



HYATT REGENCY  
PITTSBURGH INTERNATIONAL AIRPORT  
PITTSBURGH, PA



**APPENDIX A**

**Wind Loading Calculations:**

(using ASCE 7-02 Method 2 – Analytical Procedure)

V = 90 mph

Exposure C

I = 1.0

K<sub>zt</sub> = 1.0 (no topographic features)

K<sub>d</sub> = 0.85 (main lateral system)

G = 0.85 (for rigid structures - assumed)

GC<sub>pi</sub> = ±0.18 (for enclosed buildings)

**Velocity Pressure, q<sub>z</sub>**

z (ft)	K <sub>z</sub>	q <sub>z</sub> = 0.00256 K <sub>z</sub> K <sub>zt</sub> K <sub>d</sub> V <sup>2</sup> I (lb/ft <sup>2</sup> )
15	0.85	15.0
20	0.90	15.9
25	0.94	16.6
30	0.98	17.3
40	1.04	18.3
50	1.09	19.2
60	1.13	19.9
70	1.17	20.6
80	1.21	21.3
90	1.24	21.9
100	1.26	22.2
120	1.31	23.1
140	1.36	24.0
150	1.38	24.3

q<sub>h</sub> = 24.3 lb/ft<sup>2</sup>

**Wall Pressure Coefficients, C<sub>p</sub>**

Surface	Direction	L (ft)	B (ft)	L/B	C <sub>p</sub>
LEEWARD	N/S	65	273	0.2	-0.5
	E/W	273	65	4.2	-0.2
WINDWARD	N/S, E/W	All Values			0.8




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**WIND PRESSURE CALCULATIONS:**

$$p = qGC_p - q_i(GC_{pi}) \quad (lb/ft^2)$$

**WINDWARD WIND PRESSURES:**

$$p_{0-15} = 10.2 \text{ psf} \pm 2.7 \text{ psf}$$

$$p_{20} = 10.8 \text{ psf} \pm 2.9 \text{ psf}$$

$$p_{25} = 11.3 \text{ psf} \pm 3.0 \text{ psf}$$

$$p_{30} = 11.8 \text{ psf} \pm 3.1 \text{ psf}$$

$$p_{40} = 12.4 \text{ psf} \pm 3.3 \text{ psf}$$

$$p_{50} = 13.1 \text{ psf} \pm 3.5 \text{ psf}$$

$$p_{60} = 13.5 \text{ psf} \pm 3.6 \text{ psf}$$

$$p_{70} = 14.0 \text{ psf} \pm 3.7 \text{ psf}$$

$$p_{80} = 14.5 \text{ psf} \pm 3.8 \text{ psf}$$

$$p_{90} = 14.9 \text{ psf} \pm 3.9 \text{ psf}$$

$$p_{100} = 15.1 \text{ psf} \pm 4.0 \text{ psf}$$

$$p_{120} = 15.7 \text{ psf} \pm 4.2 \text{ psf}$$

$$p_{140} = 16.3 \text{ psf} \pm 4.3 \text{ psf}$$

$$p_{150} = 16.5 \text{ psf} \pm 4.4 \text{ psf}$$

**LEEWARD WIND PRESSURES:**

$$p_{N/S} = -10.3 \text{ psf} \pm 4.4 \text{ psf}$$

$$p_{E/W} = -4.1 \text{ psf} \pm 4.4 \text{ psf}$$



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**CONCRETE FRAMING**

**STORY SHEARS AND BASE SHEAR CALCULATIONS:**

**East-West Story Shears**

Story	Actual Elevation (ft)	Adjusted Elevation (ft)	Lower 'h' (ft)	Upper 'h' (ft)	Tributary Height (ft)	Tributary Width (ft)	$p_w$ (psf)	$p_L$ (psf)	Story Shear (k)
Ground	1117	0	0	7	7	73	14.5	8.4	11.7
1	1131	14	7	24	17	73	15.6	8.4	29.8
2	1151	34	24	39	15	73	16.8	8.4	27.6
3	1161	44	39	49	10	73	17.4	8.4	18.8
4	1171	54	49	59	10	73	17.9	8.4	19.2
5	1181	64	59	69	10	73	18.3	8.4	19.5
6	1191	74	69	79	10	73	18.8	8.4	19.9
7	1201	84	79	89	10	73	19.2	8.4	20.1
8	1211	94	89	99	10	73	19.4	8.4	20.3
9	1221	104	99	109	10	73	20.0	8.4	20.7
10	1231	114	109	119	10	73	20.0	8.4	20.7
11	1241	124	119	131	12	73	20.6	8.4	25.4
Roof	1255	138	131	138	7	73	20.6	8.4	14.8

E-W Base Shear = 269 kips

**North-South Story Shears**

Story	Actual Elevation (ft)	Adjusted Elevation (ft)	Lower 'h' (ft)	Upper 'h' (ft)	Tributary Height (ft)	Tributary Width (ft)	$p_w$ (psf)	$p_L$ (psf)	Story Shear (k)
Ground	1117	0	0	7	7	292	14.5	14.52	59.3
1	1131	14	7	24	17	292	15.6	14.52	149.5
2	1151	34	24	39	15	292	16.8	14.52	137.2
3	1161	44	39	49	10	292	17.4	14.52	93.2
4	1171	54	49	59	10	292	17.9	14.52	94.7
5	1181	64	59	69	10	292	18.3	14.52	95.8
6	1191	74	69	79	10	292	18.8	14.52	97.3
7	1201	84	79	89	10	292	19.2	14.52	98.5
8	1211	94	89	99	10	292	19.4	14.52	99.0
9	1221	104	99	109	10	292	20.0	14.52	100.8
10	1231	114	109	119	10	292	20.0	14.52	100.8
11	1241	124	119	131	12	292	20.6	14.52	123.1
Roof	1255	138	131	138	7	292	20.6	14.52	71.8

N-S Base Shear = 1321 kips



### STEEL FRAMING

#### STORY SHEARS AND BASE SHEAR CALCULATIONS:

##### North-South Story Shears

Story	Actual Elevation (ft)	Adjusted Elevation (ft)	Lower 'h' (ft)	Upper 'h' (ft)	Tributary Height (ft)	Tributary Width (ft)	$p_w$ (psf)	$p_L$ (psf)	Story Shear (k)
Ground	1117	0	0	7	7	292	12.9	14.7	56.4
1	1131	14	7	24	17	292	12.9	14.7	137.0
2	1151	34	24	39.5	15.5	292	14.9	14.7	134.0
3	1162	45	39.5	50.5	11	292	16.2	14.7	99.3
4	1173	56	50.5	61.5	11	292	16.9	14.7	101.5
5	1184	67	61.5	72.5	11	292	17.7	14.7	104.1
6	1195	78	72.5	83.5	11	292	18.3	14.7	106.0
7	1206	89	83.5	94.5	11	292	18.8	14.7	107.6
8	1217	100	94.5	105.5	11	292	19.1	14.7	108.6
9	1228	111	105.5	116.5	11	292	19.5	14.7	109.9
10	1239	122	116.5	127.5	11	292	19.9	14.7	111.1
11	1250	133	127.5	139	11.5	292	20.3	14.7	117.5
Roof	1262	145	139	145	6	292	20.9	14.7	62.4

E-W Base Shear = 1355 kips

##### East-West Story Shears

Story	Actual Elevation (ft)	Adjusted Elevation (ft)	Lower 'h' (ft)	Upper 'h' (ft)	Tributary Height (ft)	Tributary Width (ft)	$p_w$ (psf)	$p_L$ (psf)	Story Shear (k)
Ground	1117	0	0	7	7	73	12.9	8.5	10.9
1	1131	14	7	24	17	73	12.9	8.5	26.6
2	1151	34	24	39.5	15.5	73	14.9	8.5	26.5
3	1162	45	39.5	50.5	11	73	16.2	8.5	19.8
4	1173	56	50.5	61.5	11	73	16.9	8.5	20.4
5	1184	67	61.5	72.5	11	73	17.7	8.5	21.0
6	1195	78	72.5	83.5	11	73	18.3	8.5	21.5
7	1206	89	83.5	94.5	11	73	18.8	8.5	21.9
8	1217	100	94.5	105.5	11	73	19.1	8.5	22.2
9	1228	111	105.5	116.5	11	73	19.5	8.5	22.5
10	1239	122	116.5	127.5	11	73	19.9	8.5	22.8
11	1250	133	127.5	139	11.5	73	20.3	8.5	24.2
Roof	1262	145	139	145	6	73	20.9	8.5	12.9

N-S Base Shear = 273 kips