PART 2: LOW-RISE BUILDINGS (SIMPLIFIED)

30.5 BUILDING TYPES

The provisions of Section 30.5 are applicable to an enclosed:

– Low-rise building (see definition in Section 26.2)
– Building with $h \le 60$ ft (18.3 m)

The building has a flat roof, gable roof, or hip roof. The steps required for the determination of wind loads on components and cladding for these building types are shown in Table 30.5-1.

30.5.1 Conditions

For the design of components and cladding the building shall comply with all the following conditions:

1. The mean roof height h must be less than or equal to 60 ft (18.3 m) ($h \le 60$ ft (18.3 m)).
2. The building is enclosed as defined in Section 26.2 and conforms to the wind-borne debris provisions of Section 26.10.3.
3. The building is a regular-shaped building or structure as defined in Section 26.2.
4. The building does not have response characteristics making it subject to across wind loading, vortex shedding, or instability due to galloping or flutter; and it does not have a site location for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.
5. The building has either a flat roof, a gable roof with $\theta \le 45°$, or a hip roof with $\theta \le 27°$.

30.5.2 Design Wind Pressures

Net design wind pressures, p_{net}, for component and cladding of buildings designed using the procedure specified herein represent the net pressures (sum of internal and external) that shall be applied normal to each building surface as shown in Fig. 30.5-1. p_{net} shall be determined by the following equation:

$$p_{net} = \lambda K_{zt} p_{net30} \qquad (30.5\text{-}1)$$

where

λ = adjustment factor for building height and exposure from Fig. 30.5-1
K_{zt} = topographic factor as defined in Section 26.8 evaluated at 0.33 mean roof height, $0.33h$
p_{net30} = net design wind pressure for Exposure B, at h = 30 ft (9.1 m), from Fig. 30.5-1

User Note: Part 2 of Chapter 30 is a simplified method to determine wind pressures on C&C of *enclosed low-rise buildings* having flat, gable or hip roof shapes. The provisions of Part 2 are based on the Envelope Procedure of Part 1 with *wind pressures determined from a table* and adjusted as appropriate.

Table 30.5-1 Steps to Determine C&C Wind Loads Enclosed Low-rise Buildings (Simplified Method)

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:
- Exposure category B, C or D, see Section 26.7
- Topographic factor, K_{zt}, see Section 26.8 and Figure 26.8-1

Step 4: Enter figure to determine wind pressures at h = 30 ft., p_{net30}, see Fig. 30.5-1

Step 5: Enter figure to determine adjustment for building height and exposure, λ, see Fig. 30.5-1

Step 6: Determine adjusted wind pressures, p_{net}, see Eq. 30.5-1.