



# OBTAINING AND TESTING DRILLED PORTLAND CEMENT CONCRETE CORES

## 1. SCOPE

- 1.1 This method covers the procedures for obtaining, preparing, and testing cores drilled from concrete for length and compressive strength determination.

## 2. REFERENCED DOCUMENTS

- 1.1 AASHTO Standards
  - T22, Compressive Strength of Cylindrical Concrete Specimens
  - T148, Measuring Length of Drilled Concrete Cores

## 2. APPARATUS

- 2.1 *Core Drill* - This equipment shall be designed for use in core drilling operations. It shall be designed to drill perpendicular to the surface of the concrete. Normally a 6 1/4" (16 cm) (1/8" (0.32 cm) wall) diamond bit (12" (30 cm) long) shall be used. However, when required, other sizes may be substituted.

## 3. SAMPLING

- 3.1 Samples of concrete shall be taken when the concrete has become hard enough to permit sample removal without disturbing the bond between the mortar and coarse aggregate.
  - 3.1.1 In general, concrete should be 3 days old before coring, however, weather conditions and the urgency associated with the particular project shall be considered when determining the earliest date that coring may occur.
- 3.2 The length of drilled cores will be determined in accordance with the provisions of AASHTO T148, Measuring Length of Drilled Cores.

## 4. LOCATION OF CORES

- 4.1 When cores are obtained from structures, the location of coring will be determined based on the specific conditions.
- 4.2 Unless required by special conditions, the following procedures shall be used to determine locations of pavement cores.

- 4.2.1 One core shall be drilled for each unit of pavement. A unit is defined as 1000 linear feet (305 meters) of pavement in each traffic lane, starting at the end of the pavement with the smaller station number.
- 4.2.2 Prior to the start of paving operations, the technicians responsible for coring shall prepare a plan showing limits of each "unit". This plan shall be used to assist in determining locations of coring. The location of each core shall be randomly selected by an appropriate means.
- 4.2.3 Routine cores should not be taken closer than 300 feet (91 meters) from the beginning or end of a unit.
- 4.2.4 Upon removal from the pavement, cores should be transported to the laboratory for length measurements and preparation for tests.
- 4.2.5 Other areas, such as intersections, crossovers, ramps, and the like, will be considered separately with each "unit" representing approximately 1000 square yards (836 square meters). Small irregular areas may be included as part of another unit.

## **5. COMPRESSIVE STRENGTH TESTING REQUIREMENTS**

- 5.1 The ends of the specimens to be tested shall be essentially smooth, perpendicular to the longitudinal axis, and of the same diameter as the body of the specimen. If necessary, the end of the specimen may be cut to provide for a smooth surface.
- 5.2 Any soil-cement, bituminous material, or other matter adhering to the bottom of the core shall be removed by appropriate means before length determination and capping for compressive tests.
- 5.3 The following procedures are to be followed when compressive strength testing is to occur.
  - 5.3.1 Specimens shall be moist cured at  $73.4^{\circ} \text{F} \pm 3^{\circ} \text{F}$  ( $23^{\circ} \text{C} \pm 0.9^{\circ} \text{C}$ ) for at least 40 hours prior to test.
  - 5.3.2 Prior to testing, the length of the capped specimen shall be determined to the nearest 0.1" (0.25 cm). When using the specified diamond bit for drilling, diameter measurements will not be made on each specimen. A nominal diameter for area computation will be determined. For cores drilled by other means, diameter shall be determined at 2 locations to the nearest 0.01" (0.025 cm).
  - 5.3.3 Testing shall be performed in accordance with the applicable provisions of AASHTO T22, Test for Compressive Strength of Molded Concrete Cylinders.
  - 5.3.4 Calculations of the compressive strength of each specimen should be done using the nominal diameter or measured diameter as specified in step c. If the ratio of the

length to diameter is appreciably less than two, make allowance by multiplying the compressive strength by the applicable factor as follows:

Ratio of Length to Diameter (L / d)	Strength Correction Factor
2.00	1.00
1.75	0.99
1.50	0.97
1.25	0.94
1.00	.97

5.4 Report – The report should contain the following information.

5.4.1 Project

5.4.2 Core Number

5.4.3 Core Location

5.4.4 Total Load

5.4.5 Compressive Strength (corrected for length)

5.4.6 Depth of steel reinforcement (CRCP only) *The depth is the distance from the surface of the pavement to the top of the steel.*

5.4.7 Date Poured

5.4.8 Date Drilled

5.4.9 Date Tested

5.4.10 Age