

AMC CIVIL MUD XTRA™ reduces fluid costs and downtime on major light rail project

CASE STUDY

In metropolitan Sydney, Australia, AMC CIVIL MUD XTRA™ significantly improved trench wall stability and dispersion, assisting construction underneath a major arterial road. The bentonite free mud system minimised fluid loss and improved productivity, allowing the project to progress without interruption to surrounding road conditions.

Challenge

AMC's client was constructing a series of diaphragm walls to support the ground formation leading into a tunnel for a new metropolitan light rail system in Sydney, Australia.

The diaphragm walls consisted of 63 interlocking panels ranging from 6m long and 18m deep and was being built below a major arterial road. On completion of the first trench, high seepage was experienced, resulting in the trench collapsing and requiring filling and re-digging.

The geological profile of the site included a variety of loose grain sands, peat, basal alluvium and sandstones and the possibility of igneous dykes. While a bentonite system would ordinarily be used in these conditions, the client specified the requirement for a bentonite free, polymer mud system to ensure trench wall stability and to control dispersion, enabling fluid to be available for immediate re-use. AMC recommended several specialty products, such as AMC CIVIL MUD XTRA™, AMC SHUR SEAL™ and MAGMA FIBER to accommodate.



Results

- Minimised fluid loss, resulted in a significant reduction in fluid costs
- Improved construction productivity – five walls completed every six days
- Trench walls stabilised, no further collapse experienced
- Fluid volume maintained to meet construction demand controlling the fluid loss
- Successful use of polymer fluid system – no bentonite
- Recycled fluid free of cuttings.

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Solution

The project used AMC CIVIL MUD XTRA™, a synthetic polymer drilling fluid, specifically designed for use on civil projects. The cross-linked, synthetic polymer structure binds particles, such as the loose grain sands found on this site to improve borehole stability, while minimising the build up of drilled solids in the fluid. AMC engineers introduced AMC SHUR SEAL™ to increase the viscosity and further improve stability, together with MAGMA FIBER for additional filtrate control.

Viscosity was increased from 55 – 80 seconds, and a substantial improvement in seepage was observed. While some losses were still being experienced, the crews were able to maintain the fluid in the trench until the concrete was poured.



Sand, peat and marsh found at the bottom of the trench.



Guide wall trench.



Clam shell excavator digging with new AMC CIVIL MUD XTRA™.

Project Outcome

AMC CIVIL MUD XTRA™ fluid system successfully reduced fluid loss and stabilised the trench walls enabling crews to complete the concrete pour without the borehole collapsing. The project delivered additional productivity and cost saving benefits including;

- Reduced fluid costs as a result of minimising losses to the formation together with very little dumping of fluid
- Improved productivity, achieving completion of five walls every six days (including allowance for maintenance down time)
- Significant reduction in construction downtime as fluid system volumes were maintained to meet demand
- Recycled fluids free of all cuttings and sand, and maintaining the recommended viscosity of 65 seconds.

The client indicated they were extremely happy with the performance of AMC CIVIL MUD XTRA™ and AMC's on-site support and commitment to providing a solution.

Further Information

For more information about this case study, please contact amc@imdexlimited.com or your local AMC representative.

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