

ARAPUNI DAM, NZ

FISSURE GROUTING AND JET GROUTING TRIAL



Client: Mighty River Power
Consultant: Damwatch Services

Specialist Contractor: Menard Bachy Pty Ltd

THE PROJECT

Arapuni Dam forms the reservoir for the 186 MW Arapuni Power Station located on the Waikato River, 55km upstream of Hamilton City in the North Island of New Zealand. Intensive study of the foundation conditions at Arapuni Dam had revealed the existence of significant defects. The defects comprise of erodable clay fissures forming a flow path in the Ongatiti Ignimbrite formation beneath the dam foundation.

Menard Bachy was engaged to complete:

- Fissure Grouting. The main object of the fissure grouting consisted of relieving the high hydraulic pressures to the toe of the dam.
- High Pressure Jetting Trials. The main object of the trials was to determine the feasibility of using jet grouting techniques on the ignimbrite foundation at Arapuni Dam.

MENARD BACHY'S ROLE

Fissure Grouting

Menard Bachy was awarded the Fissure Grouting works in November/December 2001 as a specialty contractor to carry out the grout design and methodology for application of the fissure grouting.

This involved working closely with both Mighty River Power and DamWatch personnel to secure an agreeable solution to a deteriorating problem. The work also involved training of personnel supplied by Works Practise and management of the grouting application during the operation.

Fissure grouting was conducted over a 14 hour period on 12-13 December 2001. At the completion of works, water flow in the under drain had been reduced from approximately 300 litres per minute to 30 litres per minute. Dam toe pressures have been successfully relieved.

High Pressure Jetting Trials at Quarry Site

Menard Bachy was awarded the High Pressure Jetting Trials contract in December 2003 as a specialty contractor. The trials took place at two different locations; Arapuni Dam and Hinuera Stone Quarry, having similar geology to the dam site. The purpose of the trial was to assess the suitability of high pressure jetting equipment in removing clay seams from the fissured rock.

The equipment was mobilised to site to complete the objectives of the trials. As a result of the trials and the mutual co-operation between all parties, a number of options for a permanent repair to the fissure have been developed.

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