Instrumentation & Monitoring – New Metrorail Project, Perth

Project nature:	Instrumentation & Monitoring
Project:	New Perth Metrorail Project
Client:	Leighton Kumagai Joint Venture
Fugro company:	Fugro Spatial Solutions Pty Ltd
Period:	2004-2007
Project value:	Confidential

Twin bored rail tunnels were recently constructed under the city of Perth. The contractor Leighton Kumagai Joint Venture, selected Fugro to provide the monitoring, automatic data logging and web enabled reporting necessary for the successful undertaking of the project.

To meet the requirements for monitoring and reporting of movements, stresses, strains, piezometric pressures and vibrations due to excavations and tunneling on the works and on existing structures and services over 500,000 readings per week were collected and analysed from in excess of 5,500 instruments. These included inclinometers, extensometers, piezometers, electrolevel beam sensors, retro targets on buildings, rails and sheet piles, optical prisms on buildings read automatically from robotic total stations, “in-place” inclinometers, surface & building settlement points, strain gauges, vibration monitors, manual & automatic tilt meters, crack meters.

37,000 man hours were devoted to the project over a 3 year period.

Fugro’s GIMS (Geotechnical Instrumentation Monitoring System), software system was used as a basis for an automated monitoring system with a wireless LAN network established to link automated instruments to its server. All instruments had alert levels that when exceeded, triggered e-mail and SMS messages to appropriate contract managers & engineers

Innovative use of surveying techniques included monitoring of road surfaces by means of photogrammetry using highly automated processes for fast turnaround of results.

The end result was that with constant monitoring, tunneling under roads, live rail tracks, heritage buildings and other structures was able to be completed successfully without damage being caused.

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