

State of Nevada
Department of Transportation
Materials Division

**METHOD OF TEST FOR SLUMP OF PORTLAND CEMENT CONCRETE
(CONE METHOD)**

SCOPE

This test method covers the procedure to be used for determining slump of concrete, both in the laboratory and in the field. This test is not considered applicable to nonplastic and noncohesive concrete, nor when there is coarse aggregate 50 mm (2 in.) in size or larger in the concrete.

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 1.5 mm (0.060 in.), and if formed by the spinning process, there shall be no point on the mold at which the thickness is less than 1.14 mm (0.045 in.). The mold shall be in the form of the lateral surface of a cone with the base 200 ± 3 mm (8 in. $\pm 1/8$ in.) in diameter, the top 100 ± 3 mm (4 in. $\pm 1/8$ in.) in diameter, and the height 300 ± 3 mm (12 in. $\pm 1/8$ in.). 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 that 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, a round, straight steel rod 16 mm (5/8 in.) in diameter and approximately 600 mm (24 in.) in length, having the tamping end rounded to a hemispherical tip of the same diameter.

SAMPLING

Obtain a representative sample per Test Method Nev. T425.

PROCEDURE

1. This test shall be started within 5 minutes of obtaining the representative sample. The entire operation from the start of the filling with fresh concrete through the removal of the mold shall be carried out without interruption and shall be completed within an elapsed time of 2 ½ minutes.

2. Dampen the mold and place it on a flat, moist, non-absorbent (rigid) surface. The operator standing on the foot pieces shall hold it firmly in place during filling. Immediately fill the mold in three layers, each approximately one-third the volume of the mold. One-third of the volume of the mold fills it to a depth of 68 mm (2 5/8 in.); two-thirds of the volume fills it to a depth of 156 mm (6 1/8 in.).
3. 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 penetrate into the previous layer by approximately 25 mm (1 in.).

When filling and rodding the top layer, heap the concrete above the mold before rodding is started. If the rodding operation results in the concrete receding 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, continue the rod counts. After the top layer has been rodded, strike off the surface of the concrete by screeding and rolling motion of the tamping rod. Clean away all concrete spilled in the process of filling and rodding from around the base of the cone. Remove the mold immediately from the concrete by raising it carefully in a vertical direction. The 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.

4. Immediately measure the slump by determining the vertical difference between the top of the mold and the height of the displaced center of the top surface 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. If 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.

REPORT

Record the slump to the nearest 6 mm (1/4 in.). Results should be documented on NDOT form 020-017.