

TO CATEGORIES 

1.400.000 PAGES OF RESEARCH

MONTHLY
1.200.000
PAGE VIEWS

OVER
300.000
VISTORS PER MONTH

new E-BOOKS 

FULLTEXT SEARCH

[GO!](#)

NEW: [Advanced Search](#)

Periodicals:

MSF

> Materials Science Forum

KEM

> Key Engineering Materials

SSP

> Solid State Phenomena

DDF

> Defect and Diffusion Forum

AMM

> Applied Mechanics and Materials

AMR

> Advanced Materials Research

AST

> Advances in Science and Technology

JNanoR

> Journal of Nano Research

JBBTE

> Journal of Biomimetics,

The Deformation and Failure Mechanism of the Excavation Damage Soil Slope under the Action of Seismic Load

Journal [Advanced Materials Research](#) (Volume 382)

Volume [Advanced Research on Advanced Structure, Materials and Engineering](#)

Edited by Helen Zhang and David Jin

Pages 444-449

DOI 10.4028/www.scientific.net/AMR.382.444


Citation Fa You A et al., 2011, Advanced Materials Research, 382, 444

Online since November, 2011

Authors [Fa You A](#), [Ji Ming Kong](#), [Zhen Qiang Ni](#)

Keywords [Deformation](#), [Earthquake](#), [Excavation Damage](#), [Failure](#), [Soilslope](#)

Abstract Wenchuan earthquak induced a large number of mountain hazards. Through the survey found that manual excavation slopes tend to become concentrated area of mountain disaster, it' s indicate that the effect of excavation damage on the slope deformation and failure under seismic load is very obvious. Soil slope deformation as one types of mountain hazards induced by Wenchuan earthquake, and it' s also seriously affected by excavation damage. In this paper, as Shui Caoping landslide for example, using the finite element method to simulate the landslide and analysis the overall stability and the local deformation and failure of slope affected by the excavation damage. Analysis shows that the local damage is significantly induced by excavation, and resulting in vertical stress and plastic strain increased in the local of slope near the excavation face. While excavating also has the role of unloading. The results basic agreement with the characteristics of the slope deformation and failure induced by Wenchuan earthquake.

Full Paper  [Get the full paper by clicking here](#)

First page example



CONFERENCE

> GO!

11/16/2012 - 11/18/2012

11/13/2012 - 11/15/2012

The International Conference on Advanced Eng

10/19/2012 - 10/21/2012

2012 International Conference on Vibration, Str

more...

The Deformation and Failure Mechanism of the Excavation Damage Soil Slope under the Action of Seismic Load

Fayou A^{1, a}, Jiming KONG^{2, b}, Zhenqiang NI^{2, c}

¹Faculty of Land Resource Engineering, Kunming University of Science and Technology, Kunming Yunnan 650093, China

²Institute of mountain Hazards and Environment, Chinese Academy of Sciences, Chengdu Sichuan 610041, China

^aafayou@163.com

Keywords: Soilslope;excavation damage;earthquake;deformation and failure

Abstract. Wenchuan earthquak induced a large number of mountain hazards. Through the survey found that manual excavation slopes tend to become concentrated area of mountain disaster, it's indicate that the effect of excavation damage on the slope deformation and failure under seismic load is very obvious. Soil slope deformation as one types of mountain hazards induced by Wenchuan earthquake, and it's also seriously affected by excavation damage. In this paper, as Shui Caoping landslide for example, using the finite element method to simulate the landslide and analysis the overall stability and the local deformation and failure of slope affected by the excavation damage. Analysis shows that the local damage is significantly induced by excavation, and resulting in vertical stress and plastic strain increased in the local of slope near the excavation face. While excavating also has the role of unloading. The results basic agreement with the characteristics of the slope deformation and failure induced by Wenchuan earthquake.

Introduction

The 8-magnitude deadly earthquake which struck Wenchuan county, Sichuan province in China on May 12, 2008, caused lots of geological disasters, such as landslide and collapse^[1-3]. Research found that excavation damage slopes were mountain disaster-prone areas and intensive outbreak areas under the action of seismic load^[4]. As one of main types of mountain disasters in Wenchuan earthquake stricken areas, deformation damage of soil slopes was significantly influenced by excavation damage. Statistics showed that, in researched 136 typical landslides and collapse disasters occurred in the earthquake-hit areas, there were total of 17 soil landslides and collapse disasters, 10 of which occurred at highway excavation damage slopes. Soil slope excavation damage is a problem that we often encountered in mountainous area construction. Therefore, research the deformation mechanism of excavation damage soil slope under seismic load has great practical and theoretical significance which provide the theory basis for the soil excavation slope disaster prevention and control.

In past decades, foreign and domestic researchers have made lots of researches on the response and stability of slopes under the action of seismic load and mainly focused on the research on rock slopes^[3], however, excavation damage was not taken as an influence factor to analyze the stability of slope under the action of seismic load. Xie Hongqiang and other researchers researched the dynamic response and stability of slopes of compound accumulation bodies under a strong earthquake^[5], but still did not take the excavation damage effect into consideration.

Generally, there are few researches on influence of excavation on soil slope deformation damage mechanism under the action of seismic load. Therefore, taking the Shui caoping landslide as an example, the numerical simulation model of a slope was established. With ansys finite element program, the soil slope deformation damage in unexcavated and excavated conditions under the action of seismic load was compared and analyzed to study the influence of excavation on soil slope deformation damage under the action of seismic load.