Douglas Partners
Geotechnics / Environment / Groundwater

Pier and Roe Street Trenchless Excavations, WA

Trenchless excavation crossing the Perth's PTA operating rail.

Douglas Partners has been providing geotechnical advice regarding trenchless excavations on multiple occasions, and in particular to respond to Public Transport Authority (PTA)'s requirements regarding new services beneath PTA's operating railways. One of these projects, in Perth CBD, is discussed below.

The project comprised the installation of 132 kV cables over a length of approximately 2 km long along Milligan Street, Roe Street, Pier Street and Murray Street, in the Northbridge part of Perth's Central Business District (CBD). Two 600 mm diameter pipes were proposed to be installed using a microtunneling boring machine (MTBM), across the existing PTA operating railways at depths of between 4.5 m and 5.4 m.

Douglas Partners geotechnical specialists were engaged to undertake an investigation, which included cone penetration tests (CPTs) and shallow boreholes, at the locations of the proposed launch and retrieval pits (to be excavated to depths up to 5.0 m). Data from the CPTs and boreholes were used to derive a ground model within the proposed excavation depths and to provide advice on suitable trenchless excavation methods, maximum allowable drilling fluid pressure, annulus grouting pressure, estimated ground movements and monitoring requirements, to prospective drilling contractors.

Due to the location of the crossings within a bus route immediately outside a busy bus port, the investigation was undertaken during approved night periods following consultations with PTA and relevant road authorities. Test locations were carefully selected to minimise disruption to the surrounding community, whilst meeting PTA's requirements and achieving the objectives of the investigation in a cost-effective manner to our client David Wills and Associates. Finite element modelling was available to our client from Douglas Partners' specialised advanced modelling hub, if such modelling would be required.

Dewatering operations together with the use of caissons and an earth pressure balanced microtunnelling boring machine capable of handling groundwater were suggested by Douglas Partners, to address shallow groundwater.

Douglas Partners worked closely with Davis Wills and Associates to ensure that the investigation would meet both our client's and PTA's requirements.

Douglas Partners' office includes several engineers with suitable expertise and experience in assisting our clients to prepare successful trenchless excavation applications to achieve PTA's drilling approval. Douglas Partners' capability also offer advanced FEM analyses from a dedicated numerical modelling hub with a wealth of experience, directed by our Principal Analyst Dr. Richard Merifield.

CLIENT David Wills and Associates

YEAR 2018 - 2019

SCOPE OF WORK

- Developing a geotechnical ground model;
- Advice on maximum allowable drilling fluid and annulus grouting pressures;
- Advice on estimated ground movements and mitigation measures;
- Monitoring requirements; and
- Availability to undertake advanced modelling (eg. PLAXIS 3D), if required.

"Douglas Partners were great to deal with as a sub-consultant. They were organized, and communicated proactively to provide a comprehensive report in accordance with Public Transport Authority requirements."

Athena Rowcliffe
Lead Engineer
David Wills and Associates

To find out more about Douglas Partners' projects, visit our website at www.douglaspartners.com.au

GEOTECHNICS