

Separation of Pumice from Soil Mixtures

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Abstract

Pumice-rich deposits are found in a number of locations around the world, and in particular across large areas of the North Island of New Zealand. Pumice grains are commonly described as being lightweight, highly crushable, and vesicular in nature. These characteristics give rise to a unique set of behaviours under loading, and pumice-rich soils are highly problematic in terms of in situ characterisation in large part due to their crushability. The presence of pumice within a soil mixture has the potential to completely alter the stress-strain behaviour of these soils as well as require a different interpretation of results from commonly used site characterisation technique. It is therefore important to be able to determine quantitatively the percentage of pumice within a given soil deposit. This paper proposes a methodology based on a gravity separation of pumice-bearing mixtures with a heavy fluid. The application of the method to artificial mixtures of fine pumice and non-pumiceous sands is shown to be sufficiently accurate for engineering purposes.

Biography

Mark obtained his PhD from the University of Cambridge, following research on the axial load distributions on piled foundations in liquefiable soils using a geotechnical centrifuge. Since joining the CNRE department at the University of Canterbury, Mark has been involved in a series of element testing projects on New Zealand soils, including the silty soils around Christchurch and more recently, the pumice-rich deposits of the North Island. As a core part of this work, Mark has been trialling the use of the innovative gel-push samplers developed by Kiso-Jiban consultants in Japan.

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