

STRUCTURAL CALCULATIONS
BUILDING DEPARTMENT SUBMITTAL

Date: March 17, 2025

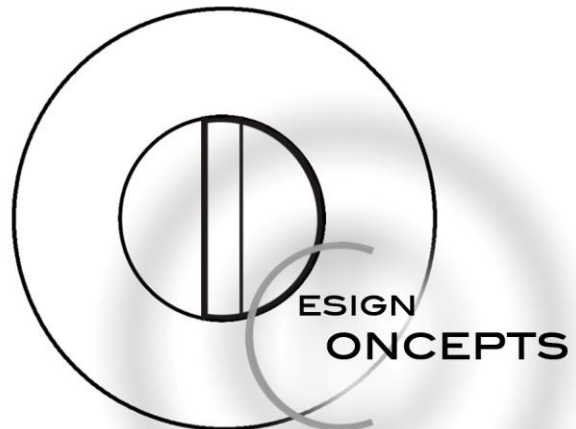
**Project: 105 S. Paire,
Inglewood, CA 90301
Proposed Addition and
Interior Remodel**



Prepared by:

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STRUCTURAL CALCULATION
EXISTING 1-STORY MEDICAL OFFICE BLDG. DR. BILL
RELEFORD, D.P.M.
105 S PRAIRIE AVE, INGLEWOOD, CA 90301

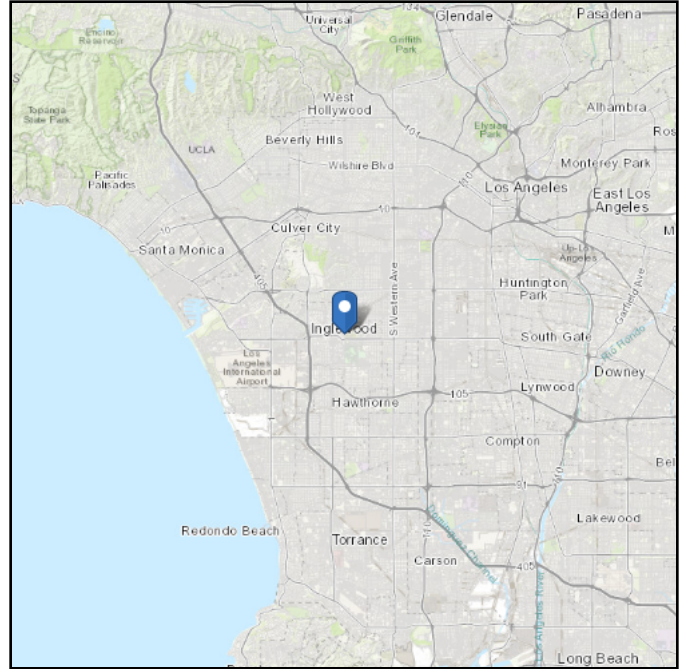
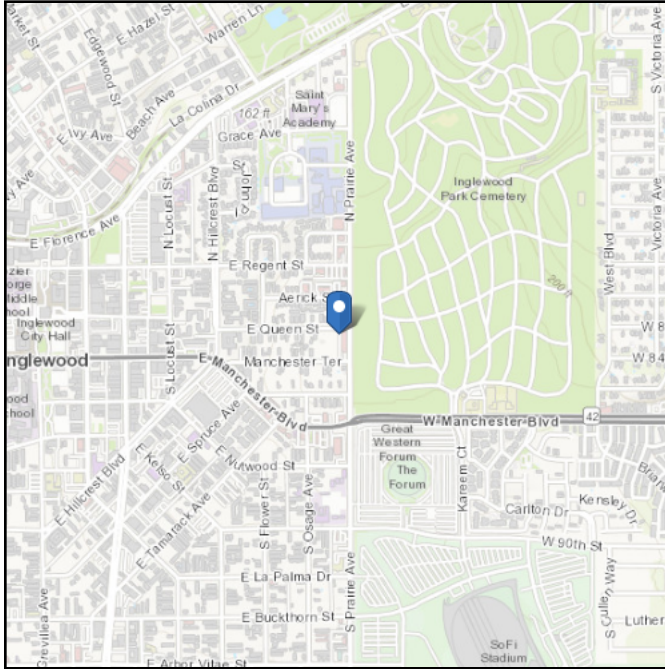
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ASCE Hazards Report

Address:
105 S Prairie Ave
Inglewood, California
90301

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: Default

Latitude: 33.96245
Longitude: -118.34436
Elevation: 170.3296800994997 ft
(NAVD 88)



Wind

Results:

Wind Speed	94 Vmph
10-year MRI	65 Vmph
25-year MRI	71 Vmph
50-year MRI	76 Vmph
100-year MRI	81 Vmph
300-year MRI	88 Vmph
700-year MRI	94 Vmph
1,700-year MRI	101 Vmph
3,000-year MRI	105 Vmph
10,000-year MRI	114 Vmph
100,000-year MRI	132 Vmph
1,000,000-year MRI	150 Vmph

Data Source: ASCE/SEI 7-22, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Sun Oct 20 2024



Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-22 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years). Values for 10-year MRI, 25-year MRI, 50-year MRI and 100-year MRI are Service Level wind speeds, all other wind speeds are Ultimate wind speeds.

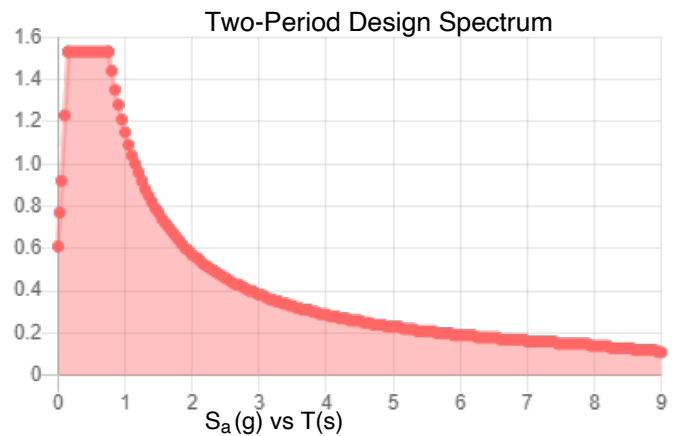
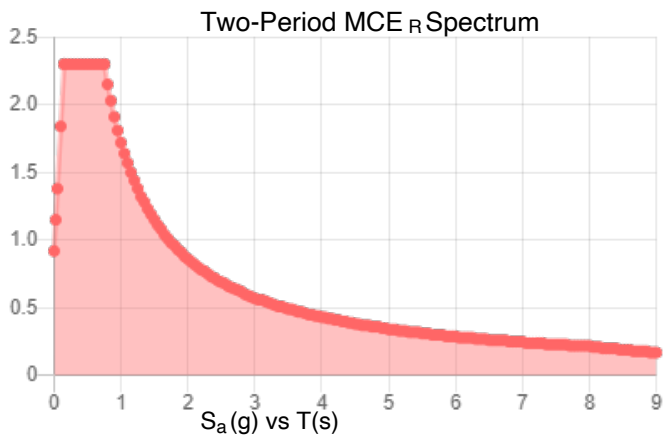
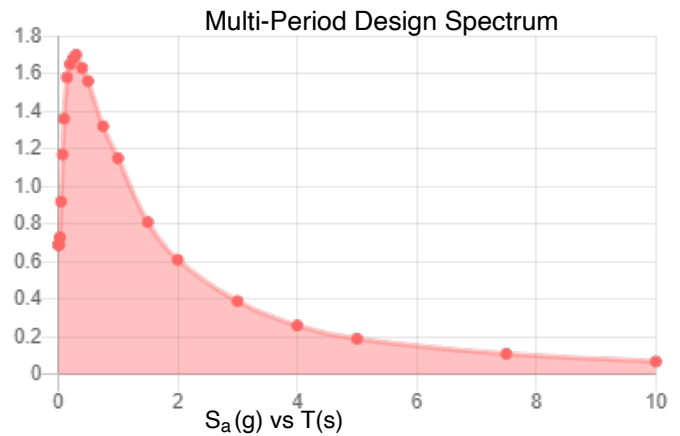
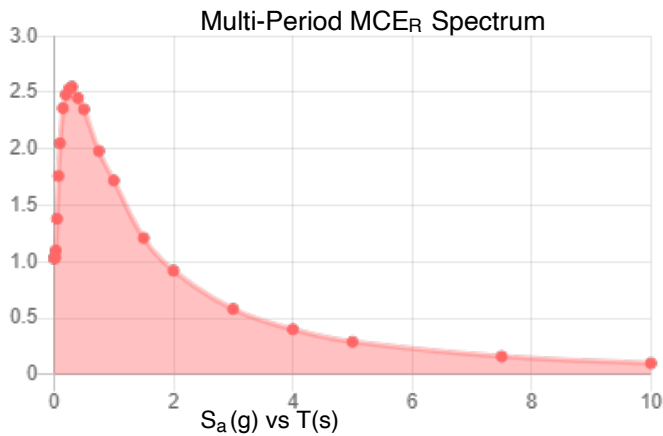
Site is not in a hurricane-prone region as defined in ASCE/SEI 7-22 Section 26.2.

Site Soil Class: Default

Results:

PGA _M :	0.92	T _L :	8
S _{MS} :	2.3	S _S :	2.19
S _{M1} :	1.72	S ₁ :	0.85
S _{DS} :	1.53	V _{S30} :	260
S _{D1} :	1.15		

Seismic Design Category: E



MCE_R Vertical Response Spectrum
Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum
Vertical ground motion data has not yet been made available by USGS.

Data Accessed: Sun Oct 20 2024

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

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GENERAL INFORMATION

I. General:		
Number of stories	2	
Building risk category	II	
Design Code	2022 CBC	
Load standard	ASCE 7-22	
Design Load Combination	ASD	
II. Lateral Parameter Loads:		
A. WIND	ASCE 7-22(Directional Procedure)	
Exposure	C	
Wind Speed V	94	
Enclosure	Enclosed Building	
Velocity pressure q_z	$0.00256K_zK_{zt}K_eV^2$	(26.10-1)
Velocity pressure exposure coefficient K_z	from	(Table 26.10-1)
Directionality Factor K_d	0.85	(Table 26.6-1)
Topographic factor defined K_{zt}	1	(26.8.2)
Gust Effect Factor G	0.85	(26.11)
Pressures for MWFRS p	$qK_dGC_p - q_iK_d(GC_{pi})$	(27.3-1)
External pressure coefficient C_p	from	(Fig. 27.3-1)
Internal pressure coefficient (GC_{pi})	0.18	(Table 26.13-1)}
B. SEISMIC	ASCE 7-22(Equivalent Lateral Force Procedure)	
Seismic Design Category	D	(Table 11.6-1)
Importance factor I_e	1	(Table 1.5-2)
Soil Site Class	Default	(Table 20-3-1)
Response Spectral Acc. (0.2 sec) S_s	2.19	
Response Spectral Acc. (1.0 sec) S_1	0.85	
T_L (sec)	8	
Max. Considered earthquake acc. S_{M5}	2.3	(11.4-1)
Max. Considered earthquake acc. S_{M1}	1.72	(11.4-2)
Design spectral acc. At short period S_{D5}	1.533	(11.4-3)
Design spectral acc. at 1s period S_{D1}	1.147	(11.4-4)
Response modification coefficient R	6.5	(Table 12.2-1)
System overstrength coefficient Ω	2.5	(Table 12.2-1)
Approximate fundamental period parameters	$C_t = 0.02 \quad x = 0.75$	(Table 12.8-2)
Building Height (ft)	23.5	
Building period $T = T_a$ (sec)	0.213	(12.8-8)
Base Shear Adjustment Factor	1	
Minimum C_s	0.067	(12.8-6 & 12.8-7)
Maximum C_s	0.826	(12.8-4 & 12.8-5)
Seismic response coefficient C_s	0.236	(12.8-3)
Adjusted C_s	0.236	
For allowable stress design $V = 0.7C_sW$	0.165W	

DESIGN LOADS

Roof Load [Remark: RF_Load]		
Clay Tile	10	psf
Framing	2.5	psf
Sheathing (1/2" CDX)	1.5	psf
Ceiling	2.5	psf
Insulation	1.5	psf
Misc.	2	psf
Dead Load	20	psf
Live Load	20	psf
Total Load	40	psf

Deck Load [Remark: DK_Load]		
Framing	3.5	psf
Sheathing (3/4" Plywood)	2.5	psf
Ceiling	2.5	psf
Lt. Wt. Conc./Flooring Tile	0	psf
Misc.	6.5	psf
Dead Load	15	psf
Live Load	60	psf
Total Load	75	psf

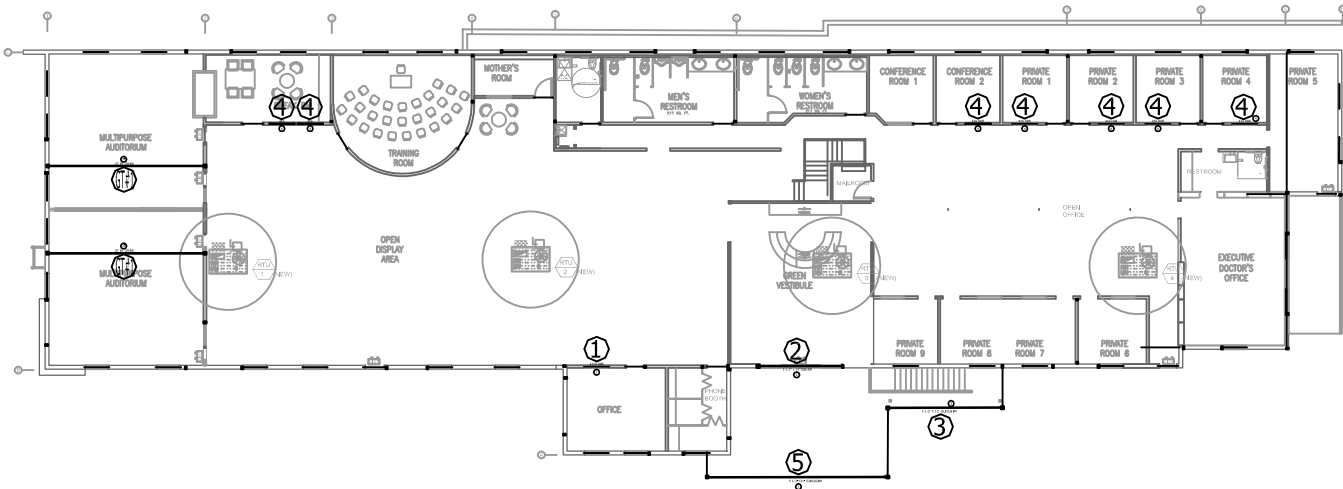
Interior Wall [Remark: In_Wall]		
Insulation	1	psf
Drywall	5	psf
Studs	1	psf
Misc.	3	psf
Dead Load	10	psf

Floor Load [Remark: FL_Load]		
Framing	3.5	psf
Sheathing (3/4" Plywood)	2.5	psf
Ceiling	2.5	psf
Lt. Wt. Conc./Flooring Tile	0	psf
Fiberglass shingles	6.5	psf
Dead Load	15	psf
Live Load	40	psf
Total Load	55	psf

Exterior Wall [Remark: Ex_Wall]		
7/8" Stucco	10	psf
Insulation	1	psf
Drywall	2.5	psf
Studs	1	psf
Misc.	0.5	psf
Dead Load	15	psf

Roof Load1 [Remark: RF_Load1]		
Asphalt shingles	2	psf
Framing	2.5	psf
Sheathing (1/2" CDX)	1.5	psf
Ceiling	2.5	psf
Insulation	1.5	psf
Misc.	6	psf
Dead Load	16	psf
Live Load	20	psf
Total Load	36	psf

Project Name: Existing 1-Story Medical Office Building
Job Address: 105 Prairie Ave., Ingle Wood, CA 90301
DATE: 2/3/20



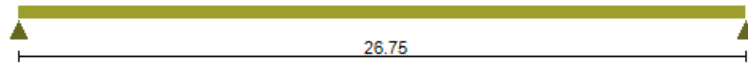
BEAM KEY PLAN
(SEE CALCULATION FOR BEAM ID)

TRUSS ID: GT1

Description: G. Truss @ Front of 3 Room Multipurpose Auditorium

Applied Loads:

RF_Load: D = 20, Lr = 20 psf, from: 0 --> 26.75 ft, Trib Width = 17.5 ft

Truss Designed by Others

Reactions (lb):	Supp. #1	Supp. #2
Down (D+Lr+L/Max. Load Comb.)	9362/9362	9363/9363
Up (D+Lr+L/Max. Load Comb.)	0/0	0/0

BEAM ID: 1

Description: Hdr @ Rear of the Office

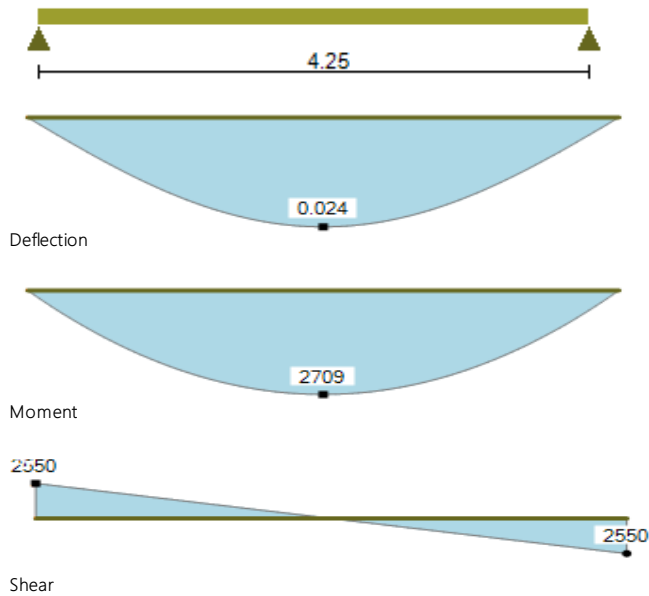
Material properties:

Fb(+)/Fb(-) (psi): 900/900 Ignore shear within (d): No
Fv (psi): 180 Repetitive member : No
E (psi): 1600000 Beam Bracing: No

Applied Loads:

RF_Load: D = 20, Lr = 20 psf, from: 0 --> 4.25 ft, Trib Width = 28.5 ft

Ex_Wall: D = 15 psf, from: 0 --> 4.25 ft, Height = 4 ft

4x10-Douglas Fir-Larch No.2**DESIGN SUMMARY****Applied Factors:**

Ct = 1, Cm = 1, CL = 0.99, CF = 1.2, Cfu = 1, Ci = 1, Cr = 1, CT = 1

Code check: Design OK

Max. Bending Ratio:	49%
Load Combination:	D + Lr
Load Duration CD:	1.25
Location of Max. Moment:	2.12 ft
Applied Moment:	2709 lb-ft
Allowable Moment:	5565 lb-ft
Max. Shear Ratio:	53%
Load Combination:	D + Lr
Load Duration CD:	1.25
Location of Max. Shear:	4.25 ft
Applied Shear:	2550 lb
Allowable Shear:	4856 lb
Max. Live Deflection:	8%
Load Combination:	Lr
Location of Max. Deflection:	2.12 ft
Applied Deflection:	0.011 in
Allowable Deflection:	0.142 in
Max. Total Deflection:	11%
Load Combination:	D + Lr
Location of Max. Deflection:	2.12 ft
Applied Deflection:	0.024 in
Allowable Deflection:	0.212 in

Reactions (lb):

Supp.	D	L	Lr	S	W _{SN}	W _{WE}	E _{SN}	E _{WE}	Max. LC (Down/Up)
1	1339	0	1211	0	0	0	0	0	2550/0
2	1339	0	1211	0	0	0	0	0	2550/0

BEAM ID: 2

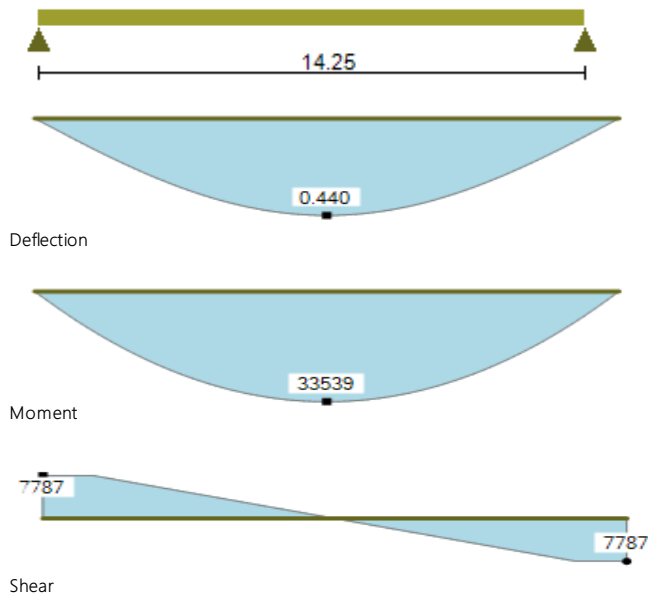
Description: Hdr @ Entry

Material properties:

Fb(+)/Fb(-) (psi): 2400/1850 Ignore shear within (d): Yes
Fv (psi): 265 Repetitive member : No
E (psi): 1800000 Beam Bracing: No

Applied Loads:

Ex_Wall: D = 15 psf, from: 0 --> 14.25 ft, Height = 6 ft
RF_Load: D = 20, Lr = 20 psf, from: 0 --> 14.25 ft, Trib Width = 21.75 ft
RF_Load1: D = 16, Lr = 20 psf, from: 0 --> 14.25 ft, Trib Width = 9.5 ft

5 1/2x15-GluLam DF/DF 24F-V4**DESIGN SUMMARY****Applied Factors:**

Ct = 1, Cm = 1, CL = 0.97, Cfu = 1, Cv = 1.00, CI = 1, Cc = 1

Code check: Design OK

Max. Bending Ratio: 67%
Load Combination: D + Lr
Load Duration CD: 1.25
Location of Max. Moment: 7.12 ft
Applied Moment: 33539 lb-ft
Allowable Moment: 49842 lb-ft

Max. Shear Ratio: 43%
Load Combination: D + Lr
Load Duration CD: 1.25
Location of Max. Shear: 14.25 ft
Applied Shear: 7787 lb
Allowable Shear: 18219 lb

Max. Live Deflection: 44%
Load Combination: Lr
Location of Max. Deflection: 7.12 ft
Applied Deflection: 0.208 in
Allowable Deflection: 0.475 in

Max. Total Deflection: 62%
Load Combination: D + Lr
Location of Max. Deflection: 7.12 ft
Applied Deflection: 0.440 in
Allowable Deflection: 0.712 in

Reactions (lb):

Supp.	D	L	Lr	S	W _{SN}	W _{WE}	E _{SN}	E _{WE}	Max. LC (Down/Up)
1	4961	0	4453	0	0	0	0	0	9415/0
2	4961	0	4453	0	0	0	0	0	9415/0

BEAM ID: 3

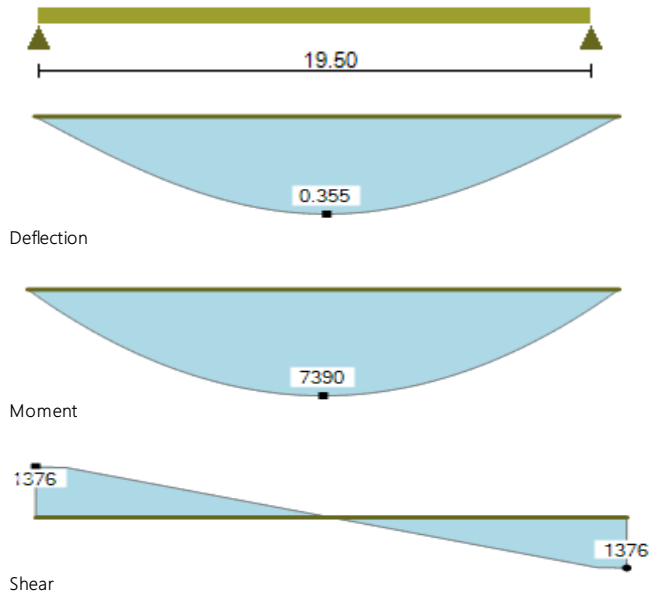
Description: Dr Bm @ Front of the Stair

Material properties:

Fb(+)/Fb(-) (psi): 2400/1850 Ignore shear within (d): Yes
Fv (psi): 265 Repetitive member : No
E (psi): 1800000 Beam Bracing: Yes

Applied Loads:

RF_Load: D = 20, Lr = 20 psf, from: 0 --> 19.5 ft, Trib Width = 3.5 ft

5 1/2x12-GluLam DF/DF 24F-V4**DESIGN SUMMARY****Applied Factors:**

Ct = 1, Cm = 1, CL = 1.00, Cfu = 1, Cv = 1.00, CI = 1, Cc = 1

Code check: Design OK

Max. Bending Ratio: 22%
Load Combination: D + Lr
Load Duration CD: 1.25
Location of Max. Moment: 9.75 ft
Applied Moment: 7390 lb-ft
Allowable Moment: 33000 lb-ft

Max. Shear Ratio: 9%
Load Combination: D + Lr
Load Duration CD: 1.25
Location of Max. Shear: 19.5 ft
Applied Shear: 1376 lb
Allowable Shear: 14575 lb

Max. Live Deflection: 25%
Load Combination: Lr
Location of Max. Deflection: 9.75 ft
Applied Deflection: 0.160 in
Allowable Deflection: 0.65 in

Max. Total Deflection: 36%
Load Combination: D + Lr
Location of Max. Deflection: 9.75 ft
Applied Deflection: 0.355 in
Allowable Deflection: 0.975 in

Reactions (lb):

Supp.	D	L	Lr	S	W _{SN}	W _{WE}	E _{SN}	E _{WE}	Max. LC (Down/Up)
1	833	0	683	0	0	0	0	0	1516/0
2	833	0	683	0	0	0	0	0	1516/0

BEAM ID: 4

Description: Hdr @ Front of the Break Room

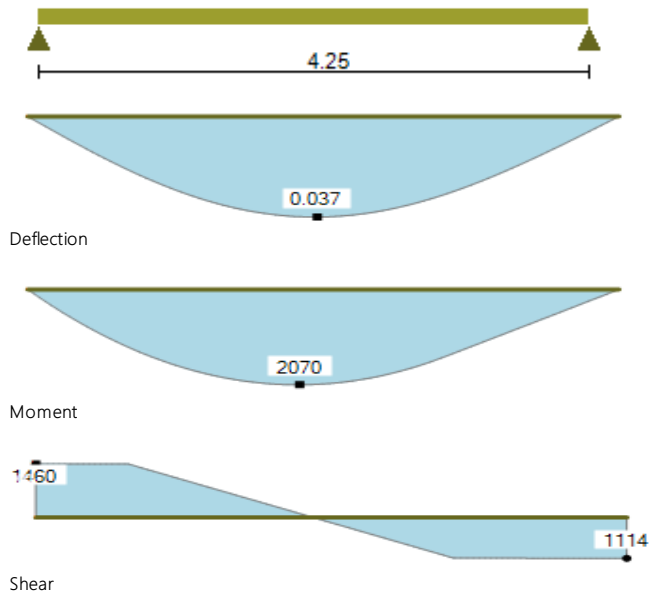
Material properties:

Fb(+)/Fb(-) (psi): 900/900 Ignore shear within (d): Yes
Fv (psi): 180 Repetitive member : No
E (psi): 1600000 Beam Bracing: No

Applied Loads:

In_Wall: D = 10 psf, from: 0 --> 4.25 ft, Height = 1 ft

RF_Load: D = 20, Lr = 20 psf, from: 0 --> 3 ft, Trib Width = 27 ft

4x8-Douglas Fir-Larch No.2**DESIGN SUMMARY****Applied Factors:**

Ct = 1, Cm = 1, CL = 0.99, CF = 1.3, Cfu = 1, Ci = 1, Cr = 1, CT = 1

Code check: Design OK

Max. Bending Ratio: 56%
Load Combination: D + Lr
Load Duration CD: 1.25
Location of Max. Moment: 1.96 ft
Applied Moment: 2070 lb-ft
Allowable Moment: 3709 lb-ft

Max. Shear Ratio: 38%
Load Combination: D + Lr
Load Duration CD: 1.25
Location of Max. Shear: 0 ft
Applied Shear: 1460 lb
Allowable Shear: 3806 lb

Max. Live Deflection: 13%
Load Combination: Lr
Location of Max. Deflection: 2.08 ft
Applied Deflection: 0.018 in
Allowable Deflection: 0.142 in

Max. Total Deflection: 17%
Load Combination: D + Lr
Location of Max. Deflection: 2.08 ft
Applied Deflection: 0.037 in
Allowable Deflection: 0.212 in

Reactions (lb):

Supp.	D	L	Lr	S	W _{SN}	W _{WE}	E _{SN}	E _{WE}	Max. LC (Down/Up)
1	1082	0	1048	0	0	0	0	0	2130/0
2	606	0	572	0	0	0	0	0	1177/0

BEAM ID: 5

Description: Drop Bm @Front of the Entry

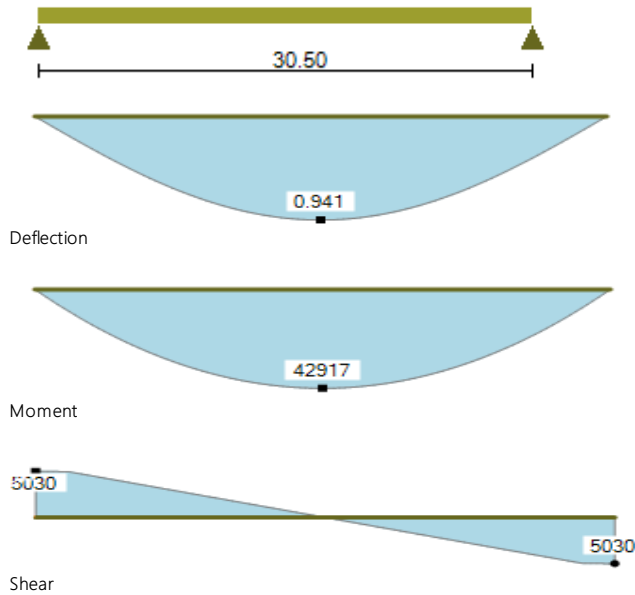
Material properties:

Fb(+)/Fb(-) (psi): 2400/1850 Ignore shear within (d): Yes
Fv (psi): 265 Repetitive member : No
E (psi): 1800000 Beam Bracing: Yes

Applied Loads:

RF_Load1: D = 16, Lr = 20 psf, from: 0 --> 30.5 ft, Trib Width = 9.5 ft

5 1/2x21-GluLam DF/DF 24F-V4

**DESIGN SUMMARY****Applied Factors:**

Ct = 1, Cm = 1, CL = 1.00, Cfu = 1, Cv = 0.90, CI = 1, Cc = 1, CT = 1

Code check: Design OK

Max. Bending Ratio: 47%
Load Combination: D + Lr
Load Duration CD: 1.25
Location of Max. Moment: 15.25 ft
Applied Moment: 42917 lb-ft
Allowable Moment: 91414 lb-ft

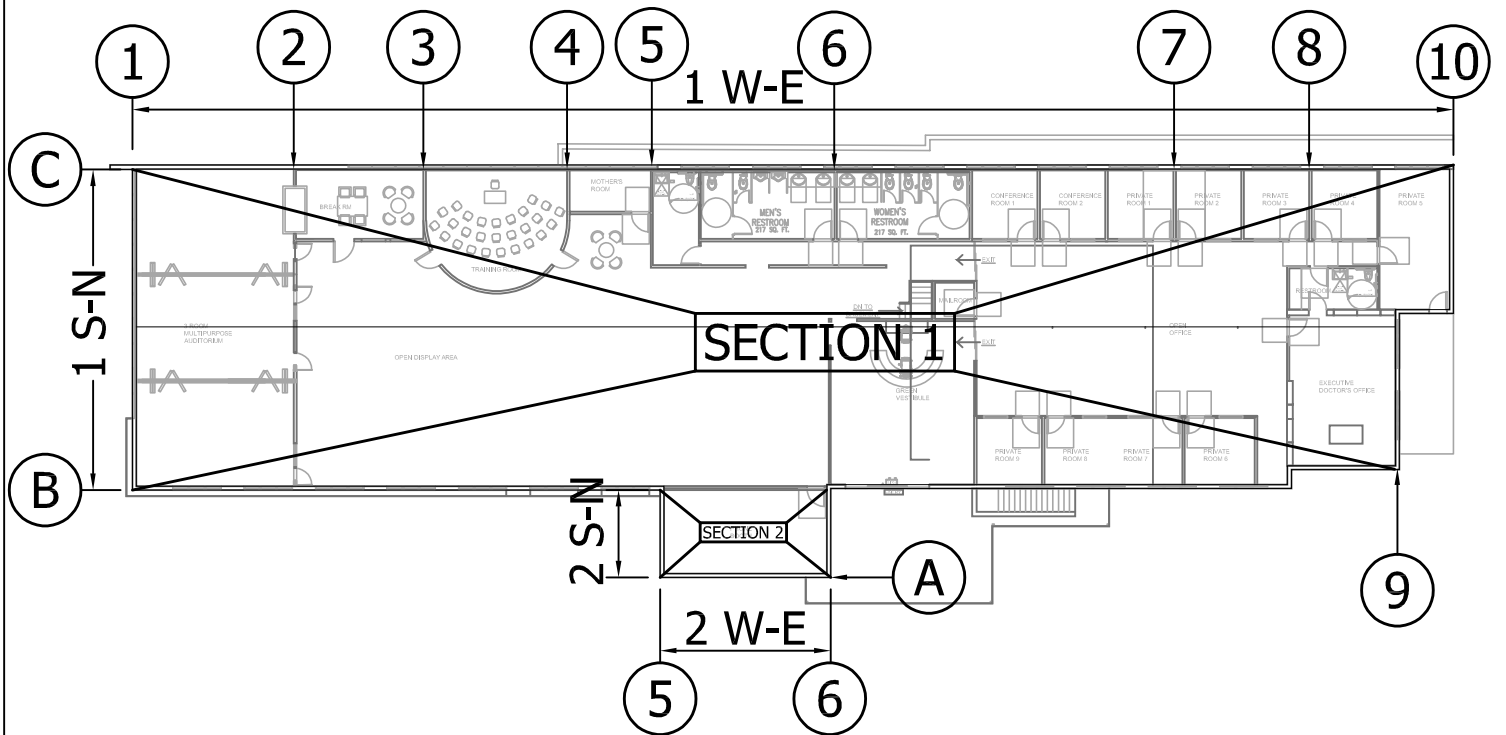
Max. Shear Ratio: 20%
Load Combination: D + Lr
Load Duration CD: 1.25
Location of Max. Shear: 0 ft
Applied Shear: 5030 lb
Allowable Shear: 25506 lb

Max. Live Deflection: 48%
Load Combination: Lr
Location of Max. Deflection: 15.25 ft
Applied Deflection: 0.484 in
Allowable Deflection: 1.017 in

Max. Total Deflection: 62%
Load Combination: D + Lr
Location of Max. Deflection: 15.25 ft
Applied Deflection: 0.941 in
Allowable Deflection: 1.525 in

Reactions (lb):

Supp.	D	L	Lr	S	W _{SN}	W _{WE}	E _{SN}	E _{WE}	Max. LC (Down/Up)
1	2731	0	2898	0	0	0	0	0	5628/0
2	2731	0	2898	0	0	0	0	0	5628/0



ROOF SHEAR WALL LAYOUT

(SEE CALCULATION FOR SHEAR LINE NUMBER)

DIAPHRAGM 1 – DIRECTION W-E

GENERAL:

Story	Top Plate Height (ft)	Roof Height (ft) / Floor Depth (in)	Ignored WW wall	Ignored LW wall
ROOF	12	6.5	No	No

Dimension (ft)	Width	Depth	Height	Base Height
Building	40 (B)	42 (L)	23.5	0.5
Diaphragm	54.5	222	-	0.5

WIND LOAD:

$K_d = 0.85 \quad G = 0.85 \quad L/B = 42/40 = 1.05$ Windward Wall $C_{pw} = 0.8$ Leeward Wall $C_{pl} = -0.49$, $q_h = 21.2$ (PSF) $q_z = 0.00256 K_z K_{zt} V^2$ (PSF) Wall press. = $(K_d G C_{pw} q_z + K_d G C_{pl} q_h) h_T$ (PLF)						
ROOF ELEMENT (PLF)		WDir (+C _{pi})	WDir (-C _{pi})	OWDir (+C _{pi})	OWDir (-C _{pi})	
Parapet (Windward): Width=54.5 ft		175.69	175.69	117.12	117.12	
Parapet (LeeWard): Width=54.5 ft		117.12	117.12	175.69	175.69	
Diaph_Story	z (ft)	K _z	q _z	h _T (ft)	Wall press	Wind_ASD (PLF)
1 (W-E)_ROOF	12.5	.8	19.2	6	111.6	242.66
TOTAL						242.66

SEISMIC LOAD: (C_s_ASD = 0.1651)

Story	Load Type		Weight W (PLF)	C _s *W (PLF)
ROOF	RF_Load (DL)	= 20 x 12195 / 54.5	4475.23	738.86
TOTAL SEISMIC LOAD				738.86
Diaph_Story	W _x (PLF)	H _x (ft)	W _x h _x /sum(W _i h _i)	F _x (PLF)
1 (W-E)_ROOF	4475.23	12	1	738.86

DIAPHRAGM DESIGN:

Diaphragm seismic loading:

Story	Sum(F _i) (PLF)	Sum(W _i) (PLF)	F _{px} (PLF)	F _{px} Min (PLF)	F _{px} Max (PLF)	F _{px} Design (PLF)
ROOF	738.86	4475.23	738.86	980.29	1960.58	980.29

Code check:

Story	Diaphragm				Seismic shear			Wind shear		
	Sheathing	Nail	Width (ft)	Depth (ft)	Applied (LB)	Allow. (LB)	Ratio	Applied (LB)	Allow. (LB)	Ratio
ROOF	15/32 Sheathing and Single-Floor Unblocked	8d @ 6", 6", 12" O.C.	54.5	222	120.3	240	0.5	29.8	335	0.09

DIAPHRAGM 1 – DIRECTION S-N

GENERAL:

Story	Top Plate Height (ft)	Roof Height (ft) / Floor Depth (in)	Ignored WW wall	Ignored LW wall
ROOF	12	6.5	No	No

Dimension (ft)	Width	Depth	Height	Base Height
Building	42 (B)	40 (L)	23.5	0.5
Diaphragm	222	54.5	-	0.5

WIND LOAD:

$K_d = 0.85 \quad G = 0.85 \quad L/B = 40/42 = 0.95$ Windward Wall $C_{pw} = 0.8$ Leeward Wall $C_{pl} = -0.5$, $q_h = 21.2$ (PSF) $q_z = 0.00256 K_z K_{zt} V^2$ (PSF) Wall press. = $(K_d G C_{pw} q_z + K_d G C_{pl} q_h) h_T$ (PLF)						
ROOF ELEMENT (PLF)		WDir (+C _{pi})	WDir (-C _{pi})	OWDir (+C _{pi})	OWDir (-C _{pi})	
Parapet (Windward): Width=222 ft		175.69	175.69	117.12	117.12	
Parapet (LeeWard): Width=222 ft		117.12	117.12	175.69	175.69	
Diaph_Story	z (ft)	K _z	q _z	h _T (ft)	Wall press	Wind_ASD (PLF)
1 (S-N)_ROOF	12.5	.8	19.2	6	112.5	243.21
TOTAL						243.21

SEISMIC LOAD: (C_s_ASD = 0.1651)

Story	Load Type		Weight W (PLF)	C _s *W (PLF)
ROOF	RF_Load (DL)	= 20 x 12195 / 222	1098.65	181.39
TOTAL SEISMIC LOAD				181.39
Diaph_Story	W _x (PLF)	H _x (ft)	W _x h _x /sum(W _i h _i)	F _x (PLF)
1 (S-N)_ROOF	1098.65	12	1	181.39

DIAPHRAGM DESIGN:

Diaphragm seismic loading:

Story	Sum(F _i) (PLF)	Sum(W _i) (PLF)	F _{px} (PLF)	F _{px} Min (PLF)	F _{px} Max (PLF)	F _{px} Design (PLF)
ROOF	181.39	1098.65	181.39	240.66	481.31	240.66

Code check:

Story	Diaphragm				Seismic shear			Wind shear		
	Sheathing	Nail	Width (ft)	Depth (ft)	Applied (LB)	Alow. (LB)	Ratio	Applied (LB)	Alow. (LB)	Ratio
ROOF	15/32 Sheathing and Single-Floor Unblocked	8d @ 6", 6", 12" O.C.	65	54.5	143.5	180	0.8	145	252	0.58

DIAPHRAGM 2 – DIRECTION W-E

GENERAL:

Story	Top Plate Height (ft)	Roof Height (ft) / Floor Depth (in)	Ignored WW wall	Ignored LW wall
ROOF	12	6.5	No	No

WIND LOAD:

$K_d = 0.85$ $G = 0.85$ $L/B = 42/40 = 1.05$ Windward Wall $C_{pw} = 0.8$ Leeward Wall $C_{pl} = -0.49$, $q_h = 21.2$ (PSF) $q_z = 0.00256K_zK_{zt}V^2$ (PSF) Wall press. = $(K_dGC_{pw}q_z + K_dGC_{pl}q_h)h_T$ (PLF)						
ROOF ELEMENT (PLF)		WDir (+C _{pi})	WDir (-C _{pi})	OWDir (+C _{pi})	OWDir (-C _{pi})	
Parapet (Windward): Width=14.75 ft		175.69	175.69	117.12	117.12	
Parapet (LeeWard): Width=14.75 ft		117.12	117.12	175.69	175.69	
Diaph_Story	z (ft)	K _z	q _z	h _T (ft)	Wall press	Wind_ASD (PLF)
2 (W-E)_ROOF	12.5	.8	19.2	6	111.6	242.66
TOTAL						242.66

DIAPHRAGM DESIGN:

Diaphragm seismic loading:

Story	Sum(F _i) (PLF)	Sum(W _i) (PLF)	F _{px} (PLF)	F _{px} Min (PLF)	F _{px} Max (PLF)	F _{px} Design (PLF)
ROOF	125.36	759.32	125.36	166.33	332.65	166.33

Code check:

Story	Diaphragm				Seismic shear			Wind shear		
	Sheathing		Nail		Width (ft)	Depth (ft)	Applied (LB)	Alow. (LB)	Ratio	
ROOF	15/32 Sheathing and Single-Floor Unblocked		8d @ 6", 6", 12" O.C.		14.75	29.75	41.2	240	0.17	60.2 335 0.18

DIAPHRAGM 2 – DIRECTION S-N

GENERAL:

Story	Top Plate Height (ft)	Roof Height (ft) / Floor Depth (in)	Ignored WW wall	Ignored LW wall
ROOF	12	6.5	No	No

WIND LOAD:

$K_d = 0.85$ $G = 0.85$ $L/B = 40/42 = 0.95$ Windward Wall $C_{pw} = 0.8$ Leeward Wall $C_{pl} = -0.5$, $q_h = 21.2$ (PSF) $q_z = 0.00256K_zK_{zt}V^2$ (PSF) Wall press. = $(K_dGC_{pw}q_z + K_dGC_{pl}q_h)h_T$ (PLF)						
ROOF ELEMENT (PLF)		WDir (+C _{pi})	WDir (-C _{pi})	OWDir (+C _{pi})	OWDir (-C _{pi})	
Parapet (Windward): Width=29.75 ft		175.69	175.69	117.12	117.12	
Parapet (LeeWard): Width=29.75 ft		117.12	117.12	175.69	175.69	
Diaph_Story	z (ft)	K _z	q _z	h _T (ft)	Wall press	Wind_ASD (PLF)
2 (S-N)_ROOF	12.5	.8	19.2	6	112.5	243.21
TOTAL						243.21

DIAPHRAGM DESIGN:

Diaphragm seismic loading:

Story	Sum(F _i) (PLF)	Sum(W _i) (PLF)	F _{px} (PLF)	F _{px} Min (PLF)	F _{px} Max (PLF)	F _{px} Design (PLF)
ROOF	62.03	375.71	62.03	82.3	164.6	82.3

Code check:

Story	Diaphragm				Seismic shear			Wind shear		
	Sheathing		Nail		Width (ft)	Depth (ft)	Applied (LB)	Alow. (LB)	Ratio	
ROOF	15/32 Sheathing and Single-Floor Unblocked		8d @ 6", 6", 12" O.C.		29.75	14.75	83	180	0.46	245.3 252 0.97

Dimension (ft)	Width	Depth	Height	Base Height
Building	40 (B)	42 (L)	23.5	0.5
Diaphragm	14.75	29.75	-	0.5

SEISMIC LOAD: (C_s_ASD = 0.1651)

Story	Load Type		Weight W (PLF)	C _s *W (PLF)
ROOF	RF_Load (DL)	= 20 x 425 / 14.75	576.27	95.14
	Ex_Wall (DL)	= 15 x 30 x (12/2) / 14.75	183.05	30.22
TOTAL SEISMIC LOAD				125.36
Diaph_Story	W _x (PLF)	H _x (ft)	W _x xh _x /sum(W _x h _i)	F _x (PLF)
2 (W-E)_ROOF	759.32	12	1	125.36

Dimension (ft)	Width	Depth	Height	Base Height
Building	42 (B)	40 (L)	23.5	0.5
Diaphragm	29.75	14.75	-	0.5

SEISMIC LOAD: (C_s_ASD = 0.1651)

Story	Load Type		Weight W (PLF)	C _s *W (PLF)
ROOF	RF_Load (DL)	= 20 x 425 / 29.75	285.71	47.17
	Ex_Wall (DL)	= 15 x 29.75 x (12/2) / 29.75	90.00	14.86
TOTAL SEISMIC LOAD				62.03
Diaph_Story	W _x (PLF)	H _x (ft)	W _x xh _x /sum(W _x h _i)	F _x (PLF)
2 (S-N)_ROOF	375.71	12	1	62.03

A. OVERTURNING LOAD COMBINATIONS

UPLIFT	DOWN
1. $0.6D - 0.6W$	1. $D + 0.6W$
2. $(0.6 - 0.14S_{ds})D - 0.7pE$	2. $D + 0.75(L + L_r + 0.6W)$
	3. $D + 0.75(L + S + 0.6W)$
	4. $(1+0.105S_{ds})D + 0.75(L + S + 0.7pE)$
	5. $(1+0.14S_{ds})D + 0.7pE$

B. SHEARWALL SCHEDULE (Design Code: 2022 CBC)

Panel Type	Sheathing	Edge Nail	Field Nail	Shear Clip	Sill plate attachment		Ga (k/in)	Seismic Allowable(plf)	Wind Allowable(plf)
					Framed Floor	Concrete			
1	3/8" Sheathing	8d @ 6	8d @ 12	A35 @ 24	16d Nails @ 6	5/8 x 10 @ 48	13	260	364
2	3/8" Sheathing	8d @ 4	8d @ 12	A35 @ 16	16d Nails @ 4	5/8 x 10 @ 42	19	380	532
3	3/8" Sheathing	8d @ 3	8d @ 12	A35 @ 8	16d Nails @ 3	5/8 x 10 @ 36	25	490	686
4	3/8" Sheathing	8d @ 2	8d @ 12	A35 @ 8	16d Nails @ 2	5/8 x 10 @ 24	39	640	896
5	15/32" Structural I	10d @ 2	10d @ 12	A35 @ 6	(2) Rows Stagg, 16d Nails @ 3	5/8 x 10 @ 18	51	870	1218
3D	3/8" Sheathing	8d @ 3	8d @ 12	(Both Sides)A35 @ 8	SDS1/4x6 @ 4	5/8 x 12 @ 22	50	980	1372
4D	3/8" Sheathing	8d @ 2	8d @ 12	(Both Sides)A35 @ 8	SDS1/4x6 @ 3	5/8 x 12 @ 16	78	1280	1792
5D	15/32" Structural I	10d @ 2	10d @ 12	(Both Sides)A35 @ 6	SDS1/4x6 @ 2	5/8 x 12 @ 8	102	1740	2436

SW_LINE 1**1st Floor**[Design OK](#)

Direction S-N

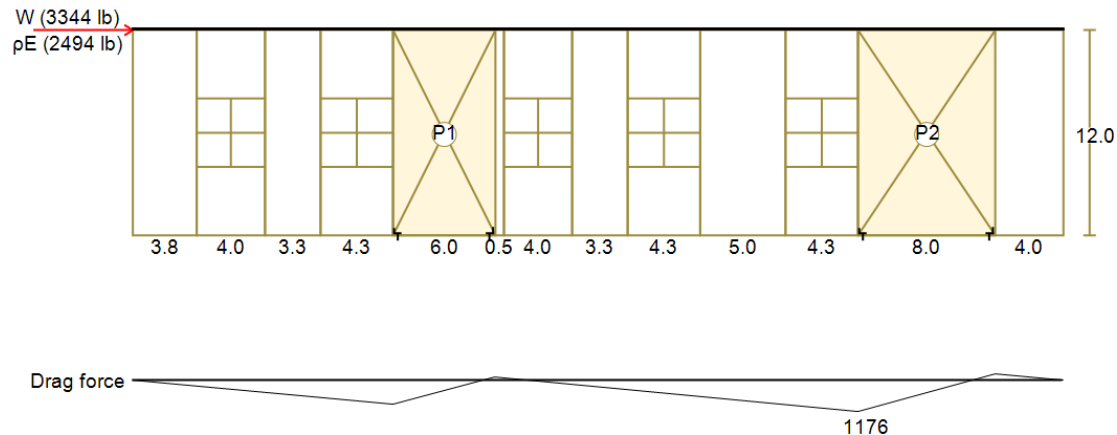
 $\rho = 1.0$

Total Length (ft): 55.00

Total panel Length (ft): 14.04

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=27.5ft): W=3344 LB, E=2494 LB

 Holddown
  Shear panel
**DESIGN SUMMARY**Shear & Deflection: USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 6.00 ft

Max. wind shear = 238 plf

Allowable Wind = 532 plf

Ratio = 45 %

Max. seismic shear = 178 plf

Allowable Seismic = 380 plf

Ratio = 47 %

Max. Deflection = 1.884 in at Panel P1

Allowable Deflection = 2.880 in

Ratio = 65 %

Overturning calculation

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D_{up}	D_{down}	L	Lr	S	W	E				
P1	6.00	12.00	LE	540	239	0	0	0	3083	2299	2759/3322	HDU2/4X4	3075/7656	0.90/0.43
			RE	540	239	0	0	0	3083	2299	2759/3322	HDU2/4X4	3075/7656	0.90/0.43
P2	8.04	12.00	LE	724	239	0	0	0	3023	2254	2589/3262	HDU2/4X4	3075/7656	0.84/0.43
			RE	724	239	0	0	0	3023	2254	2589/3262	HDU2/4X4	3075/7656	0.84/0.43

 D_{up} : used for uplift force calculation D_{down} : used for down force calculation

LE: left edge of shearwall

RE: right edge of shearwall

SW_LINE 2

1st Floor

[Design OK](#)

Direction S-N

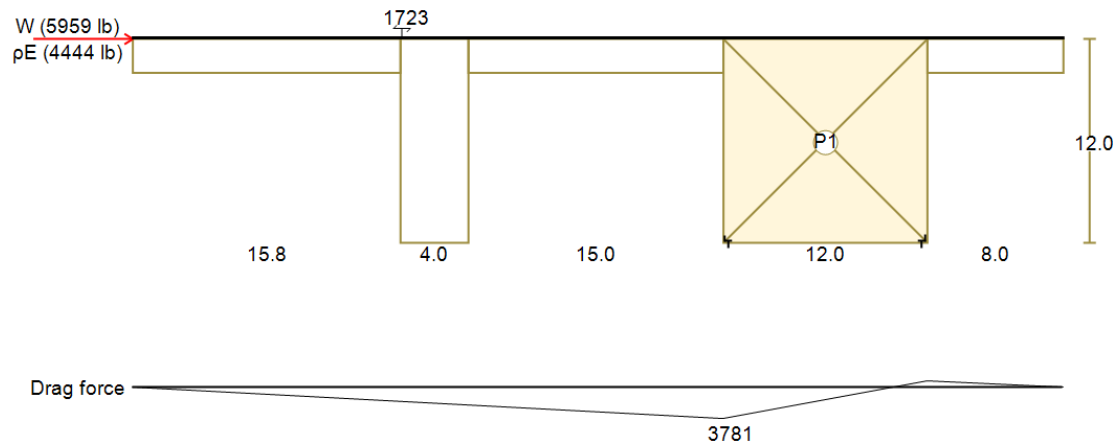
 $p = 1.0$

Total Length (ft): 55.00

Total panel Length (ft): 12.00

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=49ft): W=5959 LB, E=4444 LB

 Holddown  Drag Force (LB)  Shear panel**DESIGN SUMMARY**Shear & Deflection: USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 12.00 ft

Max. wind shear = 497 plf

Allowable Wind = 532 plf

Ratio = 93 %

Max. seismic shear = 370 plf

Allowable Seismic = 380 plf

Ratio = 97 %

Max. Deflection = 2.492 in at Panel P1

Allowable Deflection = 2.880 in

Ratio = 87 %

Overturning calculation

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	Lr	S	W	E				
P1	12.00	12.00	LE	1080	239	0	0	0	6184	4612	5536/6424	HDU5/4X6	5645/12031	0.98/0.53
			RE	1080	239	0	0	0	6184	4612	5536/6424	HDU5/4X6	5645/12031	0.98/0.53

*D_{up}: used for uplift force calculation**D_{down}: used for down force calculation**LE: left edge of shearwall**RE: right edge of shearwall*

SW_LINE 3

1st Floor

[Design OK](#)

Direction S-N

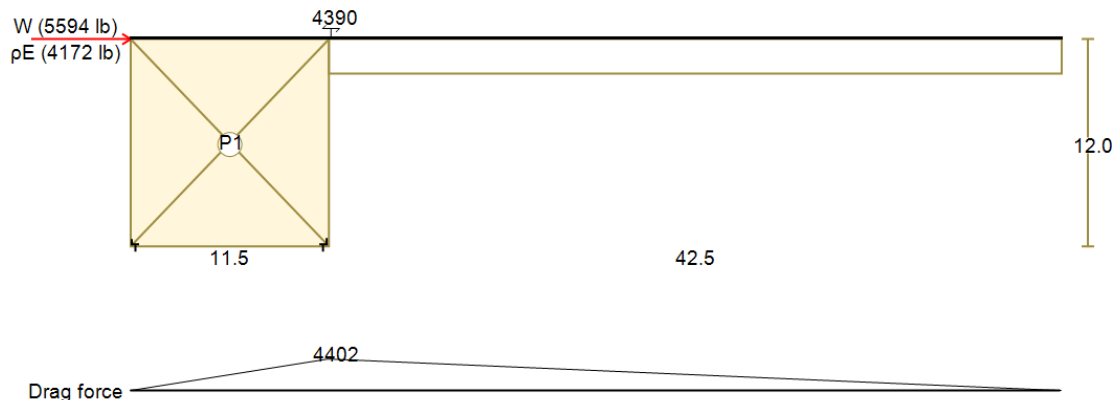
 $\rho = 1.0$

Total Length (ft): 54.00

Total panel Length (ft): 11.50

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=46ft): W=5594 LB, E=4172 LB

 Holddown
  Drag Force (LB)
  Shear panel
**DESIGN SUMMARY**Shear & Deflection: USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 11.50 ft

Max. wind shear = 486 plf

Allowable Wind = 532 plf

Ratio = **91 %**

Max. seismic shear = 363 plf

Allowable Seismic = 380 plf

Ratio = **96 %**

Max. Deflection = 2.475 in at Panel P1

Allowable Deflection = 2.880 in

Ratio = **86 %****Overturning calculation**

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D_{up}	D_{down}	L	Lr	S	W	E				
P1	11.50	12.00	LE	1035	239	0	0	0	6068	4526	5447/6307	HDU5/4X6	5645/12031	0.96/0.52
			RE	1035	239	0	0	0	6068	4526	5447/6307	HDU5/4X6	5645/12031	0.96/0.52

 D_{up} : used for uplift force calculation D_{down} : used for down force calculation

LE: left edge of shearwall

RE: right edge of shearwall

SW_LINE 4

1st Floor

[Design OK](#)

Direction S-N

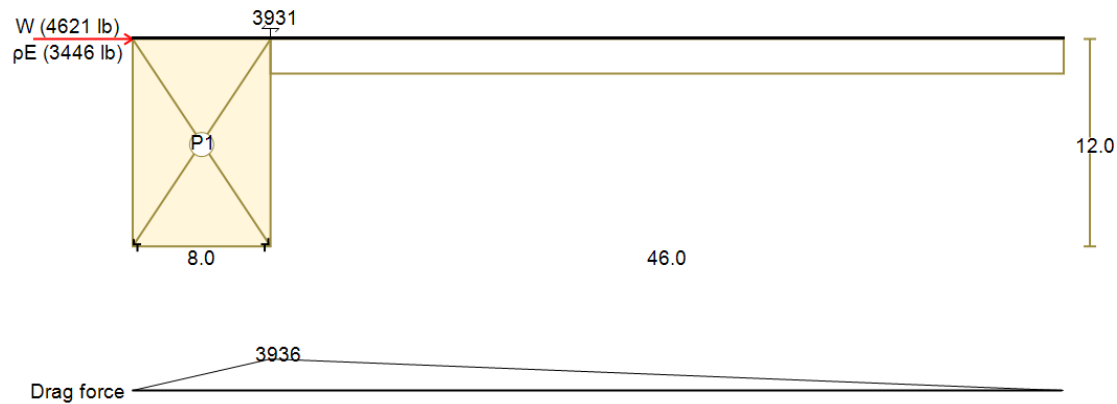
 $p = 1.0$

Total Length (ft): 54.00

Total panel Length (ft): 8.00

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=38ft): W=4621 LB, E=3446 LB

 Holddown
  Drag Force (LB)
  Shear panel
**DESIGN SUMMARY**Shear & Deflection: USE PANEL TYPE 3

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 8.00 ft

Max. wind shear = 578 plf

Allowable Wind = 686 plf

Ratio = **84** %

Max. seismic shear = 431 plf

Allowable Seismic = 490 plf

Ratio = **88** %

Max. Deflection = 2.566 in at Panel P1

Allowable Deflection = 2.880 in

Ratio = **89** %**Overturning calculation**

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	L _r	S	W	E				
P1	8.00	12.00	LE	720	239	0	0	0	7333	5469	6901/7572	HDU8/4X6	7870/12031	0.88/0.63
			RE	720	239	0	0	0	7333	5469	6901/7572	HDU8/4X6	7870/12031	0.88/0.63

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation*LE*: left edge of shearwall*RE*: right edge of shearwall

SW_LINE 5**1st Floor**[Design OK](#)

Direction S-N

 $\rho = 1.0$

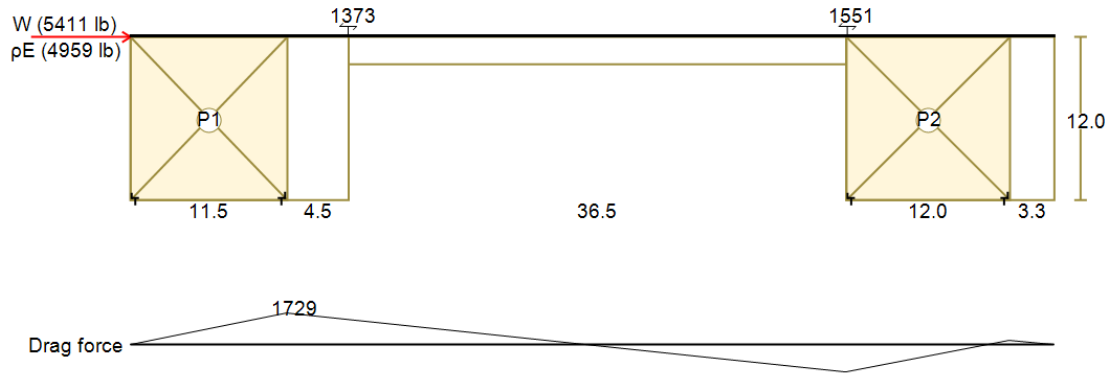
Total Length (ft): 68.00

Total panel Length (ft): 23.50

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=44.5ft): W=5411 LB, E=4036 LB

DIAPHRAGM 2 (S-N)_ROOF (Span=29.75ft): W=0 LB, E=923 LB

 Holddown
  Drag Force (LB)
  Shear panel
**DESIGN SUMMARY****Shear & Deflection:** USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 11.50 ft

Max. wind shear = 230 plf

Allowable Wind = 532 plf

Ratio = **43** %

Max. seismic shear = 211 plf

Allowable Seismic = 380 plf

Ratio = **56** %

Max. Deflection = 1.241 in at Panel P1

Allowable Deflection = 2.880 in

Ratio = **43** %**Overturning calculation**

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	L _r	S	W	E				
P1	11.50	12.00	LE	1035	239	0	0	0	2873	2632	2252/3112	HDU2/4X6	3075/12031	0.73/0.26
			RE	1035	239	0	0	0	2873	2632	2252/3112	HDU2/4X6	3075/12031	0.73/0.26
P2	12.00	12.00	LE	1080	239	0	0	0	2868	2628	2220/3107	HDU2/4X6	3075/12031	0.72/0.26
			RE	1080	239	0	0	0	2868	2628	2220/3107	HDU2/4X6	3075/12031	0.72/0.26

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation*LE*: left edge of shearwall*RE*: right edge of shearwall

SW_LINE 6**1st Floor****Design OK**

Direction S-N

 $\rho = 1.0$

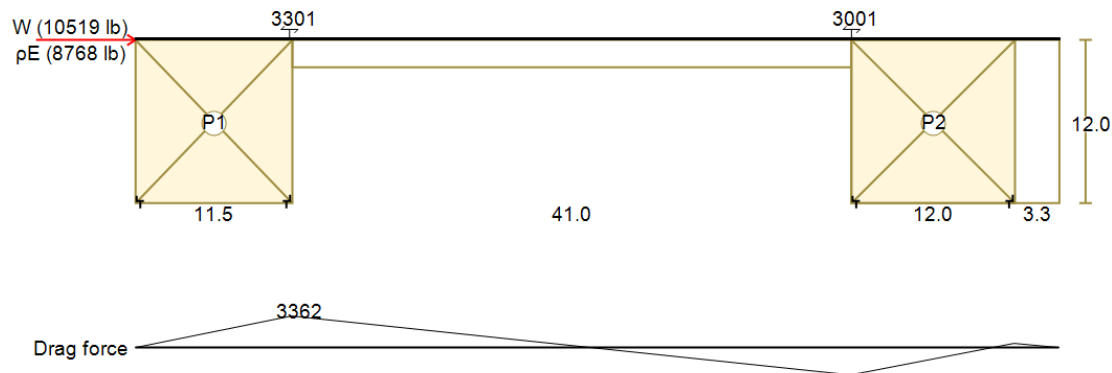
Total Length (ft): 68.00

Total panel Length (ft): 23.50

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=86.5ft): W=10519 LB, E=7845 LB

DIAPHRAGM 2 (S-N)_ROOF (Span=29.75ft): W=0 LB, E=923 LB

 Holddown
  Drag Force (LB)
  Shear panel
**DESIGN SUMMARY****Shear & Deflection:** USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 11.50 ft

Max. wind shear = 448 plf

Allowable Wind = 532 plf

Ratio = **84** %

Max. seismic shear = 373 plf

Allowable Seismic = 380 plf

Ratio = **98** %

Max. Deflection = 2.272 in at Panel P1

Allowable Deflection = 2.880 in

Ratio = **79** %**Overturning calculation**

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	Lr	S	W	E				
P1	11.50	12.00	LE	1035	239	0	0	0	5584	4654	4963/5823	HDU5/4X6	5645/12031	0.88/0.48
			RE	1035	239	0	0	0	5584	4654	4963/5823	HDU5/4X6	5645/12031	0.88/0.48
P2	12.00	12.00	LE	1080	239	0	0	0	5575	4647	4927/5814	HDU5/4X6	5645/12031	0.87/0.48
			RE	1080	239	0	0	0	5575	4647	4927/5814	HDU5/4X6	5645/12031	0.87/0.48

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation*LE*: left edge of shearwall*RE*: right edge of shearwall

SW_LINE 7**1st Floor**[Design OK](#)

Direction S-N

 $\rho = 1.0$

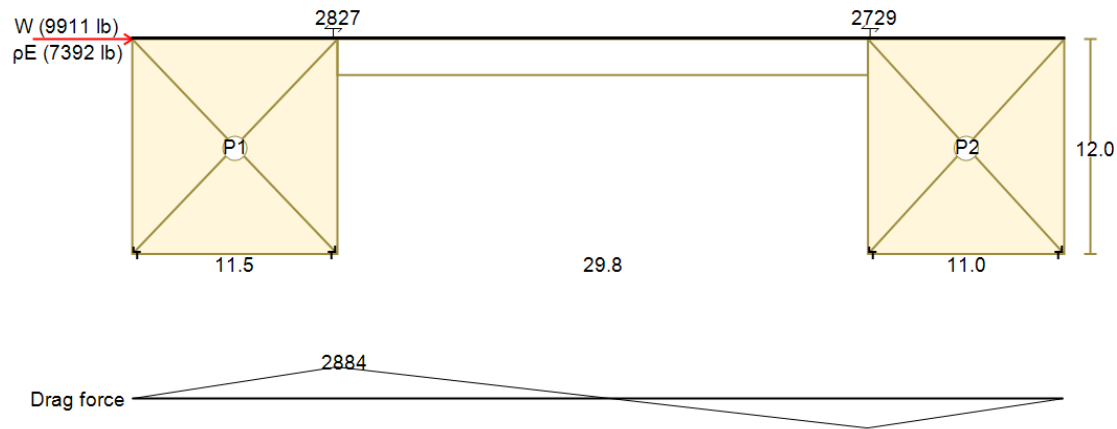
Total Length (ft): 52.00

Total panel Length (ft): 22.50

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=81.5ft): W=9911 LB, E=7392 LB

⌊ Holddown ← Drag Force (LB) ☒ Shear panel

**DESIGN SUMMARY****Shear & Deflection:** USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 11.50 ft

Max. wind shear = 441 plf

Allowable Wind = 532 plf

Ratio = **83** %

Max. seismic shear = 329 plf

Allowable Seismic = 380 plf

Ratio = **87** %

Max. Deflection = 2.27 in at Panel P2

Allowable Deflection = 2.880 in

Ratio = **79** %**Overturning calculation**

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	Lr	S	W	E				
P1	11.50	12.00	LE	1035	239	0	0	0	5495	4098	4874/5734	HDU5/4X6	5645/12031	0.86/0.48
			RE	1035	239	0	0	0	5495	4098	4874/5734	HDU5/4X6	5645/12031	0.86/0.48
P2	11.00	12.00	LE	990	239	0	0	0	5505	4105	4911/5744	HDU5/4X6	5645/12031	0.87/0.48
			RE	990	239	0	0	0	5505	4105	4911/5744	HDU5/4X6	5645/12031	0.87/0.48

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation*LE*: left edge of shearwall*RE*: right edge of shearwall

SW_LINE 8

1st Floor

[Design OK](#)

Direction S-N

 $p = 1.0$

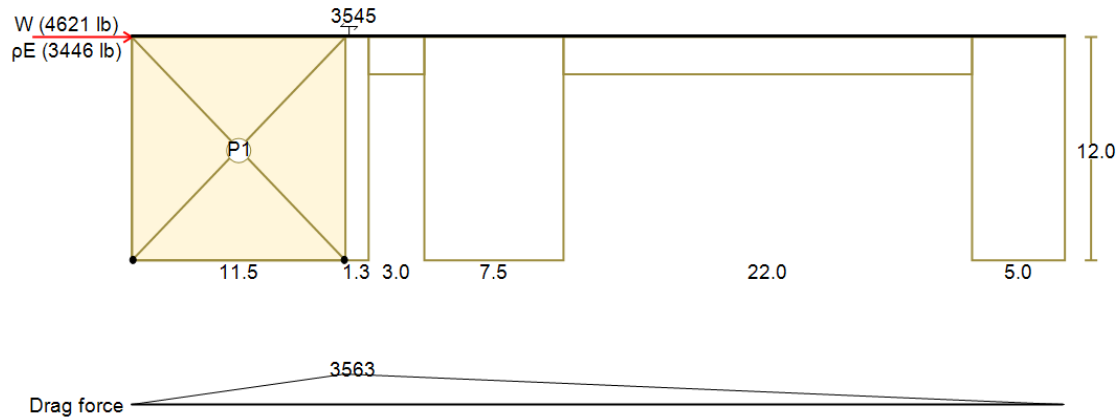
Total Length (ft): 50.00

Total panel Length (ft): 11.50

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=38ft): W=4621 LB, E=3446 LB

- Strap  Drag Force (LB)  Shear panel

**DESIGN SUMMARY**Shear & Deflection: USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 11.50 ft

Max. wind shear = 402 plf

Allowable Wind = 532 plf

Ratio = 76 %

Max. seismic shear = 300 plf

Allowable Seismic = 380 plf

Ratio = 79 %

Max. Deflection = 1.996 in at Panel P1

Allowable Deflection = 2.880 in

Ratio = 69 %

Overturning calculation

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	L _r	S	W	E				
P1	11.50	12.00	LE	1035	239	0	0	0	4948	3690	4327/5187	HDU4/4X6	4565/12031	0.95/0.43
			RE	1035	239	0	0	0	4948	3690	4327/5187	HDU4/4X6	4565/12031	0.95/0.43

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation*LE*: left edge of shearwall*RE*: right edge of shearwall

SW_LINE 9**1st Floor**[Design OK](#)

Direction S-N

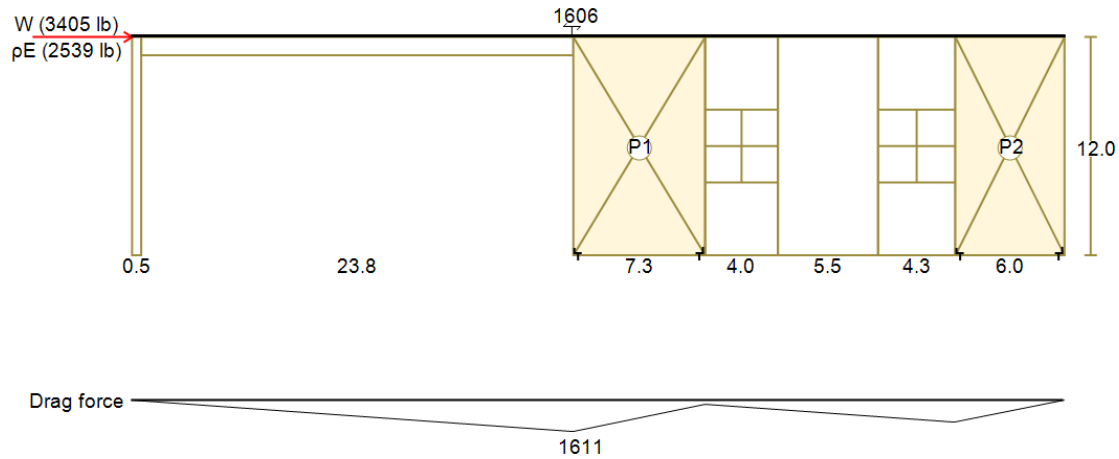
 $\rho = 1.0$

Total Length (ft): 51.00

Total panel Length (ft): 13.25

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=28ft): W=3405 LB, E=2539 LB

 Holddown
  Drag Force (LB)
  Shear panel
**DESIGN SUMMARY**Shear & Deflection: USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 7.25 ft

Max. wind shear = 257 plf

Allowable Wind = 532 plf

Ratio = **48** %

Max. seismic shear = 192 plf

Allowable Seismic = 380 plf

Ratio = **51** %

Max. Deflection = 1.979 in at Panel P2

Allowable Deflection = 2.880 in

Ratio = **69** %**Overturning calculation**

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	L _r	S	W	E				
P1	7.25	12.00	LE	653	239	0	0	0	3282	2448	2890/3521	HDU2/4X6	3075/12031	0.94/0.29
			RE	653	239	0	0	0	3282	2448	2890/3521	HDU2/4X6	3075/12031	0.94/0.29
P2	6.00	12.00	LE	540	239	0	0	0	3326	2481	3002/3566	HDU2/4X6	3075/12031	0.98/0.30
			RE	540	239	0	0	0	3326	2481	3002/3566	HDU2/4X6	3075/12031	0.98/0.30

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation*LE*: left edge of shearwall*RE*: right edge of shearwall

SW_LINE 10

1st Floor

[Design OK](#)

Direction S-N

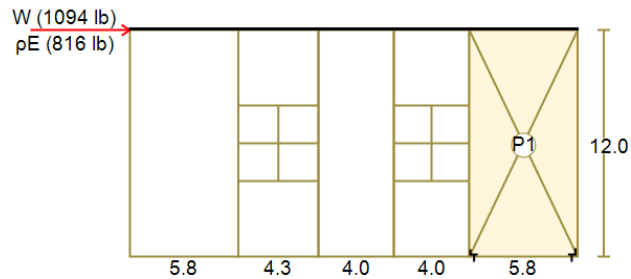
 $\rho = 1.0$

Total Length (ft): 24.00

Total panel Length (ft): 5.75

Applied Loads

DIAPHRAGM 1 (S-N)_ROOF (Span=9ft): W=1094 LB, E=816 LB

 Holddown  Shear panel**DESIGN SUMMARY****Shear & Deflection:** USE PANEL TYPE 2

Maximum shear check at Panel P1	Height H = 12.00 ft	Width W = 5.75 ft
Max. wind shear = 190 plf	Allowable Wind = 526 plf	Ratio = 36 %
Max. seismic shear = 142 plf	Allowable Seismic = 376 plf (Adjusted by 1.25-0.125h/bs)	Ratio = 38 %
Max. Deflection = 1.479 in at Panel P1	Allowable Deflection = 2.880 in	Ratio = 51 %

Overturning calculation

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	Lr	S	W	E				
P1	5.75	12.00	LE	518	239	0	0	0	2472	1844	2162/2712	HDU2/4X6	3075/12031	0.70/0.23
			RE	518	239	0	0	0	2472	1844	2162/2712	HDU2/4X6	3075/12031	0.70/0.23

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation*LE*: left edge of shearwall*RE*: right edge of shearwall

SW_LINE A

1st Floor

[Design OK](#)

Direction W-E

 $p = 1.0$

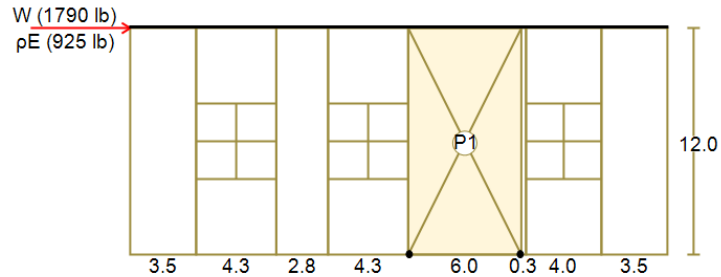
Total Length (ft): 29.00

Total panel Length (ft): 6.00

Applied Loads

DIAPHRAGM 2 (W-E)_ROOF (Span=14.75ft): W=1790 LB, E=925 LB

- Strap  Shear panel

**DESIGN SUMMARY**Shear & Deflection: USE PANEL TYPE 2

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 6.00 ft

Max. wind shear = 298 plf

Allowable Wind = 532 plf

Ratio = 56 %

Max. seismic shear = 154 plf

Allowable Seismic = 380 plf

Ratio = 41 %

Max. Deflection = 1.994 in at Panel P1

Allowable Deflection = 2.880 in

Ratio = 69 %

Overturning calculation

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	Lr	S	W	E				
P1	6.00	12.00	LE	540	239	0	0	0	3762	1944	3438/4002	HDU4/4X4	4565/7656	0.75/0.52
			RE	540	239	0	0	0	3762	1944	3438/4002	HDU4/4X4	4565/7656	0.75/0.52

*D_{up}: used for uplift force calculation**D_{down}: used for down force calculation**LE: left edge of shearwall**RE: right edge of shearwall*

SW_LINE B**1st Floor****Design OK**

Direction W-E

 $\rho = 1.0$

Total Length (ft): 213.00

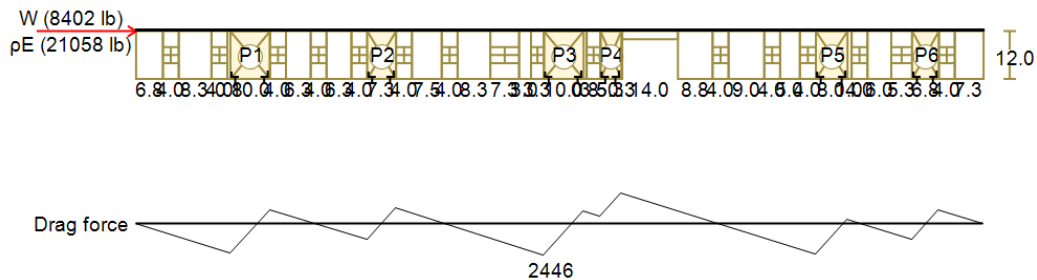
Total panel Length (ft): 47.25

Applied Loads

DIAPHRAGM 1 (W-E)_ROOF (Span=54.5ft): W=6612 LB, E=20134 LB

DIAPHRAGM 2 (W-E)_ROOF (Span=14.75ft): W=1790 LB, E=925 LB

RF_Load: D = 20, Lr = 20 psf, from: 0 --> 213.499984741211 ft, Trib Width = 10 ft

 Holddown
  Shear panel
**DESIGN SUMMARY****Shear & Deflection:** USE PANEL TYPE 3

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 10.00 ft

Max. wind shear = 178 plf

Allowable Wind = 686 plf

Ratio = **26 %**

Max. seismic shear = 446 plf

Allowable Seismic = 490 plf

Ratio = **91 %**

Max. Deflection = 2.518 in at Panel P6

Allowable Deflection = 2.880 in

Ratio = **87 %****Overturning calculation**

Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	Lr	S	W	E				
P1	10.00	12.00	LE	1900	372	0	133	0	2231	5593	4861/6045	HDU5/4X4	5645/7656	0.86/0.79
			RE	1900	372	0	133	0	2231	5593	4861/6045	HDU5/4X4	5645/7656	0.86/0.79
P2	7.25	12.00	LE	1378	372	0	133	0	2271	5692	5161/6144	HDU5/4X4	5645/7656	0.91/0.80
			RE	1378	372	0	133	0	2271	5692	5161/6144	HDU5/4X4	5645/7656	0.91/0.80
P3	10.00	12.00	LE	1900	372	0	133	0	2231	5593	4861/6045	HDU5/4X4	5645/7656	0.86/0.79
			RE	1900	372	0	133	0	2231	5593	4861/6045	HDU5/4X4	5645/7656	0.86/0.79
P4	5.25	12.00	LE	998	372	0	133	0	2455	6154	5770/6606	HDU8/4X6	7870/12031	0.73/0.55
			RE	998	372	0	133	0	2455	6154	5770/6606	HDU8/4X6	7870/12031	0.73/0.55
P5	8.00	12.00	LE	1520	372	0	133	0	2257	5658	5072/6110	HDU5/4X4	5645/7656	0.90/0.80
			RE	1520	372	0	133	0	2257	5658	5072/6110	HDU5/4X4	5645/7656	0.90/0.80
P6	6.75	12.00	LE	1283	372	0	133	0	2282	5719	5225/6171	HDU5/4X4	5645/7656	0.93/0.81
			RE	1283	372	0	133	0	2282	5719	5225/6171	HDU5/4X4	5645/7656	0.93/0.81

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation*LE*: left edge of shearwall*RE*: right edge of shearwall

SW_LINE C

1st Floor

Design OK

Direction W-E

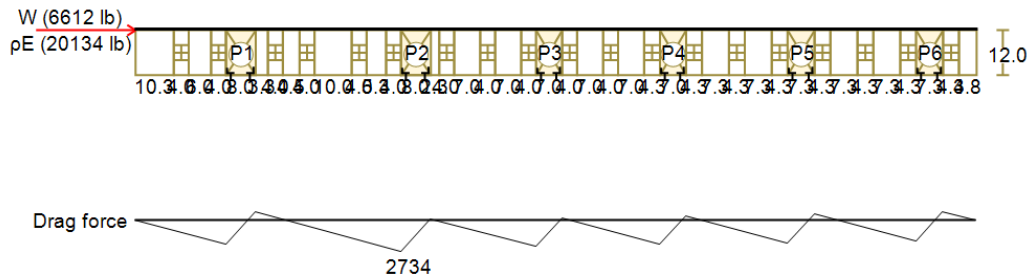
 $\rho = 1.0$

Total Length (ft): 226.00

Total panel Length (ft): 44.50

Applied Loads

DIAPHRAGM 1 (W-E)_ROOF (Span=54.5ft): W=6612 LB, E=20134 LB

 Holddown
  Shear panel


DESIGN SUMMARY

Shear & Deflection: USE PANEL TYPE 3

Maximum shear check at Panel P1

Height H = 12.00 ft

Width W = 8.00 ft

Max. wind shear = 149 plf

Allowable Wind = 686 plf

Ratio = 22 %

Max. seismic shear = 452 plf

Allowable Seismic = 490 plf

Ratio = 92 %

Max. Deflection = 2.557 in at Panel P3

Allowable Deflection = 2.880 in

Ratio = 89 %

Overturning calculation

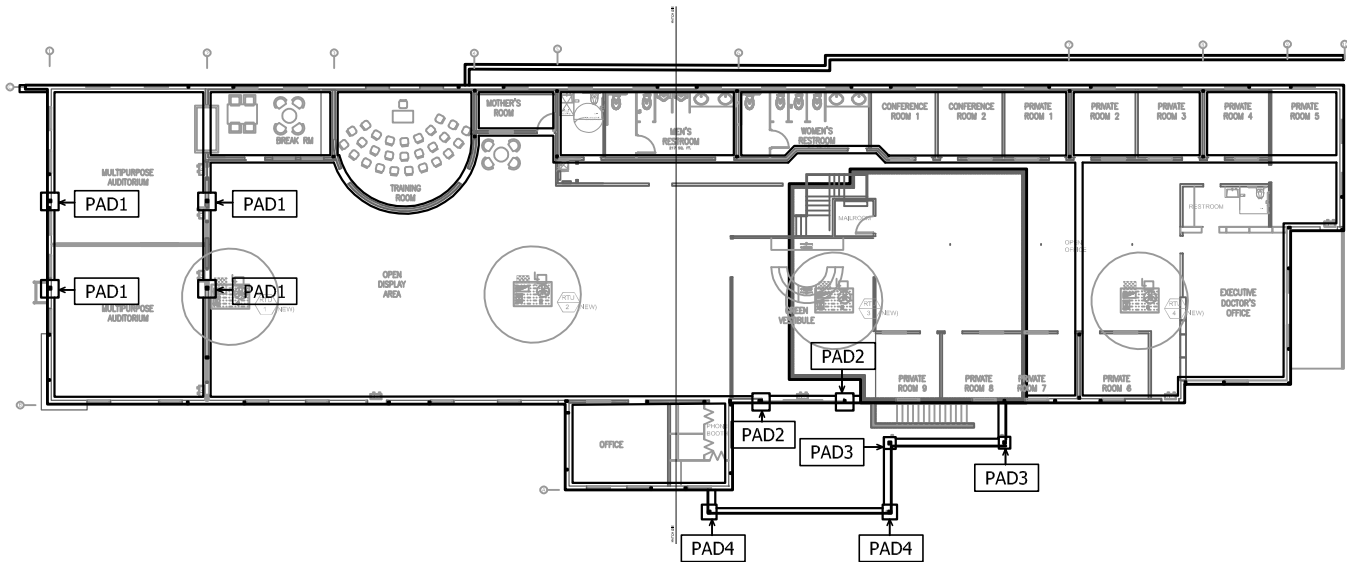
Panel	Width (ft)	Net Height (ft)	Reaction (LB)								Applied Uplift/Down (LB)	Holddown/Post	Allowable Uplift/Down (LB)	Ratio Uplift/Down
			Loc.	D _{up}	D _{down}	L	L _r	S	W	E				
P1	8.00	12.00	LE	720	239	0	0	0	1886	5743	5466/6034	HDU5/4X4	5645/7656	0.97/0.79
			RE	720	239	0	0	0	1886	5743	5466/6034	HDU5/4X4	5645/7656	0.97/0.79
P2	8.00	12.00	LE	720	239	0	0	0	1886	5743	5466/6034	HDU5/4X4	5645/7656	0.97/0.79
			RE	720	239	0	0	0	1886	5743	5466/6034	HDU5/4X4	5645/7656	0.97/0.79
P3	7.00	12.00	LE	630	239	0	0	0	1902	5791	5549/6082	HDU5/4X4	5645/7656	0.98/0.79
			RE	630	239	0	0	0	1902	5791	5549/6082	HDU5/4X4	5645/7656	0.98/0.79
P4	7.00	12.00	LE	630	239	0	0	0	1902	5791	5549/6082	HDU5/4X4	5645/7656	0.98/0.79
			RE	630	239	0	0	0	1902	5791	5549/6082	HDU5/4X4	5645/7656	0.98/0.79
P5	7.25	12.00	LE	653	239	0	0	0	1898	5778	5527/6069	HDU5/4X4	5645/7656	0.98/0.79
			RE	653	239	0	0	0	1898	5778	5527/6069	HDU5/4X4	5645/7656	0.98/0.79
P6	7.25	12.00	LE	653	239	0	0	0	1898	5778	5527/6069	HDU5/4X4	5645/7656	0.98/0.79
			RE	653	239	0	0	0	1898	5778	5527/6069	HDU5/4X4	5645/7656	0.98/0.79

D_{up}: used for uplift force calculation*D_{down}*: used for down force calculation

LE: left edge of shearwall

RE: right edge of shearwall

Project Name: Existing 1-Story Medical Office Building
Job Address: 105 Prairie Ave., Ingle Wood, CA 90301
DATE: 2/3/20



PAD FOOTING KEY PLAN
(SEE CALCULATION FOR PAD FOOTING ID)

Pad/Footing ID: PAD1

Description: @ 3 Room Multipurpose Auditorium (SUPPORT 1/2 GT1)

Soil Bearing: SB = 1500 PSF Post with parallel to footing: Bp = 3.5 in

Loading:

Weight of Footing 375.00 PLF = 150 x 1.25' x 2.00'
Weight of Pad 2700.00 LB = 150 x 3.00' x 3.00' x 2.00'
POINT From Support 2 of Beam GT1 (9363LB)
Ex_Wall D = 15 psf, Height = 12 ft

Footing Check:

Total Weight: $W_{total} = 555$ PLF
Footing Width Required: $B_f = W_{total} / SB = 555/1500 \times 12 = 4.44$ in
USE 15" WIDE X 24" DEEP Continuous Footing with #4 Cont. @ T & B (U.N.O)

Pad Check:

Total Point Load (P_{total}) = 12063 LB
Footing Length to check point load $L = 3.5 + 2 \times (24 + 6) = 63.50$ in
Footing Width B = 15 in
Capacity of Point Load on Footing: $P_{cap} = (SB \times L \times B) / 144 = 9921.88$ LB
Allowable Point Load on Footing: $P_{allow} = P_{cap} - (W_{total} \times L / 12) = 6985.00$ LB < Ptotal
Required Pad Area = $P_{total} / SB = 12063/1500 = 8.04$ Ft²
USE 3'-0" SQ x 24" DEEP PAD with (4) #4 @ Bottom, E.W.

Pad/Footing ID: PAD2

Description: @ Entry (SUPPORT 1/2 BM#2)

Soil Bearing: SB = 1500 PSF Post with parallel to footing: Bp = 3.5 in

Loading:

Weight of Footing 375.00 PLF = 150 x 1.25' x 2.00'
Weight of Pad 2700.00 LB = 150 x 3.00' x 3.00' x 2.00'
POINT From Support 1 of Beam 2 (9415LB)
Ex_Wall D = 15 psf, Height = 12 ft

Footing Check:

Total Weight: $W_{total} = 555$ PLF
Footing Width Required: $B_f = W_{total} / SB = 555/1500 \times 12 = 4.44$ in
USE 15" WIDE X 24" DEEP Continuous Footing with #4 Cont. @ T & B (U.N.O)

Pad Check:

Total Point Load (P_{total}) = 12115 LB
Footing Length to check point load $L = 3.5 + 2 \times (24 + 6) = 63.50$ in
Footing Width B = 15 in
Capacity of Point Load on Footing: $P_{cap} = (SB \times L \times B) / 144 = 9921.88$ LB
Allowable Point Load on Footing: $P_{allow} = P_{cap} - (W_{total} \times L / 12) = 6985.00$ LB < Ptotal
Required Pad Area = $P_{total} / SB = 12115/1500 = 8.08$ Ft²
USE 3'-0" SQ x 24" DEEP PAD with (4) #4 @ Bottom, E.W.

Pad/Footing ID: PAD3

Description: @ Entry (SUPPORT 1/2 BM#3)

Soil Bearing: SB = 1500 PSF Post with parallel to footing: Bp = 3.5 in

Loading:

Weight of Pad 1200.00 LB = 150 x 2.00' x 2.00' x 2.00'
POINT From Support 1 of Beam 3 (1516LB)

Pad Check:

Total Point Load (P_{total}) = 2716 LB
Required Pad Area = $P_{total} / SB = 2716/1500 = 1.81$ Ft²
USE 2'-0" SQ x 24" DEEP PAD with (3) #4 @ Bottom, E.W.

Pad/Footing ID: PAD4

Description: @ Entry (SUPPORT 1/2 BM#5)

Soil Bearing: SB = 1500 PSF Post with parallel to footing: Bp = 3.5 in

Loading:

Weight of Pad 1875.00 LB = 150 x 2.50' x 2.50' x 2.00'
POINT From Support 1 of Beam 5 (5628LB)

Pad Check:

Total Point Load (P_{total}) = 7503 LB
Required Pad Area = $P_{total} / SB = 7503/1500 = 5.00 \text{ Ft}^2$
USE 2'-6" SQ x 24" DEEP PAD with (4) #4 @ Bottom, E.W.

Pad/Footing ID: FT

Description: FOOTING

Soil Bearing: SB = 1500 PSF Post with parallel to footing: Bp = 3.5 in

Loading:

Weight of Footing 375.00 PLF = 150 x 1.25' x 2.00'
RF_Load D = 20, Lr = 20 psf, Trib Width = 27.25 ft
In_Wall D = 10 psf, Height = 12 ft

Footing Check:

Total Weight: $W_{total} = 1585 \text{ PLF}$
Footing Width Required: $Bf = W_{total} / SB = 1585/1500 \times 12 = 12.68 \text{ in}$
USE 15" WIDE X 24" DEEP Continuous Footing with #4 Cont. @ T & B (U.N.O)

General information:

Overall Height (ft):	12	Is studwall:	True	Incised treated:	False
Section type:	Douglas Fir-Larch No.2				
Section name:	2-2x4				
Fbx+/Fbx- (psi):	900/900	Fby (psi):	900		
Fvx (psi):	180	Fvy (psi):	180		
Fc (psi):	1350	Ft (psi):	575		
Ex (psi):	1600000	Ey (psi):	1600000		
Exmin (psi):	580000	Eymin (psi):	580000		
Luxx (ft):	0	Luyy (ft):	12		

Sill Plate Material:

Section type:	Douglas Fir-Larch No.2
Section name:	2x4
FcL (psi):	625

Applied Load:

AXIAL (LB): D=720 Lr=720 [ROOF LOAD]
SEFL WEIGHT (PLF): D=0.53

Factors:

Ct = 1 Cm = 1 CL = 0.99 CF = 1.5 Cfu = 1 Ci = 1 Cr = 1.15 Cp = 0.11 CT = 1

Design Summary:

Max. Axial + Bending Ratio:

50%

Governing NDS Formula:	Compression Only, fc/F'c
Load Combination:	D + Lr
Location of Max. above base:	0.00 ft
Values at Location of Max Comb:	
Applied Axial	1446 lb
Applied Moment	0 lb-ft
Allowable Axial	2887 lb
Allowable Moment	840 lb-ft

Max. Shear Ratio:

0%

Load Combination	D
Location of Max. above base	0.00 ft
Applied Shear	0 lb
Allowable Shear	1134 lb

Sill Plate Compressive Ratio:

20%

Load Combination	D + Lr
Applied Axial	1446 lb
Allowable Axial	7383 lb

Max. Lateral Deflections:

Load Combination	D
Location of Max. above base	0.00 ft
Applied deflection	0.000 in

Max. Lateral Reactions:

Top	0 lb	D
Bottom	0 lb	D
**Max Slenderness Ratio le/d < 50 per NDS 3.7.1.4:		OK

General information:

Overall Height (ft):	12	Is studwall:	True	Incised treated:	False
Section type:	Douglas Fir-Larch No.2				
Section name:	2x6				
Fbx+/Fbx- (psi):	900/900	Fby (psi):	900		
Fvx (psi):	180	Fvy (psi):	180		
Fc (psi):	1350	Ft (psi):	575		
Ex (psi):	1600000	Ey (psi):	1600000		
Exmin (psi):	580000	Eymin (psi):	580000		
Luxx (ft):	0	Luyy (ft):	12		

Sill Plate Material:

Section type:	Douglas Fir-Larch No.2
Section name:	2x6
FcL (psi):	625

Applied Load: Lateral parallel to Y-Y

LATERAL (PLF): W=38 [from Wind C&&C Analysis TRIB.Width=1.33 Eff.Area=48 Wall Zone 4 (Interior)=28.49]
SEFL WEIGHT (PLF): D=0.53

Factors:

Ct = 1 Cm = 1 CL = 1.00 CF = 1.3 Cfu = 1 Ci = 1 Cr = 1.15 Cp = 0.23 CT = 1

Design Summary:

Max. Axial + Bending Ratio:

50%

Governing NDS Formula:	Comp + Bending, NDS Eq. 3.9-3		
Load Combination:	D + 0.6W (N)		
Location of Max. above base:	6.00 ft		
Values at Location of Max Comb:	Applied Axial	6 lb	
	Applied Moment	684 lb-ft	
	Allowable Axial	5408 lb	
	Allowable Moment	1357 lb-ft	

Max. Shear Ratio:

14%

Load Combination	D + 0.6W (N)
Location of Max. above base	0.00 ft
Applied Shear	228 lb
Allowable Shear	1584 lb

Sill Plate Compressive Ratio:

0%

Load Combination	D
Applied Axial	6 lb
Allowable Axial	6445 lb

Max. Lateral Deflections:

Load Combination	D + 0.6W (S)
Location of Max. above base	6.00 ft
Applied deflection	0.533 in

Max. Lateral Reactions:

Top	228 lb	D + 0.6W (N)
Bottom	228 lb	D + 0.6W (N)
**Max Slenderness Ratio le/d < 50 per NDS 3.7.1.4:		OK
**fc < FcE = 0.822*E'min/(le/d)^2 per NDS 3.9.2:		OK

General information:

Overall Height (ft):	12	Is studwall:	True	Incised treated:	False
Section type:	Douglas Fir-Larch No.2				
Section name:	2x6				
Fbx+/Fbx- (psi):	900/900	Fby (psi):	900		
Fvx (psi):	180	Fvy (psi):	180		
Fc (psi):	1350	Ft (psi):	575		
Ex (psi):	1600000	Ey (psi):	1600000		
Exmin (psi):	580000	Eymin (psi):	580000		
Luxx (ft):	0	Luyy (ft):	12		

Sill Plate Material:

Section type:	Douglas Fir-Larch No.2
Section name:	2x6
FcL (psi):	625

Applied Load: Lateral parallel to Y-Y

LATERAL (PLF): W=44 [from Wind C&&C Analysis TRIB.Width=1.33 Eff.Area=48 Wall Zone 5 (End)=33]
SEFL WEIGHT (PLF): D=0.53

Factors:

Ct = 1 Cm = 1 CL = 1.00 CF = 1.3 Cfu = 1 Ci = 1 Cr = 1.15 Cp = 0.23 CT = 1

Design Summary:

<u>Max. Axial + Bending Ratio:</u>		58%
Governing NDS Formula:	Comp + Bending, NDS Eq. 3.9-3	
Load Combination:	D + 0.6W (N)	
Location of Max. above base:	6.00 ft	
Values at Location of Max Comb:	Applied Axial	6 lb
	Applied Moment	792 lb-ft
	Allowable Axial	5408 lb
	Allowable Moment	1357 lb-ft
<u>Max. Shear Ratio:</u>		17%
Load Combination	D + 0.6W (N)	
Location of Max. above base	0.00 ft	
Applied Shear	264 lb	
Allowable Shear	1584 lb	

<u>Sill Plate Compressive Ratio:</u>		0%
Load Combination	D	
Applied Axial	6 lb	
Allowable Axial	6445 lb	
<u>Max. Lateral Deflections:</u>		
Load Combination	D + 0.6W (S)	
Location of Max. above base	6.00 ft	
Applied deflection	0.617 in	
<u>Max. Lateral Reactions:</u>		
Top	264 lb	D + 0.6W (N)
Bottom	264 lb	D + 0.6W (N)
**Max Slenderness Ratio le/d < 50 per NDS 3.7.1.4:		OK
**fc < FcE = 0.822*E'min/(le/d)^2 per NDS 3.9.2:		OK

General information:

Overall Height (ft):	12	Is studwall:	False	Incised treated:	False
Section type:	Douglas Fir-Larch No.1				
Section name:	6x6				
Fbx+/Fbx- (psi):	1350/1350	Fby (psi):	1350		
Fvx (psi):	170	Fvy (psi):	170		
Fc (psi):	925	Ft (psi):	675		
Ex (psi):	1600000	Ey (psi):	1600000		
Exmin (psi):	580000	Eymin (psi):	580000		
Luxx (ft):	12	Luyy (ft):	12		

Sill Plate Material:

Section type:	Douglas Fir-Larch No.2
Section name:	2x6
FcL (psi):	625

Applied Load:

AXIAL (LB): D=4681 Lr=4681 [[from Supp. 1 of WoodBeam GT1]]
SEFL WEIGHT (PLF): D=7.09

Factors:

$C_t = 1$ $C_m = 1$ $C_L = 0.99$ $C_F = 1$ $C_{fu} = 1$ $C_i = 1$ $C_r = 1$ $C_p = 0.50$ $C_T = 1$

Design Summary:

Max. Axial + Bending Ratio:

54%

Governing NDS Formula:	Compression Only, f_c/F^*c
Load Combination:	D + Lr
Location of Max. above base:	0.00 ft
Values at Location of Max Comb:	
Applied Axial	9447 lb
Applied Moment	0 lb-ft
Allowable Axial	17521 lb
Allowable Moment	3874 lb-ft

Max. Shear Ratio:

0%

Load Combination	D
Location of Max. above base	0.00 ft
Applied Shear	0 lb
Allowable Shear	3086 lb

Sill Plate Compressive Ratio:

40%

Load Combination	D + Lr
Applied Axial	9447 lb
Allowable Axial	23633 lb

Max. Lateral Deflections:

Load Combination	D
Location of Max. above base	0.00 ft
Applied deflection	0.000 in

Max. Lateral Reactions:

Top	0 lb	D
Bottom	0 lb	D
**Max Slenderness Ratio $l_e/d < 50$ per NDS 3.7.1.4:		OK

General information:

Overall Height (ft):	8	Is studwall:	False	Incised treated:	False
Section type:	Douglas Fir-Larch No.2				
Section name:	4x6				
Fbx+/Fbx- (psi):	900/900	Fby (psi):	900		
Fvx (psi):	180	Fvy (psi):	180		
Fc (psi):	1350	Ft (psi):	575		
Ex (psi):	1600000	Ey (psi):	1600000		
Exmin (psi):	580000	Eymin (psi):	580000		
Luxx (ft):	8	Luyy (ft):	8		

Sill Plate Material:

Section type:	Douglas Fir-Larch No.2
Section name:	2x6
FcL (psi):	625

Applied Load:

AXIAL (LB): D=4961 Lr=4453 [from Supp. 1 of WoodBeam 2]
SEFL WEIGHT (PLF): D=2.87

Factors:

Ct = 1 Cm = 1 CL = 0.99 CF = 1.3 Cfu = 1 Ci = 1 Cr = 1 Cp = 0.27 CT = 1

Design Summary:

<u>Max. Axial + Bending Ratio:</u>		83%
Governing NDS Formula:	Compression Only, fc/F*c	
Load Combination:	D + Lr	
Location of Max. above base:	0.00 ft	
Values at Location of Max Comb:	Applied Axial	9437 lb
	Applied Moment	0 lb-ft
	Allowable Axial	11362 lb
	Allowable Moment	2130 lb-ft
<u>Max. Shear Ratio:</u>		0%
Load Combination	D	
Location of Max. above base	0.00 ft	
Applied Shear	0 lb	
Allowable Shear	2079 lb	

<u>Sill Plate Compressive Ratio:</u>		63%
Load Combination	D + Lr	
Applied Axial	9437 lb	
Allowable Axial	15039 lb	
<u>Max. Lateral Deflections:</u>		D
Load Combination	D	
Location of Max. above base	0.00 ft	
Applied deflection	0.000 in	
<u>Max. Lateral Reactions:</u>		
Top	0 lb	D
Bottom	0 lb	D
**Max Slenderness Ratio le/d < 50 per NDS 3.7.1.4:		OK

General information:

Overall Height (ft):	10	Is studwall:	False	Incised treated:	False
Section type:	Douglas Fir-Larch No.1				
Section name:	6x6				
Fbx+/Fbx- (psi):	1350/1350	Fby (psi):	1350		
Fvx (psi):	170	Fvy (psi):	170		
Fc (psi):	925	Ft (psi):	675		
Ex (psi):	1600000	Ey (psi):	1600000		
Exmin (psi):	580000	Eymin (psi):	580000		
Luxx (ft):	10	Luyy (ft):	10		

Applied Load:

AXIAL (LB): D=833 Lr=683 [from Supp. 1 of WoodBeam 3]
SEFL WEIGHT (PLF): D=7.09

Factors:

Ct = 1 Cm = 1 CL = 0.99 CF = 1 Cfu = 1 Ci = 1 Cr = 1 Cp = 0.64 CT = 1

Design Summary:

<u>Max. Axial + Bending Ratio:</u>		7%	<u>Max. Lateral Deflections:</u>		
Governing NDS Formula:	Compression Only, f_c/F^*c		Load Combination	D	
Load Combination:	D + Lr		Location of Max. above base	0.00 ft	
Location of Max. above base:	0.00 ft		Applied deflection	0.000 in	
Values at Location of Max Comb:	Applied Axial	1587 lb	<u>Max. Lateral Reactions:</u>		
	Applied Moment	0 lb-ft	Top	0 lb	D
	Allowable Axial	22365 lb	Bottom	0 lb	D
	Allowable Moment	3879 lb-ft	**Max Slenderness Ratio $l_e/d < 50$ per NDS 3.7.1.4:		
<u>Max. Shear Ratio:</u>		0%	OK		
Load Combination	D				
Location of Max. above base	0.00 ft				
Applied Shear	0 lb				
Allowable Shear	3086 lb				

General information:

Overall Height (ft):	10	Is studwall:	False	Incised treated:	False
Section type:	Douglas Fir-Larch No.1				
Section name:	6x6				
Fbx+/Fbx- (psi):	1350/1350	Fby (psi):	1350		
Fvx (psi):	170	Fvy (psi):	170		
Fc (psi):	925	Ft (psi):	675		
Ex (psi):	1600000	Ey (psi):	1600000		
Exmin (psi):	580000	Eymin (psi):	580000		
Luxx (ft):	10	Luyy (ft):	10		

Applied Load:

AXIAL (LB): D=2731 Lr=2898 [from Supp. 1 of WoodBeam 5]
SEFL WEIGHT (PLF): D=7.09

Factors:

Ct = 1 Cm = 1 CL = 0.99 CF = 1 Cfu = 1 Ci = 1 Cr = 1 Cp = 0.64 CT = 1

Design Summary:

Max. Axial + Bending Ratio:

25%

Governing NDS Formula:	Compression Only, fc/F*c	
Load Combination:	D + Lr	
Location of Max. above base:	0.00 ft	
Values at Location of Max Comb:	Applied Axial	5700 lb
	Applied Moment	0 lb-ft
	Allowable Axial	22365 lb
	Allowable Moment	3879 lb-ft

Max. Lateral Deflections:

Load Combination	D
Location of Max. above base	0.00 ft
Applied deflection	0.000 in

Max. Lateral Reactions:

Top	0 lb	D
Bottom	0 lb	D
**Max Slenderness Ratio le/d < 50 per NDS 3.7.1.4:		OK

Max. Shear Ratio:

0%

Load Combination	D
Location of Max. above base	0.00 ft
Applied Shear	0 lb
Allowable Shear	3086 lb