

## PART 3: BUILDINGS WITH $h > 60$ ft (18.3 m)

### 30.6 BUILDING TYPES

The provisions of Section 30.6 are applicable to an enclosed or partially enclosed building with a mean roof height  $h > 60$  ft. (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 components and cladding for these building types are shown in Table 30.6-1.

#### 30.6.1 Conditions

For the determination of the design wind pressures on the component and cladding using the provisions of Section 30.6.2, the conditions indicated on the selected figure(s) shall be applicable to the building under consideration.

#### 30.6.2 Design Wind Pressures

Design wind pressures on component and cladding for all buildings with  $h > 60$  ft (18.3 m) shall be determined from the following equation:

$$p = q(GC_p) - q_i(GC_{pi}) \text{ (lb/ft}^2\text{) (N/m}^2\text{)} \quad (30.6-1)$$

where

$q = q_z$  for windward walls calculated at height  $z$  above the ground

$q = q_h$  for leeward walls, side walls, and roofs evaluated at height  $h$

$q_i = q_h$  for windward walls, side walls, leeward walls, and roofs of enclosed buildings and for negative internal pressure evaluation in partially enclosed buildings

$q_i = q_z$  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  $h$  ( $q_i = q_h$ )

$(GC_p)$  = external pressure coefficients given in:

- Fig. 30.6-1 for walls and flat roofs
- Fig. 27.4-3, footnote 4, for arched roofs
- Fig. 30.4-7 for domed roofs
- Note 6 of Fig. 30.6-1 for other roof angles and geometries

$(GC_{pi})$  = internal pressure coefficient given in Table 26.11-1

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

EXCEPTION: In buildings with a mean roof height  $h$  greater than 60 ft (18.3 m) and less than 90 ft (27.4 m),  $(GC_p)$  values from Figs. 30.4-1 through 30.4-6 shall be permitted to be used if the height to width ratio is one or less.

**User Note:** Use Part 3 of Chapter 30 for determining wind pressures for C&C of *enclosed and partially enclosed buildings with  $h > 60$  ft.* having roof shapes as specified in the applicable figures. These provisions are based on the Directional Procedure with *wind pressures calculated from the specified equation* applicable to each building surface.

**Table 30.6-1 Steps to Determine C&C Wind Loads Enclosed or Partially Enclosed Building with  $h > 60$  ft**

- Step 1:** Determine risk category, see Table 1.5-1
- Step 2:** Determine the basic wind speed,  $V$ , for applicable risk category, see Figure 26.5-1A, B or C
- 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 Fig. 26.8-1
  - Enclosure classification, see Section 26.10
  - Internal pressure coefficient,  $(GC_{pi})$ , see Section 26.11 and Table 26.11-1
- Step 4:** Determine velocity pressure exposure coefficient,  $K_z$  or  $K_h$ , see Table 30.3-1
- Step 5:** Determine velocity pressure,  $q_h$ , Eq. 30.3-1
- Step 6:** Determine external pressure coefficient,  $(GC_p)$
- Walls and flat roofs ( $\theta < 10$  deg), see Fig. 30.6-1
  - Gable and hip roofs, see Fig. 30.4-2 per Note 6 of Fig. 30.6-1
  - Arched roofs, see Fig. 27.4-3, footnote 4
  - Domed roofs, see Fig. 30.4-7
- Step 7:** Calculate wind pressure,  $p$ , Eq. 30.6-1