



Time-Dependent Bending Moment Analysis for Pile-Raft Foundation of Super Tall Buildings

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Abstract

In the interaction process of superstructure and foundation for super tall buildings, materials, structures and loads all are time-dependent. With the substantially increasing of super tall buildings and the rapid development of computer technology, the time-dependent interaction study also has made great progress, and this issue has received more and more attention in the engineering field. By considering the time-dependent features of settlement and superstructure, the interaction of super tall buildings and foundation is analyzed through using time-slicing approach in this paper. Comprehensively taking into account the coupling effects of time-dependent actions, this paper discussed the time-dependent effect for raft bending moment considering construction process in super tall buildings. The analysis results show that the bending moment differences in super tall buildings raft caused by the time-dependent effect are within permissible range of engineering practice. That is to say, the traditional lumped analysis method can be able to meet the calculation accuracy requirements of the raft bending moment.

Keywords: Super tall buildings; time-dependent settlement; construction sequences; time-dependent interaction; raft bending moment.

1 Introduction

The integrated soil-foundation-structure (SFS) system of super tall buildings is a complex system of force and deformation, which relates many factors, such as, structures form, loads, types and geometric parameters of piled raft foundation, properties of soils, et al [1]. In the interaction process of superstructure and foundation for

super tall buildings, materials, structures and loads all are time-dependent [2]. Therefore, it is a very complex issue to analyze the whole integrated SFS system for super tall buildings.

With the substantially increasing of super tall buildings and the rapid development of computer technology, the time-dependent interaction study also has made great progress, and this issue has received more and more attention in the