

## PART 4: BUILDINGS WITH $h \leq 160$ ft (48.8 m) (SIMPLIFIED)

### 30.7 BUILDING TYPES

The provisions of Section 30.7 are applicable to an enclosed building having a mean roof height  $h \leq 160$  ft. (48.8 m) with a flat roof, gable roof, hip roof, monoslope roof, or mansard roof. The steps required for the determination of wind loads on components and cladding for these building types are shown in Table 30.7-1.

#### 30.7.1 Wind Loads—Components And Cladding

##### 30.7.1.1 Wall and Roof Surfaces

Design wind pressures on the designated zones of walls and roofs surfaces shall be determined from Table 30.7-2 based on the applicable basic wind speed  $V$ , mean roof height  $h$ , and roof slope  $\theta$ . Tabulated pressures shall be multiplied by the exposure adjustment factor (EAF) shown in the table if exposure is different than Exposure C. Pressures in Table 30.7-2 are based on an effective wind area of 10 ft<sup>2</sup> (0.93 m<sup>2</sup>). Reductions in wind pressure for larger effective wind areas may be taken based on the reduction multipliers (RF) shown in the table. Pressures are to be applied over the entire zone shown in the figures.

Final design wind pressure shall be determined from the following equation:

$$p = p_{table}(EAF)(RF)K_{zt} \quad (30.7-1)$$

where:

RF = effective area reduction factor from Table 30.7-2

EAF = Exposure adjustment factor from Table 30.7-2

$K_{zt}$  = topographic factor as defined in Section 26.8

##### 30.7.1.2 Parapets

Design wind pressures on parapet surfaces shall be based on wind pressures for the applicable edge and corner zones in which the parapet is located, as shown in Table 30.7-2, modified based on the following two load cases:

- Load Case A shall consist of applying the applicable positive wall pressure from the table to the front surface of the parapet while applying the applicable negative edge or corner zone roof pressure from the table to the back surface.
- Load Case B shall consist of applying the applicable positive wall pressure from the table to the back of the parapet surface and applying the applicable negative wall pressure from the table to the front surface.

**User Note:** Part 4 of Chapter 30 is a simplified method for determining wind pressures for C&C of enclosed and partially enclosed buildings with  $h \leq 160$  ft. having roof shapes as specified in the applicable figures. These provisions are based on the Directional Procedure from Part 3 with wind pressures selected directly from a table and adjusted as applicable.

**Table 30.7-1 Steps to Determine C&C Wind Loads Enclosed Building with  $h \leq 160$  ft**

<b>Step 1:</b> Determine risk category of building, see Table 1.5-1
<b>Step 2:</b> Determine the basic wind speed, $V$ , for applicable risk category, see Figure 26.5-1A, B or C
<b>Step 3:</b> Determine wind load parameters: <ul style="list-style-type: none"> <li>➤ Exposure category B, C or D, see Section 26.7</li> </ul>
<b>Step 4:</b> Enter Table 30.7-2 to determine pressure on walls and roof, $p$ , using Eq. 30.7-1. Roof types are: <ul style="list-style-type: none"> <li>➤ Flat roof (<math>\theta &lt; 10</math> deg)</li> <li>➤ Gable roof</li> <li>➤ Hip roof</li> <li>➤ Monoslope roof</li> <li>➤ Mansard roof</li> </ul>
<b>Step 5:</b> Determine topographic factors, $K_{zt}$ , and apply factor to pressures determined from tables (if applicable), see Section 26.8.

Pressures in Table 30.7-2 are based on an effective wind area of 10 sf. Reduction in wind pressure for larger effective wind area may be taken based on the reduction factor shown in the table.

Pressures are to be applied to the parapet in accordance with Fig. 30.7-1. The height  $h$  to be used with Fig. 30.7-1 to determine the pressures shall be the height to the top of the parapet. Determine final pressure from Equation 30.7-1.

##### 30.7.1.3 Roof Overhangs

Design wind pressures on roof overhangs shall be based on wind pressures shown for the applicable zones in Table 30.7-2 modified as described herein. For Zones 1 and 2, a multiplier of 1.0 shall be used on pressures shown in Table 30.7-2. For Zone 3, a multiplier of 1.15 shall be used on pressures shown in Table 30.7-2.

Pressures in Table 30.7-2 are based on an effective wind area of 10 sf. Reductions in wind pressure for larger effective wind areas may be taken based on the reduction multiplier shown in Table 30.7-2. Pressures on roof overhangs include the pressure from the top and bottom surface of overhang. Pressures on the underside of the overhangs are equal to the adjacent wall pressures. Refer to the overhang drawing shown in Fig. 30.7-2. Determine final pressure from Equation 30.7-1.