



Millstream - Greenbushes Water Main, Blackwood River Crossing

Client:
Water Corporation

Location:
Southampton WA

Construction Period:
Feb 15 – Nov 15

Project overview

Over recent years, Water Corporation has set out to secure a long term water supply scheme for the Warren-Blackwood region. The area covers the towns of Nannup, Manjimup, Boyup Brook and Kirup. As a part of the scheme, a link main between Millstream Dam and the town of Greenbushes was required to be constructed.

DM Civil was contracted by the Water Corporation to design and construct a DN400 pipe crossing of the Blackwood River. DM Civil undertook the design, verification and construction of the work under stringent environmental controls required to protect the sensitive river ecology.

In order to satisfy the project brief and controls, DM Civil designed the drill shot prior to obtaining specialist input to provide pullback calculations. This input was required to ensure that the pipework had the appropriate rating to withstand the installation forces on the pipe wall. Consulting engineers that specialise in horizontal directional drilling (HDD) works were then engaged for third party verification to ensure that the proposed design complied with the relevant industry code of practice and Australian Standards.

DM Civil's understanding and experience in implementing the appropriate trenchless technique on a project specific basis ensures that the correct methodology is always implemented to industry best practise.

Significant achievements and benefits

Concerns were raised regarding the risk of hydraulic fracture or “frac-out” of the drill shot under the river. Although recent bush fires had degraded the river system in downstream Southampton Pool, a risk of frac-out was deemed unacceptable. A hydraulic fracture analysis was modelled to gauge minimum drill depths under the river bed based on site geology.



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From the design pull-back calculations it was determined that a PN25 or SDR7.4 rated pipe would be required to meet the pull-back induced stresses. Through the DM Civil relationship with local pipe manufacturers, a special production run was able to be arranged for the higher than normal strength for this size of pipe. This allowed DM Civil to meet the construction programme set prior to several project unknowns being solved in the post-award design process.

The drill shot was designed based on the available geotechnical information and allowed for the apex of the curvature to be positioned approximately 8 metres below the river bed, or 1.5 metres above the granitic rock below. At 6 metres below the river level, rock was encountered with an estimated strength of 240-280 MPa UCS. This created a number of challenges that needed to be resolved with specialist tooling which was required to drill rock of this strength.

Through careful planning and liaison between DM Civil and Water Corporation, the rock was successfully drilled and the pipe installed. This followed a number of challenges requiring resolution during the process. DM Civil was able to demonstrate strong problem solving skills allowing completion of works under difficult conditions. This company focus ensures a commitment to deliver every project successfully.

The ability of DM Civil to adapt to the challenges of the project as they occurred, enabled the difficult ground conditions including rock with a hardness of 240-280MPa UCS to be navigated and the pipe to be installed successfully.

Contact DM Civil to discuss your trenchless technology projects.

GUARANTEED PERFORMANCE

T: (08) 9492 1800
dmc@dmcivil.com.au