

Project: Conway Castle Rock Slope Protection

Client: Cadw

Consultant: Mott Macdonald

Main Contractor: Laings

Product Used: Weldgrip Fibregrip® Rockbolts



The Conway Castle rock slope protection project was part of the general maintenance work to one of Welsh Heritage's most prestigious sites. The object of the project was to reinforce the rock outcrop on the northwest side of the Castle, below the ramparts.

Part of the slope reinforcement included Weldgrip Fibregrip® Rockbolts, using a post grouting system of installation. These were installed towards the middle and bottom of the outcrop. The rockbolts were 22mm diameter 3.9m long Polyester bar with a reverse buttress thread and 150kN high end load nut assembly. The Fibregrip® bars have a tensile and shear strength of 470kN and 129kN respectively.

The rockbolts were installed into 32mm diameter holes, which were drilled with compressed air rotary percussive leg mounted drilling machines, using hexagon drill steel and cross head bits.

Each rockbolt was point anchored by spinning into two 24mm diameter 800mm long Polyester resin capsules. These had a cure time of approximately 5 minutes. The 1.6 metre length of resin gave a bond length of approximately 2 metres.

The remainder of the hole was post grouted 24 hours later using ordinary Portland Cement (OPC) with a water solid ratio of 0.4 : 1. The nut was tightened before the grout cured. The end assembly, which included a 130mm diameter plastic end plate, was countersunk into a 250mm long by 150mm diameter overcored hole.

The mouth of the hole was faced using part of the core stone to maintain the aesthetics of the rock slope.



Rotary percussive drilled holes, over cored to a depth of 250mm.



Fibregrip® Rockbolt being inserted into a 32mm diameter hole containing two 800mm long resin capsules.



Fibregrip® Rockbolt being spun through the capsules to mix the resin. The remainder of the hole was post grouted 24 hours later.



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