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土体孔洞损伤结构演化及其力学特性的CT-三轴试验研究

Pore-damage evolution and mechanical properties of remolded soil by CT-triaxial test

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中文关键词: [土壤](#),[孔洞结构](#),[抗剪强度](#),[演化](#),[体积应变](#),[CT-三轴试验](#)

英文关键词: [soils](#) [pore structure](#) [shear strength](#) [evolution](#) [volumetric strain](#) [CT-triaxial test](#)

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作者 单位

[汪时机](#) [1. 西南大学工程技术学院, 重庆 400716;](#) [2. Department of Civil and Environmental Engineering, Imperial College London, London W7 2AZ](#)

[陈正汉](#) [3. 后勤工程学院建筑工程系, 重庆 400041](#)

[李 贤](#) [1. 西南大学工程技术学院, 重庆 400716](#)

[彭 贞](#) [1. 西南大学工程技术学院, 重庆 400716](#)

[袁 军](#) [1. 西南大学工程技术学院, 重庆 400716](#)

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中文摘要:

为了评估孔洞损伤对土体强度、变形和稳定性等力学特性的影响,该文首先对4个试样人工制造不同的孔洞损伤,再在相同的围压和吸力水平下进行CT-三轴剪切试验,定量研究了孔洞损伤结构的演化规律及其对土体力学特性的影响。结果表明:剪切过程中体积应变表现为剪缩,损伤孔径具有单调缩小趋势,在合适的质量含水率条件下,适度小孔损伤反而使土样三轴抗剪强度提高了25%,体积应变也较无损试样小。相同损伤面积的试样具有几乎相同的抗剪强度,但体积应变不具备相同规律。

英文摘要:

In order to assess the influence of pore-damage on the strength, the deformation and the stability of soils, five samples, including four samples with pore-damage and one damage-free sample, were analysed using CT(Computed Tomography)-triaxial testing apparatus under the controlled constant confining pressure and suction. The evolution of pore-damage and the mechanical properties of the samples were studied in this paper. Results showed that the volume of sample and the area of the pore reduced during testing. The shear strengths of the pore-damaged samples were improved 25 per cent under the condition of favorable moisture when the diameter of damage pore was 3 mm. The volumetric strains of pore-damaged samples were less than that of the damage-free sample. The shear strengths of the samples were identical when the areas of the damaged pores were similar. However, the volumetric strains were different even though the areas of the damaged pores were the same.

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