APPENDIX I

Properties and Schedules

LIVE LOAD

IBC 2006 Edition

	Landscaped Roof	20 lb/ft^2	1607.11.2.3
	Hotel/Multi-Family	40 lb/ft^2	Table 1607.1
	Retail (1st Floor)	100 lb/ft^2	Table 1607.1
	Retail (2nd Floor)	75 lb/ft^2	Table 1607.1
	Balconies	100 lb/ft^2	Table 1607.1

DEAD LOAD

Roof	Media/Sedum	23.5 lb/ft^2
	Root Barrier	0.5 lb/ft^2
	Insulation	1 lb/ft^2
	HDPE 80	1 lb/ft^2
	Collateral	6 lb/ft^2
		32 lb/ft^2
Terrace	Insulation	1 lb/ft^2
	EPDM	3 lb/ft^2
	Partition	10 lb/ft^2
	Pavers	10 lb/ft^2
	Collateral	6 lb/ft^2
		30 lb/ft^2
Residential	Partitions	20 lb/ft^2
	Collateral	8 lb/ft^2
		28 lb/ft^2
Commercial	Collateral	10 lb/ft^2
Span Deck®	8"x 96" w/o Topping	59 lb/ft^2
	8"x 96" w/ 2" Topping	84 lb/ft^2
	10"x 96" w/ 2" Topping	91 lb/ft^2

Old Castle Precast

SNOW LOAD

ASCE 7-05

P_g	25
C_e	1
C_t	1
I_s	1
$P_f = 0.7 C_e C_t I P_g$	18 lb/ft^2

SPAN—DECK®

8" x 96" SECTION
WITH 2" TOPPING

UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.

Standard Designation	7-WIRE P/S Strand Combination	P/S Strand Area Sq. in.	Ultimate Bending Moment ø Mn in Kip. Ft. per Unit	SIMPLE SPAN IN FEET																		ø Vcw in Kips per Unit
				16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
T8S138	13-1/2	1.989	281.0							272	243	218	195	175	158	142	127	115	103	92	83	52.64
T8S128	12-1/2	1.836	263.2							251	224	200	179	160	143	128	115	103	92	82	73	51.60
T8S118	11-1/2	1.683	244.8						257	228	203	181	161	144	128	115	102	91	81	71	63	50.55
T8S108	10-1/2	1.530	225.7					263	232	205	182	161	143	127	113	100	89	78	69	60		49.51
T8S98	9-1/2	1.377	206.0				266	234	206	181	160	141	125	110	97	85	75	65	57			48.46
T8S88	8-1/2	1.224	185.5			268	233	204	178	156	137	120	105	92	81	70	61	52				47.42
T8S78	7-1/2	1.071	164.4		265	229	199	173	150	131	114	99	86	74	63	54						46.37
T8S52	5-1/2 & 2-3/8	.935	145.2	265	226	194	167	144	125	107	92	79	68	57								45.44

*INCLUDES THE LIVE LOAN PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED SLABS IN PLACE

NOTES

1. Design Criteria: ACI 318-95
2. For complete and detailed calculations consult Oldcastle Precast, Inc.
3. For longer spans, heavier loads, or special conditions consult Oldcastle Precast, Inc.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.

Grouted weight of slabs is 84 lbs. per sq. ft.

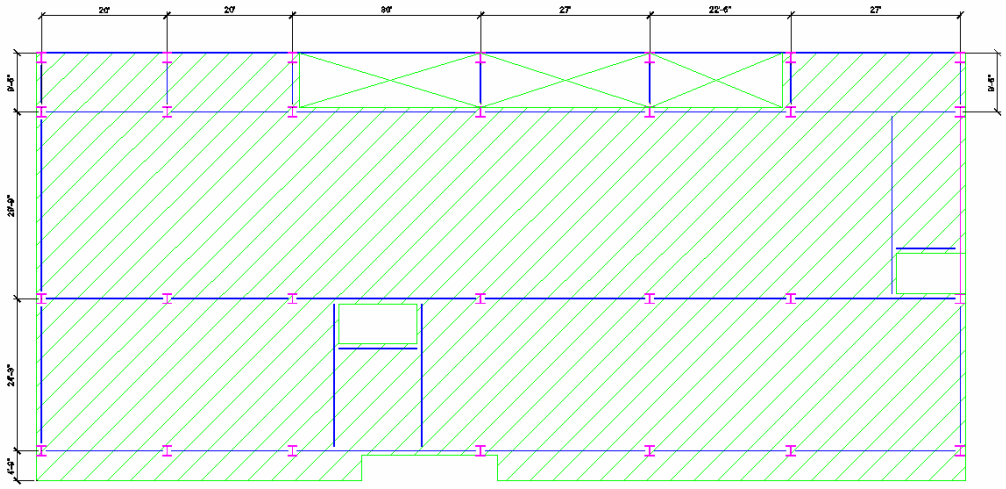
f'c = 5,000 psi f'ci = 3,500 psi Area = 364 in.²

f'pu = 270,000 psi I = 5,860 in.⁴ bw = 22.50 in.

January, 1996

Old Castle Plank Schedule

	Superimposed (D+L)	Length (ft)	Plank (ft)	Load (lb/ft^2)	Type
Roof	52 lb/ft^2	29'-9"	30	65	T8S98
	52 lb/ft^2	24'-3"	25	68	T8S52
	52 lb/ft^2	24'-3" w/c	25	68	T8S52
Level 9	68 lb/ft^2	29'-9"	30	78	T8S108
	68 lb/ft^2	24'-3"	25	86	T8S78
	68 lb/ft^2	24'-3" w/c	25	86	T8S78
Level 8	68 lb/ft^2	29'-9"	30	78	T8S108
	68 lb/ft^2	24'-3"	25	86	T8S78
	68 lb/ft^2	24'-3" w/c	25	86	T8S78
Level 7	68 lb/ft^2	29'-9"	30	78	T8S108
	68 lb/ft^2	24'-3"	25	86	T8S78
	68 lb/ft^2	24'-3" w/c	25	86	T8S78
Level 6	68 lb/ft^2	29'-9"	30	78	T8S108
	68 lb/ft^2	24'-3"	25	86	T8S78
	68 lb/ft^2	24'-3" w/c	25	86	T8S78
Terrace	130 lb/ft^2	9'-5"	16	265	T8S52
Level 5	68 lb/ft^2	29'-9"	30	78	T8S108
	68 lb/ft^2	24'-3"	25	86	T8S78
	68 lb/ft^2	24'-3" w/c	25	86	T8S78
	68 lb/ft^2	9'-5"	16	265	T8S52
Terrace	130 lb/ft^2	9'-5"	16	265	T8S52
Level 4	68 lb/ft^2	29'-9"	30	78	T8S108
	68 lb/ft^2	24'-3"	25	86	T8S78
	68 lb/ft^2	24'-3" w/c	25	86	T8S78
	68 lb/ft^2	9'-5"	16	265	T8S52
Level 3	68 lb/ft^2	29'-9"	30	78	T8S108
	68 lb/ft^2	24'-3"	25	86	T8S78
	68 lb/ft^2	24'-3" w/c	25	86	T8S78
	68 lb/ft^2	9'-5"	16	265	T8S52
Terrace	130 lb/ft^2	9'-5"	16	265	T8S52
Level 2	85 lb/ft^2	29'-9"	30	91	T8S118
	85 lb/ft^2	24'-3"	25	86	T8S78
	85 lb/ft^2	24'-3" w/c	25	86	T8S78
Level 1	110 lb/ft^2	29'-9"	30	115	T8S138
	110 lb/ft^2	24'-3"	25	125	T8S98
	110 lb/ft^2	24'-3" w/c	25	125	T8S98



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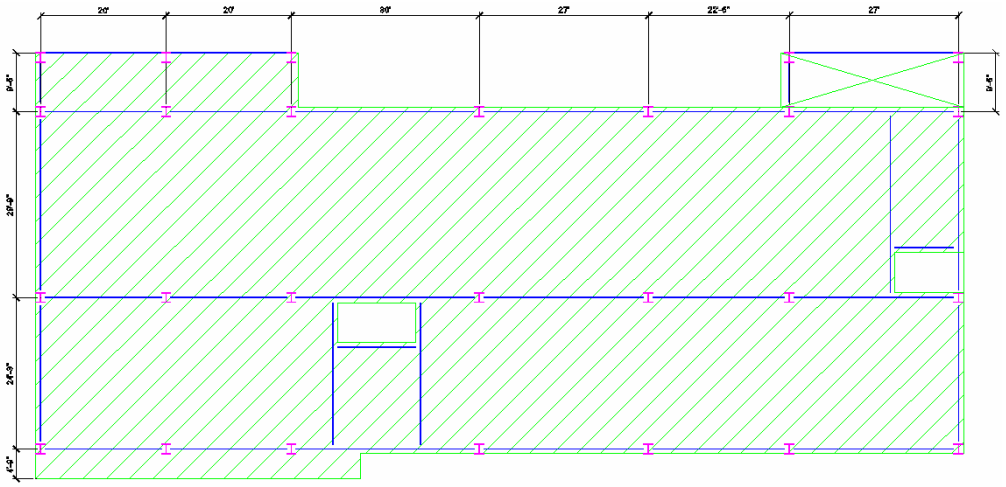

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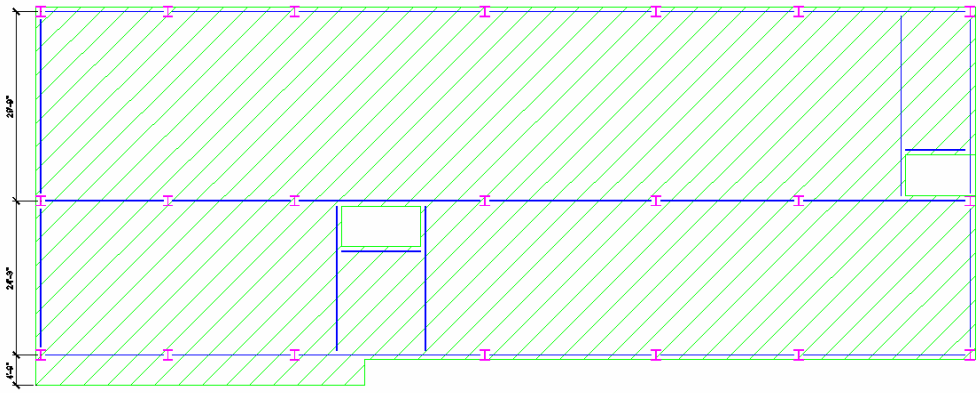


LEVEL 7

BEAM SCHEDULE

Level 8

Size	Length	Studs	Wt (lbs)
W10x 12	24.25		291
W14x 22	20.00		440
W8x 10	11.50		115
W8x 10	20.00	22	200
W8x 10	18.25		183
W12x 19	20.00		380
W14x 22	20.00		440
W8x 10	20.00	22	200
W12x 19	20.00		380
W12x 26	24.25		631
W14x 30	30.00		900
W14x 26	30.00		780
W10x 12	30.00	32	360
W14x 30	30.00		900
W8x 10	7.92		79
W8x 10	7.92		79
W12x 26	24.25		631
W14x 22	27.00		594
W8x 10	13.50	8	135
W14x 26	27.00		702
W8x 10	13.50	8	135
W14x 22	22.50		495
W10x 12	22.50	22	270
W14x 22	22.50		495
W14x 22	27.00		594
W8x 10	15.08	8	151
W14x 26	27.00		702
W8x 21	29.75	8	625
W8x 10	11.92		119
W8x 10	11.92		119
W10x 12	24.25		291
W14x 26	29.75		774
		130	13188

Level 9

Size	Length	Studs	Wt (lbs)
W10x 12	24.25		291
W14x 22	20.00		440
W8x 10	11.50		115
W8x 10	20.00	22	200
W8x 10	18.25		183
W12x 19	20.00		380
W14x 22	20.00		440
W8x 10	20.00	22	200
W12x 19	20.00		380
W12x 26	24.25		631
W14x 30	30.00		900
W14x 26	30.00		780
W10x 12	30.00	32	360
W14x 30	30.00		900
W8x 10	7.92		79
W8x 10	7.92		79
W12x 26	24.25		631
W14x 22	27.00		594
W8x 10	13.50	8	135
W14x 26	27.00		702
W8x 10	13.50	8	135
W14x 22	22.50		495
W10x 12	22.50	22	270
W14x 22	22.50		495
W14x 22	27.00		594
W8x 10	15.08	8	151
W14x 26	27.00		702
W8x 21	29.75	8	625
W8x 10	11.92		119
W8x 10	11.92		119
W10x 12	24.25		291
W14x 26	29.75		774
		130	13188

Roof

Size	Length	Studs	Wt (lbs)
W10x 12	24.25		291
W14x 22	20.00		440
W8x 10	11.50		115
W8x 10	20.00	16	200
W8x 10	18.25		183
W12x 14	20.00		280
W12x 14	20.00		280
W8x 10	20.00	16	200
W12x 14	20.00		280
W14x 22	30.00		660
W12x 16	30.00	34	480
W14x 22	30.00		660
W8x 10	24.25		243
W12x 19	27.00		513
W8x 10	13.50	8	135
W14x 22	27.00		594
W8x 10	13.50	8	135
W12x 14	22.50		315
W8x 10	22.50	24	225
W12x 16	22.50		360
W12x 19	27.00		513
W8x 10	15.08	8	151
W14x 22	27.00		594
W8x 10	11.92	8	119
W8x 10	24.25		243
W10x 15	29.75		446
		122	8654

Level 5

Size	Length	Studs	Wt (lbs)
W8x 10	24.25		243
W14x 22	20.00		440
W8x 10	11.50		115
W8x 10	20.00	22	200
W8x 10	18.25		183
W8x 10	9.50		95
W8x 10	20.00	14	200
W10x 12	20.00		240
W14x 22	20.00		440
W8x 10	20.00	22	200
W8x 10	20.00	14	200
W10x 12	20.00		240
W12x 26	24.25		631
W14x 26	30.00		780
W14x 26	30.00		780
W10x 12	30.00	32	360
W8x 10	9.50		95
W14x 30	30.00		900
W8x 10	7.92		79
W8x 10	7.92		79
W12x 26	24.25		631
W14x 22	27.00		594
W8x 10	13.50	8	135
W14x 26	27.00		702
W8x 10	13.50	8	135
W14x 22	22.50		495
W10x 12	22.50	22	270
W14x 22	22.50		495
W14x 22	27.00		594
W8x 10	15.08	8	151
W8x 10	9.50		95
W12x 14	27.00	36	378
W14x 30	27.00		810
W8x 21	29.75		625
W8x 10	11.92	8	119
W8x 10	11.92		119
W8x 10	24.25		243
W8x 21	29.75		625
W8x 10	9.50		95
		194	13809

Level 6

Size	Length	Studs	Wt (lbs)
W8x 10	24.25		243
W14x 22	20.00		440
W8x 10	11.50		115
W8x 10	20.00	22	200
W8x 10	18.25		183
W8x 10	9.50		95
W8x 10	20.00	22	200
W12x 19	20.00		380
W14x 22	20.00		440
W8x 10	20.00	22	200
W8x 10	20.00	22	200
W12x 19	20.00		380
W12x 26	24.25		631
W14x 26	30.00		780
W14x 26	30.00		780
W10x 12	30.00	32	360
W8x 10	9.50		95
W14x 30	30.00		900
W8x 10	7.92		79
W8x 10	7.92		79
W12x 26	24.25		631
W14x 22	27.00		594
W8x 10	13.50	8	135
W14x 26	27.00		702
W8x 10	13.50	8	135
W14x 22	22.50		495
W10x 12	22.50	22	270
W14x 22	22.50		495
W14x 22	27.00		594
W8x 10	15.08	8	151
W14x 26	27.00		702
W8x 21	29.75		625
W8x 10	11.92	8	119
W8x 10	11.90		119
W8x 10	24.25		243
W8x 21	29.75		625
		174	13412

Level 7

Size	Length	Studs	Wt (lbs)
W10x 12	24.25		291
W14x 22	20.00		440
W8x 10	11.50		115
W8x 10	20.00	22	200
W8x 10	18.25		183
W12x 19	20.00		380
W14x 22	20.00		440
W8x 10	20.00	22	200
W12x 19	20.00		380
W12x 26	24.25		631
W14x 30	30.00		900
W14x 26	30.00		780
W10x 12	30.00	32	360
W14x 30	30.00		900
W8x 10	7.92		79
W8x 10	7.92		79
W12x 26	24.25		631
W14x 22	27.00		594
W10x 12	22.50	22	270
W14x 22	22.50		495
W14x 22	27.00		594
W8x 10	15.08	8	151
W14x 26	27.00		702
W8x 21	29.75	8	625
W8x 10	11.92		119
W10x 12	24.25		291
W14x 26	29.75		774
		130	13188

Level 2

Size	Length	Studs	Wt (lbs)
W8x 13	24.25		315
W16x 26	20.00		520
W8x 10	11.50		115
W10x 12	20.00	22	240
W8x 10	18.25		183
W8x 10	9.50		95
W8x 10	20.00	20	200
W12x 14	20.00		280
W16x 26	20.00		520
W10x 12	20.00	22	240
W8x 10	20.00	20	200
W12x 14	20.00		280
W14x 68	30.00		2040
W12x 19	30.00	46	570
W12x 16	30.00	36	480
W16x 26	30.00		780
W14x 61	27.00		1647
W8x 10	13.50	10	135
W12x 14	27.00	28	378
W14x 22	27.00		594
W8x 10	13.50	10	135
W16x 31	22.50		698
W12x 14	22.50	24	315
W10x 12	22.50	22	270
W12x 19	22.50		428
W14x 61	27.00		1647
W8x 10	15.08	14	151
W12x 14	27.00	28	378
W14x 22	27.00		594
W8x 10	11.92	8	119
W8x 13	24.25		315
W8x 18	29.75		536
W8x 10	9.50		95
		310	15492

Level 3

Size	Length	Studs	Wt (lbs)
W8x 10	24.25		243
W14x 22	20.00		440
W8x 10	11.50		115
W8x 10	20.00	22	200
W8x 10	18.25		183
W8x 10	9.50		95
W8x 10	20.00	14	200
W10x 12	20.00		240
W14x 22	20.00		440
W8x 10	20.00	22	200
W8x 10	20.00	14	200
W10x 12	20.00		240
W12x 26	24.25		631
W14x 26	30.00		780
W14x 26	30.00		780
W10x 12	30.00	32	360
W12x 16	30.00	40	480
W14x 43	30.00		1290
W8x 10	7.92		79
W8x 10	7.92		79
W12x 26	24.25		631
W12x 40	27.00		1080
W8x 10	13.50	8	135
W12x 14	27.00	32	378
W14x 30	27.00		810
W8x 10	13.50	8	135
W14x 26	22.50		585
W14x 26	22.50	22	270
W10x 12	22.50	24	270
W14x 22	22.50		495
W12x 40	27.00		1080
W8x 10	15.08	8	151
W10x 12	27.00	31	324
W12x 14	27.00		378
W8x 21	29.75		625
W8x 10	11.92	8	119
W8x 10	11.92		119
W8x 10	24.25		243
W8x 21	29.75		625
W8x 10	9.50		95
		285	15821

Level 4

Size	Length	Studs	Wt (lbs)
W10x 12	24.25		291
W14x 22	20.00		440
W8x 10	11.50		115
W8x 10	20.00	22	200
W8x 10	18.25		183
W8x 10	9.50		95
W8x 10	20.00	22	200
W12x 19	20.00		380
W14x 22	20.00		440
W8x 10	20.00	22	200
W8x 10	20.00	22	200
W12x 19	20.00		380
W12x 26	24.25		631
W14x 26	30.00		780
W14x 26	30.00		780
W10x 12	30.00	32	360
W8x 10	9.50		95
W14x 30	30.00		900
W8x 10	7.92		79
W8x 10	7.92		79
W12x 26	24.25		631
W14x 22	27.00		594
W8x 10	13.50	8	135
W14x 26	27.00	8	702
W8x 10	13.50	8	135
W14x 22	22.50		495
W10x 12	22.50	22	270
W14x 22	22.50		495
W14x 22	27.00		594
W8x 10	15.08	8	151
W8x 10	9.50		95
W10x 12	27.00	31	324
W12x 14	27.00		378
W8x 21	29.75		625
W8x 21	11.92	8	250
W8x 10	11.92		119
W8x 10	24.25		243
W8x 21	29.75		625
W8x 10	9.50		95
		205	13782

Frame 1

Size	Quanity	Length (ft)	Size (lb/ft)	Wt (lb)
HSS4x4x½	8	15.25	21.5	328
HSS6x6x½	6	15.25	35.1	535
HSS6x6x½	2	16.50	35.1	579
HSS6x6x½	4	19.00	35.1	667
				2109

Frame 3

Size	Quanity	Length (ft)	Size (lb/ft)	Wt (lb)
HSS6x6x½	14	15.75	35.1	553
HSS6x6x½	2	17.00	35.1	597
HSS8x8x½	4	19.25	48.7	937
				2087

Frame 5

Size	Quanity	Length (ft)	Size (lb/ft)	Wt (lb)
HSS4x4x½	8	18.00	21.5	387
HSS6x6x½	6	18.00	35.1	632
HSS6x6x½	2	19.00	35.1	667
HSS6x6x½	4	21.00	35.1	737
				2423

Frame 2

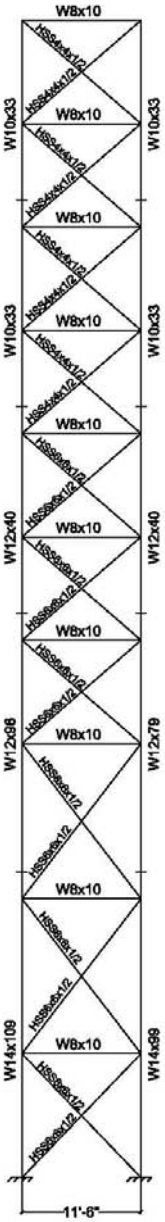
Size	Quanity	Length (ft)	Size (lb/ft)	Wt (lb)
HSS6x6x½	14	15.75	35.1	553
HSS6x6x½	4	27.00	35.1	948
HSS6x6x½	2	28.50	35.1	1000
				2501

Frame 4

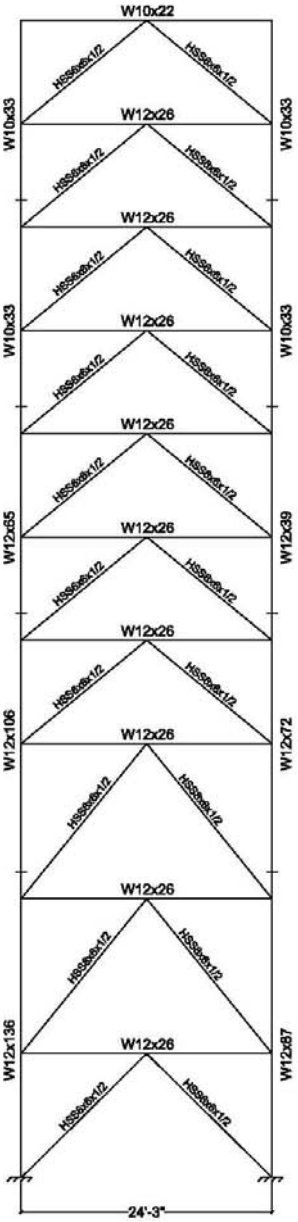
Size	Quanity	Length (ft)	Size (lb/ft)	Wt (lb)
HSS4x4x½	6	16.75	21.5	360
HSS6x6x½	8	16.75	35.1	588
HSS8x8x½	4	18.00	48.7	877
HSS8x8x½	2	20.25	48.7	986
				2811

Frame 6

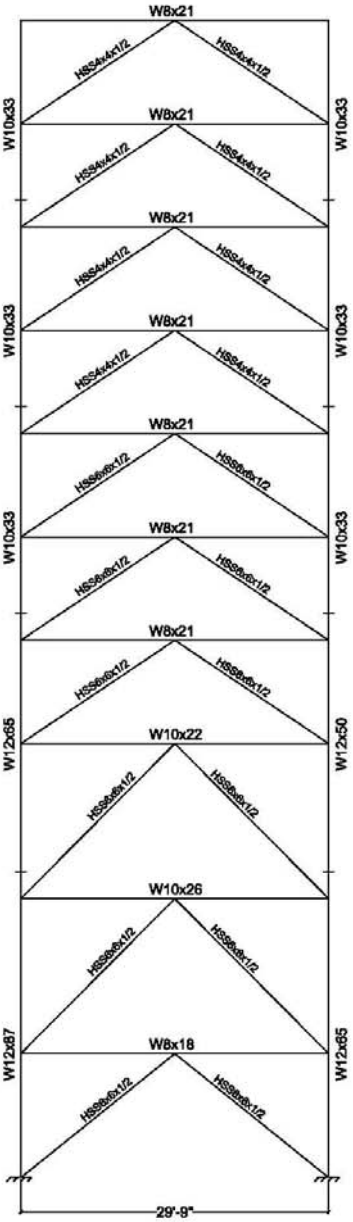
Size	Quanity	Length (ft)	Size (lb/ft)	Wt (lb)
HSS4x4x½	8	17.00	21.5	366
HSS6x6x½	6	17.00	35.1	597
HSS6x6x½	2	18.25	35.1	641
HSS6x6x½	2	18.25	35.1	641
HSS8x8x½	2	20.50	48.7	998
				3242



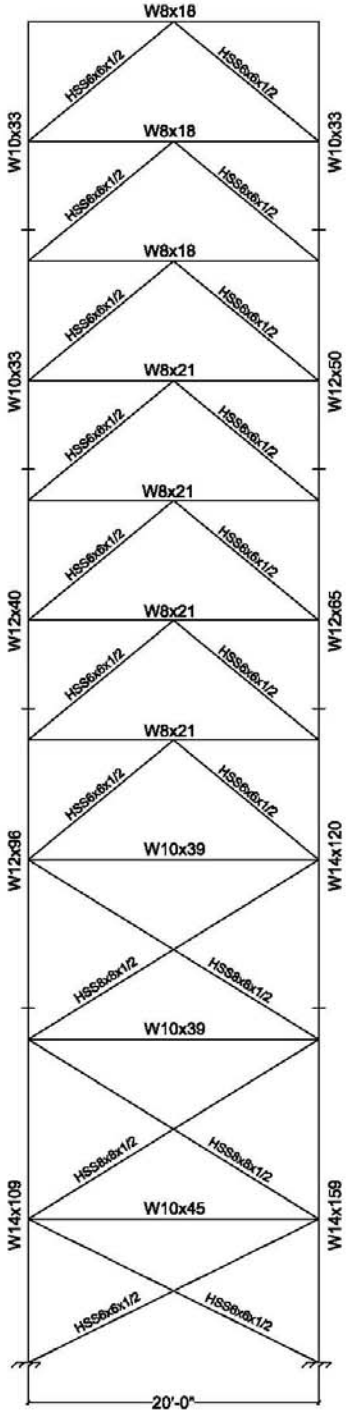
Frame 1



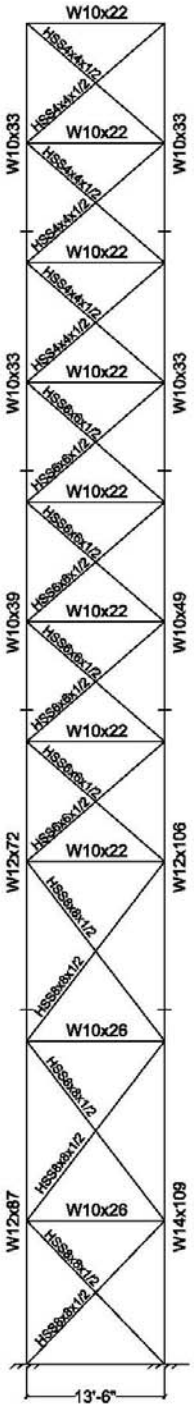
Frame 3



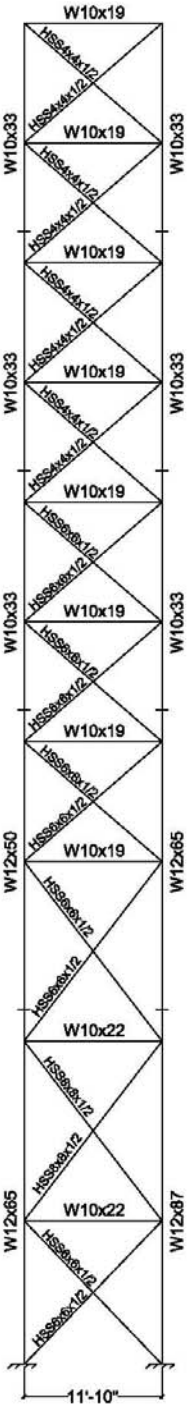
Frame 5



Frame 2



Frame 4



Frame 6

Existing Building Weight

	30x30	20x30	20Φ	w_c(lb)	Area (FT^2)	Load (lb/ft^2)	w_z(K)
Roof	0	21	1	134523	8428	130	1230
9	0	21	1	134523	8428	141	1323
8	0	21	1	134523	8428	141	1323
7	0	21	1	134523	8428	141	1323
6	0	21	1	134523	8791	141	1374
5	0	22	0	137500	9044	141	1413
4	0	22	0	137500	9044	141	1413
3	9	13	0	248442	10010	141	1660
2	15	7	0	276570	10010	160	1878
1	15	7	0	276570	9539	160	1803
							14739

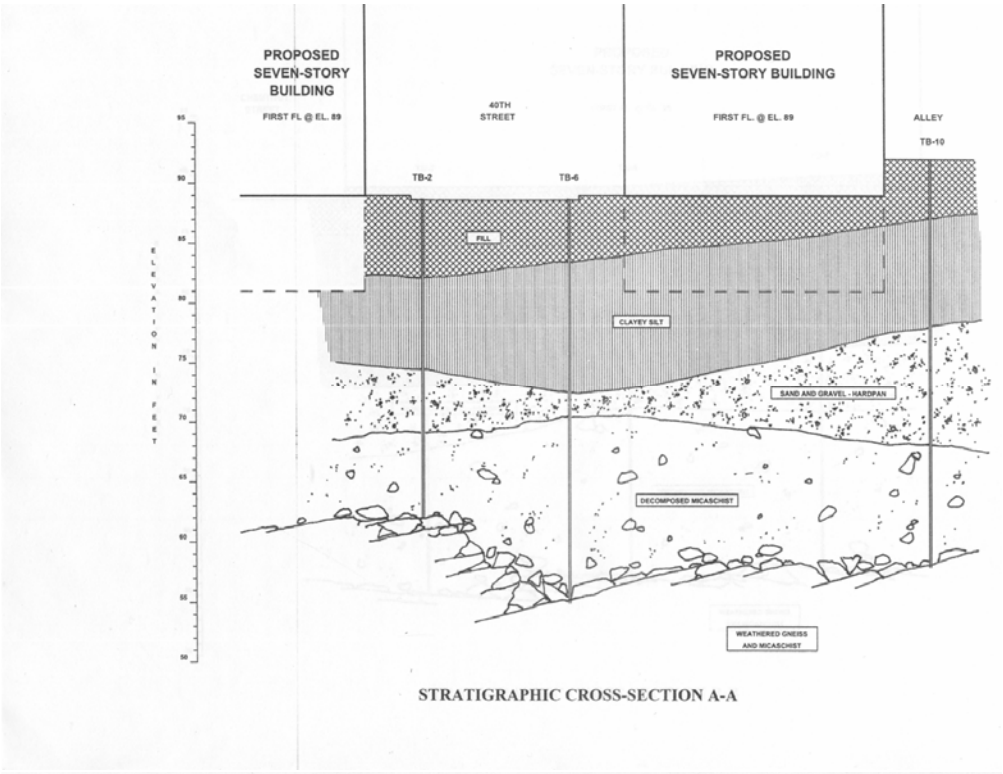
Redesign Building Weight

	Load (lb/ft^2)	Slab (lb/ft^2)	Steel (lb/ft^2)	Area (ft^2)	W_T (K)
Roof	32	84	3	8428	1003
9	28	84	3	8278	952
8	28	84	3	8278	952
7	28	84	3	8278	952
6	28	84	3	8641	994
5	28	84	3	8894	1023
4	28	84	3	8894	1023
3	28	84	3	9860	1134
2	10	84	3	10010	971
1	10	84	3	10010	971
					9974

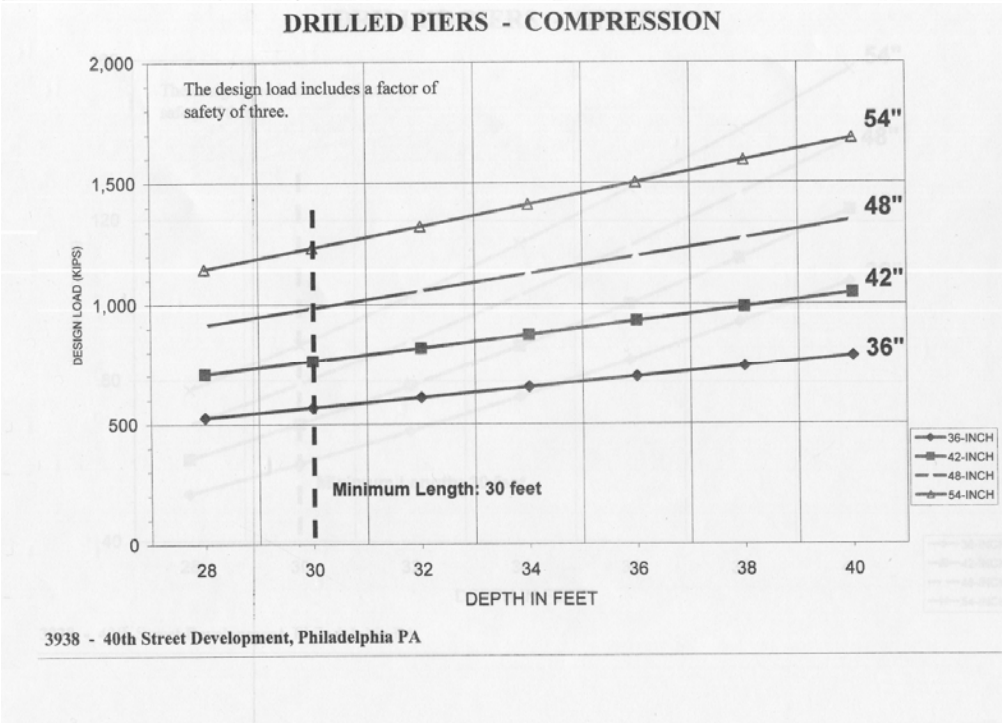
Rigidity

	Weight (K)	Xm (ft)	Ym (ft)	Xe (ft)	Ye (ft)
Roof	1003	72.12	31.02	7.4	2.98
9	952	71.75	31.06	7.4	2.98
8	952	71.75	31.06	7.4	2.98
7	952	71.75	31.06	7.4	2.98
6	994	69.27	32.56	7.4	3.45
5	1023	71.27	33.52	7.4	3.45
4	1023	71.27	33.52	7.4	3.45
3	1134	72.98	34.85	7.4	3.45
2	971	73.12	34.71	7.4	3.45
1	971	73.12	34.71	7.4	3.46

FOUNDATION AIDS



STRATIGRAPHIC CROSS-SECTION A-A



APPENDIX II

Wind Analysis

WIND ANALYSIS

ASCE 7-05 Chapter 6

Location	Philadelphia, PA
Typography	Homogeneous
Framing	Braced Frames
Cladding	Rainscreen Panel Assembly
Frequency	Flexible
Enclosure Class	Enclosed

Velocity Pressure

q_z	$0.00256 K_z K_{zt} K_d V^2 I$
V_3	90
I_w	1.00
K_d	0.85
K_{zt}	1.00

Dimensions

N/S	B_1 = *60*
N/S	B_2 = *68*
E/W	B = *148*

Internal Pressure Coefficient

GC_{pi}	± 0.18

Gust Effect Factor

1/T ≤ 1	Flexible
North/South	East/West
1.100	0.929
1.085	

External Pressure Coefficients

North/South			East/West		
Wall	*Cp*		*Wall*	*Cp*	
	0.80	Windward		0.80	Windward
	-0.30	Leeward		-0.50	Leeward
	-0.70	Side		-0.70	Side
Roof	-0.95	0 to h/2	*Roof*	-1.04	0 to h/2
	-0.83	h/2 to h		-0.70	> h/2
	-0.57	h to 2h			

Wall Pressures

			Windward				*Leeward*				*X*	*Y*
			North/South		East/West		North/South		East/West		MWFRS	
Height (FT)	K_z	q_z	*+0.18*	*-0.18*	*+0.18*	*-0.18*	*+0.18*	*-0.18*	*+0.18*	*-0.18*	*North/South*	*East/West*
0-15	0.57	10.12	5.65	11.92	4.38	10.65	-8.80	-2.53	-11.22	-4.95	14.45	15.61
20	0.62	10.93	6.35	12.62	4.99	11.26	-8.80	-2.53	-11.22	-4.95	15.15	16.21
25	0.66	11.63	6.96	13.23	5.51	11.78	-8.80	-2.53	-11.22	-4.95	15.77	16.73
30	0.70	12.36	7.59	13.86	6.05	12.32	-8.80	-2.53	-11.22	-4.95	16.39	17.27
40	0.76	13.41	8.51	14.78	6.83	13.10	-8.80	-2.53	-11.22	-4.95	17.31	18.06
50	0.81	14.29	9.27	15.54	7.49	13.76	-8.80	-2.53	-11.22	-4.95	18.08	18.71
60	0.85	15.05	9.93	16.20	8.05	14.32	-8.80	-2.53	-11.22	-4.95	18.73	19.28
70	0.89	15.72	10.70	16.97	8.55	14.82	-8.88	-2.61	-11.22	-4.95	19.58	19.77
80	0.93	16.34	11.24	17.51	9.01	15.28	-8.88	-2.61	-11.22	-4.95	20.12	20.23
90	0.96	16.90	11.74	18.01	9.43	15.70	-8.88	-2.61	-11.22	-4.95	20.62	20.65
100	0.99	17.41	12.19	18.46	9.81	16.08	-8.88	-2.61	-11.22	-4.95	21.07	21.03

Roof Pressures

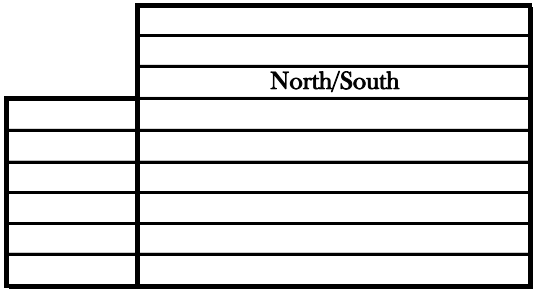
Zone	North/South		East/West	
	+0.18	*-0.18*	*+0.18*	*-0.18*
0 to h/2	-17.20	-10.93	-18.53	-10.93
h/2 to h	-15.42	-9.15	-13.50	-9.15
h to 2h	-11.57	-5.30		

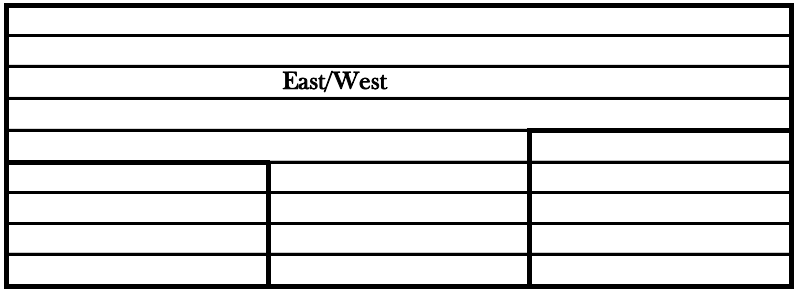
Parapet Pressures

$p_p = q_p GC_{pn}$	
Windward	Leeward
+1.50	*-1.00*
26.12	-17.41

North/South MWRS Forces

Level	Height (FT)	Tributary (FT)	Pressure	Height	Pressure	Height	Pressure	Height	Story Dist.	Cum Dist.	Story Shear	Cum Shear
Roof	100	5.00	21.07	5					105.36	1808.51	6.32	6.32
9	90	10.00	21.07	5	20.62	5			208.46	1703.15	12.51	18.83
8	80	10.00	20.62	5	20.12	5			203.73	1494.69	12.22	31.05
7	70	10.00	20.12	5	19.58	5			198.53	1290.96	11.91	42.96
6	60	10.00	19.58	5	18.73	5			191.58	1092.42	11.49	54.46
5	50	10.00	18.73	5	18.08	5			184.05	900.84	12.52	66.97
4	40	10.00	18.08	5	17.31	5			176.93	716.80	12.03	79.01
3	30	12.50	17.31	5	16.39	5	15.77	2.5	207.93	539.86	14.14	93.15
2	15	15.00	15.77	2.5	15.15	5	14.45	7.5	223.56	331.93	15.20	108.35
1	0	7.50	14.45	7.5					108.37	108.37	7.37	115.72

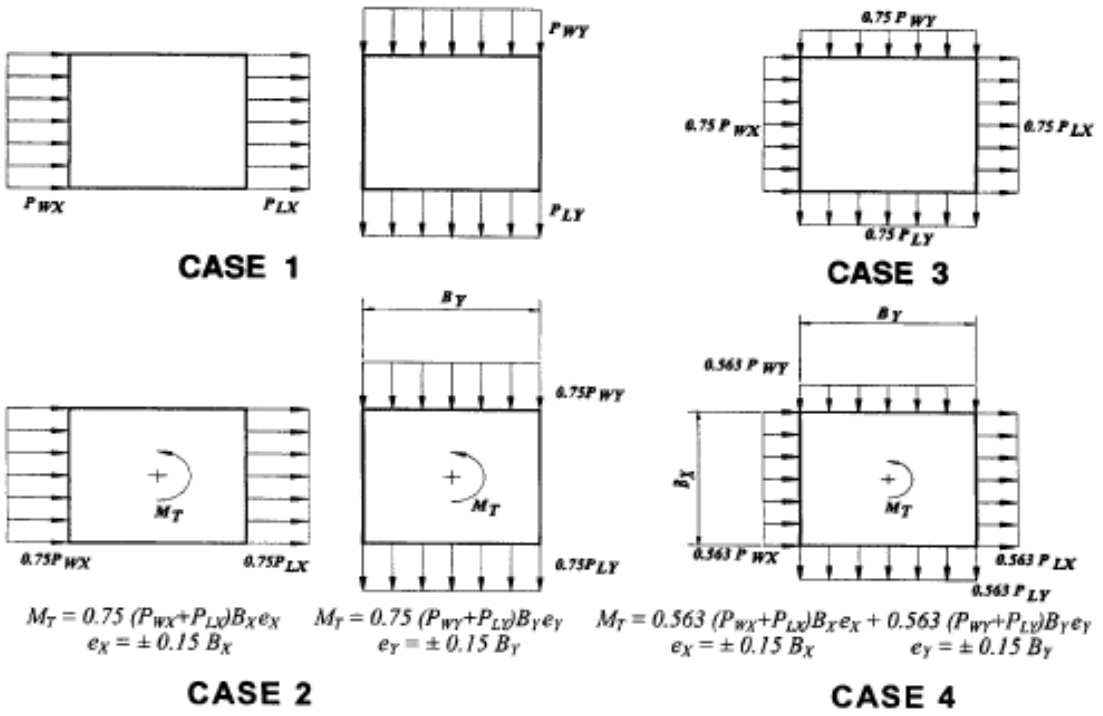




East/West MWRS Forces

Level	Height (FT)	Tributary (FT)	Pressure	Height	Pressure	Height	Pressure	Height	Story Dist.	Cum Dist.	Story Shear	Cum Shear
Roof	100	5.00	21.03	5					105.15	1862.53	15.56	15.56
9	90	10.00	21.03	5	20.65	5			208.41	1757.38	30.84	46.41
8	80	10.00	20.65	5	20.23	5			204.42	1548.96	30.25	76.66
7	70	10.00	20.23	5	19.77	5			200.03	1344.55	29.60	106.27
6	60	10.00	19.77	5	19.28	5			195.25	1144.52	28.90	135.16
5	50	10.00	19.28	5	18.71	5			189.94	949.28	28.11	163.27
4	40	10.00	18.71	5	18.06	5			183.85	759.34	27.21	190.48
3	30	12.50	18.06	5	17.27	5	16.73	2.5	218.48	575.49	32.34	222.82
2	15	15.00	16.73	2.5	16.21	5	15.61	7.5	239.95	357.01	35.51	258.33
1	0	7.50	15.61	7.5					117.06	117.06	17.32	275.65

Main Wind Force Resisting System–Method 2		All Heights
Figure 6-9	Design Wind Load Cases	



Case 1. Full design wind pressure acting on the projected area perpendicular to each principal axis of the structure, considered separately along each principal axis.

Case 2. Three quarters of the design wind pressure acting on the projected area perpendicular to each principal axis of the structure in conjunction with a torsional moment as shown, considered separately for each principal axis.

Case 3. Wind loading as defined in Case 1, but considered to act simultaneously at 75% of the specified value.

Case 4. Wind loading as defined in Case 2, but considered to act simultaneously at 75% of the specified value.

Notes:

1. Design wind pressures for windward and leeward faces shall be determined in accordance with the provisions of 6.5.12.2.1 and 6.5.12.2.3 as applicable for building of all heights.
2. Diagrams show plan views of building.
3. Notation:
   P_{WX}, P_{WY}: Windward face design pressure acting in the x, y principal axis, respectively.
   P_{LX}, P_{LY}: Leeward face design pressure acting in the x, y principal axis, respectively.
   e (e_X, e_Y) : Eccentricity for the x, y principal axis of the structure, respectively.
   M_T: Torsional moment per unit height acting about a vertical axis of the building.

Load Case 1

	X	Y
	Fx (K)	Fy (K)
Roof	6.32	15.56
9	12.51	30.84
8	12.22	30.25
7	11.91	29.60
6	11.49	28.90
5	12.52	28.11
4	12.03	27.21
3	14.14	32.34
2	15.20	35.51
	108.35	258.33

Load Case 3

	X + Y		X - Y	
	Fx (K)	Fy (K)	Fx (K)	Fy (K)
Roof	4.74	11.67	4.74	-11.67
9	9.38	23.13	9.38	-23.13
8	9.17	22.69	9.17	-22.69
7	8.93	22.20	8.93	-22.20
6	8.62	21.67	8.62	-21.67
5	9.39	21.08	9.39	-21.08
4	9.02	20.41	9.02	-20.41
3	10.60	24.25	10.60	-24.25
2	11.40	26.63	11.40	-26.63
	81.26	193.75	81.26	-193.75

Load Case 2

		X + e	X - e		Y + e	Y - e
	Fx (K)	M_T (ft-K)	M_T (ft-K)	Fy (K)	M_T (ft-K)	M_T (ft-K)
Roof	4.74	2560.13	-2560.13	11.67	38350.20	-38350.20
9	9.38	5065.61	-5065.61	23.13	76007.68	-76007.68
8	9.17	4950.66	-4950.66	22.69	74550.58	-74550.58
7	8.93	4824.39	-4824.39	22.20	72950.17	-72950.17
6	8.62	5979.55	-5979.55	21.67	71206.44	-71206.44
5	9.39	6510.41	-6510.41	21.08	69271.61	-69271.61
4	9.02	6258.76	-6258.76	20.41	67050.14	-67050.14
3	10.60	7355.33	-7355.33	24.25	79680.27	-79680.27
2	11.40	7908.01	-7908.01	26.63	87509.15	-87509.15
	81.26			193.75		

Load Case 4

			X +Y CW	X +Y CCW
	Fx (K)	Fy (K)	M_T (ft-K)	M_T (ft-K)
Roof	3.56	8.76	30710.02	-30710.02
9	7.04	17.37	60859.02	-60859.02
8	6.88	17.03	59678.93	-59678.93
7	6.71	16.67	58382.77	-58382.77
6	6.47	16.27	57940.95	-57940.95
5	7.05	15.83	56887.04	-56887.04
4	6.77	15.32	55030.55	-55030.55
3	7.96	18.20	65334.72	-65334.72
2	8.56	19.99	71626.49	-71626.49
	61.00	145.44		

APPENDIX III

Seismic Analysis

SEISMIC ANALYSIS

ASCE 7-05 Chapter 12

Location	Philadelphia, PA
Occupancy Category	II
Seismic Use Group	II
Importance Factor	1.00
Site Classification	D
Basic Structural Systen	Braced Frame
Seismic Resisting Syste	Ordinary Steel Concentrically Braced Frames
Frequency	Rigid Structure

I_E	1
S_S	0.320
S_1	0.082
F_a	1.54
F_v	2.40
S_{MS}	0.493
S_{M1}	0.197
S_{DS}	0.329
S_{D1}	0.131
R	3.25
Ω	2
C_d	3.25

Seismic Design Category B

T_L	6
C_u	1.638
h_n	100
C_t	0.02
x	0.75
T_a	0.632
T	1.04

1/*T*	0.965	? 1	
Cs	0.1011	$S_{DS}/(R/I)$	12.8-2
Cs	0.0390	$S_{D1}/T(R/I)$	12.8-3 *CONTROLS*
Cs		*> 0.01*	12.8-5

C_s	0.039
W (K)	9003
V (K)	351
k	1.268

North/South/East/West

Level	$h_{x(FT)}$	$w_{x(K)}$	$w_x h^k_x$	C_{vx}	$F_{x(K)}$	$V_{x(K)}$	$M_{x(FT-K)}$
Roof	100	1003	344565	0.211	73.96	73.96	739.59
9	90	952	286156	0.175	61.42	135.38	2093.39
8	80	952	246457	0.151	52.90	188.28	4715.78
7	70	952	208069	0.127	44.66	232.94	9878.17
6	60	994	178631	0.109	38.34	271.28	20139.76
5	50	1023	145911	0.089	31.32	302.60	40592.71
4	40	1023	109953	0.067	23.60	326.20	81421.42
3	30	1134	84638	0.052	18.17	344.37	164746.37
2	15	971	30095	0.018	6.46	350.83	329589.63
1	0	971	0	0	0	0	0
?	100	9003	1634476	1	350.83		

	X		Y	
	E_h	E_v	E_h	E_v
Roof	73.96	65.90	73.96	65.90
9	61.42	62.55	61.42	62.55
8	52.90	62.55	52.90	62.55
7	44.66	62.55	44.66	62.55
6	38.34	65.29	38.34	65.29
5	31.32	67.21	31.32	67.21
4	23.60	67.21	23.60	67.21
3	18.17	74.50	18.17	74.50
2	6.46	63.80	6.46	63.80

E_1 $E = E_h + E$ North/South controls

E_2 $E = E_h - E_v$ North/South

E_3 $E = E_h + E$ East/West

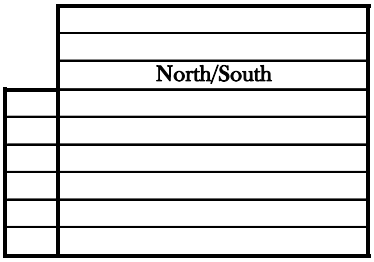
E_4 $E = E_h - E_v$ East/West controls

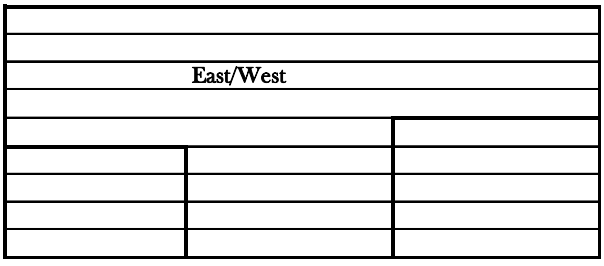
North/South *ASCE 7-05 [12.12.1]* $\Delta \le \Delta a = 0.015 h_{sx}$

Level	Story Height Below (ft)	Displace (in)	Δ (in)	Δa (in)	
Roof	10	4.597	0.577	2.4	✓
9	10	4.02	0.594	2.4	✓
8	10	3.426	0.600	2.4	✓
7	10	2.826	0.563	2.4	✓
6	10	2.263	0.537	2.4	✓
5	10	1.726	0.490	2.4	✓
4	10	1.236	0.429	2.4	✓
3	15	0.807	0.494	3.6	✓
2	15	0.313	0.313	3.6	✓
1	0	0	0	0	

East/West *ASCE 7-05 [12.12.1]* $\Delta \le \Delta a = 0.015 h_{sx}$

Level	Story Height Below (ft)	Displace (in)	Δ (in)	Δa (in)	
Roof	10	3.281	0.370	2.4	✓
9	10	2.911	0.399	2.4	✓
8	10	2.512	0.407	2.4	✓
7	10	2.105	0.367	2.4	✓
6	10	1.738	0.409	2.4	✓
5	10	1.329	0.346	2.4	✓
4	10	0.983	0.324	2.4	✓
3	15	0.659	0.386	3.6	✓
2	15	0.273	0.273	3.6	✓
1	0	0	0	0	





APPENDIX IV

Cost Analysis

Flat Plate

	Area (ft^2)	Thick (in)	Material	Install	Total/S.F.	Cost
Roof	8428	9"	6.15	7.55	13.70	115463.60
9	8428	9"	6.15	7.55	13.70	115463.60
8	8428	9"	6.15	7.55	13.70	115463.60
7	8428	9"	6.15	7.55	13.70	115463.60
6	8791	9"	6.15	7.55	13.70	120436.70
5	9044	9"	6.15	7.55	13.70	123902.80
4	9044	9"	6.15	7.55	13.70	123902.80
3	10010	9"	6.15	7.55	13.70	137137.00
2	10010	12"	6.90	7.90	14.80	148148.00
1	10010	12"	6.90	7.90	14.80	148148.00
					$	1,263,529.70

Precast Hollow-Core Planks (2" Topping)

	Area (ft^2)	Thick (in)	Material	Install	Total/S.F.	Cost
Roof	8428	8"	7.35	2.24	9.59	80824.52
9	8428	8"	7.35	2.24	9.59	80824.52
8	8428	8"	7.35	2.24	9.59	80824.52
7	8428	8"	7.35	2.24	9.59	80824.52
6	8791	8"	7.35	2.24	9.59	84305.69
5	9044	8"	7.35	2.24	9.59	86731.96
4	9044	8"	7.35	2.24	9.59	86731.96
3	10010	8"	7.35	2.24	9.59	95995.90
2	10010	8"	7.35	2.24	9.59	95995.90
1	10010	8"	7.35	2.24	9.59	95995.90
					$	869,055.39

Structral Steel

	Wt (lbs)	Material	Costs
Steel Girder	135027	$622.00 per ton	$41,993.43
Shear Studs	2026	$622.00 per ton	$630.09
Braces	15172	$622.00 per ton	$4,718.62
			$47,342.14

Cast-in-Place Concrete Columns

	Size	Wt (lb/ft)	Height (ft)	Each	Strength (psi)	Material	Install	Total/VLF	Cost
Roof	20x30	625	10	21	5000	46.50	106.00	153.00	32130.00
	20Φ	327	10	1	5000	28.00	75.50	103.50	1035.00
9	20x30	625	10	21	5000	46.50	106.00	153.00	32130.00
	20Φ	327	10	1	5000	28.00	75.50	103.50	1035.00
8	20x30	625	10	21	5000	46.50	106.00	153.00	32130.00
	20Φ	327	10	1	5000	28.00	75.50	103.50	1035.00
7	20x30	625	10	21	5000	46.50	106.00	153.00	32130.00
	20Φ	327	10	1	5000	28.00	75.50	103.50	1035.00
6	20x30	625	10	21	5000	46.50	106.00	153.00	32130.00
	20Φ	327	10	1	5000	28.00	75.50	103.50	1035.00
5	20x30	625	10	22	5000	46.50	106.00	153.00	33660.00
4	20x30	625	10	22	5000	46.50	106.00	153.00	33660.00
3	30x30	938	15	9	5000	67.00	134.00	201.00	27135.00
	20x30	625	15	13	5000	46.50	106.00	153.00	29835.00
2	30x30	938	15	15	5000	67.00	134.00	201.00	45225.00
	20x30	625	15	7	5000	46.50	106.00	153.00	16065.00
1	30x30	938	15	15	5000	67.00	134.00	201.00	45225.00
	20x30	625	15	7	5000	46.50	106.00	153.00	16065.00
									$ 412,695.00

Steel Column

Member Size	Length (ft)	Material	Install	Total/LF	Cost
W10x 33	21	38.00	9.40	47.50	997.50
W10x 39	1	48.00	9.40	57.40	57.40
W10x 45	111	57.20	7.05	64.55	7165.05
W10x 49	52	61.50	9.40	70.90	3686.80
W12x 40	40	50.50	7.05	57.55	2302.00
W12x 50	25	62.00	7.05	69.05	1726.25
W12x 65	172	83.50	9.40	92.90	15978.80
W12x 72	25	91.00	7.05	98.05	2451.25
W12x 79	25	94.50	7.05	101.55	2538.75
W12x 87	54	110.00	7.05	117.50	6345.00
W12x 96	25	110.00	7.05	117.50	2937.50
W12x 106	25	138.00	7.05	145.05	3626.25
W12x 136	27	186.00	9.40	195.40	5275.80
W14x 99	27	135.00	9.40	144.40	3898.80
W14x 109	27	138.00	7.05	145.05	3916.35
					$ 62,903.50

Gravity

Size	Length (ft)	Wt (lbs)
W10x 33	1688	55704
W10x 39	134	5226
W10x 45	111	4995
W10x 49	52	2548
		68473

Lateral

Size	Length (ft)	Wt (lbs)
W10x 33	280	9240
W10x 39	20	780
W12x 40	40	1600
W12x 50	25	1250
W12x 65	172	11180
W12x 72	25	1800
W12x 79	25	1975
W12x 87	54	4698
W12x 96	25	2400
W12x 106	25	2650
W12x 136	27	3672
W14x 99	27	2673
W14x 109	27	2943
		46861

Total Columns

		Material	Install	Total/LF	Cost
W10x 33	1968	$38.00	$9.40	$47.50	$93,480.00
W10x 39	154	$48.00	$9.40	$57.40	$8,839.60
W10x 45	111	$57.20	$7.05	$64.55	$7,165.05
W10x 49	52	$61.50	$9.40	$70.90	$3,686.80
W12x 40	40	$50.50	$7.05	$57.55	$2,302.00
W12x 50	25	$62.00	$7.05	$69.05	$1,726.25
W12x 65	172	$83.50	$9.40	$92.90	$15,978.80
W12x 72	25	$91.00	$7.05	$98.05	$2,451.25
W12x 79	25	$94.50	$7.05	$101.55	$2,538.75
W12x 87	54	$110.00	$7.05	$117.50	$6,345.00
W12x 96	25	$110.00	$7.05	$117.50	$2,937.50
W12x 106	25	$138.00	$7.05	$145.05	$3,626.25
W12x 136	27	$186.00	$9.40	$195.40	$5,275.80
W14x 99	27	$135.00	$9.40	$144.40	$3,898.80
W14x 109	27	$138.00	$7.05	$145.05	$3,916.35
					$164,168.20