2.7. DAMAGE LIMITATION

2.7.1. Limitation of story drifts

2.7.1.1 – The *reduced storey drift*, Δ_{ji} , of any column or structural wall shall be determined by **Eq.(2.21)** as the difference of displacements between the two consecutive stories.

$$\Delta_{ji} = d_{ji} - d_{j(i-1)} \qquad \textbf{(2.22)}$$

where d_{ji} and $d_{j(i-1)}$ represent lateral displacements obtained from the analysis at the j'th column or structural wall at stories i and (i – 1) under reduced seismic loads. The minimum equivalent seismic load condition defined by **Eq.(2.4)** and the scaling procedure described in **2.4.5** may not be considered in the calculation of d_{ji} and Δ_{ji}.

2.7.1.2 – When multi-mode response spectrum analysis described in **2.4** or linear response history analysis described in **2.5.1** is used, the *effective storey drift* , δ_{ji} , of the j'th column or structural wall at the i'th storey of a building shall be obtained in each direction by **Eq.(2.23)**.

$$\delta_{ji} = \frac{q}{I}\,\Delta_{ji} \qquad \textbf{(2.23)}$$

2.7.1.3 – The maximum value of effective storey drifts, $(\delta_i)_{max}$, obtained in each direction for columns or structural walls of a given i'th storey of a building shall satisfy the condition given by **Eq.(2.24)**:

$$\frac{(\delta_i)_{max}}{h_i} \le 0.02 \qquad \textbf{(2.24)}$$

This limit may be exceeded by 50% in single storey frames where seismic loads are fully resisted by steel frames with joints capable of transferring cyclic moments.

2.7.1.4 – The limit given by **Eq.(2.24)** may be exceeded by 20% if nonlinear analysis procedure is performed in accordance with **2.5.2**. For nonlinear analysis, the displacements determined are those obtained directly from the analysis without further modification.

2.7.1.5 – In the case where the condition given in **2.7.1.3** or **2.7.1.4**, whichever applicable, is not satisfied at any storey of the building, the seismic analysis shall be repeated with increased stiffness of the structural system.

2.7.2. Seismic Joints

Excluding the effects of differential settlements and rotations of foundations and the effects of temperature change, sizes of gaps to be retained in the seismic joints between building blocks or between the old and newly constructed buildings shall be determined in accordance with the following conditions:

2.7.2.1 – Sizes of gaps to be provided shall not be less than the square root of sum of squares of average storey displacements of the adjacent buildings (or buildingblocks) multiplied by the coefficient α_G specified below. Storey displacements to be considered are the average values of reduced displacements d_{ji} calculated at the column or structural wall joints of i'th storey. In the cases where the seismic analysis is not performed for the existing old building,