The monitoring and performance of rock anchors at Seathwaite Tarn Reservoir, Cumbria

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SYNOPSIS Seathwaite Tarn is a large reservoir situated within the Furness Fells west of Coniston in Cumbria. It is impounded by two dams; the main dam is of composite construction with a mass concrete section and an earth and rock-fill section with a concrete core and cut-off; the smaller, a mass concrete subsidiary dam, is located to the north of the main dam. Both dams were completed in 1907. The subsidiary dam was modified to become the Auxiliary Spillway (AS) dam in 1960. In 1975, 35No rock anchors (c3.6m c/c) were installed, each with a Design Working Load (DWL) of 540kN. Eight anchors were installed in the AS dam in 1991 each with a DWL of 640kN. Load checks and testing of the anchors has been performed since installation. There have been several modifications to the main concrete section, including closure of the original spillway, removal of an architectural masonry facing and the application of an upstream membrane, each of which may have influenced the performance of the dam and anchors.

This paper describes aspects of the anchor performance monitoring and how the anchor head detailing and conditions have influenced the check lifting process and testing. Finally there is discussion regarding the on-going collated data and how these may influence continued reliance on the anchors and future strategy.