



# GRIFFITHS

civil engineering and construction

GROUND  
ENGINEERING  
AWARDS 2018

10TH ANNIVERSARY

Winner: UK Geotechnical Team of the Year

## Rail Division Case Study Cambrian Rock Cutting Campaign

**Griffiths Rail's self-delivery model (including rope access skills) and close collaboration with Network Rail's design team has been key to delivering superior results and value for money on an extensive and award-winning rock cutting treatment programme in Mid Wales.**

The Network Rail Cambrian Rock Cutting Campaign involves the treatment of approximately 3km worth of rock cuttings in Mid Wales where the condition of the rock faces present a significant safety and performance risk to the operational railway. Several reportable instances of rock fall have occurred over the last decade.

The campaign includes six distinct projects, each of which is characterised by a single railway line running along the coastline and at the base of relatively large rock cutting slopes. The height of the cuttings vary, but are typically 10m - 15m at the highest. The slopes are generally heavily vegetated, consisting of metamorphic mudstone which is highly fractured and folded. Weathering and relaxation of the rock face results in regular rock falls.

Treatment at the six sites includes de-vegetation, de-scaling, topographical surveys, ground investigation, asset proofing and stabilisation through active rock netting and pattern bolting (where required).

To date approximately 10,000m<sup>2</sup> of rock slopes have received substantial vegetation clearance, scaling and assessment. A further 3000m<sup>2</sup> has received rock netting with over 600 rock bolts installed to secure the faces. This represents approximately 25% of the netting and bolting that will be completed when the campaign is completed in 2019.

The campaign is being delivered by a highly successful collaborative partnership between Griffiths Rail Geotechnical Team, Network Rail Buildings & Civils Design Group, and Network Rail Infrastructure Projects Wales.

Two sites were completed during 2017—the cutting slopes at both Fron Goch (Aberdovey Tunnel No.1) and Pont Panteidal. The main challenge in conducting effective and long-lasting rock face stabilisation works at these sites was access.

To overcome this challenge, works such as investigation,

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de-scaling and vegetation clearance was conducted through Summit Rope Access (IRATA 1 and 3) by Griffiths Rail's Rope Access Team during midweek and weekend possessions or line blocks due to the limited space in the cress. Test anchors and netting fixing bolts were installed using a RRV-mounted long-reach drilling rig on a specially developed 10m dipper arm commissioned by Griffiths Rail especially for this campaign.

The close collaborative working relationship between the design team and the Griffiths Rail Geotechnical Team has been fundamental in solving site issues and technical queries and ultimately to delivering a superior cost effective long-term solution.

In June 2018 the collaborative partnership between Griffiths and Network Rail was recognised and rewarded at the Ground Engineering Awards when the partnership picked up the coveted 'UK Geotechnical Team of the Year' award.

In summing up the campaign, judges commented that the Griffiths / Network Rail teams "Demonstrated clearly that they had gone beyond what they needed to do and won because they didn't have to do it that way, but chose to. They took an innovative approach to achieve common goals and had strongly aligned cultural values, demonstrated clear passion that came through in their presentation, and used every opportunity to invest in the future of people, methods, relationship and equipment."

“*There is a high level of trust between both parties and it feels like a project team rather than client, designer, contractor. There have been virtually no disruptions to the operation of the railway during the works and the various parties have worked as a single focussed project team with the goal of delivering a safe and cost efficient scheme. The end result will be a more reliable section of railway earthworks treated with products which provide a superior design life and ultimately provide a very cost efficient long term solution.*”

Jonathan Fullilove, Senior Design Manager  
(Geotechnical) at Buildings & Civils Design Group

## Project details at a glance

Client: **Network Rail**  
Location: **Powys, Mid-Wales**  
Completed: **Ongoing**  
Value: **£9.4m**  
Contract: **NR9**



Pictured:

TOP: The cutting at Pont Panteidal before work started.

CENTRE: Rock bolt locations were pre-marked by the Griffiths Rail Geotechnical team.

BOTTOM: The completed stainless steel netting will ensure rock falls on to the operational rail track are avoided for many years to come.