

An Experimental Study of the Effectiveness of Lubricants in Reducing the Sidewall Friction

Authors : Jian Zheng, Li Li, Maxime Daviault

Abstract : In several cases, one needs apply lubrication materials in laboratory tests to reduce the friction (shear strength) along the interfaces between a tested soil and the side walls of container. Several types of lubricants are available. Their effectiveness had been tested mostly through direct shear tests. These testing conditions are quite different than those when the tested soil is placed in the container. Thus, the shear strengths measured from direct shear tests may not be totally representative of those of interfaces between the tested soil and the sidewalls of container. In this paper, the effectiveness of different lubricants used to reduce the friction (shear strength) of soil-structure interfaces has been studied. Results show that the selected lubricants do not significantly reduce the sidewall friction (shear strength). Rather, the application of wax, graphite, grease or lubricant oil has effect to increase the sidewall shear strength due probably to the high viscosity of such materials. Subsequently, the application of lubricants between tested soil and sidewall and neglecting the friction (shear strength) along the sidewalls may lead to inaccurate test results.

Keywords : arching, friction, laboratory tests, lubricants

Conference Title : ICCEIE 2017 : International Conference on Civil, Environmental and Infrastructure Engineering

Conference Location : Kyoto, Japan

Conference Dates : November 16-17, 2017