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of a stiffness reduction factor ϕ_K. These I values lead to a 20 to 25 percent over-estimation of the lateral deflections that corresponds to a stiffness reduction factor ϕ_K between 0.80 and 0.85 on the $P\Delta$ moments. As a result, no additional ϕ factor is needed. Once the moments are established using Eq. (6.6.4.6.2a), selection of the cross sections of the columns involves the strength reduction factors ϕ from 21.2.2.

(b) Sum of P concept:

To check the effects of story stability, δ_s is calculated as an averaged value for the entire story based on use of $\sum P_u/\sum P_c$. This reflects the interaction of all sway-resisting columns in the story on the $P\Delta$ effects because the lateral deflection of all columns in the story should be equal in the absence of torsional displacements about a vertical axis. In addition, it is possible that a particularly slender individual column in a sway frame could have substantial midheight deflections, even if adequately braced against lateral end deflections by other columns in the story. Such a column is checked using 6.6.4.6.4.

The 0.75 in the denominator of Eq. (6.6.4.6.2b) is a stiffness reduction factor ϕ_K, as explained in R6.6.4.5.2.

In the calculation of $(EI)_{eff}$, β_{ds} will normally be zero for a sway frame because the lateral loads are generally of short duration. Sway deflections due to short-term loads, such as wind or earthquake, are a function of the short-term stiffness of the columns following a period of sustained gravity load.

For this case, the definition of β_{ds} in 6.6.3.1.1 gives $\beta_{ds} = 0$. In the unusual case of a sway frame where the lateral loads are sustained, β_{ds} will not be zero. This might occur if a building on a sloping site is subjected to earth pressure on one side but not on the other.

6.6.4.6.3 Flexural members shall be designed for the total magnified end moments of the columns at the joint.

R6.6.4.6.3 The strength of a sway frame is governed by stability of the columns and the degree of end restraint provided by the beams in the frame. If plastic hinges form in the restraining beam, as the structure approaches a failure mechanism, its axial strength is drastically reduced. This section requires the restraining flexural members to have enough strength to resist the total magnified column end moments at the joint.

6.6.4.6.4 Second-order effects shall be considered along the length of columns in sway frames. It shall be permitted to account for these effects using 6.6.4.5, where C_m is calculated using M_1 and M_2 from 6.6.4.6.1.

R6.6.4.6.4 The maximum moment in a compression member, such as a column, wall, or brace, may occur between its ends. While second-order computer analysis programs may be used to evaluate magnification of the end moments, magnification between the ends may not be accounted for unless the member is subdivided along its length. The magnification may be evaluated using the procedure outlined in 6.6.4.5.

6.6.5 *Redistribution of moments in continuous flexural members*

6.6.5.1 Except where approximate values for moments are used in accordance with 6.5, where moments have been

R6.6.5 *Redistribution of moments in continuous flexural members*

Redistribution of moments is dependent on adequate ductility in plastic hinge regions. These plastic hinge regions