

CHAPTER 30

WIND LOADS: COMPONENTS AND CLADDING

30.1 SCOPE

30.1.1 Building Types This chapter applies to the determination of wind pressures on components and cladding (C&C) on buildings.

1. Part 1 is applicable to an enclosed, partially enclosed, or partially open
 - Low-rise building (see definition in Section 26.2); or
 - Building with $h \leq 60$ ft (18.3 m).

The building has a flat roof, gable roof, multispans gable roof, hip roof, monoslope roof, stepped roof, or sawtooth roof, and the wind pressures are calculated from a wind pressure equation.

2. Part 2 is applicable to an enclosed, partially enclosed, or partially open
 - Building with $h > 60$ ft (18.3 m).

The building has a flat roof, pitched roof, gable roof, hip roof, mansard roof, arched roof, or domed roof, and the wind pressures are calculated from a wind pressure equation.

3. Part 3 is applicable to an open building of all heights that has a pitched free roof, monoslope free roof, or troughed free roof.
4. Part 4 is applicable to building appurtenances such as roof overhangs, parapets, and rooftop equipment.
5. Part 5 is applicable to non-building structures – circular bins, silos, and tanks; rooftop solar panels and roof pavers.
 - Circular bins, silos, and tanks with $h \leq 120$ ft (38.6 m);
 - Rooftop solar panels: Buildings of all heights with flat roofs or gable or hip roofs with roof slopes less than or equal to 7 degrees; and
 - Roof pavers: Buildings of all heights with roof slopes less than or equal to 7 degrees.

30.1.2 Conditions A building that has design wind loads determined in accordance with this chapter shall comply with all of the following conditions:

1. The building is a regular-shaped building as defined in Section 26.2; and
2. The building does not have response characteristics that make it subject to across-wind loading, vortex shedding, or instability caused by galloping or flutter; nor does it have a site location for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.

30.1.3 Limitations The provisions of this chapter take into consideration the load magnification effect caused by gusts in

resonance with along-wind vibrations of flexible buildings. The loads on buildings that do not meet the requirements of Section 30.1.2 or that have unusual shapes or response characteristics shall be determined using recognized literature documenting such wind load effects or shall use the wind tunnel procedure specified in Chapter 31.

30.1.4 Shielding There shall be no reductions in velocity pressure caused by apparent shielding afforded by buildings and other structures or terrain features.

30.1.5 Air-Permeable Cladding Design wind loads determined from Chapter 30 shall be used for air-permeable claddings, including modular vegetative roof assemblies, unless approved test data or recognized literature demonstrates lower loads for the type of air-permeable cladding being considered.

30.2 GENERAL REQUIREMENTS

30.2.1 Wind Load Parameters Specified in Chapter 26 The following wind load parameters are specified in Chapter 26:

- Basic wind speed, V (Section 26.5),
- Wind directionality factor, K_d (Section 26.6),
- Exposure category (Section 26.7),
- Topographic factor, K_{zt} (Section 26.8),
- Ground elevation factor, K_e (Section 26.9),
- Velocity pressure exposure coefficient, K_z or K_h (Section 26.10.1); Velocity pressure, q_z (Section 26.10.2),
- Gust-effect factor (Section 26.11),
- Enclosure classification (Section 26.12), and
- Internal pressure coefficient, (GC_{pi}) (Section 26.13).

30.2.2 Minimum Design Wind Pressures The design wind pressure for C&C of buildings shall not be less than a net pressure of 16 lb/ft² (0.77 kN/m²) acting in either direction normal to the surface.

30.2.3 Tributary Areas Greater than 700 ft² (65 m²) C&C elements with tributary areas greater than 700 ft² (65 m²) shall be permitted to be designed using the provisions for main wind force resisting systems.

30.2.4 External Pressure Coefficients Combined gust-effect factor and external pressure coefficients for C&C, (GC_p) , are given in the figures associated with this chapter. The pressure coefficient values and gust-effect factor shall not be separated.