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Effects of negative ageing on deformation and strength response of geomaterials

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Negative ageing or decay of grains with time is often ignored in conventional geotechnical investigations. Geology is always vital in such a scenario but the micro-scale geotechnical point of concern is the time-dependent loss of strength and deformation characteristics.

This paper presents unique data from torsional shear tests on crushed soft rocks from Yokosuka, Japan and 2005-Kashmir earthquake hit areas of Pakistan. Material being sensitive to disintegrate by water-action allowed to simulate the long-term stress-strain and volume change response under saturated conditions whereas dry tests on similar soil represent initial intact response of the material. Negative ageing is manipulated by an enormous decrease in shear strength parameters, changes in grain size curve and increase in volumetric compression. It is concluded that for long-term hazard evaluation of various geotechnical structures, the effects of loss of strength due to decay of grains with time should be incorporated in conventional analysis and design models.