

考虑桩 - 土相互作用效应的桩基结构地震响应数值分析

孔德森^{1, 2}, 栾茂田^{1, 3, 4}, 吕爱钟², 王渭明²

(1. 大连理工大学 土木水利学院岩土工程研究所, 辽宁 大连 116024; 2. 山东科技大学 土木建筑学院, 山东 青岛 266510; 3. 大连理工大学 海岸和近海工程国家重点实验室, 辽宁 大连 116024; 4. 中国科学院 武汉岩土力学研究所, 湖北 武汉 430071)

收稿日期 2004-10-21 修回日期 2004-11-15 网络版发布日期 2008-3-18 接受日期 2004-10-21

摘要 考虑桩 - 土相互作用效应, 建立了桩基结构地震响应分析的有限元计算模型, 并在时域上进行了整体有限元数值计算。为便于进行对比分析, 简要阐述了桩 - 土 - 结构地震响应分析的子结构方法。进而针对工程实例, 分别采用整体有限元数值计算方法和子结构分析方法, 对桩 - 土 - 结构体系的地震响应进行了对比计算和分析。研究表明, 两种方法所得计算结果是基本一致的, 从而, 为桩基结构的抗震分析与工程设计提供了参考依据。

关键词 [土动力学](#); [桩基结构](#); [桩 - 土相互作用](#); [地震响应分析](#); [有限元法](#)

分类号

ANALYSIS OF SEISMIC RESPONSE OF PILE-SUPPORTED STRUCTURES CONSIDERING PILE-SOIL INTERACTION

KONG De-sen^{1, 2}, LUAN Mao-tian^{1, 3, 4}, LU Ai-zhong², WANG Wei-ming²

(1. School of Civil and Hydraulic Engineering, Dalian University of Technology, Dalian 116024, China; 2. School of Civil and Architectural Engineering, Shandong University of Science and Technology, Qingdao 266510, China; 3. State Key Laboratory of Coastal and Offshore Engineering, Dalian University of Technology, Dalian 116024, China; 4. Institute of Rock and Soil Mechanics, Chinese Academy of Sciences, Wuhan 430071, China)

Abstract

A computational model for pile-supported structures, which can duly consider the pile-soil interaction effect, is established by use of the finite element method, and its numerical implementation is made in time domain, accordingly. For the convenience of comparative analysis, the substructure method for seismic response analysis of pile-soil-structure system is briefly presented. Then a comparative study is performed for an engineering example and it is shown that the results obtained by the finite element method is common with the computational results achieved by the substructure method. These numerical results and findings will offer instructive guideline for earthquake-resistant analysis and engineering design of the pile-supported structures in practice.

Key words [soil dynamical mechanics](#); [pile-supported structures](#); [pile-soil interaction](#); [seismic response analysis](#); [finite element method](#)

DOI:

通讯作者

扩展功能	
本文信息	
▶	Supporting info
▶	PDF(329KB)
▶	[HTML全文](0KB)
▶	参考文献
服务与反馈	
▶	把本文推荐给朋友
▶	加入我的书架
▶	加入引用管理器
▶	复制索引
▶	Email Alert
▶	文章反馈
▶	浏览反馈信息
相关信息	
▶	本刊中 包含 “土动力学; 桩基结构; 桩 - 土相互作用; 地震响应分析; 有限元法” 的相关文章
▶	本文作者相关文章
·	孔德森
·	
·	栾茂田
·	
·	
·	吕爱钟
·	王渭明