

Successfully drilling & blasting 200,000 tonnes of rock located just 100 metres from a 250-year-old stone bridge.

Project: Welsh Assembly

Client: Ty Nant on the A5

Contractor: Jones Brothers' Engineering

Location: North Wales

The project

Against a backdrop where blasting in the 1990s close to the A5 in the Ty Nant area caused safety concerns locally for several years, EPC-UK was asked to undertake a remediation programme to help upgrade the road in 2009 by drilling and blasting a considerable quantity of rock to form a newly calculated stable angle.

The portion of road being worked around routed through a gorge close to the village, where residents who remembered the levels of vibration, air overpressure and flyrock that occurred nearly 30 years ago held understandable concern regarding the work EPC-UK was being brought on board to fulfil.

Situational challenges

Back in 2006, the failure of several rock anchors on the north face of the rock cutting were discovered during routine inspections. With EPC-UK now involved in the project, a programme of public relations designed to advocate confidence in the company's drilling and blasting expertise had to be developed and implemented before the project commenced.



From the technical side, a 3D face survey and photograph revealed hundreds of long and short rock bolts, horizontal drain holes and stonework. Vertical steel dowels (100mm diameter pipes, filled with grout) were also found at 3-metre intervals the bottom of the bench.

There were also structures within 100m of the site, including two houses, a 250-year-old stone bridge and a 200-year-old stone retaining wall.

Key Facts

Vibration objectives & constraints:

- PPV @ Occupied Structures: 95% of Blasts < 6 mm/s
- Air Overpressure Limit: 140 dB(Linear)
- PPV@ Unoccupied Structures: 15 mm/s (BS7385 Part 2)

Blasting / environmental performance:

- Slope to be reduced to an angle of 34 degrees
- 200,000 tonnes of Rock to be removed
- Time slot for blasting: 30 minutes road closure
- 40 Blasts
- 5100 Electronic Detonators and
- 15.8 tonnes packaged explosive
- 100% of blast <6mm/s (58% <3mm/s)

Tailored blasting procedure

Working under the UK Quarry Regulations, we applied full blast specifications to the project including drilling plans, drilling logs, hole surveys, face surveys and photographs, hole loading diagrams, initiation and danger zone plans.

An efficient procedure for danger zone checks and post blast checks was set up to match the limited time slot for blasting (30 minutes road closure, including an inspection of the A5 wall).

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Safety & social responsibility

We conducted an extensive public relations programme prior to the blasting project commencement which involved community meetings and discussions with local schools.

Remote control drilling technology was implemented using the Atlas Copco ROC D7, to reduce the risk to operators working on unstable rock slopes. The drill rig choice also allowed for the assessment of difficult hole locations, using its articulated drill arm.

The proximity of properties also ensured that we performed 89mm diameter drilling.



Environmental performance

An objective of the project was to specify vibration limits and produce a monitoring scheme. This was successfully achieved using eight seismographs along with an electronic initiation to ensure the controlled accuracy of blast timings.

We ensured that the condition of the A5 retaining wall was checked by local highways engineers after each blast.

Furthermore, 100 percent of the 40 blasts performed - including shots fired at 80m (260ft) from the nearest residential property - were monitored at a level of below 6mm/s.

Values that define the way we work



Within all operations, EPC-UK performs using methods that support our company's established SPIRIT ethos, demonstrating **safety, passion, integrity, respect, innovation, and teamwork.**

The Welsh Assembly civils project highlights a working example of where EPC-UK's values were keenly evident.

Throughout the remediation programme, our operations demonstrated a notable level of **respect** towards local residents whose concerns regarding the events of 2006 were sincerely recognised. All communications were met with high levels of **integrity.** We ensured our **safety** operations were transparent and our danger zone and post blast checks were exemplary.

Civils solutions

Leading our Civils Solutions team is EPC-UK Civils Manager Mark Jones. With 33 years of experience within the quarrying, offshore and civil engineering industry, Mark is well placed to drive our capable civils team, having managed numerous drilling and blasting and civil engineering projects within the UK, as well as several offshore developments across the globe.

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