MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

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

CALCULATION PACKAGE

November 20, 2024

Milestone NW

Mercer Island
Lot 2

Mercer Island,
Washington

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Prepared By:

Ryan Chan, E.I.T. *Staff Engineer*

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

Signature, Seal & Date

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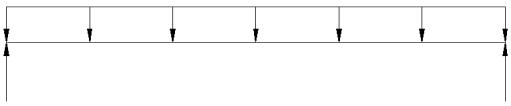
PROJECT NAME: MILESTONE NW
M.I. LOT 2
M&K PROJECT #: 203-24022
ENGINEER: RSC
DATE: 01-Nov-24

BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: TYP. EXT. HDR - H3-1 - ROOF FRAMING

PARAMETERS:

L =	8.25	FT
W =	0.21	KLF
P =	-	K



ANALYSIS:

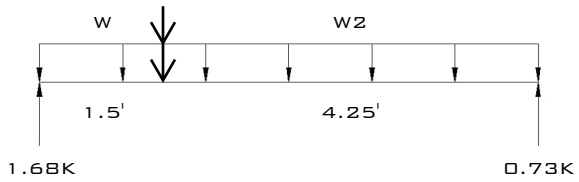
R_{MAX} =	0.87	K	V_D =	-	K	< V_{ALL} = 4.47 K	☑ ADEQUATE
M_{MAX} =	1.79	K-FT	< M_{ALL} =	5.17	K-FT		☑ ADEQUATE
Δ_{TL} =	0.06	IN.	L/	999+	< L/240		☑ ADEQUATE

4x10 DF-L NO. 2

BEAM DESCRIPTION: EXT. HDR @ STAIR - H3-2 - ROOF FRAMING

PARAMETERS:

L =	5.75	FT	
W =	0.34	KLF	W2=0.11KLF
P =	1.43	K	



ANALYSIS:

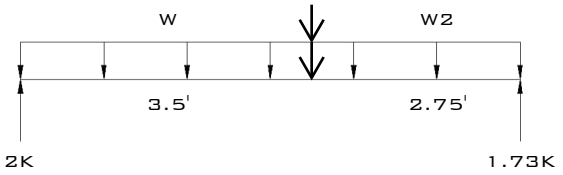
R_{MAX} =	1.68	K	V_D =	-	K	< V_{ALL} = 4.47 K	☑ ADEQUATE
M_{MAX} =	2.14	K-FT	< M_{ALL} =	5.17	K-FT		☑ ADEQUATE
Δ_{TL} =	0.03	IN.	L/	999+	< L/240		☑ ADEQUATE

4x10 DF-L NO. 2

BEAM DESCRIPTION: EXT. HDR @ BED 2 - H3-3 - ROOF FRAMING

PARAMETERS:

L =	6.25	FT	
W =	0.44	KLF	W2=0.12KLF
P =	1.86	K	



ANALYSIS:

R_{MAX} =	2	K	V_D =	-	K	< V_{ALL} = 4.47 K	☑ ADEQUATE
M_{MAX} =	4.31	K-FT	< M_{ALL} =	5.17	K-FT		☑ ADEQUATE
Δ_{TL} =	0.08	IN.	L/	914	< L/240		☑ ADEQUATE

4x10 DF-L NO. 2

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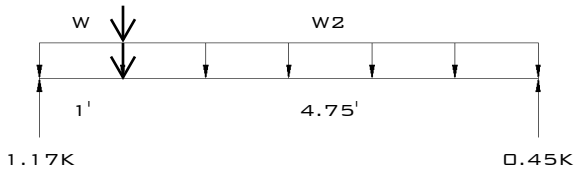
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: EXT. HDR @ PRIMARY BATH - H3-4 - ROOF FRAMING

PARAMETERS:

L =	5.75	FT	
W =	0.26	KLF	W2=0.10KLF
P =	0.88	K	



ANALYSIS:

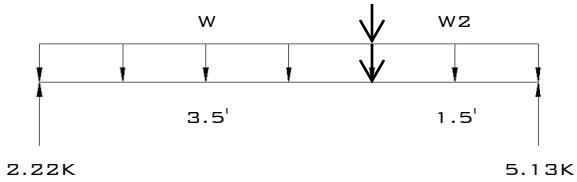
R_{MAX} =	1.17	K	V_D =	-	K	< V_{ALL} =	4.47	K ☑ ADEQUATE
M_{MAX} =	1.01	K-FT	< M_{ALL} =	5.17	K-FT			☑ ADEQUATE
Δ_{TL} =	0.02	IN.	L/	999+	< L/240			☑ ADEQUATE

4x10 DF-L NO. 2

BEAM DESCRIPTION: INT. HDR @ BATH 3 - H3-5 - ROOF FRAMING

PARAMETERS:

L =	5	FT	
W =	0.08	KLF	W2=0.38 KLF
P =	6.5	K	



ANALYSIS:

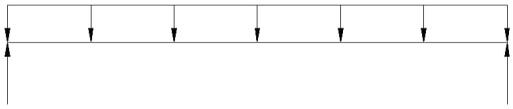
R_{MAX} =	5.13	K	V_D =	-	K	< V_{ALL} =	6.40	K ☑ ADEQUATE
M_{MAX} =	7.28	K-FT	< M_{ALL} =	10.87	K-FT			☑ ADEQUATE
Δ_{TL} =	0.08	IN.	L/	740	< L/240			☑ ADEQUATE

3-1/2"x9" 24F-V4 GLB

BEAM DESCRIPTION: TYP. EXT. HDR - H2-1 - UPPER FLR FRAMING

PARAMETERS:

L =	6.25	FT
W =	0.56	KLF
P =	-	K



ANALYSIS:

R_{MAX} =	1.75	K	V_D =	-	K	< V_{ALL} =	4.47	K ☑ ADEQUATE
M_{MAX} =	2.73	K-FT	< M_{ALL} =	5.17	K-FT			☑ ADEQUATE
Δ_{TL} =	0.05	IN.	L/	999+	< L/240			☑ ADEQUATE

4x10 DF-L NO. 2

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M.I. LOT 2
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ENGINEER: RSC
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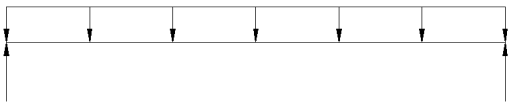
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: EXT. HDR @ DINING - H2-2 - UPPER FLR FRAMING

PARAMETERS:

L =	8.25	FT
W =	0.62	KLF
P =	-	K



ANALYSIS:

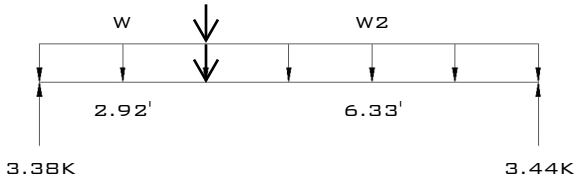
R_{MAX} =	2.56	K	V_D =	-	K	< V_{ALL} = 5.92 K	☑ ADEQUATE
M_{MAX} =	5.27	K-FT	< M_{ALL} =	6.03	K-FT		☑ ADEQUATE
Δ_{TL} =	0.13	IN.	L/	783	< L/240		☑ ADEQUATE

6x10 DF-L NO. 2

BEAM DESCRIPTION: EXT. HDR @ GREAT ROOM - H2-3 - UPPER FLR FRAMING

PARAMETERS:

L =	9.25	FT	
W =	0.51	KLF	W2=0.70KLF
P =	0.9	K	



ANALYSIS:

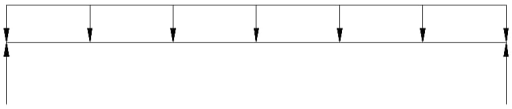
R_{MAX} =	3.44	K	V_D =	-	K	< V_{ALL} = 6.40 K	☑ ADEQUATE
M_{MAX} =	8.45	K-FT	< M_{ALL} =	10.87	K-FT		☑ ADEQUATE
Δ_{TL} =	0.32	IN.	L/	344	< L/240		☑ ADEQUATE

3-1/2"x9" 24F-V4 GLB

BEAM DESCRIPTION: EXT. HDR @ GARAGE - H2-4 - UPPER FLR FRAMING

PARAMETERS:

L =	16.25	FT
W =	0.06	KLF
P =	-	K



ANALYSIS:

R_{MAX} =	0.49	K	V_D =	-	K	< V_{ALL} = 5.43 K	☑ ADEQUATE
M_{MAX} =	1.98	K-FT	< M_{ALL} =	7.00	K-FT		☑ ADEQUATE
Δ_{TL} =	0.14	IN.	L/	999+	< L/240		☑ ADEQUATE

4x12 DF-L NO. 2

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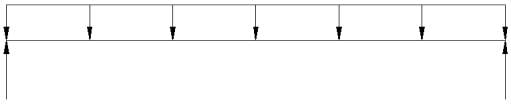
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: INT. HDR @ PANTRY - H2-5 - UPPER FLR FRAMING

PARAMETERS:

L =	2.5	FT
W =	0.99	KLF
P =	-	K



ANALYSIS:

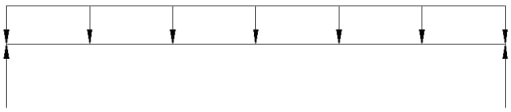
R_{MAX} =	1.24	K	V_D =	-	K	< V_{ALL} =	3.89	K	☑ ADEQUATE
M_{MAX} =	0.77	K-FT	< M_{ALL} =	4.49	K-FT				☑ ADEQUATE
Δ_{TL} =	0.01	IN.	L/	999+	< L/240				☑ ADEQUATE

4x10 DF-L NO. 2

BEAM DESCRIPTION: INT. HDR @ GARAGE - H2-6 - UPPER FLR FRAMING

PARAMETERS:

L =	2.67	FT
W =	0.51	KLF
P =	-	K



ANALYSIS:

R_{MAX} =	0.68	K	V_D =	-	K	< V_{ALL} =	3.89	K	☑ ADEQUATE
M_{MAX} =	0.45	K-FT	< M_{ALL} =	4.49	K-FT				☑ ADEQUATE
Δ_{TL} =	0.01	IN.	L/	999+	< L/240				☑ ADEQUATE

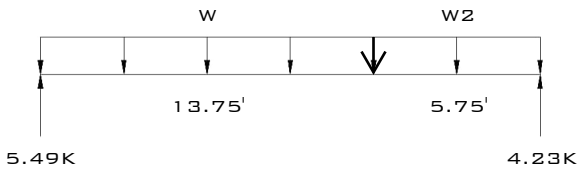
4x10 DF-L NO. 2

BEAM DESCRIPTION: FLUSH BTM BM @ GARAGE - B2-1 - UPPER FLR FRAMING

PARAMETERS:

L =	19.5	FT
W =	0.59	KLF
P =	-	K

W2=0.28KLF



ANALYSIS:

R_{MAX} =	5.49	K	V_D =	-	K	< V_{ALL} =	18.44	K	☑ ADEQUATE
M_{MAX} =	25.54	K-FT	< M_{ALL} =	57.41	K-FT				☑ ADEQUATE
Δ_{TL} =	0.45	IN.	L/	524	< L/240				☑ ADEQUATE

5-1/2"x16-1/2" 24F-V4 GLB

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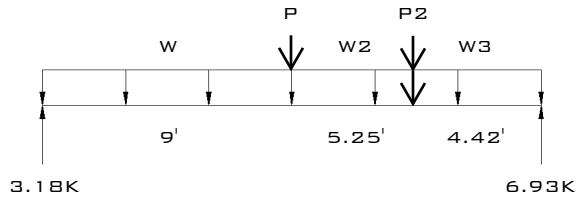
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: FLUSH BM @ GREAT ROOM - B2-2 - UPPER FLR FRAMING

PARAMETERS:

L =	18.67	FT	
W =	0.07	KLF	W2=0.41KLF
P =	2.2	K	P2=5.1K



ANALYSIS:

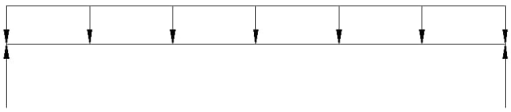
R_{MAX} =	6.93	K	V_D =	-	K	< V_{ALL} = 18.95 K	ADEQUATE
M_{MAX} =	26.66	K-FT	< M_{ALL} =	54.33	K-FT		ADEQUATE
Δ_{TL} =	0.47	IN.	L/	472	< L/240		ADEQUATE

7"x14" PSL (2.2E)

BEAM DESCRIPTION: FLUSH BM @ ENTRY - B2-3 - UPPER FLR FRAMING

PARAMETERS:

L =	8.63	FT
W =	0.32	KLF
P =	-	K



ANALYSIS:

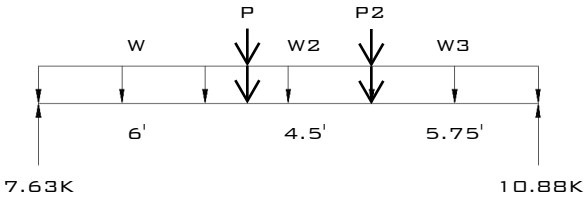
R_{MAX} =	1.38	K	V_D =	-	K	< V_{ALL} = 4.66 K	ADEQUATE
M_{MAX} =	2.98	K-FT	< M_{ALL} =	12.13	K-FT		ADEQUATE
Δ_{TL} =	0.05	IN.	L/	999+	< L/240		ADEQUATE

1-3/4"x14" LVL

BEAM DESCRIPTION: FLUSH BM @ GREAT RM - B2-4 - UPPER FLR FRAMING

PARAMETERS:

L =	16.25	FT	W2=0.81KLF
W =	0.51	KLF	W2=0.75KLF
P =	0.3	K	P2=10.33K



ANALYSIS:

R_{MAX} =	10.88	K	V_D =	-	K	< V_{ALL} = 18.95 K	ADEQUATE
M_{MAX} =	49.81	K-FT	< M_{ALL} =	54.33	K-FT		ADEQUATE
Δ_{TL} =	0.57	IN.	L/	342	< L/240		ADEQUATE

7"x14" PSL (2.2E)

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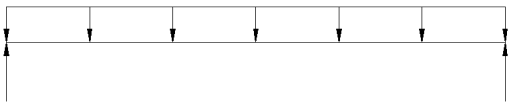
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: DROPPED BM @ COVERED PORCH - B2-5 - UPPER FLR FRAMING

PARAMETERS:

L =	11.83	FT
W =	0.07	KLF
P =	-	K



ANALYSIS:

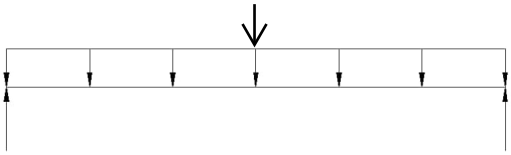
R_{MAX} =	0.41	K	V_D =	-	K	< V_{ALL} = 4.47 K	☑ ADEQUATE
M_{MAX} =	1.22	K-FT	< M_{ALL} =	5.17	K-FT		☑ ADEQUATE
Δ_{TL} =	0.08	IN.	L/	999+	< L/240		☑ ADEQUATE

4x10 DF-L NO. 2

BEAM DESCRIPTION: FLUSH BM @ KITCHEN - B2-6 - UPPER FLR FRAMING

PARAMETERS:

L =	16.33	FT
W =	0.65	KLF
P =	0.62	K



ANALYSIS:

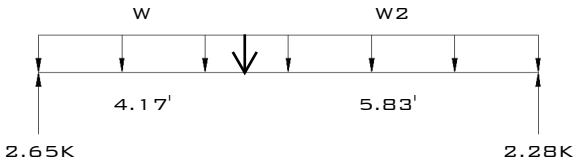
R_{MAX} =	5.62	K	V_D =	-	K	< V_{ALL} = 13.97 K	☑ ADEQUATE
M_{MAX} =	24.16	K-FT	< M_{ALL} =	36.39	K-FT		☑ ADEQUATE
Δ_{TL} =	0.51	IN.	L/	385	< L/240		☑ ADEQUATE

5-1/4"x14" LVL

BEAM DESCRIPTION: FLUSH BM @ COVERED PATIO - B2-7 - UPPER FLR FRAMING

PARAMETERS:

L =	10	FT	
W =	0.58	KLF	W2=0.43KLF
P =	-	K	



ANALYSIS:

R_{MAX} =	2.65	K	V_D =	-	K	< V_{ALL} = 4.66 K	☑ ADEQUATE
M_{MAX} =	6.04	K-FT	< M_{ALL} =	12.13	K-FT		☑ ADEQUATE
Δ_{TL} =	0.14	IN.	L/	839	< L/240		☑ ADEQUATE

1-3/4"x14" LVL

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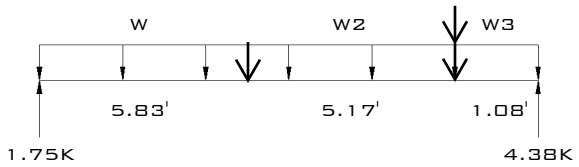
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: FLUSH BM @ COVERED PATIO - B2-8 - UPPER FLR FRAMING

PARAMETERS:

L =	12.08	FT	W3=0.59KLF
W =	0.23	KLF	W2=0.30KLF
P =	2.6	K	



ANALYSIS:

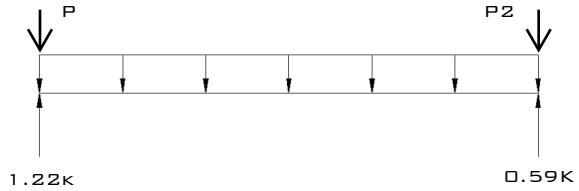
R_{MAX} =	4.38	K	V_D =	-	K	< V_{ALL} = 4.66 K	☑ ADEQUATE
M_{MAX} =	6.58	K-FT	< M_{ALL} =	12.13	K-FT		☑ ADEQUATE
Δ_{TL} =	0.23	IN.	L/	637	< L/240		☑ ADEQUATE

1-3/4"x14" LVL

BEAM DESCRIPTION: FLUSH BM @ COVERED PORCH - B2-9 - UPPER FLR FRAMING

PARAMETERS:

L =	6	FT	
W =	0.06	KLF	
P =	1.04	K	P2=0.41K



ANALYSIS:

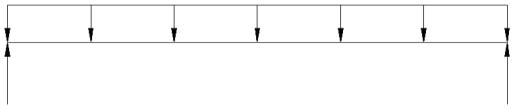
R_{MAX} =	1.22	K	V_D =	-	K	< V_{ALL} = 4.47 K	☑ ADEQUATE
M_{MAX} =	0.27	K-FT	< M_{ALL} =	5.17	K-FT		☑ ADEQUATE
Δ_{TL} =	0.01	IN.	L/	999+	< L/240		☑ ADEQUATE

4x10 DF-L NO. 2

BEAM DESCRIPTION: TYP. EXT. HDR - H1-1 - MAIN FLR FRAMING

PARAMETERS:

L =	5	FT
W =	0.51	KLF
P =	-	K



ANALYSIS:

R_{MAX} =	1.28	K	V_D =	-	K	< V_{ALL} = 3.89 K	☑ ADEQUATE
M_{MAX} =	1.59	K-FT	< M_{ALL} =	4.49	K-FT		☑ ADEQUATE
Δ_{TL} =	0.02	IN.	L/	999+	< L/240		☑ ADEQUATE

4x10 DF-L NO. 2

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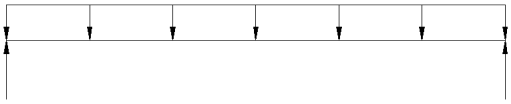
BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: EXT. HDR @ BED 4 - H1-2 - MAIN FLR FRAMING

PARAMETERS:

L =	6	FT
W =	1.13	KLF
P =	-	K



ANALYSIS:

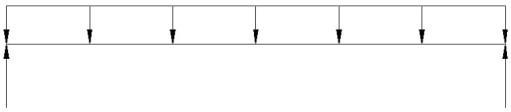
R_{MAX} =	3.39	K	V_D =	-	K	< V_{ALL} = 5.92 K	☑ ADEQUATE
M_{MAX} =	5.09	K-FT	< M_{ALL} =	6.03	K-FT		☑ ADEQUATE
Δ_{TL} =	0.06	IN.	L/	999+	< L/240		☑ ADEQUATE

6x10 DF-L NO. 2

BEAM DESCRIPTION: TYP. INT. HDR - H1-3 - MAIN FLR FRAMING

PARAMETERS:

L =	2.5	FT
W =	0.67	KLF
P =	-	K



ANALYSIS:

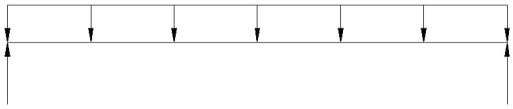
R_{MAX} =	0.84	K	V_D =	-	K	< V_{ALL} = 3.89 K	☑ ADEQUATE
M_{MAX} =	0.52	K-FT	< M_{ALL} =	4.49	K-FT		☑ ADEQUATE
Δ_{TL} =	0.01	IN.	L/	999+	< L/240		☑ ADEQUATE

4x10 DF-L NO. 2

BEAM DESCRIPTION: FLUSH BM @ COVERED PATIO - B1-1 - MAIN FLR FRAMING

PARAMETERS:

L =	4	FT
W =	0.35	KLF
P =	-	K



ANALYSIS:

R_{MAX} =	0.7	K	V_D =	-	K	< V_{ALL} = 4.66 K	☑ ADEQUATE
M_{MAX} =	0.7	K-FT	< M_{ALL} =	12.13	K-FT		☑ ADEQUATE
Δ_{TL} =	0.01	IN.	L/	999+	< L/240		☑ ADEQUATE

1-3/4"x14" LVL

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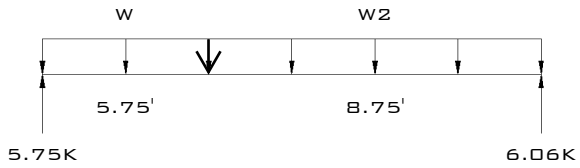
PROJECT NAME: MILESTONE NW
M.I. LOT 2
M&K PROJECT #: 203-24022
ENGINEER: RSC
DATE: 01-Nov-24

BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: FLUSH BM @ PATIO - B1-2 - MAIN FLR FRAMING

PARAMETERS:

L =	14.5	FT	
W =	0.76	KLF	W2=0.85KLF
P =	-	K	



ANALYSIS:

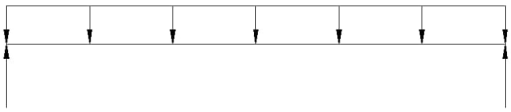
R_{MAX} =	6.06	K	V_D =	-	K	< V_{ALL} = 13.97 K	☑ ADEQUATE
M_{MAX} =	21.60	K-FT	< M_{ALL} =	36.39	K-FT		☑ ADEQUATE
Δ_{TL} =	0.36	IN.	L/	485		< L/240	☑ ADEQUATE

5-1/4"x14" LVL

BEAM DESCRIPTION: FLUSH BM @ STAIR - B1-3 - MAIN FLR FRAMING

PARAMETERS:

L =	3.5	FT
W =	0.73	KLF
P =	-	K



ANALYSIS:

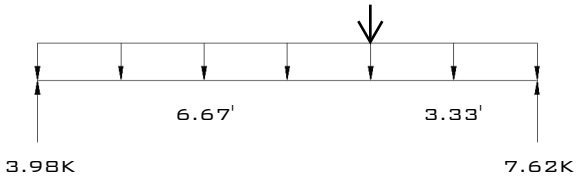
R_{MAX} =	1.28	K	V_D =	-	K	< V_{ALL} = 9.32 K	☑ ADEQUATE
M_{MAX} =	1.12	K-FT	< M_{ALL} =	24.26	K-FT		☑ ADEQUATE
Δ_{TL} =	0.01	IN.	L/	999+		< L/240	☑ ADEQUATE

3-1/2"x14" LVL

BEAM DESCRIPTION: FLUSH BM @ MECH - B1-4 - MAIN FLR FRAMING

PARAMETERS:

L =	10	FT
W =	0.07	KLF
P =	10.9	K



ANALYSIS:

R_{MAX} =	7.62	K	V_D =	-	K	< V_{ALL} = 13.97 K	☑ ADEQUATE
M_{MAX} =	24.98	K-FT	< M_{ALL} =	36.39	K-FT		☑ ADEQUATE
Δ_{TL} =	0.20	IN.	L/	608		< L/240	☑ ADEQUATE

5-1/4"x14" LVL

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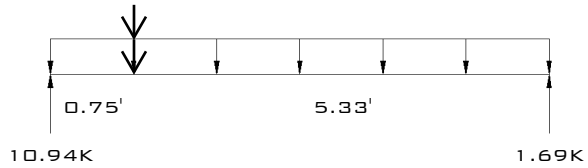
PROJECT NAME: MILESTONE NW
M.I. LOT 2
M&K PROJECT #: 203-24022
ENGINEER: RSC
DATE: 01-Nov-24

BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: FLUSH BM @ BATH 4 - B1-5 - MAIN FLR FRAMING

PARAMETERS:

L =	6.08	FT
W =	0.61	KLF W2=0.07KLF
P =	11.8	K



ANALYSIS:

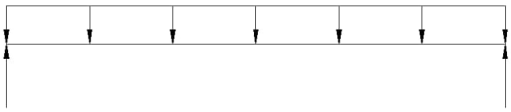
R_{MAX} =	10.94	K	V_D =	7.22	K	< V_{ALL} = 9.31 K	☑ ADEQUATE
M_{MAX} =	7.99	K-FT	< M_{ALL} =	24.26	K-FT		☑ ADEQUATE
Δ_{TL} =	0.03	IN.	L/	999+		< L/240	☑ ADEQUATE

3-1/2"x14" LVL

BEAM DESCRIPTION: FLUSH TOP BM @ PATIO - B1-6 - MAIN FLR FRAMING

PARAMETERS:

L =	10	FT
W =	0.42	KLF
P =	-	K



ANALYSIS:

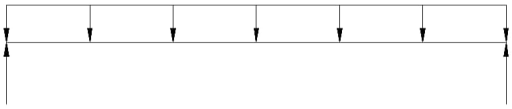
R_{MAX} =	2.1	K	V_D =	-	K	< V_{ALL} = 5.19 K	☑ ADEQUATE
M_{MAX} =	5.25	K-FT	< M_{ALL} =	10.29	K-FT		☑ ADEQUATE
Δ_{TL} =	0.15	IN.	L/	815		< L/240	☑ ADEQUATE

3-1/2"x10-1/2" 24F-V4 GLB P.T.

BEAM DESCRIPTION: TYP. DECK JOIST @ PATIO - J1-1 - MAIN FLR FRAMING

PARAMETERS:

L =	12	FT
W =	0.09	KLF
P =	-	K



ANALYSIS:

R_{MAX} =	0.54	K	V_D =	-	K	< V_{ALL} = 1.35 K	☑ ADEQUATE
M_{MAX} =	1.62	K-FT	< M_{ALL} =	2.06	K-FT		☑ ADEQUATE
Δ_{TL} =	0.18	IN.	L/	794		< L/240	☑ ADEQUATE

2x12 HF NO. 2 P.T.

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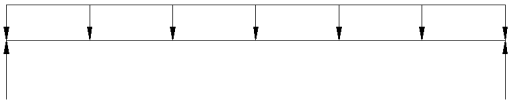
PROJECT NAME: MILESTONE NW
M.I. LOT 2
M&K PROJECT #: 203-24022
ENGINEER: RSC
DATE: 01-Nov-24

BEAM & HEADER CALCULATIONS

BEAM DESCRIPTION: FLUSH BM @ PWDER - B2-10 - UPPER FLR FRAMING

PARAMETERS:

L =	5.83	FT
W =	0.39	KLF
P =	-	K



ANALYSIS:

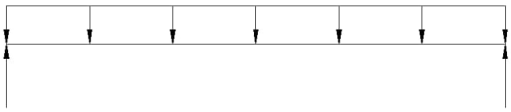
R_{MAX} =	1.14	K	V_D =	-	K	< V_{ALL} = 4.66 K	☑ ADEQUATE
M_{MAX} =	1.66	K-FT	< M_{ALL} =	12.13	K-FT		☑ ADEQUATE
Δ_{TL} =	0.01	IN.	L/	999+	< L/240		☑ ADEQUATE

1-3/4"x14" LVL

BEAM DESCRIPTION: FLUSH BM @ LANDING - B2-11 - UPPER FLR FRAMING

PARAMETERS:

L =	10.17	FT
W =	0.17	KLF
P =	-	K



ANALYSIS:

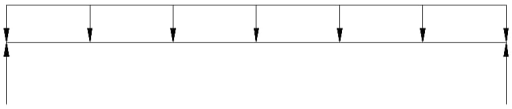
R_{MAX} =	0.86	K	V_D =	-	K	< V_{ALL} = 13.97 K	☑ ADEQUATE
M_{MAX} =	2.20	K-FT	< M_{ALL} =	15.59	K-FT		☑ ADEQUATE
Δ_{TL} =	0.13	IN.	L/	956	< L/240		☑ ADEQUATE

5-1/4"x14" LVL

BEAM DESCRIPTION: FLUSH BM @ DINING - B2-7 - UPPER FLR FRAMING

PARAMETERS:

L =	7.17	FT
W =	0.69	KLF
P =	-	K



ANALYSIS:

R_{MAX} =	2.47	K	V_D =	-	K	< V_{ALL} = 9.31 K	☑ ADEQUATE
M_{MAX} =	4.43	K-FT	< M_{ALL} =	24.26	K-FT		☑ ADEQUATE
Δ_{TL} =	0.03	IN.	L/	999+	< L/240		☑ ADEQUATE

3-1/2"x14" LVL FLUSH

Cantilevered Retaining Wall

Project File: Foundation Retaining.ec6

DESCRIPTION: 10'-3" Crawlspace Wall

Code Reference

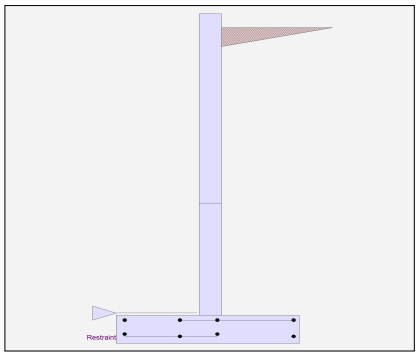
Calculations per IBC 2021 1807.3, ASCE 7-16

Criteria

Retained Height	=	10.25 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	0.00 in
Water table above bottom of footing	=	0.0 ft

Soil Data

Allow Soil Bearing	=	1,500.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 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	=	12.00 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 (Strength 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		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Earth Pressure Seismic Load

Method : Uniform		
Multiplier Used	=	7.000
(Multiplier used on soil density)		
Uniform Seismic Force	=	78.750
Total Seismic Force	=	885.938

Cantilevered Retaining Wall

Project File: Foundation Retaining.ec6

DESCRIPTION: 10'-3" Crawlspace Wall

Design Summary

Wall Stability Ratios

Overturning	=	1.87	OK
Slab Resists All Sliding !			
Global Stability	=	1.43	

Total Bearing Load	=	5,509	lbs
...resultant ecc.	=	10.57	in
Eccentricity within middle third			
Soil Pressure @ Toe	=	1,964	psf NG
Soil Pressure @ Heel	=	39	psf OK
Allowable	=	1,500	psf
Soil Pressure Exceeds Allowable!			
ACI Factored @ Toe	=	2,261	psf
ACI Factored @ Heel	=	45	psf
Footing Shear @ Toe	=	30.2	psi OK
Footing Shear @ Heel	=	34.5	psi OK
Allowable	=	75.0	psi

Sliding Calcs

Lateral Sliding Force	=	2,835.0	lbs

SOIL PRESSURE @ TOE IS ADEQUATE
DUE TO 33% INCREASE TO SOIL BEARING
PRESSURE FROM SEISMIC SURCHARGE

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

Load Factors

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

Stem Construction

		2nd	Bottom		
		Stem OK	Stem OK		
Design Height Above Ftg	ft =	4.00	0.00		
Wall Material Above "Ht"	=	Concrete	Concrete		
Design Method	=	SD	SD	SD	SD
Thickness	=	8.00	8.00		
Rebar Size	=	# 5	# 5		
Rebar Spacing	=	12.00	6.00		
Rebar Placed at	=	6.5 in	6.5 in		
Design Data					
fb/FB + fa/Fa	=	**0.446**	**0.881**		
Total Force @ Section					
Service Level	lbs =				
Strength Level	lbs =	1,585.9	3,748.9		
Moment....Actual					
Service Level	ft-# =				
Strength Level	ft-# =	3,816.7	14,187.8		
Moment.....Allowable	ft-# =	8,557.2	16,093.8		
Shear.....Actual					
Service Level	psi =				
Strength Level	psi =	20.3	48.1		
Shear.....Allowable	psi =	47.5	59.9		
Anet (Masonry)	in2 =				
Wall Weight	psf =	100.0	100.0		
Rebar Depth 'd'	in =	6.50	6.50		

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	2,500.0	2,500.0
Fy	psi =	60,000.0	60,000.0

DESCRIPTION: 10'-3" Crawlspace Wall

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.1372 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@ 13.89 in	#4@ 27.78 in
Provided Area :	0.31 in2/ft	#5@ 21.53 in	#5@ 43.06 in
Maximum Area :	0.8805 in2/ft	#6@ 30.56 in	#6@ 61.11 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.5101 in2/ft		
0.0018bh : 0.0018(12)(8) :	0.1728 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.5101 in2/ft	#4@ 13.89 in	#4@ 27.78 in
Provided Area :	0.62 in2/ft	#5@ 21.53 in	#5@ 43.06 in
Maximum Area :	0.8805 in2/ft	#6@ 30.56 in	#6@ 61.11 in

Footing Data

Toe Width	=	2.50 ft
Heel Width	=	3.00
Total Footing Width	=	5.50
Footing Thickness	=	12.00 in

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	=	2,261	45	psf
Mu' : Upward	=	6,017	977	ft-#
Mu' : Downward	=	563	7,823	ft-#
Mu: Design	=	5,454	6,846	ft-#
φ Mn	=	22,203	13,005	ft-#
Actual 1-Way Shear	=	30.22	34.55	psi
Allow 1-Way Shear	=	54.35	41.60	psi

Toe Reinforcing = # 5 @ 6.00 in
Heel Reinforcing = # 5 @ 12.00 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, φ Tn = 0.00 ft-lbs

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

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area 1.43 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

DESCRIPTION: 10'-3" Crawlspace Wall

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)		2,214.8	3.75	8,305.7	Soil Over HL (ab. water tbl)	2,630.8	4.33	11,400.3
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		4.33	11,400.3
Hydrostatic Force					Water Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=		
Added Lateral Load	=				* Axial Live Load on Stem	=		
Load @ Stem Above Soil	=				Soil Over Toe	=		
Seismic Earth Load	=	620.2	5.63	3,488.4	Surcharge Over Toe	=		
	=				Stem Weight(s)	=	1,075.0	2.83	3,045.8
					Earth @ Stem Transitions	=			
Total	=	2,835.0	**O.T.M.** =	11,794.0	Footing Weight	=	825.0	2.75	2,268.8
					Key Weight	=			
					Vert. Component	=	977.7	5.50	5,377.2
					Total =		5,508.5 lbs	**R.M.=**	22,092.1

Resisting/Overturning Ratio = **1.87**

Vertical Loads used for Soil Pressure = 5,508.5 lbs

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

If seismic is included, the OTM and sliding ratios may be 1.1 per section 1807.2.3 of IBC.

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)	0.107	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.

DESCRIPTION: 10'-3" Crawlspace Wall

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd
Stem Design Height: 4.00 ft above top of footing

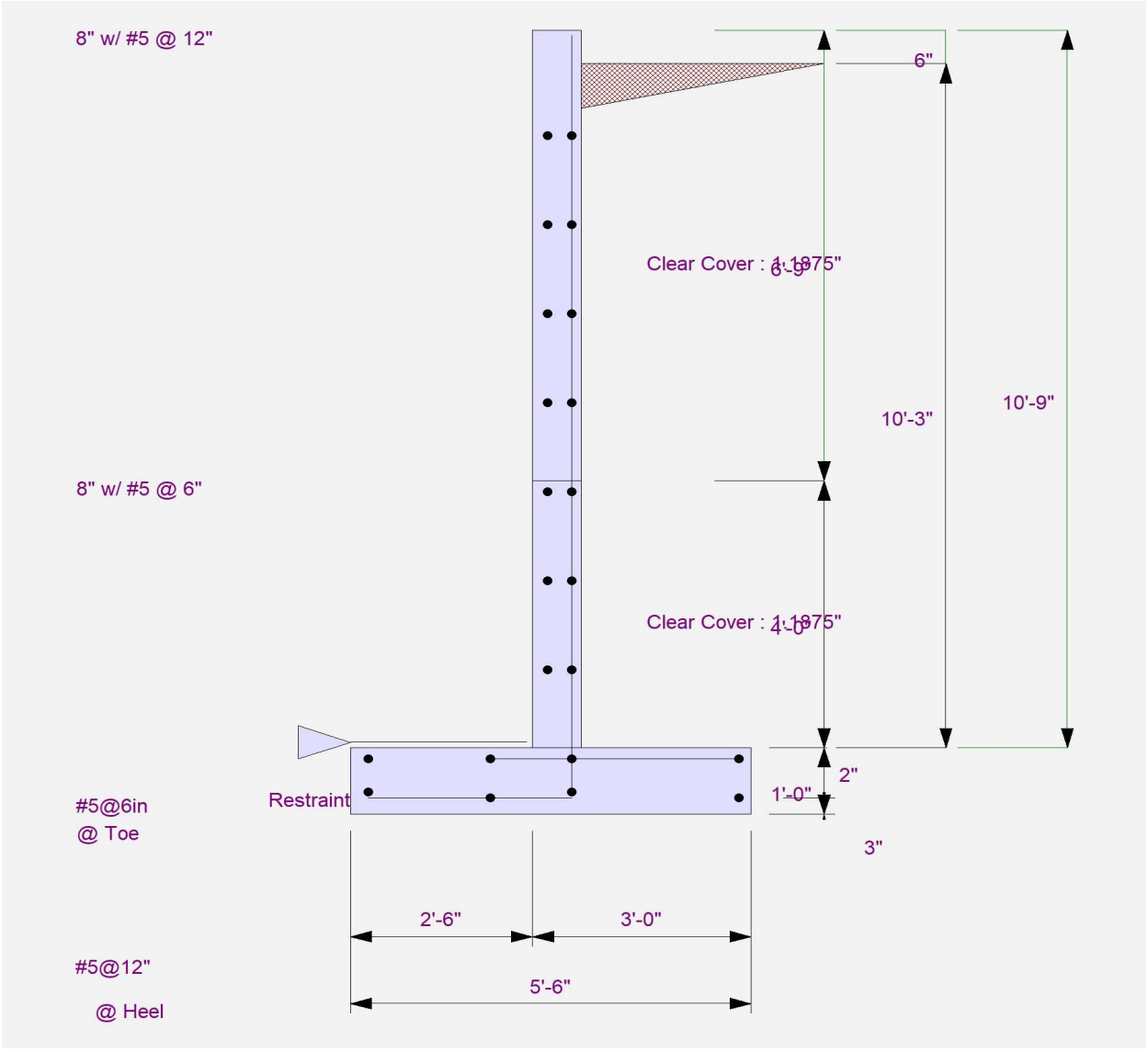
Lap Splice length for #5 bar specified in this stem design segment (25.4.2.4a) =	23.40 in
Development length for #5 bar specified in this stem design segment =	18.00 in

---

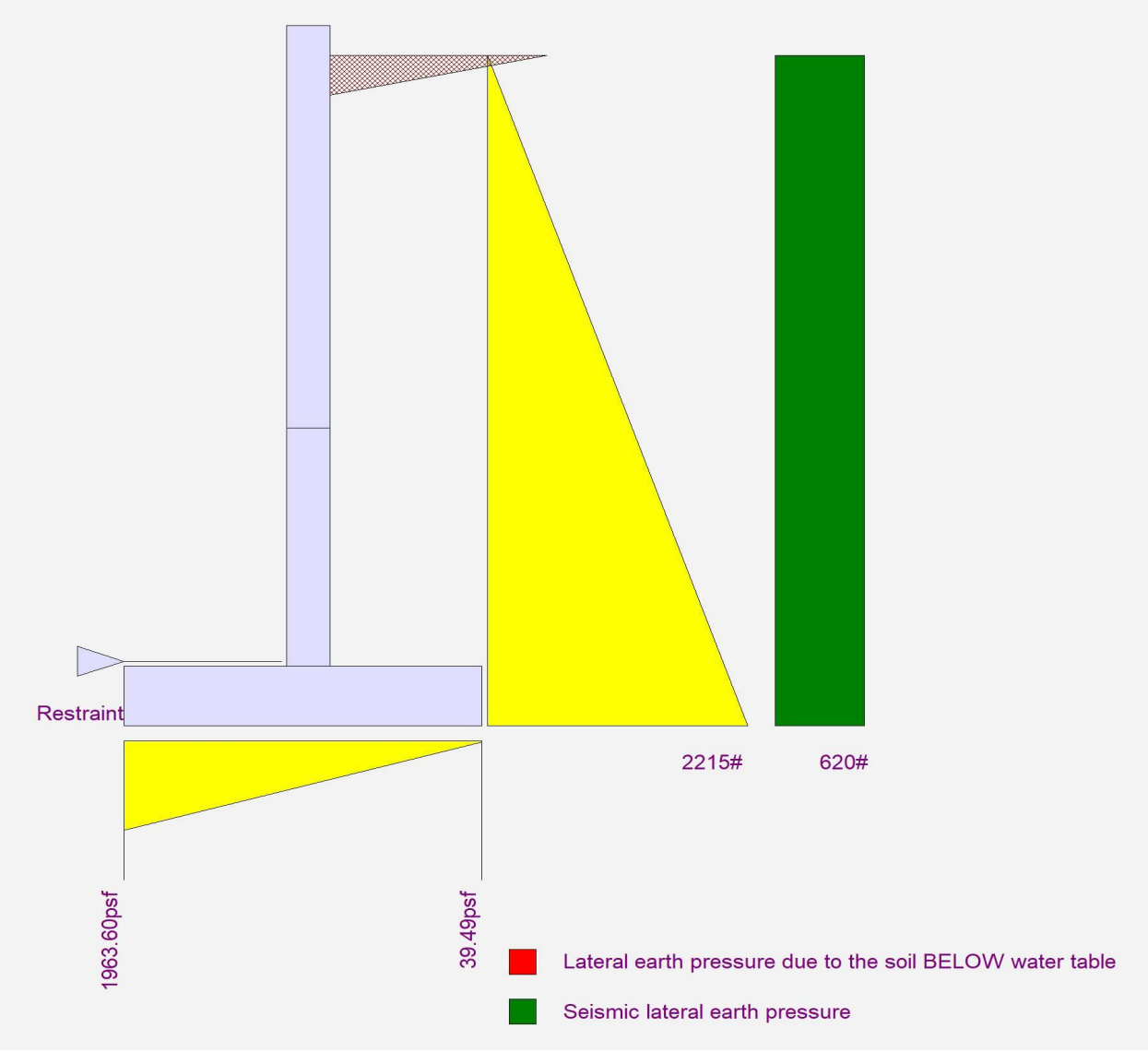
Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.4a) =	23.40 in
Development length for #5 bar specified in this stem design segment =	18.00 in
Hooked embedment length into footing for #5 bar specified in this stem design segment =	6.00 in
As Provided =	0.6200 in2/ft
As Required =	0.5101 in2/ft

DESCRIPTION: 10'-3" Crawlspace Wall



DESCRIPTION: 10'-3" Crawlspace Wall



Cantilevered Retaining Wall

Project File: Foundation Retaining.ec6

DESCRIPTION: 7'-0" Basement Wall

Code Reference

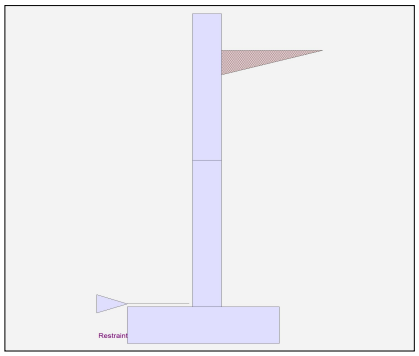
Calculations per IBC 2021 1807.3, ASCE 7-16

Criteria

Retained Height	=	7.00 ft
Wall height above soil	=	1.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	0.00 in
Water table above bottom of footing	=	0.0 ft

Soil Data

Allow Soil Bearing	=	1,500.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 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	=	12.00 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

Earth Pressure Seismic Load

Method : Uniform		
Multiplier Used (Multiplier used on soil density)	=	7.000

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 (Strength Level)	=	0.0 psf
Uniform Seismic Force	=	56.000
Total Seismic Force	=	448.000

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		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Cantilevered Retaining Wall

Project File: Foundation Retaining.ec6

DESCRIPTION: 7'-0" Basement Wall

Design Summary

Wall Stability Ratios

Overturning	=	1.66	OK
Slab Resists All Sliding !			
Global Stability	=	1.59	

Total Bearing Load	=	2,846	lbs
...resultant ecc.	=	9.26	in
Eccentricity outside middle third			
Soil Pressure @ Toe	=	1,940	psf NG
Soil Pressure @ Heel	=	0	psf OK
Allowable	=	1,500	psf
Soil Pressure Exceeds Allowable!			
ACI Factored @ Toe	=	2,244	psf
ACI Factored @ Heel	=	0	psf
Footing Shear @ Toe	=	11.6	psi OK
Footing Shear @ Heel	=	17.0	psi OK
Allowable	=	75.0	psi

Sliding Calcs

Lateral Sliding Force	=	1,433.6	lbs

SOIL PRESSURE @ TOE IS ADEQUATE
DUE TO 33% INCREASE TO SOIL BEARING
PRESSURE FROM SEISMIC SURCHARGE

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

Load Factors

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

Stem Construction

		2nd	Bottom		
		Stem OK	Stem OK		
Design Height Above Ftg	ft =	4.00	0.00		
Wall Material Above "Ht"	=	Concrete	Concrete		
Design Method	=	SD	SD	SD	SD
Thickness	=	8.00	8.00		
Rebar Size	=	# 5	# 5		
Rebar Spacing	=	16.00	16.00		
Rebar Placed at	=	6.5 in	6.5 in		
Design Data					
fb/FB + fa/Fa	=	**0.077**	**0.697**		
Total Force @ Section					
Service Level	lbs =				
Strength Level	lbs =	420.0	1,764.0		
Moment....Actual					
Service Level	ft-# =				
Strength Level	ft-# =	504.0	4,573.3		
Moment.....Allowable	ft-# =	6,513.6	6,561.4		
Shear.....Actual					
Service Level	psi =				
Strength Level	psi =	5.4	22.6		
Shear.....Allowable	psi =	43.2	47.3		
Anet (Masonry)	in2 =				
Wall Weight	psf =	100.0	100.0		
Rebar Depth 'd'	in =	6.50	6.50		

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	2,500.0	3,000.0
Fy	psi =	60,000.0	60,000.0

DESCRIPTION: 7'-0" Basement Wall

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0181 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@ 13.89 in	#4@ 27.78 in
Provided Area :	0.2325 in2/ft	#5@ 21.53 in	#5@ 43.06 in
Maximum Area :	0.8805 in2/ft	#6@ 30.56 in	#6@ 61.11 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.1644 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@ 13.89 in	#4@ 27.78 in
Provided Area :	0.2325 in2/ft	#5@ 21.53 in	#5@ 43.06 in
Maximum Area :	1.0567 in2/ft	#6@ 30.56 in	#6@ 61.11 in

Footing Data

Toe Width	=	1.50 ft
Heel Width	=	2.00
Total Footing Width	=	3.50
Footing Thickness	=	12.00 in

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	=	2,244	0	psf
Mu' : Upward	=	2,094	58	ft-#
Mu' : Downward	=	203	2,036	ft-#
Mu: Design	=	1,892	1,978	ft-#
φ Mn	=	2,500	2,500	ft-#
Actual 1-Way Shear	=	11.62	16.98	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, φ Tn = 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

DESCRIPTION: 7'-0" Basement Wall

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)		1,120.0	2.67	2,986.7	Soil Over HL (ab. water tbl)	1,026.7	2.83	2,908.9
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		2.83	2,908.9
Hydrostatic Force					Water Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=		
Added Lateral Load	=				* Axial Live Load on Stem	=		
Load @ Stem Above Soil	=				Soil Over Toe	=		
Seismic Earth Load	=	313.6	4.00	1,254.4	Surcharge Over Toe	=		
	=				Stem Weight(s)	=	800.0	1.83	1,466.7
					Earth @ Stem Transitions	=		
Total	=	1,433.6	**O.T.M.** =	4,241.1	Footing Weight	=	525.0	1.75	918.8
					Key Weight	=			
					Vert. Component	=	494.4	3.50	1,730.4
					Total =		2,846.1 lbs	**R.M.=**	7,024.7

Resisting/Overturning Ratio = **1.66**

Vertical Loads used for Soil Pressure = 2,846.1 lbs

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

If seismic is included, the OTM and sliding ratios may be 1.1 per section 1807.2.3 of IBC.

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)	0.123	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.

DESCRIPTION: 7'-0" Basement Wall

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd
Stem Design Height: 4.00 ft above top of footing

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.4a) =	23.40 in
Development length for #5 bar specified in this stem design segment =	18.00 in

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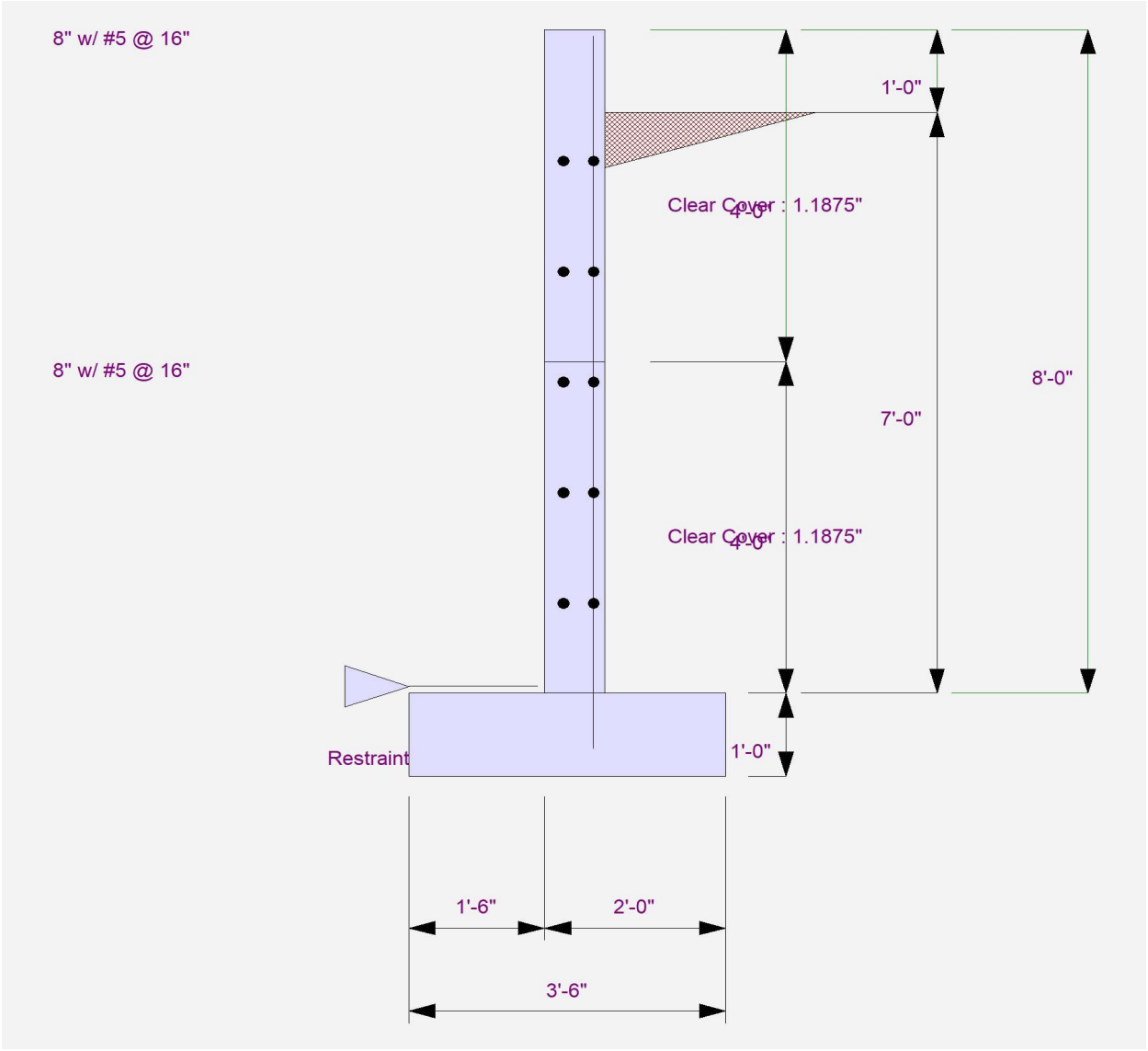
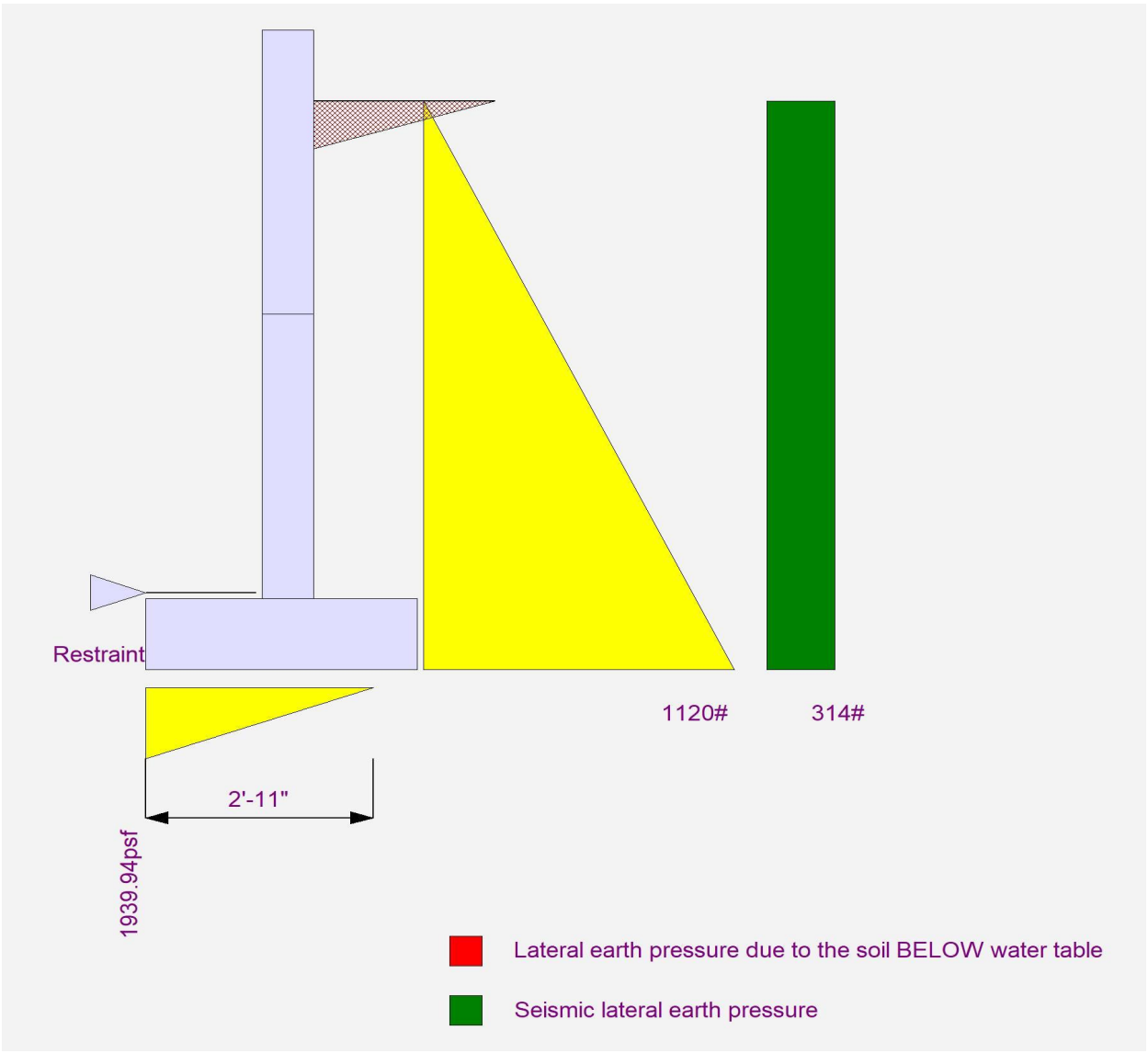
Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.4a) =	21.36 in
Development length for #5 bar specified in this stem design segment =	16.43 in
Hooked embedment length into footing for #5 bar specified in this stem design segment =	6.00 in
As Provided =	0.2325 in2/ft
As Required =	0.2192 in2/ft

DESCRIPTION: 7'-0" Basement Wall



DESCRIPTION: 7'-0" Basement Wall



MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shear Wall Calculations Wind

Milestone NW

Mercer Island Lot 2

Mercer Island, WA

Parameters:

Single Family Home

Design Wind Speed: 110 MPH

Wind Exposure Category: C

Seismic Design Category: D1

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

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Nicholas Martignetti, P.E., Project Manager

Ryan Chan, E.I.T., Staff Engineer

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

WIND DESIGN SUMMARY PER ASCE 7-16

M+K PROJECT #: 203-24022
ENGINEER: RSC

PARAMETERS:

WIND SPEED	100	
EXPOSURE CATEGORY	C	
RISK CATEGORY	II	
WIND DIRECTIONALITY FACTOR, K_D	0.85	
TOPOGRAPHIC FACTOR, K_{zt}	1.00	
GUST FACTOR, G	0.85	
GROUND ELEV. ABOVE SEA LEVEL [FT]	0	
DESIGN TYPE	ASD	0.60

ROOF GEOMETRY:

TRANS. ROOF PITCH	3.0	:12
LONG. ROOF PITCH	3.0	:12
MEAN ROOF HEIGHT, H	31.69	FT

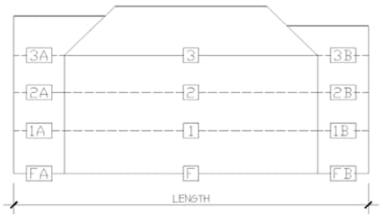
BUILDING GEOMETRY:

LENGTH	48	FT
WIDTH	44	FT
NUMBER OF STORIES	3	

TRANSVERSE DIRECTION (PERPENDICULAR TO MAIN RIDGE LINE)

TRIBUTARY DESIGN AREAS:

DIAPHRAGM LEVEL	FLOOR-TO-FLOOR HEIGHT		SECTION A	SECTION O	SECTION B	
3	8.08 FT	ROOF SURFACE	0	121	0	SQ FT
		WALL SURFACE	0	235	0	SQ FT
2	10.33 FT	ROOF SURFACE	0	0	0	SQ FT
		WALL SURFACE	0	441	0	SQ FT
1	10.33 FT	ROOF SURFACE	0	0	0	SQ FT
		WALL SURFACE	0	376	0	SQ FT
FND		ROOF SURFACE	0	0	0	SQ FT
		WALL SURFACE	0	0	0	SQ FT



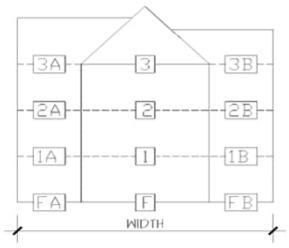
TRIBUTARY DESIGN LOADS: (0.6W)

	SECTION A	SECTION O	SECTION B	
STORY SHEAR	0.00	4.07	0.00	KIPS
TOTAL SHEAR	0.00	4.07	0.00	KIPS
		4.07		KIPS
STORY SHEAR	0.00	5.99	0.00	KIPS
TOTAL SHEAR	0.00	10.05	0.00	KIPS
		10.05		KIPS
STORY SHEAR	0.00	4.91	0.00	KIPS
TOTAL SHEAR	0.00	14.96	0.00	KIPS
		14.96		KIPS
STORY SHEAR	0.00	0.00	0.00	KIPS
TOTAL SHEAR	0.00	14.96	0.00	KIPS
		14.96		KIPS

LONGITUDINAL DIRECTION (PARALLEL TO MAIN RIDGE LINE)

TRIBUTARY DESIGN AREAS:

DIAPHRAGM LEVEL	FLOOR-TO-FLOOR HEIGHT		SECTION A	SECTION O	SECTION B	
3	8.08 FT	ROOF SURFACE	0	88	0	SQ FT
		WALL SURFACE	0	216	0	SQ FT
2	10.33 FT	ROOF SURFACE	0	0	0	SQ FT
		WALL SURFACE	0	404	0	SQ FT
1	10.33 FT	ROOF SURFACE	0	0	0	SQ FT
		WALL SURFACE	0	424	0	SQ FT
FND		ROOF SURFACE	0	0	0	SQ FT
		WALL SURFACE	0	0	0	SQ FT



TRIBUTARY DESIGN LOADS: (0.6W)

	SECTION A	SECTION O	SECTION B	
STORY SHEAR	0.00	3.53	0.00	KIPS
TOTAL SHEAR	0.00	3.53	0.00	KIPS
		3.53		KIPS
STORY SHEAR	0.00	5.39	0.00	KIPS
TOTAL SHEAR	0.00	8.91	0.00	KIPS
		8.91		KIPS
STORY SHEAR	0.00	5.43	0.00	KIPS
TOTAL SHEAR	0.00	14.35	0.00	KIPS
		14.35		KIPS
STORY SHEAR	0.00	0.00	0.00	KIPS
TOTAL SHEAR	0.00	14.35	0.00	KIPS
		14.35		KIPS

SYMBOLS AND LEGEND

- (F) FAN- DIRECT VENT TO OUTSIDE
  - BATHROOMS/LAUNDRY: 50 CFM MIN.
  - KITCHEN EXHAUST HOOD TO BE MIN. OF 1000CFM. IF EXHAUST HOOD EXCEEDS 400 CFM MAKE UP AIR MUST BE PROVIDED PER SECTION M1503.6.
- (WH) WHOLE-HOUSE FAN TO RUN CONTINUOUS 4 CONFORM TO IRC M1505.4 FAN SIZE PER PLAN. FAN RATE TO BE ADJUSTED BY A FACTOR OF 1.5 FOR A NON BALANCED NON DISTRIBUTED SYSTEM. FRESH AIR TO BE PROVIDED BY THE FORCED AIR SYSTEM DUCTS PER SECTION M1505.4.1. FAN TO HAVE A SONE RATING OF 1.0 OR LESS MEASURED AT 0.1 INCHES WATER GAUGE
- (T) THERMOSTAT @ 50" ABOVE FLOOR
- (SD) 110v SMOKE ALARM PER I.R.C. R314 WITH BATTERY BACKUP INTERCONNECTED PER R314.4 & R315.5. USE A COMBINATION SMOKE/CARBON MONOXIDE ALARM WHEN NOTED
- (HD) HEAT DETECTOR OR HEAT ALARM RATED FOR THE AMBIENT OUTDOOR TEMPERATURES & HUMIDITY PER I.R.C. R314.

MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEM FOR UNITS: PER DIV. 15/16 SEE SHEET A1

FURN WH

A. PROVIDE 6" DIAMETER FRESH AIR INTAKE FROM OUTSIDE TO RETURN AIR PLENUM AT FURNACE WITH MOTORIZED FLOW DAMPERS.
B. PROVIDE THERMAL EXPANSION TANK AT WATER HEATER.
C. STRAP WATER HEATER TO FRAMING TOP AND BOTTOM.
D. PROVIDE PRESSURE RELIEF LINE PLUMBED TO OUTSIDE.

15.0K

WIND 14.4K

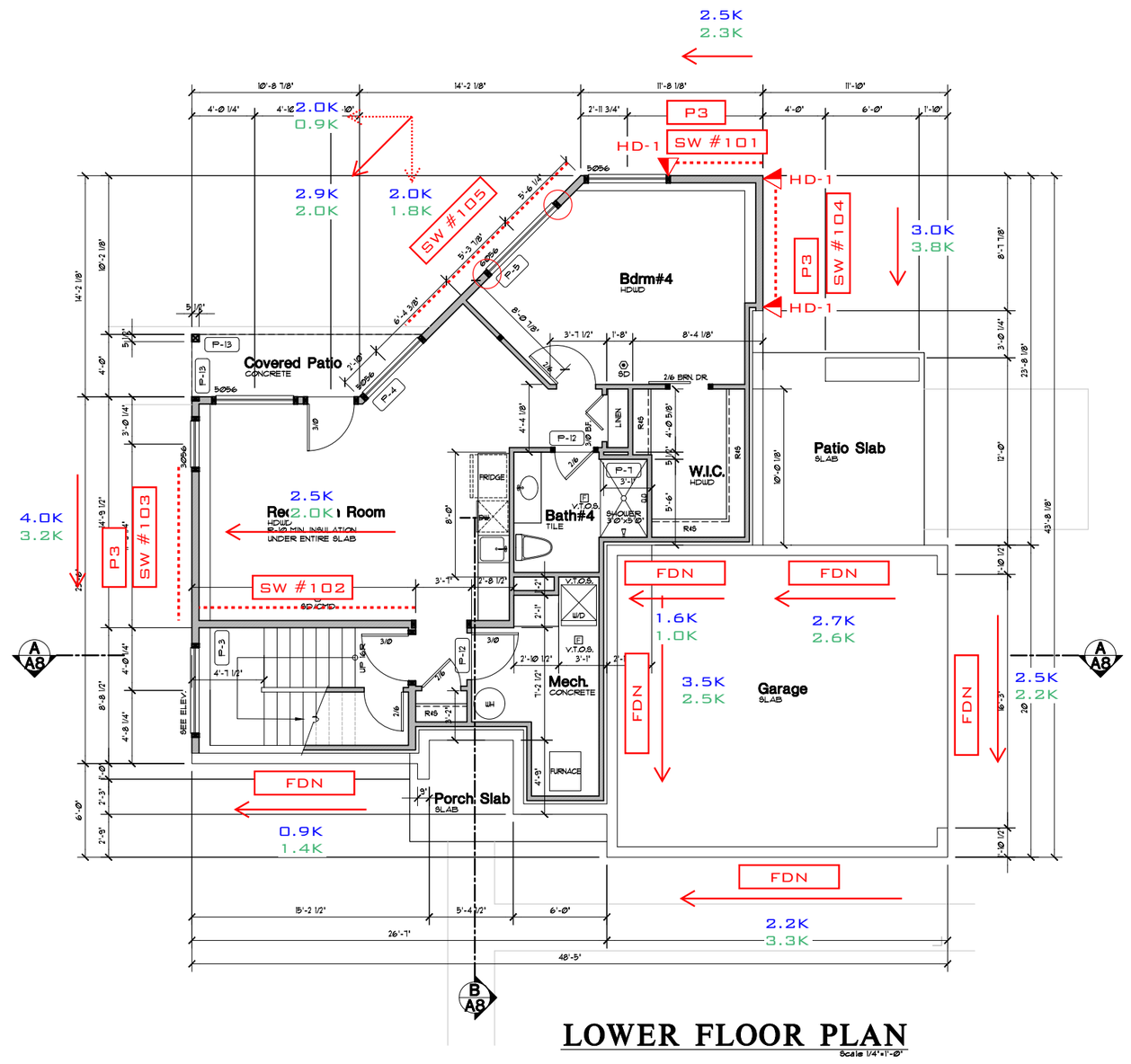
13.5K

LOADS INCREASED BY 30% FOR NON ORTHOGONAL WALLS SEISMIC

13.5K

NON-ORTHOGONAL WALLS:

45 0.71 1.0 0.71



LOWER FLOOR PLAN

Scale 1/4"=1'-0"

GENERAL PLAN NOTES

1. SEE SHEET A-1 FOR ALL GENERAL NOTES AND REQUIREMENTS.
2. ENERGY AND AIR QUALITY INFORMATION SEE DIV. 17 SHEET A-1
3. SEE BUILDING ELEVATION FOR WINDOW OPERATION SEE DIV. 8 SHEET A-1
4. SEE TYP. MATERIALS LIST ON SECTION SHEET
5. SEE SHEET A-1 FOR ALL NOTES AND REQUIREMENTS CONCERNING MECHANICAL, PLUMBING, AND ELECTRICAL.

FLOOR PLAN KEY NOTES

- P-1 OCCUPANCY SEPARATION; APPLY (1) LAYER OF ½" GWB. TO GARAGE SIDE OF RESIDENCE, ATTIC SPACES, AND TO ALL BEAMS AND POSTS SUPPORTING A FLOOR-CEILING ASSEMBLY. APPLY (1) LAYER OF ⅝" TYPE 'X' GWB. TO GARAGE CEILING WHEN UNDER HABITABLE ROOMS. DUCTS THROUGH WALL OR CEILING COMMON TO HOUSE SHALL HAVE MINIMUM 26 GAUGE STEEL SEE DIV. 01.0012.6.A. SHEET A-1.
- P-2 1⅜" MIN. SELF CLOSING SOLID WOOD CORE, HONEY-COMB CORE STEEL, OR 20-MINUTE FIRE RATED DOOR SEE DIV. 01.0012.6.B. SHEET A-1
- P-3 STAIR ASSEMBLY NOTES; PER I.R.C. SECTION R311.7
  - A. HEADROOM MIN. 6'-8" WIDTH MIN. 3'-0".
  - B. TREADS 10" MIN. DEPTH AND MIN. WIDTH OF 36" ABOVE HANDRAIL HEIGHT. RISERS 7¾" MAX. HT. TREAD NOSING TO BE MINIMUM 3/4" AND A MAXIMUM OF 1 1/4" ON STAIRS WITH SOLID RISERS.
  - C. HANDRAIL MIN. 34" TO MAX 38" ABOVE TREAD NOSING. HANDRAIL TYPE 1 CIRCULAR TO HAVE 1¼" MIN TO 2" MAX. CROSS SECTION DIMENSION AND 1 1/2" MIN. CLEAR FROM WALL. RETURN RAIL ENDS. HANDRAILS SHALL BE STRONG ENOUGH TO RESIST A 200 POUND POINT LOAD IN ANY DIRECTION PER I.R.C. TABLE R301.5
  - D. INSTALL FIRE BLOCKING BETWEEN STRINGERS AT THE TOP AND BOTTOM OF EACH RUN PER I.R.C. SECTION R302.11.
  - E. COVER USABLE SPACE UNDER STAIR W/ ½" GWB. PER I.R.C. SECTION R302.7.
  - F. INTERMEDIATE BALUSTERS SHALL BE SPACED W/ LESS THAN 4" BETWEEN BALUSTERS.
  - G. PROVIDE STAIRWAY ILLUMINATION PER I.R.C. SECTION R303.7.

  SEE DIV. 01.0012.7 SHEET A-1.
- P-4 SAFETY GLAZING PER I.R.C. SECTION R308
  - A. WINDOWS WITHIN 18" OF FLOOR
  - B. WINDOWS WITHIN A 24" ARC OF DOORS
  - C. WINDOWS AT TUBS AND SHOWERS
  - D. GLAZING IN DOORS
  - E. LESS THAN 60" HORIZ. FROM THE BOT. STAIR TREAD NOSING, & BOT. EDGE OF GLAZING IS LESS THAN 36" ABV. LANDING/WALKING SURFACE SEE DIV. 08.0800 SHEET A-1
- P-5 EGRESS WINDOW PER I.R.C. SECTION R310 SEE DIV. 08.0600 SHEET A-1
- P-6 IGNITERS FOR GAS FIRED APPLIANCES IN GARAGE TO BE 18" MIN. ABOVE TOP OF SLAB. SEE DIV. 15 SHEET A-1
- P-7 COVER WALLS ADJACENT TO TUBS AND SHOWERS WITH NON-ABSORBENT MATERIAL TO 72" ABOVE DRAIN INLETS, PER I.R.C. SECTION 307.2. SEE DIV. 09.2500 SHEET A-1
- P-8 (2) LAYERS OF FLOOR SHEATHING OVER FRAMING.
- P-9 7¾" MAX. RISER WITH 10" MIN. RUN. IF MORE THAN (3) RISERS, HANDRAIL REQUIRED PER I.R.C. SECTION R311.7.8. SEE DIV. 01.0012.7 SHEET A-1
- P-10 18"x24" CRAWL SPACE ACCESS. INSULATE AND WEATHER STRIP. SEE DIV. 01.0012.1 SHEET A-1
- P-11 22"x30" ATTIC SPACE ACCESS W/ 30" HEAD CLEARANCE. INSULATE AND WEATHER STRIP. SEE DIV. 01.0012.2 SHEET A-1
- P-12 FLOOR MATERIAL BREAK LINE
- P-13 WALL LINE ABOVE
- P-14 WALL LINE BELOW
- P-15 FIREPLACE ASSEMBLY NOTES;
  - A. DIRECT VENT GAS FIREPLACES, MUST BE LISTED, LABELED & INSTALLED PER MFG. SPECIFICATIONS, SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01.0012.12 SHEET A-1
  - B. ZERO CLEARANCE FIREPLACES SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01.0012.12 SHT A-1
  - C. HEARTH SHALL CONFORM TO I.R.C. REQUIREMENT SEE DIV. 01.0012.12
  - D. FIREBLOCK OPENINGS AROUND PENETRATIONS @ EACH FLOOR PER I.R.C. SECTION R1003.19.
  - E. FIREPLACE MUST COMPLY WITH UL 127 TESTING
- P-16 SEE SITE PLAN FOR EXTENT OF WALKS & DRIVEWAYS
- P-17 3" DIAMETER STEEL POST
- P-18 36" GUARDRAIL PER I.R.C. SECTION R312 & TABLE R301.5 CONTRACTOR TO VERIFY TO INSPECTOR THAT ALL GUARDS & RAILINGS ARE CAPABLE OF RESISTING 200lb LOAD ON TOP RAIL ACTING IN ANY DIRECTION.
- P-19 15" VENT FOR MECHANICAL 1" CLEARANCE ALL SIDES PER I.R.C. SECTION R302.11. SEE DIV. 15 SHEET A-1
- P-20 PLANT SHELF
- P-21 UPPER AND LOWER LINEN CABINETS
- P-22 SOFFIT AREA
- P-23 INTEGRATED MAKE UP AIR
- P-24 2x6 STUDS W/ R-21 INSULATION MIN.

Date	By	Description
9/9/24	AG	CONSTRUCTION SET

Milestone NW

Mercer Island Lot 2

TBD SE 22nd ST. Mercer Island, WA 98040

ARCHITECTURAL INNOVATIONS, P.S.
Forward Thinking Design Solutions For Your Environment
14311 SE 16th St
Bellevue, WA 98007
1-800-888-4517
www.kapplerhomeplans.com

TITLE

JOB NO.: 21023.05
STARTING NO.: 21023.05

SHEET

A2.1

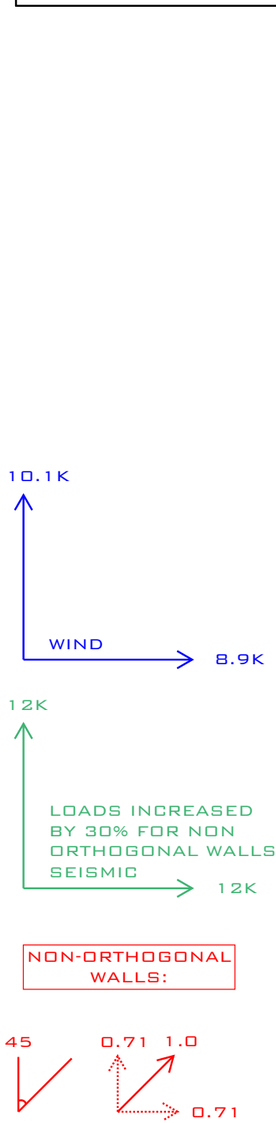
SYMBOLS AND LEGEND

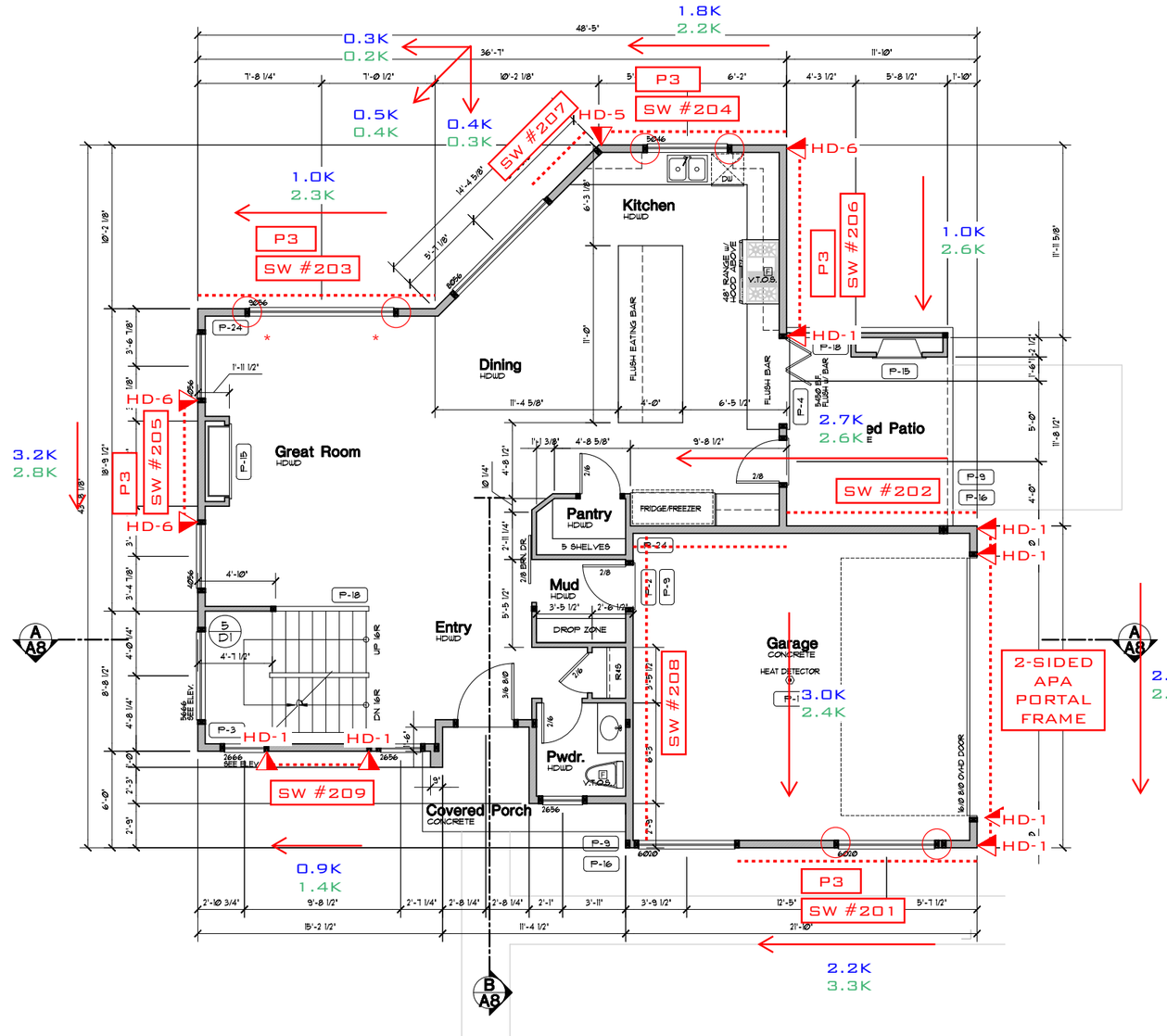
- (F) FAN- DIRECT VENT TO OUTSIDE
  - -BATHROOMS/LAUNDRY: 50 CFM MIN.
  - -KITCHEN EXHAUST HOOD TO BE MIN. OF 1000CFM. IF EXHAUST HOOD EXCEEDS 400 CFM MAKE UP AIR MUST BE PROVIDED PER SECTION M1503.6.
- (WH) WHOLE-HOUSE FAN TO RUN CONTINUOUS & CONFORM TO IRC M1505.4 FAN SIZE PER PLAN. FAN RATE TO BE ADJUSTED BY A FACTOR OF 1.5 FOR A NON BALANCED NON DISTRIBUTED SYSTEM. FRESH AIR TO BE PROVIDED BY THE FORCED AIR SYSTEM DUCTS PER SECTION M1505.4.1. FAN TO HAVE A SONE RATING OF 1.0 OR LESS MEASURED AT 0.1 INCHES WATER GAUGE
- (T) THERMOSTAT @ 50" ABOVE FLOOR
- (SD) 110v SMOKE ALARM PER I.R.C. R314 WITH BATTERY BACKUP INTERCONNECTED PER R314.4 & R315.5. USE A COMBINATION SMOKE/CARBON MONOXIDE ALARM WHEN NOTED
- (HD) HEAT DETECTOR OR HEAT ALARM RATED FOR THE AMBIENT OUTDOOR TEMPERATURES & HUMIDITY PER I.R.C. R314.

MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEM FOR UNITS: PER DIV. 15/16 SEE SHEET A1

FURN. WH

A. PROVIDE 6" DIAMETER FRESH AIR INTAKE FROM OUTSIDE TO RETURN AIR PLENUM AT FURNACE WITH MOTORIZED FLOW DAMPERS.
B. PROVIDE THERMAL EXPANSION TANK AT WATER HEATER.
C. STRAP WATER HEATER TO FRAMING TOP AND BOTTOM.
D. PROVIDE PRESSURE RELIEF LINE PLUMBED TO OUTSIDE.





MAIN FLOOR PLAN

Scale 1/4"=1'-0"

GENERAL PLAN NOTES

1. SEE SHEET A-1 FOR ALL GENERAL NOTES AND REQUIREMENTS.
2. ENERGY AND AIR QUALITY INFORMATION SEE DIV. 17 SHEET A-1
3. SEE BUILDING ELEVATION FOR WINDOW OPERATION SEE DIV. 8 SHEET A-1
4. SEE TYP. MATERIALS LIST ON SECTION SHEET
5. SEE SHEET A-1 FOR ALL NOTES AND REQUIREMENTS CONCERNING MECHANICAL, PLUMBING, AND ELECTRICAL.

FLOOR PLAN KEY NOTES

- P-1 OCCUPANCY SEPARATION: APPLY (1) LAYER OF ½" GWB. TO GARAGE SIDE OF RESIDENCE, ATTIC SPACES, AND TO ALL BEAMS AND POSTS SUPPORTING A FLOOR-CEILING ASSEMBLY. APPLY (1) LAYER OF ⅝" TYPE 'X' GWB. TO GARAGE CEILING WHEN UNDER HABITABLE ROOMS. DUCTS THROUGH WALL OR CEILING COMMON TO HOUSE SHALL HAVE MINIMUM 26 GAUGE STEEL SEE DIV. 01/002.6.A. SHEET A-1.
- P-2 1⅜" MIN. SELF CLOSING SOLID WOOD CORE, HONEY-COMB CORE STEEL, OR 20-MINUTE FIRE RATED DOOR SEE DIV. 01/002.6.B. SHEET A-1
- P-3 STAIR ASSEMBLY NOTES: PER I.R.C. SECTION R311.7
  - A. HEADROOM MIN. 6'-8" WIDTH MIN. 3'-0".
  - B. TREADS 10" MIN. DEPTH AND MIN. WIDTH OF 36" ABOVE HANDRAIL HEIGHT. RISERS 7¾" MAX. HT. TREAD NOSING TO BE MINIMUM 3/4" AND A MAXIMUM OF 1 1/4" ON STAIRS WITH SOLID RISERS.
  - C. HANDRAIL MIN. 34" TO MAX 38" ABOVE TREAD NOSING. HANDRAIL TYPE 1 CIRCULAR TO HAVE 1¼" MIN TO 2" MAX. CROSS SECTION DIMENSION AND 1 1/2" MIN. CLEAR FROM WALL. RETURN RAIL ENDS. HANDRAILS SHALL BE STRONG ENOUGH TO RESIST A 200 POUND POINT LOAD IN ANY DIRECTION PER I.R.C. TABLE R301.5
  - D. INSTALL FIRE BLOCKING BETWEEN STRINGERS AT THE TOP AND BOTTOM OF EACH RUN PER I.R.C. SECTION R302.11.
  - E. COVER USABLE SPACE UNDER STAIR W/ ½" GWB. PER I.R.C. SECTION R302.7.
  - F. INTERMEDIATE BALUSTERS SHALL BE SPACED W/ LESS THAN 4" BETWEEN BALUSTERS.
  - G. PROVIDE STAIRWAY ILLUMINATION PER I.R.C. SECTION R303.7.

  SEE DIV. 01/002.7 SHEET A-1.
- P-4 SAFETY GLAZING PER I.R.C. SECTION R308
  - A. WINDOWS WITHIN 18" OF FLOOR
  - B. WINDOWS WITHIN A 24" ARC OF DOORS
  - C. WINDOWS AT TUBS AND SHOWERS
  - D. GLAZING IN DOORS
  - E. LESS THAN 60" HORIZ. FROM THE BOT. STAIR TREAD NOSING, & BOT. EDGE OF GLAZING IS LESS THAN 36" ABV. LANDING/WALKING SURFACE

  SEE DIV. 08/800 SHEET A-1
- P-5 EGRESS WINDOW PER I.R.C. SECTION R310 SEE DIV. 08/600 SHEET A-1
- P-6 IGNITERS FOR GAS FIRED APPLIANCES IN GARAGE TO BE 18" MIN. ABOVE TOP OF SLAB. SEE DIV. 15 SHEET A-1
- P-7 COVER WALLS ADJACENT TO TUBS AND SHOWERS WITH NON-ABSORBENT MATERIAL TO 72" ABOVE DRAIN INLETS, PER I.R.C. SECTION 307.2. SEE DIV. 03/250 SHEET A-1
- P-8 (2) LAYERS OF FLOOR SHEATHING OVER FRAMING.
- P-9 7¾" MAX. RISER WITH 10" MIN. RUN. IF MORE THAN (3) RISERS, HANDRAIL REQUIRED PER I.R.C. SECTION R311.7.8. SEE DIV. 01/002.7 SHEET A-1
- P-10 18"x24" CRAWL SPACE ACCESS, INSULATE AND WEATHER STRIP. SEE DIV. 01/002.1 SHEET A-1
- P-11 22"x30" ATTIC SPACE ACCESS W/ 30" HEAD CLEARANCE. INSULATE AND WEATHER STRIP. SEE DIV. 01/002.2 SHEET A-1
- P-12 FLOOR MATERIAL BREAK LINE
- P-13 WALL LINE ABOVE
- P-14 WALL LINE BELOW
- P-15 FIREPLACE ASSEMBLY NOTES:
  - A. DIRECT VENT GAS FIREPLACES, MUST BE LISTED, LABELED & INSTALLED PER MFG. SPECIFICATIONS, & SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01/002.12 SHEET A-1
  - B. ZERO CLEARANCE FIREPLACES SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01/002.12 SHT A-1
  - C. HEARTH SHALL CONFORM TO I.R.C. REQUIREMENT SEE DIV. 01/002.12
  - D. FIREBLOCK OPENINGS AROUND PENETRATIONS @ EACH FLOOR PER I.R.C. SECTION R1003.19.
  - E. FIREPLACE MUST COMPLY WITH UL 127 TESTING
- P-16 SEE SITE PLAN FOR EXTENT OF WALKS & DRIVEWAYS
- P-17 3" DIAMETER STEEL POST
- P-18 36" GUARDRAIL PER I.R.C. SECTION R312 & TABLE R301.5 CONTRACTOR TO VERIFY TO INSPECTOR THAT ALL GUARDS & RAILINGS ARE CAPABLE OF RESISTING 200lb LOAD ON TOP RAIL ACTING IN ANY DIRECTION.
- P-19 'B' VENT FOR MECHANICAL. 1" CLEARANCE ALL SIDES PER I.R.C. SECTION R302.11. SEE DIV. 15 SHEET A-1
- P-20 PLANT SHELF
- P-21 UPPER AND LOWER LINEN CABINETS
- P-22 SOFFIT AREA
- P-23 INTEGRATED MAKE UP AIR
- P-24 2x6 STUDS W/ R-21 INSULATION MIN.

SQUARE FOOTAGE

MAIN FLOOR	1060 SF
UPPER FLOOR	1381 SF
LOWER	965 SF
TOTAL	3406 SF
GARAGE	424 SF
COV'D PORCH	28 SF
COV'D PATIO	51/120 SF

SQUARE FOOTAGE IS MEASURED TO THE OUTSIDE FACE OF WALLS. STAIRS ARE COUNTED ONCE IN CALCULATIONS, OPEN TO BELOW SPACES AND GARAGES ARE NOT INCLUDED IN CALCULATIONS.

Date	By	Description
9/9/24	AG	CONSTRUCTION SET

Milestone NW

Mercer Island Lot 2

TBD SE 22nd ST. Mercer Island, WA 98040

ARCHITECTURAL INNOVATIONS, P.S.
Forward Thinking Design Solutions For Your Environment
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Bellevue, WA 98007
1-800-888-4517
www.kanplehomeplans.com

TITLE

JOB NO.: 21023.05
STARTING NO.: 21023.03

SHEET

A3

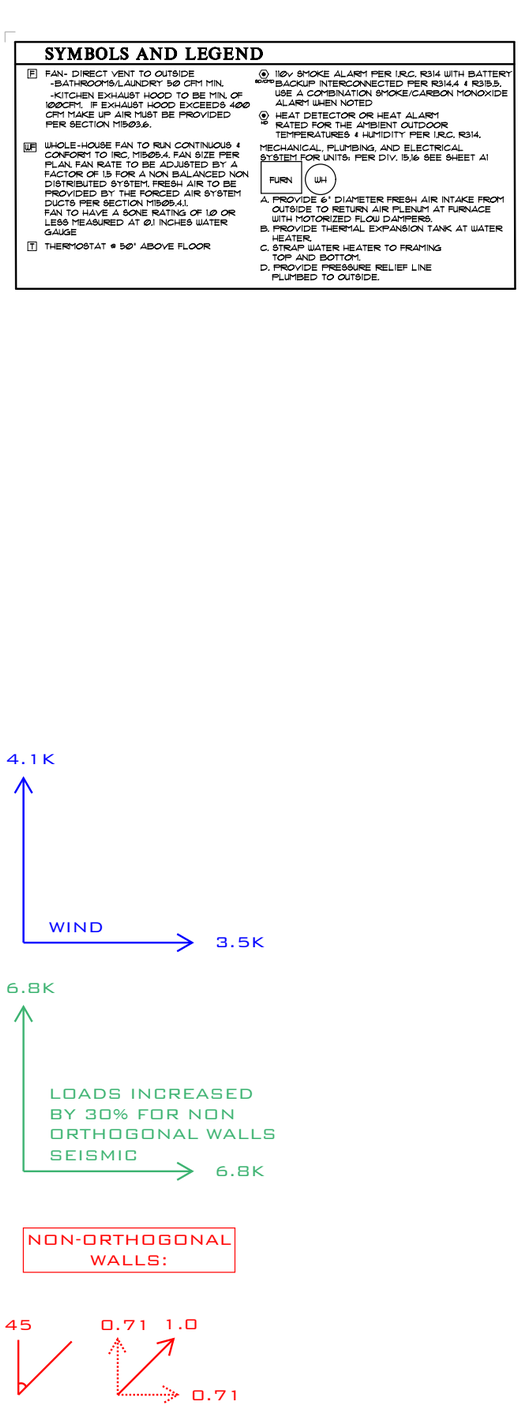
SYMBOLS AND LEGEND

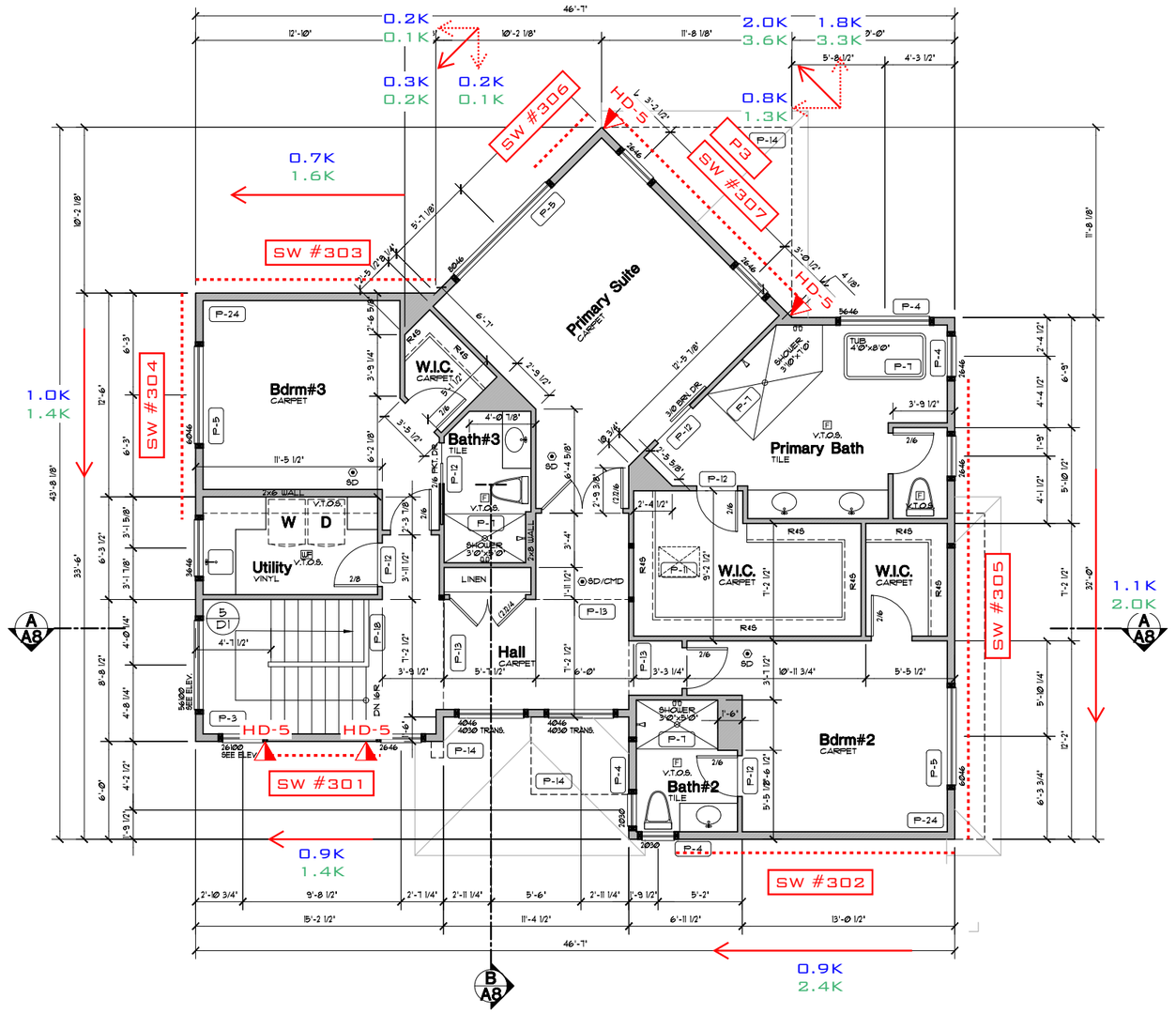
- (F) FAN- DIRECT VENT TO OUTSIDE
  - -BATHROOMS/LAUNDRY 50 CFM MIN.
  - -KITCHEN EXHAUST HOOD TO BE MIN. OF 1000CFM. IF EXHAUST HOOD EXCEEDS 400 CFM MAKE UP AIR MUST BE PROVIDED PER SECTION M1503.6.
- (WF) WHOLE-HOUSE FAN TO RUN CONTINUOUS @ COMFORT TO IRC M1505.4 FAN SIZE PER PLAN. FAN RATE TO BE ADJUSTED BY A FACTOR OF 1.5 FOR A NON BALANCED NON DISTRIBUTED SYSTEM. FRESH AIR TO BE PROVIDED BY THE FORCED AIR SYSTEM DUCTS PER SECTION M1505.4.1. FAN TO HAVE A SONE RATING OF 1.0 OR LESS MEASURED AT 0.1 INCHES WATER GAUGE
- (T) THERMOSTAT @ 50" ABOVE FLOOR
- (SD) 110v SMOKE ALARM PER I.R.C. R314 WITH BATTERY BACKUP INTERCONNECTED PER R314.4 & R315.5. USE A COMBINATION SMOKE/CARBON MONOXIDE ALARM WHEN NOTED
- (HD) HEAT DETECTOR OR HEAT ALARM RATED FOR THE AMBIENT OUTDOOR TEMPERATURES & HUMIDITY PER I.R.C. R314.

MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEM FOR UNITS: PER DIV. 15/16 SEE SHEET A1

FURN. WH

A. PROVIDE 6" DIAMETER FRESH AIR INTAKE FROM OUTSIDE TO RETURN AIR PLENUM AT FURNACE WITH MOTORIZED FLOW DAMPERS.
B. PROVIDE THERMAL EXPANSION TANK AT WATER HEATER.
C. STRAP WATER HEATER TO FRAMING TOP AND BOTTOM.
D. PROVIDE PRESSURE RELIEF LINE PLUMBED TO OUTSIDE.





UPPER FLOOR PLAN

Scale 1/4"=1'-Ø"

GENERAL PLAN NOTES

1. SEE SHEET A-1 FOR ALL GENERAL NOTES AND REQUIREMENTS.
2. ENERGY AND AIR QUALITY INFORMATION SEE DIV. 17 SHEET A-1
3. SEE BUILDING ELEVATION FOR WINDOW OPERATION SEE DIV. 8 SHEET A-1
4. SEE TYP. MATERIALS LIST ON SECTION SHEET
5. SEE SHEET A-1 FOR ALL NOTES AND REQUIREMENTS CONCERNING MECHANICAL, PLUMBING, AND ELECTRICAL.

FLOOR PLAN KEY NOTES

- P-1 OCCUPANCY SEPARATION: APPLY (1) LAYER OF ½" GWB. TO GARAGE SIDE OF RESIDENCE, ATTIC SPACES, AND TO ALL BEAMS AND POSTS SUPPORTING A FLOOR-CEILING ASSEMBLY. APPLY (1) LAYER OF ⅝" TYPE 'X' GWB. TO GARAGE CEILING WHEN UNDER HABITABLE ROOMS. DUCTS THROUGH WALL OR CEILING COMMON TO HOUSE SHALL HAVE MINIMUM 26 GAUGE STEEL SEE DIV. 01002.6.A. SHEET A-1.
- P-2 1⅜" MIN. SELF CLOSING SOLID WOOD CORE, HONEY-COMB CORE STEEL, OR 20-MINUTE FIRE RATED DOOR. SEE DIV. 01002.6.B. SHEET A-1
- P-3 STAIR ASSEMBLY NOTES: PER I.R.C. SECTION R311.7
  - A. HEADROOM MIN. 6'-8" WIDTH MIN. 3'-0".
  - B. TREADS 10" MIN. DEPTH AND MIN. WIDTH OF 36" ABOVE HANDRAIL HEIGHT. RISERS 7¾" MAX. HT. TREAD NOSING TO BE MINIMUM 3/4" AND A MAXIMUM OF 1 1/4" ON STAIRS WITH SOLID RISERS.
  - C. HANDRAIL MIN. 34" TO MAX 38" ABOVE TREAD NOSING. HANDRAIL TYPE I CIRCULAR TO HAVE 1¼" MIN TO 2" MAX. CROSS SECTION DIMENSION AND 1 1/2" MIN. CLEAR FROM WALL. RETURN RAIL ENDS. HANDRAILS SHALL BE STRONG ENOUGH TO RESIST A 200 POUND POINT LOAD IN ANY DIRECTION PER I.R.C. TABLE R301.5
  - D. INSTALL FIRE BLOCKING BETWEEN STRINGERS AT THE TOP AND BOTTOM OF EACH RUN PER I.R.C. SECTION R302.11.
  - E. COVER USABLE SPACE UNDER STAIR W/ ½" GWB. PER I.R.C. SECTION R302.7.
  - F. INTERMEDIATE BALUSTERS SHALL BE SPACED W/ LESS THAN 4" BETWEEN BALUSTERS.
  - G. PROVIDE STAIRWAY ILLUMINATION PER I.R.C. SECTION R303.7.

  SEE DIV. 01002.7 SHEET A-1.
- P-4 SAFETY GLAZING PER I.R.C. SECTION R308
  - A. WINDOWS WITHIN 18" OF FLOOR
  - B. WINDOWS WITHIN A 24" ARC OF DOORS
  - C. WINDOWS AT TUBS AND SHOWERS
  - D. GLAZING IN DOORS
  - E. LESS THAN 60" HORIZ. FROM THE BOT. STAIR TREAD NOSING, & BOT. EDGE OF GLAZING IS LESS THAN 36" ABV. LANDING/WALKING SURFACE

  SEE DIV. 08800 SHEET A-1
- P-5 EGRESS WINDOW PER I.R.C. SECTION R310 SEE DIV. 08600 SHEET A-1
- P-6 IGNITERS FOR GAS FIRED APPLIANCES IN GARAGE TO BE 18" MIN. ABOVE TOP OF SLAB. SEE DIV. 15 SHEET A-1
- P-7 COVER WALLS ADJACENT TO TUBS AND SHOWERS WITH NON-ABSORBENT MATERIAL TO 72" ABOVE DRAIN INLETS, PER I.R.C. SECTION 307.2. SEE DIV. 09250 SHEET A-1
- P-8 (2) LAYERS OF FLOOR SHEATHING OVER FRAMING.
- P-9 7¾" MAX. RISER WITH 10" MIN. RUN. IF MORE THAN (3) RISERS, HANDRAIL REQUIRED PER I.R.C. SECTION R311.7.8. SEE DIV. 01002.7 SHEET A-1
- P-10 18"x24" CRAWL SPACE ACCESS. INSULATE AND WEATHER STRIP. SEE DIV. 01002.1 SHEET A-1
- P-11 22"x30" ATTIC SPACE ACCESS W/ 30" HEAD CLEARANCE. INSULATE AND WEATHER STRIP. SEE DIV. 01002.2 SHEET A-1
- P-12 FLOOR MATERIAL BREAK LINE
- P-13 WALL LINE ABOVE
- P-14 WALL LINE BELOW
- P-15 FIREPLACE ASSEMBLY NOTES:
  - A. DIRECT VENT GAS FIREPLACES, MUST BE LISTED, LABELED &INSTALLED PER MFG. SPECIFICATIONS, &HALL CONFORM TO I.R.C.REQUIREMENTS. SEE DIV. 01002.12 SHEET A-1
  - B. ZERO CLEARANCE FIREPLACES SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01002.12 SHT A-1
  - C. HEARTH SHALL CONFORM TO I.R.C REQUIREMENT SEE DIV. 01002.12
  - D. FIREBLOCK OPENINGS AROUND PENETRATIONS @ EACH FLOOR PER I.R.C. SECTION R1003.19.
  - E. FIREPLACE MUST COMPLY WITH UL 127 TESTING
- P-16 SEE SITE PLAN FOR EXTENT OF WALKS & DRIVEWAYS
- P-17 3" DIAMETER STEEL POST
- P-18 36" GUARDRAIL PER I.R.C. SECTION R312 & TABLE R301.5 CONTRACTOR TO VERIFY TO INSPECTOR THAT ALL GUARDS & RAILINGS ARE CAPABLE OF RESISTING 200lbs LOAD ON TOP RAIL ACTING IN ANY DIRECTION.
- P-19 "B" VENT FOR MECHANICAL, 1" CLEARANCE ALL SIDES PER I.R.C. SECTION R1003.11. SEE DIV. 15 SHEET A-1
- P-20 PLANT SHELF
- P-21 UPPER AND LOWER LINEN CABINETS
- P-22 SOFFIT AREA
- P-23 INTEGRATED MAKE UP AIR
- P-24 2x6 STUDS W/ R-21 INSULATION MIN.

Date	By	Description
9/9/24	AG	CONSTRUCTION SET

Milestone NW

Mercer Island Lot 2

TBD SE 22nd ST. Mercer Island, WA 98040

ARCHITECTURAL INNOVATIONS, P.S.
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1-800-888-4517
www.kanglerhomeplans.com

TITLE

JOB NO.: 21023.05
STARTING NO.: 21023.03

SHEET
A5

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 301: 3rd - Front Ext. B.F. Wall @ Stair

Shearwall Properties:

Wall height, H	13.3	ft.	Max wall opening ht, H_o	0.0	ft.		
Wall Length, L	7.3	ft.	Qualifying Wall Length, L	7.3	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
900 lbs	<	2435 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	160	plf	Overturning Moment	12.0	k-ft	Hold Down Design Load	953	lbs
DL at ends of wall	200	lbs	Resistive Moment	5.1	k-ft	Holdown Capacity	1705	lbs

Hold-down Specification

SIMPSON CS16 STRAP TIE (14" END LENGTH)

Shearwall 302: 3rd - Front Ext. Wall @ Bath 2 - Bed 2

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	17.3	ft.	Qualifying Wall Length, L	17.3	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
900 lbs	<	5793 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	200	plf	Overturning Moment	8.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	200	lbs	Resistive Moment	29.9	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 303: 3rd - Rear Ext. Wall Bed 3

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_o	0.0	ft.		
Wall Length, L	14.7	ft.	Qualifying Wall Length, L	14.7	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
700 lbs	<	4950 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	147	plf	Overturning Moment	6.4	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	19.7	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 304: 3rd - Side Ext. Wall @ Bed 3

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	4.5	ft.		
Wall Length, L	13.9	ft.	Qualifying Wall Length, L	7.9	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1000 lbs	<	2649 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	147	plf	Overturning Moment	9.1	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	451	lbs	Resistive Moment	18.4	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 305: 3rd - Side Ext. Wall @ Primary bath - Bed 2

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	4.5	ft.		
Wall Length, L	28.4	ft.	Qualifying Wall Length, L	19.9	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1100 lbs	<	6672 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	163	plf	Overturning Moment	10.0	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	200	lbs	Resistive Moment	64.1	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 306: 3rd - Side Ext. Wall @ Primary Suite

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	4.8	ft.	Qualifying Wall Length, L	4.8	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
300 lbs	<	1612 lbs

Shearwall Assembly Specification

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

Overturning Evaluation:

Resistive DL	120	plf	Overturning Moment	2.7	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	3.0	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 307: 3rd - Side Ext. Wall @ Primary Suite

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	4.5	ft.		
Wall Length, L	16.5	ft.	Qualifying Wall Length, L	11.6	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2000 lbs	<	7291 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	170	plf	Overturning Moment	18.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	415	lbs	Resistive Moment	27.0	k-ft	Holdown Capacity	1705	lbs

Hold-down Specification

No Holdown Required

Shearwall : Basement - Not Used

Shearwall Properties:

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

Capacity Evaluation:

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

Shearwall Assembly Specification

P0 - 1-side 7/16" OSB
fastened w/ 8d nails at 6"o.c. panel edges & 12"o.c. panel field - UNBLOCKED
#DIV/0!

Overturning Evaluation:

Resistive DL	0	plf	Overturning Moment	#DIV/0!	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	0	lbs	Resistive Moment	0.0	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 201: 2ND - FRONT EXT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_o	2.0	FT.		
WALL LENGTH, L	15.0	FT.	QUALIFYING WALL LENGTH, L	9.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2200 LBS	<	5697 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	417	PLF	OVERTURNING MOMENT	20.0	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	58.7	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 202: 2ND - REAR EXT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	21.4	FT.	QUALIFYING WALL LENGTH, L	21.4	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2700 LBS	<	7176 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	340	PLF	OVERTURNING MOMENT	24.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	85.3	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 203: 2ND - REAR EXT. WALL @ GREAT ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	5.5	FT.		
WALL LENGTH, L	14.8	FT.	QUALIFYING WALL LENGTH, L	5.7	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1000 LBS	<	3586 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	386	PLF	OVERTURNING MOMENT	15.4	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	48.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 204: 2ND - REAR EXT. WALL @ KITCHEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	4.5	FT.		
WALL LENGTH, L	11.7	FT.	QUALIFYING WALL LENGTH, L	6.7	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1800 LBS	<	4216 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	126	PLF	OVERTURNING MOMENT	16.3	K-FT	HOLD DOWN DESIGN LOAD	379	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	11.9	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 205: 2ND - SIDE EXT. WALL @ GREAT ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	7.8	FT.	QUALIFYING WALL LENGTH, L	7.8	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3200 LBS	<	4922 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	267	PLF	OVERTURNING MOMENT	29.1	K-FT	HOLD DOWN DESIGN LOAD	2422	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	10.1	K-FT	HOLDOWN CAPACITY	2655	LBS

HOLD-DOWN SPECIFICATION

SIMPSON MSTC40 STRAP TIE (12" END LENGTH)

SHEARWALL 206: 2ND - SIDE EXT. WALL @ KITCEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	12.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1000 LBS	<	7562 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	126	PLF	OVERTURNING MOMENT	9.1	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	21.1	K-FT	HOLDOWN CAPACITY	2655	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 207: 2ND - SIDE EXT. WALL @ KITCHEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	4.8	FT.	QUALIFYING WALL LENGTH, L	4.8	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
500 LBS	<	1622 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	372	PLF	OVERTURNING MOMENT	7.3	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	7.4	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 208: 2ND - SIDE INT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	19.1	FT.	QUALIFYING WALL LENGTH, L	19.1	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3000 LBS	<	6407 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	100	PLF	OVERTURNING MOMENT	27.2	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	30.1	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 209: 2ND - FRONT EXT. WALL @ STAIR

SHEARWALL PROPERTIES:

WALL HEIGHT, H	7.3	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	7.3	FT.	QUALIFYING WALL LENGTH, L	7.3	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
900 LBS	<	2435 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	260	PLF	OVERTURNING MOMENT	18.6	K-FT	HOLD DOWN DESIGN LOAD	1356	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	8.8	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL : BASEMENT - NOT USED

SHEARWALL PROPERTIES:

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

CAPACITY EVALUATION:

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

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

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

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 101: 1st - Rear Ext. Wall @ Bed 4

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_o	0.0	ft.		
Wall Length, L	6.2	ft.	Qualifying Wall Length, L	6.2	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
3000 lbs	<	3901 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	327	plf	Overturning Moment	35.9	k-ft	Hold Down Design Load	3810	lbs
DL at ends of wall	1200	lbs	Resistive Moment	12.3	k-ft	Holdown Capacity	4935	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN

Shearwall 102: 1st - Front Int. Wall @ Recreation Room

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	13.9	ft.	Qualifying Wall Length, L	13.9	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2500 lbs	<	4661 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	209	plf	Overturning Moment	22.7	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	810	lbs	Resistive Moment	28.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 103: 1ST - SIDE EXT. WALL @ RECREATION ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	5.1	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	9.8	FT.	QUALIFYING WALL LENGTH, L	9.8	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4000 LBS	<	6182 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	387	PLF	OVERTURNING MOMENT	20.3	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	600	LBS	RESISTIVE MOMENT	22.1	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 104: 1ST - SIDE EXT. WALL @ BED 4

SHEARWALL PROPERTIES:

WALL HEIGHT, H	3.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	8.7	FT.	QUALIFYING WALL LENGTH, L	8.7	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3000 LBS	<	5451 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	246	PLF	OVERTURNING MOMENT	15.8	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	17.6	K-FT	HOLDOWN CAPACITY	4935	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

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RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 105: 1st - Side Ext. Wall @ Bed 4

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	5.5	ft.		
Wall Length, L	14.7	ft.	Qualifying Wall Length, L	8.7	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2900 lbs	<	2906 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	572	plf	Overturning Moment	48.5	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	800	lbs	Resistive Moment	66.3	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall : Basement - Not Used

Shearwall Properties:

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

Capacity Evaluation:

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

Shearwall Assembly Specification

P0 - 1-side 7/16" OSB
fastened w/ 8d nails at 6"o.c. panel edges & 12"o.c. panel field - UNBLOCKED
#DIV/0!

Overturning Evaluation:

Resistive DL	0	plf	Overturning Moment	#DIV/0!	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	0	lbs	Resistive Moment	0.0	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

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Shear Wall Calculations Seismic

Milestone NW

Mercer Island Lot 2

Mercer Island, WA

Parameters:

Single Family Home

Design Wind Speed: 110 MPH

Wind Exposure Category: C

Seismic Design Category: D1

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

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Nicholas Martignetti, P.E., Project Manager

Ryan Chan, E.I.T., Staff Engineer

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SEISMIC CALCULATION - ASCE 7-16

M+K PROJECT #: 203-24022
ENGINEER: RSC

SEISMIC DESIGN CATEGORY:

USER INPUTS:

SITE CLASS	D
SPECTRAL RESPONSE ACCELERATION 0.2 SEC, S_S	1.390
SPECTRAL RESPONSE ACCELERATION 1.0 SEC, S_1	0.484
OCCUPANCY CATEGORY	II

VARIABLES:

SITE COEFFICIENT, FA	1.20
SITE COEFFICIENT, FV	1.82

CALCULATED VALUES:

MAXIMUM SPECTRAL RESPONSE ACCELERATION, S_{MS}	1.668
MAXIMUM SPECTRAL RESPONSE ACCELERATION, S_{M1}	0.879
DESIGN SPECTRAL RESPONSE ACCELERATION, S_{DS}	1.112
DESIGN SPECTRAL RESPONSE ACCELERATION, S_{D1}	0.586
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	29

CALCULATED VALUES:

APPROXIMATE FUNDAMENTAL PERIOD, T_A	0.248
T_O	0.105
T_S	0.527
SPECTRAL RESPONSE ACC., S_A (G)	1.112

SITE CLASS ASSUMPTION

YES — PER ASCE 7-16 SECTION 11.4.3 THE SITE CLASS MAY BE ASSUMED TO BE D

EQUIVALENT LATERAL FORCE PROCEDURE

DEAD LOAD CALCULATION:

LEVEL	STORY HT. (FT.)	AREA (FT^2)	DEAD LOAD (PSF)	DL OF EXT WALL TRIB. TO LEVEL (KIPS)	TOTAL LEVEL DL
1	10.3	917	15	6.9	21 K
2	10.3	1654	15	8.8	34 K
3	8.1	1646	17	3.8	32 K
4	0.0	0	0	0.0	0 K
5	0.0	0	0	0.0	0 K
6	0.0	0	0	0.0	0 K
7	0.0	0	0	0.0	0 K
8	0.0	0	0	0.0	0 K
9	0.0	0	0	0.0	0 K
10	0.0	0	0	0.0	0 K
11	0.0	0	0	0.0	0 K
12	0.0	0	0	0.0	0 K
13	0.0	0	0	0.0	0 K
14	0.0	0	0	0.0	0 K
15	0.0	0	0	0.0	0 K

TOTAL DEAD LOAD OF STRUCTURE 86 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	0.171	0.171

BASE SHEARS:

ULTIMATE LOADS				x 0.7 =	ALLOWABLE LOADS			
TRANSVERSE		LONGITUDINAL			TRANSVERSE		LONGITUDINAL	
15	K	15	K		10.4	K	10.4	K

STORY SHEAR CALCULATION:

DISTRIBUTION EXPONENT, k: 1.00

		ULTIMATE LOADS				x 0.7 =	ALLOWABLE LOADS					
		TRANSVERSE		LONGITUDINAL			TRANSVERSE			LONGITUDINAL		
LEVEL	VERT. DIST. FACTOR, C_{VX}	STORY SHEAR, F_x		STORY SHEAR, F_x			STORY SHEAR, F_x		Σ STORY SHEAR	STORY SHEAR, F_x		Σ STORY SHEAR
1	0.116	1.7	K	1.7	K		1.2	K	10.4 K	1.2	K	10.4 K
2	0.385	5.7	K	5.7	K		4.0	K	9.2 K	4.0	K	9.2 K
3	0.499	7.4	K	7.4	K		5.2	K	5.2 K	5.2	K	5.2 K
4	0.000	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
5	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
6	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
7	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
8	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
9	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
10	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
11	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
12	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
13	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
14	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K
15	0.00	0.0	K	0.0	K		0.0	K	0.0 K	0.0	K	0.0 K

SYMBOLS AND LEGEND

- (F) FAN- DIRECT VENT TO OUTSIDE
  - BATHROOMS/LAUNDRY: 50 CFM MIN.
  - KITCHEN EXHAUST HOOD TO BE MIN. OF 1000CFM. IF EXHAUST HOOD EXCEEDS 400 CFM MAKE UP AIR MUST BE PROVIDED PER SECTION M1503.6.
- (WH) WHOLE-HOUSE FAN TO RUN CONTINUOUS 4 CONFORM TO IRC M1505.4 FAN SIZE PER PLAN. FAN RATE TO BE ADJUSTED BY A FACTOR OF 1.5 FOR A NON BALANCED NON DISTRIBUTED SYSTEM. FRESH AIR TO BE PROVIDED BY THE FORCED AIR SYSTEM DUCTS PER SECTION M1505.4.1. FAN TO HAVE A SONE RATING OF 1.0 OR LESS MEASURED AT 0.1 INCHES WATER GAUGE
- (T) THERMOSTAT @ 50" ABOVE FLOOR
- (SD) 110v SMOKE ALARM PER I.R.C. R314 WITH BATTERY BACKUP INTERCONNECTED PER R314.4 & R315.5. USE A COMBINATION SMOKE/CARBON MONOXIDE ALARM WHEN NOTED
- (HD) HEAT DETECTOR OR HEAT ALARM RATED FOR THE AMBIENT OUTDOOR TEMPERATURES & HUMIDITY PER I.R.C. R314.

MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEM FOR UNITS: PER DIV. 15/16 SEE SHEET A1

FURN WH

A. PROVIDE 6" DIAMETER FRESH AIR INTAKE FROM OUTSIDE TO RETURN AIR PLENUM AT FURNACE WITH MOTORIZED FLOW DAMPERS.
B. PROVIDE THERMAL EXPANSION TANK AT WATER HEATER.
C. STRAP WATER HEATER TO FRAMING TOP AND BOTTOM.
D. PROVIDE PRESSURE RELIEF LINE PLUMBED TO OUTSIDE.

15.0K

WIND 14.4K

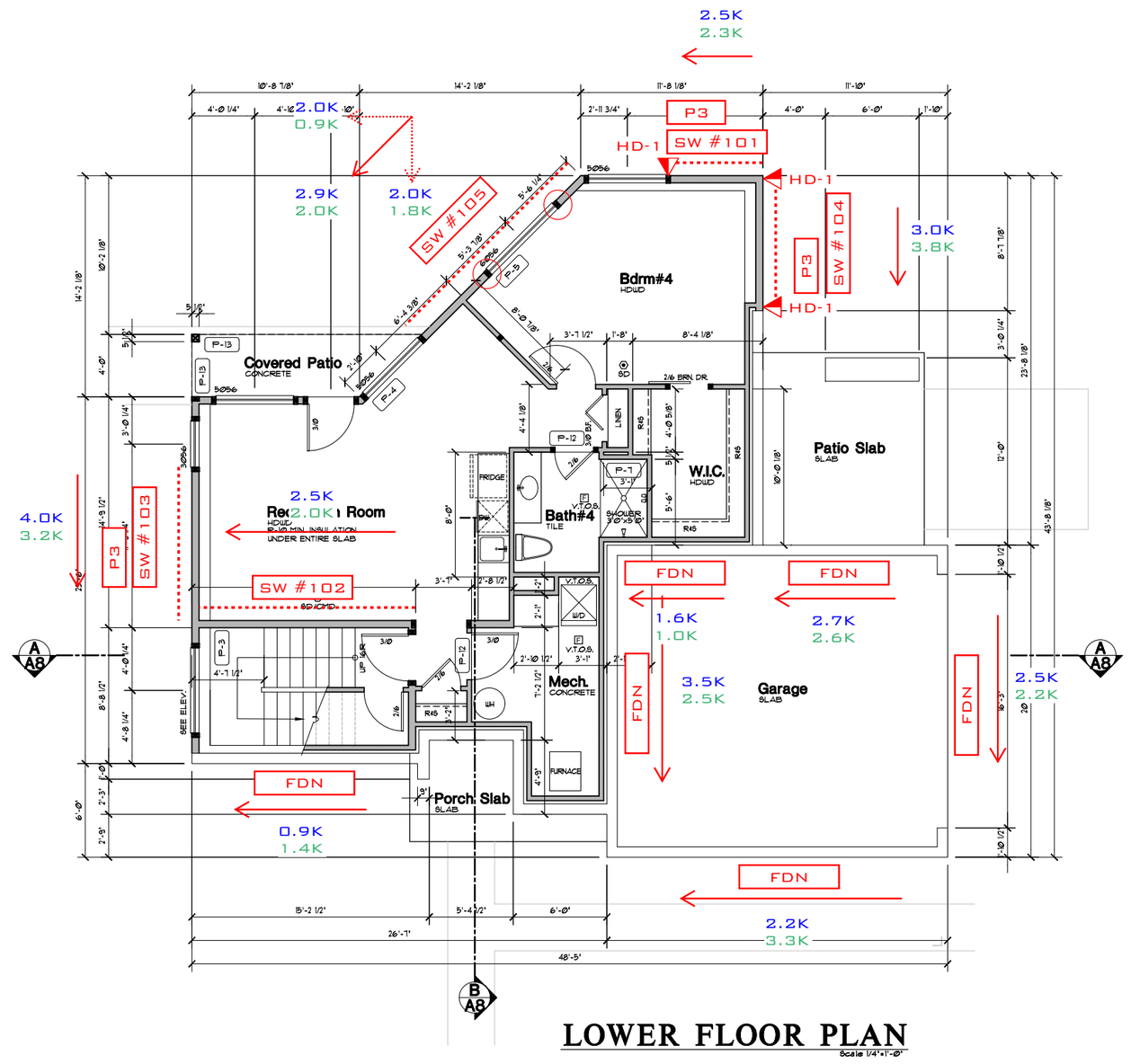
13.5K

LOADS INCREASED BY 30% FOR NON ORTHOGONAL WALLS SEISMIC

13.5K

NON-ORTHOGONAL WALLS:

45 0.71 1.0 0.71



LOWER FLOOR PLAN

Scale 1/4"=1'-0"

GENERAL PLAN NOTES

1. SEE SHEET A-1 FOR ALL GENERAL NOTES AND REQUIREMENTS.
2. ENERGY AND AIR QUALITY INFORMATION SEE DIV. 17 SHEET A-1
3. SEE BUILDING ELEVATION FOR WINDOW OPERATION SEE DIV. 8 SHEET A-1
4. SEE TYP. MATERIALS LIST ON SECTION SHEET
5. SEE SHEET A-1 FOR ALL NOTES AND REQUIREMENTS CONCERNING MECHANICAL, PLUMBING, AND ELECTRICAL.

FLOOR PLAN KEY NOTES

- P-1 OCCUPANCY SEPARATION; APPLY (1) LAYER OF ½" GWB. TO GARAGE SIDE OF RESIDENCE, ATTIC SPACES, AND TO ALL BEAMS AND POSTS SUPPORTING A FLOOR-CEILING ASSEMBLY. APPLY (1) LAYER OF ⅝" TYPE 'X' GWB. TO GARAGE CEILING WHEN UNDER HABITABLE ROOMS. DUCTS THROUGH WALL OR CEILING COMMON TO HOUSE SHALL HAVE MINIMUM 26 GAUGE STEEL SEE DIV. 01.0012.6.A. SHEET A-1.
- P-2 1⅜" MIN. SELF CLOSING SOLID WOOD CORE, HONEY-COMB CORE STEEL, OR 20-MINUTE FIRE RATED DOOR SEE DIV. 01.0012.6.B. SHEET A-1
- P-3 STAIR ASSEMBLY NOTES; PER I.R.C. SECTION R311.7
  - A. HEADROOM MIN. 6'-8" WIDTH MIN. 3'-0".
  - B. TREADS 10" MIN. DEPTH AND MIN. WIDTH OF 36" ABOVE HANDRAIL HEIGHT. RISERS 7¾" MAX. HT. TREAD NOSING TO BE MINIMUM 3/4" AND A MAXIMUM OF 1 1/4" ON STAIRS WITH SOLID RISERS.
  - C. HANDRAIL MIN. 34" TO MAX 38" ABOVE TREAD NOSING. HANDRAIL TYPE 1 CIRCULAR TO HAVE 1¼" MIN TO 2" MAX. CROSS SECTION DIMENSION AND 1 1/2" MIN. CLEAR FROM WALL. RETURN RAIL ENDS. HANDRAILS SHALL BE STRONG ENOUGH TO RESIST A 200 POUND POINT LOAD IN ANY DIRECTION PER I.R.C. TABLE R301.5
  - D. INSTALL FIRE BLOCKING BETWEEN STRINGERS AT THE TOP AND BOTTOM OF EACH RUN PER I.R.C. SECTION R302.11.
  - E. COVER USABLE SPACE UNDER STAIR W/ ½" GWB. PER I.R.C. SECTION R302.7.
  - F. INTERMEDIATE BALUSTERS SHALL BE SPACED W/ LESS THAN 4" BETWEEN BALUSTERS.
  - G. PROVIDE STAIRWAY ILLUMINATION PER I.R.C. SECTION R303.7.

  SEE DIV. 01.0012.7 SHEET A-1.
- P-4 SAFETY GLAZING PER I.R.C. SECTION R308
  - A. WINDOWS WITHIN 18" OF FLOOR
  - B. WINDOWS WITHIN A 24" ARC OF DOORS
  - C. WINDOWS AT TUBS AND SHOWERS
  - D. GLAZING IN DOORS
  - E. LESS THAN 60" HORIZ. FROM THE BOT. STAIR TREAD NOSING, & BOT. EDGE OF GLAZING IS LESS THAN 36" ABV. LANDING/WALKING SURFACE SEE DIV. 08.0800 SHEET A-1
- P-5 EGRESS WINDOW PER I.R.C. SECTION R310 SEE DIV. 08.0600 SHEET A-1
- P-6 IGNITERS FOR GAS FIRED APPLIANCES IN GARAGE TO BE 18" MIN. ABOVE TOP OF SLAB. SEE DIV. 15 SHEET A-1
- P-7 COVER WALLS ADJACENT TO TUBS AND SHOWERS WITH NON-ABSORBENT MATERIAL TO 72" ABOVE DRAIN INLETS, PER I.R.C. SECTION 307.2. SEE DIV. 09.2500 SHEET A-1
- P-8 (2) LAYERS OF FLOOR SHEATHING OVER FRAMING.
- P-9 7¾" MAX. RISER WITH 10" MIN. RUN. IF MORE THAN (3) RISERS, HANDRAIL REQUIRED PER I.R.C. SECTION R311.7.8. SEE DIV. 01.0012.7 SHEET A-1
- P-10 18"x24" CRAWL SPACE ACCESS. INSULATE AND WEATHER STRIP. SEE DIV. 01.0012.1 SHEET A-1
- P-11 22"x30" ATTIC SPACE ACCESS W/ 30" HEAD CLEARANCE. INSULATE AND WEATHER STRIP. SEE DIV. 01.0012.2 SHEET A-1
- P-12 FLOOR MATERIAL BREAK LINE
- P-13 WALL LINE ABOVE
- P-14 WALL LINE BELOW
- P-15 FIREPLACE ASSEMBLY NOTES;
  - A. DIRECT VENT GAS FIREPLACES, MUST BE LISTED, LABELED & INSTALLED PER MFG. SPECIFICATIONS, SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01.0012.12 SHEET A-1
  - B. ZERO CLEARANCE FIREPLACES SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01.0012.12 SHT A-1
  - C. HEARTH SHALL CONFORM TO I.R.C. REQUIREMENT SEE DIV. 01.0012.12
  - D. FIREBLOCK OPENINGS AROUND PENETRATIONS @ EACH FLOOR PER I.R.C. SECTION R1003.19.
  - E. FIREPLACE MUST COMPLY WITH UL 127 TESTING
- P-16 SEE SITE PLAN FOR EXTENT OF WALKS & DRIVEWAYS
- P-17 3" DIAMETER STEEL POST
- P-18 36" GUARDRAIL PER I.R.C. SECTION R312 & TABLE R301.5 CONTRACTOR TO VERIFY TO INSPECTOR THAT ALL GUARDS & RAILINGS ARE CAPABLE OF RESISTING 200lb LOAD ON TOP RAIL ACTING IN ANY DIRECTION.
- P-19 15" VENT FOR MECHANICAL 1" CLEARANCE ALL SIDES PER I.R.C. SECTION R302.11. SEE DIV. 15 SHEET A-1
- P-20 PLANT SHELF
- P-21 UPPER AND LOWER LINEN CABINETS
- P-22 SOFFIT AREA
- P-23 INTEGRATED MAKE UP AIR
- P-24 2x6 STUDS W/ R-21 INSULATION MIN.

Date	By	Description
9/9/24	AG	CONSTRUCTION SET

Milestone NW

Mercer Island Lot 2

TBD SE 22nd ST. Mercer Island, WA 98040

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TITLE

JOB NO.: 21023.05
STARTING NO.: 21023.05

SHEET

A2.1

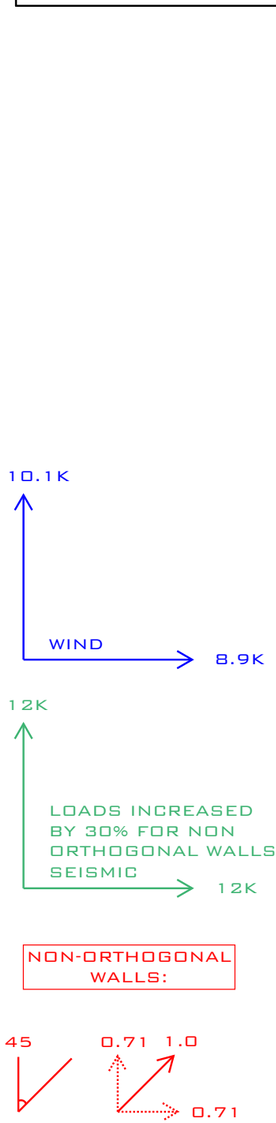
SYMBOLS AND LEGEND

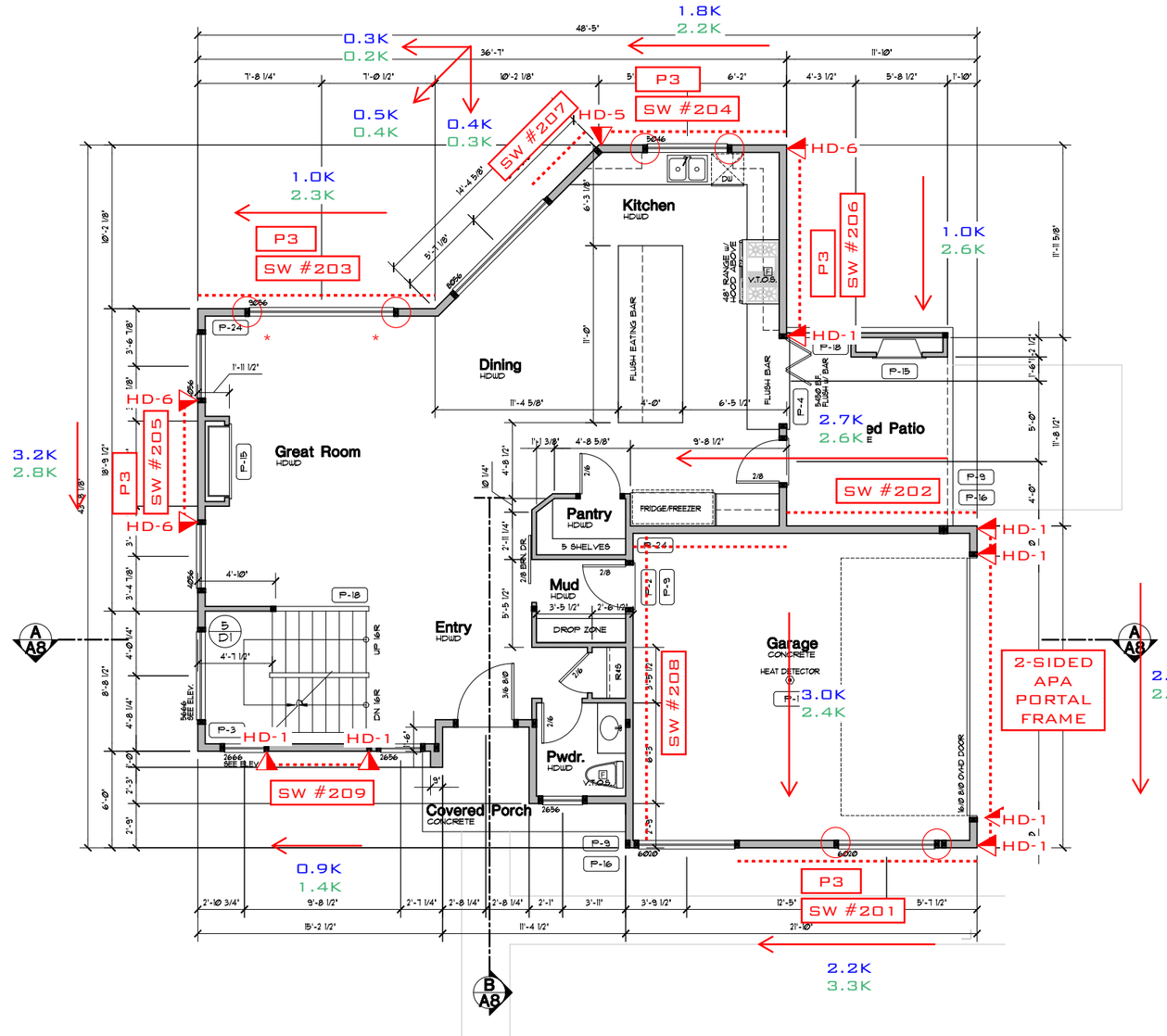
- (F) FAN- DIRECT VENT TO OUTSIDE
  - -BATHROOMS/LAUNDRY: 50 CFM MIN.
  - -KITCHEN EXHAUST HOOD TO BE MIN. OF 1000CFM. IF EXHAUST HOOD EXCEEDS 400 CFM MAKE UP AIR MUST BE PROVIDED PER SECTION M1503.6.
- (WH) WHOLE-HOUSE FAN TO RUN CONTINUOUS & CONFORM TO IRC M1505.4 FAN SIZE PER PLAN. FAN RATE TO BE ADJUSTED BY A FACTOR OF 1.5 FOR A NON BALANCED NON DISTRIBUTED SYSTEM. FRESH AIR TO BE PROVIDED BY THE FORCED AIR SYSTEM DUCTS PER SECTION M1505.4.1. FAN TO HAVE A SONE RATING OF 1.0 OR LESS MEASURED AT 0.1 INCHES WATER GAUGE
- (T) THERMOSTAT @ 50" ABOVE FLOOR
- (SD) 110v SMOKE ALARM PER I.R.C. R314 WITH BATTERY BACKUP INTERCONNECTED PER R314.4 & R315.5. USE A COMBINATION SMOKE/CARBON MONOXIDE ALARM WHEN NOTED
- (HD) HEAT DETECTOR OR HEAT ALARM RATED FOR THE AMBIENT OUTDOOR TEMPERATURES & HUMIDITY PER I.R.C. R314.

MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEM FOR UNITS: PER DIV. 15/16 SEE SHEET A1

FURN. WH

A. PROVIDE 6" DIAMETER FRESH AIR INTAKE FROM OUTSIDE TO RETURN AIR PLENUM AT FURNACE WITH MOTORIZED FLOW DAMPERS.
B. PROVIDE THERMAL EXPANSION TANK AT WATER HEATER.
C. STRAP WATER HEATER TO FRAMING TOP AND BOTTOM.
D. PROVIDE PRESSURE RELIEF LINE PLUMBED TO OUTSIDE.





MAIN FLOOR PLAN

Scale 1/4"=1'-0"

GENERAL PLAN NOTES

1. SEE SHEET A-1 FOR ALL GENERAL NOTES AND REQUIREMENTS.
2. ENERGY AND AIR QUALITY INFORMATION SEE DIV. 17 SHEET A-1
3. SEE BUILDING ELEVATION FOR WINDOW OPERATION SEE DIV. 8 SHEET A-1
4. SEE TYP. MATERIALS LIST ON SECTION SHEET
5. SEE SHEET A-1 FOR ALL NOTES AND REQUIREMENTS CONCERNING MECHANICAL, PLUMBING, AND ELECTRICAL.

FLOOR PLAN KEY NOTES

- P-1 OCCUPANCY SEPARATION: APPLY (1) LAYER OF ½" GWB. TO GARAGE SIDE OF RESIDENCE, ATTIC SPACES, AND TO ALL BEAMS AND POSTS SUPPORTING A FLOOR-CEILING ASSEMBLY. APPLY (1) LAYER OF ⅝" TYPE 'X' GWB. TO GARAGE CEILING WHEN UNDER HABITABLE ROOMS. DUCTS THROUGH WALL OR CEILING COMMON TO HOUSE SHALL HAVE MINIMUM 26 GAUGE STEEL SEE DIV. 01/002.6.A. SHEET A-1.
- P-2 1⅜" MIN. SELF CLOSING SOLID WOOD CORE, HONEY-COMB CORE STEEL, OR 20-MINUTE FIRE RATED DOOR SEE DIV. 01/002.6.B. SHEET A-1
- P-3 STAIR ASSEMBLY NOTES: PER I.R.C. SECTION R311.7
  - A. HEADROOM MIN. 6'-8" WIDTH MIN. 3'-0".
  - B. TREADS 10" MIN. DEPTH AND MIN. WIDTH OF 36" ABOVE HANDRAIL HEIGHT. RISERS 7¾" MAX. HT. TREAD NOSING TO BE MINIMUM 3/4" AND A MAXIMUM OF 1 1/4" ON STAIRS WITH SOLID RISERS.
  - C. HANDRAIL MIN. 34" TO MAX 38" ABOVE TREAD NOSING. HANDRAIL TYPE 1 CIRCULAR TO HAVE 1¼" MIN TO 2" MAX. CROSS SECTION DIMENSION AND 1 1/2" MIN. CLEAR FROM WALL. RETURN RAIL ENDS. HANDRAILS SHALL BE STRONG ENOUGH TO RESIST A 200 POUND POINT LOAD IN ANY DIRECTION PER I.R.C. TABLE R301.5
  - D. INSTALL FIRE BLOCKING BETWEEN STRINGERS AT THE TOP AND BOTTOM OF EACH RUN PER I.R.C. SECTION R302.11.
  - E. COVER USABLE SPACE UNDER STAIR W/ ½" GWB. PER I.R.C. SECTION R302.7.
  - F. INTERMEDIATE BALUSTERS SHALL BE SPACED W/ LESS THAN 4" BETWEEN BALUSTERS.
  - G. PROVIDE STAIRWAY ILLUMINATION PER I.R.C. SECTION R303.7.

  SEE DIV. 01/002.7 SHEET A-1.
- P-4 SAFETY GLAZING PER I.R.C. SECTION R308
  - A. WINDOWS WITHIN 18" OF FLOOR
  - B. WINDOWS WITHIN A 24" ARC OF DOORS
  - C. WINDOWS AT TUBS AND SHOWERS
  - D. GLAZING IN DOORS
  - E. LESS THAN 60" HORIZ. FROM THE BOT. STAIR TREAD NOSING, & BOT. EDGE OF GLAZING IS LESS THAN 36" ABV. LANDING/WALKING SURFACE

  SEE DIV. 08/800 SHEET A-1
- P-5 EGRESS WINDOW PER I.R.C. SECTION R310 SEE DIV. 08/600 SHEET A-1
- P-6 IGNITERS FOR GAS FIRED APPLIANCES IN GARAGE TO BE 18" MIN. ABOVE TOP OF SLAB. SEE DIV. 15 SHEET A-1
- P-7 COVER WALLS ADJACENT TO TUBS AND SHOWERS WITH NON-ABSORBENT MATERIAL TO 72" ABOVE DRAIN INLETS, PER I.R.C. SECTION 307.2. SEE DIV. 03/250 SHEET A-1
- P-8 (2) LAYERS OF FLOOR SHEATHING OVER FRAMING.
- P-9 7¾" MAX. RISER WITH 10" MIN. RUN. IF MORE THAN (3) RISERS, HANDRAIL REQUIRED PER I.R.C. SECTION R311.7.8. SEE DIV. 01/002.7 SHEET A-1
- P-10 18"x24" CRAWL SPACE ACCESS, INSULATE AND WEATHER STRIP. SEE DIV. 01/002.1 SHEET A-1
- P-11 22"x30" ATTIC SPACE ACCESS W/ 30" HEAD CLEARANCE. INSULATE AND WEATHER STRIP. SEE DIV. 01/002.2 SHEET A-1
- P-12 FLOOR MATERIAL BREAK LINE
- P-13 WALL LINE ABOVE
- P-14 WALL LINE BELOW
- P-15 FIREPLACE ASSEMBLY NOTES:
  - A. DIRECT VENT GAS FIREPLACES, MUST BE LISTED, LABELED & INSTALLED PER MFG. SPECIFICATIONS, & SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01/002.12 SHEET A-1
  - B. ZERO CLEARANCE FIREPLACES SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01/002.12 SHT A-1
  - C. HEARTH SHALL CONFORM TO I.R.C. REQUIREMENT SEE DIV. 01/002.12
  - D. FIREBLOCK OPENINGS AROUND PENETRATIONS @ EACH FLOOR PER I.R.C. SECTION R1003.19.
  - E. FIREPLACE MUST COMPLY WITH UL 127 TESTING
- P-16 SEE SITE PLAN FOR EXTENT OF WALKS & DRIVEWAYS
- P-17 3" DIAMETER STEEL POST
- P-18 36" GUARDRAIL PER I.R.C. SECTION R312 & TABLE R301.5 CONTRACTOR TO VERIFY TO INSPECTOR THAT ALL GUARDS & RAILINGS ARE CAPABLE OF RESISTING 200lb LOAD ON TOP RAIL ACTING IN ANY DIRECTION.
- P-19 'B' VENT FOR MECHANICAL. 1" CLEARANCE ALL SIDES PER I.R.C. SECTION R302.11. SEE DIV. 15 SHEET A-1
- P-20 PLANT SHELF
- P-21 UPPER AND LOWER LINEN CABINETS
- P-22 SOFFIT AREA
- P-23 INTEGRATED MAKE UP AIR
- P-24 2x6 STUDS W/ R-21 INSULATION MIN.

SQUARE FOOTAGE

MAIN FLOOR	1060 SF
UPPER FLOOR	1381 SF
LOWER	965 SF
TOTAL	3406 SF
GARAGE	424 SF
COV'D PORCH	28 SF
COV'D PATIO	51/120 SF

SQUARE FOOTAGE IS MEASURED TO THE OUTSIDE FACE OF WALLS. STAIRS ARE COUNTED ONCE IN CALCULATIONS, OPEN TO BELOW SPACES AND GARAGES ARE NOT INCLUDED IN CALCULATIONS.

Date	By	Description
9/9/24	AG	CONSTRUCTION SET

Milestone NW

Mercer Island Lot 2

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TITLE

JOB NO.: 21023.05
STARTING NO.: 21023.03

SHEET

A3

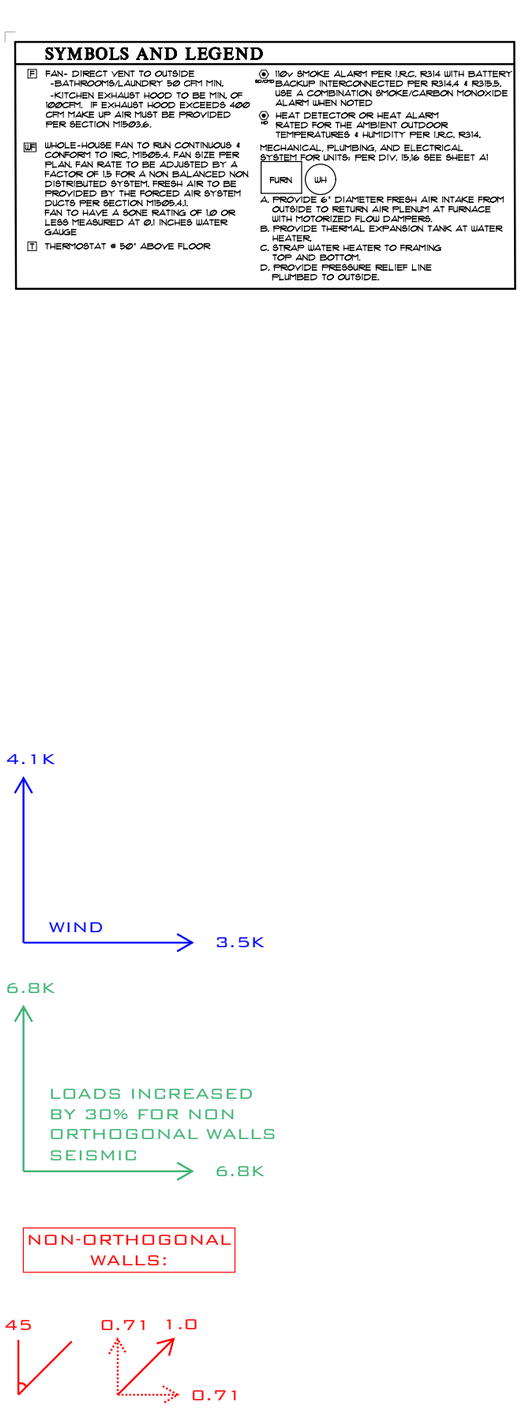
SYMBOLS AND LEGEND

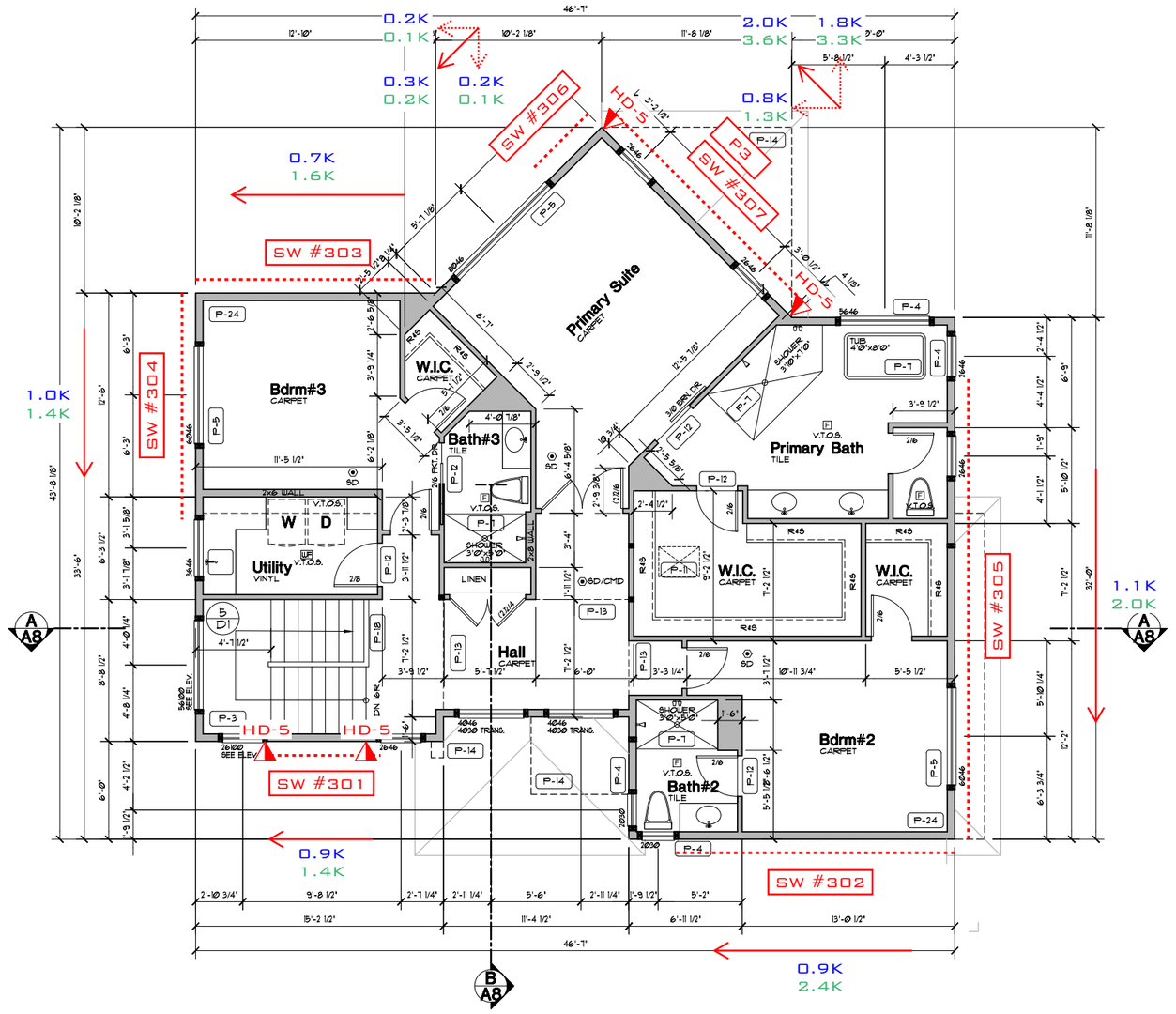
- (F) FAN- DIRECT VENT TO OUTSIDE
  - -BATHROOMS/LAUNDRY 50 CFM MIN.
  - -KITCHEN EXHAUST HOOD TO BE MIN. OF 1000CFM. IF EXHAUST HOOD EXCEEDS 400 CFM MAKE UP AIR MUST BE PROVIDED PER SECTION M1503.6.
- (WF) WHOLE-HOUSE FAN TO RUN CONTINUOUS @ COMFORT TO IRC M1505.4 FAN SIZE PER PLAN. FAN RATE TO BE ADJUSTED BY A FACTOR OF 1.5 FOR A NON BALANCED NON DISTRIBUTED SYSTEM. FRESH AIR TO BE PROVIDED BY THE FORCED AIR SYSTEM DUCTS PER SECTION M1505.4.1. FAN TO HAVE A SONE RATING OF 1.0 OR LESS MEASURED AT 0.1 INCHES WATER GAUGE
- (T) THERMOSTAT @ 50" ABOVE FLOOR
- (SD) 110v SMOKE ALARM PER I.R.C. R314 WITH BATTERY BACKUP INTERCONNECTED PER R314.4 & R315.5. USE A COMBINATION SMOKE/CARBON MONOXIDE ALARM WHEN NOTED
- (HD) HEAT DETECTOR OR HEAT ALARM RATED FOR THE AMBIENT OUTDOOR TEMPERATURES & HUMIDITY PER I.R.C. R314.

MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEM FOR UNITS: PER DIV. 15/16 SEE SHEET A1

FURN. WH

A. PROVIDE 6" DIAMETER FRESH AIR INTAKE FROM OUTSIDE TO RETURN AIR PLENUM AT FURNACE WITH MOTORIZED FLOW DAMPERS.
B. PROVIDE THERMAL EXPANSION TANK AT WATER HEATER.
C. STRAP WATER HEATER TO FRAMING TOP AND BOTTOM.
D. PROVIDE PRESSURE RELIEF LINE PLUMBED TO OUTSIDE.





UPPER FLOOR PLAN

Scale 1/4"=1'-Ø"

GENERAL PLAN NOTES

1. SEE SHEET A-1 FOR ALL GENERAL NOTES AND REQUIREMENTS.
2. ENERGY AND AIR QUALITY INFORMATION SEE DIV. 17 SHEET A-1
3. SEE BUILDING ELEVATION FOR WINDOW OPERATION SEE DIV. 8 SHEET A-1
4. SEE TYP. MATERIALS LIST ON SECTION SHEET
5. SEE SHEET A-1 FOR ALL NOTES AND REQUIREMENTS CONCERNING MECHANICAL, PLUMBING, AND ELECTRICAL.

FLOOR PLAN KEY NOTES

- P-1 OCCUPANCY SEPARATION: APPLY (1) LAYER OF ½" GWB. TO GARAGE SIDE OF RESIDENCE, ATTIC SPACES, AND TO ALL BEAMS AND POSTS SUPPORTING A FLOOR-CEILING ASSEMBLY. APPLY (1) LAYER OF ⅝" TYPE 'X' GWB. TO GARAGE CEILING WHEN UNDER HABITABLE ROOMS. DUCTS THROUGH WALL OR CEILING COMMON TO HOUSE SHALL HAVE MINIMUM 26 GAUGE STEEL SEE DIV. 01002.6.A. SHEET A-1.
- P-2 1⅜" MIN. SELF CLOSING SOLID WOOD CORE, HONEY-COMB CORE STEEL, OR 20-MINUTE FIRE RATED DOOR. SEE DIV. 01002.6.B. SHEET A-1
- P-3 STAIR ASSEMBLY NOTES: PER I.R.C. SECTION R311.7
  - A. HEADROOM MIN. 6'-8" WIDTH MIN. 3'-0".
  - B. TREADS 10" MIN. DEPTH AND MIN. WIDTH OF 36" ABOVE HANDRAIL HEIGHT. RISERS 7¾" MAX. HT. TREAD NOSING TO BE MINIMUM 3/4" AND A MAXIMUM OF 1 1/4" ON STAIRS WITH SOLID RISERS.
  - C. HANDRAIL MIN. 34" TO MAX 38" ABOVE TREAD NOSING. HANDRAIL TYPE I CIRCULAR TO HAVE 1¼" MIN TO 2" MAX. CROSS SECTION DIMENSION AND 1 1/2" MIN. CLEAR FROM WALL. RETURN RAIL ENDS. HANDRAILS SHALL BE STRONG ENOUGH TO RESIST A 200 POUND POINT LOAD IN ANY DIRECTION PER I.R.C. TABLE R301.5
  - D. INSTALL FIRE BLOCKING BETWEEN STRINGERS AT THE TOP AND BOTTOM OF EACH RUN PER I.R.C. SECTION R302.11.
  - E. COVER USABLE SPACE UNDER STAIR W/ ½" GWB. PER I.R.C. SECTION R302.7.
  - F. INTERMEDIATE BALUSTERS SHALL BE SPACED W/ LESS THAN 4" BETWEEN BALUSTERS.
  - G. PROVIDE STAIRWAY ILLUMINATION PER I.R.C. SECTION R303.7.

  SEE DIV. 01002.7 SHEET A-1.
- P-4 SAFETY GLAZING PER I.R.C. SECTION R308
  - A. WINDOWS WITHIN 18" OF FLOOR
  - B. WINDOWS WITHIN A 24" ARC OF DOORS
  - C. WINDOWS AT TUBS AND SHOWERS
  - D. GLAZING IN DOORS
  - E. LESS THAN 60" HORIZ. FROM THE BOT. STAIR TREAD NOSING, & BOT. EDGE OF GLAZING IS LESS THAN 36" ABV. LANDING/WALKING SURFACE

  SEE DIV. 08800 SHEET A-1
- P-5 EGRESS WINDOW PER I.R.C. SECTION R310 SEE DIV. 08600 SHEET A-1
- P-6 IGNITERS FOR GAS FIRED APPLIANCES IN GARAGE TO BE 18" MIN. ABOVE TOP OF SLAB. SEE DIV. 15 SHEET A-1
- P-7 COVER WALLS ADJACENT TO TUBS AND SHOWERS WITH NON-ABSORBENT MATERIAL TO 72" ABOVE DRAIN INLETS, PER I.R.C. SECTION 307.2. SEE DIV. 09250 SHEET A-1
- P-8 (2) LAYERS OF FLOOR SHEATHING OVER FRAMING.
- P-9 7¾" MAX. RISER WITH 10" MIN. RUN. IF MORE THAN (3) RISERS, HANDRAIL REQUIRED PER I.R.C. SECTION R311.7.8. SEE DIV. 01002.7 SHEET A-1
- P-10 18"x24" CRAWL SPACE ACCESS. INSULATE AND WEATHER STRIP. SEE DIV. 01002.1 SHEET A-1
- P-11 22"x30" ATTIC SPACE ACCESS W/ 30" HEAD CLEARANCE. INSULATE AND WEATHER STRIP. SEE DIV. 01002.2 SHEET A-1
- P-12 FLOOR MATERIAL BREAK LINE
- P-13 WALL LINE ABOVE
- P-14 WALL LINE BELOW
- P-15 FIREPLACE ASSEMBLY NOTES:
  - A. DIRECT VENT GAS FIREPLACES, MUST BE LISTED, LABELED &INSTALLED PER MFG. SPECIFICATIONS, &HALL CONFORM TO I.R.C.REQUIREMENTS. SEE DIV. 01002.12 SHEET A-1
  - B. ZERO CLEARANCE FIREPLACES SHALL CONFORM TO I.R.C. REQUIREMENTS. SEE DIV. 01002.12 SHT A-1
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  - D. FIREBLOCK OPENINGS AROUND PENETRATIONS @ EACH FLOOR PER I.R.C. SECTION R1003.19.
  - E. FIREPLACE MUST COMPLY WITH UL 127 TESTING
- P-16 SEE SITE PLAN FOR EXTENT OF WALKS & DRIVEWAYS
- P-17 3" DIAMETER STEEL POST
- P-18 36" GUARDRAIL PER I.R.C. SECTION R312 & TABLE R301.5 CONTRACTOR TO VERIFY TO INSPECTOR THAT ALL GUARDS & RAILINGS ARE CAPABLE OF RESISTING 200lbs LOAD ON TOP RAIL ACTING IN ANY DIRECTION.
- P-19 "B" VENT FOR MECHANICAL, 1" CLEARANCE ALL SIDES PER I.R.C. SECTION R1003.11. SEE DIV. 15 SHEET A-1
- P-20 PLANT SHELF
- P-21 UPPER AND LOWER LINEN CABINETS
- P-22 SOFFIT AREA
- P-23 INTEGRATED MAKE UP AIR
- P-24 2x6 STUDS W/ R-21 INSULATION MIN.

Date	By	Description
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TITLE

JOB NO.: 21023.05
STARTING NO.: 21023.03

SHEET
A5

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 301: 3rd - Front Ext. B.F. Wall @ Stair

Shearwall Properties:

Wall height, H	13.3	ft.	Max wall opening ht, H_o	0.0	ft.		
Wall Length, L	7.3	ft.	Qualifying Wall Length, L	7.3	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
1000 lbs	<	1739 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	160	plf	Overturning Moment	13.3	k-ft	Hold Down Design Load	1319	lbs
DL at ends of wall	200	lbs	Resistive Moment	3.8	k-ft	Holdown Capacity	1705	lbs

Hold-down Specification

SIMPSON CS16 STRAP TIE (14" END LENGTH)

Shearwall 302: 3rd - Front Ext. Wall @ Bath 2 - Bed 2

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	17.3	ft.	Qualifying Wall Length, L	17.3	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2400 lbs	<	4138 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	200	plf	Overturning Moment	21.8	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	200	lbs	Resistive Moment	22.1	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 303: 3RD - REAR EXT. WALL BED 3

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	14.7	FT.	QUALIFYING WALL LENGTH, L	14.7	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1600 LBS	<	3535 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	147	PLF	OVERTURNING MOMENT	14.5	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	14.6	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 304: 3RD - SIDE EXT. WALL @ BED 3

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	4.5	FT.		
WALL LENGTH, L	13.9	FT.	QUALIFYING WALL LENGTH, L	7.9	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1400 LBS	<	1892 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	147	PLF	OVERTURNING MOMENT	12.7	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	451	LBS	RESISTIVE MOMENT	13.6	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 305: 3rd - Side Ext. Wall @ Primary bath - Bed 2

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	4.5	ft.		
Wall Length, L	28.4	ft.	Qualifying Wall Length, L	19.9	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2000 lbs	<	4766 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	163	plf	Overturning Moment	18.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	200	lbs	Resistive Moment	47.5	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 306: 3rd - Side Ext. Wall @ Primary Suite

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	4.8	ft.	Qualifying Wall Length, L	4.8	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
200 lbs	<	1151 lbs

Shearwall Assembly Specification

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

Overturning Evaluation:

Resistive DL	120	plf	Overturning Moment	1.8	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	400	lbs	Resistive Moment	2.2	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 307: 3RD - SIDE EXT. WALL @ PRIMARY SUITE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_o	4.5	FT.		
WALL LENGTH, L	16.5	FT.	QUALIFYING WALL LENGTH, L	11.6	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3600 LBS	<	5208 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	170	PLF	OVERTURNING MOMENT	32.7	K-FT	HOLD DOWN DESIGN LOAD	768	LBS
DL AT ENDS OF WALL	415	LBS	RESISTIVE MOMENT	20.0	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

SHEARWALL : BASEMENT - NOT USED

SHEARWALL PROPERTIES:

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

CAPACITY EVALUATION:

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

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

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

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 201: 2ND - FRONT EXT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_c	2.0	FT.		
WALL LENGTH, L	15.0	FT.	QUALIFYING WALL LENGTH, L	9.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3300 LBS	<	4069 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	417	PLF	OVERTURNING MOMENT	30.0	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	43.5	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 202: 2ND - REAR EXT. WALL @ GARAGE

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	21.4	FT.	QUALIFYING WALL LENGTH, L	21.4	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2600 LBS	<	5126 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	340	PLF	OVERTURNING MOMENT	23.6	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	63.1	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 203: 2ND - REAR EXT. WALL @ GREAT ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_o	5.5	FT.		
WALL LENGTH, L	14.8	FT.	QUALIFYING WALL LENGTH, L	5.7	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2300 LBS	<	2561 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	386	PLF	OVERTURNING MOMENT	35.4	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	800	LBS	RESISTIVE MOMENT	35.8	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 204: 2ND - REAR EXT. WALL @ KITCHEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	4.5	FT.		
WALL LENGTH, L	11.7	FT.	QUALIFYING WALL LENGTH, L	6.7	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2200 LBS	<	3011 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	126	PLF	OVERTURNING MOMENT	20.0	K-FT	HOLD DOWN DESIGN LOAD	955	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	8.8	K-FT	HOLDOWN CAPACITY	1705	LBS

HOLD-DOWN SPECIFICATION

SIMPSON CS16 STRAP TIE (14" END LENGTH)

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 205: 2ND - SIDE EXT. WALL @ GREAT ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	7.8	FT.	QUALIFYING WALL LENGTH, L	7.8	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
2800 LBS	<	3516 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	267	PLF	OVERTURNING MOMENT	25.4	K-FT	HOLD DOWN DESIGN LOAD	2294	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	7.5	K-FT	HOLDOWN CAPACITY	2655	LBS

HOLD-DOWN SPECIFICATION

SIMPSON MSTC40 STRAP TIE (12" END LENGTH)

SHEARWALL 206: 2ND - SIDE EXT. WALL @ KITCEN

SHEARWALL PROPERTIES:

WALL HEIGHT, H	9.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	12.0	FT.	QUALIFYING WALL LENGTH, L	12.0	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
4300 LBS	<	5402 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	126	PLF	OVERTURNING MOMENT	39.0	K-FT	HOLD DOWN DESIGN LOAD	1950	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	15.6	K-FT	HOLDOWN CAPACITY	2655	LBS

HOLD-DOWN SPECIFICATION

SIMPSON MSTC40 STRAP TIE (12" END LENGTH)

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 207: 2nd - Side Ext. Wall @ Kitchen

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_o	0.0	ft.		
Wall Length, L	4.8	ft.	Qualifying Wall Length, L	4.8	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
400 lbs	<	1159 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	372	plf	Overturning Moment	5.5	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	800	lbs	Resistive Moment	5.5	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall 208: 2nd - Side Int. Wall @ Garage

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	19.1	ft.	Qualifying Wall Length, L	19.1	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2400 lbs	<	4576 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	100	plf	Overturning Moment	21.8	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	800	lbs	Resistive Moment	22.3	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 209: 2ND - FRONT EXT. WALL @ STAIR

SHEARWALL PROPERTIES:

WALL HEIGHT, H	7.3	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	7.3	FT.	QUALIFYING WALL LENGTH, L	7.3	FT.	SHEARWALL ASSEMBLY	P1

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
1400 LBS	<	1739 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	260	PLF	OVERTURNING MOMENT	23.6	K-FT	HOLD DOWN DESIGN LOAD	2359	LBS
DL AT ENDS OF WALL	400	LBS	RESISTIVE MOMENT	6.5	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

SHEARWALL : BASEMENT - NOT USED

SHEARWALL PROPERTIES:

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

CAPACITY EVALUATION:

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

SHEARWALL ASSEMBLY SPECIFICATION

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

OVERTURNING EVALUATION:

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

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 101: 1st - Rear Ext. Wall @ Bed 4

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_o	0.0	ft.		
Wall Length, L	6.2	ft.	Qualifying Wall Length, L	6.2	ft.	Shearwall Assembly	P3

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2300 lbs	<	2786 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	327	plf	Overturning Moment	31.5	k-ft	Hold Down Design Load	3611	lbs
DL at ends of wall	1200	lbs	Resistive Moment	9.1	k-ft	Holdown Capacity	3695	lbs

Hold-down Specification

SIMPSON STHD14RJ HOLDOWN

Shearwall 102: 1st - Front Int. Wall @ Recreation Room

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, Hc	0.0	ft.		
Wall Length, L	13.9	ft.	Qualifying Wall Length, L	13.9	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2000 lbs	<	3329 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	209	plf	Overturning Moment	18.2	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	810	lbs	Resistive Moment	20.9	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

SHEARWALL DESIGN SUMMARY

M+K PROJECT #: 203-24022
ENGINEER: RSC

SHEARWALL 103: 1ST - SIDE EXT. WALL @ RECREATION ROOM

SHEARWALL PROPERTIES:

WALL HEIGHT, H	5.1	FT.	MAX WALL OPENING HT, H_o	0.0	FT.		
WALL LENGTH, L	9.8	FT.	QUALIFYING WALL LENGTH, L	9.8	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3200 LBS	<	4416 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	387	PLF	OVERTURNING MOMENT	16.3	K-FT	HOLD DOWN DESIGN LOAD	0	LBS
DL AT ENDS OF WALL	600	LBS	RESISTIVE MOMENT	16.3	K-FT	HOLDOWN CAPACITY	0	LBS

HOLD-DOWN SPECIFICATION

NO HOLDOWN REQUIRED

SHEARWALL 104: 1ST - SIDE EXT. WALL @ BED 4

SHEARWALL PROPERTIES:

WALL HEIGHT, H	3.1	FT.	MAX WALL OPENING HT, Hc	0.0	FT.		
WALL LENGTH, L	8.7	FT.	QUALIFYING WALL LENGTH, L	8.7	FT.	SHEARWALL ASSEMBLY	P3

CAPACITY EVALUATION:

TOTAL SHEAR LOAD ON WALL		ALLOWABLE SHEARWALL CAPACITY
3800 LBS	<	3894 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	246	PLF	OVERTURNING MOMENT	39.8	K-FT	HOLD DOWN DESIGN LOAD	3098	LBS
DL AT ENDS OF WALL	1200	LBS	RESISTIVE MOMENT	13.1	K-FT	HOLDOWN CAPACITY	3695	LBS

HOLD-DOWN SPECIFICATION

SIMPSON STHD14RJ HOLDOWN

MULHERN+KULP
RESIDENTIAL STRUCTURAL ENGINEERING

Shearwall Design Summary

M+K Project #: 203-24022
Engineer: RSC

Shearwall 105: 1st - Side Ext. Wall @ Bed 4

Shearwall Properties:

Wall height, H	9.1	ft.	Max wall opening ht, H_c	5.5	ft.		
Wall Length, L	14.7	ft.	Qualifying Wall Length, L	8.7	ft.	Shearwall Assembly	P1

Capacity Evaluation:

Total Shear load on Wall		Allowable Shearwall Capacity
2000 lbs	<	2075 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	572	plf	Overturning Moment	34.8	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	800	lbs	Resistive Moment	49.1	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required

Shearwall : Basement - Not Used

Shearwall Properties:

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

Capacity Evaluation:

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

Shearwall Assembly Specification

P0 - 1-side 7/16" OSB
fastened w/ 8d nails at 6"o.c. panel edges & 12"o.c. panel field - UNBLOCKED
#DIV/0!

Overturning Evaluation:

Resistive DL	0	plf	Overturning Moment	#DIV/0!	k-ft	Hold Down Design Load	0	lbs
DL at ends of wall	0	lbs	Resistive Moment	0.0	k-ft	Holdown Capacity	0	lbs

Hold-down Specification

No Holdown Required