

Remedial Drainage to Laggan and Blackwater Gravity Dams

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SYNOPSIS. Alcan's 48m high Laggan Dam and 26m high Blackwater Dam have both been reassessed for extreme floods and seismic loading, and stability at both was found to fall short of modern guidelines. In the case of Laggan Dam the critical load case was the PMF, which would overtop the substantial masonry walls of the spillway bridge. Blackwater Dam stability was found to be marginal under normal conditions and unsatisfactory under both extreme load cases because of its slender section and serious doubts that it could carry tensile stresses, particularly at the foundation contact. An assessment of alternatives found that remedial drainage provided the cheapest satisfactory solution at both dams. At Laggan Dam this involved drilling from the dam crest to intersect the gallery and from the gallery into the foundation. At Blackwater Dam, which has no gallery, the solution involves inclined holes from the downstream face to intersect the dam/foundation interface.

The paper sets out the studies, investigations and design of the remedial works, and implementation of the work at Laggan Dam. Implementation is still to take place at Blackwater.