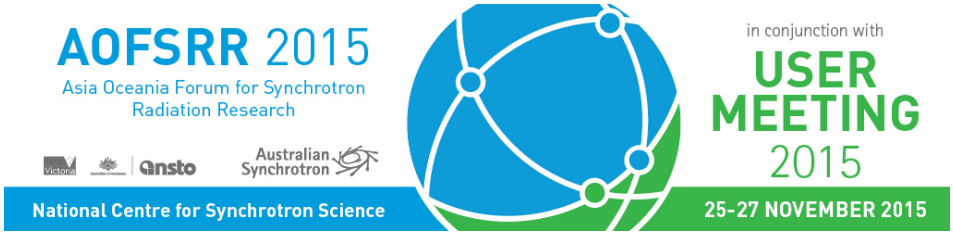

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Pore microstructure variation in gradient consolidation of Pearl River Delta saturated clay

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Clayed soils have been widely used in engineering foundation treatment in the coastal field to solve the issues of creep problems, the deformation, and strength of drainage consolidation. The microstructure porosities and pore size distribution of the clayey soil in the Pearl River Delta were studied by techniques of SEM and pressure gradient method. The loading was investigated based on the stress to improve the efficiency of saturated clayed soil foundation treatment. The effect of stress distribution on mechanical properties in the consolidation process was also investigated through the rate of anisotropy characteristics in the same full of saturated soft clay. It was found that small pores were increased with increasing loading of clay samples. Large pores with diameter of over 4 μm were obviously decreased with increasing loadings because of the squeeze effection which generated much more smaller pores. And the maximum principal stress and pore size with short axis angle were reduced. Furthermore, on the horizontal profile of samples, the round-like pores were abundant, but the direction was not obvious. While on the vertical profile, the pores were relatively flat with low abundance and the obvious direction. All of these indicated that the isotropic characteristic of clayed soil was gradually appeared with increasing pressure gradient. So the stress change in the consolidation process of the saturated soft clay is important in engineering which would be performed step by step based on the stress to improve the efficiency of saturated soft clay foundation treatment.

Keywords

clayed soil; foundation treatment; pore microstructure; seepage paths

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