



GEOINVENTIONS CASE STUDY

Epping to Thornleigh Third Track



Project: Epping to Thornleigh Third Track (ETTT)

Location: Sydney, NSW, AUSTRALIA

Contractor: Leighton Lend Lease Pty Ltd

PROJECT OVERVIEW

The \$265 million Epping to Thornleigh Third Track (ETTT) project is a key component in upgrading the main North line between Sydney and Newcastle which is shared between passenger and freight trains. The project involves the construction of 6.0km of new and upgraded track within the live rail corridor. This challenge includes significant earthworks, the need to maintain access to all stations and the need to minimize environmental and community impacts. Geoinventions Consulting Services (GCS) conducted 23 independent temporary works designs on the project and some are explained in this case study.



TEMPORARY WORKS 20

Date Designed: 20/01/2014

Risk Classification: High

Risk assessment of the Epping to Chatswood Rail Line (ECRL) down main tunnel portal should ground anchors be damaged due to proposed piling works. Several FEM analysis were conducted to calculate the maximum bending and shear force per m run on the existing piled wall. Piled wall deflections were calculated and to mitigate the risk, a geosynthetic reinforced piling platform was designed and constructed.



TEMPORARY WORKS 63

Date Designed: 24/04/2014

Risk Classification: High

Vertical king post retaining wall design to support a 5.0m wide temporary access platform which allows the operation of a 20T excavator and drilling rig in order to construct a soil nail wall near Pennant Hills Road Bridge. Challenges were space constraints and the construction of a 3.0m high wall near live rail traffic.



TEMPORARY WORKS 101

Date Designed: 28/01/2014

Risk Classification: Medium

Assessment of ground bearing pressure and support requirements for piling operations at Beecroft Station Underpass. The maximum piling rig pressure of 301kPa was supported by a 400mm piling platform constructed from recycled dense graded base (DGB). One of the challenges was the close proximity of the piling platform to an existing parapet retaining wall which would impose additional load.



TEMPORARY WORKS 170

Date Designed: 24/01/2014

Risk Classification: Medium

Assessment of ground bearing pressure and support requirements for CF6 piling and 100T crane operations at Pennant Hills Station. The maximum piling rig pressure of 248kPa was supported by a 300mm piling platform constructed from recycled dense graded base (DGB).



TEMPORARY WORKS 170

Date Designed: 23/10/2013

Risk Classification: Medium

Assessment of ground bearing pressure and support requirements for CF6 piling operations at Cheltenham Station near overhead wires. The maximum piling rig pressure of 263kPa was supported by a 400mm piling platform constructed from well compacted road base.

ULX TRENCH EXCAVATIONS

Date Designed: 24/01/2014

Risk Classification: Medium

GCS conducted over 30 ULX (underlying crossing) trench excavation design assessments at various location along the railway line. In some locations, different shoring options needed to be improvised. Trenches were excavated to a depth of 1.5m at which point shoring boxes (if required) were inserted. Efficient installation and backfilling were essential due to critical time constraints under rail possession.

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