



AJIWA DAM

Nigeria, 1996

PROJECT CHARACTERISTICS

Works: Rehabilitation and improvement of an earthfill dam and new spillway.

Purpose: irrigation and water supply

Dimensions:

- original dam height: 12 m, rehabilitated dam height: 14.7 m
- original dam crest length: 880 m, rehabilitated dam crest length: 1491.8 m
- Old embankment removed: 45 000 m³
- New fill Added: 95 000 m³

Watertightness: clay core

Materials:

- foundation: granite and gravelly sand
- original embankment: weathered granite
- new embankment: lateritic soil for the u/s portion and sandy weathered granite for the d/s one



PROFESSIONAL SERVICES PERFORMED

Analysis of the routing of a low frequency flood and of the breaching of the existing dam, plan of additional investigations, analysis of the investigations results, conceptual design, 3D CAD model of the dam, detailed design, computations, construction drawings of the rehabilitated dam and of a new spillway for 2200 m³/s, assistance during construction.

Ajiwa dam, in operation since 1975, is located in a sub-desertic area on Tagwai River, in the Katsina State, North Nigeria. In 1994 a major flood produced the breaching of the emergency spillway and damages to the service spillway and to the dam.

After the evaluation of the status of the existing dam and the analysis of results obtained from the investigation campaign the design of rehabilitation works was prepared. Rehabilitation works called for a new spillway capable of handling flows in the order of 2000 m³/s. The dam had to be raised by 2.7 m in order to increase the gross storage and to compensate the capacity lost after 20 years of silting of the reservoir.

The dam rising implied the construction of completely new wings on both banks, beyond the existing dam. The protection on both u/s and d/s slopes was placed over a geotextile separator. A toe drain, along the lower line of the d/s slope and a counterweight berm, in the lower section of the river, were added. The intake tower was also raised and refurbished. A monitoring system, based mainly on monuments for settlements, horizontal displacement measurements and piezometers, was also implemented. The spillway, 90 m long, is overpassed by a 8 spans, light weight steel bridge.

Rehabilitation works started in the spring of 1997 and were completed early in 1998.

