



Structural Calculations

Project: **Rawson Remodel**
8413 SE 82nd St.
Mercer Island, WA 98040

For: **Sturman Architects**
9 - 103rd Ave SE, Suite 203
Bellevue, WA 98004

By: **Année Structural Engineering, LLC**
1801 18th Ave S
Seattle, WA 98144

Date: **January 8, 2024**



Design Criteria



Project Name: **Rawson Residence**
 Location: **8413 SE 82nd St, Mercer Island, WA**

Date: **1/5/2024**
 Soil Bearing: **2000** psf
 Frost Depth: **12"**

Dead Loads:	<u>Roof:</u>		<u>Floors:</u>		<u>Walls:</u>	
	Comp. Roofing	5.1 PSF	Flooring	3.0 PSF	Siding	2.3 PSF
	1/2" Sheathing	1.7 PSF		0.0 PSF	Plywood	1.7 PSF
	Trusses	3.0 PSF	3/4" Sheathing	2.5 PSF	2x Studs	1.8 PSF
	Insulation	0.9 PSF	Joists	2.2 PSF	Insulation	0.5 PSF
	5/8" Gypsum	2.8 PSF	5/8" Gypsum	2.8 PSF	1/2" Gypsum	2.2 PSF
	Miscellaneous	3.5 PSF	Miscellaneous	1.5 PSF	Miscellaneous	1.5 PSF
	Total	17.0 PSF	Total	12.0 PSF	Total	10.0 PSF
Live Loads:	Snow	25.0 PSF	Floor	40.0 PSF	Wind	35.3 PSF

Seismic Loads: *per 2018 IBC, Sect. 1613 & ASCE 7-16, Chapter 11*

Design Category = **D** Importance = **1.0** Redundancy = **1.00**
 Site Class = **D** R = **6.5**
 Latitude ($^{\circ}$ N) = **47.529** (*per USGS*) $S_s = 1.466$ $F_a = 1.200$ $S_{DS} = 2/3(F_a \times S_s) = 1.173$
 Longitude ($^{\circ}$ W) = **122.227** (*per USGS*) $S_1 = 0.505$ $F_v = 1.795$ $S_{D1} = 2/3(F_v \times S_1) = 0.604$

Building $C_t = 0.02$ (wood)
 Height $h_n = 27.2$ ft.
 Period $T = C_t(h_n)^{3/4} = 0.24$ sec. $T_0 = 0.2 * (S_{D1} / S_{DS}) = 0.10$ $T_s = (S_{D1} / S_{DS}) = 0.52$

$S_a = 1.173$ $S_a = S_{DS}$ if $T_0 < T < T_{sr}$, $S_a = 0.6 * (S_{DS} / T_0) * T + 0.4 * S_{DS}$ if $T < T_0$, $S_a = S_{D1} / T$ if $T > T_s$

Not greater than: $C_s = S_{D1} / T * (R / I) = 0.390$
 Not less than: $C_s = 0.044 S_{DS} * I = 0.052$
 Design Category E or F; not less than: $C_s = 0.5 S_1 / (R / I) = 0.039$
 Seismic Design Coefficient: $C_s = S_{DS} / (R / I) = 0.180$

$C_s = 0.180$

Seismic Weight Distribution:

Diaphragm	h_i (ft.)	w_i (kips)	$h_i w_i$ (K-ft.)	$w_i h_i / \sum(w_i h_i)$	F_i (lbs.)	Sum F _i (lbs.)
			0	0	0	0
			0	0	0	0
Roof	28.6	30.03	858.3	0.2994	6,470	6,470
Upper Floor	18.8	75.12	1411	0.4921	10,635	17,105
Main Floor	9.1	65.95	597.6	0.2085	4,505	21,610
		171.1	2867			

Design Base Shear (ASD) = $0.7 * (0.180 * W) = 0.126 * W =$ **21,610 lbs.**

Wind Loads:

per ASCE 7-16, Section 27.5

Section 30.4

Cladding (ft2): 100 20

Wind Speed (MPH)	110	Zone	(ASD)	Adj.		Zone	Pn30	P	Pn30	P	
Exposure	C	Wall - Ph	27.9	31.8	(p.352)	Wall	4	-20.4	-31.8	-22.6	-35.3
Roof Pitch (x:12)	2	Wall - Po	26.6	30.3	6-1/2		5	-22.6	-35.3	-27.2	-42.5
$K_1 =$	0.00	Roof - 1	0.0	0.0	11.0	Roof	1	-12.5	-19.5	-40.2	-62.7
$K_2 =$	0.00	Roof - 2	0.0	0.0	-8.3		2e	-12.5	-19.5	-40.2	-62.7
$K_3 =$	0.00	Roof - 3	-26.7	-30.5			2n	-32.3	-50.4	-50.7	-79.1
$K_t = (1 + K_1 * K_2 * K_3)^2 =$	1.90	Roof - 4	-23.8	-27.2			2r	-32.3	-50.4	-50.7	-79.1
(p.362) $\lambda =$	1.37	Roof - 5	-19.6	-22.3			3e	-32.3	-50.4	-50.7	-79.1
(p.291) Exp. Fctr =	1.00						3r	-36.5	-57.0	-59.7	-93.2



Rawson Residence

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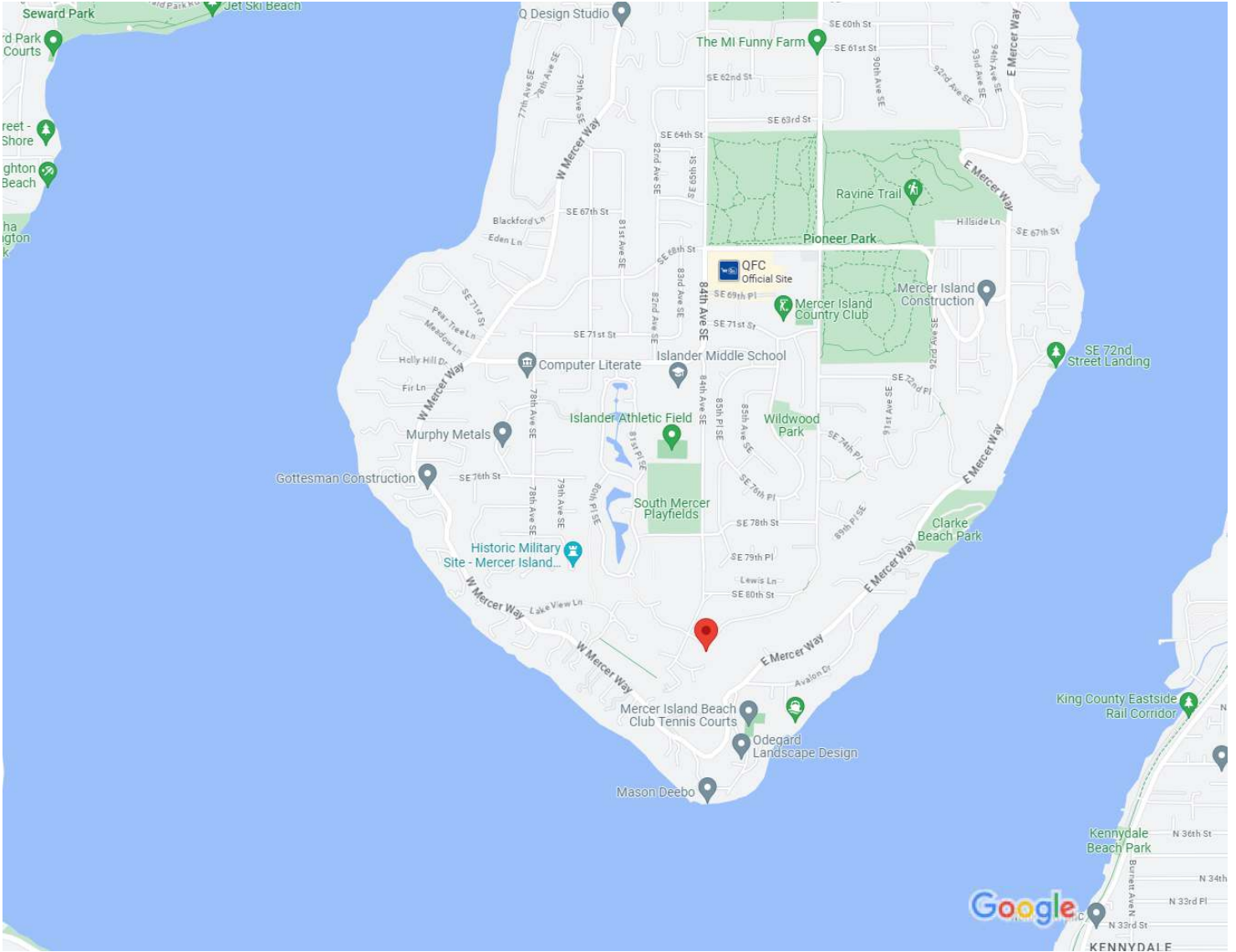
Latitude, Longitude: 47.52932269999999, -122.2269859



Date	11/15/2023, 2:49:25 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S _S	1.466	MCE _R ground motion. (for 0.2 second period)
S ₁	0.505	MCE _R ground motion. (for 1.0s period)
S _{MS}	1.759	Site-modified spectral acceleration value
S _{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S _{DS}	1.173	Numeric seismic design value at 0.2 second SA
S _{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F _a	1.2	Site amplification factor at 0.2 second
F _v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.627	MCE _G peak ground acceleration
F _{PGA}	1.2	Site amplification factor at PGA
PGA _M	0.752	Site modified peak ground acceleration
T _L	6	Long-period transition period in seconds
SsRT	1.466	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.625	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	4.32	Factored deterministic acceleration value. (0.2 second)
S1RT	0.505	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.563	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.635	Factored deterministic acceleration value. (1.0 second)



Map data ©2023 1000 ft



110 MPH, Exposure C, Kzt = 1.9

8413 SE 82nd St
Building

LATERAL ANALYSIS - SEISMIC WEIGHTS

$$\begin{aligned} \text{AT ROOF; } W_R &= 1574 \text{ ft}^2 (15 \text{ ft/ft}^2) + 10 \text{ ft}^2 \left(\frac{9.8'}{2} \times 131' \right) \\ &= 30,029 \text{ k} \end{aligned}$$

$$\begin{aligned} \text{AT 2ND FLOOR/LOWER ROOF; } W_2 &= 1,113 \text{ ft}^2 (12 \text{ ft/ft}^2) \\ &+ 2,462 \text{ ft}^2 (15 \text{ ft/ft}^2) + 10 \text{ ft}^2 \left(\frac{9.8'}{2} \times 131' + \frac{8.5'}{2} \times 140' \right) \\ &+ 12.5' (980 \text{ ft/ft}) = 75,121 \text{ k} \end{aligned}$$

$$\begin{aligned} \text{AT MAIN FLOOR; } W_1 &= 1,975 \text{ ft}^2 (12 \text{ ft/ft}^2) + 387 \text{ ft}^2 (50 \text{ ft/ft}) \\ &+ 932 \text{ ft}^2 (8 \text{ ft/ft}) + 10 \text{ ft}^2 \left(\frac{8.5'}{2} \times 140' + \frac{8.2'}{2} \times 153' \right) \\ &+ 4.2' (980 \text{ ft/ft}) = 65,945 \text{ k} \end{aligned}$$

$$\text{DESIGN BASE SHEAR; } V = \underline{21,610 \text{ k}} \text{ (ASD)}$$

WIND ANALYSIS PER ASCE 7-16 § 27.5:

TRANSVERSE DIR; EAST = 10 - WEST;

$$\text{AT ROOF; } W_{RT} = 400 \text{ ft}^2 (31.8 \text{ ft/ft}^2) = 12,720 \text{ k}$$

$$\begin{aligned} \text{AT UPPER FLOOR; } W_{UT} &= 736 (31.8) + 505 (12.6 - 9.5) \\ &= 34,565 \text{ k} \end{aligned}$$

$$\text{AT MAIN; } W_{MT} = 975 (31.8) = 31,005 \text{ k}$$

$$\Sigma W_T = \underline{78,290 \text{ k}}$$

LONGITUDINAL DIR; AT NORTH END:::

$$\text{AT ROOF; } W_{RN} = 273 \text{ ft}^2 (31.8 \text{ ft/ft}^2) = 8,872 \text{ k}$$

$$\text{AT UPPER FLOOR; } W_{UN} = 424 (31.8) = 13,483 \text{ k}$$

AT SOUTH END (EXISTING);

$$\text{AT LOW FLOOR; } W_{RLS} = 185 \text{ ft}^2 (31.8 \text{ ft/ft}^2) = 5,883 \text{ k}$$

$$\Sigma W_T = \underline{28,238 \text{ k}}$$

∴ WIND CONTROLS AT ALL LOCATIONS

LATERAL LOAD DISTRIBUTION; TO UPPER FLOOR WALLS:

$$\text{LINE (4A); } V_{4A} = 27.2 (12,270 \text{ k}) = 3,313 \text{ k}$$

$$V_{4A} = 3,313 \text{ k} / 12.2' = 272 \text{ k/ft} \rightarrow \underline{\text{SW4}}$$

$$\text{LINE (6A); } V_{6A} = 41.7 (12,270 \text{ k}) = 5,081 \text{ k}$$

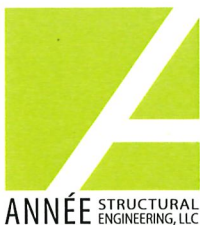
$$V_{6A} = 5,081 \text{ k} / 15.15' = 332 \text{ k/ft} \rightarrow \underline{\text{SW4}}$$

$$\text{LINE (10A); } V_{10A} = 32.7 (12,270 \text{ k}) = 3,926 \text{ k}$$

$$V_{10A} = 3,926 \text{ k} / 13.9' = 282 \text{ k/ft} \rightarrow \underline{\text{SW4}}$$

$$\text{LINE (EF); } V_{EF} = 33.7 (8,872 \text{ k}) = 2,928 \text{ k}$$

$$V_{EF} = 2,928 \text{ k} / 22.55' = 130 \text{ k/ft} \rightarrow \underline{\text{SW6}}$$



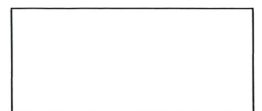
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LINE (H); $V_H = 49\% (8,872^*) = 4,347^*$
 $N_H = 4,347^* / 23.3' = 187^*/ft. \rightarrow \underline{SW6}$

LINE (J); $V_J = 18\% (8,872^*) = 1,597^*$
 $N_J = 1,597^* / 9.3' = 172^*/ft. \rightarrow \underline{SW6}$

TO MAIN FLR. WALLS:

LINE (IA); $V_{IA} = 19\% (34,565^*) = 6,567^*$
 $N_{IA} = 6,567^* / 12.5' = 529^*/ft. \rightarrow \underline{SW2}$
 (2) SIMPSON WSWH24x8

LINE (IB); $V_{IB} = 25\% (34,565^*) = 8,641^*$
 $N_{IB} = 8,641^* / 10.5' = 823^*/ft. \rightarrow \underline{SW2}$

LINE (4A); $V_{4A} = 15\% (34,565^*) + 3,313^* = 8,498^*$
 $N_{4A} = 8,498^* / 14.4' = 590^*/ft. \rightarrow \underline{SW2}$

LINE (5A); $V_{5A} = 23\% (34,565^*) + 91\% (5,031^*) + 14\% (3,926^*) = 13,078^*$
 $N_{5A} = 13,078^* / 14.9' = 878^*/ft. \rightarrow \underline{SW2}$

LINE (11A); $V_{11A} = 18\% (34,565^*) + 9\% (5,031^*) + 86\% (3,926^*) = 9,638^*$
 $N_{11A} = 9,638^* / 15.4' = 626^*/ft. \rightarrow \underline{SW2}$
 (2) SIMPSON WSWH24x8

LINE (6); $V_G = 40\% (13,483^*) + 2,928^* = 8,321^*$
 $N_G = 8,321^* / 19.8' = 420^*/ft. \rightarrow \underline{SW3}$

LINE (I); $V_I = 37\% (13,483^*) + 4,347^* = 9,386^*$
 $N_I = 9,386^* / 25.6' = 367^*/ft. \rightarrow \underline{SW6}$

LINE (J); $V_J = 14\% (13,483^*) + 1,597^* = 3,485^*$
 $N_J = 3,485^* / 18.5' = 188^*/ft. \rightarrow \underline{SW6}$

LINE (C); $V_C = \frac{110 \text{ ft}^2}{2} (31.8^*/\text{ft}^2) = 1,749^*$
 $N_C = 1,749^* / 9.2' = 190^*/ft. \rightarrow \underline{SW6}$

LINE (A'); $V_{A'} = 15\% (10,635^*) = 1,595^*$
 $N_{A'} = 1,595^* / 14.9' = 107^*/ft. \rightarrow \underline{SW6}$

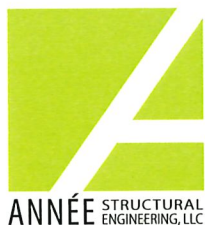
TO LOWER FLOOR WALLS:

LINE (2A); $V_{2A} = 30\% (21,005^*) + 71\% (2,633^*) = 11,171^*$
 $N_{2A} = 11,171^* / 12.5' = 894^*/ft. \rightarrow \underline{SW2 DF, 0.148 OSB}$

LINE (2.8A); $V_{2.8A} = 22\% (21,005^*) + 29\% (2,633^*) + 82\% (8,498^*) = 14,553^*$
 $N_{2.8A} = 14,553^* / 16.9' = 861^*/ft. \rightarrow \underline{SW2 DF, 0.148 OSB}$

LINE (4.5A); $V_{4.5A} = 15\% (21,005^*) + 18\% (8,498^*) + 62\% (13,078^*) = 14,289^*$
 $N_{4.5A} = 14,289^* / 15.4' = 928^*/ft. \rightarrow \underline{SW2 DF, 0.148 OSB}$

LINE (7A); $V_{7A} = 12\% (21,005^*) + 38\% (13,078^*) = 8,440^*$
 $N_{7A} = 8,440^* / 19.8' = 426^*/ft. \rightarrow \underline{SW3}$
 (2) HD58 ← 9,045* D.S. - to - FEN.



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OVERTURNING; FROM UPPER FLR. WALLS:

LINE (4A), (6A), (10A); $T_{Au} = 346 \text{ k/ft} \cdot (11.1') - \frac{179'}{2} (0.6 \times 11.1)$
 $= 3245 \text{ k} \therefore \text{MSTC52/MSTC48B3}$

LINE E/F/H/J; $T_{EFL} = 187 \text{ k/ft} \cdot (11.8') - \frac{117'}{2} (0.6 \times 11.8)$
 $= 1792 \text{ k} \rightarrow \text{C616}$
 (4.7' SW ALONG (K) WITHIN 5.1%, ALL OTHERS $\leq 1.705 \text{ k}$)

FROM MAIN FLOOR WALLS:

LINE (1A); $T_{1A} = \frac{6.567 \text{ k}}{2} \left(\frac{8.16'}{2.0'} \right) - \frac{13.1'}{2} (0.6 \times 2.8) = 11,005 \text{ k}$

PER SIMPSON; WIND ($w = 32''$; $d_e = 11''$)

(2) #3 HAIRPINS @ TOP \downarrow OK

OR USE MIN. 14" w. x 21" d. GRADE BEAM
 w/ (2) #4 CLOSURE TIES @ EA. GRADE BEAM

$M_u = \frac{5,276 \text{ k} \cdot 0.6}{2} (8.16') = 37.2 \text{ k-ft}$

$A_s \geq \frac{37.2}{4(21" \cdot 35")} = 0.53 \text{ in}^2 \therefore \text{USE (2) \#5 T+B}$

LINE (2B), (4A), (5A); $T = 818 \text{ k/ft} \cdot (8.16') - \frac{178'}{2} (0.6 \times 9.7)$

$= 6,908 \text{ k} \rightarrow \text{HDU8}$

$T_{1A} = 5,110 \text{ k} \rightarrow \text{HDU5/MSTC66}$

LINE (6); $T_G = 420 \text{ k/ft} \cdot (8.16') - \frac{3.5'}{2} (0.6 \times 8.44) = 1,390 \text{ k}$

C616 \leftarrow

LINE (11A); $T_{11A} = 9,638 \text{ k} \left(\frac{5.1'}{2.1'} \right) + \frac{9,638 \text{ k}}{2} \left(\frac{8.16'}{2.1'} \right)$

$- \frac{11.2'}{2} (0.6 \times 5.0) = 22,169 \text{ k}$

$\therefore \text{WSWH-AB1, } w = 36''; d_e = 12''$

w/ (2) #3 HAIRPINS

LINE (I); $T_{\pm} = 265 \text{ k/ft} \cdot (10.96') - \frac{25.625'}{2} (0.6 \times 11.0)$

$= 3,156 \text{ k} \rightarrow \text{HDU4}$

LINE (C), (J); $T_{CJ} = 190 \text{ k/ft} \cdot (8.46') - \frac{7.55'}{2} (0.6 \times 8.5)$

$= 1,415 \text{ k} \rightarrow \text{HDU2}$

LINE (A); $T_A = 107 \text{ k/ft} \cdot (8.46') - \frac{13.7'}{2} (0.6 \times 8.5) = 557 \text{ k}$

NO HD REQ' DUE TO ASD, WALL WT.

FROM LOWER FLOOR WALLS:

LINE (2A), (2.3A); $T_2 = 989 \text{ k/ft} \cdot (7.9') - \frac{125'}{2} (0.6 \times 9.1)$

$= 7,472 \text{ k} \rightarrow \text{HDU8 to DF}$

LINE (3A); $T_{3A} = 989 \cdot (7.9') + 5,110 - \frac{4.7'}{2} (0.6 \times 8.7) - 600 \text{ k}$

$= 12,209 \text{ k} \rightarrow \text{HDU14}$

LINE (4.5A); $T_{4.5A} = 890 \cdot (7.9') - \frac{2.9'}{2} (0.6 \times 9.1) = 6,951 \text{ k}$

HDU8 to DF



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LINE C (SEISMIC):

e MAIN FLOOR: $V_G = 44\% (6,470^*) + 31\% (10,625^*)$
 $= 6,144^*$; $V_G = 6,144^* / 19.8' = 310^* / ft.$

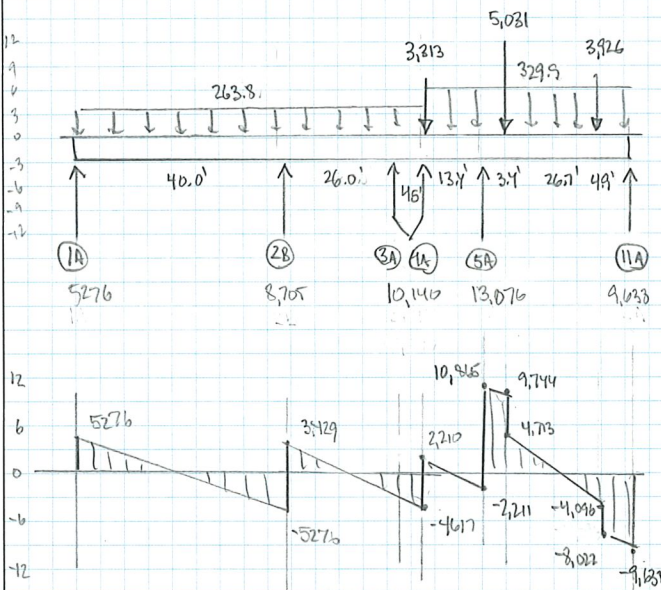
e LOWER FLOOR: $V_G = 16\% (4,505^*) + 6,144^* = 6,865^*$
 \therefore WIND CONTROL

$N_{GL} = 3,321^* / 8.75' = 951^* / ft. \rightarrow$ SW2, 0.148", OF

$T_{GL} = 951 (7.9') - \frac{10.75'}{2} (0.6 \times 127) = 7,108^* \rightarrow$ HDU8

DIAPHRAGM DESIGN; UPPER FLOOR / LOWER ROOF:

WIND CONTROL, SDPWS, TABLE 4.2C, 15/12, 8d, 2x, CASE J

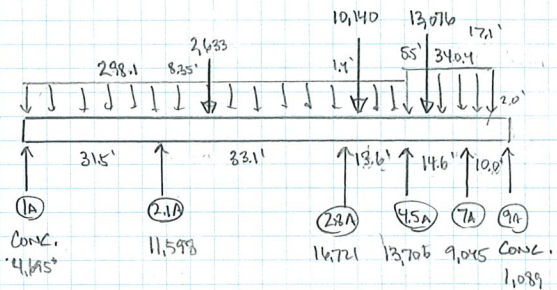


$V_{1A} = V_{2B} = 5,276^* / 26.375' = 196.3^* / ft. \rightarrow$ (E) UNBLOCKED OR

$V_{5A} = 10,865^* / 36.7' = 296^* / ft. \leq \frac{670}{2.0} \therefore$ UNBLOCKED OR

$V_{1A} = 9,633^* / 29.0' = 332^* / ft. \leq \frac{670}{2.0} \therefore$ UNBLOCKED OR

e MAIN FLOOR:



$V_{1A} = 4,145^* / 20.25' = 232^* / ft. \rightarrow$ (E) UNBLOCKED OR

$N_{21A} = 6,903^* / 20.25' = 341^* / ft. \sim \frac{670}{2.0}$; WITHIN 2%
 \therefore (E) UNBLOCKED OR

$N_{28A} = 11,129^* / 29.9' = 372^* / ft. \rightarrow$ WILL DETAIL DIRECT TRANSFER FOR 1.4' SPAN

$N_{45A} = 10,518^* / 18.33' = 574^* / ft. \leq \frac{1,435}{2.0}$ (TABLE 4.2A)
 \therefore BLK'D DIAPHRAGM, 3" OG

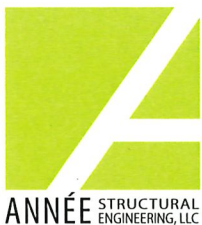
$V_{7A} = 7,465^* / 18.33' = 407^* / ft. < \frac{1,010}{2.0}$
 \therefore BLK'D DIAPHRAGM, 4" OG

DRAG @ LINE (28) @ E/WEST. ROOF



(A) = $\frac{73}{105} (0,141^*) = 6,007^* \rightarrow$ CMST 14

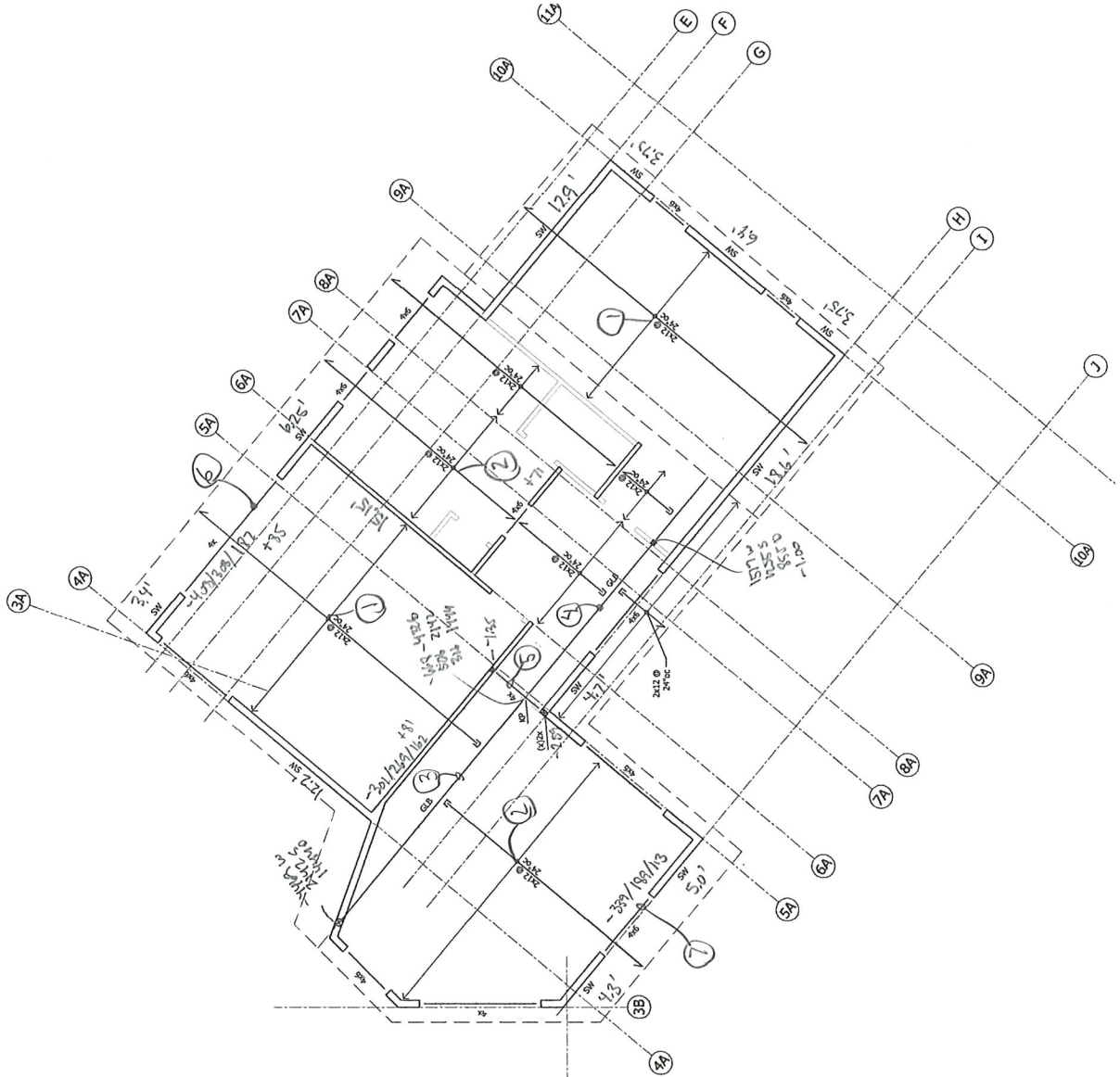
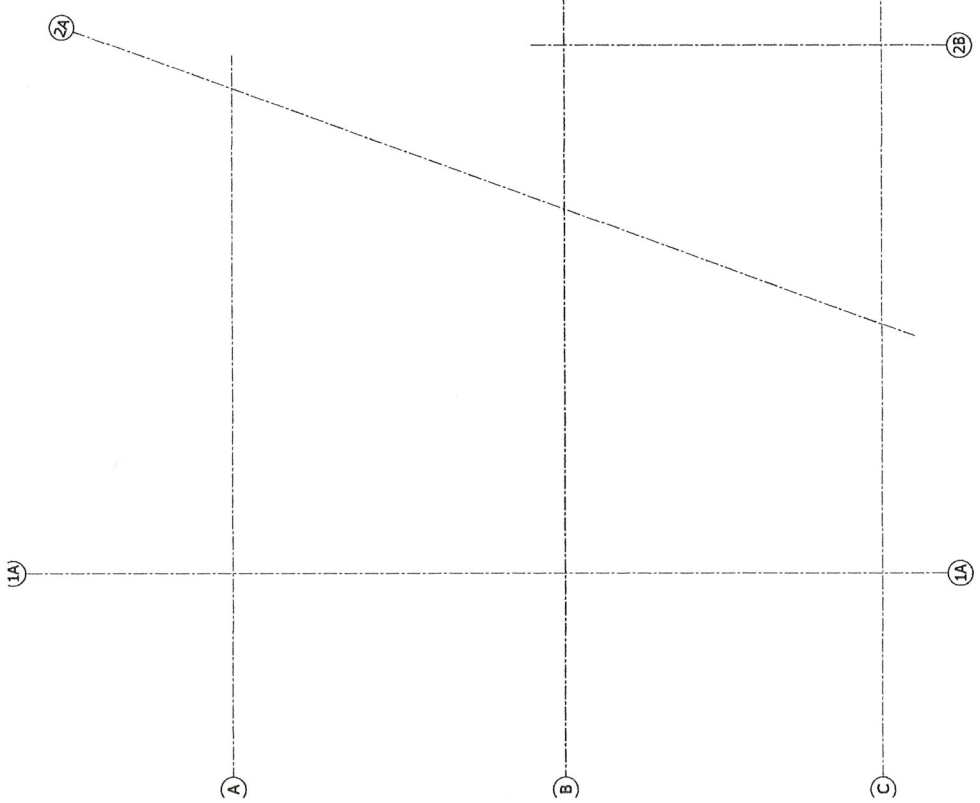
(B) = $\frac{6,007^*}{\tan(70.1^\circ)} = 2,172^* \rightarrow$ (2) CS16



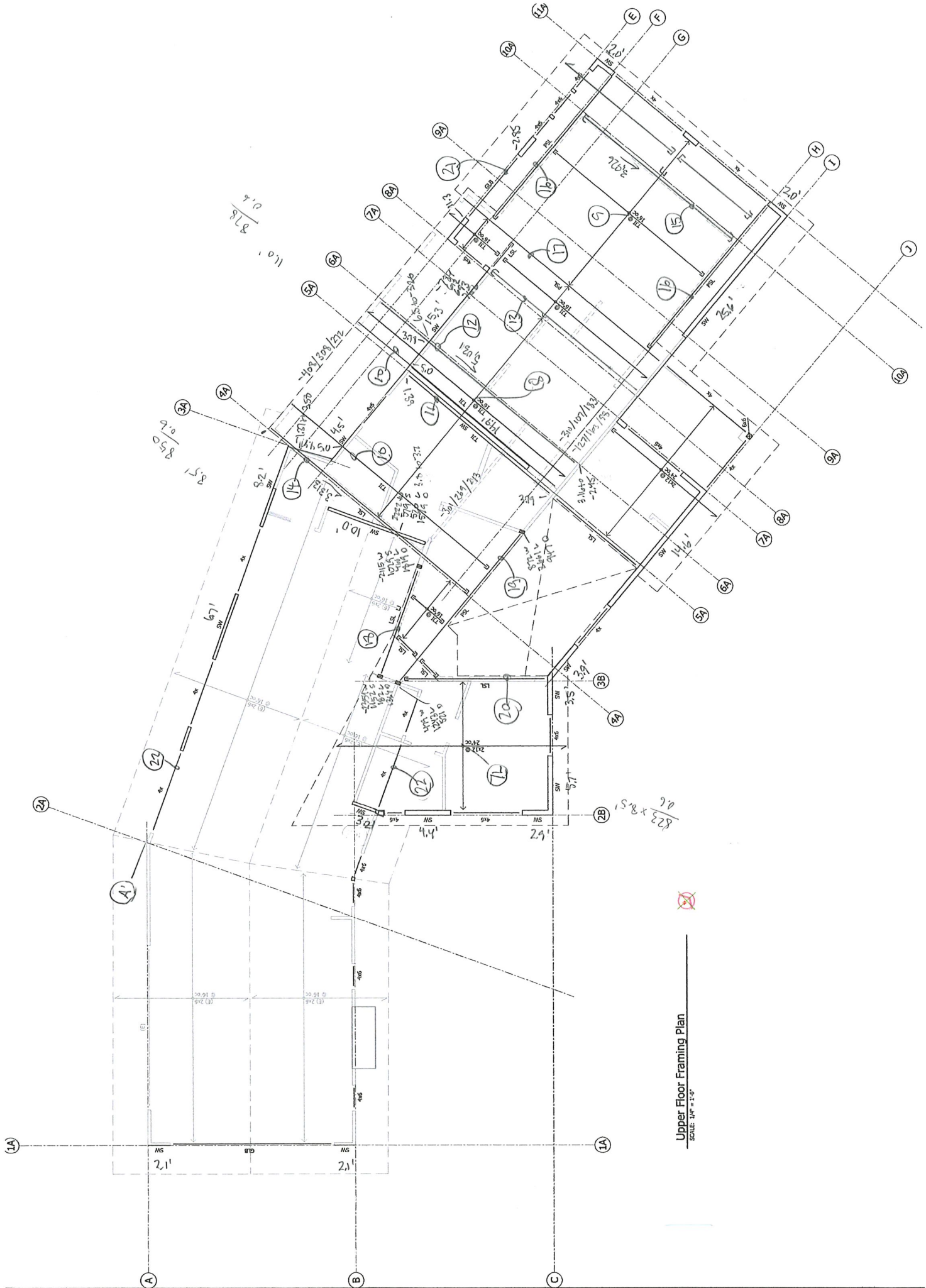
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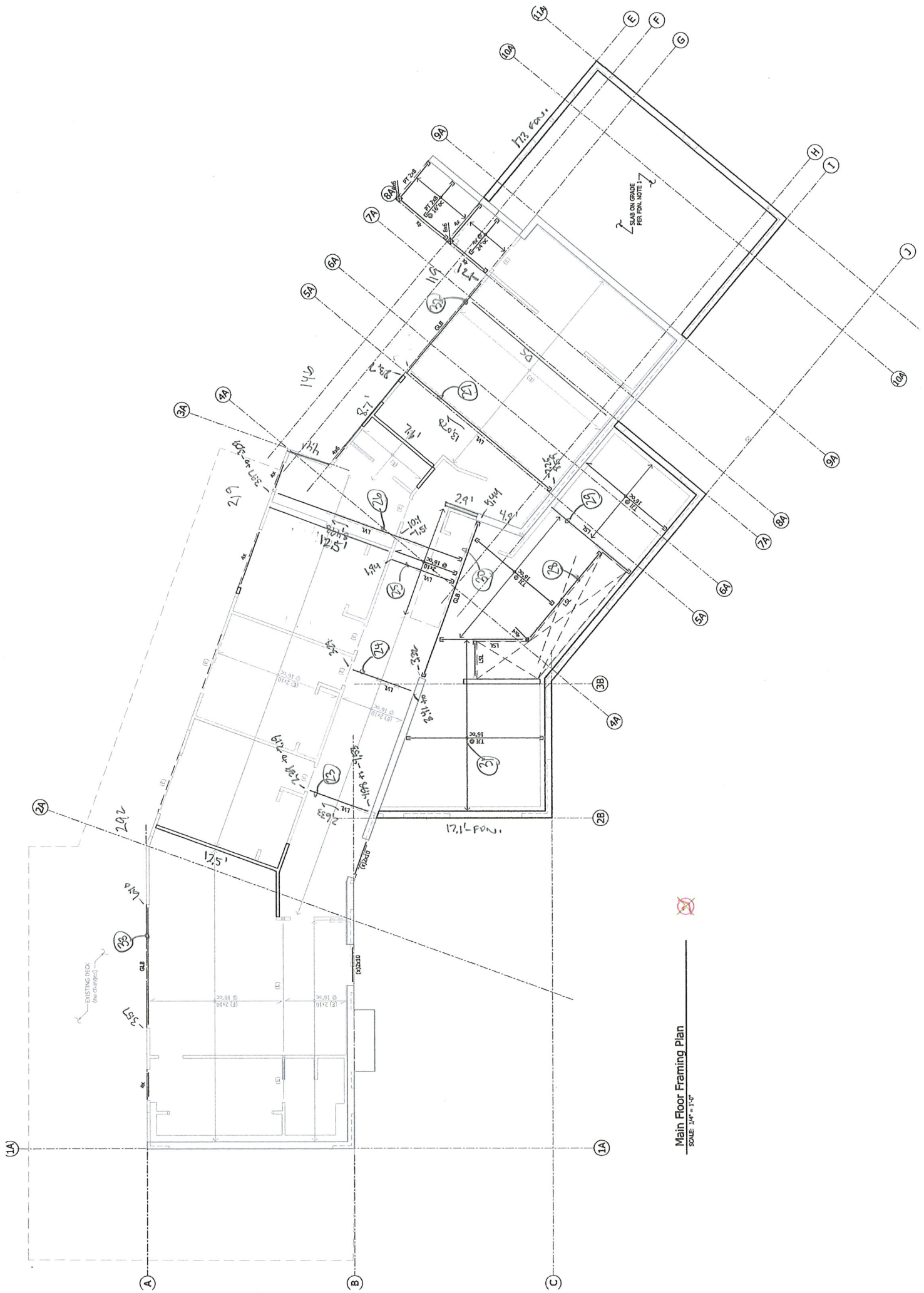




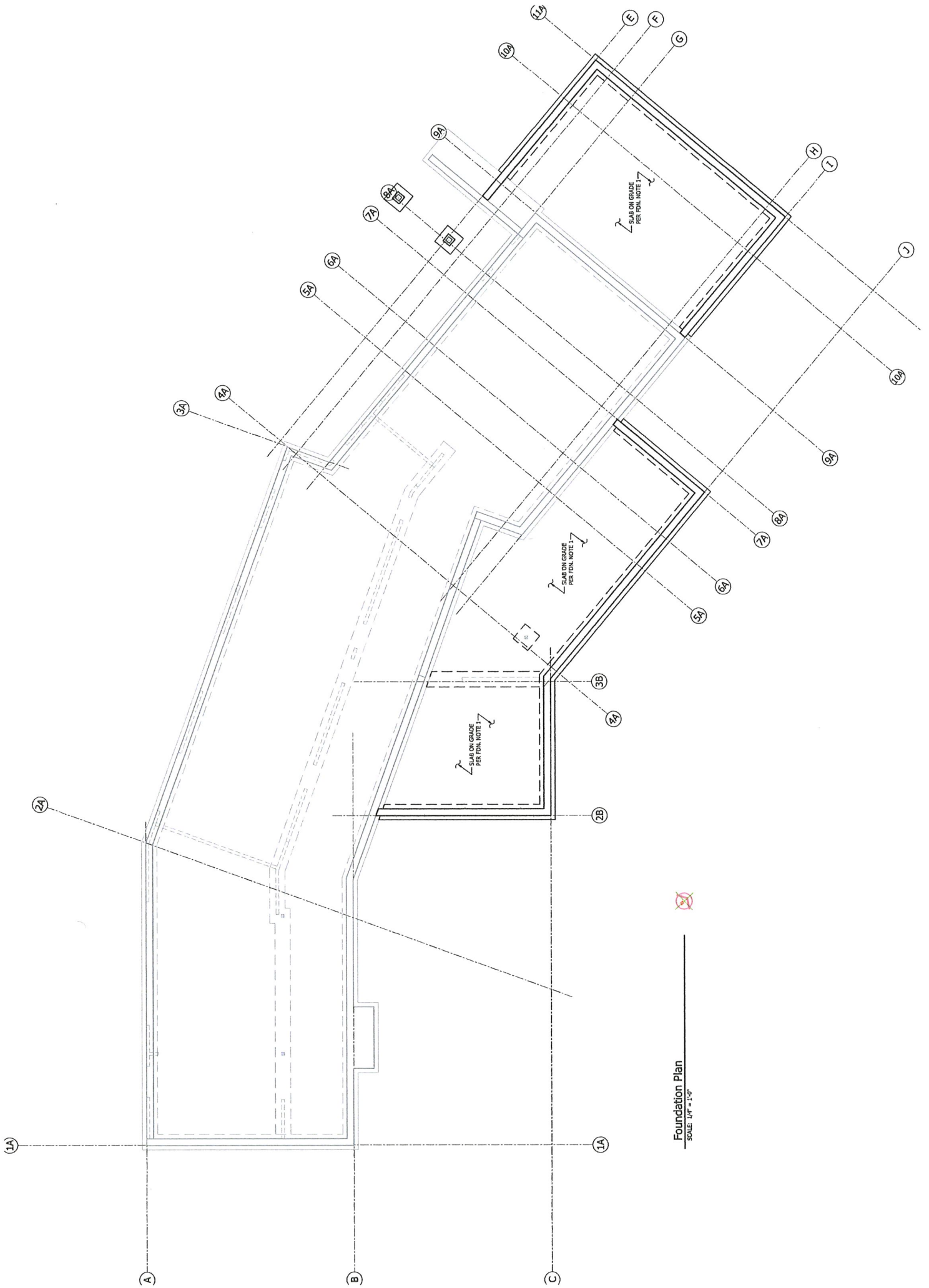
Roof Framing Plan
SCALE: 1/4" = 1'-0"



Upper Floor Framing Plan
 SCALE: 1/4" = 1'-0"



Main Floor Framing Plan
 SCALE: 1/4" = 1'-0"



Foundation Plan
 SCALE: 1/4" = 1'-0"

GRAVITY ANALYSIS - ROOF FRMNG. (25kL, 150L)*/ft²:

① SEE ATTACHED CALC. → 2x12 HP#2 @ 16"oc

② SEE ATTACHED CALC. → 2x12 HP#2 @ 24"oc

③ SEE ATTACHED CALC. → 5 1/2 x 12 GLB

④ SEE ATTACHED CALC. → 3 1/2 x 9 GLB

⑤ SEE ATTACHED CALC. → 4x10 DP#2

⑥ $L=10.3'$; $w=308\text{G}+187\text{D}=495\text{#/ft.}$

$R=V=2519\text{#}$; $M=6,561\text{ FT-#}$

$f_w=95\text{ psi}$; $f_b=1,021\text{ psi} \leq 900(1.15)$

$D_{req}=0.18\text{#}=4/10\text{#} \therefore$ 4x12 DP#2

⑦ $L=5.2'$; $w=189\text{S}+113\text{D}=302\text{#/ft.}$

$R=V=785\text{#}$; $M=1,021\text{ FT-#} \therefore$ 4x6 DP#2

UPPER P.R. FRMNG. (30-40kL, 12-220L)*/ft²:

⑧ SEE ATTACHED CALC. → 14" TJI/560 @ 16"oc

⑨ SEE ATTACHED CALC. → 14" TJI/230 @ 16"oc

⑩ SEE ATTACHED CALC. → 7x14 PSL

⑪ SEE ATTACHED CALC. → 3 1/2 x 14 LSL

⑫ SEE ATTACHED CALC. → 5 1/4 x 14 PSL

⑬ SEE ATTACHED CALC. → (2) 14" TJI/230

⑭ SEE ATTACHED CALC. → 1 3/4 x 14 LSL

⑮ SEE ATTACHED CALC. → 3 1/2 x 14 LSL

⑯ SEE ATTACHED CALC. → 5 1/2 x 15 GLB

⑰ SEE ATTACHED CALC. → 5 1/4 x 14 PSL

⑱ SEE ATTACHED CALC. → 3 1/2 x 14 LSL

3,159 -2451

6500 -3259

$w=3\text{S} 1/2$

(2) 2x4

2,593#

(3) 2x4

4,174#

(4) 2x4

6,965#

4x8

8,006#



Project _____

Designer _____

Date _____



19) SEE ATTACHED CALC. → 3 1/2 x 14 PSL

20) SEE ATTACHED CALC. → 1 3/4 x 14 LSL

21) SEE ATTACHED CALC. → 5 1/2 x 10 1/2 GLB

22) $L = 7.8'$; $w = -356w + 447s + 2700 = 717 \text{ lb/ft}$

$R = V = -708 \text{ to } -2,617 \text{ lb}$; $M = 4,776 \text{ ft-lb}$

$f_c = 118 \text{ psi}$; $f_t = 1,036 \text{ psi} \leq 900(1.1)1.15$

$\Delta_n = 0.11" = 4/65 \therefore$ 4x10 DP#2

MAIN FLOOR FLOOR FRAMING (YOU, 120) #/ft²:

23) SEE ATTACHED CALC. → 3 1/2 x 9 GLB

24) SEE ATTACHED CALC. → (3) 2x10 HF#2

25)

26) SEE ATTACHED CALC. → (4) 1 3/4 x 9 1/2 LVL

27) SEE ATTACHED CALC. → 5 1/2 x 13 1/2 GLB

STEEL OPTION; $S \geq 12.3 \text{ in}^3$

$I \geq 89.6 \text{ in}^4 \Rightarrow$ W8x31

28) SEE ATTACHED CALC. → 3 1/2 x 9 1/2 LSL

29)

30) SEE ATTACHED CALC. → 5 1/2 x 12 GLB

31) SEE ATTACHED CALC. → 9 1/2" TJI/230 @ 16" OC

32) SEE ATTACHED CALC. → 5 1/2 x 16 1/2 GLB

STEEL OPTION; $S \geq 18.2 \text{ in}^3$

$I \geq 128 \text{ in}^4$ W12x22

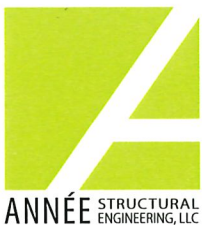
33) SEE ATTACHED CALC. → 3 1/2 x 12 GLB

HEADER (28); $L = 8.8'$; $w = \frac{269}{2} (-440w + 339s + 2120) = 551 \text{ lb/ft}$

$R = V = 2,424 \text{ lb}$; $M = 5,334 \text{ ft-lb}$; SEE # (21)

@ 8" span: 4x12 DP#2 BY INSPECTION

@ 7" span: 4x10 DP#2



Project _____

Designer _____

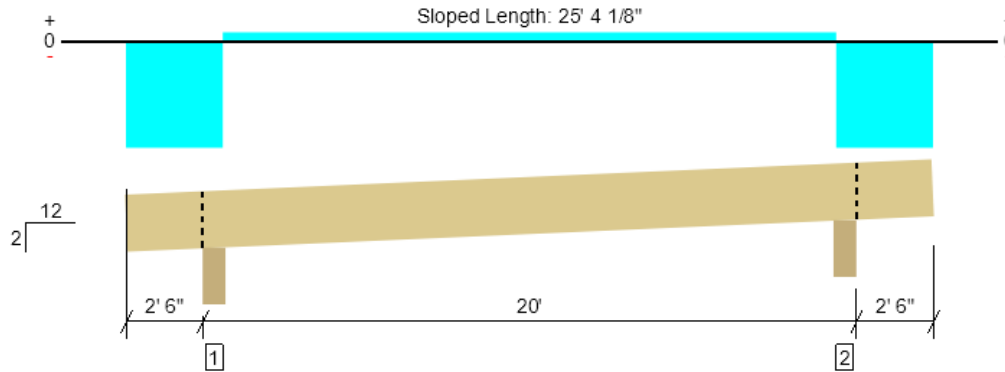
Date _____

1801 18th Ave S, Seattle, WA 98144 206.658.5169

Sheet



Roof Framing, 1 - Rafter
1 piece(s) 2 x 12 HF No.2 @ 16" OC



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

Member Length : 25' 6"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	673 @ 2' 8 3/4"	3387 (5.50")	Passed (20%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	465 @ 3' 10 5/8"	1941	Passed (24%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	2421 @ 12' 6"	2964	Passed (82%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.170 @ 25'	0.277	Passed (2L/390)	--	1.0 D + 0.6 W (Alt Spans)
Total Load Defl. (in)	0.731 @ 12' 6"	1.321	Passed (L/325)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 2/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- -401 lbs uplift at support located at 2' 8 3/4". Strapping or other restraint may be required.
- -401 lbs uplift at support located at 22' 3 1/4". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Snow	Wind	Factored	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	253	420	-922	673/-401	Blocking
2 - Beveled Plate - HF	5.50"	5.50"	1.50"	253	420	-922	673/-401	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 1" o/c	
Bottom Edge (Lu)	18' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Wind (1.60)	Comments
1 - Uniform (PSF)	0 to 3'	16"	15.0	25.0	-120.0	Default Load
2 - Uniform (PSF)	3' to 22'	16"	15.0	25.0	-32.5	Default Load
3 - Uniform (PSF)	22' to 25'	16"	15.0	25.0	-120.0	Default Load

Weyerhaeuser Notes

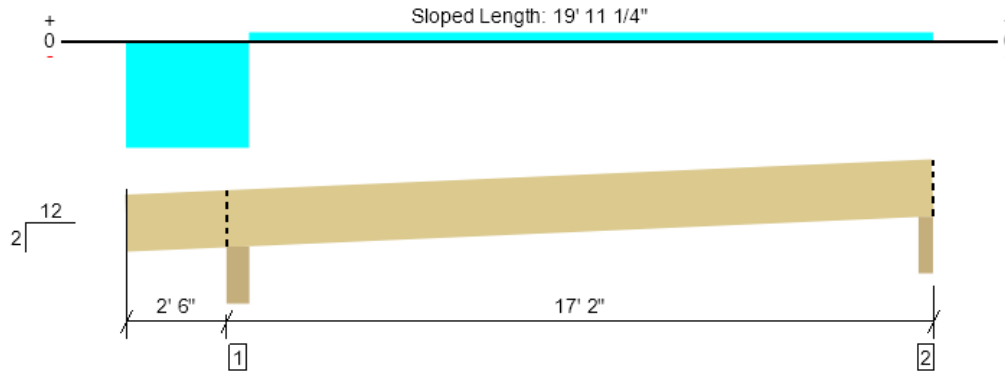
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Roof Framing, 2 - Rafter
1 piece(s) 2 x 12 HF No.2 @ 24" OC



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

Member Length : 20' 1 1/8"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	677 @ 19' 5 1/2"	2126 (3.50")	Passed (32%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	598 @ 3' 10 5/8"	1941	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2711 @ 11' 2 15/16"	2964	Passed (91%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.160 @ 0	0.277	Passed (2L/416)	--	1.0 D + 0.6 W (Alt Spans)
Total Load Defl. (in)	0.602 @ 11' 1 3/4"	1.131	Passed (L/338)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 2/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Snow	Wind	Factored	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	344	566	-1299	910/-573	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	254	423	53/-558	677/-182	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	2' 11" o/c	
Bottom Edge (Lu)	17' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

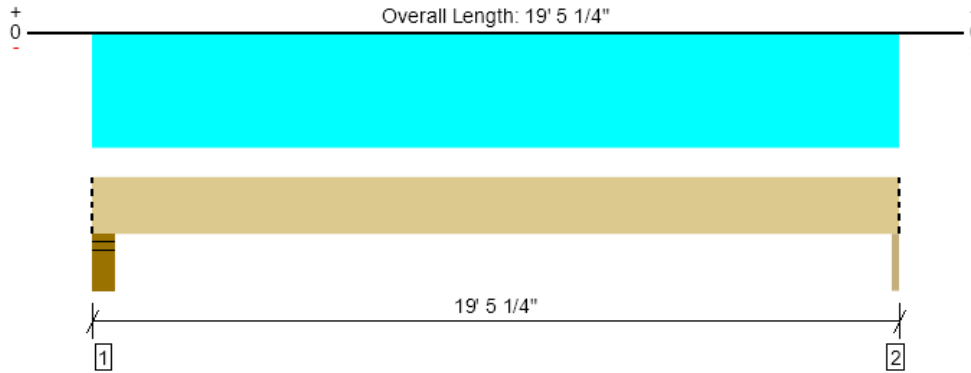
Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Wind (1.60)	Comments
1 - Uniform (PSF)	0 to 3'	24"	15.0	25.0	-120.0	Default Load
2 - Uniform (PSF)	3' to 19' 8"	24"	15.0	25.0	-32.5	Default Load

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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
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Roof Framing, 3 - Beam
1 piece(s) 5 1/2" x 12" 24F-V8 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3472 @ 19' 5"	3898 (1.75")	Passed (89%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3056 @ 1' 5 1/2"	13409	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	16530 @ 9' 10 1/2"	30360	Passed (54%)	1.15	1.0 D + 1.0 S (All Spans)
Neg Moment (Ft-lbs)	-16601 @ 9' 10 1/2"	42240	Passed (39%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.454 @ 9' 10 1/2"	0.954	Passed (L/504)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	-0.763 @ 9' 10 1/2"	1.272	Passed (L/300)	--	0.6 D + 0.6 W (All Spans)

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

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 19' 1".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 19' 1".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Snow	Wind	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.61"	1444	2142	-7446	3586/-3601	Blocking
2 - Beam - HF	1.75"	1.75"	1.56"	1398	2074	-7210	3472/-3487	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	19' 5" o/c	
Bottom Edge (Lu)	19' 5" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 19' 5 1/4"	N/A	16.0	--	--	
1 - Uniform (PSF)	0 to 19' 5 1/4" (Front)	8' 8 1/8"	15.0	25.0	-	Default Load
2 - Uniform (PLF)	0 to 19' 5 1/4" (Front)	N/A	-	-	-754.0	

Weyerhaeuser Notes

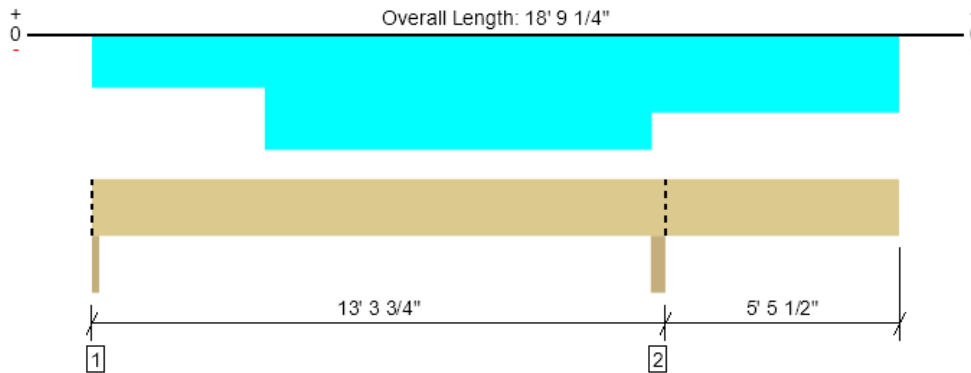
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Roof Framing, 4 - Beam
1 piece(s) 3 1/2" x 9" 24F-V8 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	822 @ 1/4"	2481 (1.75")	Passed (33%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	1197 @ 12' 3 1/4"	6400	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	3047 @ 6' 3 15/16"	10868	Passed (28%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-2096 @ 13' 2"	10868	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.304 @ 18' 9 1/4"	0.560	Passed (2L/442)	--	1.0 D + 0.6 W (Alt Spans)
Total Load Defl. (in)	0.278 @ 18' 9 1/4"	0.747	Passed (2L/484)	--	0.6 D + 0.6 W (Alt Spans)

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

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 11' 11".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 7' 4 3/16".
- -478 lbs uplift at support located at 1/4". Strapping or other restraint may be required.
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Snow	Wind	Factored	
1 - Beam - HF	1.75"	1.75"	1.50"	316	506	189/-1114	822/-478	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	855	1255	-2529	2110/-1005	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 9" o/c	
Bottom Edge (Lu)	18' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 18' 9 1/4"	N/A	7.7	--	--	
1 - Uniform (PSF)	0 to 4' 1/4" (Front)	2' 1 3/4"	15.0	25.0	-50.4	Default Load
2 - Uniform (PSF)	4' 1/4" to 13' 1/4" (Front)	4' 7 3/4"	15.0	25.0	-50.4	Default Load
3 - Uniform (PSF)	13' 1/4" to 18' 9 1/4" (Front)	3' 1 3/4"	15.0	25.0	-50.4	Default Load

Weyerhaeuser Notes

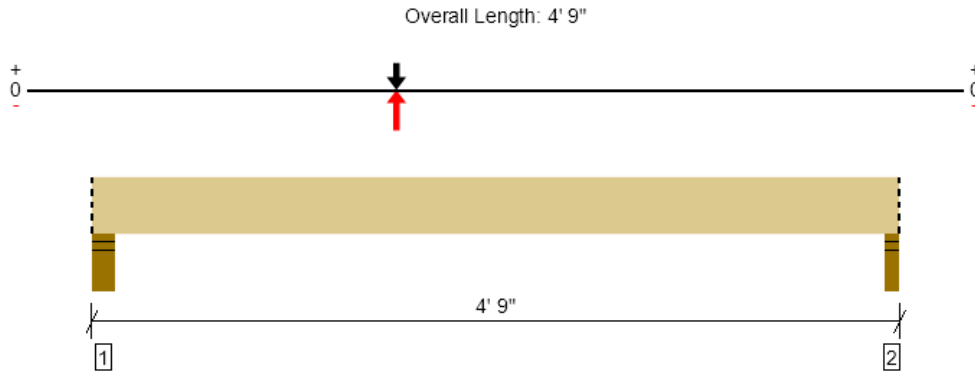
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Roof Framing, 5 - Drop Beam
1 piece(s) 4 x 10 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2841 @ 4"	7796 (5.50")	Passed (36%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2831 @ 1' 2 3/4"	4468	Passed (63%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4130 @ 1' 9 1/2"	5166	Passed (80%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.017 @ 2' 4 5/8"	0.213	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.028 @ 2' 4 5/8"	0.283	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Snow	Wind	Factored	
1 - Stud wall - HF	5.50"	5.50"	2.00"	1146	1695	-5468	2841/-2593	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	607	885	-2856	1492/-1350	Blocking

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

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

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 4' 9"	N/A	8.2	--	--	
1 - Point (lb)	1' 9 1/2" (Front)	N/A	1714	2580	-8324	Default Load

Weyerhaeuser Notes

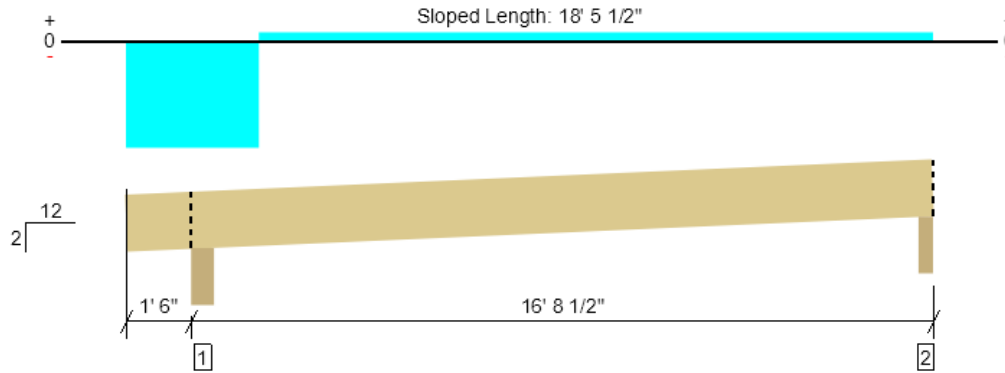
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Upper Floor Framing, 7L - Low Roof Rafter
1 piece(s) 2 x 12 HF No.2 @ 24" OC



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

Member Length : 18' 7 3/8"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	666 @ 18'	2126 (3.50")	Passed (31%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	569 @ 2' 10 5/8"	1941	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2620 @ 9' 11 1/8"	2964	Passed (88%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.099 @ 0	0.200	Passed (2L/426)	--	1.0 D + 0.6 W (Alt Spans)
Total Load Defl. (in)	0.553 @ 9' 10 5/8"	1.100	Passed (L/358)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 2/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (0.2") and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Snow	Wind	Factored	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	303	498	-1180	801/-526	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	251	415	22/-551	666/-180	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 4" o/c	
Bottom Edge (Lu)	17' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Wind (1.60)	Comments
1 - Uniform (PSF)	0 to 3'	24"	15.0	25.0	-120.0	Default Load
2 - Uniform (PSF)	3' to 18' 2 1/2"	24"	15.0	25.0	-32.5	Default Load

Weyerhaeuser Notes

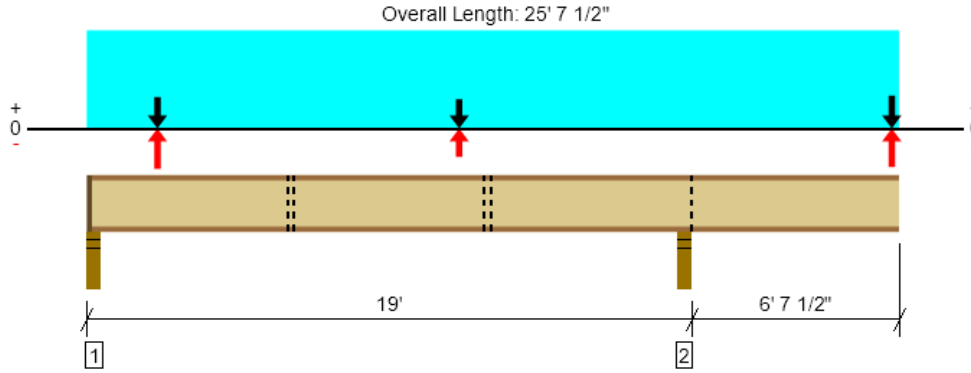
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 8 - Joist
1 piece(s) 14" TJI® 560 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1128 @ 2' 1/2"	1606 (2.25")	Passed (70%)	1.15	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Shear (lbs)	1213 @ 18' 8 1/2"	2749	Passed (44%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	-5671 @ 18' 10 1/4"	9725	Passed (58%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.267 @ 25' 7 1/2"	0.339	Passed (2L/608)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.405 @ 25' 7 1/2"	0.677	Passed (2L/402)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
TJ-Pro™ Rating	60	40	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Upward deflection on right cantilever exceeds overhang deflection criteria.
- Moment capacity over cantilever support 2 has been reduced by 25% to lessen the effects of buckling.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Upward deflection on right cantilever exceeds 0.4".
- -383 lbs uplift at support located at 2' 1/2". Strapping or other restraint may be required.
- -440 lbs uplift at support located at 18' 10 1/4". Strapping or other restraint may be required.
- 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, Perpendicular Partitions.
- Permanent bracing at third points in the back span or a direct applied ceiling over the entire back span length is required at the right span of the member. See literature detail (PB1) For clarification.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Stud wall - HF	3.50"	2.25"	1.75"	463	508/-60	386	318/-1101	1134/-383	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	3.50"	3.50"	1008	924	816	-1742	2313/-440	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 9" o/c	
Bottom Edge (Lu)	8' 2" o/c	

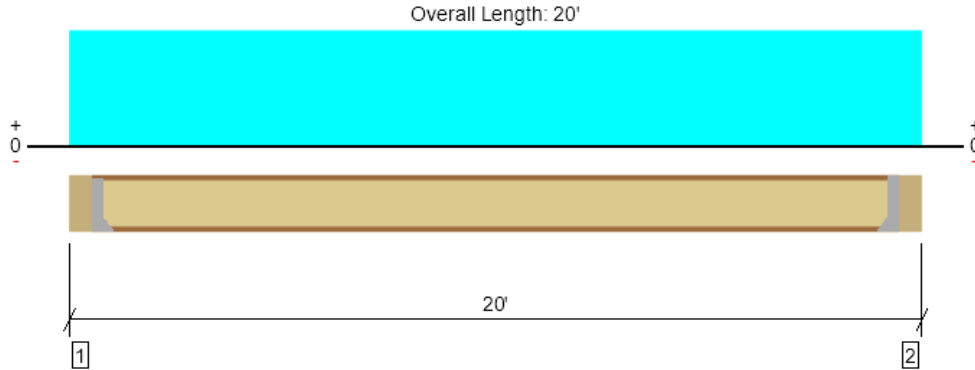
- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
1 - Uniform (PSF)	0 to 25' 7 1/2"	16"	12.0	40.0	-	-	Default Load
2 - Point (PLF)	2' 2 3/4"	16"	281.0	-	270.0	-712.0	
3 - Point (PLF)	11' 9"	16"	243.0	-	269.0	-502.0	
4 - Point (PLF)	25' 4 3/4"	16"	272.0	-	308.0	-680.0	

Forteweb Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Upper Floor Framing, 9 - Joist
1 piece(s) 14" TJI ® 230 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	534 @ 5 1/2"	1060 (1.75")	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	534 @ 5 1/2"	1945	Passed (27%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2549 @ 10'	4990	Passed (51%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.223 @ 10'	0.477	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.312 @ 10'	0.954	Passed (L/734)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	48	40	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 14" PSL beam	5.50"	Hanger ¹	1.75" / - ²	160	400	560	See note ¹
2 - Hanger on 14" PSL beam	5.50"	Hanger ¹	1.75" / - ²	160	400	560	See note ¹

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.
- ² Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 10" o/c	
Bottom Edge (Lu)	19' 1" o/c	

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

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	IUS2.37/14	2.00"	N/A	12-10dx1.5	2-Strong-Grip	
2 - Face Mount Hanger	IUS2.37/14	2.00"	N/A	12-10dx1.5	2-Strong-Grip	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 20'	16"	12.0	30.0	Default Load

Weyerhaeuser Notes

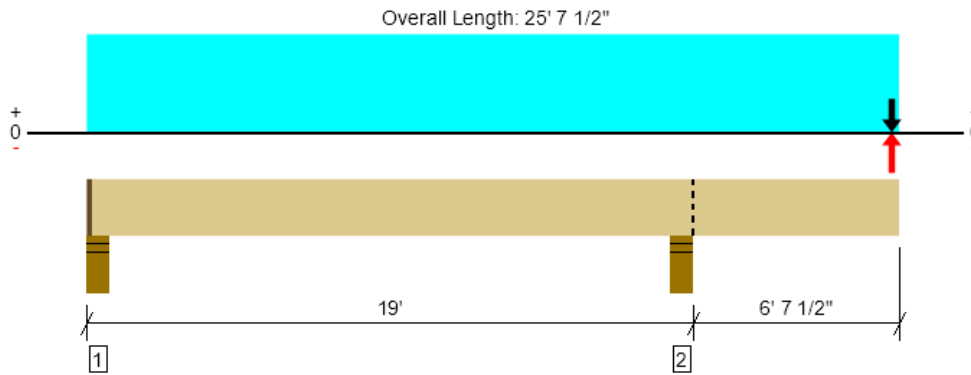
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 10 - Beam
1 piece(s) 7" x 14" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5024 @ 18' 9 1/4"	15593 (5.50")	Passed (32%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3241 @ 20' 2"	21789	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-20884 @ 18' 9 1/4"	62472	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.308 @ 25' 7 1/2"	0.343	Passed (2L/534)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.569 @ 25' 7 1/2"	0.685	Passed (2L/290)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Upward deflection on right cantilever exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Upward deflection on right cantilever exceeds 0.4".
- -691 lbs uplift at support located at 4". 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	Snow	Wind	Factored	
1 - Stud wall - HF	5.50"	4.25"	1.50"	-121	509/-62	-570	1258	777/-691	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	5.50"	1.77"	2713	925	2156	-4760	5024/-1228	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	25' 6" o/c	
Bottom Edge (Lu)	25' 6" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	1 1/4" to 25' 7 1/2"	N/A	30.6	--	--	--	
1 - Uniform (PSF)	0 to 25' 7 1/2" (Front)	1' 4"	12.0	40.0	-	-	Default Load
2 - Point (lb)	25' 4 3/4" (Front)	N/A	1401	-	1586	-3502	

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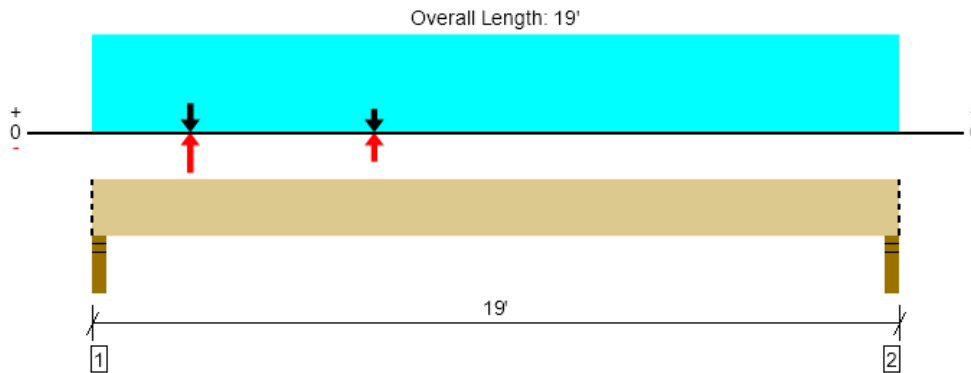
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 11 - Beam
 1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3786 @ 2"	4961 (3.50")	Passed (76%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3740 @ 1' 5 1/2"	11646	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	11578 @ 6' 7 3/4"	25116	Passed (46%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.297 @ 8' 9 7/8"	0.467	Passed (L/753)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.556 @ 8' 9 11/16"	0.933	Passed (L/403)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -588 lbs uplift at support located at 18' 10". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Stud wall - HF	3.50"	3.50"	2.67"	1708	507	2078	-6704	3786/-2998	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	640	507	502	-1620	1396/-588	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	19' o/c	
Bottom Edge (Lu)	19' 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)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 19'	N/A	15.3	--	--	--	
1 - Uniform (PSF)	0 to 19' (Front)	1' 4"	12.0	40.0	-	-	Default Load
2 - Point (lb)	2' 3 3/4" (Front)	N/A	1146	-	1695	-5468	
3 - Point (lb)	6' 7 3/4" (Front)	N/A	607	-	885	-2856	

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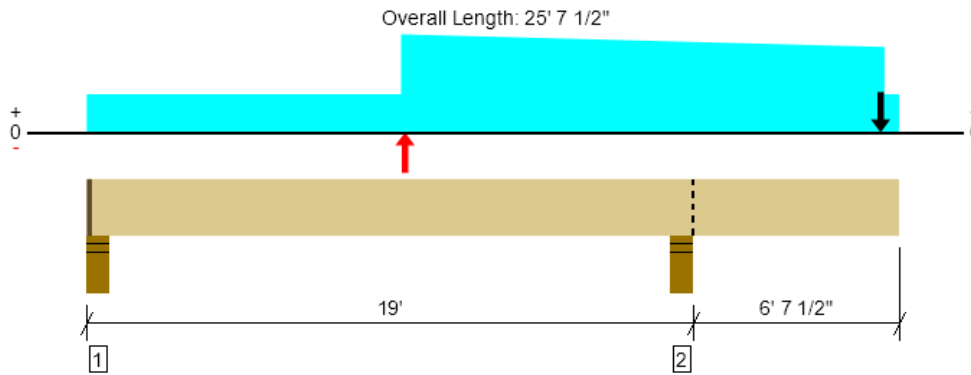
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 12 - Beam
1 piece(s) 5 1/4" x 14" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6500 @ 18' 9 1/4"	11694 (5.50")	Passed (56%)	--	1.0 D + 0.6 W (Alt Spans)
Shear (lbs)	3996 @ 20' 2"	22736	Passed (18%)	1.60	1.0 D + 0.6 W (All Spans)
Moment (Ft-lbs)	-24959 @ 10' 1/2"	65188	Passed (38%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	1.134 @ 25' 7 1/2"	0.457	Failed (2L/146)	--	1.0 D + 0.6 W (All Spans)
Total Load Defl. (in)	1.128 @ 25' 7 1/2"	0.685	Failed (2L/146)	--	0.6 D + 0.6 W (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -543 lbs uplift at support located at 18' 9 1/4". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Wind	Factored	
1 - Stud wall - HF	5.50"	4.25"	1.50"	442	509/-62	-4527	952/-2451	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	5.50"	3.06"	2025	925	7458/-2930	6500/-543	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	25' 6" o/c	
Bottom Edge (Lu)	25' 6" 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 25' 7 1/2"	N/A	23.0	--	--	
1 - Uniform (PSF)	0 to 25' 7 1/2" (Front)	1' 4"	12.0	40.0	-	Default Load
2 - Point (lb)	10' 1/2" (Front)	N/A	-	-	-5565	
3 - Tapered (PLF)	9' 11" to 25' 2" (Front)	N/A	108.0 to 85.0	-	-	
4 - Point (lb)	25' 1/2" (Front)	N/A	-	-	5565	

Weyerhaeuser Notes

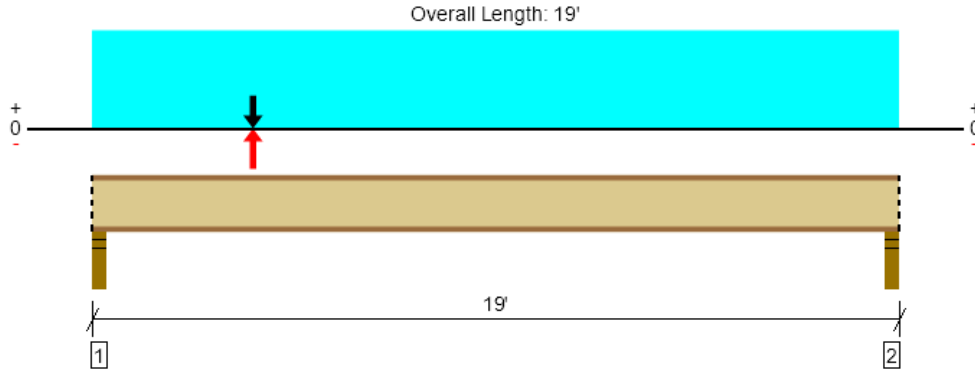
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 13 - Beam
2 piece(s) 14" TJI® 230



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2042 @ 2"	3416 (3.50")	Passed (60%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2024 @ 3 1/2"	4474	Passed (45%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	6954 @ 3' 11 1/8"	11477	Passed (61%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.255 @ 8' 10 5/16"	0.467	Passed (L/877)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.447 @ 8' 9 9/16"	0.933	Passed (L/502)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -680 lbs uplift at support located at 2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.75"	904	507	1011	-2037	2042/-680	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.75"	381	507	244	-491	944/-66	Blocking

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

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

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

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 19'	N/A	6.6	--	--	--	
1 - Uniform (PSF)	0 to 19'	1' 4"	12.0	40.0	-	-	Default Load
2 - Point (lb)	3' 9 1/2"	N/A	855	-	1255	-2528	

Weyerhaeuser Notes

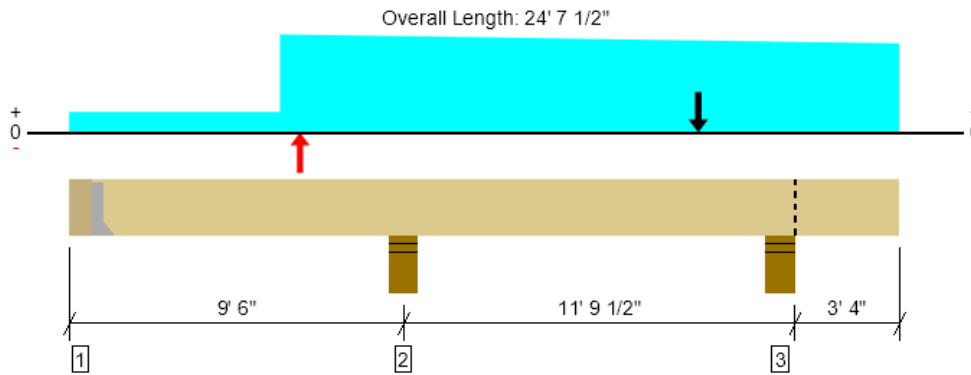
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 14 - Beam
1 piece(s) 1 3/4" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3579 @ 21'	4961 (7.00")	Passed (72%)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2745 @ 19' 6 1/2"	8101	Passed (34%)	1.60	1.0 D + 0.6 W (All Spans)
Moment (Ft-lbs)	6017 @ 18' 6"	17472	Passed (34%)	1.60	1.0 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.177 @ 15' 10 7/8"	0.287	Passed (L/778)	--	1.0 D + 0.6 W (All Spans)
Total Load Defl. (in)	0.232 @ 15' 9 9/16"	0.575	Passed (L/596)	--	1.0 D + 0.6 W (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -867 lbs uplift at support located at 5 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Hanger on 14" PSL beam	5.50"	Hanger ¹	1.50"	30	187/-23	11/-37	-1475	218/-867	See note ¹
2 - Stud wall - SPF	7.00"	7.00"	3.88"	1579	520	579	1589/-3703	2888/-1274	None
3 - Stud wall - HF	7.00"	7.00"	5.05"	1312	372	516	3590	3579	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 4" o/c	
Bottom Edge (Lu)	6' 11" 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	HUS1.81/10	3.00"	N/A	30-10dx1.5	10-10d	

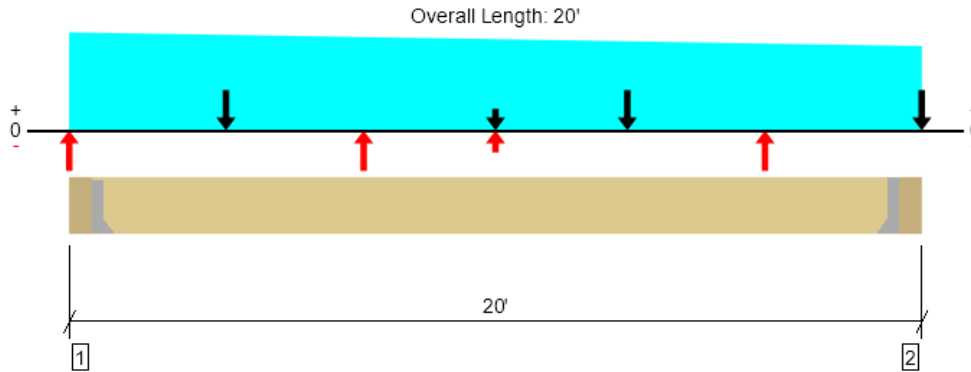
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	5 1/2" to 24' 7 1/2"	N/A	7.7	--	--	--	
1 - Uniform (PSF)	0 to 24' 7 1/2" (Front)	1'	12.0	40.0	-	-	Default Load
2 - Point (lb)	6' 6" (Front)	N/A	-	-	-	-4552	
3 - Tapered (PLF)	5' 11" to 24' 7 1/2" (Front)	N/A	142.0 to 119.0	-	56.0 to 56.0	-	
4 - Point (lb)	18' 6" (Front)	N/A	-	-	-	4552	

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 15 - Beam
1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3045 @ 5 1/2"	4725 (1.50")	Passed (64%)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2308 @ 1' 7 1/2"	11646	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	14321 @ 10'	25116	Passed (57%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.269 @ 10'	0.477	Passed (L/852)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.752 @ 10'	0.954	Passed (L/304)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Hanger on 14" PSL beam	5.50"	Hanger ¹	1.50"	1822	200	853	1183	3144	See note ¹
2 - Hanger on 14" PSL beam	5.50"	Hanger ¹	1.50"	1708	200	853	2768	3743	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)	19' 1" o/c	
Bottom Edge (Lu)	19' 1" 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	LUS414	2.00"	N/A	10-SD9112	6-SD9212		
2 - Face Mount Hanger	LUS414	2.00"	N/A	10-SD9112	6-SD9212		

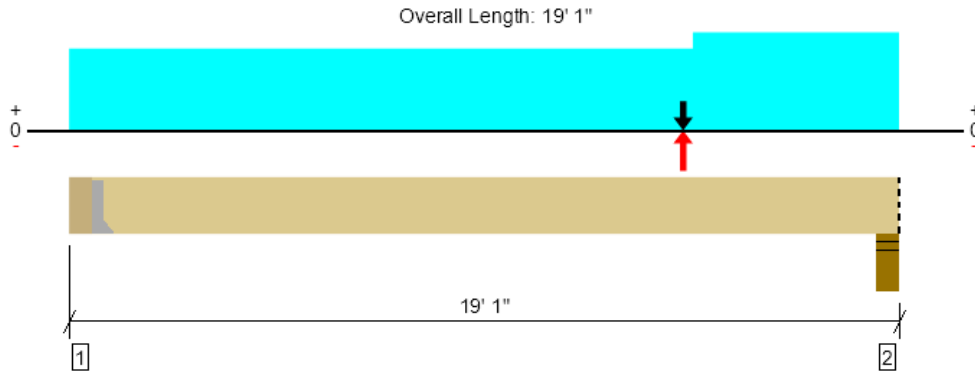
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	5 1/2" to 19' 6 1/2"	N/A	15.3	--	--	--	
1 - Uniform (PSF)	0 to 20' (Front)	8"	12.0	30.0	-	-	Default Load
2 - Point (lb)	0 (Front)	N/A	-	-	-	-4973	
3 - Point (lb)	3' 7 1/2" (Front)	N/A	-	-	-	4973	
4 - Point (lb)	6' 10 1/2" (Front)	N/A	-	-	-	-4973	
5 - Point (lb)	13' 1 1/2" (Front)	N/A	-	-	-	4973	
6 - Point (lb)	16' 4 1/2" (Front)	N/A	-	-	-	-4973	
7 - Point (lb)	20' (Front)	N/A	-	-	-	4973	
8 - Point (lb)	10' (Front)	N/A	367	-	585	-1022	
9 - Tapered (PLF)	0 to 20' (Front)	N/A	152.0 to 119.0	-	56.0 to 56.0	-	

Forteweb Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 16 - Beam
1 piece(s) 5 1/2" x 15" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	8652 @ 5 1/2"	8652 (2.42")	Passed (100%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	7515 @ 1' 8 1/2"	16761	Passed (45%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	41157 @ 9' 11 11/16"	46705	Passed (88%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Neg Moment (Ft-lbs)	-7678 @ 10' 8 7/16"	50089	Passed (15%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.423 @ 9' 7 5/16"	0.457	Passed (L/519)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.891 @ 9' 8 1/16"	0.915	Passed (L/246)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 0.98 that was calculated using length L = 18' 3 1/2".
- Critical negative moment adjusted by a volume/size factor of 0.98 that was calculated using length L = 18' 3 1/2".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Hanger on 15" PSL beam	5.50"	Hanger ¹	2.42"	4596	2881	3070	-7215	9059/-1572	See note ¹
2 - Stud wall - HF	5.50"	5.50"	3.63"	4266	2844	2258	-6295	8093/-1217	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 8" o/c	
Bottom Edge (Lu)	18' 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	HGUS5.50/12	4.00"	N/A	56-10d	20-10d	

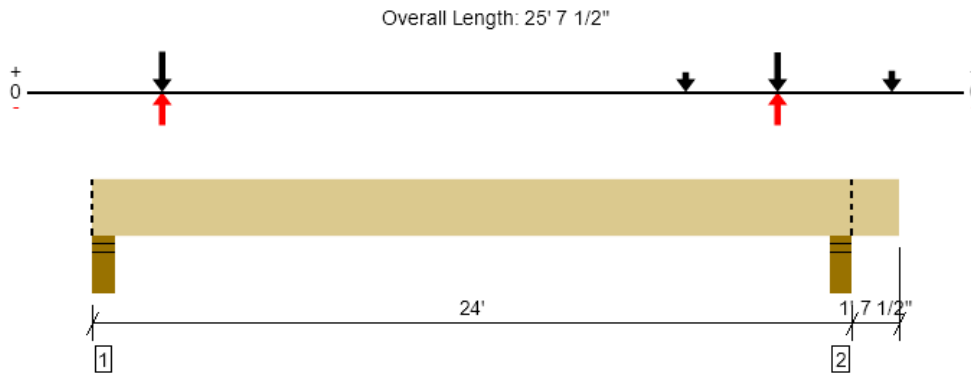
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	5 1/2" to 19' 1"	N/A	20.0	--	--	--	
1 - Uniform (PSF)	0 to 19' 1" (Front)	10'	12.0	30.0	-	-	Default Load
2 - Uniform (PLF)	0 to 14' 2 1/2" (Front)	N/A	308.0	-	315.0	-692.0	
3 - Point (lb)	13' 11 3/4" (Front)	N/A	1822	-	853	-3678	

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 17 - Beam
1 piece(s) 5 1/4" x 14" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	11575 @ 23' 9 1/4"	11694 (5.50")	Passed (99%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	9878 @ 22' 4 1/2"	16342	Passed (60%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	19176 @ 18' 10 1/4"	40743	Passed (47%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.442 @ 12' 2 7/8"	0.586	Passed (L/637)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.920 @ 12' 1 15/16"	1.172	Passed (L/306)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Upward deflection on right cantilever exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -753 lbs uplift at support located at 23' 9 1/4". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Stud wall - HF	5.50"	5.50"	4.45"	4905	3228	2859	-7247	9471/-1405	Blocking
2 - Stud wall - HF	5.50"	5.50"	5.44"	5928	3602	3929	-7183	11575/-753	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)	25' 8" o/c	
Bottom Edge (Lu)	25' 8" 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)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 25' 7 1/2"	N/A	23.0	--	--	--	
1 - Point (lb)	2' 2 3/4" (Front)	N/A	4592	3070	2881	-7215	Default Load
2 - Point (lb)	18' 10 1/4" (Front)	N/A	506	690	-	-	Default Load
3 - Point (lb)	21' 9 1/4" (Front)	N/A	4267	3070	2881	-7215	Default Load
4 - Point (lb)	25' 4 3/4" (Front)	N/A	879	-	992	-	Default Load

Weyerhaeuser Notes

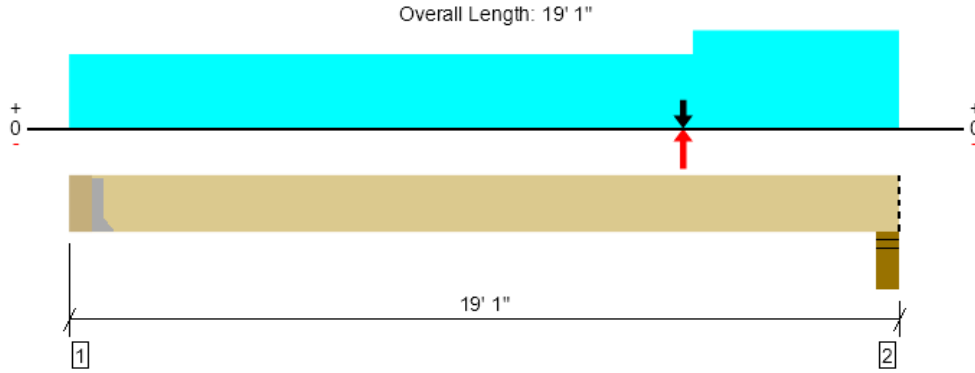
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Upper Floor Framing, 16F - Beam
1 piece(s) 5 1/2" x 15" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	8339 @ 5 1/2"	8339 (2.33")	Passed (100%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	7243 @ 1' 8 1/2"	16761	Passed (43%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	39674 @ 9' 11 11/16"	46705	Passed (85%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Neg Moment (Ft-lbs)	-8563 @ 10' 7 5/16"	50089	Passed (17%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.423 @ 9' 7 5/16"	0.457	Passed (L/519)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.859 @ 9' 8 1/16"	0.915	Passed (L/255)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 0.98 that was calculated using length L = 18' 3 1/2".
- Critical negative moment adjusted by a volume/size factor of 0.98 that was calculated using length L = 18' 3 1/2".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Hanger on 15" PSL beam	5.50"	Hanger ¹	2.33"	4267	2881	3070	-7215	8731/-1769	See note ¹
2 - Stud wall - HF	5.50"	5.50"	3.52"	4011	2844	2258	-6295	7838/-1370	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 8" o/c	
Bottom Edge (Lu)	18' 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	HGUS5.50/12	4.00"	N/A	56-10d	20-10d	

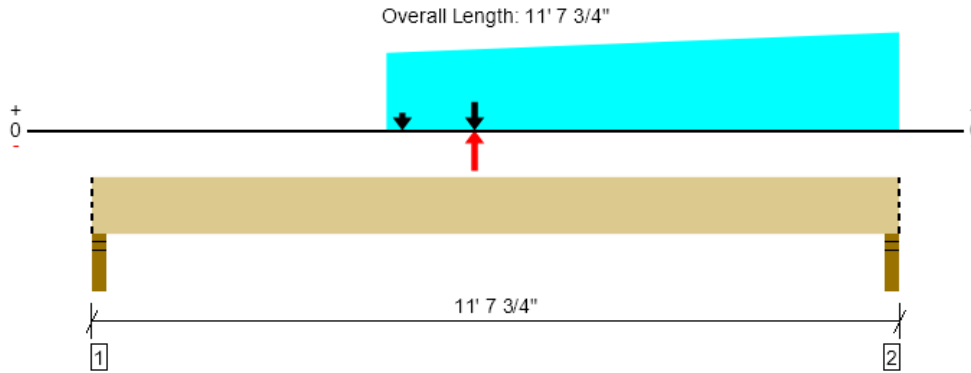
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	5 1/2" to 19' 1"	N/A	20.0	--	--	--	
1 - Uniform (PSF)	0 to 19' 1" (Front)	10'	12.0	30.0	-	-	Default Load
2 - Uniform (PLF)	0 to 14' 2 1/2" (Front)	N/A	275.0	-	315.0	-692.0	
3 - Point (lb)	13' 11 3/4" (Front)	N/A	1708	-	853	-3678	

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 18 - Beam
 1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2940 @ 11' 5 3/4"	4961 (3.50")	Passed (59%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2530 @ 10' 2 1/4"	11646	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	12936 @ 5' 6 1/4"	25116	Passed (52%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.110 @ 5' 6 1/4"	0.283	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.240 @ 5' 6 1/4"	0.566	Passed (L/565)	--	1.0 D + 1.0 S (All Spans)

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.78"	1364	182	1152	-3923	2517/-1535	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.07"	1819	466	1029	-3525	2940/-1024	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' 8" o/c	
Bottom Edge (Lu)	11' 8" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 11' 7 3/4"	N/A	15.3	--	--	--	
1 - Tapered (PLF)	4' 3" to 11' 7 3/4" (Front)	N/A	104.0 to 119.0	62.0 to 113.0	-	-	Default Load
2 - Uniform (PLF)	4' 3" to 11' 7 3/4" (Front)	N/A	85.0	-	-	-	
3 - Point (lb)	4' 5 3/4" (Front)	N/A	108	-	39	-	
4 - Point (lb)	5' 6 1/4" (Front)	N/A	1444	-	2142	-7448	

Weyerhaeuser Notes

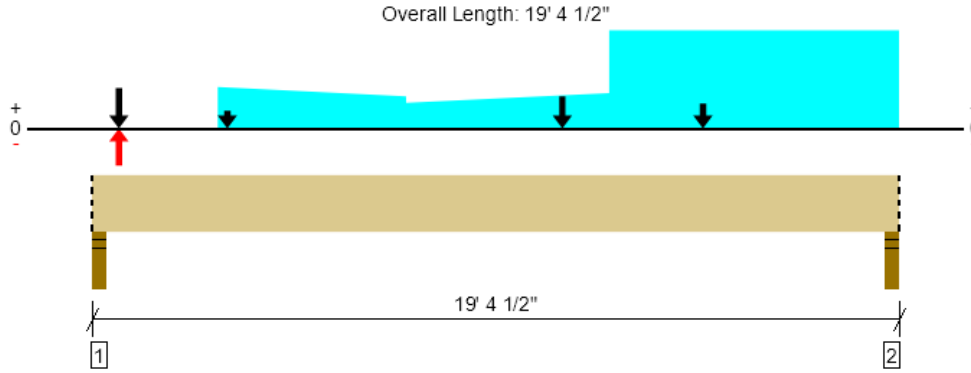
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 19 - Beam
1 piece(s) 3 1/2" x 14" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3644 @ 19' 2 1/2"	4961 (3.50")	Passed (73%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2901 @ 17' 11"	9473	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	12452 @ 11' 10 3/4"	27162	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.386 @ 10' 2 5/16"	0.476	Passed (L/591)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.530 @ 10' 1 5/16"	0.952	Passed (L/431)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Stud wall - HF	3.50"	3.50"	2.44"	1794	1374	853	-1158	3465	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.57"	980	2664	22	1403	3644	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	19' 5" o/c	
Bottom Edge (Lu)	19' 5" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 19' 4 1/2"	N/A	15.3	--	--	--	
1 - Tapered (PSF)	3' 1/4" to 7' 6 1/2" (Front)	4' to 3' 1 1/2"	12.0	40.0	-	-	Default Load
2 - Tapered (PSF)	7' 6 1/2" to 12' 5" (Front)	2' 5 5/8" to 3' 5 1/4"	12.0	40.0	-	-	
3 - Point (lb)	3' 3" (Front)	N/A	12	40	-	-	
4 - Point (lb)	11' 3 1/2" (Front)	N/A	-	-	-	1475	
5 - Point (lb)	14' 8" (Front)	N/A	-	-	-	777	
6 - Uniform (PSF)	12' 5" to 19' 4 1/2" (Front)	9' 6"	12.0	40.0	-	-	
7 - Point (lb)	7 3/4" (Front)	N/A	1306	134	875	-2007	

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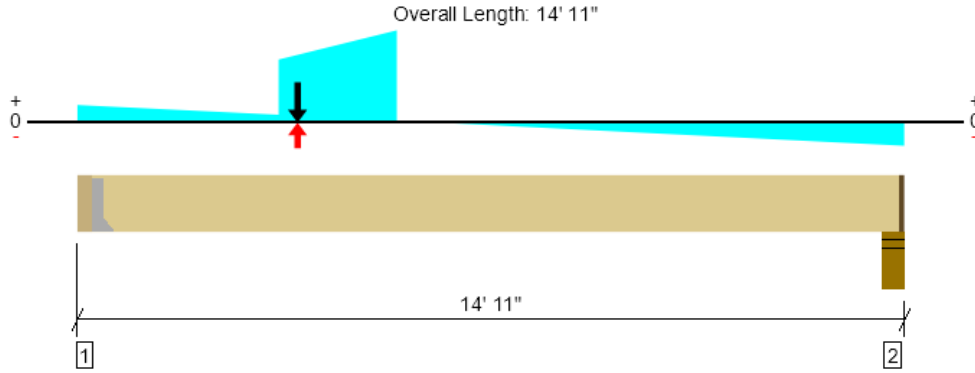
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Upper Floor Framing, 20 - Beam
1 piece(s) 1 3/4" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2115 @ 3 1/2"	2363 (1.50")	Passed (90%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1858 @ 13' 3 1/2"	5823	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	7930 @ 7' 6 1/16"	12558	Passed (63%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.217 @ 7' 6"	0.357	Passed (L/790)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.520 @ 7' 5 7/16"	0.715	Passed (L/330)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -420 lbs uplift at support located at 3 1/2". Strapping or other restraint may be required.
- -643 lbs uplift at support located at 14' 7". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Hanger on 14" HF beam	3.50"	Hanger ¹	1.50"	1306	134	875	-2007	2181/-420	See note ¹
2 - Stud wall - HF	5.50"	4.25"	3.38"	1366	57	1062	-2437	2429/-643	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 7" o/c	
Bottom Edge (Lu)	14' 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	HUS1.81/10	3.00"	N/A	30-10dx1.5	10-10d	

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

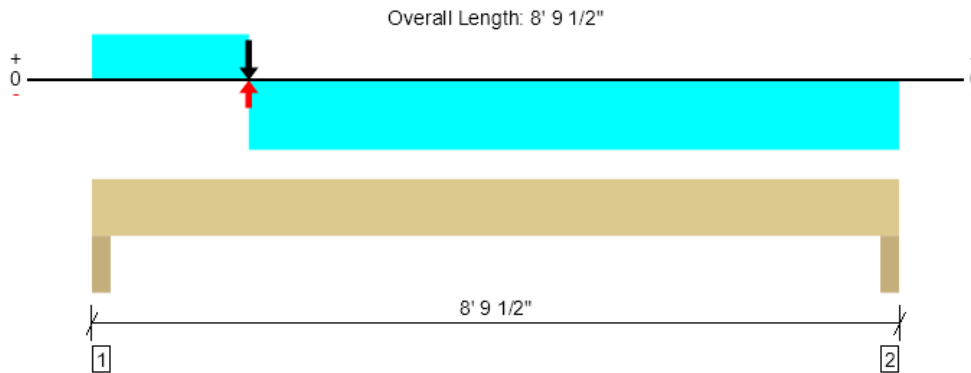
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 14' 9 3/4"	N/A	7.7	--	--	--	
1 - Tapered (PLF)	0 to 14' 11" (Front)	N/A	138.0 to 185.0	-	89.0 to 166.0	-204.0 to -381.0	Default Load
2 - Tapered (PSF)	3' 7" to 5' 8" (Front)	1' 4 1/2" to 2' 3"	12.0	40.0	-	-	
3 - Point (lb)	3' 11" (Front)	N/A	107	40	36	-82	

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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
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Upper Floor Framing, 21 - Header
 1 piece(s) 5 1/2" x 10 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	11303 @ 3"	16088 (4.50")	Passed (70%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	10278 @ 1' 3"	11733	Passed (88%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	15313 @ 1' 8 1/2"	23244	Passed (66%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Neg Moment (Ft-lbs)	-1666 @ 2' 10 7/8"	24929	Passed (7%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.075 @ 3' 11 1/2"	0.276	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.152 @ 3' 11 1/2"	0.415	Passed (L/655)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 8' 3 1/2".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 8' 3 1/2".
- -618 lbs uplift at support located at 8' 6 1/2". Strapping or other restraint may be required.
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Trimmer - HF	4.50"	4.50"	3.16"	5760	3247	4144	-8053	11303/-1376	None
2 - Trimmer - HF	4.50"	4.50"	1.50"	1445	656	1217	-2475	2850/-618	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 10" o/c	
Bottom Edge (Lu)	8' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 8' 9 1/2"	N/A	14.0	--	--	--	
1 - Uniform (PLF)	0 to 1' 8 1/2"	N/A	393.0	176.0	374.0	-892.0	Default Load
2 - Point (lb)	1' 8 1/2"	N/A	5928	3602	3929	-7183	
3 - Uniform (PLF)	1' 8 1/2" to 8' 9 1/2"	N/A	68.0	-	112.0	-257.0	Default Load

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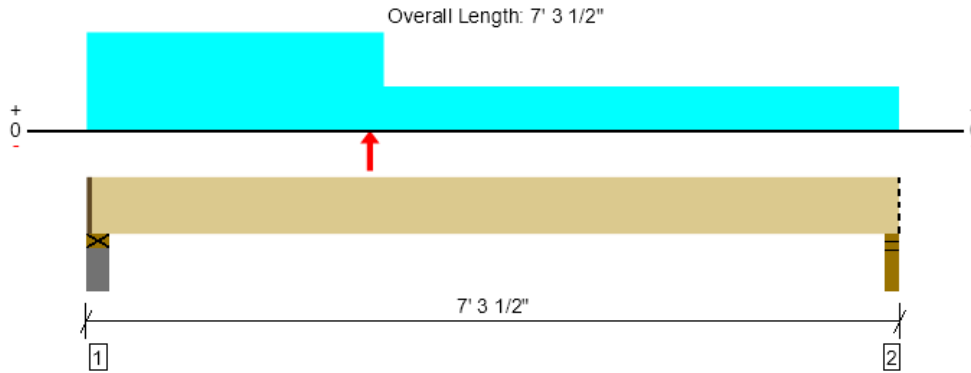
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Main Floor Framing, 23 - Beam
 2 piece(s) 1 3/4" x 9 1/4" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	469 @ 4"	6024 (4.25")	Passed (8%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4694 @ 2' 6 1/2"	9842	Passed (48%)	1.60	0.6 D + 0.6 W (All Spans)
Moment (Ft-lbs)	-10204 @ 2' 6 1/2"	17926	Passed (57%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.007 @ 3' 8 5/8"	0.226	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	-0.170 @ 3' 5 7/8"	0.340	Passed (L/480)	--	0.6 D + 0.6 W (All Spans)

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Wind	Factored	
1 - Plate on concrete - HF	5.50"	4.25"	1.50"	286	199	-7830	485/-4526	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	3.50"	1.50"	125	190	-3772	315/-2189	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 2" o/c	
Bottom Edge (Lu)	7' 2" 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 7' 3 1/2"	N/A	9.4	--	--	
1 - Uniform (PSF)	0 to 7' 3 1/2" (Front)	1' 4"	12.0	40.0	-	Default Load
2 - Point (lb)	2' 6 1/2" (Front)	N/A	-	-	-11602	
3 - Uniform (PLF)	0 to 2' 8" (Front)	N/A	85.0	-	-	

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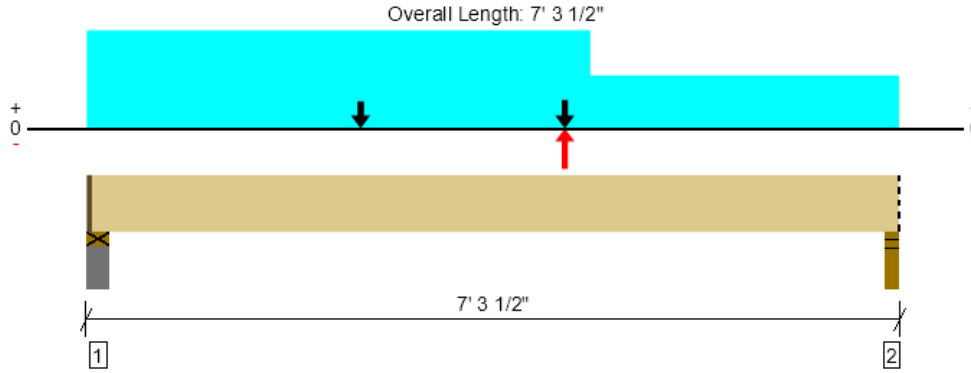
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Main Floor Framing, 24 - Beam
3 piece(s) 2 x 10 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2146 @ 7' 1 1/2"	6379 (3.50")	Passed (34%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2175 @ 1' 2 3/4"	4163	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5780 @ 4' 3 1/2"	5750	Passed (101%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.055 @ 3' 8 1/4"	0.226	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.114 @ 3' 8 5/8"	0.340	Passed (L/713)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -545 lbs uplift at support located at 7' 1 1/2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Plate on concrete - HF	5.50"	4.25"	1.50"	1215	1129	481	-1088	2423	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	3.50"	1.50"	1129	685	671	-2037	2146/-545	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6" o/c	
Bottom Edge (Lu)	7' 2" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	1 1/4" to 7' 3 1/2"	N/A	10.6	--	--	--	
1 - Uniform (PSF)	0 to 7' 3 1/2" (Front)	1' 4"	12.0	40.0	-	-	Default Load
2 - Point (lb)	2' 5 1/2" (Front)	N/A	521	1243	-	798	
3 - Point (lb)	4' 3 1/2" (Front)	N/A	1364	182	1152	-3923	
4 - Uniform (PLF)	0 to 4' 6 1/4" (Front)	N/A	59.0	-	-	-	

Weyerhaeuser Notes

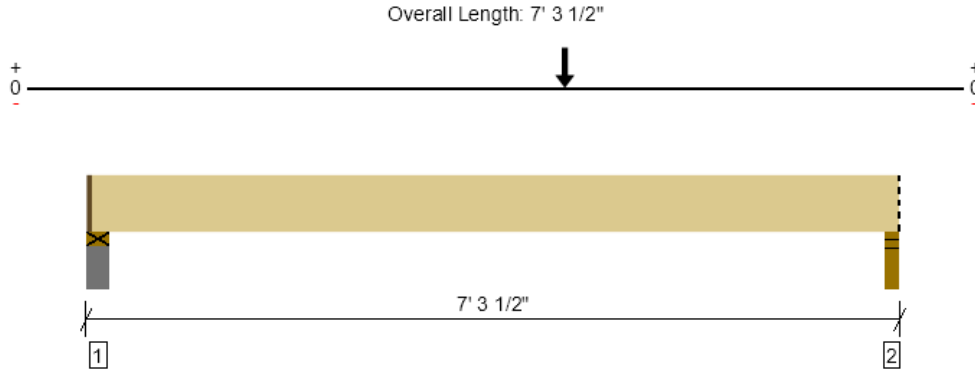
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Main Floor Framing, 25 - Beam
3 piece(s) 2 x 10 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2688 @ 7' 1 1/2"	6379 (3.50")	Passed (42%)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2673 @ 6' 2 3/4"	6660	Passed (40%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	7554 @ 4' 3 1/2"	8000	Passed (94%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.077 @ 3' 10 1/8"	0.226	Passed (L/999+)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.129 @ 3' 10 1/16"	0.340	Passed (L/630)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Plate on concrete - HF	5.50"	4.25"	1.50"	801	206	429	1471	1939	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	3.50"	1.50"	1101	283	600	2054	2688	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 5" o/c	
Bottom Edge (Lu)	7' 2" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	1 1/4" to 7' 3 1/2"	N/A	10.6	--	--	--	
1 - Uniform (PSF)	0 to 7' 3 1/2" (Front)	0	12.0	40.0	-	-	Default Load
2 - Point (lb)	4' 3 1/2" (Front)	N/A	1819	466	1029	3525	

Weyerhaeuser Notes

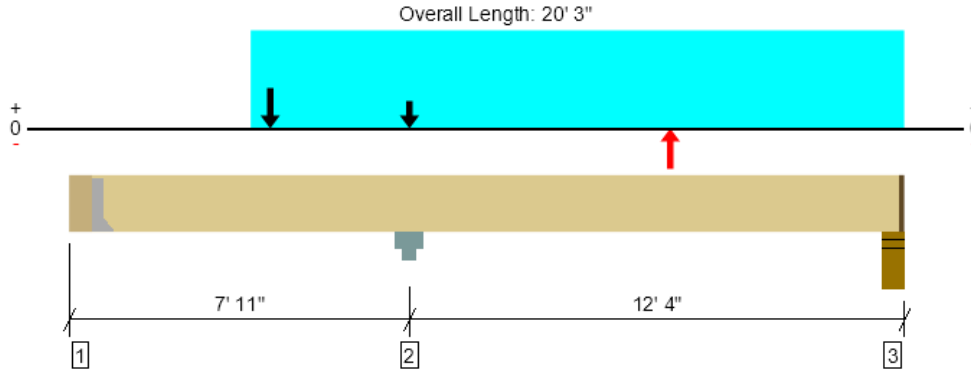
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Main Floor Framing, 26 - Beam
 4 piece(s) 1 3/4" x 9 1/2" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3899 @ 5' 1/2"	7875 (1.50")	Passed (50%)	--	0.6 D + 0.6 W (All Spans)
Shear (lbs)	4947 @ 6' 10"	20216	Passed (24%)	1.60	1.0 D + 0.6 W (Alt Spans)
Moment (Ft-lbs)	-18057 @ 14' 5"	37679	Passed (48%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.162 @ 4' 7 3/4"	0.249	Passed (L/553)	--	1.0 D + 0.6 W (All Spans)
Total Load Defl. (in)	-0.374 @ 14' 5"	0.600	Passed (L/385)	--	0.6 D + 0.6 W (All Spans)

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- 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	Snow	Wind	Factored	
1 - Hanger on 9 1/2" HF beam	5.50"	Hanger ¹	1.50"	-26	11/-5	-	6525	3899/-31	See note ¹
2 - Column Cap - steel	7.00"	7.00"	1.88"	2769	562	579	11863/-5279	9887/-1506	None
3 - Stud wall - HF	5.50"	4.25"	1.50"	553	18/-1	-	-5702	570/-3089	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	19' 8" o/c	
Bottom Edge (Lu)	19' 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	HHUS7.25/10	3.31"	N/A	30-10d	10-10d	

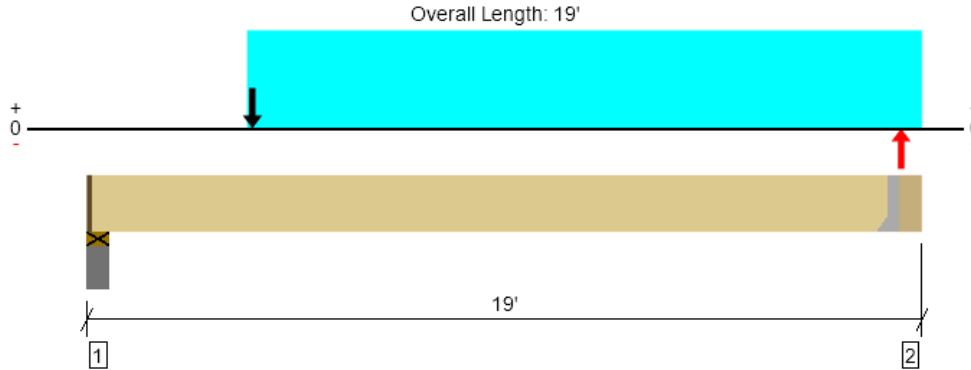
• Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	5 1/2" to 20' 1 3/4"	N/A	19.4	--	--	--	
1 - Uniform (PSF)	0 to 20' 3" (Front)	0	12.0	40.0	-	-	Default Load
2 - Point (lb)	4' 7 3/4" (Front)	N/A	-	-	-	11983	
3 - Point (lb)	7' 11" (Front)	N/A	1529	520	579	3703	
4 - Point (lb)	14' 5" (Front)	N/A	-	-	-	-11983	
5 - Uniform (PLF)	4' 2 1/4" to 20' 3" (Front)	N/A	85.0	-	-	-	

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Main Floor Framing, 27 - Beam
1 piece(s) 5 1/2" x 13 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8589 @ 4"	9467 (4.25")	Passed (91%)	--	1.0 D + 0.6 W (All Spans)
Shear (lbs)	8561 @ 1' 7"	20988	Passed (41%)	1.60	1.0 D + 0.6 W (All Spans)
Pos Moment (Ft-lbs)	30283 @ 3' 10 1/2"	53216	Passed (57%)	1.60	1.0 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.582 @ 8' 3 1/4"	0.607	Passed (L/375)	--	1.0 D + 0.6 W (All Spans)
Total Load Defl. (in)	0.726 @ 8' 6 3/8"	0.910	Passed (L/301)	--	1.0 D + 0.6 W (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 18' 2 1/2".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Wind	Factored	
1 - Plate on concrete - HF	5.50"	4.25"	3.86"	839	31	12917	8589	1 1/4" Rim Board
2 - Hanger on 13 1/2" PSL beam	5.50"	Hanger ¹	1.50"	1190	30	3119	3061	See note ¹

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

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

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HU612	2.50"	N/A	22-10dx1.5	8-10d	

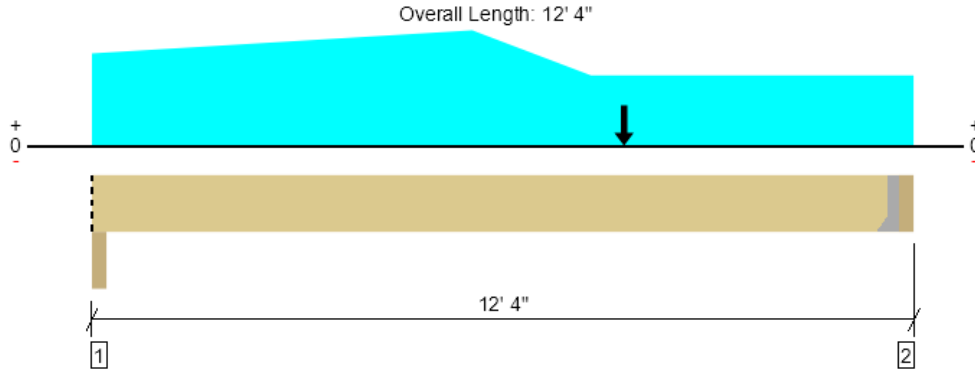
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Wind (1.60)	Comments
0 - Self Weight (PLF)	1 1/4" to 18' 6 1/2"	N/A	18.0	--	--	
1 - Uniform (PSF)	0 to 19' (Front)	0	12.0	40.0	-	Default Load
2 - Point (lb)	3' 10 1/2" (Front)	N/A	-	-	16036	
3 - Point (lb)	18' 7" (Front)	N/A	-	-	-16036	
4 - Uniform (PLF)	3' 9" to 19' (Front)	N/A	110.0	-	-	

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Main Floor Framing, 28 - Beam
1 piece(s) 3 1/2" x 9 1/2" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1640 @ 12' 1/2"	4725 (1.50")	Passed (35%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1493 @ 11' 3"	6872	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5392 @ 6' 4 7/16"	10422	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.279 @ 6' 1 3/4"	0.297	Passed (L/511)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.375 @ 6' 1 3/4"	0.594	Passed (L/380)	--	1.0 D + 1.0 L (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Column - HF	3.50"	3.50"	1.50"	447	1279	1726	Blocking
2 - Hanger on 9 1/2" LVL beam	3.50"	Hanger ¹	1.50"	438	1254	1692	See note ¹

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

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

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HHUS410	3.00"	N/A	30-10d	10-10d	

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

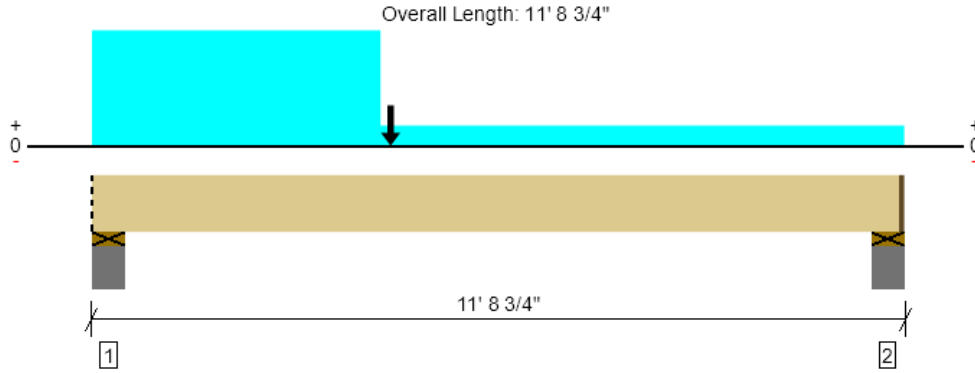
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 12' 1/2"	N/A	10.4	--	
1 - Tapered (PSF)	0 to 5' 9 3/4" (Front)	4' 5 1/4" to 5' 6 1/2"	12.0	40.0	Default Load
2 - Tapered (PSF)	5' 9 3/4" to 7' 6 3/4" (Front)	5' 6 1/2" to 3' 4 1/2"	12.0	40.0	Default Load
3 - Uniform (PSF)	7' 6 3/4" to 12' 4" (Front)	3' 4 1/2"	12.0	40.0	Default Load
4 - Point (lb)	8' 1/2" (Front)	N/A	125	416	

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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
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



Main Floor Framing, 29 - Beam
 1 piece(s) 3 1/2" x 9 1/2" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1936 @ 6 1/2"	11340 (8.00")	Passed (17%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1632 @ 1' 5 1/2"	6872	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5396 @ 4' 3 3/4"	10422	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.175 @ 5' 6 3/16"	0.266	Passed (L/731)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.255 @ 5' 6 3/16"	0.532	Passed (L/502)	--	1.0 D + 1.0 L (All Spans)

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Plate on concrete - HF	8.00"	8.00"	1.50"	685	1250	1936	Blocking
2 - Plate on concrete - HF	8.00"	6.75"	1.50"	313	650	963	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' 8" o/c	
Bottom Edge (Lu)	11' 8" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 11' 7 1/2"	N/A	10.4	--	
1 - Uniform (PSF)	0 to 11' 8 3/4" (Front)	8"	12.0	40.0	Default Load
2 - Uniform (PLF)	0 to 4' 2" (Front)	N/A	83.0	80.0	
3 - Point (lb)	4' 3 3/4" (Front)	N/A	438	1254	

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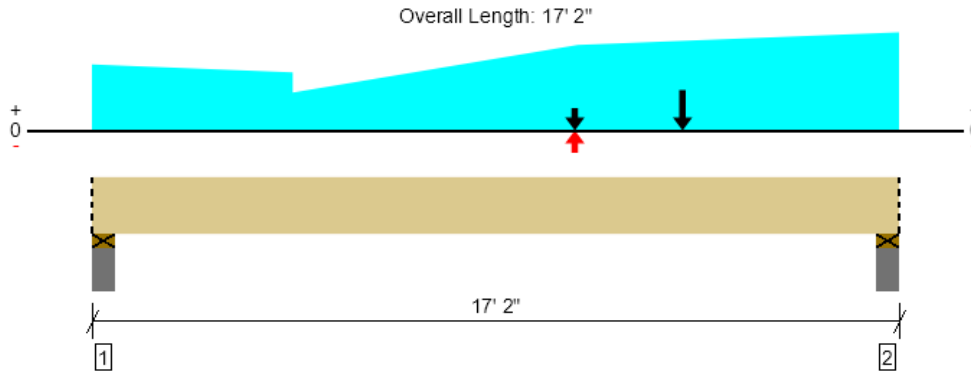
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Main Floor Framing, 30 - Beam
 1 piece(s) 5 1/2" x 12" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5441 @ 16' 10"	12251 (5.50")	Passed (44%)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3454 @ 15' 8 1/2"	11660	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	16178 @ 10' 3 1/4"	26400	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.451 @ 9' 1 5/8"	0.412	Failed (L/439)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.649 @ 9' 5/8"	0.825	Passed (L/305)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 16' 6".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Plate on concrete - HF	5.50"	5.50"	1.50"	1078	2153	171	1104	3317	Blocking
2 - Plate on concrete - HF	5.50"	5.50"	2.44"	1408	2749	258	3950	5441	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' 2" o/c	
Bottom Edge (Lu)	17' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 17' 2"	N/A	16.0	--	--	--	
1 - Tapered (PSF)	0 to 4' 3 1/4" (Front)	6' 1 1/2" to 5' 4 1/2"	12.0	40.0	-	-	
2 - Tapered (PSF)	4' 3 1/4" to 10' 4" (Front)	3' 6" to 7' 11"	12.0	40.0	-	-	
3 - Tapered (PSF)	10' 4" to 17' 2" (Front)	7' 11" to 9' 1"	12.0	40.0	-	-	
4 - Point (lb)	10' 3 1/4" (Front)	N/A	801	206	429	-1471	
5 - Point (lb)	12' 6 3/4" (Front)	N/A	-	-	-	6525	

Weyerhaeuser Notes

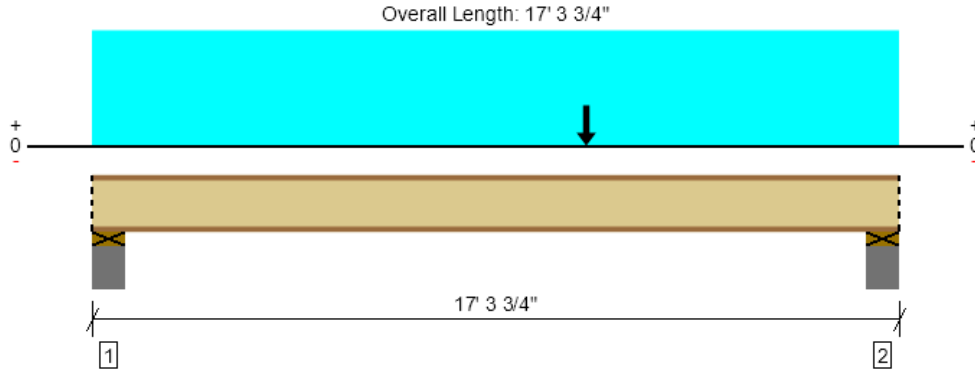
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Main Floor Framing, 31 - Joist
1 piece(s) 9 1/2" TJI® 230 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	649 @ 16' 8 3/4"	1485 (3.50")	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	603 @ 16' 7 3/4"	1330	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2507 @ 9' 1 1/16"	3330	Passed (75%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.360 @ 8' 7 7/8"	0.404	Passed (L/538)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.516 @ 8' 8 1/2"	0.807	Passed (L/375)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	46	40	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Perpendicular Partitions.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Plate on concrete - HF	8.00"	8.00"	1.75"	168	462	630	Blocking
2 - Plate on concrete - HF	8.00"	8.00"	1.75"	187	462	649	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 8" o/c	
Bottom Edge (Lu)	17' 4" o/c	

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

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 17' 3 3/4"	16"	12.0	40.0	Default Load
2 - Point (PLF)	10' 7 1/4"	16"	59.0	-	

Weyerhaeuser Notes

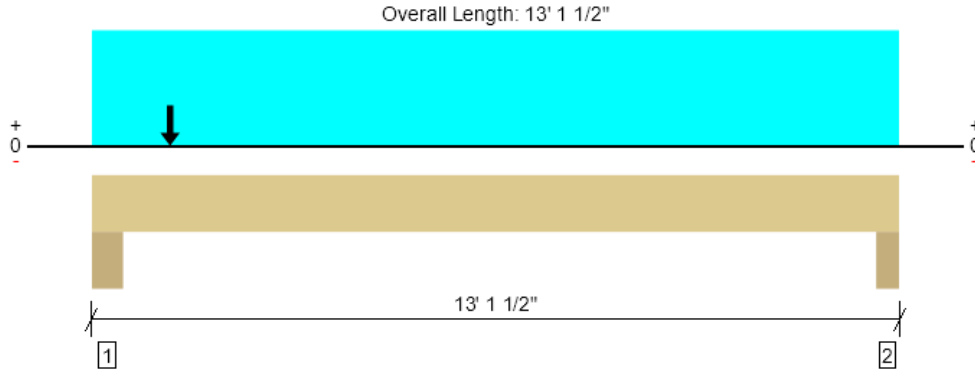
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Main Floor Framing, 32 - Header
 1 piece(s) 5 1/2" x 16 1/2" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	16759 @ 12' 9 1/2"	19663 (5.50")	Passed (85%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	11586 @ 2'	16033	Passed (72%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	45428 @ 6' 7 3/8"	49913	Passed (91%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.174 @ 6' 7 13/16"	0.410	Passed (L/849)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.361 @ 6' 7 11/16"	0.615	Passed (L/409)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 12' 3 1/2".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Trimmer - DF	7.50"	7.50"	5.10"	9897	7042	4067	-8679	18229	None
2 - Trimmer - HF	5.50"	5.50"	4.69"	8636	6866	3965	-8462	16759	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 13' 1 1/2"	N/A	22.1	--	--	--	
1 - Uniform (PSF)	0 to 13' 1 1/2"	9' 2"	50.0	40.0	-	-	Default Load
2 - Uniform (PLF)	0 to 13' 1 1/2"	N/A	841.0	693.0	612.0	-1306.0	
3 - Point (lb)	1' 3 1/4"	N/A	1190	-	-	-	

Weyerhaeuser Notes

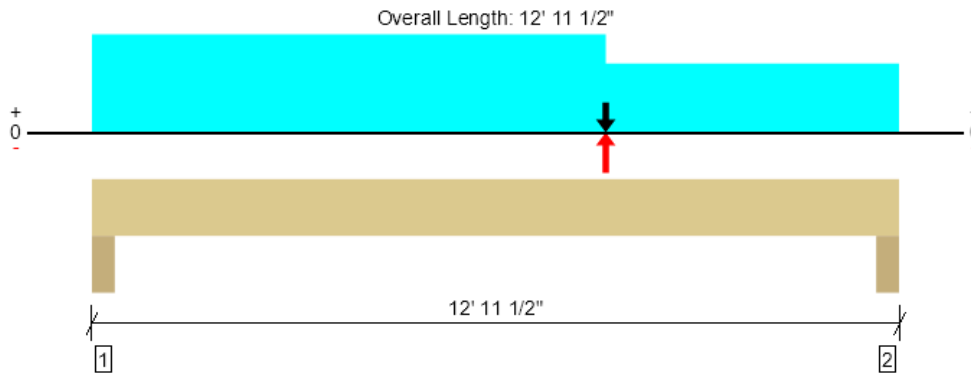
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ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



Main Floor Framing, 33 - Header
 1 piece(s) 3 1/2" x 12" 24F-V4 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	6403 @ 12' 7 1/2"	12513 (5.50")	Passed (51%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5196 @ 11' 6"	8533	Passed (61%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	18887 @ 8' 3"	19320	Passed (98%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Neg Moment (Ft-lbs)	-7914 @ 8' 3"	20720	Passed (38%)	1.60	0.6 D + 0.6 W (All Spans)
Live Load Defl. (in)	0.284 @ 6' 9 3/4"	0.410	Passed (L/519)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.494 @ 6' 10 1/8"	0.615	Passed (L/299)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 12' 3 1/2".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 12' 3 1/2".
- -778 lbs uplift at support located at 4". Strapping or other restraint may be required.
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Factored	
1 - Trimmer - DF	5.50"	5.50"	1.57"	1404	1641	1247	-2701	3571/-778	None
2 - Trimmer - HF	5.50"	5.50"	2.81"	2838	1641	3112	-6737	6403/-2340	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 6" o/c	
Bottom Edge (Lu)	13' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 12' 11 1/2"	N/A	10.2	--	--	--	
1 - Uniform (PSF)	0 to 12' 11 1/2"	6' 4"	12.0	40.0	-	-	Default Load
2 - Point (lb)	8' 3"	N/A	1727	-	2763	-5982	
3 - Uniform (PLF)	8' 3" to 12' 11 1/2"	N/A	297.0	-	339.0	-734.0	

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
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@anneestructural.com	



NDS 2018 Column Design - Combined Bending and Axial Load

Section	Grade
A	#2 SPF
B	#1 DF
C	#2 DF
D	#1 HF
E	#2 HF
F	HF-STUD
G	2.0E LVL

Stud Spacing	16
Wind (psf)	31.8
Moment (ft.-lbs.)	1,913
Moment - Strong	0
Moment - Weak	0
Axial Load (plf)	401
Load/stud (lbs.)	535
Ke	1.0

# of members	1
Section Mark	1-3/4x5-1/2
Grade Mark	G
Axial Load (lbs.)	535
Moment Strong Axis (ft.-lbs.)	1,913
Moment Weak Axis (ft.-lbs.)	0
Load Duration Factor	1.60
Repetitive Factor Cr	1.04
Incised Lumber (Y/N)	N
Unbraced Length Strong Axis (ft.)	19.00
Unbraced Length Weak Axis (ft.)	1.33
Grade	2.0E LVL
Axial alone = fc/F*c	0.12
Interaction Eq. Term 1	0.01
Interaction Eq. Term 2	0.63
Interaction Eq. Term 3	0.00
Total Interaction Eq.	0.64

Mk	Section
A	2x4
B	2x6
C	2x8
D	2x10
E	2x12
F	4x4
G	4x6
H	4x8
I	4x10
J	4x12
K	6x6
L	6x8
M	6x10
N	6x12
P	1-3/4x5-1/2

1 1-3/4x5-1/2

Strong axis deflection - uniform load over simple span of 19' =	1.79	L / 127
Weak axis deflection - uniform load over simple span of 1.33' =	0.00	L / 0
Strong axis deflection - point load at center of 19' span =	1.43	L / 159
Weak axis deflection - point load at center of 1.33' span =	0.00	L / 0

Fbx (psi) = 2,891
 Fby (psi) = 2,690
 Fc (psi) = 2,510
 Ex (psi) = 2.00E+06
 Ex min (psi) = 1.02E+06
 Ey (psi) = 2.00E+06
 Ey min (psi) = 1.02E+06

fc = P/A (psi) = 55.5	AXIAL
F*c = Fc x Cd x Ci (psi) = 4016.0	
K*(le2/d2) = 9.1	OK
K*(le1/d1) = 41.5	OK
= 486.5	
F' = Fce/F*c = 0.121	
c = 0.9	
(1+F')/2c = 0.623	
Cp = 0.120	Column Stability Factor
<u>F*c = F*c x Cp (psi) = 479.9</u>	
fc/F*c = 0.116	
(fc/F*c)^2 = 0.01	Interaction Equation, 1st term

$fb1 = M/S$ (psi) = 2602.3	STRONG AXIS BENDING
$Fb^* = Fb \times Cd \times Cr \times Ci$ (psi) = 4810.7	
$lu = 16.0$	in.
$le = 32.9$	in.
$Rb = \text{sq. rt.}(le \times d/b^2)$ 9.8	OK
$Fbe = 1.2 \times E'_{min}/Rb^2$ (psi) = 12754.1	OK
$F = Fbe/Fb^* = 2.651$	
$(1+F)/1.9 = 1.922$	
$CL = 0.972$	Beam Stability Factor
$F'b1$ (psi) = <u>4675.4</u>	
$fb1/F'b1 = \mathbf{0.557}$	
(psi) = 486.5	OK
$1-(fc/Fce1) = 0.886$	
$fb1/[F'b1*(1-(fc/Fce2))] = \mathbf{0.63}$	Interaction Equation, 2nd term

$fb2 = M/S$ (psi) = 0.0	WEAK AXIS BENDING
$Fb^* = Fb \times Cd \times Cr \times Ci$ (psi) = 4476.2	
$Fbe = 1.2 \times E'_{min}/Rb^2$ (psi) = 12754.1	OK
$F = Fbe/Fb^* = 2.849$	
$(1+F)/1.9 = 2.026$	
$CL = 0.975$	Beam Stability factor
$F'b2$ (psi) = <u>4362.7</u>	
$fb2/F'b2 = \mathbf{0.000}$	
(psi) = 10050.9	OK
$1-(fc/Fce2) = 0.994$	
$fb1/Fbe = 0.204$	
$fb2/[F'b2*(1-(fc/Fce2)-(fb1/Fbe)^2)] = \mathbf{0.00}$	Interaction Equation, 3rd term

NDS 2018 Column Design - Combined Bending and Axial Load

Section	Grade
A	#2 SPF
B	#1 DF
C	#2 DF
D	#1 HF
E	#2 HF
F	HF-STUD
G	1.8E PSL

Stud Spacing	12
Wind (psf)	0.0
Moment (ft.-lbs.)	0
Moment - Strong	0
Moment - Weak	0
Axial Load (plf)	6,500
Load/stud (lbs.)	6,500
Ke	1.0

# of members	3
Section Mark	2x6
Grade Mark	E
Axial Load (lbs.)	6,500
Moment Strong Axis (ft.-lbs.)	497
Moment Weak Axis (ft.-lbs.)	406
Load Duration Factor	1.15
Repetitive Factor Cr	1.15
Incised Lumber (Y/N)	N
Unbraced Length Strong Axis (ft.)	10.65
Unbraced Length Weak Axis (ft.)	1.33
Grade	#2 HF
Axial alone = fc/F^*c	0.41
Interaction Eq. Term 1	0.17
Interaction Eq. Term 2	0.28
Interaction Eq. Term 3	0.16
Total Interaction Eq.	0.61

Mk	Section
A	2x4
B	2x6
C	2x8
D	2x10
E	2x12
F	4x4
G	4x6
H	4x8
I	4x10
J	4x12
K	6x6
L	6x8
M	6x10
N	6x12
P	3-1/2x5-1/4
3	2x6

Strong axis deflection - uniform load over simple span of 10.65' =	0.12	L / 1023
Weak axis deflection - uniform load over simple span of 1.33' =	0.00	L / 6699
Strong axis deflection - point load at center of 10.65' span =	0.10	L / 1278
Weak axis deflection - point load at center of 1.33' span =	0.00	L / 8374

Fbx (psi) = 1,105
Fby (psi) = 1,271
Fc (psi) = 1,430
Ex (psi) = 1.30E+06
Ex min (psi) = 4.70E+05
Ey (psi) = 1.30E+06
Ey min (psi) = 4.70E+05

fc = P/A (psi) = 262.6	AXIAL
F*c = Fc x Cd x Ci (psi) = 1644.5	
K*(le2/d2) = 3.5	OK
K*(le1/d1) = 23.2	OK
= 715.5	
F' = Fce/F*c = 0.435	
c = 0.8	
(1+F')/2c = 0.897	
Cp = 0.386	Column Stability Factor
<u>F*c = F*c x Cp (psi) = 635.5</u>	
fc/F*c = 0.413	
(fc/F*c)^2 = 0.17	Interaction Equation, 1st term

$fb_1 = M/S$ (psi) = 262.6	STRONG AXIS BENDING
$Fb^* = F_b \times C_d \times C_r \times C_i$ (psi) = 1461.4	
$l_u = 16.0$	in.
$l_e = 32.9$	in.
$R_b = \text{sq. rt.}(l_e \times d/b^2)$ 3.8	OK
$F_{be} = 1.2 \times E'_{min}/R_b^2$ (psi) = 38974.2	OK
$F = F_{be}/F_b^* = 26.670$	
$(1+F)/1.9 = 14.563$	
$CL = 0.998$	Beam Stability Factor
F'_{b1} (psi) = <u>1458.5</u>	
$fb_1/F'_{b1} = \mathbf{0.180}$	
(psi) = 715.5	OK
$1-(f_c/F_{ce1}) = 0.633$	
$fb_1/[F'_{b1} \times (1-(f_c/F_{ce2}))] = \mathbf{0.28}$	Interaction Equation, 2nd term

$fb_2 = M/S$ (psi) = 262.6	WEAK AXIS BENDING
$Fb^* = F_b \times C_d \times C_r \times C_i$ (psi) = 1680.6	
$F_{be} = 1.2 \times E'_{min}/R_b^2$ (psi) = 38974.2	OK
$F = F_{be}/F_b^* = 23.191$	
$(1+F)/1.9 = 12.732$	
$CL = 0.998$	Beam Stability factor
F'_{b2} (psi) = <u>1676.8</u>	
$fb_2/F'_{b2} = \mathbf{0.157}$	
(psi) = 30713.5	OK
$1-(f_c/F_{ce2}) = 0.991$	
$fb_1/F_{be} = 0.007$	
$fb_2/[F'_{b2} \times (1-(f_c/F_{ce2})) - (fb_1/F_{be})^2] = \mathbf{0.16}$	Interaction Equation, 3rd term

Cantilevered Retaining Wall

Project File: Rawson retaining wall.ec6

LIC# : KW-06019266, Build:20.23.08.01

Annee Structural Engineering LLC

(c) ENERCALC INC 1983-2023

DESCRIPTION: 10'-0" basement retaining wall

Code Reference:

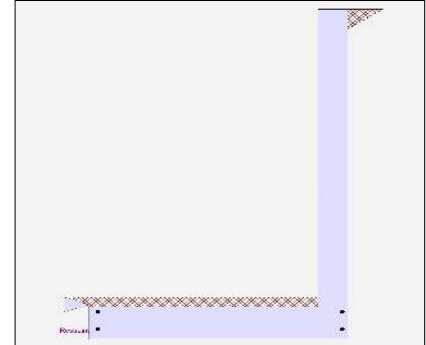
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	10.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	4.00 in
Water table above bottom of footing	=	0.0 ft

Soil Data

Allow Soil Bearing	=	2,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	50.0 psf/ft
	=	
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	120.0 pcf
Soil Density, Toe	=	120.0 pcf
Footing Soil Friction	=	0.350
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	=	50.0 psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	274.0 lbs
Axial Live Load	=	312.0 lbs
Axial Load Eccentricity	=	0.0 in

Earth Pressure Seismic Load

Method	:	Uniform
Multiplier Used	=	8.000
(Multiplier used on soil density)		

Lateral Load Applied to Stem

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

Uniform Seismic Force	=	88.667
Total Seismic Force	=	982.722

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	=	Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

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DESCRIPTION: 10'-0" basement retaining wall

Design Summary

Wall Stability Ratios		
Overturing	=	1.11 Ratio < 1.5!
Slab Resists All Sliding !		
Global Stability	=	15.32
Total Bearing Load = 3,613 lbs		
...resultant ecc.	=	31.34 in
Eccentricity outside middle third		
Soil Pressure @ Toe	=	2,283 psf NG
Soil Pressure @ Heel	=	0 psf OK
Allowable	=	2,000 psf
Soil Pressure Exceeds Allowable!		
ACI Factored @ Toe	=	3,196 psf
ACI Factored @ Heel	=	0 psf
Footing Shear @ Toe	=	27.4 psi OK
Footing Shear @ Heel	=	0.0 psi OK
Allowable	=	75.0 psi

Sliding Calcs

Lateral Sliding Force	=	3,758.9 lbs
-----------------------	---	-------------

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

Load Factors

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

Stem Construction

		2nd	Bottom
Design Height Above Ftc	ft =	Stem OK 3.83	Stem OK 0.00
Wall Material Above "Ht"	=	Concrete	Concrete
Design Method	=	SD	SD
Thickness	=	10.00	10.00
Rebar Size	=	# 4	# 5
Rebar Spacing	=	10.00	7.00
Rebar Placed at	=	Center	Edge
Design Data			
fb/FB + fa/Fa	=	0.944	0.982
Total Force @ Section			
Service Level	lbs =		
Strength Level	lbs =	2,068.1	4,886.7
Moment....Actual			
Service Level	ft-# =		
Strength Level	ft-# =	4,813.3	17,766.7
Moment.....Allowable	ft-# =	5,094.1	18,080.2
Shear.....Actual			
Service Level	psi =		
Strength Level	psi =	34.5	49.7
Shear.....Allowable	psi =	75.0	75.0
Anet (Masonry)	in2 =		
Wall Weight	psf =	125.0	125.0
Rebar Depth 'd'	in =	5.00	8.19

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

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

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Cantilevered Retaining Wall

Project File: Rawson retaining wall.ec6

LIC#: KW-06019266, Build:20.23.08.01

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DESCRIPTION: 10'-0" basement retaining wall

Concrete Stem Rebar Area Details

	<u>Vertical Reinforcing</u>	<u>Horizontal Reinforcing</u>
2nd Stem		
As (based on applied moment) :	0.2285 in2/ft	
(4/3) * As :	0.3047 in2/ft	Min Stem T&S Reinf Area 1.480 in2
200bd/fy : 200(12)(5)/60000 :	0.2 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.2285 in2/ft	#4@ 10.00 in #4@ 20.00 in
Provided Area :	0.24 in2/ft	#5@ 15.50 in #5@ 31.00 in
Maximum Area :	0.6773 in2/ft	#6@ 22.00 in #6@ 44.00 in

	<u>Vertical Reinforcing</u>	<u>Horizontal Reinforcing</u>
Bottom Stem		
As (based on applied moment) :	0.5018 in2/ft	
(4/3) * As :	0.669 in2/ft	Min Stem T&S Reinf Area 0.920 in2
200bd/fy : 200(12)(8.1875)/60000 :	0.3275 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :
	=====	<u>One layer of :</u> <u>Two layers of :</u>
Required Area :	0.5018 in2/ft	#4@ 10.00 in #4@ 20.00 in
Provided Area :	0.5314 in2/ft	#5@ 15.50 in #5@ 31.00 in
Maximum Area :	1.1092 in2/ft	#6@ 22.00 in #6@ 44.00 in

Footing Data

Toe Width	=	6.50 ft
Heel Width	=	0.83
Total Footing Width	=	7.33
Footing Thickness	=	13.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	4.83 ft
f _c =	2,500 psi	F _y = 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	=	3,196	0 psf
Mu' : Upward	=	27,539	0 ft-#
Mu' : Downward	=	6,823	0 ft-#
Mu: Design	=	20,715 OK	0 ft-# OK
phiMn	=	21,671	OK - Flush
Actual 1-Way Shear	=	27.39	0.00 psi
Allow 1-Way Shear	=	75.00	40.00 psi
Toe Reinforcing	=	# 5 @ 7.00 in	
Heel Reinforcing	=	Flush heel condition. No reinforcing required.	
Key Reinforcing	=	None Spec'd	
Footing Torsion, Tu	=		0.00 ft-lbs
Footing Allow. Torsion, phi Tu	=		0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 4.78 in, #5@ 7.41 in, #6@ 10.53 in, #7@ 14.36 in, #8@ 18.90 in, #9@ 23.93 in, #10@ 30.39 in

Heel: Flush heel condition. No reinforcing required.

Key: No key defined

Min footing T&S reinf Area	2.06	in2
Min footing T&S reinf Area per foot	0.28	in2 /ft
<u>If one layer of horizontal bars:</u>		<u>If two layers of horizontal bars:</u>
#4@ 8.55 in		#4@ 17.09 in
#5@ 13.25 in		#5@ 26.50 in
#6@ 18.80 in		#6@ 37.61 in

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

Project File: Rawson retaining wall.ec6

LIC# : KW-06019266, Build:20.23.08.01

Annee Structural Engineering LLC

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DESCRIPTION: 10'-0" basement retaining wall

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd

Stem Design Height: 3.83 ft above top of footing

Lap Splice length for #4 bar specified in this stem design segment (25.4.2.3a) = 18.72 in
Development length for #4 bar specified in this stem design segment = 14.40 in

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) = 23.40 in
Development length for #5 bar specified in this stem design segment = 18.00 in

Hooked embedment length into footing for #5 bar specified in this stem design segment = 9.91 in
As Provided = 0.5314 in²/ft
As Required = 0.5018 in²/ft

Project Title:
Engineer:
Project ID:
Project Descr:

Cantilevered Retaining Wall

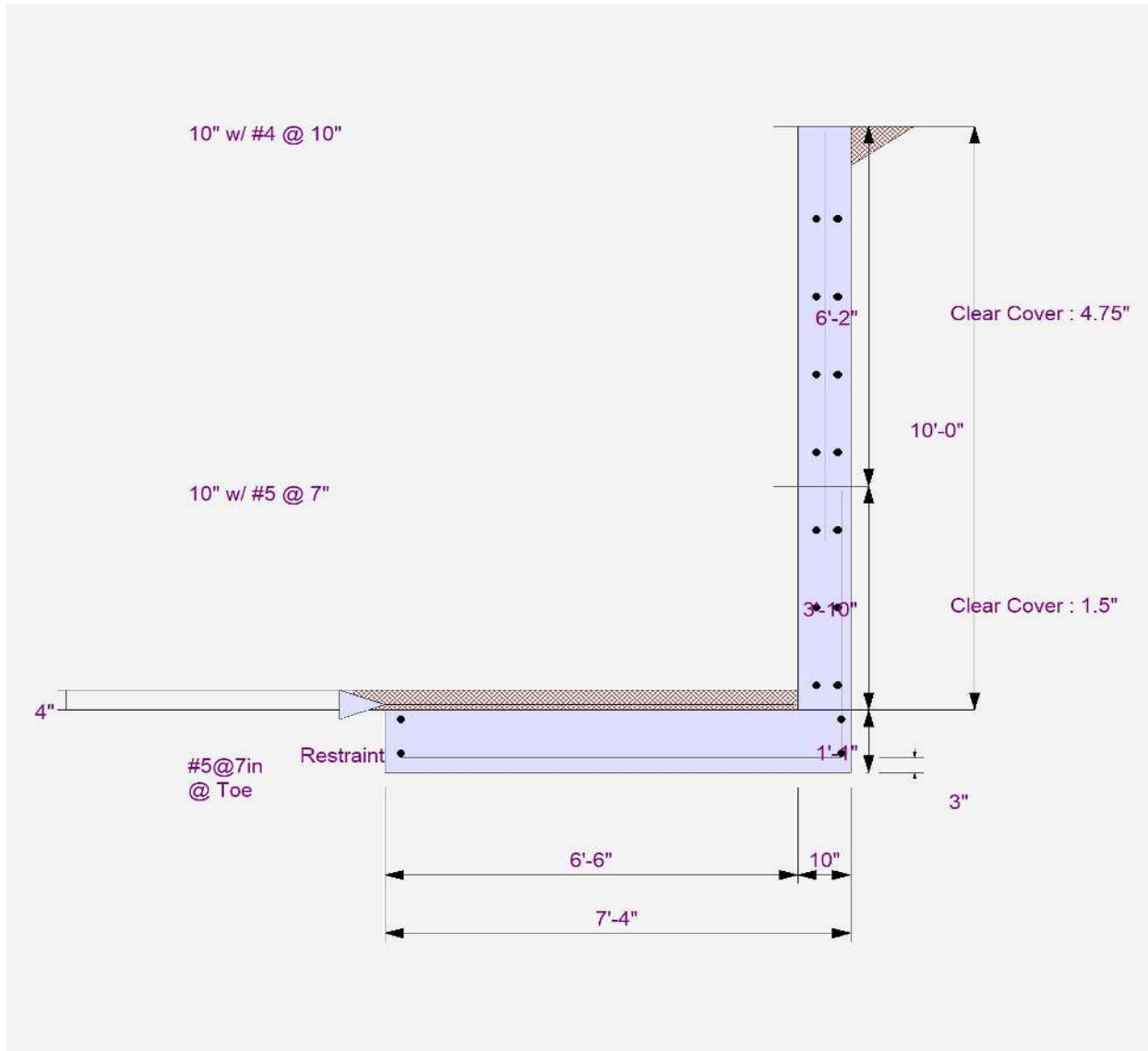
Project File: Rawson retaining wall.ec6

LIC# : KW-06019266, Build:20.23.08.01

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Cantilevered Retaining Wall

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