



Technology helps in the design of enduring and memorable environments that inspire and engage people, says Ms Lim.  
PHOTO: CHONG JUN LIANG

# A step ahead

RSP sets high standards by embracing cutting-edge technology and other advanced methodologies

MEREDITH WOO

**I**NNOVATIVE and forward-thinking design and construction methodologies were employed by RSP Architects Planners & Engineers to complete the Singapore Changi Airport Terminal 4 (T4) project.

The five-block terminal, with a total construction floor area of 376,000 sq m, was completed in just 37 months. It opened to the public on Oct 31 last year.

At this year's Building and Construction Authority's (BCA) Awards, the project won the Design and Engineering Safety Excellence Award.

### Winning factors

By using off-site precast concrete and prefabricated structural steel design and construction, RSP was able to increase productivity, quality and site safety as it could produce the materials concurrently at a separate location, in a controlled environment.

"This helped us meet the earlier handover schedule for the installation and commissioning of the airport baggage handling system," says RSP's director Jessica Lim.

Using a full precast system approach for the departure level of the terminal building, RSP reduced the construction time by 64 per cent as compared to conventional cast-in-situ construction.

For the first time in Singapore, the company employed the use of an advanced precast

mechanical beam shoe connector with anchor bolts, which enabled straightforward and robust installation, she adds.

The organisation also used an advanced Hat First construction methodology that allowed all erection works for 36 bays (each measuring 15m by 70m) to be completed in just 15 months.

Design for Manufacturing and Assembly (DfMA) principles were also employed at the fixed gangway structures. Prefabricated steel volumetric modular design made assembly swift.

"This minimised impact to existing live aircraft parking stands at airside," says Ms Lim.

### At the forefront

RSP prides itself on being an early adopter of initiatives such as DfMA and prefabricated prefinished volumetric construction.

It also uses Mass Engineered Timber, a sustainable technology that enhances buildability, shortens construction time and significantly reduces energy consumption. It reduces cost as well.

In addition, the company uses the sophisticated building information modelling (BIM), which is extended to sub-contractors, fabricators and all stakeholders, as a collaborative platform.

Ms Lim says: "Technology is a big game changer for the built industry, which is always evolving. It is an enabler for us to design enduring and memorable environments that inspire and engage people, because that is what good design is fundamentally about."

## Improve and excel

Kimly Construction's use of green initiatives and more integrated processes culminate in two BCA Awards

ARUL JOHN

**T**HE staff at Kimly Construction believe that self-improvement will help them deliver a better product for their clients' projects and drive change in the industry.

This culture is likely to have contributed to the company's success at the BCA Awards, where it picked up the BCA Construction Productivity Award (Projects) – Platinum for its project Amber Sky, and the BCA Green and Gracious Builder Award – Star.

### Striking the right balance

The awards attest to Kimly Construction's efforts in achieving its goals while still taking into account environmental concerns and constraints.

Its director Tan Beng Chuan says: "We are humbled to be recognised for our continuous efforts to be productive and green. These awards motivate us to continue to participate actively in the industry's productivity and green initiatives."

Each project came with its own challenges. For the Amber Sky condominium that was awarded the BCA Construction Productivity Award (Projects) – Platinum, the site's size constraints meant that no precasting or storage of concrete elements could be done on site, says Mr Tan, who was in charge of its operations.

The building's curved facade also took up a lot of space during the precasting stage. As a result, not many precast suppliers had sufficient production bandwidth to meet the demand.

Recalls Mr Tan: "We had very little buffer in our logistics management to deliver and install the precast elements so as to cause as little inconvenience as possible to the public."

"We also had to work very closely with our supplier to ensure the quality of the precast elements, especially for the complex curved facade elements."

Kimly Construction closely monitors energy consumption and construction material wastage at its job sites.

It also strives to adopt green practices in each project.

"We strongly believe that not only do we have a social and environmental obligation to be a responsible organisation, we also have a strong business cause to continuously improve our productivity and green practices," he adds.

Winning the Green and Gracious Builder Award – Star also attests to the company's commitment to reduce wastage, conserve resources and care for the environment during the construction process.

"IT-based data management reduced the



Mr Tan notes the industry is moving towards a DfMA approach to reduce on-site work while improving productivity. PHOTO: CHONG JUN LIANG

amount of waste produced, and also improved communication and collaboration. This optimised our planning, logistics, safety and quality processes, which in turn reduced our carbon footprint," he explains.

### Keeping up

Mr Tan notes that the industry is moving towards a Design for Manufacturing and Assembly (DfMA) approach to reduce as much work done on-site as possible while improving the productivity of workers.

But for the industry to advance in DfMA, the supply chain of the built environment must be more integrated.

In addition, he feels the stakeholders in the supply chain must learn new capabilities to work better with architects, contractors, sub-contractors and suppliers.

He adds: "Parametric design software enables architects and engineers to generate designs and shapes based on parameters set by the user and which cannot be usually done manually, or optimise designs in a much shorter time than usually required."

"Our workforce is moving towards smarter jobs. Automation and increased computerisation are not just factors for increasing productivity, but also for attracting and retaining talent in the industry, which we urgently need to do."



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