Geotechnical lessons learnt from Woolgoolga to Ballina Pacific Highway Upgrade project

Woolgoolga to Ballina is the final link in the Pacific Highway, between Hexham and the Queensland border, to be upgraded to four lanes. Upgrading the Pacific Highway and carrying out safety improvements to the existing highway have brought major improvements to road conditions. These improvements support regional development and provide:

• safer travel
• reduced travel times with improved transport efficiency
• more consistent and reliable travel
• improved amenity for local communities

Roads and Maritime Services engaged Pacific Complete, a joint venture between Laing O’Rourke and WSP, as the delivery partner for the Woolgoolga to Ballina Pacific Highway upgrade. The delivery partner model is based on the approach used to oversee the construction of infrastructure for the London Olympic Games.

The project includes upgrading the highway to motorway (Class M) or arterial (Class A) standard over its 155 kilometre length, nine interchanges, more than 170 bridges and more than 350 connectivity structures. It will bypass South Grafton, Ulmarra, Woodburn, Broadwater and Wardell.

Henry will share the considerable experience gained and good lessons learnt on the following:
- Innovations in soft ground design, construction and field instrumentation and monitoring;
- Commentary on current soft ground design and construction practice and recommendations on best practice
- Lessons learnt and state of practice in driven pile design, procurement, installation and verification and recommendations on best practice
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The Engineers Australia Civil & Structural Engineering Panel (Sydney Division) has resolved to hold an annual technical presentation to commemorate colleague and former Panel member Keith Wilson, who sadly passed away during 2013. A brief dedication will be made prior to the technical presentation.

About the speaker

Henry Zhang WSP, Technical Executive, Geotechnics

Henry is a Technical Executive, Geotechnics with WSP. He is a chartered engineer and a fellow member of Engineer Australia. He has over 20 years of professional experience in geotechnical engineering design and construction in Australia, Singapore and China. Henry has broad experience in geotechnical design on foundations, ground improvement, slope stability, deep excavations and retaining walls and finite element analysis on complex soil-structure interaction.

Henry’s leading technical skills have been demonstrated by publishing 21 technical papers/presentations on ground improvement, retaining walls and pile foundations and giving 3 invited lectures at UTS and Sydney Uni. Over the past four years, Henry worked as Lead Designer/Subject Matter Expert for Pacific Complete on soft ground and piling to deliver the Woolgoolga to Ballina Pacific Highway upgrade. Geotechnical challenges included construction of significant embankments on soft ground to mitigate risks on pavement, culvert and bridge structures and driven/bored piles terminating in soil and rock to provide a solid and durable support to the bridges.