
P2A-5

CHARACTERISTICS OF FILLED JOINT UNDER SHEAR LOADING

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ABSTRACT

Filled joints, particularly those resulting from *in situ* deposition, are among the most critical discontinuities in rock. High deformability and low shear strength are the typical behaviour exhibited by this type of discontinuity. There are certain components or features that contribute to the weaknesses exhibited by filled joint, and these include type and thickness of infilling, and surface roughness of the host joint. Due to the complex behaviour of filled joint, it is therefore essential to understand its typical behaviour under the interactive effects of these controlling components. In an attempt to study the behaviour of filled joint, a series of laboratory shear tests were undertaken on model filled joint. The physical model used in the test consists of granite residual soils as infilling and cast concrete blocks as joint blocks. Experimental variables include normal stress, infill thickness and roughness of joint surface. The shear tests were undertaken on specially fabricated servo-controlled direct shear apparatus. Laboratory test results indicate that shear strength of a joint decreases significantly with the presence of infill material in its aperture. The reduction in strength however, depends on the infill thickness and texture of the joint surface. Comparatively, the effect of infill thickness on shear strength is more significant in rougher joint surface. It is also found that the weakest point in joint filled with granular material is not necessarily within the infill, but may occur at the 'infill-joint interface'.