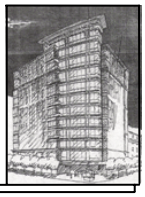


APPENDIX B

Seismic Loads

SEISMIC

Location DC

Category II site class D

seismic group I
importance factor = 1.0

$S_s = 18.0\%\,g$

$S_1 = 6.2\%\,g$

$S_{MS} = F_a S_s$
$= (1.6)(.18)$
$= .288$

$F_a = 1.6$
$F_v = 2.4$

$S_{M1} = F_v S_1$
$= (2.4)(.062)$
$= .149$

SEISMIC DESIGN CAT. I

$R = 5$

$S_{DS} = \frac{2}{3} S_{MS} = .192$

$S_{D1} = \frac{2}{3} S_{M1} = .099$

$C_{s\,min} = .044 I S_{DS}$
$= .044(1.0)(.192) = .0084$

$T = C_T h_n^x$

$C_T = .016$

$h = 147.5'$

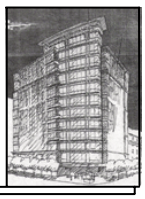
$x = .9$

$T = .016(147.5)^{.9}$
$= 1.43$

$C_s = \frac{S_{DS}}{(R/I)}$
$= \frac{.192}{(5/1.0)} = .038$

$C_{s\,max} = \frac{S_{D1}}{T(R/I)}$
$= \frac{.099}{1.43(5/1.0)} = .014$ ← controls

1/2



Dead load estimation

- concrete, 6" slab

Area of 8" drops 2341.2 ft²
Area of 3¾ edge beam 1365.9 ft²

Equivalent Floor Thickness

$$T = 6" + \frac{(8)(2341.2)}{12,200 ft^2} + \frac{(3\frac{3}{4})(1365.9)}{12200}$$

$T = 7.95"$

Curtain wall = 300 plf (450') ⇒ 135ᵏ

equivalent floor load = $\frac{135^k}{12200}$ = 11.06 psf → 12 psf

Total Dead load

concrete	99.4 psf
Sprinkler	5 psf
MEP	5 psf
Finishes	10 psf
Curtain wall	12 psf
	131.4 psf

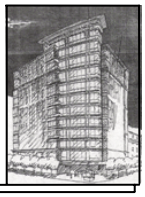
Total Floor load = (131.4 psf)(11800) ⇒ 1550ᵏ

Total roof load = (131.4 psf)(3600) ⇒ 473ᵏ

Total Building load = (1603)(12) + 473

= 19709ᵏ

2/2



SEISMIC	ht (ft)	load (k)	$W*ht^k$	C_{vx}		story force (k) =VCs
roof	147.5	473	243137	0.0581		15.52
pent.	129.5	1550	677125	0.1618		43.21
12	118.7	1550	607289	0.1451		38.76
11	107.8	1550	538400	0.1287		34.36
10	97.0	1550	471842	0.1128		30.11
9	86.2	1550	407114	0.0973		25.98
8	75.3	1550	343815	0.0822		21.94
7	64.5	1550	283323	0.0677		18.08
6	53.7	1550	225320	0.0539		14.38
5	42.8	1550	169682	0.0406		10.83
4	32.0	1550	117969	0.0282		7.53
3	21.2	1550	70510	0.0169		4.50
2	10.3	1550	28601	0.0068		1.83
		19073	4184127	1.0000		267.02