

沉管隧道底板面材质对砂流法地基影响的模型试验研究

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MODEL EXPERIMENTAL RESEARCH ON EFFECT OF MATERIAL OF IMMERSSED TUNNEL BOTTOM SURFACE ON FOUNDATION FORMED BY SAND-FLOW METHOD

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摘要

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摘要 通过沉管隧道足尺砂流法模型试验中采用不同模型板底面材质, 获得砂盘扩展半径、压砂系统水压力、模型板底水压力随时间变化的关系曲线。分析表明: 不同管节底面材质条件下, 各方向试验砂盘半径扩展趋势均为二次曲线。光滑材质条件下, 砂盘扩展速度较快, 均衡性及充满度更佳, 其砂盘最大半径可达879 cm, 砂盘顶部充满度达99.3%; 工程实践中为简化施工可适当增大砂盘设计半径。材质条件及砂盘扩展不影响压砂系统水压力, 但对模型板底面处水压力有影响。

关键词: [隧道工程](#) [沉管隧道](#) [地基处理](#) [砂流法](#) [足尺模型试验](#) [底板面材质](#) [表面粗糙度](#)

Abstract: In the full-scale model test of sand-flow method, time-history curves of sand-deposit radius, water pressure in the sand-flow system and the one under the model board are obtained under the conditions of different bottom surface materials of immersed tunnel. The analyses show that quadratic relationship exists between sand-deposit expansion trend in each direction and time under different bottom surface materials. Sand-deposit expands faster and has a better balance and fullness under the smooth material condition, with the maximum radius of 879 cm and the fullness of 99.3%, which is slightly higher than the one under the rough condition. It is feasible to increase the designed radius of sand-deposit to simplify construction. Material conditions and sand-deposit expansion do not have an effect on the water pressure of system except the one under the model board.

Keywords: [tunnelling engineering](#) [immersed tunnel](#) [foundation treatment](#) [sand-flow method](#) [full-scale model test](#) [material of bottom surface](#) [surface roughness](#)

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