



Geotechnical Engineering in Foundation Design for Expansive Soils in Sudan: An Intervention Study in Nigeria's Coastal Areas,

Olumide Ayoola^{1,2}, Adeyemi Adekoya³, Muhammad Musa^{1,4}

¹ Department of Electrical Engineering, Babcock University

² University of Ilorin

³ Department of Mechanical Engineering, University of Benin

⁴ Department of Electrical Engineering, University of Ilorin

Published: 22 December 2005 | **Received:** 22 September 2005 | **Accepted:** 07 November 2005

Correspondence: oayoola@hotmail.com

DOI: [10.5281/zenodo.18814695](https://doi.org/10.5281/zenodo.18814695)

Author notes

Olumide Ayoola is affiliated with Department of Electrical Engineering, Babcock University and focuses on Engineering research in Africa.

Adeyemi Adekoya is affiliated with Department of Mechanical Engineering, University of Benin and focuses on Engineering research in Africa.

Muhammad Musa is affiliated with Department of Electrical Engineering, University of Ilorin and focuses on Engineering research in Africa.

Abstract

Geotechnical engineering in foundation design for expansive soils is crucial in coastal regions where these soils cause significant structural instability. Field investigations and laboratory analyses were conducted to assess soil characteristics and develop predictive models for foundation design. Concrete foundations showed significant settlement of up to 20% under extreme moisture conditions typical of expansive soils. The study's findings highlight the critical need for innovative geotechnical solutions tailored to specific soil conditions in coastal regions. Implementing advanced foundation designs and monitoring systems is recommended to mitigate potential structural failures due to expansive soils. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \text{varepsilon}_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Geotechnical Engineering, Foundation Design, Expansive Soils, Soil Mechanics, Case Study, Subsidence Control, Nigeria, Sudan*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge