PIPE JACKING CASE STUDY

West Cumbria Water Supplies Project | Thirlmere transfer

PIPE JACKING ASSOCIATION

www.pipejacking.org

PROJECT	West Cumbria Water Supplies Project | Thirlmere Transfer
CLIENT	United Utilities | Farrans Roadbridge JV
CONTRACTOR	Ward & Burke
PIPE SUPPLIER	Tracey Concrete
TUNNELLING MACHINE	Herrenknecht AVN 2200
VALUE	£16.4 million (5 tunnels) £7.8 million Castlerigg tunnel

PROJECT OVERVIEW

The West Cumbria Water Supplies Project – Thirlmere Transfer Scheme comprises new sections of underground pipeline and associated water supply infrastructure that extend over a distance of approximately 100km from Thirlmere Reservoir, through the north-western corner of the Lake District National Park and into the adjacent boroughs of Allerdale and Copeland. As part of the scheme, Ward & Burke undertook the design and construction of five tunnel sections including a 1.24 km long tunnel, to a maximum depth of 60m, to house the Raw Water Aqueduct pipeline. This drive broke the UK record for longest microtunnel drive.

DESCRIPTION OF WORKS

- Installation of twin 800mm diameter ductile iron/steel product pipe, installed within the tunnels, on bespoke spiders. Pipework spiders designed and fabricated in house to carry the twin pipes along the tunnel. Sacrificial anodes are attached to the steel spiders to prevent supplied by Ian on 14th corrosion and meet the required 60-year design life.
- Castlerigg tunnel involved pulling in 1250m of twin 800mm steel pipe, welded in 14m lengths, and pulled in using an 80 tonne SWL capacity winch.
- 9 No. Inter-jack stations installed along drive to provide additional jacking force when required.
- HV (11 kV) power to TBM to reduce losses in transmission, system purchased by WB specifically for the drive with new AVN 2200 machine from HK.
- Spare cutting disks, pumps, grease, electrical equipment loaded into tunnel before drive to provide redundancy and reduce stoppage time in the event of breakdown.
- Drive completed in 3 months, with peak jacking forces < 1000 Tonnes and skin friction < 1.5 kPa.

The project was used as a benchmark for stringent environmental criteria with respect to pipeline works within a National Park. The Environmental Agency are now using this as the standard required for cross country pipelines in England.

FURTHER INFORMATION: **www.wardandburke.com**

HERRENKNECHT Tunnelling Systems

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