

PIERO SEMBENELLI
MILANO

VOL.98 NO.SM9. SEPT. 1972

JOURNAL OF THE SOIL MECHANICS AND FOUNDATIONS DIVISION

PROCEEDINGS OF
THE AMERICAN SOCIETY
OF CIVIL ENGINEERS



BITCOLD

R

ASCE

1972

3

2-R-44

AMERICAN SOCIETY OF CIVIL ENGINEERS

BOARD OF DIRECTION

President

Oscar S. Bray

President-elect

John E. Rinne

Past President

Samuel S. Baxter

Vice Presidents

Trent R. Dames

John W. Frazier

James L. Konski

James D. Wilson

Directors

William C. Ackermann

B. Austin Barry

Walter E. Blessey

L. LeRoy Crandall

Elwood D. Dobbs

Lloyd C. Fowler

William R. Gibbs

Paul C. Hassler, Jr.

Thomas C. Kavanagh

Frederick R. Knoop, Jr.

Laurens L. Wise

George J. Kral

Arno T. Lenz

Oscar T. Lyon, Jr.

John E. McCall

John T. Merrifield

Dan H. Pletta

Cranston R. Rogers

James E. Sawyer

Ralph H. Wallace

Joseph S. Ward

EXECUTIVE OFFICERS

Eugene Zwoyer, *Executive Director*

Don P. Reynolds, *Assistant Executive Director*

Joseph McCabe, *Director—Education Services*

Edmund H. Lang, *Director—Professional 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

James E. Sawyer, *Chairman*

Arno T. Lenz, *Vice Chairman*

Walter E. Blessey

Elwood D. Dobbs

John E. McCall

Laurens L. Wise

SOIL MECHANICS AND FOUNDATIONS DIVISION

Executive Committee

Elio D'Appolonia, *Chairman*

Joseph M. DeSalvo, *Vice Chairman*

Roy E. Olson, *Secretary*

Jack W. Hilf

Kenneth L. Lee

L. LeRoy Crandall, *Board Contact Member*

Publications Committee

E. T. Selig, *Chairman*

G. B. Clark

D. J. D'Appolonia

C. M. Duke

W. Duvail

R. D. Ellison

D. H. Gray

Kaare Hoeg

H. M. Horn

J. R. Hull, Jr.

T. C. Kenney

H. Y. Ko

C. C. Ladd

L. L. Langfelder

T. K. Liu

Ulrich Luscher

Gholamroza Mesri

Victor Milligon

N. Morgenstern

P. C. Rizzo

W. G. Shockley

A. S. Vesic

R. J. Woodward, Jr.

R. N. Yong

Roy E. Olson, *Exec. Comm. Contact Member*

PUBLICATION SERVICES DEPARTMENT

Paul A. Parisi, *Director*

Technical Publications

Richard R. Torrens, *Editor*

Robert D. Walker, *Associate Editor*

Kathleen H. Masur, *Assistant Editor*

Nadja Berger, *Editorial Assistant*

Virginia G. Fairweather, *Editorial Assistant*

Debbie Mandel, *Editorial Assistant*

Frank J. Loeffler, *Draftsman*

Information Services

Irving Amron, *Editor*

CONTENTS

Papers	Page
EXPERIMENTAL CATIONIC ASPHALT EMULSION GROUTING by Lloyd R. Gebhart	859
ANALYSES OF WACO DAM SLIDE by Stephen G. Wright and James M. Duncan	869
LOAD-SETTLEMENT PREDICTION FOR PILES AND PIERS by Harry G. Poulos	879
IN SITU CREEP ANALYSIS OF ROOM IN FROZEN SOIL by Erik. G. Thompson and Francis H. Sayles	899
SOIL RESISTANCE PREDICTIONS FROM PILE DYNAMICS by Frank Rausche, Fred Moses, and George G. Goble	917
BEHAVIOR OF WHARF AFFECTED BY RIVER FLUCTUATIONS by Richard A. Sullivan	939

DISCUSSION

Proc. Paper 9158

STRESS ANALYSIS OF CONTRACTIVE OR DILATIVE SOIL, by Ian M. Smith and Stephen Kay (July, 1971. Prior Discussion: Feb., 1972). closure	957
---	-----

(over)

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 is \$16.00 per year with discounts to members and libraries. Second-class postage paid at New York, N.Y. and at additional mailing offices. SM.

	Page
EFFECT OF MICA ON K_O COMPRESSIBILITY OF TWO SOILS, ^a by Charles A. Moore (Sept., 1971. Prior Discussions: Apr., May, June, 1972).	
by Mosaid M. Al-Hussaini	958
INITIAL SETTLEMENT OF STRUCTURES ON CLAY, ^a by David J. D'Appolonia, Harry G. Poulos, and Charles C. Ladd (Oct., 1971. Prior Discussion: Mar., 1972).	
by Kalidas Banerjee	961
CONSOLIDATION AT CONSTANT RATE OF STRAIN, ^a by Anwar E. Z. Wissa, John T. Christian, Edward H. Davis, and Sigurd Heiberg (Oct., 1971. Prior Discussions: May, Aug., 1972).	
by Peter M. Byrne	963
NONLINEAR ANALYSES USING SPLINE FUNCTIONS, by Chandrakant S. Desai (Oct., 1971).	
closure	967
LEAVE AND LATERAL MOVEMENTS DUE TO PILE DRIVING, ^a by D. Joseph Hagerty and Ralph B. Peck (Nov., 1971. Prior Discussion: Apr., 1972).	
by E. Montford Fucik	972
FINITE ELEMENT ANALYSES OF RETAINING WALL BEHAVIOR, ^a by G. Wayne Clough and James M. Duncan (Dec., 1971. Prior Discussion: Aug., 1972).	
by Ian K. Lee and John R. Herington	973
LOW VELOCITY PROJECTILE PENETRATION, ^a by Wen L. Wang (Dec., 1972).	
by James A. Cheney	974
STRESS FIELD UNDER SLIPPING RIGID WHEEL, ^a by Mohammed K. Elsamny and Ahmed A. Ghobarah (Jan., 1972. Prior Discussion: Aug., 1972).	
by Jo Yung Wong	977
FINITE ELEMENT ANALYSIS OF STRAIN-SOFTENING CLAY, ^a by Kaare Hoeg (Jan., 1972).	
by Kwan Y. Lo and Chack F. Lee	981

TECHNICAL NOTE

Proc. Paper 9161

EXPANDABLE TIP PILING

 by Thomas L. Adams and Fred C. Stepanich

987

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