



# GRIFFITHS

civil engineering and construction



## Rail Division Case Study **Pembroke Tunnel Rock Cutting**

**After vegetation clearance works revealed badger setts as the root cause of rock fall failures on a railway cutting in west Wales, Network Rail Asset Management (Wales Route) employed Griffiths to develop a solution for excluding badgers and subsequent installation of rock netting to secure the cutting faces.**

Pembroke North Tunnel is located approximately 1.25km north of Pembroke Station on the bi-directional PEM line between Pembroke Dock and Whitland in south west Wales.

In 2017 Network Rail engaged Griffiths' to undertake extension vegetation clearance of the Up and Down side cuttings on the approach to Pembroke North Tunnel. During the vegetation clearance works, several established badger setts were found, which proved to be the root cause of numerous rock fall failures along the 380m section of over steep cuttings.

Following completion of the vegetation clearance works, Griffiths worked collaboratively with Network Rail Design Delivery (NRDD), the Network Rail RAM team, Natural Resources Wales and our approved environmental consultants to develop the permanent works design for remediation works which included exclusion of the badger setts identified during the clearance works.

The permanent works were planned for delivery during a 19-day pre-planned rail blockade in January 2020 to

minimise months of disruption to local stakeholders and lineside neighbours.

The permanent works design involved 4500m<sup>2</sup> of Geobruigg's Tecco G65/3 stainless steel netting held in place by 1650 stainless steel rock bolts of varying lengths up to 4.5m long.

Prior to the main works commencing, a series of public liaison events were organised by the Network Rail communications team to inform stakeholders and lineside neighbours of the forthcoming 19 day blockade.

Griffiths' personnel responsible for the delivery phase assisted Network Rail during these events to ensure lineside neighbours and stakeholders had detailed knowledge and were made aware of the planned activities for the forthcoming blockade.

In September 2019, Griffiths mobilised to site to begin the extensive enabling works ahead of the pre-planned 19-day blockade.

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During the period between completion of the vegetation clearance works and the enabling works commencing, the vegetation had re-grown. The vegetation was cleared by our inhouse team of IRATA personnel and NPTC trained operatives.

Several more badgers setts had been established in addition to the setts already in use. Our preferred environmental consultants worked extensively with Natural Resources Wales to establish badger netting and gates on all setts and to monitor the entire cutting prior to the permanent works commencing which prevented the badgers from re-establishes themselves.

To reduce the noise created during the blockade and to minimise the disruption affecting the lineside neighbours, all drilling works were completed between the hours of 07:00 - 22:00. Over 70 operatives, including 50 IRATA technicians successfully installed the 1650 rock bolts using our two inhouse RRV long reach excavators, an RRV crane and two 36t long reach excavators all fitted with rock drills. A third shift of 30 operatives working between the hours of 22:00 - 07:00 installed the 4500m<sup>2</sup> of netting and associated components.

Griffiths owns a 1,500-strong inhouse civil engineering and rail plant fleet. The company holds an On-Track Plant Operations Scheme (POS) licence that enables the use of our own staff to maintain, manage and deliver work using our own On-Track Plant (OTP) equipment. Holding a POS licence enables Griffiths to offer a more comprehensive inhouse capability and greater control over projects, offering more assurance to clients. Our self-delivery model means that we can mobilise quickly and efficiently to meet constrained timescales.

Using a collaborative approach, all works were completed on time, in budget and ahead of programme.

As well as being a member of IRATA, Alun Griffiths (Construction) Ltd is also a member of the British Drilling Association, The Institution of Civil Engineers and Register of Ground Engineering Professionals.



Pictured above:

TOP: Griffiths inhouse long-reach excavators and cranes were deployed to the site to assist with the delivery of the works.

CENTRE: IRATA qualified operatives and a skid-mounted drill.

BOTTOM: The Griffiths delivery team pictured within the cutting approach to Pembroke Tunnel.

## Project details at a glance

Client: **Network Rail Asset Management, Wales Route**

Location: **West Wales**

Completed: **2020**

Value: **£3.9m**

Contract: **NR9 Design and Construct**