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INTRODUCTION

The last few years have witnessed a significant increase in interest and activity concerning earthquake effects and design of structures to withstand them. This situation has been generated by the occurrence of a number of major earthquakes coupled with advances in instrumentation, increases in the amount of recorded data, and the development of computer capabilities for analyzing the complex phenomena involved.

Earthquake research in the past has concentrated upon seismology and structural dynamics. Although the importance of soil behavior has been recognized, until experimental and computational techniques reached an adequate level of sophistication, the opportunity to obtain and make use of an understanding of soil behavior under dynamic loading was limited.

The subject of response of foundations to vibratory loading such as produced by machines or impact hammers involves many of the same soil behavioral characteristics as earthquake problems. This subject has also been the focus of recent soil dynamics studies, and many of the results apply to both problem areas.

Because of these developments this symposium was planned to provide a perspective of recent research concerning earthquake and vibration effects on soils and some examples of applications to design problems. The San Francisco meeting seemed a particularly appropriate place because of the concentration of interest in earthquake design on the west coast. Of the many excellent papers offered to the symposium committee, nine were selected to represent a cross section of the types of studies being conducted. The topics covered include the stress-strain and strength properties of soils under vibratory loading, laboratory apparatus and techniques for investigating dynamic soil behavior, studies of foundation vibrations, and design applications involving vibrations of soil-structure systems. This volume contains most of the papers presented at the symposium.

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