+ Pavilion moves to EHL Campus (Singapore)

It will be used for workshops and educational programmes centered on sustainability in the built environment. BY NARENDRA AGGARWAL

THE highly innovative +Pavilion - a structure that seeks to show what a sustainable built environment can be - moves to EHL Campus (Singapore) in Lady Hill Road in August, where it will be used for workshops and educational programmes centered on sustainability in the built environment.

EHL Singapore has been one of the key partners in the project since its inception.

"EHL is very honoured to play a part in bringing the +Pavilion project to fruition. We look forward to the interactions and conversations that the +Pavilion will bring as a gathering place, and that our collective sustainability efforts will make a positive impact on the world we live in," says EHL Campus (Singapore) managing director Jenny Ang.

The +Pavilion brings together ecosystem stakeholders to showcase the many possibilities of sustainable construction. It features innovative and sustainable designs, building materials and solutions that encourages the built environment sector to transform and "build differently", says the Swiss embassy.

Together with its Swiss and local partners Affordable Abodes, Deloitte Singapore, EHL Campus (Singapore), Haring Timber Technology, Hilti, Nespresso, Studio SKLIM, UBS, and Vitra, the Swiss embassy here launched the +Pavilion in March at Marina Barrage. It showcases innovative and sustainable designs, building materials and solutions.

At the same time, it raises awareness and educates the public on what the future of sustainable construction could look like if stakeholders from both within and outside the built environment ecosystem work together to achieve sustainability goals.

The Swiss embassy says the +Pavilion highlights the urgency to reduce the carbon footprint of the built environment – an important action that is part of the Singapore's Green Plan 2030. The built environment of every city and country in the world is collectively responsible for 39 per cent of global carbon emissions, of which 11 per cent is embodied carbon and the remaining 28 per cent is from building operations. Embodied carbon is the carbon released during the manufacturing, transportation, and construction phases of a building.

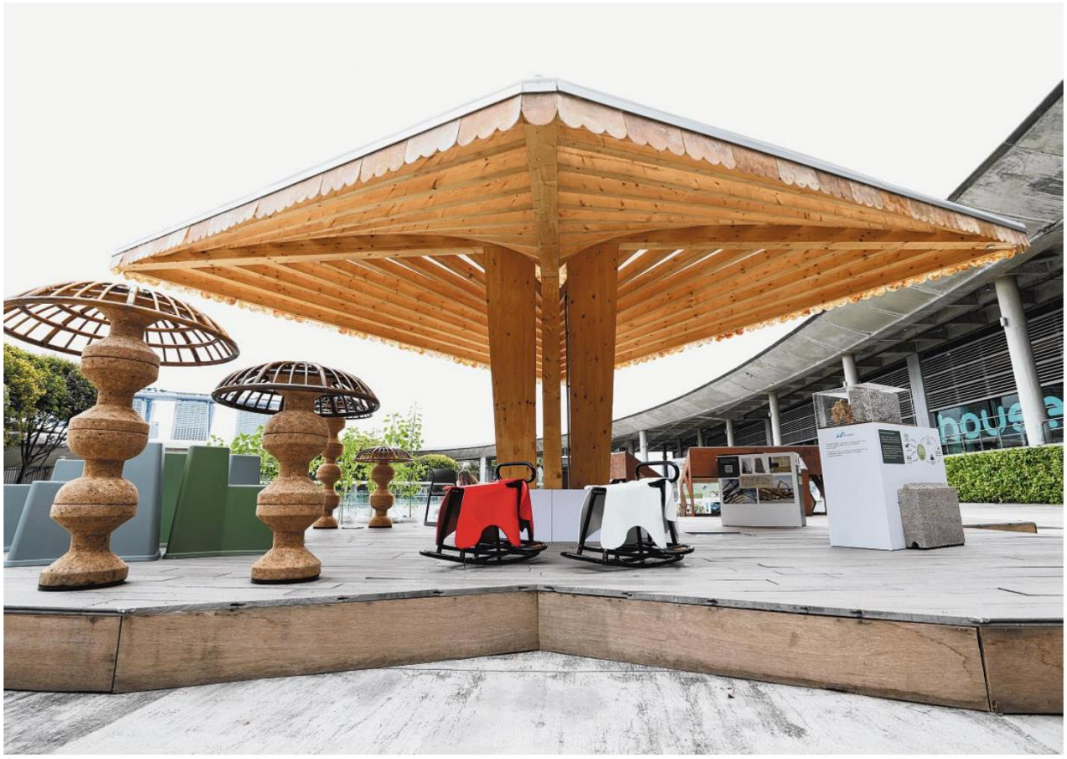

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PHOTO: YEN MENG JIIN, BT

Efficient construction methods

This means that 11 per cent of global carbon emissions cannot be recouped once buildings are constructed. Hence, sustainability and circular design techniques must be key priorities from the start of the building design and construction process, to effectively reduce carbon footprint. Designing sustainable buildings requires more efficient construction methods, and the prioritisation of the reusability and the durability of buildings and building materials.

The +Pavilion highlights several methods that can reduce the embodied carbon emission of buildings: it is based on modular design and built with pre-fabricated, pre-assembled modules, and "fit-for-purpose" services. The main structure is constructed using Swiss Glued-laminated timber technology (Glulam).

Switzerland has a well-established tradition in timber construction and conducts cutting-edge research on this topic. Engineered mass timber allows for a short and light weight construction with highly pre-fabricated elements that make timber construction a great solution to create climate-neutral buildings.

The Glulam structure is counterweighted by a pre-fabricated reinforced concrete panel. The interface is done via innovative anchoring and glued-in rod connections. The floor expands from there into a platform that consists of a modular off-site bolt and nut system, which avoids the otherwise energy intensive welding works. On top of the floor base, it uses floor panels that are upcycled from another project where they previously served their first life-cycle.

A key project partner and creator of +Pavilion, Haring Timber Technology, was responsible for construction project management, structural timber engineering and design, and also the production and installation of the Glulam main structure.

The +Pavilion is a catalyst to drive community engagement and thought leadership in sustainability, says Laurent Corpataux, director and head of Singapore, Haring Timber Technology.

"It is a first-of-its-kind inter-sectoral ground-up initiative. We are showcasing a tangible platform where visitors can understand sustainability in a more relatable way through a physical pavilion that integrates various sustainable building materials and technologies," he tells BT.

"It is a catalyst for thought leadership in sustainability and the built environment and sets a tone on how future larger developments can be designed and built more sustainably," he adds.

Corpataux says that mass timber, such as Glulam, is arguably the first major structural innovation since the invention of reinforced concrete more than 150 years ago. Crucially, it is strong enough to compete with concrete and steel, and outperforms in sustainability.

Stressing the importance of sustainability in construction, he says that the sector is responsible for nearly 40 per cent of the global CO2 emissions. Steel and concrete are responsible for up to 16 per cent of global CO2 emissions. "

Yet, ongoing global urbanisation and population growth suggest that global buildings' stock will have to double by 2060.

Having such an economic growth trajectory ahead of us, we have to radically change how we design and build in order to achieve our climate goals. I believe that Singapore can play a critical role by setting a precedent for the rest of South-east Asia," he adds.

In fact, Glulam was used by Studio SKLIM – a Singapore-based design office, as far back as 2011 when it constructed a house in Nagoya, Japan, using Glulam timber structural members.

The studio is currently completing an international school in Kolkata, India, that is on track to attain the Platinum IGBC (Indian Green Building Council) building standards.

Studio SKLIM was involved in all aspects of the +Pavilion design, from inception to furnishing and the final architectural design. In collaboration with Affordable Abodes, it has been recently awarded a Good Design Research grant by DesignSingapore to pursue material research into biocomposite tiles made from kenaf plant fibres and binders.

Says Kevin Lim, founder director of Studio SKLIM: "Sustainability has become a responsibility that should be integral to the processes of design and construction. The future of practice will involve a more vested interest in material production and innovation. Rather than only being involved in traditional design decisions on a macro scale, we can also influence change at a micro product level too."

Harmful impact

CEO of AffordAble Abodes, Tim Tan, says: "We can no longer afford to ignore the fact that how we choose to live has a harmful impact on our climate and environment. At AffordAble Abodes, we strive to offer seriously sustainable solutions to change or even reverse the detrimental effects of the conventionally built environment."

Adds Duleesha Kulasooriya, executive director, Center for the Edge, Deloitte Southeast Asia: "It is our collective responsibility to lean into transformations that leave a lower carbon footprint, preserving our environment for both current and future generations. We believe that Deloitte can play a meaningful role in bringing disparate parties together to build differently – creating built environments that are greener, more livable and enduring."

Other materials used in the pavilion include innovative biocomposite made from the Kenaf plant as parts of the roof. It is the first time that Kenaf has been used in this way in Singapore. Kenaf – a rapidly growing tropical multi-purpose plant, is seen as having great potential for transport design, shelter, and feedstock. Biocomposites are being explored as roofing components such as in reinforced central skylights.

The interior of the +Pavilion features furniture and playful elements for children and families that are made of cork, rattan and recycled plastic made from recycled household waste.

Green buildings are recognised as one of the most effective means to address the climate crisis that the world is facing today.

Hence, The +Pavilion also features green design – aspects of design that consciously strive to make the end product as sustainable and as ecologically friendly as possible. By incorporating green design into a building's life cycle and operations, it can significantly improve the built environment's resource usage efficiency and lower carbon emissions.

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