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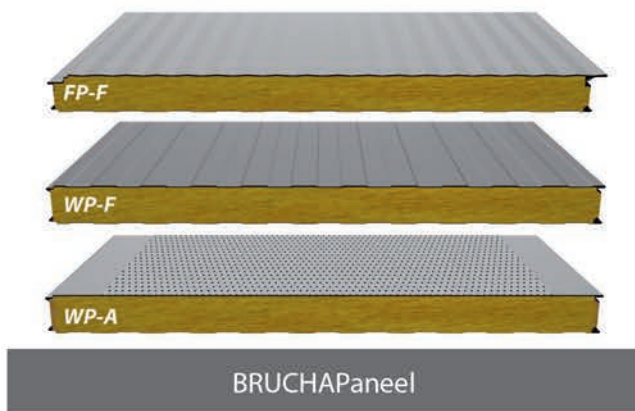
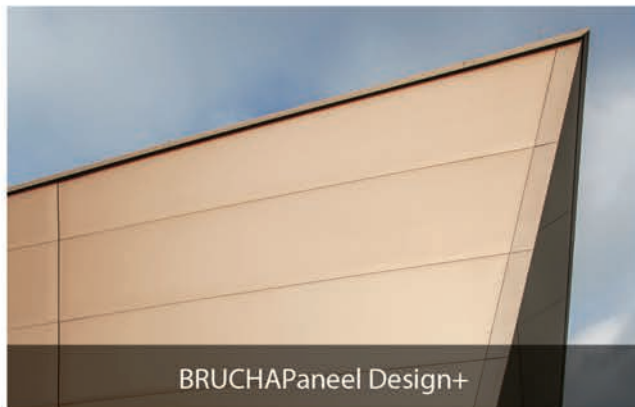
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PRESIDENT'S MESSAGE



“The construction industry is facing a period of unprecedented turbulence due to the COVID-19 pandemic. ”

In 2020, the industry expected to recover with strong demand of between \$28 billion and \$33 billion. However, the Ministry of Trade and Industry (MTI) reported that the construction sector shrank by 54.7% on a year-on-year basis in the second quarter of 2020. On a quarter-on-quarter seasonally-adjusted annualised basis, the sector contracted by a massive 95.6% in the second quarter, significantly worse than the 12.2% in the preceding quarter.

As the voice of the industry, SCAL has been championing the concerns and challenges faced by the industry amidst the COVID-19 crisis. We provided timely information, updates and clarifications through our circulars and advisories to members. Together with fellow council members, we met policy and government leaders to give feedback on the challenges confronting local businesses.

One of our key initiatives was setting up a *Back to Work Taskforce* working closely with the Building and Construction Authorities (BCA) to develop practical solutions for ensuring safe resumption of construction activities upon lifting of Circuit Breaker.

Recognising the financial difficulties of our members, we put up several proposals to Government for financial support and assistance to the construction industry. We also set up the SCAL COVID-19 Fund to help SME member firms with temporary financial relief. I am encouraged

by the strong support we have received and would like to thank members and industry partners who have come forward to help in this time of need.

As the world and Singapore emerge from this crisis, I am hopeful that the industry will rejuvenate. Construction firms will need to adopt a new normal that will encompass telecommuting, safe distancing and other safe measures at their workplaces. To be sustainable and viable in the long term, companies must embrace technology and innovate to achieve higher productivity while reducing reliance on manpower.

I would like to take this opportunity to thank my fellow council members, government agencies and other stakeholders for their hard work and support as the industry braces itself for a post-COVID era.

Most importantly, as an industry we will need to unify to ensure that the potential threat of a second wave of transmission does not occur.

Mr Ng Yek Meng

President

The Singapore Contractors Association Ltd

HELPING OUR MEMBERS TIDE THROUGH THE COVID-19 PANDEMIC

The COVID-19 pandemic has caused unforeseen disruptions to the construction industry. Many construction firms are facing labour shortage, supply chain disruptions, project delays and increased business cost. The situation was worsened when Singapore went into Circuit Breaker from 7 April 2020 to 1 June 2020 where construction companies had to stop work for two months with no revenue but yet was incurring expenses such as salary and overheads.

SCAL set up the SCAL *Back to Work Taskforce* and has been engaging the government authorities such as Building and Construction Authority (BCA), Ministry of National Development (MND), Ministry of Manpower (MOM) and government procuring entities (GPEs) to look into safe worksite, safe workers, safe accommodation, financial relief measures, contractual consideration, and resumption of works. SCAL has also provided feedback on the issues faced by the industry and has advocated for members on the following:

Financial Assistance

1. Extension of Job Support Scheme (JSS)

Advocate: Urged Government to extend the JSS of 75% in wage support up to December 2020.

Outcome: Government will co-fund 75% of the first S\$4,600 of gross monthly wages of eligible SC/PR employees from June to August. Pay out in October.

2. Foreign Worker Levy

Advocate: Full waiver of foreign worker levy plus levy rebate of \$750 for June, July and August and 75% waiver of the foreign worker levy from September onwards.

Outcome: 100% FW levy waiver and \$750 rebate in June 2020; 50% FW Levy waiver and \$375 rebate in July 2020; FW levy rebates of \$90/month for each work permit holder from Aug 2020 to Dec 2021.

3. Site Preliminaries

Advocate: To allow contractors to claim for site

preliminaries cost (exclude manpower costs) that contractors have incurred due to prolongation of projects caused by circuit breakers, slow resumption of work and reduction in productivity caused by new requirement on safe worksites.

Outcome: Public sector will provide support to the industry by co-sharing the prolongation cost of contractors on public projects for delays arising from the Circuit Breaker and controlled restart. At the request of SCAL, BCA has urged the private developers to do the same.

4. Cost of Regular Swab Test

Advocate: Alerted the cost implications to industry if employers were to bear the cost of swab testing of foreign workers every fortnight.

Outcome: Government will fund regular swabbing of workers till 31 March 2021 as part of requirements to maintain a Safe Workforce.

Resumption of Work

5. Safe Management Measures for workers on employer-provided transportation

Advocate: Gave feedback that ferrying workers under the MOM and LTA 1-metre distancing rules during Circuit Breaker is inefficient, costly and affects productivity. Highlighting that the requirements should not be more stringent than that of public transportation. SCAL proposed a 25% reduction on pre-COVID capacity for lorries in fetching workers. It should also take into consideration new arrangements to cohort workers for accommodation and at construction sites.

Outcome: Ministry of Manpower has taken into SCAL's proposal allowing 25% reduction on pre-COVID capacity for lorries in fetching workers. Safe distancing for transportation of workers to be more in line with requirements in public transport systems.

6. Facilitating the Setting up of Temporary Workers Quarters

Advocate: Provided feedback that members have to deal with multiple agencies and various

regulatory hurdles for the setting up dedicated housing such as construction temporary quarters (CTQs) and Temporary Occupation Licence quarters (TOLQs) and converting existing facilities to create safe accommodation for their workers. Requested for government to provide a centralised “green lane” application and approval for the setting up of safe accommodation. SCAL has also consulted its members extensively in recommending a comprehensive set of guidelines and a standard design template to expedite the approvals for new CTQs to provide safe onsite accommodation for their workers.

Outcome: BCA has set up a one-stop platform to facilitate the approval of CTQs, TOLQs construction and the conversion of existing workplaces and factories into suitable living quarters.

7. Swab Testing Requirement

Advocate: Provided feedback that the regular swab testing requirement on all S-Pass and Work Permit holders, whether working on site or not has added additional business costs to companies.

Outcome: BCA has removed the swab testing requirement for S-Pass and Work Permit holders staying outside dormitories, who are fully based in the offices and do not visit the worksites.

8. MOM's Pre-conditions for Levy Rebates in June and July 2020

Advocate: Provided feedback to MOM on members' concern and problem related to MOM's pre-conditions for levy rebates.

Outcome: MOM has clarified that employer who is unable to transfer or second his worker to another employer to support the early restart of other projects will not be penalised. MOM also extended the deadline to submit the acknowledgements of MOM's pre-conditions for levy rebates to 30 June 2020.

9. Renewal of Work Permit Passes

Advocate: Requested for work permit passes expiring on 1 July 2020 to be automatically extended till September 2020 as most of the workers are still locked up in purpose-built dormitories with slow resumption of construction work.

Outcome: Instead of an automatic extension, MOM will ask the employers whether they want a short renewal of three months for their work permit holders who are eligible for renewal whose passes are expiring from 6 June to 15 July 2020 without the pass holders' medical results.

10. Request for Greater Information Flow

Advocate: Provided feedback that members are concerned over the lack of information on the resumption of work e.g. who can start, when and how to start including the swab testing and access to clean workers.

Outcome: BCA will put up regular updates via BCA COVID-19 webpage on 21st of every month, to update industry on the restart plans to facilitate industry's preparations. BCA will also engage industry associations regularly.

Information and Services

1. SCAL webinar on COVID-19 (Temporary Measures) Act

SCAL organised a webinar on COVID-19 (Temporary Measures) Act and its implications for construction and supply contracts on 24 April 2020.

2. SCAL webinar on “COVID-19 Update for the Construction Industry”

SCAL conducted a webinar on “COVID-19 Update for the Construction Industry” to brief members on the preparations for back to work post Circuit Breaker on 19 May and 20 May 2020. In total, about 1500 participants attended the webinar.

3. SCAL webinar on “2nd COVID-19 Update for the Construction Industry”

SCAL conducted a webinar on “2nd COVID-19 Update for the Construction Industry” to inform and seek members’ feedback on the implementation of rostered routine testing (RRT) & swab registration system (SRS), BCA’s plan on cohorting & decanting of workers and MOM staggered rest day arrangement.

The webinar was conducted on 3 July 2020, with about 500 participants in attendance.

4. Safe Management Officer (SMO) Training Course

SCAL Academy joined BCA in conducting the SMO training course for the construction

industry to equip SMOs and Safe Distancing Officers (SDOs) with the knowledge and skills to implement and coordinate a system of Safe Management. SCAL Academy is also conducting the course in Chinese to cater for those who are mandarin speaking.

5. SCAL Construction Manpower Exchange (SCMX)

SCAL set up SCMX to facilitate change of employer for displaced and workers for BCA and MOM. As of 15 June 2020, SCMX has successfully matched about 120 workers.

6. SCAL Reusable Mask, Soap and Sanitiser

SCAL worked with Migrant Workers Centre (MWC) to make four rounds of distribution of reusable face masks, soap and sanitisers to foreign workers staying at CTQs. A total of about 62,000 reusable masks, 12,000 hand sanitisers and soap were distributed.

7. SCAL COVID-19 Fund

SCAL COVID-19 Fund is set to provide temporary relief to small and medium sized (SME) construction members firms and SLOTS registered contractors.

SCAL will continue to engage various ministries, agencies and GPEs including providing feedback on issues related to resumption of works and constantly provides timely updates to members.

SCAL COVID-19 FUND

On 8 May 2020, the Singapore Contractors Association Ltd (SCAL) set up the SCAL COVID-19 Fund to help small and medium enterprise (SME) member companies, with the aim of raising more than \$1 million through contributions from SCAL members, the Building and Construction Authority, and worked with Enterprise Singapore to tap on the SG Together Enhancing Enterprise Resilience (STEER) programme. To date, some 50 companies and individuals have contributed towards the Fund, and about 260 companies have applied for financial relief.

Almost all construction projects had stopped during the Circuit Breaker. With no revenue during that period, overheads such as operational costs and employee salaries inevitably posed financial difficulties for many construction firms, especially for the smaller companies. The extended Stay-Home Notice for work permit, S-Pass holders and their dependents had also placed extra burdens on the companies who had to continue to take care of the welfare, health and well-being of their workers, including the provision of daily meals and necessities. Although government measures such as the enhanced Job Support Scheme and foreign worker levy waivers and rebates were helpful, they cover only a portion of a company's overall costs. With no construction work and zero revenue, companies still needed to pay for office and machinery rental, employee salaries, insurance, accommodation and provision of daily necessities for workers.

Hence, the SCAL COVID-19 Fund will provide much needed financial relief for these SME member companies to tide through the COVID-19 pandemic, by rallying the construction industry for stronger member companies to help them. This will be especially timely given that, in a survey SCAL conducted among member companies, 84% indicated that they would have cash reserves to

last for at most three months. This is worrying as these SMEs, which form an important part of the construction value chain, may go out of business. Should that become a reality, there would be widespread job losses, and construction projects could be derailed. Furthermore, some of these SMEs have built up valuable skills and capabilities over the years which could all be lost.

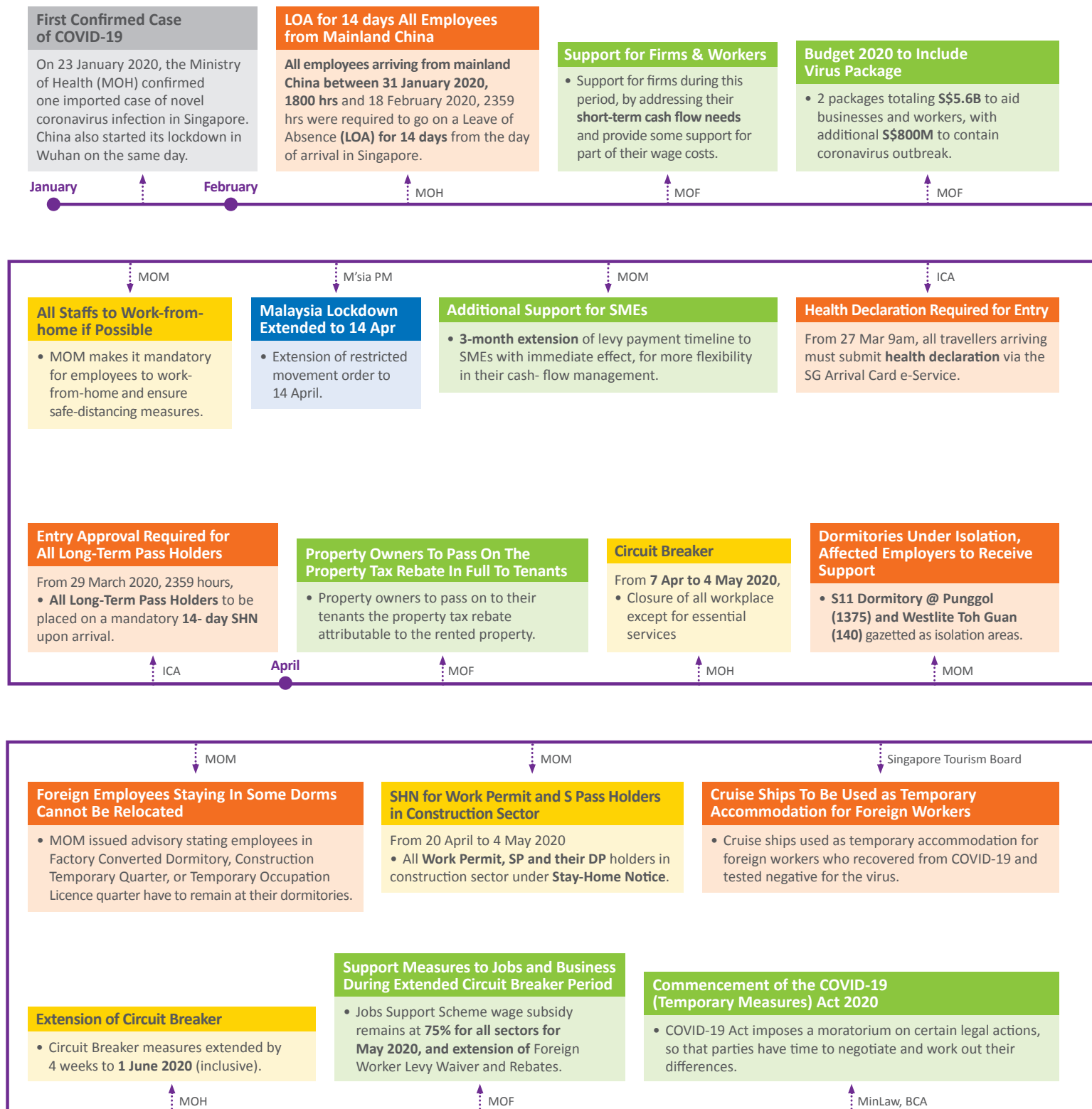
SCAL had also been working closely with the Migrant Workers Centre, the Ministry of Manpower and the Building and Construction Authority to support our members. SCAL distributed around 62,000 face masks, hand sanitisers and bars of soap to workers staying at construction temporary quarters. In appreciation to our frontline healthcare workers, SCAL had also presented 1,800 care packages to healthcare workers at Alexandra Hospital and Mount Alvernia Hospital.

"The SCAL COVID-19 Fund is our way of showing solidarity with our members. The industry has not encountered a more tumultuous time. During this extremely difficult and stressful time, we hope that stronger members will step up to help the smaller companies and their employees. Together, we can overcome the challenges posed by COVID-19 and we look forward to restarting our business safely soon," said SCAL President Mr Ng Yek Meng.

"SCAL's initiating of the SCAL COVID-19 Fund is a strong demonstration of solidarity and support for construction SMEs affected by COVID-19, particularly during the Circuit Breaker and Stay-Home Notice period for foreign workers. The Fund will help responsible employers in taking care of their workers during this period and by doing so, we can preserve industry capacity to facilitate a smooth restart when work resumes post-Circuit Breaker," said Mr Hugh Lim, Chief Executive Officer, Building and Construction Authority.

TIMELINE FOR KEY COVID-19 POLICIES

(Updated as of 22 June)



Legends

Containment Measures

Foreign Workers & Dorm

Government Support

Reopening Economy

Entry Approval, Stay-Home Notices (SHN) Expand to More Countries

From 16 March 2020, 2359 hours,

- **WP holders with travel history to ASEAN, Japan, Switzerland, or the UK** within the last 14 days must obtain MOM's approval before entry/return and be placed on a mandatory 14-day SHN upon arrival.

Malaysia lockdown till Mar 31

All borders closed and Movement Control Order imposed from **18-31 Mar**, so Malaysians would not be allowed to leave the country for two weeks.

Accommodating Workers affected by Lockdown in Malaysia

Govt looking into providing financial support, working with hotel/dormitory providers on lower cost rentals.

Entry Approval, Stay-Home Notices (SHN) to Cover All New and Existing WP Holders

From 20 March 2020, 2359 hours,

- **All new & existing WP holders** must obtain MOM's approval for entry/return and be placed on a mandatory **14-day SHN** upon arrival.

March

MOM

M'sia PM

MOM

MOM

Stop-Work Orders & Remedial Orders

- 13 Stop-Work Orders & 8 Remedial Orders issued on the day

Stricter Social Distancing

From **26 March** 2020, 2359 hours, till **30 Apr** 2020.

- Restrict gatherings outside for more than 10 persons and ensure physical distancing of **at least 1m**

Measures to Help Construction Industry

- Allow construction industry to temporarily **cross-deploy workers** to other companies, FCWDS available to search for existing construction foreign workers eligible for transfer.

14 Days LOA For Returning Employees

Companies encouraged to impose **Leave of Absence** for all employees returning to Singapore **between 14 - 20 March**.

MOM

MOH, MOM

BCA

MOM

SNH Required for All Countries

From 9 April 2020, 2359 hours,

- **All Singapore Citizens, Permanent Residents and Long Term Pass holders** entering Singapore will be required to serve a **14-day self-isolation** at dedicated Stay-Home Notice (SHN) facilities.

Safe Distancing at Public Transport

Elevated safe distancing measures for public transport:

- Safe distancing stickers
- Transport ambassador
- Thermal scanners

Malaysia Lockdown Extended to 28 Apr

- Extension of restricted movement order by 2 weeks to 28 April.

Solidarity Budget Announced

Additional relief measures implemented including raising **wage subsidy to 75% of gross monthly wages**, and **waiver of Foreign Worker levies**.

MOF

MOH

LTA

M'sia PM

MOM

MOH

MOM

Coordinate NGOs to Support Workers

- MOM to collaborate with NGOs to provide meals and donations (food items, necessities) to foreign workers in quarantined dorms.

Mandatory to Wear Mask Outside Home

- **Mandatory for all persons to wear a mask when leaving their homes.**

Ramping Up Accommodation to House Foreign Workers

- **Two floating accommodations** introduced to temporarily house 7000 healthy foreign workers.

Scaling Up Medical Facilities

- Govt to convert sport halls, community clubs to Community Care Facilities, with medical teams stationed.

Scaling Up COVID-19 Testing

- MOH to test ~3,000 dorm residents every day, including testing of workers with no symptoms.

Extension of SNH for Work Permit and S Pass Holders in Construction Sector

- **All work permits, S Pass holders and their dependents**, in the Construction Sector to serve stay-home notices (SHN) until **18 May** 2020.

MOH

MOH

May

MOM

Foreign Workers To Stay at Dormitories During Rest Days

- Phase 2 of the re-opening, migrant workers to continue staying within their dormitories on rest days.

MOM

Phase 2 Re-Opening

Revised Border Measures for Re-opening of International Travel

From 17 June 2020, 2359 hours

- Besides SHN, all incoming travelers are required to be tested before the end of their SHN.

MOM

42 More Dormitories Cleared of COVID-19

- 42 more dormitories cleared of COVID-19, total of 132 dormitories and 14 Blocks of Recovered Workers in PBDs.

MOH

Resumption of All Renovation Projects, Subject to Availability of Workers

- More than 300 construction projects have been approved to resume work.

BCA

Workers in Dormitories Returning to Work with AccessCode

- MOM cleared first batch of 60 dormitories of COVID-19. Workers in these dormitories are allowed to return to work with precautions such as staggered pick-up/drop-off timing and AccessCode for contact tracing.

MOM

Restart of Renovation Works

- BCA cleared and approved all applications for suspended residential renovation projects, with more than 5,400 renovation projects allowed to resume work on 2 June.

BCA

Regional Screening Centres Set Up to Facilitate Testing

- MOH to step up testing in the migrant worker dormitories, both to contain the spread of the virus as well as to enable migrant workers to return to work.

MOH

Phase 1 Re-Opening

- From 2 June, Construction allowed to resume in phases, but all projects suspended shall remain so until such time when BCA approval on behalf of MTI is obtained for the works to be restarted.

June

Fortitude Budget

- More than 40,000 jobs created as part of S\$2b employment, and wage subsidies under the Jobs Support Scheme extended by 1 month.

MOF

FWMOMCare App for Migrant Workers

- MOM developed new "FWMOMCare" mobile app for workers to self-monitor & report daily health status.

MOM

Dormitory Operators to Implement Safe Living Measures

Operators of foreign worker dormitories required to implement Safe Living measures in three areas:

- Tighten control of dormitory entry and exit
- Limit inter-mixing of workers
- Strengthen health monitoring and facilitate contact tracing

MOM

Requirements on Construction Foreign Employees after SHN Period

- Required to fully comply with the CB measures, failing which the passes may be revoked.

MOM

Implementing SafeEntry And Safe Management Practices

- Businesses to minimise prolonged interactions and ensure good safe management.

MOH

Relief Measures for Property Sector

- Extension of the Project Completion Period (PCP) by 6 months for residential, commercial and industrial development projects.

MND

Comprehensive Approach to Take Care of the Well-Being of Foreign Workers Living in Dormitories

- >170 Forward Assurance and Support Teams (FAST) deployed (43 at all purpose-built dorms and 127 mobile to factory converted dorms, construction temporary quarters and private residential premises).

MOM

Easing of Tighter Circuit Breaker Measures

- Reopening of work premises based on importance to the economy and supply chains, and ability to minimise risks of transmission at workplaces.

MOH

Guidelines for Gradual Resumption of Business Operations

- MTI issued guidelines for gradual resumption of business operations.

MTI

CONSTRUCTION INDUSTRY SURVEY: KEY FINDINGS

Objective: To seek members' feedback and gather data on the financial impact of COVID-19 on the construction industry.

Summary of the survey and eight key findings are as follows:



The survey was conducted from 19 May to 1 June 2020, with a total of **135** respondents.



Main contractors made up **34% of respondents**, with subcontractors making up the remaining **66%**.



Main contractors indicated that salary accounts for **71%** of total monthly cash expenditure, compared with **59%** for subcontractors.



Taken together, the **Job Support Scheme (JSS)** and **Foreign Worker Levy Rebate** provided **46%** wage support for main contractors, compared with **52%** for subcontractors.



The Job Support Scheme and levy rebate together helped to defray about a third of total monthly cash expenditure for both **main contractors (33%)** and **subcontractors (31%)**.



84% of respondents indicated that if work does not resume after Circuit Breaker, they can sustain at most three more months.



About 15,000 employees from these companies face the risk of losing their jobs, including **almost 3,700 Singapore citizens and Permanent Residents**.



Respondents requested further financial assistance from the Government to defray foreign worker accommodation and transport costs, extension of the JSS and waiver of the foreign worker levy beyond August.

Conclusions

1. Many companies will face the risk of going under if they are unable to resume work.
2. There is an urgent need for the relevant agencies to allow for more projects that are ready to restart swiftly and safely.
3. The Government needs to extend financial support to companies beyond August to help them tide through this period.

SCAL CNY LUNCH



Mr Ng Yek Meng briefed members on the outlook for construction industry

On 4 February, SCAL held its annual Lunar New Year lunch to usher in the Year of the Rat with its members. More than 170 members attended and it was a convivial and lively reunion for many.

In his opening address, Mr Ng Yek Meng, President of SCAL, gave an outlook of the construction industry for 2020, with construction demand set to remain strong between \$28 billion and \$33 billion. He highlighted that major infrastructure projects of 2020 were the Changi Airport Terminal 5, Jurong Region MRT line and Integrated Waste Facility Management.

With reference to the rapid transformation of the built environment, Mr Ng said that construction firms were now urged to adopt new and innovative methods as part of the Construction Industry Transformation Map, or ITM. These included adopting integrated digital delivery, or IDD and design for manufacturing and assembly, or DfMA.

"Members can look forward to a brand-new Construction Hub, at 10 Tannery Lane, which will launch a new chapter for SCAL," he added.



SCAL members at the lunch to usher in the Year of the Rat

BRIEFING ON THE EMPLOYMENT ACT



(From left) Mr Chow Kwok Wah, Singapore Human Resources Institute (SHRI), Mr Henri Tan, SHRI, Mr Lam Kong Hong, SCAL, Mr Then Yee Thoong, Ministry of Manpower (MOM), Mr Hao Shuo, MOM

174 participants attended a seminar on the amendments to the Employment Act which took effect on 1 April 2019. This briefing was organised by SCAL and SCAL Academy on 7 January 2020 at SCAL's Construction House.

One of the amendments was the removal of the cap of \$4,500 salary for managers and executives, for the first time all employees are now covered under the Employment Act in Singapore. This meant that the core provisions on entitlements such as timely payment of salary, paid public holidays, sick leave entitlement, and protection against wrongful dismissal are now extended to all employees.

In addition to the core provisions, additional protection is extended to more workers under the section known as Part IV. This section sets out extra protection for rank-and-file workers in areas such as hours of work, overtime pay and rest days.

Mr Hao Shuo, the speaker from the Ministry of Manpower (MOM) highlighted at the briefing session that the majority of foreign employees who made salary claims worked in construction companies and more than 90% of construction industry claims were made by SMEs. In MOM's inspection findings, most construction companies involved in salary claims or EA offences had poor understanding of EA requirements and low compliance on administrative requirements on written Key Employment Terms, itemised pay slips and employment record-keeping.

In his presentation, Mr Henri Tan from Singapore Human Resources Institute (SHRI) reiterated the statutory requirements of Employment Terms and Conditions for Workers, and the importance of issuance of written Key Employment Terms.

Mr Chow Kwok Wah from SHRI, covered the topic Workmen Injury Compensation Act and upcoming changes that will take effect on 1 September 2020.

To address EA non-compliance issues in the construction industry, MOM will be stepping up enforcement action. Employers who commit a civil contravention will be liable for an administrative penalty under the Employment Act and, MOM may also increase the impact of penalties on companies through more regular, comprehensive checks.

Join us for our upcoming seminars on Employment Act and briefing session on Work Injury Compensation Act. Visit us at www.scal-academy.com.sg for more details.



The briefing was held at the SCAL Construction House

STABILITY CONTROL SYSTEM FOR LORRY CRANES



Signing of the declaration of commitment by representatives from HDB, JTC, LTA, MOH Holdings, NParks, PUB and witnessed by SCAL, WSHC, SCA, STA



Lorry crane on display at the WSH Symposium on Cranes 2020

Citing from MOM, more than half of lorry crane-related dangerous occurrences from 2015 to 2019 were due to the outriggers not fully extended and deployed, which resulted in the toppling of cranes.

The Stability Control System (SCS) will ensure the stability of the lorry crane during lifting operation in confined areas where the outriggers cannot be fully extended or on uneven road conditions such as slope, narrow road, drainage etc.

The Safety feature in the SCS consists of the Rated Capacity Limiter in the SCS which monitors the position of the stabilisers and limits the lifting capacity corresponding to the stabilisers' deployment.

The SCS also assesses the permissible working range in real-time for any slewing angle of the boom system and for any stabiliser situation. If the crane is detected at non-working range, the SCS will stop the operation to prevent any overloading or toppling.

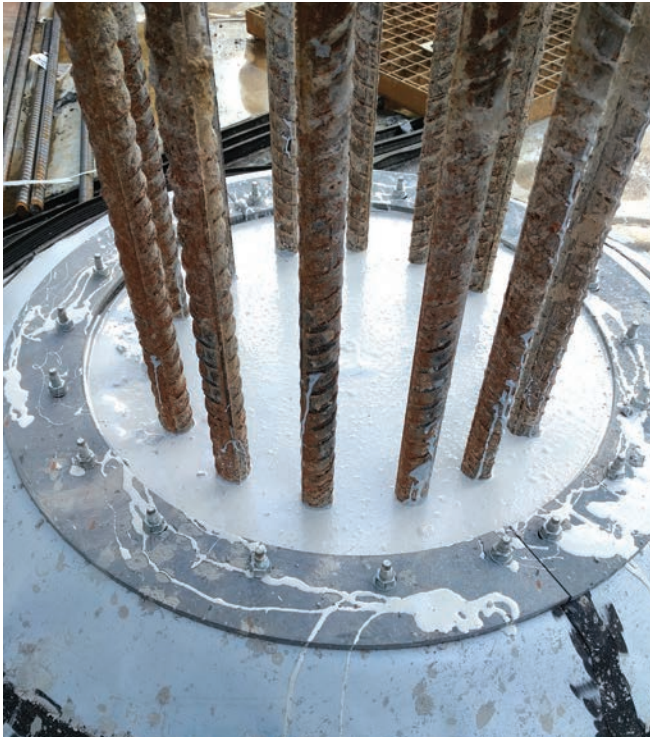
During the Workplace Safety and Health (WSH) Symposium on Cranes 2020 held on 15 Jan 2020, a declaration of commitment was signed by the public developers (HDB, JTC, LTA, MOH Holdings, NParks, PUB) to ensure the safe use of lorry cranes and effective use of the Stability Control System (SCS) technology.

It was announced that the use of SCS for new and existing lorry cranes at these public developers' worksites will be specified in the relevant procurement documents with effect from 1 June 2020.



Demonstration of lifting operations

PUTTING THE SCIENCE INTO UNDERGROUND WATERPROOFING



Epoxy capping on pile cap

We are now living in the 2020s. Why are we still hearing about underground structures which are filled with leaks, damp patches and pumps running around the clock? With all of the advancements in waterproofing materials, combined with a scientific approach to design and access to experienced installers - leaking basements should be a thing of the past.

Put simply, it comes down to doing everything right. One wrong step and water will find its way through almost any structure.

So firstly, let us take a look at what we get right.

System Design

Should the structure be tanked or drained? This decision is based upon factors including geology, statutory requirements, client expectations, future maintenance and other circumstances. Once this decision is made, a set of materials will be chosen which can either withstand the design water pressure or provide enough drainage capacity.

Selection of Membrane

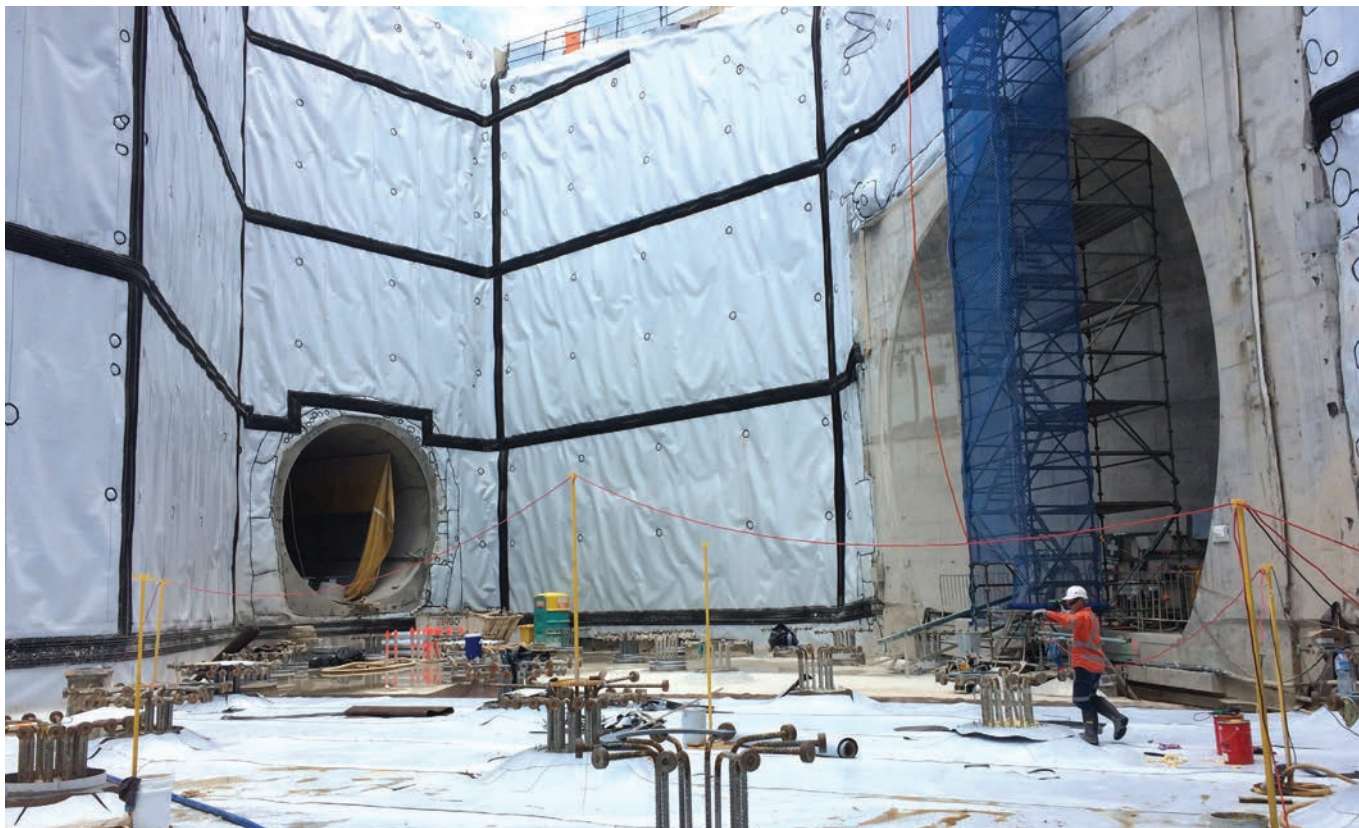
Spray applied membrane systems are typically used where shotcrete lining is to be applied as opposed to cast in-situ. Spray applied membranes allow two layers of shotcrete to be bonded together and can be applied between the two layers. Spray membrane systems are not considered 'water-tight' and are generally applied to less critical waterproofing applications. The type of sheet membrane used underground has typically been Polyvinyl Chloride (PVC) or a type of flexible polyolefin such as Very Low Density Polyethylene (VLDPE). VLDPE has greater elongation and tear strength making it suitable for areas of high movement and loading. PVC, on the other hand, has a lower cost to manufacture and is easier to install, but doesn't offer the same high grade protection and is therefore typically applied in drained structures and low-risk applications.

Pile Caps

Until recently, sealing around tension piles had not been approached with a solid engineering solution. This led to a complete redesign of the pile sealing system in 2016 on the Northwest Rapid Transit Project in Sydney. To solve the problem of leaks from the top of the pile, an epoxy capping was placed to a thickness of approximately 6mm. The compression seal was then applied to the top perimeter of the pile and the fixings completed by following the principles of design based upon the Kunz Studer formula combined with finite element analysis of the flange.

Compartmentalisation

Compartmentalisation is a recognised method of reducing water movement by limiting the lateral transfer of water in a waterproof lining system. Internal compartmentalisation is the mechanism of dividing the structure into segments so that water cannot travel to other areas if leakage occurs. External compartmentalisation is the mechanism of preventing longitudinal groundwater flow along the outside of a waterproof lining system. External compartmentalisation is created by connecting the membrane to the original rock formation using a



Compartmentalisation using BluSeal Waterstop

series of techniques including grouting of the rock, fixing the membrane to shotcrete and ring beams using rear-guard waterstop, or in simple cases adhering the membrane to the shotcrete.

Protection

Membrane protection following the installation process is an essential component of waterproofing effectiveness. Integral components such as joint seals, compartment boundaries, adhesives for bond and expansion protection systems must all be in the condition intended once the structure is complete. Typically, bonded membrane systems cannot be protected before concrete placement which introduces the possibility of the adhesion system (chemical or mechanical) being damaged.

That is what we commonly get right. But there is still plenty that we get wrong, which is what leads to damp patches and leaks. The most common of these issues are explained below.

Bonded Membranes

Bonded membranes have been used on projects throughout Australia and Asia since the 1990s. The success rate for creating a dry structure where water pressure is being resisted has not been high. The main weakness for bonded systems is the inability to weld joints in the membrane or easily terminate the perimeter. Also, once the membrane is laid in place there is no way of protecting it from damage when steel reinforcement is being laid (shown right) and other trades work in the area before casting concrete.

Lack of Formal Standards

Surprisingly, Australia does not have a formal underground waterproofing standard which can be referred to, therefore a variety of standards are applied locally on tunnel projects. In Singapore, we can refer to specifications from the LTA and other government bodies but there is no real



Bonded membrane becomes contaminated

design standard for waterproofing which provides guidance on how to engineer a watertight structure. In many ways, most of the waterproofing standards around the world do not really provide the total guidance necessary to adequately design and detail a specific solution. Compared to concrete and steel design standards, most international waterproofing standards fall well short as a complete guide.

Reluctancy to Provide Complete Design Solutions

Partially due to the standards issue mentioned above, it is now common that many engineers and architects are reluctant to provide complete design solutions for waterproofing. This leaves most of the burden with the supplier and installer to provide the required design. The installation contractors are usually small operators and may not have trained professionals available to provide the advice and experience required for complex

projects. The cornerstone of good engineering advice is independence and customisation which are often missing from waterproofing design where material suppliers try to push a one-size-fits-all solution. Often missing from waterproofing design where material suppliers try to push a one-size-fits-all solution.

Financial and Time Pressures

One of the most alarming reasons we find damp structures is due to financial and time pressures placed on contractors and designers. Detailed design is often overlooked altogether and addressed 'on the job' as the works progress. Very little professional control is then engaged for the project resulting in less than ideal results.

Waterproofing is an often overlooked and very challenging aspect of underground construction. If an engineering approach is adopted and the right techniques and materials are employed, dry structures can be created. Importantly, less emphasis needs to be placed upon selecting the lowest price and more attention must be paid to ensure that the right solution is selected and combined with the experience needed to complete the project.

Design detailing requires a combined effort from all parties before works begin on site. Although there is still some way to go, Australia is a great example of how an industry can transform itself by applying the resources required and then re-thinking the entire approach from design through to installation.

Author

Mr Daniel Bosco

Article contributed by Bluey Technologies Pty Ltd and its Asia Pacific Distributor: Quicseal Construction Chemicals Pte Ltd

DIGITALISATION IS THE FUNDAMENTAL BUILDING BLOCK OF CONSTRUCTION

By Franck le Tendre, CEO, Finalcad

2020 has been a year of considerable upheaval for the construction sector, with COVID-19 having far-reaching consequences in almost every country around the world. The long-term prospects for construction are still strong, with the global construction market expected to grow \$8 trillion by 2030. However, in the short-term, the sector naturally faces a difficult period following the 'shutdowns' in many countries.

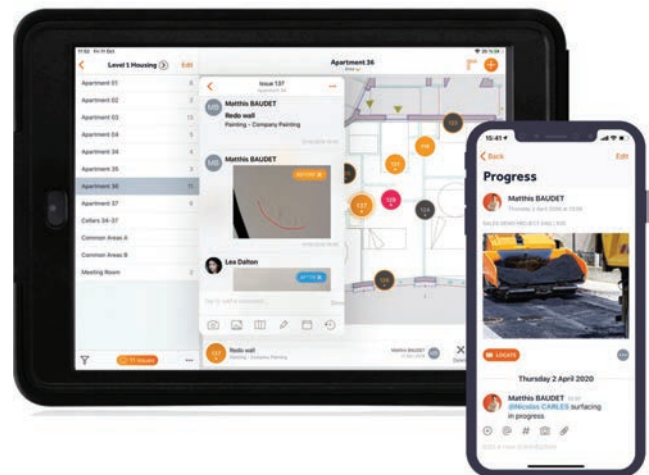
In Singapore, the 'Circuit Breaker' ended on the 2nd June with sites reopening. Sites have to comply with new safety requirements (COVID-19-Safe Return Criteria) to accommodate social distancing, ensure cleanliness is maintained, and be able to keep track of where workers are operating on site. Furthermore, Singapore's Minister for National Development and Co-Chair of the COVID-19 Task Force, Mr Lawrence Wong said that Singapore should, "...make full use of technology to implement these [safety] measures".

Construction is a complex industry encompassing the building, infrastructure, and energy sectors. Successful projects need site managers to juggle people, plans, skills and materials against a constantly shifting schedule. Inefficiencies in processes and a lack of standardised, collaborative workflows are made worse when companies rely on manual, paper-driven processes. With this in mind, and against the backdrop of the pandemic, this is no doubt going to be a challenging time for many construction companies. However, it is also an opportunity to rethink current operations and embrace change.

The value of digitalisation cannot be ignored – both to help navigate the pandemic now, and for the future success of the industry. Digital tools can help create trackable, auditable safety processes to support the immediate needs of companies around Environment, Health and Safety Management, as well as help to sustainably improve overall efficiency and productivity. This has a positive impact on profitability while also increasing the satisfaction of real estate developers and final customers. Digitalisation can improve many construction workflows, and there are two



areas which have emerged as having immediate potential: worksite logistics, and works planning and quality management. There are a number of different digital tools available, so what features should you be looking for? Here are some key aspects to bear in mind.



Digital construction management platform: By centralising and sharing information in real time with the right stakeholders, easy-to-use digital platforms enhance productivity and profitability.

Four things to look for when going digital

The market offers smart and immediately available solutions to improve processes, easily generate reporting and administrative documentation, and limit time wasting on worksites. As for works planning and quality management, digitalisation in this area helps to significantly improve productivity and construction projects' profitability.

There are four elements construction organisations should look for when it comes to digital platforms:

1. Easy-to-use

When choosing a solution, you should look to implement intuitive, user-friendly digital tools that will not require significant training while maintaining capabilities. Purpose built solutions exist today that offer a blend of capability and usability for workers both on and off site.

2. Enables mobility

Workers need to access any digital platform, and its data, from wherever they are, so any newly introduced tool should support mobility. Between sites with sporadic mobile signal, or a basement with no network connection at all, employees should still be able to use any platform to allow them to do their job.

3. Data-driven

When choosing, it's important to look for a platform that enables real-time updates and

tracking / tracing of historical information – from site plans to safety policies. As well as keeping projects on track, this also makes it easier to identify process improvements and to meet compliance requirements. And of course, any data must be adequately secured at the data centre as per any regulations – both domestic and international.

4. Company-wide

Everyone from the developer, to site manager, to bricklayer needs to be able to access information related to a project quickly, but if digitalisation means furnishing employees with a new device so they can access the tool, costs can mount up quickly. The best solution will be useable on whatever device and operating system each employee already has, and will have the capability to manage the entire project via one interface.

As the industry undergoes a period of seismic change, alongside continuing its long-term growth, those involved in construction will begin to see the true value of digital transformation. Those construction businesses that adopt digital technologies to modernise their processes and optimise their operations will secure a role in the future of construction and ensure they don't miss out on the next decade of growth.



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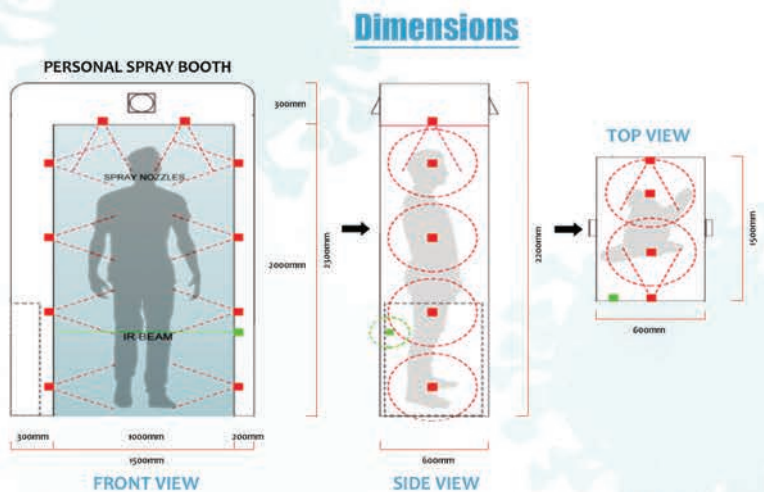
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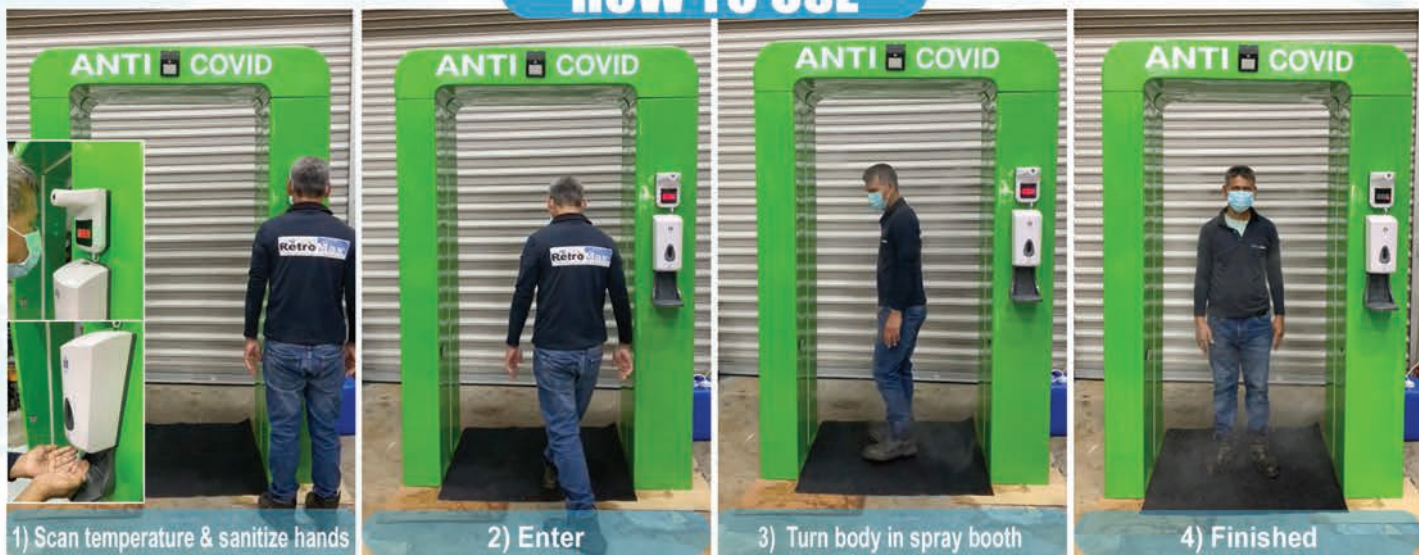
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Objectives (About us)

- ▶ Support the development of the next generation of industry leaders
- ▶ Provide a platform for networking among young building professionals in the construction industry
- ▶ Knowledge sharing among industry leaders and professionals
- ▶ Having a voice in shaping the future of the industry with engagement of different stakeholders

Eligibility (Who should join?)

- ▶ Must be from SCAL member company
- ▶ To be nominated by company
- ▶ Below age of 40 years old
- ▶ Groomed for management position
- ▶ Possess good track record and experience of construction projects
- ▶ Passionate about the building and construction industry

Benefits of the programme (Why join us?)

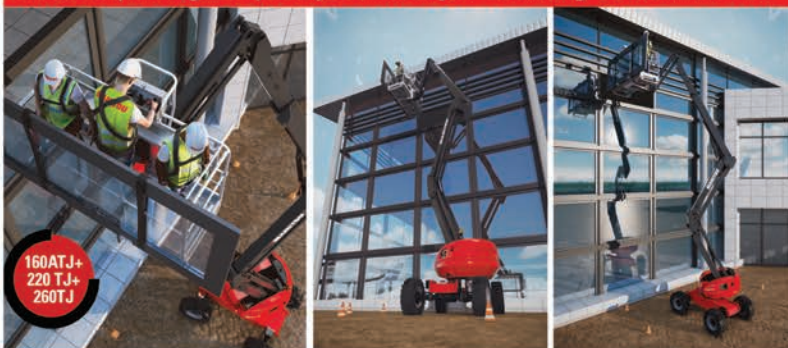
- ▶ Engage in SCAL's subcommittees to be expose to the latest industry developments and government policies
- ▶ Networking opportunities with peers and industry leaders
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- ▶ Gain wider perspective of the construction industry

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JUL - SEPT
2020

E-Learning

Developing Safe Management Measures to Combat Covid-19

Date: 23 - 24 July | Time: 9.00am - 5.00pm

Webinar

C.A.R policy - Coverage trigger mechanism and issues relating to COVID-19

Date: 29 July (Wed) | Time: 2.00pm - 5.00pm

Webinar

Safeguarding your Rights under the Workplace Safety and Health Act

Date: 18 August (Tue) | Time: 2.00pm - 5.00pm

E-Learning

Design for Safety (DfS) for PMEs (Professional, Manager and Executive)

Date: 20 August (Thu) | Time: 9.00am - 5.30pm

In-person Training

Dispute Resolution Mediation course for Professionals

(SIMI registered training program)

Month	Dispute Resolution Mediation course for Professionals (Module 1) 2 days	Dispute Resolution Mediation course for Professionals (Module 2) 3 days	Mediation Skills Assessment 1 day
August	17 – 18 Aug	19 – 21 Aug	24 Aug
September	14 – 15 Sept	16 – 18 Sept	21 Sept
October	12 – 13 Oct	14 – 16 Oct	19 Oct

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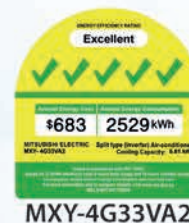


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