1. **SCOPE**

1.1. **Description of Test**

This method describes the procedure for making and curing compression test specimens from fresh concrete and for determining the compressive strength of the specimens.

2. **APPARATUS AND MATERIALS**

2.1. **Equipment Required**

Molds - cylindrical in form, made of non-absorbent material, and substantial enough to hold their form during the molding of test specimens. Standard molds shall be 150 mm in diameter and 300 mm in length. Molds shall be water tight and the base plate or bottom shall be at right angles to the axis of the cylinder.

Tamping Rod - a round straight steel rod 16 mm in diameter and 600 mm in length. One end shall be a hemisphere 16 mm in diameter.

Sampling Equipment - scoop or shovel, trowel, containers, saran wrap, tape.

Capping Compound - a mixture of sulphur and granular materials having a compressive strength equal to or greater than the anticipated strength of the specimen.

Capping Device - a device for applying a capping compound to the cylinder and surfaces in the form of plane surfaces at right angles to the axis of the cylinder.

Curing Equipment - a moist storage cabinet or room capable of maintaining specimens at a temperature within ± 1 degrees of 23°C and capable of maintaining a moist condition in which free water is maintained on the surfaces of the specimens.

Testing Machine - a machine of sufficient capacity which will apply a load continuously without shock within a range of 0.140 to 0.350 MPa per second. The testing machine shall be equipped with two steel bearing blocks with hardened faces. One bearing block shall be spherically seated and the other rigidly mounted. The testing machine shall be accurate within a tolerance of ± 1.0 percent of the compressive strength of the specimen.
3. **PROCEDURE**

3.1. **Sample Preparation**

Samples of concrete for tests will be obtained in accordance with STP 106.

3.2. **Test Procedure**

Place the mold on a firm, level surface.

Form the test sample by placing concrete in the mold in three layers of approximately equal volume.

Move the scoop around the top edge of the mold to ensure a symmetrical distribution of the concrete within the mold.

Rod each layer with 25 strokes of the tamping rod. For layers 2 and 3, the rod shall penetrate about 25 mm into the underlying layer.

Distribute the strokes uniformly over the cross-section of the mold.

Close the voids left by the tamping rod by lightly tapping the sides of the mold.

After the top layer has been rodded, the surface will be struck off with a trowel and covered with saran wrap to prevent evaporation.

Store the specimen undisturbed for 24 hours in such a way as to prevent moisture loss and to maintain the specimen within a temperature range of 15°C to 27°C.

Remove the test specimen from the mold between 20 and 48 hours and transfer carefully to the place of curing and testing. If molds are being shipped it is permissible to leave specimen in cardboard mold during transit.

Place the specimen in the water bath and store for the curing period designated in the contract.

After the specimen has been cured for the proper length of time in the water bath remove and cap. The capping compound will be prepared and applied to form a plane uniform surface at right angles to the axis of the cylinder.

Allow the sulphur capping compound to harden at least two hours before applying the load. Specimens will be kept moist until time of test.
Place the specimen in the machine and slowly bring the blocks to bear on the specimen without shock until failure occurs.

Operate the machine at a constant rate within the range of 0.140 to 0.350 MPa per second.

4. **RESULTS AND CALCULATIONS**

4.1. **Calculations**

Calculate the compressive strength in megapascals by dividing the maximum load in Newtons by the average cross sectional area of the specimen in square millimetres.

4.2. **Reporting Results**

Report the maximum load at failure.

5. **ADDED INFORMATION**

5.1. **References**

ASTM Method C873

CAN3-A23.2-M77

5.2. **General**

Make on set of three compressive strength cylinders for about 40 m³ or five truck loads.

Cylinders should be left in their cardboard forms until delivered to a commercial testing lab. The forms will help to prevent damage and will hold in the moisture. Cylinders should be packed in wet sawdust in wooden boxes for transportation to lab from field site as sudden impact may fracture the green concrete and affect the strength.

One cylinder is usually tested at seven days and the remaining two at 28 days. If report forms are available, transfer pertinent data to the form and send it along with set of test cylinders to the commercial lab.

Strengths indicative of the quality of concrete can be obtained only if this procedure is closely followed.
APPROVAL SHEET

New __ Revision ___ Date of Previous Document 85-04-01
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Format of test procedure updated.

Review/Implementation Process:
Reviewed by the Materials Section of the Technical Standards and Policies Branch.

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Nil

Follow Up/Training Required:
Nil

Comments/Concerns/Implications (Budget/Environment/Stakeholders):

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Approval Recommended by R.A. Widger ___________ - -
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Approval Recommended by A.R. Gerbrandt ___________ - -
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Approved by D.G. Metz ___________ - -
Assistant Deputy Minister, Infrastructure Date

Electronic File Updated - -
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