2.3. EQUIVALENT SEISMIC LOAD METHOD

2.3.1. Displacement Components and Application Points of Seismic Loads

2.3.1.1 – Where floors act as rigid horizontal diaphragms, two lateral displacement components and the rotation around the vertical axis shall be taken into account at each floor as independent static displacement components. At each floor, equivalent seismic loads determined in accordance with **2.3.3** shall be applied to the floor mass centre as well as to the points defined by shifting it +5% and −5% of the floor length in the perpendicular direction to the earthquake direction considered in order to account for the *accidental eccentricity effects*.

2.3.1.2 – Where floors do not act as rigid horizontal diaphragms, sufficient number of independent static displacement components shall be considered to account for the in-plane deformation of floors.

2.3.2. Base Shear

Total equivalent seismic load, i.e., the base shear, V_b , in the earthquake direction considered shall be calculated by **Eq.(2.4)**:

$$V_b = M_t S_{AR}(T_1) \geq 0.11 M_t S_{SD} I \qquad (2.4)$$

where design spectral acceleration $S_{AR}(T_1)$ and elastic short period spectral acceleration S_{SD} correspond to (E2) level earthquake. Predominant natural period in the direction of earthquake, T_1 , shall be calculated in accordance with **2.3.4.**

2.3.3. Storey Seismic Loads

2.3.3.1 – Total equivalent seismic load determined by **Eq.(2.4)** is expressed by **Eq. (2.5)** as the sum of seismic loads acting at storey levels.

$$V_b = \Delta F_N + \sum_{i=1}^{N} F_i \qquad (2.5)$$

2.3.3.2 – The *additional equivalent seismic load*, ΔF_N , acting at the *N*'th storey (roof) of the building shall be determined by **Eq.(2.6)**.

$$\Delta F_N = 0.0075 \, N V_b \qquad (2.6)$$

Excluding ΔF_N , remaining part of the total equivalent seismic load shall be distributed to stories of the building (including *N*'th storey) in accordance with **Eq.(2.7)**.

$$F_i = (V_b - \Delta F_N) \, \frac{W_i H_i}{\sum\limits_{k=1}^{N} W_k H_k} \qquad (2.7)$$

2.3.3.3 – In the case where torsional irregularity defined in **Table 1.3** exists at any i'th storey such that the condition $1.2 < \eta_{ti} \leq 2.0$ is satisfied, ±5% accidental eccentricity applied to this floor according to **2.3.1.1** shall be amplified by multiplying with coefficient D_i given by **Eq.(2.8)** for each earthquake direction.