

UK expert imparts smarts for better bridge builds

Eminent bridge designers attended a round table discussion organised by the ASI and held in Aurecon Australia's boardroom on 10 March with visiting expert **David Iles** from the UK's Steel Construction Institute (SCI) to catch up on the latest thinking on UK steel bridge design and trends.

Mr Iles manages the Bridge Design section of the SCI and has been in demand internationally following release of the new SCI design guides for bridges, *Composite Highway Bridge Design* and *Composite Highway Bridge Design: Worked Examples* (both available directly from SCI UK).

The Sydney event followed a successful two-week round of technical seminars on Bridge Design lead by Mr Iles in New Zealand the previous month organised by the Heavy Engineering Research Association (HERA) there.

Messages from the Sydney forum were around the opportunities that an efficient steel design can bring to a project and the supposition that designers and authorities in Australia may not be as open to alternative options to a traditional solution as those in Europe.

Mr Iles presented case studies where the advantages of steel could be most realised; in longer spans, bridges that were curved in plan, superstructures where there was a need for a shallow structural depth or a varying structural depth, foundations that required the structure self-weight to be minimised and bridges where appearance was particularly important.

The forum attracted participants from Arup, Aurecon Australia, Australian Rail Track Corporation, Cardno, Hyder Consulting, GHD (Melbourne), Hughes Trueman, Opus International Consulting, Pitt & Sherry, Queensland Department of Main Roads, Railcorp (NSW), Roads and Traffic Authority NSW and Sinclair Knight Merz.

Aurecon Australia Technical Director, **John Hilton** said Mr Iles demonstrated with up-to-date examples of international practice that the Australian bridge industry needs to look more closely at steel as a real option in instances where it is currently not considered.

He noted Mr Iles' advice that composite steel bridges comprise 45 percent of the total bridge market in the UK, a much greater share than in Australia.

"Bridge steel intensity here is significantly lower than for other developed nations due to a long standing preference for precast concrete," Mr Hilton said.

"While both bridge types have a place in the industry, not adopting the steel option can in some instances result in compromising the final solution.

"For example, Mr Iles explained that precast concrete highway bridges are generally limited to a span of 35 to 40 metres, whereas the span limit for steel girder bridges is much longer.

"Not providing the steel option can for example result in freeway overbridge piers in the median potentially introducing a hazard and/or reducing sight distance or needing to provide highway bridge piers in a permanent waterway with the potential for negative environmental impacts," Mr Hilton said.



The Aurecon-engineered and steel-intensive Falcon Street Pedestrian and Cyclist Bridge that crosses 19 lanes of traffic with one span in Sydney

Mr Iles outlined the effect of recent advances in both the design and construction of steel bridges in Europe which has contributed to lower construction costs, advanced durability, better safety in installation and improved sustainability, advances not yet adopted in Australia.

Mr Hilton said other aspects of Mr Iles' presentation included increased durability through the use of advanced anti-corrosion coatings and weathering steels and better detailing of connections; alternative methods of bracing and restraining critical flanges; developments in the use of ladder bridges and permanent formwork for deck slabs; new high-strength steels; and alternative methods of designing for fatigue and installation by launching, sliding, swinging as well as lifting.

Copies of Mr Iles' Sydney presentations are available for members to download from the ASI website at: <http://elibrary.steel.org.au/asi/asi/en/sci-bridge-seminar.cfm>