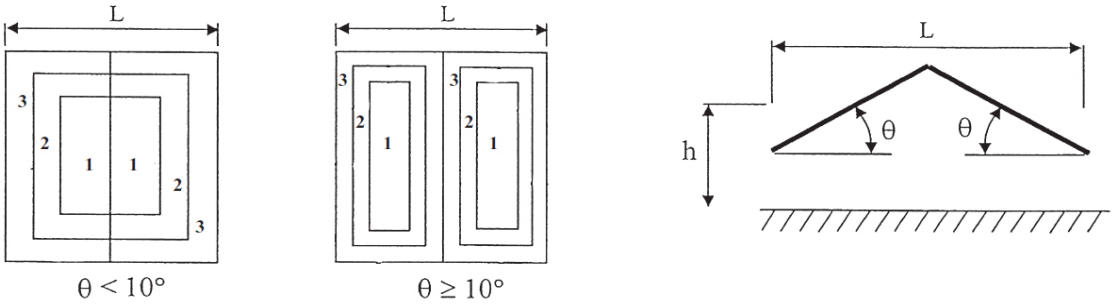
WIND (C&C)

Wind Analysis Method			Part 5: Open Buildings	
Basic Wind Speed (ultimate)		135.00	MPH	
Topography Factor	Kzt =	1.00		ASCE 7-10 Fig. 26.8-1
Directionality Factor	Kd =	0.85		ASCE 7-10 Fig. 26.6-1
Gust Effect Factor	G =	0.85		ASCE 7-10 Sec. 26.9.1
Roof Pitch		4.00	:12	18.43 DEG
Roof Eve Height		8.000	FT	
Peak Roof Height		11.500	FT	α = 9.5
Mean Roof Height		9.750	FT	zg = 900
Terrain Exp. Category		C		

Velocity Pressure $q_z = .00256 K_z K_{zt} K_d V^2$

Height (ft)			Kz	qz	
h =	9.75	FT	0.849	**33.66**	$p = q_h G C_N$



ASCE 7-10 Fig. 30.8-2

Width of Zones 2,3

smaller of:	0.1	x	21.00	=	2.10	ft
	0.4	x	9.75	=	3.90	ft
not less than:	0.04	x	21.00	=	0.84	ft
				or	3 ft	**(controls)** a = 3 ft

a^2 = 9.00 ft^2

$4.0a^2$ = 36.00 ft^2

Wind Blockage Note: Clear wind flow denotes relatively unobstructed wind flow with blockage less than or equal to 50%. Obstructed wind flow denotes objects below roof inhibiting wind flow (>50% blockage).

Roof Components

Component	Span (ft.)	Width (ft.)	Trib. Area	Span^2/3	Eff. Area	
Truss/Rafter	21	2	42.00	147.00	147.00	ft^2
Panel	2	2	4.00	1.33	4.00	ft^2
A ≤ a^2	-	-	-	-	9.00	ft^2
a < A ≤ 4.0a^2	-	-	-	-	~22.5	ft^2
A > 4.0a^2	-	-	-	-	36.00	ft^2

Roof Coeficients (C_N) taken from ASCE 7-10 Fig. 30.8-2

Roof Coefficients - Clear Wind Flow

Component	Eff. Area	Zone 1 Pos	Zone1 Neg	Zone 2 Pos	Zone 2 Neg	Zone 3 Pos	Zone 3 Neg
Truss/Rafter	147.00	1.15	-1.05	1.15	-1.05	1.15	-1.05
Panel	4.00	1.15	-1.05	1.77	-1.63	2.29	-2.11
A ≤ a^2	9.00	1.15	-1.05	1.77	-1.63	2.29	-2.11
a < A ≤ 4.0a^2	~22.5	1.15	-1.05	1.77	-1.63	1.77	-1.63
A > 4.0a^2	36.00	1.15	-1.05	1.15	-1.05	1.15	-1.05

Roof Design Pressures - Clear Wind Flow (psf) $p = q_h GC_N$

Component	Eff. Area	Zone 1 Pos	Zone1 Neg	Zone 2 Pos	Zone 2 Neg	Zone 3 Pos	Zone 3 Neg
Truss/Rafter	147.00	**32.79**	**-30.17**	**32.79**	**-30.17**	**32.79**	**-30.17**
Panel	4.00	**32.79**	**-30.17**	**50.61**	**-46.68**	**65.57**	**-60.33**
A ≤ a^2	9.00	32.79	-30.17	50.61	-46.68	65.57	-60.33
a < A ≤ 4.0a^2	~22.5	32.79	-30.17	50.61	-46.68	50.61	-46.68
A > 4.0a^2	36.00	32.79	-30.17	32.79	-30.17	32.79	-30.17

Roof Coefficients - Obstructed Wind Flow

Component	Eff. Area	Zone 1 Pos	Zone1 Neg	Zone 2 Pos	Zone 2 Neg	Zone 3 Pos	Zone 3 Neg
Truss/Rafter	147.00	0.50	-1.51	0.50	-1.51	0.50	-1.51
Panel	4.00	0.50	-1.51	0.80	-2.26	1.00	-3.02
A ≤ a^2	9.00	0.50	-1.51	0.80	-2.26	1.00	-3.02
a < A ≤ 4.0a^2	~22.5	0.50	-1.51	0.80	-2.26	0.80	-2.26
A > 4.0a^2	36.00	0.50	-1.51	0.50	-1.51	0.50	-1.51

Roof Design Pressures - Obstructed Wind Flow (psf) $p = q_h GC_N$

Component	Eff. Area	Zone 1 Pos	Zone1 Neg	Zone 2 Pos	Zone 2 Neg	Zone 3 Pos	Zone 3 Neg
Truss/Rafter	147.00	**14.31**	**-43.16**	**14.31**	**-43.16**	**14.31**	**-43.16**
Panel	4.00	**14.31**	**-43.16**	**22.89**	**-64.74**	**28.62**	**-86.33**
A ≤ a^2	9.00	14.31	-43.16	22.89	-64.74	28.62	-86.33
a < A ≤ 4.0a^2	~22.5	14.31	-43.16	22.89	-64.74	22.89	-64.74
A > 4.0a^2	36.00	14.31	-43.16	14.31	-43.16	14.31	-43.16

Note: Pressures are limit state design pressures for strength design. Multiple by 0.6 for ASD.

Min. Pressure: The design wind pressure for C&C shall not be less than 16 psf acting in either direction normal to the surface.