

Code/Edition: 2003 IBC Section: 1621

**Purpose:** To clarify the requirements regarding seismic design and attachment of equipment.

**Question:** Is seismic design and attachment, including bracing, clearances, etc., required for electrical and mechanical components, such as sprinkler piping?

**Answer:** It depends on the use of the building and the type of component. IBC Section 1621.1 requires that the seismic design and attachment of mechanical and electrical components comply with ASCE 7-02. Section 9.6 of ASCE 7-02 establishes the minimum design criteria for components and provides a number of exceptions that exempt components under certain conditions:

- Exception 1 exempts all components if the building is a Seismic Design Category A.
- Exception 3 exempts mechanical and electrical components if the building is a Seismic Design Category B.
- Exception 4 exempts components with a 'component importance factor'  $I_p = 1.0$ , if the building is a Seismic Design Category C.

The Component Importance Factor ( $I_p$ ) is assigned by ASCE 7-02, Section 9.6.1.5. Life-safety related components (e.g. sprinkler systems), components containing hazardous materials, and components necessary for continued operation of Seismic Use Group III facility are assigned an  $I_p = 1.5$ . Elevators shall be assigned an  $I_p = 1.5$  if needed for the continued operation of a Seismic Use Group III facility, or when the elevator is required as an accessible means of egress (see IBC sections 1007.2.1 and 1007.4).

The Seismic Use Group is determined by IBC Table 1604.5. Seismic Use Group III is equivalent to Table Category IV (see Table footnote a). Structures assigned a Seismic Use Group III are considered 'essential facilities' and include hospitals, fire and police stations, and other structures that are critical to have operational in an emergency.

The Seismic Design Category is determined for the project by the structural engineer-of-record. In the absence of such a determination, Seismic Design Category B may be assigned to buildings of Seismic Use Group I or II. Seismic Design Category C may be assigned to buildings of Seismic Use Group III (e.g. hospitals, fire stations, etc.). [These assumed categories are derived based on the most restrictive soil types commonly found in the City.]

In summary, seismic design and attachment is required for components with an  $I_p = 1.5$  in a building or structure of Seismic Design Category C. In general terms, seismic design and attachment is typically required for safety-related or critical components in essential facilities.

#### FOR MORE INFORMATION

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