Table 26.13-1. Main Wind Force Resisting System and Components and Cladding (All Heights): Internal Pressure Coefficient, (GC_{pi}), for Enclosed, Partially Enclosed, Partially Open, and Open Buildings (Walls and Roof).

Enclosure Classification	Criteria for Enclosure Classification	Internal Pressure	Internal Pressure Coefficient (GC_{pi})
Enclosed buildings	A_o is less than the smaller of $0.01A_g$ or 4 ft^2 (0.37 m^2), and $A_{oi}/A_{gi} \leq 0.2$	Moderate	+0.18 −0.18
Partially enclosed buildings	$A_o > 1.1A_{oi}$, and $A_o >$ the lesser of $0.01A_g$ or 4 ft^2 (0.37 m^2), and $A_{oi}/A_{gi} \leq 0.2$	High	+0.55 −0.55
Partially open buildings	A building that does not comply with Enclosed, Partially Enclosed, or Open classifications	Moderate	+0.18 −0.18
Open buildings	Each wall is at least 80% open	Negligible	0.00

Notes:

1. Plus and minus signs signify pressures acting toward and away from the internal surfaces, respectively.
2. Values of (GC_{pi}) shall be used with q_z or q_h as specified.
3. Two cases shall be considered to determine the critical load requirements for the appropriate condition:
   (a) A positive value of (GC_{pi}) applied to all internal surfaces, or
   (b) A negative value of (GC_{pi}) applied to all internal surfaces.

unpartitioned large volume, the internal pressure coefficient, (GC_{pi}), shall be multiplied by the reduction factor, R_i:

$$R_i = 1.0 \quad \text{or} \quad R_i = 0.5\left(1 + \frac{1}{\sqrt{1 + \frac{V_i}{22{,}800A_{og}}}}\right) < 1.0 \quad (26.13\text{-}1)$$

where A_{og} is the total area of openings in the building envelope [walls and roof (ft^2)], and V_i is the unpartitioned internal volume (ft^3).

26.14 CONSENSUS STANDARDS AND OTHER REFERENCED DOCUMENTS

This section lists the consensus standards and other documents that shall be considered part of this standard to the extent referenced in this chapter.

ANSI A58.1, *Minimum Design Loads for Buildings and Other Structures*, American National Standards Institute, 1982.

Cited in: Section C26.5.2.

ANSI/DASMA 115, *Standard Method for Testing Sectional Doors, Rolling Doors, and Flexible Doors: Determination of Structural Performance under Missile Impact and Cyclic Wind Pressure*, Door and Access Systems Manufacturers Association International, 2017.

Cited in: Sections 26.12.3.2, C26.12.

ASTM E330, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference*, ASTM International, 2014.

Cited in: Section C26.5.1.

ASTM E1886, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*, ASTM, 2019.

Cited in: Sections 26.12.3.2, C26.12

ASTM E1996, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*, ASTM International, 2020.

Cited in: Sections 26.12.3.2, C26.12

CAN/CSA A123.21, *Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane-Roofing Systems*, CSA Group, 2014.

Cited in: Section C26.5.1

CHAPTER 27
WIND LOADS ON BUILDINGS: MAIN WIND FORCE RESISTING SYSTEM (DIRECTIONAL PROCEDURE)

27.1 SCOPE

27.1.1 Building Types This chapter applies to the determination of Main Wind Force Resisting System (MWFRS) wind loads on enclosed, partially enclosed, partially open, and open buildings of all heights using the Directional Procedure, in which it is necessary to separate applied wind loads onto the windward, leeward, and sidewalls of the building to properly assess the internal forces in the MWFRS members.

27.1.2 Conditions A building that has design wind loads determined in accordance with this chapter shall comply with both 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.

27.1.3 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. Buildings that do not meet the requirements of Section 27.1.2 or that have unusual shapes or response characteristics shall be designed using recognized literature, documenting such wind load effects, or shall use the Wind Tunnel Procedure specified in Chapter 31.

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

27.1.5 Minimum Design Wind Loads The wind pressure to be used in the design of the MWFRS for an enclosed, or partially enclosed, building shall not be less than 16 lb/ft^2 (0.77 kN/m^2) multiplied by the wall area of the building, and 8 lb/ft^2 (0.38 kN/m^2) multiplied by the roof area of the building, projected onto a vertical plane normal to the assumed wind direction. Wall and roof loads shall be applied simultaneously. The design wind force for open buildings shall be not less than 16 lb/ft^2 (0.77 kN/m^2) multiplied by the area, A_f.

27.2 GENERAL REQUIREMENTS

User Note: Use Chapter 27 to determine wind pressures on the MWFRS of buildings with any general plan shape, building height, or roof geometry that matches the figures provided. These provisions use the traditional "all heights" method (Directional Procedure) by calculating wind pressures using *specific wind pressure equations* applicable to each building surface.

The steps to determine the wind loads on the MWFRS for enclosed, partially enclosed, partially open, and open buildings of all heights are provided in Table 27.2-1.

27.2.1 Wind Load Parameters Specified in Chapter 26 The following wind load parameters shall be determined in accordance with 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);
- Gust-effect factor (Section 26.11);
- Enclosure classification (Section 26.12); and
- Internal pressure coefficient, (GC_{pi}) (Section 26.13).

27.3 WIND LOADS: MAIN WIND FORCE RESISTING SYSTEM

27.3.1 Enclosed, Partially Enclosed, and Partially Open Rigid and Flexible Buildings Design wind pressures for the MWFRS of buildings of all heights in lb/ft^2 (N/m^2), shall be determined by the following equation:

$$p = qK_dGC_p - q_iK_d(GC_{pi}) \quad (27.3\text{-}1)$$

where

$q = q_z$ For windward walls evaluated at height z above the ground;

$q = q_h$ For leeward walls, sidewalls, and roofs evaluated at height h;