

Comparison between Open and Closed System for Dewatering with Geotextile: Field and Comparative Study

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Abstract : The present paper aims to expose two techniques of dewatering for sludge, analyzing its operations and dewatering processes, aiming at improving the conditions of disposal of residues with high liquid content. It describes the field tests performed on two geotextile systems, a closed geotextile tube and an open geotextile drying bed, both of which are submitted to two filling cycles. The sludge used in the filling cycles for the field trials is from the water treatment plant of the Technological Center of Aeronautics ‐ CTA, in São José dos Campos, Brazil. Data about volume and height abatement due to the dewatering and consolidation were collected per time, until it was observed constancy. With the laboratory analysis of the sludge allied to the data collected in the field, it was possible to perform a critical comparative study between the observed and the scientific literature, in this way, this paper expresses the data obtained and compares them with the bibliography. The tests were carried out on three fronts: field tests, including the filling cycles of the systems with the sludge from CTA, taking measurements of filling time per cycle and maximum filling height per cycle, heights against the abatement by dewatering of the systems over time; tests carried out in the laboratory, including the characterization of the sludge and removal of material samples from the systems to ascertain the solids content within the systems per time and; comparing the data obtained in the field and laboratory tests with the scientific literature. Through the study, it was possible to perceive that the process of densification of the material inside a closed system, such as the geotextile tube, occurs faster than the observed in the drying bed system. This process of accelerated densification can be brought about by the pumping pressure of the sludge in its filling and by the confinement of the residue through the permeable geotextile membrane (allowing water to pass through), accelerating the process of densification and dewatering by its own weight after the filling with sludge.

Keywords : consolidation, dewatering, geotextile drying bed, geotextile tube

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