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Xi'an, China

Research on Permeability test of loess in Heifangtai Platform under different consolidation pressures

Dr Lin Xiaoyan

School of Geological Engineering and Geomatics,
Chang'an University, Xi'an, China

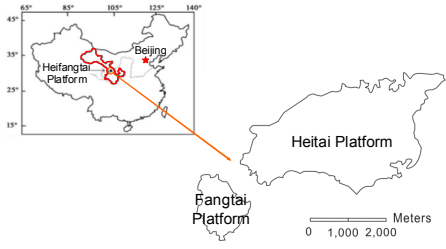
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The main topics

- 1 Introduction
- 2 Test Plan
- 3 Test Results
- 4 Finite Element Simulation
- 5 Conclusions

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1. Introduction



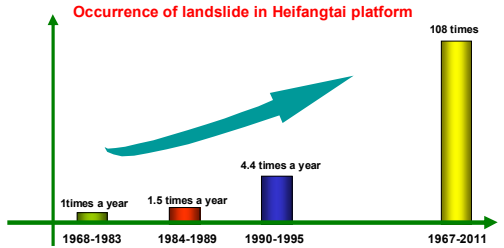
Heifangtai Platform, located in Yongjing county, Gansu province of China. It covers an area of 13.44 km². It is one of the largest benches.

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1. Introduction

★ In 1967
Irrigation project → Landslide

Occurrence of landslide in Heifangtai platform



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1. Introduction

Irrigation
↓
Permeability
↓
Permeability coefficient

The in-door experiment

Simple equipment
Low cost

The test is carried without loading
Rebound generated after unloading

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The field test

The actual pressure is considered

It can not be used in the deeper soil
Higher cost

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2. Test Plan-Instrument

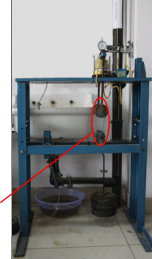
Invention patents
ZL200710018038.1



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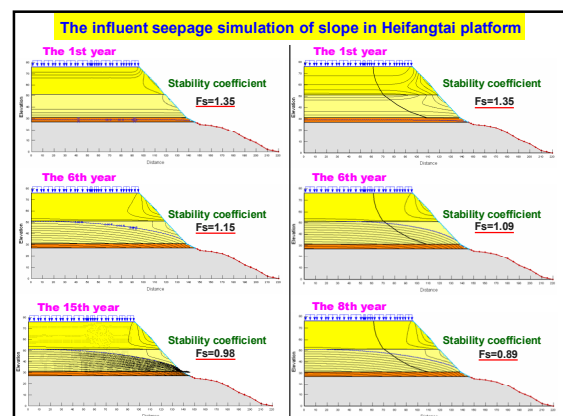
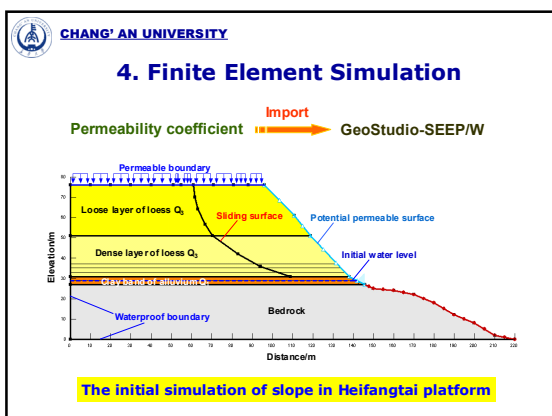
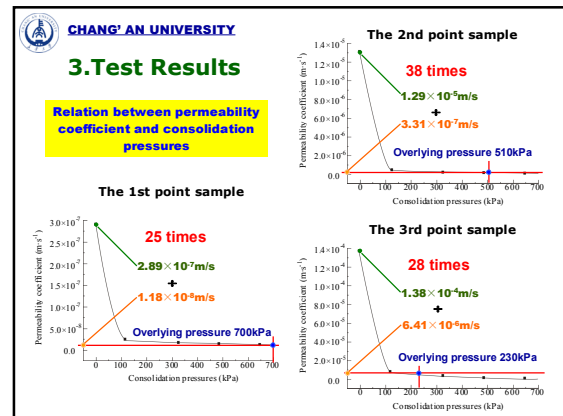
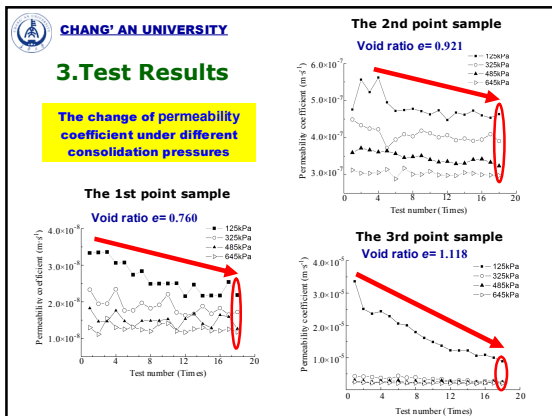
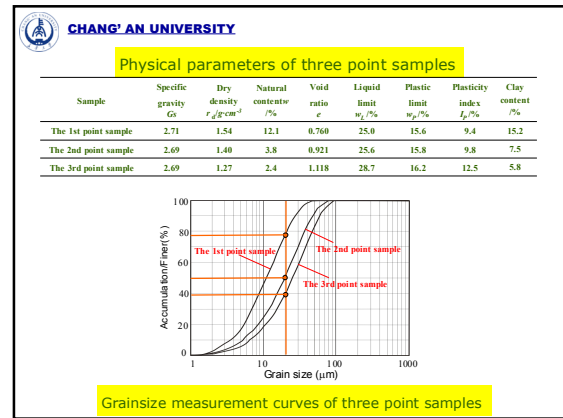
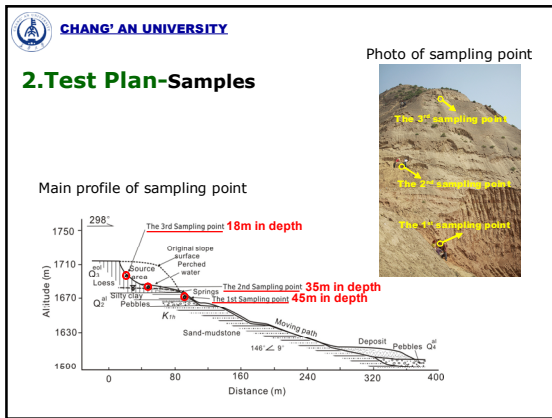
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Advantage

- > Low cost
- > Simple equipment
- > The actual pressure is considered

Pulley block





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Conclusions

- For different samples, if a same consolidation pressure was exerted, the permeability coefficients of those with higher initial void ratios tended to change more largely but reached a stable value finally, which showed that in actual working conditions, as long as the thickness of overlaying sola was not increased, soil horizon of a certain depth should have a stable permeability coefficient.
- In an indoor conventional penetration test and a penetration test under consolidation both targeted the loess from Heifangtai Platform, permeability coefficient of different soil horizons resulted from the former was 25-40 times as high as the later, which showed the results from the conventional test had overestimated the permeability coefficient.
- When the permeability coefficient resulted from the penetration test under consolidation was introduced into SEEP software to conduct a irrigation influent seepage simulation for slope, the results were consistent with actual reconnaissance ones, indicating that the data from the penetration test under consolidation are more likely to reflect practical phenomena, thus have more practical application.



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***Thank you
for your attention!***