CODE

COMMENTARY

reinforcement area proportioned to resist N_c according to Eq. (8.6.2.3(b)) is required. The tensile force N_c is calculated at service load on the basis of an uncracked, homogeneous section.

Research on unbonded post-tensioned two-way flat slab systems (Joint ACI-ASCE Committee 423 1958, 1974; ACI 423.3R; Odello and Mehta 1967) shows that bonded reinforcement in negative moment regions, proportioned on the basis of 0.075 percent of the cross-sectional area of the slab-beam strip, provides sufficient ductility and reduces crack width and spacing. The same area of bonded reinforcement is required in slabs with either bonded or unbonded tendons. The minimum bonded reinforcement area required by Eq. (8.6.2.3(c)) is a minimum area independent of grade of reinforcement or design yield strength. To account for different adjacent tributary spans, this equation is given on the basis of slab-beam strips as defined in 2.3. For rectangular slab panels, this equation is conservatively based on the greater of the cross-sectional areas of the two intersecting slab-beam strips at the column. This ensures that the minimum percentage of reinforcement recommended by research is provided in both directions. Concentration of this reinforcement in the top of the slab directly over and immediately adjacent to the column is important. Research also shows that where low tensile stresses occur at service loads, satisfactory behavior has been achieved at factored loads without bonded reinforcement. However, the Code requires minimum bonded reinforcement regardless of service load stress levels to help ensure flexural continuity and ductility, and to limit crack widths and spacing due to overload, temperature, or shrinkage. Research on post-tensioned flat plate-to-column connections is reported in Smith and Burns (1974), Burns and Hemakom (1977), Hawkins (1981), PTI TAB.1, and Foutch et al. (1990).

Unbonded post-tensioned members do not inherently provide large capacity for energy dissipation under severe earthquake loadings because the member response is primarily elastic. For this reason, unbonded post-tensioned structural members reinforced in accordance with the provisions of this section should be assumed to resist only vertical loads and to act as horizontal diaphragms between energy-dissipating elements under earthquake loadings of the magnitude defined in 18.2.1.

8.7—Reinforcement detailing

8.7.1 *General*

8.7.1.1 Concrete cover for reinforcement shall be in accordance with 20.5.1.

8.7.1.2 Development lengths of deformed and prestressed reinforcement shall be in accordance with 25.4.

8.7.1.3 Splice lengths of deformed reinforcement shall be in accordance with 25.5.

R8.7—Reinforcement detailing