D V V ASSOCIATES INC.

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ASCE 7-11-22

Glass Fallout chpt 13.5.9.1

The ASCE 7'16 version has Eqn. 13.5-3 in which Dp has been replaced with DpI = Dp x I.

(13.5-3)

$$D_{clear} \geq 1.25 D_{pI}$$

The commentary recognizes that the 1.25 factor addresses uncertainty in the calculation of the displacement demand utilizing Dp not DpI.

c13.5.9.1 General.

Eq. (13.5-2) is derived from Sheet Glass Association of Japan (1982) and is similar to an equation in Bouwkamp and Meehan (1960) that permits calculation of the story drift required to cause glass-to-frame contact in a given rectangular window frame. Both calculations are based on the principle that a rectangular window frame (specifically, one that is anchored mechanically to adjacent stories of a structure) becomes a parallelogram as a result of story drift, and that glass-to-frame contact occurs when the length of the shorter diagonal of the parallelogram is equal to the diagonal of the glass panel itself. The value $\Delta_{fallout}$ represents the displacement capacity of the system, and D_p represents the displacement demand.

The 1.25 factor in the requirements described above reflects uncertainties associated with calculated inelastic seismic displacements of building structures. Wright (1989) states that post-elastic deformations, calculated using the structural analysis process may well underestimate the actual building deformation by up to 30%. It would therefore be reasonable to require the curtain wall glazing system to withstand 1.25 times the computed maximum interstory displacement to verify adequate performance.

The reason for the second exception to Eq. (13.5-2) is that the tempered glass, if shattered, would not produce an overhead falling hazard to adjacent pedestrians, although some pieces of glass may fall out of the frame.

If you use Dclr = 1.25 DpI, (Eqn. 13.5-3 above) where I ≥ 1, say 1.25 as is common on many projects in CA. Dclr becomes 1.5625 Dp. Is necessary to apply the amplification factor of 1.25 twice, or is once sufficient.

ASCE 7'22 appears to be identical.

Sincerely,

David Van Volkinburg S.E
President