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Clayey Sand Soil's Behaviour Analysis and Imaging Subsurface Structure via Engineering Characterizations and Integrated Geophysicals Tomography Modeling Methods

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ABSTRACT

The geoelectrical resistivity and seismic refraction surveys which were used in this study on the test site, delivered a detailed image of the near-surface conditions in generally very good. Electrical resistivity and seismic refraction analysis proved that a combination of these integrated study of the physical environmental data provided a reasonable compromise between measurement time and image resolution. Quantitative interpretation of the resistivity and seismic models based on soil's parameters determined using laboratory practices and field survey could reproduce the range of resistivity and seismic values found on the site very well. The model explains the ambiguity in between resistivity and clayey sands found on the site and predict the dominant role of water saturation. Geophysical methods are used in this research in purpose to determine the internal structure of a soil mass. Various geophysical methods and their merits for imaging subsurface structures and condition are discussed. Seismic methods are often the most suitable because the measurements depend on the mechanical properties which are also important in the mechanical calculation of soil's behaviour analysis. Other geophysical method, such as geoelectric resistivity, is useful to determine the internal structure, but require a correlation of found boundaries with mechanical properties. This research was conducted to investigate the subsurface structures and conditions through geotechnical engineering properties and its geophysical characteristics. The computation analysis is used in this research in purpose to investigate clayey sand soil's behaviour. Electrical resistivity test and engineering laboratory practices such as soil strength test, liquid limit test, plastic limit test and grain size distribution test was also carried out to investigate clayey sand soil behaviour in Batu Uban, Penang area during monitoring period.

KEYWORDS

Geoelectrical Resistivity; Seismic Refraction; Soil's Behaviour; Investigate; Monitoring Period

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