## 6.4. DESIGN REQUIREMENTS FOR NONSTRUCTURAL ARCHITECTURAL AND MECHANICAL/ELECTRICAL ELEMENTS/COMPONENTS

### 6.4.1. General

**6.4.1.1 –** Independently responding appendages (balcony, parapet, chimney, etc) that are supported by the main structural system of the tall buildings, façade and partioning elements, architectural components, mechanical and electrical components and their connections shall be analysed for the seismic effects given in this Section.

**6.4.1.2 –** Component attachments shall be bolted, welded, or otherwise positively fastened without consideration of frictional resistance produced by the effects of gravity. A continuous load path of sufficient strength and stiffness between the component and the supporting structure shall be provided. Local elements of the structure including connections shall be designed and constructed for the component forces where they control the design of the elements or their connections.

**6.4.1.3 –** (E3) Earthquake Level (see **1.2.1**) shall be considered for the following nonstructural elements and their attachements to the structure:

**(a)** Elements and components in buildings of *Special Occupancy Class* (**Table 1.2**),

**(b)** Elements and components in buildings of *Normal Occupancy Class* (**Table 1.2**) that are required to remain operational immeadiately after the earthquake,

**(c)** Elements and components related to hazardous material.

**6.4.1.4 –** (E2) Earthquake Level (see **1.2.1**) shall be considered for nonstructural elements and components other than those classified in **6.4.1.3**.

**6.4.1.5 –** If the mass of the nonstructural element or component is greater than 20% of the storey mass, the element or the component shall be considered an element of the structural system with its mass and stiffness characteristics.

### 6.4.2. Equivalent Seismic Loads

**6.4.2.1 –** The seismic design force, $f_e$, applied in the horizontal direction shall be centered at the component's center of gravity and distributed relative to the component's mass distribution and shall be determined as follows:

$$f_e = \frac{m_e A_e B_e}{q_e} \qquad \textbf{(6.5)}$$

where $m_e$ represents the mass, $A_e$ is the maximum acceleration acting on the element or component, $B_e$ represents the amplification factor and $q_e$ refers to behaviour factor defined for the element or component. $B_e$ and $R_e$ are given for architectural and mechanical/electrical components in **Table 6.2** and **Table 6.3**, respectively.

**6.4.2.2 –** The maximum acceleration acting on the element or component shall be defined as the maximum value to be obtained from the following: