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Desgin Wind Pressure, p, Equation 30.6-1 (ASCE 7-10).

System Type	Structure Type	Equation
Components and Cladding Envelope Procedure	Buildings with h > 60 ft	*p* : q·(GCp) - qi·(GCpi) q : external velocity pressure qi : internal velocity pressure Gcp : Figure 30.6-1 GCpi : Table 26.11-1

Velocity Pressure Calculations:

Velocity pressure is calculated in accordance with section 30.3.

qz = Velocity pressure @ height (z)

qz = Constant · Kz · Kzt · Kd · V ² (Eq 30.3-1)

Where : Constant	=	Numerical Constant	(Section C27.3.2)
	=	½ · [(Air density lb/ cu ft) / (32.2 ft/s²)] · [(mi/h)(5280 ft/mi) · (1 hr/3600 s)] ²	
	=	0.00256	
Mean Sea Level	=	0.00 ft	
Air Density @MSL	=	0.0765 lb/cu ft	(Table C27.3-2)
Occupancy Category	=	II	(Table 1.5-1)
Exposure Category	=	C	(Section 26.7.3)
α	=	9.50	(Table 26.9-1)
Zg	=	900.00 ft	(Table 26.9-1)
Basic Wind Speed	=	115.00 mph	(Figure 26.5-1 A-C)
Mean Roof Height	=	65.00 ft	
Kh	=	Velocity pressure coefficient @ height h	
	=	2.01·(Z/Zg) ^ (2/α) for 15 ft <= Z <= Zg	(Table 30.3-1)
	=	2.01 · (15/Zg) ^ (2/α) for Z < 15 ft	
	=	1.16	
Kz at highest opening	=	z = highest opening affecting pressure	
	=	1.12	
Kzt	=	Topographic factor	(Figure 26.8-1)
	=	(1 + K1 · K2 · K3) ²	
Topography	=	None	
Kzt @h	=	1.00	
Kd	=	Wind directionality factor	(Table 26.6-1)
	=	0.85	
qh	=	33.26 (psf)	

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Internal Pressure Coefficient, GCpi, Table 26.11-1

Enclosure Classification	GCpi+	GCPi-	Aog (sq. ft.)	Vi (cu. ft.)	Ri	GCpi+	GCPi-
Partially enclosed buildings	0.55	-0.55	60	5,000,000	0.73	0.40	-0.40

External Pressure Coefficient, GCp, Figure 30.6-1. and Figure 30.4-2B

Zone	Area (sq. ft.)	Angle (deg)	GCp+	GCp-
1	10.00	23.00	0.50	-0.90
2	20.00	23.00	0.44	-1.55
3	30.00	23.00	0.40	-2.31
4	40.00	All	0.84	-0.86
5	50.00	All	0.81	-1.57
1 - Overhang	10.00	23.00		NA
2 - Overhang	20.00	23.00		-2.20
3 - Overhang	30.00	23.00		-3.13

Design Wind Pressure, p. (psf) , Equation 30.6-1 and Equation 30.10-1 for Overhangs.

Negative Wall and Roof Pressures

Zone	q = qh (psf)	qi+ = qz* (psf)	qi- = qh (psf)	GCp-	GCpi+	GCpi-	p+ (psf)	p- (psf)
1	33.26	32.11	33.26	-0.90	0.40	-0.40	-42.86	-16.55
2	33.26	32.11	33.26	-1.55	0.40	-0.40	-64.47	-38.15
3	33.26	32.11	33.26	-2.31	0.40	-0.40	-89.89	-63.58
4	33.26	32.11	33.26	-0.86	0.40	-0.40	-41.43	-15.12
5	33.26	32.11	33.26	-1.57	0.40	-0.40	-65.22	-38.91
1 - Overhang	33.26	33.26	33.26	NA	0.40	-0.40	NA	NA
2 - Overhang	33.26	33.26	33.26	-2.20	0.40	-0.40	-86.57	-59.79
3 - Overhang	33.26	33.26	33.26	-3.13	0.40	-0.40	-117.42	-90.64

p+ uses GCpi+ *p- uses GCpi-*

** qz, where z =* *55.00 ft*

Positive Roof Pressures

Zone	q = qh (psf)	qi+ = qz* (psf)	qi- = qh (psf)	GCp+	GCpi+	GCpi-	p+ (psf)	p- (psf)
1	33.26	32.11	33.26	0.50	0.40	-0.40	3.71	30.02
2	33.26	32.11	33.26	0.44	0.40	-0.40	1.70	28.02
3	33.26	32.11	33.26	0.40	0.40	-0.40	0.53	26.85

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Design Wind Pressure of Parapet, p, Equation 30.9-1.

kp = 2.01·(Parapet Height / Zg) ^ (2/α)

kpt = (1 + K1 · K2 · K3) ², where z = parapet height in the k3 multiplier

qp = Constant · Kp · Kpt ·Kd · V ²

p = qp (GCp - GCpi)

Parapet Elevation = 62.00 ft

Load Case A - windward parapet (Figure 30.9-1)

Zone	GCp	kp	kpt	qp (psf)	GCpi+	GCpi-	p+ (psf)	p- (psf)
p1 - Outside Face	0.84	1.14	1.00	32.93	0.00	0.00	27.51	27.51
p1 - Outside Face, Corner	0.81	1.14	1.00	32.93	0.00	0.00	26.83	26.83
p2 - Inside Face	-1.55	1.14	1.00	32.93	0.00	0.00	-51.03	-51.03
p2 - Inside Face, Corner	-2.31	1.14	1.00	32.93	0.00	0.00	-76.20	-76.20

p+ uses GCpi+ *p- uses GCpi-*

Load Case B - leeward parapet (Figure 30.9-1)

Zone	GCp	kp	kpt	qp (psf)	GCpi+	GCpi-	p+ (psf)	p- (psf)
p4 - Outside Face	-0.86	1.14	1.00	32.93	0.00	0.00	-28.22	-28.22
p2 - Outside Face, Corner	-1.57	1.14	1.00	32.93	0.00	0.00	-51.78	-51.78
p3 - Inside Face	0.84	1.14	1.00	32.93	0.00	0.00	27.51	27.51
p3 - Inside Face, Corner	0.81	1.14	1.00	32.93	0.00	0.00	26.83	26.83

p+ uses GCpi+ *p- uses GCpi-*

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Design Windward Wall Wind Pressures, p, Equation 30.6-1 for Zone 4.

p+ uses GCpi+ *p- uses GCpi-* ** qz, where z = 55.00 ft*

Heights (feet)	Kz	Kzt	kd	q = qz (psf)	qi+ = qz* (psf)	qi- = qh (psf)	GCp	GCpi+	GCpi-	p+ (psf)	p- (psf)
60.01 - 65.00	1.16	1.00	0.85	33.26	32.11	33.26	0.84	0.40	-0.40	14.86	41.18
50.01 - 60.00	1.14	1.00	0.85	32.71	32.11	33.26	0.84	0.40	-0.40	14.40	40.71
40.01 - 50.00	1.09	1.00	0.85	31.48	32.11	33.26	0.84	0.40	-0.40	13.37	39.68
30.01 - 40.00	1.04	1.00	0.85	30.03	32.11	33.26	0.84	0.40	-0.40	12.16	38.48
25.01 - 30.00	0.98	1.00	0.85	28.27	32.11	33.26	0.84	0.40	-0.40	10.69	37.00
20.01 - 25.00	0.95	1.00	0.85	27.20	32.11	33.26	0.84	0.40	-0.40	9.80	36.11
15.01 - 20.00	0.90	1.00	0.85	25.95	32.11	33.26	0.84	0.40	-0.40	8.76	35.07
0.00 - 15.00	0.85	1.00	0.85	24.43	32.11	33.26	0.84	0.40	-0.40	7.48	33.80

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Design Windward Wall Wind Pressures, p, Equation 30.6-1 for Zone 5.

p+ uses GCpi+ *p- uses GCpi-* ** qz, where z = 55.00 ft*

Heights (feet)	Kz	Kzt	kd	q = qz (psf)	qi+ = qz* (psf)	qi- = qh (psf)	GCp	GCpi+	GCpi-	p+ (psf)	p- (psf)
60.01 - 65.00	1.16	1.00	0.85	33.26	32.11	33.26	0.81	0.40	-0.40	14.17	40.48
50.01 - 60.00	1.14	1.00	0.85	32.71	32.11	33.26	0.81	0.40	-0.40	13.72	40.03
40.01 - 50.00	1.09	1.00	0.85	31.48	32.11	33.26	0.81	0.40	-0.40	12.72	39.03
30.01 - 40.00	1.04	1.00	0.85	30.03	32.11	33.26	0.81	0.40	-0.40	11.54	37.85
25.01 - 30.00	0.98	1.00	0.85	28.27	32.11	33.26	0.81	0.40	-0.40	10.10	36.41
20.01 - 25.00	0.95	1.00	0.85	27.20	32.11	33.26	0.81	0.40	-0.40	9.23	35.55
15.01 - 20.00	0.90	1.00	0.85	25.95	32.11	33.26	0.81	0.40	-0.40	8.22	34.53
0.00 - 15.00	0.85	1.00	0.85	24.43	32.11	33.26	0.81	0.40	-0.40	6.98	33.29