

Method of Test for
**MAKING, CURING AND TESTING SPECIMENS OF PERVIOUS CONCRETE
EDGEDRAINS (DRAINCRETE)**

DOTD Designation: TR 234

I. Scope

- A. This method covers procedures for making, curing, and testing specimens from pervious concrete (draincrete) being used in the construction of edgedrains.
- B. This method describes the procedure for making 6-inch diameter by 6-inch high pervious concrete (draincrete) samples to perform drain rate tests through cured specimens.
- C. Reference Documents
 - 1. DOTD S 301 – Sampling Fresh Concrete
 - 2. AASHTO M 205 – Molds for Forming Concrete Test Cylinders Vertically
 - 3. FM 5-570 – Florida Method of Test for Making, Curing, and Testing Specimens of Draincrete for Edgedrains

II. Apparatus

- A. Cylinder Molds – Right circular cylinders having a nominal inside diameter of 6 ($\pm 1/16$ inches) and a length of 12 ($\pm 1/4$ inches). Molds for specimens shall be made of tough, durable, nonabsorbent plastic material that is nonreactive with concrete containing Portland or other hydraulic cements. Molds shall hold their dimensions and shape under conditions of severe use. The inside surfaces shall be smooth and free of blemishes. Molds shall be watertight during the use as judged by their ability to hold water poured into them.
 - 1. Single Use Molds – All molds shall conform to AASHTO M 205. Approved plastic molds, to be used only once, with a rigid lipped opening, light gray or light in color in order that permanent black ink markings on containers can be easily read. Cardboard cylinder molds shall not be used.
- B. Water Holding Container – Use a container with a known volume. One of the following may be used:
 - 1. Graduated container (flask, beaker, bucket or other pre-measured container) measuring at least 128 ounces by volume.
 - 2. Clean, empty cylinder mold measuring 6 ($\pm 1/16$ inches) in diameter by 12 ($\pm 1/4$ inches) in height. Before testing, weigh out 8.33 pounds of water or pour 128 fluid ounces into the cylinder. Be sure not to include the weight of the cylinder in the 8.33 pounds. Legibly mark the inside of the cylinder at the height of the water column with a permanent marker.
- C. Sampling Receptacle – Suitable heavy gauge metal pan, wheelbarrow, or flat, clean nonabsorbent board of sufficient capacity to allow easy remixing of the entire sample with a shovel or trowel.
- D. Tampers – Two (2) approximately 2-inch by 2-inch square nonabsorbent plastic or wooden shaft tampers approximately 24 inches in length.
- E. Mallet – With a rubber head having a mass of 1.25 ± 0.50 pounds.
- F. Work Base – Stable platform or foundation rigid enough to accommodate a minimum of three (3) molds, (i.e., concrete, plywood, etc.).

- G. Small Tools – Pen (waterproof black ink marker), pails or buckets, shovels, trowels, blunted trowels, wheelbarrow, scoops, spoon, knife, gloves, and a stopwatch.
- H. Burlap or suitable material to cover plastic/fresh concrete from the elements.
- I. Curing Supplies – Approved polyethylene bags and rubber bands or approved plastic cap.

III. Health Precautions

**Warning – Fresh hydraulic cementitious mixtures are caustic and may cause chemical burns to skin and tissue upon prolonged exposure.*

- A. Protect against potential injury by avoiding skin contact with fresh draincrete by wearing appropriate protective clothing and eye wear.
- B. If the freshly mixed draincrete should contact skin or eyes, immediately flush with water for a minimum of 5 minutes. If symptoms continue, consult a physician immediately.
- C. Observe all precautions as specified by the manufacturer before handling fresh draincrete.

IV. Sampling

- A. Obtain sample in accordance with DOTD S 301.
- B. Using the sampling receptacle, obtain a representative portion of draincrete to be poured.
- C. Make two (2) cylindrical samples for each “Lot or Batch” of draincrete.
- D. Record all sample identification information in the project records including the location of the batch, where it was deposited and time specimens were made.
- E. Prior to making draincrete specimens, label the outside of the cylinder molds with black ink pen.

V. Molding Specimens

- A. Place the cylinder molds on a level rigid, horizontal surface, free from vibrations and other disturbances, at a place as near as practicable to the location where the specimens are to be stored and field cured during the first 24 hours.
- B. If it is not practicable to mold the specimens where they are to be stored during the first 24 hours, move the specimens to the place of storage immediately after being prepared. Avoid jarring or striking the specimens when moving the specimens to a safe place.
- C. Use an insoluble marker to place several marks on the inside of the molds 6 inches from the top to serve as a fill gauge.
- D. Using a scoop or blunted trowel, place a representative sample of the batched draincrete in the cylinder molds in one 6-inch layer. Attempt to place an amount of draincrete that will exactly fill the mold to the 6-inch gauge marks after tamping.
- E. When placing the draincrete, move the scoop or trowel around the top edge of the mold in order to ensure symmetrical distribution of the draincrete into the cylinder mold.
- F. Uniformly and forcibly tamp the layer 25 times with the tamper over the cross section of the mold. Do not penetrate the layer when tamping
- G. Immediately after tamping the layer, strike-off excess draincrete flush with the fill gauge marks inside the cylinder molds using a screeding motion with the tamper.
- H. Carefully remove any excess draincrete remaining above the fill gauge marks with a spoon, trowel or similar device.
- I. Perform all finishing of the draincrete samples with as little manipulation necessary to produce a flat surface that is level with the 6-inch gauge fill marks.

VI. Curing

- A. Immediately after finishing, cover the unhardened draincrete specimens with an approved polyethylene bag and rubber band or an approved plastic cap to prevent evaporation of water from the unhardened draincrete specimens.
- B. During the first 24 hours after molding, store all test specimens in the field in the same ambient conditions as the actual draincrete edgedrains.
- C. Specimens shall be secure, vertical, and in an upright position
- D. Store specimens in a location as close to the actual work as possible without being in danger of damage or movement.
- E. In hot weather, shield the specimens from direct sunlight using several layers of wet burlap. Hot weather limitations commence when the internal temperature of the concrete during placement, exceeds 85°F. For further definition of “Hot Weather” see Section 901 of the Louisiana Standard Specifications for Roads and Bridges.
- F. In cold weather, shield the specimens by placing several layers of dry burlap. Maintain the proper curing temperature range. Do not place concrete when the internal temperature of the concrete is below 45°F nor on frozen subgrade or into forms that are below 32°F. For further definition of “Cold Weather” see Section 901 of the Louisiana Standard Specifications for Roads and Bridges.

VII. Procedure

- A. Determine the drain rate of the draincrete specimens in the field or lab at any convenient location where a supply of potable water is available. Perform the tests between 24 hours and 7 days of preparing the specimens.
- B. Carefully cut away the bottom portion of the cylinder molds containing the specimens with an appropriate cutting tool such as a carpet knife or a small knife with a sturdy blade. Work gloves with leather palms and fingers should be worn to protect hands and fingers during this operation. Leave approximately a 1/8-inch lip around the bottom of the mold so that the sample will not fall out of the mold.
- C. Place the molds, with the bottoms removed, vertically and upright with the 6-inch top facing upward and the exposed bottom of the specimens resting on two small blocks that have been eye leveled. The two 2-inch by 2-inch tampers may be used for this purpose. The specimens should be set on the blocks in such a manner as to not impede the flow of water through the draincrete specimen.
- D. Fill the water holding container with 128 ounces or 8.33 pounds of potable water.
- E. Carefully pour the potable water from the container into the open upper end of the 6-inch draincrete specimen. Care shall be taken not to overfill the specimen mold.
- F. Use a stopwatch to time the flow of water through the draincrete specimens.
- G. Begin the timer when the water is first poured into the draincrete specimen mold.
- H. End the timer when the last of the water in the 6-inch portion of the specimen mold clears the surface of the draincrete specimen.
- I. Record the total seconds for the water to clear the surface of the draincrete specimen.
- J. If a stop watch is used, record to the nearest second.
- K. Record the total ounces used during the test (128 ounces by volume or 8.33 pounds).
- L. Calculate the drain rate by dividing the total ounces by the total time (oz./sec.).
- M. Record the drain rate in ounces per second to the nearest tenth.

VIII. Report

- A. Project Number
- B. Location
- C. Date of Pour
- D. Lot/Batch Number
- E. Sample Number (Specimen Identification)
- F. Age of Specimen
- G. Total ounces of water used for drain rate test.
- H. Total seconds from start of pour to moment water clears the surface of the specimen.
- I. Report Drain Rate in ounces per second (oz./sec.) for each cylinder in a lot/batch.
- J. Report the average Drain Rate for the two (2) cylinders in a lot/batch.