



MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

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CALCULATION PACKAGE

September 5, 2025

JAYMARC HOMES

4526 89th Ave SE

Mercer Island, WA

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Prepared By:

Adam J. Cervantes, E.I.T.

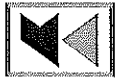
Staff Engineer II

Nicholas J. Martignetti, P.E.

Associate Owner + San Diego Office Director



Signature, Seal & Date



MULHERN + KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: 4526 89th Ave SE
JayMarc Homes
M&K PROJECT #: 154-25005
ENGINEER: AJC
DATE: 05-Sep-25

BEAM & HEADER CALCULATIONS

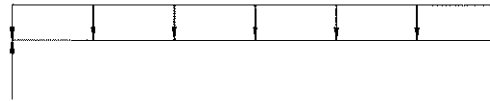
BEAM DESCRIPTION: TYPICAL EXT. HEADER

B1

PARAMETERS:

$D = 230$
 $S = 387$

$L = 1.5$ FT
 $W = 0.567$ KLF
 $P = 0$ K



ANALYSIS:

$R_{MAX} = 2.13$ K $V_D =$ K $< V_{ALL} = 4.47$ K ☒ ADEQUATE
 $M_{MAX} = 3.99$ K-FT $< M_{ALL} = 5.17$ K-FT ☒ ADEQUATE
 $\Delta_{TL} = 0.109$ IN. $L/823 < L/240$ ☒ ADEQUATE

4 x 10 DF-L No. 2

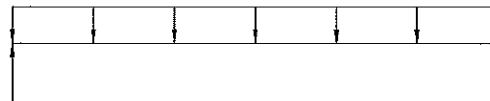
BEAM DESCRIPTION: FLUSH BEAM AT COV'D PATIO - UPPER FLR

B2

PARAMETERS:

$D = 83 + 834$
 $L = 220$
 $S = 343$

$L = 21$ FT
 $W = 0.839$ KLF
 $P = 0$ K



ANALYSIS:

$R_{MAX} = 8.81$ K $V_D =$ K $< V_{ALL} = 24.68$ K ☒ ADEQUATE
 $M_{MAX} = 46.25$ K-FT $< M_{ALL} = 78.32$ K-FT ☒ ADEQUATE
 $\Delta_{TL} = 0.626$ IN. $L/405 < L/240$ ☒ ADEQUATE

6-3/4"x18" GLB

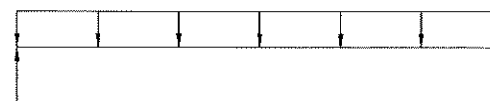
BEAM DESCRIPTION: HEADER AT GREAT RM S.G.D. - UPPER FLR

B3

PARAMETERS:

$D = 206$
 $L = 550$

$L = 15$ FT
 $W = 0.756$ KLF
 $P = 0$ K



ANALYSIS:

$\frac{478}{I}$

$R_{MAX} = 5.67$ K $V_D =$ K $< V_{ALL} = 16.03$ K ☒ ADEQUATE
 $M_{MAX} = 21.26$ K-FT $< M_{ALL} = 49.66$ K-FT ☒ ADEQUATE
 $\Delta_{TL} = 0.232$ IN. $L/775 < L/240$ ☒ ADEQUATE

5 1/2" x 16 1/2" GLB



MULHERN-KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: 4526 89th Ave SE
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ENGINEER: AJC
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BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: FLUSH BEAM AT STAIR - UPPER FLR

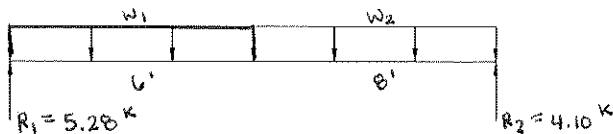
B4

PARAMETERS:

L = 14 FT

W₁ = 0.866 KLF W₂ = 0.523 KLF

P = 0 K



ANALYSIS:

R_{MAX} = 5.28 K V₀ = 0 K < V_{ALL} = 11.13 K ☒ ADEQUATE

M_{MAX} = 16.07 K-FT < M_{ALL} = 37.80 K-FT ☒ ADEQUATE

$\frac{315}{I}$

Δ_{TL} = 0.185 IN. L/ 907 < L/240 ☒ ADEQUATE

3 1/2" x 18" GLB

BEAM DESCRIPTION: DROPPED BEAM AT GREAT RM - UPPER FLR

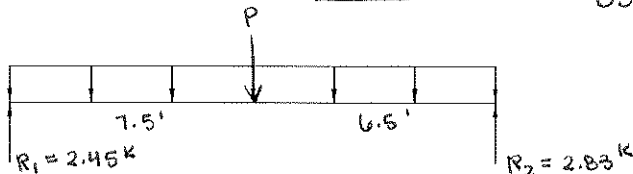
B5

PARAMETERS:

L = 14 FT

W = 0 KLF

P = 5.28 K (B4)



ANALYSIS:

R_{MAX} = 2.83 K V₀ = 0 K < V_{ALL} = 11.66 K ☒ ADEQUATE

M_{MAX} = 18.38 K-FT < M_{ALL} = 26.40 K-FT ☒ ADEQUATE

$\frac{388}{I}$

Δ_{TL} = 0.364 IN. L/ 462 < L/240 ☒ ADEQUATE

5 1/2" x 12" GLB

BEAM DESCRIPTION: DROPPED BEAM AT FOYER - UPPER FLR

B6

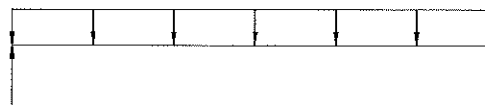
PARAMETERS:

L = 5 FT

D=90
L=240

W = 0.330 KLF

P = 0 K



ANALYSIS:

R_{MAX} = 0.83 K V₀ = 0 K < V_{ALL} = 3.89 K ☒ ADEQUATE

M_{MAX} = 1.03 K-FT < M_{ALL} = 4.49 K-FT ☒ ADEQUATE

Δ_{TL} = 0.013 IN. L/ 999+ < L/240 ☒ ADEQUATE

4 x 10 DF-L No. 2



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BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: FLUSH BEAM AT GARAGE - UPPER FLR

B7

PARAMETERS:

D=143+100
L=380

L = 10.75 FT
W = 0.623 KLF
P = 0 K



ANALYSIS:

$R_{MAX} = 3.35$ K $V_o =$ K $< V_{ALL} = 11.13$ K
 $M_{MAX} = 9.00$ K-FT $< M_{ALL} = 37.80$ K-FT
 $\Delta_{TL} = 0.061$ IN. $L/999^+$ $< L/240$

☒ ADEQUATE
☒ ADEQUATE
☒ ADEQUATE

$\frac{104}{I}$

3 1/2" x 18" GLB

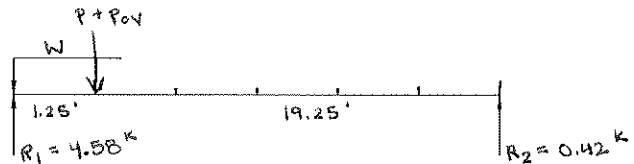
BEAM DESCRIPTION: FLUSH BEAM AT GARAGE - UPPER FLR (SEE ENERCALC)

B8

PARAMETERS:

D=98+100
S=144

L = 20.5 FT
W = 0.342 KLF
P = 3.85 K (B7)



ANALYSIS:

$R_{MAX} = 4.58$ K $V_o =$ K $< V_{ALL} =$ K
 $M_{MAX} = 5.47$ K-FT $< M_{ALL} =$ K-FT
 $\Delta_{TL} = 0.104$ IN. $L/999^+$ $< L/240$

☒ ADEQUATE
☒ ADEQUATE
☒ ADEQUATE

3 1/2" x 18" GLB

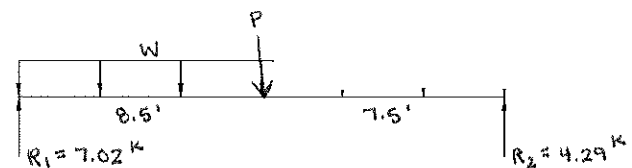
BEAM DESCRIPTION: HEADER AT GARAGE DOOR - UPPER FLR

B9

PARAMETERS:

D=180+100
L=480

L = 16 FT
W = 0.760 KLF
P = 4.85 K (B8)



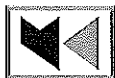
ANALYSIS:

$R_{MAX} = 7.02$ K $V_o =$ K $< V_{ALL} = 14.58$ K
 $M_{MAX} = 32.18$ K-FT $< M_{ALL} = 41.17$ K-FT
 $\Delta_{TL} = 0.533$ IN. $L/360$ $< L/240$

☒ ADEQUATE
☒ ADEQUATE
☒ ADEQUATE

$\frac{824}{I}$

5 1/2" x 15" GLB



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BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION:

FLUSH BEAM AT ADU FOYER - UPPER FLR.

B10

PARAMETERS:

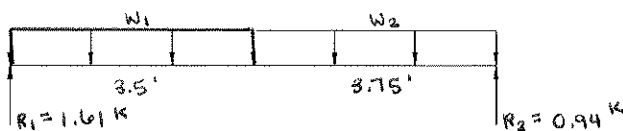
D = 148
L = 395

L = 7.25 FT

W₁ = 0.543 KLF

W₂ = 0.172 KLF

P = 0 K



ANALYSIS:

R_{MAX} = 1.61 K

V_D = K

< V_{ALL} = 11.13 K



ADEQUATE

M_{MAX} = 2.39 K-FT

< M_{ALL} = 37.80 K-FT



ADEQUATE

Δ_{TL} = 0.007 IN.

L/ 999+ < L/240



ADEQUATE

3 1/2" x 18" GLB.

BEAM DESCRIPTION:

FLUSH BEAM AT COV'D PORCH - UPPER FLR

B11

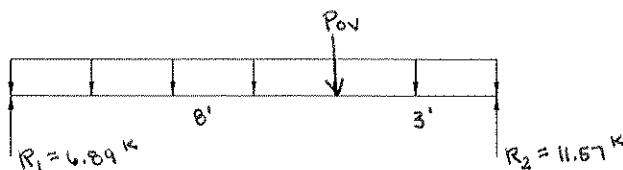
PARAMETERS:

D = 34+351
L = 90
S = 369.

L = 11 FT

W = 0.754 KLF

P = OVERSTRENGTH K



ANALYSIS:

R_{MAX} = 11.57 K

V_D = K

< V_{ALL} = K



ADEQUATE

M_{MAX} = 31.35 K-FT

< M_{ALL} = K-FT



ADEQUATE

Δ_{TL} = 0.201 IN.

L/ 657 < L/240



ADEQUATE

3 1/2" x 18" GLB

BEAM DESCRIPTION:

FLUSH BEAM AT COV'D PORCH - UPPER FLR

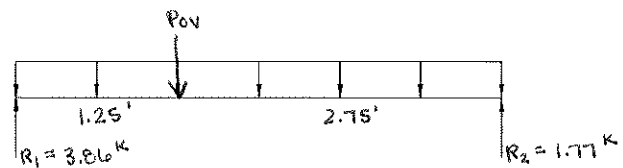
B12

PARAMETERS:

L = 4 FT

W = 0 KLF

P = OVERSTRENGTH K



ANALYSIS:

R_{MAX} = 3.86 K

V_D = K

< V_{ALL} = K



ADEQUATE

M_{MAX} = 4.81 K-FT

< M_{ALL} = K-FT



ADEQUATE

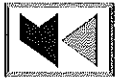
Δ_{TL} = 0.004 IN.

L/ 999+ < L/240



ADEQUATE

3 1/2" x 18" GLB



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BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION:

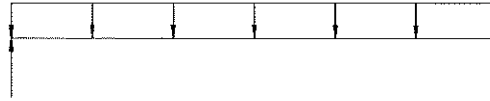
FLUSH BOTTOM BEAM AT FRONT - ROOF

B13

PARAMETERS:

D=121
S=178

L = 4.5 FT
W = 0.299 KLF
P = 0 K



ANALYSIS:

$R_{MAX} = 0.67$ K $V_D =$ K $< V_{ALL} = 2.66$ K ☒ ADEQUATE
 $M_{MAX} = 0.76$ K-FT $< M_{ALL} = 1.98$ K-FT ☒ ADEQUATE
 $\Delta_{TL} = 0.036$ IN. $L/999^+$ $< L/240$ ☒ ADEQUATE

4x6 DF-L No. 2

BEAM DESCRIPTION:

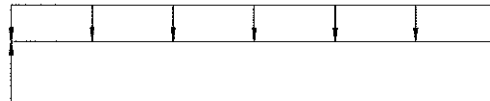
FLUSH BOTTOM AT GARAGE - UPPER FLR

B14

PARAMETERS:

D=188
L=500

L = 11 FT
W = 0.680 KLF
P = 0 K



ANALYSIS:

$\frac{126}{I}$

$R_{MAX} = 3.78$ K $V_D =$ K $< V_{ALL} = 10.20$ K ☒ ADEQUATE
 $M_{MAX} = 10.41$ K-FT $< M_{ALL} = 20.22$ K-FT ☒ ADEQUATE
 $\Delta_{TL} = 0.237$ IN. $L/566$ $< L/240$ ☒ ADEQUATE

5 1/2" x 10 1/2" GLB

BEAM DESCRIPTION:

WORST CASE INT. HEADER

B15

PARAMETERS:

D=248
L=660

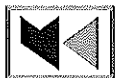
L = 2.67 FT
W = 0.908 KLF
P = 0 K



ANALYSIS:

$R_{MAX} = 1.21$ K $V_D =$ K $< V_{ALL} = 3.89$ K ☒ ADEQUATE
 $M_{MAX} = 0.81$ K-FT $< M_{ALL} = 4.49$ K-FT ☒ ADEQUATE
 $\Delta_{TL} = 0.003$ IN. $L/999^+$ $< L/240$ ☒ ADEQUATE

4x10 DF-L No. 2



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BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION:

FLUSH BEAM AT COV'D PORCH - UPPER FLR

B16

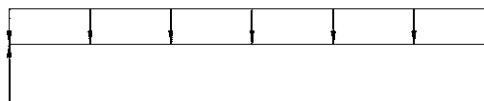
PARAMETERS:

L = 13.5 FT

W = 0.088 KLF

P = 0 K

D=25
S=63



ANALYSIS:

R_{HAX} = 0.69 K

V_D = 0 K

< V_{ALL} = 3.95 K



ADEQUATE

M_{HAX} = 2.00 K-FT

< M_{ALL} = 8.91 K-FT



ADEQUATE

Δ_{TL} = 0.134 IN.

L/999+ < L/240



ADEQUATE

1 3/4" x 11 7/8" LVL (1-PLY)

BEAM DESCRIPTION:

FLUSH BEAM AT CRAWL - MAIN FLR

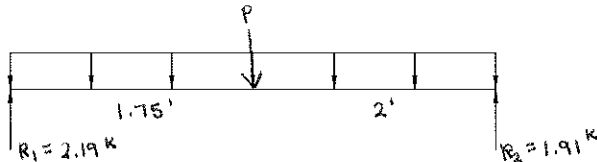
B17

PARAMETERS:

L = 3.75 FT

W = 0 KLF

P = 4.10 K (B4)



ANALYSIS:

R_{HAX} = 2.19 K

V_D = 0 K

< V_{ALL} = 3.95 K



ADEQUATE

M_{HAX} = 3.82 K-FT

< M_{ALL} = 8.91 K-FT



ADEQUATE

Δ_{TL} = 0.016 IN.

L/999+ < L/240



ADEQUATE

1 3/4" x 11 7/8" LVL (1-PLY)

BEAM DESCRIPTION:

2-SPAN CONT. FLUSH BEAM AT CRAWL - MAIN FLR

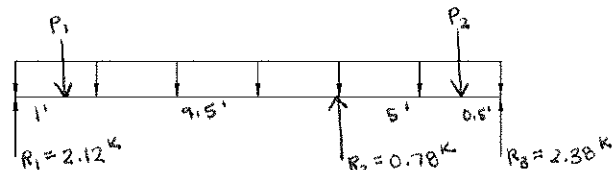
B18

PARAMETERS:

L = 16 FT

W = 0 KLF

P₁ = 2.45 K (B5)
P₂ = 2.83 K (B5)



ANALYSIS:

R_{HAX} = 2.38 K

V_D = 0 K

< V_{ALL} = 3.95 K



ADEQUATE

M_{HAX} = 2.11 K-FT

< M_{ALL} = 8.91 K-FT



ADEQUATE

Δ_{TL} = 0.039 IN.

L/999+ < L/240



ADEQUATE

1 3/4" x 11 7/8" LVL (1-PLY)



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BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: TYPICAL DROPPED BEAM AT CRAWL - MAIN FLR.

B19

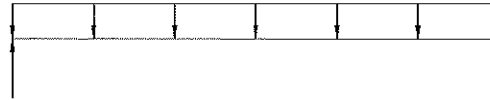
PARAMETERS:

D = 135
L = 540

L = 5.33 FT

W = 0.675 KLF

P = 0 K



ANALYSIS:

R_{MAX} = 1.80 K

V_D = 0 K

< V_{ALL} = 3.89 K



ADEQUATE

M_{MAX} = 2.40 K-FT

< M_{ALL} = 4.49 K-FT



ADEQUATE

Δ_{TL} = 0.033 IN.

L/999+ < L/240



ADEQUATE

4x10 DF-L No. 2

BEAM DESCRIPTION: DROPPED BEAM W/ B.W.A. - MAIN FLR

B20:

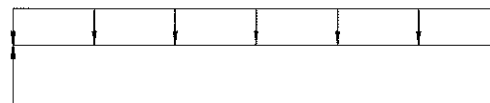
PARAMETERS:

D = 150+220+330+119
L = 600+320
S = 337+175

L = 4.25 FT

W = 1.893 KLF

P = 0 K



ANALYSIS:

R_{MAX} = 4.02 K

V_D = 0 K

< V_{ALL} = 4.47 K



ADEQUATE

M_{MAX} = 4.27 K-FT

< M_{ALL} = 5.17 K-FT



ADEQUATE

Δ_{TL} = 0.036 IN.

L/999+ < L/240



ADEQUATE

4x10 DF-L No. 2

BEAM DESCRIPTION: DROPPED BEAM W/ OFFSET B.W.A. - MAIN FLR

B21

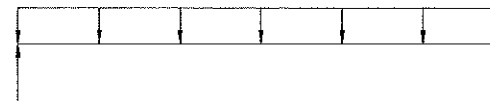
PARAMETERS:

D = 125+125
L = 500+143

L = 5.13 FT

W = 0.893 KLF

P = 0 K



ANALYSIS:

R_{MAX} = 2.29 K

V_D = 0 K

< V_{ALL} = 3.89 K



ADEQUATE

M_{MAX} = 2.94 K-FT

< M_{ALL} = 4.49 K-FT



ADEQUATE

Δ_{TL} = 0.038 IN.

L/999+ < L/240



ADEQUATE

4x10 DF-L No. 2



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BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION:

DROPPED BEAM AT CRAWL W/ P.A. - MAIN FLR

822

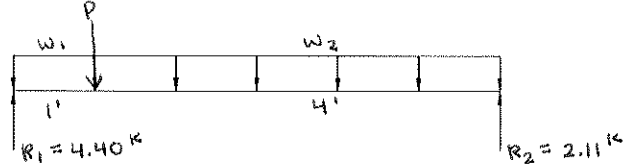
PARAMETERS:

L = 5 FT

$W_1 = 1.893$ KLF

$W_2 = 0.625$ KLF

P = 2.12 K (B10)



ANALYSIS:

$R_{MAX} = 4.40$ K $V_D =$ K $< V_{ALL} = 4.47$ K

☒ ADEQUATE

$M_{MAX} = 3.56$ K-FT $< M_{ALL} = 5.17$ K-FT

☒ ADEQUATE

$\Delta_{TL} = 0.043$ IN. $L/999^+$ $< L/240$

☒ ADEQUATE

4x10 DF-L No. 2

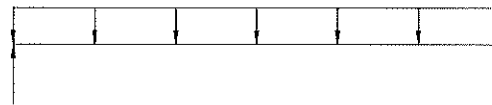
BEAM DESCRIPTION:

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

$\Delta_{TL} =$ IN. $L/$ $< L/240$

☐ ADEQUATE

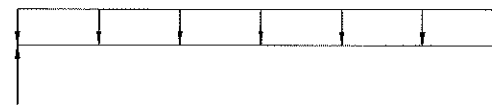
BEAM DESCRIPTION:

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

$\Delta_{TL} =$ IN. $L/$ $< L/240$

☐ ADEQUATE



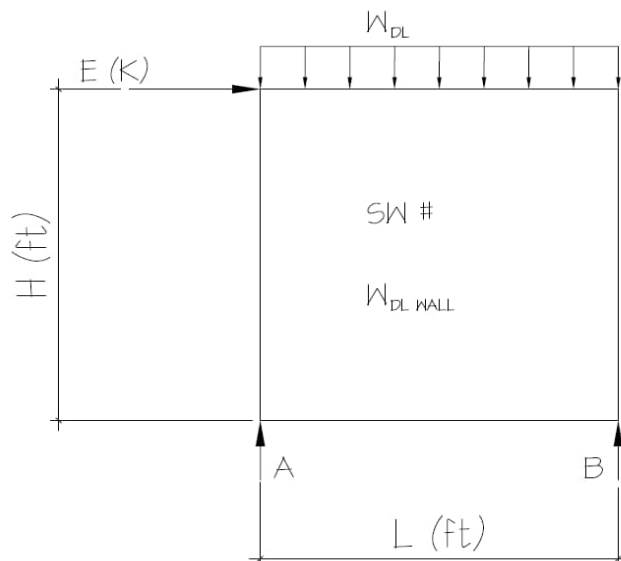
Overstrength Calculations

Wall Description/SW #:

202

Parameters:

L = 41.3 ft
H = 9.0 ft
E = 3.65 k
W_{DL Wall} = 0.10 klf
W_{DL} = 0.089 klf
Ω₀ = 2.5 (ASCE TABLE 12.2.1 FOOTNOTE G)
SDS = 1.142



analysis:

E_{mh} = Ω₀ * E = 9.13 K
E_v = 0.2 * SDS * DL = 1.783 K
E_m = E_{mh} + E_v = 10.908 K
E_m = E_{mh} - E_v = 7.342 K

E_m (max) = ΣM_A=0 = 10.91(9.0) + 0.189(41.3)(20.65) - R_b(41.3) R_B = 3.9DL + 2.4E
R_A = 3.9DL - 2.4E
E_m (min) = ΣM_A=0 = 7.34(9.0) + 0.189(41.3)(20.65) - R_b(41.3) R_B = 3.9DL + 1.6E
R_A = 3.9DL - 1.6E

check beams for axial forces shown using load combos per section 12.4.3.1 (asd)

allowable stress permitted to be increased by 1.2

see following beam
calcs for load
application



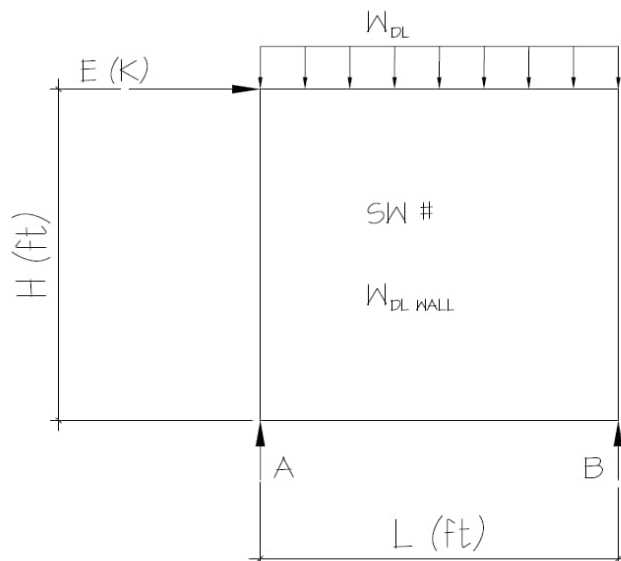
Overstrength Calculations

Wall Description/SW #:

204

Parameters:

L = 56.4 ft
H = 9.0 ft
E = 2.00 k
W_{DL Wall} = 0.10 klf
W_{DL} = 0.238 klf
Ω₀ = 2.5 (ASCE TABLE 12.2.1 FOOTNOTE G)
SDS = 1.142



analysis:

E_{mh} = Ω₀ * E = 5.00 K E_v = 0.2 * SDS * DL = 4.354 K
E_m = E_{mh} + E_v = 9.354 K
E_m = E_{mh} - E_v = 0.646 K

E_m (max) = ΣM_{A=0} = 9.35(9.0) + 0.338(56.4)(28.2) - R_b(56.4) R_B = 9.5DL + 1.5E
R_A = 9.5DL - 1.5E
E_m (min) = ΣM_{A=0} = 0.65(9.0) + 0.338(56.4)(28.2) - R_b(56.4) R_B = 9.5DL + 0.1E
R_A = 9.5DL - 0.1E

check beams for axial forces shown using load combos per section 12.4.3.1 (asd)

allowable stress permitted to be increased by 1.2

see following beam
calcs for load
application



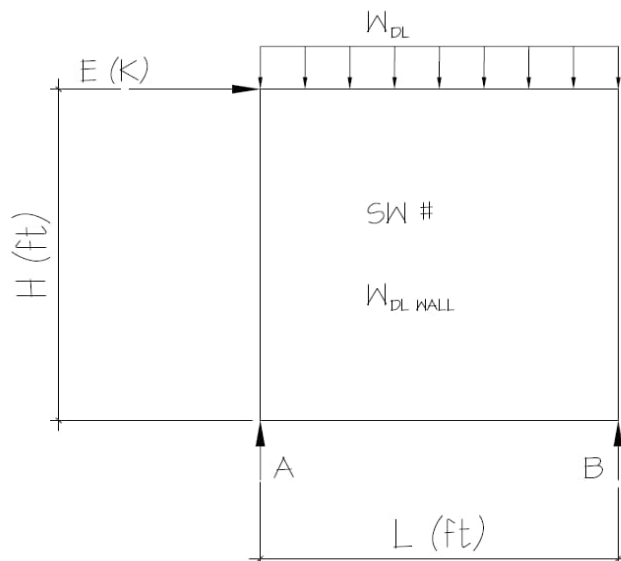
Overstrength Calculations

Wall Description/SW #:

206

Parameters:

L = 11.3 ft
H = 9.0 ft
E = 0.75 k
W_{DL Wall} = 0.10 klf
W_{DL} = 0.000 klf
Ω₀ = 2.5 (ASCE TABLE 12.2.1 FOOTNOTE G)
SDS = 1.142



analysis:

E_{mh} = Ω₀ * E = 1.88 K E_v = 0.2 * SDS * DL = 0.258 K
E_m = E_{mh} + E_v = 2.133 K
E_m = E_{mh} - E_v = 1.617 K

E_m (max) = ΣM_{A=0} = 2.13(9.0) + 0.1(11.3)(5.65) - R_b(11.3) R_B = 0.6DL + 1.7E
R_A = 0.6DL - 1.7E
E_m (min) = ΣM_{A=0} = 1.62(9.0) + 0.1(11.3)(5.65) - R_b(11.3) R_B = 0.6DL + 1.3E
R_A = 0.6DL - 1.3E

check beams for axial forces shown using load combos per section 12.4.3.1 (asd)

allowable stress permitted to be increased by 1.2

see following beam
calcs for load
application

Wood Beam

File: beam calcs with overstrength.ec6

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MULHERN & KULP STRUCTURAL ENGINEERING INC

Lic. #: KW-06004787

DESCRIPTION: B8 - Flush Beam at Garage

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, 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

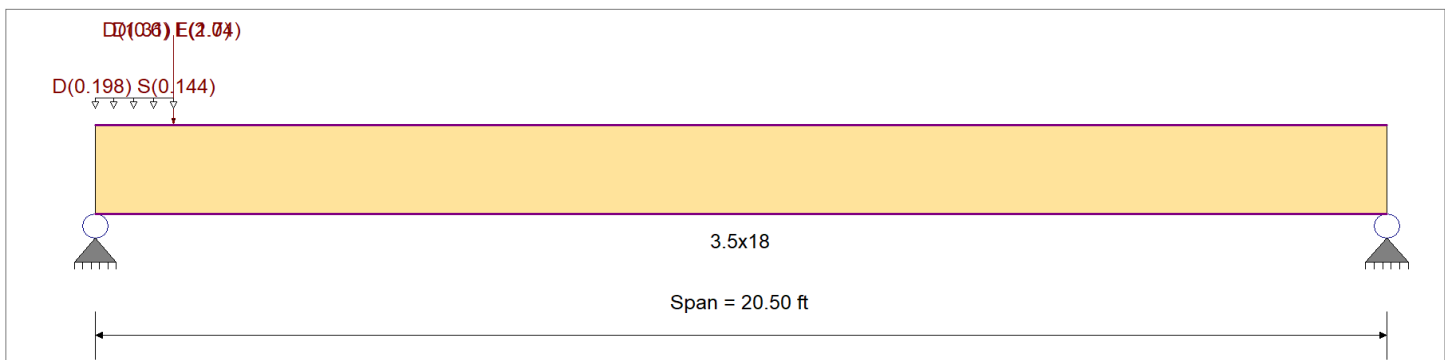
Ebend- xx 1,800.0 ksi

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 = 1.310, L = 2.040 k @ 1.250 ft

Point Load : D = 0.60, E = 1.70 k @ 1.250 ft

Uniform Load : D = 0.1980, S = 0.1440 k/ft, Extent = 0.0 --> 1.250 ft, Tributary Width = 1.0 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.109	1	Maximum Shear Stress Ratio	=	0.028	: 1
Section used for this span		3.5x18		Section used for this span		3.5x18	
fb: Actual	=	313.85	psi	fv: Actual	=	8.76	psi
Fb: Allowable	=	2,880.00	psi	Fv: Allowable	=	318.00	psi
Load Combination		+D+L+H		Load Combination		+D+L+H	
Location of maximum on span	=	1.272	ft	Location of maximum on span	=	19.004	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.039	in	Ratio =		6320	>=360
Max Upward Transient Deflection		0.000	in	Ratio =		0	<360
Max Downward Total Deflection		0.104	in	Ratio =		2371	>=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								Moment Values			Shear Values		
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv
+D+H																
Length = 20.50 ft	1	0.062	0.020	0.90	1.000	1.00	1.00	1.00	1.00	1.00	2.55	162.00	2592.00	0.24	5.80	286.20
+D+L+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1	0.109	0.028	1.00	1.000	1.00	1.00	1.00	1.00	1.00	4.94	313.85	2880.00	0.37	8.76	318.00
+D+Lr+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1	0.045	0.015	1.25	1.000	1.00	1.00	1.00	1.00	1.00	2.55	162.00	3600.00	0.24	5.80	397.50
+D+S+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1	0.051	0.016	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.66	168.70	3312.00	0.25	5.93	365.70
+D+0.750Lr+0.750L+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1	0.077	0.020	1.25	1.000	1.00	1.00	1.00	1.00	1.00	4.35	275.89	3600.00	0.34	8.02	397.50
+D+0.750L+0.750S+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

File: beam calcs with overstrength.ec6

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MULHERN & KULP STRUCTURAL ENGINEERING INC

Lic. #: KW-06004787

DESCRIPTION: **B8 - Flush Beam at Garage**

Load Combination	Segment Length	Span #	Max Stress Ratios		C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	Moment Values			Shear Values		
			M	V								M	f _b	F _b	V	f _v	F _v
Length = 20.50 ft	1		0.085	0.022	1.15	1.000	1.00	1.00	1.00	1.00	1.00	4.42	280.91	3312.00	0.34	8.12	365.70
+D+0.60W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1		0.035	0.011	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.55	162.00	4608.00	0.24	5.80	508.80
+D+0.750Lr+0.750L+0.450W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1		0.060	0.016	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.35	275.89	4608.00	0.34	8.02	508.80
+D+0.750L+0.750S+0.450W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1		0.061	0.016	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.42	280.91	4608.00	0.34	8.12	508.80
+0.60D+0.60W+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1		0.021	0.007	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.53	97.20	4608.00	0.15	3.48	508.80
+D+0.70E+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1		0.054	0.015	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.95	250.58	4608.00	0.32	7.53	508.80
+D-0.70E+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1		0.018	0.008	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.34	85.18	4608.00	0.17	4.07	508.80
+D+0.750L+0.750S+0.5250E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1		0.075	0.019	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.47	347.35	4608.00	0.40	9.41	508.80
+D+0.750L+0.750S-0.5250E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.50 ft	1		0.047	0.013	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.38	214.48	4608.00	0.29	6.82	508.80

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	0.1037	8.978		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	4.579	0.416
Overall MINimum	1.596	0.104
+D+H	2.173	0.264
+D+L+H	4.089	0.388
+D+Lr+H	2.173	0.264
+D+S+H	2.348	0.269
+D+0.750Lr+0.750L+H	3.610	0.357
+D+0.750L+0.750S+H	3.741	0.361
+D+0.60W+H	2.173	0.264
+D+0.750Lr+0.750L+0.450W+H	3.610	0.357
+D+0.750L+0.750S+0.450W+H	3.741	0.361
+0.60D+0.60W+0.60H	1.304	0.158
+D+0.70E+0.60H	3.291	0.337
+D+0.750L+0.750S+0.5250E+H	4.579	0.416
+0.60D+0.70E+H	2.422	0.231
D Only	2.173	0.264
L Only	1.916	0.124
S Only	0.175	0.005
E Only	1.596	0.104
H Only		

Wood Beam

File: beam calcs with overstrength.ec6
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 MULHERN & KULP STRUCTURAL ENGINEERING INC

Lic. #: KW-06004787

DESCRIPTION: B11 - Flush Beam at Cov'd Porch

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, CBC 2019, ASCE 7-16

Load Combination Set : ASCE 7-16

Material Properties

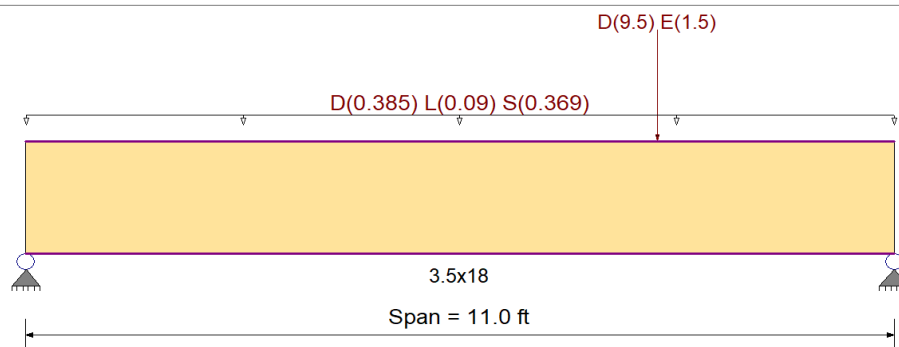
Analysis Method : Allowable Stress Design
 Load Combination : ASCE 7-16

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 = 0.3850, L = 0.090, S = 0.3690, Tributary Width = 1.0 ft

Point Load : D = 9.50, E = 1.50 k @ 8.0 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.624	1	Maximum Shear Stress Ratio	=	0.708	1
Section used for this span		3.5x18		Section used for this span		3.5x18	
fb: Actual	=	1,618.64	psi	fv: Actual	=	202.61	psi
Fb: Allowable	=	2,592.00	psi	Fv: Allowable	=	286.20	psi
Load Combination		+D+H		Load Combination		+D+H	
Location of maximum on span	=	7.989	ft	Location of maximum on span	=	9.515	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.040	in	Ratio =		3305	>=360
Max Upward Transient Deflection		0.000	in	Ratio =		0	<360
Max Downward Total Deflection		0.201	in	Ratio =		657	>=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										Moment Values			Shear Values		
		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
+D+H Length = 11.0 ft	1	0.624	0.708	0.90	1.000	1.00	1.00	1.00	1.00	1.00		25.49	1,618.64	2592.00	0.00	0.00	0.00
+D+L+H Length = 11.0 ft	1	0.586	0.664	1.00	1.000	1.00	1.00	1.00	1.00	1.00		26.58	1,687.37	2880.00	0.00	0.00	0.00
+D+Lr+H Length = 11.0 ft	1	0.450	0.510	1.25	1.000	1.00	1.00	1.00	1.00	1.00		25.49	1,618.64	3600.00	0.00	0.00	0.00
+D+S+H Length = 11.0 ft	1	0.574	0.650	1.15	1.000	1.00	1.00	1.00	1.00	1.00		29.93	1,900.43	3312.00	0.00	0.00	0.00
+D+0.750Lr+0.750L+H Length = 11.0 ft	1	0.464	0.526	1.25	1.000	1.00	1.00	1.00	1.00	1.00		26.31	1,670.19	3600.00	0.00	0.00	0.00
+D+0.750L+0.750S+H Length = 11.0 ft	1	0.568	0.644	1.15	1.000	1.00	1.00	1.00	1.00	1.00		29.63	1,881.53	3312.00	0.00	0.00	0.00

Wood Beam

File: beam calcs with overstrength.ec6

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MULHERN & KULP STRUCTURAL ENGINEERING INC

Lic. #: KW-06004787

DESCRIPTION: B11 - Flush Beam at Cov'd Porch

Load Combination Segment Length	Span #	Max Stress Ratios		C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	Moment Values			Shear Values		
		M	V								M	f _b	F _b	V	f _v	F _v
+D+0.60W+H Length = 11.0 ft	1	0.351	0.398	1.60	1.000	1.00	1.00	1.00	1.00	1.00	25.49	1,618.64	4608.00	0.00	0.00	0.00
+D+0.750Lr+0.750L+0.450W+H Length = 11.0 ft	1	0.362	0.411	1.60	1.000	1.00	1.00	1.00	1.00	1.00	26.31	1,670.19	4608.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.450W+H Length = 11.0 ft	1	0.408	0.463	1.60	1.000	1.00	1.00	1.00	1.00	1.00	29.63	1,881.53	4608.00	0.00	0.00	0.00
+0.60D+0.60W+0.60H Length = 11.0 ft	1	0.211	0.239	1.60	1.000	1.00	1.00	1.00	1.00	1.00	15.30	971.19	4608.00	0.00	0.00	0.00
+D+0.70E+0.60H Length = 11.0 ft	1	0.383	0.434	1.60	1.000	1.00	1.00	1.00	1.00	1.00	27.78	1,763.90	4608.00	0.00	0.00	0.00
+D+0.70E+0.60H Length = 11.0 ft	1	0.320	0.362	1.60	1.000	1.00	1.00	1.00	1.00	1.00	23.21	1,473.39	4608.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.5250E+H Length = 11.0 ft	1	0.432	0.490	1.60	1.000	1.00	1.00	1.00	1.00	1.00	31.35	1,990.47	4608.00	0.00	0.00	0.00
+D+0.750L+0.750S-0.5250E+H Length = 11.0 ft	1	0.385	0.436	1.60	1.000	1.00	1.00	1.00	1.00	1.00	27.92	1,772.59	4608.00	0.00	0.00	0.00

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	0.2007	5.901		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	6.892	11.568
Overall MINimum	0.409	1.091
+D+H	4.784	9.102
+D+L+H	5.279	9.597
+D+Lr+H	4.784	9.102
+D+S+H	6.813	11.131
+D+0.750Lr+0.750L+H	5.155	9.473
+D+0.750L+0.750S+H	6.677	10.995
+D+0.60W+H	4.784	9.102
+D+0.750Lr+0.750L+0.450W+H	5.155	9.473
+D+0.750L+0.750S+0.450W+H	6.677	10.995
+0.60D+0.60W+0.60H	2.870	5.461
+D+0.70E+0.60H	5.070	9.865
+D+0.750L+0.750S+0.5250E+H	6.892	11.568
+0.60D+0.70E+H	3.156	6.225
D Only	4.784	9.102
L Only	0.495	0.495
S Only	2.030	2.030
E Only	0.409	1.091
H Only		

Wood Beam

Lic. #: KW-06004787

File: beam calcs with overstrength.ec6
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MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B12 - Flush Beam at Cov'd Porch

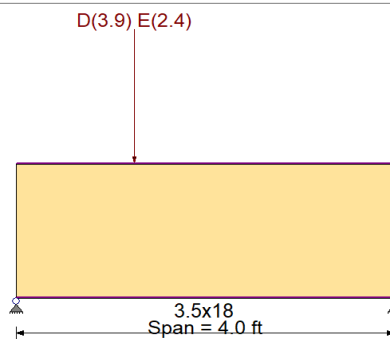
CODE REFERENCES

Calculations per NDS 2018, IBC 2021, CBC 2019, ASCE 7-16

Load Combination Set : ASCE 7-16

Material PropertiesAnalysis Method : Allowable Stress Design
Load Combination : ASCE 7-16Wood 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 psiE : 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 = 3.90, E = 2.40 k @ 1.250 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.083	1	Maximum Shear Stress Ratio	=	0.102	1
Section used for this span		3.5x18		Section used for this span		3.5x18	
fb: Actual	=	213.87	psi	fv: Actual	=	29.18	psi
Fb: Allowable	=	2,592.00	psi	Fv: Allowable	=	286.20	psi
Load Combination		+D+H		Load Combination		+D+H	
Location of maximum on span	=	1.255	ft	Location of maximum on span	=	2.511	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.001	in	Ratio =	32017	>=360	
Max Upward Transient Deflection		0.000	in	Ratio =	0	<360	
Max Downward Total Deflection		0.004	in	Ratio =	13671	>=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								Moment Values			Shear Values			
			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
+D+H													0.00	0.00	0.00	0.00	
Length = 4.0 ft	1		0.083	0.102	0.90	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	2592.00	1.23	29.18	286.20
+D+L+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.074	0.092	1.00	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	2880.00	1.23	29.18	318.00
+D+Lr+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.059	0.073	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	3600.00	1.23	29.18	397.50
+D+S+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.065	0.080	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	3312.00	1.23	29.18	365.70
+D+0.750Lr+0.750L+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.059	0.073	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	3600.00	1.23	29.18	397.50
+D+0.750L+0.750S+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.065	0.080	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	3312.00	1.23	29.18	365.70
+D+0.60W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

File: beam calcs with overstrength.ec6

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

MULHERN & KULP STRUCTURAL ENGINEERING INC

Lic. #: KW-06004787

DESCRIPTION: B12 - Flush Beam at Cov'd Porch

Load Combination	Segment Length	Span #	Max Stress Ratios		C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	Moment Values			Shear Values		
			M	V								M	f _b	F _b	V	f _v	F _v
Length = 4.0 ft	1		0.046	0.057	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	4608.00	1.23	29.18	508.80
+D+0.750Lr+0.750L+0.450W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.046	0.057	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	4608.00	1.23	29.18	508.80
+D+0.750L+0.750S+0.450W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.046	0.057	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.37	213.87	4608.00	1.23	29.18	508.80
+0.60D+0.60W+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.028	0.034	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.02	128.32	4608.00	0.74	17.51	508.80
+D+0.70E+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.066	0.082	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.81	305.35	4608.00	1.75	41.68	508.80
+D-0.70E+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.027	0.033	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.93	122.38	4608.00	0.70	16.68	508.80
+D+0.750L+0.750S+0.5250E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.061	0.076	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.45	282.48	4608.00	1.62	38.56	508.80
+D+0.750L+0.750S-0.5250E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1		0.032	0.039	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.29	145.25	4608.00	0.83	19.81	508.80

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.70E+0.60H	1	0.0035	1.810		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	3.864	1.771
Overall MINimum	1.650	0.750
+D+H	2.709	1.246
+D+L+H	2.709	1.246
+D+Lr+H	2.709	1.246
+D+S+H	2.709	1.246
+D+0.750Lr+0.750L+H	2.709	1.246
+D+0.750L+0.750S+H	2.709	1.246
+D+0.60W+H	2.709	1.246
+D+0.750Lr+0.750L+0.450W+H	2.709	1.246
+D+0.750L+0.750S+0.450W+H	2.709	1.246
+0.60D+0.60W+0.60H	1.625	0.748
+D+0.70E+0.60H	3.864	1.771
+D+0.750L+0.750S+0.5250E+H	3.575	1.640
+0.60D+0.70E+H	2.780	1.273
D Only	2.709	1.246
E Only	1.650	0.750
H Only		

JayMarc Homes
4526 89th Ave SE

Mercer Island, Washington

Seismic Shear Wall Calculations

Reviewed By: NJM

September 5, 2025

Parameters:

Single Family Home

Design Wind Speed: 100 MPH

wind Exposure Category: B

Seismic Design Category: D

Code & Design Standard: 2021 IBC Ch. 1613, ASCE 7-16 Ch. 11-12



MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING



SEISMIC CALCULATION - ASCE 7-16

Seismic Design Category:

User Inputs:

Site Class	D
Spectral Response Acceleration 0.2 sec, S_s	1.428
Spectral Response Acceleration 1.0 sec, S₁	0.496
Occupancy Category	II

Variables:

Site coefficient, F _a	1.20
Site coefficient, F _v	1.80

Calculated Values:

Maximum spectral response acceleration, S_{ms}	1.714
Maximum spectral response acceleration, S_{m1}	0.895
Design spectral response acceleration, S_{ds}	1.142
Design spectral response acceleration, S_{d1}	0.597
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	0.104
T _s	0.522
Spectral Response Acc., S _a (g)	1.142

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	2762	15	12.3	54 k
2	9.0	2360	17	5.4	46 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 99 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	0.176	0.176

Base Shears:

Ultimate Loads

x 0.7 =

Allowable Loads

Transverse	Longitudinal
17 k	17 k

Transverse	Longitudinal
12.2 k	12.2 k

Story Shear Calculation:

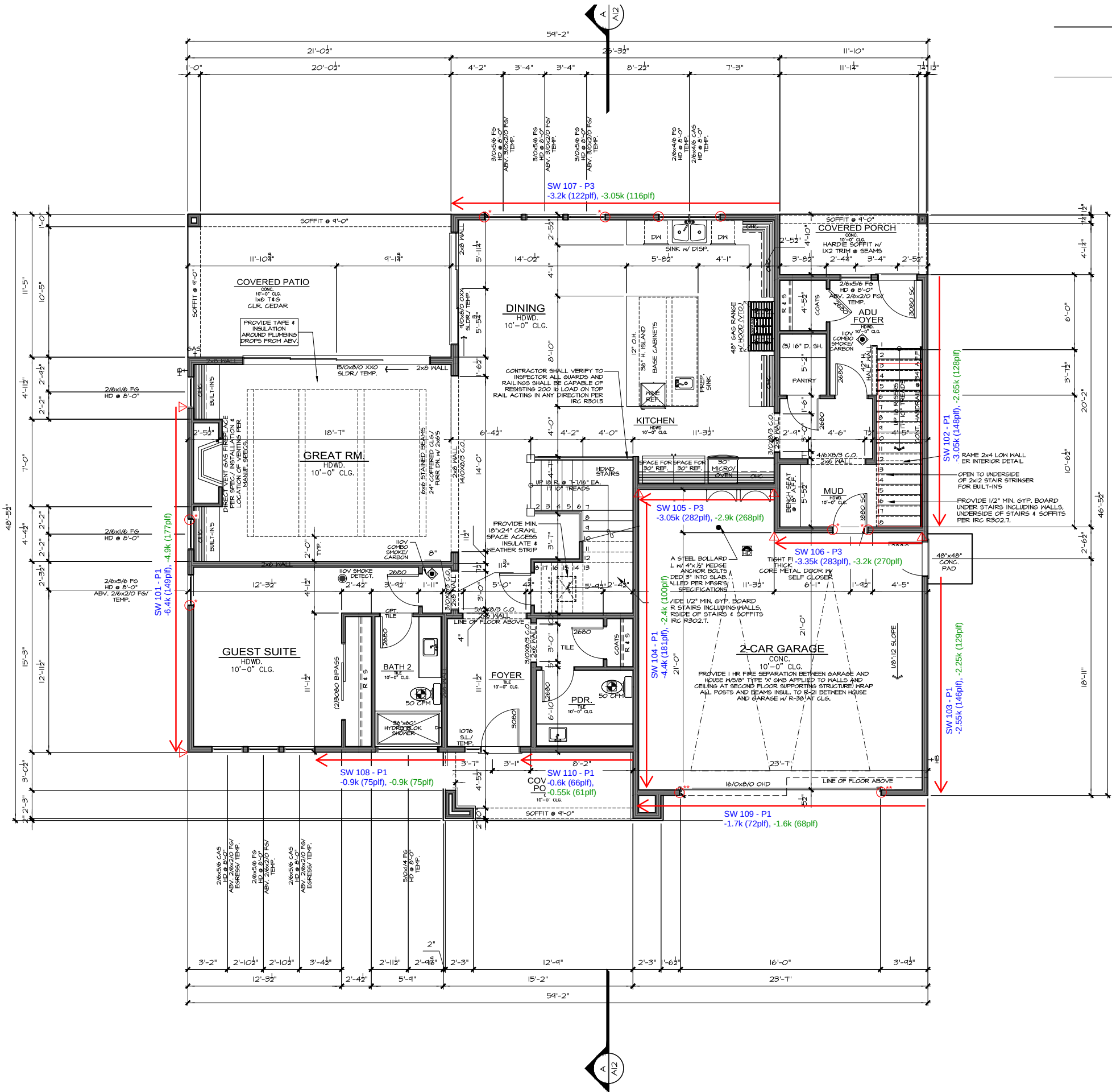
Distribution exponent, 1.00

Ultimate Loads

x 0.7 =

Allowable Loads

Level	Vert. Dist. Factor, C_{vx}	Transverse Story Shear, F_x	Longitudinal Story Shear, F_x	Transverse Story Shear, F_x	Longitudinal Story Shear, F_x
1	0.398	6.9 k	6.9 k	4.9 k	4.9 k
2	0.602	10.5 k	10.5 k	7.3 k	7.3 k
3	0.000	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
5	0.00	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
7	0.00	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
9	0.00	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
11	0.00	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
13	0.00	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
15	0.00	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
17	0.00	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
19	0.00	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



MAIN FLOOR
PLAN NOTES

1st Level

12.8k (Wind)
12.2k (Seismic)

16.4k (Wind)
12.2k (Seismic)

PLAN SPECIFIC 2021 WSEC-R SECTION 406.3
R406.3 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS.
EACH DWELLING UNIT IN A RESIDENTIAL BUILDING SHALL COMPLY W/
SUFFICIENT OPTIONS FROM TABLES R406.2 AND R406.3 SO AS TO
ACHIEVE THE FOLLOWING MIN. NUMBER OF CREDITS:
2. MEDIUM DWELLING UNIT--8 CREDITS FOR A 1501 TO 4,999 SF OR
LESS.
CREDITS PROVIDED IN THIS HOME AS FOLLOWS:

FUEL NORMALIZATION CREDIT: 3.0 CREDITS

HIGH EFFICIENCY HVAC EQUIPMENT OPT. 3.6: 0.5 CREDITS

AIR-SOURCE DUCTED HEAT PUMP W/ MIN. HSPF2 OF 10 (HSPF OF 11) IF
HEATING DESIGN TEMP IS 25F OR BELOW, A COLD CLIMATE VARIABLE
CAPACITY HEAT PUMP IS REQUIRED.

EFFICIENT WATER HEATING 5.6: 2.0 CREDITS
ELECTRIC HEAT PUMP WATER HEATER MEETING THE STANDARDS FOR
TEIR III OF NEEA'S ADVANCED WATER HEATING SPECIFICATIONS.

RENEWABLE ELECTRIC ENERGY 6.1 2.0 CREDITS
FOR EACH 600KWH OF ELECTRICAL GENERATION PER HOUSING UNIT
PROVIDED ANNUALLY BY ON-SITE WIND OR SOLAR EQUIPMENT A .5
CREDIT SHALL BE ALLOWED, UP TO 4.5 CREDITS. GENERATION SHALL
BE CALCULATED AS FOLLOWS:
FOR SOLAR ELECTRIC SYSTEMS, THE DESIGN SHALL BE
DEMONSTRATED TO MEET THIS REQUIREMENT USING THE NATIONAL
RENEWABLE LABORATORY CALCULATOR PRIVATELY OR
ALTERNATIVE APPROVED BY THE CODE OFFICIAL.
DOCUMENTATION NOTING SOLAR ACCESS SHALL BE INCLUDED ON
THE PLANS.

WHOLE HOUSE VENTILATION

PROVIDE WHOLE HOUSE VENTILATION per 2018 IRC, M505.4.3(1) and IMC
R403.8. THE WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM SHALL
PROVIDE OUTDOOR AIR AT A CONTINUOUS RATE AS DETERMINED IN
ACCORDANCE WITH TABLE M505.4.3(1) OR EQUATION 15.

SYMBOL	LOCATION	MIN. FAN REQUIREMENTS (ALL FANS VENT TO OUTSIDE)
	BATH #1 FINDER	Min. 50cfm. INTERMITTENT at .025mg per TABLE M501.4
	KITCHEN	Min. 100cfm. INTERMITTENT at .025mg per TBL. M501.4
	RANGE HOOD or DOWN DRAFT EXHAUST FAN RATED at min. 100cfm. at 0.10mg MAY BE USED FOR EXHAUST FAN REGIT. EXHAUST HOODS IN 100cfm. EXCESS OF 400cfm. SHALL BE INTERLOCKED AND PROVIDE MAKE UP AIR per M505.4	
	LAUNDRY ROOM	Min. 360cfm. INTERMITTENT at .025mg to FUNCTION AS WHOLE HOUSE FAN (WHF)
	M.C. WHF	MECHANICAL CONTRACTOR TO SIZE WHF. FAN AND SET OPERATING TIMER per TABLE M501.3.3(1) FOR A 4,501-5,000cfm. DWELLING w/ 5 OR MORE BEDRMS. TO OPERATE INTERMITTENTLY AND CONTINUOUSLY per TABLE M501.3.3(2)
	PROVIDE CONTROLS FOR WHF. per M501.3.2 AFFIX LABEL TO CONTROLS THAT READS "WHOLE HOUSE VENTILATION - SEE OPERATING INSTRUCTIONS"	

MAIN FLOOR PLAN

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA	1,830 S.F.
UPPER FLOOR AREA	2,141 S.F.
TOTAL CONDITIONED AREA	4,021 S.F.
2 CAR GARAGE	525 S.F.
COVERED PATIO	250 S.F.
COVERED PORCH	87 S.F.
TOTAL AREA UNDER ROOF	4,883 S.F.

OVERALL WIDTH	60'-0"
OVERALL DEPTH	48'-5 1/2"
Updated :	10/06/2017

Method for Calculating Square Footage - ANSI Z765-2013 excepts, 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



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

Issue Issue Date By
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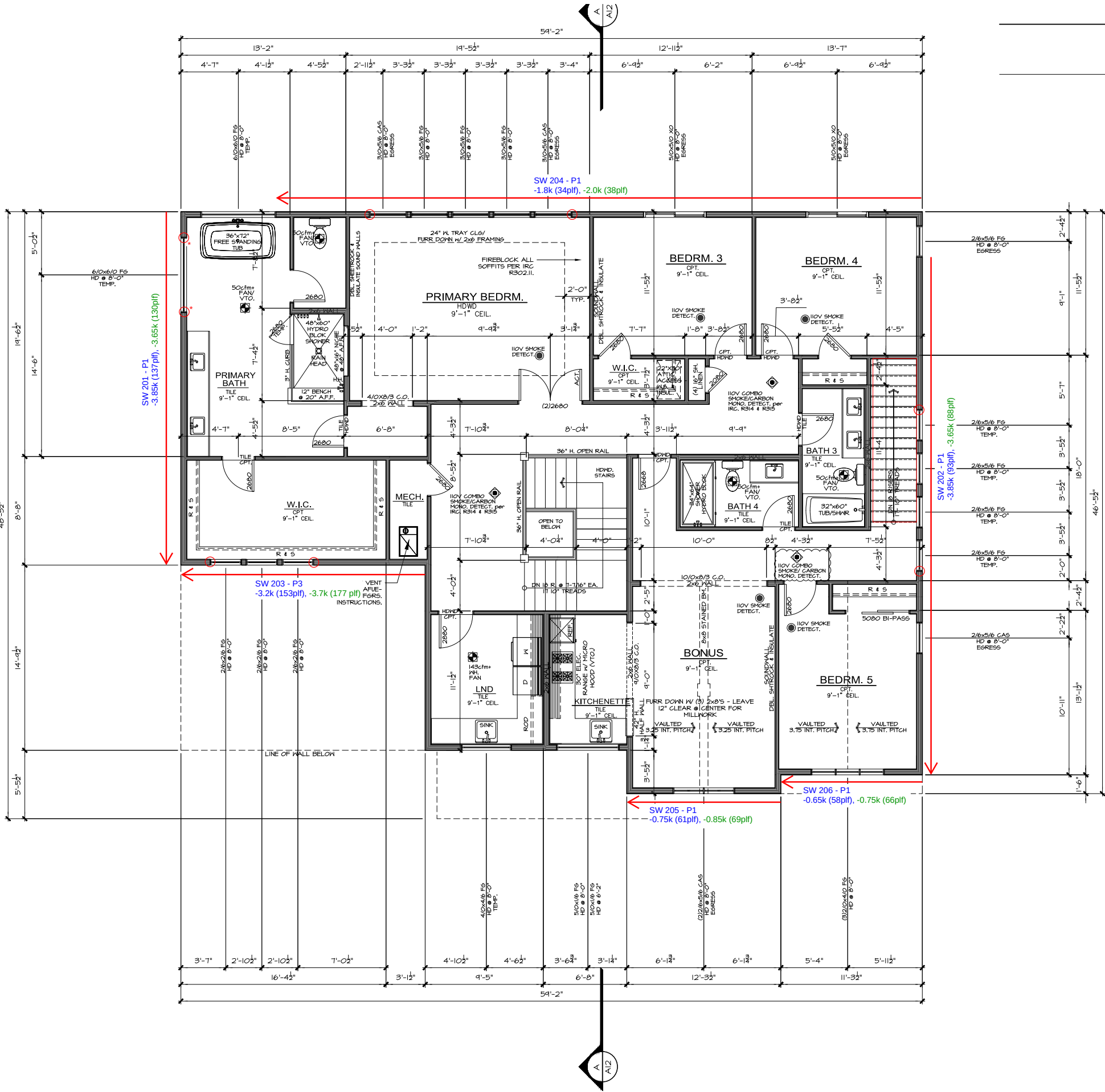
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2nd Level

6.4k (Wind)
7.3k (Seismic)



7.7k (Wind)
7.3k (Seismic)



UPPER FLOOR
PLAN NOTES:

PLAN SPECIFIC 2021 WSEC-R SECTION 406.3
R406.3 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS.
EACH DWELLING UNIT IN A RESIDENTIAL BUILDING SHALL COMPLY W/
SUFFICIENT OPTIONS FROM TABLES R406.2 AND R406.3 SO AS TO
ACHIEVE THE FOLLOWING MIN. NUMBER OF CREDITS:
2. MEDIUM DWELLING UNIT---8 CREDITS FOR A 1501 TO 4,999 SF OR
LESS.
CREDITS PROVIDED IN THIS HOME AS FOLLOWS:

FUEL NORMALIZATION CREDIT: 3.0 CREDITS

HIGH EFFICIENCY HVAC EQUIPMENT: OPT. 3.61, 0.5 CREDITS

AIR-SOURCE DUCTED HEAT PUMP W/ MIN. HSPF2 OF 10 (HSPF OF 11) IF
HEATING DESIGN TEMP IS 23F OR BELOW, A COLD CLIMATE VARIABLE
CAPACITY HEAT PUMP IS REQUIRED.

EFFICIENT WATER HEATING 5.61: 2.0 CREDITS
ELECTRIC HEAT PUMP WATER HEATER MEETING THE STANDARDS FOR
TEIR III OF NEEA'S ADVANCED WATER HEATING SPECIFICATIONS.

RENEWABLE ELECTRIC ENERGY 6.1: 2.0 CREDITS
FOR EACH 600KWH OF ELECTRICAL GENERATION PER HOUSING UNIT
PROVIDED ANNUALLY BY ON-SITE WIND OR SOLAR EQUIPMENT A .5
CREDIT SHALL BE ALLOWED, UP TO 4.5 CREDITS. GENERATION SHALL
BE CALCULATED AS FOLLOWS:
FOR SOLAR ELECTRIC SYSTEMS, THE DESIGN SHALL BE
DEMONSTRATED TO MEET THIS REQUIREMENT USING THE NATIONAL
RENEWABLE LABORATORY CALCULATOR PVWATTS OR
ALTERNATIVE APPROVED BY THE CODE OFFICIAL.
DOCUMENTATION NOTING SOLAR ACCESS SHALL BE INCLUDED ON
THE PLANS.

WHOLE HOUSE VENTILATION

PROVIDE WHOLE HOUSE VENTILATION per 2019 IRC, M505.4.3(1) and IMC
R402.9.2. THE WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM SHALL
PROVIDE OUTDOOR AIR AT A CONTINUOUS RATE AS DETERMINED IN
ACCORDANCE WITH TABLE M505.4.3(1) OR EQUATION 15.

SYMBOL	LOCATION	MIN. FAN REQUIREMENTS (ALL FANS VENT TO OUTSIDE)
BA 50cfm+	BATH #1 POWDER	Min. 50cfm. INTERMITTENT at .025mg per TABLE M507.4
KI 100cfm+	KITCHEN	Min. 100cfm. INTERMITTENT at .025mg per TBL. M507.4
LA 140cfm NHF	LAUNDRY ROOM	RANGE HOOD or DOWN DRAFT EXHAUST FAN RATED at min. 100cfm. at 0.10mg MAY BE USED FOR EXHAUST FAN REQ. EXHAUST HOODS IN EXCESS OF 400cfm. SHALL BE INTERLOCKED AND PROVIDE MAKE UP AIR per M505.4 MIN. 360cfm. INTERMITTENT at .025mg TO FUNCTION AS WHOLE HOUSE FAN (NHF.)
ME 140cfm NHF	MECHANICAL CONTRACTOR TO SIZE NHF. FAN AND SET OPERATING TIMER per TABLE M507.3(3) FOR A 4501-5000sf. DWELLING w/ 5 OR MORE BEDRMS. TO OPERATE INTERMITTENTLY and CONTINUOUSLY per TABLE M507.3(3.2)	

PROVIDE CONTROLS FOR NHF. per M507.3.2 AFFIX LABEL TO CONTROLS THAT
READS "WHOLE HOUSE VENTILATION - SEE OPERATING INSTRUCTIONS"

UPPER FLOOR PLAN

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA	1,830 S.F.
UPPER FLOOR AREA	2,191 S.F.
TOTAL CONDITIONED AREA	4,021 S.F.
2 CAR GARAGE	525 S.F.
COVERED PATIO	250 S.F.
COVERED PORCH	87 S.F.
TOTAL AREA UNDER ROOF	4,883 S.F.

OVERALL WIDTH 60'-0"
OVERALL DEPTH 48'-5 1/2"
Updated: 10/01/2017

Method for Calculating Square Footage - ANSI Z165-2018 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



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

Issue Issue Date By
Description

4526 89th AVE SE
MERCER ISLAND, WA.

Job Number:
MIS077

plan name:
marketing name: MARCELLO
plan number: MIS077
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.

The drawings in this set are
instruments of service and
shall remain the property of
JayMarc Homes, LLC.

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09.15.25

Submission 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



Shearwall Design Summary

Shearwall 201: 2nd - Primary Bath/WIC Side Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	7.0	ft.	Shearwall Assembly	P1
Wall Length, L	28.2	ft.	Qualifying Wall Length, L	22.2	ft.		

Capacity Evaluation:

Total Shear load on Wall	3650	lbs	<	Allowable Shearwall Capacity	5209	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	117	plf	Overturning Moment	32.9	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1005	lbs	Resistive Moment	32.9	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 202: 2nd - Bed 3/4 Side Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	5.5	ft.	Shearwall Assembly	P1
Wall Length, L	41.3	ft.	Qualifying Wall Length, L	25.8	ft.		

Capacity Evaluation:

Total Shear load on Wall	3650	lbs	<	Allowable Shearwall Capacity	6173	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	189	plf	Overturning Moment	32.9	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	468	lbs	Resistive Moment	79.5	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall 203: 2nd - WIC/Laundry Front Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	2.5	ft.	Shearwall Assembly	P3
Wall Length, L	19.5	ft.	Qualifying Wall Length, L	11.2	ft.		

Capacity Evaluation:

Total Shear load on Wall	3700	lbs	<	Allowable Shearwall Capacity	5069	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	340	plf	Overturning Moment	33.3	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	570	lbs	Resistive Moment	33.3	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 204: 2nd - Rear Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	5.5	ft.	Shearwall Assembly	P1
Wall Length, L	51.6	ft.	Qualifying Wall Length, L	25.4	ft.		

Capacity Evaluation:

Total Shear load on Wall	2000	lbs	<	Allowable Shearwall Capacity	6075	lbs
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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	338	plf	Overturning Moment	18.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	468	lbs	Resistive Moment	208.5	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall 205: 2nd - Bonus Front Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	5.5	ft.	Shearwall Assembly	P1
Wall Length, L	12.3	ft.	Qualifying Wall Length, L	7.3	ft.		

Capacity Evaluation:

Total Shear load on Wall	850	lbs	<	Allowable Shearwall Capacity	1742	lbs
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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	117	plf	Overturning Moment	7.7	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	776	lbs	Resistive Moment	8.1	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 206: 2nd - Bed 4 Front Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	4.0	ft.	Shearwall Assembly	P1
Wall Length, L	11.3	ft.	Qualifying Wall Length, L	5.3	ft.		

Capacity Evaluation:

Total Shear load on Wall	750	lbs	<	Allowable Shearwall Capacity	1264	lbs
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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	117	plf	Overturning Moment	6.8	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	776	lbs	Resistive Moment	7.1	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall **XXX:** - Not Used

Shearwall Properties:

Wall height, H	0.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P0
Wall Length, L	0.0	ft.	Qualifying Wall Length, L	0.0	ft.		

Capacity Evaluation:

Total Shear load on Wall	0	lbs	###	Allowable Shearwall Capacity	#DIV/0!	lbs
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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	0.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	0	lbs	Resistive Moment	0.0	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall **101:** 1st - Left Side Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	7.5	ft.	Shearwall Assembly	P1
Wall Length, L	27.6	ft.	Qualifying Wall Length, L	20.8	ft.		

Capacity Evaluation:

Total Shear load on Wall	4900	lbs	<	Allowable Shearwall Capacity	4959	lbs
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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	193	plf	Overturning Moment	49.0	k-ft	Hold Down Design Load	239	lbs
DL at ends of wall	820	lbs	Resistive Moment	42.4	k-ft	Holddown Capacity	3695	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN



Shearwall Design Summary

Shearwall 102: 1st - Stair Side Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P1
Wall Length, L	20.6	ft.	Qualifying Wall Length, L	20.6	ft.		

Capacity Evaluation:

Total Shear load on Wall	2650	lbs	<	Allowable Shearwall Capacity	4931	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	232	plf	Overturning Moment	26.5	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	928	lbs	Resistive Moment	30.1	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 103: 1st - Garage Side Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P1
Wall Length, L	17.5	ft.	Qualifying Wall Length, L	17.5	ft.		

Capacity Evaluation:

Total Shear load on Wall	2250	lbs	<	Allowable Shearwall Capacity	4183	lbs
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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	391	plf	Overturning Moment	22.5	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	928	lbs	Resistive Moment	33.5	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall 104: 1st - Garage Left Int. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P1
Wall Length, L	24.0	ft.	Qualifying Wall Length, L	24.0	ft.		

Capacity Evaluation:

Total Shear load on Wall	2400	lbs	<	Allowable Shearwall Capacity	5736	lbs
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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	294	plf	Overturning Moment	24.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1200	lbs	Resistive Moment	49.9	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 105: 1st - Garage Rear Int. Wall

Shearwall Properties:

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

Capacity Evaluation:

Total Shear load on Wall	2900	lbs	<	Allowable Shearwall Capacity	4884	lbs
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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	288	plf	Overturning Moment	29.0	k-ft	Hold Down Design Load	1816	lbs
DL at ends of wall	400	lbs	Resistive Moment	9.3	k-ft	Holdown Capacity	3695	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN



Shearwall Design Summary

Shearwall 106: 1st - Garage Rear Int. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	8.0	ft.	Shearwall Assembly	P3
Wall Length, L	11.8	ft.	Qualifying Wall Length, L	9.2	ft.		

Capacity Evaluation:

Total Shear load on Wall	3200	lbs	<	Allowable Shearwall Capacity	4131	lbs
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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	32.0	k-ft	Hold Down Design Load	1506	lbs
DL at ends of wall	400	lbs	Resistive Moment	14.2	k-ft	Holddown Capacity	3695	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN

Shearwall 107: 1st - Dining/Kitchen Rear Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	7.5	ft.	Shearwall Assembly	P3
Wall Length, L	26.3	ft.	Qualifying Wall Length, L	11.6	ft.		

Capacity Evaluation:

Total Shear load on Wall	3050	lbs	<	Allowable Shearwall Capacity	5119	lbs
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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	581	plf	Overturning Moment	30.5	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1200	lbs	Resistive Moment	102.2	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holddown Required



Shearwall Design Summary

Shearwall 108: 1st - Guest Suite Front Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	1.3	ft.	Shearwall Assembly	P1
Wall Length, L	12.0	ft.	Qualifying Wall Length, L	7.0	ft.		

Capacity Evaluation:

Total Shear load on Wall	900	lbs	<	Allowable Shearwall Capacity	1666	lbs
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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	219	plf	Overturning Moment	9.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	468	lbs	Resistive Moment	9.4	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 109: 1st - Garage Front Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	8.0	ft.	Shearwall Assembly	P1
Wall Length, L	23.5	ft.	Qualifying Wall Length, L	7.6	ft.		

Capacity Evaluation:

Total Shear load on Wall	1600	lbs	<	Allowable Shearwall Capacity	1787	lbs
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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	254	plf	Overturning Moment	16.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	758	lbs	Resistive Moment	38.7	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall 110: 1st - Powder Front Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P1
Wall Length, L	9.0	ft.	Qualifying Wall Length, L	9.0	ft.		

Capacity Evaluation:

Total Shear load on Wall	550	lbs	<	Allowable Shearwall Capacity	3034	lbs
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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	433	plf	Overturning Moment	5.5	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	736	lbs	Resistive Moment	10.7	k-ft	Holddown 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, H _c	0.0	ft.	Shearwall Assembly	P0
Wall Length, L	0.0	ft.	Qualifying Wall Length, L	0.0	ft.		

Capacity Evaluation:

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

Hold-down Specification

No Holdown Required

JayMarc Homes
4526 89th Ave SE

Mercer Island, Washington

Wind Shear Wall Calculations

Reviewed By: NJM

September 5, 2025

Parameters:

Single Family Home

Design Wind Speed: 100 MPH

wind Exposure Category: B

Seismic Design Category: D

Code & Design Standard: 2021 IBC Ch. 1609, ASCE 7-16 Ch. 26-30



MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING



Project Name: 4526 89th Ave SE
M&K Project #: 154-25005
Engineer: AJC
date: 05-Sep-25

Wind Design Summary per ASCE 7-16

Parameters:

Wind Speed	100
Exposure Category	B
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	5.0	:12
Long. Roof Pitch	5.0	:12
Mean Roof Height, H	28.00	ft

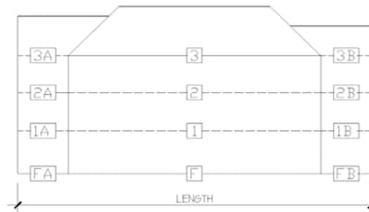
Building Geometry:

length	60	ft
Width	47	ft
Number of stories	2	

Transverse Direction (Perpendicular to Main Ridge Line)

Tributary Design Areas:

		Injury Design Areas.					
<u>Diaphragm Level</u>	<u>Floor-to-Floor Height</u>			<u>Section</u>			
				A	O	B	
2	9	ft	Roof Surface	0	427	0	sq ft
			Wall surface	0	269	0	sq ft
1	11.5	ft	Roof Surface	0	0	0	sq ft
			Wall surface	0	612	0	sq ft
FND			Roof Surface	0	0	0	sq ft
			Wall surface	0	0	0	sq ft



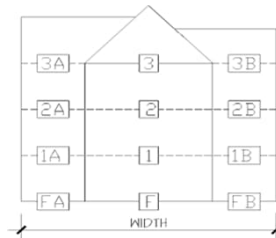
Tributary Design Loads: (0.6W)

	<u>Section</u>			
	A	O	B	
Story Shear	0.00	7.67	0.00	kips
Total Shear	0.00	7.67	0.00	kips
	7.67			kips
Story Shear	0.00	8.73	0.00	kips
Total Shear	0.00	16.40	0.00	kips
	16.40			kips
Story Shear	0.00	0.00	0.00	kips
Total Shear	0.00	16.40	0.00	kips
	16.40			kips

Longitudinal Direction (Parallel to Main Ridge Line)

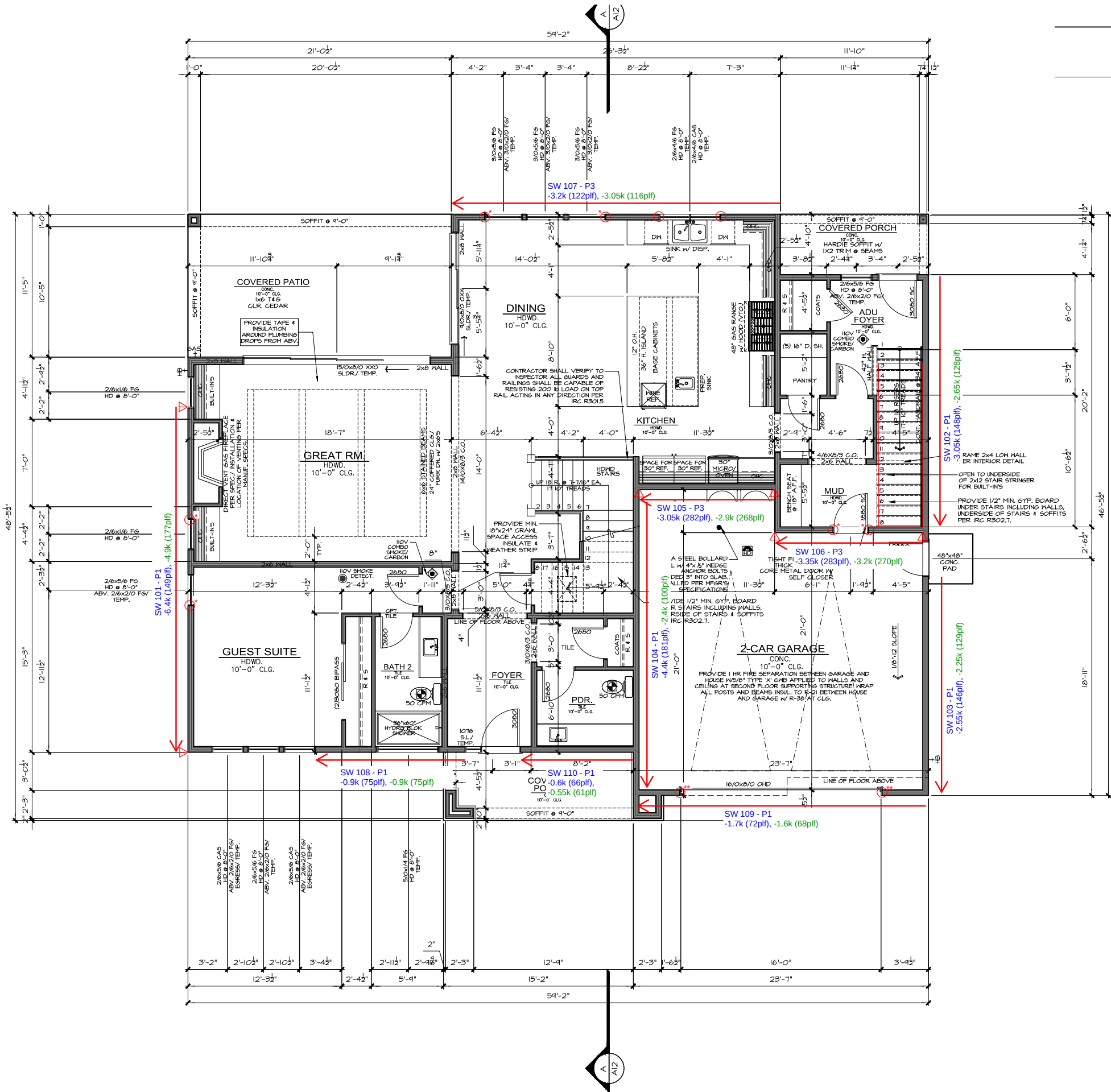
Tributary Design Areas:

<u>Diaphragm Level</u>	<u>Floor-to-Floor Height</u>		<u>Section</u>				
			A	O	B		
2	9	ft	Roof Surface	0	179	0	sq ft
			Wall surface	0	332	0	sq ft
1	11.5	ft	Roof Surface	0	0	0	sq ft
			Wall surface	0	470	0	sq ft
FND			Roof Surface	0	0	0	sq ft
			Wall surface	0	0	0	sq ft



Tributary Design Loads: (0.6W)

	<u>Section</u>			
	A	O	B	
Story Shear	0.00	6.38	0.00	kips
Total Shear	0.00	6.38	0.00	kips
	6.38			kips
Story Shear	0.00	6.39	0.00	kips
Total Shear	0.00	12.76	0.00	kips
	12.76			kips
Story Shear	0.00	0.00	0.00	kips
Total Shear	0.00	12.76	0.00	kips
	12.76			kips



MAIN FLOOR
PLAN NOTES

1st Level

12.8k (Wind)

12.2k (Seismic)

16.4k (Wind)

12.2k (Seismic)

PLAN SPECIFIC 2021 WSEC-R SECTION 406.3
R406.3 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS.
EACH DWELLING UNIT IN A RESIDENTIAL BUILDING SHALL COMPLY W/
SUFFICIENT OPTIONS FROM TABLES R406.2 AND R406.3 SO AS TO
ACHIEVE THE FOLLOWING MIN. NUMBER OF CREDITS:
2. MEDIUM DWELLING UNIT--8 CREDITS FOR A 1501 TO 4,999 SF OR
LESS.
CREDITS PROVIDED IN THIS HOME AS FOLLOWS:

FUEL NORMALIZATION CREDIT: 3.0 CREDITS

HIGH EFFICIENCY HVAC EQUIPMENT OPT. 3.6: 0.5 CREDITS

AIR-SOURCE DUCTED HEAT PUMP W/ MIN. HSPF2 OF 10 (HSPF OF 11) IF
HEATING DESIGN TEMP IS 25F OR BELOW, A COLD CLIMATE VARIABLE
CAPACITY HEAT PUMP IS REQUIRED.

EFFICIENT WATER HEATING 5.6: 2.0 CREDITS
ELECTRIC HEAT PUMP WATER HEATER MEETING THE STANDARDS FOR
TEIR III OF NEEA'S ADVANCED WATER HEATING SPECIFICATIONS.

RENEWABLE ELECTRIC ENERGY 6.1: 2.0 CREDITS
FOR EACH 600KWH OF ELECTRICAL GENERATION PER HOUSING UNIT
PROVIDED ANNUALLY BY ON-SITE WIND OR SOLAR EQUIPMENT A .5
CREDIT SHALL BE ALLOWED, UP TO 4.5 CREDITS. GENERATION SHALL
BE CALCULATED AS FOLLOWS:

FOR SOLAR ELECTRIC SYSTEMS, THE DESIGN SHALL BE
DEMONSTRATED TO MEET THIS REQUIREMENT USING THE NATIONAL
RENEWABLE LABORATORY CALCULATOR PRIVATELY OR
ALTERNATIVE APPROVED BY THE CODE OFFICIAL.
DOCUMENTATION NOTING SOLAR ACCESS SHALL BE INCLUDED ON
THE PLANS.

WHOLE HOUSE VENTILATION

PROVIDE WHOLE HOUSE VENTILATION per 2018 IRC, M505.4.3(1) and IMC
R403.8. THE WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM SHALL
PROVIDE OUTDOOR AIR AT A CONTINUOUS RATE AS DETERMINED IN
ACCORDANCE WITH TABLE M505.4.3(1) OR EQUATION 15.

SYMBOL	LOCATION	MIN. FAN REQUIREMENTS (ALL FANS VENT TO OUTSIDE)
 50cfm+	BATH # POUNDER	Min. 50cfm. INTERMITTENT at .025mg per TABLE M501.4
 100cfm+	KITCHEN	Min. 100cfm. INTERMITTENT at .025mg per TBL. M501.4
 100cfm+	RANGE HOOD or DOWN DRAFT EXHAUST FAN RATED at min. 100cfm. at CLONG MAY BE USED FOR EXHAUST FAN REGIT. EXHAUST HOODS IN 100cfm+ EXCESS OF 400cfm. SHALL BE INTERLOCKED AND PROVIDE MAKE UP AIR per M505.4	
 100cfm+	LAUNDRY ROOM	Min. 360cfm. INTERMITTENT at .025mg to FUNCTION AS WHOLE HOUSE FAN (WHF)
 100cfm+	MECHANICAL CONTRACTOR TO SIZE WHF. FAN AND SET OPERATING TIMER per TABLE M501.3.3(1) FOR A 4,501-5,000CFM DWELLING w/ 5 OR MORE BEDRMS. TO OPERATE INTERMITTENTLY AND CONTINUOUSLY per TABLE M501.3.3(2)	
 100cfm+	WHF	PROVIDE CONTROLS FOR WHF. per M501.3.2 AFFIX LABEL TO CONTROLS THAT READS "WHOLE HOUSE VENTILATION - SEE OPERATING INSTRUCTIONS"

MAIN FLOOR PLAN

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA	1,830 S.F.
UPPER FLOOR AREA	2,141 S.F.
TOTAL CONDITIONED AREA	4,021 S.F.
2 CAR GARAGE	525 S.F.
COVERED PATIO	250 S.F.
COVERED PORCH	87 S.F.
TOTAL AREA UNDER ROOF	4,883 S.F.

OVERALL WIDTH	60'-0"
OVERALL DEPTH	48'-5 1/2"
Updated:	10/06/2017

Method for Calculating Square Footage - ANSI Z765-2013 excepts, 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



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

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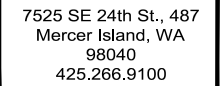
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MIS077

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.

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Sheet Title/Description

R.R.

Primary Scale

of: .

PLAN SPECIFIC 2021 WSEC-R SECTION 406.3
 R406.3 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS.
 EACH DWELLING UNIT IN A RESIDENTIAL BUILDING SHALL COMPLY W/
 SUFFICIENT OPTIONS FROM TABLES R406.2 AND R406.3 SO AS TO
 ACHIEVE THE FOLLOWING MIN. NUMBER OF CREDITS:
 2. MEDIUM DWELLING UNIT---8 CREDITS FOR A 1501 TO 4,999 SF OR
 LESS.
 CREDITS PROVIDED IN THIS HOME AS FOLLOWS:

FUEL NORMALIZATION CREDIT:	3.0 CREDITS
HIGH EFFICIENCY HVAC EQUIPMENT OPT. 3.6:	0.5 CREDITS

AIR-SOURCE DUCTED HEAT PUMP w/ MIN. HSPF2 OF 10 (HSPF OF 11) IF HEATING DESIGN TEMP IS 23F OR BELOW, A COLD CLIMATE VARIABLE CAPACITY HEAT PUMP IS REQUIRED.

EFFICIENT WATER HEATING 5.6: 2.0 CREDITS

ELECTRIC HEAT PUMP WATER HEATER MEETING THE STANDARDS FOR TEIR III OF NEEA'S ADVANCED WATER HEATING SPECIFICATIONS.

RENEWABLE ELECTRIC ENERGY 61 **2.0 CREDITS**

FOR EACH 600KWH OF ELECTRICAL GENERATION PER HOUSING UNIT PROVIDED ANNUALLY BY ON-SITE WIND OR SOLAR EQUIPMENT A 5 CREDIT SHALL BE ALLOWED, UP TO 4.5 CREDITS. GENERATION SHALL BE CALCULATED AS FOLLOWING:

FOR SOLAR ELECTRIC SYSTEMS, THE DESIGN SHALL BE DEMONSTRATED TO MEET THIS REQUIREMENT USING THE NATIONAL RENEWABLE LABORATORY CALCULATOR EXAMPTS OR AN ALTERNATIVE APPROVED BY THE CODE OFFICIAL. DOCUMENTATION NOTING SOLAR ACCESS SHALL BE INCLUDED ON THE PLANS.

PROVIDE WHOLE HOUSE VENTILATION per 2018 IRC, M1505.4.3(1) and IMC R403.8. THE WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM SHALL PROVIDE OUTDOOR AIR AT A CONTINUOUS RATE AS DETERMINED IN ACCORDANCE WITH TABLE M1505.4.3(1) OR EQUATION 15.

SYMBOL	LOCATION	MIN. FAN REQUIREMENTS (ALL FANS VENT TO OUTSIDE)
 50cfm	BATH & POWDER	Min. 50cfm, INTERMITTENT at .025kg per TABL M507.4
 100cfm	KITCHEN	Min. 100cfm, INTERMITTENT at .025kg per TABL M507.4 RANGE HOOD or DOWN DRAFT EXHAUST FAN RATED at min. 100cfm, at 100% FLOW MAY BE USED FOR EXHAUST FAN RECMT. EXHAUST HOODS IN EXCESS OF 400cfm, SHALL BE INTERLOCKED AND PROVIDE MAKE UP AIR per mH509.4
 100cfm K.W.F.F.	LAUNDRY ROOM	MIN. 360cfm, INTERMITTENT at .025kg to FUNCTION AS WHOLE HOUSE FAN (WHF)

MECHANICAL CONTRACTOR TO SIZE WHF, FAN SIZE OPERATING THEREIN per TABL M507.3(U) FOR A 4.50-5000CFM, DRYING @ 5/5 OR MORE BEDROOMS. TO OPERATE INTERMITTENTLY TO MEET TABL M507.3(U) REQUIREMENTS.

PROVIDE CONTROLS FOR WHF, per M507.3.2 AFFIX LABEL TO CONTROLS THAT READS "WHOLE HOUSE VENTILATION - SEE OPERATING INSTRUCTIONS"

6.4k (Wind)
7.3k (Seismic)

UPPER FLOOR PLAN

SQUARE FOOTAGE SUMMARY		
MAIN FLOOR AREA	1,830	S.F.
UPPER FLOOR AREA	2,191	S.F.
TOTAL CONDITIONED AREA	4,021	S.F.
2 CAR GARAGE	525	S.F.
COVD PATIO	250	S.F.
COVD PORCH	87	S.F.
TOTAL AREA UNDER ROOF	4,883	S.F.

OVERALL WIDTH 60'-0"
OVERALL DEPTH 48'-5 1/2"
Updated: 10/xx/2017

Method for Calculating Square Footage - ANSI Z165-2013 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

See Sheet "CODES" for additional Zoning required Area Calculations



Shearwall Design Summary

Shearwall 201: 2nd - Primary Bath/WIC Side Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	7.0	ft.	Shearwall Assembly	P1
Wall Length, L	28.2	ft.	Qualifying Wall Length, L	22.2	ft.		

Capacity Evaluation:

Total Shear load on Wall	3850	lbs	<	Allowable Shearwall Capacity	7323	lbs
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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	117	plf	Overturning Moment	34.7	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1005	lbs	Resistive Moment	44.8	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 202: 2nd - Bed 3/4 Side Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	5.5	ft.	Shearwall Assembly	P1
Wall Length, L	41.3	ft.	Qualifying Wall Length, L	25.8	ft.		

Capacity Evaluation:

Total Shear load on Wall	3850	lbs	<	Allowable Shearwall Capacity	8679	lbs
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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	189	plf	Overturning Moment	34.7	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	468	lbs	Resistive Moment	108.5	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall 203: 2nd - WIC/Laundry Front Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	2.5	ft.	Shearwall Assembly	P3
Wall Length, L	19.5	ft.	Qualifying Wall Length, L	11.2	ft.		

Capacity Evaluation:

Total Shear load on Wall	3200	lbs	<	Allowable Shearwall Capacity	7081	lbs
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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	340	plf	Overturning Moment	28.8	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	570	lbs	Resistive Moment	45.5	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 204: 2nd - Rear Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	5.5	ft.	Shearwall Assembly	P1
Wall Length, L	51.6	ft.	Qualifying Wall Length, L	25.4	ft.		

Capacity Evaluation:

Total Shear load on Wall	1800	lbs	<	Allowable Shearwall Capacity	8541	lbs
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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	338	plf	Overturning Moment	16.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	468	lbs	Resistive Moment	284.4	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall 205: 2nd - Bonus Front Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	5.5	ft.	Shearwall Assembly	P1
Wall Length, L	12.3	ft.	Qualifying Wall Length, L	7.3	ft.		

Capacity Evaluation:

Total Shear load on Wall	750	lbs	<	Allowable Shearwall Capacity	2449	lbs
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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	117	plf	Overturning Moment	6.8	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	776	lbs	Resistive Moment	11.0	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 206: 2nd - Bed 4 Front Ext. Wall

Shearwall Properties:

Wall height, H	9.0	ft.	Max wall opening ht, H _c	4.0	ft.	Shearwall Assembly	P1
Wall Length, L	11.3	ft.	Qualifying Wall Length, L	5.3	ft.		

Capacity Evaluation:

Total Shear load on Wall	650	lbs	<	Allowable Shearwall Capacity	1777	lbs
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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	117	plf	Overturning Moment	5.9	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	776	lbs	Resistive Moment	9.7	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall **XXX:** - Not Used

Shearwall Properties:

Wall height, H	0.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P0
Wall Length, L	0.0	ft.	Qualifying Wall Length, L	0.0	ft.		

Capacity Evaluation:

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

Hold-down Specification

No Holdown Required

Shearwall **101:** 1st - Left Side Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	7.5	ft.	Shearwall Assembly	P1
Wall Length, L	27.6	ft.	Qualifying Wall Length, L	20.8	ft.		

Capacity Evaluation:

Total Shear load on Wall	6400	lbs	<	Allowable Shearwall Capacity	6972	lbs
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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	193	plf	Overturning Moment	64.0	k-ft	Hold Down Design Load	225	lbs
DL at ends of wall	820	lbs	Resistive Moment	57.8	k-ft	Holddown Capacity	4935	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN



Shearwall Design Summary

Shearwall 102: 1st - Stair Side Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P1
Wall Length, L	20.6	ft.	Qualifying Wall Length, L	20.6	ft.		

Capacity Evaluation:

Total Shear load on Wall	3050	lbs	<	Allowable Shearwall Capacity	6932	lbs
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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	232	plf	Overturning Moment	30.5	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	928	lbs	Resistive Moment	41.1	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 103: 1st - Garage Side Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P1
Wall Length, L	17.5	ft.	Qualifying Wall Length, L	17.5	ft.		

Capacity Evaluation:

Total Shear load on Wall	2550	lbs	<	Allowable Shearwall Capacity	5880	lbs
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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	391	plf	Overturning Moment	25.5	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	928	lbs	Resistive Moment	45.7	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required



Shearwall Design Summary

Shearwall 104: 1st - Garage Left Int. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	0.0	ft.	Shearwall Assembly	P1
Wall Length, L	24.0	ft.	Qualifying Wall Length, L	24.0	ft.		

Capacity Evaluation:

Total Shear load on Wall	4400	lbs	<	Allowable Shearwall Capacity	8064	lbs
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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	294	plf	Overturning Moment	44.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1200	lbs	Resistive Moment	68.1	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 105: 1st - Garage Rear Int. Wall

Shearwall Properties:

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

Capacity Evaluation:

Total Shear load on Wall	3050	lbs	<	Allowable Shearwall Capacity	6823	lbs
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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	288	plf	Overturning Moment	30.5	k-ft	Hold Down Design Load	1641	lbs
DL at ends of wall	400	lbs	Resistive Moment	12.7	k-ft	Holddown Capacity	4935	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN



Shearwall Design Summary

Shearwall 106: 1st - Garage Rear Int. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	8.0	ft.	Shearwall Assembly	P3
Wall Length, L	11.8	ft.	Qualifying Wall Length, L	9.2	ft.		

Capacity Evaluation:

Total Shear load on Wall	3350	lbs	<	Allowable Shearwall Capacity	5771	lbs
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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	33.5	k-ft	Hold Down Design Load	1197	lbs
DL at ends of wall	400	lbs	Resistive Moment	19.3	k-ft	Holddown Capacity	4935	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN

Shearwall 107: 1st - Dining/Kitchen Rear Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	7.5	ft.	Shearwall Assembly	P3
Wall Length, L	26.3	ft.	Qualifying Wall Length, L	11.6	ft.		

Capacity Evaluation:

Total Shear load on Wall	3200	lbs	<	Allowable Shearwall Capacity	7151	lbs
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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	581	plf	Overturning Moment	32.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	1200	lbs	Resistive Moment	139.4	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holddown Required



Shearwall Design Summary

Shearwall 108: 1st - Guest Suite Front Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	1.3	ft.	Shearwall Assembly	P1
Wall Length, L	12.0	ft.	Qualifying Wall Length, L	7.0	ft.		

Capacity Evaluation:

Total Shear load on Wall	900	lbs	<	Allowable Shearwall Capacity	2342	lbs
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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	219	plf	Overturning Moment	9.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	468	lbs	Resistive Moment	12.8	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holddown Required

Shearwall 109: 1st - Garage Front Ext. Wall

Shearwall Properties:

Wall height, H	10.0	ft.	Max wall opening ht, H _c	8.0	ft.	Shearwall Assembly	P1
Wall Length, L	23.5	ft.	Qualifying Wall Length, L	7.6	ft.		

Capacity Evaluation:

Total Shear load on Wall	1700	lbs	<	Allowable Shearwall Capacity	2512	lbs
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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	254	plf	Overturning Moment	17.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	758	lbs	Resistive Moment	52.8	k-ft	Holddown Capacity	0	lbs

Hold-down Specification

No Holddown Required



Shearwall Design Summary

Shearwall 110: 1st - Powder Front Ext. Wall

Shearwall Properties:

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

Capacity Evaluation:

Total Shear load on Wall lbs < Allowable Shearwall Capacity 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 plf Overturning Moment k-ft Hold Down Design Load lbs
DL at ends of wall lbs Resistive Moment k-ft Holddown Capacity lbs

Hold-down Specification

No Holdown Required

Shearwall XXX: - Not Used

Shearwall Properties:

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

Capacity Evaluation:

Total Shear load on Wall lbs ### Allowable Shearwall Capacity 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 plf Overturning Moment k-ft Hold Down Design Load lbs
DL at ends of wall lbs Resistive Moment k-ft Holddown Capacity lbs

Hold-down Specification

No Holdown Required