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Job Name: Memorial Springs  
Job No.: 15-1185 Sheet No.:  
By: MRJ Date: Nov-15

ASCE 7-10  
Exposure D

## Components & Cladding ( V = 115 mph; Exposure D; h = 12.4 ft; Angle = 15 deg )

Reference: ASCE 7-10 (Section 30.8.1)

$$P = q_h G C_N$$

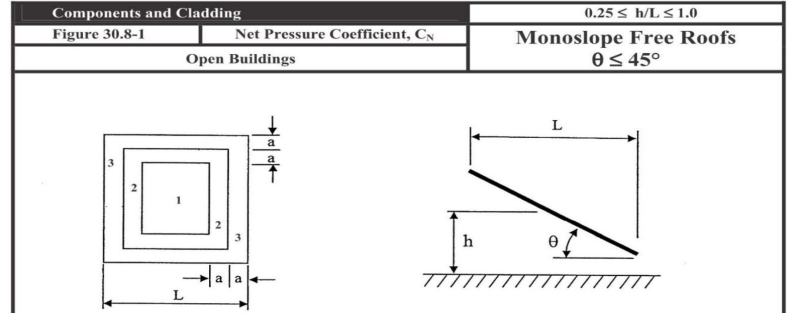
Eqn. (30.8-1)

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

Eqn. (30.3-1)

Velocity pressure exposure coefficient  $K_z = 1.03$   
Topographic factor  $K_{zt} = 1$   
Wind directionality factor  $K_d = 0.85$   
Basic wind speed  $V = 115$  mph

Velocity pressure  $q_h = 29.65$  psf  
Gust effect factor  $G = 0.85$   
Net pressure coefficient  $C_N = \text{From Fig. 30.8-1}$



Notes:

1.  $C_N$  denotes net pressures (contributions from top and bottom surfaces).
2. 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).
3. For values of  $\theta$  other than those shown, linear interpolation is permitted.
4. Plus and minus signs signify pressures acting towards and away from the top roof surface, respectively.
5. Components and cladding elements shall be designed for positive and negative pressure coefficients shown.
6. Notation:
  - a : 10% of least horizontal dimension or 0.4h, whichever is smaller but not less than 4% of least horizontal dimension or 3 ft. (0.9 m)
  - h : mean roof height, ft. (m)
  - L : horizontal dimension of building, measured in along wind direction, ft. (m)
  - $\theta$  : angle of plane of roof from horizontal, degrees

Effective wind area varies with each element being designed.  
Effective wind area =  $EA = L (L/3)$

Width of pressure coefficient zone:  $a = 3.0$  ft  
 $a^2 = 9.0$  ft<sup>2</sup>  
 $4a^2 = 36.0$  ft<sup>2</sup>

Roof	$C_N$ based on Eff. Area (EA)	Clear Wind Flow						Obstructed Wind Flow					
$\theta$ (degree)	Design Pressure	Zone 3		Zone 2		Zone 1		Zone 3		Zone 2		Zone 1	
15	$EA < a^2$	3.6	-3.8	2.7	-2.9	1.8	-1.9	2.4	-4.2	1.8	-3.2	1.2	-2.1
		90.7 psf	-95.8 psf	68. psf	-73.1 psf	45.4 psf	-47.9 psf	60.5 psf	-105.8 psf	45.4 psf	-80.6 psf	30.2 psf	-52.9 psf
	$a^2 \leq EA < 4a^2$	2.7	-2.9	2.7	-2.9	1.8	-1.9	1.8	-3.2	1.8	-3.2	1.2	-2.1
		68. psf	-73.1 psf	68. psf	-73.1 psf	45.4 psf	-47.9 psf	45.4 psf	-80.6 psf	45.4 psf	-80.6 psf	30.2 psf	-52.9 psf
	$EA \geq 4a^2$	1.8	-1.9	1.8	-1.9	1.8	-1.9	1.2	-2.1	1.2	-2.1	1.2	-2.1
		45.4 psf	-47.9 psf	45.4 psf	-47.9 psf	45.4 psf	-47.9 psf	30.2 psf	-52.9 psf	30.2 psf	-52.9 psf	30.2 psf	-52.9 psf
Roof	$C_N$ based on Eff. Area (EA)	Clear Wind Flow						Obstructed Wind Flow					
$\theta$ (degree)	Design Pressure	Zone 3		Zone 2		Zone 1		Zone 3		Zone 2		Zone 1	
30.0	$EA < a^2$	5.2	-5	3.9	-3.8	2.6	-2.5	3.2	-4.6	2.4	-3.5	1.6	-2.3
		131. psf	-126. psf	98.3 psf	-95.8 psf	65.5 psf	-63. psf	80.6 psf	-115.9 psf	60.5 psf	-88.2 psf	40.3 psf	-58. psf
	$a^2 \leq EA < 4a^2$	3.9	-3.8	3.9	-3.8	2.6	-2.5	2.4	-3.5	2.4	-3.5	1.6	-2.3
		98.3 psf	-95.8 psf	98.3 psf	-95.8 psf	65.5 psf	-63. psf	60.5 psf	-88.2 psf	60.5 psf	-88.2 psf	40.3 psf	-58. psf
	$EA \geq 4a^2$	2.6	-2.5	2.6	-2.5	2.6	-2.5	1.6	-2.3	1.6	-2.3	1.6	-2.3
		65.5 psf	-63. psf	65.5 psf	-63. psf	65.5 psf	-63. psf	40.3 psf	-58. psf	40.3 psf	-58. psf	40.3 psf	-58. psf
Roof	$C_N$ based on Eff. Area (EA)	Clear Wind Flow						Obstructed Wind Flow					
$\theta$ (degree)	Design Pressure	Zone 3		Zone 2		Zone 1		Zone 3		Zone 2		Zone 1	
15.00	$EA < a^2$	3.6	-3.8	2.7	-2.9	1.8	-1.9	2.4	-4.2	1.8	-3.2	1.2	-2.1
		90.7 psf	-95.8 psf	68. psf	-73.1 psf	45.4 psf	-47.9 psf	60.5 psf	-105.8 psf	45.4 psf	-80.6 psf	30.2 psf	-52.9 psf
	$a^2 \leq EA < 4a^2$	2.7	-2.9	2.7	-2.9	1.8	-1.9	1.8	-3.2	1.8	-3.2	1.2	-2.1
		68. psf	-73.1 psf	68. psf	-73.1 psf	45.4 psf	-47.9 psf	45.4 psf	-80.6 psf	45.4 psf	-80.6 psf	30.2 psf	-52.9 psf
	$EA \geq 4a^2$	1.8	-1.9	1.8	-1.9	1.8	-1.9	1.2	-2.1	1.2	-2.1	1.2	-2.1
		45.4 psf	-47.9 psf	45.4 psf	-47.9 psf	45.4 psf	-47.9 psf	30.2 psf	-52.9 psf	30.2 psf	-52.9 psf	30.2 psf	-52.9 psf