

In-Place Methods to Estimate Concrete Strength

Reported by ACI Committee 228

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Guidance is provided on the use of methods to estimate the in-place strength of concrete in new and existing construction. The methods include rebound number, penetrometer resistance, pullout, break-off ultrasonic pulse velocity, maturity, and cast-in-place cylinders. The principles, inherent limitations, and responsibility of each method are reviewed. Procedures are presented for developing the relationship needed to estimate compressive strength from in-place results. Factors to consider in planning in-place tests are discussed, and statistical techniques to interpret test results are presented. The use of in-place tests for acceptance of concrete is introduced. The appendix provides information on the number of strength levels that should be used to develop the strength relationship and explains a

regression analysis procedure that accounts for error in both dependent and independent variables.

Keywords: coefficient of variation; compressive strength; construction; in-place tests; nondestructive tests; safety; sampling; statistical analysis.

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