

PROCEEDINGS OF THE 2ND INTERNATIONAL SYMPOSIUM ON FIELD  
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# FIELD MEASUREMENTS IN GEOMECHANICS

*Edited by*

S.SAKURAI

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*VOLUME ONE*

- 1 *Fundamentals*
- 2 *Dams and foundations of structures*
- 3 *Soil and rock slopes*



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PROCEEDINGS OF THE 1988 INTERNATIONAL SYMPOSIUM ON THE  
MECHANICS OF SOILS AND FOUNDATIONS

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VOLUME ONE

1. Foundations

2. Geotechnical Engineering

3. Soil and Rock Mechanics

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## Preface

The 2nd International Symposium on Field Measurements in Geomechanics was in succession to that held in Zurich, Switzerland in 1983. The main objective of this Symposium was to review technical advances made in field measurements in geomechanics since the last symposium, and to provide a forum for presentation and discussion of new developments.

Field measurements are a powerful tool for the economic design and monitoring of structures at the various stages of construction, and for their service life. These structures include, for example, dams, the foundations of structures, tunnels, underground caverns, slopes, and mining and seashore structures. In designing these structures, the geological conditions of the ground in/on which the structures are to be built must first be investigated, and mechanical constants and initial stress of the ground must be measured with sufficient accuracy. Owing to the surprisingly rapid progress of electronics technology, various types of instruments have been successfully developed recently. Thus, it is not difficult to obtain sufficiently accurate and reliable data with respect to the in-situ conditions of the ground.

The real behaviour of the structure, however, frequently differs from that predicted by analysis conducted at the design stage, although sophisticated numerical analysis techniques are applied. This may be due to the fact that all the information concerning in-situ rock and soil characteristics necessary for the analyses cannot be fully assessed in advance. In order to overcome this difficulty, one possibility is to calibrate the design parameters used for the original design, by interpreting the results of field measurements performed during the construction of the structures. This is an entirely different design philosophy from that for bridge type structures, but is a rather essential feature in geotechnical engineering practices.

Under these circumstances, large scale measurements become more and more important, and efficient instruments must be developed for obtaining precise, dependable data. In particular, high accuracy and reliability are required for monitoring the isolation of radioactive waste materials, for preventing serious