

PIERO SEMBENELLI
MILANO

VOL.103 NO.GT9. SEPT. 1977

**JOURNAL
OF THE
GEOTECHNICAL
ENGINEERING
DIVISION**

PROCEEDINGS OF
THE AMERICAN SOCIETY
OF CIVIL ENGINEERS



AMERICAN SOCIETY OF CIVIL ENGINEERS

BOARD OF DIRECTION

resident

Leland J. Walker

Past President

Arthur J. Fox, Jr.

President Elect

William R. Gibbs

Vice Presidents

Frederick R. Brown

William W. Moore

Ralph H. Wallace

Joseph S. Ward

Directors

Richard O. Albright

Donald S. Austin

George D. Barnes

Lynn S. Beedle

Jose L. Capacete

William J. Carroll

Francis J. Connell

John J. Cusack

Anthony M. DiGioia, Jr.

R. Gene Ellis

George F. Flay, Jr.

James W. Gillespie

James E. Glenn

Robert T. Lawson

Eugene R. McMaster

Virgil G. Meedel

Irvan F. Mendenhall

Franklin D. Meyers

David A. Novick

Edward H. Sokolowski

John H. Wiedeman

EXECUTIVE OFFICERS

Eugene Zwayer, *Executive Director*

Louis L. Meier, *Washington Counsel/ Assistant Secretary*

William N. Carey, *Secretary Emeritus*

William H. Wisely, *Executive Director Emeritus*

Michael N. Salgo, *Treasurer*

Elmer B. Isaak, *Assistant Treasurer*

STAFF DIRECTORS

Donald A. Buzzell, *Managing Director for Education and Professional Affairs*

Don P. Reynolds, *Director—Policy, Research, and Standards Services*

Joseph McCabe, *Director—Education Services*

Edmund H. Lang, *Director—Professional Services*

Paul A. Parisi, *Director—Publication Services*

Albert W. Turchick, *Director—Technical Services*

Gail Bays, *Assistant to the Executive Director*

GEOTECHNICAL ENGINEERING DIVISION

Executive Committee

Richard E. Gray, *Chairman*

John Lysmer, *Vice Chairman*

Kenneth L. Lee

John A. Focht, Jr., *Secretary*

Woodland G. Shockley, *Management Group E*

Contact Member

William F. Swiger

Publications Committee

Raymond J. Krizek, *Chairman*

O. B. Andersland

Warren J. Baker

Don Banks

James M. Bell

Joseph Bowles

Ralph Brown

J. T. Christian

G. W. Clough

C. S. Desai

Tuncer B. Edil

Herb Einstein

L. R. Gebhart

D. H. Gray

Bobby Hardin

Robert D. Holtz

I. M. Idriss

L. H. Irwin

H. Y. Ko

William D. Kovacs

L. M. Kraft

Fred H. Kulhawy

C. C. Ladd

Poul Lade

L. J. Langfelder

Roberto Lastrico

William F. Marcuson

Gholamreza Mestri

Donald J. Murphy

Iraj Noorany

Ed Nowatzki

Ted Park

Adrian Richards

E. T. Selig

Wally Sherman

M. L. Silver

Glen S. Tarbox

G. R. Thiers

Dave Thompson

Kuei-Wu Tsai

Charles R. Ullrich

C. V. G. Vallabhan

V. N. Vijayvergiya

J. Lawrence Von Thun

S. G. Wright

R. N. Yong

John Lysmer, *Exec. Comm. Contact Member*

PUBLICATION SERVICES DEPARTMENT

Paul A. Parisi, *Director*

Technical Publications

Richard R. Torrens, *Editor*

Geraldine Fahey, *Assistant Editor*

John DeGaspari, *Editorial Assistant*

James T. Halston, *Editorial Assistant*

Susan E. Israel, *Editorial Assistant*

Shiela Menaker, *Production Editor*

Richard C. Scheblein, *Draftsman*

Information Services

Irving Amron, *Editor*

COMMITTEE ON PUBLICATIONS

John H. Wiedeman, *Chairman*

James W. Gillespie

Virgil G. Meedel

James E. Glenn

Irvan F. Mendenhall

David A. Novick

CONTENTS

Uplift Resistance of Cohesive Soils <i>by John R. Davie and Hugh B. Sutherland</i>	935
Engineering of Grout Curtains to Standards <i>by Adam Clive Housby</i>	953
Three-Dimensional Slope Stability Analysis Method <i>by H. John Hovland</i>	971
Slabjacking—State-of-the-Art <i>by the Committee on Grouting of the Geotechnical Engineering Division</i>	987

TECHNICAL NOTES

Proc. Paper 13242

Influence of Borehole Imperfections on a Pressuremeter <i>by Richard J. Fragaszy and James A. Cheney</i>	1009
Estimating Bearing Capacity in Sand from SPT Values <i>by Richard H. G. Parry</i>	1014

→

This Journal is published monthly by the American Society of Civil Engineers. Publications office is at 345 East 47th Street, New York, N.Y. 10017. Address all ASCE correspondence to the Editorial and General Offices at 345 East 47th Street, New York, N.Y. 10017. Allow six weeks for change of address to become effective. Subscription price to members is \$12.00. Nonmember subscriptions available; prices obtainable on request. Second-class postage paid at New York, N.Y. and at additional mailing offices. GT, HY.

The Society is not responsible for any statement made or opinion expressed in its publications.

DISCUSSION

Proc. Paper 13164

Bearing Capacity and Settlement of Pile Foundations , by George Geoffrey Meyerhof (Mar., 1976. Prior Discussions: Mar., Apr., 1977). <i>closure</i>	1023
Load Transfer and Hydraulic Fracturing in Zoned Dams ,* by Fred H. Kulhawy and Thomas M. Gurtowski (Sept., 1976). <i>by Heramb D. Shama, Shamsher Prakash, and G. C. Nayak</i>	1026
Bending Test for Compacted Clays ,* by Arif Ajaz and Richard H. G. Parry (Sept., 1976). <i>by Ivan Vanicek</i>	1028
Lateral Earth Pressure at Rest in Soft Clay ,* by K. Rainer Massarsch and Bengt B. Broms (Oct., 1976). <i>by Alan K. Parkin</i>	1030
<i>by David Windle and C. Peter Wroth</i>	1031
Modulus of Soil Reaction Values for Buried Flexible Pipe ,* by Amster K. Howard (Jan., 1977). <i>by Richard A. Parmelee and Ross B. Corotis</i>	1034

INFORMATION RETRIEVAL

The key words, abstract, and reference "cards" for each article in this Journal represent part of the ASCE participation in the EJC information retrieval plan. The retrieval data are placed herein so that each can be cut out, placed on a 3 x 5 card and given an accession number for the user's file. The accession number is then entered on key word cards so that the user can subsequently match key words to choose the articles he wishes. Details of this program were given in an August, 1962 article in CIVIL ENGINEERING, reprints of which are available on request to ASCE headquarters.

*Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.