Chapter C13
SEISMIC DESIGN REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS

C13.0 SEISMIC DESIGN REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS

In Section 13.5.1 of ASCE 7-05, nonstructural components supported by chains or otherwise suspended from the structure are exempt from lateral bracing requirements, provided they are designed not to inflict damage to themselves or any other component when subject to seismic motion. However, for the 2005 edition, it was determined that clarifications were needed on the type of nonstructural components allowed by these exceptions and the acceptable consequences of interaction between components. In ASCE 7-02, certain nonstructural components that could represent a fire hazard following an earthquake were exempted from meeting the Section 9.6.1 requirements. For example, gas-fired space heaters clearly pose a fire hazard following an earthquake, but were permitted to be exempted from the Section 9.6.1 requirements. The fire hazard following the seismic event must be given the same level of consideration as the structural failure hazard when considering components to be covered by this exception. In addition, the ASCE 7-02 language was sometimes overly restrictive because it did not distinguish between credible seismic interactions and incidental interactions. In ASCE 7-02, if a suspended lighting fixture could hit and dent a sheet metal duct, it would have to be braced, although no credible danger is created by the impact. The new reference in Section 13.2.3 of ASCE 7-05 allowed the designer to consider whether the failures of the component and/or the adjacent components are likely to occur if contact is made.

C13.1.4 Exemptions

Several classes of nonstructural components are exempted from the requirements of Chapter 13. The exemptions are made on the assumption that, either due to their inherent strength and stability, or the lower level of earthquake demand (accelerations and relative displacements), or both, these nonstructural components and systems can achieve the performance goals described earlier in this commentary without explicitly satisfying the requirements of this chapter.

The requirements are intended to apply only to permanent components, not furnishings and temporary or mobile equipment. Furnishings (with the exception of more massive elements like storage cabinets) may shift during strong ground shaking, but pose minimal hazards. Equipment must be anchored if it is permanently attached to the structure utility services, such as electricity, gas, or water. For the purposes of this requirement, "permanently attached" includes all electrical connections except plugs for duplex receptacles.

Temporary components remain in place for short periods of time (measured in months). It does not include components that, while movable, are expected to remain in place for long periods. For example, although modular office systems can be taken apart and relocated, they ordinarily remain in place for years and therefore are not temporary.

Mobile units include components that are moved from one point in the structure to another during ordinary use. Examples include desktop computers, office equipment, and other components that are not permanently attached to the building utility systems. Components mounted on wheels to facilitate periodic maintenance or cleaning but which otherwise remain in the same location are not considered movable for the purposes of anchorage and bracing.

With the exception of parapets supported by bearing walls or shear walls, all components in Seismic Design Categories A and B are exempt, due to the low levels of ground shaking expected. Parapets are not exempt because experience has shown that these items can fail and pose a significant falling hazard, even at low-level shaking levels.

C13.2.2 Special Certification Requirements for Designated Seismic Systems

This section addresses the qualification of active designated seismic equipment, its supports, and attachments with the goal of improving survivability and achieving a high level of confidence that a facility will be functional following a design earthquake. Active equipment has parts that rotate, move mechanically, or are energized during operation. Active designated seismic equipment constitutes a limited subset of designated seismic systems. Failure of active