MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

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

CALCULATION PACKAGE

January 28, 2021

JayMarc Homes
Pontes Residence

Mercer Island, WA

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Prepared By:

Richard J. Zabel, P.E. *Project Engineer*

Nicholas J. Martignetti, P.E. *Associate Owner + San Diego Office Director*

Signature, Seal & Date

MULHERN & KULP
STRUCTURAL ENGINEERING
20 South Maple St., Suite 150 • Ambler, Pa 19002
Telephone: 215-646-8001 • www.mulhernkulp.com
Residential + Commercial

PROJECT NAME: JAYMARC HOMES
PONTES RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

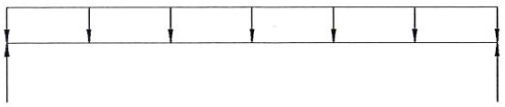
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 4X10 WORST CASE LENGTH

B1

PARAMETERS:

L = 6 FT
W = 0.284 KLF
P = - K



ANALYSIS:

R_{MAX} = 0.852 K V_D = [ ] K < V_{ALL} = 3.885 K ✓ ADEQUATE
M_{MAX} = 1.23 K-FT < M_{ALL} = 4.492 K-FT ✓ ADEQUATE
Δ_{TL} = 0.023 IN. L/ 999+ < L/240 ✓ ADEQUATE

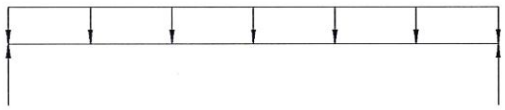
4X10

BEAM DESCRIPTION: 4X10 WORST CASE LOAD

B1

PARAMETERS:

L = 3 FT
W = 0.63 KLF
P = - K



ANALYSIS:

R_{MAX} = 0.95 K V_D = [ ] K < V_{ALL} = 3.885 K ✓ ADEQUATE
M_{MAX} = 0.71 K-FT < M_{ALL} = 4.492 K-FT ✓ ADEQUATE
Δ_{TL} = 0.01 IN. L/ 999+ < L/240 ✓ ADEQUATE

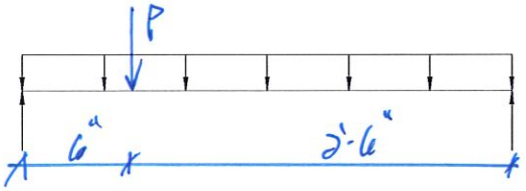
4X10

BEAM DESCRIPTION: ROOF FRAMING - HDR @ OPEN TO BELOW

B2

PARAMETERS:

L = 3 FT
W = 0.4 KLF
P = 6.8 K



ANALYSIS:

R_{MAX} = 6.3 K V_D = 4.2 K < V_{ALL} = 5.922 K ✓ ADEQUATE
M_{MAX} = 3.08 K-FT < M_{ALL} = 6.032 K-FT ✓ ADEQUATE
Δ_{TL} = 0.01 IN. L/ 999+ < L/240 ✓ ADEQUATE

6X10

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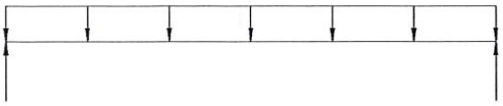
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: ROOF FRAMING - MASTER BED REAR HDR [B3]

PARAMETERS:

L = 10 FT
W = 0.76 KLF
P = - K



ANALYSIS:

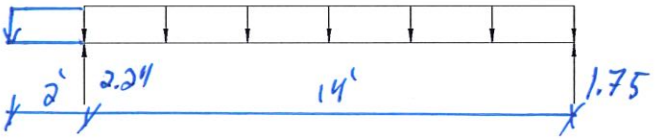
R_{MAX} = 3.8 K V_D = [ ] K < V_{ALL} = 8.745 K ✓ ADEQUATE
M_{MAX} = 9.5 K-FT < M_{ALL} = 14.85 K-FT ✓ ADEQUATE
Δ_{TL} = 0.28 IN. L/ 430 < L/240 ✓ ADEQUATE

5½" x 9" GLB

BEAM DESCRIPTION: 2nd FLOOR FRAMING - RIDGE BEAM @ COV. PORCH CANT'D [B4]

PARAMETERS:

L = 16 FT
W = 0.245 KLF
P = - K



ANALYSIS:

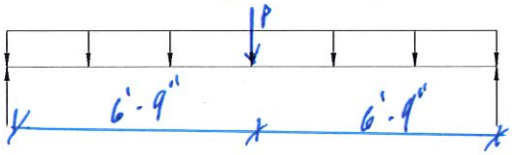
R_{MAX} = 2.24 K V_D = [ ] K < V_{ALL} = 7.168 K ✓ ADEQUATE
M_{MAX} = 6.26 K-FT < M_{ALL} = 8.84 K-FT ✓ ADEQUATE
Δ_{TL} = 0.25 IN. L/ 672 < L/240 ✓ ADEQUATE

6x12

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ REAR OF VAULTED PORCH [B5]

PARAMETERS:

L = 13.5 FT
W = - KLF
P = 2.24 K



ANALYSIS:

R_{MAX} = 1.12 K V_D = [ ] K < V_{ALL} = 7.168 K ✓ ADEQUATE
M_{MAX} = 7.56 K-FT < M_{ALL} = 8.84 K-FT ✓ ADEQUATE
Δ_{TL} = 0.22 IN. L/ 736 < L/240 ✓ ADEQUATE

6x12

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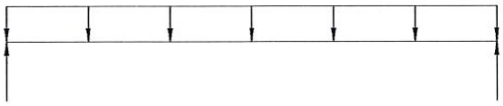
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ REAR PORCH (TYP. OF 3 @ REAR) B6

PARAMETERS:

L = 15.5 FT
W = 0.273 KLF
P = - K



ANALYSIS:

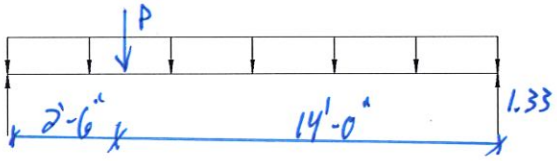
R_{MAX} = 2.11 K V_D = [ ] K < V_{ALL} = 7.16B K ☑ ADEQUATE
M_{MAX} = 8.2 K-FT < M_{ALL} = 8.84 K-FT ☑ ADEQUATE
Δ_{TL} = 0.4 IN. L/ 465 < L/240 ☑ ADEQUATE

6X12

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ REAR PORCH (TYP. OF 2 @ EDGE OF VAULT) B7

PARAMETERS:

L = 16.5 FT
W = 0.122 KLF
P = 2.11 K



ANALYSIS:

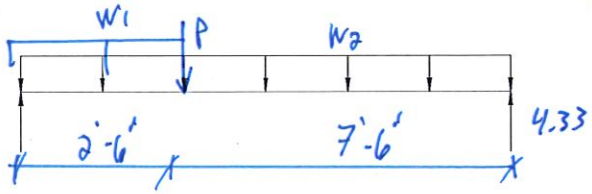
R_{MAX} = 2.79 K V_D = [ ] K < V_{ALL} = 7.16B K ☑ ADEQUATE
M_{MAX} = 7.26 K-FT < M_{ALL} = 8.84 K-FT ☑ ADEQUATE
Δ_{TL} = 0.4 IN. L/ 495 < L/240 ☑ ADEQUATE

6X12

BEAM DESCRIPTION: 2nd FLOOR FRAMING - SGD HDR @ DINING B8

PARAMETERS:

L = 10 FT
W = 1.37 KLF W_2 = 0.63
P = 3.8 K



ANALYSIS:

R_{MAX} = 7.62 K V_D = [ ] K < V_{ALL} = 11.66 K ☑ ADEQUATE
M_{MAX} = 14.88 K-FT < M_{ALL} = 26.4 K-FT ☑ ADEQUATE
Δ_{TL} = 0.19 IN. L/ 630 < L/240 ☑ ADEQUATE

5 1/8" X 12" GLB

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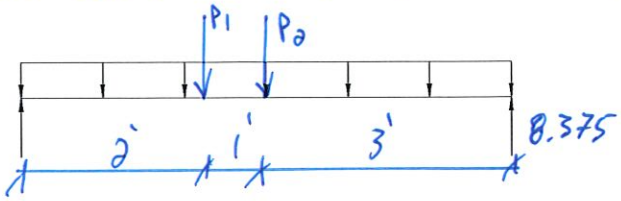
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2nd FLOOR FRAMING - HDR @ REAR OF KITCHEN (B9)

PARAMETERS:

L = 6 FT
W = 0.7 KLF
P = 16.2 K P_2=1.75



ANALYSIS:

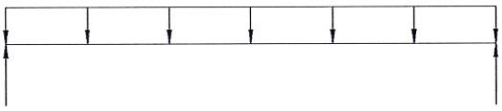
R_{MAX} = 13.775 K V_D = 13.07 K < V_{ALL} = 13.41 K ✓ ADEQUATE (cd=1.15)
M_{MAX} = 26.15 K-FT < M_{ALL} = 30.36 K-FT (cd=1.15) ✓ ADEQUATE
Δ_{TL} = 0.1 IN. L/ 700 < L/240 ✓ ADEQUATE

5½" X 13" GLB

BEAM DESCRIPTION: 2nd FLOOR FRAMING - SGD HDR @ GYM (B10)

PARAMETERS:

L = 10.33 FT
W = 0.82 KLF
P = - K



ANALYSIS:

R_{MAX} = 4.23 K V_D = K < V_{ALL} = 10.2 K ✓ ADEQUATE
M_{MAX} = 10.93 K-FT < M_{ALL} = 20.2 K-FT ✓ ADEQUATE
Δ_{TL} = 0.22 IN. L/ 563 < L/240 ✓ ADEQUATE

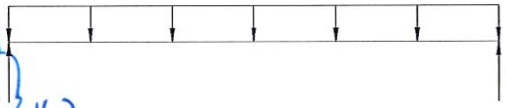
5½" X 10½" GLB

BEAM DESCRIPTION: 2nd FLOOR FRAMING - FLUSH BEAM @ KITCHEN BELOW P.A. (B11)

PARAMETERS:

L = FT
W = KLF
P = K

SEE ENERCALC OUTPUT FOR OVERSTRENGTH CALC



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" X 18" GLB

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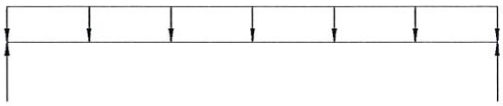
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLOOR FRAMING - FLUSH BOTTOM BEAM @ KITCHEN B12

PARAMETERS:

L = 4 FT
W = 1.1 KLF
P = - K



ANALYSIS:

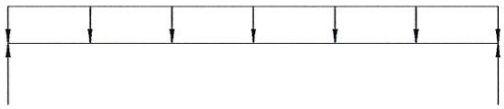
R_{MAX} = 2.2 K V_D = [ ] K < V_{ALL} = 3.885 K ☑ ADEQUATE
M_{MAX} = 2.2 K-FT < M_{ALL} = 4.492 K-FT ☑ ADEQUATE
Δ_{TL} = 0.02 IN. L/ 999+ < L/240 ☑ ADEQUATE

4X10

BEAM DESCRIPTION: 2ND FLOOR FRAMING - FLUSH BEAM @ GREAT ROOM B13

PARAMETERS:

L = 7.33 FT
W = 0.36 KLF
P = - K



ANALYSIS:

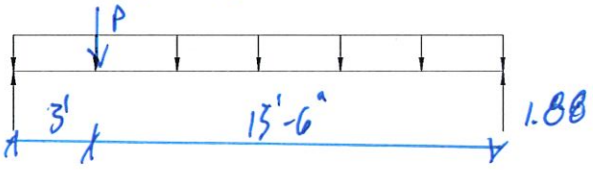
R_{MAX} = 1.32 K V_D = [ ] K < V_{ALL} = 3.885 K ☑ ADEQUATE
M_{MAX} = 2.42 K-FT < M_{ALL} = 4.492 K-FT ☑ ADEQUATE
Δ_{TL} = 0.07 IN. L/ 999+ < L/240 ☑ ADEQUATE

4X10

BEAM DESCRIPTION: 2ND FLOOR FRAMING - FLUSH BEAM @ GREAT TO DINING. B14

PARAMETERS:

L = 18.5' FT
W = 0.18 KLF
P = 1.32 K



ANALYSIS:

R_{MAX} = 2.77 K V_D = [ ] K < V_{ALL} = 11.13 K ☑ ADEQUATE
M_{MAX} = 9.81 K-FT < M_{ALL} = 37.8 K-FT ☑ ADEQUATE
Δ_{TL} = 0.2 IN. L/ 999+ < L/240 ☐ ADEQUATE

3 1/2" X 18" GLB

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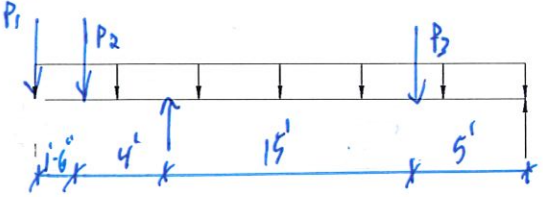
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2nd FLOOR FRAMING - FLUSH CANT'D BEAM @ STAIRS (B15)

PARAMETERS:

L = 25.5 FT
W = 0.06 KLF
P = 1.32 K (P_1) P_2=0.4 P_3=70



ANALYSIS:

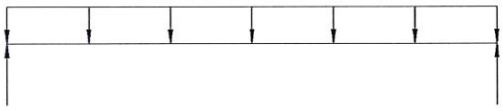
R_{MAX} =	4.9 K	V_D =	K	< V_{ALL} =	17.49 K	✓ ADEQUATE
M_{MAX} =	9.76 K-FT	< M_{ALL} =	59.4 K-FT			✓ ADEQUATE
Δ_{TL} =	0.19 IN.	2 L/	700	< L/240		✓ ADEQUATE

5½"X18" GLB

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ FOYER (B16)

PARAMETERS:

L = 6 FT
W = 0.61 KLF
P = - K



ANALYSIS:

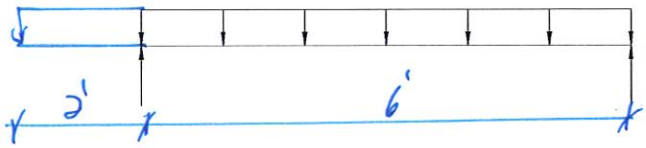
R_{MAX} =	1.83 K	V_D =	K	< V_{ALL} =	3.885 K	✓ ADEQUATE
M_{MAX} =	2.745 K-FT	< M_{ALL} =	4.492 K-FT			✓ ADEQUATE
Δ_{TL} =	0.05 IN.	L/	9994	< L/240		✓ ADEQUATE

4X10

BEAM DESCRIPTION: 2nd FLOOR FRAMING - RIDGE @ FRONT PORCH (B17)

PARAMETERS:

L = 8 FT
W = 0.2 KLF
P = - K



ANALYSIS:

R_{MAX} =	1.06 K	V_D =	K	< V_{ALL} =	9.78 K	✓ ADEQUATE
M_{MAX} =	0.9 K-FT	< M_{ALL} =	12.05 K-FT			✓ ADEQUATE
Δ_{TL} =	0.01 IN.	L/	9994	< L/240		✓ ADEQUATE

8X12

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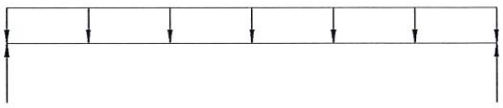
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ FRONT PORCH | B1B

PARAMETERS:

L = 11 FT
W = - KLF
P = 1.06 K



ANALYSIS:

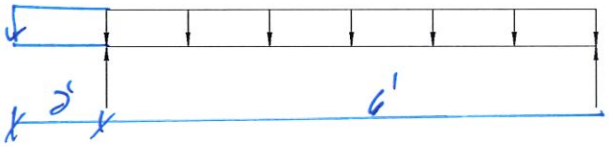
R_{MAX} = 0.53 K V_D = [ ] K < V_{ALL} = 9.70 K ☑ ADEQUATE
M_{MAX} = 2.915 K-FT < M_{ALL} = 12.05 K-FT ☑ ADEQUATE
Δ_{TL} = 0.01 IN. L/ 9994 < L/240 ☑ ADEQUATE

8X12

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ FRONT PORCH SIDE (TYP OF 3) | B1P

PARAMETERS:

L = 8 FT
W = 0.15 KLF
P = - K



ANALYSIS:

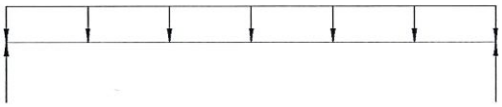
R_{MAX} = 0.8 K V_D = [ ] K < V_{ALL} = 1.70 K ☑ ADEQUATE
M_{MAX} = 0.675 K-FT < M_{ALL} = 1205 K-FT ☑ ADEQUATE
Δ_{TL} = 0.01 IN. L/ 9997 < L/240 ☑ ADEQUATE

8X12

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ STUDY/GUEST SUITE BUMP OUT. | B3D

PARAMETERS:

L = 5 FT
W = 0.44 KLF
P = - K



ANALYSIS:

R_{MAX} = 1.1 K V_D = [ ] K < V_{ALL} = 3.885 K ☑ ADEQUATE
M_{MAX} = 1.375 K-FT < M_{ALL} = 4.492 K-FT ☑ ADEQUATE
Δ_{TL} = 0.012 IN. L/ 9997 < L/240 ☑ ADEQUATE

4X10

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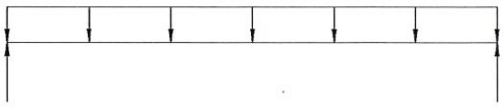
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLOOR FRAMING - 8' GARAGE DOOR HDR (B21)

PARAMETERS:

L =	8	FT
W =	0.168	KLF
P =	-	K



ANALYSIS:

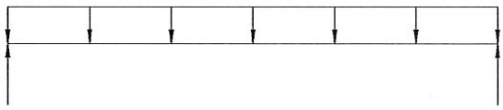
R_{MAX} =	0.672	K	V_D =		K	< V_{ALL} = 4.725 K	✓ ADEQUATE
M_{MAX} =	1.344	K-FT	< M_{ALL} =	6.091	K-FT		✓ ADEQUATE
Δ_{TL} =	0.02	IN.	L/	999+	< L/240		✓ ADEQUATE

4X12

BEAM DESCRIPTION: 2ND FLOOR FRAMING - FLUSH BEAM @ BED 4 ABV. (B22)

PARAMETERS:

L =	15	FT
W =	1.12	KLF
P =	-	K



ANALYSIS:

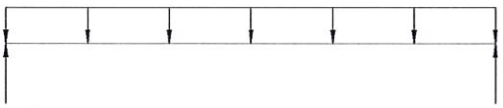
R_{MAX} =	8.4	K	V_D =		K	< V_{ALL} = 11.13 K	✓ ADEQUATE
M_{MAX} =	31.5	K-FT	< M_{ALL} =	37.8	K-FT		✓ ADEQUATE
Δ_{TL} =	0.416	IN.	L/	432	< L/240		✓ ADEQUATE

3 1/2" X 18" GLB

BEAM DESCRIPTION: 2nd FLOOR FRAMING - FLUSH BEAM @ BONUS ABV. (FRONT) (B23)

PARAMETERS:

L =	12	FT
W =	0.72	KLF
P =	-	K



ANALYSIS:

R_{MAX} =	4.32	K	V_D =		K	< V_{ALL} = 11.13 K	✓ ADEQUATE
M_{MAX} =	12.96	K-FT	< M_{ALL} =	37.8	K-FT		✓ ADEQUATE
Δ_{TL} =	0.11	IN.	L/	999+	< L/240		✓ ADEQUATE

3 1/2" X 18" GLB

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Residential + Commercial

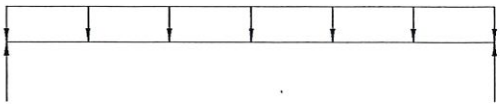
PROJECT NAME: JAYMARC HOMES
PONTES RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2nd FLOOR FRAMING - FLUSH BEAM @ BONUS ABV. (RIGHT) | B24

PARAMETERS:

L = 4 FT
W = 1.18 KLF
P = - K



ANALYSIS:

R_{MAX} =	2.36 K	V_D =		K	< V_{ALL} = 11.13 K	✓ ADEQUATE
M_{MAX} =	2.36 K-FT	< M_{ALL} =	37.8	K-FT		✓ ADEQUATE
Δ_{TL} =	0.01 IN.	L/	999+	< L/240		✓ ADEQUATE

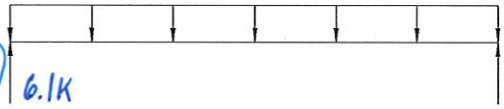
3½" X 18" GLB

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ GARAGE (LEFT) | B25

PARAMETERS:

L =
W =
P =

SEE ENERCALC OUTPUT FOR OVERSTRENGTH CALC.



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

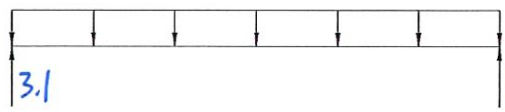
5½" X 24" GLB

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ GARAGE (RIGHT) | B26

PARAMETERS:

L =
W =
P =

SEE ENERCALC OUTPUT FOR OVERSTRENGTH CALC



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" X 19½" GLB

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M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

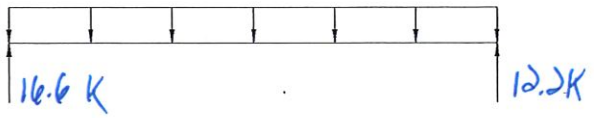
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 2ND FLOOR FRAMING - 16' GARAGE DOOR HDR (B37)

PARAMETERS:

L = [ ] FT
W = [ ] KLF
P = [ ] K

SEE ENERCALC OUTPUT FOR OVERSTRENGTH CALC



ANALYSIS:

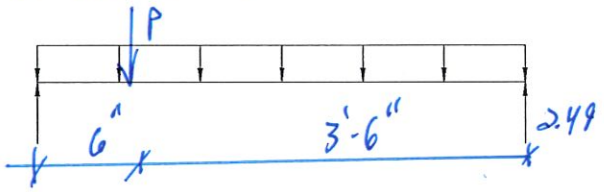
R_{MAX} =	[ ] K	V_D =	[ ] K	< V_{ALL} =	[ ] K	☑ ADEQUATE
M_{MAX} =	[ ] K-FT	< M_{ALL} =	[ ] K-FT			☑ ADEQUATE
Δ_{TL} =	[ ] IN.	L/	[ ]	< L/240		☑ ADEQUATE

5½" X 16½" GLB

BEAM DESCRIPTION: 2nd FLOOR FRAMING - DROPPED BEAM @ GARAGE STAIRS. (B38)

PARAMETERS:

L = 4 FT
W = 1.05 KLF
P = 3.1 K



ANALYSIS:

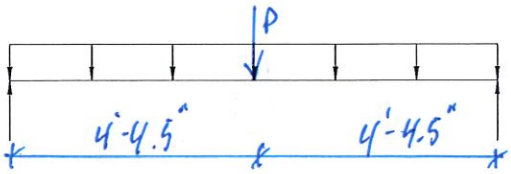
R_{MAX} =	4.81 K	V_D =	[ ] K	< V_{ALL} =	7.42 K	☑ ADEQUATE
M_{MAX} =	2.95 K-FT	< M_{ALL} =	16.8 K-FT			☑ ADEQUATE
Δ_{TL} =	0.01 IN.	L/	4997	< L/240		☑ ADEQUATE

3½" X 12" GLB

BEAM DESCRIPTION: 1ST FLOOR FRAMING - FLUSH BEAM @ STAIR POST (B39)

PARAMETERS:

L = 8.75 FT
W = 0.07 KLF
P = 4.9 K



ANALYSIS:

R_{MAX} =	2.75 K	V_D =	[ ] K	< V_{ALL} =	7.4 K	☑ ADEQUATE
M_{MAX} =	11.4 K-FT	< M_{ALL} =	17.85 K-FT			☑ ADEQUATE
Δ_{TL} =	0.16 IN.	L/	656	< L/240		☑ ADEQUATE

3½" X 11 7/8" LVL

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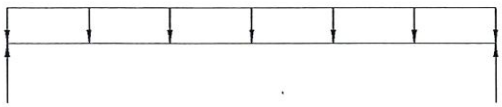
ENGINEER: RJZ
DATE: 25-JAN-21

BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 1ST FLOOR FRAMING - DROPPED BEAM REAR BEAM LINE (B30)

PARAMETERS:

L = 6 FT
W = 0.5 KLF
P = - K



ANALYSIS:

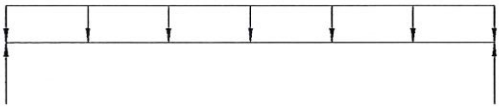
R_{MAX} = 3 K V_D = K < V_{ALL} = 3.885 K ✓ ADEQUATE
M_{MAX} = 2.25 K-FT < M_{ALL} = 4.492 K-FT ✓ ADEQUATE
Δ_{TL} = 0.04 IN. L/ 999+ < L/240 ✓ ADEQUATE

4X10

BEAM DESCRIPTION: 1ST FLOOR FRAMING - MIDDLE BEAM LINE @ BEARING ABV. (B31)

PARAMETERS:

L = 5 FT
W = 1.13 KLF
P = - K



ANALYSIS:

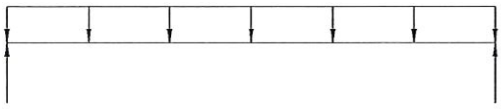
R_{MAX} = 2.825 K V_D = K < V_{ALL} = 3.885 K ✓ ADEQUATE
M_{MAX} = 3.53 K-FT < M_{ALL} = 4.492 K-FT ✓ ADEQUATE
Δ_{TL} = 0.04 IN. L/ 999+ < L/240 ✓ ADEQUATE

4X10

BEAM DESCRIPTION: 1ST FLOOR FRAMING - FRONT BEAM LINE @ BEARING ABV. (B32)

PARAMETERS:

L = 5 FT
W = 1.2 KLF
P = - K



ANALYSIS:

R_{MAX} = K V_D = K < V_{ALL} = 3.885 K ✓ ADEQUATE
M_{MAX} = 3.75 K-FT < M_{ALL} = 4.492 K-FT ✓ ADEQUATE
Δ_{TL} = 0.05 IN. L/ 999+ < L/240 ✓ ADEQUATE

4X10

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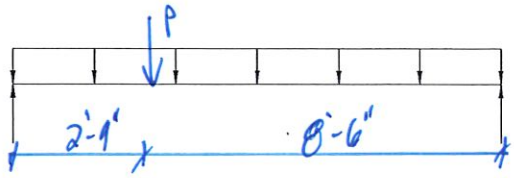
PONTES RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: 1ST FLOOR FRAMING - FLUSH BEAM @ HALL ACSY ABV. (B33)

PARAMETERS:

L = 11.25 FT
W = 0.07 KLF
P = 1.75 K



ANALYSIS:

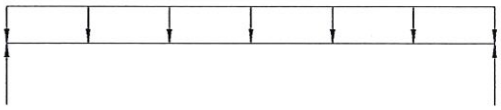
R_{MAX} = 1.71 K V_D = [ ] K < V_{ALL} = 3.95 K ✓ ADEQUATE
M_{MAX} = 4.45 K-FT < M_{ALL} = 8.925 K-FT ✓ ADEQUATE
Δ_{TL} = 0.21 IN. L/ 640 < L/240 ✓ ADEQUATE

1 3/4" X 11 7/8" LVL

BEAM DESCRIPTION:

PARAMETERS:

L = [ ] FT
W = [ ] KLF
P = [ ] K



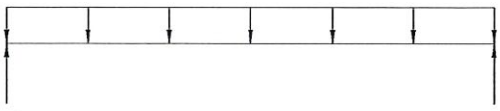
ANALYSIS:

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

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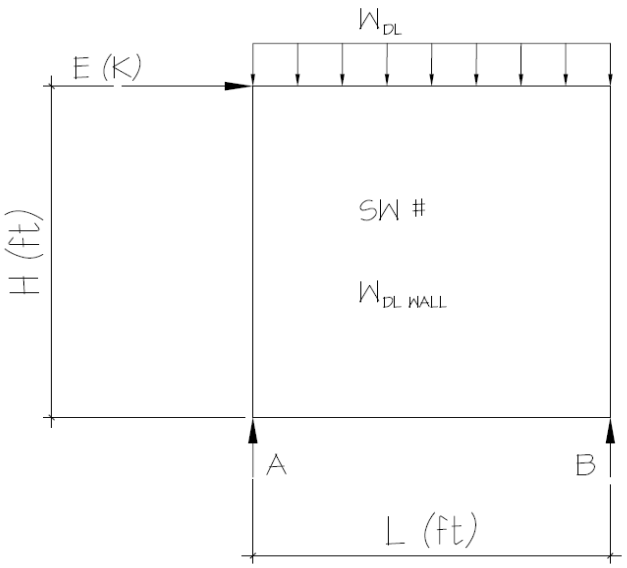
PROJECT NAME: JAYMARC PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

OVERSTRENGTH CALCULATIONS

WALL DESCRIPTION/SW #: 204

PARAMETERS:

L =	18.3	FT
H =	9.0	FT
E =	1.95	K
W_{DLWALL} =	0.10	KLF
W_{DL} =	0.306	KLF
Ω_0 =	2.5	(ASCE TABLE 12.2.1 FOOTNOTE G)
SDS =	0.915	



ANALYSIS:

$E_{MH} = \Omega_0 * E$ =	4.88 K	$E_V = 0.2*SDS*DL$ =	1.362 K
$E_M = E_{MH} + E_V$		$E_M = E_{MH} + E_V$ =	6.237 K
$E_M = E_{MH} - E_V$		$E_M = E_{MH} - E_V$ =	3.513 K

E_M (MAX) $= \sum M_A = 0$ =	6.24(9.0) + 0.406(18.33)(9.165) - R_B(18.33)	R_B =	3.7DL + 3.1E
		R_A =	3.7DL - 3.1E
E_M (MIN) $= \sum M_A = 0$ =	3.51(9.0) + 0.406(18.33)(9.165) - R_B(18.33)	R_B =	3.7DL + 1.7E
		R_A =	3.7DL - 1.7E

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

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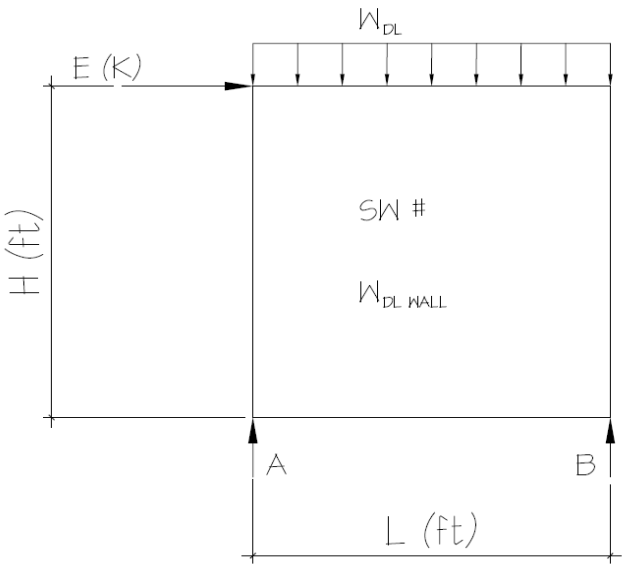
PROJECT NAME: JAYMARC PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

OVERSTRENGTH CALCULATIONS

WALL DESCRIPTION/SW #: 205

PARAMETERS:

L =	12.0	FT
H =	9.0	FT
E =	1.10	K
W_{DLWALL} =	0.10	KLF
W_{DL} =	0.051	KLF
Ω_0 =	2.5	(ASCE TABLE 12.2.1 FOOTNOTE G)
SDS =	0.915	



ANALYSIS:

$E_{MH} = \Omega_0 * E$ =	2.75 K	$E_V = 0.2*SDS*DL$ =	0.332 K
$E_M = E_{MH} + E_V$		$E_M = E_{MH} + E_V$ =	3.082 K
$E_M = E_{MH} - E_V$		$E_M = E_{MH} - E_V$ =	2.418 K

E_M (MAX) $= \sum M_A = 0$ =	3.08(9.0) + 0.151(12)(6) - R_B(12)	R_B =	0.9DL + 2.3E
		R_A =	0.9DL - 2.3E
E_M (MIN) $= \sum M_A = 0$ =	2.42(9.0) + 0.151(12)(6) - R_B(12)	R_B =	0.9DL + 1.8E
		R_A =	0.9DL - 1.8E

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

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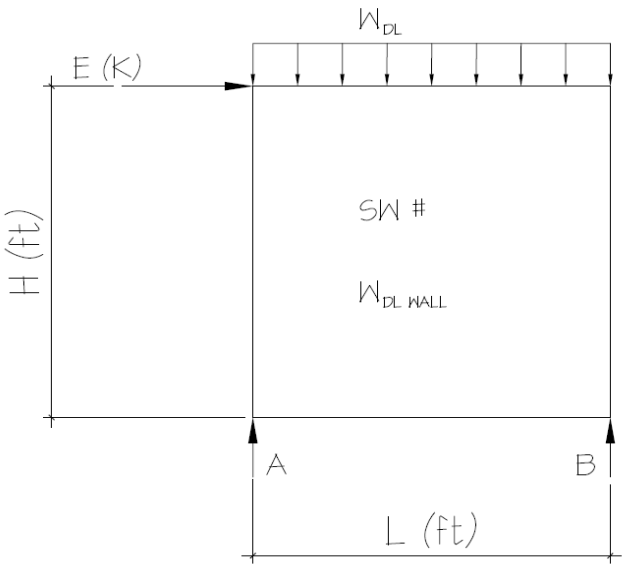
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

OVERSTRENGTH CALCULATIONS

WALL DESCRIPTION/SW #: 206

PARAMETERS:

L =	14.8	FT
H =	9.0	FT
E =	2.55	K
W_{DLWALL} =	0.10	KLF
W_{DL} =	0.306	KLF
Ω_0 =	2.5	(ASCE TABLE 12.2.1 FOOTNOTE G)
SDS =	0.915	



ANALYSIS:

$E_{MH} = \Omega_0 * E$ =	6.38 K	$E_V = 0.2*SDS*DL$ =	1.102 K
$E_M = E_{MH} + E_V$		$E_M = E_{MH} + E_V$ =	7.477 K
$E_M = E_{MH} - E_V$		$E_M = E_{MH} - E_V$ =	5.273 K

E_M (MAX) $= \sum M_A = 0$ =	7.48(9.0) + 0.406(14.83)(7.415) - R_B(14.83)	R_B =	3.0DL + 4.5E
		R_A =	3.0DL - 4.5E
E_M (MIN) $= \sum M_A = 0$ =	5.27(9.0) + 0.406(14.83)(7.415) - R_B(14.83)	R_B =	3.0DL + 3.2E
		R_A =	3.0DL - 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

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

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

DESCRIPTION: B11 - Flush Beam @ Kitchen

CODE REFERENCES

Calculations per NDS 2015, IBC 2015, CBC 2016, ASCE 7-10
Load Combination Set : ASCE 7-10

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-10

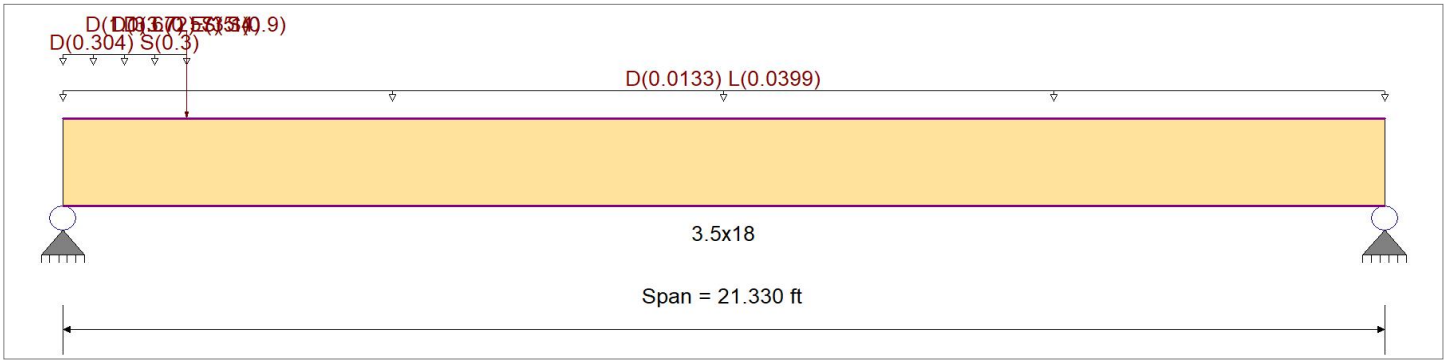
Wood Species : DF/DF
Wood Grade : 24F - V8

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

Fb +	2,880.0 psi
Fb -	2,880.0 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 = 0.010, L = 0.030 ksf, Tributary Width = 1.330 ft
Uniform Load : D = 0.3040, S = 0.30 k/ft, Extent = 0.0 -->> 2.0 ft, Tributary Width = 1.0 ft
Point Load : D = 1.10, L = 0.570, S = 0.90 k @ 2.0 ft
Point Load : D = 3.672, S = 5.40 k @ 2.0 ft
Point Load : D = 3.70, E = 3.10 k @ 2.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.546 : 1	Maximum Shear Stress Ratio	=	0.904 : 1
Section used for this span		3.5x18	Section used for this span		3.5x18
fb: Actual	=	1,800.67 psi	fv: Actual	=	330.77 psi
Fb: Allowable	=	3,298.88 psi	Fv: Allowable	=	365.70 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	2.024 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	0.216 in	Ratio =	1182 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.632 in	Ratio =	404 >=300
Max Upward Total Deflection	0.000 in	Ratio =	0 <300

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L		M	fb	F'b	V	fv	F'v
D Only														0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.404	0.670	0.90	0.996	1.00	1.00	1.00	1.00	1.00		16.41	1,042.10	2581.73	8.06	191.79	286.20
+D+L					0.996	1.00	1.00	1.00	1.00	1.00				0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.403	0.669	1.00	0.996	1.00	1.00	1.00	1.00	1.00		18.22	1,157.11	2868.59	8.94	212.81	318.00
+D+Lr					0.996	1.00	1.00	1.00	1.00	1.00				0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.291	0.482	1.25	0.996	1.00	1.00	1.00	1.00	1.00		16.41	1,042.10	3585.74	8.06	191.79	397.50
+D+S					0.996	1.00	1.00	1.00	1.00	1.00				0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.546	0.904	1.15	0.996	1.00	1.00	1.00	1.00	1.00		28.36	1,800.67	3298.88	13.89	330.77	365.70
+D+0.750Lr+0.750L					0.996	1.00	1.00	1.00	1.00	1.00				0.00	0.00	0.00	0.00

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

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

DESCRIPTION: B11 - Flush Beam @ Kitchen

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	M	fb	F'b	V	fv	F'v
Length = 21.330 ft	1	0.315	0.522	1.25	0.996	1.00	1.00	1.00	1.00	1.00	17.77	1,128.36	3585.74	8.72	207.56	397.50
+D+0.750L+0.750S					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.515	0.853	1.15	0.996	1.00	1.00	1.00	1.00	1.00	26.73	1,697.28	3298.88	13.10	311.80	365.70
+D+0.60W					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.227	0.377	1.60	0.996	1.00	1.00	1.00	1.00	1.00	16.41	1,042.10	4589.75	8.06	191.79	508.80
+1.126D+0.70E					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.310	0.516	1.60	0.996	1.00	1.00	1.00	1.00	1.00	22.41	1,422.82	4589.75	11.04	262.78	508.80
+1.126D-0.70E					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.201	0.332	1.60	0.996	1.00	1.00	1.00	1.00	1.00	14.55	924.00	4589.75	7.10	169.13	508.80
+D+0.750Lr+0.750L+0.450W					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.246	0.408	1.60	0.996	1.00	1.00	1.00	1.00	1.00	17.77	1,128.36	4589.75	8.72	207.56	508.80
+D+0.750L+0.750S+0.450W					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.370	0.613	1.60	0.996	1.00	1.00	1.00	1.00	1.00	26.73	1,697.28	4589.75	13.10	311.80	508.80
+1.090D+0.750L+0.750S+0.5250E					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.431	0.716	1.60	0.996	1.00	1.00	1.00	1.00	1.00	31.16	1,978.13	4589.75	15.30	364.17	508.80
+1.090D+0.750L+0.750S-0.5250E					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.349	0.578	1.60	0.996	1.00	1.00	1.00	1.00	1.00	25.26	1,604.02	4589.75	12.35	293.94	508.80
+0.60D+0.60W					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.136	0.226	1.60	0.996	1.00	1.00	1.00	1.00	1.00	9.85	625.26	4589.75	4.83	115.07	508.80
+0.470D+0.70E					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.161	0.269	1.60	0.996	1.00	1.00	1.00	1.00	1.00	11.64	739.20	4589.75	5.75	136.96	508.80
+0.470D-0.70E					0.996	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 21.330 ft	1	0.052	0.085	1.60	0.996	1.00	1.00	1.00	1.00	1.00	3.79	240.38	4589.75	1.82	43.32	508.80

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+1.090D+0.750L+0.750S+0.5250E	1	0.6321	9.342		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	16.206	2.186
Overall MINimum	2.809	0.291
D Only	8.545	1.110
+D+L	9.487	1.589
+D+Lr	8.545	1.110
+D+S	14.826	1.729
+D+0.750Lr+0.750L	9.251	1.470
+D+0.750L+0.750S	13.962	1.934
+D+0.60W	8.545	1.110
+1.126D+0.70E	11.588	1.454
+D+0.750Lr+0.750L+0.450W	9.251	1.470
+D+0.750L+0.750S+0.450W	13.962	1.934
+1.090D+0.750L+0.750S+0.5250E	16.206	2.186
+0.60D+0.60W	5.127	0.666
+0.470D+0.70E	5.982	0.725
D Only	8.545	1.110
L Only	0.942	0.479
S Only	6.281	0.619
E Only	2.809	0.291
H Only		

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

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

DESCRIPTION: B25 - Dropped Beam @ Garage (Left)

CODE REFERENCES

Calculations per NDS 2015, IBC 2015, CBC 2016, ASCE 7-10
Load Combination Set : ASCE 7-10

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-10

Wood Species : DF/DF
Wood Grade : 24F - V8

Beam Bracing : Beam bracing is defined Beam-by-Beam

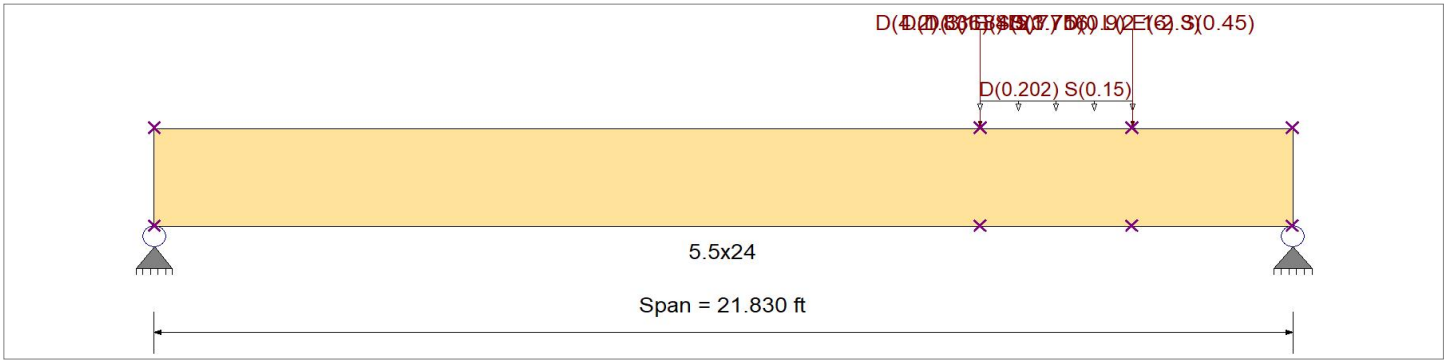
Fb +	2,880.0 psi
Fb -	2,880.0 psi
Fc - Prll	1,980.0 psi
Fc - Perp	780.0 psi
Fv	318.0 psi
Ft	1,320.0 psi

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

Unbraced Lengths

Span # 1, Defined Brace Locations, First Brace at 15.833 ft, Second Brace at 18.750 ft, Third Brace



Applied Loads

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

Beam self weight calculated and added to loads
Point Load : D = 3.0, E = 4.50 k @ 15.830 ft
Point Load : D = 4.20, L = 1.80, S = 3.750 k @ 15.830 ft
Point Load : D = 1.836, S = 2.70 k @ 15.830 ft
Uniform Load : D = 0.2020, S = 0.150 k/ft, Extent = 15.830 -->> 18.750 ft, Tributary Width = 1.0 ft
Point Load : D = 0.90, E = -2.30 k @ 18.750 ft
Point Load : D = 1.716, L = 2.160, S = 0.450 k @ 18.750 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.640 : 1	Maximum Shear Stress Ratio	=	0.496 : 1
Section used for this span		5.5x24	Section used for this span		5.5x24
fb: Actual	=	1,831.00 psi	fv: Actual	=	181.25 psi
Fb: Allowable	=	2,862.98 psi	Fv: Allowable	=	365.70 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	15.775 ft	Location of maximum on span	=	19.838 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.175 in	Ratio =	1497 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.540 in	Ratio =	485 >=300
Max Upward Total Deflection	0.000 in	Ratio =	0 <300

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
D Only													0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.460	0.128	0.90	0.923	1.00	1.00	1.00	1.00	0.92	48.30	1,097.77	2386.89	3.23	36.71	286.20
Length = 2.948 ft	1	0.459	0.273	0.90	0.923	1.00	1.00	1.00	1.00	0.99	48.31	1,097.84	2392.11	6.87	78.05	286.20
Length = 3.107 ft	1	0.281	0.378	0.90	0.923	1.00	1.00	1.00	1.00	0.99	29.55	671.68	2392.11	9.52	108.20	286.20
+D+L					0.923	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

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

DESCRIPTION: B25 - Dropped Beam @ Garage (Left)

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
Length = 15.775 ft	1	0.534	0.144	1.00	0.923	1.00	1.00	1.00	1.00	0.90	60.91	1,384.40	2594.88	4.03	45.80	318.00
Length = 2.948 ft	1	0.521	0.281	1.00	0.923	1.00	1.00	1.00	1.00	0.99	60.94	1,384.92	2657.90	7.87	89.42	318.00
Length = 3.107 ft	1	0.336	0.453	1.00	0.923	1.00	1.00	1.00	1.00	0.99	39.32	893.53	2657.90	12.68	144.12	318.00
+D+Lr					0.923	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.365	0.092	1.25	0.923	1.00	1.00	1.00	1.00	0.84	48.30	1,097.77	3009.25	3.23	36.71	397.50
Length = 2.948 ft	1	0.330	0.196	1.25	0.923	1.00	1.00	1.00	1.00	0.99	48.31	1,097.84	3322.38	6.87	78.05	397.50
Length = 3.107 ft	1	0.202	0.272	1.25	0.923	1.00	1.00	1.00	1.00	0.99	29.55	671.68	3322.38	9.52	108.20	397.50
+D+S					0.923	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.625	0.160	1.15	0.923	1.00	1.00	1.00	1.00	0.86	78.71	1,788.77	2862.98	5.16	58.61	365.70
Length = 2.948 ft	1	0.585	0.367	1.15	0.923	1.00	1.00	1.00	1.00	0.99	78.71	1,788.77	3056.59	11.82	134.37	365.70
Length = 3.107 ft	1	0.345	0.464	1.15	0.923	1.00	1.00	1.00	1.00	0.99	46.35	1,053.49	3056.59	14.93	169.69	365.70
+D+0.750Lr+0.750L					0.923	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.436	0.109	1.25	0.923	1.00	1.00	1.00	1.00	0.84	57.76	1,312.74	3009.25	3.83	43.53	397.50
Length = 2.948 ft	1	0.395	0.218	1.25	0.923	1.00	1.00	1.00	1.00	0.99	57.78	1,313.15	3322.38	7.62	86.58	397.50
Length = 3.107 ft	1	0.252	0.340	1.25	0.923	1.00	1.00	1.00	1.00	0.99	36.88	838.07	3322.38	11.89	135.14	397.50
+D+0.750L+0.750S					0.923	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.640	0.164	1.15	0.923	1.00	1.00	1.00	1.00	0.86	80.56	1,831.00	2862.98	5.28	59.95	365.70
Length = 2.948 ft	1	0.599	0.352	1.15	0.923	1.00	1.00	1.00	1.00	0.99	80.58	1,831.31	3056.59	11.34	128.82	365.70
Length = 3.107 ft	1	0.368	0.496	1.15	0.923	1.00	1.00	1.00	1.00	0.99	49.47	1,124.42	3056.59	15.95	181.25	365.70
+D+0.60W					0.923	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.329	0.072	1.60	0.923	1.00	1.00	1.00	1.00	0.72	48.30	1,097.77	3337.40	3.23	36.71	508.80
Length = 2.948 ft	1	0.258	0.153	1.60	0.923	1.00	1.00	1.00	1.00	0.99	48.31	1,097.84	4252.65	6.87	78.05	508.80
Length = 3.107 ft	1	0.158	0.213	1.60	0.923	1.00	1.00	1.00	1.00	0.98	29.55	671.68	4252.65	9.52	108.20	508.80
+1.126D+0.70E					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.439	0.096	1.60	0.923	1.00	1.00	1.00	1.00	0.72	64.46	1,465.05	3337.40	4.28	48.59	508.80
Length = 2.948 ft	1	0.345	0.229	1.60	0.923	1.00	1.00	1.00	1.00	0.99	64.46	1,465.05	4252.65	10.25	116.42	508.80
Length = 3.107 ft	1	0.193	0.260	1.60	0.923	1.00	1.00	1.00	1.00	0.98	36.12	820.96	4252.65	11.62	132.08	508.80
+1.126D-0.70E					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.302	0.067	1.60	0.923	1.00	1.00	1.00	1.00	0.72	44.31	1,007.13	3337.40	3.00	34.08	508.80
Length = 2.948 ft	1	0.237	0.117	1.60	0.923	1.00	1.00	1.00	1.00	0.99	44.34	1,007.82	4252.65	5.22	59.35	508.80
Length = 3.107 ft	1	0.163	0.219	1.60	0.923	1.00	1.00	1.00	1.00	0.98	30.43	691.66	4252.65	9.82	111.59	508.80
+D+0.750Lr+0.750L+0.450W					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.393	0.086	1.60	0.923	1.00	1.00	1.00	1.00	0.72	57.76	1,312.74	3337.40	3.83	43.53	508.80
Length = 2.948 ft	1	0.309	0.170	1.60	0.923	1.00	1.00	1.00	1.00	0.99	57.78	1,313.15	4252.65	7.62	86.58	508.80
Length = 3.107 ft	1	0.197	0.266	1.60	0.923	1.00	1.00	1.00	1.00	0.98	36.88	838.07	4252.65	11.89	135.14	508.80
+D+0.750L+0.750S+0.450W					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.549	0.118	1.60	0.923	1.00	1.00	1.00	1.00	0.72	80.56	1,831.00	3337.40	5.28	59.95	508.80
Length = 2.948 ft	1	0.431	0.253	1.60	0.923	1.00	1.00	1.00	1.00	0.99	80.58	1,831.31	4252.65	11.34	128.82	508.80
Length = 3.107 ft	1	0.264	0.356	1.60	0.923	1.00	1.00	1.00	1.00	0.98	49.47	1,124.42	4252.65	15.95	181.25	508.80
+1.090D+0.750L+0.750S+0.5250E					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.630	0.135	1.60	0.923	1.00	1.00	1.00	1.00	0.72	92.47	2,101.52	3337.40	6.05	68.70	508.80
Length = 2.948 ft	1	0.494	0.309	1.60	0.923	1.00	1.00	1.00	1.00	0.99	92.47	2,101.52	4252.65	13.84	157.25	508.80
Length = 3.107 ft	1	0.290	0.390	1.60	0.923	1.00	1.00	1.00	1.00	0.98	54.27	1,233.36	4252.65	17.48	198.67	508.80
+1.090D+0.750L+0.750S-0.5250E					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.527	0.114	1.60	0.923	1.00	1.00	1.00	1.00	0.72	77.36	1,758.08	3337.40	5.09	57.81	508.80
Length = 2.948 ft	1	0.414	0.225	1.60	0.923	1.00	1.00	1.00	1.00	0.99	77.39	1,758.85	4252.65	10.07	114.44	508.80
Length = 3.107 ft	1	0.267	0.360	1.60	0.923	1.00	1.00	1.00	1.00	0.98	50.00	1,136.39	4252.65	16.13	183.31	508.80
+0.60D+0.60W					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.197	0.043	1.60	0.923	1.00	1.00	1.00	1.00	0.72	28.98	658.66	3337.40	1.94	22.03	508.80
Length = 2.948 ft	1	0.155	0.092	1.60	0.923	1.00	1.00	1.00	1.00	0.99	28.98	658.71	4252.65	4.12	46.83	508.80
Length = 3.107 ft	1	0.095	0.128	1.60	0.923	1.00	1.00	1.00	1.00	0.98	17.73	403.01	4252.65	5.71	64.92	508.80
+0.470D+0.70E					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.223	0.048	1.60	0.923	1.00	1.00	1.00	1.00	0.72	32.78	744.91	3337.40	2.16	24.51	508.80
Length = 2.948 ft	1	0.175	0.128	1.60	0.923	1.00	1.00	1.00	1.00	0.99	32.78	744.91	4252.65	5.74	65.22	508.80
Length = 3.107 ft	1	0.089	0.128	1.60	0.923	1.00	1.00	1.00	1.00	0.98	16.73	380.34	4252.65	5.74	65.22	508.80
+0.470D-0.70E					0.923	1.00	1.00	1.00	1.00	0.98			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.086	0.020	1.60	0.923	1.00	1.00	1.00	1.00	0.72	12.63	286.99	3337.40	0.88	10.00	508.80
Length = 2.948 ft	1	0.068	0.020	1.60	0.923	1.00	1.00	1.00	1.00	0.99	12.66	287.63	4252.65	0.72	10.00	508.80
Length = 3.107 ft	1	0.059	0.080	1.60	0.923	1.00	1.00	1.00	1.00	0.98	11.05	251.04	4252.65	3.57	40.61	508.80

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

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

DESCRIPTION: B25 - Dropped Beam @ Garage (Left)

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+1.090D+0.750L+0.750S+0.5250E	1	0.5397	12.190		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	6.108	17.545
Overall MINimum	0.912	1.288
D Only	3.288	9.579
+D+L	4.087	12.739
+D+Lr	3.288	9.579
+D+S	5.215	14.989
+D+0.750Lr+0.750L	3.887	11.949
+D+0.750L+0.750S	5.333	16.007
+D+0.60W	3.288	9.579
+1.126D+0.70E	4.340	11.687
+D+0.750Lr+0.750L+0.450W	3.887	11.949
+D+0.750L+0.750S+0.450W	5.333	16.007
+1.090D+0.750L+0.750S+0.5250E	6.108	17.545
+0.60D+0.60W	1.973	5.747
+0.470D+0.70E	2.184	5.403
D Only	3.288	9.579
L Only	0.799	3.161
S Only	1.927	5.411
E Only	0.912	1.288
H Only		

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

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

DESCRIPTION: B26 - Dropped Beam @ Garage (Right)

CODE REFERENCES

Calculations per NDS 2015, IBC 2015, CBC 2016, ASCE 7-10
Load Combination Set : ASCE 7-10

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-10

Wood Species : DF/DF
Wood Grade : 24F - V8

Beam Bracing : Beam bracing is defined Beam-by-Beam

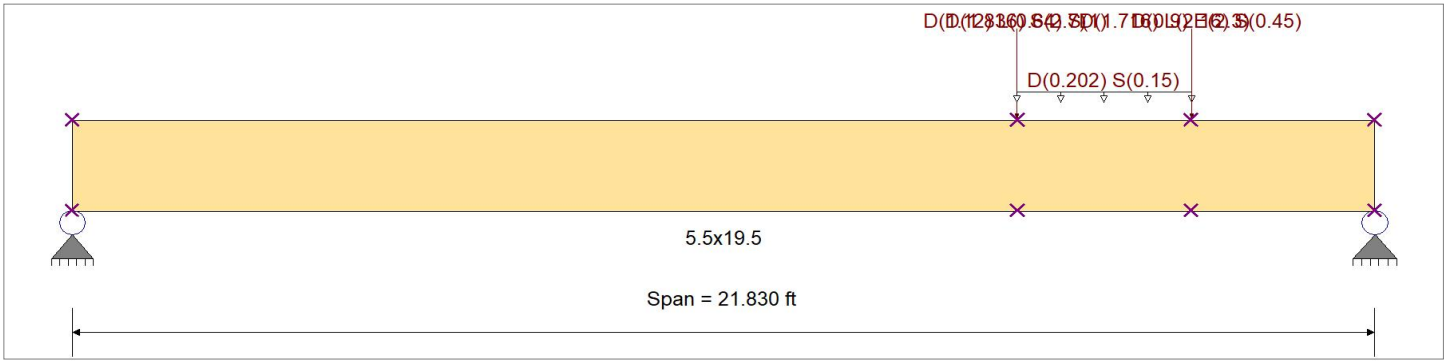
Fb +	2,880.0 psi
Fb -	2,880.0 psi
Fc - Prll	1,980.0 psi
Fc - Perp	780.0 psi
Fv	318.0 psi
Ft	1,320.0 psi

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

Unbraced Lengths

Span # 1, Defined Brace Locations, First Brace at 15.833 ft, Second Brace at 18.750 ft, Third Brace



Applied Loads

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

Beam self weight calculated and added to loads
Point Load : D = 1.120, L = 0.640, S = 1.0 k @ 15.830 ft
Point Load : D = 1.836, S = 2.70 k @ 15.830 ft
Uniform Load : D = 0.2020, S = 0.150 k/ft, Extent = 15.830 -->> 18.750 ft, Tributary Width = 1.0 ft
Point Load : D = 0.90, E = 2.30 k @ 18.750 ft
Point Load : D = 1.716, L = 2.160, S = 0.450 k @ 18.750 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.466 : 1	Maximum Shear Stress Ratio	=	0.359 : 1
Section used for this span		5.5x19.5	Section used for this span		5.5x19.5
fb: Actual	=	1,419.49 psi	fv: Actual	=	131.14 psi
Fb: Allowable	=	3,049.17 psi	Fv: Allowable	=	365.70 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	15.775 ft	Location of maximum on span	=	20.237 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.199 in	Ratio =	1316 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.512 in	Ratio =	511 >=300
Max Upward Total Deflection	0.000 in	Ratio =	0 <300

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
D Only													0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.306	0.074	0.90	0.942	1.00	1.00	1.00	1.00	0.95	21.68	746.52	2442.30	1.52	21.27	286.20
Length = 2.948 ft	1	0.306	0.118	0.90	0.942	1.00	1.00	1.00	1.00	0.99	21.71	747.28	2442.30	2.42	33.81	286.20
Length = 3.107 ft	1	0.221	0.248	0.90	0.942	1.00	1.00	1.00	1.00	0.99	15.70	540.45	2442.30	5.07	70.97	286.20
+D+L					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.372	0.088	1.00	0.942	1.00	1.00	1.00	1.00	0.94	29.27	1,007.56	2706.53	2.00	27.99	318.00

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

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

DESCRIPTION: B26 - Dropped Beam @ Garage (Right)

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 2.948 ft	1	0.372	0.113	1.00	0.942	1.00	1.00	1.00	1.00	0.99	29.31	1,009.10	2713.67	2.58	36.04	318.00
Length = 3.107 ft	1	0.290	0.325	1.00	0.942	1.00	1.00	1.00	1.00	0.99	22.85	786.53	2713.67	7.39	103.41	318.00
+D+Lr					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.229	0.054	1.25	0.942	1.00	1.00	1.00	1.00	0.91	21.68	746.52	3259.24	1.52	21.27	397.50
Length = 2.948 ft	1	0.220	0.085	1.25	0.942	1.00	1.00	1.00	1.00	0.99	21.71	747.28	3392.09	2.42	33.81	397.50
Length = 3.107 ft	1	0.159	0.179	1.25	0.942	1.00	1.00	1.00	1.00	0.99	15.70	540.45	3392.09	5.07	70.97	397.50
+D+S					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.453	0.103	1.15	0.942	1.00	1.00	1.00	1.00	0.92	40.17	1,382.77	3049.17	2.69	37.66	365.70
Length = 2.948 ft	1	0.443	0.206	1.15	0.942	1.00	1.00	1.00	1.00	0.99	40.19	1,383.60	3120.72	5.38	75.24	365.70
Length = 3.107 ft	1	0.290	0.325	1.15	0.942	1.00	1.00	1.00	1.00	0.99	26.30	905.50	3120.72	8.49	118.75	365.70
+D+0.750Lr+0.750L					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.289	0.066	1.25	0.942	1.00	1.00	1.00	1.00	0.91	27.37	942.30	3259.24	1.88	26.31	397.50
Length = 2.948 ft	1	0.278	0.089	1.25	0.942	1.00	1.00	1.00	1.00	0.99	27.41	943.64	3392.09	2.54	35.48	397.50
Length = 3.107 ft	1	0.214	0.240	1.25	0.942	1.00	1.00	1.00	1.00	0.99	21.06	725.01	3392.09	6.81	95.30	397.50
+D+0.750L+0.750S					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.466	0.106	1.15	0.942	1.00	1.00	1.00	1.00	0.92	41.23	1,419.49	3049.17	2.76	38.60	365.70
Length = 2.948 ft	1	0.455	0.182	1.15	0.942	1.00	1.00	1.00	1.00	0.99	41.27	1,420.88	3120.72	4.76	66.56	365.70
Length = 3.107 ft	1	0.320	0.359	1.15	0.942	1.00	1.00	1.00	1.00	0.99	29.01	998.80	3120.72	9.38	131.14	365.70
+D+0.60W					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.194	0.042	1.60	0.942	1.00	1.00	1.00	1.00	0.83	21.68	746.52	3846.48	1.52	21.27	508.80
Length = 2.948 ft	1	0.172	0.066	1.60	0.942	1.00	1.00	1.00	1.00	0.99	21.71	747.28	4341.87	2.42	33.81	508.80
Length = 3.107 ft	1	0.124	0.139	1.60	0.942	1.00	1.00	1.00	1.00	0.99	15.70	540.45	4341.87	5.07	70.97	508.80
+1.126D+0.70E					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.251	0.053	1.60	0.942	1.00	1.00	1.00	1.00	0.83	28.00	963.95	3846.48	1.94	27.13	508.80
Length = 2.948 ft	1	0.222	0.069	1.60	0.942	1.00	1.00	1.00	1.00	0.99	28.04	965.43	4341.87	2.50	34.90	508.80
Length = 3.107 ft	1	0.174	0.195	1.60	0.942	1.00	1.00	1.00	1.00	0.99	21.93	754.97	4341.87	7.10	99.25	508.80
+1.126D-0.70E					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.186	0.041	1.60	0.942	1.00	1.00	1.00	1.00	0.83	20.83	717.22	3846.48	1.49	20.77	508.80
Length = 2.948 ft	1	0.165	0.081	1.60	0.942	1.00	1.00	1.00	1.00	0.99	20.84	717.45	4341.87	2.95	41.25	508.80
Length = 3.107 ft	1	0.106	0.119	1.60	0.942	1.00	1.00	1.00	1.00	0.99	13.42	462.13	4341.87	4.33	60.57	508.80
+D+0.750Lr+0.750L+0.450W					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.245	0.052	1.60	0.942	1.00	1.00	1.00	1.00	0.83	27.37	942.30	3846.48	1.88	26.31	508.80
Length = 2.948 ft	1	0.217	0.070	1.60	0.942	1.00	1.00	1.00	1.00	0.99	27.41	943.64	4341.87	2.54	35.48	508.80
Length = 3.107 ft	1	0.167	0.187	1.60	0.942	1.00	1.00	1.00	1.00	0.99	21.06	725.01	4341.87	6.81	95.30	508.80
+D+0.750L+0.750S+0.450W					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.369	0.076	1.60	0.942	1.00	1.00	1.00	1.00	0.83	41.23	1,419.49	3846.48	2.76	38.60	508.80
Length = 2.948 ft	1	0.327	0.131	1.60	0.942	1.00	1.00	1.00	1.00	0.99	41.27	1,420.88	4341.87	4.76	66.56	508.80
Length = 3.107 ft	1	0.230	0.258	1.60	0.942	1.00	1.00	1.00	1.00	0.99	29.01	998.80	4341.87	9.38	131.14	508.80
+1.090D+0.750L+0.750S+0.5250E					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.411	0.084	1.60	0.942	1.00	1.00	1.00	1.00	0.83	45.87	1,579.20	3846.48	3.07	42.90	508.80
Length = 2.948 ft	1	0.364	0.132	1.60	0.942	1.00	1.00	1.00	1.00	0.99	45.93	1,581.13	4341.87	4.81	67.22	508.80
Length = 3.107 ft	1	0.267	0.299	1.60	0.942	1.00	1.00	1.00	1.00	0.99	33.61	1,157.25	4341.87	10.87	152.03	508.80
+1.090D+0.750L+0.750S-0.5250E					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.362	0.075	1.60	0.942	1.00	1.00	1.00	1.00	0.83	40.50	1,394.15	3846.48	2.73	38.13	508.80
Length = 2.948 ft	1	0.321	0.141	1.60	0.942	1.00	1.00	1.00	1.00	0.99	40.52	1,395.14	4341.87	5.15	71.98	508.80
Length = 3.107 ft	1	0.216	0.242	1.60	0.942	1.00	1.00	1.00	1.00	0.99	27.24	937.62	4341.87	8.80	123.02	508.80
+0.60D+0.60W					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.116	0.025	1.60	0.942	1.00	1.00	1.00	1.00	0.83	13.01	447.91	3846.48	0.91	12.76	508.80
Length = 2.948 ft	1	0.103	0.040	1.60	0.942	1.00	1.00	1.00	1.00	0.99	13.02	448.37	4341.87	1.45	20.29	508.80
Length = 3.107 ft	1	0.075	0.084	1.60	0.942	1.00	1.00	1.00	1.00	0.99	9.42	324.27	4341.87	3.04	42.58	508.80
+0.470D+0.70E					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.123	0.026	1.60	0.942	1.00	1.00	1.00	1.00	0.83	13.77	474.23	3846.48	0.94	13.17	508.80
Length = 2.948 ft	1	0.109	0.026	1.60	0.942	1.00	1.00	1.00	1.00	0.99	13.80	475.21	4341.87	0.91	13.17	508.80
Length = 3.107 ft	1	0.092	0.104	1.60	0.942	1.00	1.00	1.00	1.00	0.99	11.63	400.43	4341.87	3.77	52.70	508.80
+0.470D-0.70E					0.942	1.00	1.00	1.00	1.00	0.99			0.00	0.00	0.00	0.00
Length = 15.775 ft	1	0.059	0.013	1.60	0.942	1.00	1.00	1.00	1.00	0.83	6.61	227.50	3846.48	0.49	6.82	508.80
Length = 2.948 ft	1	0.052	0.037	1.60	0.942	1.00	1.00	1.00	1.00	0.99	6.61	227.50	4341.87	1.36	19.07	508.80
Length = 3.107 ft	1	0.025	0.037	1.60	0.942	1.00	1.00	1.00	1.00	0.99	3.13	107.60	4341.87	1.36	19.07	508.80

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

Lic. # : KW-06004787

MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B26 - Dropped Beam @ Garage (Right)

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+1.090D+0.750L+0.750S+0.5250E	1	0.5121	12.190		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	3.108	10.910
Overall MINimum	0.325	1.975
D Only	1.558	5.111
+D+L	2.039	7.431
+D+Lr	1.558	5.111
+D+S	2.729	8.528
+D+0.750Lr+0.750L	1.918	6.851
+D+0.750L+0.750S	2.797	9.413
+D+0.60W	1.558	5.111
+1.126D+0.70E	1.981	7.138
+D+0.750Lr+0.750L+0.450W	1.918	6.851
+D+0.750L+0.750S+0.450W	2.797	9.413
+1.090D+0.750L+0.750S+0.5250E	3.108	10.910
+0.60D+0.60W	0.935	3.067
+0.470D+0.70E	0.959	3.785
D Only	1.558	5.111
L Only	0.481	2.319
S Only	1.172	3.416
E Only	0.325	1.975
H Only		

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

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

DESCRIPTION: B27 - 16' Garage Door Header

CODE REFERENCES

Calculations per NDS 2015, IBC 2015, CBC 2016, ASCE 7-10
Load Combination Set : ASCE 7-10

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-10

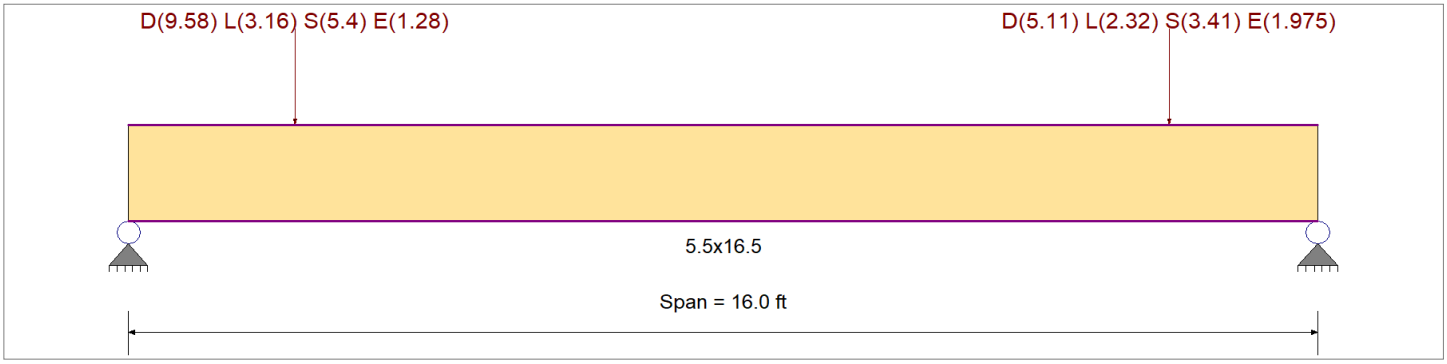
Wood Species : DF/DF
Wood Grade : 24F - V8

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

Fb +	2,880.0 psi
Fb -	2,880.0 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 = 9.580, L = 3.160, S = 5.40, E = 1.280 k @ 2.250 ft
Point Load : D = 5.110, L = 2.320, S = 3.410, E = 1.975 k @ 14.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.497 : 1	Maximum Shear Stress Ratio	=	0.681 : 1
Section used for this span		5.5x16.5	Section used for this span		5.5x16.5
fb: Actual	=	1,628.19 psi	fv: Actual	=	248.87 psi
Fb: Allowable	=	3,273.43 psi	Fv: Allowable	=	365.70 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	2.277 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	0.139 in	Ratio =	1378	>=360
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360
Max Downward Total Deflection	0.458 in	Ratio =	418	>=300
Max Upward Total Deflection	0.000 in	Ratio =	0	<300

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.380	0.520	0.90	0.988	1.00	1.00	1.00	1.00	1.00	20.25	973.65	2561.82	9.00	148.80	286.20
+D+L					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.456	0.624	1.00	0.988	1.00	1.00	1.00	1.00	1.00	27.01	1,298.63	2846.46	12.01	198.48	318.00
+D+Lr					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.274	0.374	1.25	0.988	1.00	1.00	1.00	1.00	1.00	20.25	973.65	3558.08	9.00	148.80	397.50
+D+S					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.465	0.636	1.15	0.988	1.00	1.00	1.00	1.00	1.00	31.64	1,521.40	3273.43	14.07	232.55	365.70
+D+0.750Lr+0.750L					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.342	0.468	1.25	0.988	1.00	1.00	1.00	1.00	1.00	25.32	1,217.38	3558.08	11.26	186.06	397.50
+D+0.750L+0.750S					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.497	0.681	1.15	0.988	1.00	1.00	1.00	1.00	1.00	33.86	1,628.19	3273.43	15.06	248.87	365.70

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

File: beam calcs with overstrength.ec6

Lic. # : KW-06004787

MULHERN & KULP STRUCTURAL ENGINEERING INC

DESCRIPTION: B27 - 16' Garage Door Header

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
+D+0.60W					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.214	0.292	1.60	0.988	1.00	1.00	1.00	1.00	1.00	20.25	973.65	4554.34	9.00	148.80	508.80
+1.126D+0.70E					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.263	0.360	1.60	0.988	1.00	1.00	1.00	1.00	1.00	24.92	1,198.40	4554.34	11.08	183.13	508.80
+1.126D-0.70E					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.218	0.299	1.60	0.988	1.00	1.00	1.00	1.00	1.00	20.68	994.27	4554.34	9.19	151.97	508.80
+D+0.750Lr+0.750L+0.450W					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.267	0.366	1.60	0.988	1.00	1.00	1.00	1.00	1.00	25.32	1,217.38	4554.34	11.26	186.06	508.80
+D+0.750L+0.750S+0.450W					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.358	0.489	1.60	0.988	1.00	1.00	1.00	1.00	1.00	33.86	1,628.19	4554.34	15.06	248.87	508.80
+1.090D+0.750L+0.750S+0.5250E					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.394	0.538	1.60	0.988	1.00	1.00	1.00	1.00	1.00	37.28	1,792.37	4554.34	16.57	273.95	508.80
+1.090D+0.750L+0.750S-0.5250E					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.360	0.492	1.60	0.988	1.00	1.00	1.00	1.00	1.00	34.09	1,639.27	4554.34	15.16	250.58	508.80
+0.60D+0.60W					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.128	0.175	1.60	0.988	1.00	1.00	1.00	1.00	1.00	12.15	584.19	4554.34	5.40	89.28	508.80
+0.470D+0.70E					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.123	0.168	1.60	0.988	1.00	1.00	1.00	1.00	1.00	11.64	559.68	4554.34	5.17	85.52	508.80
+0.470D-0.70E					0.988	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.078	0.107	1.60	0.988	1.00	1.00	1.00	1.00	1.00	7.39	355.55	4554.34	3.29	54.35	508.80

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+1.090D+0.750L+0.750S+0.5250E	1	0.4584	7.708		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	16.603	12.178
Overall MINimum	1.347	1.908
D Only	9.029	5.976
+D+L	12.035	8.450
+D+Lr	9.029	5.976
+D+S	14.096	9.719
+D+0.750Lr+0.750L	11.283	7.832
+D+0.750L+0.750S	15.083	10.639
+D+0.60W	9.029	5.976
+1.126D+0.70E	11.109	8.064
+D+0.750Lr+0.750L+0.450W	11.283	7.832
+D+0.750L+0.750S+0.450W	15.083	10.639
+1.090D+0.750L+0.750S+0.5250E	16.603	12.178
+0.60D+0.60W	5.417	3.585
+0.470D+0.70E	5.186	4.144
D Only	9.029	5.976
L Only	3.006	2.474
S Only	5.067	3.743
E Only	1.347	1.908
H Only		

Jaymarc Homes

Ponte Residence

Mercer Island, WA

Shear Wall Calculations - Wind Design

Reviewed By: NJM

January 25, 2021

Parameters:

Single Family Home

Design Wind Speed: 110 MPH

wind Exposure Category: B

Seismic Design Category: D

Code & Design Standard: 2015 IBC Ch. 1609, ASCE 7-10 Ch. 26-30

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

WIND DESIGN SUMMARY PER ASCE 7-10

PARAMETERS:

WIND SPEED	110
EXPOSURE CATEGORY	B
RISK CATEGORY	II
WIND DIRECTIONALITY FACTOR, K_D	0.85
TOPOGRAPHIC FACTOR, K_{ZT}	1.30
GUST FACTOR, G	0.85
DESIGN TYPE	ASD

ROOF GEOMETRY:

TRANS. ROOF PITCH	4	:12
LONG. ROOF PITCH	14	:12
MEAN ROOF HEIGHT, H	25.00	FT

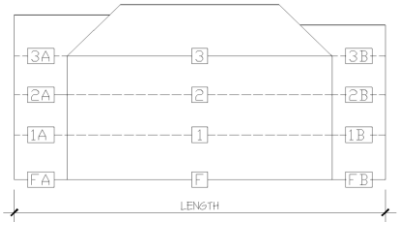
BUILDING GEOMETRY:

LENGTH	62	FT
WIDTH	63	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 FT	Roof Surface	0	245	0	sq ft
		Wall surface	0	450	0	sq ft
1	11.5 FT	Roof Surface	0	0	0	sq ft
		Wall surface	0	681	0	sq ft
FND		Roof Surface	0	0	0	sq ft
		Wall surface	0	0	0	sq ft



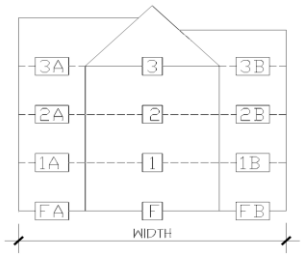
TRIBUTARY DESIGN LOADS: (0.6W)

	SECTION A	SECTION O	SECTION B	
Story Shear	0.00	8.28	0.00	kips
Total Shear	0.00	8.28	0.00	kips
		8.28		kips
Story Shear	0.00	9.39	0.00	kips
Total Shear	0.00	17.67	0.00	kips
		17.67		kips
Story Shear	0.00	0.00	0.00	kips
Total Shear	0.00	17.67	0.00	kips
		17.67		kips

LONGITUDINAL DIRECTION (PARALLEL TO MAIN RIDGE LINE)

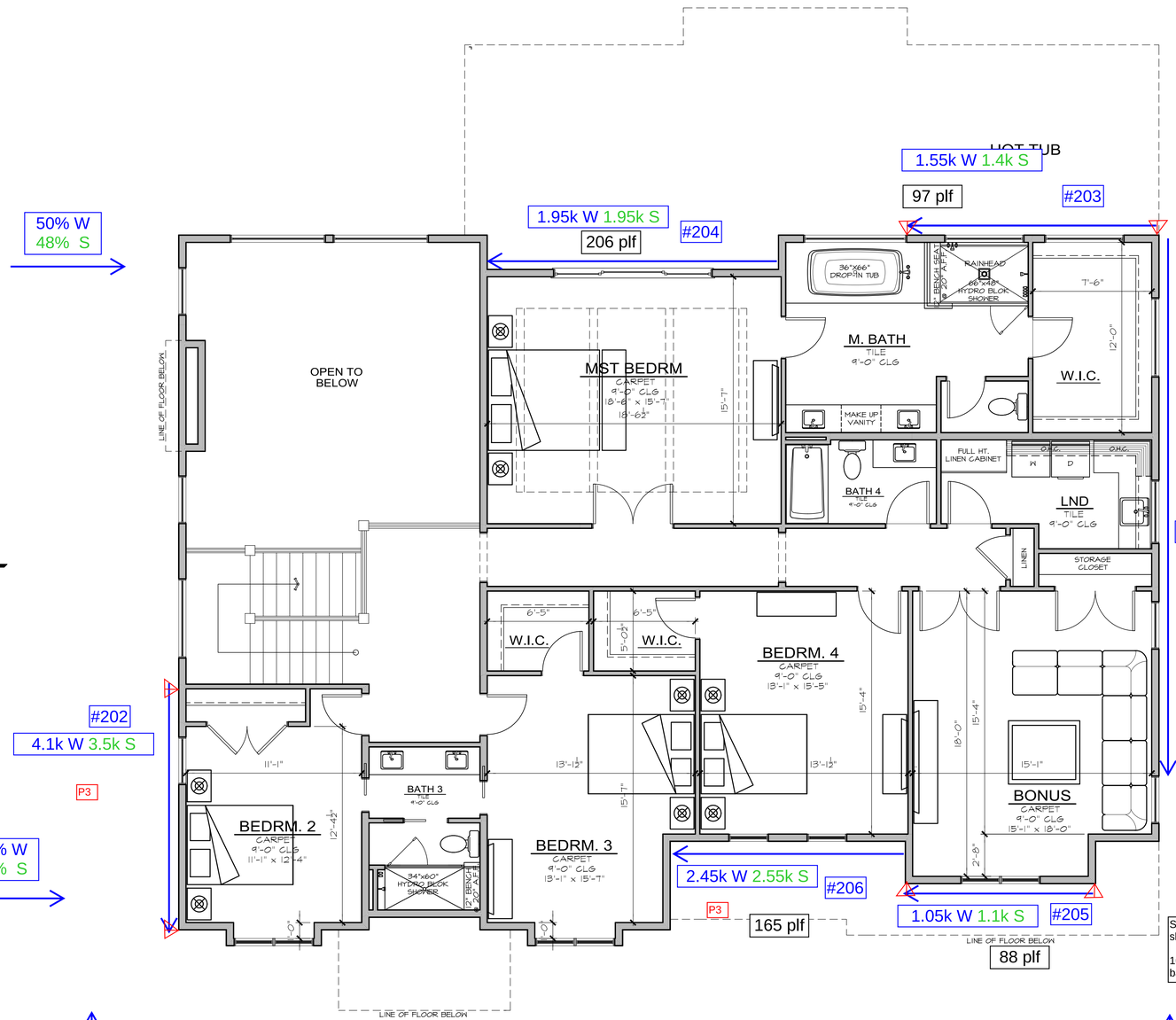
TRIBUTARY DESIGN AREAS

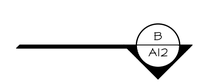
DIAPHRAGM LEVEL	FLOOR-TO-FLOOR HEIGHT		SECTION A	SECTION O	SECTION B	
2	9 FT	Roof Surface	0	200	0	sq ft
		Wall surface	0	310	0	sq ft
1	11.5 FT	Roof Surface	0	70	0	sq ft
		Wall surface	0	502	0	sq ft
FND		Roof Surface	0	0	0	sq ft
		Wall surface	0	0	0	sq ft

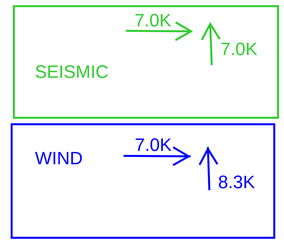


TRIBUTARY DESIGN LOADS: (0.6W)

	SECTION A	SECTION O	SECTION B	
Story Shear	0.00	6.97	0.00	kips
Total Shear	0.00	6.97	0.00	kips
		6.97		kips
Story Shear	0.00	7.80	0.00	kips
Total Shear	0.00	14.76	0.00	kips
		14.76		kips
Story Shear	0.00	0.00	0.00	kips
Total Shear	0.00	14.76	0.00	kips
		14.76		kips







UPPER FLOOR PLAN NOTES

PLAN SPECIFIC 2015 WSEC, SECTION R06

R406.2 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS (MANDATORY).

THIS RESIDENTIAL DWELLING SHALL COMPLY W/SUFFICIENT OPTIONS FROM TABLE R406.2 TO ACHIEVE THE FOLLOWING MIN. NUMBER OF CREDITS:

3.5 FOR A 1,501sf to 4,999sf HOME.

CREDITS PROVIDED IN THIS HOME AS FOLLOWS:

EFFICIENT BUILDING ENVELOPE 1a: 0.5 CREDITS

PRESCRIPTIVE COMPLIANCE IS BASED ON TABLE R402.1.1 with FOLLOWING MODIFICATIONS:

VERTICAL FENESTRATION U = 0.28 WINDOWS

FLOORS TO BE R-38 and SLAB ON GRADE TO BE R-10 PERIMETER and UNDER ENTIRE SLAB BELOW GRADE.

HIGH EFFICIENCY HVAC EQUIPMENT 3a: 1.0 CREDITS

GAS FURNACE WITH MINIMUM AFUE OF 94%

EFFICIENT WATER HEATING 5a: 0.5 CREDITS

ALL SHOWERHEAD and KITCHEN SINK FAUCETS INSTALLED IN THE HOUSE SHALL BE RATED AT 1.75 GPM or LESS.

ALL OTHER LAVATORY FAUCETS SHALL BE RATED AT 1.0 GPM or LESS.

EFFICIENT WATER HEATING 5c: 1.5 CREDITS

WATER HEATING SYSTEM SHALL BE:
GAS WATER HEATER WITH A MINIMUM EF OF 0.91

WHOLE HOUSE VENTILATION

PROVIDE WHOLE HOUSE VENTILIATION per 2015 IRC, M1507 and IMC R403.8 USING LAUNDRY ROOM EXHAUST FAN INTEGRATED INTO FORCED ARE SYSTEM (FAU.) PROVIDE OUTDOOR FRESH AIR w/DUCTS CONNECTED TO THE RETURN SIDE OF THE AIR HANDLER.

SYMBOL	LOCATION	MIN. FAN REQUIREMENTS (ALL FANS VENT TO OUTDIDE)
A 50cfm+	BATH & POWDER	Min. 50cfm, INTERMITTENT at .025wg per TABLE M1507.4
B 100cfm+	KITCHEN	Min. 100cfm, INTERMITTENT at .025wg per TBL. M1507.4
		RANGE HOOD or DOWN DRAFT EXHAUST FAN RATED at min. 100cfm, at 0.1owg MAY BE USED FOR EXHAUST FAN REQMT. EXHAUST HOODS IN EXCESS OF 400cfm, SHALL PROVIDE MAKE UP AIR per M1503.4
C 180cfm+ WHF.	LAUNDRY ROOM	MIN. 180cfm, INTERMITTENT at .025wg TO FUNCTION AS WHOLE HOUSE FAN (WHF.)

MECHANICAL CONTRACTOR TO SIZE WHF. FAN and SET OPERATING TIMER per TABLE M1507.3.3(1) FOR A 3,001-4,500sf. DWELLING w/4-5 BEDRMS. TO OPERATE INTERMITTENTLY and CONTINUOSLY per TABLE M1507.3.3(2)

PROVIDE CONTROLS FOR WHF. per M1507.3.2 AFFIX LABEL TO CONTROLS THAT READS "WHOLE HOUSE VENTILATION - SEE OPERATING INSTRUCTIONS"

SW #205 (88plf) and SW #206 (165 plf) compared based on shearwall capacity (P1/P3= 336/630 = 0.533)

165*0.5333=88 plf. therefpre #205 and #206 are proportional based on stiffness/capacity

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA + GARAGE	2,655	S.F.
UPPER FLOOR AREA	2,430	S.F.
TOTAL CONDITIONED AREA	5,085	S.F.
GOV'D ENTRY PORCH	201	S.F.
TOTAL AREA UNDER ROOF	5,286	S.F.
DECK	340	S.F.
OVERALL WIDTH	61'-10"	
OVERALL DEPTH	60'-11"	

Updated : 1/02/2018

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

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

See Sheet "CODES" for additional Zoning required Area Calculations

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		

2429 74th Ave SE
Mercer Island, WA

Job Number:

plan name: --
marketing name: VICTORIA - 'B'
plan number: --
mark sys. number: --

02.29.21
Submittal Date

Sheet Title/Description

Design Firm

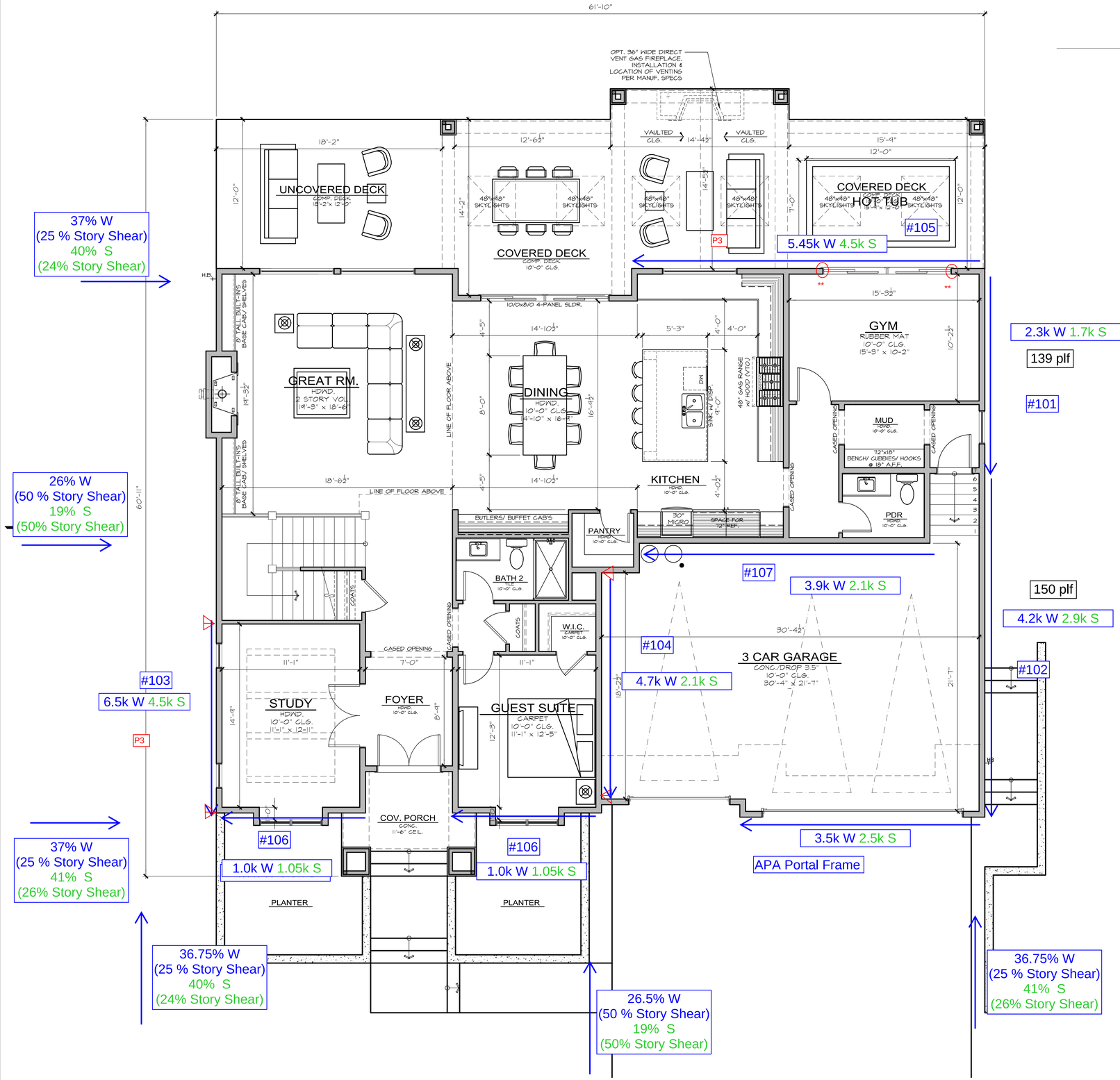
RCR
Drawn by:

SK
Checked by:

1/4 SCALE
Primary Scale

A6
of: .

Sheet Title/Description



MAIN FLOOR PLAN NOTES

PLAN SPECIFIC 2015 WSEC, SECTION R06

R406.2 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS (MANDATORY).

THIS RESIDENTIAL DWELLING SHALL COMPLY W/SUFFICIENT OPTIONS FROM TABLE R406.2 TO ACHIEVE THE FOLLOWING MIN. NUMBER OF CREDITS:

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CREDITS PROVIDED IN THIS HOME AS FOLLOWS:

EFFICIENT BUILDING ENVELOPE 1a: 0.5 CREDITS

PRESCRIPTIVE COMPLIANCE IS BASED ON TABLE R402.1.1 with FOLLOWING MODIFICATIONS:

VERTICAL FENESTRATION U = 0.28 WINDOWS

FLOORS TO BE R-38 and SLAB ON GRADE TO BE R-10 PERIMETER and UNDER ENTIRE SLAB BELOW GRADE.

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GAS FURNACE WITH MINIMUM AFUE OF 94%

EFFICIENT WATER HEATING 5a: 0.5 CREDITS

ALL SHOWERHEAD and KITCHEN SINK FAUCETS INSTALLED IN THE HOUSE SHALL BE RATED AT 1.75 GPM or LESS.

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EFFICIENT WATER HEATING 5c: 1.5 CREDITS

WATER HEATING SYSTEM SHALL BE:
GAS WATER HEATER WITH A MINIMUM EF OF 0.91

WHOLE HOUSE VENTILATION

PROVIDE WHOLE HOUSE VENTILATION per 2015 IRC, M1507 and IMC R403.8 USING LAUNDRY ROOM EXHAUST FAN INTEGRATED INTO FORCED AIR SYSTEM (FAU.) PROVIDE OUTDOOR FRESH AIR W/DUCTS CONNECTED TO THE RETURN SIDE OF THE AIR HANDLER.

SYMBOL	LOCATION	MIN. FAN REQUIREMENTS (ALL FANS VENT TO OUTSIDE)
A. 50cfm+	BATH & POWDER	Min. 50cfm, INTERMITTENT at .025wg per TABLE M1507.4
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		RANGE HOOD or DOWN DRAFT EXHAUST FAN RATED at min. 100cfm, at 0.10wg MAY BE USED FOR EXHAUST FAN REQMT. EXHAUST HOODS IN EXCESS OF 400cfm, SHALL PROVIDE MAKE UP AIR per M1503.4
C. 180cfm+ WHF.	LAUNDRY ROOM	MIN. 180cfm, INTERMITTENT at .025wg TO FUNCTION AS WHOLE HOUSE FAN (WHF.)

MECHANICAL CONTRACTOR TO SIZE WHF, FAN and SET OPERATING TIMER per TABLE M1507.3.3(1) FOR A 3,001-4,500sf. DWELLING w/4-5 BEDRMS, TO OPERATE INTERMITTENTLY and CONTINUOUSLY per TABLE M1507.3.3(2)

PROVIDE CONTROLS FOR WHF, per M1507.3.2 AFFIX LABEL TO CONTROLS THAT READS "WHOLE HOUSE VENTILATION - SEE OPERATING INSTRUCTIONS"

B
A12

SEISMIC
11.2K
11.2K

WIND
14.8K
17.7K

MAIN FLOOR PLAN

1/4" = 1'-0"

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA + GARAGE	2,655 S.F.
UPPER FLOOR AREA	2,430 S.F.
TOTAL CONDITIONED AREA	5,085 S.F.
COV'D ENTRY PORCH	201 S.F.
TOTAL AREA UNDER ROOF	5,286 S.F.
DECK	340 S.F.
OVERALL WIDTH	61'-10"
OVERALL DEPTH	60'-11"

Updated : 1/02/2018

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

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See Sheet "CODES" for additional Zoning required Area Calculations

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

Issue	Issue Date	By	Description

2429 74th Ave SE
Mercer Island, WA

Job Number:

plan name: --
marketing name: VICTORIA - 'B'
plan number: --
mark sys. number: --

02.29.21
Submittal Date

Sheet Title/Description

Design Firm

RCR
Drawn by:

SK
Checked by:

1/4 SCALE
Primary Scale

A4
of: .

Sheet Title/Description

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 201: 2ND - SIDE EXT. WALL @ WIC TO BONUS

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	5.0	FT.		
WALL LENGTH, L	34.0	FT.	QUALIFYING WALL LENGTH, L	22.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4200 LBS	<	7392 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	38.2	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	46.5	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 202: 2ND - SIDE EXT. WALL @ BED 2

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	5.0	FT.		
WALL LENGTH, L	15.3	FT.	QUALIFYING WALL LENGTH, L	12.3	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4100 LBS	<	4143 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	37.3	K-FT	HOLD DOWN DESIGN LOAD	1578	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	13.1	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 203: 2ND - REAR EXT. WALL @ MASTER BATH

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	1.5	FT.		
WALL LENGTH, L	16.0	FT.	QUALIFYING WALL LENGTH, L	6.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1550 LBS	<	2016 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	14.1	K-FT	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	14.1	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 204: 2ND - REAR EXT. WALL @ MASTER BED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	5.0	FT.		
WALL LENGTH, L	18.3	FT.	QUALIFYING WALL LENGTH, L	8.3	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1950 LBS	<	2799 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	406	PLF	OVERTURNING MOMENT	17.7	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1000	LBS	RESISTIVE MOMENT	51.9	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 205: 2ND - FRONT EXT. WALL @ BONUS

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	5.0	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	7.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1050 LBS	<	2352 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	151	PLF	OVERTURNING MOMENT	9.6	K-FT	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	600	LBS	RESISTIVE MOMENT	10.8	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 206: 2ND - FRONT EXT. WALL @ BED 4

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	5.0	FT.		
WALL LENGTH, L	14.8	FT.	QUALIFYING WALL LENGTH, L	9.8	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2450 LBS	<	6193 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	406	PLF	OVERTURNING MOMENT	22.3	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	30.3	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	0.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	0.0	FT.	QUALIFYING WALL LENGTH, L	0.0	FT.	SHEARWALL ASSEMBLY	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	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	0.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

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

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 101: 1ST - SIDE EXT. WALL @ GYM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	6.0	FT.		
WALL LENGTH, L	16.5	FT.	QUALIFYING WALL LENGTH, L	13.8	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2300 LBS	<	4591 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	234	PLF	OVERTURNING MOMENT	23.0	K-FT	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	23.1	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 102: 1ST - SIDE EXT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	28.0	FT.	QUALIFYING WALL LENGTH, L	28.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4200 LBS	<	9408 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	234	PLF	OVERTURNING MOMENT	42.0	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	61.8	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 103: 1ST - SIDE EXT. WALL @ STUDY

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	6.0	FT.		
WALL LENGTH, L	15.3	FT.	QUALIFYING WALL LENGTH, L	11.3	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
6500 LBS	<	6823 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	426	PLF	OVERTURNING MOMENT	65.0	K-FT	UPLIFT CONNECTOR DESIGN LOAD	1801	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	37.4	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 104: 1ST - SIDE INT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	18.0	FT.	QUALIFYING WALL LENGTH, L	18.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4700 LBS	<	6048 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	130	PLF	OVERTURNING MOMENT	47.0	K-FT	HOLD DOWN DESIGN LOAD	1669	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	17.0	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 105: 1ST - REAR EXT. WALL @ GYM TO KITCHEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	8.0	FT.		
WALL LENGTH, L	28.4	FT.	QUALIFYING WALL LENGTH, L	11.9	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4700 LBS	<	7300 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	391	PLF	OVERTURNING MOMENT	47.0	K-FT	UPLIFT CONNECTOR DESIGN LOAD	0 LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	101.6	K-FT	HOLDOWN CAPACITY	0 LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 106: 1ST - FRONT EXT. WALL @ GUEST SUITE & STUDY

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	8.0	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	6.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1000 LBS	<	1848 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	331	PLF	OVERTURNING MOMENT	10.0	K-FT	HOLD DOWN DESIGN LOAD	0 LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	17.2	K-FT	HOLDOWN CAPACITY	0 LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 107: 1ST - REAR INT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	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
3900 LBS	<	7728 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	385	PLF	OVERTURNING MOMENT	39.0	K-FT	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	61.1	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL XXX: 1ST - 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

Jaymarc Homes

Ponte Residence

Mercer Island, WA

Shear Wall Calculations - Seismic Design

Reviewed By: NJM

January 25, 2021

Parameters:

Single Family Home

Design Wind Speed: 110 MPH

wind Exposure Category: B

Seismic Design Category: D

Code & Design Standard: 2015 IBC Ch. 1609, ASCE 7-10 Ch. 26-30

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: PONTE RESIDENCE
JAYMARC HOMES
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SEISMIC CALCULATION - ASCE 7-10

SEISMIC DESIGN CATEGORY:

USER INPUTS:

SITE CLASS	D
SPECTRAL RESPONSE ACCELERATION 0.2 SEC, **Ss**	1.373
SPECTRAL RESPONSE ACCELERATION 1.0 SEC, **S1**	0.528
OCCUPANCY CATEGORY	II

VARIABLES:

SITE COEFFICIENT, Fa	1.00
SITE COEFFICIENT, Fv	1.50

CALCULATED VALUES:

MAXIMUM SPECTRAL RESPONSE ACCELERATION, S_{MS}	1.373
MAXIMUM SPECTRAL RESPONSE ACCELERATION, S_{M1}	0.792
DESIGN SPECTRAL RESPONSE ACCELERATION, S_{DS}	0.915
DESIGN SPECTRAL RESPONSE ACCELERATION, S_{D1}	0.528
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, T	0.193
T_0	0.115
T_S	0.577
SPECTRAL RESPONSE ACCELERATION, S_A (g)	0.915

EQUIVALENT LATERAL FORCE PROCEDURE

DEAD LOAD CALCULATION:

LEVEL	STORY HT. (FT.)	AREA (FT^2)	DEAD LOAD (PSF)	DL OF EXT WALL TRIBUTARY TO LEVEL (KIPS)	TOTAL LEVEL DL
1	11.5	3090	15	12.4	59 K
2	9.0	2850	17	6.2	55 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

TOTAL DEAD LOAD OF STRUCTURE 113 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	0.141	0.141

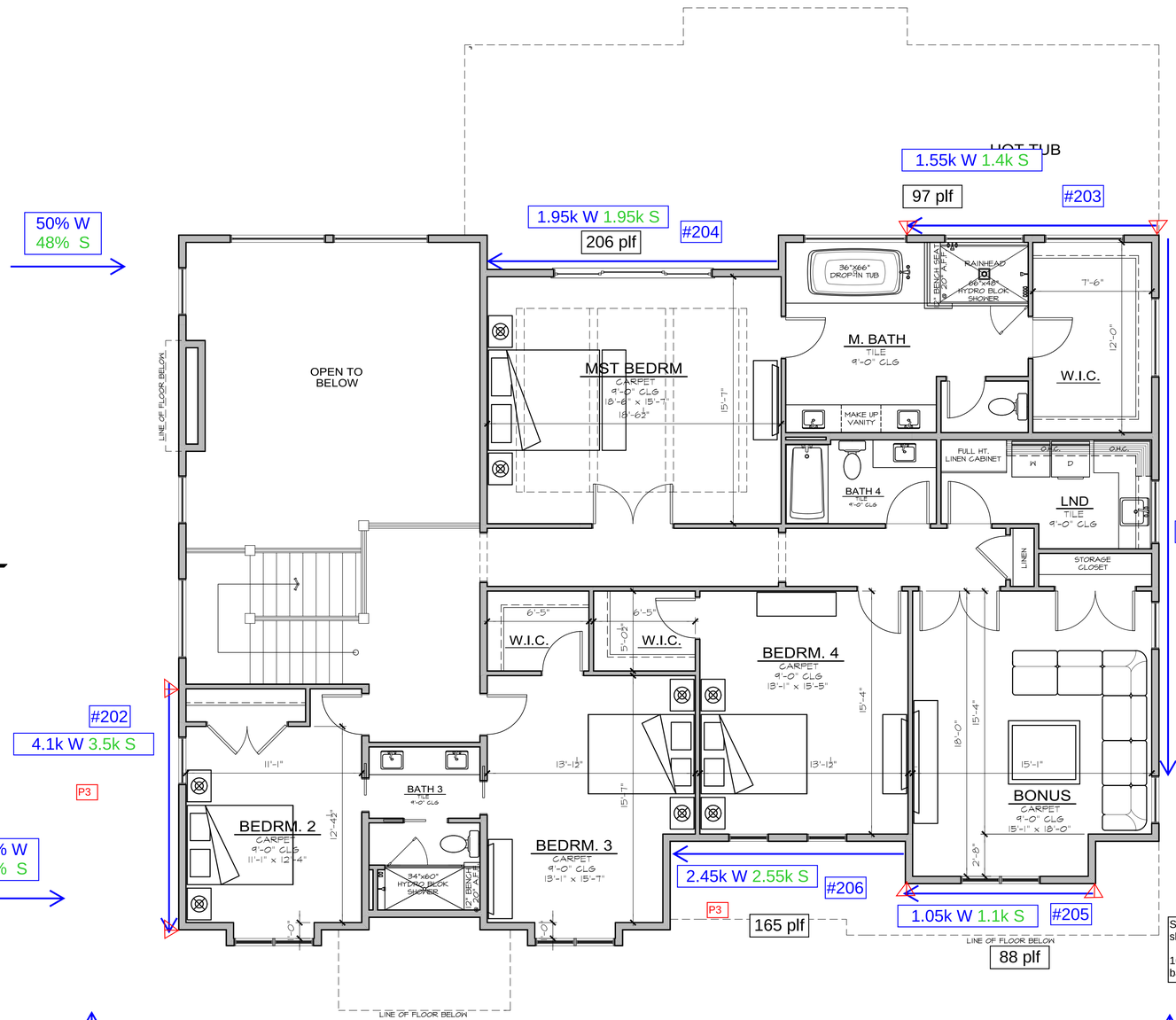
BASE SHEARS:

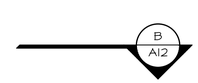
ULTIMATE LOADS				x 0.7 =	ALLOWABLE LOADS			
TRANSVERSE		LONGITUDINAL			TRANSVERSE		LONGITUDINAL	
16	K	16	K		11	K	11	K

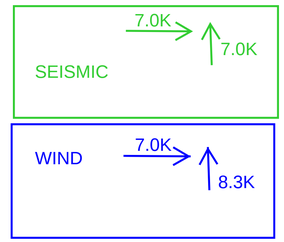
STORY SHEAR CALCULATION:

DISTRIBUTION EXPONE 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		ALLOWABLE LOADS TRANSVERSE Σ STORY SHEAR		ALLOWABLE LOADS LONGITUDINAL STORY SHEAR, F_x		ALLOWABLE LOADS LONGITUDINAL Σ STORY SHEAR	
1	0.376	6.0	K	6.0	K	4.2	K	11.2	K	4.2	K	11.2	K
2	0.624	10.0	K	10.0	K	7.0	K	7.0	K	7.0	K	7.0	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







UPPER FLOOR PLAN NOTES

PLAN SPECIFIC 2015 WSEC, SECTION R06

R406.2 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS (MANDATORY).

THIS RESIDENTIAL DWELLING SHALL COMPLY W/SUFFICIENT OPTIONS FROM TABLE R406.2 TO ACHIEVE THE FOLLOWING MIN. NUMBER OF CREDITS:

3.5 FOR A 1,501sf to 4,999sf HOME.

CREDITS PROVIDED IN THIS HOME AS FOLLOWS:

EFFICIENT BUILDING ENVELOPE 1a: 0.5 CREDITS

PRESCRIPTIVE COMPLIANCE IS BASED ON TABLE R402.1.1 with FOLLOWING MODIFICATIONS:

VERTICAL FENESTRATION U = 0.28 WINDOWS

FLOORS TO BE R-38 and SLAB ON GRADE TO BE R-10 PERIMETER and UNDER ENTIRE SLAB BELOW GRADE.

HIGH EFFICIENCY HVAC EQUIPMENT 3a: 1.0 CREDITS

GAS FURNACE WITH MINIMUM AFUE OF 94%

EFFICIENT WATER HEATING 5a: 0.5 CREDITS

ALL SHOWERHEAD and KITCHEN SINK FAUCETS INSTALLED IN THE HOUSE SHALL BE RATED AT 1.75 GPM or LESS.

ALL OTHER LAVATORY FAUCETS SHALL BE RATED AT 1.0 GPM or LESS.

EFFICIENT WATER HEATING 5c: 1.5 CREDITS

WATER HEATING SYSTEM SHALL BE:
GAS WATER HEATER WITH A MINIMUM EF OF 0.91

WHOLE HOUSE VENTILATION

PROVIDE WHOLE HOUSE VENTILIATION per 2015 IRC, M1507 and IMC R403.8 USING LAUNDRY ROOM EXHAUST FAN INTEGRATED INTO FORCED ARE SYSTEM (FAU.) PROVIDE OUTDOOR FRESH AIR w/DUCTS CONNECTED TO THE RETURN SIDE OF THE AIR HANDLER.

SYMBOL	LOCATION	MIN. FAN REQUIREMENTS (ALL FANS VENT TO OUTDIDE)
A 50cfm+	BATH & POWDER	Min. 50cfm, INTERMITTENT at .025wg per TABLE M1507.4
B 100cfm+	KITCHEN	Min. 100cfm, INTERMITTENT at .025wg per TBL. M1507.4
		RANGE HOOD or DOWN DRAFT EXHAUST FAN RATED at min. 100cfm, at 0.1owg MAY BE USED FOR EXHAUST FAN REQMT. EXHAUST HOODS IN EXCESS OF 400cfm, SHALL PROVIDE MAKE UP AIR per M1503.4
C 180cfm+ WHF.	LAUNDRY ROOM	MIN. 180cfm, INTERMITTENT at .025wg TO FUNCTION AS WHOLE HOUSE FAN (WHF.)

MECHANICAL CONTRACTOR TO SIZE WHF. FAN and SET OPERATING TIMER per TABLE M1507.3.3(1) FOR A 3,001-4,500sf. DWELLING w/4-5 BEDRMS. TO OPERATE INTERMITTENTLY and CONTINUOSLY per TABLE M1507.3.3(2)

PROVIDE CONTROLS FOR WHF. per M1507.3.2 AFFIX LABEL TO CONTROLS THAT READS "WHOLE HOUSE VENTILATION - SEE OPERATING INSTRUCTIONS"

SW #205 (88plf) and SW #206 (165 plf) compared based on shearwall capacity (P1/P3= 336/630 = 0.533)

165*0.5333=88 plf. therefpre #205 and #206 are proportional based on stiffness/capacity

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA + GARAGE	2,655	S.F.
UPPER FLOOR AREA	2,430	S.F.
TOTAL CONDITIONED AREA	5,085	S.F.
GOV'D ENTRY PORCH	201	S.F.
TOTAL AREA UNDER ROOF	5,286	S.F.
DECK	340	S.F.
OVERALL WIDTH	61'-10"	
OVERALL DEPTH	60'-11"	

Updated : 1/02/2018

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

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

See Sheet "CODES" for additional Zoning required Area Calculations

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		

2429 74th Ave SE
Mercer Island, WA

Job Number:

plan name: --
marketing name: VICTORIA - 'B'
plan number: --
mark sys. number: --

02.29.21
Submittal Date

Sheet Title/Description

Design Firm

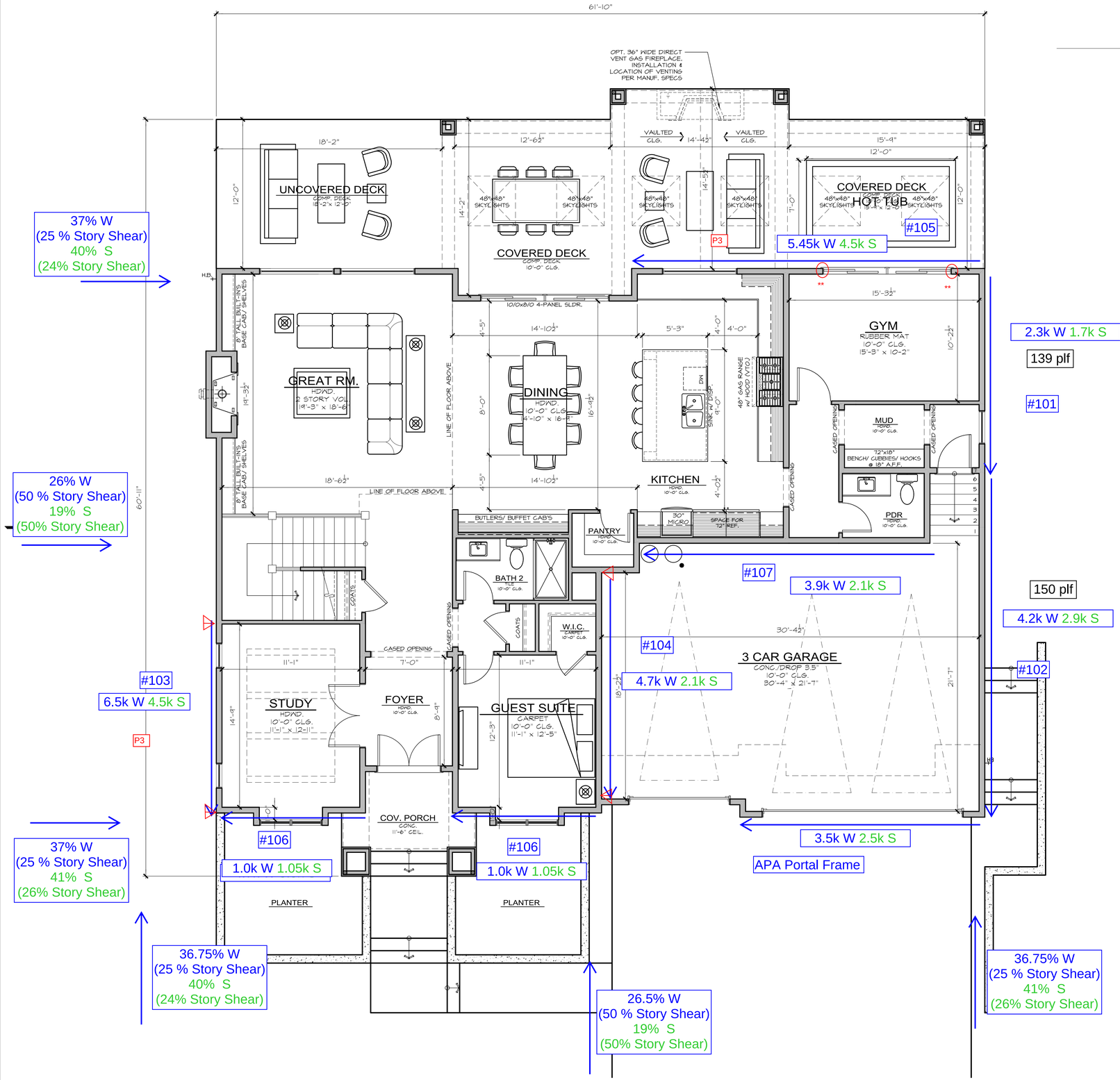
RCR
Drawn by:

SK
Checked by:

1/4 SCALE
Primary Scale

A6
of: .

Sheet Title/Description



MAIN FLOOR PLAN NOTES

PLAN SPECIFIC 2015 WSEC, SECTION R06

R406.2 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS (MANDATORY).

THIS RESIDENTIAL DWELLING SHALL COMPLY W/SUFFICIENT OPTIONS FROM TABLE R406.2 TO ACHIEVE THE FOLLOWING MIN. NUMBER OF CREDITS:

3.5 FOR A 1,501sf to 4,999sf HOME.

CREDITS PROVIDED IN THIS HOME AS FOLLOWS:

EFFICIENT BUILDING ENVELOPE 1a: 0.5 CREDITS

PRESCRIPTIVE COMPLIANCE IS BASED ON TABLE R402.1.1 with FOLLOWING MODIFICATIONS:

VERTICAL FENESTRATION U = 0.28 WINDOWS

FLOORS TO BE R-38 and SLAB ON GRADE TO BE R-10 PERIMETER and UNDER ENTIRE SLAB BELOW GRADE.

HIGH EFFICIENCY HVAC EQUIPMENT 3a: 1.0 CREDITS

GAS FURNACE WITH MINIMUM AFUE OF 94%

EFFICIENT WATER HEATING 5a: 0.5 CREDITS

ALL SHOWERHEAD and KITCHEN SINK FAUCETS INSTALLED IN THE HOUSE SHALL BE RATED AT 1.75 GPM or LESS.

ALL OTHER LAVATORY FAUCETS SHALL BE RATED AT 1.0 GPM or LESS.

EFFICIENT WATER HEATING 5c: 1.5 CREDITS

WATER HEATING SYSTEM SHALL BE:
GAS WATER HEATER WITH A MINIMUM EF OF 0.91

WHOLE HOUSE VENTILATION

PROVIDE WHOLE HOUSE VENTILATION per 2015 IRC, M1507 and IMC R403.8 USING LAUNDRY ROOM EXHAUST FAN INTEGRATED INTO FORCED AIR SYSTEM (FAU.) PROVIDE OUTDOOR FRESH AIR W/DUCTS CONNECTED TO THE RETURN SIDE OF THE AIR HANDLER.

SYMBOL	LOCATION	MIN. FAN REQUIREMENTS (ALL FANS VENT TO OUTSIDE)
A. 50cfm+	BATH & POWDER	Min. 50cfm, INTERMITTENT at .025wg per TABLE M1507.4
B. 100cfm+	KITCHEN	Min. 100cfm, INTERMITTENT at .025wg per TBL. M1507.4
		RANGE HOOD or DOWN DRAFT EXHAUST FAN RATED at min. 100cfm, at 0.10wg MAY BE USED FOR EXHAUST FAN REQMT. EXHAUST HOODS IN EXCESS OF 400cfm, SHALL PROVIDE MAKE UP AIR per M1503.4
C. 180cfm+ WHF.	LAUNDRY ROOM	MIN. 180cfm, INTERMITTENT at .025wg TO FUNCTION AS WHOLE HOUSE FAN (WHF.)

MECHANICAL CONTRACTOR TO SIZE WHF, FAN and SET OPERATING TIMER per TABLE M1507.3.3(1) FOR A 3,001-4,500sf. DWELLING w/4-5 BEDRMS, TO OPERATE INTERMITTENTLY and CONTINUOUSLY per TABLE M1507.3.3(2)

PROVIDE CONTROLS FOR WHF, per M1507.3.2 AFFIX LABEL TO CONTROLS THAT READS "WHOLE HOUSE VENTILATION - SEE OPERATING INSTRUCTIONS"

B
A12

SEISMIC
11.2K
11.2K

WIND
14.8K
17.7K

MAIN FLOOR PLAN

1/4" = 1'-0"

SQUARE FOOTAGE SUMMARY

MAIN FLOOR AREA + GARAGE	2,655 S.F.
UPPER FLOOR AREA	2,430 S.F.
TOTAL CONDITIONED AREA	5,085 S.F.
COV'D ENTRY PORCH	201 S.F.
TOTAL AREA UNDER ROOF	5,286 S.F.
DECK	340 S.F.
OVERALL WIDTH	61'-10"
OVERALL DEPTH	60'-11"

Updated : 1/02/2018

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

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

See Sheet "CODES" for additional Zoning required Area Calculations

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

Issue	Issue Date	By	Description

2429 74th Ave SE
Mercer Island, WA

Job Number:

plan name: --
marketing name: VICTORIA - 'B'
plan number: --
mark sys. number: --

02.29.21
Submittal Date

Sheet Title/Description

Design Firm

RCR
Drawn by:

SK
Checked by:

1/4 SCALE
Primary Scale

A4
of: .

Sheet Title/Description

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Project Name: JAYMARC HOMES
PONTE RESIDENCE
M&K Project #: 154-21002
Engineer: RJZ
Date: 25-Jan-21

Shearwall Design Summary

Shearwall 201: 2nd - Side Ext. Wall @ WIC to Bonus

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_o	5.0	ft.		
Wall Length, L	34.0	ft.	Qualifying Wall Length, L	22.0	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
3500 lbs	<	5258 lbs

Shearwall Assembly Specification

P1 - 1-side 7/16" OSB
fastened w/ 8d nails at 6"o.c. panel edges & 12"o.c. panel field - edges blocked
ADEQUATE

Overturning Evaluation:

Resistive DL	134	plf	Overturning Moment	31.9	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	0	lbs	Resistive Moment	36.4	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 202: 2nd - Side Ext. Wall @ Bed 2

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	5.0	ft.		
Wall Length, L	15.3	ft.	Qualifying Wall Length, L	12.3	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
3500 lbs	<	5561 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	31.9	k-ft	Hold Down Design Load	1407	lbs
DL at ends of wall	400	lbs	Resistive Moment	10.3	k-ft	Holdown Capacity	1705	lbs

Hold-down Specification

SIMPSON CS16 STRAP TIE (14" END LENGTH)

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 203: 2ND - REAR EXT. WALL @ MASTER BATH

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	1.5	FT.		
WALL LENGTH, L	16.0	FT.	QUALIFYING WALL LENGTH, L	6.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1400 LBS	<	1434 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	134	PLF	OVERTURNING MOMENT	12.7	K-FT	UPLIFT CONNECTOR DESIGN LOAD	90	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	11.3	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

SHEARWALL 204: 2ND - REAR EXT. WALL @ MASTER BED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	5.0	FT.		
WALL LENGTH, L	18.3	FT.	QUALIFYING WALL LENGTH, L	8.3	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1950 LBS	<	1991 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	406	PLF	OVERTURNING MOMENT	17.7	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1000	LBS	RESISTIVE MOMENT	40.7	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Project Name: JAYMARC HOMES
PONTE RESIDENCE
M&K Project #: 154-21002
Engineer: RJZ
Date: 25-Jan-21

Shearwall Design Summary

Shearwall 205: 2nd - Front Ext. Wall @ Bonus

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	5.0	ft.		
Wall Length, L	12.0	ft.	Qualifying Wall Length, L	7.0	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1100 lbs	<	1673 lbs

Shearwall Assembly Specification

P1 - 1-side 7/16" OSB
fastened w/ 8d nails at 6"o.c. panel edges & 12"o.c. panel field - edges blocked
ADEQUATE

Overturning Evaluation:

Resistive DL	151	plf	Overturning Moment	10.0	k-ft	Uplift Connector Design Load	126	lbs
DL at ends of wall	600	lbs	Resistive Moment	8.5	k-ft	Holdown Capacity	1705	lbs

Hold-down Specification

SIMPSON CS16 STRAP TIE (14" END LENGTH)

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

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	5.0	ft.		
Wall Length, L	14.8	ft.	Qualifying Wall Length, L	9.8	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2550 lbs	<	4433 lbs

Shearwall Assembly Specification

P3 - 1-side 7/16" OSB
fastened w/ 8d nails at 3"o.c. panel edges & 12"o.c. panel field - edges blocked
ADEQUATE

Overturning Evaluation:

Resistive DL	406	plf	Overturning Moment	23.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	23.8	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

WALL HEIGHT, H	0.0	FT.	MAX WALL OPENING HT, H_c	0.0	FT.		
WALL LENGTH, L	0.0	FT.	QUALIFYING WALL LENGTH, L	0.0	FT.	SHEARWALL ASSEMBLY	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	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	0.0	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

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

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 101: 1ST - SIDE EXT. WALL @ GYM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_o	6.0	FT.		
WALL LENGTH, L	16.5	FT.	QUALIFYING WALL LENGTH, L	13.8	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1700 LBS	<	3265 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	234	PLF	OVERTURNING MOMENT	17.0	K-FT	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	18.1	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 102: 1ST - SIDE EXT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	28.0	FT.	QUALIFYING WALL LENGTH, L	28.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2900 LBS	<	6692 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	234	PLF	OVERTURNING MOMENT	29.0	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	48.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 103: 1ST - SIDE EXT. WALL @ STUDY

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	6.0	FT.		
WALL LENGTH, L	15.3	FT.	QUALIFYING WALL LENGTH, L	11.3	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4500 LBS	<	4884 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	426	PLF	OVERTURNING MOMENT	66.6	K-FT	UPLIFT CONNECTOR DESIGN LOAD	2432	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	29.3	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL 104: 1ST - SIDE INT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	18.0	FT.	QUALIFYING WALL LENGTH, L	18.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2100 LBS	<	4302 LBS

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

RESISTIVE DL	130	PLF	OVERTURNING MOMENT	21.0	K-FT	HOLD DOWN DESIGN LOAD	429	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	13.3	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

PROJECT NAME: JAYMARC HOMES
PONTE RESIDENCE
M&K PROJECT #: 154-21002
ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 105: 1ST - REAR EXT. WALL @ GYM TO KITCHEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, H_c	8.0	FT.		
WALL LENGTH, L	28.4	FT.	QUALIFYING WALL LENGTH, L	11.9	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4500 LBS	<	5226 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	391	PLF	OVERTURNING MOMENT	45.0	K-FT	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	79.6	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 106: 1ST - FRONT EXT. WALL @ GUEST SUITE & STUDY

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	FT.	MAX WALL OPENING HT, Hc	8.0	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	6.0	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1050 LBS	<	1315 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	331	PLF	OVERTURNING MOMENT	10.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	13.5	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

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ENGINEER: RJZ
DATE: 25-JAN-21

SHEARWALL DESIGN SUMMARY

SHEARWALL 107: 1ST - REAR INT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	10.0	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
2100 LBS	<	5497 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	385	PLF	OVERTURNING MOMENT	21.0	K-FT	UPLIFT CONNECTOR DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	0	LBS	RESISTIVE MOMENT	47.9	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL XXX: - NOT USED

SHEARWALL PROPERTIES:

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

This Wall in File: p:\client files\154 - jaymarc homes\2021\21002 - pontes residence - mercer island

RetainPro (c) 1987-2019, Build 11.20.03.31
License : KW-06059959
License To : MULHERN & KULP STRUCTURAL ENGINEERING INC

Cantilevered Retaining Wall

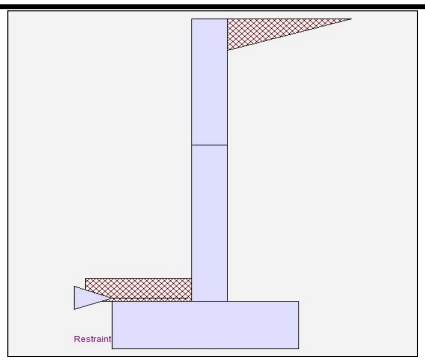
Code: IBC 2015,ACI 318-14,ACI 530-13

Criteria

Retained Height	=	6.00 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	1,500.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	60.0 psf/ft
	=	
Passive Pressure	=	250.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	0.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Service Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Design Summary

Wall Stability Ratios

Overturning	=	1.76	OK
Slab Resists All Sliding !			
Total Bearing Load	=	2,504 lbs	
...resultant ecc.	=	6.04 in	
Soil Pressure @ Toe	=	1,111 psf	OK
Soil Pressure @ Heel	=	82 psf	OK
Allowable	=	1,500 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	1,555 psf	
ACI Factored @ Heel	=	115 psf	
Footing Shear @ Toe	=	7.4 psi	OK
Footing Shear @ Heel	=	12.0 psi	OK
Allowable	=	75.0 psi	

Sliding Calcs

Lateral Sliding Force	=	1,470.0 lbs

Vertical component of active lateral soil pressure IS considered in the calculation of soil bearing pressures.

Load Factors

Building Code	IBC 2015,ACI
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Stem Construction

		2nd	Bottom
		Stem OK	Stem OK
Design Height Above Ftg	ft =	3.33	0.00
Wall Material Above "Ht"	=	Concrete	Concrete
Design Method	=	LRFD	LRFD
Thickness	=	8.00	8.00
Rebar Size	=	# 5	# 5
Rebar Spacing	=	16.00	16.00
Rebar Placed at	=	Edge	Edge
Design Data			
fb/FB + fa/Fa	=	**0.049**	**0.558**
Total Force @ Section			
Service Level	lbs =		
Strength Level	lbs =	342.2	1,728.0
Moment....Actual			
Service Level	ft-# =		
Strength Level	ft-# =	304.5	3,456.0
Moment.....Allowable	ft-# =	6,186.6	6,186.6
Shear.....Actual			
Service Level	psi =		
Strength Level	psi =	4.6	23.3
Shear.....Allowable	psi =	75.0	75.0
Anet (Masonry)	in2 =		
Rebar Depth 'd'	in =	6.19	6.19
Masonry Data			
f'm	psi =		
Fs	psi =		
Solid Grouting	=		
Modular Ratio 'n'	=		
Wall Weight	psf =	100.0	100.0
Short Term Factor	=		
Equiv. Solid Thick.	=		
Masonry Block Type	=	Medium Weight	
Masonry Design Method	=	ASD	
Concrete Data			
f'c	psi =	2,500.0	2,500.0
Fy	psi =	60,000.0	60,000.0

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Cantilevered Retaining Wall

Code: IBC 2015,ACI 318-14,ACI 530-13

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0115 in2/ft		
(4/3) * As :	0.0154 in2/ft	Min Stem T&S Reinf Area 0.513 in2	
200bd/fy : 200(12)(6.1875)/60000 :	0.2475 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1728 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2325 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8382 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.1309 in2/ft		
(4/3) * As :	0.1745 in2/ft	Min Stem T&S Reinf Area 0.639 in2	
200bd/fy : 200(12)(6.1875)/60000 :	0.2475 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.192 in2/ft	
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.1745 in2/ft	#4@ 12.50 in	#4@ 25.00 in
Provided Area :	0.2325 in2/ft	#5@ 19.38 in	#5@ 38.75 in
Maximum Area :	0.8382 in2/ft	#6@ 27.50 in	#6@ 55.00 in

Footing Data

Toe Width	=	1.50 ft
Heel Width	=	2.00
Total Footing Width	=	3.50
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 2,500 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	1,555	115	psf
Mu' : Upward	=	18,219	264	ft-#
Mu' : Downward	=	3,321	1,753	ft-#
Mu: Design	=	1,242	1,489	ft-#
Actual 1-Way Shear	=	7.42	12.03	psi
Allow 1-Way Shear	=	40.00	40.00	psi
Toe Reinforcing	=	None Spec'd		
Heel Reinforcing	=	None Spec'd		
Key Reinforcing	=	None Spec'd		
Footing Torsion, Tu	=	0.00	ft-lbs	
Footing Allow. Torsion, phi Tu	=	0.00	ft-lbs	

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: phiMn = phi'5'lambda'sqrt(fc)'Sm
Heel: phiMn = phi'5'lambda'sqrt(fc)'Sm
Key: No key defined

Min footing T&S reinf Area	0.91	in2
Min footing T&S reinf Area per foot	0.26	in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

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Summary of Overturning & Resisting Forces & Moments

Item	.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#	.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)	1,470.0	2.33	3,430.0			
HL Act Pres (be water tbl)						
Hydrostatic Force						
Buoyant Force =						
Surcharge over Heel =						
Surcharge Over Toe =						
Adjacent Footing Load =						
Added Lateral Load =						
Load @ Stem Above Soil =						
=						
Soil Over HL (ab. water tbl)				880.0	2.83	2,493.3
Soil Over HL (bel. water tbl)					2.83	2,493.3
Watre Table						
Sloped Soil Over Heel =						
Surcharge Over Heel =						
Adjacent Footing Load =						
Axial Dead Load on Stem =						
* Axial Live Load on Stem =						
Soil Over Toe =				82.5	0.75	61.9
Surcharge Over Toe =						
Stem Weight(s) =				600.0	1.83	1,100.0
Earth @ Stem Transitions =						
Footing Weight =				525.0	1.75	918.8
Key Weight =						
Vert. Component =				416.7	3.50	1,458.6
Total =	1,470.0	**O.T.M.** =	3,430.0	**Total =** 2,504.2 lbs	**R.M.=**	6,032.5

Resisting/Overturning Ratio = **1.76**
Vertical Loads used for Soil Pressure = 2,504.2 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.053	in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.