

APPENDIX III – STRUCTURAL INFORMATION REQUIRED

In order to perform the structural wind load study, the following structural information is required:

1. Floor ladder and an elevation/section of the building used as reference to create the structural model;
2. Mass properties for each floor/storey, including mass, mass moment of inertia and the location of the center of mass for each floor. Note that the lumped mass at each floor level used as input in the dynamic (i.e. modal) analysis should account for the full self-weight of the floor's structural system (i.e. slab, beams, columns, walls, bracing, etc.), superimposed dead loads (flooring, cladding, partitions, finishing, etc.), and a live load allowance (typically about 30% of the nominal value);
3. Modal information, i.e. modal periods/frequencies, modal participation factors, modal participating mass ratios and the corresponding mode shapes of vibration. This information can be extracted from the dynamic (i.e. modal) analysis results. For buildings, typically the first two sway (i.e. translational) modes and the first torsional mode are required. However, providing modal information for the higher order modes (i.e. up to the 12-th mode) is desirable;
4. A drawing showing clearly the location of the co-ordinate origin of the structural model with respect to a typical architectural/structural floor plan. In this drawing should be also shown the X and Y axes and the sign convention for these axes.

Attached please find a sample-document you may use as a reference to prepare the structural information described in the above items. Note that the structural information shown in the attached document is based on the input/output data of ETABS, a widely used structural analysis program for analysing and designing buildings. Similar input/output data in text format can be extracted from the dynamic analysis performed using other structural analysis programs such as STAAD, RAM, MIDAS, SAP 2000, ANSYS, etc.

Please note that the Story Data, Mass Data, Modal Analysis Summary and Mode Shapes data illustrated in the attached sample-document should be provided in ASCII TEXT FORMAT or EXCEL FORMAT.

STORY DATA

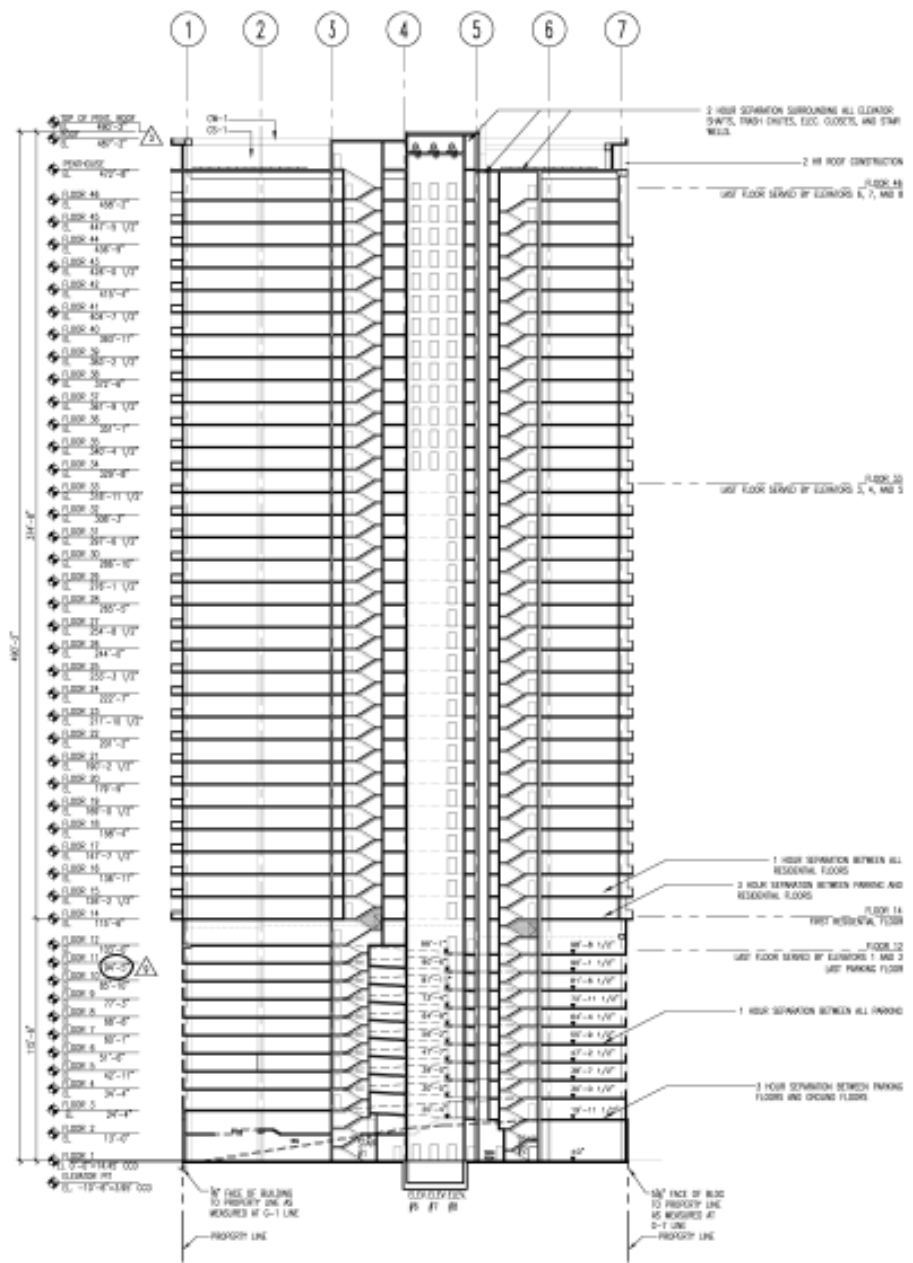
Story Data_Sample_File

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S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
ROOF	None	14.500	487.166
PENTHOUSEME	None	14.500	472.666
STORY46	None	10.708	458.166
STORY45	None	10.708	447.458
STORY44	None	10.708	436.750
STORY43	None	10.708	426.041
STORY42	None	10.708	415.333
STORY41	None	10.708	404.625
STORY40	None	10.708	393.916
STORY39	None	10.708	383.208
STORY38	None	10.708	372.500
STORY37	None	10.708	361.791
STORY36	None	10.708	351.083
STORY35	None	10.708	340.375
STORY34	None	10.708	329.666
STORY33	None	10.708	318.958
STORY32	None	10.708	308.250
STORY31	None	10.708	297.541
STORY30	None	10.708	286.833
STORY29	None	10.708	276.125
STORY28	None	10.708	265.416
STORY27	None	10.708	254.708
STORY26	None	10.708	244.000
STORY25	None	10.708	233.291
STORY24	None	10.708	222.583
STORY23	None	10.708	211.875
STORY22	None	10.708	201.166
STORY21	None	10.708	190.458
STORY20	None	10.708	179.750
STORY19	None	10.708	169.041
STORY18	None	10.708	158.333
STORY17	None	10.708	147.625
STORY16	None	10.708	136.916
STORY15	None	10.708	126.208
STORY14	None	12.583	115.500
STORY12	None	8.583	102.916
STORY11	None	8.583	94.333
STORY10	None	8.583	85.750
STORY9	None	8.583	77.166
STORY8	None	8.583	68.583
STORY7	None	8.583	60.000
STORY6	None	8.583	51.417
STORY5	None	8.583	42.833
STORY4	None	10.000	34.250
STORY3	None	11.250	24.250
STORY2	None	13.000	13.000
BASE	None		0.000

BUILDING ELEVATION / SECTION



1 EAST/WEST SECTION
1/8" = 1'-0"

MASS DATA

Mass Data_Sample_File

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M A S S S O U R C E D A T A

MASS	LATERAL	LUMP MASS
FROM	MASS ONLY	AT STORIES
Loads	Yes	Yes

M A S S S O U R C E L O A D S

LOAD	MULTIPLIER
DEADANDSUPE	1.0000
LIVE	0.3000

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D I A P H R A G M M A S S D A T A

STORY	DIAPHRAGM	MASS-X	MASS-Y	MMI	X-M	Y-M
ROOF	DIATYP	3.745E+01	3.745E+01	1.719E+05	73.664	33.500
PENTHOUSEME	DIATYP	1.082E+02	1.082E+02	5.002E+05	105.800	48.177
STORY46	DIATYP	1.117E+02	1.117E+02	5.408E+05	104.742	47.422
STORY45	DIATYP	1.107E+02	1.107E+02	5.310E+05	104.671	47.066
STORY44	DIATYP	1.087E+02	1.087E+02	5.182E+05	104.839	47.810
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STORY6	DIATYP	1.132E+02	1.132E+02	5.525E+05	104.308	49.386
STORY5	DIATYP	1.132E+02	1.132E+02	5.525E+05	104.308	49.386
STORY4	DIATYP	1.154E+02	1.154E+02	5.609E+05	104.419	49.384
STORY3	DIATYP	1.160E+02	1.160E+02	5.830E+05	105.383	51.280
STORY2	DIATYP	3.045E+01	3.045E+01	1.022E+05	99.008	51.207

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A S S E M B L E D P O I N T M A S S E S

STORY	POINT	UX	UY	UZ	RX	RY	RZ
ROOF	A11	3.766E+01	3.766E+01	0.000E+00	0.000E+00	0.000E+00	1.719E+05
PENTHOUSEME	A11	1.082E+02	1.082E+02	0.000E+00	0.000E+00	0.000E+00	5.002E+05
STORY46	A11	1.117E+02	1.117E+02	0.000E+00	0.000E+00	0.000E+00	5.408E+05
STORY45	A11	1.108E+02	1.108E+02	0.000E+00	0.000E+00	0.000E+00	5.310E+05
STORY44	A11	1.088E+02	1.088E+02	0.000E+00	0.000E+00	0.000E+00	5.182E+05
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STORY6	A11	1.132E+02	1.132E+02	0.000E+00	0.000E+00	0.000E+00	5.525E+05
STORY5	A11	1.132E+02	1.132E+02	0.000E+00	0.000E+00	0.000E+00	5.525E+05
STORY4	A11	1.154E+02	1.154E+02	0.000E+00	0.000E+00	0.000E+00	5.609E+05
STORY3	A11	1.160E+02	1.160E+02	0.000E+00	0.000E+00	0.000E+00	5.830E+05
STORY2	A11	3.799E+01	3.799E+01	0.000E+00	0.000E+00	0.000E+00	1.022E+05
BASE	A11	1.937E+01	1.937E+01	0.000E+00	0.000E+00	0.000E+00	5.465E+04
Totals	A11	5.043E+03	5.043E+03	0.000E+00	0.000E+00	0.000E+00	2.384E+07

MODAL ANALYSIS SUMMARY

Modal Information_Sample_File

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M O D A L P E R I O D S A N D F R E Q U E N C I E S

MODE NUMBER	PERIOD (TIME)	FREQUENCY (CYCLES/TIME)	CIRCULAR FREQ (RADIANS/TIME)
Mode 1	3.90494	0.25609	1.60904
Mode 2	3.74076	0.26733	1.67965
Mode 3	2.91025	0.34361	2.15899

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M O D A L P A R T I C I P A T I O N F A C T O R S

MODE	UX	UY	UZ	RX	RY	RZ
Mode 1	5.3627	-3.2361	0.0000	13530.9439	24851.3384	-11575.3147
Mode 2	-0.7692	16.1547	0.0000	-64681.5018	-2185.1451	-3126.7718
Mode 3	-15.7196	-1.8012	0.0000	7651.9969	-61734.1620	-4521.1327

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M O D A L P A R T I C I P A T I N G M A S S R A T I O S

MODE NUMBER	X-TRANS %MASS <SUM>	Y-TRANS %MASS <SUM>	Z-TRANS %MASS <SUM>	RX-ROTN %MASS <SUM>	RY-ROTN %MASS <SUM>	RZ-ROTN %MASS <SUM>
Mode 1	6.87 < 7>	2.50 < 3>	0.00 < 0>	4.07 < 4>	13.73 < 14>	46.76 < 47>
Mode 2	0.14 < 7>	62.34 < 65>	0.00 < 0>	93.01 < 97>	0.11 < 14>	3.41 < 50>
Mode 3	59.03 < 66>	0.77 < 66>	0.00 < 0>	1.30 < 98>	84.73 < 99>	7.13 < 57>

MODE SHAPES

Mode Shapes_Sample_File

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MODE SHAPES

STORY	DIAPHRAGM	MODE	UX	UY	UZ	RX	RY	RZ
ROOF	DIATYP	Mode 1	-3.0021E-02	-1.8625E-02	0.00000	0.00000	0.00000	1.0309E-04
ROOF	DIATYP	Mode 2	4.3449E-03	-1.0320E-01	0.00000	0.00000	0.00000	2.8231E-05
ROOF	DIATYP	Mode 3	8.8657E-02	-4.9069E-03	0.00000	0.00000	0.00000	4.6522E-05
PENTHOUSEME	DIATYP	Mode 1	-4.5891E-02	2.0627E-02	0.00000	0.00000	0.00000	1.0046E-04
PENTHOUSEME	DIATYP	Mode 2	-4.1282E-04	-8.9466E-02	0.00000	0.00000	0.00000	2.7423E-05
PENTHOUSEME	DIATYP	Mode 3	7.8382E-02	1.2627E-02	0.00000	0.00000	0.00000	4.4888E-05
STORY46	DIATYP	Mode 1	-4.2714E-02	1.8864E-02	0.00000	0.00000	0.00000	9.7882E-05
STORY46	DIATYP	Mode 2	4.2934E-05	-8.7019E-02	0.00000	0.00000	0.00000	2.6593E-05
STORY46	DIATYP	Mode 3	7.6712E-02	1.1672E-02	0.00000	0.00000	0.00000	4.3186E-05
STORY45	DIATYP	Mode 1	-4.0591E-02	1.8384E-02	0.00000	0.00000	0.00000	9.5960E-05
STORY45	DIATYP	Mode 2	3.0901E-04	-8.5046E-02	0.00000	0.00000	0.00000	2.6005E-05
STORY45	DIATYP	Mode 3	7.5352E-02	1.1354E-02	0.00000	0.00000	0.00000	4.1849E-05
STORY44	DIATYP	Mode 1	-3.9677E-02	1.8140E-02	0.00000	0.00000	0.00000	9.4003E-05
STORY44	DIATYP	Mode 2	2.4314E-04	-8.3064E-02	0.00000	0.00000	0.00000	2.5434E-05
STORY44	DIATYP	Mode 3	7.3442E-02	1.1157E-02	0.00000	0.00000	0.00000	4.0426E-05
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STORY6	DIATYP	Mode 1	9.0098E-04	1.4231E-04	0.00000	0.00000	0.00000	2.1079E-06
STORY6	DIATYP	Mode 2	6.9307E-04	-4.8148E-03	0.00000	0.00000	0.00000	1.3335E-06
STORY6	DIATYP	Mode 3	4.3491E-03	2.1447E-04	0.00000	0.00000	0.00000	0.00000
STORY5	DIATYP	Mode 1	7.8451E-04	7.6807E-05	0.00000	0.00000	0.00000	1.6461E-06
STORY5	DIATYP	Mode 2	5.5015E-04	-3.6599E-03	0.00000	0.00000	0.00000	1.1032E-06
STORY5	DIATYP	Mode 3	3.3951E-03	1.6118E-04	0.00000	0.00000	0.00000	0.00000
STORY4	DIATYP	Mode 1	6.4793E-04	3.0114E-05	0.00000	0.00000	0.00000	1.2180E-06
STORY4	DIATYP	Mode 2	4.1434E-04	-2.5926E-03	0.00000	0.00000	0.00000	0.00000
STORY4	DIATYP	Mode 3	2.5143E-03	1.1412E-04	0.00000	0.00000	0.00000	0.00000
STORY3	DIATYP	Mode 1	4.5058E-04	6.0475E-06	0.00000	0.00000	0.00000	0.00000
STORY3	DIATYP	Mode 2	2.5541E-04	-1.4976E-03	0.00000	0.00000	0.00000	0.00000
STORY3	DIATYP	Mode 3	1.5950E-03	6.7906E-05	0.00000	0.00000	0.00000	0.00000
STORY2	DIATYP	Mode 1	2.4068E-04	-3.0242E-05	0.00000	0.00000	0.00000	0.00000
STORY2	DIATYP	Mode 2	1.1706E-04	-5.6841E-04	0.00000	0.00000	0.00000	0.00000
STORY2	DIATYP	Mode 3	7.2146E-04	2.4969E-05	0.00000	0.00000	0.00000	0.00000

STRUCTURAL MODEL CO-ORDINATE ORIGIN

