



Structural Calculations For:

Zettel Residence

Mercer Island, WA



Prepared for: Piano Nobile

Job #: 10824-2020-06

Date: August 11, 2020

CRITERIA

DEAD LOADS

FLOOR	FLOORING		ROOF	ROOFING	
	3/4" PLY.	2.3 PSF		1/2" PLY.	1.5 PSF
	JOIST	2.0 PSF		JOIST	2.0 PSF
	MECH/MISC.	2.4 PSF		INS.	1.0 PSF
	5/8" GYP.	2.3 PSF		MECH/MISC	4.0 PSF
		<u>10 PSF</u>		5/8" GYP.	2.3 PSF
					<u>13.3 PSF</u>
					$Z = 13.3 \Rightarrow 15 \text{ PSF}$

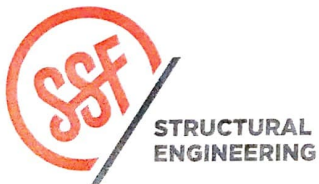
LIVE LOADS

25 PSF	SNOW
40 PSF	FLOOR
60 PSF	DECK

WIND: WIND SPEED-UP EFFECTS DO NOT OCCUR @ SITE
 PER ASCE 7-10 § 26.8.1-5

$$\therefore K_{zt} = 1.00$$

K_{zt} CALCULATIONS PROVIDED ON CRIT 2-4



ZETTEL RESIDENCE
 PROJECT 10824 - 2020 - 06

7/2/20
 DATE
 PROJ. # SRO
 DESIGN CRIT 1
 SHEET

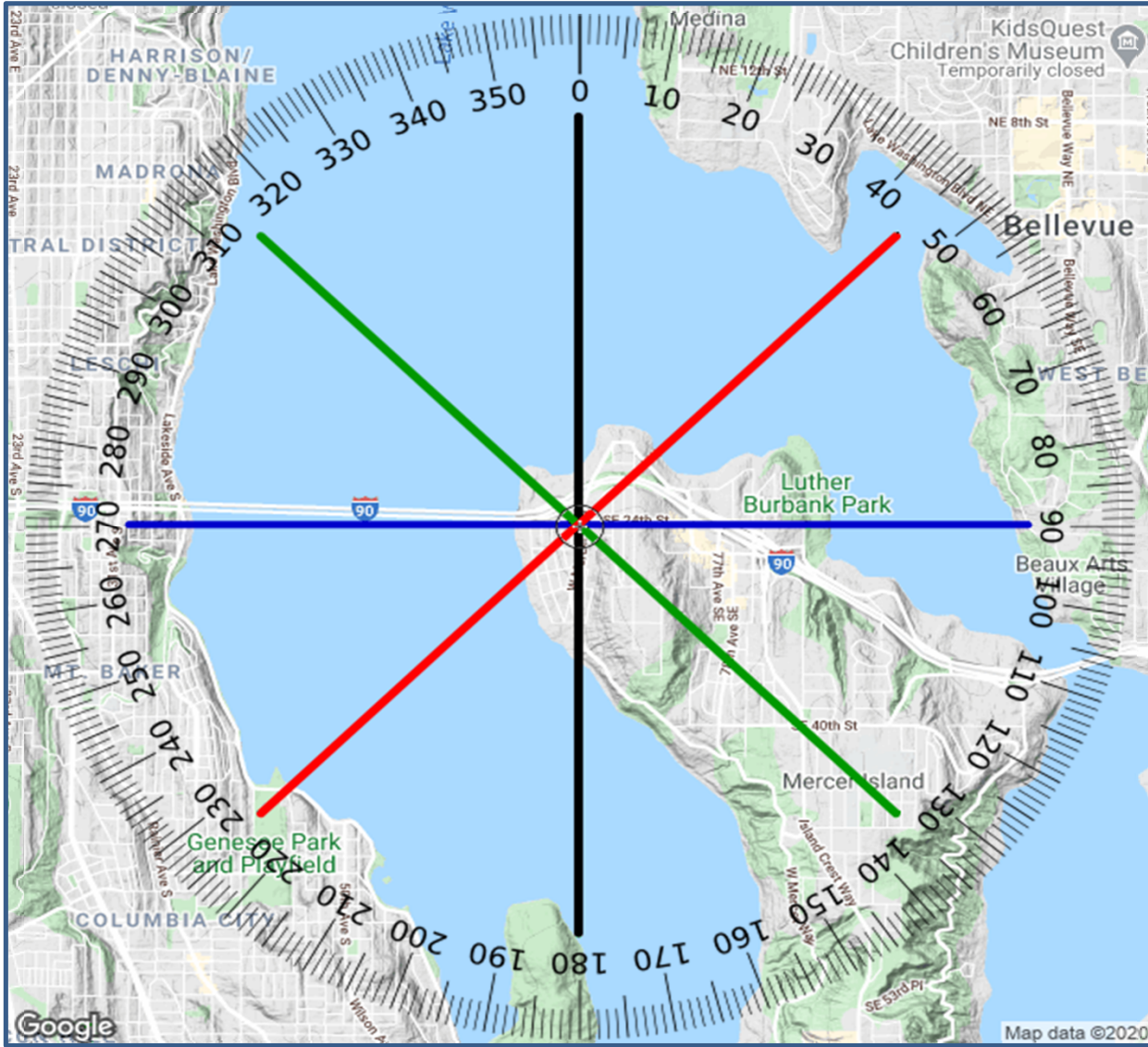
Site Address

Address 6415 SE 24th Street
 City: Mercer Island State: WA
 Lat Long 47.588879 -122.2485

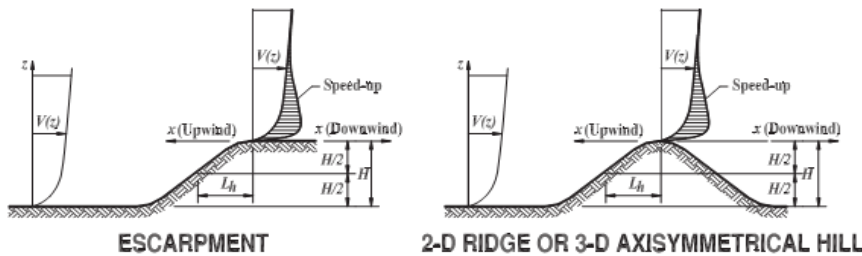
Wind Radius 2.00 Miles
 Angle 0°
 Exposure B

Profile 1: 0° to 180°
 Profile 2: 270° to 90°
 Profile 3: 315° to 135°
 Profile 4: 45° to 225°

SITE MAP



Topography from Figure 26.8-1



$$K_{zt} = (1 + K_1 K_2 K_3)^2$$

$K_1 =$ Per Figure

$$K_2 = (1 - |x|/\mu L_h)$$

$$K_3 = e^{-\gamma z/L_h}$$

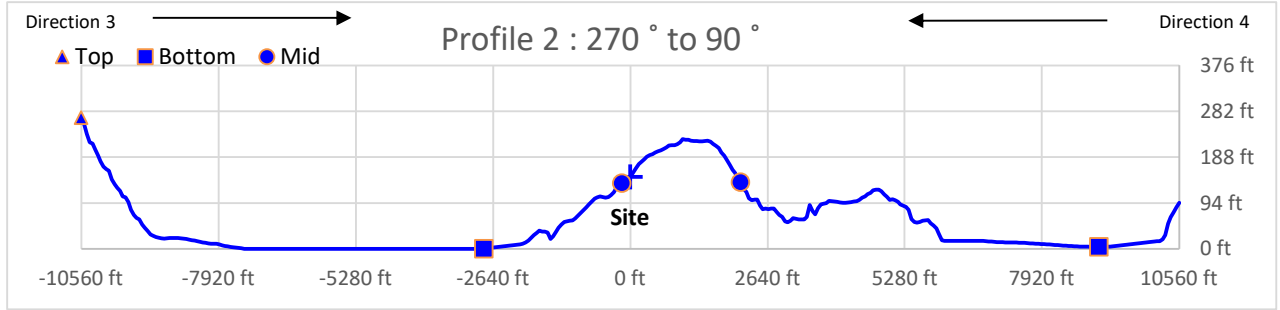
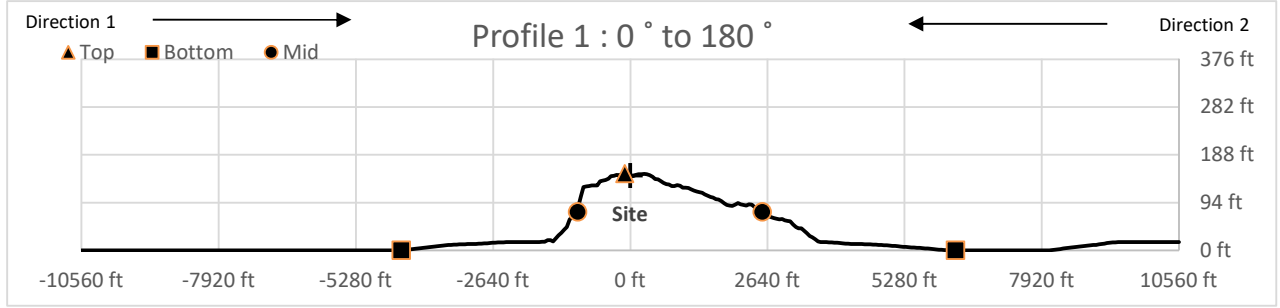
$$K_{zt} = 1, \text{ if } H/L_h \leq 0.2$$

PER FIGURE 26.8-1



Zettel Residence _____
 Kzt Calculations _____

DATE 7/6/2020
 PROJ. # _____
 DESIGN SRO
 SHEET CRIT 2



Direction 1 - 0° to Site

Direction 2 - Site to 180°

Direction 3 - 270° to Site

Direction 4 - Site to 90°

Site Conditions (26.8.1)

1. Unobstructed	Yes
2. Isolated	Yes
3. Upper Half Hill	Yes
4. H/Lh ≥ 0.2	No
5. H ≥ 60'	Yes

Kzt=1

Site Conditions (26.8.1)

1. Unobstructed	Yes
2. Isolated	Yes
3. Upper Half Hill	Yes
4. H/Lh ≥ 0.2	No
5. H ≥ 60'	Yes

Kzt=1

Site Conditions (26.8.1)

1. Unobstructed	Yes
2. Isolated	Yes
3. Upper Half Hill	Yes
4. H/Lh ≥ 0.2	No
5. H ≥ 60'	Yes

Kzt=1

Site Conditions (26.8.1)

1. Unobstructed	Yes
2. Isolated	Yes
3. Upper Half Hill	Yes
4. H/Lh ≥ 0.2	No
5. H ≥ 60'	Yes

Kzt=1

Terrain Data

Terrain	Escrpmt
Top of Hill Dist.	-106
Bott. of Hill Dist.	-4404
L @ H/2	-1008
Site	downwnd
Top of Hill Elev.	151
Bott. of Hill Elev.	0
Site Elev.	147.5
Site Dist.	0
H/2	76

Terrain Data

Terrain	Ridge
Top of Hill Dist.	-106
Bott. of Hill Dist.	6262
L @ H/2	2547
Site	upwind
Top of Hill Elev.	151
Bott. of Hill Elev.	0
Site Elev.	147.5
Site Dist.	0
H/2	76

Terrain Data

Terrain	Hill
Top of Hill Dist.	-10560
Bott. of Hill Dist.	-2812
L @ H/2	-159
Site	downwnd
Top of Hill Elev.	269
Bott. of Hill Elev.	0
Site Elev.	147.5
Site Dist.	0
H/2	134

Terrain Data

Terrain	Ridge
Top of Hill Dist.	-10560
Bott. of Hill Dist.	9021
L @ H/2	2123
Site	upwind
Top of Hill Elev.	269
Bott. of Hill Elev.	4
Site Elev.	147.5
Site Dist.	0
H/2	136

Kzt Calculations

H=	151
Lh=	902
x=	106
z=	60
μ=	4
γ=	2.5
K1 value =	0.75
K1=	0.13
K2=	0.97
k3=	0.85
H/Lh =	0.17
Kzt =	1.00

Kzt Calculations

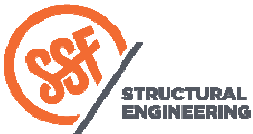
H=	151
Lh=	2653
x=	106
z=	60
μ=	1.5
γ=	3
K1 value =	1.3
K1=	0.07
K2=	0.97
k3=	0.93
H/Lh =	0.06
Kzt =	1.00

Kzt Calculations

H=	269
Lh=	10401
x=	10560
z=	60
μ=	1.5
γ=	4
K1 value =	0.95
K1=	0.02
K2=	0.32
k3=	0.98
H/Lh =	0.03
Kzt =	1.00

Kzt Calculations

H=	265
Lh=	12683
x=	10560
z=	60
μ=	1.5
γ=	3
K1 value =	1.3
K1=	0.03
K2=	0.44
k3=	0.99
H/Lh =	0.02
Kzt =	1.00



Zettel Residence

Kzt Calculations

DATE

7/6/2020

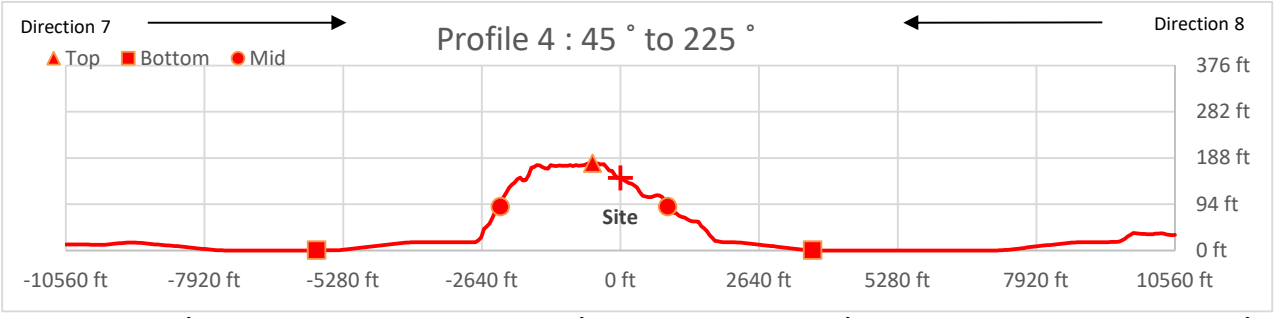
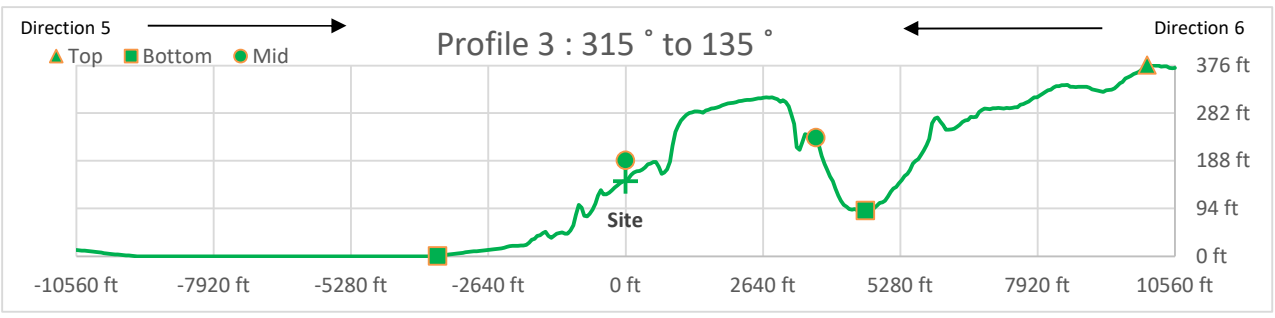
PROJ. #

DESIGN

SRO

SHEET

CRIT 3



Direction 5 - 315° to Site

Direction 6 - Site to 135°

Direction 7 - 45° to Site

Direction 8 - Site to 225°

Site Conditions (26.8.1)

1. Unobstructed	Yes
2. Isolated	Yes
3. Upper Half Hill	No
4. H/Lh ≥ 0.2	No
5. H ≥ 60'	Yes

Kzt=1

Site Conditions (26.8.1)

1. Unobstructed	Yes
2. Isolated	
3. Upper Half Hill	No
4. H/Lh ≥ 0.2	No
5. H ≥ 60'	Yes

Kzt=1

Site Conditions (26.8.1)

1. Unobstructed	Yes
2. Isolated	Yes
3. Upper Half Hill	Yes
4. H/Lh ≥ 0.2	No
5. H ≥ 60'	Yes

Kzt=1

Site Conditions (26.8.1)

1. Unobstructed	Yes
2. Isolated	Yes
3. Upper Half Hill	Yes
4. H/Lh ≥ 0.2	No
5. H ≥ 60'	Yes

Kzt=1

Terrain Data

Terrain	Ridge
Top of Hill Dist.	10029
Bott. of Hill Dist.	-3608
L @ H/2	0
Site	upwind
Top of Hill Elev.	377
Bott. of Hill Elev.	0
Site Elev.	147.5
Site Dist.	0
H/2	189

Terrain Data

Terrain	Ridge
Top of Hill Dist.	10029
Bott. of Hill Dist.	4617
L @ H/2	3662
Site	downwnd
Top of Hill Elev.	377
Bott. of Hill Elev.	90
Site Elev.	147.5
Site Dist.	0
H/2	233

Terrain Data

Terrain	Ridge
Top of Hill Dist.	-531
Bott. of Hill Dist.	-5784
L @ H/2	-2282
Site	downwnd
Top of Hill Elev.	177
Bott. of Hill Elev.	0
Site Elev.	147.5
Site Dist.	0
H/2	89

Terrain Data

Terrain	Ridge
Top of Hill Dist.	-531
Bott. of Hill Dist.	3662
L @ H/2	902
Site	upwind
Top of Hill Elev.	177
Bott. of Hill Elev.	0
Site Elev.	147.5
Site Dist.	0
H/2	89

Kzt Calculations

H=	377
Lh=	10029
x=	10029
z=	60
μ=	1.5
γ=	3
K1 value =	1.3
K1=	0.05
K2=	0.33
k3=	0.98
H/Lh=	0.04
Kzt =	1.00

Kzt Calculations

H=	287
Lh=	6367
x=	10029
z=	60
μ=	1.5
γ=	3
K1 value =	1.3
K1=	0.06
K2=	0.00
k3=	0.97
H/Lh=	0.05
Kzt =	1.00

Kzt Calculations

H=	177
Lh=	1751
x=	531
z=	60
μ=	1.5
γ=	3
K1 value =	1.3
K1=	0.13
K2=	0.80
k3=	0.90
H/Lh=	0.10
Kzt =	1.00

Kzt Calculations

H=	177
Lh=	1433
x=	531
z=	60
μ=	1.5
γ=	3
K1 value =	1.3
K1=	0.16
K2=	0.75
k3=	0.88
H/Lh=	0.12
Kzt =	1.00

Zettel Residence _____
 Kzt Calculations _____

DATE 7/6/2020
 PROJ. # _____
 DESIGN SRO
 SHEET CRIT 4



LATERAL ANALYSIS

NO INCREASE IN SEISMIC LOAD. ANALYZE FOR INCREASE IN WIND LOAD ONLY.

WIND: EXP B

$$K_d = 0.85$$

$$K_z = 0.70$$

$$K_{zt} = 1.00$$

ROOF HT = 30'

$$\theta = 33^\circ$$

$$I = 1.0$$

$$V = 110 \text{ MPH}$$

$$q = 0.00256 K_d K_z K_{zt} I V^2 = (0.00256)(0.85)(0.70)(1.0)(1.0)(110)^2$$

$$q_h = 18.4 \text{ PSF (ULT)}$$

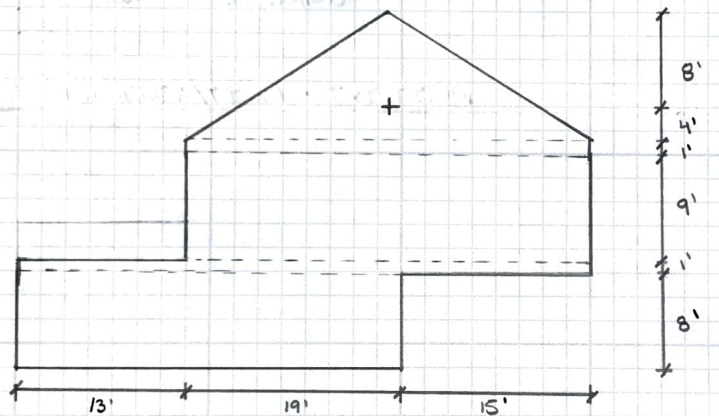
$$q_z = 26.3 \times K_z \text{ PSF (ULT)}$$

$$q_h = 11.1 \text{ PSF (ALL)}$$

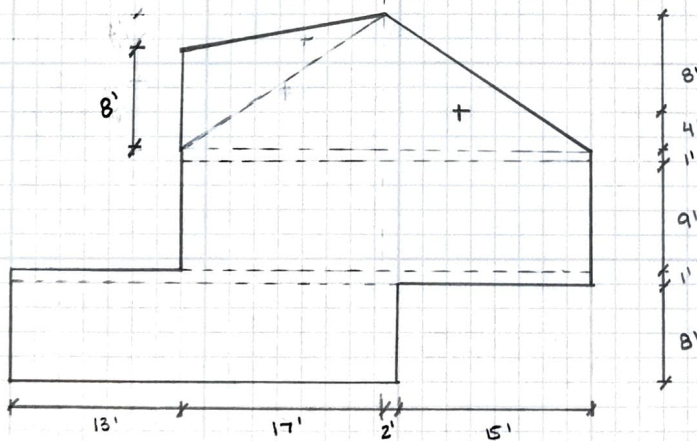
$$q_z = 15.8 \times K_z \text{ PSF (ALL)}$$

$C_p = 0.8$ WINDOWWARD / 0.5 LEEWARD

SOUTH ELEVATION - EXISTING



SOUTH ELEVATION - NEW



ZETTEL RESIDENCE

PROJECT

DATE

PROJ. #

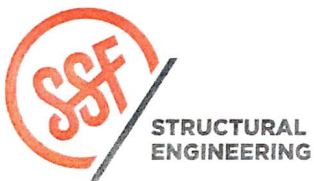
DESIGN

SHEET

7/2/20

SR0

LAT1



N/S

HEIGHT	Kz	WINDWARD	LEEWARD	Z
0-15	0.58	6.2 PSF	4.7 PSF	10.9 PSF
15-20	0.62	6.7 PSF	↓	11.4 PSF
20-25	0.66	7.1 PSF		11.8 PSF
25-30	0.70	7.5 PSF		12.2 PSF

FORCE PER FLOOR

N/S - EXISTING

LEVEL	TRIB. HT.	#1	L	FORCE
ROOF	9'1/2'	$(3)(11.8) + (5)(11.4) + (15)(10.9) = 109 \#1$	34'	3.69k
FLOOR UPPER	9'1/2'	$(9'1/2')(10.9 \text{ PSF}) = 104 \#1$	19'	1.97k
FLOOR LOWER	5'	$(5)(10.9 \text{ PSF}) = 55 \#1$	13'	2.69k
				8.35k

N/S - NEW

LEVEL	TRIB. HT.	#1	L	FORCE
ROOF NEW	TRIB AREA = $60' \times 12.0 \text{ PSF} = 0.72k$			0.72k
ROOF OLD	9'1/2'	109 #1	34'	3.69k
FLOOR UPPER	9'1/2'	104 #1	19'	1.97k
FLOOR LOWER	5'	55 #1	13'	2.69k
				9.07k

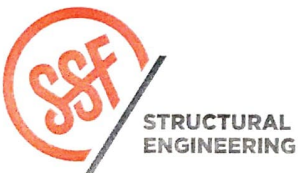
LOAD INCREASE = 12%

LOAD INCREASE = 8.69k < 10% INCREASE

(E) LATERAL SYSTEM ADEQUATE TO TAKE
ADDITIONAL WIND LOAD. RESOLVE (N)
LOAD INTO (E) DIAPHRAGM

NEW WIND LOAD @ WEST ELEVATION:

LOAD	0.72k
LENGTH	5'
SHEAR	144 #1
WALL	W6
O.T.	0.9k
H.D.	CS16

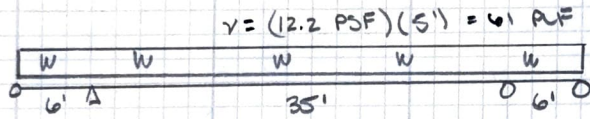


PROJECT ZETTEL RESIDENCE

DATE 7/2/20
 PROJ. # S20
 DESIGN LAT 2
 SHEET

LATERAL DESIGN

TRANSFER (N) LATERAL LOAD IN NORTH & SOUTH CORNER
WALLS INTO FLOOR DIAPHRAGM



LOAD	1.25 ^k	1.25 ^k
LENGTH	8'	8'
SHEAR	156 #1	156 #1
WALL	W6	W6
O.T.	0.7 ^k	0.7 ^k
H.D.	CS16	CS16

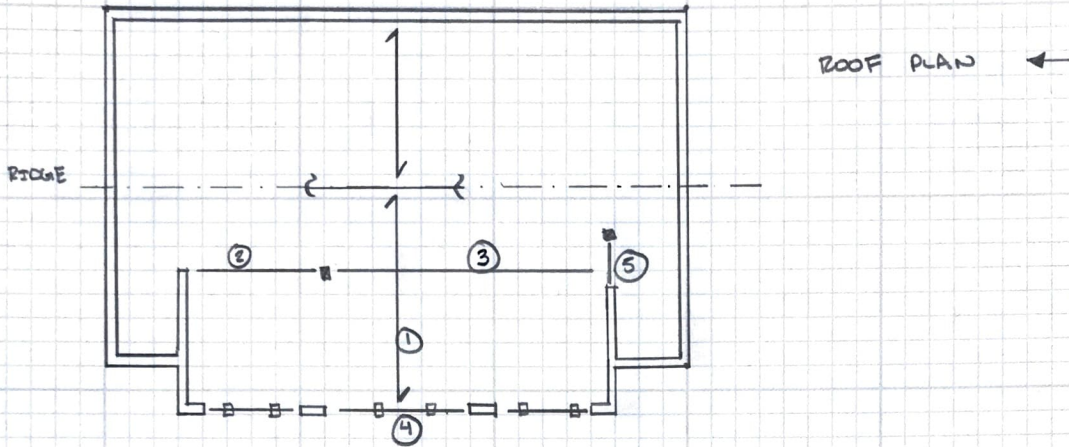
$$V = 1.25^k$$

$$L_{OEA} = 11'$$

$$V = \frac{1.25^k}{11'} = 114 \#1 < V_{OEA} = 240 \#1$$

NO DIAPHRAGM BLOCKING REQUIRED

VERTICAL DESIGN



① LVL 131/4 x 9 1/2 @ 16" o/c

$L = 17'$

$W = 53 \#$

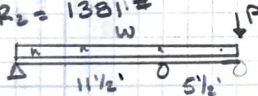
$P = (40 \text{ psf})(133)(8'1/2) = 453 \#$

$M_{pos} = 0.01 \text{ k}$

$M_{ng} = -3.34 \text{ k}$

$R_1 = 34 \#$

$R_2 = 1381 \#$



$f_b = 1526 \text{ psi}$

$f_v = 60 \text{ psi}$

$\Delta_{pos} = 0.12" = 4/1150$

$\Delta_{ng} = 0.39" = 24/223$

③ GLB 621/4 x 16 1/2

$L = 22'1/2'$

$W = 1036 \#$

$M = 65.50 \text{ k}$

$R = 11.06 \text{ k}$

$f_b = 2732 \text{ psi}$
 $CV = 0.94$

$f_v = 157 \text{ psi}$

$\Delta = 1.31" = 4/240$

④ 6x6B

$L = 6'$

$W = 240 \#$
 $Trib = 6'$

$M = 1.08 \text{ k}$

$R = 0.72 \text{ k}$

$f_b = 467 \text{ psi}$

$f_v = 36 \text{ psi}$

$\Delta = 0.06" = 4/1254$

② GLB 51/2 x 12

$L = 11'1/2'$

$W = 1036 \#$
 $(1381 \# / 10'')$

$M = 17.13 \text{ k}$

$R = 5.96 \text{ k}$

$f_b = 1671 \text{ psi}$

$f_v = 145 \text{ psi}$

$\Delta = 0.31" = 4/450$

⑤ 4x10 HOR

$L = 3'$

$P = 11.06 \text{ k}$

$M = 7.77 \text{ k}$

$R_1 = 7.77 \text{ k}$

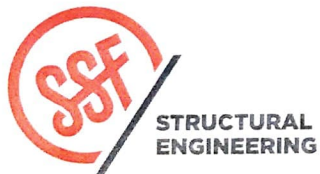
$R_2 = 3.89 \text{ k}$



$f_b = 1128 \text{ psi}$

$f_v = 223 \text{ psi}$

$\Delta = 0.01" = 4/2009$



ZETTEL RESIDENCE

PROJECT _____

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DATE _____

PROJ. # _____

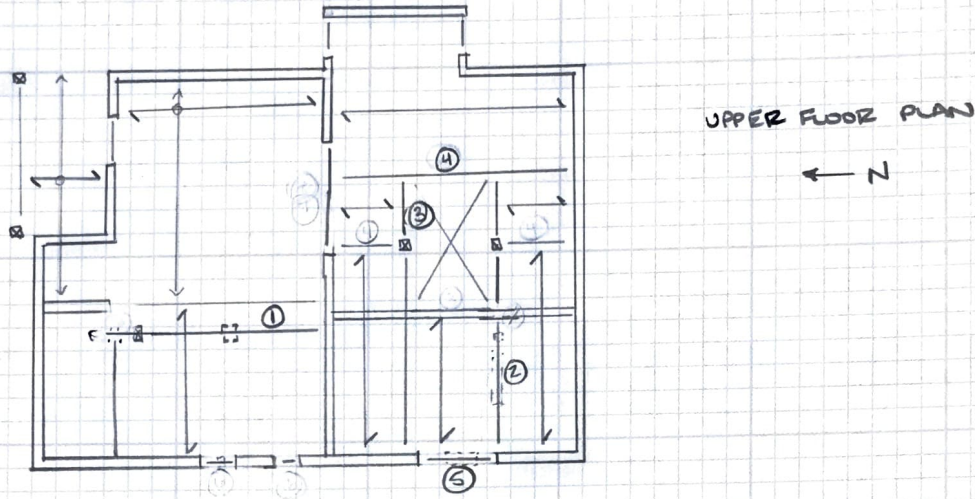
SR2

DESIGN _____

V1

SHEET _____

VERTICAL DESIGN



① WBx35

$L = 19'$

$W = 338 \#1$
 $Trib = 63/4'$

$P_1 = 5.96k + 11.66k = 17.62k$

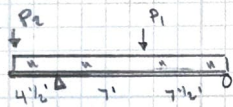
$P_2 = 5.96k$

$M_{pos} = 57.56k'$

$M_{neg} = -30.60k'$

$R_1 = 21.57k$

$R_2 = 9.10k$



③ (2) 2x8

$L = 4 1/2'$

$W = 350 \#1$
 $Trib = 7'$

$M = 0.89k'$

$R = 0.79k$

$f_b = 405 \text{ psi}$

$f_v = 54 \text{ psi}$

$\Delta = 0.03'' = L/2069$

② (5) LVL 13/4 x 7/4

$L = 14 1/2'$

$P_1 = 7.77k$

$P_2 = 3.89k$

$M = 18.52k'$

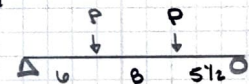
$R_1 = 1.61k$

$R_2 = 10.05k$

$f_b = 22.1 \text{ ksi}$

$\Delta_{pos} = 0.18'' = L/600$

$\Delta_{neg} = -0.44'' = L/394$



④ (3) LVL 13/4 x 7/4

$L = 19 1/2'$

$P = 0.79k$

$M = 4.62k'$

$R_1 = 0.77k$

$R_2 = 0.81k$

$f_b = 1205 \text{ psi}$

$f_v = 32 \text{ psi}$

$\Delta = 0.91'' = L/245$

⑤ (2) 2x10

$L = 7'$

$W = 505 \#1$
 $Trib = 6 1/2' \text{ FUR}$
 $+ 1/2' \text{ RT}$

$P = 0.9k$

$M = 4.42k'$

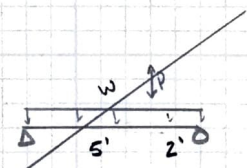
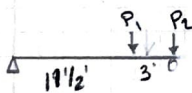
$R_1 = 2.23k (0.07k)$

$R_2 = 2.62k (-0.32k)$

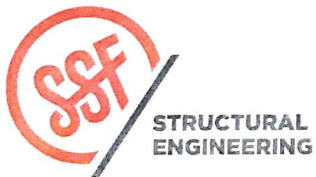
$f_b = 1240 \text{ psi}$
(970 psi w/o O.T.)

$f_v = 142 \text{ psi}$

$\Delta = 0.15'' = L/553$



↑ UPLIFT w/ 0.60DL



PROJECT ZETTEL RESIDENCE

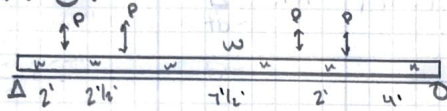
DATE 7/13/20
PROJ. # S20
DESIGN V2
SHEET

⑤ DESIGN NEW RIM TO TAKE OUT O.T. FROM ABOVE

$P = 0.9k$

$W = (0.6)(10\text{PSF})(13') = 7.8k$

RIM ①:



$R = 0.93k$

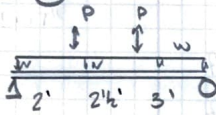
$0.48k$

$R = 0.48k$

$R = 0.93k$

NO UPLIFT, ✓ OK

RIM ②:



$R = 0.03k$

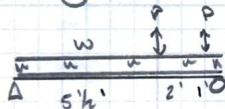
$0.59k$

$R = 0.59k$

$0.03k$

NO UPLIFT, ✓ OK

RIM ③:



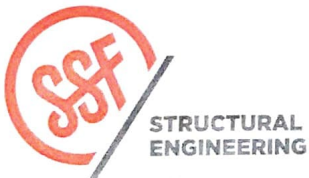
$R = 0.54k$

$0.12k$

$R = 0.12k$

$0.54k$

NO UPLIFT, ✓ OK



PROJECT ZETTEL RESIDENCE

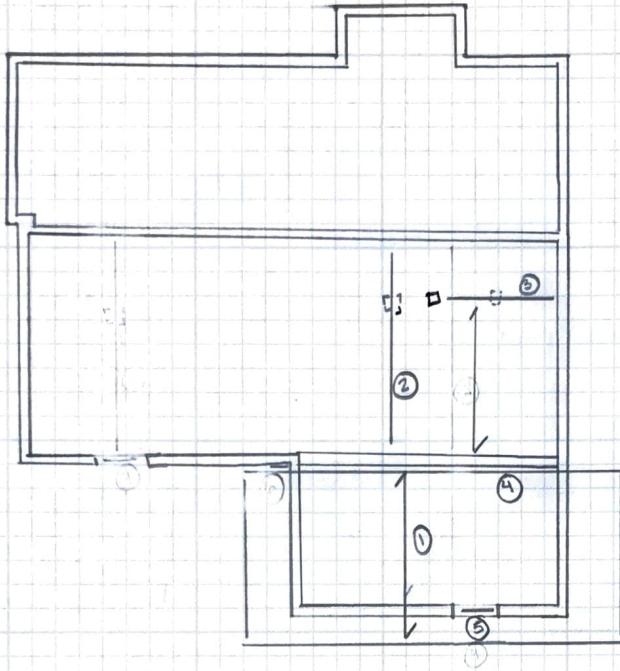
DATE 7/22/20

PROJ. # seo

DESIGN V3

SHEET

VERTICAL DESIGN



① (2) 2x8 @ 24" o.c.

$L = 13\frac{1}{2}'$

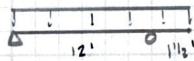
$w = 140 \text{ \#/ft}$
DECK LL = 60 PSF

$M_{pos} = 2.52 \text{ k-ft}$

$M_{neg} = -0.16 \text{ k-ft}$

$R_1 = 854 \text{ \#}$

$R_2 = 1099 \text{ \#}$



$f_b = 1152 \text{ psi}$

$f_v = 118 \text{ psi}$

$\Delta_{pos} = 0.16" = \frac{24}{225}$

$\Delta_{neg} = 0.43" = \frac{4}{335}$

③ (2) LVL 1 3/4 x 9 1/4

$L = 11'$

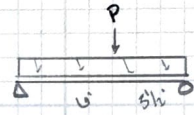
$w = 325 \text{ \#/ft}$
Trib = 4 1/2'

$P = 1.04 \text{ k}$

$M = 7.71 \text{ k-ft}$

$R_1 = 2.26 \text{ k}$

$R_2 = 2.35 \text{ k}$



$f_b = 1854 \text{ psi}$

$f_v = 109 \text{ psi}$

$\Delta = 0.34" = \frac{4}{390}$

② (2) LVL 1 3/4 x 9 1/4

$L = 17\frac{1}{2}'$

$P = 0.79 \text{ k} + 50 \frac{(4.5)^2}{4} = 1.04 \text{ k}$

$M = 3.48 \text{ k-ft}$

$R_1 = 0.77 \text{ k}$

$R_2 = 0.27 \text{ k}$

$f_b = 836 \text{ psi}$

$f_v = 36 \text{ psi}$

$\Delta = 0.31" = \frac{4}{676}$

④ GLB 3 1/8 x 7 1/2

$L = 12'$

$w = 420 \text{ \#/ft}$
Trib = 16'

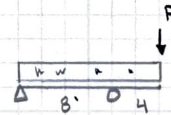
$P = (70 \text{ PSF})(2)(4') = 560 \text{ \#}$

$M_{pos} = 1.16 \text{ k-ft}$

$M_{neg} = -5.64 \text{ k-ft}$

$R_1 = 0.99 \text{ k}$

$R_2 = 4.67 \text{ k}$



$f_b = 2381 \text{ psi}$

$C_v = 0.97$

$f_v = 154 \text{ psi}$

$\Delta_{pos} = 0.02" = \frac{4}{1454}$

$\Delta_{neg} = -0.25"$



ZETTEL RESIDENCE
PROJECT _____

7/14/20
DATE _____
PROJ. # **S20**
DESIGN **V4**
SHEET _____

5 (2) 2x4

L = 3'

W = 550 #/ft
(1099/24")

M = 0.62 k

R = 0.83 k

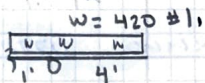
f_b = 1212 psi [F_b = (1.5)(800) = 1275 psi]

f_v = 118 psi

Δ = 0.07" = 4/501

12 B

REACTION C (4) BOLTED WOOD TO WOOD JOINT

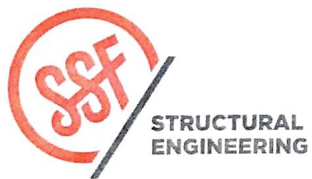


Z_m = 3 1/2" Z_s = 1 1/2"

R = 2100 #

o o o

$\phi P_n = 1.5 A_b F_u$
 $\phi P_n = 1.5 (0.44) (58) = 39.3$
 $\phi P_n = 1.5 A_b F_u$
 $\phi P_n = 1.5 (0.44) (58) = 39.3$
 $\phi P_n = 1.5 A_b F_u$
 $\phi P_n = 1.5 (0.44) (58) = 39.3$



ZETTEL RESIDENCE

PROJECT _____

7/14/20

DATE _____

PROJ. # SR0

DESIGN VS

SHEET _____

Column Buckling Calculations

NDS 2012

Column Geometry Data

6X Posts Doug Fir - Larch #1	
-N/A-	
b	5.5 in
d	5.5 in
Le ₁	8.50 ft
Le ₂	8.50 ft
le _{bending}	ft

Column Design Values

F _b	1200 psi
F _c	1000 psi
E' _{min}	580 ksi
F _{cperp}	0 psi
cb	1.00

Column Loading

P	21570 lbs
W ₁	5.0 plf
M1	45 ft-lbs
W ₂	5.0 plf
M2	45 ft-lbs

Flexural Stress Adjustment Factors

Roof/EQ / Wind - C _D	1.15
Size Factor - C _F	1.00
Repetitive - C _r	1.00

Compressive Parallel Adjustment Factors

Roof/EQ / Wind - C _D	1.15
Size Factor - C _F	1.00

Other Factors

Visually Graded Lumber	
c	0.8
Solid Column	
K _f	1
Column: Pinned Pinned	
K _e	1

Column Stability Factor Calculation

Strong Axis

F _{ce1}	1386 psi
F _{c*1}	1150 psi
F _{ce1} /F _{c*1}	1.205
C _{p1}	0.751

Weak Axis

F _{ce2}	1386 psi
F _{c*2}	1150 psi
F _{ce2} /F _{c*2}	1.205
C _{p2}	0.751

Bracing

No Brace
No Brace

Beam Stability Factor Calculation

Strong Axis

F _{be1}	20946 psi
F _{b'1}	1380 psi
F _{be1} /F _{b'1}	15.2
le	15.2 ft
CL ₁	1.00

Weak Axis

F _{be2}	20,850 psi
F _{b'2}	1380 psi
F _{be2} /F _{b'2}	15

Bearing

Area
Increase
No

Adjusted Allowable Stresses

Strong Axis

F _{c'1}	864 psi
F _{b'1}	1380 psi

Weak Axis

F _{c'2}	864 psi
F _{b'2}	1380 psi

Imposed Column Stresses

Strong Axis

f _{c1}	713 psi
f _{b1}	20 psi

Weak Axis

f _{c2}	713 psi
f _{b2}	20 psi

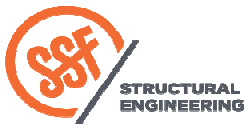
Perpendicular to Grain Stress Check f _c /F _c ' =	-N/A-	OK
Slenderness Check le/d	19	OK
Slenderness Check le/b	19	OK

$$(1) \left(\frac{f_c}{F_c'} \right)^2 + \frac{f_{b1}}{F_{b1}' [1 - f_c/F_{cE}]} + \frac{f_{b2}}{F_{b2}' [1 - f_c/F_{cE} - (f_{b1}/F_{b1}')] } \leq 1.0$$

$$(2) \frac{f_c}{F_{cE2}} + \left(\frac{f_{b1}}{F_{bE}} \right)^2 < 1.0$$

$$(3) \frac{f_c}{F_{c1}'} , \frac{f_{b1}}{F_{b1}'} , \frac{f_{b2}}{F_{b2}'} < 1.0$$

Allowable Stress Interaction Formula	0.83	OK
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Office: 206.443.6212
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Project: Zettel Residence Date: 7/29/2020

6x6 posts under steel beam Project #: _____

Design: SRO

Sheet: V6

FOUNDATION DESIGN

- WORST CASE @ NEW BEAM SEPARATING KITCHEN & DINING

$$P_{max} = 21.57k$$

$$p = 1500 \text{ PSF (ALLOWABLE BEARING PRESSURE)}$$

$$A_{FTG} = \frac{21.57k}{1.5k/ft^2} = 14.4 \text{ ft}^2$$

USE 4'-0" SQ. X 10" DP. FTG
W/ (5) #4 E.W. BOT

- ELSEWHERE

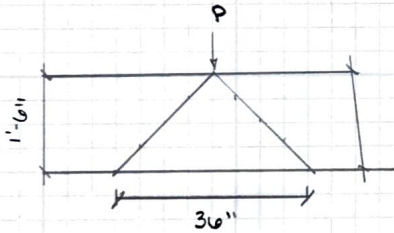
$$P_{max} = 9.10k$$

$$p = 1500 \text{ PSF}$$

$$A_{FTG} = \frac{9.10k}{1.5} = 6.06 \text{ ft}^2$$

USE 2'-6" SQ. X 10" DP. FTG
W/ (3) #4 E.W. BOT.

- UNDER (N) 6x10 POST @ DECK LEONER



$$A_{FTG} = \frac{(36")(16")}{144 \text{ ft}^2/\text{ft}^2} = 4 \text{ ft}^2$$

$$P_{allow} = (1.5 \text{ ksf})(4 \text{ ft}^2) = 6.0k > 4.67k$$

(E) FOUND ON FOR
ADD'L LOAD