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# FOUNDATION STUDIES FOR BRIDGE DESIGN AND CONSTRUCTION AT THE DOWN STREAM OF SHIRORO HYDROPOWER PLANT USING GEOELECTRIC METHOD

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## ABSTRACT

Subsurface geophysical site investigations aimed at establishing the depth to stable basement rock in order to establish a suitable platform for engineering construction was carried out downstream of Shiroro Dam. Engineering geology with the application of geophysical methods is an efficient means of subsurface investigation. Without high level engineering exploration constructions of great dimensions are inconceivable. Geophysical investigation employing VES carried out on the bank of river Kaduna at Shiroro, downstream of the Shiroro dam procured comprehensive high quality information with regard to the subsurface. The survey was aimed at establishing the depth to fresh basement rock so as to establish a suitable platform for engineering construction at the northern and southern abutments of the project site. The profiling chart and iterated geo-electric parametric value suitably established an overburden (regolith, boulders and weathered rocks) unit depth of  $15\text{m} \pm 1\text{m}$  from the surface at the northern abutment. Thirty six meter from the established center line upstream, outcrops were found to be exposed at the surface (VES 108 and 120). At the southern abutment the overburden depth is dipping towards the river channel ranging from 5m for VES 1,2,3,4 and 12 to 10m for VES 7, 8, 9 and 10. The foundation for the proposed bridge could be established successfully at the southern abutment to the depth range of 5m to 10m while the foundation at the northern abutment may be difficult to achieve due to the existence of a large quantity of boulders underlying the subsurface. Conventional engineering