the effective wind area used to evaluate (GC_p) need not be taken as less than one-third the length of the area. This increase in effective wind area has the effect of reducing the average wind pressure acting on the component. Note, however, that this effective wind area should only be used in determining the (GC_p) in Figs. 30.4-1, through 30.4-6 and 30.4-8. The induced wind load should be applied over the actual area tributary to the component being considered.

For membrane roof systems, the effective wind area is the area of an insulation board (or deck panel if insulation is not used) if the boards are fully adhered (or the membrane is adhered directly to the deck). If the insulation boards or membrane are mechanically attached or partially adhered, the effective wind area is the area of the board or membrane secured by a single fastener or individual spot or row of adhesive.

For typical door and window systems supported on three or more sides, the effective wind area is the area of the door or window under consideration. For simple spanning doors (e.g., horizontal spanning section doors or coiling doors), large specialty constructed doors (e.g., aircraft hangar doors), and specialty constructed glazing systems, the effective wind area of each structural component composing the door or window system should be used in calculating the design wind pressure.

MAIN WIND-FORCE RESISTING SYSTEM (MWFRS): Can consist of a structural frame or an assemblage of structural elements that work together to transfer wind loads acting on the entire structure to the ground. Structural elements such as cross-bracing, shear walls, roof trusses, and roof diaphragms are part of the Main Wind-Force Resisting System (MWFRS) when they assist in transferring overall loads (Mehta and Marshall 1998).

WIND-BORNE DEBRIS REGIONS: Windborne debris regions are defined to alert the designer to areas requiring consideration of missile impact design. These areas are located within hurricane prone regions where there is a high risk of glazing failure due to the impact of windborne debris.

C26.3 SYMBOLS AND NOTATION

The following additional symbols and notation are used herein:

A_{ob} = average area of open ground surrounding each obstruction

n = reference period, in years

P_a = annual probability of wind speed exceeding a given magnitude (Eq. C26.5-7)

P_n = probability of exceeding design wind speed during n years (see Eq. C26.5-7)

S_{ob} = average frontal area presented to the wind by each obstruction

V_t = wind speed averaged over t s (see Fig. C26.5-1), in mi/h (m/s)

V_{3600} = mean wind speed averaged over 1 hour (see Fig. C26.5-1), in mi/h (m/s)

β = damping ratio (percentage of critical damping)

C26.4.3 Wind Pressures Acting on Opposite Faces of Each Building Surface

Section 26.4.3 is included in the standard to ensure that internal and external pressures acting on a building surface are taken into account by determining a net pressure from the algebraic sum of those pressures. For additional information on the application of the net components and cladding wind pressure acting across a multilayered building envelope system, including air-permeable cladding, refer to Section C30.1.5.

C26.5.1 Basic Wind Speed

This 2010 edition of ASCE 7 departs from prior editions by providing wind maps that are directly applicable for determining pressures for strength design approaches. Rather than using a single map with importance factors and a load factor for each building risk category, in this edition there are different maps for different categories of building occupancies. The updated maps are based on a new and more complete analysis of hurricane characteristics (Vickery et al. 2008a, 2008b and 2009) performed over the past 10 years.

The decision to move to multiple-strength design maps in conjunction with a wind load factor of 1.0 instead of using a single map used with an importance and a load factor of 1.6 relied on several factors important to an accurate wind specification:

i. A strength design wind speed map brings the wind loading approach in line with that used for seismic loads in that they both essentially eliminate the use of a load factor for strength design.
ii. Multiple maps remove inconsistencies in the use of importance factors that actually should vary with location and between hurricane-prone and nonhurricane-prone regions for Risk Category I structures and acknowledge that the demarcation between hurricane and nonhurricane winds change with the recurrence interval.