自重湿陷性黄土地区合理桩长初探

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摘要　考虑桩周土体及桩－土接触的非线性，建立了空间轴对称有限元模型；结合此模型提出了计算自重湿陷性黄土地区合理桩长的方法——叠加法，得出了当中性点上、下土层摩擦力分布形式相同时，应增加的桩长与摩擦力的分布形式无关，而只与极限摩擦力的大小有关的结论。运用此方法分析了自重湿陷性黄土湿陷特性对桩基承载性状的影响规律，结果表明：在极限荷载时，中性点深度与桩长有关；湿陷系数对桩剩余承载力的影响是非线性的；定量给出了中性点深度及应增加桩长的范围。

关键词　土力学；自重湿陷性黄土；合理桩长；仿真分析；叠加法

分类号

STUDY OF THE PROPER PILE LENGTH IN THE SELF-WEIGHT COLLAPSIBLE LOESS

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Abstract
 The spatial axisymmetric finite element model is established considering the nonlinear of the soil and the interface between pile and soil. Based on the model，a superposition method is proposed to calculate proper pile length in the self-weight collapsible loess，and it is concluded that，when the distribution of skin friction at the upper and lower parts of soil is of same pattern，added pile length DL has no significant influence on distribution of skin friction，but it has on ultimate friction resistance. By this method，the influence of property of the self-weight collapsible loess on pile bearing performance is analyzed. It is observed that：(1) when pile is under ultimate capacity，the depth of neutral point is related to pile length，and (2) the influence of collapse coefficient on rest bearing capacity of pile is nonlinear，and (3) the quantitative range of the depth of neutral point and the added pile length is given.
Key words　soil mechanics；self-weight collapsible loess；proper pile length；simulation analysis；superposition method

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