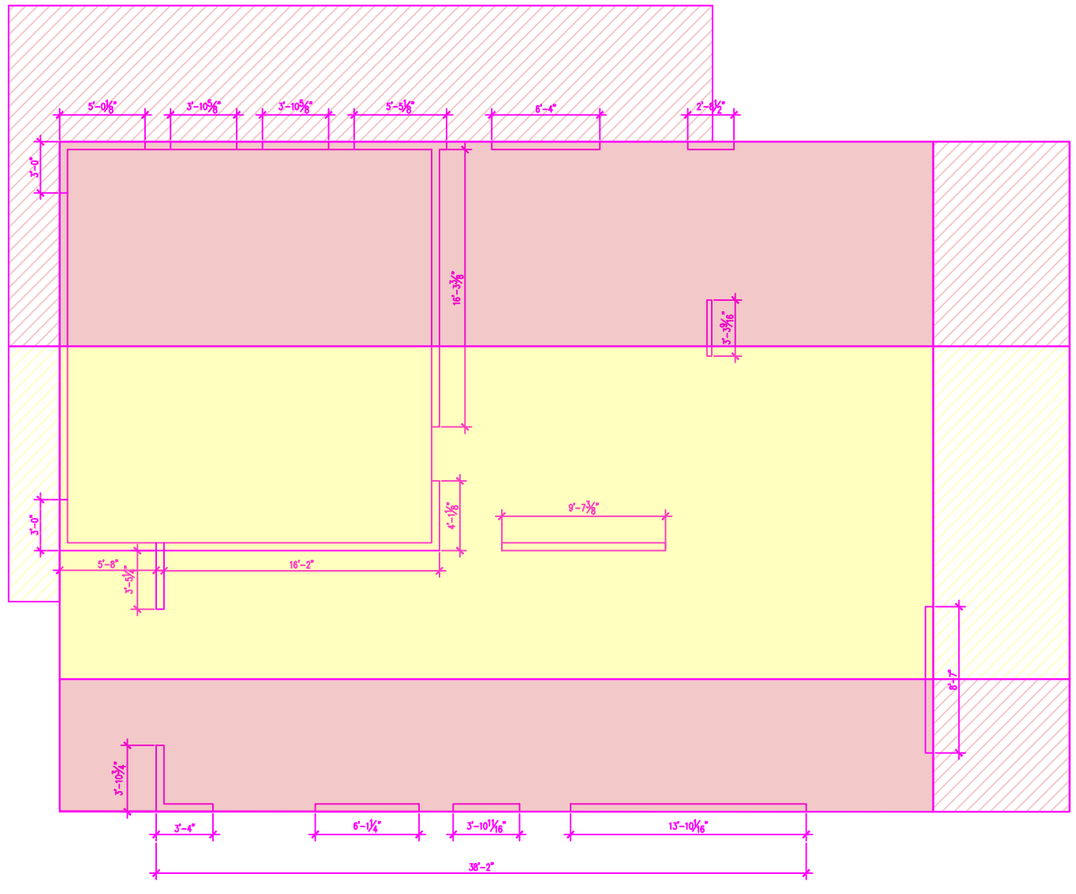
8'-7"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6'-4"
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3'-5⅞"
3'-0"
4'-1⅛"
9'-7⅞"
5'-8"
16'-2"
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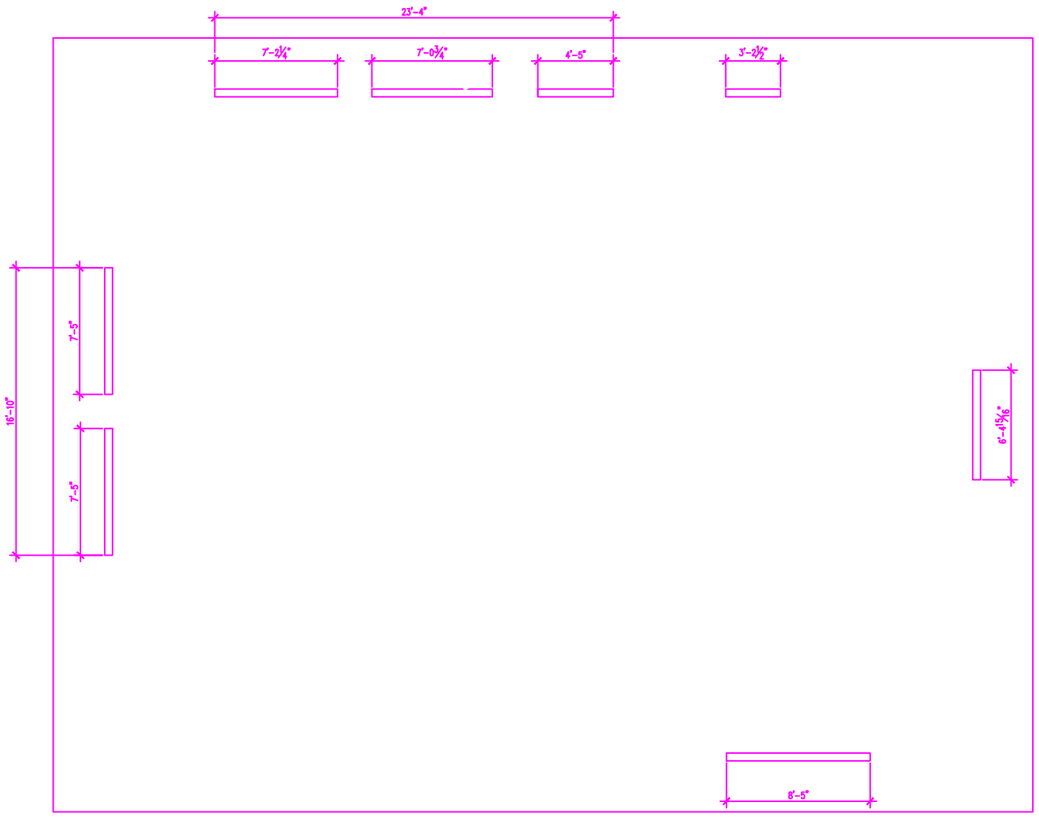
8'-7"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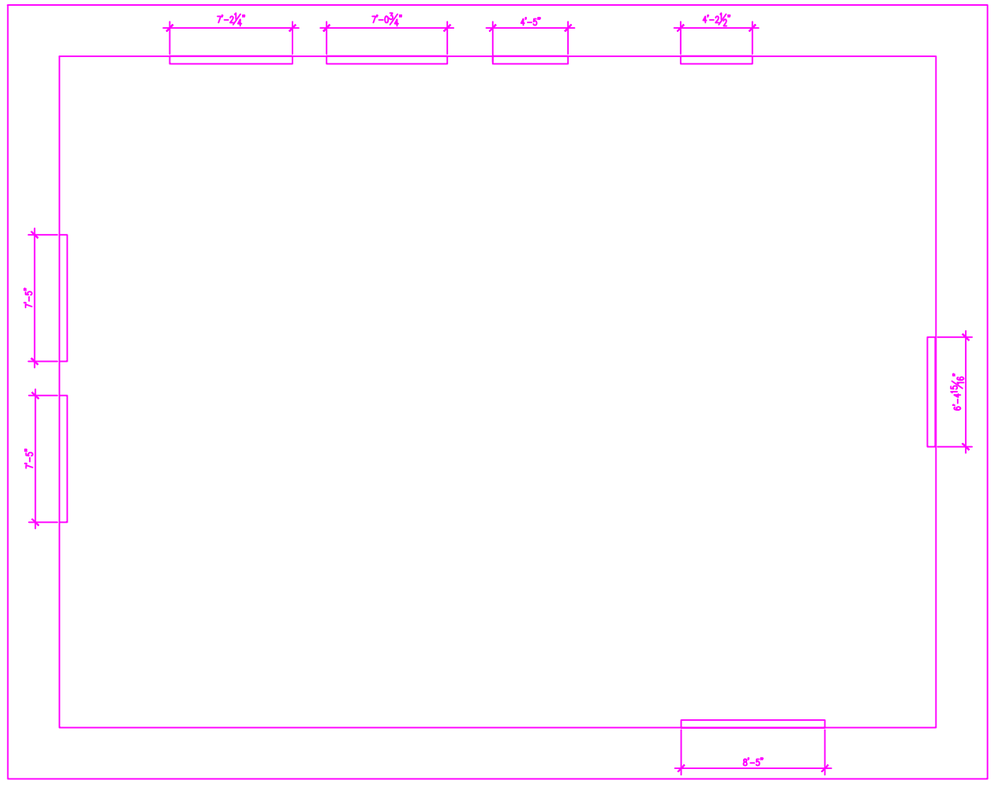
7'-2¼"
7'-0¾"
4'-5"
4'-2½"
7'-5"
7'-5"
6'-1⅝"
8'-5"

45 sf
x 6.3 psf

247 sf x 12.6 psf

91 sf
x 6.3 psf

480 sf x 12.6 psf

89 sf
x 6.3 psf

459 sf x 12.6 psf

16'-0"

16'-0"

8'-0"

8'-0"

9'-0"

10'-0"

33'-0"

5'-0"

5'-0"

5'-0"

5'-0"

9'-9"

3'-0"

40'-0"

3'-2"

5'-4"

6'-3"

6'-3"

5'-0"

5'-0"

5'-0"

8'-0"

BSMT 256

62'-0½"

8'-0"

EAST ELEV.

46 sf
x 6.3 psf

326 sf x 12.6 psf

90 sf
x 6.3 psf

653 sf x 12.6 psf

77 sf
x 6.3 psf

589 sf x 12.6 psf

10'-0"

7'-0"

5'-0"

5'-0"

reversable
awning

3'-6"

5'-10"

2'-0"

9'-0"

5'-6"

5'-6"

egress

5'-0"

1'-6"

8'-1"

9'-0"

wood siding

6'-3"

6'-3"

5'-5"

MAIN 266.5

5'-0"

6'-0"

6'-3"

10'-9 15/16"

NORTH ELEV.

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JOB TITLE 3632 90th Ave SE (Mithalia)

JOB NO. 210-2022 **SHEET NO.**
CALCULATED BY JDA **DATE** 7/16/22
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Code Search

Code: ASCE 7

Occupancy:

Occupancy Group = R Residential

Risk Category & Importance Factors:

Risk Category =	II	
Wind factor =	1.00	use 0.60 NOTE: Output will be nominal wind pressures
Snow factor =	1.00	
Seismic factor =	1.00	

Type of Construction:

Fire Rating:

Roof =	0.0 hr
Floor =	0.0 hr

Building Geometry:

Roof angle (θ)	0.00 / 12	0.0 deg
Building length (L)	62.0 ft	
Least width (B)	40.0 ft	
Mean Roof Ht (h)	33.0 ft	
Parapet ht above grd	0.0 ft	
Minimum parapet ht	0.0 ft	

Live Loads:

Roof

0 to 200 sf:	20 psf	use 25.0 psf
200 to 600 sf:	25 psf	
over 600 sf:	25 psf	

Floor:

Typical Floor	40 psf	
Partitions	N/A	
Partitions	N/A	
Partitions	N/A	
Partitions	N/A	

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Wind Loads : ASCE 7

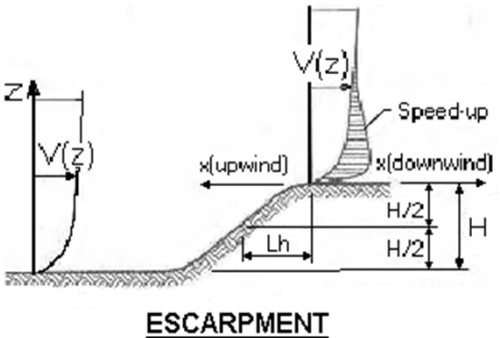
Ultimate Wind Speed	110 mph
Nominal Wind Speed	85.2 mph
Risk Category	II
Exposure Category	B
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85
Kh case 1	0.720
Kh case 2	0.720
Type of roof	Gable

Topographic Factor (Kzt)

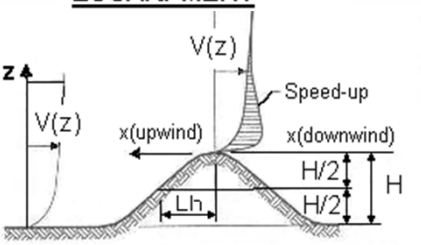
Topography		2D Escarpment
Hill Height	(H)	0.0 ft
Half Hill Length (Lh)		39.4 ft
Actual H/Lh	=	0.00
Use H/Lh	=	0.00
Modified Lh	=	39.4 ft
From top of crest: x =		0.0 ft
Bldg up/down wind?		upwind

H< 60ft;exp B
∴ Kzt=1.0

H/Lh= 0.00 K_1 = 0.000
x/Lh = 0.00 K_2 = 1.000
z/Lh = 0.84 K_3 = 0.123
At Mean Roof Ht:
Kzt = $(1+K_1K_2K_3)^2$ = 1.00 use 1.60



ESCARPMENT



2D RIDGE or 3D AXISYMMETRICAL HILL

Gust Effect Factor

h = 33.0 ft
B = 40.0 ft
/z (0.6h) = 30.0 ft

Flexible structure if natural frequency < 1 Hz (T > 1 second).
However, if building h/B < 4 then probably rigid structure (rule of thumb).
h/B = 0.83 Rigid structure

G = 0.85 Using rigid structure default

Rigid Structure

$\bar{e}$ =	0.33	
ℓ =	320 ft	
z_{min} =	30 ft	
c =	0.30	
g_Q, g_v =	3.4	
L_z =	310.0 ft	
Q =	0.89	
I_z =	0.30	
G =	0.86	use G = 0.85

Flexible or Dynamically Sensitive Structure

Natural Frequency (η_1) =	0.0 Hz				
Damping ratio (β) =	0				
/b =	0.45				
/α =	0.25				
Vz =	70.9				
N_1 =	0.00				
R_n =	0.000				
R_h =	28.282	η =	0.000	h =	33.0 ft
R_B =	28.282	η =	0.000		
R_L =	28.282	η =	0.000		
g_R =	0.000				
R =	0.000				
G =	0.000				

Enclosure Classification

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JOB NO. 210-2022 **SHEET NO.**
CALCULATED BY JDA **DATE** 7/16/22
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Test for Enclosed Building: A building that does not qualify as open or partially enclosed.

Test for Open Building: All walls are at least 80% open.
Ao ≥ 0.8Ag

Test for Partially Enclosed Building:

	Input			Test	
Ao	0.0	sf	Ao ≥ 1.1Aoi	YES	
Ag	0.0	sf	Ao > 4' or 0.01Ag	NO	
Aoi	0.0	sf	Aoi / Agi ≤ 0.20	NO	Building is NOT
Agi	0.0	sf			Partially Enclosed

Conditions to qualify as Partially Enclosed Building. Must satisfy all of the following:
Ao ≥ 1.1Aoi
Ao > smaller of 4' or 0.01 Ag
Aoi / Agi ≤ 0.20
Where:
Ao = the total area of openings in a wall that receives positive external pressure.
Ag = the gross area of that wall in which Ao is identified.
Aoi = the sum of the areas of openings in the building envelope (walls and roof) not including Ao.
Agi = the sum of the gross surface areas of the building envelope (walls and roof) not including Ag.

Reduction Factor for large volume partially enclosed buildings (Ri) :

If the partially enclosed building contains a single room that is unpartitioned , the internal pressure coefficient may be multiplied by the reduction factor Ri.

Total area of all wall & roof openings (Aog): 0 sf
Unpartitioned internal volume (Vi) : 0 cf
Ri = 1.00

Altitude adjustment to constant 0.00256 (caution - see code) :

Altitude = 0 feet
Constant = 0.00256
Average Air Density = 0.0765 lbm/ft^3

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JOB TITLE 3632 90th Ave SE (Mithalia)

JOB NO. 210-2022 **SHEET NO.**
CALCULATED BY JDA **DATE** 7/16/22
CHECKED BY **DATE**

Wind Loads - MWFRS h≤60' (Low-rise Buildings) Enclosed/partially enclosed only

Kz = Kh (case 1) = 0.72
Base pressure (qh) = **18.2 psf**
GCpi = +/-0.18

Edge Strip (a) = 4.0 ft
End Zone (2a) = 8.0 ft
Zone 2 length = 20.0 ft

Wind Pressure Coefficients

	CASE A				CASE B		
Surface	GCpf	θ = 0 deg w/-GCpi	w/+GCpi		GCpf	w/-GCpi	w/+GCpi
1	0.40	0.58	0.22		-0.45	-0.27	-0.63
2	-0.69	-0.51	-0.87		-0.69	-0.51	-0.87
3	-0.37	-0.19	-0.55		-0.37	-0.19	-0.55
4	-0.29	-0.11	-0.47		-0.45	-0.27	-0.63
5					0.40	0.58	0.22
6					-0.29	-0.11	-0.47
1E	0.61	0.79	0.43		-0.48	-0.30	-0.66
2E	-1.07	-0.89	-1.25		-1.07	-0.89	-1.25
3E	-0.53	-0.35	-0.71		-0.53	-0.35	-0.71
4E	-0.43	-0.25	-0.61		-0.48	-0.30	-0.66
5E					0.61	0.79	0.43
6E					-0.43	-0.25	-0.61

Nominal Wind Surface Pressures (psf)

1		10.6	4.0		-4.9	-11.5
2		-9.3	-15.8		-9.3	-15.8
3		-3.5	-10.0		-3.5	-10.0
4		-2.0	-8.6		-4.9	-11.5
5					10.6	4.0
6					-2.0	-8.6
1E		14.4	7.8		-5.5	-12.0
2E		-16.2	-22.7		-16.2	-22.7
3E		-6.4	-12.9		-6.4	-12.9
4E		-4.5	-11.1		-5.5	-12.0
5E					14.4	7.8
6E					-4.5	-11.1

Parapet

Windward parapet = 0.0 psf (GCpn = +1.5)
Leeward parapet = 0.0 psf (GCpn = -1.0)

Windward roof overhangs = 12.7 psf (upward) add to windward roof pressure

Horizontal MWFRS Simple Diaphragm Pressures (psf)

Transverse direction (normal to L)

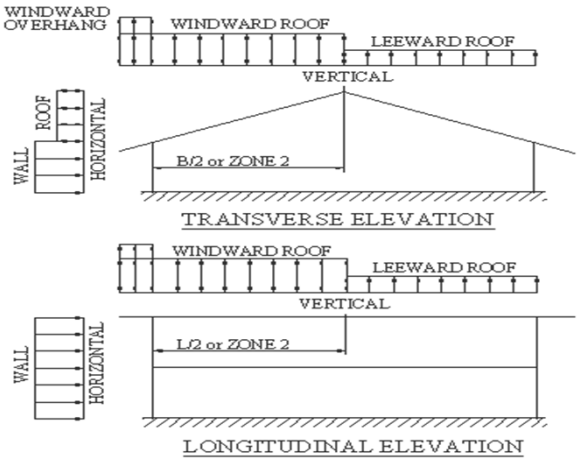
Interior Zone: Wall 12.6 psf
Roof -5.8 psf **
End Zone: Wall 18.9 psf
Roof -9.8 psf **

Longitudinal direction (parallel to L)

Interior Zone: Wall 12.6 psf
End Zone: Wall 18.9 psf

** NOTE: Total horiz force shall not be less than that determined by neglecting roof forces (except for MWFRS moment frames).

The code requires the MWFRS be designed for a min ultimate force of 16 psf multiplied by the wall area plus an 8 psf force applied to the vertical projection of the roof.



Location of MWFRS Wind Pressure Zones

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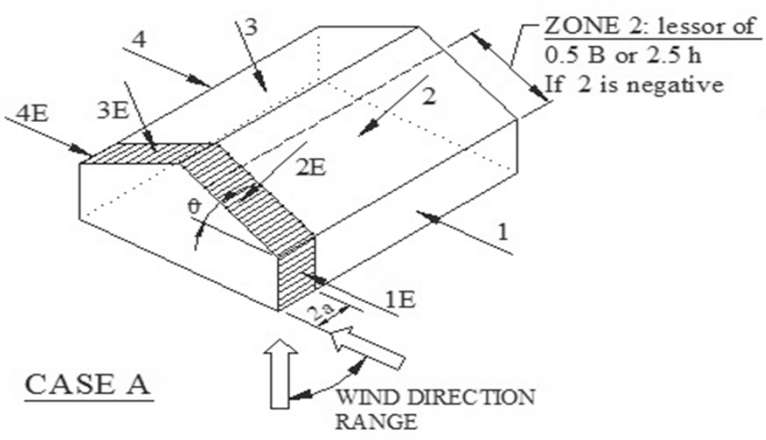
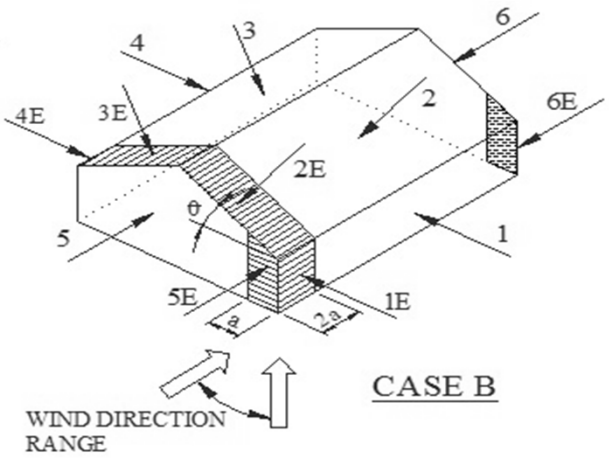
JOB TITLE	3632 90th Ave SE (Mithalia)		
JOB NO.	210-2022	**SHEET NO.**	
CALCULATED BY	JDA	**DATE**	7/16/22
CHECKED BY		**DATE**	





NOTE: Torsional loads are 25% of zones 1 - 6. See code for loading diagram.

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JOB NO. 210-2022 **SHEET NO.**
CALCULATED BY JDA **DATE** 7/16/22
CHECKED BY **DATE**

Nominal Wind Pressures

Wind Loads - Components & Cladding : h <= 60'

Kh (case 1) =	0.72	h =	33.0 ft
Base pressure (qh) =	**18.2 psf**	a =	4.0 ft
Minimum parapet ht =	0.0 ft	GCpi =	+/-0.18
Roof Angle (θ) =	0.0 deg		
Type of roof =	Gable		

Roof

	GCp +/- GCpi			Surface Pressure (psf)			**User input**	
Area	10 sf	50 sf	100 sf	10 sf	50 sf	100 sf	10 sf	147 sf
Negative Zone 1	-1.18	-1.11	-1.08	-21.5	-20.2	-19.7	-21.5	-19.7
Negative Zone 2	-1.98	-1.49	-1.28	-36.0	-27.1	-23.3	-36.0	-23.3
Negative Zone 3	-2.98	-1.79	-1.28	-54.2	-32.6	-23.3	-54.2	-23.3
Positive All Zones	0.48	0.41	0.38	10.0	10.0	10.0	10.0	10.0
Overhang Zone 1&2	-1.70	-1.63	-1.60	-30.9	-29.7	-29.1	-30.9	-26.9
Overhang Zone 3	-2.80	-1.40	-0.80	-51.0	-25.5	-14.6	-51.0	-14.6

Overhang pressures in the table above assume an internal pressure coefficient (Gcpi) of 0.0
Overhang soffit pressure equals adjacent wall pressure reduced by internal pressure of 3.3 psf

Parapet

qp = 0.0 psf

CASE A = pressure towards building (pos)
CASE B = pressure away from bldg (neg)

	Surface Pressure (psf)			**User input**
Solid Parapet Pressure	10 sf	100 sf	500 sf	40 sf
CASE A : Interior zone:	0.0	0.0	0.0	0.0
Corner zone:	0.0	0.0	0.0	0.0
CASE B : Interior zone:	0.0	0.0	0.0	0.0
Corner zone:	0.0	0.0	0.0	0.0

Walls

	GCp +/- GCpi			Surface Pressure (psf)			**User input**	
Area	10 sf	100 sf	500 sf	10 sf	100 sf	500 sf	10 sf	91 sf
Negative Zone 4	-1.17	-1.01	-0.90	-21.3	-18.4	-16.4	-21.3	-18.5
Negative Zone 5	-1.44	-1.12	-0.90	-26.2	-20.4	-16.4	-26.2	-20.7
Positive Zone 4 & 5	1.08	0.92	0.81	19.7	16.8	14.7	19.7	16.9

Note: GCp reduced by 10% due to roof angle <= 10 deg.

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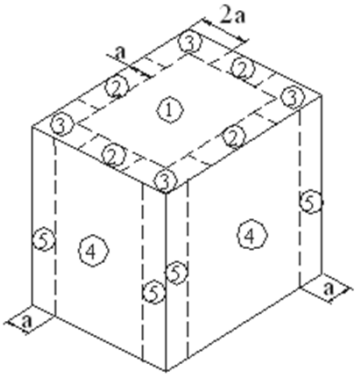
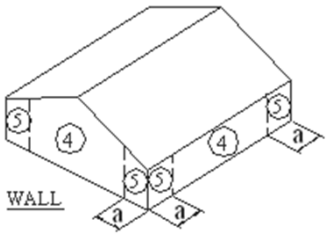
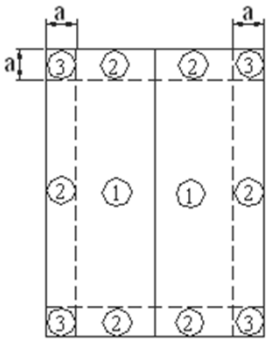
Location of C&C Wind Pressure Zones



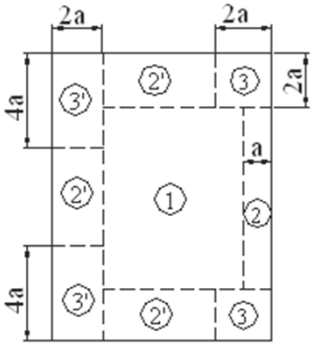
Roofs w/ θ ≤ 10°
and all walls
h > 60'



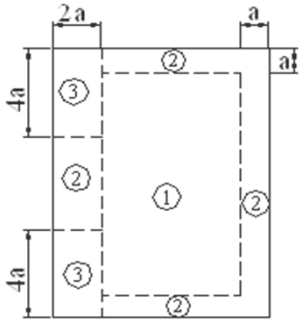
Walls h ≤ 60'
& alt design h<90'



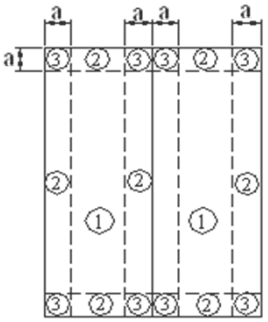
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



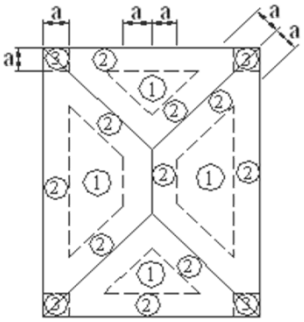
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



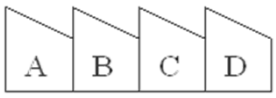
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'

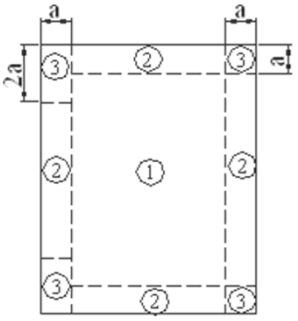


Multispan Gable &
Gable 7° < θ ≤ 45°

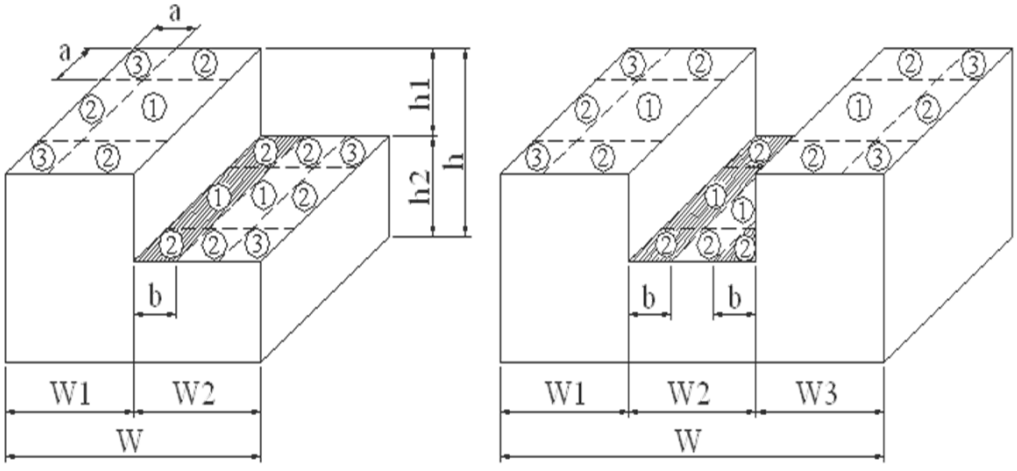


Hip 7° < θ ≤ 27°





Sawtooth 10° < θ ≤ 45°
h ≤ 60' & alt design h<90'



Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'

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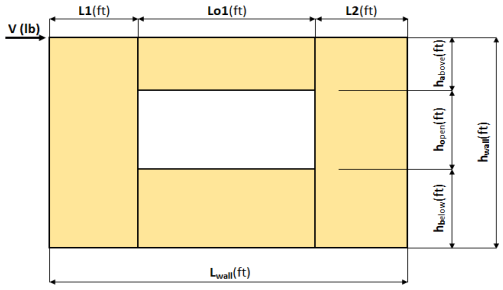
Project Information

Code:	2018 IBC
Designer:	JDA
Client:	CenterLine
Project:	Mithalia
Wall Line:	N - Upper to Roof

Date: 4/4/2024



Shear Wall Calculation Variables

V	4218 lbf	Opening 1	
L1	7.19 ft	h_a	2.00 ft
L2	7.00 ft	h_o	6.00 ft
h_{wall}	10.00 ft	h_b	2.00 ft
L_{wall}	16.19 ft	Lo1	2.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	0.83	N/A
P2=h_o/L2=	0.86	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 2605 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 651 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1303 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 660 lbf
F2 = O1(L2)/(L1+L2) = 643 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 1.01 ft
T2 = (L2*Lo1)/(L1+L2) = 0.99 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 297 plf
v2 = (V/L)(T2+L2)/L2 = 297 plf
Check v1*L1+v2*L2=V? 4218 lbf **OK**

7. Resistance to corner forces

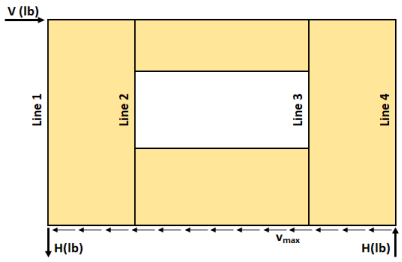
R1 = v1*L1 = 2137 lbf
R2 = v2*L2 = 2081 lbf

8. Difference corner force + resistance

R1-F1 = 1477 lbf
R2-F2 = 1438 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 205 plf
vc2 = (R2-F2)/L2 = 205 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		822	1784	2605 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	2605	822	1784	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	2605	822	1784	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		822	1784	2605 lbf

Design Summary*

Req. Sheathing Capacity	651 plf	**4-Term Deflection**	0.453 in.	**3-Term Deflection**	0.498 in.
Req. Strap Force	660 lbf	**4-Term Story Drift %**	0.015 %	**3-Term Story Drift %**	0.017 %
Req. HD Force (H)	2605 lbf				
Req. Shear Wall Anchorage Force (v_{max})	261 plf				

***The Design Summary assumes that the shear wall is designed as blocked.**

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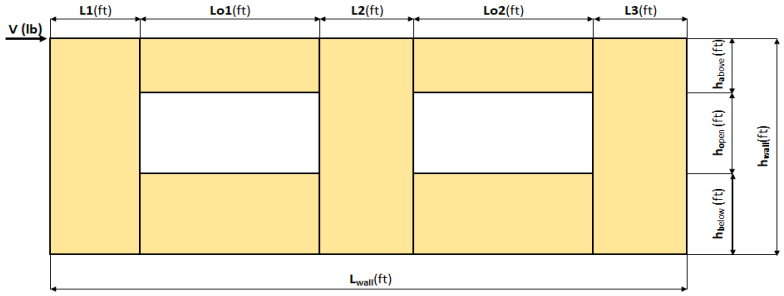
Project Information

Code:	**Date:** 4/4/2024
Designer:	2018 WBC
Client:	Centerline
Project:	Mithalia
Wall Line:	N - Main to Upper



Shear Wall Calculation Variables

			Opening 1		Opening 2
V	6336 lbf				
L1	21.73 ft	h_a1	2.00 ft	h_a2	2.00 ft
L2	6.33 ft	h_o1	5.50 ft	h_o2	5.50 ft
L3	3.71 ft	h_b1	3.00 ft	h_b2	3.00 ft
h_{wall}	10.50 ft	Lo1	10.57 ft	Lo2	2.00 ft
L_{wall}	44.34 ft				

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	0.25	N/A
P2=h_o/L2=	0.87	N/A
P3=h_o/L3=	1.48	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 1500 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a1+h_b1) =	300 plf
Second opening: va2 = vb2 = H/(h_a2+h_b2) =	300 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) =	3172 lbf
Second opening: O2 = va2 x (Lo2) =	600 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) =	2456 lbf
F2 = O1(L2)/(L1+L2) =	716 lbf
F3 = O2(L2)/(L2+L3) =	378 lbf
F4 = O2(L3)/(L2+L3) =	222 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) =	8.19 ft
T2 = (L2*Lo1)/(L1+L2) =	2.38 ft
T3 = (L2*Lo2)/(L2+L3) =	1.26 ft
T4 = (L3*Lo2)/(L2+L3) =	0.74 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 =	197 plf
v2 = (V/L)(T2+L2+T3)/L2 =	225 plf
v3 = (V/L)(T4+L3)/L3 =	171 plf
Check v1*L1+v2*L2+v3*L3=V?	6336 lbf **OK**

7. Resistance to corner forces

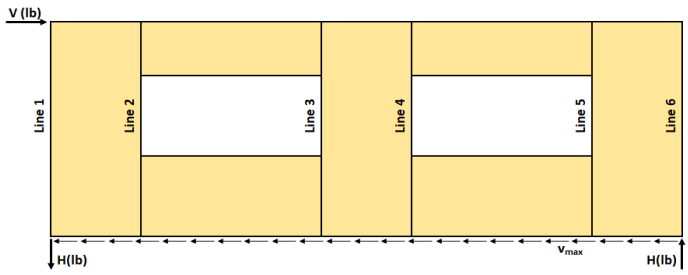
R1 = v1*L1 =	4275 lbf
R2 = v2*L2 =	1425 lbf
R3 = v3*L3 =	636 lbf

8. Difference corner force + resistance

R1-F1 =	1818 lbf
R2-F2-F3 =	332 lbf
R3-F4 =	414 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 =	84 plf
vc2 = (R2-F2-F3)/L2 =	52 plf
vc3 = (R3-F4)/L3 =	112 plf



Check Summary of Shear Values for Two Openings

Line 1: vc1(h_a1+h_b1)+v1(h_o1)=H?		418	1082	1500 lbf
Line 2: va1(h_a1+h_b1)-vc1(h_a1+h_b1)-v1(h_o1)=0?	1500	418	1082	0
Line 3: vc2(h_a1+h_b1)+v2(h_o1)-va1(h_a1+h_b1)=0?	262	1239	1500	0
Line 4: va2(h_a2+h_b2)-v2(h_o2)-vc2(h_a2+h_b2)=0?	1500	1239	262	0
Line 5: va2(h_a2+h_b2)-vc3(h_a2+h_b2)-v3(h_o2)=0?	1500	558	942	0
Line 6: vc3(h_a2+h_b2)+ v3(h_o2) = H?		558	942	1500 lbf

Design Summary*

Req. Sheathing Capacity	300 plf	**4-Term Deflection**	0.311 in.	**3-Term Deflection**	0.355 in.
Req. Strap Force	2456 lbf	**4-Term Story Drift %**	0.010 %	**3-Term Story Drift %**	0.011 %
Req. HD Force	1500 lbf				
Req. Shear Wall Anchorage Force	143 plf				

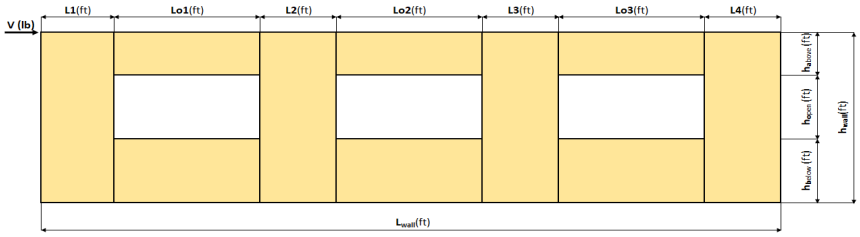
***The Design Summary assumes that the shear wall is designed as blocked.**

This version of the Force Transfer Around Openings calculator has expired.
Please go to **www.apawood.org** to download the latest version.

Project Information

Code:	2018 WBC
Designer:	JDA
Client:	Centerline
Project:	Mithalia
Wall Line:	S - Main to Upper

Date: 4/4/2024



Shear Wall Calculation Variables

			Opening 1		Opening 2		Opening 3
V	9034 lbf						
L1	3.29 ft	h_a1	2.00 ft	h_a2	2.00 ft	h_a3	2.00 ft
L2	6.19 ft	h_o1	5.00 ft	h_o2	5.00 ft	h_o3	5.00 ft
L3	4.00 ft	h_b1	3.00 ft	h_b2	3.00 ft	h_b3	3.00 ft
L4	13.67 ft	Lo1	6.00 ft	Lo2	2.00 ft	Lo3	3.00 ft
h_{wall}	10.00 ft						
L_{wall}	38.15 ft						

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	1.52	N/A
P2=h_o/L2=	0.81	N/A
P3=h_o/L3=	1.25	N/A
P4=h_o/L4=	0.37	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 2368 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a1+h_b1) =	474 plf
Second opening: va2 = vb2 = H/(h_a2+h_b2) =	474 plf
Third opening: va3 = vb3 = H/(h_a3+h_b3) =	474 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) =	2842 lbf
Second opening: O2 = va2 x (Lo2) =	947 lbf
Third opening: O3 = va3 x (Lo3) =	1421 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) =	986 lbf
F2 = O1(L2)/(L1+L2) =	1855 lbf
F3 = O2(L2)/(L2+L3) =	575 lbf
F4 = O2(L3)/(L2+L3) =	372 lbf
F5 = O3(L3)/(L3+L4) =	322 lbf
F6 = O3(L4)/(L3+L4) =	1099 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) =	2.08 ft
T2 = (L2*Lo1)/(L1+L2) =	3.92 ft
T3 = (L2*Lo2)/(L2+L3) =	1.21 ft
T4 = (L3*Lo2)/(L2+L3) =	0.79 ft
T5 = (L3*Lo3)/(L3+L4) =	0.68 ft
T6 = (L4*Lo3)/(L3+L4) =	2.32 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 =	387 plf
v2 = (V/L)(T2+L2+T3)/L2 =	433 plf
v3 = (V/L)(T4+L3+T5)/L3 =	323 plf
v4 = (V/L)(T6+L4)/L4 =	277 plf
Check v1*L1+v2*L2+v3*L3+v4*L4=V?	9034 lbf **OK**

7. Resistance to corner forces

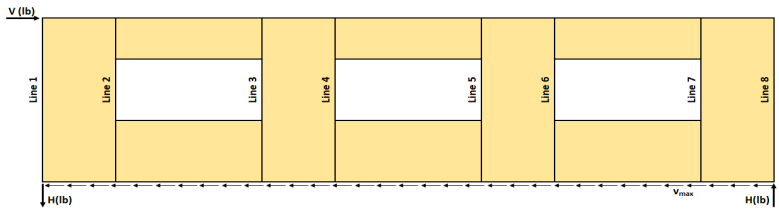
R1 = v1*L1 =	1272 lbf
R2 = v2*L2 =	2681 lbf
R3 = v3*L3 =	1294 lbf
R4 = v4*L4 =	3787 lbf

8. Difference corner force + resistance

R1-F1 =	286 lbf
R2-F2-F3 =	250 lbf
R3-F4-F5 =	600 lbf
R4-F6 =	2687 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 =	87 plf
vc2 = (R2-F2-F3)/L2 =	40 plf
vc3 = (R3-F4-F5)/L3 =	150 plf
vc4 = (R4-F6)/L4 =	197 plf



Check Summary of Shear Values for Three Openings

Line 1: vc1(h_a1+h_b1)+v1(h_o1)=H?		435	1933	2368 lbf
Line 2: va1(h_a1+h_b1)-vc1(h_a1+h_b1)-v1(h_o1)=0?	2368	435	1933	0
Line 3: vc2(h_a1+h_b1)+v2(h_o1)-va1(h_a1+h_b1)=0?	202	2166	2368	0
Line 4: va2(h_a2+h_b2)-v2(h_o2)-vc2(h_a2+h_b2)=0?	2368	2166	202	0
Line 5: va2(h_a2+h_b2)-vc3(h_a2+h_b2)-v3(h_o2)=0?	2368	751	1617	0
Line 6: va3(h_a3+h_b3)-v3(h_o3)-vc3(h_a3+h_b3)=0?	2368	1617	751	0
Line 7: va3(h_a3+h_b3)-vc4(h_a3+h_b3)-v4(h_o3)=0?	2368	983	1385	0
Line 8: vc4(h_a3+h_b3)+v4(h_o3)=H?		983	1385	2368 lbf

Design Summary*

Req. Sheathing Capacity	474 plf
Req. Strap Force	1855 lbf
Req. HD Force (H)	2368 lbf
Req. Shear Wall Anchorage Force (v_{max})	237 plf

4-Term Deflection	0.382 in.
4-Term Story Drift %	0.013 %

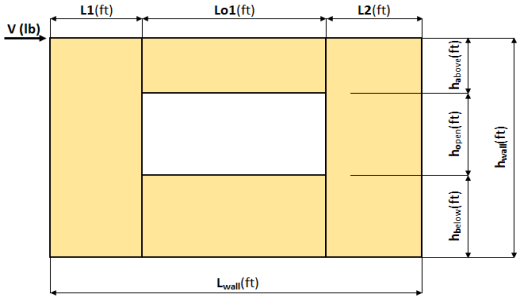
3-Term Deflection	0.412 in.
3-Term Story Drift %	0.014 %

***The Design Summary assumes that the shear wall is designed as blocked.**

This version of the Force Transfer Around Openings calculator has expired.
Please go to **www.apawood.org** to download the latest version.

Project Information

Code:	2018 WBC	**Date:**	
Designer:	JDA		
Client:	Centerline		
Project:	Mithalia		
Wall Line:	W - Upper to Roof		



Shear Wall Calculation Variables

V	6336 lbf	Opening 1	
L1	7.42 ft	h_a	2.00 ft
L2	7.42 ft	h_o	5.50 ft
h_{wall}	10.50 ft	h_b	3.00 ft
L_{wall}	16.84 ft	Lo1	2.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	0.74	N/A
P2=h_o/L2=	0.74	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 3951 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 790 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1580 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 790 lbf

F2 = O1(L2)/(L1+L2) = 790 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 1.00 ft

T2 = (L2*Lo1)/(L1+L2) = 1.00 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 427 plf

v2 = (V/L)(T2+L2)/L2 = 427 plf

Check v1*L1+v2*L2=V? 6336 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 3168 lbf

R2 = v2*L2 = 3168 lbf

8. Difference corner force + resistance

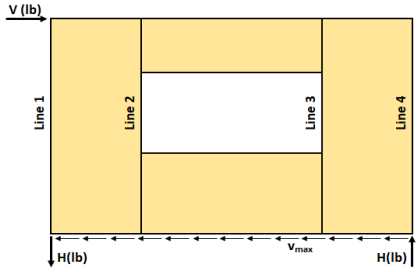
R1-F1 = 2378 lbf

R2-F2 = 2378 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 320 plf

vc2 = (R2-F2)/L2 = 320 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		1602	2348	3951 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	3951	1602	2348	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	3951	1602	2348	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		1602	2348	3951 lbf

Design Summary*

Req. Sheathing Capacity	790 plf	**4-Term Deflection**	0.299 in.	**3-Term Deflection**	0.341 in.
Req. Strap Force	790 lbf	**4-Term Story Drift %**	0.009 %	**3-Term Story Drift %**	0.011 %
Req. HD Force (H)	3951 lbf				
Req. Shear Wall Anchorage Force (v_{max})	376 plf				

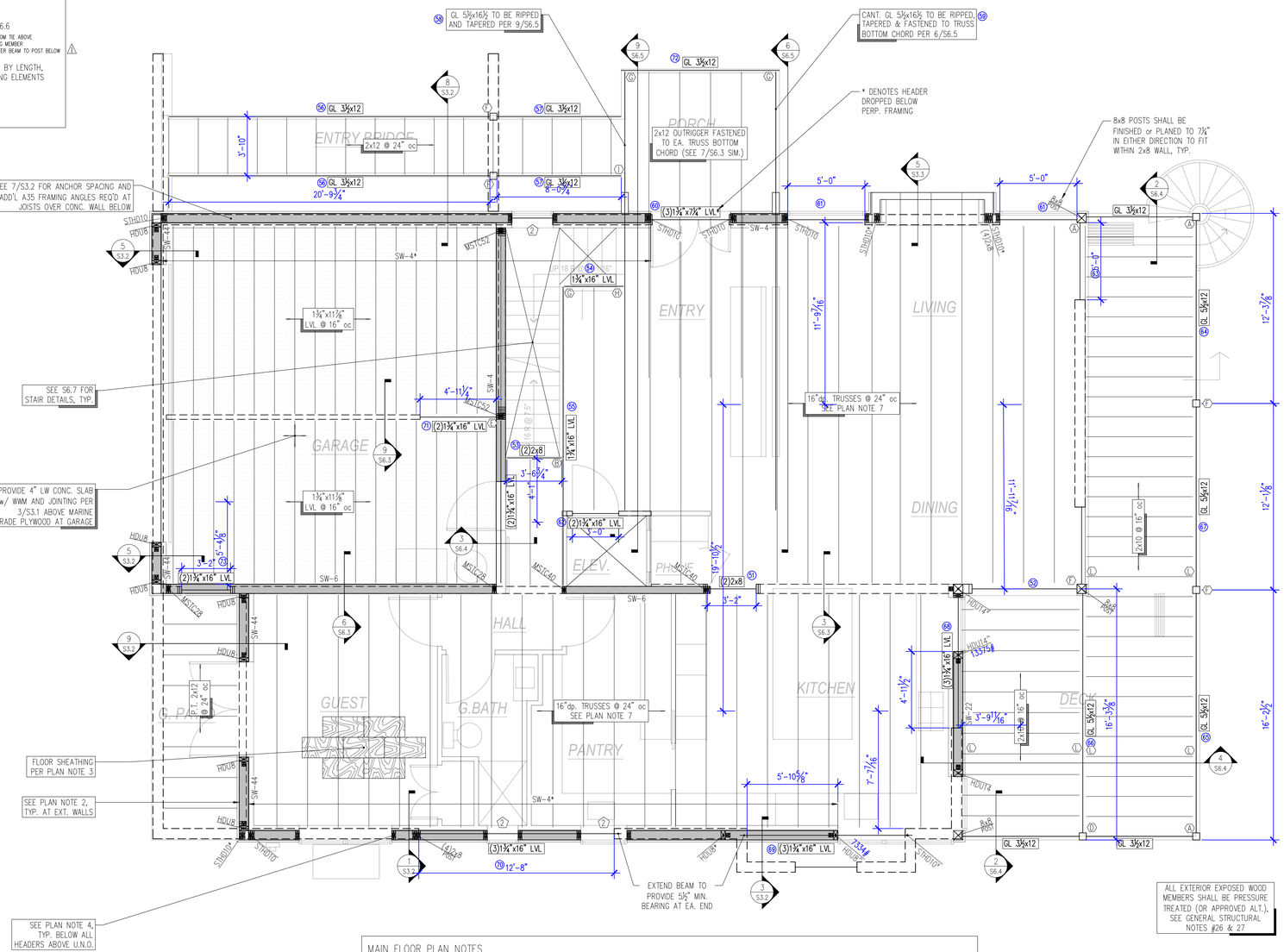
***The Design Summary assumes that the shear wall is designed as blocked.**

LEGEND

- STRUCTURAL WOOD STUDWALL BELOW
- STRUCTURAL WOOD STUDWALL ABOVE
- POST BELOW
- POST ABOVE
- WOOD JOIST
- WOOD BEAM or HEADER
- WOOD RAFTER
- SW-_ — DENOTES EXTENT OF SHEARWALL TYPE SW-_ PER 1/S6.6
- SW-_* — DENOTES STRAPPED SHEARWALL PER 7/S6.6, WITH ⏢ DENOTING STRAP PER SCHEDULE ABOVE & BELOW OPENING
- HDU4, MSTC — DENOTES SHEARWALL TENSION TIE PER 4/S6.6
  - * – DENOTES TRANSFER TIE FROM TIE ABOVE
  - ^ – DENOTES TIE ATOP FRAMING MEMBER
  - * – DENOTES TIE FROM TRANSFER BEAM TO POST BELOW
- STRAP x LENGTH — DENOTES STRAP TYPE BY LENGTH, CENTERED ON ABUTTING ELEMENTS

CONNECTOR TABLE

	SIMPSON DESIGNATION	NOTES
A	ECCLQ, ECCRQ	L-POST CAP
B	HUS ~or~ BU	HANGER
C	HGU ~or~ EGQ	HANGER
D	CCT	T-POST CAP
E	IUS ~or~ ITS	HANGER
F	CCQ	COLUMN CAP
G	HUCQ	CONCEALED FLANGE HANGER
H	IUS ~or~ MIT	HANGER
I	LUS ~or~ HWPH	HANGER
J	HHUS	HANGER



MAIN FLOOR PLAN NOTES

1. SOLID WALLS AND SHEARWALLS SHOWN IN PLAN ARE ABOVE FRAMING LEVEL. DASHED WALLS SHOWN IN PLAN ARE BELOW FRAMING LEVEL.
2. EXTERIOR STUDWALLS SHALL BE PRE-ASSEMBLED PANELS CONSISTING OF 2x8 STUDS @ 24" oc (MAX). SEE ARCHITECTURAL FOR INTERIOR STUDWALLS. SEE 6/6.1, 5/S6.2, AND 2/S6.2 FOR ALLOWABLE HOLES & NOTCHES IN STUDWALL STUDS AND TOP & BOTTOM PLATES.
3. FLOOR SHEATHING SHALL CONSIST OF ¾" T&G SHEATHING (PANEL SPAN RATING 48/24). NAIL SHEATHING AT ALL FRAMED PANEL EDGES, DIAPHRAGM BOUNDARIES, BLOCKING, AND SHEAR WALLS w/ 10d @ 6" oc; AND AT ALL INTERMEDIATE SUPPORTS w/ 10d @ 12" oc (SEE 3/S6.2). GLUE SHEATHING AT ALL SUPPORTS w/ ADHESIVE CONFORMING TO ASTM SPECIFICATION D3498.
4. ALL HEADERS ABOVE (SEE 1/S2.3) SHALL HAVE A MINIMUM NUMBER OF POSTS PER 4/S6.1 AT NON-LOAD BEARING EXTERIOR WALLS, AND PER 6/S6.1 AT LOAD BEARING EXTERIOR WALLS
5. HEADERS IN EXTERIOR WALLS SHALL BE PER DETAIL 6/S6.1 U.N.O. IN PLAN.
6. AT AREA(S) INDICATED AS BLOCKED DIAPHRAGM, INSTALL 2x FLAT BLOCKING AT ALL UNFRAMED PANEL EDGES. NAIL SHEATHING PER PLAN NOTE 3.
7. SEE GENERAL STRUCTURAL NOTE #23 FOR FLOOR TRUSS REQUIREMENTS.

1 S2.2 — MAIN FLOOR FRAMING PLAN

1/4" = 1'-0"

NORTH

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Mithala Residence
3632 90th Ave SE
Mercer Island, WA - 98040

CONTENTS

Main Floor Framing Plan

DRAWN BY
JDA

DATE
10.18.22
06.09.23 ⚠1
03.22.24 ⚠2

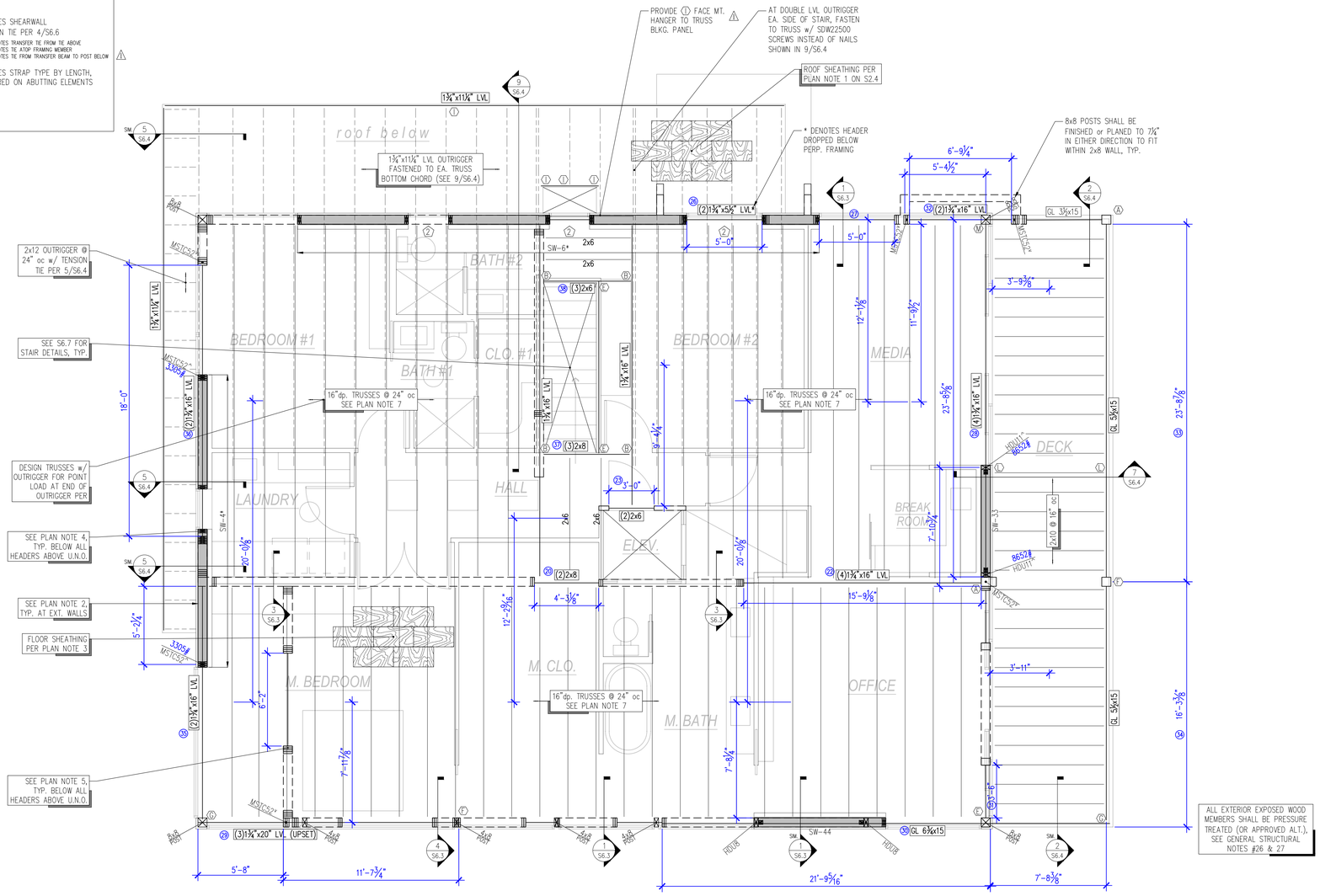
S2.2

LEGEND

- STRUCTURAL WOOD STUDWALL BELOW
- STRUCTURAL WOOD STUDWALL ABOVE
- POST BELOW
- POST ABOVE
- WOOD JOIST
- WOOD BEAM or HEADER
- WOOD RAFTER
- SW-_ — DENOTES EXTENT OF SHEARWALL TYPE SW-_ PER 1/S6.6
- SW-_* — DENOTES STRAPPED SHEARWALL PER 7/S6.6, WITH ⏀ DENOTING STRAP PER SCHEDULE ABOVE & BELOW OPENING
- HDU_ / MSTC_ — DENOTES SHEARWALL TENSION TIE PER 4/S6.6
  - * – DENOTES TRANSFER TIE FROM TIE ABOVE
  - ^ – DENOTES TIE AT/OF FRAMING MEMBER
  - * – DENOTES TIE FROM TRANSFER BEAM TO POST BELOW
- STRAP x LENGTH — DENOTES STRAP TYPE BY LENGTH, CENTERED ON ABUTTING ELEMENTS

CONNECTOR TABLE

	SIMPSON DESIGNATION	NOTES
(A)	ECCLQ, ECCRQ	L-POST CAP
(B)	HUS ~or~ BU	HANGER
(C)	HGU ~or~ EGQ	HANGER
(D)	CCT	T-POST CAP
(E)	IUS ~or~ ITS	HANGER
(F)	CCQ	COLUMN CAP
(G)	HUCQ	CONCEALED FLANGE HANGER
(H)	IUS ~or~ MIT	HANGER
(I)	LUS ~or~ HWPH	HANGER
(J)	HHUS	HANGER



UPPER FLOOR PLAN NOTES

1. SOLID WALLS AND SHEARWALLS SHOWN IN PLAN ARE ABOVE FRAMING LEVEL. DASHED WALLS SHOWN IN PLAN ARE BELOW FRAMING LEVEL.
2. EXTERIOR STUDWALLS SHALL BE PRE-ASSEMBLED PANELS CONSISTING OF 2x8 STUDS @ 24" oc (MAX). SEE ARCHITECTURAL FOR INTERIOR STUDWALLS. SEE 6/6.1, 5/S6.2, AND 2/S6.2 FOR ALLOWABLE HOLES & NOTCHES IN STUDWALL STUDS AND TOP & BOTTOM PLATES.
3. FLOOR SHEATHING SHALL CONSIST OF ¾" T&G SHEATHING (PANEL SPAN RATING 48/24). NAIL SHEATHING AT ALL FRAMED PANEL EDGES, DIAPHRAGM BOUNDARIES, BLOCKING, AND SHEAR WALLS w/ 10d @ 6" oc; AND AT ALL INTERMEDIATE SUPPORTS w/ 10d @ 12" oc (SEE 3/S6.2). GLUE SHEATHING AT ALL SUPPORTS w/ ADHESIVE CONFORMING TO ASTM SPECIFICATION D3498.
4. ALL HEADERS ABOVE (SEE 1/S2.4) SHALL HAVE A MINIMUM NUMBER OF POSTS PER 4/S6.1 AT NON-LOAD BEARING EXTERIOR WALLS, AND PER 6/S6.1 AT LOAD BEARING EXTERIOR WALLS
5. HEADERS IN EXTERIOR WALLS NOT SUPPORTING RAFTERS, JOISTS, OR BEAMS SHALL BE PER DETAIL 4/S6.1 U.N.O. IN PLAN.
6. AT AREA(S) INDICATED AS BLOCKED DIAPHRAGM, INSTALL 2x FLAT BLOCKING AT ALL UNFRAMED PANEL EDGES. NAIL SHEATHING PER PLAN NOTE 3.
7. SEE GENERAL STRUCTURAL NOTE #23 FOR FLOOR TRUSS REQUIREMENTS.

1 S2.3 — UPPER FLOOR FRAMING PLAN

1/4" = 1'-0"

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CONTENTS

Upper Floor Framing Plan

DRAWN BY
JDA

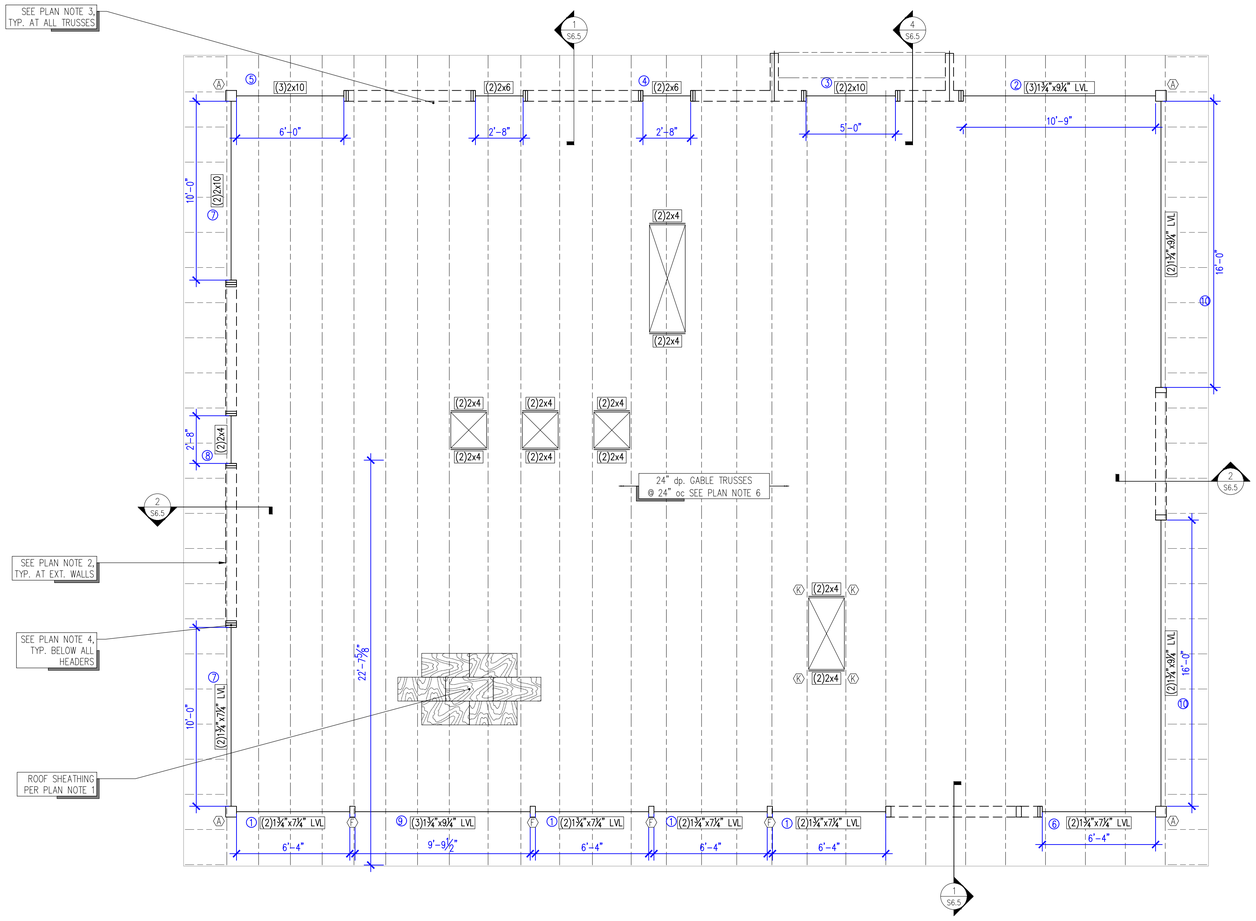
DATE
10.18.22
06.09.23 ⚠1
03.22.24 ⚠2

S2.3

LEGEND

- STRUCTURAL WOOD STUDWALL BELOW
- POST BELOW
- WOOD RAFTER
- WOOD BEAM or HEADER
- DENOTES STRAP TYPE BY LENGTH, CENTERED ON ABUTTING ELEMENTS
  - STRAP x LENGTH

CONNECTOR TABLE		
	SIMPSON DESIGNATION	NOTES
Ⓐ	ECCLQ, ECCRQ	L-POST CAP
Ⓑ	HUS ~or~ BU	HANGER
Ⓒ	HGU ~or~ EGQ	HANGER
Ⓓ	CCT	T-POST CAP
Ⓔ	IUS ~or~ ITS	HANGER
Ⓕ	CCQ	COLUMN CAP
Ⓖ	HUCQ	CONCEALED FLANGE HANGER
Ⓗ	IUS ~or~ MIT	HANGER
Ⓘ	LUS ~or~ HWPH	HANGER
Ⓙ	HHUS	HANGER



ROOF PLAN NOTES

1. ROOF SHEATHING SHALL CONSIST OF ⅝" SHEATHING (PANEL SPAN RATING 32/16) NAILED AT UNDERSIDE OF FRAMING AT ALL FRAMED PANEL EDGES, DIAPHRAGM BOUNDARIES, AND BLOCKING w/ 10d @ 6" oc; AND AT ALL INTERMEDIATE SUPPORTS w/ 10d @ 12" oc (SEE 3/S6.2). ADDITIONALLY, ¾" T&G OSB SHEATHING SHALL BE APPLIED ATOP 60 mm WOODFIBER INSULATION BOARD w/ ¼"ø x 4½" SCREWS @ 12" oc AT ALL TRUSSES AND BLOCKING BELOW
2. DASHED WALLS AND SHEARWALLS SHOWN IN PLAN ARE BELOW ROOF FRAMING ELEVATION (i.e. FROM THIRD FLOOR TO UNDERSIDE OF ROOF).
3. PROVIDE CS22 STRAPS PRE-INSTALLED TO WALL PANEL WITH (4)10d NAILS AND NAILED TO END OF TRUSS WITH (6)10d NAILS FIELD-INSTALLED.
4. ALL HEADERS SHALL HAVE A MINIMUM NUMBER OF POSTS PER 4/S6.1 AT NON-LOAD BEARING EXTERIOR WALLS, AND PER 6/S6.1 AT LOAD BEARING EXTERIOR WALLS
5. HEADERS IN EXTERIOR WALLS NOT SUPPORTING RAFTERS, JOISTS, OR BEAMS SHALL BE PER DETAIL 4/S6.1 U.N.O. IN PLAN.
6. SEE GENERAL STRUCTURAL NOTE #23 FOR ROOF TRUSS REQUIREMENTS.

1 S2.4 ROOF FRAMING PLAN

1/4" = 1'-0"

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CONTENTS

Roof Framing Plan

DRAWN BY
JDA

DATE
10.18.22
06.09.23 ⚠1
03.22.24 ⚠2

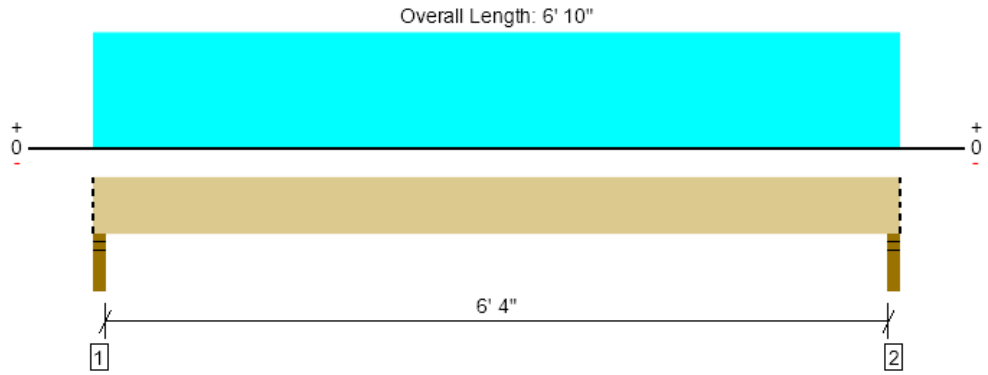
S2.4

Roof			
Member Name	Results (Max UTIL %)	Current Solution	Comments
1	Passed (83% M)	2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
2	Passed (99% M)	3 piece(s) 1 3/4" x 9 1/4" 2.0E Microllam® LVL	
3	Passed (96% M)	2 piece(s) 2 x 10 DF No.1	
4	Passed (70% M)	2 piece(s) 2 x 6 DF No.1	
6	Passed (91% M)	3 piece(s) 2 x 10 DF No.1	
7	Passed (85% M)	2 piece(s) 2 x 10 DF No.1	
8	Passed (48% M)	1 piece(s) 2 x 4 DF No.1	
9	Passed (82% M)	3 piece(s) 1 3/4" x 9 1/4" 2.0E Microllam® LVL	
10	Passed (73% ΔT)	2 piece(s) 1 3/4" x 9 1/4" 2.0E Microllam® LVL	
Upper			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Deck Joists	Passed (42% M)	1 piece(s) 2 x 10 DF No.1 @ 16" OC	
20	Passed (58% M)	2 piece(s) 2 x 8 DF No.1	
22	Passed (91% ΔL)	3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
23	Passed (61% M)	2 piece(s) 2 x 6 DF No.1	
26	Passed (76% ΔT)	2 piece(s) 1 3/4" x 5 1/2" 2.0E Microllam® LVL	
27	Passed (55% R)	1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
28	Passed (72% R)	4 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
28 (w_overstrength)	Failed (98% R)	4 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	Multiple Failures/Errors
29	Passed (89% R)	3 piece(s) 1 3/4" x 20" 2.0E Microllam® LVL	
30	Passed (74% ΔL)	1 piece(s) 6 3/4" x 15" 24F-V8 DF Glulam	
31	Passed (47% R)	1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
32	Passed (88% V)	2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
33	Passed (74% ΔT)	1 piece(s) 5 1/2" x 15" 24F-V4 DF Glulam	
34	Passed (50% R)	1 piece(s) 5 1/2" x 15" 24F-V4 DF Glulam	
35	Passed (59% R)	2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
35 (w_overstrength)	Failed (88% R)	2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	Multiple Failures/Errors
36	Passed (63% R)	2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
36 (w_overstrength)	Failed (88% R)	2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	Multiple Failures/Errors
37	Passed (85% M)	3 piece(s) 2 x 8 DF No.1	
38	Passed (37% M)	3 piece(s) 2 x 6 DF No.1	

Main			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Garage Joists	Passed (36% M)	1 piece(s) 1 3/4" x 11 1/4" 2.0E Microllam® LVL @ 16" OC	
51	Passed (80% R)	2 piece(s) 2 x 8 DF No.1	
52	Passed (80% R)	1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
53	Passed (56% M)	2 piece(s) 2 x 8 DF No.1	
54	Passed (46% R)	1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
55	Passed (77% R)	1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
56	Passed (84% ΔT)	1 piece(s) 3 1/2" x 12" 24F-V4 DF Glulam	
57	Passed (21% R)	1 piece(s) 3 1/2" x 12" 24F-V4 DF Glulam	
58	Failed (113% ΔL)	1 piece(s) 5 1/2" x 16" 24F-V8 DF Glulam	Right cantilever exceeds the maximum braced cantilever length of 7'.
59	Failed (91% ΔL)	1 piece(s) 5 1/2" x 16" 24F-V4 DF Glulam	Right cantilever exceeds the maximum braced cantilever length of 7'.
60	Passed (93% ΔT)	2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
61	Passed (65% R)	1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
62	Passed (63% R)	1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
63	Passed (33% R)	1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
64	Passed (35% M+)	1 piece(s) 3 1/2" x 12" 24F-V4 DF Glulam	
65	Passed (43% ΔL)	1 piece(s) 5 1/2" x 12" 24F-V4 DF Glulam	
66	Passed (88% ΔL)	1 piece(s) 5 1/2" x 12" 24F-V4 DF Glulam	
67	Passed (36% M+)	1 piece(s) 3 1/2" x 12" 24F-V4 DF Glulam	
68	Failed (68% R)	3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	Multiple Failures/Errors
68 (w_overstrength)	Failed (121% R)	3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	Multiple Failures/Errors
69	Passed (88% R)	3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
69 (w_overstrength)	Failed (98% R)	3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	Multiple Failures/Errors
70	Passed (92% R)	3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
71	Passed (57% R)	2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
72	Passed (46% R)	1 piece(s) 3 1/2" x 12" 24F-V4 DF Glulam	
73	Passed (95% R)	2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL	
33+34	Passed (39% B/C)	1 piece(s) 6 x 6 DF No.1	
33+34+66+63	Passed (67% f_c)	1 piece(s) 6 x 6 DF No.1	

Roof, 1

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4279 @ 1 1/2"	6563 (3.00")	Passed (65%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3209 @ 10 1/4"	5544	Passed (58%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6785 @ 3' 5"	8182	Passed (83%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.146 @ 3' 5"	0.329	Passed (L/542)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.269 @ 3' 5"	0.439	Passed (L/294)	--	1.0 D + 1.0 S (All Spans)

Member Length : 6' 10"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	3.00"	3.00"	1.96"	1959	2320	4279	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.96"	1959	2320	4279	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)	6' 10" o/c	
Bottom Edge (Lu)	6' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 10"	N/A	7.4	--	
1 - Uniform (PSF)	0 to 6' 10" (Top)	22' 7 5/8"	25.0	30.0	Default Load

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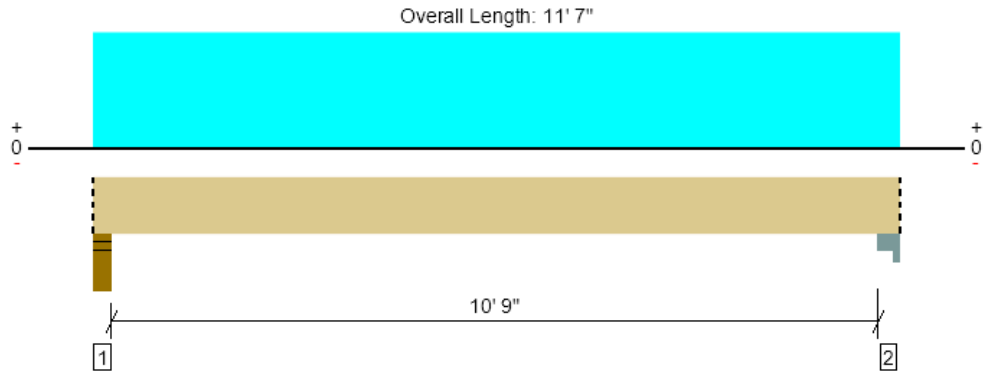
Roof, 2

3 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)	7240 @ 3"	10041 (4.50")	Passed (72%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	5797 @ 1' 1 3/4"	10611	Passed (55%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	19044 @ 5' 9"	19327	Passed (99%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.347 @ 5' 9"	0.550	Passed (L/380)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.644 @ 5' 9"	0.733	Passed (L/205)	--	1.0 D + 1.0 S (All Spans)

Member Length : 11' 7"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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 - SPF	4.50"	4.50"	3.24"	3335	3905	7240	Blocking
2 - Column Cap - steel	5.50"	5.50"	1.87"	3384	3961	7345	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)	2' 7" o/c	
Bottom Edge (Lu)	11' 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 11' 7"	N/A	14.2	--	
1 - Uniform (PSF)	0 to 11' 7" (Top)	22' 7 5/8"	25.0	30.0	Default Load

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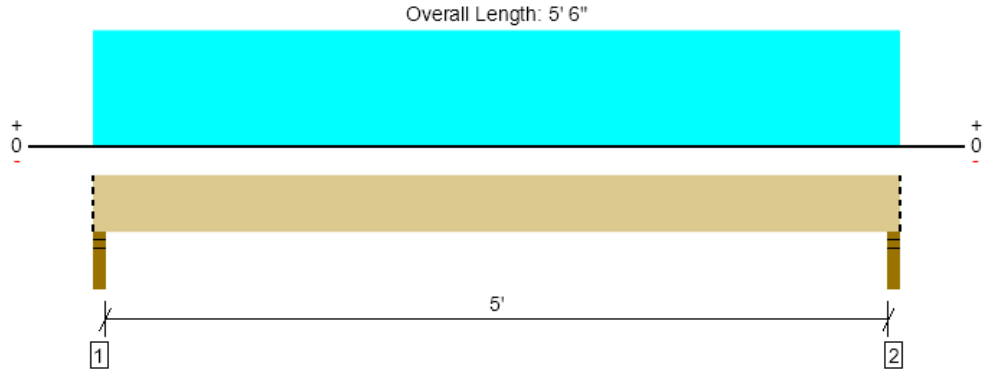
Roof, 3

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



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)	3443 @ 1 1/2"	5625 (3.00")	Passed (61%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2165 @ 1' 1/4"	3830	Passed (57%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4313 @ 2' 9"	4510	Passed (96%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.035 @ 2' 9"	0.262	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.064 @ 2' 9"	0.350	Passed (L/990)	--	1.0 D + 1.0 S (All Spans)

Member Length : 5' 6"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.84"	1576	1867	3443	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.84"	1576	1867	3443	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)	5' 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 5' 6"	N/A	7.0	--	
1 - Uniform (PSF)	0 to 5' 6" (Top)	22' 7 5/8"	25.0	30.0	Default Load

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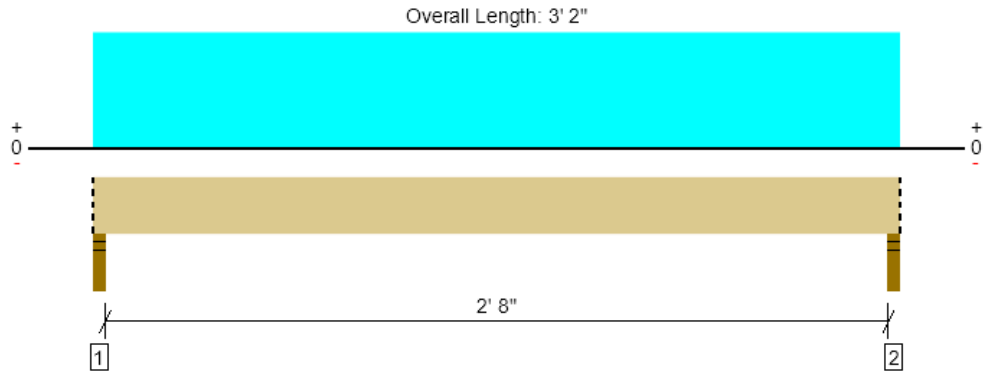
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Roof, 4

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



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)	1978 @ 1 1/2"	5625 (3.00")	Passed (35%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1093 @ 8 1/2"	2277	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1328 @ 1' 7"	1884	Passed (70%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.016 @ 1' 7"	0.146	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.029 @ 1' 7"	0.194	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 3' 2"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	903	1075	1978	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	903	1075	1978	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)	3' 2" o/c	
Bottom Edge (Lu)	3' 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 3' 2"	N/A	4.2	--	
1 - Uniform (PSF)	0 to 3' 2" (Top)	22' 7 5/8"	25.0	30.0	Default Load

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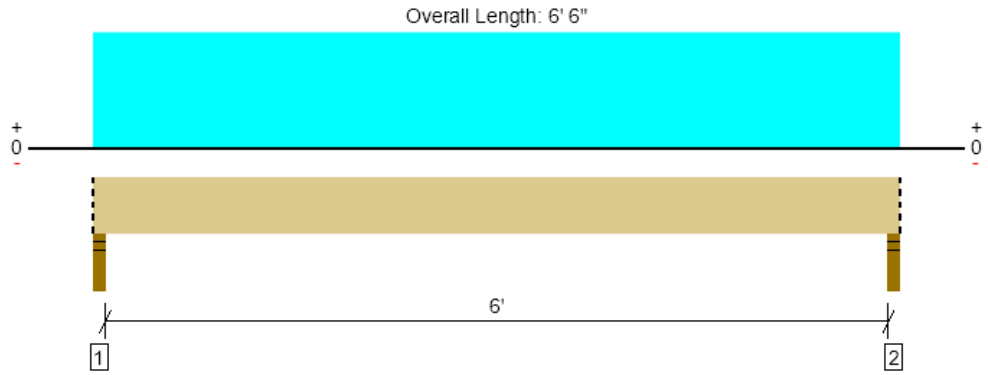
ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Roof, 6

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



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)	4080 @ 1 1/2"	8438 (3.00")	Passed (48%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2799 @ 1' 1/4"	5744	Passed (49%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6130 @ 3' 3"	6765	Passed (91%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.046 @ 3' 3"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.085 @ 3' 3"	0.417	Passed (L/878)	--	1.0 D + 1.0 S (All Spans)

Member Length : 6' 6"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	1873	2207	4080	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	1873	2207	4080	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)	6' 6" o/c	
Bottom Edge (Lu)	6' 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 6' 6"	N/A	10.6	--	
1 - Uniform (PSF)	0 to 6' 6" (Top)	22' 7 5/8"	25.0	30.0	Default Load

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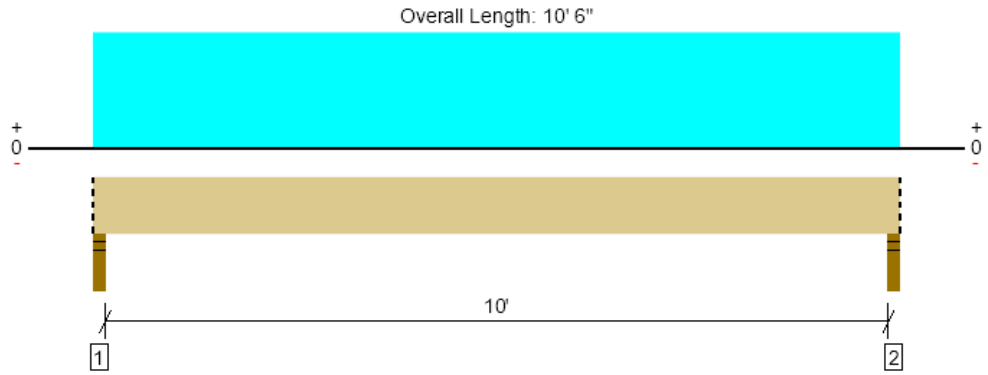
ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Roof, 7

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



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)	1538 @ 1 1/2"	5625 (3.00")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1239 @ 1' 1/4"	3830	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3847 @ 5' 3"	4510	Passed (85%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.115 @ 5' 3"	0.512	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.216 @ 5' 3"	0.683	Passed (L/569)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 6"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	719	819	1538	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	719	819	1538	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)	10' 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 10' 6"	N/A	7.0	--	
1 - Uniform (PSF)	0 to 10' 6" (Top)	5' 2 3/8"	25.0	30.0	Default Load

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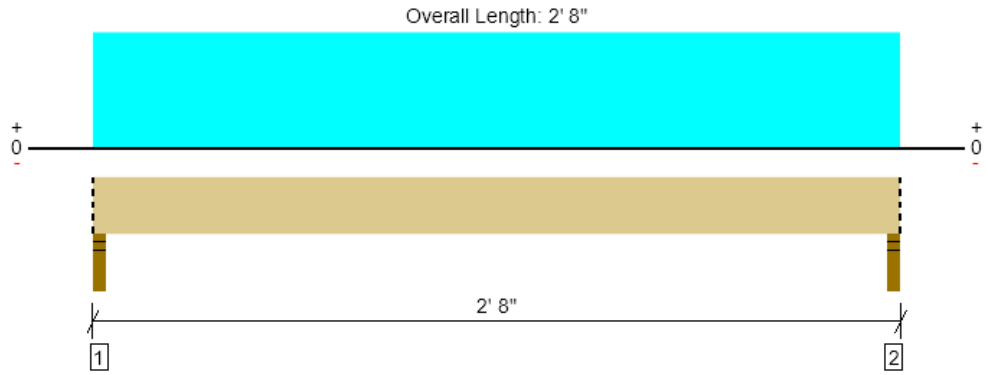
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Roof, 8

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



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)	383 @ 1 1/2"	2813 (3.00")	Passed (14%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	227 @ 6 1/2"	725	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	210 @ 1' 4"	440	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.013 @ 1' 4"	0.121	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.024 @ 1' 4"	0.161	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 2' 8"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	175	208	383	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	175	208	383	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)	2' 8" o/c	
Bottom Edge (Lu)	2' 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 2' 8"	N/A	1.3	--	
1 - Uniform (PSF)	0 to 2' 8" (Top)	5' 2 3/8"	25.0	30.0	Default Load

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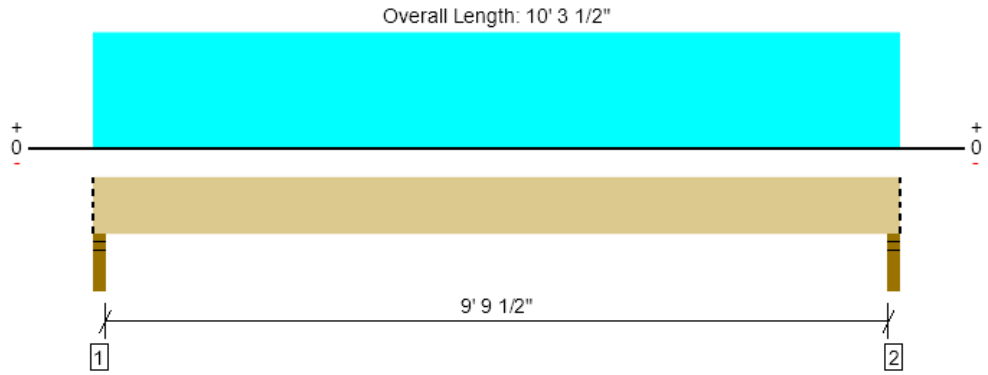
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Roof, 9

3 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)	6479 @ 1 1/2"	9844 (3.00")	Passed (66%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	5194 @ 1' 1/4"	10611	Passed (49%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	15870 @ 5' 1 3/4"	19327	Passed (82%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.245 @ 5' 1 3/4"	0.502	Passed (L/493)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.454 @ 5' 1 3/4"	0.669	Passed (L/266)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 3 1/2"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	3.00"	3.00"	1.97"	2985	3494	6479	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.97"	2985	3494	6479	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)	10' 4" o/c	
Bottom Edge (Lu)	10' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 3 1/2"	N/A	14.2	--	
1 - Uniform (PSF)	0 to 10' 3 1/2" (Top)	22' 7 5/8"	25.0	30.0	Default Load

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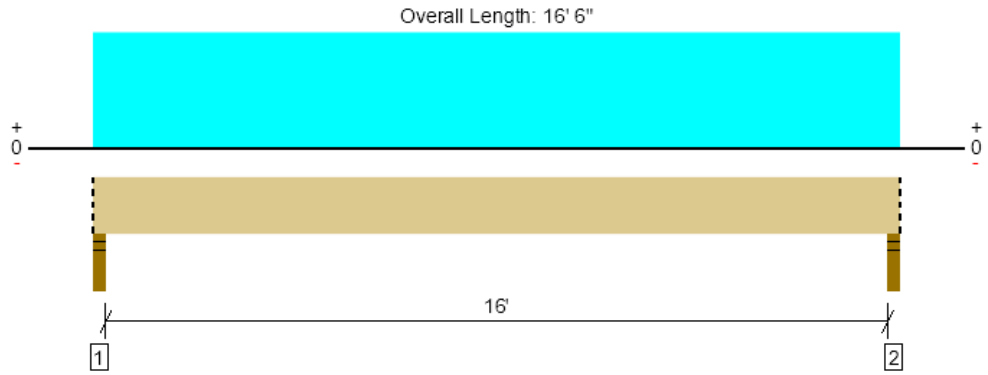
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, 10

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)	1855 @ 1 1/2"	6563 (3.00")	Passed (28%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1626 @ 1' 1/4"	7074	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	7422 @ 8' 3"	12884	Passed (58%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.413 @ 8' 3"	0.813	Passed (L/472)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.791 @ 8' 3"	1.083	Passed (L/247)	--	1.0 D + 1.0 S (All Spans)

Member Length : 16' 6"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	3.00"	3.00"	1.50"	886	969	1855	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	886	969	1855	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)	15' 3" o/c	
Bottom Edge (Lu)	16' 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 16' 6"	N/A	9.4	--	
1 - Uniform (PSF)	0 to 16' 6" (Top)	3' 11"	25.0	30.0	Default Load

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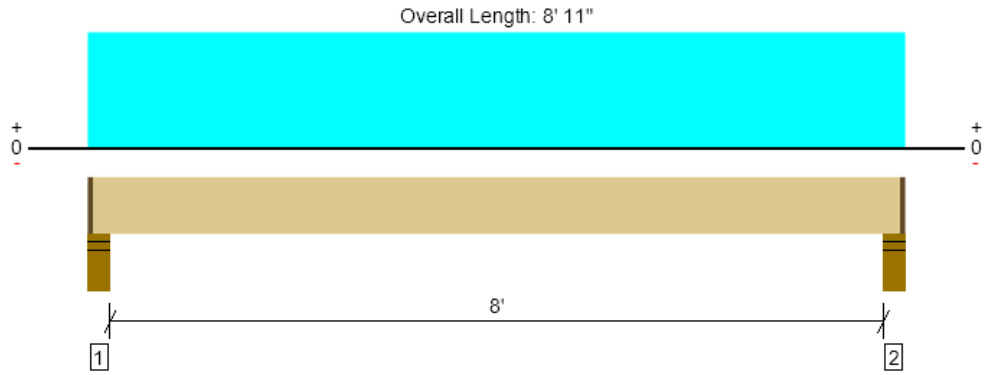
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, Deck Joists
1 piece(s) 2 x 10 DF No.1 @ 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)	493 @ 4 1/2"	3984 (4.25")	Passed (12%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	366 @ 1' 2 3/4"	1665	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	945 @ 4' 5 1/2"	2255	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.048 @ 4' 5 1/2"	0.204	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.067 @ 4' 5 1/2"	0.408	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 8' 8 1/2"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
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 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - DF	5.50"	4.25"	1.50"	149	357	505	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	1.50"	149	357	505	1 1/4" Rim Board

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 8' 11"	16"	25.0	60.0	Default Load

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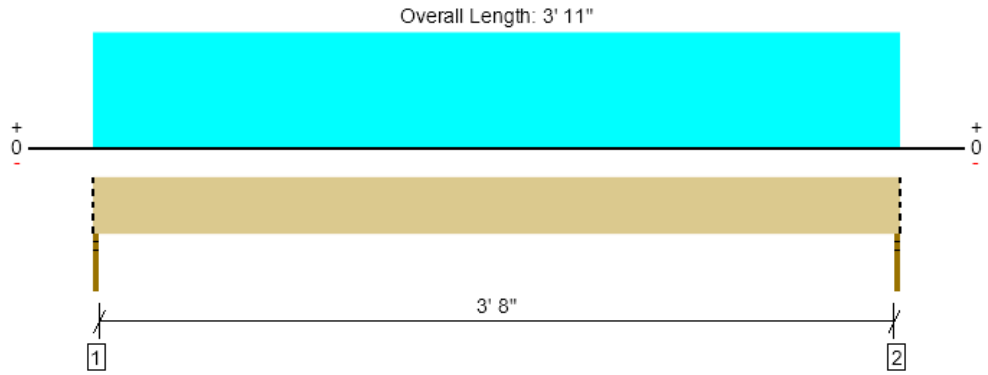
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, 20
2 piece(s) 2 x 8 DF No.1



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)	1570 @ 0	2813 (1.50")	Passed (56%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	985 @ 8 3/4"	2610	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1537 @ 1' 11 1/2"	2628	Passed (58%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.016 @ 1' 11 1/2"	0.098	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.026 @ 1' 11 1/2"	0.196	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 3' 11"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) 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 - Stud wall - DF	1.50"	1.50"	1.50"	611	960	1570	Blocking
2 - Stud wall - DF	1.50"	1.50"	1.50"	611	960	1570	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)	3' 11" o/c	
Bottom Edge (Lu)	3' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 11"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 3' 11" (Top)	12' 3"	25.0	40.0	Default Load

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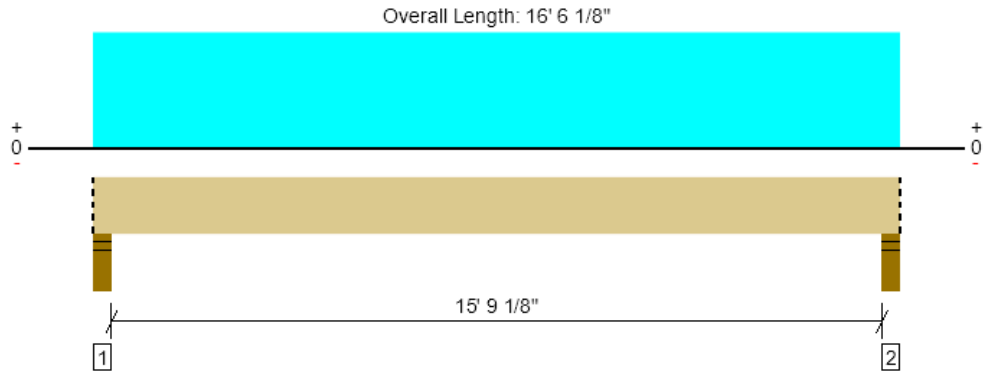
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 22

3 piece(s) 1 3/4" x 16" 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)	10940 @ 3"	14766 (4.50")	Passed (74%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	8676 @ 1' 8 1/2"	15960	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	42461 @ 8' 3 1/16"	46671	Passed (91%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.365 @ 8' 3 1/16"	0.400	Passed (L/526)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.605 @ 8' 3 1/16"	0.801	Passed (L/318)	--	1.0 D + 1.0 L (All Spans)

Member Length : 16' 6 1/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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 - Stud wall - DF	4.50"	4.50"	3.33"	4332	6608	10940	Blocking
2 - Stud wall - DF	4.50"	4.50"	3.33"	4332	6608	10940	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)	5' 6" o/c	
Bottom Edge (Lu)	16' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 16' 6 1/8"	N/A	24.5	--	
1 - Uniform (PSF)	0 to 16' 6 1/8" (Top)	20' 1/8"	25.0	40.0	Default Load

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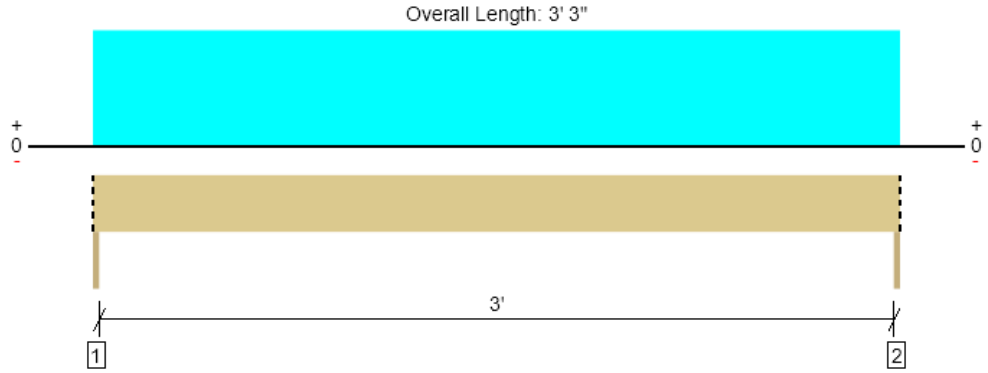
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 23
2 piece(s) 2 x 6 DF No.1



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)	1239 @ 0	2813 (1.50")	Passed (44%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	794 @ 7"	1980	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1006 @ 1' 7 1/2"	1639	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.017 @ 1' 7 1/2"	0.081	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.027 @ 1' 7 1/2"	0.162	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 3' 3"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) 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 - Beam - DF	1.50"	1.50"	1.50"	459	779	-68	1239	Blocking
2 - Beam - DF	1.50"	1.50"	1.50"	459	779	-68	1239	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)	3' 3" o/c	
Bottom Edge (Lu)	3' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.2	--	--	
1 - Uniform (PLF)	0 to 3' 3" (Front)	N/A	278.5	479.5	-42.0	Linked from: Floor: Joist w/ Cant, Support 1

Weyerhaeuser Notes

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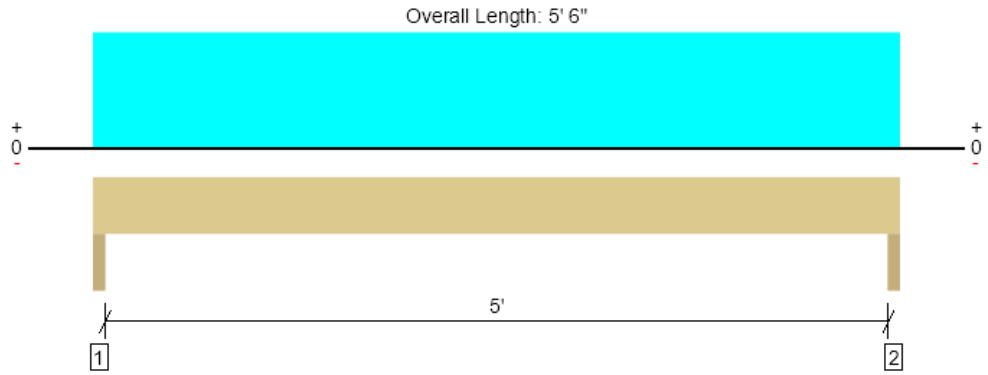
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 26

2 piece(s) 1 3/4" x 5 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)	2793 @ 1 1/2"	7875 (3.00")	Passed (35%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1891 @ 8 1/2"	3658	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3191 @ 2' 9"	4251	Passed (75%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.112 @ 2' 9"	0.175	Passed (L/562)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.200 @ 2' 9"	0.262	Passed (L/315)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 5' 6"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
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	3.00"	3.00"	1.50"	1225	1321	769	2793	None
2 - Trimmer - DF	3.00"	3.00"	1.50"	1225	1321	769	2793	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	5.6	--	--	
1 - Uniform (PLF)	0 to 5' 6"	N/A	440.0	480.5	279.5	Linked from: Floor: Joist w/ Cant, Support 2

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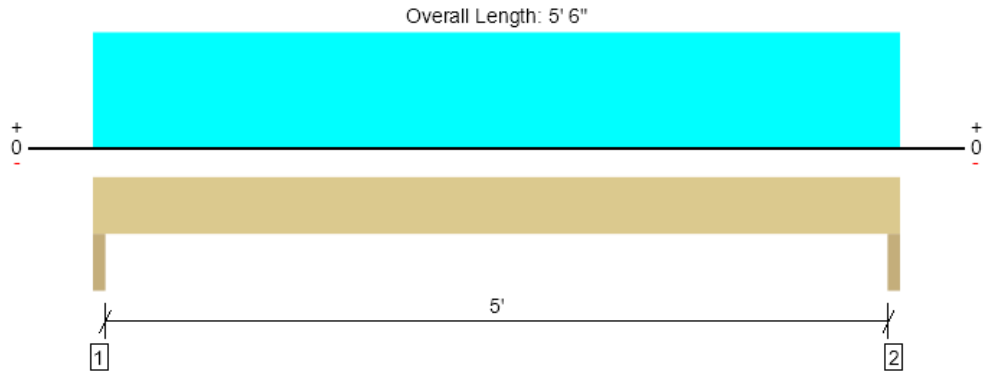
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, 27

1 piece(s) 1 3/4" x 16" 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)	2184 @ 1 1/2"	3938 (3.00")	Passed (55%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	927 @ 1' 7"	5320	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2736 @ 2' 9"	15557	Passed (18%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.014 @ 2' 9"	0.175	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.023 @ 2' 9"	0.262	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 5' 6"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
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	Factored	
1 - Trimmer - DF	3.00"	3.00"	1.66"	854	1330	2184	None
2 - Trimmer - DF	3.00"	3.00"	1.66"	854	1330	2184	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 5' 6"	12' 1 1/8"	25.0	40.0	

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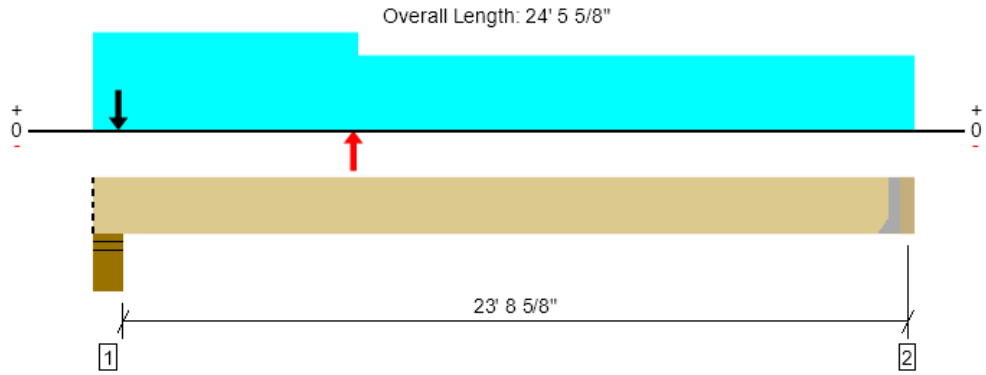
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 28

4 piece(s) 1 3/4" x 16" 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)	5686 @ 24' 2 1/8"	7875 (1.50")	Passed (72%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4942 @ 1' 11 1/4"	21280	Passed (23%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	31159 @ 11' 11 13/16"	62228	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.416 @ 12' 3 15/16"	0.790	Passed (L/684)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.695 @ 12' 2 15/16"	1.185	Passed (L/409)	--	1.0 D + 1.0 L (All Spans)

Member Length : 24' 2 1/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -203 lbs uplift at support located at 5 3/4". Strapping or other restraint may be required.
- -631 lbs uplift at support located at 24' 2 1/8". Strapping or other restraint may be required.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Factored	
1 - Stud wall - DF	7.25"	7.25"	1.50"	2697	3290	2601/-2601	6530/-203	Blocking
2 - Hanger on 16" LVL beam	3.50"	Hanger[1]	1.50"	1983	3240	2601/-2601	5779/-631	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)	12' 7" o/c	
Bottom Edge (Lu)	24' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HGUS7.25/12	4.00"	N/A	56-10d	20-10d	

- 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)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 24' 2 1/8"	N/A	32.7	--	--	
1 - Uniform (PSF)	0 to 24' 5 5/8" (Top)	3' 9 3/8"	25.0	60.0	-	Default Load
2 - Uniform (PSF)	0 to 24' 5 5/8" (Top)	1'	25.0	40.0	-	Default Load
3 - Uniform (PSF)	0 to 8' 1/2" (Top)	10'	12.0	-	-	Default Load
4 - Point (lb)	9 1/4" (Front)	N/A	-	-	8652	
5 - Point (lb)	7' 10 3/4" (Front)	N/A	-	-	-8652	

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

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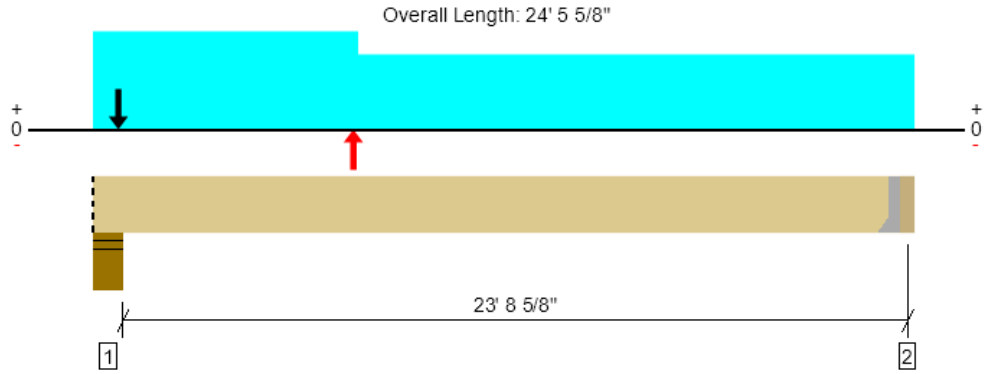
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 28 (w_overstrength)

4 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL

An excessive uplift of -2934 lbs at support located at 5 3/4" failed this product.

An excessive uplift of -3362 lbs at support located at 24' 2 1/8" failed this product.



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)	7734 @ 24' 2 1/8"	7875 (1.50")	Passed (98%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	10702 @ 1' 11 1/4"	34048	Passed (31%)	1.60	1.0 D - 0.7 E (All Spans)
Moment (Ft-lbs)	85662 @ 7' 10 3/4"	99565	Passed (86%)	1.60	1.0 D - 0.7 E (All Spans)
Live Load Defl. (in)	0.416 @ 12' 3 15/16"	0.790	Passed (L/684)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.695 @ 12' 2 15/16"	1.185	Passed (L/409)	--	1.0 D + 1.0 L (All Spans)

Member Length : 24' 2 1/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Factored	
1 - Stud wall - DF	7.25"	7.25"	1.96"	2697	3290	6503/-6503	8578/-2934	Blocking
2 - Hanger on 16" LVL beam	3.50"	Hanger[1]	1.50"	1983	3240	6503/-6503	7827/-3362	See note [1]

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 1" o/c	
Bottom Edge (Lu)	7' 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
2 - Face Mount Hanger	HGUS7.25/12	4.00"	N/A	56-10d	20-10d	

- 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)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 24' 2 1/8"	N/A	32.7	--	--	
1 - Uniform (PSF)	0 to 24' 5 5/8" (Top)	3' 9 3/8"	25.0	60.0	-	Default Load
2 - Uniform (PSF)	0 to 24' 5 5/8" (Top)	1'	25.0	40.0	-	Default Load
3 - Uniform (PSF)	0 to 8' 1/2" (Top)	10'	12.0	-	-	Default Load
4 - Point (lb)	9 1/4" (Front)	N/A	-	-	21630	
5 - Point (lb)	7' 10 3/4" (Front)	N/A	-	-	-21630	8652 with overstrength

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

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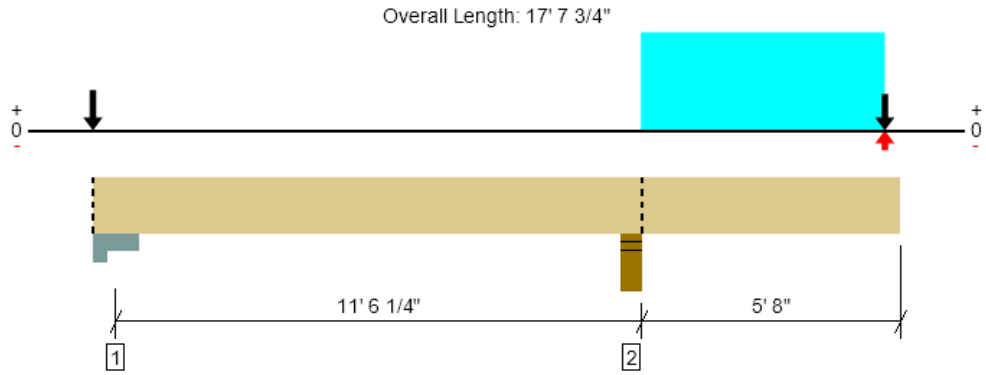
Upper, 29

3 piece(s) 1 3/4" x 20" 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) [Group]
Member Reaction (lbs)	14555 @ 11' 9 1/4"	16406 (5.00")	Passed (89%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans) [8]
Shear (lbs)	8589 @ 13' 7 3/4"	22943	Passed (37%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Moment (Ft-lbs)	-45257 @ 11' 9 1/4"	81355	Passed (56%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Live Load Defl. (in)	0.163 @ 17' 7 3/4"	0.392	Passed (2L/864)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Total Load Defl. (in)	0.407 @ 17' 7 3/4"	0.587	Passed (2L/346)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]

Member Length : 17' 7 3/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/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	Seismic	Factored	
1 - Column Cap - steel	11.00"	11.00"	1.95"	2663	-613	5022	566/-566	7684	Blocking
2 - Stud wall - DF	5.00"	5.00"	4.44"	8140	2649	4723	1687/-1687	14555	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	17' 8" o/c	
Bottom Edge (Lu)	8' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 17' 7 3/4"	N/A	30.6	--	--	--	
1 - Uniform (PSF)	11' 11 3/4" to 17' 3 3/4" (Top)	7' 11 7/8"	25.0	40.0	-	-	Default Load
2 - Point (lb)	17' 3 3/4" (Top)	N/A	1959	-	2320	-	Linked from: 1, Support 1
3 - Point (lb)	17' 3 3/4" (Top)	N/A	719	-	819	-	Linked from: 7, Support 1
4 - Point (lb)	0 (Top)	N/A	1959	-	2320	-	Linked from: 1, Support 1
5 - Point (lb)	0 (Top)	N/A	2985	-	3494	-	Linked from: 9, Support 1
6 - Point (lb)	17' 3 3/4" (Front)	N/A	1575	331	-	1121/-1121	Linked from: 35, Support 2

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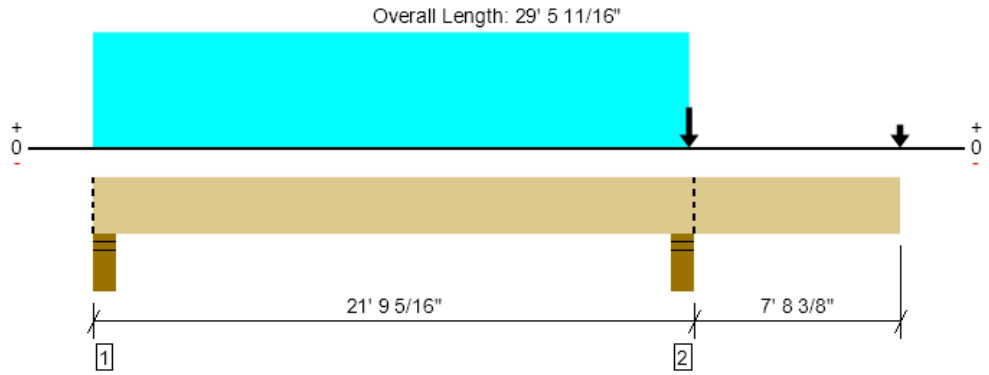
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, 30

1 piece(s) 6 3/4" x 15" 24F-V8 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)	15015 @ 21' 6 9/16"	23203 (5.50")	Passed (65%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6877 @ 20' 13/16"	17888	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	33081 @ 10' 4 3/16"	48390	Passed (68%)	1.00	1.0 D + 1.0 L (Alt Spans)
Neg Moment (Ft-lbs)	-18221 @ 21' 6 9/16"	50603	Passed (36%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.389 @ 29' 5 11/16"	0.528	Passed (2L/490)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.762 @ 10' 8 5/8"	1.061	Passed (L/334)	--	1.0 D + 1.0 L (Alt Spans)

Member Length : 29' 5 11/16"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- A 4.4% decrease in the moment capacity has been added to account for lateral stability.
- Critical positive moment adjusted by a volume/size factor of 0.96 that was calculated using length L = 20' 7/16".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 12' 9 3/4".
- Upward deflection on right cantilever exceeds 0.4".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.62"	3460	3364/-470	-	6824	Blocking
2 - Stud wall - DF	5.50"	5.50"	3.56"	8397	5648	3176	15015	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)	Continuous	
Bottom Edge (Lu)	Continuous	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 29' 5 11/16"	N/A	24.6	--	--	
1 - Uniform (PSF)	0 to 21' 9 1/4" (Top)	7' 8 1/4"	25.0	40.0	-	Default Load
2 - Point (lb)	21' 9 1/4" (Top)	N/A	1873	-	2207	Linked from: 6, Support 2
3 - Point (lb)	21' 9 1/4" (Front)	N/A	886	-	969	Linked from: 10, Support 1
4 - Uniform (PSF)	0 to 21' 9 1/4" (Top)	9'	15.0	-	-	Default Load
5 - Point (lb)	21' 9 1/4" (Front)	N/A	309	589	-	Linked from: 31, Support 1
6 - Point (lb)	29' 5 11/16" (Front)	N/A	941	1258	-	

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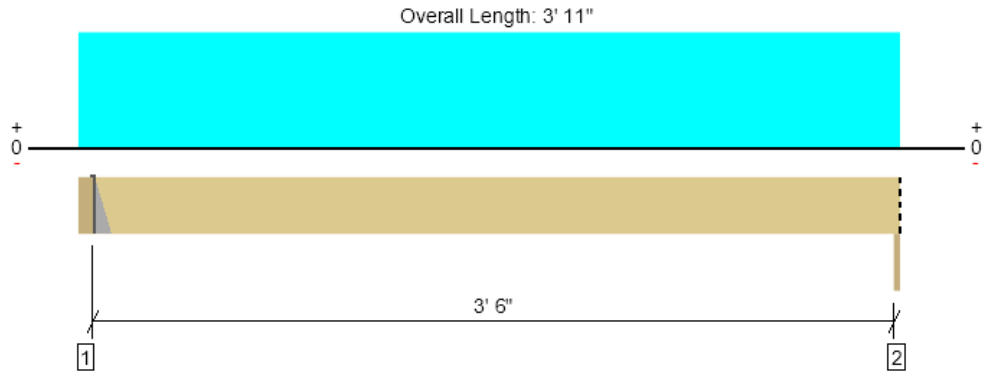
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 31

1 piece(s) 1 3/4" x 16" 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)	776 @ 3' 11"	1641 (1.50")	Passed (47%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	205 @ 1' 7 1/2"	5320	Passed (4%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	703 @ 2' 1 1/4"	15557	Passed (5%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.003 @ 2' 1 1/4"	0.121	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.004 @ 2' 1 1/4"	0.181	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 3' 7 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Factored	
1 - Hanger on 16" DF beam	3.50"	Hanger[1]	1.50"	309	589	899	See note [1]
2 - Beam - DF	1.50"	1.50"	1.50"	269	508	776	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 - Top Mount Hanger	ITS1.81/16	2.00"	4-10dx1.5	4-10dx1.5	4-10dx1.5	

- 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 1/2" to 3' 11"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 3' 11" (Top)	4'	25.0	60.0	Default Load
2 - Uniform (PSF)	0 to 3' 11" (Top)	1'	40.0	40.0	Default Load

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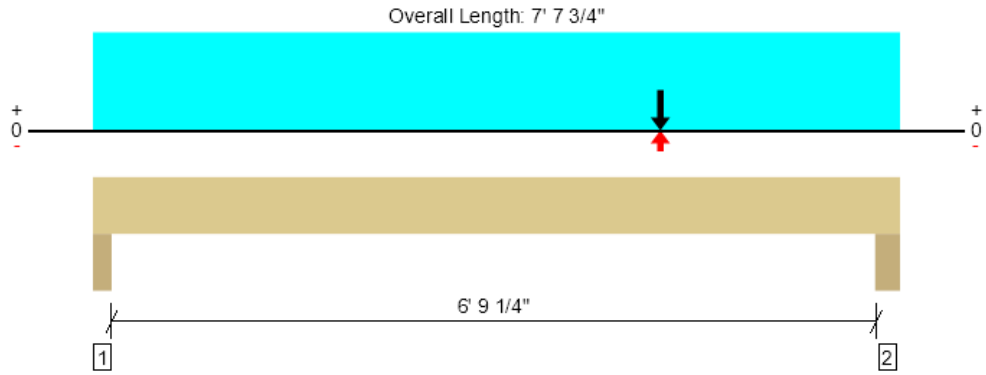
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, 32

2 piece(s) 1 3/4" x 16" 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) [Group]
Member Reaction (lbs)	13299 @ 7' 3 1/4"	15750 (6.00")	Passed (84%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans) [1]
Shear (lbs)	10762 @ 5' 9 3/4"	12236	Passed (88%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Moment (Ft-lbs)	21216 @ 5' 4 1/2"	35781	Passed (59%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Live Load Defl. (in)	0.049 @ 4' 9/16"	0.234	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]
Total Load Defl. (in)	0.104 @ 4' 3/8"	0.351	Passed (L/814)	--	1.0 D + 0.75 L + 0.75 S (All Spans) [1]

Member Length : 7' 7 3/4"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
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	Seismic	Factored	
1 - Trimmer - DF	4.50"	4.50"	2.62"	3520	2645	1331	702/-702	6872	None
2 - Trimmer - DF	6.00"	6.00"	5.07"	6457	4194	3599	1899/-1899	13299	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 5" o/c	
Bottom Edge (Lu)	7' 8" 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)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 7' 7 3/4"	N/A	16.3	--	--	--	
1 - Uniform (PSF)	0 to 7' 7 3/4"	11' 9 1/4"	40.0	40.0	-	-	
2 - Point (lb)	5' 4 1/2"	N/A	3384	-	3961	-	Linked from: 2, Support 2
3 - Point (lb)	5' 4 1/2"	N/A	886	-	969	-	Linked from: 10, Support 1
4 - Point (lb)	5' 4 1/2"	N/A	1983	3240	-	2601/-2601	Linked from: 28, Support 2

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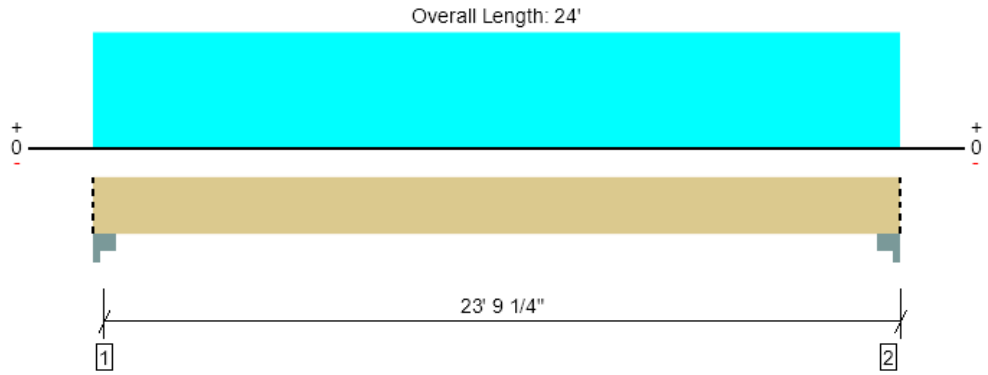
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 33

1 piece(s) 5 1/2" x 15" 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)	4321 @ 4"	19663 (5.50")	Passed (22%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3706 @ 1' 8 1/2"	14575	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	24504 @ 12'	39636	Passed (62%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.575 @ 12'	0.778	Passed (L/487)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.862 @ 12'	1.167	Passed (L/325)	--	1.0 D + 1.0 L (All Spans)

Member Length : 24'
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 0.96 that was calculated using length L = 23' 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	Floor Live	Factored	
1 - Column Cap - steel	5.50"	5.50"	1.50"	1441	2880	4321	Blocking
2 - Column Cap - steel	5.50"	5.50"	1.50"	1441	2880	4321	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' o/c	
Bottom Edge (Lu)	24' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 24'	N/A	20.0	--	
1 - Uniform (PSF)	0 to 24' (Top)	4'	25.0	60.0	Default Load

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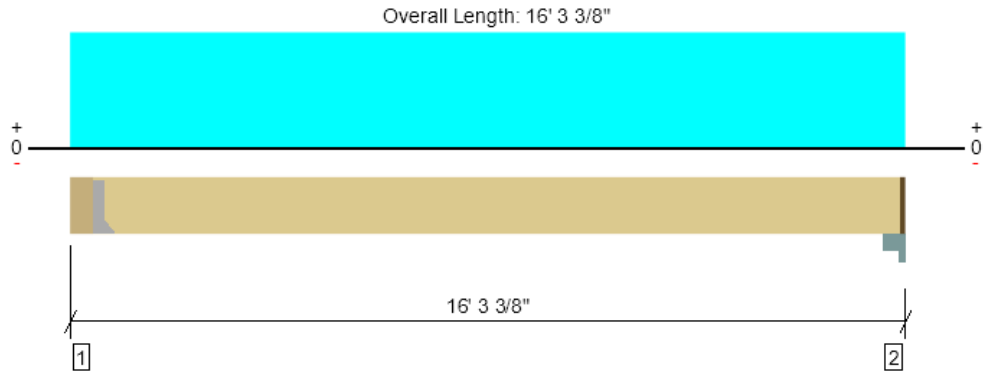
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, 34

1 piece(s) 5 1/2" x 15" 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)	2679 @ 5 1/2"	5363 (1.50")	Passed (50%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2246 @ 1' 8 1/2"	14575	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	10373 @ 8' 2 7/16"	41250	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.107 @ 8' 2 7/16"	0.516	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.161 @ 8' 2 7/16"	0.774	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15' 8 5/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- 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 = 15' 5 7/8".
- 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	Floor Live	Factored	
1 - Hanger on 15" GLB beam	5.50"	Hanger[1]	1.50"	941	1887	2828	See note [1]
2 - Column Cap - steel	5.50"	4.25"	1.50"	934	1858	2792	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing 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)	15' 9" o/c	
Bottom Edge (Lu)	15' 9" 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	HUC612	2.50"	N/A	22-10d	8-10d	

- 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)	5 1/2" to 16' 2 1/8"	N/A	20.0	--	
1 - Uniform (PSF)	0 to 16' 3 3/8" (Top)	3' 10"	25.0	60.0	Default Load

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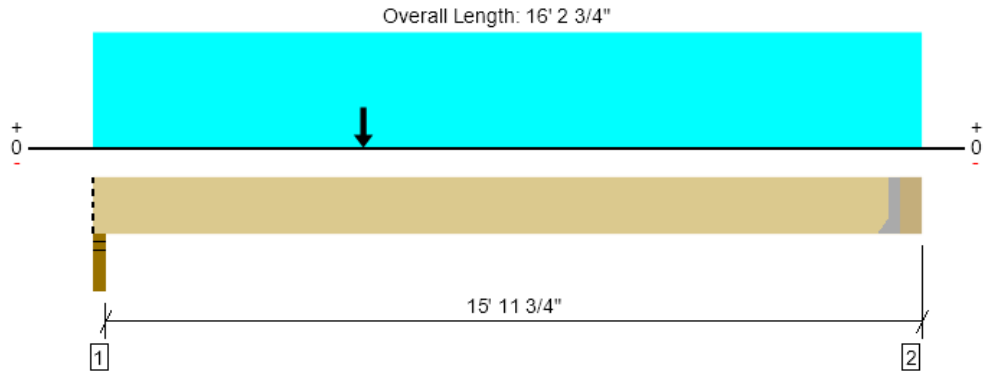
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, 35

2 piece(s) 1 3/4" x 16" 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)	2322 @ 15' 9 1/2"	3938 (1.50")	Passed (59%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2749 @ 1' 7"	17024	Passed (16%)	1.60	1.0 D + 0.7 E (All Spans)
Moment (Ft-lbs)	13385 @ 5' 5 1/4"	49783	Passed (27%)	1.60	1.0 D + 0.7 E (All Spans)
Live Load Defl. (in)	0.025 @ 7' 11 1/2"	0.522	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.146 @ 7' 11 1/2"	0.783	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15' 9 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -615 lbs uplift at support located at 1 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	1523	318	2184/-2184	3052/-615	Blocking
2 - Hanger on 16" LVL beam	5.25"	Hanger[1]	1.50"	1575	331	1121/-1121	2412	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)	14' 2" o/c	
Bottom Edge (Lu)	15' 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	THAC422	1.75"	N/A	22-16d	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)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 15' 9 1/2"	N/A	16.3	--	--	
1 - Uniform (PSF)	0 to 16' 2 3/4" (Top)	1'	40.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 16' 2 3/4" (Top)	9'	15.0	-	-	Default Load
3 - Point (lb)	5' 5 1/4" (Front)	N/A	-	-	3305	

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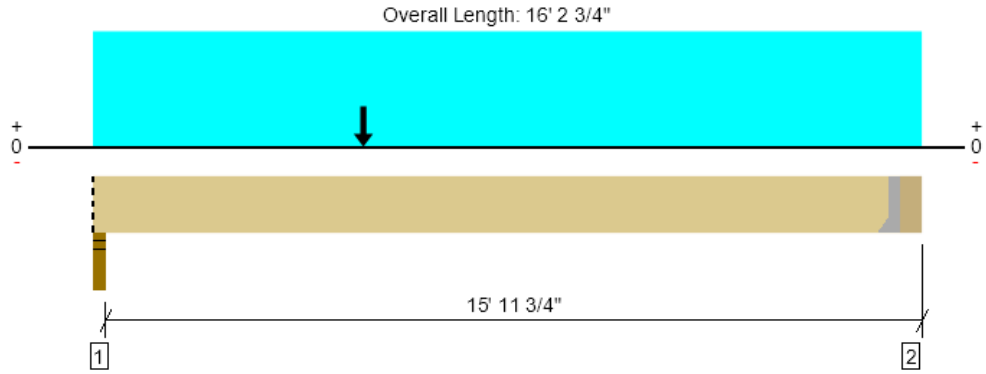
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 35 (w_overstrength)

2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL

An excessive uplift of -2909 lbs at support located at 1 1/2" failed this product.

An excessive uplift of -1016 lbs at support located at 15' 9 1/2" failed this product.



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)	3460 @ 15' 9 1/2"	3938 (1.50")	Passed (88%)	--	1.0 D + 0.7 E (All Spans)
Shear (lbs)	5042 @ 1' 7"	17024	Passed (30%)	1.60	1.0 D + 0.7 E (All Spans)
Moment (Ft-lbs)	25569 @ 5' 5 1/4"	49783	Passed (51%)	1.60	1.0 D + 0.7 E (All Spans)
Live Load Defl. (in)	0.025 @ 7' 11 1/2"	0.522	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.146 @ 7' 11 1/2"	0.783	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15' 9 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Seismic	Factored	
1 - Stud wall - DF	3.00"	3.00"	2.44"	1523	318	5461/-5461	5345/-2909	Blocking
2 - Hanger on 16" LVL beam	5.25"	Hanger[1]	1.50"	1575	331	2802/-2802	3537/-1016	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)	6' 8" o/c	
Bottom Edge (Lu)	10' 5" 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	THAC422	1.75"	N/A	22-16d	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)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 15' 9 1/2"	N/A	16.3	--	--	
1 - Uniform (PSF)	0 to 16' 2 3/4" (Top)	1'	40.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 16' 2 3/4" (Top)	9'	15.0	-	-	Default Load
3 - Point (lb)	5' 5 1/4" (Front)	N/A	-	-	8263	

Weyerhaeuser Notes

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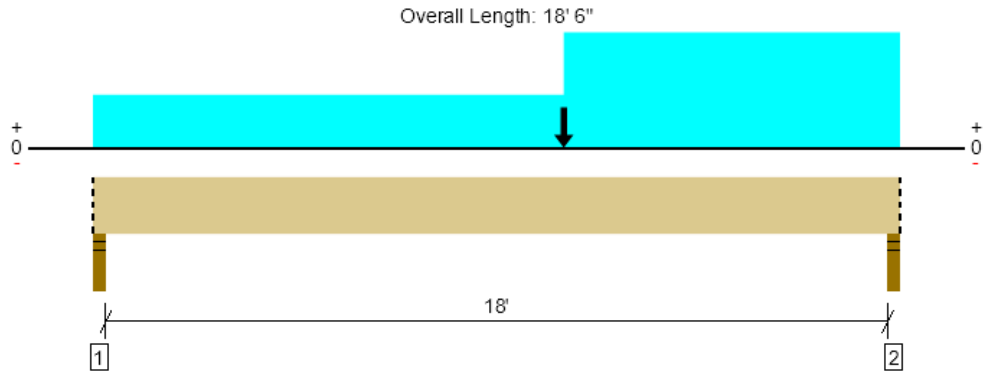
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 36

2 piece(s) 1 3/4" x 16" 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)	4152 @ 18' 4 1/2"	6563 (3.00")	Passed (63%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	3289 @ 16' 11"	13300	Passed (25%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	15295 @ 10' 10 5/8"	38893	Passed (39%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.167 @ 9' 7 5/16"	0.608	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.412 @ 9' 6 3/16"	0.913	Passed (L/532)	--	1.0 D + 1.0 Lr (All Spans)

Member Length : 18' 6"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Roof Live	Seismic	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	1771	1078	1373/-1373	2849	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.90"	2363	1789	1932/-1932	4152	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' o/c	
Bottom Edge (Lu)	18' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 18' 6"	N/A	16.3	--	--	
1 - Uniform (PSF)	0 to 18' 6" (Top)	3'	15.0	30.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 6" (Top)	9'	12.0	-	-	Default Load
3 - Point (lb)	10' 9 1/2" (Front)	N/A	-	-	3305	
4 - Uniform (PSF)	10' 9 1/2" to 18' 6" (Top)	5' 2 3/8"	25.0	30.0	-	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
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

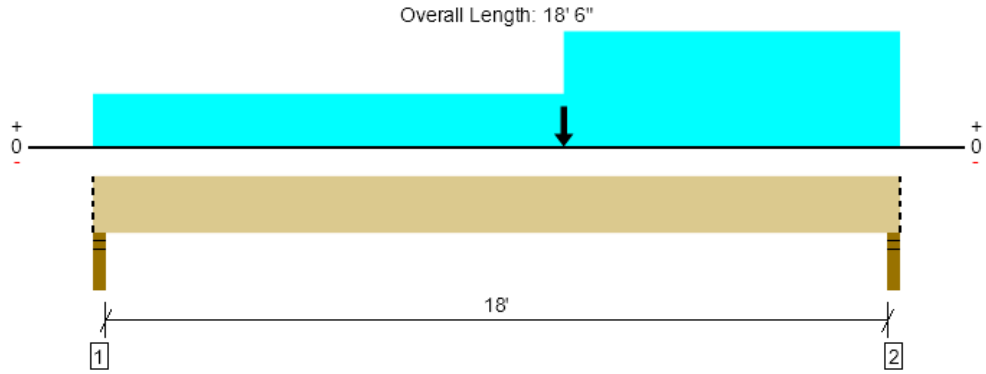
Weyerhaeuser

Upper, 36 (w_overstrength)

2 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL

An excessive uplift of -1341 lbs at support located at 1 1/2" failed this product.

An excessive uplift of -1962 lbs at support located at 18' 4 1/2" failed this product.



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)	5744 @ 18' 4 1/2"	6563 (3.00")	Passed (88%)	--	1.0 D + 0.7 E (All Spans)
Shear (lbs)	5270 @ 16' 11"	17024	Passed (31%)	1.60	1.0 D + 0.7 E (All Spans)
Moment (Ft-lbs)	34668 @ 10' 9 1/2"	49783	Passed (70%)	1.60	1.0 D + 0.7 E (All Spans)
Live Load Defl. (in)	0.167 @ 9' 7 5/16"	0.608	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.412 @ 9' 6 3/16"	0.913	Passed (L/532)	--	1.0 D + 1.0 Lr (All Spans)

Member Length : 18' 6"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Roof Live	Seismic	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.91"	1771	1078	3433/-3433	4174/-1341	Blocking
2 - Stud wall - DF	3.00"	3.00"	2.63"	2363	1789	4829/-4829	5744/-1962	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' 8" o/c	
Bottom Edge (Lu)	8' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 18' 6"	N/A	16.3	--	--	
1 - Uniform (PSF)	0 to 18' 6" (Top)	3'	15.0	30.0	-	Default Load
2 - Uniform (PSF)	0 to 18' 6" (Top)	9'	12.0	-	-	Default Load
3 - Point (lb)	10' 9 1/2" (Front)	N/A	-	-	8263	w/ 2.5 overstrength
4 - Uniform (PSF)	10' 9 1/2" to 18' 6" (Top)	5' 2 3/8"	25.0	30.0	-	Default Load

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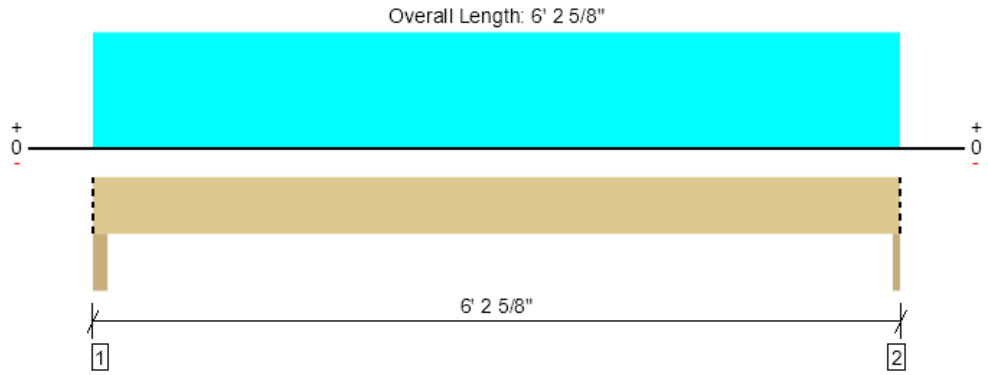
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, 37
3 piece(s) 2 x 8 DF No.1



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)	2226 @ 6' 2 3/8"	4922 (1.75")	Passed (45%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1676 @ 10 3/4"	3915	Passed (43%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3334 @ 3' 2 3/16"	3942	Passed (85%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.050 @ 3' 2 3/16"	0.151	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.090 @ 3' 2 3/16"	0.302	Passed (L/806)	--	1.0 D + 1.0 L (All Spans)

Member Length : 6' 2 5/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) 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 - Beam - DF	3.50"	3.50"	1.50"	1039	1294	2333	Blocking
2 - Beam - DF	1.75"	1.75"	1.50"	991	1235	2226	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)	6' 3" o/c	
Bottom Edge (Lu)	6' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 6' 2 5/8"	N/A	8.3	--	
1 - Uniform (PSF)	0 to 6' 2 5/8" (Front)	4' 3 1/4"	40.0	40.0	
2 - Uniform (PSF)	3' 9 1/4" to 6' 2 5/8" (Front)	5' 10 3/4"	25.0	40.0	
3 - Uniform (PSF)	0 to 3' 9 1/4" (Front)	5' 10 3/4"	25.0	40.0	

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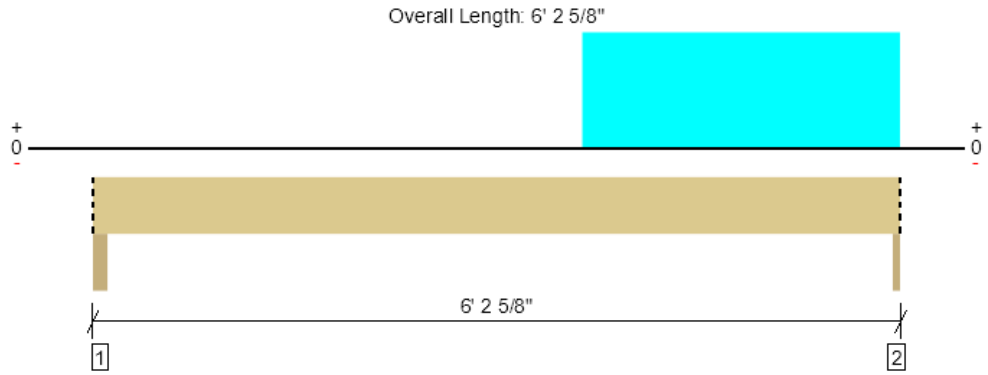
Upper, 38
3 piece(s) 2 x 6 DF No.1



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)	943 @ 6' 2 3/8"	4922 (1.75")	Passed (19%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	655 @ 5' 7 3/8"	2970	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	911 @ 4' 2 15/16"	2458	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.023 @ 3' 5 9/16"	0.151	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.048 @ 3' 5 7/16"	0.302	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 6' 2 5/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) 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 - Beam - DF	3.50"	3.50"	1.50"	135	115	250	Blocking
2 - Beam - DF	1.75"	1.75"	1.50"	481	462	943	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)	6' 3" o/c	
Bottom Edge (Lu)	6' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 6' 2 5/8"	N/A	6.3	--	
1 - Uniform (PSF)	3' 9 1/4" to 6' 2 5/8" (Front)	5' 10 3/4"	40.0	40.0	

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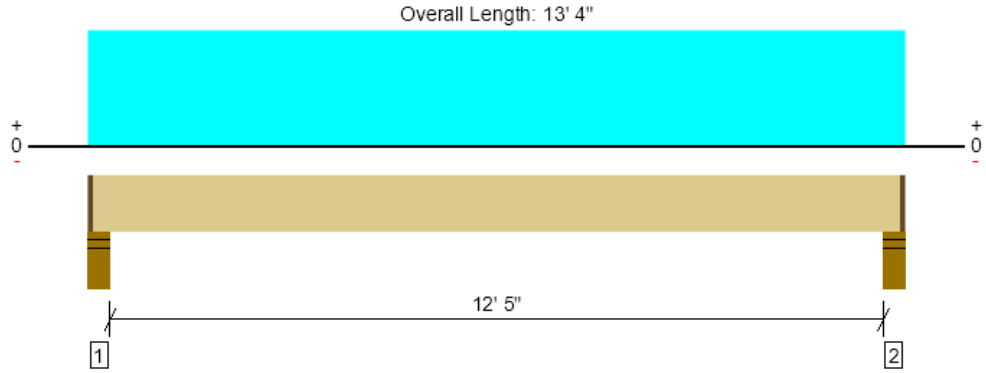
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main, Garage Joists
1 piece(s) 1 3/4" x 11 1/4" 2.0E Microllam® LVL @ 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)	1006 @ 4 1/2"	4648 (4.25")	Passed (22%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	808 @ 1' 4 3/4"	3741	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3035 @ 6' 8"	8391	Passed (36%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.071 @ 6' 8"	0.315	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.205 @ 6' 8"	0.629	Passed (L/737)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	61	40	Passed	--	--

Member Length : 13' 1 1/2"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
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 4% increase in the moment capacity has been added to account for repetitive member usage.
- 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	5.50"	4.25"	1.50"	667	356	1022	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	1.50"	667	356	1022	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 2" o/c	
Bottom Edge (Lu)	13' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 13' 4"	16"	75.0	40.0	Default Load

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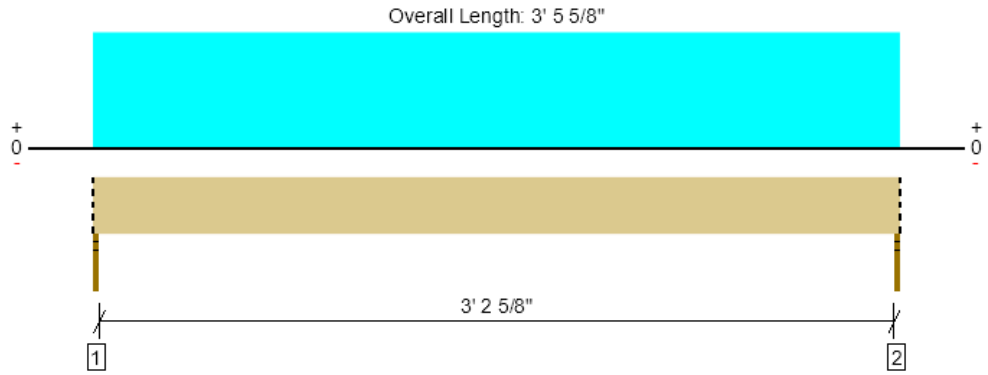
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main, 51
2 piece(s) 2 x 8 DF No.1



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)	2250 @ 0	2813 (1.50")	Passed (80%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1304 @ 8 3/4"	2610	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1951 @ 1' 8 13/16"	2628	Passed (74%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.016 @ 1' 8 13/16"	0.087	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.026 @ 1' 8 13/16"	0.173	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 3' 5 5/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) 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 - Stud wall - DF	1.50"	1.50"	1.50"	871	1379	2250	Blocking
2 - Stud wall - DF	1.50"	1.50"	1.50"	871	1379	2250	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)	3' 6" o/c	
Bottom Edge (Lu)	3' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 5 5/8"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 3' 5 5/8" (Top)	19' 10 1/2"	25.0	40.0	Default Load

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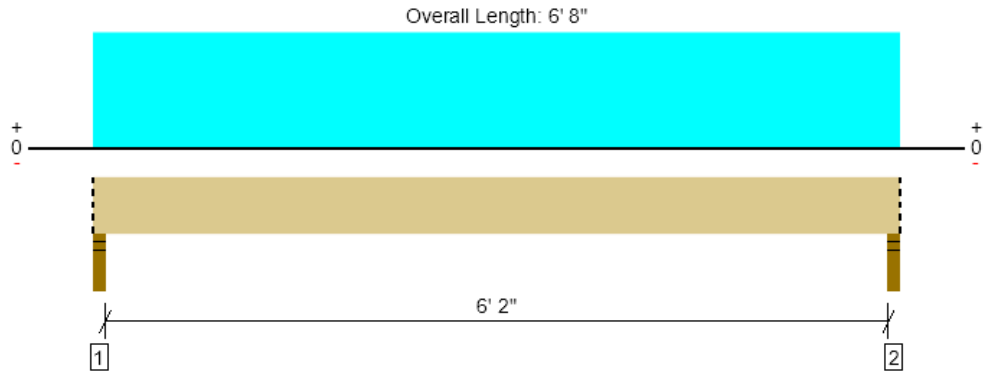
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main, 52

1 piece(s) 1 3/4" x 16" 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)	2627 @ 1 1/2"	3281 (3.00")	Passed (80%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1379 @ 1' 7"	5320	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4056 @ 3' 4"	15557	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.025 @ 3' 4"	0.160	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.042 @ 3' 4"	0.321	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 6' 8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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 - Stud wall - DF	3.00"	3.00"	2.40"	1027	1600	2627	Blocking
2 - Stud wall - DF	3.00"	3.00"	2.40"	1027	1600	2627	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)	6' 8" o/c	
Bottom Edge (Lu)	6' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 6' 8"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 6' 8" (Top)	12'	25.0	40.0	Default Load

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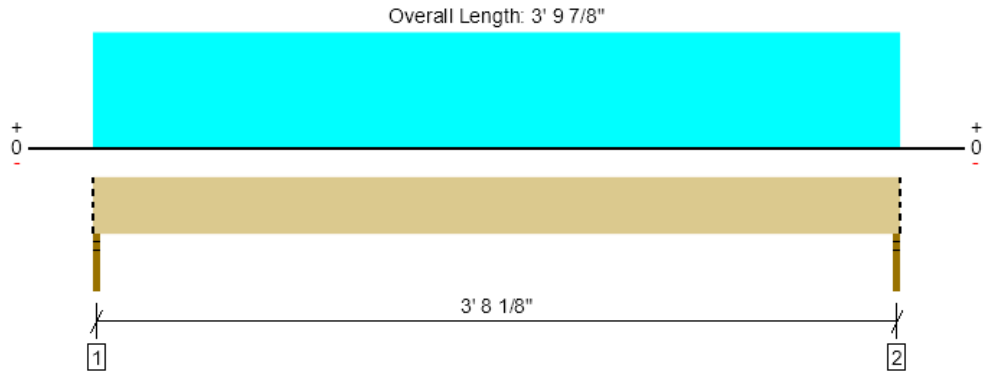
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main, 53
2 piece(s) 2 x 8 DF No.1



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)	1569 @ 1/4"	3281 (1.75")	Passed (48%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	953 @ 9"	2610	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1467 @ 1' 10 15/16"	2628	Passed (56%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.013 @ 1' 10 15/16"	0.095	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.023 @ 1' 10 15/16"	0.189	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 3' 9 7/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) 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 - Stud wall - DF	1.75"	1.75"	1.50"	684	886	1569	Blocking
2 - Stud wall - DF	1.75"	1.75"	1.50"	684	886	1569	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)	3' 10" o/c	
Bottom Edge (Lu)	3' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 9 7/8"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 3' 9 7/8" (Top)	4' 2"	40.0	40.0	Default Load
2 - Uniform (PSF)	0 to 3' 9 7/8" (Top)	7' 5"	25.0	40.0	Default Load

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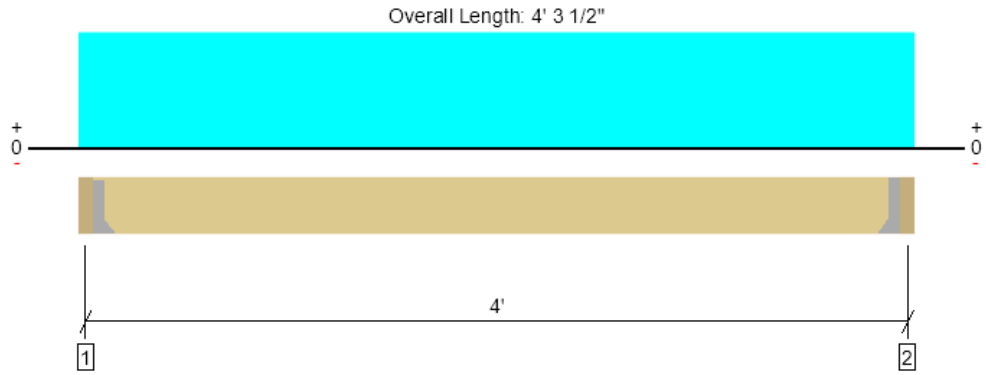
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main, 54

1 piece(s) 1 3/4" x 16" 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)	909 @ 3 1/2"	1969 (1.50")	Passed (46%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	255 @ 1' 7 1/2"	5320	Passed (5%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	843 @ 2' 1 3/4"	15557	Passed (5%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.003 @ 2' 1 3/4"	0.093	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.005 @ 2' 1 3/4"	0.185	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 3' 8 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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 16" DF beam	3.50"	Hanger[1]	1.50"	413	637	1050	See note [1]
2 - Hanger on 16" DF beam	3.50"	Hanger[1]	1.50"	413	637	1050	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)	3' 9" o/c	
Bottom Edge (Lu)	3' 9" 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	HUCQ1.81/11-SDS	3.00"	N/A	10-SDS25134	4-SDS25134	
2 - Face Mount Hanger	IUS1.81/11.88	2.00"	N/A	10-10dx1.5	2-10dx1.5	

- 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 1/2" to 4'	N/A	8.2	--	
1 - Uniform (PSF)	0 to 4' 3 1/2" (Top)	7' 5"	25.0	40.0	Default Load

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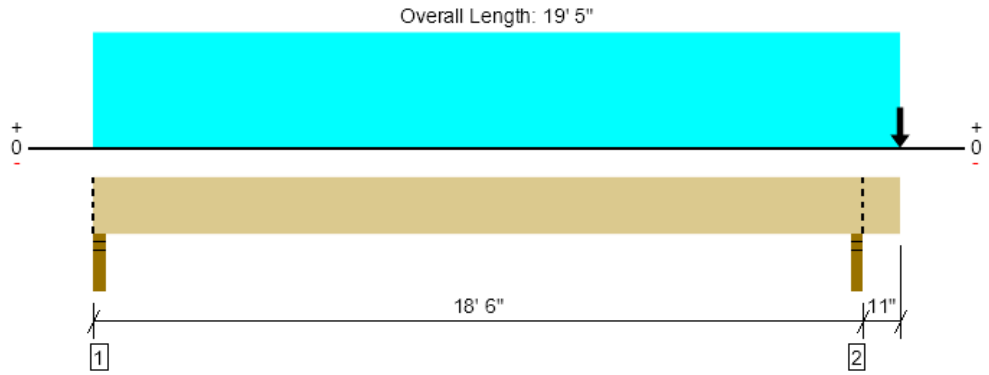
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 55

1 piece(s) 1 3/4" x 16" 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)	2519 @ 18' 4 1/2"	3281 (3.00")	Passed (77%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1123 @ 16' 11"	5320	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5524 @ 9' 13/16"	15557	Passed (36%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.181 @ 9' 3"	0.456	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.298 @ 9' 2 1/4"	0.913	Passed (L/734)	--	1.0 D + 1.0 L (Alt Spans)

Member Length : 19' 5"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/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 - Stud wall - DF	3.00"	3.00"	1.50"	513	740/-39	1253	Blocking
2 - Stud wall - DF	3.00"	3.00"	2.30"	1030	1489	2519	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)	10' 2" o/c	
Bottom Edge (Lu)	19' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 19' 5"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 19' 5" (Top)	2'	25.0	40.0	Default Load
2 - Point (lb)	19' 5" (Front)	N/A	413	637	Linked from: 54, Support 1

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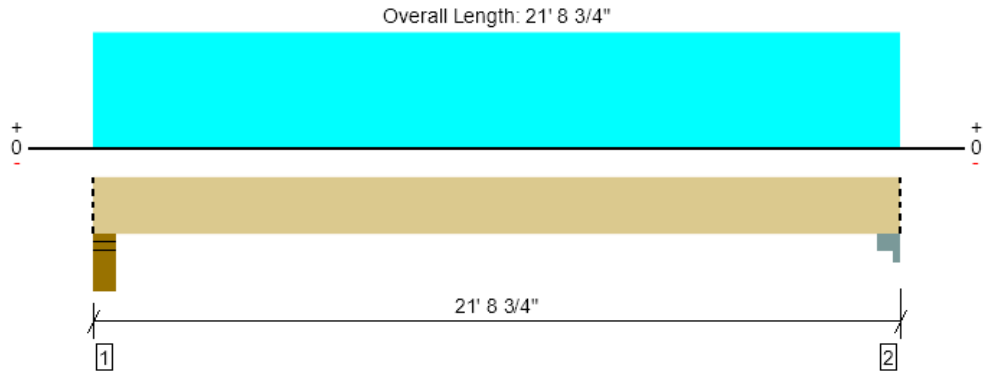
Main, 56

1 piece(s) 3 1/2" x 12" 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)	1958 @ 4"	12031 (5.50")	Passed (16%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1695 @ 1' 5 1/2"	7420	Passed (23%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	9993 @ 10' 10 3/8"	16800	Passed (59%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.586 @ 10' 10 3/8"	0.702	Passed (L/432)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.880 @ 10' 10 3/8"	1.053	Passed (L/287)	--	1.0 D + 1.0 L (All Spans)

Member Length : 21' 8 3/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- 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 = 21' 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	Floor Live	Factored	
1 - Stud wall - DF	5.50"	5.50"	1.50"	654	1304	1958	Blocking
2 - Column Cap - steel	5.50"	5.50"	1.50"	654	1304	1958	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	21' 9" o/c	
Bottom Edge (Lu)	21' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 21' 8 3/4"	N/A	10.2	--	
1 - Uniform (PSF)	0 to 21' 8 3/4" (Top)	2'	25.0	60.0	Default Load

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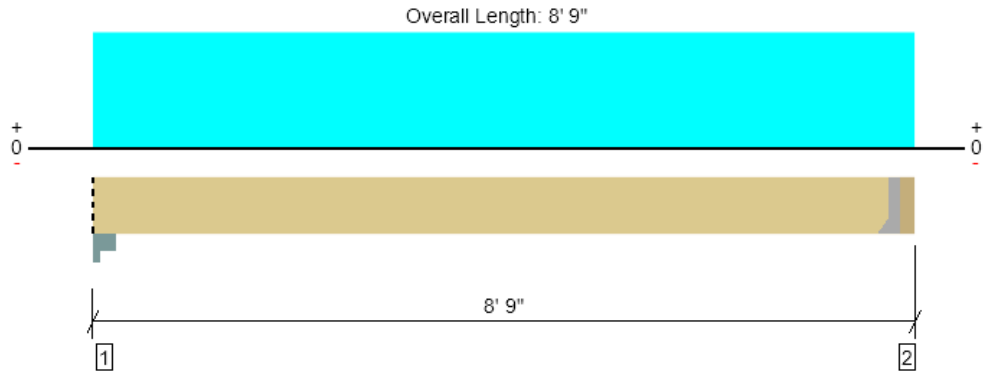
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 57

1 piece(s) 3 1/2" x 12" 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)	732 @ 8' 5 1/2"	3413 (1.50")	Passed (21%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	552 @ 7' 5 1/2"	7420	Passed (7%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	1487 @ 4' 4 3/4"	16800	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.013 @ 4' 4 3/4"	0.203	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.019 @ 4' 4 3/4"	0.406	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 8' 5 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- 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' 1 1/2".
- 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	Floor Live	Factored	
1 - Column Cap - steel	5.50"	5.50"	1.50"	265	528	792	Blocking
2 - Hanger on 12" LVL beam	3.50"	Hanger[1]	1.50"	259	523	782	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)	8' 6" o/c	
Bottom Edge (Lu)	8' 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
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)	0 to 8' 5 1/2"	N/A	10.2	--	
1 - Uniform (PSF)	0 to 8' 9" (Top)	2'	25.0	60.0	Default Load

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ForteWEB Software Operator	Job Notes
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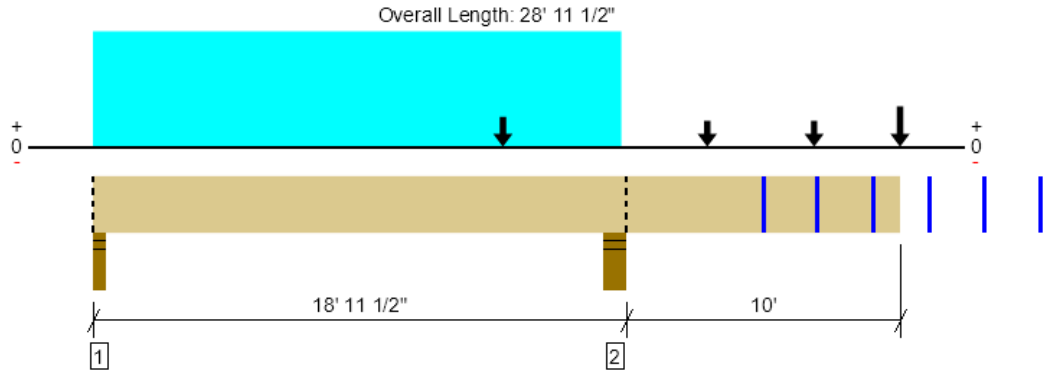
Weyerhaeuser

Main, 58

1 piece(s) 5 1/2" x 16" 24F-V8 DF Glulam

Right cantilever exceeds the maximum braced cantilever length of 7'.



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)	7485 @ 18' 8 3/4"	18906 (5.50")	Passed (40%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3669 @ 17' 2"	15547	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	4877 @ 7' 5 1/2"	46933	Passed (10%)	1.00	1.0 D + 1.0 L (Alt Spans)
Neg Moment (Ft-lbs)	-26824 @ 18' 8 3/4"	32901	Passed (82%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.772 @ 28' 11 1/2"	0.682	Failed (2L/318)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	1.118 @ 28' 11 1/2"	1.023	Failed (2L/220)	--	1.0 D + 1.0 L (Alt Spans)

Member Length : 28' 11 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- 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.
- Moment capacity over cantilever support 2 has been reduced by 25% to lessen the effects of buckling.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 14' 7 9/16".
- Critical negative moment adjusted by a volume/size factor of 0.93 that was calculated using length L = 28' 10".
- -397 lbs uplift at support located at 1 1/2". Strapping or other restraint may be required.
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	461	892/-858	1353/-397	Blocking
2 - Stud wall - DF	5.50"	5.50"	2.18"	3294	4191	7485	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)	29' o/c	
Bottom Edge (Lu)	29' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 28' 11 1/2"	N/A	21.4	--	
1 - Uniform (PSF)	0 to 18' 11 1/2" (Top)	2'	40.0	40.0	Default Load
2 - Point (lb)	22' 1/2" (Front)	N/A	259	523	Linked from: 57, Support 2
3 - Point (lb)	25' 10 1/2" (Front)	N/A	259	523	Linked from: 57, Support 2
4 - Point (lb)	28' 11 1/2" (Front)	N/A	688	1025	Linked from: 72, Support 1
5 - Point (lb)	14' 8 1/2" (Front)	N/A	413	637	Linked from: 54, Support 1

ForteWEB Software Operator

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Job Notes

Weyerhaeuser

Location Analysis	Shear (lbs)			Moment (Ft-lbs)			Deflection (in)		Comments
	Actual	Allowed	LDF	Actual	Allowed	LDF	Live Load	Total	
1 - 24' 1"	2599	15547	1.00	-10006	44751	1.00	0.361	0.513	
2 - 26'	1776	15547	1.00	-5161	44751	1.00	0.518	0.744	
3 - 28'	1733	15547	1.00	-1651	44751	1.00	0.689	0.996	
4 - 30'	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5 - 32'	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
6 - 34'	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Weyerhaeuser Notes

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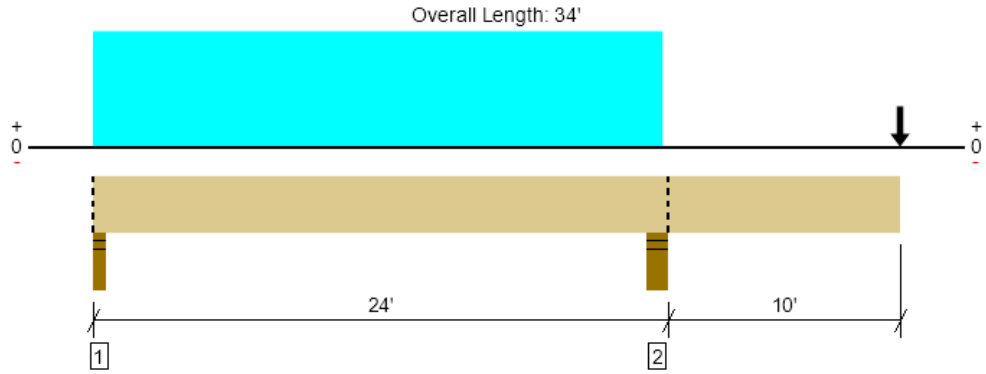
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main, 59

1 piece(s) 5 1/2" x 16" 24F-V4 DF Glulam

Right cantilever exceeds the maximum braced cantilever length of 7'.



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)	4540 @ 23' 9 1/4"	18906 (5.50")	Passed (24%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2342 @ 22' 2 1/2"	15547	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	6895 @ 9' 8"	45716	Passed (15%)	1.00	1.0 D + 1.0 L (Alt Spans)
Neg Moment (Ft-lbs)	-18645 @ 23' 9 1/4"	25074	Passed (74%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.619 @ 34'	0.682	Passed (2L/396)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.891 @ 34'	1.023	Passed (2L/276)	--	1.0 D + 1.0 L (Alt Spans)

Member Length : 34'
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Moment capacity over cantilever support 2 has been reduced by 25% to lessen the effects of buckling.
- Critical positive moment adjusted by a volume/size factor of 0.97 that was calculated using length L = 19' 1 1/16".
- Critical negative moment adjusted by a volume/size factor of 0.92 that was calculated using length L = 32' 3 13/16".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	508	956/-444	1464	Blocking
2 - Stud wall - DF	5.50"	5.50"	1.50"	2107	2433	4540	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)	34' o/c	
Bottom Edge (Lu)	34' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 34'	N/A	21.4	--	
1 - Uniform (PSF)	0 to 24' (Top)	2'	25.0	40.0	Default Load
2 - Point (lb)	34' (Front)	N/A	688	1025	Linked from: 72, Support 1

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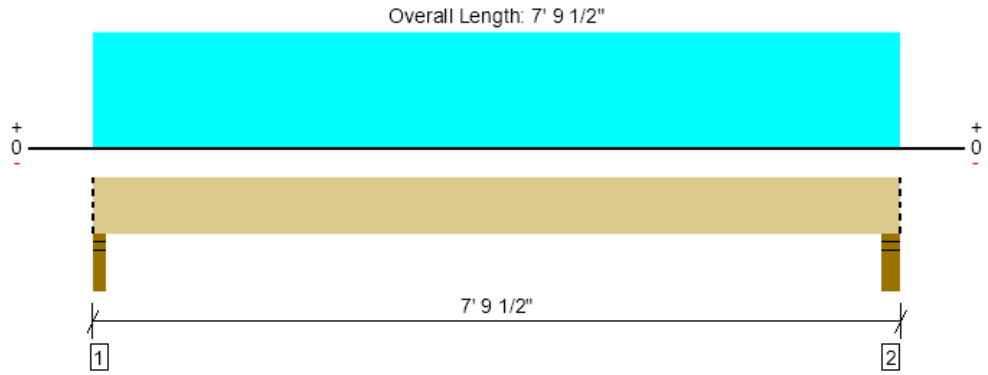
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 60

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3900 @ 1 1/2"	6563 (3.00")	Passed (59%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2764 @ 10 1/4"	4821	Passed (57%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	6380 @ 3' 10"	7115	Passed (90%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.192 @ 3' 10"	0.247	Passed (L/463)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.343 @ 3' 10"	0.371	Passed (L/259)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 7' 9 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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 - Stud wall - DF	3.00"	3.00"	1.78"	1715	1842	1071	3900	Blocking
2 - Stud wall - DF	4.50"	4.50"	1.84"	1771	1902	1106	4027	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' 10" o/c	
Bottom Edge (Lu)	7' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 9 1/2"	N/A	7.4	--	--	
1 - Uniform (PLF)	0 to 7' 9 1/2" (Front)	N/A	440.0	480.5	279.5	Linked from: Floor: Joist w/ Cant, Support 2

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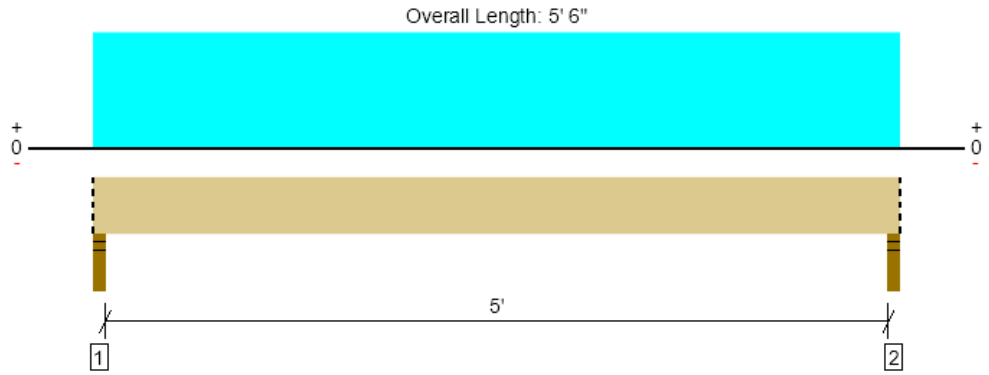
Main, 61

1 piece(s) 1 3/4" x 16" 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)	2138 @ 1 1/2"	3281 (3.00")	Passed (65%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	907 @ 1' 7"	5320	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2678 @ 2' 9"	15557	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.013 @ 2' 9"	0.175	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.022 @ 2' 9"	0.262	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 5' 6"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.95"	836	1302	2138	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.95"	836	1302	2138	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)	5' 6" o/c	
Bottom Edge (Lu)	5' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 5' 6" (Top)	11' 10"	25.0	40.0	Default Load

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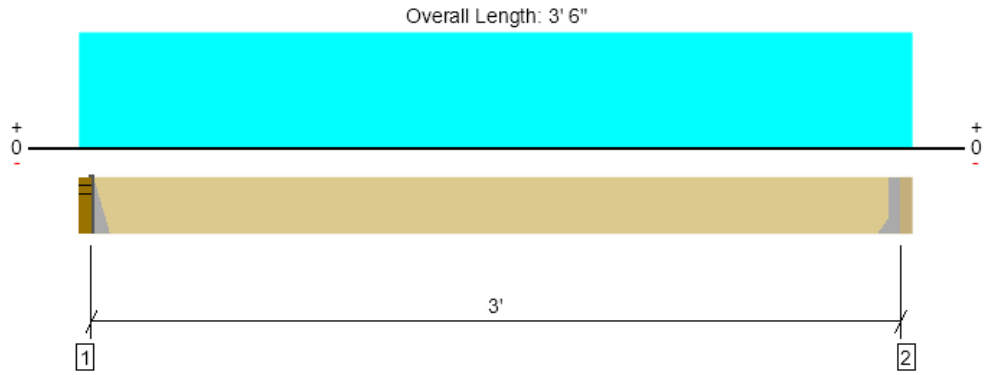
Main, 62

1 piece(s) 1 3/4" x 16" 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)	1231 @ 3"	1969 (1.50")	Passed (63%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	137 @ 1' 7"	5320	Passed (3%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	923 @ 1' 9"	15557	Passed (6%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.003 @ 1' 9"	0.100	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.005 @ 1' 9"	0.150	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 3'
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Factored	
1 - Hanger on DF studWall	3.00"	Hanger[1]	1.50"	559	875	1434	See note [1]
2 - Hanger on 16" DF beam	3.00"	Hanger[1]	1.50"	559	875	1434	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)	3' o/c	
Bottom Edge (Lu)	3' 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 - Top Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	
2 - Face Mount Hanger	IUS1.81/14	2.00"	N/A	14-10dx1.5	2-10dx1.5	

- 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 3' 3"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 3' 6" (Top)	12' 6"	25.0	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
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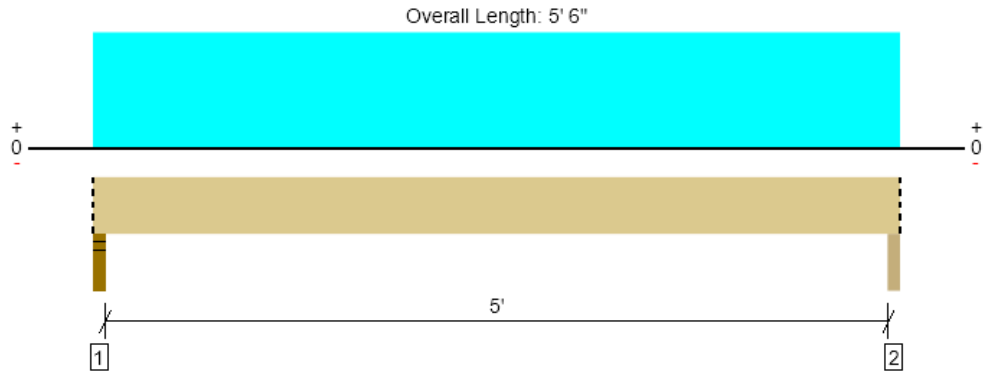
Weyerhaeuser

Main, 63

1 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1083 @ 1 1/2"	3281 (3.00")	Passed (33%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	459 @ 1' 7"	5320	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1356 @ 2' 9"	15557	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.008 @ 2' 9"	0.175	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.011 @ 2' 9"	0.262	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 5' 6"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	350	732	1083	Blocking
2 - Beam - DF	3.00"	3.00"	1.50"	350	732	1083	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)	5' 6" o/c	
Bottom Edge (Lu)	5' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 5' 6" (Top)	3' 9 1/4"	25.0	60.0	Default Load
2 - Uniform (PSF)	0 to 5' 6" (Top)	1'	25.0	40.0	Default Load

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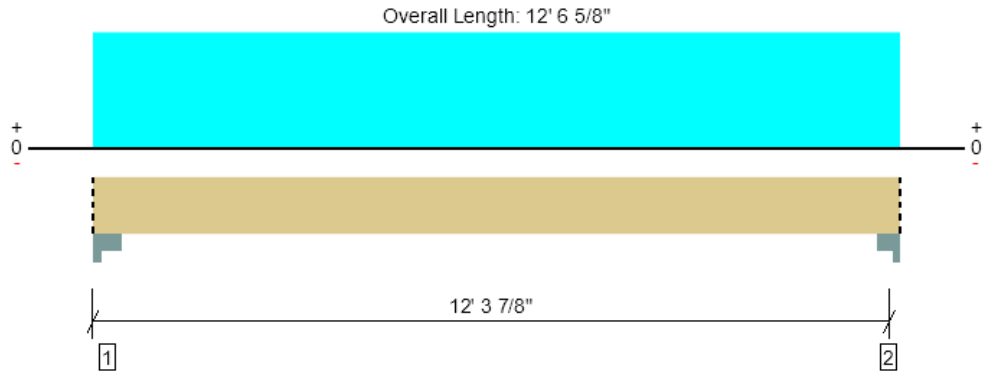
Main, 64

1 piece(s) 3 1/2" x 12" 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)	2132 @ 12' 2 5/8"	12513 (5.50")	Passed (17%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1632 @ 1' 7"	7420	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	5932 @ 6' 4 1/16"	16800	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.111 @ 6' 4 1/16"	0.392	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.163 @ 6' 4 1/16"	0.588	Passed (L/867)	--	1.0 D + 1.0 L (All Spans)

Member Length : 12' 6 5/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- 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' 9 1/8".
- 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	Floor Live	Factored	
1 - Column Cap - steel	7.00"	7.00"	1.50"	685	1490	2175	Blocking
2 - Column Cap - steel	5.50"	5.50"	1.50"	672	1460	2132	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' 7" o/c	
Bottom Edge (Lu)	12' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 12' 6 5/8"	N/A	10.2	--	
1 - Uniform (PSF)	0 to 12' 6 5/8" (Top)	3' 11"	25.0	60.0	Default Load

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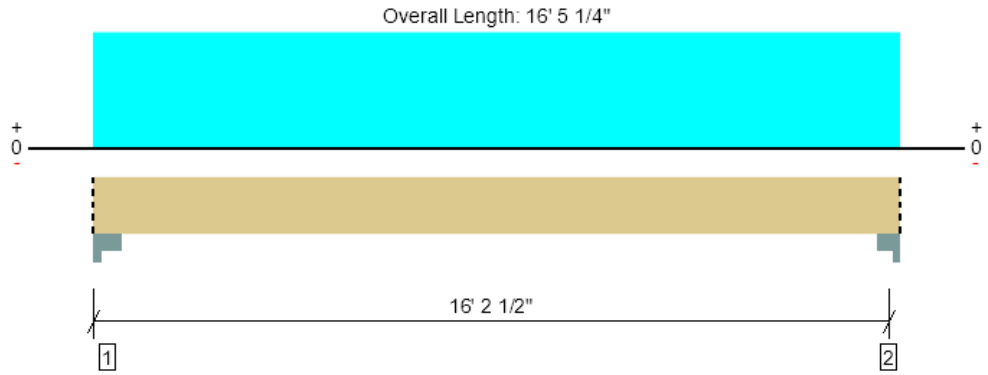
ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 65

1 piece(s) 5 1/2" x 12" 24F-V4 DF Glulam



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2846 @ 16' 1 1/4"	19663 (5.50")	Passed (14%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2337 @ 1' 7"	11660	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	10678 @ 8' 3 3/8"	26400	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.222 @ 8' 3 3/8"	0.522	Passed (L/845)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.330 @ 8' 3 3/8"	0.782	Passed (L/569)	--	1.0 D + 1.0 L (All Spans)

Member Length : 16' 5 1/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- 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 = 15' 7 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	Floor Live	Factored	
1 - Column Cap - steel	7.00"	7.00"	1.50"	944	1946	2890	Blocking
2 - Column Cap - steel	5.50"	5.50"	1.50"	929	1917	2846	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)	16' 5" o/c	
Bottom Edge (Lu)	16' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 16' 5 1/4"	N/A	16.0	--	
1 - Uniform (PSF)	0 to 16' 5 1/4" (Top)	3' 11"	25.0	60.0	Default Load

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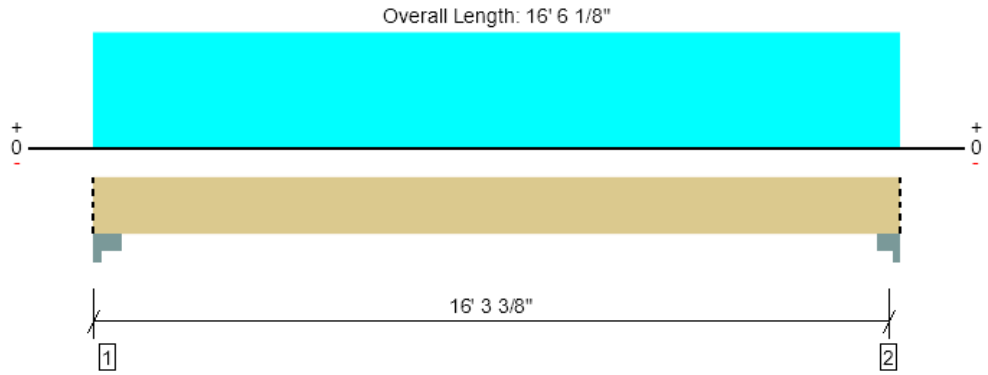
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 66

1 piece(s) 5 1/2" x 12" 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)	5702 @ 16' 2 1/8"	19663 (5.50")	Passed (29%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4687 @ 1' 7"	11660	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	21497 @ 8' 3 13/16"	26400	Passed (81%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.462 @ 8' 3 13/16"	0.524	Passed (L/408)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.671 @ 8' 3 13/16"	0.786	Passed (L/281)	--	1.0 D + 1.0 L (All Spans)

Member Length : 16' 6 1/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- 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 = 15' 8 5/8".
- 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	Floor Live	Factored	
1 - Column Cap - steel	7.00"	7.00"	1.62"	1797	3993	5789	Blocking
2 - Column Cap - steel	5.50"	5.50"	1.60"	1770	3933	5702	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)	16' 6" o/c	
Bottom Edge (Lu)	16' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 16' 6 1/8"	N/A	16.0	--	
1 - Uniform (PSF)	0 to 16' 6 1/8" (Top)	8'	25.0	60.0	Default Load

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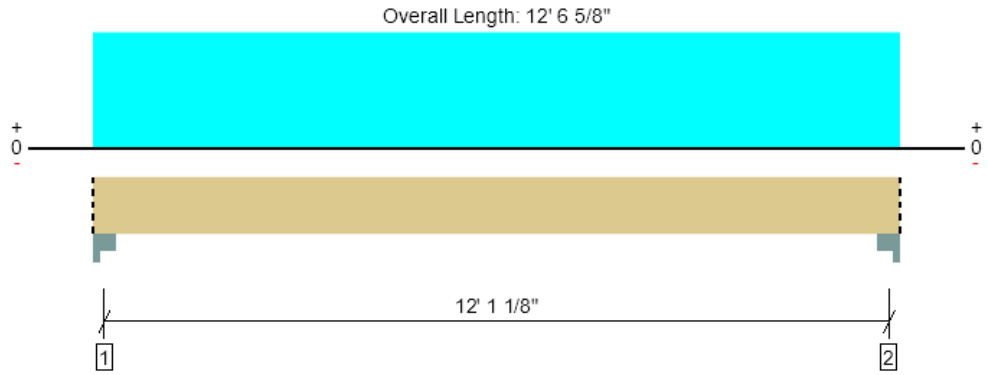
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 67

1 piece(s) 3 1/2" x 12" 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)	2153 @ 4"	12513 (5.50")	Passed (17%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1653 @ 1' 5 1/2"	7420	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	6059 @ 6' 3 5/16"	16800	Passed (36%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.116 @ 6' 3 5/16"	0.396	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.170 @ 6' 3 5/16"	0.594	Passed (L/840)	--	1.0 D + 1.0 L (All Spans)

Member Length : 12' 6 5/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- 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' 10 5/8".
- 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	Floor Live	Factored	
1 - Column Cap - steel	5.50"	5.50"	1.50"	679	1475	2153	Blocking
2 - Column Cap - steel	5.50"	5.50"	1.50"	679	1475	2153	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' 7" o/c	
Bottom Edge (Lu)	12' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 12' 6 5/8"	N/A	10.2	--	
1 - Uniform (PSF)	0 to 12' 6 5/8" (Top)	3' 11"	25.0	60.0	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
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

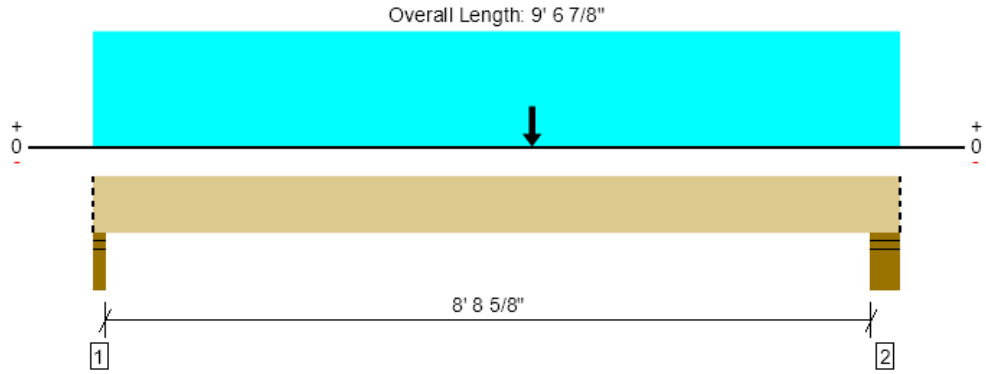
Weyerhaeuser

Main, 68

3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL

An excessive uplift of -3010 lbs at support located at 1 1/2" failed this product.

An excessive uplift of -4180 lbs at support located at 9' 1 1/8" failed this product.



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)	6687 @ 1 1/2"	9844 (3.00")	Passed (68%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6451 @ 7' 7 5/8"	25536	Passed (25%)	1.60	1.0 D + 0.7 E (All Spans)
Moment (Ft-lbs)	24354 @ 5' 2 1/2"	74674	Passed (33%)	1.60	1.0 D + 0.7 E (All Spans)
Live Load Defl. (in)	0.030 @ 4' 7 5/16"	0.299	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.051 @ 4' 7 5/16"	0.448	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 9' 6 7/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Seismic	Factored	
1 - Stud wall - DF	3.00"	3.00"	2.04"	1744	2535	5794/-5794	6687/-3010	Blocking
2 - Stud wall - DF	7.25"	7.25"	2.41"	1878	2730	7581/-7581	7905/-4180	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' 7" o/c	
Bottom Edge (Lu)	9' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 9' 6 7/8"	N/A	24.5	--	--	
1 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	3' 11"	25.0	60.0	-	Default Load
2 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	1'	25.0	40.0	-	Default Load
3 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	9'	12.0	-	-	Default Load
4 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	3' 11"	25.0	60.0	-	Default Load
5 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	1'	25.0	40.0	-	Default Load
6 - Point (lb)	5' 2 1/2" (Front)	N/A	-	-	13375	

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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
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

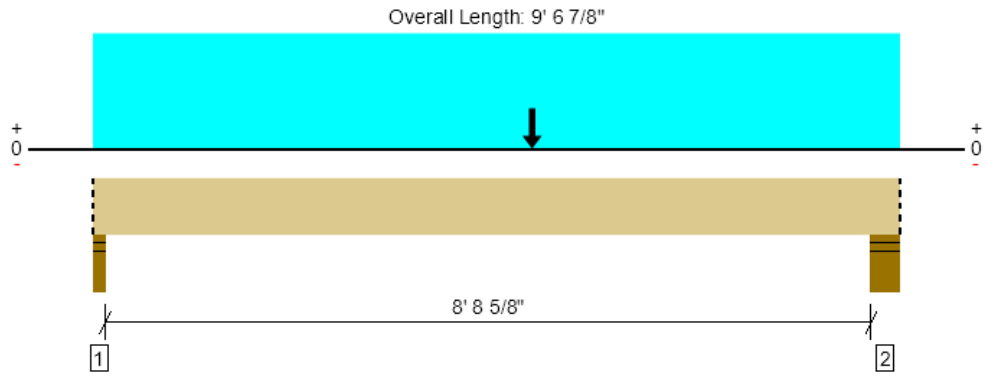
Main, 68 (w_overstrength)

3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL

Support 1 failed reaction check due to insufficient bearing capacity.

An excessive uplift of -9094 lbs at support located at 1 1/2" failed this product.

An excessive uplift of -12140 lbs at support located at 9' 1 1/8" failed this product.



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)	11884 @ 1 1/2"	9844 (3.00")	Failed (121%)	--	1.0 D + 0.7 E (All Spans)
Shear (lbs)	14411 @ 7' 7 5/8"	25536	Passed (56%)	1.60	1.0 D + 0.7 E (All Spans)
Moment (Ft-lbs)	55281 @ 5' 2 1/2"	74674	Passed (74%)	1.60	1.0 D + 0.7 E (All Spans)
Live Load Defl. (in)	0.030 @ 4' 7 5/16"	0.299	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.051 @ 4' 7 5/16"	0.448	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 9' 6 7/8"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Seismic	Factored	
1 - Stud wall - DF	3.00"	3.00"	3.62"	1744	2535	14486/-14486	11884/-9094	Blocking
2 - Stud wall - DF	7.25"	7.25"	4.62"	1878	2730	18952/-18952	15144/-12140	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)	5' 7" o/c	
Bottom Edge (Lu)	6' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 9' 6 7/8"	N/A	24.5	--	--	
1 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	3' 11"	25.0	60.0	-	Default Load
2 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	1'	25.0	40.0	-	Default Load
3 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	9'	12.0	-	-	Default Load
4 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	3' 11"	25.0	60.0	-	Default Load
5 - Uniform (PSF)	0 to 9' 6 7/8" (Top)	1'	25.0	40.0	-	Default Load
6 - Point (lb)	5' 2 1/2" (Front)	N/A	-	-	33438	

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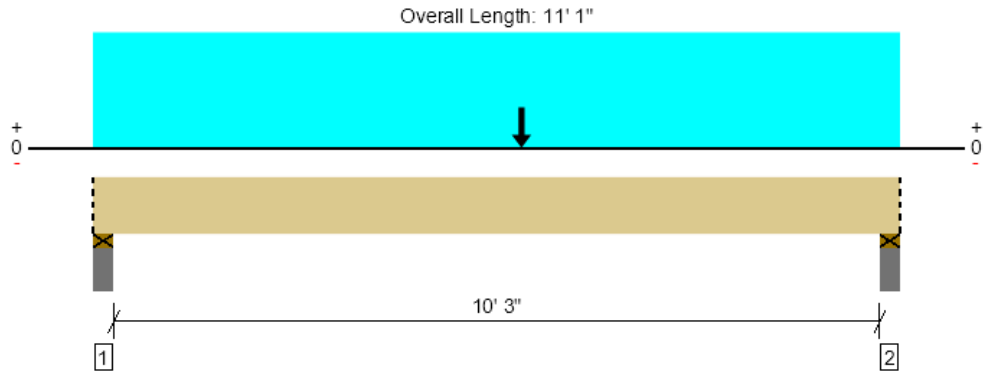
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 69

3 piece(s) 1 3/4" x 16" 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)	14475 @ 10' 9 1/2"	16406 (5.00")	Passed (88%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	8500 @ 1' 9"	18354	Passed (46%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	30896 @ 5' 6 1/2"	53672	Passed (58%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.092 @ 5' 6 7/16"	0.350	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.213 @ 5' 6 7/16"	0.525	Passed (L/590)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 11' 1"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Seismic	Factored	
1 - Plate on concrete - DF	5.00"	5.00"	4.33"	7056	3394	3763	3427/-3427	14223	Blocking
2 - Plate on concrete - DF	5.00"	5.00"	4.41"	7056	3394	3763	3907/-3907	14475	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)	8' 2" o/c	
Bottom Edge (Lu)	11' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 11' 1"	N/A	24.5	--	--	--	
1 - Uniform (PSF)	0 to 11' 1" (Top)	7' 7 1/2"	25.0	40.0	-	-	Default Load
2 - Point (lb)	5' 10 5/8" (Front)	N/A	-	-	-	7334	
3 - Uniform (PSF)	0 to 11' 1" (Top)	7' 8 1/4"	25.0	40.0	-	-	Default Load
4 - Uniform (PSF)	0 to 11' 1" (Top)	22' 7 5/8"	25.0	-	30.0	-	Default Load
5 - Uniform (PSF)	0 to 11' 1" (Top)	20'	15.0	-	-	-	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
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

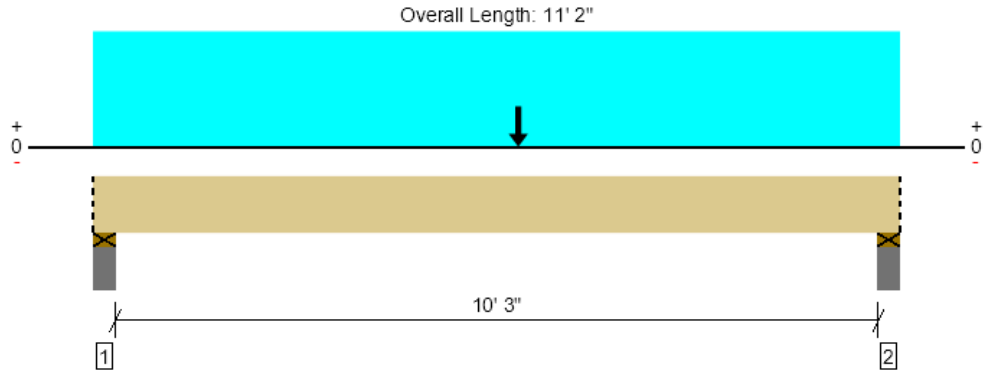
Weyerhaeuser

Main, 69 (w_overstrength)

3 piece(s) 1 3/4" x 16" 2.0E Microllam® LVL

An excessive uplift of -1783 lbs at support located at 4" failed this product.

An excessive uplift of -2521 lbs at support located at 10' 10" failed this product.



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)	17607 @ 10' 10"	18047 (5.50")	Passed (98%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	13590 @ 9' 4 1/2"	25536	Passed (53%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	55978 @ 5' 10 5/8"	74674	Passed (75%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.092 @ 5' 6 15/16"	0.350	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.213 @ 5' 6 15/16"	0.525	Passed (L/590)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 11' 2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Seismic	Factored	
1 - Plate on concrete - DF	5.50"	5.50"	5.20"	7109	3420	3791	8640/-8640	17053/-1783	Blocking
2 - Plate on concrete - DF	5.50"	5.50"	5.37"	7109	3420	3791	9695/-9695	17607/-2521	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)	5' 6" o/c	
Bottom Edge (Lu)	11' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 11' 2"	N/A	24.5	--	--	--	
1 - Uniform (PSF)	0 to 11' 2" (Top)	7' 7 1/2"	25.0	40.0	-	-	Default Load
2 - Point (lb)	5' 10 5/8" (Front)	N/A	-	-	-	18335	
3 - Uniform (PSF)	0 to 11' 2" (Top)	7' 8 1/4"	25.0	40.0	-	-	Default Load
4 - Uniform (PSF)	0 to 11' 2" (Top)	22' 7 5/8"	25.0	-	30.0	-	Default Load
5 - Uniform (PSF)	0 to 11' 2" (Top)	20'	15.0	-	-	-	Default Load

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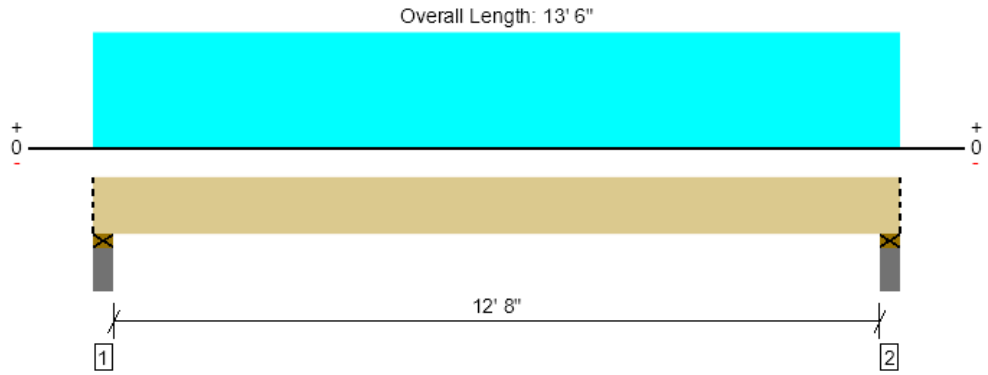
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 70

3 piece(s) 1 3/4" x 16" 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)	15133 @ 3 1/2"	16406 (5.00")	Passed (92%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	11209 @ 1' 9"	18354	Passed (61%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	46754 @ 6' 9"	53672	Passed (87%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.197 @ 6' 9"	0.431	Passed (L/787)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.456 @ 6' 9"	0.646	Passed (L/340)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 13' 6"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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 - Plate on concrete - DF	5.00"	5.00"	4.61"	8594	4134	4584	15133	Blocking
2 - Plate on concrete - DF	5.00"	5.00"	4.61"	8594	4134	4584	15133	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)	5' 8" o/c	
Bottom Edge (Lu)	13' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 6"	N/A	24.5	--	--	
1 - Uniform (PSF)	0 to 13' 6" (Top)	7' 7 1/2"	25.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 13' 6" (Top)	7' 8 1/4"	25.0	40.0	-	Default Load
3 - Uniform (PSF)	0 to 13' 6" (Top)	22' 7 5/8"	25.0	-	30.0	Default Load
4 - Uniform (PSF)	0 to 13' 6" (Top)	20'	15.0	-	-	Default Load

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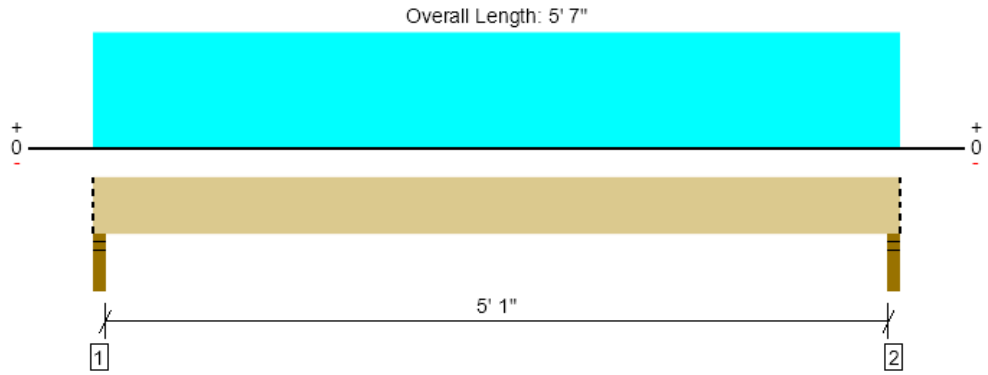
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 71

2 piece(s) 1 3/4" x 16" 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)	3764 @ 1 1/2"	6563 (3.00")	Passed (57%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1629 @ 1' 7"	10640	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4794 @ 2' 9 1/2"	31114	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.007 @ 2' 9 1/2"	0.178	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.020 @ 2' 9 1/2"	0.267	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 5' 7"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.72"	2471	1293	3764	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.72"	2471	1293	3764	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)	5' 7" o/c	
Bottom Edge (Lu)	5' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 5' 7"	N/A	16.3	--	
1 - Uniform (PSF)	0 to 5' 7" (Top)	11' 7"	75.0	40.0	Default Load

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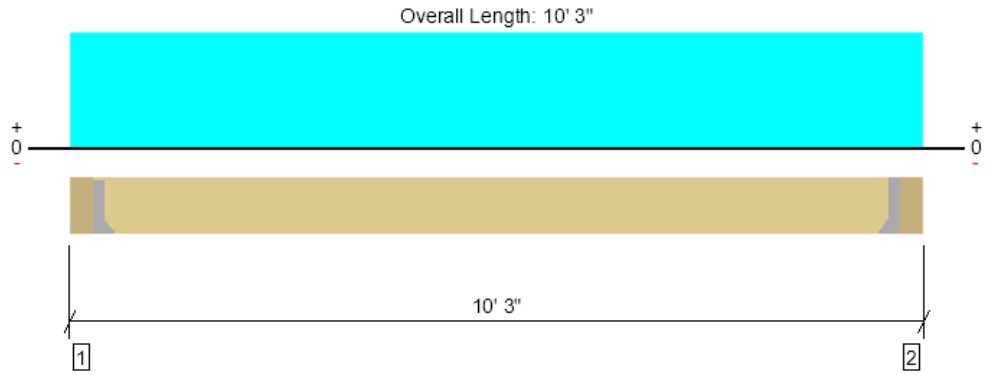
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main, 72

1 piece(s) 3 1/2" x 12" 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)	1564 @ 5 1/2"	3413 (1.50")	Passed (46%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1229 @ 1' 5 1/2"	7420	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	3650 @ 5' 1 1/2"	16800	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.038 @ 5' 1 1/2"	0.233	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.063 @ 5' 1 1/2"	0.467	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 9' 4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- 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' 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	Floor Live	Factored	
1 - Hanger on 12" DF beam	5.50"	Hanger[1]	1.50"	688	1025	1713	See note [1]
2 - Hanger on 12" DF beam	5.50"	Hanger[1]	1.50"	688	1025	1713	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)	9' 4" o/c	
Bottom Edge (Lu)	9' 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	8-16d	6-16d	
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-16d	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)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	5 1/2" to 9' 9 1/2"	N/A	10.2	--	
1 - Uniform (PSF)	0 to 10' 3" (Top)	5'	25.0	40.0	Default Load

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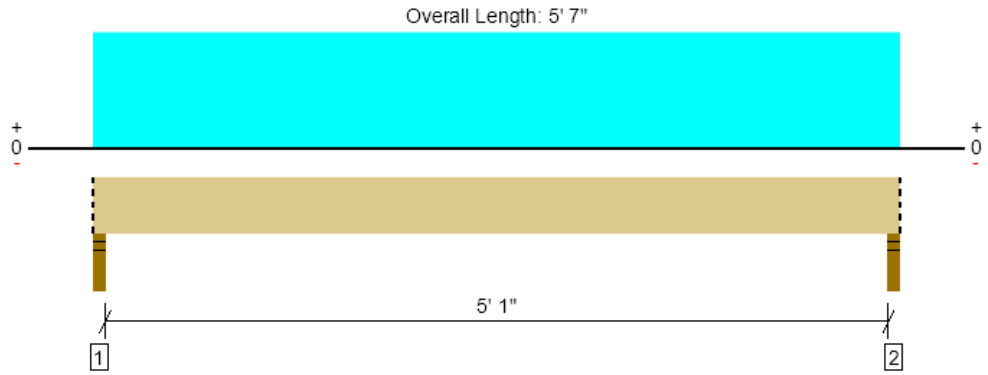
ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, 73

2 piece(s) 1 3/4" x 16" 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)	6251 @ 1 1/2"	6563 (3.00")	Passed (95%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2706 @ 1' 7"	10640	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	7962 @ 2' 9 1/2"	31114	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.017 @ 2' 9 1/2"	0.178	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.033 @ 2' 9 1/2"	0.267	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 5' 7"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
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	Factored	
1 - Stud wall - DF	3.00"	3.00"	2.86"	3078	3173	6251	Blocking
2 - Stud wall - DF	3.00"	3.00"	2.86"	3078	3173	6251	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)	5' 7" o/c	
Bottom Edge (Lu)	5' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 5' 7"	N/A	16.3	--	
1 - Uniform (PSF)	0 to 5' 7" (Top)	5' 5"	75.0	40.0	Default Load
2 - Uniform (PSF)	0 to 5' 7" (Front)	2'	15.0	60.0	
3 - Uniform (PSF)	0 to 5' 7" (Front)	20'	25.0	40.0	
4 - Uniform (PSF)	0 to 5' 7" (Front)	10'	15.0	-	

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Main, 33+34
1 piece(s) 6 x 6 DF No.1

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	22	50	Passed (44%)	--	--
Compression (lbs)	7149	20918	Passed (34%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	7149	898425	Passed (1%)	--	1.0 D + 1.0 L
Bending/Compression	0.39	1	Passed (39%)	1.00	1.0 D + 1.0 L

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.

Supports	Type	Material
Base	Beam	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2015
Design Methodology : ASD

Vertical Loads	Dead (0.90)	Floor Live (1.00)	Comments
1 - Point (lb)	1441	2880	Linked from: 33, Support 2
2 - Point (lb)	941	1887	Linked from: 34, Support 1

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

Main, 33+34+66+63
1 piece(s) 6 x 6 DF No.1

Post Height: 10'

Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	22	50	Passed (44%)	--	--
Compression (lbs)	14021	20918	Passed (67%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	14021	898425	Passed (2%)	--	1.0 D + 1.0 L
Bending/Compression	N/A	1	Passed (N/A)	--	N/A

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.

Supports	Type	Material
Base	Beam	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post
Building Code : IBC 2015
Design Methodology : ASD

Vertical Loads	Dead (0.90)	Floor Live (1.00)	Comments
1 - Point (lb)	1441	2880	Linked from: 33, Support 2
2 - Point (lb)	350	732	Linked from: 63, Support 1
3 - Point (lb)	1797	3993	Linked from: 66, Support 1
4 - Point (lb)	941	1887	Linked from: 34, Support 1

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CANTILEVER RETAINING WALL EXTERNAL STABILITY

limitations: uses Rankine coefficients for noncohesive soils, external moment at top of wall does not contribute to restoring moment (overturning only), no deflection or service load checks, soil on low side of wall does not brace wall against overturning (sliding only)

reference: Nilson & Winter, Design of Concrete Structures, 11th Edition, page 680

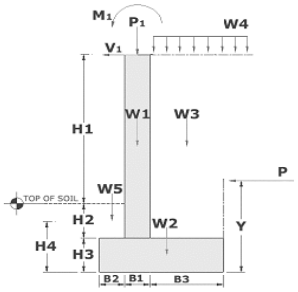
SOIL DATA

w	120	(pcf)	soil unit weight
phi	35	(deg)	soil internal angle of friction
del	0	(deg)	surface angle incline
	0.35		coeff. friction w/Concrete
	0.819		cosine(phi)
	1.000		cosine(del)
Ca	0.292	*35 psf*	coeff. of active pressure
Cp	2.917	*350 psf*	coeff. of passive pressure

Coeff. Friction			
Unit Weight	Int Friction	w. Conc	Soil
110-120	33-40	0.5-0.6	Sand or gravel, no fines
120-130	25-35	0.4-0.5	Sand or gravel, w/ fines
110-120	23-30	0.3-0.4	Silty sand, high clay
100-120	25-35	0.2-0.4	Medium or stiff clay
90-110	20-25	0.2-0.3	Soft clay, silt

WALL GEOMETRY

H1	8.5	(ft)	soil retained
H2	0	(ft)	soil depth above toe
H3	0.6666667	(ft)	footing thickness
H4	0.6666667	(ft)	passive pressure soil depth
B1	0.6666667	(ft)	wall width
B2	8	(ft)	toe width
B3	0	(ft)	heel width
H	9.1666667	(ft)	total height
B	8.6666667	(ft)	total base
	150	(pcf)	concrete unit weight



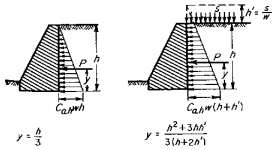
EXTERNAL LOADS

$P_{applied}$	0	(lb/ft)
$V_{applied}$	0	(lb/ft)
$M_{applied}$	0	(lb-ft / ft)
Surcharge	0	(psf)

LOAD CALCULATIONS

lateral soil force and overturning moment

H_{prime}	0.00	(ft)	converted surcharge
Y	3.06	(ft)	distance to soil load resultant
P	1470	(lbs)	soil load resultant
	4500	(lb-ft)	Mo, soil + surcharge
	0	(lb-ft)	Mo, external load
	4,500	(lb-ft)	total overturning Moment

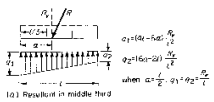


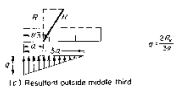
$y = \frac{h}{3}$ $\quad P = \frac{1}{2} C_a h w h^2$

$y = \frac{h^2+3hh'}{3(h+2h')}$ $\quad P = \frac{1}{2} C_a h w h (h+2h')$

wall restoring forces

component	weight (#)	arm (ft)	moment (#-ft)
w1 (concrete)	850	8.33	7083
w2 (concrete)	867	4.33	3756
w3 (heel soil)	0	8.67	0
w4 (surcharge)	0	8.67	0
w5 (toe soil)	0	4.00	0
P applied	0	8.33	0
vert. force	1,717	moment	10,839



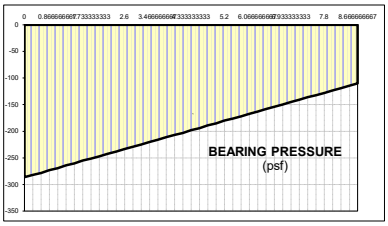


lateral sliding resistance

78	(lb)	passive pressure sliding resistance
601	(lb)	soil friction force
679	(lb)	total sliding resistance

STABILITY FACTOR OF SAFETY CHECKS

	1		F.S. overturning
	0.01		F.S. sliding
overturning	2.41	OK	Mr / Mo
sliding	0.46	OK	(PP+F)/(Ph+V)



SOIL BEARING

a	3.69	(ft)	distance to resultant
	2.89' to 5.78'		middle third of footing
q1	286	(psf)	bearing pressure @ toe
q2	110	(psf)	bearing pressure @ heel

FACTORED (1.6) STEM LOAD FORCES

8.5	(ft)	H1 + H2
2.83	(ft)	line of action (above base)
1264	(lbs)	P (arm only)
1264	(lbs)	Ph (arm only)
5.7	(kip-ft)	Mu (arm moment)

FACTORED (1.6) FOOTING LOADS

12.3	(kip-ft)	Mu @ Toe (Bot Reinf)
0.0	(kip-ft)	Mu @ Heel (Bot Reinf)
2.71	(kip)	Vu @ Toe
0.24	(kip)	Vu @ Heel

Footing			**Wall**				
ØVc	5,400	8" thick	ØVc	5,400	8" thick	5,400	8" thick
As	0.88	#6 @ 6" oc	As	0.44	#6 @ 12" oc	0.31	#5 @ 12" oc
a	2.0706		a	1.0353		0.7294	
ØMn	19.66	k-ft	ØMn	11.85	k-ft	8.56	k-ft
	1.86	6-#5		0.004583	Reinf. Ratio	0.003229167	Reinf. Ratio
	0.0022356	Reinf. Ratio					
	0.0091667	Reinf. Ratio					

LRFD soil 198 psf @ Wall interface 458 'psf @ Toe

198 psf @ Wall interface 176 'psf @ Heel

1581 # in Toe @ 4 ft from Wall
1126 # in Toe @ 5.333333333 ft from Wall

238 # in Heel 0 ft from Wall

Table 24.4.3.2—Minimum ratios of deformed shrinkage and temperature reinforcement area to gross concrete area

Reinforcement type	f_y, psi	Minimum reinforcement ratio	
Deformed bars	< 60,000	0.0020	
Deformed bars or welded wire reinforcement	≥ 60,000	Greater of:	$\frac{0.0018 \times 60{,}000}{f_y}$
			0.0014

Table 11.6.1—Minimum reinforcement for walls with in-plane $V_u \le 0.5\phi V_c$

Wall type	Type of nonprestressed reinforcement	Bar/wire size	f_y, psi	Minimum longitudinal[B], ρ_l	Minimum transverse, ρ_t
Cast-in-place	Deformed bars	≤ No. 5	≥ 60,000	0.0012	0.0020
			< 60,000	0.0015	0.0025
		> No. 5	Any	0.0015	0.0025
	Welded-wire reinforcement	≤ W31 or D31	Any	0.0012	0.0020
Precast[C]	Deformed bars or welded-wire reinforcement	Any	Any	0.0010	0.0010

[B] Prestressed walls with an average effective compressive stress of at least 225 psi need not meet the requirement for minimum longitudinal reinforcement ρ_l.

[C] In one-way precast, prestressed walls not wider than 12 ft and not mechanically connected to cause restraint in the transverse direction, the minimum reinforcement requirement in the direction normal to the flexural reinforcement need not be satisfied.

CANTILEVER RETAINING WALL EXTERNAL STABILITY

limitations: uses Rankine coefficients for noncohesive soils, external moment at top of wall does not contribute to restoring moment (overturning only), no deflection or service load checks, soil on low side of wall does not brace wall against overturning (sliding only)

reference: Nilson & Winter, Design of Concrete Structures, 11th Edition, page 680

file author: S. Frech last modified: 4/25/2002

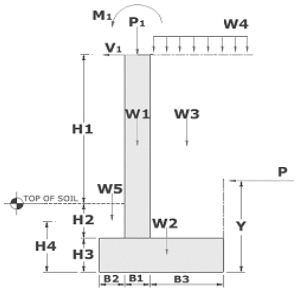
SOIL DATA

w	120	(pcf)	soil unit weight
phi	35	(deg)	soil internal angle of friction
del	0	(deg)	surface angle incline
	0.35		coeff. friction w/Concrete
	0.819		cosine(phi)
	1.000		cosine(del)
Ca	0.375	*45 psf*	coeff. of active pressure
Cp	2.917	*350 psf*	coeff. of passive pressure

Coeff. Friction			
Unit Weight	Int Friction	w. Conc	Soil
110-120	33-40	0.5-0.6	Sand or gravel, no fines
120-130	25-35	0.4-0.5	Sand or gravel, w/ fines
110-120	23-30	0.3-0.4	Silty sand, high clay
100-120	25-35	0.2-0.4	Medium or stiff clay
90-110	20-25	0.2-0.3	Soft clay, silt

WALL GEOMETRY

H1	8.5	(ft)	soil retained
H2	0	(ft)	soil depth above toe
H3	0.6666667	(ft)	footing thickness
H4	0.6666667	(ft)	passive pressure soil depth
B1	0.6666667	(ft)	wall width
B2	8	(ft)	toe width
B3	0	(ft)	heel width
H	9.1666667	(ft)	total height
B	8.6666667	(ft)	total base
	150	(pcf)	concrete unit weight



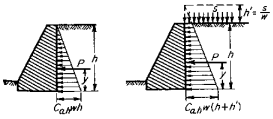
EXTERNAL LOADS

$P_{applied}$	653.75	(lb/ft)
$V_{applied}$	404.6	(lb/ft)
$M_{applied}$	1719.55	(lb-ft / ft)
Surcharge	0	(psf)

LOAD CALCULATIONS

lateral soil force and overturning moment

H_{prime}	0.00	(ft)	converted surcharge
Y	3.06	(ft)	distance to soil load resultant
P	1891	(lbs)	soil load resultant
	5790	(lb-ft)	Mo, soil + surcharge
	1719.55	(lb-ft)	Mo, external load
	7,510	(lb-ft)	total overturning Moment

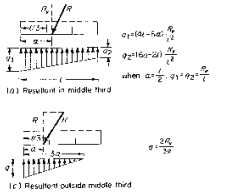


wall restoring forces

component	weight (#)	arm (ft)	moment (#-ft)
w1 (concrete)	850	8.33	7083
w2 (concrete)	867	4.33	3756
w3 (heel soil)	0	8.67	0
w4 (surcharge)	0	8.67	0
w5 (toe soil)	0	4.00	0
P applied	653.75	8.33	5448
vert. force	2,370	moment	16,287

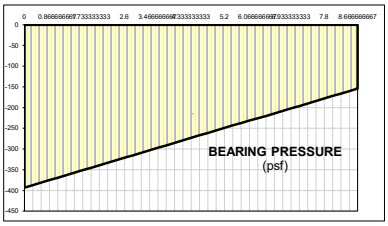
lateral sliding resistance

78	(lb)	passive pressure sliding resistance
830	(lb)	soil friction force
908	(lb)	total sliding resistance



STABILITY FACTOR OF SAFETY CHECKS

	1		F.S. overturning
	0.01		F.S. sliding
overturning	2.17	OK	Mr / Mo
sliding	0.37	OK	(PP+F)/(Ph+V)



SOIL BEARING

a	3.70	(ft)	distance to resultant
	2.89' to 5.78'		middle third of footing
q1	393	(psf)	bearing pressure @ toe
q2	154	(psf)	bearing pressure @ heel

FACTORED (1.6) STEM LOAD FORCES

8.5	(ft)	H1 + H2
2.83	(ft)	line of action (above base)
1626	(lbs)	P (arm only)
1626	(lbs)	Ph (arm only)
9.8	(kip-ft)	Mu (arm moment)

FACTORED (1.6) FOOTING LOADS

17.0	(kip-ft)	Mu @ Toe (Bot Reinf)
0.0	(kip-ft)	Mu @ Heel (Bot Reinf)
3.74	(kip)	Vu @ Toe
0.34	(kip)	Vu @ Heel

Footing			**Wall**				
ØVc	5,400	8" thick	ØVc	5,400	8" thick	5,400	8" thick
As	0.88	#6 @ 6" oc	As	0.44	#6 @ 12" oc	0.31	#5 @ 12" oc
a	2.0706		a	1.0353		0.7294	
ØMn	19.66	k-ft	ØMn	11.85	k-ft	8.56	k-ft
	1.86	6-#5		0.004583	Reinf. Ratio	0.003229167	Reinf. Ratio
	0.0022356	Reinf. Ratio					
	0.0091667	Reinf. Ratio					

LRFD soil 276 psf @ Wall interface 276 psf @ Wall interface
629 'psf @ Toe 246 'psf @ Heel

2207 # in Toe @ 4 ft from Wall 336 # in Heel 0 ft from Wall
1530 # in Toe @ 5.333333333 ft from Wall

Table 24.4.3.2—Minimum ratios of deformed shrinkage and temperature reinforcement area to gross concrete area

Reinforcement type	f_y, psi	Minimum reinforcement ratio	
Deformed bars	< 60,000	0.0020	
Deformed bars or welded wire reinforcement	≥ 60,000	Greater of:	$\frac{0.0018 \times 60{,}000}{f_y}$
			0.0014

Table 11.6.1—Minimum reinforcement for walls with in-plane $V_u \le 0.5\phi V_c$

Wall type	Type of nonprestressed reinforcement	Bar/wire size	f_y, psi	Minimum longitudinal[1], ρ_l	Minimum transverse, ρ_t
Cast-in-place	Deformed bars	≤ No. 5	≥ 60,000	0.0012	0.0020
			< 60,000	0.0015	0.0025
		> No. 5	Any	0.0015	0.0025
	Welded-wire reinforcement	≤ W31 or D31	Any	0.0012	0.0020
Precast[2]	Deformed bars or welded-wire reinforcement	Any	Any	0.0010	0.0010

[1]Prestressed walls with an average effective compressive stress of at least 225 psi need not meet the requirement for minimum longitudinal reinforcement ρ_l.

[2]In one-way precast, prestressed walls not wider than 12 ft and not mechanically connected to cause restraint in the transverse direction, the minimum reinforcement requirement in the direction normal to the flexural reinforcement need not be satisfied.