

[1]陈爱军,张家生.基于线弹性力学的非饱和红粘土裂缝开展分析[J].自然灾害学报,2013,03:198-204.

CHEN Aijun,ZHANG Jiasheng.Analysis of crack development of unsaturated red clay based on linear elasticity mechanics[J].,2013,03:198-204.

点击

复制

基于线弹性力学的非饱和红粘土裂缝开展分析

《自然灾害学报》[ISSN:/CN:23-1324/X] 期数: 2013年03期 页码: 198-204 栏目: 出版日期: 2013-07-30

Title: Analysis of crack development of unsaturated red clay based on linear elasticity mechanics

作者: [陈爱军^{1, 2}](#); [张家生¹](#)

1. 中南大学 土木工程学院, 湖南 长沙 410075;
2. 湖南工程学院 建筑工程学院,湖南 湘潭 411108

Author(s): [CHEN Aijun^{1, 2}](#); [ZHANG Jiasheng¹](#)

1. School of Civil Engineering, Central South University, Changsha 410075, China;
2. School of Architecture Engineering, Hunan Institute of Engineering, Xiangtan 411108, China

关键词: [红粘土](#); [非饱和土](#); [裂缝深度](#); [地表基质吸力](#); [吸力梯度](#)

Keywords: [red clay](#); [unsaturated soils](#); [crack depth](#); [surface matrix suction](#); [suction gradient](#)

分类号: TU43

DOI: -

文献标识码: -

摘要: 湖南郴宁高速公路沿线分布的红粘土是一种典型的高塑性粘土,极易干燥失水开裂导致严重的工程病害.以郴宁高速公路红粘土为研究对象,分析了粘土干缩裂缝的开展机理,采用线弹性力学和非饱和土力学理论,在一定的假设条件下导出了考虑土体抗拉强度的裂缝开展深度的理论解.理论解分析表明,裂缝开展深度主要受地表基质吸力控制,地表基质吸力越大,裂缝越深;当吸力梯度较小时,吸力梯度对裂缝深度的影响较大;土体参数泊松比对裂缝开展深度的影响较小.

Abstract: The red clay distributed along the Chen-Ning Expressway in Hunan Province is a typical high-plasticity clay, which is readily to dry and crack and cause serious engineering diseases. With the red clay of Chen-Ning Expressway as an object of study, the mechanism of clay shrinkage crack was analyzed herein. Based on the linear elastic and unsaturated soil mechanics theories, certain assumptions and with the tensile strength of the soil in mind, a theoretical solution of the crack depth was derived. Analysis of

导航/NAVIGATE

[本期目录/Table of Contents](#)

[下一篇/Next Article](#)

[上一篇/Previous Article](#)

工具/TOOLS

[引用本文的文章/References](#)

[下载 PDF/Download PDF\(1004KB\)](#)

[立即打印本文/Print Now](#)

[推荐给朋友/Recommend](#)

统计/STATISTICS

[摘要浏览/Viewed](#) 109

[全文下载/Downloads](#) 57

[评论/Comments](#)



the theoretical solution shows that, the depth of the crack development is mainly controlled by the surface matrix suction. The greater the surface matrix suction, the deeper the cracks; crack depth is greatly influenced by the suction gradient when the suction gradient is small; crack depth development is less