

CODE

14.5.1.4 Flexure and axial strength calculations shall be based on a linear stress-strain relationship in both tension and compression.

14.5.1.5 λ for lightweight concrete shall be in accordance with 19.2.4.

14.5.1.6 No strength shall be assigned to steel reinforcement.

14.5.1.7 When calculating member strength in flexure, combined flexure and axial load, or shear, the entire cross section shall be considered in design, except for concrete cast against soil where overall thickness h shall be taken as 50 mm less than the specified thickness.

14.5.1.8 Unless demonstrated by analysis, horizontal length of wall to be considered effective for resisting each vertical concentrated load shall not exceed center-to-center distance between loads, or bearing width plus four times the wall thickness.

14.5.2 Flexure

14.5.2.1 M_n shall be the lesser of Eq. (14.5.2.1a) calculated at the tension face and Eq. (14.5.2.1b) calculated at the compression face:

$$M_n = 0.42\lambda\sqrt{f'_c}S_m \quad (14.5.2.1a)$$

$$M_n = 0.85f'_cS_m \quad (14.5.2.1b)$$

where S_m is the corresponding elastic section modulus.

14.5.3 Axial compression

14.5.3.1 P_n shall be calculated by:

$$P_n = 0.60f'_cA_g \left[1 - \left(\frac{\ell_c}{32h} \right)^2 \right] \quad (14.5.3.1)$$

14.5.4 Flexure and axial compression

14.5.4.1 Unless permitted by 14.5.4.2, member dimensions shall be proportioned to be in accordance with Table 14.5.4.1, where M_n is calculated in accordance with Eq. (14.5.2.1b) and P_n is calculated in accordance with Eq. (14.5.3.1).

COMMENTARY

R14.5.1.7 The reduced overall thickness h for concrete cast against earth is to allow for unevenness of excavation and for some contamination of the concrete adjacent to the soil.

R14.5.2 Flexure

R14.5.2.1 Equation (14.5.2.1b) may control for nonsymmetrical cross sections.

R14.5.3 Axial compression

R14.5.3.1 Equation (14.5.3.1) is presented to reflect the general range of braced and restrained end conditions encountered in plain concrete elements. The effective length factor was omitted as a modifier of ℓ_c , the vertical distance between supports, because this is conservative for walls with assumed pin supports that are required to be braced against lateral translation as in 14.2.2.2.

R14.5.4 Flexure and axial compression