## PERMEABILITY AND CAPILLARITY OF SOILS

STP 417
AMERICAN SOCIETY FOR
TESTING AND MATERIALS

# PERMEABILITY AND CAPILLARITY OF SOILS

A Symposium
presented at the
Sixty-ninth Annual Meeting
AMERICAN SOCIETY FOR
TESTING AND MATERIALS
Atlantic City, N. J., 26 June–1 July, 1966

ASTM SPECIAL TECHNICAL PUBLICATION NO. 417

List price \$10.50; 30 per cent discount to members



© BY AMERICAN SOCIETY FOR TESTING AND MATERIALS 1967 Library of Congress Catalog Card Number: 67-16980

#### NOTE

The Society is not responsible, as a body, for the statements and opinions advanced in this publication.

#### Foreword

The papers and discussions included in this Symposium on Permeability and Capillarity of Soils were presented on July 1, 1966, during the 69th Annual Meeting of the Society in Atlantic City, N. J. Committee D-18 on Soils and Rocks for Engineering Purposes sponsored this symposium. A. I. Johnson, U.S. Geological Survey, Denver, Colo., developed the program and served as symposium chairman.

The objective of this symposium was to bring to the attention of ASTM members the test methods and apparatus used by a variety of technical disciplines in the testing of soils and rocks for their permeability and capillarity.

## Related ASTM Publications

Compaction of Soils, STP 377 (1965), \$7.00

Instruments and Apparatus for Soil and Rock Mechanics, STP 392 (1965), \$8.50

Vane Shear and Cone Penetration Resistance Testing of In-Situ Soils, STP 399 (1966), \$2.25

### **Contents**

Introduction	1
Moisture Flow and Equilibria in Unsaturated Soils for Shallow Foun-	
dations—B. J. RICHARDS	4
Discussion	34
Pumping Test Methods for Determining Aquifer Characteristics—	
S. M. LANG	35
Hydraulic Properties of Disturbed and Undisturbed Soils—G. E. LALI- BERTE AND A. T. COREY	56
Apparatus for Measuring Hydraulic Conductivity of Undisturbed Soil	
Samples—K. E. WIT	72
Permeability and Capillarity in Petroleum Reservoir Engineering—	
O. C. BAPTIST	84
Discussion	104
Abnormalities in Hydraulic Flow Through Fine-Grained Soils— J. K. MITCHELL AND J. S. YOUNGER	106
Discussion	140
Field Determination of Permeability by the Infiltration Test—w. E.	1.42
SCHMID	142
Discussion	158
ir and Water Permeability of Compacted Soils—E. L. MATYAS	160
Selected Bibliography on Permeability and Capillarity Testing of Rock	
and Soil Materials—A. I. JOHNSON AND R. C. RICHTER	176

THIS PUBLICATION is one of many issued by the American Society for Testing and Materials in connection with its work of promoting knowledge of the properties of materials and developing standard specifications and tests for materials. Much of the data result from the voluntary contributions of many of the country's leading technical authorities from industry, scientific agencies, and government.

Over the years the Society has published many technical symposiums, reports, and special books. These may consist of a series of technical papers, reports by the ASTM technical committees, or compilations of data developed in special Society groups with many organizations cooperating. A list of ASTM publications and information on the work of the Society will be furnished on request.

