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层状地基中单桩荷载传递规律

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摘 要: 对桩侧土和桩端土分别采用三折线荷载传递软化和三折线全塑性荷载传递模型, 基于传递矩阵法, 利用土力学及弹性理论导出了一套完整的确层状土中桩顶荷载-沉降关系的解析算式. 研究表明: 对于置于淤泥、粘土、粉土、砂质粘土、残积土的人工挖孔桩, 当桩土相对位移达3~7 mm时, 桩侧摩阻力达到极限状态, 此时, 桩侧摩阻力约占桩顶荷载的40%~50%; 随着荷载的进一步增大, 桩侧摩阻力减小, 当桩土相对位移约为20 mm时, 桩侧摩阻力几乎全部丧失. 同时, 利用在某地区得到的桩侧摩阻力及深井试验测得的土工计算参数, 运用该算法对某工程试桩进行了计算对比, 其计算值与实测值吻合.

关键字: 荷载; 桩; 地基

Single pile load—transfer law in layered ground

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Abstract: With three-linear softening model to pile-surrounding soil and three-linear wholly plastic model to pile end soil, based on transfer matrix method, soil mechanics and elastic theory, a set of analytical equations for the axial loading-settlement relation of pile-top in layered ground are established. It is indicated that as for the manpower dig-hole pile installed in silt, clay and silty soil, residual soil and sandy clay, when pile-soil relative displacement reaches 3-7 mm, frictional force of pile side reaches ultimate state, and frictional force of pile side is 40%~50% of pile-top load or so. With pile-top load further increasing, frictional force of pile side diminishes. When pile-soil relative displacement reaches 20 mm, frictional force of pile side almost loses. Meanwhile, based on soil mechanics parameter obtained by pile-surrounding friction force and deep-hole testing, calculating contrast to testing-pile is carried out by the method in this paper, and the calculating results are conformable to the test results.

Key words: load; pile; ground

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