

Introduction

Performance monitoring today plays a major role in civil engineering construction involving soil and rock. Typical reasons for embarking on a performance monitoring program are to check the validity of design assumptions, to provide an early warning of distress to an excavation support or a structure, to verify suitability of an innovative and potentially cost saving construction technique, and to provide data for advancing the state of the art. Although many dependable performance monitoring instruments are available, the success of a monitoring program depends heavily on the skill with which engineers establish basic monitoring criteria and procedures.

Recognizing the importance of these basic criteria and procedures, ASTM Committee D-18 on Soil and Rock for Engineering Purposes considered it desirable to organize and sponsor this symposium. The specific purpose of the symposium was to provide a baseline from which to establish criteria and methods for monitoring geotechnical construction. Emphasis in calling for papers and presentations was placed in two categories: (1) discussions of why monitoring is necessary, what parameters should be measured, what accuracy is required, and how instrumentation data should be evaluated, and (2) case studies of performance monitoring, in which a particular effort is made to include a thorough and honest evaluation of the adequacy of the total monitoring program. No limitation was placed on the type of construction project.

In general, this volume presents particular case studies rather than general criteria. The papers describe braced excavation projects, tieback projects, a program to consolidate soft soils by dewatering, railroad embankments, large buried culverts, mat foundations, and an innovative deformation measuring technique.

The symposium was divided into two sessions. During the morning session five case histories were presented, covering instrumentation to monitor performance of a braced excavation, two tied-back excavations, a program of consolidation by dewatering, and an embankment on soft soils. The presentations were followed by a discussion between: L. I. Stern (moderator), Dames & Moore; G. E. Bauer, University of Ottawa; R. A. Brown, Law Engineering Testing Co.; A. Partos, Site Engineers

Inc.; U. Dash, Pennsylvania Department of Transportation; and J. A. Shuster, American Drilling and Boring Co., Inc.

The afternoon session consisted of a panel discussion, with participation from the floor, on the topic "Planning of Instrumentation Programs to Monitor Geotechnical Construction." An opening statement was made by the moderator, C. J. Dunnicliff, Soil & Rock Instrumentation Inc., suggesting that many instrumentation programs fail in their purpose because the engineer does not approach the program design in a logical sequence. The opening statement included suggestions for a suitable and complete logical design sequence, and subsequent discussion centered on those suggestions. Pannelists were: E. T. Selig, State University of New York at Buffalo; R. J. Dietrich, Shannon & Wilson, Inc.; T. L. Neff, Massachusetts Institute of Technology; and W. E. Jaworski, Goldberg-Zoino & Associates, Inc.

The papers in this volume have been grouped according to project type. It is hoped that the accumulated information on planning and executing monitoring programs will provide a useful basis for other engineers faced with similar tasks.

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Soil & Rock Instrumentation, Inc., Newton
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L. I. Stern

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