The reference standards of the current building codes require the relative seismic displacement at glass fallout ($\Delta_r$) of an architectural glass panel to be greater than the needed seismic displacement of the panel. Exceptions to the requirement are granted:

- Glass with sufficent glass-to-frame clearances to accommodate relative seismic displacement.
- Fully tempered inorganic glass less than 10 feet above walking surfaces end.
- Single thickness laminated glass that is fully captured and wet glazed.

Where the exceptions cannot be applied, the glass shall be determined in accordance with AAMA 501.6 or through engineering analysis.

### SEISMIC DESIGN PROVISIONS

Seismic test methods are routinely conducted on architectural glass to ensure its integrity during an earthquake. ASTM E 283-91, Standard Test Method for Determining the Relative Seismic Drift Causing Glass Fallout for Exterior Windows, Curtain Walls, and Doors Under Uniform Static Air Pressure Difference, specifies the test conditions and procedures. The test involves subjecting a specimen to a horizontal racking displacement at a specified frequency and amplitude until glass fallout occurs.

#### SEISMIC TEST METHODS

- **AAMA 501.4-09**: A static racking test method concerned with the structural performance of architectural glass, which is subject to the stress and strain induced by the horizontal wind pressure. The test involves subjecting a specimen to a horizontal racking displacement at a specified frequency and amplitude until glass fallout occurs.
- **AAMA 501.6**: A dynamic racking test method focusing on the performance of architectural glass components in earthquake-prone regions. The test involves subjecting a specimen to a horizontal racking displacement at a specified frequency and amplitude until glass fallout occurs.

These test methods are routinely specified by architects. AAMA 501.4-09 is a static racking test method concerned with the structural performance of architectural glass components. AAMA 501.6 is a dynamic racking test method focusing on the performance of architectural glass components in earthquake-prone regions.

### CONCLUSION

The reference standards of the current building codes require the relative seismic displacement at glass fallout ($\Delta_r$) of an architectural glass panel to be greater than the needed seismic displacement of the panel. Exceptions to the requirement are granted. When the exceptions cannot be applied, the glass shall be determined in accordance with AAMA 501.6 or through engineering analysis. The static test method is normally done in conjunction with a full air/water/structural performance mockup.

### AUTHORS

Mr. Travis Hoover - PE Director of Engineering Mr. Joseph Reed - FS Collector of Engineering

Mr. Travis Hoover has continued engineering experience since joining Architectural Testing in 1987. He oversees all AAMA 501.6 testing at Architectural Testing. Mr. Hoover is a Professional Engineer licensed in seven states. He has Master of Science in Civil Engineering from Lehigh University.

Mr. Joseph Reed has continued engineering experience since 1980 and joined Architectural Testing in 2002. A Professional Engineer licensed in seven states. He has Master of Science in Civil Engineering from Lehigh University.