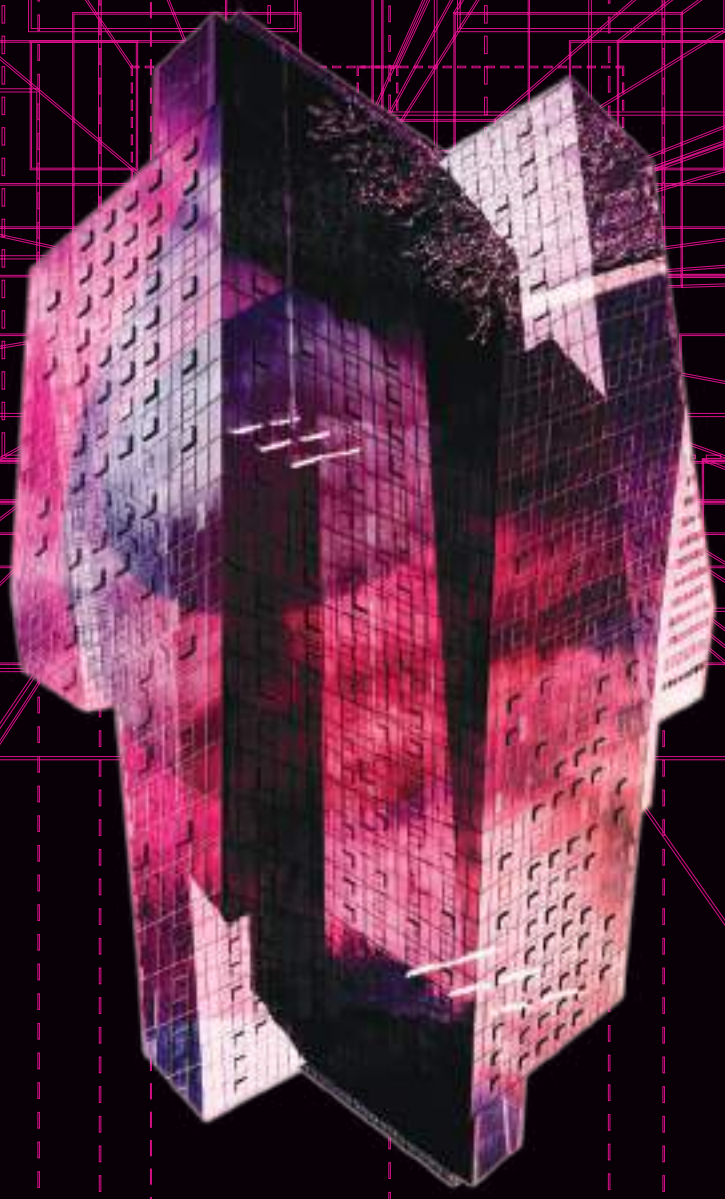
CONSTRUCTION+

Bringing The Building And Design Industry To You

JUNE 2019 | ISSUE 17 | RM25 | SGD10
PP19040/06/2016 (034532)
MCI (P) 114/07/2018



DISRUPTING CONSTRUCTION

EMBARKING ON THE DIGITAL JOURNEY

INTEGRATING EACH STAGE OF THE PROJECT LIFECYCLE

CHECK OUT THE BCI ASIA AWARDS 2019 WINNERS

CONSTRUCTION+ MALAYSIA & SINGAPORE
JUNE 2019
ISSUE 17
BCI ASIA

NEX
EMINENT

Italian Engineering, Infinity Usage

Nex Eminent

Italian Engineering, Infinity Usage

Nex Eminent is a strong and versatile Italian engineering slab with large sizes and minimal thickness. It is a perfect material for all the surfaces and applications. It is an innovative product with international patented process. With Nex Eminent, you can have your own creativity for all tops, ie kitchen, vanities and furniture. It is so versatile that you can use it indoor and outdoor with beautiful marble look, also the look of onyx, wood, metal and concrete slabs Nex Eminent can also apply to wall and floor, bathrooms and outdoor terraces or deck. The format comes in 1200 X 2400 X 6mm and 3200 X 1600 X 12mm. durability and aesthetics come hand in hand in Nex Eminent with large sizes and minimal thickness, making it perfect materials for all surfaces and applications. The amazing product, Nex Eminent is so strong and durable that it can be used for external wall and floor and withstands all weathering, The main functions of the outer cladding are aesthetics and protective Appluications: Kitchen Tops, Vanity & Furnitures tops. Wall and floor indoor and outdoor. Bathrooms, hospitals and wellness centre Key features: Utmost beauty like stones, wood, metal. Special surfaces like matt, structures and glossy Stain resistant, Chemical resistant, deep abrasion resitant, non-porous, bacteria free, fire proof. Safe for direct food contact

Product Features

Resistant to UV | Resistant to Impact Force | Resistant to Scratch | Low Water Absorption | Resistant to Acid and Alkali | Resistant to Chemical | Resistant to Stain | Hygienic | Resistant to Fire and Heat

Contact

Office & Gallery
No. 30, Jalan SS21/1,
Damansara Utama,
47400 Petaling Jaya,
Selangor Darul Ehsan.
(CIDB Qualifier)

☎ 603-7733 7232
www.ecointeriorsupplies.com
ecoiseco@gmail.com
sales@ecointeriorsupplies.com
ecointeriorsupplies

BLUESCOPE LYSAGHT

SHAPING A WORLD OF ICONS

We're all about delivering a complete range of avant-garde steel roofing products and solutions, which are highly versatile and adaptable for different market segments.

For over 50 years, our robust products and innovative solutions played a vital part in constructing iconic landmarks across the regions ranging from Marina Bay Sands and Tun Razak Exchange (TRX 106), to the distinctive Sarawak Oil Palms refinery and culturally unique Malaysian Han Studies.

Journey with us, as we continue to engage the market with technologically enhanced products, shaping the ever-changing construction landscape.

FIND OUT MORE ABOUT US

PENINSULAR MALAYSIA 1700-81-8688 | **SARAWAK** +6082-333-621
SABAH +6088-445-161 | **BRUNEI** +673-244-7155 | **SINGAPORE** +65-6264-1577

lysaghtasean.com

CONSTRUCTION+

Bringing The Building And Design Industry To You

PUBLISHED BY

BCI Asia Construction Information Sdn Bhd
Unit 1106, Block B
Phileo Damansara II
Jalan 16/11, Section 16
46350 Petaling Jaya, Selangor
Malaysia
t (603) 7661-1380
f (603) 7661-1381

BCI Asia Construction Information Pte Ltd
300 Beach Road #34-01
The Concourse
Singapore 199555

t +65 6536 7197
f +65 6538 6896

EDITORIAL TEAM

managing editor Candice Lim
senior editor Joanna Sze
assistant editor Lim Yi Zuo
contributing editor Aylwin Chooi
e (editorial) construction@bciasia.com

GRAPHIC DESIGNER

Bazura Zulkiffli

ADVERTISING

Lee Loong Fei; Desmond Wong; Sally Kheng; Selina Foo
e (Malaysia) malaysia@bciasia.com
e (Singapore) singapore@bciasia.com

PRINTER

Printelligence Trading
Lot 465 & 466, Jalan Nilai 7/10,
Kawasan Industrial Nilai Inland Port,
71800 Nilai, Negeri Sembilan

www.constructionplusasia.com

www.facebook.com/constructionplusasia/

@ConstructionPlusAsia

@CPlusAsia

Download the free Construction Plus App on Google Play or App Store

GET IT ON Google Play

Download on the App Store

Publication frequency: Quarterly (4 issues per year)

COVER CAPTION:
The construction sector is heading towards a long-awaited technology shake-up

CONSTRUCTION+ SUPPORTING ASSOCIATIONS

Construction Industry Development Board (CIDB) Malaysia
(www.cidb.gov.my)

Institute of Landscape Architects Malaysia (ILAM)
(www.ilamalaysia.org)

Malaysian Association of Facility Management (MAFM)
(www.mafm.org.my)

Malaysian Interior Industry Partners Association (MIIP)
(www.miip.com.my)

Malaysia Green Building Council (malaysiaGBC)
(www.mgbc.org.my)

Malaysian Timber Industry Board (MTIB)
(www.mtib.gov.my)

Royal Institution of Surveyors Malaysia
(www.rism.org.my)

Royal Institution of Chartered Surveyors
(www.rics.org/ASEAN)

The Federation of Malaysia Hardware, Machinery & Building Materials Dealers' Association (FMHMBA)
(www.mhmba.org.my)

Waste Management Association of Malaysia
(www.wmam.org)

SEA Drymix Mortar Association
(www.seadma.org)

American Concrete Institute – Singapore Chapter (ACI-SC)
(www.concrete.org.sg)

Interior Design Confederation Singapore (IDCS)
(www.idcs.sg)

International Facility Management Association (IFMA) Singapore Chapter
(ifmasingapore.org)

Landscape Industry Association of Singapore (LIAS)
(www.lias.org.sg)

The Singapore Contractors Association Ltd (SCAL)
(www.scal.com.sg)

Singapore Building Materials Suppliers' Association (SBMSA)
(www.stas.com.sg/members/sg-building-materials)

Singapore Environment Council (SEC)
(www.sec.org.sg)

Singapore Electrical Trades Association (SETA)
(www.seta.org.sg)

Society of Interior Designers Singapore (SIDS)
(www.sid-singapore.org)

Singapore Manufacturing Federation (SMF)
(www.smfederation.org.sg)

Security Systems Association of Singapore (SSAS)
(ssas.org.sg)

ACOTEC®

Acotec wall panel is a construction method of choice for system building that has been successfully implemented in numerous projects throughout Singapore and Malaysia; where award-winning factories – located in Johor, Negri Sembilan and Perak with total annual capacity of 2,400,000 m² – are well-positioned to serve the markets.

Acotec Sdn Bhd (722214)
(A member of DSH Group)
Level 16, Plaza DSK, Jalan Ampang,
50450 Kuala Lumpur.

Tel : 03-2177 1838 Fax : 03-2177 1833
Email enquiry : enquiry.central@acotec.com.my | enquiry.southern@acotec.com.my | enquiry.northern@acotec.com.my

The construction sector continues to play a vital role in Malaysia's economic growth, contributing 4.2 per cent towards the country's GDP in 2018.

The Ministry of Works is committed to realising the goals of the Construction Industry Transformation Programme (CITP), which forms an important part of the 11th Malaysia Plan to transform Malaysia into an advanced and high-income nation by the year 2020.

In today's fast-changing world, the rise of new digital technology is a catalyst for the growth and transformation we are working towards under the CITP. We should embrace disruptive innovation and leverage technology in our local construction industry to ensure we remain competitive on the global playing field.

Technologies such as building information modelling (BIM) and industrialised building systems (IBS) provide a holistic construction scheme from the beginning of the project cycle towards the end. The ultimate aim of these innovative construction methods is not just cost-savings in construction, but also the speeding up of the construction process within a safer working environment. It not only improves quality, productivity and efficiency but also reduces wastage and avoids wet conditions on site.

I am glad that BCI Asia's *Construction+* magazine is highlighting this issue of digitalising the construction industry to spur industry players to embrace innovation and realise the opportunities presented in this technology-driven market.

I believe the government's efforts to build a BIM ecosystem in Malaysia will become a vital platform for the development of artificial intelligence, smart total asset management and smart cities, as we head towards the Industrial Revolution 4.0.

BARU BIAN
Minister of Works Malaysia

RIGEL®
smart sanitary solutions

A Stroke of Perfection

THE RESIDENTIAL **IMPRESSIONS** SERIES

Make a bold statement and leave a lasting impression with Rigel's IMPRESSIONS bathroom series. With its evocative form and expressive lines, the IMPRESSIONS series adds a sleek edginess to any contemporary bathroom style.

RIGEL® smart sanitary solutions
RIGEL TECHNOLOGY (M) SDN BHD Wisma Rigel, No. 16 & 18, Jalan 3/33B, MWE Commercial Park,6 ½ Miles, Off Jalan Kepong, 52000 Kuala Lumpur, Malaysia
+603 6258 6016 +603 6258 5498 sales.my@rigel-group.com www.rigel.com.my

"Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road."
— **Stewart Brand**

The construction industry is often seen as a laggard in a fast-changing world, but even it can't hold off rapid technological advancements.

While the old way of getting things done still works, as it has in ages past, digitalisation adds a whole new dimension to the construction process. It ties the different parts and players of the project cycle together, improving collaboration and communication. When used effectively, it increases efficiency and productivity, as well as minimises costly mistakes and wastages.

Construction+ helps to break down the technology hype a little with some first steps you can take in Embracing the Digital Revolution (page 12), while practitioners in Singapore share their experience designing and constructing with integrated digital delivery (pages 20 and 24).

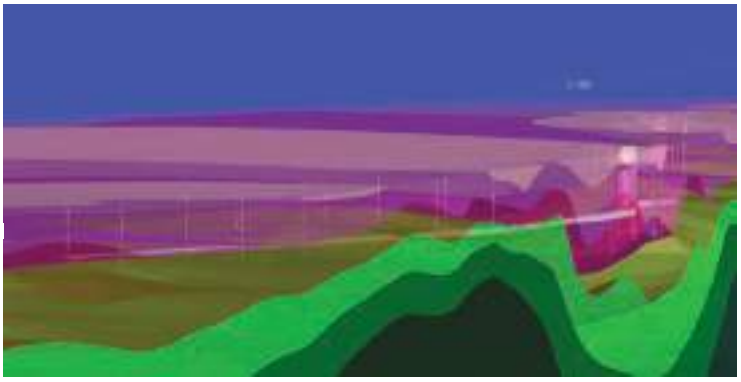
We talk to an engineer who has been "doing BIM before it was called BIM" in our Spotlight interview (page 40) and check out how technology is put to good use in some key projects, such as the JTC Logistics Hub @ Gul (page 50), IKEA Batu Kawan (page 54), Landmark 81 (page 72), and the MRT Line 2 (page 112). Students at a local university share about their first-hand real-life experience in using BIM (page 118).

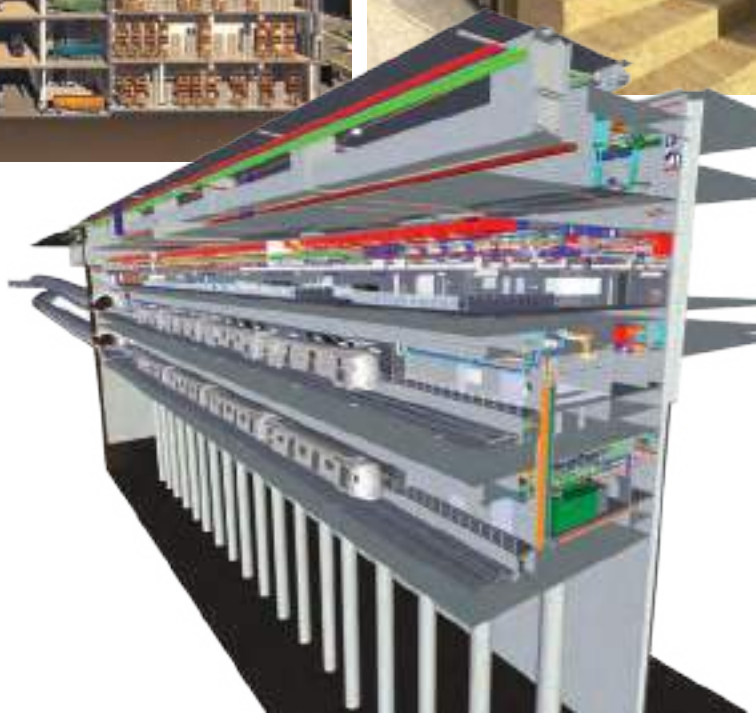
In this issue, we also highlight the award-winning companies and projects that have been recognised in BCI Asia Awards 2019, specifically the Top Ten Architects and Developers and Interior Design Awards.

It's been an eye-opening and enlightening issue for us at *Construction+* as we catch a glimpse of the building industry of the future. We hope you enjoy reading it as much as we did putting it together.

Happy steamrolling!

Joanna Sze
Senior Editor
Construction+





JOTUN

Paint for iconic buildings and beautiful homes

Many iconic buildings and beautiful homes around the world have been painted with Jotun. We put great effort into our research and development to create the best innovations, whether it be for the Eiffel Tower or your home.

Jotun Paints (Malaysia) Sdn. Bhd. (824636-K)

jotun.com.my Jotun Malaysia

JOTUN

JOTASHIELD

SUPERIOR EXTERIOR PROTECTION

LONGER LASTING COLOURS

All new Jotashield protect your home with
Superior UV Protected Colours.

The all-new Jotashield offers superior protection with long-lasting beautiful colours. It is certified by external lab to protect your home from natural weathering and relieves you from worrying about maintenance. It is made with a wide selection of colours, carefully selected by experts to fit your choice and make your home beautiful.

Jotun Paints (Malaysia) Sdn. Bhd. (824636-K)

jotun.com.my Jotun Malaysia

EMBRACING THE DIGITAL REVOLUTION

How do you transform a business built on brick and mortar into bits and bytes?

BY JOANNA SZE

It is a no-brainer that technology greatly improves efficiency, accuracy and productivity. After all, design industry veterans would opt not to return to the back-breaking days of pencils and T-squares before the advent of drafting and modelling software.

Yet, despite the obvious and compelling benefits of digitalisation in recent years, the construction industry in Malaysia remains mostly on manual transmission, with all its inefficiencies and quality control issues.

Hopefully this will soon change.

"Construction is a notoriously conservative sector," says Datuk Ir Ahmad 'Asri Abdul Hamid, CEO of the Construction Industry Development Board (CIDB). "However, it is also one of the major industries of the world that is ready for technological disruption."

CIDB has been pushing to elevate the local building industry in various key areas via its Construction Industry Transformation Programme (CITP) 2016-2020.

"The construction industry requires a radical transformation, not just an

The construction industry requires a radical transformation, not just an enhancement of current practices. Technology has to be the main driver of transformation.

enhancement of current practices," says Ahmad Asri. "Technology has to be the main driver of transformation, as only through digitalisation and new tools that provide higher efficiency can we achieve the CITP's targets within the five-year time frame."

Two of the main thrusts in the technology push are the adoption of building information modelling (BIM) and industrialised building systems (IBS). BIM is a process for creating and managing a digital representation of a construction project across its lifecycle, while IBS refers to a construction technique where components are prefabricated or manufactured in a controlled environment for on-site assembly.

BIM adoption in Malaysia currently stands at 17 per cent—which is low compared to the United States (71 per cent), the United Kingdom (39 per cent) and Singapore (65 per cent). With increased awareness, the government hopes to drive adoption levels up to 30 per cent by the end of the year.

"Certainly, there is room for greater growth and adoption of BIM in the industry," says Ahmad 'Asri. "The low adoption of BIM in Malaysia is largely due to the lack of awareness, the high cost of adoption, the lack of skilled talents, and the unwillingness to adapt working processes to BIM."

To address these issues, the Works Ministry is working to create a BIM ecosystem, with initiatives such as mandating the use of BIM on government projects worth over RM100 million by 2020 and the use of the BIM eSubmission system for initial project submissions for all city-status local councils by 2021.

Public projects worth more than RM10 million are also required to use IBS with a score of 70 per cent of more, while private projects worth more than RM50 million will need to achieve a score of 50 per cent or more.

These push factors are slowly helping to drive building and design professionals on board the digital train.

"More clients, especially the government agencies and larger established developers, are insisting their consultants be competent with IBS, BIM and other new technologies," says Ar Abu Zarim Abu Bakar, deputy president of the Malaysia Institute of Architects (PAM). "As such, many architectural practices have now established BIM units in their practice, or will have to."

"The main focus of the Institute of Engineers, Malaysia (IEM) is in line with sustainability and digital transformation, such as Industry Revolution (IR) 4.0," adds Ir Yasser Asrul Ahmad, who chairs IEM's Information and Communications Technology Special Interest Group (ICTSIG).

CIDB's subsidiary, CIDB E-Construct, is also in the final stages of drafting the IR 4.0 Roadmap 2020-2025, which aims to provide a clear direction for industry players and streamline future programmes related to the fourth industrial revolution, particularly the use of BIM and cloud-based integration.

No doubt an exciting transformative journey lies ahead for the construction industry. It may seem a little overwhelming, but if you are considering or preparing to make the digital leap, here are a few thoughts to get you started.

ASK THE WHY

First off, take a step back from the hype and evaluate why and how technology can add value to your company.

"When deciding on the use of a new piece of technology or process, make sure it is underpinned by a robust strategy," says Paul King, Bentley Systems' sector director of Constructioneering.

"It's really important to understand what is the challenge you have—the business need you are solving—and then to ask whether technology can help to solve some of that or not and what the likely payback is," he adds. "That may be financial, e.g. something you can put a dollar value to, or something more intangible, such as improved safety."

Ahmad 'Asri: Innovation is key

Abu Zarim: Clients look for BIM competency

Spend time to educate and train to get buy-in

When deciding on the use of a new piece of technology or process, make sure it is underpinned by a robust strategy.

START SMALL

In rolling out any new technology, it is important to do it in a phased and managed way. "Phased implementation is very important, and it is often described as the 'crawl, walk, run' process," says King. "It never works if a firm tries to do all these in one go."

For example, to get started on BIM, it would be prudent to test it out on one part of a project—say, one floor—as a mini case study to compare between the traditional method and the new technology.

"This will help you understand what the technology can do and what the benefit might be for your business," King adds. "You can also use the results to make a business case to get ongoing investments. If you don't have a case study, it's a big risk for any firm to invest that money in the process."

Initial investments can also be staggered. "If you have never done a BIM project before, you don't necessarily need to buy a full suite of software or hardware; you can start by leasing it," says Ronan Collins, head of Project Information Management at Gamuda.

"Of course, you would need to commit to some investments on the fundamental building blocks, such as a modelling platform for design consultants, but there are companies that offer services such as laser scanning and drone surveying that can give you the point cloud data you need," he adds. "So for smaller firms, rent the technology, use it and see the return on investments."

PARADIGM SHIFT

One of the biggest challenges is getting the buy-in of different players and users in the project's lifecycle.

"When you implement something new, there is often resistance to it because it's not what people are familiar with," says King. "Sometimes, people, particularly the older generation of workers, are scared that it might take away their jobs or show them to be not very technologically proficient."

Construction academies and resource centres, such as CIDB's myBIM Centre and IEM's training academy, provide a safe space for people to be educated and trained in technology and processes, and also be supported and engaged as the project goes on.

"What we find is that when you spend time to educate and explain to people, they understand why they are doing it and what is in it for them," King adds.

Collaboration is essential in any BIM project, and fostering this takes a lot of encouragement. "You need to change people's mind-set," says Collins. "Engineers and architects generally don't like sharing information that is not perfect or is still being developed,

but in a common data environment (CDE), everyone has to share information every two weeks or so, for the entire project team to access. We have to create an environment where it is considered safe and secure for that to happen."

LEARN FROM OTHERS

Keeping abreast on what is happening in the industry and how technology is applied in other projects is also a good way to start. Events such as CIDB's National BIM Conference and the upcoming PAM-organised BIM Buzz, BIM Summit 2019 and BIM BootCamp, are effective learning grounds.

"It's really about engaging with the industry and seeing what your peers are doing, as well as looking further afield, internationally, to learn from others' experience," says King. "Find out what's deemed to be best practice in Malaysia, how you can adopt those, what the benefits of doing so are, and what case studies you can refer to."

For example, the ongoing Line 2 project of the Klang Valley Mass Rail Transit (MRT) emulates the Crossrail metro project in London in using BIM Level 2, which follows the PAS 1192 guidelines. "MRT started doing BIM Level 2, and that's how people started becoming aware of these British standards," says Collins.

CONCLUSION

Technology has come a long way in the past decade or so, and it will continue to evolve rapidly.

As King points out, "In Australia's mining industry, for example, automated remote-controlled trains and trucks have become business as usual, and I think construction will go the same way when new technologies become mainstream."

Collins concurs. "BIM is not going to go away. Data is not going to go away. Digital is not going to go away. The only question is: How quickly is it going to affect our business? And how do we control, manage and leverage it? That's the challenge we've got."

So it is time to level up and make sure you don't get left behind.

"In the unpredictable and fast-shifting world business environment today, innovation is the key for construction industry players to remain effective beyond 2020," says CIDB's Ahmad.

"Companies need to continuously build their capability and improve their productivity to ensure long-term sustainability and resilience in the market."

HYBRID DESIGN AND BUILD MODEL

What are the considerations involved when novating design responsibilities to contractors?

BY CHAN KHENG HOE

In a traditional building contract, the employer's consultants undertake the design work, and the contractor executes the physical construction of the building according to the design.

In a traditional design and build contract, the employer prepares a design brief with both architectural as well as engineering requirements. The contractor, then, is responsible for designing the building to fulfil the brief and its requirements.

But when the lines are blurred, such as in a hybrid design and build model, then there arises the question of who is responsible for what.

A hybrid model of the design-and-build contract is one where the initial design is commissioned by the employer, and once the initial concept is complete, the contract is awarded to a contractor, and all consultancy agreements between the employer and its consultants would be novated to the contractor.

Singapore has practised this hybrid model quite extensively, whereby the principal architect and quantity surveyor remain engaged by the employer, while all other consultants are novated to the contractor. In this way, the architect's role is to ensure that the employer's requirements are fulfilled, while the design responsibility for all other aspects fall under the purview of the contractor instead.

The said hybrid model has been adopted in some instances in Malaysia. There is no "standard practice" in the industry, but instead, different projects novate different aspects of the consultancy agreements. Some projects novate all consultancy agreements (including that of the principal architect), others novate all except the quantity surveyor, who would be responsible to value the progress of works, while yet others may adopt an approach similar to Singapore's by retaining the principal architect and quantity surveyor.

COMPARISON OF APPROACHES

<table>
<tr><th>Areas of Responsibility</th><th>Traditional Building Contract</th><th>Traditional Design and Build Contract</th><th>Hybrid Model</th></tr>
<tr><td>Architectural design</td><td rowspan="2">Design responsibilities lie with the employer. The contractor merely executes the physical construction works.</td><td rowspan="2">Design responsibilities lie with the contractor, provided it fulfils the design brief stipulated by the employer.</td><td>Initially commissioned by the employer. The architect remains engaged by the employer throughout and ensures that the concept and requirements of the employer are interpreted appropriately.</td></tr>
<tr><td>Engineering design</td><td>Initially commissioned by the employer. Once a contractor has been appointed, the consulting engineers are novated to the contractor, who then assumes responsibility for engineering design.</td></tr>
<tr><td>Valuation of works</td><td colspan="3">Quantity surveyors are ordinarily engaged by the employer and will be responsible for valuing the works progressively throughout the contract.</td></tr>
<tr><td>Defects</td><td>Employer will be responsible for design defects. Contractor will be responsible for defective workmanship.</td><td>Contractor will be responsible for all defects, whether design or workmanship.</td><td>Employer will be responsible for architectural design defects. Contractor will be responsible for engineering design and workmanship defects.</td></tr>
<tr><td>Variations</td><td>Contractors may be entitled to additional payment for any variations.</td><td>Contractor is only entitled to additional payments for variations if there was a change to the employer's requirements.</td><td>Contractors may be entitled to additional payments for architectural design changes; Contractors would not be entitled to variation payments for all other changes within the scope of the employer's requirements (eg materials used, construction methodology, or workflow).</td></tr>
</table>

HYBRID MODEL PROCESS

An example of the process is as follows:

Step 1: Employer commissions a concept architect and other consultants. These consultants prepare an initial design to sufficiently represent the employer's requirements and design brief.

Step 2: Employer commissions a quantity surveyor to prepare the contract documents.

Step 3: A tender is called for contractors to bid for the project, and the contract is awarded to a successful bidder.

Step 4: Consultancy agreements entered into between employer and the various consultants (except the principal architect and the quantity surveyor) are novated to the contractor.

Step 5: The contractor develops the details of the design with the help of the consultants who are now engaged by him. This refinement to the details is approved by the architect who would ensure that the details adhere to the employer's requirements and design brief.

Step 6: Contractor proceeds with physical construction works, making claims progressively, which are evaluated by the quantity surveyor who remains engaged by the employer.

ISSUES WITH THE HYBRID MODEL

In a traditional building contract, liability is easily split between design and workmanship issues, whereby design liability lies with the employer

and workmanship liability lies with the contractor. In a traditional design and build contract, the contractor essentially assumes all liability.

A problem with the hybrid model is that design responsibilities are now split between architectural design responsibilities and engineering design responsibilities. Architectural design responsibilities remain with the employer because the principal architect remains engaged by the employer. However, engineering responsibilities lie with the contractor to whom the engineering consultants have been novated.

An issue arises when integrating the designs produced by the architect and the engineers: Where there is a conflict in the designs, whose design is to be amended? It must be borne in mind that where the architectural design is amended, then it becomes a variation for which the contractor may be entitled to claim for additional payments. However, if it is the engineering design that is amended, then the contractor will not be entitled to variation payments because the contractor has assumed responsibility for the engineering design.

POSSIBLE RESOLUTION

Therefore, it is important to have a clear predetermined workflow that is agreed upon by all parties. This would allow parties to identify the stage at which there was a departure that led to a design conflict.

The use of building information modelling (BIM) software would also be helpful to detect these potential clashes and conflicts, enabling such issues to be resolved upfront before physical works render a costlier resolution.

CHAN KHENG HOE
Principal, Kheng Hoe Advocates

Chan is a Malaysian construction lawyer, focused on construction and building contract disputes.

He is a Fellow of the Chartered Institute of Arbitrators, and a panel arbitrator, adjudicator and mediator with the Asian International Arbitration Centre. He also sits on the Contracts & Practices Committee of the Master Builders' Association of Malaysia, and has spoken and written extensively on matters related to construction law.

STAY SAFE FROM DUST ON THE JOBSITE

DUST CAN HAVE HAZARDOUS CONSEQUENCES TO HEALTH & SAFETY

A shockingly high number of people die each year of lung cancer caused by over-exposure to respirable silica dust. Others suffer from dust-related diseases, like COPD, so badly that they can no longer work. So, dust can have severe consequences to your workforce and the company's finances if not tackled head-on. Several national and international organisations have realised the urgency of the issues and launched initiatives and campaigns to combat dust at the workplace.

As an employer, there's a responsibility to monitor your workers' health & safety on the construction site. It's generally regulated by law but considering the consequences to individuals and their families it should be in your interest to protect your employees the best you can.

What are the consequences?

When the human body inhales dust, natural defence mechanisms kick in e.g. sneezing, coughing. But those human defence mechanisms are limited and for some kinds of dust, ineffective. Special care must be taken when working with materials containing silica.

Silica is a natural material. About 27% of our earth crust is covered with it. It occurs in many materials common on constructions sites like sandstone, concrete, mortar, tile, brick and more.

When processing these materials, fine dust that contains respirable crystalline silica (RCS) occurs. Over-exposure to these RSC particles can be very dangerous because they reach deep into our lungs and settle in our lungs' air sacks (alveoli). Over time scar tissue is produced and reduces the ability to breath-in oxygen. This incurable disease is called silicosis.

Introducing the Hilti portfolio of dust removal solutions

How to control dust with Hilti expert knowledge

www.hilti.com.sg | T: 6777 7887

MODERNISING THE BUILT ENVIRONMENT INDUSTRY

IDD and BIM bring both benefits and challenges, with the key to success being the mindsets of stakeholders.

BY DWIGHT YOUNG SONG

With the increasing demand for construction, paired with a steadily decreasing labour force and rising cost of development, the built environment industry in Singapore now has to do more with less.

In response to the need for efficiency and productivity, the Building Innovation Panel (BIP) was established in 2019. This inter-agency platform evaluates and advances the latest innovative methods according to the Construction Industry Transformation Map (ITM). One such innovations is integrated digital delivery (IDD).

Overall, the use of IDD will help us save time, reduce errors, and maintain information integrity throughout the project and beyond.

CONNECTING THE DOTS

Traditionally, a building project consists of isolated stages of development, with each stage working sequentially, having little interaction with each other. The designers and engineers first design the building according to the client's requirements. The contractor then coordinates and constructs the building, which involves developing the fabrication and construction methods. Upon completion, the building is finally handed over to the building operator, who manages its operations and maintenance.

Between each stage, only a portion of relevant information is transferred, and time and effort are wasted either redeveloping or repeating things that were not resolved or considered in the previous stages. This method of working creates a level of inefficiency that has so far been an accepted part of the built environment industry.

IDD seeks to break away from this inefficient approach. A holistic approach to building design that uses digital technologies in an integrated workflow to develop the entire building lifecycle, IDD consists of five stages: digital design, digital analysis, digital fabrication, digital construction, and digital asset delivery and management. The requirements of each stage are identified and incorporated from the onset. While many different digital technologies can and will be utilised over the course of the project, all of them will centre around the building information model (BIM), which transfers relevant information through all the stages.

The first stage, digital design, uses BIM for intelligent objects to enhance coordination and clash detection between design and engineering consultants. The workflow is integrated and iterative—design and engineering works occur concurrently. By involving engineers early in the process, architects are able to resolve design issues earlier; and by designing earlier, engineers can more thoroughly coordinate their designs and costings for overall accuracy, which saves time during actual construction. BIM also helps clients and stakeholders visualise the design so that the entire team is able to reach better alignment and expectations.

The next stage involves digital analysis, which is the semi-automation or automation of checking processes to reduce errors. Different tools assist to provide timely design and cost analyses for more informed decision making. Computational BIM can also assist to generate design options using parametric design.

The digital fabrication stage is generally associated with the term "design for manufacturing and assembly" (DfMA). DfMA develops fabrication models from BIM that can be sent for manufacturing. This highly automated process can be executed from planning, production and storage to delivery for onsite installation.

Digital construction uses BIM to develop the coordination works and monitor the progress and productivity of the construction. Some examples of technologies used at this stage include 4D BIM for GPS tracking; RFID for tagging and tracking precast elements to reduce installation errors; and drone photography for construction works sequencing.

Lastly, digital asset delivery and maintenance further utilise the digital field feedback for tracking and monitoring of post-occupancy operations, as well as predictive maintenance of assets by the building operators and maintenance team. Over the lifecycle of a building, such data analytics can help inform owners and designers on possible design improvements to make the building more efficient.

In essence, BIM is the single source of information that connects all the IDD activities together.

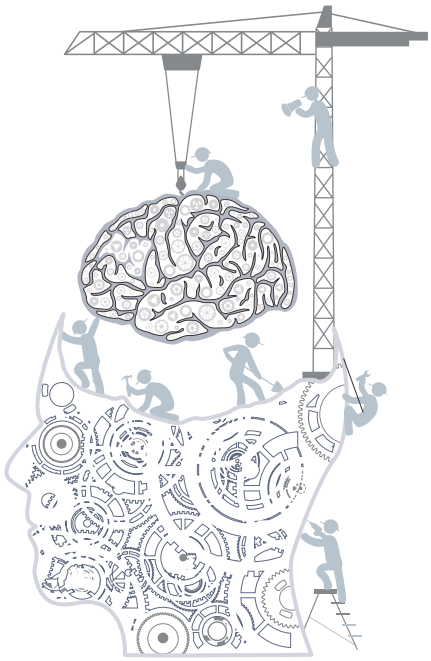
BENEFITS

As a regional multi-disciplinary infrastructure and building management consultancy, we at CPG have taken the initiative to incorporate the use of IDD in several of our projects in Singapore.

One of the projects, involving a renovation of a conservation building, is currently at the design stage and is being developed as a fully digital design, using BIM for coordination. This has helped us better realise the benefits, and challenges, involved in implementing IDD.

At the current design stage, the use of BIM and cloud-based sharing has helped us reduce errors and better coordinate with engineers, designers, and quantity surveyors. Our design and production time for client presentations have been greatly shortened with the use of real-time rendering software. The automation of processes, such as generating schedules, has also resulted in much faster deliveries.

During the construction detailing and DfMA stage, we expect to see a reduction in time and manpower needs, as well as better quality with the use of factory-like assembly methods to produce wall finishes and ACMV ducting. Construction, site coordination and sequencing can all be better managed, saving time and reducing labour. By incorporating advanced building monitoring systems in BIM models, building managers can



The new integrated workflow must first be preceded by a new working mindset.

monitor buildings more accurately and efficiently.

Overall, the use of IDD will help us save time, reduce errors, and maintain information integrity.

CHALLENGES

While the benefits promised by IDD may paint a rosy picture, there remain several challenges that must still be addressed.

One challenge is the education and training needed for the workforce to fully utilise the necessary tools. Everyone, from the architect to the construction labourer, must first learn the relevant new technologies and workflows. The new integrated workflow must first be preceded by a new working mindset. Changing the technical infrastructure, as well as educating stakeholders, require initial investments of money and time.

Because the IDD workflow considers all subsequent stages from the start, the design stage becomes the most challenging, and designers and engineers will be affected the most. To prepare our staff, many were enrolled in BIM courses to update their knowledge and skillset. As further encouragement, team members were given more freedom to explore and use new programmes and hardware, such as real-time rendering software and virtual reality headsets.

The IDD process is also seemingly best suited for new construction projects, in which most factors can be controlled. However, for this conservation building project, which involves addition and alteration (A&A), there are inherently many unknown factors, such as deviations from measured or as-built drawings and incomplete reference documents. Additionally, as an occupied and active building with inaccessible areas, a full building survey was not feasible.

As a result, we had to develop the BIM model to incorporate a certain level of tolerance and flexibility to address possible deviations. Such levels of flexibility may well have an impact in later stages, which we are currently evaluating. As more buildings undergo renovations in the future, A&A works will continue to be a challenge for IDD, which relies heavily on precision.

A third challenge, which hopefully is being studied, is the legality dilemma posed with passing on the BIM model. Questions of ownership, responsibility and intellectual property must be addressed if all parties are to use a common reference model. A multi-disciplinary firm that is able to take on a majority or all aspects of the project definitely has an advantage in this case.

LOOKING AHEAD

It is apparent that the conventional design and construction workflow is unsustainable, and modernising the built environment industry through the adoption of new technologies and processes is necessary. Hopefully, the Singapore Building and Construction Authority (BCA)'s implementation, adoption and promotion of IDD will result in the creation of an industry standard for all stakeholders.

And while the technological aspects of IDD may be often touted, its success ultimately depends on the stakeholders and their willingness to work together in this new and transformative way.

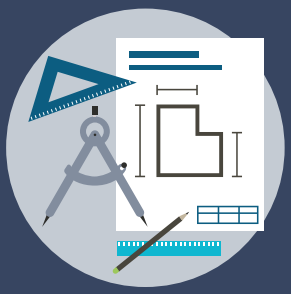
DWIGHT YOUNG SONG
Senior Principal Architectural Associate, CPG Consultants; CPG Corporation

Song is senior principal architectural associate at CPG Consultants. As an enthusiastic proponent of using technology to improve the design and development process, Song undertook a pilot project in CPG Consultants in 2018 to explore using BIM, cloud-based platforms and virtual reality as collaborative tools for integrated design.

INTEGRATED DIGITAL DELIVERY (IDD)

IDD refers to the use of digital technologies through the four stages of the built environment lifecycle to better integrate work processes and stakeholders. It provides a real-time view of the construction process and access to shared information for all stakeholders.

01 | DIGITAL DESIGN



02 | DIGITAL FABRICATION

03 | DIGITAL CONSTRUCTION

04 | DIGITAL MANAGEMENT

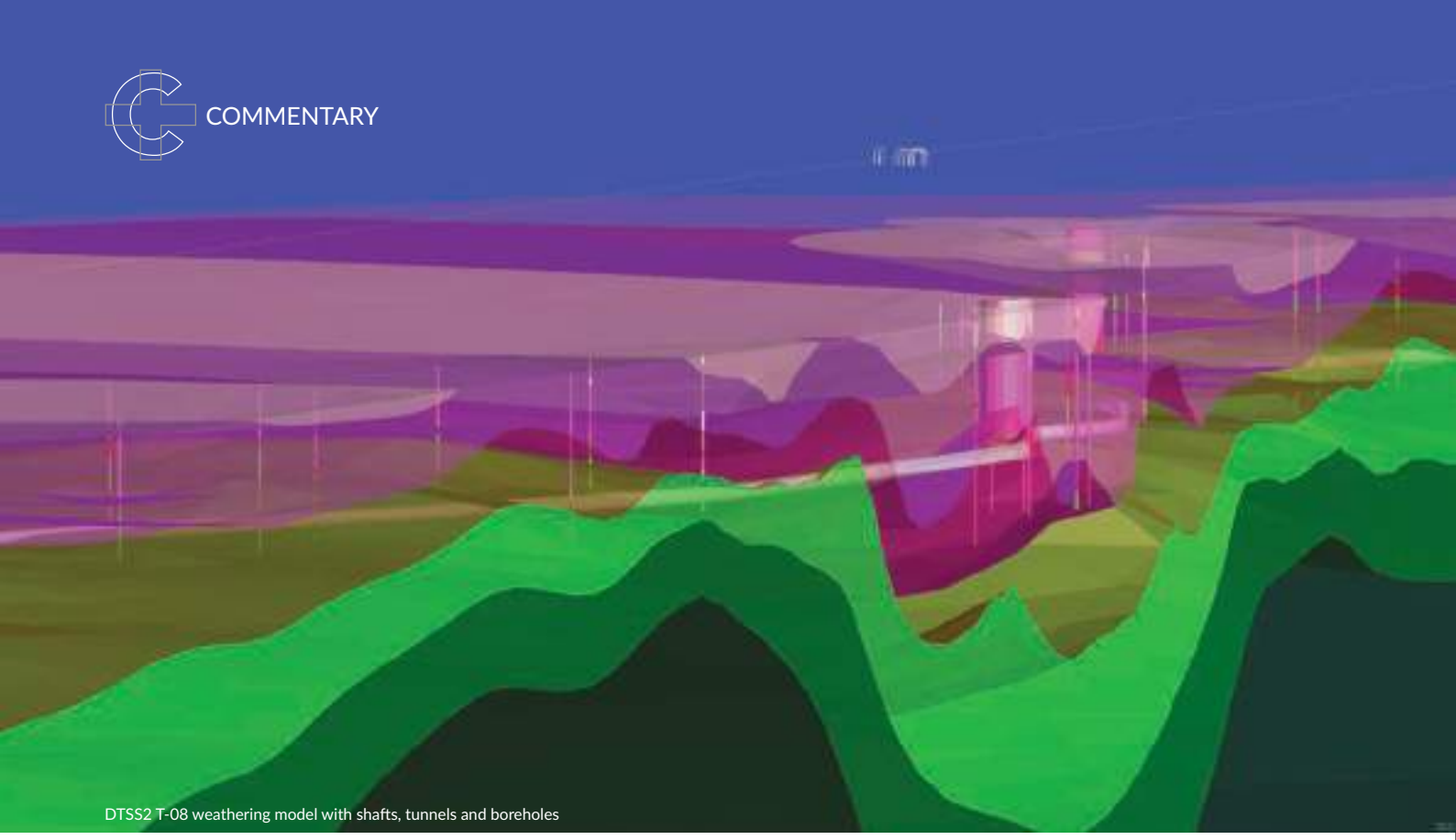
By 2020, Singapore's Building and Construction Authority (BCA) targets to:

- Implement **40 to 60** IDD projects
- Involve over **150** Singapore-based firms
- Train **300 to 400** IDD professional

STRATEGIES:

- Raising awareness of IDD benefits through demonstration prrojects
- Developing the IDD ecosystem, with enabling solutions, platforms and standards.
- Strengthening the industry's competency in IDD with various training programmes
- Published two guides on IDD implementation

Infographic by Construction+; Source: Building and Construction Authority Singapore



DTSS2 T-08 weathering model with shafts, tunnels and boreholes

CONSTRUCTING WITH IDD

How technology is integral in improving efficiency, increasing productivity and reducing waste in the construction project lifecycle

BY MICHELLE LEE SIU ZHI

Productivity in the construction industry has long been lagging behind the global economy and other sectors, such as manufacturing.

After all, there has been little or no change to the tools used for civil engineering over the past 20 years, whereas manufacturing has been revolutionised with Toyota's concept of lean manufacturing.

While it is easy to see improvements in a factory environment, where millions of units of a product are produced, how can one apply lean solutions and see the results in the complex construction industry—where every building is unique, roads stretch for thousands of kilometres, and tunnels bore invisibly underground?

BIM, VDC AND IDD

Building information modelling (BIM) is an intelligent 3D model-based process with the ability to include information into its 3D elements. BIM adoption picked up quickly in Singapore after the Building Construction Authority (BCA) of Singapore made it compulsory for most construction projects.

The ability to merge data with 3D elements is what enables the move to virtual design and construction (VDC). VDC is a framework for the management of BIM models, people and processes; essentially, it entails the building of a project virtually first—fully simulating design and construction in a virtual environment—prior to actual on-site execution.

The integration of CIM with BIM gives a more holistic view of a project under construction.

This is where the complexities inherent to the construction industry are apparent, having to manage various inputs from design consultants, clients, specialists and contractors, as well as fabricators, throughout the project cycle.

A typical workflow for a construction project involves design, fabrication, construction and maintenance. With technological advances of BIM tools, simulating these stages virtually enables visualisation of how a large-scale construction project is realised without having to build an actual prototype. Relating this back to lean concepts, being able to experience the whole construction process virtually aids in identification and elimination of wastage, which in turn improves productivity.

Considering the various parties involved in the full lifecycle of a construction project, certain information has to be transferred effectively through the different stages. Where a lapse in the transfer of information occurs, major rework may be required.

Hence, integrated digital delivery (IDD), as coined by the BCA, refers to the use of digital technologies to integrate work processes and to manage the transfer of information throughout the construction and building lifecycle—specifically digital design, digital fabrication, digital construction and digital asset delivery and management.

ENTER CIM

In Singapore, BIM has been very much focused on building construction. However, to maximise the full benefits of implementing IDD in virtual construction, particularly for the infrastructure industry, consideration has to be given to construction information modelling (CIM), a localised term used in Japan's construction industry.

The integration of CIM with BIM gives a more holistic view of a project under construction. CIM data includes geological information, topography surveys, drone reports of visual construction progress, etc, which when overlaid and viewed together with the BIM model, allows contractors to plan ahead. The beauty of digitising such information is that it can be processed quickly by pre-set algorithms, compared to conventional paper reports.

IDD FROM DESIGN TO CONSTRUCTION

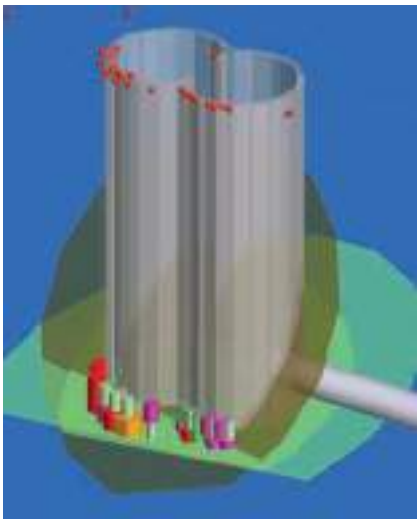
At Penta-Ocean Construction, we implement IDD—using BIM and CIM—for both building and infrastructure projects, such as Sengkang General Hospital (SKGH), Bright Hill MRT Station and Tunnel, as well as ground improvement and infrastructure works for Changi Airport Terminal 5.

The ongoing Deep Tunnel Sewerage System Phase 2 Project (DTSS2) Contract T-08 is another project that extensively applies VDC. The project involves the design and construction of 10 shafts and approximately 10 kilometres of underground bored tunnel. At the design stage, the BIM model for the tunnels and shafts are developed and overlaid onto a 3D geological model, with additional boreholes and site investigation information integrated when available.

One of the important aspects of a tunnelling project is to plan for maintenance and repairs for the tunnel boring machine (TBM), such as cutterhead interventions (CHI). Planning CHI locations requires an understanding of the rock and soil characteristics expected during the TBM drive and at the planned CHI sites.

The 3D tunnel alignment and digital geological model gives engineers the means to evaluate upcoming ground conditions for stability and flooding potential and to manage and minimise risks to the operation. Any section of the geological model can be studied using cross sections, horizontal sections or block sections, while cross referencing various data. Every aspect of sub-surface excavation and construction is carried out in a unique 3D environment, allowing information to be analysed quickly and presented easily, improving efficiency.

BIM model of tunnel segments



Shaft model showing possible water-bearing fault intersections and expected grouting use

Site utilisation plan in BIM at Shaft Z and Zi of DTSS2 T-08

All images by Penta-Ocean Construction

DIGITAL FABRICATION

When BIM is used for virtual sequencing and site planning, it allows visualisation of construction methods and sequences, enabling easier identification and elimination of wastes on a micro level.

At DTSS2 Contract T-08, BIM is used with a supply chain management system that enables the tracking and management of approximately 42,500 precast tunnel segments. There are four types of rings, with each ring having five segments and one key. When a precast segment is produced, it is serialised with a QR code, and information about the segment is stored in the cloud.

Having a BIM model allows engineers to immediately extract quantities and segment types required for upcoming installations. This information, when communicated effectively to the factory, enables management of inventory waste both at the staging area and at the factory.

The supply chain management system also allows us to integrate site information with the BIM model in the IDD cycle, enabling us to visualise and quantify progress of tunnel construction. Such information, coupled with the site utilisation model, allows for planning of segment layouts at the staging areas with installation sequence to optimise the transfer of segments during delivery and installation, minimising inventory, movement and waiting waste.

Additionally, from a quality perspective, knowing spatially where each segment is installed allows tracing of the individual segment's quality records. The wealth of information stored in the cloud and transferred to the BIM model enables visualisation of data to produce deliverables, such as progress reports and optimised construction planning. The adoption of this system is expected to improve productivity of tunnel construction by 20 per cent, based on initial studies by the project team.

This idea of synchronising precast data to the BIM model was first adopted at the SKGH project, where a similar system was used for managing the precast façade. While each construction project is unique, it is up to the team to identify similar processes and adapt existing solutions to their project requirements.

To realise the full benefits of IDD, every stakeholder has to be involved in the IDD process, especially at the design stage.

MAINTENANCE STAGE

Since the BIM models are used for design and construction coordination, it would be easy to extract equipment and building information that are required for the facility maintenance stage from the models. This saves the maintenance team time and the extra work involved in drawing up an inventory of items.

CONCLUSION

The key idea of IDD is to improve construction productivity by reducing waste. If information is properly transferred between the various construction stages, there is no need to do double data entry. If information is properly coordinated with fabricators, there will be less inventory wastage. If information is analysed to plan construction activities, there will be less time spent waiting and moving to and fro.

To realise the full benefits of IDD, every stakeholder has to be involved in the IDD process, especially at the design stage, because design changes made downstream in the delivery will inevitably result in rework that could have been avoided.

As the building construction industry gears up for digitalisation and new technologies are invented, perhaps productivity in the construction industry will finally be catching up with the global economy.

MICHELLE LEE SIU ZHI
Digital Delivery Manager
Penta-Ocean Construction Co, Ltd

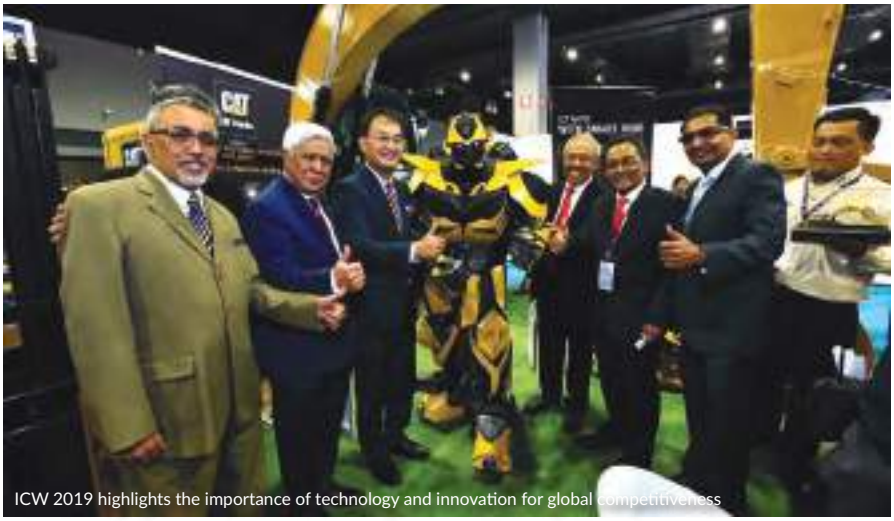
Lee's interests lie mainly in using technology to improve work processes in construction. She has been involved in BIM implementation within Penta-Ocean for both civil and building projects. She is currently leading a centralised digital team in Singapore to establish a foundation for digital transformation within Penta-Ocean internationally.

With a background in civil engineering, and experience in architectural and MEP gained from involvement in hospital projects, she is able to provide insights for bridging the gap between technology and engineering. She was involved in BIM management of the Sengkang Hospital project, as well as introducing the use of a 3D geological model for civil projects.

ICW 2019
19-21 March 2019

This year's instalment of the annual International Construction Week (ICW) is themed "Construction Beyond 2020", highlighting the need for the construction industry to step up its transformation efforts through technology and innovation to compete in the global business environment.

The opening ceremony was graced by Baru Bian, the Minister of Works, and Tan Sri Dr Ir Ahmad Tajuddin Ali, chairman of the Construction Industry Development Board (CIDB) Malaysia.



ICW 2019 highlights the importance of technology and innovation for global competitiveness

At the opening, CIDB also launched Sustainable Infrastructure Rating Tool (Sustainable INFRASTAR), which was developed to measure sustainable elements in the design, construction and operation of an infrastructure project. Five pilot projects are currently undergoing the assessment exercise. This new tool supports the target of 50 per cent of new infrastructure projects worth more than RM100 million to be certified with sustainability infrastructure tools from December 2020 onwards, as part of the environmental sustainability strategic thrust of the Construction Industry Transformation Programme 2016–2020 (CITP).

The week included seminar sessions

on topics such as Artificial Intelligence for Building and Construction and Engineered Timer – the New Concrete, and events such as BIM Day and QLASSIC Day.

For the first time, ICW was also held in conjunction with ASEAN Super 8, a mega construction trade fair with eight industry exhibitions.

Guests of honour at launch of BIM Day 2019

BIM DAY 2019

20 March 2019

Held in conjunction with ICW 2019 in Kuala Lumpur, this annual event provides a platform for sharing knowledge, technology and experience in building information modelling (BIM).

In his official address, Secretary General of the Ministry of Works Dato' Dr Syed Omar Sharifuddin Syed Ikhsan stated that "the adoption of BIM is a key game changer to ensure that the construction industry maintains its competitiveness at the local and international fronts."

The day's sessions included talks on the use of BIM in construction of the SOHO Li Ze Tower in Beijing and the Klang Valley Mass Rail Transit Line 2 project, the importance of standardisation in BIM implementation, and key engineering technologies used in the Hong Kong–Zhuhai–Macao Bridge Island tunnel project.

BCI EQUINOX 2019

29 March 2019 (Singapore);
5 April 2019 (Kuala Lumpur)

BCI Equinox is a series of evening boutique exhibitions held across Asia designed to connect architects, interior designers and design specifiers with product suppliers.

Unlike larger tradeshows and exhibitions, the more intimate and relaxed environment of BCI Equinox means specifiers can easily engage with suppliers and manufacturers over drinks and canapes while discovering the latest in new building product innovations.

The recent exhibitions in Singapore and Kuala Lumpur hosted 37 and 28 exhibitors, respectively. Each event drew about 350 guests, comprising mainly architects and interior designers, as well as contractors, developers, engineers and consultants.

Technology hubs featuring the latest products and technologies from the industry were scheduled throughout the evening, as well as lucky draws.

In the KL instalment, Ar Ezumi Harzani Ismail, then-president of the Malaysian Institute of Architects (PAM), gave a talk on Housing: Price or Space from an architect's perspective, while mechanical and electrical engineer Ir Yau Chau Fong spoke on the importance of safe and economical electrical system design for residential buildings.

Highlights from the Singapore and Malaysia events

UPCOMING EVENT

ARCHIDEX 2019 MALAYSIA

3-6 July 2019

In its 20th year, ARCHIDEX—an international architecture, interior design and building exhibition—expects 35,000 professional and trade visitors from over 70 countries.

With three newly built halls at the new wing of the Kuala Lumpur Convention Centre, the exhibition will occupy a total of 10 halls, covering 24,000 square metres, with about 600 local and international exhibitors, 1,400 exhibition booths and four country pavilions.

The Malaysian Institute of Architects' (PAM) Pavilion of Tomorrowland will be housed in the new Innovation Hall, showcasing technological possibilities in architecture and urban design for the future. The four days will also be filled with networking events, conferences, forums, workshops and tours, such as Biz@ARCHIDEX and the Focus Forum@ ARCHIDEX.

Jointly organised by the leading Malaysian trade and lifestyle exhibitions organiser C.I.S Network Sdn Bhd (C.I.S) and PAM, ARCHIDEX is held in conjunction with the annual Kuala Lumpur Architecture Festival (KLAF).

One of the key events under the KLAF is the annual International Architecture & Design Conference (DATUM:KL). "The event gathers some of the best architects in the world so that Malaysian architects can have the chance to expose themselves to global benchmarks and at the same time, get incentivised to see what's happening in the design and production world that supports the building industry," says PAM President Ar Lillian Tay.

Other concurrent exhibitions include ECO-B (Eco Building & Design Exhibition), FACIMEX (Facilities Management & Cleaning Exhibition) and ENGINEER (Mechanical, Electrical & Civil Engineering Exhibition).

Construction+ is an official media partner for Archidex 2019. Pre-register today at www.archidex.com.my.

4 – 6 SEPTEMBER 2019
SANDS EXPO & CONVENTION CENTRE SINGAPORE

YOU'RE INVITED!

TO THE REGION'S LEADING EXHIBITIONS FOR THE ENTIRE BUILT ENVIRONMENT VALUE CHAIN

SUSTAINABILITY — BEX ASIA

ENERGY EFFICIENCY — mcs RSIR mostra convegno expocomfort

PRODUCTIVITY — INNO BUILD ASIA

SMART — SMART CITIES & BUILDINGS ASIA

WHAT'S NEW THIS YEAR!

First fully integrated exhibitions in the region covering the entire built environment value chain

2 newly launched exhibitions focusing on productivity and smart

Cutting edge sustainability, energy efficiency, construction and smart **technologies that are new in the market**

Specially curated feature to showcase the future of smart buildings

REGISTER NOW TO MEET YOUR FELLOW BUILT ENVIRONMENT PROFESSIONALS

T : +65 6780 4594
E : info@bex-asia.com
W : www.builtenvironmentexpo.com

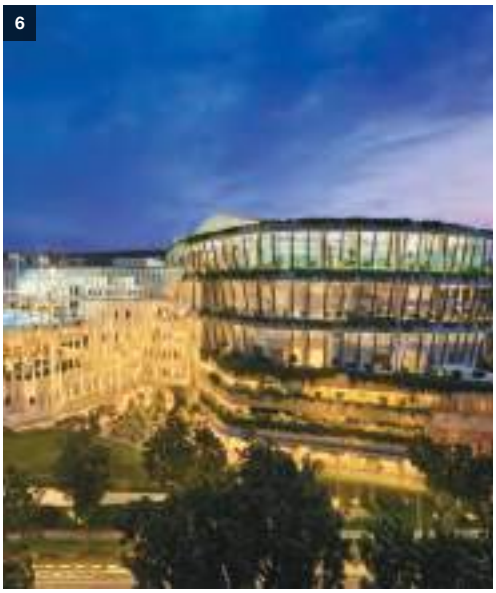
Exhibitions Organiser: Reed Exhibitions

IBEW Organiser: Building and Construction Authority

4 Anchor Exhibitions Under: IBEW


25
YEARS OF
QUALITY
No.1
roofing solutions
in Malaysia since 1994
TERREAL
Building Beauty
25
Years of
TERREAL
in Malaysia
www.terreal.com.my

BCI ASIA AWARDS 2019



TOPTEN
ARCHITECTS 2019

1. ADDP ARCHITECTS LLP
2. ARCHITECTS 61 PTE LTD
3. DESIGN LINK ARCHITECTS PTE LTD
4. DP ARCHITECTS PTE LTD
5. ID ARCHITECTS PTE LTD
6. ONG&ONG PTE LTD
7. P&T CONSULTANTS PTE LTD
8. RSP ARCHITECTS PLANNERS & ENGINEERS (PTE) LTD
9. SAA ARCHITECTS PTE LTD
10. SURBANA JURONG CONSULTANTS PTE LTD

SINGAPORE

7 JUNE 2019 | FAIRMONT SINGAPORE


1


2


3


4


5


6


7


8


9


10

TOPTEN
DEVELOPERS 2019

1. CITY DEVELOPMENTS LTD
2. GARDENS DEVELOPMENT PTE LTD (A KEPPEL LAND-WING TAI JV)
3. HOI HUP REALTY PTE LTD
4. LOGAN PROPERTY (SINGAPORE) COMPANY PTE LTD
5. NANSHAN GROUP SINGAPORE CO PTE LTD
6. OXLEY HOLDINGS LTD
7. QINGJIAN REALTY (SOUTH PACIFIC) GROUP PTE LTD
8. ROXY-PACIFIC HOLDINGS LTD
9. S P SETIA
10. SLB DEVELOPMENT LTD

BCI ASIA AWARDS 2019

TOPTEN
ARCHITECTS 2019

1. AKIPRAKTIS
2. AKITEK AKIPRIMA SDN BHD
3. ARCHIMATRIX SDN BHD
4. ARKITEK KDI SDN BHD
5. CHY ARCHITECTS SDN BHD
6. NWKA ARCHITECTS SDN BHD
7. RDC ARKITEK SDN BHD
8. SA ARCHITECTS SDN BHD
9. T & T ARCHITECT SDN BHD
10. VERITAS ARCHITECTS SDN BHD

MALAYSIA

21 JUNE 2019 | JW MARRIOT HOTEL KUALA LUMPUR


1


2


3


4


5


6


7


8

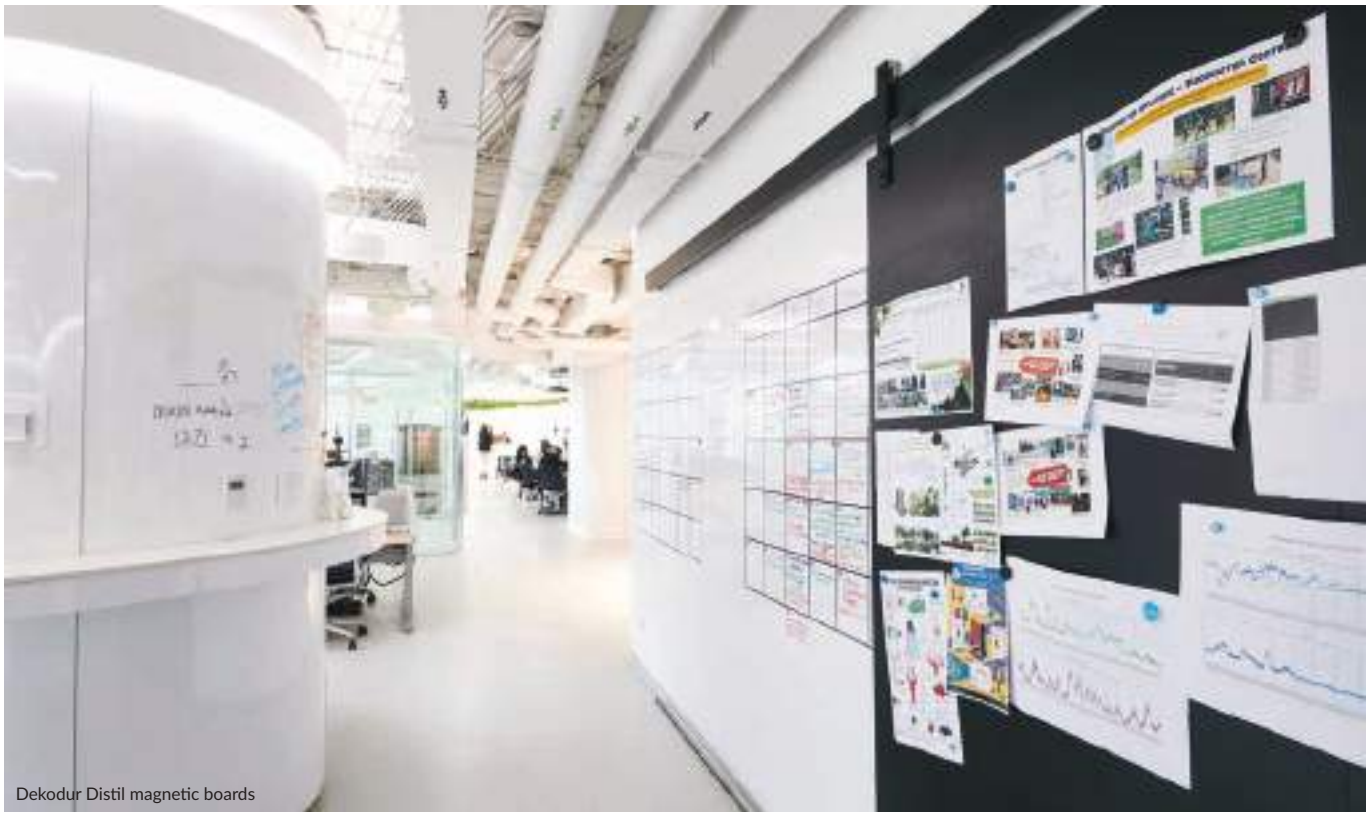

9


10

TOPTEN
DEVELOPERS 2019

1. ECO WORLD DEVELOPMENT GROUP BHD
2. GAMUDA LAND
3. KSL HOLDINGS BHD
4. LBS BINA GROUP BHD
5. MAH SING GROUP BHD
6. SIME DARBY PROPERTY BHD
7. SKYWORLD DEVELOPMENT GROUP
8. S P SETIA BHD
9. SUNWAY BHD
10. TROPICANA CORPORATION BHD

GET CREATIVE WITH LAMINATE SURFACES



Dekodur Distil magnetic boards

IDEAS THAT STICK: MAGNETIC LAMINATES

Dekodur Distil's magnetic laminate surfaces allow magnetic objects to adhere firmly thanks to a special embedded core. These multipurpose laminates add functionality to the interior spaces in residential or commercial sectors.

Offering writing and painting options, they are an excellent platform for creativity and expression at home or at work. In addition, the matte surface can be used as a projection wall. The magnetic laminates are available in matte or gloss finish, with a choice of coloured (white, black, tank green) or raw textures. They come in sizes of 4 by 8 feet, with 4 by 10 feet on an indent basis.

LEAVE NO MARKS WITH MAGIC TOUCH

Dekodur Distil's Magic Touch supermatt laminates are sleek and beautiful, yet highly functional and durable, a choice material for the modern, sophisticated interior. They offer smart features such as anti-fingerprint, as well as impact and abrasion resistance. Magic Touch is ideal for horizontal and vertical applications in high traffic areas that demand superior performance. Available in seven colours (Alabaster, Anthracite, Bianco, Cosmos, Merlot, Nero and Nude), they come in two sizes: 4 by 8 feet and 4 by 10 feet.

Dekodur Distil Magic Touch

ABOUT THE COMPANY

Armed with fresh perspectives, Catalyste has set benchmarks in the laminate industry with leading interior surface brands, such as Lamitak, O2, Dekodur Distil and Alvic. With innovative products such as sleek decorative metal laminates, anti-fingerprint and magnetic functionalities, the company provides ideal solutions for every visual aspiration.

For more information, please visit dekodurdistil.com or email enquiry@catalyste.co.

LILIN releases Maintenance Devicehub DH032 & Device Cloud of Device Management for Installers

LILIN DeviceHub DH032 can manage IP cameras and NVRs via LILIN Device Cloud and LILINHub Apps for efficient remote maintenance.

LILIN Device Cloud is a device management service platform that receives recording, online and operational status sent by LILIN DeviceHub. When there are any issues, the LILINHub App sends push notifications to LILIN installers.

The NVR/DVR hard disk and camera SD card recordings, NVR/DVR device health and camera disconnection can then

be immediately analysed remotely.

LILIN installers are able to use LILIN P2P NVR through a 4G router for video, Navigator systems for central video management, and Navigator's Google Map for installation sites' video management for efficient maintenance management services. A remote reboot via LILIN Web Smart PoE switch can be performed before technicians go on site.

Mr. Steve Hu, Product Manager of LILIN, said: "We are very pleased to release LILIN DeviceHub and the Device Cloud to solve the problems of long-term unattended CCTV equipment. No one knows when the NVR does not record, the camera gets disconnected, or CCTV devices are broken. These issues can be remotely managed through LILIN Device Cloud and LILINHub Apps. This solves the most troublesome personnel dispatching issues, which includes expensive traveling costs and maintenance operation of LILIN installers.

"LILIN Device Cloud also provides extra recurrent revenue for LILIN installers by servicing device operation management for end users. The goal is a win-win situation between the installers and their customers."

LILIN Device Cloud communicates to LILIN DH032 DeviceHub using HTTPs protocol, with an encrypted database for extra protection. The LILIN DeviceHub is designed for providing secured IoT device maintenance management. In the near future, LILIN will provide the integration of power SmartPlug for other non-PoE devices to support more IoT devices.

For more info: **www.meritlilin.com**

LILIN

RONAN COLLINS

Civil and structural engineer Ronan Collins is committed to driving innovation and digital transformation in the local construction industry.

Graduating from University College Dublin in 1996, Collins began his career at Arup Ireland and transferred to the Arup Hong Kong office in late 2000. He started his own BIM consultancy business in 2003 and was involved in rail and airport infrastructure projects, along with an international school, hotels, casinos and retail developments. He was also involved in the drafting of the Construction Industry Council BIM Standards for Hong Kong, based on the UK's PAS 1192 BIM Level 2 standards.

In 2016, he accompanied his wife, who is originally from Ipoh, and son to Malaysia, where he was hired by Aecom as BIM Manager for the underground section of the Klang Valley Mass Rail Transit (KVMRT) Line 2, in collaboration with MMC Gamuda.

Today, Collins is serving as Head of Project Information Management at Gamuda, where he supports the different teams working on BIM and data management across the various business units in the group.

He shares some of his experience and thoughts with *Construction+* editor Joanna Sze.

How did you first get involved in BIM?
Back when I was in university, computers were just starting to be used in engineering. When I began work at Arup in 1996, my first experience was learning rudimentary 3D modelling for structural analysis on my own. After using 3D analytical models to design a couple of projects, I immediately understood its potential benefits.

Then in the late-1990s, we won a competition to design the Irish Pavilion for an Expo 2000 in Germany. We had to design a building in Ireland that could be assembled in Hanover, Germany, while meeting their strict building codes, and then returned back to Ireland after the exhibition. We designed a steel structural frame, with modular cladding systems, that could be bolted together and taken apart. I initially did an analytical 3D model for the design, from which our CAD team came up with the 2D construction drawings, which were then sent to the steel fabricators.

However, the steel fabricators had trouble translating the 2D drawings into their 3D steel detailing platform, which was a forerunner for Tekla back then. After visiting the steel fabricators office and observing what they were doing,

The Irish Pavilion: A steel structural frame with modular cladding that can be bolted together and taken apart

To this day, our industry still struggles with designers issuing 2D drawings with insufficient details to fabricators.

I realised that our 2D drawings lacked sufficient details for fabrication—the solutions had to be derived in 3D. From this experience, I learnt the importance of engineers designing and fabricating buildings in 3D and collaborating with contractors.

To this day, our industry still struggles with designers issuing 2D drawings with insufficient details to fabricators—the problems that we faced in 1999 are the same problems we are dealing with in 2019.

When I moved to Hong Kong, I arrived with 3D engineering knowledge and some software tools and started doing 3D modelling in 2003 for major contractors. Then my team started doing 4D modelling to do construction sequencing—this became known as BIM in 2006/2007. In essence, I was doing BIM before it was called BIM.

How does technology change the dynamics in a construction project?
A lot of technology and innovation come from putting different ideas together. For example, we experimented with a process where you could use a drone to take photos and convert them into 3D models—a process called photogrammetry. Working with an experienced drone pilot, we did a sample to see if the process would work for a site and realised that it was very powerful—it has now become part of our surveying team's skillset. If I were to do a new project now, I'd ask the surveying team to give me a drone survey of the site, so I get a 3D model of the ground topography that I can use for my design and coordination.

Collins (centre) at a panel discussion during Digital & Automated Construction and MRT Corp BIM Day 2019

As the innovations develop, they start to layer and increase in value. In the KVMRT project, for example, MRT specified that we had to use a geographic information system (GIS).

GIS is not normally used in building construction as it is more suited to larger location-based projects, such as cabling and utility works. We employed someone from another sector who knew how to use GIS, and through innovation and sharing of ideas, he figured out how to convert our BIM and drone models, integrate them onto the GIS platform, and make them available via an Internet browser—making it easier for everyone to access the BIM information online.

Up until that point, if you wanted to access the models, you needed to know where they were stored, how to download them, and how to open the model software. Now you just need to know the URL.

Our challenge is to make things simpler and easy to use, and technology helps us to make it happen.

The KVMRT is a BIM Level 2 project. What does this mean for the project workflow?
We've been following the UK BIM Level 2 standards, PAS 1192, for the MRT project, which is information driven.

We can continue to operate on our own, but as an industry, we will all be more successful if the whole sector gets on the digital bandwagon.

One of the foundation stones of that standard is collaboration, and one of the tools to make collaboration successful is the common data environment (CDE). The idea is that the entire project team has one place to find information, which is updated regularly by all stakeholders.

We are now using our CDE platform as an integrated electronic data management system (EDMS), which has all our BIM files, along with other data such as pdf reports, Word documents, Excel spreadsheets, photographs, meeting minutes etc, structured within it.

For future rail projects in Malaysia, we anticipate that we will be required to deploy our own CDE. We will then collaborate with the project owner on when to share information with them and how to seamlessly push data from our platform to their information systems.

How would you describe the state of technology use in the local construction industry?
A lot of the documentation produced by the Construction Industry Development Board (CIDB) and the Public Works Department are based upon 3D modelling principles for coordination and not around the bigger picture of information and data management. CIDB is aware they have to keep improving their requirements, but they are also aware there is an inertia in the industry. The number of architects, QS and engineers that are still working in 2D CAD today is a concern but also a reflection of where the industry is at.

As a construction group, we are one of the first movers—we have scale, business needs and the opportunity to invest in technology. We are using BIM to improve the efficiency of our designs, quality of our digital IBS and productivity of our sites to ensure our processes produce a higher quality product in a quicker time

Our challenge is to make things simpler and easy to use, and technology helps us to make it happen.

frame at a competitive price.

We can continue to operate on our own, but as an industry, we will all be more successful if the whole sector gets on the digital bandwagon. We need to move the needle to get more consultants to adopt BIM. We want to move the conversation forward and try to get owners to understand why they should be considering investing in BIM for facility management because the whole industry has to move together.

Why is it so important for companies to invest in building technologies?
Someone asked me at a conference last year: "What is the cost of investing in BIM?", and I responded, "What's the value of your business?"

The relevant question is not about the cost of a piece of software. The issue is the viability of your business over the next three to five years. If you don't invest in BIM platforms, while there are other companies that are doing it aggressively, they will win the contracts, and you may not win new business. The cost of being a laggard is potentially your business losing market share. It is a developing trend in Malaysia as clients are seeking BIM-capable architects, engineers and builders to carry out their projects.

Our industry is slowly but surely being dragged into the digital age. We believe that companies that figure out how to leverage digital processes to improve their collaboration and productivity will be the ones that survive and succeed, and the ones who stand by and wait to see what happens are the ones that will be quickly left behind.

Collins conducts regular staff training in the use of digital technologies

DARREN PAVITT

Pavitt has more than 20 years of experience in the fit-out and construction industry across the UK and UAE. He served as ISG's pre-construction director for the Middle East in Dubai before being appointed managing director for its business in Malaysia. A key part of his new role is to expand the firm's engineering business into new sectors, both within Malaysia and in the region.

Having been with ISG since 2009, which project stands out the most for you?
One of the significant projects for me was the refurbishment of the Kempinski Hotel at the Mall of Emirates in the Middle East. Completed in 2015 over two phases, with a final value of AED180 million, the scope included refurbishment of 400 rooms, 16 ski chalets, an all-day dining restaurant and an award-winning cocktail bar, along with structural modifications to enhance the fire safety strategy of the building in meeting the new layouts.

What is an important lesson you learnt from this project?
One of the best experiences was realising the benefits of challenging the norm and exploring alternative methodologies to create value for our customers. For example, we undertook the majority of the repair works at height via abseiling instead of constructing a full scaffolding around the external façade. To overcome logistical constraints, several joinery works were also carried out in the basement carpark, where we set up a number of spray booths and an assembly area. With these methods, the project benefitted from significant time and cost savings, with minimal disruption to the hotel operations and its guests.

When looking at these large-scale, complex and phased projects, it is important to challenge the conventional construction methods and explore the opportunities they present to innovate better, faster and smarter.

The success of this 340,000-square-foot project also provided the springboard for other significant projects, including the refurbishment of the 200-key Golden Tulip Hotel in Dubai, which was completed last year.

You have been managing the business in Malaysia since August 2018. What are your main plans and goals?
I have taken on the Malaysia business to help it realise its full potential. It is a robust marketplace that offers abundant opportunities. My goal is to help grow this

business to almost double its size within the next five years.

For example, I am working on expanding the geographical footprint of ISG beyond Kuala Lumpur. Over 90 per cent of the projects delivered in the past have been within Malaysia's capital, and I am keen to explore growth opportunities in other cities, such as Johor Bahru—where we are currently delivering the fit-out of a research and development facility for a renowned British technology company.

I also want to further demonstrate our multi-sector capabilities to help our customers understand the strength and depth of our delivery credentials, especially in highly complex and technical schemes that require niche expertise. Our growth plans in the region include expanding our offerings by positioning our engineering services, as well as building our experience in the local market.

My background in pre-construction will also help the Malaysia business achieve commercial competitiveness and strengthen relationships with key supply chain partners—many of whom are global suppliers to the wider group—to improve the control we have on projects.

What are some of the key initiatives that you have implemented so far?
I've been working on further refining our work-winning strategies, allowing the team to learn through the active tender processes and understanding the requirements of each customer. Each customer is different, and the earlier we realise their key drivers, the better our offer can be. For some, it may be having minimal disruption in a live environment, while for others, it may be about having high standards of health and safety. We get one opportunity to bid, and getting it right from the outset eradicates the need to recover it through the project lifecycle.

I also want to strengthen the business in different areas to cope with growth, ensuring the policies and procedures

The Noir Bar at the Kempinski Dubai

It is important to challenge the conventional construction methods and explore the opportunities they present to innovate better, faster and smarter.

are adapted to suit the new challenges ahead. For example, our information technology systems are being improved this year with the migration to Office 365. We will also embed a new ERP finance tool, pricing software and site management application to help us for improved efficiency and accuracy from the estimating stage through to construction and final accounts.

What would you say are the strengths of ISG Malaysia, and how will you contribute towards its success?
Client demands, regardless of geography, are often similar—reasonably priced projects that are built with futureproofing in mind and completed on time. In Malaysia, we have delivered projects across challenging timelines, such as the fit-out of Zurich Insurance and Zurich Takaful's office—spanning more than 110,000 square feet—at KL Eco City within 15 weeks.

The Zurich office at KL Eco City completed in 15 weeks

All images by ISG

It is essential to have a clear proposition and key differentiators because merely competing on a cost basis is unsustainable.

As such, many customers return to us each time their business expands. In 2019, we will be delivering significant projects for three repeat customers across Kuala Lumpur. At the same time, we have also secured an equal number of projects with new customers in a heavily competitive market.

I will use the continuous feedback received from customers to continually improve how we deliver our services. Over the next 12 months, we will develop an account management approach, where we will provide each customer with a dedicated expert relationship manager to ensure projects are delivered above and beyond expectations.

What are some of the main challenges in the Malaysian market?

Malaysia is a developing nation with immense opportunity, and this attracts a broad range and quality of services to the business community due to a relatively low entry barrier to market.

We are in a market that is fundamentally driven by cost; however, it is incumbent on leading contractors to have those honest conversations with customers about the implications of merely looking at cost criteria. It is essential to have a clear proposition and key differentiators because merely competing on a cost basis is unsustainable.

There is also a correlation between a cost-driven market and the ability to introduce real change and innovations at a much wider level. At ISG, we never compromise on the health, safety and well-being of our team. Having such rigorous standards and a zero-tolerance

Fast-paced and rapid advancements of digitalisation and technology increase the rate of adoption in built environments as businesses evolve accordingly to meet the opportunities, requirements and challenges they pose.

approach to risk on site, we work hard to make the wider construction industry in Malaysia a safer place to operate in.

The multi-national composition of our workforce in Malaysia brings both advantages and challenges. Such a diverse talent pool means that innovation can flourish in our industry, with different ideas and insights from across the globe collaborating on projects. The challenge that this brings can be the language barriers and the differing standards that workers are familiar with. We see this latter point as a critical area where ISG can raise the bar for standards across the industry.

In the face of the digitalisation of the construction industry, how does ISG harness technology in its work, and is it a business priority?

Fast-paced and rapid advancements of digitalisation and technology increase the rate of adoption in built environments as businesses evolve accordingly to meet the opportunities, requirements and challenges they pose. This provides us with the opportunity to innovate and influence and drive the construction industry forward.

ISG recognises that technology is one of the key enablers for the business to drive operational efficiencies. As earlier mentioned, our network of offices around the world are now connected on a single Office platform, supported with collaborative tools that provide instant access to site teams and employees. When fully adopted, our new pricing software will transform the quality of our commercial output, while our ERP system will consolidate our financial accounting. On site, we are looking to deploy a laser scanning equipment that builds 3D models for proof of concept prior to the build stage.

These are a string of examples of technologies we are harnessing in proactive and meaningful ways to enhance our value and delivery model, while preventing unnecessary construction errors that result in delays and cost implications.

GRAPHENSTONE

THE ORIGINAL & AUTHENTIC

World's 1st ecological paint with Graphene Technology

- EXCELLENT COVERING POWER
- GRAPHENE TECHNOLOGY
- WASHABLE
- RESISTANT AND DURABLE

ENERGY EFFICIENCY

The graphene technology (material with greater thermal conductivity scientifically proven), regulates and distributes the temperature of the spaces avoiding condensations and reducing cold spots.

More than 13 National & International Awards

World's Most Certified Green Brand

PAINTS FOR THE *green* GENERATION

Graphenstone Far East Sdn Bhd
(1239335-T) No. 1, Tkt 3 Jalan PJU 1A/41B,
Pusat Perdagangan NZX, Ara Jaya, 47301
Petaling Jaya, Selangor Darul Ehsan,
MALAYSIA
T: +6 03-7885 0791
fareast@graphenstone.com

DAIKIN

MAKE THE SWITCH

DAIKIN GAS TIGHT JOINT

Daikin Gas Tight Joint (DGT) is a non-brazed connection for refrigerant piping. Connection method is simple, hassle free and fast without the use of special tools.

DGT joint meets all the stringent requirements in terms of safety and leak tightness while providing substantial benefits such as:

i. Improved productivity resulting in time savings
ii. No Hot-work Permit is required resulting in easier clearance on site
iii. Enhanced safety as no brazing tools on site are required

DGT joint is also the first refrigerant pipe fitting awarded the Singapore Green Building Council (SGBC) 3-tick Excellant rating.

ABOUT DAIKIN

Daikin Airconditioning (Singapore) Pte Ltd is a subsidiary of Daikin Industries Ltd. As The Only Japanese Aircon Specialist, we apply cutting-edge technologies to enhance man's inner space, providing the comfort of sophisticated air conditioning systems to thousands of Singaporean home, educational and recreational needs, now and in the near future. Apart from delivering premium, energy-efficient products that allow our customers to enjoy quality lifestyles, Daikin Singapore also values our relationship with them. We aim to be “Everywhere With You”, in a partnership that begins by putting customers first. Always.

For more than 40 years, Daikin Singapore has been touching the lives of Singaporeans. Set up here in 1968, Daikin has mirrored the nation’s growth and gone on to achieve many firsts in Singapore. When the nation’s Housing and Development Board (HDB) was paving the way to house Singaporeans of growing affluence, Daikin was the first to introduce multi-split air-conditioning systems to HDB homeowners. As businesses boomed, Daikin also introduced to the island in 1986, the world’s first super-efficient VRV® Systems for commercial buildings.

More recently, we popularized inverter technology to address the country’s quest for greater eco-friendly and energy efficient products. In short, the Daikin story in Singapore is intertwined with the glowing success of the nation-state.

SINGAPORE GREEN BUILDING PRODUCT SGBC EXCELLENT

JTC LOGISTICS HUB @ GUL

Upon completion in 2020, the JTC Logistics Hub @ Gul will be Singapore's first high-rise multi-tenant logistics facility to house container depots, warehouses and a heavy vehicle park—all within a single development.

This will reduce travelling time between logistics nodes, hence improving operational and cost efficiency for the logistics sector.

The eight-storey warehouse facility includes around 30 warehouse units, sized between between 1,700 and 2,500 square metres with flexibility to form larger units, and comes with 128 loading bays.

The inland container depot (ICD)—spread over two levels—will house up to two container depot units, with a maximum capacity of 6,000 TEUs per floor and complete with operational space for container inspection, maintenance and repair services.

The facility's design has been developed for efficiency and safety through the single-directional heavy vehicle traffic flow. The traffic management system, which can be integrated with the automated overhead crane system, helps optimise container flow and communication across multiple parties, such as depot operators, logistics service providers and transportation companies.

DIGITAL APPROACH

The JTC Logistics Hub is one of the first 12 integrated digital delivery (IDD) pilot projects under Singapore's Construction Industry Transformation Map, with IDD implemented from tender stage and design development to construction and up through facilities management.

Singapore's first high-rise multi-tenant integrated logistics facility


jtc
jtc Logistics Hub

Section view of container depot and warehousing under one roof

The digital technologies include systems for digital ordering/manufacturing, BIM-based digital logistics management, safety management and defect management—all of which contribute towards improved site productivity, reduced site wastage and lower construction risks.

For example, the digital logistics management helps ensure on-time assembly and delivery by allowing the tracking of location and delivery schedules of components, such as large pre-fabricated pieces, from the factory to the final installation site via RFID tags. Special gantries detect when the component departs or arrives at the worksite, and a smart crane automatically determines where the component should be installed.

The digital ordering and manufacturing system for materials, such as reinforced bars, cuts down on unnecessary paperwork and improves accuracy and productivity.

Site progress is monitored with aerial drones using photogrammetry, which creates 3D-like images. An omni-directional camera also captures the state of the worksite at various development milestones, allowing people to 'walk through' the site virtually.

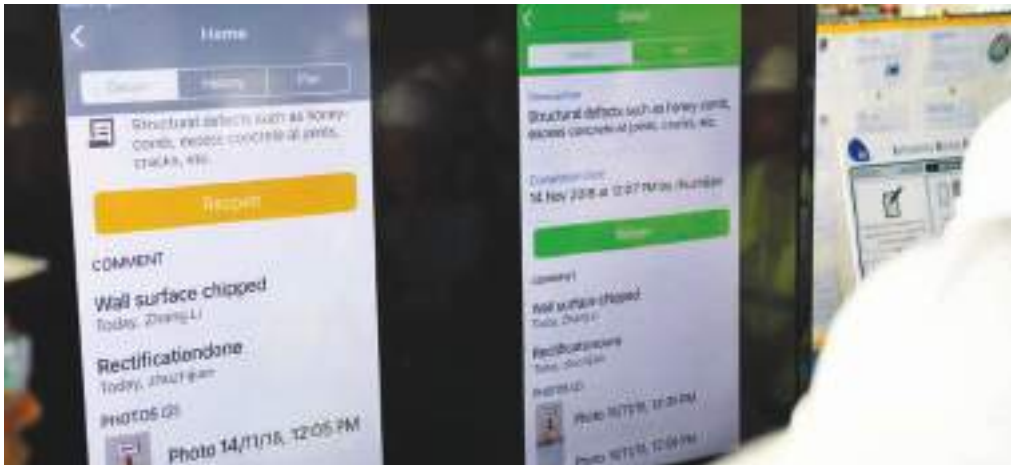
When a defect is lodged using a mobile device, sub-contractors will be alerted in real-time to rectify it. The defect data will also be updated in a project database for easy viewing and report generating.

All this digital information is accessible to stakeholders located anywhere through cloud-enabled collaboration.

STRUCTURAL INNOVATION

Another notable feature of this project is its innovative structural system. The ICD has 45-metre-high structural columns spaced 16 metres apart. Using conventional steel reinforced concrete columns, with 4-metre-deep floor structural trusses, would require labour-intensive and time-consuming welding work.

As such, the main contractor teamed up with SEN Engineering Group to explore an alternative structural design using form



Digitalised process allows real-time project information to be readily accessible


Precast components are RFID-tagged for individual tracking

prefabricated steel reinforced concrete (F-PSRC) columns and a thin steel-plate composite (TSC) beam system.

The F-PSRC column is a steel and reinforced concrete composite that uses structural steel angles with batten plates to form a lattice structure. The steel angles replace conventional I-sections, which reduces steel content per metre square, and are designed with bolted connections for faster installation. The integrated formwork also eliminates on-site formwork erection for the concreting process.

The TSC beams are U-beams fabricated from built-up steel plates, which will be filled with concrete in the permanent stage. They range from 0.95 to 2.2 metres in depth—less than the original floor trusses—giving more headroom for MEP provisions. The beams' surface area also allows for easier fireproofing application.

This project will no doubt be a milestone in the transformation of the local construction and logistics industries, both of which are critical enablers and drivers of the economy. C

PROJECT DATA

Project Name
JTC Logistics Hub

Location
1 Gul Circle, Singapore

Expected Completion
Mid-2020

Site Area
58,922 square metres

Gross Floor Area
144,076 square metres

Client/Owner
JTC Corporation

Architecture Firm
AWP Pte Ltd

Civil & Structural Engineer
Meinhardt (Singapore) Pte Ltd

Mechanical & Electrical Engineer
Meinhardt (Singapore)

Main Contractor
Kimly Construction

Images
JTC Corporation

IKEA BATU KAWAN

As a catalyst for the Aspen Vision City mixed development, the new IKEA store in Batu Kawan, Penang, is one of the first developments to proceed on this greenfield site.

While IKEA Batu Kawan is similar to other stores in the IKEA portfolio—in terms of concept, design and fit-out—it is notable for its fully modular precast construction, which has earned an impressive industrialised building system (IBS) score of 92.3 out of 100.

Fabricated offsite, the structural components were put together with the help of hoisting machines and teams of lifting supervisors and signalmen (not unlike fixing a giant IKEA furniture). This resulted in less site labour and wastage, as well as better quality and safety, saving both construction time and cost.

The reduced on-site manpower also contributed to the project's zero lost time injuries (LTIs). Every step of the construction sequence was planned and graphed out with safety precautions, resulting in smooth controlled construction planning and a safer work environment. The project also achieved the 5 Stars SHASSIC Award 2018 and National OSH Award 2018 for its safety and health standards.

The project team implemented BIM design to LOD 400, which is the fabrication and assembly level of development, allowing for advanced clash detection at an early design stage. As IKEA's design concept includes open ceilings in the majority of its public areas, the use of BIM ensured the design and positioning of all services met the design intent. BIM was further used to model the fire sprinkler patterns, ensuring that any spray path clashes were identified and resolved during the design process.

More than 4,000 solar panels to power the store


KEA

Modular precast project with IBS score of 92.3

BIM design for fabrication and assembly

Collaboration was also fostered by an innovative project setup, where the client's team, consultant designers and contractors were all co-located in the same project office, for greater efficiency and productivity.

Sustainability is also a priority in this project, which is designed for both GBI and LEED Gold standards. The iconic 'Blue Box' design allows for a wall-cladding system made up of locally available component, which meets the energy efficiency and air tightness requirements.

Leveraging upon the local weather conditions, the development taps on rain-water harvesting and has more than 4,000 rooftop solar panels installed to power the store. Other features include energy recovery equipment, eco-friendly refrigerants, optimised air-conditioning and lighting control systems, and water-saving toilet fittings.

To create a pollution-free zone during construction, dust, drainage and sewer water was carefully managed, with periodic testing to ensure the waterways were not contaminated. Construction waste was also segregated and used as backfilling material.

PROJECT NAME

Project Name
IKEA Batu Kawan

Location
Batu Kawan, Simpang Ampat, Penang, Malaysia

Completion Date
March 2019

Site Area
24 acres

Gross Floor Area
90,600 square metres

Building Height
4 storeys; 25 metres

Client/Owner
Ikano Pte Ltd

Project Management Consultant
AECOM Malaysia

Design Consultant
Design 103 International Ltd

Master Planner
Arkitek LLA Sdn Bhd

Executive Architect
Arkitek Rekawasan

Interior Design Firm
Kajima (Malaysia) Sdn Bhd

Civil & Structural Engineer
KESHMEN Consult Sdn Bhd

MEP Design Engineer
Han Associates Group Sdn Bhd (GroupHAN)

Executive MEP Engineer
I Consultancy

Quantity Surveyor
KPK Quantity Surveys (Semenanjung) Sdn Bhd

Lighting Consultant
Kajima (Malaysia) Sdn Bhd

Landscape Architect
MLA Landscape Architects Sdn Bhd

Green Building Consultant
IEN Consultants Sdn Bhd

Design and Build Contractor
Kajima (Malaysia) Sdn Bhd

IBS Contractor
Eastern Pretech (Malaysia) Sdn Bhd)

Electrical Contractor
SECM Sdn Bhd

MVAC & Plumbing
Shinryo (Malaysia) Sdn Bhd

Lifts Installation
KONE Elevator (M) Sdn Bhd

Images
Ikano Pte Ltd

AGV ENVIRONMENT
ENVIRONMENTAL SPECIALIST

ENVIRONMENTAL PERMITTING & COMPLIANCE

- Environmental Impact Assessment
- Environmental Management Plan
- Environmental Compliance Audits
- Social Impact Assessment
- Water Quality Assessment
- Air Quality Assessment
- Quantitative Risk Assessment
- Hydrology Studies
- Hydrogeology Studies
- Ecology Studies

ENVIRONMENTAL SITE ASSESSMENT

- Phase 1 & Phase 2 Environmental Site Assessment
- Environmental Baseline Survey
- Site Remediation
- Transaction Advisory Services
- Environmental Due Diligence

SUSTAINABLE DEVELOPMENT

- Sustainability Reporting
- Sustainable Development
- Biodiversity Surveys & Conservation Programs
- Carbon Footprint Reports
- RSPO Reports

AGV ENVIRONMENT SDN BHD (1155709T)
AGV SUSTAINABILITY & ESG SERVICES SDN BHD (1177585U)

Malaysia
100-6-035, Block J, Jaya One, 72A, Jalan University,
Petaling Jaya 46200, Selangor
Tel +603 79311455
Fax +603 79313512

Penang
Suite 163-16-01, Level 16,
Hunza Tower,Gurney Paragon,
Jalan Kelawai, Georgetown,
10250 Penang
Tel +604 2228986
Fax +604 2228801

Johor Bahru
25.03A, Level 25,
Johor Bahru City Square Office Tower,
106-108, Jalan Wong Ah Fook,
80000 Johor Bahru, Johor
Tel +607 2087535
Fax +607 2087401

East Malaysia
Lot 9.05, 9th Floor,
Wisma Perindustrian,
Jalan Istiadat, Likas,
84400 Kota Kinabalu, Sabah

AGV ENVIRONMENT ASIA PTE LTD (UEN:201726942G)

Singapore
12 Marina Boulevard #17-01
Marina Bay Financial Centre Tower 3
Singapore 018982
Tel +65 6809 5058
Fax +65 6809 5001

www.agvenvironment.com
inquiry@agvenvironment.com

www.agvsustainability.com
inquiry@agvsustainability.com

PROJECTS

The new headquarters with signature cantilever roof and curved building shape

LAMAN PKNS

Any new development next to a well-established public park will draw serious scrutiny. In view of this sensitivity, the architects intricately balanced between the client's need of a landmark building that reflects their new corporate image and maintaining the public green space.

At the same time, the project sets out to be a demonstration of true Green architecture that blends seamlessly with its natural setting.

The new PKNS headquarters is designed for lower energy consumption and emissions using the three inter-related aspects of passive design, active design, and operations and maintenance.

The thermally-efficient building envelope—with double glazed windows, a specially composed exterior/spandrel wall, a green roof and additional insulation between mechanically ventilated floors—is a key factor behind reduced cooling requirements. The ceiling along the façade perimeter is also designed with an angled slope to maximise the depth of natural light penetration.

The overall massing, orientation and internal layout of the building is designed for optimal energy use, with most of the glazed façades facing north and south. Service spaces, such as toilets and storage, are located on the east–west sections of the building blocks, acting as an insulating buffer to the working space. The entrances to the offices are also located on the inner part of the building to reduce substantial cool air leak and heat transmission from the outside.

The Sky Park adds 2 acres of public green spaces

The building is boldly covered by a large grass roof, which blends it with its environment and provides civic spaces for the public. The grass roof with its soil system also reduces heat transmission from the roof and the heat island effect towards the city.

In terms of active design, the development uses individually-controlled variable air volume units, supplemented by an absorption chiller that is powered by a large solar thermal system, for its cooling needs. In double volume spaces, such as the auditorium hall, a displacement ventilation system is used. Water consumption is reduced by over 60 per cent, with a dripping irrigation system, dual flush WCs, infrared taps and the use of rainwater and recycled grey water for all toilets and irrigation.

The building will offset more than 5,000 tonnes of CO_2 emissions annually, reducing energy use by 75 per cent compared to typical Malaysian office buildings. The project is close to existing public transport hubs and provides parking priority to carpools and Green vehicles, with provision of electric vehicle chargers.

One the world's largest solar air-conditioning systems with 2,120 square metres of panels

GREEN CONSTRUCTION

During construction, a system formwork was used to minimise the use of timber and construction waste and to divert 75 per cent of waste that otherwise would be disposed at the landfills. During site clearance, 78, or more than half, of the existing trees were removed and transplanted at parks and other locations in Shah Alam. Construction materials were mostly manufactured or harvested within 500 kilometres of the site, encouraging local supplier participation and recycling of waste.

All these are only possible through the use of a multi-faceted approach involving different stakeholders, from the client to the consultants and contractors, to achieve an efficient design and construction execution.

The result is a truly Green building that the owner, the public and the city can be proud of.

View of breezeway gap at main plaza roof

Slanting ceiling and curtain walls in the gallery area maximise natural light

PROJECT DATA

Project Name
Laman PKNS
(PKNS Headquarters)

Location
2, Jalan Indah 14/8, Seksyen 14, Shah Alam, Selangor, Malaysia

Completion Date
September 2017 (final works)

Site Area
1.84 hectares

Gross Floor Area
270,000 square feet

Building Height
6 storeys

Number of Blocks
4

Developer
Perbadanan Kemajuan Negeri Selangor (PKNS)

Chief Architect & Project Manager
Tuan Hj Ar Wan Muhd Hisham Wan Hawari

Architecture Firm
VERITAS Architects Sdn Bhd

Conceptual Design Architect
Ar Azril Amir Jaafar

Project Architect
Ar Noor Halwani Ab Rahman

Interior Design Firm
Skala Design Consult Sdn Bhd

Principal Designer
Shafie Alip

Geotechnical & Structural Engineer
Arup Jururunding Sdn Bhd

MEP Engineer
Arup Jururunding Sdn Bhd

Quantity Surveyor
Yusof Associates

Lighting Consultant
Neosigma Sdn Bhd

Landscape Architect
Nodes Sdn Bhd

Green Building Consultant
Neapoli Sdn Bhd

Main Contractor
Conlay Construction Sdn Bhd

Interior Fit-Out Contractor
Jurubena Experto Sdn Bhd

Images
PKNS; VERITAS Architects (Paul Gadd)

PROJECTS


Three-storey strip mall

SANCTUARY MALL

Located in the heart of the upcoming Eco Sanctuary City, the Sanctuary Mall will be developed in phases according to market needs and the growth of the new township.

The first phase is designed as a three-storey strip mall—inspired by suburban California in the 1920s—housing a mix of 50 F&B, retail and service-oriented tenants within 100,000 square feet of nett lettable space.

The F&B outlets occupy the majority of the ground floor, followed by lifestyle retail and exhibition spaces on the second floor, and furniture, household and specialty stores on the highest level.

Traversing through the mall is a centralised pedestrian walkway, which defines the main internal circulation spine. The central atrium connects the different floors, allowing customers to get an overview of the mall's offerings by circulating vertically through the escalators.

The double-storey glass façade on the the northern end of the mall and the linear skylight at the southern tip ensure the interior space is flushed with ample natural daylight.

Aluminium-lined louvres wrap the side elevation and act as screen to the mechanical services behind, while adding visual interest to the façade. Eye-catching materials, art installations and landscaping also enhance the aesthetics.

The centrepiece is a dramatic extended and angular roof that soars above its enclosure and serves as the main mall frontage. Supported by 18-metre-high steel columns, the roof also shades the semi-outdoor roof garden and patio on the northern façade.

Façade with glass and aluminium-lined louvres

Angular roof over semi-outdoor garden and patio

PROJECT DATA

Project Name
Sanctuary Mall

Location
Telok Panglima Garang, Selangor, Malaysia

Completion Date
December 2018

Site Area
14,800 square metres

Gross Floor Area
12,000 square metres

Building Height
3 storeys; 18 metres

Developer
Eco Sanctuary Sdn Bhd (subsidiary of Eco World Development Group Bhd)

Architecture Firm
ONG&ONG 360 Consultancy Sdn Bhd

Directors in Charge
Tan Kee Keat; Ng Cho You

Project Team
Haniffi Harun; Nani Khalid

Interior Design Firm
Art Et Domain Sdn Bhd (common areas)

Civil & Structural Engineer
Jurutera Perunding Pesona Rekabina Sdn Bhd

Mechanical & Electrical Engineer
Coburg Consulting Sdn Bhd

Quantity Surveyor
JUBM Sdn Bhd

Façade Lighting
OSRAM (Malaysia) Sdn Bhd

Landscape Architect
AT9 Design Studio Sdn Bhd

Main Contractor
Jasmurni Construction Sdn Bhd

Images
ONG&ONG 360 Consultancy

ETANIA GREEN SCHOOL

The Etania schools are learning centres for marginalised, undocumented, and stateless kids in Sabah, Malaysia—many of whom are children of legal and illegal migrant plantation workers—who currently have no access to education.

Etania's ambitious plan is to build 30 centres across Sabah, which will provide a full learning programme six days a week. Hence, it approached social enterprise billionBricks to prepare a prototype school design for the first such school, which will accommodate 350 children aged between 5 and 13.

One of the main challenges for this school was its riverside location, which is prone to massive flooding every 10 years or so. Therefore, the prototype school is, not unlike much of Borneo's vernacular architecture, raised from the ground, albeit in a more unconventional way.

The classrooms are raised atop five decommissioned shipping containers and a mound created from soil excavated for a water harvesting pond—this minimises the structural components needed and stabilises the framework. The covered space below the classrooms is used as a lunch and gathering area, while the containers themselves are used for storage and toilets.

Lunch and gathering space under the classrooms


TRITON

Corridor

East classroom

The students can move around the school in multiple ways—via a centrally located staircase, two ladders or the slopes of the mound. This way, the school becomes a place for exploration and overcoming challenges, in line with its educational philosophy.

On the first floor, three blocks are placed alternately on either side of a central veranda. Two blocks contain four classrooms, and the third block on the mound is for the teachers' room and library. These are oriented along the east–west direction to minimise heat gain; this also means that the classrooms all face the river and enjoy a natural draft of air.

Between two classrooms, there are two smaller rooms for group work or for more flexible teaching arrangements. One of the rooms is a reading room with a netted floor for a comfortable reading spot.

Classrooms sit atop recycled shipping containers and artificial mound

Classrooms face the river and enjoy natural wind ventilation

PROJECT DATA

Project Name
Etania Green School

Location
Beaufort, Sabah, Malaysia

Completion Date
2018

Site Area
470 square metres

Client
Matakana Educational Society – Etania Schools

Design Team
billionBricks; Architecture BRIO

Images
Fernando GomuLya

NATIONAL UNIVERSITY CENTRE FOR ORAL HEALTH SINGAPORE

The new Centre for Oral Health (COH) is the most recent addition to the National University Health System medical precinct. It acts as the fulcrum of the existing campus, linking academic and medical spaces with necessary outreach and connections, including a landscaped green area, civic spaces and a network of bridges and covered walkways.

When fully operational, the multi-disciplinary facility will accommodate approximately 500 patients a day and offer clinical dental services, education and research facilities under one roof.

CONVERGENCE

The COH embodies a new building typology that obscures the lines between teaching, healing and practice, through a convergence of spaces and porosity between programmes.

The treatment floors are designed with a combination of tutorial rooms, open concept areas for dental chairs aggregated into pods with low partition walls, private spaces and flexible waiting areas.

The fulcrum of the medical precinct

Treatments can take place close to tutorial spaces, allowing for close cooperation between teaching and treating, while providing spontaneous opportunities for knowledge exchange.

SUSTAINABILITY

The façade design features extensive use of glass with floor-to-ceiling windows to promote a connection with nature. Horizontal shading helps maintain a comfortable interior environment, while articulated louvres temper solar gain. The bridge in the main courtyard on the west side of the building, as well as slab extensions, also provide shading to the office and teaching spaces.

On the other hand, the design for the tower uses natural daylight as much as possible, with light shelves that bounce light to be reflected off the ceiling for deeper penetration into the floorplate.

Just as the outdoor path system encourages outdoor public circulation and reduces the need for air-conditioned common zones, many of the tower floors feature public lobby areas and landscaped courtyards that open to the outdoors and provide sheltered exterior circulation for events, gatherings, meetings and waiting areas.

UNIVERSAL DESIGN

The COH Building was also awarded the BCA Universal Design Mark Gold (Design) Award by the Building & Construction Authority (BCA) in 2017 for creating an environment that addresses the needs of all age groups and abilities.

The centre is designed to serve the elderly, especially those with mobility challenges and special needs. Deliberate efforts have been taken to incorporate features such as braille/tactile indicators on staircase handrails, step-less entry, designated nursing rooms and resting areas with spaces for wheelchair and strollers.

Universal design features cater for the elderly

Reception and waiting area

Open treatment area

Courtyard garden

PROJECT DATA

Project Name
National University Centre for Oral Health Singapore

Location
9, Lower Kent Ridge Road, Singapore

Completion Date
30 April 2018 (main building and external works)

Site Area
64,489.23 square metres

Gross Floor Area
34,317.22 square metres

Building Height
11 storeys (with a basement)

Client
National University Hospital (Singapore) Pte Ltd

Project Management Consultant
ARCADIS Project Management Pte Ltd

Design Consultant
B+H Architects (Singapore) Pte Ltd

Design Team
Karen Cvornyek; Stéphane Lasserre; David Stavros; Thosapond Chawatpunjaroen; Phongsak Gunkum; Van Thuy Ha; Winy Wijaya

Medical Planning Team
Fiona Teoh; Peter Lambur; Christopher Zed; Sammy Chan; Maria Ionescu

Project Management
Davin Tan

Executive Architect
Architects 61 Pte Ltd

Principal Architect (QP)
Michael Ngu

Interior Design Firm/ Joinery Contractor
Design Studio Group Ltd

Civil & Structural Engineer
AECOM Singapore Pte Ltd

MEP Engineer
Beca Carter Hollings & Ferner (SEA) Pte Ltd

Quantity Surveyor
Rider Levett Bucknall LLP

Lighting Consultant
Lighting Planners Associates (S) Pte Ltd

Landscape Architect
ICN Design International Pte Ltd

Green Building Consultant
Building System & Diagnostics Pte Ltd

Main Contractor
Obayashi Singapore Pte Ltd

Images
B+H Architects (Singapore); Benny Loh; Stéphane Lasserre

The new iconic building of Ho Chi Minh city

LANDMARK 81

The 461-metre-high Landmark 81 tower—currently the tallest in Southeast Asia—is the centrepiece of the Vinhomes Central Park development in Ho Chi Minh City, Vietnam

The 81-storey mixed-use development comprises high-end residential apartments, a 450-key hotel and a multi-storey 360-degree observation deck, topped with a 61-metre-high spire.

A 50,000-square-metre retail podium sits at the base, complete with a series of roof terraces that create a flowing landscape, melding the tower with its surroundings.

BAMBOO INSPIRATIONS

The project's design is conceptually based on the ubiquitous bamboo stems, which speaks of strength gained through unity.

This is depicted through the tower's form—36 square tubes of different heights clustered in a six-by-six matrix. The surrounding tubes are progressively sculpted to form a dramatic spire-like profile, with the core tower in the centre. Many of these tube structures are topped with roof gardens.

The structural system relies on a central core, which is connected to the columns at the centre of each square tube by beams—this aids stability against lateral forces, such as wind and earthquakes. All primary structural elements are cast in situ concrete, and the tower is crowned with a steel frame partially clad with feature fins.

Care is taken in the design of the façade, with fixed screens that permit views out but obstruct diagonal overlooking from room to room. In other cases, suites are positioned so that the units do not overlook other units.

Observation deck

LOCAL PRIDE

In a breakthrough for the local construction industry, Vietnamese company Coteccons Construction was appointed general contractor for the foundation and upper body construction.

BIM technology was used in the construction of the complex core and steel structures, as well as for the detailed designs for the building services, which were developed over three months. BIM data was also used to improve collaboration throughout the entire construction workflow and to enable 4D BIM-based mapping that tracks progression over the building's lifetime.

The local construction team had a steep learning curve with the new technologies and technical methods—such as high-grade concrete, shortening columns and geodetic systems—along with the challenges of hauling more than 4,500 tons of steel, constructing 30-metre-high floors and pouring of concrete … all at great heights.

A purpose-built jump form system was used to construct the 81 storeys, allowing a typical floor build cycle time of between three and four days. Working continuously round-the-clock for 14 months, the team officially topped out the tower on 9 March 2018, 45 days ahead of schedule.

BUILT TO LAST

One of the main construction challenges was the poor ground conditions in Ho Chi Minh. To ensure a strong foundation, rectangular concrete piles, or barrettes, were arranged at near-maximum-allowable density and extended to a depth of over 90 metres. The design took into account data from site-specific, seismic ground investigations and wind-tunnel testing.

The excavation for the construction of the tower's pile cap was separated from that of the podium basement. This enabled the concrete pile cap to be cast earlier, reducing the overall programme by three months.

Constructing the tower's 8.5-metre-thick pile cap required the largest continuous concrete pour ever in Vietnam. This involved the excavation of 25,000 cubic metres of soil, installation of 6,500 tonnes of reinforced steel, the use of 17,000 cubic metres of concrete, and a workforce of 700 people.

Detailed logistical planning—which include the construction of temporary roads and walkways, staircases, a 3,000-square-metre retractable roofing system and a specially-designed water-cooling system to control the heat of hydration of the concrete—as well as extensive traffic management were essential for this two-month-long operation.

The tower's tube structures topped with roof gardens

Retail podium

Interior of retail

SUSTAINABILITY

The building is fitted with low-E glass windows, LEDs and daylight sensors, and a water management system.

The residential apartments use a central air-conditioning system—a first in Vietnam—to give the building a smoother appearance without unsightly individual units. The HVAC system is designed to meet Green building standards, with waste heat from the air-conditioning plant channelled for use elsewhere, such as providing hot water.

The tower's fire escapes are designed to meet and exceed the latest NFPA 5000 standards, with specially designed lifts for the upper floors, in addition to conventional stairs. This will significantly reduce evacuation time and aid those with mobility limitations in an emergency.

The firefighting system is designed to enable the podium and three basement levels to use water tanks from neighbouring buildings. The gravity-activated system also cuts costs on the pumping system.

This iconic landmark stands tall as a tribute to the achievements of the Vietnamese people, as well as an eye-catching testament to collaborative design with specialist consultants and international experts.

PROJECT DATA

Project Name
Landmark 81

Location
Vinhomes Central Park,
Phuong 22, Binh Thanh,
Ho Chi Minh, Vietnam

Completion Date
July 2018
(residential and retail)

Site Area
3 hectares

Gross Floor Area
241,000 square metres

Building Height
81 floors; 461.2 metres

Developer
Vingroup

Lead Designers
Atkins

Executive Architect
Vietnam National Construction Consultants (VNCC)

Principal Interior Designer
Atkins

Landscape Architect
Atkins

Geotechnical & Structural Engineer
Arup

MEP Engineer
Aurecon

Green Building Consultant
Aurecon

Lighting Consultant
Aurecon

Quantity Surveyor
Atkins

Main Contractor
Coteccons Construction

Project and Construction Management
Mace Group

Images
Vinhomes; Atkins


TROX
THE TROX PRINCIPLE
www.troxapo.com

TOPOS height-adjustable tables provide ergonomic solutions that give people the choice to sit or stand and change postures throughout the day.

Office Planner Pte Ltd
100G Pasir Panjang Road
#05-01/02 Interlocal Centre
Singapore 118523
Tel: 65-6835-6789
Fax: 65-6235-6789

www.o-planner.com

BCI ASIA IDA INTERIOR DESIGN AWARDS 2019

The annual BCI Asia Interior Design Awards (IDA) seeks to recognise great interior architectural designs that stand out aesthetically, functionally and ergonomically. The 2019 cycle, presented by An Cuong Wood Working JSC, drew 182 submissions from across the region. Entries were invited in seven categories and had to be located in Hong Kong (China), Indonesia, Malaysia, Philippines, Singapore, Thailand or Vietnam.

The following pages show the winning and merit projects in Malaysia, Singapore, Thailand and Vietnam. Hong Kong (China) and Indonesia projects are presented in the respective local editions of *Construction+* magazine and website.

JURY

The esteemed jury members comprise some of the top creative minds around the world.

KULDEJ SINTHAWANARONG (Thailand)
CEO, JARKEN group

MAY LANDAU (New York)
Design director, Wilson Associates

LEA AVILIANI AZIZ (Indonesia)
Director/Principal, PT Elenbee Dwi Panata

BCI ASIA AWARDS 2019

MALAYSIA

WINNER

WORKING

INTERIOR DESIGN CONSULTANCY SERVICES FOR GEOMETRY
M. Moser Associates Sdn Bhd
Jury: A unique approach to the work-and-play concept, with a variety of well-designed spaces that are both industrial yet warm.

MERIT

LIVING

SHARON PHANG RESIDENCE
Ooi Design & Associates Sdn Bhd

RETAILING

MONALISA BOOK STORE
Ooi Design & Associates Sdn Bhd

BCI ASIA AWARDS 2019

SINGAPORE

WINNER

LEARNING

SUSTAINABLE SINGAPORE GALLERY

Zarch Collaboratives Pte Ltd

Jury: An iconic design with a strong concept transforms and activates the space into a stunning and user-friendly gallery. The use of organic sculpture elements sparks a memorable and impactful experience for visitors.

LEARNING

NATIONAL UNIVERSITY OF SINGAPORE CENTRAL LIBRARY

Architects 61 Pte Ltd

Jury: A good interaction of spatial design and execution, the design combines a much-needed openness with the use of screening and warm materials to create an inviting and conducive environment.

FUNAN

Woods Bagot

Jury: The connectivity and interactivity of spaces are well thought out and help promote human interaction in this mall redevelopment project.

TERMINAL 4, CHANGI AIRPORT

Benoy

Jury: Excellent design space blended with technology, art elements and lighting, together with vertical landscaping, result in a bright and airy modern airport with clarity for navigation.

BCI ASIA AWARDS 2019

SINGAPORE

MERIT

NAFA ARTS PRESCHOOL
SODA (Spirit Of Design Analogy)

ID21 OFFICE
ID21 Pte Ltd

THAILAND

MERIT

DWP OFFICE
dwp

SINGHA COMPLEX / RETAIL PODIUM
Steven J. Leach, Jr + Associates Ltd

THAILAND

WINNER

LIVING

EYSE 43

Steven J. Leach, Jr + Associates Ltd

Jury: Modern meets minimalism in this 109-square-metre condominium, which exudes warmth and understated elegance through the right combination of materials, colours and lighting.

LIVING

THE ESSE SUKHUMVIT 36

dwp

Jury: A well-executed modern and luxe approach with a combination of wood, marble, glass and lighting. The layout is designed to capitalise on natural light, giving the space a warm, modern and open look.

BCI ASIA AWARDS 2019

THAILAND

WINNER

SOCIALISING

AHSA FARMSTAY
Creative Crews
Jury: Open space, ventilation, natural light and reclaimed timber blend this farmstay with its environment. Using vernacular architecture, it showcases simplicity at its best.

WORKING

CC OFFICE
Creative Crews
Jury: A good combination of urban and industrial design, with much respect for its environment, bringing the outdoors into the interiors.

VIETNAM

WINNER

LODGING

LIBERTY HOTEL QUY NHON
Kaze Vietnam Co, Ltd

Jury: The design gives a good and thoughtful perception of refined history, with the use of curves in sculptural elements to convey a connection to fishing villages.

MERIT

LODGING

EASTIN HOTEL RESIDENCES HANOI
Baumschlager Eberle

INTERIORS

GEOMETRY MALAYSIA

Multinational advertising agency Geometry Malaysia is one of 12 operating companies housed within the WPP Campus. The holding group aspired to create a new lifestyle and workstyle for its multi-generational talents with bolder and better office spaces.

Geometry's activity-based workplace embraces the idea of agility, transparency and integration, allowing seamless connectivity between spaces.

A café serves as a communal meeting space for guests and staff before they are organically dispersed through shared spaces on each side. Within the confines of the front of house are informal work points, complete with lounge areas, bar-height tables, cosy corners and small meeting rooms.

A feature column of vintage TVs stacked with LCD screens projects Geometry's visual brand identity while paying homage to the evolution of media. The use of linear suspended lights mixed with pendant lights at the reception area creates different ambiences for various activities and act as indirect wayfinding.

The design brief called for several private meeting rooms, together with small and large collaboration areas. The use of 3D-modelling tools in creating the design solutions helped mitigate risks and potential misunderstandings.

Flexible spaces were key to maximising space and avoiding wastage, without compromising the needs and quality of each area. As such, the pantry is integrated with a mobile greeting space, which can expand into a large meeting area. A meeting room borders the pantry lounge, with pivot doors that opens up for a larger setting. Both spaces are visually connected to the entrance and waiting area, forming a multifunctional front of house zone.

Café serves as communal meeting space


geometry
geometry
geometry
metry

Variety of work settings

A variety of work settings, with multiple types of seating and height-adjustable tables, cater to the ergonomic needs of employees while encouraging people to move around the workplace. A careful combination of enclosed rooms and open work plans ensure sufficient natural light is accessible to all users.

The interiors are dressed in a mixture of complementing and contrasting textures and finishes, with raw and rustic balanced out with timber and soft finishes. Bold patterned rugs that run seamlessly from floor to cement wall create a sense of warmth, while rattan chairs add a local touch and character to the space.

A perforated mash in the gallery serve a dual purpose—for echo control and as a pin-up board for notes and ideas. Moss wall installations at discussion booths and potted crawlers infuses a calming green of natural elements.

Seating booths are placed along the walkway connected to the back of house, while cosy pockets allow for individual privacy as well as small collaborations. Lockers and storage are strategically provided throughout for ease of access and also act as subtle boundaries between settings.

Raw and rustic meets timber and soft finishing

Sufficient natural light throughout

Discussion booths with green walls

Feature column of vintage TVs stacked with LCD screens

PROJECT DATA

Project Name
Geometry Malaysia

Location
Level 15, WPP Campus (Tower H), Empire City, Damansara Perdana Selangor, Malaysia

Completion Date
August 2018

Gross Floor Area
929 square metres

Client
Geometry Malaysia

Interior Design Firm
M. Moser Associates Sdn Bhd

Principal Designer
Ramesh Subramaniam

Mechanical & Electrical Engineer
J. Roger Preston (Malaysia) Sdn Bhd

Lighting Consultant
Exin Lighting

Main Contractor
ISG Asia (Malaysia) Sdn Bhd

Interior Fit-Out Contractor
ISG Asia (Malaysia) Sdn Bhd

Images
H. Lin Ho Photography

MONALISA BOOKSTORE

This Feng Shui-inspired project seeks to offer a different bookstore experience to expand readers' knowledge of Chinese culture, literature and dialects. Housed in two three-storey shop units, the bookstore offers a variety of timeless and welcoming spaces, including an event room, office space and in-house cafés at each floor.

The interior is dominated by warm textures, rich wood tones and subtle earthy shades, with touches of brass and reflective surfaces selectively placed to enhance the overall ambience.

The various book display areas are separated by category and different types of flooring that help guide customers visually. On the highest floor, there is a reading zone for kids and teenagers, as well as a second-hand books area. A notable display is the six Stonehenge-inspired book towers in the architecture books section.

A reading zone for the young ones

Themed bookcases

A variety of shelving display and soft lighting

Book display units of different heights are used, with lower units at the aisles and entrances and taller shelves along the perimeter. Some custom-designed book display units double as staircase railings or barriers. Wallpaper with Chinese grid paper motifs line the walls, while table lamps and built-in strip lights help soften the interior atmosphere.

Loose furniture and an open-style floor plan allow for a variety of seating configurations in the event area, which can be used for book readings, seminars, talks and activities. A circular rug in middle of the room mimics the ceiling design and gives the space a pop of colour and character.

The Feng Shui-inspired cashier counters each sport a different look, such as the lightning bolt-shaped counter on the ground floor. The location, angle, colour and materials used carry its own special significance.

Each in-house café has its distinctive theme, such as the Nyonya café at the ground floor, the Japanese-themed café on the first floor and the dessert-centric café on the highest floor.

The open-style event area

Dessert-themed café

PROJECT DATA

Project Name
Monalisa Bookstore

Location
Bukit Jalil, Kuala Lumpur, Malaysia

Completion Date
June 2018

Gross Floor Area
8,600 square feet

Building Height
3 storeys

Client/Owner
Liew Wei Chyan

Interior Design Firm
Ooi Design & Associates Sdn Bhd

Main Contractor
Ornamental Details & Aesthetic Sdn Bhd

Images
Gavinyam Studio

Main gallery space anchored by the suspended white 'ribbon'

SUSTAINABLE SINGAPORE GALLERY

For the island city-state of Singapore, survival entails the prudent management of scarce natural resources and sensible handling of environmental challenges.

The Sustainable Singapore Gallery seeks to communicate the message of sustainability in ways that would raise public interest and maximise public engagement.

Integrated with the Marina Barrage, the gallery is designed not as an isolated exhibition but as part of the holistic experience of the building and context. Documenting Singapore's environmental transformation, the gallery educates the public on present and future environmental threats, promoting a more sustainable lifestyle.

The design team co-ordinated between various stakeholders and agencies to curate an inclusive story that is translated spatially into distinct zones. The gallery layout is designed to be freely navigated and readily understood, with the integration of wayfinding and a feature 'ribbon' element providing structure to the narrative.

The suspended white 'ribbon' weaves through the 'shells' of the gallery space, evoking the familiar and historic Singapore River as part of the narration of Singapore's water story.

To amplify the gallery's message, the spatial language incorporates everyday objects—such as PVC water pipes, copper conduits and recyclable waste—to encourage visitors to reflect on their possible personal contributions towards sustainability. A feature sculpture made of recyclable objects form the highlight of Zone E: Journey to Zero, designed with the participation and contribution of local schoolchildren.

The gallery provides a multi-layered experience where architecture, text and multimedia are combined to spark interest, curiosity and engagement.

Glass floor installation depicting the island's landfill

Mirror finish and lights create a futuristic atmosphere

Perforated circular discs depict water droplets

Interactive installation on imagining mobility

Feature ceiling constructed out of PVC pipes and embedded with lights

PROJECT DATA

Project Name
Sustainable Singapore Gallery

Location
Marina Barrage, Singapore

Completion of Renovation
April 2018

Gross Floor Area
1,618 square metres

Owner
Public Utilities Board (PUB), Singapore's National Water Agency

Architecture & Exhibition Designer
Zarch Collaboratives

Principal Architect
Randy Chan

Interior Design Firm
Zarch Collaboratives

Principal Designer
Randy Chan

Mechanical & Electrical Engineer
Icon Engineers LLP

Quantity Surveyor
QS Consultants Pte Ltd

Lighting Consultant
SWITCH

Lighting Designer
Takeo Sugamata

Multimedia Consultant
Ong Kian Peng

Graphics Consultant
Tan Wee Lee

Main Fit-Out Contractor
PICO Art International Pte Ltd

Images
Zarch Collaboratives; Finbar Fallon

CENTURY SQUARE RENOVATION

The decades-old Century Square mall needed a major makeover—in terms of façade, facilities, mechanical systems and finishing—to remain competitive and relevant.

The mall has always been an important point of connection for residents and office workers in Tampines, an essence that has been retained and enhanced with the SGD60 million renovation works. The existing connections between the mall and surrounding homes, transportation nodes and other office and commercial buildings have been taken into account in planning its entry points, with added visual cues and lighting for easy navigation.

For a more efficient turnaround process and shorter renovation time, the mall was closed in September 2017 for about nine months. This allowed the construction team full access to the mechanical systems for replacements and upgrades for better energy efficiency. The older air-conditioning systems have been replaced, an energy-efficient chilled water plant has been installed, along with LED lights with smart-control systems and water-efficient sanitary fittings.

The retail units have also been reconfigured to create a thematic shopping destination, with a marketplace concept that includes a new supermarket in the basement, a cooking school and a sports concept store.

The modernised exterior façade boasts a cladding composed of line motives, representing the vital connections between the mall and its surrounding community. A skin of perforated aluminium screens off the existing walls, columns and roof, while lights and large LED screens showcase the mall's new dynamic energy at night.

Digital technologies such as an 'e-doodling wall' and a virtual library are incorporated to keep up with the times, while family-friendly facilities, parking spots for hybrid cars and bike stations with shower facilities further serve the needs of shoppers and the local community.

Lights and large LED screens showcase the mall's dynamic energy at night


CENTURY
SQUARE

Retail units have been reconfigured to create a thematic shopping destination

Roof deck

PROJECT DATA

Project Name
Century Square Renovation

Location
2, Tampines Central 5, Singapore

Completion Date
May 2018

Building Height
6 storeys

Owner
Century Square Holdings Pte Ltd

Operator
AsiaMalls Management Pte Ltd

Architecture Firm
DCA Architects Pte Ltd

Interior Design Firm
I.DCA Pte Ltd

Green Mark Consultant
DCA Architects Pte Ltd

Civil & Structural Engineer
P&T Consultants Pte Ltd

Mechanical & Electrical Engineer
J Roger Preston (S) Pte Ltd

Quantity Surveyor
Arcadis Singapore Pte Ltd

Interior Fit-Out Contractor
Shimizu Corporation

Building Services Contractor
Kandenko Co Ltd

Cold Water Plumbing & Sanitary
Union M&E Pte Ltd

Façade Contractor
GTM Aluminium Pte Ltd

Roofing & Waterproofing
Heng Boon Seng Construction Pte Ltd

Images
AsiaMalls Management Pte Ltd

YOUR STYLE
YOUR SPACE

GEZE sliding door systems for manual glass, wood and metal doors

GEZE offers a wide range of fittings solutions for functional and optically appealing sliding door systems, room partitions or other moving elements with glass, wood or metal leaves. These enable considerable design freedom and planning flexibility. Demanding technologies, high-quality materials and first-class workmanship move the roller carriages precisely, gently and quietly over the guide rails and make the fittings system extremely durable with a long-life.

Door Technology | Automatic Door Systems | RWA and Ventilation Systems | Safety Technology | Glass Systems

THE ESSE RESIDENCE

This super-luxury condominium in Sukhumvit, Thonglor, melds traditional Thai architectural elements with modern contemporary design.

Following the concept "a harmony of contrast", the finest modern raw materials, with nuances of earthy tones and opulent oriental fabrics, are matched with contemporary patterns to create a sense of space and connection to nature.

The lobby's vertiginous ceilings feature a custom-made silk chandelier, while its folding doors are subtly decorated with Thai art patterns. It is accessed through a corridor space that is designed for both privacy and a sense of arrival. This hallway also links to all the facilities, borrowing from the art of Thai landscaping, with the incorporation of big trees and water features.

The flexibility of the spaces in this development represents a fusion of life in the big city with the need for privacy. The facilities—including a lobby, reading lounge, kids room, gym, Sky Lounge, residence lounge, Sky Theatre and Japanese onsen (for a twist of international flavour)—can be easily adapted for both public or personal use.

The reading lounge, for example, has a private corner as well as a common area that can be modified to requirements. It is surrounded by water and fitted with full-size windows to allow the garden to flow inside.

The residence lounge with private dining rooms have wall-windows that open to a city backdrop. Warmth and elegance are created with taupe and earth tones, a woven metal chandelier and polished marble walls that reflect the light and expand the space.

Lobby

The onsen caters to the Japanese expat community

A custom-made silk chandelier in the lobby

The Sky Lounge is dressed in earth-toned polished marble walls, matte stone floors and ceilings, a central bar, a glass wall of Bangkok and a separate lounge for privacy. Furniture finishes are in darkest mahogany to complement the warm tones.

In the residential show unit, the bedrooms are finished in dark matte granite and marble for a soft intimate ambience. This theme is continued through to the bathrooms, glass-walled showers, large oval bath and amenities.

The living room is fitted with huge windows that allow light and views to flood in. Thoughtful detailing is in all the luxury fixtures, fittings and finishes, as well as the home automation system, which controls the light and temperature.

Show bedroom finished in dark matte granite

Sky Theatre

PROJECT DATA

Project Name
The Esse Residence

Location
Bangkok, Thailand

Expected Completion
October 2020

Site Area
0.4 hectares

Gross Floor Area
38,000 square metres

Building Height
43 storeys

Number of Units
338

Clients
Singha Estate Public Co, Ltd;
Hongkong Land Holdings Ltd

Architecture Firms
Tandem Architects (2001);
Skidmore, Owings and Merrill (Thailand) Co, Ltd

Interior Design Firm
dwp

Civil & Structural Engineer
Meinhardt

Mechanical & Electrical Engineer
Meinhardt

Quantity Surveyor
Management 103 Co, Ltd

Landscape Architect
Shma Co, Ltd

Main Contractor
Bouygues-Thai Ltd

Images
dwp;
Weerapon Singnoi (sales gallery)

LIBERTY CENTRAL QUY NHON

Situated along the central coastline road of Quy Nhon, the Liberty Central Hotel combines refined local essence with a modern design language.

The diversity of the surrounding landscape—mountain, forest, rice fields, sea and island—is woven into the interior design to create a resort-like environment within a city hotel.

Most prominently is the large boat sculptures hanging from the lobby's ceiling, a nod to Quy Nhon's traditional fishing villages. The check-in counter looks over the seashore afar, while the reception void is filled with ample natural light, albeit in a controlled manner. Basalt stone, a popular local material, plays its part as a light-absorbing complement and contributes to a more relaxing and tranquil setting. A pond in the centre, inspired by the An Lao waterfall in Binh Dinh, becomes a traffic orientation point.

The ballroom and meeting rooms on the first floor are accessible by elevators and an impressive spiral staircase. This ballroom has the largest capacity in Quy Nhon and opens up to the pre-function area using a long door system. Wood laminates and fabric not only create a cosy atmosphere but also provides an acoustic effect for the ballroom. Full-room carpet patterns, inspired by surrounding rice fields, along with ethnic pendants are some of the local touches integrated in the design.

Lobby with ample natural light and a statement spiral staircase

Hanging boats a nod to Quy Nhon's traditional fishing villages

The all-day dining restaurant on the third floor enjoys a full sea view, while the eye-catching ceiling feature becomes the focal point at night. A centralised buffet counter and various seating styles inject some of the local market vibe into the space.

The multifunctional executive lounge on the 22nd floor serves the suites and presidential suites. The design is flexible, casual and maximises utilities within a small space. The hotel's spa features a combination of local materials, such as granite and tiles, alongside rattan craftsmanship.

The guest rooms are larger than other hotels in the chain and are laid out with an open space concept, with a curtain separating the bathroom. All rooms have sea views and balconies, accentuating the resort-like ambience. Traditional 'fire-painted art' is used to create the bedhead accent, and the abstract graphics are illustrative of traditional fishermen's tools.

Feature ceiling and sea view at the dining area

Poolside bar area

PROJECT DATA

Project Name
Liberty Central Quy Nhon

Location
Quy Nhon, Binh Dinh, Vietnam

Expected Completion
March 2020

Site Area
5,821 square metres

Gross Floor Area
60,896 square metres

Building Height
24 storeys

Number of Rooms
251

Client/Owner
Kim Cúc

Architecture Firms
2050; MIA design studio

Principal Architects
Nguyen Thanh Tuan (2050); Manh (MIA)

Interior Design Firm
KAZE Interior Design Studio

Principal Designer
Fong Chan Paw Zeuthen

Civil & Structural Engineer
ASPT

Mechanical & Electrical Engineer
MARS Corp

Landscape Architect
TA Landscape Design

Main Contractor
Hoa Binh

Images
Kaze Vietnam Co, Ltd

MALAYSIA

SUNWAY AVILA

PANGSAPURI SERVIS ASTON ACACIA

PROJECT TITLE	PROJECT TYPE	LOCATION	DEVELOPER	ARCHITECT/ CONSULTANT	CONSTRUCTION START	ESTIMATED PROJECT VALUE (RM 'MILLION)
Aeropod @ Tanjung Aru (Phase 5A)	Residential	Kota Kinabalu, Sabah	Aeropod Sdn Bhd (subsidiary of S P Setia Bhd)	ArchiCentre Sdn Bhd	Q3 2019	500
IOI City Mall 2	Retail/Office	Putrajaya	IOI Properties Group Bhd	PI Architect	Q3 2019	870
IPD Tun HS Lee Police Station	Legal	Kuala Lumpur	PNB Merdeka Ventures Sdn Bhd	NR Architect	Q3 2019	50
Mint modernisation project	Industrial	Shah Alam, Selangor	Bank Negara Malaysia	DBA Akitek (M) Sdn Bhd	Q3 2019	70
Miri City Hall office	Government Office	Miri, Sarawak	Majlis Bandaraya Miri	Arkitek Visireka Sdn Bhd	Q3 2019	70
Nova Square	Residential/Retail	Jalan Imbi, Kuala Lumpur	TA Global Bhd	NRY Architects Sdn Bhd	Q3 2019	400
Pangsapuri Servis Aston Acacia	Residential/Office	Bukit Mertajam, Penang	Tinggian Development Sdn Bhd (subsidary of Hua Yang Bhd)	aLM Architects	Q3 2019	197
Permatang Bogak Mosque	Community	Seberang Perai Utara, Penang	Pejabat Pembangunan Persekutuan Pulau Pinang (ICU JPM)	Perunding Pinang Sdn Bhd	Q3 2019	45
Seremban KPJ Specialist Hospital new block	Health	Seremban, Negri Sembilan	KPJ Healthcare Bhd	KPJ Healthcare Bhd	Q3 2019	40
Sunway Avila	Residential/Retail	Wangsa Maju, Selangor	Sunglobal Resources Sdn Bhd (Sunway Bhd - Huatland Development JV Sdn Bhd)	Akitek Akiprima Sdn Bhd	Q3 2019	243

Source: BCI Asia Research

SINGAPORE

1953@TESSENSOHN

PROJECT TITLE	PROJECT TYPE	LOCATION	DEVELOPER	ARCHITECT/ CONSULTANT	CONSTRUCTION START	ESTIMATED PROJECT VALUE (SGD 'MILLION)
1953@Tessensohn	Mixed Use	1, 3, 5, 7, 9, 7A, 9A and 11 Balestier Road	Oxley Amethyst Pte Ltd	Park + Associates Pte Ltd	March 2019	5
Façade replacement works at Changi Business Park	Transport	15 Changi Business Park Central 1	JTC Corporation	SQFT Architects Pte Ltd	June 2019	8.98
Former Olina Lodge redevelopment	Residential	15 Holland Hill	Peak Opal	P&T Consultants Pte Ltd	June 2019	40
Former Tulip Garden redevelopment	Residential	Farrer Road	Asia Radiant Pte Ltd	DCA Architects Pte Ltd	June 2019	100
Hotel at former Tai Wah Building	Hospitality	110 Killiney Road	Lucrum Capital	ONG@ONG Pte Ltd	June 2019	20
Jurong Region Line MRT: Hong Kah & Corporation Station	Transport	Jurong Eastern Line	Land Transport Authority (LTA)	T.Y. Lin International Pte Ltd	June 2019	200
Jurong Region Line MRT: Jurong East Station	Transport	Jurong Eastern Line	Land Transport Authority (LTA)	Surbana Jurong – Atkins Design Engineering Consultants JV	June 2019	200
Mayflower Primary School: Alterations & Additions	Educational	200 Ang Mo Kio Avenue 5	Ministry of Education	LAUD Architects Pte Ltd	June 2019	40
Outram Medical Campus	Healthcare	Plot H9A, Jalan Bukit Merah	Ministry of Health	RDC Architects Pte Ltd	June 2019	160
Parc Clematis	Residential	Jalan Lempeng	SingHaiYi Properties	P&T Consultants Pte Ltd	June 2019	180

Source: BCI Asia Research

MRT LINE 2 (SSP) UNDERGROUND WORKS

The Klang Valley Mass Rapid Transit (KVMRT) is a three-line modern railway system to improve transport and reduce traffic congestion across Greater Kuala Lumpur.

The first MRT line, the Sungai Buloh–Kajang (SBK) Line, was completed in July 2017, while work is currently ongoing for the 52.2-kilometre-long Sungai Buloh–Serdang–Putrajaya (SSP) Line.

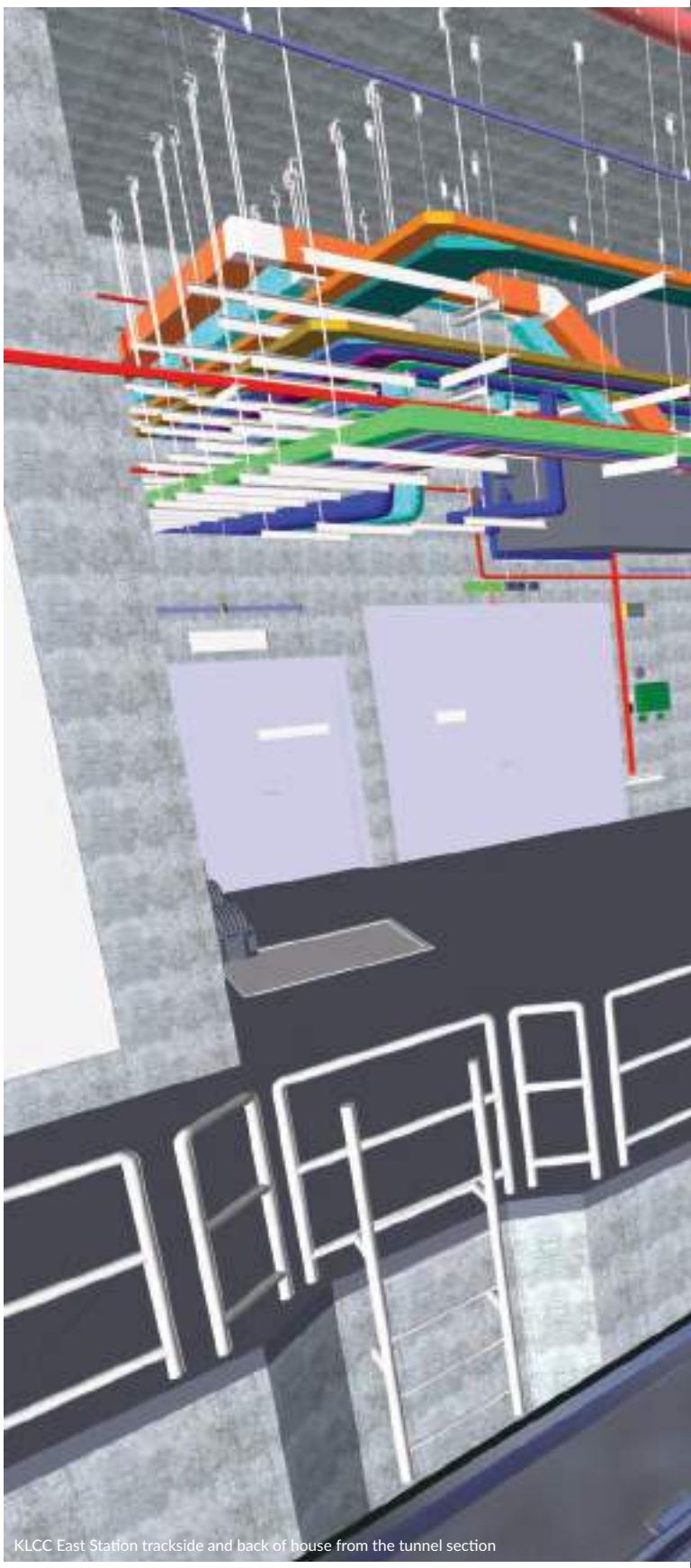
The SSP project is managed by two different entities—project owner Mass Rapid Transit Corporation (MRT Corp) as project manager for the underground design and build package; and MMC Gamuda JV as the project delivery partner for the elevated and system works packages.

MRT Corp's SSP Line Project Division manages the construction of the line's elevated guideway depots, tunnels and stations, as well as the electrical and mechanical systems required for a fully functional railway system.

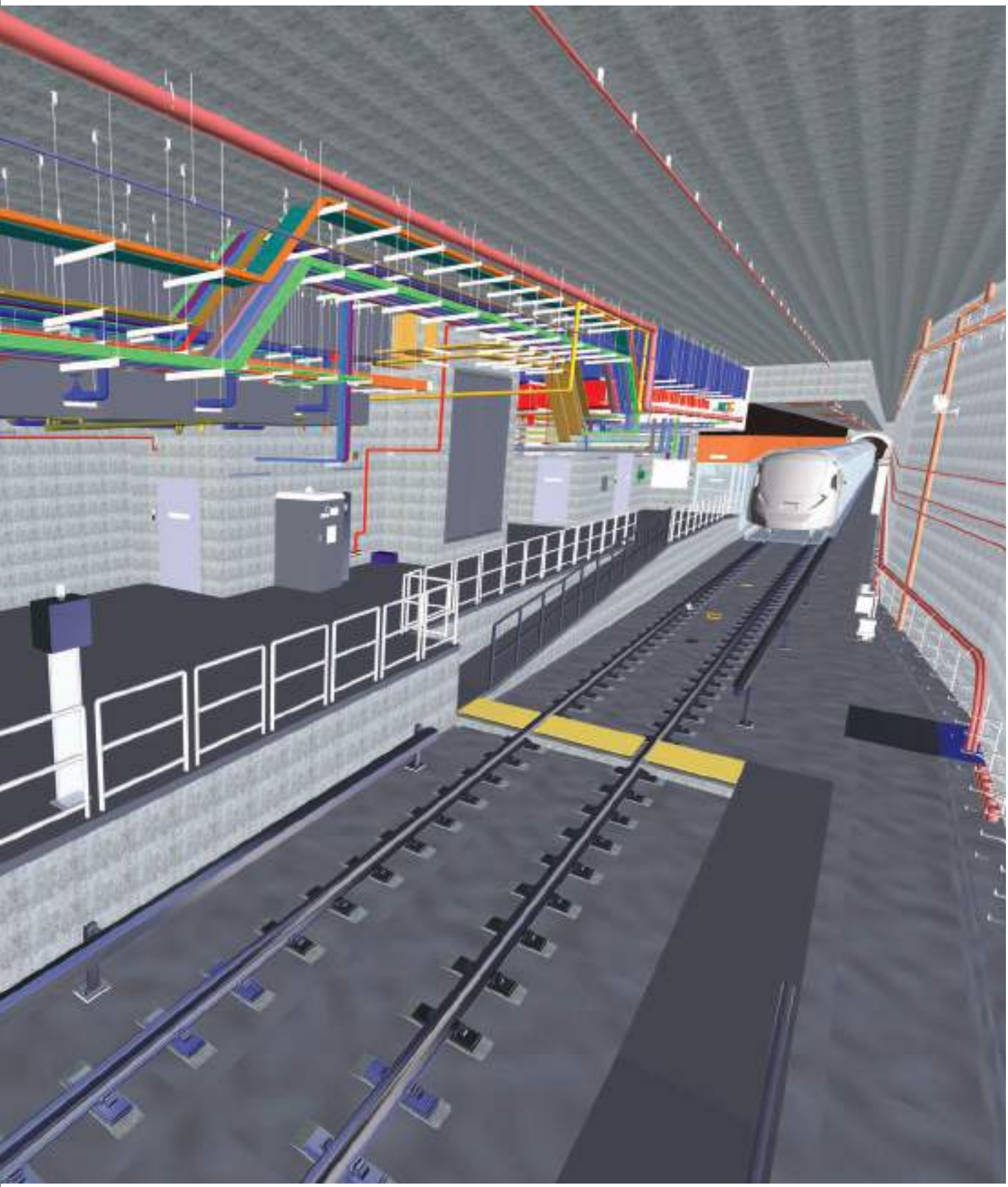
Following its experience with the construction of the first line, MRT Corp is pushing for increased productivity and efficiency in the delivery of the SSP line project.

Some of the key issues faced previously were the many on-site changes during construction resulting from design discrepancies or site constraints, delays in design submission due to poor design management, and lack of coordination with the different disciplines to identify clashes in the combined services drawing (CSD).

To better manage these issues, building information modelling (BIM) is used extensively and intentionally from the early stages of the project. In fact, MRT Corp has become the first infrastructure developer in the region to achieve BIM Level 2 accreditation, according to international standards, with the SSP Line.



KLCC East Station trackside and back of house from the tunnel section



MRT Corp's BIM management plan spells out what models are required and their purposes, outlining objectives, deliverable standards and the level of BIM details to be achieved for the project lifecycle—from concept and design to construction and final project phase.

BIM Level 2 involves the use of a common data environment (CDE) database to host all the 3D design models and asset information. In this project, some 2.3 terabytes of information is stored in the cloud-based CDE—comprising 70,000 pages of 3D models, 200,000 drawings and 30,000 documents—shared by more than 700 users from various stakeholders.

The design information is managed via a common process and stringent BIM workflow—with standardised naming convention, information exchange dates, data format and level of detail at different stages of the project—improving collaboration between designers and contractors.

The use of BIM has significantly improved productivity at the design stage and reduced abortive works in the construction phase. For example, about 1,000 conflicts were identified for each MRT site and resolved prior to construction commencing, saving on time and expensive recovery.

This platform also ensures the quick and efficient onboarding of MRT Corp's engineers, allowing the team to identify potential issues and design clashes through visualisation and advanced modelling.

Taking a leaf from the Crossrail metro project in the UK, a 'digital twin' approach is also applied in the SSP line, where BIM is used to build a digital replica of the project, allowing data to be updated real-time and synced seamlessly across the physical and virtual worlds.

The extensive digital platform used for this project also includes a geographic information system, which contains all related spatial data; reality capture models generated from aerial photography for site progress and incident record; terrestrial laser scanning; mobile apps for construction inspections and reporting; and asset lifecycle management.

Sectional view of Titiwangsa Station reflecting system and MEP services arrangement for a two-level station

Sectional view of KLCC East Station with planned TOD

CATALYST FOR CHANGE

Back in 2015, when MRT Corp had first implemented the BIM Level 2 requirements for its civil contractor and system-wide contractors involved in the underground package, the supply chain in Malaysia was nowhere ready to deliver an infrastructure project of this scale using BIM as a collaboration tool.

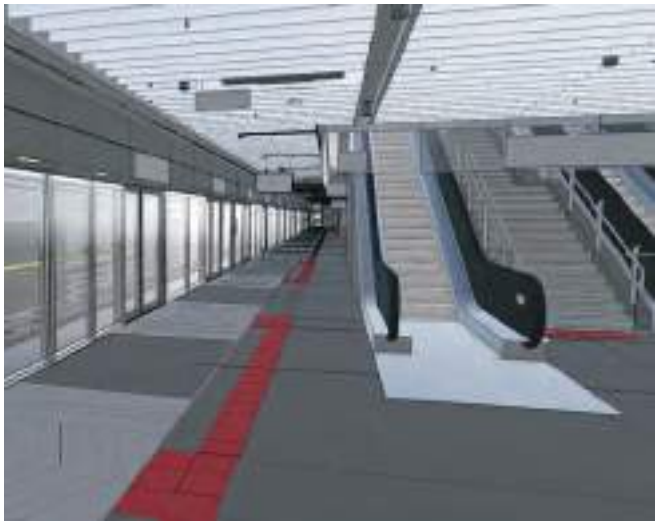
There was also a lack of a BIM-competent workforce that could execute the stringent requirements in the Employer Information Requirement (EIR), with some users taking shortcuts or skipping processes along the workflow in the initial stages.

To counter this, MRT Corp initiated a project-centric training centre, BIM in Rail Academy and Training Centre (BIRAC), to promote awareness and upskill the contractors and consultants on the workflow management for successful BIM implementation.

The use of BIM Level 2 constituted a paradigm shift in the construction industry as it has changed how the project team and supply chain work together, compared with conventional projects that only rely on 2D drawing or 3D model submissions.

This digital transformation would not only benefit the asset owner in the long run but also uplift Malaysia's construction industrial standards, in line with the Construction Industry's Transformation Programme.

Kampung Baru North MRT station



Platform view

PROJECT DATA

Project Name
SSP Line 2 Underground Works

Location
Sungai Buloh, Serdang, Putrajaya, Malaysia

Expected Completion
2022

Underground tunnels
13.5 kilometres

Owner/Developer
Mass Rapid Transit Corporation Sdn Bhd (MRT Corp)

Project Management
MRT Corp

BIM & GIS Champion (Design & Technical)
Yeap Beow Heng (B.H)

Reference Design Consultant
Arup Jururunding Sdn Bhd

Executive Architect
SAA Architects Pte Ltd

Principal Architect
Yeo Siew Haip

Project Architect
Rustam

Lead Consultant
AECOM Perunding Sdn Bhd

Civil & Structural Engineer
AECOM Perunding Sdn Bhd

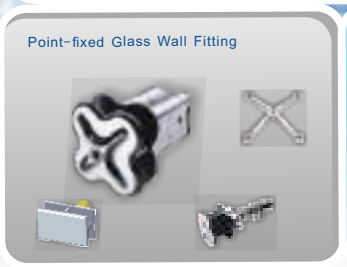
MEP Engineer
AECOM Perunding Sdn Bhd

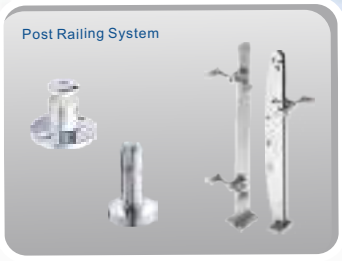
Main Contractor
MMC Gamuda KWMRT (T) Sdn Bhd

Images
SAA Architects; MRT Corp

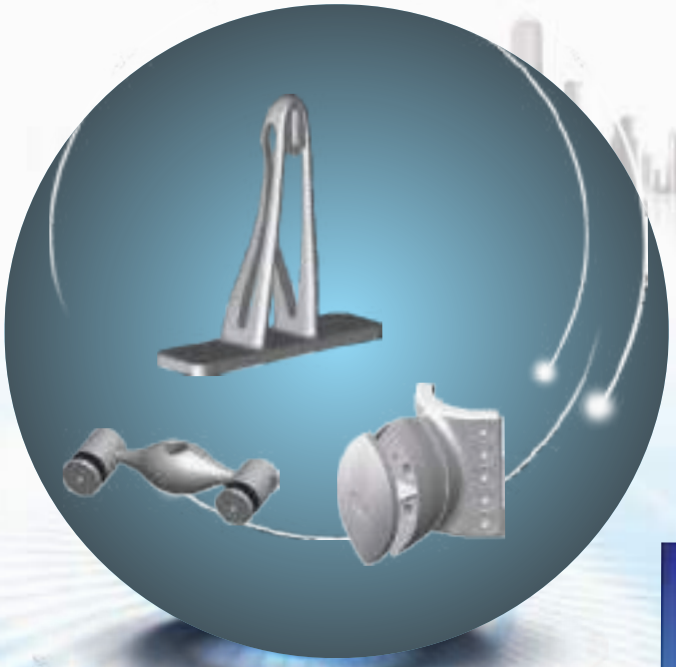
KIN LONG

Construction Hardware Expert





Over 8000 employees guarantee leading technologies & services.



KIN LONG (MALAYSIA) SDN BHD
Add: A206, Block A, Kelana Square,
17, Jalan SS7/26, 47301 Petaling Jaya,
Selangor Darul'Ehsan.
Tel: +006-03-7806 3559
Fax: +006-03-7803 5449
Email: malaysia@kinlong.com

GUANGDONG KIN LONG HARDWARE PRODUCTS CO.,LTD
Add: No.3 Jianlang Rd, Daping Industrial Zone, Tangxia Town,
Dongguan City, China, 523722

www.kinlong.com

Vitally
Our Product Ranges
• Vitally Kitchen
• Bi-fold Door
• Sliding Door
• Swing Door
• Cabinet & Drawer
• Shower Enclosure
• Shoe Cabinet
VITALLY KITCHEN
ALUMINIUM AND WOODGRAIN PERFECTION
BI-FOLD KING
BI-FOLD KING® AIR
230B
Headquarter & Factory
VITALLY SDN. BHD.
www.vitally.com.my
vitallygroup
vitally
Our Quality Assurance:
Our Awards & Achievements:

vitally
The first local ACP manufacturer certified with PPS and MALAYSIAN STANDARD.
Headquarter & Factory
VITALLY INDUSTRIES SDN. BHD.
www.vitally-acp.com
vitallygroup
Our Quality Assurance:
Our Awards & Achievements:

VERTU RESORT

This employer project—a collaboration between INTI International University and Kerjaya Prospek—offered students hands-on experience in project-based learning.

The students from INTI's Faculty of Engineering and Quantity Surveying were tasked with producing a BIM model for an apartment building, Vertu Resort, in Aspen Vision City, Penang.

The development comprises 1,282 residential units within five blocks—from 20 to 36 storeys—atop a nine-storey podium carpark with common facilities. It is built using an aluminium system formwork and is scheduled for completion in November 2020.

The students were divided into four groups, each with its own focus area, namely foundation and roof level, podium level, facilities level and typical residences level. The experience included site visits, learning how to read construction drawings and sitting in site meetings.

They then spent four months to complete the BIM model at the university's BIM Development Centre, an external training centre for Cubicost software.

They started by creating a base file, which was then shared to the four teams to work on their respective parts. The completed parts were then merged and imported using a BIM-based quantity takeoff software to measure the quantity of reinforcement bars. The same process was repeated, and the final product checked to ensure there were no mistakes before the quantities were exported to a spreadsheet.

Regular follow-ups were needed to obtain the most updated and accurate design data and other details to ensure the element of costs generated reflected the latest updates as these would be used for the bill of quantities.

PROJECT DATA

Student Leaders
Kit Sheng Ren; Chew Ze Hong

School
INTI International University, Malaysia

Programme
Bachelor (Hons) in Quantity Surveying

Supervisor/Instructor
Nurulhuda Ahamad

Project Name
Vertu Resort

Student Project Completion Date
2017

Location
Seberang Perai, Penang, Malaysia

Client/Developer
Aspen Vision City Sdn Bhd

Main Contractor
Kerjaya Prospek Group Bhd

Images
INTI International University

Project perspectives renderings

Interior corridor

On-site experience

With Datuk Tee Eng Ho, executive chairman of Kerjaya Prospek

since 1999

EXCELSPORTS

-Sports & Us Are One-

THINK SPORTS. THINK EXCELSPORTS

ExcelSports a family-owned Business since 1999, offers excellent service in design, supply and installation of sports, recreational and leisure facilities and great after-sales service. Your Go-To company for all your sports surfacing needs as we provide the best turnkey solutions for Synthetic Sports Courts both indoors and outdoors.

LOCAL TEAM

VAST EXPERIENCE

CERTIFIED SURFACES

9-1B, 1st Floor, Block A, Jalan Sentosa 1,
Taman Sentosa, Sungai Jelok,
43000 Kajang, Selangor Darul Ehsan, Malaysia.

Tel: 03 – 8737 3952 | Fax: 03 – 8736 7271
E-mail: info@excelsports.com.my
Website: www.excelsports.com.my

Multifunctional communal space

THE HEARTY WANDERER

This co-living and co-working space is designed specifically for digital nomads, millennials who are particular about living a healthy lifestyle.

The concept incorporates elements for users to be able to access different healthy options, be it physically or interactively.

A key feature is the large communal space features multifunctional yellow-coloured poles and bars that are suitable for working out and exercising. Sunken and normal seats are incorporated to create interactive pods for working and socialising.

With all the interconnected bars and poles, it was a challenge to create functional access points. Software such as 3DsMax was used to create prototypes to test out the functionality of the feature.

An elevated jogging track is used as a backbone for the connective flow of all the zones. The rest of the space includes a reception area, kitchen, mini café, outdoor lounge and shared accommodation.

The heritage status of the building site posed a number of restrictions, such as the need to retain the existing columns and most exterior walls. As such, an open concept is adopted, without many walls and doors. Instead, punctured ceilings, skylights and full-height windows are incorporated to infuse a sense of space.

This project is the first-place winning entry in a design competition organised by Temasek Polytechnic School of Design and Space Matrix, where students had to conceptualise the future of co-living spaces in Singapore.

Section views

Floor plan

Co-living space

PROJECT DATA

Student Name
Eunice Bacay

School
Temasek Polytechnic,
School of Design, Singapore

Programme
Diploma in Interior Architecture & Design

Lecturer
Jonathon Poh

Project Name
The Hearty Wanderer

Project's Date
2018/2019

Location
306, Tanglin Road, Singapore
(Space Matrix's office)

Site Area
2,769.87 square metres

Gross Floor Area
1,390.43 square metres

Client/Owner
Space Matrix

SP.ace
METAL STRIP CEILING . SCREENS . FACADE

YOUR ONE STOP
METAL BUILDING FAÇADE & CEILING SOLUTION

Space Products Sdn. Bhd. is a young and dynamic manufacturing company for the SP.ace™ range of metal building products.

SP.ace™ has a stylish range of metal louvres, sunshades, strip ceilings, custom perforated panels, profiled screens and various systems that makes up an uniquely crafted collection championed by fine engineering for today's performance demanding and fashion conscious Designer. Also cost effective and versatile, this collection is highly suitable for the institutional, commercial, industrial and residential buildings of tomorrow.

The Company is able to draw on a deep well of expertise from its core of dedicated team members, with more than 15 years in the design and development, manufacturing and installation of these systems and products. It is confident that no other local manufacturer is able to boast of such a breath of expertise and experience.

Designers today have to find the most creative and productive ways to use technology to meet the current challenges of climate change and rapid urban growth. Our experience in metal facade design is a blend or art and science where aesthetics, performance, technology, and regulatory requirements merge to positively influence the environment whilst giving each building an unique urban personality.

For further enquiry, please contact us at:
SPACE PRODUCTS SDN BHD (956538-U)
No. 45, Jalan TIAJ 2/1, Taman Industri
Alam Jaya, 42300 Bandar Puncak Alam,
Selangor.
T: +603-6038 6066 / 8066
F: +603-6038 9066
E: info@spaceproducts.com.my

JB BRANCH:
No. 35, Jalan Austin Perdana,
Taman Mount Austin,
81100 Johor Bahru
T: +607-351 1452
F: +607-351 2905

For more information, please visit us at *www.spaceproducts.com.my* or contact our local offices.

Order online at http://bit.ly/Architecture19
or via your local BCI office

BCI ASIA

An Event Of:
KLAF2019
KUALA LUMPUR ARCHITECTURE FESTIVAL

3 ▸ 6 JULY 2019

KUALA LUMPUR
CONVENTION CENTRE

ARCHIDEX®

THE 20TH INTERNATIONAL ARCHITECTURE, INTERIOR DESIGN & BUILDING EXHIBITION 2019, MALAYSIA

20 Years
BUILDING TOGETHER

THE REGION'S LEADING ARCHITECTURE BUSINESS EVENT

Events & Highlights:

- Innovation Hall
- ArchiTALENT
- Biz@ARCHIDEX
- ARCHIDEX Awards Gallery
- Focus Forum@ARCHIDEX
- International Architecture Conference
- Business Matching Programme

Featuring:
ECO-B®
ECO BUILDING & DESIGN EXHIBITION

Concurrent Exhibitions:
FACIMEX™
FACILITIES MANAGEMENT & CLEANING EXHIBITION 2019, MALAYSIA

ENGINEER™
MECHANICAL, ELECTRICAL AND CIVIL ENGINEERING EXHIBITION 2019, MALAYSIA

Concurrent Conference:
>DATUM:KL

Jointly Organised By:
PAM
CIS

Endorsed By:
MATRADE
Malaysia External Trade Development Corporation

Supported By:
MINISTRY OF WORKS, MALAYSIA
malaysiaGBC
MINISTRY OF TOURISM, ARTS & CULTURE MALAYSIA
Malaysia Convention & Exhibition Bureau
Malaysia Truly Asia

Premier Partners:
LARSEN
Roca

Official Airline:
malaysia airlines

ARCHIDEX
ARCHIDEX.MY
ARCHIDEX TV

www.ARCHIDEX.com.my

SCAN HERE to Pre-Register your Visit!
@reg.ARCHIDEX.com.my