

Structural Design (2018 IBC)

Gravity Design Loads (IBC 1606, 1607, 1608)																														
Description	I.D.	Dead Loads (D)																		Live Load (L)	Snow Load (S) (ASCE 7-16 Chap. 7)									
		Pitch	Material ₁	Spc. (in.)	D ₁ (psf)	Material ₂	Spc. (in.)	D ₂ (psf)	Material ₃	Spc. (in.)	D ₃ (psf)	Material ₄	Spc. (in.)	D ₄ (psf)	Material ₅	Spc. (in.)	D ₅ (psf)	D (psf)			L/L _r (psf)	Drift Surcharges								
																		Flat	Slope			Used	W _b	h _r	X _d	W _d	Drift	Slide	Un-bal	Slope
1	Roof Load	R	8 : 12	Trusses		3.5	5/8" Plywood		1.9	Comp		2.0	5/8" Sheetrock		2.8	Insulation	12.00	1.2	11.3	13.6	15.0	25.0								9
2	Floor	F		TJI 11.875-230	16.00	2.3	3/4" Plywood		2.3	Hardwood		3.4	5/8" Sheetrock		2.8	Gypcrete	1.50	9.8	20.4	20.4	25.0	40.0								
3	Wall	W		2x6	16.00	1.2	1/2" Plywood		1.5	1/2" Sheetrock		2.2	Insulation	5.50	0.6	Hardi		2.3	7.7	7.7	10.0	0.0								
4	Deck	D		TJI 11.875-230	16.00	2.3	3/4" Plywood		2.3	Comp		2.0	Pavers		25.0				31.5	31.5	60.0	0.0								
5	Ceiling Joist																													
6																														
7																														
8																														
9																														
10																														

Lumber Strengths (psi)		F _b	F _t	F _v	F _{c⊥}	F _c	E
Joist/Rafters							
	Hem-Fir #2	850	525	150	405	1300	1.30
Beams and Headers							
	4" Nominal Doug-Fir #2	900	575	180	625	1350	1.60
	6" Nominal Doug-Fir #1	1350	675	170	625	925	1.60
Posts							
	4" Nominal Doug-Fir #1	1000	675	180	625	1500	1.70
	6" Nominal Doug-Fir #1	1200	950	170	625	1000	1.60
	Studs Hem-Fir Stud	675	400	150	405	800	1.20
Laminated Strand Lumber (LSL)							
	1.3 E	1700		400	680	1400	1.30
	1.55 E	2325		310	400	2050	1.55
Microllam (LVL)							
	1.9 E	2600	1555	285	750	2510	1.90
Parallel Strand Lumber (PSL)							
	2.0 E	2900	2025	290	750	2900	2.00
	P.T. 2.0 E	2175		191	465	2059	1.78
Glu-Laminated Timbers							
	24F-V4	2400	1100	240	650	1650	1.80
APA Rated Sheathing							
		Span Rating		Max Span with Design Loads (in)			
	Roof 5/8" Ply	20/40		24.0			
	Wall 15/32" Ply	24/0		16.0			
	Floor (T&G) 3/4 Ply	48/24		24.0			

Wind Loads (IBC 1609.1.1)	
ASCE (7-16) Chap 27 Directional Procedure	
3 Second Gust = 110 mph	
Exposure Category = C	Sect. 26.7.3
Mean Roof Height = 26.0 ft	
K _d = 0.85 ft	Table 26.6-1
K _{zt} = 1.00	Eq 26.8.1
K _h = 0.95	Table 27.3-1
K _e = 0.99	Table 26.9-1
q _z = 24.9 lb/ft ²	Eq 26.10-1
G = 0.85	Sec. 26.11
p = q _h (GC _p - GC _{p_i})	Eq 27.3-1

Deflection Limits (IBC Table 1604.3)			
	L	S or W	D + L
Roof			
Plaster	360	360	240
Nonplaster	240	240	180
None	180	180	120
Floor	360		240
Walls		240	

Seismic Loads (IBC 1613.1)	
ASCE (7-16) Sec. 12.14 Simplified Alternative for Simple Bearing Wall Systems	
Spectral Response Acceleration, S _S = 144.80	
Site Class = D	Table 20.3-1
Site Coefficient, F _a = 1.20	Table 11.4-1
Height Coefficient, F = 1.20	Sec. 12.14.8.1
Maximum Spectral Response Acceleration, S _{MS} = 173.8	Equation 11.4-1
5%Damped Design Spectral Response Acceleration, S _{DS} = 115.8	Equation 11.4-3
Seismic Design Category = D	Table 11.6-1
Default Response Modification Coefficient, R = 6.50	Table 12.14-1

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500	
			y-y	x-x		Live	Dead	#l _i	#l _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live				Dead
1	Roof	6x6	10.00	10.00	SPF					R	R	4.00	-2.00	4.00	6.60	6.60						0.56	425	67	754	67	12,856	743	446	2,030	1	
										2																	523	314				
2	Roof	HUC610			DF2					3		18.60	9.30													2,020	523	314	840	2		
3	Roof	6x6	5.00	5.00	DF2					R	R	4.00	-2.00	4.00	9.30	9.30						0.91	625	56	1,231	56	18,906	1,046	628	1,680	3	
4	Roof	2-2x6		17.00	PLY					R	R	4.00		4.00	6.60	6.60						0.30	340	32	241	32	3,975	330	198	530	4	
5	Roof	2-2x8		19.50	PLY					6												0.29	340	11	425	11	7,395	93	142	240	5	
6	Roof	HUC48			DF2					R	R	3.70		3.70	2.00	2.00											1,280	93	56	240	6	
										W	W	3.70		3.70	4.00	6.00											0	86				
7	Roof	HUC48			DF2					R	R	3.70		3.70	2.00	2.00											1,280	93	56	250	7	
										W	W	3.70		3.70	6.00	4.00											0	99				
8	Roof	3-2x8		21.50	PLY					7												0.25	340	54	356	54	11,093	93	154	1,760	8	
										9																	805	707				
9	Roof	HUC410			DF2					R	R	6.40		6.40	2.00	2.00											4,920	160	96	1,520	9	
										W	W	6.40		3.20	6.00	8.00											0	165				
										W	W	6.40	3.20	6.40	8.00	6.00											0	59				
										10		6.40	3.20														645	387				
10	Roof	4x6	5.00	5.00	DF2					R	R	11.10		11.10	9.30	9.30						0.73	625	108	989	108	12,031	1,290	774	2,070	10	
11	Roof	2-2x6		17.00	PLY					12		18.60	9.30									0.30	340	76	241	76	3,975	777	466	1,250	11	
12	Roof	6x6	5.00	5.00	DF2					R	R	7.00		7.00	9.30	9.30						0.91	625	82	1,231	82	18,906	814	488	2,490	12	
										R	R	7.00		1.30	9.30	9.30											274	165				
										R	R	7.00	1.30	7.00	9.30	5.50											466	280				
13	Roof	2-2x6		17.00	PLY					R	R	16.90		16.90	7.70							0.30	340	105	241	105	3,975	1,084	651	1,740	13	
14	Roof	2x6		8.00	PLY					R	R	6.20		6.20	8.30	8.30						0.81	340	125	645	125	2,805	643	386	1,030	14	
15	Roof	2x6		9.00	PLY					R	R	2.70		2.70	4.00	4.00						0.74	340	30	593	30	2,805	135	81	250	15	
										W	W	2.70		2.70	1.50	3.20											0	28				
16	Roof	2x6		10.00	PLY					R	R	2.70		2.70	4.00	4.00						0.67	340	32	537	32	2,805	135	81	260	16	
										W	W	2.70		2.70	3.20	1.50											0	36				
17	Roof	2x6		14.00	PLY					R	R	2.70		2.70	4.00	4.00						0.42	340	305	337	305	2,779	135	81	2,520	17	
										W	W	2.70		2.70	6.30	6.30											0	85				
										18		2.70	1.60														1,384	830				
18	Roof	2-2x6		6.00	DF2					R	R	21.10		17.20	12.90	12.90						0.90	625	330	724	330	10,313	3,286	1,972	5,440	18	
										R	R	21.10	17.20	21.10	12.90	10.90											110	66				
19	Roof	2x6		14.00	PLY					R	R	2.70		2.70	4.00	4.00						0.42	340	55	337	55	2,779	135	81	450	19	
										W	W	2.70		2.70	6.30	6.30											0	85				
										15		2.70	1.10														80	65				
20	Roof	2x6		12.00	PLY					R	R	4.20		4.20	4.00	4.00						0.53	340	50	427	50	2,805	210	126	410	20	
										W	W	4.20		4.20	3.80	2.20											0	69				
21	Roof	2x6		9.00	PLY					R	R	4.20		4.20	4.00	4.00						0.74	340	48	593	48	2,805	210	126	400	21	
										W	W	4.20		4.20	2.20	3.80											0	57				
22	Roof	3-2x4		8.00	PLY					23		18.60	9.30									0.50	340	46	399	46	5,355	445	267	720	22	
23	Roof									R	R	7.00		5.70	4.50	7.00											462	277	1,430	23		

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500	
			y-y	x-x		y-y	x-x	Live	Dead	#1 _i	#1 _f		X _i /X _p	X _f	Sp _i	Sp _f						F _v , F _c	F _c	F _{c⊥}	All.		Act.	All.				Act.
44	Roof	2-2x8		16.80	PLY					5											0.38	340	18	553	18	7,395	93	142	390	44		
										45																0	148					
45	Roof	HUC48			DF2					W	W	3.70		3.70	8.00	8.00										1,280	0	148	150	45		
46	Roof	2-2x8		19.10	PLY					8											0.30	340	100	442	100	7,395	898	861	2,170	46		
										45																0	148					
										47																0	256					
47	Roof	HUC48			DF2					W	W	6.40		6.40	8.00	8.00										1,280	0	256	260	47		
48	Second Floor	6x8		9.00	PLY	8.500	7.250			R	R	22.80		8.20	7.70	7.70					1.07	0.89	363	237	824	366	14,482	1,295	777	14,590	48	
										R	R	22.80	8.20	22.80	2.00	2.00											234	140				
										W	W	22.80		22.80	8.00	8.00											0	912				
										F	F	22.80		22.80	8.10	8.10											3,694	2,309				
										F	F	22.80	19.10	22.80	7.30	7.30											88	55				
										24		22.80	7.00														538	323				
										25		22.80	8.20														694	417				
										26		22.80	9.90														1,378	827				
										27		22.80	14.00														172	103				
										70		22.80	19.10														63	40				
										4																	330	198				
48D1	Second Floor	6x8		9.00	PLY			0.75		R	R	22.80		8.20	7.70	7.70					0.89	340	327	824	327	13,558	971	777	13,030	48D1		
								0.75		R	R	22.80	8.20	22.80	2.00	2.00											175	140				
								0.75		W	W	22.80		22.80	8.00	8.00											0	912				
								0.75		F	F	22.80		22.80	8.10	8.10											2,770	2,309				
								0.75		F	F	22.80	19.10	22.80	7.30	7.30											66	55				
								0.75		24		22.80	7.00														404	323				
								0.75		25		22.80	8.20														521	417				
								0.75		26		22.80	9.90														1,033	827				
								0.75		3U		22.80	10.10														601	0				
								0.75		27		22.80	14.00														129	103				
								0.75		70		22.80	19.10														48	40				
								0.75		3U-		22.80	22.00														-38	0				
								0.75		4																	248	198				
48D2	Second Floor	6x8		9.00	PLY			0.00	0.60	R	R	22.80		8.20	7.70	7.70					0.89	340	111	824	111	13,558	0	466	4,420	48D2		
								0.00	0.60	R	R	22.80	8.20	22.80	2.00	2.00											0	84				
								0.00	0.60	W	W	22.80		22.80	8.00	8.00											0	547				
								0.00	0.60	F	F	22.80		22.80	8.10	8.10											0	1,385				
								0.00	0.60	F	F	22.80	19.10	22.80	7.30	7.30											0	33				
								0.00	0.60	24		22.80	7.00														0	194				
								0.00	0.60	25		22.80	8.20														0	250				
								0.00	0.60	26		22.80	9.90														0	496				
										3U		22.80	10.10														802	0				
								0.00	0.60	27		22.80	14.00														0	62				

Post Calculations

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#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500	
			y-y	x-x		Live	Dead	#1 _i	#1 _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live				Dead
								0.00	0.60	70		22.80	19.10														0	24				
										3U-		22.80	22.00															-51	0			
								0.00	0.60	4																	0	119				
48U1	Second Floor	6x8		9.00	PLY			0.75		R	R	22.80		8.20	7.70	7.70					0.89	340	299	824	299	13,558	971	777	11,910	48U1		
								0.75		R	R	22.80	8.20	22.80	2.00	2.00											175	140				
								0.75		W	W	22.80		22.80	8.00	8.00											0	912				
								0.75		F	F	22.80		22.80	8.10	8.10											2,770	2,309				
								0.75		F	F	22.80	19.10	22.80	7.30	7.30											66	55				
								0.75		24		22.80	7.00														404	323				
								0.75		25		22.80	8.20														521	417				
								0.75		26		22.80	9.90														1,033	827				
								0.75		3U-		22.80	10.10														-601	0				
								0.75		27		22.80	14.00														129	103				
								0.75		70		22.80	19.10														48	40				
								0.75		3U		22.80	22.00														38	0				
								0.75		4																	248	198				
48U2	Second Floor	6x8		9.00	PLY			0.00	0.60	R	R	22.80		8.20	7.70	7.70					0.89	340	73	824	73	13,558	0	466	2,910	48U2		
								0.00	0.60	R	R	22.80	8.20	22.80	2.00	2.00											0	84				
								0.00	0.60	W	W	22.80		22.80	8.00	8.00											0	547				
								0.00	0.60	F	F	22.80		22.80	8.10	8.10											0	1,385				
								0.00	0.60	F	F	22.80	19.10	22.80	7.30	7.30											0	33				
								0.00	0.60	24		22.80	7.00														0	194				
								0.00	0.60	25		22.80	8.20														0	250				
								0.00	0.60	26		22.80	9.90														0	496				
										3U-		22.80	10.10														-802	0				
								0.00	0.60	27		22.80	14.00														0	62				
								0.00	0.60	70		22.80	19.10														0	24				
										3U		22.80	22.00														51	0				
								0.00	0.60	4																0	119					
49	Second Floor	2x6		9.00	PLY					R	R	3.20		3.20	10.00	10.00					0.74	340	101	593	101	2,805	400	240	830	49		
										W	W	3.20		3.20	3.00	3.00											0	48				
										F	F	3.20		3.20	1.33	1.33											85	53				
50	Second Floor	2-2x6		9.00	PLY					R	R	6.40		6.40	10.00	10.00					0.74	340	101	593	101	5,610	800	480	1,660	50		
										W	W	6.40		6.40	3.00	3.00											0	96				
										F	F	6.40		6.40	1.33	1.33											170	106				
51	Deck	MGU5.62-SDS			GLB					D	D	18.10		18.10	1.90	4.70										6,237	1,539	385	1,930	51		
52	Second Floor	2-2x6		9.00	PLY					D	D	8.00	-4.20		1.33	1.33					0.74	340	210	593	210	5,610	423	106	3,470	52		
										51		8.00	-4.20														2,346	587				
53	Second Floor	2x6		9.00	PLY					W	W	6.20		6.20	8.00	8.00					0.74	340	269	593	269	2,805	0	248	2,220	53		
										F	F	6.20		6.20	1.33	1.33											165	103				
										D	D	6.20		6.20	2.50	3.60											533	133				

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500																				
			y-y	x-x		Live	Dead	#1 _i	#1 _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live				Dead																			
								0.75		W	W	22.80		22.80	8.00	8.00																	0	912																	
								0.75		F	F	22.80		3.70	7.30	7.30																		745	620																
								0.75		F	F	22.80		22.80	8.10	8.10																		2,770	2,309																
								0.75		F	F	4.20		4.20	9.60	9.60																		605	504																
								0.75		3U-		22.80	0.80																						-1,042	0															
								0.75		70		22.80	3.70																							246	205														
								0.75		27		22.80	8.80																								205	164													
								0.75		3U		22.80	12.70																									478	0												
								0.75		26		22.80	12.90																										793	634											
								0.75		25		22.80	14.60																											293	234										
								0.75		24		22.80	15.80																												179	143									
								0.75		31																																1,779	1,423								
71U2	Second Floor	5.5x10.5 GLB		9.00	PLY			0.00	0.60	R	R	22.80		8.20	2.00	2.00						0.97	340	69	1,603	69	19,635													0	121	3,990	71U2								
								0.00	0.60	R	R	22.80	8.20	22.80	7.70	7.70																													0	324					
								0.00	0.60	W	W	22.80		22.80	8.00	8.00																													0	547					
								0.00	0.60	F	F	22.80		3.70	7.30	7.30																												0	372						
								0.00	0.60	F	F	22.80		22.80	8.10	8.10																												0	1,385						
								0.00	0.60	F	F	4.20		4.20	9.60	9.60																												0	302						
										3U-		22.80	0.80																																-1,389	0					
								0.00	0.60	70		22.80	3.70																															0	123						
								0.00	0.60	27		22.80	8.80																															0	98						
										3U		22.80	12.70																																638	0					
								0.00	0.60	26		22.80	12.90																																0	381					
								0.00	0.60	25		22.80	14.60																															0	140						
								0.00	0.60	24		22.80	15.80																															0	86						
								0.00	0.60	31																																			0	854					
72	Second Floor	2x4		9.00	PLY					32												0.41	340	133	331	133	1,739																435	261	700	72					
73	Second Floor	2x4		9.00	PLY					F	F	4.20		4.20	9.10	9.10						0.41	340	238	331	238	1,739																	764	478	1,250	73				
74	Second Floor	2x4		9.00	PLY					F	F	5.60		1.80		1.30						0.41	340	70	331	70	1,739																	37	23	370	74				
										F	F	5.60	1.80	5.60	3.70	3.70																													191	119					
75	Second Floor	4x8		9.00	PLY					F	F	5.60		3.80	3.70	3.70						0.64	340	101	862	101	6,545																	372	232	1,940	75				
										F	F	5.60	3.80	5.60	1.30																															10	6				
										F	F	4.20		4.20	9.60	9.60																														806	504				
76	Second Floor	2x4		5.00	PLY					F	F	3.80		3.80	2.90	2.90						0.81	340	69	652	69	1,785																	220	138	360	76				
77	Second Floor	2x4		5.00	PLY					F	F	3.80		3.80	2.90	2.90						0.81	340	170	652	170	1,785																		220	138	890	77			
										F	F	3.80		3.80	4.30	4.30																														327	204				
78	Second Floor	2x4		9.00	PLY					W	W	3.80		3.80	8.00	8.00						0.41	340	192	331	192	1,739																			0	152	1,010	78		
										F	F	3.80		3.80	6.90	6.90																														524	328				
79	Second Floor	2x6		9.00	PLY					33												0.74	340	55	593	55	2,805																		280	168	450	79			
80	Second Floor	2x6		9.00	PLY					34												0.74	340	119	593	119	2,805																		612	367	980	80			
81	Second Floor	2x6		9.00	PLY					35												0.74	340	45	593	45	2,805																			228	137	370	81		

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500
			y-y	x-x		y-y	x-x	Live	Dead	#1 _i	#1 _f		X _i /X _p	X _f	Sp _i	Sp _f						F _v , F _c	F _c	F _{c⊥}	All.		Act.	All.			
82	Second Floor	2x6		9.00	PLY					36											0.74	340	88	593	88	2,805	453	272	730	82	
83	Second Floor	2x6		5.00	PLY					F	F	3.80		3.80	4.30	4.30					0.94	340	65	750	65	2,805	327	204	540	83	
84	Second Floor	2x6		9.00	PLY					W	W	3.80		3.80	8.00	8.00					0.74	340	122	593	122	2,805	0	152	1,010	84	
										F	F	3.80		3.80	6.90	6.90										524	328				
85	Second Floor	2x6		9.00	PLY					R	R	2.70		2.70	4.00	4.00					0.74	340	127	593	127	2,805	135	81	1,050	85	
										W	W	2.70		2.70	8.40	8.40										0	113				
										F	F	2.70		2.70	8.20	8.20										443	277				
86	Second Floor	2-2x6		9.00	PLY					R	R	5.40		5.40	4.00	4.00					0.74	340	128	593	128	5,610	270	162	2,110	86	
										W	W	5.40		5.40	8.70	8.70										0	235				
										F	F	5.40		5.40	8.20	8.20										886	554				
87	Second Floor	2-2x6		9.00	PLY					R	R	5.40		5.40	4.00	4.00					0.74	340	173	593	173	5,610	270	162	2,860	87	
										W	W	5.40		5.40	9.70	9.70										0	262				
										F	F	5.40		5.40	8.20	8.20										886	554				
										26		2.70	2.20													451	271				
88	Second Floor	2-2x6		9.00	PLY					R	R	2.70		2.70	4.00	4.00					0.74	340	258	593	258	5,610	135	81	4,260	88	
										W	W	2.70		2.70	10.40	10.40										0	140				
										F	F	2.70		2.70	8.20	8.20										443	277				
										26		2.70	0.50													1,984	1,191				
89	Second Floor	2-2x6		9.00	PLY					R	R	10.20		2.10	4.00	4.00					0.74	340	279	593	279	5,610	188	113	4,600	89	
										R	R	10.20	8.30	10.20	4.00	4.00										18	11				
										R	R	10.20		10.20	1.00	1.00										128	77				
										W	W	10.20		2.10	9.50	9.50										0	179				
										W	W	10.20	2.10	8.30	8.00	8.00										0	243				
										W	W	10.20	8.30	10.20	12.80	2.80										0	17				
										F	F	10.20		10.20	9.10	9.10										1,856	1,160				
										37		10.20	2.10													246	239				
										38		10.20	8.30													58	59				
90	Roof	4x4	7.00	7.00	HF2					R	R	6.70	-3.20	6.70	2.60	2.60					0.49	405	63	657	63	4,961	475	285	770	90	
91	Second Floor	2x6		9.00	PLY					R	R	6.20		6.20	2.90	2.90					0.74	340	161	593	161	2,805	225	135	1,330	91	
										F	F	6.20		6.20	1.00	1.00										124	78				
										90																475	285				
92	Second Floor	2x6		9.00	PLY					R	R	6.20		6.20	2.90	2.90					0.74	340	136	593	136	2,805	225	135	1,120	92	
										F	F	6.20		6.20	1.00	1.00										124	78				
										93																348	209				
93	Roof	4x4	7.00	7.00	HF2					R	R	10.70		10.70	2.60	2.60					0.49	405	46	657	46	4,961	348	209	560	93	
94	Second Floor	3-2x4		9.00	PLY					R	R	10.20		1.90	4.00	4.00					0.41	340	297	331	297	5,217	172	103	4,670	94	
										R	R	10.20	8.10	10.20	4.00	4.00											22	13			
										R	R	10.20		10.20	1.00	1.00											128	77			
										W	W	10.20		1.90	12.80	12.80											0	221			
										W	W	10.20	1.90	8.10	8.00	8.00											0	253			
										W	W	10.20	8.10	10.20	9.50	9.50											0	21			

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500
			y-y	x-x		Live	Dead	#l _i	#l _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live			
										F	F	8.60		8.60	1.33	1.33											229	143			
										D	D	8.60		8.60	2.00	2.00											516	129			
										46		4.20	3.00													257	362				
107	Man Floor	6x10		10.00	SPF					F	F	22.80		22.80	11.20	11.20					0.87	425	159	1,180	159	22,206	5,107	3,192	8,300	107	
107D1	Man Floor	6x10		10.00	SPF					F	F	22.80		22.80	11.20	11.20					0.87	425	159	1,180	159	22,206	5,107	3,192	8,300	107D1	
108	Man Floor	6x10		10.00	SPF					48											0.87	425	279	1,180	279	22,206	8,486	6,099	14,590	108	
109	Man Floor	2x6		10.00	SPF					49											0.67	425	101	537	101	3,506	485	341	830	109	
110	Man Floor	2x6		10.00	SPF					50											0.67	425	201	537	201	3,506	970	682	1,660	110	
111	Man Floor	2x6		10.00	SPF					11											0.67	425	152	537	152	3,506	777	466	1,250	111	
112	Man Floor	2x6		10.00	SPF					54											0.67	425	279	537	279	3,506	1,410	887	2,300	112	
113	Man Floor	2x6		10.00	SPF					W	W	3.40		3.40	10.00	10.00					0.67	425	421	537	421	3,506	0	170	3,470	113	
										F	F	3.40		3.40	8.60	8.60										585	366				
										W	W	3.40		3.40	9.00	9.00										0	153				
										F	F	3.40		3.40	15.50	15.50										1,054	659				
										61		3.40	2.60												268	209					
114	Man Floor	2-2x6		10.00	SPF					W	W	3.40		3.40	10.00	10.00					0.67	425	275	537	275	7,013	0	170	4,540	114	
										F	F	3.40		3.40	8.60	8.60										585	366				
										W	W	3.40		3.40	9.00	9.00										0	153				
										F	F	3.40		3.40	15.50	15.50										1,054	659				
										61		3.40	0.80												872	678					
115	Man Floor	2x6		10.00	SPF					62											0.67	425	160	537	160	3,506	696	620	1,320	115	
116	Man Floor	2x6		10.00	SPF					63											0.67	425	259	537	259	3,506	1,314	822	2,140	116	
117	Man Floor	6x6		10.00	SPF					68											0.56	425	331	754	331	12,856	521	326	10,010	117	
										69															5,726	3,436					
118	Man Floor	2x6		10.00	SPF					F	F	15.00		15.00	1.33	1.33					0.67	425	385	537	385	3,506	399	249	3,180	118	
										64		15.00	2.00													381	238				
										F	F	9.30		9.30	1.33	1.33										247	155				
										66		9.30	0.90													929	581				
119	Man Floor	6x10		10.00	SPF					71											0.87	425	369	1,180	369	22,206	11,388	7,890	19,280	119	
120	Man Floor	2x6		10.00	SPF					F	F	2.90		2.90	8.70	8.70					0.67	425	99	537	99	3,506	505	315	820	120	
121	Man Floor	2x6		10.00	SPF					72											0.67	425	85	537	85	3,506	435	261	700	121	
122	Man Floor	2x6		10.00	SPF					73											0.67	425	152	537	152	3,506	764	478	1,250	122	
123	Man Floor	2x6		10.00	SPF					F	F	12.80		4.10	4.10	4.10					0.67	425	156	537	156	3,506	565	353	1,290	123	
										F	F	12.80	4.10	12.80	1.90	1.90										225	140				
124	Man Floor	2x6		10.00	SPF					74		3.40	2.90								0.67	425	7	537	7	3,506	33	21	60	124	
125	Man Floor	2x6		10.00	SPF					74		3.40	0.50								0.67	425	39	537	39	3,506	194	121	320	125	
126	Man Floor	2x6		10.00	SPF					F	F	2.70		2.70	3.70	3.70					0.67	425	40	537	40	3,506	200	125	330	126	
127	Man Floor	2x6		10.00	SPF					75											0.67	425	235	537	235	3,506	1,188	743	1,940	127	
128	Man Floor	2x6		10.00	SPF					73											0.67	425	152	537	152	3,506	764	478	1,250	128	
129	Man Floor	2x6		10.00	SPF					F	F	3.80		3.80	2.90	2.90					0.67	425	87	537	87	3,506	220	138	720	129	
										76																220	138				

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500	
			y-y	x-x		Live	Dead	#1 _i	#1 _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live				Dead
130	Man Floor	2x6		10.00	SPF					F	F	3.80		3.80	2.90	2.90						0.67	425	216	537	216	3,506	220	138	1,780	130	
										F	F	3.80		3.80	4.30	4.30											327	204				
										77																	547	342				
131	Man Floor	2x6		10.00	SPF					F	F	3.80		3.80	4.80	4.80						0.67	425	194	537	194	3,506	365	228	1,600	131	
										78																	524	480				
132	Man Floor	2x6		10.00	SPF					79												0.67	425	55	537	55	3,506	280	168	450	132	
133	Man Floor	2x6		10.00	SPF					80												0.67	425	119	537	119	3,506	612	367	980	133	
134	Man Floor	2x6		10.00	SPF					81												0.67	425	45	537	45	3,506	228	137	370	134	
135	Man Floor	2x6		10.00	SPF					82												0.67	425	88	537	88	3,506	453	272	730	135	
136	Man Floor	2x6		10.00	SPF					F	F	3.80		3.80	4.30	4.30						0.67	425	130	537	130	3,506	327	204	1,070	136	
										83																	327	204				
137	Man Floor	2x6		10.00	SPF					F	F	3.80		3.80	4.80	4.80						0.67	425	194	537	194	3,506	365	228	1,600	137	
										84																	524	480				
138	Man Floor	2x6		10.00	SPF					F	F	12.80		8.70	1.90	1.90						0.67	425	108	537	108	3,506	436	273	890	138	
										F	F	12.80	8.70	12.80	4.10	4.10											108	67				
139	Man Floor	2-2x6		10.00	SPF					F	F	18.50		18.50	9.40	9.40						0.67	425	297	537	297	7,013	3,478	2,174	4,900	139	
										140		18.50	9.40														-363	-392				
139D1	Man Floor	2-2x6		10.00	SPF			0.75		F	F	18.50		18.50	9.40	9.40						0.67	425	281	537	281	7,013	2,609	2,174	4,630	139D1	
										140D1		18.50	9.40														231	-392				
139D2	Man Floor	2-2x6		10.00	SPF			0.00	0.60	F	F	18.50		18.50	9.40	9.40						0.67	425	173	537	173	7,013	0	1,304	2,860	139D2	
										140D2		18.50	9.40														1,783	-235				
139U1	Man Floor	2-2x6		10.00	SPF			0.75		F	F	18.50		18.50	9.40	9.40						0.67	425	219	537	219	7,013	2,609	2,174	3,620	139U1	
										140U1		18.50	9.40														-776	-392				
139U2	Man Floor	2-2x6		10.00	SPF			0.00	0.60	F	F	18.50		18.50	9.40	9.40						0.67	425	-44	537	-44	7,013	0	1,304	-720	139U2	
										140U2		18.50	9.40														-1,783	-235				
140	Man Floor									R	R	3.00	3.00	5.10	2.00	2.00											-37	-22	-1,540	140		
										W	W	3.00	3.00	5.10	9.00	9.00											0	-66				
										F	F	3.00		5.10	1.33	1.33											41	25				
										143		3.00	5.10														-742	-733				
140D1	Man Floor							0.75		R	R	3.00	3.00	5.10	2.00	2.00											-28	-22	-330	140D1		
								0.75		W	W	3.00	3.00	5.10	9.00	9.00											0	-66				
								0.75		F	F	3.00		5.10	1.33	1.33											31	25				
								0.75		3M-		3.00	5.10														2,719	0				
										143D1		3.00	5.10														-2,253	-733				
140D2	Man Floor							0.00	0.60	R	R	3.00	3.00	5.10	2.00	2.00											0	-13	3,150	140D2		
								0.00	0.60	W	W	3.00	3.00	5.10	9.00	9.00											0	-40				
								0.00	0.60	F	F	3.00		5.10	1.33	1.33											0	15				
										3M-		3.00	5.10														3,626	0				
										143U2		3.00	5.10														0	-440				
140U1	Man Floor							0.75		R	R	3.00	3.00	5.10	2.00	2.00											-28	-22	-2,380	140U1		
								0.75		W	W	3.00	3.00	5.10	9.00	9.00											0	-66				

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500			
			y-y	x-x		Live	Dead	#l _i	#l _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live				Dead		
141U1	Man Floor	6x8		10.00	SPF			0.75		R	R	20.60	8.40	10.50	4.00	4.00						0.86	425	322	794	322	16,947	85	68	12,820	141U1			
								0.75		W	W	20.60	8.40	10.50	11.30	11.30												0	128					
								0.75		W	W	20.60		10.50	9.00	9.00												0	704					
								0.75		F	F	20.60		10.50	1.50	15.00												1,756	1,463					
								0.75		F	F	20.60	10.50	20.60	2.70	2.70												201	167					
								0.75		86		20.60	2.90															745	817					
								0.75		87		20.60	5.60															877	909					
								0.75		88		20.60	8.30															1,147	1,008					
								0.75		89		20.60	10.50															917	1,028					
										142U1		20.60	10.50															-1,220	1,111					
								0.75		85																		433	471					
141U2	Man Floor	6x8		10.00	SPF			0.00	0.60	R	R	20.60	8.40	10.50	4.00	4.00						0.86	425	120	794	120	16,947	0	41	4,800	141U2			
								0.00	0.60	W	W	20.60	8.40	10.50	11.30	11.30													0	77				
								0.00	0.60	W	W	20.60		10.50	9.00	9.00													0	422				
								0.00	0.60	F	F	20.60		10.50	1.50	15.00													0	878				
								0.00	0.60	F	F	20.60	10.50	20.60	2.70	2.70													0	100				
								0.00	0.60	86		20.60	2.90																0	490				
								0.00	0.60	87		20.60	5.60																0	545				
								0.00	0.60	88		20.60	8.30																0	605				
								0.00	0.60	89		20.60	10.50																0	617				
										142U2		20.60	10.50																52	683				
								0.00	0.60	85																			0	283				
142	Man Floor									R	R	3.00	-2.10		2.00	2.00													142	85	4,440	142		
										W	W	3.00	-2.10		9.00	9.00														0	255			
										F	F	3.00	-2.10	3.00	1.33	1.33													231	144				
										143		3.00	-2.10																1,802	1,781				
142D1	Man Floor							0.75		R	R	3.00	-2.10		2.00	2.00													106	85	8,020	142D1		
								0.75		W	W	3.00	-2.10		9.00	9.00														0	255			
								0.75		F	F	3.00	-2.10	3.00	1.33	1.33													173	144				
										143D1		3.00	-2.10																5,471	1,781				
142D2	Man Floor							0.75		R	R	3.00	-2.10		2.00	2.00													106	85	1,500	142D2		
								0.00	0.60	W	W	3.00	-2.10		9.00	9.00														0	153			
								0.00	0.60	F	F	3.00	-2.10	3.00	1.33	1.33													0	86				
										143D2		3.00	-2.10																	0	1,069			
142U1	Man Floor							0.75		R	R	3.00	-2.10		2.00	2.00													106	85	-230	142U1		
								0.75		W	W	3.00	-2.10		9.00	9.00														0	255			
								0.75		F	F	3.00	-2.10	3.00	1.33	1.33													173	144				
										143U1		3.00	-2.10																-2,768	1,781				
142U2	Man Floor							0.75		R	R	3.00	-2.10		2.00	2.00													106	85	1,500	142U2		
								0.00	0.60	W	W	3.00	-2.10		9.00	9.00														0	153			
								0.00	0.60	F	F	3.00	-2.10	3.00	1.33	1.33													0	86				

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500		
			y-y	x-x		Live	Dead	#1 _i	#1 _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live				Dead	
144D1	Man Floor	2-2x6		10.00	SPF			0.75		F	F	18.50		18.50	9.40	9.40						0.67	425	280	537	280	7,013	2,609	2,174	4,620	144D1		
										140D1		18.50	9.10														239	-404					
144D2	Man Floor	2-2x6		10.00	SPF			0.00	0.60	F	F	18.50		18.50	9.40	9.40						0.67	425	176	537	176	7,013	0	1,304	2,910	144D2		
										140D2		18.50	9.10														1,842	-243					
144U1	Man Floor	2-2x6		10.00	SPF			0.75		F	F	18.50		18.50	9.40	9.40						0.67	425	217	537	217	7,013	2,609	2,174	3,580	144U1		
										140U1		18.50	9.10														-801	-404					
144U2	Man Floor	2-2x6		10.00	SPF			0.00	0.60	F	F	18.50		18.50	9.40	9.40						0.67	425	-48	537	-48	7,013	0	1,304	-790	144U2		
										140U2		18.50	9.10														-1,842	-243					
145	Man Floor	6x8		10.00	SPF					R	R	20.60	10.10	12.70	4.00	4.00						0.86	425	356	794	356	16,947	116	70	14,210	145		
										W	W	20.60	10.10	12.70	11.30	11.30											0	131					
										W	W	20.60	10.10	20.60	9.00	9.00											0	241					
										F	F	20.60		10.10	2.70	2.70											823	515					
										F	F	20.60	10.10	20.60	1.50	1.50											161	100					
										89		20.60	10.10														1,271	1,069					
										142		20.60	10.10														1,108	1,155					
										88		20.60	12.30														1,032	680					
										87		20.60	15.00														437	339					
										86		20.60	17.70														163	134					
										94																	2,494	2,166					
145D1	Man Floor	6x8		10.00	SPF			0.75		R	R	20.60	10.10	12.70	4.00	4.00						0.86	425	344	794	344	16,947	87	70	13,720	145D1		
								0.75		W	W	20.60	10.10	12.70	11.30	11.30												0	131				
								0.75		W	W	20.60	10.10	20.60	9.00	9.00												0	241				
								0.75		F	F	20.60		10.10	2.70	2.70												618	515				
								0.75		F	F	20.60	10.10	20.60	1.50	1.50												120	100				
								0.75		89		20.60	10.10															953	1,069				
								0.75		142D1		20.60	10.10															2,198	1,155				
								0.75		88		20.60	12.30															774	680				
								0.75		87		20.60	15.00															328	339				
										86		20.60	17.70															163	134				
								0.75		94																		1,870	2,166				
145D2	Man Floor	6x8		10.00	SPF			0.00	0.60	R	R	20.60	10.10	12.70	4.00	4.00						0.86	425	98	794	98	16,947	0	42	3,910	145D2		
								0.00	0.60	W	W	20.60	10.10	12.70	11.30	11.30													0	79			
								0.00	0.60	W	W	20.60	10.10	20.60	9.00	9.00													0	145			
								0.00	0.60	F	F	20.60		10.10	2.70	2.70													0	309			
								0.00	0.60	F	F	20.60	10.10	20.60	1.50	1.50													0	60			
								0.00	0.60	89		20.60	10.10																0	641			
								0.00	0.60	142D2		20.60	10.10																0	426			
								0.00	0.60	88		20.60	12.30																0	408			
								0.00	0.60	87		20.60	15.00																0	204			
										86		20.60	17.70																163	134			
								0.00	0.60	94																			0	1,300			

Post Calculations

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#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500			
			y-y	x-x		Live	Dead	#1 _i	#1 _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live				Dead		
145U1	Man Floor	6x8		10.00	SPF			0.75		R	R	20.60	10.10	12.70	4.00	4.00						0.86	425	265	794	265	16,947	87	70	10,570	145U1			
								0.75		W	W	20.60	10.10	12.70	11.30	11.30												0	131					
								0.75		W	W	20.60	10.10	20.60	9.00	9.00												0	241					
								0.75		F	F	20.60		10.10	2.70	2.70												618	515					
								0.75		F	F	20.60	10.10	20.60	1.50	1.50												120	100					
								0.75		89		20.60	10.10															953	1,069					
								0.75		142U1		20.60	10.10															-951	1,155					
								0.75		88		20.60	12.30															774	680					
								0.75		87		20.60	15.00															328	339					
										86		20.60	17.70															163	134					
								0.75		94																		1,870	2,166					
145U2	Man Floor	6x8		10.00	SPF			0.00	0.60	R	R	20.60	10.10	12.70	4.00	4.00						0.86	425	98	794	98	16,947	0	42	3,910	145U2			
								0.00	0.60	W	W	20.60	10.10	12.70	11.30	11.30													0	79				
								0.00	0.60	W	W	20.60	10.10	20.60	9.00	9.00													0	145				
								0.00	0.60	F	F	20.60		10.10	2.70	2.70													0	309				
								0.00	0.60	F	F	20.60	10.10	20.60	1.50	1.50													0	60				
								0.00	0.60	89		20.60	10.10																0	641				
								0.00	0.60	142U2		20.60	10.10																0	426				
								0.00	0.60	88		20.60	12.30																0	408				
								0.00	0.60	87		20.60	15.00																0	204				
										86		20.60	17.70																163	134				
								0.00	0.60	94																			0	1,300				
146	Man Floor	4x6		10.00	PLY					R	R	10.10		1.70	2.90	2.90							0.56	340	128	754	128	6,545	113	68	2,460	146		
										R	R	10.10	8.00	10.10	2.90	2.90														16	9			
										W	W	10.10		10.10	8.00	8.00														0	404			
										F	F	10.10		10.10	1.00	1.00														202	126			
										93		10.10	1.70																	289	174			
										91		10.10	8.00																	171	103			
										R	R	4.00		4.00	6.10	6.10														305	183			
										147		4.00	1.30																	131	163			
146D1	Man Floor	4x6		10.00	PLY			0.75		R	R	10.10		1.70	2.90	2.90							0.56	340	238	754	238	6,545	85	68	4,580	146D1		
								0.75		R	R	10.10	8.00	10.10	2.90	2.90														12	9			
								0.75		W	W	10.10		10.10	8.00	8.00														0	404			
								0.75		F	F	10.10		10.10	1.00	1.00														152	126			
								0.75		93		10.10	1.70																	217	174			
								0.75		3M		10.10	1.70																3,231	0				
								0.75		91		10.10	8.00																	129	103			
								0.75		3M-		10.10	8.00																	-808	0			
								0.75		R	R	4.00		4.00	6.10	6.10														229	183			
								0.75		147		4.00	1.30																	98	163			
146D2	Man Floor	4x6		10.00	PLY			0.00	0.60	R	R	10.10		1.70	2.90	2.90							0.56	340	206	754	206	6,545	0	41	3,970	146D2		

Post Calculations

#	Location	I.D.	Length (ft.)		I.D.	X-section (in.)		Load Factors		Load Type		Span (ft.)	Placement (ft.)		Spacing (ft.)		C _D	C _F	C _b	K _f	C _P	Bearing		Buckling		All.	Trib.		Total	#	Footin g Size 1500	
			y-y	x-x		Live	Dead	#1 _i	#1 _f	X _i /X _p	X _f		Sp _i	Sp _f	F _v , F _c	F _c						F _{c⊥}	All.	Act.	All.		Act.	Live				Dead
								0.00	0.60	R	R	10.10	8.00	10.10	2.90	2.90											0	6				
								0.00	0.60	W	W	10.10		10.10	8.00	8.00												0	242			
								0.00	0.60	F	F	10.10		10.10	1.00	1.00												0	76			
								0.00	0.60	93		10.10	1.70															0	104			
										3M		10.10	1.70														4,308	0				
								0.00	0.60	91		10.10	8.00															0	62			
										3M-		10.10	8.00															-1,077	0			
								0.00	0.60	R	R	4.00		4.00	6.10	6.10												0	110			
								0.00	0.60	147		4.00	1.30															0	98			
146U1	Man Floor	4x6		10.00	PLY			0.75		R	R	10.10		1.70	2.90	2.90					0.56	340	-15	754	-15	6,545	85	68	-280	146U1		
								0.75		R	R	10.10	8.00	10.10	2.90	2.90												12	9			
								0.75		W	W	10.10		10.10	8.00	8.00												0	404			
								0.75		F	F	10.10		10.10	1.00	1.00												152	126			
								0.75		93		10.10	1.70															217	174			
								0.75		3M-		10.10	1.70															-3,231	0			
								0.75		91		10.10	8.00															129	103			
								0.75		3M		10.10	8.00															808	0			
								0.75		R	R	4.00		4.00	6.10	6.10												229	183			
								0.75		147		4.00	1.30															98	163			
146U2	Man Floor	4x6		10.00	PLY			0.00	0.60	R	R	10.10		1.70	2.90	2.90					0.56	340	-130	754	-130	6,545	0	41	-2,500	146U2		
								0.00	0.60	R	R	10.10	8.00	10.10	2.90	2.90												0	6			
								0.00	0.60	W	W	10.10		10.10	8.00	8.00												0	242			
								0.00	0.60	F	F	10.10		10.10	1.00	1.00												0	76			
								0.00	0.60	93		10.10	1.70															0	104			
										3M-		10.10	1.70															-4,308	0			
								0.00	0.60	91		10.10	8.00															0	62			
										3M		10.10	8.00															1,077	0			
								0.00	0.60	R	R	4.00		4.00	6.10	6.10												0	110			
								0.00	0.60	147		4.00	1.30															0	98			
147	Man Floor									R	R	6.50	2.50	6.50	2.00	2.00												62	37	440	147	
										W	W	6.50	2.50	6.50	8.00	8.00												0	98			
										F	F	6.50	2.50	6.50	1.00	1.00												49	31			
										97		6.50	3.10															50	31			
										98		6.50	5.40															33	45			
148	Roof	2-2x4		10.00	SPF					R	R	4.00		4.00	6.10	6.10					0.35	425	60	277	60	2,908	305	183	630	148		
										147		4.00	2.70															63	79			
149	Roof	2-2x4		10.00	SPF					R	R	5.20	-2.00		6.10	6.10					0.35	425	56	277	56	2,908	364	218	590	149		
149A	Roof	2-2x4		10.00	SPF					154		8.80	4.40								0.35	425	87	277	87	2,908	517	391	910	149A		
150	Roof	4x6		10.00	PLY					95											0.56	340	168	754	168	6,545	1,849	1,386	3,240	150		
151	Roof	2x6		10.00	PLY					R	R	6.20		6.20	1.00	1.00					0.67	340	192	537	192	2,805	78	47	1,580	151		
										W	W	6.20		6.20	5.00	5.00												0	155			

Beam Calculations

Beam			Loading									Adjustment factors				Stresses								Deflection									
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments				Live			Total			#		
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#		
1	Roof	6x12			3		18.60	9.30								837	837	20	170	856	7784	771	1350	175	0.22	0.93	428	0.35	1.24	357	1		
2	Roof	6x12			R	R	4.00		4.00	6.60	6.60					528	528	13	170		528	52	1350		0.00	0.20		0.00	0.27		2		
3	Roof	6x12			R	R	4.00		4.00	9.30	9.30					744	744	18	170	963	744	74	1350		0.00	0.20		0.00	0.27		3		
4	Roof	4x8			R	R	3.70		3.70	2.00	2.00			1.30		234	247	15	250		222	87	1755		0.00	0.19		0.00	0.25		4		
					W	W	3.70		3.70	4.00	6.00																						
5	Roof	4x10			R	R	6.40		6.40	2.00	2.00			1.20		1512	1512	70	180	257	4088	983	1140	116	0.04	0.32	788	0.07	0.43	588	5		
					W	W	6.40		3.20	6.00	8.00																						
					W	W	6.40	3.20	6.40	8.00	6.00																						
					10		6.40	3.20																									
6	Roof	6x12			R	R	7.00		7.00	9.30	9.30					1302	1302	31	170	551	2279	226	1350	599	0.01	0.35		0.02	0.47		6		
7	Roof	6x12			12		18.60	9.30								1243	1243	29	170	577	11562	1144	1350	118	0.32	0.93	288	0.52	1.24	240	7		
8	Roof	4x8			R	R	6.20		6.20	8.30	8.30			1.30		1029	1029	61	250	411	1595	624	1755	281	0.04	0.31	799	0.06	0.41	666	8		
9	Roof	4x8			R	R	2.70		2.70	4.00	4.00			1.30		252	244	15	250		167	65	1755		0.00	0.14		0.00	0.18		9		
					W	W	2.70		2.70	3.20	1.50																						
10	Roof	4x8			R	R	2.70		2.70	4.00	4.00			1.30		446	400	26	250	949	351	137	1755		0.00	0.14		0.00	0.18		10		
					W	W	2.70		2.70	6.30	6.30																						
					15		2.70	1.10																									
11	Roof	4x8			R	R	4.20		4.20	4.00	4.00			1.30		405	393	24	250		419	164	1755		0.00	0.21		0.01	0.28		11		
					W	W	4.20		4.20	3.80	2.20																						
12	Roof	5.5x13.5 GLB			R	R	21.10		21.10	12.90	12.90			0.98		5444	5444	110	265	241	28716	2063	2354	114	0.71	1.06	149	1.13	1.41	124	12		
13	Roof	2-2x12			R	R	16.90		16.90	7.70				1.15		1735	868	77	207	268	5630	1068	1150	108	0.29	0.85	289	0.47	1.13	241	13		
14	Roof	6x12			R	R	7.00		7.00	9.30	9.30					1302	1302	31	170	551	2279	226	1350	599	0.01	0.35		0.02	0.47		14		
15	Roof	6x12			23		18.60	9.30								713	713	17	170		6626	656	1350	206	0.18	0.93	503	0.30	1.24	419	15		
16	Roof	6x12			R	R	8.90		8.90	5.50						653	326	15	170		1115	110	1350		0.01	0.45		0.01	0.59		16		
17	Roof	6x12			R	R	14.60		5.40	10.90	6.50			1.15		3900	3795	92	196	211	15513	1536	1553	101	0.39	0.73	187	0.63	0.97	155	17		
					R	R	14.60	5.40	14.60	6.50	13.90																						
					29		14.60	5.40																									
					29		14.60	5.40																									
					30		14.60	5.40																									
18	Roof	3.5x12 GLB			R	R	16.10		16.10	12.10	12.10					3896	3896	139	265	190	15682	2240	2560	114	0.50	0.81	160	0.81	1.07	133	18		
19	Roof	4x8			R	R	2.70		2.70	12.90	12.90			1.30		697	697	41	250	607	470	184	1755	954	0.00	0.14		0.00	0.18		19		
20	Roof	4x8			R	R	2.70		2.70	8.30	8.30			1.30		448	448	26	250	944	303	118	1755		0.00	0.14		0.00	0.18		20		
21	Roof	4x8			R	R	3.20		3.20	8.30	8.30			1.30		531	531	31	250	796	425	166	1755		0.00	0.16		0.00	0.21		21		
22	Roof	4x8			R	R	2.20		2.20	8.30	8.30			1.30		365	365	22	250		201	79	1755		0.00	0.11		0.00	0.15		22		
23	Roof	4x8			R	R	6.20		6.20	4.00	4.00			1.30		626	611	37	250	675	959	375	1755	468	0.02	0.31		0.03	0.41		23		
					W	W	6.20		6.20	4.70	3.20																						
24	Roof	4x8			W	W	1.70		1.70	2.00	2.00			1.30		17	17	1	250		7	3	1755		0.00	0.09		0.00	0.11		24		
25	Roof	4x8			R	R	3.60		3.60	4.00	4.00			1.30		435	427	26	250	972	388	152	1755		0.00	0.18		0.00	0.24		25		

Beam Calculations

Beam			Loading									Adjustment factors				Stresses								Deflection									
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments				Live			Total			#		
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#		
					R	R	3.60		3.60	1.20	1.20																						
					W	W	3.60		3.60	3.80	2.50																						
26	Roof	4x8			R	R	4.30		4.30	2.70	2.70			1.30		232	232	14	250		250	98	1755		0.00	0.22		0.00	0.29		26		
27	Roof	4x8			W	W	3.70		3.70	8.00	8.00			1.30		148	148	9	250		137	54	1755		0.00	0.19		0.00	0.25		27		
28	Roof	4x8			W	W	6.40		6.40	8.00	8.00			1.30		256	256	15	250		410	160	1755		0.00	0.32		0.02	0.43		28		
29	Roof	4x8			R	R	3.20		3.20	10.00	10.00			1.30		826	826	49	250	512	661	259	1755	678	0.00	0.16		0.01	0.21		29		
					W	W	3.20		3.20	3.00	3.00																						
					F	F	3.20		3.20	1.33	1.33																						
30	Deck	5.5x10.5 GLB			D	D	18.10		18.10	4.70	1.90					2557	1923	66	265	399	10176	1208	2451	203	0.36	0.60	169	0.45	0.60	135	30		
31	Deck	5.5x10.5 GLB			D	D	8.00	-4.20		1.33	1.33					1120	1120	29	265	911	8957	1064	2051	193	0.03	0.27	776	0.04	0.27	621	31		
					51		8.00	-4.20																									
32	Second Floor	4x8			W	W	6.20		6.20	8.00	8.00			1.30		1268	1183	75	250	334	1899	743	1755	236	0.03	0.21	686	0.06	0.31	550	32		
					F	F	6.20		6.20	1.33	1.33																						
					D	D	6.20		6.20	3.60	2.50																						
33	Second Floor	4x8			W	W	2.70		2.70	8.00	8.00			1.30		863	863	51	250	490	582	228	1755	770	0.00	0.09		0.00	0.14		33		
					F	F	2.70		2.70	8.60	8.60																						
34	Second Floor	4x8			W	W	2.70		2.70	12.60	12.60			1.30		846	846	50	250	500	571	223	1755	785	0.00	0.09		0.00	0.14		34		
					F	F	2.70		2.70	7.70	7.70																						
35	Second Floor	4x8			W	W	4.10		4.10	10.00	10.00			1.30		338	338	20	250		347	136	1755		0.00	0.14		0.01	0.21		35		
					F	F	4.10		4.10	1.00	1.00																						
36	Second Floor	4x8			W	W	3.70		3.70	10.00	10.00			1.30		1219	1219	72	250	347	1128	441	1755	398	0.01	0.12		0.02	0.19		36		
					F	F	3.70		3.70	8.60	8.60																						
37	Second Floor	3.5x11.875 LSL			F	F	6.20		6.20	10.60	10.60					2136	2136	77	310	402	3311	483	2327	482	0.02	0.21		0.03	0.31		37		
38	Second Floor	4x8			F	F	2.90		2.90	1.33	1.33			1.30		1672	715	99	250	253	1272	498	1755	352	0.01	0.10		0.01	0.15		38		
					65		2.90	0.80																									
39	Second Floor	3.5x11.875 LSL			F	F	14.70		14.70	1.33	1.33					635	635	23	310		2335	341	2327	683	0.07	0.49	664	0.12	0.74	613	39		
40	Second Floor	4x8			F	F	2.80		2.80	9.30	9.30			1.30		846	846	50	250	500	592	232	1755	757	0.00	0.09		0.00	0.14		40		
41	Second Floor	5.5x22.5 GLB			R	R	22.80		8.20	7.70	7.70			0.92		14057	13443	170	265	156	87547	2264	17091	755	0.67	0.76	113	1.14	1.14	100	41		
					R	R	22.80	8.20	22.80	2.00	2.00																						
					W	W	22.80		22.80	8.00	8.00																						
					F	F	22.80		22.80	8.10	8.10																						
					F	F	22.80	19.10	22.80	7.30	7.30																						
					24		22.80	7.00																									
					25		22.80	8.20																									
					26		22.80	9.90																									
					27		22.80	14.00																									
					70		22.80	19.10																									
41D1	Second Floor	5.5x22.5 GLB	0.75		R	R	22.80		8.20	7.70	7.70			0.92		12582	10941	153	265	174	80368	2078	17091	822	0.55	0.76	139	1.01	1.14	112	41D1		

Beam Calculations

Beam			Loading								Adjustment factors				Stresses								Deflection										
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments			Live			Total			#			
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#		
			0.75		R	R	22.80	8.20	22.80	2.00	2.00																						
			0.75		W	W	22.80		22.80	8.00	8.00																						
			0.75		F	F	22.80		22.80	8.10	8.10																						
			0.75		F	F	22.80	19.10	22.80	7.30	7.30																						
			0.75		24		22.80	7.00																									
			0.75		25		22.80	8.20																									
			0.75		26		22.80	9.90																									
			0.75		3U		22.80	10.10																									
			0.75		27		22.80	14.00																									
			0.75		70		22.80	19.10																									
			0.75		3U-		22.80	22.00																									
41D2	Second Floor	5.5x22.5 GLB	0.00	0.60	R	R	22.80		8.20	7.70	7.70				0.92	4292	2662	52	265	509	29316	758	17091		0.06	0.76		0.34	1.14	338	41D2		
			0.00	0.60	R	R	22.80	8.20	22.80	2.00	2.00																						
			0.00	0.60	W	W	22.80		22.80	8.00	8.00																						
			0.00	0.60	F	F	22.80		22.80	8.10	8.10																						
			0.00	0.60	F	F	22.80	19.10	22.80	7.30	7.30																						
			0.00	0.60	24		22.80	7.00																									
			0.00	0.60	25		22.80	8.20																									
			0.00	0.60	26		22.80	9.90																									
					3U		22.80	10.10																									
			0.00	0.60	27		22.80	14.00																									
			0.00	0.60	70		22.80	19.10																									
					3U-		22.80	22.00																									
41U1	Second Floor	5.5x22.5 GLB	0.75		R	R	22.80		8.20	7.70	7.70				0.92	11455	12068	146	265	181	69150	1788	17091	956	0.46	0.76	164	0.93	1.14	123	41U1		
			0.75		R	R	22.80	8.20	22.80	2.00	2.00																						
			0.75		W	W	22.80		22.80	8.00	8.00																						
			0.75		F	F	22.80		22.80	8.10	8.10																						
			0.75		F	F	22.80	19.10	22.80	7.30	7.30																						
			0.75		24		22.80	7.00																									
			0.75		25		22.80	8.20																									
			0.75		26		22.80	9.90																									
			0.75		3U-		22.80	10.10																									
			0.75		27		22.80	14.00																									
			0.75		70		22.80	19.10																									
			0.75		3U		22.80	22.00																									
41U2	Second Floor	5.5x22.5 GLB	0.00	0.60	R	R	22.80		8.20	7.70	7.70				0.92	2790	4165	50	265	525	14642	379	17091		0.06	0.76		0.22	1.14	513	41U2		
			0.00	0.60	R	R	22.80	8.20	22.80	2.00	2.00																						
			0.00	0.60	W	W	22.80		22.80	8.00	8.00																						

Beam Calculations

Beam			Loading									Adjustment factors				Stresses								Deflection										
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments				Live			Total			#			
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#			
			0.00	0.60	F	F	22.80		22.80	8.10	8.10																							
			0.00	0.60	F	F	22.80	19.10	22.80	7.30	7.30																							
			0.00	0.60	24		22.80	7.00																										
			0.00	0.60	25		22.80	8.20																										
			0.00	0.60	26		22.80	9.90																										
					3U-		22.80	10.10																										
			0.00	0.60	27		22.80	14.00																										
			0.00	0.60	70		22.80	19.10																										
					3U		22.80	22.00																										
42	Second Floor	3.5x11.875 LSL			F	F	5.60		3.80	3.70	3.70				620	370	22	310		799	117	2327		0.00	0.19		0.01	0.28				42		
					F	F	5.60	3.80	5.60	1.30																								
43	Second Floor	2-2x8			F	F	3.80		3.80	2.90	2.90			1.20	358	358	25	180	729	340	155	1200	772	0.00	0.13		0.01	0.19				43		
44	Second Floor	2-2x8			F	F	3.80		3.80	4.30	4.30			1.20	531	531	37	180	491	504	230	1200	521	0.00	0.13		0.01	0.19				44		
45	Second Floor	3.5x11.875 LSL			F	F	4.20		4.20	9.10	9.10				1242	1242	45	310	692	1304	190	2327		0.00	0.14		0.01	0.21				45		
46	Second Floor	4x8			R	R	2.70		2.70	4.00	4.00			1.30	1049	1049	62	250	403	708	277	1755	633	0.00	0.09		0.01	0.14				46		
					W	W	2.70		2.70	8.40	8.40																							
					F	F	2.70		2.70	8.20	8.20																							
47	Second Floor	4x8			R	R	2.70		2.70	4.00	4.00	1.15		1.30	4251	1797	251	288	114	2023	792	2018	255	0.01	0.09		0.01	0.14	987			47		
					W	W	2.70		2.70	10.40	10.40																							
					F	F	2.70		2.70	8.20	8.20																							
					26		2.70	0.50																										
48	Second Floor	5.5x9 GLB			R	R	10.20		2.10	4.00	4.00				4591	4571	139	265	190	10840	1752	2636	150	0.22	0.34	152	0.43	0.51	119			48		
					R	R	10.20	8.30	10.20	4.00	4.00																							
					R	R	10.20		10.20	1.00	1.00																							
					W	W	10.20		2.10	9.50	9.50																							
					W	W	10.20	2.10	8.30	8.00	8.00																							
					W	W	10.20	8.30	10.20	12.80	2.80																							
					F	F	10.20		10.20	9.10	9.10																							
					37		10.20	2.10																										
					38		10.20	8.30																										
49	Second Floor	4x8			R	R	6.20		6.20	2.90	2.90			1.30	561	561	33	250	754	870	340	1755	516	0.02	0.21	983	0.03	0.31	916			49		
					F	F	6.20		6.20	1.00	1.00																							
50	Roof	4x8			R	R	6.70		6.70	2.60	2.60			1.30	348	348	21	250		584	228	1755	768	0.02	0.34		0.03	0.45				50		
51	Roof	4x8			R	R	2.20		2.20	1.90	1.90			1.30	155	155	9	250		85	33	1755		0.00	0.11		0.00	0.15				51		
					F	F	2.20		2.20	1.00	1.00																							
52	Second Floor	5.5x7.5 GLB			R	R	8.00		2.00	4.00	4.00				3234	3231	118	265	225	5957	1386	2751	198	0.14	0.27	188	0.26	0.40	153			52		
					R	R	8.00	6.00	8.00	4.00	4.00																							
					R	R	8.00		8.00	0.50	0.50																							

Beam Calculations

Beam			Loading									Adjustment factors				Stresses								Deflection									
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments				Live			Total			#		
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#		
					W	W	8.00		2.00	9.40	9.40																						
					W	W	8.00	6.00	8.00	9.40	9.40																						
					F	F	8.00		8.00	7.40	7.40																						
					39		8.00	2.00																									
					41		8.00	6.00																									
53	Second Floor	2-2x8			R	R	2.80		2.80	1.90	1.90			1.20		467	467	32	180	559	516	235	1200	510	0.00	0.09		0.00	0.14		53		
					F	F	2.80		2.80	1.00	1.00																						
					98a		2.80	1.40																									
54	Roof	4x8			R	R	13.00		13.00	2.60	2.60			1.30		676	676	40	250	626	2197	860	1755	204	0.23	0.65	277	0.38	0.87	231	54		
55	Deck	3.5x12 GLB			D	D	18.60		18.60	2.00	2.00					1395	1395	50	265	532	6487	927	2524	272	0.36	0.62	174	0.45	0.62	139	55		
56	Deck	3.5x12 GLB			D	D	17.40		17.40	6.00	2.10					3067	2219	110	265	242	11563	1652	2541	154	0.41	0.58	142	0.51	0.58	113	56		
57	Main Floor	4x8			W	W	4.20		4.20	10.00	10.00			1.30		2252	1325	133	250	188	2440	955	1755	184	0.02	0.14	816	0.04	0.21	550	57		
					F	F	4.20		4.20	1.33	1.33																						
					D	D	4.20		4.20	2.00	2.00																						
					46		4.20	1.20																									
58	Deck	P.T. 2x12			D	D	12.50		12.50	1.33	1.33					623	623	55	150	271	1948	739	850	115	0.15	0.42	271	0.19	0.42	217	58		
59	Main Floor	P.T. 2x12			D	D	3.30		3.30	2.80	2.80					346	347	31	150	487	286	108	850	784	0.00	0.11		0.00	0.17		59		
60	Main Floor	3.5x11.875 LSL			F	F	15.00	-2.00	15.00	1.33	1.33					1110	186	40	310	774	6928	1011	2327	230	0.05	0.50	962	0.09	0.75	797	60		
					57		15.00	-2.00																									
61	Main Floor	3.5x11.875 LSL			F	F	15.00	-2.00	15.00	1.33	1.33					834	462	30	310		2789	407	2327	572	0.04	0.50		0.05	0.75		61		
					58		15.00	-2.00																									
62	Main Floor	6x8			W	W	3.40		3.40	10.00	10.00					3463	4537	165	170	103	3410	794	1350	170	0.01	0.11	887	0.02	0.17	735	62		
					F	F	3.40		3.40	8.60	8.60																						
					W	W	3.40		3.40	9.00	9.00																						
					F	F	3.40		3.40	15.50	15.50																						
					61		3.40	2.60																									
63A	Main Floor	5.5x21 glb			F	F	22.80		22.80	9.30	9.30			0.93		6891	6891	89	265	296	39280	1166	2235	192	0.30	0.76	257	0.48	1.14	237	63A		
63	Main Floor	5.5x21 glb			F	F	22.80		22.80	11.20	11.20			0.93		8619	8619	112	265	237	49131	1458	2235	153	0.36	0.76	213	0.60	1.14	189	63		
					B	B	22.80		22.80	1.00	1.00																						
63D1	Main Floor	5.5x21 GLB	0.75		F	F	22.80		22.80	11.20	11.20			0.93		7973	6712	104	265	256	49340	1465	2235	153	0.37	0.76	208	0.61	1.14	187	63D1		
			0.75		B	B	22.80		22.80	1.00	1.00																						
			0.75		3M		22.80	18.20																									
			0.75		3M-		22.80	21.90																									
63D2	Main Floor	6.75X22.5 GLB	0.00	0.60	F	F	22.80		22.80	11.20	11.20			0.91		2948	1267	29	265	910	23505	495	2175	439	0.09	0.76	858	0.18	1.14	617	63D2		
			0.00	0.60	B	B	22.80		22.80	1.00	1.00																						
					3M		22.80	18.20																									
					3M-		22.80	21.90																									
63U1	Main Floor	5.5X21 GLB	0.75		F	F	22.80		22.80	11.20	11.20			0.93		7973	6712	104	265	256	49340	1465	2235	153	0.37	0.76	208	0.61	1.14	187	63U1		

Beam Calculations

Beam			Loading									Adjustment factors				Stresses								Deflection							
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments				Live			Total			#
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#
			0.75		B	B	22.80		22.80	1.00	1.00																				
			0.75		3M		22.80	18.20																							
			0.75		3M-		22.80	21.90																							
63U2	Main Floor	6.75X22.5 GLB	0.00	0.60	F	F	22.80		22.80	11.20	11.20				0.91	2948	1267	29	265	910	23505	495	2175	439	0.09	0.76	858	0.18	1.14	617	63U2
			0.00	0.60	B	B	22.80		22.80	1.00	1.00																				
					3M		22.80	18.20																							
					3M-		22.80	21.90																							
64	Main Floor	4x8			F	F	2.90		2.90	8.70	8.70			1.30	820	820	48	250	516	594	233	1755	754	0.00	0.10		0.01	0.15		64	
65	Main Floor	4x8			74		3.40	2.90						1.30	54	315	19	250		157	62	1755		0.00	0.11		0.00	0.17		65	
66	Main Floor	4x8			F	F	2.70		2.70	3.70	3.70			1.30	325	325	19	250		219	86	1755		0.00	0.09		0.00	0.14		66	
67	Main Floor	2-2x8			F	F	3.80		3.80	2.90	2.90			1.20	358	358	25	180	729	340	155	1200	772	0.00	0.13		0.01	0.19		67	
68	Main Floor	2-2x8			F	F	3.80		3.80	4.30	4.30			1.20	531	531	37	180	491	504	230	1200	521	0.00	0.13		0.01	0.19		68	
69	Main Floor	3.5x11.875 LSL			F	F	3.80		3.80	4.80	4.80				593	593	21	310		563	82	2327		0.00	0.13		0.00	0.19		69	
70	Main Floor	3.5x11.875 LSL			F	F	12.80		12.80	4.10	4.10				1706	1706	62	310	504	5458	796	2327	292	0.13	0.43	326	0.21	0.64	301	70	
71	Main Floor	5.5x15 GLB			F	F	18.50		18.50	9.40	9.40			0.98	4897	4872	89	265	298	19595	1140	2360	207	0.30	0.62	209	0.45	0.93	204	71	
					140		18.50	9.40																							
71D1	Main Floor	5.5x15 GLB	0.75		F	F	18.50		18.50	9.40	9.40			0.98	4622	4616	84	265	315	20632	1200	2360	197	0.31	0.62	202	0.46	0.93	200	71D1	
					140D1		18.50	9.40																							
71D2	Main Floor	5.5x15 GLB	0.00	0.60	F	F	18.50		18.50	9.40	9.40			0.98	2853	2904	53	265	502	20356	1184	2360	199	0.30	0.62	208	0.39	0.93	237	71D2	
					140D2		18.50	9.40																							
71U1	Main Floor	5.5x15 GLB	0.75		F	F	18.50		18.50	9.40	9.40			0.98	3615	3577	66	265	403	12596	733	2360	322	0.14	0.62	447	0.30	0.93	313	71U1	
					140U1		18.50	9.40																							
71U2	Main Floor	5.5x15 GLB	0.00	0.60	F	F	18.50		18.50	9.40	9.40			0.98	714	781	14	265		12638	735	1180	160	0.30	0.62	208	0.20	0.93	457	71U2	
					140U2		18.50	9.40																							
72	Main Floor	3.5x11.875 LSL			R	R	3.00	-2.10		2.00	2.00				1794	1534	65	310	479	4992	728	2327	320	0.00	0.10		0.01	0.15		72	
					W	W	3.00	-2.10		9.00	9.00																				
					F	F	3.00	-2.10	3.00	1.33	1.33																				
					143		3.00	-2.10																							
72D1	Main Floor	3.5x11.875 LSL	0.75		R	R	3.00	-2.10		2.00	2.00				3265	3046	118	310	263	9467	1381	2327	169	0.01	0.10	882	0.02	0.15	998	72D1	
			0.75		W	W	3.00	-2.10		9.00	9.00																				
			0.75		F	F	3.00	-2.10	3.00	1.33	1.33																				
					143D1		3.00	-2.10																							
72D2	Main Floor	3.5x11.875 LSL	0.75		R	R	3.00	-2.10		2.00	2.00				574	514	21	310		1632	238	2327	978	0.00	0.10		0.00	0.15		72D2	
			0.00	0.60	W	W	3.00	-2.10		9.00	9.00																				
			0.00	0.60	F	F	3.00	-2.10	3.00	1.33	1.33																				
					143D2		3.00	-2.10																							
72U1	Main Floor	3.5x11.875 LSL	0.75		R	R	3.00	-2.10		2.00	2.00				127	346	13	310		710	104	2327		0.01	0.10		0.00	0.15		72U1	
			0.75		W	W	3.00	-2.10		9.00	9.00																				

Beam Calculations

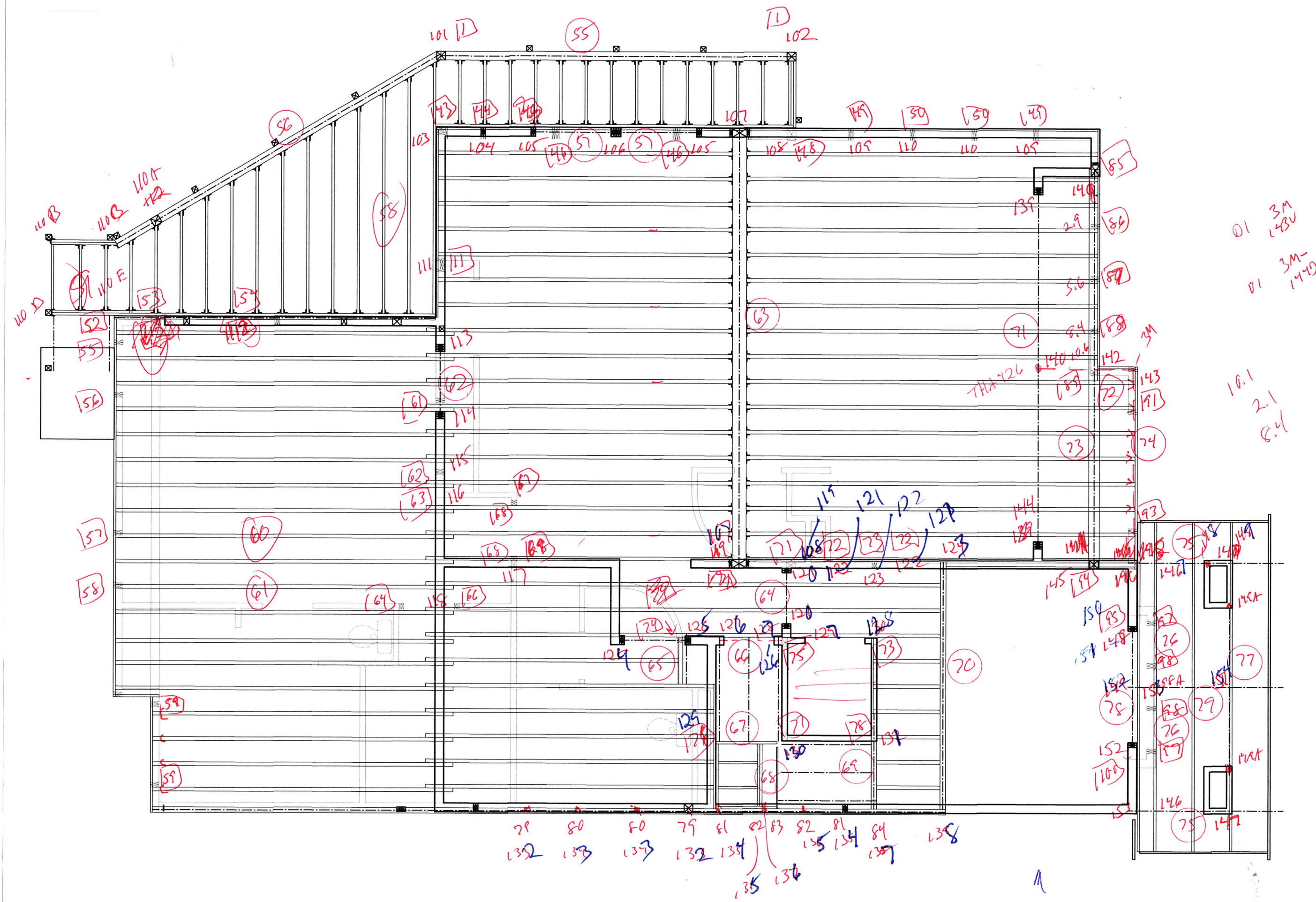
Beam			Loading									Adjustment factors				Stresses								Deflection									
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments				Live			Total			#		
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#		
			0.75		F	F	3.00	-2.10	3.00	1.33	1.33																						
					143U1		3.00	-2.10																									
72U2	Main Floor	3.5x11.875 LSL	0.75		R	R	3.00	-2.10		2.00	2.00				574	514	21	310			1632	238	2327	978	0.00	0.10		0.00	0.15		72U2		
			0.00	0.60	W	W	3.00	-2.10		9.00	9.00																						
			0.00	0.60	F	F	3.00	-2.10	3.00	1.33	1.33																						
					143U2		3.00	-2.10																									
73	Main Floor	6.75x22.5 GLB			R	R	20.60	8.40	10.50	4.00	4.00				0.92	16107	11056	159	265	167	102743	2165	2197	101	0.31	0.69	225	0.58	1.03	177	73		
					W	W	20.60	8.40	10.50	11.30	11.30																						
					W	W	20.60		10.50	9.00	9.00																						
					F	F	20.60		10.50	1.50	15.00																						
					F	F	20.60	10.50	20.60	2.70	2.70																						
					86		20.60	2.90																									
					87		20.60	5.60																									
					88		20.60	8.30																									
					89		20.60	10.50																									
					142		20.60	10.50																									
73	Main Floor	6.75x22.5 GLB	0.75		R	R	20.60	8.40	10.50	4.00	4.00				0.92	15951	11642	158	265	168	109622	2310	2197	95	0.34	0.69	201	0.62	1.03	167	73		
			0.75		W	W	20.60	8.40	10.50	11.30	11.30																						
			0.75		W	W	20.60		10.50	9.00	9.00																						
			0.75		F	F	20.60		10.50	1.50	15.00																						
			0.75		F	F	20.60	10.50	20.60	2.70	2.70																						
			0.75		86		20.60	2.90																									
			0.75		87		20.60	5.60																									
			0.75		88		20.60	8.30																									
			0.75		89		20.60	10.50																									
					142D1		20.60	10.50																									
73	Main Floor	6.75x22.5 GLB	0.00	0.60	R	R	20.60	8.40	10.50	4.00	4.00				0.92	4511	3072	45	265	595	28939	610	2197	360	0.00	0.69		0.17	1.03	607	73		
			0.00	0.60	W	W	20.60	8.40	10.50	11.30	11.30																						
			0.00	0.60	W	W	20.60		10.50	9.00	9.00																						
			0.00	0.60	F	F	20.60		10.50	1.50	15.00																						
			0.00	0.60	F	F	20.60	10.50	20.60	2.70	2.70																						
			0.00	0.60	86		20.60	2.90																									
			0.00	0.60	87		20.60	5.60																									
			0.00	0.60	88		20.60	8.30																									
			0.00	0.60	89		20.60	10.50																									
					142D2		20.60	10.50																									
73	Main Floor	6.75x22.5 GLB	0.75		R	R	20.60	8.40	10.50	4.00	4.00				0.92	11912	7443	118	265	225	69522	1465	2197	150	0.12	0.69	584	0.39	1.03	262	73		
			0.75		W	W	20.60	8.40	10.50	11.30	11.30																						

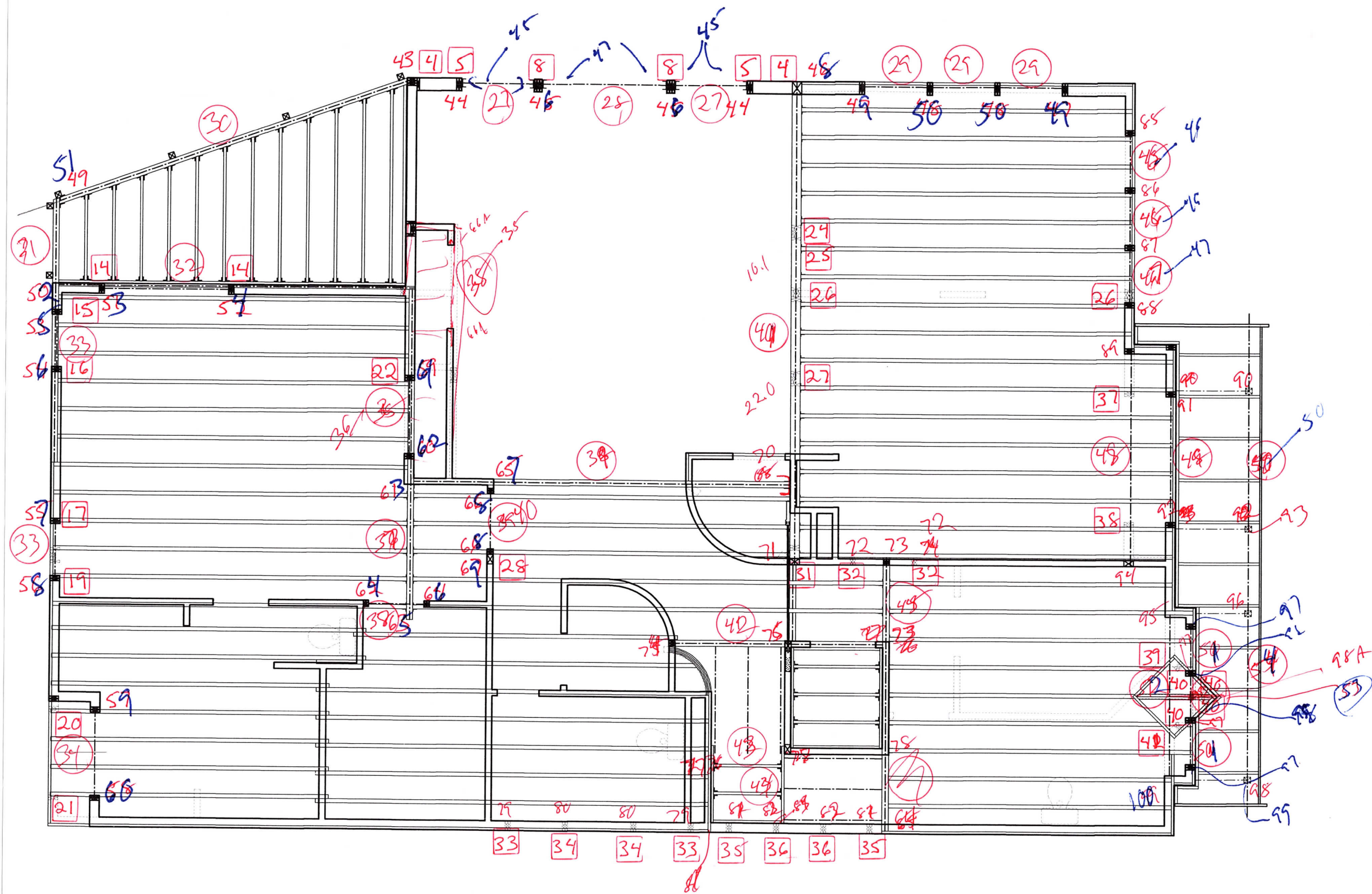
Beam Calculations

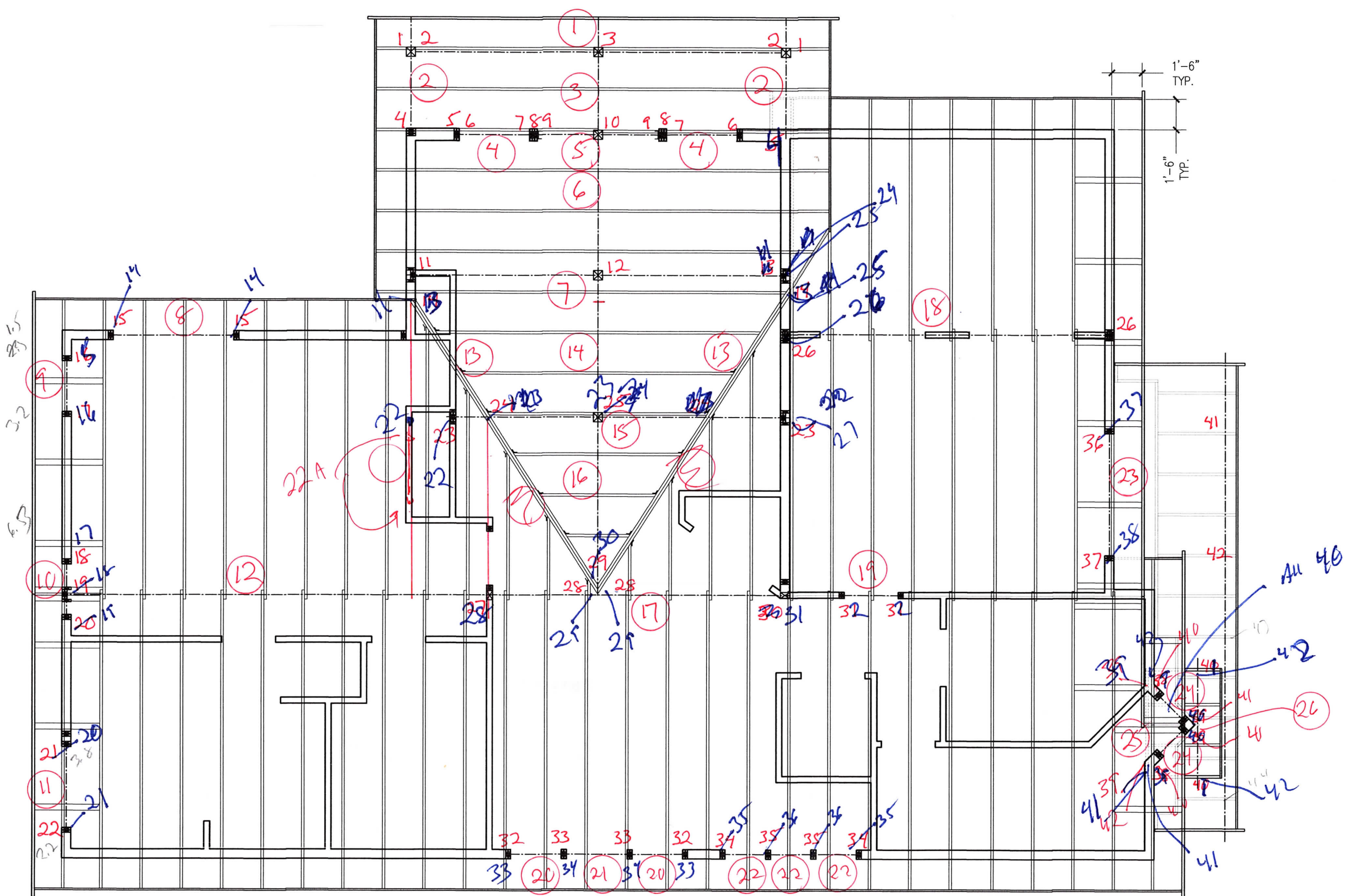
Beam			Loading								Adjustment factors				Stresses								Deflection										
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments			Live			Total			#			
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#		
			0.75		W	W	20.60		10.50	9.00	9.00																						
			0.75		F	F	20.60		10.50	1.50	15.00																						
			0.75		F	F	20.60	10.50	20.60	2.70	2.70																						
			0.75		86		20.60	2.90																									
			0.75		87		20.60	5.60																									
			0.75		88		20.60	8.30																									
			0.75		89		20.60	10.50																									
					142U1		20.60	10.50																									
73	Main Floor	6.75x22.5 GLB	0.00	0.60	R	R	20.60	8.40	10.50	4.00	4.00				0.92	4511	3072	45	265	595	28939	610	2197	360	0.00	0.69		0.17	1.03	607	73		
			0.00	0.60	W	W	20.60	8.40	10.50	11.30	11.30																						
			0.00	0.60	W	W	20.60		10.50	9.00	9.00																						
			0.00	0.60	F	F	20.60		10.50	1.50	15.00																						
			0.00	0.60	F	F	20.60	10.50	20.60	2.70	2.70																						
			0.00	0.60	86		20.60	2.90																									
			0.00	0.60	87		20.60	5.60																									
			0.00	0.60	88		20.60	8.30																									
			0.00	0.60	89		20.60	10.50																									
					142U2		20.60	10.50																									
74	Main Floor	3.5x11.875 LSL			R	R	10.10		2.10	2.90	2.90					2108	1676	76	310	408	4043	590	2327	395	0.07	0.34	487	0.14	0.51	372	74		
					R	R	10.10	8.40	10.10	2.90	2.90																						
					W	W	10.10		10.10	8.00	8.00																						
					F	F	10.10		10.10	1.00	1.00																						
					91		10.10	2.10																									
					93		10.10	8.40																									
74D1	Main Floor	3.5x11.875 LSL	0.75		R	R	10.10		2.10	2.90	2.90					4266	945	154	310	201	8142	1188	2327	196	0.08	0.34	414	0.14	0.51	350	74D1		
			0.75		R	R	10.10	8.40	10.10	2.90	2.90																						
			0.75		W	W	10.10		10.10	8.00	8.00																						
			0.75		F	F	10.10		10.10	1.00	1.00																						
			0.75		3M		10.10	2.10																									
			0.75		91		10.10	2.10																									
			0.75		3M-		10.10	8.40																									
			0.75		93		10.10	8.40																									
74D2	Main Floor	3.5x11.875 LSL	0.00	0.60	R	R	10.10		2.10	2.90	2.90					629	531	23	310		1285	187	2327		0.00	0.34		0.04	0.51		74D2		
			0.00	0.60	R	R	10.10	8.40	10.10	2.90	2.90																						
			0.00	0.60	W	W	10.10		10.10	8.00	8.00																						
			0.00	0.60	F	F	10.10		10.10	1.00	1.00																						
			0.00	0.60	3M		10.10	2.10																									
			0.00	0.60	91		10.10	2.10																									

Beam Calculations

Beam			Loading									Adjustment factors				Stresses								Deflection								
#			Load Factors		Type		Span	Placement (ft.)		Spacing (ft.)		C _D	C _r	C _F	C _v	Loads (lb)		Shear (psi)			Moments				Live			Total			#	
#	Location	I.D.	Live	Dead	#1 _i	#1 _f	(ft.)	X _i /X _p	X _f	Sp _i	Sp _f					Left	Right	f _V	F' _V	%	M _{max} (lb-ft)	f _b	F' _b	%	Δ _{act.}	Δ _{all.}	%	Δ _{act.}	Δ _{all.}	%	#	
			0.00	0.60	3M-		10.10	8.40																								
			0.00	0.60	93		10.10	8.40																								
74U1	Main Floor	3.5x11.875 LSL	0.75		R	R	10.10		2.10	2.90	2.90					580	3901	141	310	220	6017	878	2327	265	0.05	0.34	741	0.10	0.51	482	74U1	
			0.75		R	R	10.10	8.40	10.10	2.90	2.90																					
			0.75		W	W	10.10		10.10	8.00	8.00																					
			0.75		F	F	10.10		10.10	1.00	1.00																					
			0.75		3M-		10.10	2.10																								
			0.75		91		10.10	2.10																								
			0.75		3M		10.10	8.40																								
			0.75		93		10.10	8.40																								
74U2	Main Floor	3.5x11.875 LSL	0.00	0.60	R	R	10.10		2.10	2.90	2.90					629	531	23	310		1285	187	2327		0.00	0.34		0.04	0.51		74U2	
			0.00	0.60	R	R	10.10	8.40	10.10	2.90	2.90																					
			0.00	0.60	W	W	10.10		10.10	8.00	8.00																					
			0.00	0.60	F	F	10.10		10.10	1.00	1.00																					
			0.00	0.60	3M-		10.10	2.10																								
			0.00	0.60	91		10.10	2.10																								
			0.00	0.60	3M		10.10	8.40																								
			0.00	0.60	93		10.10	8.40																								
75	Roof	6x12			R	R	4.00		4.00	6.10	6.10					782	630	19	170	917	812	80	1350		0.00	0.20		0.00	0.27		75	
					147		4.00	1.30																								
76	Main Floor	2x8			R	R	6.50	2.50	6.50	2.00	2.00			1.20		436	1078	149	180	121	1355	1237	1200	97	0.07	0.22	319	0.16	0.33	206	76	
					W	W	6.50	2.50	6.50	8.00	8.00																					
					F	F	6.50	2.50	6.50	1.00	1.00																					
					97		6.50	3.10																								
					98		6.50	5.40																								
77	Roof	6x12			154		8.80	4.40								908	908	22	170	789	3997	396	1350	341	0.02	0.44		0.04	0.59		77	
78	Main Floor	4x8			R	R	6.20		6.20	1.00	1.00			1.30		1575	1575	93	250	269	4138	1619	1755	108	0.06	0.21	325	0.13	0.31	230	78	
					W	W	6.20		6.20	5.00	5.00																					
					F	F	6.20		6.20	1.00	1.00																					
					152		6.20	3.10																								
79	Roof	6x12			R	R	5.20		5.20	6.60	6.60					2189	1187	52	170	327	2623	260	1350	520	0.01	0.26		0.01	0.35		79	
					153		5.20	1.30																								







Main Wind Force Resisting System

Grid #	Factor	Grid # for Load Above	L (ft)	B (ft)	Proj. Area (ft ²)	Surface Direction	Surface Type	Roof Angle		Pressure Coefficients		Design Pressure	Design Load		Min. Design Load		Load used for Design F (lb)						
								Pitch	θ (Deg)	C_p (Fig 27.3.1) External	GC_{pi} (Table 26.13-1) Internal	p (Eq 27.3-1) (psf)	Tributary F (lb)	Total F (lb)	Tributary F (lb)	Total F (lb)							
1U			36.0	60.0	30	Windward	Wall			0.80	-0.18	17.0	509	2225	480	1008	1335						
			36.0	60.0	30	Leeward	Wall			-0.50	0.18	10.6	318										
			36.0	60.0	66	Windward	Roof	5	20.6	0.40	-0.18	8.5	559		528								
			36.0	60.0	66	Leeward	Roof	5	20.6	-0.60	0.18	12.7	839										
2U			36.0	60.0	96	Windward	Wall			0.80	-0.18	17.0	1627	4408	1536	2176	2645						
			36.0	60.0	64	Leeward	Wall			-0.50	0.18	10.6	678										
			36.0	60.0	80	Windward	Roof	5	20.6	0.40	-0.18	8.5	678		640								
			36.0	60.0	112	Leeward	Roof	5	20.6	-0.60	0.18	12.7	1424										
3U			36.0	60.0	66	Windward	Wall			0.80	-0.18	17.0	1119	3814	1056	1968	2289						
			36.0	60.0	60	Leeward	Wall			-0.50	0.18	10.6	636										
			36.0	60.0	114	Windward	Roof	5	20.6	0.40	-0.18	8.5	966		912								
			36.0	60.0	86	Leeward	Roof	5	20.6	-0.60	0.18	12.7	1093										
4U			36.0	60.0	44	Windward	Wall			0.80	-0.18	17.0	746	2458	704	1152	1475						
			36.0	60.0	16	Leeward	Wall			-0.50	0.18	10.6	170										
			36.0	60.0	56	Windward	Roof	5	20.6	0.40	-0.18	8.5	475		448								
			36.0	60.0	84	Leeward	Roof	5	20.6	-0.60	0.18	12.7	1068										
AU			60.0	36.0	142	Windward	Wall			0.80	-0.18	17.0	2407	3823	2272	2736	2294						
			60.0	36.0	24	Leeward	Wall			-0.37	0.18	7.8	186										
			60.0	36.0	58	Windward	Roof	7	30.3	0.40	-0.18	8.5	492		464								
			60.0	36.0	58	Leeward	Roof	7	30.3	-0.60	0.18	12.7	737										
BUA			60.0	36.0	22	Windward	Wall			0.80	-0.18	17.0	373	1537	352	768	922						
			60.0	36.0	8	Leeward	Wall			-0.37	0.18	7.8	62										
			60.0	36.0	52	Windward	Roof	7	30.3	0.40	-0.18	8.5	441		416								
			60.0	36.0	52	Leeward	Roof	7	30.3	-0.60	0.18	12.7	661										
BUB			60.0	36.0	76	Windward	Wall			0.80	-0.18	17.0	1288	2825	1216	1984	1695						
		BUA											1537		768								
CU			60.0	36.0	140	Windward	Wall			0.80	-0.18	17.0	2373	3119	2240	2240	1872						
			60.0	36.0	96	Leeward	Wall			-0.37	0.18	7.8	746										
1M			36.0	60.0	86	Windward	Wall			0.80	-0.18	17.0	1458	4594	1376	2384	2756						
			36.0	60.0	86	Leeward	Wall			-0.50	0.18	10.6	911										
		1U											2225		1008								
2M			36.0	60.0	176	Windward	Wall			0.80	-0.18	17.0	2984	9256	2816	4992	5554						
			36.0	60.0	176	Leeward	Wall			-0.50	0.18	10.6	1865										
		2U											4408		2176								
3M			36.0	60.0	182	Windward	Wall			0.80	-0.18	17.0	3085	8828	2912	4880	5297						

Main Wind Force Resisting System

Grid #	Factor	Grid # for Load Above	L (ft)	B (ft)	Proj. Area (ft ²)	Surface Direction	Surface Type	Roof Angle		Pressure Coefficients		Design Pressure p (Eq 27.3-1) (psf)	Design Load		Min. Design Load		Load used for Design F (lb)								
								Pitch	θ (Deg)	C_p (Fig 27.3.1) External	GC_{pi} (Table 26.13-1) Internal		Tributary F (lb)	Total F (lb)	Tributary F (lb)	Total F (lb)									
			36.0	60.0	182	Leeward	Wall			-0.50	0.18	10.6	1928												
		3U											3814		1968										
4M			36.0	60.0	100	Windward	Wall			0.80	-0.18	17.0	1695	5213	1600	2752	3128								
			36.0	60.0	100	Leeward	Wall			-0.50	0.18	10.6	1060												
		4U											2458		1152										
AM			60.0	36.0	178	Windward	Wall			0.80	-0.18	17.0	3018	6840	2848	5584	4104								
		AU											3823		2736										
BM			60.0	36.0	166	Windward	Wall			0.80	-0.18	17.0	2814	6028	2656	4640	3617								
			60.0	36.0	50	Leeward	Wall			-0.37	0.18	7.8	388												
		BUB											2825		1984										
CM			60.0	36.0	166	Windward	Wall			0.80	-0.18	17.0	2814	6928	2656	4896	4157								
			60.0	36.0	128	Leeward	Wall			-0.37	0.18	7.8	995												
		CU											3119		2240										
2L			36.0	60.0	186	Windward	Wall			0.80	-0.18	17.0	3153	12409	2976	7968	7445								
		2M											9256		4992										
3L			36.0	60.0	190	Windward	Wall			0.80	-0.18	17.0	3221	12049	3040	7920	7229								
		3M											8828		4880										
4L			36.0	60.0	104	Windward	Wall			0.80	-0.18	17.0	1763	7696	1664	4688	4618								
			36.0	60.0	34	Windward	Roof	6	26.6	0.40	-0.18	8.5	288		272										
			36.0	60.0	34	Leeward	Roof	6	26.6	-0.60	0.18	12.7	432												
		4M											5213		2752										
AL			60.0	36.0	92	Windward	Wall			0.80	-0.18	17.0	1560	8400	1472	7056	5040								
		AM											6840		5584										
BL			60.0	36.0	188	Windward	Wall			0.80	-0.18	17.0	3187	9619	3008	7648	5771								
			60.0	36.0	52	Leeward	Wall			-0.37	0.18	7.8	404												
		BM											6028		4640										
CL			60.0	36.0	188	Windward	Wall			0.80	-0.18	17.0	3187	10115	3008	7904	6069								
		CM											6928		4896										

Seismic Calculations

Spectral Response Acceleration, $S_s = 144.80$

Maximum Spectral Response Acceleration, $S_{MS} = 1.74$

Site Class = D

5% Damped Design Spectral Response Acceleration, $S_{DS} = 1.16$

Site Coefficient, $F_a = 1.20$

Default Response Modification Coefficient, $R = 6.50$

Height Coefficient, $F = 1.20$

Seismic Design Category = D

Grid #	Load Type	Level	Direction (On Page)	Areas (ft ²)	Code Sect.	Fctr.	Ω_o	R	Loads						Eq. 12.4-3 $E = \rho Q_E$ (lb)	Eq. 5 0.7*E (lb)	Eq. 12.4-7 $E_m = \Omega_o Q_E$ (lb)							
									Live (lb/ft ²)	Dead (lb/ft ²)	w_x (lb)	FS_{DS}/R	F_{xi} (lb)	Q_E (lb)									ρ_{used}	
1U	R	Upper Floor	U-D	296						15.0	4440	0.214	950	950	1.30	1234	950							
2U	R	Upper Floor	U-D	688						15.0	10320	0.214	2207	2207	1.30	2869	2209							
3U	R	Upper Floor	U-D	668						15.0	10020	0.214	2143	2143	1.30	2786	2145							
4U	R	Upper Floor	U-D	394						15.0	5910	0.214	1264	1264	1.30	1643	1265							
AU	R	Upper Floor	L-R	560						15.0	8400	0.214	1796	1796	1.30	2335	1798							
BUA	R	Upper Floor	L-R	236						15.0	3540	0.214	757	757	1.30	984	758							
BUB	R	Upper Floor	L-R	376						15.0	5640	0.214	1206	1963	1.30	2552	1965							
	BUA												757											
CU	R	Upper Floor	L-R	874						15.0	13110	0.214	2804	2804	1.30	3645	2806							
1M	F	Main Floor	U-D	232						35.0	8120	0.214	1737	3328	1.30	4326	3331							
	D			50						60.0	3000	0.214	642											
	1U												950											
2M	F	Main Floor	U-D	194						35.0	6790	0.214	1452	4583	1.30	5958	4588							
	D			72						60.0	4320	0.214	924											
	2U												2207											
3M	F	Main Floor	U-D	460						35.0	16100	0.214	3443	5586	1.30	7262	5592							
	3U												2143											
4M	R	Main Floor	U-D	116						15.0	1740	0.214	372	4331	1.30	5630	4335							
	F			360						35.0	12600	0.214	2695											
	4U												1264											
AM	F	Main Floor	L-R	266						35.0	9310	0.214	1991	5353	1.30	6959	5358							
	D			122						60.0	7320	0.214	1565											
	AU												1796											
BM	R	Main Floor	L-R	40						15.0	600	0.214	128	5199	1.30	6759	5204							
	F			314						35.0	10990	0.214	2350											
	BUA	Main Floor	U-D	432								0.214	757											
	BUB												1963											
CM	R	Main Floor	L-R	76						15.0	1140	0.214	244	9455	1.30	12291	9464							
	F			856						35.0	29960	0.214	6407											
	CU												2804											
2L	F	Lower Floor	U-D	576						35.0	20160	0.214	4311	10665	1.30	13865	10676							
	D			138						60.0	8280	0.214	1771											
	2M												4583											

Seismic Calculations

Spectral Response Acceleration, $S_s = 144.80$

Maximum Spectral Response Acceleration, $S_{MS} = 1.74$

Site Class = D

5%Damped Design Spectral Response Acceleration, $S_{DS} = 1.16$

Site Coefficient, $F_a = 1.20$

Default Response Modification Coefficient, $R = 6.50$

Height Coefficient, $F = 1.20$

Seismic Design Category = D

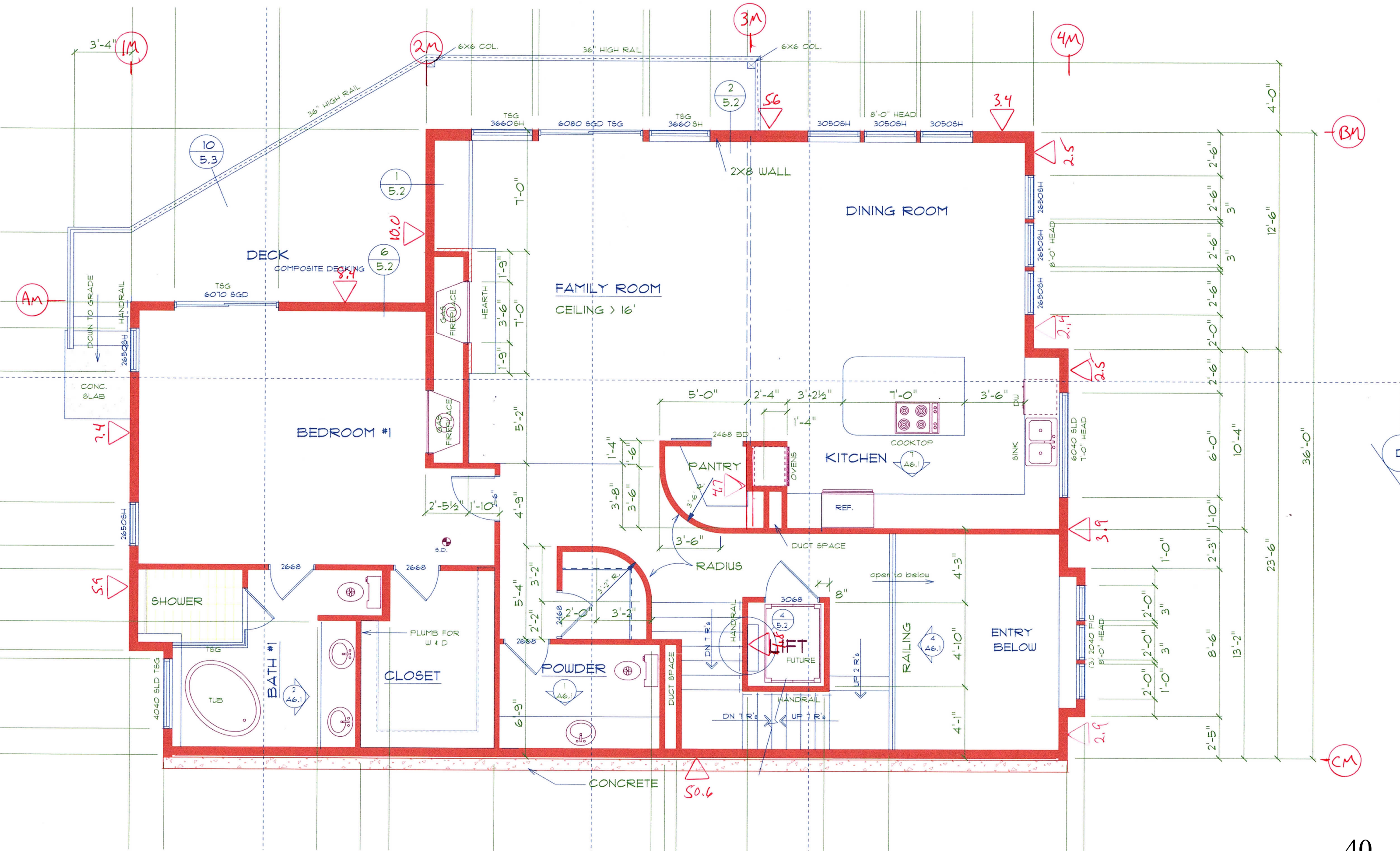
Grid #	Load Type	Level	Direction (On Page)	Areas (ft ²)	Code Sect.	Fctr.	Ω_o	R	Loads						Eq. 12.4-3 $E = \rho Q_E$ (lb)	Eq. 5 $0.7 * E$ (lb)	Eq. 12.4-7 $E_m = \Omega_o Q_E$ (lb)					
									Live (lb/ft ²)	Dead (lb/ft ²)	w_x (lb)	FS_{DS}/R	F_{xi} (lb)	Q_E (lb)								
3L	F	Lower Floor	U-D	638						35.0	22330	0.214	4775	10849	1.30	14104	10860					
	D			38						60.0	2280	0.214	488									
	3M												5586									
4L	R	Lower Floor	U-D	128						15.0	1920	0.214	411	6313	1.30	8207	6319					
	F			210						35.0	7350	0.214	1572									
	4M												4331									
AL	F	Lower Floor	L-R	232						35.0	8120	0.214	1737	8552	1.30	11118	8561					
	D			114						60.0	6840	0.214	1463									
	AM												5353									
BL	F	Lower Floor	L-R	696						35.0	24360	0.214	5210	12102	1.30	15733	12114					
	D			132						60.0	7920	0.214	1694									
	BM												5199									
CL	R	Lower Floor	L-R	128						15.0	1920	0.214	411	15195	1.30	19753	15210					
	F			712						35.0	24920	0.214	5329									
	CM												9455									

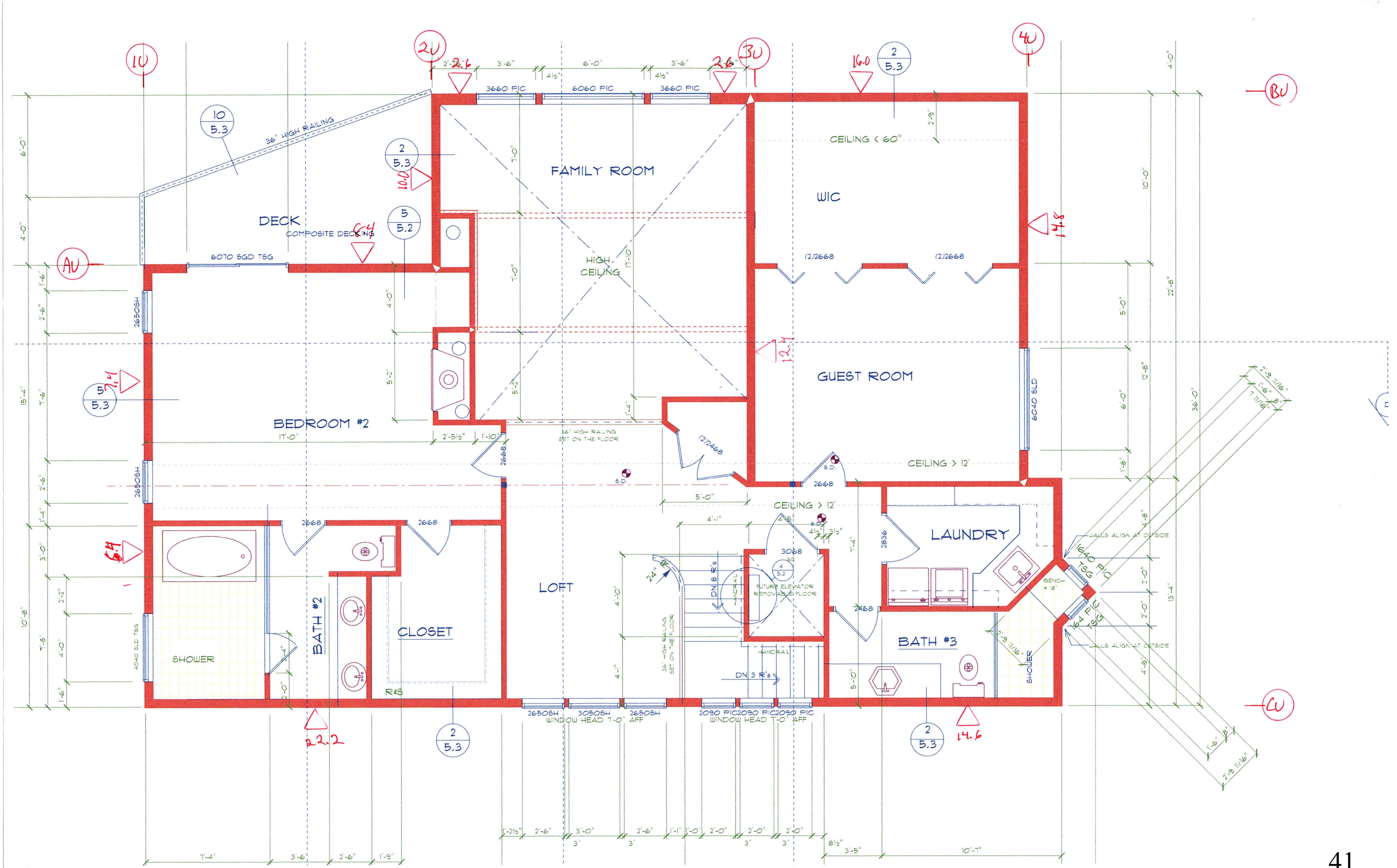
Panel Analysis

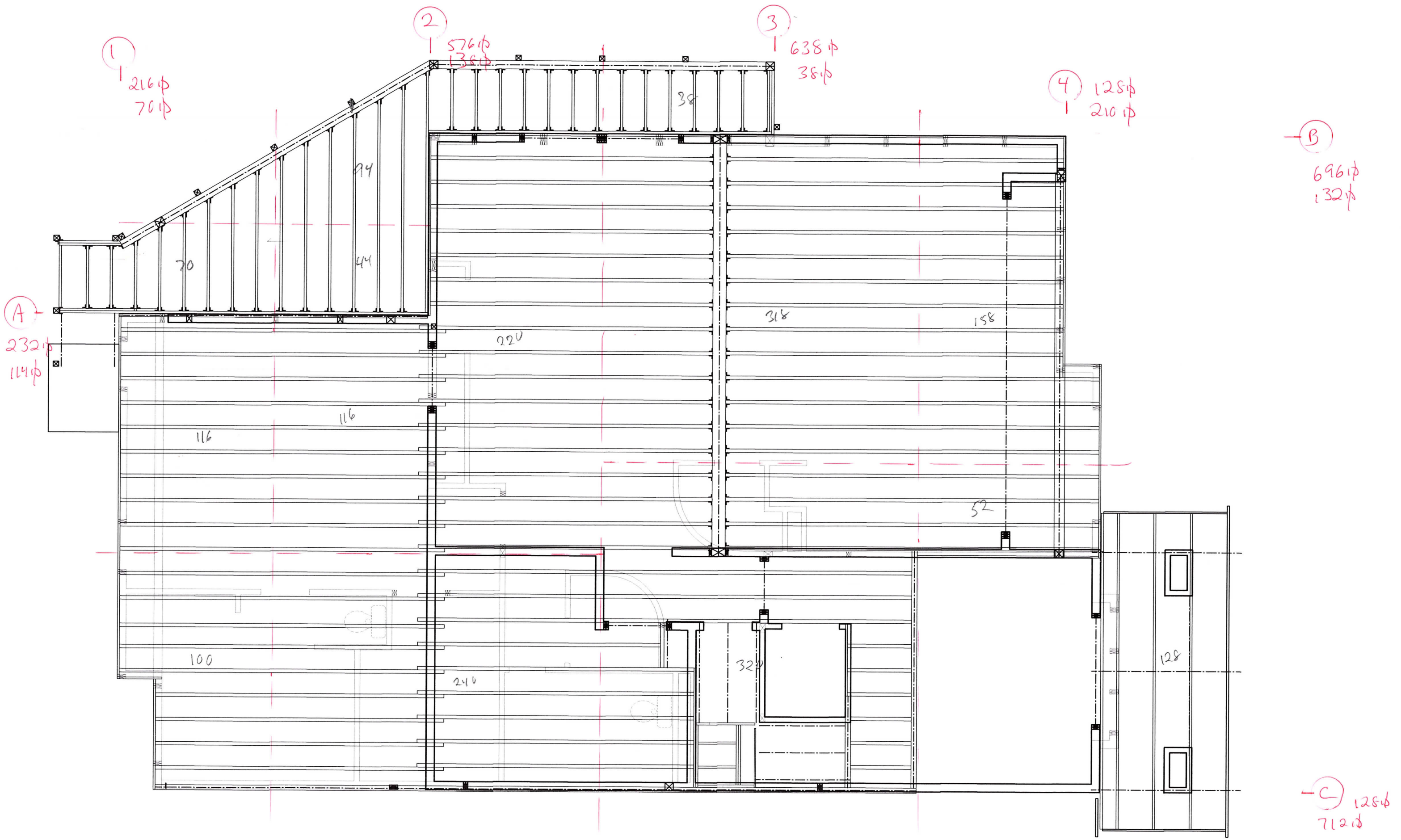
Panel																Design Loads		Panel Shears								Holdown Options												
Grid #		Materials				Height (ft.)	Individual Panel Lengths						Shear Panel Adjustments				Wind (lb)	Seismic (lb)	Wind			Seismic					Post Loads			Anchor Bolt Holdowns								
Level _i	Grid Above	Wall Size	Nail Size	Panel Type	S.G.		#1 (ft)	#2 (ft)	#3 (ft)	#4 (ft)	#5 (ft)	#6 (ft)	Perforated Panel			S.G.			Act. (lb/ft)	Allowable			Act. (lb/ft)	Allowable				Uplift (lb)	2/3 Dead (lb)	Net (lb)	Model	Post		Cap. (lb)	Tie Straps			
													Max Height (ft)	Total Width (ft)	%					C _o	C _{SG}	Type		Base (lb/ft)	Cap. (lb/ft)	Type	Base (lb/ft)					C _s	Cap. (lb/ft)		Grade	Size	Model	Cap. (lb)
		Defaults (Dflt.)					SPF	2-2x																														
1U						7.8	7.4	6.4							0.93	1,335	950	97	P1-6	365	339	69	P1-6	260		242	755		755									
2U						7.8	10.0								0.93	2,645	2,209	264	P1-6	365	339	221	P1-6	260		242	2063		2063	HDU2			2215	MSTC40	2320	11		
3U						7.8	12.4								0.93	2,289	2,145	185	P1-6	365	339	173	P1-6	260		242	1440		1440	HDU2			2215	MSTC40	2320	7		
4U						7.8	14.8								0.93	1,475	1,265	100	P1-6	365	339	85	P1-6	260		242	777		777									
AU						7.8	8.4								0.93	2,294	1,798	273	P1-6	365	339	214	P1-6	260		242	2130		2130	HDU2			2215	MSTC40	2320	11		
BUA						4.0	2.6	2.6							0.93	922	758	177	P1-6	365	339	146	P1-6	260		242	709		709									
BUB						4.0	16.0								0.93	1,695	1,965	106	P1-6	365	339	123	P1-6	260		242	491		491									
CU						7.8	14.6	22.2							0.93	1,872	2,806	51	P1-6	365	339	76	P1-6	260		242	595		595									
1M						8.8	7.4	5.9					5.0	2.5	0.84	0.86	0.93	2,756	3,331	207	P1-6	365	339	250	P1-4	380		305	2557		2557	HDU4			3285	MSTC52	3645	13
2M	2U					8.8	10.0								0.93	5,554	4,588	555	P1-3	685	637	459	P1-2	640		595	4887		4887	HDU5	DF	4x6	5645	MSTC66	5495	25		
3M						8.8	4.7	4.8							0.93	5,297	5,592	558	P1-3	685	637	589	P1-2	640		595	6950		6950	HDU8	DF	4x6	6970				36	
4M			10d			8.3	2.5	2.4	2.5	3.9	2.9				0.93	3,128	4,335	220	P1-6-10d	435	405	305	P1-3-10d	600	0.58	323	5180		5180	HDU5	DF	4x6	5645	MSTC66	5495	27		
AM	AU		10d			8.8	8.4								0.93	4,104	5,358	489	P1-4-10d	645	600	638	P1-2-10d	770		716	2534		2534	HDU4			3285	MSTC52	3645	13		
BM						8.8	3.4	5.6							0.93	3,617	5,204	402	P1-4	532	495	578	P2-3	980	0.77	704	5613		5613	HDU5	DF	4x6	5645	MSTC78	5860	29		
CM						8.8	50.6								0.93	4,157	9,464	82	P1-6	365	339	187	P1-6	260		242	7743		7743	HDU8	DF	6x6	7870				40	
2L	2M					6.0	10.0	21.4							0.93	7,445	10,676	237	P1-6	365	339	340	P1-4	380		353	5088		5088	HDU5	DF	4x6	5645	MSTC66	5495	26		
3L	3M					9.8	4.8	4.8							0.93	7,229	10,860	753	P1-2	895	832	1131	P2-2	1280	0.98	1166	1646		1646	HDU2			2215	MSTC40	2320	9		
4L						9.8	3.7	3.7							0.93	4,618	6,319	624	P1-3	685	637	854	P2-2	1280	0.76	899	2040		2040	HDU2			2215	MSTC40	2320	11		

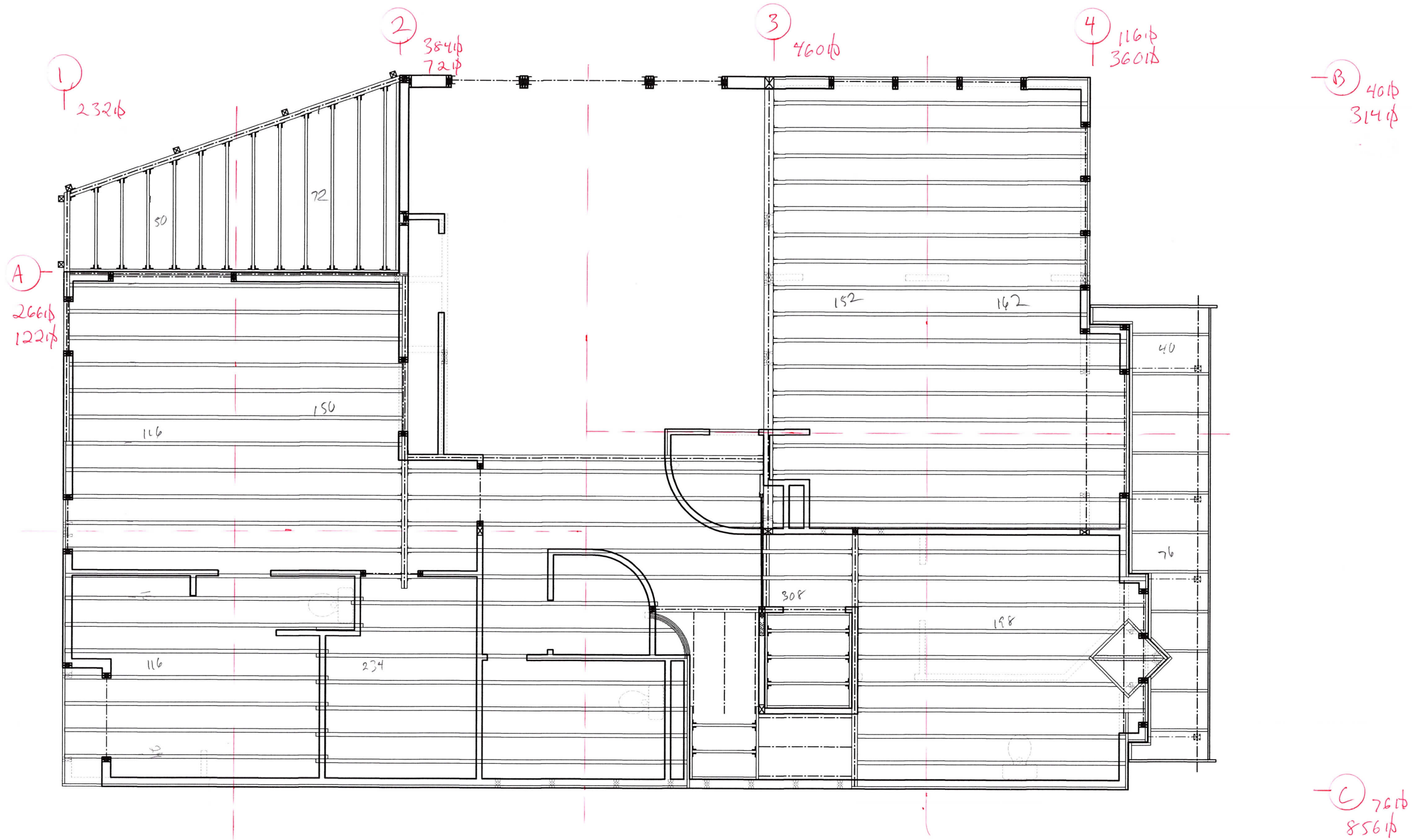
Panel Analysis

Panel															Design Loads		Panel Shears								Holddown Options													
Grid #		Materials				Individual Panel Lengths						Shear Panel Adjustments					Wind (lb)	Seismic (lb)	Wind			Seismic					Post Loads			Anchor Bolt Holdowns								
Level _i	Grid Above	Wall Size	Nail Size	Panel Type	S.G.	Height (ft.)	#1 (ft)	#2 (ft)	#3 (ft)	#4 (ft)	#5 (ft)	#6 (ft)	Perforated Panel						S.G.	Act. (lb/ft)	Allowable			Act. (lb/ft)	Allowable				Uplift (lb)	2/3 Dead (lb)	Net (lb)	Model	Post		Cap. (lb)	Tie Straps		
													Max Height (ft)	Total Width (ft)	%	C _o					C _{SG}	Type	Base (lb/ft)		Cap. (lb/ft)	Type	Base (lb/ft)	C _s					Cap. (lb/ft)	Grade		Size	Model	Cap. (lb)
Defaults (Dflt.)				2x6	8d	15/32" Ply	0.4																															
AL	AM					2.0	15.0								0.93	5,040	8,561	336	P1-6	365	339	571	P1-2	640		595	1141		1141	HDU2			2215	MSTC40	2320	6		
																																			46			
BL	BM					9.8	21.2	5.2							0.93	5,771	12,114	219	P1-6	365	339	459	P1-2	640		595	4497		4497	HDU4	DF	4x6	4565	MSTC66	5495	23		
																																			50			
CL						0.5	50.6								0.93	6,069	15,210	120				301																

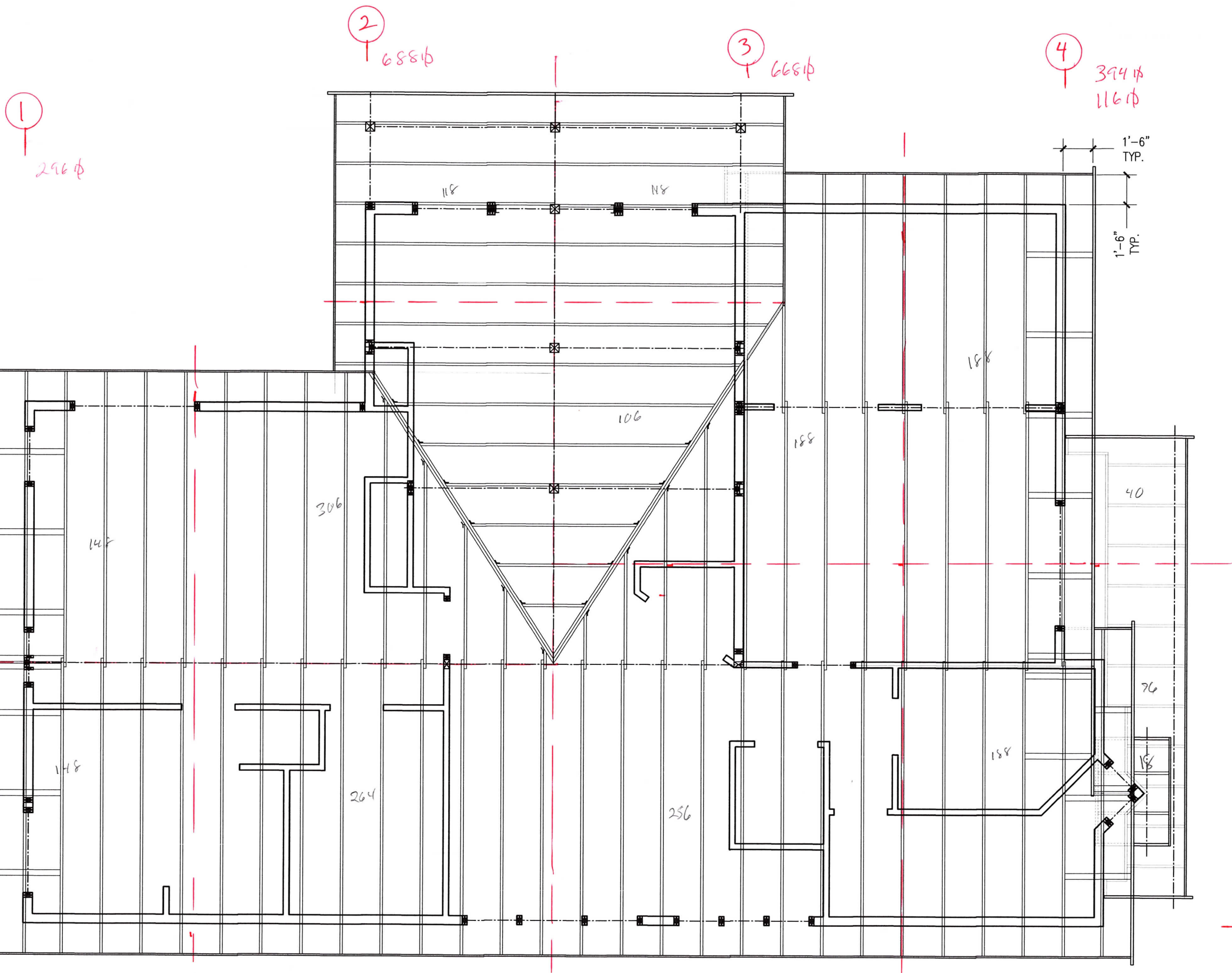








HUC28-2
HANGERS



①
296φ

②
688φ

③
668φ

④
394φ
116φ

Ⓑ
236φ
376φ
461φ

Ⓐ
560φ

Ⓒ
874φ

1'-6"
TYP.
1'-6"
TYP.

118

118

188

106

188

40

148

306

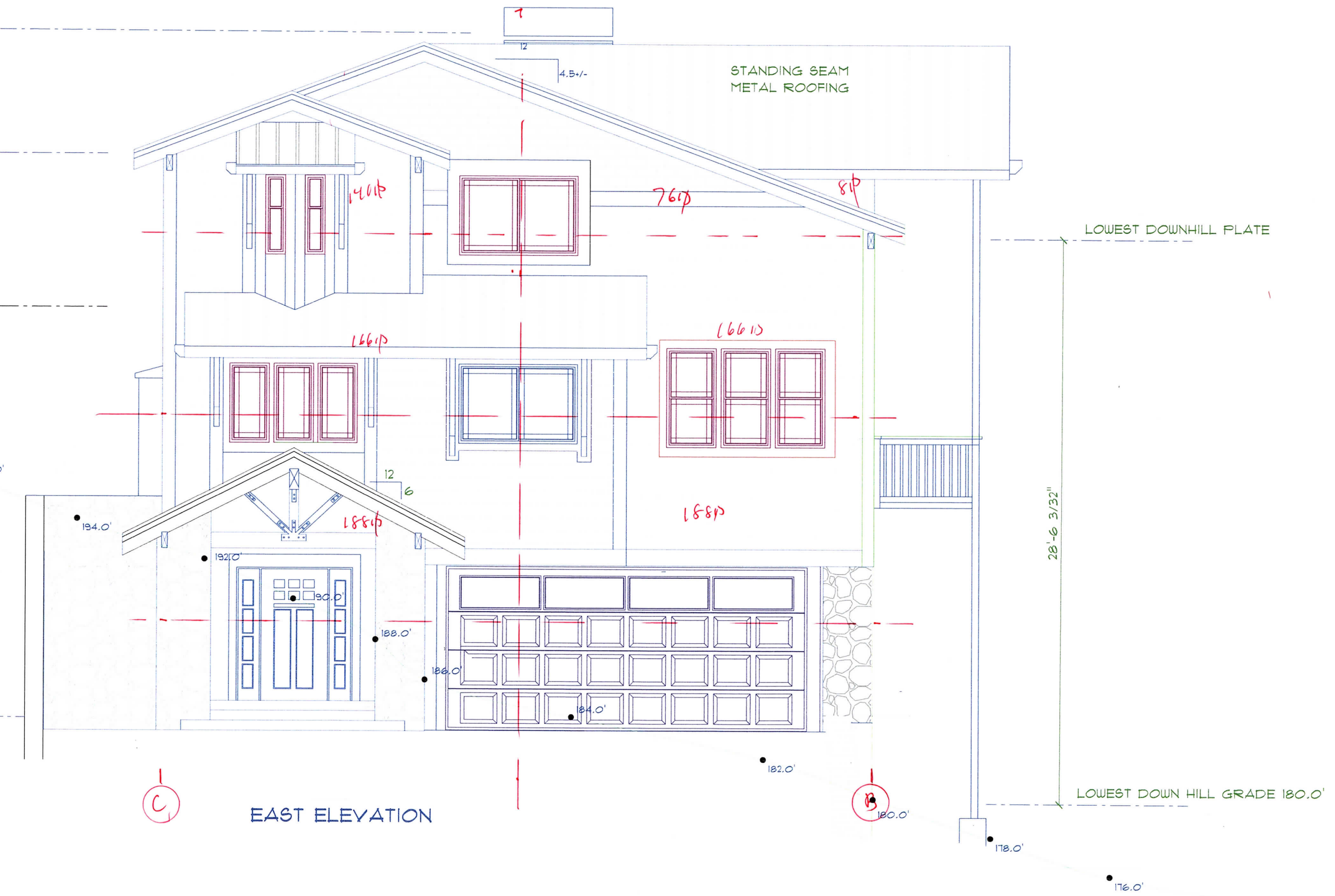
76

148

264

188

256

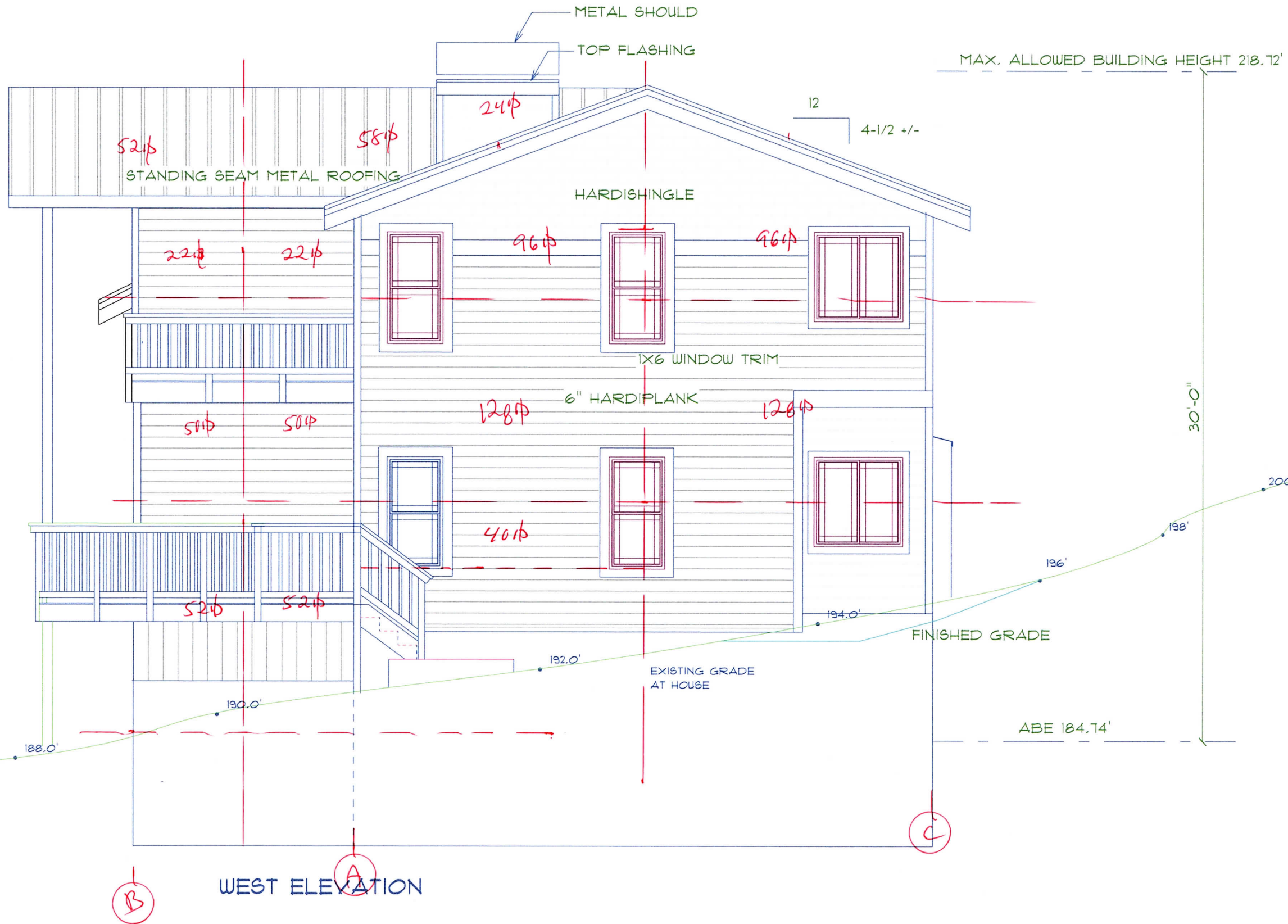


EAST ELEVATION

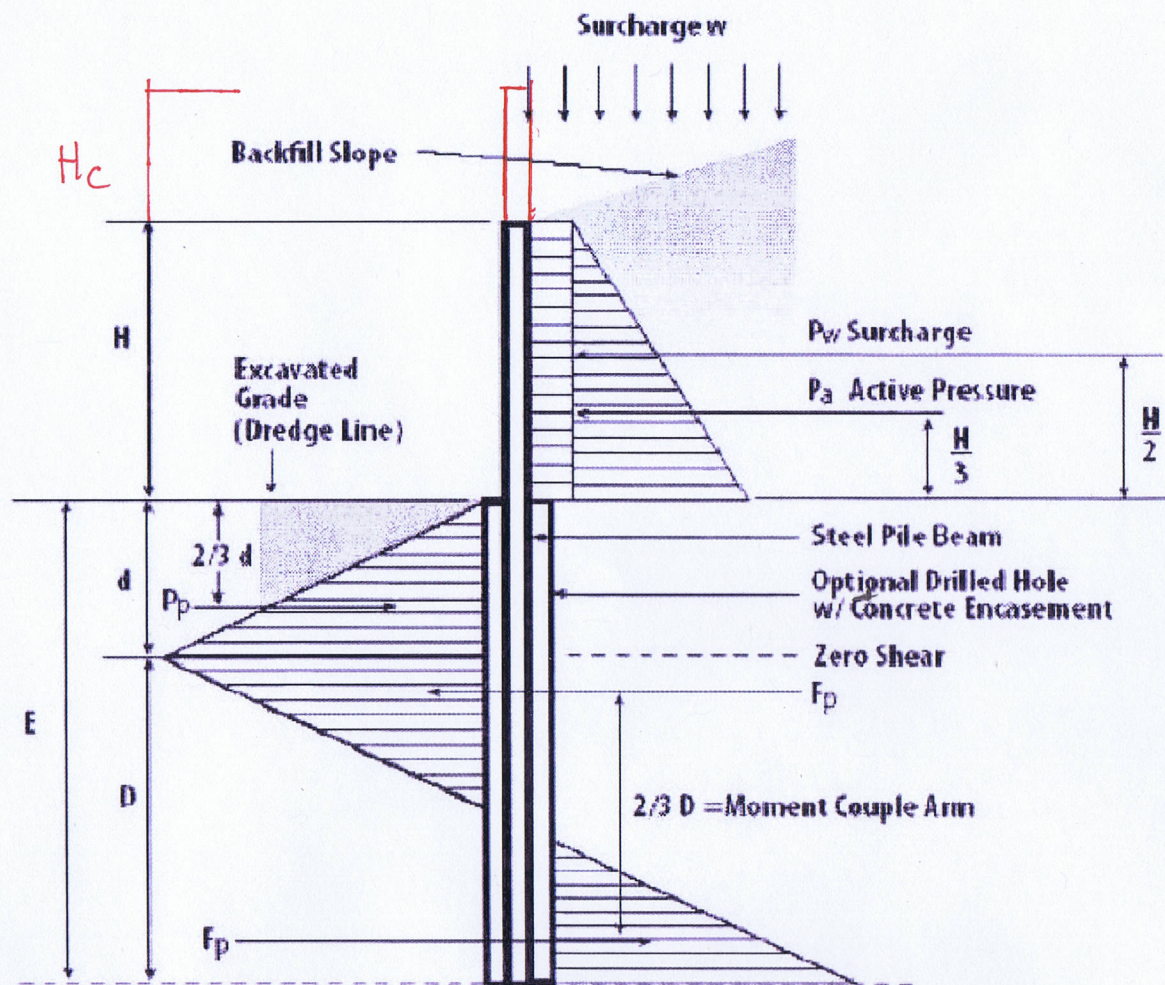
EXISTING GRADE HEIGHT 218.72'



NORTH ELEVATION



Soldier Pile Wall Design



Catchment Wall Piles 1-9

$$H = 7.2'$$

$$H_c = 8.0'$$

$$P_p = P_w + P_a \quad P_w = (6') (60 \text{ pcf}) (8' + 7.2') = 5472 \text{ lb}$$

$$P = 275 \text{ pcf} \quad P_a = (6') (75 \text{ pcf}) \frac{(7.2')^2}{2} = 11,664 \text{ lb}$$

$$D = 2.0'$$

$$A = 2$$

$$P_a = 75 \text{ pcf}$$

$$P_w = 60 \text{ pcf}$$

$$\text{Spacing} = 6.0'$$

$$d = \left(\frac{(2)(P_p)(SF)}{PDA} \right)^{1/2}$$

$$d = \left(\frac{(2)(17,136)(1.5)}{(275 \text{ pcf})(2.0')(2)} \right)^{1/2} = 6.8363'$$

$$M_{max} = P_a(0.33H + 0.67d) + P_w(0.5(H + H_c) + 0.67d)$$

$$M_{max} = 11,664 \text{ lb} \left[(0.33)(7.2') + (0.67)(6.8363') \right] + 5472 \text{ lb} \left[0.5(8' + 7.2') + (0.67)(6.8363') \right]$$

$$M_{max} = 147,650 \text{ lb-ft} = 1,771,801 \text{ lb-in}$$

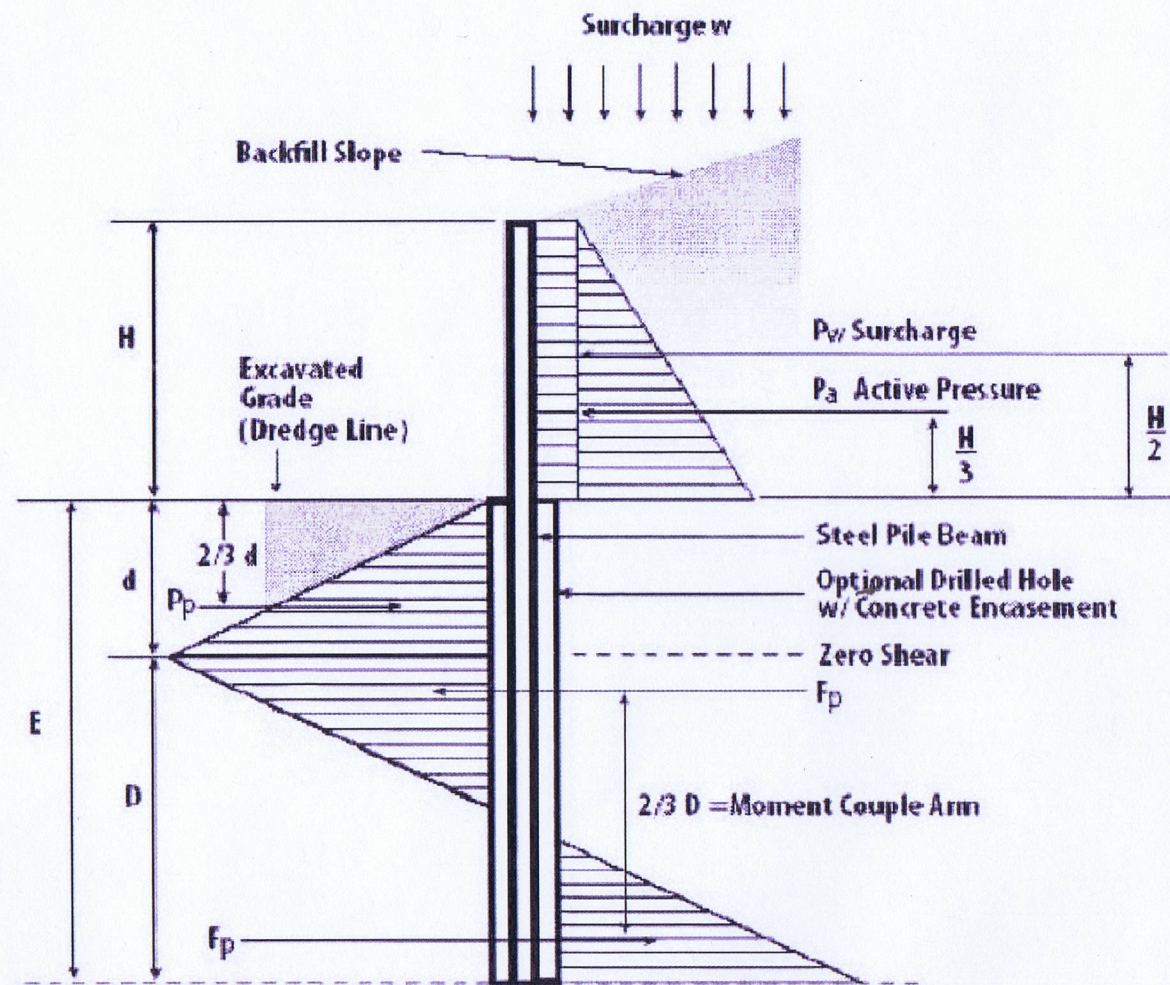
$$S_{req} = \frac{1,771,801}{36,000 \text{ lb/in}^2} = 49.22 \text{ in}^3 \quad \text{Use W10x45, } S = 49.1 \text{ in}^3 \approx 49.22 \text{ in}^3 \leftarrow \text{Steel}$$

$$D = \left[\frac{(M_{max})(SF)}{PDA(0.25)(0.67)} \right]^{1/2} = \left[\frac{(147,650)(1.5)}{(275 \text{ pcf})(2.0')^2(2)(0.25)(0.67)} \right]^{1/2} = 24.5157'$$

$$D_{Tot} = 24.5157' + 6.8363' = 31.35' = 31'-6'' \leftarrow \text{Total Pile Depth}$$

Catchment Wall

Soldier Pile Wall Design



Standard Wall Piles 10-13

$$H = 9.0'$$

$$P_p = P_w + P_a$$

$$P = 275 \text{ pcf}$$

$$D = 2.0'$$

$$A = 2$$

$$P_a = 75 \text{ pcf}$$

$$P_w = 8H = 72 \text{ pcf}$$

$$\text{Spacing} = 6.0'$$

$$d = \left[\frac{(2)(P_p)(SF)}{PDA} \right]^{1/2}$$

$$d = \left[\frac{(2)(22,113 \text{ lb})(1.2)}{(275 \text{ pcf})(2.0')(2)} \right]^{1/2} = 6.9460'$$

$$M_{max} = P_a(0.33H + 0.67d) + P_w(0.5H + 0.67d)$$

$$M_{max} = (18,225 \text{ lb})(0.33(9.0) + 0.67(6.946')) + 3888 \text{ lb}(0.5(9.0) + 0.67(6.946'))$$

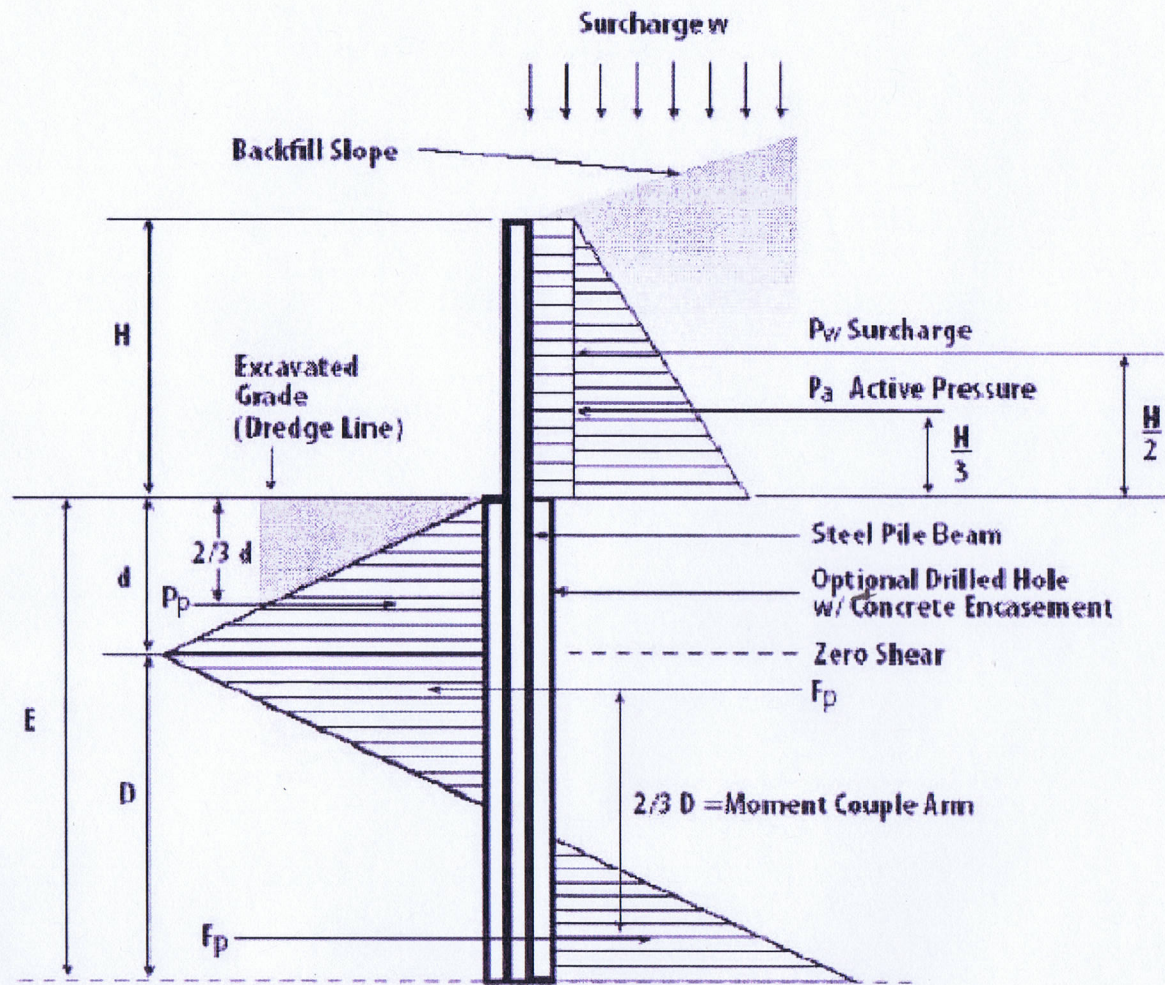
$$M_{max} = 174,534 \text{ lb-in} = 2,094,410 \text{ lb-in}$$

$$S_{req} = \frac{2,094,410 \text{ lb-in}}{36,000 \text{ lb/in}^2} = 58.17 \text{ in}^3 \quad \text{USE W10x54 } S = 60.0 \text{ in}^3 \approx \text{Steel}$$

$$D = \left[\frac{(M_{max})(SF)}{PDA(0.25)(0.67)} \right]^{1/2} = \left[\frac{(174,534 \text{ lb-in})(1.2)}{(275 \text{ pcf})(2.0')^2(2)(0.25)(0.67)} \right]^{1/2} = 23.8403'$$

$$D_{TOT} = 23.8403' + 6.9460' = 30.7863' = 30'-10" \quad \leftarrow \text{Total Pile Depth}$$

Soldier Pile Wall Design



Standard Wall Piles 14-16

$$H = 8.0'$$

$$P_w = (6') (64 \text{pcf}) (8') = 3072 \text{ lb}$$

$$P_p = P_w + P_a$$

$$P_a = (6') (75 \text{pcf}) \frac{(8')^2}{2} = 14,400 \text{ lb}$$

$$P = 275 \text{pcf}$$

$$D = 20'$$

$$A = 2$$

$$P_a = 75 \text{pcf}$$

$$P_w = 8 H = 64 \text{pcf}$$

$$\text{Spacing} = 6.0'$$

$$d = \left[\frac{(2)(P_p)(SF)}{P D A} \right]^{1/2}$$

$$d = \left[\frac{(2)(17,472)(1.2)}{(275 \text{pcf})(2.0')(2)} \right]^{1/2} = 6.1742'$$

$$M_{max} = P_a (0.33H + 0.67d) + P_w (0.5H + 0.67d)$$

$$M_{max} = 14,400 \text{ lb} [(0.33)(8.0') + (0.67)(6.1742')] + 3072 \text{ lb} [0.5(8.0') + (0.67)(6.1742')] = 122,581 \text{ lb-ft}$$

$$M_{max} = 122,581 \text{ lb-ft} = 1,470,968 \text{ lb-in}$$

$$S_{req} = \frac{1,470,968 \text{ lb-in}}{36,000 \text{ lb/in}} = 40.86 \text{ in}^3 \quad \text{Use W10x39, } S = 42.1 \text{ in}^3 \quad \leftarrow \text{Steel}$$

$$D = \left[\frac{(M_{max})(SF)}{P D^2 A (0.25)(0.67)} \right]^{1/2} = \left[\frac{(122,581 \text{ lb-ft})(1.2)}{(275 \text{pcf})(2.0')^2 (2)(0.25)(0.67)} \right]^{1/2} = 19.9794'$$

$$D_{TOT} = 19.9794' + 6.1742' = 26.15' = 26'-2" \quad \leftarrow \text{Total Pile Depth}$$

Concrete Retaining Wall Design (All values are per foot of wall)

South Wall 4/29/2022

Wall Stability Calculations																																							
Equivalent Fluid Pressure, $p_{efp} = 35$ psf/ft										Allowable bearing pressure, $q_{all} = 1500$ psf										Soil Density, $\delta_s = 120$ pcf																			
Passive soil pressure, $p_p = 300$ psf/ft										Coefficient of friction, $f_{fr} = 0.40$										Concrete Density, $\delta_c = 150$ pcf																			
Height of fluff, $h_f =$ ft																																							
#	Wall	Depth of Unbalanced Fill	Soil Parameters						Wall Parameters						Vertical Loads						Horizontal Forces						Stability												
			Active Pressures		Surcharge q_{sur} (psf)	Depth		Slope		Wall		Footing				Load above W_a (lb)	Concrete		Soil		Total W_T (lb)	Resistive Forces			Active Forces			Slide F.S. 1.50	Bearing			Overturning							
			k_v (pcf)	k_h (pcf)		Toe h_{st} (ft)	Heel h_{sh} (ft)	Angle θ (deg)	Hgt. h_{sh}^θ (ft)	Top t_{wt} (in)	Base t_{wb} (in)	Hgt. h_w (ft)	Toe ℓ_t (in)	Heel ℓ_h (in)	Hgt. t_{fig} (in)		Lgth. ℓ_{fig} (ft)	Wall W_w (lb)	Ftg W_{fig} (lb)	Toe W_{st} (lb)		Heel W_{sh} (lb)	Heel P_v (lb)	Base w_{pb} (lb/ft)	Total P_{pT} (lb)	Frict. P_{fr} (lb)	Surf. w_{as} (lb/ft)		Base w_{ab} (lb/ft)	Total P_{aT} (lb)	F.S. 1.00	Pressures q_t (psf)	q_h (psf)	Moments M_R (lb-ft)	M_O (lb-ft)	F.S. 1.50			
1	10'			35		0.00	8.50			10.00	10.00	8.00	18.00	18.00	12.00	3.83		1000	575	0	1530		3105	Slab					333	1579	Pin	12.43	2350		Pile	7736	5001	1.55	
2	12'			35			12.00			10.00	10.00	13.00	34.00	34.00	12.00	6.50		1625	975		4080		6680	Slab					455	2958	Pin	9.59	1785	270	Pile	29190	12816	2.28	
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Wall Reinforcement Calculations																																												
Service Load Factor, SLF = 1.60										Strength Reduction Factor, $\phi = 0.90$ for flexure										ρ_{min} horizontal footing = 0.0015																								
Steel Strength, $f_y = 60.0$ ksi										Strength Reduction Factor, $\phi_s = 1.00$ for stress block										ρ_{min} horizontal wall = 0.0025																								
Concrete Strength, $f'_c = 2500$ psi																				ρ_{min} vertical wall = 0.0015																								
																				$\rho_{bal} = 0.0178$																								
																				$0.75\rho_{bal} = 0.0134$																								
																				$\rho_{min} = 0.0033$																								
Wall	See matching #'s above for soil loading used on walls ¹	Stemwall Capacities																		Footing Capacities																								
		Footing to Stemwall (Bar 'A')									Stem (Bar 'B')									Horiz. (Bar 'C')			Toe (Bar 'D')					Heel (Bar 'E')					Longitude (Bar 'F')											
		Rebar			Moments			Rebar			Moments			Rebar			Moments			Rebar			Moments		Rebar			Moments		Qty.														
Bar#	Spc. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ℓ_{dh} (in)	ℓ_b (in)	ϕM_n (kip-in)	M_u (kip-in)	Bar#	Spc. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ϕM_n (kip-in)	$h_{\phi M_n}$ (ft)	Bar#	Spc. (in)	Bar#	Spc. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ϕM_n (kip-in)	M_u (kip-in)	Bar#	Spc. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ϕM_n (kip-in)	M_u (kip-in)	Bar#	Bott.	Top		
1	10'	4	12.0	1.50	0.20	8.25	0.47	0.0020	6.7	24	86.6	68.8	4	12.0	1.50	0.20	8.25	0.47	#####	86.6	8.5	5	12.0	4	12.0	3.00	0.20	8.75	0.47	0.0019	92.0	37.9	4	18.0	2.00	0.13	9.75	0.31	0.0011	69.1	25.2	5	5	5
2	12'	6	8.0	2.00	0.66	7.63	1.55	0.0072	10.0	65	244.1	193.5	5	16.0	1.50	0.23	8.19	0.55	0.0024	99.4	9.6	5	12.0	6	8.0	3.00	0.66	8.63	1.55	0.0064	279.7	109.1	4	14.0	2.00	0.17	9.75	0.40	0.0015	88.4	84.8	5	8	8
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Detail 6/S3.1, 8/S3.1, 10/S3.1

Concrete Retaining Wall Design (All values are per foot of wall)

Garage Slab 4/29/2022

Wall Stability Calculations																																					
Equivalent Fluid Pressure, $p_{efp} = 35$ psf/ft										Allowable bearing pressure, $q_{all} = 3000$ psf										Soil Density, $\delta_s = 108$ pcf																	
Passive soil pressure, $p_p = 300$ psf/ft										Coefficient of friction, $f_{fr} = 0.55$										Concrete Density, $\delta_c = 135$ pcf																	
Height of fluff, $h_f =$ ft																																					
#	Wall	Depth of Unbalanced Fill	Soil Parameters						Wall Parameters						Vertical Loads						Horizontal Forces						Stability										
			Active Pressures		Surcharge q_{sur} (psf)	Depth		Slope		Wall		Footing				Load above W_a (lb)	Concrete		Soil		Total W_T (lb)	Resistive Forces			Active Forces			Slide F.S. 1.50	Bearing		Overturning		F.S. 1.50				
			k_v (pcf)	k_h (pcf)		Toe h_{st} (ft)	Heel h_{sh} (ft)	Angle θ (deg)	Hgt. h_{sh}^θ (ft)	Top t_{wt} (in)	Base t_{wb} (in)	Hgt. h_w (ft)	Toe l_t (in)	Heel l_h (in)	Hgt. t_{fig} (in)		Lgth. l_{fig} (ft)	Wall W_w (lb)	Ftg W_{fig} (lb)	Toe W_{st} (lb)		Heel W_{sh} (lb)	Heel P_v (lb)	Base w_{pb} (lb/ft)	Total P_{pT} (lb)	Frict. P_{fr} (lb)	Surf. w_{as} (lb/ft)		Base w_{ab} (lb/ft)	Total P_{aT} (lb)	F.S. 1.00	Pressures q_t (psf) q_h (psf)		Moments M_R (lb-ft) M_O (lb-ft)			
1	4'		35	100	0.67	4.50			8.00	8.00	4.50	3.00	36.00	10.00	3.92		405	441	18	1458		2322	451	339	1277	32	219	671	2.41	4.88	962	224	3.12	4795	1192	4.02	
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Wall Reinforcement Calculations																																											
Service Load Factor, SLF = 1.60										Strength Reduction Factor, $\phi = 0.90$ for flexure										ρ_{min} horizontal footing = 0.0015																							
Steel Strength, $f_y = 60.0$ ksi										Strength Reduction Factor, $\phi_s = 1.00$ for stress block										ρ_{min} horizontal wall = 0.0025																							
Concrete Strength, $f'_c = 2500$ psi																				ρ_{min} vertical wall = 0.0015																							
																				$\rho_{bal} = 0.0178$																							
																				$0.75\rho_{bal} = 0.0134$																							
																				$\rho_{min} = 0.0033$																							
See matching #'s above for soil loading used on walls ¹	Wall	Stemwall Capacities																		Footing Capacities																							
		Footing to Stemwall (Bar 'A')										Stem (Bar 'B')								Horiz. (Bar 'C')	Toe (Bar 'D')					Heel (Bar 'E')					Longitude (Bar 'F')												
		Rebar					Moments					Rebar				Moments					Rebar					Moments		Bar#	Qty.														
Bar#	Spc. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	l_{dh} (in)	l_b (in)	ϕM_n (kip-in)	M_u (kip-in)	Bar#	Spc. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ϕM_n (kip-in)	$h_{\phi M_n}$ (ft)	Bar#	Spc. (in)	Bar#	Spc. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)			ρ	ϕM_n (kip-in)	M_u (kip-in)	Bar#	Spc. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ϕM_n (kip-in)	M_u (kip-in)	Bar#	Bott.
1	4'	4	18.0	1.50	0.13	6.25	0.31	0.0018	6.0	51	43.9	10.9									4	10.0	4	18.0	3.00	0.13	6.75	0.31	0.0016	47.5	0.5									16.1	4	2	4
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Detail 16/S3.0

Concrete Retaining Wall Design (All values are per foot of wall)

Driveway 4/29/2022

Wall Stability Calculations																																							
Equivalent Fluid Pressure, $p_{efp} = 35$ psf/ft										Allowable bearing pressure, $q_{all} = 1500$ psf										Soil Density, $\delta_s = 120$ pcf																			
Passive soil pressure, $p_p = 300$ psf/ft										Coefficient of friction, $f_{fr} = 0.35$										Concrete Density, $\delta_c = 150$ pcf																			
Height of fluff, $h_f =$ ft																																							
#	Wall	Depth of Unbalanced Fill	Soil Parameters						Wall Parameters						Vertical Loads						Horizontal Forces						Stability												
			Active Pressures		Surcharge q_{sur} (psf)	Depth		Slope		Wall		Footing				Load above W_a (lb)	Concrete		Soil		Total W_T (lb)	Resistive Forces			Active Forces			Slide F.S. 1.50	Bearing		Overturning		F.S. 1.50						
			k_v (pcf)	k_h (pcf)		Toe h_{st} (ft)	Heel h_{sh} (ft)	Angle θ (deg)	Hgt. h_{sh}^θ (ft)	Top t_{wt} (in)	Base t_{wb} (in)	Hgt. h_w (ft)	Toe l_t (in)	Heel l_h (in)	Hgt. t_{fig} (in)		Lgth. l_{fig} (ft)	Wall W_w (lb)	Ftg W_{fig} (lb)	Toe W_{st} (lb)		Heel W_{sh} (lb)	Heel P_v (lb)	Base w_{pb} (lb/ft)	Total P_{pT} (lb)	Frict. P_{fr} (lb)	Surf. w_{as} (lb/ft)		Base w_{ab} (lb/ft)	Total P_{aT} (lb)	F.S. 1.00	Pressures q_t (psf)		q_h (psf)	Moments M_R (lb-ft)	M_O (lb-ft)			
1	4'			35		0.00	4.00			6.00	6.00	4.00	6.00	24.00	10.00	3.00		300	375	0	960		1635	250	104	572		169	409	1.65	2.75	795	295	1.89	2736	659	4.15		
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Wall Reinforcement Calculations																																										
Service Load Factor, SLF = 1.60										Strength Reduction Factor, $\phi = 0.90$ for flexure										ρ_{min} horizontal footing = 0.0015																						
Steel Strength, $f_y = 40.0$ ksi										Strength Reduction Factor, $\phi_s = 1.00$ for stress block										ρ_{min} horizontal wall = 0.0025																						
Concrete Strength, $f'_c = 2500$ psi																				ρ_{min} vertical wall = 0.0015																						
																				$\rho_{bal} = 0.0309$																						
																				$0.75\rho_{bal} = 0.0232$																						
																				$\rho_{min} = 0.0050$																						
Wall	See matching #'s above for soil loading used on walls ¹	Stemwall Capacities																		Footing Capacities																						
		Footing to Stemwall (Bar 'A')									Stem (Bar 'B')									Horiz. (Bar 'C')			Toe (Bar 'D')						Heel (Bar 'E')				Longitude (Bar 'F')									
		Rebar						Moments			Rebar						Moments			Rebar			Moments			Rebar		Moments		Bar #	Qty.											
Bar #	Sp. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	l_{dh} (in)	l_b (in)	ϕM_n (kip-in)	M_u (kip-in)	Bar #	Sp. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ϕM_n (kip-in)	$h_{\phi M_n}$ (ft)	Bar #	Sp. (in)	Bar #	Sp. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ϕM_n (kip-in)			M_u (kip-in)	Bar #	Sp. (in)	Cov. (in)	A_s (in ²)	d (in)	a (in)	ρ	ϕM_n (kip-in)	M_u (kip-in)	Bar #
1	4'	4	18.0	1.50	0.13	4.25	0.21	0.0026	6.0	45	19.9	7.2									4	13.0	4	18.0	3.00	0.13	6.75	0.21	0.0016	31.9	1.5	4	36.0	2.00	0.07	7.75	0.10	0.0007	18.5	7.6	4	3
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Detail 18/S3.1