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BUILDING A SAFETY MINDSET

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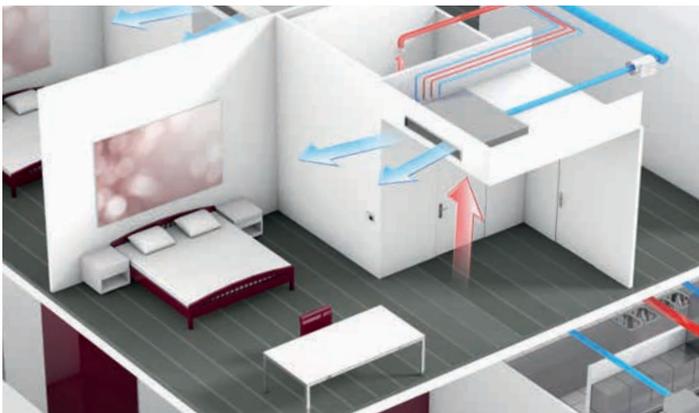
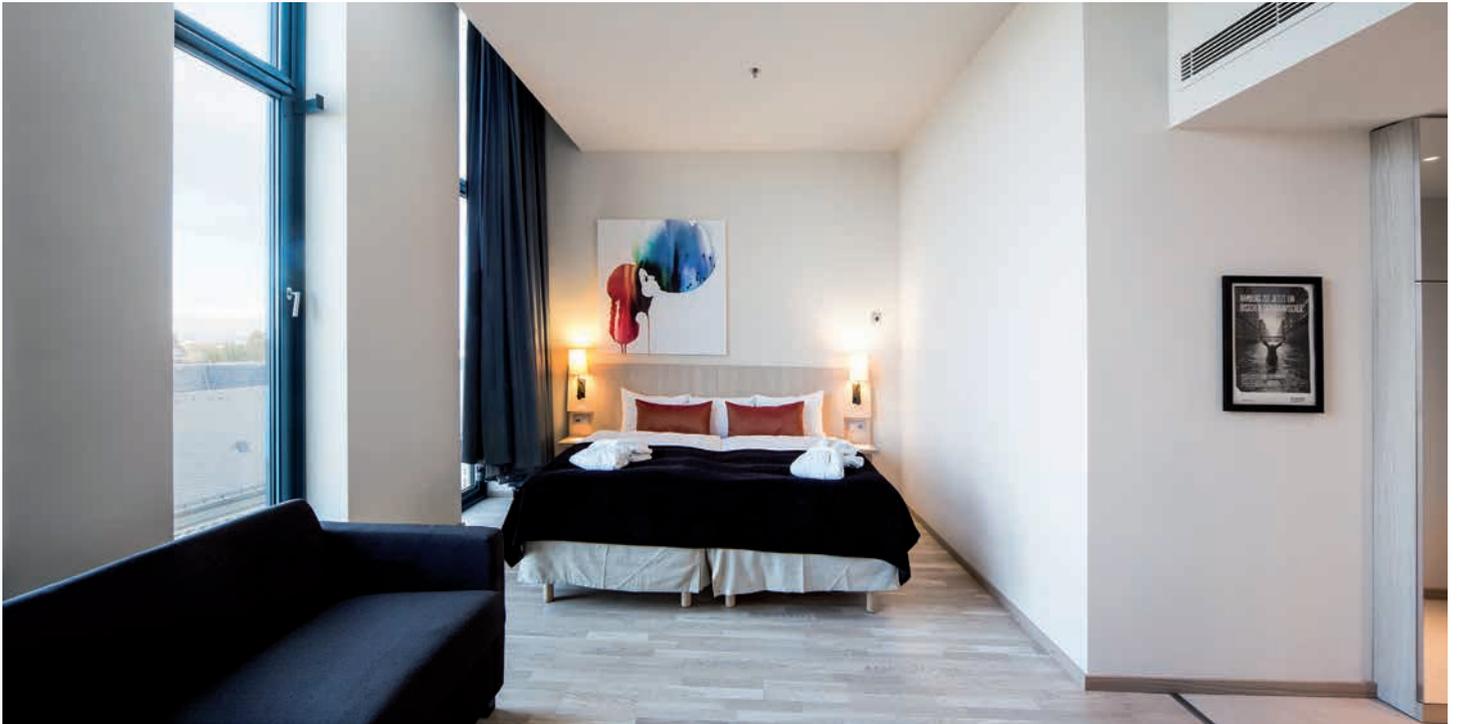
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I applaud *Construction+* for dedicating this issue to cover topics on construction safety. This is one of several areas the construction industry can examine further to transform itself into a professional, progressive, productive and profitable industry.

Safety and construction activities are heavily intertwined. I believe every construction professional will be able to relate a near-miss or accident that they have come across.

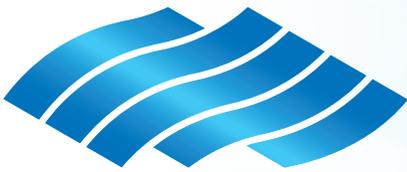
Construction management and professionals face ever increasing and complex situations in their efforts to prevent and control workplace injury and illness, property damage (including fire), security breaches, pollution and public liability.

It has been proven that productivity and quality are inextricably interrelated with workplace safety and health. Investment in workplace safety and health will eventually lead to higher productivity and better quality of work. Efforts put in to enhance workplace safety and health also have a positive impact on the organisation, in terms of attaining organisational goals, better morale, and a more competitive workforce.

Safety and health regulations get tougher after lives are lost needlessly in accidents. Unless leaders and managers of organisations step forward proactively to provide sound safety leadership, the authorities will have to step in with increasing regulatory control. Such a vicious cycle is counter-productive.

It is imperative that all stakeholders in the construction industry understand and accept their roles in making construction sites and workplaces as safe, healthy and risk free as possible. It is only with all stakeholders' commitment and cooperation towards safety and health that construction accidents can be prevented.

Goh Chye Guan
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Dear readers,

Throughout history, some of the greatest construction projects of the world—from the Great Wall of China to the Burma–Siam Railway—have been stained by the blood of its workers.

What is perhaps more tragic is that, with all the modernisation and technological advances of construction today, it is still a norm for lives to be lost due to accidents, errors and preventable disasters.

In the first 10 months of 2018 alone, there have been at least 81 construction deaths in Malaysia, while Singapore had 12 construction fatalities in the first three quarters.

The recent case reports on Malaysia's Department of Occupational Safety and Health website tell a sad story: construction worker crushed by collapsed structure; tower crane operator died after a brick wall collapse while on the way to the resting area; subcontractor killed after falling from a height of 8 metres into a sewer hole; worker died after falling from level nine while installing aluminium formwork; worker died after being hit by debris from broken pipe during hydrostatic testing ...

Each of these casualties was someone's loved one. Labour may be cheap, but life shouldn't be. Do we want to continue building our cities, highways and skyscrapers at such costs?

A nation's greatness is measured by how it treats its weakest members. Hence, as we strive to build more impressive and more sustainable developments, we should also ensure we build them safer for everyone. In this issue of *Construction+*, we shine the spotlight on safety in construction, a topic that should be the priority of every industry stakeholder.

Our commentators from both sides of the Causeway discuss the importance of Construction Design Management, or Design for Safety—where safety considerations and risk elimination are an integral part of each construction project from the start, rather than slapped on as an afterthought. We also look at what it takes to create a zero-injury culture that is embraced by all levels of employees and how to understand human behaviour and tackle resistance to change.

As we cross over into 2019, we face challenging times for the sector with global slowdowns and economic uncertainties. It is a good time as any to dig deep and lay strong foundations of safety, quality and sustainability, to enable the construction industry to move on to greater heights.

Enjoy your read, and do share your thoughts with us at construction@bciasia.com.

Thank you.

Joanna Sze
Senior Editor

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TOWARDS WORLD-CLASS SAFETY STANDARDS

Construction is often seen as a 3D sector—dirty, dangerous and difficult—and this seems to be proven true with numerous recent reports of site accidents and fatalities in Malaysia. What can be done to transform the sector's safety record under the Construction Industry Transformation Programme 2016–2020 (CITP)?

BY DATO' IR AHMAD 'ASRI ABDUL HAMID

In 2017, more than 4,000 accidents and 180 fatalities were recorded at construction sites in Malaysia—three times higher than those recorded in other industries. What are the latest figures and trends from recent years? What are the Construction Industry Development Board's (CIDB) targets in terms of reducing fatalities?

The CITP sets out a KPI of a 50 per cent reduction in worksite fatalities by 2020,

from 10.94 per 100,000 workers in 2015.

However, the fatality rate has risen to 12.9 persons per 100,000 workers in 2017, according to statistics by the Department of Occupational Safety and Health (DOSH).

Since the start of the year until October 2018, the construction industry had recorded the highest number of fatalities

—81—from investigated occupational accidents.

This is indeed a concern for CIDB, and we are committed to drive proactive measures and cohesive action to lower fatality rates in the construction industry.

Why has there been a rise in accident and fatality rates in the construction industry? Who should be responsible for safety?

In most cases, if not all, these fatalities could have been avoided if the proper guidelines, procedures and safety systems had been implemented.

As outlined in the CITP, the poor health and safety record can be attributed to low enforcement efforts, as well as low level of safety awareness among construction workers. Furthermore, there is an underlying misconception that occupational safety and health protection is an unnecessary expenditure.

Adequate training can help avoid injuries and the tragic loss of life. Contractors must ensure that workers involved have a solid overall understanding of the site and other work taking place around them.

Therefore, safety must start from the top and trickle down, so that all stakeholders—from the project owner and client, to consultants and designers, to contractors and construction workers—are responsible in ensuring the health and safety of the entire project life cycle.

In other words, the top entities in the value chain—the client or project owner—must be committed to the safety of their respective projects, and are ultimately responsible as the project originators.

As the statutory body to regulate, develop and facilitate the construction industry towards global competitiveness, what are CIDB's efforts in addressing this issue?

We recognise that safety is one of the primary prerequisites towards establishing Malaysia's construction

Safety must start from the top and trickle down, so that all stakeholders are responsible in ensuring the health and safety of the entire project life cycle.

industry as 'world-class'. In fact, the CITP sets out 'quality, safety and professionalism' as a key strategic thrust for the Malaysian construction sector towards year 2020.

While we are on track for most initiatives, we recognise that more needs to be done in terms of safety. As such, CIDB has driven several initiatives to specifically address issues of site safety in the Malaysian construction sector. For instance, CIDB has been working to increase construction-specific safety training curricula and courses to increase the quality and quantity of certified Safety and Health Officers (SHO) and Site Safety Supervisors (SSS) in the industry.

In fact, as of Q2 2018, we have gone beyond our target KPIs for SHO and SSS trained—Since 2016, 1,239 SHO have been trained, exceeding our target of 671; while 1,836 SSS have been trained, exceeding our target of 413.

What else can be done to lower fatality rates in the industry?

It is necessary to re-think the current safety and health practices in the construction industry. New strategies need to be adopted immediately to bring about improved outcomes if the Malaysian construction sector is to achieve the industry safety targets by year 2020.

Recently, DOSH introduced the Guidelines of Occupational Safety and Health in Construction Industry (Management) (OSCHIM), to lower the number of fatalities and incidents in the construction industry.

The implementation of these guidelines, also known as Construction Design Management (CDM), has been proven

to be very effective in elevating the safety and health performance of the construction industry in the UK and Singapore, where it has been implemented.

Can you explain further on how CDM works?

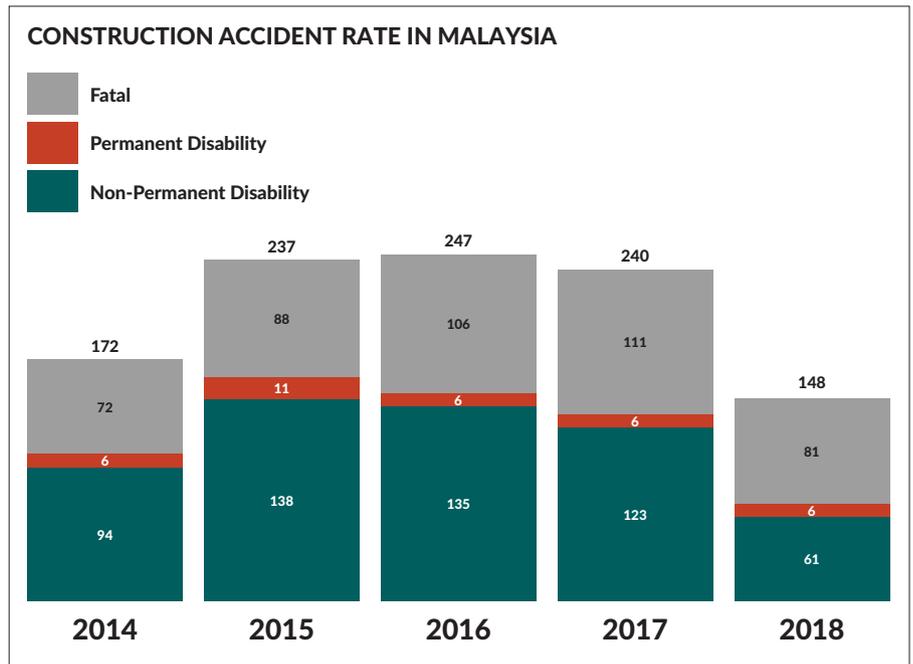
CDM is a regulation based on the principle of prevention through design. Introduced in the UK in 1995, CDM makes all parties responsible in ensuring safety at construction sites, from clients, consultants and contractors.

OSHCIM was first introduced in February 2017 as a guideline, and it recommends the minimum role of every stakeholder and how they can execute their responsibilities. OSHCIM also reverberates the spirit of the Occupational Safety and Health Act (OSHA), which clearly places responsibility on those who create risk to manage it.

The idea behind CDM is that managing occupational safety and health risks at the planning and design stage is often more effective, easier to sustain and cheaper to achieve, as compared to making changes later when the hazards become real risks on-site. These guidelines provide practical guidance to the client, designer and contractor on the management of safety, health and welfare when carrying out construction projects.

What difference does CDM bring to safety culture in construction?

With CDM, all stakeholders in a project—from conception to completion—share the responsibility for ensuring the health and safety of the entire project life cycle. In fact, under CDM, the top entities in the value chain—the client or project owner—are held ultimately responsible as the project originators.



Source: DOSH

This is in contrast to the current situation, where only contractors are held liable for any untoward incidents on-site. Hence, CDM will be a driving force for all interested parties to ensure adequate safety measures have been taken.

OSHCIM will be incorporated into the OSHA 1994. CIDB and DOSH are jointly carrying out nationwide road shows to educate and engage with the industry about OSHCIM before its actual introduction.

What has been the outcome of CDM implementation in other countries?

The experiences of countries that have adopted CDM prove that it results in better safety records and overall cost efficiencies. In the UK, the fatality rate for the construction industry was 1.37 per 100,000 workers in 2017, which is about 30 per cent lower than the five-year average.

In Singapore, there were 2.6 fatalities per 100,000 workers in 2017, as compared to 7.2 fatalities per 100,000 workers in 2013. Both countries show decreasing rate of construction site accidents since mandating CDM.

Have any Malaysian companies taken up the method?

Some industry players have taken ownership of CDM at their own initiative. One pioneer is Putrajaya Holdings Bhd (PJH). PJH's experience demonstrates that CDM contributes to effective management of risks at the construction site, resulting in fewer lost man-hours and lower fatalities.

It is time for the other industry players to make meaningful change as well. While this may require significant adjustments to current industry practices and thinking, the benefits far outweigh the inconveniences.

What other methods are there that can improve the safety of the construction sector?

As mentioned, the CITP's first strategic thrust identifies 'quality, safety and professionalism' as primary prerequisites towards transforming the Malaysian construction industry into a responsible, developed sector.

In addition to the initiatives mentioned of safety training and CDM, a few other measures that uplift safety and health

Occupational safety and health not only affect employees, but also the society at large, businesses, and the overall economy in the long term.

levels of the industry are:

i. Industrialised Building Systems (IBS)

IBS changes the way construction work is done, by moving a large part of the work to factories or a controlled environment through mechanisation and automation. In this way, temporary works are also minimised. Therefore, this modern construction technology not only increases productivity, but also enhances on-site safety.

ii. Training and Accreditation

By enhancing the skills of the workforce through training and accreditation, workers are better informed and educated on best practices and correct methods in their respective line of work.

iii. Health and Safety Induction Course through Construction Labour Exchange Centre Berhad (CLAB)

This course is a requirement for all construction personnel, on practicable health and safety procedures at work. Participants will also be issued a construction card (Green Card), which helps to identify their field of work and skill levels.

iv. Safety & Health Assessment System in Construction (SHASSIC)

SHASSIC is an independent method to assess and evaluate the safety and health performance of a contractor in construction works and projects. CIDB targets to make SHASSIC mandatory by 2020, and is currently creating awareness on the assessment method among contractors.

Higher standards of occupational safety and health can positively influence the construction industry at large. It is important to note that the enterprises

with the best occupational safety and health practices are the most productive and the most economically, socially and environmentally friendly businesses.

Furthermore, healthy employees in safe working conditions have the potential to maximise productivity and efficiency, thereby boosting employee morale and, in turn, the quality of products, services and business reputation as well.

Why is OSH such a key part of the CITP targets for the construction sector?

Occupational safety and health not only affect employees, but also the society at large, businesses, and the overall economy in the long term.

Stakeholders should view safety as a catalyst for springboarding the Malaysian construction sector to its next level of growth, to ensure that it remains on track towards the 2020 Strategic Goals.

As the Malaysian construction sector continues to thrive, we can expect more workers employed by Malaysian companies. Industry players have a responsibility to adequately ensure health and safety of their projects so that all workers have the assurance that they can go home to their families at the end of the day.

Furthermore, to reduce the nation's over-reliance on foreign labour, many more local talents are needed to join the construction sector. A commitment to world-class health and safety standards will give Malaysians the confidence to join this sector. In order to achieve our aspiration to have a truly world-class construction industry, stakeholders must commit to operating at world-class standards, including for safety. 



DATO' IR AHMAD 'ASRI ABDUL HAMID
Chief Executive, Construction Industry Development Board Malaysia (CIDB)

Prior to his appointment as CIDB chief executive in March 2016, Dato' Ahmad 'Asri has served in various capacities in the organisation for the past 17 years, including as senior general manager of the Management Sector.

Dato' Ahmad 'Asri has been in public service for more than three decades, including as a mechanical engineer in the Public Works Department for 13 years. He also served as the president for the Professional Services Development Corporation (PSDC) for three years, where he was responsible for developing the capability and capacity of the professional services sector in facing with the challenges of liberalisation.



DESIGNING FOR SAFETY

All stakeholders have to take responsibility for managing and minimising building risks throughout its lifecycle.

BY GOH CHYE GUAN

Accidents due to design can be catastrophic, and such accidents can happen any time in a building project life cycle—whether during construction, maintenance or occupancy stages.

The Morandi Motorway Bridge in Italy collapsed on 14 August 2018, killing 43 people. While investigations are still ongoing, many reports point towards the

original bridge design as a cause of the collapse. The bridge was opened to the public in 1967.

Closer to home, in Singapore, a Pan Island Expressway (PIE) viaduct under construction at Upper Changi Road East collapsed on 14 July 2017, killing one worker and injuring 10 others. The main contractor and five individuals—



and SGD20.3 million.

These cases should sound an alarm for all stakeholders to avoid accidents due to failure in design.

PREVENTION BETTER THAN CURE

Design for Safety (DfS) is an essential framework for ensuring safer buildings by identifying and managing foreseeable risks throughout the lifecycle of a project and communicating these risks to all stakeholders.

In Singapore, workplace safety and health (WSH) is well covered by the WSH Act and its subsidiary legislations. The WSH (DfS) Regulations were enacted on 10 July 2015 and came into force on 1 August 2016 in Singapore.

The far-reaching WSH (DfS) Regulations set out to ensure DfS is incorporated into all new building and infrastructure development or redevelopment projects with a contract sum of SGD10 million or more.

It covers the roles and responsibilities of five main stakeholders—developer, contractor, designer, DfS professional, and registered proprietor—in managing safety and health risks, from the design and planning stages to construction and maintenance.

The regulations also mandate the need for DfS review meetings and a DfS risk register for construction projects. The review meetings ensure all design risks are highlighted and managed in a systematic and coordinated way, while the risk register records all documents generated through the review process for future reference.

The accompanying DfS guidelines is another key document published by the WSH Council, in collaboration with Singapore's Ministry of Manpower (MoM) to assist stakeholders in understanding

and fulfilling their duties under the regulations.

Research has shown that opportunities to influence safety diminishes as the project progresses from concept and design to construction, maintenance and demolition. Conversely, the cost of improving safety through design increases over this same period.

Hence, it is more cost-effective to design for safety at the upstream stages, instead of incorporating it as an afterthought once the building is completed. If implemented correctly, WSH (DfS) Regulations and guidelines will go a long way to eliminate or minimise such residual risks at minimal cost over the lifespan of a building or structure.

TEAM RESPONSIBILITY

Ensuring design safety is a complex and evolving task. The regulations require all stakeholders to work together to address risks at source and eliminate, or reduce as far as reasonably practicable, all foreseeable design risks. The DfS guidelines provide further information on how to ensure design for safety through a team approach.

As the key stakeholder, the developer has to work closely with designers and contractors to ensure they are competent and have sufficient time, resources and relevant information to perform their duties.

A common misconception is that the WSH (DfS) Regulations are just another piece of legislation targeted at contractors for construction safety. This possibly stems from the provision for developer to delegate the duties of review meetings and risk register to the DfS professional. In many cases, this duty gets delegated to the contractor through a normal construction contract or a design-and-build contract.

three from the main contractor, one professional engineer and one accredited checker—were charged.

A fire at an industrial building at Toh Guan Road on 4 May 2017 resulted in one fatality and led the Singapore Civil Defence Force (SCDF) to take immediate action on buildings with certain types of cladding island-wide.

In a High Court judgement released on 11 Sep 2018, the owner of the 35-storey Centennial Tower, from which stone panels fell in two incidents, on 10 Sep 2004 and 13 Feb 2011, won the lawsuit against the building's main contractor and cladding installer. The re-cladding of the building is estimated to cost between SGD12.3 million

Hence, the developer should appoint a DfS professional well in advance of the construction stage to help carry out the Guide 1 and Guide 2 for a normal construction contract—or Guide 1 for a design-and-build contract—of the DfS guidelines, which cover concept and/or detailed design. The DfS professional will also ensure that the relevant information is conveyed to the designers and contractors appointed thereafter.

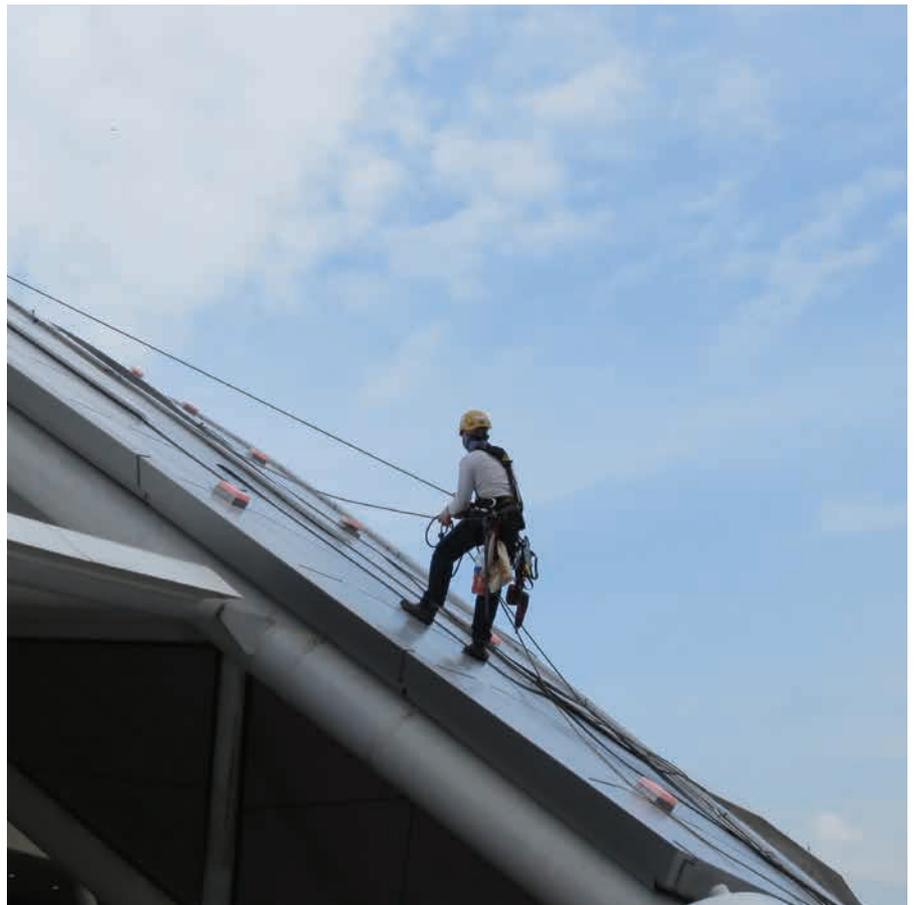
CASE STUDIES

Apart from construction stage, DfS applies to the maintenance phase also. The WSH (DfS) Regulations state that where it is not reasonably practicable to eliminate a foreseeable design risk, the developer must ensure that the design risk is reduced to as low as is reasonably practicable, by collective protective measures, instead of individual protective measures.

For example, at the Gardens by the Bay, a building maintenance unit (BMU) designed and installed on its roof structure provides maintenance workers a safer means of access to carry out their tasks.

In the case where a roof is designed without a BMU, workers will have to climb on top of the roof using the rope access method to carry out cleaning or maintenance work.

This comes with higher risks compared to the use of BMU, as each individual worker will have to ensure that they apply their own protective gears properly to avoid falling from height while working. Rope access workers need to be properly trained and certified to perform their tasks safely. There are also higher risks of accidents due to other reasons, such as the installation of the anchors, integrity of the ropes, and the certification, testing



Rope access, as an individual protective measure, carries higher risks for workers

As the key stakeholder, the developer has to work closely with designers and contractors to ensure they are competent and have sufficient time, resources and relevant information to perform their duties.

and inspections of the whole rope access system.

CONCLUSION

Without a doubt, the spirit of design for safety throughout the lifecycle of a building or structure is enshrined in the WSH (DfS) Regulations. However, it is just the first step, albeit a critical one, forward towards design safety. We have come thus far in terms of mandating design for safety since 1998, and it will take many more years for this process to evolve.

However, what is most important in ensuring safety in the environment that we work and live in is our individual attitudes towards safety of ourselves and of others, whether we are developer, designer, contractor, maintenance worker, or the everyday person who uses the building or structure.

Our goal should be to prevent future accidents and incidents due to inadequate consideration in design safety that results in the loss of innocent lives. **C**



GOH CHYE GUAN
Specialist Adult Educator,
SCAL Academy Pte Ltd
Founder, SMER Pte Ltd

Goh has more than 30 years of workplace safety & health (WSH) and strategic planning experience from both the public and private sectors.

He is the Specialist Adult Educator of SCAL Academy Pte Ltd, a subsidiary of the Singapore Contractors Association Limited (SCAL). His main role is to assist in the implementation of the Construction Industry Transformation Map (ITM).

Concurrently, he is the founder and owner of SMER Pte Ltd, which specialises in the provision of WSH planning and leadership services.

Previously, Goh has worked with Singapore's MoM the WSH Council, Det Norske Veritas (DNV) Industry, Singapore Construction Safety and Consultancy Pte Ltd (SC2), and IRM Consultants.

His involvement with design for safety dates back to 1998 when he took part in the first Construction (Design and Management) Regulations study mission to the UK. He subsequently launched the first edition of the *Guidelines on Design for Safety* as well as the Train-the-Trainer course for Design for Safety Professionals, when he was the Director (Industry Capability Building) of the WSH Council of the MoM from 2005 to 2011.



A building maintenance unit provides workers a safer means of access in carrying out their tasks

WHAT IS DESIGN FOR SAFETY

Design for Safety (DFS) is about identifying and managing risks right from the design and planning of a building project, to the construction and maintenance phases.

Risks should be eliminated or reduced to as low as reasonably practicable at all phases.

Any foreseeable risks should be communicated to all stakeholders throughout the project lifecycle.



The WSH (DfS) Regulations applies to all construction projects in Singapore with a contract value of SGD10 million and above, wef 1 August 2016

WHO ARE THE STAKEHOLDERS AND WHAT ARE THEIR DUTIES?

Risk Mitigation Principles:

- 1 Eliminate all foreseeable risks at the design stage
- 2 Where it is not reasonably practicable to eliminate, to reduce design risks to ALARP, taking into account:
 - i) Reduce design risks at source
 - ii) Collective protective measures instead of individual protective measures
- 3 The person who creates the risks must be responsible to manage the risks



DEVELOPERS

- Together with the Designer, ensure foreseeable design risks are eliminated or reduced
- Communicate foreseeable design risks, allocate sufficient time and appropriate resources for Designers and Contractors to perform their duties



Dfs PROFESSIONALS

- Convene Dfs Review Meetings on behalf of Developer
- Keep an updated copy of Dfs Register
- Provide all relevant information on each foreseeable risk identified and its mitigation to the Developer



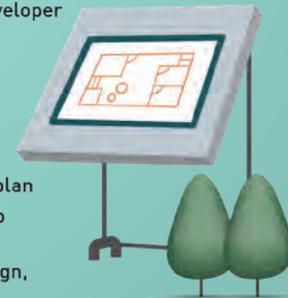
DESIGNERS

- Ensure foreseeable design risks are eliminated or reduced through the design plan
- Collective protective measures are taken to manage any residual design risks
- Ensure all relevant information on the design, construction and maintenance are available to stakeholders



CONTRACTORS

- Inform Developer or Main contractor of any foreseeable risks
- Provide all relevant information and ensure persons hired are competent to carry out their duties



OWNERS

- Keep a copy of the Dfs Register, communicate all foreseeable risks to persons carrying out maintenance and future works
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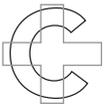


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Tackling resistance to change is key in creating new culture

CREATING A ZERO-INJURY CULTURE

Changing mindsets and behaviours towards safety is a key step in reducing hazards, injuries and human error on construction sites and beyond.

BY LARRY WILSON

Most construction companies are aware that safety training is likely to save them money in the long run in terms of reduced downtime due to damaged equipment, serious injuries and stopped work. However, many do not realise that safety training can also reduce costly human errors that lead to delays, customer complaints, wastage and reworking.

Creating a safety culture that is acknowledged and embraced by all levels of employees is essential in the quest for a zero-injury work site. Without it, it will be an uphill battle to convince construction workers that they can go a year or more without a recordable injury.

To achieve zero injuries, everyone on site must accept a different level of safety than they would typically have for themselves after work. This is likely going to be more difficult in communities

where overall safety standards are almost non-existent and people are generally complacent with how things are done.

Achieving zero injuries can also be more challenging when there is a constant flux of subcontractors and equipment at different stages of a project. Each of these subcontractors may have a different culture or 'normal' way of doing things, and their workers may have their own sets of beliefs that can be difficult and slow to change.

TRAIN THE SUPERVISORS

Hence, the supervisors who work for the general contractor must be trained on how to achieve a zero-injury culture and how to apply these concepts with the contractors—something which requires time, money, effort and a willingness to change.

Safety professionals need to play a part



It is essential to create a safety culture that is embraced by all levels of employees

in changing their own belief systems too. Many assume that as long as everybody follows the rules and wears the required personal protection equipment (PPE), nobody will get hurt. They have not considered unintentional at-risk behaviours, such as turning, moving or setting down their hands without looking first.

Safety professionals should also learn to use positive reinforcement and constructive feedback to educate and train workers about human factors and critical errors.

UNDERSTANDING HUMAN FACTORS

Having the right state of mind is essential in achieving a zero-injury workplace and culture. To work safely, workers must mediate human factors—such as rushing, frustration, fatigue and complacency—which can increase risks

of injury or damage.

Most people do not recognise these human factors as high-risk states because they happen every day. They do not realise what these states do to your brain, how they cause critical errors and compromise decision-making, especially if there is a deadline and the project is behind schedule.

For example, when a worker is rushing—going faster than what he is used to, as opposed to just going fast—it could cause his or her mind not to be on task and may result in a loss of balance, traction or grip.

Complacency with familiar situations is not a character flaw—it's the way our brains are hardwired. For example, you would smell the chlorine when near a

Safety professionals should learn to use positive reinforcement and constructive feedback to educate and train workers about human factors and critical errors.

swimming pool but not notice it after an hour as your brain has filtered it out. So, if you're used to seeing tripping hazards on site, you would probably cease to notice them after a while until you actually trip over one of them.

Frustration and fatigue are what most people deal with daily, both at and away from work. The result of lack of sleep, working overtime, an argument with a spouse, being late to work and many other situations, can cause us to take our eyes and mind off the task and put us in the line of fire. Being able to recognise these states on the fly is essential to ensure focus on the task at hand.

TACKLING RESISTANCE TO CHANGE

Changing mindsets and behaviours are often met with resistance, even when those who need to implement them cognitively understand the benefits of the change. This is natural, and supervisors have to be trained on how to educate and coach their workers without getting frustrated.

When supervisors and workers understand the above human factors as significant potential risks, a culture shift occurs and resistance decreases significantly. The organisation will quickly develop a common language around safety, realising that rushing, frustration, fatigue and complacency cause critical errors.

COMMUNICATION

However, getting everyone on the same page is only the first step. The next step is training supervisors on how to engage the employees in meaningful conversations about these risks.

Supervisors need to know how to approach others and to ask the right

kind of questions so the person can understand how their state of mind affects their behaviour instead of taking any feedback personally.

For example, teaching supervisors how to use tools such as 'rate your state' would be more helpful than simply asking them to 'talk to workers more often'. By asking employees to rate their level of rushing or their level of complacency from 1 to 10, supervisors can engage more effectively with workers.

Similarly, getting workers to anticipate where and when they could make a serious performance error that could waste a lot of time or money would also help to stimulate meaningful conversations.

If a worker rates himself at 6 or 7 for complacency, for instance, the supervisor could ask a simple question such as, "What is the worst mistake you could make when you're a bit too comfortable or complacent on this job?"

You can also train workers on the best techniques for positive intervention if they see something unsafe, and train everybody on how to receive feedback graciously. For instance, if one employee sees another lifting an object that is heavy or awkward, they could offer to assist with the lift, rather than pointing out that the person isn't doing it correctly.

MAINTENANCE AND ENFORCEMENT

Discussing the right state of mind at work would be difficult, to say the least, if the safety equipment is not regularly inspected and properly maintained. The condition, use and enforcement of PPE is also important for preventing injuries and improving credibility when

discussing human factors and critical errors.

For example, giving a driver a warning such as "Don't speed because the truck needs new brakes" isn't bad advice, but it doesn't convey a lot of concern for overall safety. First you should ensure the brakes and the rest of the truck are working properly and then advise the driver to drive safely and obey speed limits.

GOVERNMENT ROLE

When governments start increasing their enforcement efforts, companies react. As a result, companies tend to place more emphasis on compliance than injury reduction.

Unfortunately, there comes a point where improved compliance no longer produces improved safety performance and fewer injuries, so governments need to improve their understanding of behavioural approaches to injury prevention.

Instead of focusing on problematic companies, governments can also learn from how companies are achieving zero injuries and encourage others to emulate them.

In Singapore, the annual Work and Safety Health (WSH) awards are held to recognise companies and individuals for achieving workplace safety and health. One of the 158 award recipients for the 2018 iteration is Infineum Singapore Pte Ltd. By incorporating technology in its work processes, the company is able to identify hazards early and mitigate any risks of accidents at the workplace. This minimises human intervention in work processes while upgrading its workforce with new skills. Infineum's Behaviour Based Safety Observation (BBSO) programme encourages all employees to look out for, and document, safety observations of other colleagues, and stop any unsafe acts at work.

Governments, especially in Southeast Asian countries, also have to tackle one

Getting workers to anticipate where and when they could make a serious performance error that could waste a lot of time or money would also help to stimulate meaningful conversations.

big challenge—corruption—which can easily come into play when companies that use inferior building materials or do not conform to fire or electrical safety standards do not get inspected, fined or shut down.

SAFETY EXCELLENCE

It is easy enough for companies that would normally strive for excellence in other areas, such as customer service or efficiency, to become so frustrated with the 'burden of compliance' that they do not pursue excellence in safety. This frustration usually manifests itself as a 'good enough' type of safety culture as opposed to a zero-injury culture.

With all you know about the

construction industry, ask yourself if a zero-injury culture is truly possible. Compared to other industries such as manufacturing, oil and gas and engineering, a zero-injury culture requires a huge paradigm shift for the construction industry. However, just because mindsets change slowly and training is difficult to organise, it does not mean a zero-injury culture is impossible to achieve; it just means that it's more challenging to do so.

In the long run, embracing and practising a zero-injury mindset will cost less money and work than dealing with several and severe incidents and injuries caused by rushing, frustration, fatigue and complacency. 



LARRY WILSON
CEO, SafeStart International

Wilson was a traditional behaviour-based safety (BBS) consultant in North America when he determined the need for a programme that went beyond the limitations of BBS. In 1998, he developed and launched the SafeStart programme, followed by SafeTrack, to reduce injury and instil positive culture change in workplaces.

He has also authored numerous articles and co-authored the book *"Inside Out: Rethinking Traditional Safety Management Paradigms"*. He has more than 25 years of speaking experience at health and safety conferences and international events.

SafeStart was one of the exhibitors at the 12th edition of OS+H Asia, a regional exhibition on occupational safety and health held in Singapore. The next iteration of OS+H Asia will be held from 26 to 28 August 2020. For more information, visit www.osha-singapore.com.



Avoiding complacency on construction site will help to avoid potential risks

HILTI CELEBRATES 50 YEARS IN SINGAPORE

The Hilti Group is a leading manufacturer and supplier of specialised products and services to improve construction productivity and safety.

Founded in 1941 in Schaan, Liechtenstein, by brothers Martin and Eugen Hilti, the company first ventured into the Asian market via Singapore in 1968—50 years ago.

“Singapore is a very developed country, and that’s why what happens here is very important for us as it has an impact on other countries in this region,” Michael Hilti, honorary chairman of the Hilti board and son of co-founder Martin, tells Construction+.

Today, the Singapore office has about 150 team members from more than 27 countries.

“Singapore is a very good place to attract talents, not only for the local market but also for the region and globally,” adds Gavin Gui, General Manager of Hilti Far East Pte Ltd. “As part of an international group—active in 120 countries, with 28,000 employees and sales of more than USD5 billion—Hilti in Singapore is very connected and supported by a strong global team and lead markets.”

Coinciding with the celebration of this milestone 50th year, the group has established a regional hub in Singapore—Hilti Asia Pacific Pte Ltd—to accelerate its development in ASEAN, India, Australia and New Zealand.

“The regional hub as a competence centre is strongly involved in developing the different countries,” says Michael Hilti.

Although best known for its hardware—such as fastening systems, power tools and fire protection—Hilti is also substantially investing in developing construction software solutions, using the Internet-of-Things (IoT) to connect the hardware with the digital information



Michael Hilti: Innovation was and is the DNA of the company

and service processes.

“Innovation was and is the DNA of the company,” says Michael Hilti. “We have more than 1,500 people in R&D, we spend 6 per cent of our sales in R&D, we are among the top 100 patent applicants at the European Patent Office, and we are in direct contact with customers, which requires us to be highly innovative because people expect that from us.

“In the construction industry, which is very competitive and price-sensitive, productivity is getting more and more important. We not only look at the product as such—we look at the whole working process to find areas of improvement,” he adds.

“The company is in a change process from a hardware and services company to a

hardware–services–software company, and digitalisation offers us fantastic new opportunities.”

Always continuously seeking to do things better, Hilti is ready to embrace the future.

“Two years ago, we celebrated 75 years of Hilti globally,” says Michael Hilti. “How many industries, especially family companies, survive the first 50 years? And how many survive 75 years? There are not that many.

“And when we set our anniversary motto ‘We are ready for the future’, we knew that we were really ready,” he adds. “I think we have a better team than ever, and we are more innovative than ever—so the sky has no limit, and we are very excited about the future.” 

REGULAR MACHINERY MAINTENANCE: AN OPERATIONAL PRIORITY

An always-on electrical system is critical to any production facility and must not be disrupted by needless incidents resulting from poor machinery maintenance.



Most of the electrical work that happens in a production facility, such as scheduled maintenance and de-energising of the system, are fundamental requirements for safety. Outages from poorly maintained machines are not only more prone to electrical hazards but have the potential to induce a chain of damages—from the faulty equipment to the electrical system.

Here are six practical reasons why regular machinery maintenance should be a priority for your business.

1. You don't want any surprises that could disrupt or halt production

Neglecting regular maintenance of electrical equipment, especially over a long period of time, may lead to a damaging system failure or an incident to disrupt facility operations.

2. All equipment, no matter how good the make, require servicing

This is particularly important for machines hidden from view, as they tend to be overlooked when everything is operating normally.

3. Not all machines come with warning capabilities

If workers could identify equipment that is about to fail before the failure occurs, it would be less disruptive to operations as proper steps could be taken to prevent or minimise the downtime impact to people, processes, equipment and production.

4. You can't discover problems brewing in the hardware if you don't open it up

Regular maintenance is required to ensure that equipment can operate as expected. For example, contacts that are not regularly exercised tend to stick or not open at all, leading to longer clearing times than expected.

5. Planned maintenance is a disruption made effective and efficient

While de-energising equipment is a fundamental requirement for electrical safety, the process of de-energising is disruptive to facility operations. Anticipating and planning for maintenance enable you to prepare for potential glitches beforehand, greatly enhancing the coordination and orchestration of different servicing activities. This approach can significantly improve the safety and speed

of the maintenance execution.

6. Predictability is key to containing servicing and downtime costs

Scheduled maintenance is financially far more advantageous than unexpected maintenance. Knowing when a facility-wide shutdown is happening allows you to take steps to minimise operational disruptions. For example, if you don't have trained and qualified electrical workers inhouse, you can anticipate and budget for qualified service companies in your planning.

With regular maintenance of electrical capital assets, factories can avoid potential losses from unexpected downtime, injuries and investigations. What's more, these benefits can be further enhanced when you keep safety procedures up-to-date, as this ensures better compliance, complexity management and execution efficiency.

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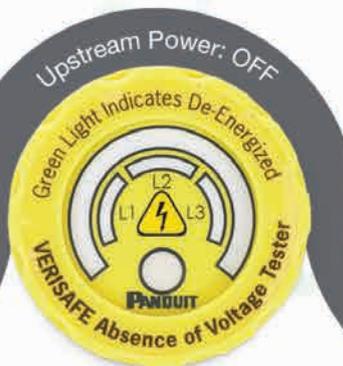
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GREEN indicates the absence of voltage is verified.



The VeriSafe™ AVT safely, reliably, and efficiently verifies the absence of voltage before workers access potentially dangerous electrical equipment. This results in a significant increase in worker safety when verifying the absence of voltage in electrical equipment and can reliably be done in a fraction of the time compared to portable testers. AVTs complement any lockout/tagout program while improving safety and efficiency hazards.



From left: Dr Yeoh, Chang and Minister of State Zaqy Mohamad at the IES Lifetime Engineering Achievement Award presentation

IES GREEN BUILDING RECEIVES ASEAN ENERGY AWARD

Date: 29 October 2018

The IES clinched first runner-up position in the 'Green Building Awards - Small and Medium Green Buildings' category of the ASEAN Energy Awards 2018 for the IES Green Building at Bukit Tinggi.

ASEAN Secretary-General Dato' Lim Jock Hoi presented the award to IES President Prof Yeoh Lean Weng at the 36th ASEAN Ministers on Energy Meeting (AMEM) official dinner held in Singapore.

Completed in 2016, the IES Green Building is a three-storey well-insulated institutional building, with several energy efficiency features, including use of renewable energy, water efficiency, indoor environment quality, operation and maintenance features.

The ASEAN Energy Award is the region's highest recognition of efforts in energy efficiency, renewable energy and energy management. It aims to promote the incorporation of sustainable and innovative features for building projects in ASEAN.



Dato' Lim (left) presenting the award to Dr Yeoh

INSTITUTION OF ENGINEERS, SINGAPORE (IES) 52ND ANNUAL DINNER

Date: 14 November 2018

The IES celebrated outstanding achievements of engineers at its annual dinner, jointly held with the closing banquet of the 36th Conference of the ASEAN Federation of Engineering Organisations (CAFEO 36).

Minister of State for National Development and Manpower Zaqy Mohamad graced the event, which was attended by close to 1,700 conference delegates, IES members and industry guests.

The event was preceded by the signing of the Singapore Declaration by member organisations of the ASEAN Federation of Engineering Organisations (AFEO) to show commitment in promoting railway and transportation connectivity, urban sustainable solutions, the Vision Zero movement to realise injury-free workplaces, sharing of project knowledge, start-up incubator development and excellence in engineering education.

In recognition of his leadership and contributions to the engineering industry and community, Er. Chang Meng Teng became the sixth winner of the IES Lifetime Engineering Achievement

Award—the topmost honour accorded to engineers in Singapore.

An electrical engineer by training, Chang devoted his career to Singapore's infrastructural development across the public and private built environment sectors. He served with the Public Utilities Board and spent 20 years as managing director of Squire Mech Pte Ltd.

"IES hopes that his achievements will inspire our young engineers to deliver innovative solutions and contribute to the well-being of our economy as well as improving our quality of life," said IES President Prof Yeoh Lean Weng.

Other awards presented at the dinner include the ASEAN Outstanding Engineering Achievement Awards and the AFEO Honorary Awards, while Chartered Engineer certifications were presented to local transportation engineers.

Construction+ was a media partner of CAFEO 36, which drew more than 1,000 engineering professionals to Singapore from 12 to 14 November 2018 to exchange knowledge and create solutions in engineering—notably in rail connectivity and education—to stimulate progress in ASEAN.

JTC AT BUILDTECH ASIA 2018 (BTA)

Date: 22-24 October 2018

The eighth edition of international building technology expo BTA is themed "Enhancing construction productivity through digital transformation".

As Singapore's lead government agency responsible for the planning and development of industrial infrastructure, JTC Corporation showcased how it digitises the way it designs, plans and builds industrial projects for greater construction productivity.

On display at the JTC booth were six different technologies that are implemented at its developments, demonstrated via 3D model structures, videos, posters, interactive TV screen and live webcast. Guided tours with more in-depth explanations were also held for students from institutes of higher



Guided tours with live demonstrations

learning, industry partners and overseas delegates.

Some of the technologies on display

include the BIM-based digital logistics management system, the industrial design automator, and the modular mechanical, electrical and plumbing (MEP) installation.

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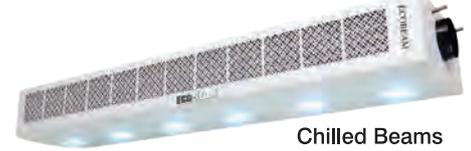
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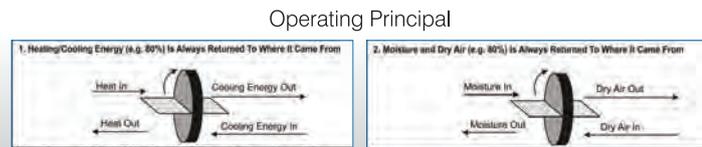
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INTERNATIONAL URBAN SUSTAINABILITY & GREEN BUILDING CONFERENCE 2018 (IUSGBC)

Date: 18 October 2018

IUSGBC 2018 is a joint collaboration between Malaysia Green Building Confederation (MGBC) and Construction Research Institute of Malaysia (CREAM).

This conference—held in conjunction with the International Greentech & Eco Products Exhibition & Conference Malaysia (IGEM)—is a platform to promote net zero energy buildings, with a focus on tropical climate countries. This is in line with the World Green Building Council's initiative for market transformation towards 100 per cent net zero carbon building by 2050.

Tropical-climate countries are the emerging economies of the world, with infrastructures and buildings being built at a faster rate



Panel of experts sharing their thoughts on achieving net zero

than anywhere else. This demands high consumption of resources, increasing the need and urgency for net zero development on energy, water and waste management.

International and local expert speakers shared their knowledge on the subject,

highlighting projects and achievements that can help shape the change needed to drive professional and government policies. Building industry stakeholders also shared their thoughts and initiatives for Malaysia to achieve net zero for sustainable development.



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THE ARCHITECTURE AND BUILDING SERVICES (ABS) 2018

Date: 2-4 October 2018

The ABS 2018 series, held at the Marina Bay Sands Singapore Expo and Convention Centre, was attended by more than 10,300 visitors and conference delegates from 46 countries.

The three-day show presented six key architectural and building services exhibitions and 14 industry conferences, addressing new challenges and developments impacting Singapore's ever-changing built environment.

With 10,000 square metres worth of exhibition space and 239 exhibitors, the event also showcased solutions for 'smart nation' building, architecture and building management industries' needs. The ABS 2018 umbrella comprises ArchXpo 2018, iFaME 2018



(International Facility Management Expo), LED & Light Asia 2018, Safety and Security Asia 2018, Fire & Disaster Asia 2018, and Work Safe Asia 2018.

The inaugural showcase of Smart Solutions at the Smart Pavilion simulated a high-security commercial office building and township, including a smart home.

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INTERNATIONAL CONFERENCE ON WORLD CLASS SUSTAINABLE CITIES 2018

Date: 27 September 2018

The 10th series of the WCSC 2018 was held in Kuala Lumpur recently.

Themed 'Kuala Lumpur: Today & Beyond', the conference explores how Malaysian cities can prepare for present and future challenges—to be more liveable, resilient, inclusive and sustainable—towards the implementation of the New Urban Agenda.

The event was jointly organised by Real Estate & Housing Developers' Association Kuala Lumpur (REHDA KL), Malaysian Institute of Planners (MIP) and Malaysian Institute of Architects (PAM). More than 500 delegates, representing the built environment, government and other stakeholders,

attended the event.

Keynote speakers included Malaysian Minister of Territories YB Tuan Haji Khalid Abdul Samad; Riccardo Andrea Marini, founder and director, Marini Urbanismo, Italy; Dr Belinda Yuen, research director of

Lee Kuan Yew Centre for Innovative Cities, Singapore; Peter Ramstedt, vice president and project director, Turner International, USA; and MIP President Hj Ihsan Zainal Mokhtar, among others. There was also a panel session on 'Affordable Housing – Need, Requirements & Reality'.



WCSC 2018 keynote speakers and panellists

LILIN 2018 Summer Intercontinental Seminar Introduces a New Generation of Video Surveillance

Organised by LILIN Enterprise, the LILIN 2018 Summer Seminar was successfully held from 16-17 July in Yilan, Taiwan. In addition to exhibiting the latest IVS applications, license plate recognition and face recognition technologies, the seminar also discussed the possibility of applying artificial intelligence (AI) to future monitoring applications. The conference laid down product applications and sales strategies for the second half of 2018 – putting in place the foundations for integrating monitoring assets across all verticals and explained the role of IoT technologies in video surveillance.

The 2018 Summer Seminar gathered some of the company's global sales elites and strategic partners to experience the advanced functions and amazing performance of LILIN's products. The seminar consisted of intensive field application discussions and product highlights, including face recognition, license plate recognition, various IVS intelligent monitoring technologies, cloud device management, and artificial intelligence. The event received positive feedbacks and promoted a warm exchange between LILIN's vertical and horizontal strategic partners.

LILIN is committed to encouraging itself and motivating industry partners to develop more advanced solutions through experience and case sharing, and to explore the need of users in creating a highly flexible product structure.

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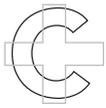
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SEARCH



JOANNE KOH PHUAY THENG

A certified BCA Green Mark facility manager since 2010, Koh joined Temasek Polytechnic (TP) a year later and has since been tasked to infuse sustainability issues into the diploma curriculum.

Graduating with a Bachelor of Science (Honours) in Building from the National University of Singapore, Koh is also a certified fire safety manager in Singapore. Prior to joining academia, she was in projects and facilities management, managing numerous Singapore government facilities, space utilisation and sustainability-related projects.

She shares with *Construction+* her thoughts on preparing students for a Green world.

What is sustainability to you?

For me, sustainability is a mindset, and it is practised in every aspect of life. If you need something or enjoy certain things, there is always this question: When will

it run out? Will there come a day when it no longer exists? With that, it is not about passion anymore but more because I wanted something to last as long as it could.

How do you infuse this mindset into a curriculum?

In any other diplomas in the built environment, students can take subjects on sustainability and what they can potentially do now and in the future.

In TP's Diploma in Integrated Facility management, we add a little more by getting students to go back to their alma mater to provide consultancy for their schools to achieve their BCA Green

Mark awards. The intent is to let the students see that they are the agents of continuity and, at the same time, give them an opportunity to practise what they have learnt in the classroom and put it to good use. The pilot was so successful that it was officially launched as the Back to School programme by Building & Construction Authority (BCA) and the Ministry of Education in September 2016.

The students' diploma project programme provides a real environment for them to see and generate value in the workplace. At the end of the day, the content they learn are just words, and these can only become knowledge when they manage to

generate worth based on what they have learnt.

Could you give another example of how content is translated into knowledge in a practical way?

In one of the subjects, the students are given a fictitious building to work on to achieve the BCA Green Mark award. What is different about this project is that there are no presentations, and students are expected to attend a 'client brief'. This exercise requires the students to answer any questions that the lecturer (posing as a client) might have.

It is also to let them experience the challenges in helping people understand more about sustainability and its technologies. We subject them to rejection that is 'cushioned' and pseudo challenges, from internships or mentorships.

However, as much as we try to make things as realistic as possible, there are always differences between the real and made-up world. When the students step out of the institution, they will realise that every organisation has its own priorities and resources. In the classroom, the concepts and theories are all passed in the most idealistic way—there are no costs associated with the latest sustainability technologies. In the real world, there are always competing needs and profit margins that every business looks at.

What do you think are major challenges faced in successfully educating students in sustainability?

Today, the term 'YOLO' is the attitude young people live by. Our parents however, believed in saving for rainy days, and this goes to show the conflicting principles different generations have.

We are brought up very differently from the students that we are educating. There is always this gap in thinking that sets us apart. We can design for students to face challenges and rejection, but their reaction to it is always something unexpected. We are dealing with people, and the different content we have designed all eventually go down differently with different individuals.

I try to let student know that sustainability is not just about being Green in the built environment but that it applies to every aspect of life. A building has to be sustainable, much like one's lifestyle has to be sustainable.

What principles are fundamental to your work ethos and culture?

In my line of work, I constantly remind myself that we are all different and that my work has an impact on the future. This is something that I developed when I joined academia.

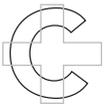
When I was in the industry, it was amazing to see the different disciplines come together to build something. Differences due to conflict of interest will always be there, and it is always a battle of whose voice is louder. In academia, instead of a building, I am a part of what builds a person now, and that is sometimes scary. It cannot be a battle anymore. At the end of the day,

The students' diploma project programme provides a real environment for them to see and generate value in the workplace.



Students gain real-life experience by helping their alma mater achieve BCA Green Mark awards

Image by Temasek Polytechnic



Koh at the Young Green Advocate of the Year 2017 awards ceremony

Image by Singapore Green Building Council

Whatever sustainable designs and features that are incorporated during the design stage will only be effective if the occupants and users are also a part of it.

the differences have to be accepted and the students have to walk out knowing one more thing than yesterday.

What are some of the rewarding moments in your line of work?

The Young Green Advocate of the Year was the first award that I have ever won. This year, I have also submitted my work in sustainability to the Cities of Love award (COLA) and was awarded merit. With every school that my students and I have worked with, the schools have always said it is not so much about the award but the outcome and the process that matter, and I totally agree. In my course of work, nothing is more rewarding than seeing a student coming to a decision that the built environment is a place where he/she wants to explore working in.

What are your upcoming plans for 2018–2019?

The work for sustainability will continue. In the next two years, I will be working more on the area of facility management as it has gained more attention from the industry. As the longest stage of the life cycle of a building, facility management is something that has been long neglected. Whatever sustainable designs and features that are incorporated during the design stage will only be effective if the occupants and users are also a part of it.

With more highlight on facility management, there are better ways to integrate the people in the design stage with the occupants. It is going to be exciting as we see more changes taking place in the facility management arena in Singapore. ●



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Bird's eye view of Par 3 development

PAR 3 CONDO & CONDO VILLA

This high-end development is nestled within an 18-hole championship golf course, close to IOI City Mall in Puchong.

The project consists of a 32-storey condominium tower and a three-storey low-rise block with 18 units of condo villas. The 207 condo units range from 1,278 to 1,617 square feet, while the condo villas have built-ups from 1,726 to 2,244 square feet.

The low-density condominium has eight units per floor, with two separate lift lobbies serving four units each. Likewise, the low-rise villas have separate lift lobbies serving two units each. The lift lobbies are also designed with generous natural lighting and cross ventilation.

All units have a view of the golf course and are orientated north-south to avoid the morning and afternoon sun. Large

windows and sliding doors enable natural light and breezes to flow into most of the unit.

Taking advantage of its location and visibility from the South Klang Valley Expressway, the building's façade is designed with a prominent undulating fin pattern and crown, finished in a brilliant metallic mesh. From the avant-garde design reflected in the entrance archway and the building façade, the development exudes a sense of contemporary luxury living.

Recreational facilities include a cosy sunken lounge, surrounded by a water feature, a multipurpose hall with foldable doors, a cantilevered gym room with double volume ceiling and glass wall facing the golf course, a spa pool and a 27-metre-long infinity edge swimming pool. Sky gardens at the various floors complement the vertical green walls of the podium. 



Large windows and sliding doors for natural lighting and ventilation



Condominium entrance with avant-garde archway



Spa pool

PROJECT DATA

Project Name
Par 3 Condo & Condo Villa

Location
Putrajaya, Sepang, Selangor,
Malaysia

Expected Completion
10 April 2019

Site Area
11,708 square metres

Gross Floor Area
36,508 square metres

Building Height
32 storeys; 126 metres

Client/ Developer
Pine Properties Sdn Bhd
(IOI Group)

Architecture Firm
T & T Architect Sdn Bhd

Principal Architect
Ar Kiat Tung

Other Architects/Designers
Ar Ian Iskandar Tan; Chan C.H.;
Vivian Yong

Civil & Structural Engineer
SNA Consult Sdn Bhd

Mechanical & Electrical Engineer
NDY (Malaysia) Sdn Bhd

Contractor
Awangsa Bina Sdn Bhd

Images
Pine Properties Sdn Bhd



Cruise ship-like design



RESIDENSI SEFINA MONT'KIARA

Residensi Sefina is a high-rise condominium designed to offer residents a luxurious 'cruise' getaway in a tropical vacation setting.

One of the main features is the Star Deck—with a podium shaped like the deck of a cruise ship—which offers a 50-metre lap pool, sauna, reading pavilion, games pavilion, yoga deck, multipurpose hall and a gymnasium, among others.

The centralised landscape area is located on the western side of the site, forming the 'beach', with a sand field, coconut palms with hammocks, a raised timber pavilion resembling a small hut, and pavement with wave-like patterns. The 'beach' allows various activities, from beach volleyball to sandcastles.

The tower block faces north-south to avoid direct sun exposure and to take advantage of the natural cooling breeze. The typical floor houses eight units, for maximum views and privacy.

The project's construction complies with QCLASSIC and GBI requirements. Aluminium formwork, which is recyclable, is used for quick construction due to its accuracy in dimension, resulting in high-quality finished concrete surfaces. Environmentally-friendly materials, such as low-VOC interior paints, are used for residents' health and comfort and sustainability. 



Sunken BBQ pavilion



Sandy volleyball court at the 'beach'



Reading pavilion

PROJECT DATA

Project Name
Residensi Sefina Mont'Kiara

Location
Jalan Kiara 3, Mont'Kiara,
Kuala Lumpur, Malaysia

Expected Completion
June 2019

Site Area
2.73 acres

Gross Floor Area
45,193 square metres

Building Height
35 storeys, including four-level
below-ground carpark podium

Number of Units
245

Developer
Sunrise Bhd
(wholly owned subsidiary
of UEM Sunrise Bhd)

Design Consultant
Liu & Wo Architects Pte Ltd

Executive Architect
CS Chew Architects Sdn Bhd

Landscape Architect
Landart Design Sdn Bhd

Interior Design Firm
Axis Identity Group Sdn Bhd

Civil & Structural Engineer
SMA Bersekutu Sdn Bhd

**Mechanical & Electrical
Engineer**

Jurutera Perunding Valdun
Sdn Bhd

Quantity Surveyor
QS Associates

Substructure Contractor
Keller (M) Sdn Bhd

Main Contractor
HAB Construction Sdn Bhd

Images
Sunrise Bhd



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HOTEL GRAND BARON

Hotel Grand Baron in Taiping, Perak, is an elegant contemporary building with splashes of tropical-induced design, set against the backdrop of the nearby Taiping Lake Gardens.

The family-owned hotel comprises 90 rooms, with facilities such as gymnasium, sauna, column-less ballroom, swimming pool, rooftop viewing deck and sub-basement carpark.

The design approach for this project is 'bringing nature into the building', and this is actualised by maximising the number and sizes of openings to ensure a constant visual connection between the interior and the surrounding landscape.

To maximise the benefits of the site, the building is oriented to capture wind flow from the south and southwest, while west-facing rooms can take advantage of the Larut Hill views.

The façade embraces warm dark timber tones. Due to budgetary constraints, aluminium louvres are used instead of timber ones, while painted plaster walls with groove lines replace timber panels.

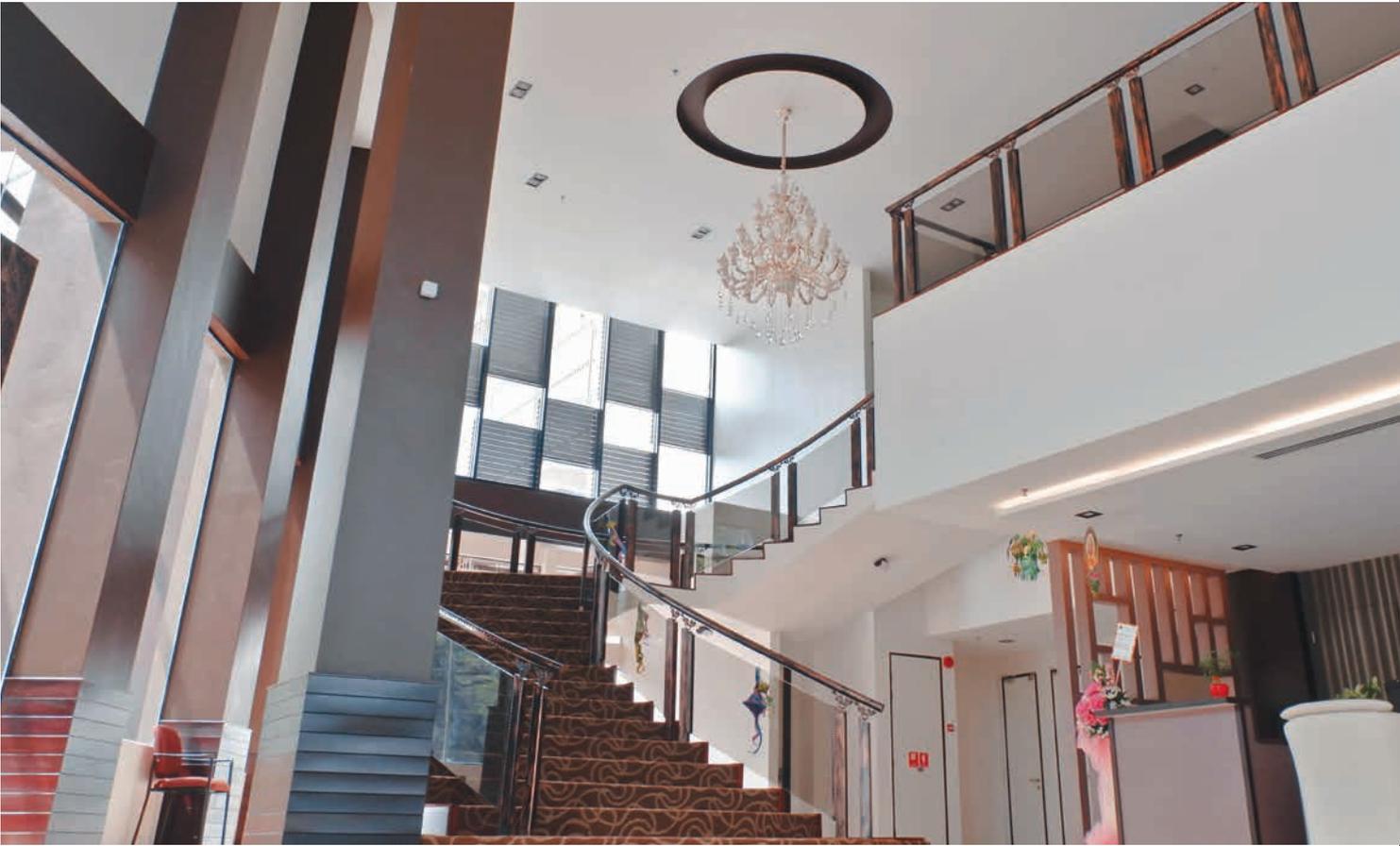
Locally sourced marble is applied on the architrave of the hotel entrance, as well as the flooring of the entrance lobby area and dining area. Hanging ivy vine plants on each roof feature blends the building with the neighbourhood.

Louvres at the entrance lobby and atrium provide natural ventilation to the common areas. The waiting area of the hotel is designed to produce a stacking effect by creating a chimney-like structure that forces hot air to rise out of the building and allowing cool air to flow in. Shading devices on the glass panels at the stairwell create a light-and-shadow effect. ©



Warm dark timber tones on the façade

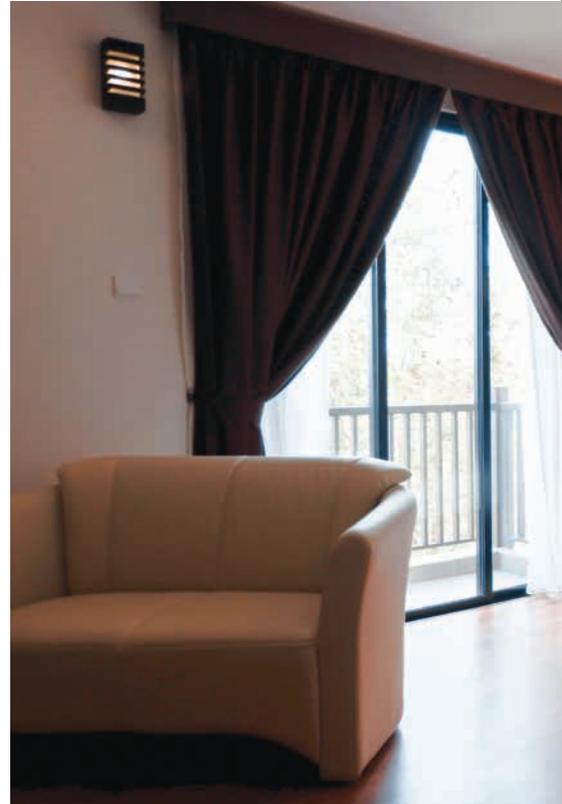




Grand staircase at the entrance lobby



Bathroom with option of a view



Guestroom



Skylight at the atrium



PROJECT DATA

Project Name
Hotel Grand Baron

Location
Jalan Bukit Larut, Taiping,
Perak, Malaysia

Completion Date
February 2018

Site Area
5,217.16 square metres

Gross Floor Area
12,357.50 square metres

Building Height
3 storeys

Number of Keys
80

Client/Owner
High Baron Sdn Bhd

Architecture Firm
CG Cheng Architect

Principal Architect
Ar Cheng Chew Giap

Interior Design Firm
CG Cheng Architect

Civil & Structural Engineer
P.M.K. Taiping Sdn Bhd

**Mechanical & Electrical
Engineer**
Primedge Consultant Sdn Bhd

Design & Build Contractor
Kejuruteraan Kumpulan Teknik
Sdn Bhd

Images
CG Cheng Architect

TOLL CITY

Unlike other warehouses in the area, this building is clad in fire-rated aluminium composite panels to project a sleek and modern image befitting its role as Toll Group's main headquarters in Singapore.

The interior of the building is fitted with industrial-type materials, such as cladding, mesh, cement panel and black-framed glazed partitions and doors, giving it a modern industrial look.

As the site has two vehicular accesses, it is necessary to have a clear division of heavy vehicular movement and car movement. With both entrances being very close to junctions and road bends, the design team also had to ensure that there are sufficient queuing lengths within the site to avoid queues on the road.

The main public traffic access to the site is via Gul Crescent road, which is not the building's main address; hence, the ramp at the entrance is dressed in mesh to add prominence to it.

The first storey of the building holds the car parking and other ancillary facilities for the warehouse operations. The central core is organised to house the reception, next to the vertical circulation through the building. Other required spaces such as a first aid room, staff rooms, drivers' rooms, store and facility management rooms, together with all the main M&E rooms, are also housed on this floor.





Five storeys of warehouse space

The second to sixth storeys are designed with a 16,000-square-metre warehouse floor plate, with 22 loading/unloading bays. Each warehouse had a mezzanine that houses the warehouse operational office. The ramp is designed as a double loop to reduce the footprint, with the extra space converted into a dedicated truck parking zone for each warehouse.

Due to a height restriction of 85 metres AMSL on the site, the client was not able to have a two-storey corporate office on the seventh floor. As a result, the sixth-storey mezzanine was redesigned to house part of the corporate office and canteen, with the remaining corporate office and gym on the seventh floor.

The corporate office is designed around a green courtyard and landscaped terrace—an urban oasis within an industrial zone—and overlooks a stunning view of the dockyard. The building's orientation maximises the north-south axis of the site. The corporate office is shielded from the western sun, with its full-glazed façade facing south and partly east. 



Aerial view



Lounge with oak vinyl flooring



Café hub with central stretch of banquette seating framed with black steel

PROJECT DATA

Project Name	Toll City	Civil & Structural Engineer	RSP Architects Planners & Engineers (Pte) Ltd
Location	60 Pioneer Road, Singapore	Mechanical & Electrical Engineer	Aurecon Singapore (Pte) Ltd
Completion Date	5 June 2017	Quantity Surveyor	WT Partnership (Singapore) Pte Ltd
Site Area	40,528.8 square metres	Landscape Architect	Chen Wa Landscape Pte Ltd
Gross Floor Area	101,009.98 square metres	Green Building Consultants	Building System & Diagnostics Singapore Pte Ltd; Aurecon Singapore (Pte) Ltd
Building Height	7 storeys; 85 metres	Main Contractor	Precise Development Pte Ltd
Owner	Toll Logistics (Asia) Ltd	Interior Fit-Out Contractor	Tarkus Interiors Pte Ltd
Architecture Firm	RSP Architects Planners & Engineers (Pte) Ltd	Images	Precise Development Pte Ltd; Toll Logistics (Asia) Ltd (interiors)
Principal Architect	Ng Meng Hui		
Interior Design Firm	Geyer Environments Pte Ltd		
Principal Designer	Jessica Green		

TUAS LINK MRT STATION

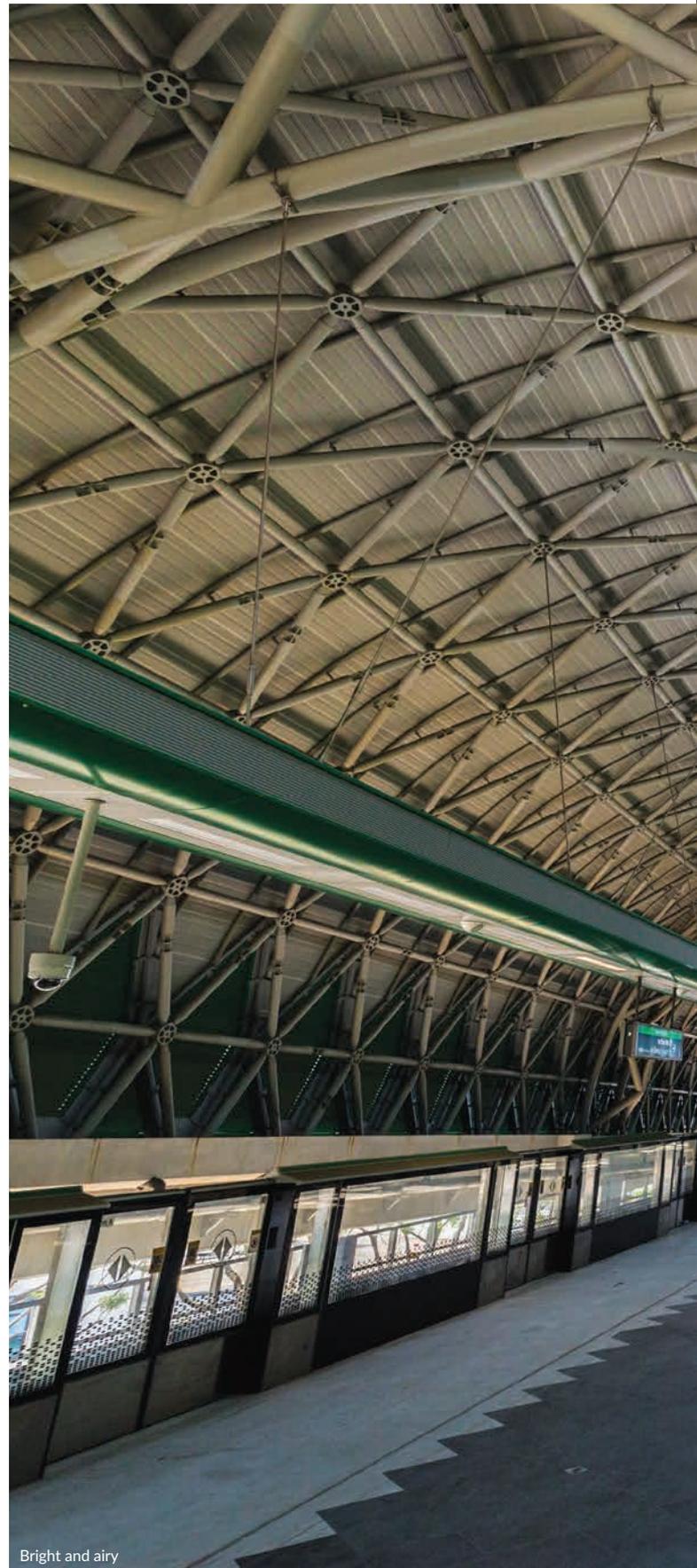
The Tuas West Extension (TWE) consists of four above-ground stations added to the existing East–West Line from Joo Koon Station. The 7.5-kilometre-long extension opened for service in June 2017, enhancing rail connectivity to the western area of Singapore.

The Tuas Link MRT Station is the final station on the western segment of the line, before trains proceed to the Tuas Depot, about 300 metres away.

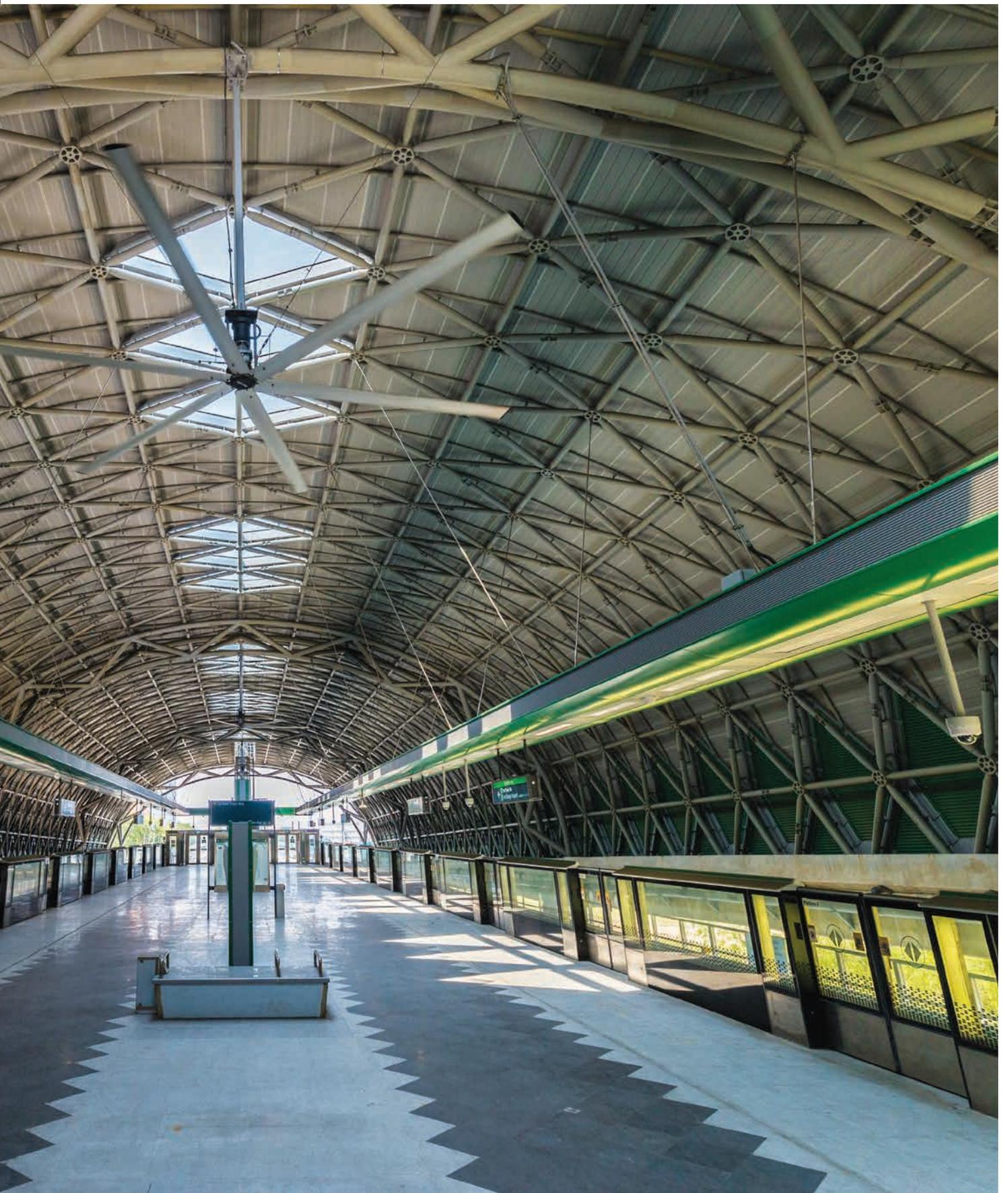
It also holds the distinction of being the first ‘inverted’ above-ground station in Singapore, where the train platform is located at a lower level than the ticketing concourse. In other above-ground stations, the train platforms are typically located above the concourses, where the fare gates are located. This non-conventional layout is designed to meet geographical constraints and operational needs.

As the elevated tracks also carry trains to the ground level of Tuas Depot, the tracks could not be too high as trains had to descend safely to the depot in a short distance. This was a major design challenge for both the station and depot planning teams as they also had to account for the height clearance level for vehicles plying Tuas Link Road, located right below the railway viaduct.

The station footprint is also bounded by the Raffles Marina Country Club and the LTA road reserve; hence, the concourse could not be located at ground level as it would exceed the site boundaries.



Bright and airy



INTUITIVE WAY-FINDING

The architecture of Tuas Link station is also designed to promote seamless way-finding. At about 2,300 square metres, the concourse is the smallest among elevated MRT stations, with the escalators and lift to the platform tucked away at one end.

Passengers coming down the escalators are treated to an unobstructed view of the platform and its high voluminous ceiling, which contributes towards ease of direct passenger flow in and out of the station.

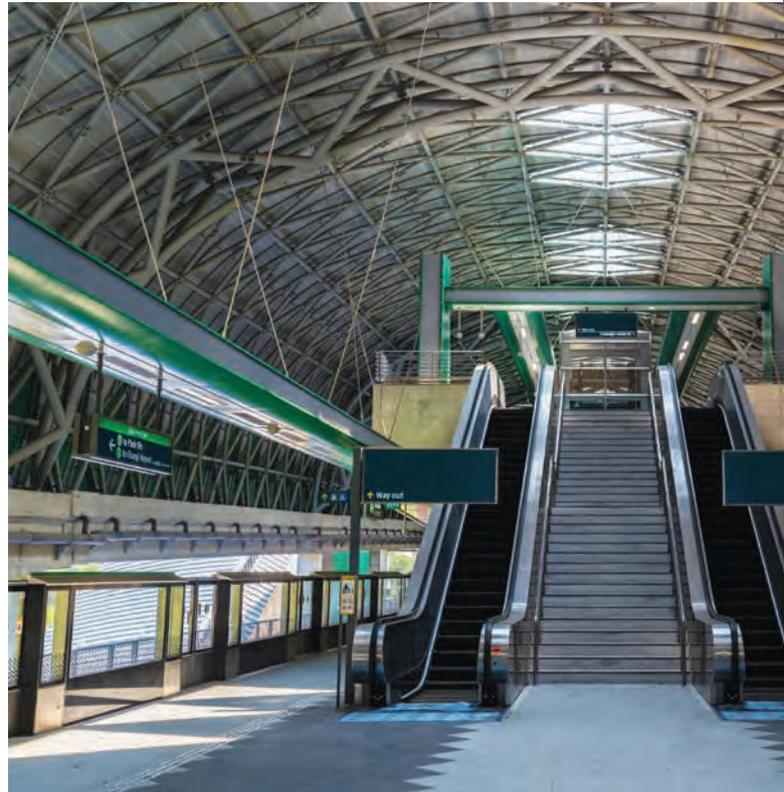
This intuitive way-finding is further accentuated by the sloping roof, where the height of the barrel vault roof rises towards the concourse. Spatially, this play of volume also creates a dramatic effect for the station interiors, further enhancing commuters' experience.

FORM AND FUNCTION

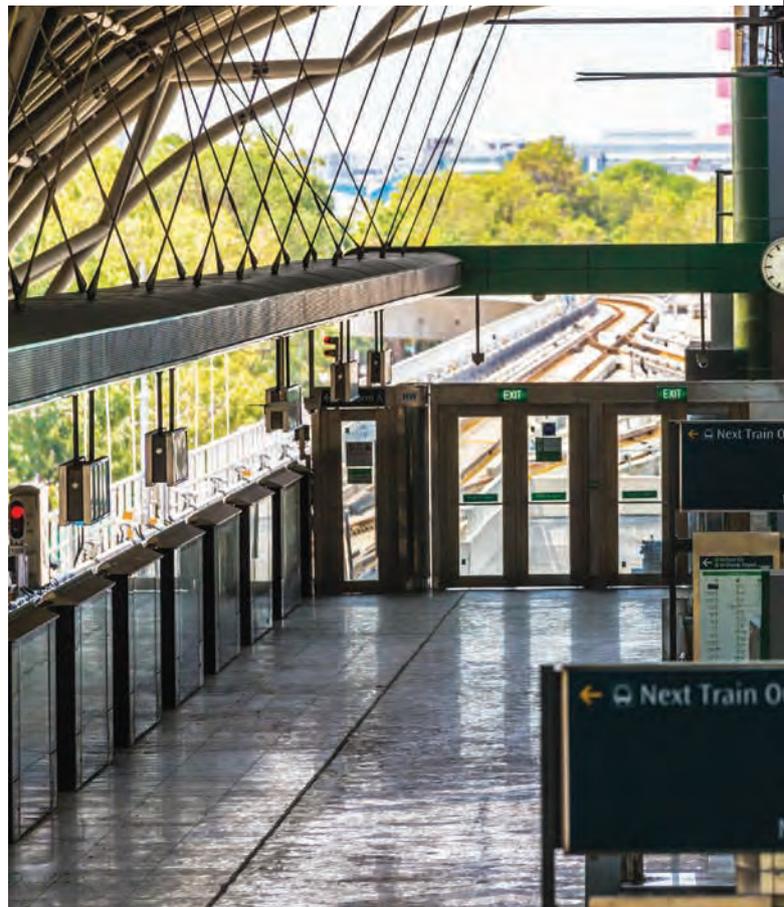
The station's design also takes into account its geographical proximity to Singapore's coastline. As the infrastructure will be exposed to higher atmospheric saline content, a special coating is applied to the station's tubular steel roof support and pillars to prevent accelerated rust formation.

Aluminium louvres are strategically placed along the station's sides to facilitate natural ventilation, while clear roof panels running the length of the station provide natural lighting during the day.

The lower roof line along the platform edge also limits commuters' exposure to wind-driven rain. 🌧️



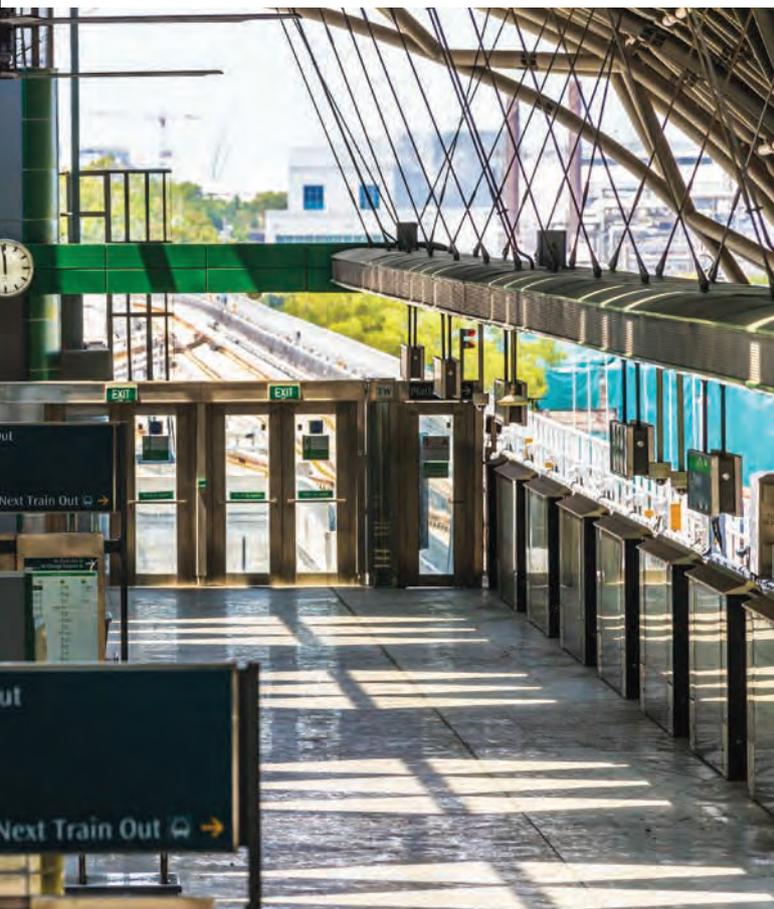
Escalators leading down from concourse



Lower roof line protects against wind and rain



First 'inverted' above-ground station in Singapore



PROJECT DATA

Project Name
Tuas Link MRT Station

Location
Tuas West Drive, Singapore

Completion Date
December 2016

Site Area
7,965 square metres

Gross Floor Area
11,252 square metres

Building Height
25.4 metres

Client/Owner
Land Transport Authority (LTA)

Architecture Firm
Aedas Pte Ltd

Principal Architects
William Chee; David Cheung;
Vinaya Rayaburg; Craig Watkins

Civil & Structural Engineer
AECOM Singapore Pte Ltd

Lighting Consultants
AECOM Singapore Pte Ltd;
Lighting Images

Main Contractor
China Railway 11 Bureau Group
Corporation (Singapore Branch)

Images
LTA



Planting beds styled as French parterres



LYCÉE FRANÇAIS DE SINGAPOUR

The Lycée Français de Singapour (LFS) is an educational institution catering to Singapore's French community. This project is a new primary school extension to the existing secondary school on an adjacent site.

The landscape design re-interprets the rich depth of French culture to create an innovative learning environment in tropical Singapore with an Asian-French identity.

The overriding challenge in the project was the successful preservation and integration of four heritage-value mature rain trees on site, which are sandwiched between the reconstruction of the old canal and the new school buildings.

The trees now form a key visual landmark that greets visitors upon entry. Nestled within their shade are poetic interpretations of place, leading from the Welcome Garden to the Woodland Garden.



An outdoor living room



Open-air play courts

The Welcome Garden, with its wooden deck and benches, serves as an outdoor living room, inviting a moment of repose.

In the Woodland Garden, rainwater is collected, held and channelled into the re-built canal, with timber terraces suspended over rocks and boulders, mixed in with indigenous plants and broad-leaved lush planting.

The canteen space opens out to the Woodland Garden, which transitions into a structured space called the Formal Garden—a series of rectangular lawns and linear hedges with punctuating columnar trees.

Along the classroom blocks is the Botanic Learning Walk, with a long timber-like terrace extension. A series of strongly patterned concrete planting beds—resembling French-styled parterres—form child-sized mazes to engage curiosity and instil appreciation for flora diversity.

The edge of the botanic walk is defined by brightly coloured concrete benches that form a sinuous wave in the landscape, sliced following the parterre planters. This wave reflects and forms a counter-wave to the curve of the walkway above.

The learning section of the development features three open-air play courts in basic geometric forms—square, circle and triangle—with two- and three-dimension concrete and pebble wash motifs, such as raised artificial lawn planes, folded forms, mounds, and depressions for imaginative play. 📍



The mature rain trees onsite have been preserved and integrated



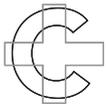
A wave of brightly coloured concrete benches



PROJECT DATA

Project Name
Lycée Français de Singapour
Location
2900, Ang Mo Kio Avenue 3,
Singapore
Completion Date
2017
Site Area
29,960 square metres
Client
Lycée Français de Singapour Ltd
Landscape Architect
STX Landscape Architects
Architect
Aedas Pte Ltd
Civil & Structural Engineer
Beca Carter Hollings &
Ferner (S.E. Asia) Pte Ltd

**Mechanical & Electrical
Engineer**
Beca Carter Hollings &
Ferner (S.E. Asia) Pte Ltd
Quantity Surveyor
David Langdon KPK (Singapore)
Pte Ltd
Main Contractor/Builder
Lian Soon Construction Pte Ltd
Images
John Gollings Photography
Pty Ltd; Helen Smith-Yeo



Tree-shaped structures line the façade

KUGAYAMA SOUTH GATE BUILDING

This commercial building is located in the west part of central Tokyo, Japan, in the immediate vicinity of Kugayama station.

The area is rimmed with greenery, with hints of the hilly countryside of the past. To the south of the station, there are waterways such as Kanda River and Tamagawa Aqueduct, and to the north, there is a trace of an old pilgrimage trail. The site faces the gateway to an attractive shopping lane, opening its two sides to the public.

Exploring how the building can communicate with the site's uniqueness was the starting point of the design, as these different values are synchronised into the project.

In the face of rapid modern development in the suburbs, there remains an innate desire to interact with the beauty of nature.

To capture that essence, a fractal tree shape is integrated into and repeated through the façade of the building, blurring the boundary between art and nature.

The tree shapes are functional too, acting as rainwater drainage, support for plants, and façade lighting. H beams are used as trunks, pipes as branches, and wires for plants.

The trunks provide multiple routes of rainwater drainage to minimise roof slab height and maximise rental space. Rainwater flows along the sides of the H beams into the basement reservoir, and is then pumped up for reuse in the building and as irrigation for the plants, before being drained into the river.

By openly showing the rainwater flow, the building is also integrated as part of the natural water cycle. The tree shapes will also evolve over years as the plants grow over them, making the building a continuous part of the surrounding landscape.

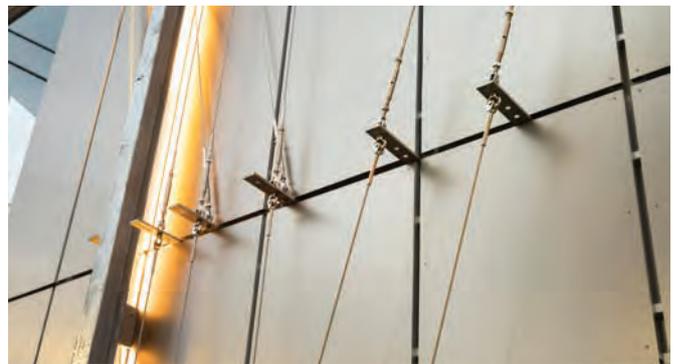
The special lustre on the aluminium cladding reflects the ever-changing ambience at different times of the day, blending the building with the mature townscape. 



Internal walls



Aluminium panelling reflect the changing ambient lights



Combination of H beams, pipes and wires

PROJECT DATA

Project Name Kugayama South Gate Building	Architecture Firm Sasaki Architecture
Location 3-23-16 Kugayama, Suginami-ku, Tokyo, Japan	Principal Architect Ryuichi Sasaki
Completion Date October 2017	Other Architects/Designers Gen Sakaguchi; Anna Kwapierń
Site Area 429.46 square metres	Lighting Design Natsuha Kameoka, Lighting Sou
Total Area 953.60 square metres	Metal Façade Shinko Stainless Kemma Co, Ltd
Building Height 3 storeys	Main Contractor Magome Construction Company
Client Shinko Shoji	Images Takumi Ota



MERU HOUSE

This private family home is located within the Meru Valley Golf Resort, Ipoh—a place famous for its natural surroundings, with views of the Titiwangsa mountain range to the west and northwest.

The house comprises three main interconnected elements—main residence, living space and floating barn—in an interesting play of level changes, double-height volumes and landscaped courtyards.

The public spaces, including a guest room and an AV room, are located at the ground level. The living area is a stand-alone pavilion, adjoining with a bamboo garden and a central courtyard, subtly turning spaces inside out. The grand dining hall has open skylights that are controlled with automatic blackout blinds.

With its ribbon-like balustrade, a spiralling wood-clad staircase connects the ground spaces to the upper floors, which house the master suites, additional bedrooms and a family space.

Two loft bedrooms form the top level, discretely carved into the pitched 'floating barn' roof. The use of standing seam metal roofing gives the barn the simplest roof profile over seamless glass walls. The barn cantilevers over the landscape, providing panoramic views from its full height windows.

Large sliding glass doors and the courtyards define the volumes and spaces, while off-white rendered walls complement the contrasting barn red. Bespoke joinery and metal works are fully integrated into the overall architectural design.



The striking elliptical staircase





Living spaces turned inside out with natural daylight

TROPICAL COOL

The home relies on the courtyards and pocket spaces for shade and daylight. The surrounding veranda is designed with a purposeful depth to form the key shading from the hot sun and tropical rainstorms. It also acts as a peripheral façade, providing a natural privacy buffer to the home itself.

Other passive design elements for energy-efficiency include the building's orientation, plan layout, window design, insulation, thermal mass, shading and natural ventilation.

Reinforced concrete structure with steel portal frames makes up the skeletal of the house, while the external envelope is primarily infilled with a double cavity wall system, which is uncommon in Malaysia. The cavity wall helps to alleviate the excessive heat gain exposure and maintain indoor climate comfort.

An on-site rainwater harvesting system collects rainwater and stores it in an underground concrete tank, keeping the water cooled below ground.

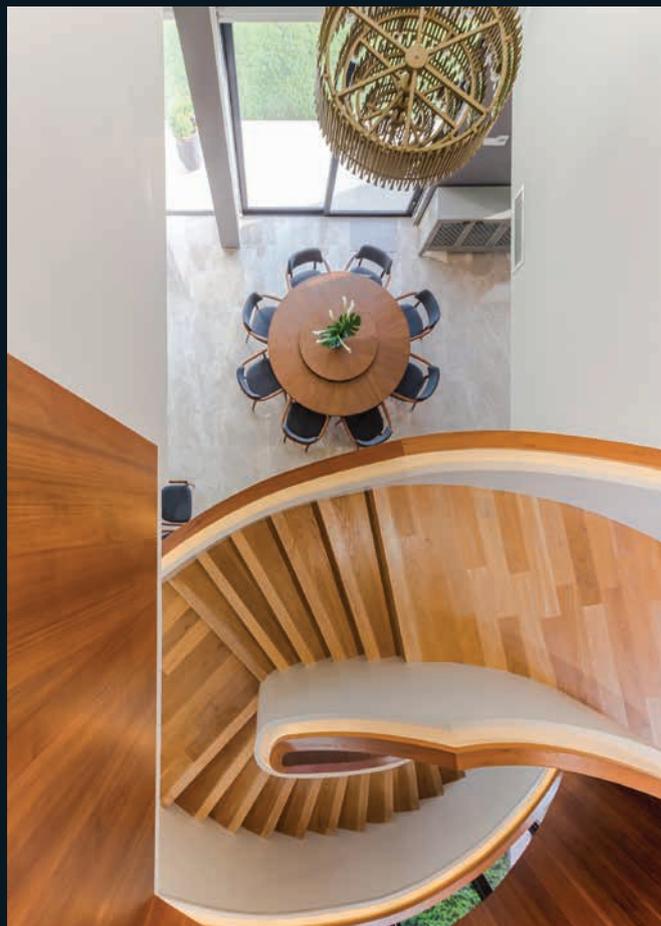
A wind catcher is used to cool the inside of the house, as part of the overall ventilation and heat movement strategy. Hot air is drawn upwards due to the temperature gradient, assisted by prevailing wind flowing past the catcher, creating a stack effect through volumetric play. Airflow is enhanced with cross-ventilation louvres at various height levels. 



The simple, delineated roof lines of the 'floating barn'



Barn with standing seam metal roofing



The dining hall shares the double-height atrium with the wood-clad stairs



A play of inter-connecting blocks

PROJECT DATA

Project Name	Architecture Firm
Meru House	A3 PROJECTS
Location	(formerly known as Arch Cubic)
Meru Valley Golf Resort, Ipoh, Perak, Malaysia	Principal Architects
Completion Date	Kenny Chong Khor Leat;
December 2016	Ho Choon Sin
Site Area	Interior Designer
0.43 acres	A3 PROJECTS
Gross Floor Area	Civil & Structural Engineer
450 square metres	F. C. Ng Perunding
Building Height	Images
2.5 storeys	Lawrence Choo



A display of dominant white with black clean-cut lines

MONOCHROMATIC CRUSH

The colour white is often seen as boring and bland when applied to interior spaces, but one designer begs to differ.

Calling it 'the staple of modern interiors', interior designer Michael Tan set out to create a refreshing, elegant and inspiring residence with dominant white monotonies and clean-cut black lines.

The black-and-white palette not only evokes a sense of class but also complements and blends well with other colours, shapes, textures and elements. The result is a synchronised and timeless blend, full of surprises at every turn.

Smooth surfaces accented with bright coloured furniture and art pieces exude a modern chic vibe, setting the perfect canvas for a play of light. Dramatic use of different lightings

creates an optical feast and enhances the monochromatic space.

SPATIAL DESIGN

To cater for a bachelor's lifestyle, the designer retained an open flow between the living, dining and kitchen areas. The fully functional kitchen is designed to be compact and space saving.

The extra bedroom is converted into an open-system wardrobe, equipped with railings and LED light strips that resemble a boutique store.

The existing door of this extra bedroom, which links to the living room, was closed up, while a new entrance leading directly into the master bedroom was constructed for more privacy and a logical flow between the spaces. 



Open-plan layout for a bachelor lifestyle



Master bedroom with walk-in wardrobe



Compact and space-saving kitchen

PROJECT DATA

Project Name
Monochromatic Crush

Location
Mont Kiara, Kuala Lumpur,
Malaysia

Completion Date
2017

Gross Floor Area
170 square metres

Interior Design Firm
MX DESIGN

Interior Fit-Out Contractor
MX DESIGN

Images
Shea Studio

hansgrohe



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Water consumption: 4.80 litres/min
Type of product: Sink/Bib Taps and Mixers
Brand: Hansgrohe
Model: M7120-H320 (73806E)
Registration number: SKT/BT-2017/022526



Hotel lobby



SOFITEL KUALA LUMPUR DAMANSARA

Sofitel's first hotel in Malaysia is located within the Damansara City integrated development in Kuala Lumpur.

The existing architectural footprint inspired the urban maze design concept, which aptly mirrors the notorious planning of Kuala Lumpur city.

The interior design team carved a series of raised platforms that gradually open into different social zones, creating pockets of spaces where guests can unwind. This typology is similar to the city's urban complexity, where different cultural enclaves segue into a visual experience.

The double volume lobby—an interpretation of the city's chaotic order—has been re-oriented to a diagonal format for a more dynamic social flow. A 10-metre suspended art installation at the entrance is an abstract expression of the constant tropical rain, with the legends of folklores inscribed into the hanging transparent pieces.



Le Bar

Various wings frame this central towering volume, with several components—such as lounge seats for check-in guests, console cabinetry for the reception, and a shimmering metal curtain as a visual and physical veil—linking this space to the lobby lounge.

The hotel's interior design blends local heritage with French culture, with iconic art pieces and sculptures, such as a feature wall depicting the *wau bulan* or the French carved vanity mirror-lined walls. Bespoke artwork integrated into the wall panels feature Malaysian flora and fauna with French prose.

Modern furniture pieces with Asian-inspired silhouettes, along with contemporary tailored details, luxurious textures and playful decorative light fixtures, create a modern canvas for the discerning guest. The finishes and materials are fresh, vibrant and modern, with a silvery marble stone palette and a rich burgundy leather accent wall to tie everything together.

The key art wall that faces the lobby is composed of children's fingerprints from across Damansara, representing the country's young. Locally fabricated furniture is tailored to suit the concept with surprising twists and details, displaying the workmanship of local furniture makers. 



Wan Chun Ting Chinese restaurant



Wau Bulan 2 (Classroom)



Exterior



PROJECT DATA

Project Name
Sofitel Kuala Lumpur Damansara

Location
Jalan Damanlela, Kuala Lumpur,
Malaysia

Completion Date
August 2017

Site Area
15,500 square metres

Building Height
23 storeys

Number of Rooms
312

Client/Owner
GuocoLand (M) Bhd

Hotel Operator
ACCOR

Architecture Firms
P&T;
Kumpulan Senireka Sdn Bhd

Interior Design Firm
Wilson Associates

Principal Designer
Aldwin Ong

Mechanical & Electrical Engineer
Li-Zainal

Lighting Consultant
The Lightbox Pte Ltd

Landscape Architect
Aecom

Images
Sofitel Kuala Lumpur Damansara

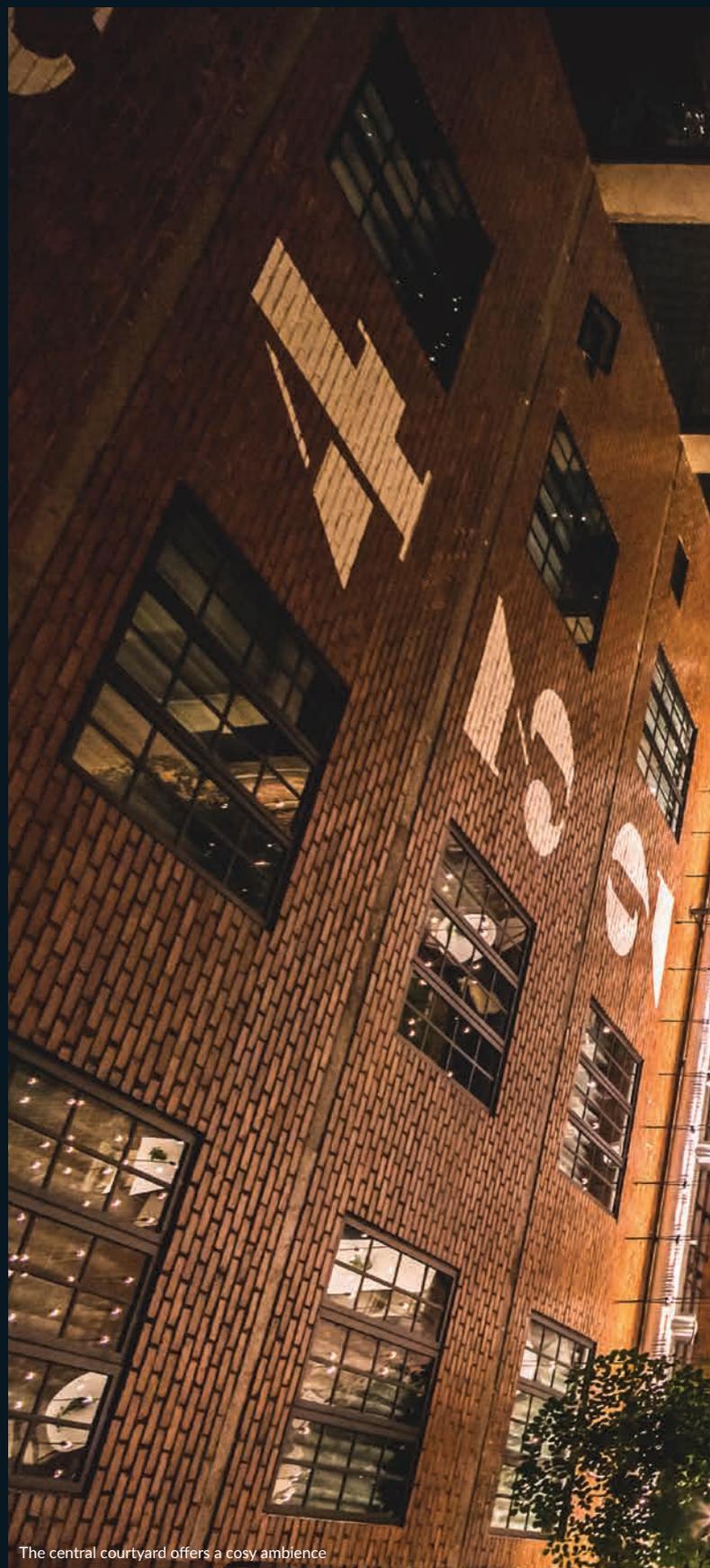


ROSA MALACCA

Located on a narrow longish site, sandwiched between old three-storey buildings, sits a seven-storey boutique hotel.

Being an 'infill' building site, the rooms are designed on a north-south orientation to avoid direct sunlight and to capture front street views and back sea views. The middle-section rooms overlook a central courtyard, filled with lush greenery for a cosy all-day dining ambience. Each of the 60 rooms feature a distinctive artwork that lends character to the space.

Featuring a modern rustic concept, the hotel adopts bare minimal finishing with exposed clay brick walls. Its traditional reinforced concrete design and rigid building structural grid also contribute towards economical construction. Double-layer bricks with cement mortar infill help ensure water tightness is achieved, especially for the building coverage.



The central courtyard offers a cosy ambience





The boutique hotel is set for expansion into the neighbouring lots

The hotel currently has its own restaurant, fitness centre and private carpark. As the owners managed to acquire the land on both sides of the hotel, there are plans to expand the development with 40 more rooms, complete with rooftop swimming pool and other amenities on the left, as well as a landscaped carpark on the right for a more comprehensive hotel setting.

CONSTRUCTION CONSTRAINTS

The narrow site posed a huge construction challenge as it was difficult for big machinery and cranes to access the land. Instead of the conventional piling method, the more costly injection piling was used. The contractors had to construct the rear of the building first before working on the front. The ground floor height was also raised to a level that allowed easier site access for large machinery.

To get local consultants and contractors onto the same page for the hotel's concept, tours to a few similar completed projects around Malaysia were arranged for them to get an idea of the desired look and feel.

The project team also travelled to villages around Malaysia to source for old reclaimed wood. For the rustic metal steel work, the designers tapped on the old steel makers who could hand solder the metal connecting joints for the necessary rustic look and finishing. 



Modern rustic design with exposed bricks



Reception area



Each room is decorated with distinctive artworks

PROJECT DATA

- Project Name**
Rosa Malacca
- Location**
Jalan Parameswara, Melaka, Malaysia
- Completion Date**
January 2017
- Site Area**
1,143 square metres
- Gross Floor Area**
5,049.48 square metres
- Building Height**
7 storeys
- Number of Rooms**
60
- Client/Owner**
Rosa Hotel Sdn Bhd
- Architecture Firm**
Arkitek KHP
- Principal Architect**
Tony Khoo
- Interior Design Firm**
Lifeshop Atelier
- Principal Designer**
Lee Boon Keat
- Civil & Structural Engineer**
Lead Engineering
- Mechanical & Electrical Engineer**
City MNE
- Quantity Surveyor**
Kumpulan Ukur Petanah (KUP)
- Lighting Consultant**
Lifeshop Atelier
- Landscape Architect**
Chee Brothers & Landscape
- Main Contractor**
Boh Huat Chan Construction
- Interior Fit-Out Contractor**
Lifeshop Atelier
- Images**
Rosa Malacca

KARA CAFÉ AND DESSERT BAR

KARA Café & Dessert Bar is envisioned as a welcoming space for warm encounters.

The all-day dining outlet replaced the flagship Sogurt shop—by the same owner—on Bukit Timah Road in Singapore.

Due to budgetary constraints, the interior design was an exercise in ‘creative hacking’ of the previous store—for example, refinishing the base of the booth seats and the counter, and shifting things around to create a new layout.

To reach the health-conscious foodies, while retaining its regular client base, the store’s former bright pink palette has been swapped for more sophisticated tones, depicting the shift towards natural ingredients in the menu.

With a mix of muted pink, pale earth wood tones and copper accents, the space provides a calm canvas upon which new encounters may be etched.

Steeping through the door arches, one enters a world of tropical foliage and imaginary creatures designed in collaboration with local artist Mark Wee.

Due to the typical longish shophouse layout, the only source of natural light stems from the main entrance doors. Hence, a series of elliptical wall mirrors invites daylight deep into the space, creating a bright, airy atmosphere.

Curved copper pipe light fittings overhead are a nod towards the company’s redesigned logo, which suggests an open arch door as well as a heart. 



Botanical art with hidden creatures





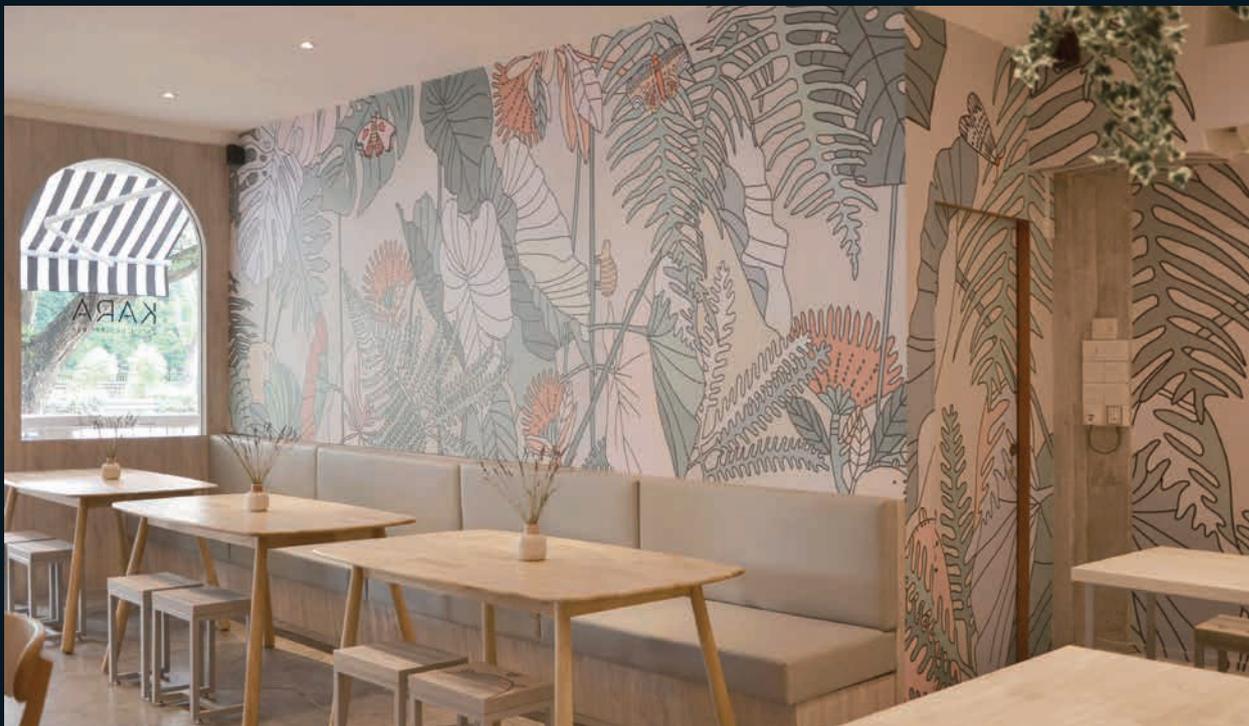
Elliptical mirrors enhance natural lighting



Ordering counter



Shopfront entrance



Booth seat and main art wall



PROJECT DATA

Project Name
KARA Café and Dessert Bar

Location
617, Bukit Timah Road,
Singapore

Completion Date
May 2017

Project Site Area
1,200 square feet

Interior Design Firm
Quarters Studio Pte Ltd

Principal Designer
Felicia Toh

Interior Fit-Out Contractor
Q Design

Images
Felicia Toh,
Quarters Studio Pte Ltd

WAFUKEN OUE DOWNTOWN

Located at OUE Downtown 2, Singapore, Wafuken II is a dine-in restaurant that serves modern Japanese food with a strong focus on wellness.

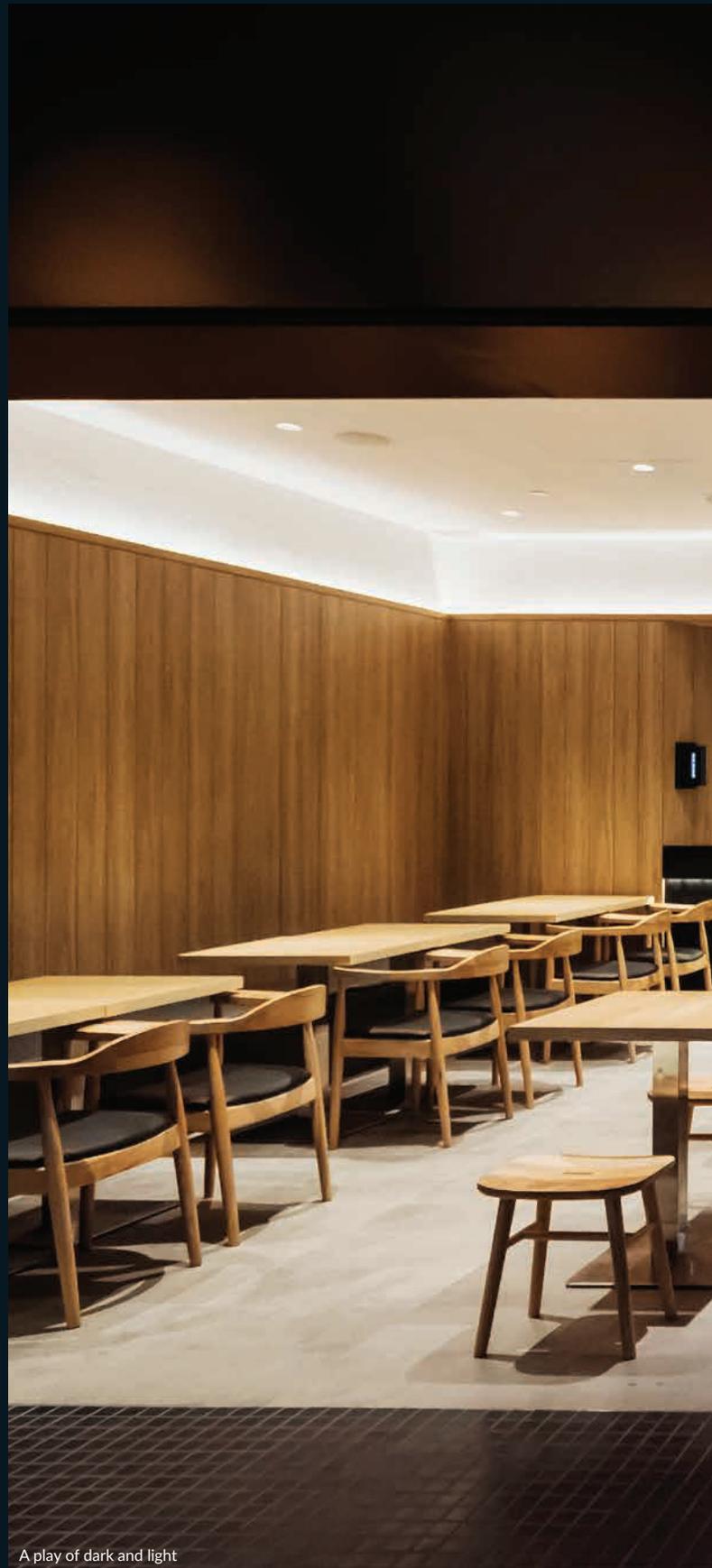
The design brief given was simply to optimise the kitchen work flow and sitting area to capture the lunch crowd in the area.

Interior design firm JOW Architects—in its second project with the owners—conceived a design that embodies a sense of spatial and visual order to reinforce the restaurant's wellness concept.

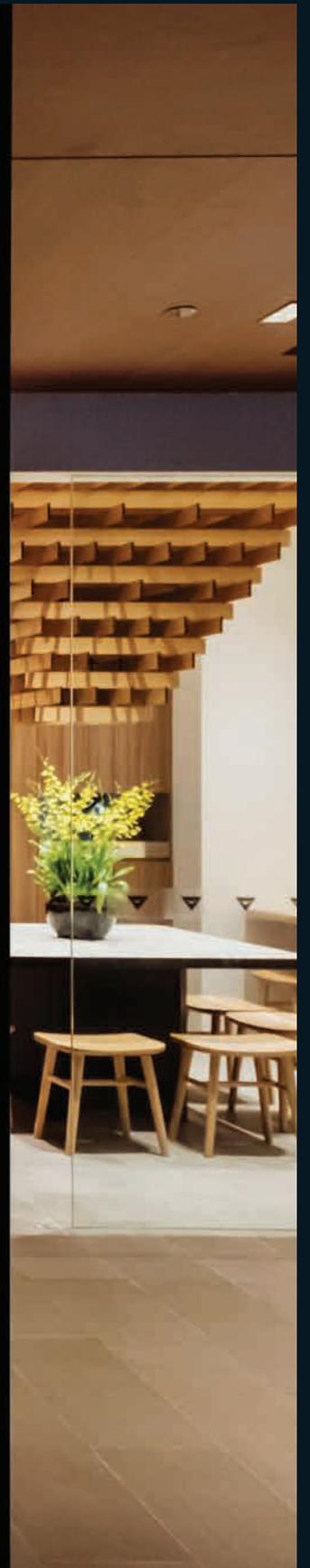
The restaurant is made up of a series of spaces experienced in sequential order. The dark compressed entrance portal opens up to an expanded dining space, accentuated by uplighting along oak timber-panelled walls, culminating in a communal table set beneath a sculptural light feature, made from timber plywood with dark stained edges.

The visual elements are executed in a restrained manner to create a calm composed space infused with subtle contemporary Japanese aesthetics.

To cater for the lunch crowd, different types of sitting options are provided, for individuals and groups. Ample waiting space is provided within the shop for those who are waiting for their take-out orders. 



A play of dark and light

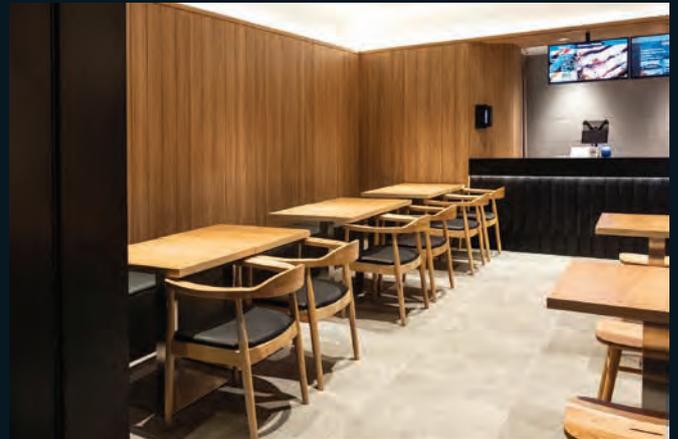




Uplighting along oak timber panelling



A communal table set under a sculptural light feature



Subtle contemporary Japanese aesthetics

PROJECT DATA

Project Name
Wafuken OUE Downtown

Location
6A, Shenton Way, OUE
Downtown Gallery, Singapore

Completion Date
June 2017

Site Area
95 square metres

Gross Floor Area
95 square metres

Interior Design Firm
JOW Architects

Principal Designers
Joseph Wong; Zhenwei Lai

Interior Fit-Out Contractor
Stancel Construction Pte Ltd

Images
Ker You Quan; JOW Architects



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Mixed-use building in a prefabricated steel structure



Open design blends interior spaces with garden

SERENE HOUSE

The 'Serene House', a three-storey mixed-use contemporary building, blends modernist and Indochine styles.

The prefabricated steel structure integrates sustainable materials to create a high-end villa in the district of Thao Dien in Saigon, Vietnam.

The building's flexible steel frame creates a three-dimensional puzzle, with spaces that can be filled according to the changing needs of its occupants—from showrooms to office units and rooms for rent.

The adjustable system accommodates double-height ceilings

that alternate with lower mezzanines. Lightweight sliding and folding panel façade elements allow users to control light, shade and air, blurring the boundary between inside and outside.

The surrounding tropical garden brings nature indoors, while a roof terrace offers a relaxing spot for yoga classes, lounge or lookout point.

Decorative items, collected during many travels throughout the years, combined with digitally designed and locally produced futuristic 'lava' furniture and lighting, play an important role in creating a distinct ambience. **©**



Open design blends interior spaces with garden



Digitally designed 'lava' furniture and lighting



Blurring the boundaries



The flexible steel structure allows for a variety of functions



PROJECT DATA

Project Name
Serene House

Location
Thao Dien, District 2,
Ho Chi Minh City, Vietnam

Completion Date
September 2017

Site Area
650 square metres

Gross Floor Area
200 square metres

Building Height
3 storeys

Interior Design Firm
MODULE K

Principal Designers
Jade Nguyen; Huy Anh

Interior Fit-Out Contractor
MODULE K and associates

Images
Hiroyuki Oki

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ZEN TILE SERIES



MALAYSIA'S CONSTRUCTION INDUSTRY OVERVIEW

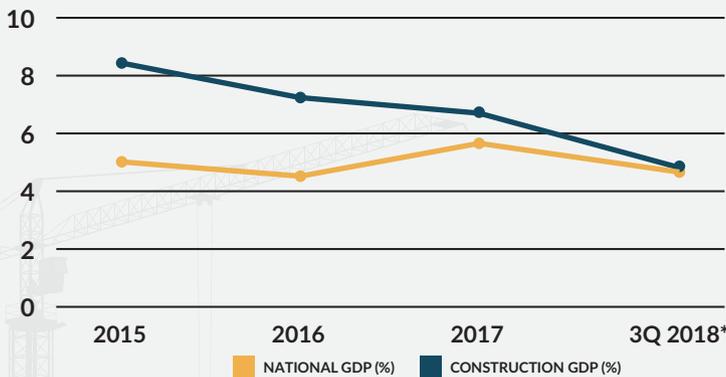
The construction sector's gross domestic product (GDP) grew by 4.8 per cent for the nine months ended September 2018, compared with the corresponding period in 2017.

For the first three quarters of 2018, the construction sector recorded RM109 billion worth of construction works, driven by growth in the civil engineering and special trades activities sub-sectors, with civil engineering being the biggest contributor to value of construction work done.

Construction activity continues to be propelled by the private sector, with a 53.6 per cent share (RM32.7 billion), as compared to the public sector, with a 46.4 per cent share (RM28.3 billion).

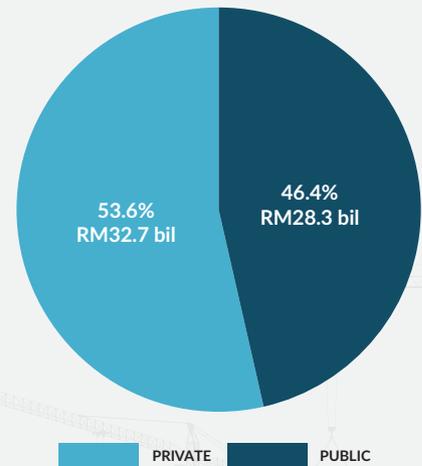
In 2019, the construction industry is expected to continue to expand, albeit more slowly, amid revisions of mega projects, non-residential property overhang, and the global construction sector slowdown. The industry is expected to be buoyed by an increase in new planned supply in the affordable homes and industrial segments, according to the Ministry of Finance's Economic Report 2018/19.

GDP GROWTH

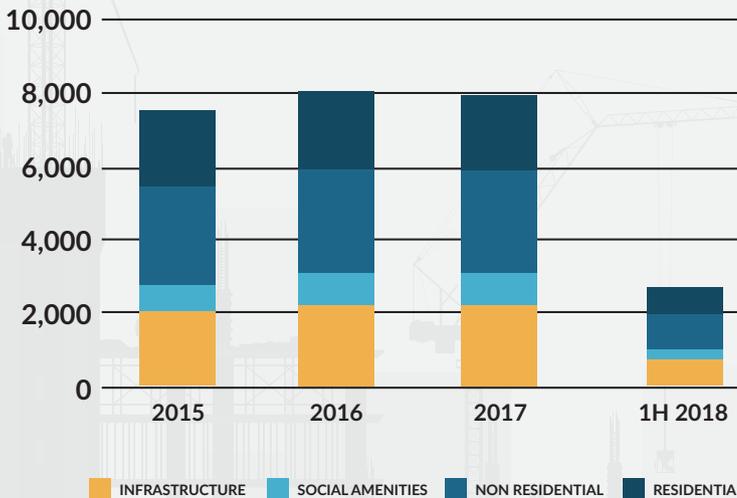


Note: Y-o-Y, based on Constant 2010 Prices
* Compared with corresponding 2017 period

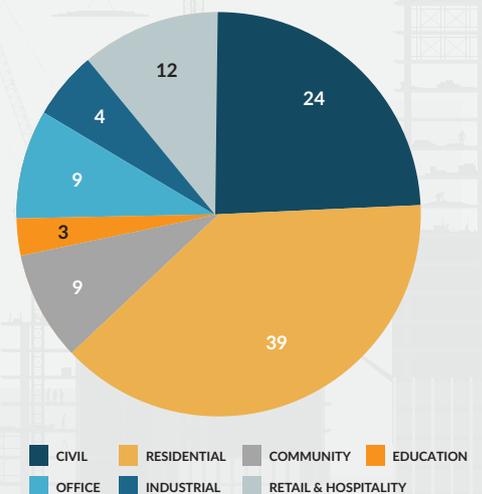
1H 2018 PROJECTS BY SECTORS



PROJECTS AWARDED BY TYPE

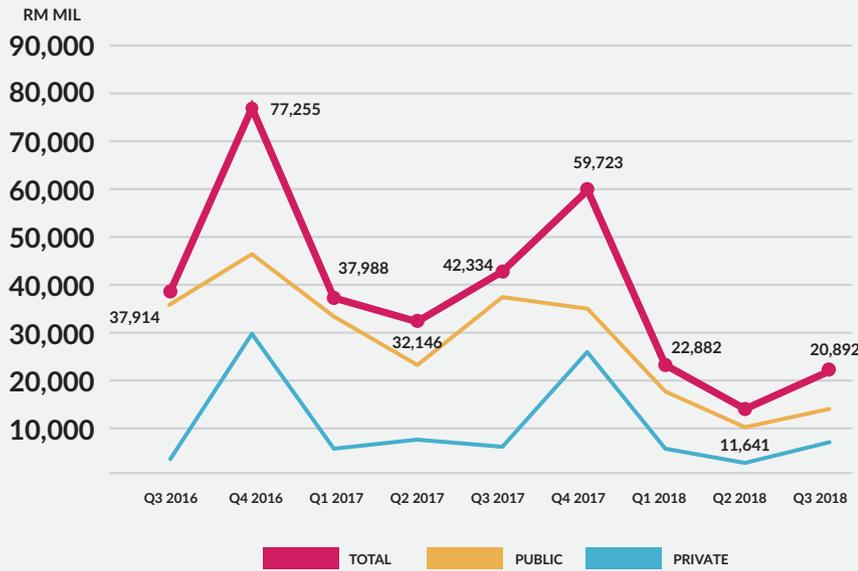


2018 CONSTRUCTION STARTS (%)



Sources: Bank Negara Malaysia; Construction Industry Development Board; Department of Statistics Malaysia; BCI Forecaster Malaysia September 2018-January 2019; BCI Pipeline Report Malaysia Q3 2018

TOTAL CONCEPT & DESIGN STAGE PROJECTS IN MALAYSIA



PROJECT TITLE	PROJECT TYPE	LOCATION	DEVELOPER	ARCHITECT/CONSULTANT	CONSTRUCTION START	ESTIMATED PROJECT VALUE (RM MILLION)
TNB Headquarters	Offices	Jalan Bangsar, Kuala Lumpur	Tenaga Nasional Berhad (TNB)	Neuformation Architects Sdn Bhd	4Q 2018	750
Kompleks Islam In Sri Aman	Religious building, shops, offices	Sarawak	Tabung Baitulmal Sarawak	Arkiskape Sdn Bhd	4Q 2018	40
Sultan Azlan Shah Hospital-Specialist Training Hospital & Quarters	Health, apartments	Kampar, Perak	Universiti Tunku Abdul Rahman (UTAR)	SN Low & Associates Sdn Bhd	4Q 2018	300
1Gateway Klang	Hotel, SOVO	Klang, Selangor	Lagenda Erajuta Sdn Bhd	ALM Architects	4Q 2018	350
Columbia Asia Hospital	Health	Miri, Sarawak	Columbia Asia Group	Environmental Design Practice Sdn Bhd	4Q 2018	60
Likas Boulevard	Apartment, hotel, offices, shopping centre	Kota Kinabalu, Sabah	Gandingan Erajuta Sdn Bhd	Arkitek Mok JY	Feb 2019	1,300
Alila Dalit Bay Sabah	Private villas	Tuaran, Sabah	Tekun Cemerlang Sdn Bhd	AreaDesigns (Singapore)	1Q 2019	30
Penang International Commercial Centre (PICC)	Apartments	Penang	Hunza Properties Bhd	Arkitek Permata	1Q 2019	136
Pavilion Embassy	Apartments	Kuala Lumpur	Pedoman Ikhtisas Sdn Bhd	Atelier ADT Arkitek (Asia) Sdn Bhd	1Q 2019	600
Mixed development in Batu Kawah	Hotel, shopping mall, apartments	Kuching, Sarawak	Kuching City Mall Development Sdn Bhd	Arkitek KDI Sdn Bhd	2019	1,100

Source: BCI Asia Research

SINGAPORE'S CONSTRUCTION INDUSTRY OVERVIEW

The construction sector's gross domestic product (GDP) contracted slightly by 3.89 per cent for the nine months ended September 2018, compared with the corresponding period in 2017.

Construction activity continues to be propelled by the private sector, with a 54.5 per cent share (SGD11.4 billion), as compared to the public sector, with a 45.5 per cent share (SGD9.5 billion). This weakness in public sector construction activities has weighed down construction output.

In 2019, the performance of the construction sector is projected to improve, as the pickup in contracts awarded since the second half of 2017 is expected to translate into construction activities in year ahead, according to the Ministry of Trade and Industry.

GDP GROWTH

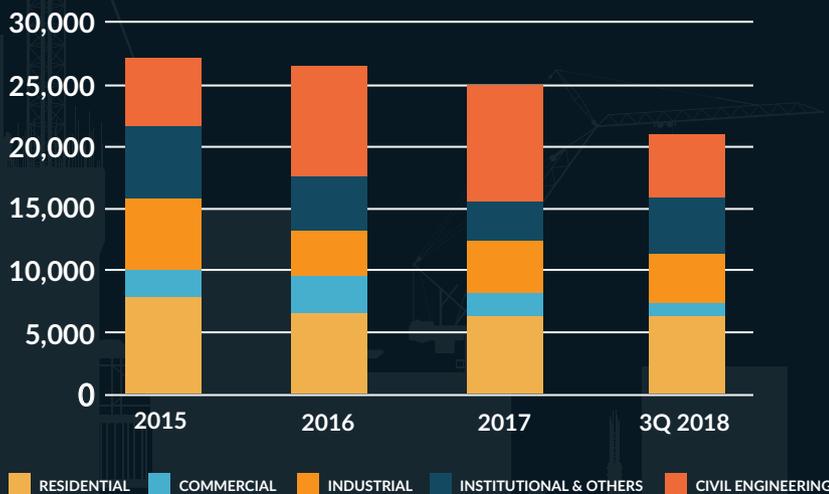


3Q 2018 PROJECTS BY SECTORS

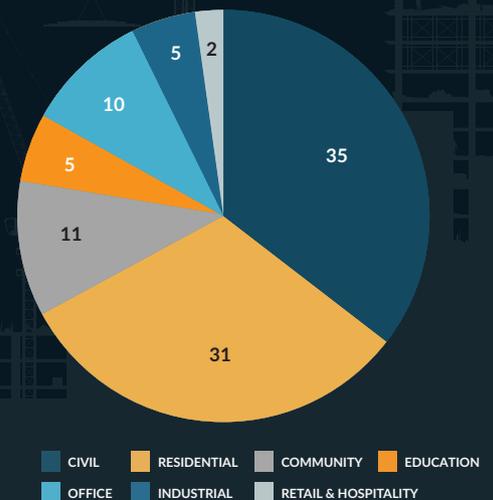


Note: Y-o-Y, based on Constant 2010 Prices
* Compared with corresponding 2017 period

PROJECTS AWARDED BY TYPE

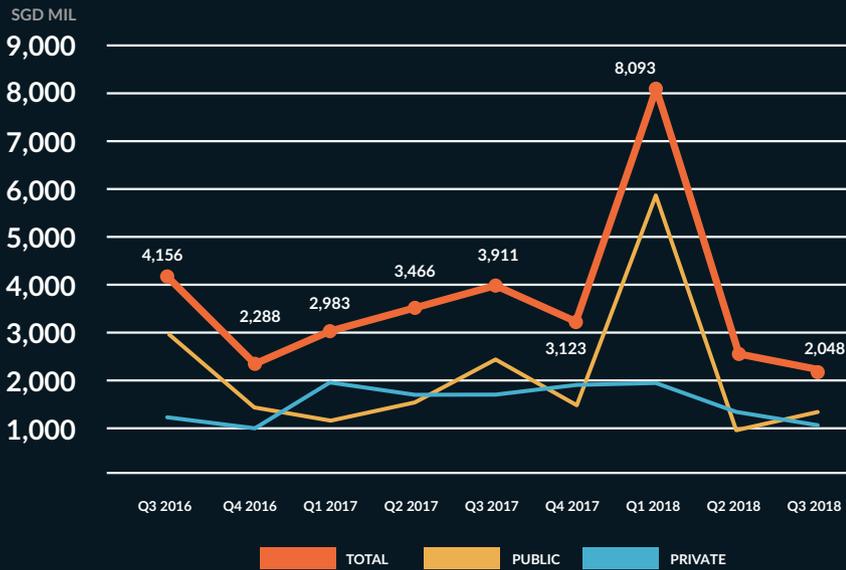


2018 CONSTRUCTION STARTS (%)



Sources: Singapore Department of Statistics; Building and Construction Authority; Ministry of Trade and Industry; BCI Forecaster Singapore October–December 2018; BCI Pipeline Report Singapore Q3 2018

TOTAL CONCEPT & DESIGN STAGE PROJECTS IN SINGAPORE



UPCOMING PROJECTS

Riverfront Residences

PROJECT TITLE	PROJECT TYPE	LOCATION	DEVELOPER	ARCHITECT/CONSULTANT	CONSTRUCTION START	ESTIMATED PROJECT VALUE (SGD MILLION)
Apartments at former Derby Court	Residential	5, Derbyshire Road	RH Developments Two Pte Ltd	Kyoob Architects Pte Ltd	Dec 2018	30
Changi Garden	Residential	32, Jalan Mariam	Chip Eng Seng Corporation Ltd	Park + Associates Pte Ltd	Dec 2018	55
Factory at Quality Road	Industrial	30B, Quality Road	Neo Group Pte Ltd	ID Architects Pte Ltd	Dec 2018	15
Immigration & Checkpoints Authority (ICA) Building upgrade	Institutional	10, Kallang Road	Ministry of Home Affairs	CPG Consultants Pte Ltd	Dec 2018	300
Normanton Park redevelopment	Residential	1, Normanton Park	Kingsford Huray Development	P & T Consultants Pte Ltd	Dec 2018	300
Hotel at Cuscaden Road	Hospitality	9, Cuscaden Road	Shun Tak Real Estate (Singapore)	ONG&ONG Pte Ltd	Dec 2018	65
Warehouse at Tuas South Link	Industrial	Tuas South Link 3 - Plot 22	Hexacon Construction Pte Ltd	Architects Project Group LLP	Dec 2018	10
Factory at Tuas South Link	Industrial	Tuas South Link 3 - Plot 17	Goh Sin Guan Huat Pte Ltd	Tenwit Consultants Pte Ltd	Dec 2018	10
Riverfront Residences	Residential	Hougang Avenue 7	Rio Casa Venture Pte Ltd	ADDP Architects LLP	Dec 2018	266
MHA Neil Road Mixed-Use Complex	Institutional	Neil Road	Ministry of Home Affairs	CPG Consultants Pte Ltd	Dec 2018	85

Source: BCI Asia Research



Retail podium interconnected with boulevard



THE ERA, DUTA NORTH

The ERA is a mixed commercial development designed to rejuvenate the industrial neighbourhood along the Jalan Segambut area in Kuala Lumpur.

The project consists of two main components arranged in two curves. On one plot, there are six blocks of serviced apartments—ranging from 53 to 63 storeys—atop a seven-storey carpark and retail podium. On another plot, there are three blocks—of 13 to 19 storeys—of retail units and office suites.

The podium also houses a five-acre landscaped facilities deck with expansive greenery and vertical gardens, creating an urban oasis in the midst of the industrial jungle.

The three-storey retail area is interconnected with a vibrant 800-metre-long retail pedestrian boulevard. Designed with a commercial streetscape and surrounded by greens, the boulevard features meandering terraces of shops with alfresco dining. **C**



Layout of residential towers (level 8)



Vertical gardens create an urban oasis



Three blocks of retail units and office suites surrounded by six residential blocks



Vibrant retail pedestrian boulevard

PROJECT DATA

Project Name
The ERA, Duta North

Location
Jalan Segambut, Kuala Lumpur,
Malaysia

Expected Completion
June 2020

Site Area
56,685 square metres

Gross Floor Area
705,048 square metres

Building Height
63 storeys; 220 metres

Architecture Firm
NRY Architect Sdn Bhd

Principal Architect
Ar Yew Bu Hwa

Civil & Structural Engineer
TY Lin International Sdn Bhd

Mechanical & Electrical Engineer
Kotrek Konsult Sdn Bhd

Main Contractor
China State Construction
Engineering (M) Sdn Bhd

Landscape Architect
Praxis Design Sdn Bhd

Images
NRY Architect Sdn Bhd

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The shop offices (left) and the hotel

CENTRUM (PHASE 1)

This mixed development project is part of an overall 80-acre township development in Brinchang town, Cameron Highlands.

The project comprises four- and five-storey shop offices, a nine-storey hotel and a multi-level carpark.

The distinguishing Tudor style from the colonial era is captured on the façade design, with steep gabled roof, rows of metal-framed casement windows, and elaborate wall patterns composed by bricks and precast glass fibre reinforced concrete.

Due to the site's steep terrain, which has an 18-metre height difference from one end to the other, the project is composed in two parts—shop offices at the lower plateau, and the hotel at the higher plateau.

The shop office blocks are lined in two rows, facing northwest and southwest, to form a central pedestrian boulevard in between.

The open boulevard—covered by a tensile membrane roof structure—will serve as a walking path and host a series of outdoor activities, adding value to the ground floor shops.

These shops are designed with double frontage for better business exposure, while an 40,825-square-foot anchor tenant space is located at the lower ground level.

The boutique hotel block offers 158 rooms, nine president suites, and a series of facilities, such as lounge, pre-function halls, banquet hall, gymnasium, games room and spa. 



The open boulevard creates a vibrant space for shopping and dining



The distinctive Tudor-styled architecture

PROJECT DATA

Project Name
Centrum (Phase 1)

Location
Brinchang, Cameron Highlands,
Pahang, Malaysia

Expected Completion
October 2020

Site Area
5.66 acres

Gross Floor Area
82,315 square metres

Building Height
4-5 storeys (shops);
9 storeys (hotel)

Client/Owner
Casa Inspirasi Sdn Bhd

Architecture Firm
Simplex Architects &
Associates Sdn Bhd

Principal Architect
Ar B.K. Low

Civil & Structural Engineer
Perunding JPC Sdn Bhd

Mechanical & Electrical Engineer
Power Spectra Consult

Quantity Surveyor
Quanticonsult Sdn Bhd

Main Contractor
MITC Engineering Sdn Bhd

Landscape Architect
Urban Design Group Sdn Bhd

Images
Simplex Architects &
Associates Sdn Bhd



TAHIR FOUNDATION CONNEXION

The Tahir Foundation Connexion is a new five-storey addition to the Singapore Management University (SMU) city campus to support experiential learning through real-world projects and cultivate innovation and entrepreneurship.

“The project set out to fulfil four key design goals, namely: encourage experimentation, enable 24/7 learning, engage the city, and embrace new environment sustainability initiatives,” said Sundaravadivelan Selvam, vice president of SMU’s Campus Infrastructure and Services.

The 8,600-square-metre space includes active learning classrooms, brainstorming hubs, collaborative zones, a dining commons, integrated learning studios, makerspace, student lounges, and incubation spaces for start-ups.

For maximum flexibility, the building has open floor plates—with minimal fixed walls—that can be adapted to accommodate new learning modalities in the future. Learning spaces will be defined through creative use of furniture for a sense of openness and transparency.

The design includes various distinctive urban spaces, such as the North Plaza and the Campus Boulevard, which help improve

connectivity and strengthen the relationship between the campus and the city. The North Plaza is designed as a natural extension of the adjacent greenery, blurring the boundary between the building and its surroundings.

SMART AND GREEN

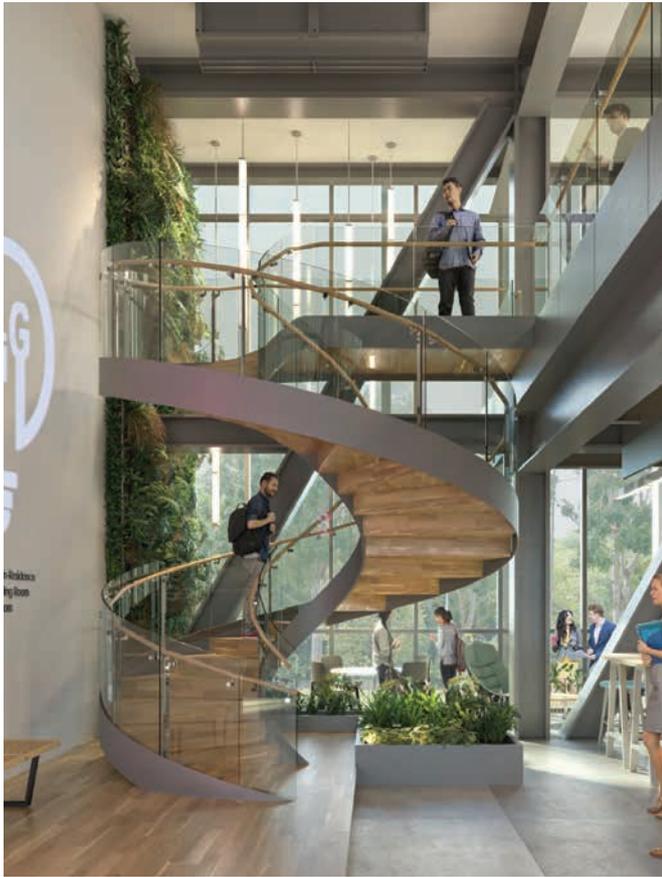
The Tahir Foundation Connexion is designed to meet the Building and Construction Authority (BCA) Green Mark Platinum certification and the international WELL Building Standard.

It also holds the distinction of being the city centre’s first large-scale mass engineered timber (MET) development and an on-site net zero energy building, with its own power generated from a photovoltaic system.

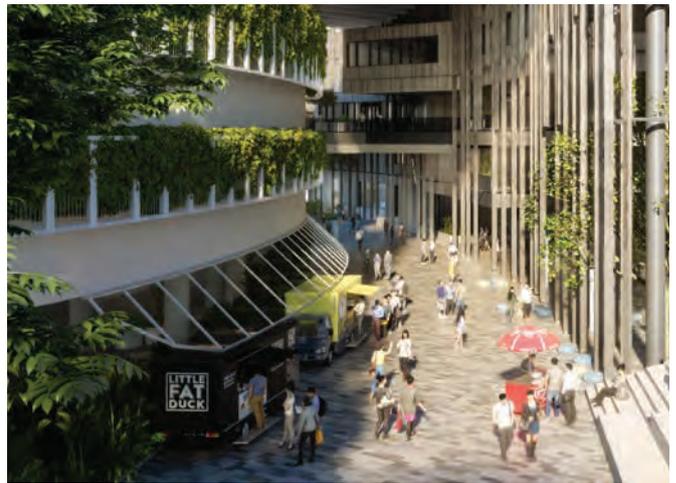
Other Green features and technologies include advanced passive displacement cooling, smart LED lighting and predictive smart building control systems.

CHALLENGES

Fitting all the building’s functional requirements into five storeys, with a building height limit of 24 metres AMSL, on an odd-shaped site is a design achievement.



The business incubator housed in the Innovation Bridge



Campus Boulevard



North Plaza, one of the urban spaces

Due to the small building footprint and limited roof space, the roof canopy has to be extended across the Stamford Canal, which runs along the site, to accommodate the required number of solar panels. This extension also creates an all-weather pedestrian boulevard below, transforming an under-utilised space into a vibrant student street, activated by a cafeteria at ground level.

Given the close proximity of various existing critical infrastructures—such as the Fort Canning tunnel, the Stamford Canal and the School of Accountancy building—construction work and vehicular movements have to be carried out sensitively.

The construction of a three-storey-high link bridge building, connecting Tahir Foundation Connexion to the School of Law over a busy three-lane Fort Canning link road, is also an engineering challenge that requires careful planning and specific construction methodologies for safety.

The site also includes an inherited congested network of underground services; SMU managed to divert some of these ahead of the construction, while the building's design had to accommodate the rest of the constraints. **C**

PROJECT DATA

Project Name
Tahir Foundation Connexion

Location
Stamford Road Land Parcel
A-South 2, Singapore

Expected Completion
Q1 2019

Site Area
3,543.5 square metres

Gross Floor Area
8,600 square metres

Building Height
5 storeys

Owner
Singapore Management
University (SMU)

Architecture Firm
MKPL Architects Pte Ltd

Principal Architect
Siew Man Kok

Interior Design Firm
MKPL Architects Pte Ltd

Structural Engineer
Meinhardt (Singapore) Pte Ltd

Mechanical & Electrical Engineer
Meinhardt (Singapore) Pte Ltd

Quantity Surveyor
Rider Levett Bucknall (LLP)

Landscape Architect
Salad Dressing

Main Contractor
Lian Ho Lee Construction Pte Ltd

Images
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Distinctive geometric-patterned screens

CENTRIUM SQUARE

Located in Little India, Centrium Square—formerly Serangoon Plaza—is a 19-storey mixed-use commercial development comprising offices, medical suites and a five-storey podium with retail, restaurants, car park and sky terrace.

The office tower consists of three levels of medical suites and 11 levels of office units, with high ceilings and full-height glass windows that offer unobstructed views and maximise daylighting.

The 115-metre-long podium façade utilises flat two-dimensional geometric tessellation patterned screens to create a visual effect of three-dimensional cubes.

The decorative façade screen with varying heights is a modern interpretation of the neighbouring historical shophouse streetscape, with its fine textures and intricate and colourfully detailed decorations. Vertical slots accentuate the screen as an expression of the shophouse party wall rhythmic datum.

An outdoor garden with a 12-metre-high covered sky terrace on the podium roof provides a sanctuary from the streets.

Part of the podium façade screen is 'folded' over the roof garden to create two distinct outdoor pavilions for communal usage. The aluminium façade screens also conceal the carpark

levels, without hindering natural light and ventilation.

High-performance low-E double glazed panels are used for the curtain wall, minimising solar heat gain and reducing noise for an optimal office environment.

CONSTRUCTION CONSTRAINTS

This project has a very congested site area, with hotels surrounding the development boundary, hence, noise metres are installed nearby the hotel areas.

Post-tensioned slabs and beams are used for reduced thickness and size, while lighter precast panels that can be managed with a tower crane enable faster construction.

As the geology of the area is pre-dominated by marine clay formation, which is notorious for its excessive settlement properties, special care is being taken to prevent any sinking of surrounding buildings. Vibrations from the construction, as well as ground and building settlements, are being closely monitored.

Gondola systems and catwalks have been incorporated into the design to ensure a safer working environment for building maintenance staff within the development boundary. 



Roof garden: oasis in the city



Office tower lobby



Office drop-off



Perspective view



PROJECT DATA

Project Name
Centrium Square

Location
320, Serangoon Road, Singapore

Expected Completion
2023

Site Area
6,365.8 square metres

Gross Floor Area
19,100 square metres

Building Height
19 storeys, including five-storey podium

Number of Units
143 offices; 49 retail lots;
39 medical suites

Developer
Feature Development Pte Ltd

Architecture Firm
DP Architects Pte Ltd

Civil & Structural Engineer
DP Engineers Pte Ltd

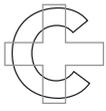
Mechanical & Electrical Engineer
DP Engineers Pte Ltd

Quantity Surveyor
Rider Levett Bucknall LLP

Landscape Architect
DP Green Pte Ltd

Main Contractor
Kimly Construction Pte Ltd

Images
Feature Development Pte Ltd



Circular seats to help users face each other

KIT-PARK

The design brief for this student project was to design a special senior citizen corner for the elderly to come together.

Through interviews, it was found that the elderly do not go to the existing corners due to the lack of facilities and activities, as well as poor ergonomics. The survey results also showed that the elderly enjoy cooking and gardening and that coffee shop chairs are most comfortable for them.

With advancing age, the elderly often lose their independence and freedom of choice. This affects their self-esteem and confidence levels, thus, preventing them from aging gracefully.

Kit-Park is designed as a space that allows the elderly to come together to connect, gather and learn together independently.

Using techniques of push, pull and turning, the furniture and fittings in Kit-Park will be elderly friendly, such as anti-slip

outdoor tiles. There will be a kitchen and garden area, as well as a learning area, with comfortable and flexible seats that are easy to construct and maintain.

The site chosen for Kit-Park is at the Tampines Changkat district, which is near a market for convenience and a small park with pavilions for enjoyment. The corner is located at an area where the entrance to the park is less steep.

The space is laid out in a circular pattern to allow the elderly to either face each other when doing activities together or to face nature. A viewing gallery with void decks, not unlike a movie theatre, opens up to a view of surrounding trees.

The main materials—such as bricks, black powdered coated stainless steel, marine plywood with fire-proof laminate, and green walls—will be locally sourced. Ample use of wood and greenery helps create a natural ambience. 



Ergonomic kitchen island



Library



Isometric view

PROJECT DATA

Student Name

Janice Chu

School

Temasek Polytechnic

Lecturer

Matthias Low

Project Name

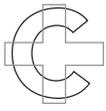
Kit-Park

Location

Block 113, Tampines Street 11,
Tampines Changkat District,
Singapore

Images

Temasek Polytechnic



Front elevation

HOPE, THE INFERTILITY CARE

This student project is about building a place that provides holistic emotional, mental and physical treatment and care for women struggling with infertility, surrogates and new mothers.

The space and programme are designed to provide a supportive home environment for women who are hoping to have a baby, as well as to build a strong connection between mothers and babies.

The constraints of the site are the existing columns and beams, which required some out-of-the-box thinking to create the desired environment. The space design plays on the relationship between voids, layers and nature.

Voids are used to build up different layers of height to create a sense of space. Circles and curvy shapes create

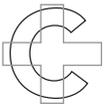
negative space and help express a sense of emotion, motion, harmony and connectivity. The circular spaces are mirrored in the customised lights and ceiling structures, held up by round support structures.

Courtyards on the ground and mezzanine floors bring nature indoors as therapeutic gardens. Reception, shops, lounge and F&B areas are located on the ground floor, while specific rooms are designed for infertility and surrogate consultation, treatment and recovery, as well as for baby care.

For a relaxing ambience, the interiors are fitted mostly with wood and glass, while concrete and metals are used for a sense of solidity amid the smooth edges and curves. Indoor plants and landscaping are one of the key features in the design. The glass façade and skylights allow ample natural lighting and contribute towards a positive energy. 



Infertility treatment area



Entrance area



Baby room

PROJECT DATA

Student Name

Yang Wen Wei

School

Taylor's Lakeside University

Programme

Bachelor of Arts (Hons)

Interior Architecture

Lecturer

Ar Qhwarizmi Norhisham

Project Name

Hope, The Infertility Care

Location

Glenmarie Furniture Street,
Shah Alam, Selangor, Malaysia

Site Area

30,000 square feet

Building Height

4 storeys; 128.3 metres

Images

Yang Wen Wei



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