



Structural Calculations For:

Kaempf Residence

8238 Southeast 72nd Street

Mercer Island, Washington 98040



Prepared for: HERE architecture + interiors

Job #: 13021-2022-03

Date: February 22, 2022

Criteria Sheet

Codes

Structural IBC 2018
 Loading ASCE 7-16
 Wood: NDS 2018
 Steel: AISC 360-16
 Concrete: ACI 318-14
 Masonry: TMS 402/602-16

Project Location

Street & Number 8238 SE 72nd St
 City: Mercer Island State: WA
 ZIP: 98040
 Latitude: 47.5387 N
 Longitude: -122.2280 W
 Ground Elevation 321 ft

Occupancy Category

Risk Category: II ASCE 7 Table 1.5-1

Seismic Load Summary:

Analysis Procedure: Equivalent Lateral Force Procedure
 Lateral System: Light-frame (wood) Walls Sheathed with Wood
 Structural Panels Rated for Shear Resistance
 R: 6.50 $C_d = 4$
 Base Shear V = 20 kips $\Omega_o = 2.5$
 $S_s = 1.465$ $S_1 = 0.506$
 $S_{DS} = 1.17$ $S_{D1} = 0.57$
 $C_s = 0.180$ $I_e = 1.0$



Story Information

Stories Above Grade (Including Mezzanine Levels) 3

Horizontal and Vertical Irregularities:

Is the building a "Regular Structure"? (No horizontal or vertical irregularities) No

Wind Load Summary:

V = 110 $K_{zt} = 1.30$
 Exposure = B

Dead Loads:

Roof		Floor	
Roofing	2.5 psf	Finish Floor	1 psf
1/2" Sheathing	1.5 psf	3/4" Sheathing	2.3 psf
Rafters/Trusses	2 psf	Joists	2.6 psf
Insulation	1 psf	5/8" GWB	3.1 psf
5/8" GWB	3.1 psf	Misc./Mech.	1 psf
Solar Panels	5 psf		10 psf
	15 psf	Use	10 psf
Use	15 psf		

Live Loads:

Roof	20 psf
Floor	40 psf
Deck	60 psf

Snow Loading Criteria:

Ground Snow, p_g	20 psf	Flat Roof Snow Load, p_f	25.0 psf
Exposure Factor, C_e	1.00	Sloped Roof Snow Load, p_s	25.0 psf
Thermal Factor, C_t	1.00		
Importance Factor, I_s	1.00		
Slope Factor, C_s	1.00		

Soils:

Soils Report Provided?	No	To be approved by the authority having jurisdiction, per 11.8.2 exception.	
Allowable Bearing	1500 psf	Active	55/35 pcf (Restrained/Unrestrained)
Sliding, μ	0.45	Seismic Surcharge	8H
Passive	350 pcf		



Kaempff Residence
 Mercer Island, Washington

DATE 2/9/2023

PROJ. #

DESIGN JDT

SHEET CR1

Seismic Design

ASCE 7-16 Seismic Analysis

Equivalent Lateral Force Procedure

Seismic Force Resisting System Per Table 12.2-1	System	Bearing Wall Systems
	Type:	Light-frame (wood) Walls Sheathed with Wood Structural Panels Rated for Shear Resistance

Seismic Design Cat.	D
Risk Category	II
Site Class	D (Default)
Diaphragm Flexibility	Flexible

I, II, or III, or IV per Table 1.5-1
Assumed default soil properties, per 11.4.3.

Section 12.8.1.3 Exceptions

Regular Structure	No
≤ 5 Stories above grade	Yes
$T \leq 0.5s$	Yes
$\rho = 1.0$	No
Not Site Class E or F	Yes
Risk Category I or II	Yes

If all exceptions are met, S_{DS} may be taken as 1, but not less than $0.7 \times (\text{Calculated } S_{DS})$

S_s	1.465 g	2% in 50 yr, Latitude & Longitude lookup
S_1	0.506 g	2% in 50 yr, Latitude & Longitude lookup
R	6.50	
C_d	4.0	
Ω_o	2.5	
I_e	1.00	Table 1.5-2
h_n	25.5 ft	
C_t	0.02	Table 12.8-2
x	0.75	Table 12.8-2
T_a	0.23 sec	
T	0.23 sec	Eq. 12.8-7
T_o	0.10 sec	
T_s	0.49 sec	
T_L	6.00 sec	
F_a	1.20	Table 11.4-1
F_v	1.70	Table 11.4-2
S_{MS}	1.76 g	Eq. 11.4-1
S_{M1}	0.86 g	Eq. 11.4-2
S_{DS}	1.172 g	Eq. 11.4-3
S_{D1}	0.573 g	Eq. 11.4-4
C_s	0.180 Controls	Eq. 12.8-2
	0.389	Eq. 12.8-3 need not exceed, $T < T_L$
	0.010	Eq. 12.8-5 or 12.8-6 minimum
C_s, design	0.180	Section 11.4.8 Exception 2 Applied
Bldg. Weight	109.2 k	
$V = C_s W$	19.7 k	Eq. 12.8-1, Strength Level Base Shear
$V = C_{s,asd} W$	13.8 k	Eq. 12.8-1 ASD Base Shear

Building Period Per Alternate Analysis

T (sec)	
---------	--

Per Geotech Report

F_a	
F_v	

$$T_a = C_t h_n^x \quad \text{Eq. 12.8.7}$$

$$S_{MS} = F_a S_s \quad \text{Eq. 11.4-1}$$

$$S_{M1} = F_v S_1 \quad \text{Eq. 11.4-2}$$

$$S_{DS} = \frac{2}{3} S_{MS} \quad \text{Eq. 11.4-3}$$

$$S_{D1} = \frac{2}{3} S_{M1} \quad \text{Eq. 11.4-4}$$

$$C_s = \frac{S_{DS}}{(R/I_e)} \quad \text{Eq. 12.8-2}$$

$$C_s = \frac{S_{D1}}{T(R/I_e)} \quad \text{Eq. 12.8-3}$$

$$C_s = \frac{S_{D1} T_L}{T^2 (R/I_e)} \quad \text{Eq. 12.8-4}$$

$$C_s \geq 0.044 S_{DS} I_e \quad \text{Eq. 12.8-5}$$

$$C_s \geq 0.01 \quad \text{Eq. 12.8-5}$$

$$C_s \geq 0.5 \frac{S_1}{(R/I_e)} \quad \text{Eq. 12.8-6}$$

$$C_{VX} = w_x h_x^k / \sum_{i=1}^n w_x h_i^k \quad \text{Eq. 12.8-12}$$

$$F_{px} = \frac{\sum_{i=x}^n F_i}{\sum_{i=x}^n w_i} w_{px} \quad \text{Eq. 12.10-1}$$

$$F_{px} \geq 0.2 S_{DS} I_e w_{px} \quad \text{Eq. 12.10-2}$$

$$F_{px} \leq 0.4 S_{DS} I_e w_{px} \quad \text{Eq. 12.10-3}$$

Vertical Distribution ASD $\rho = 1.3$ $k = 1.000$

Level	h_x (ft)	W_x (k)	h_x^k (ft)	$W_x h_x^k$	Story Shear ASD			Diaphragm Force (ρ not included)						
					C_{vx} (%)	F_x (k)	SV (k)	$F_{px,calc}$	$F_{px,min}$	$F_{px,max}$	$F_{px,design}$	$V = F_{px} / F_x$		
Roof	25.5	21.3	25.5	543	0.319	5.7	5.7	4.4	3.5	7.0	4.4	0.77		
Second	16.8	50.9	16.8	853	0.501	9.0	14.7	8.0	8.4	16.7	8.4	0.93		
First	8.3	37.0	8.3	305	0.179	3.2	17.9	4.7	6.1	12.1	6.1	1.89		
Σ		109.2		1701		17.9								



Kaempf Residence	DATE	2/9/2023
Mercer Island, Washington	PROJ. #	
	DESIGN	JDT
	SHEET	CR2

Wind Design - MWFRS

ASCE 7 Chapter 27 - Directional Procedure

Design Method	ASD
---------------	-----

Wind Coefficients

Exposure	B	
V=	110	mph
K_d =	0.85	Table 26.6-1
K_{zt} =	0.67	Table 26.10-1
K_e =	0.99	Table 26.9-1
G=	0.85	26.9.4

Transverse Wind Pressures

L/B = 0.42 h/L = 0.84

Pressure Coefficients from Figure 27.3-1:

Bldg Face	C_p
Windward Wall	0.8
Leeward Wall	-0.50
Windward Roof	-1.17 / -0.18
Leeward Roof	-0.63

Location and Building Dimensions

Calculate K_{zt} ?	No	
K_{zt}	1.30	
Roof Type	Gable	
Roof Slope - Transverse Dir	0	degrees
Roof Slope - Long Dir	15	degrees
Ground to top of roof	27.25	ft
Bot of roof to top of roof	3.5	ft
Mean Roof Height, h	25.5	ft
Short Plan Dimension	30.5	ft
Long Plan Dimension	72.5	ft
Parapet ?	No	
Ground to top of parapet		ft
Average Parapet Height		ft

Velocity Pressure at Mean Roof Height, q_n =	22.6	psf
--	------	-----

Wall Pressures (Unfactored):

ASD

Ht	K_z	q_z	$P_{ww \text{ walls}}$	$P_{lw \text{ walls}}$	$P_{\text{walls (psf)}}$
0-15	0.57	19.28	13.11	9.62	13.6
15-20	0.62	20.98	14.26	9.62	14.3
20-25	0.66	22.33	15.18	9.62	14.9
25-30	0.7	23.68	16.10	9.62	15.4
30-40	0.76	25.71	17.48	9.62	16.3
41-50	0.81	27.40	18.64	9.62	17.0
51-60	0.85	28.76	19.56	9.62	17.5
61-70	0.89	30.11	20.48	9.62	18.1
71-80	0.93	31.46	21.40	9.62	18.6
81-90	0.96	32.48	22.09	9.62	19.0
91-100	0.99	33.49	22.78	9.62	19.4

Roof Pressures (Unfactored)

ASD

Windward		Leeward	Horiz Proj (psf)
Max	Min		
-3.5	-22.5	-12.2	5.24

Longitudinal Wind Pressures

L/B = 2.38 h/L = 0.35

Pressure Coefficients from Figure 27.4-1:

Bldg Face	C_p
Windward Wall	0.8
Leeward Wall	-0.28
Windward Roof	-0.58 / -0.07
Leeward Roof	-0.50

Wall Pressures (Unfactored):

ASD

Ht	K_z	q_z	$P_{ww \text{ walls}}$	$P_{lw \text{ walls}}$	$P_{\text{walls (psf)}}$
0-15	0.57	19.28	13.11	5.41	11.11
15-20	0.62	20.98	14.26	5.41	11.80
20-25	0.66	22.33	15.18	5.41	12.35
25-30	0.7	23.68	16.10	5.41	12.91
30-40	0.76	25.71	17.48	5.41	13.74
41-50	0.81	27.40	18.64	5.41	14.43
51-60	0.85	28.76	19.56	5.41	14.98
61-70	0.89	30.11	20.48	5.41	15.53
71-80	0.93	31.46	21.40	5.41	16.08
81-90	0.96	32.48	22.09	5.41	16.50
91-100	0.99	33.49	22.78	5.41	16.91

Roof Pressures (Unfactored)

ASD

Windward		Leeward	Horiz Proj (psf)
Max	Min		
-1.4	-11.2	-9.6	4.92



Kaempff Residence
 Mercer Island, Washington

DATE 2/9/2023
 PROJ. #
 DESIGN JDT
 SHEET CR3

LATERAL ANALYSIS

SEISMIC DESIGN

ROOF DIA.: 15 PSF x 1,115 SQ.FT. + 5 PSF x 909 SQ. FT. = 21.3 K

SECOND FLOOR & LOW ROOF DIA.: 20 PSF x 909 SQ. FT. + 15 PSF x 1,577 SQ. FT.
+ 5 PSF x 1,125 SQ. FT. + 10 PSF x 342 SQ, FT, = 50.9 K

FIRST FLOOR DIA.: 15 PSF x 2,034 SQ. FT. + 10 PSF x 648 SQ. FT. = 37.0 K

BASE SHEAR = 17.9 KIPS

WIND DESIGN

ROOF DIA.: 15.40 PSF x 3.5 FT. x 0.5 FT. + 14.90 PSF x 3.5 FT. = 79 PLF

SECOND FLOOR DIA.: 14.90 PSF x 0.25 FT. 14.30 PSF x 5 FT. + 13.60 PSF x 2.5 FT. = 109 PLF

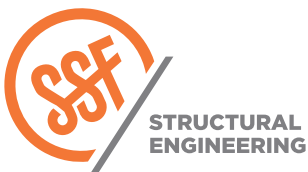
LOW ROOF DIA.: 5.24 PSF x 3.5 FT. + 14.30 PSF x 1 FT. + 13.60 PSF x 2.875 FT. = 72 PLF

FIRST FLOOR DIA.: 13.60 PSF x 8.375 FT. = 114 PLF

DIRECTION	LEVEL	PLF	WIDTH	FORCE
N/S	ROOF DIA.	79 PLF	48 FT.	3.8 KIPS
N/S	SECOND FLOOR DIA.	109 PLF	48 FT.	5.2 KIPS
N/S	LOW ROOF DIA.	72 PLF	25.5 FT.	1.8 KIPS
N/S	FIRST FLOOR DIA.	114 PLF	72.5 FT.	8.3 KIPS
E/W	ROOF DIA.	79 PLF	22 FT.	1.7 KIPS
E/W	SECOND FLOOR DIA.	109 PLF	22 FT.	2.4 KIPS
E/W	LOW ROOF DIA.	72 PLF	8.5 FT.	0.6 KIPS
E/W	FIRST FLOOR DIA.	114 PLF	30.5 FT.	3.5 KIPS

N/S BASE SHEAR = 19.1 KIPS

E/W BASE SHEAR = 8.2 KIPS



KAEMPF RESIDENCE

PROJECT
MERCER ISLAND, WASHINGTON

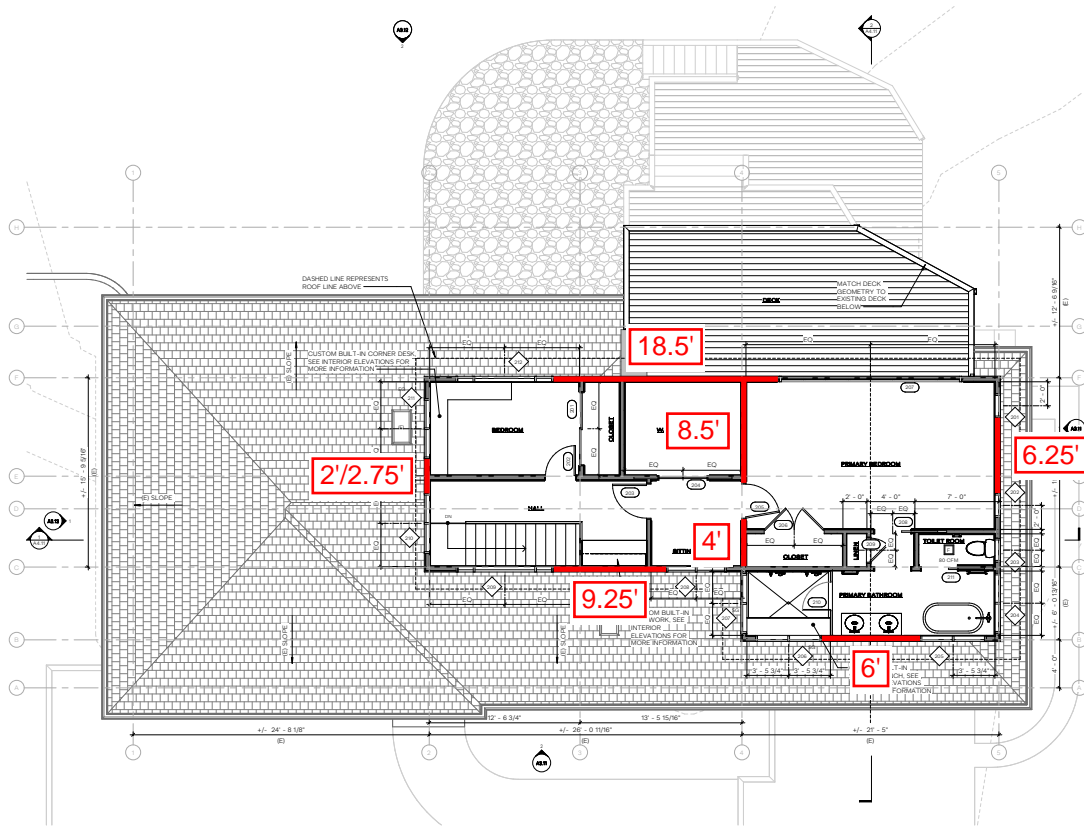
DATE

PROJ. # JDT

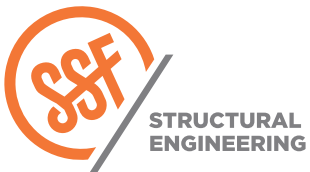
DESIGN L1

SHEET

LATERAL DESIGN KEY PLAN



SECOND FLOOR PLAN



KAEMPF RESIDENCE

PROJECT
 MERCER ISLAND, WASHINGTON

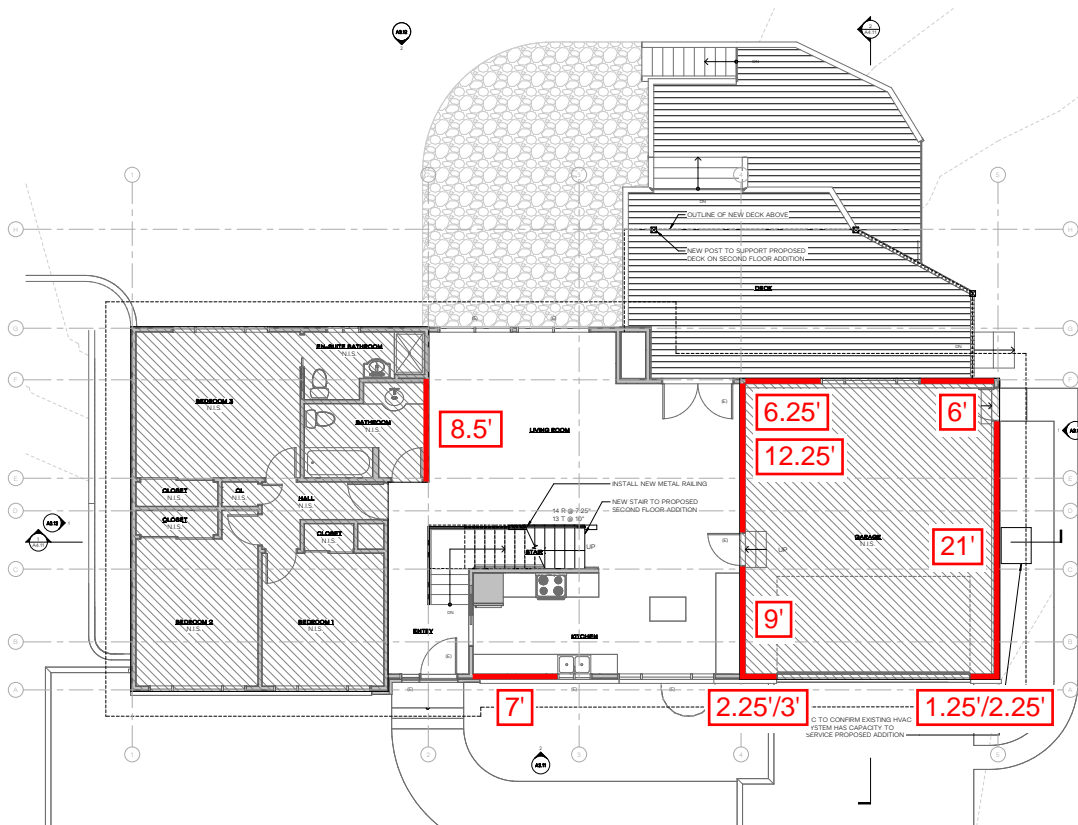
DATE _____

PROJ. # **JDT**

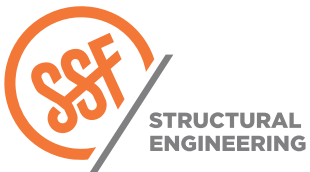
DESIGN **L2**

SHEET _____

LATERAL DESIGN KEY PLAN



FIRST FLOOR PLAN



KAEMPF RESIDENCE
 PROJECT
MERCER ISLAND, WASHINGTON

DATE	
PROJ. #	JDT
DESIGN	L3
SHEET	

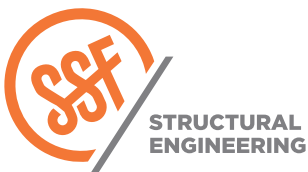
LATERAL DESIGN

N/S DIRECTION - SEISMIC DESIGN

ROOF DIA.:	1.4 K	2.9 K	1.4 K
FORCE (KIPS)	1.4 K	2.9 K	1.4 K
SHEARWALL LENGTH (FT.)	2 FT./2.75 FT.	12.5 FT.	6.25 FT.
SHEAR (PLF)	700 PLF	232 PLF	224 PLF
SHEARWALL TYPE	2W3	W6	W6
OVERTURNING (KIPS)	3.6 K - 0.6 DL	1.6 K - 0.6 DL	1.6 K - 0.6 DL
HOLDOWN TYPE	(2)CS16	CS16	CS16

N/S DIRECTION - SEISMIC DESIGN

SECOND FLOOR & LOW ROOF DIA.:	4.7 K	5.5 K	2.9 K
FORCE (KIPS)	4.7 K	5.5 K	2.9 K
SHEARWALL LENGTH (FT.)	8.5 FT.	21.25 FT.	21 FT.
SHEAR (PLF)	553 PLF	259 PLF	138 PLF
SHEARWALL TYPE	W2	W4	W6
OVERTURNING (KIPS)	4.4 K - 0.6 DL	2.1 K - 0.6 DL	1.1 K - 0.6 DL
HOLDOWN TYPE	(3)CS16	HDU2	NONE



KAEMPF RESIDENCE

PROJECT
MERCER ISLAND, WASHINGTON

DATE

PROJ. # JDT

DESIGN L4

SHEET

LATERAL DESIGN

E/W DIRECTION - SEISMIC DESIGN

ROOF DIA.:

FORCE (KIPS)

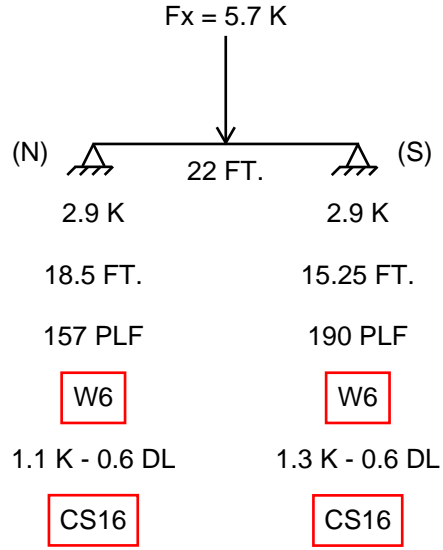
SHEARWALL LENGTH (FT.)

SHEAR (PLF)

SHEARWALL TYPE

OVERTURNING (KIPS)

HOLDOWN TYPE



E/W DIRECTION - SEISMIC DESIGN

SECOND FLOOR & LOW ROOF DIA.:

FORCE (KIPS)

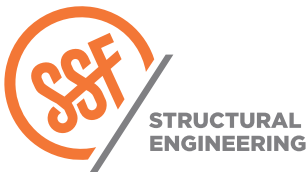
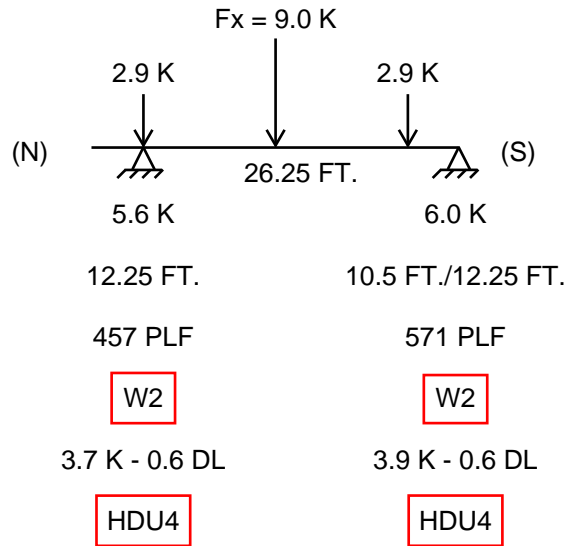
SHEARWALL LENGTH (FT.)

SHEAR (PLF)

SHEARWALL TYPE

OVERTURNING (KIPS)

HOLDOWN TYPE



KAEMPF RESIDENCE

PROJECT
MERCER ISLAND, WASHINGTON

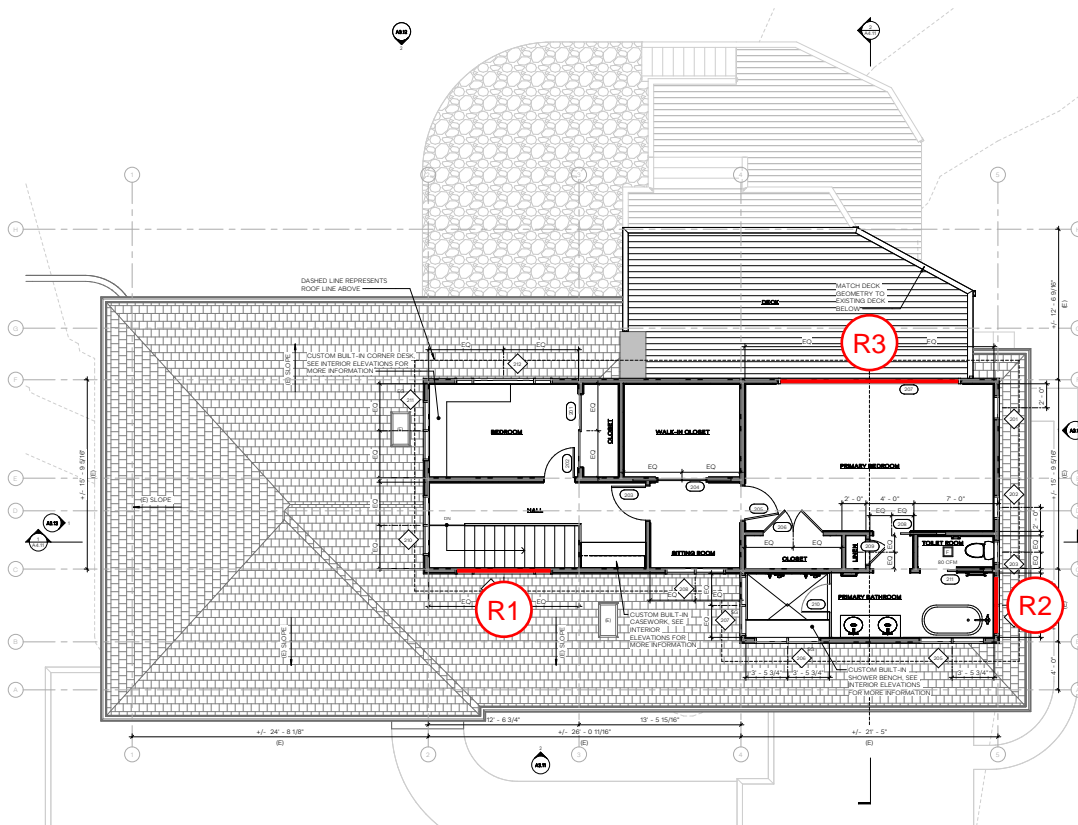
DATE

PROJ. # JDT

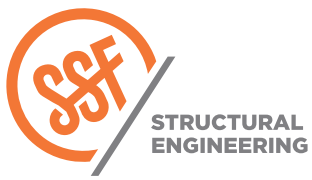
DESIGN L5

SHEET

GRAVITY DESIGN KEY PLAN



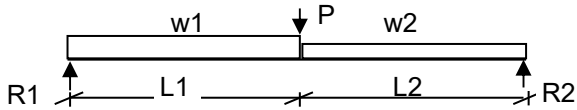
ROOF FRAMING PLAN



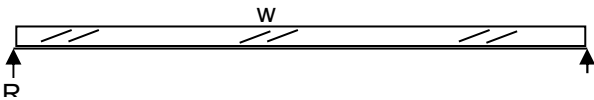
KAEMPF RESIDENCE
 PROJECT
MERCER ISLAND, WASHINGTON

DATE	
PROJ. #	JDT
DESIGN	G1
SHEET	

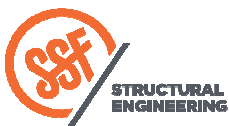
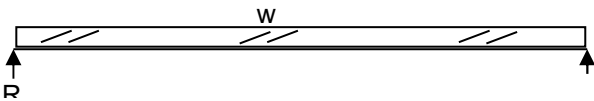
Header		R1		GL 3 1/2x9
w1=	120	plf		R1 = 1,223 lbs
w2=	400	plf		R2 = 2,237 lbs
L1=	6	ft		M = 4,911 lb-ft
L2=	3	ft		Fb = 1,247 psi
X=	4.5	ft		Fv = 92 psi
P=	1,600	lbs		Δ = 0.14 in
b=	3.50	in		I/
d=	9.00	in		Cv = 1.00
E=	1,800	ksi		



Header		R2		(2)2x8
w=	520	plf		R= 1,365 lbs
L=	5.25	ft		M= 1,792 ft-lbs
b=	3.00	in		Fb= 818 psi
d=	7.25	in		Fv= 72 psi
E=	1300	ksi		Δ = 0.07 in
Cv=	1.00	≤ 1.0		I/



Header		R3		GL 5 1/2x9
w=	120	plf		R= 930 lbs
L=	15.5	ft		M= 3,604 ft-lbs
b=	5.50	in		Fb= 582 psi
d=	9.00	in		Fv= 25 psi
E=	1800	ksi		Δ = 0.26 in
Cv=	1.00	≤ 1.0		I/

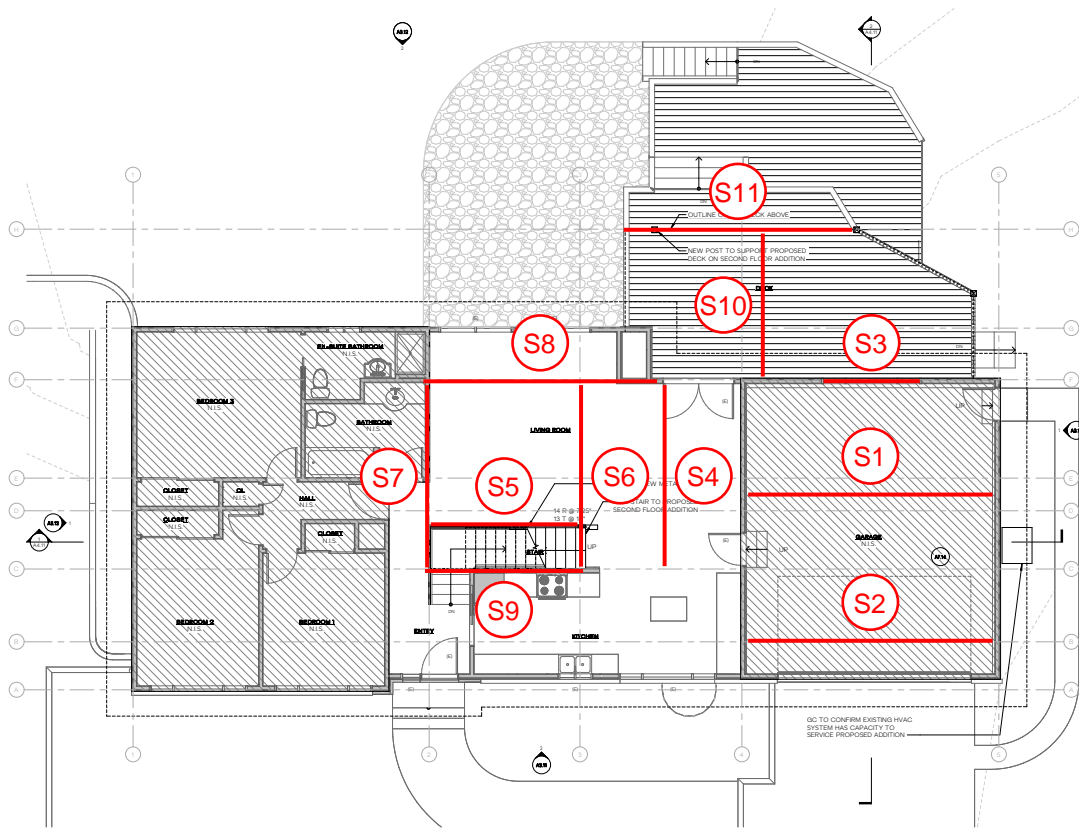


2124 Third Avenue . Suite 100 . Seattle . WA 98121
www.swensonsayfaget.com

Office: 206.443.6212
Fax: 206.443.4870

Project: Kaempf Residence Date: 01/26/23
Mercer Island, Washington Project #: _____
Roof Framing Design: JDT
 _____ Sheet: G2

GRAVITY DESIGN KEY PLAN

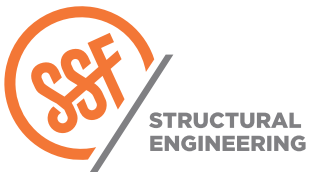


2124 Third Ave, Suite 100, Seattle, WA 98121 | ☎ 206.443.6212
934 Broadway, Suite 100, Tacoma, WA 98402 | ☎ 253.284.9470

SEATTLE
TACOMA

ssfengineers.com

SWENSON SAY FAGÉT



KAEMPF RESIDENCE
PROJECT
MERCER ISLAND, WASHINGTON

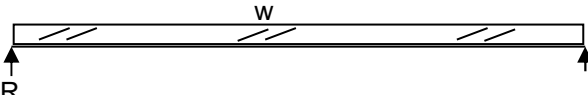
DATE _____

PROJ. # JDT

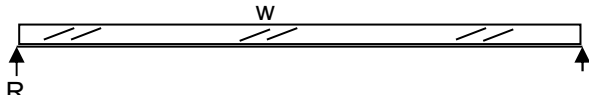
DESIGN G3

SHEET _____

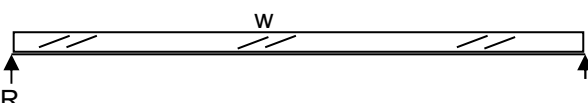
Joist		S1	11 7/8" TJI 360 @ 16" oc	
w=	67	plf	R=	712 lbs
L=	21.25	ft	M=	3,782 ft-lbs
b=	12.00	in	Mn/Ω =	6,180 ft-lbs
d=	1.00	in	Vn/Ω =	1,705 lbs
E=	419000	ksi	Δ=	0.73 in
Cv=	1.00	≤1.0	I/	348



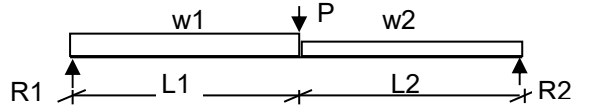
Beam		S5	PSL 5 1/4x11 7/8	
w=	300	plf	R=	1,950 lbs
L=	13	ft	M=	6,338 ft-lbs
b=	5.25	in	Fb=	616 psi
d=	11.88	in	Fv=	40 psi
E=	2200	ksi	Δ=	0.12 in
Cv=	1.00	≤1.0	I/	1304



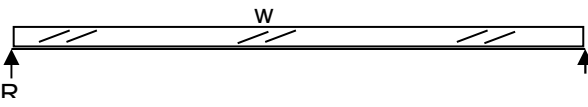
Beam		S2	PSL 7x11 7/8	
w=	327	plf	R=	3,474 lbs
L=	21.25	ft	M=	18,458 ft-lbs
b=	7.00	in	Fb=	1,346 psi
d=	11.88	in	Fv=	57 psi
E=	2200	ksi	Δ=	0.70 in
Cv=	0.97	≤1.0	I/	365



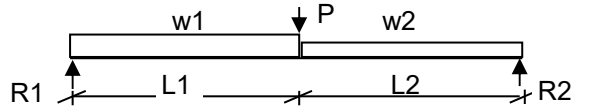
Beam		S6	PSL 5 1/4x11 7/8	
w1=	67	plf	R1 =	1,024 lbs
w2=	67	plf	R2 =	1,999 lbs
L1=	12	ft	M =	7,458 lb-ft
L2=	4	ft	Fb =	725 psi
X=	8.5	ft	Fv =	46 psi
P=	1,950	lbs	Δ=	0.19 in
b=	5.25	in	I/	1,037
d=	11.88	in	Cv=	1.00
E=	2,200	ksi		



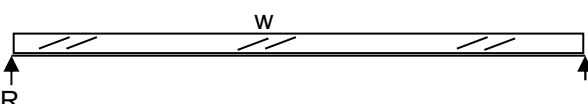
Beam		S3	LSL 1 3/4x11 7/8	
w=	722	plf	R=	3,159 lbs
L=	8.75	ft	M=	6,910 ft-lbs
b=	1.75	in	Fb=	1,450 psi
d=	14.00	in	Fv=	142 psi
E=	1500	ksi	Δ=	0.16 in
Cv=	1.00	≤1.0	I/	662



Beam		S7	PSL 5 1/4x11 7/8	
w1=	427	plf	R1 =	3,904 lbs
w2=	427	plf	R2 =	4,879 lbs
L1=	12	ft	M =	17,267 lb-ft
L2=	4	ft	Fb =	1,679 psi
X=	8.5	ft	Fv =	107 psi
P=	1,950	lbs	Δ=	0.51 in
b=	5.25	in	I/	374
d=	11.88	in	Cv=	1.00
E=	2,200	ksi		



Joist		S4	11 7/8" TJI 230 @ 16" oc	
w=	67	plf	R=	536 lbs
L=	16	ft	M=	2,144 ft-lbs
b=	12.00	in	Mn/Ω =	4,215 ft-lbs
d=	1.00	in	Vn/Ω =	1,655 lbs
E=	347000	ksi	Δ=	0.28 in
Cv=	1.00	≤1.0	I/	674




2124 Third Avenue . Suite 100 . Seattle . WA 98121
www.swensonsayfaget.com

Office: 206.443.6212
Fax: 206.443.4870

Project: Kaempf Residence Date: 01/28/23
Mercer Island, Washington Project #: _____
Second Floor and Low Roof Framing Design: JDT
 Sheet: G4

SINGLE-SPAN BEAM ANALYSIS

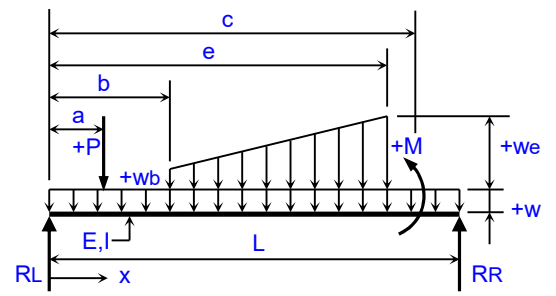
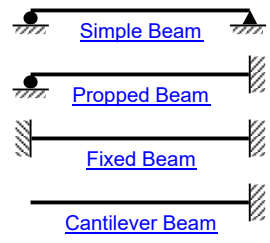
For Simple, Propped, Fixed, or Cantilever Beams

Job Name: Kaempf Residence	Subject: Second Floor & Low Roof Framing - S8
Job Number: 13021-2022-03	Originator: JDT Checker: JDT

Input Data: **PSL 5 1/4x16**

$f_b = 2,725$ psi
 $f_v = 214$ psi

Beam Data:
Span Type? **Simple**
Span, L = **20.0000** ft.
Modulus, E = **2200** ksi
Inertia, I = **1792.00** in.⁴



Nomenclature

Beam Loadings:

Full Uniform:

w = kips/ft.

	Start		End	
	b (ft.)	Wb (kips/ft.)	e (ft.)	We (kips/ft.)
#1:	0.0000	0.2600	0.5000	0.2600
#2:	0.5000	0.6000	3.0000	0.6000
#3:	3.0000	0.4800	11.2500	0.4800
#4:	11.2500	0.8800	13.5000	0.8800
#5:	13.5000	0.9800	20.0000	0.9800
#6:				
#7:				
#8:				

Results:

Reactions:

RL = 11.99 k	RR = 10.33 k
ML = N.A.	MR = N.A.

Maximum Moments:

+M(max) = 50.86 ft-k	@ X = 11.25 ft.
-M(max) = 0.00 ft-k	@ X = 0.00 ft.

Maximum Deflections:

-Δ(max) = -0.895 in.	@ X = 10.23 ft.
+Δ(max) = 0.000 in.	@ X = 0.00 ft.
Δ(ratio) = L/268	

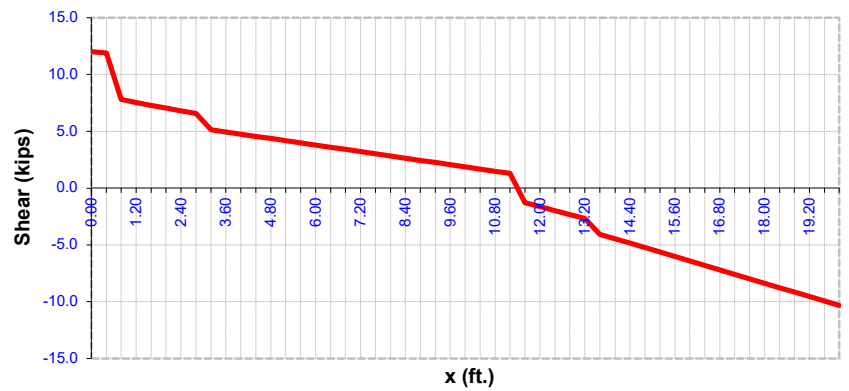
Point Loads:

	a (ft.)	P (kips)
#1:	0.5000	3.90
#2:	3.0000	1.22
#3:	11.2500	2.24
#4:	13.5000	1.02
#5:		
#6:		
#7:		
#8:		
#9:		
#10:		
#11:		
#12:		
#13:		
#14:		
#15:		

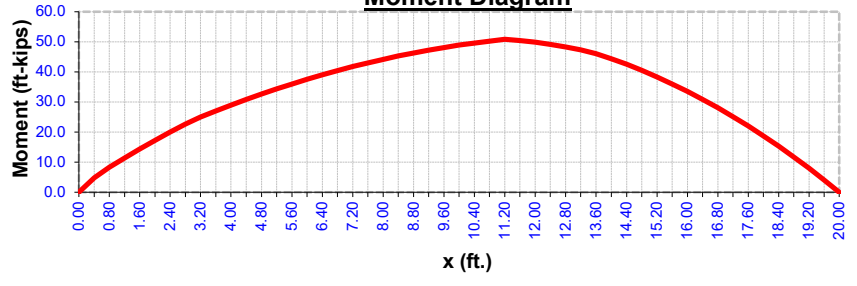
Moments:

	c (ft.)	M (ft-kips)
#1:		
#2:		
#3:		
#4:		

Shear Diagram



Moment Diagram



GRAVITY DESIGN

SECOND FLOOR AND LOW ROOF FRAMING

S9:

W1 = 380 PLF

W2 = 660 PLF

P1 = 4,879 #

P2 = 1,223 #

P3 = 2,237 #

L1 = 2.25 FT.

L2 = 1.75 FT.

L3 = 6.75 FT.

L4 = 2.25 FT.

R1 = 12,960 #

R2 = 1,290 #

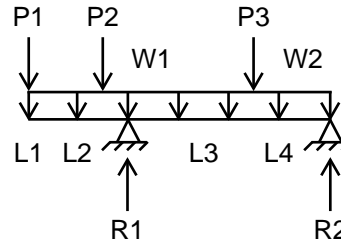
M = 24,906 FT.-#

fb = 1,334 psi

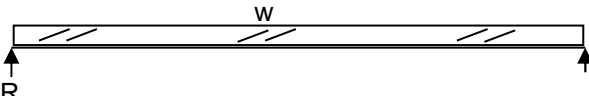
fv = 138 psi

$\Delta_{total} = 0.16" = 2L/600$

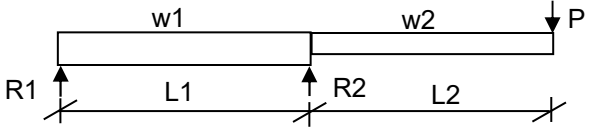
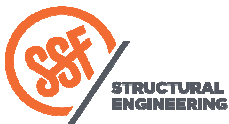
USE PSL 5 1/4x16



Joist		S10	P.T. 2x12 @ 16" oc	
w=	94	plf	R=	611 lbs
L=	13	ft	M=	1,986 ft-lbs
b=	1.50	in	Fb=	753 psi
d=	11.25	in	Fv=	46 psi
E=	1300	ksi	Δ =	0.26 in
Cv=	1.00	≤ 1.0	I/I	598



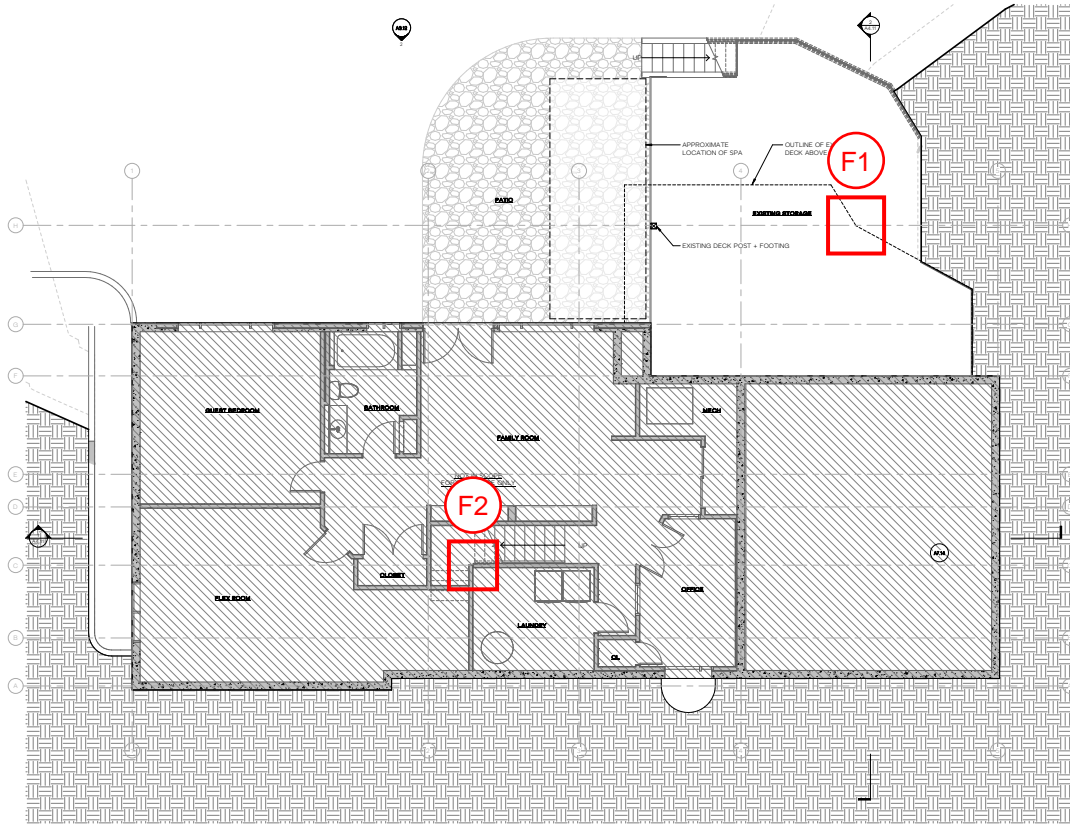
Beam		S11	Rosboro Treated GL 5 1/2x12	
w1=	455	plf	R1=	3726 lbs
w2=	455	plf	R2=	5,033 lbs
L1=	17	ft	M+=	15,254 lb-ft
L2=	3	ft	M-=	1,422 lb-ft
X=	8.38	ft	Fb=	1,387 psi
P=	-	lbs	Fv=	78 psi
b=	5.50	in	Δ_{span} =	0.535 in
d=	12.00	in	I span/	376
E=	1,800	ksi	Δ_{cant} =	(0.24) in
Cv=	1.00		I cant/	(247)

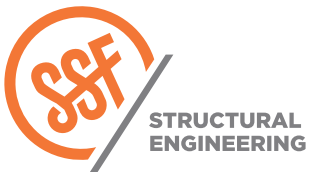
2124 Third Avenue . Suite 100 . Seattle . WA 98121
 www.swensonsayfaget.com
 Office: 206.443.6212
 Fax: 206.443.4870

Project: Kaempff Residence Date: 01/27/23
Mercer Island, Washington Project #: _____
Second Floor and Low Roof Framing Design: JDT
 Sheet: G7

GRAVITY DESIGN KEY PLAN



FIRST FLOOR FRAMING & FOUNDATION PLAN



KAEMPF RESIDENCE

PROJECT
MERCER ISLAND, WASHINGTON

DATE

PROJ. # JDT

DESIGN G8

SHEET

GRAVITY DESIGN

FOUNDATION DESIGN

F1:

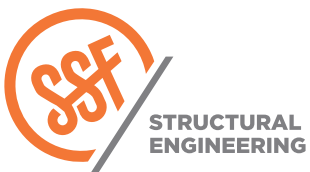
P = 16,027#
qallow = 1,500 psf
Areq = 10.7 square feet

USE 3'-6"x3'-6"x14" DEEP CONCRETE PAD FOOTING WITH (5)#4's EACH WAY BOTTOM

F2:

P = 12,960#
qallow = 1,500 psf
Areq = 8.6 square feet

USE 3'-0"x3'-0"x12" DEEP CONCRETE PAD FOOTING WITH (4)#4's EACH WAY BOTTOM



KAEMPF RESIDENCE
PROJECT
MERCER ISLAND, WASHINGTON

DATE

PROJ. # JDT

DESIGN G9

SHEET