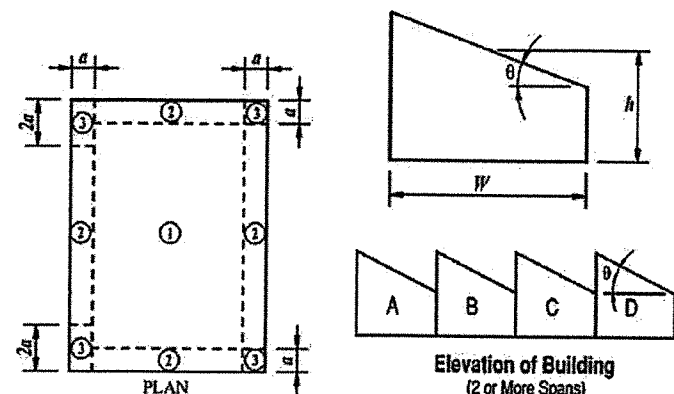


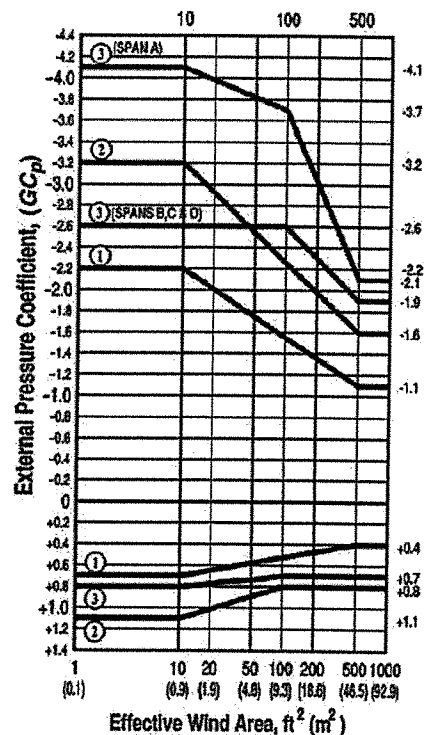
Diagrams



Notation

a = 10% of least horizontal dimension or $0.4h$, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
 h = Mean roof height, ft (m), except that eave height shall be used for $\theta \leq 10^\circ$.
 W = Building module width, ft (m).
 θ = Angle of plane of roof from horizontal, degrees.

External Pressure Coefficients

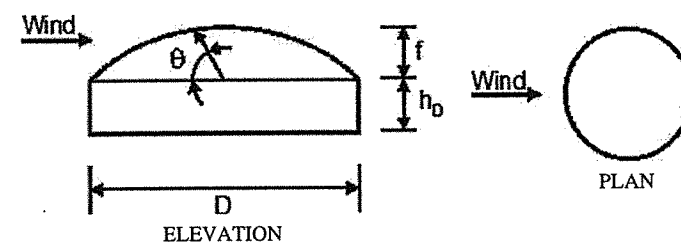


Notes

- Vertical scale denotes (GC_p) to be used with q_h .
- Horizontal scale denotes effective wind area A , ft² (m²).
- Plus and minus signs signify pressures acting toward and away from the surfaces, respectively.
- Each component shall be designed for maximum positive and negative pressures.
- For $\theta \leq 10^\circ$, values of (GC_p) from Figure 30.3-2A shall be used.

Figure 30.3-6. Components and cladding [$h \leq 60$ ft ($h \leq 18.3$ m)]: external pressure coefficients, (GC_p) , for enclosed, partially enclosed, and partially open buildings—sawtooth roofs.

Diagram



Notation

f = Dome rise, ft (m).
 D = Diameter of a circular structure or member, ft (m).
 h_D = Height to base of dome, ft (m).
 θ = Angle of plane of roof from horizontal, degrees.

Coefficients for Domes with a Circular Base

External Pressure	Negative Pressures	Positive Pressures	Positive Pressures
θ , degrees	0-90	0-60	61-90
(GC_p)	-0.9	+0.9	+0.5

Notes

- Values denote (GC_p) to be used with $q(h_D+f)$ where h_D+f is the height at the top of the dome.
- Plus and minus signs signify pressures acting toward and away from the surfaces, respectively.
- Each component shall be designed for the maximum positive and negative pressures.
- Values apply to $0 \leq h_D/D \leq 0.5$, $0.2 \leq f/D \leq 0.5$.
- $\theta = 0$ degrees on dome springline, $\theta = 90$ degrees at dome center top point. f is measured from springline to top.

Figure 30.3-7. Components and cladding (all heights): external pressure coefficients, (GC_p) , for enclosed, partially enclosed, and partially open buildings and structures—domed roofs.

$q_i = q_z$ For positive internal pressure evaluation in partially enclosed buildings where height z is defined as the level of the highest opening in the building that could affect the positive internal pressure. For positive internal pressure evaluation, q_i may conservatively be evaluated at height $h(q_i = q_h)$;

(GC_{pi}) = External pressure coefficients given in

- Figure 30.4-1 for walls and flat roofs,
- Figure 30.3-8 for arched roofs,
- Figure 30.3-7 for domed roofs,
- Note 6 of Figure 30.4-1 for other roof angles and geometries; and
- Figure 30.4-1 for bottom surfaces of elevated buildings.

(GC_{pi}) = Internal pressure coefficient given in Table 26.13-1.

q and q_i shall be evaluated using exposure as defined in Section 26.7.3.

30.4.2.1 Bottom Horizontal Surface of Elevated Buildings Design wind pressures for C&C elements on the bottom flat horizontal surface of elevated buildings shall be determined using the roof pressure coefficients from Figure 30.4-1 with the following modifications:

- The velocity pressure, q , used in Equation 30.4-1 shall be calculated at a height equal to the height above grade of the bottom horizontal surface plus 25% of the height of the elevated building above the horizontal bottom surface, calculated as $[h_B + 0.25(h - h_B)]$. For elevated

buildings with a flat bottom horizontal building surface and situated on a slope, h_B shall be taken as the maximum height between the slope and the bottom of the elevated building.

- Areas of the horizontal surface above partially enclosed spaces and areas extending a distance a_B perpendicular to walls with plan dimension greater than 4 ft (1.2 m), as shown by the shaded regions in Figure 30.4-1A, shall be designed to resist positive pressures equal to the Zone 4 wall pressures obtained using Figure 30.4-1. The value of a_B shall equal $0.4 h_B$ or the width of the wall, whichever is smaller, for determining zone dimensions from Figure 30.4-1A.

The loading convention shall denote downward loading on the bottom surface with negative pressure coefficients and upward loading on the bottom surface with positive pressure coefficients.

EXCEPTION: In buildings with a mean roof height h greater than 60 ft (18.3 m) and less than 90 ft (27.4 m), Figures 30.3-1 through 30.3-6 shall be permitted to be used if the mean roof height h does not exceed least horizontal dimension.

PART 3: OPEN BUILDINGS

User Note: Use Part 3 of Chapter 30 for determining wind pressures for C&C of *open buildings* that have pitched, monoslope, or troughed roofs. These provisions are based on the Directional Procedure with *wind pressures calculated from the specified equation* applicable to each roof surface.