MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

7220 Trade Street, Suite 350, San Diego, CA 92121 ▸ p 619-650-0010 ▸ *mulhernkulp.com*

CALCULATION PACKAGE

February 11, 2022

JayMarc Homes
Piha Residence
3745 77th Ave SE

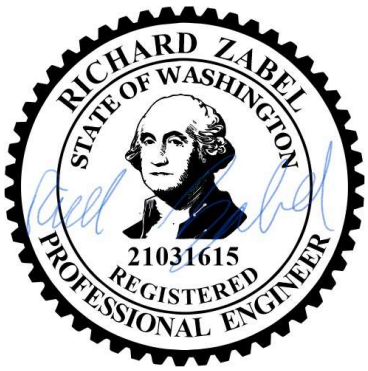
Mercer Island, Washington

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Prepared By:

John C. Leone, E.I.T. *Staff Engineer*

Richard J. Zabel, P.E. *Project Manager + Director of Engineering*



Signature, Seal & Date

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

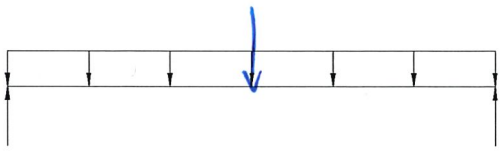
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: TYP EXT HDR - WORST CASE POINT LOAD

B1

PARAMETERS:

L = 3 FT
W = 0.084 KLF
P = 4.5 K



ANALYSIS:

R_{MAX} =	2.4 K	V_D =		K	< V_{ALL} =	3.89 K	☑ ADEQUATE
M_{MAX} =	3.51 K-FT	< M_{ALL} =	4.49	K-FT	(C_D=1.0)		☑ ADEQUATE
Δ_{TL} =	0.012 IN.	L/	999+	< L/240			☑ ADEQUATE

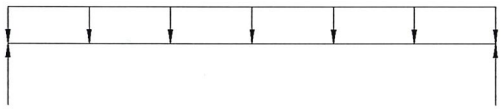
4 x 10

BEAM DESCRIPTION: TYP EXT HDR - WORST CASE UNIFORM LOAD

B1

PARAMETERS:

L = 6 FT
W = 0.84 KLF
P = — K



ANALYSIS:

R_{MAX} =	2.52 K	V_D =		K	< V_{ALL} =	3.89 K	☑ ADEQUATE
M_{MAX} =	3.78 K-FT	< M_{ALL} =	4.49	K-FT	(C_D= 1.0)		☑ ADEQUATE
Δ_{TL} =	0.067 IN.	L/	999+	< L/240			☑ ADEQUATE

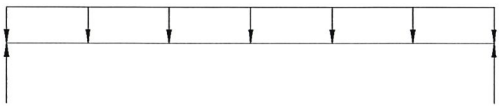
4 x 10

BEAM DESCRIPTION: TYP INT HDR - WORST CASE

B2

PARAMETERS:

L = 3 FT
W = 0.95 KLF
P = — K



ANALYSIS:

R_{MAX} =	1.43 K	V_D =		K	< V_{ALL} =	3.89 K	☑ ADEQUATE
M_{MAX} =	1.07 K-FT	< M_{ALL} =	4.49	K-FT	(C_D= 1.0)		☑ ADEQUATE
Δ_{TL} =	0.005 IN.	L/		< L/240			☑ ADEQUATE

4 x 10

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

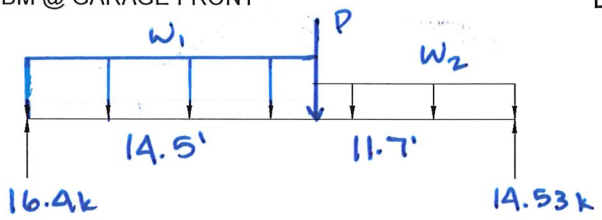
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLR FRMG - DROPPED BM @ GARAGE FRONT

B3

PARAMETERS:

L = 26.2 FT
W_1 = 1.162 KLF W_2 = 0.794
P = 4.8 K



ANALYSIS:

R_{MAX} =	16.4 K	V_D =	K	< V_{ALL} =	33.52 K	☑ ADEQUATE
M_{MAX} =	115.73 K-FT	< M_{ALL} =	189.8 K-FT	(C_D = 1.15)		☑ ADEQUATE
Δ_{TL} =	0.642 IN.	L/	490	< L/240		☑ ADEQUATE

5 1/2 x 30 GLB

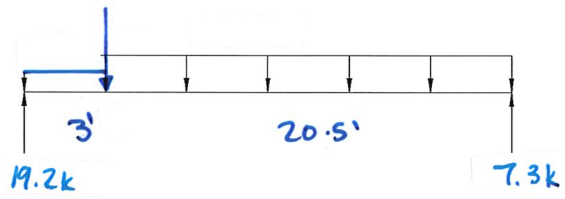
BEAM DESCRIPTION: 2ND FLR FRMG - DROPPED BM @ GARAGE SIDE

B4

PARAMETERS:

L = 23.5 FT
W = KLF
P = K

SEE ENERCALC OUTPUT



ANALYSIS:

R_{MAX} =	K	V_D =	K	< V_{ALL} =	K	☑ ADEQUATE
M_{MAX} =	K-FT	< M_{ALL} =	K-FT	(C_D =)		☑ ADEQUATE
Δ_{TL} =	IN.	L/		< L/240		☑ ADEQUATE

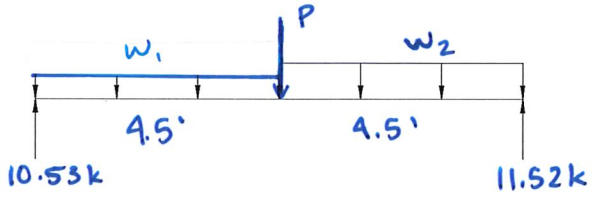
5 1/2 x 24 GLB

BEAM DESCRIPTION: 2ND FLR FRMG - SHORT GARAGE HDR

B5

PARAMETERS:

L = 9 FT
W_1 = 0.063 KLF W_2 = 0.504
P = 19.5 K



ANALYSIS:

R_{MAX} =	11.52 K	V_D =	K	< V_{ALL} =	16.76 K	☑ ADEQUATE
M_{MAX} =	46.79 K-FT	< M_{ALL} =	47.45 K-FT	(C_D = 1.15)		☑ ADEQUATE
Δ_{TL} =	0.2 IN.	L/	552	< L/240		☑ ADEQUATE

5 1/2 x 15 GLB

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

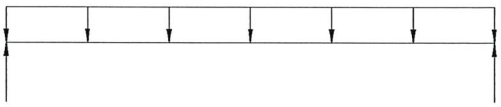
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLR FRMG - LONG GARAGE HDR

B6

PARAMETERS:

L = 16 FT
W = 0.084 KLF
P = — K



ANALYSIS:

R_{MAX} =	0.672 K	V_D =		K	< V_{ALL} =	8.25 K	☑ ADEQUATE
M_{MAX} =	2.7 K-FT	< M_{ALL} =	10.2 K-FT	(C_D=1.15)			☑ ADEQUATE
Δ_{TL} =	0.187 IN.	L/	999+	< L/240			☑ ADEQUATE

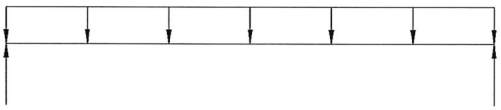
6 x12

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BM @ KITCHEN / NOOK

B7

PARAMETERS:

L = 6.5 FT
W = 1.154 KLF
P = — K



ANALYSIS:

R_{MAX} =	3.75 K	V_D =		K	< V_{ALL} =	12.8 K	☑ ADEQUATE
M_{MAX} =	6.1 K-FT	< M_{ALL} =	43.47 K-FT	(C_D=1.15)			☑ ADEQUATE
Δ_{TL} =	0.015 IN.	L/	999+	< L/240			☑ ADEQUATE

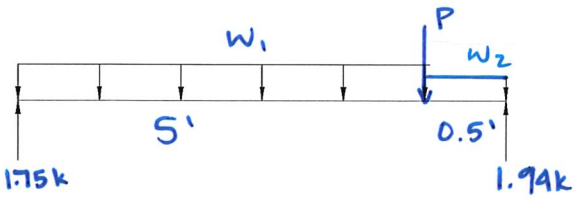
3½ x 18 GLB

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BM @ KITCHEN / FOYER

B8

PARAMETERS:

L = 5.5 FT
W_1 = 0.63 KLF W_2 = 0.5
P = 0.3 K



ANALYSIS:

R_{MAX} =	1.99 K	V_D =		K	< V_{ALL} =	12.8 K	☑ ADEQUATE
M_{MAX} =	2.43 K-FT	< M_{ALL} =	43.47 K-FT	(C_D=1.15)			☑ ADEQUATE
Δ_{TL} =	0.004 IN.	L/	999+	< L/240			☑ ADEQUATE

3½ x 18 GLB

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

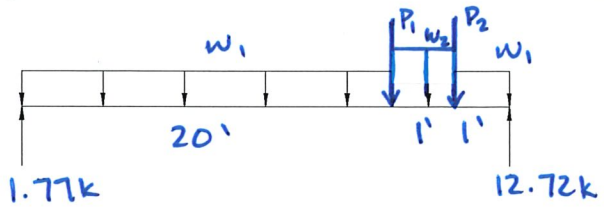
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BM @ KITCHEN

B9

PARAMETERS:

L = 22 FT
W_1 = 0.06 KLF W_2=0.478
P_1 = 11 K P_2 = 1.75 k



ANALYSIS:

R_{MAX} =	12.72 K	V_D =		K	< V_{ALL} =	12.8 K	☑ ADEQUATE
M_{MAX} =	23.4 K-FT	< M_{ALL} =	43.47	K-FT	(C_D=1.15)		☑ ADEQUATE
Δ_{TL} =	0.53 IN.	L/	496	< L/240			☑ ADEQUATE

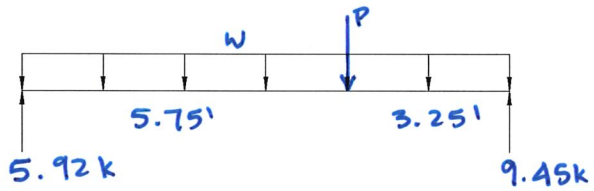
3 1/2 x 18 GLB

BEAM DESCRIPTION: 2ND FLR FRMG - EXT WNDW HDR @ KITCHEN

B10

PARAMETERS:

L = 9 FT
W = 0.294 KLF
P = 12.72 K



ANALYSIS:

R_{MAX} =	9.45 K	V_D =		K	< V_{ALL} =	16.76 K	☑ ADEQUATE
M_{MAX} =	29.16 K-FT	< M_{ALL} =	47.45	K-FT	(C_D=1.15)		☑ ADEQUATE
Δ_{TL} =	0.153 IN.	L/	707	< L/240			☑ ADEQUATE

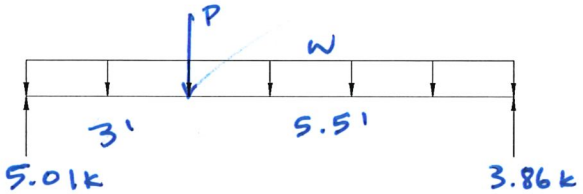
5 1/2 x 15 GLB

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BTTM BM @ BUTLERS

B11

PARAMETERS:

L = 8.5 FT
W = 0.589 KLF
P = 3.9 K



ANALYSIS:

R_{MAX} =	5.01 K	V_D =		K	< V_{ALL} =	9.3 K	☑ ADEQUATE
M_{MAX} =	12.4 K-FT	< M_{ALL} =	26.26	K-FT	(C_D= 1.0)		☑ ADEQUATE
Δ_{TL} =	0.091 IN.	L/	999+	< L/240			☑ ADEQUATE

3 1/2 x 15 GLB

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

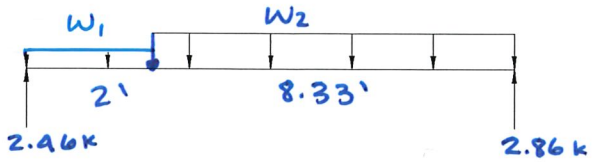
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BTTM BM @ PDR / FOYER

B12

PARAMETERS:

L = 10.33 FT
W_1 = 0.315 KLF W_2 = 0.563
P = — K



ANALYSIS:

R_{MAX} = 2.86 K V_D = ____ K < V_{ALL} = 7.17 K ☑ ADEQUATE
M_{MAX} = 7.26 K-FT < M_{ALL} = 8.84 K-FT (C_D=1.0) ☑ ADEQUATE
Δ_{TL} = 0.154 IN. L/ 805 < L/240 ☑ ADEQUATE

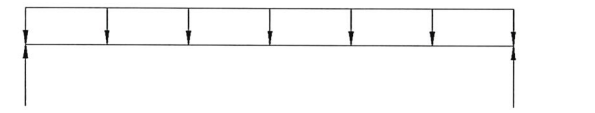
6x12

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BTTM BM @ STAIR STORAGE

B13

PARAMETERS:

L = 5.2 FT
W = 0.315 KLF
P = — K



ANALYSIS:

R_{MAX} = 0.82 K V_D = ____ K < V_{ALL} = 4.7 K ☑ ADEQUATE
M_{MAX} = 1.065 K-FT < M_{ALL} = 6.09 K-FT (C_D=1.0) ☑ ADEQUATE
Δ_{TL} = 0.008 IN. L/ 999+ < L/240 ☑ ADEQUATE

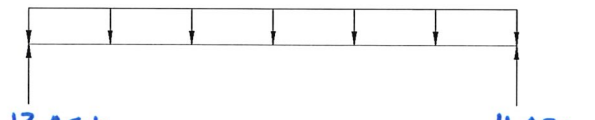
4x12

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BM @ GREAT ROOM / NOOK

B14

PARAMETERS:

L = 17.5 FT (SEE ENERCALC OUTPUT)
W = ____ KLF
P = ____ K



ANALYSIS:

R_{MAX} = ____ K V_D = ____ K < V_{ALL} = ____ K ☑ ADEQUATE
M_{MAX} = ____ K-FT < M_{ALL} = ____ K-FT (C_D=) ☑ ADEQUATE
Δ_{TL} = 0.506 IN. (W/OUT D.S.) L/ 415 < L/240 ☑ ADEQUATE

5 1/2 x 18 GLB

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

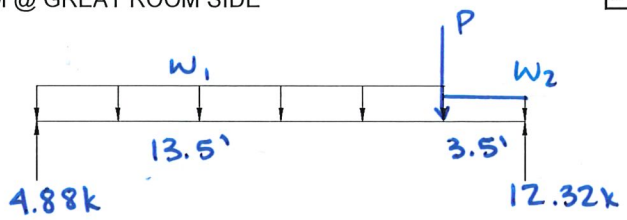
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BM @ GREAT ROOM SIDE

B15

PARAMETERS:

L = 17 FT
W_1 = 0.256 KLF $W_2 = 0.084$
P = 13.45 K



ANALYSIS:

R_{MAX} =	12.32 K	V_D =		K	< V_{ALL} =	20.65 K (13.8 K)	☑ ADEQUATE
M_{MAX} =	42.55 K-FT	< M_{ALL} =	66.85	K-FT	(C_D=1.15)		☑ ADEQUATE
Δ_{TL} =	0.434 IN.	L/	471		< L/240		☑ ADEQUATE

5 1/4 x 18 LVL

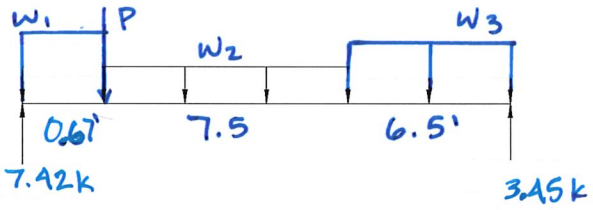
SLOPE CUT TO 12" MIN.

BEAM DESCRIPTION: 2ND FLR FRMG - DROPPED BM @ GREAT ROOM / STAIRS

B16

PARAMETERS:

L = 14.67 FT
W_1 = 0.604 KLF $W_2 = 0.315$ $W_3 = 0.495$
P = 4.88 K



ANALYSIS:

R_{MAX} =	7.42 K	V_D =		K	< V_{ALL} =	13.409 K	☑ ADEQUATE
M_{MAX} =	12.05 K-FT	< M_{ALL} =	30.36	K-FT	(C_D= 1.15)		☑ ADEQUATE
Δ_{TL} =	0.33 IN.	L/	538		< L/240		☑ ADEQUATE

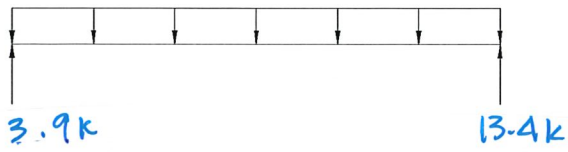
5 1/2 x 12 GLB

BEAM DESCRIPTION: 2ND FLR FRMG - FLUSH BM @ NOOK

B17

PARAMETERS:

L = 26 FT (SEE ENERCALC OUTPUT)
W = KLF
P = K



ANALYSIS:

R_{MAX} =	K	V_D =		K	< V_{ALL} =	K	☑ ADEQUATE
M_{MAX} =	K-FT	< M_{ALL} =		K-FT	(C_D=)		☑ ADEQUATE
Δ_{TL} =	IN.	L/			< L/240		☑ ADEQUATE

5 1/2 x 18 GLB

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

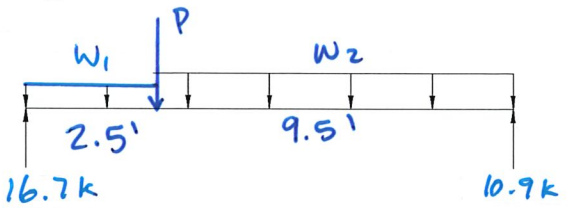
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLR FRMG - EXT SGD HDR @ NOOK

B18

PARAMETERS:

L = 12 FT
W_1 = 0.9 KLF W_2 = 1.385
P = 13.9 K



ANALYSIS:

R_{MAX} =	16.7 K	V_D =	K	< V_{ALL} =	20.11 K	☑ ADEQUATE
M_{MAX} =	42.9 K-FT	< M_{ALL} =	68.3 K-FT	(C_D=1.15)		☑ ADEQUATE
Δ_{TL} =	0.231 IN.	L/	623	< L/240		☑ ADEQUATE

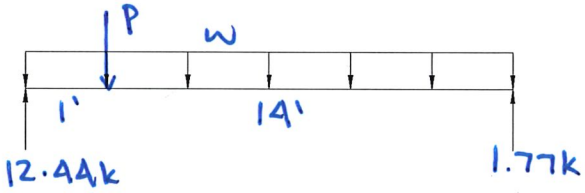
5 1/2 x 18 GLB

BEAM DESCRIPTION: 2ND FLR FRMG - EXT SGD HDR @ GREAT ROOM

B19

PARAMETERS:

L = 15 FT
W = 0.126 KLF
P = 12.32 K



ANALYSIS:

R_{MAX} =	12.44 K	V_D =	K	< V_{ALL} =	16.76 K	☑ ADEQUATE
M_{MAX} =	12.43 K-FT	< M_{ALL} =	47.45 K-FT	(C_D=1.15)		☑ ADEQUATE
Δ_{TL} =	0.181 IN.	L/	796	< L/240		☑ ADEQUATE

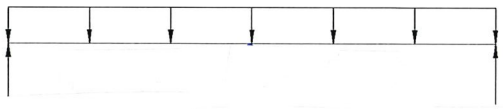
5 1/2 x 15 GLB

BEAM DESCRIPTION: 2ND FLR FRMG - DROPPED BM @ DECK

B20

PARAMETERS:

L = 19 FT
W = 0.336 KLF
P = — K



ANALYSIS:

R_{MAX} =	3.192 K	V_D =	K	< V_{ALL} =	15.09 K	☑ ADEQUATE
M_{MAX} =	15.162 K-FT	< M_{ALL} =	38.43 K-FT	(C_D=1.15)		☑ ADEQUATE
Δ_{TL} =	0.485 IN.	L/	470	< L/240		☑ ADEQUATE

5 1/2 x 13 1/2 GLB

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

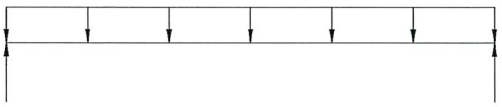
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLR FRMG - DROPPED BM @ PORCH

B21

PARAMETERS:

L = 10 FT
W = 0.126 KLF
P = — K



ANALYSIS:

R_{MAX} =	0.63 K	V_D =		K	< V_{ALL} =	3.89 K	☑ ADEQUATE
M_{MAX} =	1.575 K-FT	< M_{ALL} =	4.49 K-FT	(C_D=1.0)			☑ ADEQUATE
Δ_{TL} =	0.08 IN.	L/	999+	< L/240			☑ ADEQUATE

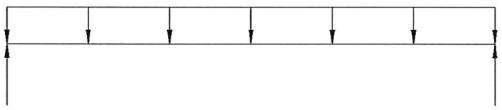
4x10

BEAM DESCRIPTION: 1ST FLR FRMG - DROPPED GRDR W/ BRG

B22

PARAMETERS:

L = 9.5 FT
W = 1.55 KLF
P = — K



ANALYSIS:

R_{MAX} =	3.5 K	V_D =		K	< V_{ALL} =	3.89 K	☑ ADEQUATE
M_{MAX} =	3.92 K-FT	< M_{ALL} =	4.49 K-FT	(C_D=1.0)			☑ ADEQUATE
Δ_{TL} =	0.039 IN.	L/	999+	< L/240			☑ ADEQUATE

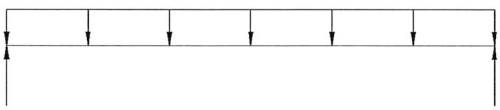
4x10

BEAM DESCRIPTION: 1ST FLR FRMG - DROPPED GRDR W/OUT BRG

B23

PARAMETERS:

L = 8 FT
W = 0.55 KLF
P = — K



ANALYSIS:

R_{MAX} =	2.2 K	V_D =		K	< V_{ALL} =	3.89 K	☑ ADEQUATE
M_{MAX} =	4.4 K-FT	< M_{ALL} =	4.49 K-FT	(C_D=1.0)			☑ ADEQUATE
Δ_{TL} =	0.137 IN.	L/	700	< L/240			☑ ADEQUATE

4x10

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PIHA RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 4-FEB-22

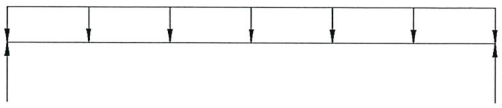
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 1ST FLR FRMG - FLUSH BM @ SW#110

B24

PARAMETERS:

L = 8 FT
W = 0.1 KLF
P = — K



ANALYSIS:

R_{MAX} =	0.4 K	V_D =		K	< V_{ALL} =	3.95 K	☑ ADEQUATE
M_{MAX} =	0.8 K-FT	< M_{ALL} =	8.925	K-FT	(C_D= 1.0)		☑ ADEQUATE
Δ_{TL} =	0.02 IN.	L/	999+	< L/240			☑ ADEQUATE

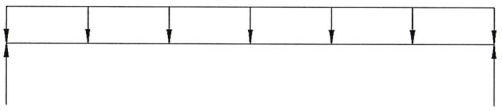
1 3/4 x 11 7/8 LVL

BEAM DESCRIPTION: 1ST FLR FRMG - TYP DECK JOIST

B25

PARAMETERS:

L = 15 FT
W = 0.07 KLF
P = — K



ANALYSIS:

R_{MAX} =	0.53 K	V_D =		K	< V_{ALL} =	1.7 K	☑ ADEQUATE
M_{MAX} =	1.97 K-FT	< M_{ALL} =	2.06	K-FT	(C_D= 1.0)		☑ ADEQUATE
Δ_{TL} =	0.345 IN.	L/	522	< L/240			☑ ADEQUATE

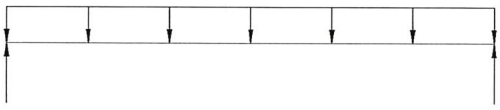
2 x 12 P.T. @ 12" O.C.

BEAM DESCRIPTION: 1ST FLR FRMG - FLUSH BM @ DECK

B26

PARAMETERS:

L = 9.5 FT
W = 0.525 KLF
P = — K



ANALYSIS:

R_{MAX} =	2.5 K	V_D =		K	< V_{ALL} =	4.73 K	☑ ADEQUATE
M_{MAX} =	5.92 K-FT	< M_{ALL} =	6.09	K-FT	(C_D= 1.0)		☑ ADEQUATE
Δ_{TL} =	0.145 IN.	L/	788	< L/240			☑ ADEQUATE

4 x 12

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING
7220 Trade Street, Suite 350 ▸ San Diego, CA 92121
p 619-650-0010 ▸ mulhernkulp.com

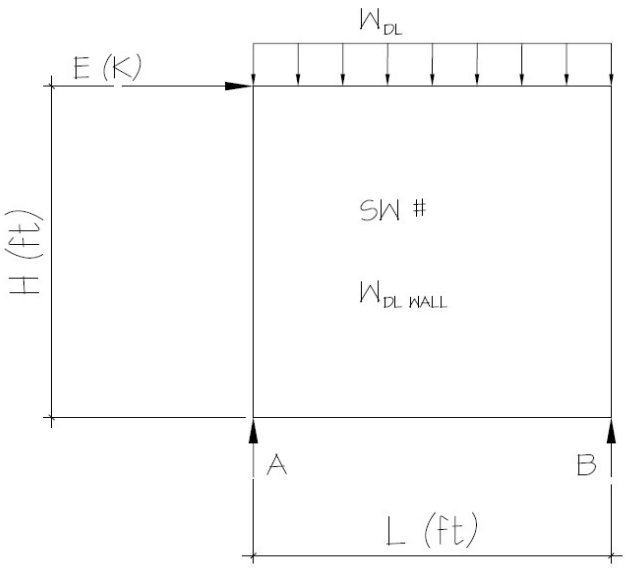
PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 07-FEB-22

OVERSTRENGTH CALCULATIONS

WALL DESCRIPTION/SW #: 204

PARAMETERS:

L =	13.5	FT
H =	9.1	FT
E =	1.15	K
W_{DLWALL} =	0.10	KLF
W_{DL} =	0.320	KLF
Ω_0 =	2.5	(ASCE TABLE 12.2.1 FOOTNOTE G)
SDS =	1.132	



ANALYSIS:

$E_{MH} = \Omega_0 * E$ =	2.88 K	$E_V = 0.2*SDS*DL$ =	1.284 K
$E_M = E_{MH} + E_V$		$E_M = E_{MH} + E_V$ =	4.159 K
$E_M = E_{MH} - E_V$		$E_M = E_{MH} - E_V$ =	1.591 K

E_M (MAX) $= \sum M_A = 0$ =	4.16(9.1) + 0.42(13.5)(6.75) - R_B(13.5)	R_B =	2.8DL + 2.8E
		R_A =	2.8DL - 2.8E
E_M (MIN) $= \sum M_A = 0$ =	1.59(9.1) + 0.42(13.5)(6.75) - R_B(13.5)	R_B =	2.8DL + 1.1E
		R_A =	2.8DL - 1.1E

CHECK BEAMS FOR AXIAL FORCES SHOWN USING LOAD COMBOS PER SECTION 12.4.3.1 (ASD)

ALLOWABLE STESS PERMITTED TO BE INCREASED BY 1.2

SEE FOLLOWING BEAM CALCS FOR LOAD APPLICATION

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING
7220 Trade Street, Suite 350 ▸ San Diego, CA 92121
p 619-650-0010 ▸ *mulhernkulp.com*

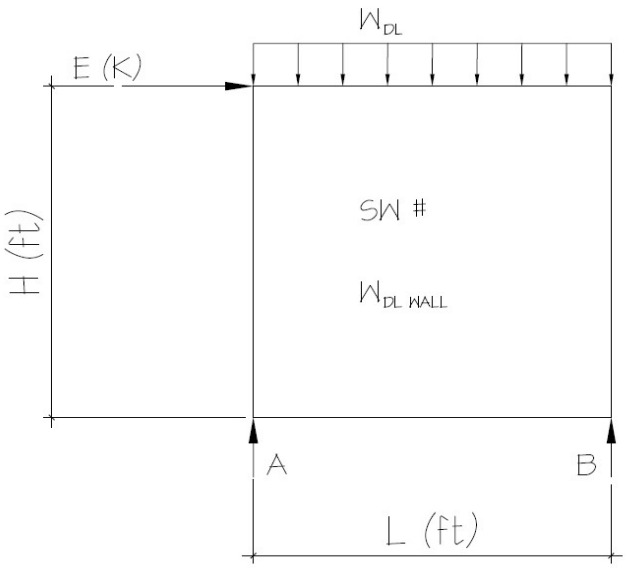
PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 07-FEB-22

OVERSTRENGTH CALCULATIONS

WALL DESCRIPTION/SW #: 208

PARAMETERS:

L =	25.0	FT
H =	9.1	FT
E =	1.70	K
W_{DLWALL} =	0.10	KLF
W_{DL} =	0.034	KLF
Ω_0 =	2.5	(ASCE TABLE 12.2.1 FOOTNOTE G)
SDS =	1.132	



ANALYSIS:

$E_{MH} = \Omega_0 * E$ =	4.25 K	$E_V = 0.2*SDS*DL$ =	0.758 K
$E_M = E_{MH} + E_V$		$E_M = E_{MH} + E_V$ =	5.008 K
$E_M = E_{MH} - E_V$		$E_M = E_{MH} - E_V$ =	3.492 K

E_M (MAX) $= \sum M_A = 0$ =	5.01(9.1) + 0.134(25)(12.5) - R_B(25)	R_B =	1.7DL + 1.8E
		R_A =	1.7DL - 1.8E
E_M (MIN) $= \sum M_A = 0$ =	3.49(9.1) + 0.134(25)(12.5) - R_B(25)	R_B =	1.7DL + 1.3E
		R_A =	1.7DL - 1.3E

CHECK BEAMS FOR AXIAL FORCES SHOWN USING LOAD COMBOS PER SECTION 12.4.3.1 (ASD)

ALLOWABLE STESS PERMITTED TO BE INCREASED BY 1.2

SEE FOLLOWING BEAM CALCS FOR LOAD APPLICATION

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING
7220 Trade Street, Suite 350 ▸ San Diego, CA 92121
p 619-650-0010 ▸ *mulhernkulp.com*

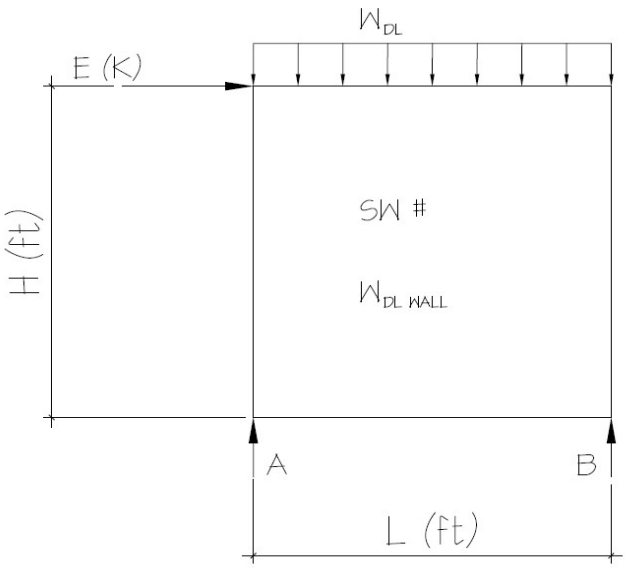
PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 07-FEB-22

OVERSTRENGTH CALCULATIONS

WALL DESCRIPTION/SW #: 209

PARAMETERS:

L =	31.3	FT
H =	9.1	FT
E =	3.40	K
W_{DLWALL} =	0.10	KLF
W_{DL} =	0.034	KLF
Ω_0 =	2.5	(ASCE TABLE 12.2.1 FOOTNOTE G)
SDS =	1.132	



ANALYSIS:

$E_{MH} = \Omega_0 * E$ =	8.50 K	$E_V = 0.2*SDS*DL$ =	0.950 K
$E_M = E_{MH} + E_V$		$E_M = E_{MH} + E_V$ =	9.450 K
$E_M = E_{MH} - E_V$		$E_M = E_{MH} - E_V$ =	7.550 K

E_M (MAX) $= \sum M_A = 0$ =	9.45(9.1) + 0.134(31.33)(15.665) - R_B(31.33)	R_B =	2.1DL + 2.7E
		R_A =	2.1DL - 2.7E
E_M (MIN) $= \sum M_A = 0$ =	7.55(9.1) + 0.134(31.33)(15.665) - R_B(31.33)	R_B =	2.1DL + 2.2E
		R_A =	2.1DL - 2.2E

CHECK BEAMS FOR AXIAL FORCES SHOWN USING LOAD COMBOS PER SECTION 12.4.3.1 (ASD)

ALLOWABLE STESS PERMITTED TO BE INCREASED BY 1.2

SEE FOLLOWING BEAM CALCS FOR LOAD APPLICATION

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: OVERSTRENGTH.ec6

Lic. # : KW-06004787
MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B4 - 2ND FLR FRMG - DROPPED BM @ GARAGE SIDE

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

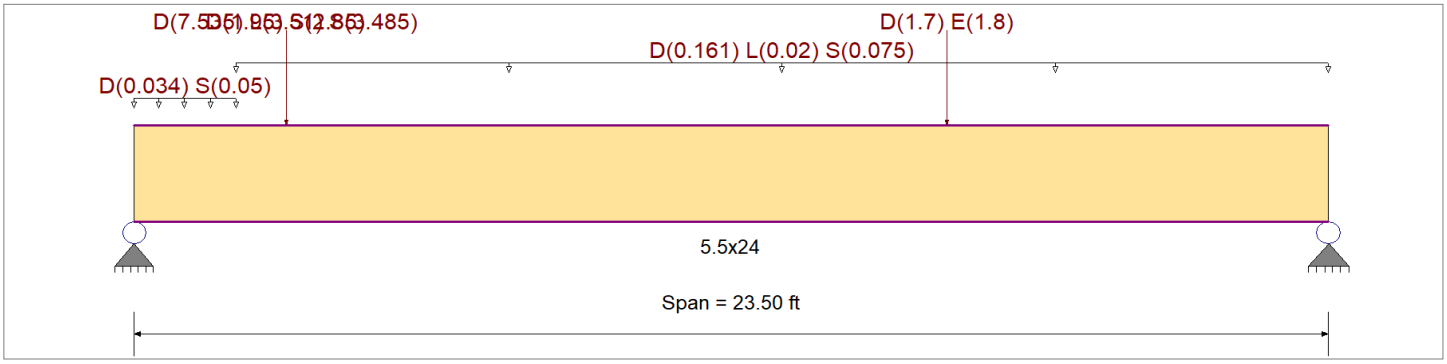
Wood Species : DF/DF
Wood Grade : 24F - V4

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,880.0 psi
Fb -	2,220.0 psi
Fc - Prll	1,980.0 psi
Fc - Perp	780.0 psi
Fv	318.0 psi
Ft	1,320.0 psi

E : Modulus of Elasticity

Ebend- xx	1,800.0 ksi
Eminbend - xx	950.0 ksi
Ebend- yy	1,600.0 ksi
Eminbend - yy	850.0 ksi
Density	31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads
Point Load : D = 1.70, E = 1.80 k @ 16.0 ft
Point Load : D = 1.950, S = 2.850 k @ 3.0 ft
Point Load : D = 7.535, L = 3.510, S = 3.485 k @ 3.0 ft
Uniform Load : D = 0.0340, S = 0.050 k/ft, Extent = 0.0 -->> 2.0 ft, Tributary Width = 1.0 ft
Uniform Load : D = 0.1610, L = 0.020, S = 0.0750 k/ft, Extent = 2.0 -->> 23.50 ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.408 : 1	Maximum Shear Stress Ratio	=	0.554 : 1
Section used for this span		5.5x24	Section used for this span		5.5x24
fb: Actual	=	1,236.69 psi	fv: Actual	=	202.47 psi
Fb: Allowable	=	3,034.14 psi	Fv: Allowable	=	365.70 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	5.661 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.145 in	Ratio =	1949 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.538 in	Ratio =	524 >=300
Max Upward Total Deflection	0.000 in	Ratio =	0 <300

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
D Only					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.332	0.424	0.90	0.916	1.00	1.00	1.00	1.00	1.00	34.70	788.73	2374.54	10.68	121.34	286.20
+D+L					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.371	0.498	1.00	0.916	1.00	1.00	1.00	1.00	1.00	43.10	979.47	2638.38	13.94	158.37	318.00
+D+Lr					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.239	0.305	1.25	0.916	1.00	1.00	1.00	1.00	1.00	34.70	788.73	3297.98	10.68	121.34	397.50
+D+S					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.392	0.526	1.15	0.916	1.00	1.00	1.00	1.00	1.00	52.27	1,187.94	3034.14	16.94	192.49	365.70
+D+0.750Lr+0.750L					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: OVERSTRENGTH.ec6

Lic. # : KW-06004787
MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B4 - 2ND FLR FRMG - DROPPED BM @ GARAGE SIDE

Load Combination		Max Stress Ratios									Moment Values			Shear Values		
Segment Length	Span #	M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	M	fb	F'b	V	fv	F'v
Length = 23.50 ft	1	0.282	0.375	1.25	0.916	1.00	1.00	1.00	1.00	1.00	40.94	930.45	3297.98	13.12	149.11	397.50
+D+0.750L+0.750S					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.408	0.554	1.15	0.916	1.00	1.00	1.00	1.00	1.00	54.41	1,236.69	3034.14	17.82	202.47	365.70
+D+0.60W					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.187	0.238	1.60	0.916	1.00	1.00	1.00	1.00	1.00	34.70	788.73	4221.41	10.68	121.34	508.80
+1.126D+0.70E					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.230	0.278	1.60	0.916	1.00	1.00	1.00	1.00	1.00	42.79	972.42	4221.41	12.43	141.20	508.80
+1.126D-0.70E					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.194	0.260	1.60	0.916	1.00	1.00	1.00	1.00	1.00	36.13	821.03	4221.41	11.62	132.06	508.80
+D+0.750Lr+0.750L+0.450W					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.220	0.293	1.60	0.916	1.00	1.00	1.00	1.00	1.00	40.94	930.45	4221.41	13.12	149.11	508.80
+D+0.750L+0.750S+0.450W					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.293	0.398	1.60	0.916	1.00	1.00	1.00	1.00	1.00	54.41	1,236.69	4221.41	17.82	202.47	508.80
+1.090D+0.750L+0.750S+0.5250E					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.320	0.426	1.60	0.916	1.00	1.00	1.00	1.00	1.00	59.39	1,349.81	4221.41	19.08	216.82	508.80
+1.090D+0.750L+0.750S-0.5250E					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.301	0.413	1.60	0.916	1.00	1.00	1.00	1.00	1.00	55.90	1,270.43	4221.41	18.48	209.97	508.80
+0.60D+0.60W					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.112	0.143	1.60	0.916	1.00	1.00	1.00	1.00	1.00	20.82	473.24	4221.41	6.41	72.80	508.80
+0.470D+0.70E					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.111	0.121	1.60	0.916	1.00	1.00	1.00	1.00	1.00	20.55	467.02	4221.41	5.42	61.60	508.80
+0.470D-0.70E					0.916	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 23.50 ft	1	0.075	0.103	1.60	0.916	1.00	1.00	1.00	1.00	1.00	13.89	315.63	4221.41	4.62	52.46	508.80

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+1.090D+0.750L+0.750S+0.5250E	1	0.5377	11.150		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	19.289	7.418
Overall MINimum	0.574	1.226
D Only	10.801	4.585
+D+L	14.060	5.267
+D+Lr	10.801	4.585
+D+S	17.161	6.273
+D+0.750Lr+0.750L	13.245	5.096
+D+0.750L+0.750S	18.015	6.362
+D+0.60W	10.801	4.585
+1.126D+0.70E	12.565	6.021
+D+0.750Lr+0.750L+0.450W	13.245	5.096
+D+0.750L+0.750S+0.450W	18.015	6.362
+1.090D+0.750L+0.750S+0.5250E	19.289	7.418
+0.60D+0.60W	6.481	2.751
+0.470D+0.70E	5.479	3.013
D Only	10.801	4.585
L Only	3.259	0.681
S Only	6.360	1.688
E Only	0.574	1.226
H Only		

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: OVERSTRENGTH.ec6

Lic. # : KW-06004787
MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B14 - 2ND FLR FRMG - FLUSH BM @ GREAT ROOM / NOOK

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

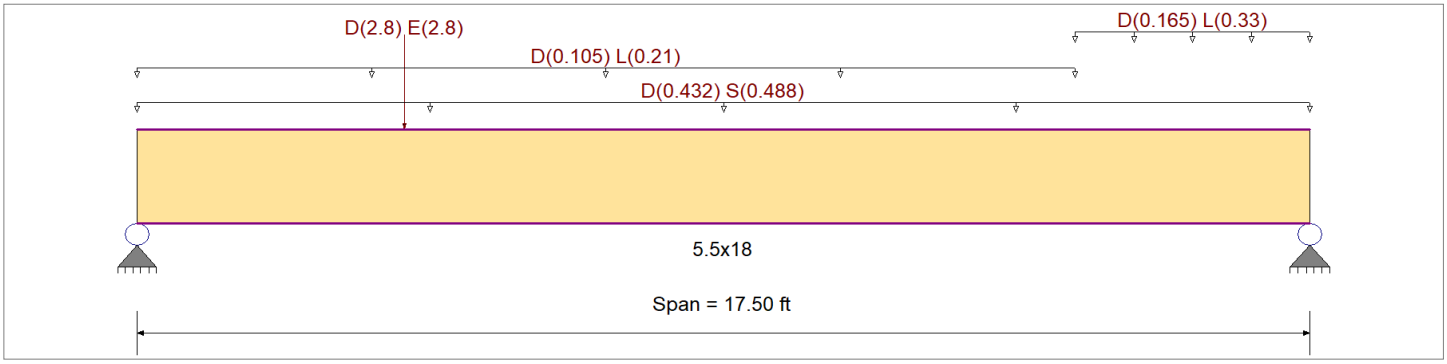
Wood Species : DF/DF
Wood Grade : 24F - V4

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,880.0 psi
Fb -	2,220.0 psi
Fc - Prll	1,980.0 psi
Fc - Perp	780.0 psi
Fv	318.0 psi
Ft	1,320.0 psi

E : Modulus of Elasticity

Ebend- xx	1,800.0 ksi
Eminbend - xx	950.0 ksi
Ebend- yy	1,600.0 ksi
Eminbend - yy	850.0 ksi
Density	31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads
Uniform Load : D = 0.4320, S = 0.4880 , Tributary Width = 1.0 ft
Uniform Load : D = 0.1050, L = 0.210 k/ft, Extent = 0.0 -->> 14.0 ft, Tributary Width = 1.0 ft
Uniform Load : D = 0.1650, L = 0.330 k/ft, Extent = 14.0 -->> 17.50 ft, Tributary Width = 1.0 ft
Point Load : D = 2.80, E = 2.80 k @ 4.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.598 : 1	Maximum Shear Stress Ratio	=	0.418 : 1
Section used for this span		5.5x18	Section used for this span		5.5x18
fb: Actual	=	1,924.73 psi	fv: Actual	=	152.88 psi
Fb: Allowable	=	3,216.12 psi	Fv: Allowable	=	365.70 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	8.175 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.215 in	Ratio =	975 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.623 in	Ratio =	337 >=300
Max Upward Total Deflection	0.000 in	Ratio =	0 <300

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
D Only													0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.442	0.331	0.90	0.971	1.00	1.00	1.00	1.00	1.00	27.51	1,111.32	2516.96	6.25	94.65	286.20
+D+L					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.517	0.373	1.00	0.971	1.00	1.00	1.00	1.00	1.00	35.79	1,445.87	2796.63	7.82	118.46	318.00
+D+Lr					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.318	0.238	1.25	0.971	1.00	1.00	1.00	1.00	1.00	27.51	1,111.32	3495.78	6.25	94.65	397.50
+D+S					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.578	0.406	1.15	0.971	1.00	1.00	1.00	1.00	1.00	46.03	1,859.65	3216.12	9.80	148.49	365.70
+D+0.750Lr+0.750L					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.390	0.283	1.25	0.971	1.00	1.00	1.00	1.00	1.00	33.71	1,361.94	3495.78	7.43	112.51	397.50

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: OVERSTRENGTH.ec6

Lic. # : KW-06004787

MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B14 - 2ND FLR FRMG - FLUSH BM @ GREAT ROOM / NOOK

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+0.750L+0.750S					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.598	0.418	1.15	0.971	1.00	1.00	1.00	1.00	1.00	47.64	1,924.73	3216.12	10.09	152.88	365.70
+D+0.60W					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.248	0.186	1.60	0.971	1.00	1.00	1.00	1.00	1.00	27.51	1,111.32	4474.60	6.25	94.65	508.80
+1.126D+0.70E					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.321	0.254	1.60	0.971	1.00	1.00	1.00	1.00	1.00	35.55	1,436.23	4474.60	8.55	129.49	508.80
+1.126D-0.70E					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.241	0.164	1.60	0.971	1.00	1.00	1.00	1.00	1.00	26.71	1,079.35	4474.60	5.52	83.67	508.80
+D+0.750Lr+0.750L+0.450W					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.304	0.221	1.60	0.971	1.00	1.00	1.00	1.00	1.00	33.71	1,361.94	4474.60	7.43	112.51	508.80
+D+0.750L+0.750S+0.450W					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.430	0.300	1.60	0.971	1.00	1.00	1.00	1.00	1.00	47.64	1,924.73	4474.60	10.09	152.88	508.80
+1.090D+0.750L+0.750S+0.5250E					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.481	0.351	1.60	0.971	1.00	1.00	1.00	1.00	1.00	53.29	2,152.95	4474.60	11.79	178.58	508.80
+1.090D+0.750L+0.750S-0.5250E					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.425	0.283	1.60	0.971	1.00	1.00	1.00	1.00	1.00	47.02	1,899.97	4474.60	9.52	144.22	508.80
+0.60D+0.60W					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.149	0.112	1.60	0.971	1.00	1.00	1.00	1.00	1.00	16.50	666.79	4474.60	3.75	56.79	508.80
+0.470D+0.70E					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.160	0.132	1.60	0.971	1.00	1.00	1.00	1.00	1.00	17.73	716.22	4474.60	4.45	67.40	508.80
+0.470D-0.70E					0.971	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.50 ft	1	0.080	0.054	1.60	0.971	1.00	1.00	1.00	1.00	1.00	8.89	359.32	4474.60	1.81	27.44	508.80

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+1.090D+0.750L+0.750S+0.5250E	1	0.6227	8.622		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	13.450	11.430
Overall MINimum	2.160	0.640
D Only	7.067	5.715
+D+L	8.947	7.931
+D+Lr	7.067	5.715
+D+S	11.337	9.985
+D+0.750Lr+0.750L	8.477	7.377
+D+0.750L+0.750S	11.680	10.580
+D+0.60W	7.067	5.715
+1.126D+0.70E	9.470	6.884
+D+0.750Lr+0.750L+0.450W	8.477	7.377
+D+0.750L+0.750S+0.450W	11.680	10.580
+1.090D+0.750L+0.750S+0.5250E	13.450	11.430
+0.60D+0.60W	4.240	3.429
+0.470D+0.70E	4.834	3.134
D Only	7.067	5.715
L Only	1.880	2.216
S Only	4.270	4.270
E Only	2.160	0.640
H Only		

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: OVERSTRENGTH.ec6

Lic. # : KW-06004787
MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B17 - 2ND FLR FRMG - FLUSH BM @ NOOK

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

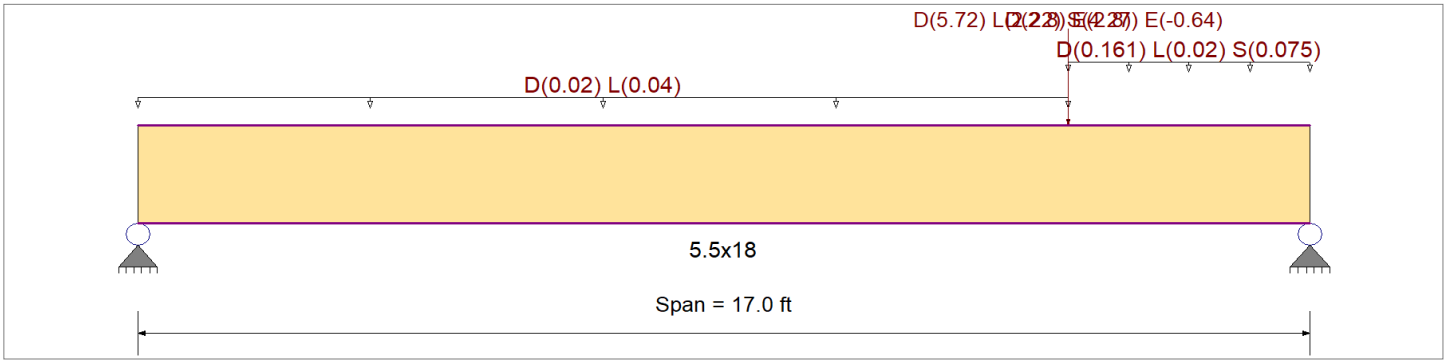
Wood Species : DF/DF
Wood Grade : 24F - V4

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,880.0 psi
Fb -	2,220.0 psi
Fc - Prll	1,980.0 psi
Fc - Perp	780.0 psi
Fv	318.0 psi
Ft	1,320.0 psi

E : Modulus of Elasticity

Ebend- xx	1,800.0 ksi
Eminbend - xx	950.0 ksi
Ebend- yy	1,600.0 ksi
Eminbend - yy	850.0 ksi
Density	31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads
Point Load : D = 2.80, E = 2.80 k @ 13.50 ft
Uniform Load : D = 0.020, L = 0.040 k/ft, Extent = 0.0 -->> 13.50 ft, Tributary Width = 1.0 ft
Uniform Load : D = 0.1610, L = 0.020, S = 0.0750 k/ft, Extent = 13.50 -->> 17.0 ft, Tributary Width = 1.0 ft
Point Load : D = 5.720, L = 2.220, S = 4.270, E = -0.640 k @ 13.50 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.497 : 1	Maximum Shear Stress Ratio	=	0.474 : 1
Section used for this span		5.5x18	Section used for this span		5.5x18
fb: Actual	=	1,603.80 psi	fv: Actual	=	173.23 psi
Fb: Allowable	=	3,225.46 psi	Fv: Allowable	=	365.70 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	13.464 ft	Location of maximum on span	=	15.511 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.097 in	Ratio =	2110	>=360
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360
Max Downward Total Deflection	0.372 in	Ratio =	548	>=300
Max Upward Total Deflection	0.000 in	Ratio =	0	<300

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
D Only					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.405	0.386	0.90	0.974	1.00	1.00	1.00	1.00	1.00	25.29	1,021.72	2524.27	7.29	110.44	286.20
+D+L					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.465	0.443	1.00	0.974	1.00	1.00	1.00	1.00	1.00	32.30	1,304.90	2804.75	9.30	140.90	318.00
+D+Lr					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.291	0.278	1.25	0.974	1.00	1.00	1.00	1.00	1.00	25.29	1,021.72	3505.93	7.29	110.44	397.50
+D+S					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.470	0.448	1.15	0.974	1.00	1.00	1.00	1.00	1.00	37.49	1,514.64	3225.46	10.80	163.70	365.70
+D+0.750Lr+0.750L					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.352	0.335	1.25	0.974	1.00	1.00	1.00	1.00	1.00	30.54	1,234.11	3505.93	8.80	133.29	397.50

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: OVERSTRENGTH.ec6

Lic. # : KW-06004787
MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B17 - 2ND FLR FRMG - FLUSH BM @ NOOK

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+0.750L+0.750S					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.497	0.474	1.15	0.974	1.00	1.00	1.00	1.00	1.00	39.69	1,603.80	3225.46	11.43	173.23	365.70
+D+0.60W					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.228	0.217	1.60	0.974	1.00	1.00	1.00	1.00	1.00	25.29	1,021.72	4487.59	7.29	110.44	508.80
+1.126D+0.70E					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.294	0.280	1.60	0.974	1.00	1.00	1.00	1.00	1.00	32.66	1,319.79	4487.59	9.41	142.55	508.80
+1.126D-0.70E					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.219	0.209	1.60	0.974	1.00	1.00	1.00	1.00	1.00	24.28	981.12	4487.59	7.01	106.17	508.80
+D+0.750Lr+0.750L+0.450W					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.275	0.262	1.60	0.974	1.00	1.00	1.00	1.00	1.00	30.54	1,234.11	4487.59	8.80	133.29	508.80
+D+0.750L+0.750S+0.450W					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.357	0.340	1.60	0.974	1.00	1.00	1.00	1.00	1.00	39.69	1,603.80	4487.59	11.43	173.23	508.80
+1.090D+0.750L+0.750S+0.5250E					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.406	0.387	1.60	0.974	1.00	1.00	1.00	1.00	1.00	45.11	1,822.76	4487.59	12.99	196.81	508.80
+1.090D+0.750L+0.750S-0.5250E					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.350	0.333	1.60	0.974	1.00	1.00	1.00	1.00	1.00	38.83	1,568.75	4487.59	11.19	169.52	508.80
+0.60D+0.60W					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.137	0.130	1.60	0.974	1.00	1.00	1.00	1.00	1.00	15.17	613.03	4487.59	4.37	66.27	508.80
+0.470D+0.70E					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.145	0.138	1.60	0.974	1.00	1.00	1.00	1.00	1.00	16.08	649.54	4487.59	4.63	70.10	508.80
+0.470D-0.70E					0.974	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.069	0.066	1.60	0.974	1.00	1.00	1.00	1.00	1.00	7.69	310.87	4487.59	2.23	33.72	508.80

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+1.090D+0.750L+0.750S+0.5250E	1	0.3722	9.555		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	3.857	13.392
Overall MINimum	0.445	1.715
D Only	2.157	7.561
+D+L	2.947	9.601
+D+Lr	2.157	7.561
+D+S	3.063	11.187
+D+0.750Lr+0.750L	2.750	9.091
+D+0.750L+0.750S	3.429	11.811
+D+0.60W	2.157	7.561
+1.126D+0.70E	2.740	9.714
+D+0.750Lr+0.750L+0.450W	2.750	9.091
+D+0.750L+0.750S+0.450W	3.429	11.811
+1.090D+0.750L+0.750S+0.5250E	3.857	13.392
+0.60D+0.60W	1.294	4.537
+0.470D+0.70E	1.325	4.754
D Only	2.157	7.561
L Only	0.790	2.040
S Only	0.906	3.626
E Only	0.445	1.715
H Only		

JayMarc Homes

Piha Residence

Mercer Island, WA

Shear Wall Calculations - Wind

Reviewed By: RJZ

February 3, 2022

Parameters:

Single Family Home

Design Wind Speed: 100 MPH

wind Exposure Category: C

Seismic Design Category: D

Code & Design Standard: 2018 IBC Ch. 1609, ASCE 7-16 Ch. 26-30

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: 3745 77TH AVE SE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 01-Feb-22

WIND DESIGN SUMMARY PER ASCE 7-16

PARAMETERS:

WIND SPEED	100
EXPOSURE CATEGORY	C
RISK CATEGORY	II
WIND DIRECTIONALITY FACTOR, K_d	0.85
TOPOGRAPHIC FACTOR, K_{zt}	1.60
GUST FACTOR, G	0.85
GROUND ELEV. ABOVE SEA LEVEL [FT]	0
DESIGN TYPE	ASD

0.60

ROOF GEOMETRY:

TRANS. ROOF PITCH	4.0	:12
LONG. ROOF PITCH	12.0	:12
MEAN ROOF HEIGHT, H	24.00	FT

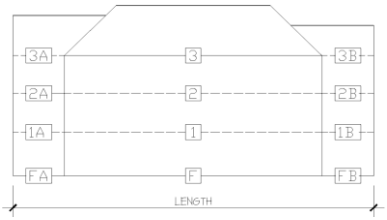
BUILDING GEOMETRY:

LENGTH	63	FT
WIDTH	45	FT
NUMBER OF STORIES	2	

TRANSVERSE DIRECTION (PERPENDICULAR TO MAIN RIDGE LINE)

TRIBUTARY DESIGN AREAS:

DIAPHRAGM LEVEL	FLOOR-TO-FLOOR HEIGHT		SECTION A	SECTION O	SECTION B	
2	9.1 FT	Roof Surface	0	254	0	sq ft
		Wall surface	0	350	0	sq ft
1	11.5 FT	Roof Surface	0	27	0	sq ft
		Wall surface	0	620	0	sq ft
FND		Roof Surface	0	0	0	sq ft
		Wall surface	0	0	0	sq ft



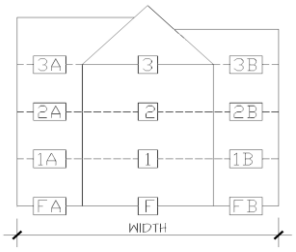
TRIBUTARY DESIGN LOADS: (0.6W)

	SECTION A	SECTION O	SECTION B	
Story Shear	0.00	9.80	0.00	kips
Total Shear	0.00	9.80	0.00	kips
		9.80		kips
Story Shear	0.00	12.89	0.00	kips
Total Shear	0.00	22.69	0.00	kips
		22.69		kips
Story Shear	0.00	0.00	0.00	kips
Total Shear	0.00	22.69	0.00	kips
		22.69		kips

LONGITUDINAL DIRECTION (PARALLEL TO MAIN RIDGE LINE)

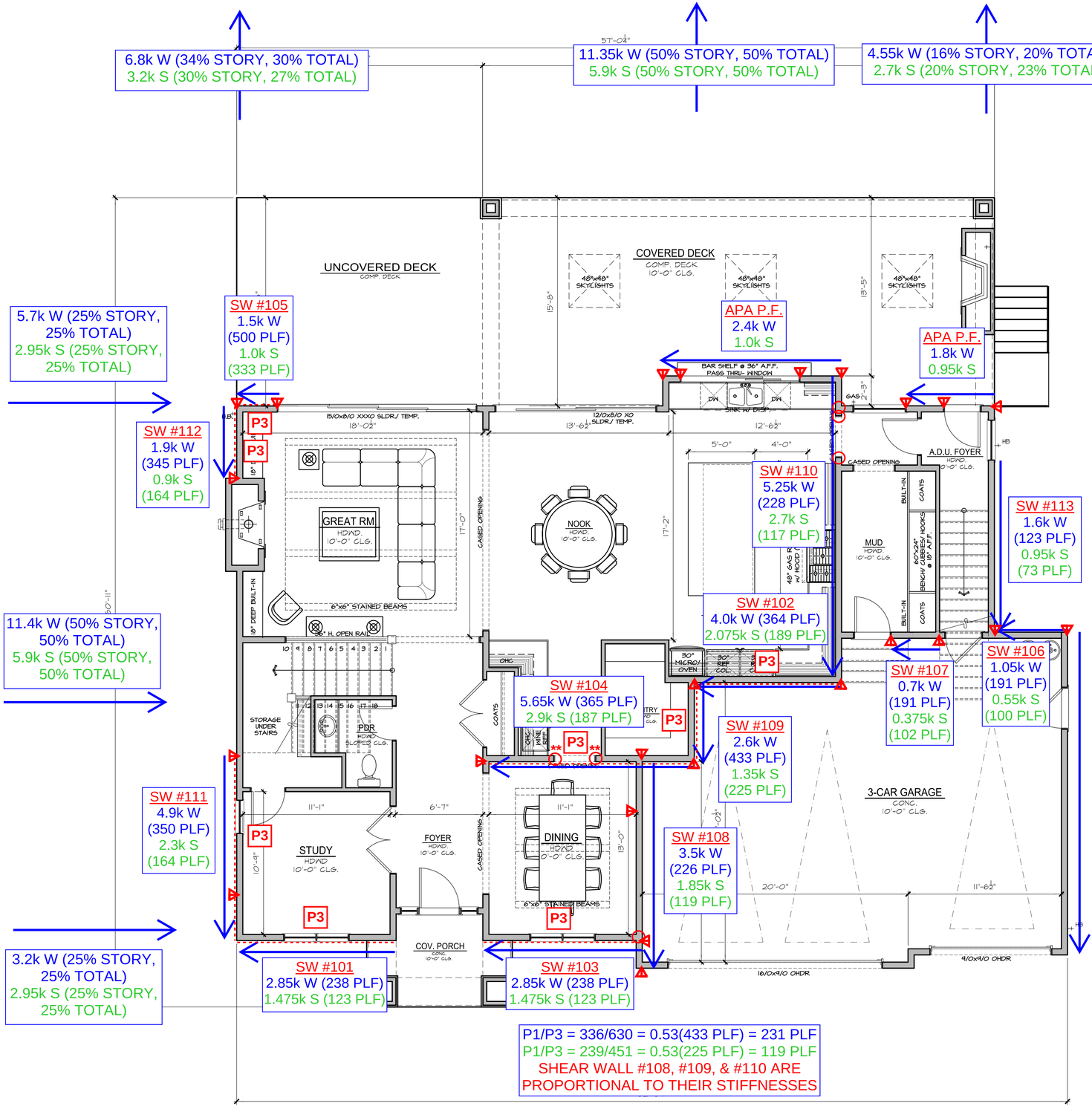
TRIBUTARY DESIGN AREAS:

DIAPHRAGM LEVEL	FLOOR-TO-FLOOR HEIGHT		SECTION A	SECTION O	SECTION B	
2	9.1 FT	Roof Surface	0	146	0	sq ft
		Wall surface	0	380	0	sq ft
1	11.5 FT	Roof Surface	0	0	0	sq ft
		Wall surface	0	670	0	sq ft
FND		Roof Surface	0	0	0	sq ft
		Wall surface	0	0	0	sq ft

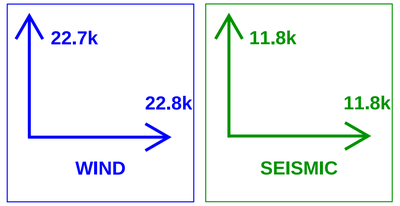


TRIBUTARY DESIGN LOADS: (0.6W)

	SECTION A	SECTION O	SECTION B	
Story Shear	0.00	9.98	0.00	kips
Total Shear	0.00	9.98	0.00	kips
		9.98		kips
Story Shear	0.00	12.76	0.00	kips
Total Shear	0.00	22.75	0.00	kips
		22.75		kips
Story Shear	0.00	0.00	0.00	kips
Total Shear	0.00	22.75	0.00	kips
		22.75		kips



MAIN FLOOR PLAN NOTES



MAIN FLOOR PLAN

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA + GARAGE	2,495	S.F.
UPPER FLOOR AREA	2,012	S.F.
TOTAL AREA	4,507	S.F.
COV'D DECK	568	S.F.
COV'D FRONT PORCH	68	S.F.
TOTAL AREA UNDER ROOF	5,143	S.F.

OVERALL WIDTH 0'-0"
OVERALL DEPTH 0'-0"

Updated : 1/02/2018

Method for Calculating Square Footage - ANSI Z765-2013 except: no separate distinction of 'above-grade or below-grade' areas and each level is measured to the outside of studs not the exterior finished surface.

Square footage calculations for this house were made based on plan dimensions only and may vary from the finished square footage of the house as built.

See Sheet "CODES" for additional Zoning required Area Calculations

JAYMARC HOMES
7525 SE 24th St., 487
Mercer Island, WA 98040
425.266.9100

Issue	Issue Date	By	Description

PIHA RESIDENCE
3745 77th Ave SE
MERCER ISLAND, WA.

plan name:
marketing name: VENICE
plan number: --
mark sys. number:--

Submittal Date

Sheet Title/Description

Design Firm

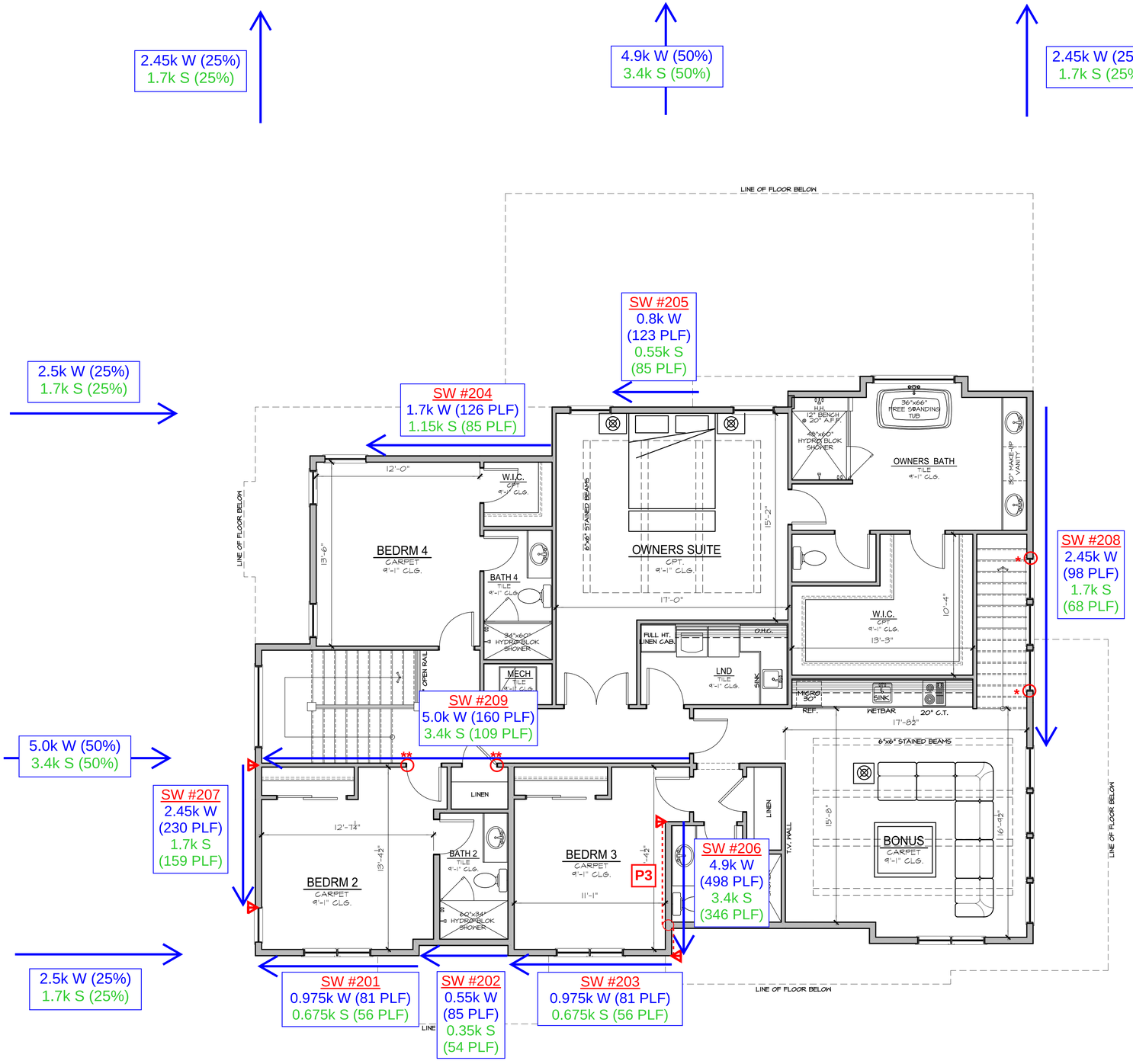
KCS
Drawn by:

Checked by:

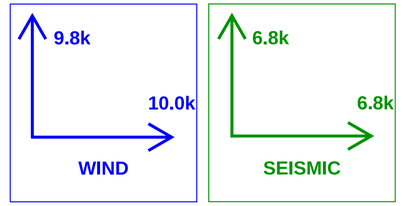
1/4"=1'-0" (48)
Primary Scale

A8
of: .28

Sheet Title/Description



UPPER FLOOR PLAN NOTES



UPPER FLOOR PLAN

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA + GARAGE	2,495	S.F.
UPPER FLOOR AREA	2,012	S.F.
TOTAL AREA	4,507	S.F.
COV'D DECK	568	S.F.
COV'D FRONT PORCH	68	S.F.
TOTAL AREA UNDER ROOF	5,143	S.F.

OVERALL WIDTH	0'-0"
OVERALL DEPTH	0'-0"

Updated : 1/02/2018

Method for Calculating Square Footage - ANSI Z765-2013 except: no separate distinction of 'above-grade or below-grade' areas and each level is measured to the outside of studs not the exterior finished surface.

Square footage calculations for this house were made based on plan dimensions only and may vary from the finished square footage of the house as built.

See Sheet "CODES" for additional Zoning required Area Calculations

JAYMARC HOMES
7525 SE 24th St., 487
Mercer Island, WA 98040
425.266.9100

Issue	Issue Date	By	Description
△			

PIHA RESIDENCE
3745 77th Ave SE
MERCER ISLAND, WA.

plan name:
marketing name: VENICE
plan number: --
mark sys. number:--

Submittal Date

Sheet Title/Description

Design Firm

Drawn by: KCS

Checked by:

Primary Scale: 1/4"=1'-0" (48)

A12

of: .28

Sheet Title/Description

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 201: 2ND - FRONT EXT BEDROOM 2

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	6.0	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	7.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
975 LBS	<	2352 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	8.9	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	14.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 202: 2ND - FRONT EXT BATH 2

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	6.5	FT.	QUALIFYING WALL LENGTH, L	6.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
550 LBS	<	2184 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	406	PLF	OVERTURNING MOMENT	5.0	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	9.8	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 203: 2ND - FRONT EXT BEDROOM 3

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	6.0	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	7.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
975 LBS	<	2352 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	8.9	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	14.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 204: 2ND - REAR EXT BEDROOM 4

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	13.5	FT.	QUALIFYING WALL LENGTH, L	13.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1700 LBS	<	4536 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	420	PLF	OVERTURNING MOMENT	15.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	460	LBS	RESISTIVE MOMENT	26.7	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 205: 2ND - REAR EXT OWNERS SUITE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	6.5	FT.	QUALIFYING WALL LENGTH, L	6.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
800 LBS	<	2184 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	432	PLF	OVERTURNING MOMENT	7.3	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	485	LBS	RESISTIVE MOMENT	7.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	0.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	0.0	FT.	QUALIFYING WALL LENGTH, L	0.0	FT.	SHEARWALL ASSEMBLY	P0

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
0 LBS	####	#DIV/0! LBS

SHEARWALL ASSEMBLY SPECIFICATION

P0 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - UNBLOCKED
#DIV/0!

OVERTURNING EVALUATION:

RESISTIVE DL	0	PLF	OVERTURNING MOMENT	#DIV/0!	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	0.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 206: 2ND - SIDE INT BEDROOM / BATH 3

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	9.8	FT.	QUALIFYING WALL LENGTH, L	9.8	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4900 LBS	<	6193 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	44.6	K-FT	HOLD DOWN DESIGN LOAD	4021	LBS
DL AT ENDS OF WALL	200	LBS	RESISTIVE MOMENT	5.1	K-FT	HOLDOWN CAPACITY	4645	LBS

HOLD-DOWN SPECIFICATION

SIMPSON MSTC66 STRAP TIE (20" END LENGTH)

SHEARWALL 207: 2ND - SIDE EXT BEDROOM 2

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	10.7	FT.	QUALIFYING WALL LENGTH, L	10.7	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2450 LBS	<	3585 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	22.3	K-FT	HOLD DOWN DESIGN LOAD	1601	LBS
DL AT ENDS OF WALL	100	LBS	RESISTIVE MOMENT	5.2	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 208: 2ND - SIDE EXT OWNERS BATH

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_o	7.0	FT.		
WALL LENGTH, L	25.0	FT.	QUALIFYING WALL LENGTH, L	15.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2450 LBS	<	5040 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	22.3	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	100	LBS	RESISTIVE MOMENT	26.6	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 209: 2ND - REAR INT STAIRS / HALL

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	8.0	FT.		
WALL LENGTH, L	31.3	FT.	QUALIFYING WALL LENGTH, L	24.7	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
5000 LBS	<	8289 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	45.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	47.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	0.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	0.0	FT.	QUALIFYING WALL LENGTH, L	0.0	FT.	SHEARWALL ASSEMBLY	P0

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
0 LBS	####	#DIV/0! LBS

SHEARWALL ASSEMBLY SPECIFICATION

P0 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - UNBLOCKED
#DIV/0!

OVERTURNING EVALUATION:

RESISTIVE DL	0	PLF	OVERTURNING MOMENT	#DIV/0!	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	0.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 101: 1ST - FRONT EXT STUDY

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	7.5	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	7.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2850 LBS	<	4331 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	339	PLF	OVERTURNING MOMENT	28.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	2000	LBS	RESISTIVE MOMENT	29.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 102: 1ST - FRONT INT GARAGE / KITCHEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	11.0	FT.	QUALIFYING WALL LENGTH, L	11.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4000 LBS	<	6930 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	310	PLF	OVERTURNING MOMENT	40.0	K-FT	HOLD DOWN DESIGN LOAD	1893	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	19.2	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 103: 1ST - FRONT EXT DINING

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	7.5	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	7.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2850 LBS	<	4331 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	339	PLF	OVERTURNING MOMENT	28.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	2000	LBS	RESISTIVE MOMENT	29.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 104: 1ST - FRONT INT DINING / GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	8.0	FT.		
WALL LENGTH, L	15.5	FT.	QUALIFYING WALL LENGTH, L	12.3	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
5650 LBS	<	7749 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	393	PLF	OVERTURNING MOMENT	56.5	K-FT	HOLD DOWN DESIGN LOAD	1578	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	32.0	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

SHEARWALL 105: 1ST - REAR EXT GREAT ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	3.0	FT.	QUALIFYING WALL LENGTH, L	3.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1500 LBS	<	1575 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	15.0	K-FT	HOLD DOWN DESIGN LOAD	4639	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	1.1	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 106: 1ST - REAR EXT GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	14.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	5.5	FT.	QUALIFYING WALL LENGTH, L	5.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1050 LBS	<	1722 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	321	PLF	OVERTURNING MOMENT	14.7	K-FT	HOLD DOWN DESIGN LOAD	1783	LBS
DL AT ENDS OF WALL	600	LBS	RESISTIVE MOMENT	4.9	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 107: 1ST - FRONT INT GARAGE / MUD

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	3.7	FT.	QUALIFYING WALL LENGTH, L	3.7	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
700 LBS	<	1121 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	400	PLF	OVERTURNING MOMENT	7.0	K-FT	HOLD DOWN DESIGN LOAD	1197	LBS
DL AT ENDS OF WALL	450	LBS	RESISTIVE MOMENT	2.6	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	0.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	0.0	FT.	QUALIFYING WALL LENGTH, L	0.0	FT.	SHEARWALL ASSEMBLY	P0

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
0 LBS	####	#DIV/0! LBS

SHEARWALL ASSEMBLY SPECIFICATION

P0 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - UNBLOCKED
#DIV/0!

OVERTURNING EVALUATION:

RESISTIVE DL	0	PLF	OVERTURNING MOMENT	#DIV/0!	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	0.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 108: 1ST - SIDE INT GARAGE FRONT

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	15.5	FT.	QUALIFYING WALL LENGTH, L	15.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3500 LBS	<	5208 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	264	PLF	OVERTURNING MOMENT	35.0	K-FT	HOLD DOWN DESIGN LOAD	310	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	30.2	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 109: 1ST - SIDE INT GARAGE BACK

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	6.0	FT.	QUALIFYING WALL LENGTH, L	6.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2600 LBS	<	3780 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	130	PLF	OVERTURNING MOMENT	26.0	K-FT	HOLD DOWN DESIGN LOAD	3379	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	5.7	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 110: 1ST - SIDE INT KITCHEN / MUD

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	8.0	FT.		
WALL LENGTH, L	23.0	FT.	QUALIFYING WALL LENGTH, L	20.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
5250 LBS	<	6636 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	130	PLF	OVERTURNING MOMENT	52.5	K-FT	HOLD DOWN DESIGN LOAD	906	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	31.7	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 111: 1ST - SIDE EXT STUDY

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	8.0	FT.		
WALL LENGTH, L	14.0	FT.	QUALIFYING WALL LENGTH, L	11.5	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4900 LBS	<	7166 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	249	PLF	OVERTURNING MOMENT	49.0	K-FT	HOLD DOWN DESIGN LOAD	1974	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	21.4	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 112: 1ST - SIDE EXT GREAT ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	5.5	FT.	QUALIFYING WALL LENGTH, L	5.5	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1900 LBS	<	3465 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	19.0	K-FT	HOLD DOWN DESIGN LOAD	2993	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	2.5	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 113: 1ST - SIDE EXT ADU FOYER / STAIRS

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	13.0	FT.	QUALIFYING WALL LENGTH, L	13.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1600 LBS	<	4368 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	249	PLF	OVERTURNING MOMENT	16.0	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	490	LBS	RESISTIVE MOMENT	16.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 114: 1ST - SIDE EXT GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	14.0	FT.	MAX WALL OPENING HT, Hc	8.0	FT.		
WALL LENGTH, L	24.3	FT.	QUALIFYING WALL LENGTH, L	21.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2950 LBS	<	7056 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	41.3	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1315	LBS	RESISTIVE MOMENT	42.8	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

JayMarc Homes

Piha Residence

Mercer Island, WA

Shear Wall Calculations - Seismic

Reviewed By: RJZ

February 3, 2022

Parameters:

Single Family Home

Design Wind Speed: 100 MPH

wind Exposure Category: C

Seismic Design Category: D

Code & Design Standard: 2018 IBC Ch. 1609, ASCE 7-16 Ch. 26-30

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Project Name: 3745 77th Ave SE
JayMarc Homes
M&K Project #: 154-22002
Engineer: JCL
Date: 01-Feb-22

SEISMIC CALCULATION - ASCE 7-16

Seismic Design Category:

User Inputs:

Site Class	D
Spectral Response Acceleration 0.2 sec, **Ss**	1.415
Spectral Response Acceleration 1.0 sec, **S1**	0.492
Occupancy Category	II

Variables:

Site coefficient, Fa	1.20
Site coefficient, Fv	1.81

Calculated Values:

Maximum spectral response acceleration, S_{MS}	1.698
Maximum spectral response acceleration, S_{M1}	0.890
Design spectral response acceleration, S_{DS}	1.132
Design spectral response acceleration, S_{D1}	0.593
Seismic Design Category (short term)	D
Seismic Design Category (1.0 second term)	D

Building period Determination:

User Inputs:

Building period coefficient, C_T	0.020
Long-Period Trans Period, T_L (sec)	6
Ht. abv base to highest level, h_n	21

Calculated Values:

Approximate Fundamental Period, T_A	0.193
T_0	0.105
T_S	0.524
Spectral Response Acc., S_A (g)	1.132

Site Class Assumption

Yes — Per ASCE 7-16 Section 11.4.3 the Site Class may be assumed to be D

EQUIVALENT LATERAL FORCE PROCEDURE

Dead Load Calculation:

Level	Story Ht. (ft.)	Area (ft^2)	Dead Load (psf)	DL of ext wall trib. to level (kips)	Total level DL
1	11.5	2875	15	11.9	55 k
2	9.1	2116	17	5.7	42 k
3	0.0	0	0	0.0	0 k
4	0.0	0	0	0.0	0 k
5	0.0	0	0	0.0	0 k
6	0.0	0	0	0.0	0 k
7	0.0	0	0	0.0	0 k
8	0.0	0	0	0.0	0 k
9	0.0	0	0	0.0	0 k
10	0.0	0	0	0.0	0 k
11	0.0	0	0	0.0	0 k
12	0.0	0	0	0.0	0 k
13	0.0	0	0	0.0	0 k
14	0.0	0	0	0.0	0 k
15	0.0	0	0	0.0	0 k
16	0.0	0	0	0.0	0 k
17	0.0	0	0	0.0	0 k
18	0.0	0	0	0.0	0 k
19	0.0	0	0	0.0	0 k
20	0.0	0	0	0.0	0 k

Total Dead Load Of Structure 97 Kips

Seismic Response Coefficient:

	Transverse	Longitudinal
Response modification factor, **R**	6.5	6.5
Occupancy Importance Factor, I_E	1.00	1.00
Seismic Response Coefficient, C_s	0.174	0.174

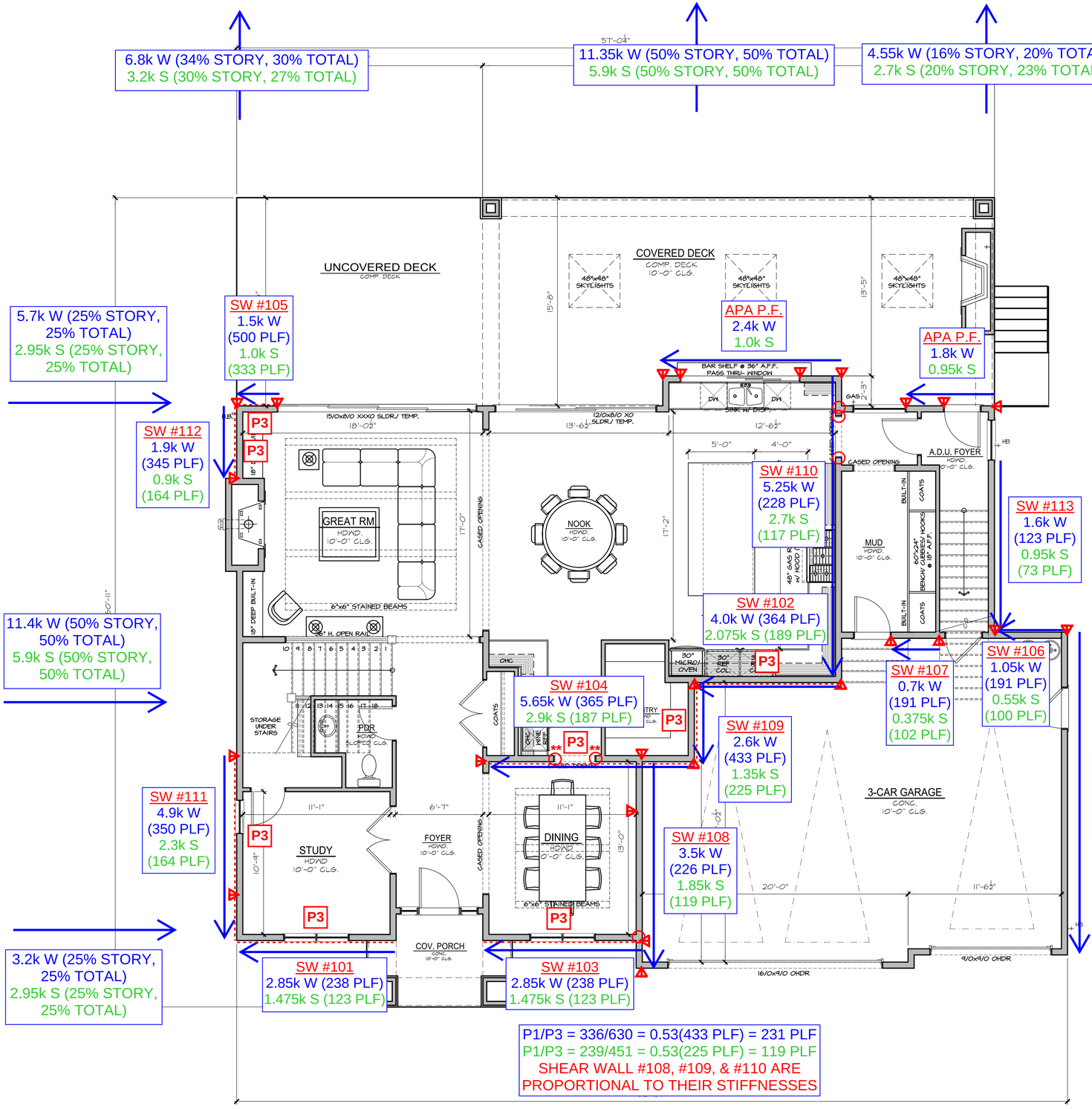
Base Shears:

Ultimate Loads		x 0.7 =	Allowable Loads	
Transverse	Longitudinal		Transverse	Longitudinal
17 k	17 k		11.8 k	11.8 k

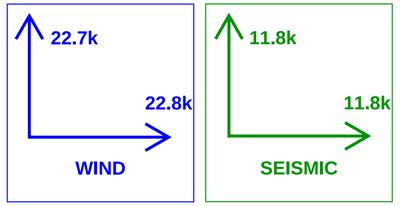
Story Shear Calculation:

Distribution exponent, k = 1.00

		Ultimate Loads				x 0.7 =	Allowable Loads					
		Transverse		Longitudinal			Transverse			Longitudinal		
Level	Vert. Dist. Factor, C_{vx}	Story Shear, F_x		Story Shear, F_x			Story Shear, F_x	Σ Story Shear		Story Shear, F_x	Σ Story Shear	
1	0.424	7.1	k	7.1	k		5.0 k	11.8	k	5.0 k	11.8	k
2	0.576	9.7	k	9.7	k		6.8 k	6.8	k	6.8 k	6.8	k
3	0.000	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
4	0.000	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
5	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
6	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
7	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
8	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
9	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
10	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
11	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
12	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
13	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
14	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
15	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
16	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
17	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
18	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
19	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k
20	0.00	0.0	k	0.0	k		0.0 k	0.0	k	0.0 k	0.0	k



MAIN FLOOR PLAN NOTES



MAIN FLOOR PLAN

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA + GARAGE	2,495	S.F.
UPPER FLOOR AREA	2,012	S.F.
TOTAL AREA	4,507	S.F.
COV'D DECK	568	S.F.
COV'D FRONT PORCH	68	S.F.
TOTAL AREA UNDER ROOF	5,143	S.F.

OVERALL WIDTH 0'-0"
OVERALL DEPTH 0'-0"

Updated : 1/02/2018

Method for Calculating Square Footage - ANSI Z765-2013 except: no separate distinction of 'above-grade or below-grade' areas and each level is measured to the outside of studs not the exterior finished surface.

Square footage calculations for this house were made based on plan dimensions only and may vary from the finished square footage of the house as built.

See Sheet "CODES" for additional Zoning required Area Calculations

JAYMARC HOMES
7525 SE 24th St., 487
Mercer Island, WA 98040
425.266.9100

Issue	Issue Date	By	Description

PIHA RESIDENCE
3745 77th Ave SE
MERCER ISLAND, WA.

plan name:
marketing name: VENICE
plan number: --
mark sys. number:--

Submittal Date

Sheet Title/Description

Design Firm

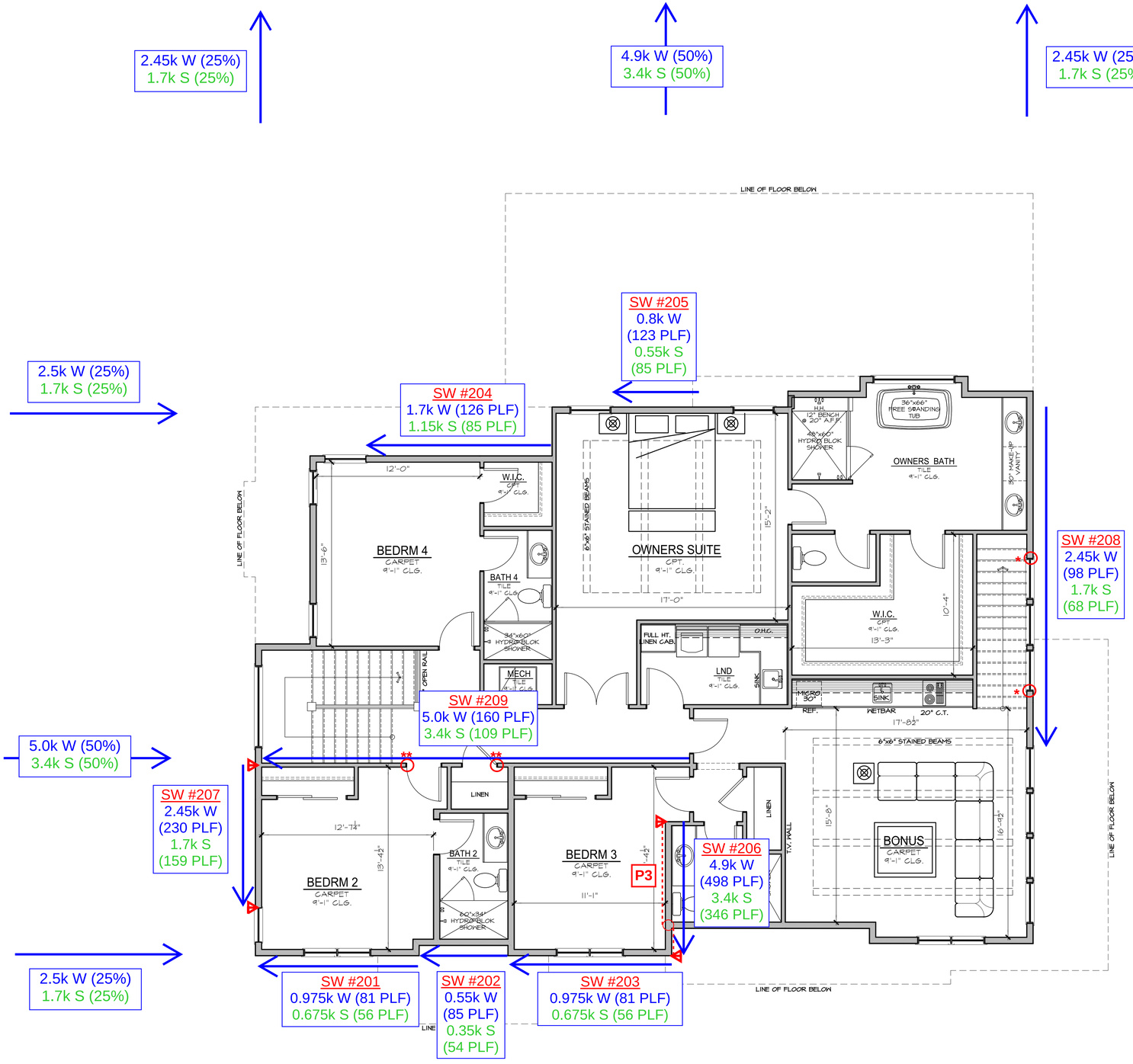
KCS
Drawn by:

Checked by:

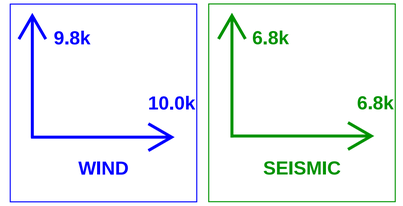
1/4"=1'-0" (48)
Primary Scale

A8
of: .28

Sheet Title/Description



UPPER FLOOR PLAN NOTES



UPPER FLOOR PLAN

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA + GARAGE	2,495	S.F.
UPPER FLOOR AREA	2,012	S.F.
TOTAL AREA	4,507	S.F.
COV'D DECK	568	S.F.
COV'D FRONT PORCH	68	S.F.
TOTAL AREA UNDER ROOF	5,143	S.F.

OVERALL WIDTH	0'-0"
OVERALL DEPTH	0'-0"

Updated : 1/02/2018

Method for Calculating Square Footage - ANSI Z765-2013 except: no separate distinction of 'above-grade or below-grade' areas and each level is measured to the outside of studs not the exterior finished surface.

Square footage calculations for this house were made based on plan dimensions only and may vary from the finished square footage of the house as built.

See Sheet "CODES" for additional Zoning required Area Calculations

JAYMARC HOMES
7525 SE 24th St., 487
Mercer Island, WA 98040
425.266.9100

Issue	Issue Date	By	Description
△			

PIHA RESIDENCE
3745 77th Ave SE
MERCER ISLAND, WA.

plan name:
marketing name: VENICE
plan number: --
mark sys. number:--

Submittal Date

Sheet Title/Description

Design Firm

Drawn by: KCS

Checked by:

Primary Scale: 1/4"=1'-0" (48)

A12

of: .28

Sheet Title/Description

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 201: 2ND - FRONT EXT BEDROOM 2

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	6.0	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	7.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
675 LBS	<	1673 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	6.1	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	10.9	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 202: 2ND - FRONT EXT BATH 2

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	6.5	FT.	QUALIFYING WALL LENGTH, L	6.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
350 LBS	<	1554 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	406	PLF	OVERTURNING MOMENT	3.2	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	7.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 203: 2ND - FRONT EXT BEDROOM 3

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	ft.	MAX WALL OPENING HT, H_c	6.0	ft.		
WALL LENGTH, L	12.0	ft.	QUALIFYING WALL LENGTH, L	7.0	ft.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
675 lbs	<	1673 lbs

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	plf	OVERTURNING MOMENT	6.1	k-ft	HOLD DOWN DESIGN LOAD	0	lbs
DL AT ENDS OF WALL	1200	lbs	RESISTIVE MOMENT	10.9	k-ft	HOLDOWN CAPACITY	0	lbs

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 204: 2ND - REAR EXT BEDROOM 4

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	ft.	MAX WALL OPENING HT, Hc	0.0	ft.		
WALL LENGTH, L	13.5	ft.	QUALIFYING WALL LENGTH, L	13.5	ft.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1150 lbs	<	3227 lbs

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	420	plf	OVERTURNING MOMENT	10.5	k-ft	HOLD DOWN DESIGN LOAD	0	lbs
DL AT ENDS OF WALL	460	lbs	RESISTIVE MOMENT	20.2	k-ft	HOLDOWN CAPACITY	0	lbs

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 205: 2ND - REAR EXT OWNERS SUITE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	6.5	FT.	QUALIFYING WALL LENGTH, L	6.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
550 LBS	<	1554 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	432	PLF	OVERTURNING MOMENT	5.0	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	485	LBS	RESISTIVE MOMENT	5.6	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	0.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	0.0	FT.	QUALIFYING WALL LENGTH, L	0.0	FT.	SHEARWALL ASSEMBLY	P0

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
0 LBS	####	#DIV/0! LBS

SHEARWALL ASSEMBLY SPECIFICATION

P0 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - UNBLOCKED
#DIV/0!

OVERTURNING EVALUATION:

RESISTIVE DL	0	PLF	OVERTURNING MOMENT	#DIV/0!	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	0.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-FEB-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 206: 2ND - SIDE INT BEDROOM / BATH 3

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	9.8	FT.	QUALIFYING WALL LENGTH, L	9.8	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3400 LBS	<	4433 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	30.9	K-FT	HOLD DOWN DESIGN LOAD	2759	LBS
DL AT ENDS OF WALL	200	LBS	RESISTIVE MOMENT	3.8	K-FT	HOLDOWN CAPACITY	4645	LBS

HOLD-DOWN SPECIFICATION

SIMPSON MSTC66 STRAP TIE (20" END LENGTH)

SHEARWALL 207: 2ND - SIDE EXT BEDROOM 2

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	10.7	FT.	QUALIFYING WALL LENGTH, L	10.7	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1700 LBS	<	2550 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	15.5	K-FT	HOLD DOWN DESIGN LOAD	1081	LBS
DL AT ENDS OF WALL	100	LBS	RESISTIVE MOMENT	3.9	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 208: 2ND - SIDE EXT OWNERS BATH

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	7.0	FT.		
WALL LENGTH, L	25.0	FT.	QUALIFYING WALL LENGTH, L	15.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1700 LBS	<	3585 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	15.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	100	LBS	RESISTIVE MOMENT	20.1	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 209: 2ND - REAR INT STAIRS / HALL

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	8.0	FT.		
WALL LENGTH, L	31.3	FT.	QUALIFYING WALL LENGTH, L	24.7	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3400 LBS	<	5896 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	30.9	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	35.5	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	0.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	0.0	FT.	QUALIFYING WALL LENGTH, L	0.0	FT.	SHEARWALL ASSEMBLY	P0

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
0 LBS	####	#DIV/0! LBS

SHEARWALL ASSEMBLY SPECIFICATION

P0 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - UNBLOCKED
#DIV/0!

OVERTURNING EVALUATION:

RESISTIVE DL	0	PLF	OVERTURNING MOMENT	#DIV/0!	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	0.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 101: 1ST - FRONT EXT STUDY

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	7.5	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	7.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1475 LBS	<	3101 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	339	PLF	OVERTURNING MOMENT	14.8	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	2000	LBS	RESISTIVE MOMENT	21.9	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 102: 1ST - FRONT INT GARAGE / KITCHEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	11.0	FT.	QUALIFYING WALL LENGTH, L	11.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2075 LBS	<	4961 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	310	PLF	OVERTURNING MOMENT	20.8	K-FT	HOLD DOWN DESIGN LOAD	570	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	14.5	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 103: 1ST - FRONT EXT DINING

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	7.5	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	7.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1475 LBS	<	3101 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	339	PLF	OVERTURNING MOMENT	14.8	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	2000	LBS	RESISTIVE MOMENT	21.9	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 104: 1ST - FRONT INT DINING / GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_o	8.0	FT.		
WALL LENGTH, L	15.5	FT.	QUALIFYING WALL LENGTH, L	12.3	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2900 LBS	<	5547 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	393	PLF	OVERTURNING MOMENT	29.0	K-FT	HOLD DOWN DESIGN LOAD	310	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	24.2	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

SHEARWALL 105: 1ST - REAR EXT GREAT ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	3.0	FT.	QUALIFYING WALL LENGTH, L	3.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1000 LBS	<	1128 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	10.0	K-FT	HOLD DOWN DESIGN LOAD	3061	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	0.8	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 106: 1ST - REAR EXT GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	14.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	5.5	FT.	QUALIFYING WALL LENGTH, L	5.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
550 LBS	<	1225 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	321	PLF	OVERTURNING MOMENT	7.7	K-FT	HOLD DOWN DESIGN LOAD	728	LBS
DL AT ENDS OF WALL	600	LBS	RESISTIVE MOMENT	3.7	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 107: 1ST - FRONT INT GARAGE / MUD

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	3.7	FT.	QUALIFYING WALL LENGTH, L	3.7	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
375 LBS	<	798 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	400	PLF	OVERTURNING MOMENT	3.8	K-FT	HOLD DOWN DESIGN LOAD	485	LBS
DL AT ENDS OF WALL	450	LBS	RESISTIVE MOMENT	2.0	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	0.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	0.0	FT.	QUALIFYING WALL LENGTH, L	0.0	FT.	SHEARWALL ASSEMBLY	P0

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
0 LBS	####	#DIV/0! LBS

SHEARWALL ASSEMBLY SPECIFICATION

P0 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - UNBLOCKED
#DIV/0!

OVERTURNING EVALUATION:

RESISTIVE DL	0	PLF	OVERTURNING MOMENT	#DIV/0!	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	0.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 108: 1ST - SIDE INT GARAGE FRONT

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	15.5	FT.	QUALIFYING WALL LENGTH, L	15.5	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1850 LBS	<	3705 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	264	PLF	OVERTURNING MOMENT	18.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	22.8	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 109: 1ST - SIDE INT GARAGE BACK

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	6.0	FT.	QUALIFYING WALL LENGTH, L	6.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1350 LBS	<	2706 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	130	PLF	OVERTURNING MOMENT	13.5	K-FT	HOLD DOWN DESIGN LOAD	1530	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	4.3	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 110: 1ST - SIDE INT KITCHEN / MUD

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	8.0	FT.		
WALL LENGTH, L	23.0	FT.	QUALIFYING WALL LENGTH, L	20.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2700 LBS	<	4720 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	130	PLF	OVERTURNING MOMENT	27.0	K-FT	HOLD DOWN DESIGN LOAD	134	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	23.9	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 111: 1ST - SIDE EXT STUDY

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	8.0	FT.		
WALL LENGTH, L	14.0	FT.	QUALIFYING WALL LENGTH, L	11.5	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2300 LBS	<	5130 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	249	PLF	OVERTURNING MOMENT	23.0	K-FT	HOLD DOWN DESIGN LOAD	491	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	16.1	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 112: 1ST - SIDE EXT GREAT ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	5.5	FT.	QUALIFYING WALL LENGTH, L	5.5	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
900 LBS	<	2481 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P3 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 3"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	9.0	K-FT	HOLD DOWN DESIGN LOAD	1288	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	1.9	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PIHA RESIDENCE
M&K PROJECT #: 154-22002
ENGINEER: JCL
DATE: 03-Feb-22

SHEARWALL DESIGN SUMMARY

SHEARWALL 113: 1ST - SIDE EXT ADU FOYER / STAIRS

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	13.0	FT.	QUALIFYING WALL LENGTH, L	13.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
950 LBS	<	3107 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	249	PLF	OVERTURNING MOMENT	9.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	490	LBS	RESISTIVE MOMENT	12.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 114: 1ST - SIDE EXT GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	14.0	FT.	MAX WALL OPENING HT, Hc	8.0	FT.		
WALL LENGTH, L	24.3	FT.	QUALIFYING WALL LENGTH, L	21.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1750 LBS	<	5019 LBS

SHEARWALL ASSEMBLY SPECIFICATION

P1 - 1-SIDE 7/16" OSB
FASTENED W/ 8D NAILS AT 6"O.C. PANEL EDGES & 12"O.C. PANEL FIELD - EDGES BLOCKED
ADEQUATE

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	24.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1315	LBS	RESISTIVE MOMENT	32.3	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED