Benjamin M. Douglass
AE 481 Tech Report 3
Lateral System Analysis and Confirmation Design

TOWERS CRESCENT BUILDING F

CHANTILLY, VA

Executive Summary

This report is a study of the lateral force resisting system of Towers Crescent Building F, a 230' speculative office building containing 5 levels of parking. The foundation is auger cast piles. The gravity system is a reinforced concrete flat slab with drop panels and drop bands framing into reinforced concrete columns. The lateral system is a combination of reinforced concrete shear walls, and the moment resisting frames created by the monolithically cast columns and slab. The slab acts as a rigid diaphragm and distributes lateral load to the lateral load resisting elements according to stiffness.

Seismic loading controls the design of the lateral system of Towers Crescent Building F. The shear walls in the North-South direction are adequate for strength but not for serviceability criteria. The shear walls in the East-West direction are adequate neither for strength nor serviceability. Also, the seismic load will create overturning moments which the foundations are not adequate to bear. Therefore, shear walls will need to be slightly increased in size in the North-South direction, and dramatically increased in size in the East-West direction. Moreover, the foundations will have to be upsized where they will be required to resist overturning moment.

Description of Structural System

Foundation and Slab on Grade

The building utilizes a foundation system of 80T 16"Φ auger cast piles. Pile caps are laid out on a roughly regular 30' x 30' structural grid as well as one semicircular line which follows the rounded face of the building. Pile groups range from 3 in the parking areas to 42 for the interior tower columns. A common pile cap for the areas supporting only parking is 6'-6" x 6'-6", 44" deep, containing 10 #6 reinforcing bars in each direction, and caps 4 piles. A common pile cap in the area beneath the office tower is 15' x 20', 55" deep, containing 20 #11 reinforcing bars in each direction, and caps 20 piles. The slab-on-grade is 6" thick stone concrete at f'c = 4 ksi reinforced with 6 x 6 #8/#8 W.W.F. It is placed over a vapor barrier on top of 6" of washed gravel fill.

Columns

Columns are reinforced concrete, with material strengths as follows:

- Base to 2nd floor - 8 ksi
- 2nd floor to 8th floor - 7 ksi
- 8th floor to 13th floor - 6 ksi
- 13th floor to main roof - 5 ksi
- Main roof to penthouse roof - 4 ksi.

The parking areas are held up by a mostly regular grid of concrete columns (typically 24" x 24" with 6 #9 reinforcing bars) extending usually from the pile caps to the P-4 or P-6 level. The tower is held up by a rectangular grid of columns as well as a semicircular line which follows the curvature of the building. A typical internal tower column on the rectangular grid runs as follows:

- Base - P2: 24”x48”, 16 #18
- P2 - P3: 24”x48”, 16 #14
- P3 - 2/P6 level: 24”x48”, 20 #11
- 2/P6 level - 4th floor: 24”x30”, 16 #11
- 4th floor - 5th floor: 24”x24”, 16 #11
- 5th floor - 6th floor: 24”x24”, 12 #11
- 6th floor - 7th floor: 24”x24”, 10 #11
- 7th floor - 9th floor: 24”x24”, 8 #11
- 9th floor - 13th floor: 24”x24”, 6 #11
- 13th floor - main roof: 24”x24”, 4 #11

A typical column along the semicircular line runs as follows:

- Base - P3: 42” Φ, 8 #11
- P3 - 2/P6 level: 42” Φ, 7 #11
- 2/P6 level - 4th floor: 36” Φ, 7 #11
- 4th floor - main roof: 36” Φ, 6 #11
- Main roof - penthouse roof: 36” Φ, 6 #11, W14x82

The reinforcement is spliced by overlapping bars.

Floors

The floors are 9” minimum flat structural concrete slab (f’c = 4 ksi) reinforced by a bottom mat of #5 rebar at 12” O.C. in each direction. Where the slab is 10” thick, it is reinforced by #5 rebar at 9” O.C. in each direction, and where it is 12” thick, it is reinforced by #7 rebar at 12” O.C. in each direction. Additional reinforcement is provided as needed, almost always top reinforcement (#5 or #6) to resist the tensile stresses which result from the negative moments, especially around the columns. Around every column there is a drop panel 5-1/2” below the lowest adjacent slab soffit at 1/6 the column span in each direction, a drop band 5-1/2” below the lowest adjacent slab soffit at 1/4 the column span in each direction, or a similar system.

Detailed Description of Lateral System

There is a structural core area in the center of the tower with 4 large concrete shear walls. Table 1 describes these walls at level P6:

Table 1. Description of Shear Walls at Level P6

Along Gridline	Length	Vertical Reinforcement	Horizontal Reinforcement	End Column Dimensions	End Column Reinforcement
FQ.3	22'10"	#6 @ 6" O.C.	#5 @ 9" O.C.	36" x 12"	(12) #11
FP	29'2"	#5 @ 6" O.C.	#4 @ 12" O.C.	30" x 24"	(16) #10
FN	29'2"	#5 @ 6" O.C.	#4 @ 12" O.C.	30" x 24"	(16) #10
FM	28'	#6 @ 6" O.C.	#5 @ 9" O.C.	30" x 24"	(16) #10

Walls are 16" thick from the foundation to level P6, and 12" thick above. Wall reinforcement and end column size and reinforcement vary throughout the height of the building. Length is constant. The shear walls are attached to concrete columns at either end to provide resistance against overturning moment as well as added shear capacity.

These four walls run from north to south through the building's narrow section. Since the flat floor slab is cast monolithically with the building's concrete columns, the resulting frames will have an inherent moment resisting capacity and hence contribute somewhat to the lateral stiffness of the tower in this direction. However, the stiffness of these is expected to be very small in comparison to the large shear walls. As such, I have treated the shear walls as the only lateral system in this direction with respect to choosing an R value (R = 5).

Six shorter shear walls (9'6" effective length, including end columns) of the same width and containing similar reinforcement run in the perpendicular direction. These resist lateral load through the long direction of the tower. Since (1) these walls are not of themselves sufficiently strong or stiff to resist the lateral loads to which Towers Crescent Building F might be subjected, and (2) the moment frames created by the monolithically cast concrete columns and slabs are stiffer in this direction than in the previous, the two systems will necessarily work in tandem. Hence, in this direction, R = 5.5

The load path for lateral loads is as follows. In the case of wind loading, the curtain wall will receive the load and distribute it to the minimum 9" thick floor slabs above and below. The slabs will then act as rigid diaphragms and thus distribute lateral load to the lateral load resisting elements according to stiffness. In the case of seismic loading, load will be distributed from all massive elements, through their structural connections with the slab, which again, will act as a rigid diaphragm. There exist no massive structural elements with no connection or merely a tenuous connection to the slab. A logical load path thus exists from the point of application of all lateral loads to the elements which will resist them.

Between the basement and level P6, the floor area of Towers Crescent Building F increases dramatically. At these levels the central tower area is surrounded by additional structure which will be used for parking. These areas contain additional moment resisting frames produced by the monolithic casting of the slab-beams and columns, some of which provide a small but significant resistance.

All lateral elements in the tower are pictured on the following pages.

Two large sections of the parking structure are separated by expansion joints. These sections will rely entirely on moment resisting frames for their lateral resistance. Since they are far shorter than the tower, they are anticipated to deflect less than the central slab area under wind or seismic loads. Therefore I have assumed that, whatever structural contact would occur between them during a wind or seismic event, these sections would act as restraints against the motion of the central section. Assuming linear behavior, they could properly be modeled as a series of springs which resisted compressive but not tensile forces. For the purposes of this report I have neglected them. I will justify the assumption that they deflect less than the central section in a future report.

Building Codes and Design Standards

Towers Crescent Building F was designed by the 2000 USBC Virginia statewide building code, which is a variation of the IBC 2000 model code. This references the ASCE 7-98 design standard. Nevertheless, I have chosen to design by ASCE 7-02, due to my greater familiarity with it. ASCE 7 sections 6.0 and 9.0, on wind and seismic loads, respectively, are especially relevant to this assignment. Concrete structural elements would have been designed originally by the standards of ACI 318-99, but again, I will be designing based on the updated code ACI 318-02. Steel structures would have been designed either with the ASD manual of steel construction, 9th edition, or the LRFD manual of steel construction, 1st edition. I will use the LRFD 3rd edition.

Earthquake Load Computations

Seismic loads were calculated by the equivalent lateral force analysis procedure as prescribed by ASCE 7-02 section 9.0. See the Appendix for computations. Table 2 presents the results of the analysis:

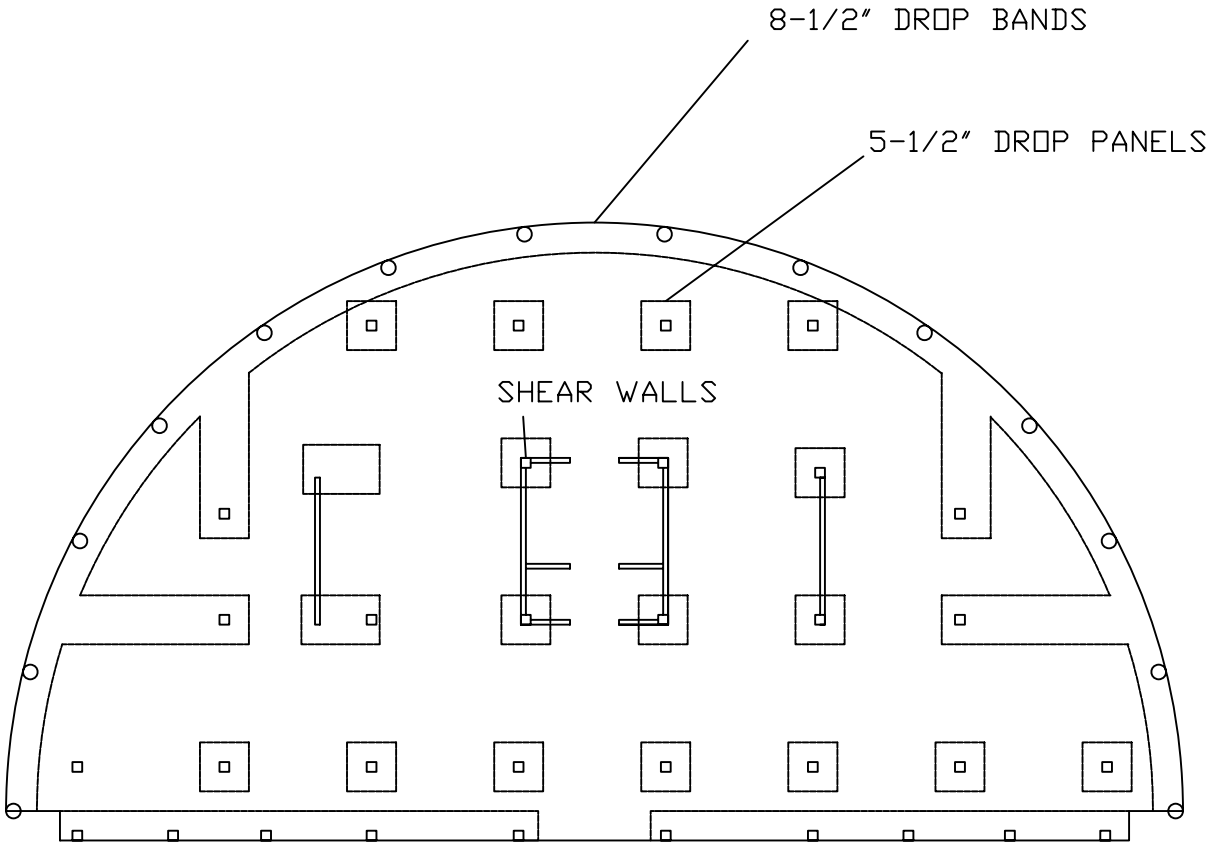

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Table 2. Seismic Loads

Level	N-S Seismic Load (k)	E-W Seismic Load (k)
Pent. Roof	21.3	19.4
Elv./Mch	46.7	42.6
Roof	420.0	383.0
15	345.1	314.8
14	268.5	244.9
13	244.0	222.5
12	222.8	203.3
11	202.2	184.4
10	182.1	166.1
9	162.5	148.2
8	143.5	130.9
7	125.2	114.2
6	107.4	98.0
5	90.4	82.5
4	74.2	67.6
3	46.4	42.3
P6	107.5	98.1
P5	40.8	37.2
P4	68.8	62.7
P3	33.6	30.7
P2	13.3	12.2

Wind Load Computations

I have computed wind loads by the analytical procedure prescribed by ASCE 7-02 Section 6.0. I have assumed the structure to be rigid for this analysis, and will justify this assumption in a future report. I have only calculated the wind load against the North face of the building, as this is the largest by inspection, and since this load does not control the design of the main wind force resisting system, neither will the others. See the Appendix for calculations. Wind may control the design of components and cladding, so I will calculate other directions of wind load when this becomes a concern.

Once I obtained the design wind pressures against the North face for the main wind force resisting system, I factored them by 1.6 per ASCE 7-02 section 2.3.2. I then modeled the curtain wall in SAP 2000 as a series of simply supported beams with the floor slabs as the supports, and applied the factored load. This yielded the distribution of the wind load to the various floors, which is presented in Table 3.

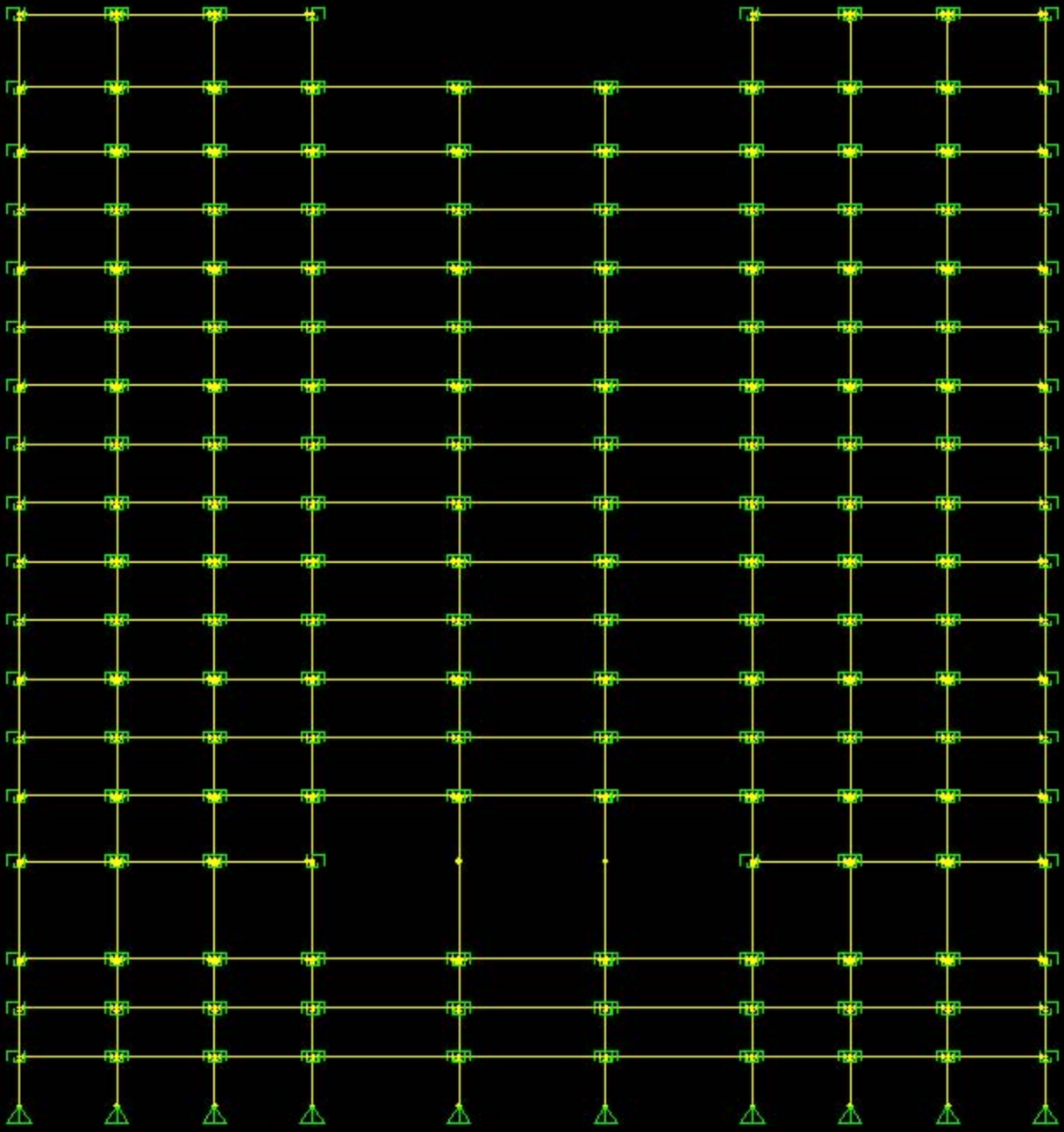
Table 3. Wind Load Due to Loading on North Wall

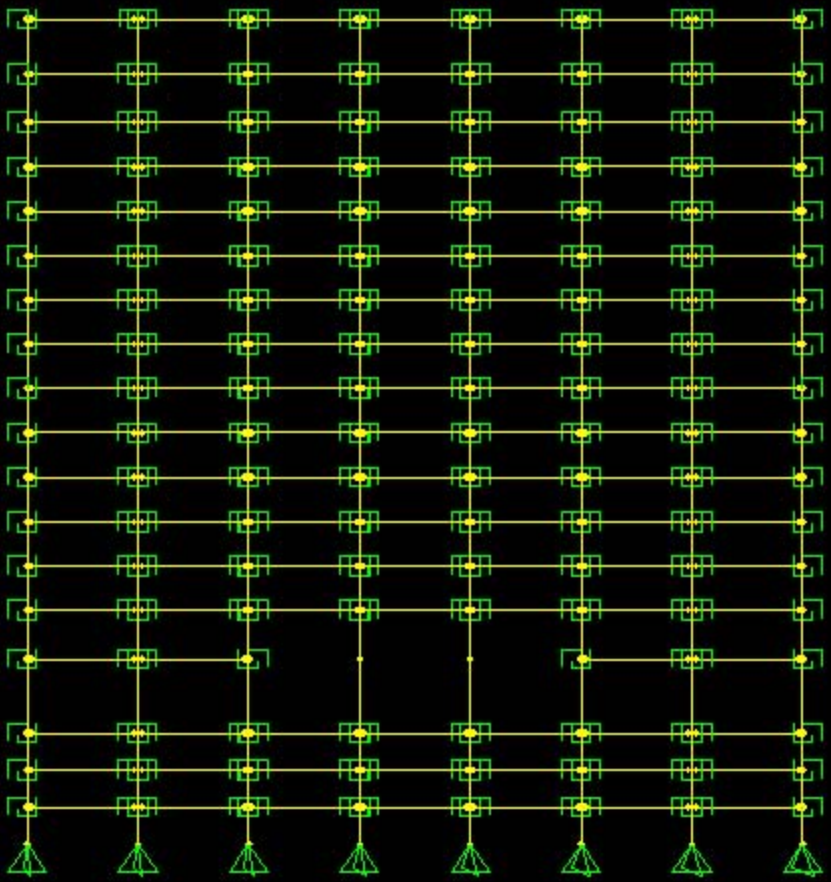
Factored Wind Load (k)	
Roof	570.6
15	150.0
14	130.1
13	123.4
12	122.1
11	120.7
10	119.4
9	117.6
8	116.2
7	114.1
6	112.1
5	109.4
4	107.1
3	106.8
P6	101.3
P5	97.9
P4	94.1
P3	88.8
P2	85.0

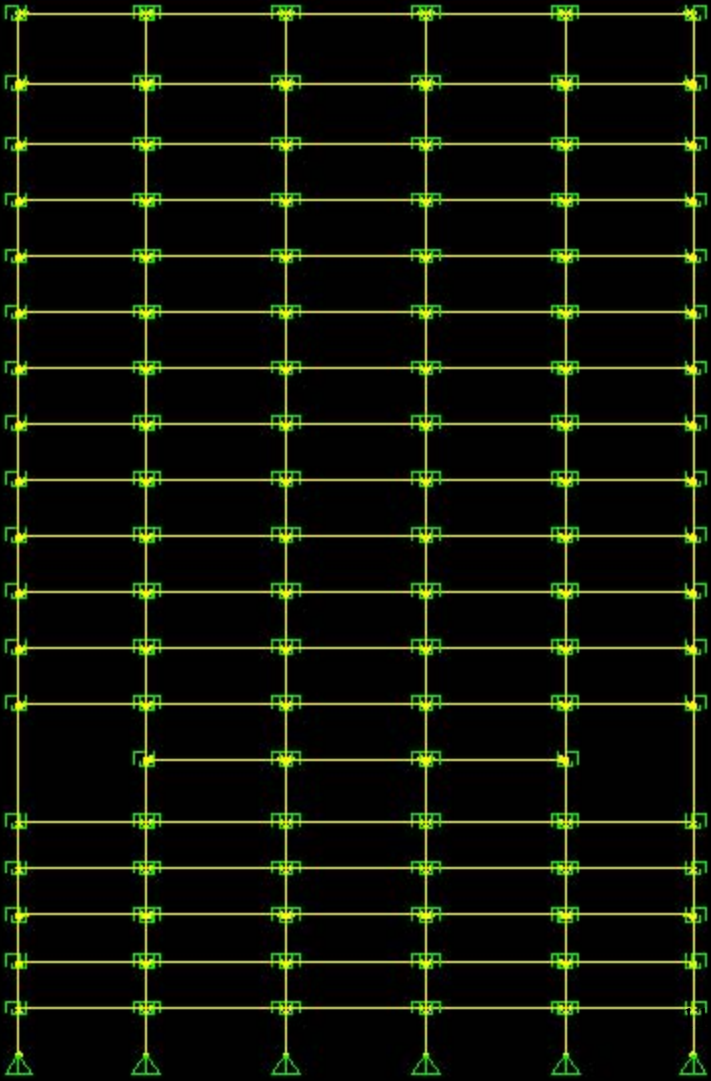
Stiffness of Concrete Frames and Shear Walls

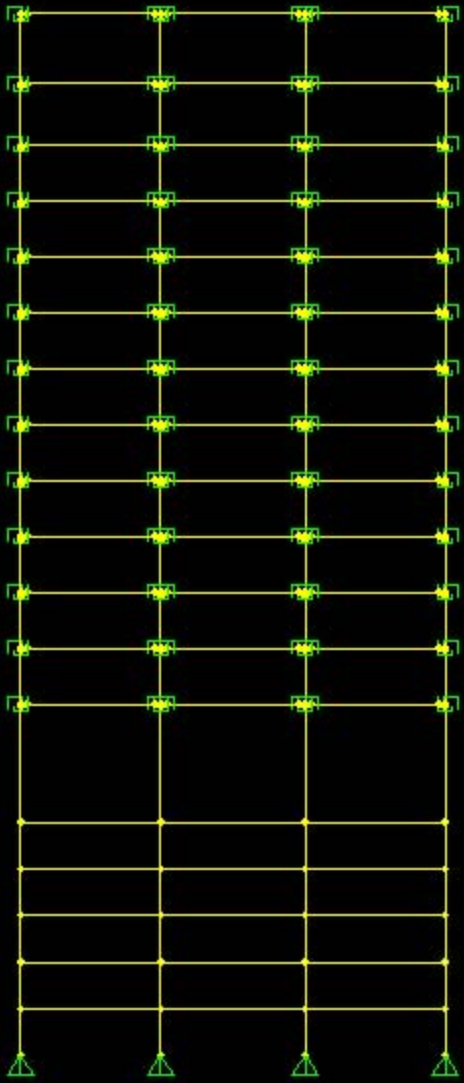
As stated above, lateral load is resisted in Towers Crescent Building F by a combination of (a) concrete moment frames created by the interface of slab-beams and columns, and (b) reinforced concrete shear walls.

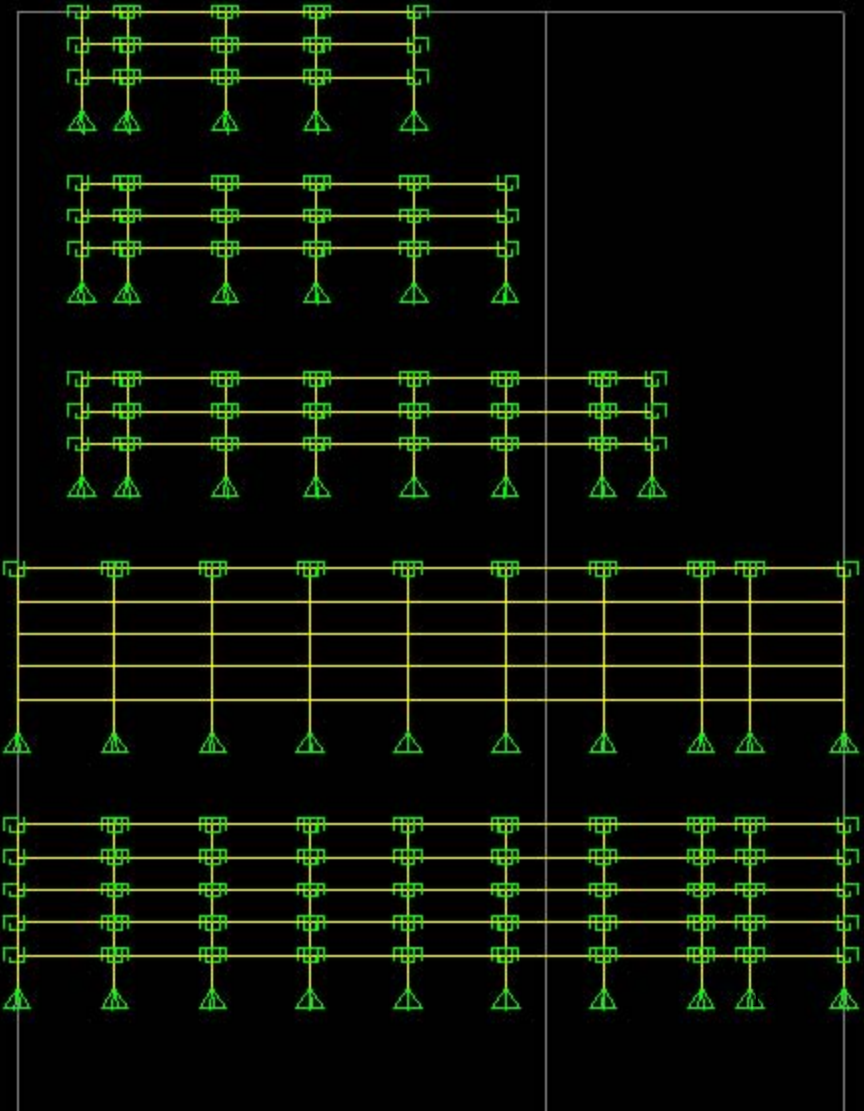
To determine the lateral stiffness of the moment frames, I employed the equivalent frame method. In a series of spreadsheets, provided in the Appendix, I calculated (1) the stiffness of the slab-beams, (2) the strength increase factor for the portions of the slab-beams within the face of their supports, (3) the stiffness of the columns, and (4) the stiffness of the equivalent torsional members which simulate the semi-rigid connections between the slab-beams and the supports. Due to the irregular nature of the frames, I made the following simplifying assumptions in theses calculations: I neglected changes in slab-beam stiffness along length, using the section of lowest stiffness for the whole; I used the axial area at the column face for the axial area of slab-beam; I assumed the same column stiffness above as below the slab for the sake of finding the stiffness of the torsional members. Once the frames were described, I assembled them in SAP 2000, using non-linear link elements to model the torsional members. Next, I loaded the frames with 1 kip at each floor and recorded the deflections produced by each of these loads at the level of application. The inverse of these deflections yielded the relative stiffness of the frame at every level. Pictures of the frames are provided on the following pages.











Determining the lateral stiffness of the shear walls was a simpler process. I modeled each shear wall as a cantilever, and repeated the process described above of applying 1 kip loads at each floor and determining relative stiffness. Pictures are on the following page. SAP calculated a deflection of 0.0248" for Wall FM under 1 kip applied at the roof. I checked this answer by the formula:

$\Delta = PL^3/(3EI) = 1(2680^3)/(2(4031)(46656000)) = 0.034$"

The slightly higher result is expected since I neglected the increases in E and I below the 13^{th} floor.

Upon completion of this analysis it was discovered that at the higher levels the equivalent moment frames contribute significantly to lateral stiffness; the largest frame is almost as rigid as the deepest shear wall. However, at the lower floors the shear walls begin to dominate; at the bottom floor even the small East-West shear walls are over four times as rigid as the strongest equivalent frame.

Lateral Load Application and Distribution

To determine the point of application of the North-South and East-West lateral loads, certain preliminary calculations are necessary.

Center of Mass

For the more regular floors, I estimated the center of mass by the center of area, this being obtained by drawing the area in AutoCAD 2007, creating a region, and using the inquiry tool. For more irregular floors, involving areas with different slab thicknesses, I broke the region into subsections and determined the area and center of area for each. Then, I weighted the areas to reflect their various average weights, relative to an area with a 9" slab, and found the aggregate COA by the equation:

$(A_1x_1 + \ldots + A_nx_n)/(A_1 + \ldots + A_n)$

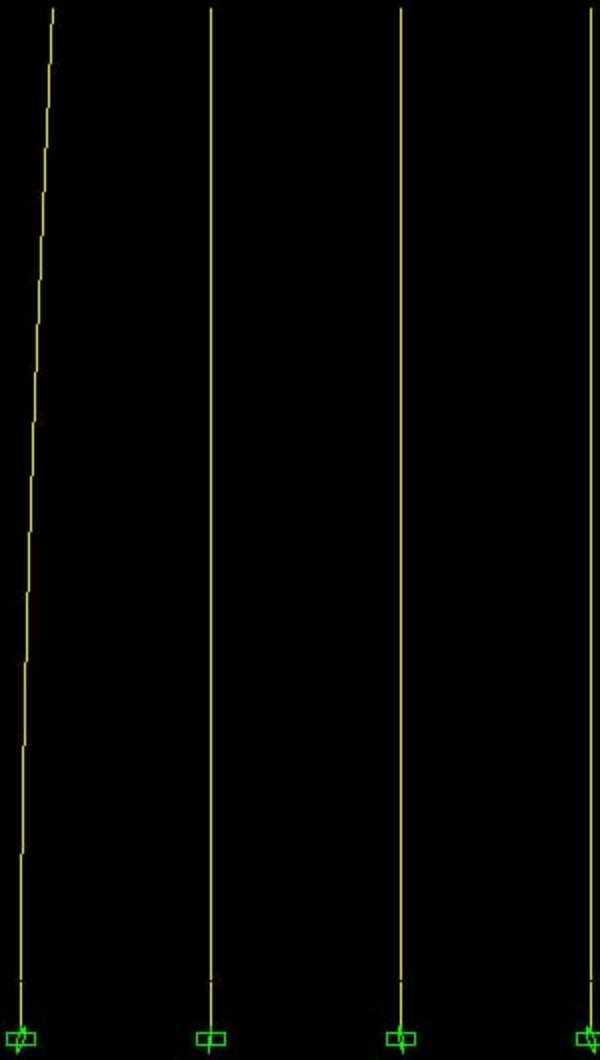
These values I took as the center of mass.

Center of Rigidity

The center of rigidity is calculated by the formulas:

$x_r = \Sigma(R_yx)/\Sigma R_y$
$y_r = \Sigma(R_xy)/\Sigma R_x$

Where x_r is the x (East-West) coordinate of the center of rigidity, y_r is the y (North-South) coordinate, R_y is the relative stiffness of each element against loading in the y



direction, R_x is stiffness in the x direction, x is the distance in the x direction of each element from a reference datum, and y is the distance in the y direction.

Calculated Eccentricities

The calculated eccentricity in the application of wind loading is the distance between the center of wind area and the center of rigidity. The center of wind area is determined graphically, and the center of rigidity is determined as above. The eccentricity of seismic loading is the distance between the center of mass and the center of rigidity. Center of mass and center of rigidity are determined as above.

Application Cases

I considered the following lateral load cases:

- The North-South seismic load, applied at an eccentricity offset by 5% of the building width to the West of the calculated seismic, x direction eccentricity
- The same, but eccentricity offset to the East
- The East-West seismic load, applied at an eccentricity offset by 5% of the building width to the South of the calculated seismic, y direction eccentricity
- The same, but eccentricity offset to the North
- The wind load at the North face, applied at the calculated wind, x direction eccentricity
- 75% of the above, applied at an eccentricity offset 15% of the building width to the West of the calculated wind, x direction eccentricity
- The same, but eccentricity offset to the East

I have not considered other directions of wind loading because, by inspection, it is clear that they will not control the design of the main wind force resisting system.

Distribution

The lateral load is distributed by the floor slab, which acts as a rigid diaphragm, according to the stiffness of the lateral load resisting elements. It has two components: direct shear and torsional shear. Direct shear is distributed by the formula:

$$H_{N,D} = H_S K_{SN} / \Sigma K_{S,//}$$

Where $H_{N,D}$ is the direct shear induced in an element at a floor, H_S is the total shear applied at that floor, K_{SN} is the relative stiffness of the element, and $\Sigma K_{S,//}$ is the sum of the stiffnesses of all lateral elements parallel to that under consideration, at that floor.

Torsional shear is calculated as follows:

$$H_{N,S} = H_S e K_{SN} C_N / \Sigma(K_{SN} C_N^2)$$

Where $H_{N,S}$ is the torsional shear induced in an element at a floor, H_S is the total shear applied at that floor, e is the relevant eccentricity, K_{SN} is the relative stiffness of the element, and C_N is the perpendicular distance from the element to a parallel line running through the center of stiffness.

I calculated the direct shear and torsional shears in each element for each of the above load cases. Where torsional shear loaded an element in the same direction as direct shear, I added the two. I then calculated the accumulated shear in each element at each floor, due to the shears induced on floors above.

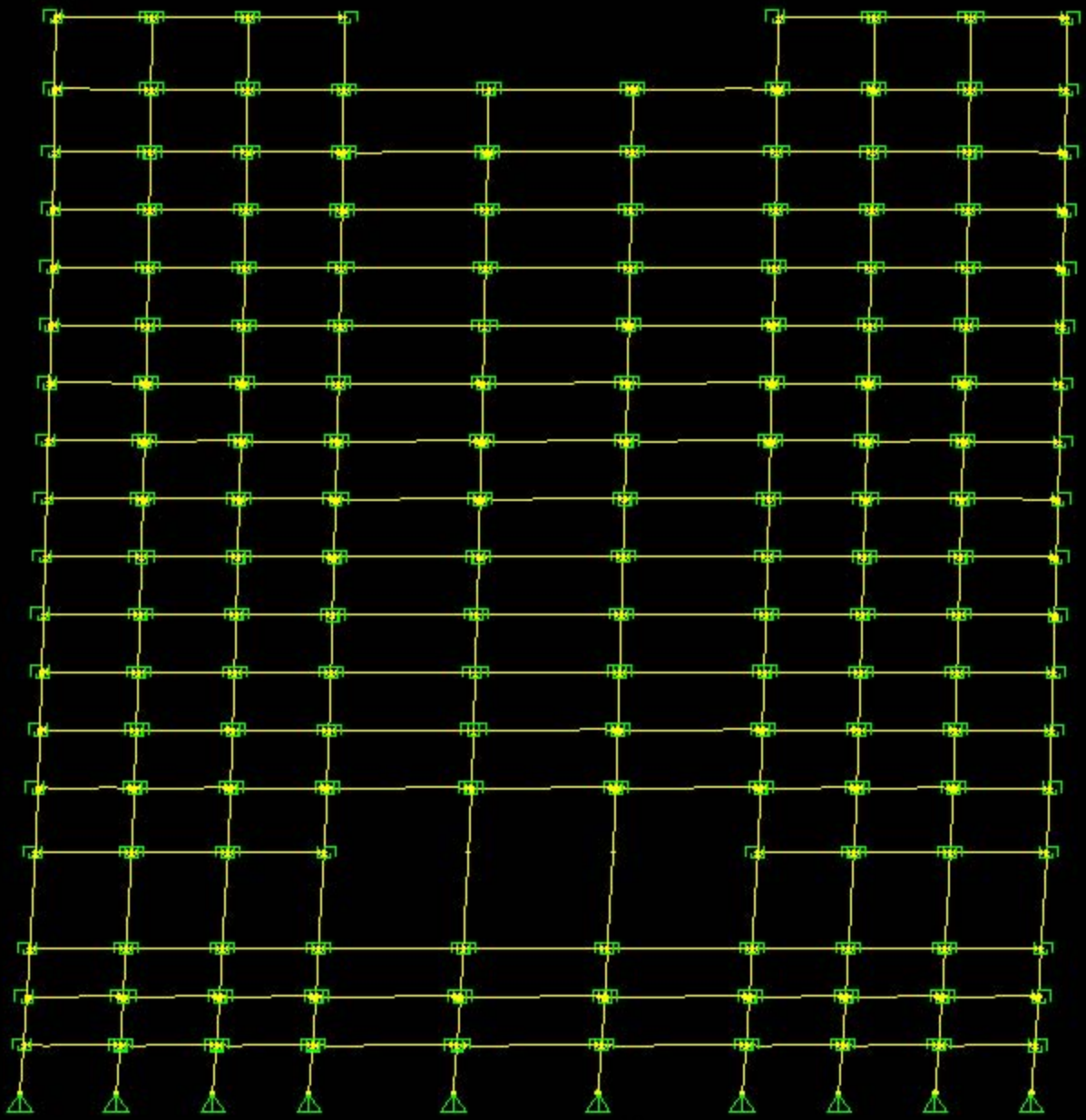
It was found that seismic load controlled the design of every element. At the lower levels, seismic eccentricities were quite large, but this did not induce especially large loads, due to the small story shears. Calculations can be found in the spread sheets in the Appendix.

Drift

To determine the building total drift I loaded lateral resisting elements with the controlling loads determined in the section above. The resulting deflection of wall FN, and hence the maximum building drift under loading in the North-South direction, was found to be approximately 10". The deflection of the two walls along line F6, and hence the building drift under loading in the East-West direction, was found to be 21.2". I checked this value by loading frame F8 with the values determined above, and found that it deflected approximately 15". A picture of the deflected shape is on the following page.

Theoretically these latter two deflections should be closer to each other, with frame F8 even deflecting slightly more than the walls along F6 due to the increased torsional loading resulting from its being located further away from the center of stiffness. However, the current method of distribution is not exact. The exact distribution of loads would simultaneously satisfy all compatibility requirements, i.e., each lateral element will have the same deflection, with some variations for torsion, at every floor. I, on the other hand, have distributed loads in such a manner as to satisfy compatibility at one floor at a time. Hence, my distribution is approximate; it ignores the effect of the slab diaphragm redistributing loads at each floor.

In any case, all of these values are above the acceptable drift value of l/400 = 6.92". Many stories fail the story drift criterion as well. In the case of North-South drift, this situation could be remedied by slightly increasing the length, thickness, or concrete quality of the four large shear walls which resist nearly all the lateral loading in this direction. A more rigorous analysis, which took into account the effects of the 2 small slab-beam/column frames which work beside the shear walls, and the slab-beam/column frames which brace against the shear walls, would also bring the calculated deflection closer to the acceptable level.



For East-West drift, the most obvious solution would be to connect together each of the three pairs of shear walls which work through the same line of action. This would be done with a deep shear beam, either reinforced with diagonal rebar or composed of fiber reinforced concrete. This would greatly increase stiffness. Unfortunately, given that (a) the pairs of shear walls are currently 12'-8" apart, and (b) the depth of the shear beams would be limited by an important architectural consideration, viz., that people have to be able to walk under them, it would probably be necessary to extend the shear walls towards each other and reduce the space between them. Architecturally, this would have the effect of rendering the elevator lobby a more enclosed space. If this were unacceptable to the architects, the engineer would have to pursue a different solution. The next possible consideration would be to add shear walls where the current plan places non-structural partition walls.

Strength Checks

Strength of Shear Wall FN at Base
$V_n = A_{cv}(\alpha_c\sqrt{(f'_c)} + \rho_t f_y)$

$h_w/l_w > 2 \Rightarrow \alpha_c = 2.0$
$A_{cv} = 16(404) = 6464\ in^2$; $\rho_t = 2(0.20)/(16(9)) = 0.002778$

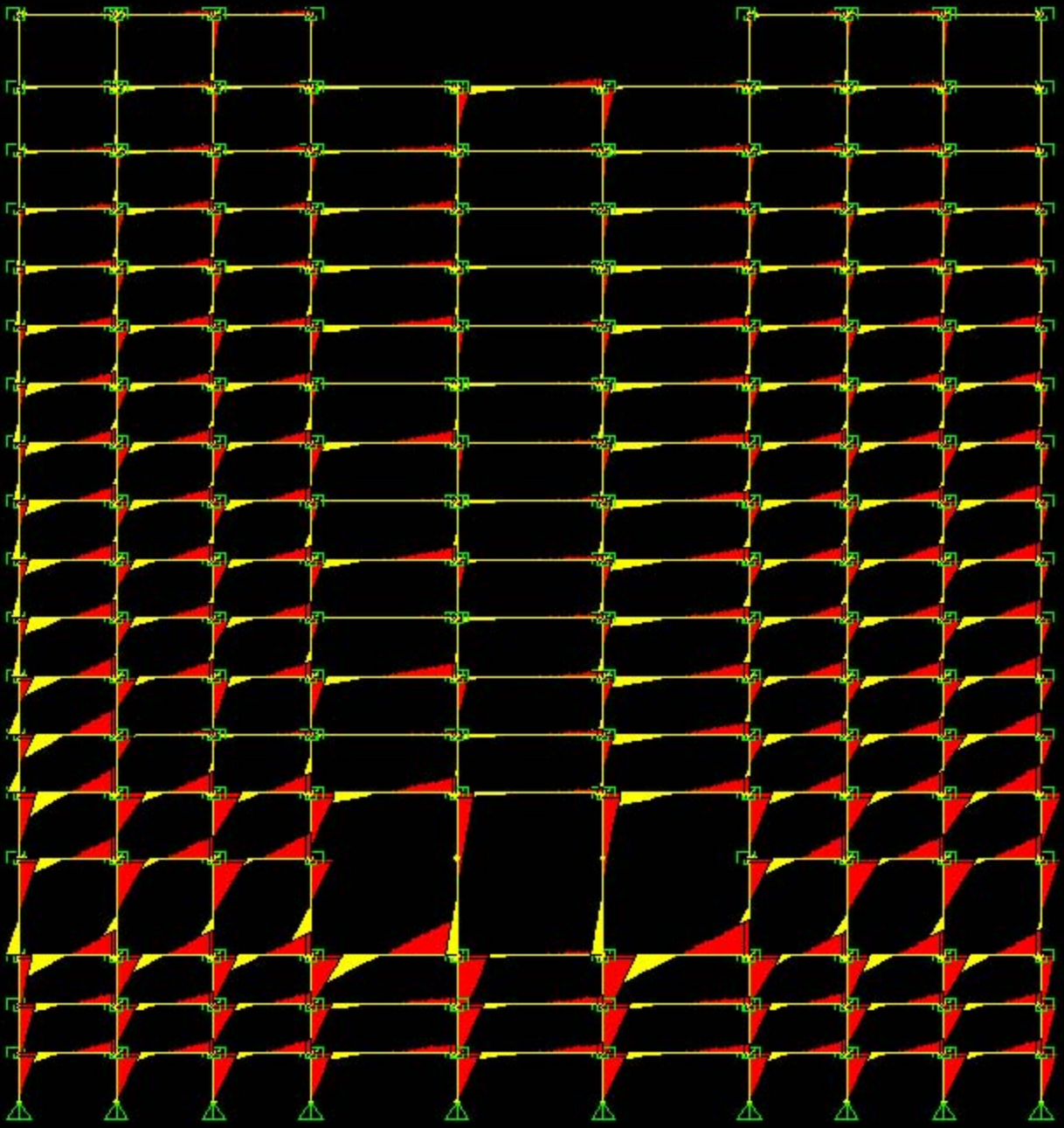
$\Phi V_n = 0.6(6464)(2\sqrt{(8000)} + 0.002778(60000)) = 1340^k > 956^k$ (ok)

Strength of Shear Wall FN at 3rd Floor
$h_w/l_w > 2 \Rightarrow \alpha_c = 2.0$
$A_{cv} = 12(404) = 4848\ in^2$; $\rho_t = 2(0.20)/(12(12)) = 0.002778$

$\Phi V_n = 0.6(4848)(2\sqrt{(7000)} + 0.002778(60000)) = 972^k > 640^k$ (ok)

Bending Strength of Slab Beam along F8 between FM & FM at Level P4
$a = 8(0.44)(60)/[0.85(4)(96) = 0.647$"
$\Phi M_n = 0.9(8)(0.44)(60)(17.5 - 1.5 - .75/2 - 0.657/3)/12 = 242.4$ ft-k
Section is tension controlled by inspection.

According to the SAP model, pictured on the next page, this slab-beam will be subjected to a bending moment of over 1000 ft-k under maximum lateral loads. This underscores the necessity of adding shear walls in the East-West direction. The concrete frames are simply not adequate to provide most of the lateral resistance.



Overturning and Impact on Foundations

The overturning moment at the base of Wall FN, taken from the SAP model, is 141,138 ft-k. This must be resisted by a couple with 4457^{k} compression at one end and 4457^{k} tension at the other end. The pile cap underneath either end of this column caps 20 80T piles, which means it can withstand a load of 3200^{k}. Thus, clearly, the foundation is inadequate at these points.

Summary and Conclusions

Seismic loading controls the design of the lateral system of Towers Crescent Building F. It is distributed by the floor slab at each floor according to stiffness. The shear walls in the North-South direction are adequate for strength but not for serviceability criteria. On the other hand, the shear walls in the East-West direction are adequate neither for strength nor serviceability. Moreover, because they lack sufficient stiffness, much of the load will distribute to the slab-beam/column frames, the members of which are not adequate to resist the resulting flexural stresses. Also, the seismic load will create overturning moments which the foundations are not adequate to bear.

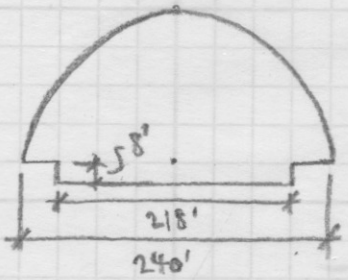
Therefore, shear walls will need to be slightly increased in size in the North-South direction, and dramatically increased in size in the East-West direction. The most feasible solution would be to place them in place of the partition walls which currently run in that direction in the region of the structural core. Finally, the foundations will have to be upsized where they will be required to resist overturning moment.

Appendix

- Building Weight and Snow Load Computations
- Seismic Load Computations
- Wind Load Computations
- Equivalent Frame Analysis Spreadsheets
- Lateral Resisting Systems Stiffness Spreadsheets
- Load Eccentricity and Lateral Load Distribution Spreadsheets

Weight of Building by floor

$$A_{floor} = \frac{1}{2}\pi(120^2) + 218(8) = 24364\ ft.^2$$



Penthouse roof level framing plan – EL = 694.33'

slab: $30'(51.\bar{6}')\left(\frac{9}{12}'\right)(150\,pcf) = 174.4^k$

beams: $(34'+4.5'+4.5'+4.5'+4.5'+13.5')\frac{(12)(30-9)}{144}(150) = 17.2^k$

$(13.5')\frac{(12)(18-9)}{144}(150) = 1.52^k$

$(29.5'(2)+15'(2))\frac{(12)(80-9)}{144}(150) = 79.0^k$

roof system: $30'(51.\bar{6}')(5\,psf) = 7.75^k$

fan ornament: attached at main roof

total: 280^k

Elevator machine room – EL = 685.58'

slab: $14'(33.5')\left(\frac{9}{12}'\right)(150\,pcf) + 16'(33.5')\left(\frac{5}{12}'\right)(150\,pcf) + 8'(21')\left(\frac{8}{12}'\right)(150) = 103^k$

beams: $[(10'(6)+40'(4)+30'(4)+19'+10'(2)+28']\frac{(12)(30-9)}{144}(150) = 107^k$

$(16')\frac{(12)(60-5)}{144}(150) = 11^k$

$(150)(13.5'(2)+34'(2)+4')\frac{(8)(48-5)}{144} = 35.5^k$

Posts and columns: $4\frac{(24)(24)}{144}(150)(688.91-685.58) = 8^k$

$30\frac{(12)(12)}{144}(150)(694.33-685.58) = 39.4^k$

$10\frac{(12)(36)}{144}(150)(694.33-685.58) = 39.4^k$

mechanical room floor:

$30'(33.5')(150\,psf) + 8'(21')(150\,psf) = 176^k$

exterior facade: $(2)(55psf)(40'(3))(688.91' - 685.58') = 44^k$

$(55\,psf)(30'(2) + 51.6'(2))(694.33 - 685.58) = 78.6^k$

total: 642^k

Roof/penthouse floor – EL 678.33'

$A_{floor} = \frac{1}{2}\pi(120^2) + (86')(2)(8') - 4'(31') - 2(8')(32') - 29'(6') - 12'(4') - 6'(8') - 13(\pi)(1.5^2) - 30(2')(2') - 3(1)(90)$

$= 22758\,ft.^2$

slab: $150\,pcf\,(1')(22{,}758\,ft.^2) = 3414^k$

drop panels/bands:

$(2)(10')(7.5')(5.5/12)(150) = 10.3^k$

$(\frac{3}{5})(22{,}758)(150)(5.5/12) = 626^k$

beams: $(210' + 21' + 31'^{*2} + 29'^{*2} + 60' + 28' + 64' + 32' + 20' + 90' + 18(6))\frac{(10)(40)}{144}(150) = 314^k$

posts and columns: $(14)\pi(1.5^2)(0.05(450) + 0.95(150))(703.5 - 678.33) = 410^k$

* $\frac{15(24)(24)}{144}(150)(685.58 - 678.33) = 65.3^k$

$30\frac{(12)(12)}{144}(150)(685.58 - 678.33) + 2\frac{(12)(12)}{144}(150)(694.33 - 678.33) = 37.4^k$

fan ornament: $[2(33.5')(130\,plf) + 2(15')(29.2\,plf) + 2(5')(29.2') + 6(10')(29.2\,plf) + 28'(73.3\,\#) + 30'(73.3\,\#) + (34')(47.8\,plf) + (34')(10.5\,plf) + 3psf(32')(32') + 2(1.5')(82\,plf) + 2(25.7')(76\,plf)](12) = 301^k$

mechanical room floor: $(150\,psf)(14')(30') = 63^k$

walls: $(3)(40')(685.58' - \frac{9}{12}' - 678.33')(55\,psf) = 42.9^k$

$(34' + 92' + 97')(685.58' - 678.33')(55psf) = 88.9^k$; $(9')(190')(55psf) = 44.6\,psf$

screen wall: $212'(16')(\frac{3}{12})(170\,pcf) + 3(32.6\,plf)(212') = 117^k$

* $6\frac{(12)(36)}{144}(150)(685.58 - 678.33) = 19.6^k$

screen wall, cont.:

$333'(10'(125psf) + 15.6plf(2) + 11'(\frac{25'}{12})(450pcf)) = 461^k$

superimposed dead load for roofing system:

$5psf(11494ft.^2 - 112'(40')) = 35^k$

total: 6050^k

15^{th} floor - EL = 663.33'

$A_{floor} = 22{,}758 + 47'(10') = 23{,}228\ ft.^2$

slab: $150\ pcf(\frac{9'}{12})(11{,}964\ ft.^2) = 2613^k$

drop panels/bands:

$2(10')(7.5')(\frac{5.5'}{12})(150) + (76+90+70+88+65+52)(\frac{5.5'}{12})(150) = 40.6^k$

$A_{17.5band} = 3341\ ft.^2$; $3341\ ft.^2(\frac{17.5-9}{12})(150pcf) = 355^k$

$A_{24band} = 80'(52') = 4160\ ft^2$; $4160\ ft^2(\frac{24-9}{12})(150\ pcf) = 780^k$

beams: $(8'(4) + 21' + (2)31' + (2)29' + 2(31') + 18' + 20' + 4(5'))\frac{(10)(40)}{144}(150) = 122^k$

posts and columns: $14\pi(1.5^2)(0.05(450) + 0.95(150))(678.33 - 663.33) = 244^k$

$31(4ft.^2)(150\ pcf)(678.33 - 663.33) = 279^k$

$2(1ft.^2)(150\ pcf)(15') = 4.5^k$

spire: $\pi[(18^2-16^2)(35) + (16^2-14^2)(29') + (14^2-12^2)(29') + (12^2-10^2)(29')]\frac{450}{144} = 67.8^k$

partition load & other finishes: $15\ psf(23{,}228\ ft.^2) = 348^k$

walls: shear - $(29' + 26' + 2(30) + 6(8'))(1')(15')(150pcf) = 367^k$

curtain - 15 psf for glass secs., 110 psf for brick; Nwall 1/3 brick ∴ 46.7 psf

S wall 15 psf, central glass area 15 psf

$15'(15psf(40') + 46.7psf(86')(2) + 15psf(8')(2) + 15psf(\frac{1}{2}\pi(240'))) = 218^k$

electrical/mech sys.: $11'(12')(150\ psf) = 19.8^k$

total: 5456^k

4th - 14th floors

slab: 2613^k

drop panels / bands:

$[6(10')(7.5') + 4(10')(10') + 2(7.5)(7.5) + 76 + 90 + 70 + 88 + 65 + 52]\left(\frac{5.5'}{12}\right)(150) = 96.5^k$

$A_{17.5\,band} = 3341\,ft.^2 + 2(10')(29') = 3921\,ft.^2$; $3921\,ft.^2\left(\frac{17.5-9}{12}\right)(150\,pcf) = 417^k$

beams: 122^k

posts & columns: $2(\pi)\left(\frac{15}{12}\right)^2(12)(150) = 17.7^k$ (19.1^k on 14th)

$31(4)(150)(12) = 223^k$ (242^k on 14th)

$14\pi(1.5^2)(150)(12) = 178^k$ (193^k on 14th)

partition load & other finishes: 348^k

walls: shear - 367^k

curtain - 174^k (189^k on 14th)

elec/mech sys. - 19.8^k

total: 4576^k (4626^k on 14th)

3rd floor

slab: $\left[\frac{1}{2}\pi(108^2) + 8(216) - \ldots\right]\frac{9'}{12}(150\,pcf) = 2127^k$

drop panels / bands:

$[6(10')(7.5') + 2(7.5)(7) + 76 + 90 + 70 + 88 + 65 + 52 + 2(10)(16) + 2(10)(7) + 2(10)(4) + 4(9)(25)]\left(\frac{5.5}{12}\right)(150) = 167^k$

$A_{17.5\,band} = 2(98')(7') = 1372\,ft.^2$; $1372\,ft.^2\left(\frac{17.5-9}{12}\right)(150\,pcf) = 146^k$

beams: $(8'(4) + 21' + (2)29' + (2)31' + 18' + 20' + 4(5'))\frac{(10)(40)}{144}(150) = 96.3^k$

posts & columns: $17.7^k + 223^k = 241^k$

partition load & other finishes: $15\,psf(18904\,ft.^2) = 284^k$

walls: shear - 367^k

curtain - $12'(15(40) + 46.7(86)(2) + 15(\frac{1}{2}\pi(246))) = 165^k$

elec/mech sys. - 19.8^k ; total: 3613^k

P6/2nd floor

$[30'(30')(1')(150pcf) + (10)(10)(\frac{5.5}{12})(150) + 4(12)(150) + 30(1)(110pcf)(12)] / (30\times30)$

$= 210$ psf (parking area)

total: $5456^k + 210(45469) = 15{,}000^k$

P5/Mezzanine

$210(51763) = 10{,}870^k$

P4/First floor

$5456^k + 210(82800) = 22{,}800^k$

P3/P2/P1

$4576^k + 210(82{,}800) = 22{,}000^k$

Snow load

$p_s = 25$ psf, Eposure B

$C_e = 1.3$; $C_t = 1.0$; $I_s = 1.1$

$p_f = 25(1.3)(1.0)(1.1) = 36$ psf ; $p_{f,lower} = 2.5(1.1) = 27.5$ psf

$36psf(\frac{1}{2}\pi(120^2) + 2(8)(86)) = 864^k$

Seismic Load Computations

Occupancy Category III - Seismic Use Group II
I = 1.25
Seismic Site Classification D

$S_s = 0.195$; $S_1 = 0.07$
$S_{ms} = 1.6(0.195) = 0.312$; $S_{m1} = 2.4(0.07) = 0.168$
$S_{ds} = 2/3(S_{ms}) = 0.208$; $S_{d1} = 2/3(S_{m1}) = 0.112$

Seismic design category B; $\rho = 1.0$

Analytical procedure – equivalent lateral force analysis – 9.5.5

$W = 280 + 642 + 6050 + 5456 + 4626 + 4576(11) + 3613 + 11400 + 5820 + 14420 + 12120(2) + (0.2)(864) = 127046^k$

North – South Direction

Ordinary reinforced concrete shear walls. R = 5

$C_s = 0.208 / (5 / 1.25) = 0.052$
$T_s = 0.02(682.83 - 455)^{0.75}) = 1.17s$
$C_s = 0.112 / (1.17\ (5 / 1.25)) = 0.0239$ <= controls
$C_s = 0.044(0.208)(1.25) = 0.01144$

$V = 0.0239(127046) = 3037^k$
$k = (1.17 – 0.5) / (2.5 – 0.5) * (2 – 1) + 1 = 1.34$
$\Sigma w_i h_i^k = 5.97 \times 10^7$

East – West Direction

Shear wall-frame interactive system with ordinary reinforced concrete moment frames and ordinary reinforced concrete shear walls. R = 5.5

$C_s = 0.208 / (5.5 / 1.25) = 0.0473$
$T_s = 0.02(682.83 - 455)^{0.75}) = 1.17s$
$C_s = 0.112 / (1.17\ (5.5 / 1.25)) = 0.0218$ <= controls
$C_s = 0.044(0.208)(1.25) = 0.01144$

$V = 0.0218(127046) = 2770^k$
$k = (1.17 – 0.5) / (2.5 – 0.5) * (2 – 1) + 1 = 1.34$
$\Sigma w_i h_i^k = 5.97 \times 10^7$

Level	Wt. (k)	Ht. (ft)	NS Seis. Ld. (k)	EW Seis. Ld. (k)
Pent Rf.	280	239	21.3	19.4
Elv./Mch.	642	231	46.7	42.6
Roof	6050	223	420.0	383.0
15	5456	208	345.1	314.8
14	4626	195	268.5	244.9
13	4576	183	244.0	222.5
12	4576	171	222.8	203.3
11	4576	159	202.2	184.4
10	4576	147	182.1	166.1
9	4576	135	162.5	148.2
8	4576	123	143.5	130.9
7	4576	111	125.2	114.2
6	4576	99	107.4	98.0
5	4576	87	90.4	82.5
4	4576	75	74.2	67.6
3	3613	63	46.4	42.3
P6	11400	50	107.5	98.1
P5	5820	40	40.8	37.2
P4	14420	30	68.8	62.7
P3	12120	20	33.6	30.7
P2	12120	10	13.3	12.2

Wind Load Computations

North Face
I_w = 1.15 (occupancy > 5000); Surface roughness B; Exposure B
V = 90 mph; K_d = 0.85; K_{zt} = 1.0

h = 685.58 – 455 = 230.58'
$T_a = C_t h_n^x = 0.02(231)^{0.75}$ = 1.19 sec; f = 1/T = 0.844 Hz < 1 Hz => dynamic structure
z = 0.6(231) = 139' > z_{min} (ok)

Gust Effect Factor
(for rigid structure)
$I_z = 0.3(33/139)^{1/6} = 0.236$
$L_z = 320(139/33)^{1/3} = 516.8$
$Q = (1/(1 + 0.63((240+230.6)/516.8)^{0.63}))^{1/2} = 0.792$

$G = 0.925(1 + 1.7(3.4)(0.236)(0.792))/(1 + 1.7(3.4)(0.236)) = 0.814$

(for dynamic structure)
$V_z = 0.45(139/33)^{1/4}(90)(88/60) = 85$ ft./s
$\beta = 0.05$
$\eta_{Rh} = 4.6(0.844)(230.58)/85 = 10.53$
$R_h = 0.0904$
$\eta_{Rb} = 4.6(0.844)/85 = 0.046$
$R_b = 0.97$
$\eta_{RL} = 15.4(0.844)(132)/85 = 20.2$
$R_L = 0.0483$
$L_z = 320(139/33)^{1/3} = 516.8$; $N_1 = 0.844(516.8)/85 = 5.13$
$R_n = 7.47(5.13)/(1 + 10.3(5.13))^{5/3} = 0.05$
$Q = (1/(1 + 0.63((240+231)/516.8)^{0.63}))^{1/2} = 0.792$
$R = ((1/0.05)(0.0904)(0.05)(0.97)(0.53 + 0.47(0.0483)))^{1/2} = 0.22$
$g_r = (2\ln(3600(0.844)))^{1/2} + 0.577/(2\ln(3600(0.844)))^{1/2} = 4.15$
$I_z = 0.3(33/139)^{1/6} = 0.236$

$G_f = 0.925(1 + 1.7(0.236)(3.4^2(0.792^2) + 3.4^2(0.22^2))^{1/2})/(1 + 1.7(3.4)(0.236)) = 0.83$

Velocity Pressures and Design Pressures
Enclosure Classification: Closed
$q_z = 0.00256(1.0)(0.85)(90^2)(1.15)K_z = 20.27K_z$

GC_{pi} = +- 0.18
$C_{p,\ windward} = 0.8$; $C_{p,\ leeward} = -0.5$
$C_{p,\ roof}$ = -1.3(0.8), -0.18 between 0 and h/2
= -0.7, -0.18 between h/2 and h

Treat raised slab as roof height, barrier as 16' parapet.
GC_{pn} = + 1.8 windward, - 1.1 leeward

Height (ft.)	Kz	q (psf)	p (psf)	factored p (psf)
Parapet	1.28	25.9	75.1	120.2
231	1.28	25.9	28.0	44.8
200	1.2	24.3	26.9	43.0
180	1.17	23.7	26.5	42.4
160	1.13	22.9	26.0	41.5
140	1.09	22.1	25.4	40.7
120	1.04	21.1	24.7	39.6
100	0.99	20.1	24.1	38.5
90	0.96	19.5	23.7	37.9
80	0.93	18.9	23.3	37.2
70	0.89	18.0	22.7	36.4
60	0.85	17.2	22.2	35.5
50	0.81	16.4	21.7	34.6
40	0.76	15.4	21.0	33.6
30	0.7	14.2	20.2	32.3
25	0.66	13.4	19.6	31.4
20	0.62	12.6	19.1	30.5
0-15	0.57	11.6	18.4	29.5

FRAME ALONG EGDE
Roof, 15th, 14th Floors

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
Q				82448	35685	29580286
Qr		1.97	67563			
Q-P	34343					
Pl		1.97	67563			
P				82448	35685	13236093
Pr		1.52	55045			
P-N	36202					
Nl		1.52	55045			
N				82448	35685	13236093
Nr		1.97	67563			
N-M	34343					
Ml		1.97	67563			
M				82448	35685	29580286

FRAME ALONG EGDE

13th, 12th, 11th, 10th, 9th Floors

Slab E (ksi)	3605
Col. E (ksi)	4415

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
Q				82448	35685	29580286
Qr		1.97	67563			
Q-P	34343					
Pl		1.97	67563			
P				82448	35685	13236093
Pr		1.52	55045			
P-N	36202					
Nl		1.52	55045			
N				82448	35685	13236093
Nr		1.97	67563			
N-M	34343					
Ml		1.97	67563			
M				82448	35685	29580286

FRAME ALONG EGDE
8th, 7th, 6th, 5th Floors

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
Q				82448	35685	29580286
Qr		1.97	67563			
Q-P	34343					
Pl		1.97	67563			
P				82448	35685	13236093
Pr		1.52	55045			
P-N	36202					
Nl		1.52	55045			
N				82448	35685	13236093
Nr		1.97	67563			
N-M	34343					
Ml		1.97	67563			
M				82448	35685	29580286

FRAME ALONG GRIDLINE F4
Roof

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				82448	35685	7578280
Rr		1.33	44773			
R-Q	33696					
Ql		1.33	44773			
Q				27648	23179	4446532
Qr		1.24	41838			
Q-P	33696					
Pl		1.24	41838			
P				27648	23179	3754610
Pr		1.21	46278			
P-N	38304					
Nl		1.21	46278			
N				27648	23179	3754610
Nr		1.24	41838			
N-M	33696					
Ml		1.24	41838			
M				27648	23179	4446532
Mr		1.33	44773			
M-L	33696					
Ll		1.33	44773			
L				82448	35685	7578280

FRAME ALONG GRIDLINE F4
15th Floor

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				82448	35685	7578280
Rr		1.33	18889			
R-Q	14216					
Ql		1.33	18889			
Q				27648	4454	854456
Qr		1.24	17650			
Q-P	14216					
Pl		1.24	17650			
P				27648	4454	721495
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				27648	4454	721495
Nr		1.24	17650			
N-M	14216					
Ml		1.24	17650			
M				27648	4454	854456
Mr		1.33	18889			
M-L	14216					
Ll		1.33	18889			
L				82448	35685	7578280

FRAME ALONG GRIDLINE F4
14th Floor

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				82448	35685	7578280
Rr		1.33	18889			
R-Q	14216					
Ql		1.33	18889			
Q				27648	15106	2897803
Qr		1.24	17650			
Q-P	14216					
Pl		1.24	17650			
P				27648	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				27648	15106	2446877
Nr		1.24	17650			
N-M	14216					
Ml		1.24	17650			
M				27648	15106	2897803
Mr		1.33	18889			
M-L	14216					
Ll		1.33	18889			
L				82448	35685	7578280

FRAME ALONG GRIDLINE F4
13th, 12th, 11th, 10th, 9th Floors

Slab E (ksi)	3605
Col. E (ksi)	4415

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				82448	35685	7578280
Rr		1.33	18889			
R-Q	14216					
Ql		1.33	18889			
Q				27648	15106	2897803
Qr		1.24	17650			
Q-P	14216					
Pl		1.24	17650			
P				27648	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				27648	15106	2446877
Nr		1.24	17650			
N-M	14216					
Ml		1.24	17650			
M				27648	15106	2897803
Mr		1.33	18889			
M-L	14216					
Ll		1.33	18889			
L				82448	35685	7578280

FRAME ALONG GRIDLINE F4
8th, 7th, 6th, 5th Floors

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				82448	35685	7578280
Rr		1.33	18889			
R-Q	14216					
Ql		1.33	18889			
Q				27648	15106	2897803
Qr		1.24	17650			
Q-P	14216					
Pl		1.24	17650			
P				27648	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				27648	15106	2446877
Nr		1.24	17650			
N-M	14216					
Ml		1.24	17650			
M				27648	15106	2897803
Mr		1.33	18889			
M-L	14216					
Ll		1.33	18889			
L				82448	35685	7578280

FRAME ALONG GRIDLINE F4
4th Floor

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				82448	35685	7578280
Rr		1.33	18889			
R-Q	14216					
Ql		1.33	18889			
Q				34560	15106	2897803
Qr		1.24	17650			
Q-P	14216					
Pl		1.24	17650			
P				34560	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				34560	15106	2446877
Nr		1.24	17650			
N-M	14216					
Ml		1.24	17650			
M				34560	15106	2897803
Mr		1.33	18889			
M-L	14216					
Ll		1.33	18889			
L				82448	35685	7578280

FRAME ALONG GRIDLINE F4
3th Floor

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				82448		
Q				34560	15106	2897803
Qr		1.25	17070			
Q-P	13608					
Pl		1.25	17070			
P				34560	15106	2446877
Pr		1.18	21532			
P-N	18225					
Nl		1.18	21532			
N				34560	15106	2446877
Nr		1.25	17070			
N-M	13608					
Ml		1.25	17070			
M				34560	15106	2897803
L				82448		

FRAME ALONG GRIDLINE F4
2nd Floor

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				152745	46403	10782733
Rr		1.41	47542			
R-Q	33696					
Ql		1.41	47542			
Q				55296	15106	2897803
Qr		1.24	41838			
Q-P	33696					
Pl		1.24	41838			
P				55296	23179	3754610
Pr		1.21	46278			
P-N	38304					
Nl		1.21	46278			
N				55296	23179	3754610
Nr		1.24	41838			
N-M	33696					
Ml		1.24	41838			
M				55296	15106	2897803
Mr		1.41	47542			
M-L	33696					
Ll		1.41	47542			
L				152745	46403	10782733

FRAME ALONG GRIDLINE F4
P-5

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				152745	7613	2009382
Rr		1.41	18514			
R-Q	13122					
Ql		1.41	18514			
Q				55296	15106	2897803
Qr		1.24	17650			
Q-P	14216					
Pl		1.24	17650			
P				55296	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				55296	15106	2446877
Nr		1.24	17650			
N-M	14216					
Ml		1.24	17650			
M				55296	15106	2897803
Mr		1.41	18514			
M-L	13122					
Ll		1.41	18514			
L				152745	7613	2009382

FRAME ALONG GRIDLINE F4
1st Floor, P-3, P-2

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Slb. bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
R				152745	28317	7473733
Rr		1.41	18514			
R-Q	13122					
Ql		1.41	18514			
Q				55296	15106	2897803
Qr		1.24	17650			
Q-P	14216					
Pl		1.24	17650			
P				55296	15106	2423233
Pr		1.21	19495			
P-N	16160					
Nl		1.21	19495			
N				55296	15106	2423233
Nr		1.24	17650			
N-M	14216					
Ml		1.24	17650			
M				55296	15106	2897803
Mr		1.41	18514			
M-L	13122					
Ll		1.41	18514			
L				152745	28317	7473733

FRAME ALONG GRIDLINE F7
Roof

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	15106	2446877
Sr		1.21	19524			
S-R	16160					
Rl		1.21	19524			
R				27648	15106	2446877
Rr		1.21	19524			
R-Q	16160					
Ql		1.21	19524			
Q				27648	23179	3754610
Qr		1.28	59533			
Q-P	46349					
Pl		1.28	59533			
P				27648	23179	4834202
Pr		1.26	99391			
P-N	78889					
Nl		1.26	99391			
N				27648	23179	4834202
Nr		1.28	59533			
N-M	46349					
Ml		1.28	59533			
M				27648	23179	3754610
Mr		1.21	19524			
M-L	16160					
Ll		1.21	19524			
L				27648	15106	2446877
Lr		1.21	19524			
L-K	16160					
Kl		1.21	19524			
K				27648	15106	2446877

FRAME ALONG GRIDLINE F7
15th Floor

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	4454	721495
Sr		1.21	19524			
S-R	16160					
Rl		1.21	19524			
R				27648	15106	2446877
Rr		1.21	19524			
R-Q	16160					
Ql		1.21	19524			
Q				27648	40919	6628114
Qr		1.21	370226			
Q-P	306432					
Pl		1.21	370226			
P				27648	40919	6628114
Pr		1.21	370226			
P-N	306432					
Nl		1.21	370226			
N				27648	40919	6628114
Nr		1.21	370226			
N-M	306432					
Ml		1.21	370226			
M				27648	40919	6628114
Mr		1.21	19524			
M-L	16160					
Ll		1.21	19524			
L				27648	15106	2446877
Lr		1.21	19524			
L-K	16160					
Kl		1.21	19524			
K				27648	4454	721495

FRAME ALONG GRIDLINE F7
14th Floor

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	15106	2446877
Sr		1.21	19524			
S-R	16160					
Rl		1.21	19524			
R				27648	15106	2446877
Rr		1.21	19524			
R-Q	16160					
Ql		1.21	19524			
Q				27648	15106	2446877
Qr		1.21	19524			
Q-P	16160					
Pl		1.21	19524			
P				27648	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				27648	15106	2446877
Nr		1.21	19524			
N-M	16160					
Ml		1.21	19524			
M				27648	15106	2446877
Mr		1.21	19524			
M-L	16160					
Ll		1.21	19524			
L				27648	15106	2446877
Lr		1.21	19524			
L-K	16160					
Kl		1.21	19524			
K				27648	15106	2446877

FRAME ALONG GRIDLINE F7
13th, 12th, 11th, 10th, 9th Floors

Slab E (ksi)	3605
Col. E (ksi)	4415

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	15106	2446877
Sr		1.21	19524			
S-R	16160					
Rl		1.21	19524			
R				27648	15106	2446877
Rr		1.21	19524			
R-Q	16160					
Ql		1.21	19524			
Q				27648	15106	2446877
Qr		1.21	19524			
Q-P	16160					
Pl		1.21	19524			
P				27648	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				27648	15106	2446877
Nr		1.21	19524			
N-M	16160					
Ml		1.21	19524			
M				27648	15106	2446877
Mr		1.21	19524			
M-L	16160					
Ll		1.21	19524			
L				27648	15106	2446877
Lr		1.21	19524			
L-K	16160					
Kl		1.21	19524			
K				27648	15106	2446877

FRAME ALONG GRIDLINE F7
8th, 7th, 6th, 5th Floors

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	15106	2446877
Sr		1.21	19524			
S-R	16160					
Rl		1.21	19524			
R				27648	15106	2446877
Rr		1.21	19524			
R-Q	16160					
Ql		1.21	19524			
Q				27648	15106	2446877
Qr		1.21	19524			
Q-P	16160					
Pl		1.21	19524			
P				27648	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				27648	15106	2446877
Nr		1.21	19524			
N-M	16160					
Ml		1.21	19524			
M				27648	15106	2446877
Mr		1.21	19524			
M-L	16160					
Ll		1.21	19524			
L				27648	15106	2446877
Lr		1.21	19524			
L-K	16160					
Kl		1.21	19524			
K				27648	15106	2446877

FRAME ALONG GRIDLINE F7
4th Floor

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				34560	15106	2446877
Sr		1.21	19524			
S-R	16160					
Rl		1.21	19524			
R				34560	15106	2446877
Rr		1.21	19524			
R-Q	16160					
Ql		1.21	19524			
Q				34560	15106	2446877
Qr		1.21	19524			
Q-P	16160					
Pl		1.21	19524			
P				34560	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				34560	15106	2446877
Nr		1.21	19524			
N-M	16160					
Ml		1.21	19524			
M				34560	15106	2446877
Mr		1.21	19524			
M-L	16160					
Ll		1.21	19524			
L				34560	15106	2446877
Lr		1.21	19524			
L-K	16160					
Kl		1.21	19524			
K				34560	15106	2446877

FRAME ALONG GRIDLINE F7
3th Floor

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				34560	15106	2446877
Sr		1.21	19524			
S-R	16160					
Rl		1.21	19524			
R				34560	15106	2446877
Rr		1.21	19524			
R-Q	16160					
Ql		1.21	19524			
Q				34560	15106	2446877
Qr		1.21	19524			
Q-P	16160					
Pl		1.21	19524			
P				55296	15106	2446877
Pr		1.21	19524			
P-N	16160					
Nl		1.21	19524			
N				55296	15106	2446877
Nr		1.21	19524			
N-M	16160					
Ml		1.21	19524			
M				34560	15106	2446877
Mr		1.21	19524			
M-L	16160					
Ll		1.21	19524			
L				34560	15106	2446877
Lr		1.21	19524			
L-K	16160					
Kl		1.21	19524			
K				34560	15106	2446877

FRAME ALONG GRIDLINE F7
2nd Floor

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				55296	15106	2423233
Sr		1.21	19641			
S-R	16281					
Rl		1.21	19641			
R				55296	15106	2423233
Rr		1.21	19641			
R-Q	16281					
Ql		1.21	19641			
Q				55296	23179	3718328
P				55296		
N				55296		
M				55296	23179	3718328
Mr		1.21	19641			
M-L	16281					
Ll		1.21	19641			
L				55296	15106	2423233
Lr		1.21	19641			
L-K	16281					
Kl		1.21	19641			
K				55296	15106	2423233

FRAME ALONG GRIDLINE F7
1st Floor

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				55296	15106	2423233
Sr		1.21	19641			
S-R	16281					
Rl		1.21	19641			
R				55296	15106	2423233
Rr		1.21	19641			
R-Q	16281					
Ql		1.21	19641			
Q				55296	23179	3718328
Qr		1.21	19641			
Q-P	16281					
Pl		1.21	19641			
P				55296	23179	3718328
Pr		1.21	19641			
P-N	16281					
Nl		1.21	19641			
N				55296	23179	3718328
Nr		1.21	19641			
N-M	16281					
Ml		1.21	19641			
M				55296	23179	3718328
Mr		1.21	19641			
M-L	16281					
Ll		1.21	19641			
L				55296	15106	2423233
Lr		1.21	19641			
L-K	16281					
Kl		1.21	19641			
K				55296	15106	2423233

FRAME ALONG GRIDLINE F7
P-3, P-2

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Cl. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				55296	15106	2423233
Sr		1.21	19641			
S-R	16281					
Rl		1.21	19641			
R				55296	15106	2423233
Rr		1.21	19641			
R-Q	16281					
Ql		1.21	19641			
Q				55296	15106	2423233
Qr		1.21	19641			
Q-P	16281					
Pl		1.21	19641			
P				55296	15106	2423233
Pr		1.21	19641			
P-N	16281					
Nl		1.21	19641			
N				55296	15106	2423233
Nr		1.21	19641			
N-M	16281					
Ml		1.21	19641			
M				55296	15106	2423233
Mr		1.21	19641			
M-L	16281					
Ll		1.21	19641			
L				55296	15106	2423233
Lr		1.21	19641			
L-K	16281					
Kl		1.21	19641			
K				55296	15106	2423233

FRAME ALONG GRIDLINE F8
Roof

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	23179	23338313
Sr		1.92	49446			
S-R.3	25699					
R.3l		1.92	49446			
R.3				27648	23179	23338313
R.3r		1.92	49446			
R.3-Q.7	25699					
Q.7l		1.92	49446			
Q.7				27648	23179	23338313
Q.7r		1.92	49446			
Q.7-Q	25699					
Ql		1.92	49446			
Q				27648	23179	23338313
M				27648	23179	23338313
Mr		1.92	49446			
M-L.3	25699					
L.3l		1.92	49446			
L.3				27648	23179	23338313
L.3r		1.92	49446			
L.3-K.7	25699					
K.7l		1.92	49446			
K.7				27648	23179	23338313
K.7r		1.92	49446			
K.7-K	25699					
Kl		1.92	49446			
K				27648	23179	23338313

FRAME ALONG GRIDLINE F8
15th Floor

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	23179	17823977
Sr		1.75	76762			
S-R.3	43768					
R.3l		1.75	76762			
R.3				27648	23179	17823977
R.3r		1.75	48339			
R.3-Q.7	27562					
Q.7l		1.75	48339			
Q.7				27648	23179	17823977
Q.7r		1.75	48339			
Q.7-Q	27562					
Ql		1.75	48339			
Q				27648	23179	17823977
Qr		1.75	48339			
Q-P	27562					
Pl		1.62	44513			
P				39761	44643	37269690
Pr		1.62	226981			
P-N	140544					
Nl		1.62	226981			
N				39761	44643	37269690
Nr		1.62	44513			
N-M	27562					
Ml		1.75	48339			
M				27648	23179	17823977
Mr		1.75	48339			
M-L.3	27562					
L.3l		1.75	48339			
L.3				27648	23179	17823977
L.3r		1.75	48339			
L.3-K.7	27562					
K.7l		1.75	48339			
K.7				27648	23179	17823977
K.7r		1.75	76762			
K.7-K	43768					
Kl		1.75	76762			
K				27648	23179	17823977

FRAME ALONG GRIDLINE F8
14th Floor

Slab E (ksi)	3605
Col. E (ksi)	4031

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	23179	23338313
Sr		1.92	73900			
S-R.3	38409					
R.3l		1.92	73900			
R.3				27648	23179	23338313
R.3r		1.92	42719			
R.3-Q.7	22203					
Q.7l		1.92	42719			
Q.7				27648	23179	23338313
Q.7r		1.92	42719			
Q.7-Q	22203					
Ql		1.92	42719			
Q				27648	23179	23338313
Qr		1.92	42719			
Q-P	22203					
Pl		1.62	35857			
P				39761	26752	22333755
Pr		1.62	11970			
P-N	7412					
Nl		1.62	11970			
N				39761	26752	22333755
Nr		1.62	35857			
N-M	22203					
Ml		1.92	42719			
M				27648	23179	23338313
Mr		1.92	42719			
M-L.3	22203					
L.3l		1.92	42719			
L.3				27648	23179	23338313
L.3r		1.92	42719			
L.3-K.7	22203					
K.7l		1.92	42719			
K.7				27648	23179	23338313
K.7r		1.92	73900			
K.7-K	38409					
Kl		1.92	73900			
K				27648	23179	23338313

FRAME ALONG GRIDLINE F8
13th, 11th, 9th Floors

Slab E (ksi)	3605
Col. E (ksi)	4415

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	23179	17823977
Sr		1.75	76762			
S-R.3	43768					
R.3l		1.75	76762			
R.3				27648	23179	17823977
R.3r		1.75	48339			
R.3-Q.7	27562					
Q.7l		1.75	48339			
Q.7				27648	23179	17823977
Q.7r		1.75	48339			
Q.7-Q	27562					
Ql		1.75	48339			
Q				27648	23179	17823977
Qr		1.75	48339			
Q-P	27562					
Pl		1.62	44513			
P				39761	26752	22333755
Pr		1.62	11970			
P-N	7412					
Nl		1.62	11970			
N				39761	26752	22333755
Nr		1.62	44513			
N-M	27562					
Ml		1.75	48339			
M				27648	23179	17823977
Mr		1.75	48339			
M-L.3	27562					
L.3l		1.75	48339			
L.3				27648	23179	17823977
L.3r		1.75	48339			
L.3-K.7	27562					
K.7l		1.75	48339			
K.7				27648	23179	17823977
K.7r		1.75	76762			
K.7-K	43768					
Kl		1.75	76762			
K				27648	23179	17823977

FRAME ALONG GRIDLINE F8
12th, 10th Floors

Slab E (ksi)	3605
Col. E (ksi)	4415

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	23179	23338313
Sr		1.92	73900			
S-R.3	38409					
R.3l		1.92	73900			
R.3				27648	23179	23338313
R.3r		1.92	42719			
R.3-Q.7	22203					
Q.7l		1.92	42719			
Q.7				27648	23179	23338313
Q.7r		1.92	42719			
Q.7-Q	22203					
Ql		1.92	42719			
Q				27648	23179	23338313
Qr		1.92	42719			
Q-P	22203					
Pl		1.62	35857			
P				39761	26752	22333755
Pr		1.62	11970			
P-N	7412					
Nl		1.62	11970			
N				39761	26752	22333755
Nr		1.62	35857			
N-M	22203					
Ml		1.92	42719			
M				27648	23179	23338313
Mr		1.92	42719			
M-L.3	22203					
L.3l		1.92	42719			
L.3				27648	23179	23338313
L.3r		1.92	42719			
L.3-K.7	22203					
K.7l		1.92	42719			
K.7				27648	23179	23338313
K.7r		1.92	73900			
K.7-K	38409					
Kl		1.92	73900			
K				27648	23179	23338313

FRAME ALONG GRIDLINE F8
8th, 6th Floors

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	23179	23338313
Sr		1.92	73900			
S-R.3	38409					
R.3l		1.92	73900			
R.3				27648	23179	23338313
R.3r		1.92	42719			
R.3-Q.7	22203					
Q.7l		1.92	42719			
Q.7				27648	23179	23338313
Q.7r		1.92	42719			
Q.7-Q	22203					
Ql		1.92	42719			
Q				27648	23179	23338313
Qr		1.92	42719			
Q-P	22203					
Pl		1.62	35857			
P				39761	26752	22333755
Pr		1.62	11970			
P-N	7412					
Nl		1.62	11970			
N				39761	26752	22333755
Nr		1.62	35857			
N-M	22203					
Ml		1.92	42719			
M				27648	23179	23338313
Mr		1.92	42719			
M-L.3	22203					
L.3l		1.92	42719			
L.3				27648	23179	23338313
L.3r		1.92	42719			
L.3-K.7	22203					
K.7l		1.92	42719			
K.7				27648	23179	23338313
K.7r		1.92	73900			
K.7-K	38409					
Kl		1.92	73900			
K				27648	23179	23338313

FRAME ALONG GRIDLINE F8
7th, 5th Floors

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				27648	23179	17823977
Sr		1.75	76762			
S-R.3	43768					
R.3l		1.75	76762			
R.3				27648	23179	17823977
R.3r		1.75	48339			
R.3-Q.7	27562					
Q.7l		1.75	48339			
Q.7				27648	23179	17823977
Q.7r		1.75	48339			
Q.7-Q	27562					
Ql		1.75	48339			
Q				27648	23179	17823977
Qr		1.75	48339			
Q-P	27562					
Pl		1.62	44513			
P				39761	26752	22333755
Pr		1.62	11970			
P-N	7412					
Nl		1.62	11970			
N				39761	26752	22333755
Nr		1.62	44513			
N-M	27562					
Ml		1.75	48339			
M				27648	23179	17823977
Mr		1.75	48339			
M-L.3	27562					
L.3l		1.75	48339			
L.3				27648	23179	17823977
L.3r		1.75	48339			
L.3-K.7	27562					
K.7l		1.75	48339			
K.7				27648	23179	17823977
K.7r		1.75	76762			
K.7-K	43768					
Kl		1.75	76762			
K				27648	23179	17823977

FRAME ALONG GRIDLINE F8
4th Floor

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				34560	23179	23338313
Sr		1.92	73900			
S-R.3	38409					
R.3l		1.92	73900			
R.3				34560	23179	23338313
R.3r		1.92	42719			
R.3-Q.7	22203					
Q.7l		1.92	42719			
Q.7				34560	23179	23338313
Q.7r		1.92	42719			
Q.7-Q	22203					
Ql		1.92	42719			
Q				34560	23179	23338313
Qr		1.92	42719			
Q-P	22203					
Pl		1.62	35857			
P				39761	26752	22333755
Pr		1.62	11970			
P-N	7412					
Nl		1.62	11970			
N				39761	26752	22333755
Nr		1.62	35857			
N-M	22203					
Ml		1.92	42719			
M				34560	23179	23338313
Mr		1.92	42719			
M-L.3	22203					
L.3l		1.92	42719			
L.3				34560	23179	23338313
L.3r		1.92	42719			
L.3-K.7	22203					
K.7l		1.92	42719			
K.7				34560	23179	23338313
K.7r		1.92	73900			
K.7-K	38409					
Kl		1.92	73900			
K				34560	23179	23338313

FRAME ALONG GRIDLINE F8
3rd Floors

Slab E (ksi)	3605
Col. E (ksi)	4769

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				34560	23179	17823977
Sr		1.75	76762			
S-R.3	43768					
R.3l		1.75	76762			
R.3				34560	23179	17823977
R.3r		1.75	48339			
R.3-Q.7	27562					
Q.7l		1.75	48339			
Q.7				34560	23179	17823977
Q.7r		1.75	48339			
Q.7-Q	27562					
Ql		1.75	48339			
Q				34560	23179	17823977
Qr		1.75	48339			
Q-P	27562					
Pl		1.62	44513			
P				39761	26752	22333755
Pr		1.62	11970			
P-N	7412					
Nl		1.62	11970			
N				39761	26752	22333755
Nr		1.62	44513			
N-M	27562					
Ml		1.75	48339			
M				34560	23179	17823977
Mr		1.75	48339			
M-L.3	27562					
L.3l		1.75	48339			
L.3				34560	23179	17823977
L.3r		1.75	48339			
L.3-K.7	27562					
K.7l		1.75	48339			
K.7				34560	23179	17823977
K.7r		1.75	76762			
K.7-K	43768					
Kl		1.75	76762			
K				34560	23179	17823977

FRAME ALONG GRIDLINE F8
2nd Floor

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				55296	15106	12101522
Sr		1.78	30987			
S-R.3	17430					
R.3l		1.78	30987			
R.3				55296	15106	12101522
R.3r		1.78	30987			
R.3-Q.7	17430					
Q.7l		1.78	30987			
Q.7				55296	15106	12101522
Q.7r		1.78	30987			
Q.7-Q	17430					
Ql		1.78	30987			
Q				55296	23179	18569174
P				39761		
N				39761		
M				55296	23179	18569174
Mr		1.78	30987			
M-L.3	17430					
L.3l		1.78	30987			
L.3				55296	15106	12101522
L.3r		1.78	30987			
L.3-K.7	17430					
K.7l		1.78	30987			
K.7				55296	15106	12101522
K.7r		1.78	30987			
K.7-K	17430					
Kl		1.78	30987			
K				55296	15106	12101522

FRAME ALONG GRIDLINE F8
1st Floor

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				55296	15106	12101522
Sr		1.78	30987			
S-R.3	17430					
R.3l		1.78	30987			
R.3				55296	15106	12101522
R.3r		1.78	30987			
R.3-Q.7	17430					
Q.7l		1.78	30987			
Q.7				55296	15106	12101522
Q.7r		1.78	30987			
Q.7-Q	17430					
Ql		1.78	30987			
Q				55296	15106	12101522
Qr		1.78	76222			
Q-P	42875					
Pl		2.12	90711			
P				81000	33898	35255972
Pr		2.12	12339			
P-N	5832					
Nl		2.12	12339			
N				81000	33898	35255972
Nr		2.12	90711			
N-M	42875					
Ml		1.78	76222			
M				55296	15106	12101522
Mr		1.78	30987			
M-L.3	17430					
L.3l		1.78	30987			
L.3				55296	15106	12101522
L.3r		1.78	30987			
L.3-K.7	17430					
K.7l		1.78	30987			
K.7				55296	15106	12101522
K.7r		1.78	30987			
K.7-K	17430					
Kl		1.78	30987			
K				55296	15106	12101522

FRAME ALONG GRIDLINE F8
P-3, P-2

Slab E (ksi)	3605
Col. E (ksi)	5098

Intersecting	Slb. bm. I (in.^4)	Str. fctr.	Bm. in supp. I (in.^4)	Col. blw. I (in.^4)	C	Tor. mem. K (in-K/rad)
S				55296	15106	12101522
Sr		1.78	10368			
S-R.3	5832					
R.3l		1.78	10368			
R.3				55296	15106	12101522
R.3r		1.78	10368			
R.3-Q.7	5832					
Q.7l		1.78	10368			
Q.7				55296	15106	12101522
Q.7r		1.78	10368			
Q.7-Q	5832					
Ql		1.78	10368			
Q				55296	15106	12101522
Qr		1.78	10368			
Q-P	5832					
Pl		2.12	12339			
P				81000	21203	22052568
Pr		2.12	12339			
P-N	5832					
Nl		2.12	12339			
N				81000	21203	22052568
Nr		2.12	12339			
N-M	5832					
Ml		1.78	10368			
M				55296	15106	12101522
Mr		1.78	10368			
M-L.3	5832					
L.3l		1.78	10368			
L.3				55296	15106	12101522
L.3r		1.78	10368			
L.3-K.7	5832					
K.7l		1.78	10368			
K.7				55296	15106	12101522
K.7r		1.78	10368			
K.7-K	5832					
Kl		1.78	10368			
K				55296	15106	12101522

	Displacement under One Kip Load (in.)							
Level	Wall FQ.3	Walls FP, FN	Wall FM	Walls Elev	Rim	F4	F7	F8
Roof	0.0266	0.0177	0.0248	0.8043	0.0332	0.0566	0.0453	0.0202
15	0.0213	0.0142	0.01996	0.6794	0.0297	0.0515	0.0428	0.0185
14	0.0174	0.0116	0.0163	0.5582	0.0273	0.0475	0.0404	0.0174
13	0.0143	0.00951	0.0134	0.4602	0.0251	0.0442	0.038	0.0165
12	0.0115	0.0077	0.0108	0.3746	0.0229	0.041	0.0356	0.0156
11	0.0092	0.00614	0.00861	0.3004	0.0209	0.0378	0.0332	0.0147
10	0.00721	0.00482	0.00675	0.237	0.0189	0.0346	0.0308	0.0138
9	0.00554	0.00371	0.00519	0.1832	0.0169	0.0315	0.0285	0.013
8	0.00416	0.00279	0.00389	0.1384	0.0149	0.0283	0.0261	0.0121
7	0.00304	0.00204	0.00285	0.1016	0.013	0.0252	0.0237	0.0113
6	0.00215	0.00145	0.00201	0.072	0.011	0.022	0.0214	0.0105
5	0.00146	0.000993	0.00137	0.0489	0.00896	0.0189	0.0189	0.00971
4	0.000948	0.000649	0.00089	0.0314	0.00673	0.0157	0.0163	0.00882
3	0.000579	0.0004	0.000544	0.0187		0.0126	0.0134	0.00789
P6	0.000303	0.000213	0.0002859	0.00929	0.00282	0.00943	0.00972	0.00638
P5	0.000173	0.000124	0.000163	0.00483	0.00224	0.00732		
P4	0.0000886	0.0000662	0.0000844	0.0021	0.0017	0.00514	0.00453	0.00359
P3	0.0000396	0.0000313	0.0000381	0.000677	0.00113	0.00297	0.0027	0.00224
P2	0.000014	0.0000118	0.0000136	0.000121	0.000491	0.001	0.001	0.000803

	Relative Stiffness							
Level	Wall FQ.3	Walls FP, FN	Wall FM	Walls Elev	Rim	F4	F7	F8
Roof	37.6	56.5	40.3	1.2	30.1	17.7	22.1	49.5
15	46.9	70.4	50.1	1.5	33.7	19.4	23.4	54.1
14	57.5	86.2	61.3	1.8	36.6	21.1	24.8	57.5
13	69.9	105.2	74.6	2.2	39.8	22.6	26.3	60.6
12	87.0	129.9	92.6	2.7	43.7	24.4	28.1	64.1
11	108.7	162.9	116.1	3.3	47.8	26.5	30.1	68.0
10	138.7	207.5	148.1	4.2	52.9	28.9	32.5	72.5
9	180.5	269.5	192.7	5.5	59.2	31.7	35.1	76.9
8	240.4	358.4	257.1	7.2	67.1	35.3	38.3	82.6
7	328.9	490.2	350.9	9.8	76.9	39.7	42.2	88.5
6	465.1	689.7	497.5	13.9	90.9	45.5	46.7	95.2
5	684.9	1007.0	729.9	20.4	111.6	52.9	52.9	103.0
4	1054.9	1540.8	1123.6	31.8	148.6	63.7	61.3	113.4
3	1727.1	2500.0	1838.2	53.5		79.4	74.6	126.7
P6	3300.3	4694.8	3497.7	107.6	354.6	106.0	102.9	156.7
P5	5780.3	8064.5	6135.0	207.0	446.4	136.6		
P4	11286.7	15105.7	11848.3	476.2	588.2	194.6	220.8	278.6
P3	25252.5	31948.9	26246.7	1477.1	885.0	336.7	370.4	446.4
P2	71428.6	84745.8	73529.4	8264.5	2036.7	1000.0	1000.0	1245.3

Level	Displacement under One Kip Load (in.)				
	FU	FT	FS, FR, FK	F1	F2
P6				0.00187	0.00635
P5				0.00151	0.00547
P4	0.00835	0.0068	0.00479	0.00118	0.00385
P3	0.00526	0.0043	0.00306	0.000907	0.00306
P2	0.00223	0.00183	0.00133	0.00056	0.0011

Level	Relative Stiffness				
	FU	FT	FS, FR, FK	F1	F2
P6				534.8	157.5
P5				662.3	182.8
P4	119.8	147.1	208.8	847.5	259.7
P3	190.1	232.6	326.8	1102.5	326.8
P2	448.4	546.4	751.9	1785.7	909.1

Roof	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			37.6		-2105.3
Wall FP	-15.5			56.5		-875.7
Wall FN	15.5			56.5		875.7
Wall FM	45.5			40.3		1834.7
Walls F4.8		36.5	2.5		90.8	
Walls F5.5		48.5	2.5		120.6	
Walls F6		71.0	2.5		176.6	
Frame Rim		117.0	30.1		3524.1	
Frame F4		94.0	17.7		1660.8	
Frame F7		7.5	22.1		165.6	
Frame F8		-7.0	49.5		-346.5	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	126.8	190.9	5391.8	-270.6
		xr	-1.4			
		yr	42.5			
		ex, seis, offset (r,l)	13.4	-10.6		
		ey, seis, offset (u,d)	9.9	-2.9		
		ex, wind, actual	1.4			
		ex, wind, offset (r,l)	37.4	-34.6		

Roof			Seismic					
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	
Wall FQ.3	-54.6	112002.5	96.1	-22.67	-15.24	17.88	4.49	**114.0**
Wall FP	-14.1	11204.6	144.4	-8.79	-5.91	6.93	1.74	**151.3**
Wall FN	16.9	16169.3	144.4	10.56	7.10	-8.33	-2.09	**155.0**
Wall FM	46.9	88759.5	103.1	20.90	14.05	-16.48	-4.14	**124.0**
Walls F4.8	-6.0	89.9	8.7	-0.17	-0.11	0.13	0.03	**8.8**
Walls F5.5	6.0	89.1	8.7	0.16	0.11	-0.13	-0.03	**8.8**
Walls F6	28.5	2018.0	8.7	0.78	0.53	-0.62	-0.15	**9.25**
Frame Rim	74.5	167119.0	105.7	24.78	16.66	-19.55	-4.91	**122.4**
Frame F4	51.5	46836.3	62.0	10.05	6.75	-7.93	-1.99	**68.8**
Frame F7	-35.0	27061.6	77.5	-8.54	-5.74	6.73	1.69	**79.2**
Frame F8	-49.5	121362.0	173.7	-27.08	-18.20	21.36	5.36	**179.1**
Frame FK	106.4							
Frame FR	-73.8							
Frame FS	-103.8							
Frame FT	-133.8							
Frame FU	-163.8							
Frame F1	124.5							
Frame F2	109.5							
	Sum	592711.9						

Wind						
	Direct Shear		Torsional Shear			Design Load
Level	Full	75%	e actual	e offset right	e offset left	
Wall FQ.3	112.4	84.3	-2.8	-55.43	51.23	**135.5**
Wall FP	168.8	126.6	-1.1	-21.49	19.86	**168.8**
Wall FN	168.8	126.6	1.3	25.82	-23.86	**168.8**
Wall FM	120.5	90.4	2.6	51.11	-47.23	**141.5**
Walls F4.8			0.0	-0.40	0.37	**-0.4**
Walls F5.5			0.0	0.40	-0.37	**0.4**
Walls F6			0.1	1.91	-1.77	**1.9**
Frame Rim			3.1	60.61	-56.02	**60.6**
Frame F4			1.2	24.57	-22.71	**24.6**
Frame F7			-1.1	-20.88	19.30	**-20.9**
Frame F8			-3.3	-66.21	61.20	**-66.2**
Frame FK						
Frame FR						
Frame FS						
Frame FT						
Frame FU						
Frame F1						
Frame F2						

15	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			46.9		-2629.1
Wall FP	-15.5			70.4		-1091.5
Wall FN	15.5			70.4		1091.5
Wall FM	45.5			50.1		2279.6
Walls F4.8		36.5	2.9		107.4	
Walls F5.5		48.5	2.9		142.8	
Walls F6		71.0	2.9		209.0	
Frame Rim		117.0	33.7		3939.4	
Frame F4		94.0	19.4		1825.2	
Frame F7		7.5	23.4		175.2	
Frame F8		-7.0	54.1		-378.4	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	139.3	237.9	6020.7	-349.5
		xr	-1.5			
		yr	43.2			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	9.2	-3.6		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

15			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	139605.3	68.1	-17.34	-10.79	13.56	4.24	**81.7**	**195.6**
Wall FP	-14.0	13863.3	102.2	-6.69	-4.17	5.23	1.64	**107.4**	**258.7**
Wall FN	17.0	20278.8	102.2	8.09	5.04	-6.33	-1.98	**110.3**	**265.2**
Wall FM	47.0	110527.0	72.7	15.94	9.92	-12.46	-3.90	**88.6**	**212.6**
Walls F4.8	-6.7	132.5	6.7	-0.13	-0.08	0.10	0.03	**6.7**	**15.4**
Walls F5.5	5.3	82.4	6.7	0.11	0.07	-0.08	-0.03	**6.7**	**15.6**
Walls F6	27.8	2273.5	6.7	0.55	0.34	-0.43	-0.14	**7.00**	**16.2**
Frame Rim	73.8	183333.8	76.1	16.83	10.47	-13.16	-4.11	**86.5**	**208.9**
Frame F4	50.8	50090.5	43.9	6.68	4.16	-5.22	-1.63	**48.0**	**116.8**
Frame F7	-35.7	29793.9	52.8	-5.65	-3.52	4.42	1.38	**54.2**	**133.3**
Frame F8	-50.2	136270.8	122.1	-18.38	-11.44	14.37	4.49	**126.6**	**305.7**
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	123.8								
Frame F2	108.8								
	Sum	686251.8							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	29.6	22.2	-0.8	-15.72	14.49	**36.7**	**172.2**
Wall FP	44.4	33.3	-0.3	-6.07	5.59	**44.4**	**213.2**
Wall FN	44.4	33.3	0.4	7.34	-6.76	**44.4**	**213.2**
Wall FM	31.6	23.7	0.8	14.45	-13.32	**38.1**	**179.6**
Walls F4.8			0.0	-0.12	0.11	**-0.1**	**-0.5**
Walls F5.5			0.0	0.10	-0.09	**0.1**	**0.5**
Walls F6			0.0	0.50	-0.46	**0.5**	**2.4**
Frame Rim			0.8	15.26	-14.06	**15.3**	**75.9**
Frame F4			0.3	6.06	-5.58	**6.1**	**30.6**
Frame F7			-0.3	-5.12	4.72	**-5.1**	**-26.0**
Frame F8			-0.9	-16.67	15.36	**-16.7**	**-82.9**
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

14	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			57.5		-3218.4
Wall FP	-15.5			86.2		-1336.2
Wall FN	15.5			86.2		1336.2
Wall FM	45.5			61.3		2791.4
Walls F4.8		36.5	3.6		130.8	
Walls F5.5		48.5	3.6		173.8	
Walls F6		71.0	3.6		254.4	
Frame Rim		117.0	36.6		4285.7	
Frame F4		94.0	21.1		1978.9	
Frame F7		7.5	24.8		185.6	
Frame F8		-7.0	57.5		-402.3	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	150.7	291.2	6606.9	-427.0
		xr	-1.5			
		yr	43.9			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	8.5	-4.3		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

14			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	170916.4	53.0	-14.50	-8.39	11.35	4.18	64.3	260.0
Wall FP	-14.0	16978.5	79.5	-5.60	-3.24	4.38	1.61	83.8	342.6
Wall FN	17.0	24814.5	79.5	6.77	3.92	-5.29	-1.95	86.2	351.5
Wall FM	47.0	135326.1	56.6	13.33	7.72	-10.43	-3.84	69.9	282.5
Walls F4.8	-7.4	193.8	5.8	-0.12	-0.07	0.10	0.04	5.9	21.3
Walls F5.5	4.6	77.3	5.8	0.08	0.04	-0.06	-0.02	5.9	21.4
Walls F6	27.1	2640.1	5.8	0.45	0.26	-0.35	-0.13	6.08	22.3
Frame Rim	73.1	195979.1	59.5	12.40	7.18	-9.70	-3.57	66.7	275.6
Frame F4	50.1	52937.8	34.2	4.89	2.83	-3.82	-1.41	37.0	153.8
Frame F7	-36.4	32714.5	40.2	-4.16	-2.41	3.26	1.20	41.4	174.8
Frame F8	-50.9	148632.4	93.4	-13.52	-7.83	10.58	3.90	97.3	403.0
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	123.1								
Frame F2	108.1								
	Sum	781210.7							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	25.7	19.3	-0.8	-14.67	13.52	32.8	205.0
Wall FP	38.5	28.9	-0.3	-5.66	5.22	38.5	251.8
Wall FN	38.5	28.9	0.4	6.85	-6.31	38.5	251.8
Wall FM	27.4	20.6	0.7	13.49	-12.43	34.0	213.7
Walls F4.8			0.0	-0.12	0.11	-0.1	-0.6
Walls F5.5			0.0	0.08	-0.07	0.1	0.6
Walls F6			0.0	0.46	-0.42	0.5	2.9
Frame Rim			0.7	12.54	-11.56	12.5	88.4
Frame F4			0.3	4.94	-4.55	4.9	35.6
Frame F7			-0.2	-4.21	3.88	-4.2	-30.2
Frame F8			-0.7	-13.68	12.61	-13.7	-96.6
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

13	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			69.9		-3916.1
Wall FP	-15.5			105.2		-1629.9
Wall FN	15.5			105.2		1629.9
Wall FM	45.5			74.6		3395.5
Walls F4.8		36.5	4.3		158.6	
Walls F5.5		48.5	4.3		210.8	
Walls F6		71.0	4.3		308.6	
Frame Rim		117.0	39.8		4661.4	
Frame F4		94.0	22.6		2126.7	
Frame F7		7.5	26.3		197.4	
Frame F8		-7.0	60.6		-424.2	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	162.4	354.9	7239.1	-520.6
		xr	-1.5			
		yr	44.6			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	7.8	-5.0		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

13			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	207961.9	48.1	-14.10	-7.48	11.03	4.75	**59.1**	**319.1**
Wall FP	-14.0	20707.3	72.3	-5.46	-2.89	4.27	1.84	**76.6**	**419.1**
Wall FN	17.0	30271.0	72.3	6.60	3.50	-5.16	-2.22	**78.9**	**430.4**
Wall FM	47.0	164618.9	51.3	12.96	6.87	-10.14	-4.36	**64.3**	**346.7**
Walls F4.8	-8.1	283.0	6.0	-0.13	-0.07	0.10	0.04	**6.0**	**27.3**
Walls F5.5	3.9	67.1	6.0	0.06	0.03	-0.05	-0.02	**6.0**	**27.4**
Walls F6	26.4	3036.0	6.0	0.42	0.23	-0.33	-0.14	**6.18**	**28.5**
Frame Rim	72.4	209012.7	54.6	10.67	5.66	-8.35	-3.59	**60.2**	**335.8**
Frame F4	49.4	55280.6	31.0	4.14	2.19	-3.23	-1.39	**33.2**	**187.0**
Frame F7	-37.1	36161.2	36.1	-3.61	-1.91	2.82	1.21	**37.3**	**212.0**
Frame F8	-51.6	161174.8	83.0	-11.56	-6.13	9.04	3.89	**86.9**	**489.9**
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	122.4								
Frame F2	107.4								
	Sum	888574.5							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	25.6	19.2	-0.8	-15.69	14.46	**33.7**	**238.7**
Wall FP	38.6	28.9	-0.3	-6.07	5.60	**38.6**	**290.3**
Wall FN	38.6	28.9	0.4	7.34	-6.77	**38.6**	**290.3**
Wall FM	27.4	20.5	0.8	14.42	-13.29	**34.9**	**248.6**
Walls F4.8			0.0	-0.14	0.13	**-0.1**	**-0.8**
Walls F5.5			0.0	0.07	-0.06	**0.1**	**0.6**
Walls F6			0.0	0.47	-0.44	**0.5**	**3.3**
Frame Rim			0.6	11.88	-10.95	**11.9**	**100.3**
Frame F4			0.2	4.60	-4.24	**4.6**	**40.2**
Frame F7			-0.2	-4.01	3.70	**-4.0**	**-34.2**
Frame F8			-0.7	-12.86	11.85	**-12.9**	**-109.4**
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

12	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			87.0		-4869.6
Wall FP	-15.5			129.9		-2013.0
Wall FN	15.5			129.9		2013.0
Wall FM	45.5			92.6		4213.0
Walls F4.8		36.5	5.3		194.9	
Walls F5.5		48.5	5.3		258.9	
Walls F6		71.0	5.3		379.1	
Frame Rim		117.0	43.7		5109.2	
Frame F4		94.0	24.4		2292.7	
Frame F7		7.5	28.1		210.7	
Frame F8		-7.0	64.1		-448.7	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	176.3	439.3	7996.7	-656.6
		xr	-1.5			
		yr	45.4			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	7.0	-5.8		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

12			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	258332.9	44.1	-13.87	-6.59	10.80	5.41	54.9	374.0
Wall FP	-14.0	25473.9	65.9	-5.32	-2.53	4.14	2.07	70.0	489.2
Wall FN	17.0	37509.0	65.9	6.46	3.07	-5.03	-2.52	72.3	502.7
Wall FM	47.0	204490.8	47.0	12.73	6.05	-9.91	-4.96	59.7	406.4
Walls F4.8	-8.9	419.7	6.2	-0.14	-0.07	0.11	0.05	6.2	33.5
Walls F5.5	3.1	52.4	6.2	0.05	0.02	-0.04	-0.02	6.2	33.6
Walls F6	25.6	3508.1	6.2	0.40	0.19	-0.31	-0.16	6.35	34.9
Frame Rim	71.6	224075.4	50.4	9.15	4.35	-7.13	-3.57	54.7	390.6
Frame F4	48.6	57687.7	28.1	3.47	1.65	-2.70	-1.35	29.8	216.8
Frame F7	-37.9	40277.8	32.4	-3.11	-1.48	2.42	1.21	33.6	245.6
Frame F8	-52.4	175786.8	73.9	-9.82	-4.67	7.65	3.83	77.7	567.7
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	121.6								
Frame F2	106.6								
	Sum	1027614.5							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	24.4	18.3	-0.9	-16.01	14.73	33.1	271.7
Wall FP	36.5	27.4	-0.3	-6.14	5.65	36.5	326.8
Wall FN	36.5	27.4	0.4	7.45	-6.86	34.8	325.1
Wall FM	26.0	19.5	0.8	14.70	-13.52	34.2	282.8
Walls F4.8			0.0	-0.16	0.15	-0.2	-1.0
Walls F5.5			0.0	0.06	-0.05	0.1	0.7
Walls F6			0.0	0.46	-0.43	0.5	3.8
Frame Rim			0.6	10.56	-9.72	10.6	110.8
Frame F4			0.2	4.01	-3.69	4.0	44.2
Frame F7			-0.2	-3.59	3.31	-3.6	-37.8
Frame F8			-0.6	-11.34	10.43	-11.3	-120.8
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

11	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			108.7		-6087.0
Wall FP	-15.5			162.9		-2524.4
Wall FN	15.5			162.9		2524.4
Wall FM	45.5			116.1		5284.6
Walls F4.8		36.5	6.7		243.0	
Walls F5.5		48.5	6.7		322.9	
Walls F6		71.0	6.7		472.7	
Frame Rim		117.0	47.8		5598.1	
Frame F4		94.0	26.5		2486.8	
Frame F7		7.5	30.1		225.9	
Frame F8		-7.0	68.0		-476.2	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	192.4	550.6	8873.2	-802.4
		xr	-1.5			
		yr	46.1			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	6.3	-6.5		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

11			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	323358.2	39.9	-13.43	-5.72	10.52	5.93	50.4	424.4
Wall FP	-14.0	32116.4	59.8	-5.18	-2.21	4.06	2.29	63.9	553.0
Wall FN	17.0	46832.8	59.8	6.26	2.67	-4.90	-2.76	66.1	568.8
Wall FM	47.0	256097.2	42.7	12.36	5.27	-9.68	-5.45	55.0	461.5
Walls F4.8	-9.6	615.2	6.4	-0.15	-0.06	0.11	0.06	6.4	40.0
Walls F5.5	2.4	37.9	6.4	0.04	0.02	-0.03	-0.02	6.4	40.0
Walls F6	24.9	4123.6	6.4	0.38	0.16	-0.29	-0.17	6.54	41.4
Frame Rim	70.9	240429.5	45.9	7.68	3.27	-6.02	-3.39	49.1	439.7
Frame F4	47.9	60665.9	25.4	2.87	1.22	-2.25	-1.27	26.6	243.4
Frame F7	-38.6	44908.4	28.9	-2.64	-1.12	2.06	1.16	30.0	275.7
Frame F8	-53.1	191903.6	65.2	-8.19	-3.49	6.41	3.61	68.8	636.5
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	120.9								
Frame F2	105.9								
	Sum	1201088.8							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	24.1	18.1	-0.9	-16.93	15.61	33.7	305.4
Wall FP	36.1	27.1	-0.3	-6.53	6.02	36.1	362.9
Wall FN	36.1	27.1	0.4	7.89	-7.27	35.0	360.1
Wall FM	25.8	19.3	0.8	15.57	-14.36	34.9	317.7
Walls F4.8			0.0	-0.18	0.17	-0.2	-1.1
Walls F5.5			0.0	0.05	-0.04	0.0	0.7
Walls F6			0.0	0.47	-0.44	0.5	4.3
Frame Rim			0.5	9.69	-8.93	9.7	120.5
Frame F4			0.2	3.62	-3.34	3.6	47.8
Frame F7			-0.2	-3.32	3.06	-3.3	-41.1
Frame F8			-0.5	-10.32	9.51	-10.3	-131.1
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

10	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			138.7		-7767.0
Wall FP	-15.5			207.5		-3215.8
Wall FN	15.5			207.5		3215.8
Wall FM	45.5			148.1		6740.7
Walls F4.8		36.5	8.4		308.0	
Walls F5.5		48.5	8.4		409.3	
Walls F6		71.0	8.4		599.2	
Frame Rim		117.0	52.9		6190.5	
Frame F4		94.0	28.9		2716.8	
Frame F7		7.5	32.5		243.5	
Frame F8		-7.0	72.5		-507.2	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	212.1	701.8	9960.0	-1026.2
		xr	-1.5			
		yr	47.0			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	5.4	-7.4		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

10			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	412532.0	36.0	-12.96	-4.77	10.15	6.47	46.1	470.6
Wall FP	-14.0	40882.9	53.8	-4.99	-1.84	3.91	2.49	57.7	610.8
Wall FN	17.0	59693.2	53.8	6.03	2.22	-4.72	-3.01	59.9	628.6
Wall FM	47.0	326735.1	38.4	11.92	4.39	-9.33	-5.95	50.4	511.8
Walls F4.8	-10.5	924.7	6.6	-0.15	-0.06	0.12	0.08	6.7	46.6
Walls F5.5	1.5	19.8	6.6	0.02	0.01	-0.02	-0.01	6.6	46.6
Walls F6	24.0	4873.8	6.6	0.35	0.13	-0.27	-0.17	6.74	48.1
Frame Rim	70.0	259498.4	41.4	6.35	2.34	-4.97	-3.17	43.8	483.5
Frame F4	47.0	63931.6	22.6	2.33	0.86	-1.82	-1.16	23.5	266.9
Frame F7	-39.5	50574.7	25.4	-2.20	-0.81	1.72	1.10	26.5	302.2
Frame F8	-54.0	211051.9	56.8	-6.70	-2.47	5.25	3.34	60.1	696.6
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	120.0								
Frame F2	105.0								
	Sum	1430718.1							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	23.8	17.9	-0.9	-17.92	16.52	34.4	339.8
Wall FP	35.7	26.8	-0.4	-6.90	6.36	35.7	398.6
Wall FN	35.7	26.8	0.4	8.34	-7.69	35.1	395.2
Wall FM	25.5	19.1	0.9	16.48	-15.20	35.6	353.3
Walls F4.8			0.0	-0.21	0.19	-0.2	-1.3
Walls F5.5			0.0	0.03	-0.03	0.0	0.8
Walls F6			0.0	0.48	-0.44	0.5	4.8
Frame Rim			0.5	8.78	-8.09	8.8	129.3
Frame F4			0.2	3.22	-2.97	3.2	51.0
Frame F7			-0.2	-3.04	2.80	-3.0	-44.2
Frame F8			-0.5	-9.27	8.54	-9.3	-140.3
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

9	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			180.5		-10108.3
Wall FP	-15.5			269.5		-4177.9
Wall FN	15.5			269.5		4177.9
Wall FM	45.5			192.7		8766.9
Walls F4.8		36.5	10.9		398.5	
Walls F5.5		48.5	10.9		529.5	
Walls F6		71.0	10.9		775.1	
Frame Rim		117.0	59.2		6923.1	
Frame F4		94.0	31.7		2984.1	
Frame F7		7.5	35.1		263.2	
Frame F8		-7.0	76.9		-538.5	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	235.7	912.3	11335.0	-1341.4
		xr	-1.5			
		yr	48.1			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	4.3	-8.5		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

9			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	536727.8	32.2	-12.39	-3.61	9.69	7.13	**41.8**	**512.4**
Wall FP	-14.0	53053.4	48.0	-4.76	-1.39	3.72	2.74	**51.7**	**662.5**
Wall FN	17.0	77627.0	48.0	5.76	1.68	-4.50	-3.31	**53.8**	**682.4**
Wall FM	47.0	425091.2	34.3	11.40	3.32	-8.91	-6.55	**45.7**	**557.5**
Walls F4.8	-11.6	1467.7	6.9	-0.16	-0.05	0.12	0.09	**7.0**	**53.6**
Walls F5.5	0.4	1.8	6.9	0.01	0.00	0.00	0.00	**6.9**	**53.5**
Walls F6	22.9	5727.6	6.9	0.31	0.09	-0.25	-0.18	**6.96**	**55.1**
Frame Rim	68.9	280942.5	37.2	5.13	1.50	-4.01	-2.95	**38.7**	**522.2**
Frame F4	45.9	66898.0	20.0	1.83	0.53	-1.43	-1.06	**20.5**	**287.4**
Frame F7	-40.6	57822.4	22.1	-1.79	-0.52	1.40	1.03	**23.1**	**325.3**
Frame F8	-55.1	233495.1	48.4	-5.34	-1.56	4.17	3.07	**51.5**	**748.0**
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	118.9								
Frame F2	103.9								
	Sum	1738854.4							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	23.6	17.7	-1.0	-19.00	17.51	**35.2**	**375.0**
Wall FP	35.3	26.5	-0.4	-7.30	6.73	**35.3**	**433.9**
Wall FN	35.3	26.5	0.5	8.83	-8.14	**35.3**	**430.5**
Wall FM	25.2	18.9	0.9	17.47	-16.10	**36.4**	**389.7**
Walls F4.8			0.0	-0.24	0.23	**-0.2**	**-1.6**
Walls F5.5			0.0	0.01	-0.01	**0.0**	**0.8**
Walls F6			0.0	0.48	-0.44	**0.5**	**5.2**
Frame Rim			0.4	7.87	-7.25	**7.9**	**137.2**
Frame F4			0.1	2.81	-2.59	**2.8**	**53.8**
Frame F7			-0.1	-2.75	2.53	**-2.7**	**-46.9**
Frame F8			-0.4	-8.18	7.54	**-8.2**	**-148.5**
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

8	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			240.4		-13461.5
Wall FP	-15.5			358.4		-5555.6
Wall FN	15.5			358.4		5555.6
Wall FM	45.5			257.1		11696.7
Walls F4.8		36.5	14.5		527.5	
Walls F5.5		48.5	14.5		700.9	
Walls F6		71.0	14.5		1026.0	
Frame Rim		117.0	67.1		7852.3	
Frame F4		94.0	35.3		3321.6	
Frame F7		7.5	38.3		287.4	
Frame F8		-7.0	82.6		-578.5	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	266.8	1214.3	13137.1	-1764.9
		xr	-1.5			
		yr	49.2			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	3.2	-9.6		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

8			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	715223.6	28.4	-11.66	-2.49	9.14	7.62	37.6	550.0
Wall FP	-14.0	70719.2	42.4	-4.48	-0.96	3.51	2.93	45.9	708.4
Wall FN	17.0	103017.3	42.4	5.40	1.16	-4.24	-3.53	47.8	730.2
Wall FM	47.0	566741.2	30.4	10.73	2.29	-8.41	-7.02	41.1	598.7
Walls F4.8	-12.7	2347.9	7.1	-0.16	-0.04	0.13	0.11	7.2	60.8
Walls F5.5	-0.7	8.1	7.1	-0.01	0.00	0.01	0.01	7.1	60.6
Walls F6	21.8	6838.3	7.1	0.28	0.06	-0.22	-0.18	7.15	62.2
Frame Rim	67.8	308088.8	32.9	4.04	0.86	-3.17	-2.64	33.8	556.0
Frame F4	44.8	70772.7	17.3	1.41	0.30	-1.10	-0.92	17.6	305.0
Frame F7	-41.7	66773.1	18.8	-1.42	-0.30	1.11	0.93	19.7	345.0
Frame F8	-56.2	261461.2	40.6	-4.13	-0.88	3.24	2.70	43.3	791.3
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	117.8								
Frame F2	102.8								
	Sum	2171991.3							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	23.3	17.5	-1.0	-19.93	18.39	35.8	410.9
Wall FP	34.7	26.0	-0.4	-7.65	7.06	34.7	468.6
Wall FN	34.7	26.0	0.5	9.24	-8.52	35.3	465.8
Wall FM	24.9	18.7	0.9	18.35	-16.93	37.0	426.7
Walls F4.8			0.0	-0.28	0.26	-0.3	-1.9
Walls F5.5			0.0	-0.02	0.02	0.0	0.8
Walls F6			0.0	0.48	-0.44	0.5	5.7
Frame Rim			0.4	6.91	-6.38	6.9	144.1
Frame F4			0.1	2.40	-2.22	2.4	56.2
Frame F7			-0.1	-2.43	2.24	-2.4	-49.4
Frame F8			-0.4	-7.07	6.52	-7.1	-155.6
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

7	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			328.9		-18421.1
Wall FP	-15.5			490.2		-7598.0
Wall FN	15.5			490.2		7598.0
Wall FM	45.5			350.9		15964.9
Walls F4.8		36.5	19.7		718.5	
Walls F5.5		48.5	19.7		954.7	
Walls F6		71.0	19.7		1397.6	
Frame Rim		117.0	76.9		9000.0	
Frame F4		94.0	39.7		3730.2	
Frame F7		7.5	42.2		316.5	
Frame F8		-7.0	88.5		-619.5	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	306.4	1660.2	15498.0	-2456.1
		xr	-1.5			
		yr	50.6			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	1.8	-11.0		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

7			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	977794.3	24.8	-10.85	-1.33	8.47	8.07	33.3	583.2
Wall FP	-14.0	96361.3	37.0	-4.16	-0.51	3.25	3.09	40.2	748.6
Wall FN	17.0	141323.7	37.0	5.04	0.62	-3.93	-3.75	42.0	772.2
Wall FM	47.0	774408.7	26.5	9.97	1.22	-7.79	-7.42	36.4	635.1
Walls F4.8	-14.1	3907.6	7.3	-0.17	-0.02	0.13	0.12	7.5	68.3
Walls F5.5	-2.1	85.9	7.3	-0.02	0.00	0.02	0.02	7.3	67.9
Walls F6	20.4	8200.8	7.3	0.24	0.03	-0.19	-0.18	7.37	69.6
Frame Rim	66.4	339261.4	28.7	3.09	0.38	-2.41	-2.30	29.0	585.0
Frame F4	43.4	74781.8	14.8	1.04	0.13	-0.81	-0.78	14.9	319.9
Frame F7	-43.1	78340.8	15.7	-1.10	-0.13	0.86	0.82	16.5	361.6
Frame F8	-57.6	293496.6	33.0	-3.08	-0.38	2.41	2.29	35.3	826.6
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	116.4								
Frame F2	101.4								
	Sum	2787963.0							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	23.0	17.3	-1.1	-21.02	19.36	36.6	447.5
Wall FP	34.3	25.7	-0.4	-8.05	7.42	34.3	502.9
Wall FN	34.3	25.7	0.5	9.75	-8.98	35.5	501.3
Wall FM	24.6	18.4	1.0	19.32	-17.79	37.7	464.4
Walls F4.8			0.0	-0.33	0.30	-0.3	-2.2
Walls F5.5			0.0	-0.05	0.04	0.0	0.7
Walls F6			0.0	0.47	-0.43	0.5	6.2
Frame Rim			0.3	5.99	-5.51	6.0	150.1
Frame F4			0.1	2.02	-1.86	2.0	58.3
Frame F7			-0.1	-2.13	1.96	-2.1	-51.5
Frame F8			-0.3	-5.97	5.50	-6.0	-161.6
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

6	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			465.1		-26046.5
Wall FP	-15.5			689.7		-10689.7
Wall FN	15.5			689.7		10689.7
Wall FM	45.5			497.5		22636.8
Walls F4.8		36.5	27.8		1013.9	
Walls F5.5		48.5	27.8		1347.2	
Walls F6		71.0	27.8		1972.2	
Frame Rim		117.0	90.9		10636.4	
Frame F4		94.0	45.5		4272.7	
Frame F7		7.5	46.7		350.5	
Frame F8		-7.0	95.2		-666.7	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	361.7	2341.9	18926.2	-3409.7
		xr	-1.5			
		yr	52.3			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	0.1	-12.7		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

6			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	1383746.9	21.3	-9.86	-0.05	7.72	8.51	29.1	612.3
Wall FP	-14.0	136024.8	31.6	-3.76	-0.02	2.95	3.25	34.6	783.2
Wall FN	17.0	198278.3	31.6	4.54	0.02	-3.56	-3.92	36.2	808.4
Wall FM	47.0	1096944.9	22.8	9.08	0.04	-7.11	-7.83	31.9	667.0
Walls F4.8	-15.8	6961.6	7.5	-0.17	0.00	0.13	0.15	7.7	75.9
Walls F5.5	-3.8	407.7	7.5	-0.04	0.00	0.03	0.04	7.5	75.4
Walls F6	18.7	9681.5	7.5	0.20	0.00	-0.16	-0.17	7.53	77.1
Frame Rim	64.7	380189.6	24.6	2.28	0.01	-1.79	-1.97	24.6	609.7
Frame F4	41.7	78923.1	12.3	0.74	0.00	-0.58	-0.64	12.3	332.2
Frame F7	-44.8	93916.6	12.7	-0.81	0.00	0.64	0.70	13.4	374.9
Frame F8	-59.3	335253.6	25.8	-2.20	-0.01	1.72	1.89	27.7	854.3
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	114.7								
Frame F2	99.7								
	Sum	3720328.4							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	22.7	17.0	-1.1	-21.86	20.16	37.2	484.7
Wall FP	33.6	25.2	-0.4	-8.34	7.70	33.6	536.5
Wall FN	33.6	25.2	0.5	10.07	-9.29	35.3	536.5
Wall FM	24.2	18.2	1.0	20.13	-18.56	38.3	502.7
Walls F4.8			0.0	-0.38	0.35	-0.4	-2.6
Walls F5.5			0.0	-0.09	0.08	-0.1	0.6
Walls F6			0.0	0.45	-0.41	0.4	6.6
Frame Rim			0.3	5.06	-4.67	5.1	155.1
Frame F4			0.1	1.63	-1.50	1.6	59.9
Frame F7			-0.1	-1.80	1.66	-1.8	-53.3
Frame F8			-0.3	-4.87	4.49	-4.9	-166.4
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

5	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			684.9		-38356.2
Wall FP	-15.5			1007.0		-15609.3
Wall FN	15.5			1007.0		15609.3
Wall FM	45.5			729.9		33211.7
Walls F4.8		36.5	40.9		1492.8	
Walls F5.5		48.5	40.9		1983.6	
Walls F6		71.0	40.9		2903.9	
Frame Rim		117.0	111.6		13058.0	
Frame F4		94.0	52.9		4973.5	
Frame F7		7.5	52.9		396.8	
Frame F8		-7.0	103.0		-720.9	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	443.1	3429.0	24087.9	-5144.5
		xr	-1.5			
		yr	54.4			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	-2.0	-14.8		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

5			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	2034395.0	18.1	-8.79	1.16	6.83	8.76	24.9	637.2
Wall FP	-14.0	197373.0	26.6	-3.32	0.44	2.58	3.31	29.1	812.3
Wall FN	17.0	291047.7	26.6	4.03	-0.53	-3.13	-4.02	30.6	838.9
Wall FM	47.0	1612429.8	19.2	8.07	-1.07	-6.28	-8.05	27.3	694.3
Walls F4.8	-17.9	13047.0	7.6	-0.17	0.02	0.13	0.17	7.8	83.7
Walls F5.5	-5.9	1404.7	7.6	-0.06	0.01	0.04	0.06	7.6	83.0
Walls F6	16.6	11324.0	7.6	0.16	-0.02	-0.12	-0.16	7.59	84.7
Frame Rim	62.6	437913.4	20.8	1.65	-0.22	-1.28	-1.64	20.6	630.2
Frame F4	39.6	83136.9	9.8	0.49	-0.07	-0.38	-0.49	9.8	342.0
Frame F7	-46.9	116185.6	9.8	-0.58	0.08	0.45	0.58	10.4	385.4
Frame F8	-61.4	387756.3	19.2	-1.49	0.20	1.16	1.48	20.6	874.9
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	112.6								
Frame F2	97.6								
	Sum	5186013.5							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	22.4	16.8	-1.2	-22.70	20.88	37.7	522.3
Wall FP	32.9	24.7	-0.5	-8.57	7.89	32.9	569.4
Wall FN	32.9	24.7	0.6	10.41	-9.58	35.1	571.6
Wall FM	23.9	17.9	1.1	20.86	-19.19	38.8	541.5
Walls F4.8			0.0	-0.44	0.41	-0.4	-3.0
Walls F5.5			0.0	-0.15	0.13	-0.1	0.5
Walls F6			0.0	0.41	-0.38	0.4	7.1
Frame Rim			0.2	4.25	-3.91	4.3	159.4
Frame F4			0.1	1.28	-1.17	1.3	61.2
Frame F7			-0.1	-1.51	1.39	-1.5	-54.8
Frame F8			-0.2	-3.84	3.54	-3.8	-170.3
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

4	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			1054.9		-59071.7
Wall FP	-15.5			1540.8		-23882.9
Wall FN	15.5			1540.8		23882.9
Wall FM	45.5			1123.6		51123.6
Walls F4.8		36.5	63.7		2324.8	
Walls F5.5		48.5	63.7		3089.2	
Walls F6		71.0	63.7		4522.3	
Frame Rim		117.0	148.6		17384.8	
Frame F4		94.0	63.7		5987.3	
Frame F7		7.5	61.3		460.1	
Frame F8		-7.0	113.4		-793.7	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	578.1	5260.1	32974.9	-7948.1
		xr	-1.5			
		yr	57.0			
		ex, seis, offset (r,l)	13.5	-10.5		
		ey, seis, offset (u,d)	-4.6	-17.4		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	37.5	-34.5		

4			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	3131908.2	14.9	-7.53	2.36	5.85	8.87	20.7	657.9
Wall FP	-14.0	301527.8	21.7	-2.83	0.89	2.19	3.33	23.9	836.3
Wall FN	17.0	445878.0	21.7	3.44	-1.08	-2.67	-4.05	25.2	864.1
Wall FM	47.0	2483186.5	15.8	6.92	-2.17	-5.38	-8.15	22.8	717.1
Walls F4.8	-20.5	26873.9	7.5	-0.17	0.05	0.13	0.20	7.7	91.4
Walls F5.5	-8.5	4646.1	7.5	-0.07	0.02	0.06	0.08	7.5	90.5
Walls F6	14.0	12411.6	7.5	0.12	-0.04	-0.09	-0.14	7.42	92.1
Frame Rim	60.0	534192.7	17.4	1.17	-0.37	-0.91	-1.38	17.0	647.2
Frame F4	37.0	87005.7	7.5	0.31	-0.10	-0.24	-0.36	7.4	349.4
Frame F7	-49.5	150569.4	7.2	-0.40	0.12	0.31	0.47	7.6	393.0
Frame F8	-64.0	464990.0	13.3	-0.95	0.30	0.74	1.12	14.4	889.3
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	110.0								
Frame F2	95.0								
	Sum	7643189.9							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	21.9	16.5	-1.2	-23.15	21.28	37.7	560.1
Wall FP	32.1	24.0	-0.5	-8.68	7.98	32.1	601.5
Wall FN	32.1	24.0	0.6	10.56	-9.71	34.6	606.2
Wall FM	23.4	17.5	1.1	21.27	-19.56	38.8	580.3
Walls F4.8			0.0	-0.53	0.48	-0.5	-3.5
Walls F5.5			0.0	-0.22	0.20	-0.2	0.3
Walls F6			0.0	0.36	-0.33	0.4	7.4
Frame Rim			0.2	3.59	-3.30	3.6	163.0
Frame F4			0.1	0.95	-0.87	0.9	62.1
Frame F7			-0.1	-1.22	1.13	-1.2	-56.0
Frame F8			-0.2	-2.92	2.69	-2.9	-173.2
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

3	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			1727.1		-96718.5
Wall FP	-15.5			2500.0		-38750.0
Wall FN	15.5			2500.0		38750.0
Wall FM	45.5			1838.2		83639.7
Walls F4.8		36.5	107.0		3903.7	
Walls F5.5		48.5	107.0		5187.2	
Walls F6		71.0	107.0		7593.6	
Frame Rim		117.0				
Frame F4		94.0	79.4		7460.3	
Frame F7		7.5	74.6		559.7	
Frame F8		-7.0	126.7		-887.2	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0				
Frame F2		152.0				
		Sum	601.6	8565.4	23817.3	-13078.8
		xr	-1.5			
		yr	39.6			
		ex, seis, offset (r,l)	12.3	-9.3		
		ey, seis, offset (u,d)	8.2	-3.4		
		ex, wind, actual	1.5			
		ex, wind, offset (r,l)	33.8	-30.7		

3			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.5	5124895.2	9.4	-4.85	-2.94	3.64	1.22	13.0	670.9
Wall FP	-14.0	488116.0	13.5	-1.80	-1.09	1.35	0.45	14.9	851.1
Wall FN	17.0	724791.7	13.5	2.19	1.33	-1.65	-0.55	15.7	879.8
Wall FM	47.0	4065318.1	10.0	4.45	2.70	-3.35	-1.12	14.4	731.5
Walls F4.8	-3.1	1021.6	7.5	-0.02	-0.01	0.01	0.00	7.5	98.9
Walls F5.5	8.9	8489.6	7.5	0.05	0.03	-0.04	-0.01	7.6	98.1
Walls F6	31.4	105513.5	7.5	0.17	0.11	-0.13	-0.04	7.63	99.8
Frame Rim	77.4								647.2
Frame F4	54.4	234951.1	5.6	0.22	0.14	-0.17	-0.06	5.7	355.1
Frame F7	-32.1	76851.2	5.2	-0.12	-0.07	0.09	0.03	5.3	398.3
Frame F8	-46.6	275118.2	8.9	-0.30	-0.18	0.23	0.08	9.0	898.3
Frame FK	106.5								
Frame FR	-73.7								
Frame FS	-103.7								
Frame FT	-133.7								
Frame FU	-163.7								
Frame F1	127.4								
Frame F2	112.4								
	Sum	11105066.2							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	21.6	16.2	-1.4	-22.99	20.91	37.1	597.2
Wall FP	31.3	23.4	-0.5	-8.54	7.76	31.3	632.7
Wall FN	31.3	23.4	0.6	10.40	-9.46	33.9	640.1
Wall FM	23.0	17.2	1.3	21.12	-19.21	38.4	618.7
Walls F4.8			0.0	-0.08	0.07	-0.1	-3.6
Walls F5.5			0.0	0.23	-0.21	0.2	0.5
Walls F6			0.0	0.82	-0.75	0.8	8.2
Frame Rim				0.00	0.00		163.0
Frame F4			0.1	1.06	-0.96	1.1	63.2
Frame F7			0.0	-0.59	0.53	-0.6	-56.6
Frame F8			-0.1	-1.44	1.31	-1.4	-174.6
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1							
Frame F2							

P6	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			3300.3		-184818.5
Wall FP	-15.5			4694.8		-72770.0
Wall FN	15.5			4694.8		72770.0
Wall FM	45.5			3497.7		159146.6
Walls F4.8		36.5	215.3		7857.9	
Walls F5.5		48.5	215.3		10441.3	
Walls F6		71.0	215.3		15285.3	
Frame Rim		117.0	354.6		41489.4	
Frame F4		94.0	106.0		9968.2	
Frame F7		7.5	102.9		771.6	
Frame F8		-7.0	156.7		-1097.2	
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0	534.8		89304.8	
Frame F2		152.0	157.5		23937.0	
		Sum	2058.4	16187.7	197958.3	-25671.9
		xr	-1.6			
		yr	96.2			
		ex, seis, offset (r,l)	19.1	-9.6		
		ey, seis, offset (u,d)	3.6	-14.0		
		ex, wind, actual	8.6			
		ex, wind, offset (r,l)	51.6	-34.4		

P6			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.4	9771932.5	21.9	-13.68	-2.37	6.84	9.11	**28.8**	**699.7**
Wall FP	-13.9	908932.0	31.2	-4.98	-0.86	2.49	3.31	**33.7**	**884.8**
Wall FN	17.1	1370552.0	31.2	6.11	1.06	-3.05	-4.07	**37.3**	**917.1**
Wall FM	47.1	7754742.5	23.2	12.55	2.17	-6.27	-8.36	**35.8**	**767.3**
Walls F4.8	-59.7	766585.2	10.3	-0.98	-0.17	0.49	0.65	**10.9**	**109.8**
Walls F5.5	-47.7	489268.5	10.3	-0.78	-0.14	0.39	0.52	**10.8**	**108.8**
Walls F6	-25.2	136414.8	10.3	-0.41	-0.07	0.21	0.27	**10.53**	**110.3**
Frame Rim	20.8	153826.7	16.9	0.56	0.10	-0.28	-0.37	**17.0**	**664.2**
Frame F4	-2.2	500.4	5.1	-0.02	0.00	0.01	0.01	**5.1**	**360.2**
Frame F7	-88.7	808928.4	4.9	-0.70	-0.12	0.35	0.46	**5.4**	**403.6**
Frame F8	-103.2	1668421.9	7.5	-1.23	-0.21	0.62	0.82	**8.3**	**906.6**
Frame FK	106.6								
Frame FR	-73.6								
Frame FS	-103.6								
Frame FT	-133.6								
Frame FU	-163.6								
Frame F1	70.8	2682651.0	25.5	2.89	0.50	-1.44	-1.92	**28.4**	**28.4**
Frame F2	55.8	490823.3	7.5	0.67	0.12	-0.33	-0.45	**8.2**	**8.2**
	Sum	27003579.1							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	21.8	16.3	-6.1	-27.48	18.33	**34.7**	**631.9**
Wall FP	31.0	23.2	-2.2	-10.00	6.67	**31.0**	**663.7**
Wall FN	31.0	23.2	2.7	12.28	-8.19	**35.5**	**675.6**
Wall FM	23.1	17.3	5.6	25.20	-16.81	**42.5**	**661.2**
Walls F4.8			-0.4	-1.97	1.31	**-2.0**	**-5.6**
Walls F5.5			-0.3	-1.57	1.05	**-1.6**	**-1.1**
Walls F6			-0.2	-0.83	0.55	**-0.8**	**7.4**
Frame Rim			0.3	1.13	-0.75	**1.1**	**164.1**
Frame F4			0.0	-0.04	0.02	**0.0**	**63.1**
Frame F7			-0.3	-1.40	0.93	**-1.4**	**-58.0**
Frame F8			-0.5	-2.47	1.65	**-2.5**	**-177.1**
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1			1.3	5.80	-3.87	**5.8**	**5.8**
Frame F2			0.3	1.35	-0.90	**1.3**	**1.3**

P5	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			5780.3		-323699.4
Wall FP	-15.5			8064.5		-125000.0
Wall FN	15.5			8064.5		125000.0
Wall FM	45.5			6135.0		279141.1
Walls F4.8		36.5	414.1		15113.9	
Walls F5.5		48.5				
Walls F6		71.0				
Frame Rim		117.0	446.4		52232.1	
Frame F4		94.0	136.6		12841.5	
Frame F7		7.5				
Frame F8		-7.0				
Frame FK	105.0					
Frame FR	-75.2					
Frame FS	-105.2					
Frame FT	-135.2					
Frame FU	-165.2					
Frame F1		167.0	662.3		110596.0	
Frame F2		152.0	182.8		27787.9	
		Sum	1842.2	28044.3	218571.5	-44558.3
		xr	-1.6			
		yr	118.6			
		ex, seis, offset (r,l)	23.0	-5.7		
		ey, seis, offset (u,d)	2.2	-8.2		
		ex, wind, actual	8.6			
		ex, wind, offset (r,l)	51.6	-34.4		

P5			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-54.4	17113138.9	8.4	-7.52	-0.64	1.85	2.46	10.2	709.9
Wall FP	-13.9	1560645.5	11.7	-2.68	-0.23	0.66	0.88	12.4	897.2
Wall FN	17.1	2355071.5	11.7	3.30	0.28	-0.81	-1.08	15.0	932.1
Wall FM	47.1	13603435.4	8.9	6.91	0.59	-1.70	-2.26	15.8	783.1
Walls F4.8	-82.1	2794316.7	8.4	-0.81	-0.07	0.20	0.27	8.6	118.4
Walls F5.5	-70.1								108.8
Walls F6	-47.6								110.3
Frame Rim	-1.6	1212.3	9.0	-0.02	0.00	0.00	0.01	9.0	673.2
Frame F4	-24.6	82994.3	2.8	-0.08	-0.01	0.02	0.03	2.8	362.9
Frame F7	-111.1								403.6
Frame F8	-125.6								906.6
Frame FK	106.6								
Frame FR	-73.6								
Frame FS	-103.6								
Frame FT	-133.6								
Frame FU	-163.6								
Frame F1	48.4	1548296.1	13.4	0.77	0.07	-0.19	-0.25	14.1	42.5
Frame F2	33.4	203357.1	3.7	0.15	0.01	-0.04	-0.05	3.8	12.0
	Sum	39262467.8							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	20.9	15.7	-7.0	-31.39	20.94	36.6	668.5
Wall FP	29.1	21.8	-2.5	-11.20	7.47	29.3	693.0
Wall FN	29.1	21.8	3.1	13.75	-9.17	35.6	711.2
Wall FM	22.2	16.6	6.4	28.83	-19.23	45.5	706.6
Walls F4.8			-0.8	-3.40	2.26	-3.4	-9.0
Walls F5.5			0.0	0.00	0.00	0.0	-1.1
Walls F6			0.0	0.00	0.00	0.0	7.4
Frame Rim			0.0	-0.07	0.05	-0.1	164.0
Frame F4			-0.1	-0.34	0.22	-0.3	62.8
Frame F7			0.0	0.00	0.00	0.0	-58.0
Frame F8			0.0	0.00	0.00	0.0	-177.1
Frame FK							
Frame FR							
Frame FS							
Frame FT							
Frame FU							
Frame F1			0.7	3.20	-2.13	3.2	9.0
Frame F2			0.1	0.61	-0.41	0.6	2.0

P4	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			11286.7		-632054.2
Wall FP	-15.5			15105.7		-234139.0
Wall FN	15.5			15105.7		234139.0
Wall FM	45.5			11848.3		539099.5
Walls F4.8		36.5	952.4		34761.9	
Walls F5.5		48.5	952.4		46190.5	
Walls F6		71.0	952.4		67619.0	
Frame Rim		117.0	588.2		68823.5	
Frame F4		94.0	194.6		18287.9	
Frame F7		7.5	220.8		1655.6	
Frame F8		-7.0	278.6		-1949.9	
Frame FK	105.0			208.8		21920.7
Frame FR	-75.2			208.8		-15699.4
Frame FS	-105.2			208.8		-21962.4
Frame FT	-135.2			147.1		-19882.4
Frame FU	-165.2			119.8		-19784.4
Frame F1		167.0	847.5		141525.4	
Frame F2		152.0	259.7		39480.5	
		Sum	5246.4	54239.6	416394.6	-148362.6
		xr	-2.7			
		yr	79.4			
		ex, seis, offset (r,l)	-29.1	-57.8		
		ey, seis, offset (u,d)	0.4	-17.2		
		ex, wind, actual	-19.3			
		ex, wind, offset (r,l)	39.7	-78.3		

P4			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-53.3	32021743.6	14.3	12.91	-0.18	25.64	6.94	40.0	749.9
Wall FP	-12.8	2461286.1	19.2	4.14	-0.06	8.22	2.23	27.4	924.6
Wall FN	18.2	5023063.1	19.2	-5.92	0.08	-11.75	-3.18	13.2	945.4
Wall FM	48.2	27566893.2	15.0	-12.27	0.17	-24.37	-6.60	2.7	785.8
Walls F4.8	-42.9	1750093.7	11.4	0.88	-0.01	1.74	0.47	11.9	130.3
Walls F5.5	-30.9	907414.4	11.4	0.63	-0.01	1.25	0.34	11.7	120.6
Walls F6	-8.4	66676.5	11.4	0.17	0.00	0.34	0.09	11.48	121.8
Frame Rim	37.6	833074.3	7.0	-0.48	0.01	-0.94	-0.26	7.0	680.3
Frame F4	14.6	41657.3	2.3	-0.06	0.00	-0.12	-0.03	2.3	365.3
Frame F7	-71.9	1140153.9	2.6	0.34	0.00	0.68	0.18	2.8	406.5
Frame F8	-86.4	2077798.4	3.3	0.52	-0.01	1.03	0.28	3.6	910.2
Frame FK	107.7	2423152.1	0.3	-0.48	0.01	-0.96	-0.26	-0.7	-0.7
Frame FR	-72.5	1096269.4	0.3	0.32	0.00	0.65	0.17	0.9	0.9
Frame FS	-102.5	2191860.4	0.3	0.46	-0.01	0.91	0.25	1.2	1.2
Frame FT	-132.5	2580425.3	0.2	0.42	-0.01	0.83	0.23	1.0	1.0
Frame FU	-162.5	3161050.7	0.2	0.42	-0.01	0.84	0.23	1.0	1.0
Frame F1	87.6	6508054.6	10.1	-1.60	0.02	-3.17	-0.86	10.1	52.6
Frame F2	72.6	1370265.2	3.1	-0.41	0.01	-0.80	-0.22	3.1	15.1
	Sum	93220932.1							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	20.4	15.3	12.2	-18.81	37.04	52.3	720.8
Wall FP	27.3	20.4	3.9	-6.03	11.88	32.3	725.3
Wall FN	27.3	20.4	-5.6	8.62	-16.97	29.1	740.2
Wall FM	21.4	16.0	-11.6	17.88	-35.21	33.9	740.6
Walls F4.8			0.8	-1.28	2.52	-1.3	-10.3
Walls F5.5			0.6	-0.92	1.81	-0.9	-2.0
Walls F6			0.2	-0.25	0.49	-0.2	7.2
Frame Rim			-0.4	0.69	-1.36	0.7	164.7
Frame F4			-0.1	0.09	-0.18	0.1	62.9
Frame F7			0.3	-0.50	0.98	-0.5	-58.5
Frame F8			0.5	-0.75	1.48	-0.8	-177.9
Frame FK	0.4	0.3	-0.5	0.70	-1.39		
Frame FR	0.4	0.3	0.3	-0.47	0.93		
Frame FS	0.4	0.3	0.4	-0.67	1.32		
Frame FT	0.3	0.2	0.4	-0.61	1.20		
Frame FU	0.2	0.2	0.4	-0.61	1.20		
Frame F1			-1.5	2.32	-4.58	2.3	11.3
Frame F2			-0.4	0.59	-1.16	0.6	2.5

P3	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			25252.5		-1414141.4
Wall FP	-15.5			31948.9		-495207.7
Wall FN	15.5			31948.9		495207.7
Wall FM	45.5			26246.7		1194225.7
Walls F4.8		36.5	2954.2		107828.7	
Walls F5.5		48.5	2954.2		143279.2	
Walls F6		71.0	2954.2		209748.9	
Frame Rim		117.0	885.0		103539.8	
Frame F4		94.0	336.7		31649.8	
Frame F7		7.5	370.4		2777.8	
Frame F8		-7.0	446.4		-3125.0	
Frame FK	105.0			326.8		34313.7
Frame FR	-75.2			326.8		-24575.2
Frame FS	-105.2			326.8		-34379.1
Frame FT	-135.2			232.6		-31441.9
Frame FU	-165.2			190.1		-31406.8
Frame F1		167.0	1102.5		184123.5	
Frame F2		152.0	326.8		49673.2	
		Sum	12330.4	116800.1	829495.8	-307404.9
		xr	-2.6			
		yr	67.3			
		ex, seis, offset (r,l)	-15.2	-43.9		
		ey, seis, offset (u,d)	18.4	0.8		
		ex, wind, actual	-19.4			
		ex, wind, offset (r,l)	39.6	-78.4		

P3			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-53.4	71923110.7	7.3	3.63	-4.01	10.48	-0.18	17.8	767.6
Wall FP	-12.9	5290359.7	9.2	1.11	-1.22	3.20	-0.05	12.4	937.0
Wall FN	18.1	10503687.8	9.2	-1.56	1.72	-4.50	0.08	7.6	953.0
Wall FM	48.1	60805218.3	7.6	-3.40	3.76	-9.82	0.17	4.2	790.0
Walls F4.8	-30.8	2797447.3	7.4	0.24	-0.27	0.71	-0.01	7.3	137.6
Walls F5.5	-18.8	1041063.9	7.4	0.15	-0.17	0.43	-0.01	7.3	127.9
Walls F6	3.7	41050.4	7.4	-0.03	0.03	-0.09	0.00	7.35	129.1
Frame Rim	49.7	2188355.5	2.2	-0.12	0.13	-0.34	0.01	2.3	682.6
Frame F4	26.7	240528.2	0.8	-0.02	0.03	-0.07	0.00	0.9	366.1
Frame F7	-59.8	1323233.6	0.9	0.06	-0.07	0.17	0.00	0.9	407.4
Frame F8	-74.3	2462668.8	1.1	0.09	-0.10	0.26	0.00	1.1	911.3
Frame FK	107.6	3785824.7	0.1	-0.09	0.10	-0.27	0.00	-0.2	-0.9
Frame FR	-72.6	1720957.7	0.1	0.06	-0.07	0.18	0.00	0.3	1.2
Frame FS	-102.6	3437979.5	0.1	0.09	-0.10	0.26	0.00	0.4	1.5
Frame FT	-132.6	4087047.4	0.1	0.08	-0.09	0.24	0.00	0.3	1.3
Frame FU	-162.6	5024408.8	0.1	0.08	-0.09	0.24	0.00	0.3	1.3
Frame F1	99.7	10965390.7	2.7	-0.30	0.33	-0.86	0.01	2.7	55.4
Frame F2	84.7	2346006.2	0.8	-0.07	0.08	-0.22	0.00	0.8	15.9
	Sum	189984339.5							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	20.4	15.3	12.9	-19.85	39.25	54.5	775.3
Wall FP	25.8	19.3	3.9	-6.06	11.97	31.3	756.6
Wall FN	25.8	19.3	-5.6	8.53	-16.87	27.8	768.1
Wall FM	21.2	15.9	-12.1	18.61	-36.79	34.5	775.0
Walls F4.8			0.9	-1.34	2.65	-1.3	-11.6
Walls F5.5			0.5	-0.82	1.62	-0.8	-2.8
Walls F6			-0.1	0.16	-0.32	0.2	7.3
Frame Rim			-0.4	0.65	-1.28	0.6	165.4
Frame F4			-0.1	0.13	-0.26	0.1	63.0
Frame F7			0.2	-0.33	0.64	-0.3	-58.8
Frame F8			0.3	-0.49	0.97	-0.5	-178.4
Frame FK	0.3	0.2	-0.3	0.52	-1.02		
Frame FR	0.3	0.2	0.2	-0.35	0.69		
Frame FS	0.3	0.2	0.3	-0.49	0.98		
Frame FT	0.2	0.1	0.3	-0.45	0.90		
Frame FU	0.2	0.1	0.3	-0.46	0.90		
Frame F1			-1.1	1.62	-3.20	1.6	12.9
Frame F2			-0.3	0.41	-0.81	0.4	3.0

P2	Center of Stiffness and Load Eccentricity					
	Dist. From 0 Ref. (in.)		Relative Rigidity			
Level	x (ft.)	y (ft.)	Rx	Ry	Rx*y	Ry*x
Wall FQ.3	-56.0			71428.6		-4000000.0
Wall FP	-15.5			84745.8		-1313559.3
Wall FN	15.5			84745.8		1313559.3
Wall FM	45.5			73529.4		3345588.2
Walls F4.8		36.5	16528.9		603305.8	
Walls F5.5		48.5	16528.9		801652.9	
Walls F6		71.0	16528.9		1173553.7	
Frame Rim		117.0	2036.7		238289.2	
Frame F4		94.0	1000.0		94000.0	
Frame F7		7.5	1000.0		7500.0	
Frame F8		-7.0	1245.3		-8717.3	
Frame FK	105.0			751.9		78947.4
Frame FR	-75.2			751.9		-56541.4
Frame FS	-105.2			751.9		-79097.7
Frame FT	-135.2			546.4		-73879.8
Frame FU	-165.2			448.4		-74080.7
Frame F1		167.0	1785.7		298214.3	
Frame F2		152.0	909.1		138181.8	
		Sum	57563.6	317700.0	3345980.4	-859064.0
		xr	-2.7			
		yr	58.1			
		ex, seis, offset (r,l)	-15.1	-43.8		
		ey, seis, offset (u,d)	27.6	10.0		
		ex, wind, actual	-19.3			
		ex, wind, offset (r,l)	39.7	-78.3		

P2			Seismic						
	Dist. from	K * Dist^2	Direct Shear	Torsional Shear (e right, up)		Torsional Shear (e left, down)		Design Load	Design Load
Level	CO Stiffness			From N-S Load	From E-W Load	From N-S Load	From E-W Load	(floor)	(cumulative)
Wall FQ.3	-53.3	202890183.5	3.0	1.49	-2.48	4.32	-0.90	7.3	774.9
Wall FP	-12.8	13876047.8	3.6	0.43	-0.71	1.23	-0.26	4.8	941.8
Wall FN	18.2	28083557.1	3.6	-0.60	1.00	-1.75	0.36	3.0	956.0
Wall FM	48.2	170854894.4	3.1	-1.39	2.31	-4.02	0.83	1.7	791.7
Walls F4.8	-21.6	7730811.4	3.5	0.14	-0.23	0.41	-0.08	3.4	141.0
Walls F5.5	-9.6	1531790.5	3.5	0.06	-0.10	0.18	-0.04	3.5	131.4
Walls F6	12.9	2739204.8	3.5	-0.08	0.14	-0.24	0.05	3.54	132.7
Frame Rim	58.9	7059196.8	0.4	-0.05	0.08	-0.14	0.03	0.5	683.1
Frame F4	35.9	1286893.8	0.2	-0.01	0.02	-0.04	0.01	0.2	366.4
Frame F7	-50.6	2563062.6	0.2	0.02	-0.03	0.06	-0.01	0.2	407.6
Frame F8	-65.1	5282050.9	0.3	0.03	-0.05	0.09	-0.02	0.2	911.5
Frame FK	107.7	8721920.1	0.0	-0.03	0.05	-0.09	0.02	-0.1	-0.9
Frame FR	-72.5	3951630.5	0.0	0.02	-0.04	0.06	-0.01	0.1	1.3
Frame FS	-102.5	7898818.0	0.0	0.03	-0.05	0.09	-0.02	0.1	1.7
Frame FT	-132.5	9592998.6	0.0	0.03	-0.05	0.08	-0.02	0.1	1.4
Frame FU	-162.5	11840783.3	0.0	0.03	-0.05	0.08	-0.02	0.1	1.4
Frame F1	108.9	21166778.1	0.4	-0.08	0.13	-0.22	0.05	0.4	55.7
Frame F2	93.9	8011087.9	0.2	-0.03	0.06	-0.10	0.02	0.2	16.1
	Sum	515081710.2							

Wind							
	Direct Shear		Torsional Shear			Design Load	Design Load
Level	Full	75%	e actual	e offset right	e offset left	(floor)	(cumulative)
Wall FQ.3	20.0	15.0	12.7	-19.55	38.55	53.5	828.8
Wall FP	23.7	17.8	3.6	-5.57	10.98	28.8	785.4
Wall FN	23.7	17.8	-5.1	7.92	-15.62	25.7	793.8
Wall FM	20.6	15.4	-11.8	18.20	-35.89	33.6	808.6
Walls F4.8			1.2	-1.84	3.62	-1.8	-13.4
Walls F5.5			0.5	-0.82	1.61	-0.8	-3.6
Walls F6			-0.7	1.09	-2.15	1.1	8.4
Frame Rim			-0.4	0.62	-1.21	0.6	166.0
Frame F4			-0.1	0.18	-0.36	0.2	63.2
Frame F7			0.2	-0.26	0.51	-0.3	-59.1
Frame F8			0.3	-0.42	0.82	-0.4	-178.8
Frame FK	0.2	0.2	-0.3	0.42	-0.82		
Frame FR	0.2	0.2	0.2	-0.28	0.55		
Frame FS	0.2	0.2	0.3	-0.40	0.78		
Frame FT	0.2	0.1	0.2	-0.37	0.73		
Frame FU	0.1	0.1	0.2	-0.37	0.74		
Frame F1			-0.6	1.00	-1.97	1.0	13.9
Frame F2			-0.3	0.44	-0.86	0.4	3.4