



Integrating Geophysical and Geotechnical Methods to Optimize Foundation Design of a Power Station Site in Basrah, Iraq

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ABSTRACT

The geotechnical soil investigation in Al-Siba District in southern Iraq for a Gas Power Plant Project reveals soft to very soft silty clay soil with varying elastic moduli values across different depths. The soil is divided into six layers; with moduli values ranging from 342.23 m/sec to 548.02 m/sec and 215.43 m/sec to 307.73 m/sec starting from 1.0 to 24.0 m depths, respectively. The Poisson's ratio and Young's modulus values are found to be between 0.21 and 0.325 in BH.3, with the minimum and maximum values being 74.5 and 171.5 Mpa. The study has identified zones of weakness at depths of 5-19 meters based on low N-values (Number of blows). The foundation soil demonstrated the ability to withstand double the design load without settlement. Plate load tests and elasticity theory results aligned closely, indicating allowable bearing capacity values between 13 to 25.5 T/m². A strong correlation is found between subgrade reaction and permanent deformation moduli. Overall, the site's soil characteristics and gas production potential support the recommendation for implementing the Gas Power Plant in Al-Siba District.

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