CHARACTERIZATION OF FAILURE IN SAND UNDER TRIAXIAL COMPRESSION USING AN INDUSTRIAL X-RAY CT SCANNER

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ABSTRACT

A new triaxial compression test apparatus was developed for use with an industrial X-ray computed tomography (X-ray CT) scanner and used to characterize progressive failure with strain localization in sand. Performance of the new triaxial compression apparatus was verified separately prior to use within an X-ray CT scanner system. High quality visualizations obtained from a series of nondestructive tests conducted under triaxial compression with the new test apparatus made it possible to visually characterize progressive failure with propagating strain localization in a soil specimen using three-dimensional CT images. Specifications for the new apparatus and procedures for its use were established and potential applications and avenues of further research were discussed.

Key words: triaxial compression test apparatus, X-ray CT Scanner, failure, stress-strain relationship, sand, strain localization, visualization, image processing analysis