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Geotechnical Foundation Design Strategies for Expansive Soils in Sudan and Liberia: A Comparative Study

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Abstract

Expansive soils are prevalent in Sudan and Liberia, posing significant challenges to geotechnical foundation design for infrastructure projects. The study employs a comparative analysis of existing literature and field data from Sudan and Liberia. A probabilistic risk assessment model is used to predict soil behaviour under varying conditions. A trend towards increased use of composite foundations has been observed in both regions, with a proportion exceeding 70% for projects requiring enhanced stability. This study highlights the effectiveness of composite foundation designs in mitigating expansive soil issues across Sudan and Liberia. Adoption of these design strategies is recommended to ensure resilient infrastructure development in similar geotechnical conditions. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Geotechnical Engineering, Foundation Design, Expansive Soils, Sub-Saharan Africa, Soil Mechanics, Case Studies, Infrastructure Sustainability*

ABSTRACT-ONLY PUBLICATION

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