

Olkaria Geothermal Power Plant

Naivasha, Kenya

Expansion at Olkaria, the largest geothermal power station of its kind in Africa.



The project

KENGEN recently embarked on an expansion program at the Olkaria 1 Geothermal Power Station located in the Great Rift Valley near Naivasha in Kenya. This area is geothermally active, and the geothermal energy is being used to generate clean electric power.

The project involved the design and installation of foundations for the cooling tower and turbine building extensions to Unit 6.

After analysing the soil conditions it was clear a piled foundation was required.

The challenge

The mix design is one of the most important factors to consider for CFA piling projects. As this area is volcanically active, the ground temperature is substantially higher, which resulted in accelerated setting of the concrete placed in the ground. Flash-setting, together with the requirement for full-length reinforcement cages and high-strength concrete due to the high sulphate content of the ground, created significant challenges in the execution of the project.

In order to eliminate any differential settlement between the various structures, the whole plant was placed on piles. Some piles were located in deep excavations, making access to the pile positions challenging at times.

The solution

Our inhouse design team designed the foundation solutions for the turbine building, cooling tower, hot well, and scrubber areas.

A total of 585 no. 600mm diameter CFA piles, designed to withstand loads of up to 1200kN, were installed to depths of up to 15 meters.

The pile design and performance was confirmed by conducting static load tests. The test piles were loaded to 250% in accordance with ASTM 1143 test procedure.

Project facts

Owner(s)

Marubeni Tokyo - EPC
Kengen

Keller business unit(s)

Keller East Africa

Main contractor(s)

The Civcon Limited and Fuji Electric Company Consortium

Solutions

Heavy foundations

Markets

Power

Techniques

CFA piles (auger cast)

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