ENGINEERING PROPERTIES OF LATERITIC SOILS

PROPRIETES MECANIQUES ET PHYSIQUES DES LATERITES

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The purpose of this Specialty Session was to discuss specific problems of identification and classification, determination of engineering properties, interpretation of testing results, and utilization of lateritic soils for construction. The development of this Session was based upon some 22 papers presented by interested participants from 12 countries. A volume of transaction containing 18 of the 22 papers was published prior to the Conference.

The papers covered a wide range of topics, from geological formation to field performance. The 22 papers may be broadly divided into several groups •, namely:

(1) Definition and formation - 2 papers
(2) Mineralogy and index properties - 2 papers
(3) Classification - 1 paper
(4) Effects of method of preparation on engineering characteristics - 2 papers
(5) Regional studies on the engineering properties - 10 papers
(6) Method of improvement - 1 paper
(7) In situ properties - 2 papers
(8) Field performance of lateritic soils in road construction - 2 papers

To facilitate discussion, the papers were grouped and the program of the Session was subdivided into four main parts (two for each afternoon on the 28th and 29th of August). The topics discussed in the course of the Session were:

(1) Definition, formation and classification (one part)
(2) Engineering characteristics(two parts)
(3) Field performance (one part)

The meetings were conducted in a combination of formal presentation and informal discussion. Each meeting was started with the presentation of a state-of-the-art report by the General Reporter, followed by a panel discussion and informal participation of the members of the audience. A.L. Little of the United Kingdom, J.W.S. de Graft-Johnson of Ghana and Raymong Lundgren of the U.S.A. acted as the general reporters for the three main topics. The panels consisted of authors of papers and invited speakers. The meetings were chaired by E.W. Brand of Thailand/U.K., Chin Fung Kee of Malaysia and Sean Mackey of Hong Kong.

There has been considerable controversy up to now on the use of the terms "laterite" and "lateritic soil". For this Specialty Session, in the course of selecting papers and reviewing of literature, the broadest definition has been followed. This subject matter was of considerable interest and generated a number of discussions during the first meeting. In his general report, LITTLE proposed the following definition:

"Igneous (and metamorphic••) rock tropically weathered in situ wich has decomposed partially or totally with a concentration of iron or aluminium sesquioxides, at the expense of silica"

DE GRAFT-JOHNSON presented a comprehensive review on the various engineering characteristics, including compaction characteristics, strength, permeability, consolidation, swelling properties and stabilization techniques.

LUNDGREN gave a very detailed account on the field performance of lateritic soils and laterites in a large number of countries. Performance records described included the use of and problems associated with lateritic soils in roads and airfields, earth structures, foundations and cut slopes. Several problems of particular importance were discussed, including degradation, compaction, environmental effects, stabilization, construction and design practices.

Reading the papers presented to this Specialty Session has made everyone to realize that we are each pursuing our own particular lines of enquiry to the exclusion of all others. As LITTLE said in his report,"Instead of coming closer together we are drifting further apart and shall soon reach a position of total incomprehensibility and non-communication with each other". It was suggested that the International Society cor-

relates the research effort in laterites to produce some worthwhile ideas applicable to laterites whatever their origin. The Organizer would like to propose that further discussion be held among engineers and researchers interested in this problem, particularly those from the African, Asian and Pan American regions.

• As a matter of fact, there were many overlaps in the subject matter.

•• Metamorphic rock was included after discussion

LIST OF PAPERS

1. LITTLE, A.L. The Engineering Classification of Residual Tropical Soils
2. RUDDOCK, E.C., Properties and Position in Lateritic Ground: Some Statistical Relationships
3. Moh, Z.C. and MAZHAR, F.M., Effects of Method of Preparation on Index Properties of Lateritic Soils
4. CORREIA, J.A.; ANTUNES, A.M.C. and TEIXEIRA, J.A.P.G., Results of the Fractional Identification of Three Lateritic Gravels
5. MORIN, W.J. and PARRY, W.T., Mineralogy and Index Properties of Some African Lateritic Residual Soils
6. NOVAIS-FERREIRA. H. and MEIRELES, J.M.F. The Influence of Temperature of Humidification on the Geotechnical Properties of Lateritic Soils
7. TROW, W.A. and MORTON, J.D., Laterite Soils at Guardarraya, La Republica Dominicana, Their Development, Composition and Engineering Properties
8. LAB. NAC. ENG. CIVIL, et al, Portuguese Studies on Engineering Properties of Lateritic Soils
9. DE CASTRO, E.A. A Swelling Test for the Study of Lateritic Soils
10. BRAND, E.W. and HONGSNOI, M., Effects of Method of Preparation on Compaction and Strength Characteristics of Lateritic Soils
11. DE GRAFT-JOHNSON, J.W.S., BHATIA, H.S. and GIDIGASU, D.M., The Engineering Characteristics of the Laterite Gravels of Ghana
12. BALDOVIN, G., The Shear Strenght of Lateritic Soils
13. MATYAS, E.L., Some Engineering Properties of Sasumua Clay
14. MUKTABHANT, C. and ONGSKUL, S., Stabilization of Lateritic Soil with Sand
15. PRAKASH, S. and BASAVANNA, B.M., In Situ Properties of a Leterite for Hammer Foundations
16. CHIN, F.K., The Point Resistance of Model Piles in Remoulded Lateritic Clay
17. SANTOS, J.C., Utilization of Lateritic Soils for Construction Purposes
18. MELLIER, G. and PHILIPPONNAT, G., Utilisation Routiere des Laterites-Gabon
19. SHUSTER, J.A., Durability Testing of Lateritic Gravels from Thailand
20. VALLERGA, B.A., VAN TIL, C.J. and RANANAND, N., Engineering Properties of Lateritic Soils Used in Thailand Road Construction
21. PEAKER, K.R. and MORTON, J.D., Engineering and Geological Properties of Lateritic Materials - Singapore
22. MAHMOOD, A. and MOH, Z.C., Triaxial and Stabilometer Properties of a Lateritic Soil

GENERAL REPORTERS

1. LITTLE, A.L., Definition, Formation and Classification
2. DE GRAFT-JOHNSON, J.W.S., Engineering Characteristics
3. LUNDGREN, R., Field Performance

The printed PROCEEDINGS of this Specialty SESSION consist of two volumes. The first volume contains 18 papers, and the second volume includes the three General Reports, written discussions and the remaining papers. PRODEEDINGS may be ordered at U.S. $ 25 per set, including postages, from the Organizer at the following address:

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All orders must be accompanied by payment (payable to the Asian Institute of Technology).