工程力学
ENGINEERING MECHANICS
ISSN 1000-4750
CN 11-2595/O3
CODEN GOLIEB
Ei 收录期刊

» 2011, Vol. 28 » Issue (1): 124-130, DOI:

饱和土中桩-桩竖向动力相互作用及群桩竖向振动

*刘林超1，杨 骁2

(1. 信阳师范学院土木工程学院，河南，信阳 464000；2. 上海大学土木工程系，上海 200072)

PILE TO PILE VERTICAL DYNAMIC INTERACTION AND VERTICAL VIBRATION OF PILE GROUPS IN SATURA SOIL

*LIU Lin-chao1 , YANG Xiao2

(1. School of Civil Engineering, Xinyang Normal University, Xinyang, Henan 464000, China; 2. Department of Civil Engineering, Shanghai University, Shanghai 200072, China)

摘要 由于饱和土中孔隙水的流动特性以及桩基与土体的不同渗透率，饱和土与单相土中桩基的力学行为，尤其是动力学行为存在很大差异。运用Novak薄层法和引入势函数的方法，得到了饱和土层的竖向动力阻抗和自由场竖向位移衰减函数，在此基础上研究了饱和土中桩-桩的竖向动力相互作用及群桩的竖向动力阻抗问题。分析讨论了桩土力学参数对饱和土中群桩竖向动力阻抗的影响。研究表明：桩间距、液固耦合系数、桩土模量比等参数对桩-桩竖向相互作用和群桩竖向动力阻抗有影响，研究成果对于桩基动力检测和抗震设计具有较大的实际应用 价值。

关键词： 动力阻抗 饱和土 相互作用 薄层法 竖向振动

Abstract： The mechanical properties, especially dynamic behaviors of the pile in saturated soil and single-phase soil are significantly different due to the flow quality of pore water in saturated soil and the difference in the porosity of soil and pile. The vertical impedance of saturated soil and the attenuation function of displacement of free field were obtained by using layer method and potential functions. The interaction of pile to pile and the vertical impedance of pile groups in saturated soil were investigated. The results indicated that the distance between piles, force factor of fluid phase and solid phase, modulus ratio of pile and soil affected vertical dynamic impedance of pile groups in saturated soil. The study of the pile in saturated soil provided significant help for dynamic inspection and design of pile.

Key words： dynamical impedance saturated soil interaction layer method vertical vibration

收稿日期: 1900-01-01;

PACS:

引用本文:

刘林超,杨 骁. 饱和土中桩-桩竖向动力相互作用及群桩竖向振动[J]. , 2011, 28(1): 124-130,.

LIU Lin-chao,YANG Xiao. PILE TO PILE VERTICAL DYNAMIC INTERACTION AND VERTICAL VIBRATION OF PILE GROUPS IN SATURATED SOIL[J]. Engineering Mechanics, 2011, 28(1): 124-130,.

链接本文:

http://gclx.tsinghua.edu.cn/CN/

没有找到本文相关图表信息

没有本文参考文献

[1] 彭旺虎;邵旭东. 悬索桥纵向和竖向耦合自振研究[J]. , 2012, 29(2): 142-148.

[2] 付兵;王振宇. 微极饱和土波动分析中的变分原理[J]. , 2012, 29(1): 27-31,3.

[3] 王菲;姜南. 土-结构三维动力分析的线性-非线性混合子结构法[J]. , 2012, 29(1): 155-161.

[4] 王开云;刘鹏飞. 车辆蛇形运动状态下重载铁路轮轨系统振动特性[J]. , 2012, 29(1): 235-239.

[5] 魏 凯;伍勇吉;徐 灿;庞于涛;袁万城. 桥梁群桩基础-水耦合系统动力特性数值模拟[J]. , 2011, 28(增刊I): 195-200.

[6] 吴薪柳;姜忻良. 结构-桩-土振动台试验桩土地震反应规律分析[J]. , 2011, 28(增刊I): 201-204,.

[7] 王文全;张立翔;闫 妍;郭亚昆. 方柱绕流诱发的弹性薄板流固耦合特性研究[J]. , 2011, 28(3): 17-022.

[8] 徐明江;魏德敏. 非饱和土地基的三维非轴对称动力响应[J]. , 2011, 28(3): 78-085.

[9] 吴顺川;潘旦光;高永涛. 深埋圆形巷道围岩和衬砌相互作用解析解[J]. , 2011, 28(3): 136-142.

[10] 汪 强;王进廷;金 峰;张楚汉. 结构-地基动力相互作用的实时耦联动力试验[J]. , 2011, 28(2): 94-100,.

[11] 王滨;李昕;周晶. 走滑断层作用下埋地钢质管道反应的改进解析方法[J]. , 2011, 28(12): 51-58.

[12] 刘林超;闫启方. 分数导数模型描述的粘弹性土层中桩基水平振动研究[J]. , 2011, 28(12): 139-145.