Elan Valley Aqueduct

Tail skin grease used on TBM for creation of new bypass tunnel

Our reference in Birmingham, (United Kingdom): Elan Valley Aqueduct

Project:
Elan Valley Aqueduct

Location:
Birmingham

Client:
Severn Trent Water

Contractor:
Barhale / North Midland Construction

Designer:
Atkins

Market sector:
Underground Construction

Products used:
MasterRoc TSG 800
MasterRoc SWA 710

The background

The Elan Valley Aqueduct has provided a source of water from Wales, to the city of Birmingham, for over 100 years.

Due to the age, and degradation of the structure, some existing sections of the aqueduct had to be taken out of service.

Barhale and North Midland Construction (BNM) were tasked with creating a new tunnel, at Knighton, to bypass one of these existing sections and guarantee a constant water supply to Birmingham.

The challenge

The tunnel drive took place through some challenging geology – Murcia Mudstone / soft rock. Within these sections it was envisaged that a certain amount of water would be encountered throughout the drive.

Within the first 100m of the drive, the TBM crew were experiencing large volumes of water within the excavated spoil, thus rapidly slowing the rate of advance.

In addition, having chosen a competitor's tail skin grease, the TBM team found that the grease didn't have the required water-resistant capabilities to hold back the injected annulus grout, plus any additional water ingress. Thus, creating a saturated, and unpleasant, working environment.

Contact:
Andrew Barlow
Phone: +44 (0) 161 727 6300
andrew.barlow@masterbuilders.com
www.master-builders-solutions.com

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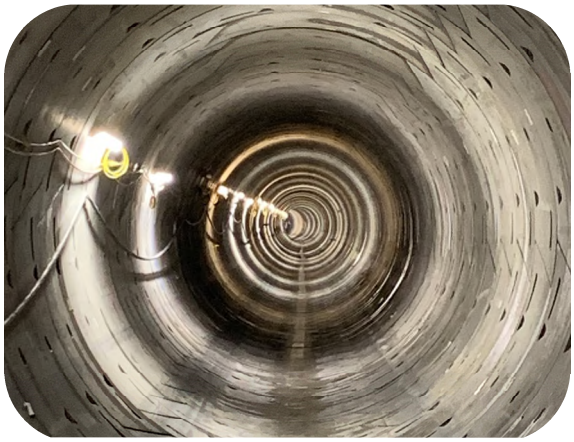

Our solution

Master Builders Solutions new innovative tail skin grease, MasterRoc TSG 800 was chosen to help with these challenges. With its fireproofing and water-resistant properties of up to 34 bar MasterRoc TSG 800 was put to the team to solve the ingress of grout and water behind the brushes. Once the brushes were completely filled with the product, a dry environment was created for the team to work in resulting in less grout waste being made.

Master Builders Solutions MasterRoc SWA 710 sophisticated soil thickener was introduced at the front of the cutterhead to help with the water ingress within the spoil. Immediately, the team saw a measurable difference where they were able to work with a workable material, rather than a saturated soil. This led to higher advance rates being made and a more productive environment being built.

A total 14 tonnes of TSG 800 tail skin grease and 4,000 litres of MasterRoc SWA 710 soil thickener were used on the project.

The customers benefit

- MasterRoc TSG800 excellent water-resistant properties stopped water ingress through the brushes creating a dry environment to work in.
- MasterRoc SWA 710 bound the water content within the excavated soil leading to a more workable product being made and higher advance rates being produced.

Project facts at a glance

- The full scheme, replacing certain sections of the aqueduct, will total around £75million
- The aqueduct feeds Frankley Water Treatment Works on the outskirts of Birmingham
- The total length of the replacement is approximately 5 kilometres
- The TBM was a 3.1m diameter EPB Herrenknecht

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