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基于面积和应力修正的直剪试验数据分析

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ANALYSIS OF DIRECT SHEAR TEST DATA BASED ON AREA AND

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摘要 直剪试验具有方便、经济的优点，被广泛应用，提高直剪试验数据的可靠性具有重要意义。在总结前人研究成果的基础
剪试验结果数据的修正分为2类：单点面积修正方法和多点面积修正方法。通过简化受剪切土体受力物理模型，提出基于面积
应力修正的单点面积应力修正方法。结果表明：该方法是有效、可靠的，修正后的强度指标要大于其他2种方法，并且对3种
际运用进行简单探讨。在推导过程中，提出面积修正系数和正应力修正系数。修正系数结果表明：随着剪切位移的增加，有
上的剪应力大于实测值；有效剪切面积上的正应力小于施加的竖向应力，并且随着剪切位移的增加而逐渐减小；非有效剪切
应力呈逐渐增大趋势。由于直剪试验本身的缺陷，使得其修正后的强度参数与三轴试验结果存在一定差别。提出的单点面积
方法提高了利用直剪试验获取土体抗剪强度参数的可靠性和准确性。

关键词： 土力学 直剪试验 抗剪强度参数修正 面积修正 应力修正

Abstract： The direct shear test(DST) is widely used because of its convenience and economy. It is of
significance to improve the reliability of the DST data. Based on the summary of former test results，the
correction is divide into two types，single-point area correction method and multipoint area correction m
simplifying the force analysis model of shearing soil，an area-stress correction(ASC) method is presented
results show that this method is effective and reliable. The corrected strength parameters are more than
other two methods. A simple discussion on the practical application of these methods is done. In the deri
process，the area correction coefficient and the normal stress correction coefficient are put forward. Th
correction coefficients of ASC show that the shear stress on the effective shear plane is greater than th
measured results；and the normal stress on the effective shear area is less than the applied vertical stre
the shear displacement increasing. The normal stress on the non-effective shear plane is increasing. Sinc
disadvantages and defects of the DST，there are some differences between the corrected strength para
and those of triaxial test. The mathematical analysis and test results indicate that ASC method is effecti
reliable. It improves the accuracy of soil shear strength parameters obtained from DST.

Keywords： soil mechanics direct shear test shear strength parameters correction area correction
correction

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