

Keeping the Conwy Valley connected



A decorative vertical line on the left side of the slide, composed of a series of horizontal blue bars of varying lengths, creating a stylized railway track or ladder effect.

1. The Conwy Valley Line

2. The Event

3. Works Required

4. Resilience

5. The Finished Works

6. Stakeholder Management

7. Sustainability

The Conwy Valley Line (ELR LTJ1)

The Conwy Valley line is a railway line in north-west Wales.

It runs from Llandudno (via Llandudno Junction) to Blaenau Ffestiniog, and was originally part of the London and North Western Railway, being opened in stages to 1879.

The primary purpose of the line was to carry slate from the Ffestiniog quarries to a specially built quay at Deganwy for export by sea.

The line also provided goods facilities for the market town of Llanrwst, and via the extensive facilities at Betws-y-Coed on the London to Holyhead A5 turnpike road it served many isolated communities in Snowdonia and also the developing tourist industry.

Today the line is currently served by 6 trains per day in both directions from Monday to Saturday between Llandudno and Blaenau Ffestiniog and continues to provide vital connectivity for local residents as well as the visiting tourists who provide much needed revenue for local businesses.



The Event

Factors Influencing 16th March 2019 Event



129.8mm rain in Capel Curig in 24-hour period



6.0m Spring high-tide
(reaching 8.2m the following week)



Saturated ground from Storm Gareth, then Storm Hannah



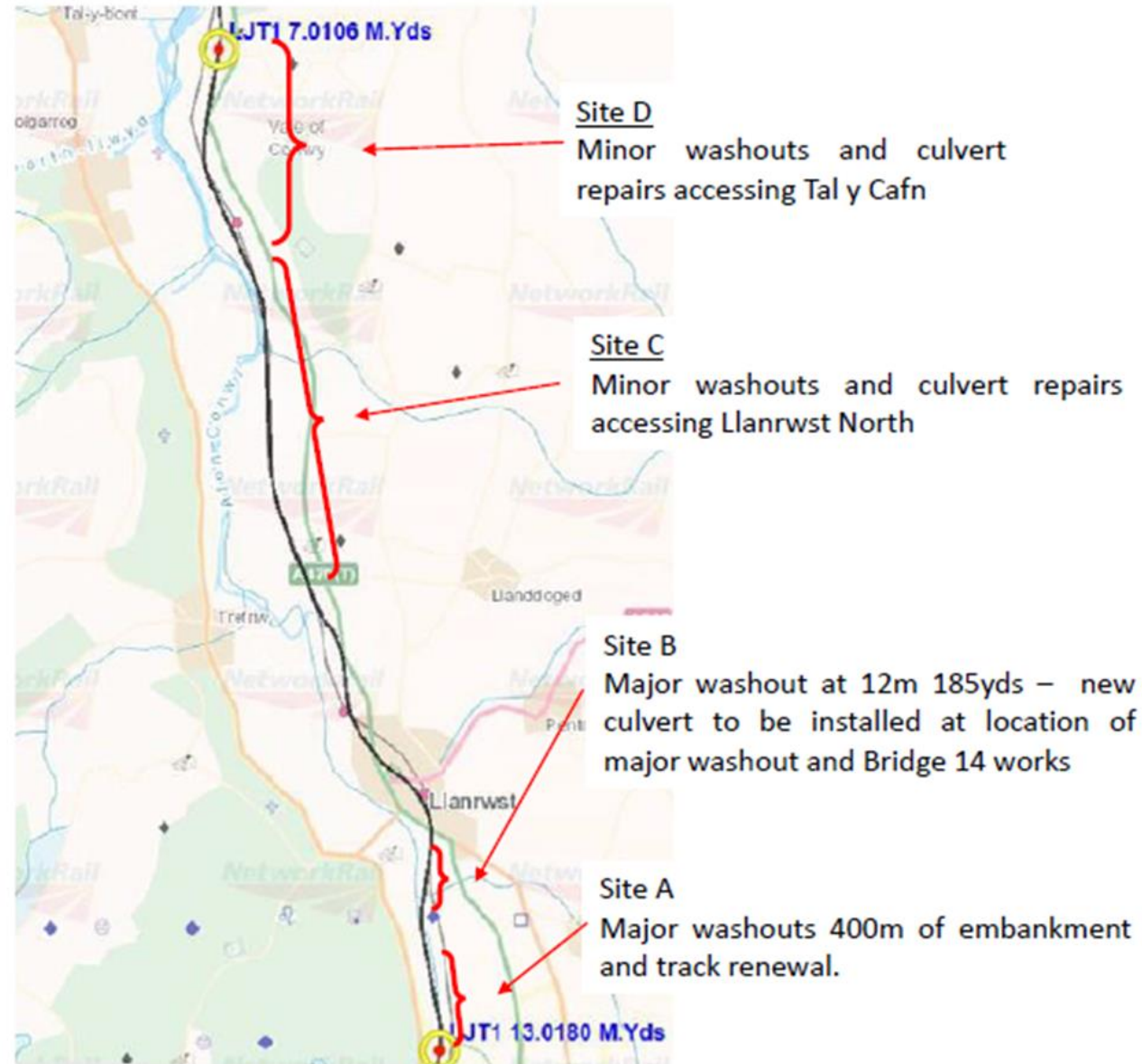
Low lying position of Llanrwst and river catchment

1 in 150 year event



The Event

- The Site runs from 05m to 14m and the line was designated a highstreet environment to allow for safer and more efficient working.
- The site was split into 4 areas with differing design issues and solutions.



The Event

Site A Major washouts 400m of embankment and track renewal.



Site B Major washout at 12m 185yds – new culvert to be installed and Bridge 14 works



Sites C & D Minor washouts and culvert repairs



Works Required

Site A – The track was required to be removed and the embankment dug out to formation level and re-formed followed by the addition of rock armour to the embankments.

Before



During





Works Required

Site B – Site of the largest wash out - following discussions with NRW a 6 pipe culvert was designed for installation here.

Before



During

Rebar and shuttering, site B





Works Required

Site C – This section has 10 culverts running under the track, two had collapsed and 8 required cleaning out. The two which collapsed were required to be re-lined and re-built. Repairs and gabion baskets were added to the outlets to provide stability in future events.

Before



Culvert at 9m 870yds





Works Required

Site D – This section had ditching which was full of ballast wash out and small track ballast washouts.

Before



During

Low mileage ditching works



Resilience – providing a railway fit for 2019 not 1879....

Due to its location, the Conwy Valley Line is often badly hit by storms and other extreme weather events.

Due to the line being very close to the river, it is susceptible to flooding and we understand how frustrating it is for passengers when the line is closed, especially at short notice.

We therefore worked very closely with our In-House Designers, our Asset Managers as well as Natural Resources Wales to explore preventive measures that could be put in place to minimise the impact of extreme weather on the line in the future.



This included expansive hydraulic modelling and thorough placements of FRAP's to ensure that any measures introduced would indeed provide additional resilience and would not serve to cause further harm to the sensitive flood plain areas.

It's worth noting that that back in 2015 when the line experienced similar flooding, we were able to deliver preventative work, including rebuilding and strengthening embankments south of Llanrwst. The area where we installed these preventive measures has remained largely unaffected by the March 2019 storms.



Resilience

These are some of the measures installed:



GeoGrid has been added to the embankment rebuilds at site A & B to add friction to the rip-rap installed at these locations should there be a future event this will add resilience.

A 6 pipe culvert has been built into the area which experienced the largest washout. This area held back the water for a long period of time before giving way and causing a major washout the culvert will allow flow of water through this pinch point and prevent the railway giving way in future events.



Rock armour at a 45 degree angle has been added to the embankments at Sites A & B to ensure resilience during future flood events, where this was installed in 2015 events the embankment has survived in these locations





Extra gabion baskets were installed at all culverts to add stability to the culvert outlets, it is assumed that during future events the water will be better directed through the culverts into the ditches which will prevent ballast flowing back into the culverts and in some cases causing collapse.

All ditches have been cleaned out to allow flow during future events.



The Finished Works

Site A



The Finished Works

Site B



Stakeholder Management

10th April 2019 – A presentation was given to the public turnout approx. 80 people, feeling was that the public want the railway to be built on stilts or culverts



02nd May 2019 – Public drop in event at Blaenau Ffestiniog



25th April 2019 – Joint public event with Council & NRW about the event



Stakeholder Management

13th June 2019 – A visit to site by Wales Route Supervisory Board (RSB)



9th April 2019 – Site visits with Community Rail Partnership Officer



Sustainability

- The washout material was recycled (not in time for re-use on our works however there wasn't waste as a result).
- The local quarry in Penmaenmawr which delivered the new rock, also took away the washout material saving on the environmental impacts of multiple lorry trips.
- Re-usable water bottles were provided by the Contractor to all staff onsite to prevent single use plastic bottles being used.
- Staff on site were local employees to the North Wales area – based out of Contractor's local office in Mochdre.
- The team utilised local suppliers, for items from rebar, stone and concrete to food suppliers.



Summary –

Network Rail and partners, putting passengers first and keeping Conwy Valley connected by providing a railway fit for 2019 not 1879....



Questions.....?

