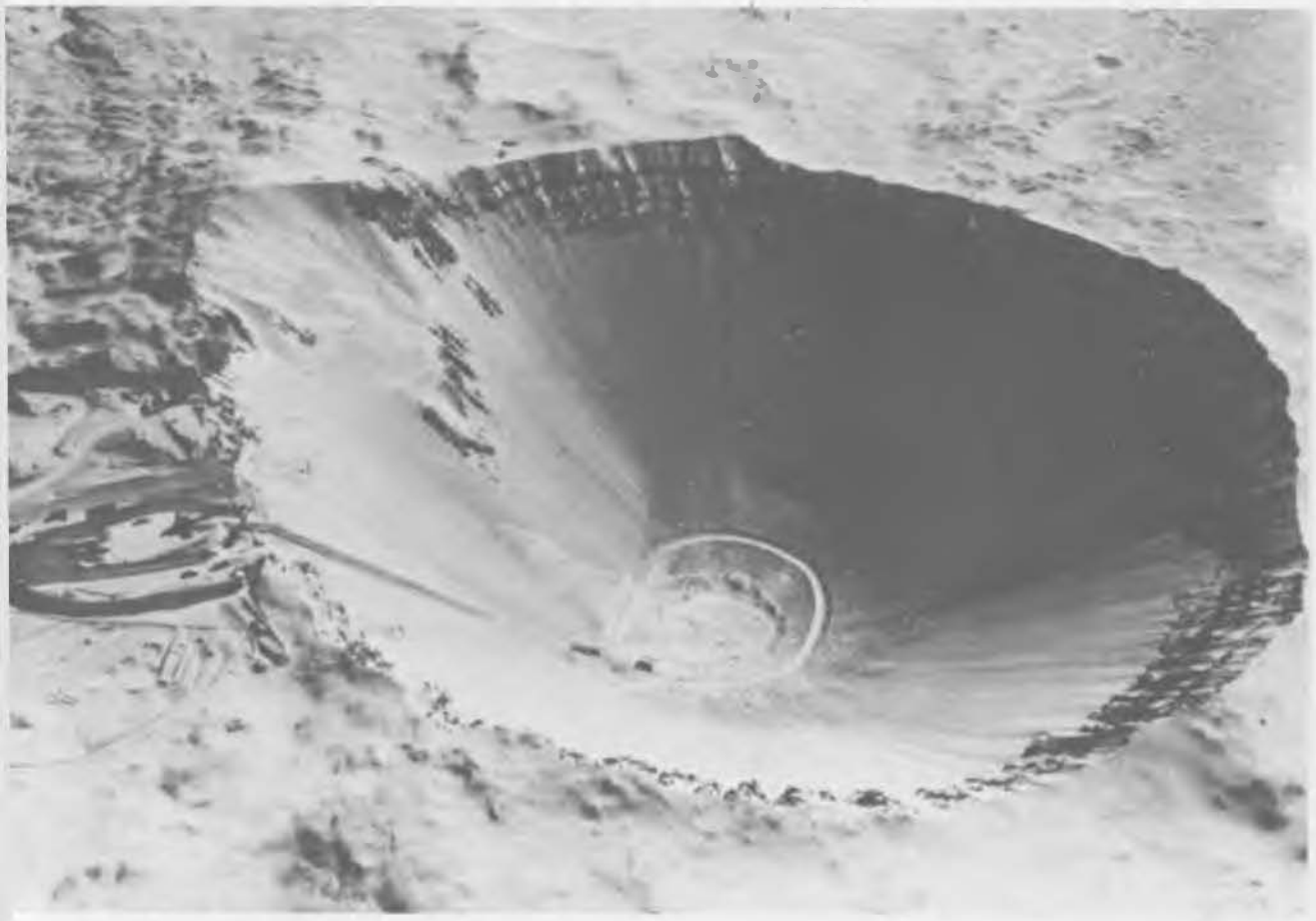
ENGINEERING GEOLOGY
CASE HISTORY NUMBER 9

Geological Factors in Rapid Excavation

Edited by Howard Pincus



THE
GEOLOGICAL SOCIETY
OF AMERICA
ENGINEERING GEOLOGY DIVISION

Geological Factors in Rapid Excavation

Edited by Howard Pincus

with contributions by
Vinton Bacon, M. Friedman,
Richard Hamburger, George E. Heim,
Takeshi Iwasaki, Stanley A. Kling,
Dennis Lachel, John Logan,
Leonard A. Obert, Joseph M. Pugliese,
Carl H. Roach, George M. Sowers,
and James R. Swaisgood

Prepared for the
Engineering Geology Division of
The Geological Society of America

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Preface

Burgeoning interest in recent years in the technology of rapid excavation is manifest in a spate of titles of symposia, lectures, published articles, and technical reports on this subject.

The symposium, "Geological Factors in Rapid Excavation," presented as part of the Engineering Geology program of the 1970 meetings of The Geological Society of America, addressed itself to the roles of both geology and geologists in rapid excavation. Symposium speakers and attendants included many who were not geologists and, accordingly, the discourse was neither parochial nor self-congratulatory.

This volume is the vehicle for presenting the published versions of most of the papers presented at the symposium.

Some of the authors (Obert, Lachel, Heim and others, and Roach) call our attention to needs; for example, for refinement of measurements of "rock quality," for training engineering geologists to provide reliable evaluations on excavation problems, for training both engineers and geologists to relate soil and rock properties to stratigraphy, for reliably predicting rock properties ahead of the working face, and for geological data that will support a total systems approach to rapid excavation.

Other authors (Hamburger, Pugliese) show how geological information is used or should be used in particular excavation procedures or rock types. Elsewhere (Pugliese, Sowers, Logan and others) the volume presents approaches to rock fragmentation that rest primarily on field, laboratory, or theoretical work. The variety of analyses presented here, even in such a small number of papers, suggests that the armamentarium for attacking our technical problems may be considerably more formidable than many of us had realized. For example, the papers on extension fracture (Sowers) and sliding friction (Logan and others) lay the groundwork for far-reaching practical developments.

The opening paper by Obert was presented midway through the symposium as the featured address at the annual Engineering Geology Luncheon. Its style and content, however, qualify it as a highly appropriate technical introduction to the volume.

The closing note by Heim, Swaisgood, and Bacon, who presided as session co-chairmen and who concluded the symposium with a panel and floor discussion, succinctly presents their views and their reactions to some of the discussions. Especially noteworthy is the recommendation that prospective contractors certify that they have, in fact, reviewed the basic geological and geophysical data collected for the project: the acquisition of such data must become more than a contractual formality.

This collection of papers does not dispose of major obstacles to achieving routinely efficient "rapid excavation." (In fact, "efficient" seems to emerge here as a more important and inclusive adjective than "rapid.") However, the papers do seem to point the way to greater efficiency by both operational and scientific routes. If this volume should cast a little light along such a pathway, it will have served its purpose.

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