

Tunnel Refurbishment.
Reefton Powerhouse Project.

Reefton Power Station supplied electricity to the very prosperous gold mining town of Reefton in New Zealand and was the first power station to supply municipal electricity in the Southern Hemisphere. It started operation on 4 August 1888. [Wikipedia](#)

Reefton's historic hydro-electric power scheme ('The Scheme') is fed by water conduit consisting of open races and small tunnels developed in Greenland Group Greywacke. Volunteer work has successfully refurbished much of the water race but minor tunnel related difficulties required specialist equipment and personnel to remediate the problems. Geotech Limited were engaged to sort out those small areas that were beyond the volunteer workforce.

Geotech worked on the interface of the newly installed culvert with the existing tunnel. At the interface a large gap of some 2 metres existed and this was both structurally not acceptable and dangerous. Local mine engineer Nigel Slonker provided steel work design for a steel shotcrete solution. Many materials were donated by Federation Mining and all design effort was centred around providing a robust but least cost solution.

Geotech installed steel sets with a mesh lining that enables the shotcrete to be applied. Wet shotcrete with a high (6 kg / m³) polypropylene fibre (HPP) content was successfully applied closing the gap and enhancing the steel structure. To enable work to progress in the tunnel we installed downstream electric fan providing forcing ventilation. Some intensive scaling of the old tunnel was required.

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Establishing tunnel ventilation prior to commencement of work.



Interface Gap between existing tunnel and newly installed concrete box culvert, steel work commenced.



Tunnel refurbishment with wet fibre reinforced shotcrete. (FRS)

“Karamea express” Jack Wilkinson on the nozzle at the box culvert - tunnel interface.



Team talk over required shotcrete thickness.



Post shotcrete team after a good day out.