

ISSUE 3

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Building Our Nation Together

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PIA GOLD WINNER:
WELLTECH CONSTRUCTION PTE LTD

COVER STORY

**SCAL Productivity and
Innovation Awards (PIA) 2022**
WINNERS RAISE THE [ADJUSTABLE] BAR FOR
CONSTRUCTION INNOVATION

**MANAGING ENVIRONMENTS FOR
Better Construction and
Sustainable Sites**

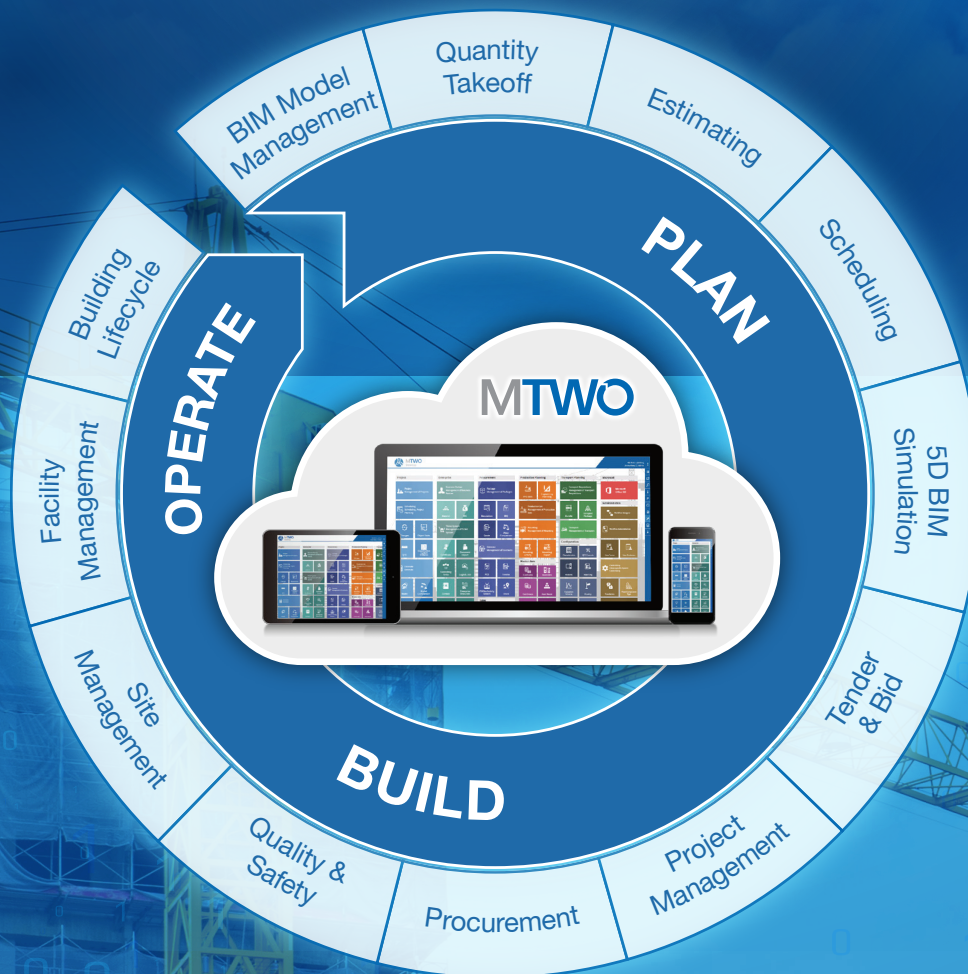
**PEEKING BEYOND THE
“Phygita” Horizon**

**LOOKING BACK ON 2022’s LESSONS
Looking Forward To
2023’s Goals**

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Message From the President

MR NG YEK MENG
PRESIDENT
THE SINGAPORE CONTRACTORS ASSOCIATION LTD

Dear members,

As the year comes to an end, it is also a time for us to reflect and take stock on the past year and look forward to where the industry is heading in the year ahead.

Introspection is the main focus of this end-of-year SCAL Newsletter edition. As an industry, we have collectively confronted the greatest challenges that were presented to us and are now ready to chart the way forward. At SCAL's first physical annual dinner celebrating our 85th Anniversary in October, I echoed this same sentiment. The event brought the entire industry together as a show of confidence and optimism for our recovery from the worst of the pandemic.

The dinner saw the awarding of the 2022 Productivity & Innovation Awards (PIA), appreciating the best of the industry's talents in ideation, experimentation, and implementation. The award recognizes not only what it takes to drive innovation in the construction industry, but how to make ideas a reality as well as how to overcome common challenges during the journey towards innovation. SCAL is proud to honour the champions of innovation within our industry.

Two focus areas for innovation in the coming year and over the long run will be digitalisation and environmental sustainability. This edition aims to cover both and discuss why digitalisation is necessary for contractors as well as sharing more about environment monitoring and management plans. Embracing digital and environmental innovation will be crucial for competitiveness and business success for contractors in the times ahead.

We concluded the year with a collection of some 30 webinars and events. I wish to acknowledge the great support of my Council and the many initiatives led by the Chairs of respective Subcommittees. The SCAL's Secretariat and subsidiaries have been unflinching in their commitment to making our industry more Productive, Progressive, and Professional.

I wish all members a joyous 2023 – and to greater success and greater heights!

MR NG YEK MENG
PRESIDENT
THE SINGAPORE CONTRACTORS ASSOCIATION LTD

SCAL Productivity and Innovation Awards (PIA) 2022

Winners Raise the (Adjustable) Bar for Construction Innovation

At the 85th Anniversary SCAL Annual Dinner in October 2022, three firms were felicitated for outstanding contributions to Productivity & Innovation in construction PIA Awards 2022. The Gold PIA was awarded to Welltech Construction Pte Ltd, Silver to Keller Foundations (S E Asia) Pte Ltd and Bronze to Gammon Pte. Ltd. & TTJ Design and Engineering Pte Ltd. Four very different awardees with different teams and different specialties but a common conjunction of best practices, attitudes, and mindsets that make for creative problem solving.

Solving problems on construction sites is not easy. With a dizzying number of moving parts, keeping things steady is already difficult and costly enough. Problems are simply an additional layer of pain and difficulty. But they are inescapable—in fact most of the construction profession can be described as fighting fires and keeping to plan. In confronting these fires, great steps have been made in the technologies that builders can employ as weapons: BIM has improved how projects are captured, from the big picture to intricate details; robotics and automation are changing the face of routine tasks.

But the complexity and sophistication of these solutions are both the source of their power and the source of apprehension and even resistance by most contractors: innovation, it seems, is either too costly, too over-the-top, or too “cheem” for the average contractor; a big word found in seminars and in the verbal wallets of big firm executives, not on the ground and on the sites of regular contractors.

The winners of the 2022 PIA awards, who were chosen from a stable of applicants by appointed judges and in collaboration with SCAL's Productivity & Technology Subcommittee, are the walking, talking evidence that the opposite is true: innovation is not about budgets, it's about budging; innovation can be found in big and small places and has much more to do with a firm's mindset than costs and complexity.

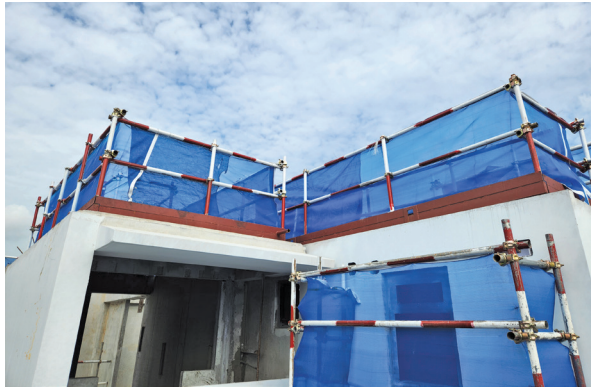
AN ECONOMICAL AND EFFICIENT SOLUTION TO THE PROBLEM OF METAL DECKINGS FOR PPVC PROJECT

The Gold Award was awarded to Welltech for a solution whose simplicity is only matched by its profoundly positive effects for practically any project involving Prefabricated Prefinished Volumetric Construction (PPVC) today. Welltech's team, led by Project Manager Maverick Lee and supported by Project Engineer Nikko Gozo, noticed that recycling metal decking from a previous project proved to be very costly in terms of time, energy, money, and space needed to modify the decking to fit the dimensions of the new project. Modifying existing decking is difficult work that can also add unnecessary risks to the project site. Often, making these modifications can cost as much as procuring new decking, and with tight project deadlines, contractors are caught between a rock and a hard place: waste previous decking by fabricating anew, or modify and waste time and effort—both at the same cost.

INNOVATION IS NOT ABOUT BUDGETS, IT'S ABOUT BUDGING; INNOVATION CAN BE FOUND IN BIG AND SMALL PLACES AND HAS MUCH MORE TO DO WITH A FIRM'S MINDSET THAN COSTS AND COMPLEXITY



Gold Award Winner: Welltech Construction Pte Ltd
Adjustable Metal Decking for PPVC



External View of Metal Decking



Adjustable System Underneath Metal Decking

Welltech’s team decided to confront this head on. After a brainstorm, it became clear that slotting or telescoping might be a promising way to make the deckings adjustable, and so more easily reusable project to project. Two designs were settled on—one based on plates and the other on hollow slots—before Welltech’s team came together to evaluate and settle on one. And here collaboration was key: the on-site team came back with feedback on the recesses at the end of the metal deck, the Professional Engineer (PE) offered calculations on structural integrity, and the steel fabricators offered advice on the workability of their design.

A prototype was assembled, but only after a fair wait. Pressure was on and nervousness set in—the team was confident that their prototype would stand the test (literally). But if they failed, on-site progress would grind to a halt. “We were taking a risk with this new solution,” Maverick said, “if it didn’t work out, we would have to rush to get the right metal decking to avoid delays on site.” Nikko added: “There was definitely a lot of pressure because we were exploring this solution in parallel to our regular site work.”

But it paid off, and Welltech’s solution was successfully installed at their project, setting a foundation for future projects as well. The team expects that 4- or 5-sided precast modules, such as those used by HDB, would benefit from this stackable, modular solution.



Silver Award Winner: Keller Foundations (S E Asia) Pte Ltd
Remote Controlled Air Valve Assembly

REMOTE-CONTROLLED AIR-HAMMER OPERATION

And regarding foundations, digging deeper to lay them is what Keller Foundations—the Silver PIA awardee and a geotechnical contractor—must reckon with every single day. Drilling and piling work require the use of an air- pressure-operated Down the Hole (DTH) hammer, often without alternatives since the next best thing (a water hammer) is weaker and unacceptably polluting. DTH hammer work involves many extremes: of pressure, of temperature, and of noise. The operator of the DTH hammer’s air compressor must face all of these while also being in the line of fire of the air pressure hoses.. Communication errors are also rampant as other team members need to shout over the great noise to pass instruction to the operator. Unsurprisingly, a 2020 internal analysis of near-misses and site hazards found that air hammers accounted for 20 near-misses—a high number compared to other sources of near-misses.

So, Keller’s team, led by Deputy Project Manager Wong Jian Wen and supported by Senior HSEQ Executive Phyo Thiha Aung, set out to support their on-site staff and make DTH hammer air compressor operation safer and more efficient. Three teams—the safety team, the operations team, and the mechanical (yard) team—put heads together.

Since most other options such as water-powered DTH hammers were easily eliminated (on grounds of site feasibility and productivity), it became evident that automation of the DTH hammer air compressor unit was the way to go. But asking the manufacturer to make the equipment fully remotely controllable would be too costly as well since there are only so many DTH hammer compressors to procure in the market.

Keller's team therefore decided to take the DTH hammer compressor in their own hands: they would develop remote-controlled valves as a brilliant midway solution between full remote and manual operation of the equipment. The mechanic team sourced the hardware but the individual components of their remote-controlled valve (the wires, the bulbs, etc.) were all individually sourced by the team and then assembled. A prototype came together, and the team learned that it worked better than expected—remote valve control from greater than a Kilometer away. But the team also learned that the prototype needed to be refined to show equipment status to the remote operator.

Exceeding expectations, Keller's remote-controlled compressor valve had several important benefits: apart from the obvious improvements of safety outcomes, the solution proved to be practical in its ease of installation, use, and maintenance, and reduced the footprint of the air hammer in sites that often have scarce laydown space.

MODULAR CLIMBING BRACKET SYSTEM

The Bronze Award was awarded to Gammon & TTJ Design and Engineering for a solution that started from simple first principles but built atop itself (not just figuratively) to produce a complex solution. Faced with a very tight project laydown area that would have certainly been choked by hefty temporary works and a precast, modular structure, Gammon's team—led by General Manager Michael O'Connell and supported by Raymond Ngiam—thought to get two birds with one net. By exploiting the repetitive and modular structure of the structure, Gammon developed a similarly modular and repetitive bracket that, like a vine, climbed with the structure as it installed additional layers.

What started with a hand sketch with Gammon's cooperative specialist contractor TTJ Design and Engineering was then translated to BIM before a virtual installation using the BIM model. It was the model that then validated the initial idea. Finally, a prototype, many shop drawings, and some lessons later, Gammon's climbing bracket finally began to come together and materialize on the actual project site. Benefits included less steel, less labour, and less time - and so less cost.

3 LESSONS FROM THE WINNERS REGARDING CONSTRUCTION INNOVATION THAT ALL CONTRACTORS CAN TAKEAWAY

The first is that resistance to change must be expected and planned for. Jian Wen from Keller shared, "Inertia is a major factor. The longer the team does the same thing, the harder it is to change. The best time to change was five years ago (since change takes time to bear fruit). The second-best time is today." Michael from Gammon also resonated with that challenge. "There was a lot of scepticism, to be honest. There's always a level of disbelief when something bespoke without precedent is done." In Gammon's case, this disbelief (potential and actual) came from many quarters: the site team, the consultants, regulators such as BCA, and management. "Internal scepticism was stronger than external scepticism," Michael added. But both Gammon and Keller converged on the same solution to suspending this disbelief and inspiring confidence: get it done, and they will come round. Through mockups, prototypes, and demonstrations, both firms were able to overcome doubt that often paralyses innovation at other construction firms.

Keller additionally overcame one of the greatest sources of doubt—cost—by reasoning out a business case for their proposed remote-controlled valve. By demonstrating clear financial costs and benefits, time-to-profit, and



Automatic remote-control valve in operation on high pressure air compressor

Electric Valve Actuator



Bronze Award Winner: Gammon Pte. Ltd. & TTJ Design and Engineering Pte Ltd

Self-supporting climbing bracket

LESSON 1:

RESISTANCE TO CHANGE MUST BE EXPECTED AND PLANNED FOR

break-evens for the solution without feeling intimidated by the upfront cost, Keller overcame the inertia that often sets in when a good idea is given a price tag. Gammon overcame another key doubt—safety—by adhering to its robust internal practice of Zero Harm presentations to management.

LESSON 2:

INNOVATION IS IMPOSSIBLE WITHOUT COLLABORATION AND, IMPORTANTLY, THE BLESSING OF MANAGEMENT

The second lesson is that innovation is impossible without collaboration and, importantly, the blessing of management. A collaboratively innovative culture doesn't grow overnight. It needs tending to, nurturing leadership, and a transparent environment. Gammon is a leader in this field, with an established practice of using BIM early in its construction methodology as well as an initiative to have site teams use SketchUp to develop and implement their own solutions. But this outlook isn't just for the bigger fish. Keller has broken down the siloes between its departments—on-site and in the office—and hosts an annual Continuous Improvement and Innovation Day (CIID), where the whole company takes a day off, books a seminar room, and works towards bettering themselves individually and as a firm—

from engineering to finance. Sometimes, the empathy cultivated from a collaborative environment is enough to trigger innovation. "I always put myself in the workers' shoes," Jian Wen from Keller said, "If I'm able to do what they're doing then okay but if I can't then I need to come up with a better way. If we take them for granted, we won't realise there's a problem, and so innovation can't happen."

Strong and committed leadership is necessary to set up and then sustain such an environment while balancing healthy risk-taking with the best interests of the firm. Keller and Welltech both concurred that a supportive and open-minded management buoyed their innovation successes. In Gammon's case, Michael was the management but found support from his colleagues both above and below.

Welltech's Maverick and Nikko said that success for their team came from believing in their team and not backing down in the face of adversities, but also depending on partners across the project value chain—from suppliers to experienced fabricators. Gammon's project was so indebted to a strong relationship with a specialist subcontractor that it shared the award with Gammon, said that having a specialist subcontractor willing to take an off-the-wall idea and turn it into reality gives hope for innovation. Most subcontractors simply do not bite this bullet. "The most pleasing thing was that, while others might say that the idea was silly, the subcontractor took it at face value, developed it, and ran with it."

LESSON 3:

OPEN MINDEDNESS MUST BE ENHANCED WITH OPEN DATA

Finally, the third lesson is that open mindedness must be enhanced with open data. All three sets of awardees used BIM or other data-driven technologies for their solutions—Gammon to develop the design and simulate installation, Keller used self-sourced hardware and communications technology, and Welltech used BIM for shop drawings. Technology is essential as a bedrock on which can rest excellent collaboration and transformation.

The 2022 PIA winners have made a mark in the sand of construction innovation in a period of great change for the construction industry.

MAKING ENGINEERING BREAKTHROUGHS

MRT Cross Island Line (Phase 1), Singapore ●
– Defu Station and Tunnels

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OLÁ, Singapore ●

Sydney Metro West, Australia ●
– Western Tunnelling Package

Coffs Harbour Bypass, Australia ●

MRT Kajang Line (Line 1), Malaysia ●

MRT Putrajaya Line (Line 2), Malaysia ●

Stormwater Management
and Road Tunnel (SMART), Malaysia ●

Marine Bridge – GuanTang, Taiwan ●

Seawall – Taipei Port, Taiwan ●

Kaohsiung Metropolitan MRT System ●
– Orange Line Package C04, Taiwan

Our current infrastructure projects in Singapore:



Defu Station and Tunnels



Gali Batu Multi-Storey Bus Depot

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Peeking Beyond the “Phygital” Horizon

In recent years, construction has become increasingly digital. Singaporean contractors, by now, have had their fair dose of hearing the virtues of Building Information Modelling (BIM), Virtual Design and Construction (VDC), and Integrated Design and Delivery (IDD) extolled in various webinars and seminars. While this alphabet soup of acronyms can sometimes be alarming, there is a crisp logic to digitalisation which contractors are already familiar with. In this article, we’ll cut through the jargon to focus on the essentials of digitalisation, why it matters for contractors, and how contractors can begin their digitalisation journey today.



AT THE MOST BASIC LEVEL, DIGITALISATION IS THE CONVERSION OR REDIRECTION OF INEFFICIENT INFORMATION CHANNELS INTO MORE EFFICIENT INFORMATION CHANNELS.

At the most basic level, digitalisation is the conversion or redirection of inefficient information channels into more efficient information channels. Consider how much more efficient it is to write an instruction down—say, a sequence of work—than it is to yell it over the phone or even simply say it in person. When information is written down, it becomes easier to share and copy, and its permanence allows for stability in communication (compared to the game of telephone where words shed meaning as they move from one person to the next). But writing is slow, difficult to duplicate, and prone to human error and illegibility. An improvement on writing is printing using fonts and graphing tools to standardise information and make duplication easier. Print information—in the form of tables, paperwork, charts, drawings, etc.—is still the dominant form of information channel for construction today.



Mr Gerald Ho, Deputy Project Director, Soilbuild Construction Group Ltd shares Soilbuild's Integrated Digital Delivery (IDD) experience at a recent IDD Contractor Masterclass workshop conducted by Autodesk Asia Pte Ltd.

Digitalisation seeks to improve upon printing to produce the most efficient information channel available today. Digital data shouldn't be thought of as simply printed information reproduced on an LED or backlit screen—whether it be a phone or a laptop. It is something else entirely. Digital information is information that can be simultaneously presented, changed, shared, and aggregated—at the same time for different users in different places. By making information digital, contractors make their information almost infinitely fast and abundant. But some of the most important, but underrated, benefits of digital information are searchability and automation: digital data is tagged with hidden data of its own (metadata) to help a contractor sift through thousands of records to find the exact piece of information they need; and digital information can be the basis of automation since it is an input that can be received by computer programs and algorithms.

This last point is vital. Just as a highly productive and qualified consultant would be unable to receive and process verbal instructions repeated on a noisy site in quick succession, so an excellent IT setup would be unable to receive and process written or even print information. Contractors that invest in IT infrastructure but not comprehensive digitalisation of their information ultimately create a rifle but don't load it with anything substantial.

Digital information has a few key use cases in construction:

1 DIGITALISATION OF PROJECT MANAGEMENT WORKFLOWS

A single project is an ocean of information, from checklists and drawings to schedules and specifications. The single biggest issue with all of this data is that it's siloed: not only physically but also in terms of format. Shop drawing printouts, printed floor plans with crucial handwritten notes on the margins, or worker rosters:

all this information exists in formats that make consolidation (and so analysis) impossible. Digitalised project workflows unlock Common Data Environments (CDEs) where all project stakeholders can bring their data to the same table, and data of the same or similar formats can talk to one another, creating new insights into project progress.

2 DIGITALISATION OF PROJECT SPECIFICATIONS AND REQUIREMENTS

This is the familiar refrain about BIM and IDD. By digitalising physical information, project teams and contractors are able to have an intricate understanding of the project's dimensions and physical development across all stages of construction. By linking digital representations of projects (such as 3D BIM models) with mobile human input or even Internet of Things (IoT) remote sensors, contractors can produce a real-time digital twin of their project—this is beneficial not only for the construction stage but well after and long into the operation stage (for BIM FM). This is increasingly appealing for developers and other forward-looking clients.

3 DIGITALISATION OF HANDOVERS AND REGULATORY REQUIREMENTS

Finally, digitalisation helps cut the clutter and clear the red tape for contractors' interface with government agencies and authorities. By bringing together the best of digitalised workflows and digitalised project information (in Project Information Models), contractors will be able to work to streamline regulatory processes and approvals in a way simply impossible with regular paperwork and printed information.

The final point has become especially pertinent with two emergent developments in Singapore's local construction landscape: the rollout of the Government's CORENET X digital regulatory ecosystem and the recent release of BCA's technical guide on BIM handovers. CORENET X, set to launch in 2023, is a collaborative, centralised, and digital platform that digitally manages every step of the construction regulatory process: from basic structural approvals and fire all the way to TOP. QPs who once needed to run from pillar to post between nearly eight agencies and twenty gateways can now experience a one-stop-shop from start to end. CORENET X will also use a standard digital format (IFC SG) to ensure that BIM files are all accessible by regulators and developers as well. The release of BCA's technical guide on BIM handovers also works to cement the role of BIM in contract documents and requirements—a crucial area for contractors.

All these excellent benefits to digitalisation don't come without their own caveats and considerations. While cost is the obvious one, a more overlooked but urgent consideration is security. While we have spent some time talking down written and printed information, they are undeniable secure—their weaknesses in duplication and permanence become strengths when it comes to information security. And with digitalisation, such security is within the realm of cyber security. At a recent webinar on the topic, SCAL hosted a local cybersecurity firm alongside the Cyber Security Agency of Singapore to help contractors understand the key challenges to their digital information security as well as regulations surrounding data protection and privacy. Having a sound data protection, privacy, and cyber security strategy across all nodes of a digital information system—from sensors and data collection points to servers and devices—will ensure that contractors stave off the worst of malicious attacks to capture, sabotage, or compromise a project's data.

The coming together of digital information and business processes in construction has come later than many other industries, but this is in large part since digitalisation in construction represents the unity of both digital and physical information. This new “phygital” horizon, where brick and mortar are supplemented, not supplanted, by bits and megabytes is a new edge for construction firms. The richness of the information they capture will not only improve their own projects and profitability but will ultimately contribute to a more sustainable, economically efficient, and aesthetically striking built environments for all in Singapore. Just as the move from speaking to writing brought us the built environment in the first place with early humanity's first urbanisation.



Ms Veronica Tan from Cyber Security Agency of Singapore (CSA) as well as Mr Poh Cheong Tham and Mr Roy Chua from EQCOMS Technology spoke at a recent webinar to enlighten SCAL members on the importance of safeguarding company's data and preventing breaches and cyberattacks

Celebrating SCAL's Past and Charting its Future at Annual Dinner 2022

The SCAL Annual Dinner, held on 12th October 2022, marked 85 years of SCAL's continuing service to the development and transformation of the Singaporean construction industry. Held at Marina Bay Sands, the evening overflowed with excellent company, ideas, dinner, drink, and conversations—the first SCAL dinner since the COVID-19 pandemic, taking advantage of the joy of meeting in-person. Like a great beacon, the dinner brought together many flocks from across the built environment: contractors, specialists, technologists, regulators, Past Presidents, and life members.



The dawn of the evening saw more than 1,110 SCAL members and industry representatives crossing old paths and making new ones as they mingled in the foyer for a networking cocktail. It seemed as if both the din of conversation and the drinks in their hands bubbled and frothed together, as stories, contacts, ideas, and opportunities whizzed around the room. The energy and excitement for the evening to come was compressed within the foyer like a loaded spring, and the doors opened to bring that atmosphere of anticipation into a room that could hold it.





“ DURING THE DARKEST TIMES, SINGAPORE’S BUILDERS AND THE INDUSTRY PARTNERS STOOD UNITED. ”

MR NG YEK MENG
PRESIDENT, SCAL

The excitement that built up through the networking and rendezvous of the early evening finally found their explosive release in a gripping Taiko drumming opening that set the tone and gravity of the rest of the dinner. President Mr Ng Yek Meng then took the stage to address the gathering and unpack the past two years of difficulty. “That we are able to be together this evening, speaks to our strong determination and to the solidarity between industry players, Government agencies and all the association partners in the Built Environment Sector. During the darkest times, Singapore’s builders and the industry partners stood united.” President Ng described an industry that had weathered weltering in the wake of the pandemic—financially, technically, and even spiritually—but had still survived and come back stronger. Before celebrations were in order, however, much work needed doing according to President Ng: improving safety, rolling out of financial morasses, and more equitable risk sharing across the value chain.

President Ng’s remarks were then followed by the Guest of Honour for the special evening—Minister of National Development Mr Desmond Lee—who also expressed his happiness at once again being able to meet the industry in-person after nearly three years. Minister Lee thought back to the difficulties of those intervening years, as the learning curve for working with the industry’s multiplying problems grew suddenly steep. But the pressures only “forged a spirit of mutual trust and respect,” according to Minister Lee, “All stakeholders are closely integrated and inter-related.”

Minister Lee also discussed new headwinds pushing back against the industry’s emerging recovery from the pandemic—rising materials costs with a backdrop of decade-high inflation, safety management on construction sites, and better labour management. To help the industry contain and counter these, Minister Lee reminded the audience of the refreshed Construction Industry Transformation Map (ITM), rolled out in September, which calls the industry to deepen its involvement and investment in novel technologies and efficient best practices for both individual and collective benefit.

Minister Lee also highlighted three key areas of collaboration between SCAL and MND: first, advocating for business-friendly policy, trust, relationships, and practices including collaborative contracting; second, developing a “strong local core of Singaporeans” by investing in people and promoting industry development; and third, innovating to foster a safe and productive environment. These key areas would be revisited later in the evening with SCAL’s recognition of innovation and professional excellence in the industry.



The evening also saw the reveal and release of a commemorative book chronicling the tribulations and turbulences endured by the industry during the COVID-19 pandemic. Launched with a video highlighting the milestones of that pandemic endurance story, the book was formally unveiled by President Ng and Minister Lee before being distributed to the audience members at their various tables, by then deep in fruitful chats with their industry colleagues and contacts.



SCAL also took the evening to commemorate much else. It celebrated individuals such as Past President and Council Member Dr. Ho Nyok Yong for decades of contributions and service to the industry as well as a leading role in the careful development and roll-out of the new SCAL CPAS professional accreditation scheme.



SCAL highlighted the many partners and collaborators of SCAL and their role in shaping the industry as well as SCAL's initiatives. And SCAL marked the hard work of its large and growing family of staff, without whom the evening wouldn't have materialised and been the success that it was.

Two felicitations, however, stood out: the awarding of the Productivity and Innovation Awards (PIA) 2022 and the accreditation of the inaugural batch of Construction Professional Accreditation Scheme (CPAS) professionals. Both represent major leaps for the local construction industry and a deepening of SCAL's commitment, in its 85th year, to a progressive, productive, and professional Singaporean construction sector. The inaugural batch of CPAS professionals were lauded by President Ng and other SCAL Council Members and presented their credentials—CPAS, with its comprehensive coverage of technical, soft skills, and managerial elements of construction management, promises to be one of the industry's standard bearers for better building in Singapore.

BOTTOM RIGHT:
Inaugural batch of
SCAL's Construction
Professional
Accreditation
Scheme (CPAS) Tier
A-Star accredited
construction
professionals:
Mr Lincoln Lim (Kimly
Construction Pte Ltd),
Mr Chua Cheng
Hoon (Wee Hur
Construction Pte
Ltd), Mr Wang Gewei
(Woh Hup (Private)
Limited), Mr Benjamin
Lee (Teambuild
Engineering &
Construction Pte Ltd)
& Mr Chew Heng Ngap
(Kimly Construction
Pte Ltd).

The evening ended on a high note as guests and SCAL members took the best of the evening with them and back into the industry. Until the next dinner, SCAL will continue to represent that best of the industry—both in interests and initiatives—and looks forward to hosting that best once more in 2023!



RELIVE THE EXCITEMENT AND EXPERIENCE



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Managing Environments for Better Construction and Sustainable Sites



Er. Tan spoke at a recent seminar attended by SCAL members.

“

EVEN IF MOST SINGAPOREAN CONTRACTORS DEPEND ON LOCAL DEMAND, ONCE THEY'RE OUT IN THE INTERNATIONAL MARKET AND FACING GLOBAL STANDARDS AND PROJECTS FINANCED BY MULTILATERAL INSTITUTIONS, ENVIRONMENTAL REQUIREMENTS ARE NOT SO LAX ANYMORE.

ER. TAN SENG CHUAN
TEMBUSU ASIA CONSULTING

”

On October 7th 2022, at SCAL's Construction House in Bukit Merah, Er. Tan Seng Chuan and his team from TEMBUSU Asia Consulting addressed a host of SCAL members including contractors, subcontractors, and related construction professionals regarding environment management for construction. But while many in the construction industry are well-accustomed to talks and seminars on the environment, sustainability, and contractors' roles in both, Er. Tan's talk focused on one especially important and emerging tool that every contractor will soon need in their green construction toolkit: the **Environment Monitoring & Management Plan (EMMP)**.

Er. Tan is both a traditionally heeled member of the old guard of Singaporean construction and a maverick blazing new trails in construction consulting for the local industry and beyond. Starting fresh out of engineering school with a main contractor, Er. Tan pivoted to plant engineering and explored EPC contracting work before finding a niche in upfront environment evaluation. Coming into his own as a leading environmental engineer and evaluator at Ramboll, Er. Tan—where others would simply retire—is now on his third act with TEMBUSU Asia Consulting: a firm that brings together many of Er. Tan's lifelong interests in science, engineering, and management consulting.

With that seasoned perspective, Er. Tan has had a high view of environmental regulation and planning for construction activities in Singapore and has witnessed its evolution. “Environment requirements are not new in the region,” he said, “But in Singapore, these are often managed by the Government or integrated in the design stage.” While this has generally insulated contractors from the brunt of staying atop such requirements, this will not always be the case. As construction becomes more complex and Design-Build projects become more appealing to clients, Singaporean contractors will need to closely acquaint themselves with the best practices in environmental management.



“This is particularly true for international business,” Er. Tan added, “Even if most Singaporean contractors depend on local demand, once they’re out in the international market and facing global standards and projects financed by multilateral institutions, environmental requirements are not so lax anymore.” Even locally, the specter of environmental regulation continues to take up more and more of contractors’ bandwidths. With the ambitious SG Green Plan 2030 and the Singaporean Government’s push towards a cleaner, net zero built environment industry, local familiarity with environmental management will be essential.

Contractors can confront the rising tide of environmental requirements by exploring, understanding, and deploying Environment Monitoring and Management Plans (EMMPs). An EMMP is a proactive and systematic set of measures, rules, and contingencies to effectively control the environmental impact of a construction project across all phases: from pre-construction to commissioning. EMMPs can best be thought of as a parallel plan to ensure the main project plan is in sync with local environmental regulations and doesn’t upset the delicate environmental and sustainability harmony involving the site.

Maintaining this harmony is not as straightforward as only reducing emissions (of noise, light, or carbon) or using greener materials. “There are three components of sustainability,” Er. Tan explained, “Economic, environmental, and social. Contractors should be aware of all three when putting together their EMMP.” Economic sustainability has to do with using resilient, reusable, recycled materials with lower embodied carbon to support greener construction. Social sustainability includes monitoring and curtailing the health impacts of construction work on local communities: the effects of noise and air pollution, the disruption of local livelihoods, the discharge of wastewater into surrounding areas, etc. “You must take care of the local community. In overseas markets, they may object and cause political roadblocks if they are dissatisfied with the contractor’s practices.”

Environmental sustainability, the largest of the components, engages a varied set of issues: from the effects of geotechnical and other earth works on soil health and the water table to managing animal presences on or near the site (especially for endangered animals). In a nutshell, if former PM Mr. Lee Kuan Yew wished for Singapore to be a city in a garden, the goal of EMMPs, at the very least and when well-functioning, is to have construction sites be located within the larger garden of Singapore as well.

EMMPs, which are completed after preliminary Environmental Impact Assessments (EIAs), are not a trivial consideration for contractors. Depending on the site involved, many moving parts dynamically interact to create a complex environmental web that tangles workers, nature, residents, weather, materials, and regulations. Working to ensure that every node of the larger web is correctly accounted for, and then controlled for with mitigation measures, can end up being very demanding for contractors if not done early.



Er. Tan and his team from TEMBUSU Asia answered questions from the audience at the seminar.



THERE ARE THREE COMPONENTS OF SUSTAINABILITY... ECONOMIC, ENVIRONMENTAL, AND SOCIAL. CONTRACTORS SHOULD BE AWARE OF ALL THREE WHEN PUTTING TOGETHER THEIR EMMP.

ER. TAN SENG CHUAN
TEMBUSU ASIA CONSULTING



Left to Right: Ms Louise Chua (Executive Director of SCAL), Er. Tan Seng Chuan (Managing Director of TEMBUSU Asia Consulting), Mr Kenneth Siew (SCAL Council Member), Ms Holly Siow and Ms Sarah Pascoe (TEMBUSU Asia Consulting) who spoke at the seminar.

“

FOR BASIC THINGS LIKE DISCHARGE, EROSION, AND WATER CONSUMPTION, CONTRACTORS SHOULD DEVELOP IN-HOUSE CAPABILITY. BUT FOR AUDITING PURPOSES, YOU’LL NEED EXTERNAL CONSULTANTS TO AVOID A CONFLICT OF INTEREST.

”

ER. TAN SENG CHUAN
TEMBUSU ASIA CONSULTING

But the need for EMMPs is stronger than ever. In the past, local Singaporean contractor scopes have usually been narrowly defined to exclude most environmental and social issues. Even if contractors wished to include these, they were unable to input these for tender pricing. Being out of the ambit for so long has likely made most Singaporean contractors (and even developers, many staffed by former contractors) unfamiliar with the ins and outs of required environmental regulations and management as contained in an EMMP.

WITH MOST NET ZERO GOALS CONVERGING ON EITHER THE 2030S OR THE 2050S, THE CROP OF BUILDING TENDERS AND PROJECTS FOR THE NEXT DECADE WILL FOCUS INCREASINGLY ON EMMPs AS PART OF THE BROADER PUSH FOR GREENER CONSTRUCTION.

Contractors that sit out the transition to better environmental management will be left behind, especially as Singapore has in recent years mandated Green Mark compliance for all new construction projects. Outcompeted in the next wave of greener construction, the contractors who have been left out will be clustered with other late-comers and must compete for limited environmental expertise and consultants.



The seminar ended with networking among the members and speakers.

And that is reason enough for contractors to shore up in-house environmental expertise that closely aligns with existing functions in construction management, site engineering, and safety and health. “For basic things like discharge, erosion, and water consumption, contractors should develop in-house capability. But for auditing purposes, you’ll need external consultants to avoid a conflict of interest.” More importantly, top management should understand the imminent impacts to their business from EMMP non-compliance and exercise foresight to invest in building up this capability or working with external partners and consultants early to cultivate preferential relationships.

Contractors have long been stewards of future homes, future workplaces, and future cities—carefully and assiduously constructing with the best engineering and safety standards from first brick to last to make a future space a reality and pass it over

to end users. With improved sensitivity to environmental regulations and enhanced environmental management with EMMPs and the like, contractors will now soon also have to be stewards of a future environment—managed, protected, and passed on to end users alongside homes, workplaces, and cities. All within a garden.

Dr. Ho Nyok Yong, Tireless Champion for Industry Improvement, Honoured with SCAL's Highest Personal Accolade

In the annals of the Singaporean construction industry, few and far between stand out as clearly as Dr. Ho Nyok Yong in terms of foresight offered and service rendered to the industry. Dr. Ho is a man of many talents: a registered Professional Engineer of Singapore and a Chartered Engineer of UK. A contractor, a scholar, green warrior, true professional leader, champion for the industry. But across all these talents, what is most striking is his consistency and commitment. And at the 85th Anniversary Annual Dinner in October this year, SCAL honoured Dr. Ho with its highest personal accolade: the SCAL Honorary Life Membership Award.

Dr. Ho first joined SCAL in 1991 and then served as its President from 2011 to 2015, during which time he initiated lasting programs that uplifted the entire construction industry. The impacts of those programs are still felt today. As President, Dr. Ho advocated for environmental sustainability by establishing platforms to create awareness about sustainable construction. These encouraged industry players to forge a greener, climate-resilient, and future-ready Built Environment. He also promoted the upskilling and productivity improvement of our local construction workforce through Core Trade schemes. Dr. Ho has also often fronted national media events for SCAL, helping to drive forward a progressive vision for the industry. He has also spearheaded many Corporate Social Responsibility (CSR) initiatives, which to date have raised more than S\$400,000 in donations to various charitable causes.

Beyond SCAL, Dr. Ho previously held positions including President of Singapore Concrete Institute (SCI), Chairman of the Construction Industry Joint Committee (CIJC), as well as Member of the Technical Committee defining national standards for the industry. He is also the Principal Investigator for many industry research projects with Institutes of Higher Learning (IHLs) and several government agencies. His research efforts have yielded over 80 papers in various journals and conferences. Over the years, Dr. Ho has been awarded many distinguished awards within the industry, from the BCA-SGBC Green Innovator Award in 2011 to the BCA Distinguished Fellow title in 2020.

To this day, Dr. Ho continues to be a champion of the industry, lending his intelligence and gravitas wherever they are needed. He is presently the Chairman for the committee reviewing the WSH ConSASS and is also Co-Chair of the latest BCA Green Built Environment Advisory Committee. To raise the standard of professionalism in the industry, Dr. Ho has also led the conceptualisation and implementation of the SCAL Construction Professional Accreditation Scheme (CPAS). This scheme is meant for personnel in our industry to have a recognised authority for accreditation of their professional roles. He continues to serve as Chairman of SCAL's Standards and Quality committee, supporting the industry's efforts to standardise and professionalise. Dr. Ho is also driving a greener and more sustainable vision for Singapore in his role as the Immediate Past President of the Singapore Green Building Council.

Dr. Ho accomplishes all of this while still giving to his full-time job as Chief Operating Officer of the Samwoh Group of companies. For being a long-time role model to his peers, his colleagues, and his students over these many years, SCAL thanked Dr. Ho sincerely for his immense contribution to the Singaporean construction industry in both the past as well as in the future, by honoring Dr. Ho Nyok Yong with SCAL's highest personal accolade: the SCAL Honorary Life Membership Award. All of SCAL wishes Dr. Ho continued success in his quest to make the industry more progressive, productive, and professional and will continue to work with him to achieve the same.



Dr. Ho Nyok Hong giving his thank you speech as he receives the SCAL Honorary Life Membership Award.



LOOKING BACK ON 2022's LESSONS

LOOKING FORWARD TO 2023's GOALS

As another challenging year for the industry comes to a cautiously optimistic close, the end of the year allows room for reflection, review, and reconsideration. The preceding year (and the two years before that) have been rough and tumble for the local industry, but many valuable lessons have been shaken loose in all the tumbling.

To mark the end of 2022—which saw important recoveries and reopening—and the start of 2023—which promises new progress but also new perils—we spoke to three members of the built environment community to hear their thoughts on the year that has passed and the year to come.

These were Mr Hong Wee Khong (Construction Director at Teambuild Engineering & Construction Pte Ltd), Mr Chor Chong Leen (Business Director / General Director at ZAP Piling Pte. Ltd.), Ms Louise Chua (Executive Director at SCAL) and Mr Sumit Oberoi (Industry Strategy Manager APAC at Autodesk Construction Solutions). Blending their perspectives allows us to see how diverse branches of our built environment community—main contractors, subcontractors, SCAL itself and solution provider—see the current landscape and pulse of the industry.



Mr Hong Wee Khong
Construction Director
Teambuild
Engineering &
Construction Pte Ltd

Overall, 2022 continued to be a challenging one for the built environment sector. We continued to feel the effects of manpower constraints from the pandemic, and this continued to push up labour costs over the past year. Materials costs also rose in tandem due to increased logistical costs. These higher costs, combined with the urgent need to make up for lost time over the pandemic, has led to much stress placed on contractors.

In the coming year, we expect these challenges to remain. New jobs will be few and far between in a more competitive landscape. And a balance must be struck by contractors between clients pressing for steep discounts and subcontractors pushing for higher rates to cope with higher inflation. This will squeeze margins. Since the global economic climate seems to be deteriorating further, we are not optimistic that 2023 will present any immediate relief. It will continue to offer challenges.

Despite the above difficulties and challenges, we will continue our commitment and efforts to build up our IDD capabilities so that we can automate and digitise our work and make it more efficient. Over the years, we have progressively expanded our digital use cases and explored the latest technologies available since the adoption of digital platform in 2018. One noteworthy example is the recent development of a digitalized logistics module for tracking of precast components from precast plant and fit-out yards to site installation.

For the year 2023, we hope the built environment will continue to improve safety culture. The stresses of the past year have led to a regrettable rise in accidents that we must come together as an industry to address. Although it is a long and difficult process, it is possible and worthwhile to pursue.

“PREVENTION IS A SMART BUSINESS STRATEGY AND IT IS ALSO SIMPLY THE RIGHT THING TO DO.”

2022 was a year of transitions for the entire construction industry and SCAL Secretariat. With transitions and change come a lot of inertia and resistance to change. But change was ultimately necessary and that was the key lesson of 2022—even though the industry had begun to come out of the COVID-19 pandemic, new challenges arose with materials and labour inflation. SCAL'S Secretariat and members worked together to help the construction industry navigate these new risks and plan for its future amid an uncertain recovery.

In 2022, SCAL recognised a clear need for better processes and automation to improve the Secretariat's productivity and efficiency. A more productive and efficient SCAL Secretariat made for better service of SCAL's members and a more effective pursuit of our targets and initiatives to be the leading voice in the construction industry. I'm glad that we are embarking on this change and we are well on our way in this journey with the team.

On the whole, 2022 was positive for the industry and for SCAL since the signs of recovery from the COVID-19 pandemic have been encouraging. Beyond the obvious challenges of costs and demand, the coming year will also be an opportunity for contractors to confront outdated and underperforming practices. COVID as well as the years that followed offered an opportunity for the industry to do things differently, and SCAL will continue to capitalise on this opportunity in our engagements with relevant agencies and partners.

I'm truly thankful that the SCAL community—member companies, partners, agencies, business associates and the team — stood by us as we navigated the challenges of 2022 together. I'm confident that, on this footing, we can navigate the challenges of 2023 together as well. I am reminded of the Chinese proverb 人心齐，泰山移 (When people work with one heart, we can even move Mountain Tai).

“LOOKING FORWARD TO 2023, SCAL REMAINS COMMITTED TO FOSTERING COLLABORATIVE PARTNERSHIPS AND PLAYING A POSITIVE ROLE IN SUPPORTING OUR MEMBERS TO WORK TOWARDS A TRANSITION JOURNEY THAT HELPS NURTURE A PRODUCTIVE, PROGRESSIVE, AND PROFESSIONAL INDUSTRY.”



Ms Louise Chua
Executive Director
The Singapore
Contractors
Association Ltd



Mr Chor Chong Leen
Business Director /
General Director
ZAP Piling Pte. Ltd.

One of the main lessons learned from the past year is that you must always be prepared for unforeseen circumstances like pandemics, which greatly impacted the construction industry in 2020 and 2021. But while hoping for the pandemic to pass, one challenge was not to get complacent and just wait for it to blow over. There's always new challenges around the corner that need to be prepared for. Just as the strictest pandemic measures began to ease, the war in Ukraine began and disrupted materials prices. One challenge after another.

During this year, I myself came across the importance of Environmental, Social, and Governance (ESG) for construction. I think this is the future of the industry and it's coming to our doorstep soon if it's not here already. I think ESG will be crucial for the industry to transform positively and support Singapore's green ambitions, not to mention the fight against global warming and climate change.

I didn't see 2022 as a bounce back from the pandemic. The pandemic is not yet over, and new challenges in the world energy and materials markets have created new problems for the local construction industry. If I could go back to the start of 2022, one thing I would do differently would be to do less. I would have consolidated company strengths by reducing overheads and providing more high skill training for better work efficiency. This would be better than overcommitting for potentially loss-making projects.

Looking forward to 2023, I see better work prospects for public sector but maybe not so for the private sector. I also think next year will be marked by high operating costs, high materials costs, thinner margins, and higher risk.

“I THINK BY TAKING THE LESSONS LEARNED SO FAR ON BEING PREPARED AND AVOIDING COMPLACENCY, THE INDUSTRY CAN RISE TO THE CHALLENGES OF 2023 AS WELL.”



Mr Sumit Oberoi
Industry Strategy
Manager APAC
Autodesk Construction
Solutions

Considering what we have faced as a global community over the past three years, providing any form of a prediction was certainly a challenging prospect in 2022. However, I believe the APAC construction industry is helping the economy rebound in the region and transform the industry at a rapid pace beyond 2022.

First, we will see companies being increasingly data driven. We are aware that a staggering research statistic found that 96% of data generated in the engineering and construction phase of a project goes unused. So we would expect increased focus and scrutiny on unlocking the value of their data to drive better decision making both at the project level as well as the firm level.

Second, the ongoing labour shortages in APAC will drive the need for increased automation to augment human processes both in the office and on the jobsite. Third, we expect to see SCAL member companies exploring alternative business models such as vertical integration, DfMA and offsite construction amongst others as they look to uncover scale economies.

Finally, given that our industry generates the most amount of waste compared to any other industry, and on the back of the outcomes from this year's COP27 in Egypt we expect to see an acceleration of global focus on sustainability.

"THROUGHOUT THE APAC REGION A NUMBER OF CONSTRUCTION FIRMS HAVE PLEDGED THEIR INTENTION TO BECOME NET ZERO EMISSION COMPANIES. THERE WILL BE A SIGNIFICANT OPPORTUNITY TO PARTNER SCAL MEMBERS AND ASSIST THE INDUSTRY TRANSITION TO A LOW CARBON FUTURE."

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11 Jan 2023 | 2pm – 3.30pm

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PRACTICAL PAYROLL PROCESSING

13 Jan 2023 | 9.00am – 5.00pm

Learn the proper way of payroll processing to avoid unnecessary expenses or even violations of employment acts and regulations.



RECENT DEVELOPMENTS ON EXTENSION OF TIME AND LIQUIDATED DAMAGES

17 Jan 2023 | 2.00pm – 5.00pm

Find out what is the legal position of concurrent delays under standard form contracts in Singapore.



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10 Feb 2023 | 9.30am – 5.30pm

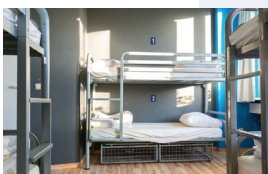
Gain insights into emerging technologies and how organisations may harness these technologies to their advantage



CRITICAL SAFETY ASPECTS IN CONSTRUCTION PROJECTS

2 Mar 2023 | 1.00pm – 5.00pm

Understand the hazards involved in construction sites and learn how to minimise risk by knowing how to implement the appropriate risk control measures.



EXPANSION OF THE FOREIGN EMPLOYEE DORMITORIES ACT 2015 (FEDA) IN A POST-PANDEMIC ERA

6 Mar 2023 | 2.00pm – 4.00pm

Find out what the new changes arising from the expansion of the FEDA are and the key standards to be complied that you should of by operators of migrant worker dormitories.



3S (SAFETY, SECURITY AND SUSTAINABILITY)

8 Mar 2023 | 9.00am – 1.00pm

Learn how to incorporate the 3S specifically in your role to perform better and more efficiently.



Understanding COP on Chief Executives and BOD WSH Duties

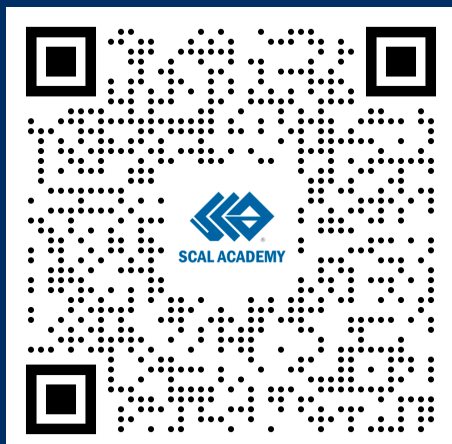


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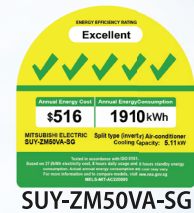
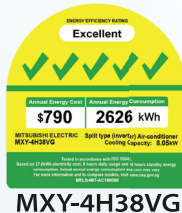
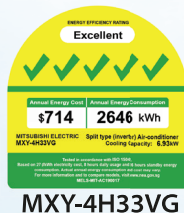
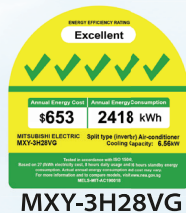
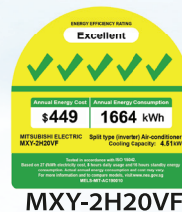
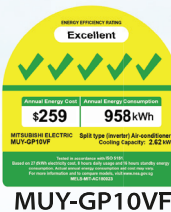


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