

论文

基于监测信息的十三陵抽水蓄能电站引水洞抢险加固设计

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摘要:

北京地区十三陵抽水蓄能电站的引水洞穿过破碎岩体时, 因地质条件很差而在开挖初期发生了塌方险情。抢险后及时进行了洞内位移监测。监测结果显示原设计所使用的挂网锚喷加钢拱架组成的支护结构变形较大, 特别是在边墙部位, 变形更加明显。根据监测结果对引水洞的支护方案进行了重要修改: 加密钢拱架和挂网钢筋, 并增加喷射混凝土厚度, 在洞底增加仰拱。施行上述措施后, 洞体位移收敛变小, 并趋于稳定, 达到了设计和安全使用要求。该可变更设计的成功, 充分说明了在工程地质条件复杂, 难以准确界定的情况下, 信息化施工与可变更设计的重要性。

关键词: 抽水蓄能电站 可变更设计 监测信息 围岩支护 隧洞

MONITORING BASED EMERGENCY REINFORCEMENT DESIGN FOR DIVERSION TUNNEL OF MING TOMBS PUMPED-STORAGE STATION IN BEIJING

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Abstract:

When the diversion tunnel of Ming Tombs pumped storage station in Beijing passed through the fragmented rock mass, landslip happened in the early stage of excavation because of bad geological conditions. Displacement monitoring was performed in time after landslip. The monitored results showed that support structure composed of anchoring shotcrete with wire mesh and steel arch frame used by the original design had great deformation, especially in the side walls. According to the monitored results, supporting scheme for the diversion tunnel was modified significantly. For example, steel arch frames and reinforced bars for the wire mesh were increased. Sprayed concrete was thickened. The inverted arch was added for the tunnel floor. After the above measures were constructed, the displacement of the tunnel has decreased and the deformation has stabilized. The displacement and deformation have reached the design and operation requirements. The successful design illustrates that the monitoring during construction for design change is very important under complicated engineering geologic conditions. Design of other tunnels can draw lessons from this case study.

Keywords: Pumped storage station, Design change, Monitoring information, Support of wall rock, Tunnel

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