越江盾构隧道纵向变形曲率与管环渗漏的关系研究

Correlation study of cross-river shield tunnel between longitudinal deformation curvature and segment leakage

作者	单位	E-mail
周宁	同济大学	znwin@126.com
袁勇	同济大学	

中文摘要

　　分析了三次样条插值法在越江隧道纵向变形曲线拟合中的适用性与计算方法，应用三次样条插值对越江盾构隧道纵向变形曲线进行了拟合，并通过曲线拟合方程计算了隧道全长纵向的变形曲率。应用越江隧道纵向结构分析模型计算了隧道不同纵向变形临界状态下的纵向变形曲率与环缝张开量的关系，并通过与越江隧道渗漏现场检测结果的分析对比，对越江隧道纵向变形曲率与管环渗漏间的相关性进行了评价。研究表明：与地铁隧道相比，越江隧道曲率半径的限值要求可适当放宽。越江隧道纵向变形曲率半径小于2407.1m，环缝张开量大于3mm时，隧道发生渗漏的概率就较大。越江隧道纵向变形曲率半径小于1256.8m，环缝张开量大于6mm时，环缝密封止水措施失效，隧道可能会出现较严重的渗水漏泥现象。

英文摘要

　　Applicability and calculation method of cubic spline interpolation applied in longitudinal deformation curve fitting of cross-river shield tunnel were analyzed, and longitudinal deformation curve of cross-river shield tunnel was fitted by using cubic spline interpolation method, and longitudial deformation curvature of whole tunnel was calculated by curve fitting equation. Based on longitudinal structure analysis model of cross-river tunnel, relationship under different critical state between longitudinal deformation curvature and circular seam stretching-amount was built. Correlation between longitudinal deformation curvature of cross-river tunnel and circular seam leakage was evaluated, by comparing leakage detection results of cross-river tunnel on site. The results show that critical curvature radius value of cross-river shield tunnel is smaller than metro shield tunnel. When longitudinal deformation curvature radius of cross-river tunnel is less than 2407.1m and its circular seam stretching-amount is more than 3mm, the probability that leakage appear in circular seam is relatively high. When longitudinal deformation curvature radius of cross-river tunnel is less than 1256.8m and its circular seam stretching-amount is more than 6mm, water sealing measures of circular seam is invalid, and serious leakage may appear in tunnel.

查看全文 查看/发表评论