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长江下游桥梁工程地基土体渗透特性研究

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摘要 以江阴长江公路大桥北锚碇为例，首先阐述了锚碇地基土孔隙水压力观测和渗透性分析的意义。并根据江阴长江公路大桥地基基础安全监测成果，分析了孔隙水与长江水的水力联系。在比奥固结理论的基础上，采用变尺度优化方法反演了土工有限元分析中北锚碇地基土的渗透系数。并利用该桥北锚碇沉井浇筑完成后的实测变形结果，验证了反演参数的合理性。从而得知，土体的应力状态发生变化后将响应为土体参数的变化。上覆巨型基础的静荷载使地基土体渗透性减小，对基础的稳定性是有利的。

关键词 桥梁工程；江阴长江公路大桥；锚碇；比奥固结理论；水力联系；监测；渗透特性

分类号

STUDY ON PERMEABILITY OF FOUNDATION SOIL OF BRIDGES ON LOWER REACHES OF YANGTZE RIVER

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Abstract

The importance to monitor the pore water pressure and to study the permeability of soil under the north anchorage of Jiangyin Yangtze River Highway Bridge is analyzed firstly. According to the observed data，the hydraulic connection characteristics of pore water and river water are analyzed. Then，based on Biot's consolidation theory，the permeability coefficient of the foundation soil under the north anchorage is obtained by back analysis and varying-scale optimization method. It shows that the permeability coefficient of the soil under the anchorage is 23 percent of the original value. Finally，the rationality of the parameter is verified by comparison btween the straight analysis results and the observed displacement. Parameters of soil will change with the stress condition. Load of huge

foundation will affect the permeability of soil. The reduction of permeability of soil is beneficial to the stability of foundation soil.
Key words bridge engineering；Jiangyin Yangtze River Highway Bridge；anchorage；Biot's consolidation theory；hydraulic connection；monitoring；permeability

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