ANNÉE STRUCTURAL ENGINEERING, LLC

Structural Calculations

Project:

Lanctot Residence
4603 89th Avenue SE
Mercer Island, WA 98040

For:

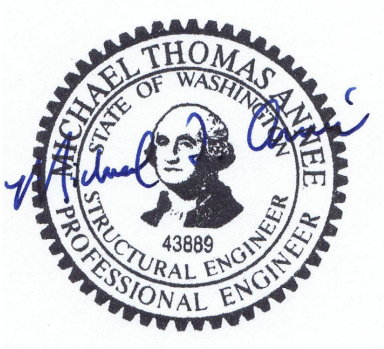
Sturman Architects
9 – 103rd Avenue NE, Suite 203
Bellevue, WA 98004

By:

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

Date:

April 22, 2022



Design Criteria

Project Name: Lanctot Residence
Location: 4603 89th Ave SE, Mercer Island, WA

Date: 4/22/2022
Soil Bearing: 2500 psf
Frost Depth: 12"

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Dead Loads:	Roof:		Floors:		Walls:	
	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
	Total	**15.0 PSF**	Total	**12.0 PSF**	Total	**10.0 PSF**
Live Loads:	Snow	**25.0 PSF**	Floor	**40.0 PSF**	*Wind*	*21.1 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 (°N) = 47.564 *(per USGS)* S_s = 1.430 F_a = 1.000 $S_{DS} = 2/3(F_a x S_s)$ = 0.953
Longitude (°W) = 122.220 *(per USGS)* S_1 = 0.497 F_v = 1.803 $S_{D1} = 2/3(F_v x S_1)$ = 0.597

Building Height C_t = 0.02 (wood)
h_n = 27.7 ft.
Period $T=C_t(h_n)^{3/4}$ = 0.24 sec. $T_0=0.2*(S_{D1}/S_{DS})$ = 0.13 $T_S=(S_{D1}/S_{DS})$ = 0.63

S_a = 0.953 $S_a=S_{DS}$ if $T_0<T<T_s$, $S_a=0.6*(S_{DS}/T_0)*T+0.4*S_{DS}$ if $T<T_0$, $S_a=S_{D1}/T$ if $T>T_s$

Not greater than:	$C_s=S_{D1}/T*(R/I)$ =	0.381
Not less than:	$C_s=0.044S_{DS}*I$ =	0.042
Design Category E or F; not less than:	$C_s=0.5S_1/(R/I)$ =	0.038
Seismic Design Coefficient:	$C_s=S_{DS}/(R/I)$ =	0.147
	C_s =	**0.147**

Seismic Weight Distrubution:

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
			0	0	**0**	0
Roof	20.2	43.21	874.5	0.5886	**5,897**	5,897
2nd Floor	11.2	54.37	611.1	0.4114	**4,121**	10,018
		97.58	1486			

Design Base Shear (ASD) = 0.7*(0.147 * W) = 0.103 * W = **10,018 lbs.**

Wind Loads: *per ASCE 7-16, Section 27.5* *Section 30.4* Cladding (ft2): 100 20

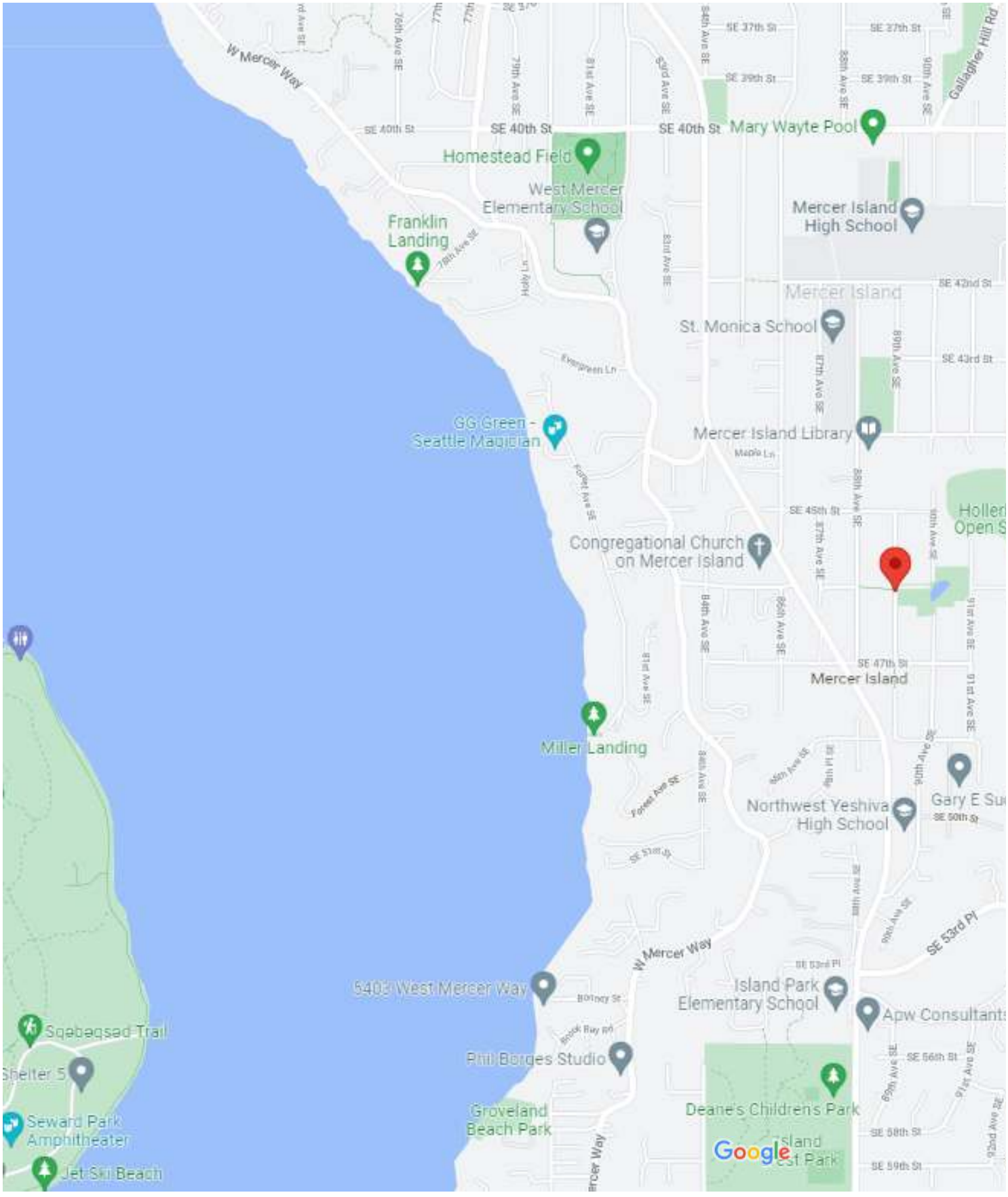
				(ASD) **Adj.**
Wind Speed (MPH)	110	Zone		
Exposure	B	Wall - Ph	19.1	**18.4**
Roof Pitch (x:12)	7	Wall - Po	17.9	**17.2**
K_1=	0.00	Roof - 1	11.1	**7.5**
K_2=	0.00	Roof - 2	-8.3	**-5.7**
K_3=	0.00	Roof - 3	-26.9	**-18.3**
$K_t=(1+K_1*K_2*K_3)^2$=	1.60	Roof - 4	-23.9	**-16.3**
(p.362) λ =	0.97	Roof - 5	-19.6	**-13.3**
(p.291) Exp. Fctr =	0.71			

(p.352)

	Zone	Pn30	(ASD) P	Pn30	(ASD) P
Wall	4	-20.4	-19.1	-22.6	**-21.1**
	5	-22.6	-21.1	-27.2	**-25.5**
Roof	1	-18.1	**-16.9**	-31.0	-29.0
	2e	-18.1	**-16.9**	-31.0	-29.0
	2n	-26.0	**-24.3**	-35.9	-33.6
	2r	-18.1	**-16.9**	-31.0	-29.0
	3e	-20.7	**-19.4**	-43.7	-40.9
	3r	-26.0	**-24.3**	-35.9	-33.6

Google Maps 4603 89th Ave SE

110 MPH, Exposure B, Kzt = 1.60



Lanctot Residence

4603 89th Ave SE, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.56363940000001, -122.2202297

Date	2/18/2022, 2:27:38 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.43	MCE_R ground motion. (for 0.2 second period)
S_1	0.497	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.716	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.144	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

Sds = 0.953
Sd1 = 0.597

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	0.612	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.735	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
SsRT	1.43	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.585	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	3.893	Factored deterministic acceleration value. (0.2 second)
S1RT	0.497	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.553	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.531	Factored deterministic acceleration value. (1.0 second)
PGAd	1.314	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.902	Mapped value of the risk coefficient at short periods
C_{R1}	0.898	Mapped value of the risk coefficient at a period of 1 s

Fa = 1.000 per Table IBC 1613.2.3(1)
Fv = 1.803 per Table IBC 1613.2.3(2)

LATERAL ANALYSIS - SEISMIC WEIGHT:

AT ROOF; $W_R = 1{,}954\ ft^2 (17\#/ft^2) + 10\#/ft^2 \left(\frac{91}{2} \times 222'\right)$

$= 43{,}208\#$

AT UPPER FLR; $W_F = 1{,}788\ ft^2 (12\#/ft^2) + 592\ ft^2 (17\#/ft^2)$

$+ 209\ ft^2 (18\#/ft^2) + 10\#/ft^2 \left(\frac{91}{2} \times 222' + \frac{10'}{2} \times 182'\right)$

$= 54{,}372\#$

5,887
4,131

DESIGN BASE SHEAR; $V = 10{,}018\#$ (ASD)

$F_{PR} = 8{,}238\#$
$F_{PF} = 10{,}367\#$

WIND ANALYSIS PER ASCE §27.5:

TRANSVERSE DIR; NORTH-TO-SOUTH:

AT ROOF; $W_{R_T} = 341\ ft^2 (18.4\#/ft^2) + 340\ ft^2 (7.5 - (-5.7))\#/ft^2$

$= 10{,}762\#$

AT UPPER FLR; $W_{F_T} = 550\ ft^2 (18.4\#/ft^2) = 10{,}120\#$

$\Sigma W_T = 20{,}882\#$

LONGITUDINAL DIR; EAST-TO-WEST:

AT ROOF; $W_{R_L} = 415\ ft^2 (18.4\#/ft^2) + 168\ ft^2 (7.5 - (-5.7))\#/ft^2$

$= 9{,}854\#$

AT UPPER FLR; $W_{F_L} = 528\ ft^2 (18.4\#/ft^2) = 9{,}715\#$

$\Sigma W_L = 19{,}569\#$

∴ WIND CONTROLS IN BOTH DIRECTIONS

LATERAL LOAD DISTRIBUTION TO UPPER FLR WALLS:

LINE ④; $V_4 = 17\% (10{,}762\#) = 1{,}830\#$

$v_4 = 1{,}830\#/7.9' = 232\#/ft. \rightarrow$ SW6

LINE ⑤; $V_5 = 22\% (10{,}762\#) = 2{,}368\#$

$v_5 = 2{,}368\#/7.1' = 334\#/ft. \rightarrow$ SW4

LINE ⑥; $V_6 = 34\% (10{,}762\#) = 3{,}659\#$

$v_6 = 3{,}659\#/13.0' = 281\#/ft. \rightarrow$ SW4

LINE ⑨,⑩; $V_{9,10} = 27\% (10{,}762\#) = 2{,}905\#$

$v_{9,10} = 2{,}905\#/9.0' = 323\#/ft. \rightarrow$ SW4

LINE Ⓒ; $V_C = 32.5\% (9{,}854\#) = 3{,}202\#$

$v_C = 3{,}202\#/15.1' = 212\#/ft. \rightarrow$ SW6

LINE Ⓕ; $V_F = 45.5\% (9{,}854\#) = 4{,}484\#$

$v_F = 4{,}484\#/11.8' = 380\#/ft. \rightarrow$ SW4

LINE Ⓗ; $V_H = 22\% (9{,}854\#) = 2{,}168\#$

$v_H = 2{,}168\#/12.7' = 171\#/ft. \rightarrow$ SW6

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TO MAIN FLOOR WALLS:

LINE ③④: V_{34} = 30% (10,120#) + 34% (2,368#)

+ 1,835# = 5,671#

V_{34} = 5,671# / 18.75' = 302#/ft. → SW4

LINE ⑥: V_6 = 44% (10,120#) + 66% (2,368#)

+ 3,659# = 9,978#

V_6 = 9,978# / 17.4' = 573#/ft. → SW2

LINE ⑨,⑩: $V_{9,10}$ = 26% (10,120#) + 2,905# = 5,536#

$V_{9,10}$ = 5,536# / 11.4' = 486#/ft. → SW3

LINE Ⓑ,Ⓒ: V_{BC} = 32% (9,715#) + 3,202# = 6,311#

V_{BC} = 6,311# / 14.9' = 424#/ft. → SW3

LINE Ⓕ,Ⓖ: V_{FG} = 50% (9,715#) + 4,484# = 9,342#

V_{FG} = 9,342# / 32.0' = 292#/ft. → SW4

LINE Ⓗ: V_H = 18% (9,715#) + 2,168# = 3,916#

V_H = 3,916# / 17.8' = 220#/ft. → SW6

DIAPHRAGM FORCES; DIAG/COLLECTOR LOADS:

AT ROOF DIAPHRAGM:

LINE ⑤ AT GRID Ⓖ: D_{5G} = 67% (2,368#) =

= 1,587# ↔ DSC2

LINE ⑥: $D_6 = \frac{23.5'}{28.0'}$ (3,659#) = 3,071# → (6) A35

LINE Ⓘ: D_I = 208#/ft. $\left(\frac{18.25^2}{2}\right)$ / 23.5' = 1,474#

DSC2

LINE Ⓒ: $D_C = \frac{22.7'}{48.54'}$ (32.5% × 8,238# × 1.25) = 1,565#

DSC2

LINE Ⓕ: $D_F = \frac{33.5'}{51.75'}$ (45.5% × 8,238# × 1.25) = 3,033#

DSC5

LINE Ⓖ: D_G = 199#/ft. $\left(\frac{15.3^2}{2}\right)$ / 28.9' = 805# → DSC2

AT UPPER FLR. DIAPHRAGM:

LINE ③,④: $D_{34} = \frac{17'}{50'}$ (30% × 10,367# × 1.25 + 34% (2,368#) + 1,830#)

@ Ⓖ -7.0' (348#/ft.) = 217# → NO HARDWARE REQ'D

@ Ⓓ = 2,436# → DSC2 ; @ Ⓔ = 606#

LINE ⑤: $D_5 = \frac{33'}{50}$ (2,368#) = 1,563#

L_{d_5} = 1,563# / [2 (180 × 0.98)] = 4.67'

∴ CS16 × 1'-4" + 5'-4" = 6'-8"

LINE ⑥: $D_6 = \frac{24.1'}{45.5'}\left(44\% \times 10{,}367^{\#} \times 1.25 + 66\%\,(2{,}368^{\#})\right)$

$= 3{,}451^{\#} \rightarrow$ CMSTC16 x2'-0" x9'-4" = 11'-4"

$L_{d_6} = 3{,}451^{\#} / [(180 \times 93 + 240 \times 0.93)] = 8.8'$

LINE Ⓑ: $D_B = \frac{30.75'}{49.25'}\left(32\% \times 10{,}367^{\#} \times 1.25'\right) + 3{,}202^{\#}$

$- 3.5'\,(493^{\#}/\text{ft.}) = 4{,}118^{\#} \rightarrow$ DSC5 or (8)A35's

LINE Ⓕ: $D_F = \frac{24.5'}{91.75'}\left(50\% \times 10{,}367^{\#} \times 1.25\right) + 4{,}484^{\#}$

$- 24.5'\,(343^{\#}/\text{ft.}) = 3488^{\#} \rightarrow$ DSC5

LINE Ⓖ: $D_G = \frac{47.25'}{54.75'}\left(50\% \times 10{,}367^{\#} \times 1.25'\right)$

$- 7.5'\,(343^{\#}/\text{ft.}) = 3{,}022^{\#} \rightarrow$ CMSTC16

$L_{d_6} = 3{,}022^{\#} / [2(140 \times .93)] = 11.6'$

∴ CMSTC16 x9'-6"

OVERTURNING: FROM UPPER FLR. WALLS:

LINE Ⓕ: $T_F = 396^{\#}/\text{ft.}\,(9.0') - \frac{8'}{2}(0.6 \times 90) = 3{,}204^{\#}$

SIM. @ ⑤ AND ⑨⑩ 2680# → MSTC52 or MSTC48B3

LINE Ⓗ: $T_H = 171^{\#}/\text{ft.}\,(9.0') - \frac{15.75'}{2}(0.6 \times 90) = 1{,}114^{\#}$

SIM. @ Ⓒ AND ④ 1,427# 1,720# → CS16

LINE ⑥: $T_6 = 281^{\#}/\text{ft.}\,(9.0') - \frac{13'}{2}(0.6 \times 90) = 2{,}178^{\#}$

→ MSTC40

FROM MAIN FLOOR WALLS:

LINE ③,④: $T_{34} = 302^{\#}/\text{ft.}\,(12.0') - \frac{13.5'}{2}(0.6 \times 120)$

$= 3{,}138^{\#} \rightarrow$ HDU4/5

$= 4{,}816^{\#}$ @ Ⓑ → HDU5

LINE ⑥: $T_6 = 573\,(11.05') - \frac{20.5'}{2}(0.6 \times 221) = 4{,}971^{\#}$

→ HDU5 to 4x8P

LINE ⑩: $T_{10} = 486\,(11.05') - \frac{4.8'}{2}(0.6 \times 98) + 2{,}680^{\#}$

$= 7{,}909^{\#} \rightarrow$ HDU8

LINE Ⓑ,Ⓒ: $T_{BC} = 424\,(11.05') - \frac{6.3'}{2}(0.6 \times 98) = 4{,}500^{\#}$

→ HDU5

LINE Ⓕ,Ⓖ: $T_{FG} = 292\,(12.0') - \frac{7.5'}{2}(0.6 \times 120) = 3{,}234^{\#}$ @ ③,④

$= 292\,(11.05') + \frac{11.8'}{24.5'}\,(3{,}234^{\#}) - \frac{24.5'}{2}(0.6 \times 241)$

$= 3{,}013^{\#} \rightarrow$ HDU4/5

LINE Ⓗ: $T_H = 171\,(11.05') + 1{,}114^{\#} - \frac{11.5'}{2}(0.6 \times 108)$

$= 2{,}631^{\#} \rightarrow$ HDU2

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LATERAL ANALYSIS – SEISMIC WEIGHT:

AT ROOF; $W_R = 504\,ft^2\,(17\#/ft^2) + 10\#/ft^2\left(\frac{12'}{2} \times 46'\right)$

$= 11{,}328\#$

DESIGN BASE SHEAR; $V = 1{,}163\#$ (ASD)

WIND ANALYSIS PER ASCE 7 §27.5:

TRANSVERSE DIR; NORTH-TO-SOUTH:

AT ROOF; $W_{R_T} = 153\,ft^2\,(18.4\#/ft^2) + 61\,ft^2\,(7.5-(5.7))$

$= 3{,}620\#$

LONGITUDINAL DIR; EAST-TO-WEST:

AT ROOF; $W_{R_L} = 199\,ft^2\,(18.4\#/ft^2) = 3{,}662\#$

∴ WIND CONTROLS IN BOTH DIRECTIONS

LATERAL LOAD DISTRIBUTION; TO MAIN FLR. WALLS:

LINES ①,②; $V_1 = V_2 = 50\%\,(3{,}620\#) = 1{,}810\#$

$V_1 = 1{,}810\#/7.8' = 232\#/ft. \rightarrow$ SW6

$V_2 = 1{,}810\#/15.5' = 117\#/ft. \rightarrow$ SW6

LINES Ⓐ,Ⓓ; $V_A = V_D = 50\%\,(3{,}662\#) = 1{,}831\#$

$V_A = 1{,}831\#/19.95' = 92\#/ft. \rightarrow$ SW6

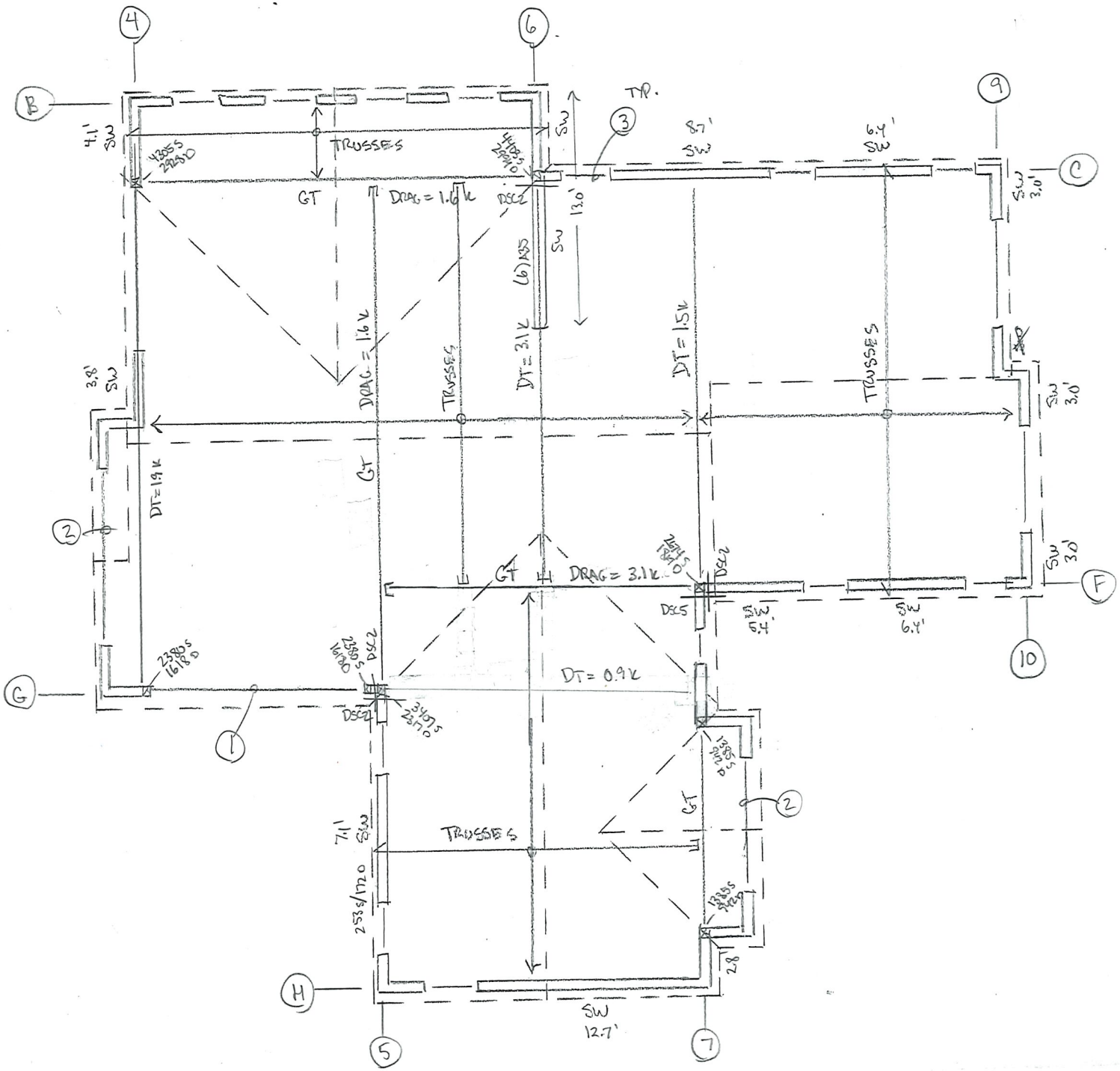
$V_D = 1{,}831\#/15.25' = 120\#/ft. \rightarrow$ SW6

OVERTURNING; FROM MAIN FLR. WALLS:

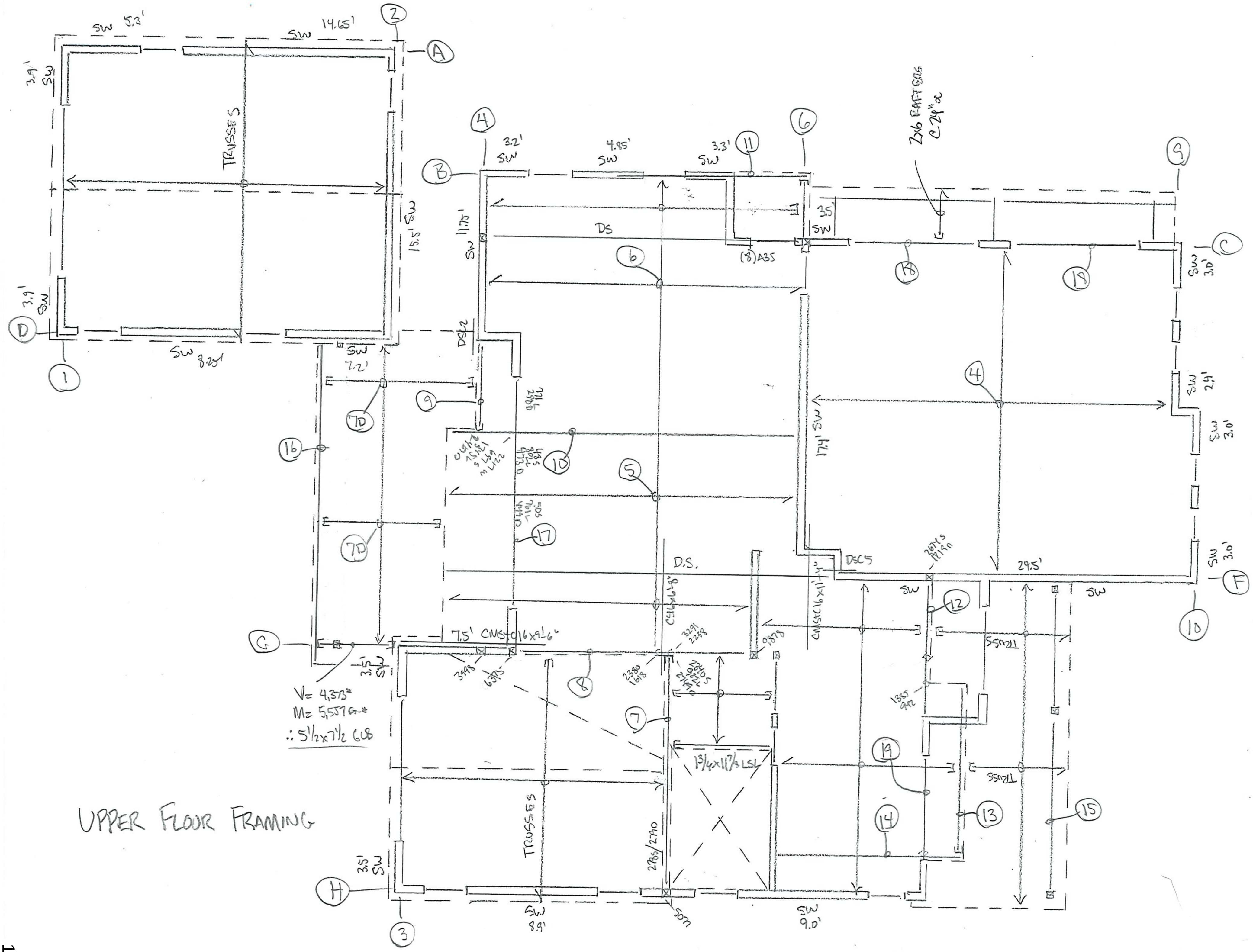
LINE ①; $T_1 = 232\#(12.0') - \frac{16.1'}{2}(0.6 \times 120)$

$= 2{,}204\# \rightarrow$ HDU2

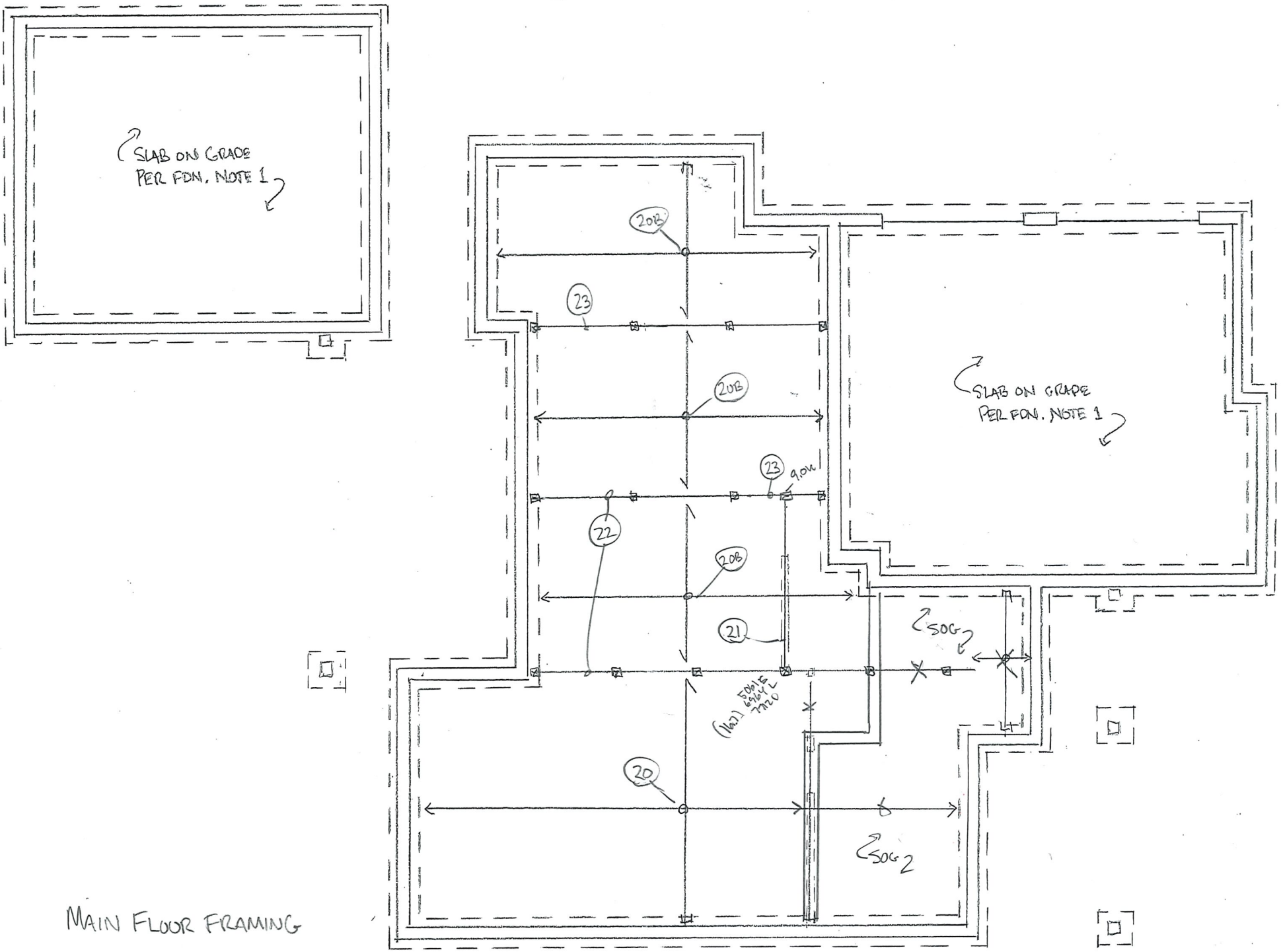
SIM. @ ②, Ⓐ, Ⓓ



ROOF FRAMING



UPPER FLOOR FRAMING



MAIN FLOOR FRAMING

GRAVITY ANALYSIS – ROOF FRAMING (25SL, 70L) #/FT²:

① L = 12.3'; w = 15.5'(25+17) = 650#/ft.

R = V = 3,998#; M = 12,292 FT-#

f_v = 104 psi; f_b = 1,460 psi; Δ_{TL} = 0.35" = L/421

∴ 5½x10½ GLB

② L = 10.3'; w = 2.25(25+17) = 95#/ft.

R = V = 487#; M = 1,253 FT-#

f_v = 38 psi; f_b = 852 psi; Δ_{TL} = 0.31" = L/399

∴ 4x6 DF#2

③ L = 3.2'; P = 1,300# @ M10-Pt. OR AT (2) PTS.

R = V = 1,300#; M = 1,040 FT-#

f_v = 101 psi; SEE #② for f_b, Δ_{TL}

∴ 4x6 DF#2 TYP, UNO

UPPER FLOOR FRAMING (30-40LL, 120L) #/FT²:

④⑤⑥ SEE ATTACHED CALC's → 14" TJI/230 @ 16"oc

560's

⑦ SEE ATTACHED CALC. → 3½x14 PSL

⑧ SEE ATTACHED CALC. → 7x14 PSL

⑨ SEE ATTACHED CALC. → 3½x14 LSL

⑩ SEE ATTACHED CALC. → 3½x14 PSL

⑪ SEE ATTACHED CALC. → 3½x14 LSL

⑫ SEE ATTACHED CALC. → 3½x14 LSL

⑬⑭ SEE ATTACHED CALC. → 1¾x14 LSL

⑮ L = 12.6'; w = 5.2'(25+15) = 209#/ft.

R = V = 1,315#; M = 4,143 FT-#

f_v = 59 psi; f_b = 944 psi; Δ_{TL} = 0.30" = L/510

∴ 4x10 DF#2

⑯ L = 21.5'; w = 9'/2 (60+18) = 351#/ft.

R = V = 3,773#; M = 20,281 FT-#

f_v = 76 psi; f_b = 1,457 psi; Δ_{TL} = 0.83" = L/310

∴ 5½x13½ GLB

USE 5½x15 GLB

STEEL OPTION; S ≥ 8.11 in³ (50 KSI)

I ≥ 83.4 in⁴ ∴ W8x28/W10x19

⑰D; L = 8.5'; w = 16"/12" (60+18) = 104#/ft.

R = V = 442#; M = 939 FT-#

f_v = 68 psi; f_b = 775 psi; Δ_{TL} = 0.17" = L/602

∴ 2x10 HF#2 @ 16"oc (RIPPED ¼" PER PLY)

@ 12"oc (LONGER SPAN)

(17) SEE ATTACHED CALC. → 5½x18 GLB

(18) L = 18.5'; w = 1575'(25SL+17DL) + 1175'(20LL+12DL)
+ 1220DL = 394SL + 352LL + 531DL = 1,090#/ft.

R=V= 10,087#; M= 46,653 ft-#

f_v = 167 psi; f_b = 2,243 psi; Δ_{TL} = 0.78" = L/286

∴ 5½x16½ GLB

(19) SEE ATTACHED CALC. → 4x10 DF#2

MAIN FLOOR FRAMING, (40LL, 12-22DL)#/ft²:

(20) SEE ATTACHED CALC. → 11⅞" TJI/360 @ 16"oc

(20B) SEE ATTACHED CALC. → 11⅞" TJI/210 @ 16"oc

(21) L = 10.8'; w = 293L + 131D + $\frac{12'}{2}$(20L+22D) + 10'(7DL)
= 473L + 333D = 806#/ft.

R=V= 4,352#; M= 11,751 ft-#

f_v = 157 psi; f_b = 1,714 psi; Δ_{TL} = 0.32" = L/405

∴ 3½x11⅞ LSL

(22) L=5.25'; w = 695L + 209D = 904#/ft.

R=V= 2,373#; M= 3,115 ft-#

f_v = 107 psi; f_b = 710 psi; Δ_{TL} = 0.04" = L/1630

∴ 4x10 DF#2

(23) L = 6.25'; w = 541L + 162D = 703#/ft.

R=V= 2,197#; M= 3,433 ft-#

f_v = 99 psi; f_b = 782 psi ∴ 4x10 DF#2

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

E' = 1.2E+06 psi Fc = 1300 psi $Fc_{\perp}$ = 405 psi

height	**(feet)**					**6**	**8**	**9**	**10**	**11**	**12**	**13**	**22**	**25**
height	(in.)					72	96	108	120	132	144	156	264	300
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.)	**Pmax** (lbs.)
(1) 2x3	2.5	3.75	1.15	1.15	**1519**	**1907**	**1141**	**914**	**748**	**622**	**525**	**449**	**159**	**123**
					Fce	434.03	244.14	192.901	156.25	129.132	108.507	92.4556	32.2831	25
(1) 2x4	3.5	5.25	1.15	1.15	**2126**	**4362**	**2896**	**2372**	**1967**	**1652**	**1404**	**1206**	**433**	**337**
(2) 2x4	3.5	10.50	1.15	1.15	**4253**	**8724**	**5791**	**4745**	**3934**	**3304**	**2808**	**2413**	**867**	**673**
(3) 2x4	3.5	15.75	1.15	1.15	**6379**	**13085**	**8687**	**7117**	**5901**	**4955**	**4212**	**3619**	**1300**	**1010**
(4) 2x4	3.5	21.00	1.15	1.15	**8505**	**17447**	**11583**	**9489**	**7868**	**6607**	**5616**	**4826**	**1734**	**1347**
(5) 2X4	3.5	26.25	1.15	1.15	**10631**	**21809**	**14478**	**11862**	**9835**	**8259**	**7020**	**6032**	**2167**	**1684**
(6) 2X4	3.5	31.50	1.15	1.15	**12758**	**26171**	**17374**	**14234**	**11802**	**9911**	**8423**	**7238**	**2601**	**2020**
					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 Fc = 1300 psi $Fc_{\perp}$ = 405 psi

height	**(feet)**					**6**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**18**
height	(in.)					72	96	108	120	132	144	156	168	216
Column	d (in.)	area (sq.in.)	C_D 1	C_F	**$P_{\perp}$** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)
(1) 2x6	5.5	8.25	1.15	1.10	**3341**	**9339**	**7904**	**7046**	**6197**	**5417**	**4733**	**4147**	**3650**	**2309**
(2) 2x6	5.5	16.50	1.15	1.10	**6683**	**18678**	**15807**	**14091**	**12393**	**10834**	**9466**	**8294**	**7300**	**4618**
(3) 2x6	5.5	24.75	1.15	1.10	**10024**	**28017**	**23711**	**21137**	**18590**	**16251**	**14199**	**12441**	**10950**	**6928**
(4) 2x6	5.5	33.00	1.15	1.10	**13365**	**37356**	**31615**	**28182**	**24786**	**21668**	**18932**	**16589**	**14600**	**9237**
(5) 2X6	5.5	41.25	1.15	1.10	**16706**	**46695**	**39518**	**35228**	**30983**	**27085**	**23665**	**20736**	**18251**	**11546**
(6) 2X6	5.5	49.50	1.15	1.10	**20048**	**56034**	**47422**	**42273**	**37179**	**32502**	**28399**	**24883**	**21901**	**13855**
					Fce	2100.7	1181.6	933.642	756.25	625	525.174	447.485	385.842	233.41

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

E' = 1.2E+06 psi Fc = 1300 psi $Fc_{\perp}$ = 405 psi

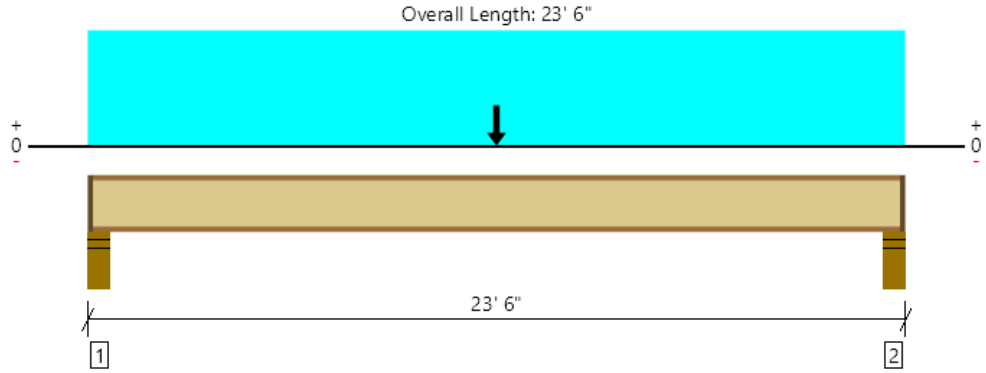
height	**(feet)**					**6**	**8**	**9**	**10**	**11**	**12**	**13**	**22**	**25**
height	(in.)					72	96	108	120	132	144	156	264	300
Column	d (in.)	area (sq.in.)	C_D	C_F	**$P_{\perp}$** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)
(1) 2x3	2.5	3.75	1.15	1.15	**1519**	**1907**	**1141**	**914**	**748**	**622**	**525**	**449**	**159**	**123**
					Fce	434.03	244.14	192.901	156.25	129.132	108.507	92.4556	32.2831	25
(1) 2x4	3.5	5.25	1.15	1.15	**2126**	**4362**	**2896**	**2372**	**1967**	**1652**	**1404**	**1206**	**433**	**337**
(2) 2x4	3.5	10.50	1.15	1.15	**4253**	**8724**	**5791**	**4745**	**3934**	**3304**	**2808**	**2413**	**867**	**673**
(3) 2x4	3.5	15.75	1.15	1.15	**6379**	**13085**	**8687**	**7117**	**5901**	**4955**	**4212**	**3619**	**1300**	**1010**
(4) 2x4	3.5	21.00	1.15	1.15	**8505**	**17447**	**11583**	**9489**	**7868**	**6607**	**5616**	**4826**	**1734**	**1347**
(5) 2X4	3.5	26.25	1.15	1.15	**10631**	**21809**	**14478**	**11862**	**9835**	**8259**	**7020**	**6032**	**2167**	**1684**
(6) 2X4	3.5	31.50	1.15	1.15	**12758**	**26171**	**17374**	**14234**	**11802**	**9911**	**8423**	**7238**	**2601**	**2020**
					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 Fc = 1300 psi $Fc_{\perp}$ = 405 psi

height	**(feet)**					**6**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**18**
height	(in.)					72	96	108	120	132	144	156	168	216
Column	d (in.)	area (sq.in.)	C_D 1	C_F	**$P_{\perp}$** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)	**Pmax** (lbs.)
(1) 2x6	5.5	8.25	1.15	1.10	**3341**	**9339**	**7904**	**7046**	**6197**	**5417**	**4733**	**4147**	**3650**	**2309**
(2) 2x6	5.5	16.50	1.15	1.10	**6683**	**18678**	**15807**	**14091**	**12393**	**10834**	**9466**	**8294**	**7300**	**4618**
(3) 2x6	5.5	24.75	1.15	1.10	**10024**	**28017**	**23711**	**21137**	**18590**	**16251**	**14199**	**12441**	**10950**	**6928**
(4) 2x6	5.5	33.00	1.15	1.10	**13365**	**37356**	**31615**	**28182**	**24786**	**21668**	**18932**	**16589**	**14600**	**9237**
(5) 2X6	5.5	41.25	1.15	1.10	**16706**	**46695**	**39518**	**35228**	**30983**	**27085**	**23665**	**20736**	**18251**	**11546**
(6) 2X6	5.5	49.50	1.15	1.10	**20048**	**56034**	**47422**	**42273**	**37179**	**32502**	**28399**	**24883**	**21901**	**13855**
					Fce	2100.7	1181.6	933.642	756.25	625	525.174	447.485	385.842	233.41

Upper Floor Framing, 4 -Garage 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)	694 @ 4 1/2"	1725 (3.50")	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	674 @ 5 1/2"	2390	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4101 @ 11' 9"	11275	Passed (36%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.265 @ 11' 9"	0.569	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.411 @ 11' 9"	1.138	Passed (L/664)	--	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, Perpendicular Partitions.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	5.50"	4.25"	1.75"	230	470	700	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	4.25"	1.75"	230	470	700	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 8" o/c	
Bottom Edge (Lu)	23' 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 23' 6"	16"	12.0	30.0	Default Load
2 - Point (PLF)	11' 9"	16"	63.0	-	

Weyerhaeuser Notes

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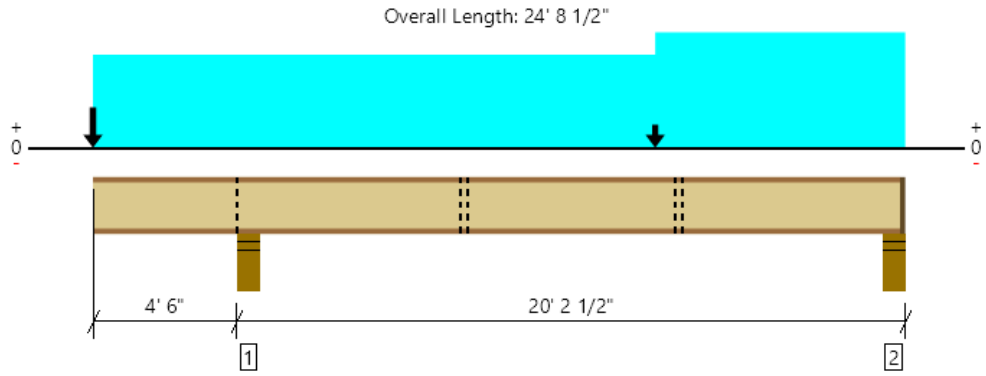
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper Floor Framing, 5 - Kitchen 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)	1700 @ 4' 8 3/4"	2790 (5.25")	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	876 @ 4' 6"	1945	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-3577 @ 4' 8 3/4"	3743	Passed (96%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.263 @ 0	0.315	Passed (2L/430)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.326 @ 0	0.473	Passed (2L/348)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	51	40	Passed	--	--

System : Floor
Member Type : Joist
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).
- Moment capacity over cantilever support 1 has been reduced by 25% to lessen the effects of buckling.
- 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.
- Permanent bracing at third points In the back span or a direct applied ceiling over the entire back span length is required at the Left end of the member. See literature detail (PB1) For clarification.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	5.50"	5.50"	3.50"	631	1069	65	1765	Blocking
2 - Stud wall - HF	5.50"	4.25"	1.75"	196	491/-104	-13	687/-117	1 1/4" Rim Board

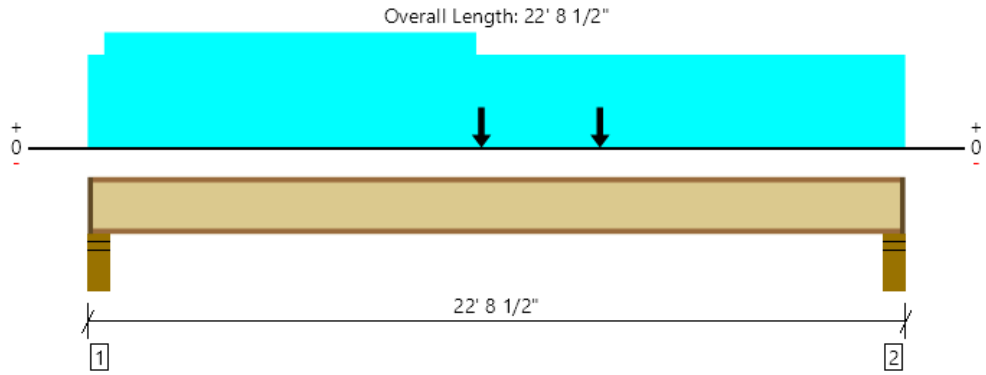
- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 5" o/c	
Bottom Edge (Lu)	4' 10" 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)	Comments
1 - Uniform (PSF)	0 to 17' 1 1/4"	16"	12.0	30.0	-	Default Load
2 - Point (PLF)	17' 1 1/4"	16"	63.0	-	-	
3 - Uniform (PSF)	17' 1 1/4" to 24' 8 1/2"	16"	12.0	40.0	-	Default Load
4 - Point (PLF)	17' 1 1/4"	16"	63.0	-	-	
5 - Point (PLF)	0	16"	198.0	270.0	39.0	

Upper Floor Framing, 6 - Mudroom 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)	809 @ 4 1/2"	1725 (3.50")	Passed (47%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	790 @ 5 1/2"	2390	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4534 @ 10' 11 1/4"	11275	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.232 @ 11' 4 1/4"	0.549	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.429 @ 11' 3 7/8"	1.098	Passed (L/614)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	51	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	Total	
1 - Stud wall - HF	5.50"	4.25"	1.75"	361	454	815	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	4.25"	1.75"	308	454	762	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 2" o/c	
Bottom Edge (Lu)	22' 6" 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 22' 8 1/2"	16"	12.0	30.0	Default Load
2 - Point (PLF)	10' 11 1/4"	16"	63.0	-	
3 - Point (PLF)	14' 2 3/4"	16"	63.0	-	
4 - Uniform (PSF)	5 1/2" to 10' 9 1/2"	16"	10.0	-	

Weyerhaeuser Notes

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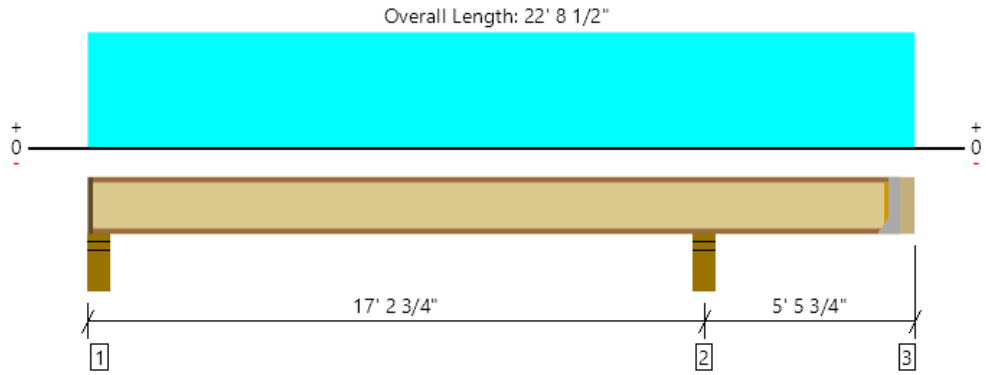
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper Floor Framing, 6b - Bedroom 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)	1253 @ 17' 2 3/4"	2790 (5.25")	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	655 @ 17'	1945	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-1937 @ 17' 2 3/4"	4990	Passed (39%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.087 @ 7' 11 1/2"	0.421	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.149 @ 7' 11 5/16"	0.843	Passed (L/999+)	--	1.0 D + 1.0 L (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).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -271 lbs uplift at support located at 22' 5". 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.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - HF	5.50"	4.25"	1.75"	210	288	498	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	5.50"	3.50"	530	723	1253	None
3 - Hanger on 14" LSL beam	3.50"	Hanger[1]	1.75" / - [2]	-73	109/-198	109/-271	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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 6" o/c	
Bottom Edge (Lu)	6' 9" o/c	

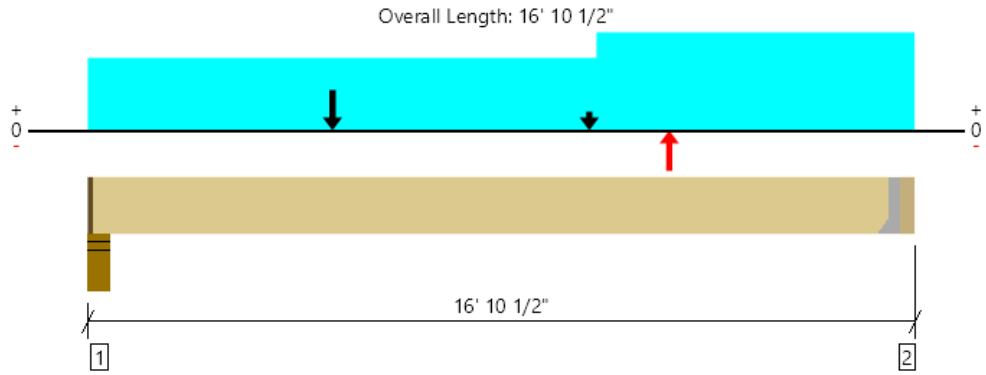
- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
3 - Face Mount Hanger	U3516/20	2.00"	N/A	16-10dx1.5	6-10dx1.5	Web Stiffeners

- 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 22' 8 1/2"	16"	22.0	30.0	Default Load

Upper Floor Framing, 7 - Grid 5 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)	5007 @ 16' 7"	5007 (2.29")	Passed (100%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4237 @ 15' 5"	10894	Passed (39%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	19518 @ 8' 7 1/8"	31236	Passed (62%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.267 @ 8' 5 1/2"	0.406	Passed (L/729)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.569 @ 8' 5 13/16"	0.813	Passed (L/343)	--	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	Total	
1 - Stud wall - HF	5.50"	4.25"	3.83"	2564	256	2351	2120	7291	1 1/4" Rim Board
2 - Hanger on 14" PSL beam	3.50"	Hanger[1]	2.29"	2749	922	2340	-2120	6011/-2120	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)	16' 6" o/c	
Bottom Edge (Lu)	16' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
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)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	1 1/4" to 16' 7"	N/A	15.3	--	--	--	
1 - Uniform (PLF)	0 to 16' 10 1/2" (Front)	N/A	279.0	-	278.0	-	Default Load
2 - Point (lb)	10' 4 1/4" (Front)	N/A	66	221	-	-	
3 - Uniform (PSF)	10' 6" to 16' 10 1/2" (Front)	3' 9"	12.0	40.0	-	-	
4 - Point (lb)	5' 1" (Front)	N/A	-	-	-	5010	
5 - Point (lb)	11' 11 1/2" (Front)	N/A	-	-	-	-5010	

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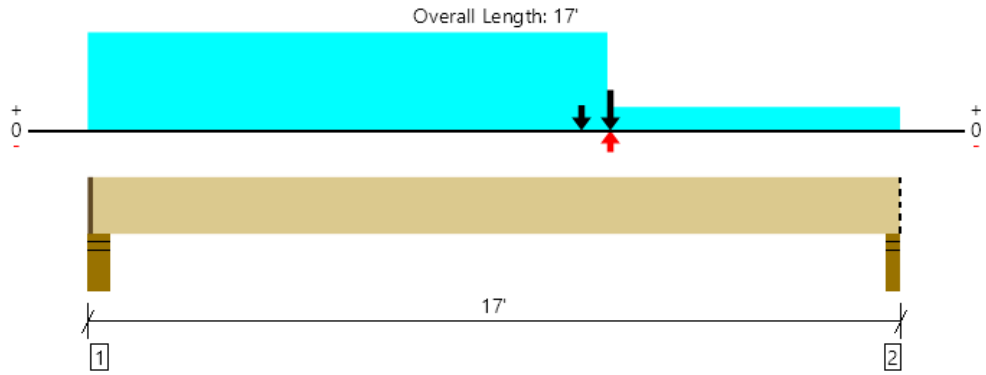
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper Floor Framing, 8 - Grid G 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)	9879 @ 16' 10"	9923 (3.50")	Passed (100%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	9822 @ 15' 6 1/2"	21789	Passed (45%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	57534 @ 10' 11 1/4"	62472	Passed (92%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.363 @ 9' 1 13/16"	0.412	Passed (L/546)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.713 @ 9' 1 1/4"	0.825	Passed (L/278)	--	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.
- 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	Total	
1 - Stud wall - HF	5.50"	4.25"	2.25"	3425	501	2950	-758	6876/-758	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	3.50"	3.48"	4817	761	5061	-1362	10639/-1362	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)	16' 11" o/c	
Bottom Edge (Lu)	16' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	1 1/4" to 17'	N/A	30.6	--	--	--	
1 - Uniform (PLF)	0 to 10' 10 1/2" (Front)	N/A	90.0	-	-	-	Default Load
2 - Point (lb)	10' 4" (Front)	N/A	1618	-	2380	-	
3 - Point (lb)	10' 11 1/4" (Front)	N/A	4987	922	5631	-2120	
4 - Uniform (PSF)	0 to 17' (Front)	8"	12.0	30.0	-	-	

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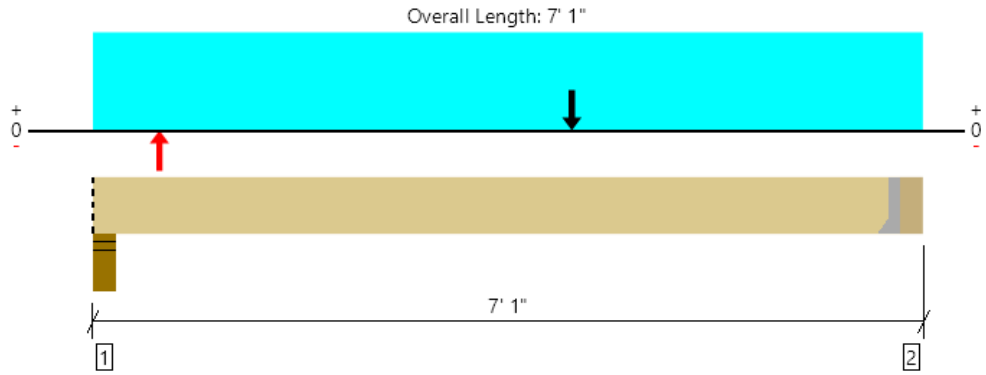
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper Floor Framing, 9 - 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)	2480 @ 6' 7 1/2"	4725 (1.50")	Passed (52%)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1887 @ 5' 5 1/2"	16203	Passed (12%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	4612 @ 4' 1 1/2"	34944	Passed (13%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.027 @ 4' 1 1/2"	0.157	Passed (L/999+)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.037 @ 3' 6 3/4"	0.315	Passed (L/999+)	--	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.
- -692 lbs uplift at support located at 4". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Total	
1 - Stud wall - HF	5.50"	5.50"	1.50"	805	1148	136	-1959	2089/-1959	Blocking
2 - Hanger on 14" PSL beam	5.50"	Hanger[1]	1.50"	827	1189	141	1959	4116	See note [1]

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

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

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-16d	6-16d	

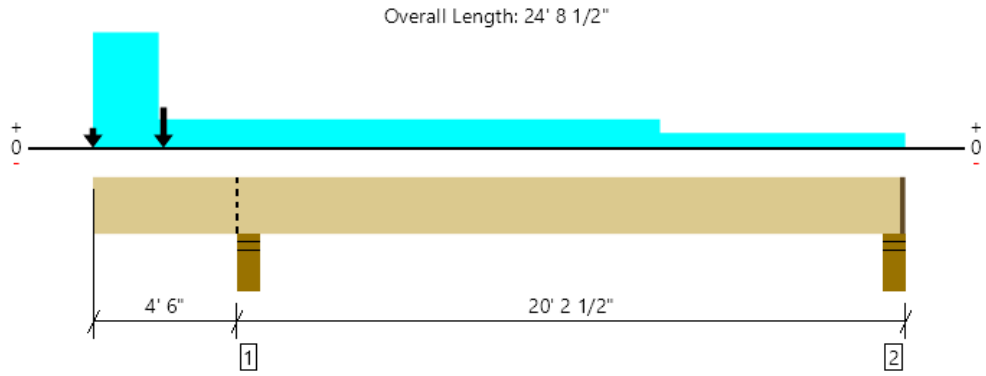
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 6' 7 1/2"	N/A	15.3	--	--	--	
1 - Uniform (PSF)	0 to 7' 1" (Front)	5' 6"	18.0	60.0	-	-	Default Load
2 - Uniform (PLF)	0 to 7' 1" (Front)	N/A	117.0	-	39.0	-	
3 - Point (lb)	7" (Front)	N/A	-	-	-	-3480	
4 - Point (lb)	4' 1 1/2" (Front)	N/A	-	-	-	3480	

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

Weyerhaeuser

Upper Floor Framing, 10 - 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)	6312 @ 4' 8 3/4"	7796 (5.50")	Passed (81%)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3336 @ 3' 4"	9473	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-10415 @ 4' 8 3/4"	27162	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.299 @ 0	0.315	Passed (2L/380)	--	1.0 D + 0.45 W + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.376 @ 0	0.473	Passed (2L/302)	--	1.0 D + 0.45 W + 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/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Wind	Total	
1 - Stud wall - HF	5.50"	5.50"	4.45"	2843	2598	697	2217	8355	Blocking
2 - Stud wall - HF	5.50"	4.25"	1.50"	311	542/-268	-104	-258	853/-630	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)	24' 7" o/c	
Bottom Edge (Lu)	24' 7" 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 24' 7 1/4"	N/A	15.3	--	--	--	
1 - Uniform (PSF)	0 to 24' 8 1/2" (Front)	1' 4"	12.0	40.0	-	-	Default Load
2 - Uniform (PLF)	0 to 2' (Front)	N/A	243.0	-	226.0	-	
3 - Point (lb)	2' 1 3/4" (Front)	N/A	827	1189	141	1959	
4 - Uniform (PLF)	2' to 17' 3" (Front)	N/A	63.0	-	-	-	
5 - Point (lb)	0 (Front)	N/A	108	360	-	-	

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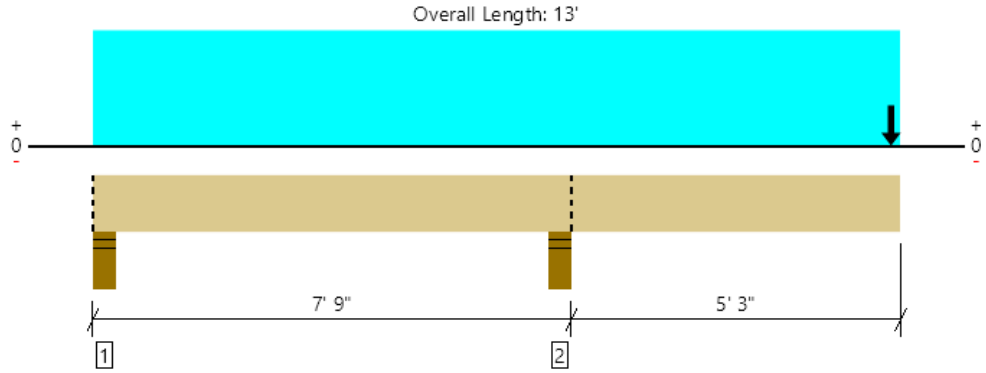
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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)	5022 @ 7' 6 1/4"	7796 (5.50")	Passed (64%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2450 @ 8' 11"	11646	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-11810 @ 7' 6 1/4"	25116	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.182 @ 13'	0.365	Passed (2L/722)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.385 @ 13'	0.548	Passed (2L/342)	--	1.0 D + 1.0 S (Alt 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).
- Right cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -991 lbs uplift at support located at 4". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	5.50"	5.50"	1.50"	-327	79/-224	-662	79/-1213	Blocking
2 - Stud wall - HF	5.50"	5.50"	3.54"	3043	650	1979	5672	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)	13' o/c	
Bottom Edge (Lu)	13' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13'	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 13' (Front)	8"	22.0	30.0	-	Default Load
2 - Uniform (PLF)	0 to 13' (Front)	N/A	117.0	-	39.0	
3 - Point (lb)	12' 10 1/4" (Front)	N/A	805	245	886	

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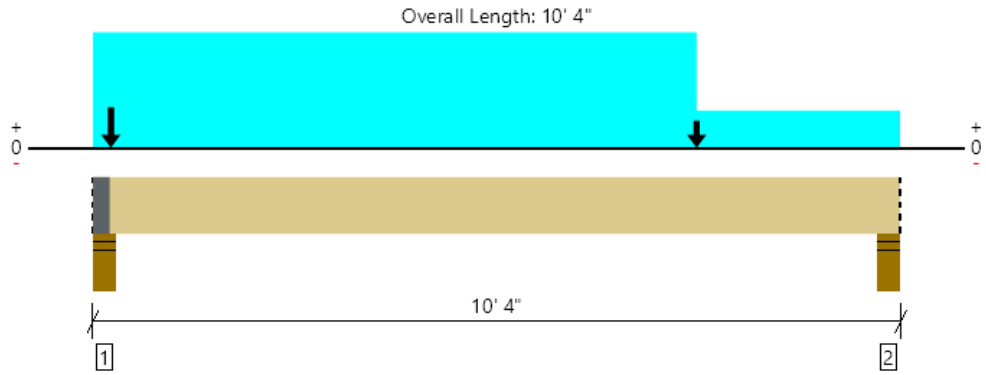
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper Floor Framing, 12 - 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)	4858 @ 4"	7796 (5.50")	Passed (62%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4212 @ 8' 8 1/2"	11646	Passed (36%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	11825 @ 5' 6 3/16"	25116	Passed (47%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.097 @ 5' 3"	0.322	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.197 @ 5' 2 7/8"	0.483	Passed (L/588)	--	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.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	5.50"	5.50"	3.43"	4328	1076	4729	10133	Blocking, Squash Blocks
2 - Stud wall - HF	5.50"	5.50"	3.30"	2326	1076	2058	5460	Blocking

- Squash Blocks are assumed to carry all loads applied directly above them, 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' 4" o/c	
Bottom Edge (Lu)	10' 4" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 4"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 10' 4" (Front)	5' 2 1/2"	22.0	40.0	-	Default Load
2 - Uniform (PLF)	0 to 7' 8 3/4" (Front)	N/A	330.0	-	353.0	
3 - Point (lb)	7' 8 3/4" (Front)	N/A	942	-	1385	
4 - Point (lb)	2 3/4" (Front)	N/A	1819	-	2674	

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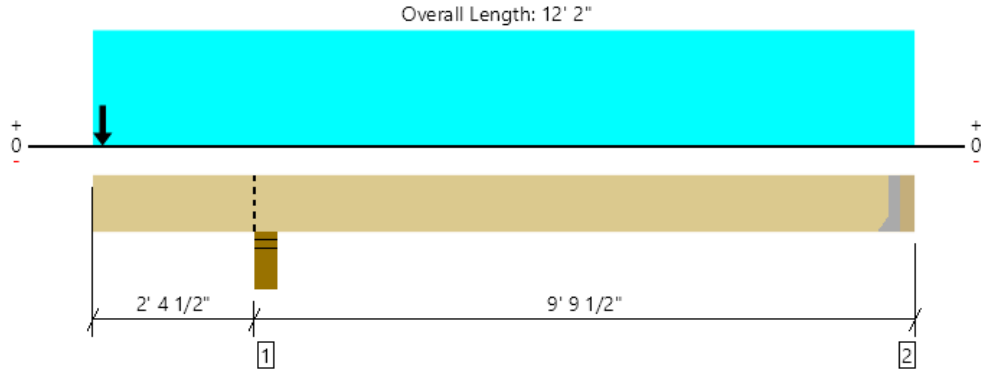
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper Floor Framing, 13 - 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)	2881 @ 2' 7 1/4"	3898 (5.50")	Passed (74%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1213 @ 4'	5823	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2496 @ 7' 9 11/16"	12558	Passed (20%)	1.15	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Live Load Defl. (in)	0.033 @ 7' 4 3/8"	0.309	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.077 @ 7' 5 7/8"	0.464	Passed (L/999+)	--	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/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	5.50"	5.50"	4.07"	1738	285	1143	3166	Blocking
2 - Hanger on 14" HF beam	3.50"	Hanger[1]	1.50"	782	185/-3	523	1490/-3	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)	11' 11" o/c	
Bottom Edge (Lu)	11' 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
2 - Face Mount Hanger	IUS1.81/14	2.00"	N/A	14-10dx1.5	2-10dx1.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 10 1/2"	N/A	7.7	--	--	
1 - Uniform (PSF)	0 to 12' 2" (Front)	1' 3"	12.0	30.0	-	Default Load
2 - Uniform (PLF)	0 to 12' 2" (Front)	N/A	117.0	-	39.0	
3 - Uniform (PLF)	0 to 12' 2" (Front)	N/A	47.0	-	77.0	
4 - Point (lb)	1 3/4" (Front)	N/A	252	-	206	

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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	

Weyerhaeuser

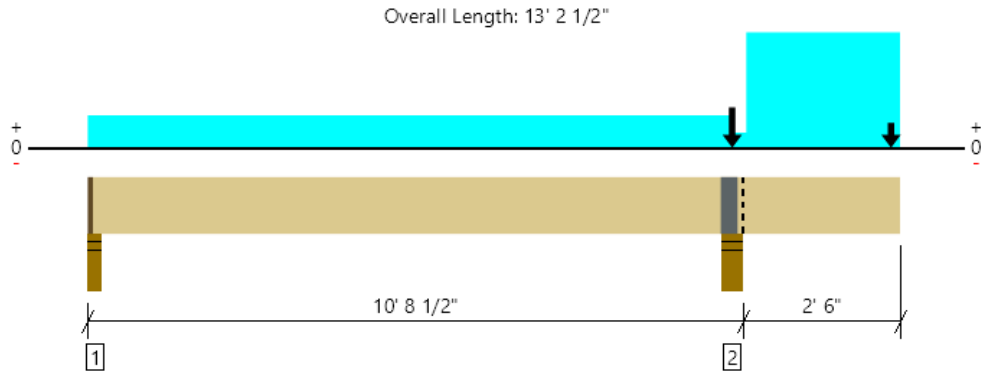
4/22/2022 10:24:37 PM UTC

ForteWEB v3.2, Engine: V8.2.0.17, Data: V8.1.0.16

File Name: Lantcot Residence

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)	2776 @ 10' 5 3/4"	3898 (5.50")	Passed (71%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1368 @ 11' 10 1/2"	5823	Passed (23%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	-3631 @ 10' 5 3/4"	12558	Passed (29%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.052 @ 13' 2 1/2"	0.200	Passed (2L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.109 @ 13' 2 1/2"	0.273	Passed (2L/600)	--	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/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - HF	3.50"	2.25"	1.50"	239	213/-72	-99	452/-171	1 1/4" Rim Board
2 - Stud wall - HF	5.50"	5.50"	3.92"	2738	637	2054	5429	Blocking, Squash Blocks

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Squash Blocks are assumed to carry all loads applied directly above them, 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)	13' 1" o/c	
Bottom Edge (Lu)	11' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 13' 2 1/2"	N/A	7.7	--	--	
1 - Uniform (PSF)	0 to 13' 2 1/2" (Front)	1' 4"	12.0	30.0	-	Default Load
2 - Uniform (PLF)	0 to 10' 5 3/4" (Front)	N/A	63.0	-	-	
3 - Point (lb)	10' 5 3/4" (Front)	N/A	942	-	1385	
4 - Uniform (PLF)	10' 8 1/2" to 13' 2 1/2" (Front)	N/A	202.0	-	165.0	
5 - Point (lb)	13' 3/4" (Front)	N/A	559	246	158	

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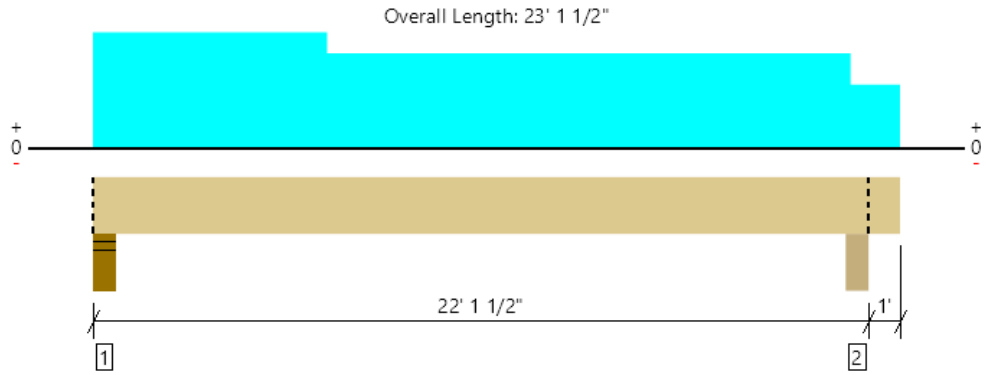
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

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)	4571 @ 4"	12251 (5.50")	Passed (37%)	--	1.0 D + 1.0 L (Alt Spans)
Shear (lbs)	3804 @ 1' 8 1/2"	14575	Passed (26%)	1.00	1.0 D + 1.0 L (Alt Spans)
Pos Moment (Ft-lbs)	22336 @ 10' 10 15/16"	39953	Passed (56%)	1.00	1.0 D + 1.0 L (Alt Spans)
Neg Moment (Ft-lbs)	-192 @ 21' 10 3/4"	31797	Passed (1%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.492 @ 11' 3/4"	0.719	Passed (L/526)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.674 @ 11' 3/4"	1.078	Passed (L/384)	--	1.0 D + 1.0 L (Alt 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.
- Critical positive moment adjusted by a volume factor of 0.97 that was calculated using length L = 21' 6 9/16".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 1' 3 5/16".
- 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	Total	
1 - Stud wall - HF	5.50"	5.50"	2.05"	1224	3347/-6	4571/-6	Blocking
2 - Beam - LVL	5.50"	5.50"	1.50"	1195	3178	4373	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' 2" o/c	
Bottom Edge (Lu)	23' 2" 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 23' 1 1/2"	N/A	20.0	--	
1 - Uniform (PSF)	0 to 6' 8 1/2" (Front)	5' 6"	18.0	60.0	Default Load
2 - Uniform (PSF)	6' 8 1/2" to 21' 8 1/2" (Front)	4' 6"	18.0	60.0	
3 - Uniform (PSF)	21' 8 1/2" to 23' 1 1/2" (Front)	3'	18.0	60.0	

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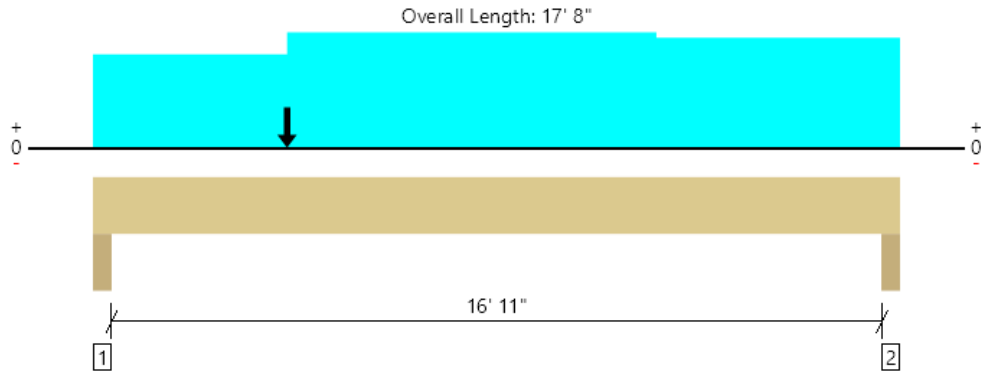
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper Floor Framing, 17 - 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)	13570 @ 3"	16088 (4.50")	Passed (84%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	11521 @ 1' 10 1/2"	17490	Passed (66%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	54506 @ 8' 2 1/4"	57791	Passed (94%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.354 @ 8' 8 13/16"	0.429	Passed (L/582)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.606 @ 8' 8 1/4"	0.858	Passed (L/340)	--	1.0 D + 1.0 L (All Spans)

System : Wall
Member Type : Header
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 0.97 that was calculated using length L = 17' 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	Total	
1 - Trimmer - HF	4.50"	4.50"	3.80"	5603	7968	778	1700	16049	None
2 - Trimmer - HF	4.50"	4.50"	3.35"	4774	7195	573	517	13059	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Wind (1.60)	Comments
0 - Self Weight (PLF)	0 to 17' 8"	N/A	24.1	--	--	--	
1 - Uniform (PLF)	0 to 4' 3"	N/A	298.0	771.0	-	-	Default Load
2 - Point (lb)	4' 3"	N/A	2467	1345	697	2217	Default Load
3 - Uniform (PLF)	4' 3" to 12' 4"	N/A	473.0	802.0	48.0	-	Default Load
4 - Uniform (PLF)	12' 4" to 17' 8"	N/A	449.0	761.0	50.0	-	Default Load

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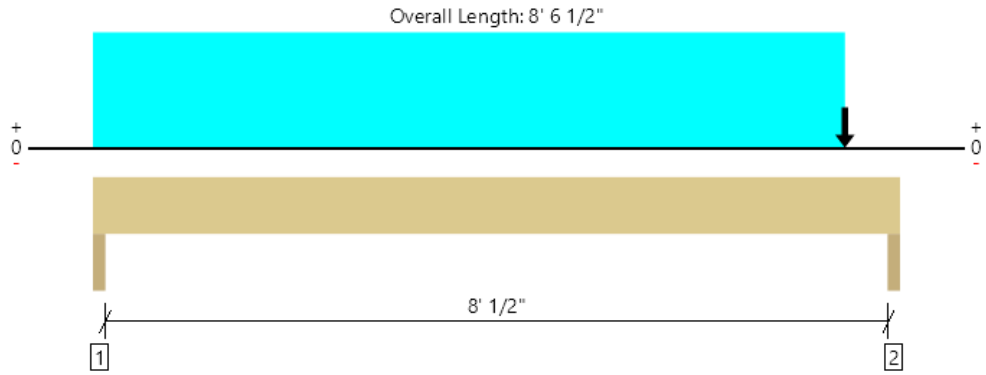
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Upper Floor Framing, 19 - Header
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)	5018 @ 8' 5"	6563 (3.00")	Passed (76%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2414 @ 7' 6 1/4"	4468	Passed (54%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	3107 @ 4' 10 1/16"	4492	Passed (69%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.058 @ 4' 3 1/2"	0.207	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.107 @ 4' 4 13/16"	0.415	Passed (L/929)	--	1.0 D + 1.0 L (All Spans)

System : Wall
Member Type : Header
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.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Trimmer - HF	3.00"	3.00"	1.50"	510	843	114	1467	None
2 - Trimmer - HF	3.00"	3.00"	2.29"	2792	1027	1940	5759	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 7" o/c	
Bottom Edge (Lu)	8' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 6 1/2"	N/A	8.2	--	--	
1 - Uniform (PSF)	0 to 7' 11 1/2"	6' 5 1/2"	12.0	30.0	-	Default Load
2 - Point (lb)	7' 11 1/2"	N/A	2615	328	2054	Default Load

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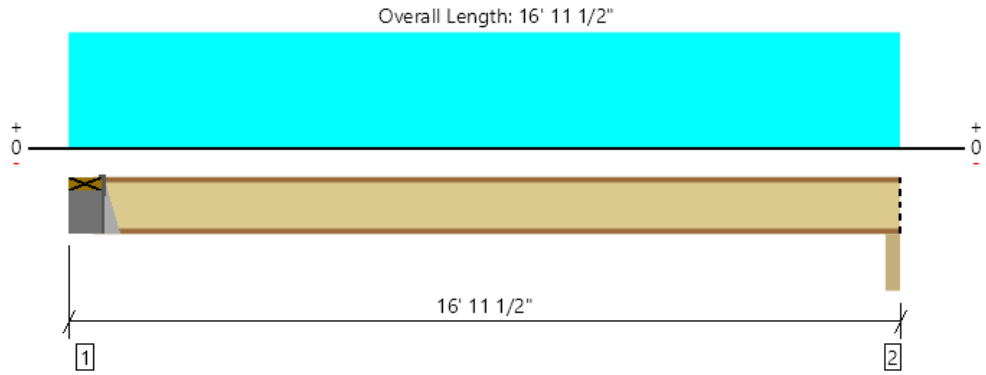
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Main Floor Framing, 20 - Joist
1 piece(s) 11 7/8" TJI® 360 @ 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)	558 @ 8"	1080 (1.75")	Passed (52%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	558 @ 8"	1705	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2242 @ 8' 8 1/2"	6180	Passed (36%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.193 @ 8' 8 1/2"	0.402	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.250 @ 8' 8 1/2"	0.804	Passed (L/771)	--	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: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Hanger on Single 2X HF plate	8.00"	Hanger[1]	1.75" / - [2]	139	464	603	See note [1]
2 - Beam - HF	3.50"	3.50"	1.75"	132	440	572	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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 4" o/c	
Bottom Edge (Lu)	16' 4" 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 - Top Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 16' 11 1/2"	16"	12.0	40.0	Default Load

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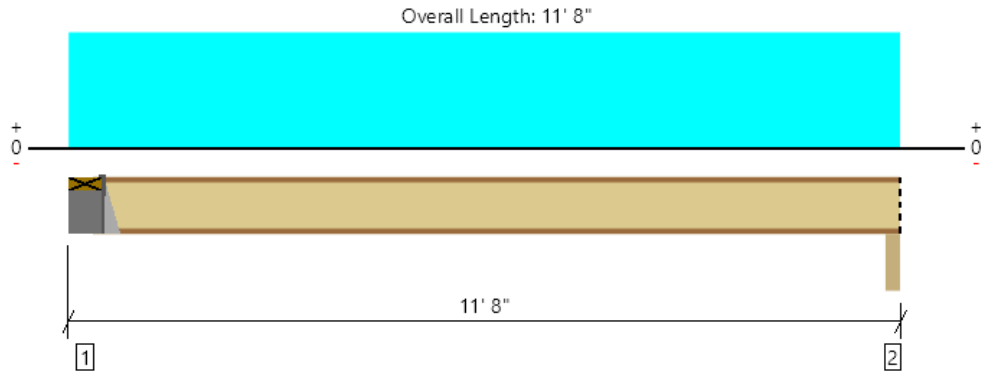
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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

Weyerhaeuser

Main Floor Framing, 20B - 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)	374 @ 8"	1005 (1.75")	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	374 @ 8"	1655	Passed (23%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1009 @ 6' 3/4"	3795	Passed (27%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.056 @ 6' 3/4"	0.270	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.073 @ 6' 3/4"	0.540	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	59	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	Total	
1 - Hanger on Single 2X HF plate	8.00"	Hanger[1]	1.75" / - [2]	97	323	420	See note [1]
2 - Beam - HF	3.50"	3.50"	1.75"	90	299	389	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.
- [2] Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 5" o/c	
Bottom Edge (Lu)	11' 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 - Top Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 11' 8"	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@anneestructural.com	

Weyerhaeuser

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