

METHODS OF SAMPLING AND TESTING
MT 106-05
METHOD OF MEASURING LENGTH OF
DRILLED CONCRETE CORES
(Modified AASHTO T 148)

1 Scope:

- 1.1 This method covers the procedure for determining the length of a core drilled from a concrete pavement or structure.

2 Referenced Documents:

2.1 AASHTO:

T 148 Measuring Length of Drilled Concrete Cores

MT Materials Manual:

MT 112 Obtaining and Testing Drilled Concrete Cores

MT 609 Field Numbering Concrete Cylinders

3 Apparatus:

- 3.1 The apparatus shall consist of a caliper that will measure the length of axial elements of the core. While the details of the mechanical design are not prescribed, the apparatus shall conform to the requirements of paragraphs 2.2 through 2.6, inclusive.
- 3.2 The apparatus shall be so designed that the specimen will be held with its axis in a vertical position by three symmetrically placed supports bearing against the lower end. These supports shall be short posts or studs of hardened steel, and the ends that bear against the surface of the specimen shall be rounded to a radius of not less than 6.4 mm ($\frac{1}{4}$ inch) and not more than 12.7 mm ($\frac{1}{2}$ inch).
- 3.3 The apparatus shall provide for the accommodation of specimens of different nominal lengths over a range of at least 100 to 250 mm (4 to 10 inches).
- 3.4 The caliper shall be so designed that it will be possible to make a length measurement at the center of the upper end of the specimen and at eight additional points. The additional points should be spaced at equal intervals along the circumference of a circle whose center point coincides with that of the end area of the specimen and whose radius is not less than one-half, or more than three-fourths of the radius of the specimen.
- 3.5 The measuring rod or other device that makes contact with the end surface of the specimen for measurement shall be rounded to a radius of 3.2 mm ($\frac{1}{8}$ inch). The scale on which the length readings are made shall be marked with clear, definite, and accurately spaced graduations. The spacing of the graduations shall be 2.54 mm (0.10 inch) or a decimal part thereof.
- 3.6 The apparatus shall be stable and sufficiently rigid to maintain its shape and alignment without a distortion or deflection of more than 0.25 mm (0.01 inch) during all normal measuring operations. (Note 1)

Note 1 - For further information relating to the development of this method and apparatus, reference should be made to the "Project Report on a Study of Methods of Measurement of the Length of Cores Drilled from Concrete Structures," prepared by L. W. Teller for Subcommittee VII on Methods and Apparatus for Testing Concrete, of Committee C-9, see Proceedings, Am. Soc. for Testing Materials, Vol. 41 (1942).

4 Test Specimen:

- 4.1** Cores used as specimens for length measurement shall be in every way representative of the concrete in the structure from which they are removed. The specimen shall be drilled with the axis normal to the surface of the structure, and the ends shall be free from all conditions not typical of the surfaces of the structure. Cores that show abnormal defects or that have been damaged appreciably in the drilling operation shall not be used.

5 Procedure:

- 5.1** Before any measurements of the core length are made, the apparatus shall be calibrated with suitable gages so that errors caused by mechanical imperfections in the apparatus are known. When these errors exceed 0.25 mm (0.01 inch), suitable corrections shall be applied to the core length measurements.
- 5.2** The specimen shall be placed in the measuring apparatus with the smooth end of the core (that is, the end that represents the upper surface of a pavement slab or a formed surface in the case of other structures) placed down so as to bear against the three hardened-steel supports. The specimen shall be so placed on the supports that the central measuring position of the measuring apparatus is directly over the mid-point of the upper end of the specimen.
- 5.3** Nine measurements of the length shall be made on each specimen, one at the central position and one each at eight additional positions spaced at equal intervals along the circumference of the circle of measurement described in paragraph 2.4. Each of these nine measurements shall be read directly to 2.5 mm (0.10 inch) and to 1.27 mm (0.05 inch) either directly or by estimation. (Note 2)

Note 2 - If, in the course of the measuring operation it is discovered that at one or more of the measuring points the surface of the specimen is not representative of the general plane of the core end because of a small projection or depression, the specimen shall be rotated slightly about its axis and a complete set of nine measurements made with the specimen in the new position.

6 Report:

- 6.1** The individual observation shall be recorded to the nearest 1.27 mm (0.05 inch) and the average of the nine measurements expressed to the nearest 2.5 mm (0.10 inch) shall be reported as the length of the concrete core.