

State of Nevada
Department of Highways
Materials and Testing Division

METHOD OF TEST FOR SLUMP OF PORTLAND CEMENT CONCRETE
CONE METHOD

SCOPE

This method of test covers the procedure to be used for determining slump of concrete, both in the laboratory and in the field, and is a modification of ASTM Designation C143.

A. APPARATUS

1. **Mold.** The test specimen shall be formed in a mold made of metal not readily attacked by the cement paste. The metal shall not be thinner than No. 16 gage (Bwg), and if formed by the spinning process, there shall be no point on the mold at which the thickness is less than 0.045 inch (1.14 mm). The mold shall be in the form of the lateral surface of the frustum of a cone with the base 8 inches + 1/8 inch (203.2 + 3.18 mm) in diameter, the top 4 inches + 1/8 inch (101.6 + 3.18 mm) in diameter, and the height 12 inches + 1/8 inch (304.8 + 3.18 mm). The base and the top shall be open and parallel to each other and at right angles to the axis of the cone. The mold shall be provided with foot pieces and handles. The mold may be constructed either with or without a seam. The interior of the mold shall be relatively smooth and free from projections such as protruding rivets. The mold shall be free from dents. A mold which clamps to a nonabsorbent base plate is acceptable provided the clamping arrangement is such that it can be fully released without movement of the mold.
2. **Tamping Rod.** The tamping rod shall be a round, straight steel rod 5/8 inch (15.88 mm) in diameter and approximately 24 inches (609.6 mm) in length, having the tamping end rounded to a hemispherical tip the diameter of which is 5/8 inch (15.88 mm).

B. PROCEDURE

1. **Test Sample.** The sample of concrete from which test specimens are made shall be representative of the entire batch. It shall be obtained in accordance with the method of sampling fresh concrete (Test Method Nev. T425).

¹This test is not considered applicable to nonplastic and noncohesive concrete, nor when there is a considerable amount of coarse aggregate over 2 inches (5.08 cm) in size in the concrete.

2. The test shall be performed as follows:
 - a. Dampen the mold and place it on a flat, moist, non-absorbent (rigid) surface. It shall be held firmly in place during filling by the operator standing on the two foot pieces. From the sample of concrete obtained as described in Procedure 1 above, immediately fill the mold in three layers, each approximately one-third the volume of the mold.²
 - b. Rod each layer with 25 strokes of the tamping rod. Uniformly distribute the strokes over the cross-section of each layer. For the bottom layer this will necessitate inclining the rod slightly and making approximately half of the strokes near the perimeter, and then progressing with vertical strokes spirally toward the center. Rod the bottom layer throughout its depth. Rod the second layer and the top layer each throughout its depth, so that the strokes just penetrate into the underlying layer.
 - c. In filling and rodding the top layer, heap the concrete above the mold before rodding is started. If the rodding operation results in subsidence of the concrete below the top edge of the mold, add additional concrete to keep an excess of concrete above the top of the mold at all times. After the top layer has been rodded, strike off the surface of the concrete by means of a screeding and rolling motion of the tamping rod. Clean away from around the base of the cone all concrete spilled in the process of filling and rodding. Remove the mold immediately from the concrete by raising it carefully in a vertical direction.³
 - d. Immediately measure the slump by determining the difference between the height of the mold and the height over the original center of the base of the specimen. If a decided falling away or shearing off of concrete from one side or portion of the mass occurs, disregard the test and make a new test on another portion of the sample.⁴

²One-third of the volume of the slump mold fills it to a depth of 2 5/8 inches (66.8 mm); two-thirds of the volume fills it to a depth of 6 1/8 inches (155.6 mm).

³The operation of raising the mold shall be performed in 5 to 10 seconds by a steady upward lift with no lateral or torsional motion being imparted to the concrete. The entire operation from the start of the filling through removal of the mold shall be carried out without interruption and shall be completed within an elapsed time of 2 1/2 minutes.

⁴If two consecutive tests on a sample of concrete show a falling away or shearing off of a portion of the concrete from the mass of the specimen, the concrete probably lacks necessary plasticity and cohesiveness for the slump test to be applicable.

C. REPORT

1. Record the slump in terms of inches (mm) to the nearest 1/4 inch (6.35 mm) of subsidence of the specimen during the test as follows:

Slump = 12, minus inches (304.8 minus mm) of height after subsidence.

REFERENCE

ASTM Designation C143