

## CODE

## COMMENTARY

- (d) Other changes in mixture proportions;
- (e) Reduction in delivery time;
- (f) Closer control of air content;
- (g) Improvement in the quality of the testing, including strict compliance with **ASTM C172**, **ASTM C31**, and **ASTM C39**.

Such changes in operating procedures or small changes in cementitious materials content or water content should not require a formal resubmission of mixture proportions; however, changes in sources of cement, aggregates, or admixtures should be accompanied by evidence submitted to the licensed design professional that the concrete strength will be improved.

(c) Requirements of 26.12.6 for investigating strength tests shall apply if the requirements of 26.12.3.1(a)(2) are not met.

**26.12.4** *Acceptance criteria for shotcrete***R26.12.4** *Acceptance criteria for shotcrete***26.12.4.1** Compliance requirements:

- (a) Specimens for acceptance tests shall be in accordance with (1) and (2):
  - (1) Test panels shall be prepared in the same orientation and by the same nozzle operator placing shotcrete.
  - (2) Cores shall be obtained, conditioned, and tested in accordance with **ASTM C1604**.
- (b) Strength of a shotcrete mixture shall be acceptable if (1) and (2) are satisfied:
  - (1) Every arithmetic average of the strengths from three consecutive test panels equals or exceeds  $f_c'$ .
  - (2) The average compressive strength of three cores from a single test panel is not less than  $0.85f_c'$  with no core having a strength less than  $0.75f_c'$ .
- (c) If either of the requirements of 26.12.4.1(b) are not satisfied, steps shall be taken to increase the average of subsequent strength results.
- (d) Requirements for investigating low strength-test results shall apply if the requirements of 26.12.4.1(b)(2) are not met.

**R26.12.4.1(a)** Cores taken from shotcrete test panels, made in accordance with **ASTM C1140**, typically have length-to-diameter ratios less than 1.75. Therefore the core strengths used for comparison with the acceptance criteria are the values after correction for the length to diameter ratio in accordance with **ASTM C1604**.

**26.12.5** *Acceptance criteria for density of lightweight concrete***R26.12.5** *Acceptance criteria for density of lightweight concrete***26.12.5.1** Compliance requirements:

- (a) Frequency of sampling for determining fresh density shall be according to 26.12.2.
- (b) Sampling of lightweight concrete for determining fresh density shall be at the point of delivery in accordance with **ASTM C172**.
- (c) Fresh density of lightweight concrete shall be determined in accordance with **ASTM C138**.