

WIND (C&C)

Wind Analysis Method

Part 1: Low Rise Buildings

Basic Wind Speed (ultimate)

155.00 MPH

Topography Factor

K_{zt} = 1.00 ASCE 7-10 Fig. 26.8-1

Directionality Factor

K_d = 0.85 ASCE 7-10 Fig. 26.6-1

Internal Pressure Coefficients

(GC_{pi}) = 0.18 -0.18 ASCE 7-10 Table 26.11-1

Roof Pitch

5.00 :12 22.62 DEG

Roof Eave Height

12.500 FT

Peak Roof Height

16.330 FT

α = 9.5

Mean Roof Height

14.415 FT

z_g = 900

Terrain Exp. Category

C

Velocity Pressure

$$q_z = 0.00256 K_z K_{zt} K_d V^2$$

Height (ft)

K_z

q_z

h = 14.42 FT

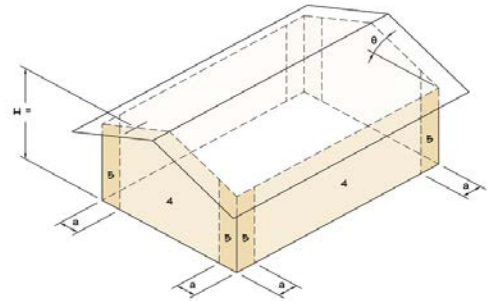
0.849

44.38

Wall Components

$$p = q h (GC_p - GC_{pi})$$

Component	Span Length (ft.)	Width (ft.)	Trib. Area	Eff. Area
Stud	11	1.33	14.63	40.33
Panel	8	4	32.00	32.00
A ≤ 10 ft ²	-	-	-	10.00
A = 20 ft ²	-	-	-	20.00
A = 50 ft ²	-	-	-	50.00
A = 100 ft ²	-	-	-	100.00
A = 200 ft ²	-	-	-	200.00
A ≥ 500 ft ²	-	-	-	500.00



Wall Coefficients taken from ASCE 7-10 Fig. 30.4-1

Wall Coefficients

Component	Eff. Area	Zone 4 Pos	Zone 4 Neg	Zone 5 Pos	Zone 5 Neg
Stud	40.33	0.89	-0.99	0.89	-1.19
Panel	32.00	0.91	-1.01	0.91	-1.22
A ≤ 10 ft ²	10.00	1.00	-1.10	1.00	-1.40
A = 20 ft ²	20.00	0.95	-1.05	0.95	-1.29
A = 50 ft ²	50.00	0.88	-0.98	0.88	-1.15
A = 100 ft ²	100.00	0.82	-0.92	0.82	-1.05
A = 200 ft ²	200.00	0.77	-0.87	0.77	-0.94
A ≥ 500 ft ²	500.00	0.70	-0.80	0.70	-0.80

Wall Design Pressures

(psf)

Component	Eff. Area	Zone 4 Pos	Zone 4 Neg	Zone 5 Pos	Zone 5 Neg
Stud	40.33	47.62	-52.06	47.62	-60.62
Panel	32.00	48.41	-52.85	48.41	-62.20
A ≤ 10 ft ²	10.00	52.37	-56.80	52.37	-70.12
A = 20 ft ²	20.00	50.01	-54.44	50.01	-65.40
A = 50 ft ²	50.00	46.89	-51.33	46.89	-59.16
A = 100 ft ²	100.00	44.53	-48.97	44.53	-54.44
A = 200 ft ²	200.00	42.17	-46.61	42.17	-49.72
A ≥ 500 ft ²	500.00	39.05	-43.49	39.05	-43.49

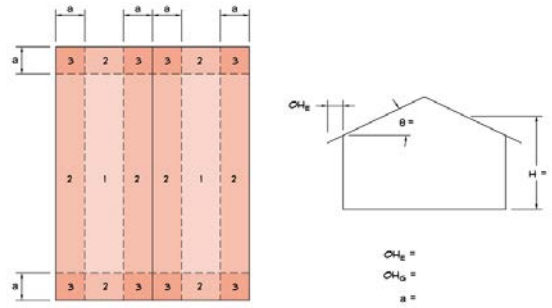
Note: Pressures are limit state design pressures for strength design. Multiple by 0.6 for ASD.

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

$$p = qh(GC_p - GC_{pi})$$

Roof Components

Component	Span Length (ft.)	Width (ft.)	Trib. Area	Eff. Area
Truss/Rafter	16	2	32.00	85.33
Panel	8	4	32.00	32.00
A ≤ 10 ft ²	-	-	-	10.00
A = 20 ft ²	-	-	-	20.00
A = 50 ft ²	-	-	-	50.00
A ≥ 100 ft ²	-	-	-	100.00



Roof Coefficients taken from ASCE 7-10 Fig. 30.4-2B and Fig. 30.4-2C

Roof Coefficients

Component	Eff. Area	Zone 1 Pos	Zone1 Neg	Zone 2 Pos	Zone 2 Neg	Zone 3 Pos	Zone 3 Neg
Truss/Rafter	85.33	0.31	-0.81	0.31	-1.23	0.31	-2.04
Panel	32.00	0.40	-0.85	0.40	-1.45	0.40	-2.30
A ≤ 10 ft ²	10.00	0.50	-0.90	0.50	-1.70	0.50	-2.60
A = 20 ft ²	20.00	0.44	-0.87	0.44	-1.55	0.44	-2.42
A = 50 ft ²	50.00	0.36	-0.83	0.36	-1.35	0.36	-2.18
A ≥ 100 ft ²	100.00	0.30	-0.80	0.30	-1.20	0.30	-2.00

Roof Design Pressures

(psf)

Component	Eff. Area	Zone 1 Pos	Zone1 Neg	Zone 2 Pos	Zone 2 Neg	Zone 3 Pos	Zone 3 Neg
Truss/Rafter	85.33	21.91	-43.80	21.91	-62.77	21.91	-98.58
Panel	32.00	25.69	-45.69	25.69	-72.22	25.69	-109.92
A ≤ 10 ft ²	10.00	30.18	-47.93	30.18	-83.43	30.18	-123.37
A = 20 ft ²	20.00	27.51	-46.59	27.51	-76.75	27.51	-115.36
A = 50 ft ²	50.00	23.97	-44.83	23.97	-67.92	23.97	-104.76
A = 100 ft ²	100.00	21.30	-43.49	21.30	-61.24	21.30	-96.74

Roof Coefficients

(Overhang)

Component	Eff. Area	Zone 1 Pos	Zone1 Neg	Zone 2 Pos	Zone 2 Neg	Zone 3 Pos	Zone 3 Neg
Truss/Rafter	85.33	0.31	-0.81	0.31	-2.20	0.31	-2.58
Panel	32.00	0.40	-0.85	0.40	-2.20	0.40	-3.09
A ≤ 10 ft ²	10.00	0.50	-0.90	0.50	-2.20	0.50	-3.70
A = 20 ft ²	20.00	0.44	-0.87	0.44	-2.20	0.44	-3.34
A = 50 ft ²	50.00	0.36	-0.83	0.36	-2.20	0.36	-2.86
A ≥ 100 ft ²	100.00	0.30	-0.80	0.30	-2.20	0.30	-2.50

Roof Design Pressures

(Overhang)

(psf)

Component	Eff. Area	Zone 1 Pos	Zone1 Neg	Zone 2 Pos	Zone 2 Neg	Zone 3 Pos	Zone 3 Neg
Truss/Rafter	85.33	21.91	-43.80	21.91	-105.62	21.91	-122.60
Panel	32.00	25.69	-45.69	25.69	-105.62	25.69	-145.29
A ≤ 10 ft ²	10.00	30.18	-47.93	30.18	-105.62	30.18	-172.19
A = 20 ft ²	20.00	27.51	-46.59	27.51	-105.62	27.51	-156.16
A = 50 ft ²	50.00	23.97	-44.83	23.97	-105.62	23.97	-134.96
A = 100 ft ²	100.00	21.30	-43.49	21.30	-105.62	21.30	-118.93

Width of Zones 2,3 and 5

smaller of:	0.1 x	16.00 =	1.60 ft
	0.4 x	14.42 =	5.77 ft
not less than:	0.04 x	16.00 =	0.64 ft
		or	3 ft
			(controls) a = 3 ft

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.