and acceleration response in the along-wind direction obtained by the procedure in ASCE 7-02. Also the building experiences much higher across-wind load effects when compared to the along-wind response for this example, which reiterates the significance of wind loads and their effects in the across-wind direction.

C26.10 ENCLOSURE CLASSIFICATION

The magnitude and sense of internal pressure is dependent upon the magnitude and location of openings around the building envelope with respect to a given wind direction. Accordingly, the standard requires that a determination be made of the amount of openings in the envelope to assess enclosure classification (enclosed, partially enclosed, or open). "Openings" are specifically defined in this version of the standard as "apertures or holes in the building envelope which allow air to flow through the building envelope and which are designed as "open" during design winds." Examples include doors, operable windows, air intake exhausts for air conditioning and/or ventilation systems, gaps around doors, deliberate gaps in cladding, and flexible and operable louvers. Once the enclosure classification is known, the designer enters Table 26.11-1 to select the appropriate internal pressure coefficient.

This version of the standard has four terms applicable to enclosure: wind-borne debris regions, glazing, impact-resistant glazing, and impact protective system. "Wind-borne debris regions" are specified to alert the designer to areas requiring consideration of missile impact design and potential openings in the building envelope. "Glazing" is defined as "any glass or transparent or translucent plastic sheet used in windows, doors, skylights, or curtain walls." "Impact-resistant glazing" is specifically defined as "glazing that has been shown by testing to withstand the impact of test missiles." "Impact protective systems" over glazing can be shutters or screens designed to withstand wind-borne debris impact. Impact resistance of glazing and protective systems can be tested using the test method specified in ASTM E1886-2005 (2005), with missiles, impact speeds, and pass/fail criteria specified in ASTM E1996-2009 (2009). Other approved test methods are acceptable. Origins of missile impact provisions contained in these standards are summarized in Minor (1994) and Twisdale et al. (1996).

Attention is drawn to Section 26.10.3, which requires glazing in Category II, III, and IV buildings in wind-borne debris regions to be protected with an impact protective system or to be made of impact-resistant glazing. The option of unprotected glazing was eliminated for most buildings in the 2005 edition of the standard to reduce the amount of wind and water damage to buildings during design wind storm events.

Prior to the 2002 edition of the standard, glazing in the lower 60 ft (18.3 m) of Category II, III, or IV buildings sited in wind-borne debris regions was required to be protected with an impact protective system, or to be made of impact-resistant glazing, or the area of the glazing was assumed to be open. Recognizing that glazing higher than 60 ft (18.3 m) above grade may be broken by wind-borne debris when a debris source is present, a new provision was added in 2002. With that new provision, aggregate surfaced roofs on buildings within 1,500 ft (457 m) of the new building need to be evaluated. For example, roof aggregate, including gravel or stone used as ballast that is not protected by a sufficiently high parapet should be considered as a debris source. Accordingly, the glazing in the new building, from 30 ft (9.1 m) above the source building to grade would need to be protected with an impact protective system or be made of impact-resistant glazing. If loose roof aggregate is proposed for the new building, it too should be considered as a debris source because aggregate can be blown off the roof and be propelled into glazing on the leeward side of the building. Although other types of wind-borne debris can impact glazing higher than 60 ft above grade, at these higher elevations, loose roof aggregate has been the predominate debris source in previous wind events. The requirement for protection 30 ft (9.1 m) above the debris source is to account for debris that can be lifted during flight. The following references provide further information regarding debris damage to glazing: Beason et al. (1984), Minor (1985 and 1994), Kareem (1986), and Behr and Minor (1994).

Although wind-borne debris can occur in just about any condition, the level of risk in comparison to the postulated debris regions and impact criteria may also be lower than that determined for the purpose of standardization. For example, individual buildings may be sited away from likely debris sources that would generate significant risk of impacts similar in magnitude to pea gravel (i.e., as simulated by 2 gram steel balls in impact tests) or butt-on 2 × 4 impacts as required in impact testing criteria. This situation describes a condition of low vulnerability only as a result of limited debris sources within the vicinity of the building. In other cases, potential sources of debris may be present, but extenuating conditions can lower the risk. These extenuating conditions include the type of materials and surrounding construction,