

## CODE

- (f) Requirements for ducts for bonded tendons.
- (g) Requirements for grouting of bonded tendons, including maximum water-soluble chloride ion ( $\text{Cl}^-$ ) content requirements in [19.4.1](#).

**26.10.2 Compliance requirements:**

- (a) Type, size, details, and location of post-tensioning anchorage systems not shown in the construction documents shall be submitted to the licensed design professional for review.
- (b) Tendons and post-tensioning ducts shall be placed within required tolerances and supported to prevent displacement beyond required tolerances during concrete placement.
- (c) Couplers shall be placed in areas approved by the licensed design professional and enclosed in housings long enough to permit necessary movements.
- (d) Burning or welding operations in the vicinity of prestressing reinforcement shall be performed in such a manner that prestressing reinforcement is not subject to welding sparks, ground currents, or temperatures that degrade the properties of the reinforcement.
- (e) Prestressing force and friction losses shall be verified by (1) and (2).
- (1) Measured elongation of prestressed reinforcement compared with elongation calculated using the modulus of elasticity determined from tests or as reported by the manufacturer.
  - (2) Jacking force measured using calibrated equipment such as a hydraulic pressure gauge, load cell, or dynamometer.
- (f) The cause of any difference in force determination between (1) and (2) of 26.10.2(e) that exceeds 5 percent for pretensioned construction or 7 percent for post-tensioned construction shall be ascertained and corrected, unless approved by the licensed design professional.
- (g) Loss of prestress force due to unreplaced broken prestressed reinforcement shall not exceed 2 percent of

## COMMENTARY

ments of the general building code unless the installation of external post-tensioning is to only improve serviceability.

**R26.10.1(f)** Guidance for specifying duct requirements for bonded tendons is provided in [PTI M50.3](#) and [PTI M55.1](#).

**R26.10.1(g)** Guidance for specifying grouting requirements for bonded tendons is provided in [PTI M55.1](#).

**R26.10.2(e)** Elongation measurements for prestressing should be in accordance with the procedures outlined in the *Manual for Quality Control for Plants and Production of Structural Precast Concrete Products* ([MNL 117](#)), published by the Precast/Prestressed Concrete Institute.

**R26.10.2(f)** The 5 percent tolerance for pretensioned construction reflects experience with production of those members. Because prestressing reinforcement for pretensioned construction is usually stressed in air with minimal friction effects, a 5 percent tolerance is considered reasonable. For post-tensioned construction, a slightly higher tolerance is permitted. Elongation measurements for post-tensioned construction are affected by several factors that are less significant or that do not exist for pretensioned construction. The friction along prestressing reinforcement in post-tensioning applications may be affected to varying degrees by placing tolerances and small irregularities in tendon profile due to tendon and concrete placement. The friction coefficients between the prestressing reinforcement and the duct are also subject to variation.

**R26.10.2(g)** This provision applies to all prestressed concrete members. For cast-in-place post-tensioned slab