

MWFRS**Wind Speed: 110 mph****Exposure : B****Site Elevation: 368'****Surface Roughnes: B****Velocity Pressure Equation :** **$q_z = 0.00256 K_z K_{zt} K_d K_e V^2$ (lb/ft²)****where: $K_{zt} = 1.0$, $K_d = 0.85$, $K_e = 1.0$, $K_z = 0.57$** **$q_z = 0.00256 \times 0.57 \times 1.0 \times 0.85 \times 1.0 \times 110^2$ (lb/ft²)** **$q_z = 15$ lb/ft²****Width = 14 feet** **Slope = 24°****Length = 22.5 feet** **Gust (G) = 0.85****L Least = 21 feet****h = 10 feet** **qh = 15 psf (MWFRS)**

SLOPE	Load Case	Wind Direction: 0 Degree				Wind Direction: 180 Degree			
		Clear		Obstruct		Clear		Obstruct	
		C _{nw}	C _{ni}	C _{nw}	C _{ni}	C _{nw}	C _{ni}	C _{nw}	C _{ni}
22.5°	A	-1.5	-1.6	-1.5	-1.7	1.7	1.8	0.5	-1
	B	-2.4	-0.3	-2.3	-0.9	2.2	0.7	1.3	0
30°	A	-1.8	-1.8	-1.5	-1.8	2.1	2.1	0.6	-1
	B	-2.5	-0.5	-2.3	-1.1	2.6	1	1.6	0.1
24°	A	-1.56	-1.64	-1.50	-1.72	1.78	1.86	0.52	-1.00
	B	-2.42	-0.34	-2.30	-0.94	2.28	0.76	1.36	0.02

P= qh GC_n**EQ. 27.3.-2****G = 0.85****qz= qh (Section 26.10.2)**

ANGLE	Load Case	PRESSURE (psf)							
		Wind Direction: 0 Degree				Wind Direction: 180 Degree			
		Clear		Obstruct		Clear		Obstruct	
		C _{nw}	C _{ni}	C _{nw}	C _{ni}	C _{nw}	C _{ni}	C _{nw}	C _{ni}
24°	A	-19.92	-20.93	-19.13	-21.94	22.73	23.74	6.64	-12.75
	B	-30.86	-4.35	-29.33	-12.00	29.11	9.72	17.37	0.26

COMPONENT & CLADDING

$$P = qh GC_n$$

Horizontal Wind Direction (L) = 12.79'

Mean Roof Height (h) = 10'

10% of (L) = 1.28'

0.4h = 4'

4% of (L) = 0.51'

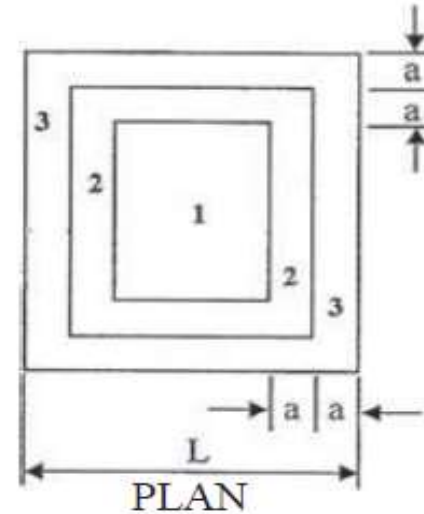
Minimum 3'

Therefore a = 3'

$a^2 = 9.00$ sq feet

$4.0a^2 = 36.00$ sq feet

Slope = 24°
Gust (G) = 0.85
qh = psf C&C
qh = 15 psf (MWFRS)



Design Wind Pressure : $P = qhGC_n$ Equation: 30.7-1)

NET PRESSURE COEFFICIENTS, C_n

ANGLE	EFFECTIVE WIND AREA	CLEAR WIND FLOW						OBSTRUCTED WIND FLOW					
	AREA	ZONE 3		ZONE 2		ZONE 1		ZONE 3		ZONE 2		ZONE 1	
15°	$\leq a^2$	3.6	-3.8	2.7	-2.9	1.8	-1.9	2.4	-4.2	1.8	-3.2	1.2	-2.1
	$> a^2, \leq 4.0a^2$	2.7	-2.9	2.7	-2.9	1.8	-1.9	1.8	-3.2	1.8	-3.2	1.2	-2.1
	$> 4.0a^2$	1.8	-1.9	1.8	-1.9	1.8	-1.9	1.2	-2.1	1.2	-2.1	1.2	-2.1
30°	$\leq a^2$	5.2	-5	3.9	-3.8	2.6	-2.5	3.2	-4.6	2.4	-3.5	1.6	-2.3
	$> a^2, \leq 4.0a^2$	3.9	-3.8	3.9	-3.8	2.6	-2.5	2.4	-3.5	2.4	-3.5	1.6	-2.3
	$> 4.0a^2$	2.6	-2.5	2.6	-2.5	2.6	-2.5	1.6	-2.3	1.6	-2.3	1.6	-2.3
24°	$\leq a^2$	4.56	-4.52	3.42	-3.44	2.28	-2.26	2.88	-4.44	2.16	-3.38	1.44	-2.22
	$> a^2, \leq 4.0a^2$	3.42	-3.44	3.42	-3.44	2.28	-2.26	2.16	-3.38	2.16	-3.38	1.44	-2.22
	$> 4.0a^2$	2.28	-2.26	2.28	-2.26	2.28	-2.26	1.44	-2.22	1.44	-2.22	1.44	-2.22

$$P = qhGC_n = 15 \times 0.85 \times C_n$$

		WIND PRESSURE											
EFFECTIVE WIND AREA		CLEAR WIND FLOW						OBSTRUCTED WIND FLOW					
ANGLE	AREA	ZONE 3		ZONE 2		ZONE 1		ZONE 3		ZONE 2		ZONE 1	
24°	$\leq a^2$	58.14	-57.63	43.61	-43.86	29.07	-28.82	36.72	-56.61	27.54	-43.10	18.36	-28.31
	$> a^2, \leq 4.0a^2$	43.61	-43.86	43.61	-43.86	29.07	-28.82	27.54	-43.10	27.54	-43.10	18.36	-28.31
	$> 4.0a^2$	29.07	-28.82	29.07	-28.82	29.07	-28.82	18.36	-28.31	18.36	-28.31	18.36	-28.31