## 13.5 ARCHITECTURAL COMPONENTS

### 13.5.1 General

Architectural components, and their supports and attachments, shall satisfy the requirements of this section. Appropriate coefficients shall be selected from Table 13.5-1.

**EXCEPTION:** Components supported by chains or otherwise suspended from the structure are not required to satisfy the seismic force and relative displacement requirements provided they meet all of the following criteria:

1. The design load for such items shall be equal to 1.4 times the operating weight acting down with a simultaneous horizontal load equal to 1.4 times the operating weight. The horizontal load shall be applied in the direction that results in the most critical loading for design.
2. Seismic interaction effects shall be considered in accordance with Section 13.2.3.
3. The connection to the structure shall allow a 360° range of motion in the horizontal plane.

### 13.5.2 Forces and Displacements

All architectural components, and their supports and attachments, shall be designed for the seismic forces defined in Section 13.3.1.

Architectural components that could pose a life-safety hazard shall be designed to accommodate the seismic relative displacement requirements of Section 13.3.2. Architectural components shall be designed considering vertical deflection due to joint rotation of cantilever structural members.

### 13.5.3 Exterior Nonstructural Wall Elements and Connections

Exterior nonstructural wall panels or elements that are attached to or enclose the structure shall be designed to accommodate the seismic relative displacements defined in Section 13.3.2 and movements due to temperature changes. Such elements shall be supported by means of positive and direct structural supports or by mechanical connections and fasteners in accordance with the following requirements:

a. Connections and panel joints shall allow for the story drift caused by relative seismic displacements ($D_p$) determined in Section 13.3.2, or 0.5 in. (13 mm), whichever is greatest.
b. Connections to permit movement in the plane of the panel for story drift shall be sliding connections using slotted or oversize holes, connections that permit movement by bending of steel, or other connections that provide equivalent sliding or ductile capacity.
c. The connecting member itself shall have sufficient ductility and rotation capacity to preclude fracture of the concrete or brittle failures at or near welds.
d. All fasteners in the connecting system such as bolts, inserts, welds, and dowels and the body of the connectors shall be designed for the force ($F_p$) determined by Section 13.3.1 with values of $R_p$ and $a_p$ taken from Table 13.5-1 applied at the center of mass of the panel.
e. Where anchorage is achieved using flat straps embedded in concrete or masonry, such straps shall be attached to or hooked around reinforcing steel or otherwise terminated so as to effectively transfer forces to the reinforcing steel or to assure that pullout of anchorage is not the initial failure mechanism.

### 13.5.4 Glass

Glass in glazed curtain walls and storefronts shall be designed and installed in accordance with Section 13.5.9.

### 13.5.5 Out-of-Plane Bending

Transverse or out-of-plane bending or deformation of a component or system that is subjected to forces as determined in Section 13.5.2 shall not exceed the deflection capability of the component or system.

### 13.5.6 Suspended Ceilings

Suspended ceilings shall be in accordance with this section.

**EXCEPTIONS:**

1. Suspended ceilings with areas less than or equal to 144 ft$^2$ (13.4 m$^2$) that are surrounded by walls or soffits that are laterally braced to the structure above are exempt from the requirements of this section.
2. Suspended ceilings constructed of screw- or nail-attached gypsum board on one level that are surrounded by and connected to walls or soffits that are laterally braced to the structure above are exempt from the requirements of this section.

#### *13.5.6.1 Seismic Forces*

The weight of the ceiling, $W_p$, shall include the ceiling grid; ceiling tiles or panels; light fixtures if attached to, clipped to, or laterally supported by the ceiling grid; and other components that are laterally supported by the ceiling. $W_p$ shall be taken as not less than 4 psf (192 N/m$^2$).