# The long term performance and remediation of a colloidal concrete dam.

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SYNOPSIS.

## INTRODUCTION

Within Scottish and Southern Energy plc's (SSE) stock of concrete dams a small but nevertheless interesting subset is colloidal dams. SSE own three dams that are part formed using this technique. A brief history of colloidal dams is given followed by detailed information on particular problems at Loch Dubh Dam. Babtie Group (BG) are currently conducting studies leading to remediation proposals.

Colloidal concrete or Colcrete depends on the production of a colloidal grout that is stable but highly fluid and can be injected into prelaid aggregate. The aggregate, from which all material below 1.5 inch must be excluded, is placed in position independently, and the grout is either poured over it and allowed to penetrate downwards, or introduced near the bottom through grouting pipes or channels and allowed to fill upwards. If correctly adopted the method ensures that the aggregate has point contact in all directions. The voidage is therefore less, and proportionately less grout, and therefore less cement, is required to fill it; thermal stresses are reduced, and cumulative contraction is prevented. Cement shortages were a significant issue during the early hydro development period and any reduction in use was sought.

This is a rare form of construction with known shortcomings in terms of performance when compared to conventional mass concrete, mainly due to the high water cement ratio required for placing.