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September / October 2020

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ARCHITECT'S CORNER Interview with Bhakti Loonawat, Design Associate at MuseLAB, on Winning the Coronavirus Design Competition
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Southeast Asia Building is available free-of-charge to applicants in the building industry who meet the publication's terms of control. For applicants who do not qualify for free subscription, copies will be made available, subject to acceptance by the publisher, for a subscription fee, which varies according to the country of residence in the following manner:

Annual Subscription

Airmail: America/Europe – S\$185, Japan, Australia, New Zealand – S\$185, Middle East – \$185, Asia – S\$155, Malaysia / Brunei – S\$105

Surface mail: Singapore – S\$60

(Incl 7% GST Reg No.: M2-0108708-2)

Printed in Singapore by Fuisland Offset Printing (S) Pte Ltd
MCI (P) 071/07/2020 KDN No: 1560 (1270) - (6)
ISSN 2345-7066 (Print) and ISSN 2345-7074 (E-periodical)

Trade Link Media Pte Ltd also publishes:

- Bathroom + Kitchen Today
- Lighting Today
- Security Solutions Today
- Southeast Asia Construction

SOUTHEAST ASIA BUILDING is published bi-monthly by:

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#06-04, Prosper House, Singapore 388399

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Co. Reg. no: 199204277K

Features

PROJECTS – Green Buildings

- 22 Savio di Ravenna – A project by Mapei
- 24 Eden
- 28 New Futura
- 32 Oasis Terraces
- 36 Can Gio Pavilions
- 40 THE PAVILIA BAY
- 44 Hideout Bali
- 47 The Red Roof
- 50 Viettel Headquarters
- 52 Adventurous Global School

ARCHITECT'S CORNER – Interview

- 56 Architects share their thoughts on how green buildings can help to prevent and control Covid-19
- 62 An interview with Bhakti Loonawat, Design Associate at MuseLAB, on winning the Coronavirus Design Competition

TRENDS – Smart Building

- 66 Interviews with architects

on trends that will shape the future of smart buildings

- 72 How Industry 4.0 is ushering a sustainable era – An article by dormakaba

Regulars

NEWS

- 6 News from Asia Pacific, Middle East & the World

EVENTS CALENDAR

- 73 Guide to international trade shows, expos & fairs



On the Cover: Eden in Singapore.
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Cover design by Fawzeeah Yamin

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Dear readers, we are excited to be with you again in the September/October 2020 issue, which is also our annual green issue. Inside, we have showcased a wide range of green

building projects around the world. Each project demonstrates how a building's design can be unique, sustainable and friendly to the environment.

In line with our green issue theme, we have also explored the topic of Smart Building in the Trends section. We have lined up interviews with architects on the trends that will shape the future of smart buildings.

We are still in the middle of a pandemic but architects are already looking at ways to redesign spaces to create better health in buildings. To learn more about this, read the interviews with architects who have shared with us their thoughts on how green buildings can help to prevent and control Covid-19.

Lastly, don't miss reading the interview with Bhakti Loonawat, Design Associate at MuseLAB, on how the firm won the Coronavirus Design Competition.

We hope that you would enjoy reading this issue and that you would gain valuable insights from the views shared by the architects.

Take care and stay safe!

Amita Natverlal

NEXT ISSUE THEMES

- Projects – Educational
- Trends – Windows, Doors & Building Profiles
- M.E.P. Systems (Refer to Media Kit)
- Advertorial – Virtual Reality



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Soundproofing solutions for living comfort from MAPEI

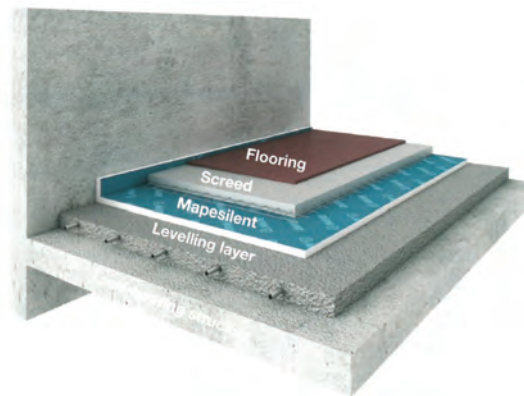
Singapore – Urban development and increased population density in cities have led to an inevitable increase of noise coming from within and our external surroundings. The quality of life translates to living comfort – in one such aspect – by reducing the exposure to noise for less disturbance and the ability to concentrate better. One solution is to improve the acoustic efficiency of our living and working environments.

Mapei offers two types of soundproofing solutions for enhanced living comfort.

MAPESONIC CR

MAPESONIC CR is an innovative, under-floor soundproofing system meant to combat the noise of footsteps transmitted through floor slabs, applied before laying ceramic tile, stone and engineered wood floor finishes. The beauty of this system is that it has been specifically developed for application in existing buildings to improve soundproofing without removing the floors and screeds thus speeding up installation process. It can be applied over cement-based substrates or old ceramic and natural stone floors. Mapesonic CR is manufactured using recomposed cork and rubber bound together with high-quality polyurethane composite with very low emission of volatile organic compounds (EMICODE EC1 Plus).

Mapesonic CR is easy to install in just a few steps. Mapesonic Strip insulating



Mapesilent is applied below floating screeds before laying flooring material. Photos: © Mapei



strip is first laid in a continuous layer around the perimeter of the room and around pillars and all other abutments. Next is to spread the adhesive onto the sound substrate and lay Mapesonic CR. New flooring finishes may be bonded after 24-48 hours later.

Mapesonic CR comes in two thickness, 2mm and 4mm. The 2mm thick Mapesonic CR can effectively reduce noise from footsteps of 10 dB with ceramic tiles, compliant with ISO 10140-3. Moreover, its very low level of volatile organic compound make it safe for the user, installer and the environment.

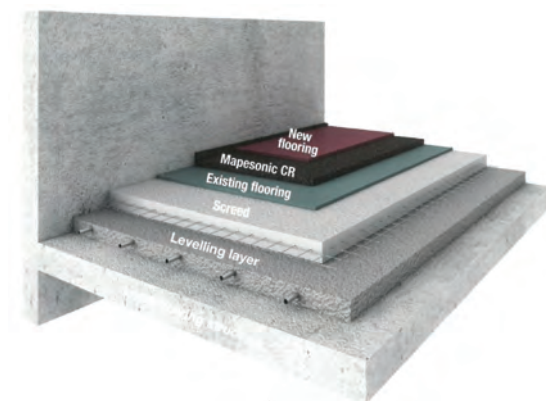
MAPESILENT ROLL

MAPESILENT ROLL system offers another alternative for soundproofing to floors. It offers a simple, reliable and efficient method to form an isolating floating screed which is perfectly insulated

from the support structure (floor slab + separating walls) before laying all kinds of flooring material such as ceramic tiles, stone, resilient and wood coverings.

Mapesilent Roll system comprises of three components: Mapesilent Roll, a bitumen and special polymer-based elasto-plastomeric membrane sandwiched together with a non-woven fabric and polyester fibre-backing, available in 10m by 1m rolls; Mapesilent Band R, a closed-cell foam polyethylene adhesive band to be applied around the perimeter of walls to avoid the formation of acoustic bridges; Mapesilent Tape, a closed-cell polystyrene sealing tape for sealing overlaps and joints of Mapesilent Band R and Mapesilent Roll.

Installation is quick and easy by loose laying Mapesilent Roll on the floor, while ensuring that the each border overlaps the adjacent one. The joints between the rolls of Mapesilent Roll are then sealed with Mapesilent Tape. Mapesilent Band R is applied on the perimeter of the walls. Thereafter, lay the floating screed (thickness $\geq 40\text{mm}$) and then install the selected floor finishes. During the phase before laying the screed, Mapesilent Roll's high resistance prevents foot traffic or other accidental impact due to dropped tools from damaging it. Mapesilent is certified by international standards EN ISO 10140-3:2010, EN ISO 717-2:2007, EN 29052-1:1993 and EN 29053:1993. When fully installed, the reduction in the noise of footsteps (ΔL_w) can be more than 30 dB.



Mapesonic CR is bonded onto the existing floors and screeds. Tile, Stone and Wood flooring finishes are then bonded onto the soundproofing layer with an adhesive. Photos: © Mapei



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CT Art Creation launches new outdoor furniture company, Outerspace

Singapore – Outerspace aims to be an industry leader with an integrated collection of design led site furniture and amenities for the outdoor environments. Established by veteran playground specialist CT Art Creation Pte Ltd in early 2020, Outerspace serves the outdoor socio-urban zone with an expansive street furniture selection such as street bench, bollards, bicycle parking solutions, e-scooter parking solutions, outdoor fitness, picnic tables, and large scale modular planters for landscape and urban design. Being citizens at the heart of the city, the solutions Outerspace offers are true living spaces for the outdoors that takes into consideration the end users' wellbeing, comfort and quality of life. The company's DNA is simple, they value designability, sustainability, and durability.

An emerging trend towards smart city design has spurred the company to connect with smart city product specialist such as Include EU, who have installed 1200 solar wireless charging benches in 13 cities worldwide.

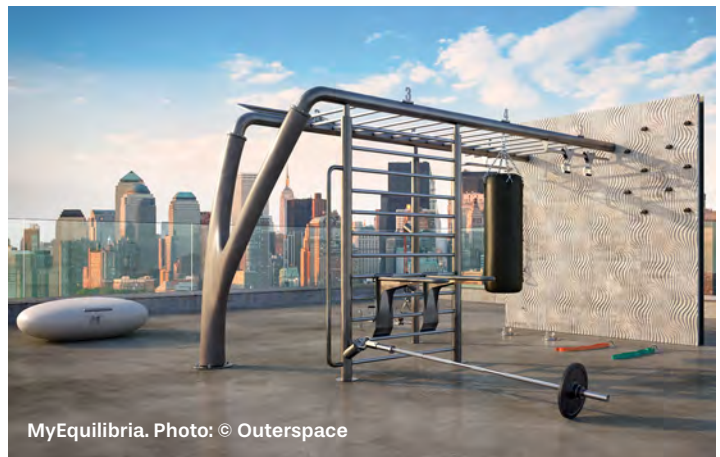
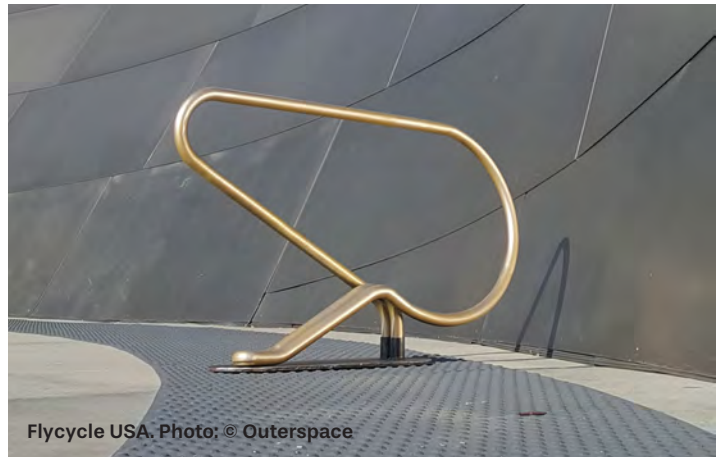
In recent times, cycling has become the front runner in outdoor activities during the Covid-19 lockdown. Outerspace's cycling solutions such as Bikekeep mobile app bicycle parking solution offers cyclist a self-locking smart system where bike theft will no longer be a concern. Space efficient bicycle parking solutions from Flycycle utilises 20 percent less bike

parking space compared to traditional bike parking bays.

Social distancing has become the "new norm" where indoor fitness activities have been curtailed. Indoor workouts could now migrate to the outdoors with MyEquilibria brand of outdoor training with full body circuit training capabilities. Technology in the form of phone app technology coupled with intuitive social features is able to support all levels of fitness enthusiast. The wide ranging capabilities of MyEquilibria allows for beach sand installation at Miami Beach, cruise ship installation as seen on Virgin Voyages USA, and hospitality projects such as One & Only Mauritius.

Through the company's partnerships with Bellitalia, Urbantime, Flycycle, Bikekeep, MyEquilibria, and Include EU, Outerspace fully supports placemakers to create a sense of place within the outdoor environments.

Together with CT Art Creation's track record of 25 years in the market, Outerspace is positioned to help designers, architects, and curators of outdoor spaces to realise their objectives. Its 365 degree holistic services starts from product selection, specifications, product installation and after sales maintenance programme. Together, Outerspace helps design urban outdoor spaces for today and the future. Welcome to the great outdoors.



smart city innovation

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solar wireless charging bench



bike parking app based solutions



solar smart cycling bench



red dot award outdoor fitness equipment



outdoor fitness with training app

Nanchang Waves takes inspiration from the natural qualities of the wetland

Nanchang, China – Nanchang Waves, designed by Nordic Office of Architecture, is a new community centre, which takes inspiration from the natural qualities of the wetland. The project is located next to the Elephant Lake Wetland Park which informed and inspired the design. The design concept is to bring the natural qualities of the wetlands into the project, creating a spatial experience where the building and the landscape blend together. The design consists of three natural elements, water, earth and sky, corresponding to three functional areas: the front square, the commercial facilities and the observation tower.

The landscape design of the front square is integrated with the ancient water culture of Nanchang and the landscape of the Elephant Lake. Each of the landscape nodes contain functions for people of different ages and provide interesting and memorable spatial experiences.

The main body of the building forms a continuation of the landscape elements in three dimensions through the language of stretched curves and waves. The landscape of the front square extends above the three-dimensional space of the architecture, through a slowly unfolding outdoor amphitheatre.

The rooftop garden is accessible from



Photo: © Schranimage

both sides of the building. Underneath the rooftop space are scattered retail and commercial functions, which are linked to the rich outdoor activity space in the front plaza, bringing vitality to the community around the project. At the end of the park facing Elephant Lake Wetlands stands the project's biggest highlight: a viewing tower that represents the blueprint for future living and the new spirit of the city.

The double spiral staircase serves a greater function than simply allowing one to get up and down from the viewing tower. It is an interesting journey in itself, curving around and providing wonderful vistas along the way. When reaching the top, one enters the observation deck, where people can get an unparalleled

view of the natural landscape of the nearby wetlands, admire the city skyline in the distance, and experience the changing landscape at sunrise and sunset.

"The project is inspired by the surrounding wetlands as well as the cultural heritage of Nanchang, with its many towers. It is our contemporary contribution to a proud history. Our concept is based on creating a green and blue centre for the community, where the natural qualities of the wetlands are brought into the heart of the development, turning an indoor commercial program into an extended outdoor experience," said Thomas Lindgård Fagernes, lead architect, Nordic Office of Architecture.

Total solar DG enters into Vietnam market with first project with Ching Luh Group

Singapore – Total Solar Distributed Generation (DG) has signed an agreement with Ching Luh Group to provide the manufacturing company with 3.2 MW of solar-powered rooftops for two of its facilities in Vietnam.

This marks a milestone for Total Solar DG as it secures its first solar project in Vietnam. Total Solar DG has been active in Southeast Asia since 2018 and has a portfolio of in-operation solar systems across seven countries, currently generating around 17 GWh of solar energy annually. Alongside other

projects in current development, this project with Ching Luh Group will add 4.4 GWh upon its completion later in 2020.

Ching Luh Group, one of the world's leading athletic footwear manufacturers, will have two of its Vietnam facilities equipped with a 2 MWp and 1.2 MWp rooftop solar system, respectively, by Total Solar DG. In line with Ching Luh Group's sustainability initiative, an estimated 19,000 tons of carbon dioxide emissions will be reduced over the 12-year contract period.

2id architects designs a zigzag duplex house for two families

Tokyo, Japan – This project took place in northern Hamamatsu, over a duplex house for two families – the mother and her son's family – standing on its own in the midst of an industrial district lined with a number of factories.

One of the two families was represented by the mother and nobody else, and the other: her son, his spouse and four children. 2id architects were required to work out an arrangement for this unbalanced inhabitant ratio as well as secure an open space for the families to get together.

Along with the physical limitations of the site impeding reclamation of the external environment, 2id architects deliberated on the openness of the internal space and control of light.

In consideration of the ambient surrounding, the architects ensured privacy by keeping a fixed distance from the outside space. Meanwhile, clerestories gather plenty of light and its soft reflection on the wall surface permeates throughout the space.

The shared living room attracts the families as it gathers much light through the clerestory and becomes the hub of communication within the house.

2id architects assigned each of the three blocks produced by the zigzag structure a function: "for the mother", "sharing" and "for the son and his family". The simple dimensional structure design created space for clerestory while protecting privacy,



Photo: © Kiyoshi Nishioka

extensive living space and large-volume underfloor storage and dedicated the second for to the son and his family. The uneven roof created multiple clerestories, resembling the iconic appearance of the factories in the neighbourhood.

A sleek and contemporary revival – Aedas Singapore Office by Aedas Interiors

Singapore – Just off a busy thoroughfare in Singapore's science and technology hub, Buona Vista lies a busy business hub. Once a quiet neighbourhood is now dotted with high technology offices, young working professionals, shopping and entertainment centres and contemporary residential developments. Amongst all the newness and set in the backdrop of a progressive community is the brand-new Aedas Singapore Office. The objective of the redesign was to create a live-work environment that endorses greater peer collaboration while also ensuring a welcoming environment where the firm's work can be showcased to clients.

A project led by Managing Director Logan MacWatt and Executive Principal Steven Shaw, the new Aedas Singapore design studio is fitted with a substantial range of work, collaboration and meeting spaces to promote teamwork and virtual connectivity.



Photo: © Aedas

Rocco Design Architects Associates completes their latest project, Vanke Cloud City in Shenzhen

Hong Kong – This commercial centre – located at the middle of a development zone in Shenzhen – creates a new neighbourhood hub that knits the surrounding areas into a unified urban district.

The project sits in the middle of several important centres of life in the area, including a cherished park, a major commercial and residential district, and Tong Fa Nan Lu, one of the area's most trafficked roadways. Previously, the undeveloped site disconnected these areas from one another, impeding pedestrian flow from one neighbourhood to the next. Vanke Cloud City resolves this, slicing a soaring retail-lined atrium through the site that weaves the disparate neighbourhoods into a cohesive downtown district.

The base of the development is lined with shops and cafes, generating activity at all hours and creating a lively, pedestrian-friendly atmosphere. Offices on the higher floors of the tower are arrayed on the perimeter edges of the building, allowing signature landscaped terraces to overlook the public zones at the centre of the development. A sculptural skybridge spans the public



Vanke Cloud City. Photo: © Henry He

zone, linking the two sides of the terrace while introducing a new architectural focal point in the area.

The design of the facade distinguishes between the commercial and office zones, resulting in a highly legible building that offers spaces tailored to their uses. The commercial areas are

enclosed in an opaque facade that focuses the interior experience on the retail offerings within. The office portion of the building, on the other hand, is lined with floor-to-ceiling glass that maximises views and daylighting, creating distinctive and contemporary work environments.

Surbana Jurong acquires blast testing and consultancy firm Prostruct Consulting

Singapore – Surbana Jurong, a global multidisciplinary urban, infrastructure and managed services consultancy has acquired Prostruct Consulting, a leading urban and infrastructure protection firm specialising in security, blast consultancy and testing. This move augments Surbana Jurong's portfolio of built environment services, which includes solutions to protect buildings and infrastructure against blast and other effects of explosions and weapons.

Iconic buildings and infrastructure that attract high crowd density or provide essential services are common targets for terrorist attacks. This underscores the need to incorporate protective security features into the design and development of the built environment. With Prostruct's specialisation in designing blast resistant structural systems, Surbana Jurong

Group can couple it with its existing architectural and civil and structural engineering expertise, and deliver building designs with integrated security measures. The process, dubbed Security by Design, ensures that security measures are effectively incorporated into the building without compromising the design of the building or requiring expensive retrofitting during the later stages of the development life cycle.

The newly acquired specialist capability is timely for the Group as the Singapore government has enacted an Infrastructure Protection Act that requires designated buildings to integrate security measures, such as strengthening against blast effects, into their designs before they are built or renovated. These designs must be assessed by certified security and blast consultants.

Aedas' TOD solution linking the past and future of a timber factory site in Chengdu

Hong Kong – Aedas was recently commissioned to design Poly's Timber Factory Plots Redevelopment Project in Chengdu, providing urban renewal to a historically important area of the city. With the TOD model being the foundation of this project, the design encapsulates the site's prime location and urban context, creating an imperative and crucial commercial and business hub on the central axis of the city.

Adjacent to the city's Second Ring Road and North Railway Station, the redevelopment project stands as a gateway to Chengdu's North Central Business District. The timber factory and traditional market nearby have been a witness of Chengdu's rapid economic and urban development, while also carried memories of the local communities.

The site is adjacent to Metro Line 5 and 7 interchange stations and the Second Ring Road BRT station on the North, and also overlooks Metro Line 1 and Chengdu North Station. Surrounded by a plethora of transportation options, the design adopts the TOD model to build a three-dimensional composite cross-block transportation network and, in doing so, stitches the surrounding area together. The core commercial site is vertically linked from the MRT station's concourse Level to

the BRT's link bridge Level and above. It is seamlessly connected to surrounding slow-moving systems through multi-level public spaces, such as the sky bridge and sunken plaza.



Photo: © Aedas

The development of a green axis landscape encompasses the site's surrounding water system, creating an urban and green ecological network within the project. The ample greenery also reserves a public space for citizens to enjoy tranquility and scenic views in a bustling business district in downtown Chengdu.

To celebrate the city's heritage and unite the past and present, the design draws inspiration from the wood processing plant through the depiction of wood stack mounds within the architectural contours, exterior detailing and sculptural display in the commercial atrium.

The project is expected to be completed in 2022.

Fabrication advance: spray-on clear coatings for cheaper smart windows

Melbourne, Australia – A simple method for making clear coatings that can block heat and conduct electricity could radically cut the cost of energy-saving smart windows and heat-repelling glass.

The spray-on coatings developed by researchers at RMIT University in Melbourne, Australia, are ultra-thin, cost-effective and rival the performance of current industry standards for transparent electrodes.

Combining the best properties of glass and metals in a single component, a transparent electrode is a highly conductive clear coating that allows visible light through.

The coatings – key components of technologies including smart windows, touchscreen displays, LED lighting and solar panels – are currently made through time-consuming processes that rely on expensive raw materials.

The new spray-on method is fast,



The ultra-thin clear coatings are made with a new spray-on method that is fast, cost-effective and scalable. Photo: © RMIT University

scalable and based on cheaper materials that are readily available.

The method could simplify the fabrication of smart windows, which can be both energy-saving and dimmable, as well as low-emissivity glass, where a conventional glass panel is coated with a special layer to minimise ultraviolet and infrared light.

Lead investigator Dr Enrico Della Gaspera said the pioneering approach

could be used to substantially bring down the cost of energy-saving windows and potentially make them a standard part of new builds and retrofits.

"Smart windows and low-E glass can help regulate temperatures inside a building, delivering major environmental benefits and financial savings, but they remain expensive and challenging to manufacture," said Dr Della Gaspera, a senior lecturer and Australian Research Council DECRA Fellow at RMIT.

"We're keen to collaborate with industry to further develop this innovative type of coating. The ultimate aim is to make smart windows much more widely accessible, cutting energy costs and reducing the carbon footprint of new and retrofitted buildings," added Dr Gaspera.

The new method can also be precisely optimised to produce coatings tailored to the transparency and conductivity requirements of the many different applications of transparent electrodes.

LWK + PARTNERS has adopted Modular Integrated Construction for sustainable future

Hong Kong – COVID-19 has brought both challenges and opportunities, as innovation flourished and new technologies found their ways to advance further. In April 2020, LWK + PARTNERS completed the temporary quarantine facilities in Sai Kung Outdoor Recreation Centre in collaboration with Paul Y. Construction and Paul Y. – iMax to assist the government's response to COVID-19. It is one of Hong Kong's pilot cases for Modular Integrated Construction (MiC), and it took only 77 days to design and build three blocks of three-storey facilities from scratch, setting the city's record.

Paul Ng, LWK + PARTNERS Director who oversees the quarantine facilities project, explained, "MiC is an innovative construction method based on the concept 'factory assembly followed by on-site installation'. Free-standing integrated modules are fabricated, finished and inspected in the factory before being transported to the site for installation. On-site processes like foundation works can be carried out all the while the above take place, substantially raising the levels of efficiency and quality." There have been previous examples in mainland China, Singapore, the UK and the US. Singapore is leading the way in Asia with relatively mature technologies, providing references and benchmarking for others in the region.

In Hong Kong, MiC is still in its early stages. The approval process takes much longer time and involves complicated preparation. Last year, LWK + PARTNERS and Paul Y. – iMax took the initiative to work together on an MiC installation



Three blocks of three-storey temporary quarantine facilities were built in the mini soccer pitch of Sai Kung Outdoor Recreation Centre. Every building consists of 33 temporary units, making up a total of 99, all with their own toilets and connected through steel staircases and open-air corridors. While all the modular units were made in factories, steel staircase and semi-open corridors were built on site.
Photo: © Paul Y. – IMAX

system which secured 'pre-acceptance' from the city's Building Department. This provided critical technological foundations for the temporary quarantine facilities in Sai Kung Outdoor Recreation Centre.

Timber industry in business during pandemic

Kuala Lumpur, Malaysia – The Covid-19 pandemic brought much of the world economies to a grinding halt. It was tough for businesses to keep their financial wheels turning and the impact of lockdowns were particularly brutal for companies with little reserves for managing sudden slumps.

Malaysia was not spared as the economic indicators showed a worrying trend during the Movement Control Order (MCO) when it was first implemented from 18-31 March 2020 to contain the pandemic.

As many companies faced mounting challenges to survive as supply and demand for both overseas and domestic

markets were disrupted, the government of Malaysia had promptly rolled out the "Prihatin Stimulus Package" of over RM260 billion (USD61 billion) to weather the financial crisis brought on by Covid-19. Numerous consultation sessions among the various ministries, government agencies and the private sectors took place throughout the MCO to discuss and finetune the implementation of the regulations and SOPs for businesses that were given approval to operate during the MCO.

As many industries were contemplating a shutdown, the timber sector received special approval from the Ministry of Health through the

Ministry of Plantation Industries and Commodities (MPIC) to operate under strict adherence to the SOPs during the MCO. More than 500 timber-based companies were granted approvals of which over 70 percent were furniture and moulding manufacturers.

The Malaysian Timber Council (MTC), together with many public and private sector organisations, played a key role in facilitating the smooth operation of the timber sector by analysing and channelling feedback from the industry players to the government through consultation sessions.

MTC had also conducted an industry-wide survey. Among the findings of the

survey were concerns over the slowing global and domestic demands, cashflow management, order fulfilling issues and workforce sustenance.

The MCO was extended in stages and on 4 May 2020 the government implemented the Conditional Movement Control Order (CMCO), which is effective till 9 June 2020 and allowed most economic sectors, including the timber sector, to operate based on regulated SOPs.

One of the primary hiccups during the MCO involved the supply disruption of timber raw materials which was swiftly resolved during the CMCO when the government granted permission for the transportation of logs from the landing sites to the respective factories. Since then timber-based manufacturers were assured of regular supply of raw materials for their operations.

The timber sector has been literally up and running during the MCO and

CMCO with 90 percent of manufacturers having resumed operations and more than 60 percent had begun exporting their products. These timber-based manufacturers are also revisiting their business plans and actively relooking at digitalisation and automation options to further fortify their operations.

The timber industry is an important contributor to the Malaysian economy. In 2019, it achieved RM22.5 billion in exports which is 2.2 percent of the country's total merchandise export. The industry attracted a total investment worth RM1.1 billion in 2018 and has a domestic market worth RM13.6 billion. The industry also provides employment to more than 50,000 local workers.

The timber sector in Malaysia has been largely operating unhindered, thanks to the quick response and strong support from the government which has also signalled of more assistance to stimulate the economy to enable

businesses to weather the pandemic storm.

MTC, too, in line with its role and obligation to the timber industry has taken the necessary steps to transform its operation model and activities to suit the current and post-Covid-19 business needs.

"It's a digital push we are looking at now. We simply cannot ignore this fact and businesses must now consider operating on e-platforms," said MTC Acting CEO Mr Wong Kah Cane, who also assured buyers of Malaysian timber products that any order will be readily met by local manufacturers and suppliers.

Together with the cooperation and collaboration among various ministries, agencies and the private sector, MTC will do its part to ensure that the Malaysian economy and timber industry will be more resilient post-Covid-19," said Mr Wong.

10 Design Completes Industrial Service Centre in Jinwan Aviation City

Hong Kong – The Industrial Service Centre provides 54,699 square metres of office space for burgeoning start-up companies and entrepreneurs to collaborate, establishing an incubation platform in the new Jinwan Aviation City Zhuhai, China Designed by 10 Design, the Industrial Service Centre (ISC) is a socially interactive campus community which sits within a wider 3.8 square kilometres masterplan.

The ISC is an attractive campus that is unique, pragmatic, commercially viable and well-integrated on the site. Inspired by the concept of a flowing stream, a central green landscaped area provides convenient access to all occupiers and connects all buildings. It also serves as a central pedestrian link, providing a view corridor through the site to the new man-made lake, the primary amenity of the district.

Nick Cordingley, Design Partner commented: "Creating opportunities for interaction, collaboration and visibility is an important objective of our masterplan. An extensive green area that runs through the centre of the site becomes the social heart of the entire campus. Each integrated building faces directly to it, further increasing visibility to create a sense of community."

Each of the three buildings has been designed as paired blocks with a central atrium. These central atriums provide shared entrances for the office buildings and contain shared



Photo: © Zhang Chao

meeting rooms and collaboration space to further increase visibility and interaction.

Flexibility has been positioned at the forefront of the design process. This is accomplished by the creation of adaptable planning modules that allow for multiple tenant configurations, sizes and sectors.

New Light + Building Director: Maria Hasselman hands over to Johannes Möller

Frankfurt, Germany – She put Light + Building on track to becoming the world's leading trade fair for the sector. Now, he will lead the trade fair for lighting and building-services technology into the future. At the beginning of July 2020, Maria Hasselman hands over the management of Light + Building to Johannes Möller.

From now on, Johannes Möller is responsible for the future success of Light + Building. The graduate trade-fair, congress and event manager gathered sales experience with the Prolight + Sound trade fair for many years before spending four years as personal assistant to the President and Chief Executive Officer of Messe Frankfurt. Subsequently, in 2017, he was appointed Director of the Brand Management and Development Team in the company's Technology Business Unit.

Johannes Möller is clear about the challenges facing the lighting and building-services sector. "My aim is to add to the experience of the fair for all concerned, including through the use of digital channels.

Accordingly, the portfolio will soon be supplemented by a variety of formats, such as podcasts, online product and trend shows, as well as internet discussion forums," said Möller. "At the same time, there can be no doubt that personal encounters are irreplaceable. This applies not only to confidence-building measures and product quality analysis but also, of course, to networking and the exchange of ideas and information. I am looking forward to achieving this aim by continuing the close working relationship with our cooperation partners, the ZVEI and ZVEH associations," added Möller.



Maria Hasselman. Photo: © Messe Frankfurt Exhibition GmbH



Johannes Möller. Photo: © Messe Frankfurt Exhibition GmbH

Gensler's Jordan Goldstein elevated to IIDA College of Fellows

New York, USA — Gensler is proud to announce that Jordan Goldstein, Principal and Global Director of Design, was elevated to the International Interior Design Association (IIDA) College of Fellows for 2020.

The IIDA College of Fellows is the highest honour awarded by IIDA to its professional members, recognising designers who have made a significant impact to the industry, to the association, and to shaping the future of design. IIDA Fellows positively influence design through their thought leadership and mentorship, involvement within their communities, and commitment toward molding the next generation of talent.

Goldstein oversees Gensler's global influence of design innovation and project delivery. Throughout his career, he has led the design of more than 8 million square feet of commercial projects in the U.S. and abroad. A sought-

after spokesperson on the future of design both domestically and globally, Jordan has been featured in many prominent design publications.

"For more than 20 years, I have dedicated my career to using the power of design to develop solutions to challenges in our communities and cities around the world," said Goldstein. "One key to success is surrounding yourself with innovative, inspiring people and ensuring that their voices are heard in the design process. I have found that combination in practice at Gensler and through fellow designers at IIDA. I am honoured to be elevated to this year's IIDA College of Fellows."

In 2015, the Washington Business Journal named Jordan one of the 25 top innovators in Washington, D.C., and has regularly included him on its list of the 100 most influential leaders in that market. An advocate of helping the next



Jordan Goldstein. Photo: © Gensler

generation of designers prepare for tomorrow, Jordan has frequently taught a course on design at the University of Pennsylvania, where he earned a master's degree in architecture and has been the Kea Professor at the University of Maryland, where he earned his Bachelor of Science in Architecture.

Carbone Design wins Luxury Lifestyle Award



Tea Lounge, Grand Resort Bad Ragaz in Bad Ragaz, Switzerland. Photography by brechenmacher-baumann.com



Health-Restaurant Verve by Sven, Grand Resort Bad Ragaz in Bad Ragaz, Switzerland. Photography by brechenmacher-baumann.com

Wolfhalden, Switzerland – Carbone Design has won the Luxury Lifestyle Award in the category of The Best Luxury Architect and Interior Design Studio in Switzerland.

The Carbone Interior Design AG team is based in the Swiss village of Wolfhalden. The eighteenth-century property, which is home to modern offices, lies high up in the hills with stunning panoramic views out over Lake Constance.

The showroom, which resembles

an enticing treasure room with its shimmering material samples stacked up to the ceiling, is housed in a former cowshed. The location of this small but inspiring workspace out in the countryside clearly illustrates the philosophy of the founder Claudio Carbone, who says: "Natural beauty goes beyond artificial beauty. Man is part of nature. We love the unaffected and the creaturely. What is spread, stilted and mannered, on the other hand, seems

boring and bland to us."

CarboneInteriorDesign creates spaces that are defined by a certain elegance and cosiness without unnecessary design experiments or superficial effects. Its interiors feature clear lines, precise craftsmanship and stunning natural materials that invite you to feel and touch them. Light and color, elements that perhaps influence our emotions more strongly than any others, also play a crucial role.

David Chipperfield Architects Berlin completes Carmen Würth Forum

Berlin, Germany – The Würth Collection, which was founded in the 1970s by Reinhold Würth, today comprises more than 18,000 works of modern and contemporary art as well as a significant number of late medieval paintings and sculptures. It is one of the most important private art collections in Europe. Würth grants the general public free access to the Würth Collection through the Kunsthalle Würth in Schwäbisch Hall and 14 other museums and associated galleries across Europe. Every year, the exhibitions attract hundreds of thousands of visitors.

"This second construction phase will mark the completion of the Carmen Würth Forum, fulfilling Reinhold Würth's vision to create a gathering place for the employees of Würth and the wider community beyond. It symbolises the connection between a place of work, its community and the surrounding environment, which the company has nurtured so impressively over the years," said David Chipperfield, founder of David Chipperfield Architects.



Photo: © Simon Menges

Two towers at La Chapelle International neighbourhood in Paris

Paris, France – In the heart of the Chapelle International neighbourhood in the 18th arrondissement of Paris, currently undergoing major renewal, the firms of Brenac & Gonzalez & Associés and MOA Architecture are delivering two towers with a total of 254 apartments attached to 20 SOHO-type business spaces with apartments (Small Office/Home Office).

The E plot, composed of a platform dedicated to SOHO (Small Offices/Home Offices) and the two E1 and E2 towers, is inserted into a very sophisticated grid, evoking a lower and an upper town.

The specifically SOHO type of apartments offer a new vision blending workplace and home. The SOHO section base is divided along its length by a broad interior street designed as a lively, common area. This interior street extends all the way to the entrance lobby of the E2 in order to strengthen the link between the E1 and E2 towers. 20 business spaces located on the ground floor are directly accessible from the public area and benefit from a generous height of 3.80 metres. The apartments linked to these office spaces are found on the next floor of the base.

E1 tower

The E1 tower, designed by Brenac & Gonzalez & Associés, is designed with a gap so one can perceive not one tower but rather two smaller, sleek and slender towers. These two towers are joined together by a planted interstice and by an outdoor staircase, which bring light directly into the common

areas and, oriented in the direction of Sacré-Cœur, offer meeting places for the occupants.

An intermediate register comprised of balconies ensures the transition between the SOHO section and the World above. This section runs around the tower's entire circumference from level G+2 to G+6 to compose the lower skyline, designed to correspond to the current height of Paris buildings. The upper skyline extends from level G+6 to G+16 and is comprised of a prefabricated white concrete exoskeleton, highlighting broad horizontal lines and offering generous spaces supporting differentiated exterior spaces, thereby providing the project with a genuine interiority, which opens to spectacular views of the broader Paris cityscape.

E2 tower

The E2 tower, designed by MOA Architecture is comprised of two interlocking towers forming a single block. The "urban tower," aligned with the street and facing buildings opposite, possesses a "perforated wall" of windows based on a traditional model. The warmth of the carpentry with its wooden shutters balance the austerity of a plain concrete facade.

The "landscape tower," oriented southeastward in the direction of Sacré-Coeur, has a very delicate structure, on a 40-cm-wide column and beam grid, opening the interior spaces toward the urban landscape of Paris. Floor-to-ceiling glazed wooden doors offer total



E1 tower (on the left), Brenac & Gonzalez & Associés; E2 tower (on the right), MOA Architecture Photo: © Stefan Tuchila

transparency through the guardrails, which are designed to be virtually invisible from the terraces.

The tower's envelopes were designed as "exostructures." These so-called "tube-towers", lessen the building's weight by approximately 1/3 as compared with "Miesian" towers and their concrete core. This lightening of the weight offers maximum flexibility because, over time, not only can the useful spaces be reconfigured but also all the core spaces of distribution, which are defined by non-loadbearing walls. In addition, the savings in terms of concrete are an environmental and financial plus that cannot be ignored.

<p>ARCHITECTURE - INTERIOR DESIGN - LANDSCAPING - M.E.P. SYSTEMS</p> <p>SEAB SOUTHEAST ASIA BUILDING</p> <p>Temasek Shophouse Singapore</p> <p>PROJECT: Temasek Shophouse ARCHITECT: B&G Architects ARCHITECT'S OWNER: Temasek Water, President of Singapore Photo: Andrew Giam</p>	<p>ARCHITECTURE - INTERIOR DESIGN - LANDSCAPING - M.E.P. SYSTEMS</p> <p>SEAB SOUTHEAST ASIA BUILDING</p> <p>Capella Sanya Hainan, China</p> <p>PROJECT: Capella Sanya ARCHITECT'S OWNER: Capella Hotels & Resorts ARCHITECT'S OWNER: Capella Hotels & Resorts</p>	<p>ARCHITECTURE - INTERIOR DESIGN - LANDSCAPING - M.E.P. SYSTEMS</p> <p>SEAB SOUTHEAST ASIA BUILDING</p> <p>Jeju Shinhwa Theme Park Jeju Island, South Korea</p> <p>PROJECT: Jeju Shinhwa Theme Park ARCHITECT: B&G Architects ARCHITECT'S OWNER: Shinhwa Group ARCHITECT'S OWNER: Shinhwa Group</p>	<p>ARCHITECTURE - INTERIOR DESIGN - LANDSCAPING - M.E.P. SYSTEMS</p> <p>SEAB SOUTHEAST ASIA BUILDING</p> <p>The Galleria Singapore, Singapore</p> <p>PROJECT: The Galleria ARCHITECT: B&G Architects ARCHITECT'S OWNER: The Galleria ARCHITECT'S OWNER: The Galleria</p>
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<http://seab.tradelinkmedia.biz>

Ref Tools keeps HVACR professionals on the cutting edge

Nordborg, Denmark – As the cooling industry continues to evolve, HVACR professionals need tools, guidance, support, and information that keep them on the cutting edge. Ref Tools puts all of that in the palm of their hand.

Danfoss announced today that Refrigerant Slider, their popular P/T calculation app that has over 2 million downloads, will transform into Ref Tools, an essential, all-in-one mobile app for air conditioning and refrigeration technicians. Ref Tools will give HVACR professionals the tools, guidance, support, and information to keep them on the cutting edge.

Ref Tools includes five of Danfoss's most popular and useful air-conditioning and refrigeration tools:

Refrigerant Slider

While Refrigerant Slider is changing into Ref Tools, it will retain all the core functionality that made it a hit with millions of installers around the world. Users can still find Refrigerant Slider within Ref Tools and use it to quickly calculate pressure/temperature ratios for over 80 refrigerants.

Low-GWP Tool

Low-GWP Tool helps users find and compare climate-friendly refrigerants for retrofitting by checking compatibility with the cooling system's TXV.

Troubleshooter

Troubleshooter helps users identify and compare symptoms in a refrigeration system that's acting up. Once they identify the issue, Troubleshooter also recommends solutions to try.

Spare Parts

Spare Parts lets users access and order an extensive list of Danfoss spare parts and service kits for industrial refrigeration applications, right from the job site.



The new Ref Tools app includes five of Danfoss's most popular and useful air-conditioning and refrigeration tools. Photo: © Danfoss

Magnetic Tool

Magnetic Tool helps users test and troubleshoot solenoid valve coils quickly and easily.

Ref Tools lets users track their most visited service sites and save unique settings for each one. Users can also access Danfoss's popular Chilling with Jens podcast directly in the app, giving them a chance to learn something new about refrigeration while on the go.

"Ref Tools is an exciting next step into the future of digital tools in the cooling industry. By putting helpful tools in our customers' hands, we hope to make their daily tasks in the field much easier so they can save time. Ref Tools includes more than the tools they already know so well – and there's more coming down the road. We can't wait to reveal what's next," said Janni Koie, Director of Concepts & Content at Danfoss Cooling.

Ref Tools will be available to download for free in the Apple App Store and Google Play Store.

ASLA compelled to cancel the 2020 conference on landscape architecture

Washington, D.C., USA – The American Society of Landscape Architects (ASLA) announced it is canceling the 2020 ASLA Conference on Landscape Architecture, originally scheduled to take place in Miami Beach, Florida, in early October. The action comes amidst serious health and safety concerns surrounding the ongoing COVID-19 pandemic.

"For the health and safety of everyone involved, ASLA is unfortunately compelled to cancel the Conference on Landscape Architecture," said ASLA President Wendy Miller, FASLA. "While we're all disappointed an in-person conference is not possible this year, we now have a unique opportunity

to rethink how we as landscape architects connect – to one another, to the Society, and to our profession as a whole."

The 2020 Conference on Landscape Architecture will not be rescheduled. However, ASLA is planning to host a virtual event later in the fall.

"Our ASLA team is hard at work putting together a powerful virtual program for the fall that will keep everyone safe, increase access for those who couldn't or wouldn't travel this year, and help accomplish the goal we'd set out to achieve: rekindling the spirit of the profession for the year ahead," added Miller.

Finland's Biennial Architectural Review reflects architecture as a generator of well-being and stability of society

Helsinki, Finland – Finnish Architecture – Biennial Review 2020 presents a selection of recent projects showcasing new trends and high standards of excellence in Finnish architecture. The review is organised jointly by the Museum of Finnish Architecture, the Finnish Association of Architects SAFA and the Alvar Aalto Foundation. The review jury this year consists of Martin Braathen PhD., architect, from the National Museum of Norway (Nasjonalmuseet), Harri Hautajärvi D.Sc. (Tech) architect SAFA, and Kirsi Korhonen architect SAFA. This year the jury selected 15 architectural sites. According to the jury, the selections emphasised comprehensive quality-related aspects. At their best, the projects combine high-quality and creative architecture, a measured relationship with the environment, functionality, as well as ecologically sustainable building criteria.

"As regards the 15 projects included here – and not forgetting we had to exclude many good projects from the selection – we find that they represent the best Finnish architecture of the time. This sample is, for its part, a proof of the wellbeing and stable state of Finnish society. Many studies have ranked Finland amongst the best societies and happiest nations in the world – and here we find proof that it also continues to be a country of high-quality architecture," stated the jury.

The Exhibition Finnish Architecture – Biennial Review 2020 will open at the Museum of Finnish Architecture on 4 September 2020.

The 2020 projects are:

- Lapinmäki daycare centre (AFKS Architects)
- Helsinki Central Library Oodi (ALA Architects)
- Tuupala school (alt Architects and Architecture Office Karsikas)
- Käpylän Posteljooni housing block (Anttinen Oiva Architects)
- Gullkronan senior housing (Huttunen-Lipasti Architects)
- Amos Rex and Lasipalatsi restoration (JKMM Architects)
- Serpentine House renovation (Kati Salonen & Mona Schalin Architects)
- Sauna in the Yard (Mattila & Merz)
- Lammassaari Nature Trail (Nomaji Landscape Architects and Studio Puisto Architects)
- House MK5 (ORTRAUM architects)
- Fuzhou Strait Culture and Art Centre (PES-Architects)
- Sipoonlahti school extension (Architects Rudanko + Kankkunen and AFKS Architects)
- Airut residential block (Sauerbruch Hutton and Optiplan)
- Kakola Funicular (Vapaavuori Architects)
- Aalto University Väre building (Verstas Architects)

CHYBIK + KRISTOF ARCHITECTS win competition for the construction of the Jihlava Multipurpose Arena

Jihlava, Czech Republic – The result of a much-anticipated public competition, CHYBIK + KRISTOF ARCHITECTS & URBAN DESIGNERS have been selected to complete the construction of the Jihlava Multipurpose Arena – one of the largest sports and leisure complexes in the Czech Republic. The construction, due to begin in 2021 and end in 2023, will build on the city's existing hockey stadium, a deteriorating indoor sporting arena built in 1956, and expand into a four-building multifunctional centre bringing together an adaptable ice rink, a rooftop running track and a gym as well as a sports academy, hospitality establishments and shops. Hosting both regional sporting and cultural events, the completed structure will act as a public platform open to a variety of audiences for a diverse range of activities, in an effort to revitalise this long-neglected area of the city.

CHYBIK + KRISTOF's design for the new Jihlava Multipurpose Arena revisits the existing structure of the building, initially developed as the home stadium for the regional ice hockey club. A multifunctional space with a capacity of 5,600 spectators, the project extends the stadium's original purpose by creating a versatile space, adapted to both its primary sporting purposes within state-of-the-art facilities and a broad spectrum of activities – and their respective audiences.



Rendering for the Jihlava Multipurpose Arena. Image credit: monolot. Courtesy of CHYBIK + KRISTOF Architects & Urban Designers.

PLP Architecture designs smart headquarters for Yandex

London, UK – PLP Architecture is designing an innovative new smart headquarters for Yandex, the global technology leader, in the Gagarinsky District of Moscow. The inclusive, 170,000 square metres campus will enable staff to have a healthy and sustainable place for seamless work and recreation, a space for inspiration and fun that will integrate technology with materiality to inspire new ideas and refined ways of working. The campus will be a striking yet sensitive addition to the city's skyline, sitting on a prominent site near the Moskva River a short distance from the some of the city's leading research institutions and the location of the company's first office.

The sculptural, titanium-clad building will respect its sensitive context and connect to nearby parkland. Its adaptable design will bring a distinct



Rendering: © PLP Architecture

new ambition to the tech campus, accommodating employees under one roof for the first time in a secure, interactive, collaborative environment

that celebrates the company's identity, technological innovation and collaborative achievements and aspirations.

First Czech 3D-printed floating house is here

Praha, Czech Republic – Recently, PRVOK od Buřinky (PROTOZON by Buřinka), the first Czech 3D-printed floating house from concrete was "built" in České Budějovice. The whole house including inside partitions was printed in 22 hours and required 17 tons of the concrete mixture. As the concrete hardens, completion is under process, and when it is finished, the house will be transported to Prague.

At the end of the summer, it will open to the public at Střelecký ostrov. Progressively, PRVOK (PROTOZON) is



Photo: © Buřinka

undergoing important tests, such as the static pressure test, which concluded that the internal load-bearing wall can withstand 50-ton load, much more than any avalanche can throw at it. Other tests required for further development of 3D-printed houses will follow. The project is under the patronage of Karel Havlíček, Minister of Industry and Trade of the Czech Republic.

In the beginning of June, Buřinka, building society of Česká spořitelna (member of ERSTE), conducted a survey among its clients asking about important factors while purchasing a new house or restoring an old one. Almost 9,000 answers clearly show that sustainability is a key element for Czechs. Eco-friendly technologies reducing the cost of living, such as the heat pump or solar panels for water heating, are considered important by 48 percent of the respondents.

The survey also showed that the 3D-printing technology is well received by the public.

Working with the Experimental Centre of the Faculty of Civil Engineering at the Czech Technical University in Prague, team conducted a test of mechanical resistance and stability on a test 3D-print of one third of the house. They put a 50-ton load corresponding to two trucks fully loaded with gravel on the internal load-bearing wall. PRVOK (PROTOZON) can withstand a higher load than presented by the snow during an avalanche.



MAPEPLAN T WT is non-toxic and is also provided with its own EPD.

Savio di Ravenna

Mapeplan membranes are supplied by Polyglass (a subsidiary of the Mapei Group) for the largest hydroponics farm in Europe, a project of excellence in the name of sustainability.

Savio, in the province of Ravenna (central Italy), just on the edge of the Po Delta Regional Park, is the home of Valle Standiana Farm. Polyglass (a subsidiary of the Mapei Group) supplied MAPEPLAN T WT membrane to waterproof 13 hectares of tanks used for hydroponic cultivation, the largest in Europe in terms of size, applied technology and quality of crops harvested. A truly hi-tech greenhouse where various varieties of lettuce are grown in tanks floating on water, with a low impact on the environment and almost zero waste. The idea to transform 13 hectares of land into a hydroponics farm came from a visionary businessman, Gianluca Rossi. After a number of years studying the subject and spending time

abroad, he decided to take on the risks caused by climate change and the various diseases found in open-field cultivation, as well as improve working conditions. This was how the Ninfa brand of lettuce was developed, marketed by the companies Rossi Ortofrutta Srl and Agr'It Produce Srl.

99 percent of Valle Standiana Farm's hydroponic cultivation system is automated, guaranteeing that products are consistently high in quality without the risks normally associated with open-field farming. In fact, thanks to this floating system, it is possible to grow lettuce without the use of herbicides, considerably reducing the use of chemical substances.

Unlike traditional cultivation systems,

nutrients (mineral salts) are contained in the water and are fed through a high technology distribution system. They are absorbed by the plants according to their individual daily requirements, which means there is no leaching phenomenon or waste and they do not end up in the surrounding land or groundwater. The greenhouses also have open sides to provide natural ventilation and oxygenation.

Waterproofing the tanks

Design work on this complex system also involved the contribution of Polyglass to waterproof the water tanks. The product chosen in this case was MAPEPLAN T WT, a synthetic waterproofing membrane in flexible polyolefin TPO/FPO, suitable for hydroponic cultivation systems, potable water tanks, reservoirs, basins, cisterns, and irrigation canals. This type of membrane is root-resistant and resistant to microbiological attacks and weathering and has excellent mechanical properties, good workability and excellent weldability.

MAPEPLAN T WT waterproofing membranes are thermoplastic elastomers and are hot air welded. This process forms a fusion between the chains of molecules and the weld beads in MAPEPLAN T WT membranes are resistant to hydraulic heads and mechanical loads and stresses.

MAPEPLAN T WT membranes are flexible and have a glass mat reinforcement, which gives them a high level of dimensional stability and a low rate of linear thermal expansion, ensuring a minimum amount of movement caused by temperature variations (day/night, winter/summer) and, therefore, no risk of folds and waves, thereby forming a perfect membrane to



The water tanks were waterproofed using MAPEPLAN T WT.

ensure the hydroponic system functions perfectly.

MAPEPLAN T WT membranes come in a special green colour to help them blend in with its surroundings, but the colour also acts as a signal layer so that any damage caused by impact, scratches or tears in the surface can be identified and repaired immediately.

MAPEPLAN T WT is non-toxic, formulated without plasticizers and without hazardous substances which can be dangerous for both the human health and the planet. It is provided with its own EPD (Environmental Product Declaration). An Environmental Product Declaration is a report, written according to international standards (ISO 14025 and EN 15804), which documents the environmental impacts of a product during its whole life-cycle, measured according to the LCA (Life Cycle Assessment) methodology. This

is further proof of the commitment of Polyglass and the Mapei Group to the issues of environmental sustainability and transparency towards their clientele. MAPEPLAN T WT contains neither plasticizers nor substances that could be dangerous or harmful for human health and the environment.

In 2019, Valle Standiana Farm is expecting to cultivate around 9 million plants using the floating system, for a total of 4,000 tonnes of lettuce. Using traditional cultivation methods, it would take around 180 hectares of land to produce the same amount as the floating system, which only requires an area of 13 hectares. In savings terms, this system requires 70–80 percent less water and completely eliminates the use of herbicides, reducing the use of chemicals to a minimum. This cultivation system is a perfect example of the values shared by Polyglass: sustainable progress and technological development that respects the environment and reduces energy consumption.

Polyglass Product:
Mapeplan T WT
(For further information on products visit www.polyglass.com.)

Article source: Realtà Mapei International no. 77/2019

For more information, email mapei@mapei.com.sg.

PROJECT DATA

Project Name: Hydroponic cultivation tanks
Location: Savio di Ravenna, Italy
Year of Construction: 2017
Year of the Intervention: 2017
Intervention by Polyglass: Supply of products to waterproof tanks used in hydroponic cultivation
Client: Valle Standiana Farm
Installation Contractor: Fotonica Srl
Polyglass Coordinator: Mauro Redemagni, Polyglass SpA (Italy)
Photos: Provided by Mapei



Eden

Eden, designed by Heatherwick Studio, is a radical departure from the glass and steel tower typology.

Heatherwick Studio was commissioned by Swire Properties to design an apartment building in the historic Newton district of Singapore. Inspired by the vision of a 'city in a garden' imagined by Lee Kuan Yew 50 years ago, and by the lush tropical setting of the area, the studio's design for Eden is a radical departure from the glass and steel tower typology. The studio set out to craft homes within a garden that also harnessed all the benefits of apartment living; a place where residents would feel connected to the city's tree-lined streets whilst enjoying views, light and privacy. The design team's approach was to be empathetic to how it feels to live with all the thrill and excitement of living in a dense and busy city combined with our human need to have private space to escape to.

By pulling apart the square block of a conventional residential tower and moving the services to the perimeter, each apartment has a large central living space, surrounded by smaller individual rooms and wide shell-like balconies. The apartments are lifted 23 metres above an intensely planted ground-level tropical garden.

The strategic thinking behind the layout was to remove the need for mechanical cooling by raising up the first apartment and allowing natural

cross-ventilation through each apartment.

The windows in the concrete wall are minimised, thereby reducing solar gain, which can be a problem when big panes of glass are used to clad a building. To further optimise the passive cooling qualities, every large window is setback in the external wall, further protecting the glass from thermal conductivity.

Each balcony is recessed back towards the centre and embraced by the adjacent walls creating a protected exterior space. The south facing balconies alternate up the building providing a double height space yet also providing additional solar protection to the living space within.

The thermal massing qualities of the concrete contributes to the building's wider environmental strategy, but rather than casting a flat facade, the external walls are moulded with a topographical map of Singapore's terrain, which has been abstracted to create a unique three-dimensional texture. This brought the material to life and gives it tactility and a texture that is specific to this particular project.

The colour of the building also plays a role in creating the identity of the project. To find the ideal tone that would appear natural and complement the concrete, more than a hundred deep red, purple and brown shades were tested under the Singaporean sun.





Interior surfaces have been crafted to give the living spaces warmth by celebrating the natural imperfections of organic materials; natural knot marks are left visible in the handmade parquet flooring which continues outdoors with a textured herringbone-patterned slate.

The large central space and glass-fronted balconies fill the

interior with natural light. The lighting strategy is designed to complement the textures of the natural materials, while giving residents flexibility to create different settings.

The building represents a unique way of living in the city, with its combination of evocative natural materials, textures and crafted details and its celebration of the area's natural landscape.

Over time, the building is designed to mature, as the lush planting grows, like a sapling that has taken root beneath the streets, pulling the landscape of Singapore up into the sky.

At ground level, entrance is through a canyon-like corridor, 1.5 metres wide and more than ten times as high, lined with black granite. This opens into a dramatic 18-metre-high lobby at the heart of the building, hung with living plant chandeliers. The exposed undersides of the balconies are rendered in smooth, highly polished concrete. The studio developed a bespoke casting technique to bring the ideal mixture and concentration of stones to the surface at these points, giving a rugged, industrial material a precious, gem-like quality.

In the bathrooms, the sink, vanity unit and bath have been custom-designed for the project by Heatherwick Studio, and utilise a restrained yet rich palette of materials.

A beautifully crafted lift takes residents to their dedicated private floor. At the heart of every apartment, there is a large light central space, sheltered by the concrete structure and wrapped in the greenery of the lush tropical balcony, with views of the city beyond – this is conceived as a place for togetherness. More private rooms and discreet service areas extend from this main living space. The outdoor space flows organically from the interior and is shaded both by the curated planting and the strategic positioning of the balconies above.





At ground level the language of mineral textures and lush tropical planting is continued: the swimming pool is clad in deep green ceramic tiles to give the impression of a natural lake, the paths, social spaces and hard landscaping are paved in different shades of green granite, and the fitness centre is in a garden pavilion. Specially commissioned Spun chairs made from polished green granite are set within the natural shade

provided by the landscaped garden at ground level.

To create tranquil and luxurious outdoor living spaces for the ground level a rich variety of unusual and exotic tropical plants with different forms, heights, textures, and colours have been used. The Eden had won the Green Mark Platinum award in 2019 from the Building and Construction Authority (BCA) in Singapore.



Thomas Heatherwick.
Photo: © Heatherwick Studio

“Like most global cities, Singapore’s skyline is filled with angular steel and glass towers. With Swire Properties we wanted to create something distinctive that represents Singapore as a city in a garden, and recreate the verdant backyard access once ubiquitous across homes here. Instead of glass-clad edifices with token balconies, each home within ‘EDEN’ will have a lush garden right at the doorstep with organic and generous living spaces achieved by breaking up the traditional boxy floorplate.”

– Thomas Heatherwick, Founder of Heatherwick Studio



PROJECT DATA

Project Name: Eden
Location: Singapore
Architecture Firm: Heatherwick Studio
Gross Floor Area: 6,521 square metres
Completion: 2019
Photos: © Hufton + Crow



New Futura

Located in a vibrant centre-city district characterised by bold architecture, New Futura is a striking addition to the Singapore skyline. It is designed by Skidmore, Owings & Merrill (SOM).

The design of the residential complex is inspired by rigorous patterns, rich hardwoods, the beauty of repetition, and strong and precise detail. Integrated massing and programming and an efficient facade strategy are key to the project's innovative, iconic design.

The 23,217-square-metre New Futura condominium is comprised of two mirroring 36-storey towers, located at the heart of a vibrant centre-city district in Singapore. The towers' design, comprised of rigorous, curvilinear patterns, was crafted in response to the site's energetic urban context – making them a fitting addition to a neighbourhood already characterised by its bold architecture. Creating a top-tier residential experience was one of SOM's primary design objectives: the towers provide tranquility within a busy city, featuring spacious luxury units with



panoramic views of Singapore as well as a variety of premier on-site amenities. Sustainability and efficiency were also leading design objectives.

SOM designed a custom unitized curtain wall system to enhance quality control during fabrication and to facilitate rapid and efficient installation. High-performance insulating glass was selected to create a sustainable thermal performance in the facade. An advanced, low-e coating provides solar control, while still offering ample natural light transmittance to the interior. Sculpted aluminum fins, which alternate with the glass, serve as external sunshades with advanced paint coatings that further reduce direct solar radiation. Wrapping around the facade, the aluminum sunshades simultaneously act as light shelves,







bringing indirect sunlight deeper into the apartment units. Custom balconies lend the facade a sculptural aesthetic and provide additional shade. Sky and roof terraces reduce the heat island effect and help manage stormwater.

The twin towers occupy a footprint of just 25 percent. This frees up the remaining 75 percent of the 87,000-square-foot site for more than 50 facilities, including the multi-tiered landscape, waterfall, green atrium, a 45-metre infinity lap pool, aqua beds, and a hot tub. At Club Futura, a two-level clubhouse, residents and their guests will be able to enjoy private dining. The landscaped grounds feature iconic masterpieces by renowned sculptor David Harber. Flexible floorplates and efficient unit sizes maximise unit count and allow for a wide variety of unit sizes. Public and private layers are woven together in a smooth and complex form – six sky gardens are placed periodically throughout the towers, allowing greenspace to punctuate the glass and aluminum facade. Additional amenities include pools, a playground, a jogging track, gourmet dining facilities, a barbecue terrace, and a clubhouse.

PROJECT DATA

Project Name: New Futura
Location: Singapore
Client: City Developments Ltd (CDL)
Lead Architectural Designer: Skidmore, Owings & Merrill (SOM)
Local Design Firm: ADDP Architects LLP
Gross Floor Area: 23,217 square metres
Completion: 2017
Photos: Courtesy SOM © Studio Periphery



Colin Koop. Photo: © SOM

“Our objective was to create an iconic complex that also provides a top-level residential experience. With its bold, curvilinear facade – which is punctuated by a series of communal gardens – New Futura is a compelling addition to Singapore’s skyline, and fits perfectly into the neighbourhood’s energetic urban context.”

– SOM Design Partner Colin Koop



Oasis Terraces

Serie and Multiply Architects have completed Oasis Terraces, a neighbourhood centre and polyclinic at Punggol in Singapore.

Serie Architects working in collaboration with Multiply Architects has completed Oasis Terraces, the new Punggol Neighbourhood Centre and Polyclinic in Singapore.

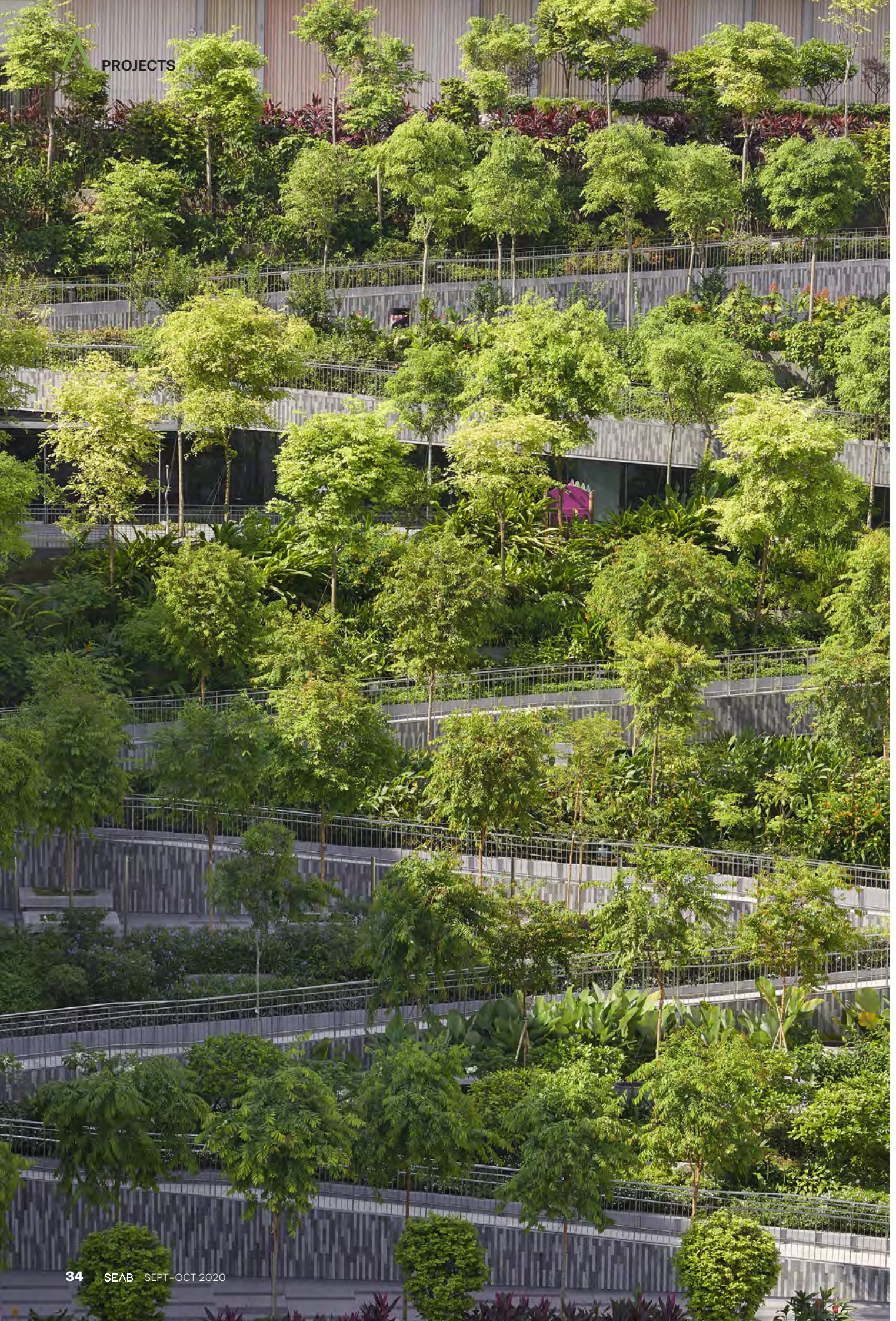
Oasis Terraces is a new generation of community centres developed by Singapore's Housing and Development Board to serve its public housing neighbourhoods. The 27,000 square metres centre comprises communal facilities, shopping, amenities and a government polyclinic.

Serie Architects' design utilises a series of lush garden terraces that slope towards the waterway as one of the key elements to generate communal activities. These lush gardens act as communal spaces, children's playgrounds and a natural amphitheatre.

The roof is also heavily landscaped and features planting beds for urban farming. The gardens play more than just an aesthetic role in the community; they are a collective horticultural project. By bringing residents together to plant, maintain and enjoy them, the gardens help nourish community bonds.

Overlooking the communal gardens on platforms are rooms and outdoor areas for communal dining, restaurants, education centres, and polyclinic services. These spaces are directly connected to the terraced







garden, allowing dining activities to spill out into these areas. Likewise, the waiting areas of the polyclinic enjoy views of the garden terraces and waterways.

A large sheltered plaza fronting the waterways creates the vibrant heart for the community. This plaza will be used for a wide range of communal activities and events and sits at the crossing point of the east-west and north-south thoroughfares of the site. All circulation through the site and from the adjacent Oasis LRT station culminates at the plaza.

Every visible elevation of the building is covered with lush plating. Together with the veranda spaces that wrap around the restaurants and polyclinic, the plants act as an environmental filter between the exterior and interior spaces. The architecture is also characterised by a sense of lightness and openness allowing daylight and breezes to permeate the building, promoting the use of natural ventilation.

The project was awarded the World Architecture Festival's Best Completed Mixed-Use Building in 2019.



Christopher Lee. Photo: © Jordi Huisman

“Our design is informed by the open frames commonly found in the facades and corridors of HDB’s housing blocks of the 70s and 80s. We’ve transformed this precedent into a light and open frame that captures and accommodates diverse programmes for the community in a landscape setting – it is an architectural framework for communal life to unfold.”

– Christopher Lee, Principal of Serie Architects



PROJECT DATA

Project Name: Oasis Terraces
Location: Singapore
Client: Housing & Development Board (HDB)
Design Architect: Serie Architects
Executive Architect: Multiply Architects LLP
Area: 27,000 square metres
Completion: 2018
Photography: Hufton + Crow



Can Gio Pavilions

Designed by Olivier SOUQUET and DE-SO Asia, the Can Gio Pavilions is a sustainable project located in the green lung of the city.

The Can Gio forest stretches over 75,740 hectare of land, which gathers about 150 plant species. Close to Ho Chi Minh City (60 kilometres), this area is also considered as the green lung of the city with its typical mangroves possessing a variety of unique and rare species.

A bird wings-shaped building

Can Gio Restaurant is designed like a pair of bird wings spreading across the Can Gio Mangrove Forest located in the South of Ho Chi Minh City (the natural space has been classified as one of the International Biosphere Reserves by UNESCO in 2000).



The wings forming a V shape frame up the view to the far horizon where the sun rises.

A natural mineral stone platform leveling up the base emphasises this clear angle of view towards the mangrove horizon and the view to the appealing circular green lake in the front. The project is located in a touristic and populated area.

The project designed as an opened public space, protected from the typical sunlight and heavy rains of the region by two V-shaped roofs. These large roofs function as a picture frame capturing all the beautiful surrounding landscape. This sophisticated design adapts perfectly to the program desired by the Investor. The purpose is to create a welcoming area to receive visitors and a multi-functional space to organise various kinds of events: Conference and seminar meetings, temporary restaurant





equipped with professional kitchen facilities, events functions for large groups and seasonal exhibitions.

"The building is like an observatory of the landscape. The shape of building defined windows and perspectives to admire the natural landscape. Heavy and light; massive platform, moucharabieh of laterite and light filter, metallic roof works together to reveals the site and the natural atmosphere of the site," said Olivier Souquet, Architect Partner Chairman, DE-SO Asia.

The main facilities of the venue are:

- Two dining rooms equipped with air conditioning.
- A large kitchen with storage and chilled room.
- Sanitary areas.

This model complements to the tourist planning which usually consisted of just hotels, resorts equipped with swimming pool, townhouses and villas, to offer an opportunity to go relaxing out of HCM city on the weekends.



The project must be able to cope with:

- The strong sun that whitens everything around
- Heavy rains and thunderstorms coming from the East Sea
- The dry wind

The colour of the project is inspired from typical local sand colour and mangrove trees roots. The project uses also light gray colour similar to the silt which highlights the saturated green vegetation of the mangrove.

The base

Using the monolithic laterite stones to build the base in order to lift up the ground floor level and establish an architectural order so as to well anchor the house into the sandy and silty site.

Ramps and stairs lead the way up to terrace. A central tree with ethereal foliage (*Termilia Mantaly*) brings shade and freshness to the terrace.

The four buildings (pentagon) and the base are made of concrete covered with gray laterite stone. They are unitary.

This laterite is also used in massive stones of 10cm thickness to create the lattice wall for closed and air-conditioned dining rooms.

At night the lattice plays as a Chinese lantern diffusing the saturated colour on the walls of the interior spaces.

Construction

Constructing a building in the harsh tropical climate like the Can Gio region is a technical and ecological challenge, the pavilions are built with local Vietnamese materials and with the minimum of composite materials.

The construction elements are elements of small sizes assembled. Can Gio is a peninsula accessible by ferry, it is difficult to deliver materials by boat and deliveries are always limited to small quantities. It's about being strong, durable, withstanding heavy rain, the hot vertical sun, and skillfully taking advantage of the chill wind coming from the ocean.

Garden

The construction materials used are matt, only the glazed elements and the black and green ceramic pots imported from Bin Duong bring reflections. (Recalls of Mekong jars storing water or Nuoc mam). A garden composed of tamarins surrounds the project. Designed in 2018, the project was delivered in 2020.



Olivier Souquet. Photo: © DE-SO

“Our attention to the specific geography and location of every project is done here with the geometric shape of the two wings. The strong angular geometry revealed the smooth geography of the rivers and the lake. Each project’s intended uses, functionality and materials are all underpinned by our mastery of the drawing, where geometry meets geography.”

– Olivier Souquet, Architect Partner Chairman, DE-SO Asia



PROJECT DATA

Project Name: Can Gio Pavilions
Location: Can Gio, Ho Chi Minh City, Vietnam
Architecture Firm: DE-SO Asia
Gross Floor Area: 350 square metres
Completion: 2020
Photos: © Hiroki Oki



THE PAVILIA BAY

Designed by LWK + PARTNERS, THE PAVILIA BAY is a luxury and sustainable residential project in Hong Kong that sails under iridescent sunlight upon the Rambler Channel.

The project site sits on the waterfront, and the brilliant sunset over the waters struck the heart of the designer – basked in sunlight, the concept for THE PAVILIA BAY was thus conceived. In the dense city of Hong Kong, this magnificent open view must be highlighted – the project can be read as a yacht embarking its journey towards the waters.

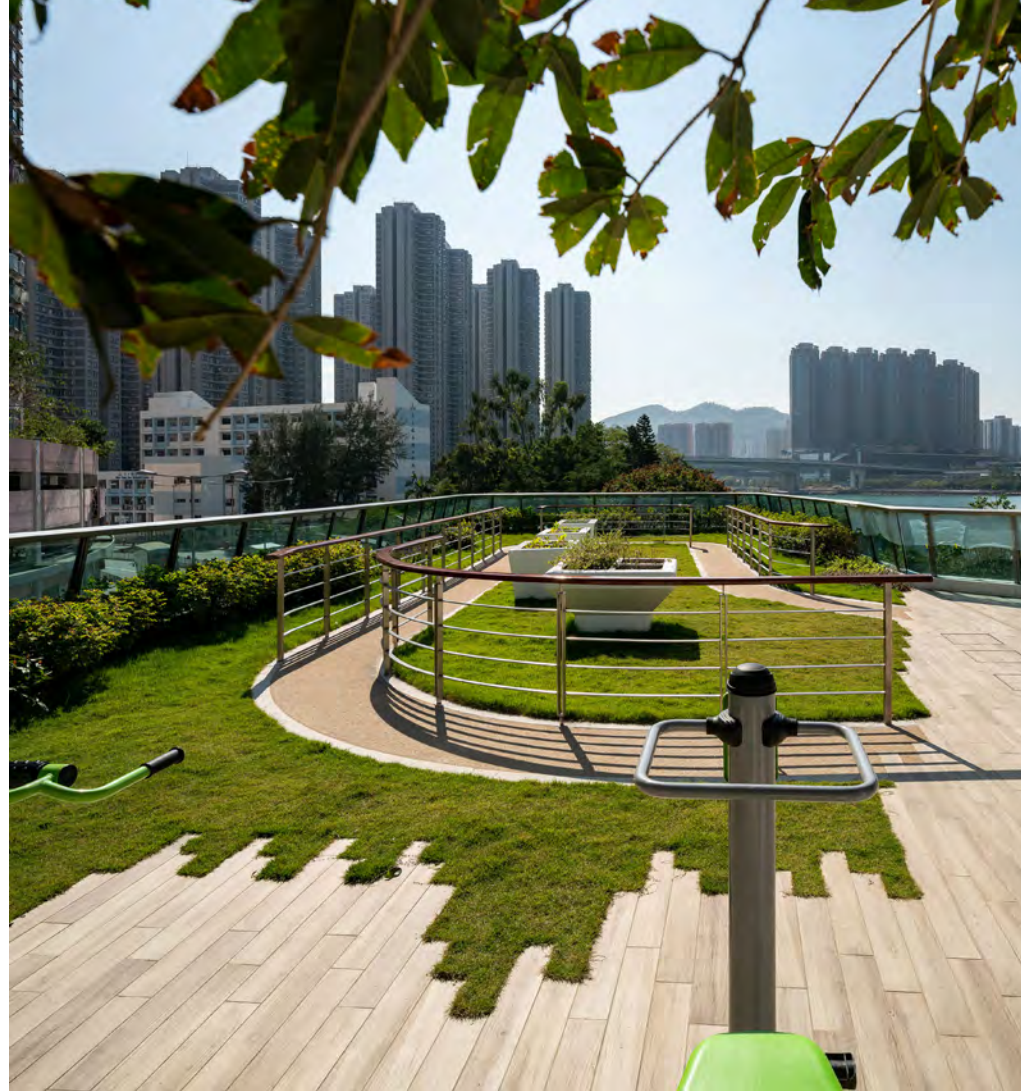
The themes of 'sunshine' and 'yachting' was carried all the way from macro building form, elevation, interiors, down to micro details such as door handle and signage designs.

The nautical design language and visualisation of sunlight is articulated through and highlighted by the streamlines that

form the main character and feature of the building form. There are no sharp corners or straight lines in the three-dimensional curvy form of the elevation. This softens the often stiff and rigid architecture and allows the building to merge with the surrounding. The design also uses neutral colours such as white, cream, heather grey and beige to radiate a calm, balanced aura. The use of materials, texture and colour palette all have a strong association to a super yacht.

To take full advantage of the site, the residential towers are oriented to maximise sea view for each residential unit. The project features a large number of open air terraces and balconies with posh sofas, lounge chairs and transparent parapets, so that residents can have an unobstructed view of the Rambler Channel, enhancing the overall visual connection with the surroundings. The large on-grade featured and uncovered landscape area is connected to the main pedestrian route, encouraging visual contact between the residents, and ultimately promotes social integration within the development.

An efficient, safe, and convenient pedestrian circulation system is laid







out throughout the neighbourhood. Landscape elements are designed for the pedestrian route at main entrance to create better walking experience, and separate it from vehicular circulation.

Trees and plantings will be placed around the road as buffer to the pedestrian zone whilst the well ventilated open space also enhances pedestrian comfort. All private vehicles will be directed to the underground car park to create efficient vehicular circulation system.

Various studies were carried out to measure the impacts of the use of specific building materials. For example, solar study was carried out to determine the thermal performance of the low

emissivity insulated glazing units (IGUs), while noise impact assessment was carried out on noise sensitive receivers of the residential units, such as the vertical fins, enhanced glazing, and other parts of the building where needed.

To combat adverse effects of insulation, the reflectance of roof materials has a Solar Reflective Index of no less than 78. This, together with the IGUs, can lower heat gain and relieve the cooling loads of air-conditioning in the building. Over 10 percent of the hard-pavers in the development are recycled materials, while food decomposers are installed to minimise the impact of waste to the environment.



HC Chan. Photo: © LWK + PARTNERS

“Integration of yacht design into architecture skillfully straddle the line between deconstruction to reconstruction, shaping the urban skyline with its distinctive brand of architecture and offering its own interpretations of sustainable vision in close proximity to vibrant waterfront.”

– HC Chan, Director,
LWK + PARTNERS



PROJECT DATA

Project Name: THE PAVILIA BAY
Location: Hong Kong, China
Client: New World Development Company Limited
Architect Firm: LWK + PARTNERS
Gross Floor Area: 62,710.038 square metres
Completion: 2018
Photos: © LWK + PARTNERS



Hideout Bali. Photo: © @thenomad

Hideout Bali

Hideout Bali, designed by Studio WNA, is a unique eco getaway in the Karangasem region of Bali. It is made from sustainable bamboo design.

Bali is one of the top tourism destinations in the world with amazing nature, beautiful art and culture. Also, the hospitality of its people has become a world attraction. The Hideout Bali is not a fancy hotel but a Glamping (glamorous camping) project comprising of Hideout Beehive, Hideout Falcon, Hideout Horizon and Hideout Bali bamboo cabins. The project is aimed at young people who love exciting adventures and love the environment, as well as honeymooners and millennials who want to be alone from the crowd of the city. The client, Hideout Bali, does not only sells the rooms but more importantly the experiences that each building can give to the guests. The modern bamboo design with simple shape, comfortable, eco friendly and instgramable design

were the design goals of the architects for this project.

Studio WNA's building's design is open to allow good air flow, no air-conditioning, and maximum lighting from skylights also open walls. So it really saves energy in every building. While the hot air is filtered by the trees around the building. Besides that the plants also become a very sound barrier, privacy between buildings and the environment. Bamboo and thatch roofs also reduce the sun's heat entering the building. With a land area of 3,200 square metres, the architects built only six building units. So they only used 20 percent of the total land area, so each of the buildings has a large garden for good rainwater catchment. Many of the buildings have raised floors, reducing the footprint of the building.

This Glamping is designed to use bamboo material as the main material, which is of course environmentally friendly, and is obtained from the local community around the project who are actively planting bamboo in their village. Bamboo can be used as building material when it is three years old and is able to grow quickly.

In this project, Studio WNA taught local communities to process bamboo using 'organic plant extract' (Freemite) so that bamboo can be used for more than 20 years. The architects used local bamboo skill craftsmen who live near this project and taught them how to build good quality, strong and beautiful bamboo buildings. This is like the transfer of knowledge from professional bamboo architects to the local community to improve their carpentry knowledge.





Hideout Bali. Photo: © @valentinoluis.indonesia



Hideout Falcon. Photo: © @driftersandlovers



Widhi Nugroho. Photo: © @studioWNA

“In this project, we not only designed environmentally friendly buildings, but we also involved local communities in the process. So they also benefitted economically and have good bamboo construction skills for their future.”

– Widhi Nugroho,
Principal Architect, Studio WNA

PROJECT DATA

Project Name: Hideout Bali
Location: Selat, Karangasem, Bali Indonesia
Client: Hideout Bali (Jarmil + Alena)
Architectural Firm: Studio WNA
Gross Floor Area: 334 square metres
Completion: 2015 to 2019



Vegetable garden and multi-purpose playground on the roof contrast with surrounding iron roofs.

The Red Roof

Conceptualised by TAA Design, the Red Roof has a green covering structure, which both cools the inside and reduces heat radiation to the environment.

The project is a small house on an area of 80 square metres. The site is located on the main road of the village. Urbanisation has changed the architecture and living space of this village. New houses with styles that one can easily find in big cities has disrupted their familiar landscape and lifestyle.

The house is meant for a married couple over 50s who has been living in this rural area since they were born. In search for a new appropriate typology for the context, we are convinced that adapting the new architecture based on the traditional



The stair-step method create a comfortable slope and reduces the height of facade.

cultural lifestyle of the couple is the most important task.

Vegetable garden, playground and connecting space

Connecting with nature, daily activities are gardening, paddy drying, etc. Vegetable gardens and multi-purpose playgrounds become the soul of houses in this village.

Instead of having a large yard like other houses in the village, we create many courtyards with different heights, suitable for the height of the house structure. Rooftop garden is adjacent to the courtyard of the mezzanine floor, creating a playground & vegetable garden that connects from the roof to the ground floor.

Ecosystem

The house is designed with a green covering structure of the roof, both cooling inside and reducing heat radiation to the environment.

Rooftop garden also have the role of providing fresh and available food for daily meals, the agricultural lifestyle is preserved and developed in parallel with urbanisation.

The owner have shared their products with the neighbor families, unexpectedly, the architecture has been generating community social interactions in the village.



Garden layers connect from ground floor and mezzanine floor to the roof.



Ecosystem - The roof greening structure and return green space to the urban.

Energy saving

With the solution of planting trees on the roof. Soil and vegetable have created insulation, moisturising and cooling layers for the space below. In the tropical zone, the hot season can reach 40 degrees Celsius, but the inside temperature of the house decreases 8 degrees Celsius compared to the outside.

Combined with the 2-layer wall, there are ventilation openings on the wall and courtyards with natural lighting, so the house is always airy. The space and function of the house help the owner feel close to the life of a countryside, where associated with land, light, rain, trees and animals.

Rural architectural typology

In Vietnamese traditional landscape, red terracotta-roof houses represented

for a time of regional local architecture. However, now new multi-storey houses with steel roofs seem to have lost the identity of village landscape.

The stair-step method reduces the height of façade, help urban space is not overwhelmed, and create a comfortable slope. This establishes the communication between the space on the roof and the space under the road. "The red roof" has the intent to keep, to store and remind the familiar rural lifestyle.

Replicability

Preserving the agricultural & cultural lifestyle. In the context of rapid urbanisation, houses on the main roads in the villages have small plot area, not enough to contain garden space and agricultural activities. Therefore, the idea of agricultural garden and multi-

purpose space on the roof is suitable for the context and lifestyle of people in this area.

Replicating this model and suiting individual needs with the creativity of each roof structure, the agricultural activities on the roof will create a unique and interesting culture of the region.

PROJECT DATA

Project Name: The Red Roof
Location: Quang Ngai, Vietnam
Client: Confidential
Architectural Firm: TAA Design
Gross Floor Area: 190 square metres
Completion: 2019
Photos: © TAA Design



Mr Nguyen Van Thien. Photo: © TAA Design

““The Red Roof” has the intent to keep the familiar lifestyle of people in a small site area, through playground and garden on the roof. The house is not only to live, but also agricultural production. The green roof is an impressive highlight in the context of the hot metal – roof houses, increasing in the village.”

– Mr Nguyen Van Thien,
 Founder and Architecture Principal of TAA Design



Viettel Headquarters

A new ideal for the corporate world, Viettel Group's new headquarters, designed by Gensler, integrates work and landscape spaces seamlessly.

Keeping in mind the importance of environmental sustainability and urban biodiversity while melding a strong corporate identity, this in result has created a responsible, productive and attractive workplace.

Located in Hanoi's new commercial centre, Viettel's one-of-a-kind headquarters is Gensler's first headquarters office building designed and completed in Vietnam. As the hub of Vietnam's largest telecommunication company, this unique structure stands out from a uniform cityscape. The optimized oval geometry fosters a

high-energy collaborative working environment through connecting employees via interconnected floor spaces across all eight levels. This includes a 800-seat auditorium which serves to provide a functional event space in the premises itself.

Keeping local cultural and tradition requirements in mind, the Gensler team delivered efficient design of the building massing and orientation on a fast track project programme.

With employee work environment and sustainability as core design drivers, the building is designed from the inside-out. Floor plates customised to an ideal depth



EeTiong Lim. Photo: Courtesy of Gensler (Photography by Owen Raggett)

with its series of skylights brings natural light to all working areas and reduces the need for artificial lighting.

The facility also utilises natural barriers to combat Hanoi's tropical climate and fosters an ecological habitat within the city.

Despite an abundance of natural light, horizontal louvers installed screen the interior from solar glare and effectively reduce solar heat gain, resulting in a smaller heating, ventilation, and air-conditioning (HVAC) load. The aesthetically pleasing landscape design incorporated with native plants forms the

iconic green roof which also similarly reduces heat gain throughout the day. Users can also enjoy the break-out space at the landscaped terraced roof gardens on either sides of the sloping roof. Other green features include a rainwater harvesting system.

Gensler's design for Viettel's new campus in Hanoi redefines how an office building performs. Viettel's strong roots in the telecommunication market will continue to prevail as they champion innovation and embrace change with a building that will last for generations to come.

“A signature project that represents the client's company ethos, culture and aspirations through its unique form, spatial design and sustainable features.”

– EeTiong Lim, ARB (UK), RIBA, LEED GA, Studio Director, Gensler



PROJECT DATA

Project Name: Viettel Headquarters
Location: Hanoi, Vietnam
Client: Viettel Group
Architectural Firm: Gensler
Gross Floor Area: 23,710 square metres
Completion: 2020
Photo: Courtesy of Gensler (Photography by Owen Raggett)



Adventurous Global School

Orient Occident Atelier utilized local construction methodology in a contemporary way to mitigate climatic problems, for cost-savings and to empower people with local skills.

The school transforms the construction site itself into a learning kit. The building is not only a traditional lecture space but a proactive space for learning design, construction and spatial creativity. During construction, students will take part in some manageable design. Local



kids explore new uses of space by action. They climb the "Griddy" construction as though it is a jungle gym.

The school is a versatile architectural building envelope. There are spatial flexibilities to the end-users, the "Griddy" detail ironmongeries allow the re-configuration of the openings, shelves and lockers. The wall is a double layer steel frame with local wood plates allowing storage and even vertical circulation. The ground classrooms are seamlessly connected with adjacent houses and fields, thereby catering to different events, learning activities and class sizes. The relation between interior and exterior can thus be customised by the users in the future. It is a welcoming space in which other villagers and students can always see what's going on and join the classes.

The design utilises vernacular methodologies and material. Bricks, GMS, and wood were discovered from the region which are common building materials. Levitated concrete structure mitigates flooding problems and preserves the traditional Cambodian ground floor open space. Local construction methodology was used – cost-saving and also empowers people with local skills. The use of the local construction methodologies enabled cost-savings and empowered people with local skills to help build with efficiency.

The project preserves the village context with a bottom-up design approach. The school development triggers various improvements for the rural village.

The school embodies a versatile architectural building envelope named "Griddy". Its detail and ironmongeries allow the re-configuration of the openings, shelves and lockers. The wall consists of a double layer steel frame with local timber plates inserted allowing storage and even vertical circulation. The ground classrooms are seamlessly connected with adjacent houses and fields, in which its relationship between the interior and exterior can be

customised by the users, thereby catering different event needs, learning activities and class sizes. It is a welcoming space in which other villagers and students can always see what's going on and join the classes. After the school was set up, more power supply, tuck shops, water filtration system were set up around. The building is not merely a cluster of classrooms but a social hub where the provision of education, sanitation, retail, community infrastructure, gathering space, etc. could be possible, hence improving daily lives of the villagers. Over the course of 3 years, it has attracted dozens of volunteers to help build and teach at the site.







PROJECT DATA

Project Name: Adventurous Global School
Location: Sneung, Battambang, Kingdom of Cambodia
Client: Adventurous Global School, Ptea Teuk Dong
Architectural Firm: Orient Occident Atelier
Gross Built Area: 400 square metres
Completion: 2017
Photos: © Magic Kwan and © Kenrick Wong



Magic Kwan. Photo: © Orient Occident Atelier



Kenrick Wong. Photo: © Orient Occident Atelier

“We believe in the power of architecture enriching the lives of those improvised. The school design empowers the teachers and students to constantly engage in design, redesign and utilize the teaching and learning spaces which best suit their interests and curriculum needs.”

– Magic Kwan and Kenrick Wong, Co-Founders of Orient Occident Atelier



University of Windsor – Ed Lumley Centre for Engineering Innovation, designed by B+H Architects.

ROLE OF GREEN BUILDINGS IN TACKLING COVID-19 CRISIS

In this section, we hear from architects on how green buildings can help to prevent and control Covid-19.

Cory Hawbecker

RA, LEED AP, CPHC,
Principal and
Sustainability Director
at Holst



Cory Hawbecker. Photo: © KLiK Concepts

Suddenly we are all much more aware of the way that we physically interact with each other, and the direct and indirect ways in which buildings influence those interactions. The most obvious consideration is the amount of personal space afforded to building occupants, as well as circulation constraints that limit the ability to maintain safe distances between individuals.

Far less obvious but just as important are issues having to do with maintaining healthy air inside spaces. Green buildings are in some ways well suited to prevent the spread of COVID 19, and in other ways they face challenges.

Green buildings often provide generous access to natural daylight, which can help destroy the virus in the air and on surfaces. Green buildings are often constructed to be more air-tight than standard construction, so also typically provide a greater amount of fresh air to interior spaces. This reduces the likelihood that the interior air will pass the virus from one individual to the next.

However, the ventilation systems of green buildings need to be carefully considered to balance energy consumption with clean, fresh air. Opening windows is a way to increase

the amount of fresh air in a space, but in hot or cold climates, or urban areas where noise or pollution are a concern, uncontrolled natural ventilation is not desirable and can greatly increase energy consumption. One way to save energy is to mechanically recirculate interior air, thereby reducing heating or cooling loads. Without proper filtration, this recirculated air could quickly distribute the virus around the building and potentially infect other occupants. A clear way to prevent this is to provide a constant supply of 100 percent outside air to spaces, but the system should be designed with an Energy Recovery Ventilator (ERV) to reduce energy consumption.

It is important to protect individuals from the spread of COVID 19, but the emergency of anthropomorphic climate change is still facing us even after the pandemic has passed. It is critical that we not lose sight of that challenge while society mobilizes to fight COVID 19. It is my hope that the massive effort to address the pandemic will make us aware that we have the ability to organise in a large scale way to address global problems, and we can use this awareness to direct our collective effort towards reducing humanity's impact on the climate.

Ondřej Chybík and Michal Krištof

Architects and Founders of CHYBIK + KRISTOF
Architects & Urban Designers



By building sustainably – using local and natural materials that do not emit any toxic substances, orienting the building appropriately to its climate, using proper ventilation systems, implementing eco-paint, water management tactics, integrating generous outdoor and indoor green spaces, etc. – architects have already been designing spaces that are not only healthy for the end user, but also for the people involved in the building process. We trust that the principles of sustainability will successfully guide us in tackling not only the pandemic that has now taken hold of our society, but even more importantly the bigger threat of climate change.

Ondřej Chybík (left) and Michal Krištof. Photography by Vojtěch Veškrna. Courtesy of CHYBIK + KRISTOF.

Melissa Venoy

AIA, LEED AP,
Associate Principal,
Goettsch Partners



Melissa Venoy

Green building strategies have been recognised as effective measures in fighting pandemics and outbreaks on a global scale several times in the past. The 1918 influenza outbreak in New York, for example, led to housing reform that offered "sunshine, space and air" to all building tenants. The SARS outbreak in 2003 led to changes in high-rise sanitary systems. Bacterial disease outbreaks such as tuberculosis have led to treatment environments

that incorporate plenty of fresh air and sunlight. In looking to past examples, it is clear that green buildings can offer some of the solutions needed to prevent and control Covid-19.

Covid-19 has been described as an airborne illness spread through droplets released when an infected person sneezes, coughs or talks. With this idea in mind, one of the most critical ways green buildings can help prevent and control Covid-19 is by improving indoor air quality.

Typically, buildings utilise recirculating air systems, which can increase the chance of contaminated air becoming trapped in air vents and conditioning systems, thus recirculating the virus. Green buildings, however, maintain a higher level of indoor air quality by being well ventilated and providing increased amounts of outside air. The outside air helps to decrease the contaminants and reduce the spread of the virus. Many GP projects, including completed ones such as the 150 North Riverside office tower in Chicago, are evaluating the cost of upgrading ventilation systems to improve the airflow within the building. It is clear that increasing the ventilation of a building to provide a healthier environment will become more important as a result of this pandemic.

In addition to mechanical ventilation,

providing fresh air through operable windows and access to exterior spaces helps improve the overall health and immunity of the building occupants. Biophilic design, a design that more closely connects building occupants with nature, has been shown to lower blood pressure, improve heart rates and boost immune system performance, which are critical factors for an individual to stay healthy during a pandemic. In Shantou, China, GP is currently in design on a mixed-use complex for which the five tower facades and 60,000 square metres of retail space were completely redesigned in response to the pandemic. The tower façades now incorporate terraces and greenery for all tower users while the retail mall incorporates external terracing and two floors of outdoor mall space to ensure that retail customers feel connected to nature throughout their entire shopping and dining experience.

Covid-19 will likely not be the last pandemic the world will need to overcome; however, due to the widespread outbreak of this virus, there is real potential for green building strategies to become the norm to help mitigate future outbreaks and create healthy environments in general. These two scenarios would be two positive outcomes from this epidemic that would benefit generations to come.

Casey Chua

Director and Founder,
ADX Architects,
Singapore



Casey Chua. Photo: © ADX Architects Pte Ltd

The COVID 19 pandemic has permanently changed the way we view our environments. The way it is utilised and consumed is under closer scrutiny than ever. Spatial quality is now essential for space to be used safely and responsibly. Green buildings will take a crucial role in transforming our spaces towards a better and safer environment for us.

The manner in which Green buildings can contribute and assist in our fight against the virus can be broadly categorised into three themes – *Efficiency, Sustainability and Intelligence*.

Efficiency refers to the efficient use of our natural resources – light, water and air. Architecture should design buildings that allow the efficient use

of sunlight, rain water and natural air flow. For example, the design of light tubes, skylights and air wells will allow light penetration into buildings thereby reducing need for artificial lighting. Principles of building orientation in the direction of prevailing winds and siting of openings will allow efficient cross ventilation and reduce the need for mechanical cooling systems. Rainwater can be efficiently harnessed for a multitude of uses including irrigation of plants and toilet flushing systems.

Sustainability refers to buildings that are able harness renewable energy for the building's long-term life cycle. It is a combination of using energy-efficient practices, technology, materials. For example, the use of solar panels, wind tunnels, green products,

waste management and recycling practices all contribute to sustainable architecture.

Finally, *Intelligence* refers to the innovation in design. Smart homes, intelligent systems and robotics are some of the modern methods that can further enhance green buildings. Examples of such technology include sensor lighting, intelligent mechanical and electrical systems and robotics for cleaning and monitoring systems.

Buildings that embody these green architecture themes all help to bring

our built environment to the next level of cleanliness and hygiene. They also minimise human efforts for maintenance and monitoring – harnessing natural and technological means to carry out these processes.

Intelligence and innovation may play a greater part moving forward. An example for this is the Smartway2 (www.smartway2.com) technology which enables the use of smart desk booking systems. The technology allows efficient use of office space, eliminating space wastage by 30

percent. They inform building facility managers of when the tables have been vacated to allow time for cleaning, and only permit booking only after cleaning is done. Analytics calculate which tables can be utilised to consistently maintain safe distancing throughout the building.

Moving forward, I believe these themes will play an increasingly critical role in our development of Green Architecture, with a definite renewed relevance in light of the current pandemic situation.

Arjun Kaicker

Co-Head of Zaha Hadid Architects Insights & Analytics unit



Arjun Kaicker. Photograph courtesy of Zaha Hadid Architects.

There has always been a strong link between designing green buildings and designing healthy buildings. There is growing evidence that many of the measures that make green buildings healthier for occupiers, and therefore stronger at fighting the virus, also may actually directly help prevent and control Covid-19. Here are a few examples. Dependent on climate, designing for openable windows and natural ventilation whenever possible instead of energy hungry

and ozone depleting air-conditioning provides not only generally healthier environments but can reduce potential airborne transmission of Covid-19. Designing visible and easily accessible staircases in low-rise buildings that encourage mobility and exercise while reducing building energy usage also can reduce the risk of transmission of the virus in elevators. Designing to increase daylighting reduces energy consumption and improves worker productivity and occupants' overall health and may also reduce the lifespan of Covid-19 in the air and on surfaces through the UV-C in sunlight.

Green design can also promote behaviours and practices that both reduce carbon footprint and simultaneously help prevent and control Covid 19. Workplace design provides many examples of this. Redesigning office spaces (and home spaces) that support home working where desired and effective, can improve staff satisfaction and productivity, reduce the pollution and energy use of commuting and help limit the spread of Covid 19. Designing spaces that better support and encourage virtual meetings both in the office and home office environment can significantly reduce travel to meetings, which has the greatest environmental impact when those meetings involve international business travel.

One of the most significant ways green buildings can be designed to prevent and control Covid 19 is actually by encouraging occupiers to spend less

time in them, and more time outside.

A Japanese Study found that the odds of catching the coronavirus are nearly 20 times higher indoors than outdoors. Designing restaurants and bars that optimise use of outdoor areas can help reduce overall energy usage, reduce risk of Covid spread and help them remain open during lower levels of lockdown. Similarly office occupiers are being encouraged by various government guidelines to hold meetings outdoors where possible and designing workplaces where both collaborative and individual work can be carried out outside. Increased use of outdoor space can lead to higher levels of staff wellbeing and performance because of the biophilic benefits of contact with nature, reduce workplace energy usage, and minimise spread of Covid 19.

These spaces can include green roofs that may otherwise have not been a priority for building owners but now can have greatly increased workplace utility, as well as providing a myriad of environmental benefits from storm water management and regulating building temperature, to increasing wildlife habitats and reducing heat-island effects. Similarly providing more green space in residential buildings, particularly urban ones, in the form of terraces and green roofs, can also provide highly desirable access to outdoor space for residents concerned about the possibility of future lockdowns and enhance people's ability to psychologically cope with one if it does happen.

Ben van Berkel

Founder / Principal Architect UNStudio and Founder UNSense



Ben van Berkel. Photo: © Els Zweerink

Fortunately in recent years the design of sustainable and energy neutral buildings has also begun to take the health of the user into consideration from the outset. The two things are in no way mutually exclusive, as an intelligently designed building will contribute to both the health of the planet and to that of its occupants.

Recent research has shown that the Corona virus spreads most successfully in overcrowded interior spaces, and as a result, Covid-19 has highlighted how important it is to properly ventilate interior spaces. A well-designed building can incorporate innovative natural ventilation techniques, alongside mechanical, ceiling-extraction ventilation systems that are powered by PV integration in the facade.

Flexibility of the interior layout also plays a key role with respect to making sure that spaces can be reconfigured when necessary, to allow for changing numbers of occupants at any given time and thus avoid overcrowding of any spaces. But such flexibility can also play a role in ensuring the future adaptability and thus the life-span of the building.

Outdoor spaces for socialising are also becoming more common, so green roofs can be used as kitchen gardens for the occupants to grow their own fresh produce. The use of mechanically operated lifts is also being discouraged by the addition of staircases between multiple floors in tall buildings. This not only means that confined spaces such as elevators can be avoided, it also encourages the occupants to be more physically active, to move more, which in turn aids their general health, their immune systems, cardiovascular issues or diabetes.

Er Yong Siew Onn

Director of DP Sustainable Design



Er Yong Siew Onn. Photo: © DP Architects

Green buildings are typically designed to save energy, water, materials and resources and to promote environmentally responsible, cost-effective and healthier places to live and work. There are many building codes, standards, ratings and certification programs available for us to adopt to deliver sustainable and high-performance buildings. In the midst of the COVID-19 pandemic, it can be very challenging for individuals and organisations to embrace energy optimisation while also placing emphasis on how to prevent spread of the virus, whether at home or in a workplace environment. As opposed to placing energy performance of buildings on the backseat so as to prioritise safe management measures for occupants' health, the same passive design strategies and smart technologies for monitoring and reducing consumption can function for the purpose of increasing building resilience against widespread contagion. The role of green buildings in the prevention of COVID-19 transmission prevention and control can

be summarised as below:

• Promote Natural Ventilation

When outdoor air quality is at acceptable levels, optimising the building form and layout to enhance the effectiveness of naturally ventilated spaces will assist in diluting human and product-generated air pollutants. This can be done via means for porosity and/or operable windows. A well-designed building that allows for natural ventilation can deliver much higher ventilation rates in a more energy-efficient manner as compared to mechanical means of air circulation; and thereby, reduce the risk of cross-infection. At the same time, these spaces can also be used to access higher levels of daylight, which can result in improved productivity and moods in the workplace and at home, respectively.

• Enhance Indoor Air Quality

For air-conditioned spaces, we can enhance indoor air quality through the implementation of advanced ventilation strategies such as increased outdoor

air supply, demand-control ventilation, displacement ventilation and advanced air distribution. A higher outdoor air supply ventilation rate can provide higher dilution capability and potentially reduce the risk of airborne infections.

With proper maintenance and implementation of adequate air filtration, together with Ultra-Violet Germicidal Irradiation air treatment in air handling units, we can mitigate mould build-up and particulates that potentially propagate the airborne virus. Another strategy to lower the risk of virus transmission is to keep the relative humidity of the air-conditioning system between 40 percent and 60 percent. To reduce the risk of virus transmission even further, recommended strategies include dilution, differential room pressurisation, personalised ventilation and zonal air-conditioning system control which will

help prevent cross infection.

• Leverage Smart Office Technology

As a result of COVID-19, expectations for a safe working environment have risen and there is a shift in focus towards intelligent technology that gives managers and occupants of buildings more control and understanding of the Indoor Air Quality (IAQ) at workplaces. These include smart IAQ sensors, physical distancing management apps and occupancy sensors monitoring systems that can be interfaced with building air-conditioning system to provide basic functions for pandemic management, prevention and control.

On top of enabling organizations to track, monitor and optimise the energy consumption of their buildings, these smart office technologies play an important role in helping to lower

operating cost and reduce the carbon footprint as part of green building design. On an individual level, such technology enables employees to make adjustments to their surroundings in terms of temperature and lighting, and increases awareness of the workplace IAQ parameters. This can make them feel safe, more empowered and productive.

As we gradually adjust to the next normal post-pandemic, sustainable design has the potential to promote a safer and healthier working environments. This can be achieved through the adoption of passive design for natural ventilation, indoor air quality enhancement and the deployment of smart technologies, which will better equip building managers and occupants to mitigate the spread of COVID-19 within the building and community.

Lisa Bate

Global Sustainability Lead, Senior Principal at B+H Architects



Lisa Bate. Photo: © B+H Architects

What the COVID-19 crisis has underscored above all is the inextricable link between environmental health and human health. Today's built environment is embedded with lessons from global health crises of the past – from improved air circulation and M&E systems as a result of Legionnaires' Disease in the mid-1970s to phasing out hospital wards in favour of private and semi-private patient rooms in response to SARS in 2003. From every disaster emerged new learning that prompted architects, designers, and planners to reevaluate our cities with a new lens, prioritising public health. Now, in 2020, what will a 'healthy' world look like post COVID-19? And how we will approach social and environmental health differently?

Perhaps our greatest opportunity lies in building resilience throughout our urban fabric, harnessing other assets in our built environment, at various scales, to create a sustainable rapid response model. Consider how different our response could have been if we had tapped into existing buildings to reduce the strain on the hospitals in the areas most impacted by the virus. Sports arenas transforming into screening and triage centers, exhibition halls providing large-scale patient care or recovery facilities, hotels and serviced apartments into quarantine facilities, the opportunities are endless.

The global crisis has forced us to re-evaluate the purpose of all our buildings and how they are meant to function in the new world we will emerge in. The question is not about how we will change our designs to suit the pandemic, but how the pandemic will ultimately force us to question the very roots of our design thinking, and lead us to greater introspection about why and how we will design in the future.

“The Market On Wheels is all about honest and functional design.”

- An interview with **Bhakti Loonawat**,
Design Associate at **MuseLAB**

MuseLAB, an end-to-end design studio based in Mumbai, India, recently won the Coronavirus Design Competition organised by Go Design Class. Their winning project called Market On Wheels, is inspired by the humble hand cart that is an accepted form of delivery in most of Southeast Asia. Bhakti Loonawat, Design Associate at MuseLAB, tells us why their design was selected and is suitable for the current and post pandemic situation. The project team members also include: Huzefa Rangwala, Jasem Pirani, Namrata Tidke, Bhakti Loonawat and Atharva Gune.



Bhakti Loonawat

SEAB: Congratulations on winning the Coronavirus Design Competition. How is your team feeling?

BHAKTI: Thank you, our team feels ecstatic on winning the competition and it has been extremely reassuring as the Market On Wheels is all about honest and functional design. It is an intervention where the aesthetics consciously takes a backseat and is driven by the functionality and materiality. Design is a powerful tool that has the ability to shape and transform our built environment and as designers we have a certain responsibility towards the society and resources available and therefore we must design responsibly.

SEAB: Can you give us a brief background about your firm MuseLAB?

BHAKTI: MuseLAB is an end-to-end design studio; creating thoughtful and engaging architecture, interior

environments, furniture and products. Each experience and or product we create embodies integrity with the same care, skill and attention to detail. At MuseLAB every challenge is treated as an opportunity which is given careful thought and consideration. We use both intuitive and traditional methods of analysis to identify the tangible and the intangible. By a systematic process of conceptualization, schematic design and design development we look to provide pure and focused experiential design. Each project irrespective of scale and typology is concept-driven and relates to a central narrative. Independent of our projects we like to explore and research materials and design and therefore in 2015 we launched MuseMART our product design division.

These self-propelled projects empower us to embrace the uncomfortable, learn from our failures

and nurture our creativity. As a practice, we are continuously seeking to explore, learn and find solutions. In early 2020 we launched MuseX, our studio's dedicated research arm. Through this conscious effort, we are looking to explore relevant technological tools to be able to adapt to changing environments and deliver unique solutions through collaborations. Market On Wheels, our entry for the Coronavirus Design competition is a conscious effort to build on that conversation and establish the importance of resilient design.

Design is at the forefront of our practice. Our team is a collective of architects, interior designers and furniture designers. As designers, we strive to strike a balance between our strengths and weaknesses and believe in the power of collaboration. As a team, we are always curious and constantly exploring ways, by which design can



“With Market On Wheels, our aim was to create a resilient delivery system while sustaining the livelihood of the vendors and protecting their health and safety.” – Bhakti Loonawat

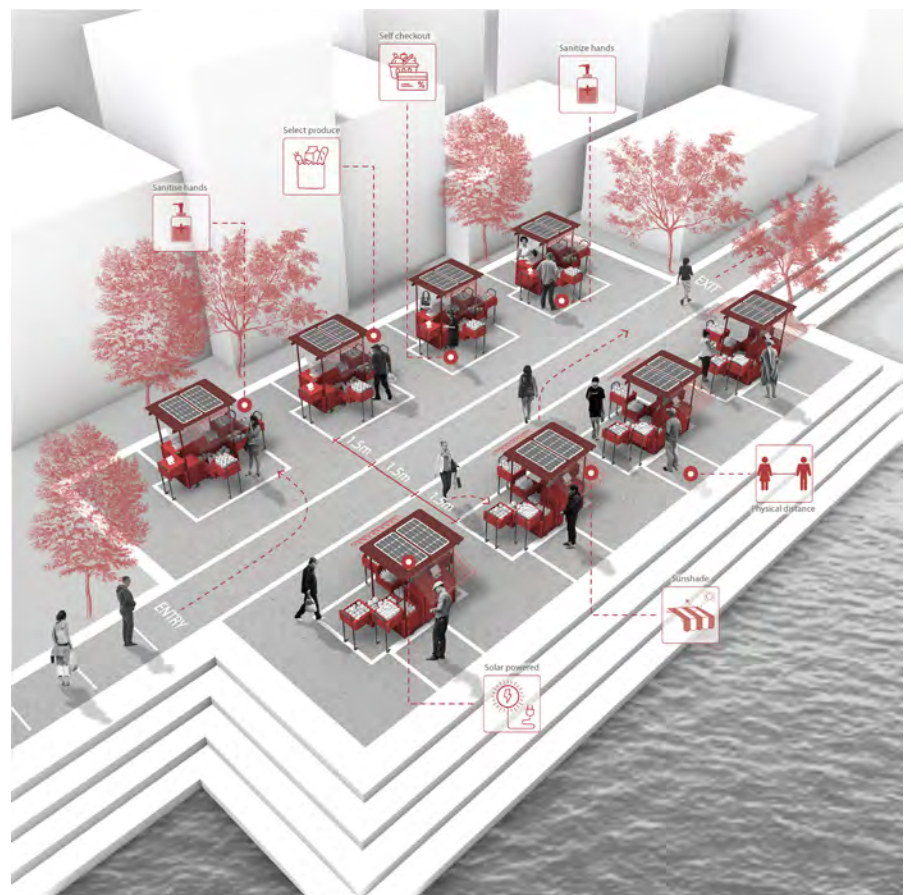
Mobile Market

The mobile markets contain movement within neighbourhoods and condense the food supply chain. A pandemic triggers a ripple effect and doesn't just lead to loss of life but loss of livelihoods as well. Market On Wheels not only creates a resilient delivery system but also allows to sustain the livelihood of a vendor while still protecting their health and safety. Photo: © MuseLAB

simplify, advance and enhance lives and our environment.

SEAB: Your winning project is a compact modular mobile cart system that transforms into a stand-alone kiosk. Tell us about its key features and why is it suitable for the current and post pandemic situation.

BHAKTI: The initial stages of the design coincided with the initial phase of the lockdown in India. From the outset, we realised that the pandemic brought with it not

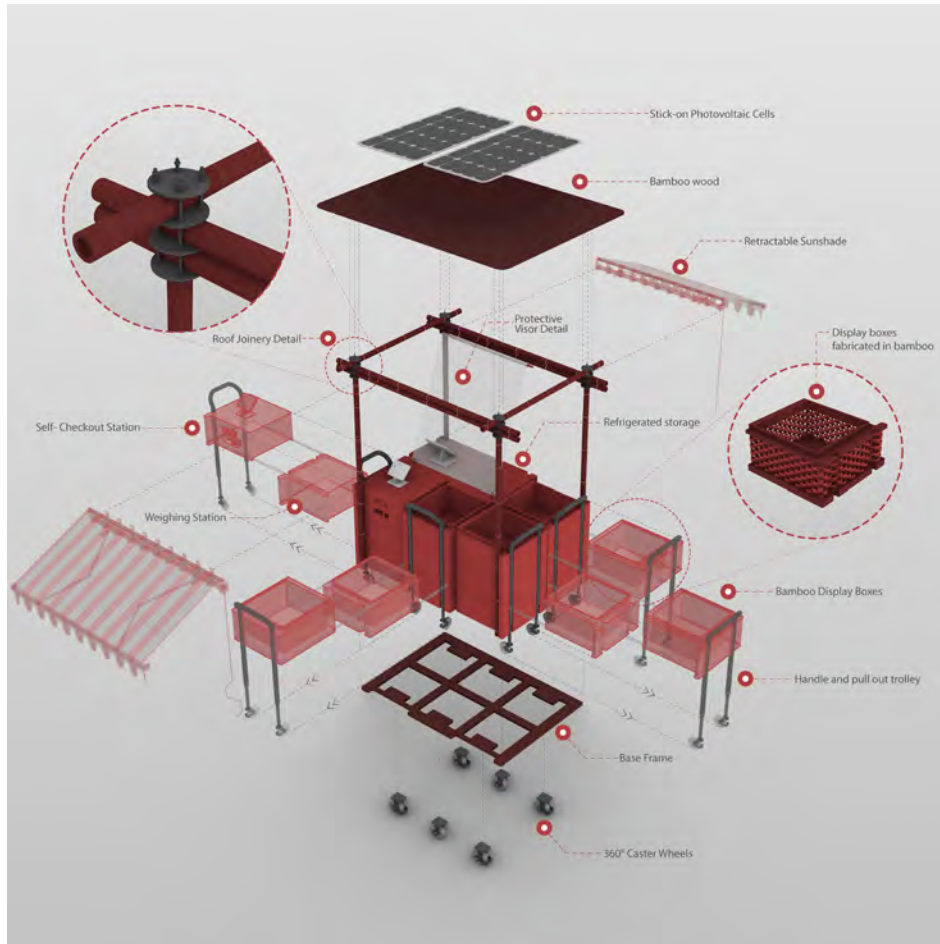


Market On Wheels

Inspired by the humble hand-cart, an accepted method of delivery in the Indian subcontinent and most of Southeast Asia. The reformed cart is a compact modular mobile system that transforms into a stand-alone kiosk. Photo: © MuseLAB

"Market On Wheels is made from circular and safe materials as sensitive and responsible design is another need of the hour."

– Bhakti Loonawat



Decentralized markets

This delivery system helps to decentralize the market as it services different neighbourhoods. Pictured in different situations the cart can be plugged into existing markets and open public spaces. These makeshift decentralized markets allow us to be a step closer in having 15-minute cities. Photo: © MuseLAB

only loss of lives but loss of livelihoods as well. The ripples of these problems were felt in various other parts of our lives that we were experiencing simultaneously. One of the biggest obstacles we observed was the total disruption of supply chains all across the world. During times like this, the best approach is that of quiet subversion – where the idea of change is applied in a subtle manner so that you nudge people towards the change rather than forcing it upon them. With Market On Wheels, our aim was to

create a resilient delivery system while sustaining the livelihood of the vendors and protecting their health and safety.

Market On Wheels is inspired by the humble hand cart that is an accepted form of delivery in most of Southeast Asia. The reformed cart is a compact modular mobile system that transforms into a stand-alone kiosk. These tiered modules slide open to allow for the display of groceries while providing physical distancing between two customers, and the customers and the

vendor. The idea is to separate the two main functions: the selection of products and the checkout process. The cart has a sanitization point incorporated within each of these zones.

It also has refrigerated containers that will allow for the supply of dairy products and help in keeping the produce fresh. The self-checkout area allows for a contact-less exchange between customer and vendor.

Made of bamboo, the container modules of the cart are securely placed on a metal base frame. The canopy is held up by bamboo poles. Solar panels are mounted atop the canopy that has retractable awnings providing shade for both the customer and the vendor.

Market On Wheels is made from circular and safe materials as sensitive and responsible design is another need of the hour. We wanted to make something that could be put together today itself, so it was important to look at readily available materials and revamp them.

The world we inhabit is inevitably prone to adversities in the form of natural and man-made calamities and even pandemics. We must strive to build a better future with values of resilience instilled within the built environment to sustain ourselves as a society and as a community.

SEAB: Do you foresee any challenges in making this design proposal into a reality?

BHAKTI: Currently, we are working towards taking the design from paper to reality. The challenges we are working towards resolving would be to make the cart truly affordable for the vendors without compromising on any of the added functionality. To instill resiliency in our delivery systems, we need to look at decentralized systems, which would require a systemic change that can only be brought about through cooperation and collaboration.

SAUTER technology chosen for two COVID-19 vaccine research and development facilities in Beijing

SAUTER, a leading provider of solutions for building automation technology in green buildings, was entrusted with two projects in Beijing. Due to the outbreak of the current coronavirus in China and its huge impact on society and daily life, the Chinese government undertook massive efforts to respond to epidemics. Thereby, directed by the central government, the establishment of a national bio-security system, as well as the construction of new facilities related to biosafety labs were initiated.

Sinopharm BPI COVID-19 Vaccine Production Plant

The first project, a vaccine production plant run by the China National Pharmaceutical Group (Sinopharm), was completed earlier this year with a total area of more than 1,700 square metres. SAUTER installed the entire BMS system with 1,300 data points in 43 rooms, 12 of which are operated under negative pressure. The entire cleanroom area on the first floor is operated in positive pressure. SAUTER provided detailed design, installation, testing and commissioning as well as support for the Biosafety Level 3 (BSL-3) certification process. According to Chinese media reports "the world's biggest COVID-19 vaccine manufacturing shop achieved construction and certification in Beijing within 60 days".

Sinovac COVID-19 Vaccine Development Project

The second and larger project related to COVID-19 vaccine development is owned by Beijing Sinovac Research & Development Co. Ltd. and Biotech Co. Ltd. The facility's



SAUTER differential pressure transducers (EGP) installed at the Sinopharm vaccine production plant.

construction is currently on-going with an estimated number of data points of more than 4,500. Just as the Sinopharm project, SAUTER's scope of work includes detailed design, installation, testing and commissioning as well as support for the BSL-3 certification of the laboratory.



New Beijing Sinovac Biotech Co. Ltd. facilities.





Smart Buildings – Trends Shaping The Future

Architects around the world share their views on the trends that will shape the future of *smart buildings*.



Caro van de Venne

Co-founder & Director of Barcode Architects



Caro van de Venne. Photo: © Barcode Architects

anonymous volumes, in which residents and users hardly know their neighbours or experience a sense of community, are a drawback.

As architects, we are therefore committed to the development of the human city, with more social interaction between residents, vitality and vibrancy at street level, accessible public transport and facilities and healthy living and working conditions. Social high-rise, with shared functions throughout the tower and a transparent ground floor with facilities for the entire area can contribute immensely to creating a human city. Our designs are sustainable, flexible and contribute to the community both within the tower, and at street level. We stand for designing high-quality buildings with a pleasant living environment for all.

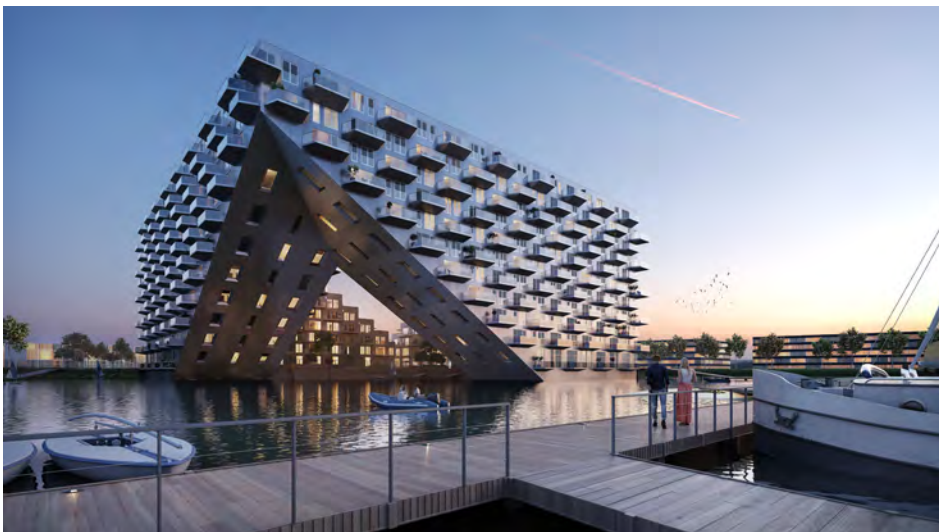
The hybrid city is a place where all functions and people mix. Living, working and relaxing are intertwined. A high-density urban area needs a mix of people and uses to create a vibrant neighbourhood. Complementary functions ensure that there is always life in an area. Finding the right mix is therefore important: a good combination of different target groups and a wide range of housing typologies in the tower, from smaller apartments for students and recent graduates, larger duplexes for families, to exclusive

penthouses with great views over the city. In addition to creating a broad housing mix, use smart programming of facilities that connect both residents and passers-by and visitors, such as a coffee bar, shared workspaces, or a gym. Collectivity within the tower also plays an important role. By adding shared spaces throughout the building, we diminish the anonymity usually associated with high-rise buildings and strengthen the connection between residents. For example, a laundry bar or a beautiful shared kitchen with a connection to the collective roof garden. These relatively small functions can have a huge positive effect on the immediate living environment of the residents of the new block.

In our high-rise designs, we integrate new technologies and the latest knowledge in the field of sustainable energy systems, healthy buildings, and circular and climate adaptive construction. In our design process, we use materials that age well and that are sustainably sourced. We want to be at the forefront of using new technologies and are finding other ways or implementing new energy sources in our buildings. On the user level, we stimulate sustainable mobility by integrating smart mobility concepts in the design. Bicycle parking facilities are easily accessible at ground level and are well designed for intensive daily use and shared electric cars are available to all residents. We aim to design parking garages in such a way that when parking demand decreases, the space can be reused for different future uses.

By going further than just sustainable technical solutions and working with a broader sense of sustainability, we create a real community within the towers that we design – now and in the future.

Barcode Architects believes densification is a solution to lack of housing in many cities around the world. But sky-high



Barcode Architects' and Bjarke Ingels Group's Sluishuis housing development in IJburg, Amsterdam. Impression: © Barcode Architects



HC Chan

**Director,
LWK + PARTNERS**



HC Chan. Photo: © LWK + PARTNERS

The construction industry is now facing a host of challenges: prolonged periods of construction, high costs and labour shortage. This is exacerbated by an ageing labour force as young people are reluctant to join the industry, creating a skill gap especially in fields like formwork, rebar fixing, concrete casting, etc. Taking Hong Kong as an example, with massive building demands coming in, the government and the city's Construction Industry Council joined hands to set up the Design For Manufacture and Assembly (DfMA) Alliance, engaging government authorities, developers, professionals like Architects, Structural Engineers and Building Services Engineers, Consultants, Contractors, Suppliers and Academia to study how DfMA might be a solution.

DfMA and BIM is playing a significant role in the future of Smart Buildings

Unlike conventional construction methods, DfMA works more like the manufacturing industry. Individual parts are prefabricated in an off-site factory, moving most of the complicated

processes there. This may include the main flooring, facades, interior finishing, building services, sanitary fittings and more. The prefabricated parts or integrated modules are then delivered to the site for assembly and 'stacked up' as a building. As a result, productivity and cost effectiveness are enhanced, while quality control is strengthened.

With DfMA, volumetric precast components are produced under the concept of 'factory prefabrication followed by on-site assembly', which is much more effective with the assistance of Building Information Modelling (BIM) and technical advancements in 3D software. BIM allows us to informatise layout plans, structural designs and electrical and mechanical properties, enhancing the efficiency of coordination among different disciplines and resolving common clashes and conflicts such as clear headroom, building service alignment and structural member depth.

Curvilinear or 3-dimensional surfaces design are also more adequately expressed in BIM software. Compared with 2D technique, it smoothen the multi-disciplinary coordination at early design stages. It facilitates the development of Modular Integrated Construction in Hong Kong, for instance, where its government promotes this new policy in order to facilitate the building industry to move forward in quality, speed and safety, paving the way for quality, greener construction with appropriate economies of scale.

Architecture is the art of blending aesthetics, engineering, culture and history. It does not benefit from the Industrial Revolution in the same way as manufacturing does: while manufactured products can be homogenised, specified and standardised through mass production, buildings shall be designed in response to site constraints and tailored to the human-oriented demands and comfort. If we treat our city as a manufactured object without considering its unique history and culture, we are doomed to have a monotonous, homogenous living environment. Is that what we want?



Sai Kung Outdoor Recreation Centre Temporary Quarantine Facilities in Hong Kong.
Photo: © LWK + PARTNERS



Stefan Behnisch

Founder and Partner
Behnisch Architekten



Stefan Behnisch. Photo: © Christoph Soeder

The definition of the word smart is quite unclear, it can mean many different things. Smartly dressed – tidy, fashionable. Smart – having or showing a quick-witted intelligence. All of the above doesn't really apply to smart buildings.

The way I understand smart buildings and their future is more simple, low tech: a really smart building doesn't need all that much technical support, all that much data, all that much high-tech. It is a building where the smartness is in the design, well enough thought through that it doesn't need much energy to be maintained, to run. The adobe, white chalked clay building in hot climate, is quite smart. The wooden cabin in intermediate or colder climate is quite smart. Nowadays, we can't really go back to these examples, but we can try to achieve their characteristic and qualities with today's smart materials.

Progress lays in our abilities to design smartly, to have different materials available. I don't foresee much future in buildings that fail if we have a blackout, buildings we have to leave if electricity is cut off. The analysis of conditions in buildings with sensors is helpful to learn and design better buildings. But having refrigerators that shop for you, buildings that monitor all your moves, that analyse your comfort zone is rather scary considering who owns the data – Cambridge Analytica was a true eye opener here. The future is low energy, comfort by adapting our comfort zone to more realistic conditions. The smartness is in the design and our behaviour, not on technical gimmicks.



IBN – Institute for Forestry and Nature Research in Wageningen (now Lumen), The Netherlands, a project by Behnisch Architekten. Photo: © Stefan Behnisch

Lee Polisano

President & Founding Partner, PLP Architecture, London



Lee Polisano. Photo: © PLP Architecture

The built environment is responsible for almost 40 percent of the world's carbon emissions. The current pandemic has exposed the fragility of our public health systems worldwide and the importance of individual health and wellbeing.

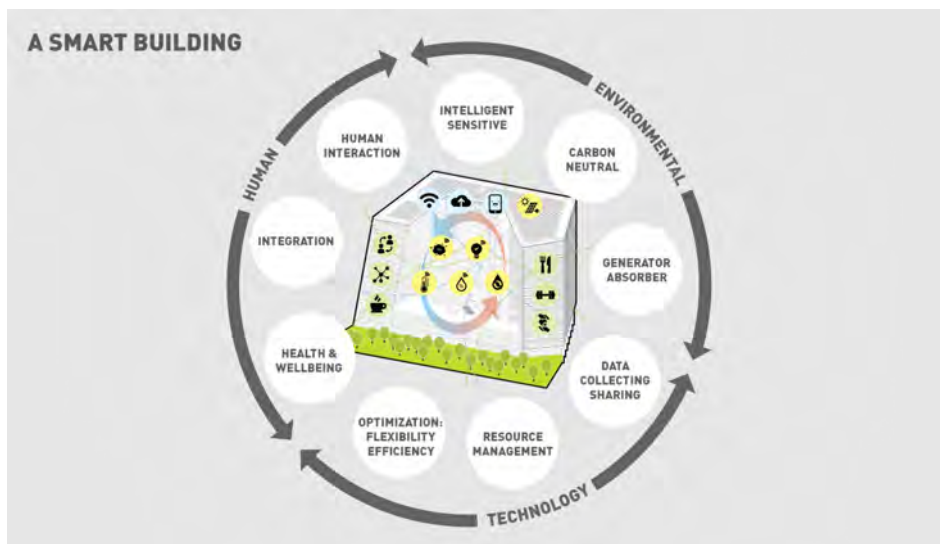
We believe that the next generation of smart buildings should have a vital and active role in addressing both of these issues. Our design of The Edge in Amsterdam created the first universally smart and sustainable office building in the world. With it, we realised a building that successfully operates on a carbon neutral basis. The Edge is able to heat and cool itself without carbon waste and at zero cost. It collects and recycles water and waste, and it generates clean energy to power the building's facilities and charge electric cars. The building promotes biodiversity and, most importantly, it gives occupants the opportunity to personalise their own environment, comfort levels and individual workplace settings whenever and wherever they want.

The outcomes from this experience and our continued research into the subject has informed our current design activities on the next generation

of smart and sustainable buildings. We envision promoting an even greater collaborative and productive work environment, with a much greater emphasis on individual health and wellbeing in the office. These technology-enabled structures can also provide a safe working environment for occupants with touchless surfaces, robotic cleaning and automated services that will increase the resiliency of buildings in the future.

However, if we are to make a significant improvement to our environment and eliminate carbon waste, we must take bolder steps and we must begin to utilise our smart buildings as part of a larger sustainable urban ecosystem. Smart buildings can become net-providers of energy, linking multiple buildings together to cohabitate as a network. These networks form interdependent ecosystems that allow for the creation of a resilient, sustainable, carbon neutral infrastructure that creates, absorbs and shares clean energy. Such networks can also share data, which will allow for a higher utilisation of a building's spaces and offer greater opportunities for buildings to function after work hours, activating otherwise empty spaces that could be used as community facilities, or cultural spaces, for example. The result will lead to the elimination of wasted space in buildings and avoid building new buildings needlessly.

Sustainable urban systems that generate clean power can be freely distributed to manufacturing and industrial facilities and support a sustainable carbon free urban infrastructure. Cities that become "low-carbon" and sustainable will produce a richer, more resilient future society. A low-pollution, resilient city will enjoy a higher quality of life and provide a safe, clean, healthy environment. Its people will be healthier and more productive. Producing smart, sustainable buildings will make a real impact and we're excited to remain at the forefront of this crucial activity.



A Smart Building. Image: © PLP Architecture



Simon Chua

**Co Founder &
Executive Director,
Lead8**



Simon Chua. Photo: © Lead8

The pandemic is a reset for Mother Nature. Many smart buildings are empty at the moment. It is not what we put inside a building that will make it smart in the future; it is how we use it.

We measure smart buildings through their performance and impact on our environments, embracing new technologies to become more efficient, smarter and seamless. But, does this make our environments and buildings safer? How can our smart buildings also keep us going during public health crises and pandemics, both now and in the future?

Cities are smart when they become liveable. Buildings are smart when they enable you to use them safely. To make our cities and economies smarter, we must think of 'Safe' as the new 'Smart'. New technologies such as distancing behaviour sensors, public stress levels, airborne bacteria sensors and full in-room sanitisation are on the way and are defining the next smart building movement.



Multi-retail component of One Bangkok by Lead8. Rendering: © One Bangkok

How Industry 4.0 is Ushering in a Sustainable Era

Text and photos courtesy of dormakaba.



Revolving door driven by Electromagnetic Direct Propulsion Technology.
Photo: © dormakaba

Industry 4.0 doesn't necessarily refer to a specific set of technologies – although things like cloud computing, IoT, and machine learning are undoubtedly critical parts of the equation. These technologies illustrate the primary aim of Industry 4.0, which is merging physical processes with digital connectivity. A sustainable smart building, for instance, might have connected IoT sensors that self-regulate energy usage based on real-time demand and use.

Another hallmark of Industry 4.0 is data and data analytics. Connected devices, equipment, and users are constantly generating data. Big data tools like AI, machine learning, and real-time data processing allow organizations to increase productivity further, optimise processes, and enhance growth. In the context of sustainable development, this can mean operating factories run more leanly, more energy-efficient, and with fewer carbon emissions as a result.

The applications of Industry 4.0 in construction range from design to ongoing management. Architects now use tools like building information modeling (BIM) software to optimise buildings for sustainability. They can design industrial and commercial buildings with elements like eco-friendly bacteria that repair structures organically. Sustainable design and architecture can now be conducted with Industry 4.0 technology in mind.

Once erected, heating and cooling systems can self-regulate for energy efficiency in real-time. With attendance-tracking



Access Control Solutions to track attendance and regulate entry. Photo: © dormakaba

HSW FLEX Therm Horizontal Sliding Wall System ensures energy efficiency through improved thermal separation.
Photo: © dormakaba



access solutions, sensors and IoT devices can be programmed to alert the environmental control systems to make

automatic adjustment to the lights and air-conditioning when people exit a room or building. Automatic doors also help to keep the temperature regulated by ensuring the doors don't stay open longer than necessary. Industry 4.0 is a sustainable construction game-changer because smart buildings can operate in an eco-friendly manner.

Ultimately, Industry 4.0 tech might enable buildings to be entirely closed-loop for resource usage, energy consumption, and overall sustainability. The wastewater might automatically be filtered and recycled. And AI systems will continuously analyse data to make real-time adjustments for more sustainable energy usage.



Charon Turnstiles as an access point to specific areas. Photo: © dormakaba

With Industry 4.0, business growth and environmental sustainability don't have to be mutually exclusive. Industries like manufacturing and construction are, in many ways, the backbone of the global economy. And business leaders need

to look no further than technologies like connected factory equipment, AI-enabled energy systems, and industrial IoT devices to help those industries growing strong, smart, and sustainably.

With more than 150 years of experience specialising in safe and secure technology, dormakaba is more than willing and able to champion the sustainability movement. For more information on how your workspace can be adapted for efficiency without compromise, contact dormakaba for the high-tech solutions to your sustainability needs.



Worker safeguarding quality in the production of energy-efficient products and solutions.
Photo: © dormakaba

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