into account the seismic masses of the *basement stories only*. In this case, resulting elastic modal loads should not be reduced (i.e., $q_R = 1$).

(c) Since vibration modes affecting the stiff basement stories and flexible upper stories are expected to be far apart, two separate response spectrum analyses may be performed based on modal seismic loads defined in **(a)** and **(b)** above. In each of those analyses, interaction with the soil surrounding basement stories may be considered with an appropriate soil modeling. The results of such analyses may be directly superimposed.

(d) In-plane strength of ground floor system, which is surrounded by very stiff basement walls and located in the transition zone with the upper stories, shall be checked for internal forces obtained from the analysis explained in **(c)** above.

2.4.3. Number of Vibration Modes

Sufficient number of vibration modes, NS, to be taken into account in the analysis shall be determined to the criterion that the sum of effective participating masses calculated for each mode in each of the given x and y perpendicular lateral earthquake directions shall in no case be less than 90% of the total building mass.

$$\sum_{n=1}^{NS} M_{xn} = \sum_{n=1}^{NS} \frac{L_{xn}^2}{M_n^*} \geq 0.90 \sum_{i=1}^{N} M_i$$

$$\sum_{n=1}^{NS} M_{yn} = \sum_{n=1}^{NS} \frac{L_{yn}^2}{M_n^*} \geq 0.90 \sum_{i=1}^{N} M_i$$

(2.16)

Expressions for L_{xn}, L_{yn} and modal mass M_n shown in **Eqs.(2.16)** are given below for buildings with rigid floor diaphragms:

$$L_{xn} = \sum_{i=1}^{N} M_i \Phi_{xin} \quad ; \quad L_{yn} = \sum_{i=1}^{N} M_i \Phi_{yin}$$

$$M_n^* = \sum_{i=1}^{N} (M_i \Phi_{xin}^2 + M_i \Phi_{yin}^2 + M_{\theta i} \Phi_{\theta in}^2)$$

(2.17)

2.4.4. Modal Combination

2.4.4.1 – *Complete Quadratic Combination (CQC) Rule* shall be applied for the combination of maximum modal contributions of response quantities calculated for each vibration mode, such as the base shear, storey shear, internal force components, displacements and storey drifts. It is imperative that modal combination is applied independently for each response quantity.

2.4.4.2 – In the calculation of *cross correlation coefficients* to be used in the application of the rule, modal damping factors shall be taken as 5% for all modes.

2.4.5. Scaling of Response Quantities

In the case where the base shear in the given earthquake direction, V_{bCx} or V_{bCy}, which is obtained through modal combination according to **2.4.4**, is less than 85% of the corresponding base shear, V_{bx} or V_{by}, obtained by Equivalent Seismic Load Method according to **2.3.2** ($V_{bC} < 0.85V_b$), all internal force and displacement quantities determined by Response Spectrum Analysis Method shall be amplified in accordance with **Eq.(2.18)**.