

ARCHITECTURE · INTERIOR DESIGN · LANDSCAPING · M.E.P. SYSTEMS

November / December 2023

# SEAB

SOUTHEAST ASIA BUILDING



***In This Issue***

## Luxurious Hospitality

**Exclusive Content: Decarbonisation In the Built Environment  
- What It Means To Architects**

ON THE COVER: Renaissance Bali Nusa Dua Resort / Indonesia

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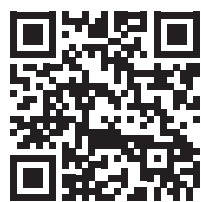
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**SEAB**  
SOUTHEAST ASIA BUILDING



**Project:**  
Office of WE Communications Singapore and WATATAWA  
**Interior Design:**  
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Photo credit: Kelvin Cuff  
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**Welcome to Nov/Dec issue!**

Luxurious hotel properties have carved a special niche for themselves in the hospitality industry. From their stunning architecture to elegant interior elements, luxury hotels are one of the most sought after places to stay in. In this issue, we showcase some projects, which have been designed to provide people with not only an elegant but comfortable stay.

In the interior design section, we have a theme on offices and we have put together two projects that are aesthetic and functional at the same time.

In playgrounds, we have a special interview with a landscape architect and with the MD of CT-Art Creation, a leading playground equipment supplier in Singapore. Do read their thoughts on putting 'play value' in playgrounds.

In this second part of decarbonisation in the built environment, architects share their views on how design can help to combat climate change.

In the PDF copy, we have a show review of BEX Asia 2023 – which took place in Singapore from 6–8 September 2023. Check out the latest innovations in the AEC industry in the review.

I hope you enjoy reading this jam-packed issue. Take care and we will be back with a new issue in 2024.

*Amita Natverlal*

**January/February 2024 Issue**

**FEATURES:**

- Adaptive Reuse Architecture
- Educational Interior Design
- Playgrounds & Landscaping
- Interview With Property Developers On Current Issues

Exclusive – Solar Energy (Outlook in Asia)



**Industry Partners of SEAB**

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 Philippine Green Building Council	 Singapore Green Building Council	 Society of Interior Designers (Singapore)
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# ES PROLINE sliding door operator

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### Sustainable

The ES PROLINE system is modular, economical, utilises dormakaba Direct Drive motor technology, and is packaged in 100% recyclable materials

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<https://dk.world/dormakabaSGCEC>

## Danfoss achieves new milestone in Vietnam

**Singapore** – On 2 October 2023, Danfoss Vietnam officially transitioned into a local entity – Danfoss Viet Nam Company Limited. The move is to enable Danfoss to have a stronger presence and commitment in the Vietnam market.

Danfoss Vietnam Representative Office was established in 1997, with a dedicated team consisting of Business Development Experts and Managers. Previously functioning as a liaison office and to conduct local market research, the team helped accelerate the execution of contracts/agreements on trade businesses. The team also assisted in technical commitments and investments concluded between Danfoss Singapore Pte Ltd and Vietnamese counterparts authorized with foreign transactions.

Vietnam, with its burgeoning economy and dynamic industrial landscape, has emerged as a prime destination for businesses seeking growth and opportunities. By establishing an official local entity in Vietnam, Danfoss is poised to deepen its commitment to the Vietnamese market and foster collaborations that will drive innovation



Danfoss Viet Nam Company Limited celebrates their official transition. Photo courtesy of Danfoss

and sustainability.

Allan Jensen, Head of SEA-North, congratulated Danfoss Viet Nam Company Limited: "It's a big milestone for the representative office, which has been established for 26 years and is now taking a new leap forward. The full legal entity demonstrates our commitment to the market; to growth, to helping

Vietnam become more energy efficient and competitive and in the process creating exciting opportunities for all you, our Vietnamese colleagues now and future colleagues to come as we grow our Share of Wallet. Vietnam is a vast country with almost a 100 million people: industrious, studious, hardworking, ambitious, and entrepreneurial."

## Sapphire Windows opens state-of-the-art headquarters

**Singapore** – Sapphire Windows, a leading window and door system specialist, has moved into a new state-of-the-art headquarters at 2 Loyang Drive. Costing around S\$10 million, the move marks a pivotal milestone for Sapphire Windows, setting a new industry standard in window production within Singapore.

The headquarters showcases Sapphire Windows' commitment to innovative solutions for Singaporean homes and businesses, offering advanced security, thermal insulation, and soundproofing.

Designed by local design firm HA Architects, the Sapphire Windows Headquarters in Loyang, Singapore, spans 65,000 square feet across four levels. Built with meticulous attention to detail within two years, this showroom displays avant-garde designs, highlighting how Sapphire Windows' products can enhance living spaces. Technology has revolutionised operations, enabling precise and efficient handling of labour-intensive tasks, greatly increasing production capabilities. In just one 8-hour shift, the skilled workforce can produce around 100 complete windows, including outer and inner panels.



Sapphire Windows' state-of-the-art headquarters is located at 2 Loyang Drive, Singapore 508935. Photo credit: Mike Hoi and Jonathan Wijaya.





# Are you ready to conquer the Tianzi Mountain with CTART?

Tianzi, the thrilling climbing net system, redefines playtime by offering an array of challenges that foster bonding among children. With a design inspired by Tianzi Mountain in China's Hunan Province, it boasts grid-patterned rope pathways, a rubber balance beam, a jubilant bell, and colorful flags. These features ensure children can conquer heights and create lasting memories, making playtime an unforgettable adventure. Choose Tianzi and elevate your child's playtime to new heights today.



## PlanRadar holds masterclass event on "Digitalization Construction Management"

**Singapore** – On 12 October 2023, PlanRadar, a leading construction and facility management software company, in collaboration with the Association of Women in Construction Singapore, hosted a masterclass event that delved into the transformative landscape of "Digitalizing Construction Management."

The event brought together notable industry players, including Balanced Engineering and Construction, China Railway No. 5 Engineering Group, L E Construction & Engineering, and Oomph Technology, for an insightful exploration of how digital technologies are reshaping construction project management. There was a great turnout from the construction, engineering, marine and consultancy industries, with an interactive and engaging exchange of ideas throughout the event.

The masterclass event provided attendees with a unique opportunity to gain valuable insights into the world of digital construction management and how it has been instrumental in reshaping construction projects globally.

By embracing digital task management and seamless cloud-based reporting, attendees learned how construction projects have become more efficient and cost-effective. The digitalization of processes has resulted in reduced costs, enhanced productivity, minimized errors, streamlined processes, and reduced waste. This empowers construction professionals to consistently deliver high-quality projects within budget and on time. The shift towards digital construction management has been highlighted as a crucial tool in improving transparency through the documentation of daily site events using digital site diaries and progress reports. Attendees also discovered how digitalization improves on-site safety, productivity, work efficiency, and resource utilization, while promoting sustainable practices by reducing waste and the carbon footprint and enhancing the quality of construction materials.

During the event, participants had the opportunity to explore key trending technologies in construction, facility management, and real estate. These included Building Information Modeling (BIM), Artificial Intelligence (AI), Augmented and Virtual Reality (AR/VR), Common Data Environment and Collaboration tools, Marketplaces, and Smart Contracts. These technologies are driving the industry forward by enhancing collaboration, data-driven decision-making, and project efficiency.

A significant highlight of the event was a real-world success story shared by PlanRadar. Attendees had the chance to learn from a practical example of how the software was employed by Kimly Construction on the SGD \$144 million construction of Eunoia Junior College (EJC) in Singapore. This project, commissioned in 2020, was notable for being the first high-rise junior college in Singapore with an elevated field and an integrated development featuring a community center. The use of Mass Engineered Timber (MET) solutions



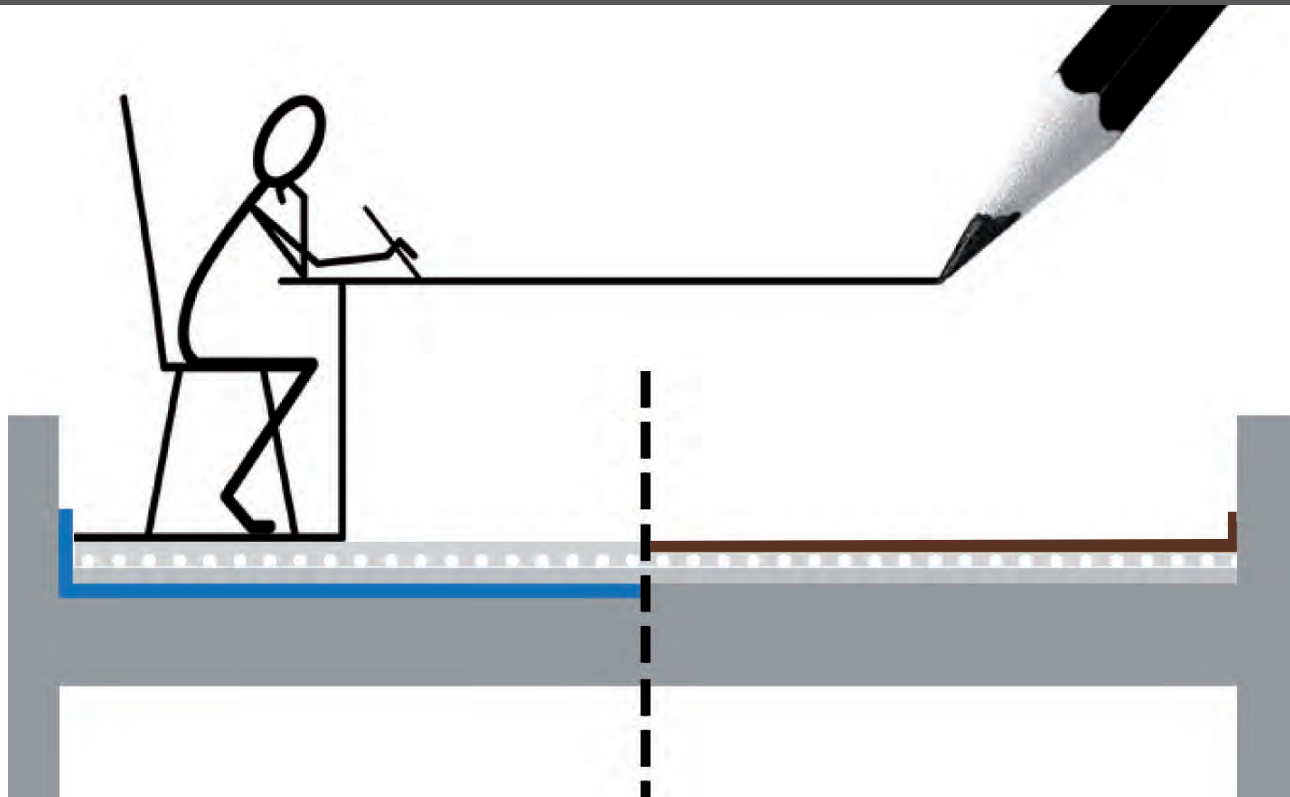
involving Glulam and Cross-Laminated Timber (CLT) added to the project's uniqueness. The successful application of PlanRadar demonstrated how the software played a pivotal role in managing a complex construction project efficiently and cost-effectively.

Tyler Sun, from Chan Rong Fen, also shared his insights and experience using construction management software for enhanced digitization on large-scale construction projects. Attendees were pleased to receive Professional Development Unit (PDU) points for their attendance at the masterclass, enhancing their professional credentials and industry knowledge.

The event concluded on a convivial note, as attendees enjoyed a complementary buffet lunch and a networking session. This part of the event provided an excellent opportunity for construction professionals to connect, share experiences, and forge valuable industry relationships.

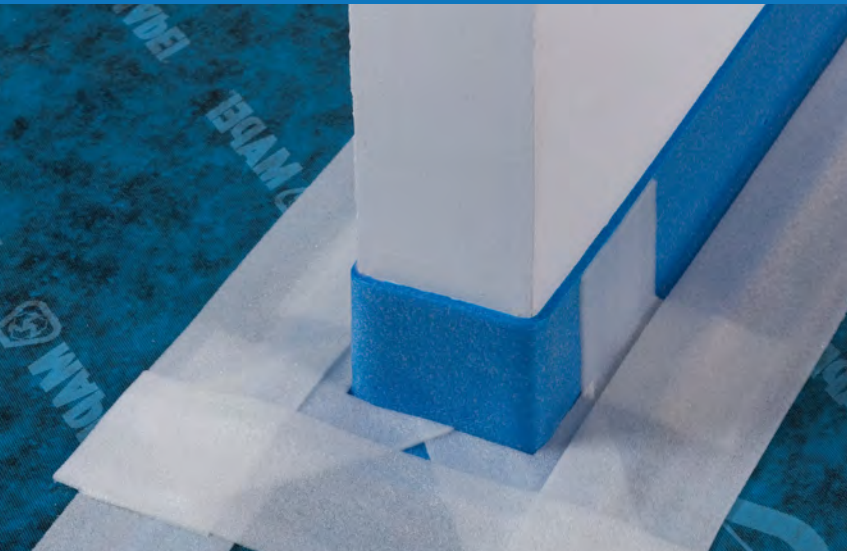
*All photos by Elizabeth Chia, Events & Partnerships Manager, PlanRadar Singapore.*

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## Zaha Hadid Architects to build Sanya's new harbourside cultural district

**Sanya, Hainan, China** – The city of Sanya in Hainan, China has announced Zaha Hadid Architects (ZHA) as winners of the international design competition to build the city's new harbourside cultural district.

Situated on the southern tip of Hainan Island, China's most southerly province with its tropical forests, mountain parks and white sand beaches welcoming over 80 million tourists each year, Sanya has grown to a city of over a million residents.

Located at the entrance to Sanya's harbour, the new cultural district by ZHA is adjacent to the Jiangang Road terminus of Sanya's tram network that connects many of the residential and hotel districts on Sanya Bay with the city's high-speed rail station.

Establishing the harbour as the heart of Sanya's cultural life, the new district defines the city as a gateway to the tropical waters of Sanya Bay and beyond to the South China Sea.

A central axis through the masterplan directly links the new harbourside district with the city's existing urbanism and divides the cultural programming of its performing arts theatre and exhibition galleries from its commercial programming for conferences and trade fairs; both facilities share a new public square with sweeping views over the harbour that welcomes visitors, audiences and delegates to the events within.

The centre's layered roofs feather outwards and cascade from their highest points along this axis, framing the entrance lobbies of the performing arts theatre and the conference centre. Visible throughout the harbour and from Sanya Bay, these roofs softly reflect sunlight and appear to float above the water like sails in a sea breeze, defining an architectural landmark of ascending geometries that echo the mountainous landscapes of Hainan's interior behind the city.

Gently rising from the ground surface of the district's new public square to shelter the entrances of the cultural centre and conference centre, the roofs' composition opens to face the harbour in layers of public terraces with panoramic views of the water.

Connecting with the existing urbanism of the city centre, the cultural district's 26.7 hectares incorporates new public plazas, gardens, marinas and harbourside boardwalk together with the cultural, exhibition and conference facilities designed to host the widest variety of performances and events by local, national and international artists, institutions and companies.

With a total of 409,000 square metres of built area, the new harbourside district also includes city-centre residences and offices as well as hotels, shopping and dining amenities to serve the many millions of tourists who visit Sanya every year.

Located within Hainan's tropical climate that is heavily influenced by monsoons, the cultural district's architecture incorporates low-carbon design, procurement, construction and operational strategies with photovoltaics and rainwater collection embedded within the large roof areas that include deep overhanging eaves to shade the interiors and shelter the outdoor public terraces throughout the year.

The district's orientation, composition and landscaping



Render by Negativ.



Render by Negativ.



Render by Brick Visual.

are designed to optimise natural indirect sunlight as well as natural ventilation from cooling on-shore winds. A central plant is designed to include high-efficiency equipment and sea water heat exchangers for cooling. A smart building management system will automatically adjust shading, lighting and ventilation for optimum comfort and efficiencies.

Timber cladding on the underside of the cultural and conference centre's roofs will be sourced from certified sustainable forests and selected for its resilience to local coastal weather conditions without chemical treatments. Procurement for each building within the district will prioritise the use of local and recycled materials.

## Nippon Paint China works with academia to develop air-purifying architectural coatings



Nippon Paint China, ECUST and ECNU formally established the strategic cooperation. Photo credit: Nippon Paint China

**Shanghai, China** – Nippon Paint (China) Co., Ltd. (Nippon Paint China), East China University of Science and Technology (ECUST), and East China Normal University (ECNU) together formally announced the establishment of the "Photocatalytic Purification Coating Technology Innovation Platform" recently.

This platform seeks to promote innovation and application of photocatalytic purification coating technology by establishing a cooperative industry-academia model of innovation. Taking this launch as an opportunity, Nippon Paint China is committed to leading the development of future efficient solutions for urban air pollution control, improving living environments, and accelerating the construction of a beautiful China.

As China's "3060" dual-carbon goals and the new round of the Shanghai Clean Air Action Plan starting from 2023 progress, the "green transformation" of the coating industry has accelerated.

Dr. Xiu Guangli, Professor of the ECUST School of Resource and Environmental Engineering, Director of key laboratories endorsed by Ministry of Ecology and Environment and Shanghai Municipal Bureau of Ecology and Environment, emphasized the significance of updating architectural coating technology to reduce volatile organic compounds (VOCs) for greener buildings and greener cities.

Photocatalysis refers to the oxidation-reduction reaction

generated by specific catalyst materials when exposed to light sources of a specific wavelength. Dr. Sun Zhuo, professor at the ECNU School of Physics and Electronic Science and academician of the Asia Pacific Academy of Materials, explained that nanocrystalline titanium nanomaterials have been demonstrated to be environmentally friendly, safe, and effective.

Currently, nanocrystalline titanium materials are utilised in the R&D of Nippon Paint China. Recent studies have proved that Nippon Paint China's photocatalytic purification coating technology used in interior coating has formaldehyde removal, odor removal, antibacterial, and antiviral properties, whereas exterior coating can reduce nitrogen oxides effectively, with the removal rate of nitrogen dioxide reaching more than 80 percent in 2 hours.

This launch event marks the beginning of a strategic partnership between Nippon Paint China, ECUST, and ECNU that will strengthen joint scientific research, talent development, brand promotion, and technology transfer. Mr. Eric Chung, CEO of Nippon Paint China concluded that, "adhering to the corporate vision of 'building the most valuable ecological platform with technology and becoming the leader of the overall coating solutions', we will make technological innovation, talent cultivation, and industrial applications closely linked through this cooperation, creating a green future for the coating industry".

## Art of Play event by Playpoint and Lappset Group Ltd a success

**Singapore** – Playpoint (Singapore) Pte Ltd organised another inspiring Art of Play event with Lappset Group Ltd at the Asian Civilisations Museum in August 2023.

At the event, attendees discovered why well-designed outdoor spaces promote social interaction. They also learned to create sustainable playgrounds with wood, and experienced the featured fitness playgrounds and products firsthand.

"The attendees learned tips on designing senior communal spaces, adult fitness and creating sustainable playgrounds. They also got to know the new brand Lappset that we are representing," said Jason Sim, Managing Director, Playpoint (Singapore) Pte Ltd.

The event's esteemed speakers, Mr. Leon Tan, Head of Sales and Aarni Mertala, Sports Concept Manager at Lappset Group Ltd., shared invaluable expertise and insight on the harmony of play and fitness.

As attendees exchanged opinions and thoughts, this event was also a great opportunity to grow network and participate in lively discussions.

"The different kinds of outdoor gym available in the market, which help them to make informed decision when selecting fitness equipment. For senior fitness equipment, they learned about how seniors using the equipment benefit from improved cognition, balance and memory," added Jason.

*All photos credit: Playpoint (Singapore) Pte Ltd*



## Asia Pacific Interior Designers' Accreditation Program (AP-ID-AP) elevates standards in interior design qualification across the region

**Singapore** – The Asia Pacific Space Designers Association (APSDA) is proud to announce its start of its preparation of the Asia Pacific Interior Designers' Accreditation Program, marking a significant milestone in the field of interior design education within the Asia Pacific region.

The official announcement was made with a launch ceremony graced by Singapore's Minister of State for Trade & Industry, Ms Low Yen Ling, during the FIND Design Asia Fair 2023 exhibition held at the Marina Bay Sands, Singapore in the presence of the Board Members of APSDA.

Singapore's Minister of State for Trade & Industry, Ms Low Yen Ling, stated, "The AP-ID-AP is the first regional accreditation scheme for interior design practitioners in the Asia Pacific region. Together with

the Mutual Recognition Agreement (MRA) on Interior Design Services, this will facilitate greater mobility of interior design professionals within the Asia Pacific Space Designers Association (APSDA) and enhance exchange in the area of best practices, standards of interior design education, professional practices and qualifications."

AP-ID-AP is set to transform the landscape of interior design education by upholding rigorous standards and ensuring quality education for aspiring interior designers with mutual recognition across borders.

AP-ID-AP is a collaborative initiative undertaken by leading interior design associations who are members in APSDA who already have existing accreditation program in place. With a shared commitment to advancing excellence in interior design education, AP-ID-AP aims to create a comprehensive and standardized framework for accreditation, evaluation, and continuous improvement of interior design programs.

Key objectives of the Asia Pacific Interior Designers' Accreditation Program include:

1. **Enhancing Educational Quality:** AP-ID-AP will work closely with interior design associations to evaluate and enhance the quality of interior design education. This will involve rigorous assessments of curriculum, faculty qualifications, student outcomes, and facilities.
2. **Ensuring Global Competitiveness:** Accreditation by AP-ID-AP will provide interior design programs with international recognition and validation, positioning graduates to compete effectively in the global marketplace.
3. **Fostering Collaboration:** AP-ID-AP will serve as a platform for collaboration between educational institutions, industry professionals, and accreditation bodies, fostering a dynamic and innovative learning environment.
4. **Continuous Improvement:** Accredited programs will be required to commit to continuous improvement, ensuring that students receive the most up-to-date education in the field of interior design.

The AP-ID-AP accreditation process will be thorough and impartial, involving a comprehensive evaluation by a team of experts in the field. Institutions that meet AP-ID-AP's stringent standards will be granted accreditation, which will serve as a mark of excellence and quality in interior design education.

Prof. Keat Ong, President of APSDA, stated, "We are excited to initiate the preparation of the Asia Pacific Interior Designers' Accreditation Program, as it represents a significant step towards ensuring the highest standards in interior design education across the region. We believe that this initiative will not only benefit the Interior Designers but will also contribute to the growth and development of the interior design industry in the Asia Pacific."

**For further information, contact email APSDA at [joelle@apsda.org](mailto:joelle@apsda.org) or visit <https://apsda.org/>**



Photo credit: Asia Pacific Space Designers Association (APSDA)

## Hong Kong Green Building Council launches “Zero-Carbon-Ready Building Certification Scheme” to combat climate change



Over 800 industry leaders and experts united in the Zero-Carbon-Ready Building Certification Scheme Launching Ceremony with their shared commitment to driving energy efficiency and carbon reduction for the built environment. Photo credit: Hong Kong Green Building Council

**Hong Kong** – The Hong Kong Green Building Council (HKGBC) announced the official launch of the highly anticipated “Zero-Carbon-Ready Building Certification Scheme” on 26 September 2023 in a hybrid format at HKEX Connect Hall, and awarded certifications to a total of 29 projects from seven pioneering developers and property management companies at the launch of the scheme.

This momentous occasion brings together a distinguished assemblage of over 800 industry leaders and experts, with over 200 in-person participants and approximately 600 online attendees, united in their shared commitment to driving energy efficiency and carbon reduction for the built environment.

The event was graced by esteemed officiating guests, including Mr WONG Chuen-fai, JP, Commissioner for Climate Change of The Office of Climate Change and Carbon Neutrality, Environment and Ecology Bureau, The Government of the HKSAR, Dr CHEUNG Tin-cheung, SBS, Chairman of the HKGBC, Ir PAN Shu-jie, Chairman of the Sustainable Development Committee of the HKGBC, Ir Dr Cary CHAN, JP, Executive Director of the HKGBC, and Ir Dr Raymond YAU, General Manager – Technical Services & Sustainable Development of Swire Properties Limited and HKGBC Climate Change Framework For Built Environment Chapter 3 Convenor. Their presence underscores the significance of this initiative and highlights the collective dedication to shaping a sustainable future for Hong Kong.

Newly launched in the third quarter of 2023, the Zero-Carbon-Ready Building Certification Scheme (Scheme)

exemplifies a collective dedication to combating climate change and mitigating carbon emissions in the building sector. This initiative marks a significant stride towards fostering a greener and more sustainable built environment. As an integral component of the HKGBC Climate Change Framework For Built Environment (Framework), officially introduced in June of this year, the Scheme reinforces the unwavering commitment of the HKGBC and its partners to driving positive transformation within Hong Kong’s building sector. It also aligns with Hong Kong’s vision to become a low-carbon and resilient city. Notably, the Framework has already amassed over 7,000 downloads from 39 regions across the globe, highlighting its traction and influence among industry stakeholders.

Dr CHEUNG Tin-cheung, SBS, Chairman of the HKGBC, said, “Today is a momentous milestone in our pursuit of a sustainable future for Hong Kong’s built environment. The Zero-Carbon-Ready Building Certification Scheme establishes a groundbreaking standard for energy efficiency and carbon reduction, in line with our vision to become a low-carbon city. I extend my gratitude to the dedicated professionals and stakeholders who have shaped this initiative. Let us seize this opportunity to build a greener and more sustainable Hong Kong together.”

The event also signified a collaboration between the building and green finance sectors, with the Hong Kong Green Finance Association (HKGFA) as a supporting partner.

**For more information on the projects that were awarded, visit [www.hkgbc.org.hk](http://www.hkgbc.org.hk).**



## LivingRope: Plants on a rope

**Text and photo courtesy of Jakob Rope Systems.**

How can a facade be greened as quickly and effectively as possible? Vertical greening with climbing structures usually takes six to eight years to achieve full greening, depending on the growth height of the plants. In densely built-up cities, there is also the fact that the ground for planting is often limited by substructure or by sealing. When retrofitting greenery on existing facades, the building's physics specifications and applicable fire protection regulations must be observed. Overall, the greening should be technically implemented in such a way that the effort for irrigation, nutrient supply, and maintenance remains as manageable as possible.

### Plants positioned at any height

The LivingRope system solves all these requirements with a wire rope construction from which planters are suspended and watered fully automatically. LivingRope is installed at just two attachment points. One on the ground. The other is at the uppermost point of the facade. The facade remains untouched. The wire rope thus suspended supports planters from which the greenery grows. Two additional, thin guide ropes, serve for stabilization in storm winds. The planters are positioned at any height on the main rope. This gives a lot of freedom for the design.

For optimal care of the plants, the vessels are filled with a substrate. This provides the root system of the plants with an ideal balance of moisture, aeration and temperature regulation. The substrate is also storm and weather resistant. Irrigation and nutrient supply are automatically triggered and supplied via an integrated hose system.

Sensors monitor the humidity in the planters. If the humidity drops, the irrigation is activated. The water comes from a connected tank that could collect rainwater, for example. Liquid fertilizer is added to the water at controlled

intervals. Users can monitor and control all this via an app. It provides information on the humidity and temperature in the planters, as well as the date and amount of the last waterings. If watering is urgently needed, it can be triggered immediately via the app.



The possibilities and advantages:

Facades, interiors, plant diversity:

- Greening is already present from the first day on the entire height. Vertical greening with construction heights of at least 30 metres is possible.
- Outdoor and indoor applications are possible.
- The number of planters per rope and their distribution in height is freely selectable. Individual vessels can be replaced or supplemented at any time.
- With different plants, flowers and herbs per rope, green structures can be reinvented and designed and staged by the architects.

Installation, anchor points:

- The green area of the cylindrical planters is 3 times higher compared to their projection area, and thus to conventional facade greening.
- No complex attachment to the building structure is necessary. Only two attachment points are used to attach the suspension rope and the two guide ropes.

Care, irrigation, fire protection:

- Pre-cultivation of the planters is done before mounting them on the wire rope structure.
- Closed automated irrigation and fertilization system. Excess water

drains from planters and flows back into the storage tank. At temperatures below 5°C, the system drains and automatically switches back on at 10°C.

- The planters are thermally insulated and have a low dead weight. Their size and geometry is freely selectable on request. The coating is according to the colour catalog RAL.
- The substrate provides a powerful combination of water – fertilizer – evaporation. This leads to optimal conditions for roots and growth of plants.
- The fire hazard is minimized by variable distances to the building. Fire compartments can be created by freely selecting the distances between the vessels.
- Optionally, a sprinkler system can be integrated.
- Optionally, webcams can be installed for external monitoring of the plants.

Developers:

- Development and engineering: Jakob Rope Systems
- Development and sales partner: duroplant, Seftigen (Switzerland)
- Botany and planting: Fritz & Kaori Wassmann-Takigawa, Siblingen (Switzerland)
- Irrigation technology: Irrigation Reh, Murg (Germany)

# Automation & Automatic Doors

**Text and photos provided by dormakaba.**

First modern robots were developed in the second part of the 20th century, but people's fascination with replacing human effort and automating tasks dates back to the Ancient World. In 1979, the Robot Institute of America described a robot officially: "a reprogrammable, multifunctional manipulator designed to move material, parts, tools, or specialized devices through various programmed motions for the performance of a variety of tasks".

While they don't always represent a human form, a robot is an automatically operating machine that can replace human effort.

The global robotics technology market size is expected to soar to USD 189.36 billion by 2027, from USD 62.75 billion in 2019. There's a reason why the multi-billion market will have more than tripled in less than a decade: robots work safer, faster, cheaper, making almost no mistakes, and using fewer resources.

Meanwhile, on a seemingly unrelated topic, the security of a building lies heavily in the reliability of its entry points. Entry points have always been a primary area of concern for developers and owners alike. Keeping security airtight is a priority, but managing the flow of people is no less of a consideration.

dormakaba has won the trust of their customers all over the world through their innovative solutions that cater to both.

Over the last few years, trials have been successfully carried out with autonomous cleaning, scrubbing, and even delivery robots traversing through dormakaba IoT-enabled door systems. Stemming from the COVID manpower crunch, particularly in the healthcare industry, this innovation has been able to alleviate the pains of adapting to a post-pandemic world.

Robots are able to deploy with minimal harm to even



**Robot may be a symbol of advanced technology, but robotics is not a new concept.**

quarantine rooms, delivering medications and food. A single person is able to oversee multiple robots due to their autonomous programming, freeing up manpower and resources for other pressing tasks.

The use of IoT also allows organizations that have experience, or familiarity with other IoT solutions and the technical capability to successfully integrate the raw data into the platforms of their choice. For example, dormakaba's EntriWorX EcoSystem facilitates the integration of door data flexibly and seamlessly into building monitoring/management systems to maximise the value of door insights, not only to implement quick response to ensure minimal downtime, but also to enhance existing ecosystems for the future.

Robots running through your buildings are unlikely to be a distant dream. At present, apart from the healthcare sector, cleaning robots have already been introduced to food centres for area cleaning and to serve food. Security



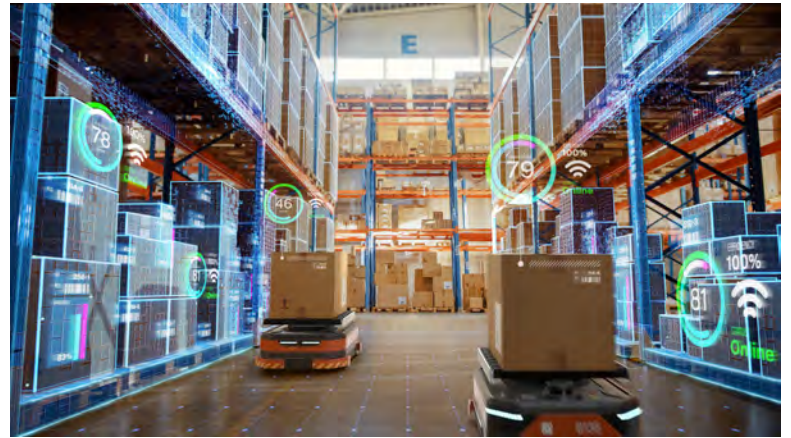
**dormakaba automatic sliding door ST FLEX**



**Robots can be programmed to assist with providing care.**



With sometimes hundreds of doors in a single facility, robotics can ease the workload of facility managers by independently reporting on the health of IoT-enabled doors in real time.



Robots deployed in a warehouse.

robots have been deployed in public for surveillance, and room service robots have also been noted in the hospitality industry.

With data from software like EntriWorX Door Insights, robots can also be programmed accordingly to take varying contingency actions should their usual doorways be down or obstructed. By independently deciding on their alternative routes, they minimize downtime and continue through to complete their tasks without incident.

What remains is ensuring automation

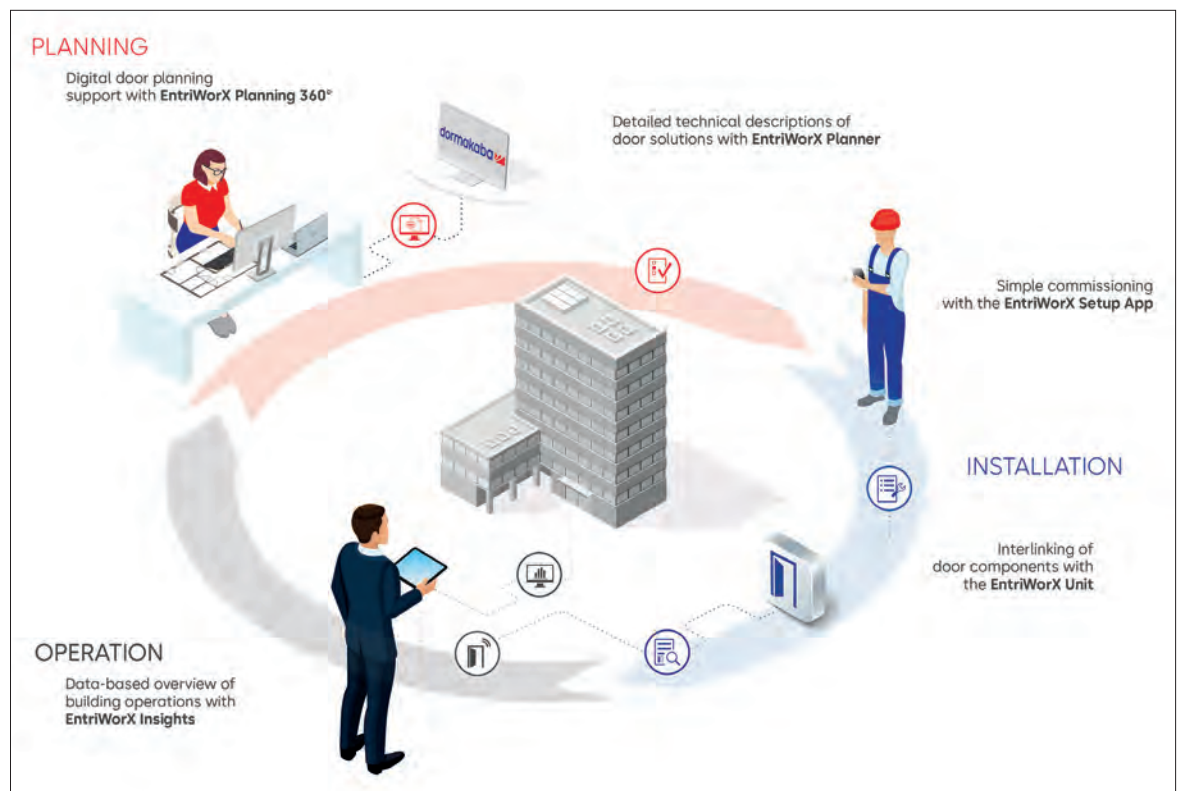
is maximised to its full potential, programming these robots to run effortlessly throughout a building, through doors and elevators with the appropriate authorisation, with little to no human intervention needed.

A notable requirement for this to happen would be the integrability of the automatic doors with the differing communication protocols across different robots, which dormakaba has been developing, and has already been tested. Realised use cases of this IoT interconnectivity can be observed at dormakaba Singapore's new Customer

Experience Centre, with notable examples being their new ICU door for the healthcare sector, ED100/250 swing door operator and new ES Proline sliding operator, which are all cloud and future-ready.

The evolution of security needs and technologies go hand-in-hand with the unstoppable growth of demand for the most reliable products. Thus, there's no doubt that the data-driven security systems that incorporate technologies such as robotics, AI, or biometric recognition have become the future of building security.

**EntriWorX EcoSystem** is the innovative new digital environment that helps you work smarter across all your access challenges and at every phase of the building lifecycle, from planning and installation to operations.



# Bailey Hotel & Resort



The Bailey Hotel & Resort is a modern and innovative luxurious accommodation facility, completed in 2020.

**A new five-star hotel was completed in north-eastern Australia with Mapei products for waterproofing and installing ceramic tiles, wood and LVT. (Some products featured in this article are sold by Mapei Far East. If a specific product is not available locally, suitable alternatives are also available.)**

**T**ourism and hospitality group, Crystalbrook Collection, is set to transform the skyline of Cairns City (Queensland, Australia) with an almost 320 million Euro investment in three new international hotels. The company is the Australian business of the Dubai-based Ghassan Aboud Group (GAG), headed by billionaire businessman and philanthropist Muhammed Ghassan Aboud. Mr Aboud holidayed in tropical North Queensland in 2016 and became so enchanted with the beauty of the area that he invested a slice of his fortune in the region's tourism industry. With a cost of over 82 million Euros, the new Bailey Crystalbrook Collection hotel is the second of three five-star hotels. It includes 217 rooms, 110 apartments, 5 restaurants and bars including a signature Crystalbrook Station steakhouse and Parilla grill, a 24-hour fitness centre and meeting spaces for up to 150 people. The hotel opened in November 2019 and is Cairns' second new five-star hotel in over 20 years.

**Project overview**

The development of Bailey Hotel & Resort saw the construction of two towers: Lake Street Tower Hotel providing 217 rooms and Abbott Street Apartment. The Apartment tower includes 110 apartments encompassing one, two and three-bedroom options, as well as a lap pool, a gym, a spa and a games room. The Bailey towers share a basement

and common area podium. The hotel provides a range of separate facilities to compliment both towers. Bailey Hotel Tower offers exclusive facilities, including Bar/Grill & Colada Restaurants along with a "Milk Bar", a swimming pool, a 24 Hour Fitness Centre, four event/function areas, concierge and gift shop.

The completion of this five-star hotel was a large boost for the Cairns community. This project is environmentally responsive and reflects the unique qualities that the owners wanted to portray in this beautiful part of Australia. The nature of this project was to deliver a modern, innovative and aesthetically pleasing, luxurious hotel and resort. Prime Constructions was engaged to deliver this project and took on a multi-faceted role that incorporated project management, principal contractor and full fit-out contractual works. The lead architects, Thompson Adsett, delivered the design development, construction documentation and interior design for the main hotel. The restaurants and bar were designed by Jess White and her team at CTRL Space.



The substrates of the pools of the complex were waterproofed with MAPELASTIC SMART, before installing ceramic tiles with KERAFLEX MAXI S1 and grouting the joints with KERAPOXY.

Together the all Queensland design team has delivered a space that puts it on par with the new wave of five-star hotels that have infiltrated other areas of Australia.

**The pools**

The multiple pool installations were awarded to Baldwin Aquatics, a pool builder located in South Queensland. Contractors waterproofed the pool substrates by embedding MAPENET 150 alkali-resistant fibreglass mesh into the first layer of MAPELASTIC SMART cementitious waterproofing membrane. MAPELASTIC SMART is a highly flexible waterproofing mortar that is ideal for use in swimming pools to protect the concrete structure that may be subject to vibration and cracks. To fully embed the MAPENET 150 reinforcement mesh, a second layer of MAPELASTIC SMART was applied.

Over 1,000 cubic metres of ceramic tiles were installed over the waterproofing membrane using KERAFLEX MAXI S1 high-performance cementitious adhesive, while joints



Ceramic tiles were installed in several areas of the complex using KERAFLEX MAXI S1.



In the bathrooms the screeds were made of TOPCEM, before waterproofing the substrates with MAPEGUM WPS.



Wooden floors were installed in the restaurant and foyer areas using ULTRABOND ECO S955 1K, one-component, solvent-free, sililated polymer adhesive.

were grouted with KERAPOXY two-component, acid-resistant epoxy grout. KERAPOXY is an ideal grout for joints in swimming pools due to the product's excellent mechanical and chemical resistance, smooth final surface, low water absorption, uniform colour and resistance to ultra-violet rays and atmospheric agents. It is easily workable with no shrinkage; therefore no cracking or fissures are present in the grouted joints.

### Installing ceramic tiles in public areas

The contract for ceramic installation in all public areas was awarded to Jerry and The Tilemakers, professional tiling contractors also located in North Queensland.

Contractors installed all ceramic tiles through the hotel resort using KERAFLEX MAXI S1. This adhesive is not only a high performance and versatile mortar but can also be used to install large format tiles, porcelain tiles, ceramic and mosaic tiles as well as natural stone. It is thixotropic, has a long open time and can be installed in a up to 15 mm thick layer.

Ceramic tiles were installed in the restaurant areas, podium decks, balconies and walkways after installing acoustic underlay with ULTRABOND ECO S955 1K polyurethane adhesive.

### Preparing substrates and waterproofing

In the bathrooms, screeds were created using TOPCEM, a special normal-setting, quick-drying, controlled-shrinkage hydraulic binder, and special

aggregates. The substrates were then treated with PLANICRETE SP (a multi-purpose latex to create high performance mortars and screeds distributed in Australia by Mapei Australia) and waterproofed with two coats of MAPEGUM WPS, fast-drying flexible liquid membrane.

TOPCEM was also used for screeds around the pools to create falls and on all balconies to create falls to drains prior to the application of MAPELASTIC SMART highly flexible waterproofing membrane.

### LVT and wooden floorings

Acoustic underlay was installed with ULTRABOND ECO S955 1K one-component, solvent-free, sililated polymer-based adhesive prior to the installation of LVT (Luxury Vinyl Tiles) on the floors in the hotel rooms.

Contractors used ULTRABOND ECO MS 4 LVT WALL high performance, one-component sililated polymer-based adhesive, which is also suitable for all

kinds of textile and resilient floorings, to install the LVT planks.

Wooden floors were installed in the restaurant and foyer areas using ULTRABOND ECO S955 1K, one-component, solvent-free, sililated polymer adhesive with very low emission level of volatile organic compounds (VOC), which is suitable for bonding all types of wooden floors.

MAPEPROOF TURBO 1K one-component, solvent-free moisture vapour barrier was applied to the concrete surfaces prior to the installation, followed by a coat of ECO PRIM T PLUS solvent-free, low odour acrylic primer in water dispersion. Contractors also used ULTRAPLAN ECO, ultra-fast hardening self-levelling smoothing compound, to correct any irregularities in the concrete surface.

### MAPEI PRODUCTS

Waterproofing: Mapeelastic Smart, Mapenet 150, Mapegum WPS, Mapeproof Turbo 1K

Preparing screeds and substrates: Topcem, Planicrete SP\*, Eco Prim T Plus, Ultraplan Eco

Installing ceramic tiles: Keraflex Maxi S1, Kerapoxy, Mapesil AC

Installing acoustic layers and wooden floors: Ultrabond Eco S955 1K

Installing LVT floors: Ultrabond Eco MS 4 LVT Wall

*\*This product is manufactured and distributed in Australia by Mapei Australia Pty. Ltd.*

*Article source: RM International 87/2021*

### PROJECT DETAILS

**PROJECT NAME:** Bailey Hotel & Resort

**PROJECT LOCATION:** Cairns, Queensland, Australia

**OWNER:** Bailey Crystalbrook Resort, Ghassan Aboud Group

**PERIOD OF CONSTRUCTION:** 2019-2020

**PERIOD OF MAPEI'S INTERVENTION:** 2019-2020

**DESIGN:** Thomson Adsett

**MAIN CONTRACTOR:** Prime Constructions

**CERAMIC INSTALLATION COMPANY:** Jerry & The Tilemakers

**POOL CONTRACTOR:** Baldwin Aquatics

**MAPEI CO-ORDINATOR:** Rod Howard, Mapei Australia Pty Ltd.

**PHOTOS:** Crystalbrook Collections

# Le Méridien Petaling Jaya









**L**e Méridien Hotels & Resorts, part of Marriott Bonvoy's portfolio of 30 extraordinary brands, announced the opening of Le Méridien Petaling Jaya in June 2022. Owned by Jelas Puri Sdn Bhd, the new hotel features 300 timeless chic guestrooms, distinctive dining options and unique brand programmes for guests to savour the good life. Taking cues from the brand's mid-century modern design aesthetic, Le Méridien Petaling Jaya will bring Le Méridien's distinctive European heritage to the city of Petaling Jaya.

Petaling Jaya is located 11 kilometres southwest of Kuala Lumpur, the capital of Malaysia. Le Méridien Petaling Jaya is strategically situated in the heart of the town and with proximity to some of the city's places of interest such as Batu Caves, PJ Performing Arts Centre, and more.

The distinct timeless chic design at Le Méridien Petaling Jaya is inspired by the brand's roots in the glamorous halcyon days of travel. The 300 thoughtfully designed guestrooms and suites feature bamboo flooring to convey both tactile warmth and





a feeling of spaciousness. With sleek furnishings and marble-clad bathrooms to create an element of opulence, every room is decked with unique local-themed artwork and design for a sense of place that is proudly Malaysian. Guests will also be able to enjoy premium bathroom amenities by MALIN+GOETZ which was specifically developed for the Le Méridien brand.

### PROJECT DETAILS

**PROJECT NAME:** Le Méridien Petaling Jaya

**PROJECT LOCATION:** Petaling Jaya, Malaysia

**OWNER:** Jelas Puri Sdn Bhd

**ARCHITECT:** RSP Architect Sdn Bhd

**SITE AREA:** Block A = 1,960 square metres, Block E = 7,752 square metres

**GROSS FLOOR AREA:** Block A = 28,106 square metres, Block E = 4,707 square metres

**OPENING:** June 2022

**PHOTO CREDIT:** Ideabox Photography Studio



# Hotel in Bodh Gaya





**B**odh Gaya, where Lord Buddha is deemed to have received enlightenment, is one of the holiest and oldest pilgrimage sites for Buddhists. Hundreds of thousands of pilgrims and tourists from around the globe visit the city annually.

Spread over 5-acres, not far from the Mahabodhi Temple (one of the four holy sites related to the life of Lord Buddha), the Hotel in Bodh Gaya responds to the religious tourism in the region – designed as an ode to the historical roots of Buddhism in India.

The 78-key hotel consists of two key zones – the public block closer to the northern access road and the guest block on the site's southern end. All vehicular movement is restricted to the site periphery.

The public block has spaces arranged around a long, central courtyard, which forms the physical and emotional heart of the hotel. This zone comprises a reception, banqueting facilities, a health centre with a spa, a gym, a swimming pool, and a restaurant. A linear waterbody oriented east-west separates this public zone from the residential block comprising guest rooms and suites.

**Invoking Memory and Emotion**

Each space in the hotel represents the tenets of Buddhism through two key architectural lyrics – memory and emotion.

The first one – memory – is invoked through traditional features of Buddhist architecture. Vaults, corbelled arches and stepped jambs are re-envisioned in a contemporary idiom across all spaces in the hotel – reminiscent of the past but designed for the present.

The other architectural lyric of emotion conveys the Buddhist ethos of simplicity, compassion and serenity through a series of gestures.

In that spirit, a series of layers from outside to inside in the



form of outdoor, semi-outdoor and indoor spaces allow for a gentle transition into the public spaces as one enters the public block.

Portals are formed at the edges of these transitional spaces. Viewing spaces through these frames is like viewing the passage of life and its different phases. A banyan tree, the same tree species under which the Buddha is said to have received enlightenment, sits at the other end of the central courtyard, which is seen through these frames – signifying Buddhism's ultimate goal of enlightenment.

The building embraces the human scale, which is conveyed through the proportions of the courtyards, verandahs, arches and windows. The soothing colour palette of muted whites and warm terracotta further lends to the lyric of emotion.

The landscaping of exterior spaces, including the linear, river-like water body with floating lotus plants (associated with the purity of body, speech and mind in Buddhism) gives rise to calmness and tranquillity. Edged by *ghat*-like steps (ceremonial stairway to a river), the water body allows visitors to rest and rejuvenate in the outdoors.

**Buddhist Philosophy and Symbolism as a Tool for Wayfinding**

Ideas from Buddhist philosophy and symbology are translated into the hotel's interiors, artwork and signage, which also eases navigation.

The five wisdoms associated with Buddhism, represented in the Buddhist icon of *Vajradhatu Mandala*, are expressed in the five public spaces – reception, cafe, banquet, lounge and spa-gym-pool. These wisdoms are fearlessness, the wisdom of *dharma*, giving and sharing, unity with oneself and oneness with the earth.

The mandala associates each wisdom with a *mudra* (a symbolic hand gesture). Each *mudra* is further associated with specific colours, seasons, elements and symbols, which are translated into interior design schemes for the spaces.

**To Brick or Not to Brick**

The romance of working with brick, widely used in Bodh Gaya's local and traditional architecture, was immense. However, the architects found that sandy soil on the site with a poor bearing capacity made brick foundations prohibitive. Furthermore, brick vaults are not accepted in the Indian Standard Codes





thus reducing energy consumption.

Courtyards are introduced to facilitate natural ventilation. All circulation spaces including the entrance lobby, comprising 30 percent of the total space, completely depend on the natural air flow, significantly reducing air-conditioning loads. Additionally, water bodies on site further aid evaporative cooling.

### **Channelling, Conserving and Restoring Water**

The hotel's extensive water management system illustrates the Buddhist idea of mindfulness and conscious consumption. The site is located on a low-lying paddy field, in close proximity to the Falgu river. In the three months of monsoon, the river floods the regions in its vicinity. Therefore, the site has been raised to the same level as a nearby culvert that does not get submerged during monsoons.

In sharp contrast, the water in the river disappears during summers. At this time, like many other parts of India, water availability becomes a challenge in Bodh Gaya – making it crucial to harvest

rainwater on site. However, due to its sandy-silty soil, the region's water percolation rate is exceedingly slow. Thus, to give the soil adequate time to soak in all the rainwater, several interventions are adopted to hold water while preventing flooding on site, and thus, any obstacles to the hotel's operations:

for earthquake resistance. Studies conducted also suggested that Autoclaved Aerated Concrete (AAC) blocks would insulate the interiors 1.5 times better than brick, thus saving costs and energy in the long run. Ultimately a combination of materials was chosen – RCC, local brick and AAC blocks for the structure, and terracotta-tinted concrete for the vaults – each material doing what is best for the project.

### **Collaborating with the Local Community**

The hotel uses locally-made roof tiles with an earthy, crafted visual appeal to them as the last layer of insulation over the RCC vault roof – a conscious choice born out of the opportunity and need to support the local economy.

The architects collaborated with 26 local families in 12 villages near Bodh Gaya to handcraft 80,000 clay tiles, which insulate the vaulted ceilings – cheaper and far more sustainable than industrial insulation alternatives.

### **Passive Design Strategies to Regulate the Local Microclimate**

Several passive design strategies are integrated into the design to reduce energy consumption and create a thermally comfortable environment, particularly during Bodh Gaya's hot and dry summers.

The residential blocks are oriented in the north-south direction to minimise heat gain from the western facade during the summer months. Aerated concrete blocks, double-glazed windows, and a double roof system topped with clay tiles create a well-insulated envelope.

The double roof constitutes a concrete vault and a pitched roof covered with steel and clay tiles, with an air gap between them. This keeps indoor temperatures comfortable in all seasons,

- Rainwater is collected into a number of underground harvesting pits on site. These deep pits with honeycombed walls hold the water until it seeps into the earth via openings in their walls and base.
- Rainwater from some roofs is collected in underground tanks for irrigation.
- Bioswales have been integrated to allow water to seep into the earth as it flows through the site. The swales emulate natural streams supporting a host of plants that grow on both edges.
- A pond has been created in the lowest portion of the site in the east; this pond can act as an emergency water holding area in case of a flash flood.

### **PROJECT DETAILS**

**PROJECT NAME:** Hotel at Bodh Gaya

**PROJECT LOCATION:** Bodh Gaya, Bihar, India

**CLIENT:** M/s Marasa Hospitality Pvt Ltd

**ARCHITECT:** SJK Architects

**AREA:** 76,000 square feet on 4.5 acre land

**COMPLETION:** January 2020

**PHOTO CREDIT:** Niveditaa Gupta

# Capella Sydney









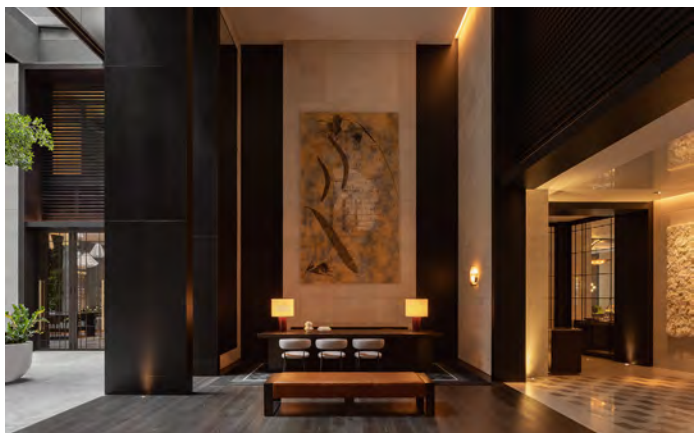
**A**fter a seven-year restoration and renovation process, Capella Sydney is now open. Occupying an entire city block just moments from Circular Quay, the Opera House and Harbour Bridge, the hotel welcomes guests to a benchmark destination of luxury accommodation, exceptional cuisine and unrivalled cultural immersion.

Capella Sydney is housed within the Department of Education building, originally designed in the early 1900s by NSW government architect George McRae. Forming part of the city's prestigious Sandstone Precinct, the building has been meticulously restored and reimagined by Pontiac Land. Leading architecture practice, Make Architects led the Capella Sydney project, working with BAR Studio on interior design.

Capella Sydney brings to the city 192 beautifully appointed guestrooms and suites, arranged across nine levels. Representing the epitome of luxury, the guestrooms and suites are replete with deluxe textiles, standalone tubs and Italian Frette linen, carrying a custom pantone and a bespoke collection of vegan, sustainable in-room amenities designed in partnership with Haeckels.

Cristiano Rinaldi, President of Capella Hotel Group, is pleased to introduce the Capella brand to Australia for the very first time. "The opening of Capella Sydney is a milestone moment in the company's global expansion," says Rinaldi.

Make's Project Lead, Michelle Evans, says: "We're so proud of what's been delivered at Capella Sydney. Opening the building up to the public was key to the design vision. On the ground floor, we designed the arrival sequence to play with scale and invite the public into the previously inaccessible building, taking guests from the beautifully restored heritage entrance



at Farrer Place through to the double-height reception evoking the openness of the original atrium."

Guests enter the hotel via the Farrer Place lobby where the arrival experience is heightened by the integration of acquired and commissioned art. The ground-floor collection includes works by the likes of Australian artists Judy Watson, Otis Hope Carey, Elise Cakebread and Georgia Bisley, culminating with a large robotic lighting installation by Dutch art duo DRIFT.

Titled *Meadow*, the installation by DRIFT is suspended in the hotel's central gathering space. This voluminous lounge area, now known as Aperture, occupies the original courtyard of the old building – the fulcrum from which all the hotel's amenities are accessed. This includes two other drink-and-dine venues: the landmark restaurant Brasserie 1930 and McRae Bar, both of which feature cuisine in collaboration with The Bentley Group.



Staying in-house at Capella Sydney opens the doors to an exclusive world of luxury and cultural connection. On level six, guests are invited to indulge in rejuvenating treatments at Auriga Spa or swim in the 20-metre heated indoor pool, designed to provide the ultimate wellness experience in the heart of the city.

The Living Room, a signature space of all Capella properties, is the private ground-floor retreat for in-house guests. It is also the place where the hotel's culture and experience programs are conceptualised, facilitated by Culturists who are on-hand to shape the guest experience from pre-arrival to departure.

One such experience involves a spectacular two-hour storytelling tour of a bygone era. Guests who join the walking tour, which travels from the hotel to the laneways of The

Rocks, will hear fascinating stories about the history of the Department of Education building, now Capella Sydney, the Sandstone Precinct in which it resides and the culture, crime and convicts that shaped the city.

## PROJECT DETAILS

**PROJECT NAME:** Capella Sydney

**PROJECT LOCATION:** Sydney, Australia

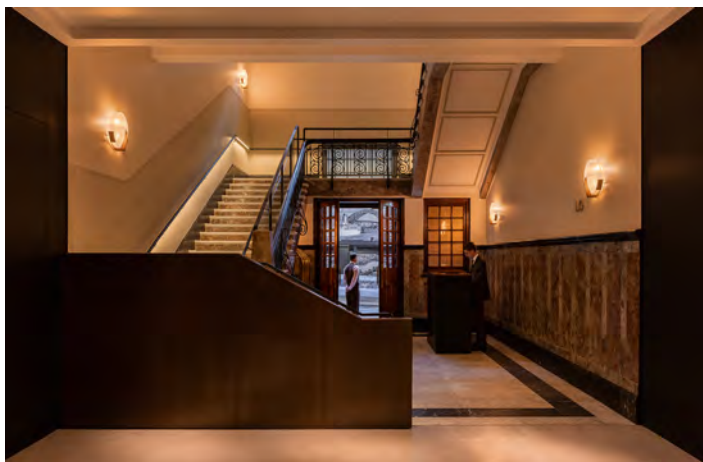
**CLIENT:** Capella Hotel Group and Pontiac Land

**ARCHITECT:** Make Architects

**GROSS FLOOR AREA:** 18,524 square metres

**COMPLETION:** 2023

**PHOTO CREDIT:** Timothy Kaye



# Renaissance Bali Nusa Dua Resort







**P**erched in the hilly area of the Southern Bali Peninsular, Renaissance Nusa Dua in Bali is surrounded by natural beauty, culture, and history. ONG&ONG adopted the Tri Angga concept for the design process, where the complex is a journey of the different hierarchies of the realms: kelod, madya, and kaja. Harmony and balance are maintained throughout the three parts.

Paying homage to the local culture, building placements are modelled after traditional Balinese village settings where there are courtyards and clustered spaces in between buildings. There are 388 keys, an avant-





garde Grand Ballroom that can fit up to 800 people, a spa for relaxation and plenty of F&B options for guests to dine in at the Renaissance Bali Nusa Dua Resort. At the hotel, courtyards designed as Balinese secret gardens are set within proximity of guest rooms, creating an ambience that is private and sacred.

The Renaissance Nusa Dua was conceived with an awareness of environmental sustainability and sensitivity, where many techniques, both passive and programmatic, were deployed to achieve the attributes of a highly sustainable development. Minimalist but chic, the hotel is set to make every stay extraordinary.

## PROJECT DETAILS

**PROJECT NAME:** Renaissance Bali Nusa Dua Resort

**PROJECT LOCATION:** Bali, Indonesia

**CLIENT:** PT. Royal Pacific Nusantara

**HOTEL OPERATOR:** Marriott International Inc.

**ARCHITECTURE:** ONG&ONG

**SITE AREA:** 102,500 square metres

**GROSS FLOOR AREA:** 85,000 square metres

**COMPLETION:** December 2021

**PHOTOGRAPHY:** Marriott International Inc



**Project Name:**  
Office of WE  
Communications Singapore  
and WATATAWA

**Project Scope:**  
Design & Build

**Project Location:**  
Harbourfront Centre,  
Singapore

**Interior Design:**  
Conexus Studio

**Floor Area:**  
6,512 square feet

**Completion:**  
2022

**Photo credit:**  
Kelvin Cuff

**P**ost-pandemic, WE Communications Singapore and WATATAWA set out to reimagine the workplace, prioritising hybrid work and agility to meet the ever-changing needs of their employees. Guided by the brand's culture and values, Conexus Studio helped to craft a high-performing and inspiring office that supports better team collaboration and employee productivity.

The trendsetting insights that drive the firm's work are reflected in the creative design of the space, where bold statements are made about the future of work. The vibe is electric and your best work can be done anywhere — lounging by the sea, nestled in a cosy cafe booth or on your feet at a height-adjustable desk; and the bar is always open.

### **Design Balances Work, Life and Fun!**

Blending industrial touches with a modern experiential design expressed in a bold mix of textures and finishes, the new office is a characterful environment that speaks more of hospitality than office. An open bar takes pride of place welcoming all who enter, ensuring that social connections form part of the core workday experience, expressing how the firm's culture values work life balance.

At the back of house, a live tree in the centre of the space is an attractive reminder that the great outdoors are just a few steps away. The office layout also maximises natural light and views, despite the deep floor plate. To promote personal wellbeing and relaxation throughout the day, comfortable seating areas are situated by the windows — perfect spots to relax and take inspiration from the location's waterfront view.

### **Office Layout Connects The Community**

The office layout prioritises interaction and connectivity, with a strong organic flow centered around the bar, boardroom and breakout area. This multi-functional front of house space is extremely scalable, thanks to a flexible furniture plan and platforms that double as additional seating: enabling everything from cosy





discussions to townhall and event settings accommodating up to 100 people.

With a goal to foster an culture of collaboration and creativity, the open back of house is designed with clear sightlines yet optimised for productivity with movable dividers, ample light and greenery and easy access to phone booths for focus work. Here, a green feature wall emblazoned with an oversized neon sign proudly states: "We Are WE", reinforcing the idea that this is a firm built on community.

"Conexus went above and beyond to transform the experience we wanted for our teams, employees, clients and brand into reality. We weren't the easiest clients, but their ingenuity and vision help craft a hybrid office that epitomizes our culture, magnifies our values, and propels our work to extraordinary heights. No better space than this that fuels our innovation and creativity. Thank you, Conexus! We'll look forward to redefining the game from our inspiring new home!" said Daryl Ho, Managing Director, WE Communications Singapore.





**Project Name:**  
Office of IMC Pan Asia  
Alliance Group

**Project Location:**  
Singapore

**Floor Area:**  
19,360 square feet

**Completion:**  
June 2022

**Design Team:**  
ID21

**Project Management Team:**  
ID21

**Fit-Out Team:**  
ID21

**Photography Credits:**  
Marcus Lim

ID21, an award-winning office interior design and build firm that conceptualises and constructs spaces to address the people, branding and functional needs of companies, completed the design and fit-out for the office of IMC Pan Asia Alliance Group in Singapore.

Inspired by IMC's belief that business is intertwined with the sustainability of its greater environment and the well-being of an individual, the design approach of ID21 is aimed at tapping the senses to redefine the boundaries and expectations of a corporate office environment.





In wanting to make a lasting first impression and create a sense of arrival, the front-of-house is reminiscent of a well-appointed yet welcoming hotel lounge. Soft curves define the space, from the striking ceiling feature, to the carpet and loose furniture positioned symmetrically beneath, right down to the custom-made counter in a beautiful bronze-chrome finish. A cove curtain adds a soft touch behind the reception counter, while cleverly concealing a storage area and the back of house. An ambient scent further elevates the visitor experience and creates a calming mood.

The pantry, with its textured self-service bar counter, cosy furniture and café-style seating projects a communal and hospitable vibe. Coupled with floor-to-ceiling windows that provides one with views of the outdoor area, the pantry can be seamlessly connected to the boardroom located adjacent to it by opening up the operable walls, creating more space for larger gatherings.

To encourage the flow of natural light, the work zone is flanked by full-height glass windows and doors. Here, a 11-metre-long communal work table



makes clever use of two otherwise imposing concrete pillars, creating a prime spot for collaborative work or hotdesking.

Stepping through the doors, one is led to the outdoor garden terrace and greeted by fresh air, extensive landscaping, and modern outdoor seating. This green retreat doubles up as a multi-purpose hub that allows employees to take their work or lunch break outside, indulge in

a spot of herb gardening, or relax with fellow colleagues after a hard day's work. It is also utilised as a spacious event and exercise space, be it during the day or when the sun sets.

With an emphasis on beauty, nature and creating spaces that encourage rest and reflection, IMC's new address is set to become a place where creativity and collaboration grow in a most organic manner.



# DECARBONISATION IN THE BUILT ENVIRONMENT

## - *Insights From Architects*

In part 2 of the article examining decarbonization in the built environment, we ask architects to share with us their thoughts on how design can help to meet carbon reduction targets and the challenges that they face.

**Ar. Najeeb Rahmat,**  
Studio Director of  
Gensler Singapore

**Q: What does decarbonisation mean to architects and designers?**

**A:** Decarbonization of the built environment continues to be the imperative of our time. As architects and designers, we have a responsibility to address the climate crisis through the work we do every day. Decarbonization refers to the process of reducing or eliminating carbon dioxide emissions, particularly in the context of mitigating climate change. It involves reducing the amount of carbon dioxide released into the atmosphere, which is a major greenhouse gas responsible for global warming and climate change. Gensler's biggest opportunity to make a positive impact is through our project work. Using a combination of energy saving and energy generating strategies, low-carbon material selection, passive solar design, and more, we are actively eliminating millions of metric tons of potential carbon emissions through our project efforts.

The built environment is responsible for roughly 40 percent of global



Najeeb Rahmat (Photo credit: Gensler)

carbon emissions related to energy consumption, with particular emphasis on the significance of embodied carbon emissions. Embodied carbon usually constitutes 30 percent of the total carbon emissions within buildings, while the remaining 70 percent is attributed to ongoing operational activities. Operational carbon can be enhanced throughout the building's

lifespan, but unless measures are implemented to address embodied carbon emissions during the design phase of a construction project, building owners will have no opportunity to recover carbon savings once the construction is finished, and the building is operational.

In Singapore, where buildings often have shorter lifespans due to



**NBA project in Sydney.** Building upon Gensler's successful NBA retail fit-outs in London, Paris, and Berlin, Gensler designed the flagship NBA Sydney store at 5 Martin Place. This historic site, formerly the Commonwealth Bank's "moneybox building" built in 1913, is one of Sydney's iconic heritage sandstone structures. The Gensler team collaborated closely with heritage consultants and structural engineers to install retail fixtures in a way that preserved the building's heritage fabric. (Photo credit: Gensler)

urban renewal, the carbon emissions associated with the construction of buildings can make up as much as 40 percent of the total carbon emissions throughout the building's lifetime. It is crucial for professionals in the construction and building industry to treat the decarbonization process with utmost seriousness. Architects and designers are well placed to redefine the norm and unveil future designs that embrace whole life carbon considerations and significantly reduce embodied carbon right from the beginning.

**Q: How can architects and designers embrace decarbonisation in their design?**

**A:** The WGBC (World Green Building Council) has advocated for reduction

in carbon primarily through prevention, which represents the most effective approach to mitigating embodied carbon emissions. As part of a four-step framework, prevention highlights alternative strategies such as challenging the necessity of using material altogether. As difficult as this may seem, architects must consider the potentials of adaptive reuse of existing buildings instead of demolition and new construction. An alternative is to also retrofit existing buildings to improve energy efficiency and reduce their carbon footprint.

Gensler is currently working with the Land Transport Authority (LTA) in Singapore to repurpose a 1 kilometre stretch of its MRT viaduct and spaces beneath the Tanah Merah Station when it is set to become defunct in

2026. Instead of demolishing this 1 kilometre stretch on the East-West Line, we are working on a proposal which would transform it into a green and active mobility corridor for the public to enjoy. Our team will collaborate with LTA, other government agencies, and the community to create socially resilient and inclusive spaces along with pursuing sustainable and resilient design solutions.

We recognise the impact of this project in its contribution and commitment to Singapore national climate target to achieve net zero emissions by 2050 as part of its Long-Term-Low-Emissions Development Strategy (LEDS). Similarly, Gensler has established the Gensler Cities Climate Challenge (GC3) as a call-to-action for the built environment industry, and our commitment to

achieving net zero carbon impact for our entire portfolio by 2030. As the world's largest design firm, we have a unique obligation and opportunity to act against the climate crisis. Our decades of leadership, innovation, and global influence on this topic demands it.

We are mobilizing our efforts around decreasing operational and embodied carbon on our projects. Achieving carbon neutrality entails eliminating or offsetting all CO<sub>2</sub> emissions from the built environment. Gensler has prepared product-specific sustainability standards (GPS v.1.0) for many of the most commonly used items in our architecture and interiors projects. We will share sustainability criteria with the industry that focus on high-impact, market-ready materials within Gensler's control. Our goal is to work with manufacturers to reduce environmental impacts from their products, and ultimately transform the architectural supply chain. Embodied carbon must become a priority for the entire industry value chain, as mentioned by our Co-CEO Diane Hoskins.

In Central London, a repositioning and reuse project targets a 95 percent reuse, recovery, and recycling of construction waste. Our proposed design seeks to redefine 100 New Bridge Street as a contemporary, Grade A office building, which will operate to the highest standards of sustainability. By refurbishing the existing building, the project will require significantly less resources than a new build scheme. The repositioning presents an opportunity to boldly rethink the property's use of materials, and to reimagine the future of New Bridge Street. With a strong commitment to material reuse, the repositioning maximizes the building's sustainability, wellness, and ESG credentials.

**Q: What are the obstacles/challenges?**

**A:** Addressing such a significant challenge is not a straightforward process, as there are significant obstacles that architects must overcome to realize the desired transformation towards a carbon-neutral built environment.

Frequently, clients place a high emphasis on cost-efficient solutions and may exhibit reluctance when it comes to adopting sustainable practices and decarbonization strategies, particularly if they view them as expensive or intricate. Architects must navigate a delicate balance between meeting client expectations and fulfilling sustainability objectives, considering the potential returns on investments and their implications for capital expenditures. In the absence of real-time data and a robust analytical framework, clients may lack the necessary guidance. Convincing clients and investors about the long-term cost savings and advantages of sustainable design and decarbonization measures can prove to be a formidable task for architects, requiring them to present compelling economic arguments.

Architects can encounter challenges when dealing with building codes and regulations that may not keep pace with the advancements in sustainable technology and design practices. Navigating these intricate and outdated regulations, which may not fully support efforts toward decarbonization, can prove to be a hurdle. Take, for instance, the adoption of mass timber as an alternative structural system. Traditional cement production, for example, contributes to nearly 10 percent of global carbon emissions, while steel, commonly used in building structures, is also highly carbon intensive. In contrast, timber boasts a relatively low embodied energy, often up to five times less than steel. Furthermore, since trees absorb CO<sub>2</sub> during their lifespan, wood has the added benefit of permanently storing carbon, preventing its release into the atmosphere. However, in certain regions such as in South-East Asia, building codes exhibit caution when it comes to incorporating timber as a structural element, particularly in areas where reinforced concrete is the prevailing choice. It may take some time for authorities to revise these building codes to accommodate the use of mass timber as a viable alternative.

The location and context of a building can present challenges that

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**“Gensler's biggest opportunity to make a positive impact is through our project work.”**

may be difficult or costly to resolve. For example, urban infill projects may have limited space for renewable energy installations or green spaces, making it challenging to achieve sustainability goals. However, such challenges can potentially be addressed through policy measures. An example is Singapore's landscape replacement policy, which mandates developers to compensate for the greenery lost during development by adding green elements elsewhere within the project site. Architects must also strike a delicate balance in selecting materials that not only align with sustainability goals but also meet project-specific requirements. Sourcing and specifying sustainable building materials can prove to be particularly challenging in certain regions, especially when considering factors such as cost, availability, and performance. When materials need to be transported over significant distances from their source to the project location, the carbon footprint associated with transportation increases. Additionally, the emissions generated are influenced by various factors, including the mode of transportation and the weight of the materials. In essence, heavier materials transported over longer distances tend to result in higher emissions.

Despite these challenges, architects are increasingly recognizing the importance of decarbonization in addressing climate change and are finding innovative solutions to overcome these obstacles. Government incentives, industry standards, and public awareness are also driving the adoption of sustainable design practices in the architectural profession.

**Dr. Christopher Drew, PhD,**  
 Director of Sustainability,  
 Adrian Smith + Gordon Gill  
 Architecture



Dr. Christopher Drew. (Photo credit: Adrian Smith + Gordon Gill Architecture)

**Q: What does decarbonisation mean to architects and designers?**

**A:** For me, decarbonization means significantly reducing or entirely removing carbon emissions. It can apply to processes, places, objects, events – anything that has a carbon footprint associated with it. Decarbonization should be a transformative process, that would typically involve eliminating fossil fuel derived energy with renewable energy. Offsetting carbon emissions is not the same as decarbonization, nor is it part of the decarbonization process. Electrification of a building, or transit system, on the other hand, can be part of the decarbonization process. Likewise, saving energy is often part of the decarbonization approach.

**Q: How can architects and designers embrace decarbonisation in their design?**

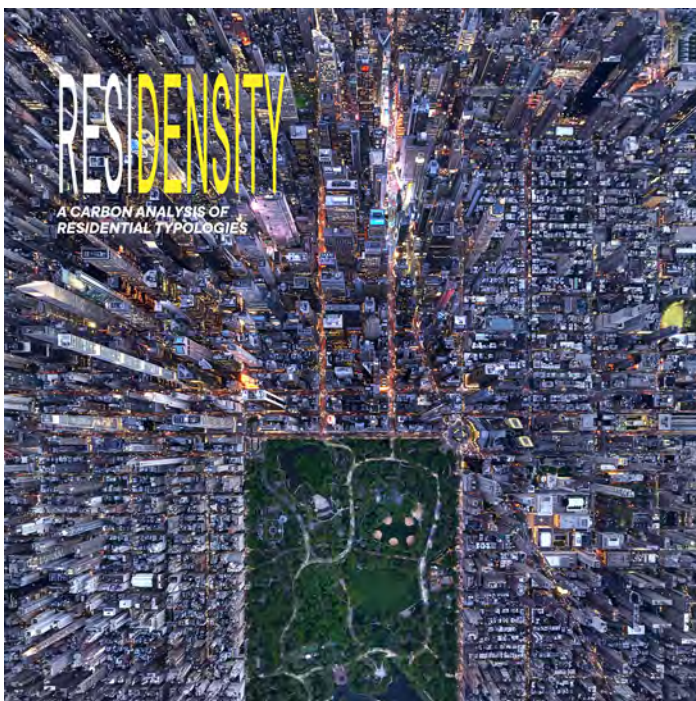
**A:** I think an easy way to think of decarbonization is that it is the evolution of energy-efficient design, where instead of kWh or Dollars as a metric, it is carbon. That means that throughout the design process designers need to constantly ask themselves how their design can help reduce operational and embodied carbon emissions, how the building can become regenerative, be an integral part of a blended infrastructure approach.

**Q: What are the obstacles / challenges?**

**A:** This holistic approach requires more thought and

“Decarbonization should be a transformative process, that would typically involve eliminating fossil fuel derived energy with renewable energy.”

sophistication in terms of simulation and modeling. You can't blindly consider operational emissions. For instance, using insulation to reduce energy use. How far to push the envelope is a function of climate: embodied carbon of the insulation product, grid emissions factor, costs, etc. Not everyone has the skillset or experience to find the right balance. The additional upfront study work invariably adds to the cost, and potentially time, of early design phases. At the same time, the engineering team should be able to reduce equipment sizes that yield construction cost savings. Nevertheless, for some clients this adjustment to the typical cost model can be off-putting. Ultimately, though, I think that the level of awareness of the importance of decarbonization within our industry has reached a point that most of our clients are either asking us to meet carbon reduction targets or are supportive when we propose them.



The image shows the cover of a book called "ResiDensity: A Carbon Analysis of Residential Typologies" that Dr. Christopher Drew co-authored in house. "RESIDENSITY: A Carbon Analysis of Residential Typologies" is the culmination of a seven-year study analyzing nine building typologies to understand the relationships between building densities and the amount of land and infrastructure required to support them. The book investigates how much embodied and consumed carbon is used in each typology and how it affects density and open space from the viewpoint of sustainability, carbon emissions, and carbon sequestration. The study determines which building typology is the most sustainable on a comparative basis. Nine prototypical buildings were designed – Megatall, Supertall, High-Rise, Mid-Rise, Low-rise, Courtyard, Three-Flat, Urban Single-Family, and Suburban Single-Family – set within nine prototypical communities. The study designates an archetypal residential community of 2,000 units with an average unit size of 150 square metres as a reasonable and representative cross section of different housing typologies. (Image credit: Copyright AS+GG/Photo by Andrew Griffiths from Lensaloft Aerial Photography)

**Loh Kee Soon, Senior Associate, RSP Architects Planners & Engineers (Pte) Ltd**

**Q: What does decarbonisation mean to architects and designers?**

**A:** Decarbonisation refers to the process of reducing or eliminating carbon emissions associated with the construction and operation of buildings. This represents a shift in design philosophy, emphasising on environmental responsibility rather than merely focusing on aesthetics and functionality.

Architects and designers are increasingly emphasising sustainable design, which centres around energy efficiency, resource conservation, and the reduction of carbon emissions. This involves creating buildings utilising renewable energy, optimising natural lighting and ventilation, and integrating sustainable materials. For instance, at RSP we have launched our very own sustainability studio RSP.SM Energy Group to strengthen efforts in reducing Singapore's carbon footprint and energy consumption, which is in tandem with Singapore's goal to achieve net zero emissions by 2050.

**Q: How can architects and designers embrace decarbonisation in their design?**

**A:** Architects and designers must first establish the clear sustainability goals and targets for the project with all stakeholders, which include the client, partnering consultant and contractor. This includes defining the specific energy efficiency, carbon reduction, and sustainability objectives that align with local regulations and international standards. Once the sustainability goals are set, there are several strategies which architects and designers can employ in their designs to reduce carbon emission. For example,

1. **Low-Carbon Materials:** Architects and designers could specify low-carbon building materials that have a lower environmental impact in terms of carbon emissions during production and transportation. This may involve using recycled materials such as recycled steel and concrete, or sustainably sourced wood. For instance, we used Mass Engineered Timber (MET), which is a highly renewable, environmentally-friendly material for the Nanyang Technology University (NTU) Academic Building South. Better known as Gaia, it is Asia's largest 6-storey, 42,000 square metres MET building. Such materials have a smaller carbon footprint because they either require less energy to produce or sequester carbon.
2. **Energy Efficiency:** One of the major decarbonisation methods involves designing buildings that are highly energy efficient. This includes designing buildings that require less energy for heating, cooling, lighting, and other operational needs. Architects and designers could also incorporate features such as high-performance insulation, energy-efficient HVAC systems, and smart



Loh Kee Soon (Photo credit: RSP Architects Planners & Engineers (Pte) Ltd)

building technologies to reduce energy consumption.

3. **Renewable Energy Integration:** Architects and designers could integrate renewable energy sources such as solar panels into their designs. The goal is to make buildings generate as much clean energy as possible, reducing reliance on fossil fuels.
4. **Passive Design Strategies:** By optimising the building orientation for maximum use of natural daylight and reducing solar heat gain, the need for excessive energy consumption and artificial lighting reduces, thus lowering carbon emissions.
5. **Water Efficiency:** Design water-efficient systems, including fixtures, landscaping, and rainwater harvesting, to reduce water consumption and the energy required for water treatment and distribution.

Embracing decarbonisation in design requires a commitment to sustainable principles, ongoing learning, and a willingness to innovate and adapt to new technologies and practices. Architects and designers play a pivotal role in shaping a





Gaia at NTU. (Photo credit: RSP Architects Planners & Engineers (Pte) Ltd)

more sustainable and low-carbon built environment, and their choices can have a significant positive impact on the fight against climate change.

**Q: What are the obstacles / challenges?**

**A:** While Singapore has made significant strides in sustainable building practices, there are still challenges that need to be addressed.

Firstly, sustainable building materials and technologies can sometimes come with a higher upfront cost. Architects and designers must work closely with clients to demonstrate the long-term cost savings and environmental benefits of these investments.

Secondly, as much of Singapore's building stock is already constructed, retrofitting existing buildings to meet the modern sustainability standards can be costly and technically challenging.

Thirdly, as Singapore is a highly urbanised city-state, it can be challenging to find space for renewable energy installations like solar farms. Architects and designers may need to explore creative solutions, such as building-integrated photovoltaics.

Lastly, decarbonisation through the implementation of sustainable design requires ongoing efforts from all stakeholders. Architects and designers should endeavour to engage in education efforts to raise awareness about the importance of decarbonisation in the built environment and to promote sustainable design practices among clients, colleagues, and the public to help them understand the environmental and financial advantages of sustainable choices.

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**“Embracing decarbonisation in design requires a commitment to sustainable principles, ongoing learning, and a willingness to innovate and adapt to new technologies and practices.”**

**Vaishali Mangalvedhekar, Partner at SJK Architects**

**Q: What does decarbonisation mean to architects and designers?**

**A:** Based on the Global status report 2017 by the UN Environment Program and International Energy Agency, nearly 40 percent of all greenhouse emissions are due to the construction industry!

In light of the current climate crisis and pledges to move to carbon neutrality, directly or indirectly, this puts a staggering responsibility on the shoulders of architects and designers. Of this 40 percent, 28 percent is due to the operational energy of a building in use. So, over the last couple of decades, sensitive architects and consultants have endeavoured to design buildings that lower their energy consumption and, therefore, their carbon footprint.

The remaining 12 percent is due to the embodied energy of materials while they are being manufactured, processed and transported to the site. Recent studies claim that the percentage of embodied energy emissions now contributes to nearly 22 percent of all global emissions – bringing the total impact of the construction industry to around 50 percent! This makes lowering the embodied energy of materials a big priority for all architects and designers.

**Q: How can architects and designers embrace decarbonisation in their design?**

**A:** While there is now a lot of technology that can help reduce operational energy, such as replacing conventional air conditioning with newer systems like radiant cooling, these are often expensive to use and, thereby, difficult to implement for every project. Passive design strategies (combined with some common-sense decision involving all stakeholders), on the other hand, can often save both capital and operational costs (and energy) of the project:

1. Firstly, by examining the brief, particularly in tropical/sub-tropical countries, we can identify areas or zones in a building that can be left without the need for air-conditioning.

For example, it is perfectly possible for all circulation spaces, like corridors and lobbies in a hotel, to depend purely on natural ventilation by working with basic principles of passive design – orientation, correct fenestration design, use of courtyards, etc. to ensure a reasonably comfortable environment. That can help reduce air-conditioning requirements by 15-30 percent.

2. When not possible to achieve a comfortable environment without air-conditioning, it can be best to design a flexible façade that opens up and allows for cross-ventilation, even for commercial glass buildings, to ensure that through the monsoon and winter months or in the morning or evening hours, the building can switch off its air-conditioning systems. Providing fans for all spaces is useful when it is not windy. This strategy can again help reduce up to 50 percent of the overall operational energy of a building.

3. Working with a well-insulated envelope is a no-brainer – in one instance, we calculated that just a double-roof composition helped save up to 4 percent of the energy requirement. While low-e glass is now available, combined with well-designed sunshades – horizontals on the south/north, louvers on the east-west can be useful to stretch the benefits. Similarly, surrounding your building with greens can help the envelope remain cooler.

4. Suffusing all your spaces with daylight is another principle of design that promotes both decarbonisation as well as a sense of well-being amongst the end-users.

Designing for low embodied energy is more challenging for architects, particularly in India, where it is expensive and time consuming to avail of LCAs and due to the lack of data to calculate the impact of transport up-to-site. Here are some strategies that can help regardless:

i) While wood as a material is prehistoric,



Vaishali Mangalvedhekar (Photo credit: SJK Architects)

the new way of using it (GLT, CLT, VLT avatars) – under the name of mass timber, has globally made it the biggest thing in sustainability. Why? Because wood is a carbon sink.

But the reality is that at the moment, wood is not a material that can be used for mainstream construction in India for the following reasons –

- Responsibly grown forests and certified timber are not easily available in the country.
- Lack of availability of facilities for seasoning and mass-production of GLT, etc.
- Sourcing wood from Europe, Canada or New Zealand is expensive.
- Long-distance transportation is certainly not sustainable.

We hope this will change in the near future, but until then – we are back to using steel and concrete as our mainstream materials – both much more carbon-positive.

ii) While using steel, thinking about the end of life of buildings and designing for disassembly is an important step in the future of decarbonisation. This can allow for our buildings to be reassembled in whole or part on another site (reuse as



JSW Sanjeevani Multispeciality Hospital in Dolvi, Maharashtra, India, designed by SJK Architects. (Photo copyright: Rajesh Vora)

opposed to energy-heavy recycling).

iii) Again, while enough is discussed about concrete being a highly carbon-positive material, its great strength is that it can be made to last long.

In a book called *How Buildings Learn*, Steward Brant elaborates on the theory of – Shearing layers of change.

Essentially, the idea is that a building is not seen as a single entity with a single lifecycle, but a composition of several layers comprising elements with different concerns (site, structure, skin, services, space plan, and stuff) and with varying lifecycles/timescales based on their amenability to change. A building's structure can last more than 100 years; its skin or envelope can last at least half that time. On the other hand, a change in technology or efficiency can lead to a change in services within 7–15 years. Interior walls (space plan) and stuff (loose furniture to artifacts and all objects in the space) may need to change more often based on changing needs, style and fashion!

Bearing this in mind, he urges us to shift our attitude and design all projects for ease of adaptability by disassociating each layer from the other, making the process of change natural and easy for the end-users/owners.

While we wait for miracle carbon-neutral and affordable materials, – and they will come, – I end with a quote that I love – if you don't like something, change it, – if you can't change it, change your attitude. This is what we feel we need to do with good old steel and concrete to lower our carbon footprint.

**Q: What are the obstacles/challenges?**

**A:** There is a perception that sustainable buildings are much more expensive.

- Passively designed buildings can be cheaper!
- Rather than offering to aim for a complete net zero, aiming for smaller wins is better – as stated in the earlier example, it may be easy to convince a client to leave the circulation spaces (15–30 percent) of any project as

non-airconditioned spaces. One can support one's design and logic with CFD simulation that helps prove that non-airconditioned environments can be comfortable.

- Educate the clients about the threshold of discomfort. It is possible for human beings to feel comfortable at 26–27 degrees with adequate wind movement as opposed to aiming for 22 degrees of air-conditioning. Rather than looking at it as a compromise, emphasising on benefits of connecting to the outdoors and with greenery can be emphasised.
- Another way to convince clients is to work with them on a pay-back analysis.

Another challenge is that there is plenty of 'green-washing' going around. The only solution to counter this is to ensure that all the measures one takes are genuine, can be proven through calculations and are measurable.

# Putting Play Value In Playgrounds

**A good playground design is one that is not only fun, sustainable but also has play value. In this interview, we are excited and honoured to speak to Patrick Lee, one of the industry’s most well known playground industry leaders. Patrick explains what is play value and how it can be achieved in playground design. He also talks about the challenges of creating sustainable playgrounds.**

## About Patrick Lee



Patrick Lee is a distinguished figure in the playground and outdoor fitness industry, boasting a remarkable 25-year career. Beyond his role as Director and Founder of CT-Art Creation, Patrick holds the prestigious position of a probationary CPSI Instructor with the National Recreation and Park Association (NRPA) in the USA, emphasising his unwavering commitment to safety and the highest standards in playground design. His visionary leadership has significantly impacted the industry, focusing on creating eco-friendly, adaptable, and inclusive play environments that promote child development. Patrick's dedication to safety is further demonstrated by his roles as a CPSI and EN1176 Annual Inspector, ensuring that playgrounds consistently surpass the most stringent safety standards. His ongoing contributions drive innovation in developing sustainable, secure, and engaging play spaces for children, leaving an indelible mark on the industry.

**SEAB: CT-Art Creation provides a wide array of recreational products: Playground, Aquatic Play, Multi Generation Fitness, Outdoor Furniture and Safety Surfacing. Can you tell us a bit about brands that you carry?**

**Patrick:** At CT-Art Creation, we take immense pride in our extensive range of recreational products, which encompass Playground equipment, Aquatic Play solutions, Multi-Generation Fitness facilities, Outdoor Furniture, and Safety Surfacing. Our commitment to providing high-quality, safe, and innovative solutions is underscored by our collaborations with esteemed brands in the industry. Notable names within our portfolio include Playworld, Hags, Berliner, Vortex, Miracle, Walltopia and Atlantics, each of which brings their own distinctive expertise and commitment to excellence. These partnerships enable us to offer a comprehensive and top-tier selection of products that cater to the diverse needs of our clients within the recreational industry. We believe that the synergy between our company and these respected brands is instrumental in elevating the standards of safety and enjoyment for all who engage with our recreational products.

**SEAB: Playgrounds are usually built to last for a long time. But more recently, they need to be sustainable too. In your opinion, how can we make a playground sustainable?**

**Patrick:** Our manufacturing partners emphasise eco-friendly materials, longevity in design, and energy efficiency, recycling and safety on aquatic facilities, and the use of solar-powered elements in their designs.

Recent demand for custom playgrounds in my opinion are not sustainable where theming has little or no value to play, the resources to design and build these expensive structures usually result in very low play safety standards and modifications where costs, manpower, unnecessary wastage of resources like travel, manpower, use of less than desired, or un-researched materials and methodology.

A good custom playground should be built by an experienced and professional manufacturer with a good history of manufacturing and a team of professional design and safety team. Play value should be the main objective for that custom design.



**Photos 1, 2 & 3: Marine Cove playground project by CT-Art Creation in Singapore. (Photo credit: CT-Art Creation Pte Ltd)**



Photos 4, 5 & 6: Kampung Siglap Life Skills Training & Retreat Centre playground project by CT-Art Creation in Singapore. (Photo credit: CT-Art Creation Pte Ltd)

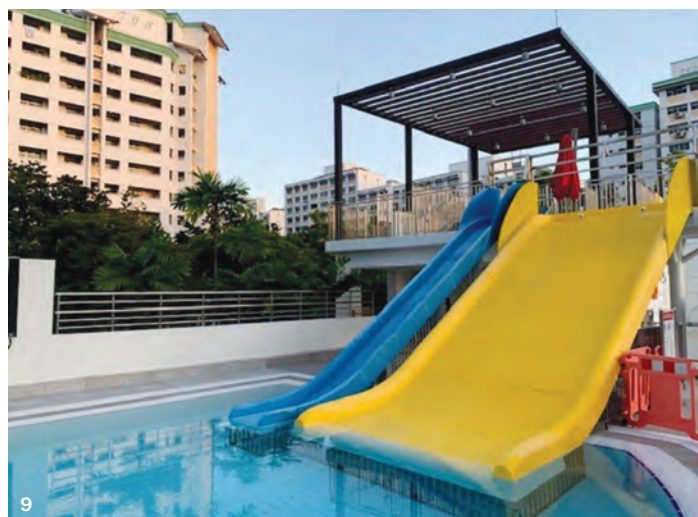
Maintenance and regular inspections are other sustainable activities under the responsibility of the owners.

**SEAB: Creating sustainable playground products is an important initiative, but it comes with its share of challenges. Could you elaborate on some of these challenges?**

**Patrick:** Education on safety, understanding suitable materials that are researched and demonstrated durability for use in a playground, engineering and fabrication methods are challenges for owners who wants to have new and exclusive designs. The selection of a vendor who has the ability to provide and satisfy sustainable materials, fabrication methods and play values within the budget is always a challenge.



Photos 10, 11 & 12: Vista Park playground project by CT-Art Creation in Singapore. (Photo credit: CT-Art Creation Pte Ltd)



Photos 7, 8 & 9: Choa Chu Kang Sports Complex playground project by CT-Art Creation in Singapore. (Photo credit: CT-Art Creation Pte Ltd)

**SEAB: Besides sustainability, play value is also an important topic in playground design. what is the role and value of play?**

**Patrick:** As I mentioned earlier, Play Value is the main objective of having a Playground. Owners, Architects and Landscape Architects should plan a playground with first thoughts of what play value can be offered to users. It can be climbing, spinning, sliding, crawling, balancing, sensing, spinning etc. Playground manufacturers are constantly researching and designing new ways of play equipment and is always based on the basics of how children play.

**SEAB: Is the playground industry creating enough play value for children? Give us your thoughts?**

**Patrick:** The international playground industry is very big and leading manufacturers in the US, Germany, Canada, and other European countries take the lead in creating safe play equipment which are compliant to either or both ASTM and EN standards. Again, Owners and Architects can rely on their services to provide play value and safety compliance. Such practice would also mitigate liability issues for the industry in event of injury at playgrounds.

## Giving Back Through Volunteering at LIAS & SILA

Ruen Qing Wong is a landscape architect, mentor, teacher and also a volunteer for LIAS - CPSI VP and SILA council member in Singapore. She shares her volunteering journey with SEAB and her thoughts on how landscape architects can help to decarbonise the built environment.



Ruen Qing Wong. Photo credit: RIOS

**SEAB: Can you briefly tell us a bit about yourself?**

**Ruen Qing:** I am a designer specialising in the realms of interiors and landscape architecture. My approach is uniquely transdisciplinary, combining a fusion of fields, encompassing architecture and landscape architecture with substantial experience in interior design. This multidisciplinary perspective fuels my quest to create distinctive and holistic environments. Currently, I hold the position of Project Designer at RIOS, while also actively mentoring and teaching undergraduate and graduate students of landscape architecture

at the Department of Architecture at the National University of Singapore, fostering a bridge between academia and professional practice.

**SEAB: Why did you choose landscape architect as a career?**

**Ruen Qing:** My journey into landscape architecture was driven by my deep appreciation for the field's inherent richness, which continues to fuel my curiosity every day. I find great satisfaction in the investigative and hands-on nature of the work, frequently commencing with site visits and a bottom-up approach. This profession

uniquely engages with both the technical and aesthetic aspects of landscape and urban design, while also delving into broader political and philosophical considerations. This multifaceted nature makes it a highly stimulating endeavour that engages both the analytical and creative aspects of the intellect.

**SEAB: Besides working as a landscape architect, you also volunteer as a LIAS – CPSI VP and SILA council member. Why do you volunteer for these organisations and what do you hope to get out of the volunteering experience?**



Photo of Ruen Qing with her co-tutor, fellow landscape architect Lehana Guo, with their students of the design studio Ephemeral Landscapes, 2023. Photo credit: Terrence Tan Chun Liang

**Ruen Qing:** My commitment to volunteering stems from a strong belief in actively contributing to the community, which is a practice I have continued since I was young. My active participation within organisations such as the Singapore Institute of Landscape Architects (SILA) and the Landscape Industry Association (Singapore) (LIAS) represents a means to make a positive impact on our community. It is a channel through which I bridge the gap between my students, who are future professionals in the landscape field, and the industry. This interaction involves organising seminars and educational events, fostering valuable connections, and ultimately cultivating long-lasting friendships with like-minded individuals who share a commitment to enhancing our built environment and strengthening our relationship with the natural world.

**SEAB: What has been your favourite landscape design project you have worked on or witnessed, and what made it great?**

**Ruen Qing:** My favourite landscape

design project is invariably the one I am presently involved in. Currently, that project entails the development of a new aquatic playscape at Jacob Ballas Children's Garden. Designing outdoor play spaces is a truly enjoyable endeavour, and this particular project holds special significance, thanks to its unique location and the dedicated team that's part of it.

**SEAB: How can landscape architects play a role in decarbonising the built environment?**

**Ruen Qing:** Landscape architects play a crucial role in decarbonising the built environment by incorporating ecosystem services into their designs, leveraging the power of nature to reduce carbon emissions. This is achieved through:

- Carbon Sequestration: By integrating ecosystems like rainforests and wetlands, landscape architects enhance carbon storage.
- Urban Green Spaces: In urban planning, the integration of green spaces reduces the need

for energy-intensive cooling, effectively countering the urban heat island effect.

- Stormwater Management: The use of natural systems for stormwater management reduces the demand for energy-intensive infrastructure.
- Biodiversity Conservation: Creating diverse habitats maintains ecological balance and supports carbon cycling.
- Air Quality Improvement: Urban forests and green spaces act as natural filters, enhancing air quality while reducing energy consumption for air purification.

In summary, landscape architects are equipped with the tools and expertise to create carbon-absorbing environments, advocate for sustainable design principles, and collaborate with other professionals, ultimately contributing to the realisation of a decarbonised built environment. Our role is vital in mitigating the impacts of climate change and advancing a more sustainable future.

## Graphisoft holds global launch of new product line up at Building Together event

**Archicad users will accelerate their design processes by modeling, documenting, and visualizing design options and combinations faster and easier than ever.**

**Budapest, Hungary** – The launch included significant feature updates to Graphisoft's Archicad, BIMcloud, BIMx, and DDScad. The latest version boasts a brand-new design option solution, professional visualization tools, improved management of complex projects, and advances in open, multidisciplinary design collaboration.

"Last year, we outlined a bold new vision when we unveiled our Product Roadmap – and we delivered," said Márton Kiss, VP of Product Success at Graphisoft. "The 2023 release includes significant advances across the Graphisoft ecosystem with major enhancements and feature updates offering the greatest value in recent times for both new and existing users."

### **Archicad**

Archicad's powerful built-in tools and user-friendly interface make it the most efficient and intuitive BIM software on the market. Featuring out-of-the-box design documentation, one-click publishing, photo-realistic rendering, and best-in-class analysis, Archicad lets architects focus on what they do best: design great buildings.

Archicad's new integrated design option management capability, built on a smooth end-to-end design workflow, empowers architects and multidisciplinary teams to evaluate and communicate design options to clients more efficiently, allowing them to find the best design alternatives in a significantly shorter time. "The introduction of the new Design Options tool is a valuable feature, aiding architects in realizing infinite possibilities and ultimately enhancing their creative expression," said Kevin Lee, Director of Technology | BIM, at TZG Architects in Australia. "This tool is a much-awaited gift to the architectural community."

With a continuous focus on project manageability, Archicad now delivers highly requested additions to the attribute management workflow. This upgrade increases design team efficiency, allowing users to organise more attributes by folders. Improved consistency and new productivity tools, such as distance guides for placing elements, make designing with Archicad more enjoyable and intuitive for architects switching from other design platforms.

### **BIMcloud**

With BIMcloud, users get secure, real-time collaboration between project team members, regardless of the size of the design project, the location of the offices, or the Internet



**Huw Roberts, CEO, Graphisoft, presenting the new product lineup to the media at the global press conference on 4 October 2023. Photo credit: Tamas Molnar, Motomfoto**

connection speed. Private and public cloud configurations on standard hardware and Software as a Service (SaaS) allow even smaller offices to take advantage of fast, efficient, and secure access to shared projects in real-time.

A solid platform for multidisciplinary design collaboration makes BIMcloud the tool architects and engineers can count on. The latest innovations focus on security – a key concern of all design firms – thanks to the recently introduced multi-factor authentication.

### **BIMx**

With BIMx, the most popular presentation and coordination app for desktop, iPad, iPhone, and Android phones and tablets, users can bridge the gap between the design studio, the client's office, and the construction site.

BIMx is far more than a great 3D viewer – it's a productive workplace and mobile collaboration solution. New, built-in issue-reporting capabilities shorten the time required to resolve problems found on the construction site or during project coordination meetings.

### **Archicad Collaborate**

This subscription-based offer combines Archicad, BIMx, and BIMcloud SaaS at an affordable price point. Unlike other BIM software providers that charge additional fees for cloud services, Archicad Collaborate lowers the barrier to entry by offering award-winning BIMcloud SaaS as part of the Archicad subscription price in the user-friendly online Graphisoft Store.



"Customers demand powerful solutions that are easy to buy, learn, and use," said Márton Kiss. "Archicad Collaborate allows practices to acquire Archicad, BIMx, and BIMcloud SaaS at a price even smaller firms can afford."

### DDScad

DDScad combines great architecture with peak building performance thanks to intelligent Mechanical, Electrical, and Plumbing (MEP) design tools, integrated calculations, and comprehensive documentation solutions for all building systems. Users can design and deliver high-quality MEP projects on time and within budget while collaborating seamlessly with BIM project stakeholders.

Engineers now save more time by modeling building systems smoothly and quickly thanks to streamlined solutions in DDScad. Accessing manufacturer data, a crucial part of MEP design, is now available out-of-the-box. In addition, new product data technology with enhanced OPEN BIM capabilities allows engineers to design MEP projects with greater freedom and flexibility.

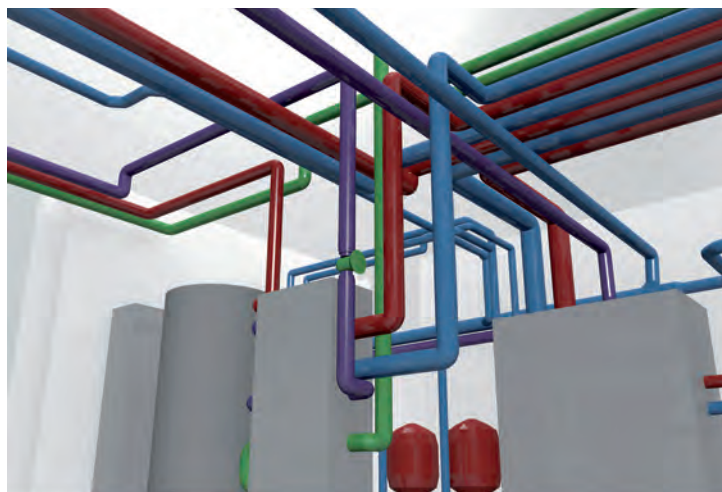
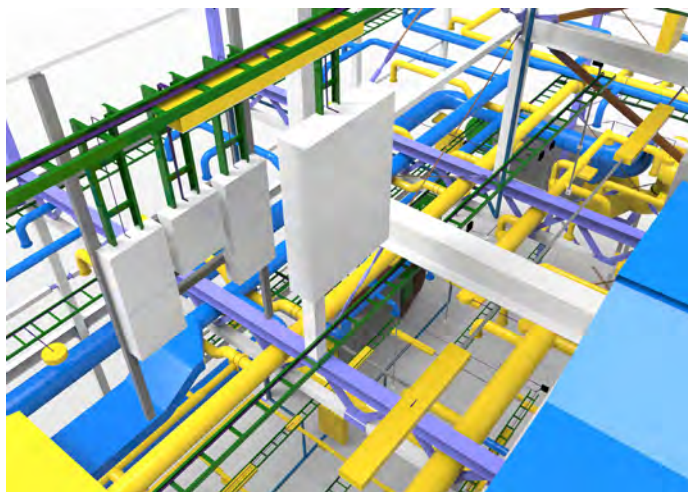
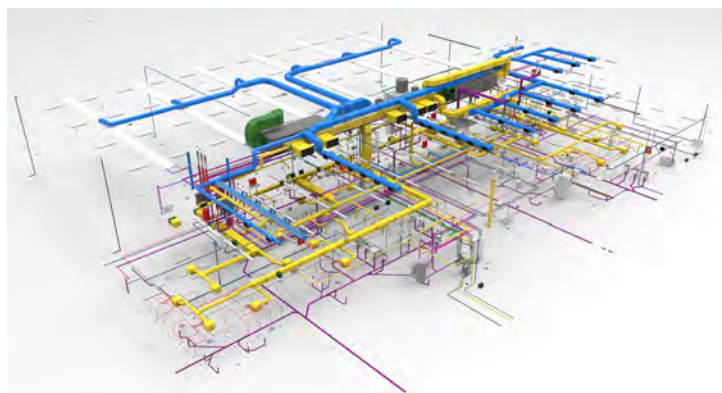
"DDScad supports us greatly in our electrical design," said

Uwe Bullwinkel, Ingenieurgesellschaft Schnittger Wilde, Germany. "With version 19, we are now even more flexible. For instance, the parallel power feed of distribution boards comes at the right time, as we need it for planning photovoltaic systems, among other things. And with the new overview diagram, we can quickly review the respective power supply system. These and the other innovations make DDScad the best option for efficient MEP design."

DDScad is now available in select countries in the Graphisoft Store as a monthly and annual subscription and will be introduced in additional countries soon. DDScad is also available as a perpetual license.

### Multidisciplinary workflow improvements

Archicad further enhances the collaboration between architects and engineers working in multidisciplinary teams. The latest version of MEP Modeler delivers a significant boost in the built-in MEP modeling workflow, while the latest updates in Structural Analytical Model creation shorten the structural design delivery time on even large and complex projects.



DDScad photos. Images courtesy of Graphisoft.

# BEX Asia 2023 brings latest innovations under one roof



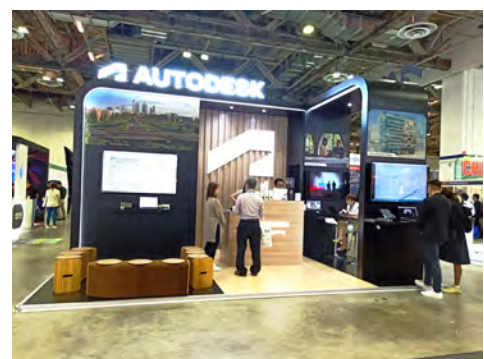
Ribbon cutting ceremony at BEX Asia 2023. Photo credit: International Built Environment Week 2023



Opening address by Mr Desmond Lee, Minister for National Development and Minister-in-Charge of Social Services Integration, at the opening ceremony of the International Built Environment Week 2023 at Sands Expo and Convention Centre on 6 September 2023. Photo credit: International Built Environment Week 2023

**B**EX Asia 2023, one of the region's biggest exhibitions for the built environment, took place from 6–8 September 2023 at the Sands Expo and Convention Centre in Singapore. BEX Asia showcased the newest and broadest range of products and technologies in advanced construction, sustainability, energy efficiency, productivity, and smart solutions from Singapore and around the world.

It provided a great meeting place for industry players and key players from the built environment community to explore various business opportunities under one roof. Over the next few pages, we have compiled some of the exhibitors' products and technologies presented at the show.



## Armstrong Fluid Systems showcases 'the next generation of hydraulic pumping'

At BEX Asia 2023, Armstrong Fluid Systems Shanghai Limited presented 'Design Envelope' which is a range of intelligent variable speed pumps with cloud based active performance management.

Armstrong Design Envelope Pumps are a complete solution for heating, cooling and plumbing systems. The integration of a perfectly matched pump, motor, intelligent variable speed controller and cloud based Active Performance Management creates the highest value pumping solution.

"We exhibited in BEX Asia to showcase our new Design Envelope product," said Penny Chen, Marketing Communications Manager, China and Asia Pacific, Armstrong Fluid Systems Shanghai Limited.

Design Envelope solutions reduce pumping costs through a variable speed, demand-based operation – consuming only the energy required, based on current system demand.

### Demand-Based Operation

Design Envelope Pumps use a combination of optimised impeller size and speed control for energy efficient operation within a given performance envelope. The performance envelopes are selected for the best pump efficiency where variable flow systems operate most often. This ensures a building's pumping system consumes as little energy as possible. It also ensures that the installation meets or exceeds ASHRAE 90.1 guidelines requiring 70 percent energy savings at 50 percent of peak load.

### Energy Savings

Armstrong Design Envelope variable speed technology fundamentally changes the operation of a pump within the larger HVAC system. The variable speed intelligence embedded in the Armstrong Design Envelope controller adjusts the pump operation to meet the immediate demand. The pump responds instantaneously and draws only the power required to meet that demand.

For more information, visit [www.armstrongfluidtechnology.com](http://www.armstrongfluidtechnology.com).



Penny Chen (left) and her colleague Janet Low at the Armstrong Fluid Systems booth at BEX Asia.

## Arrowhead exhibits valves & fittings at BEX Asia



Mr. Jim Kapparos, Managing Director, Americas, Arrowhead (right) and Mr. Phuoc Dang, Regional Business Director, Southeast Asia, Arrowhead (left). Photo credit: Arrowhead

Arrowhead Brass & Plumbing LLC is a US-based manufacturer of plumbing valves & irrigation product with a rich history dating back to 1936.

The company joined the BEX Asia exhibition to expand its regional operations and establish global partnerships to bring its premium plumbing and irrigation products to the ASEAN countries.

At BEX Asia, the company exhibited its wide range of brass, stainless steel material of valve & fitting products to showgoers.

"We see that Southeast Asia is a strong and steadily growing market and we would like to locally present ourselves to customers here," said Phuoc Dang, Regional Business Director, Southeast Asia, Arrowhead.

Arrowhead is planning to expand into Malaysia, Singapore, Vietnam, Thailand, Indonesia, and the Philippines for customers to directly access to the premium lead-free plumbing products, extensive industry expertise and localised service experience.

For more information, visit [www.arrowheadbrass.com](http://www.arrowheadbrass.com).

## YiTac presents Passive Displacement Ventilation (PDV) system

YiTac (S) Pte Ltd is an engineering solution provider and a leading supplier of building materials in Singapore.

At BEX Asia 2023, the company presented its innovative Twenty80 Passive Displacement Ventilation (PDV) system.

According to the company, the PDV system is more energy, space and resource efficient than a conventional airside system as it uses natural convection to deliver cold air to spaces without the need of a mechanical fan or air ducts.

Conventional airside systems use air handling units (AHUs) and fan coil units (FCUs) to deliver cold air to spaces via ducting. These systems consume about 20% of a building's cooling energy, or 0.28 watts per m<sup>3</sup>/hr of cold air delivered to an air-conditioned space. They also require a large amount of material for ducting and diffusers. In conventional AHU ducted systems, there is the need for a large plant room and ceiling space to accommodate the ducting and equipment. These systems also require frequent servicing and costly maintenance.



Photo credit: YiTac (S) Pte Ltd

The PDV system offers the following advantages:

- Consumes absolutely zero airside energy, thus savings up to 20 percent of a building energy
- Is virtually maintenance free
- Requires no plant room or over-head or under-floor ducting
- Is completely vibration and noise free
- Is integrated into interior design so it can be invisible
- Can be completely pre-fabricated and tested off site

PDV cools like mother-nature does. Warm air gets cooled where it rises naturally...at the top. Cold air is supplied where it gravitates naturally at the bottom. PDV system is simple and effective.

The company had set up an experiential room at its booth for visitors to "experience" the Twenty80 Passive Displacement Ventilation (PDV) system.

YiTac has installed the PDV system in a number of projects in Singapore. Examples include: 3M Woodlands; NTU Sports Hall – The Wave, Nanyang Business School (NBS)@NTU, Temasek Polytechnic, Dulwich College, and many more. Future projects include the Kallang Tennis Centre and Singapore Institute of Technology (SIT) Centralised Campus in Punggol.

**For more information, visit [www.yitac.com.sg](http://www.yitac.com.sg).**

## Henning exhibits elevator monitoring services

Henning GmbH & Co. KG is an international company providing lift components, test and measurement, and remote lift performance and condition monitoring. It has an Asia Headquarter Technical Support & Training Centre in Singapore called Henning Asia Pte Ltd to support Asia region.

At BEX Asia, Henning Asia exhibited its Elevator Monitoring solution "WEARwatcher" which provides predictive maintenance to lift companies, building management and FM managers.

Commenting on the solution, Janson Koh, Advisor, Henning Asia Pte Ltd, said: "Our WEARwatcher can predict when a lift part is going to fail, and this feature prevents lifts from breaking down suddenly. Our product is different in this way."

Henning's Elevator Monitoring solution, WEARwatcher, is a smart way to maintain lifts and ensure they continue to operate smoothly.

For more information, visit [www.henning-gmbh.de](http://www.henning-gmbh.de).



From left to right: Janson Koh; Alicia Gay, Director of Henning Asia Pte Ltd; and his team at the Henning booth at BEX Asia.

## Tectus Group exhibits green construction solutions

Tectus Group, a global leader in the construction and engineering industry, exhibited its innovative solutions at BEX Asia 2023.

Tectus presented its brands BBR, Screening Eagle, and Moderna Homes, showcasing a future-focused approach to sustainable construction.

The building and construction sectors combined have been identified as the single largest contributor to CO2 emissions, accounting for 40 percent of the global total annually. An increasing proportion of the built environment's impact is due to embodied carbon emissions – those stemming from the sourcing, manufacturing, transporting, and installation of the materials and components that make up a structure, and include the lifetime emissions across construction, maintenance, repair, replacement and eventual demolition.

Tectus contributes to lowering embodied carbon, leveraging its 80 year history in construction and engineering alongside its pioneering and entrepreneurial spirit to protect, maintain and responsibly grow the built world, through the BBR network offering leading certified post-tensioning systems applied extensively in the construction and maintenance of buildings and infrastructure globally, Moderna Homes who has pioneered high-rise modular construction in Singapore with steel hybrid modular construction techniques, and Screening Eagle Technologies promoting asset efficiency and longevity through sensors, software and data for digitalized asset condition monitoring and preventive maintenance.

For more information, visit [www.tectusgroup.com](http://www.tectusgroup.com); [www.bbrnetwork.com](http://www.bbrnetwork.com); and [www.screeningeagle.com](http://www.screeningeagle.com).



Yong Kwok Leong (left) and Liu Jingwei (right) at the Tectus booth at BEX Asia 2023.

## Googol Company brings flexible solar products to BEX Asia

Googol Company is a leader in the photovoltaic industry specialising in the development, manufacturing, and distribution of solar energy products and systems.

Based in Taiwan, the company took part in BEX Asia for the first time with the aim of tapping on the green growth in Singapore.

"We think that the green growth in Singapore is rapid because the government is implementing policies to force the growth. Also, we feel that Singapore has become the fastest growing country in Asia – companies are setting up their headquarters here and sourcing materials here. Lastly, there is plenty of sunlight here which is good for us to promote our products," said Betty Shih, International Sales Manager, Googol Company.

"This time to BEX, the most attractive product and got most inquires is the [Bifacial Flexible Solar Panel]. Unlike traditional glass solar panel, Flexible solar panel is thin and lightweight. It can be installed in any type and any shape of building structure. 80 percent of the visitors show very high interest about this product!" said Betty Shih, International Sales Manager, Googol Company.

The company has been manufacturing solar products for over 20 years. It has been supplying its solar panels and system integrators to the public and private sectors all over the world. It exports to Europe, USA and North America and now it wants to expand its business into Asia.

For more information, visit [www.googolcom.com](http://www.googolcom.com).



Betty Shih (left); Michael Lin, Chief Executive Officer (centre); and their colleague at the Googol booth at BEX Asia. Photo credit: Googol Company

## MayAir presents clean air solutions



Damian (right) and his colleague at the MayAir booth at BEX Asia 2023.

MayAir Singapore Pte. Ltd. exhibited in BEX Asia to showcase its air filtration equipment and clean air solutions.

With more than 20 years of experience, MayAir has established itself as leading solution provider to create clean, healthy air for various sectors.

"We joined BEX Asia to showcase our air purification equipment and clean air solutions for cleanrooms including but not limited to semiconductor, pharmaceutical, data centre, electrical and electronic, biomedical industries, and etc," said Damian Gan Wei Fung, Global Cleanroom Product Manager, MayAir Singapore Pte. Ltd.

The company also provides its indoor air quality solutions to the commercial and residential sectors.

For more information, visit [www.mayairgroup.com](http://www.mayairgroup.com).

## Big Ass Fans unveils new products at BEX Asia

Big Ass Fans introduced a couple of new products at BEX Asia. One of them was the Haiku® L Outdoor Fan.

The outdoor fan is an upgraded version of the indoor fan, which is primarily used in residential.

Its ultralightweight design, remarkable performance and durability make it a suitable fan for open-air application. In addition, it is wet rated and comes with a fan stabilizer for safe, lasting outdoor performance.

Big Ass Fans also announced at the show that Haiku is certified as a Singapore Green Building Product by Singapore Green Building Council. The certification is a small but important part of the company's sustainability efforts.

For more information, visit [www.bigassfans.com](http://www.bigassfans.com).



Photo credit: Big Ass Fans

## Cupix presents construction technology solutions at BEX Asia 2023

Cupix is a cutting-edge technology company that specializes in revolutionizing the way we document and visualize construction projects. Established in 2015, Cupix has rapidly gained recognition as a leader in the field of construction technology. Their innovative solutions leverage the power of Spatial Digital Twin to provide comprehensive project documentation and management tools for the construction industry.

Cupix had several objectives of exhibiting at BEX Asia 2023. They were:

(1) **Showcase Innovative Solutions:** Cupix aims to use this platform to showcase their latest advancements in construction technology, particularly their groundbreaking CupixWorks solutions. They intend to demonstrate how these solutions can transform the construction industry by enhancing project documentation, collaboration, and decision-making.

(2) **Network and Collaboration:** BEX Asia is a premier event for the construction and built environment sectors. Cupix seeks to connect with industry professionals, potential clients, and collaborators. They hope to foster partnerships and explore opportunities for integration with other construction technologies.

(3) **Educate the Market:** Cupix recognizes the need to educate the market about the benefits of their technology. By participating in BEX Asia, they can engage with a diverse audience, including contractors, architects, engineers, and project managers, to impart knowledge about how CupixWorks can streamline construction processes.

(4) **Market Expansion:** BEX Asia provides a platform for Cupix to expand its market reach beyond its current geographical areas. The event attracts attendees and exhibitors from across Asia, enabling Cupix to explore new markets and business opportunities in the region.

Solutions presented by Cupix in the event were CupixWorks SiteView.

For more information, visit [www.cupix.com](http://www.cupix.com).



Ismail Salim, Account Director ASEAN, Cupix (centre) and his colleagues at the Cupix booth at BEX Asia.

## Two industrial projects TOP virtually in first pilot by JTC and BCA

Singapore – At the International Built Environment Week, JTC and the Building and Construction Authority (BCA) announced they have successfully piloted inspections for Temporary Occupation Permit (TOP) at two industrial sites without the need for inspectors to be present on-site.

Using reality capture technologies such as LiDAR scanning and 360-degree photo capture, the JTC Logistics Hub @ Gul and JTC semiconSpace received TOPs through virtual inspections, reaping savings in manpower and time of up to 30 percent. The pilot also paves the way for industry-wide adoption: JTC and BCA are developing guidelines for virtual TOP inspections and JTC has also specified the requirement for virtual TOP inspections in subsequent construction projects.

The virtual TOP inspections took place at JTC Logistics Hub @ Gul in April 2021 and JTC semiconSpace in Tampines Wafer Fab Park in September 2022. The projects then received their TOP in May 2021 and October 2022, respectively. Since then, JTC and BCA have been working closely to develop the virtual TOP guidelines for JTC projects, which will pave the way for an industry framework for wider adoption.

The virtual inspection at the two sites is enabled by advancement in reality capture technology, which allows accurate and reliable 3D data to be produced. Using point cloud data<sup>1</sup> and integrating with 360-degree photo capture solutions, detailed inspections can be conducted on works to allow for checking and an easy tracking of progress for construction. LiDAR scanning has been utilised for the first virtual TOP inspection at JTC Logistics Hub @ Gul as LiDAR scanning produces highly accurate 3D data (with deviations of less than 2 mm), also known as point cloud data. After the first virtual TOP inspection, JTC improved the workflow by adding a 360-degree photo platform for the second inspection at JTC semiconSpace project. 360-degree photo, also known as a panoramic photo or spherical photo, is an image that captures a complete view of the surroundings in all directions (akin to street view function in common digital maps). This helps to speed up the process because virtual site walkthroughs in the 360-degree photo platform can be done.

Instead of a physical TOP inspection, the new workflow piloted allows the BCA inspector and project team to access the site virtually together through the 360-degree photo platform and point cloud data. Measurements and close-up photos can be prepared ahead of time and attached in the 360-degree photo platform. Inspection locations within the building can be switched instantaneously on the platform to check the measurements attached for regulatory compliance, and cross-reference them with the point cloud data, if necessary. This process is much faster as compared to physically accessing the site and manually taking measurements across the building site. The quality of the inspection is further ensured as the inspection comments are digitally recorded and tracked for closure, including its specific location. A report can also be auto generated for ease of reference and documentation. Comparisons before



The virtual TOP inspection session in progress at JTC semiconSpace with screen (left) showing a 360-degree photo of the building and screen (right) showing its point cloud data. Credit: JTC

and after the follow-ups can also be traced through the platform to enhance and streamline the TOP process. This new virtual TOP workflow can potentially reduce time and manpower by up to 30 percent for both the project team and inspection officers.

Besides adopting technology solutions for virtual TOP inspection, JTC is also using 360-degree reality capture solutions in construction site management. 360-degree images of construction sites are captured regularly and the platform is used for coordination, progress tracking, documentation and reporting by the site teams across various time periods. JTC's initial trials show potential manhour savings and productivity gains of up to 50 percent across the entire construction value chain, from the developers to site staff, main contractors and sub-contractors. Additionally, this technology also provides JTC with a better oversight of the whole construction site, improves the speed and accuracy of site information shared among project team members for ease of follow-ups, and ensures better accountability.

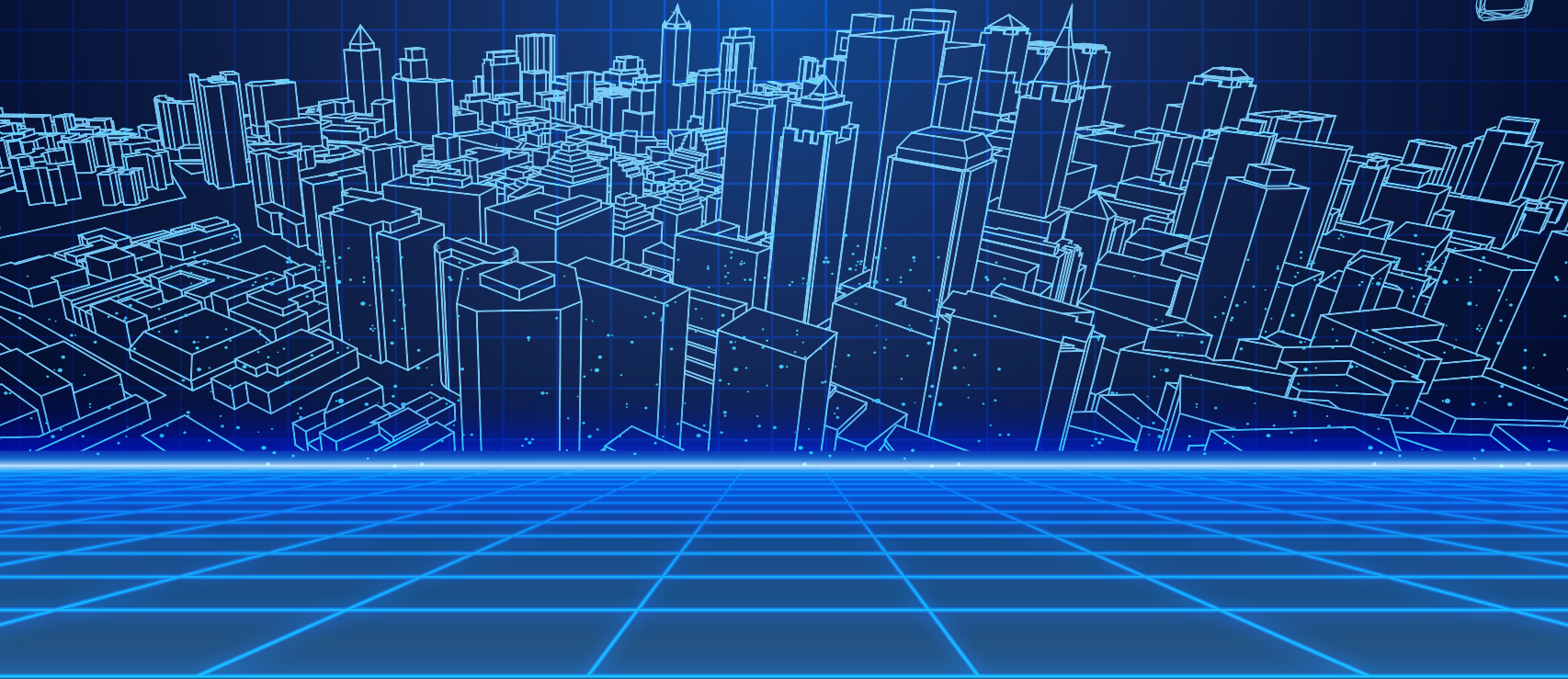
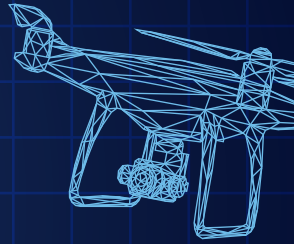
To capture the savings and proliferate the use of reality capture technologies to the industry, JTC has launched a tender to use such reality capture technologies at all JTC-managed projects. This will enable JTC to enhance progress tracking, improve quality control, and improve safety through remote inspection. JTC is also exploring other use cases to maximise the benefits of such technologies in the area of facilities management and construction preliminary work surveys.

<sup>1</sup> Point cloud data is a collection of data points in a three-dimensional coordinate system. These points represent the external surface of objects or environments, and they are usually generated through technologies like laser scanning, LiDAR (Light Detection and Ranging). Each point in the point cloud is defined by its spatial coordinates (X, Y, and Z) and sometimes includes additional information like colour or intensity.



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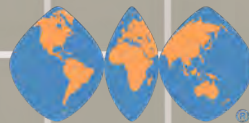
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Name: \_\_\_\_\_  
Position: \_\_\_\_\_  
Company: \_\_\_\_\_  
Address: \_\_\_\_\_  
Tel: \_\_\_\_\_ E-Mail: \_\_\_\_\_

### IMPORTANT

Please commence my subscription in  
\_\_\_\_\_ (month/year)

Professionals (choose one):

- |   |  |  |  |
|---|--|--|--|
| <input type="checkbox"/> Architect        | <input type="checkbox"/> Landscape Architect   | <input type="checkbox"/> Interior Designer | <input type="checkbox"/> Developer/Owner |
| <input type="checkbox"/> Property Manager | <input type="checkbox"/> Manufacturer/Supplier | <input type="checkbox"/> Engineer          | <input type="checkbox"/> Others          |

Bank transfer payable to:

**Trade Link Media Pte Ltd**

**Bank Details**

Account Name: Trade Link Media Pte Ltd  
Account Number: 033-016888-8  
Name of Beneficiary Bank: DBS Bank  
Address of Beneficiary Bank: 12 Marina Boulevard, DBS Asia Central,  
Marina Bay Financial Centre Tower 3,  
Singapore 018982  
Country: Singapore  
SWIFT Address/Code: DBSSGSG

PAYNOW to:

**Trade Link Media Pte Ltd**



PAYNOW option is applicable for Singapore companies only.

Company Registration Number: 199204277K





2023

15-17  
Nov

### Architecture & Building Services 2023

Sands Expo & Convention Centre  
Marina Bay Sands  
Singapore  
T: +65 6278 8666  
E: shirley@cems.com.sg  
W: <https://architecturebuildingservices.com.sg>

2023

15-17  
Nov

### BuildXpo Malaysia 2023

MITEC  
Kuala Lumpur, Malaysia  
T: +60 3 6211 4224  
E: [enquiry@buildxpo.com.my](mailto:enquiry@buildxpo.com.my)  
W: <https://buildxpo.com.my>

2024

16-18  
Jan

### Light + Intelligent Building Middle East 2024

Dubai World Trade Centre  
Dubai, UAE  
T: +97 1 4 3894 500  
F: +97 1 4 3585 533  
E: [lightandbuild@uae.messefrankfurt.com](mailto:lightandbuild@uae.messefrankfurt.com)  
W: <https://light-middle-east.ae.messefrankfurt.com/dubai/en.html>

2024

23-25  
Jan

### World of Concrete 2024

Las Vegas Convention Centre  
Las Vegas, USA  
E: [contactus@worldofconcrete.com](mailto:contactus@worldofconcrete.com)  
W: [www.worldofconcrete.com](http://www.worldofconcrete.com)

2024

14-17  
Mar

### WORLDBEX 2024

World Trade Center Metro Manila and  
SMX Convention Center Manila  
Manila, Philippines  
T: +63 2 8656 9239  
E: [inquire@worldbexevents.com](mailto:inquire@worldbexevents.com)  
W: [www.worldbex.com](http://www.worldbex.com)

2024

16-19  
Mar

### Xiamen Stone Fair 2024

Xiamen International Conference and  
Exhibition Center  
Xiamen, China  
T: +86 592 5959616  
E: [info@stonefair.org.cn](mailto:info@stonefair.org.cn)  
W: <https://stonefair.org.cn>

2024

3-6  
July

### ARCHIDEX 2024

Kuala Lumpur Convention Centre  
Kuala Lumpur, Malaysia  
T: +60 3 7982 4668  
E: [info@archidex.com.my](mailto:info@archidex.com.my)  
W: <https://archidex.com.my>

2024

18-20  
Sept

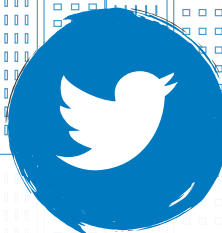
### Thailand International Woodworking & Furniture Exhibition 2024

Hall 11, IMPACT Exhibition & Convention Centre  
Bangkok, Thailand  
T: +66 2 833 5370  
E: [info@thailandwoodworking.com](mailto:info@thailandwoodworking.com)  
W: <https://thailandwoodworking.com>

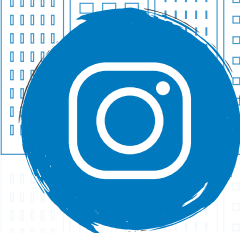
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Mapei Far East	Singapore	+65 6862 3488	mapei@mapei.com.sg	www.mapei.com.sg	9

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DML Ceiling & Louvres Marketing (S) Pte Ltd	Singapore	+65 6246 3002	sales@dml.com.my	www.dml.com.my	OBC

**See us at following upcoming events!**

Event	Date	City	Country	Website	Page
Architecture & Building Services 2023	15-17 Nov 2023	Singapore	Singapore	https://architecturebuildingservices.com.sg	64
BuildXpo Malaysia 2023	15-17 Nov 2023	Kuala Lumpur	Malaysia	https://buildxpo.com.my	69
Light + Intelligent Building Middle East 2024	16-18 Jan 2024	Dubai	UAE	https://light-middle-east.ae.messefrankfurt.com/dubai/en.html	IFC
World of Concrete 2024	23-25 Jan 2024	Las Vegas	USA	www.worldofconcrete.com	IBC
WORLDBEX 2024	14-17 Mar 2024	Manila	Philippines	www.worldbex.com	67
Xiamen Stone Fair 2024	16-19 Mar 2024	Xiamen	China	https://stonefair.org.cn	65
ARCHIDEX 2024	3 - 6 July 2024	Kuala Lumpur	Malaysia	https://archidex.com.my	66
Thailand International Woodworking & Furniture Exhibition 2024	18-20 Sept 2024	Bangkok	Thailand	https://thailandwoodworking.com	68

**Legend:** IFC (Inside Front Cover), IBC (Inside Back Cover), OBC (Outside Back Cover)



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EXHIBITS: JANUARY 23-25, 2024  
EDUCATION: JANUARY 22-25  
LAS VEGAS CONVENTION CENTER



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