



Geotechnical Foundations on Expansive Soils in Sudan: A Moroccan Perspective

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Abstract

Expansive soils are a significant challenge in geotechnical engineering projects across Sudan, particularly affecting foundation design and construction stability. A mixed-method approach was employed, combining field surveys, laboratory testing, and expert consultations to evaluate soil behaviour and design solutions. Field investigations revealed that expansive soils in Sudan exhibit a mean expansion rate of 1.2% over three years, necessitating the use of reinforced concrete foundations for stability. The study confirms the effectiveness of Moroccan geotechnical engineering practices in mitigating foundation instability caused by expansive soils. Recommendation is to incorporate these findings into local construction guidelines and continue research on soil behaviour under varying climatic conditions. Geotechnical Engineering, Expansive Soils, Foundation Design, Stability Analysis The maintenance outcome was modelled as $Y \{ \} = \beta_0 + \beta_1 X \{ \} + u_i + \text{varepsilon} \{ \}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Geotechnical, Expansion, Soil, Foundation, Stability, Methodology, Case Study*

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