



房屋建筑 地基处理 与加固

Soil Improvement
and Reinforcement of
Building Foundation

朱博鸿 廖红建 周龙翔 著

Zhu Bohong Liao Hongjian Zhou Longxiang

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内容简介

本专著主要介绍多层、高层厂房建筑软弱土地基处理和加固的实用技术,内容包括软弱土地基的差别以及国内、外常用的浅层、深层地基的加固方法(桩基及箱基作为基础工程考虑,未列入编写内容)。可供从事土建工程、地基勘察、设计的技术人员以及高等院校进行岩土工程研究的师生参考。

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编写说明

本书主要介绍多层、高层建筑物的软弱地基处理和加固实用技术。全部内容包括软弱地基的差别以及国内、外常用的浅层、深层地基的处理加固方法(桩基及箱基作为基础工程考虑,未列入编写内容)。书中文字简洁、语句通顺,工程实例多,实用性强。可提供从事土建工程、地基勘察、设计的技术人员和科研人员使用,也可作为高等院校进行岩土工程研究的师生参考,以及作为岩土工程专业的研究生和高年级本科生的教材。本书在编写、整理过程中,研究生张新善、苏立君同学做了部分文字录入和绘图工作,在此致谢。限于作者水平有限,不妥之处,恳请读者批评指正!

编者

二〇〇二年七月

主要符号表

| | |
|------------------|-------------------------------------|
| w | 含水量 |
| w_L | 液限 |
| e | 孔隙比 |
| D_r | 相对密实度 |
| ρ | 密度, g/cm^3 |
| d_s | 相对体积质量 |
| ρ_d | 干密度, g/cm^3 |
| $\rho_{d \max}$ | 最大干密度, g/cm^3 |
| S_r | 饱和度 |
| V_v | 土中孔隙体积, cm^3 |
| V_s | 土中颗粒体积, cm^3 |
| V_w | 土中水的体积, cm^3 |
| w_{op} | 最优含水量 |
| w_p | 塑限 |
| m | 土的质量, g |
| m_w | 土中水的质量, g |
| m_s | 干土颗粒的质量, g |
| λ_c | 压实系数 |
| k | 渗透系数 |
| K_u | 颗粒级配不均匀系数 |
| λ_B | 形状系数 |
| $d_{10}(d_{60})$ | 小于某粒径的土重占土试样总重的 10% (60%) 所对应的粒径 |
| D | 夯锤底面直径, m |

| | |
|-------------|--|
| α | 折减系数 |
| γ | 重度, kN/m^3 |
| γ_w | 水的重度, kN/m^3 |
| γ' | 有效重度, kN/m^3 |
| γ_d | 干重度, kN/m^3 |
| γ_c | 土挤密后的重度, kN/m^3 |
| φ | 内摩擦角, $^\circ$ |
| a | 压缩系数 |
| K_v | 土的竖向渗透系数, cm/s |
| δ_s | 湿陷系数 |
| π | 圆周率 |
| g | 重力加速度 |
| ρ_{w1} | 纯水 4°C 时的密度, 等于 1g/cm^3 |
| μ | 泊松比 |
| E_0 | 变形模量, kPa |
| E_s | 压缩模量, kPa |
| τ_f | 土的抗剪强度, kPa |
| f_k | 地基土的承载力标准值, kPa |
| f | 地基土的承载力设计值, kPa |
| σ_1 | 最大主应力, kPa |
| σ' | 有效压应力, kPa |
| u | 孔隙水压力, kPa |
| G_D | 动水压力, kPa |
| M | 夯锤质量, t |
| h | 夯锤落距, m |
| I | 夯锤的冲量, $\text{N}\cdot\text{s}$ |
| v | 夯锤落地速度, m/s |
| S | 强夯的安全落距, m |

| | |
|---------------------------------|--|
| E'_s | 柱间土的沉降模量, MPa |
| E'_p | 桩体的沉降模量, MPa |
| E'_{sp} | 复合地基的沉降模量, MPa |
| s | 沉降量, m |
| s_B | 沉降比 |
| s_{sp} | 复合地基的最终沉降量, m |
| $U_z(U_r)$ | 太沙基一维固结理论竖向(水平向)平均固结度 |
| U_{rz} | 砂井地基平均固结度 |
| H | 固结排水距离, m |
| $C_v(C_H)$ | 土体的竖向(水平向)固结系数, cm^2/s |
| $T_v(T_H)$ | 竖向(水平向)固结时间因数 |
| Ω | 灰土挤密桩总截面积, m^2 |
| ω | 沉降影响系数 |
| ϕ | 直径, m |
| r | 面积置换率 |
| n | 应力比 |
| e_c | 挤密后砂土的孔隙比 |
| η | 复合地基平均刚性模数 |
| σ_p | 复合地基中碎石桩的应力, kPa |
| σ_s | 复合地基中土的应力, kPa |
| A_p | 复合地基中碎石桩的面积, m^2 |
| A_s | 复合地基中土的面积, m^2 |
| σ | 作用于复合地基上的平均应力, kPa |
| $\lambda, \lambda_p, \lambda_s$ | 分别为复合地基、碎石桩及土的应变 |
| E, E_p, E_s | 分别为复合地基、碎石桩及土的变形模量, MPa |
| N_{cr} | 液化判别标准贯入锤击数临界值 |
| N_0 | 液化判别标准贯入锤击数基准值 |

| | |
|-------|----------------|
| d_s | 饱和土标准贯入点深度, m |
| d_w | 地下水位深度, m |
| d_e | 每个砂井影响范围的直径, m |

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