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GEOTECHNICAL PRACTICE IN DAM REHABILITATION

Proceedings of the specialty conference

Sponsored by the Geotechnical Engineering Division
of the American Society of Civil Engineers

North Carolina State University
Raleigh, North Carolina
April 25-28, 1993

Edited by Loren R. Anderson

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ABSTRACT

This proceedings, *Geotechnical Practice in Dam Rehabilitation*, consists of papers presented at the Specialty Conference sponsored by the Geotechnical Engineering Division of the American Society of Civil Engineers held in Raleigh, North Carolina, April 25-28, 1993. The conference provided a forum for the discussion of the rehabilitation of dams, including case histories and current geotechnical practice. The topics covered by this proceeding include: 1) Inspection and monitoring of dams; 2) investigation and evaluation of dams and foundations; 3) risk and reliability assessment; 4) increasing reservoir capacity, spillway modifications and overtopping; 5) seepage control; 6) improving stability of dams, foundations and reservoir slopes; 7) rehabilitation for seismic stability; and 8) geosynthetics and ground improvement techniques.

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PREFACE

In recent years, new dam construction has been limited in the United States; but major efforts are underway to rehabilitate many existing dams. Many of these dam modifications have been initiated to satisfy new hydrologic or hydraulic criteria; however, almost all remedial work requires geotechnical investigations, design and construction. The conference addressed new developments and advances in all areas of geotechnical practice associated with the analysis, design and performance of dam rehabilitation. This well-defined area of geotechnical practice is of major importance to the geotechnical profession. Examples of pertinent subject areas in which significant advances have been made include dam safety assessment, site characterization techniques, stability and seepage analysis techniques, software develpment, seepage control, stabilization, spillway improvements, use of geosynthetics, and performance monitoring and instrumentation. Important recent developments in these areas are presented and discussed.

In addition, the conference sessions presented new procedures for improving seismic stability, including applications of geosynthetics and ground improvement techniques. Also, issues related to sudden drawdown analysis and risk and reliability assessment were discussed. The program featured invited papers by internationally recognized experts, presentations of selected submitted papers, a panel discussion, a poster session and technical exhibits.

The idea for this specialty conference was developed by Nick Sitar, Chair of the Engineering Geology Committee. In June, 1991, a full proposal was prepared by Ray Martin and submitted to the Executive Committee of the Geotechnical Engineering Division in behalf of the Engineering Geology and Embankment Dams and Slopes Committees. Following approval by the Executive Committee and ASCE the organizing committee listed below was appointed to plan the conference.

SPONSORING ORGANIZATION: Geotechnical Engineering Division of ASCE
HOST ORGANIZATIONS: North Carolina State University, Civil Engineering Department
North Carolina Section of ASCE
CO-OPERATING ORGANIZATIONS: U.S. Committee on Large Dams
Association of State Dam Safety Officials

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The committee acknowledges the support of ASCE Staff in organizing and publicizing the conference.

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FOREWORD

This publication contains the papers prepared for oral and poster session presentation at the ASCE Specialty Conference on Geotechnical Practice in Dam Rehabilitation held in Raleigh, North Carolina from April 25 through April 28, 1993. The conference focused on Dam Rehabilitation and included papers and discussions on case histories and geotechnical practice associated with inspection and monitoring; investigation and evaluation; risk and reliability assessment; increasing reservoir capacity, spillway modifications and overtopping; seepage control; improving stability of dams, foundations and reservoir slopes; rehabilitation for seismic stability; and geosynthetics and ground improvement techniques.

In response to the initial call for papers 130 abstracts were submitted for review by the organizing committee. In reviewing the abstracts the committee considered whether or not the topic of the abstract would fit the theme of the conference, the perceived potential quality of the full paper and the need for program balance. Included in these proceedings are sixteen invited papers and fifty five papers that were submitted through the call for papers. It is the practice of the Geotechnical Engineering Division that each paper published in a Conference Proceedings undergo a peer review before being acccepted. The standards for review and acceptance for this conference were essentially the same as those for papers being reviewed for possible publication in the ASCE Journal of Geotechnical Engineering. Since many of the papers submitted for the conference were case histories acceptance criteria for case history papers were further defined. Each paper was sent to two reviewers and required two positive reviews to be accepted for publication in the proceedings. In the case of a split review the paper was sent for a third review. The individuals listed below served as referees during the peer review process:

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Kenneth D. Weaver
Joseph Welsh
Les Youd

All papers published in these proceedings are eligible for discussion in the Journal of the Geotechnical Engineering Division. The due date for discussions is the same as that for an April, 1993 journal paper. All of the papers are also eligible for ASCE awards.

Finally, I express thanks to Lisa Brenchley of Utah State University and to Shiela Menaker for the ASCE staff who made these proceedings possible. Lisa did a tremendous job in tracking all of the papers, processing all of the mail and the many telephone calls.

Loren R. Anderson
Civil & Environmental Engineering
Utah State University
Editor

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