Geotechnical Engineering and Environmental Control

La Géotechnique et la Maîtrise de l'Environnement

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The subject matter of geotechnical engineering and environmental control is relatively new and broad in scope. The purpose of this Specialty Session is to provide an opportunity to geotechnical engineers from all over the world to discuss the role of geotechnical engineering with respect to the environment. It is intended to review and to examine problems confronting the profession and to discuss methods for dealing with them.

During the preparatory stage, a questionnaire was sent to all national societies of the ISSMFE to assess what have been done in the various countries around the world and also to solicit opinions and suggestions in regard to the organization of the Specialty Session. Opinions and advices were also sought from a number of individuals who are well known for their activities or interest in the topic of this Specialty Session. On the basis of the opinions gathered, the theme of the Session was set as:

1. The role of geotechnical engineering in the protection of environmental quality, and

2. The geotechnical aspects of environmental protection.

Papers were invited in six areas. A total of 32 papers contributed by authors from 14 countries was accepted for publication in a volume of PROCEEDINGS.

The six areas in which papers were presented are:

1. Environmental problems associated with geotechnical activities and their control —— 6 papers.

2. Geotechnical aspects of environmental protection —— 8 papers.

3. Interaction between geotechnical engineering and other disciplines and their joint efforts on environmental protection —— 2 papers.

4. Geotechnical utilization and control of environmental wastes —— 11 papers.

5. Effects of environmental changes on the behavior of soils —— 4 papers.

6. Modeling of geotechnical data for environmental planning and environmental impact assessment —— 1 paper.

The meeting of this Specialty Session was held in the afternoon of 14th July, the time allocated to the Session was only 3 hours. In order to utilize this limited time efficiently, the Session was led off with a panel discussion and followed by oral contributions from the audience. No paper presentation by authors was allowed.

The panel consisted of three members. Professor George F. Sowers of the Geogia Institute of Technology presented an interesting summary report of the Specialty Conference on the Disposal and Utilization of Solid Waste which was held only one month before the IX ICSMFE under the sponsorship of the American Society of Civil Engineers. The Conference, with emphasis on the United States, pinpointed the complex nature of the problem and examined the many different approaches. SOWERS stated that 'although the nature of the materials involved is generally familiar to geotechnical engineers, the dynamic changes that can take place require a broader outlook than the specialist often commands. A multiple-discipline approach is necessary. The geotechnical engineer most familiar with the behavior of the materials involved, should be best qualified to head the efforts if he will enlarge his perspective and utilize the knowledge and experience of other professionals.'

Mr. B. A. Kantey of Kantey & Templer in South Africa presented a discussion on Geotechniques and the Environment from a practicing engineer's view point. He stated that 'we should try and concentrate on how we can use geotechniques to work with nature and either make our products blend into the natural environment or at the very least, so disguise or hide some of the aspects so as to disarm criticism at the source.' To illustrate the point, KANTEY discussed a specific project in South Africa where geotechniques has played a major part in

providing an acceptable environmental solution.

In Japan, due to rapid development, environmental pollution becomes a serious problem in recent years. The basic law for Environmental Pollution Control was promulgated in 1967. Air pollution, water pollution, soil pollution, noise, vibration, ground subsidence and offensive odor were denoted as typical environmental pollutions. For this Specialty Session, a total of 11 papers was contributed by authors from Japan. Professor Kano Ueshita of Nagoya University presented a summary report on environmental problems related to geotechnical engineering in Japan. As pointed out by the other two panel members and many authors, UESHITA also emphasized the importance of cooperation among specialists in different fields to solve environmental problems.

Following the panel discussions, 11 participants contributed discussions on various topics. The meeting was attended by about 300 Conference delegates. Judging from the enthusiastic response, both in terms of number of papers submitted and participations at the meeting, discussion on this subject matter is certainly worthy to pursue further. As pointed out by Professor C. van der Veen, co-organizer of the Session, a first approach to the problem cannot be otherwise than hesitating and perhaps even erratic. It was suggested that the ISSMFE takes necessary actions by considering the following suggestions:

1. To formulate a clear definition of the meaning of the word "environment" with respect to geotechnical activities.

2. To narrow down and specify the subjects in the geotechnical and environmental fields to a limited and clearly defined number.

3. To consider if anything could be formulated that might serve as part of the legal and moral code of our profession.

LIST OF PAPERS

I/1 Geohydrological Activities in Urban Areas for Environmental Control
L. Andréasson, G. Svensson and P. Svensson, Sweden

I/2 Environmental Impacts on Groundwater by Chemical Grouting
S. Ando and M. Makita, Japan

I/3 Aspects of Environmental Protection in the Geotechnical Preparatory Work of Use-Zoning
P. Reményi, Hungary

I/4 Study on Noise Control by Enclosing Diesel Pile Hammer
J. Saito, Japan

I/5 Environmental Problems Relating to Geotechnical Engineering in Japan
K. Ueshita and S. Imaizumi, Japan

I/6 Noise and Vibration Problems and Control in Geotechnical Engineering (A State-of-the-Art Review)
Y.S. Chae, U.S.A.

II/1 Geotechnical and Environmental Considerations of Development in Hilly Areas
R.N. Chowdhury, Australia

II/2 Environmental Problems of Istanbul's Golden Horn
H.T. Durgunoğlu and S.S. Tezcan, Turkey

II/3 Landfill of Solid Waste on Soft Subsoil
G.J. Flórián, ir., The Netherlands

II/4 Some New Methods of Protecting Natural Slope without Disturbing Environment
M. Fukuoka, Japan

II/5 Natural and Environmental Disasters Caused by Typhoons, Torrential Rains, and Earthquakes in Japan
H. Kawasaki and T. Yamamoto, Japan

II/6 Environmental Control with Underground Dams
S. Matsuo, Japan

II/7 Multistage Environment Controlling System in Geotechnics during Construction and Operating
P. Reményi and M. Varga, Hungary

II/8 Environmental Aspects Related to Sabarmati River Bank Structures,
R.C. Sonpal, India

III/1 Measurement of Absolute Subsidence of the Soft Clay Area of Bangkok
J. Hothmer, Germany

III/2 Dredging PCB Contaminated Sediments in the Hudson River
T.F. Zimmie, and T.J. Tofflemire, U.S.A.

IV/1 Solidification of Harmful Wastes and Muds by Means of the Formation of Cement Bacillus and Its Application
A. Ariizumi, T. Oosuga and H. Kurihara, Japan

IV/2 Load Bearing Capacity of Compacted Waste Disposal Materials
H.Y. Fang, R.G. Slutter and R.M. Koerner, U.S.A.

IV/3 Exploratory Studies of Calcined Bauxite-Waste as Pozzolana for Road Stabilization
A.A. Hammond, Ghana

IV/4 Generation, Movement and Control of Gas in Sanitary Landfills
J.G. Laguros and J.M. Robertson, U.S.A.

IV/5 Identification of a Bauxite Waste for Engineering Purposes
M.D. Gidigasu, Ghana

IV/6 Some Measurements of Compressibility of Sanitary Landfill Material
P.J. Moore and I.V. Pedler, Australia

IV/7 Geotechnical Reformation of a River Depositing Sludge Containing Toxic Substances Such As Mercuric Compounds
T. Kuwayama, Y. Yamamoto, K. Murate, and S. Matsuda, Japan

IV/8 Utilization of Environmental Wastes in Highway Engineering Practice
T.K. Natarajan and E.S. Rao, India

IV/9 On a Reclaimable Technique by Cementing Treatment for Soils, Ashes of Urban Trash and Industrial Wastes
E. Shimizu, Japan

IV/10 Mineralogical and Geotechnical Controls on the Storage and Use of British Coal-Mine Wastes
R.K. Taylor and A.E. Cobb, U.K.

IV/11 Effect of Environmental Pollution from a Cement Factory on Geotechnical Properties of Soils
R.B. Singh, India

V/1 A Study of the Effects of Environment on the Resistance of Earth Works in Tropical Climate — A Few Suggestions for a Possible Improvement
J.M. Gresillon, Haute-Volta

V/2 Influences of Microorganisms on Engineering Properties of Soft Clay
S. Matsuo, M. Kamon, and P.N. Lan, Japan

V/3 Influence of Amorphous Material on Soil Performance and Its Relation to Environmental Weathering
R.N. Yong and A.J. Sethi, Canada

V/4 Effect of Leaching on Undrained Shear Strength Behavior of a Sedimented Clay
S.M. Woo and Z.C. Moh, R.O.C.

VI/1 Modeling of the Nōbi Ground Water Basin to Solve the Subsidence Problem
K. Ueshita, K. Itabashi, H. Tanahashi, and T. Satō, Japan

The printed PROCEEDINGS of this Specialty Session consists of two volumes. The first volume contains the 32 papers and is 480 pages. The second volume includes the panel presentations and other written contributions. The PROCEEDINGS may be obtained at US$32.00 per set, including insurance and surface postages, from the Organizer at the following address:

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