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Estimation of joint shear strength based on fractal method

YIN Hong-mei[1], ZHANG Yi-hu[2], KONG Xiang-hui[2]

(1. *CCCC Second Harbor Consultants Co. Ltd., Wuhan* 430000, *China*;
2. *Changjiang Scientific Research Institute/Key Laboratory of Geotechnical Mechanics and Engineering of the Ministry of Water Resources Division of Geotechnical Engineering, Wuhan* 430010, *China*)

Abstract: Estimation method can effectively make up the shortages of testing method in determining the shear strength of hard joint. While, the estimation methods commonly used nowadays are all formed based on 2-D shape of joint, and the 3-D character of joint surface is ill-considered. To solve this problem, a new kind of simple measuring equipment which can be used to get 3-D shape of joint surface was manufactured. And then, the fractal method was used to describe the 3-D shape of joint surface. The index of *JRC* in *JRC-JCS* formula which was brought forward by Barton in 1977 was replaced by function of fractal dimension D, and the following estimation formula was formed: $\tau = \sigma_n \mathrm{tg}\left[(6.12D - 13.53)\lg\left(\frac{JCS}{\sigma_n}\right) + \varphi_b\right]$. The improved estimation formula can consider the 3D effect effectively. Application result indicted that the improved estimation formula was satisfying.

Key words: hard joint; shear strength; estimation; 3-D; fractal dimension

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· 新书推介 ·

《中国地质灾害区域预警方法与应用》

刘传正博士等撰写的《中国地质灾害区域预警方法与应用》专著已由地质出版社正式出版发行。本书概述了国内外地质灾害区域预警预报理论研究和应用服务发展动态,阐述了中国地质环境和地质灾害分布特点,提出了地质灾害区域隐式统计预警、显式统计预警和动力预警原理,简单总结了采用临界降雨判据方法(隐式统计)建立的第一代中国国家级地质灾害预警系统 2003 ~ 2007 年期间的应用经验及其局限性。通过建立包括 30 个图层的全国地质环境信息系统、因子分析确定权重、多元统计和人工神经网络模型对比,分区建立了显式统计预警模型,研发了第二代中国国家级地质灾害预警预报软件系统,经过 2008 年汛期地质灾害区域预警预报服务检验,效果良好。概括提出了地质灾害区域预警预报的工作程序及其基本要求。本书可供从事地质灾害防治预警服务、公共管理、科学技术研究人员和高等院校师生参考使用。

(本刊编辑部)