STRUCTURAL CALCULATIONS

Wu-Chang Residence
2956 72nd Ave SE
Mercer Island, WA

Client: CenterLine Architects

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206-427-7233

ATLAS CONSULTING ENGINEERS INC.

Project:	2956 72nd Ave SE (Mercer Island)	By:	JDA
Proj No:	248-2024	Date:	03/05/2024

Summary

The project consists of a new two story 2800 SF (+) single family residence (SFR) located in Mercer Island. The upper floor will include living space and a 190 SF (+) covered deck at the north elevation, while the main floor will encompass entertaining and gathering spaces. The two floors will be joined by central staircase located at the south. An existing 1100 SF (+) garage on the lot will be completely separate from the new SFR and not have impact on the project.

The SFR will be comprised of the following: reinforced concrete strip and spread footings; reinforced concrete foundation walls; wood framed crawl-space main floor supported on exterior foundation walls and interior posts and beams; wood framed upper floor supported on interior and exterior wood framed load bearing walls, beams, and posts; and connector plate wood trusses framing the roofs. The lateral system will consist of wood sheathed diaphragms and shear walls (tongue & groove plywood floor sheathing, plywood roof and plywood wall sheathing), and Simpson StrongTie holdowns.

See page 2 for lateral design. Site seismic variables are shown on pages 3 - 4; shearwall lengths shown on page 5 - 6; wind areas shown on page 7; and wind load derivation shown on pages 8 - 14. Seismic and wind loads were determined using ASCE 7-16 procedures. As shown on page 2, shearwalls with 10d nails spaced at 6" o.c. (SW-6), 4" o.c. (SW-4), and 3" o.c. (SW-3) 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 page 2. 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. Use strapped shearwalls to minimize amount and magnitude of holdowns; see pages 15 - 27. Extend straps above and below opening a sufficient distance to ensure strap has capacity and shearwall capacity is not exceeded.

Gravity system was designed for 25 psf roof snow load, 15 psf roof dead load (20 psf at attic trusses), 40 psf floor live load, 60 psf deck load, and 25 psf floor dead load. See pages 28-30 for framing key; and pages 31 - 55 for member designs. Uplift for each member considering 0.6D+0.6W will be resisted by straps at headers/beams; and H2.5a hurricane ties at rafters and trusses.

Design new footings for a 1500 psf bearing pressure, and provide minimum reinforcing in footings and walls per ACI.

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R	6.5	*ASCE 7-16 Table 12.2-1*			
Ω_o	2.5				
C_d	4				
Soil Class	CD		D	C	CD
V	**18.0**	= CsW – ASCE 7-22 (12.8-1)			Kips
C_s	**0.180**		0.174	0.178	0.180
	-	= S_{DS} / (R/I_e) – ASCE 7-22 (12.8-2) Method 1	-	-	-
	0.180	= S_{D1} / (R/I_e) – ASCE 7-22 (12.8-2) Method 2	0.174	0.178	0.180
	0.372	< S_{D1} / T(R/I_e) – if T<T_L, ASCE 7-22 (12.8-4)	0.454	0.296	0.372
	-	< $S_{D1}T_L$ / T^2(R/I_e) – if T>T_L, ASCE 7-22 (12.8-5)	-	-	-
	0.008	>0.08S_{DS}(R/I_e) – ASCE 7-22 (15.4-2)	0.008	0.008	0.008
	0.049	>0.5S_1 / (R/I_e) – if S_1>0.6g, ASCE 7-22 (12.8-7)	0.049	0.049	0.049
W	100	Kips			
I_e	1	*ASCE 7-22 Table 1.5-2*			
S_a	-	ASCE 7 Hazard Tool	-	-	-
S_s	1.56	ASCE 7 Hazard Tool	1.56	1.56	1.56
S_1	0.64	ASCE 7 Hazard Tool	0.64	0.64	0.64
S_{mS}	1.75	ASCE 7 Hazard Tool	1.7	1.73	1.75
S_{m1}	1.09	ASCE 7 Hazard Tool	1.34	0.88	1.09
S_{dc}	1.17	= 2/3 S_{ms} – ASCE 7-22 (11.4-1)	1.13	1.16	1.17
S_{d1}	0.73	= 2/3 S_{m1} – ASCE 7-22 (11.4-2)	0.89	0.58	0.73
T_L	6	ASCE 7 Hazard Tool	6	6	6
PGA_m	0.73	ASCE 7 Hazard Tool	0.72	0.7	0.73
V_{S30}	365	ASCE 7 Hazard Tool	260	530	365
S_{DC}	D	ASCE 7 Hazard Tool	D	D	D
C_t	0.025	*ASCE 7-22 Table 12.8-2*			
h_n	22.50	feet			
x	0.8	*ASCE 7-22 Table 12.8-2*			
T	0.302	seconds = $C_t h_n^x$, ASCE 7-22 (12.8-8)			

Story	*Weight* (Kips)	*Height* (ft)	*Story H* (ft)	*Wh* (Kip-ft)	C_{vx} (Wh/$\sum$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 E/W ASD	$\sum F_{xW}$, Kips E/W ASD	F_{xW}, Kips N/S ASD	$\sum F_{xW}$, Kips N/S ASD	F_{px} ASD
Roof	27.63	22.50	10.00	622	0.53	*9.6*	*9.6*	*6.718*	***6.718***	*3.609*	*3.609*	*4.464*	*4.464*	*6.718*
Upper Floor	36.13	12.50	10.00	452	0.39	*7.0*	*16.6*	*4.880*	***11.598***	*3.854*	*7.463*	*5.143*	*9.607*	*6.655*
Main Floor	36.02	2.50	2.50	90	0.08	*1.4*	*18.0*	*0.973*	***5.854***	*0.000*	*7.463*	*0.000*	*9.607*	*5.901*
$\sum W$	99.78													

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			
WEST	50.0%	21.66	3,359			2,232									*10.00*	*ft*	
	100.0%	24.58	3,359	137	1,366	2,232	91	908	2,950	0	0	0	723	3,083	4	OK	MSTC28 OK
	40.5%	8.77	1,360	155		904	103								4		
	59.5%	12.89	1,999	155		1,328	103								4		
EAST	50.0%	14.67	3,359			2,232											
	100.0%	23.21	3,359	145	1,447	2,232	96	962	2,785	0	0	0	840	3,068	4	OK	MSTC28 OK
	23.9%	3.50	802	229		533	152								4	OK	
	26.1%	3.83	878	229		583	152								4	OK	
	26.1%	3.83	878	229		583	152								4	OK	
	23.9%	3.50	802	229		533	152								4	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			
WEST	50.0%	16.66	5,799			4,803									*10.00*	*ft*	
	100.0%	24.66	5,799	235	2,352	4,803	195	1,948	5,918	0	0	0	1,061	5,795	4	OK	HDU2 OK
	46.7%	7.77	2,706	348		2,241	288								4	OK	
	29.2%	4.86	1,694	348		1,403	288								4	OK	
	24.1%	4.02	1,400	348		1,160	288								4	OK	
EAST	50.0%	20.83	5,799			4,803											
	86.6%	23.00	5,022	218	2,184	4,160	181	1,809	5,520	0	0	0	980	5,396	4	OK	HDU2 OK
	15.8%	3.29	916	278		759	231								4	OK	
	23.4%	4.88	1,357	278		1,124	231								4	OK	
	47.4%	9.88	2,749	278		2,277	231								4	OK	
	13.4%	2.79	777	278	2,784	644	231	2,306	670	0	0	0	2,637	3,173	4	OK	HDU2 OK

LEFT-to-RIGHT 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			
NORTH	50.0%	17.00	3,359			2,232									*10.00*	*ft*	
	29.4%	17.00	988	58	581	656	39	386	2,040	495	297	0	0	2,649	6	OK	None OK
	16.1%	2.73	539	198		358	131								6	OK	
	13.4%	2.27	449	198		298	131								6	OK	
	11.8%	2.00	395	198	1,976	263	131	1,313	240	0	0	0	1,924	2,116	4	OK	MSTC40 OK
	11.8%	2.00	395	198	1,976	263	131	1,313	240	0	0	0	1,924	2,116	4	OK	MSTC40 OK
	47.1%	13.00	1,581	122	1,216	1,050	81	808	1,560	450	270	0	110	2,760	4	OK	MSTC28 OK
	28.1%	4.77	943	198		626	131								4	OK	
	19.0%	3.23	638	198		424	131								4	OK	
SOUTH	50.0%	21.98	3,359			2,232											
	37.5%	13.25	1,261	95	952	838	63	632	1,590	495	297	0	0	2,676	6	OK	None OK
	10.9%	2.40	366	153		243	102								6	OK	
	26.6%	5.85	895	153		594	102								6	OK	
	26.1%	8.23	876	106	1,064	582	71	707	988	0	0	0	849	1,639	6	OK	MSTC28 OK
	13.0%	2.86	438	153		291	102								6	OK	
	13.0%	2.86	438	153		291	102								6	OK	
	36.4%	13.00	1,223	94	940	812	62	625	1,560	450	270	0	0	2,553	6	OK	None OK
	21.7%	4.77	729	153		484	102								6	OK	
	14.7%	3.23	493	153		328	102								6	OK	

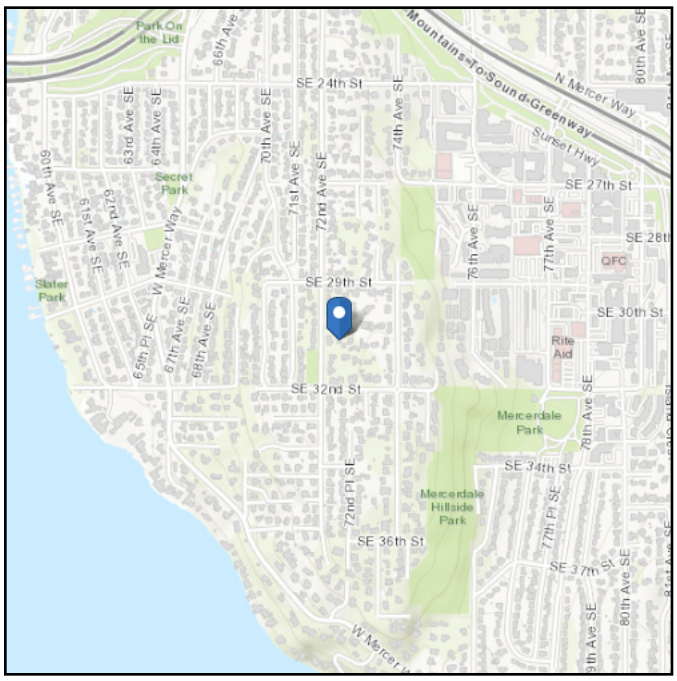
Main - to- Upper

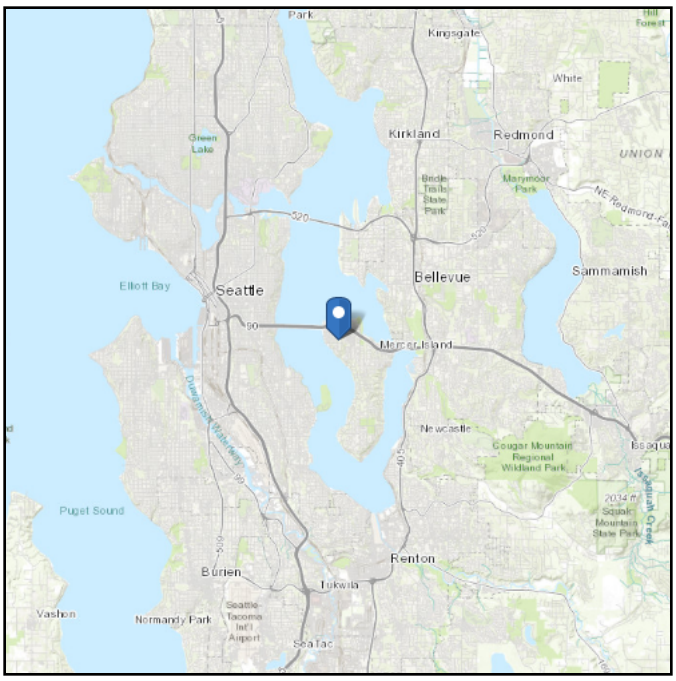
				SEISMIC			WIND	GRAVITY LOADING (plf)								
	%	Length (ft)	# in Wall	PLF	Chord F (#)	# in Wall	PLF	Chord F (#)	Wall W (#)	Snow	Dead	Live	Uplift	Comp			
NORTH	50.0%	13.42	5,799			4,803									*10.00*	*ft*	
	40.4%	17.00	2,341	138	1,377	1,939	114	1,141	4,080	495	491	311	0	5,069	3	OK	None OK
	20.3%	2.73	1,180	432		977	358								3	OK	
	20.0%	2.69	1,162	432		962	358								3	OK	
	59.6%	13.00	3,458	266	2,660	2,864	220	2,203	3,120	450	551	449	418	5,701	3	OK	HDU2 OK
	26.9%	3.61	1,562	432		1,294	358								3	OK	
	32.7%	4.39	1,896	432		1,570	358								3	OK	
SOUTH	50.0%	24.48	5,799			4,803											
	67.3%	13.25	3,904	295	2,946	3,234	244	2,440	3,180	495	449	243	957	5,593	4	OK	HDU2 OK
	9.8%	2.40	568	237		470	196								4	OK	
	23.9%	5.85	1,387	237		1,149	196								4	OK	
	33.6%	8.23	1,950	237	2,369	1,615	196	1,962	1,975	0	0	0	1,938	3,518	6	OK	HDU2 OK
	32.7%	13.00	1,895	146	1,458	1,570	121	1,208	3,120	450	422	243	0	4,346	6	OK	None OK
	19.5%	4.77	1,130	237		936	196								6	OK	
	13.2%	3.23	765	237		634	196								6	OK	

ASCE Hazards Report

Address:
2956 72nd Ave SE
Mercer Island, Washington
98040

Standard:	ASCE/SEI 7-22	**Latitude:**	47.582987
Risk Category:	II	**Longitude:**	-122.242525
Soil Class:	CD	**Elevation:**	313.1704605890397 ft (NAVD 88)





Seismic

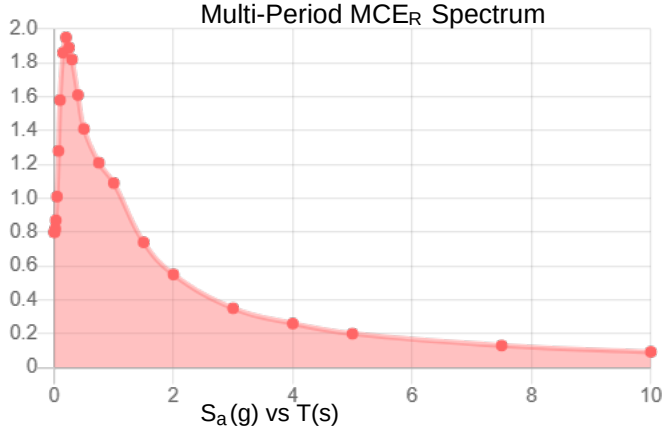
Site Soil Class: CD

Results:

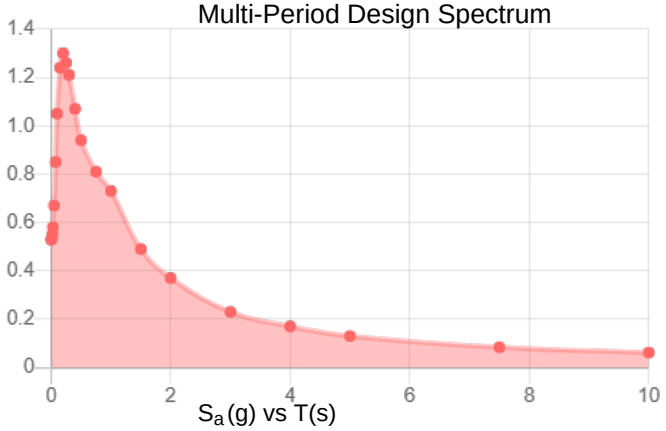
PGA_M :	0.73	T_L :	6
S_{MS} :	1.75	S_S :	1.56
S_{M1} :	1.09	S_1 :	0.64
S_{DS} :	1.17	V_{S30} :	365
S_{D1} :	0.73		

Seismic Design Category: D

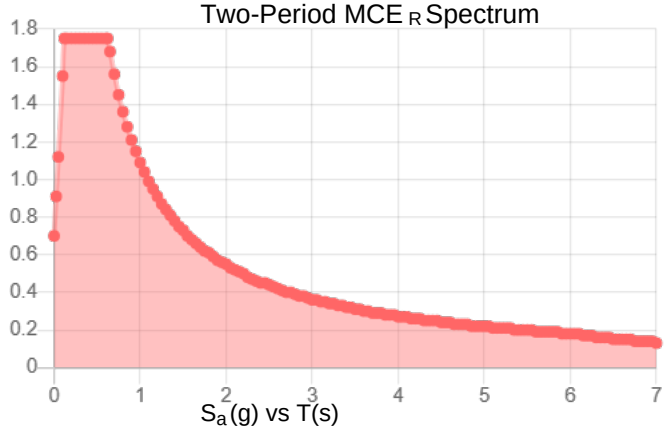
Multi-Period MCE_R Spectrum



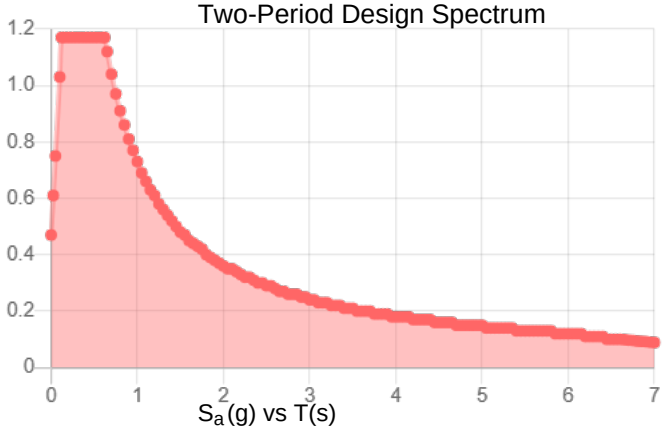
Multi-Period Design Spectrum



Two-Period MCE_R Spectrum



Two-Period Design Spectrum

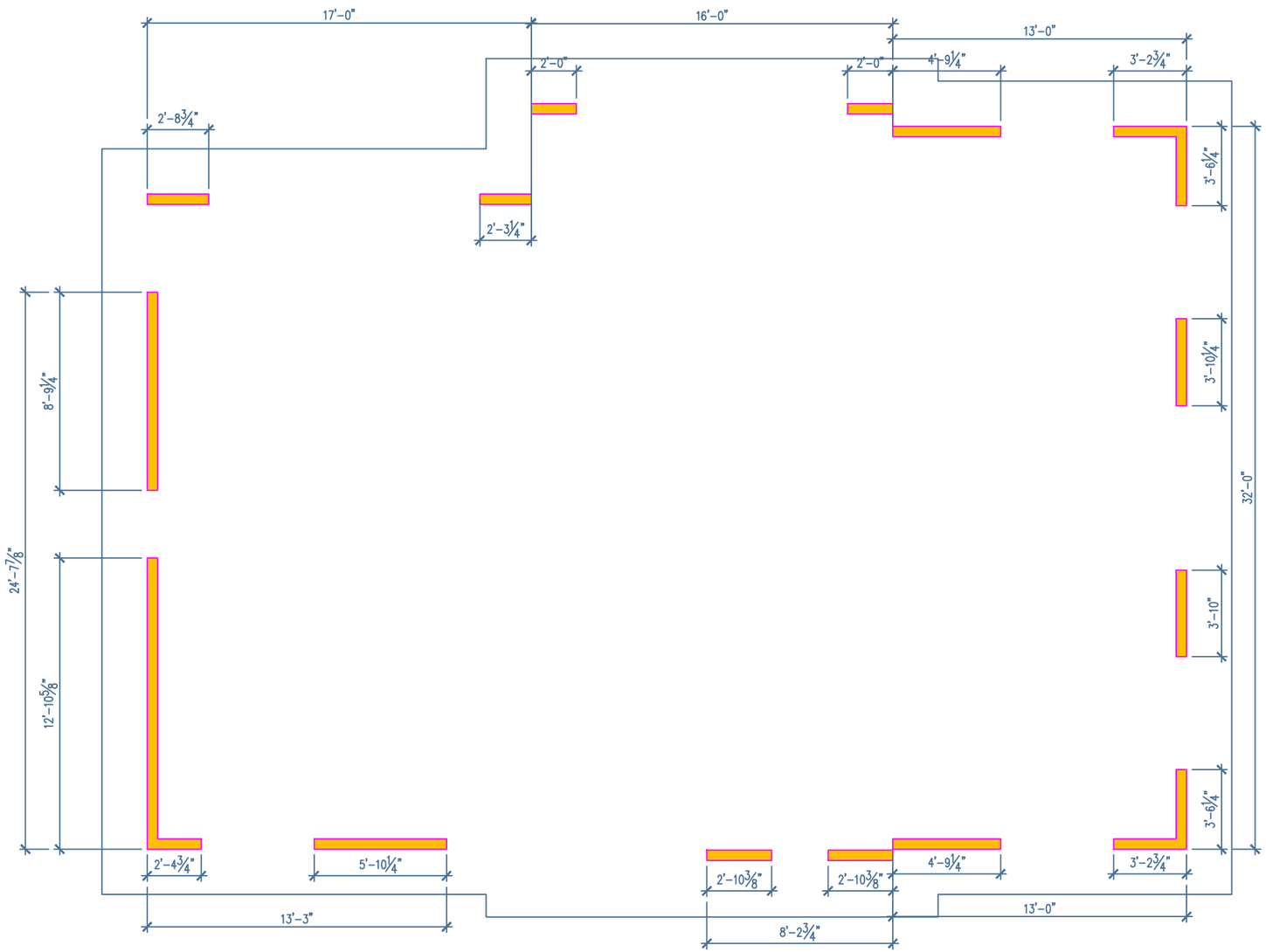


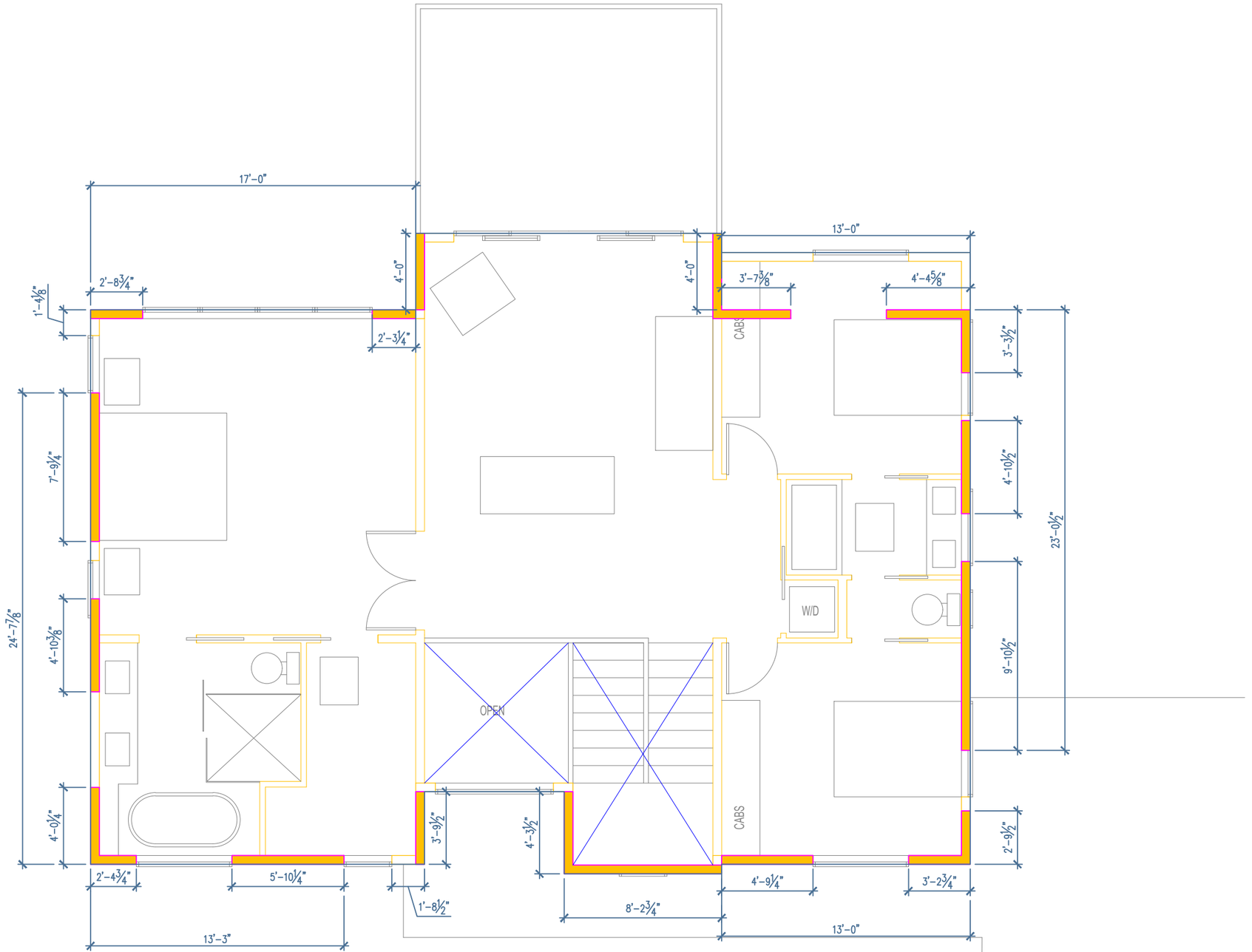
MCE_R Vertical Response Spectrum

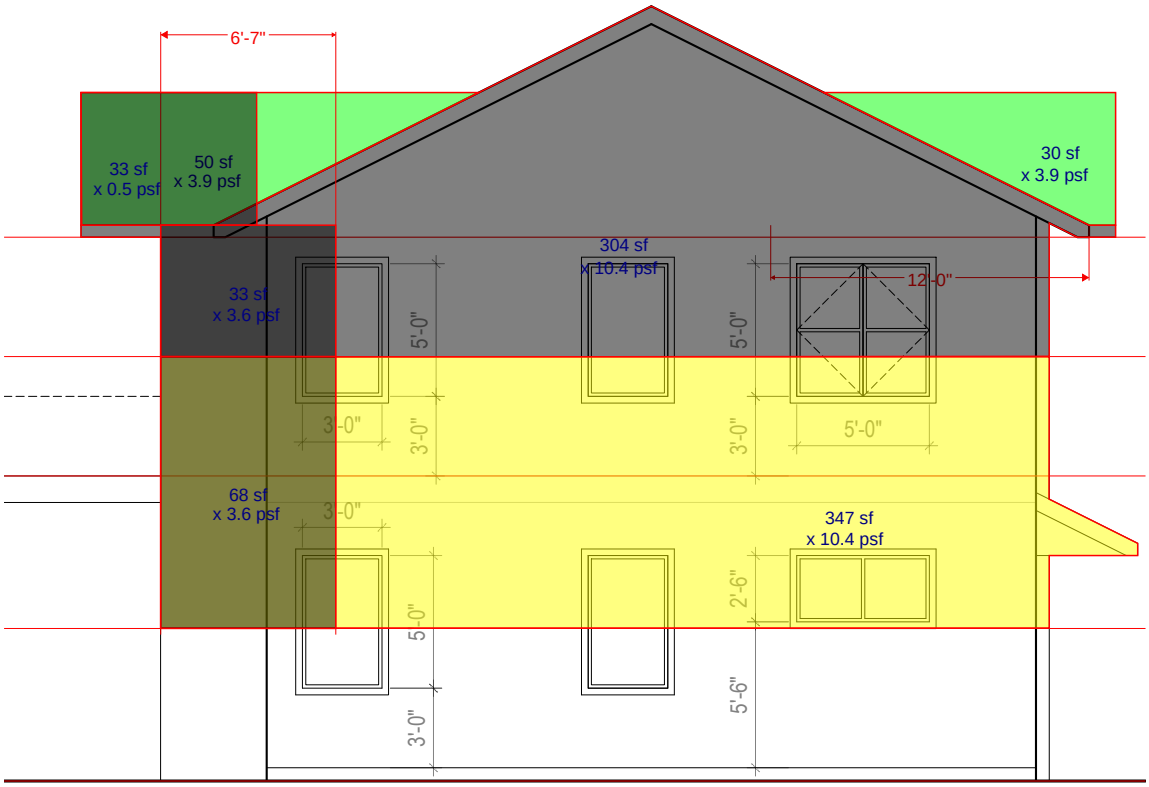
Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

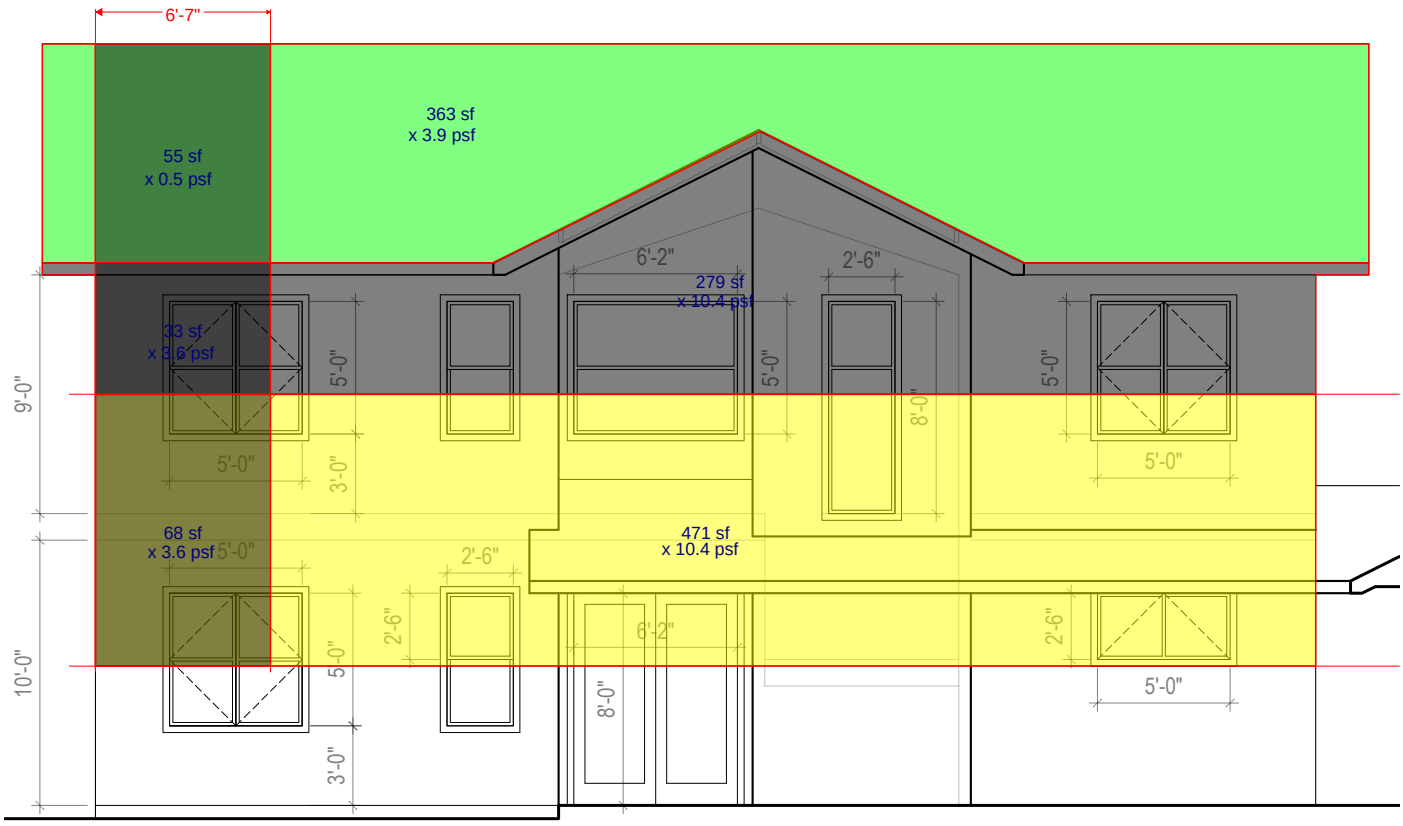

17'-0"
16'-0"
13'-0"
2'-0"
2'-0"
4'-9 1/4"
3'-2 3/4"
2'-8 3/4"
2'-3 1/4"
3'-6 1/4"
3'-10 1/4"
32'-0"
8'-9 1/4"
24'-7 7/8"
12'-10 5/8"
3'-10"
3'-6 1/4"
2'-4 3/4"
5'-10 1/4"
2'-10 3/8"
2'-10 3/8"
4'-9 1/4"
3'-2 3/4"
13'-3"
13'-0"
8'-2 3/4"


17'-0"
2'-8¾"
1'-4⅛"
4'-0"
2'-3¼"
13'-0"
4'-0"
3'-7⅜"
4'-4⅝"
CABS
3'-3½"
4'-10½"
9'-10½"
23'-0½"
7'-9¼"
4'-10⅜"
24'-7⅞"
4'-0¼"
OPEN
CABS
W/D
3'-9½"
4'-3½"
2'-9½"
2'-4¾"
5'-10¼"
1'-8½"
8'-2¾"
4'-9¼"
3'-2¾"
13'-3"
13'-0"



WEST ELEVATION

1/4" = 1'-0"



SOUTH ELEVATION

1/4" = 1'-0"

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206-427-7233

JOB TITLE Wu Chang

JOB NO. 248-2024 **SHEET NO.**
CALCULATED BY JDA **DATE** 3/5/24
CHECKED BY **DATE**

www.struware.com

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)	6.00 / 12	26.6 deg
Building length (L)	45.0 ft	
Least width (B)	33.0 ft	
Mean Roof Ht (h)	20.5 ft	
Parapet ht above grd	0.0 ft	
Minimum parapet ht	0.0 ft	

Live Loads:

Roof

0 to 200 sf:	18 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

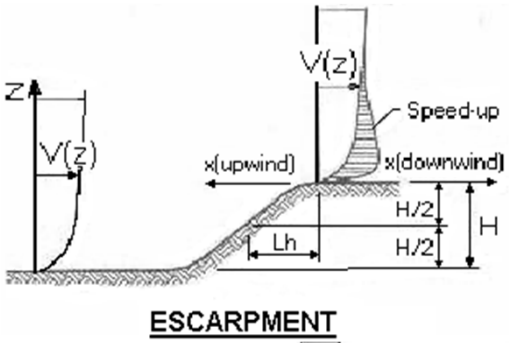
Ultimate Wind Speed	110 mph
Nominal Wind Speed	85.2 mph
Risk Category	II
Exposure Category	B
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85
Kh case 1	0.701
Kh case 2	0.628
Type of roof	Gable

Topographic Factor (Kzt)

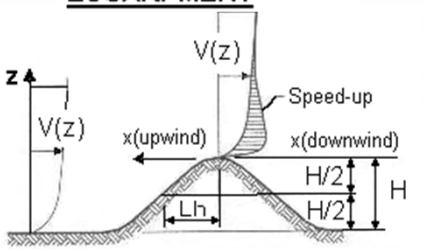
Topography		2D Escarpment
Hill Height	(H)	0.0 ft
Half Hill Length (Lh)		39.4 ft
Actual H/Lh	=	0.00
Use H/Lh	=	0.00
Modified Lh	=	39.4 ft
From top of crest: x =		0.0 ft
Bldg up/down wind?		upwind

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 = 0.52	K_3 =	0.272
At Mean Roof Ht:		
	Kzt = $(1+K_1K_2K_3)^2$ =	1.00



ESCARPMENT



2D RIDGE or 3D AXISYMMETRICAL HILL

Gust Effect Factor

h =	20.5 ft
B =	33.0 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 = 0.62 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 =	0.91
I_z =	0.30
G =	0.87 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 =	20.5 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				

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Enclosure Classification

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

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Kenmore, WA
206-427-7233

JOB TITLE Wu Chang

JOB NO. 248-2024 SHEET NO.
CALCULATED BY JDA DATE 3/5/24
CHECKED BY DATE

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

Kz = Kh (case 1) = 0.70
Base pressure (qh) = **11.1 psf**
GCpi = +/-0.18

Edge Strip (a) = 3.3 ft
End Zone (2a) = 6.6 ft
Zone 2 length = 16.5 ft

Wind Pressure Coefficients

	CASE A				CASE B		
		θ = 26.6 deg					
Surface	GCpf	w/-GCpi	w/+GCpi		GCpf	w/-GCpi	w/+GCpi
1	0.55	0.73	0.37		-0.45	-0.27	-0.63
2	-0.10	0.08	-0.28		-0.69	-0.51	-0.87
3	-0.45	-0.27	-0.63		-0.37	-0.19	-0.55
4	-0.39	-0.21	-0.57		-0.45	-0.27	-0.63
5					0.40	0.58	0.22
6					-0.29	-0.11	-0.47
1E	0.73	0.91	0.55		-0.48	-0.30	-0.66
2E	-0.19	-0.01	-0.37		-1.07	-0.89	-1.25
3E	-0.58	-0.40	-0.76		-0.53	-0.35	-0.71
4E	-0.53	-0.35	-0.71		-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		8.1	4.1		-3.0	-7.0
2		0.9	-3.1		-5.6	-9.6
3		-3.0	-6.9		-2.1	-6.1
4		-2.3	-6.3		-3.0	-7.0
5					6.4	2.4
6					-1.2	-5.2
1E		10.0	6.1		-3.3	-7.3
2E		-0.1	-4.1		-9.9	-13.8
3E		-4.5	-8.5		-3.9	-7.9
4E		-3.9	-7.9		-3.3	-7.3
5E					8.7	4.8
6E					-2.8	-6.8

Parapet

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

Windward roof overhangs = 7.7 psf (upward) add to windward roof pressure

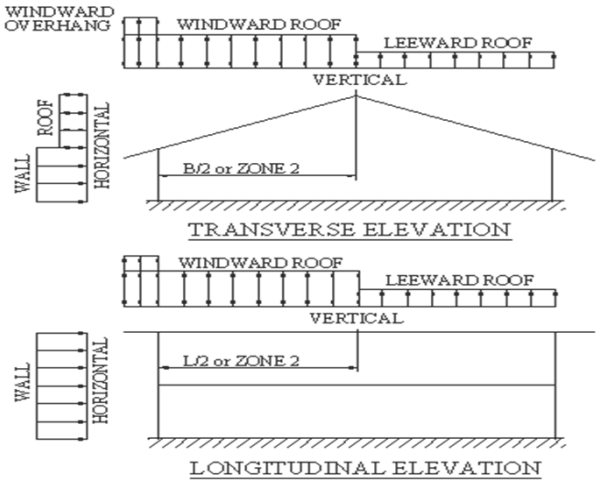
Horizontal MWFRS Simple Diaphragm Pressures (psf)

Transverse direction (normal to L)

Interior Zone: Wall 10.4 psf
Roof 3.9 psf
End Zone: Wall 14.0 psf
Roof 4.4 psf

Longitudinal direction (parallel to L)

Interior Zone: Wall 7.6 psf
End Zone: Wall 11.5 psf



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.

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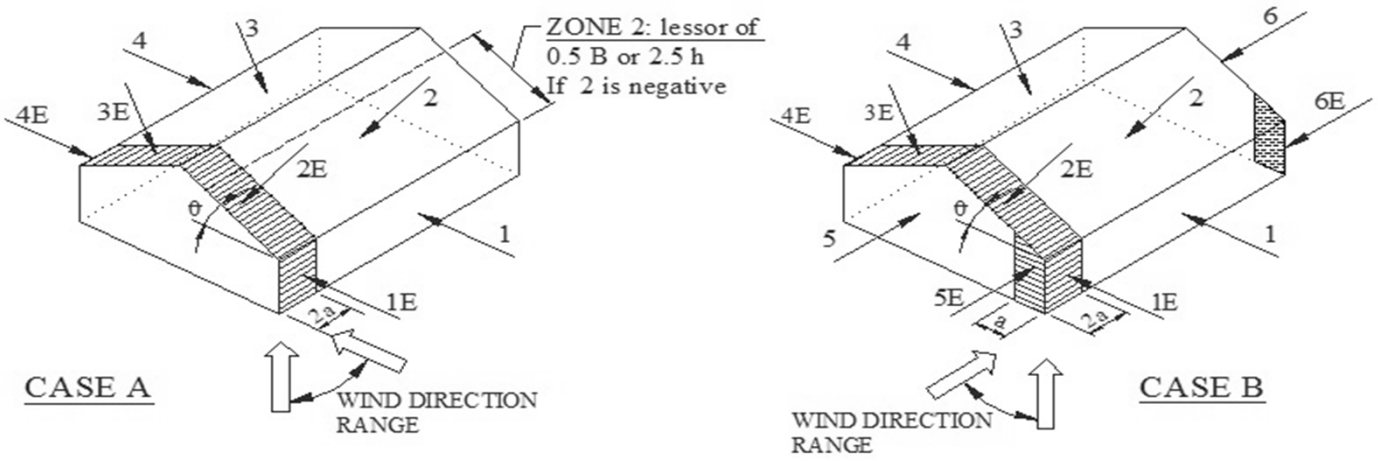
CHECKED BY **DATE**

Location of MWFRS Wind Pressure Zones



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

ASCE 7 -99 and ASCE 7-10 (& later)

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JOB TITLE Wu Chang
JOB NO. 248-2024 **SHEET NO.**
CALCULATED BY JDA **DATE** 3/5/24
CHECKED BY **DATE**

Nominal Wind Pressures

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

Kh (case 1) =	0.70	h =	20.5 ft
Base pressure (qh) =	**11.1 psf**	a =	3.3 ft
Minimum parapet ht =	0.0 ft	GCpi =	+/-0.18
Roof Angle (θ) =	26.6 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	-1.08	-1.01	-0.98	-12.0	-11.2	-10.8	-12.0	-10.8
Negative Zone 2	-1.88	-1.53	-1.38	-20.8	-16.9	-15.3	-20.8	-15.3
Negative Zone 3	-2.78	-2.36	-2.18	-30.8	-26.1	-24.1	-30.8	-24.1
Positive All Zones	0.68	0.54	0.48	10.0	10.0	10.0	10.0	10.0
Overhang Zone 2	-2.20	-2.20	-2.20	-24.3	-24.3	-24.3	-24.3	-24.3
Overhang Zone 3	-3.70	-2.86	-2.50	-41.0	-31.7	-27.7	-41.0	-27.7

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 2 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	-1.28	-1.10	-0.98	-14.2	-12.2	-10.8	-14.2	-12.3
Negative Zone 5	-1.58	-1.23	-0.98	-17.5	-13.6	-10.8	-17.5	-13.7
Positive Zone 4 & 5	1.18	1.00	0.88	13.1	11.1	10.0	13.1	11.2

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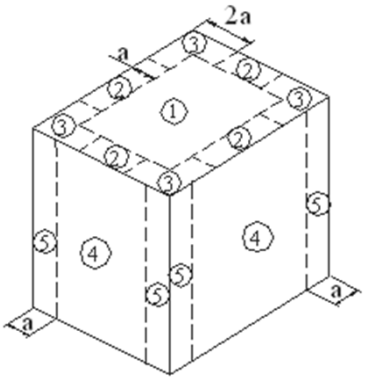
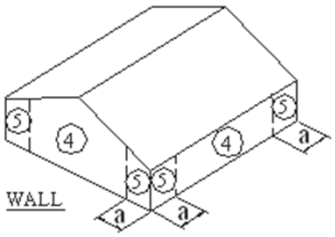
CHECKED BY **DATE**

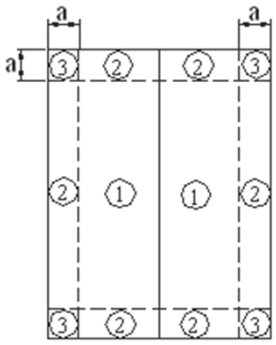
Location of C&C Wind Pressure Zones



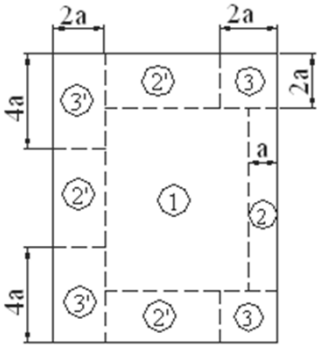
Roofs w/ θ ≤ 10°
and all walls
h > 60'



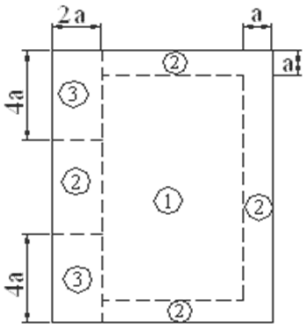
Walls h ≤ 60'
& alt design h<90'



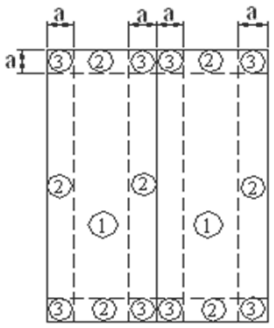
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



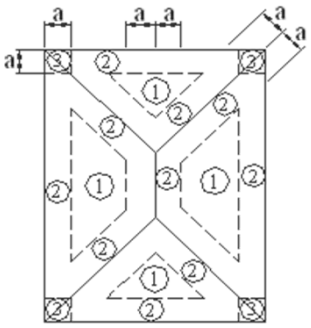
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



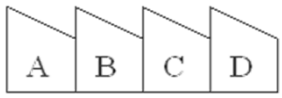
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'

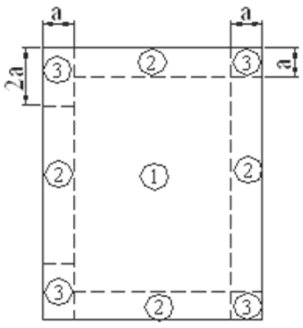


Multispan Gable &
Gable 7° < θ ≤ 45°

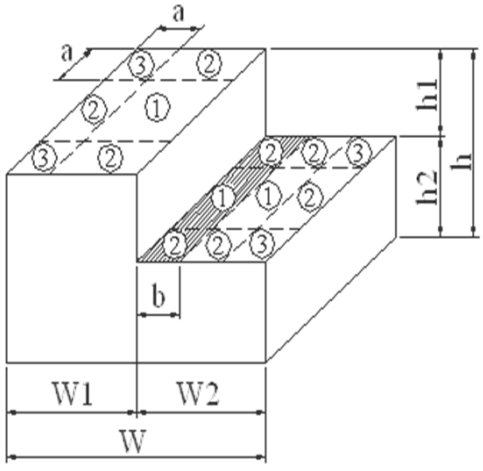


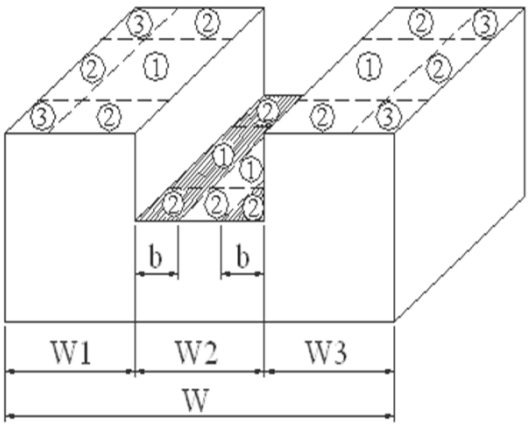
Hip 7° < θ ≤ 27°





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

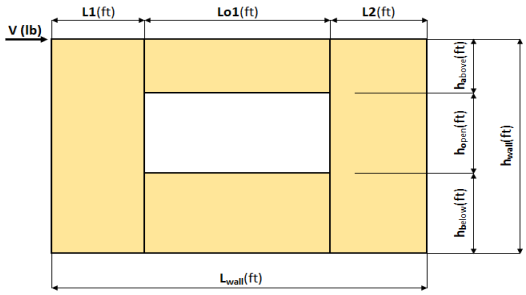




Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	West (Upper to Roof)		



Shear Wall Calculation Variables

V	3287 lbf	Opening 1	
L1	8.77 ft	h_a	1.00 ft
L2	12.89 ft	h_o	5.00 ft
h_{wall}	9.00 ft	h_b	3.00 ft
L_{wall}	24.66 ft	Lo1	3.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	0.57	N/A
P2=h_o/L2=	0.39	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 1200 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 300 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 900 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 364 lbf

F2 = O1(L2)/(L1+L2) = 535 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 1.21 ft

T2 = (L2*Lo1)/(L1+L2) = 1.79 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 152 plf

v2 = (V/L)(T2+L2)/L2 = 152 plf

Check v1*L1+v2*L2=V? 3287 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 1331 lbf

R2 = v2*L2 = 1956 lbf

8. Difference corner force + resistance

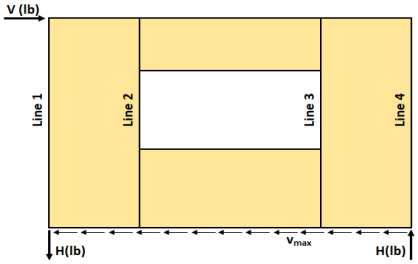
R1-F1 = 967 lbf

R2-F2 = 1421 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 110 plf

vc2 = (R2-F2)/L2 = 110 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		441	759	1200 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	1200	441	759	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	1200	441	759	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		441	759	1200 lbf

Design Summary*

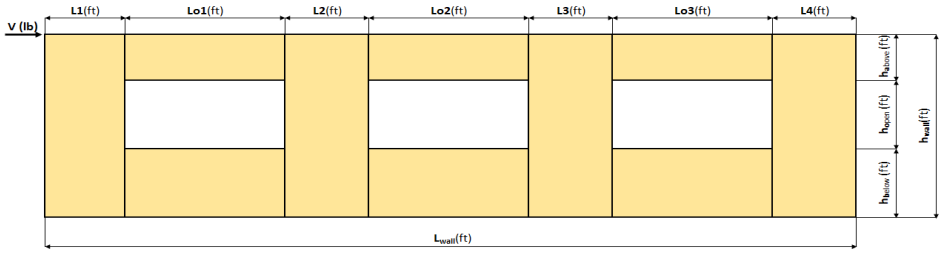
Req. Sheathing Capacity	300 plf	**4-Term Deflection**	0.210 in.	**3-Term Deflection**	0.257 in.
Req. Strap Force	535 lbf	**4-Term Story Drift %**	0.008 %	**3-Term Story Drift %**	0.010 %
Req. HD Force (H)	1200 lbf				
Req. Shear Wall Anchorage Force (v_{max})	133 plf				

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

Project Information

Code:	2018 IBC
Designer:	JDA
Client:	CenterLine
Project:	2956 72nd Ave SE (Mercer Island)
Wall Line:	East (Upper to Roof)

Date:



Shear Wall Calculation Variables

V	3287 lbf	Opening 1		Opening 2		Opening 3		Adj. Factor Method =		2bs/h	
L1	3.50 ft	h_a1	1.00 ft	h_a2	1.00 ft	h_a3	1.00 ft	Wall Pier Aspect Ratio		Adj. Factor	
L2	3.83 ft	h_o1	5.00 ft	h_o2	5.00 ft	h_o3	5.00 ft	P1=h_o/L1=	1.43	N/A	
L3	3.83 ft	h_b1	3.00 ft	h_b2	3.00 ft	h_b3	3.00 ft	P2=h_o/L2=	1.31	N/A	
L4	3.50 ft	Lo1	5.00 ft	Lo2	7.27 ft	Lo3	5.00 ft	P3=h_o/L3=	1.31	N/A	
h_{wall}	9.00 ft							P4=h_o/L4=	1.43	N/A	
L_{wall}	31.93 ft										

Note to Designer: The width-to-height ratio of sheathing above or below the openings exceeds 6.5:1. Exercise caution when assuming fixity at corner regions, as assumed in this calculator.

1. Hold-down forces: H = Vh_{wall}/L_{wall} 926 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a1+h_b1) =	232 plf
Second opening: va2 = vb2 = H/(h_a2+h_b2) =	232 plf
Third opening: va3 = vb3 = H/(h_a3+h_b3) =	232 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) =	1158 lbf
Second opening: O2 = va2 x (Lo2) =	1684 lbf
Third opening: O3 = va3 x (Lo3) =	1158 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) =	553 lbf
F2 = O1(L2)/(L1+L2) =	605 lbf
F3 = O2(L2)/(L2+L3) =	842 lbf
F4 = O2(L3)/(L2+L3) =	842 lbf
F5 = O3(L3)/(L3+L4) =	605 lbf
F6 = O3(L4)/(L3+L4) =	553 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) =	2.39 ft
T2 = (L2*Lo1)/(L1+L2) =	2.61 ft
T3 = (L2*Lo2)/(L2+L3) =	3.64 ft
T4 = (L3*Lo2)/(L2+L3) =	3.64 ft
T5 = (L3*Lo3)/(L3+L4) =	2.61 ft
T6 = (L4*Lo3)/(L3+L4) =	2.39 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 =	173 plf
v2 = (V/L)(T2+L2+T3)/L2 =	271 plf
v3 = (V/L)(T4+L3+T5)/L3 =	271 plf
v4 = (V/L)(T6+L4)/L4 =	173 plf
Check v1*L1+v2*L2+v3*L3+v4*L4=V?	3287 lbf **OK**

7. Resistance to corner forces

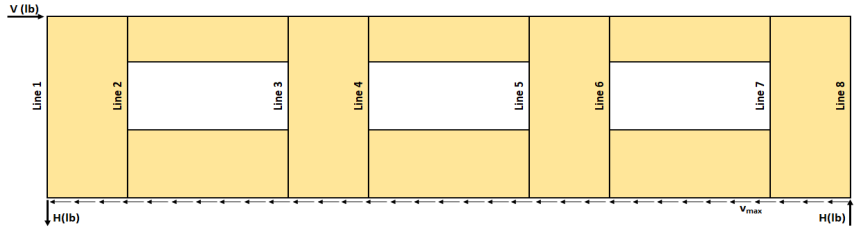
R1 = v1*L1 =	606 lbf
R2 = v2*L2 =	1037 lbf
R3 = v3*L3 =	1037 lbf
R4 = v4*L4 =	606 lbf

8. Difference corner force + resistance

R1-F1 =	53 lbf
R2-F2-F3 =	-410 lbf
R3-F4-F5 =	-410 lbf
R4-F6 =	53 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 =	15 plf
vc2 = (R2-F2-F3)/L2 =	-107 plf
vc3 = (R3-F4-F5)/L3 =	-107 plf
vc4 = (R4-F6)/L4 =	15 plf



Check Summary of Shear Values for Three Openings

Line 1: vc1(h_a1+h_b1)+v1(h_o1)=H?		61	866	926 lbf
Line 2: va1(h_a1+h_b1)-vc1(h_a1+h_b1)-v1(h_o1)=0?	926	61	866	0
Line 3: vc2(h_a1+h_b1)+v2(h_o1)-va1(h_a1+h_b1)=0?	-428	1354	926	0
Line 4: va2(h_a2+h_b2)-v2(h_o2)-vc2(h_a2+h_b2)=0?	926	1354	-428	0
Line 5: va2(h_a2+h_b2)-vc3(h_a2+h_b2)-v3(h_o2)=0?	926	-428	1354	0
Line 6: va3(h_a3+h_b3)-v3(h_o3)-vc3(h_a3+h_b3)=0?	926	1354	-428	0
Line 7: va3(h_a3+h_b3)-vc4(h_a3+h_b3)-v4(h_o3)=0?	926	61	866	0
Line 8: vc4(h_a3+h_b3)+v4(h_o3)=H?		61	866	926 lbf

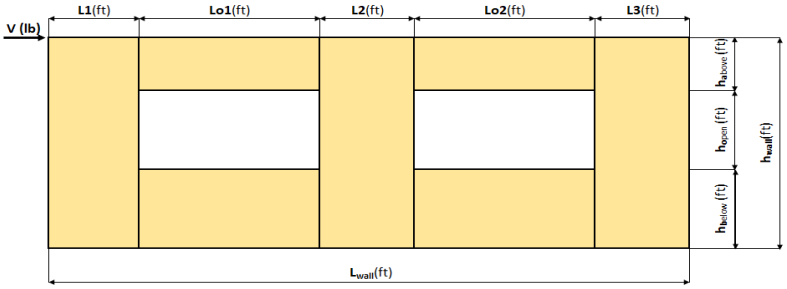
Design Summary*

Req. Sheathing Capacity	271 plf	**4-Term Deflection**	0.591 in.	**3-Term Deflection**	0.610 in.
Req. Strap Force	842 lbf	**4-Term Story Drift %**	0.022 %	**3-Term Story Drift %**	0.023 %
Req. HD Force (H)	926 lbf				
Req. Shear Wall Anchorage Force (v_{max})	103 plf				

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

Project Information

Code:	2018 IBC	**Date:**	3/4/2024
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	West (Main to Upper)		



Shear Wall Calculation Variables

			Opening 1		Opening 2
V	5746 lbf				
L1	7.77 ft	h_a1	2.00 ft	h_a2	2.00 ft
L2	4.86 ft	h_o1	5.00 ft	h_o2	5.00 ft
L3	4.02 ft	h_b1	3.00 ft	h_b2	3.00 ft
h_{wall}	10.00 ft	Lo1	3.00 ft	Lo2	5.00 ft
L_{wall}	24.65 ft				

Adj. Factor Method =	2bs/h
Wall Pier Aspect Ratio	Adj. Factor
$P1=h_o/L1=$ 0.64	N/A
$P2=h_o/L2=$ 1.03	N/A
$P3=h_o/L3=$ 1.24	N/A

1. Hold-down forces: $H = Vh_{wall}/L_{wall}$ 2331 lbf

2. Unit shear above + below opening

First opening: $va1 = vb1 = H/(h_a1+h_b1) =$ 466 plf

Second opening: $va2 = vb2 = H/(h_a2+h_b2) =$ 466 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1399 lbf

Second opening: O2 = va2 x (Lo2) = 2331 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 860 lbf

F2 = O1(L2)/(L1+L2) = 538 lbf

F3 = O2(L2)/(L2+L3) = 1276 lbf

F4 = O2(L3)/(L2+L3) = 1055 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 1.85 ft

T2 = (L2*Lo1)/(L1+L2) = 1.15 ft

T3 = (L2*Lo2)/(L2+L3) = 2.74 ft

T4 = (L3*Lo2)/(L2+L3) = 2.26 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 288 plf

v2 = (V/L)(T2+L2+T3)/L2 = 420 plf

v3 = (V/L)(T4+L3)/L3 = 364 plf

Check v1*L1+v2*L2+v3*L3=V? 5746 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 2241 lbf

R2 = v2*L2 = 2040 lbf

R3 = v3*L3 = 1465 lbf

8. Difference corner force + resistance

R1-F1 = 1381 lbf

R2-F2-F3 = 226 lbf

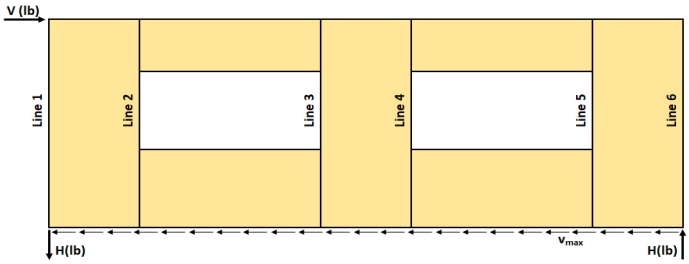
R3-F4 = 409 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 178 plf

vc2 = (R2-F2-F3)/L2 = 46 plf

vc3 = (R3-F4)/L3 = 102 plf



Check Summary of Shear Values for Two Openings

Line 1: $vc1(h_a1+h_b1)+v1(h_o1)=H$?		889	1442	2331 lbf
Line 2: $va1(h_a1+h_b1)-vc1(h_a1+h_b1)-v1(h_o1)=0$?	2331	889	1442	0
Line 3: $vc2(h_a1+h_b1)+v2(h_o1)-va1(h_a1+h_b1)=0$?	232	2099	2331	0
Line 4: $va2(h_a2+h_b2)-v2(h_o2)-vc2(h_a2+h_b2)=0$?	2331	2099	232	0
Line 5: $va2(h_a2+h_b2)-vc3(h_a2+h_b2)-v3(h_o2)=0$?	2331	509	1822	0
Line 6: $vc3(h_a2+h_b2)+ v3(h_o2) = H$?		509	1822	2331 lbf

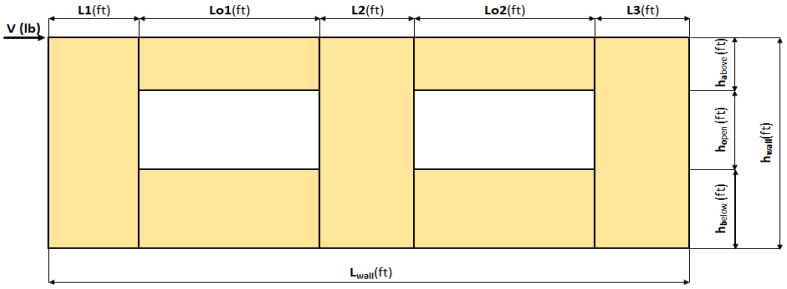
Design Summary*

Req. Sheathing Capacity	466 plf	**4-Term Deflection**	0.859 in.	**3-Term Deflection**	0.684 in.
Req. Strap Force	1276 lbf	**4-Term Story Drift %**	0.029 %	**3-Term Story Drift %**	0.023 %
Req. HD Force	2331 lbf				
Req. Shear Wall Anchorage Force	233 plf				

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

Project Information

Code:	2018 IBC	**Date:**	3/4/2024
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	East (Main to Upper)		



Shear Wall Calculation Variables

			Opening 1		Opening 2
V	4976 lbf				
L1	3.29 ft	h_a1	2.00 ft	h_a2	2.00 ft
L2	4.88 ft	h_o1	5.00 ft	h_o2	5.00 ft
L3	9.88 ft	h_b1	3.00 ft	h_b2	3.00 ft
h_{wall}	10.00 ft	Lo1	2.50 ft	Lo2	2.50 ft
L_{wall}	23.05 ft				

Adj. Factor Method =	2bs/h
Wall Pier Aspect Ratio	Adj. Factor
$P1=h_o/L1=$ 1.52	N/A
$P2=h_o/L2=$ 1.02	N/A
$P3=h_o/L3=$ 0.51	N/A

1. Hold-down forces: $H = Vh_{wall}/L_{wall}$ 2159 lbf

2. Unit shear above + below opening

First opening: $va1 = vb1 = H/(h_a1+h_b1) =$ 432 plf

Second opening: $va2 = vb2 = H/(h_a2+h_b2) =$ 432 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1079 lbf

Second opening: O2 = va2 x (Lo2) = 1079 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 435 lbf

F2 = O1(L2)/(L1+L2) = 645 lbf

F3 = O2(L2)/(L2+L3) = 357 lbf

F4 = O2(L3)/(L2+L3) = 723 lbf

5. Tributary length of openings

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

T2 = (L2*Lo1)/(L1+L2) = 1.49 ft

T3 = (L2*Lo2)/(L2+L3) = 0.83 ft

T4 = (L3*Lo2)/(L2+L3) = 1.67 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 282 plf

v2 = (V/L)(T2+L2+T3)/L2 = 319 plf

v3 = (V/L)(T4+L3)/L3 = 252 plf

Check v1*L1+v2*L2+v3*L3=V? 4976 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 928 lbf

R2 = v2*L2 = 1554 lbf

R3 = v3*L3 = 2494 lbf

8. Difference corner force + resistance

R1-F1 = 493 lbf

R2-F2-F3 = 553 lbf

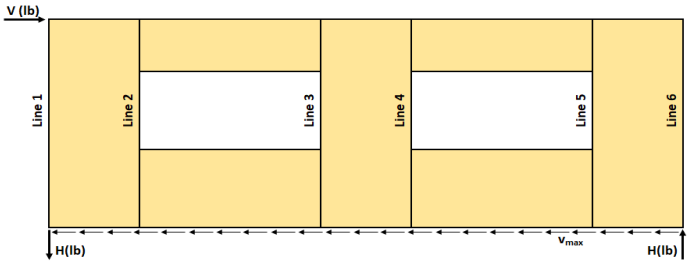
R3-F4 = 1772 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 150 plf

vc2 = (R2-F2-F3)/L2 = 113 plf

vc3 = (R3-F4)/L3 = 179 plf



Check Summary of Shear Values for Two Openings

Line 1: $vc1(h_a1+h_b1)+v1(h_o1)=H?$		749	1410	2159 lbf
Line 2: $va1(h_a1+h_b1)-vc1(h_a1+h_b1)-v1(h_o1)=0?$	2159	749	1410	0
Line 3: $vc2(h_a1+h_b1)+v2(h_o1)-va1(h_a1+h_b1)=0?$	566	1593	2159	0
Line 4: $va2(h_a2+h_b2)-v2(h_o2)-vc2(h_a2+h_b2)=0?$	2159	1593	566	0
Line 5: $va2(h_a2+h_b2)-vc3(h_a2+h_b2)-v3(h_o2)=0?$	2159	897	1262	0
Line 6: $vc3(h_a2+h_b2)+ v3(h_o2) = H?$		897	1262	2159 lbf

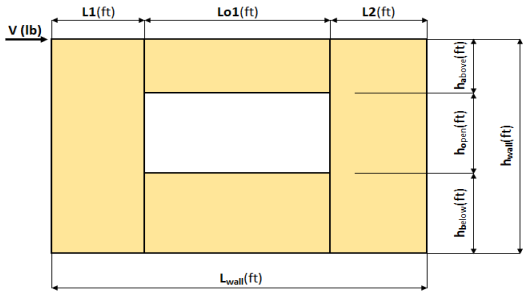
Design Summary*

Req. Sheathing Capacity	432 plf	**4-Term Deflection**	0.605 in.	**3-Term Deflection**	0.581 in.
Req. Strap Force	723 lbf	**4-Term Story Drift %**	0.020 %	**3-Term Story Drift %**	0.019 %
Req. HD Force	2159 lbf				
Req. Shear Wall Anchorage Force	216 plf				

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

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	North (Upper to Roof)		



Shear Wall Calculation Variables

V	967 lbf	Opening 1	
L1	2.73 ft	h_a	1.00 ft
L2	2.69 ft	h_o	5.00 ft
h_{wall}	9.00 ft	h_b	3.00 ft
L_{wall}	10.42 ft	Lo1	5.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	1.83	N/A
P2=h_o/L2=	1.86	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 835 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 209 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1044 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 526 lbf

F2 = O1(L2)/(L1+L2) = 518 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 2.52 ft

T2 = (L2*Lo1)/(L1+L2) = 2.48 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 178 plf

v2 = (V/L)(T2+L2)/L2 = 178 plf

Check v1*L1+v2*L2=V? 967 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 487 lbf

R2 = v2*L2 = 480 lbf

8. Difference corner force + resistance

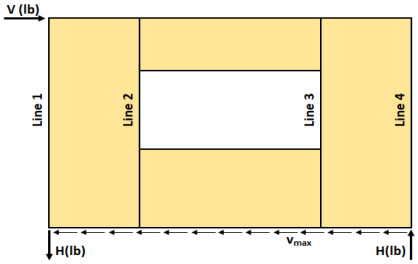
R1-F1 = -39 lbf

R2-F2 = -38 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = -14 plf

vc2 = (R2-F2)/L2 = -14 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		-57	892	835 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	835	-57	892	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	835	-57	892	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		-57	892	835 lbf

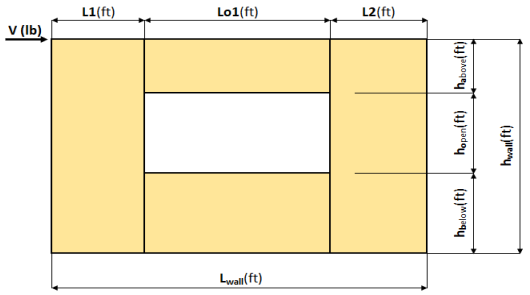
Design Summary*

Req. Sheathing Capacity	209 plf	**4-Term Deflection**	0.898 in.	**3-Term Deflection**	0.944 in.
Req. Strap Force	526 lbf	**4-Term Story Drift %**	0.033 %	**3-Term Story Drift %**	0.035 %
Req. HD Force (H)	835 lbf				
Req. Shear Wall Anchorage Force (v_{max})	93 plf				

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

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	North (Upper to Roof)		



Shear Wall Calculation Variables

V	1547 lbf	Opening 1	
L1	4.77 ft	h_a	1.00 ft
L2	3.23 ft	h_o	5.00 ft
h_{wall}	9.00 ft	h_b	3.00 ft
L_{wall}	20.00 ft	Lo1	12.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	1.05	N/A
P2=h_o/L2=	1.55	N/A

Note to Designer: The width-to-height ratio of sheathing above or below the openings exceeds 6.5:1. Exercise caution when assuming fixity at corner regions, as assumed in this calculator.

1. Hold-down forces: H = Vh_{wall}/L_{wall} 696 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 174 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 2088 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 1245 lbf

F2 = O1(L2)/(L1+L2) = 843 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 7.16 ft

T2 = (L2*Lo1)/(L1+L2) = 4.85 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 193 plf

v2 = (V/L)(T2+L2)/L2 = 193 plf

Check v1*L1+v2*L2=V? 1547 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 922 lbf

R2 = v2*L2 = 625 lbf

8. Difference corner force + resistance

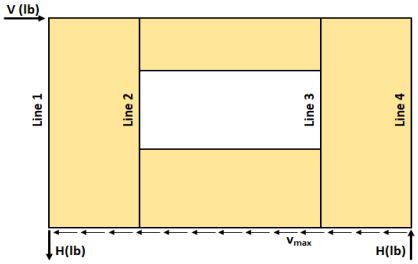
R1-F1 = -323 lbf

R2-F2 = -219 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = -68 plf

vc2 = (R2-F2)/L2 = -68 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		-271	967	696 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	696	-271	967	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	696	-271	967	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		-271	967	696 lbf

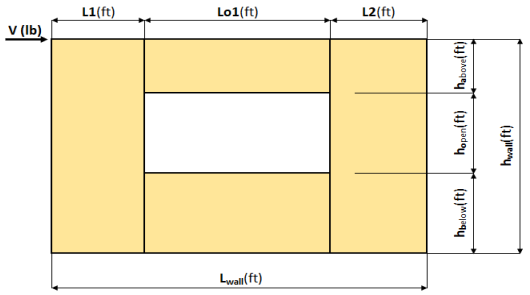
Design Summary*

Req. Sheathing Capacity	193 plf	**4-Term Deflection**	0.845 in.	**3-Term Deflection**	0.888 in.
Req. Strap Force	1245 lbf	**4-Term Story Drift %**	0.031 %	**3-Term Story Drift %**	0.033 %
Req. HD Force (H)	696 lbf				
Req. Shear Wall Anchorage Force (v_{max})	77 plf				

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

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	South (Upper to Roof)		



Shear Wall Calculation Variables

V	1234 lbf	Opening 1	
L1	2.40 ft	h_a	1.00 ft
L2	5.85 ft	h_o	5.00 ft
h_{wall}	9.00 ft	h_b	3.00 ft
L_{wall}	13.25 ft	Lo1	5.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	2.08	0.960
P2=h_o/L2=	0.85	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 838 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 210 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1048 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 305 lbf

F2 = O1(L2)/(L1+L2) = 743 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 1.45 ft

T2 = (L2*Lo1)/(L1+L2) = 3.55 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 150 plf

v2 = (V/L)(T2+L2)/L2 = 150 plf

Check v1*L1+v2*L2=V? 1234 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 359 lbf

R2 = v2*L2 = 875 lbf

8. Difference corner force + resistance

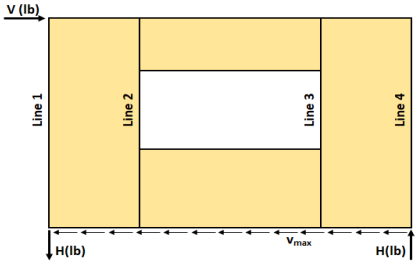
R1-F1 = 54 lbf

R2-F2 = 132 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 23 plf

vc2 = (R2-F2)/L2 = 23 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		90	748	838 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	838	90	748	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	838	90	748	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		90	748	838 lbf

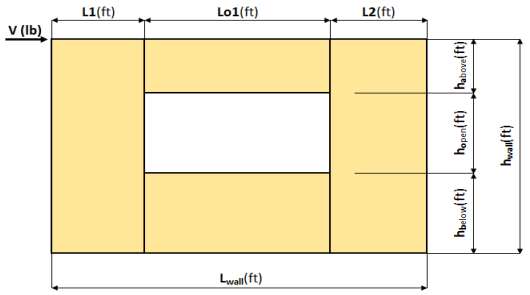
Design Summary*

Req. Sheathing Capacity	210 plf	**4-Term Deflection**	0.608 in.	**3-Term Deflection**	0.655 in.
Req. Strap Force	743 lbf	**4-Term Story Drift %**	0.023 %	**3-Term Story Drift %**	0.024 %
Req. HD Force (H)	838 lbf				
Req. Shear Wall Anchorage Force (v_{max})	93 plf				

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

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	South (Upper to Roof)		



Shear Wall Calculation Variables

V	857 lbf	Opening 1	
L1	2.86 ft	h_a	1.00 ft
L2	2.86 ft	h_o	8.00 ft
h_{wall}	12.00 ft	h_b	3.00 ft
L_{wall}	8.22 ft	Lo1	2.50 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	2.80	0.715
P2=h_o/L2=	2.80	0.715

1. Hold-down forces: H = Vh_{wall}/L_{wall} 1251 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 313 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 782 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 391 lbf

F2 = O1(L2)/(L1+L2) = 391 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 1.25 ft

T2 = (L2*Lo1)/(L1+L2) = 1.25 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 150 plf

v2 = (V/L)(T2+L2)/L2 = 150 plf

Check v1*L1+v2*L2=V? 857 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 429 lbf

R2 = v2*L2 = 429 lbf

8. Difference corner force + resistance

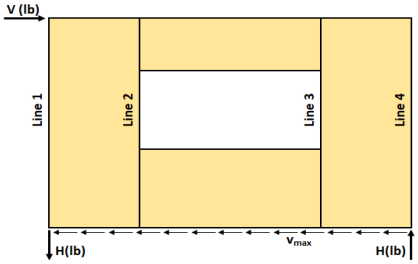
R1-F1 = 38 lbf

R2-F2 = 38 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 13 plf

vc2 = (R2-F2)/L2 = 13 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		52	1199	1251 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	1251	52	1199	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	1251	52	1199	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		52	1199	1251 lbf

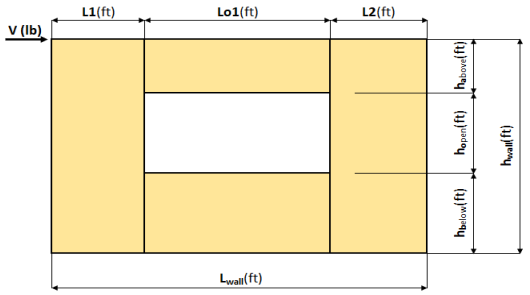
Design Summary*

Req. Sheathing Capacity	313 plf	**4-Term Deflection**	0.939 in.	**3-Term Deflection**	1.005 in.
Req. Strap Force	391 lbf	**4-Term Story Drift %**	0.026 %	**3-Term Story Drift %**	0.028 %
Req. HD Force (H)	1251 lbf				
Req. Shear Wall Anchorage Force (v_{max})	104 plf				

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

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	South (Upper to Roof)		



Shear Wall Calculation Variables

V	1196 lbf	Opening 1	
L1	4.77 ft	h_a	1.00 ft
L2	3.23 ft	h_o	5.00 ft
h_{wall}	9.00 ft	h_b	3.00 ft
L_{wall}	13.00 ft	Lo1	5.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	1.05	N/A
P2=h_o/L2=	1.55	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 828 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 207 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1035 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 617 lbf

F2 = O1(L2)/(L1+L2) = 418 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 2.98 ft

T2 = (L2*Lo1)/(L1+L2) = 2.02 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 150 plf

v2 = (V/L)(T2+L2)/L2 = 150 plf

Check v1*L1+v2*L2=V? 1196 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 713 lbf

R2 = v2*L2 = 483 lbf

8. Difference corner force + resistance

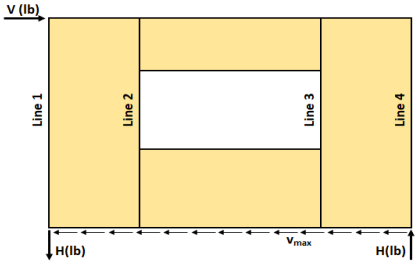
R1-F1 = 96 lbf

R2-F2 = 65 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 20 plf

vc2 = (R2-F2)/L2 = 20 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		80	748	828 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	828	80	748	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	828	80	748	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		80	748	828 lbf

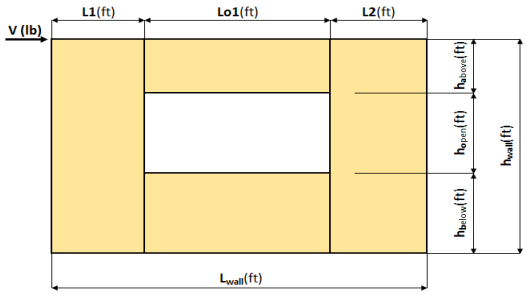
Design Summary*

Req. Sheathing Capacity	207 plf	**4-Term Deflection**	0.553 in.	**3-Term Deflection**	0.600 in.
Req. Strap Force	617 lbf	**4-Term Story Drift %**	0.020 %	**3-Term Story Drift %**	0.022 %
Req. HD Force (H)	828 lbf				
Req. Shear Wall Anchorage Force (v_{max})	92 plf				

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

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	North (Main to Upper)		



Shear Wall Calculation Variables

V	2320 lbf	Opening 1	
L1	2.73 ft	h_a	2.00 ft
L2	2.69 ft	h_o	5.00 ft
h_{wall}	10.00 ft	h_b	3.00 ft
L_{wall}	10.42 ft	Lo1	5.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	1.83	N/A
P2=h_o/L2=	1.86	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 2226 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 445 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 2226 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 1121 lbf

F2 = O1(L2)/(L1+L2) = 1105 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 2.52 ft

T2 = (L2*Lo1)/(L1+L2) = 2.48 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 428 plf

v2 = (V/L)(T2+L2)/L2 = 428 plf

Check v1*L1+v2*L2=V? 2320 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 1169 lbf

R2 = v2*L2 = 1151 lbf

8. Difference corner force + resistance

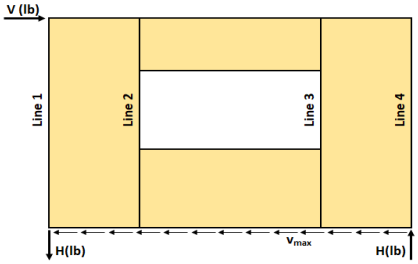
R1-F1 = 47 lbf

R2-F2 = 46 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 17 plf

vc2 = (R2-F2)/L2 = 17 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		86	2140	2226 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	2226	86	2140	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	2226	86	2140	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		86	2140	2226 lbf

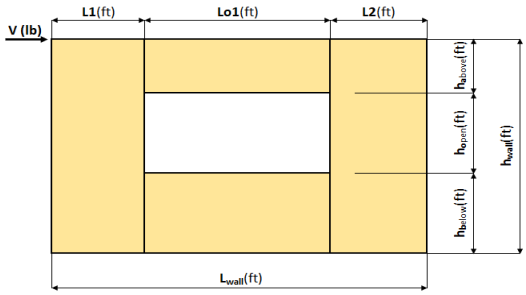
Design Summary*

Req. Sheathing Capacity	445 plf	**4-Term Deflection**	1.777 in.	**3-Term Deflection**	1.368 in.
Req. Strap Force	1121 lbf	**4-Term Story Drift %**	0.059 %	**3-Term Story Drift %**	0.046 %
Req. HD Force (H)	2226 lbf				
Req. Shear Wall Anchorage Force (v_{max})	223 plf				

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

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	North (Main to Upper)		



Shear Wall Calculation Variables

V	3426 lbf		Opening 1
L1	3.61 ft	h_a	2.00 ft
L2	4.39 ft	h_o	5.00 ft
h_{wall}	10.00 ft	h_b	3.00 ft
L_{wall}	13.00 ft	Lo1	5.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	1.39	N/A
P2=h_o/L2=	1.14	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 2635 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 527 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 2635 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 1189 lbf

F2 = O1(L2)/(L1+L2) = 1446 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 2.26 ft

T2 = (L2*Lo1)/(L1+L2) = 2.74 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 428 plf

v2 = (V/L)(T2+L2)/L2 = 428 plf

Check v1*L1+v2*L2=V? 3426 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 1546 lbf

R2 = v2*L2 = 1880 lbf

8. Difference corner force + resistance

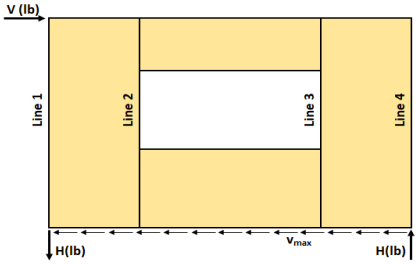
R1-F1 = 357 lbf

R2-F2 = 434 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 99 plf

vc2 = (R2-F2)/L2 = 99 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		494	2141	2635 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	2635	494	2141	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	2635	494	2141	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		494	2141	2635 lbf

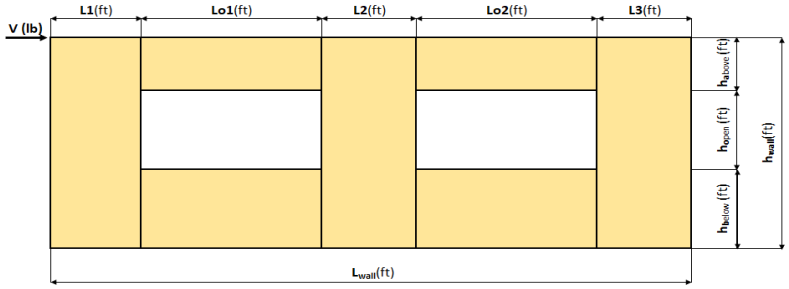
Design Summary*

Req. Sheathing Capacity	527 plf	**4-Term Deflection**	1.389 in.	**3-Term Deflection**	0.979 in.
Req. Strap Force	1446 lbf	**4-Term Story Drift %**	0.046 %	**3-Term Story Drift %**	0.033 %
Req. HD Force (H)	2635 lbf				
Req. Shear Wall Anchorage Force (v_{max})	264 plf				

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

Project Information

Code:	2018 IBC	**Date:**	3/4/2024
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	South (Main to Upper)		



Shear Wall Calculation Variables

			Opening 1		Opening 2
V	3868 lbf	h_a1	2.00 ft	h_a2	2.00 ft
L1	2.40 ft	h_o1	5.00 ft	h_o2	5.00 ft
L2	5.85 ft	h_b1	3.00 ft	h_b2	3.00 ft
L3	8.23 ft	Lo1	5.00 ft	Lo2	2.50 ft
h_{wall}	10.00 ft				
L_{wall}	23.98 ft				

Adj. Factor Method =	2bs/h
Wall Pier Aspect Ratio	Adj. Factor
P1=h_o/L1= 2.08	0.960
P2=h_o/L2= 0.85	N/A
P3=h_o/L3= 0.61	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 1613 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a1+h_b1) = 323 plf

Second opening: va2 = vb2 = H/(h_a2+h_b2) = 323 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 1613 lbf

Second opening: O2 = va2 x (Lo2) = 807 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 469 lbf

F2 = O1(L2)/(L1+L2) = 1144 lbf

F3 = O2(L2)/(L2+L3) = 335 lbf

F4 = O2(L3)/(L2+L3) = 471 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 1.45 ft

T2 = (L2*Lo1)/(L1+L2) = 3.55 ft

T3 = (L2*Lo2)/(L2+L3) = 1.04 ft

T4 = (L3*Lo2)/(L2+L3) = 1.46 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 259 plf

v2 = (V/L)(T2+L2+T3)/L2 = 288 plf

v3 = (V/L)(T4+L3)/L3 = 190 plf

Check v1*L1+v2*L2+v3*L3=V? 3868 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 622 lbf

R2 = v2*L2 = 1683 lbf

R3 = v3*L3 = 1563 lbf

8. Difference corner force + resistance

R1-F1 = 153 lbf

R2-F2-F3 = 204 lbf

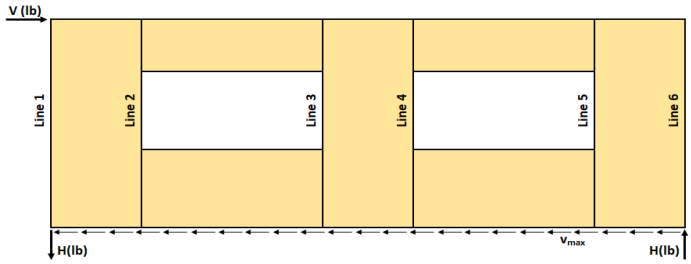
R3-F4 = 1092 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 64 plf

vc2 = (R2-F2-F3)/L2 = 35 plf

vc3 = (R3-F4)/L3 = 133 plf



Check Summary of Shear Values for Two Openings

Line 1: vc1(h_a1+h_b1)+v1(h_o1)=H?		318	1295	1613 lbf
Line 2: va1(h_a1+h_b1)-vc1(h_a1+h_b1)-v1(h_o1)=0?	1613	318	1295	0
Line 3: vc2(h_a1+h_b1)+v2(h_o1)-va1(h_a1+h_b1)=0?	175	1438	1613	0
Line 4: va2(h_a2+h_b2)-v2(h_o2)-vc2(h_a2+h_b2)=0?	1613	1438	175	0
Line 5: va2(h_a2+h_b2)-vc3(h_a2+h_b2)-v3(h_o2)=0?	1613	663	950	0
Line 6: vc3(h_a2+h_b2)+ v3(h_o2) = H?		663	950	1613 lbf

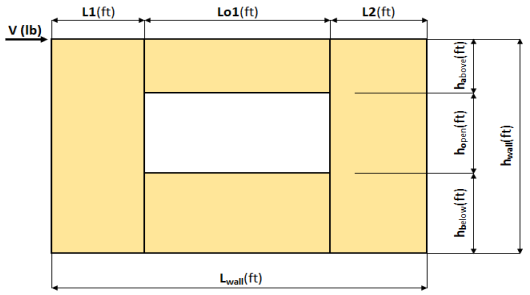
Design Summary*

Req. Sheathing Capacity	323 plf	**4-Term Deflection**	0.657 in.	**3-Term Deflection**	0.668 in.
Req. Strap Force	1144 lbf	**4-Term Story Drift %**	0.022 %	**3-Term Story Drift %**	0.022 %
Req. HD Force	1613 lbf				
Req. Shear Wall Anchorage Force	161 plf				

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

Project Information

Code:	2018 IBC	**Date:**	
Designer:	JDA		
Client:	CenterLine		
Project:	2956 72nd Ave SE (Mercer Island)		
Wall Line:	South (Main to Upper)		



Shear Wall Calculation Variables

V	1878 lbf	Opening 1	
L1	4.77 ft	h_a	2.00 ft
L2	3.23 ft	h_o	2.50 ft
h_{wall}	10.00 ft	h_b	5.50 ft
L_{wall}	13.00 ft	Lo1	5.00 ft

Adj. Factor Method =		2bs/h
Wall Pier Aspect Ratio		Adj. Factor
P1=h_o/L1=	0.52	N/A
P2=h_o/L2=	0.77	N/A

1. Hold-down forces: H = Vh_{wall}/L_{wall} 1445 lbf

2. Unit shear above + below opening

First opening: va1 = vb1 = H/(h_a+h_b) = 193 plf

3. Total boundary force above + below openings

First opening: O1 = va1 x (Lo1) = 963 lbf

4. Corner forces

F1 = O1(L1)/(L1+L2) = 574 lbf

F2 = O1(L2)/(L1+L2) = 389 lbf

5. Tributary length of openings

T1 = (L1*Lo1)/(L1+L2) = 2.98 ft

T2 = (L2*Lo1)/(L1+L2) = 2.02 ft

6. Unit shear beside opening

v1 = (V/L)(L1+T1)/L1 = 235 plf

v2 = (V/L)(T2+L2)/L2 = 235 plf

Check v1*L1+v2*L2=V? 1878 lbf **OK**

7. Resistance to corner forces

R1 = v1*L1 = 1120 lbf

R2 = v2*L2 = 758 lbf

8. Difference corner force + resistance

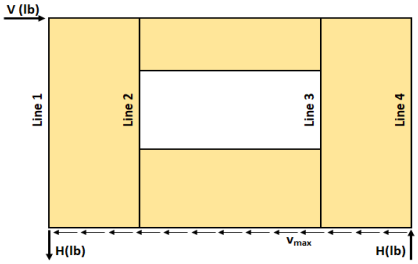
R1-F1 = 546 lbf

R2-F2 = 369 lbf

9. Unit shear in corner zones

vc1 = (R1-F1)/L1 = 114 plf

vc2 = (R2-F2)/L2 = 114 plf



Check Summary of Shear Values for One Opening

Line 1: vc1(h_a+h_b)+v1(h_o)=H?		858	587	1445 lbf
Line 2: va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?	1445	858	587	0
Line 3: va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?	1445	858	587	0
Line 4: vc2(h_a+h_b)+v2(h_o)=H?		858	587	1445 lbf

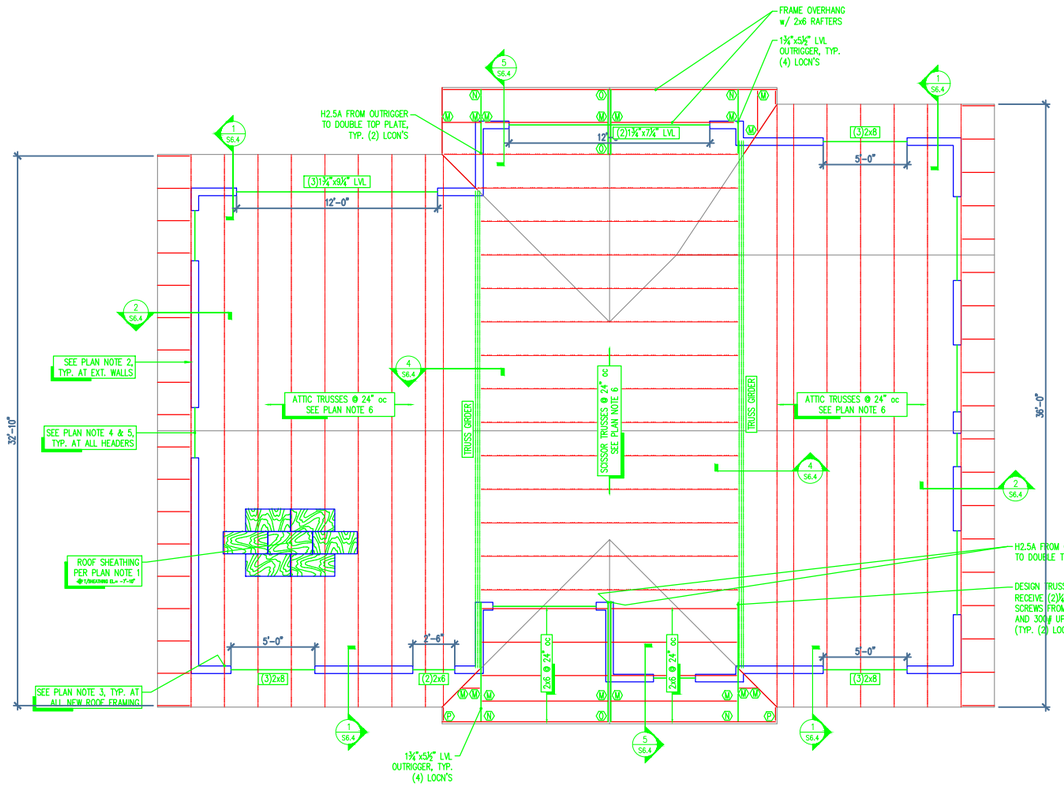
Design Summary*

Req. Sheathing Capacity	235 plf	**4-Term Deflection**	0.618 in.	**3-Term Deflection**	0.642 in.
Req. Strap Force	574 lbf	**4-Term Story Drift %**	0.021 %	**3-Term Story Drift %**	0.021 %
Req. HD Force (H)	1445 lbf				
Req. Shear Wall Anchorage Force (v_{max})	144 plf				

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

LEGEND

- STRUCTURAL WOOD STUDWALL BELOW
- POST BELOW
- HEADER or BEAM
- CONNECTOR PLATE WOOD TRUSS
- ROOF FRAMING



ROOF FRAMING PLAN NOTES

1. ROOF SHEATHING SHALL CONSIST OF ⅞" SHEATHING (PANEL SPAN RATING 32/16) NAILED AT ALL FRAMED PANEL EDGES, DIAPHRAGM BOUNDARIES, AND SHEAR WALLS w/ 10d @ 6" oc; AND AT ALL INTERMEDIATE SUPPORTS w/ 10d @ 12" oc (SEE 3/S6.2).
2. DASHED WALLS AND SHEARWALLS SHOWN IN PLAN ARE BELOW ROOF FRAMING ELEVATION.
3. PROVIDE H2.5A HURRICANE TIES AT EACH END OF ALL ROOF FRAMING.
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 #9, 10, AND 22 FOR CONNECTOR PLATE ROOF TRUSS REQUIREMENTS.

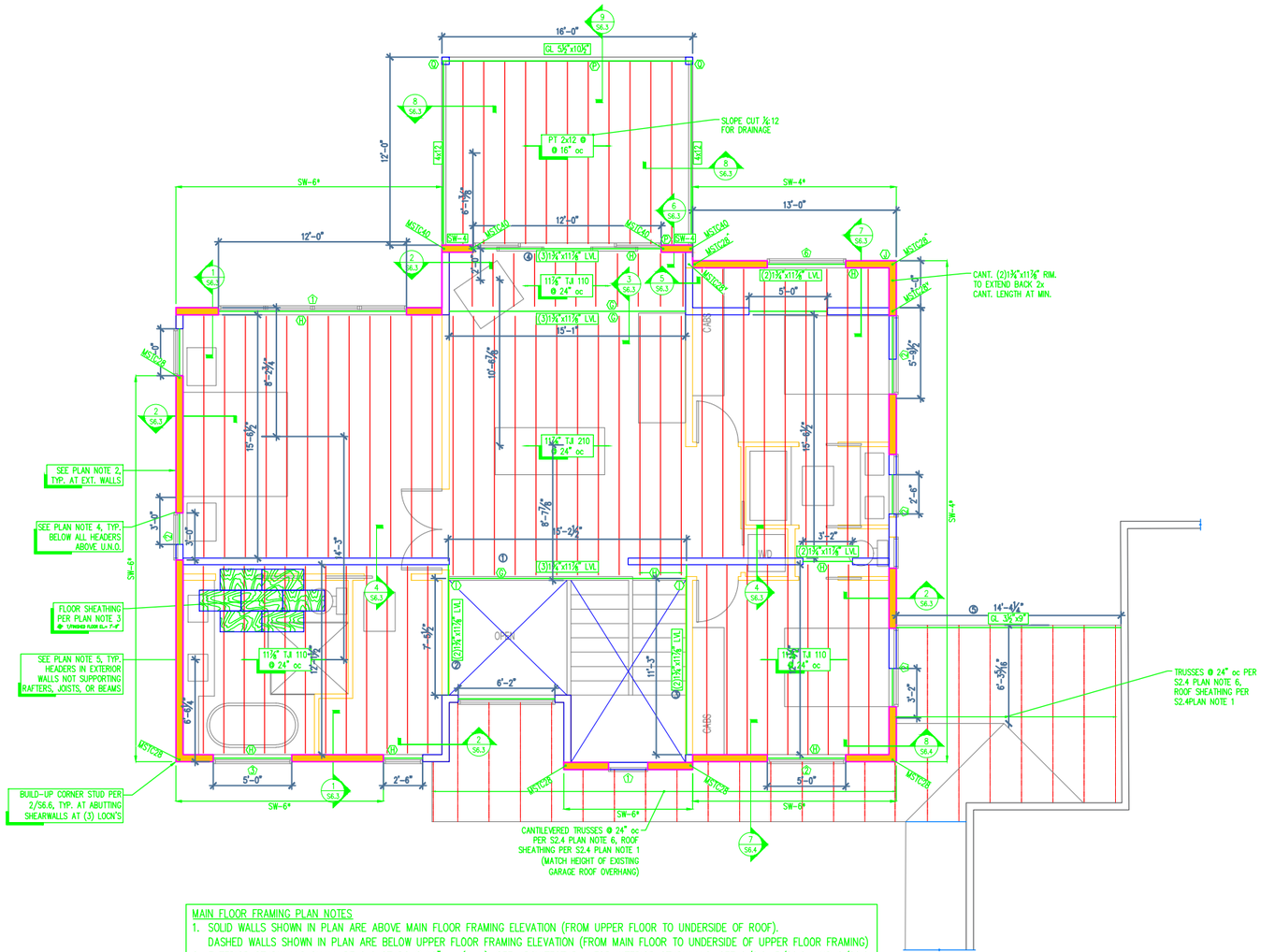
1 / S2.4 ROOF FRAMING PLAN

1/4" = 1'-0"

NORTH

LEGEND

- STRUCTURAL WOOD STUDWALL BELOW
- STRUCTURAL WOOD STUDWALL
- POST BELOW
- POST
- HEADER or BEAM
- JOIST
- SW–_ — DENOTES EXTENT OF SHEARWALL TYPE SW–_ PER 1/S6.5
- 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 or 8/S6.6
  - * – DENOTES TRANSFER TIE FROM TIE ABOVE
  - * – DENOTES TIE ATOP STEEL BEAM, SEE 8/S6.6



MAIN FLOOR FRAMING PLAN NOTES

1. SOLID WALLS SHOWN IN PLAN ARE ABOVE MAIN FLOOR FRAMING ELEVATION (FROM UPPER FLOOR TO UNDERSIDE OF ROOF). DASHED WALLS SHOWN IN PLAN ARE BELOW UPPER FLOOR FRAMING ELEVATION (FROM MAIN FLOOR TO UNDERSIDE OF UPPER FLOOR FRAMING)
2. EXTERIOR STUDWALLS SHALL BE 2x6 STUDS @ 16" oc (MAX). SEE ARCHITECTURAL FOR INTERIOR STUDWALLS. SEE 6/6.2, 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, AND SHEAR WALLS w/ 10d @ 6" oc; AND AT ALL INTERMEDIATE SUPPORTS w/ 10d @ 12" oc (SEE 3/S6.1). 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/S6.2 AT NON-LOAD BEARING EXTERIOR WALLS, AND PER 6/S6.2 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.

1 / S2.3 — UPPER FLOOR FRAMING PLAN

1/4" = 1'-0"

NORTH

LEGEND

- CONCRETE WALL BELOW
- CONCRETE WALL
- STRUCTURAL WOOD STUDWALL
- POST BELOW
- POST
- HEADER or BEAM
- JOIST

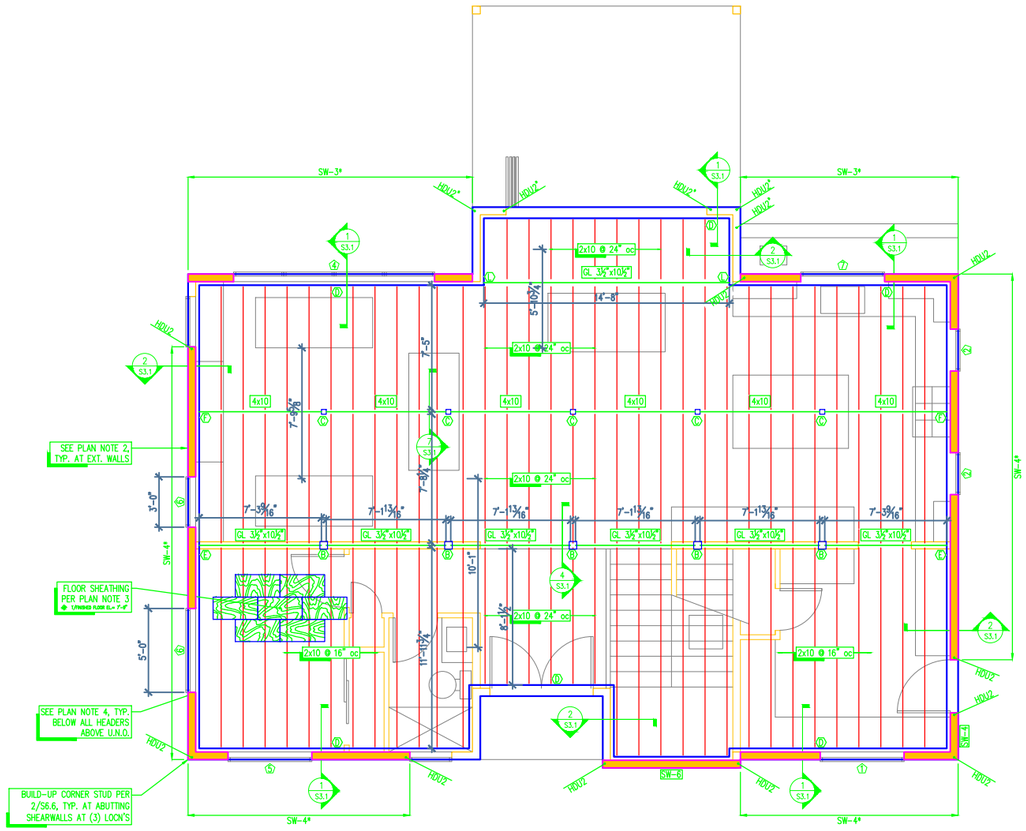
SW–_ — DENOTES EXTENT OF SHEARWALL TYPE SW–_ PER 1/S6.5

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 or 8/S6.6

* – DENOTES TRANSFER TIE FROM TIE ABOVE

* – DENOTES TIE ATOP STEEL BEAM, SEE 8/S6.6



MAIN FLOOR FRAMING PLAN NOTES

1. SOLID WALLS SHOWN IN PLAN ARE ABOVE MAIN FLOOR FRAMING ELEVATION (FROM MAIN FLOOR TO UNDERSIDE OF UPPER FLOOR). DASHED WALLS SHOWN IN PLAN ARE BELOW MAIN FLOOR FRAMING ELEVATION (FROM FOUNDATION TO UNDERSIDE OF MAIN FLOOR FRAMING)
2. EXTERIOR STUDWALLS SHALL BE 2x6 STUDS @ 16" oc (MAX). SEE ARCHITECTURAL FOR INTERIOR STUDWALLS. SEE 6/6.2, 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, AND SHEAR WALLS w/ 10d @ 6" oc; AND AT ALL INTERMEDIATE SUPPORTS w/ 10d @ 12" oc (SEE 3/S6.1). 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/S6.2 AT NON-LOAD BEARING EXTERIOR WALLS, AND PER 6/S6.2 AT LOAD BEARING EXTERIOR WALLS

1 / S2.2 — MAIN FLOOR FRAMING PLAN

1/4" = 1'-0"

NORTH

Roof			
Member Name	Results (Max UTIL %)	Current Solution	Comments
5' Header	Passed (92% M)	3 piece(s) 2 x 8 DF No.2	
2.5' Header	Passed (55% M)	2 piece(s) 2 x 6 DF No.2	
12' Header (attic)	Passed (97% M)	3 piece(s) 1 3/4" x 9 1/4" 2.0E Microllam® LVL	
12' Header (scissor)	Passed (54% ΔT)	2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL	
Upper			
Member Name	Results (Max UTIL %)	Current Solution	Comments
5' Header	Passed (79% R)	1 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	
2.5' Header	Passed (58% R)	1 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	
12' Header	Passed (94% R)	2 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	
Floor: Joist (15'-6.5")	Passed (94% M)	1 piece(s) 11 7/8" TJI® 210 @ 24" OC	
Floor: Joist (12'-1.5")	Passed (72% M)	1 piece(s) 11 7/8" TJI® 110 @ 24" OC	
Deck Joist	Passed (80% M)	1 piece(s) 2 x 10 DF No.2 @ 16" OC	
Deck Beam	Passed (92% ΔL)	1 piece(s) 5 1/2" x 10 1/2" 24F-V4 DF Glulam	
Floor: Flush Beam at North Nook	Passed (100% ΔL)	3 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	
1	Passed (80% ΔL)	3 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	
2	Passed (52% V)	2 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	
3	Passed (57% V)	2 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	
4	Failed (112% R)	2 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL	Support 1 failed reaction check due to insufficient bearing capacity.
5	Passed (74% ΔT)	1 piece(s) 3 1/2" x 9" 24F-V4 DF Glulam	
Main			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Floor: Drop Beam w/ Bearing Wall Above	Passed (100% R)	1 piece(s) 3 1/2" x 10 1/2" 24F-V4 DF Glulam	
Floor: Drop Beam	Passed (71% M)	1 piece(s) 4 x 10 DF No.1	
Floor: Drop Beam at North Nook	Passed (92% ΔT)	1 piece(s) 3 1/2" x 10 1/2" 24F-V4 DF Glulam	
Floor: Joist (11'-11.75")	Passed (78% M)	1 piece(s) 2 x 10 DF No.2 @ 16" OC	
Floor: Joist (8'-1.5")	Passed (54% M)	1 piece(s) 2 x 10 DF No.2 @ 24" OC	

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

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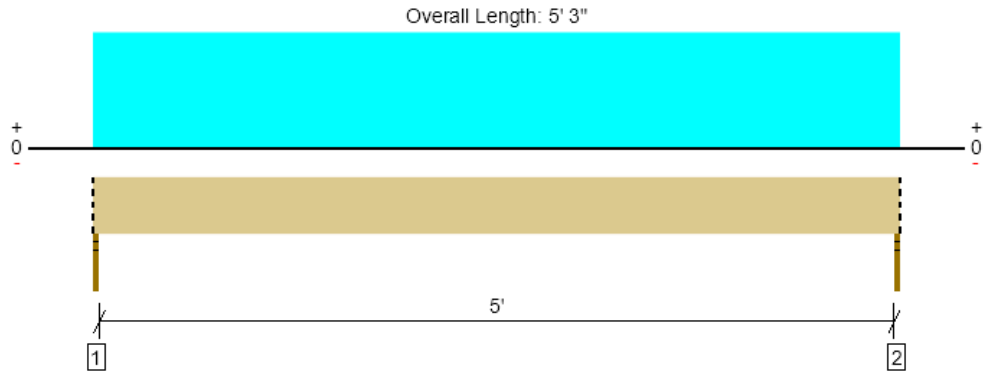
File Name: WuChang

Roof, 5' Header
3 piece(s) 2 x 8 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2850 @ 0	4219 (1.50")	Passed (68%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2058 @ 8 3/4"	4502	Passed (46%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	3741 @ 2' 7 1/2"	4080	Passed (92%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.050 @ 2' 7 1/2"	0.262	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.081 @ 2' 7 1/2"	0.350	Passed (L/776)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 5' 3"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	Floor Live	Snow	Factored	
1 - Stud wall - DF	1.50"	1.50"	1.50"	1078	945	1418	2850	Blocking
2 - Stud wall - DF	1.50"	1.50"	1.50"	1078	945	1418	2850	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' 3" o/c	
Bottom Edge (Lu)	5' 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 5' 3"	N/A	8.3	--	--	
1 - Uniform (PSF)	0 to 5' 3" (Top)	18'	22.4	20.0	30.0	Default Load

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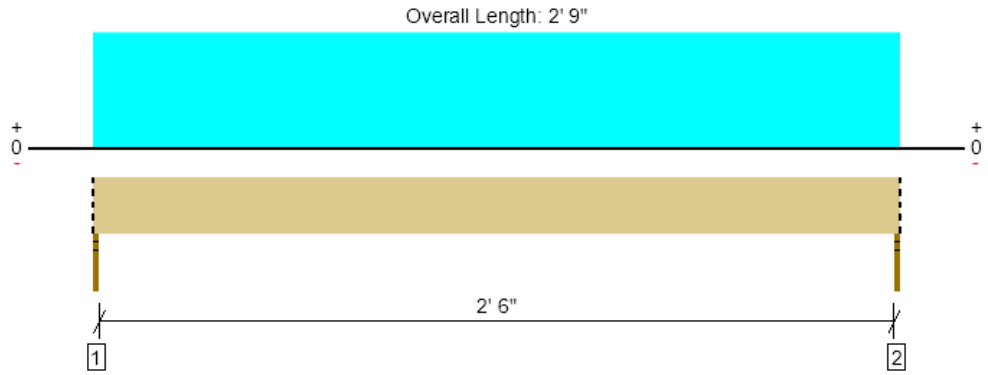
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, 2.5' Header
2 piece(s) 2 x 6 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1364 @ 0	2813 (1.50")	Passed (48%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	785 @ 7"	2277	Passed (34%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	938 @ 1' 4 1/2"	1696	Passed (55%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.012 @ 1' 4 1/2"	0.138	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.019 @ 1' 4 1/2"	0.183	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 2' 9"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	Floor Live	Snow	Factored	
1 - Stud wall - DF	1.50"	1.50"	1.50"	513	454	681	1364	Blocking
2 - Stud wall - DF	1.50"	1.50"	1.50"	513	454	681	1364	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' 9" o/c	
Bottom Edge (Lu)	2' 9" 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 2' 9"	N/A	4.2	--	--	
1 - Uniform (PSF)	0 to 2' 9" (Top)	16' 6"	22.4	20.0	30.0	Default Load

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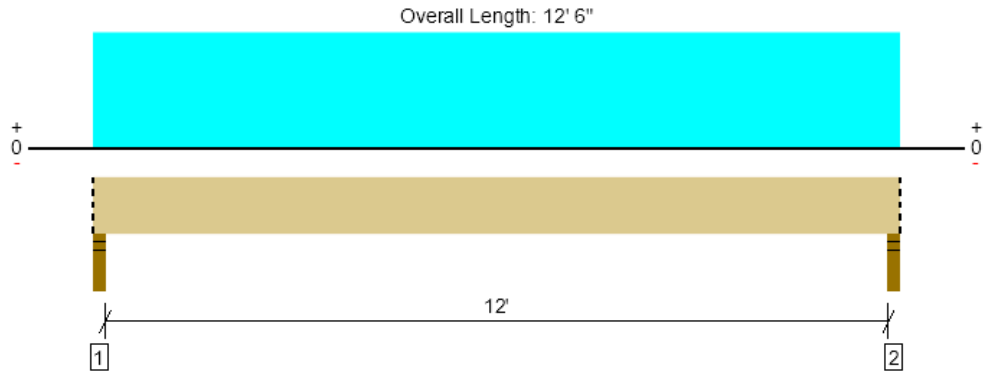
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Roof, 12' Header (attic)

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)	6262 @ 1 1/2"	9844 (3.00")	Passed (64%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5239 @ 1' 1/4"	10611	Passed (49%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	18793 @ 6' 3"	19327	Passed (97%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.480 @ 6' 3"	0.613	Passed (L/306)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.778 @ 6' 3"	0.817	Passed (L/189)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 12' 6"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	Floor Live	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.91"	2394	2063	3094	6262	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.91"	2394	2063	3094	6262	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' 1" o/c	
Bottom Edge (Lu)	12' 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 12' 6"	N/A	14.2	--	--	
1 - Uniform (PSF)	0 to 12' 6" (Top)	16' 6"	22.4	20.0	30.0	Default Load

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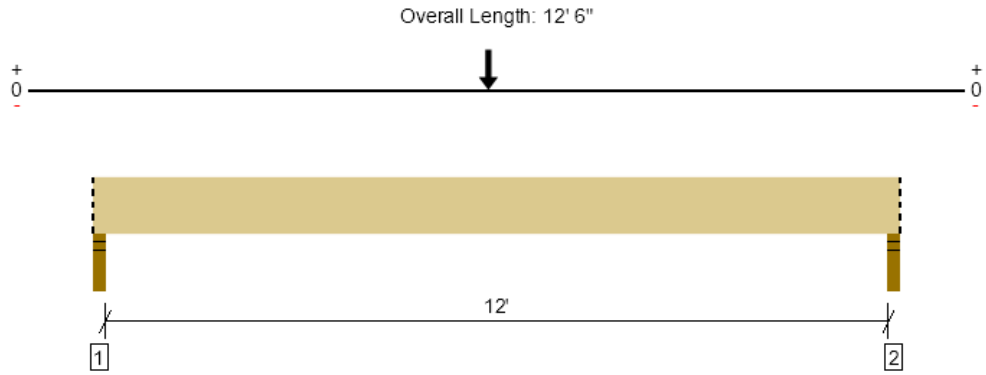
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Roof, 12' Header (scissor)
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)	735 @ 1 1/2"	6563 (3.00")	Passed (11%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	729 @ 10 1/4"	5544	Passed (13%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4271 @ 6' 1 1/2"	8182	Passed (52%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.280 @ 6' 1 1/2"	0.613	Passed (L/525)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.438 @ 6' 1 1/2"	0.817	Passed (L/336)	--	1.0 D + 1.0 S (All Spans)

Member Length : 12' 6"
System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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"	276	459	735	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	267	441	707	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' 6" o/c	
Bottom Edge (Lu)	12' 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 12' 6"	N/A	7.4	--	
1 - Point (lb)	6' 1 1/2" (Top)	N/A	450	900	30 sf trib as point load

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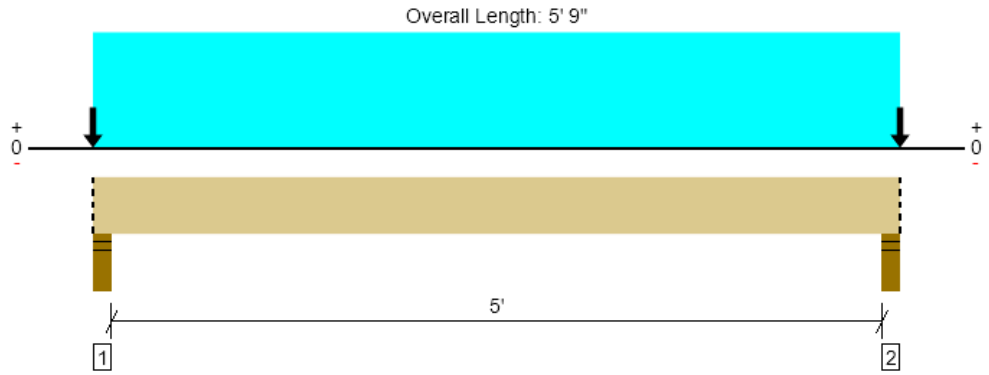
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper, 5' Header

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



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3899 @ 3"	4922 (4.50")	Passed (79%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	649 @ 1' 4 3/8"	3948	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1481 @ 2' 10 1/2"	8924	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.014 @ 2' 10 1/2"	0.175	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.023 @ 2' 10 1/2"	0.262	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 5' 9"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	4.50"	4.50"	3.56"	1564	1695	1418	3899	Blocking
2 - Stud wall - DF	4.50"	4.50"	3.56"	1564	1695	1418	3899	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' 9" o/c	
Bottom Edge (Lu)	5' 9" 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 5' 9"	N/A	6.1	--	--	
1 - Uniform (PSF)	0 to 5' 9" (Top)	6' 6 1/4"	25.0	40.0	-	Default Load
2 - Point (lb)	0 (Front)	N/A	1078	945	1418	Linked from: 5' Header, Support 1
3 - Point (lb)	5' 9" (Front)	N/A	1078	945	1418	Linked from: 5' Header, Support 2

Member Notes

(converted from: Roof Flush Beam)

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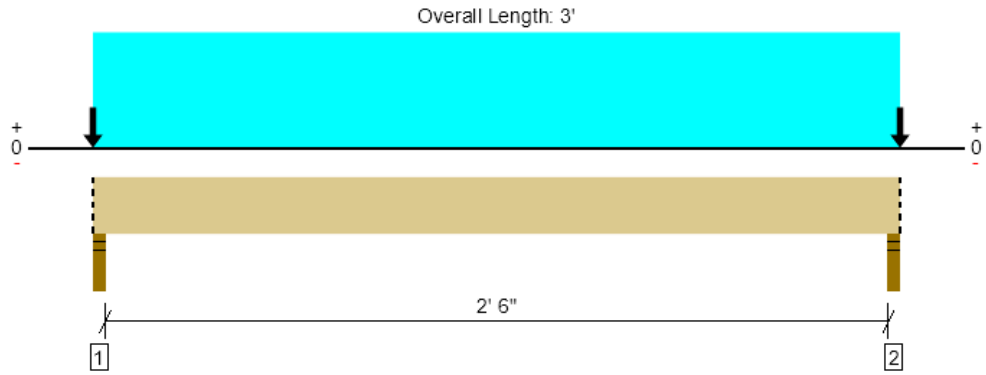
Weyerhaeuser

Upper, 2.5' Header
1 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1911 @ 1 1/2"	3281 (3.00")	Passed (58%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	112 @ 1' 2 7/8"	3948	Passed (3%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	406 @ 1' 6"	8924	Passed (5%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.002 @ 1' 6"	0.092	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.003 @ 1' 6"	0.138	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 2021
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"	1.75"	767	845	681	1911	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.75"	767	845	681	1911	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' o/c	
Bottom Edge (Lu)	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'	N/A	6.1	--	--	
1 - Uniform (PSF)	0 to 3' (Top)	6' 6 1/4"	25.0	40.0	-	Default Load
2 - Point (lb)	0 (Front)	N/A	513	454	681	Linked from: 2.5' Header, Support 1
3 - Point (lb)	3' (Front)	N/A	513	454	681	Linked from: 2.5' Header, Support 2

Member Notes

(converted from: Roof Flush Beam)

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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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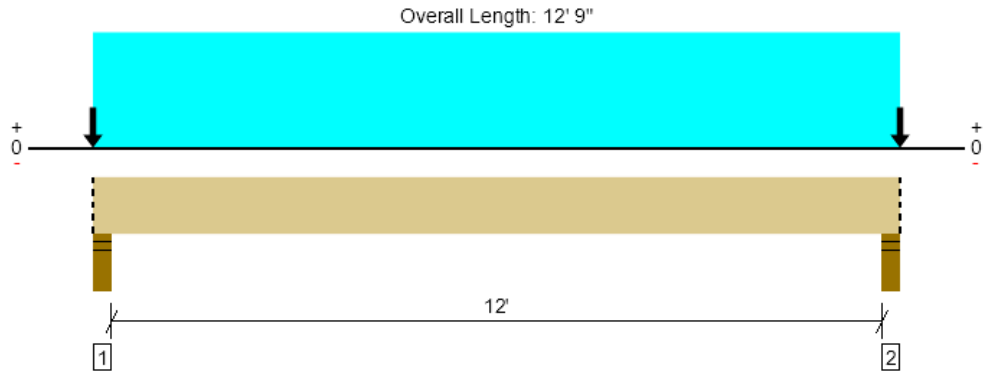
Weyerhaeuser

Upper, 12' Header
2 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	9224 @ 3"	9844 (4.50")	Passed (94%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2741 @ 1' 4 3/8"	7897	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	10261 @ 6' 4 1/2"	17848	Passed (57%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.188 @ 6' 4 1/2"	0.408	Passed (L/783)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.312 @ 6' 4 1/2"	0.613	Passed (L/471)	--	1.0 D + 1.0 L (All Spans)

Member Length : 12' 9"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	4.50"	4.50"	4.22"	3783	4161	3094	9224	Blocking
2 - Stud wall - DF	4.50"	4.50"	4.22"	3783	4161	3094	9224	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' 9" o/c	
Bottom Edge (Lu)	12' 9" 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 12' 9"	N/A	12.1	--	--	
1 - Uniform (PSF)	0 to 12' 9" (Top)	8' 2 3/4"	25.0	40.0	-	Default Load
2 - Point (lb)	0 (Front)	N/A	2394	2063	3094	Linked from: 12' Header (attic), Support 1
3 - Point (lb)	12' 9" (Front)	N/A	2394	2063	3094	Linked from: 12' Header (attic), Support 2

Member Notes

(converted from: Roof Flush Beam)

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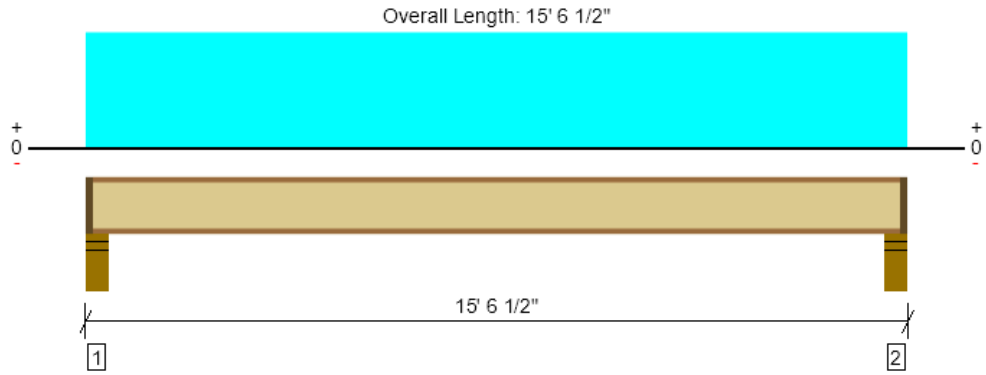
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper, Floor: Joist (15'-6.5")
1 piece(s) 11 7/8" TJI® 210 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	991 @ 4 1/2"	1460 (3.50")	Passed (68%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	951 @ 5 1/2"	1655	Passed (57%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3555 @ 7' 9 1/4"	3795	Passed (94%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.250 @ 7' 9 1/4"	0.370	Passed (L/709)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.407 @ 7' 9 1/4"	0.740	Passed (L/436)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	41	40	Passed	--	--

Member Length : 15' 3"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - DF	5.50"	3.75"	1.75"	389	622	1010	1 3/4" Rim Board
2 - Stud wall - DF	5.50"	3.75"	1.75"	389	622	1010	1 3/4" 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)	3' 9" o/c	
Bottom Edge (Lu)	15' 3" o/c	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 15' 6 1/2"	24"	25.0	40.0	Default Load

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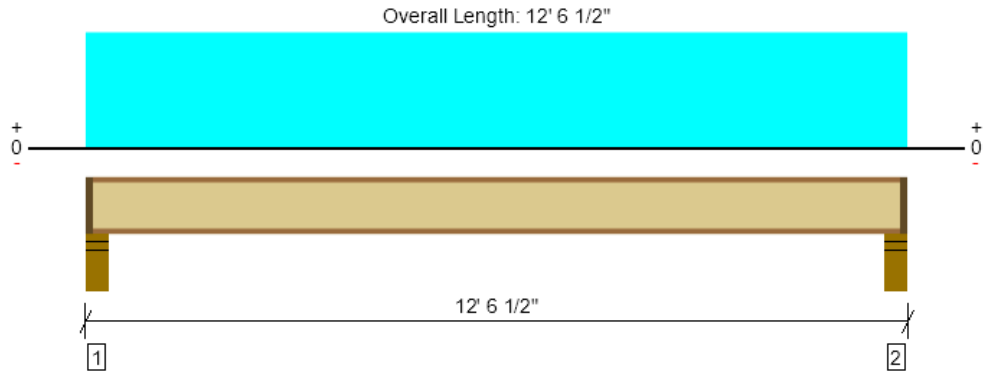
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper, Floor: Joist (12'-1.5")
1 piece(s) 11 7/8" TJI® 110 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	796 @ 4 1/2"	1375 (3.50")	Passed (58%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	756 @ 5 1/2"	1560	Passed (48%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2259 @ 6' 3 1/4"	3160	Passed (72%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.123 @ 6' 3 1/4"	0.295	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.200 @ 6' 3 1/4"	0.590	Passed (L/707)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	50	40	Passed	--	--

Member Length : 12' 3"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - DF	5.50"	3.75"	1.75"	314	502	815	1 3/4" Rim Board
2 - Stud wall - DF	5.50"	3.75"	1.75"	314	502	815	1 3/4" 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)	3' 9" o/c	
Bottom Edge (Lu)	12' 3" o/c	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 12' 6 1/2"	24"	25.0	40.0	Default Load

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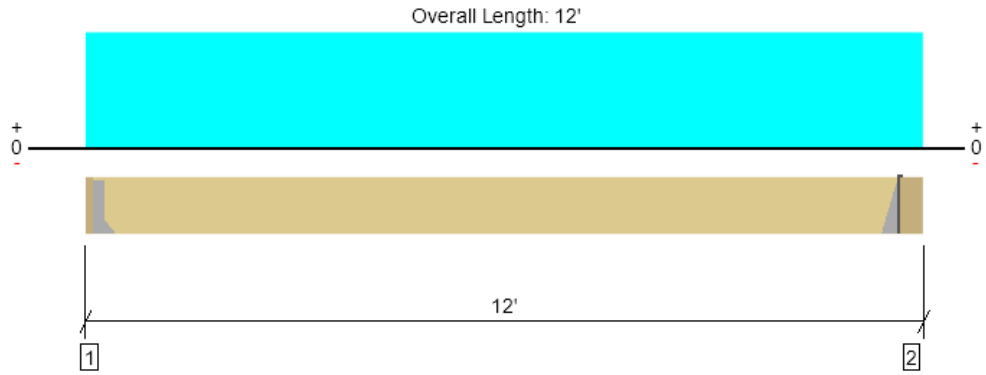
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, Deck Joist
1 piece(s) 2 x 10 DF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	570 @ 1 3/4"	1406 (1.50")	Passed (41%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	493 @ 11"	1665	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1623 @ 5' 10 1/8"	2029	Passed (80%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.192 @ 5' 10 1/8"	0.285	Passed (L/713)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.240 @ 5' 10 1/8"	0.570	Passed (L/570)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 11' 4 3/4"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2021
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 - Hanger on 9 1/4" LVL beam	1.75"	Hanger[1]	1.50"	117	467	584	See note [1]
2 - Hanger on 9 1/4" GLB beam	5.50"	Hanger[1]	1.50"	123	492	616	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)	6' 6" o/c	
Bottom Edge (Lu)	11' 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
1 - Face Mount Hanger	LU28	1.50"	N/A	8-10dx1.5	6-10dx1.5	
2 - Top Mount Hanger	THA213	1.75"	4-10d	2-10d	4-10dx1.5	

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 12'	16"	15.0	60.0	Default Load

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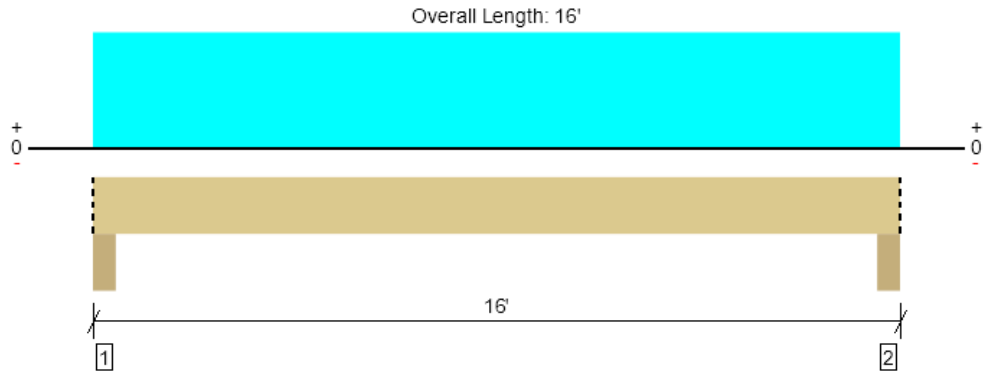
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper, Deck Beam

1 piece(s) 5 1/2" x 10 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3712 @ 4"	19663 (5.50")	Passed (19%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3094 @ 1' 4"	10203	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	13638 @ 8'	20213	Passed (67%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.469 @ 8'	0.511	Passed (L/392)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.604 @ 8'	0.767	Passed (L/304)	--	1.0 D + 1.0 L (All Spans)

Member Length : 16'
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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' 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 - DF	5.50"	5.50"	1.50"	832	2880	3712	Blocking
2 - Column - DF	5.50"	5.50"	1.50"	832	2880	3712	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' o/c	
Bottom Edge (Lu)	16' 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'	N/A	14.0	--	
1 - Uniform (PSF)	0 to 16' (Top)	6'	15.0	60.0	Default Load

Member Notes

(converted from: Roof Flush Beam)

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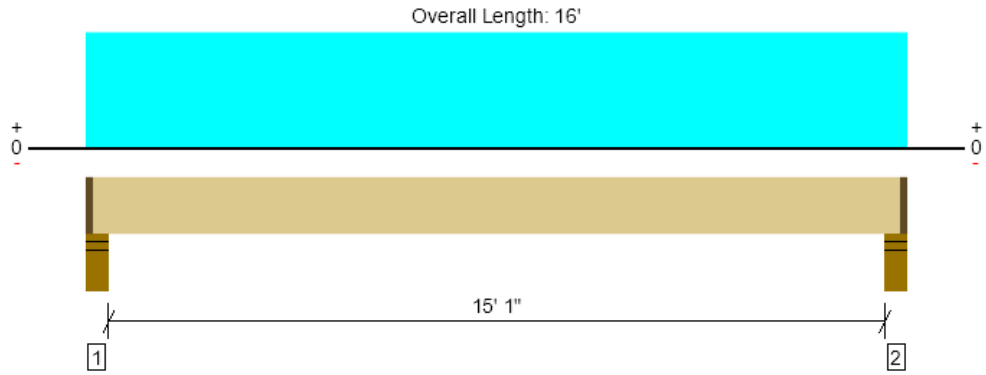
ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, Floor: Flush Beam at North Nook

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5541 @ 4"	12305 (3.75")	Passed (45%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4622 @ 1' 5 3/8"	11845	Passed (39%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	20732 @ 8'	26772	Passed (77%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.382 @ 8'	0.383	Passed (L/482)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.637 @ 8'	0.767	Passed (L/289)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15' 8 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	5.50"	3.75"	1.69"	2257	3383	5641	1 3/4" Rim Board
2 - Stud wall - DF	5.50"	3.75"	1.69"	2257	3383	5641	1 3/4" 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)	12' 4" o/c	
Bottom Edge (Lu)	15' 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)	1 3/4" to 15' 10 1/4"	N/A	18.2	--	
1 - Uniform (PSF)	0 to 16' (Top)	10' 6 7/8"	25.0	40.0	Default Load

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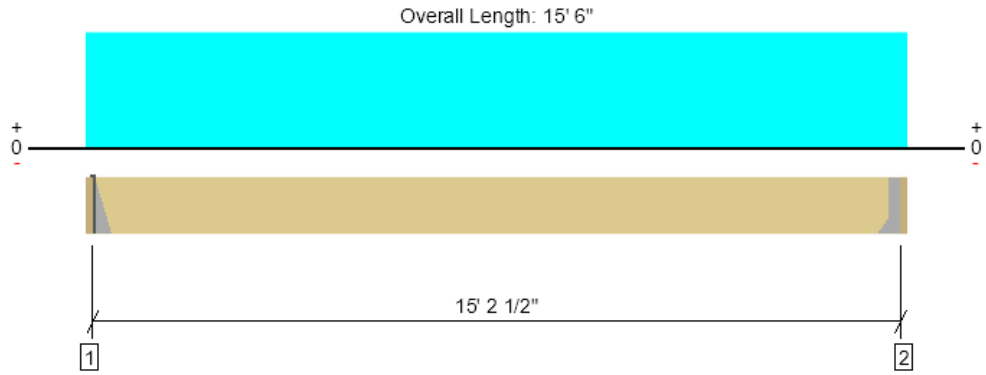
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 1

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4417 @ 1 3/4"	5906 (1.50")	Passed (75%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3842 @ 1' 1 5/8"	11845	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	16793 @ 7' 9"	26772	Passed (63%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.303 @ 7' 9"	0.380	Passed (L/602)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.508 @ 7' 9"	0.760	Passed (L/359)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15' 2 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 11 7/8" LVL beam	1.75"	Hanger[1]	1.50"	1815	2683	4499	See note [1]
2 - Hanger on 11 7/8" LVL beam	1.75"	Hanger[1]	1.50"	1815	2683	4499	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)	15' 3" o/c	
Bottom Edge (Lu)	15' 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	HHUS5.50/10	3.00"	N/A	30-16d	10-16d	

- 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)	1 3/4" to 15' 4 1/4"	N/A	18.2	--	
1 - Uniform (PSF)	0 to 15' 6" (Top)	8' 7 7/8"	25.0	40.0	Default Load

Weyerhaeuser Notes

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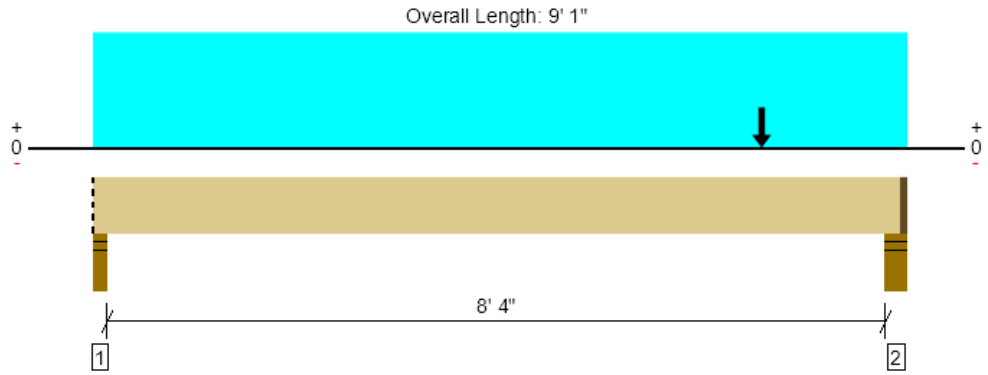
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper, 2

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4264 @ 8' 9"	8203 (3.75")	Passed (52%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4135 @ 7' 7 5/8"	7897	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5401 @ 7' 5 1/2"	17848	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.041 @ 4' 10 15/16"	0.215	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.070 @ 4' 10 7/8"	0.429	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 8' 11 1/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	3.50"	3.50"	1.50"	476	642	1117	Blocking
2 - Stud wall - DF	5.50"	3.75"	1.95"	1750	2526	4276	1 3/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- 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' 11" o/c	
Bottom Edge (Lu)	8' 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 8' 11 1/4"	N/A	12.1	--	
1 - Uniform (PSF)	0 to 9' 1" (Top)	1' 4"	25.0	40.0	Default Load
2 - Point (lb)	7' 5 1/2" (Front)	N/A	1815	2683	Linked from: 1, Support 1

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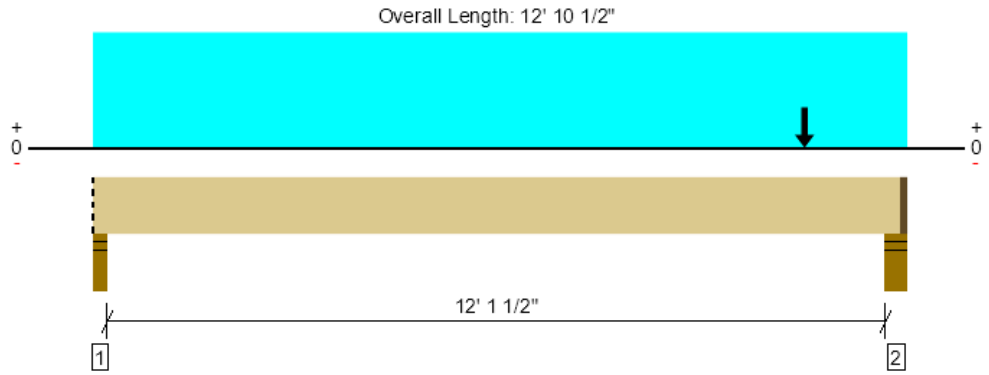
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper, 3

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4658 @ 12' 6 1/2"	8203 (3.75")	Passed (57%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4530 @ 11' 5 1/8"	7897	Passed (57%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5912 @ 11' 1 1/4"	17848	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.096 @ 6' 11 1/4"	0.309	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.166 @ 6' 11"	0.619	Passed (L/896)	--	1.0 D + 1.0 L (All Spans)

Member Length : 12' 8 3/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	3.50"	3.50"	1.50"	478	619	1097	Blocking
2 - Stud wall - DF	5.50"	3.75"	2.13"	1920	2751	4671	1 3/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- 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' 9" o/c	
Bottom Edge (Lu)	12' 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 12' 8 3/4"	N/A	12.1	--	
1 - Uniform (PSF)	0 to 12' 10 1/2" (Top)	1' 4"	25.0	40.0	Default Load
2 - Point (lb)	11' 3" (Front)	N/A	1815	2683	Linked from: 1, Support 1

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

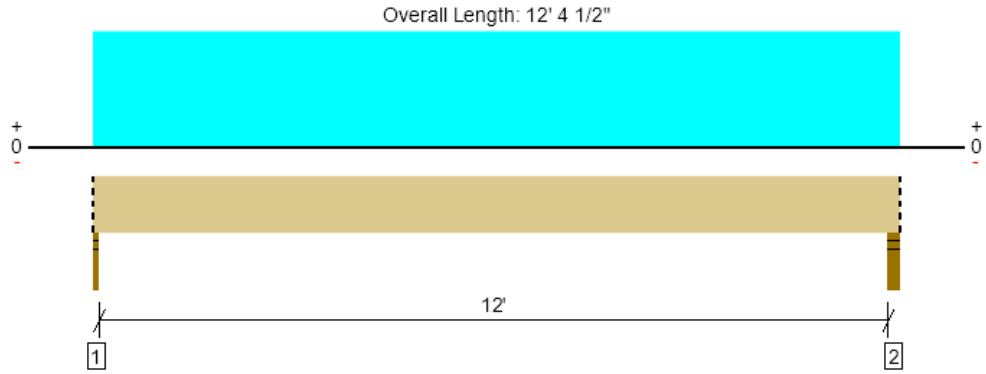
ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Upper, 4

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

Support 1 failed reaction check due to insufficient bearing capacity.



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)	3679 @ 0	3281 (1.50")	Failed (112%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3010 @ 1' 1 3/8"	7897	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	11268 @ 6' 1 1/2"	17848	Passed (63%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.255 @ 6' 1 1/2"	0.306	Passed (L/576)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.343 @ 6' 1 1/2"	0.613	Passed (L/429)	--	1.0 D + 1.0 L (All Spans)

Member Length : 12' 4 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
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	1.50"	1.50"	1.68"	942	2737	3679	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.72"	962	2793	3754	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' 5" o/c	
Bottom Edge (Lu)	12' 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 12' 4 1/2"	N/A	12.1	--	
1 - Uniform (PSF)	0 to 12' 4 1/2" (Top)	2'	25.0	40.0	Default Load
2 - Uniform (PSF)	0 to 12' 4 1/2" (Top)	6' 1 3/8"	15.0	60.0	Default Load

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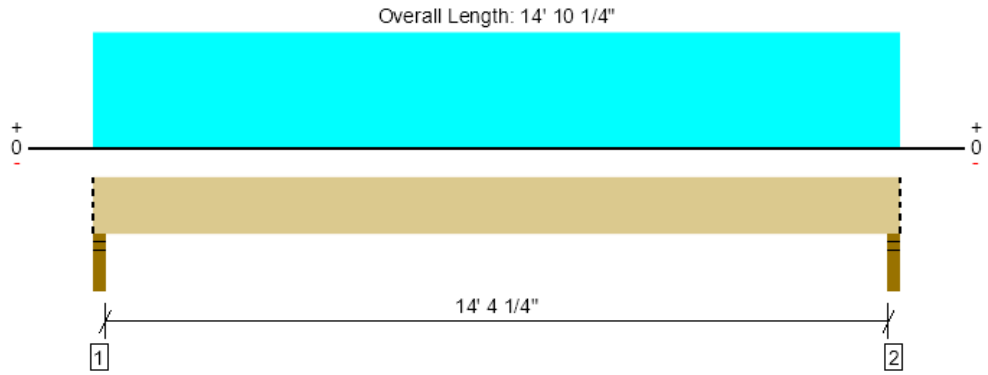
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Upper, 5

1 piece(s) 3 1/2" x 9" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2006 @ 1 1/2"	6563 (3.00")	Passed (31%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1735 @ 1'	6400	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	7199 @ 7' 5 1/8"	10868	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.420 @ 7' 5 1/8"	0.730	Passed (L/417)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.722 @ 7' 5 1/8"	0.974	Passed (L/243)	--	1.0 D + 1.0 S (All Spans)

Member Length : 14' 10 1/4"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 14' 7 1/4".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	3.00"	3.00"	1.50"	839	1166	2006	Blocking
2 - Stud wall - DF	3.00"	3.00"	1.50"	839	1166	2006	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)	14' 10" o/c	
Bottom Edge (Lu)	14' 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 14' 10 1/4"	N/A	7.7	--	
1 - Uniform (PSF)	0 to 14' 10 1/4" (Top)	6' 3 3/8"	16.8	25.0	Default Load

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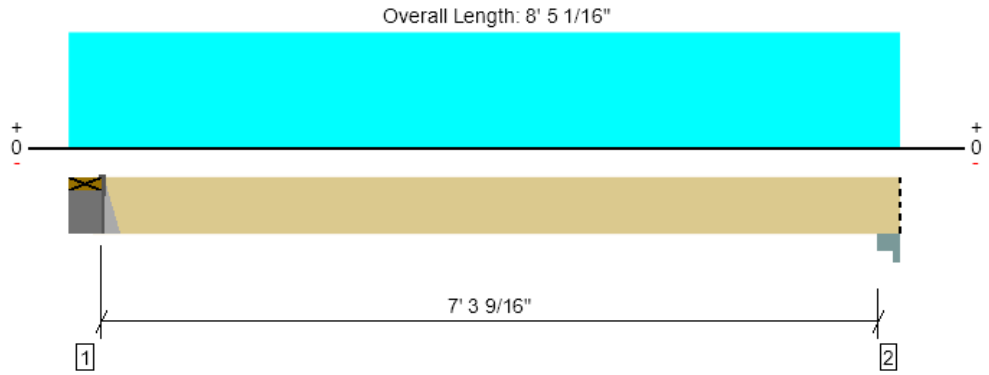
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Main, Floor: Drop Beam w/ Bearing Wall Above
1 piece(s) 3 1/2" x 10 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6348 @ 8"	6348 (2.79")	Passed (100%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4851 @ 1' 6 1/2"	6493	Passed (75%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	11778 @ 4' 4 1/2"	12863	Passed (92%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.109 @ 4' 4 1/2"	0.247	Passed (L/815)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.192 @ 4' 4 1/2"	0.371	Passed (L/463)	--	1.0 D + 1.0 L (All Spans)

Member Length : 7' 9 1/16"
System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2021
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 = 7' 5 1/16".
- 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 - Hanger on Single 2X DF plate	8.00"	Hanger[1]	2.79"	3222	4261	7482	See note [1]
2 - Column Cap - steel	5.50"	5.50"	3.04"	2982	3936	6918	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)	7' 9" o/c	
Bottom Edge (Lu)	7' 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 - Top Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	8" to 8' 5 1/16"	N/A	8.9	--	
1 - Uniform (PSF)	0 to 8' 5 1/16" (Top)	10' 1"	25.0	40.0	Default Load
2 - Uniform (PSF)	0 to 8' 5 1/16" (Top)	14' 3"	25.0	40.0	Default Load
3 - Uniform (PSF)	0 to 8' 5 1/16" (Front)	10'	12.0	-	Studwall

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

Weyerhaeuser

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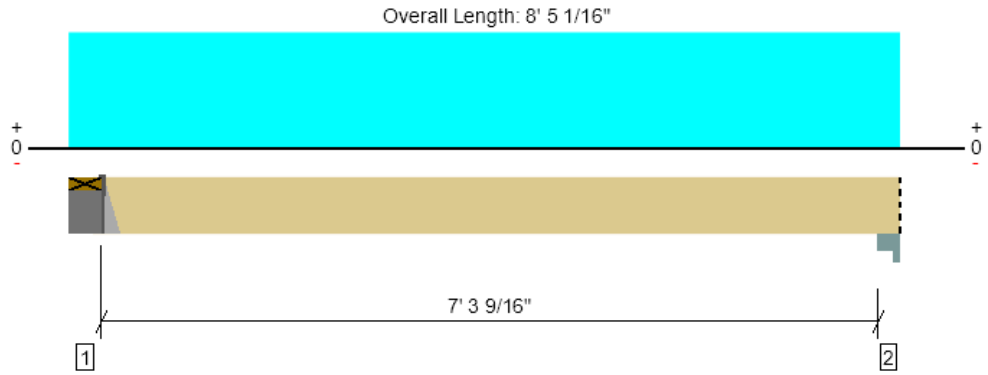
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Main, Floor: Drop Beam
1 piece(s) 4 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)	1920 @ 8"	3281 (1.50")	Passed (59%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1521 @ 1' 5 1/4"	3885	Passed (39%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3562 @ 4' 4 1/2"	4991	Passed (71%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.055 @ 4' 4 1/2"	0.247	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.090 @ 4' 4 1/2"	0.371	Passed (L/990)	--	1.0 D + 1.0 L (All Spans)

Member Length : 7' 9 1/16"
System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on Single 2X DF plate	8.00"	Hanger[1]	1.50"	888	1372	2259	See note [1]
2 - Column Cap - steel	5.50"	5.50"	1.50"	825	1267	2092	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)	7' 9" o/c	
Bottom Edge (Lu)	7' 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 - Top Mount Hanger	BA3.56/9.25	3.00"	6-10dx1.5	4-10dx1.5	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)	8" to 8' 5 1/16"	N/A	8.2	--	
1 - Uniform (PSF)	0 to 8' 5 1/16" (Top)	7' 10"	25.0	40.0	Default Load

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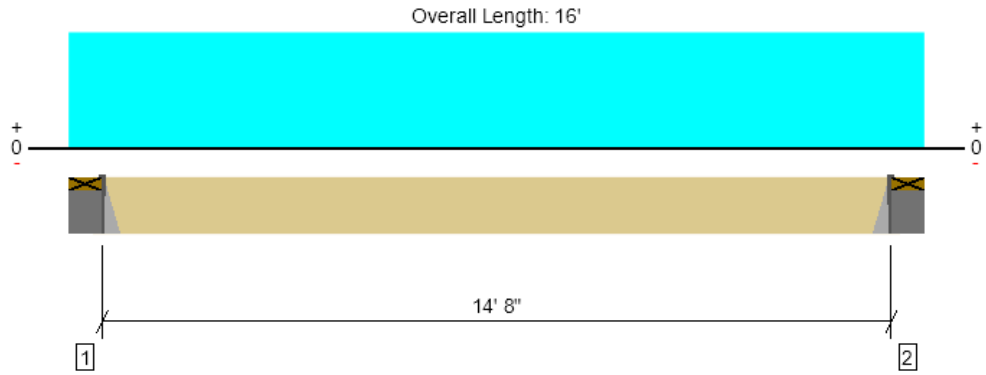
ForteWEB Software Operator	Job Notes
Javid Abdi Atlas Consulting Engineers (206) 427-7233 javiddabdi@yahoo.com	

Weyerhaeuser

Main, Floor: Drop Beam at North Nook
1 piece(s) 3 1/2" x 10 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2876 @ 8"	3413 (1.50")	Passed (84%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2533 @ 1' 6 1/2"	6493	Passed (39%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	10545 @ 8'	12863	Passed (82%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.404 @ 8'	0.489	Passed (L/436)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.672 @ 8'	0.733	Passed (L/262)	--	1.0 D + 1.0 L (All Spans)

Member Length : 14' 8"
System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2021
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 = 14' 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 Single 2X DF plate	8.00"	Hanger[1]	1.50"	1245	1887	3131	See note [1]
2 - Hanger on Single 2X DF plate	8.00"	Hanger[1]	1.50"	1245	1887	3131	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)	14' 8" o/c	
Bottom Edge (Lu)	14' 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	Connector not found	N/A	N/A	N/A	N/A	
2 - Top Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	8" to 15' 4"	N/A	8.9	--	
1 - Uniform (PSF)	0 to 16' (Top)	5' 10 3/4"	25.0	40.0	Default Load

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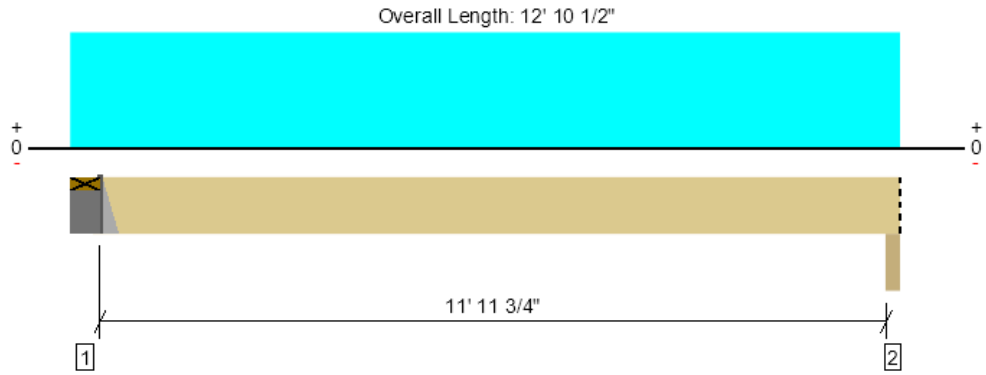
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Main, Floor: Joist (11'-11.75")
1 piece(s) 2 x 10 DF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	523 @ 7 1/4"	1406 (1.50")	Passed (37%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	456 @ 1' 4 1/2"	1665	Passed (27%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1576 @ 6' 7 5/8"	2029	Passed (78%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.161 @ 6' 7 5/8"	0.302	Passed (L/902)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.261 @ 6' 7 5/8"	0.603	Passed (L/555)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 12' 3 1/4"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2021
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 - Hanger on Single 2X DF plate	7.25"	Hanger[1]	1.50"	221	354	575	See note [1]
2 - Beam - DF	3.50"	3.50"	1.50"	208	333	541	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)	6' 11" o/c	
Bottom Edge (Lu)	12' 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	JB210A	2.00"	4-10dx1.5	2-10dx1.5	2-10dx1.5	

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 12' 10 1/2"	16"	25.0	40.0	Default Load

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ForteWEB Software Operator	Job Notes
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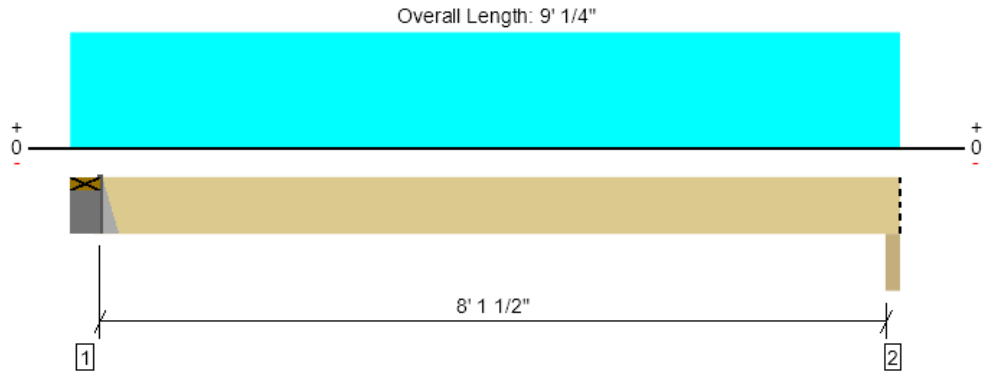
Weyerhaeuser

Main, Floor: Joist (8'-1.5")
1 piece(s) 2 x 10 DF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	534 @ 7 1/4"	1406 (1.50")	Passed (38%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	433 @ 1' 4 1/2"	1665	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1095 @ 4' 8 1/2"	2029	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.052 @ 4' 8 1/2"	0.205	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.084 @ 4' 8 1/2"	0.410	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' 5"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2021
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 - Hanger on Single 2X DF plate	7.25"	Hanger[1]	1.50"	235	377	612	See note [1]
2 - Beam - DF	3.50"	3.50"	1.50"	216	345	561	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)	8' 5" o/c	
Bottom Edge (Lu)	8' 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
1 - Top Mount Hanger	JB210A	2.00"	4-10dx1.5	2-10dx1.5	2-10dx1.5	

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 9' 1/4"	24"	25.0	40.0	Default Load

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