EFFECT OF BENTONITE AND POLYMER DRILLING FLUIDS ON SKIN FRICTION OF BORED PILES

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DECLARATION

I hereby declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

Skin friction is a major component in any pile foundation's load bearing capacity. In terms of a floating pile, almost entire bearing capacity depends on the skin friction. Skin friction may depend on the soil type and parameters while there are several methods of obtaining the skin frictional resistance of a pile depending on the soil type. Most of the high rise structures in Sri Lanka stand on bored end bearing pile foundations. Construction of bored piles widely involves usage of Bentonite as a drilling liquid and as a borehole soil stabilizer which may result in retention of a considerable amount of Bentonite and soil mix between the pile and the surrounding soil. Hence it is arguable that the used Bentonite slurry has an effect on the skin friction of the pile. Polymer liquid is not a commonly used drilling liquid in Sri Lanka but still it has been used in the current study. Main objective of this research is to investigate the effect of using Bentonite and Polymer liquids on the skin friction of pile foundations in Sri Lankan soils. From the results obtained from the direct shear tests conducted in laboratory for laterite soil and sand, it was evident that polymer liquid had no significant effect on soil strength parameters but with time due to the filter cake formation, bentonite will cause a significant change in soil strength parameters.

Keywords: Skin friction, Pile foundations, Bentonite, Ploymer

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