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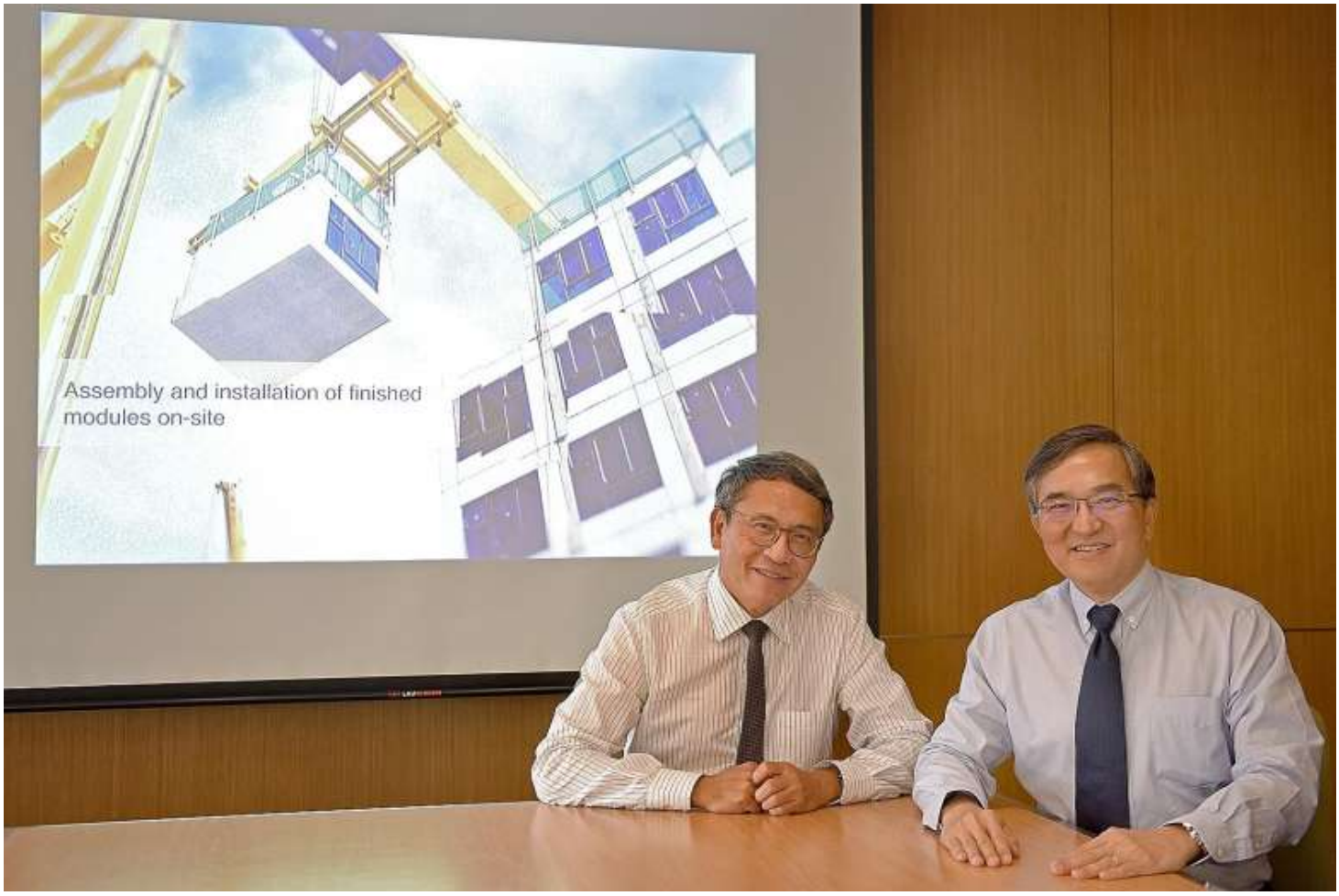
SME Spotlight

Building on novel material



Mr Anthony Chia (far left) said CDL wanted to extend the use of prefabricated units in its projects, and Mr Johnny Lim said Teambuild had the know-how in the area of prefabricated prefinished volumetric construction. ST PHOTO: FELINE LIM

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In this productivity-focused era, large companies can benefit from working with some smaller, home-grown firms to develop new, high-tech methods of production. City Developments, a major Asian real estate developer, has teamed up with Teambuild Engineering and Construction to use a rather novel building material. CDL executive vice-president (projects) Anthony Chia and executive director of Teambuild Johnny Lim talk to Sabrina Theseira about how they have collaborated to use prefabricated prefinished volumetric construction to build an executive condominium in Canberra Drive.

Sabrina Theseira **(mailto:tsabrina@sph.com.sg)**

Q: What was the collaboration about and when did it start?

Mr Chia: CDL and Teambuild started working together on The Brownstone in October 2014. The Brownstone is a luxury executive condominium in Canberra Drive built using the application of prefabricated prefinished volumetric construction (PPVC).

In PPVC, building modules complete with finishes, fixtures and fittings are manufactured off-site in factories. They are then transported to the site for installation in a "Lego-like" manner.

Slated to be completed in the fourth quarter of 2017, The Brownstone will consist of eight 10- to 12-storey blocks. There will be 638 apartments ranging from two- to four-bedroom units and five-bedroom penthouse units.

Mr Lim: The use of concrete PPVC is projected to increase productivity by up to 40 per cent, shortening construction time. It will improve worksite safety as fewer workers will be required on site.

Worksites will also be cleaner and quieter as this new construction method generates less construction site debris and noise.

Q: What did each firm contribute to the collaboration?

Mr Chia: The Brownstone was a collaborative effort. CDL was the developer, while Teambuild was the builder for this project. For more than 10 years, CDL had already been doing prefabricated bathroom units and wanted to see what more we could do beyond bathrooms. We thought, why not extend that to the living rooms and bedrooms.

Mr Lim: This is where Teambuild comes in. Given that we were experienced and have the know-how in the area of PPVC, we could work closely with CDL to build this project using this technology.

We modularised the apartment units into modules that can be manufactured off-site in our factory and transported to the project site to be installed subsequently.

Q: How is the use of concrete PPVC different from the PPVC methods of construction already available in the market?

Mr Chia: The Brownstone is likely the world's largest and the first-of- its-kind application of concrete PPVC for a large-scale private residential development. Other countries like Finland or the United Kingdom have adopted PPVC in construction. But PPVC abroad is mostly done in steel, timber or other lightweight construction material.

Mr Lim: For The Brownstone project, we are using concrete which is the more tested and preferred construction material for homes here. Concrete is heavier and has its fair share of challenges.

The prevalent construction method is the use of 2D concrete panels, where the floors and walls are separate and have to be assembled together. For our project, we are using three-dimensional digital modelling to design and produce entire modules according to various apartment layouts to be assembled on site. Fewer components will be required as these are larger in size, and fewer joints are needed to stitch the modules together.

Mr Chia: This prevents our apartments from having the "stacked- up-container" look associated with many PPVC apartments overseas.

Q: Why did CDL choose to work with Teambuild instead of a larger firm or MNC?

Mr Chia: The size of the firm was not important to us. When we first started, concrete PPVC as a method for construction was an unfamiliar area for many developers.

The technology used to develop The Brownstone was not scaled up to a sufficient extent overseas.

We needed a like-minded partner with the technological capabilities for this complex project.

Teambuild is experienced in the areas of concrete PPVC. They also shared the desire to build new technologies that allowed us to do more with less. Thus, it made sense for us to work together.

Q: How did Teambuild benefit from working with CDL?

Mr Lim: People know the CDL brand for quality and reliability and being associated with them gave us the extra mileage.

When other firms know that a big company like CDL believes in the use of concrete PPVC, they will start to seriously look at it as an alternative form of construction that is feasible.

Since our initial collaboration, we have gone on to secure four other projects using this form of technology with other developers.

We have also made improvements on our PPVC system to allow easier and faster construction.

Additionally, because of our belief in this new technology, and in anticipation of a higher adoption rate of this new construction method, we have invested in building an Integrated Construction Precast Hub in Singapore so that we can produce the modules locally.

This new factory will be completed by the end of next year and will save us time as we previously had to transport the modules from our factory in Johor Baru, Malaysia.

Overall, working with a multinational has given us better exposure and helped us in the expansion of our business.

Q: What were some of the challenges faced during the project?

Mr Chia: As the pioneer adopter of an advanced construction method, there was a steep learning curve as there was no precedent to follow.

We had to ensure that the design of the bedroom units suited the preferences of Singaporeans.

We focused on creating units that did not look like typical PPVC "container-like" apartments.

Mr Lim: Singapore's land scarcity posed another issue as the factories needed for module production are very large.

Finding the workers with the right skills for finishing the modules was also a challenge. In addition, the modules are over 20 tonnes and typical tower cranes could not lift such loads. Thus, we had to use the giant gantry cranes commonly found in our shipping ports.

Moving forward, higher capacity tower cranes are now available as a result of demand arising from this new PPVC construction method.

Mr Chia: There were many adjustments we had to make during the course of this collaboration but ultimately, our shared vision allowed us to see it through.