



GRIFFITHS

civil engineering and construction

Geotechnical Division Case Study Tylorstown Landslide Remediation Phase 3A

Following named storm events in February 2020, historical coal tips located at the crest of the Tylorstown valley side gave way to a significant landslide. The Geotechnical Division assisted in the phased remediation of this by installing soil nails and high tensile mesh to stabilise the lower slope. Further works included installation of and scour protection and new drainage systems.

Storm Dennis gave rise to intense rainfall in South Wales, with 157mm recorded in Powys between 15/02/2020 and 17/02/2020. This event triggered a series of landslides throughout the South Wales Valleys, most significant of which was the landslide experienced at Tylorstown. Saturation of the historical colliery spoil tips at the crest of the Northern valley side caused a major failure of these. This resulted in approximately 60,000 tonnes of spoil cascading down the valley side to river below. This event received widespread publicity owing to its similarity to the tragic events experienced in Aberfan in 1966, with this further exemplifying the hazardous legacy of coal mining in South Wales and the requirement for proportionate risk management.

Following completion of the immediate Phase 1 and 2 remediation works by others (including removal of tipped material and reconstruction of river embankment), Griffiths Geotechnical were appointed by Rhondda Cynon Taff County Council through competitive tender to complete Phase 3A of the overall Tylorstown Landslide Remediation. This workscope included scaling the existing rockface of loose material, installing a

rockfall protection system across the prominent incised slope features, installation of scour protection, installation of cascade drainage systems, revetment repairs, erosion control matting and installation of lower slope drainage measures.

The project workscope was technically challenging and involved working in an inherently dangerous environment. This included working at height and operating drilling plant and other equipment on a steep, active landslide. Utilising our in-house technical skillset including highly experienced engineering and project management staff, Griffiths Geotechnical were able to develop a safe method and sequence of construction utilising roped access measures and bespoke temporary works systems. All works were self-delivered by Griffiths Geotechnical, including Temporary works systems developed by engineering staff in conjunction with our design partners; Jubb Ltd. and Pascoe Ltd.

www.alungriffiths.co.uk

Despite the proposed construction period occurring in late summer/autumn 2021, the risk of a further landslide event from the colliery spoil could not be eliminated. This risk was carefully managed throughout the construction phase with a strict monitoring regime. Griffiths Geotechnical undertook baseline surveys of the colliery tips prior to commencement on site and then implemented continuous monitoring of these throughout the construction phase. Weather forecasting and rainfall monitoring were undertaken throughout the construction phase, with threshold criteria developed for these triggers. If triggers were exceeded, works were to be stopped and all staff evacuated from the worksite.

Drainage works previously undertaken at the site had assisted in reducing the causative factors of a repeat event, however the residual risk exposure required further management. On-slope works were avoided in the first instance by using long reach excavators, mounted with drilling equipment and positioned from the cycle path. These worked at a slewed angle to prevent being positioned directly beneath the activity. Tiered/managed exclusion zones were implemented as part of the Griffiths Geotechnical bespoke Permit to Drill system, outlining areas of total exclusion and safe walkway areas. Where work on the slope was unavoidable, suitable plant secured to bespoke, purpose-built Temporary Works support/tethering systems were utilised. Appropriate rescue systems and methods were developed by the Griffiths Geotechnical in-house IRATA division, ensuring safe systems of work were maintained throughout the construction phase.

Whilst no further landslides of the colliery tips were recorded during the construction phase, significant debris flows occurred during yellow weather events of September and October 2021. These events, caused by intense rainfall, mobilised a significant amount of material. This was channelled downslope towards to the worksite by the incised slope topography. Griffiths Geotechnical were successful in identifying these events immediately, evacuating the worksite and developing a new safe method of construction and rescue without significant delay to the construction programme. All works were safely and successfully completed in November 2021. The project received significant media attention and Griffiths Geotechnical were proud to have assisted in providing the local community with additional safeguards against the hazardous legacy of coal mining in South Wales.

Project details at a glance

Client: **RCT County Council**
Location: **Tylorstown, Wales**
Completed: **November 2021**
Value: **£600k**
Contract: **NEC4 Option A**



TOP: Site conditions prior to works commencement

CENTRE: Mechanised drilling using heavy plant

BOTTOM: Example of debris flows during construction