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Behaviour of sand-bentonite buffer material of deep geological repository under high confining pressure

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Deep geological repositories have been proposed as a safe waste management system for high-level radioactive wastes. Sand-bentonite buffer materials are used in engineered barrier system of deep geological facilities thank to their excellent swelling properties. In this research, volumetric and strength behaviour of sand-bentonite buffer material under high confining pressures of 1-3MPa were studied using a newly developed double-cell triaxial testing apparatus. The specimens were prepared with 30% of sand as proposed for geological repositories in Japan. The suction behaviour of sand-bentonite specimens were also studied.

The results indicate that the degree of saturation influences the strength and volumetric behaviour significantly, which suggests that local groundwater flow affects the performance of buffer material upon decommissioning of a deep geological repository. It also indicates that suction behavior is significantly affected by the degree of saturation, although it was less affected by confining pressure.

Primary author: Dr KUMARA, Janaka J. (Department of Civil Engineering, Meijo University, Japan)

Co-author: Prof. KODAKA, Takeshi (Department of Civil Engineering, Meijo University, Japan)

Presenter: Dr KUMARA, Janaka J. (Department of Civil Engineering, Meijo University, Japan)

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