

TUNNELLING UNDER THE TURF

D.J. Mac Cormick Contractors has completed a critical piece of infrastructure for Perth's new AU\$1.21 billion stadium, with the installation of 125 m of 900 mm concrete jacking pipe and a 700 mm MSCL Water Main.

DJ. Mac Cormick Contractors has recently completed two high profile crossings in Burswood, Perth, for RCR Water, which involved the microtunnelling installation of two 900 mm concrete jacking pipe drives with lengths 75 m and 50 m. Together the crossings form a critical piece of infrastructure in the supply of water to Perth's new AU\$1.21 billion, 60,000 seat stadium which is nearing completion.

The first drive crossed under one of Perth's most congested arterial roads, the Great Eastern Highway, which links its CBD to the eastern suburbs, and the international and domestic airports. The other crossed under the Perth to Armadale railway line, which runs through the new sporting precinct and which is also being upgraded as part of the stadium's development.

The D.J. Mac Cormick team had to account for continuous movement of trains above where the tunnelling was taking place. Given the critical nature of the works and to minimise the risk of settlement microtunnelling methodology, using a closed face slurry tunnelling machine, was decided as the best solution for the project.

An independent consulting engineer was required to complete predicted settlements prior to the construction starting, due to the depth of the cover to the top of the pipe, predicted settlements were noted to be 16-19 mm as a result of the sand soil conditions at pipe level. D.J. Mac Cormick minimised the risk by ensuring the ground material was analysed at pipe level and a bentonite mix was designed to suit the sand.

A survey of the track was also undertaken prior to commencement and checked regularly throughout the daily operations to ensure that the settlement was within acceptable levels, it also performed volume checks for each pipe installed for further verification. Drive records, daily microtunnelling reports, volume check sheets for grouting and spoil removal and inspection, and test plans were utilised to verify the boring in accordance with quality and service requirements.

A survey for further verification following the completion of the project, showed that the tunnelling crew managed to limit the maximum settlement to 2 mm on the pipeline along both the rail crossing and the Great Eastern Highway Crossing. Every third pipe along the drive length had grout ports installed and grouting was performed immediately after each of the drives was completed, with pressure gauge and volume checks also undertaken along each section of pipeline.



The project TBM on site.

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D.J. Mac Cormick worked with various stakeholders to successfully complete the project, including RCR Water, Water Corporation, Railtrain, Main Roads WA and the Public Transport Authority. It says the it would not have been possible without an efficient and high level of communication, pre-planning and professionalism.

The contractor has also recently completed tunnelling work interstate, including a 120 m highway crossing, with a high volume of traffic, on the Gateway Project in QLD. It has made a further addition to its Herrenknecht fleet of tunnelling machines and systems with the acquisition of a AVN 1600 TB, which is suitable for various ground from soft to hard basalt in excess of 150 MPA and capable of drive lengths over 500 m. **T**

D.J. Mac Cormick contractors is a leading tunnelling and infrastructure construction company, with branches located in Western Australia, South Australia, Victoria, New South Wales and Queensland. Its specialist team of personnel have over 40 years' experience and a reputation for excellence as substantiated by its numerous Australian and international projects and awards.

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