PIERO SEMBENELLI MILANO NOVEMBER 1964
PART 1 OF 2 PARTS

JUURNAL of the

Soil Mechanics and Foundations Division

BITCOLD R ASCE 1964

PROCEEDINGS OF THE



AMERICAN SOCIETY

OF CIVIL ENGINEERS

BASIC REQUIREMENTS FOR MANUSCRIPTS

Original papers and discussions of current papers should be submitted to the Manager of Technical Publications, ASCE. Authors should indicate the technical division to which the paper is referred. The final date on which a discussion should reach the Society is given as a footnote with each paper. Those who are planning to submit material will expedite the review and publication procedures by complying with the following basic requirements:

- 1. Titles must have a length not exceeding 50 characters and spaces.
- 2. A summary of approximately 50 words must accompany the paper, a 300-word synopsis must precede it, and a set of conclusions must end it.
- 3. The manuscript (an original ribbon copy and two duplicate copies) should be double-spaced on one side of 8½-inch by 11-inch paper. Three copies of all illustrations, tables, etc., must be included.
- 4. The author's full name, Society membership grade, and footnote reference stating present employment must appear on the first page of the paper.
- 5. Mathematics are recomposed from the copy that is submitted. Because of this, it is necessary that letters be drawn carefully, and that special symbols be properly identified. The letter symbols used should be defined where they first appear, in the illustrations or in the text, and arranged alphabetically in an Appendix.
- 6. Tables should be typed (an original ribbon copy and two duplicate copies) on one side of 8½-inch by 11-inch paper. Specific illustrations and explanation must be made in the text for each table.
- 7. Illustrations must be drawn in black ink on one side of 8½-inch by 11-inch paper. Because illustrations will be reproduced with a width of between 3-inches and 4½-inches, the lettering must be large enough to be legible at this width. Photographs should be submitted as glossy prints. Explanations and descriptions must be made within the text for each illustration.
- 8. The desirable average length of a paper is about 10,000 word equivalents and the absolute maximum is 15,000 word equivalents. As an approximation, each full manuscript page of text, table, or illustration is the equivalent of 300 words.
- 9. Technical papers intended for publication must be written in the third person.
- 10. A list of key words and an informative abstract should be provided for information retrieval purposes.

Reprints from this Journal may be made on condition that the full title, name of author, name of publication, page reference, and date of publication by the Society are given. The Society is not responsible for any statement made or opinion expressed in its publications.

This Journal is published bi-monthly by the American Society of Civil Engineers. Publication office is at 2500 South State Street, Ann Arbor, Michigan. Editorial and General Offices are at United Engineering Center, 345 East 47th Street, New York 17, N.Y. \$4.00 of a member's dues are applied as a subscription to this Journal. Second-class postage paid at Ann Arbor, Michigan.

The index for 1963 was published as ASCE Publication 1964-15 (list price \$2.00); indexes for previous years are also available.

EM.HY.SA.SM.ST.

Piero Jemberell Vol. 90 No. SM 6

Journal of the

SOIL MECHANICS AND FOUNDATIONS DIVISION

Proceedings of the American Society of Civil Engineers

SOIL MECHANICS AND FOUNDATIONS DIVISION EXECUTIVE COMMITTEE

Bramlette McClelland, Chairman; Wesley G. Holtz; T. William Lambe; Woodland G. Shockley; H. Bolton Seed, Secretary; Clyde D. Gessel, Board Contact Member

COMMITTEE ON PUBLICATIONS

Robert V. Whitman, Chairman; Richard G. Ahlvin; John A. Focht, Jr.; Bernard B. Gordon; James P. Gould; Milton E. Harr; Kenneth S. Lane; L. C. Reese; Frank E. Richart, Jr.; R. J. Woodward; H. Bolton Seed, Executive Committee Contact Member

CONTENTS

PIERO SEMBENELLI MILANO

November, 1964

Papers

| | Page |
|--|------|
| Lateral Response of Piles by William R. Spillers and Robert D. Stoll | 1 |
| Piles in Cohesionless Soil Subject to Oblique Pull by Yoshiaki Yoshimi | 11 |
| Soil Properties Research Inventory by Report of the Committee on Properties of Soils and Soil Deposits | 25 |
| Earthquake Stability of Slopes of Cohesionless Soils by H. Bolton Seed and Richard E. Goodman | 43 |
| Fundamental Aspects of the Atterberg Limits by H. Bolton Seed, Richard J. Woodward, and Raymond Lundgren | 75 |

Copyright 1964 by the American Society of Civil Engineers. Note.—Part 2 of this Journal is the 1964-47 Newsletter of the Soil Mechanics Division.

The three preceding issues of this Journal are dated May, 1964, July, 1964, and September, 1964.

| | Page |
|--|---------------------------------|
| Buckling of Long Unsupported Timber Piles by Earle J. Klohn and G. T. Hughes | 107 |
| Analysis of Clay Deformation as a Rate Process by Richard W. Christensen and Tien Hsing Wu | 125 |
| DISCUSSION | |
| | |
| Analysis of Primary and Secondary Consolidation, by Harvey E. Wahls. (December, 1962. Prior discussion: May, July, November, 1963. Discussion closed.) by Harvey E. Wahls (closure) | 161 |
| Laterally Loaded Piles in a Layered Soil System, by M. T. Davisson and H. L. Gill. (May, 1963. Prior discussion: January, 1964. Discussion closed.) by M. T. Davisson and H. L. Gill (closure) | 165 |
| Importance of Free Ends in Triaxial Testing, by Peter W. Rowe and Laing Barden. (January, 1964. Prior discussion: July, 1964. Discussion closed.) by Roy E. Olson and Larry M. Campbell by K. L. Lee and H. Bolton Seed by J. MacNeill Turnbull by Steve J. Poulos | 167 173 175 177 |
| Shearing Resistance of Soils as a Rate Process, by J. K. Mitchell. (January, 1964. Prior discussion: None. Discussion closed.) by J. MacNeill Turnbull by Charles C. Ladd by Ronald F. Scott | 181 181 186 |
| Concept of Curtain Grouting Evaluation, by Leland F. Grant. (January, 1964. Prior discussion: July, 1964. Discussion closed.) by Richard D. Hayes by Lewis A. Schmidt, Jr. by L. E. Culbertson and M. J. Osborne by Portland P. Fox by J. M. Mullarkey and W. S. Zoino | 193 196 198 200 200 |
| Prediction of Pile Capacity by the Wave Equation, by Paul W. Forehand and Joseph L. Reese, Jr. (March, 1964. Prior discussion: None. Discussion closed.) by Teddy J. Hirsch and Charles H. Samson, Jr. | 207 |
| by E. A. L. Smith | 208 |

| | rage |
|--|-------------------|
| Lateral Resistance of Piles in Cohesive Soils, by Bengt B. Broms. (March, 1964. Prior discussion: None. Discussion closed.) by Lyman W. Heller | 211 |
| Mechanics of Inclined Filters in Earth Dams, by V. J. Patel, A. V. Gopala Krishnayya, and K. L. Arora. (March, 1964. Prior discussion: None. Discussion closed.) | 213 |
| by H. Y. Hammad by Asit K. Biswas by Petar Anagnosti by V. N. S. Murthy and N. Babu Shankar | 216 217 218 |
| Unwatering Akosombo Cofferdams, by Donald J. Bleifuss. (March, 1964. Prior discussion: None. Discussion closed.) by H. George Gerdes | 221 |
| Soil Lime Research at Iowa State University, by Manuel Mateos. (March, 1964. Prior discussion: None. Discussion closed.) | 995 |
| by S. Sridhara by Vahit Kumbasar and Ergun Togrol by T. S. Nagaraj | 223 224 225 |
| Analysis of Pile Groups with Flexural Resistance, by Arthur J. Francis. (May, 1964. Prior discussion: None. Discussion closed.) | |
| by Hamilton Gray by B. D. Barmby by Raymond A. Priddle | 227 234 234 |
| Electric Analogs in Time-Settlement Problems, by Patrick Domenico and Glen Clark. (May, 1964. Prior discussion: None. Discussion closed.) | |
| by Julio Barreiros Martins | 239 |
| Current Lunar Soil Research, by James K. Mitchell. (May, 1964. Prior discussion: None. Discussion closed.) | |
| by William D. Rust | 245 |
| Foundation Behavior of Iron Ore Storage Yards, by Ralph B. Peck and Tonis Raamot. (May, 1964. Prior discussion: None. Discussion closed.) | |
| by Melvin I. Esrig | 247 |