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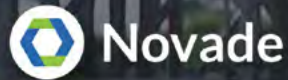
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COVER STORY

Gearing up for the digital leap

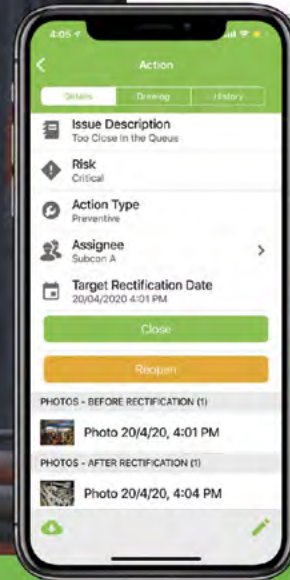
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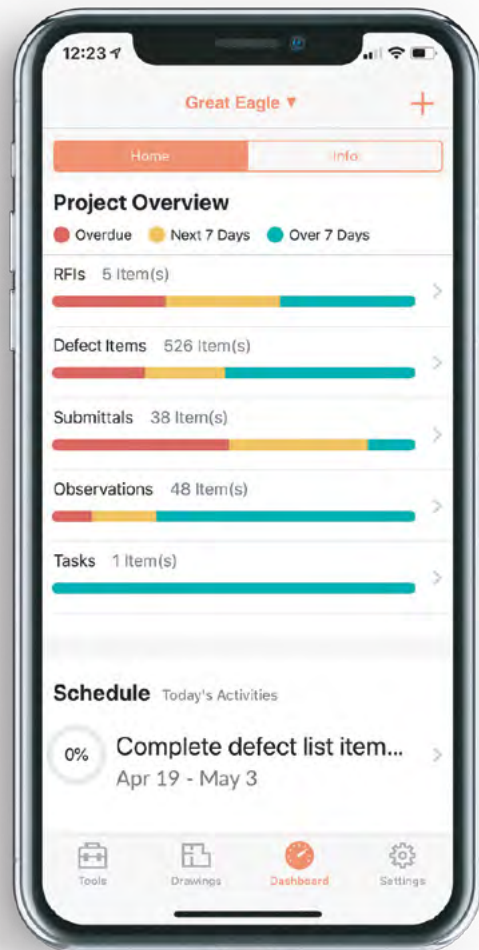
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President
The Singapore Contractors
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“We will persevere in advancing the mission of SCAL and do our utmost to move the industry out of this difficult time towards a better tomorrow.”

PRESIDENT'S MESSAGE

As COVID-19 continues to impact the construction sector in the 2nd quarter of this year, SCAL pressed ahead in our role to help the industry overcome short-term challenges and to stay focused on long-term growth in the future.

Knowing that Workplace Safety and Health (WSH) is an issue of growing concern amidst the pandemic, SCAL continued to promote good WSH standards. Our efforts included organising the 'Innovation and Technology for the Construction Industry' roadshow and seminar on 9 April 2021 to boost the capacity of SCAL members in harnessing technology to improve WSH; and the SCAL Safety Campaign 2021 with the theme "Plan Safety, Work Safely" on 25 June 2021.

We also launched the Construction Site Traffic Management Guide to promote better traffic management and reduce risk of traffic-related accidents at worksites; presented the WSH Innovation Awards 2021 and WSH Awards for Supervisors 2021 to recognise exemplary achievements in WSH in Singapore.

In the meantime, SCAL has also not taken our eyes off the goals of the Construction Industry Transformation Map (ITM).

We continued to champion capability development for the sector by taking over the administration of the Certified Quality Mark/CONQUAS Supervisor and Manager schemes; and set our sights on rolling out the Construction Professional Accreditation Scheme (CPAS) in the near future. These schemes play a key role in enhancing recognition and career progression pathways for quality assurance and quality control personnel; and construction project managers respectively.

In 2019, we announced the launch of SCAL Accredited Builders Scheme (SABS) during our annual dinner to help small and medium sized local contractors with a benchmark to raise quality and standards. The scheme will enable accredited builders to be recognised for having sound quality

management systems covering areas such as quality, safety, contractual practices and sustainability.

All the above mentioned schemes will also encourage upskilling within the construction industry to embrace future challenges.

I am also pleased to share that SCAL's plans to redevelop 10 Tannery Lane into the new Construction Hub has made important progress, with the appointment of LAUD Architects as the project's architectural consultant in May 2021. Their well-thought-out planning and layout form will support our vision of creating a one-stop centre that will enable us to better implement the Construction ITM.

In this issue, we are also delving into the topic of digital revolution – identified in the Construction ITM as a key global trend shaping the construction sector. Our aim is to bring construction firms to the forefront of the industry's digital transformation, as well as showcase success stories of SCAL members who have reaped the benefits of digitalisation – and spur more companies to do the same.

I would like to take this opportunity to thank all SCAL members for their participation in the 43rd Annual General Meeting (AGM) held on 29 June 2021. I am humbled and honoured to be re-elected as the SCAL President. Thank you for your support.

Together with the elected or re-elected Council Members, we will continue to advocate for members, particularly in areas where you are facing the greatest challenges including manpower, contracts, digital transformation, financial support and internationalisation. We will persevere in advancing the mission of SCAL and do our utmost to move the industry out of this difficult time towards a better tomorrow.

Ng Yek Meng
President
The Singapore Contractors Association Ltd

GEARING UP FOR THE DIGITAL LEAP

Digital transformation is steadily gaining traction in Singapore's built environment industry. More construction players are embracing technological advancements to enhance productivity, reduce costs, improve safety and create better jobs – and realising the value of going digital.

A key driver of this digitalisation trend is the Construction Industry Transformation Map (ITM). Launched in 2017, the ITM envisions an advanced and integrated built environment sector in Singapore with widespread adoption of leading technologies.

Since then, significant progress has been made in the rollout of Integrated Digital Delivery, or IDD - identified under the ITM as a key area for transformation. More than 35 IDD projects are currently underway and IDD capabilities have also been built up in more than 150 firms.

Such advancements have made important contributions to the construction industry's output, leading to a seven per cent improvement in productivity since 2017.

One firm that has been successful in riding the digital wave is Boustead Projects. Weighed down by onerous paper-based administration processes, the company decided to progressively digitise its business including adoption of IDD and Industry 4.0 technologies.

This digital push has enabled Boustead to boost productivity, enhance quality management, drive sustainability and gain visibility on progress of projects. Please refer to page 18 for more information on Boustead's transformational journey.

The pandemic factor

COVID-19 has further quickened the pace of the construction industry's digital transformation. More firms are ramping up their digital investments to reduce reliance on manpower and promote productivity, to overcome near-term labour shortage and build long-term resilience.

The government has been guiding more construction firms to seize the window of opportunity to transform, with the launch of various digital initiatives. Examples include a S\$20 million Advanced Digital Solutions (ADS) scheme for firms to build integrated digital solutions to keep worksites and workers safe; and the Intelligent National Productivity and Quality Specifications (INPQS), a cloud-based digital platform, to help firms reduce time needed for generating and sharing project files.

In addition, the Digitalising Built Environment Alliance for Action (AfA) has also identified Common Data Environment (CDE) Data Standards as a key enabler to drive digitalisation across the entire value chain.

In all, 2020 was a year that proved the ability of the construction industry to move in the digital direction, according to Procore, a construction project management software company. Please refer to page 14 for Procore's insights into connecting the site and office as the step towards successful digital transformation.

Job Redesign in the Digital Age

As the industry heads into a digital era, jobs in the sector are also undergoing a transformation. New roles such as Building Information Modelling (BIM) specialists, digital delivery managers and IDD application specialists – many of which did not even exist a decade ago – are now in high demand.

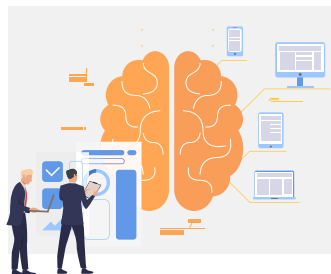
BCA has identified the emerging skills needed to support the transformation of the built environmental sector, alongside existing competencies, in the Skills Framework for Built Environment. They include BIM Application, IDD Application and Smart Facilities Management.



BIM Application - Using BIM to make design, project and operational information accurate, accessible and actionable



IDD Application - Driving the adoption, integration and implementation of IDD technologies to manage projects and building life-cycle efficiently from digital design, digital fabrication and digital construction to digital asset delivery and management



Smart Facilities Management - Integration of digital technologies and smart automation into facility operations and maintenance to optimise efficiency and performance

Cognizant of the growing demand for BIM-trained individuals, BCA has launched the Professional Conversion Programme (PCP) for BIM Professionals to train mid-career individuals to make the switch to the built environment sector. SCAL members can work with the BCA Academy to provide on-the-job training for programme participants and fill up their BIM roles.

Planning for the Future

Whilst digital skillsets are rising in importance, established roles, such as engineers, site supervisors and architects are still very much in demand. For example, the industry is currently facing a shortage of site supervisors.

How should firms then plan their manpower to face current and future needs, as competition for skilled manpower becomes more intense in the industry?

A clear goal is upskilling. This starts with knowing the skills well-represented in your current employees, the skills needed to fill in the gaps and recognising that competencies will only get more technology-driven, as artificial intelligence, autonomous construction equipment and drones become more commonplace in the industry.

Consider using predictive hiring practices to understand, analyse and invest in the right technology and approaches for future skills; and training those staff interested to develop their skills to fill current or upcoming roles.

For the longer term, it is also important for construction companies to explore partnerships with Institutes of Higher Learning and schools and collaborate with them to recruit for the future.

Leading the digital charge

Adoption of digitalisation is no longer a choice for the construction sector – it has become a necessity and a game-changer. The government's imminent rollout of Corenet X will accelerate this trend in Singapore, as it will become mandatory for construction firms to digitalise their work processes.

To put our construction industry in the best position to capture the opportunities ahead, the newly elected SCAL Council of Management has identified digital transformation as one of our key thrusts for the next two years. This involves contributing to the development of the Construction ITM2, with the aim of promoting greater collaboration and innovation while reducing reliance on labour.

SCAL is committed to support our members to stay ahead of the digitalisation curve and successfully reach our common goal of building better and faster.

“SCAL is committed to support our members to stay ahead of the digitalisation curve and successfully reach our common goal of building better and faster.”

SCAL 43RD ANNUAL GENERAL MEETING (AGM)

Mr Ng Yek Meng re-elected as SCAL President for a second term at the 43rd Annual General Meeting



Left to right: Mr Wilson Wong, Mr Ng Yek Meng and Mr Yong Jian Rong



Members attending the 43rd AGM

The Singapore Contractors Association Ltd (SCAL) held its 43rd Annual General Meeting (AGM) on Tuesday, 29 June 2021 at the SCAL Multi-Purpose Hall.

Chaired by SCAL President, Mr Ng Yek Meng, the AGM began with confirmation of minutes of the 42nd AGM. Mr Yong Jian Rong, Assistant Treasurer then delivered the 2020 Financial Report, highlighting that despite challenges posed by the COVID-19 pandemic, SCAL is in a good fiscal position.

Next, Mr Wilson Wong presented the Secretary-General's report, providing a comprehensive overview of the construction industry in 2020. He updated members about the impact of the pandemic on construction demand that resulted in a drop of 36% from \$33.5 billion in 2019 to \$21.3 billion in 2020.

Mr Wong also shared that since the onset of the crisis, SCAL has represented members in voicing concerns and challenges; and set in motion initiatives to support the industry. These initiatives include the SCAL Back-to-Work Taskforce, the SCAL COVID-19 fund, the SCAL Construction Manpower Exchange Programme (SCMX) and the distribution of care packages and personal protective equipment to hospitals and foreign workers.

SCAL also managed to address key issues with levy waivers and rebates being granted including a 100% levy waiver and \$750 rebate in June 2020, 50% levy waiver and \$375 rebate in July 2020, and monthly levy rebates of \$90 for each work permit holder for over a year from August 2020 until December 2021.

He then reported on SCAL's activities and events in 2020, including the virtual launch of the Young Leaders Programme in September 2020. He also provided insights into the construction industry outlook, where construction demand is expected to grow to between \$23 billion and \$28 billion in 2021.

He concluded his presentation by highlighting key challenges in the road ahead including manpower shortage as well as the need for digitalisation and internationalisation. He emphasised that SCAL will continue to work closely with government agencies and stakeholders to advocate for members on these issues.

“We have identified digital transformation, sustainability, professionalism, talent attraction and enhanced member support through the new Construction Hub as our priorities,” said Mr Ng.

Election of Council of Management for term 2021 - 2023

Elections for 18 SCAL council member positions for the term of 2021 - 2023 were held during the AGM. The newly elected Council of Management comprises:

President: Mr Ng Yek Meng (re-elected)
 1st Vice President: Mr Lee Kay Chai
 2nd Vice President: Mr Quek Hong Peng
 Secretary General: Mr Wilson Wong
 Assist Sec-Gen: Mr Roy Khoo
 Treasurer: Mr Yong Jian Rong
 Asst Treasurer: Mr James Yuen
 Immediate Past President: Mr Kenneth Loo

Council Members:

Mr Kenneth Siew
 Mr Dominic Choy
 Mr Benjamin Tan
 Mr Jeffrey Yu
 Mr Goh Poh Khim
 Mr Jacob Wong
 Mr David Leong
 Dr Ho Nyok Yong
 Mr Raymond Chan
 Mr Edmund Eng

"I am honoured to be re-elected as the SCAL President for a second term. 2020 has been an unsettling and difficult year for Singapore's construction industry. As we embark on the next two-year journey for SCAL, my Council and I will continue to help the industry overcome present challenges and transform into a sector that is progressive, productive and professional. We have identified digital transformation, sustainability, professionalism, talent attraction and enhanced member support through the new Construction Hub as our priorities," said Mr Ng.

After the election, Mr Ng Yek Meng declared the conclusion of the 43rd AGM.


SCAL COUNCIL (2021-2023)

PRESIDENT  Mr Ng Yek Meng Progressive Builders Pte Ltd	FIRST VICE PRESIDENT  Mr Lee Kay Chai Lian Soon Construction Pte Ltd	SECOND VICE PRESIDENT  Mr Quek Hong Peng Quek & Quek Civil Engineering Pte Ltd
SECRETARY GENERAL  Mr Wilson Wong LC&T Builder (1971) Pte Ltd	ASST. SECRETARY GENERAL  Mr Roy Khoo Kimly Construction Pte Ltd	TREASURER  Mr Yong Jian Rong Woh Hup (Private) Limited
ASST TREASURER  Mr James Yuen Gammon Pte Ltd	IMMD PAST PRESIDENT  Mr Kenneth Loo Straits Construction Pte Ltd	COUNCIL MEMBER  Mr Kenneth Siew Expand Construction Pte Ltd
COUNCIL MEMBER  Mr Dominic Choy Hexacon Construction Pte Ltd	COUNCIL MEMBER  Mr Benjamin Tan Ho Lee Construction Pte Ltd	COUNCIL MEMBER  Mr Jeffrey Yu HSL Ground Engineering Pte Ltd
COUNCIL MEMBER  Mr Goh Poh Khim Koh Brothers Building & Civil Engineering Contractor Pte Ltd	COUNCIL MEMBER  Mr Jacob Wong Kwan Yong Construction Pte Ltd	COUNCIL MEMBER  Mr David Leong Low Keng Huat (Singapore) Limited
COUNCIL MEMBER  Dr Ho Nyok Yong Samwoh Corporation Pte Ltd	COUNCIL MEMBER  Mr Raymond Chan Teambuild Engineering & Construction Pte Ltd	COUNCIL MEMBER  Mr Edmund Eng Wan Chung Construction (SIN) Pte Ltd

The incoming SCAL council



New SCAL Executive Director

SCAL also welcomed its new Executive Director, Ms Louise Chua at the AGM. Armed with 27 years of experience in the exhibition and conference industry, including 14 years in the Built Environment industry, Ms Chua will helm the SCAL Secretariat to support the SCAL President and the Council to carry out SCAL's tasks.

She has a wealth of experience driving engagement activities with the Built Environment fraternity and long-term partnerships with key multinational stakeholders of the construction value chain.

Correction note:

The article "Members show support as they attend 42nd Annual General Meeting 2020 during Phase Two of the pandemic" in the Jul - Dec 2020 issue of The Contractor stated that a sum of \$45 million was initially approved at the 38th AGM in 2018 for a new SCAL building. This is incorrect. It should be the 39th AGM in 2017. We apologise for the error.

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**MAKE YOUR MARK FOR
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SCAL CHOSE LAUD ARCHITECTS AS ARCHITECTURAL CONSULTANTS FOR NEW CONSTRUCTION HUB

Moving forward with its plans to redevelop the building at 10 Tannery Lane into the new SCAL Construction Hub, SCAL appointed LAUD Architects as the project's architectural consultant in May 2021.

A home-grown architectural firm, LAUD Architects was chosen out of five strong submissions. The decision was based on their well thought-out planning and layout that seamlessly integrates office, learning and greenery spaces into one; and a design treatment that mirrors SCAL's robust and firm image.

Their proposal supports SCAL's vision for the hub to offer one-stop services for Singapore's construction industry, contractors and other stakeholders.

LAUD Architects fulfils requirements for the hub to not only house SCAL's head office, subsidiaries and training facilities, but support its plans to offer new and expanded services to its customers and the construction industry at large; and incorporate an innovation centre to showcase latest construction technologies. Their design also integrates a multi-purpose hall, a meeting point for smaller construction-related trade associations and a Lu Ban Hall to honour the tradition of SCAL.

With work commencing with LAUD Architects as the consultant for the architectural, interior design and construction of the development, Singapore construction industry's contractors can look forward to a new place to meet, network and collaborate by Q2 of 2023.

The five design proposals for SCAL Construction Hub



2021 WSH AWARDS RECOGNISE OUTSTANDING ACHIEVEMENTS IN PROMOTING SAFETY AND HEALTH IN WORKPLACES

Winners of the WSH Innovation Awards 2021 and WSH Awards for Supervisors 2021 for the construction industry were unveiled at the SCAL Safety Campaign 2021 Webinar on 25 June. Mr Lee Kay Chai, First Vice President, SCAL presented the awards to recognise exemplary achievements in Workplace Safety and Health (WSH) in Singapore.

At the event, the WSH Innovation Awards 2021 were bestowed upon teams in the following organisations for implementing innovative solutions to improve safety and health standards in their workplaces:

- Gold Award: Welltech Construction Pte Ltd
- Silver Award: Chip Eng Seng Contractors (1988) Pte Ltd
- Bronze Award: Tiong Seng Contractors Pte Ltd

This year's WSH Awards for Supervisors were conferred upon the following individuals for taking care of their workers by enhancing safety and health performance in their workplaces:

- Gold Award: Wong Zhi Xue from Teambuild Engineering & Construction Pte Ltd
- Silver Award: Chinnadurai Satish from Straits Construction Singapore Pte Ltd
- Bronze Award: Manogaran Nandakumar from Woh Hup (Private) Limited

These winners had been evaluated by a panel of judges comprising representatives from the government authorities and professional organisations using stringent criteria.

"This year's winners have set remarkable examples in the advancement of WSH in the construction industry. We hope that the awards will inspire other practitioners to push WSH standards to new heights for the well-being of our workers," said Mr Lee.

Both awards are presented annually by the WSH Council and supported by the Ministry of Manpower (MOM).





SCAL MEMBERS WELCOME THE LAUNCH OF THE CONSTRUCTION PROFESSIONAL ACCREDITATION SCHEME (CPAS)

Construction project managers play a central role in ensuring smooth and timely execution and completion of projects. As the industry transforms and projects grow in scale and complexity, it has become pivotal for these project managers to continually enhance their skills and competencies.

To elevate the level of professional standards in Singapore's construction industry and provide career progression pathways for construction project managers, SCAL announced the upcoming launch of the Construction Professional Accreditation Scheme (CPAS) in July 2021.

Prior to the launch, more than 60 SCAL member companies have already indicated interest to sign up their employees for CPAS.

New Accreditation Scheme

SCAL CPAS is a peer recognition programme for personnel performing the role of a construction project manager or equivalent, particularly targeting professionals working in contractor firms. The scheme is the latest SCAL initiative to support the goals of the Construction Industry Transformation Map.

In alignment with the Skills Framework of the Building and Construction Authority (BCA), CPAS recognises construction project managers through a standard benchmark of skills and competency standards. These standards have been meticulously curated to match the highest level of professional practices, skills and qualifications relevant to the current market.

Benefits of CPAS

- Gain recognition as an "Accredited Construction Professional" by industry stakeholders including contractors, government procurement entities and developers
- Confirmation and reflection of expertise in the field of construction project management through assessment and validation of competencies
- Identification by hiring firms as a "Construction Professional" who has achieved the stipulated level of competency and professionalism
- Upgrading of skills and maintaining up-to-date industry practices through assessment and interview procedures

Accredited personnel are entitled to use designations and post-nominals after their names, based on the given accreditation tier that is tied to their industry experience and size of project involved.

Applying for Accreditation

SCAL members interested to send their staff for accreditation can contact SCAL at 62789577 or visit <https://www.scal.com.sg/accreditation/cpas>. Only those performing the role of a construction project manager or equivalent can apply.



Figure 1: Seven key evaluation competencies under CPAS

SCAL TO TAKE OVER CERTIFIED QUALITY MARK/CONQUAS SCHEMES ADMINISTRATION

From 1 July 2021 onwards, the Singapore Contractors Association Limited (SCAL) has taken over the administration of the Certified Quality Mark/CONQUAS Supervisor and Manager schemes.

This move is in line with the Construction Industry Transformation Map (ITM), whereby Trade Associations and Chambers (TACs) are encouraged to lead industry transformation by championing capability development.

By administering the schemes, SCAL aims to strengthen its contributions to the transformation of Singapore's Built Environment sector, in partnership with the Building and Construction Authority (BCA).

Launched in January 2007, these schemes accord recognition to construction industry personnel who play pivotal quality assurance (QA) and quality control (QC) roles in delivering projects of high quality. These projects are benchmarked against the Construction Quality Assessment System (CONQUAS), a national standard for assessing the quality of building projects.

SCAL will move forward to help more project managers, engineers and supervisors performing quality assurance (QA) and quality control (QC) roles obtain professional certification in support of their career progression. In doing so, it hopes to better support SCAL members in building up a substantial pool of quality personnel and raise the overall workmanship quality of the industry.

Interested and existing certified applicants can email SCAL at accreditation@scal.com.sg with immediate effect or visit <https://bit.ly/SCALCONQUAS>



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DIGITISING CONSTRUCTION: CONNECTING THE SITE AND OFFICE

The construction industry is one of the largest sectors in the world, employing approximately 7% of the world's working-age population. Being such a large contributor to the global economy (about US\$10 trillion is spent each year), it should also be the most efficient at labour productivity. However, in the last 20 years, labour productivity in construction has increased by only 1%. In contrast, other industries such as manufacturing have grown by 3.6% in the same time period. A recent McKinsey report found that if construction productivity was to catch up with the rest of the economy, it could rise by an estimated US\$1.6 trillion per year.

Why has the construction industry failed to move the productivity needle?

Experts suggest that a large part is due to poor connectivity between the construction site and the office. Project information that

is delayed or not delivered and received in real-time, coupled with constantly evolving compliance regulations, easily creates a productivity nightmare. As the industry moves away from manual paper processes, it is becoming more important than ever for companies to implement leading technology solutions to help improve this.

If anything, 2020 has proven construction is very able to move in the right direction.

With advancements in AI, BIM, robotics, mobile capability and 3D printing, coupled with many governments now endorsing a move to a more digitised solution, the industry is proving it can take on technology with ease. But while these tools address their individual issues really well, they tend to operate as single-point solutions that silo their information within their own system. This often results in disjointed systems which

hinder collaboration and prevent companies from gaining a true, comprehensive picture of project health. Simply put, it makes the whole project management process more cumbersome.

Growth is very much anticipated for the region

This means that the demand for construction technology is at an all-time high and with companies under pressure to complete projects more efficiently and safely, businesses are calling for technology that is both simple to use, scalable and built 'for-purpose'. The answer lies in technology that operates more like a complete platform for project management, connecting the dots between functions. With centralised data, standardised processes and streamlined workflows, all-in-one solutions lead to enhanced communication and greater consistency between project teams and clients. As a result, projects progress more efficiently, morale skyrockets and most importantly, productivity dramatically improves.

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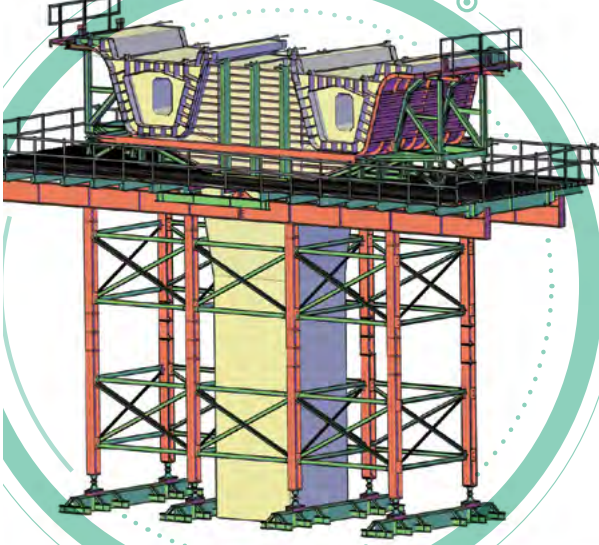
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MILLENIA PTE LTD V DRAGAGES SINGAPORE PTE LTD AND OTHERS [2018] SGHC 193

Introduction

This short note considers some important aspects of construction law raised in the decision of *Millenia Pte Ltd v Dragages Singapore Pte Ltd and others* [2018] SGHC 193, which are generally relevant to anyone in the construction industry.

What happened in this case?

The matter concerned defects found on the façade of Centennial Tower, a prominent 35-storey Grade A office skyscraper in the Marina Centre downtown area. The façade was originally clad in over 16,000 granite stone panels of around 1m (width) x 1.6m (height) x 30mm (thickness), each weighing over 100kg. The design life of the building was 50 years.

The building was commissioned by Millenia Pte Ltd (formerly known as Pontiac Marina Pte Ltd) ("Millenia") in 1995. The main contractor for the project was Dragages Singapore Pte Ltd ("Dragages"), which contracted with Millenia in December 2015 ("Contract"), under a modified version of the Joint Contracts Tribunal Standard Form of Building Contract with Contractor's Design (1981). The sub-contractor in charge of the façade installation was Builders Shop Pte Ltd ("Builders Shop"). The parties were also advised by façade consultants, namely Arup Singapore Pte Ltd ("Arup") for Millenia and Meinhardt Façade Technology ("Meinhardt Façade") for Dragages.

Practical completion of the building was achieved in September 1997. At the same time, Millenia, Dragages and Builders Shop executed a deed of warranty ("Deed") under which, for a period of 15 years, Dragages and Builders Shop were obliged to remedy any defects in the works.

In September 2004, a stone panel fell from the 29th storey of Centennial Tower. No one was injured, but the Building and Construction Authority ("BCA") ordered an investigation and asked Millenia to propose rectification. This led to a series of disputes between the parties, which eventually concluded in a settlement in 2007. Under the terms of the Settlement Agreement, Dragages and Builders Shop agreed that there would be an inspection and rectification of the façade. The rectification works were completed in October 2009, although the parties were subsequently unable to agree that the said works were done satisfactorily.

On 10 February 2011, a second stone panel fell from the 25th storey of Centennial Tower. This time, two passers-by were injured by the debris and significant property damage was caused. Consequently, Millenia decided to reclad the entire façade on the advice of Arup, and sued Dragages and Builders Shop for their breaches of duty resulting in serious and substantial defects on the façade of the building. Millenia also sued Meinhardt Façade and Arup, the parties' consultants, for their role in the inspection process.

The Court found that Dragages and Builders Shop had breached their duties under the Deed and the Settlement Agreement; and that Millenia was entitled to recover the costs of recladding the façade from them. Although the Court agreed that Dragages and Builders Shop had also breached their duties in tort and under the Contract, such claims were time-barred and compromised by the Settlement Agreement. The claims against Meinhardt Façade and Arup were dismissed.

Why is this case important?

Many significant legal issues were raised in the suit. This article focuses on two.

The definition of "defects"

One key clarification given by the Court that a defect is work that does not comply with contractual requirements (at [226]). However, it is important to distinguish between two types of defects.

First, if there is a specific contractual requirement, e.g. for the size of materials to be installed, then all that a complainant needs to show is a departure from these specifications to demonstrate that the works are defective. There is no further requirement that such work has to compromise the safety and structure integrity of the structure, or its fitness for purpose, in order to be considered a defect.

Second, if there are no specifications, drawings, or other material given in the contract to spell out these requirements, then a different standard applies. Such works will be considered defective only if they do not comply with general contractual requirements such as safety risks (which must be real and non-speculative) and fitness for purpose.

Design life of the building

The purpose of the building was to serve as an office building that allowed its occupants to enter and exit safely. The Court agreed that under the Contract, the Deed and the Settlement Agreement, Dragages and Builders Shop had the obligation to exercise care and skill in designing and constructing the building, and to ensure that the works were fit for purpose.

To decide whether those obligations had been met, the Court extensively relied on the fact that the design life of the building was meant to be 50 years. This was evident in two key aspects.

First, the technical experts who testified in Court, including from Meinhardt Façade and Arup, gave the view that many of the panels that Millenia alleged to be defective were not in immediate danger of falling, and therefore did not pose a safety risk. The Court disagreed and held that it was not necessary that there should be an immediate danger of falling for a safety risk to arise, because the design life of the building was 50 years (at [246]).

Second, Dragages argued that the defects found on the façade were due to vibrations generated by nearby MRT works. The Court disagreed and made several important observations:

The applicable vibration threshold is found in the German standard, DIN 4150: Part 3 (1999) as adopted by the BCA and Land Transport Authority, and that because the MRT works had taken place over some years, the standard for long-term vibrations was appropriate. As the building was for commercial use, Line 1 of the DIN standard was applicable – notwithstanding that certain elements such as the cladding may have been more sensitive to vibration.

Objective data, such as vibration meters, will be given greater weight than subjective evidence, such as complaints from tenants – because human perception is not a reliable metric for assessing vibrations that occurred.

In a dense city state such as Singapore, a building should be designed to have a certain degree of robustness, and the warranties given by the builder did extend to ensuring that the building would be able to withstand foreseeable vibrations generated by construction activity in the vicinity.

Although the Court did not explicitly refer to the design life of the building when making such observations, it is evident that a building meant to last 50 years, and situated in an area where neighbouring construction activity was to be expected, should be sufficiently "robust" to withstand ordinary levels of vibrations not exceeding the applicable DIN standards.

Conclusion

The Centennial Tower litigation is a critical decision by the Singapore Court that deserves careful attention from the construction industry. Not only does it define what constitutes a defect, it also clarifies what constitutes a "safety risk", and the considerations to be borne in mind when designing a building to be sufficiently robust in the eyes of a Singapore Court.

One final point is this. Because of the comments made about the design life of the building (i.e. 50 years), some questions have been raised as to whether – as a result of this decision – contractors are now on the hook for defects even after the statutory or contractually agreed defects liability period. That is not the correct reading of this decision. The limitation period for claims is unchanged by the decision, and the Court also recognised that the usual limitation periods of 6 and 15 years (as agreed under the Deed) applied to bar Millenia's claims.

The only relevance of the design life is confined to the question of whether the building was fit for purpose – at the time that the dispute arose, and not afterwards. The Court referred to the design life of 50 years as the benchmark by which it assessed the safety of the façade. This meant that if there is evidence, for example, that a panel is in danger of falling after 5 – 7 years, i.e. in the medium or long term, then that panel could well be considered defective because the design life was for much longer. But that is not to say that Millenia was free to wait for another decade before it decides to sue. If it did, then its claim may well have been thrown out, regardless of whether latent defects in the panels are later discovered.



Article contributed by:

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Jiaxiang is a specialist in handling complex commercial disputes. He has handled disputes stemming from diverse industries such as energy, telecommunications, oil and gas, steel, commodities, pharmaceuticals, water and chemical processing, signal and defence technology.

BOUSTEAD PROJECTS' DIGITALISATION JOURNEY - USING DATA TO IMPROVE QUALITY MANAGEMENT IN CONSTRUCTION

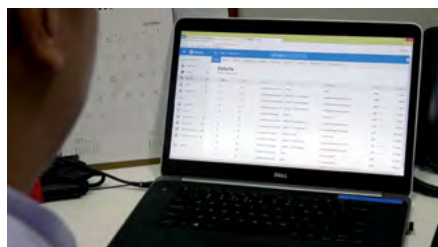
Established in 1996, Boustead Projects has constructed and developed more than 3,000,000 square metres of real estate in Singapore, China, Malaysia and Vietnam. Its wholly-owned design-and-build Singapore subsidiary is an eco-sustainability leader and a champion of best practices for quality, environmental and workplace safety and health (WSH) management.

Challenges faced by Boustead Projects

Boustead Projects' teams were weighed down by the onerous administrative process of having to first manually fill paper forms then enter the data.

Besides taking time away from doing value-adding work, such inefficiencies in capturing data also did not support real-time tracking of project completion status. The multi-channel on-site communication – emails, paper-based reports and various messaging apps also led to difficulty in traceability.

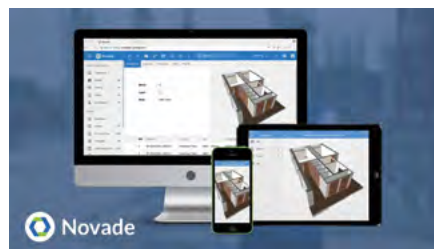
Aiming to improve construction quality management and provide real-time project status visibility for over 14 projects in Singapore, Boustead Projects decided to digitalise and automate all critical site processes.



Injecting new thinking to an old problem

They set targets to progressively digitalise their business by adopting transformative methodologies including Integrated Digital Delivery (IDD) and Industry 4.0 technologies and seek strategic partnerships to co-create smart, eco-sustainable and future-ready developments.

By using Novade Quality Module, a key feature of the Novade enterprise platform, their team has successfully eliminated manual form-filling and transited to digital data entry – using mobile phones.



Real-time project status visibility

For Boustead Projects, managing tasks and project status involving data input, consolidation and retrieval was time-consuming and resulted in non-homogeneous data, time lag, data loss and huge physical storage spaces for document archival.

To improve productivity and traceability, Boustead Projects worked with Novade to digitalise all repetitive sequential tasks and enable better data collection. They can now gain visibility of key project data and keep track of project status in real time, on or off the field; and give decision-makers reliable, instantaneous data for smarter, faster and safer business decisions.

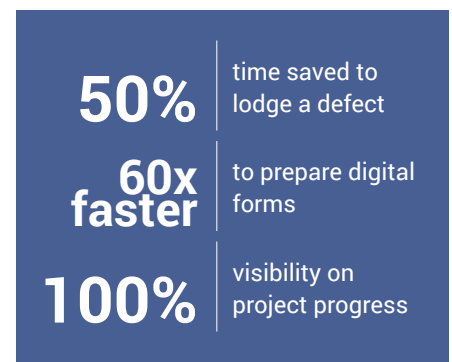
Connectivity in construction

With the creation of 28,000 quality forms, Boustead Projects has enabled more than 900 site personnel users to identify and rectify 13,000 defects, with more than 67,000 tasks created to manage activities in the field.

Integrating Novade's solutions with Boustead Projects' existing Building Information Modelling (BIM) software to connect workflows and data has also enabled seamless management of quality issues and continual accessibility of latest designs.

Reduced administration costs & increased productivity

With Novade, digital forms are now ready in just four minutes, compared to the typical 240 minutes taken for a conventional inspection process. Lodging of a defect has also been reduced from one minute on paper to half a minute in the app. The ability to instantly export relevant data from the Novade platform in digital format has also quickened report preparation.



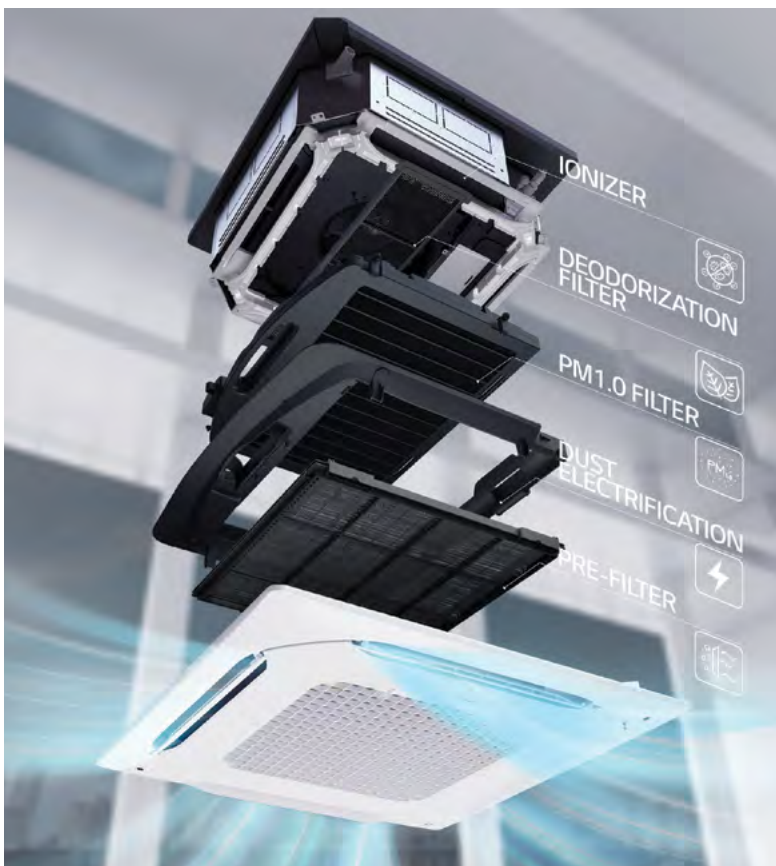


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¹TUV has verified to remove 99% of 3 kinds of adhering bacteria (Staphylococcus aureus, Escherichia coli and Pseudomonas aeruginosa). ²Intertek has verified that tobacco adhesive odor intensity is reduced from 3.6 to under 1.5 after 60 minutes (Toluene, Ammonia, Acetic acid). ³The Air purification kit can be purchased as an option. ⁴The bacteria and virus removal performance was verified by TUV Rheinland in the test No. 60375745 001, to remove 99.9% of Staphylococcus epidermidis bacteria in 60 minutes and remove 99.4% of Phi-X174 virus in 30 minutes in a 60 m³ chamber and by Intertek in the test No. RT20E-S0054, to inactivate 99% of bacteria on the surfaces. ⁵The fine dust removal performance of the air purification kit was verified by TUV Rheinland in the test No. 60382341 001, based on the Korean experimental standard SPS-KACA002-132, 2018, to eliminate 99.9% of fine dust of 50 nm and 100 nm.

E-PERMIT TO WORK (E-PTW) SEMINAR SHOWCASED INNOVATIVE DIGITAL SOLUTIONS

To boost the capacity of SCAL members in harnessing technology to improve workplace safety and health (WSH), the SCAL WSH Sub-committee organised the 'Innovation and Technology for the Construction Industry' roadshow and seminar at the SCAL @ Construction House on 9 April 2021.

The event focused on deepening members' understanding of the latest digital solutions for Permit to Work, a requirement for WSH for the construction industry; and putting them in touch with cost-effective e-PTW solutions. It was held in support of one of the three National WSH 2028 strategies – promoting technology-enabled WSH.

More than 80 SCAL members attended the event over two sessions, in strict adherence to safe management measures. The presenters include e-PTW vendor Novade Solutions giving insights on "The Importance of Safety as a Mindset"; and another vendor AcuiZen Technologies providing insights on empowering the construction industry with simple, scalable and sustainable digital solutions for managing operational workflows and to continually upskill the workforce.

Participants also had the opportunity to view live demonstrations of the vendors' e-PTW solutions for possible implementation at their worksites. This has enabled them to take an important step forward in digitalising their PTW systems to realise greater safety at construction worksites.



SCAL SAFETY CAMPAIGN 2021 WEBINAR PROMOTES "PLAN SAFETY, WORK SAFELY"

As safety and health of all our employees remain as a top priority amidst the pandemic, SCAL chose "Plan Safety, Work Safely" as the theme for this year's online Safety Campaign. Held on 25 June, the annual event stressed upon the need for careful planning throughout the life cycle of a project from conceptualisation right through its execution till demolition.

Attended by over 400 participants, the webinar saw representatives from several regulatory institutions presenting on a range of pertinent topics including:

- "Recent Accident Case Studies and Learning Points" by Ministry of Manpower
- "The New ConSASS Programme and Checklist" by Association of Safety Auditing Firms (ASAF)
- "Revised Code of Practice for Environmental Control Officer for Construction Sites" by National Environment Agency (NEA)
- "Dengue Prevention and Control in Singapore" by NEA

NEW CONSTRUCTION SITE TRAFFIC MANAGEMENT GUIDE TO PROMOTE SAFE WORKSITES

SCAL has published another useful resource for the construction industry in Singapore - the Construction Site Traffic Management Guide. The compendium serves as a valuable reference guide to enable contractors to better manage traffic and reduce risk of traffic-related accidents at worksites.

The guidebook covers a comprehensive range of topics related to worksite traffic management including principles in traffic safety, factors leading to traffic-related hazards, examples of such hazards and recommended control measures to eliminate or mitigate risks. It also provides a summary of the latest innovative tools for traffic management on construction sites.

Through this guide, SCAL hopes to spur contractors to develop their own traffic management plans, implement control measures and regularly review adopted traffic management systems. These steps are critical in removing potential risks that could result in loss of lives, human injuries and property damage; as well as lead to stop work orders that could negatively impact a contractor's productivity, reputation and business opportunities.

Prepared by the Construction Site Traffic Management Guide Working Group, the guide was approved by the SCAL Workplace Safety & Health Sub-committee on 31 March 2021 and is now available for download at the official SCAL website.

- "Requirements for Workers and Worksite Operations to Sustain a COVID-Safe Built Environment Sector" by Building and Construction Authority

The 2021 WSH Innovation Gold Award winner, Welltech Construction also took the stage to share about their project. Please refer to the WSH Awards article on page 12 for more information.

Attendees walked away from the webinar with learning points and latest updates not just on safety and health, but also on environmental control and dengue prevention. This knowledge will help them during review, development and implementation of their safety and health plans.

"The SCAL Safety Campaign was a timely event as it enabled us to learn from various authorities about the latest requirements that will impact the construction sector. The event was well organised with experienced speakers giving insightful presentations. Well done to SCAL," said Mr. Allan Low, Senior EHS Manager, Teambuild Engineering & Construction Pte Ltd, a webinar participant.

"Through the talk, NEA offered greater clarity to the roles and duties of the ECOs and the occupiers of the construction site. We also urge all contractors to maintain vigilance and do their part to stem dengue despite the lower levels of cases as compared to the previous year," said Mr. Muhd Nur Hidayat Sudirman, Senior Assistant Director, Vector Control Policy Department and Mr. Djamil Ackburally, Senior Assistant Director (Operations Control and Planning Branch), Vector Control Operations Division, Environmental Public Health Operations Group, speakers from NEA.

"The event allowed us to increase understanding of key changes made to ConSASS including

increased focus on the implementation of WSH practices, reduced questions in the Checklist and the new Scorecard format," said Mr. Lee Nam Wah, Member of ConSASS Review Workgroup, Asst Hon. Secretary of Association of Safety Auditing Firms (ASAF), another speaker at the event. Mr. Lee's updates served as an important reminder for contractors to step up their workplace safety and health management system to achieve optimum results.

In response to WSH Council's call that was issued in view of a spate of nine workplace accidents resulting in nine fatalities across various sectors, SCAL also urged all members to conduct Safety Time-Out (STO) to review and ensure that all work activities were conducted according to the safe work practices/processes.



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LET SC2 BE THE GUIDE IN YOUR ORGANISATION'S JOURNEY TO WORKPLACE SAFETY

SC2, founded in 1993 as a wholly owned subsidiary of Singapore Contractors Association Limited (SCAL), has been offering Workplace Safety and Health (WSH) management system auditing service to the industry since 1993. We can assist your organisation in fulfilling your WSH achievements with a one-stop service from start to the end of the journey.

With the contribution of our auditors, SC2 has audited the WSH management system of more than 5,000 organisations and projects of various nature and size locally and regionally. Our auditors are experienced WSH auditors approved by the Ministry of Manpower (MOM) and registered with the International Register of Certificated Auditors (IRCA).

Since its establishment, SC2 has worked proactively to enhance the bonds between management and employees to improve safety standards of workplaces.

SC2 provides the following suite of services:

1. Workplace Safety & Health (WSH) Management System Audit
2. Management System Certification
3. Physical Condition Checks (PCC)
4. Safety & Green Management Assessment (SgMA) Scheme
5. RoofSAFE Contractor Scheme
6. BizSAFE Programme

1. SC2 has helped many organisations to:

- Build up industry WSH standards and culture by strengthening the WSH management system executed at workplaces
- Improve WSH capability of the workforce in the industry
- Provide excellent and professional WSH services at reasonable prices to local industry
- Enhance industry competitive edge by minimising the financial losses from mishaps and accidents

2. Seeking to certify your company's management system, SC2

offers solutions for the following management systems:

- Singapore Standard SS 506 Part 1: 2009 – Occupational Health & Safety Management System – Specification (Accredited by SAC)
- ISO 9001: 2015 Quality Management System (Accredited by SAC)
- ISO 14001: 2015 – Environmental Management System
- ISO 45001: 2018 Occupational Health and Safety Management System (Accredited by SAC)
- British Standard BS OHSAS 18001:2007 – Occupational Health & Safety Management System

3. The Physical Condition Checks

(PCC) is an independent impromptu check to assist companies to improve their overall workplace safety.

- The surprise check helps to identify and spot lapses (unsafe acts / unsafe conditions) that may compromise your safety performance. Our professional Auditors will provide unbiased assessment and insightful feedback to help enhance your site condition and practices. With Physical Condition Checks in place, it will ensure your project team stays vigilant and safety-conscious at all times.

4. In addition, SC2 also helps organisations with the **SAFETY & GREEN MANAGEMENT ASSESSMENT (SgMA) SCHEME.**

- SCAL required all SLOTS registered contractors to obtain the SgMA Scheme. This is part of the government's efforts to extend safety awareness to SLOTS registered contractors requiring them to develop and implement a simplified occupational health & safety management system (OHSMS).

5. In response to the recent spate of fall from roof accidents, SCAL proposed the development of a **RoofSAFE Contractor Scheme** for their members. The scheme aims to help tighten up safe work procedures for the roof work community by establishing the basic WSH requirements and creating a common platform to enhance communication.

6. **bizSAFE Programme** is an initiative by WSH Council. It promotes WSH through recognition of safety efforts contributed by the organisation. In this programme, there are five different levels to achieve.

SC2 will access and evaluate your organisation's Risk Management Plan according to Workplace Safety & Health (Risk Management) Regulations. The RM audit will be carried out by a MOM-approved auditor.

So don't hesitate and do approach SCAL at www.scal.com.sg or email enquiry@scal.com.sg for more information.

SCA KEY COURSES

Apply Workplace Safety and Health in Construction Sites

Date: Weekly schedule available | Time: 8.30am – 6.00pm | Venue: 164 Gul Circle
Language: English, Mandarin, Malay, Tamil, Bengali, Myanmar, Thai | Duration: 2 Days

WSQ Apply Workplace Safety and Health in Construction Sites is a mandatory Workplace Safety and Health (WSH) training course for those who are working in the construction industry. Construction workers are required to go through the course before start work.

CET for Multi-skilling (Safety) Pathway: Workplace Safety and Health-related Trades

Date: 15 Jul, 29 Jul, 12 Aug, 26 Aug, 16 Sep, 30 Sep 2021 | Time: 9.00am – 1.00pm | Venue: Online
Language: English | Duration: 0.5 Day

We are an Approved Training and Testing Centre (ATTC) by BCA. The objective of this course is to update candidates with current developments in WSH. In this course, candidates will learn the latest regulation, code of practice, innovations on safety and good industry practices related to Workplace Safety and Health.

Develop a Risk Management Implementation Plan (Synchronous e-learning)

Date: Weekly schedule available | Time: 9.00am – 6.00pm | Venue: Online
Language: English | Duration: 2 Days

Upon completion of this course, learners will acquire the knowledge and skills to be a Risk Management Champion for the organisation in reducing risks at source by managing the risk management process at workplace and for recognition of bizSAFE Level 2 by Workplace Safety and Health Council. It involves developing a practical risk management implementation plan for the organisation that identifies specific actions to be taken, by whom and at what time for their completion. It also entails formation of risk management team, risk assessment,

controlling and monitoring the risks, communicating these risks to all persons involved and in compliance with the Risk Management Code of Practice (RMCP).

JTC Safety Induction Course

Date: Daily schedule available | Time: 8.30am – 5.30pm | Venue: 164 Gul Circle
Language: English, Mandarin | Duration: 1 Day

JTC Safety Induction Course is mandatory for every construction worker or supervisor who works in JTC worksites. Upon completion of this course, learners will be able to apply the acquired skills and knowledge to ensure safety of oneself and other personnel in all JTC projects.

Occupational First Aid Course

Date: 7 – 9 Jul, 15 – 17 Sep, 10 – 12 Nov 2021 | Time: 8.30am – 5.30pm | Venue: 164 Gul Circle
Language: English | Duration: 3 Days

Occupational First Aid Course is a mandatory training for occupational first aiders. The course aims to train individuals to render first-aid treatment to the casualty during an emergency or accident at the workplace.

Perform Design for Safety Professionals Duties

Date: 14 – 15 Jul, 5 – 6 Aug, 2 – 3 Sep 2021 | Time: 9.00am – 6.30pm | Venue: Online
Language: English | Duration: 2 Days

The "Perform Design for Safety Professional Duties" is a mandatory WSH training course for all persons who would like to undertake the role of a Design for Safety (DfS) professional. The course aims to equip learners to facilitate the DfS Review Meetings to identify and mitigate the safety and health risks. In this course, learners will also learn to maintain records of safety and health issues arising from the DfS Review Meetings and actions taken as well as to communicate Safety and Health information to Stakeholders.

Manage Work at Height

Date: Monthly schedules available | Time: 8.30am – 6.15pm | Venue: 164 Gul Circle
Language: English | Duration: 2.5 Days

Manage Work At Height course is designed to meet the minimum standards for work at height training for supervisors, assessors and managers in Singapore, as recommended in the WSH (WAH) Regulations 2013 and the Approved Code of Practice for Working Safely at Height (2011). The course aims to equip all personnel with the relevant WSH competencies to work in the construction related industry with the knowledge and skills in performing in planning, supervising, assessing and or managing work at height.

Registered Earthworks Supervisor Course

Date: Weekly schedule available | Time: 1.30pm – 5.00pm / 6.30pm – 10.00pm | Venue: Online
Language: English | Duration: 4 Days

This course aims to provide an overview of the relevant earthworks legislation and code of practice relating to construction earthworks carried out in the vicinity of the electricity cable / gas pipes. Participants will learn about the key requirements of the relevant legislation, control measures and good practices to prevent damage to the underground cable, gas pipes and services.

Workshop to Enhance the Safety of Crane Operation

Date: Monthly schedules available | Time: 9.00am – 3.00pm | Venue: 164 Gul Circle
Language: English, Mandarin | Duration: 1 Day

The objective of this workshop is to update crane operators with the latest legal requirements as well as to provide them with a platform to discuss safe lifting procedures and case studies that identifies causes of crane accidents.

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SCA UPCOMING EVENTS

Apply Labour Legislation in People-Management Practices for the Built Environment Sector

Date: 25 – 26 Aug 2021 | Time: 9.00am – 5.45pm | Venue: SCAL Bukit Merah

Apply Labour Legislation in People-Management Practices for the Built Environment Sector course is accredited by IHRP and will equip learners with in-depth knowledge of current labour policies & legislation in the Built Environment Sector. Learners on successful completion of the course and assessment will achieve the national IHRP Paper A on labour policies and legislation and be one step nearer to achieving the IHRP-Certified Professional qualification.

Dispute Resolution Mediation course for Professionals (Module 1 & 2)

Date: 22 – 28 Jul 2021 | Time: 9.00am – 5.45pm | Venue: Online

Date: 27 Sept – 1 Oct 2021 | Time: 9.00am – 5.45pm | Venue: Online

With the signing of the Singapore Convention in August 2019, mediated settlement agreement is now formally recognised by the court, and enforceable in all the signatory countries. This course will give you a basic understanding of the process of mediation and will help you understand the basic principle of mediation.

As a follow-up, enrol in Module 2 in Dispute Resolution Mediation course for Professionals on how an effective mediator one can be. There are many techniques involved in getting oneself proficient in mediating. Techniques such as active listening, body language, facial expressions, paraphrasing, reframing, and many other tools will be taught during the course. Participants will also be taking part in role playing to experience the dynamics and difficulties of mediation process. Through role playing, participants can also learn from each other about the skill and pitfalls of mediation process. In addition, participants will also be exposed to the difficulties that one would face while mediating in a conflicting cultural situation. Understand why cultural differences are deemed important factors in dispute resolutions and learn the ways to overcome the difficulties. Finally, the participants would

have to go through a practical and a written test for accreditation.

Data Analytics - Visualisation Pivotal Insights

Date: 7 Jun 2021, 18 Oct 2021 | Time: 9.00am – 5.00pm | Venue: Online

This workshop aims to provide a broad but practical overview of the entire analytics value chain, with a focus on leveraging data visualisation to facilitate the analytics process and to communicate pivotal insights. This includes building data visualisations directly from a database, from selecting the right data visualisation for the right message and building an interactive dashboard report. This is targeted at professionals and managers in non-analyst roles but may be required to work with or make sense of data and to presenting data in their work.

Data Analytics - Building & Delivering a Compelling Data Story

Date: 5 Jul 2021, 05 Nov 2021 | Time: 9.00am – 5.00pm | Venue: Online

This workshop aims to provide a broad but practical overview of the entire analytics value chain; with a focus on building a compelling narrative to secure an audience to care and to act. This includes organising pivotal messages from data into a story in a concise, coherent, and compelling fashions that makes an audience take an interest in. This workshop aims to address such capability gaps; especially for professionals and managers who have some experience with analysis, but are finding some challenges in making an impact in the “last mile” of value in analytics.

Data Analytics - Data Mining for Insights

Date: 5 Aug 2021, 13 Dec 2021 | Time: 9.00am – 5.00pm | Venue: Online

This workshop aims to provide a broad but practical overview of the entire analytics value chain, with a specific focus on the methods required to glean objective insights from data. Attendees will get a practical introduction to the analytical process, including an overview of statistical concepts and relevant analytical tools with which to apply the concepts. Attendees will also get the opportunity to get their hands “dirty” applying these concepts

with data in realistic situations to glean and interpret objective insights and draw reliable observations from the analysis. This is targeted at professionals and managers in analyst roles that require them to conduct data driven analysis to support people decisions in their organisation.

Data Analytics – Data Management & Reporting

Date: 3 Sep 2021 | Time: 9.00am – 5.00pm | Venue: Online

This workshop aims to provide a broad but practical overview of the entire analytics value chain, with a specific focus on data management and processing. Delegates will get the opportunity to get their hands “dirty” with large data sets and experience what it takes to process and manage data to deliver objective insights, which include the building and maintenance of interactive reports. This is targeted at professionals and managers in non-analyst roles but may be required to work with or manage data and reporting in their work.

Safe Management Officers Course For Construction (Synchronous E-Learning)

Date: Weekly schedule available | Time: 9.00am – 1.00pm / 2.00pm – 6.00pm | Venue: Online

The course is specifically curated for the construction sector, to equip Safe Management Officers (SMO)s and Safe Distancing Officers (SDO)s with the knowledge and skills to implement, coordinate a system and leverage on technology for effective Safe Management Measures (SMM) suitable for the sector.

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