

GRIFFITHS

civil engineering and construction



Winner: Bill Ward Sustainability Award at the ICE Wales Cymru Project Awards 2020

Rail Division Case Study Rebuilding and Future Proofing the Conwy Valley Railway

In March 2019 six miles of the Conwy Valley Line was significantly damaged by high tides and extreme rainfall. The repair work stands as an example of how, when there is an opportunity to improve the line to deliver a more robust railway fit for the future, it should be taken. Not only that, but the push for sustainability should never be sacrificed.

A combination of high tides and extreme rainfall in March 2019 resulted in the River Conwy bursting its banks and causing significant damage to the Conwy Valley railway unprecedented in the history of the line. Damage included the destruction of 6 miles of railway embankment and track, 10 level crossings, 9 undertrack culverts and Dolgarrog Station itself.

The railway is an important transport link for the local community and tourists. Reopening the line as quickly as possible was vital for the local economy. A key milestone was reopening the railway in readiness for the National Eisteddfod for Wales in August 2019.

While it was important to reopen the railway as quickly as possible, it was equally important to future proof the line from similar weather events and in as sustainable a way as possible.

As an emergency project, the works had no pre-planned budget. On Network Rail's request Griffiths scoped the required work to develop an outline budget.

Network Rail and Griffiths worked closely on a more

resilient design for the reinstatement works, which encompassed 6 miles of new embankment and track, and nine new track culverts. At the same time, opportunities were taken to improve journey time and reliability by removing a historic 30mph speed restriction and restoring the line speed to 45mph. The core philosophy was to rebuild the railway with improved flood protection assets, which included 9,500 tonnes of additional rock armour and an increase in the capacity of culverts.

Griffiths used its construction experience on rail infrastructure and local knowledge to influence changes to the design of embankments, scour protection and the capacity of culverts and tidal flaps. These changes improved the future proofing of the design. Through standardising the design and construction of culverts, construction costs were reduced and productivity improved.

Griffiths immediately began procuring materials (ballast, embankment materials and rock armour) on the day that the contract started (21 March) to be delivered to site the following week. This ensured the tight programme was

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not delayed. Site setup began on the 28 March with the first minor washout works commencing 2 April. The more major embankment and culvert repairs commenced 19 April.

As Network Rail and Griffiths were focused on delivering the best outcomes for passengers and keeping them updated on progress, Transport for Wales and the Conwy Valley Community Partnership were brought into the project team.

Despite it being emergency work, Griffiths and Network Rail committed to using local suppliers for everything from rebar and concrete to food suppliers, including having 9,500 tonnes of rock armour and 3,000 tonnes of ballast delivered from nearby quarries. With sustainability a priority for the project, the methodology developed for the works saw 91% of the washout material removed from site during the works recycled and approximately 5,000 tonnes of topsoil reused on site.

From the start of work in March through to reopening the line and completing all works a total of 107,078 hours were worked, including hours worked on the railway and in the local site office. At its peak Alun Griffiths had approximately 100 people onsite at the same time. Although there were no trains running because the line was closed, there were nevertheless significant safety considerations due to the scope of the work, the challenging weather conditions, and the number of workers and plant working in close proximity to each other, also the logistical challenge of work conducted in several areas at once. However, careful planning and the adoption of comprehensive Safe Systems of Work resulted not only in no RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations) incidences recorded across the entire project, but indeed no accidents whatsoever.

As part of Griffiths' strict Health & Safety regime, 144 planned general safety inspections and task specific inspections were conducted and 88 examples of transferrable good practice were identified during safety tours, investigations, feedback or forums. An Office of Road and Rail inspection of the works found no incidences of concern.

The project won the Bill Ward Sustainability Award at the ICE Wales Cymru Project Awards 2020 and was a finalist at the Construction News Awards 2020.



Pictured above:

TOP: Following the extreme weather event, detailed inspections revealed multiple sections of track, lineside equipment, embankments, bridges, level crossings and stations required significant repairs.

CENTRE: Works included the restoration of nine culverts, designing and building new improved culverts, constructing new embankments and installing new track.

BOTTOM: The opening of the repaired line was celebrated by Network Rail and the local community.

Project details at a glance

Client: **Network Rail**
Location: **Conwy Valley, Wales**
Completed: **July 2019**
Value: **£7.6m**
Contract: **NR12**