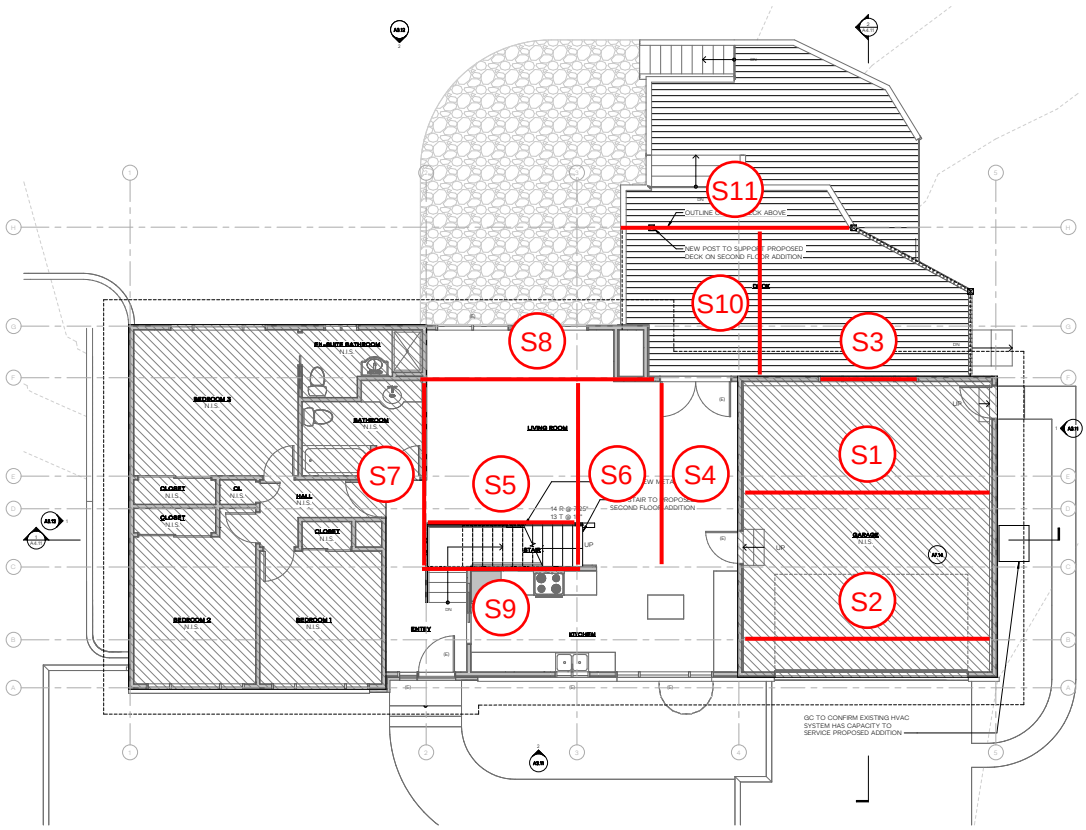
GRAVITY DESIGN KEY PLAN



SECOND FLOOR & LOW ROOF FRAMING PLAN

SWENSON SAY FAGÉT
ssfengineers.com
SEATTLE
2124 Third Ave, Suite 100, Seattle, WA 98121 | O 206.443.6212
TACOMA
934 Broadway, Suite 100, Tacoma, WA 98402 | O 253.284.9470

STRUCTURAL ENGINEERING

KAEMPF RESIDENCE

PROJECT
MERCER ISLAND, WASHINGTON

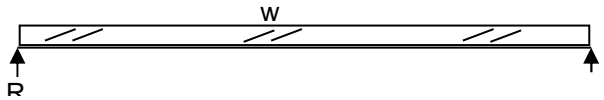
DATE

PROJ. # JDT

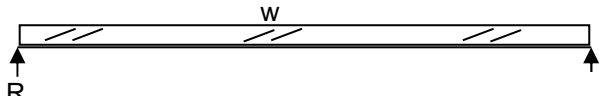
DESIGN G3

SHEET

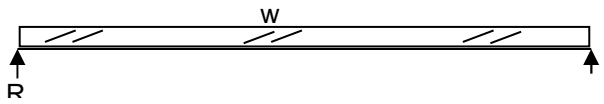
Joist	S1			11 7/8" TJI 360 @ 16" oc	
w=	67	plf	R=	712	lbs
L=	21.25	ft	M=	3,782	ft-lbs
b=	12.00	in	Mn/Ω =	6,180	ft-lbs
d=	1.00	in	Vn/Ω =	1,705	lbs
E=	419000	ksi	Δ=	0.73	in
Cv=	1.00	≤1.0	l /	348	



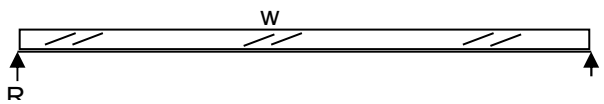
Beam	S2			PSL 7x11 7/8	
w=	327	plf	R=	3,474	lbs
L=	21.25	ft	M=	18,458	ft-lbs
b=	7.00	in	Fb=	1,346	psi
d=	11.88	in	Fv=	57	psi
E=	2200	ksi	Δ=	0.70	in
Cv=	0.97	≤1.0	l /	365	



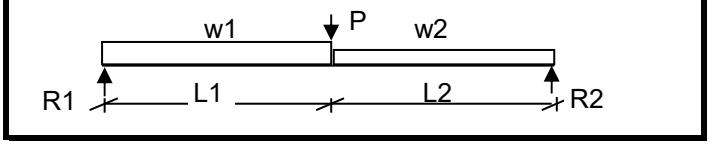
Beam	S3			LSL 1 3/4x11 7/8	
w=	722	plf	R=	3,159	lbs
L=	8.75	ft	M=	6,910	ft-lbs
b=	1.75	in	Fb=	1,450	psi
d=	14.00	in	Fv=	142	psi
E=	1500	ksi	Δ=	0.16	in
Cv=	1.00	≤1.0	l /	662	



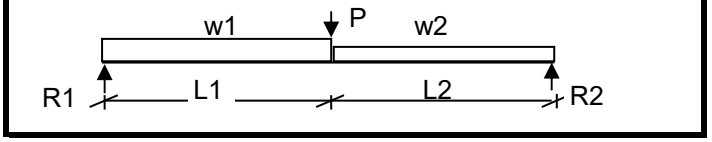
Joist	S4			11 7/8" TJI 230 @ 16" oc	
w=	67	plf	R=	536	lbs
L=	16	ft	M=	2,144	ft-lbs
b=	12.00	in	Mn/Ω =	4,215	ft-lbs
d=	1.00	in	Vn/Ω =	1,655	lbs
E=	347000	ksi	Δ=	0.28	in
Cv=	1.00	≤1.0	l /	674	



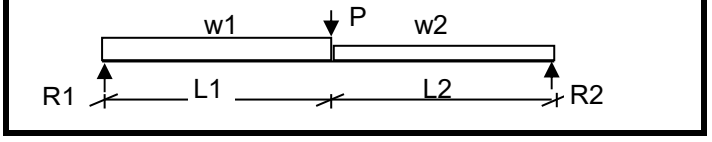
Beam	S5			PSL 5 1/4x11 7/8	
w1=	300	plf	R1 =	2,488	lbs
w2=	300	plf	R2 =	2,112	lbs
L1=	3	ft	M =	7,314	lb-ft
L2=	10	ft	Fb =	711	psi
X=	6.5	ft	Fv =	53	psi
P=	700	lbs	Δ=	0.14	in
b=	5.25	in	l /	1,101	
d=	11.88	in	Cv=	1.00	
E=	2,200	ksi			



Beam	S6			PSL 5 1/4x11 7/8	
w1=	67	plf	R1 =	1,064	lbs
w2=	67	plf	R2 =	2,120	lbs
L1=	12	ft	M =	7,944	lb-ft
L2=	4	ft	Fb =	773	psi
X=	8.5	ft	Fv =	49	psi
P=	2,112	lbs	Δ=	0.20	in
b=	5.25	in	l /	982	
d=	11.88	in	Cv=	1.00	
E=	2,200	ksi			



Beam	S7			PSL 5 1/4x11 7/8	
w1=	427	plf	R1 =	4,038	lbs
w2=	427	plf	R2 =	5,282	lbs
L1=	12	ft	M =	18,276	lb-ft
L2=	4	ft	Fb =	1,777	psi
X=	8.3	ft	Fv =	117	psi
P=	2,488	lbs	Δ=	0.55	in
b=	5.25	in	l /	350	
d=	11.88	in	Cv=	1.00	
E=	2,200	ksi			



SSF STRUCTURAL ENGINEERING

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

Project: Kaempf Residence — *Date:* 08/08/23

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

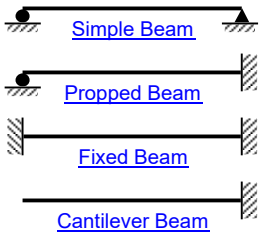
Job Name:	Kaempf Residence	Subject:	Second Floor & Low Roof Framing - S8	
Job Number:	13021-2022-03	Originator:	JDT	Checker: JDT

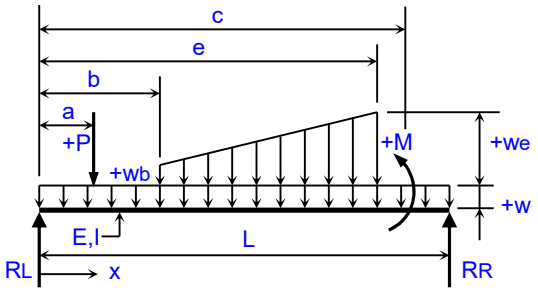
fb = 2,734 psi
fv = 217 psi

Input Data: PSL 5 1/4x16

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.

Distributed:

	Start b (ft.)	Wb (kips/ft.)	End 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:				

Point Loads:

	a (ft.)	P (kips)
#1:	0.5000	4.04
#2:	3.0000	1.22
#3:	11.2500	2.24
#4:	13.5000	1.06
#5:		
#6:		
#7:		
#8:		
#9:		
#10:		
#11:		
#12:		
#13:		
#14:		
#15:		

Moments:

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

Results:

Reactions:

RL =	12.14 k	RR =	10.36 k
ML =	N.A.	MR =	N.A.

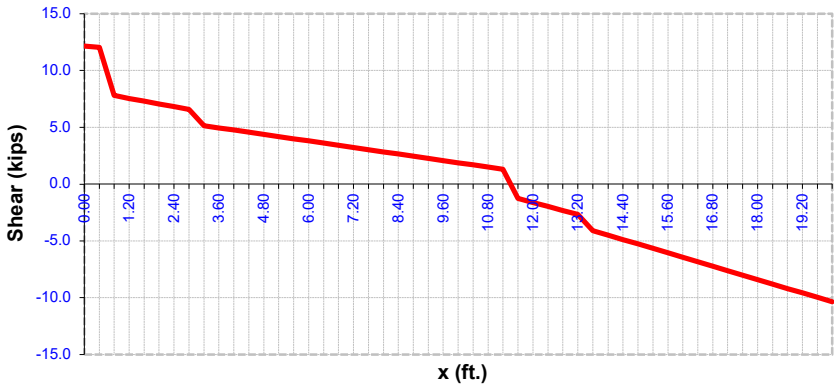
Maximum Moments:

+M(max) =	51.03 ft-k	@ x =	11.25 ft.
-M(max) =	0.00 ft-k	@ x =	0.00 ft.

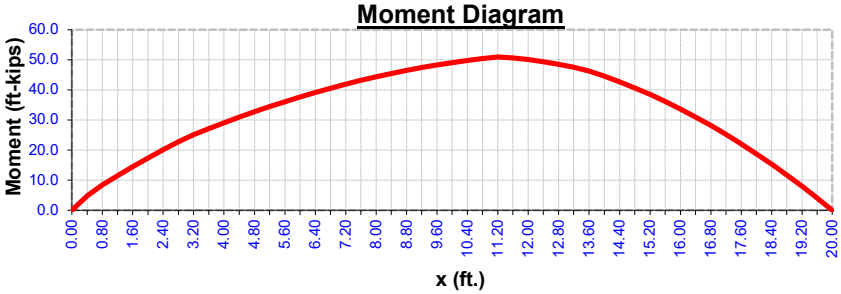
Maximum Deflections:

-Δ(max) =	-0.898 in.	@ x =	10.23 ft.
+Δ(max) =	0.000 in.	@ x =	0.00 ft.
Δ(ratio) =	L/267		

Shear Diagram

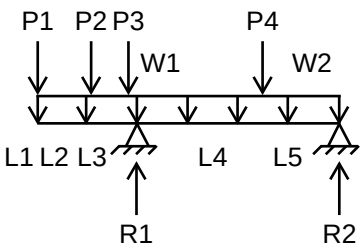


Moment Diagram



GRAVITY DESIGN

SECOND FLOOR AND LOW ROOF FRAMING



S9:

W1 = 380 PLF
W2 = 660 PLF
P1 = 5,282 #
P2 = 1,223#
P3 = 700#
P4 = 2,237 #
L1 = 2.25 FT.
L2 = 0.75 FT.
L3 = 1 FT.
L4 = 6.75 FT.
L5 = 2.25 FT.

R1 = 13,738 #
R2 = 1,212 #
M = 25,606 FT.-#

fb = 1,372 psi
fv = 150 psi
△total = 0.17" = 2L/565

USE PSL 5 1/4x16

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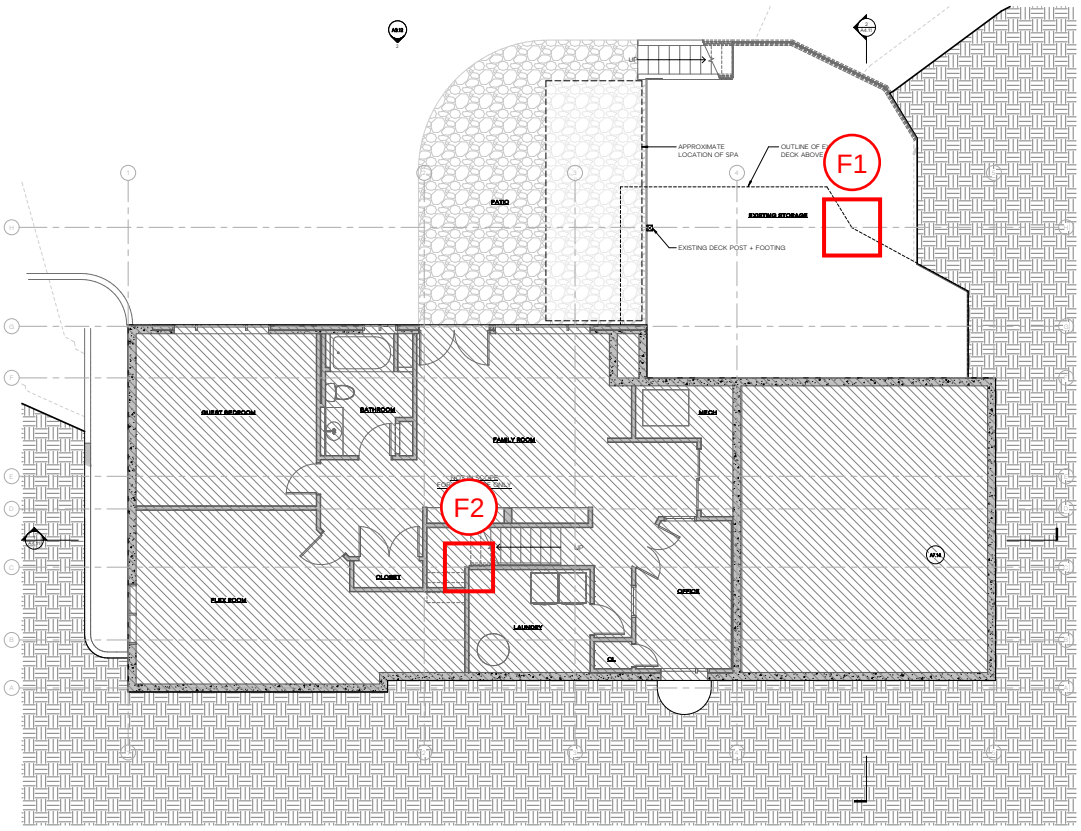
GRAVITY DESIGN KEY PLAN



FIRST FLOOR FRAMING & FOUNDATION PLAN

SWENSON SAY FAGÉT
SEATTLE
2124 Third Ave, Suite 100, Seattle, WA 98121 | O 206.443.6212
TACOMA
934 Broadway, Suite 100, Tacoma, WA 98402 | O 253.284.9470
ssfengineers.com

STRUCTURAL ENGINEERING

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 = 14,419#
qallow = 1,500 psf
Areq = 9.6 square feet

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

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