Impervious grout curtain into a fossil valley

PIEDRA DEL AGUILA DAM
ALICOPA HYDROELECTRIC COMPLEX - ARGENTINA

General view of the site

CLIENT: HIDRONOR
ENGINEERS: IATASA
MAIN CONTRACTOR: UCASA
WORK PERFORMED FROM OCTOBER 1988 TO JUNE 1992

The Piedra del Aguila dam is a solid concrete gravity dam rising 180 m above its foundations and 800 m long at its crest.

The site offers exceptional hydro-electric potential and a great geological anomaly.

The present valley, in which the construction stands, is contiguous to a second fossil valley which is full of extremely heterogeneous alluvials covered with a layer of basalt.

In order to guarantee the stability of the Left bank, it was necessary to construct an impervious trilinear grout curtain through the fossil valley from two underground galleries, and complete the work with a large drainage system.

The injection curtain measures 600 m long by 210 m high at its deepest point.

Given the short time allowed to complete the work, start-up planned for the 10th Oct., 1989 and dam operation planned for the 1st Sept., 1990, with 72,300 lm of drilling and 22,600 m^3 of grout to be injected between these dates plus all the mobilisation, it was necessary to transport more than

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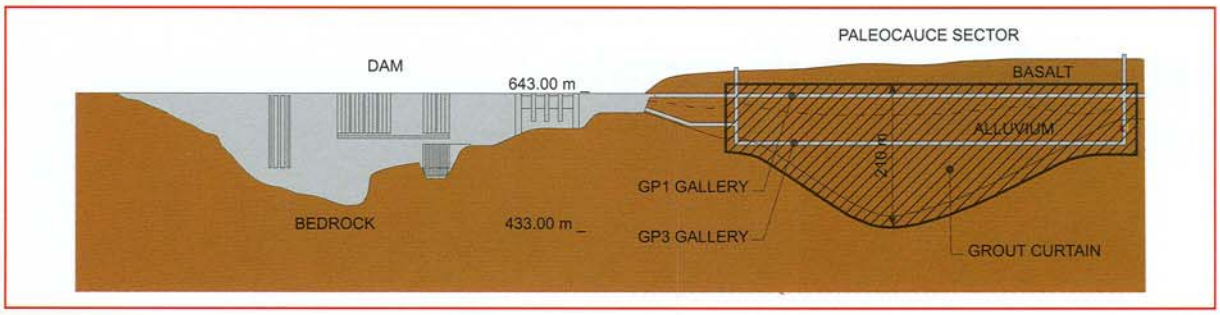
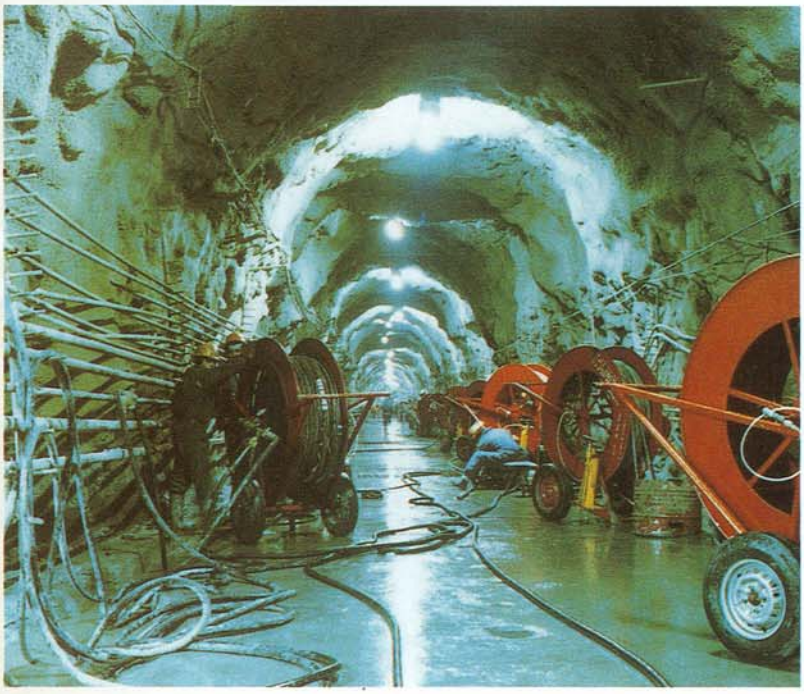


Longitudinal section of the gravity dam and the fossil valley

EPICEA station : recording and injection control



View of the GP1 gallery

400 tons of equipment from France by air freight.

At the heart of the success of the work within schedule, was a sophisticated computer system, which took care of the recording of the drilling parameters, the recording of the grouting parameters, the command and control of the grout pumps and the statistic processing of the injection results.

It would have been impossible to manage manually, 60 points of injection simultaneously, as well as 17 drilling machines.

In order to ensure the best possible distribution of the grout into the soil, in spite of its heterogeneity, C3S grout (high penetration bentonite/cement) was used with great success.

Equipment and personnel

17 drilling machines
70 grout pumps
6 EPICEA stations
700 personnel

Work details

Drillings: 110,500 lm

Injection: 63,100 m^3 of which 40,000 m^3 were C3S grout

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