CODE

(e) Calculated out-of-plane deflection due to service loads, Δ_s, including $P\Delta$ effects, does not exceed $\ell_c/150$

11.8.2 *Modeling*

11.8.2.1 The wall shall be analyzed as a simply supported, axially loaded member subject to an out-of-plane uniformly distributed lateral load, with maximum moments and deflections occurring at midheight.

11.8.2.2 Concentrated gravity loads applied to the wall above any section shall be assumed to be distributed over a width equal to the bearing width, plus a width on each side that increases at a slope of 2 vertical to 1 horizontal, but not extending beyond (a) or (b):

(a) The spacing of the concentrated loads
(b) The edges of the wall panel

11.8.3 *Factored moment*

11.8.3.1 M_u at midheight of wall due to combined flexure and axial loads shall include the effects of wall deflection in accordance with (a) or (b):

(a) By iterative calculation using

$$M_u = M_{ua} + P_u\Delta_u \qquad (11.8.3.1a)$$

where M_{ua} is the maximum factored moment at midheight of wall due to lateral and eccentric vertical loads, not including $P\Delta$ effects.
Δ_u shall be calculated by:

$$\Delta_u = \frac{5M_u\ell_c^2}{(0.75)48E_cI_{cr}} \qquad (11.8.3.1b)$$

where I_{cr} shall be calculated by:

$$I_{cr} = \frac{E_s}{E_c}\left(A_s + \frac{P_u}{f_y}\frac{h}{2d}\right)(d-c)^2 + \frac{\ell_w c^3}{3} \qquad (11.8.3.1c)$$

and the value of E_s/E_c shall be at least 6.
(b) By direct calculation using:

$$M_u = \frac{M_{ua}}{\left(1 - \frac{5P_u\ell_c^2}{(0.75)48E_cI_{cr}}\right)} \qquad (11.8.3.1d)$$

11.8.4 *Out-of-plane deflection – service loads*

COMMENTARY

R11.8.3 *Factored moment*

R11.8.3.1 The neutral axis depth c in Eq. (11.8.3.1c) corresponds to the following effective area of longitudinal reinforcement.

$$A_{se,w} = A_s + \frac{P_u}{f_y}\left(\frac{h/2}{d}\right)$$

R11.8.4 *Out-of-plane deflection – service loads*