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# 长江三峡库区黄腊石边坡地下水作用规律与动态稳定性评价

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摘要

以黄腊石滑坡为例，针对地下水在边坡失稳过程中的关键作用，定量研究地下水渗透力对滑坡稳定性的影响。采用更接近于实际地下水位的渗透力计算方法，计算了黄腊石边坡地下水渗流场在地下水位变化时的水头分布情况；并对渗透力进行了计算，从而定量地分析了地下水对滑坡的作用，发现渗透力的峰值分布在应力集中的前缘段。在此基础上，在剩余推力法中引入渗透力的算法，根据地下水的月平均观测水位，得出考虑渗透力和未考虑渗透力情况下稳定性系数与时间的关系。发现考虑渗透力的情况下黄腊石边坡稳定性系数有随时间逐渐减小的趋势，最大降幅可达0.202 0，且出现在地下水位迅速降落之时。这说明地下水位突降时，其引起的渗透压力最大，且渗透力对黄腊石边坡稳定性的降低作用随时间有增大的趋势。根据地下水的作用机理和渗透力分布的计算分析结果，结合该边坡的实际情况对黄腊石边坡的防治提出了相应的建议。

关键词 边坡工程；黄腊石边坡；地下水；渗透力；动态稳定性

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# GROUNDWATER ACTION LAW AND EVALUATION ON DYNAMIC STABILITY OF HUANGLASHI SLOPE IN THREE GORGES REGION

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**Abstract**

Taking the typical accumulative slope of Huanglashi as an example and considering the special role of groundwater in landslide，the effects of the groundwater seepage on the stability of the landslide are studied quantitatively. The calculating method of seepage is adopted in which the groundwater level approaches to the real situation；and the head of groundwater and the seepage pressure are calculated when the groundwater level changes in the seepage flow field of the Huanglashi slope. Therefore，the role of the groundwater in the Huanglashi slope is quantitatively analyzed. It is found that the maximum value of the seepage pressure is located in the former part of the slope. On the basis of the result，the calculation of seepage pressure is drawn into the Spush method. According to the mean monthly water level，the relationships of

the stability coefficient with the time is calculated，respectively，when the seepage pressure is(or not) taken into account. According to the calculation results，the stability coefficient has the decreasing tendency under the periodic action of seepage，and the maximum reduction is seen to be 0.202 0 and it happens when underground water level declines rapidly. It shows that the abrupt decline of underground water level is the most disadvantage factor，and the effect of the seepage pressure on the stability of the Huanglashi slope has increasing tendency. In terms of the former analysis results of the groundwater action law and the distribution of seepage pressure，as well as the actual local situation of the slope，the prevention and control methods are proposed.

**Key words** slope engineering；Huanglashi slope；groundwater；seepage pressure；dynamic stability

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