

地震作用下含弱面斜坡变形破坏实验研究

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EXPERIMENTAL STUDY OF DEFORMATION AND FAILURE FOR SLOPES WITH WEAK PLANES UNDER EARTHQUAKE EFFECT

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- 摘要
- 参考文献
- 相关文章

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摘要 为了研究含弱面斜坡在强震作用下变形破坏规律,对含单一弱面的3组斜坡模型模拟地震作用下的变形破坏,并用数字散斑相关方法对实验结果进行处理,得到斜坡模型位移和应变。从实验结果可以发现:位移和应变均集中在弱面上,随着震动的持续,这种变形积累最终导致斜坡发生破坏;模型对比中可以发现,在斜坡体内弱面越深则斜坡稳定性越强,在斜坡体内弱面越长则斜坡稳定性越弱。分析模型最初在顶部出现裂缝和沿弱面发生滑动的原因。

关键词: 地震作用 斜坡 弱面 相似材料模拟 数字散斑相关方法(DSCM)

Abstract: This paper examines the law of the deformation and failure of slopes associated with weak planes under earthquake effects. Experiments with a single three group weak surface slope model is carried out under simulated earthquake deformation and failure in shaking table. The digital speckle correlation method is used to process the experimental results. The displacement and strain of model slope are obtained. From the experimental results, it can be found that the displacement and strain are concentrated in the weak surface slope with the continuous vibration, eventually leading to the slope damage. It can be found from the experimental model comparisons that the deeper the weak surface in the slope body, the more stable the slope. The longer of the weak surface in the body, the less stable the slope. The test model first appeared fractures in the top, and then damaged along a weak surface, which is analyzed for the cause of the slope failure.

Key words: Earthquake Slope Stability Weak plane Similar material simulation Shaking table Beichuan

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