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Pontypridd Retaining Wall, Network Rail

Bringing stability to South Wales rail scheme

£2m
/ Project value

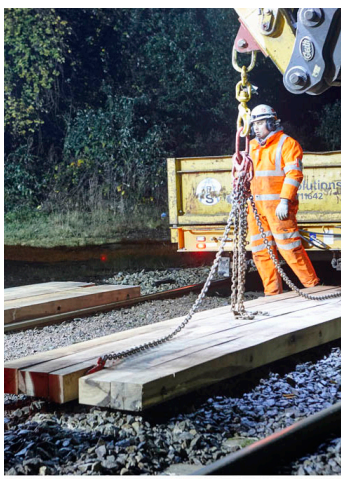
March 2017
/ The project commenced

February 2018
/ The project was completed

An intricate planned maintenance scheme, the Pontypridd Retaining Wall project involved the stabilisation of a 70m long and 7.5m high section of an existing failed retaining wall. At its closest point, our works programme was undertaken just 2.3m from the live railway line on the south side of Pontypridd Railway Station (South Wales). In addition to strengthening adjacent sections of the steep railway embankment, we also reconstructed the existing drainage channels and pipework, and conducted repairs to the signals and telecoms cable toughing. In recognition of the positive community engagement associated with this project, it was named as the winner of the Considerate Constructors Scheme – Ivor Goodsite Hoarding Competition (2017).

The brief

Appointed as Principal Contractor, this was our first contract award under Network Rail's Wales Route Plan for CP5 (Control Period 5) Framework – a framework for planned maintenance of structures and earthworks assets.



"The engagement at project conception, I believe, was over and above what any other contractor has achieved for me during my four years as a delivery manager."

Richard Compton
Network Rail Works Delivery Manager (Civils)

"We were delighted to develop an innovative solution for part of the scheme, installing and testing 112 rock anchors reaching depths of 12m in certain areas. The works are another example of our wide-ranging and expanding capabilities in the rail infrastructure sector."

Andrew Henry
GRAHAM Contracts Manager

The challenges

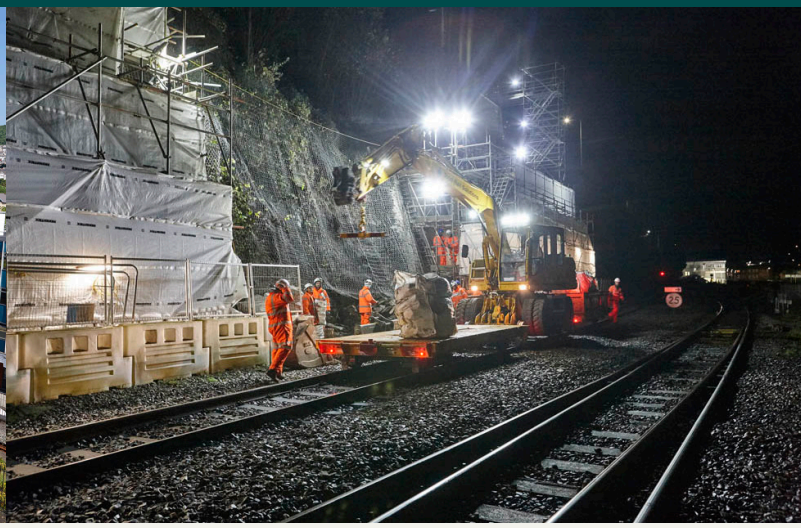
Anchor installation presented a significant challenge, particularly as the condition of the bed rock behind the dry stone wall was uncertain. After a series of tests, it was evident that a diamond coring technique was unsuitable because the cores would collapse before the anchors or grout could be installed. Also, the coring rig would have had inadequate material to correctly purchase on. Therefore, we developed an effective resolution, adopting a rotary percussive drilling method with a sacrificial cutting head, and changed the bars from solid 40mm GEWI bars to hollow Ischebeck 40/16mm bars.

The solution

Noteworthy for the effective management of possessions and the on-time delivery of works, this project has contributed to the "safe and efficient management" of the rail network in Wales. Initially, finn and filter drains were installed with two layers of steel reinforcing fixed to the face of the wall, before 150m^3 of spray concrete was applied to the east and west sections. This process secured the section of the wall that remained intact. In turn, the failed section of the wall was cleared over the course of two night possessions, using a combination of trained abseilers and Road Rail Vehicles (RRVs). Once the area was removed, and due to the sensitive nature of work close to the unstable rock face, 110 one-tonne bags were filled by hand and then removed from site using the RRVs. Subsequently, the stabilisation works were completed with the construction of a new gabion basket wall that was filled with no-fines concrete. And, following the completion of the rock bolting and associated works, the existing drainage channels and pipework were reconstructed, and the signals and telecoms cable toughing repaired.

Outputs & Benefits

- **Community engagement:** As part of the project, we worked with Artis Community Centre to transform the site hoardings into a mural of a steam train with a rotating exhibition of local amateur photographers' work displayed in the windows of the train
- **Dry mix:** We used dry mix concrete instead of a wet mix because the wet spray was prone to causing pipe blockages, and a dry mix can utilise silos for storage, giving us an assured feed of material
- **Temporary works:** We produced a cantilevered scaffold design that followed the curved profile of the cutting. Our layout provided us with access to all four rows of anchors without any platform modifications that would have required possession or ROTR working
- **Redesign:** To reduce manual handling in the work platform and material transport to the worksite, we redesigned the mesh layers of the new anchor wall face to two layers of reinforcing bar



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+44 (0) 28 9268 9500 info@graham.co.uk graham.co.uk

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