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METHOD OF TEST FOR DETERMINATION OF WATER TRANSMISSION RATE BY CAPILLARY ACTION THROUGH NATURAL BUILDING STONES

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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METHOD OF TEST FOR DETERMINATION OF WATER TRANSMISSION RATE BY CAPILLARY ACTION THROUGH NATURAL BUILDING STONES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 16 May 1967, after the draft finalized by the Stones Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Dense varieties of natural building stones are sometimes used for waterproofing or damp-proofing courses in buildings and their performance would depend upon the satisfactory prevention of flow of water by capillary transmission. The determination of water transmission rate by capillary action through natural building stones, therefore, assumes considerable importance. This standard provides a uniform basis for determination of water transmission rate by capillary action through natural building stones.

0.3 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

0.4 This standard is one of a series of Indian Standards on method of test for natural building stones. Other standards published so far in the series are given in Appendix A.

0.5 In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard lays down the procedure for determination of rate of water transmission rate by capillary action through natural building stones.

*Rules for rounding off numerical values (*revised*).

2. SAMPLING

2.1 The sample shall be selected by the purchaser or his authorized representative from the quarried stone or taken from the natural rock as described in **2.2** and **2.3** so as to represent a true average of the type or grade of stone under consideration.

2.2 In case of stone from ledges or quarries the ledge or quarry face of the stone shall be inspected to determine any variation in different strata. Differences in colour, texture and structure shall be observed. Separate samples of stone weighing at least 25 kg each of unweathered type shall be obtained from all strata that appear to vary in colour, texture and structure. Pieces that have been damaged by blasting driving wedges, heating, etc, shall not be included in the sample.

2.3 In case of field stone and boulders a detailed inspection of the deposits of field stone and boulders, over the area where the supply is to be obtained, shall be made. The different kinds of stone and their condition in the various deposits shall be recorded. Separate samples shall be selected of all classes of stone that would be considered for use in construction as indicated by visual inspection.

2.4 When perceptible variations occur in the quality of rock, the purchaser shall select as many samples as are necessary for determining the range in properties.

3. TEST SPECIMENS

3.1 Test pieces shall be square prism 5×5 cm in cross section and 6 cm in length. The pieces shall be square-cut or fine tooled on all the faces and the dimension 5×5 cm should be cut along the planes of stratification.

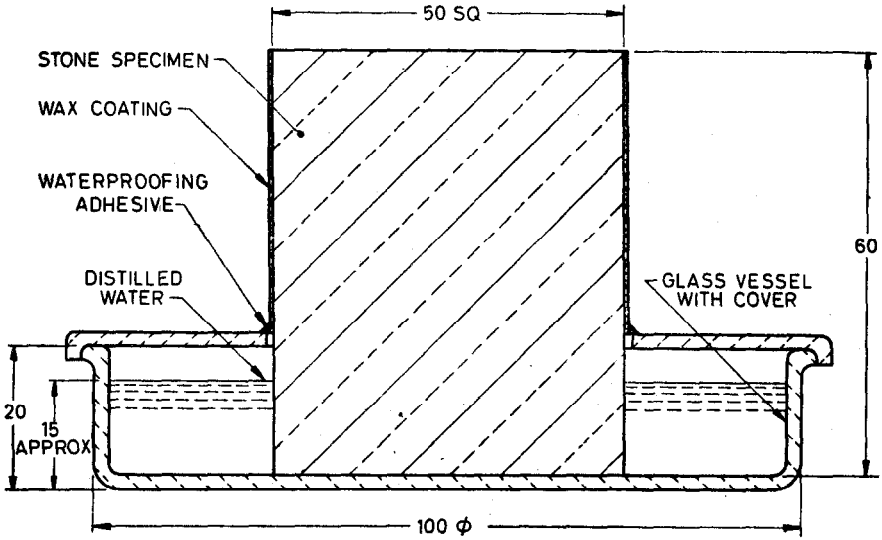
3.2 At least 6 test pieces shall be used for the test.

4. APPARATUS

4.1 General — The apparatus shall consist of a shallow glass vessel 10 cm in diameter and 2 cm deep. The glass vessel shall be provided with a cover plate with a square hole of $5{\cdot}25 \times 5{\cdot}25$ cm in the centre (*see* Fig. 1). The cover should have ground glass flange. The flange should rest on the ground glass flange of the shallow glass vessel. The flanges should be properly greased before putting the cover plate over the glass vessel so as to make the joint leak-proof.

4.2 Sealing Material — Paraffin wax mixed with resin or some other suitable material may be used for sealing the joints and in the hole so as to make the whole arrangement leak-proof.

4.3 Balance — A balance sensitive to 0·01 g for weighing shall be used.



All dimensions in millimetres.

FIG. 1 TYPICAL ARRANGEMENT OF WATER TRANSMISSION TEST

5. TEST PROCEDURE

5.1 The specimen shall be placed in the centre of the glass vessel. The vessel shall then be filled with the distilled water to nearly three fourths (1·5 cm) of its depth and the cover plate shall be placed in position over the vessel so that part of the test specimen projects through the central hole of the cover plate. The sides of the specimen exposed above the cover plate shall be given wax coating so as to prevent evaporation from the sides of specimen.

5.2 All joints shall be made water-tight by using paraffin wax mixed with resin or some other suitable material to ensure that these are leak-proof and no evaporation takes place through them.

5.3 The test shall be carried out at a relative humidity of 65 ± 5 percent and at a temperature of 27 ± 2°C and the sample shall be maintained to this condition for 24 hours before the test is carried out.

5.4 The whole of this arrangement shall then be carefully weighed over the sensitive balance specified in **4.3.**

5.5 Weighing shall be repeated after every 24 hours interval so as to record the rate of loss of water that results due to its evaporation from the top surface of the specimen.

6. REPORT OF TEST RESULTS

6.1 The total loss of water in grams at the end of 48 hours shall be reported.

6.2 The period and the values of rate of loss of water after which it becomes constant shall be reported.

6.3 The water transmission rate by capillary action shall be expressed as loss in water in grams in 48 hours after the rate of loss has become constant.

APPENDIX A

(*Clause* 0.4)

INDIAN STANDARDS ON METHODS OF TESTS FOR NATURAL BUILDING STONES

IS : 1121-1957	Determination of compressive, transverse and shear strengths of natural building stones
IS : 1122-1957	Determination of specific gravity and porosity of natural building stones
IS : 1123-1957	Petrographical examination for natural building stones
IS : 1124-1957	Water absorption of natural building stones
IS : 1125-1957	Weathering of natural building stones
IS : 1126-1957	Durability of natural building stones
IS : 1706-1960	Determination of resistance to wear by abrasion of natural building stones
IS : 4122-1967	Surface softening of natural building stones by exposure to acidic atmospheres

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