IIS UNIVERSITY OF TOKYO
GDM

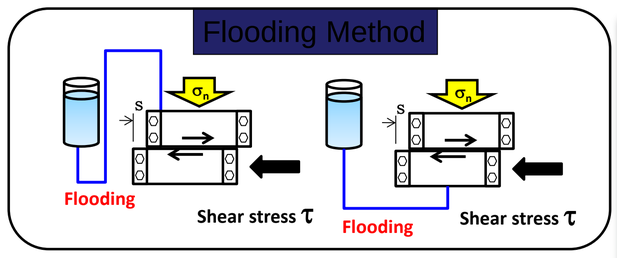
SLAKING EFFECT ON SHEAR STRENGTH AND DEFORMATION OF MUDSTONE

1. Introduction

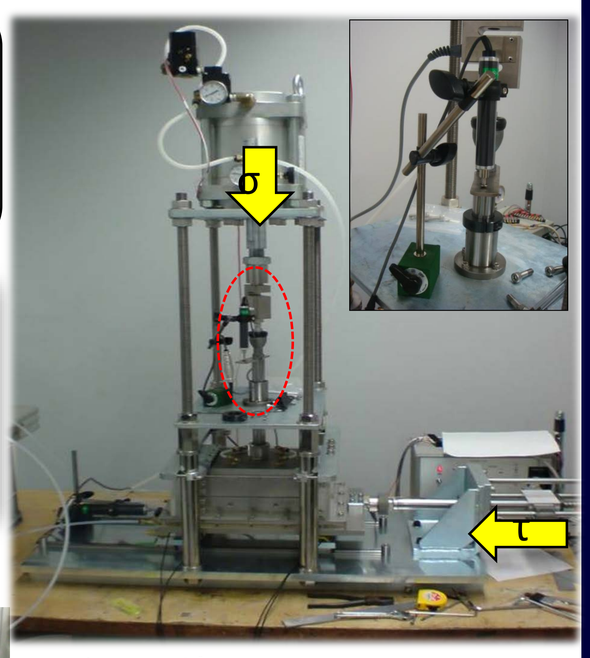
The Dam formed by Kashmir earthquake 2005 was breached in 2010 just after moderate rainfall is assumed due to slaking of mudstone. Slaking was considered a vital factor for collapsing of the embankment during Suruga Bay earthquake 2009. After a drought has ended, and an intense rain has occurred, the new threat of landslides becomes present. As the droughts and rains intensify, the severity of a landslide increases as well. Slaking is assumed a key factor for landslide in this phenomena. With increasing global warming and climate change problem, Slaking becoming a cause of land slides.

2. Laboratory Apparatus and Materials

In this study, Direct Shear Test is performed to evaluate the slaking effect on shear strength and deformation of mudstone. This instrument has dimensions 20 cm*20 cm*10.8 cm, one of the largest DSB with upper box fixed. It is advanced than conventional DSB, where we can saturate sample with creep load simultaneously. It has 6 load cells and 2 LVDTs for automation.



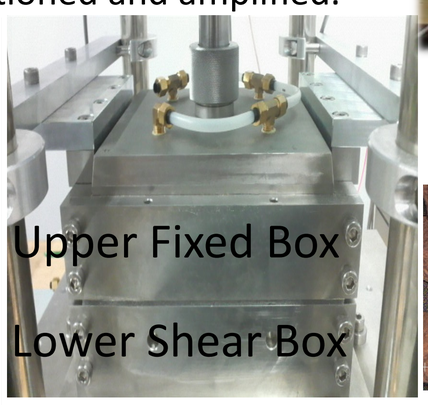
Signals from transducers were conditioned and amplified.

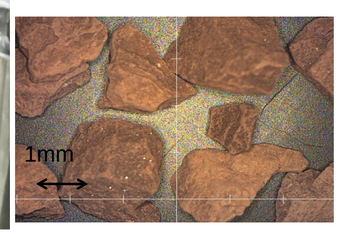


Direct Shear Test Apparatus at Kiyota Lab, IIS.

Materials: Mudstone
Specimen size:
200 mm × 200 mm × 91.4 mm
(Op = 10 mm)
Dry unit wt. ρ_d = 1.475 gm/cm^3
Size: 2.0mm ~ 4.75mm
Void ratio e = 0.750

Sample	Initial water content	Test condition
MS101	0%	Dry
MS102	0%	Saturation
MS103	3%	Saturation
Ms104	6 %	Saturation

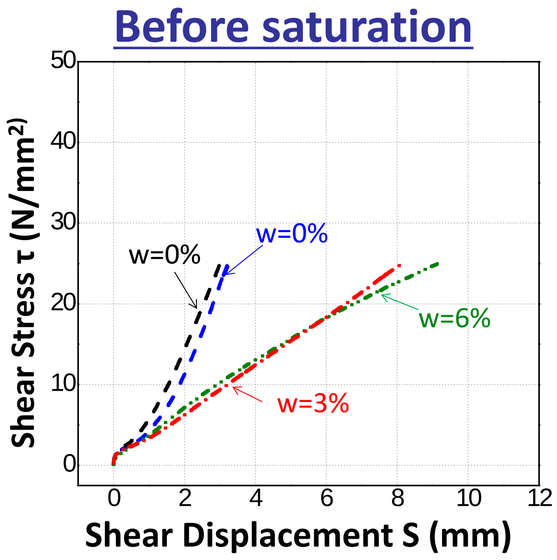




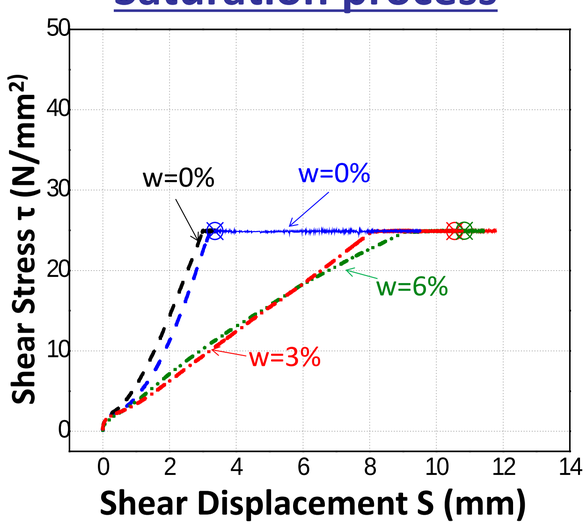
Tested Mudstone

3. Test Results

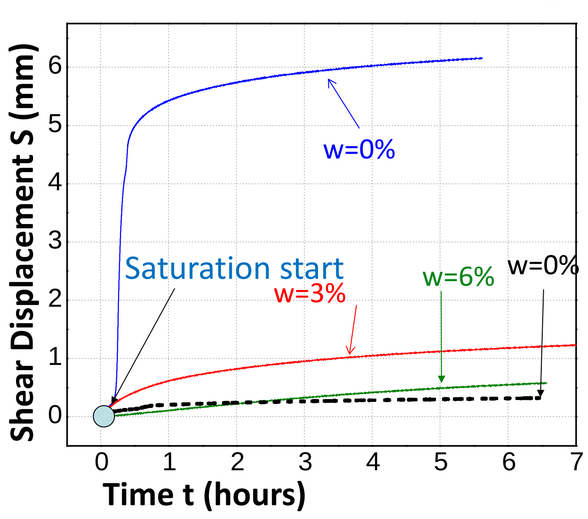
Before saturation



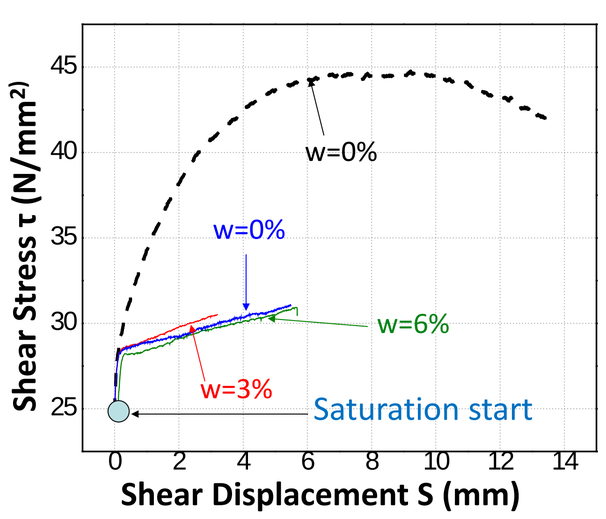
Saturation process



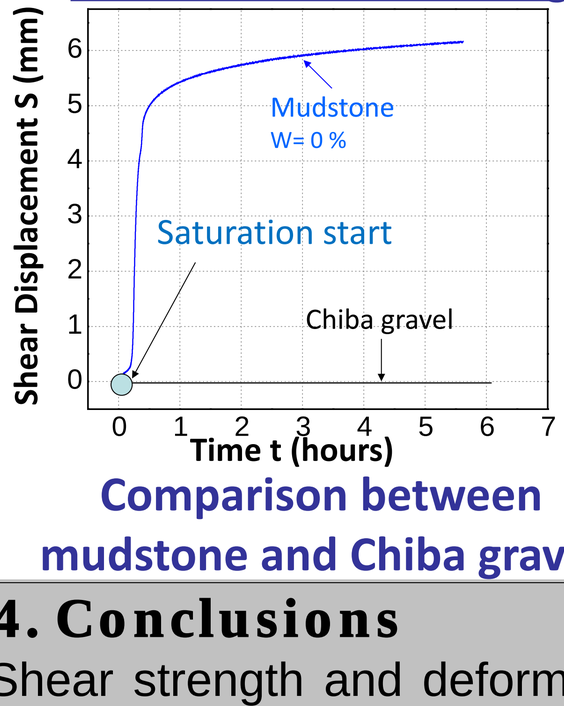
After saturation starting



After saturation starting

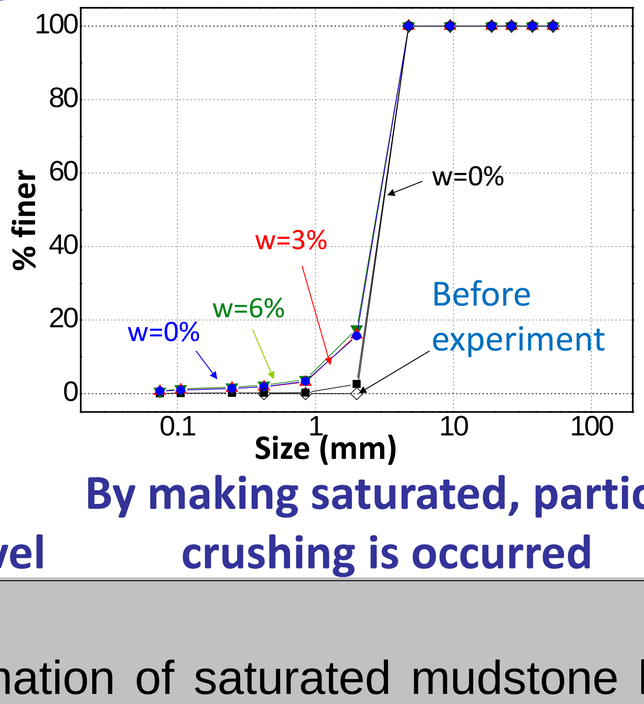


After saturation starting



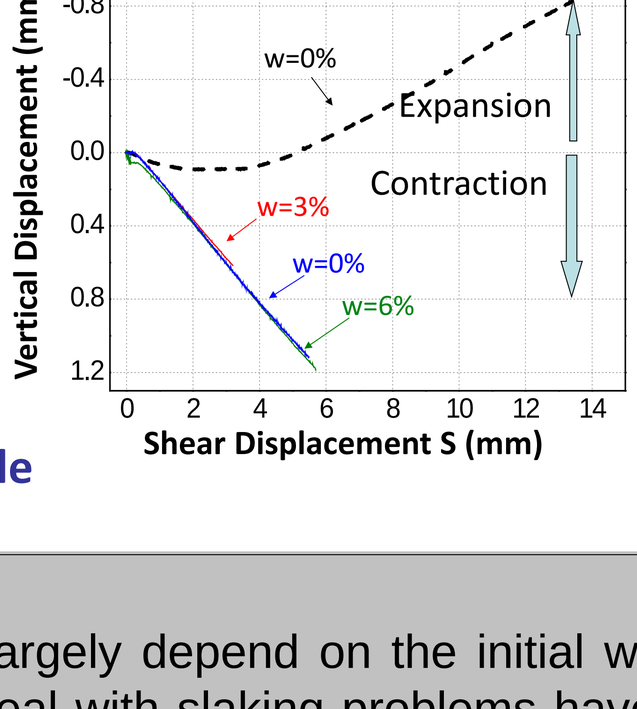
Comparison between mudstone and Chiba gravel

Particles sizes distribution

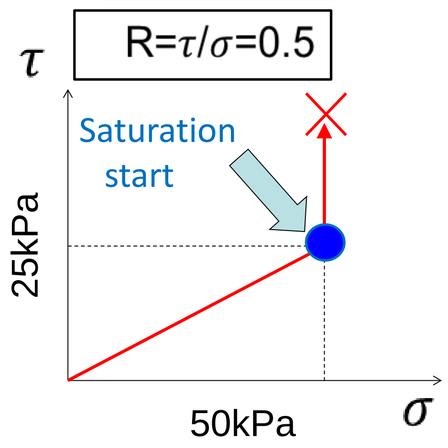


By making saturated, particle crushing is occurred

After saturation starting



Stress Path



4. Conclusions

Shear strength and deformation of saturated mudstone largely depend on the initial water content. Impact of slaking is strangely higher for dry sample .Measures to deal with slaking problems have been based on some empirical rules (formulae), and less attempts have been made to describe mechanical features of slakable materials. So, after complete research of slaking of mudstone, we can describe the features of slaking.