Seismic Analysis and Design for Soil-Pile-Structure Interactions

Proceedings of a session sponsored by the
Committee on Geotechnical Earthquake Engineering of
The Geo-Institute of the
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PREFACE

Pile foundations are used extensively to support buildings and other structures. Earthquakes may cause dynamic loads on such structures. The response of pile foundations to these dynamic loads is extremely complex. Soil behavior is non-linear during earthquakes. There has been interest in this subject throughout the world. In buildings and other structures, the interaction of superstructure becomes extremely important. Studies on piles during earthquakes is difficult because earthquakes cannot be made to order! Therefore, recourse is made to alternate studies, e.g. on centrifuge models and/or shake table models and analytical solutions. In many cases, analysis of piles is carried out by neglecting the superstructure effects by the geotechnical engineers and analysis of structures is performed considering them fixed at their base. In a realistic analysis, soil-pile-structure interactions need to be considered.

The objective of this session was to address this problem in terms of practice in analysis and design of pile foundations under dynamic loads and focus on the unsolved issues. The papers were, therefore, invited from authors both within and outside the USA. This session was held at the ASCE Fall Convention in Minneapolis, MN on October 6, 1997 and was sponsored by the Soil Dynamics Committee (now the Geotechnical Earthquake Engineering Committee) of the Geotechnical Engineering Division of ASCE (now The Geo-Institute of the ASCE).

It is the current practice of The Geo-Institute that each paper published in a Special Technical Publication (STP) be reviewed for its content and quality. These special technical publications are intended to reinforce the programs presented at convention sessions or specialty conferences and to contain papers that are timely and may be controversial to some extent. Because of the need to have the STP available at the convention, time available for reviews is generally not as long and reviews may not be as comprehensive as those given to papers submitted to the Journal of the Institute. These STP reviews ordinarily are carried out within a three month time frame. Therefore, it should be recognized that there is a difference in the purpose of contributions to the special technical publications as compared to those in the Journal. In accordance with ASCE policy, all papers published in this volume are eligible for discussion in the Journal of Geotechnical and Geoenvironmental Engineering and are eligible for ASCE awards. Reviews of papers published in this volume were conducted by the Geotechnical Earthquake Engineering Committee of The Geo-Institute. The following committee members or cooperating persons from the general membership reviewed these papers:

John Charles
David Frost
Mary Ellen Hynes
Nozar Kishi
T. Nogami
Jay Shen
Panos Dakoulas
Phil Gould
T. Kagawa
Sanjeev Kumar
V.K. Puri

Personal thanks go to Panos Dakoulas, Chairman of the Geotechnical Earthquake Engineering Committee, for his help and support. I want to thank the body of experts who

gave both the time and effort in reviewing the papers. Last but not least, thanks are due to all the authors who kindly accepted the invitation to contribute to this volume and to the session in Minneapolis and the participants in the session and their discussions.

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Session Organizer and Editor

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