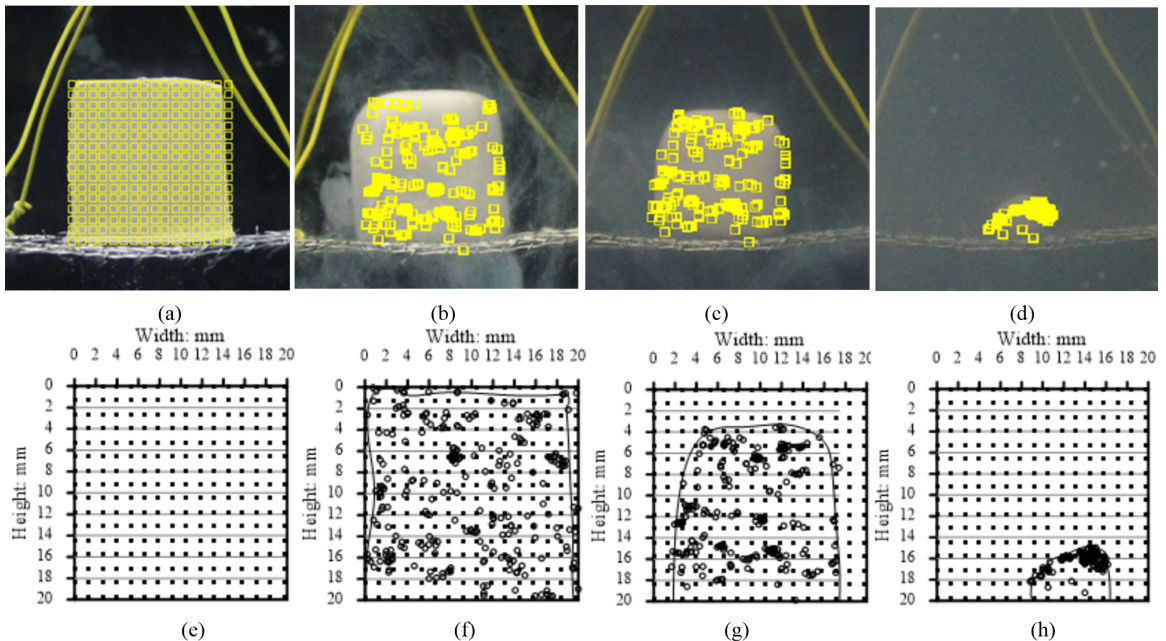


Double porous clay fills

Restoration of a site previously prepared using dredged and waste clays from underground construction or tailing sludge, is a serious geotechnical problem. Much of these clays exist as lumps which ranges in size from a few tens of millimetres to a meter suspended in slurry, with poor engineering properties. This double porous material consolidates because of the expulsion of water from the voids between the lumps, as well as the voids within each lump. Due to this complex nature, the conventional theory of consolidation is not applicable to lumpy clay fills.

Notwithstanding the above, the lumps invariably swell and disintegrate if sufficient time between the dumping of lumps and the application of surcharge is permitted. The first phase of this study aims to attain a better understanding of the lump disintegration. The effect of physicochemical and index properties along with clay mineralogy were investigated. In the second phase, tests were conducted on lumpy samples in flexible wall permeameter to investigate the effect of lump's size and stiffness, and packing on the volume change. Pore pressures were measured separately in the lump and the slurry. With the help of the data collected over months, a soil model is developed using the critical state concept.



Digitised clay lump in object space coordinates