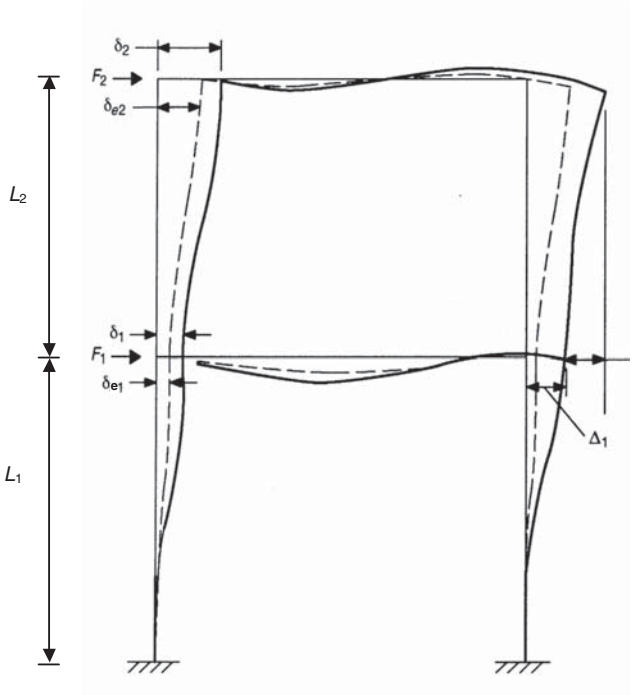

Story Level 2
F_2 = strength-level design earthquake force
δ_{e2} = elastic displacement computed under strength-level design earthquake forces
δ_2 = $C_d\,\delta_{e2}/I_E$ = amplified displacement
Δ_2 = $(\delta_{e2} - \delta_{e1})\,C_d/I_E \le \Delta_a$ (Table 12.12-1)

Story Level 1
F_1 = strength-level design earthquake force
δ_{e1} = elastic displacement computed under strength-level design earthquake forces
δ_1 = $C_d\,\delta_{e1}/I_E$ = amplified displacement
Δ_1 = $\delta_1 \le \Delta_a$ (Table 12.12-1)

Δ_i = Story Drift
Δ_i/L_i = Story Drift Ratio
δ_2 = Total Displacement

FIGURE 12.8-2 Story Drift Determination

12.8.6.2 Period for Computing Drift

For determining compliance with the story drift limits of Section 12.12.1, it is permitted to determine the elastic drifts, (δ_{xe}), using seismic design forces based on the computed fundamental period of the structure without the upper limit (C_uT_a) specified in Section 12.8.2.

12.8.7 P-Delta Effects

P-delta effects on story shears and moments, the resulting member forces and moments, and the story drifts induced by these effects are not required to be considered where the stability coefficient (θ) as determined by the following equation is equal to or less than 0.10:

$$\theta = \frac{P_x \Delta I_e}{V_x h_{sx} C_d} \qquad (12.8\text{-}16)$$

where

P_x = the total vertical design load at and above Level x (kip or kN); where computing P_x, no individual load factor need exceed 1.0
Δ = the design story drift as defined in Section 12.8.6 occurring simultaneously with V_x (in. or mm)
I_e = the importance factor determined in accordance with Section 11.5.1
V_x = the seismic shear force acting between Levels x and $x - 1$ (kip or kN)
h_{sx} = the story height below Level x (in. or mm)
C_d = the deflection amplification factor in Table 12.2-1

The stability coefficient (θ) shall not exceed θ_{max} determined as follows:

$$\theta_{max} = \frac{0.5}{\beta C_d} \le 0.25 \qquad (12.8\text{-}17)$$

where β is the ratio of shear demand to shear capacity for the story between Levels x and $x - 1$. This ratio is permitted to be conservatively taken as 1.0.

Where the stability coefficient (θ) is greater than 0.10 but less than or equal to θ_{max}, the incremental factor related to P-delta effects on displacements and member forces shall be determined by rational analysis. Alternatively, it is permitted to multiply displacements and member forces by $1.0/(1 - \theta)$.

Where θ is greater than θ_{max}, the structure is potentially unstable and shall be redesigned.

Where the P-delta effect is included in an automated analysis, Eq. 12.8-17 shall still be satisfied, however, the value of θ computed from Eq. 12.8-16 using the results of the P-delta analysis is permitted to be divided by $(1 + \theta)$ before checking Eq. 12.8-17.