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Challenges and Recent Advances in Geotechnical and Seismic Research and Practices



Proceedings of the Second International Conference on Geotechnical and Earthquake Engineering

EDITED BY
Jianping Hu, Jianlin Ma, Jorge Meneses, Tong Qiu, Xiong (Bill) Yu, and Xiangwu (David) Zeng

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Challenges and Recent Advances in Geotechnical and Seismic Research and Practices

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Chengdu, China

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The Chinese Academy of Engineering, Division of Civil, Hydraulic, and Architecture Engineering
The Geo-Institute of the American Society of Civil Engineers

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Preface

This Geotechnical Special Publication contains selected technical papers of the 2nd International Conference on Geotechnical and Earthquake Engineering organized by the International Association of Chinese Geotechnical Engineers (IACGE) and the Chinese Academy of Engineering, Division of Civil, Hydraulic and Architecture Engineering. The conference covers a broad field of topics in geotechnical and geotechnical earthquake engineering, including soil dynamics and earthquake engineering, foundation engineering and pile testing, excavation and shoring, embankments and retaining walls, tunnels and underground structures, dams and levees, slopes and landslides, expansive soils and loess, geology and rock mechanics, ground improvement techniques, geotechnical numerical modeling and computation, and geotechnical support technologies during construction.

About four hundred abstracts were received in response to the Call for Papers. The abstracts were reviewed by the organizing committee and as a result three hundred and fifty invitations were extended to prepare and submit full-length papers. A total of three hundred and twenty full-length papers were received in response to these invitations and one hundred and seventy papers out of the total were written in English.

The papers written in English were reviewed following the same procedures and technical standards of the ASCE Geotechnical Special Publications. Each paper must have received two positive reviews to be accepted and must have revised to conform to the mandatory revisions of the reviewers. A number of papers went through more than one cycle of review and revision. Standard editorial review forms and checklists were utilized to maintain uniform technical standards of the papers. As a result, one hundred and thirty papers were accepted for the conference and ninety-two papers were selected to be included in this ASCE Geotechnical Special Publications. All the papers selected for the Geotechnical Special Publications are eligible for discussion in the ASCE Journal of Geotechnical and Geoenvironmental Engineering and for ASCE award nominations.

The paper review would not have been possible without the help of a group of lead reviewers, who, on behalf of the Technical Committee, organized and in some cases conducted the review of a group of papers. The editors would like to acknowledge the invaluable contribution of the following lead reviewers:

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Some Advice on Vertical Draining Channels in Settlement Calculation of Soft-Soil Roadbed with Finite Element Method (Vacuum Preloading)

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ABSTRACT: Aiming at some disputation about disposal methods on vertical draining channels in model of numerical analysis of vacuum preloading, some analysis was carried out in the paper. Through a practical key project, two different disposal methods of vertical draining channels were used in the project. The finite element software was used to simulate the consolidation process of soft-soil in site. The results of simulating calculation and results measuring in site were compared. Differences of the two methods were shown clearly in the paper. Applicable instances for the two different disposal methods were pointed out.

INTRODUCTION

Vacuum preloading is an effective method that reinforces soft-soil foundation at present. For expedite consolidation speed of soft-soil foundation, some vertical draining channels with some depth are often set up in the foundation. The vertical draining channel may be sand drain and also it may be plastic draining board. The methods of numerical calculation of vacuum preloading of reinforcing soft-soil foundation have been studied by some researchers at home and abroad (Dong et al. 2008; He et al. 2005; Qin 2003; Wang et al. 2001; Xu et al. 2004; Zhu et al. 2007). But there are some disputes about the methods of numerical calculation. One of the disputes is about treating of vertical draining channel. However it can not reach an agreement that is that the vertical draining channel is thought as a media with high permeability through adjusting its permeability coefficient or that the vertical draining channel is considered as a stable negative pressure boundary condition with some rule in depth. In the paper, settlement and displacement of soft-soil in a key