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## 降雨作用下浅层碎石土滑坡解体破坏机理研究(PDF)

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Title: Study on mechanism of disintegration and failure of shallow debris landslide under rainfall action

作者: [许建聪<sup>1</sup>](#); [尚岳全<sup>2</sup>](#)

1. 同济大学土木工程学院, 上海200092;
2. 浙江大学建筑工程学院, 浙江杭州310027

Author(s): [XU Jian-cong<sup>1</sup>](#); [SHANG Yue-quan<sup>2</sup>](#)

1. College of Civil Engineering, Tongji University, Shanghai 200092, China;
2. College of Civil Engineering and Architecture, Zhejiang University, Hangzhou 310027, China

关键词: [岩土力学计算](#); [浅层滑坡](#); [弹塑性有限元](#); [接触算法](#); [解体破坏](#)

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摘要: 为了揭示浅层碎石土滑坡的变形解体破坏机理,通过资料搜集整理与分析、现场工程地质调查与勘探和室内外的物理力学试验,采用数理统计分析方法、不平衡推力法和不分离接触弹塑性有限元强度折减法,获得了滑坡的整体稳定性系数;运用碎石土边坡地下水管网状排泄系统的理论,分析了该类型滑坡的变形解体破坏过程,揭示了强降雨作用下浅层碎石土滑坡变形解体破坏的主要机理和一般的力学机理。结果表明,浅层碎石土滑坡的解体破坏过程中,滑体位移、滑体沿滑面滑动状态和塑性应变的发展以及滑面上摩擦应力的发挥程度是不一致的;强降雨是浅层碎石土滑坡体发生失稳的主要触发因素;采用弹塑性接触有限元算法可以更好地反映该类型滑坡在降雨作用下所处的实际状态及滑坡的滑动过程,为该类型滑坡稳定性的准确评价和预测预报提供可资借鉴的方法。

Abstract: In order to reveal the mechanism of disintegration deformation and failure of shallow debris landslide, through the collection, arrangement and analysis of related data, the insitu investigation and exploration of engineering geology, indoor and outdoor physical mechanics test, adopting mathematic statistics, disequilibrium thrust method and non-separation contacte lasto plastic FEM strength reduction method, the integral stability coefficient of this debris landslide was derived, and its process of the deformation, disintegration and failure was analyzed, in which the mechanism of deformation, disintegration and

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failure is revealed. The results are shown as follows: First, the disintegration deformation and failure of shallow debris landslide is mainly caused by discordant slip-mass displacement, discordant slip-mass sliding state along sliding plane, and ever-developing plastic strain and its discordant development. Second, the utilization degree of contact friction stress on sliding plane is discordant in the course of disintegration deformation and failure of shallow debris landslide. Third, adopting contact elastoplastic FEM algorithm may better reflect the actual locating state and sliding process of shallow debris landslide under the action of rain, and it may afford one method that can be used as a reference of the stability analysis, accurate evaluation and forecast of this type of landslide.

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作者简介: 许建聪(1967-), 男, 博士, 工程师, 主要从事岩土工程与工程地质、地下结构工程、防灾减灾工程及防护工程等研究. E-mail: xjc0702@163.com

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