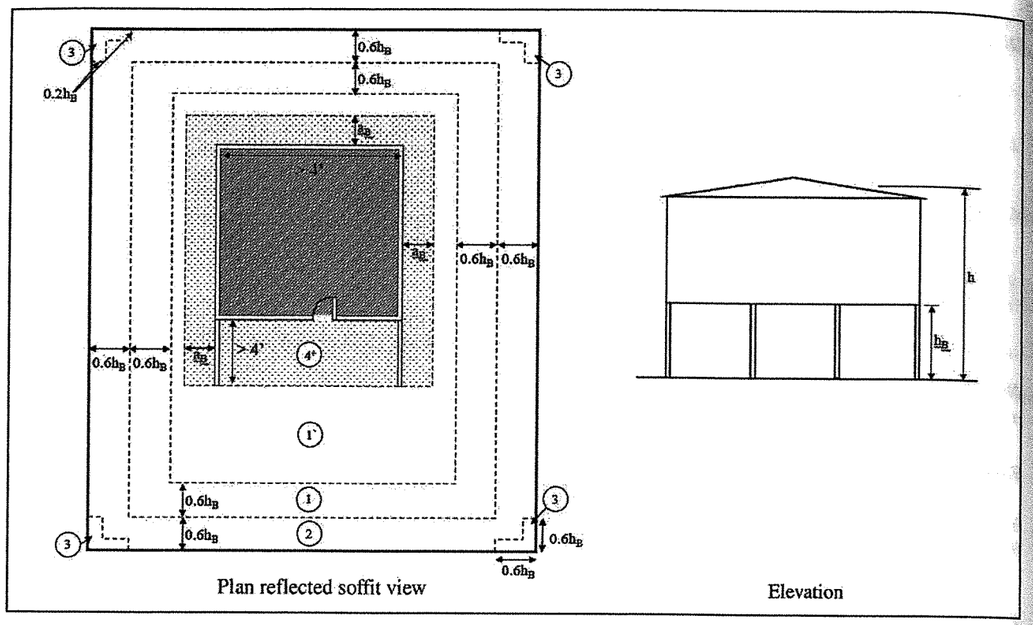


Figure 30.3-1A. Components and cladding [$h \leq 60$ ft (18.3 m)]: external pressure coefficient zones for enclosed, partially enclosed, and partially open elevated buildings with partially enclosed spaces and areas beneath the elevated building—bottom horizontal surface of elevated buildings.

30.4 BUILDING TYPES

The provisions of Section 30.4 are applicable to an enclosed, partially enclosed, or partially open building with a mean roof height [$h > 60$ ft ($h > 18.3$ m)] with a flat roof, pitched roof, gable roof, hip roof, mansard roof, arched roof, or domed roof. The steps required for the determination of wind loads on C&C for these building types are shown in Table 30.4-1.

30.4.1 Conditions For the determination of the design wind pressures on the C&C using the provisions of Section 30.4.2, the conditions indicated on the selected figure(s) shall be applicable to the building under consideration.

30.4.2 Design Wind Pressures Design wind pressures on C&C for all buildings with [$h > 60$ ft ($h < 18.3$ m)] shall be determined from the following equation:

$$p = qK_d(GC_p) - q_iK_d(GC_{pi})(\text{lb/ft}^2) \qquad (30.4\text{-}1)$$

$$p = qK_d(GC_p) - q_iK_d(GC_{pi})(\text{N/m}^2) \qquad (30.4\text{-}1.\text{SI})$$

where

$q = q_z$ For windward walls calculated at height z above the ground;
$q = q_h$ For leeward walls, sidewalls, and roofs evaluated at height h;
K_d = Wind directionality factor, see Section 26.6;
$q_i = q_h$ For windward walls, sidewalls, leeward walls, and roofs of enclosed and partially open buildings and for negative internal pressure evaluation in partially enclosed buildings;

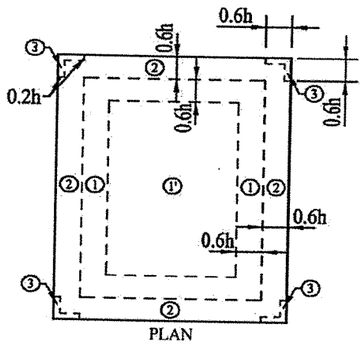
Table 30.4-1. Steps to determine C&C wind loads for enclosed, partially enclosed, or partially open building with $h > 60$ ft ($h > 18.3$ m)].

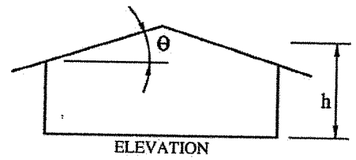
Step 1: Determine risk category; see Table 1.5-1.
Step 2: Determine the basic wind speed, V, for applicable risk category; see Figure 26.5-1.
Step 3: Determine wind load parameters:
- Wind directionality factor, K_d; see Section 26.6 and Table 26.6-1.
- Exposure Category B, C, or D; see Section 26.7.
- Topographic factor.
- K_{zt}; see Section 26.8 and Figure 26.8-1.
- Ground elevation factor, K_e; see Section 26.9 and Table 26.9-1.
- Enclosure classification; see Section 26.12.
- Internal pressure coefficient, GC_{pi}; see Section 26.13 and Table 26.13-1.

Step 4: Determine velocity pressure exposure coefficient, K_z or K_h; see Table 26.10-1.
Step 5: Determine velocity pressure, q_h, Equation (26.10-1).
Step 6: Determine external pressure coefficient (GC_p):
- Walls and flat roofs ($\theta < 10°$); see Figure 30.4-1.
- Gable and hip roofs; see Figure 30.3-2 per Note 6 of Figure 30.4-1.
- Arched roofs; see Figure 30.3-8.
- Domed roofs; see Figure 30.3-7.
- Bottom horizontal surface of elevated buildings; see Section 30.4.2.1.

Step 7: Calculate wind pressure, p, Equation (30.4-1).

Diagrams

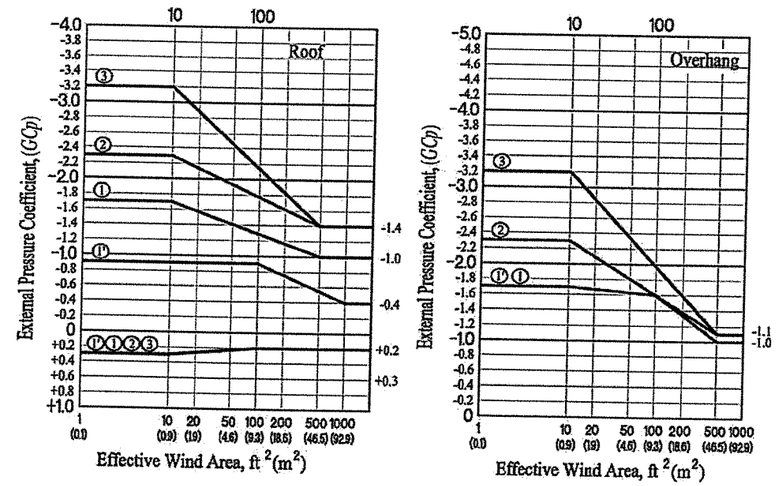




Notation

B = Horizontal dimension of building measured normal to wind direction, ft (m).
h = Eave height shall be used for $\theta = 10°$.
θ = Angle of plane of roof from horizontal, degrees.

External Pressure Coefficients



Notes

1. Vertical scale denotes (GC_p) to be used with q_h.
2. Horizontal scale denotes effective wind area A, ft² (m²).
3. Plus and minus signs signify pressures acting toward and away from the surfaces, respectively.
4. Each component shall be designed for maximum positive and negative pressures.
5. If a parapet equal to or higher than 3 ft (0.9 m) is provided around the perimeter of the roof with $\theta \leq 7°$, the negative values of (GC_p) in Zone 3 shall be equal to those for Zone 2, and positive values of (GC_p) in Zones 2 and 3 shall be set equal to those for wall Zones 4 and 5, respectively, in Figure 30.3-1.
6. Values of (GC_p) for roof overhangs include pressure contributions from both upper and lower surfaces.
7. If overhangs exist, the lesser horizontal dimension of the building shall not include any overhang dimension, but the edge distance, a, shall be measured from the outside edge of the overhang.

Figure 30.3-2A. 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—gable roofs, $\theta \leq 7°$.