$$\bar{h} = \frac{\sum_{i=1}^{n} w_i \varphi_{i1} h_i}{\sum_{i=1}^{n} w_i \varphi_{i1}} \qquad (19.3\text{-}2)$$

where

w_i = the portion of the total gravity load of the structure at Level i

φ_{i1} = the displacement amplitude at the i^{th} level of the structure when vibrating in its fundamental mode

h_i = the height above the base to Level i

The preceding designated values of $\bar{W}$, $\bar{h}$, T, and $\tilde{T}$ also shall be used to evaluate the factor α from Eq. 19.2-6 and the factor β_o from Fig. 19.2-1. No reduction shall be made in the shear components contributed by the higher modes of vibration. The reduced base shear ($\tilde{V}_1$) shall in no case be taken less than $0.7V_1$.

19.3.2 Other Modal Effects

The modified modal seismic forces, story shears, and overturning moments shall be determined as for structures without interaction using the modified base shear ($\tilde{V}_1$) instead of V_1. The modified modal deflections ($\tilde{\delta}_{xm}$) shall be determined as follows:

$$\tilde{\delta}_{x1} = \frac{\tilde{V}_1}{V_1}\left[\frac{M_{o1} h_x}{K_\theta} + \delta_{x1}\right] \qquad (19.3\text{-}3)$$

and

$$\tilde{\delta}_{xm} = \delta_{xm} \text{ for } m = 2, 3, \ldots \qquad (19.3\text{-}4)$$

where

M_{o1} = the overturning base moment for the fundamental mode of the fixed-base structure using the unmodified modal base shear V_1

δ_{xm} = the modal deflections at Level x of the fixed-base structure using the unmodified modal shears, V_m

The modified modal drift in a story ($\tilde{\Delta}_m$) shall be computed as the difference of the deflections ($\tilde{\delta}_{xm}$) at the top and bottom of the story under consideration.

19.3.3 Design Values

The design values of the modified shears, moments, deflections, and story drifts shall be determined as for structures without interaction by taking the square root of the sum of the squares (SRSS) of the respective modal contributions. In the design of the foundation, it is permitted to reduce the overturning moment at the foundation–soil interface determined in this manner by 10 percent as for structures without interaction.

The effects of torsion about a vertical axis shall be evaluated in accordance with the provisions of Section 12.8.4, and the P-delta effects shall be evaluated in accordance with the provisions of Section 12.8.7 using the story shears and drifts determined in Section 19.3.2.