

## CODE

forcement is not required in the direction perpendicular to the flexural reinforcement if (a) through (c) are satisfied.

- (a) Precast members are not wider than 3.6 m
- (b) Precast members are not mechanically connected to cause restraint in the transverse direction
- (c) Reinforcement is not required to resist transverse flexural stresses

**24.4.4 Prestressed reinforcement**

**24.4.4.1** Prestressed reinforcement to resist shrinkage and temperature stresses shall conform to Table 20.3.2.2, and the effective prestress after losses shall provide an average compressive stress of at least 0.7 MPa on gross concrete area.

**24.5—Permissible stresses in prestressed concrete flexural members****24.5.1 General**

**24.5.1.1** Concrete stresses in prestressed flexural members shall be limited in accordance with 24.5.2 through 24.5.4 unless it is shown by test or analysis that performance will not be impaired.

**24.5.1.2** For calculation of stresses at transfer of prestress, at service loads, and at cracking loads, elastic theory shall be used with assumptions (a) and (b):

- (a) Strains vary linearly with distance from neutral axis in accordance with 22.2.1.
- (b) At cracked sections, concrete resists no tension.

**24.5.2 Classification of prestressed flexural members**

## COMMENTARY

slabs with closely spaced ribs, there is usually no need to provide reinforcement to withstand shrinkage and temperature stresses in the short direction. This is generally also true for precast, nonprestressed floor and roof slabs. The 3.6 m width is less than that in which shrinkage and temperature stresses can build up to a magnitude requiring reinforcement. In addition, much of the shrinkage occurs before the members are tied into the structure. Once in the final structure, the members are usually not as rigidly connected transversely as monolithic concrete, thus, the transverse restraint stresses due to both shrinkage and temperature change are significantly reduced.

The waiver does not apply where reinforcement is required to resist flexural stresses, such as in thin flanges of precast single and double tees.

**R24.4.4 Prestressed reinforcement**

**R24.4.4.1** Prestressed reinforcement requirements have been selected to provide an effective force on the slab approximately equal to the force required to yield nonprestressed shrinkage and temperature reinforcement. This amount of prestressing—0.7 MPa on the gross concrete area—has been used successfully on a large number of projects.

The effects of slab shortening should be evaluated to ensure serviceable behavior of the structure. In most cases, the low level of prestressing recommended should not cause difficulties in a properly detailed structure. Additional attention may be required where thermal effects or restraint become significant.

**R24.5—Permissible stresses in prestressed concrete flexural members****R24.5.1 General**

**R24.5.1.1** Permissible stresses in concrete address serviceability but do not ensure adequate design strength, which should be checked in accordance with other Code requirements.

A mechanism is provided such that Code limits on stress need not inhibit the development of new products, materials, and techniques in prestressed concrete construction. Approvals for the design should be in accordance with 1.10 of the Code.

**R24.5.2 Classification of prestressed flexural members**