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# 圆梁山隧道毛坝向斜高水压富水区注浆施工技术

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**摘要** 渝怀铁路圆梁山隧道毛坝向斜段高水压富水区的地质条件极其复杂, 曾经被认为是隧道修建的禁区。系统介绍了该地段的岩溶发育特征, 对地质及岩溶构造进行了分类; 采用红外线超前地质预测预报、TSP超前地质预测预报、超前探水孔钻探和地质素描综合判断等先进方法对溶洞的位置、形态以及充填物的状况进行了探测, 并作出可靠的预报。在对充填物结构和强度分析的基础上, 选择和确定了合理的注浆材料和注浆工艺; 分别实施了超前预注浆、隧道围岩径向注浆和衬砌背后补充注浆, 并提出了注浆效果的检测和评价方法, 以保证注浆加固效果的可靠性。上述措施实施后, 取得了非常满意的效果, 保证了复杂地质条件下隧道施工的安全。该成果对岩溶地区的隧道修建具有重要的指导作用和参考价值。

**关键词** [隧道工程](#); [圆梁山隧道](#); [溶洞](#); [地质预报](#); [注浆](#); [管棚](#)

分类号

## GROUTING TECHNIQUE FOR HIGH-PRESSURE AND WATER-RICH AREA IN MAOBA SYNCLINE AT YUANLIANGSHAN TUNNEL

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### Abstract

The geologic condition of the high-pressure and water-rich area in Maoba syncline at Yuanliangshan tunnel of Chongqing—Huaihua Railway is complex and regarded as a forbidden area of tunnel construction. The karst development characteristics of this area is systematically introduced; and the geologic and karst structure is classified. The distribution and shape of karst caves and the filling in them are investigated by the advanced investigation means, and reliable forecast is made accordingly. Based on analysis of structure and intensity of the filling, the reasonable grouting materials and grouting technology are determined. Pre-grouting, radial grouting in surrounding rock and reinforcing grouting behind lining are implemented respectively according to the geologic condition; and inspecting method and estimating method of grouting effect are also brought forward to ensure the grouting reliability. Satisfying results are achieved; and safety of tunnel construction is ensured through adopting these measures. The results can provide references to tunnel construction in karst region.

**Key words** [tunneling engineering](#); [Yuanliangshan tunnel](#); [karst cave](#); [geology forecasting](#); [grouting](#); [pipe shed](#)

