MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

7220 Trade Street, Suite 295, San Diego, CA 92121 ▸ p 619-650-0010 ▸ *mulhernkulp.com*

CALCULATION PACKAGE

January 18, 2024

JayMarc Homes

4104 83rd Ave SE
Mercer Island, WA

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Prepared By:

Blake F. Durham, E.I.T. *Staff Engineer*

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

Signature, Seal & Date

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

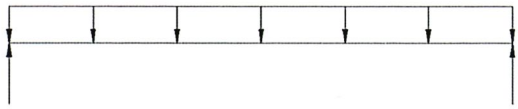
PROJECT NAME: 4104 83RD AVE SE
JAYMARC HOMES
M&K PROJECT #: 154-23017
ENGINEER: BFD
DATE: 12-JAN-24

BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: TYP. HDR (WORST CASE LOAD) — B1

PARAMETERS:

L =	6	FT
W =	0.78	KLF
P =	—	K



ANALYSIS:

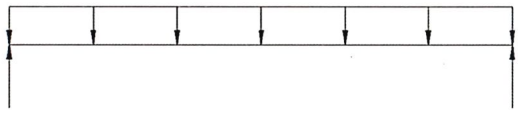
R_{MAX} =	2.3 K	V_D =	— K	< V_{ALL} =	4.5 K	✓	ADEQUATE
M_{MAX} =	2.9 K-FT	< M_{ALL} =	5.2 K-FT			✓	ADEQUATE
Δ_{TL} =	0.05 IN.	L/	999+	< L/240		✓	ADEQUATE

4x10 DF #2

BEAM DESCRIPTION: TYP. HDR (WORST CASE LENGTH) — B1

PARAMETERS:

L =	8	FT
W =	0.27	KLF
P =	—	K



ANALYSIS:

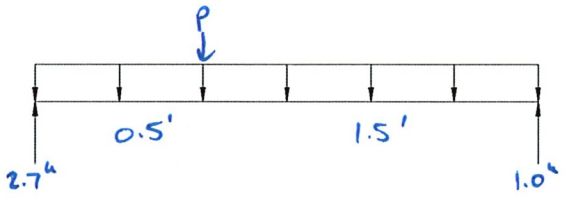
R_{MAX} =	1.1 K	V_D =	— K	< V_{ALL} =	4.5 K	✓	ADEQUATE
M_{MAX} =	2.2 K-FT	< M_{ALL} =	5.2 K-FT			✓	ADEQUATE
Δ_{TL} =	0.07 IN.	L/	999+	< L/240		✓	ADEQUATE

4x10 DF #2

BEAM DESCRIPTION: ROOF FRMG - HDR @ BATH 5 — B2

PARAMETERS:

L =	2	FT
W =	0.17	KLF
P =	3.4	K



ANALYSIS:

R_{MAX} =	2.7 K	V_D =	— K	< V_{ALL} =	4.5 K	✓	ADEQUATE
M_{MAX} =	1.3 K-FT	< M_{ALL} =	5.2 K-FT			✓	ADEQUATE
Δ_{TL} =	0.01 IN.	L/	999+	< L/240		✓	ADEQUATE

4x10 DF #2

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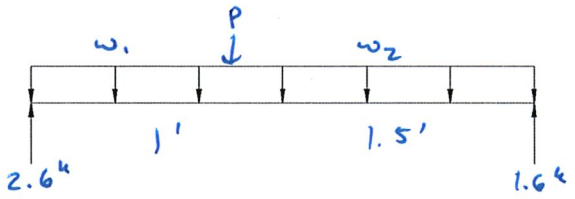
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: ROOF FRMG - HDR @ BED 3 / BONUS (B3)

PARAMETERS:

L = 2.5 FT
W_1 = 0.78 KLF, W_2 = 0.17 KLF
P = 3.1 K



ANALYSIS:

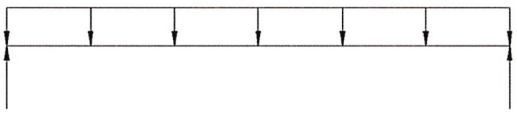
R_{MAX} =	2.6 K	V_D =	– K	< V_{ALL} =	4.5 K	✓ ADEQUATE
M_{MAX} =	2.2 K-FT	< M_{ALL} =	5.2 K-FT			✓ ADEQUATE
Δ_{TL} =	0.01 IN.	L/	999+	< L/240		✓ ADEQUATE

4x10 DF #2

BEAM DESCRIPTION: UPPER FLR FRMG - TYP. INT. HDR / FLUSH BOT. BM / DROPPED BM (CLOSEST CASE) (B4)

PARAMETERS:

L = 4.25 FT
W = 1.0 KLF
P = – K



ANALYSIS:

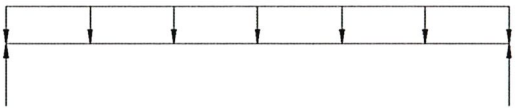
R_{MAX} =	2.1 K	V_D =	– K	< V_{ALL} =	3.9 K	✓ ADEQUATE
M_{MAX} =	2.3 K-FT	< M_{ALL} =	4.5 K-FT			✓ ADEQUATE
Δ_{TL} =	0.02 IN.	L/	999+	< L/240		✓ ADEQUATE

4x10 DF #2

BEAM DESCRIPTION: UPPER FLR FRMG - DROPPED BM @ KITCHEN / GREAT ROOM (B5)

PARAMETERS:

L = 16.17 FT
W = 1.1 KLF
P = – K



ANALYSIS:

R_{MAX} =	8.9 K	V_D =	– K	< V_{ALL} =	16.0 K	✓ ADEQUATE
M_{MAX} =	36.0 K-FT	< M_{ALL} =	49.3 K-FT			✓ ADEQUATE
Δ_{TL} =	0.46 IN.	L/	424	< L/240		✓ ADEQUATE

5½" x 16½" GLB

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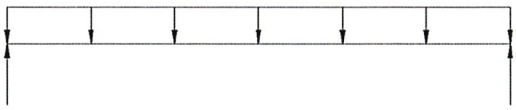
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: UPPER FLR FRMG - SGD HDR @ NOOK

B6

PARAMETERS:

L = 12 FT
W = 0.47 KLF
P = – K



ANALYSIS:

R_{MAX} =	2.8 K	V_D =	– K	< V_{ALL} =	15.1 K	✓ ADEQUATE
M_{MAX} =	8.5 K-FT	< M_{ALL} =	38.4 K-FT			✓ ADEQUATE
Δ_{TL} =	0.11 IN.	L/	999+	< L/240		✓ ADEQUATE

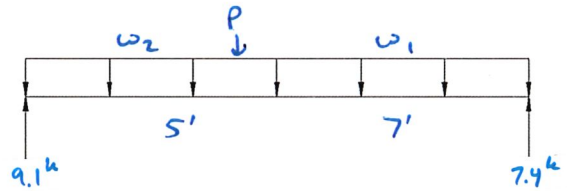
5½" x 13½" GLB

BEAM DESCRIPTION: UPPER FLR FRMG - SGD HDR @ DINING

B7

PARAMETERS:

L = 12 FT
W_1 = 1.1 KLF, ω_2 = 1.4 KLF
P = 1.2 K



ANALYSIS:

R_{MAX} =	9.1 K	V_D =	– K	< V_{ALL} =	21.8 K	✓ ADEQUATE
M_{MAX} =	25.0 K-FT	< M_{ALL} =	79.6 K-FT			✓ ADEQUATE
Δ_{TL} =	0.10 IN.	L/	999+	< L/240		✓ ADEQUATE

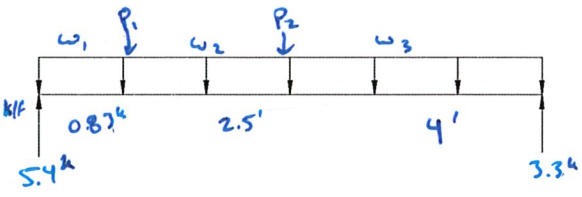
5½" x 19½" GLB

BEAM DESCRIPTION: UPPER FLR FRMG - HDR @ ADU SUITE

B8

PARAMETERS:

L = 7.33 FT
W_1 = 1.2 KLF, ω_2 = 0.55 KLF, ω_3 = 0.69 KLF
P_1 = 2.6 K, P_2 = 1.6 K



ANALYSIS:

R_{MAX} =	5.4 K	V_D =	– K	< V_{ALL} =	8.2 K	✓ ADEQUATE
M_{MAX} =	7.8 K-FT	< M_{ALL} =	10.2 K-FT			✓ ADEQUATE
Δ_{TL} =	0.08 IN.	L/	999+	< L/240		✓ ADEQUATE

6 X 12 DF #2

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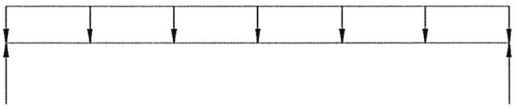
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: UPPER FLR FRMG - GARAGE DOOR HDR @ PORTAL FRAME

B9

PARAMETERS:

L = 8.17 FT
W = 0.21 KLF
P = — K



ANALYSIS:

R_{MAX} =	0.86 K	V_D =	— K	< V_{ALL} =	5.4 K	✓	ADEQUATE
M_{MAX} =	1.8 K-FT	< M_{ALL} =	7.0 K-FT			✓	ADEQUATE
Δ_{TL} =	0.01 IN.	L/	999+	< L/240		✓	ADEQUATE

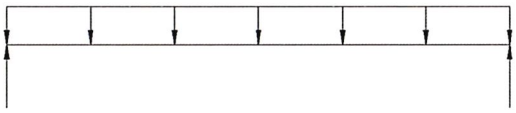
4X12 DF #2

BEAM DESCRIPTION: UPPER FLR FRMG - FLUSH BM @ COVERED PATIO (PERP. TO FRMG)

B10

PARAMETERS:

L = 2.33 FT
W = 0.4 KLF
P = — K



ANALYSIS:

R_{MAX} =	0.47 K	V_D =	— K	< V_{ALL} =	12.8 K	✓	ADEQUATE
M_{MAX} =	0.27 K-FT	< M_{ALL} =	43.5 K-FT			✓	ADEQUATE
Δ_{TL} =	0.01 IN.	L/	999+	< L/240		✓	ADEQUATE

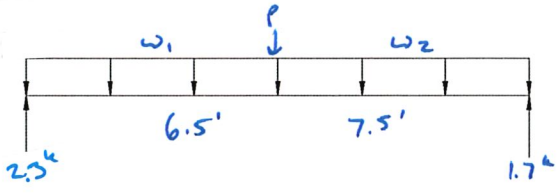
3½" x 18" GLB

BEAM DESCRIPTION: UPPER FLR FRMG - FLUSH BM @ COVERED PATIO (PARA. TO FRMG)

B11

PARAMETERS:

L = 14 FT
W_1 = 0.34 KLF, W_2 = 0.174 KLF
P = 0.47 K



ANALYSIS:

R_{MAX} =	2.3 K	V_D =	— K	< V_{ALL} =	6.9 K	✓	ADEQUATE
M_{MAX} =	7.7 K-FT	< M_{ALL} =	30.8 K-FT			✓	ADEQUATE
Δ_{TL} =	0.19 IN.	L/	899	< L/240		✓	ADEQUATE

(3) 1¾" x 11⅞" LVL (SLOPE CUT TO 6" MIN. DEPTH)

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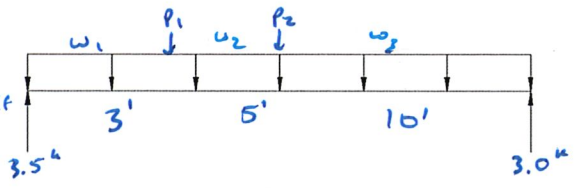
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: UPPER FLR FRMG- TYP. DROPPED BM @ COVERED PORCH (WORST CASE) (B12)

PARAMETERS:

L = 18 FT
W_1 = 0.08 KLF, W_2 = 0.17 KLF, W_3 = 0.29 KLF
P_1 = 1.7 K, P_2 = 0.8 K



ANALYSIS:

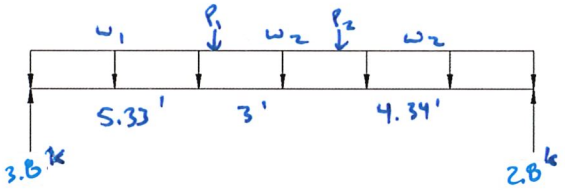
R_{MAX} =	3.5 K	V_D =	– K	< V_{ALL} =	15.1 K	✓ ADEQUATE
M_{MAX} =	15.6 K-FT	< M_{ALL} =	35.3 K-FT			✓ ADEQUATE
Δ_{TL} =	0.45 IN.	L/	482	< L/240		✓ ADEQUATE

5½" x 13½" GLB

BEAM DESCRIPTION: UPPER FLR FRMG- FLUSH BM @ LAUNCH (B13)

PARAMETERS:

L = 12.67 FT
W = 0.61 KLF, W_2 = 0.27 KLF
P_1 = 0.7 K, P_2 = 1.0 K



ANALYSIS:

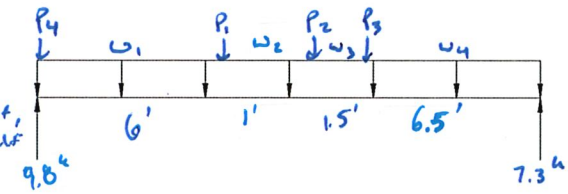
R_{MAX} =	3.8 K	V_D =	– K	< V_{ALL} =	20.1 K	✓ ADEQUATE
M_{MAX} =	11.1 K-FT	< M_{ALL} =	68.3 K-FT			✓ ADEQUATE
Δ_{TL} =	0.07 IN.	L/	999+	< L/240		✓ ADEQUATE

5½" x 18" GLB

BEAM DESCRIPTION: UPPER FLR FRMG- FLUSH BM @ STUDY (B14)

PARAMETERS:

L = 15 FT
W_1 = 1.3 KLF, W_2 = 0.59 KLF, W_3 = 0.51 KLF, W_4 = 0.65 KLF
P_1 = 2.6 K, P_2 = 0.5 K, P_3 = 1.6 K



ANALYSIS:

R_{MAX} =	9.8 K	V_D =	– K	< V_{ALL} =	12.8 K	✓ ADEQUATE
M_{MAX} =	36.2 K-FT	< M_{ALL} =	43.5 K-FT			✓ ADEQUATE
Δ_{TL} =	0.46 IN.	L/	387	< L/240		✓ ADEQUATE

3½" x 18" GLB

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BEAM & HEADER CALCULATIONS

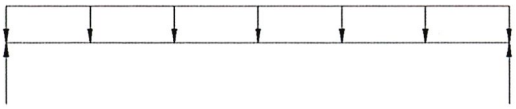
BEAM DESCRIPTION: UPPER FLR FRMG - FLUSH BM @ FOYER / STUDY

B15

PARAMETERS:

L = 11 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			✓ ADEQUATE
Δ_{TL} =		IN.	L/		< L/240			✓ ADEQUATE

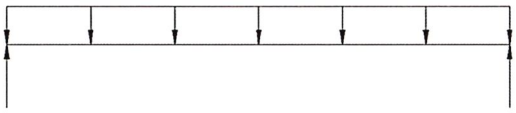
3½"x18" GLB

BEAM DESCRIPTION: UPPER FLR FRMG - FLUSH BM @ GREAT ROOM

B16

PARAMETERS:

L = 20 FT
W = 0.74 KLF
P = - K



ANALYSIS:

R_{MAX} =	7.4	K	V_D =	-	K	< V_{ALL} =	20.1	K	✓ ADEQUATE
M_{MAX} =	36.8	K-FT	< M_{ALL} =	65.5	K-FT			✓ ADEQUATE
Δ_{TL} =	0.55	IN.	L/	433	< L/240			✓ ADEQUATE

5½"x18" GLB

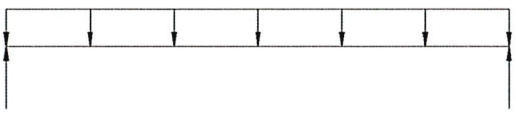
BEAM DESCRIPTION: UPPER FLR FRMG - DROPPED BM @ FOYER / GREAT ROOM

B17

PARAMETERS:

L = 11 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			✓ ADEQUATE
Δ_{TL} =		IN.	L/		< L/240			✓ ADEQUATE

5½" x12" GLB

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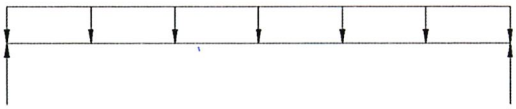
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: UPPER FLR FRMG - FLUSH BM @ GARAGE (PARA. TO FRMG) (B18)

PARAMETERS:

L = 10 FT
W = 0.52 KLF
P = - K



ANALYSIS:

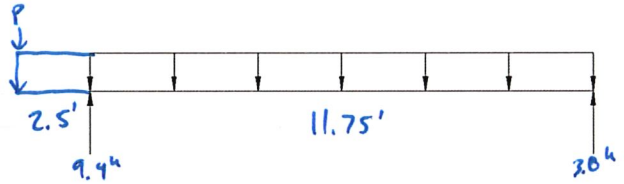
R_{MAX} =	2.6 K	V_D =	- K	< V_{ALL} =	20.1 K	☑ ADEQUATE
M_{MAX} =	6.5 K-FT	< M_{ALL} =	66.3 K-FT			☑ ADEQUATE
Δ_{TL} =	0.02 IN.	L/	999+	< L/240		☑ ADEQUATE

5½" x 18" GLB

BEAM DESCRIPTION: UPPER FLR FRMG - CANT'D FLUSH BM @ GARAGE (PERP. TO FRMG) (B19)

PARAMETERS:

L = 14.25 FT
W = 0.78 KLF
P = 2.6 K



ANALYSIS:

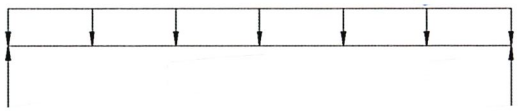
R_{MAX} =	9.4 K	V_D =	- K	< V_{ALL} =	12.8 K	☑ ADEQUATE
M_{MAX} =	9.5 K-FT	< M_{ALL} =	43.5 K-FT			☑ ADEQUATE
Δ_{TL} =	0.07 IN.	L/	999+	< L/240		☑ ADEQUATE

3½" x 18" GLB

BEAM DESCRIPTION: UPPER FLR FRMG - HDR @ GARAGE (B20)

PARAMETERS:

L = 16.17 FT
W = 0.17 KLF
P = - K



ANALYSIS:

R_{MAX} =	1.4 K	V_D =	- K	< V_{ALL} =	5.4 K	☑ ADEQUATE
M_{MAX} =	5.6 K-FT	< M_{ALL} =	7.0 K-FT			☑ ADEQUATE
Δ_{TL} =	0.40 IN.	L/	489	< L/240		☑ ADEQUATE

4 x 12 DF #2

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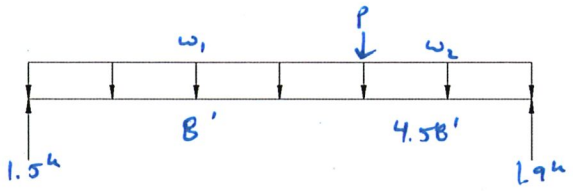
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: UPPER FLR FRMG - TYP. DROPPED BM @ FRONT PORCH (WORST CASE LOAD) [B21]

PARAMETERS:

L = 12.58 FT
W_1 = 0.17 KLF, W_2 = 0.21 KLF
P = 1.0 K



ANALYSIS:

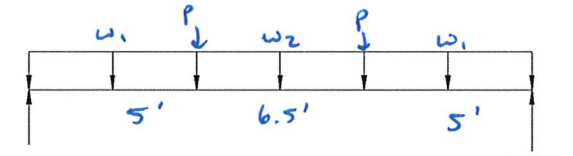
R_{MAX} =	1.9 K	V_D =	— K	< V_{ALL} =	8.2 K	☑ ADEQUATE
M_{MAX} =	6.3 K-FT	< M_{ALL} =	10.2 K-FT			☑ ADEQUATE
Δ_{TL} =	0.18 IN.	L/	818	< L/240		☑ ADEQUATE

6x12 DF #2

BEAM DESCRIPTION: UPPER FLR FRMG - TYP. DROPPED BM @ FRONT PORCH (WORST CASE LENGTH) [B21]

PARAMETERS:

L = 16.5 FT
W = 0.11 KLF, W_2 = 0.19 KLF
P = 0.4 K



ANALYSIS:

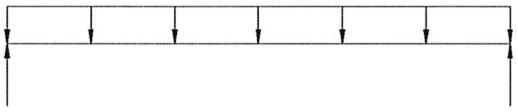
R_{MAX} =	1.5 K	V_D =	— K	< V_{ALL} =	8.2 K	☑ ADEQUATE
M_{MAX} =	7.4 K-FT	< M_{ALL} =	10.2 K-FT			☑ ADEQUATE
Δ_{TL} =	0.4 IN.	L/	494	< L/240		☑ ADEQUATE

6x12 DF #2

BEAM DESCRIPTION: MAIN FLR FRMG - TYP. DROPPED BM (WORST CASE) [B22]

PARAMETERS:

L = 6.5 FT
W = 0.75 KLF
P = — K



ANALYSIS:

R_{MAX} =	2.4 K	V_D =	— K	< V_{ALL} =	3.9 K	☑ ADEQUATE
M_{MAX} =	4.0 K-FT	< M_{ALL} =	4.5 K-FT			☑ ADEQUATE
Δ_{TL} =	0.08 IN.	L/	947	< L/240		☑ ADEQUATE

4x10 DF #2

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: 4104 83RD AVE SE
JAYMARC HOMES
M&K PROJECT #: 154-23017
ENGINEER: BFD
DATE: 12-JAN-24

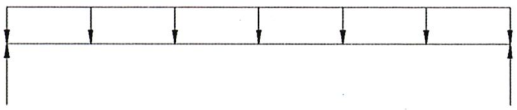
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: MAIN FLR FRMG - FLUSH BM @ B.W.A. (WORST CASE)

B23

PARAMETERS:

L = 5 FT
W = 1.1 KLF
P = – K



ANALYSIS:

R_{MAX} =	2.8 K	V_D =	– K	< V_{ALL} =	7.9 K	✓ ADEQUATE
M_{MAX} =	3.4 K-FT	< M_{ALL} =	17.9 K-FT			✓ ADEQUATE
Δ_{TL} =	0.02 IN.	L/	999+	< L/240		✓ ADEQUATE

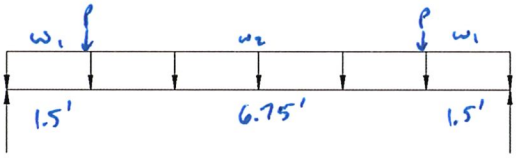
(2) 1 3/4"x11 7/8" LVL

BEAM DESCRIPTION: UPPER FLR FRMG - HDR @ FOYER/ COVERED PORCH

B24

PARAMETERS:

L = 9.75 FT
W_1 = 0.23 KLF, W_2 = 0.42 KLF
P = 0.4 K



ANALYSIS:

R_{MAX} =	2.1 K	V_D =	– K	< V_{ALL} =	6.8 K	✓ ADEQUATE
M_{MAX} =	5.3 K-FT	< M_{ALL} =	6.9 K-FT			✓ ADEQUATE
Δ_{TL} =	0.18 IN.	L/	645	< L/240		✓ ADEQUATE

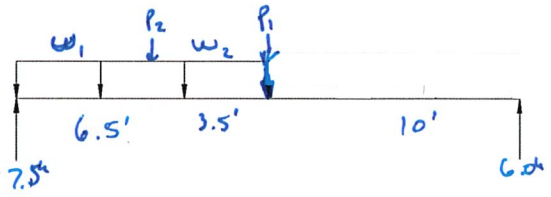
6x10 DF #2

BEAM DESCRIPTION: UPPER FLR FRMG - DROPPED BM @ GARAGE

B25

PARAMETERS:

L = 20 FT
W_1 = 0.17 KLF, W_2 = 0.39 KLF
P_1 = 9.4 K, P_2 = 1.4 K



ANALYSIS:

R_{MAX} =	7.5 K	V_D =	– K	< V_{ALL} =	21.8 K	✓ ADEQUATE
M_{MAX} =	58.9 K-FT	< M_{ALL} =	76.2 K-FT			✓ ADEQUATE
Δ_{TL} =	0.57 IN.	L/	417	< L/240		✓ ADEQUATE

5½" x 19½" GLB

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Project Name: 4104 83rd Ave SE
JayMarc Homes
M&K Project #: 154-23017
Engineer: BFD
Date: 12-Jan-24

Beam & Header Calculations

Beam Description: UPPER FLR FRMG - HDR @ NOOK

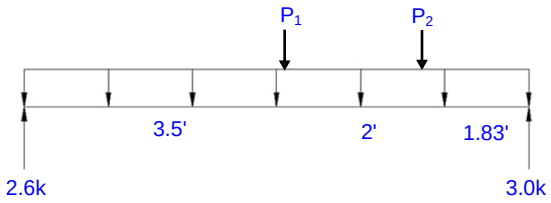
B26

Parameters:

L = 7.33 ft

W = 0.27 klf

P_1 = 2.7 k, P_2 = 1.0k



Analysis:

R_{max} =	3.0 K	V_d =	- K	< V_{all} =	8.2 K	✓	Adequate
M_{max} =	7.6 k-ft	< M_{all} =	10.2 k-ft			✓	Adequate
Δ_{tl} =	0.07 in.	L/	999+	< L/240		✓	Adequate

6x12 DF #2

Beam Description:

Parameters:

L = ft

W = klf

P = k

Analysis:

R_{max} =	K	V_d =	K	< V_{all} =	K		Adequate
M_{max} =	k-ft	< M_{all} =	k-ft				Adequate
Δ_{tl} =	in.	L/		< L/240			Adequate

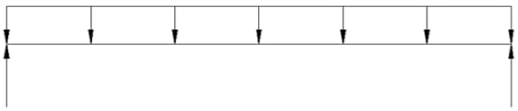
Beam Description:

Parameters:

L = ft

W = klf

P = k



Analysis:

R_{max} =	K	V_d =	K	< V_{all} =	K		Adequate
M_{max} =	k-ft	< M_{all} =	k-ft				Adequate
Δ_{tl} =	in.	L/		< L/240			Adequate

Wood Beam

Project File: 4104 83rd Ave SE.ec6

DESCRIPTION: B15

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

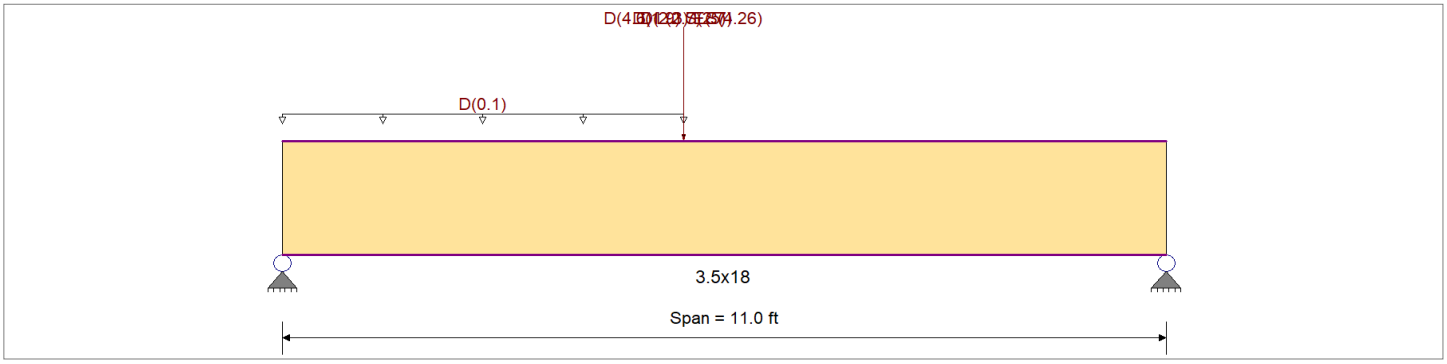
Wood Species : DF/DF
Wood Grade : 24F - V4

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 loading
Load for Span Number 1
Uniform Load : D = 0.10 k/ft, Extent = 0.0 -->> 5.0 ft, Tributary Width = 1.0 ft, (wall)
Point Load : D = 1.90, S = 2.70 k @ 5.0 ft, (g.t.)
Point Load : D = 4.60, L = 2.70, S = 4.260 k @ 5.0 ft, (B14)
Point Load : D = 2.30, E = 5.0 k @ 5.0 ft, (OS)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.853 : 1	Maximum Shear Stress Ratio	=	0.589 : 1
Section used for this span		3.5x18	Section used for this span		3.5x18
fb: Actual	=	2,826.08 psi	fv: Actual	=	215.34 psi
F'b	=	3,312.00 psi	F'v	=	365.70 psi
Load Combination		+D+0.750L+0.750S+H	Load Combination		+D+0.750L+0.750S+H
Location of maximum on span	=	5.018 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	0.108 in	Ratio =	1218	>=360	Span: 1 : S Only
Max Upward Transient Deflection	-0.078 in	Ratio =	1695	>=360	Span: 1 : E Only * -1.0
Max Downward Total Deflection	0.297 in	Ratio =	444	>=300	Span: 1 : +D+0.750L+0.750S+0.5250E+H
Max Upward Total Deflection	0 in	Ratio =	0	<300	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+H														0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.608	0.424	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	24.81	1,575.3	2,592.0	5.09	121.3	286.2
+D+L+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.709	0.492	1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00	32.15	2,041.5	2,880.0	6.57	156.3	318.0
+D+Lr+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.438	0.305	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	24.81	1,575.3	3,600.0	5.09	121.3	397.5
+D+S+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0

DESCRIPTION: B15

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 11.0 ft	1	0.838	0.579	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	43.74	2,776.9	3,312.0	8.89	211.6	365.7
+D+0.750Lr+0.750L+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.535	0.371	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	30.32	1,924.9	3,600.0	6.20	147.6	397.5
+D+0.750L+0.750S+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.853	0.589	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	44.51	2,826.1	3,312.0	9.04	215.3	365.7
+D+0.60W+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.342	0.238	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	24.81	1,575.3	4,608.0	5.09	121.3	508.8
+D-0.60W+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.342	0.238	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	24.81	1,575.3	4,608.0	5.09	121.3	508.8
+D+0.750Lr+0.750L+0.450W-					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.418	0.290	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	30.32	1,924.9	4,608.0	6.20	147.6	508.8
+D+0.750Lr+0.750L-0.450W+					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.418	0.290	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	30.32	1,924.9	4,608.0	6.20	147.6	508.8
+D+0.750L+0.750S+0.450W+					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.613	0.423	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	44.51	2,826.1	4,608.0	9.04	215.3	508.8
+D+0.750L+0.750S-0.450W+					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.613	0.423	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	44.51	2,826.1	4,608.0	9.04	215.3	508.8
+0.60D+0.60W+0.60H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.205	0.143	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	14.89	945.2	4,608.0	3.06	72.8	508.8
+0.60D-0.60W+0.60H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.205	0.143	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	14.89	945.2	4,608.0	3.06	72.8	508.8
+D+0.70E+0.60H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.473	0.328	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	34.33	2,179.6	4,608.0	7.00	166.7	508.8
+D-0.70E+0.60H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.211	0.149	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	15.30	971.1	4,608.0	3.18	75.8	508.8
+D+0.750L+0.750S+0.5250E-					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.712	0.490	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	51.65	3,279.2	4,608.0	10.48	249.4	508.8
+D+0.750L+0.750S-0.5250E+					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.515	0.356	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	37.37	2,372.9	4,608.0	7.61	181.3	508.8
+0.60D+0.70E+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.336	0.232	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	24.40	1,549.4	4,608.0	4.96	118.2	508.8
+0.60D-0.70E+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.074	0.054	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	5.37	341.0	4,608.0	1.15	27.3	508.8

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S+0.5250E+H	1	0.2968	5.339		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	10.645	8.675
Max Upward from Load Combinations	10.645	8.675
Max Upward from Load Cases	5.261	4.189
Max Downward from all Load Conditio	-2.727	-2.273
Max Downward from Load Cases (Resis	-2.727	-2.273
+D+H	5.261	4.189
+D+L+H	6.734	5.416
+D+Lr+H	5.261	4.189
+D+S+H	9.058	7.352
+D+0.750Lr+0.750L+H	6.366	5.109
+D+0.750L+0.750S+H	9.213	7.482

DESCRIPTION: B15

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
+D+0.60W+H	5.261	4.189
+D-0.60W+H	5.261	4.189
+D+0.750Lr+0.750L+0.450W+H	6.366	5.109
+D+0.750Lr+0.750L-0.450W+H	6.366	5.109
+D+0.750L+0.750S+0.450W+H	9.213	7.482
+D+0.750L+0.750S-0.450W+H	9.213	7.482
+0.60D+0.60W+0.60H	3.157	2.513
+0.60D-0.60W+0.60H	3.157	2.513
+D+0.70E+0.60H	7.171	5.780
+D-0.70E+0.60H	3.352	2.598
+D+0.750L+0.750S+0.5250E+H	10.645	8.675
+D+0.750L+0.750S-0.5250E+H	7.781	6.289
+0.60D+0.70E+H	5.066	4.104
+0.60D-0.70E+H	1.248	0.922
D Only	5.261	4.189
L Only	1.473	1.227
S Only	3.796	3.164
E Only	2.727	2.273
E Only * -1.0	-2.727	-2.273
H Only		

Wood Beam

Project File: 4104 83rd Ave SE.ec6

DESCRIPTION: B17

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

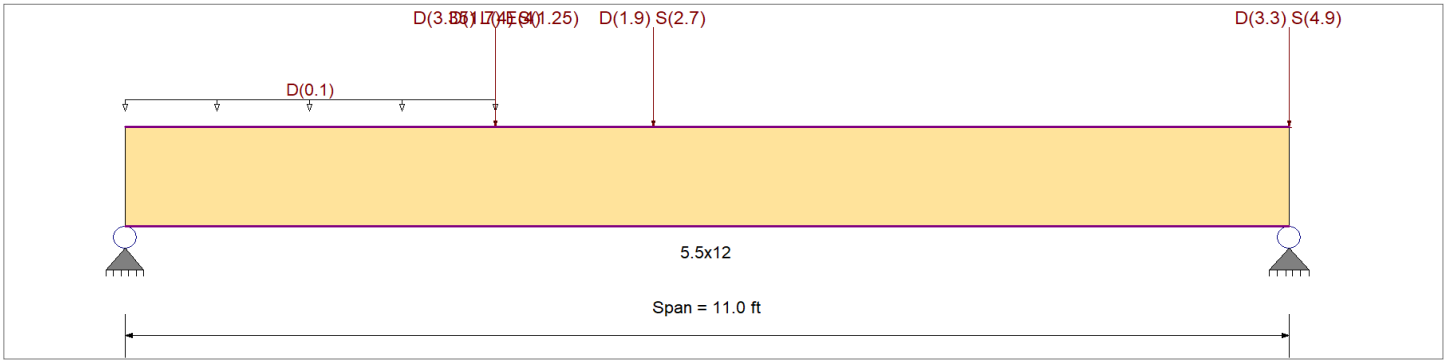
Wood Species : DF/DF
Wood Grade : 24F - V4

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 loading
Load for Span Number 1
Uniform Load : D = 0.10 k/ft, Extent = 0.0 -->> 3.50 ft, Tributary Width = 1.0 ft, (wall)
Point Load : D = 1.90, S = 2.70 k @ 5.0 ft, (g.t.)
Point Load : D = 3.350, L = 4.0, S = 1.250 k @ 3.50 ft, (B16)
Point Load : D = 1.70, E = 4.0 k @ 3.50 ft, (OS)
Point Load : D = 3.30, S = 4.90 k @ 11.0 ft, (G.T.)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.814 : 1	Maximum Shear Stress Ratio	=	0.534 : 1
Section used for this span		5.5x12	Section used for this span		5.5x12
fb: Actual	=	2,343.35 psi	fv: Actual	=	169.77 psi
F'b	=	2,880.00 psi	F'v	=	318.00 psi
Load Combination		+D+L+H	Load Combination		+D+L+H
Location of maximum on span	=	3.493 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	0.125 in	Ratio =	1052 >=240	Span: 1 : S Only
Max Upward Transient Deflection	-0.113 in	Ratio =	1168 >=240	Span: 1 : E Only * -1.0
Max Downward Total Deflection	0.452 in	Ratio =	291 >=180	Span: 1 : +D+0.750L+0.750S+0.5250E+H
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+H														0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.570	0.377	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	16.26	1,478.6	2,592.0	4.74	107.8	286.2
+D+L+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.814	0.534	1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00	25.78	2,343.3	2,880.0	7.47	169.8	318.0
+D+Lr+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.411	0.271	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	16.26	1,478.6	3,600.0	4.74	107.8	397.5

DESCRIPTION: B17

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+S+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.689	0.439	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	25.11	2,282.9	3,312.0	7.07	160.6	365.7
+D+0.750Lr+0.750L+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.591	0.388	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	23.40	2,126.9	3,600.0	6.79	154.3	397.5
+D+0.750L+0.750S+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.810	0.530	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	29.52	2,683.8	3,312.0	8.53	193.9	365.7
+D+0.60W+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.321	0.212	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	16.26	1,478.6	4,608.0	4.74	107.8	508.8
+D-0.60W+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.321	0.212	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	16.26	1,478.6	4,608.0	4.74	107.8	508.8
+D+0.750Lr+0.750L+0.450W-					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.462	0.303	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	23.40	2,126.9	4,608.0	6.79	154.3	508.8
+D+0.750Lr+0.750L-0.450W+					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.462	0.303	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	23.40	2,126.9	4,608.0	6.79	154.3	508.8
+D+0.750L+0.750S+0.450W+					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.582	0.381	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	29.52	2,683.8	4,608.0	8.53	193.9	508.8
+D+0.750L+0.750S-0.450W+					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.582	0.381	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	29.52	2,683.8	4,608.0	8.53	193.9	508.8
+0.60D+0.60W+0.60H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.193	0.127	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	9.76	887.1	4,608.0	2.85	64.7	508.8
+0.60D-0.60W+0.60H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.193	0.127	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	9.76	887.1	4,608.0	2.85	64.7	508.8
+D+0.70E+0.60H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.452	0.297	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	22.92	2,083.6	4,608.0	6.65	151.2	508.8
+D-0.70E+0.60H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.198	0.127	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	10.02	910.9	4,608.0	2.83	64.4	508.8
+D+0.750L+0.750S+0.5250E-					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.681	0.445	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	34.51	3,137.4	4,608.0	9.96	226.4	508.8
+D+0.750L+0.750S-0.5250E+					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.484	0.317	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	24.53	2,230.2	4,608.0	7.10	161.4	508.8
+0.60D+0.70E+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.324	0.212	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	16.42	1,492.6	4,608.0	4.75	108.1	508.8
+0.60D-0.70E+H					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.076	0.042	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	3.87	351.5	4,608.0	0.94	21.3	508.8

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S+0.5250E+H	1	0.4524	5.139		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	10.074	12.430
Max Upward from Load Combinations	10.074	12.430
Max Upward from Load Cases	4.853	6.525
Max Downward from all Load Conditio	-2.727	-1.273
Max Downward from Load Cases (Resis	-2.727	-1.273
+D+H	4.853	5.905
+D+L+H	7.580	7.178
+D+Lr+H	4.853	5.905
+D+S+H	7.178	12.430
+D+0.750Lr+0.750L+H	6.898	6.859

DESCRIPTION: B17

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
+D+0.750L+0.750S+H	8.642	11.753
+D+0.60W+H	4.853	5.905
+D-0.60W+H	4.853	5.905
+D+0.750Lr+0.750L+0.450W+H	6.898	6.859
+D+0.750Lr+0.750L-0.450W+H	6.898	6.859
+D+0.750L+0.750S+0.450W+H	8.642	11.753
+D+0.750L+0.750S-0.450W+H	8.642	11.753
+0.60D+0.60W+0.60H	2.912	3.543
+0.60D-0.60W+0.60H	2.912	3.543
+D+0.70E+0.60H	6.762	6.796
+D-0.70E+0.60H	2.943	5.014
+D+0.750L+0.750S+0.5250E+H	10.074	12.421
+D+0.750L+0.750S-0.5250E+H	7.210	11.085
+0.60D+0.70E+H	4.821	4.434
+0.60D-0.70E+H	1.002	2.652
D Only	4.853	5.905
L Only	2.727	1.273
S Only	2.325	6.525
E Only	2.727	1.273
E Only * -1.0	-2.727	-1.273
H Only		

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING
7220 Trade Street, Suite 295, San Diego, CA 92121 ▸ p 619-650-0010 ▸ mulhernkulp.com

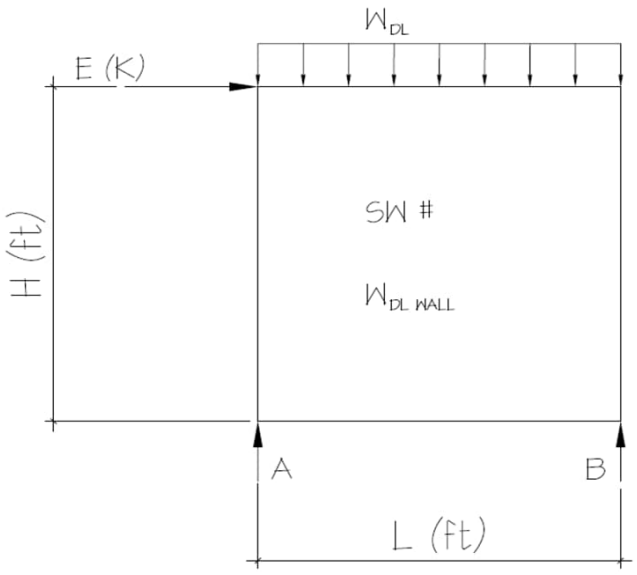
Project Name: JayMarc Homes
4104 83rd Ave SE
M&K Project #: 154-23017
Engineer: BFD
Date: 12-Jan-24

Overstrength Calculations

Wall Description/SW #: 201

Parameters:

L =	20.1	ft
H =	10.1	ft
E =	2.00	k
W_{DLWall} =	0.10	klf
W_{DL} =	0.068	klf
Ω_0 =	2.5	(ASCE TABLE 12.2.1 FOOTNOTE
SDS =	1.134	



analysis:

E (unfactored) = 2.86

$E_{mh} = \Omega 0 * E$ = 7.14 K

$E_v = 0.2*SDS*DL$ = 0.766 K

$E_m = E_{mh} + E_v$

$E_m = E_{mh} - E_v$

$E_m = E_{mh} + E_v$ = 7.909 K

$E_m = E_{mh} - E_v$ = 6.377 K

E_m (max) = $\sum M_A = 0$ = 7.91(10.1) + 0.168(20.1)(10.05) - Rb(20.1)

R_B = 1.7DL + 4.0E

Ra = 1.7DL - 4.0E

E_m (min) = $\sum M_A = 0$ = 6.38(10.1) + 0.168(20.1)(10.05) - Rb(20.1)

R_B = 1.7DL + 3.2E

Ra = 1.7DL - 3.2E

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

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING
7220 Trade Street, Suite 295, San Diego, CA 92121 ▸ p 619-650-0010 ▸ mulhernkulp.com

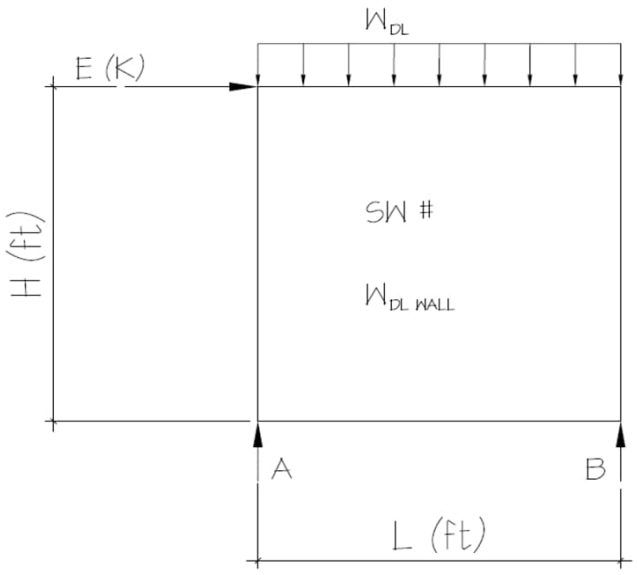
Project Name: JayMarc Homes
4104 83rd Ave SE
M&K Project #: 154-23017
Engineer: BFD
Date: 12-Jan-24

Overstrength Calculations

Wall Description/SW #: 202

Parameters:

L =	15.5	ft
H =	9.1	ft
E =	2.10	k
W_{DLWall} =	0.10	klf
W_{DL} =	0.193	klf
Ω_0 =	2.5	(ASCE TABLE 12.2.1 FOOTNOTE
SDS =	1.134	



analysis:

E (unfactored) = 3.00

$E_{mh} = \Omega 0 * E$ = 7.50 K

$E_v = 0.2*SDS*DL$ = 1.030 K

$E_m = E_{mh} + E_v$

$E_m = E_{mh} - E_v$

$E_m = E_{mh} + E_v$ = 8.530 K

$E_m = E_{mh} - E_v$ = 6.470 K

E_m (max) = $\sum M_A = 0$ = 8.53(9.1) + 0.293(15.5)(7.75) - Rb(15.5)

R_B = 2.3DL + 5.0E

Ra = 2.3DL - 5.0E

E_m (min) = $\sum M_A = 0$ = 6.47(9.1) + 0.293(15.5)(7.75) - Rb(15.5)

R_B = 2.3DL + 3.8E

Ra = 2.3DL - 3.8E

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

Shear Wall Calculations - Wind

JayMarc Homes

4104 83rd Ave SE

Mercer Island, WA

Parameters:

Single Family Home

Design Wind Speed: 100 MPH

wind Exposure Category: B

Seismic Design Category: D

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

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Richard J. Zabel, P.E., Project Manager

Blake F. Durham, Staff Engineer

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

WIND DESIGN SUMMARY PER ASCE 7-16

M+K Project #: 154-23017
Engineer: BFD

Parameters:

Wind Speed	100
Exposure Category	B
Risk Category	II
Wind Directionality Factor, K_d	0.85
Topographic Factor, K_{zt}	1.30
Gust Factor, G	0.85
Ground Elev. Above Sea Level [ft]	0
Design Type	ASD 0.60

Roof Geometry:

Trans. Roof Pitch	3.0	:12
Long. Roof Pitch	3.0	:12
Mean Roof Height, H	24.00	ft

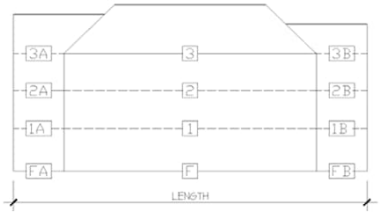
Building Geometry:

length	78	ft
Width	55	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	232	0	sq ft
		Wall surface	0	271	0	sq ft
1	11.56 ft	Roof Surface	0	138	0	sq ft
		Wall surface	0	660	0	sq ft
FND		Roof Surface	0	0	0	sq ft
		Wall surface	0	0	0	sq ft



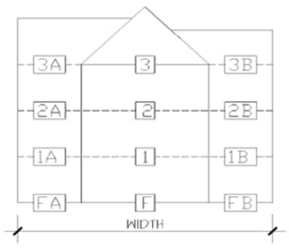
Tributary Design Loads: (0.6W)

	Section A	Section O	Section B	
Story Shear	0.00	4.33	0.00	kips
Total Shear	0.00	4.33	0.00	kips
		4.33		kips
Story Shear	0.00	8.15	0.00	kips
Total Shear	0.00	12.48	0.00	kips
		12.48		kips
Story Shear	0.00	0.00	0.00	kips
Total Shear	0.00	12.48	0.00	kips
		12.48		kips

Longitudinal Direction (Parallel to Main Ridge Line)

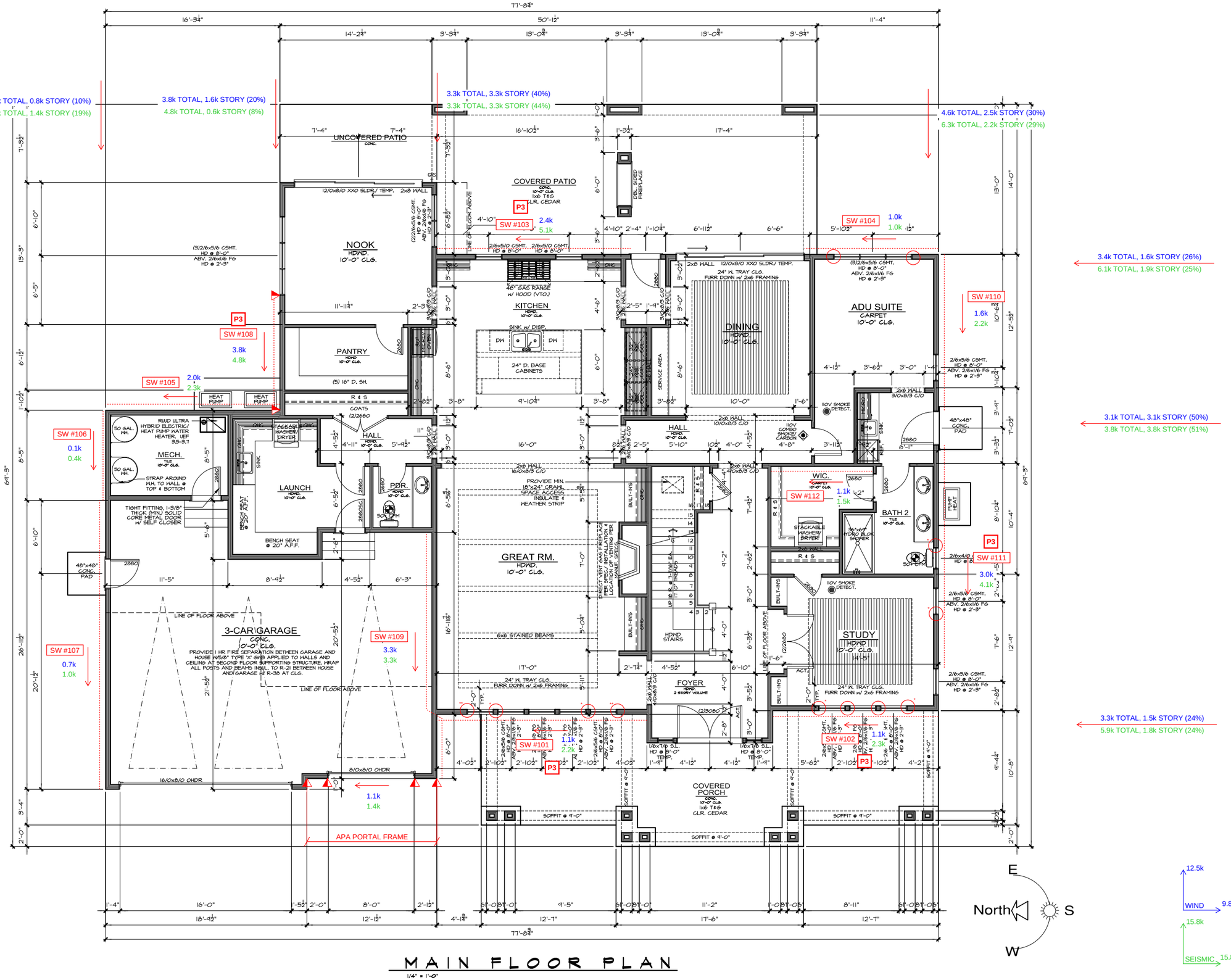
Tributary Design Areas:

Diaphragm Level	Floor-to-Floor Height		Section A	Section O	Section B	
2	9.1 ft	Roof Surface	0	181	0	sq ft
		Wall surface	0	248	0	sq ft
1	11.56 ft	Roof Surface	0	99	0	sq ft
		Wall surface	0	541	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	3.59	0.00	kips
Total Shear	0.00	3.59	0.00	kips
		3.59		kips
Story Shear	0.00	6.17	0.00	kips
Total Shear	0.00	9.76	0.00	kips
		9.76		kips
Story Shear	0.00	0.00	0.00	kips
Total Shear	0.00	9.76	0.00	kips
		9.76		kips



MAIN FLOOR PLAN

1/4" = 1'-0"

JAYMARC HOMES

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

Issue	Issue Date	By
Description		
△		

4104 83rd Ave SE
Mercer Island, WA.

Job Number:
MIS076

plan name: –
marketing name: XXXXX
plan number: MIS076
mark sys. number: –

06.15.21
Submittal Date

Sheet Title/Description

JAYMARC HOMES
Design Firm

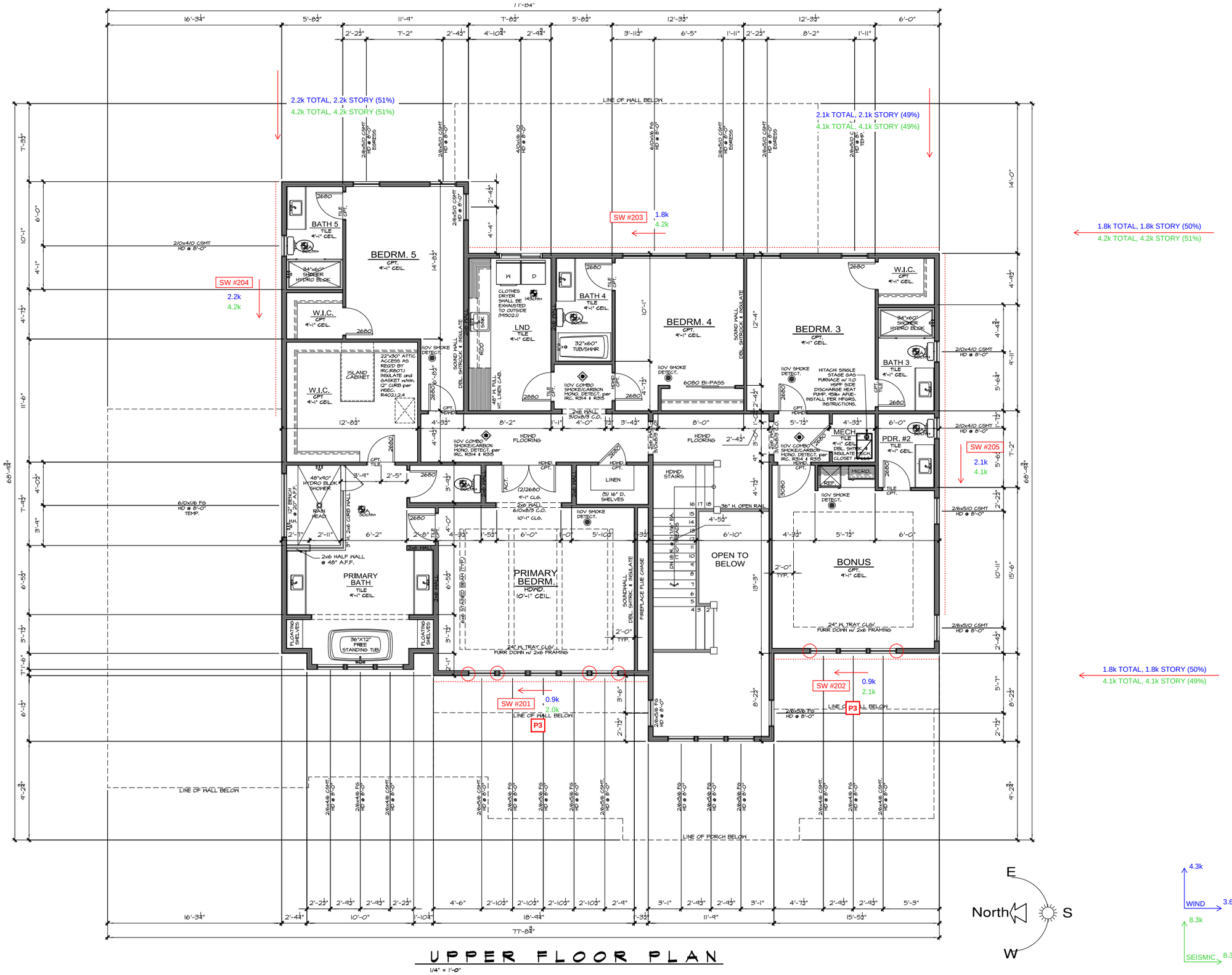
R.R.
Drawn by:

R.R./ S.K.
Checked by:

Primary Scale

A5
of: .

Sheet Title/Description



UPPER FLOOR PLAN

1/4" = 1'-0"

JAYMARC HOMES

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

Issue	Issue Date	By	Description
△			
.			
.			

4104 83rd Ave SE
Mercer Island, WA.

Job Number:
MIS076

plan name: –
marketing name: XXXXXX
plan number: MIS076
mark sys. number: –

Conditions not specifically represented graphically or in writing or which conflict with the current International Residential Code (IRC.) or those of the local municipality then the current standards and requirements of each respectively shall govern.

06.15.21
Submittal Date

.
Sheet Title/Description

JAYMARC HOMES
Design Firm

R.R.
Drawn by:

R.R./ S.K.
Checked by:

.
Primary Scale

A7
of: .

Sheet Title/Description

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 201: 2nd - Front Ext. Wall @ Primary Bed

Shearwall Properties:

Wall height, H	10.1	ft.	Max wall opening ht, H_c	5.5	ft.		
Wall Length, L	20.1	ft.	Qualifying Wall Length, L	6.1	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
900 lbs	<	3819 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	168	plf	Overturning Moment	9.1	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	37.6	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 202: 2nd - Front Ext. Wall @ Bonus

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	4.5	ft.		
Wall Length, L	15.5	ft.	Qualifying Wall Length, L	7.4	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
900 lbs	<	4651 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	293	plf	Overturning Moment	8.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	37.1	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 203: 2nd - Rear Ext. Wall @ Laundry/Bed 3/4

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	5.0	ft.		
Wall Length, L	44.0	ft.	Qualifying Wall Length, L	24.9	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1800 lbs	<	8327 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	368	plf	Overturning Moment	16.4	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	336.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 204: 2nd - Side Ext. Wall @ Primary Bath/WIC/Bath 5

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	4.0	ft.		
Wall Length, L	22.0	ft.	Qualifying Wall Length, L	20.0	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2200 lbs	<	6723 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	202	plf	Overturning Moment	20.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	52.0	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 205: 2nd - Side Ext. Wall @ Bath 3/Bonus

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	5.0	ft.		
Wall Length, L	33.8	ft.	Qualifying Wall Length, L	27.3	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2100 lbs	<	9151 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	168	plf	Overturning Moment	19.1	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	200	lbs	Resistive Moment	92.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall : Basement - 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	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
0 lbs	####	#DIV/0! 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
#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

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 101: 1st - Front Ext. Wall @ Great Room

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H_c	7.5	ft.		
Wall Length, L	19.6	ft.	Qualifying Wall Length, L	5.6	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1100 lbs	<	3238 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	11.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	30.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 102: 1st - Front Ext. Wall @ Study

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	7.5	ft.		
Wall Length, L	15.5	ft.	Qualifying Wall Length, L	7.2	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1100 lbs	<	4415 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	168	plf	Overturning Moment	11.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1000	lbs	Resistive Moment	32.0	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 103: 1st - Rear Ext. Wall @ Kitchen/Patio

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H_c	5.0	ft.		
Wall Length, L	18.1	ft.	Qualifying Wall Length, L	13.1	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2400 lbs	<	8243 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	737	plf	Overturning Moment	24.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	114.9	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 104: 1st - Rear Ext. Wall @ ADU Suite

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	7.5	ft.		
Wall Length, L	12.5	ft.	Qualifying Wall Length, L	5.2	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1000 lbs	<	1508 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	418	plf	Overturning Moment	10.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	800	lbs	Resistive Moment	38.4	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 105: 1st - Rear Ext. Wall @ Mech/Launch

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H_c	0.0	ft.		
Wall Length, L	16.3	ft.	Qualifying Wall Length, L	16.3	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2000 lbs	<	5463 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	168	plf	Overturning Moment	20.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	800	lbs	Resistive Moment	31.7	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 106: 1st - Side Ext. Wall @ Mech

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	8.4	ft.	Qualifying Wall Length, L	8.4	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
100 lbs	<	2827 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	168	plf	Overturning Moment	1.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	8.4	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 107: 1st - Side Ext. Wall @ Garage

Shearwall Properties:

Wall height, H	10.9	ft.	Max wall opening ht, H_c	8.0	ft.		
Wall Length, L	27.0	ft.	Qualifying Wall Length, L	24.1	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
700 lbs	<	8103 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	238	plf	Overturning Moment	7.6	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	87.6	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 108: 1st - Side Ext. Wall @ Pantry/Nook

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	10.8	ft.	Qualifying Wall Length, L	10.8	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
3800 lbs	<	6775 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	317	plf	Overturning Moment	38.0	k-ft	Hold Down Design Load	1281	lbs
DL at ends of wall	800	lbs	Resistive Moment	24.2	k-ft	Holdown Capacity	4935	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 109: 1st - Side Ext./Int. Wall @ Garage/Great Room

Shearwall Properties:

Wall height, H	10.9	ft.	Max wall opening ht, H_c	0.0	ft.		
Wall Length, L	23.0	ft.	Qualifying Wall Length, L	23.0	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
3300 lbs	<	7707 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	120	plf	Overturning Moment	35.9	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1000	lbs	Resistive Moment	49.1	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 110: 1st - Side Ext. Wall @ ADU Suite

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	7.5	ft.		
Wall Length, L	14.6	ft.	Qualifying Wall Length, L	12.1	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1600 lbs	<	3994 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	283	plf	Overturning Moment	16.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	32.5	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 111: 1st - Side Ext. Wall @ Bath 2/Study

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H_c	7.5	ft.		
Wall Length, L	20.8	ft.	Qualifying Wall Length, L	14.6	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
3000 lbs	<	9176 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	283	plf	Overturning Moment	30.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	62.8	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 112: 1st - Front Int. Wall @ WIC/ADU Suite

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	9.5	ft.	Qualifying Wall Length, L	9.5	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1100 lbs	<	3204 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	380	plf	Overturning Moment	11.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1000	lbs	Resistive Moment	24.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

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Shear Wall Calculations - Seismic

JayMarc Homes

4104 83rd Ave SE

Mercer Island, WA

Parameters:

Single Family Home

Design Wind Speed: 100 MPH

wind Exposure Category: B

Seismic Design Category: D

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

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Richard J. Zabel, P.E., Project Manager

Blake F. Durham, Staff Engineer

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RESIDENTIAL STRUCTURAL ENGINEERING

SEISMIC CALCULATION - ASCE 7-16

M+K Project #: 154-23017
Engineer: BFD

Seismic Design Category:

User Inputs:

Site Class	D
Spectral Response Acceleration 0.2 sec, **Ss**	1.418
Spectral Response Acceleration 1.0 sec, **S1**	0.493
Occupancy Category	II

Variables:

Site coefficient, Fa	1.20
Site coefficient, Fv	1.81

Calculated Values:

Maximum spectral response acceleration, S_{ms}	1.702
Maximum spectral response acceleration, S_{m1}	0.891
Design spectral response acceleration, S_{ds}	1.134
Design spectral response acceleration, S_{d1}	0.594
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	0.194
T_0	0.105
T_s	0.524
Spectral Response Acc., S_a (g)	1.134

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	11.6	4354	15	14.6	80 k
2	9.1	2568	17	5.6	49 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

Total Dead Load Of Structure 129 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	0.175	0.175

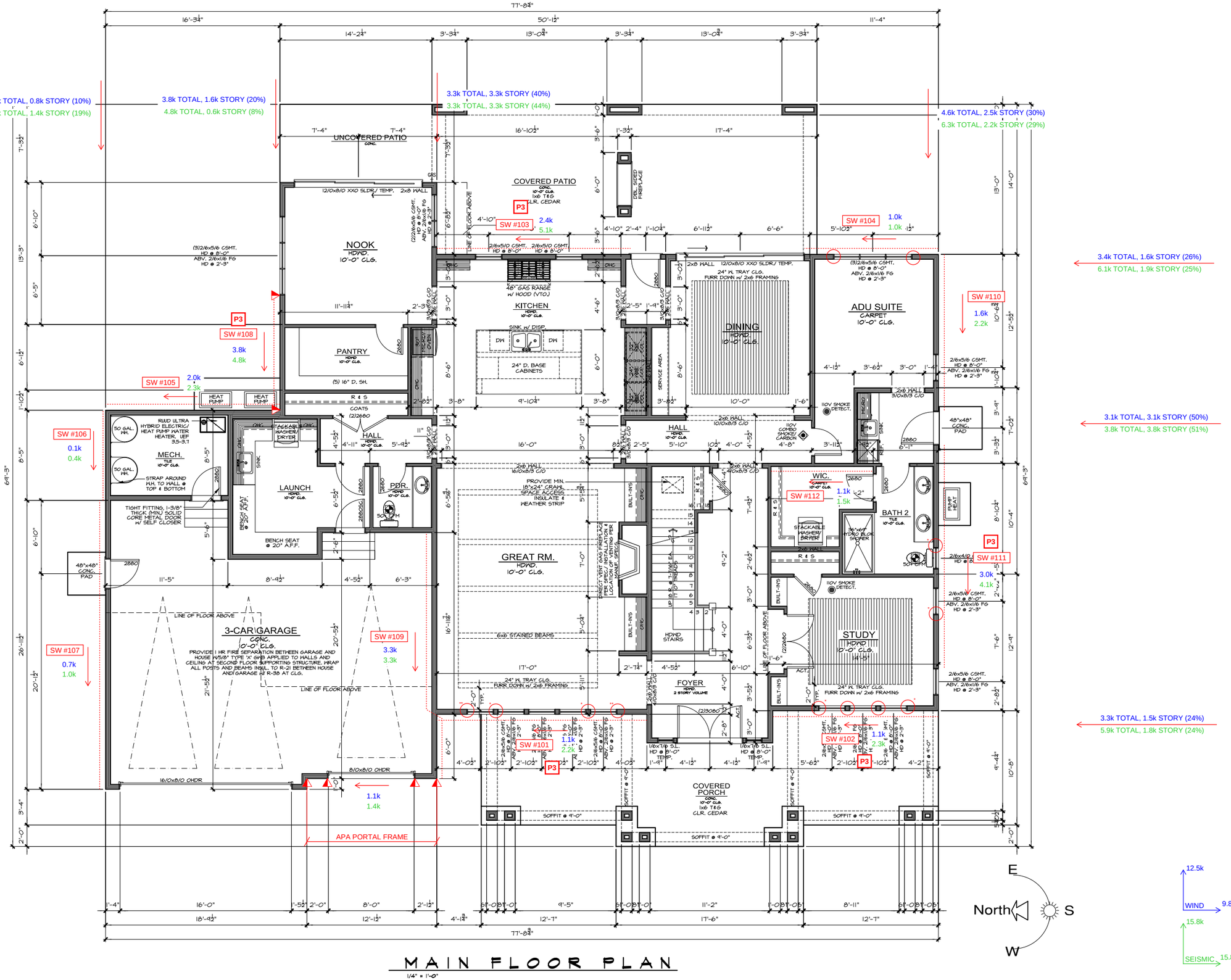
Base Shears:

Ultimate Loads				x 0.7 =	Allowable Loads			
Transverse		Longitudinal			Transverse		Longitudinal	
23	k	23	k		15.8	k	15.8	k

Story Shear Calculation:

Distribution exponent, k: 1.00

Level	Vert. Dist. Factor, C_{vx}	Ultimate Loads: Transverse *Story Shear, F_x*	Ultimate Loads: Longitudinal *Story Shear, F_x*	x 0.7 = Allowable Loads: Transverse *Story Shear, F_x*	Transverse *Σ Story Shear*	Allowable Loads: Longitudinal *Story Shear, F_x*	Longitudinal *Σ Story Shear*
1	0.476	10.7 k	10.7 k	7.5 k	15.8 k	7.5 k	15.8 k
2	0.524	11.8 k	11.8 k	8.3 k	8.3 k	8.3 k	8.3 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



MAIN FLOOR PLAN

1/4" = 1'-0"

JAYMARC HOMES

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

Issue	Issue Date	By
Description		
△		

4104 83rd Ave SE
Mercer Island, WA.

Job Number:
MIS076

plan name: –
marketing name: XXXXX
plan number: MIS076
mark sys. number: –

06.15.21
Submittal Date

Sheet Title/Description

JAYMARC HOMES
Design Firm

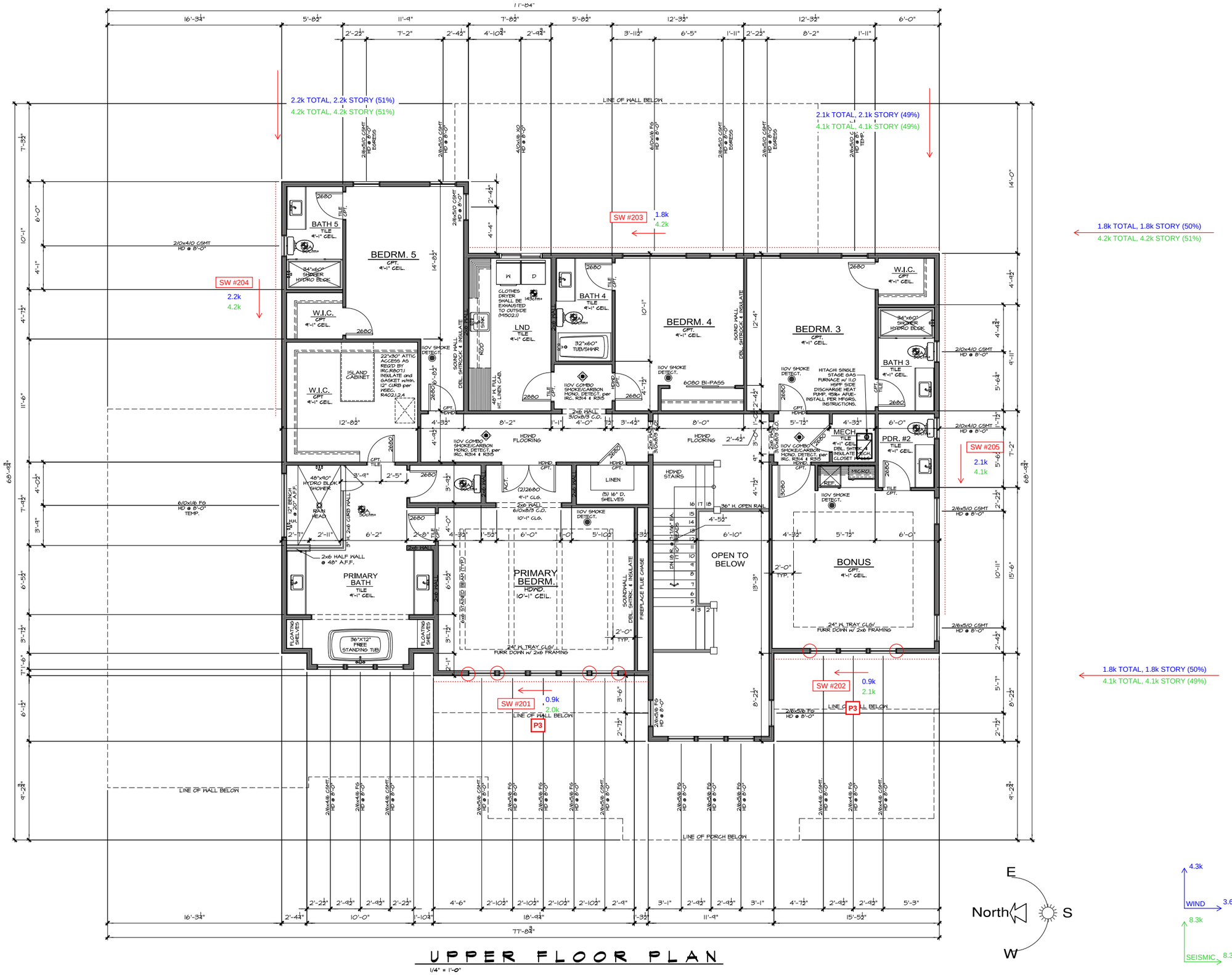
R.R.
Drawn by:

R.R./ S.K.
Checked by:

Primary Scale

A5
of: .

Sheet Title/Description



UPPER FLOOR PLAN

1/4" = 1'-0"

JAYMARC HOMES

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

Issue	Issue Date	By	Description
△			
.			
.			

4104 83rd Ave SE
Mercer Island, WA.

Job Number:
MIS076

plan name: –
marketing name: XXXXXX
plan number: MIS076
mark sys. number: –

Conditions not specifically represented graphically or in writing or which conflict with the current International Residential Code (IRC.) or those of the local municipality then the current standards and requirements of each respectively shall govern.

06.15.21
Submittal Date

.
Sheet Title/Description

JAYMARC HOMES
Design Firm

R.R.
Drawn by:

R.R./ S.K.
Checked by:

.
Primary Scale

A7
of: .

Sheet Title/Description

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 201: 2nd - Front Ext. Wall @ Primary Bed

Shearwall Properties:

Wall height, H	10.1	ft.	Max wall opening ht, H_c	5.5	ft.		
Wall Length, L	20.1	ft.	Qualifying Wall Length, L	6.1	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2000 lbs	<	2728 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	168	plf	Overturning Moment	20.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	27.7	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 202: 2nd - Front Ext. Wall @ Bonus

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	4.5	ft.		
Wall Length, L	15.5	ft.	Qualifying Wall Length, L	7.4	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2100 lbs	<	3322 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	293	plf	Overturning Moment	19.1	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	27.3	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 203: 2nd - Rear Ext. Wall @ Laundry/Bed 3/4

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	5.0	ft.		
Wall Length, L	44.0	ft.	Qualifying Wall Length, L	24.9	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
4200 lbs	<	5948 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	368	plf	Overturning Moment	38.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	247.3	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 204: 2nd - Side Ext. Wall @ Primary Bath/WIC/Bath 5

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	4.0	ft.		
Wall Length, L	22.0	ft.	Qualifying Wall Length, L	20.0	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
4200 lbs	<	4802 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	202	plf	Overturning Moment	38.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	38.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 205: 2nd - Side Ext. Wall @ Bath 3/Bonus

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	5.0	ft.		
Wall Length, L	33.8	ft.	Qualifying Wall Length, L	27.3	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
4100 lbs	<	6536 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	168	plf	Overturning Moment	37.3	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	200	lbs	Resistive Moment	67.8	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall : Basement - 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	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
0 lbs	####	#DIV/0! 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
#DIV/0!

Overturning Evaluation:

Resistive DL	0	plf	Overturning Moment	0.0	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

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 101: 1st - Front Ext. Wall @ Great Room

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H_c	7.5	ft.		
Wall Length, L	19.6	ft.	Qualifying Wall Length, L	5.6	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2200 lbs	<	2313 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	22.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	22.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 102: 1st - Front Ext. Wall @ Study

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	7.5	ft.		
Wall Length, L	15.5	ft.	Qualifying Wall Length, L	7.2	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2300 lbs	<	3153 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	168	plf	Overturning Moment	23.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1000	lbs	Resistive Moment	23.5	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 103: 1st - Rear Ext. Wall @ Kitchen/Patio

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H_c	5.0	ft.		
Wall Length, L	18.1	ft.	Qualifying Wall Length, L	13.1	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
5100 lbs	<	5888 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	737	plf	Overturning Moment	51.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	84.5	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 104: 1st - Rear Ext. Wall @ ADU Suite

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	7.5	ft.		
Wall Length, L	12.5	ft.	Qualifying Wall Length, L	5.2	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1000 lbs	<	1077 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	418	plf	Overturning Moment	10.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	800	lbs	Resistive Moment	28.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 105: 1st - Rear Ext. Wall @ Mech/Launch

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H_c	0.0	ft.		
Wall Length, L	16.3	ft.	Qualifying Wall Length, L	16.3	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2300 lbs	<	3902 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	168	plf	Overturning Moment	23.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	800	lbs	Resistive Moment	23.3	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 106: 1st - Side Ext. Wall @ Mech

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	8.4	ft.	Qualifying Wall Length, L	8.4	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
400 lbs	<	2020 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	168	plf	Overturning Moment	4.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	6.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

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RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 107: 1st - Side Ext. Wall @ Garage

Shearwall Properties:

Wall height, H	10.9	ft.	Max wall opening ht, H_c	8.0	ft.		
Wall Length, L	27.0	ft.	Qualifying Wall Length, L	24.1	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1000 lbs	<	5788 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	238	plf	Overturning Moment	10.9	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	64.4	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 108: 1st - Side Ext. Wall @ Pantry/Nook

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	10.8	ft.	Qualifying Wall Length, L	10.8	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
4800 lbs	<	4839 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	317	plf	Overturning Moment	48.0	k-ft	Hold Down Design Load	2808	lbs
DL at ends of wall	800	lbs	Resistive Moment	17.8	k-ft	Holdown Capacity	3695	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN

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RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 109: 1st - Side Ext./Int. Wall @ Garage/Great Room

Shearwall Properties:

Wall height, H	10.9	ft.	Max wall opening ht, H_c	0.0	ft.		
Wall Length, L	23.0	ft.	Qualifying Wall Length, L	23.0	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
3300 lbs	<	5505 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	120	plf	Overturning Moment	35.9	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1000	lbs	Resistive Moment	36.1	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 110: 1st - Side Ext. Wall @ ADU Suite

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	7.5	ft.		
Wall Length, L	14.6	ft.	Qualifying Wall Length, L	12.1	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2200 lbs	<	2853 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	283	plf	Overturning Moment	22.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	23.9	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 154-23017
Engineer: BFD

Shearwall 111: 1st - Side Ext. Wall @ Bath 2/Study

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H_c	7.5	ft.		
Wall Length, L	20.8	ft.	Qualifying Wall Length, L	14.6	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
4100 lbs	<	6554 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	283	plf	Overturning Moment	41.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	46.1	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 112: 1st - Front Int. Wall @ WIC/ADU Suite

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	9.5	ft.	Qualifying Wall Length, L	9.5	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1500 lbs	<	2288 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	380	plf	Overturning Moment	15.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1000	lbs	Resistive Moment	17.8	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required