

# 论文类成果

## 土的液化机理

### 【创新性】

论文基于国内外历次地震震害液化破坏现象观察、理论分析及试验研究，系统论述了土的液化机理，以此为基础，构建了我国土液化研究的学科框架。在国内外最早提出了孔隙水压力产生、扩散及消散的计算模型和计算理论，是现代土工动力有效应力分析方法的雏形。提出了土液化的严格学术定义。在国内外最先归纳提出了三种典型液化（即沙沸、流滑和往返活动性）的机理，并一直被国内外广泛引用和应用。研究了结构性、排水条件和边界条件对液化的影响，澄清了土体液化与极限平衡及破坏间的区别与联系，提出了防止土体液化破坏的原则和方法，解决了长期困扰土工抗震界的难题，在国内外土动力学的发展中起到正本清源的作用。

主要完成人：汪闻韶

获奖单位：岩土所

### 【影响力】

论文自发表以来，一直都是我国土的液化研究领域的经典代表性文献，也被国际范围内的研究同行所重视。论文构建了我国土液化研究的学科框架，主要研究成果也奠定了学科研究的理论基础，在国内发表和国际学术会议交流后，引起了学术界的热烈讨论。论文的研究成果促进了我国土动力学学科的发展，得到了W.D.L.Finn等国际著名学者的高度认可，并在其专著中对这些成果进行了系统介绍，奠定了汪闻韶院士和我国土体液化研究在国际土动力学界的学术地位和声誉。

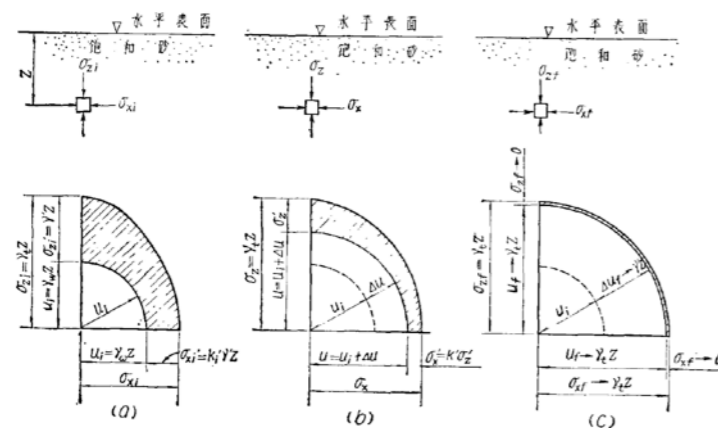


图1 砂沸过程中应力状态的演变示意图  
(a)初始状态 (b)中间状态 (c)最终状态

# SOIL LIQUEFACTION MECHANISM

### 【Innovation】

This paper systematically expounds the soil liquefaction mechanism based on the observation, theoretical analysis and experimental study of liquefaction disasters caused by earthquake at home and abroad, and establishes a framework for the discipline of soil liquefaction study in China. It presented, earliest in the world, the model and theory for calculation of the generation, diffusion and dissipation of porewater pressure, which is the prototype of modern analytical methodology for effective stress of soil dynamics. It also presents the rigorous academic definition of soil liquefaction. It concluded that, earliest in the world, the mechanisms of three typical types of liquefaction (sand boil, flow slide and cyclic mobility) have been always cited and applied widely at home and abroad. This paper studies

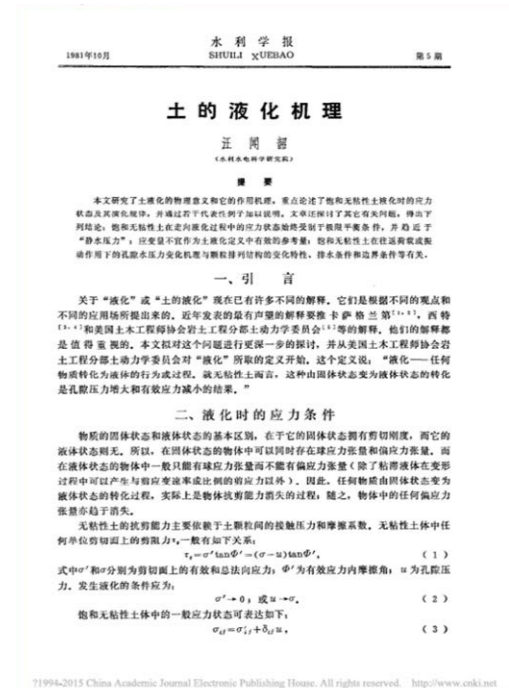
### 【Influence】

Since it was published, the thesis has been always a representative classic literature in the soil liquefaction research field in China, and has attracted much attention from international peers. It establishes a framework of the discipline of soil liquefaction study in China, and its core research findings have also laid a theoretical foundation for disciplinary study. Heated discussions were aroused in the academic circles after it was published in China and discussed on international conferences. Its research findings have promoted the development of soil dynamics discipline in China, which has been highly affirmed by famous international scholars like W.D.L. Finn, whose book contains a systematic introduction to these research findings, have improved the academic status and reputation of Academician Wang Wenshao and China's soil liquefaction study in the international soil dynamics profession as well.

Main Contributor : Wang Wenshao

Award-winning Unit : Department of Geotechnical Engineering

liquefaction impact from fabric, drainage condition and boundary condition, clarifies the distinction and relation between soil liquefaction, the state of limit equilibrium and failure, presents the principle and method of preventing soil liquefaction, tackles the difficult problems in seismic resistance field.



©1994-2015 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net