

金沙江特大桥左岸岸坡岩体结构面强度参数取值及工程稳定性评价

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STRENGTH OF STRUCTURE SURFACES AND SLOPE STABILITY EVALUATION FOR LEFT ROCK SLOPE OF JINSHAJIANG BRIDGE

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- 摘要
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摘要 丽香铁路金沙江特大桥位于金沙江虎跳峡镇高地震烈度深切峡谷地段。香格里拉端岸坡地形陡峻,卸荷裂隙发育,岸坡岩体在地震及工程荷载作用下的稳定性直接控制了桥梁选址方案的可行性。在深入分析对岸坡工程地质条件的基础上,基于节理特征分析的Barton模型、岩体结构面强度实验,讨论了岩体结构面强度参数,并在此基础上采用底摩擦实验研究了岸坡在自然和工程荷载作用下的稳定性,进而采用离散单元法计算分析了岸坡岩体在自然、桥基荷载作用下、地震加桥基荷载作用工况条件下的破坏趋势。研究表明,岸坡整体稳定,但在地震和桥梁荷载作用下,岸坡卸荷裂隙进一步发育,对桥基影响较大,应加强卸荷带岩体的工程整治以确保桥基安全。

关键词: 岸坡 结构面强度 底摩擦实验 离散元法

Abstract: Jinsha Jiang Bridge is located in the deep gorge of the Jinsha River Tiger Leaping Gorge town, a high seismic intensity area. The rock slope at left of the bridge and on the side of Shangri-La City is affected by terrain steep unloading fractures. It is importance to study the slope rock stability in loads of engineering. According to the engineering geological conditions and the characteristics of joints, Barton model and shear stress test, strength parameters of rock mass structure surface are discussed. Then, the failure trend in gravity and engineering are analyzed by bottom friction test. In order to evaluate the damage trends of the rock mass under the different loading conditions such gravity, bridge loading and seismic load, a calculation model based on the geological model and slope stability is simulated and analyzed using Discrete Element Method(DEM).The numerical analysis results indicate the effect of degradation of discontinuities on the slope stability. The results have shown that the destruction of rock mass under the gravity and bridge foundation is mainly concentrated within 30m depth of the slope. The slope under loading may cause loosening strength along joint planes. But under earthquake and bridge loads, bridge foundation should be strengthened.

Key words: Slope Strength of joint Bottom friction test DEM method

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