

Resolving risks and wider issues following a landslip

Amey Infrastructure Wales

Background

In January 2023, Amey Infrastructure Wales (AiW) alerted us to an embankment failure on a Saturday morning via our reactive emergency call-out framework. Heavy rainfall had caused groundwater to seep through the substrate below the track, washing away the fine material that comprised the adjacent embankment. Where the railway line curved, the embankment had fallen away, leaving the ends of the sleepers unsupported and creating a hazard for operational use.

The slip had also occurred during a planned possession of the line, which had required a significant amount of forward planning and organisation. In order to prevent high abortive costs and negative publicity, the client required us to complete the works within the time remaining for the existing possession; to integrate our works with pre-planned engineering train movements (critical to the transformation programme of works); and to offer progressive design assurance.

Approach

As a matter of urgency, we attended the scene with the AiW and Transport for Wales (TfW) Mobile Operations Managers and Asset Engineers to assess the hazards, ascertain the cause of the slip and mobilise any necessary mitigations to secure the safety of rail lines used by track plant and engineering trains to the various work sites.

HIGHLIGHTS

Progressive assurance approach - reduced risk, increased efficiency, and provided greater assurance over quality, outcomes, programme, and costings.

Delivered ahead of schedule

Prevented potentially high abortive costs & negative publicity

Before



After



Mobilisation

Given the urgency, we mobilised the following activities simultaneously:

- **Assigning the Geotechnical Design Engineer.** They surveyed the site and produced a reinstatement design, enabling us to swiftly procure and deploy the necessary plant, labour, and materials, contributing to our delivery ahead of schedule.
- **Mobilising temporary works.** We rapidly needed to support the sleeper ends, to avoid further damage to the line and risk to the ongoing transformation works. With the lines made safe, we could utilise Road Rail excavators/equipment to transport materials by rail, maximising efficiency and minimising disruption for the client and local stakeholders.

Site set-up and logistics

The only access route to the works was through agricultural land. We supported negotiations with the landowner for access, outlining our approach, emphasising the safety measures we would take, and how we would reinstate the land.

Enabling works and preparation for main works

Once the reinstatement works design had been agreed, our procurement team sourced materials and specialist plant. We set up the site compound and welfare and received delivery of materials such as aggregate.



To ensure onsite safety and maximum efficiency, we set out the extent of works for our in-house engineers according to the Approved For Construction (AFC) drawings.

Main works delivery

We began by excavating the failed embankment, disposing of the waste offsite via the haul roads. Logistics were complex during this project, requiring us to calculate the maximum safe working load supported by narrow agricultural railway over-bridge. The bridge also had a limited weight loading that needed to be factored into the haul route. As part of the planning phase, we ensured the correct plant would be available and utilised, this was critical to ensure the continuous flow of stone and aggregate to site.

At the end of the works, we conducted a verification topographical survey to ensure we achieved the required levels as set out in the AFC drawings.

Handover

We reinstated fencing and the farmer's agricultural land, taking pre-demobilisation photographs to demonstrate the site was handed back appropriately.

Outcomes

After providing progressive design assurance, we handed the works back nine hours ahead of schedule, completing the works over 12-hour, not 24-hour, shifts, demonstrating our efficiency and confidence of delivery. This enabled us to finish the works well within the existing possession period. Our effective logistics planning enabled us to integrate with the movements of other parties undertaking works. Speaking to the quality of our works, our temporary access road was so well built that the landowner decided to keep it.

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