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论文

非饱和结构性黄土本构模型的研究

金旭,赵成刚,陈铁林

（北京交通大学土木建筑学院〓北京〓100044）

摘要：

本文在饱和土扰动概念基础上,提出了可以考虑外力和增湿两个扰动因素对非饱和土结构性影响的耦合扰动变量。根据复合材料均匀化理论的思想建立了适用于非饱和结构性黄土的本构模型,并给出了耦合扰动变量的演化方程。通过将BBM模型和本文模型的计算结果分别与已有的实验结果进行对比说明,本文模型能够更好地反映非饱和原状黄土的力学特性。通过对结构性参数 β、α 进行分析说明,所给出的耦合扰动变量的演化方程能够较好地描述土结构性随变形劣化的规律。

关键词： 扰动变量〓非饱和黄土〓结构性〓劣化〓模型

STUDY ON CONSTITUTIVE MODEL FOR UNSATURATED STRUCTURAL LOESS

JIN Xu,ZHAO Chenggang,CHEN Tielin

（School of Civil Engineering,Beijing Jiaotong University|Beijing〓100044)

Abstract:

On the basis of disturbed state concept for saturated soils,a new expression form of coupled disturbing variable for unsaturated soils is defined in this paper,in which both of disturbance factors that external force and wetting are considered. Moreover,a new constitutive model of unsaturated intact soils is build up in accordance with homogenization theory for composites materials,and the evolution equation of the coupled

disturbing variable is proposed. Comparing the calculation results of BBM and this model with the experimental results respectively,it can be seen clearly that this model can better simulate the mechanical properties of unsaturated intact loess. In addition,according to the analysis results of the influence of structural parameters on shear behavior,the degradation law of soil structure can be well described by the proposed evolution equation of coupled disturbing variable.

Keywords: Disturbing variable Unsaturated loess Structure Degradation Model

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作者简介:

作者**Email**: 06115218@bjtu.edu.cn