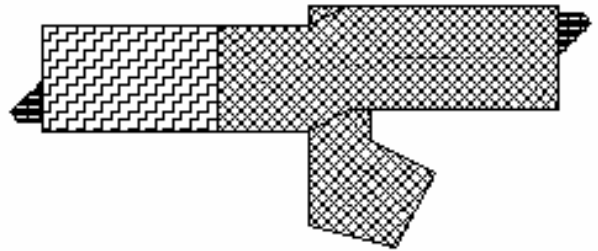
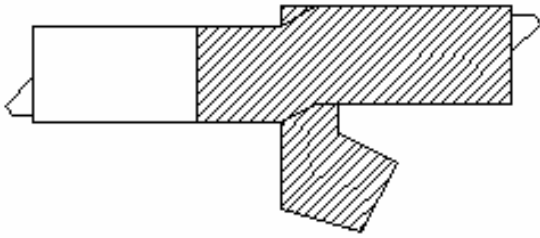


Appendices

Appendix A: Live Load Diagrams

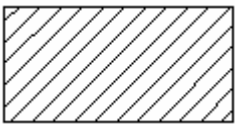
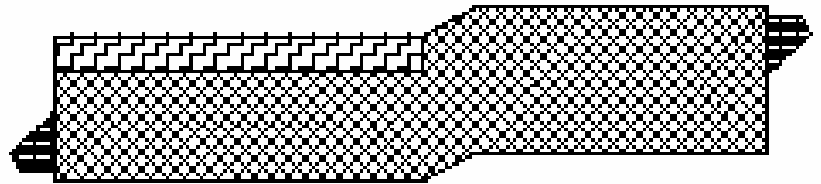
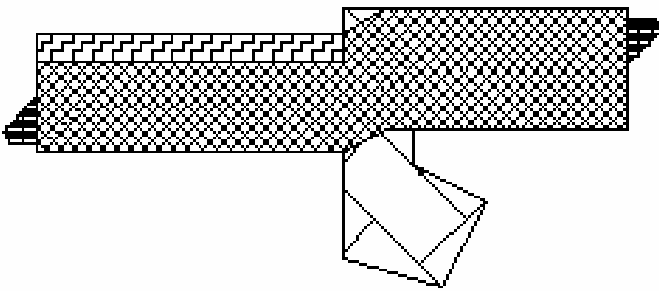
Basement

1st Floor

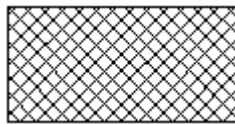


2nd Floor

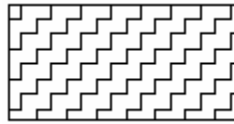
3rd – 4th Floor



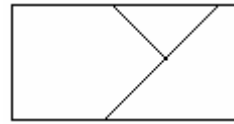
150 psf



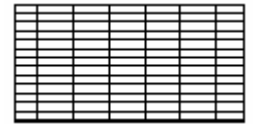
80 psf



125 psf



60 psf



100 psf

Appendix B: Wind Load Calculations

Velocity Pressure		
K_{zt}	1	From Fig. 6-4
K_d	0.85	From Table 6-4
V	90	From Fig 6-1
I	1	From Table 6-1

le 1

Gust Factor Calculator			
Frequency	2.26		Rigid
C_t	0.02		
h	62		
x	0.75		
G	0.85		
z_{min}	15		
c	0.2		
l	500		
ϵ	0.200		
gq	3.4		
gv	3.4		
z	37.2	z_h	37.2
h	62		
L_z	512.12		
l_z	0.20		
Base	307	Q	0.813126
G	0.833		

Pressures		
Z (ft)	N-S (psf)	E-W (psf)
0-15	9.99	10.45
20	10.57	11.06
25	11.04	11.55
30	11.51	12.04
40	12.22	12.78
50	12.81	13.39
60	13.27	13.89
70	13.75	14.38

Tab

External Pressure Coefficients				
	Windward Wall			
	C_p	0.8	From Fig. 6-6	
	Leeward Wall			
N-S	length	62.6	C_p	-0.5
	base	307		
	ratio l/b	0.20		
E-W	length	307	C_p	-0.2
	base	62.6		
	ratio l/b	4.90		

Z (ft)	K_z (Table 6-3)	q_z
0-15	0.85	14.982
20	0.9	15.863
25	0.94	16.568
30	0.98	17.273
40	1.04	18.331
50	1.09	19.212
60	1.13	19.917
70	1.17	20.622
80	1.21	21.327
90	1.24	21.856
100	1.26	22.208
120	1.31	23.090
140	1.36	23.971
160	1.39	24.500

q_h 20.105

Interpolation at max. height

Table 2

Forces (kips)						
Story	N-S windward	N-S leeward	N-S total	E-W windward	E-W leeward	E-W total
1	50.4	41.16	91.5	10.74	3.51	14.25
2	53.8	37.73	91.5	11.46	3.22	14.68
3	58.1	37.73	95.83	12.4	3.22	15.62
4	30.1	18.9	49	6.4	1.61	8.01

Appendix C: RAM Output



Beam Summary

STEEL BEAM DESIGN SUMMARY:

Floor Type: Fourth Floor

Bm #	Length ft	+M kip-ft	-M kip-ft	Seff in3	Fy ksi	Beam Size	Studs
1	22.00	53.4	0.0	21.3	50.0	W12X19	
71	23.00	126.9	0.0	54.6	50.0	W14X38	
88	8.49	1.9	0.0	7.8	50.0	W8X10	
98	13.00	55.5	0.0	29.0	50.0	W14X22	
107	22.00	116.7	0.0	47.2	50.0	W16X31	
97	30.17	127.7	0.0	47.2	50.0	W16X31	
38	7.00	0.1	0.0	7.8	50.0	W8X10	
2	30.17	163.9	0.0	68.4	50.0	W18X40	
39	10.00	0.3	0.0	7.8	50.0	W8X10	
3	32.50	246.1	0.0	93.0	50.0	W21X48	
56	10.00	0.0	0.0	7.8	50.0	W8X10	
72	10.00	0.3	0.0	7.8	50.0	W8X10	
4	30.17	188.9	0.0	81.6	50.0	W21X44	
40	20.00	134.1	0.0	56.5	50.0	W16X36	
5	32.50	217.5	0.0	81.6	50.0	W21X44	
57	20.00	261.9	0.0	115.0	50.0	W24X55	
73	20.00	144.4	0.0	68.4	50.0	W18X40	
109	30.17	188.9	0.0	81.6	50.0	W21X44	
108	32.50	217.5	0.0	81.6	50.0	W21X44	
6	30.17	188.9	0.0	81.6	50.0	W21X44	
41	10.00	0.3	0.0	7.8	50.0	W8X10	
7	32.50	217.5	0.0	81.6	50.0	W21X44	
58	10.00	0.0	0.0	7.8	50.0	W8X10	
74	10.00	0.3	0.0	7.8	50.0	W8X10	
8	30.17	188.9	0.0	81.6	50.0	W21X44	
42	20.00	134.1	0.0	56.5	50.0	W16X36	
9	32.50	217.5	0.0	81.6	50.0	W21X44	
59	20.00	261.9	0.0	115.0	50.0	W24X55	
75	20.00	144.4	0.0	68.4	50.0	W18X40	
111	30.17	188.9	0.0	81.6	50.0	W21X44	
110	32.50	217.5	0.0	81.6	50.0	W21X44	
10	30.17	188.9	0.0	81.6	50.0	W21X44	
43	10.00	0.3	0.0	7.8	50.0	W8X10	
11	32.50	217.5	0.0	81.6	50.0	W21X44	
60	10.00	0.0	0.0	7.8	50.0	W8X10	
76	10.00	0.3	0.0	7.8	50.0	W8X10	
12	30.17	188.9	0.0	81.6	50.0	W21X44	
44	20.00	134.1	0.0	56.5	50.0	W16X36	
13	32.50	217.5	0.0	81.6	50.0	W21X44	
61	20.00	261.9	0.0	115.0	50.0	W24X55	



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Beam Summary

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Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
77	20.00	144.4	0.0	68.4	50.0	W18X40	
113	30.17	188.9	0.0	81.6	50.0	W21X44	
112	32.50	217.5	0.0	81.6	50.0	W21X44	
14	30.17	188.9	0.0	81.6	50.0	W21X44	
45	10.00	0.3	0.0	7.8	50.0	W8X10	
15	32.50	217.5	0.0	81.6	50.0	W21X44	
62	10.00	0.0	0.0	7.8	50.0	W8X10	
78	10.00	0.3	0.0	7.8	50.0	W8X10	
16	30.17	188.9	0.0	81.6	50.0	W21X44	
46	21.50	154.1	0.0	64.7	50.0	W16X40	
17	32.50	217.5	0.0	81.6	50.0	W21X44	
63	20.00	269.9	0.0	115.0	50.0	W24X55	
79	20.00	144.4	0.0	68.4	50.0	W18X40	
115	30.17	201.1	0.0	81.6	50.0	W21X44	
114	32.50	217.5	0.0	81.6	50.0	W21X44	
18	32.50	217.5	0.0	81.6	50.0	W21X44	
64	10.00	33.7	0.0	16.2	50.0	W10X17	
80	20.00	144.5	0.0	68.4	50.0	W18X40	
89	30.17	188.9	0.0	81.6	50.0	W21X44	
47	8.50	0.2	0.0	7.8	50.0	W8X10	
19	30.17	251.2	0.0	93.0	50.0	W21X48	
48	10.00	0.3	0.0	7.8	50.0	W8X10	
90	32.50	217.7	0.0	81.6	50.0	W21X44	
91	10.00	0.0	0.0	7.8	50.0	W8X10	
99	9.16	13.8	0.0	7.8	50.0	W8X10	
21	23.34	196.7	0.0	81.6	50.0	W21X44	
106	26.50	45.5	0.0	20.9	50.0	W8X24	
92	21.17	0.6	0.0	7.8	50.0	W8X10	
101	9.16	23.8	0.0	10.9	50.0	W10X12	
94	21.17	1.4	0.0	7.8	50.0	W8X10	
102	9.00	27.7	0.0	10.9	50.0	W10X12	
103	9.00	22.1	0.0	10.9	50.0	W10X12	
22	26.34	180.1	0.0	68.4	50.0	W18X40	
81	20.00	1.2	0.0	7.8	50.0	W8X10	
23	30.17	313.9	0.0	115.0	50.0	W24X55	
49	10.00	0.3	0.0	7.8	50.0	W8X10	
24	32.50	312.0	0.0	115.0	50.0	W24X55	
66	10.00	0.0	0.0	7.8	50.0	W8X10	
82	10.00	0.3	0.0	7.8	50.0	W8X10	
25	30.17	188.9	0.0	81.6	50.0	W21X44	
50	20.00	134.1	0.0	56.5	50.0	W16X36	
26	32.50	217.5	0.0	81.6	50.0	W21X44	
67	20.00	261.9	0.0	115.0	50.0	W24X55	
83	20.00	144.4	0.0	68.4	50.0	W18X40	
117	30.17	188.9	0.0	81.6	50.0	W21X44	



Beam Summary

Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
116	32.50	217.5	0.0	81.6	50.0	W21X44	
27	30.17	188.9	0.0	81.6	50.0	W21X44	
51	10.00	0.3	0.0	7.8	50.0	W8X10	
28	32.50	217.5	0.0	81.6	50.0	W21X44	
68	10.00	0.0	0.0	7.8	50.0	W8X10	
84	10.00	0.3	0.0	7.8	50.0	W8X10	
29	30.17	188.9	0.0	81.6	50.0	W21X44	
52	20.00	134.1	0.0	56.5	50.0	W16X36	
30	32.50	217.5	0.0	81.6	50.0	W21X44	
69	20.00	261.9	0.0	115.0	50.0	W24X55	
85	20.00	144.4	0.0	68.4	50.0	W18X40	
119	30.17	188.9	0.0	81.6	50.0	W21X44	
118	32.50	217.5	0.0	81.6	50.0	W21X44	
31	30.17	188.9	0.0	81.6	50.0	W21X44	
53	10.00	0.3	0.0	7.8	50.0	W8X10	
32	32.50	217.5	0.0	81.6	50.0	W21X44	
70	10.00	0.0	0.0	7.8	50.0	W8X10	
86	10.00	0.3	0.0	7.8	50.0	W8X10	
33	30.17	188.9	0.0	81.6	50.0	W21X44	
54	20.00	134.1	0.0	56.5	50.0	W16X36	
34	32.50	217.5	0.0	81.6	50.0	W21X44	
95	20.00	261.9	0.0	115.0	50.0	W24X55	
87	20.00	144.4	0.0	68.4	50.0	W18X40	
121	30.17	188.9	0.0	81.6	50.0	W21X44	
120	32.50	217.5	0.0	81.6	50.0	W21X44	
35	27.33	155.1	0.0	57.6	50.0	W18X35	
55	4.00	0.0	0.0	7.8	50.0	W8X10	
65	10.00	0.3	0.0	7.8	50.0	W8X10	
96	8.49	4.0	0.0	7.8	50.0	W8X10	
37	21.33	50.2	0.0	21.3	50.0	W12X19	

Floor Type: Third Floor

Bm #	Length ft	+M kip-ft	-M kip-ft	Seff in3	Fy ksi	Beam Size	Studs
69	22.00	63.8	0.0	29.0	50.0	W14X22	
70	23.00	152.4	0.0	64.7	50.0	W16X40	
73	8.49	1.7	0.0	7.8	50.0	W8X10	
71	13.00	52.8	0.0	29.0	50.0	W14X22	
108	22.00	138.6	0.0	57.6	50.0	W18X35	
72	30.17	121.5	0.0	47.2	50.0	W16X31	
74	7.00	0.0	0.0	7.8	50.0	W8X10	
28	30.17	153.4	0.0	57.6	50.0	W18X35	
45	10.00	0.0	0.0	7.8	50.0	W8X10	
29	32.50	271.4	0.0	115.0	50.0	W24X55	
53	10.00	0.0	0.0	7.8	50.0	W8X10	



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Beam Summary

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Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
61	10.00	0.0	0.0	7.8	50.0	W8X10	
30	30.17	175.6	0.0	68.4	50.0	W18X40	
46	20.00	126.6	0.0	57.6	50.0	W18X35	
31	32.50	242.0	0.0	93.0	50.0	W21X48	
54	20.00	258.0	0.0	115.0	50.0	W24X55	
62	20.00	169.9	0.0	68.4	50.0	W18X40	
110	30.17	175.6	0.0	68.4	50.0	W18X40	
109	32.50	242.0	0.0	93.0	50.0	W21X48	
32	30.17	175.6	0.0	68.4	50.0	W18X40	
47	10.00	0.0	0.0	7.8	50.0	W8X10	
33	32.50	242.0	0.0	93.0	50.0	W21X48	
55	10.00	0.0	0.0	7.8	50.0	W8X10	
63	10.00	0.0	0.0	7.8	50.0	W8X10	
34	30.17	175.6	0.0	68.4	50.0	W18X40	
48	20.00	126.6	0.0	57.6	50.0	W18X35	
35	32.50	242.0	0.0	93.0	50.0	W21X48	
56	20.00	258.0	0.0	115.0	50.0	W24X55	
64	20.00	169.9	0.0	68.4	50.0	W18X40	
112	30.17	175.6	0.0	68.4	50.0	W18X40	
111	32.50	242.0	0.0	93.0	50.0	W21X48	
36	30.17	175.6	0.0	68.4	50.0	W18X40	
49	10.00	0.0	0.0	7.8	50.0	W8X10	
37	32.50	242.0	0.0	93.0	50.0	W21X48	
57	10.00	0.0	0.0	7.8	50.0	W8X10	
65	10.00	0.0	0.0	7.8	50.0	W8X10	
38	30.17	175.6	0.0	68.4	50.0	W18X40	
50	20.00	126.6	0.0	57.6	50.0	W18X35	
39	32.50	242.0	0.0	93.0	50.0	W21X48	
58	20.00	258.0	0.0	115.0	50.0	W24X55	
66	20.00	169.9	0.0	68.4	50.0	W18X40	
114	30.17	175.6	0.0	68.4	50.0	W18X40	
113	32.50	242.0	0.0	93.0	50.0	W21X48	
40	30.17	175.6	0.0	68.4	50.0	W18X40	
51	10.00	0.0	0.0	7.8	50.0	W8X10	
41	32.50	242.0	0.0	93.0	50.0	W21X48	
59	10.00	0.0	0.0	7.8	50.0	W8X10	
67	10.00	0.0	0.0	7.8	50.0	W8X10	
42	30.17	175.6	0.0	68.4	50.0	W18X40	
52	21.50	145.6	0.0	68.4	50.0	W18X40	
43	32.50	242.0	0.0	93.0	50.0	W21X48	
60	20.00	265.0	0.0	115.0	50.0	W24X55	
68	20.00	169.9	0.0	68.4	50.0	W18X40	
115	30.17	186.3	0.0	68.4	50.0	W18X40	
116	32.50	242.0	0.0	93.0	50.0	W21X48	
44	32.50	242.0	0.0	93.0	50.0	W21X48	



Beam Summary

Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
76	10.00	31.9	0.0	17.1	50.0	W12X16	
80	20.00	169.9	0.0	68.4	50.0	W18X40	
75	30.17	175.6	0.0	68.4	50.0	W18X40	
78	8.50	0.0	0.0	7.8	50.0	W8X10	
77	30.17	191.4	0.0	81.6	50.0	W21X44	
79	10.00	0.0	0.0	7.8	50.0	W8X10	
81	32.50	242.2	0.0	93.0	50.0	W21X48	
83	10.00	0.0	0.0	7.8	50.0	W8X10	
84	9.16	13.1	0.0	7.8	50.0	W8X10	
82	23.34	203.0	0.0	81.6	50.0	W21X44	
107	26.50	43.3	0.0	20.9	50.0	W8X24	
88	21.17	0.6	0.0	7.8	50.0	W8X10	
93	9.16	22.6	0.0	10.9	50.0	W10X12	
103	21.17	0.6	0.0	7.8	50.0	W8X10	
94	9.00	26.5	0.0	10.9	50.0	W10X12	
91	9.00	21.0	0.0	7.8	50.0	W8X10	
92	26.34	166.9	0.0	68.4	50.0	W18X40	
90	20.00	0.5	0.0	7.8	50.0	W8X10	
1	30.17	285.1	0.0	115.0	50.0	W24X55	
5	10.00	0.0	0.0	7.8	50.0	W8X10	
2	32.50	284.5	0.0	115.0	50.0	W24X55	
6	10.00	0.0	0.0	7.8	50.0	W8X10	
7	10.00	0.0	0.0	7.8	50.0	W8X10	
3	30.17	175.6	0.0	68.4	50.0	W18X40	
16	20.00	126.6	0.0	57.6	50.0	W18X35	
4	32.50	202.0	0.0	81.6	50.0	W21X44	
20	20.00	243.5	0.0	115.0	50.0	W24X55	
24	20.00	136.6	0.0	56.5	50.0	W16X36	
118	30.17	175.6	0.0	68.4	50.0	W18X40	
117	32.50	202.0	0.0	81.6	50.0	W21X44	
8	30.17	175.6	0.0	68.4	50.0	W18X40	
17	10.00	0.0	0.0	7.8	50.0	W8X10	
9	32.50	202.0	0.0	81.6	50.0	W21X44	
21	10.00	0.0	0.0	7.8	50.0	W8X10	
25	10.00	0.0	0.0	7.8	50.0	W8X10	
10	30.17	175.6	0.0	68.4	50.0	W18X40	
18	20.00	126.6	0.0	57.6	50.0	W18X35	
11	32.50	202.0	0.0	81.6	50.0	W21X44	
22	20.00	243.5	0.0	115.0	50.0	W24X55	
26	20.00	136.6	0.0	56.5	50.0	W16X36	
120	30.17	175.6	0.0	68.4	50.0	W18X40	
119	32.50	202.0	0.0	81.6	50.0	W21X44	
12	30.17	175.6	0.0	68.4	50.0	W18X40	
19	10.00	0.0	0.0	7.8	50.0	W8X10	
13	32.50	202.0	0.0	81.6	50.0	W21X44	



Beam Summary

Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
23	10.00	0.0	0.0	7.8	50.0	W8X10	
27	10.00	0.0	0.0	7.8	50.0	W8X10	
14	30.17	175.6	0.0	68.4	50.0	W18X40	
98	20.00	126.6	0.0	57.6	50.0	W18X35	
15	32.50	202.0	0.0	81.6	50.0	W21X44	
95	20.00	243.5	0.0	115.0	50.0	W24X55	
96	20.00	136.6	0.0	56.5	50.0	W16X36	
122	30.17	175.6	0.0	68.4	50.0	W18X40	
121	32.50	202.0	0.0	81.6	50.0	W21X44	
97	27.33	145.4	0.0	57.6	50.0	W18X35	
99	4.00	0.0	0.0	7.8	50.0	W8X10	
102	10.00	0.0	0.0	7.8	50.0	W8X10	
100	8.49	3.7	0.0	7.8	50.0	W8X10	
101	21.33	46.8	0.0	17.1	50.0	W12X16	

Floor Type: Second Floor

Bm #	Length ft	+M kip-ft	-M kip-ft	Seff in3	Fy ksi	Beam Size	Studs
119	22.00	63.8	0.0	29.0	50.0	W14X22	
2	23.00	152.4	0.0	64.7	50.0	W16X40	
105	8.49	1.7	0.0	7.8	50.0	W8X10	
55	13.00	52.8	0.0	29.0	50.0	W14X22	
121	22.00	138.6	0.0	57.6	50.0	W18X35	
54	30.17	121.5	0.0	47.2	50.0	W16X31	
52	7.00	0.0	0.0	7.8	50.0	W8X10	
17	30.17	153.4	0.0	57.6	50.0	W18X35	
26	10.00	0.0	0.0	7.8	50.0	W8X10	
15	32.50	271.4	0.0	115.0	50.0	W24X55	
38	10.00	0.0	0.0	7.8	50.0	W8X10	
3	10.00	0.0	0.0	7.8	50.0	W8X10	
18	30.17	175.6	0.0	68.4	50.0	W18X40	
27	20.00	126.6	0.0	57.6	50.0	W18X35	
16	32.50	242.0	0.0	93.0	50.0	W21X48	
39	20.00	258.0	0.0	115.0	50.0	W24X55	
4	20.00	169.9	0.0	68.4	50.0	W18X40	
123	30.17	175.6	0.0	68.4	50.0	W18X40	
122	32.50	242.0	0.0	93.0	50.0	W21X48	
19	30.17	175.6	0.0	68.4	50.0	W18X40	
28	10.00	0.0	0.0	7.8	50.0	W8X10	
46	32.50	242.0	0.0	93.0	50.0	W21X48	
40	10.00	0.0	0.0	7.8	50.0	W8X10	
5	10.00	0.0	0.0	7.8	50.0	W8X10	
20	30.17	175.6	0.0	68.4	50.0	W18X40	
29	20.00	126.6	0.0	57.6	50.0	W18X35	
47	32.50	242.0	0.0	93.0	50.0	W21X48	



Beam Summary

Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
41	20.00	258.0	0.0	115.0	50.0	W24X55	
6	20.00	169.9	0.0	68.4	50.0	W18X40	
124	30.17	175.6	0.0	68.4	50.0	W18X40	
125	32.50	242.0	0.0	93.0	50.0	W21X48	
21	30.17	175.6	0.0	68.4	50.0	W18X40	
30	10.00	0.0	0.0	7.8	50.0	W8X10	
48	32.50	242.0	0.0	93.0	50.0	W21X48	
42	10.00	0.0	0.0	7.8	50.0	W8X10	
7	10.00	0.0	0.0	7.8	50.0	W8X10	
22	30.17	175.6	0.0	68.4	50.0	W18X40	
31	20.00	126.6	0.0	57.6	50.0	W18X35	
49	32.50	242.0	0.0	93.0	50.0	W21X48	
43	20.00	258.0	0.0	115.0	50.0	W24X55	
8	20.00	169.9	0.0	68.4	50.0	W18X40	
127	30.17	175.6	0.0	68.4	50.0	W18X40	
126	32.50	242.0	0.0	93.0	50.0	W21X48	
23	30.17	175.6	0.0	68.4	50.0	W18X40	
32	10.00	0.0	0.0	7.8	50.0	W8X10	
50	32.50	242.0	0.0	93.0	50.0	W21X48	
44	10.00	0.0	0.0	7.8	50.0	W8X10	
9	10.00	0.0	0.0	7.8	50.0	W8X10	
24	30.17	175.6	0.0	68.4	50.0	W18X40	
33	21.50	145.6	0.0	68.4	50.0	W18X40	
51	32.50	242.0	0.0	93.0	50.0	W21X48	
45	20.00	265.0	0.0	115.0	50.0	W24X55	
10	20.00	169.9	0.0	68.4	50.0	W18X40	
128	30.17	186.3	0.0	68.4	50.0	W18X40	
129	32.50	242.0	0.0	93.0	50.0	W21X48	
13	32.50	242.0	0.0	93.0	50.0	W21X48	
14	10.00	31.9	0.0	17.1	50.0	W12X16	
11	20.00	169.9	0.0	68.4	50.0	W18X40	
25	30.17	175.6	0.0	68.4	50.0	W18X40	
34	8.50	0.0	0.0	7.8	50.0	W8X10	
36	30.17	164.9	0.0	68.4	50.0	W18X40	
35	10.00	0.0	0.0	7.8	50.0	W8X10	
57	32.50	242.2	0.0	93.0	50.0	W21X48	
56	10.00	0.0	0.0	7.8	50.0	W8X10	
37	12.00	52.5	0.0	21.3	50.0	W12X19	
58	9.16	13.1	0.0	7.8	50.0	W8X10	
12	23.34	202.3	0.0	81.6	50.0	W21X44	
61	21.17	0.6	0.0	7.8	50.0	W8X10	
59	9.16	22.6	0.0	10.9	50.0	W10X12	
60	21.17	0.6	0.0	7.8	50.0	W8X10	
62	9.00	25.8	0.0	10.9	50.0	W10X12	
63	9.00	21.0	0.0	7.8	50.0	W8X10	



Beam Summary

Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
64	26.34	154.6	0.0	57.6	50.0	W18X35	
65	20.00	0.5	0.0	7.8	50.0	W8X10	
98	27.33	236.5	0.0	93.0	50.0	W21X48	
81	10.00	0.0	0.0	7.8	50.0	W8X10	
112	32.50	284.5	0.0	115.0	50.0	W24X55	
106	10.00	0.0	0.0	7.8	50.0	W8X10	
66	10.00	0.0	0.0	7.8	50.0	W8X10	
99	27.33	146.0	0.0	57.6	50.0	W18X35	
80	20.00	126.6	0.0	57.6	50.0	W18X35	
113	32.50	202.0	0.0	81.6	50.0	W21X44	
107	20.00	243.5	0.0	115.0	50.0	W24X55	
67	20.00	136.6	0.0	56.5	50.0	W16X36	
130	30.17	175.6	0.0	68.4	50.0	W18X40	
131	32.50	202.0	0.0	81.6	50.0	W21X44	
100	27.33	146.0	0.0	57.6	50.0	W18X35	
79	10.00	0.0	0.0	7.8	50.0	W8X10	
114	32.50	202.0	0.0	81.6	50.0	W21X44	
108	10.00	0.0	0.0	7.8	50.0	W8X10	
68	10.00	0.0	0.0	7.8	50.0	W8X10	
101	27.33	146.0	0.0	57.6	50.0	W18X35	
78	20.00	126.6	0.0	57.6	50.0	W18X35	
115	32.50	202.0	0.0	81.6	50.0	W21X44	
109	20.00	243.5	0.0	115.0	50.0	W24X55	
69	20.00	136.6	0.0	56.5	50.0	W16X36	
133	30.17	175.6	0.0	68.4	50.0	W18X40	
132	32.50	202.0	0.0	81.6	50.0	W21X44	
102	27.33	146.0	0.0	57.6	50.0	W18X35	
77	10.00	0.0	0.0	7.8	50.0	W8X10	
116	32.50	202.0	0.0	81.6	50.0	W21X44	
110	10.00	0.0	0.0	7.8	50.0	W8X10	
70	10.00	0.0	0.0	7.8	50.0	W8X10	
103	27.33	146.0	0.0	57.6	50.0	W18X35	
76	20.00	126.6	0.0	57.6	50.0	W18X35	
117	32.50	202.0	0.0	81.6	50.0	W21X44	
120	20.00	243.5	0.0	115.0	50.0	W24X55	
71	20.00	136.6	0.0	56.5	50.0	W16X36	
135	30.17	175.6	0.0	68.4	50.0	W18X40	
134	32.50	202.0	0.0	81.6	50.0	W21X44	
104	27.33	145.4	0.0	57.6	50.0	W18X35	
75	4.00	0.0	0.0	7.8	50.0	W8X10	
72	10.00	0.3	0.0	7.8	50.0	W8X10	
74	8.49	3.7	0.0	7.8	50.0	W8X10	
73	21.33	46.8	0.0	17.1	50.0	W12X16	



Beam Summary

Floor Type: First Floor

Bm #	Length ft	+M kip-ft	-M kip-ft	Seff in3	Fy ksi	Beam Size	Studs
53	22.00	63.8	0.0	29.0	50.0	W14X22	
54	23.00	152.4	0.0	64.7	50.0	W16X40	
91	8.49	3.5	0.0	7.8	50.0	W8X10	
127	13.00	0.0	0.0	7.8	50.0	W8X10	
126	22.00	138.6	0.0	57.6	50.0	W18X35	
90	7.00	0.0	0.0	7.8	50.0	W8X10	
66	30.17	196.3	0.0	81.6	50.0	W21X44	
77	10.00	0.0	0.0	7.8	50.0	W8X10	
65	32.50	271.4	0.0	115.0	50.0	W24X55	
85	10.00	0.0	0.0	7.8	50.0	W8X10	
55	10.00	0.0	0.0	7.8	50.0	W8X10	
67	30.17	175.6	0.0	68.4	50.0	W18X40	
78	20.00	126.6	0.0	57.6	50.0	W18X35	
68	32.50	242.0	0.0	93.0	50.0	W21X48	
86	20.00	258.0	0.0	115.0	50.0	W24X55	
56	20.00	169.9	0.0	68.4	50.0	W18X40	
113	30.17	175.6	0.0	68.4	50.0	W18X40	
112	32.50	242.0	0.0	93.0	50.0	W21X48	
76	30.17	175.6	0.0	68.4	50.0	W18X40	
79	10.00	0.0	0.0	7.8	50.0	W8X10	
69	32.50	242.0	0.0	93.0	50.0	W21X48	
87	10.00	0.0	0.0	7.8	50.0	W8X10	
57	10.00	0.0	0.0	7.8	50.0	W8X10	
75	30.17	175.6	0.0	68.4	50.0	W18X40	
80	20.00	126.6	0.0	57.6	50.0	W18X35	
70	32.50	242.0	0.0	93.0	50.0	W21X48	
88	20.00	258.0	0.0	115.0	50.0	W24X55	
58	20.00	169.9	0.0	68.4	50.0	W18X40	
114	30.17	175.6	0.0	68.4	50.0	W18X40	
115	32.50	242.0	0.0	93.0	50.0	W21X48	
74	30.17	175.6	0.0	68.4	50.0	W18X40	
81	10.00	0.0	0.0	7.8	50.0	W8X10	
71	32.50	242.0	0.0	93.0	50.0	W21X48	
89	10.00	0.0	0.0	7.8	50.0	W8X10	
59	10.00	0.0	0.0	7.8	50.0	W8X10	
73	30.17	175.6	0.0	68.4	50.0	W18X40	
82	20.00	126.6	0.0	57.6	50.0	W18X35	
72	32.50	242.0	0.0	93.0	50.0	W21X48	
2	20.00	258.0	0.0	115.0	50.0	W24X55	
60	20.00	169.9	0.0	68.4	50.0	W18X40	
117	30.17	175.6	0.0	68.4	50.0	W18X40	
116	32.50	242.0	0.0	93.0	50.0	W21X48	



Beam Summary

Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
1	30.17	175.6	0.0	68.4	50.0	W18X40	
83	10.00	0.0	0.0	7.8	50.0	W8X10	
5	32.50	242.0	0.0	93.0	50.0	W21X48	
3	10.00	0.0	0.0	7.8	50.0	W8X10	
61	10.00	0.0	0.0	7.8	50.0	W8X10	
4	30.17	175.6	0.0	68.4	50.0	W18X40	
111	21.50	145.6	0.0	68.4	50.0	W18X40	
6	32.50	242.0	0.0	93.0	50.0	W21X48	
18	20.00	265.0	0.0	115.0	50.0	W24X55	
62	20.00	169.9	0.0	68.4	50.0	W18X40	
118	30.17	186.3	0.0	68.4	50.0	W18X40	
119	32.50	242.0	0.0	93.0	50.0	W21X48	
7	32.50	242.0	0.0	93.0	50.0	W21X48	
11	10.00	31.9	0.0	17.1	50.0	W12X16	
63	10.00	0.0	0.0	7.8	50.0	W8X10	
8	30.17	175.6	0.0	68.4	50.0	W18X40	
9	8.50	0.0	0.0	7.8	50.0	W8X10	
10	30.17	164.9	0.0	68.4	50.0	W18X40	
17	10.00	0.0	0.0	7.8	50.0	W8X10	
12	32.50	242.2	0.0	93.0	50.0	W21X48	
51	10.00	0.0	0.0	7.8	50.0	W8X10	
64	10.00	0.0	0.0	7.8	50.0	W8X10	
19	12.00	52.5	0.0	21.3	50.0	W12X19	
52	9.16	13.1	0.0	7.8	50.0	W8X10	
50	23.34	202.3	0.0	81.6	50.0	W21X44	
108	21.17	0.6	0.0	7.8	50.0	W8X10	
106	9.16	22.6	0.0	10.9	50.0	W10X12	
107	21.17	0.6	0.0	7.8	50.0	W8X10	
110	9.00	25.8	0.0	10.9	50.0	W10X12	
47	9.00	21.0	0.0	7.8	50.0	W8X10	
20	26.34	166.9	0.0	68.4	50.0	W18X40	
21	20.00	0.5	0.0	7.8	50.0	W8X10	
38	27.33	236.5	0.0	93.0	50.0	W21X48	
92	10.00	0.0	0.0	7.8	50.0	W8X10	
22	35.34	582.6	0.0	213.0	50.0	W27X84	
24	10.00	0.0	0.0	7.8	50.0	W8X10	
101	10.00	0.0	0.0	7.8	50.0	W8X10	
37	27.33	146.0	0.0	57.6	50.0	W18X35	
93	20.00	114.5	0.0	57.6	50.0	W18X35	
23	35.34	515.0	0.0	213.0	50.0	W27X84	
25	20.00	243.5	0.0	115.0	50.0	W24X55	
102	20.00	148.9	0.0	68.4	50.0	W18X40	
120	27.33	146.0	0.0	57.6	50.0	W18X35	
121	35.34	236.4	0.0	93.0	50.0	W21X48	
36	27.33	146.0	0.0	57.6	50.0	W18X35	



Beam Summary

Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
94	10.00	0.0	0.0	7.8	50.0	W8X10	
32	35.34	515.0	0.0	213.0	50.0	W27X84	
26	10.00	0.0	0.0	7.8	50.0	W8X10	
103	10.00	0.0	0.0	7.8	50.0	W8X10	
35	27.33	146.0	0.0	57.6	50.0	W18X35	
95	20.00	114.5	0.0	57.6	50.0	W18X35	
31	35.34	515.0	0.0	213.0	50.0	W27X84	
27	20.00	243.5	0.0	115.0	50.0	W24X55	
104	20.00	148.9	0.0	68.4	50.0	W18X40	
123	27.33	146.0	0.0	57.6	50.0	W18X35	
122	35.34	236.4	0.0	93.0	50.0	W21X48	
34	27.33	146.0	0.0	57.6	50.0	W18X35	
96	10.00	0.0	0.0	7.8	50.0	W8X10	
30	35.34	515.0	0.0	213.0	50.0	W27X84	
39	10.00	0.0	0.0	7.8	50.0	W8X10	
105	10.00	0.0	0.0	7.8	50.0	W8X10	
41	27.33	146.0	0.0	57.6	50.0	W18X35	
97	20.00	114.5	0.0	57.6	50.0	W18X35	
42	35.34	515.0	0.0	213.0	50.0	W27X84	
40	20.00	243.5	0.0	115.0	50.0	W24X55	
49	20.00	148.9	0.0	68.4	50.0	W18X40	
124	27.33	146.0	0.0	57.6	50.0	W18X35	
125	35.34	236.4	0.0	93.0	50.0	W21X48	
33	27.33	145.4	0.0	57.6	50.0	W18X35	
98	4.00	0.0	0.0	7.8	50.0	W8X10	
29	10.00	0.0	0.0	7.8	50.0	W8X10	
99	8.49	3.7	0.0	7.8	50.0	W8X10	
100	21.33	46.8	0.0	17.1	50.0	W12X16	

Floor Type: Foundation

Bm #	Length ft	+M kip-ft	-M kip-ft	Seff in3	Fy ksi	Beam Size	Studs
15	20.00	0.5	0.0	7.8	50.0	W8X10	
31	30.17	1.1	0.0	7.8	50.0	W8X10	
29	32.50	1.3	0.0	7.8	50.0	W8X10	
16	10.00	0.0	0.0	7.8	50.0	W8X10	
32	30.17	1.1	0.0	7.8	50.0	W8X10	
30	32.50	1.3	0.0	7.8	50.0	W8X10	
17	20.00	0.5	0.0	7.8	50.0	W8X10	
33	32.50	1.3	0.0	7.8	50.0	W8X10	
35	10.00	0.3	0.0	7.8	50.0	W8X10	
34	30.17	1.1	0.0	7.8	50.0	W8X10	
40	8.50	0.0	0.0	7.8	50.0	W8X10	
37	30.17	1.1	0.0	7.8	50.0	W8X10	
41	10.00	0.0	0.0	7.8	50.0	W8X10	



Beam Summary

Bm #	Length	+M	-M	Seff	Fy	Beam Size	Studs
36	32.50	1.6	0.0	7.8	50.0	W8X10	
38	10.00	0.0	0.0	7.8	50.0	W8X10	
42	12.00	0.0	0.0	7.8	50.0	W8X10	
44	26.50	687.2	0.0	414.0	50.0	W27X146	
43	26.50	97.6	0.0	70.6	50.0	W12X53	
47	9.16	0.0	0.0	7.8	50.0	W8X10	
39	23.34	0.7	0.0	7.8	50.0	W8X10	
45	26.50	388.3	0.0	157.0	50.0	W14X99	
48	9.16	0.0	0.0	7.8	50.0	W8X10	
49	9.00	0.0	0.0	7.8	50.0	W8X10	
27	26.34	0.9	0.0	7.8	50.0	W8X10	
26	20.00	0.5	0.0	7.8	50.0	W8X10	
28	20.00	0.5	0.0	7.8	50.0	W8X10	
7	27.33	0.9	0.0	7.8	50.0	W8X10	
24	35.34	2.1	0.0	7.8	50.0	W8X10	
14	10.00	0.0	0.0	7.8	50.0	W8X10	
6	27.33	0.9	0.0	7.8	50.0	W8X10	
23	35.34	1.6	0.0	7.8	50.0	W8X10	
12	20.00	0.5	0.0	7.8	50.0	W8X10	
5	27.33	0.9	0.0	7.8	50.0	W8X10	
22	35.34	1.6	0.0	7.8	50.0	W8X10	
13	10.00	0.0	0.0	7.8	50.0	W8X10	
4	27.33	0.9	0.0	7.8	50.0	W8X10	
21	35.34	1.6	0.0	7.8	50.0	W8X10	
11	20.00	0.5	0.0	7.8	50.0	W8X10	
3	27.33	0.9	0.0	7.8	50.0	W8X10	
20	35.34	1.6	0.0	7.8	50.0	W8X10	
10	10.00	0.0	0.0	7.8	50.0	W8X10	
2	27.33	0.9	0.0	7.8	50.0	W8X10	
18	35.34	1.6	0.0	7.8	50.0	W8X10	
9	20.00	0.5	0.0	7.8	50.0	W8X10	
19	20.00	0.5	0.0	7.8	50.0	W8X10	
1	27.33	0.9	0.0	7.8	50.0	W8X10	
8	10.00	0.0	0.0	7.8	50.0	W8X10	

* after Size denotes beam failed stress/capacity criteria.

after Size denotes beam failed deflection criteria.

u after Size denotes this size has been assigned by the User.



RAM Steel v10.0
DataBase: EES
Building Code: IBC

Gravity Column Design Summary

03/30/06 14:30:19
Steel Code: ASD 9th Ed.

Column Line 1 - CC

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	10.2	6.0	0.0	1	0.13 Eq H1-3	90.0	50	W10X33
Third Floor	21.9	3.5	0.0	1	0.17 Eq H1-3	90.0	50	W10X33
Second Floor	31.5	3.2	0.0	3	0.21 Eq H1-1	90.0	50	W10X33
First Floor	40.7	2.8	0.0	1	0.35 Eq H1-1	90.0	50	W10X33

Column Line 1 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	22.5	5.8	6.8	1	0.44 Eq H1-3	90.0	50	W10X33
Third Floor	44.1	3.0	3.5	5	0.35 Eq H1-1	90.0	50	W10X33
Second Floor	63.8	2.8	3.3	5	0.47 Eq H1-1	90.0	50	W10X33
First Floor	82.8	2.5	2.9	1	0.86 Eq H1-1	90.0	50	W10X33

Column Line 2 - EF

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	1.6	0.3	0.3	1	0.02 Eq H1-3	90.0	50	W10X33
Third Floor	3.1	0.2	0.1	1	0.03 Eq H1-3	90.0	50	W10X33
Second Floor	4.6	0.4	0.3	1	0.04 Eq H1-3	90.0	50	W10X33
First Floor	7.3	0.3	0.3	1	0.07 Eq H1-3	90.0	50	W10X33

Column Line 22 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	16.9	9.8	0.1	10	0.22 Eq H1-3	90.0	50	W10X33
Third Floor	30.3	4.2	0.1	3	0.21 Eq H1-1	90.0	50	W10X33
Second Floor	42.7	4.0	0.1	4	0.30 Eq H1-1	90.0	50	W10X33
First Floor	44.2	0.1	0.1	1	0.35 Eq H1-1	90.0	50	W10X33

Column Line 3 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	22.4	13.3	0.0	6	0.29 Eq H1-3	90.0	50	W10X33
Third Floor	39.8	5.6	0.0	3	0.27 Eq H1-1	90.0	50	W10X33
Second Floor	56.3	7.0	0.0	1	0.38 Eq H1-1	90.0	50	W10X33
First Floor	75.7	5.7	0.0	1	0.67 Eq H1-1	90.0	50	W10X33

Column Line 3 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	55.8	5.5	3.8	3	0.49 Eq H1-1	90.0	50	W10X33
Third Floor	102.3	3.0	1.6	3	0.70 Eq H1-1	90.0	50	W10X33
Second Floor	147.0	2.9	1.8	3	0.53 Eq H1-1	90.0	50	W10X49
First Floor	190.8	1.1	0.0	1	0.72 Eq H1-1	90.0	50	W10X49



Gravity Column Design Summary

Column Line 3 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.3	18.1	4.9	10	0.51 Eq H1-2	90.0	50	W10X33
Third Floor	76.4	9.0	2.5	2	0.58 Eq H1-1	90.0	50	W10X33
Second Floor	111.1	8.8	2.4	2	0.54 Eq H1-1	90.0	50	W10X45
First Floor	144.9	7.8	2.1	1	0.98 Eq H1-1	90.0	50	W10X45

Column Line 4 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	6	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	4	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	94.4	6.1	2.7	4	0.46 Eq H1-1	90.0	50	W10X45
First Floor	122.0	5.5	2.4	1	0.80 Eq H1-1	90.0	50	W10X45

Column Line 4 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	3.8	13.0	5	0.66 Eq H1-1	90.0	50	W12X40
Third Floor	131.6	3.2	5.7	5	0.83 Eq H1-1	90.0	50	W12X40
Second Floor	189.4	3.3	6.4	5	0.59 Eq H1-1	90.0	50	W12X58
First Floor	246.4	1.0	5.7	1	0.94 Eq H1-1	90.0	50	W12X58

Column Line 4 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	6	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	76.9	7.8	3.5	5	0.60 Eq H1-1	90.0	50	W10X33
Second Floor	111.8	7.6	3.9	5	0.42 Eq H1-1	90.0	50	W10X49
First Floor	145.8	6.8	3.5	1	0.64 Eq H1-1	90.0	50	W10X49

Column Line 5 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	10	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	3	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	94.4	6.1	2.7	3	0.46 Eq H1-1	90.0	50	W10X45
First Floor	122.0	5.5	2.4	1	0.80 Eq H1-1	90.0	50	W10X45

Column Line 5 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	3.8	13.0	2	0.66 Eq H1-1	90.0	50	W12X40
Third Floor	131.6	3.2	5.7	2	0.83 Eq H1-1	90.0	50	W12X40
Second Floor	189.4	3.3	6.4	2	0.59 Eq H1-1	90.0	50	W12X58
First Floor	246.4	1.0	5.7	1	0.94 Eq H1-1	90.0	50	W12X58



Gravity Column Design Summary

Column Line 5 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	10	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	76.9	7.8	3.5	2	0.60 Eq H1-1	90.0	50	W10X33
Second Floor	111.8	7.6	3.9	2	0.42 Eq H1-1	90.0	50	W10X49
First Floor	145.8	6.8	3.5	1	0.64 Eq H1-1	90.0	50	W10X49

Column Line 6 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	6	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	4	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	94.4	6.1	2.7	4	0.46 Eq H1-1	90.0	50	W10X45
First Floor	122.0	5.5	2.4	1	0.80 Eq H1-1	90.0	50	W10X45

Column Line 6 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	3.8	13.0	5	0.66 Eq H1-1	90.0	50	W12X40
Third Floor	131.6	3.2	5.7	5	0.83 Eq H1-1	90.0	50	W12X40
Second Floor	189.4	3.3	6.4	5	0.59 Eq H1-1	90.0	50	W12X58
First Floor	246.4	1.0	5.7	1	0.94 Eq H1-1	90.0	50	W12X58

Column Line 6 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	6	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	76.9	7.8	3.5	5	0.60 Eq H1-1	90.0	50	W10X33
Second Floor	111.8	7.6	3.9	5	0.42 Eq H1-1	90.0	50	W10X49
First Floor	145.8	6.8	3.5	1	0.64 Eq H1-1	90.0	50	W10X49

Column Line 7 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	10	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	3	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	94.4	6.1	2.7	3	0.46 Eq H1-1	90.0	50	W10X45
First Floor	122.0	5.5	2.4	1	0.80 Eq H1-1	90.0	50	W10X45

Column Line 7 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	3.8	13.0	2	0.66 Eq H1-1	90.0	50	W12X40
Third Floor	131.6	3.2	5.7	2	0.83 Eq H1-1	90.0	50	W12X40
Second Floor	189.4	3.3	6.4	2	0.59 Eq H1-1	90.0	50	W12X58
First Floor	246.4	1.0	5.7	1	0.94 Eq H1-1	90.0	50	W12X58



Gravity Column Design Summary

Column Line 7 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	10	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	76.9	7.8	3.5	2	0.60 Eq H1-1	90.0	50	W10X33
Second Floor	111.8	7.6	3.9	2	0.42 Eq H1-1	90.0	50	W10X49
First Floor	145.8	6.8	3.5	1	0.64 Eq H1-1	90.0	50	W10X49

Column Line 8 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	6	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	4	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	94.4	6.1	2.7	4	0.46 Eq H1-1	90.0	50	W10X45
First Floor	122.0	5.5	2.4	1	0.80 Eq H1-1	90.0	50	W10X45

Column Line 8 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	3.8	13.0	5	0.66 Eq H1-1	90.0	50	W12X40
Third Floor	131.6	3.2	5.7	5	0.83 Eq H1-1	90.0	50	W12X40
Second Floor	189.4	4.2	6.4	5	0.59 Eq H1-1	90.0	50	W12X58
First Floor	246.4	0.6	5.7	1	0.94 Eq H1-1	90.0	50	W12X58
Foundation	247.4	0.6	0.0	1	0.74 Eq H1-1	90.0	50	W12X58

Column Line 8 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	6	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	76.9	7.8	3.5	5	0.60 Eq H1-1	90.0	50	W10X33
Second Floor	111.8	7.6	3.9	5	0.42 Eq H1-1	90.0	50	W10X49
First Floor	145.8	6.8	3.5	1	0.64 Eq H1-1	90.0	50	W10X49

Column Line 9 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	10	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	3	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	94.4	6.1	2.7	3	0.46 Eq H1-1	90.0	50	W10X45
First Floor	122.0	5.5	2.4	1	0.80 Eq H1-1	90.0	50	W10X45

Column Line 9 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	3.8	13.0	2	0.66 Eq H1-1	90.0	50	W12X40
Third Floor	131.6	3.2	5.7	2	0.83 Eq H1-1	90.0	50	W12X40
Second Floor	189.4	3.3	6.4	2	0.59 Eq H1-1	90.0	50	W12X58
First Floor	246.4	1.0	5.7	1	0.94 Eq H1-1	90.0	50	W12X58
Foundation	247.8	0.0	0.0	1	0.74 Eq H1-1	90.0	50	W12X58



Gravity Column Design Summary

Column Line 9 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	10	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	76.9	7.8	3.5	2	0.60 Eq H1-1	90.0	50	W10X33
Second Floor	111.8	7.6	3.9	2	0.42 Eq H1-1	90.0	50	W10X49
First Floor	145.8	6.8	3.5	1	0.64 Eq H1-1	90.0	50	W10X49

Column Line 10 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	38.8	14.7	7.7	6	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	69.3	6.2	3.2	4	0.52 Eq H1-1	90.0	50	W10X33
Second Floor	98.7	6.1	3.1	4	0.48 Eq H1-1	90.0	50	W10X45
First Floor	127.7	5.4	2.8	1	0.86 Eq H1-1	90.0	50	W10X45

Column Line 10 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	72.5	3.8	13.5	5	0.68 Eq H1-1	90.0	50	W12X40
Third Floor	132.9	3.2	5.9	5	0.85 Eq H1-1	90.0	50	W12X40
Second Floor	191.4	3.3	6.6	5	0.59 Eq H1-1	90.0	50	W12X58
First Floor	248.9	1.0	5.9	1	0.96 Eq H1-1	90.0	50	W12X58
Foundation	250.3	0.0	0.0	1	0.75 Eq H1-1	90.0	50	W12X58

Column Line 10 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	6	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	76.9	7.8	3.5	5	0.60 Eq H1-1	90.0	50	W10X33
Second Floor	111.8	7.6	3.9	5	0.42 Eq H1-1	90.0	50	W10X49
First Floor	145.8	6.8	3.5	1	0.64 Eq H1-1	90.0	50	W10X49

Column Line 11 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	64.8	17.2	5.5	11	0.57 Eq H1-1	90.0	50	W12X40
Third Floor	122.2	7.8	2.9	11	0.78 Eq H1-1	90.0	50	W12X40
Second Floor	178.6	7.6	3.1	11	0.62 Eq H1-1	90.0	50	W12X53
First Floor	233.9	6.9	2.8	10	0.95 Eq H1-1	90.0	50	W12X53
Foundation	239.6	0.1	0.0	1	0.79 Eq H1-1	90.0	50	W12X53

Column Line 11 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	48.4	15.4	1.8	7	0.49 Eq H1-1	90.0	50	W10X33
Third Floor	94.6	7.6	1.4	7	0.73 Eq H1-1	90.0	50	W10X33
Second Floor	145.5	7.4	4.1	5	0.56 Eq H1-1	90.0	50	W10X49
First Floor	179.0	6.6	3.4	1	0.78 Eq H1-1	90.0	50	W10X49



Gravity Column Design Summary

Column Line 112 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	10	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.4	6.2	2.8	3	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	94.5	6.1	2.7	3	0.46 Eq H1-1	90.0	50	W10X45
First Floor	122.2	5.5	2.4	1	0.80 Eq H1-1	90.0	50	W10X45
Foundation	123.1	0.0	0.0	1	0.59 Eq H1-1	90.0	50	W10X45

Column Line 115 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	42.1	25.4	0.0	6	0.46 Eq H1-1	90.0	50	W10X33
Third Floor	64.6	7.2	0.0	3	0.44 Eq H1-1	90.0	50	W10X33
Second Floor	82.0	5.6	0.0	3	0.53 Eq H1-1	90.0	50	W10X33
First Floor	99.3	5.0	0.0	1	0.85 Eq H1-1	90.0	50	W10X33

Column Line 115 - D

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	55.2	3.4	1.9	2	0.42 Eq H1-1	90.0	50	W10X33
Third Floor	99.3	3.3	0.8	2	0.66 Eq H1-1	90.0	50	W10X33
Second Floor	139.7	3.4	0.9	2	0.48 Eq H1-1	90.0	50	W10X49
First Floor	179.4	1.3	0.8	1	0.69 Eq H1-1	90.0	50	W10X49
Foundation	180.6	0.0	0.0	1	0.63 Eq H1-1	90.0	50	W10X49

Column Line 115 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
First Floor	31.1	18.7	0.0	1	0.44 Eq H1-1	90.0	50	W10X33

Column Line 12 - F

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	0.6	0.0	0.1	1	0.01 Eq H1-3	90.0	50	W10X33
Third Floor	1.1	5.5	0.0	1	0.07 Eq H1-3	90.0	50	W10X33
Second Floor	19.5	6.0	0.0	1	0.10 Eq H1-3	90.0	50	W10X54
First Floor	34.3	4.5	31.1	1	0.63 Eq H1-3	90.0	50	W10X54
Foundation	138.9	0.0	33.7	1	0.91 Eq H1-1	90.0	50	W10X54

Column Line 12 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	46.3	16.8	4.1	4	0.51 Eq H1-1	90.0	50	W10X33
Third Floor	85.4	7.8	1.7	3	0.65 Eq H1-1	90.0	50	W10X33
Second Floor	113.8	6.6	0.0	3	0.60 Eq H1-1	90.0	50	W10X39
First Floor	141.6	5.9	0.0	1	0.96 Eq H1-1	90.0	50	W10X39
Foundation	142.4	0.0	0.0	1	0.81 Eq H1-1	90.0	50	W10X39



Gravity Column Design Summary

Column Line 12 - B

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	46.4	20.1	7.1	1	0.64 Eq H1-2	90.0	50	W10X33
Third Floor	87.8	9.3	3.5	2	0.68 Eq H1-1	90.0	50	W10X33
Second Floor	127.1	9.2	3.9	2	0.35 Eq H1-1	90.0	50	W10X68
First Floor	154.4	8.3	21.8	1	0.67 Eq H1-1	90.0	50	W10X68
Foundation	227.7	0.0	23.6	1	0.86 Eq H1-1	90.0	50	W10X68

Column Line 15 - BC

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	36.0	10.8	0.0	3	0.31 Eq H1-1	90.0	50	W10X33
Third Floor	64.3	4.6	0.0	3	0.42 Eq H1-1	90.0	50	W10X33
Second Floor	90.5	5.6	0.0	2	0.58 Eq H1-1	90.0	50	W10X33
First Floor	117.1	3.9	0.0	1	0.98 Eq H1-1	90.0	50	W10X33
Foundation	117.9	0.0	0.0	1	0.81 Eq H1-1	90.0	50	W10X33

Column Line 15 - A

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	28.1	16.8	0.1	2	0.30 Eq H1-1	90.0	50	W10X33
Third Floor	50.0	7.1	0.0	2	0.35 Eq H1-1	90.0	50	W10X33
Second Floor	67.8	7.4	0.0	1	0.45 Eq H1-1	90.0	50	W10X33
First Floor	88.4	6.1	0.0	1	0.77 Eq H1-1	90.0	50	W10X33
Foundation	89.1	0.0	0.0	1	0.62 Eq H1-1	90.0	50	W10X33

Column Line 16 - E

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	42.2	25.5	0.1	3	0.45 Eq H1-1	90.0	50	W10X33
Third Floor	75.5	10.7	0.0	3	0.52 Eq H1-1	90.0	50	W10X33
Second Floor	104.5	9.5	0.0	3	0.56 Eq H1-1	90.0	50	W10X39
First Floor	133.2	8.5	0.0	1	0.93 Eq H1-1	90.0	50	W10X39

Column Line 16 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Second Floor	35.5	76.3	0.0	2	0.49 Eq H1-3	90.0	50	W12X58
First Floor	242.6	50.9	0.0	1	0.96 Eq H1-1	90.0	50	W12X58
Foundation	244.0	0.0	0.0	1	0.73 Eq H1-1	90.0	50	W12X58

Column Line 16 - C

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	75.4	3.1	0.0	2	0.50 Eq H1-1	90.0	50	W10X33
Third Floor	135.4	0.6	0.0	1	0.84 Eq H1-1	90.0	50	W10X33



Gravity Column Design Summary

Column Line 16 - A

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.2	23.6	0.1	10	0.41 Eq H1-1	90.0	50	W10X33
Third Floor	70.0	9.9	0.0	2	0.48 Eq H1-1	90.0	50	W10X33
Second Floor	99.8	16.3	0.0	1	0.48 Eq H1-1	90.0	50	W10X45
First Floor	144.4	13.4	0.0	1	0.87 Eq H1-1	90.0	50	W10X45

Column Line 17 - E

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	6	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	4	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	92.5	5.4	2.7	4	0.53 Eq H1-1	90.0	50	W10X39
First Floor	117.5	4.9	2.2	1	0.95 Eq H1-1	90.0	50	W10X39

Column Line 17 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Second Floor	22.2	71.2	8.6	2	0.61 Eq H1-3	90.0	50	W10X60
First Floor	226.5	45.4	5.6	1	0.99 Eq H1-1	90.0	50	W10X60
Foundation	228.0	0.0	0.0	1	0.65 Eq H1-1	90.0	50	W10X60

Column Line 17 - C

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	1.9	13.0	4	0.65 Eq H1-1	90.0	50	W10X39
Third Floor	129.0	0.5	5.4	1	0.89 Eq H1-1	90.0	50	W10X39

Column Line 17 - A

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	6	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	71.0	6.6	3.0	5	0.53 Eq H1-1	90.0	50	W10X33
Second Floor	101.2	12.5	4.0	1	0.39 Eq H1-1	90.0	50	W10X49
First Floor	146.5	10.2	3.2	1	0.66 Eq H1-1	90.0	50	W10X49

Column Line 18 - E

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	10	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	3	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	92.5	5.4	2.7	3	0.53 Eq H1-1	90.0	50	W10X39
First Floor	117.5	4.9	2.2	1	0.95 Eq H1-1	90.0	50	W10X39

Column Line 18 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Second Floor	22.2	71.2	8.6	5	0.61 Eq H1-3	90.0	50	W10X60
First Floor	226.5	45.4	5.6	1	0.99 Eq H1-1	90.0	50	W10X60
Foundation	228.0	0.0	0.0	1	0.65 Eq H1-1	90.0	50	W10X60



Gravity Column Design Summary

Column Line 18 - C

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	1.9	13.0	3	0.65 Eq H1-1	90.0	50	W10X39
Third Floor	129.0	0.5	5.4	1	0.89 Eq H1-1	90.0	50	W10X39

Column Line 18 - A

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	10	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	71.0	6.6	3.0	2	0.53 Eq H1-1	90.0	50	W10X33
Second Floor	101.2	12.5	4.0	1	0.39 Eq H1-1	90.0	50	W10X49
First Floor	146.5	10.2	3.2	1	0.66 Eq H1-1	90.0	50	W10X49

Column Line 19 - E

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	6	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	4	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	92.5	5.4	2.7	4	0.53 Eq H1-1	90.0	50	W10X39
First Floor	117.5	4.9	2.2	1	0.95 Eq H1-1	90.0	50	W10X39

Column Line 19 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Second Floor	22.2	71.2	8.6	2	0.61 Eq H1-3	90.0	50	W10X60
First Floor	226.5	45.4	5.6	1	0.99 Eq H1-1	90.0	50	W10X60
Foundation	228.0	0.0	0.0	1	0.65 Eq H1-1	90.0	50	W10X60

Column Line 19 - C

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	1.9	13.0	4	0.65 Eq H1-1	90.0	50	W10X39
Third Floor	129.0	0.5	5.4	1	0.89 Eq H1-1	90.0	50	W10X39

Column Line 19 - A

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	6	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	71.0	6.6	3.0	5	0.53 Eq H1-1	90.0	50	W10X33
Second Floor	101.2	12.5	4.0	1	0.39 Eq H1-1	90.0	50	W10X49
First Floor	146.5	10.2	3.2	1	0.66 Eq H1-1	90.0	50	W10X49

Column Line 20 - E

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	10	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	3	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	92.5	5.4	2.7	3	0.53 Eq H1-1	90.0	50	W10X39
First Floor	117.5	4.9	2.2	1	0.95 Eq H1-1	90.0	50	W10X39



Gravity Column Design Summary

Column Line 20 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Second Floor	22.2	71.2	8.6	5	0.61 Eq H1-3	90.0	50	W10X60
First Floor	226.5	45.4	5.6	1	0.99 Eq H1-1	90.0	50	W10X60
Foundation	228.0	0.0	0.0	1	0.65 Eq H1-1	90.0	50	W10X60

Column Line 20 - C

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	1.9	13.0	3	0.65 Eq H1-1	90.0	50	W10X39
Third Floor	129.0	0.5	5.4	1	0.89 Eq H1-1	90.0	50	W10X39

Column Line 20 - A

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	10	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	71.0	6.6	3.0	2	0.53 Eq H1-1	90.0	50	W10X33
Second Floor	101.2	12.5	4.0	1	0.39 Eq H1-1	90.0	50	W10X49
First Floor	146.5	10.2	3.2	1	0.66 Eq H1-1	90.0	50	W10X49

Column Line 21 - E

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	37.1	14.7	6.7	6	0.53 Eq H1-2	90.0	50	W10X33
Third Floor	66.3	6.2	2.8	4	0.49 Eq H1-1	90.0	50	W10X33
Second Floor	92.5	5.4	2.7	4	0.53 Eq H1-1	90.0	50	W10X39
First Floor	117.5	4.9	2.2	1	0.95 Eq H1-1	90.0	50	W10X39

Column Line 21 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Second Floor	22.2	71.2	8.6	2	0.61 Eq H1-3	90.0	50	W10X60
First Floor	226.5	45.4	5.6	1	0.99 Eq H1-1	90.0	50	W10X60
Foundation	228.0	0.0	0.0	1	0.65 Eq H1-1	90.0	50	W10X60

Column Line 21 - C

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	71.8	1.9	13.0	4	0.65 Eq H1-1	90.0	50	W10X39
Third Floor	129.0	0.5	5.4	1	0.89 Eq H1-1	90.0	50	W10X39

Column Line 21 - A

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	39.7	15.8	7.2	6	0.57 Eq H1-2	90.0	50	W10X33
Third Floor	71.0	6.6	3.0	5	0.53 Eq H1-1	90.0	50	W10X33
Second Floor	101.2	12.5	4.0	1	0.39 Eq H1-1	90.0	50	W10X49
First Floor	146.5	10.2	3.2	1	0.66 Eq H1-1	90.0	50	W10X49



Gravity Column Design Summary

Column Line 22 - E

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	33.7	12.6	6.8	10	0.50 Eq H1-2	90.0	50	W10X33
Third Floor	60.2	5.3	2.8	3	0.45 Eq H1-1	90.0	50	W10X33
Second Floor	85.6	5.2	2.7	3	0.49 Eq H1-1	90.0	50	W10X39
First Floor	109.7	4.6	2.2	1	0.87 Eq H1-1	90.0	50	W10X39

Column Line 22 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	23.3	13.9	0.1	1	0.30 Eq H1-3	90.0	50	W10X33
Third Floor	41.5	5.9	0.0	2	0.29 Eq H1-1	90.0	50	W10X33
Second Floor	58.9	5.7	6.4	5	0.47 Eq H1-1	90.0	50	W10X39
First Floor	95.1	4.9	5.1	1	0.88 Eq H1-1	90.0	50	W10X39
Foundation	96.0	0.0	0.0	1	0.54 Eq H1-1	90.0	50	W10X39

Column Line 22 - A

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	15.2	0.0	7.9	1	0.37 Eq H1-3	90.0	50	W10X33
Third Floor	22.2	0.0	3.5	6	0.26 Eq H1-3	90.0	50	W10X33
Second Floor	39.0	0.0	3.3	2	0.28 Eq H1-1	90.0	50	W10X33
First Floor	51.0	0.0	3.1	1	0.51 Eq H1-1	90.0	50	W10X33

Column Line 222 - E

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	2.2	0.5	0.4	6	0.03 Eq H1-3	90.0	50	W10X33
Third Floor	4.2	0.2	0.2	1	0.04 Eq H1-3	90.0	50	W10X33
Second Floor	6.2	0.2	0.2	1	0.05 Eq H1-3	90.0	50	W10X33
First Floor	8.3	0.2	0.2	1	0.07 Eq H1-3	90.0	50	W10X33

Column Line 23 - DE

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	11.7	5.4	0.6	8	0.15 Eq H1-3	90.0	50	W10X33
Third Floor	22.4	2.4	0.3	2	0.17 Eq H1-3	90.0	50	W10X33
Second Floor	31.4	2.1	0.2	3	0.21 Eq H1-1	90.0	50	W10X33
First Floor	40.2	1.9	0.2	1	0.35 Eq H1-1	90.0	50	W10X33

Column Line 23 - CD

Level	P	Mx	My	LC	Interaction Eq.	Angle	Fy	Size
Fourth Floor	10.0	5.8	0.1	1	0.13 Eq H1-3	90.0	50	W10X33
Third Floor	19.1	2.7	0.0	1	0.15 Eq H1-3	90.0	50	W10X33
Second Floor	26.8	2.5	0.0	2	0.18 Eq H1-1	90.0	50	W10X33
First Floor	34.3	2.2	0.0	1	0.29 Eq H1-1	90.0	50	W10X33

Appendix D: Beam Spotcheck

$$1.2D+1.6L=1.2(82.5 \text{ psf}) +1.6(100\text{psf}) = 259 \text{ psf}$$

$$259 \text{ psf} * 10 \text{ feet} = 2,590 \text{ plf}$$

$$M=wl^2/8= (2,590 \text{ plf} * (30 \text{ ft})^2)/8 = 291 \text{ ft-k}$$

Using Table 5-3 it is seen that a W18x40 would have been sufficient, the RAM model suggested that a W21x44 should have been used. The W21x44 is the most efficient beam in the next category up. It was probably suggested so to deflection criterion.

Appendix E: Parapet Calculations

8" CMU, fully grouted, reinforced with #6's at 40 in spacing

$$M=15 \text{ psf} (8.5)(4.25)=541.9 \text{ ft-lb/ft}$$

Compression check:

$$F_m=\{541(12)/12(3.81)^2\}[2/.894(.319)]=261.36 \text{ psi} < F_b=500 \text{ psi OK}$$

Tension check:

$$.133(24,000)(.894)(3.8)/12=904 \text{ ft-lbs} > 541.9 \text{ ft-lbs OK}$$

Appendix F: Cost Analysis

Eliminated Items									
Steel	Beams			Excavation	Area		Backhoe 100 CY/hr	20 CY truck 1 mile roud trip	
W12x16	122	\$1,830		Soil	13206.5 ft2				
W16x26	296	\$5,757			211304 ft3				
W16x31	357.5	\$8,201			7826 yard3	\$10,956		\$17,295	
W18x35	175	\$4,569							
W18x40	91	\$2,695		Metal Decking	Area			Slab on Deck	
W21x50	32.5	\$1,113			13206.5 ft2		\$17,168	57102 ft2	\$701,393
Steel Columns				Poured 3" Concrete	Area			Roof Deck	\$22,269
W10x33	48	\$1,078			193 yd3		\$17,176	19034 ft2	
W10x39	32	\$864							
W10x45	32	\$1,010		12" CMU wall 16' height					
W10x68	160	\$7,472			8704 ft2	\$49,265			

Added Items									
Slab on Grade 5" conc			13206.5 ft2		\$18,489			2952 ft2	\$12,044
Hollowcore Plank			76136 ft2		\$605,281				

Steel change											
2nd Floor			Columns			2nd Floor			Columns		
W14x30	210	\$4,691	W10x33	1261	\$28,309	W18x35	363	\$9,477	W10x33	1852	\$41,577
W16x26	285	\$5,543	W10x39	1446	\$36,150	W18x40	530	\$15,693	W10x39	438	\$10,950
W16x31	274	\$6,285	W10x45	648	\$20,457	W21x48	511.5	\$17,519	W10x45	320	\$10,102
W18x35	558	\$14,569	W10x49	260	\$9,360	W24x55	204	\$7,572	W10x49	480	\$17,280
W18x40	140	\$4,145	W10x54	140	\$5,320				W10x54	32	\$1,216
W24x84(50)	204	\$11,262	W10x60	260	\$10,920	3rd Floor			W10x60	192	\$8,064
			W10x68	240	\$11,208	W16x31	30	\$688	W12x40	240	\$7,920
					\$121,725	W16x36	60	\$1,500	W12x58	288	\$10,656
3rd floor						W18x35	332	\$8,668			\$107,766
W14x30	261	\$5,830				W18x40	59	\$1,747			
W16x31	733	\$16,815				W21x44	260	\$7,865			
W18x35	562	\$14,673				W21x48	416	\$14,248			
W18x40	80	\$2,368				W24x55	64	\$2,375			
4th Floor						4th Floor					
W14x30	261	\$5,830				W16x31	30	\$688			
W16x31	733	\$16,815				W16x36	60	\$1,500			
W18x35	562	\$14,673				W18x35	197	\$5,143			
W18x40	80	\$2,368				W18x40	696	\$20,608			
						W21x44	286	\$8,651			
Roof						W21x48	416	\$14,248			
18k5	60	\$319				W24x55	59	\$2,190			
22k5	144	\$813									
22k6	135	\$783				Roof					
26k7	723	\$4,700				W16x36	120	\$3,000			
28k7	1592.5	\$11,275				W18x40	170	\$5,033			
W16x31	558	\$12,800				W21x44	1280	\$38,720			
W18x40	160	\$4,737				W24x55	150	\$5,568			
		\$161,293						\$192,701			

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