

Digital technology

# Changing the landscape of engineering and construction



Mr Paul Roberts

Digital and specialist skills help clients see the bigger picture as Asia-Pacific prepares for unprecedented investment.

**D**igital technology is changing the landscape of engineering and construction, but clients and contractors must adapt to reap the benefits, according to HKA Partner Paul Roberts.

"Clients need to be highly skilled in understanding the new digital era we're entering so they can exploit its potential for their projects and, where they also own assets, in their facilities management," Paul explained.

Governments have a lead role in driving public sector investment and engagement with digital, notably Building Information Modelling (BIM). "The uptake of BIM had been slow in Asia-Pacific region, compared with the UK and Europe, but it is ramped up over the last three-to-four years. BIM is now becoming mandatory in

China and Hong Kong," said Paul, who is based in the HKA Brisbane office.

HKA's global presence confirms that the digital challenge is proving daunting for contractors across all territories. "Construction companies are still struggling to configure their businesses to operate in a digital environment. They need digital transformation programmes to best serve clients' needs."

BIM's potential goes beyond sharing design information, Paul stressed. HKA is using BIM in the management of projects and contractual disputes. "We are now taking BIM information, records from site, and costing information and linking it into programs to produce visual models of a project through its life."

Visual models also make it much easier to understand the implications of

delays without having to interpret the written word and bar charts, especially where clients and partners do not share the same first language. Presenting the impact visually, when a complex project is running six months behind, is far more powerful and persuasive, said Paul, a Chartered Quantity Surveyor who has specialised in dispute avoidance and resolution for the last decade.

Reality capture and 3/4/5D modelling provide advantages across risk management and commercial negotiation as well. Models with 4D and 5D links to time (e.g. through programmes) and costs (e.g. through pricing documents and/or accounts) are not only more readily understood by a layperson. They can also be extended through operations and beyond, and help clients focus on value rather than cost, Paul added.

This change of mindset is urgently needed as lowest-price tender awards drive margins even lower. Given the added risks of cyclical swings in workload, firms are reducing their investment in innovation, just as they need to invest more to reap the rewards of digital and other technological advances.

"This continual focus on price reduces investment by providers and stifles innovation," Paul warned. "There is no short-term fix for this. The client's perspective should extend all the way from a project's conception to completion and into its operational life." Rather than focus on capital expenditure (CAPEX), often without fully considering the operational (OPEX), the client needs to focus on long-term value to drive TOTEX (total expenditure) solutions.

### **BIM and digital developments can help clients see this bigger picture**

An unprecedented boom in investment across the Asia-Pacific region is going to test the capabilities of clients and their suppliers. "There is a global uptake in infrastructure activity, which is increasing the squeeze on skills and resources. Careful planning and supply chain management will be key to ensuring that the right skills are provided at the right time."

Many major projects are underway or

coming to market across the region. Such as Changi Airport Terminal 5 will be the most valuable project ever in Singapore, to be followed by a high-speed rail link to Kuala Lumpur.

HKA is working on Taiwan's metro project, and with Chinese main contractors delivering the growing super-power's Belt and Road strategy in Asia and on other continents.

New Zealand's open economy is proving attractive and growing. Emerging economies too, including Indonesia, Malaysia, Sri Lanka and Vietnam are poised for massive infrastructure spending, not least in energy.

The complexity of such projects demands innovation and a breadth of capabilities that large consultancies may not be able to meet, especially in a buoyant market. Agile, tailored solutions are called for, said Paul.

SMEs can offer the independent thinking and specialist talent that they lack. HKA is showing how highly organised yet flexible groups of specialised SMEs can outperform established mega-consultancies.

Co-opting and blending the technical expertise of SMEs can give clients the best joined-up solutions available. For example, niche skills in risk management, BIM, data analytics and other areas were a differentiating factor in HKA's successful bid for Hong Kong's third runway framework.

This agile approach and digital know-how span the practice. For another project, it was a suite of highly innovative models for reality capture that set HKA's proposal apart from other bids.

"As the world's preeminent construction claims and expert consultancy, we not only have local knowledge in most territories, we can share world-class best practice with clients across the whole project lifecycle," Paul added.

Another way HKA does this is by connecting clients with their peers around the world so they can apply lessons from similar projects.

"If we are to deliver the best outcomes for clients we need to tap this global network of best practice and talented disruptors to exploit the changing landscape for engineering and construction."