PART 6: BUILDING APPURTENANCES AND ROOFTOP STRUCTURES AND EQUIPMENT

30.9 PARAPETS

The design wind pressure for component and cladding elements of parapets for all building types and heights, except enclosed buildings with $h \leq 160$ ft (48.8 m) for which the provisions of Part 4 are used, shall be determined from the following equation:

$$p = q_p((GC_p) - (GC_{pi})) \qquad (30.9\text{-}1)$$

where

q_p = velocity pressure evaluated at the top of the parapet

(GC_p) = external pressure coefficient given in
- Fig. 30.4-1 for walls with $h \leq 60$ ft (48.8 m)
- Figs. 30.4-2A to 30.4-2C for flat roofs, gable roofs, and hip roofs
- Fig. 30.4-3 for stepped roofs
- Fig. 30.4-4 for multispan gable roofs
- Figs. 30.4-5A and 30-5B for monoslope roofs
- Fig. 30.4-6 for sawtooth roofs
- Fig. 30.4-7 for domed roofs of all heights
- Fig. 30.6-1 for walls and flat roofs with $h > 60$ ft (18.3 m)
- Fig. 27.4-3 footnote 4 for arched roofs

(GC_{pi}) = internal pressure coefficient from Table 26.11-1, based on the porosity of the parapet envelope

Two load cases, see Fig. 30.9-1, shall be considered:

- Load Case A: Windward Parapet shall consist of applying the applicable positive wall pressure from Fig. 30.4-1 ($h \leq 60$ ft (18.3 m)) or Fig. 30.6-1 ($h >$ 60 ft (18.3 m)) to the windward surface of the parapet while applying the applicable negative edge or corner zone roof pressure from Figs. 30.4-2 (A, B or C), 30.4-3, 30.4-4, 30.4-5 (A or B), 30.4-6, 30.4-7, Fig. 27.4-3 footnote 4, or Fig. 30.6-1 ($h > 60$ ft (18.3 m)) as applicable to the leeward surface of the parapet.
- Load Case B: Leeward Parapet shall consist of applying the applicable positive wall pressure from Fig. 30.4-1 ($h \leq 60$ ft (18.3 m)) or Fig. 30.6-1 ($h >$ 60 ft (18.3 m)) to the windward surface of the parapet, and applying the applicable negative wall pressure from Fig. 30.4-1 ($h \leq 60$ ft (18.3 m)) or Fig. 30.6-1 ($h > 60$ ft (18.3 m)) as applicable to the leeward surface. Edge and corner zones shall be arranged as shown in the applicable figures. (GC_p) shall be determined for appropriate roof angle and effective wind area from the applicable figures.

If internal pressure is present, both load cases should be evaluated under positive and negative internal pressure.

The steps required for the determination of wind loads on component and cladding of parapets are shown in Table 30.9-1.

User Note: Use Part 6 of Chapter 30 for determining wind pressures for C&C on roof overhangs and parapets of buildings. These provisions are based on the Directional Procedure with *wind pressures calculated from the specified equation* applicable to each roof overhang or parapet surface.

Table 30.9-1 Steps to Determine C&C Wind Loads Parapets

Step 1: Determine risk category of building, 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_h, at top of the parapet see Table 30.3-1

Step 5: Determine velocity pressure, q_p, at the top of the parapet using Eq. 30.3-1

Step 6: Determine external pressure coefficient for wall and roof surfaces adjacent to parapet, (GC_p)
- Walls with $h \leq 60$ ft., see Fig. 30.4-1
- Flat, gable and hip roofs, see Figs. 30.4-2A to 30.4-2C
- Stepped roofs, see Fig. 30.4-3
- Multispan gable roofs, see Fig. 30.4-4
- Monoslope roofs, see Figs. 30.4-5A and 30.4-5B
- Sawtooth roofs, see Fig. 30.4-6
- Domed roofs of all heights, see Fig. 30.4-7
- Walls and flat roofs with h > 60 ft., see Fig. 30.6-1
- Arched roofs, see footnote 4 of Fig. 27.4-3

Step 7: Calculate wind pressure, p, using Eq. 30.9-1 on windward and leeward face of parapet, considering two load cases (Case A and Case B) as shown in Fig. 30.9-1.