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Characterization of Soil Stability to Withstand Erection of High-Rise Structure Using Electrical Resistivity Tomography

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Abstract

In this paper, we used the Electrical Resistivity Tomography (ERT) technique to examine the suitability of the subsurface for its ability to withstand erection of a proposed high-rise structure in Emmanuel Alayande College of Education, Oyo, Nigeria. The Wenner array was used for the ERT survey, with the varying electrode separations of 1.0, 3.0, 6.0 and 8.0 m

respectively, and the electrode increment of 5.0 m across the three (3) traverses that were established in the study area. The traverses were of distance 100 m each, with W-E orientation that would enable the subsurface imaging of the study area. The subsurface features experienced in the study area were topsoil/laterites, weathered layer, clayey zone, and bedrock. The inverse model along traverses 1 and 2 revealed that the clayey zones beneath these traverses are very thick, which showed that the study area was unsuitable for construction of high-rise building without the certified building engineers' advice.

Keywords

Soil characterization Soil stability High-rise structure Electrical resistivity tomography Pre-foundation investigation