

# Clunie Dam, Anchors

**Client :**  
Scottish & Southern Energy

**Designer :**  
Atkins

**Location :**  
Perthshire, Scotland

**Date :**  
2007



BAM Ritchies was appointed by Scottish and Southern Energy to drill and install 23 vertical permanent rock anchors through the gravity sections of Clunie Dam in Perthshire, Scotland. The anchors varied in capacity from 1400kN to 2500kN (10 – 17strand) and lengths between 11m and 40m.

The first site activity was the 700mm diameter cores to form the anchor head recess pits. Then the anchor boreholes were continued using the Klemm 701 drilling rig with 50m extended hoses to the power pack. An 8" down-the-hole (DTH) hammer using a 254mm button bit was used to drill the bores through the dam and into the bedrock below. Where steel obstructions were encountered, the DTH was replaced with a 254mm heavy duty core bar.

It was suggested that helicopters would be required to install the anchors since craneage could not be used. However, BAM Ritchies designed a bespoke anchor wheel which was fitted to and controlled by a roto telehandler, mounted on a uni-flote work barge located behind the upstream side of the dam.

Grouting was carried out using a 4/10 mixer with grout pumped through 25mm alkathene pipes to the anchor location. The anchors were supplied with three internal grout lines which were used during grouting. The first for the internal bond section, the second for the internal free length and the final line for the outer annulus between anchor and bore. Stressing works were undertaken using a 4,000kN hollow ram jack and petrol power pack.

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Construction Category

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