

## 三峡茅坪溪高沥青混凝土心墙堆石坝运行性状研究

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收稿日期 2006-10-17 修回日期 2007-1-2 网络版发布日期 2007-7-20 接受日期 2006-10-17

**摘要** 茅坪溪防护坝是三峡工程的副坝, 也是目前中国最高的沥青混凝土心墙坝。分析该坝在三峡库水位135 m时的变形规律, 据此对坝体填料的参数进行反分析。在此基础上对设计水位175 m时及不同水位下, 高沥青混凝土心墙的应力与变形进行非线性有限元数值仿真, 并研究沥青混凝土参数取值对心墙运行性状的影响。采用双曲函数与幂函数结合的模式拟合沥青混凝土的三轴蠕变试验曲线, 对大坝进行蠕变分析。分析结果表明, 考虑蠕变效应, 心墙的水平变形与最大主应力将有较大的增加。研究结果同时也表明, 不同蓄水过程对心墙性状的影响不大, 心墙产生水力劈裂、剪切破坏与挠曲破坏的可能性不大。研究结果可供大坝蓄水计划参考, 并为高水头下高沥青混凝土心墙坝的运行提供一定的参考。

**关键词** [水利工程](#); [三峡工程](#); [沥青混凝土心墙堆石坝](#); [应力与变形](#)

分类号

## STUDY ON BEHAVIORS OF MAOPINGXI HIGH ROCKFILL DAM WITH ASPHALT CONCRETE CORE OF THREE GORGES PROJECT

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### Abstract

Maopingxi high rockfill dam is the accessorial dam of Three Gorges Project(TGP), which is also the highest rockfill dam with asphalt concrete core in China. The deformation rules of the dam when the water level of TGP reservoir reaches to 135 m are analyzed; and the parameters of filling materials are back analyzed. Based on the parameters of back analysis, the behaviors of core wall and the dam are studied by nonlinear FEM when the water level of TGP reservoir reaches to the elevations of 156, 165, 172, and 175 m(the planed level), respectively. Effects of parameters of the asphalt concrete on behaviors of core wall are analyzed. Furthermore, a function of hyperbola combined power is adopted in modeling the curves of long-term triaxial creep test of the asphalt concrete; and creep analysis is performed for the dam. Results show that the displacement in horizontal direction and the maximum principal stress of core wall will increase to a larger extent if the creep effect of asphalt concrete is considered. The study results also show that different water level procedures have small differential effects on the behaviors of core wall; and there is little probability of hydraulic fracture, shear and bend failure to the core wall. These results can be referenced to the plan of water level procedures on the dam; and the behaviors of high rockfill dam with asphalt concrete core under high water head are studied.

### Key words

### 扩展功能

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[hydraulic engineering; Three Gorges Project; rockfill dam with asphalt concrete core; stress and deformation](#)

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