Collaborating with United Utilities

Cumbrian Pipes – a new line in water supply

›› Ennerdale and the River Ehen in Cumbria are sensitive environments and the European Habitats Directive requires a reduction in the amount of water United Utilities takes from the area for public water supplies. Hence the Environment Agency has confirmed to United Utilities that in 2025 the abstraction licence for Ennerdale Water and surrounding sources will be withdrawn.

As a consequence United Utilities has decided to link West Cumbria to the rest of the region's water network via a major new 32km long Large Diameter Trunk Main (LDTM) raw water aqueduct. The route will lie between an existing valve house, to the north of Thirlmere Impounding Reservoir (I.R.) at Bridge End and the site of a proposed new Water Treatment Works (WTW) at Williamsgate, Bridekirk to the West.

Challenges

- Work entirely within the Lake District National Park
- 400m long tunnel under the River Greta (Keswick)
- Open land through Keswick
- Eight crossings of Trunk and A roads including: A66, A591 and A595
- Approx. 90 watercourse crossings
- Challenging terrain

Additional water mains will be constructed between Williamsgate WTW and Summergrove to the southwest and Quarry Hill to the north east. Slip lining through the existing pipeline will be used between Cockermouth WTW and Cornhow to the southeast and Stainburn Surface Reservoir to the west.

Where gravity fed mains are not possible, new Pumping Stations and Surface Reservoirs will be needed.

Following competitive tender and presentations by Geotechnics' North-West Regional Manager Paul Hayes and Managing Director John Booth, the company was awarded the contract for geotechnical and geoenvironmental investigation services. The data obtained will enable United Utilities Engineering to analyse ground conditions and allow subsequent construction phase tenderers to assess the requirements and constraints for pricing.

The difficult access and risks associated with working in environments classified as Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Sites of Special Scientific Interest (SSSI) requires close collaboration to ensure compliance with strict environmental and health and safety guidelines and to work sympathetically with the communities to be affected by the works. Geotechnics' project team, led on-site by Chris Jones, has successfully completed the works at particular installation/crossing sites and is currently undertaking works along the LDTM route.

Geotechnics Limited is proud to be involved with such an important and complex project and the collaborative approach adopted by Geotechnics and United Utilities makes it professionally satisfying and maximises the benefit to all.

On the 4th December 2015 Geotechnics Limited was invited to attend United Utilities Engineering's Christmas Party and Director of Engineering Awards evening at The Park Royal Hotel in Stretton, Warrington.

In recognition of the work currently being undertaken by UU's Geotechnical Engineer Sam Fishburne and Geotechnics' Site Agent, Chris Jones, both were awarded Trophies for Leadership in Health, Safety and Wellbeing.

This recognition is much appreciated by the whole team and illustrates the benefits of the collaborative working ethos within UU and Geotechnics.

Right; Geotechnics' Tom Birch handing Chris Jones his trophy on-site in Cumbria

BLACK MOSS – an uplifting experience

›› Upper Black Moss Reservoir near Barley-in-Pendle in Lancashire is a Larger Raised Reservoir (Reservoirs Act 1975); Category A, as defined by the Guide to Floods and Reservoir Safety (1996). It is one of 180 embankment dams under United Utilities' management and, like many of these, is over 120 years old.

As part of United Utilities' programme Geotechnics was commissioned to determine the nature and properties of both the dam material and underlying strata to improve and streamline future maintenance.

Access to most of the boreholes with a cable tool rig was straight forward but one located on the dam crest required additional consideration since:

- The embankment crest was some 2.50m wide and uneven,
- A wave wall defined the upstream edge of the crest,
- The ground at the toe was uneven and soft.

The narrow crest and the wave wall limited movement by conventional means and a working platform was required for drilling from it. Lifting by crane was considered but required substantial ground improvements in an environmentally sensitive area.

Following discussions between Ray Macklin, and United Utilities' Geotechnical Engineer, it was agreed to use a helicopter. An aircraft with a maximum payload of 950kg was found but the choice & availability of a suitable rig to comply with this restriction became critical.

A Pilcon 1500 rig designed for export had been used for similar work before and proved ideal for this project. It has the advantage of a main mast that bolts together and front legs that can easily be removed. A load cell checked that the load did not exceed the maximum lift and some parts had to be removed from the main engine and winch frame unit to comply with the limit. All other parts were within the lift capacity. Similarly, casings and drilling tools were loaded onto stillages to pre-designated weights.

Prior to the lifting operations, a split-level working platform was constructed utilising specialist scaffolding which spread the dead and working loads across the face of the dam. The lifting operation was completed within 2 hours, requiring 9 lifts. The rig was reassembled and drilling commenced at the end of the same day. On completion of the borehole, the rig was successfully taken apart and lifted down in the same manner.

This project presented Geotechnics with some serious access challenges but by using experience, the right equipment, careful management and close liaison between all parties the team took it to successful completion.

Contacts

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