

# Appendix C

## Solution Area III

- C.1 – Load calculations
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Load Calculations - Based on a 15' Tributary width

Trib width (ft) 9

Level	Area ft <sup>2</sup>	Roof Dead psf	Area ft <sup>2</sup>	Office Dead psf	Length ft	Enclosure Dead pif*	Total Dead kip
Level 900	135	95	0	96	0	405	12.8
Level 800	135	95	135	96	9	405	16.6
Level 700	135	95	270	96	18	405	16.6
Level 600	135	95	405	96	27	405	16.6
Level 500	135	95	540	96	36	405	16.6

\*30psf\*13.5

\*These are the loads applied to each diaphragm level in STAAD or ETABS

Trib width (ft) 13.5

Level	Area ft <sup>2</sup>	Roof Dead psf	Area ft <sup>2</sup>	Office Dead psf	Length ft	Enclosure Dead pif*	Total Dead kip
Level 900	202.5	95	0	96	0	405	19.2
Level 800	202.5	95	202.5	96	13.5	405	24.9
Level 700	202.5	95	405	96	27	405	24.9
Level 600	202.5	95	607.5	96	40.5	405	24.9
Level 500	202.5	95	810	96	54	405	24.9

\*30psf\*13.5

\*These are the loads applied to each diaphragm level in STAAD or ETABS

Trib width (ft) 18

Level	Area ft <sup>2</sup>	Roof Dead psf	Area ft <sup>2</sup>	Office Dead psf	Length ft	Enclosure Dead pif*	Total Dead kip
Level 900	270	95	0	96	0	405	25.7
Level 800	270	95	270	96	18	405	33.2
Level 700	270	95	540	96	36	405	33.2
Level 600	270	95	810	96	54	405	33.2
Level 500	270	95	1080	96	72	405	33.2

\*30psf\*13.5

\*These are the loads applied to each diaphragm level in STAAD or ETABS

Trib width (ft) 22.5

Level	Area ft <sup>2</sup>	Roof Dead psf	Area ft <sup>2</sup>	Office Dead psf	Length ft	Enclosure Dead pif*	Total Dead kip
Level 900	337.5	95	0	96	0	405	32.1
Level 800	337.5	95	337.5	96	22.5	405	41.5
Level 700	337.5	95	675	96	45	405	41.5
Level 600	337.5	95	1013	96	67.5	405	41.5
Level 500	337.5	95	1350	96	90	405	41.5

\*30psf\*13.5

\*These are the loads applied to each diaphragm level in STAAD or ETABS

Trib width (ft) 27

Level	Area ft <sup>2</sup>	Roof Dead psf	Area ft <sup>2</sup>	Office Dead psf	Length ft	Enclosure Dead pif*	Total Dead kip
Level 900	405	95	0	96	0	405	38.5
Level 800	405	95	405	96	27	405	48.8
Level 700	405	95	810	96	54	405	48.8
Level 600	405	95	1215	96	81	405	48.8
Level 500	405	95	1620	96	108	405	48.8

\*30psf\*13.5

\*These are the loads applied to each diaphragm level in STAAD or ETABS

Level	Area ft <sup>2</sup>	Snow psf	Total Snow kip
Level 900	135	30	4.1
Level 800	135	30	4.1
Level 700	135	30	4.1
Level 600	135	30	4.1
Level 500	135	30	4.1

Level	Area ft <sup>2</sup>	Snow psf	Total Snow kip
Level 900	202.5	30	6.1
Level 800	202.5	30	6.1
Level 700	202.5	30	6.1
Level 600	202.5	30	6.1
Level 500	202.5	30	6.1

Level	Area ft <sup>2</sup>	Snow psf	Total Snow kip
Level 900	270	30	8.1
Level 800	270	30	8.1
Level 700	270	30	8.1
Level 600	270	30	8.1
Level 500	270	30	8.1

Level	Area ft <sup>2</sup>	Snow psf	Total Snow kip
Level 900	337.5	30	10.1
Level 800	337.5	30	10.1
Level 700	337.5	30	10.1
Level 600	337.5	30	10.1
Level 500	337.5	30	10.1

Level	Area ft <sup>2</sup>	Snow psf	Total Snow kip
Level 900	405	30	12.2
Level 800	405	30	12.2
Level 700	405	30	12.2
Level 600	405	30	12.2
Level 500	405	30	12.2

Area ft <sup>2</sup>	Office Live psf	Kil	LLR	Reduced LL psf	Total Live kip
0	50	4	1	50.0	0.0
135	50	4	0.895	44.8	6.0
270	50	4	0.706	35.3	9.5
405	50	4	0.623	31.1	12.6
540	50	4	0.573	28.6	15.5

Area ft <sup>2</sup>	Office Live psf	Kil	LLR	Reduced LL psf	Total Live kip
0	50	4	1	50.0	0.0
202.5	50	4	0.777	38.9	7.9
405	50	4	0.623	31.1	12.6
607.5	50	4	0.554	27.7	16.8
810	50	4	0.514	25.7	20.8

Area ft <sup>2</sup>	Office Live psf	Kil	LLR	Reduced LL psf	Total Live kip
0	50	4	1	50.0	0.0
270	50	4	0.706	35.3	9.5
540	50	4	0.573	28.6	15.5
810	50	4	0.514	25.7	20.8
1080	50	4	0.478	23.9	25.8

Area ft <sup>2</sup>	Office Live psf	Kil	LLR	Reduced LL psf	Total Live kip
0	50	4	1	50.0	0.0
337.5	50	4	0.658	32.9	11.1
675	50	4	0.539	26.9	18.2
1013	50	4	0.486	24.3	24.6
1350	50	4	0.454	22.7	30.7

Area ft <sup>2</sup>	Office Live psf	Kil	LLR	Reduced LL psf	Total Live kip
0	50	4	1	50.0	0.0
405	50	4	0.623	31.1	12.6
810	50	4	0.514	25.7	20.8
1215	50	4	0.465	23.3	28.3
1620	50	4	0.436	21.8	35.3

CASE 2	1.2D+1.6L+5S	Deflection Service Loads
17.4	17.4	16.9
29.6	29.6	22.6
20.1	20.1	20.1
24.8	24.8	19.7
24.5	24.5	19.5

0.92

CASE 2	1.2D+1.6L+5S	Deflection Service Loads
28.1	28.1	23.3
42.5	42.5	32.8
37.5	37.5	29.6
36.7	36.7	29.1
36.2	36.2	28.9

0.93

CASE 2	1.2D+1.6L+5S	Deflection Service Loads
34.8	34.8	33.8
55.1	55.1	42.7
49.3	49.3	39.1
48.4	48.4	38.5
47.9	47.9	38.2

0.93

CASE 2	1.2D+1.6L+5S	Deflection Service Loads
43.5	43.5	42.2
67.6	67.6	52.6
61.1	61.1	48.6
60.1	60.1	47.9
59.5	59.5	47.6

0.94

CASE 2	1.2D+1.6L+5S	Deflection Service Loads
52.2	52.2	50.6
80.0	80.0	62.4
72.9	72.9	58.0
71.7	71.7	57.3
71.1	71.1	56.9

0.94

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### N-S Direction

Coefficients	
Windward	16.3
Leeward	-3.7

Height (ft)	Kz	Windward (psf)	Leeward (psf)	Total MWFRS (psf)
0-15	0.57	9.3	-3.7	13.0
15-20	0.62	10.1	-3.7	13.8
20-25	0.66	10.8	-3.7	14.5
25-30	0.70	11.4	-3.7	15.1
30-40	0.76	12.4	-3.7	16.1
40-50	0.81	13.2	-3.7	16.9
50-60	0.85	13.9	-3.7	17.6
60-70	0.89	14.5	-3.7	18.2
70-80	0.93	15.2	-3.7	18.9

### E-W Direction

Coefficients	
Windward	16.3
Leeward	-9.1

Height (ft)	Kz	Windward (psf)	Leeward (psf)	Total MWFRS (psf)
0-15	0.57	9.3	-9.1	18.4
15-20	0.62	10.1	-9.1	19.2
20-25	0.66	10.8	-9.1	19.9
25-30	0.70	11.4	-9.1	20.5
30-40	0.76	12.4	-9.1	21.5
40-50	0.81	13.2	-9.1	22.3
50-60	0.85	13.9	-9.1	23.0
60-70	0.89	14.5	-9.1	23.6
70-80	0.93	15.2	-9.1	24.3

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**E-W Direction Windward**

Building height (ft)	72
Building trib width (ft)	300

Level	Story ht. (ft)	Trib ht. (ft)	Total ht. (ft)	P 1 (psf)	H 1 (ft)	P 2 (psf)	H 2 (ft)	P 3 (psf)	H 3 (ft)	Story Dist. Load (plf)
Roof		14.5		14.5	4.75	15.2	9.75			217
	13.5		65.25							
800		13.5		13.9	8.25	14.5	5.25			191
	13.5		51.75							
700		13.5		12.4	1.75	13.2	10	13.9	1.75	178
	13.5		38.25							
600		13.5		10.8	0.25	11.4	5	12.4	8.25	162
	13.5		24.75							
500		15.75		9.3	6	10.1	5	10.8	4.75	158
	18		9							
400 (ground)		9		9.3	9					N/A

**E-W Direction Leeward**

Building height (ft)	72
Building trib width (ft)	300

Level	Story ht. (ft)	Trib ht. (ft)	Total ht. (ft)	P 1 (psf)	H 1 (ft)	P 2 (psf)	H 2 (ft)	P 3 (psf)	H 3 (ft)	Story Dist. Load (plf)
Roof		14.5		9.1	4.75	9.1	9.75			132
	13.5		65.25							
800		13.5		9.1	8.25	9.1	5.25			123
	13.5		51.75							
700		13.5		9.1	1.75	9.1	10	9.1	1.75	123
	13.5		38.25							
600		13.5		9.1	0.25	9.1	5	9.1	8.25	123
	13.5		24.75							
500		15.75		9.1	6	9.1	5	9.1	4.75	143
	18		9							
400 (ground)		9		9.1	9					N/A

**N-S Direction Windward**

Building height (ft)	72
Building trib width (ft)	300

Level	Story ht. (ft)	Trib ht. (ft)	Total ht. (ft)	P 1 (psf)	H 1 (ft)	P 2 (psf)	H 2 (ft)	P 3 (psf)	H 3 (ft)	Story Dist. Load (plf)
Roof		14.5		14.5	4.75	15.2	9.75			217
	13.5		65.25							
800		13.5		13.9	8.25	14.5	5.25			191
	13.5		51.75							
700		13.5		12.4	1.75	13.2	10	13.9	1.75	178
	13.5		38.25							
600		13.5		10.8	0.25	11.4	5	12.4	8.25	162
	13.5		24.75							
500		15.75		9.3	6	10.1	5	10.8	4.75	158
	18		9							
400 (ground)		9		9.3	9					N/A

**N-S Direction Leeward**

Building height (ft)	72
Building trib width (ft)	300

Level	Story ht. (ft)	Trib ht. (ft)	Total ht. (ft)	P 1 (psf)	H 1 (ft)	P 2 (psf)	H 2 (ft)	P 3 (psf)	H 3 (ft)	Story Dist. Load (plf)
Roof		14.5		3.7	4.75	3.7	9.75			54
	13.5		65.25							
800		13.5		3.7	8.25	3.7	5.25			50
	13.5		51.75							
700		13.5		3.7	1.75	3.7	10	3.7	1.75	50
	13.5		38.25							
600		13.5		3.7	0.25	3.7	5	3.7	8.25	50
	13.5		24.75							
500		15.75		3.7	6	3.7	5	3.7	4.75	58
	18		9							
400 (ground)		9		3.7	9					N/A

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### E-W Direction Windward

Level	Story Dist. Load (plf)
Roof	217
800	191
700	178
600	162
500	158

### E-W Direction Leeward

Level	Story Dist. Load (plf)
Roof	132
800	123
700	123
600	123
500	143

### N-S Direction Windward

Level	Story Dist. Load (plf)
Roof	217
800	191
700	178
600	162
500	158

### N-S Direction Leeward

Level	Story Dist. Load (plf)
Roof	54
800	50
700	50
600	50
500	58

\*These are the loads applied to the ETABS model



### C.3 - Long span gravity displacement example

#### Point Displacements Trial 5

Story	Point	UZ	Story	Point	UZ	Difference	Delta col	Allowable	
			STORY5	1	-0.6706				
			STORY5	2	-0.4991				
STORY1	3	-0.1059	STORY5	3	-0.3228	-0.2169			
			STORY5	4	-0.3092				
			STORY5	5	-0.336				
STORY1	6	-0.1485	STORY5	6	-0.3796	-0.2311			
			STORY5	7	-0.3974				
			STORY5	8	-0.4109				
STORY1	9	-0.1579	STORY5	9	-0.4205	-0.2626			
			STORY5	10	-0.425				
			STORY5	11	-0.4265				
STORY1	12	-0.1591	STORY5	12	-0.4258	-0.2667			
			STORY5	13	-0.4257				
			STORY5	14	-0.4238				
STORY1	15	-0.1576	STORY5	15	-0.4192	-0.2616			
			STORY5	16	-0.4096				
			STORY5	17	-0.3976				
STORY1	18	-0.1494	STORY5	18	-0.3837	-0.2343			
			STORY5	19	-0.3496				
			STORY5	20	-0.3346				
STORY1	21	-0.1422	STORY5	21	-0.3524	-0.2102			
			STORY5	22	-0.3615				
			STORY5	23	-0.4293				
STORY1	24	-0.1558	STORY5	24	-0.5848	-0.429			
STORY1	25	-1.2518	STORY5	25	-1.04	0.2118			
STORY1	26	-1.5888	STORY5	26	-1.377	0.2118			
STORY1	27	-1.732	STORY5	27	-1.5202	0.2118	41' Span 63' length	-1.5826	1.37
STORY1	28	-1.6912	STORY5	28	-1.4794	0.2118			
STORY1	29	-1.4782	STORY5	29	-1.2664	0.2118			
STORY1	30	-1.1614	STORY5	30	-0.9496	0.2118			
STORY1	31	-0.1494	STORY5	31	-0.5568	-0.4074			
			STORY5	32	-0.4219				
			STORY5	33	-0.3464				
STORY1	34	-0.1327	STORY5	34	-0.311	-0.1783			
			STORY5	35	-0.2445				
			STORY5	36	-0.2077				
STORY1	37	-0.109	STORY5	37	-0.2079	-0.0989			
			STORY5	38	-0.1612				
			STORY5	39	-0.2656				
STORY1	40	-0.146	STORY5	40	-0.5537	-0.4077			
			STORY5	41	-1.1504				
STORY1	42	-2.1795	STORY5	42	-1.7719	0.4076			
			STORY5	43	-2.2359				
STORY1	44	-2.9771	STORY5	44	-2.5695	0.4076	90' Span 90' length	-2.8311	3.00
			STORY5	45	-2.6453				
STORY1	46	-2.9536	STORY5	46	-2.546	0.4076			
			STORY5	47	-2.1987				
STORY1	48	-2.1486	STORY5	48	-1.741	0.4076			
			STORY5	49	-1.1552				
STORY1	50	-0.2286	STORY5	50	-0.633	-0.4044			
			STORY5	51	-0.5472				
STORY1	52	-0.8797	STORY5	52	-0.5696	0.3101	43' Span 45' length	-0.6974	1.43
STORY1	53	-0.7835	STORY5	53	-0.5717	0.2118			
STORY1	54	-0.7557	STORY5	54	-0.5438	0.2119			
STORY1	55	-0.1823	STORY5	55	-0.4983	-0.316			
STORY1	56	-0.9722	STORY5	56	-0.662	0.3102			
			STORY5	57	-0.7586				
STORY1	58	-1.0734	STORY5	58	-0.8242	0.2492	45' Span 45' length	-0.8911	1.50
			STORY5	59	-0.7794				
STORY1	60	-0.3657	STORY5	60	-0.7872	-0.4215			
STORY1	61	-1.2854	STORY5	61	-1.0736	0.2118			
STORY1	62	-1.4664	STORY5	62	-1.2546	0.2118			
STORY1	63	-1.4781	STORY5	63	-1.2663	0.2118	48' Span 63' length	-1.1124	1.60
STORY1	64	-1.4051	STORY5	64	-1.1932	0.2119			
STORY1	65	-1.1698	STORY5	65	-1.0757	0.0941			
STORY1	66	-1.0532	STORY5	66	-0.9592	0.094			
STORY1	67	-0.4129	STORY5	67	-0.9318	-0.5189			
STORY1	68	-1.5504	STORY5	68	-1.4128	0.1376			
			STORY5	69	-1.9515				
STORY1	70	-2.7973	STORY5	70	-2.505	0.2923			
			STORY5	71	-2.9498				
STORY1	72	-3.7562	STORY5	72	-3.2924	0.4638	107' Span 117' length	-3.7283	3.57
			STORY5	73	-3.4355				
STORY1	74	-3.8367	STORY5	74	-3.4291	0.4076			
			STORY5	75	-3.2119				
STORY1	76	-3.2802	STORY5	76	-2.8726	0.4076			
			STORY5	77	-2.3874				
STORY1	78	-2.2881	STORY5	78	-1.8805	0.4076			
			STORY5	79	-1.3111				
STORY1	80	-0.1084	STORY5	80	-0.8015	-0.6931			
			STORY5	81	-0.7342				
STORY1	82	-1.1773	STORY5	82	-0.7697	0.4076			
			STORY5	83	-0.7815				
STORY1	84	-1.3143	STORY5	84	-0.8098	0.5045	63' Span 63' length	-1.2084	2.10

**Diaphragm Drift Comparison**

Story	Diaphragm Load	Trial 1		Trial 2		Trial 3		Trial 4		Trial 5		delta/fir.	% Accept.
		UX	UY	delta/fir. UX	UY	delta/fir. UX	UY	delta/fir. UX	UY	delta/fir. UX	UY		
STORY5	LVL900 EWWIND	3.0069	2.74	0.6489	2.3527	0.6099	2.3527	0.5385	1.5842	0.418	1.5971	0.4239	0.92
STORY4	LVL800 EWWIND	2.358	2.1301	0.5994	1.8142	0.5685	1.8142	0.5154	1.1662	0.3817	1.1732	0.384	0.83
STORY3	LVL700 EWWIND	1.7586	1.5616	0.6021	1.2988	0.5587	1.2988	0.5037	0.7845	0.3365	0.7892	0.3383	0.73
STORY2	LVL600 EWWIND	1.1565	1.0029	0.5442	0.7951	0.4936	0.7951	0.4212	0.448	0.2625	0.4509	0.2633	0.57
STORY1	LVL500 EWWIND	0.6123	0.5093	0.3824	0.3739	0.3487	0.3739	0.2939	0.1855	0.1759	0.1876	0.1748	0.38
STORY1	LVL400 EWWIND	0.2299	0.1606	0.2299	0.1606	0.1606	0.08	0.08	0.0096	0.0096	0.0128	0.0128	0.03
STORY5	LVL900 NSWIND	-2.1664	-0.4676	-1.9125	-0.4427	-1.6367	-0.3977	-1.0877	-0.2851	-1.2899	-0.3225	-0.3225	0.70
STORY4	LVL800 NSWIND	-1.6988	-0.389	-1.4698	-0.3538	-1.239	-0.324	-0.8026	-0.2472	-0.9674	-0.2802	-0.2802	0.61
STORY3	LVL700 NSWIND	-1.3098	-0.414	-1.1116	-0.3677	-0.915	-0.3371	-0.5554	-0.2328	-0.6872	-0.2639	-0.2639	0.57
STORY2	LVL600 NSWIND	-0.8958	-0.4066	-0.7483	-0.3507	-0.5779	-0.2953	-0.3226	-0.1848	-0.4233	-0.2191	-0.2191	0.47
STORY1	LVL500 NSWIND	-0.4892	-0.2247	-0.3976	-0.1894	-0.2826	-0.1498	-0.1378	-0.0896	-0.2042	-0.1171	-0.1171	0.25
STORY1	LVL400 NSWIND	-0.2645	-0.2645	-0.2082	-0.2082	-0.1328	-0.1328	-0.0482	-0.0482	-0.0871	-0.0871	-0.0871	0.19
		Percent of Trial 1		Percent of Trial 1		Percent of Trial 1		Percent of Trial 1		Percent of Trial 1			
		0.91	0.78	0.78	0.53	0.53	0.53	0.53	0.53	0.53	0.53		
		0.90	0.77	0.77	0.49	0.49	0.49	0.49	0.49	0.49	0.49		
		0.89	0.74	0.74	0.45	0.45	0.45	0.45	0.45	0.45	0.45		
		0.87	0.69	0.69	0.39	0.39	0.39	0.39	0.39	0.39	0.39		
		0.83	0.61	0.61	0.30	0.30	0.30	0.30	0.30	0.31	0.31		
		0.70	0.35	0.35	0.04	0.04	0.04	0.04	0.04	0.06	0.06		
		0.88	0.76	0.76	0.50	0.50	0.50	0.50	0.50	0.60	0.60		
		0.87	0.73	0.73	0.47	0.47	0.47	0.47	0.47	0.57	0.57		
		0.85	0.70	0.70	0.42	0.42	0.42	0.42	0.42	0.52	0.52		
		0.84	0.65	0.65	0.36	0.36	0.36	0.36	0.36	0.47	0.47		
		0.81	0.58	0.58	0.28	0.28	0.28	0.28	0.28	0.42	0.42		
		0.79	0.50	0.50	0.18	0.18	0.18	0.18	0.18	0.33	0.33		



**Superimposed Load Types**

	Area Occupancy	Floor Finish (psf)	Floor Slab (psf)	Ceiling/Services (psf)	Partitions (psf)	Additional (psf)	Total Dead (psf)	Live Load (psf)	Total Unfactored (psf)
1	High Roof		60	10			70	30	100
2	Office		66	10	20		96	50	146
3	Multi-purpose club		66	10			76	100	176
4	Stair					30	30	100	130
5	Atrium/Corridor	25	66	10			101	100	201
6	Mechanical room		66	10		50	126	125	251
7	Computer lab	25	66	10			101	100	201
8	Fixed seating		110	10		10	130	60	190
9	Stage	25	66	10			101	100	201
10	Lobby/General assembly	25	66	10			101	100	201
11	Locker room	25		10	20		55	100	155
12	Work area	25	65	10	20		120	100	220
13	Showers/Rest room	25	66	10			101	60	161
14	Storage	25	66	10			101	125	226
15	Laundry	25		10			35	150	185
16	Ramp	25	66				91	100	191
17	Elevator machine room		66				66	250	316
18	Meeting room		66	10			76	60	136
19	Treatment area	25	66	10	20		121	100	221
20	Video room	25	66	10	20		121	100	221
21	Hydrotherapy	25	66	10			101	400	501
22	Loading dock	30	66	10			106	100	206
23	Ambulance parking	30	79	10			119	100	219
24	Walkway roof	13	5				18	30	48
25	Theater control room	25	66	10	20		121	100	221
26	Trash compactor		66	10			76	350	426
27	Roof	25	60	10			95	60	155
28	Exterior truck loading	90	79	10			179	100	279
29	Exterior non-truck loading	90	66	10			166	100	266

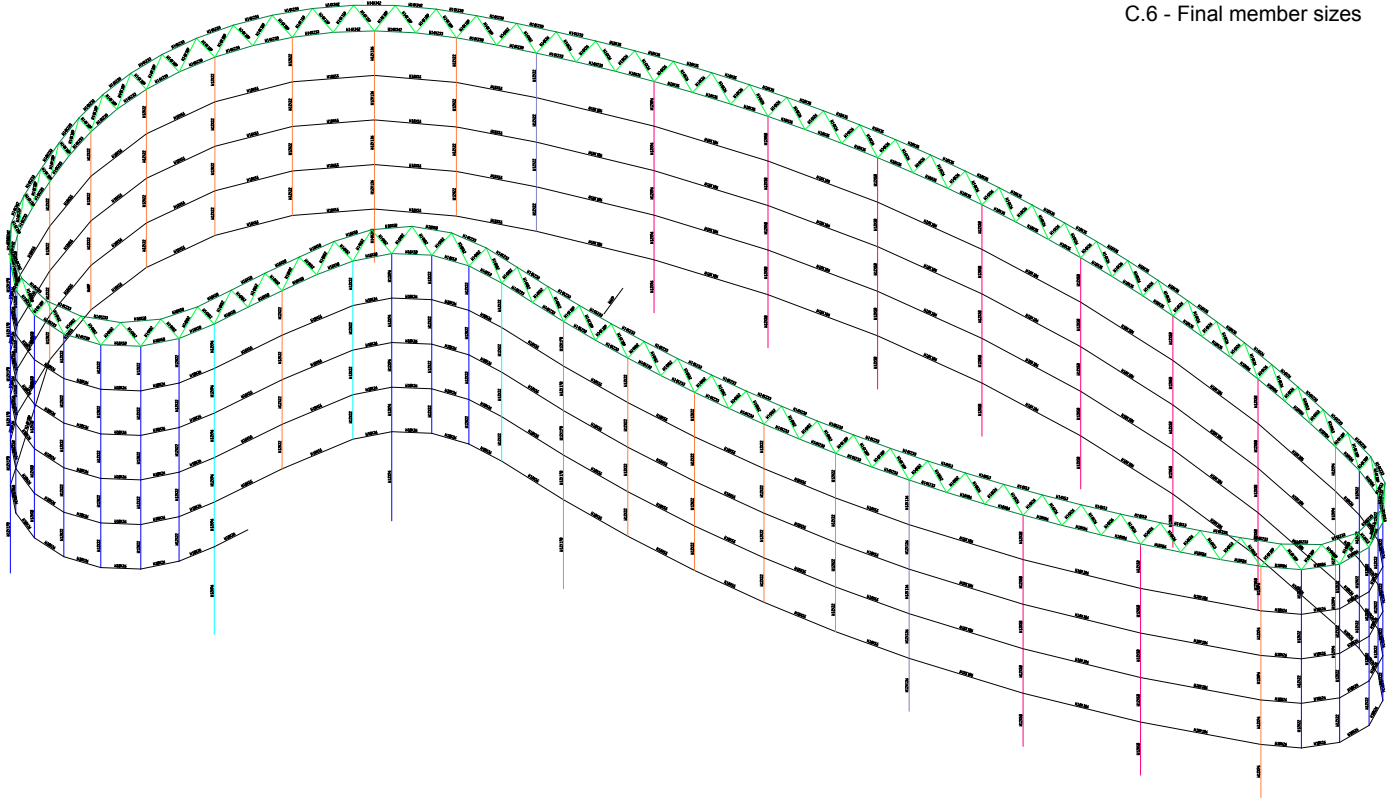
**Superimposed Dead Load Calculations**

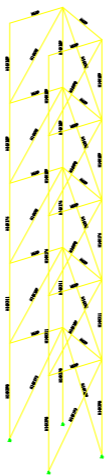
Type	100		200		300		400		500		600		700		800		Roof		
	Area (ft <sup>2</sup> )	Total (kip)	Area (ft <sup>2</sup> )	Total (kip)	Area (ft <sup>2</sup> )	Total (kip)	Area (ft <sup>2</sup> )	Total (kip)	Area (ft <sup>2</sup> )	Total (kip)	Area (ft <sup>2</sup> )	Total (kip)	Area (ft <sup>2</sup> )	Total (kip)	Area (ft <sup>2</sup> )	Total (kip)	Area (ft <sup>2</sup> )	Total (kip)	
1																			
2			2224	214	997	96	3586	344	7583	728	10249	984	9973	957	10038	964	10382	727	
3													4234	322	4772	363			
4			483	14	669	20	1046	31	1615	48	1428	43	1694	51	1655	50			
5			3750	379	3598	363			6170	623	5887	595	6106	617	6058	612			
6			1558	196	10932	1377					5472	689							
7									2228	225									
8							2307	300	2485	323									
9							803	81					544	55					
10							8907	900											
11	17259	949																	
12																			
13																			
14			641	65			2017	204	1053	106	501	51	969	98	955	96			
15	4393	154																	
16																			
17	358	24																	
18			8510	647															
19			3529	427															
20																			
21			943	95															
22					2556	271													
23					1033	123													
24																			
25									1282	155									
26					451	34													
27																			
28					5050	904	4723	845									13119	1246	
29							13982	2321											
Sums	22010	1127	21638	2037	28470	3523	37371	5026	22416	2209	23537	2361	23520	2100	23478	2084	23501	1973	

**Superstructure Dead Load**

Level	Floor Framing			Interior Columns					Perimeter Truss System			
	Dist. Load (psf)	Area (ft <sup>2</sup> )	Weight/floor (kips)	# of cols.	Typ. weight (plf)	Story Ht. (ft)	Wt./floor (kips)	Trib. Wt. (kips)	Truss (kips)	Columns (kips)	Trib. Wt. (kips)	Total
Roof	10	23500	235					6.9	279.4	42	21.0	542.3
800	10	23500	235	17	60	13.5	13.8	13.8		42	42.0	290.8
700	10	23500	235	17	60	13.5	13.8	13.8		42	42.0	290.8
600	10	23500	235	17	60	13.5	13.8	13.8		42	42.0	290.8
500	10	23500	235	17	60	13.5	13.8	13.8		42	21.0	285.6
400	10	37500	375	21	120	18	45.4	22.7				397.7

C.6 - Final member sizes





## C.6 - Final member sizes

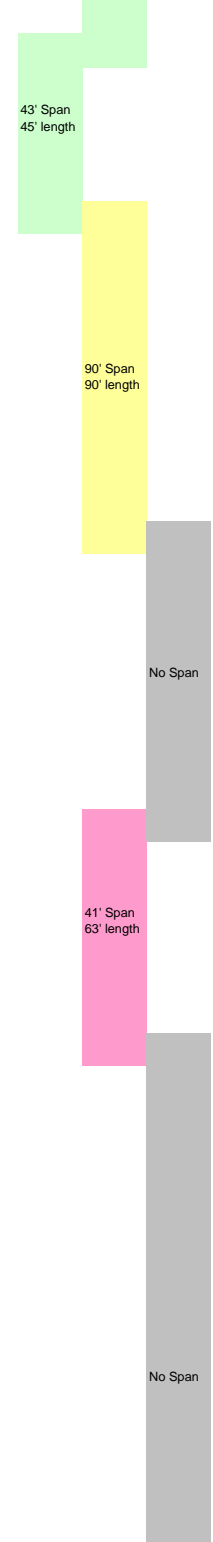


**Truss Horizontal Members - Partial Bracing**  
Actual Applied Sizes - Trial 6

**Member Information**

Story	Name	W14x26	W14x53	W14x82	W14x233	W14x342
STORY6	B085		X			
STORY6	B085		X			
STORY6	B086		X			
STORY6	B086		X			
STORY6	B087		X			
STORY6	B087		X			
STORY6	B088				X	
STORY6	B088				X	
STORY6	B089				X	
STORY6	B089				X	
STORY6	B090				X	
STORY6	B090				X	
STORY6	B091				X	
STORY6	B091				X	
STORY6	B092				X	
STORY6	B092				X	
STORY6	B093				X	
STORY6	B093				X	
STORY6	B094				X	
STORY6	B094				X	
STORY6	B095				X	
STORY6	B095				X	
STORY6	B096				X	
STORY6	B096				X	
STORY6	B097				X	
STORY6	B097				X	
STORY6	B098				X	
STORY6	B098				X	
STORY6	B099				X	
STORY6	B099				X	
STORY6	B100				X	
STORY6	B100				X	
STORY6	B101				X	
STORY6	B101				X	
STORY6	B102		X			
STORY6	B102		X			
STORY6	B103		X			
STORY6	B103		X			
STORY6	B104		X			
STORY6	B104		X			
STORY6	B105		X			
STORY6	B105		X			
STORY6	B106		X			
STORY6	B106		X			
STORY6	B107		X			
STORY6	B107		X			
STORY6	B108		X			
STORY6	B108		X			
STORY6	B109				X	
STORY6	B109				X	
STORY6	B110				X	
STORY6	B110				X	
STORY6	B111				X	
STORY6	B111				X	
STORY6	B112				X	
STORY6	B112				X	
STORY6	B113				X	
STORY6	B113				X	
STORY6	B114				X	
STORY6	B114				X	
STORY6	B115				X	
STORY6	B115				X	
STORY6	B116				X	
STORY6	B116				X	
STORY6	B117				X	
STORY6	B117				X	
STORY6	B118				X	
STORY6	B118				X	
STORY6	B119	X				
STORY6	B119	X				
STORY6	B120	X				
STORY6	B120	X				
STORY6	B121	X				
STORY6	B121	X				
STORY6	B122	X				
STORY6	B122	X				
STORY6	B123	X				
STORY6	B123	X				
STORY6	B124	X				
STORY6	B124	X				
STORY6	B125	X				
STORY6	B125	X				
STORY6	B126	X				
STORY6	B126	X				
STORY6	B127	X				
STORY6	B127	X				
STORY6	B128	X				
STORY6	B128	X				
STORY6	B129	X				
STORY6	B129	X				
STORY6	B130	X				
STORY6	B130	X				
STORY6	B131	X				
STORY6	B131	X				
STORY6	B132	X				
STORY6	B132	X				

Story	Name	W14x26	W14x53	W14x109	W14x233	W14x342
STORY5	B56		X			
STORY5	B56		X			
STORY5	B55		X			
STORY5	B55		X			
STORY5	B54		X			
STORY5	B54		X			
STORY5	B53		X			
STORY5	B53		X			
STORY5	B52		X			
STORY5	B52		X			
STORY5	B51				X	
STORY5	B51				X	
STORY5	B50				X	
STORY5	B50				X	
STORY5	B49				X	
STORY5	B49				X	
STORY5	B48				X	
STORY5	B48				X	
STORY5	B47				X	
STORY5	B47				X	
STORY5	B46				X	
STORY5	B46				X	
STORY5	B45				X	
STORY5	B45				X	
STORY5	B44				X	
STORY5	B44				X	
STORY5	B43				X	
STORY5	B43				X	
STORY5	B42				X	
STORY5	B42				X	
STORY5	B41				X	
STORY5	B41				X	
STORY5	B40				X	
STORY5	B40				X	
STORY5	B39				X	
STORY5	B39				X	
STORY5	B38		X			
STORY5	B38		X			
STORY5	B37		X			
STORY5	B37		X			
STORY5	B36		X			
STORY5	B36		X			
STORY5	B35		X			
STORY5	B35		X			
STORY5	B34		X			
STORY5	B34		X			
STORY5	B33		X			
STORY5	B33		X			
STORY5	B32		X			
STORY5	B32		X			
STORY5	B31		X			
STORY5	B31		X			
STORY5	B30		X			
STORY5	B30		X			
STORY5	B29		X			
STORY5	B29		X			
STORY5	B28		X			
STORY5	B28		X			
STORY5	B27		X			
STORY5	B27		X			
STORY5	B26		X			
STORY5	B26		X			
STORY5	B25		X			
STORY5	B25		X			
STORY5	B24		X			
STORY5	B24		X			
STORY5	B23		X			
STORY5	B23		X			
STORY5	B22		X			
STORY5	B22		X			
STORY5	B21		X			
STORY5	B21		X			
STORY5	B20	X				
STORY5	B20	X				
STORY5	B19	X				
STORY5	B19	X				
STORY5	B18	X				
STORY5	B18	X				
STORY5	B17	X				
STORY5	B17	X				
STORY5	B16	X				
STORY5	B16	X				
STORY5	B15	X				
STORY5	B15	X				
STORY5	B14	X				
STORY5	B14	X				
STORY5	B13	X				
STORY5	B13	X				
STORY5	B12	X				
STORY5	B12	X				
STORY5	B11	X				
STORY5	B11	X				
STORY5	B10	X				
STORY5	B10	X				
STORY5	B09	X				
STORY5	B09	X				



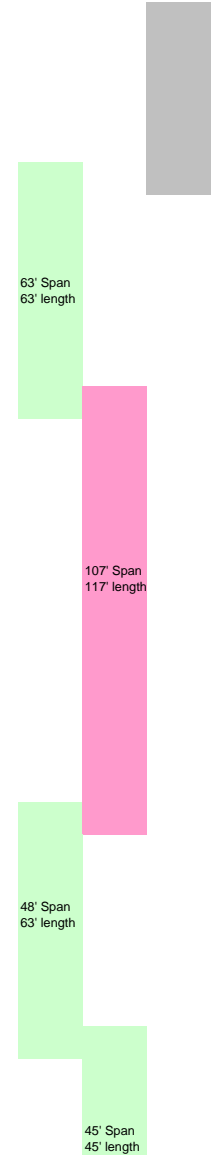
# C.7 - Recorded trial size example

STORY6 B133	X				
STORY6 B133	X				
STORY6 B134	X				
STORY6 B134	X				
STORY6 B135	X				
STORY6 B135	X				
STORY6 B136	X				
STORY6 B136	X				
STORY6 B137	X				
STORY6 B137	X				
STORY6 B138	X				
STORY6 B138	X				
STORY6 B139	X				
STORY6 B139	X				
STORY6 B140		X			
STORY6 B140		X			
STORY6 B141		X			
STORY6 B141		X			
STORY6 B142		X			
STORY6 B142		X			
STORY6 B143		X			
STORY6 B143		X			
STORY6 B144			X		
STORY6 B144			X		
STORY6 B145			X		
STORY6 B145			X		
STORY6 B146			X		
STORY6 B146			X		
STORY6 B147		X			
STORY6 B147		X			
STORY6 B148		X			
STORY6 B148		X			
STORY6 B149		X			
STORY6 B149		X			
STORY6 B150		X			
STORY6 B150		X			
STORY6 B151		X			
STORY6 B151		X			
STORY6 B152		X			
STORY6 B152		X			
STORY6 B153		X			
STORY6 B153		X			
STORY6 B154		X			
STORY6 B154		X			
STORY6 B155		X			
STORY6 B155		X			
STORY6 B156		X			
STORY6 B156		X			
STORY6 B157			X		
STORY6 B157			X		
STORY6 B158			X		
STORY6 B158			X		
STORY6 B159			X		
STORY6 B159			X		
STORY6 B160		X			
STORY6 B160		X			
STORY6 B161		X			
STORY6 B161		X			
STORY6 B162		X			
STORY6 B162		X			
STORY6 B163			X		
STORY6 B163			X		
STORY6 B164			X		
STORY6 B164			X		
STORY6 B165			X		
STORY6 B165			X		
STORY6 B166			X		
STORY6 B166			X		
STORY6 B167			X		
STORY6 B167			X		
STORY6 B168			X		
STORY6 B168			X		
STORY6 B168	42	32	0	82	12
STORY6 B168	26	53	82	233	233
STORY6 B168	9	9	9	9	9
STORY6 B168	9828	15264	0	171954	25164

sum/2 = 111.105 kips  
 \*Divide by 2 since there were two outputs per element  
 TOTAL = 170.46

STORY5 B08	X				
STORY5 B08	X				
STORY5 B07	X				
STORY5 B07	X				
STORY5 B06	X				
STORY5 B06	X				
STORY5 B05	X				
STORY5 B05	X				
STORY5 B04	X				
STORY5 B04	X				
STORY5 B03	X				
STORY5 B03	X				
STORY5 B02	X				
STORY5 B02	X				
STORY5 B01			X		
STORY5 B01			X		
STORY5 B84			X		
STORY5 B84			X		
STORY5 B83			X		
STORY5 B83			X		
STORY5 B82			X		
STORY5 B82			X		
STORY5 B81			X		
STORY5 B81			X		
STORY5 B80			X		
STORY5 B80			X		
STORY5 B79			X		
STORY5 B79			X		
STORY5 B78			X		
STORY5 B78			X		
STORY5 B77			X		
STORY5 B77			X		
STORY5 B76			X		
STORY5 B76			X		
STORY5 B75			X		
STORY5 B75			X		
STORY5 B74			X		
STORY5 B74			X		
STORY5 B73			X		
STORY5 B73			X		
STORY5 B72			X		
STORY5 B72			X		
STORY5 B71			X		
STORY5 B71			X		
STORY5 B70			X		
STORY5 B70			X		
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STORY5 B69			X		
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STORY5 B68			X		
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STORY5 B65			X		
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STORY5 B62			X		
STORY5 B62			X		
STORY5 B61			X		
STORY5 B61			X		
STORY5 B60			X		
STORY5 B60			X		
STORY5 B59			X		
STORY5 B59			X		
STORY5 B58			X		
STORY5 B58			X		
STORY5 B57			X		
STORY5 B57			X		
STORY5 B57	38	28	0	38	8
STORY5 B57	26	53	109	233	233
STORY5 B57	9	9	9	9	9
STORY5 B57	8892	13356	0	79686	16776

sum/2 = 59.355  
 \*Divide by 2 since there were two outputs per element



Length ft	Dead Load						Total Dead kip
	Trib ft	Roof Dead psf	Trib ft	Office Dead psf	Height ft	Enclosure Dead plf*	
9	15	0	15	96	13.5	405	6.91
18	15	0	15	96	13.5	405	6.91
27	15	0	15	96	13.5	405	6.91

\* 30psf\*13.5'

Area ft <sup>2</sup>	Live Load				Total Live kip
	Office Live psf	Kll	LLR	Reduced LL psf	
135	50	1	1,000	50.0	0.75
270	50	1	1,000	50.0	0.75
405	50	1	0.995	49.8	0.75

Factored 1.2D+1.6L
9.49
9.49
9.48

Mu	Least Weight*	W18 or smaller*
96	W10x26	W10x26
384	W18x55	W18x55
864	W27x84	W18x106

\*using beam design table in AISC manual



Original System Steel Take-off - Diagrid

		Length ft/pc.	Pieces/Level	# of Levels	Total Length ft	Member size	Weight lb/ft	Total Weight tons
Light	Upper	9	37	3	999	W14x53	53	26.5
	Diagonal	14.2	74	2	2102	W12x35	35	36.8
	Lower	9	37	2	666	W14x53	53	17.6
	Diagonal	14.2	74	2	2102	W12x50	50	52.5

Heavy	Upper	9	47	3	1269	W14x82	82	52.0
	Diagonal	14.2	94	2	2670	W12x53	53	70.7
	Lower	9	47	2	846	W14x82	82	34.7
	Diagonal	14.2	94	2	2670	W12x87	87	116.1

V columns	W-shape	16.6	24	1	398	W12x170	170	33.9
	Box	26.6	8	1	213	12.75x2x.75x.75	122.5	13.0

		Sums	
		Horizontals	V columns
Light	Upper	Horizontal	
	Diagonal	26.5	
	Lower	Horizontal	
	Diagonal	17.6	36.8
Heavy	Upper	Horizontal	
	Diagonal	52.0	
	Lower	Horizontal	
	Diagonal	34.7	70.7
V columns	Upper	Horizontal	
	Diagonal	116.1	
	Lower	Horizontal	
	Diagonal	52.5	116.1
		<b>130.8</b>	<b>276.2</b>
			<b>46.9</b>

Light	Upper	Horizontal	
	Diagonal	26.5	
	Lower	Horizontal	
	Diagonal	17.6	36.8
Heavy	Upper	Horizontal	
	Diagonal	52.0	
	Lower	Horizontal	
	Diagonal	34.7	70.7
V columns	Upper	Horizontal	
	Diagonal	116.1	
	Lower	Horizontal	
	Diagonal	52.5	116.1
		<b>130.8</b>	<b>276.2</b>
			<b>46.9</b>

V columns	W-shape		33.9
	Box		13.0
		<b>130.8</b>	<b>46.9</b>

Original System Steel Take-off - Below-grade bracing

	Size 1				Size 2				Size 3			
	Size	Weight lb/ft	Length ft	Total tons	Size	Weight lb/ft	Length ft	Total tons	Size	Weight lb/ft	Length ft	Total tons
<b>BF1</b>	<b>Columns</b>	W14x311	311	248								
	<b>Beams</b>	W10x12	12	18	W14x30	30	54	0.8				
	<b>Diagonals</b>	W14x22	22	36	W14x90	90	36	1.6				
<b>BF4</b>	<b>Columns</b>	W14x311	311	124								
	<b>Beams</b>	W10x12	12	9	W27x84	84	9	0.4	W14x30	30	18	0.27
	<b>Diagonals</b>	W14x90	90	18								

Subtotals = 59.2

2.8

0.3

Total = 62.3