

PIERO SEMBENELLI
MILANO

VOL.99 NO.SM8. AUGUST 1973

**JOURNAL
OF THE
SOIL MECHANICS
AND FOUNDATIONS
DIVISION**

PROCEEDINGS OF
THE AMERICAN SOCIETY
OF CIVIL ENGINEERS



AMERICAN SOCIETY OF CIVIL ENGINEERS

BOARD OF DIRECTION

President

John E. Rinne

President-elect

Charles W. Yoder

Past President

Oscar S. Bray

Vice Presidents

John W. Frazier

James L. Konski

Dean F. Peterson

L. A. Woodman

Directors

William C. Ackermann

B. Austin Barry

Walter E. Blessey

Bevan W. Brown, Jr.

L. LeRoy Crandal

Elwood D. Dobbs

Lloyd C. Fowler

William R. Gibbs

Paul C. Hassler, Jr.

Hugh W. Hempel

Elmer B. Isaak

Russel C. Jones

Thomas C. Kavanagh

Frederick R. Knoop, Jr.

Arno T. Lenz

Oscar T. Lyon, Jr.

John E. McCall

Jack McMinn

John T. Merrifield

Cranston R. Rogers

Christopher G. Tyson

EXECUTIVE OFFICERS

Eugene Zwoyer, *Executive Director*

Don P. Reynolds, *Assistant Executive Director*

Joseph McCabe, *Director—Education Services*

Edmund H. Lang, *Director—Professional Services*

Paul A. Parisi, *Director—Publication Services*

Albert W. Turchick, *Director—Technical Services*

William D. French, *Director—Support and Administrative Services*

William N. Carey, *Secretary Emeritus*

William H. Wisely, *Executive Director Emeritus*

William S. LaLonde, Jr., *Treasurer*

Elmer K. Timby, *Assistant Treasurer*

COMMITTEE ON PUBLICATIONS

Arno T. Lenz, *Chairman*

Walter E. Blessey, *Vice Chairman*

Bevan W. Brown, Jr., Elwood D. Dobbs

John E. McCall, Jack H. McMinn

SOIL MECHANICS AND FOUNDATIONS DIVISION

Executive Committee

Joseph M. DeSalvo, *Chairman*

Roy E. Olson, *Vice Chairman*

Elio D'Appolonia, Kenneth L. Lee, *Secretary*

George F. Sowers

Jack W. Hill, *Management Group E Contact Member*

Publications Committee

E. T. Selig, *Chairman*

G. B. Clark

D. J. D'Appolonia

C. M. Duke

James M. Duncan

R. D. Ellison

H. L. Gill

D. H. Gray

D. J. Hagerty

Kaare Hoeg

H. M. Horn

J. R. Hall, Jr.

Izzat M. Idriess

H. Y. Ko

R. J. Krizek

K. L. Lee, *Exec. Comm. Contact Member*

C. C. Ladd

L. J. Langfelder

T. K. Liu

Ulrich Luscher

Gholamreza Mesri

Victor Milligan

N. Morgenstern

Donald J. Murphy

Iraj Noorany

P. C. Rizzo

W. G. Shockley

D. H. Shields

A. S. Vesic

R. J. Woodward, Jr.

S. G. Wright

PUBLICATION SERVICES DEPARTMENT

Paul A. Parisi, *Director*

Technical Publications

Richard R. Torrens, *Editor*

Robert D. Walker, *Associate Editor*

Geraldine Cioffi, *Assistant Editor*

Elaine C. Cuddihy, *Editorial Assistant*

Melinda S. Charles, *Editorial Assistant*

Monica Frizell, *Editorial Assistant*

Victoria Koestler, *Editorial Assistant*

Frank J. Loeffler, *Draftsman*

Information Services

Irving Amron, *Editor*

CONTENTS

Compaction Grouting <i>by Douglas R. Brown and James Warner</i>	589
Numerical Analysis of Electro-Osmotic Flow in Soils <i>by Roland W. Lewis and C. Humpheson</i>	603
Axial Stress-Strain Characteristics of Sand <i>by Herbert Breth, Ernst Schuster, and Prabhakar Pise</i>	617

DISCUSSION

Proc. Paper 9892

Load Settlement Prediction for Piles and Piers,^a by Harry G. Poulos (Sept., 1972). <i>errata</i>	635
Analysis of Waco Dam Slide,^a by Stephen G. Wright and James M. Duncan (Sept., 1972. Prior Discussions: Apr., July, 1973). <i>by Kolinjuvadi S. Sankaran and Ravikumar Bhaskaran</i>	635
Current Practice in Abutment and Foundation Treatment,^a by Harris H. Burke, Charles S. Content, and Richard L. Kulesza (Oct., 1972). <i>errata</i>	636

→

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 \$8.00. Nonmember subscriptions available; prices obtainable on request. Second-class postage paid at New York, N.Y. and at additional mailing offices. HY, SM.

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

Strength Properties of Chemically Solidified Soils,^a by James Warner (Nov., 1972).	
<i>by Bruce Lamberton</i>637
<i>by David F. Fawcett</i>638
Soil Parameters for Design of Mt. Baker Ridge Tunnel in Seattle,^a by Mehmet A. Sherif and Robert J. Strazer (Jan., 1973).	
<i>by Birger Schmidt</i>640
Coefficient of Secondary Compression,^a by Gholamreza Mesri (Jan., 1973).	
<i>by William E. Kelly</i>641
<i>by Robert P. Vallee and Orlando B. Andersland</i>642
Constructional Deformations in Rockfill Dam,^a by Arthur Penman and Andrew Charles (Feb., 1973).	
<i>by Nigel A. Skermer</i>644
Comments on Conventional Design of Retaining Structures,^a by Leo Casagrande (Feb., 1973).	
<i>by Walter Lum</i>648

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 × 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.

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