Chapter 29

WIND LOADS ON OTHER STRUCTURES AND BUILDING APPURTENANCES—MWFRS

29.1 SCOPE

29.1.1 Structure Types

This chapter applies to the determination of wind loads on building appurtenances (such as rooftop structures and rooftop equipment) and other structures of all heights (such as solid freestanding walls and freestanding solid signs, chimneys, tanks, open signs, lattice frameworks, and trussed towers) using the Directional Procedure.

The steps required for the determination of wind loads on building appurtenances and other structures are shown in Table 29.1-1.

> **User Note:** Use Chapter 29 to determine wind pressures on the MWFRS of solid freestanding walls, freestanding solid signs, chimneys, tanks, open signs, lattice frameworks and trussed towers. Wind loads on rooftop structures and equipment may be determined from the provisions of this chapter. The wind pressures are *calculated using specific equations based upon the Directional Procedure*.

29.1.2 Conditions

A structure whose design wind loads are determined in accordance with this section shall comply with all of the following conditions:

1. The structure is a regular-shaped structure as defined in Section 26.2.
2. The structure does not have response characteristics making it subject to across-wind loading, vortex shedding, or instability due to galloping or flutter; or it does not have a site location for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.

29.1.3 Limitations

The provisions of this chapter take into consideration the load magnification effect caused by gusts in resonance with along-wind vibrations of flexible structures. Structures not meeting the requirements of Section 29.1.2, or having 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.

29.1.4 Shielding

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

29.2 GENERAL REQUIREMENTS

29.2.1 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)
– Enclosure classification (Section 26.10)

29.3 VELOCITY PRESSURE

29.3.1 Velocity Pressure Exposure Coefficient

Based on the exposure category determined in Section 26.7.3, a velocity pressure exposure coefficient K_z or K_h, as applicable, shall be determined from Table 29.3-1.

For a site located in a transition zone between exposure categories that is near to a change in ground surface roughness, intermediate values of K_z or K_h, between those shown in Table 29.3-1, are permitted, provided that they are determined by a rational analysis method defined in the recognized literature.

29.3.2 Velocity Pressure

Velocity pressure, q_z, evaluated at height z shall be calculated by the following equation:

$$q_z = 0.00256 \ K_z K_{zt} K_d V^2 \ (\text{lb/ft}^2) \qquad (29.3\text{-}1)$$

[In SI: $q_z = 0.613 \ K_z K_{zt} K_d V^2$ (N/m^2); V in m/s]

where

K_d = wind directionality factor defined in Section 26.6
K_z = velocity pressure exposure coefficient defined in Section 29.3.1
K_{zt} = topographic factor defined in Section 26.8.2
V = basic wind speed from Section 26.5