DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
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METHOD OF TEST FOR DETERMINING LENGTH OF DRILLED CONCRETE CORES

A. SCOPE

This method describes the procedure for determining the length of a core drilled from a concrete structure, particularly from a concrete pavement. This method is a modification of ASTM C174/C174M and AASHTO T 148.

B. REFERENCES

AASHTO T 148 - Measuring Length of Drilled Concrete Cores
ASTM C174/C174M - Measuring Thickness of Concrete Elements Using Drilled Concrete Cores

C. APPARATUS

1. The apparatus shall consist of a caliper-type device 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 immediately below.

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 ¼ in. and not more than ½ in.

3. The apparatus shall provide for the accommodation of specimens of different nominal lengths of at least 4 to 10 in.

4. The calipering device shall be so designed that it will be possible to make a length measurement at the center of the top of the specimen as placed in the device, and at eight additional points spaced at equal intervals along the circumference of a circle whose centerpoint coincides with that of the end area of the specimen and whose radius is not less than one-half nor more than three-fourths of the radius of the specimen.

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 1/8 in. The scale on which the length readings are made shall be marked with clear, definite, accurately spaced graduations. The spacing of the graduations shall be 0.005 ft.

6. The apparatus shall be stable and sufficiently rigid to maintain its shape and alignment without a distortion or deflection of more than 0.001 ft during all normal measuring operations.

D. TEST SPECIMENS

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.

2. Drill the cores with the axis normal to a surface of the structure, and the ends free from all conditions not typical of the surfaces of the structure.

3. Do not use any cores that show abnormal defects or that have been damaged appreciably in the drilling operation.

4. Make certain all extraneous material, such as asphaltic curing seal and cement treated base, is removed from the core before measuring. Use care in removing this material so as to not damage the concrete core sample.

E. PROCEDURE

1. Calibration

   a. Before any measurements of the core length are made, calibrate the apparatus with suitable gages so that errors caused by mechanical imperfections in the apparatus are known or eliminated.

   b. When these errors exceed 0.001 ft, recalibrate the apparatus.

2. Placing the Specimen

   a. Place the specimen in the measuring apparatus with the smooth end of the core, (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.

   b. Place the specimen on the supports so that the central measuring rod of the measuring apparatus is directly over the mid-point of the upper end of the specimen.

3. Measuring the Specimen

   a. Make nine measurements of the length 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 Section C.4.

   b. Read each of these nine measurements directly to the nearest 0.005 ft.

   NOTE: 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.

F. REPORT

Record the individual observations to the nearest 0.005 of a ft and report the average of the nine measurements to the nearest 0.01 of a ft as the length of the concrete core.

G. NOTES

A drawing of an apparatus, that satisfies the conditions of Sections C.1.—C.6., is available from the Transportation Laboratory.

H. HEALTH AND SAFETY

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

Users of this method do so at their own risk.

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(California Test 531 contains 3 pages)