## 2.2. SEISMIC ANALYSIS

### 2.2.1. Applicable analysis methods

The analysis methods applicable for the seismic analysis of building structural systems are given in the following:

**2.2.1.1 –** *Equivalent Seismic Load Method* described in **2.3** is the simplified single-mode response-spectrum analysis method, which can be used for low- to medium-rise buildings with conditions given in **2.2.2**.

**2.2.1.2 –** *Multi-Mode Response Spectrum Analysis Method* described in **2.4** is an advanced linear dynamic analysis method, which can be used for both low- to medium-rise as well as tall buildings.

**2.2.1.3 –** *Linear Response History Analysis Method* described in **2.5.1** is the most advanced linear dynamic analysis method, which can be used for both low- to medium-rise as well as tall buildings.

**2.2.1.4 –** *Nonlinear Response History Analysis Method* described in **2.5.2** is the most advanced nonlinear dynamic analysis method, which can be used for both low- to medium-rise and tall buildings.

### 2.2.2. Selection of analysis method for low- to medium-rise buildings

**2.2.2.1 –** *Equivalent Seismic Load Method* can be used for structures with $H_N \leq 40$ m provided that type **A2** torsional irregularity factor in any story does not exceed 2 ($\eta_{ti} \leq 2$ – see **Table 1.3**) type **B2** irregularity does not exists with reference to **1.5**.

**2.2.2.2 –** *Multi-Mode Response Spectrum Analysis Method* is the acceptable analysis method for all low- to medium-rise buildings.

### 2.2.3. Definition of seismic mass

Total seismic mass of the building, $M_t$, shall be determined by **Eq.(2.3)**:

$$M_t = \frac{W_t}{g} = \frac{1}{g}\sum_{i=1}^{N} W_i \qquad ; \qquad W_i = G_i + n_1\, n_2\, Q_i \qquad \textbf{(2.3)}$$

where *live load mass reduction factor* $n_1$ and *live load participation factor* $n_2$ shall be taken from **Table 2.3** and **Table 2.4**, respectively.

**Table 2.3 – Live load mass reduction factor** ($n_1$)

| Type of occupancy | $n_1$ |
|---|---|
| Storeys with correlated occupancies | 0.80 |
| Storeys with independent occupancies | 0.30 |