

Farnworth Rail Tunnel Upgrade

Sprayed concrete lined tunnel refurbishment and reinforcement



Our reference in Bolton, (United Kingdom): Farnworth Rail Tunnel Upgrade

The background

As part of the Manchester to Preston Electrification program, the two Victorian-built Farnworth rail tunnels (Up & Down) were refurbished. Enlargement of the Up tunnel would, on completion, provide a new larger rail tunnel with two electrified lines running North to West and South to West.

The enabling works for this meant that the 270m Down tunnel (which was kept operational through the project) would require both refurbishment and re-strengthening. Over a program of weekend track possession, between April and July 2015, an internal mesh frame and a series of permanent ribs were installed, making ready for 200mm of reinforced wet sprayed concrete to create the new tunnel lining.

The challenge

The project required the production of a consistent reinforced wet spray concrete that could be pumped up to 300 metres while still being suitable to spray.

Project:

Farnworth Rail Tunnel Upgrade

Location:

Bolton

Client:

Network Rail Limited

Contractor/Applicator:

J Murphy & Sons Limited with
Fineturret Ltd (spray contractor)

Concrete Producer:

CPI EuroMix

Market sector:

Underground Construction

Products used:

MasterRoc SAI 60

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Our solution

Working with CPI EuroMix, Master Builders Solutions concrete admixtures were used to create a dry-silo mix, an innovative approach first used on the Crossrail project, and now being effectively used to provide the flexibility required for work to be carried out throughout the possessions.

Atlas Copco Suprema pumps, located next to the four 30-tonne CPI EuroMix silos, pumped the wet concrete to the required locations.

MasterRoc SA I 60 alkali free accelerator was introduced at the nozzle of the Murphy's-owned Atlas Copco Meyco Oruga that had been mounted on an adapted RRV trailer to spray the wet reinforced concrete.

The customers benefit

- Producing a consistent reinforced wet spray concrete that could be pumped up to 300 meters and remain suitable to spray.
- Master Builders Solutions concrete admixtures and SA I 60 accelerator provided a workable concrete that performed both technically and reliably within the possession timeframes.
- Adherence to Eurocode Standards using an innovative, careful approach to working with shotcrete at low tolerance has protected this structure for another 100 years.

Project facts at a glance

- 1800 tonnes of concrete used to complete the work
- Up to 100 tonnes used in a single possession
- Pumped up to 300m from the silos to the spray set up.
- Wet spray concrete accelerated at the nozzle with MasterRoc SA I 60
- Designed to latest Eurocode to provide full structural integrity for a 100-year design life

