

TESTING FORUM

New ASTM Subcommittee to Develop Standards on Field Instrumentation of Soil and Rock

Participants are needed for a new ASTM subcommittee, tentatively titled D18.23 on Field Instrumentation of Soil and Rock, which is currently being organized by ASTM standards-writing Committee D-18 on Soil and Rock.

The new subcommittee will develop standards associated with *in situ* instrumentation of soil and rock. Its tentative scope includes standards for procurement, installation, and monitoring of field instruments to measure internal and external movements, hydraulic or soil pressure, and other items related to the performance of soil and rock or the fluids contained within them, as well as promotion of knowledge and stimulation of research related to such instrumentation.

The standards to be developed will benefit those in the construction industry.

All interested parties are welcome to participate in the work of this subcommittee. An organizing meeting will be held 16 June 1992 in Louisville, Kentucky, in connection with the 14–18 June 1992 standards development meetings of Committee D-18. The next meeting will be held during the 17–22 Jan. 1993 meetings of this committee.

For more information, contact Charles N. Easton, Woodward-Clyde Consultants, 101 South 108th Avenue, Omaha, NE 68154; Tel: 402/334-8181, or Bob Morgan, ASTM, 1916 Race Street, Philadelphia, PA 19103-1187, Tel: 215/299-5505.

ISR Assisting Committee D18 to Establish Standard Soils and Precision Statements

Through a new ASTM Institute for Standards Research (ISR) project, Committee D18 on Soil and Rock will be developing four standard reference soils and precision statements for twelve test methods. The project is a significant step toward improving performance and quality control in testing laboratories.

There have been many attempts by ASTM Committee D18 to understand the precision of its soil test methods through round-robin programs. It may be concluded that the greatest variation in results occurs between laboratories (reproducibility), rather than between operators in the same laboratory (repeatability).

It has become increasingly apparent that there are wide discrepancies in the quality of results of tests performed using many of D18 test methods. Part of the lack of reproducibility might be a result of the laboratories stating they followed the ASTM test method, when in actuality they did not. The intent of the ISR project is to determine and improve the precision of D18 test methods and the laboratories performing them.

The cost of the ISR program is about \$586,000. It is a three-year program to be performed in three parts. Part one involves the preparation of four large standard reference soil samples (about nine tons each): a clean sand, silt, lean clay, and fat clay.

Each sample will be thoroughly blended and placed in five-gallon plastic buckets for storage/shipment: about 125 buckets of sand (about 70 lb each) and about 170 buckets of each fine-grained soil (about 40 lb each) for a total of about 635 buckets.

Parts two and three involve testing to establish the precision (reproducibility and repeatability) for the following test methods:

ASTM Designation	Test Description	Sand	Silt	Lean Clay	Fat Clay
D 422	Sieve/Hyd.	I ⁽³⁾	I	II	II
D 698	Std. Compaction	— ⁽⁴⁾	I	II	II
D 854	Specific Gravity	I	I	I	I
D 1140	% Fines	—	I	II	II
D 2166	UC ⁽¹⁾	—	—	I	II
D 2434	Sand Permeability	II	—	—	—
D 2435	Consolidation	—	—	I	II
D 2850	Triaxial-UU ⁽²⁾	—	—	I	II
D 3080	Direct Shear	II	II	I	II
D 4253	Max. Density	I	—	—	—
D 4254	Min. & Rel. Density	I	—	—	—
D 4318	Atterberg Limits	—	I	I	I

(1) Unconfined Compression

(2) Unconsolidated Undrained

(3) Sieve portion only

(4)—Indicates test not applicable

One group of laboratories (about eight) will perform triplicate tests, such that repeatability and reproducibility precision statements can be determined. Another, larger group of laboratories (about ten) will perform single tests, thereby expanding the data base for the reproducibility precision statement.

Project director Richard S. Ladd, ASTM Committee D18 Chairman, will oversee the project with the assistance of a task group consisting of at least five members. Three task group members will be D18 members: Robert T. Donaghe, Waterways Ex-

periment Station; John T. Germaine, Massachusetts Institute of Technology; and Jan C. Wildman, Ardaman & Associates, Inc. Remaining task group members will be determined when funding is completed.

Sponsors of the program will receive periodic progress reports as well as a final report covering how the standard reference soil samples were prepared, stored, shipped, and tested, along with results of the round-robin testing program and the precision statements. Upon completion of the final testing phase, sponsors

TESTING FORUM

and participating laboratories will receive a portion of the standard reference soil.

These standard reference soil samples will be very beneficial in programs involving quality control, quality improvement, certification, and more. At the conclusion of the project, Committee D18 will retain a portion of the standard reference samples for future use in the development or revision of its standards, mainly precision statements. The committee will also retain a portion of the samples for project participants and sponsors as well as for sale to the general public. Proceeds will be used to replenish the soils for an ongoing program.

A meeting outlining the project will be held during the June ASTM Committee Week, Monday 15 June 1992, from 4:00 p.m. until 6:00 p.m. in Louisville, KY. For further information, contact Kathleen Riley, ASTM Institute for Standard Research, 1916 Race Street, Philadelphia, PA 19103 215-299-5527.

Erratum

Please note the following corrections to the article by Timothy D. Stark and Joseph J. Vettel entitled "Bromhead Ring Shear Test Procedure" in the March 1992 issue of GTJ journal. The last sentence of the second full paragraph in column one on page 26 should read: "It should be noted that remolded specimens are not precut prior to drained shear." The last sentence of the first full paragraph in column two on page 27 should read: "If settlement of the top platen exceeds 0.75 mm, soil should be added and the specimen reconsolidated to reduce the effects of wall friction." The correct spelling of the engineering firm in the last reference on page 32 is Wykeham-Farrance Engineering Ltd.

Call for Papers

ASTM to Hold Symposium on Analysis of Soils Contaminated with Petroleum Constituents

Original papers are needed for the Symposium on Analysis of Soils Contaminated with Petroleum Constituents, sponsored by ASTM Committee D-18 on Soil and Rock in cooperation with the American Petroleum Institute. The symposium will be held 24-25 June 1993 in Atlanta, Georgia.

The symposium will provide an opportunity to examine the existing technology used by scientists and engineers to measure and evaluate soil material which has become contaminated with organic derivatives of petroleum hydrocarbons or unrefined petroleum.

Papers which address the topics listed below are solicited:

- Contaminated Soil Sample Collection
- Volatile Organic Compound Analysis of Soil Contaminated with Petroleum Constituents

- Semi-Volatile Organic Compound Analysis of Soil Contaminated with Petroleum Constituents

- Pesticide and PCB Analysis of Soil Contaminated with Petroleum Constituents

- "Total" Preparation/Analyses of Soil Contaminated with Petroleum Constituents: Total Petroleum Hydrocarbons, Total Organic Carbon, Total Halogenated Carbon, Oil and Grease

- Contaminated Soil Data Interpretation and Statistical Analysis

Prospective authors are asked to submit a title, a 250-300 word abstract, and an ASTM Paper Submittal Form by 23 June 1992 to Dorothy Savini, Symposia Operations, ASTM, 1916 Race Street, Philadelphia, PA 19103-1187, 215/299-5413. Sending your abstract by fax is not encouraged because copies do not reproduce well. Paper Submittal Forms are available from Ms. Savini or from the symposium chairman.

A Special Technical Publication (STP) based on the symposium proceedings is anticipated by ASTM. For more information contact Symposium Chairman Tracey O'Shay, Gordon and Lawton, P.O. Box 80072, Austin, TX 78727-0072, 512/475-2302; or Co-Chairman Keith Hoddinott, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-ME-SR, Aberdeen Proving Grounds, MD 21010-5422, 301/671-2953.

Committee D18 to Hold Meeting

ASTM Committee D18 on Soil and Rock is holding a organizational meeting to establish a new subcommittee. This subcommittee will develop standards associated with in situ instrumentation of soil and rock. The meeting will be held on Tuesday afternoon of 16 June 1992 at the Commonwealth Convention Center, Louisville, KY. The purpose of this meeting will be to finalize its title and scope, along with establishing a priority for standards development. A tentative title is D18.23 on Field Instrumentation of Soil and Rock; while its scope might be: It shall be the responsibility of Subcommittee D18.23 to develop standards for procurement, installation and monitoring of field instruments to measure internal and external movements, hydraulic or soil pressure or other items related to performance of soil and rock, or the fluids contained therein. It shall also be the responsibility of this subcommittee to promote knowledge and stimulate research related to instrumentation of soil and rock. For more information contact Charles N. Easton, (402) 334-8181.

Call for Papers

Symposium on Dynamic Geotechnical Testing II

Papers are invited for a Symposium on Dynamic Geotechnical Testing II sponsored by ASTM Committee D-18 on Soil and Rock and its Subcommittee D18.09 on Dynamic Properties of Soil. The symposium will be held 27-28 Jan. 1994 in Reno, Nevada in conjunction with the 23-26 Jan. 1994 standards development meetings of Committee D-18.

Original papers are sought in three main categories as shown below, but are not limited to these areas:

TESTING FORUM

1. Field Methods

1.1 Seismic/Wave Propagation Methods

- 1.1.1 Refraction/Reflection
- 1.1.2 Crosshole/Downhole Methods Improvements
- 1.1.3 Spectral Analysis of Surface Waves (SASW)
- 1.1.4 Newly Emerging Techniques

1.2 Performance Monitoring

- 1.2.1 Steady State Vibrations
- 1.2.2 Blast/Transient Loads

2. Laboratory Methods

2.1 Travel Time Methods

2.2 Resonance Methods

2.3 Cyclic Testing

- 2.3.1 Resilient Modulus
- 2.3.2 Liquefaction
- 2.3.3 Properties Determination

3. Centrifuge Testing

3.1 Scaling and Modeling Laws

3.2 Boundary Effects on Model Tests

3.3 Instrumentation

- 3.3.1 Accuracy and Optimization of Measurements
- 3.3.2 New and Existing Suitable Instruments

3.4 New Centrifuge Facilities and Apparatus Used in Model Testing

3.5 Inter/Intralaboratory Programs

The primary goal of the symposium is to identify both established and innovative tests for determining cyclic and dynamic properties of soils which are candidates for standardization. A secondary goal is to provide a forum for a discussion of testing which has been conducted using standard methods which can provide insight into considerations for modifying or extending existing standards.

Prospective authors are requested to submit a title, a 250–300 word abstract, and the ASTM Paper Submittal Form below by **23 June 1992** to Dorothy Savini, Symposia Operations, ASTM, 1916 Race Street, Philadelphia, PA 19103-1187, Telephone: 215/299-5413. Authors are urged not to send abstracts by fax because the copies do not reproduce clearly. Additional Paper Submittal Forms are available from Ms. Savini or from the Symposium Chairmen.

Authors will be notified of their papers' acceptance for presentation by 30 Sept. 1992 by the symposium chairman. ASTM may print and distribute abstracts with the approval of the symposium chairman.

A Special Technical Publication (STP) based on the symposium proceedings is anticipated by ASTM. Papers presented at the symposium will be included in the STP if they are approved through the ASTM peer review process. Main authors will receive a complimentary copy of the volume(s) containing their papers. The main author is defined as the author corresponding with the ASTM publications staff. All published authors may purchase reprints of the papers at a nominal cost.

Final manuscripts for the STP based on this symposium are due by **1 March 1993**. This deadline will be rigidly enforced. All papers received after this deadline may be forwarded to an appropriate ASTM journal to be considered for publication.

More information is available from Symposium Chairman Ronald J. Ebelhar, Westinghouse Environmental and Geotechnical Services, Inc., 11785 Highway Dr., Suite 100, Cincinnati, OH 45241, Tel: 513/733-9374, Fax: 513/733-8213; or Co-Chairman Dr. Vincent P. Drnevich, Purdue University, 1284 Civil Engineering Bldg., West Lafayette, IN Tel: 317/494-2159, Fax: 317/494-0395 and Bruce L. Kutter, University of California, Dept. of Civil Engineering, Davis, CA 95616, Tel: 916/752-8099, Fax: 916/752-8924.

Report on Fourth International Symposium on Land Subsidence

by A. I. Johnson

Symposium General Chairman (IAHS)

7474 Upham Court

Arvada, Colorado 80003 USA

Subsidence (land surface sinking) is a phenomenon that occurs in many parts of the world. The subsidence results from the heavy withdrawal of ground water, geothermal fluids, oil, and gas; the extraction of coal, sulphur, and other solids through mining; the hydro-compaction of sediments; oxidation and shrinkage of organic deposits, the catastrophic development of sinkholes in karst terrain, and other phenomena. Over 150 areas of contemporary subsidence are known, such as much as 10 m (33 ft) in countries such as Mexico, Japan, and the United States, for example. Many more areas are likely to develop in the next few decades as a result of accelerated exploitation of natural resources in order to meet the demands of increasing population and industrial development in many developed countries of the world.

Developers, as well as the engineers and scientists making the studies and plans, for industrial complexes, urban developments, water supply systems, and natural resource extractions need to know about the potential hazards, costs, and socio-environmental impacts that can result from land subsidence. To provide a forum for exchange of such information from those specialists who have had to deal with the problems related to land subsidence, a series of international symposia on land subsidence have been organized by the International Association of Hydrological Sciences (IAHS) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) starting in 1969.

The problems of land subsidence were among those included in the list of research projects recommended by UNESCO's International Hydrological Decade, which began in 1965, and the International Hydrological Program—a continuing UNESCO program beginning in 1975. The land subsidence research needs stated in IHD/IHP project documents have resulted in IAHS/UNESCO sponsorship of the International Symposium on Land Subsidence in 1969 in Tokyo, Japan; the Second International Symposium on Land Subsidence in 1976 in Anaheim, California, USA; and the Third International Symposium in 1984 in Venice, Italy. All three symposia have been held in locations of major subsidence problems. Selected papers presented in the three symposia were published as IAHS Publications No. 88 and 89, 121, and 151, respectively.

TESTING FORUM

UNESCO continued a subsidence oriented Working Group under IHP-IV (1991–1995) as project M-3.5(c): “Ground Water Assessment and Environmental Impact due to Over-Development—Land Subsidence.” The Working Group consists of A. Ivan Johnson, Chairman (USA), Laura Carbognin (Italy), Soki Yamamoto (Japan), German Figueroa Vega (Mexico) and Joseph F. Poland (USA). As a first initiative of the IHP-IV Working Group, a Fourth International Symposium on Land Subsidence (FISOLS) was held 12–17 May 1991 in Houston, Texas, USA—a site of major subsidence-induced problems. The symposium was convened by the IAHS Ground Water Commission and UNESCO and was cosponsored by the Harris-Galveston Coastal Subsidence District, U.S. National Committee for Scientific Hydrology, U.S. Geological Survey, and U.S. Bureau of Mines. Cooperators included the Association of Geoscientists for International Development, International Association of Hydrogeologists, the International Society for Mine Surveying, International Society of Soil Mechanics and Foundation Engineers, International Mine Water Association, and Texas Section of the American Society of Civil Engineers. Many local industries and consulting firms also provided some financial support for the symposium.

Because of man’s continuing heavy impact on the surface and subsurface environment, the problems of land subsidence have become increasingly critical over the years since 1969. Therefore, the purpose of the Fourth Symposium was to bring together international interdisciplinary specialists on the problems of land subsidence and to present results of new research and practice in the subject; to exchange with all participants the experiences related to cause, effect, control and remediation of subsidence; to promote technology transfer between the various disciplines and countries represented at the meeting; and to evaluate the advance of knowledge taking place on this subject since 1984 and thus chart a path for future research on land subsidence.

This symposium was somewhat different from the others in several aspects. One is that it was even broader and more interdisciplinary in coverage than the previous symposia. A second aspect was the presentation of a number of new mathematical analyses and modeling techniques useful in predicting the amount of subsidence that may result from certain actions. The program also showed the potential interrelationships of subsidence characteristics, methods of study, and means of remedial work, whether due directly to withdrawal of fluids or due indirectly to dewatering in relation to certain types of mining. The need for a broad interdisciplinary approach to any study of subsidence and to correction of resultant problems is a concept recognized by many of us who have been studying this subject for years. The concept was adequately demonstrated by the interdisciplinary program, the breadth of attendance, and the wide range of sponsors and cosponsors that worked together to develop the program. Of the 62 papers published in the proceedings, eight discussed subsidence problems related to ground water withdrawal, four to oil and gas withdrawal, ten to mining, six to earth fissures, three on special subsidence phenomena related to sinkholes and organic deposits, five on environmental factors, three on coastal and inland flooding, five on instrumentation and measurement, five

on remedial measures, and thirteen on theory and modeling. Nearly 200 scientists and engineers from 21 countries and 21 states of the USA received useful and interesting information from over 100 papers presented orally or by poster at the symposium.

On Wednesday May 15 a field trip by boat and by bus took place in the vicinity of Houston. After a brief tour of the San Jacinto monument museum, the attendees boarded a boat of the Port of Houston Authority. The weather was very pleasant as the boat traveled down the Houston Ship Channel towards the upper part of the Galveston Bay. The trip showed the high density industry, mainly petrochemical, along the Ship Channel that has caused around 6 feet of subsidence from the massive use of ground water by that industry. The boat unloaded at the Sam Houston Dock and attendees toured by bus the Goose Creek Oil Field where subsidence amounts to about 7 feet due to heavy pumping of oil. The bus then wound its way through the Brownwood Subdivision where subsidence due to ground water pumpage caused over 8 feet of subsidence and necessitated construction of a levee that formed an elevated road around the area of several hundreds of nice homes. When hurricane Alicia hit the area in 1983, the resulting storm surge destroyed most of the homes in the subsided area. An excellent field trip guide book that describes all sights and discusses details of the subsidence due to both the ground water and the oil withdrawal was provided to all attendees.

About 50% of the oral and poster authors prepared full length papers for publication. These papers were submitted to three specialists for peer review, after which any needed revision was made and camera ready copy was prepared. Selected papers from this Fourth Symposium have been published as IAHS Publication No. 200.

General Chairman for the FISOLS symposium was Ivan Johnson, Consulting Engineer, Arvada, Colorado, USA. Ronald Neighbors, Manager, Harris-Galveston Coastal Subsidence District, Friendwood, Texas, was Chairman of the Local Arrangements Committee and was assisted by many of his staff members, especially Bill Holzchuh and Carole Baker, as well as by other local Houstonians Neil Bishop of Turner, Collie, & Braden; Bob Gabrysch of the U.S. Geological Survey; Frank Marshall of McClelland Engineers; Jerry Rogers of the University of Houston; and John Seifert of William F. Guyton Associates, Inc. The Technical Program Committee was chaired by Ivan Johnson, Honorary President of IAHS; and other members were Joseph F. Poland, U.S. Geological Survey (Retired), Sacramento, California, USA; Alice Aureli, UNESCO Representative, Paris, France; Laura Carbognin, National Research Council’s Institute for Study of Dynamics of Large Masses, Venice, Italy; Soki Yamamoto, Professor Emeritus, University of Tsukuba, Japan; German Figueroa Vega, ISSMFE Representative, Consultant, Mexico City, Mexico; and Adam Chrzanowski, ISMS Representative, University of New Brunswick, Fredericton, NB, Canada. In addition to assisting with development of the program, members of the Program Committee also served as reviewers of the authors’ papers. Regretfully, Dr. Poland died a few weeks after the symposium.

TESTING FORUM

Appreciation is expressed to the United Nations Educational, Scientific, and Cultural Organization for their cosponsorship and travel grant assistance. Appreciation is also expressed to the other cosponsors, cooperating organizations, and local consulting firms for their financial or service support to the symposium. Also acknowledged with appreciation are the contributions of members of the FISOLS Local Arrangements and Program Committees, session chairmen, authors, reviewers, and many other people who gave of their time, effort, and knowledge to produce the successful program and field trips. A special thanks goes to Ron Neighbors and his office staff in Houston who operated a highly efficient registration system and who were always available when local arrangements or administrative problems arose; to Betty Johnson who provided the very extensive and high quality secretarial assistance needed for the symposium; and to IAHS Secretary General Henny Colenbrander in The Netherlands who provided continual support of IAHS throughout the symposium planning and production years. Finally, the proceedings volume would not have been possible without the excellent publication assistance of Penny Kisby and her assistants at the IAHS Publication Office in Wallingford, UK.

The FISOLS Organizing Committee hopes all readers find the proceedings interesting and informative. The interdisciplinary nature of the program and of the sponsorship of this symposium and its proceedings should encourage new multidisciplinary research and study to solve the many problems related to land subsidence. Many attendees thought this series of symposia should be held every 3 or 4 years to accelerate awareness of this phenomenon, to learn of new subsidence sites, and to encourage research on protection, control, and remediation. Informal invitations to hold the Fifth International Symposium in either the Netherlands or China were received during the meeting and these offers are being pursued through proper channels.

The 704 page Symposium proceedings, IAHS Publication No. 200, edited by A. I. Johnson, is available for \$65 from the IAHS Publications Offices: International Association of Hydrological Sciences, c/o American Geophysical Union, 2000 Florida Avenue, N.W., Washington, D.C. 20009 or Ms. Penny Kisby, Manager, IAHS Press, Institute of Hydrology, Wallingford, Oxfordshire, OX10 8BB, England. The "Field Trip Guide Book on Land Subsidence in Houston, Texas, USA" containing the field trip log, trip stop descriptions and four papers on the oil and ground-water subsidence studies in the area, may be purchased for US \$8.00, by surface mail, from A. Ivan Johnson, AIJ Inc., 7474 Upham Court, Arvada, CO 80003 USA.

Symposium on Durability and Specification Conformance Testing of Rock Used for Erosion Control

The Symposium on Durability and Specification Conformance Testing of Rock Used for Erosion Control will be held 18 June 1992 at the Commonwealth Convention Center in Louisville, KY. The symposium is sponsored by ASTM Committees D-4, D-18, and D-35. The program for the symposium follows:

THURSDAY, JUNE 18, 1992

8:30 a.m.

Opening Remarks—C. McElroy and D. Lienhart, Symposium Co-Chairmen; R. Ladd, D-18 Chairman; and H. Fisher, Subcommittee D18.16 Chairman

SESSION IA: Durability Testing

Session D. Lienhart
Chairman: Symposium Co-Chairman

8:50 a.m.

The Influence of Fabric and Composition on the Durability of Appalachian Shales—L. E. Vallejo, U.S. Office of Surface Mining, Pittsburgh, Pennsylvania, USA; R. A. Welsh, Jr., U.S. Office of Surface Mining, Denver, Colorado, USA; C. W. Lovell, West Lafayette, Indiana, USA; and M. K. Robinson, U.S. Office of Surface Mining, Pittsburgh, Pennsylvania, USA

9:20 a.m.

Verification of Rock Durability Evaluation Procedures Using Petroglyphs and Indian Rock Art—T. L. Johnson, U.S. Nuclear Regulatory Commission, Washington, DC, USA; S. R. Abt, Fort Collins, Colorado, USA; and M. Fliegel, U.S. Nuclear Regulatory Commission, Washington, District of Columbia, USA

9:50 a.m. BREAK

10:10 a.m.

Fractals, Pore Potential and Sphinx Limestone Durability—K. L. Gauri and S. S. Yerrapragada, University of Louisville, Kentucky, USA

10:40 a.m.

The Mill Abrasion for Wear Resistance of Armour Stone—J. P. Latham, Queen Mary and Westfield College, London University, London, UK

11:10 a.m.

Bureau of Reclamation Experience in Testing of Riprap for Erosion Control Embankment Dams—J. A. Farrar, Bureau of Reclamation, Denver, Colorado, USA

11:40 a.m. LUNCH

SESSION IB: DURABILITY TESTING (Continued)

Session C. McElroy
Chairman: Symposium Co-Chairman

TESTING FORUM

1:00 p.m.

Insoluble Residue of Carbonate Rock and Its Application to Rock Durability—H. Fisher, USDA, Soil Conservation Service, Columbus, Ohio, USA

1:30 p.m.

Environmental Testing of Rock Used as Erosion Protection in Arid Environments—D. Duffy, Arizona State University, Tempe, Arizona, USA; and H. Hatzell, Arizona State University, Tempe, Arizona, USA

2:00 p.m.

The Mechanism of Free-Thaw Deterioration on the Great Lakes—D. Lienhart, U.S. Army Corps of Engineers, Cincinnati, Ohio, USA

2:30 p.m.

Experience with Armor Stone Deterioration on the Great Lakes—P. Erickson, U.S. Army Corps of Engineers, Detroit, Michigan, USA

3:00 p.m. BREAK

SESSION III: SPECIFICATION CONFORMANCE TESTING

3:30 p.m.

Proposed Specifications of Rock Used for Erosion Control—C. R. Marek, Vulcan Materials Company, Birmingham, Alabama, USA

4:00 p.m.

Ambiguities Contained in Rock Gradation Specifications—S. N. Stehiik, Colaska Production Company, Nebraska City, Nebraska, USA

4:30 p.m.

Production of Erosion Control Stone—H. Schauburger, Reed Crushed Stone, Paducah, Kentucky, USA

SESSION IV: DISCUSSION

5:30 p.m. CLOSING REMARKS AND SYMPOSIUM
ADJOURNMENT

Call for Papers

International Symposium on Applications of Geosynthetic Technology

The International Symposium on Applications of Geosynthetic Technology will be held 1–2 Oct. 1992 at the Hotel Indonesia, Jakarta, Indonesia.

In 1985, CI-PREMIER CONFERENCE presented perhaps the first conference on geotextiles in the Asian Region. And at that time geotextiles was relatively a new construction technology that has been introduced to assist engineers and contractors overcome problems in soil erosion, shore protection, subsoil drainage, waterway construction, road building, railroad construction, agricultural engineering, hydraulic engineering and many other areas. Over the period, many developments have been made and applications of the technology have also widened in the civil and geotechnical engineering fields.

It is timely, therefore, to call this International Symposium on Geosynthetic Technology to provide another platform and another opportunity for all those involved and interested in Geosynthetics to meet and to discuss the latest developments and especially to share the experiences of the applications of geotextiles, geomembranes, geogrids, geonets and geocomposite drains, etc. in providing solutions to problems.

Authors are invited to submit abstracts (200–300 words) in one A4-page on any aspect of GEOSYNTHETICS covering:

- design & analysis
- functions
- performance
- installation & construction
- specification
- testing
- new application areas, etc

Please note that it is part of the requirements of submission of abstract that the author or one of his co-authors will present the paper at the symposium. Only papers that are registered and presented would be included in the Symposium Documentation.

The following deadlines are to be followed:

—latest date for submission of abstract	31 May 92
—acknowledgment of acceptance	30 June 93
—full text to reach secretariat	15 August 92

The special registration fee for authors/co-authors is S\$600.00 and this fee includes attendance, morning and afternoon refreshments and lunches during the official programme, conference kit and the symposium documentation.

Please send submission to: Symposium Director: John S. Y. Tan, 150 Orchard Road #07-14, Orchard Plaza, Singapore 0923, Tel: 7332922, Tlx: RS 33205 FAIRCO, Fax: 2353530.

MOVING?

To insure uninterrupted service on your *GTJ* subscription, please notify us at least six weeks before you move.

1. Attach your address label from a recent issue in the space provided opposite. (If label is not available, be sure to give your old address, including Zip Code.)



2. Print your name, membership no., and address below. (Be sure to include Zip Code.)

3. Mail entire notice to: **ASTM**

Subscription Dept.—GTJ
1916 Race St.
Philadelphia, PA 19103

Name _____ Membership No. _____

New Address _____

City _____ State _____ Zip Code _____

(please print or type the above information)