

Structural Calculations for Permit Submittal:

Mercer Island Residence

5236 W Mercer Way

Mercer Island, WA



Client: N5 Architecture

Date: September 22, 2025

Project No: 0031-2025-06



Seismic Design Loads (ASCE 7-16)

for a Wood Framed Structure

RISK CAT. II Table 1.5-1
IMP. FACTOR 1 Table 1.5-2
SITE CLASS d Table 20.3-1
R = 6.5 Table 12.2-1

SEISMIC
DESIGN CATEGORY D 11.6-1 & 11.6-2

$S_s = 1.44$
 $S_1 = 0.55$
 $F_a = 1.00$ Table 11.4-1
 $F_v = 1.50$ Table 11.4-2
 $S_{DS} = 0.96$
 $S_{D1} = 0.55$

$C_{sULT} = 0.148$ Eqn. 12.8-2
 $C_{sASD} = 0.103$

Seismic Dead Load: 15^{psf} Roof
10^{psf} Floor
10^{psf} Wall
5^{psf} PV/Decking

$W_{roof} = 12 + 10/2 + 5 = 22^{psf}$
 $W_{floor} = 10 + 10 = 20^{psf}$

Vertical Design Loads

Criteria

IBC 2015

Dead Loads

Roof (Composit)	2.5 psf	Flooring	1 psf
1/2" Ply	1.5 psf	3/4" Ply	2.3 psf
Rafter/Truss	2 psf	Joist	2.6 psf
Insulation	1 psf	5/8" GWB	3.1 psf
5/8" GWB	3.1 psf	Misc. Mech	1 psf
Misc./Mech.	1.9 psf		psf
	12 psf		10
Use	12 psf	Use	10 psf

Live Loads

Snow (roof)	25 psf
floor	40 psf
decks	60 psf

Soil Bearing

3000 psf

Project: 5236 W Mercer

Date: 9/16/2025
Project #: 0031-2025-06
Design: EAF
Sheet: Criteria 1

Wind Design Loads (ASCE 7-16)

Chapter 27 Part 1

Risk Cat II
 Exposure c
 V= 110 mph
 K_d= 0.85
 I= 1
 G= 0.85

Table 1.5-1
 Fig 26.5-1
 Table 26.6-1
 Table 1.5-2
 26.9.1

Roof Angle = 23 degrees
 Ground to top of roof 27 ft
 Bottom of roof to top of roof 7 ft
 (mean roof height) h= 23.5 ft

Topography from Website

K_{zt}= 1.60

Pressure Coefficients
 from Figure 27.4-1:

Bldg Face	C _p
Windward Wall	0.8
Leeward Wall	-0.5
Windward Roof	0.3
Leeward Roof	-0.6

*Note= Cp values are conservative
 worst case values

Pressures:

Ht	K _z	q _z	P _{ww walls}	P _{lw walls}	P _{walls (psf)}
0-15	0.85	35.81	24.35	16.83	41.18
15-20	0.9	37.91	25.78	16.83	42.61
20-25	0.94	39.60	26.93	16.83	43.76
25-30	0.98	41.28	28.07	16.83	44.90
30-40	1.04	43.81	29.79	16.83	46.62

24.71
 25.57
 26.25
 26.94
 27.97

P _{ww roof}	P _{lw roof}	P _{roof (psf)}
10.10	20.20	30.29

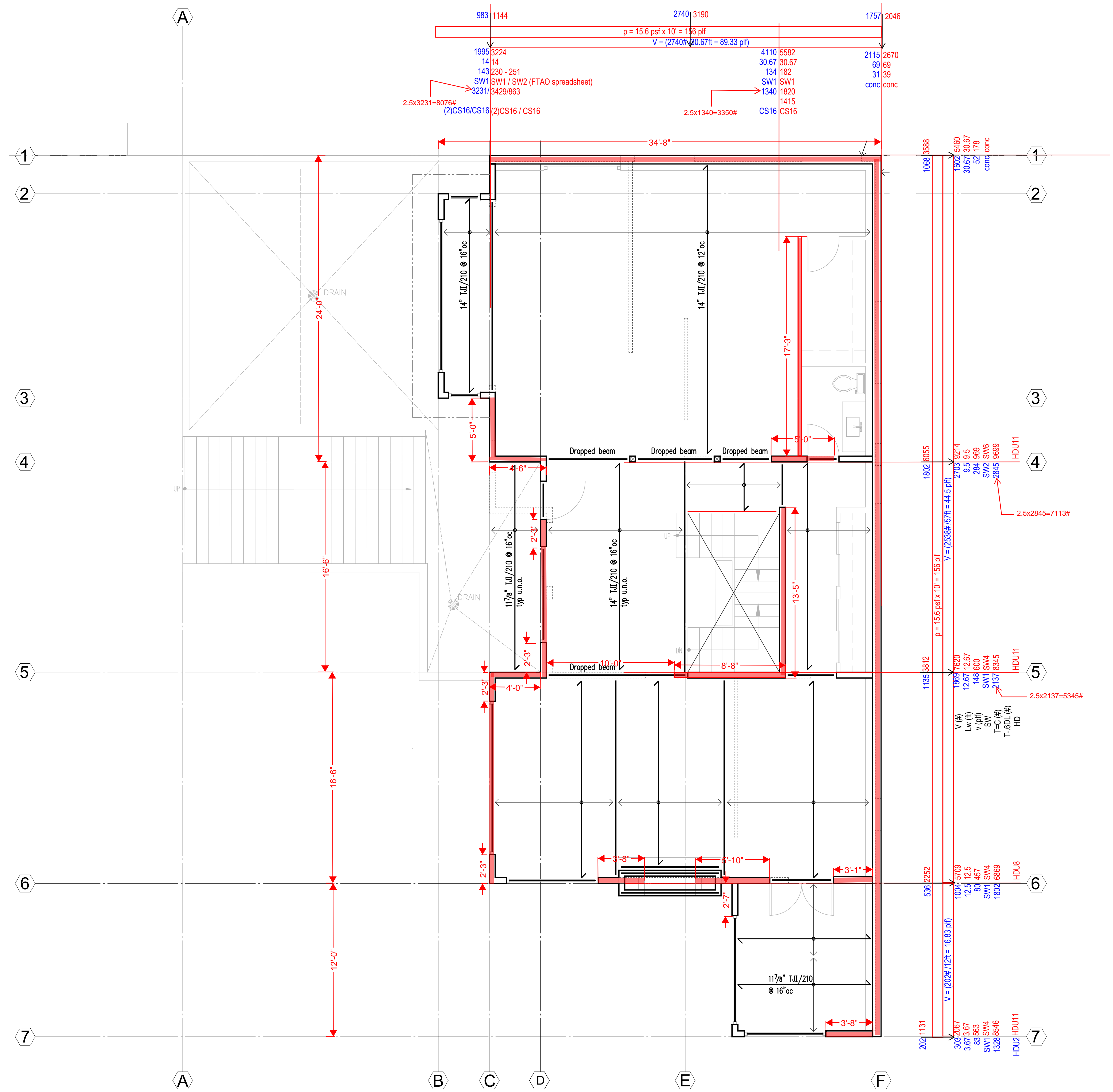
Project: 5236 W Mercer

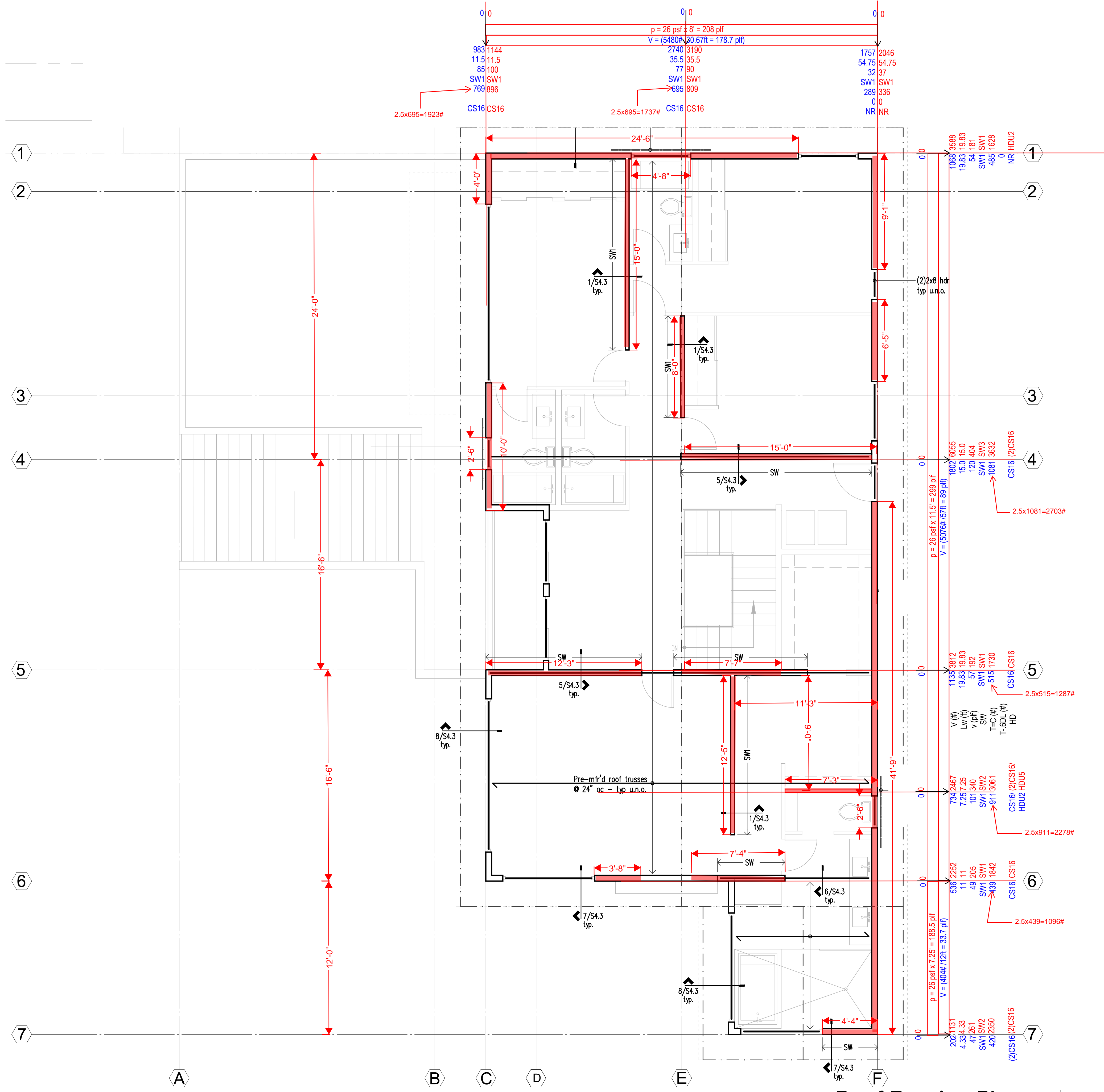
Date: 9/16/2025
 Project #: 0031-2025-06
 Design: EAF
 Sheet: Criteria 2

WOOD SEISMIC

ROOF MASS	22 PSF	Cs	0.103 (allowable)	Sds	0.96
FLOOR MASS	20 PSF	V	8.2 (kips)	I	1.0

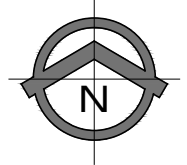
BUILDING MASSES				VERTICAL DISTRIBUTION				DIAPHRAGM FORCES					
DIAPH (level)	AREA (ft ²)	w (psf)	W (kips)	h (ft)	W x h (kip-ft)	W x h / (Σ W x h) % V	Fp (kips)	Σ Fi (kips)	Σ wi (kips)	wpx (kips)	Fpx (kips)	min (kips)	Fx (kips)
ROOF	1900	22	42	20	836	66.7%	5.480	5.5	42	42	5.5	5.7	5.7
UPPER	1900	20	38	11	418	33.3%	2.740	8.2	80	38	3.9	5.2	5.2
			79.80		1254	100%	8.219						





Roof Framing Plan

Scale: 1/4" = 1'-0"





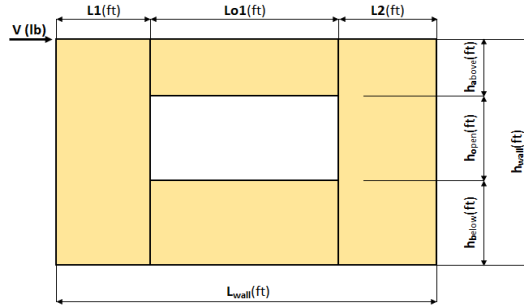
Force Transfer Around Openings Calculator

ONE OPENING

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

Project Information

Code:		Date: 9/16/2025
Designer:	EAF	
Client:	N5	
Project:	5236 Mercer	
Wall Line:	west wall center	



Shear Wall Calculation Variables

V	1035 lbf	Opening 1	Adj. Factor Method =	1.25-0.125h/bs
L1	2.25 ft	h _a	Wall Pier Aspect Ratio	Adj. Factor
L2	2.25 ft	h _o	P1=h _o /L1=	2.67
h _{above}	10.00 ft	h _b	P2=h _o /L2=	2.67
L _{wall}	12.00 ft	L _{o1}		0.917
				0.917

1. Hold-down forces: $H = Vh_{wall}/L_{wall}$ = 863 lbf

2. Unit shear above + below opening
 First opening: $va1 = vb1 = H/(h_a+h_b) = 216$ plf

3. Total boundary force above + below openings
 First opening: $O1 = va1 \times (L_{o1}) = 1617$ lbf

4. Corner forces
 $F1 = O1(L1)/(L1+L2) = 809$ lbf
 $F2 = O1(L2)/(L1+L2) = 809$ lbf

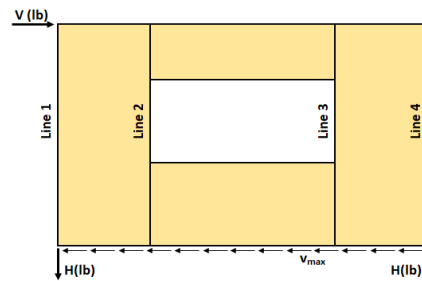
5. Tributary length of openings
 $T1 = (L1 \times L_{o1})/(L1+L2) = 3.75$ ft
 $T2 = (L2 \times L_{o1})/(L1+L2) = 3.75$ ft

6. Unit shear beside opening
 $v1 = (V/L)(L1+T1)/L1 = 230$ plf
 $v2 = (V/L)(L2+T2)/L2 = 230$ plf
 Check $v1 \times L1 + v2 \times L2 = V?$ 1035 lbf **OK**

7. Resistance to corner forces
 $R1 = v1 \times L1 = 518$ lbf
 $R2 = v2 \times L2 = 518$ lbf

8. Difference corner force + resistance
 $R1-F1 = -291$ lbf
 $R2-F2 = -291$ lbf

9. Unit shear in corner zones
 $vc1 = (R1-F1)/L1 = -129$ plf
 $vc2 = (R2-F2)/L2 = -129$ plf



Check Summary of Shear Values for One Opening

Line 1: $vc1(h_a+h_b)+v1(h_o)=H?$	-518	1380	863 lbf
Line 2: $va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?$	863	-518	1380
Line 3: $va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?$	863	-518	1380
Line 4: $vc2(h_a+h_b)+v2(h_o)=H?$	-518	1380	863 lbf

Design Summary*

Req. Sheathing Capacity	251 plf	**	4-Term Deflection		3-Term Deflection	
Req. Strap Force	809 lbf		4-Term Story Drift %		3-Term Story Drift %	
Req. HD Force (H)	863 lbf					
Req. Shear Wall Anchorage Force (v _{max})	86 plf					

**Req. Sheathing Capacity has been adjusted per the Aspect Ratio Adjustment Factor

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



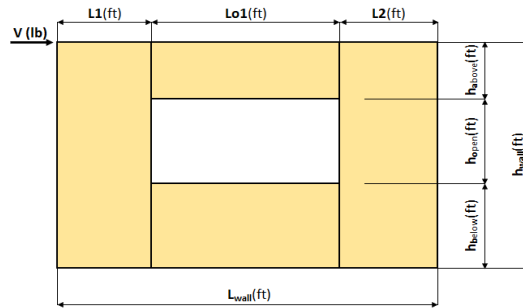
Force Transfer Around Openings Calculator

ONE OPENING

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

Project Information

Code:		Date:	9/16/2025
Designer:	EAF		
Client:	N5		
Project:	5236 Mercer		
Wall Line:	west wall south end		



Shear Wall Calculation Variables

V	1035 lbf	Opening 1	Adj. Factor Method =	1.25-0.125h/bs
L1	2.25 ft	h _a	Wall Pier Aspect Ratio	Adj. Factor
L2	2.25 ft	h _o	P1=h _o /L1=	2.67
h _{wall}	10.00 ft	h _b	P2=h _o /L2=	2.67
L _{wall}	16.50 ft	Lo1		0.917
				0.917

1. Hold-down forces: $H = Vh_{wall}/L_{wall} = 627 \text{ lbf}$

2. Unit shear above + below opening
First opening: $va1 = vb1 = H/(h_a+h_b) = 157 \text{ plf}$

3. Total boundary force above + below openings
First opening: $O1 = va1 \times (Lo1) = 1882 \text{ lbf}$

4. Corner forces
 $F1 = O1(L1)/(L1+L2) = 941 \text{ lbf}$
 $F2 = O1(L2)/(L1+L2) = 941 \text{ lbf}$

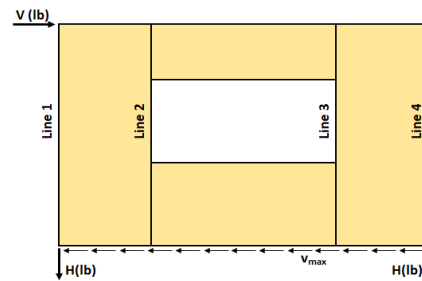
5. Tributary length of openings
 $T1 = (L1 \times Lo1)/(L1+L2) = 6.00 \text{ ft}$
 $T2 = (L2 \times Lo1)/(L1+L2) = 6.00 \text{ ft}$

6. Unit shear beside opening
 $v1 = (V/L)(L1+T1)/L1 = 230 \text{ plf}$
 $v2 = (V/L)(L2+T2)/L2 = 230 \text{ plf}$
Check $v1 \times L1 + v2 \times L2 = V?$ 1035 lbf **OK**

7. Resistance to corner forces
 $R1 = v1 \times L1 = 518 \text{ lbf}$
 $R2 = v2 \times L2 = 518 \text{ lbf}$

8. Difference corner force + resistance
 $R1-F1 = -423 \text{ lbf}$
 $R2-F2 = -423 \text{ lbf}$

9. Unit shear in corner zones
 $vc1 = (R1-F1)/L1 = -188 \text{ plf}$
 $vc2 = (R2-F2)/L2 = -188 \text{ plf}$



Check Summary of Shear Values for One Opening

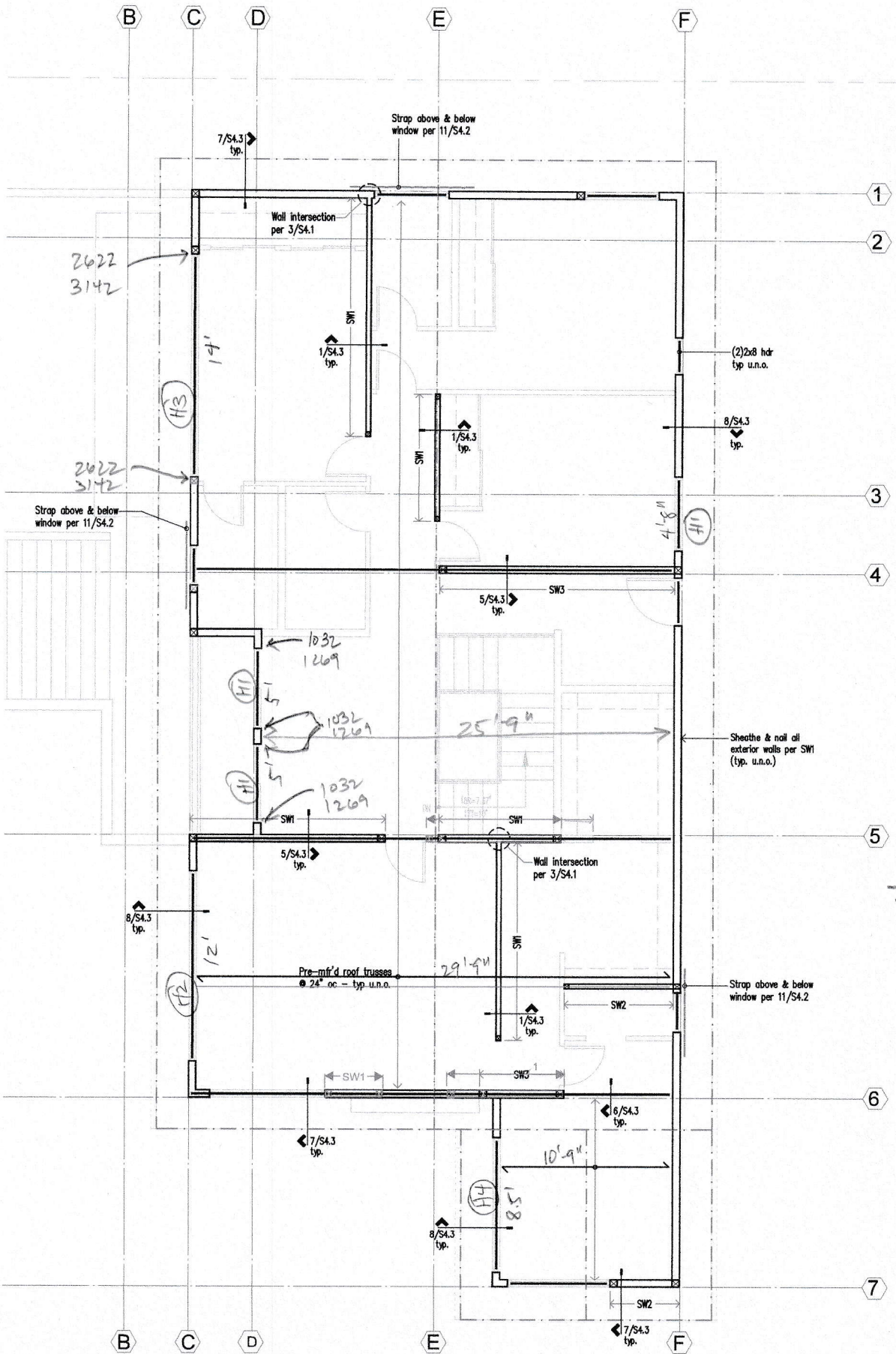
Line 1: $vc1(h_a+h_b)+v1(h_o)=H?$	-753	1380	627 lbf
Line 2: $va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?$	627	-753	1380
Line 3: $va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?$	627	-753	1380
Line 4: $vc2(h_a+h_b)+v2(h_o)=H?$	-753	1380	627 lbf

Design Summary*

Req. Sheathing Capacity	251 plf	**	4-Term Deflection		3-Term Deflection	
Req. Strap Force	941 lbf		4-Term Story Drift %		3-Term Story Drift %	
Req. HD Force (H)	627 lbf					
Req. Shear Wall Anchorage Force (v _{max})	63 plf					

**Req. Sheathing Capacity has been adjusted per the Aspect Ratio Adjustment Factor

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

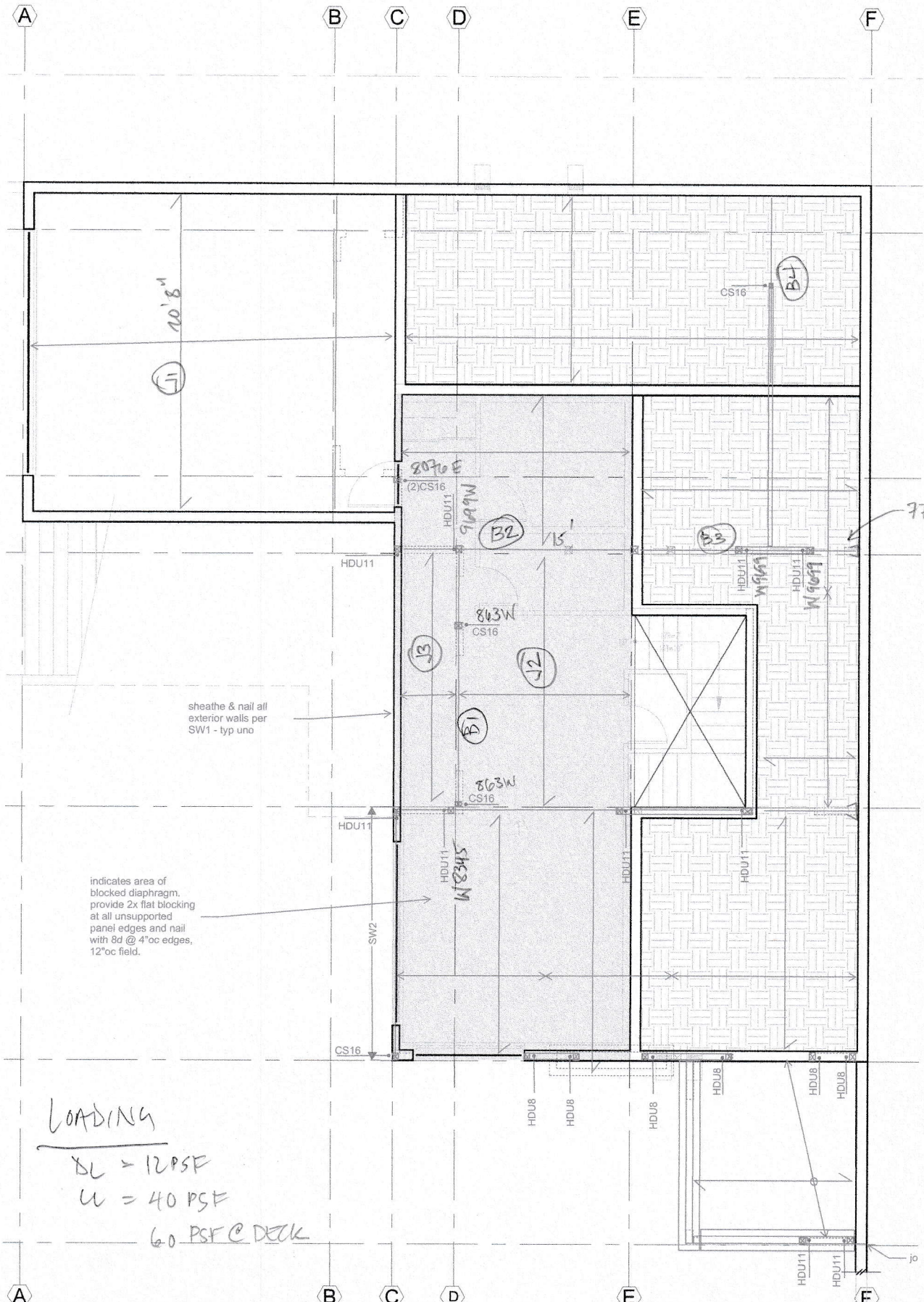


LOADING:
 DL = 15 + 15 PV
 LL = 25 SNOW

KEY PLAN Roof Framing Plan

Scale: 1/4" = 1'-0"





LOADING
 DL = 12 PSF
 LL = 40 PSF
 60 PSF @ DECK

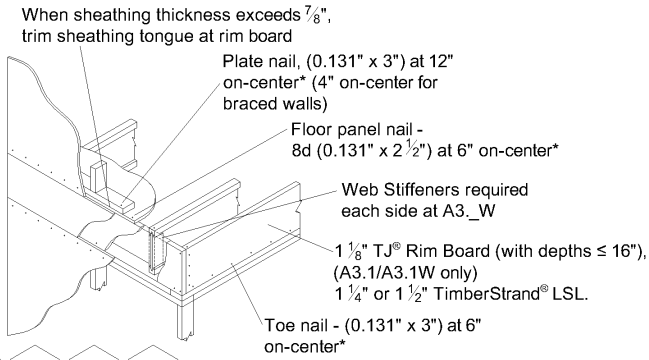
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KEY PLAN Main Floor Fram

Roof			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Wall: Header H1	Passed (62% M)	1 piece(s) 4 x 8 DF No.1	
Wall: Header H1	Passed (79% M)	1 piece(s) 4 x 8 DF No.1	
Wall: Header H2	Passed (97% R)	1 piece(s) 5 1/8" x 10 1/2" 24F-V4 DF Glulam	
Wall: Header H3	Passed (78% ΔT)	1 piece(s) 5 1/8" x 12" 24F-V4 DF Glulam	
Wall: Header H4	Passed (90% M)	1 piece(s) 4 x 8 DF No.1	
Upper Floor			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Floor: Joist J1	Passed (70% ΔL)	1 piece(s) 14" TJI@ 360 @ 12" OC	
Floor: Joist J2	Passed (54% M)	1 piece(s) 14" TJI@ 210 @ 16" OC	
Floor: Joist J3	Passed (65% ΔL)	1 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL @ 16" OC	
Floor: Flush Beam B1	Passed (84% R)	1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL	
Floor: Flush Beam B2	Passed (50% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B3	Passed (50% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B4	Passed (37% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B5	Passed (51% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B6	Passed (27% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B7	Passed (25% ΔT)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B8	Passed (97% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B9	Passed (48% ΔL)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B10	Passed (48% ΔL)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B11	Passed (13% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B12	Passed (31% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B13	Passed (68% R)	1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL	
Floor: Flush Beam B14	Passed (91% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B15	Passed (94% ΔL)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Floor: Flush Beam B16	Passed (43% R)	1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL	
Main Floor			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Floor: Joist J1	Passed (84% ΔL)	1 piece(s) 11 7/8" TJI@ 360 @ 12" OC	
Floor: Joist J2	Passed (63% M)	1 piece(s) 11 7/8" TJI@ 210 @ 16" OC	
Floor: Joist J3	Passed (92% ΔL)	1 piece(s) 1 3/4" x 9 1/2" 2.0E Microllam® LVL @ 16" OC	
Floor: Flush Beam B1	Passed (45% ΔL)	1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL	
Floor: Flush Beam B2	Failed (100% R)	1 piece(s) 7" x 11 7/8" 2.2E Parallam® PSL	An excessive uplift of -3552 lbs at support located at 3 1/2" failed this product.
Floor: Flush Beam B3	Passed (100% R)	1 piece(s) 5 1/4" x 11 7/8" 2.2E Parallam® PSL	

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	





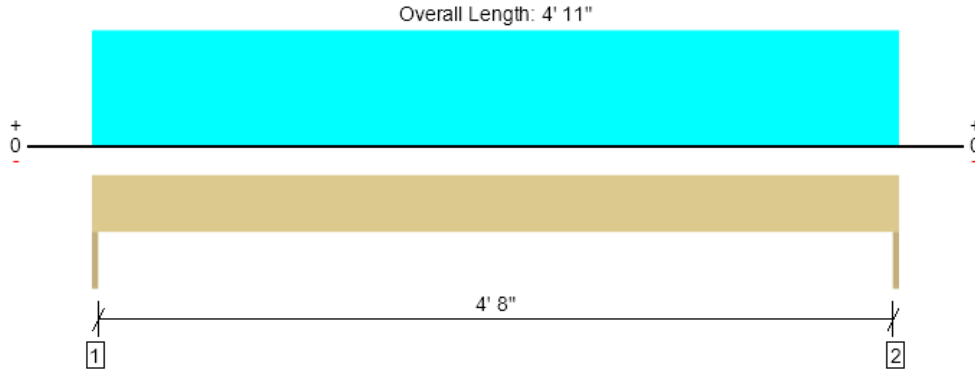
* For A3.1-A3.3 installation specifications see Rim Board Details and Installation in *Weyerhaeuser Installation Guide for Floor and Roof Framing*, TJ-9001.

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



Roof, Wall: Header H1

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1933 @ 0	3281 (1.50")	Passed (59%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1360 @ 8 3/4"	3502	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2376 @ 2' 5 1/2"	3820	Passed (62%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.030 @ 2' 5 1/2"	0.164	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.055 @ 2' 5 1/2"	0.246	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4' 11"
 System : Wall
 Member Type : Header
 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	Snow	Factored	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	868	1065	1933	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	868	1065	1933	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 11" o/c	
Bottom Edge (Lu)	4' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 11"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 4' 11"	17' 4"	20.0	25.0	Default Load

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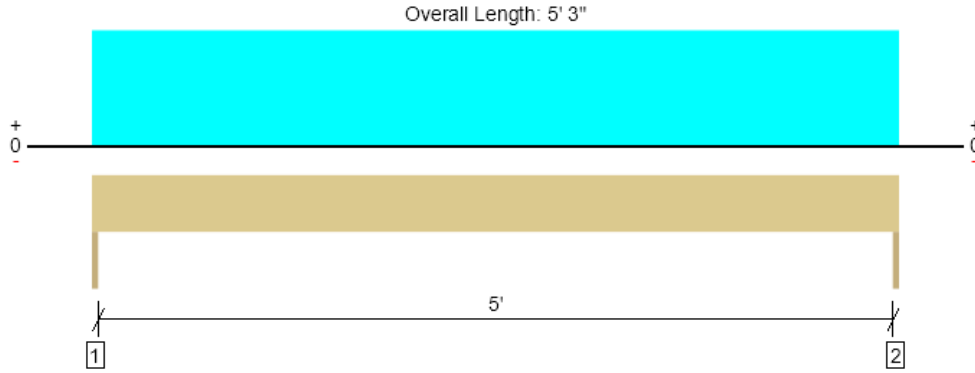
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



Roof, Wall: Header H1

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2301 @ 0	3281 (1.50")	Passed (70%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1662 @ 8 3/4"	3502	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3020 @ 2' 7 1/2"	3820	Passed (79%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.044 @ 2' 7 1/2"	0.175	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.079 @ 2' 7 1/2"	0.262	Passed (L/795)	--	1.0 D + 1.0 S (All Spans)

Member Length : 5' 3"
 System : Wall
 Member Type : Header
 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	Snow	Factored	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	1032	1269	2301	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	1032	1269	2301	None

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	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 5' 3"	19' 4"	20.0	25.0	Default Load

Weyerhaeuser Notes

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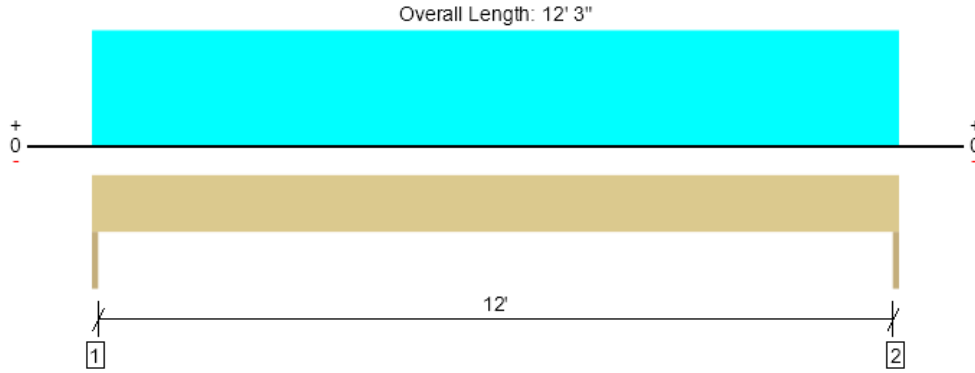
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



Roof, Wall: Header H2

1 piece(s) 5 1/8" x 10 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4858 @ 0	4997 (1.50")	Passed (97%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4065 @ 1'	10933	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	14876 @ 6' 1 1/2"	21660	Passed (69%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.247 @ 6' 1 1/2"	0.408	Passed (L/596)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.452 @ 6' 1 1/2"	0.613	Passed (L/326)	--	1.0 D + 1.0 S (All Spans)

Member Length : 12' 3"
 System : Wall
 Member Type : Header
 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.
- Volume factor of 1.00 was calculated for positive bending using length L = 12' 3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	2203	2654	4858	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	2203	2654	4858	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 3" o/c	
Bottom Edge (Lu)	12' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12' 3"	N/A	13.1	--	
1 - Uniform (PSF)	0 to 12' 3"	17' 4"	20.0	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

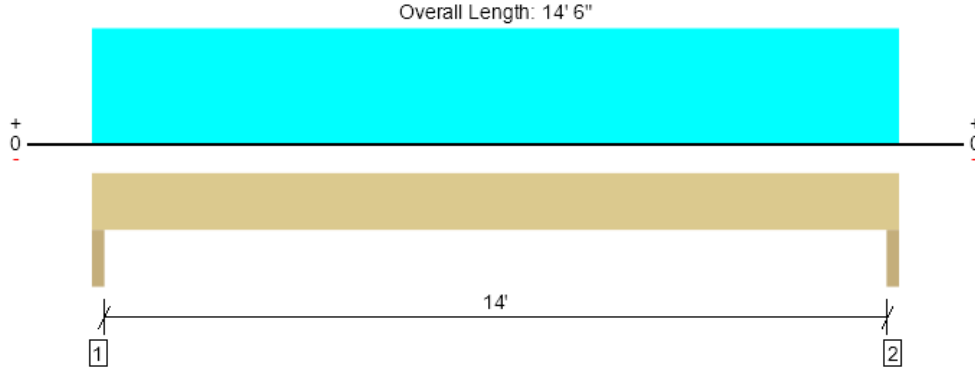
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 ForteWEB v3.9, Engine: V8.4.3.94, Data: V8.1.7.3
 File Name: 5236 Mercer

Roof, Wall: Header H3

1 piece(s) 5 1/8" x 12" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5763 @ 1 1/2"	9994 (3.00")	Passed (58%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4770 @ 1' 3"	12495	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	20178 @ 7' 3"	28290	Passed (71%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.303 @ 7' 3"	0.475	Passed (L/565)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.555 @ 7' 3"	0.712	Passed (L/308)	--	1.0 D + 1.0 S (All Spans)

Member Length : 14' 6"
 System : Wall
 Member Type : Header
 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.
- Volume factor of 1.00 was calculated for positive bending using length L = 14' 3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - SPF	3.00"	3.00"	1.73"	2622	3142	5763	None
2 - Trimmer - SPF	3.00"	3.00"	1.73"	2622	3142	5763	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 6" o/c	
Bottom Edge (Lu)	14' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 6"	N/A	14.9	--	
1 - Uniform (PSF)	0 to 14' 6"	17' 4"	20.0	25.0	Default Load

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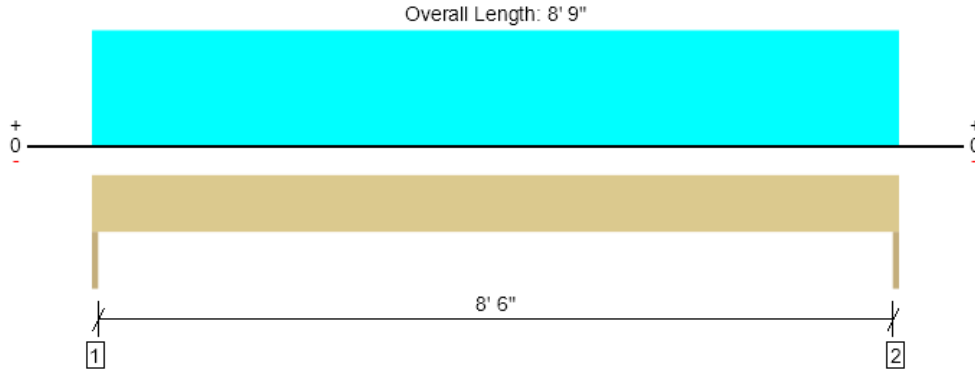
ForteWEB Software Operator	Job Notes
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 File Name: 5236 Mercer

Roof, Wall: Header H4

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



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1570 @ 0	3281 (1.50")	Passed (48%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1309 @ 8 3/4"	3502	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3435 @ 4' 4 1/2"	3820	Passed (90%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.137 @ 4' 4 1/2"	0.292	Passed (L/768)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.251 @ 4' 4 1/2"	0.313	Passed (L/419)	--	1.0 D + 1.0 S (All Spans)

Member Length : 8' 9"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2021
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (5/16").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - SPF	1.50"	1.50"	1.50"	714	857	1570	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	714	857	1570	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 9"	N/A	6.4	--	
1 - Uniform (PSF)	0 to 8' 9"	7' 10"	20.0	25.0	Default Load

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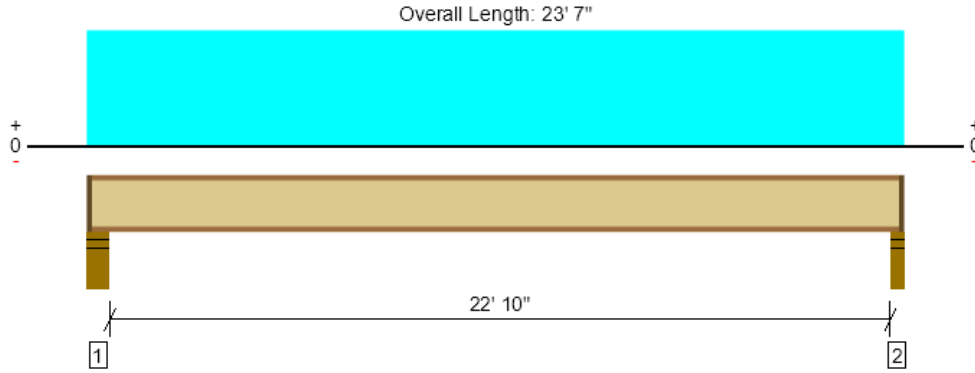
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ForteWEB Software Operator	Job Notes
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Upper Floor, Floor: Joist J1
1 piece(s) 14" TJI® 360 @ 12" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	603 @ 23' 4 1/2"	1202 (2.25")	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	594 @ 5 1/2"	1955	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3439 @ 11' 10 1/2"	7335	Passed (47%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.401 @ 11' 10 1/2"	0.575	Passed (L/688)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.521 @ 11' 10 1/2"	1.150	Passed (L/529)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	43	40	Passed	--	--

Member Length : 23' 4 1/2"
 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: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories	Details
	Total	Available	Required	Dead	Floor Live	Factored		
1 - Stud wall - SPF	5.50"	4.25"	1.75"	143	475	618	1 1/4" Rim Board	A3
2 - Stud wall - SPF	3.50"	2.25"	1.75"	141	468	609	1 1/4" Rim Board	A3

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 7" o/c	
Bottom Edge (Lu)	23' 5" 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 23' 7"	12"	12.0	40.0	Default Load

Weyerhaeuser Notes

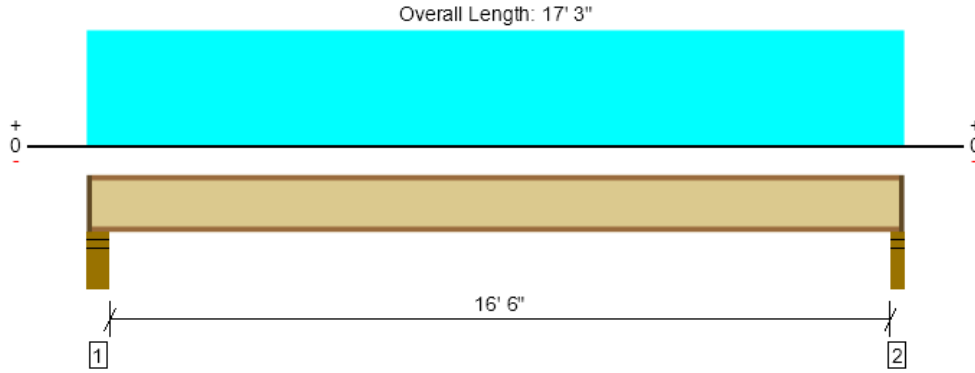
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Upper Floor, Floor: Joist J2
1 piece(s) 14" TJI® 210 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	585 @ 17' 1/2"	1134 (2.25")	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	572 @ 5 1/2"	1945	Passed (29%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2407 @ 8' 8 1/2"	4490	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.193 @ 8' 8 1/2"	0.417	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.251 @ 8' 8 1/2"	0.833	Passed (L/797)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	54	40	Passed	--	--

Member Length : 17' 1/2"
 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: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories	Details
	Total	Available	Required	Dead	Floor Live	Factored		
1 - Stud wall - SPF	5.50"	4.25"	1.75"	139	464	604	1 1/4" Rim Board	A3
2 - Stud wall - SPF	3.50"	2.25"	1.75"	137	456	592	1 1/4" Rim Board	A3

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 2" o/c	
Bottom Edge (Lu)	17' 1" 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 17' 3"	16"	12.0	40.0	Default Load

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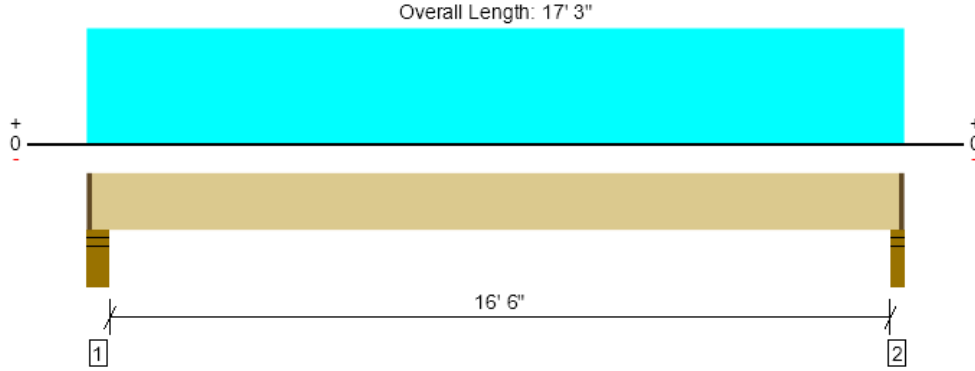
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Upper Floor, Floor: Joist J3

1 piece(s) 1 3/4" x 11 7/8" 2.0E Microllam® LVL @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	900 @ 17' 1/2"	1673 (2.25")	Passed (54%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	774 @ 1' 5 3/8"	3948	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3704 @ 8' 8 1/2"	9281	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.272 @ 8' 8 1/2"	0.417	Passed (L/734)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.363 @ 8' 8 1/2"	0.833	Passed (L/551)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	56	40	Passed	--	--

Member Length : 17' 1/2"
 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 4% increase in the moment capacity has been added to account for repetitive member usage.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - SPF	5.50"	4.25"	1.50"	232	697	929	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	228	683	911	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 7" o/c	
Bottom Edge (Lu)	17' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 17' 3"	16"	20.0	60.0	Default Load

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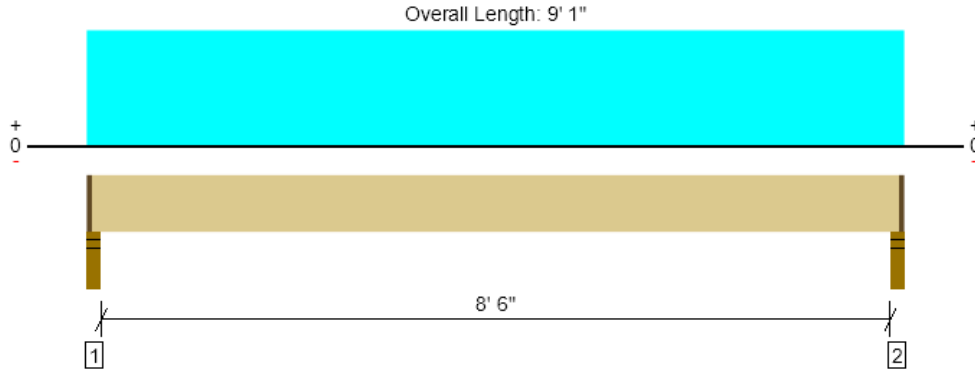
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 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B1
1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1413 @ 2"	1673 (2.25")	Passed (84%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1038 @ 1' 3 3/8"	4295	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3048 @ 4' 6 1/2"	7977	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.100 @ 4' 6 1/2"	0.219	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.133 @ 4' 6 1/2"	0.438	Passed (L/791)	--	1.0 D + 1.0 L (All Spans)

Member Length : 8' 10 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 - SPF	3.50"	2.25"	1.90"	356	1090	1446	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.90"	356	1090	1446	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 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)	1 1/4" to 8' 11 3/4"	N/A	6.5	--	
1 - Uniform (PSF)	0 to 9' 1" (Front)	6'	12.0	40.0	Default Load

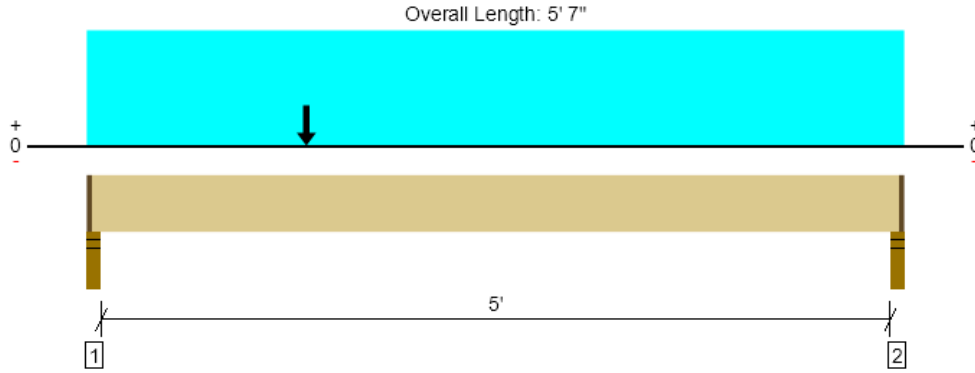
• Side loads are assumed to not induce cross-grain tension.

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Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



Upper Floor, Floor: Flush Beam B2
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1675 @ 2"	3347 (2.25")	Passed (50%)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1143 @ 1' 5 1/2"	16203	Passed (7%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	1665 @ 2' 9 1/2"	21840	Passed (8%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.011 @ 2' 8 1/8"	0.131	Passed (L/999+)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.014 @ 2' 8 3/8"	0.262	Passed (L/999+)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)

Member Length : 5' 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	Wind	Factored	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	343	1005	1374	1715	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	343	1005	468	1348	1 1/4" Rim Board

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Wind (1.60)	Comments
0 - Self Weight (PLF)	1 1/4" to 5' 5 3/4"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 5' 7" (Front)	9'	12.0	40.0	--	Default Load
2 - Point (lb)	1' 6" (Front)	N/A	--	--	1842	

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

Weyerhaeuser Notes

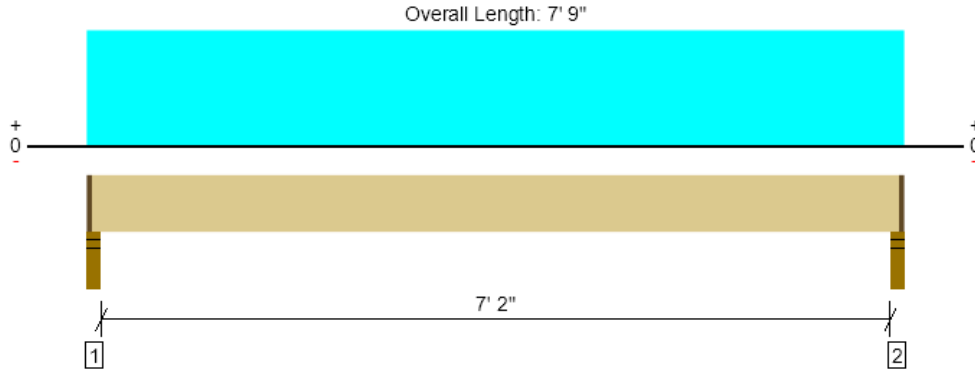
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



Upper Floor, Floor: Flush Beam B3
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1675 @ 2"	3347 (2.25")	Passed (50%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1074 @ 1' 5 1/2"	10127	Passed (11%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3055 @ 3' 10 1/2"	21840	Passed (14%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.025 @ 3' 10 1/2"	0.185	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.034 @ 3' 10 1/2"	0.371	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 7' 6 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 - SPF	3.50"	2.25"	1.50"	441	1279	1720	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	441	1279	1720	1 1/4" Rim Board

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 7' 7 3/4"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 7' 9" (Front)	8' 3"	12.0	40.0	Default Load
2 - Point (lb)	1' 6" (Front)	N/A	--	--	

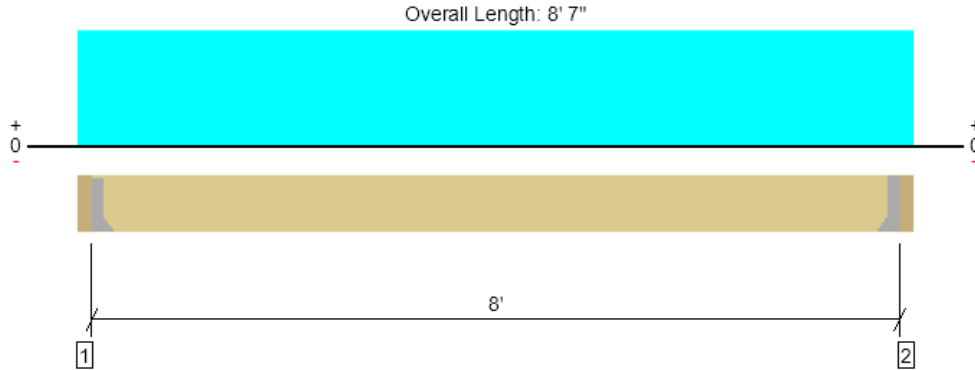
• Side loads are assumed to not induce cross-grain tension.

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

ForteWEB Software Operator	Job Notes
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Upper Floor, Floor: Flush Beam B4
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1725 @ 3 1/2"	4725 (1.50")	Passed (37%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1222 @ 1' 5 1/2"	10127	Passed (12%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3451 @ 4' 3 1/2"	21840	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.032 @ 4' 3 1/2"	0.200	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.043 @ 4' 3 1/2"	0.400	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 8'
 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 14" SPF beam	3.50"	Hanger ¹	1.50"	473	1373	1847	See note ¹
2 - Hanger on 14" SPF beam	3.50"	Hanger ¹	1.50"	473	1373	1847	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)	8' o/c	
Bottom Edge (Lu)	8' o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	HU412	2.50"	N/A	22-10dx1.5	10-10d		
2 - Face Mount Hanger	HU412	2.50"	N/A	22-10dx1.5	10-10d		

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	3 1/2" to 8' 3 1/2"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 8' 7" (Front)	8'	12.0	40.0	Default Load
2 - Point (lb)	1' 6" (Front)	N/A	--	--	

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

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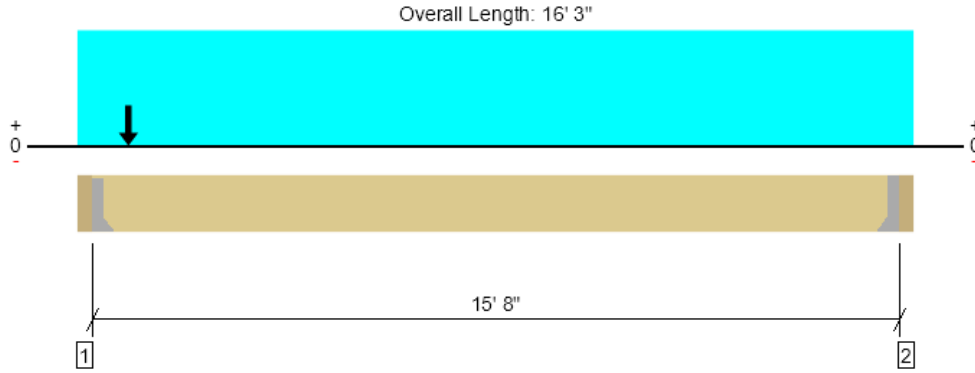
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



9/17/2025 9:19:31 PM UTC
 ForteWEB v3.9, Engine: V8.4.3.94, Data: V8.1.7.3
 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B5
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2426 @ 3 1/2"	4725 (1.50")	Passed (51%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1634 @ 1' 5 1/2"	10127	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3292 @ 7' 1 11/16"	21840	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.086 @ 7' 10 1/16"	0.392	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.130 @ 7' 10 7/16"	0.783	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15' 8"
 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 14" SPF beam	3.50"	Hanger ¹	1.50"	702	1744	2446	See note ¹
2 - Hanger on 14" SPF beam	3.50"	Hanger ¹	1.50"	271	495	767	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' 8" o/c	
Bottom Edge (Lu)	15' 8" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	HHUS410	3.00"	N/A	30-10d	10-10d		
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d		

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	3 1/2" to 15' 11 1/2"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 16' 3" (Front)	1' 4"	12.0	40.0	Default Load
2 - Point (lb)	1' (Front)	N/A	473	1373	

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

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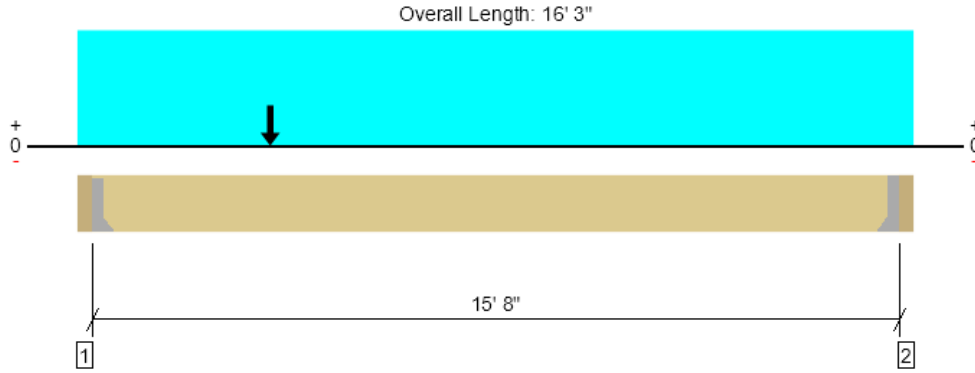
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ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



9/17/2025 9:19:31 PM UTC
 ForteWEB v3.9, Engine: V8.4.3.94, Data: V8.1.7.3
 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B6
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1269 @ 3 1/2"	4725 (1.50")	Passed (27%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1186 @ 1' 5 1/2"	16203	Passed (7%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	2597 @ 8' 1 1/2"	21840	Passed (12%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.063 @ 8' 1 1/2"	0.392	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.100 @ 8' 1 1/2"	0.783	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15' 8"
 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.
- -798 lbs uplift at support located at 3 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Factored	
1 - Hanger on 14" SPF beam	3.50"	Hanger ¹	1.50"	250	433	1354/-135 ₄	1286/-798	See note ¹
2 - Hanger on 14" SPF beam	3.50"	Hanger ¹	1.50"	250	433	383/-383	776/-118	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' 8" o/c	
Bottom Edge (Lu)	15' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	HU412	2.50"	N/A	16-10dx1.5	6-10d		
2 - Face Mount Hanger	HU412	2.50"	N/A	16-10dx1.5	6-10d		

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

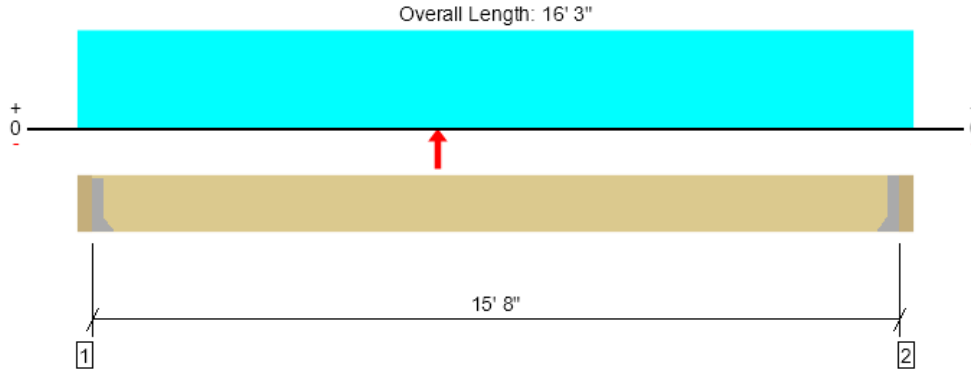
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 15' 11 1/2"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 16' 3" (Front)	1' 4"	12.0	40.0	--	Default Load
2 - Point (lb)	3' 9" (Front)	N/A	--	--	1737	

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

Forteweb Software Operator	Job Notes
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Upper Floor, Floor: Flush Beam B7
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	663 @ 3 1/2"	4725 (1.50")	Passed (14%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1029 @ 7'	16203	Passed (6%)	1.60	0.6 D + 0.6 W (All Spans)
Moment (Ft-lbs)	-6480 @ 7'	34944	Passed (19%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.063 @ 8' 1 1/2"	0.392	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	-0.197 @ 7' 9 5/8"	0.783	Passed (L/956)	--	0.6 D + 0.6 W (All Spans)

Member Length : 15' 8"
 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.
- -900 lbs uplift at support located at 3 1/2". Strapping or other restraint may be required.
- -636 lbs uplift at support located at 15' 11 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Wind	Factored	
1 - Hanger on 14" SPF beam	3.50"	Hanger ¹	1.50"	250	433	-1750	683/-900	See note ¹
2 - Hanger on 14" SPF beam	3.50"	Hanger ¹	1.50"	250	433	-1311	683/-636	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' 8" o/c	
Bottom Edge (Lu)	15' 8" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	HU412	2.50"	N/A	16-10dx1.5	6-10d		
2 - Face Mount Hanger	HU412	2.50"	N/A	16-10dx1.5	6-10d		

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Wind (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 15' 11 1/2"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 16' 3" (Front)	1' 4"	12.0	40.0	--	Default Load
2 - Point (lb)	7' (Front)	N/A	--	--	-3061	

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

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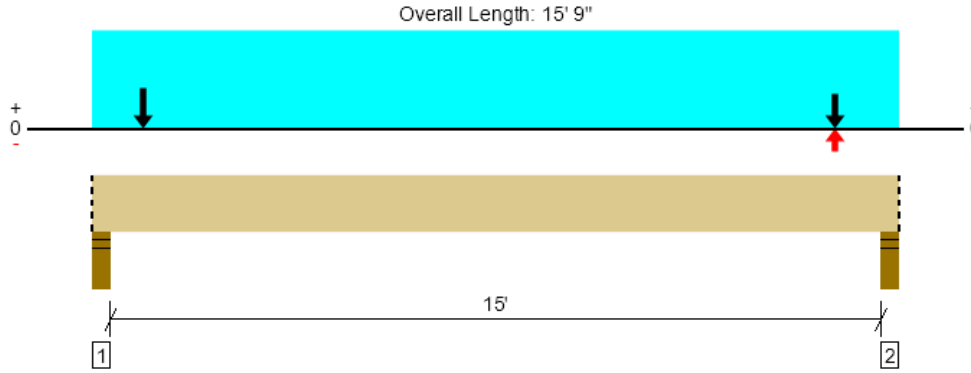
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



9/17/2025 9:19:31 PM UTC
 ForteWEB v3.9, Engine: V8.4.3.94, Data: V8.1.7.3
 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B8
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6515 @ 3"	6694 (4.50")	Passed (97%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4521 @ 14' 2 1/2"	11646	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6476 @ 9' 1/4"	25116	Passed (26%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.132 @ 7' 11 13/16"	0.381	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.265 @ 7' 11 7/8"	0.762	Passed (L/690)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 15' 9"
 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	Snow	Seismic	Factored	
1 - Stud wall - SPF	4.50"	4.50"	4.38"	2912	420	3194	1702/-1702	6515	Blocking
2 - Stud wall - SPF	4.50"	4.50"	4.27"	2826	420	3090	1702/-1702	6352	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	15' 9" 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)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 15' 9"	N/A	15.3	--	--	--	
1 - Uniform (PSF)	0 to 15' 9" (Front)	1' 4"	12.0	40.0	--	--	Default Load
2 - Point (lb)	1' (Front)	N/A	2622	--	3142	1923	
3 - Point (lb)	14' 6" (Front)	N/A	2622	--	3142	-1923	

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

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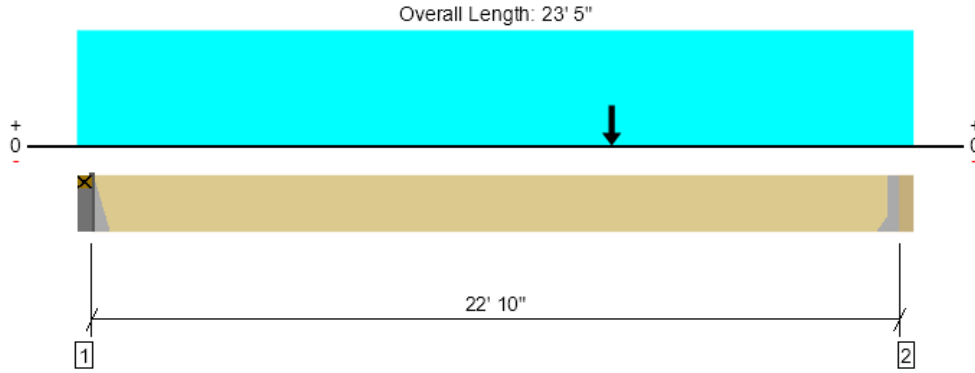
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



9/17/2025 9:19:31 PM UTC
 ForteWEB v3.9, Engine: V8.4.3.94, Data: V8.1.7.3
 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B9
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1402 @ 23' 1 1/2"	4725 (1.50")	Passed (30%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	868 @ 1' 5 1/2"	10127	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	9034 @ 15'	34944	Passed (26%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.273 @ 11' 8 1/2"	0.571	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.434 @ 11' 8 1/2"	1.142	Passed (L/631)	--	1.0 D + 1.0 L (All Spans)

Member Length : 22' 10"
 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.
- -215 lbs uplift at support located at 3 1/2". Strapping or other restraint may be required.
- -566 lbs uplift at support located at 23' 1 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Factored	
1 - Hanger on Single 2X SPF plate	3.50"	Hanger ¹	1.50"	362	624	618/-618	1155/-215	See note ¹
2 - Hanger on 14" SPF beam	3.50"	Hanger ¹	1.50"	362	624	1119/-1119	1418/-566	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)	22' 10" o/c	
Bottom Edge (Lu)	22' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Top Mount Hanger	BA3.56/14	3.00"	6-10dx1.5	4-10dx1.5	2-10dx1.5	
2 - Face Mount Hanger	HU412	2.50"	N/A	16-10dx1.5	6-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 23' 1 1/2"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 23' 5" (Front)	1' 4"	12.0	40.0	--	Default Load
2 - Point (lb)	15' (Front)	N/A	--	--	1737	

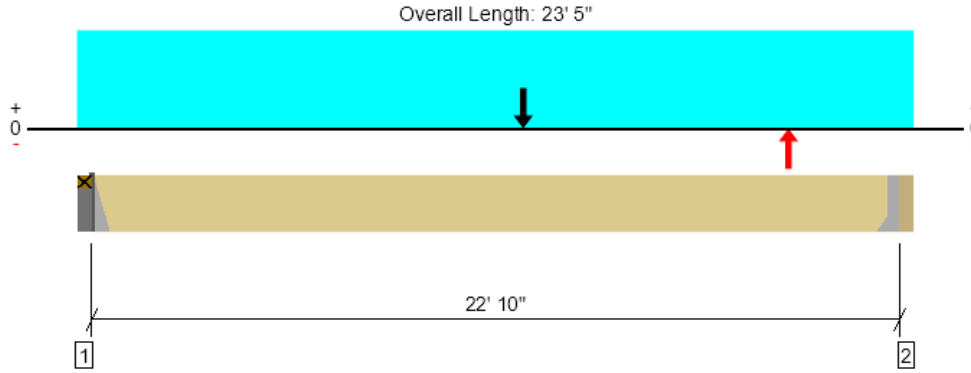
• Side loads are assumed to not induce cross-grain tension.

ForteWEB Software Operator	Job Notes
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9/17/2025 9:19:31 PM UTC
 ForteWEB v3.9, Engine: V8.4.3.94, Data: V8.1.7.3
 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B10
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1114 @ 3 1/2"	4725 (1.50")	Passed (24%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	868 @ 1' 5 1/2"	10127	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5517 @ 11' 8 1/2"	21840	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.273 @ 11' 8 1/2"	0.571	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.434 @ 11' 8 1/2"	1.142	Passed (L/631)	--	1.0 D + 1.0 L (All Spans)

Member Length : 22' 10"
 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	Seismic	Factored	
1 - Hanger on Single 2X SPF plate	3.50"	Hanger ¹	1.50"	362	624	571/-571	1130/-182	See note ¹
2 - Hanger on 14" SPF beam	3.50"	Hanger ¹	1.50"	362	624	571/-571	1130/-182	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)	22' 10" o/c	
Bottom Edge (Lu)	22' 10" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Top Mount Hanger	BA3.56/14	3.00"	6-10dx1.5	4-10dx1.5	2-10dx1.5		
2 - Face Mount Hanger	HU412	2.50"	N/A	16-10dx1.5	6-10d		

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 23' 1 1/2"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 23' 5" (Front)	1' 4"	12.0	40.0	--	Default Load
2 - Point (lb)	12' 6" (Front)	N/A	--	--	1737	
3 - Point (lb)	20' (Front)	N/A	--	--	-1737	

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

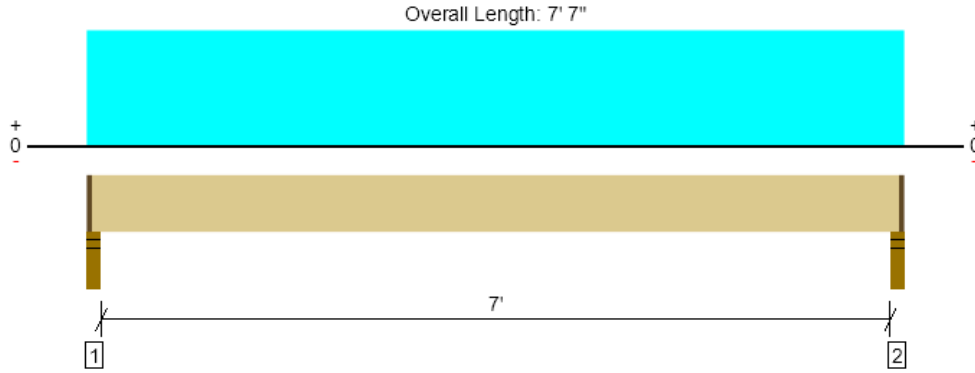
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Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



9/17/2025 9:19:31 PM UTC
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 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B11
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	440 @ 2"	3347 (2.25")	Passed (13%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	278 @ 1' 5 1/2"	10127	Passed (3%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	784 @ 3' 9 1/2"	21840	Passed (4%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.006 @ 3' 9 1/2"	0.181	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.008 @ 3' 9 1/2"	0.363	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 7' 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 - SPF	3.50"	2.25"	1.50"	147	303	451	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	147	303	451	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 5" o/c	
Bottom Edge (Lu)	7' 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)	1 1/4" to 7' 5 3/4"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 7' 7" (Front)	2'	12.0	40.0	Default Load
2 - Point (lb)	1' 6" (Front)	N/A	--	--	

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

Weyerhaeuser Notes

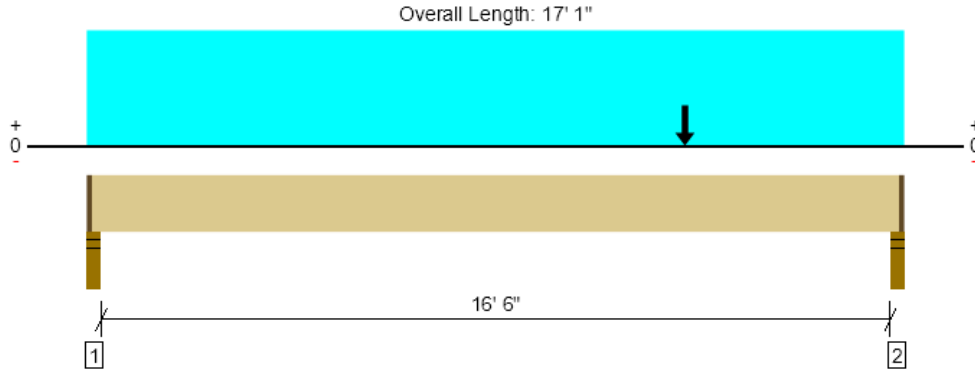
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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Upper Floor, Floor: Flush Beam B12
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1046 @ 16' 11"	3347 (2.25")	Passed (31%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	931 @ 15' 7 1/2"	10127	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4046 @ 9' 11 5/16"	21840	Passed (19%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.114 @ 8' 9 5/8"	0.419	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.177 @ 8' 9 7/16"	0.837	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 16' 10 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 - SPF	3.50"	2.25"	1.50"	305	535	840	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	374	679	1053	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	16' 11" o/c	
Bottom Edge (Lu)	16' 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)	1 1/4" to 16' 11 3/4"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 17' 1" (Front)	1' 4"	12.0	40.0	Default Load
2 - Point (lb)	12' 6" (Front)	N/A	147	303	

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

Weyerhaeuser Notes

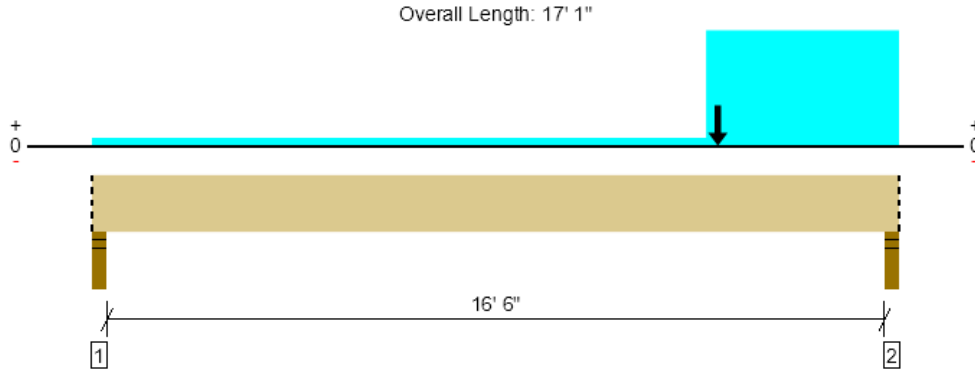
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Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



Upper Floor, Floor: Flush Beam B13
1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3548 @ 16' 11"	5206 (3.50")	Passed (68%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1988 @ 15' 9 5/8"	9878	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	7987 @ 13' 3"	25525	Passed (31%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.167 @ 9' 2"	0.419	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.336 @ 9' 2 7/16"	0.837	Passed (L/598)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 17' 1"
 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	Snow	Seismic	Factored	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	378	323	198	421/-421	990/-68	Blocking
2 - Stud wall - SPF	3.50"	3.50"	2.38"	1433	197	1571	1502/-150 2	3548/-191	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	17' 1" o/c	
Bottom Edge (Lu)	17' 1" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 17' 1"	N/A	13.0	--	--	--	
1 - Uniform (PSF)	0 to 13' (Front)	8"	20.0	60.0	--	--	Default Load
2 - Point (lb)	13' 3" (Front)	N/A	--	--	--	1923	
3 - Uniform (PSF)	13' to 17' 1" (Front)	17' 4"	20.0	--	25.0	--	Default Load

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

Weyerhaeuser Notes

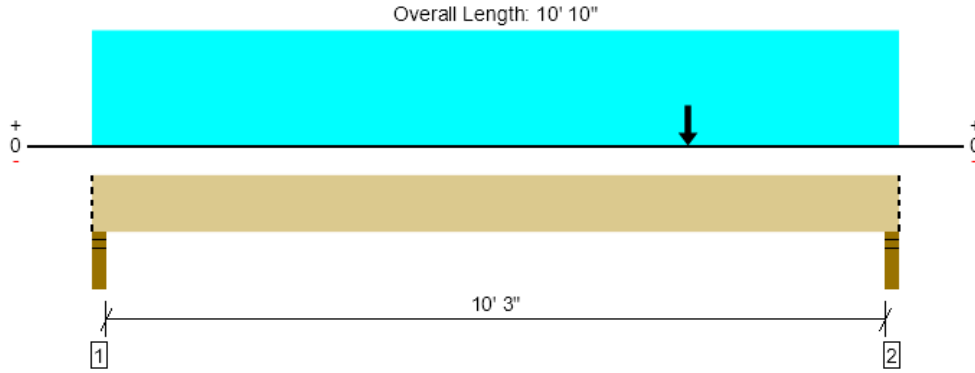
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Upper Floor, Floor: Flush Beam B14
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4730 @ 2"	5206 (3.50")	Passed (91%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3457 @ 1' 5 1/2"	10127	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	12035 @ 5' 5"	21840	Passed (55%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.173 @ 5' 5 1/16"	0.262	Passed (L/728)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.229 @ 5' 5 1/16"	0.525	Passed (L/550)	--	1.0 D + 1.0 L (All Spans)

Member Length : 10' 10"
 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	Wind	Factored	
1 - Stud wall - SPF	3.50"	3.50"	3.18"	1155	3575	439	4730	Blocking
2 - Stud wall - SPF	3.50"	3.50"	3.18"	1155	3575	1291	4730	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 10' 10"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 10' 10" (Front)	16' 6"	12.0	40.0	--	Default Load
2 - Point (lb)	8' (Front)	N/A	--	--	1730	

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

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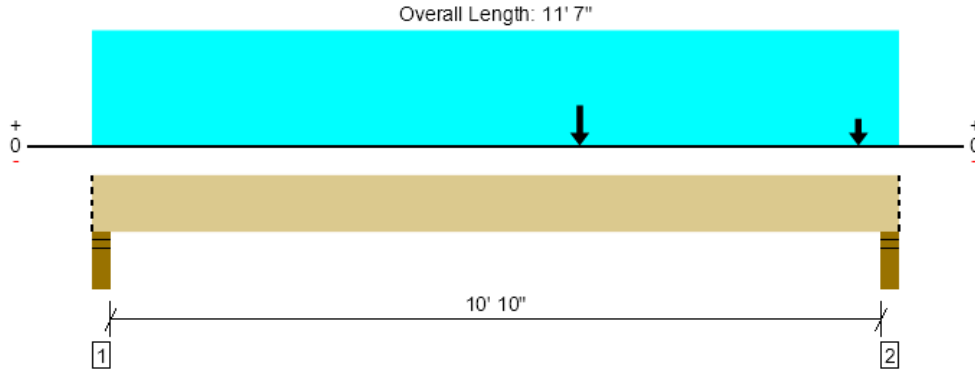
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 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B15
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6187 @ 3"	6694 (4.50")	Passed (92%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4540 @ 1' 6 1/2"	10127	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	16404 @ 5' 9 1/2"	21840	Passed (75%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.259 @ 5' 9 9/16"	0.277	Passed (L/513)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.342 @ 5' 9 9/16"	0.554	Passed (L/389)	--	1.0 D + 1.0 L (All Spans)

Member Length : 11' 7"
 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	Seismic	Factored	
1 - Stud wall - SPF	4.50"	4.50"	4.16"	1496	4691	455/-455	6187	Blocking
2 - Stud wall - SPF	4.50"	4.50"	4.16"	1496	4691	1235/-1235	6187	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' 7" o/c	
Bottom Edge (Lu)	11' 7" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 11' 7"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 11' 7" (Front)	20' 3"	12.0	40.0	--	Default Load
2 - Point (lb)	7' (Front)	N/A	--	--	1119	
3 - Point (lb)	11' (Front)	N/A	--	--	571	

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

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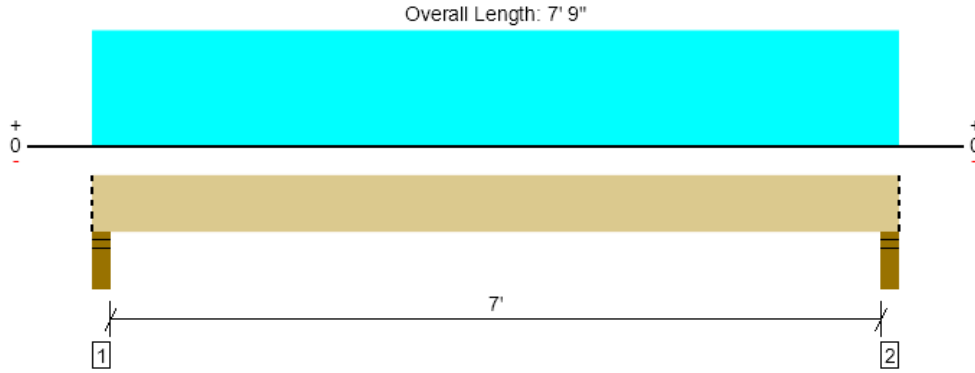
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



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 File Name: 5236 Mercer

Upper Floor, Floor: Flush Beam B16
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2880 @ 3"	6694 (4.50")	Passed (43%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1734 @ 1' 6 1/2"	10127	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4884 @ 3' 10 1/2"	21840	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.039 @ 3' 10 1/2"	0.181	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.052 @ 3' 10 1/2"	0.363	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 7' 9"
 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 - SPF	4.50"	4.50"	1.94"	710	2170	2880	Blocking
2 - Stud wall - SPF	4.50"	4.50"	1.94"	710	2170	2880	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 9" o/c	
Bottom Edge (Lu)	7' 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 7' 9"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 7' 9" (Front)	14'	12.0	40.0	Default Load

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

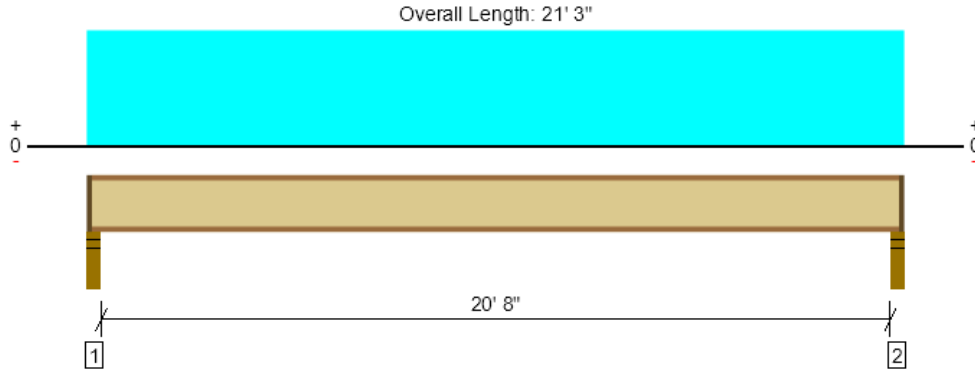
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Main Floor, Floor: Joist J1

1 piece(s) 11 7/8" TJI® 360 @ 12" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	842 @ 2 1/2"	1202 (2.25")	Passed (70%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	827 @ 3 1/2"	1705	Passed (48%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4340 @ 10' 7 1/2"	6180	Passed (70%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.587 @ 10' 7 1/2"	0.694	Passed (L/426)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.782 @ 10' 7 1/2"	1.042	Passed (L/320)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	44	40	Passed	--	--

Member Length : 21' 1/2"
 System : Floor
 Member Type : Joist
 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.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories	Details
	Total	Available	Required	Dead	Floor Live	Factored		
1 - Stud wall - SPF	3.50"	2.25"	1.75"	213	637	850	1 1/4" Rim Board	A3
2 - Stud wall - SPF	3.50"	2.25"	1.75"	213	637	850	1 1/4" Rim Board	A3

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 5" o/c	
Bottom Edge (Lu)	21' 1" 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 21' 3"	12"	20.0	60.0	Default Load

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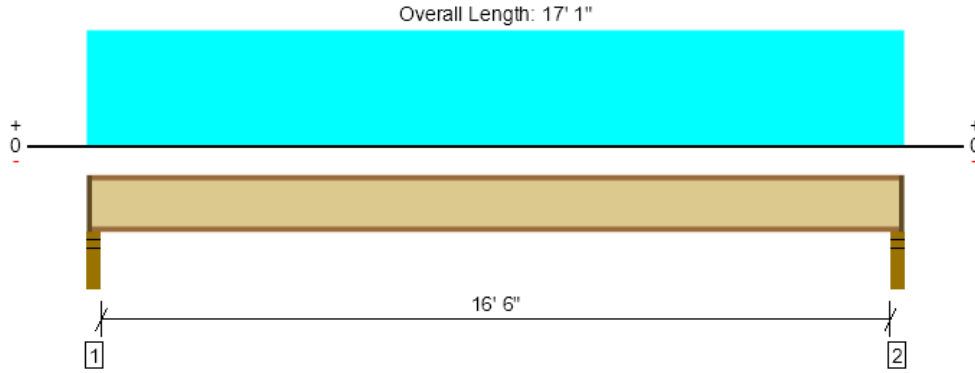
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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Main Floor, Floor: Joist J2

1 piece(s) 11 7/8" TJI® 210 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	585 @ 2 1/2"	1134 (2.25")	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	572 @ 3 1/2"	1655	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2407 @ 8' 6 1/2"	3795	Passed (63%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.272 @ 8' 6 1/2"	0.556	Passed (L/734)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.354 @ 8' 6 1/2"	0.833	Passed (L/565)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	48	40	Passed	--	--

Member Length : 16' 10 1/2"
 System : Floor
 Member Type : Joist
 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.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories	Details
	Total	Available	Required	Dead	Floor Live	Factored		
1 - Stud wall - SPF	3.50"	2.25"	1.75"	137	456	592	1 1/4" Rim Board	A3
2 - Stud wall - SPF	3.50"	2.25"	1.75"	137	456	592	1 1/4" Rim Board	A3

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 8" o/c	
Bottom Edge (Lu)	16' 11" 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 17' 1"	16"	12.0	40.0	Default Load

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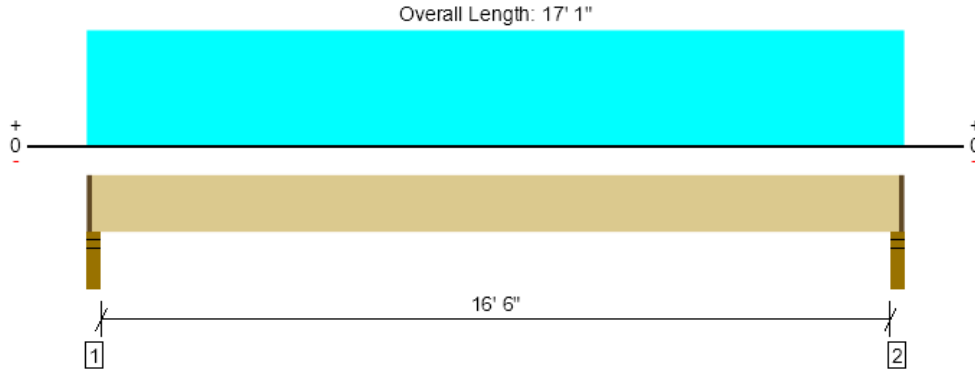
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Main Floor, Floor: Joist J3

1 piece(s) 1 3/4" x 9 1/2" 2.0E Microllam® LVL @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	900 @ 2 1/2"	1673 (2.25")	Passed (54%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	796 @ 1' 1"	3159	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3704 @ 8' 6 1/2"	6123	Passed (60%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.510 @ 8' 6 1/2"	0.556	Passed (L/392)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.679 @ 8' 6 1/2"	0.833	Passed (L/294)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	45	40	Passed	--	--

Member Length : 16' 10 1/2"
 System : Floor
 Member Type : Joist
 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.
- A 4% increase in the moment capacity has been added to account for repetitive member usage.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	228	683	911	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	228	683	911	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 7" o/c	
Bottom Edge (Lu)	16' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 17' 1"	16"	20.0	60.0	Default Load

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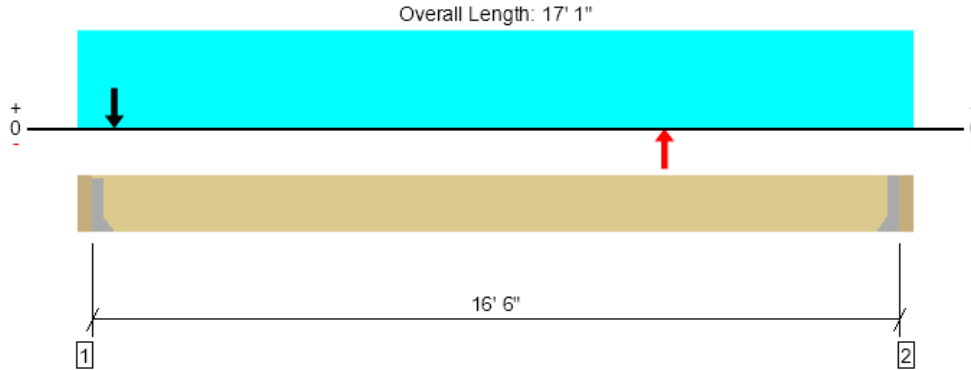
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 File Name: 5236 Mercer

Main Floor, Floor: Flush Beam B1

1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1087 @ 3 1/2"	4725 (1.50")	Passed (23%)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	869 @ 1' 3 3/8"	8590	Passed (10%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4072 @ 8' 6 1/2"	15953	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.186 @ 8' 6 1/2"	0.412	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.278 @ 8' 6 1/2"	0.825	Passed (L/712)	--	1.0 D + 1.0 L (All Spans)

Member Length : 16' 6"
 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	Wind	Factored	
1 - Hanger on 11 7/8" SPF beam	3.50"	Hanger ¹	1.50"	335	683	588	1112	See note ¹
2 - Hanger on 11 7/8" SPF beam	3.50"	Hanger ¹	1.50"	335	683	-588	1018/-152	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)	16' 6" o/c	
Bottom Edge (Lu)	16' 6" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	HU410	2.50"	N/A	14-10dx1.5	6-10d		
2 - Face Mount Hanger	HU410	2.50"	N/A	14-10dx1.5	6-10d		

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Wind (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 16' 9 1/2"	N/A	13.0	--	--	
1 - Uniform (PSF)	0 to 17' 1" (Front)	1' 4"	20.0	60.0	--	Default Load
2 - Point (lb)	9" (Front)	N/A	--	--	863	
3 - Point (lb)	12' (Front)	N/A	--	--	-863	

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

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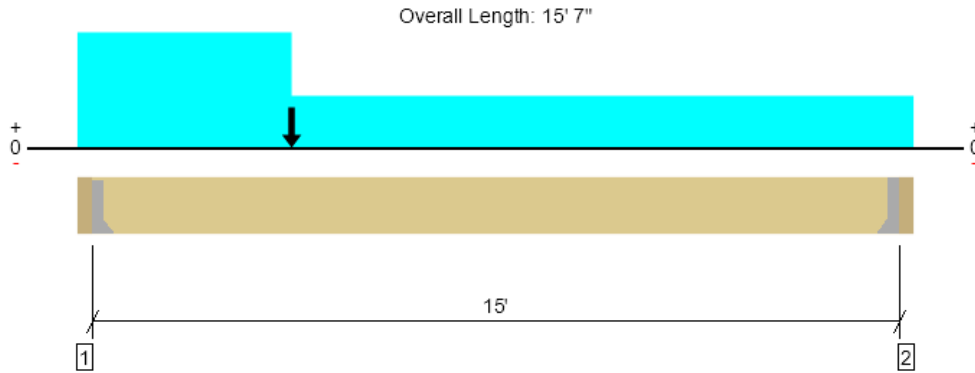
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Main Floor, Floor: Flush Beam B2
1 piece(s) 7" x 11 7/8" 2.2E Parallam® PSL

An excessive uplift of -3552 lbs at support located at 3 1/2" failed this product.



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	11990 @ 3 1/2"	11990 (2.74")	Passed (100%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	8135 @ 1' 3 3/8"	16071	Passed (51%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	28614 @ 7' 2 15/16"	39805	Passed (72%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.437 @ 7' 7 7/8"	0.500	Passed (L/412)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.583 @ 7' 7 7/8"	0.750	Passed (L/309)	--	1.0 D + 1.0 L (All Spans)

Member Length : 15'
 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.
- -569 lbs uplift at support located at 15' 3 1/2". Strapping or other restraint may be required.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Factored	
1 - Hanger on 11 7/8" SPF beam	3.50"	Hanger ¹	2.74"	2598	8011	7301/-730 1	12440/-355 2	See note ¹
2 - Hanger on 11 7/8" SPF beam	3.50"	Hanger ¹	1.63"	1849	5514	2398/-239 8	7363/-569	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' o/c	
Bottom Edge (Lu)	15' 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	HGUS7.25/12	4.00"	N/A	56-16d	20-16d		
2 - Face Mount Hanger	HGUS7.25/10	4.00"	N/A	46-16d	16-16d		

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 15' 3 1/2"	N/A	26.0	--	--	
1 - Uniform (PSF)	0 to 15' 7" (Front)	16' 6"	12.0	40.0	--	Default Load
2 - Point (lb)	4' (Front)	N/A	--	--	9699	
3 - Uniform (PSF)	0 to 4' (Front)	20' 3"	12.0	40.0	--	Default Load

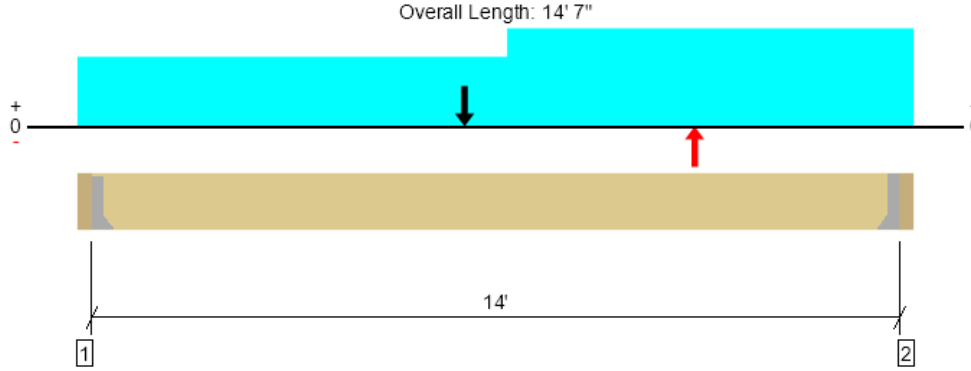
- Side loads are assumed to not induce cross-grain tension.

ForteWEB Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



Main Floor, Floor: Flush Beam B3

1 piece(s) 5 1/4" x 11 7/8" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7450 @ 14' 3 1/2"	7450 (2.27")	Passed (100%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6260 @ 13' 3 5/8"	12053	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	23912 @ 7' 9 13/16"	29854	Passed (80%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.423 @ 7' 4 11/16"	0.467	Passed (L/397)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.561 @ 7' 4 11/16"	0.700	Passed (L/299)	--	1.0 D + 1.0 L (All Spans)

Member Length : 14'
 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.
- -979 lbs uplift at support located at 3 1/2". Strapping or other restraint may be required.
- -808 lbs uplift at support located at 14' 3 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Factored	
1 - Hanger on 11 7/8" SPF beam	3.50"	Hanger ¹	1.99"	1602	4884	2771/-277 1	6719/-979	See note ¹
2 - Hanger on 11 7/8" SPF beam	3.50"	Hanger ¹	2.27"	1886	5831	2771/-277 1	7717/-808	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' o/c	
Bottom Edge (Lu)	14' 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	HGUS5.50/12	4.00"	N/A	56-10d	20-10d	
2 - Face Mount Hanger	HGUS5.50/12	4.00"	N/A	56-10d	20-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 14' 3 1/2"	N/A	19.5	--	--	
1 - Uniform (PSF)	0 to 14' 7" (Front)	1' 4"	12.0	40.0	--	Default Load
2 - Point (lb)	6' 9" (Front)	N/A	--	--	9699	
3 - Point (lb)	10' 9" (Front)	N/A	--	--	-9699	
4 - Uniform (PSF)	0 to 7' 6" (Front)	14'	12.0	40.0	--	Default Load
5 - Uniform (PSF)	7' 6" to 14' 7" (Front)	20' 3"	12.0	40.0	--	Default Load

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

Forteweb Software Operator	Job Notes
Elizabeth Fekete Frank Co. (206) 579-8160 liz@frankcompany.com	



9/17/2025 9:19:31 PM UTC
 Forteweb v3.9, Engine: V8.4.3.94, Data: V8.1.7.3
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Cantilevered Retaining Wall

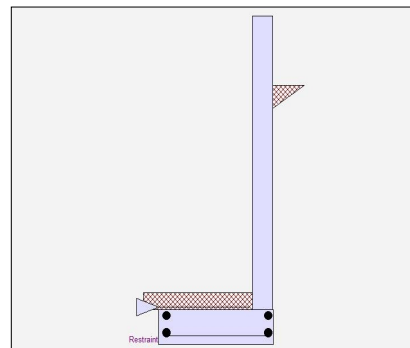
Criteria

Retained Height = 6.50 ft
Wall height above soil = 2.00 ft
Slope Behind Wall = 0.00
Height of Soil over Toe = 6.00 in
Water height over heel = 0.0 ft

Soil Data

Allow Soil Bearing = 3,000.0 psf
Equivalent Fluid Pressure Method
Active Heel Pressure = 35.0 psf/ft

Passive Pressure = 300.0 psf/ft
Soil Density, Heel = 110.00 pcf
Soil Density, Toe = 110.00 pcf
Footing||Soil Friction = 0.400
Soil height to ignore for passive pressure = 12.00 in



Surcharge Loads

Surcharge Over Heel = 0.0 psf
Used To Resist Sliding & Overturning
Surcharge Over Toe = 0.0
Used for Sliding & Overturning

Lateral Load Applied to Stem

Lateral Load = 0.0 #/ft
...Height to Top = 0.00 ft
...Height to Bottom = 0.00 ft
Load Type = Wind (W)
(Service Level)
Wind on Exposed Stem = 0.0 psf
(Service Level)

Adjacent Footing Load

Adjacent Footing Load = 0.0 lbs
Footing Width = 0.00 ft
Eccentricity = 0.00 in
Wall to Ftg CL Dist = 0.00 ft
Footing Type = Line Load
Base Above/Below Soil at Back of Wall = 0.0 ft
Poisson's Ratio = 0.300

Axial Load Applied to Stem

Axial Dead Load = 170.0 lbs
Axial Live Load = 560.0 lbs
Axial Load Eccentricity = 0.0 in

Earth Pressure Seismic Load

Method : Uniform
Multiplier Used = 9.000
(Multiplier used on soil density)

Uniform Seismic Force = 67.500
Total Seismic Force = 506.250

Design Summary

Wall Stability Ratios
Overturning = 1.23 Ratio < 1.5!
Slab Resists All Sliding !

Total Bearing Load = 2,298 lbs
...resultant ecc. = 7.69 in

Soil Pressure @ Toe = 1,283 psf OK
Soil Pressure @ Heel = 0 psf OK
Allowable = 3,000 psf
Soil Pressure Less Than Allowable
ACI Factored @ Toe = 1,797 psf
ACI Factored @ Heel = 0 psf
Footing Shear @ Toe = 21.4 psi OK
Footing Shear @ Heel = 0.0 psi OK
Allowable = 75.0 psi

Sliding Calcs
Lateral Sliding Force = 1,338.8 lbs

Stem Construction

Design Height Above Ftg ft = 0.00
Wall Material Above "Ht" = Concrete
Design Method = LRFD ASD LRFD
Thickness = 8.00
Rebar Size = # 4
Rebar Spacing = 12.00
Rebar Placed at = Edge

Design Data
fb/FB + fa/Fa = 0.737

Total Force @ Section
Service Level lbs =
Strength Level lbs = 1,621.8

Moment....Actual
Service Level ft-# =
Strength Level ft-# = 3,989.1
Moment....Allowable = 5,412.6

Shear....Actual
Service Level psi =
Strength Level psi = 21.6
Shear....Allowable psi = 75.0
Anet (Masonry) in2 = 139.50
Rebar Depth 'd' in = 6.25

Masonry Data
f'm psi =
Fs psi =
Solid Grouting =
Modular Ratio 'n' =
Wall Weight psf = 100.0
Short Term Factor =
Equiv. Solid Thick. =
Masonry Block Type = Medium Weight
Masonry Design Method = ASD

Concrete Data
f'c psi = 2,500.0
Fy psi = 60,000.0

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code ACI
Dead Load 1.200
Live Load 1.600
Earth, H 1.600
Wind, W 1.000
Seismic, E 1.000

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Cantilevered Retaining Wall

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.1495 in2/ft		
(4/3) * As :	0.1993 in2/ft	Min Stem T&S Reinf Area 1.632 in2	
200bd/ft : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	=====	One layer of :	Two layers of :
Required Area :	0.1993 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Dimensions & Strengths

Toe Width	=	3.00 ft
Heel Width	=	0.67
Total Footing Width	=	3.67
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c =	2,500 psi	Fy = 60,000 psi
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	2.00	@ Btm.= 3.00 in

Footing Design Results

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	1,797	0 psf
Mu' : Upward	=	5,827	0 ft-#
Mu' : Downward	=	1,107	0 ft-#
Mu: Design	=	4,720	0 ft-#
Actual 1-Way Shear	=	21.43	0.03 psi
Allow 1-Way Shear	=	75.00	40.00 psi
Toe Reinforcing	=	# 4 @ 9.00 in	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	None Spec'd	

Other Acceptable Sizes & Spacings

Toe: #4@ 9.26 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.78 in, #8@ 36.57 in, #9@ 46
 Heel: Not req'd: Mu < phi*5*lambda*sqrt(f'c)*Sm
 Key: No key defined

Min footing T&S reinf Area	0.95 in2
Min footing T&S reinf Area per foot	0.26 in2 /ft
If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Summary of Overturning & Resisting Forces & Moments

ItemOVERTURNING.....			RESISTING.....		
	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	= 984.4	2.50	2,460.9	Soil Over Heel	= 2.4	3.67	8.7
Surcharge over Heel	=			Sloped Soil Over Heel	=		
Surcharge Over Toe	=			Surcharge Over Heel	=		
Adjacent Footing Load	=			Adjacent Footing Load	=		
Added Lateral Load	=			Axial Dead Load on Stem	= 170.0	3.33	566.7
Load @ Stem Above Soil	=			* Axial Live Load on Stem	= 560.0	3.33	1,866.7
Seismic Earth Load	= 354.4	3.75	1,328.9	Soil Over Toe	= 165.0	1.50	247.5
	=			Surcharge Over Toe	=		
Total	1,338.8	O.T.M.	3,789.8	Stem Weight(s)	= 850.0	3.33	2,833.3
	=	=	=	Earth @ Stem Transitions	=		
Resisting/Overturning Ratio		=	1.23	Footing Weight	= 550.5	1.84	1,010.2
Vertical Loads used for Soil Pressure =		2,297.9 lbs		Key Weight	=		
				Vert. Component	=		
				Total =	1,737.9 lbs	R.M.=	4,666.4

If seismic is included, the OTM and sliding ratios be 1.1 per section 1807.2.3 of IBC

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

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Cantilevered Retaining Wall

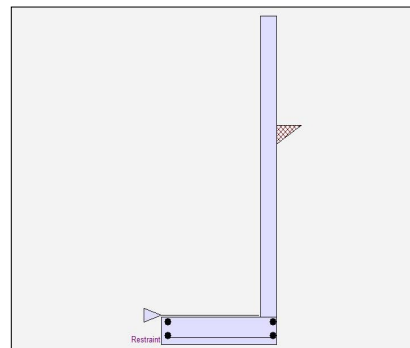
Criteria

Retained Height = 7.00 ft
Wall height above soil = 4.00 ft
Slope Behind Wall = 0.00
Height of Soil over Toe = 0.00 in
Water height over heel = 0.0 ft

Soil Data

Allow Soil Bearing = 3,000.0 psf
Equivalent Fluid Pressure Method
Active Heel Pressure = 50.0 psf/ft

Passive Pressure = 300.0 psf/ft
Soil Density, Heel = 110.00 pcf
Soil Density, Toe = 110.00 pcf
Footing||Soil Friction = 0.400
Soil height to ignore for passive pressure = 12.00 in



Surcharge Loads

Surcharge Over Heel = 0.0 psf
Used To Resist Sliding & Overturning
Surcharge Over Toe = 0.0
Used for Sliding & Overturning

Lateral Load Applied to Stem

Lateral Load = 0.0 #/ft
...Height to Top = 0.00 ft
...Height to Bottom = 0.00 ft
Load Type = Wind (W)
(Service Level)
Wind on Exposed Stem = 0.0 psf
(Service Level)

Adjacent Footing Load

Adjacent Footing Load = 0.0 lbs
Footing Width = 0.00 ft
Eccentricity = 0.00 in
Wall to Ftg CL Dist = 0.00 ft
Footing Type = Line Load
Base Above/Below Soil at Back of Wall = 0.0 ft
Poisson's Ratio = 0.300

Axial Load Applied to Stem

Axial Dead Load = 170.0 lbs
Axial Live Load = 560.0 lbs
Axial Load Eccentricity = 0.0 in

Earth Pressure Seismic Load

Method : Uniform
Multiplier Used = 9.000
(Multiplier used on soil density)

Uniform Seismic Force = 72.000
Total Seismic Force = 576.000

Design Summary

Wall Stability Ratios
Overturning = 1.22 Ratio < 1.5!
Slab Resists All Sliding !

Total Bearing Load = 2,533 lbs
...resultant ecc. = 10.50 in

Soil Pressure @ Toe = 1,157 psf OK
Soil Pressure @ Heel = 0 psf OK
Allowable = 3,000 psf
Soil Pressure Less Than Allowable
ACI Factored @ Toe = 1,619 psf
ACI Factored @ Heel = 0 psf
Footing Shear @ Toe = 26.8 psi OK
Footing Shear @ Heel = 0.0 psi OK
Allowable = 75.0 psi

Sliding Calcs
Lateral Sliding Force = 2,003.2 lbs

Stem Construction

Design Height Above Ftg ft = 0.00
Wall Material Above "Ht" = Concrete
Design Method = LRFD ASD LRFD
Thickness = 8.00
Rebar Size = # 4
Rebar Spacing = 12.00
Rebar Placed at = Edge

Design Data
fb/FB + fa/Fa = No Good

Total Force @ Section
Service Level lbs =
Strength Level lbs = 2,464.0

Moment....Actual
Service Level ft-# =
Strength Level ft-# = 6,337.3
Moment....Allowable = 5,412.6

Shear....Actual
Service Level psi =
Strength Level psi = 32.9
Shear....Allowable psi = 75.0
Anet (Masonry) in2 = 139.50
Rebar Depth 'd' in = 6.25

Masonry Data
f'm psi =
Fs psi =
Solid Grouting =
Modular Ratio 'n' =
Wall Weight psf = 100.0
Short Term Factor =
Equiv. Solid Thick. =
Masonry Block Type = Medium Weight
Masonry Design Method = ASD

Concrete Data
f'c psi = 2,500.0
Fy psi = 60,000.0

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code = ACI
Dead Load = 1.200
Live Load = 1.600
Earth, H = 1.600
Wind, W = 1.000
Seismic, E = 1.000

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Cantilevered Retaining Wall

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.2374 in2/ft		
(4/3) * As :	0.3166 in2/ft	Min Stem T&S Reinf Area 2.112 in2	
200bd/ft : 200(12)(6.25)/60000 :	0.25 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	=====	One layer of :	Two layers of :
Required Area :	0.25 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8467 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Dimensions & Strengths

Toe Width	=	4.00 ft
Heel Width	=	0.67
Total Footing Width	=	4.67
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c =	2,500 psi	Fy = 60,000 psi
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	2.00	@ Btm.= 3.00 in

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure	= 1,619	0 psf
Mu' : Upward	= 9,011	0 ft-#
Mu' : Downward	= 1,440	0 ft-#
Mu: Design	= 7,571	0 ft-#
Actual 1-Way Shear	= 26.81	0.03 psi
Allow 1-Way Shear	= 75.00	40.00 psi
Toe Reinforcing	= # 4 @ 12.00 in	
Heel Reinforcing	= None Spec'd	
Key Reinforcing	= None Spec'd	

Other Acceptable Sizes & Spacings

Toe: #4@ 8.75 in, #5@ 13.57 in, #6@ 19.26 in, #7@ 26.26 in, #8@ 34.57 in, #9@ 43
 Heel: Not req'd: Mu < phi*5*lambda*sqrt(f'c)*Sm
 Key: No key defined

Min footing T&S reinf Area	1.21 in2
Min footing T&S reinf Area per foot	0.26 in2 /ft
If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Summary of Overturning & Resisting Forces & Moments

ItemOVERTURNING.....		RESISTING.....			
	Force lbs	Distance ft	Moment ft-#	Force lbs	Distance ft	Moment ft-#	
Heel Active Pressure	= 1,600.0	2.67	4,266.7	Soil Over Heel	= 2.6	4.67	12.0
Surcharge over Heel	=			Sloped Soil Over Heel	=		
Surcharge Over Toe	=			Surcharge Over Heel	=		
Adjacent Footing Load	=			Adjacent Footing Load	=		
Added Lateral Load	=			Axial Dead Load on Stem	= 170.0	4.33	736.7
Load @ Stem Above Soil	=			* Axial Live Load on Stem	= 560.0	4.33	2,426.7
Seismic Earth Load	= 403.2	4.00	1,612.8	Soil Over Toe	=		
	=			Surcharge Over Toe	=		
Total	2,003.2	O.T.M.	5,879.5	Stem Weight(s)	= 1,100.0	4.33	4,766.7
	=	=		Earth @ Stem Transitions	=		
Resisting/Overturning Ratio		=	1.22	Footing Weight	= 700.5	2.34	1,635.7
Vertical Loads used for Soil Pressure	=	2,533.1 lbs		Key Weight	=		
				Vert. Component	=		
				Total =	1,973.1 lbs	R.M.=	7,151.0

If seismic is included, the OTM and sliding ratios be 1.1 per section 1807.2.3 of IBC

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

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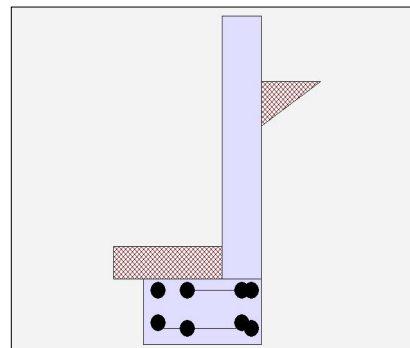
Cantilevered Retaining Wall

Criteria

Retained Height	=	3.00 ft
Wall height above soil	=	1.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	50.0 psf/ft
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0
Used for Sliding & Overturning		

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem	=	0.0 psf (Service Level)

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	400.0 lbs
Axial Live Load	=	820.0 lbs
Axial Load Eccentricity	=	0.0 in

Earth Pressure Seismic Load

Method : Uniform		
Multiplier Used	=	9.000
(Multiplier used on soil density)		
Uniform Seismic Force	=	36.000
Total Seismic Force	=	144.000

Design Summary

Wall Stability Ratios		
Overturning	=	2.28 OK
Sliding	=	1.31 Ratio < 1.5!
Total Bearing Load	=	1,993 lbs
...resultant ecc.	=	1.91 in
Soil Pressure @ Toe	=	519 psf OK
Soil Pressure @ Heel	=	1,477 psf OK
Allowable	=	3,000 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	727 psf
ACI Factored @ Heel	=	2,067 psf
Footing Shear @ Toe	=	3.5 psi OK
Footing Shear @ Heel	=	3.5 psi OK
Allowable	=	75.0 psi
Sliding Calcs		
Lateral Sliding Force	=	500.8 lbs
less 100% Passive Force	= -	187.5 lbs
less 100% Friction Force	= -	469.1 lbs
Added Force Req'd	=	0.0 lbs OK
...for 1.5 Stability	=	94.6 lbs NG

Stem Construction

Design Height Above Ftg		ft =	0.00	Stem OK
Wall Material Above "Ht"	=	Concrete		
Design Method	=	LRFD	ASD	LRFD
Thickness	=	8.00		
Rebar Size	=	# 4		
Rebar Spacing	=	12.00		
Rebar Placed at	=	Center		
Design Data				
fb/FB + fa/Fa	=	0.154		
Total Force @ Section				
Service Level	lbs =			
Strength Level	lbs =	468.0		
Moment....Actual				
Service Level	ft-# =			
Strength Level	ft-# =	522.0		
Moment....Allowable	=	3,387.6		
Shear....Actual				
Service Level	psi =			
Strength Level	psi =	9.8		
Shear....Allowable	psi =	75.0		
Anet (Masonry)	in2 =	139.50		
Rebar Depth 'd'	in =	4.00		

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Wall Weight	psf =	100.0
Short Term Factor	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	Medium Weight
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	2,500.0
Fy	psi =	60,000.0

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	ACI
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

This Wall in File: c:\users\le_fek\desktop\nas sync\nas sync\engineering\l5 (formerly mas)

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Cantilevered Retaining Wall

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0315 in2/ft		
(4/3) * As :	0.042 in2/ft	Min Stem T&S Reinf Area 0.768 in2	
200bd/ft : 200(12)(4)/60000 :	0.16 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	=====	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.5419 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Dimensions & Strengths

Toe Width	=	1.33 ft
Heel Width	=	0.67
Total Footing Width	=	2.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c =	2,500 psi	Fy = 60,000 psi
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	2.00	@ Btm.= 3.00 in

Footing Design Results

	<u>Toe</u>	<u>Heel</u>
Factored Pressure	= 727	2,067 psf
Mu' : Upward	= 906	0 ft-#
Mu' : Downward	= 218	0 ft-#
Mu: Design	= 689	0 ft-#
Actual 1-Way Shear	= 3.46	3.55 psi
Allow 1-Way Shear	= 40.00	40.00 psi
Toe Reinforcing	= # 4 @ 12.00 in	
Heel Reinforcing	= # 4 @ 18.00 in	
Key Reinforcing	= None Spec'd	

Other Acceptable Sizes & Spacings

Toe: Not req'd: $\mu < \phi * 5 * \lambda * \sqrt{f'c} * S_m$
 Heel: Not req'd: $\mu < \phi * 5 * \lambda * \sqrt{f'c} * S_m$
 Key: No key defined

Min footing T&S reinf Area	0.52 in2
Min footing T&S reinf Area per foot	0.26 in2 /ft
If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Summary of Overturning & Resisting Forces & Moments

ItemOVERTURNING.....		RESISTING.....		
	Force lbs	Distance ft	Moment ft-#	Force lbs	Distance ft	Moment ft-#
Heel Active Pressure	= 400.0	1.33	533.3	Soil Over Heel	=	2.00
Surcharge over Heel	=			Sloped Soil Over Heel	=	
Surcharge Over Toe	=			Surcharge Over Heel	=	
Adjacent Footing Load	=			Adjacent Footing Load	=	
Added Lateral Load	=			Axial Dead Load on Stem	= 400.0	1.66 665.3
Load @ Stem Above Soil	=			* Axial Live Load on Stem	= 820.0	1.66 1,363.9
Seismic Earth Load	= 100.8	2.00	201.6	Soil Over Toe	= 73.2	0.67 48.6
	=			Surcharge Over Toe	=	
Total	500.8	O.T.M.	734.9	Stem Weight(s)	= 400.0	1.66 665.3
	=	=		Earth @ Stem Transitions	=	
Resisting/Overturning Ratio		=	2.28	Footing Weight	= 299.5	1.00 299.0
Vertical Loads used for Soil Pressure =		1,992.7 lbs		Key Weight	=	
				Vert. Component	=	
				Total =	1,172.7 lbs	R.M.= 1,678.3

If seismic is included, the OTM and sliding ratios be 1.1 per section 1807.2.3 of IBC

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.