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管幕内顶进箱涵时外表面摩擦系数的试验研究

肖世国1，2，夏才初1，2，李向阳2，朱合华1，2，沈桂平3，葛金科4

(1. 同济大学 岩土工程重点实验室，上海 200092；2. 同济大学 地下建筑与工程系，上海 200092；
3. 上海市中环线建设发展有限公司，上海 200072；4. 上海市第二市政工程有限公司，上海 200063)

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摘要　上海市中环线虹许路北虹路下立交工程是目前世界上在饱和含水软土地层中施工的横截面最大的管幕法工程。箱涵外表面与附近浆土混合物或钢管之间的摩擦系数对于箱涵在顶进过程中合理设计千斤顶的顶进推力十分重要。采用室内试验的方法研究了混凝土与配制的5种由膨润土触变泥浆和实际工程中的粘性土形成的浆土混合物之间以及混凝土与钢管之间的摩擦系数，研究结果表明，在纯粘性土时该2种摩擦系数均最大，而随着触变泥浆与粘性土的质量比的增大，摩擦系数则逐渐减小，在纯触变泥浆时摩擦系数则达到或接近最小值。

关键词　岩土力学；管幕；箱涵；摩擦系数；触变泥浆；浆土混合物

分类号

EXPERIMENTAL STUDY ON COEFFICIENT OF FRICTION BETWEEN A BOX CULVERT AND MIXTURE COMPOSED OF THIXOTROPIC SLURRY AND CLAY OR STEEL PIPE DURING CULVERT BEING PUSHED BY PIPE-ROOF

XIAO Shi-guo1，2，XIA Cai-chu1，2，LI Xiang-yang2，ZHU He-hua1，2，SHEN Gui-ping3，GE Jin-ke4

(1. Key Laboratory of Geotechnical Engineering，Tongji University，Shanghai 200092，China；
2. Department of Geotechnical Engineering，Tongji University，Shanghai 200092，China；
3. The Middle Ring Road Construction and Development Co.，Ltd.，Shanghai 200072，China；
4. The Second Municipal Construction Co.，Ltd.，Shanghai 200063，China)

Abstract

Up to now，the subway crossing project through Hongxu Road is a pipe-roof project with the biggest cross-section box culvert in the world. It is constructed in saturated soft soil stratum in the Beihong Road located in the middle ring-road in Shanghai. Coefficients of friction between the box culvert and mixture composed of thixotropic slurry and clay or steel pipe are of great importance for rationally designing jacks used for pushing the culvert. The coefficients are studied by test. Five kinds of mixtures composed of different proportional thixotropic slurry and clay are used for test. The results show that the coefficients reach maximum when the mixture is completely composed of clay and they reach or approach minimum when the mixture is completely composed

of thixotropic slurry. In addition，the coefficients will decrease generally as mass of thixotropic slurry proportion to mass of clay increases.
Key words rock and soil mechanics；pipe-roof；box culvert；coefficient of friction；thixotropic slurry；mixture composed of thixotropic slurry and clay

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通讯作者