



Asia

# Perth Metrorail City Project Temporary Works and Ground Movements

## Description of Work

The Perth Metrorail City Project involves construction of an underground mass transit railway from the existing Perth Rail Yard to the Narrows Bridge, which includes approximately 700 m cut and cover tunnels. The tunnels are constructed within and above thick deposits of a soft compressible soil layer named the Swan River Alluvium. GCG (Asia), acting as a sub-consultant to Worley Parsons, have provided geotechnical support to the Perth City Rail project management team on design issues and as a technical reviewer of construction methodology. This work included an independent review on the possible effect of long term ground settlement on the permanent tunnel structures and a review of the tenderers temporary works proposals for deep cofferdams.

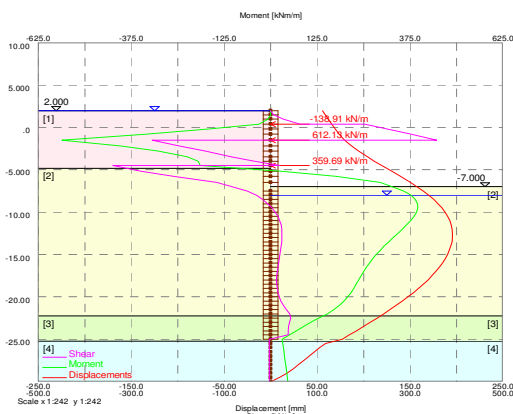
Numerical modelling was carried out to assess the impacts of long term settlement (creep) and lateral ground movement on both a floating tunnel option and a tunnel supported on piles. The modelling revealed that the long term settlement is unlikely to be an area of concern and, subject to a more detailed ground investigation, there may be scope for reducing or even possibly eliminating piled foundations beneath the tunnels.

The review of the tenderer's temporary works proposals included both numerical modelling and limit equilibrium analyses. The aim of this work was to assess the structural adequacy of the proposed sheet pile wall and strutting arrangement and to determine the magnitude of ground movement adjacent to the excavation and the potential impact on adjacent structures. This proved to be a valuable to the Client in evaluating the risk profile of the works through design and construction.

**Client:** Worley Infrastructure

**Dates:** 2003-2004

**Estimated Project Cost:**  
HK\$ 1.9 billion



**FREW analysis of strutted deep excavation in soft clay**

