



## Structural Calculations

Project: **Madrona Crest**  
3608 86<sup>th</sup> Ave SE  
Mercer Island, WA 98040

For: **First Lamp architecture & construction**  
4915 Rainier Ave S, Suite 202  
Seattle, WA 98118

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

Date: **June 9, 2023**



# Design Criteria



Project Name: **Madrona Crest**  
 Location: **3608 86th Ave SE, Mercer Island, WA**

Date: **5/11/2023**  
 Soil Bearing: **2000** psf  
 Frost Depth: **12"**

<b>Dead Loads:</b>	<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
	Rafters	2.2 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	2.3 PSF	Miscellaneous	1.5 PSF	Miscellaneous	1.5 PSF
	<b>Total</b>	<b>15.0 PSF</b>	<b>Total</b>	<b>12.0 PSF</b>	<b>Total</b>	<b>10.0 PSF</b>
<b>Live Loads:</b>	Snow	<b>25.0 PSF</b>	Floor	<b>40.0 PSF</b>	Wind	<b>16.7 PSF</b>

**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) = **47.578**                      (*per USGS*)                       $S_s = 1.405$                        $F_a = 1.20$                        $S_{DS} = 2/3(F_a \times S_s) = 1.124$   
 Longitude ( $^{\circ}$ W) = **122.224**                      (*per USGS*)                       $S_1 = 0.489$                        $F_v = 1.81$                        $S_{D1} = 2/3(F_v \times S_1) = 0.590$

Building                       $C_t = 0.02$  (wood)  
 Height                       $h_n = 25.3$  ft.  
 Period                       $T = C_t(h_n)^{3/4} = 0.23$  sec.                       $T_0 = 0.2 * (S_{D1}/S_{DS}) = 0.11$                        $T_s = (S_{D1}/S_{DS}) = 0.53$

$S_a = 1.124$                        $S_a = S_{DS}$  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:                       $C_s = S_{D1}/T * (R/I) = 0.403$   
 Not less than:                       $C_s = 0.044 S_{DS} * I = 0.049$   
 Design Category E or F; not less than:                       $C_s = 0.5 S_1 / (R/I) = 0.038$   
 Seismic Design Coefficient:                       $C_s = S_{DS} / (R/I) = 0.173$

**$C_s = 0.173$**

**Seismic Weight Distribution:**

Diaphragm	$h_i$ (ft.)	$w_i$ (kips)	$h_i w_i$ (K-ft.)	$w_i h_i / \sum(w_i h_i)$	<b>F<sub>i</sub> (lbs.)</b>	Sum F <sub>i</sub> (lbs.)
			0	0	<b>0</b>	0
			0	0	<b>0</b>	0
			0	0	<b>0</b>	0
Roof	21.1	46.28	977.7	0.562	<b>7,861</b>	7,861
2nd Floor	11.0	69.28	762	0.438	<b>6,127</b>	13,988
		115.56	1740			

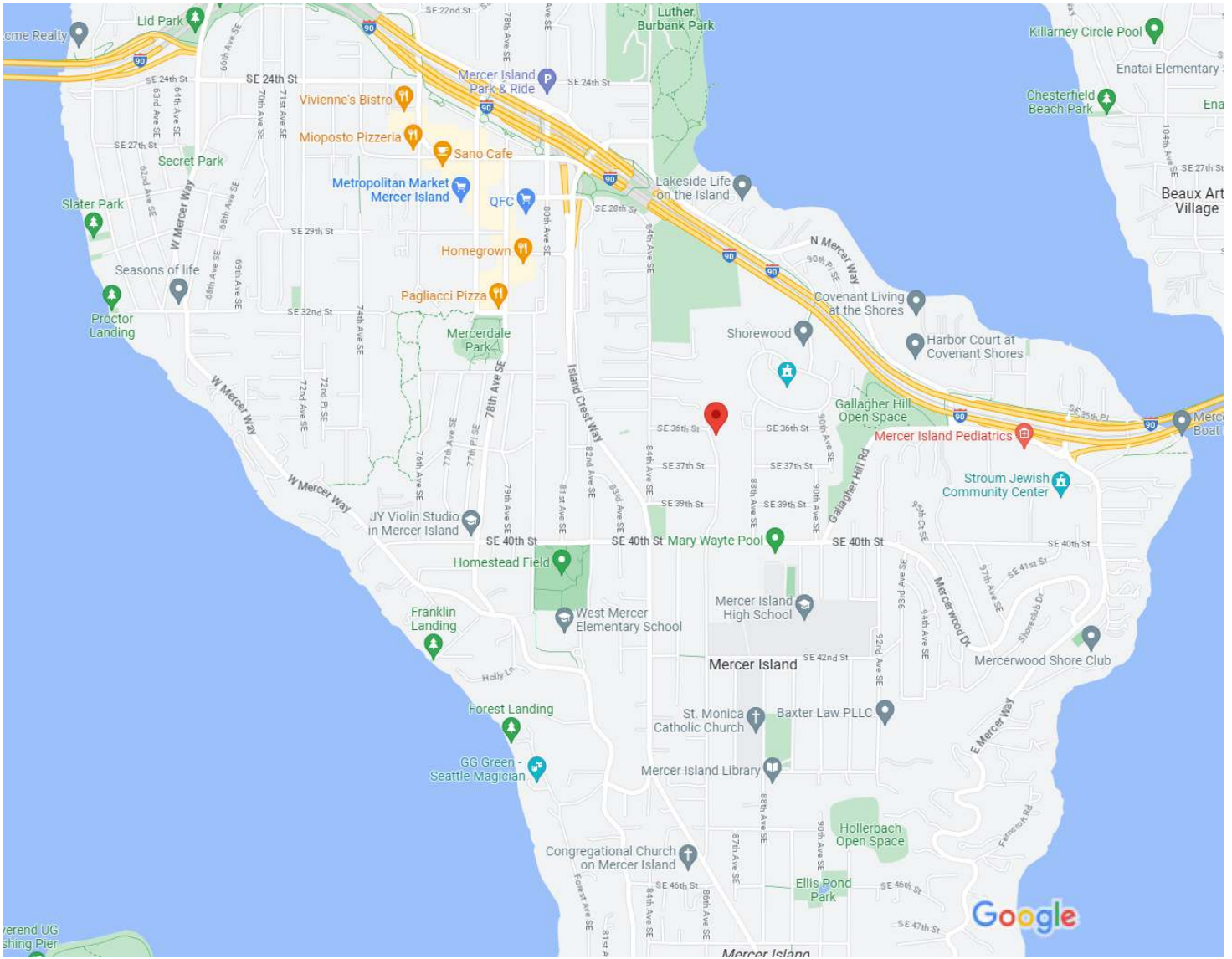
Design Base Shear (ASD) =  $0.7 * (0.173 * W) = 0.121 * W =$  **13,988 lbs.**

**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	B	Wall - Ph	18.6	<b>14.5</b>	Wall	4	-20.4	-15.1	-22.6	<b>-16.7</b>
Roof Pitch (x:12)	9	Wall - Po	17.7	<b>13.8</b>		5	-22.6	-16.7	-27.2	<b>-20.1</b>
$K_1 =$	0.00	Roof - 1	12.9	<b>7.1</b>	Roof	1	-31.0	<b>-22.9</b>	-18.1	-13.4
$K_2 =$	0.00	Roof - 2	-8.2	<b>-4.5</b>		2e	-31.0	<b>-22.9</b>	-18.1	-13.4
$K_3 =$	0.00	Roof - 3	-26.4	<b>-14.5</b>		2n	-35.9	<b>-26.6</b>	-26.0	-19.2
$K_t = (1 + K_1 * K_2 * K_3)^2 =$	1.30	Roof - 4	-23.5	<b>-12.9</b>		2r	-31.0	<b>-22.9</b>	-18.1	-13.4
(p.362) $\lambda =$	0.95	Roof - 5	-19.2	<b>-10.6</b>		3e	-43.7	<b>-32.3</b>	-30.7	-22.7
(p.291) Exp. Fctr =	0.70					3r	-35.9	<b>-26.6</b>	-26.0	-19.2



Map data ©2023 Google 1000 ft



110 MPH, Exposure B, Kzt = 1.3

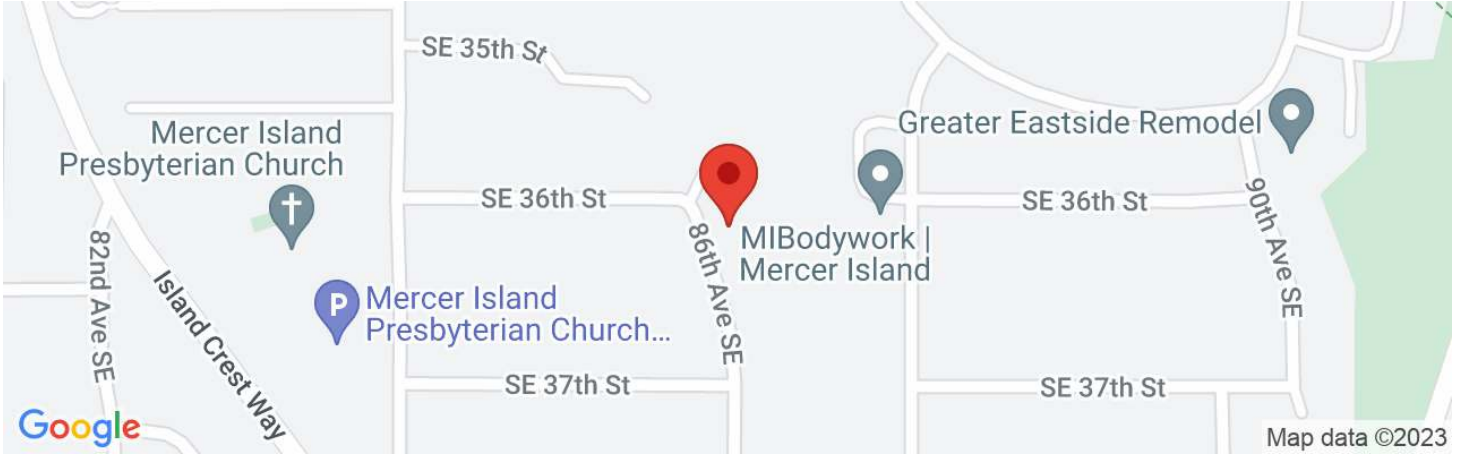
3608 86th Ave SE



# Madrona Crest

3608 86th Ave SE, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.5779851, -122.2237957



<b>Date</b>	4/28/2023, 1:30:43 PM
<b>Design Code Reference Document</b>	ASCE7-16
<b>Risk Category</b>	II
<b>Site Class</b>	D - Default (See Section 11.4.3)

Type	Value	Description
$S_S$	1.405	$MCE_R$ ground motion. (for 0.2 second period)
$S_1$	0.489	$MCE_R$ ground motion. (for 1.0s period)
$S_{MS}$	1.686	Site-modified spectral acceleration value
$S_{M1}$	null -See Section 11.4.8	Site-modified spectral acceleration value
$S_{DS}$	1.124	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	0.601	$MCE_G$ peak ground acceleration
$F_{PGA}$	1.2	Site amplification factor at PGA
$PGA_M$	0.721	Site modified peak ground acceleration
$T_L$	6	Long-period transition period in seconds
$S_{sRT}$	1.405	Probabilistic risk-targeted ground motion. (0.2 second)
$S_{sUH}$	1.556	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
$S_{sD}$	3.5	Factored deterministic acceleration value. (0.2 second)
$S_{1RT}$	0.489	Probabilistic risk-targeted ground motion. (1.0 second)
$S_{1UH}$	0.545	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
$S_{1D}$	1.409	Factored deterministic acceleration value. (1.0 second)
$PGAd$	1.198	Factored deterministic acceleration value. (Peak Ground Acceleration)
$PGA_{UH}$	0.601	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration

LATERAL ANALYSIS - SEISMIC WEIGHT:

AT ROOF;  $W_R = 2,072 \text{ ft}^2 (17 \text{ ft}^2/\text{ft}^2) + 10 \text{ ft}^2/\text{ft}^2 \left(\frac{10.1}{2} \times 219\right)$   
 $= 46,284 \text{ ft}^2$

AT UPPER;  $W_U = 1,620 \text{ ft}^2 (17 \text{ ft}^2/\text{ft}^2) + 1,653 \text{ ft}^2 (12 \text{ ft}^2/\text{ft}^2)$   
 $+ 10 \text{ ft}^2/\text{ft}^2 \left(\frac{10.1}{2} \times 219 + \frac{9.9}{2} \times 219\right) = 69,276 \text{ ft}^2$

AT MAIN FL;  $W_M = 1,950 \text{ ft}^2 (12 \text{ ft}^2/\text{ft}^2) + 10 \text{ ft}^2/\text{ft}^2 \left(\frac{9.9}{2} \times 219\right)$   
 $= 33,040 \text{ ft}^2$

DESIGN BASE SHEAR;  $V = \frac{7,861 \text{ ft}^2 + 6,127 \text{ ft}^2 + 3,999 \text{ ft}^2}{17,987 \text{ ft}^2 (ASO)}$

WIND ANALYSIS PER ASCE 7, §27.5:

LONGITUDINAL DIR; EAST-TO-WEST:

AT ROOF;  $W_R = 493 \text{ ft}^2 (14.5 \text{ ft}^2/\text{ft}^2) + 70 \text{ ft}^2 (7.1 - (-4.5))$   
 $= 7,961 \text{ ft}^2$

AT UPPER FL;  $W_U = 550 \text{ ft}^2 (14.5 \text{ ft}^2/\text{ft}^2) + 69 \text{ ft}^2 (7.1 - (-4.5))$   
 $= 8,717 \text{ ft}^2$   
 $\Sigma W_U = 16,678 \text{ ft}^2$

TRANSVERSE DIR; NORTH-TO-SOUTH:

AT ROOF;  $W_R = 192 \text{ ft}^2 (14.5) + 357 (7.1 - (-4.5))$   
 $= 6,925 \text{ ft}^2$

AT UPPER FL;  $W_U = 575 \text{ ft}^2 (14.5) + 24 \text{ ft}^2 (7.1 - (-4.5))$   
 $= 8,616 \text{ ft}^2$

$\Sigma W_U = 15,541 \text{ ft}^2$

∴ SEISMIC CONTROLS @ DIAPHRAGMS AND UPPER FLOOR WALLS IN N-S DIRECTION; WIND CONTROLS ELSEWHERE

LATERAL LOAD DISTRIBUTION:

TO UPPER FL WALLS;

LINE ②;  $V_2 = 43\% (7,961 \text{ ft}^2) = 3,423 \text{ ft}^2 (W), 3,066 \text{ ft}^2 (E)$   
 $V_2 = 3,423 \text{ ft}^2 / 14.3 \text{ ft} = 239 \text{ ft}^2/\text{ft} \rightarrow \underline{\text{SWY}}$

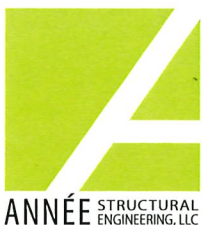
LINE ⑤/6;  $V_{5/6} = 57\% (7,961 \text{ ft}^2) = 4,538 \text{ ft}^2 (W), 4,795 \text{ ft}^2 (E)$   
 $V_{5/6} = 4,795 \text{ ft}^2 / 20.7 \text{ ft} = 232 \text{ ft}^2/\text{ft} \rightarrow \underline{\text{SWY}}$

LINE ④;  $V_4 = 58\% (7,961 \text{ ft}^2) = 4,166 \text{ ft}^2 (E), 3,947 \text{ ft}^2 (W)$   
 $V_4 = 4,166 \text{ ft}^2 / 23.6 \text{ ft} = 177 \text{ ft}^2/\text{ft} \rightarrow \underline{\text{SWY}}$

LINE ⑥;  $V_6 = 47\% (7,961 \text{ ft}^2) = 3,695 \text{ ft}^2 (E), 2,978 \text{ ft}^2 (W)$   
 $V_6 = 3,695 \text{ ft}^2 / 16.0 \text{ ft} = 231 \text{ ft}^2/\text{ft} \rightarrow \underline{\text{SWY}}$

TO MAIN FL. WALLS:

LINE ②;  $V_2 = 52\% (8,717 \text{ ft}^2) + 3,423 \text{ ft}^2 = 7,956 \text{ ft}^2 (W)$   
 $= 50\% (6,127 \text{ ft}^2) + 3,066 \text{ ft}^2 = 6,130 \text{ ft}^2 (E)$



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Designer \_\_\_\_\_  
Date \_\_\_\_\_



$$V_2 = 7,956^* / 20.1' = 396^* / \text{ft.} \rightarrow \text{SW4}$$

$$\text{LINE (5/b)}; V_{5b} = 48\% (8,717^*) + 4,538^* = 8,722^* (w) \\ = 50\% (6,127^*) + 4,795^* = 7,859^* (E)$$

$$N_{5b} = 8,722^* / 20.0' = 436^* / \text{ft.} \rightarrow \text{SW3}$$

$$\text{LINE (A)}; V_A = 18\% (8,616^*) + 38\% \left( \frac{8'}{23.6'} \times 3,947^* \right) \\ = 2,059^*; N_A = 2,059^* / 4.30' = 48^* / \text{ft.} \rightarrow \text{SW6}$$

$$\text{LINE (C)}; V_C = 48\% (8,616^*) + 3,947^* - 38\% \left( \frac{8'}{23.6'} \times 3,947^* \right) \\ = 7,575^*; N_C = 7,575^* / 16.9' = 476^* / \text{ft.} \rightarrow \text{SW3}$$

$$\text{LINE (G)}; V_G = 34\% (8,616^*) + 2,978^* = 5,907^* (w) \\ = 38\% (6,127^*) + 3,695^* = 6,023^* (E) \\ N_G = 6,023^* / 16.8' = 359^* / \text{ft.} \rightarrow \text{SW3}$$

OVERTURNING: FROM UPPER FIN. WALLS:

$$\text{LINE (2)}; T_{2w} = 239^* / \text{ft.} (10.1') - \frac{11.5'}{2} (0.6 \times 101)$$

$$\text{Sim. e (5/b)} = 2,065^* \rightarrow \text{MSTC40/4883} \\ \text{SIM.}$$

$$\text{LINE (F)}; T_{6w} = 231^* / \text{ft.} (10.1') - \frac{13'}{2} (0.6 \times 101)$$

$$\text{Sim. e (C)} = 1,946^* \rightarrow \text{MSTC40}$$

From MAIN FIN. WALLS:

$$\text{LINE (2)}; T_{2m} = 396 (9.9') + 2,065^* - \frac{16'}{2} (0.6 \times 204) \\ = 5,006^* \rightarrow \text{HDUS}$$

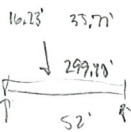
$$\text{LINE (5/b)} T_{5b} = 436 (9.9') + 1,857^* - \frac{18.75'}{2} (0.6 \times 265) \\ = 5,020^* \rightarrow \text{HDUS}$$

LINE (A); NO HD BY INSPECTION

$$\text{LINE (C)}; T_{cm} = 476 (9.9') + 1,255^* - \frac{19.15'}{2} (0.6 \times 135) \\ = 5,159^* \rightarrow \text{HDUS}$$

$$\text{LINE (G)}; T_{gm} = 359 (9.9') + 1,946^* - \frac{13'}{2} (0.6 \times 107) \\ = 5,077^* \rightarrow \text{HDUS}$$

4,116



11,652  
43

271^\* / ft.

$N_{6a} = 8,369$

$N_{6b} = 7,722$

$T_{5b} = 2,137^*$

$N_{6c} = 6,385$

$T_{6c} = 1,535^*$



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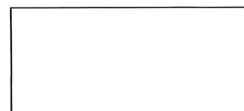
Project \_\_\_\_\_

Designer \_\_\_\_\_

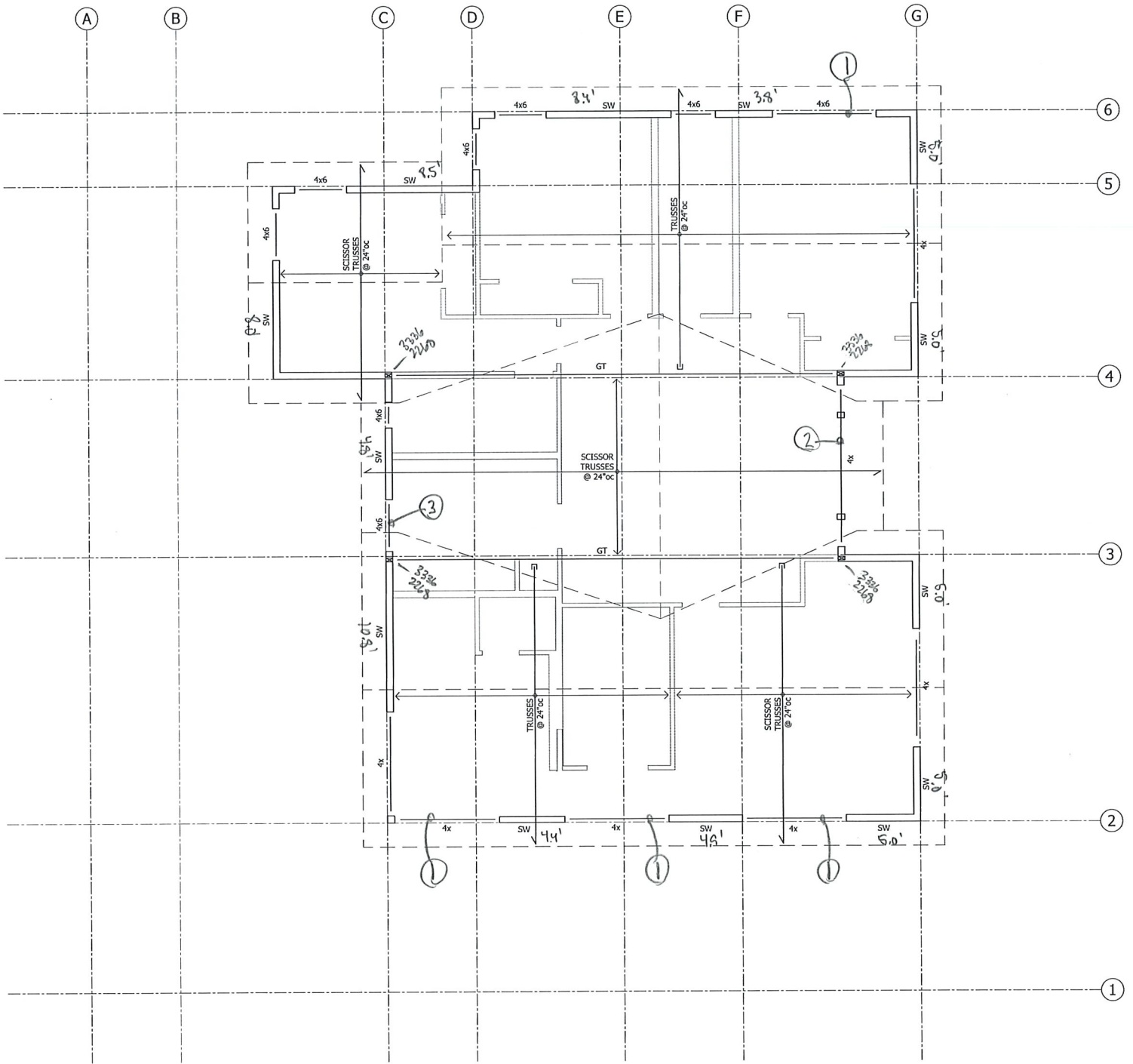
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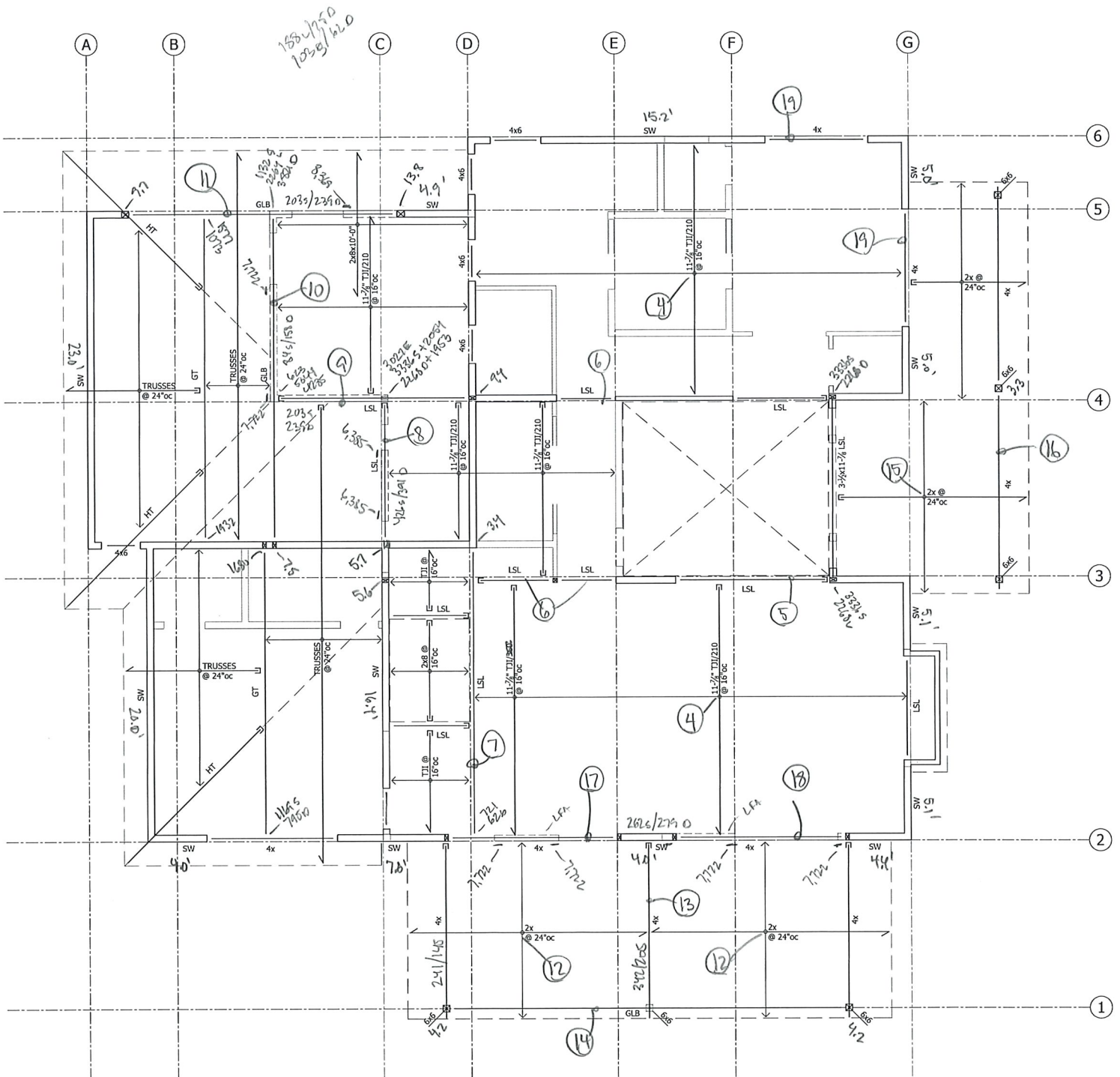
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Roof Framing Plan

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





Upper Level Framing Plan

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







GRAVITY ANALYSIS - ROOF FEMING. (25SL, 170L) #/ft:

①  $L = 7.2'$ ;  $w = 262s + 1730 = 440 \text{ #/ft.}$

$R = V = 1,584 \text{ #}; M = 2,851 \text{ ft-#}$

$f_v = 91 \text{ psi}; f_b = 1,013 \text{ psi}; \Delta_n = 0.14'' = L/639$

$\therefore$  4x8 DP #2

②  $L = 6.7'$ ;  $w = 132'(25s + 170) = 764 \text{ #/ft.}$

$R = V = 2,559 \text{ #}; M = 4,287 \text{ ft-#}$

$f_v = 115 \text{ psi}; f_b = 977 \text{ psi}; \Delta_n = 0.09'' = L/929$

$\therefore$  4x10 DP #2

③  $L = 3.65'$ ;  $w = 17.1'(25s + 170) = 716 \text{ #/ft.}$

$R = V = 1,307 \text{ #}; M = 1,193 \text{ ft-#}$

$f_v = 102 \text{ psi}; f_b = 811 \text{ psi}; \therefore$  4x6 DP #2 (TYP.)

UPPER PUL. FRAMING (30-40 u, 12-22.0L) #/ft:

④ SEE ATTACHED CALC.  $\rightarrow$  11 7/8 TJI/210 @ 16" oc

⑤  $L = 10.75'$ ;  $w = \frac{18'}{2}(30s + 120) = 378 \text{ #/ft.}$

$R = V = 2,032 \text{ #}; M = 5,460 \text{ ft-#}$

$f_v = 147 \text{ psi}; f_b = 1,593 \text{ psi}; \Delta_n = 0.30'' = L/430$

$\therefore$  1 3/4 x 11 7/8 LSL

⑥  $L = 5.85'$ ;  $w = \frac{30'}{2}(40 + 12) = 780 \text{ #/ft.}$

$R = V = 2,282 \text{ #}; M = 3,337 \text{ ft-#}; \therefore$  1 3/4 x 11 7/8 LSL

⑦ SEE ATTACHED CALC.  $\rightarrow$  3 1/2 x 11 7/8 PSL

⑧ SEE ATTACHED CALC.  $\rightarrow$  3 1/2 x 11 7/8 LSL

⑨ SEE ATTACHED CALC.  $\rightarrow$  5 1/2 x 16 1/2 GLB

⑩ SEE ATTACHED CALC.  $\rightarrow$  5 1/2 x 19 1/2 GLB

⑪ SEE ATTACHED CALC.  $\rightarrow$  5 1/2 x 18 GLB

⑫  $L = 13.7'$ ;  $w = \frac{24''}{12''}(25s + 15) = 80 \text{ #/ft.}$

$R = V = 518 \text{ #}; M = 1,877 \text{ ft-#}$

$f_v = 59 \text{ psi}; f_b = 1,053 \text{ psi} \leq 850(1.15)^2 = 1,111$

$\Delta_n = 0.49'' = L/333; \therefore$  2x10 HP #2 @ 24" oc

⑬  $L = 11.4'$ ;  $w = 342s + 2050 = 547 \text{ #/ft.}$

$R = V = 3,118 \text{ #}; M = 8,886 \text{ ft-#}$

$f_v = 90 \text{ psi}; f_b = 1,289 \text{ psi}; \Delta_n = 0.31'' = L/440$

$\therefore$  6x10 DP #1

or 5 1/2 x 9 GLB



⑭  $L = 27.2'$ ;  $P = 3,447^*$  @ 110-span

$R = V = 1,724^*$ ;  $M = 23,440 \text{ ft-lb}$

$f_v =$  ;  $f_b = 1,364 \text{ psi}$ ;  $\Delta_n = 0.90'' = 4/364$

$\therefore$  5 1/2 x 15 GLB

⑮  $L = 11.1'$ ;  $w = 86^*/\text{ft}$

$R = V = 443^*$ ;  $M = 1,228 \text{ ft-lb}$

$f_v = 61 \text{ psi}$ ;  $f_b = 1,122 \text{ psi}$ ;  $\Delta_n = 0.44'' = 4/303$

$\therefore$  2 x 8 HF#2 @ 24" oc

⑯  $L = 12.7'$ ;  $w = 77'(25+15) = 357^*/\text{ft}$

$R = V = 1,948^*$ ;  $M = 6,186 \text{ ft-lb}$

$f_v = 56 \text{ psi}$ ;  $f_b = 897 \text{ psi}$ ;  $\Delta_n = 0.29'' = 4/583$

$\therefore$  6 x 10 DF#2

⑰ SEE ATTACHED CALC.  $\rightarrow$  3 1/2 x 12 GLB

⑱

⑰  $L = 7.2'$ ;  $w = \frac{17.5'}{2}(30+12) + 10.1'(6) = 428^*/\text{ft}$

$R = V = 1,541^*$ ;  $M = 2,773 \text{ ft-lb}$

$f_v = 88 \text{ psi}$ ;  $f_b = 1,085 \text{ psi}$   $\therefore$  4 x 8 DF#2

⑳  $L = 9.0'$ ;  $w = 11.7'(25+15) = 468^*/\text{ft}$

$R = V = 2,104^*$ ;  $M = 4,735 \text{ ft-lb}$

$f_v = 95 \text{ psi}$ ;  $f_b = 1,079 \text{ psi} \leq 900(1.15) 1.1$

$\Delta_n = 0.17'' = 4/625$   $\therefore$  4 x 10 DF#2

MAIN RR. PENNG. (400, 12 DL) #12:

㉑ SEE ATTACHED CALC.  $\rightarrow$  9 1/2" TJI/210 @ 16" oc

㉒ SEE ATTACHED CALC.  $\rightarrow$  (3) 9 1/2" TJI/210

㉓ SEE ATTACHED CALC.  $\rightarrow$  (2) 9 1/2" TJI/210

㉔  $L = 7.3'$ ;  $w = 81^*/\text{ft}$

$R = V = 2,340^*$ ;  $M = 4,270 \text{ ft-lb}$

$f_v = 106 \text{ psi}$ ;  $f_b = 973 \text{ psi} \leq 900(1.1)$

$\Delta_n = 0.10'' = 4/856$   $\therefore$  4 x 10 DF#2

㉕  $L = 4.5'$ ;  $w = 1,701^*/\text{ft}$

$R = V = 3,827^*$ ;  $M = 4,306 \text{ ft-lb}$

$f_v = 173 \text{ psi} \leq 180$ ;  $f_b = 983 \text{ psi} \leq 900(1.1)$

$\therefore$  4 x 10 DF#2

㉖  $L = 9.7'$ ;  $w = \frac{16'}{2}(60+30) = 91^*/\text{ft}$

$R = V = 449^*$ ;  $M = 1,111 \text{ ft-lb}$

$f_v = 49 \text{ psi}$ ;  $f_b = 623 \text{ psi}$ ;  $\Delta_n = 0.15'' = 4/780$

$\therefore$  PT 2 x 10 HF#2 @ 16" oc

㉗  $L = 6.2'$ ;  $w = \frac{10.71'}{2}(60+8) = 346^*/\text{ft}$

$R = V = 1,072^*$ ;  $M = 1,661 \text{ ft-lb}$

$f_v = 48 \text{ psi}$ ;  $f_b = 379 \text{ psi}$   $\therefore$  PT 4 x 10 HF#2



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Designer \_\_\_\_\_

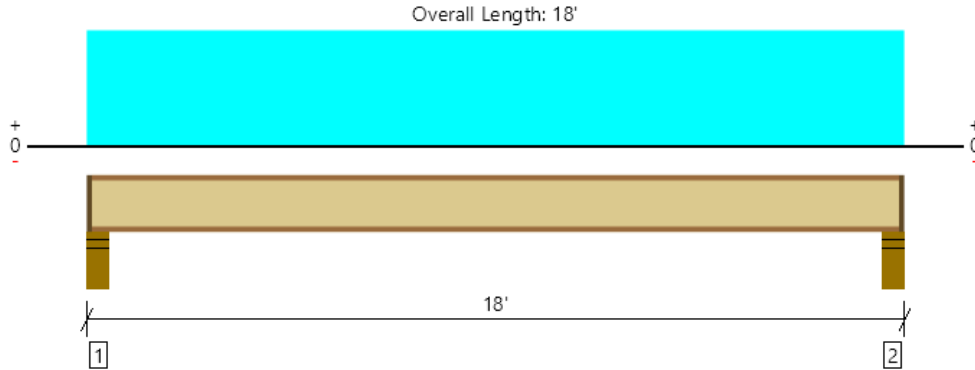
Date \_\_\_\_\_

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Upper Floor Framing, 4 - Joist  
1 piece(s) 11 7/8" TJI @ 210 @ 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)	498 @ 4 1/2"	1460 (3.50")	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	478 @ 5 1/2"	1655	Passed (29%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2083 @ 9'	3795	Passed (55%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.233 @ 9'	0.431	Passed (L/890)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.326 @ 9'	0.863	Passed (L/636)	--	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.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	5.50"	4.25"	1.75"	144	360	504	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	4.25"	1.75"	144	360	504	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 1" o/c	
Bottom Edge (Lu)	17' 10" o/c	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 18'	16"	12.0	30.0	Default Load

**Weyerhaeuser Notes**

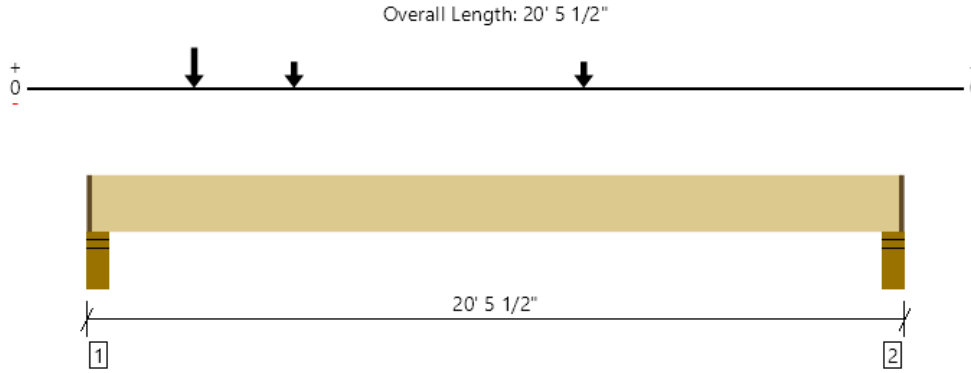
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



Upper Floor Framing, 7 - Beam  
1 piece(s) 3 1/2" x 11 7/8" 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)	3398 @ 4"	6024 (4.25")	Passed (56%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3381 @ 1' 5 3/8"	8035	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	10624 @ 5' 2 1/4"	19902	Passed (53%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.419 @ 9' 8 1/8"	0.495	Passed (L/567)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.737 @ 9' 9 1/4"	0.990	Passed (L/322)	--	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 - Stud wall - HF	5.50"	4.25"	2.40"	1220	2179	3398	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	4.25"	1.50"	626	721	1348	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	20' 3" o/c	
Bottom Edge (Lu)	20' 3" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	1 1/4" to 20' 4 1/4"	N/A	13.0	--	
1 - Point (lb)	2' 8 1/4" (Front)	N/A	527	1755	Default Load
2 - Point (lb)	5' 2 1/4" (Front)	N/A	583	513	Default Load
3 - Point (lb)	12' 5 1/4" (Front)	N/A	473	632	Default Load

**Weyerhaeuser Notes**

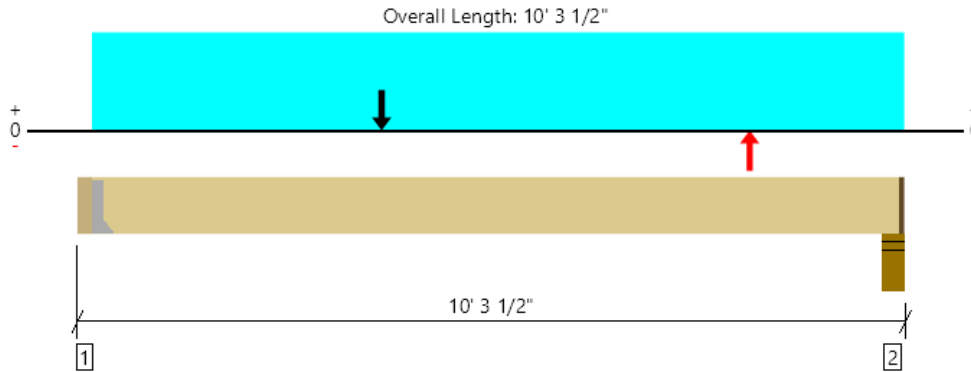
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



Upper Floor Framing, 8 - Beam  
1 piece(s) 3 1/2" x 11 7/8" 1.5E 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)	5391 @ 3 1/2"	5391 (1.71")	Passed (100%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3379 @ 1' 3 3/8"	9878	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	10267 @ 5' 1 1/2"	18346	Passed (56%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.183 @ 4' 7 9/16"	0.242	Passed (L/635)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.310 @ 4' 9 3/4"	0.483	Passed (L/375)	--	1.0 D + 0.525 E + 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.
- -875 lbs uplift at support located at 3 1/2". Strapping or other restraint may be required.
- -790 lbs uplift at support located at 9' 11 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Factored	
1 - Hanger on 11 7/8" LSL beam	3.50"	Hanger <sup>1</sup>	1.71"	2073	129	2175	3027/-3027	5391/-875	See note <sup>1</sup>
2 - Stud wall - HF	5.50"	4.25"	3.93"	2215	138	2325	3027/-3027	5652/-790	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
- <sup>1</sup> See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 11" o/c	
Bottom Edge (Lu)	9' 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	HHUS48	3.00"	N/A	22-16d	8-16d	

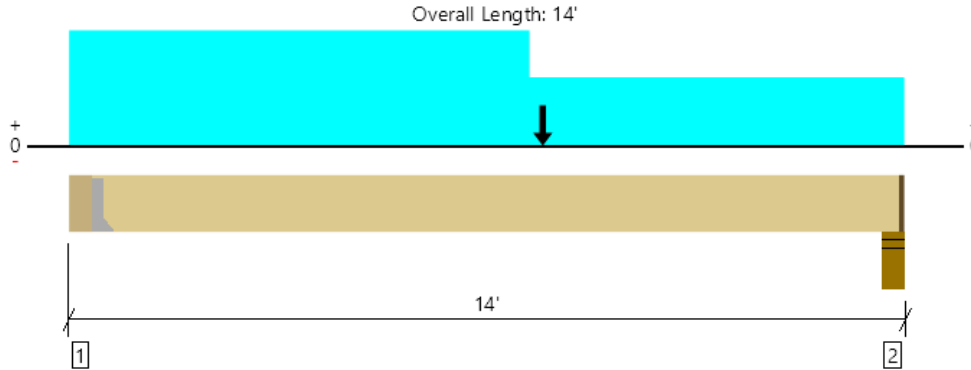
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 10' 2 1/4"	N/A	13.0	--	--	--	
1 - Uniform (PLF)	3 1/2" to 10' 3 1/2" (Front)	N/A	416.0	26.7	450.0	-	Default Load
2 - Point (lb)	3' 9" (Front)	N/A	-	-	-	6385	
3 - Point (lb)	8' 4" (Front)	N/A	-	-	-	-6385	

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



Upper Floor Framing, 9 - Beam  
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)	9273 @ 5 1/2"	9273 (2.59")	Passed (100%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	8293 @ 12' 2"	16033	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	44060 @ 7' 9 1/4"	49913	Passed (88%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.185 @ 7' 2"	0.330	Passed (L/858)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.340 @ 7' 1 3/4"	0.660	Passed (L/467)	--	1.0 D + 0.525 E + 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 factor of 1.00 that was calculated using length L = 13' 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	Snow	Seismic	Factored	
1 - Hanger on 16 1/2" GLB beam	5.50"	Hanger <sup>1</sup>	2.59"	4575	3947	1851	1351/-1351	9633	See note <sup>1</sup>
2 - Stud wall - HF	5.50"	4.25"	4.21"	4285	5044	623	1676/-1676	9415	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
- <sup>1</sup> See Connector grid below for additional information and/or requirements.

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

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	MGU5.50-SDS H=16.5	4.50"	N/A	24-SDS25212	16-SDS25212		

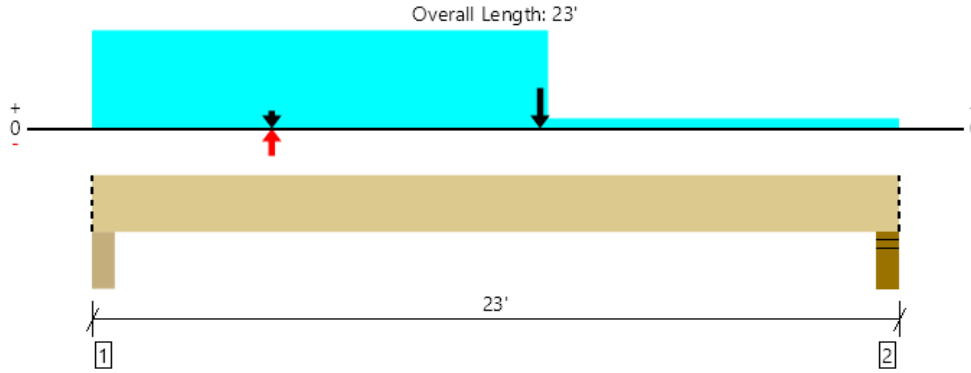
• Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	5 1/2" to 13' 10 3/4"	N/A	22.1	--	--	--	
1 - Uniform (PSF)	0 to 14' (Front)	6' 3 1/4"	12.0	30.0	-	-	Default Load
2 - Uniform (PLF)	0 to 7' 6 1/2" (Front)	N/A	324.0	-	328.0	-	
3 - Point (lb)	7' 9 1/4" (Front)	N/A	4221	5389	-	3027	
4 - Uniform (PLF)	7' 6 1/2" to 14' (Front)	N/A	131.0	150.0	-	-	

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) 5 1/2" x 19 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)	7547 @ 22' 8"	12251 (5.50")	Passed (62%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6306 @ 20' 11"	18948	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	60687 @ 12' 9 1/4"	65537	Passed (93%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.428 @ 12' 3 3/16"	0.558	Passed (L/626)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.828 @ 11' 11 5/8"	1.117	Passed (L/324)	--	1.0 D + 0.525 E + 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 factor of 0.94 that was calculated using length L = 22' 4".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Factored	
1 - Beam - GLB	5.50"	5.50"	2.23"	3901	2465	1132	2644/-2644	7987	Blocking
2 - Stud wall - HF	5.50"	5.50"	3.39"	3380	3039	667	2644/-2644	7547	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)	23' o/c	
Bottom Edge (Lu)	23' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 23'	N/A	26.1	--	--	--	
1 - Uniform (PSF)	0 to 23' (Front)	8"	12.0	30.0	-	-	Default Load
2 - Point (lb)	5' 1 1/2" (Front)	N/A	158	-	84	-7722	
3 - Point (lb)	12' 9 1/4" (Front)	N/A	4285	5044	623	7722	
4 - Uniform (PLF)	0 to 13' (Front)	N/A	158.0	-	84.0	-	

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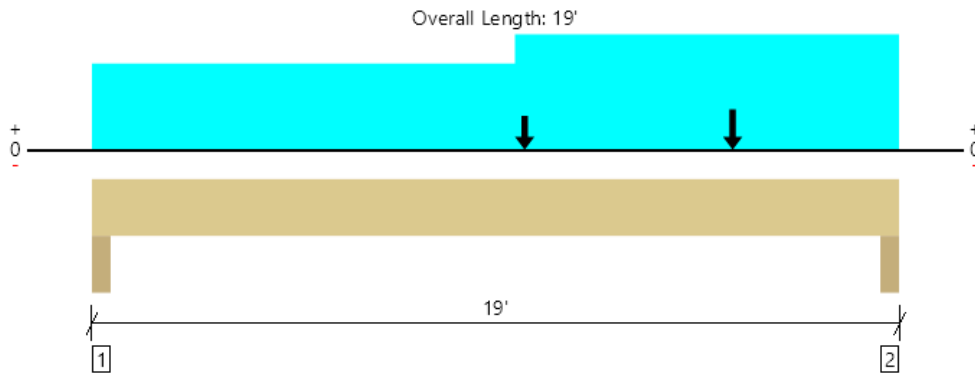
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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





Upper Floor Framing, 11 - Header  
 1 piece(s) 5 1/2" x 18" 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)	13770 @ 18' 9"	16088 (4.50")	Passed (86%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	12325 @ 17' 1 1/2"	27984	Passed (44%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	57845 @ 10' 2 1/4"	65965	Passed (88%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Neg Moment (Ft-lbs)	-6814 @ 15' 1"	73260	Passed (9%)	1.60	0.6 D - 0.7 E (All Spans)
Live Load Defl. (in)	0.417 @ 9' 11 1/16"	0.617	Passed (L/532)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.782 @ 9' 9 9/16"	0.925	Passed (L/284)	--	1.0 D + 0.525 E + 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 factor of 0.97 that was calculated using length L = 18' 6".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 5' 8 11/16".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Factored	
1 - Trimmer - HF	4.50"	4.50"	2.71"	4730	1441	4027	1659/-1659	9702	None
2 - Trimmer - HF	4.50"	4.50"	3.85"	5565	2523	3720	6710/-6710	13770/-1358	None

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	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 19'	N/A	24.1	--	--	--	
1 - Uniform (PSF)	0 to 9' 11 1/2"	15' 5 1/2"	17.0	-	25.0	-	Default Load
2 - Point (lb)	10' 2 1/4"	N/A	3821	2264	1132	-	
3 - Uniform (PLF)	9' 11 1/2" to 19'	N/A	376.0	188.0	306.0	-	
4 - Point (lb)	15' 1"	N/A	-	-	-	8369	

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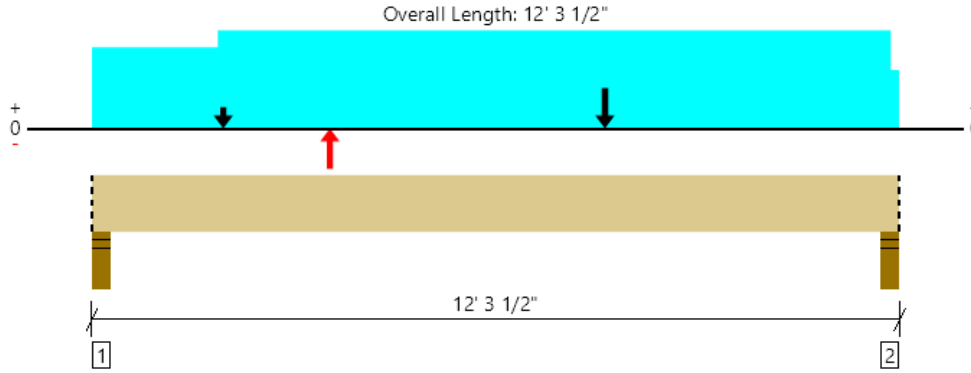
ForteWEB Software Operator	Job Notes
Mike Annee Annee Structural Engineering LLC (206) 658-5169 mike@annestructural.com	



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File Name: Madrona Crest

Upper Floor Framing, 17 - Beam  
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)	7057 @ 3"	9844 (4.50")	Passed (72%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4217 @ 1' 4 1/2"	7420	Passed (57%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	14653 @ 5' 11 5/16"	19320	Passed (76%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Neg Moment (Ft-lbs)	-4103 @ 7' 9 3/4"	20720	Passed (20%)	1.60	0.6 D - 0.7 E (All Spans)
Live Load Defl. (in)	0.242 @ 6' 11 1/8"	0.590	Passed (L/585)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.445 @ 6' 7 1/8"	0.786	Passed (L/318)	--	1.0 D + 0.525 E + 0.75 L + 0.75 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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 11' 9 1/2".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 5' 3 11/16".
- -418 lbs uplift at support located at 12' 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	Seismic	Factored	
1 - Stud wall - DF	4.50"	4.50"	3.23"	2928	1976	1610	2742/-2742	7057/-163	Blocking
2 - Stud wall - DF	4.50"	4.50"	2.93"	2502	1675	1610	2742/-2742	6405/-418	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 4" o/c	
Bottom Edge (Lu)	12' 4" o/c	

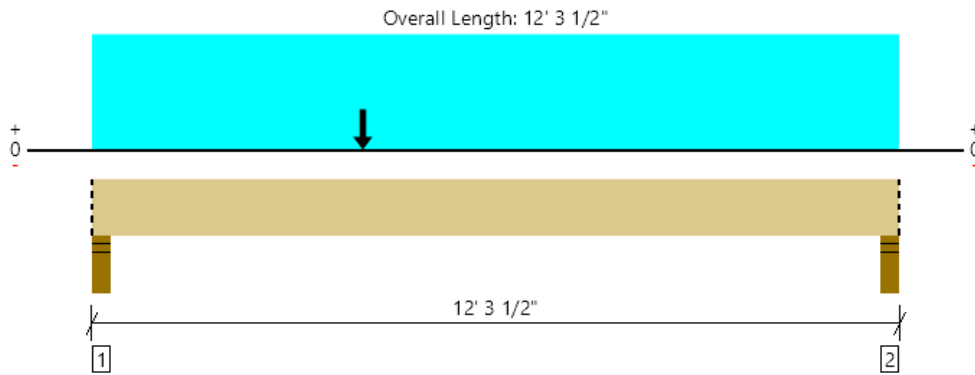
•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 12' 3 1/2"	N/A	10.2	--	--	--	
1 - Uniform (PSF)	0 to 1' 11" (Front)	4' 1/2"	22.0	30.0	-	-	Default Load
2 - Point (lb)	2' (Front)	N/A	626	721	-	-	Default Load
3 - Uniform (PSF)	1' 11" to 12' 2" (Front)	8' 9 1/4"	12.0	30.0	-	-	Default Load
4 - Point (lb)	3' 7 1/2" (Front)	N/A	-	-	-	-7722	Default Load
5 - Point (lb)	7' 9 3/4" (Front)	N/A	-	-	-	7722	Default Load
6 - Uniform (PLF)	0 to 12' 3 1/2" (Front)	N/A	279.0	-	262.0	-	

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 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)	7567 @ 3"	9844 (4.50")	Passed (77%)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6483 @ 1' 4 1/2"	11872	Passed (55%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	22682 @ 4' 5 1/2"	26880	Passed (84%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Neg Moment (Ft-lbs)	-10432 @ 4' 1 1/2"	20720	Passed (50%)	1.60	0.6 D - 0.7 E (All Spans)
Live Load Defl. (in)	0.413 @ 5' 10 5/16"	0.590	Passed (L/343)	--	1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.601 @ 5' 11 7/16"	0.786	Passed (L/235)	--	1.0 D + 0.525 E + 0.75 L + 0.75 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.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 11' 9 1/2".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 11' 9 1/2".
- -322 lbs uplift at support located at 12' 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	Seismic	Factored	
1 - Stud wall - DF	4.50"	4.50"	3.46"	2424	1617	1610	5184/-5184	7567/-2175	Blocking
2 - Stud wall - DF	4.50"	4.50"	2.82"	2424	1617	1610	2538/-2538	6177/-322	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 4" o/c	
Bottom Edge (Lu)	12' 4" o/c	

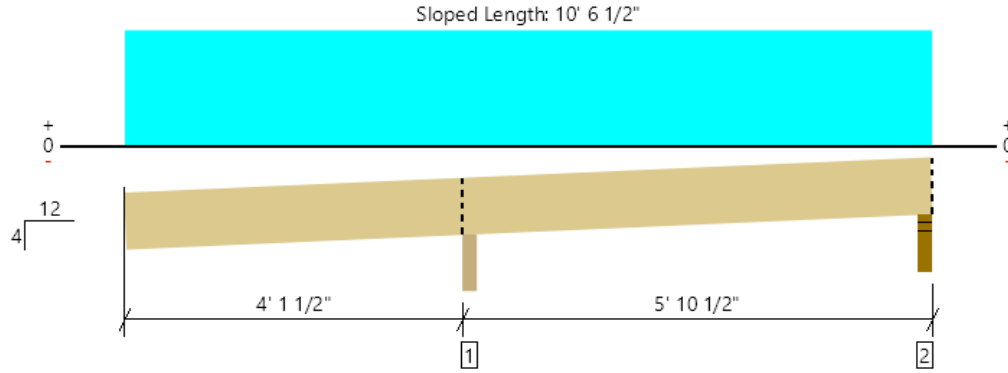
•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 12' 3 1/2"	N/A	10.2	--	--	--	
1 - Uniform (PSF)	0 to 12' 3 1/2" (Front)	8' 9 1/4"	12.0	30.0	-	-	Default Load
2 - Point (lb)	4' 1 1/2" (Front)	N/A	-	-	-	7722	Default Load
3 - Uniform (PLF)	0 to 12' 3 1/2" (Front)	N/A	279.0	-	262.0	-	

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



Upper Floor Framing, Roof Eave  
1 piece(s) 2 x 6 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 : 10' 8 5/16"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	709 @ 4' 3 1/4"	2241 (3.50")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	313 @ 4' 10 3/16"	949	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-744 @ 4' 3 1/4"	921	Passed (81%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.349 @ 0	0.450	Passed (2L/310)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.536 @ 0	0.600	Passed (2L/202)	--	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 : 4/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	275	434	709	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	42	107/-8	149	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 6" o/c	
Bottom Edge (Lu)	7' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 10'	24"	15.0	25.0	Default Load

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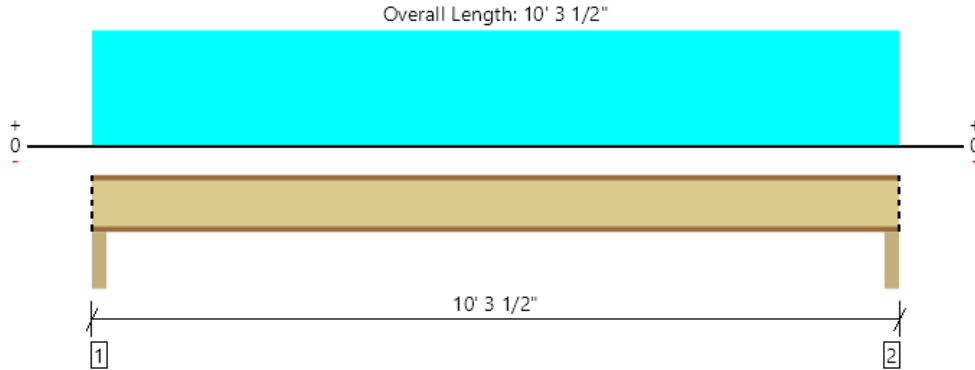
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



Main Floor Framing, 21 - Joist  
1 piece(s) 9 1/2" TJI® 210 @ 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)	357 @ 2 1/2"	1460 (3.50")	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	337 @ 3 1/2"	1330	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	845 @ 5' 1 3/4"	3000	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.064 @ 5' 1 3/4"	0.247	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.083 @ 5' 1 3/4"	0.494	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	56	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: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Beam - DF	3.50"	3.50"	1.75"	82	274	357	Blocking
2 - Beam - DF	3.50"	3.50"	1.75"	82	274	357	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 1" o/c	
Bottom Edge (Lu)	10' 4" o/c	

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

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

**Weyerhaeuser Notes**

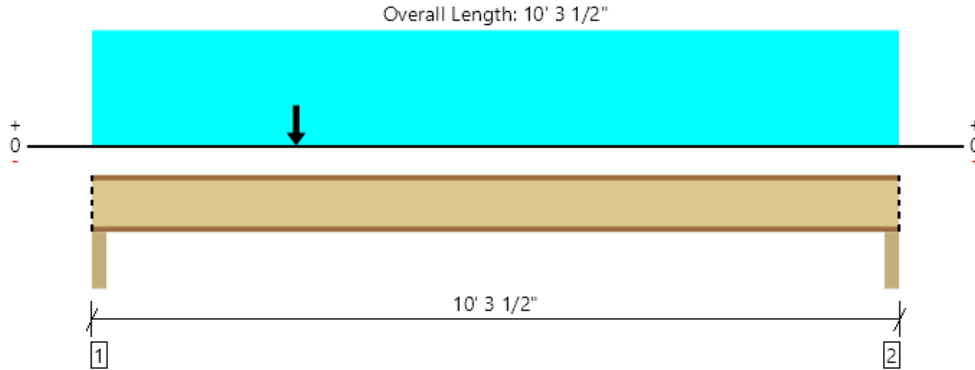
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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



Main Floor Framing, 22 - Beam  
3 piece(s) 9 1/2" TJI® 210 @ 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)	3311 @ 2 1/2"	4380 (3.50")	Passed (76%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3290 @ 3 1/2"	3990	Passed (82%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	7698 @ 2' 7 1/4"	9000	Passed (86%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.167 @ 4' 8 1/8"	0.247	Passed (L/709)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.217 @ 4' 8 1/8"	0.494	Passed (L/545)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	66	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: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Beam - DF	3.50"	3.50"	2.13"	764	2547	3311	Blocking
2 - Beam - DF	3.50"	3.50"	1.75"	301	1002	1303	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 11" o/c	
Bottom Edge (Lu)	10' 4" o/c	

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

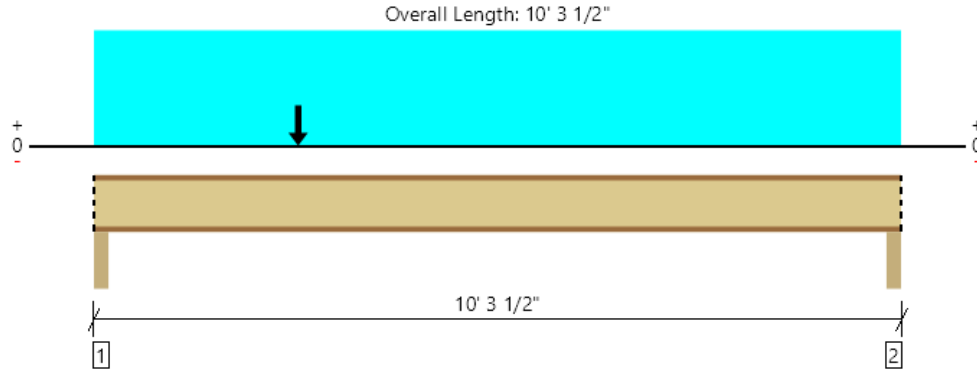
Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 10' 3 1/2"	16"	12.0	40.0	Default Load
2 - Point (lb)	2' 7 1/4"	N/A	900	3000	

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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, 23 - Beam  
2 piece(s) 9 1/2" TJI® 210 @ 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)	2214 @ 2 1/2"	2920 (3.50")	Passed (76%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2194 @ 3 1/2"	2660	Passed (82%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5071 @ 2' 7 1/4"	6000	Passed (85%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.165 @ 4' 8 9/16"	0.247	Passed (L/717)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.215 @ 4' 8 9/16"	0.494	Passed (L/552)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	64	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: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Beam - DF	3.50"	3.50"	2.15"	511	1703	2214	Blocking
2 - Beam - DF	3.50"	3.50"	1.75"	220	732	952	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 11" o/c	
Bottom Edge (Lu)	10' 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 10' 3 1/2"	16"	12.0	40.0	Default Load
2 - Point (lb)	2' 7 1/4"	N/A	566	1886	

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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	



**Compressive Member Design Guide**  
**Hem Fir Standard Grade: Studs, Plates & Miscellaneous Framing**

$E' = 1.2E+06$  psi       $F_c = 1300$  psi       $F_{c\perp} = 405$  psi

<b>height (feet)</b>						<b>6</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>22</b>	<b>25</b>
height (in.)						72	96	108	120	132	144	156	264	300
<b>Column</b>	<b>d (in.)</b>	<b>area (sq.in.)</b>	<b>C<sub>D</sub></b>	<b>C<sub>F</sub></b>	<b>P<sub>⊥</sub> (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>
<b>(1) 2x3</b>	2.5	3.75	1.15	1.15	<b>1519</b>	<b>1907</b>	<b>1141</b>	<b>914</b>	<b>748</b>	<b>622</b>	<b>525</b>	<b>449</b>	<b>159</b>	<b>123</b>
					<b>Fce</b>	434.03	244.14	192.901	156.25	129.132	108.507	92.4556	32.2831	25
<b>(1) 2x4</b>	3.5	5.25	1.15	1.15	<b>2126</b>	<b>4362</b>	<b>2896</b>	<b>2372</b>	<b>1967</b>	<b>1652</b>	<b>1404</b>	<b>1206</b>	<b>433</b>	<b>337</b>
<b>(2) 2x4</b>	3.5	10.50	1.15	1.15	<b>4253</b>	<b>8724</b>	<b>5791</b>	<b>4745</b>	<b>3934</b>	<b>3304</b>	<b>2808</b>	<b>2413</b>	<b>867</b>	<b>673</b>
<b>(3) 2x4</b>	3.5	15.75	1.15	1.15	<b>6379</b>	<b>13085</b>	<b>8687</b>	<b>7117</b>	<b>5901</b>	<b>4955</b>	<b>4212</b>	<b>3619</b>	<b>1300</b>	<b>1010</b>
<b>(4) 2x4</b>	3.5	21.00	1.15	1.15	<b>8505</b>	<b>17447</b>	<b>11583</b>	<b>9489</b>	<b>7868</b>	<b>6607</b>	<b>5616</b>	<b>4826</b>	<b>1734</b>	<b>1347</b>
<b>(5) 2X4</b>	3.5	26.25	1.15	1.15	<b>10631</b>	<b>21809</b>	<b>14478</b>	<b>11862</b>	<b>9835</b>	<b>8259</b>	<b>7020</b>	<b>6032</b>	<b>2167</b>	<b>1684</b>
<b>(6) 2X4</b>	3.5	31.50	1.15	1.15	<b>12758</b>	<b>26171</b>	<b>17374</b>	<b>14234</b>	<b>11802</b>	<b>9911</b>	<b>8423</b>	<b>7238</b>	<b>2601</b>	<b>2020</b>

**Fce**      850.69   478.52   378.086   306.25   253.099   212.674   181.213   63.2748      49

**Compressive Member Design Guide**  
**Hem Fir Standard Grade: 2x6**

$E' = 1.2E+06$  psi       $F_c = 1300$  psi       $F_{c\perp} = 405$  psi

<b>height (feet)</b>						<b>6</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>18</b>
height (in.)						72	96	108	120	132	144	156	168	216
<b>Column</b>	<b>d (in.)</b>	<b>area (sq.in.)</b>	<b>C<sub>D</sub><sub>1</sub></b>	<b>C<sub>F</sub></b>	<b>P<sub>⊥</sub> (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>	<b>Pmax (lbs.)</b>
<b>(1) 2x6</b>	5.5	8.25	1.15	1.10	<b>3341</b>	<b>9339</b>	<b>7904</b>	<b>7046</b>	<b>6197</b>	<b>5417</b>	<b>4733</b>	<b>4147</b>	<b>3650</b>	<b>2309</b>
<b>(2) 2x6</b>	5.5	16.50	1.15	1.10	<b>6683</b>	<b>18678</b>	<b>15807</b>	<b>14091</b>	<b>12393</b>	<b>10834</b>	<b>9466</b>	<b>8294</b>	<b>7300</b>	<b>4618</b>
<b>(3) 2x6</b>	5.5	24.75	1.15	1.10	<b>10024</b>	<b>28017</b>	<b>23711</b>	<b>21137</b>	<b>18590</b>	<b>16251</b>	<b>14199</b>	<b>12441</b>	<b>10950</b>	<b>6928</b>
<b>(4) 2x6</b>	5.5	33.00	1.15	1.10	<b>13365</b>	<b>37356</b>	<b>31615</b>	<b>28182</b>	<b>24786</b>	<b>21668</b>	<b>18932</b>	<b>16589</b>	<b>14600</b>	<b>9237</b>
<b>(5) 2X6</b>	5.5	41.25	1.15	1.10	<b>16706</b>	<b>46695</b>	<b>39518</b>	<b>35228</b>	<b>30983</b>	<b>27085</b>	<b>23665</b>	<b>20736</b>	<b>18251</b>	<b>11546</b>
<b>(6) 2X6</b>	5.5	49.50	1.15	1.10	<b>20048</b>	<b>56034</b>	<b>47422</b>	<b>42273</b>	<b>37179</b>	<b>32502</b>	<b>28399</b>	<b>24883</b>	<b>21901</b>	<b>13855</b>

**Fce**      2100.7   1181.6   933.642   756.25      625   525.174   447.485   385.842   233.41



**Compressive Member Design Guide  
Doug Fir No. 2 4x Posts**

$E' = 1.6E+06$  psi       $F_c = 1350$  psi       $F_{c\perp} = 625$  psi

height (feet)						8	9	10	11	12	13	14	18
height (in.)						96	108	120	132	144	156	168	216
Column	d (in.)	area (sq.in.)	$C_D$	$C_F$	$P_{\perp}$ (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)
4 X 4	3.5	12.25	1.00	1.15	7656	7664	6320	5261	4430	3772	3245	2819	1735
4 X 6	3.5	19.25	1.00	1.10	12031	11627	9561	7946	6683	5686	4890	4246	2610
4 X 8	3.5	25.38	1.00	1.05	15863	14766	12110	10048	8441	7176	6168	5354	3289
4 X 10	3.5	32.38	1.00	1.00	20238	18101	14806	12265	10293	8744	7512	6517	4000

Fce= 638.021 504.115 408.333 337.466 283.5648 241.6174 208.3333 126.0288

**Compressive Member Design Guide  
Douglas Fir No 1: (6X Posts**

$E' = 1.6E+06$  psi       $F_c = 1000$  psi       $F_{c\perp} = 625$  psi

height (feet)						8	9	10	11	12	13	14	18
height (in.)						96	108	120	132	144	156	168	216
Column	d (in.)	area (sq.in.)	$C_D$	$C_F$	$P_{\perp}$ (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)
6X6	5.5	30.25	1.00	1.00	18906	24841	23015	20989	18906	16902	15061	13421	8710
6X8	5.5	41.25	1.00	1.00	25781	33874	31384	28621	25781	23048	20538	18302	11877
6X10	5.5	52.25	1.00	1.00	32656	42908	39753	36253	32656	29194	26015	23183	15044

Fce= 1575.52 1244.86 1008.33 833.333 700.2315 596.6469 514.4558 311.214

**Compressive Member Design Guide  
PSL Posts**

$E' = 2.0E+06$  psi       $F_c = 2900$  psi       $F_{c\perp} = 750$  psi

height (feet)						8	9	10	11	12	13	14	18
height (in.)						96	108	120	132	144	156	168	216
Column	d (in.)	area (sq.in.)	$C_D$	$C_F$	$P_{\perp}$ (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)	Pmax (lbs.)
5.25X5.25	5.25	27.56	1.00	1.00	17225	40889	34029	28494	24081	20556	17719	15412	9512
7X7	7	49.00	1.00	1.00	30625	72697	60502	50660	42814	36548	31503	27402	16911

Fce= 1794.43 1417.82 1148.44 949.122 797.526 679.5488 585.9375 354.456

note: these tables do not account for lateral uniform loading (wind)