

# PILLARS

NOV  
2017

We shape a **safe**, **high quality**, **sustainable** and **friendly** built environment

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Office of the Future  
at BCA ZEB

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## YOUNG REVOLUTION

Grooming our future talents  
to lead the way

# A CHAT WITH OUR CEO

# WE ARE GOING DIGITAL!

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# CEO'S MESSAGE



**Hugh Lim**  
Chief Executive Officer

## DEAR READERS,

I am pleased to share that BCA has achieved much on the sustainability forefront, particularly for green buildings. To date, more than one-third of our entire building stock (in terms of gross floor area) has met the BCA Green Mark standards. Our long-term aspiration is for all low-rise buildings in Singapore to be positive-energy, all medium-rise buildings to be net zero energy, and all high-rise buildings to be super-low energy.

We will continue pushing the boundaries of research and development for innovative green building technologies. Our Zero Energy Building (ZEB) at the BCA Academy has been generating surplus energy since it was launched in 2009. Works are currently under way to make it even more energy-efficient. The project will be completed in end-2018, giving users an "Office of the Future" equipped with energy-efficient innovations such as dimmable task lamps and demand-based ventilation system that caters to the individual occupant's needs.

I am also heartened to share that our efforts in R&D are showing good results. This year, the BCA SkyLab celebrated its first anniversary with a significant milestone, by winning the IES Prestigious Engineering Achievement Award. Congratulations to the SkyLab team for this accomplishment!

On the construction productivity front, the Inter-Agency Design for Manufacturing and Assembly (DfMA) Taskforce, co-led by BCA

and the Ministry of National Development (MND) won the MND Minister's Award at the MND National Day Observance Ceremony 2017. I am confident that the taskforce will bring the adoption of DfMA technologies in Singapore to even greater heights.

In addition, harnessing technologies can help us work more efficiently. For instance, BCA created an easy-to-use reporting mobile app which enables amusement ride operators to submit incident reports anytime and anywhere. Users can also use the app to report incidents. This quicker reporting process reduces the downtime of some rides, reducing monetary losses for businesses.

Besides working closely with our industry stakeholders, it is also important to engage our youth. To raise awareness on the importance of green buildings and their features, we worked with Ngee Ann Polytechnic (NP) to bring secondary school students from around Singapore together to compete at the fourth edition of the BCA-NP Design Challenge. It is certainly encouraging to see such promise in our youth today, and I am excited to see them grow and develop a deeper knowledge of green buildings and the benefits it brings to them and their loved ones.

Let's work together to build a future-ready Singapore for all.

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# POSITIVE ENERGY BUILDING

Imagine a world with super energy-efficient office buildings that not only power themselves but also export their surplus for other uses. BCA's refurbished Zero Energy Building (ZEB) aims to be a positive energy building and offers clues to the workplace of the future.

BCA's ZEB aims to achieve an energy surplus of 40% and enhance its energy efficiency by 20% – a four-fold increase from the 7-9% surplus generated yearly since its launch in 2009.

The refurbished ZEB, a project helmed by BCA and Singapore-Berkeley Building Efficiency and Sustainability in the Tropics (SinBerBEST), will adopt more smart building technologies that enhance user comfort and behaviour. For example, the number of sensors in the building will be tripled to 1,000. This enables the ZEB's smart building management system (BMS) to better monitor and analyse occupants' activities to meet their energy needs, so that it can create a more comfortable and energy-efficient office environment.

**DID YOU KNOW?**  
Like all buildings, BCA's ZEB is connected to the national power grid. But unlike other buildings, it supplies energy to the grid whenever it generates surplus and is redistributed to the buildings within BCA Academy!

## ZEB in a Nutshell

Through the use of active and passive technologies such as single-coil twin fan and solar panels, BCA's ZEB produces more than enough energy to run itself. This former workshop was retrofitted to serve as a test bed for energy-efficient building designs and technologies. Today, it houses offices, classrooms and the Centre of Lean and Virtual Construction.

# WELCOME TO THE OFFICE OF THE FUTURE

# 7

Energy-efficient innovations in the refurbished ZEB, targeted for completion in end 2018.

### 01 Energy-Efficient Façade

A "second skin" of glass on the building's facade enhances insulation, resulting in energy savings.



### 02 Demand-based Ventilation System

A smart system provides workspace ventilation according to occupants' needs, reducing average power consumption from cooling by 15 – 20%.



### 03 Network-Powered Lighting System

Powered via network cables (Power over Ethernet) instead of conventional electrical power cables, this system gives users control over their preferred lighting environment. For example, it ensures optimal brightness levels, switches off the lights automatically when there are no occupants, and harvests daylight to achieve energy savings of up to 30%. The smart lighting system includes ceiling lights and desk lamps.

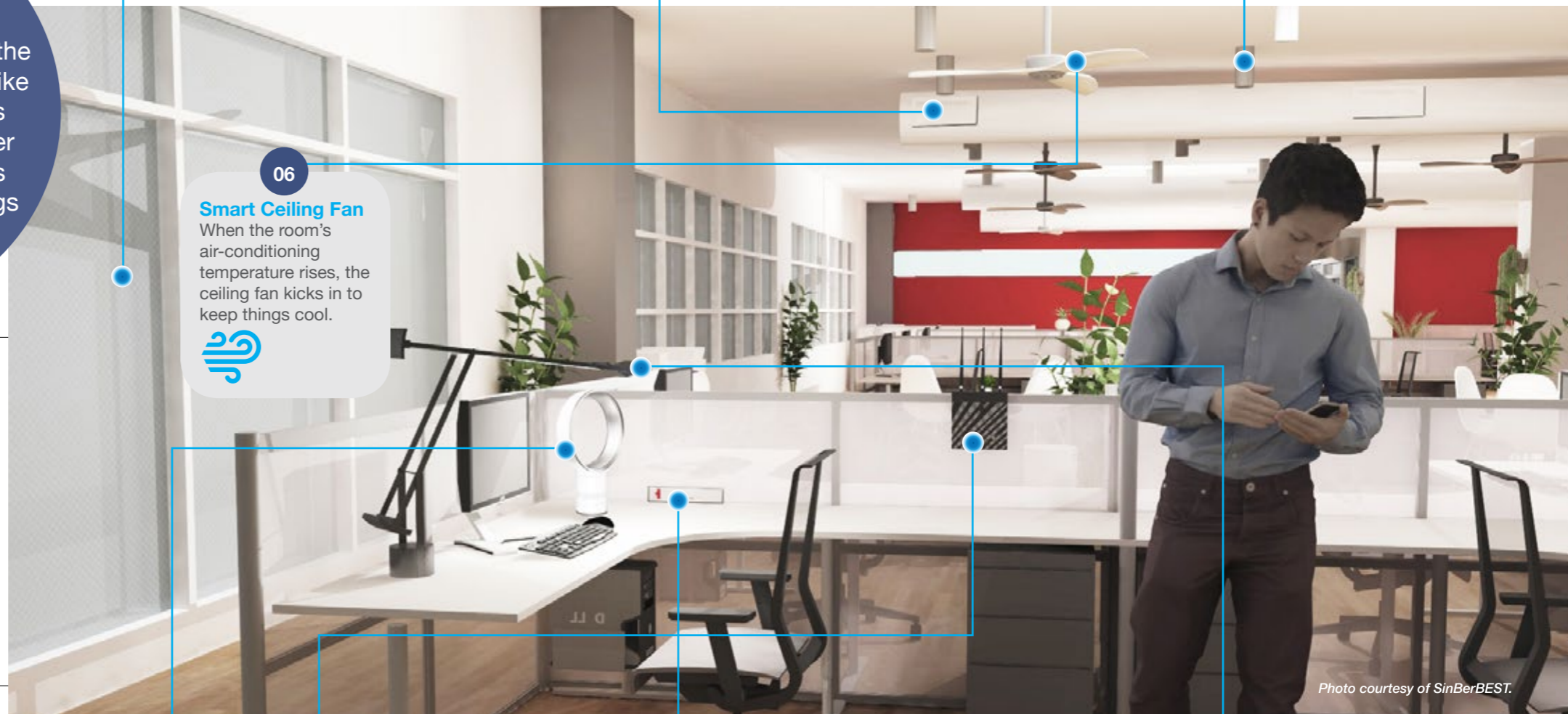


Photo courtesy of SinBerBEST.

06

### Smart Ceiling Fan

When the room's air-conditioning temperature rises, the ceiling fan kicks in to keep things cool.



04

### Personalised Comfort

Such settings enable the system to manage users' personal spaces according to their preferences, by adjusting temperature and brightness



05

### Real-time Monitoring of User Needs

Keeping track of occupancy levels through WiFi-enabled mobile devices, the system monitors energy consumption, from air-conditioning to lighting and electrical

sockets. Also, by monitoring and analysing energy consumption, an intelligent plug load management system determines when energy is wasted. It also shuts down electrical operations when no power is needed.



07

### Dimmable Task Lamps

Depending on users' needs, the desk lamps' brightness can be monitored and adjusted remotely via Ethernet or manually to minimise energy wastage.





# BCA RECOGNISED FOR CREATING A CONDUCTIVE WORKPLACE

BCA has been working closely with industry partners to put in place necessary infrastructure, which is the hardware. Besides the hardware, it is equally important to develop and look into the needs of its people – the software. BCA is doing just that, and its efforts are bearing fruit. At the Singapore Human Resources Institute's (SHRI) HR Awards, BCA was conferred a total of three awards.

## Singapore HR Awards 2017 Presentation Gala



14 July 2017



Marina Bay Sands (Sands Expo and Convention Centre)

### About the Awards

The annual SHRI HR Awards serves to recognise organisations that made significant contributions in enhancing people and human capital management and development practices. The awards are presented to organisations in both the public and private sector across various industries.



## BCA'S 3 WINNING WORKPLACE PRACTICES



Ms Lim See Hian, Director of Human Capital Development Department (second from right) with other award recipients at the SHRI HR Awards 2017.

### THINKING AHEAD

Award:

#### Manpower Resourcing and Planning

BCA's HR strategies aim to meet business objectives as well as add value to the organisation and its people. These strategies support the delivery of organisational objectives. For instance, the Manpower Planning Framework ensures that manpower requirements are addressed while the Strategic Workforce Planning conceptualises the right workforce for key competency areas needed for now and the future.

### ENGAGING ITS PEOPLE

Award:

#### Employer Engagement and Alignment

BCA has in place a set of comprehensive engagement and alignment programmes to keep its staff engaged and well-informed of its policies. BCA staff are engaged via multiple platforms at individual and team levels to meet key focus areas in planning, innovation, service and communication.



Staff engagement session with BCA Senior Management.

### EQUALITY IN THE WORKPLACE

Award:

#### Fair and Inclusive Employment Practices

BCA's work-life programmes provide support to staff's well-being at different life stages, as well as training for staff across all levels. It also has a performance management framework in place to reward employees fairly based on their ability, performance, contributions and experience. In addition, its recruitment practices also follow the Tripartite Guidelines on Fair Employment Practices.



Team members of the Human Capital Development Department at the SHRI HR Awards 2017.



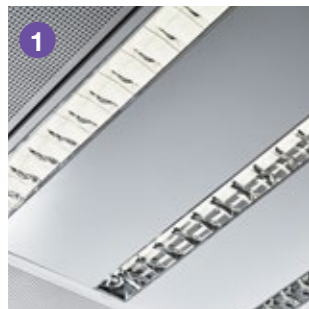
# REACHING FOR THE SKY



BCA SkyLab achieves new highs in green building technology research, and bags a winning spot at the IES Prestigious Engineering Achievement Awards 2017.

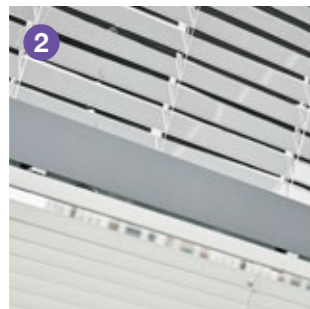
## 4 Emerging Energy Efficiency Technologies will be tested at the BCA SkyLab

Housed atop a six-storey building at BCA Academy, the BCA SkyLab gives researchers a place to test and validate energy-efficient building technologies and materials in real-world tropical weather conditions. Here are the research projects the SkyLab team, with its partners, has embarked on since its launch in July 2016.



### 1. Intelligent Lighting System

Using sensors, this lighting system automatically adjusts brightness based on occupancy or daylight availability. This can result in up to 47% lighting energy savings – more, if combined with automated reflective blinds.



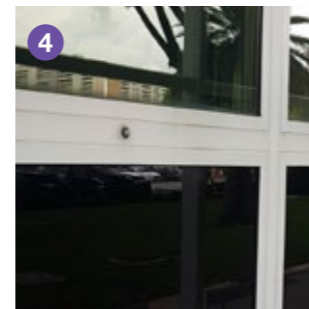
### 2. Automated Reflective Blinds and Smart LED Lighting System

A recently-completed study, this project features an integrated system that automatically adjusts the reflective blinds and dimmable lighting systems, according to weather conditions. This ensures optimal brightness levels and results in lighting energy savings of up to 74%, compared to manual blinds with no dimming control.



### 3. Active Chilled Beam System

This cooling system circulates cool water within its cooling coils instead of using a built-in fan, resulting in higher energy savings. Plus, it requires little maintenance as the system has no moving parts.



### 4. Electro-chromic Glass

This type of glass changes colour and properties based on ambient environment conditions, occupant thermal or visual comfort based on pre-defined algorithms, etc. by self-tinting or activating a switch, thus reducing the heat load entering the building, as well as the glare of daylight. As a result, energy used for air-conditioning is saved while visual comfort for building occupants is enhanced.

## THE FUTURE'S SO BRIGHT

What's ahead for BCA SkyLab:

### More Energy-Efficient Possibilities with New Partners

With over 20 organisations expressing interest in testing the latest building technologies such as cool construction materials that reduce surrounding temperature, BCA SkyLab looks forward to seeing even more breakthroughs in the world of smart building technology.

### More Solutions for Local Climates

BCA will continue its collaboration with the Lawrence Berkeley National Laboratory in R&D and knowledge sharing. One focus will be exploring and testing various technologies such as energy-efficient windows and facades to suit Singapore's tropical climate.

### More Technologies for Singapore's Buildings

BCA is exploring new technologies such as smart demand-controlled air-conditioning and solar-powered innovations. These solutions will eventually be used in Singapore's offices, schools, homes and public amenities.



BCA SkyLab's efforts and technologies led to its win at the IES Prestigious Engineering Achievement Awards 2017 in the Engineering Projects category. The Awards event took place at the World Engineers Summit 2017 Conference, where 12 winners were awarded for their contributions to Singapore.



### About the Awards

The IES Prestigious Engineering Achievement Awards recognises achievements of organisations and people responsible for outstanding engineering projects in Singapore – projects that have made significant contributions to the engineering progress and quality of life in Singapore.

### Assessment Criteria

- i. Innovative engineering practices and environmental sustainability
- ii. Contribution to general public, society and nation with considerations of the commercial and social impact delivered
- iii. Only one nomination or application per category for nominators and applicants
- iv. Engineering project must be current and completed within the last three years
- v. Project must represent a genuinely new approach or a significantly improved solution over an existing practice



We are pleased that the BCA SkyLab, on its first anniversary, has won the IES Prestigious Engineering Achievement Awards 2017. We will continue to provide “real-world” tests on the latest green building technologies for the tropics and to accelerate their adoption in order to maximise energy savings. In doing so, we also hope to enhance Singapore's R&D in building energy efficiency to support our ambition of having Positive Energy Low Rise, Zero Energy Medium Rise and Super Low Energy High Rise buildings for the tropics.

**Er Lam Siew Wah**

BCA's Managing Director, Built Environment Research Innovation Institute (BERII)



# UP CLOSE AND PERSONAL WITH OUR CEO

Mr Hugh Lim took over as BCA Chief Executive Officer on 1 June 2017. Prior to joining BCA, Mr Lim was the Deputy Secretary (Community, Youth and Sports) at the Ministry of Culture, Community and Youth (MCCY), and before that, the Deputy Secretary, Ministry of Law (MinLaw), and Chief of Staff (General Staff) at the Singapore Armed Forces (SAF).

Pillars finds out about his key priorities for BCA and his take on the road ahead for the built environment sector in Singapore. Mr Lim also shares with us his biggest influencers in life and joys outside of work.

## What are your key priorities for the team at BCA?

My key focus in the next three years will be to work with industry firms and practitioners to bring about the transformation of our built environment sector. We have launched a roadmap on this in October this year. Developed in collaboration with industry stakeholders and the Ministry of National Development, the roadmap focuses on three main areas – the proliferation of Design for Manufacturing and Assembly (DfMA), the introduction of Integrated Digital Delivery (IDD) and the equipping of new and practising PMETs in the sector with knowledge and skills needed for the transformation.

As a building regulator, BCA's continuing priority is to shape a safe, high-quality, sustainable and friendly built environment. We do this through regular reviews of our codes and regulations, in consultation with our industry partners. For example, we recently introduced an enhanced regulatory framework to improve lift and escalator safety and reliability.

## The Government is pushing for Smart Nation initiatives. What is BCA doing in this area, and how will it impact stakeholders in the built environment sector?

As we move towards becoming a Smart Nation, BCA is encouraging the wider adoption of info-communication tools and sensors. We would like to see greater interconnectivity between firms and better access to shared building information to aid design, production and delivery of components, construction and operations. These will form the basis for Integrated Digital Delivery in the construction sector. Already, we are seeing the wider use of Building Information Modelling (BIM) not just for 3D visualisation but also for controlling the production of pre-fabricated components in our new Integrated Construction & Pre-Fabrication Hubs (ICPHs). As codes for using and sharing BIM become more standardised, we will see just-in-time delivery onsite, automated construction (for example, through the use of "smart cranes") and eventually, sensor-equipped smart buildings becoming more energy-efficient and well-maintained.

In the next five to 10 years, the built environment sector in Singapore will become more seamlessly integrated, and its workforce, more highly skilled and digitally-enabled. Also, more jobs such as green facilities managers will be created for Singaporeans pursuing careers in the built environment sector at the professional, manager, executive and technician (PMET) levels. They will also enjoy more holistic experiences and professional satisfaction.

## With "disruption" being the buzzword in many industries, what is BCA doing to future proof the sector and to attract more young talents into the built environment industry?

To attract a new generation of leaders to the built environment sector, BCA has been partnering the industry to offer scholarships and sponsorships to Singaporeans at all levels. About 2,500 such awards have been given out in the last few years. There are workshops and courses on productive technologies to help smaller firms build capabilities amongst their people and grow their collective expertise. These include courses and workshops by the BCA Academy on lean construction and DfMA. The courses are funded by the Construction Productivity and Capability Fund (CPCF), with up to 90% co-funding from the Government. These training courses expose the smaller players to the latest technologies and build up their expertise, enabling them to gain a competitive edge both locally and overseas.

To propel the industry forward as a global leader in constructing green, best-in-class buildings, BCA has been encouraging firms to upgrade their workers' skills and to retain skilled and experienced workers. We have also put in place multiple upgrading pathways for eligible workers to qualify for higher-skilled statuses. Firms are required to have a minimum proportion of higher-skilled workers. BCA provides funding to help firms defray the cost of training and upgrading their workers.

## On a personal note, what were the biggest influences in your life and why? In what ways have these helped you become who you are today?

In the earlier part of my service with the SAF, there were many greenfield areas to be developed, as well as opportunities to pioneer new ideas and innovations. Over time, the gains moved from being single service solutions towards more integrated ones, where we sought the benefits of collaboration and inter-dependencies between the different arms and services in the SAF. In a similar way, I expect the built environment sector will benefit from such "combined arms/joint service" integration, albeit without the benefit of a "superior headquarters" to drive it. BCA will have to play that role in concert with our partners in the public service and industry. Being able to share common information is a key enabler for such a transformation.







My roles at MinLaw and MCCY have also shown me the power of collaboration and partnership with the private and people sector. I believe we must better tap the collective wisdom and passion of our partners to chart out the implementation steps in our Industry Transformation Map. As our sector is multi-layered and professionally diverse, we have to bring along many different people into the process for any change to be, in order for any change to be enduring. Ultimately, I would like to see us working towards the common goal of *Building Singapore*.

#### What do you enjoy doing most outside work?

Our green spaces have become much more accessible and well connected thanks to the efforts of NParks. So, I get to exercise and visit our green spaces much more easily these days. Singapore Botanic Gardens is a favourite spot for me, as is the Punggol and East Cost park connectors. At the same time, our downtown has become more walkable, and the Marina Bay area is a great place for a walk or jog.

I remain an aspiring photographer, hoping to hone my craft in digital sports photography as well as in capturing the ever-changing cityscape in Singapore, which offers some truly unique City in a Garden views you would not find elsewhere.

I enjoy the growing line-up of sports offerings at our Sports Hub, and look forward to the day when Liverpool FC will play there. My high points there so far have been the 2015 SEA Games and the opportunity to watch my son play in his national school's rugby finals in 2014 and 2017!

## Changing the way we Build

### Design for Manufacturing and Assembly (DfMA)

DfMA comprises game-changing technologies such as Prefabricated Prefinished Volumetric Construction (PPVC), Mass Engineered Timber (MET) and Modular Mechanical, Electrical and Plumbing (MEP) systems. These technologies shift traditional, labour intensive on-site construction work to off-site prefabrication in a controlled factory environment.

The result is significant savings in time and manpower at the construction site as well as prefabrication factories. Having less construction works carried out on-site also reduces disamenities to the surrounding environment and residents.

### Building Information Modelling (BIM)

BIM allows building professionals of various disciplines to visualise and examine building projects digitally through 3D models. It facilitates better teamwork among building professionals and improves planning, reducing unnecessary reworks during construction. Also, it supports Virtual Design and Construction (VDC), a solution which allows professionals to build virtually before actual construction, improving productivity and further minimising wastage of resources.

### Integrated Digital Delivery (IDD)

Enabled by BIM, IDD is a new concept that will help to fully integrate processes and stakeholders along the value chain through advanced info-communications technology (ICT) and smart technologies. IDD leverages cloud and digital technology to integrate stakeholders in the building life cycle management. It connects the entire project delivery process from design, fabrication, to on-site assembly, as well as operations and maintenance of buildings when construction is completed.



# A WIN FOR DFMA MULTI-AGENCY TASKFORCE

Congratulations to the team for receiving the MND Minister's (Team) Award at the National Day Observance Ceremony 2017 on 8 August 2017!



Mr Neo Choon Keong, BCA's Deputy CEO (Industry Development) receiving the MND Minister's Award from Mr Lawrence Wong, Minister for National Development and Second Minister for Finance at the National Day Observance Ceremony 2017.

Co-led by BCA and the Ministry of National Development (MND), the national Design for Manufacturing and Assembly (DfMA) taskforce is supported by 15 other ministries and agencies, as well as various Institutes of Higher Learning. Through close inter-agency collaboration and consultation with the industry, the taskforce, set up in March 2016, aims to formulate strategies to resolve critical regulatory hurdles, and create lead demand and build up supply and capabilities to enable wider adoption of DfMA technologies for the built environment sector. Here's more on what the taskforce has done over the past year:

## KEY OBJECTIVES OF THE DfMA TASKFORCE

## WHY DfMA?

1. Higher-quality Products
2. Significant Savings in Manpower and Time
3. Safer and More Conducive Workplaces



Increase Adoption of DfMA Technologies



Reduce Cost Premium of Technology Options of DfMA Technologies



Build Supply Capacity and Capabilities for DfMA Technologies



#OneNationTogether

## STRATEGY: Raising Productivity in Building Works

### What the Taskforce is doing:

1. Creating demand for DfMA technologies
  - For Public Sector: Took the lead to spur adoption of DfMA technologies through the Productivity Gateway Framework (PGF) and Public Sector Construction Productivity Fund (PSCPF).
  - For Private Sector: Enhanced productivity requirements for the Government Land Sales (GLS) sites. Provided financial incentives for voluntary adoption of DfMA technologies.
2. Resolving regulatory hurdles
  - Resolved 11 Hurdles, for example
    - Relaxation of escort requirements for heavy vehicles
    - Removal of height limit for MET buildings
    - Review of fire protection requirements for structural steel
3. Building supply capacity and industry capabilities
  - Developed local manufacturing facilities
    - Set land aside and reduced costs for building such facilities.
  - Strengthened personnel capabilities
    - Training existing workforce and building a sustainable future workforce of DfMA-ready graduates.

### What's Next?

The built environment ecosystem is taking shape, thanks to strong support from the public sector and industry. Today, about \$50 million of the \$150 million PSCPF has been committed, and public agencies such as the Ministry of Education and Ministry of Health will be tapping the Fund to procure innovative and productive solutions, including DfMA technologies.



## More Winning Work

### 1. BCA SkyLab

A state-of-the-art test facility, the BCA SkyLab provides researchers with a place to test and develop energy-efficient building technologies and materials such as facades and air-conditioning. To date, the SkyLab has completed a testing project on automated reflective blinds and dimmable LED Lighting systems. Several more projects are ongoing, and BCA is in talks with over 20 organisations to test more building technologies.

### 2. Sino-Singapore Tianjin Eco-City

This project is the result of an agreement between the governments of Singapore and China to jointly develop a socially harmonious, environmentally friendly and resource-conserving city. Today, the city is nationally recognised for its green building standards. BCA is proud to be part of the team (working with Public Utilities Board and National Environmental Agency) behind this project. Besides being responsible for enhancing the awareness of green building concepts and developing industry capabilities in green building technologies in the Eco-City, it also conducted customised training programmes for Tianjin and Eco-City Administrative government officials and industry professionals. BCA is also a technical advisor for the Eco-Business Park's Low Carbon Living Lab.



# NURTURING YOUNG LEADERS FOR THE BUILT ENVIRONMENT SECTOR

Meet three young professionals handpicked by their firms to join BCA's Built Environment Young Leaders Programme (YLP).

## About the Built Environment Young Leaders Programme

YLP is BCA's initiative to retain and nurture young professionals with the potential and calibre to lead and transform the built environment sector in the near future. Launched in 2009, the Programme seeks to identify and groom Young Leaders (YLPs) working in the built environment sector who show leadership potential and passion in their work. YLPs are nominated by their respective firms and together with fellow YLPs, aspire to innovate solutions and formulate policies to transform the sector. The Programme also enables them to widen their professional networks, deepen their knowledge through local and overseas site visits, mentor younger students and more.

## SPECIALISATION: SUSTAINABILITY

*Ivie Sim*  
Senior Development Executive,  
Paya Lebar Quarter, Lendlease

It all started when Ivie attended a course on "Strategies for Sustainable Architecture" in her third year of engineering studies at university. There, she picked up an interest in sustainable buildings and green technologies, intrigued by the fact that there was no "one concept fits all" approach to achieving sustainability in the built environment. It was also where she discovered the importance of creating strategies and practices that meet local needs. One of the 27-year-old's recent achievements in sustainability is being part of the team that developed the Sustainability Plan for Paya Lebar Quarter (PLQ), an upcoming lifestyle, business and residential hub.

## Where do you see yourself in 10 years?

I look forward to being recognised as a trusted individual, with strong knowledge and broad experience in the built environment, who can help to create the best sustainable places in Singapore and make a positive difference to places where my family, friends and I will live, work and play.

## Describe Singapore's built environment in three words or less.

Ever-growing and transformational. Landmark destinations such as Marina Bay Sands and Gardens by the Bay did not exist when I was younger but are now well known locally and internationally. Possibly closer to the hearts of many Singaporeans was the makeover of the National Stadium (which hosts many shared memories of past National Day celebrations and sporting events) into what is known as the Singapore Sports Hub now – and where many more memories and experiences will continue to be created. Such examples demonstrate how Singapore's built environment has been transformed in the past and will undoubtedly continue to.

## What words of advice do you have for other young talents in the built environment?

The built environment is an ever-growing sector that offers endless learning opportunities. However, the responsibility lies within oneself to take ownership of your learning voyage, to embrace new knowledge and never hold back on pursuing your curiosity.



Ivie Sim (left) and Colin Yip (right) work on the sustainability and Building Information Modelling (BIM) technology aspects of Paya Lebar Quarter (PLQ) respectively.

## SPECIALISATION: BUILDING INFORMATION MODELLING (BIM) TECHNOLOGY

*Colin Yip*  
Senior Structural Engineer,  
Arup Singapore Pte Ltd

First introduced to BIM technology when he was transferred to Arup's Amsterdam office in 2011, Colin opened his eyes to the array of technological possibilities that could enhance how professionals design the built environment. When he returned to Singapore, he was determined to reinvigorate the computation team he was in, in the hopes of inspiring the younger engineers to lead new frontiers in technology. In the last three years, the 37-year-old has been mentoring his junior colleagues on the use of digital design tools such as BIM. Currently, he is a Qualified Person (QP) for the Paya Lebar Quarter project where he and his team embrace productive technology workflows to manage BIM data across both the design and coordination phases.

## How do you feel about being picked for the YLP?

I am honoured and humbled to be chosen to impart my knowledge and mentor younger engineers and designers. This initiative enables me to raise awareness and contribute better to the industry's development.

## What are some of your biggest takeaways from YLP to date?

I am fortunate to work with other like-minded and extraordinary YLPs in the built environment sector. We share many interesting conversations of our best practices and experiences and come together to partake in BCA's career promotion efforts. This involvement gives me extra satisfaction in doing what I love and loving what I do! The connection with my peers creates great camaraderie. Their engagement, enthusiasm and commitment to raise industry standards are really heartening.

## Where do you see yourself in 10 years?

It is no secret that technology will be a disruptive force faced by the built environment sector. I would be really excited and proud to be part of that transformation and play a leading role on the digital front, shaping the built environment of Singapore and the region.



## SPECIALISATION: INTERNATIONALISATION

*Khoo Jyh Hao*  
Director, Utracon Overseas Pte Ltd

Jyh Hao's overseas venture started 10 years ago, when he was tasked to spearhead the international business expansion for the Utracon Group. Unfazed by challenges such as the 2008 financial crisis, he and his team worked hard to expand the business not only to the ASEAN countries, but also as far away as Uganda in East Africa and Guam, the American Territory in the Pacific Ocean. Jyh Hao believes that it makes good business sense for local built environment firms with proven capabilities and niche expertise to venture overseas and leverage the 'Singapore' brand name which has gained recognition for high quality and credibility.

## How do you feel about being picked for the YLP?

I was one year shy of the cut-off age when I was selected to be a YLP last year. Knowing that the age limit for the YLP is 40, I felt really lucky to be considered as a "Young" leader.

## What's your biggest takeaway from the YLP to date?

It is definitely the opportunity to gain insights into how we can change the way we build by embracing new or disruptive technologies, to solve the challenges faced by the built environment sector in Singapore.

## Where do you see yourself in 10 years?

Business expansion through internationalisation is an endless move. Ten years down the road, I believe I can play a part in helping my firm gain a competitive edge in the international arena and build it into one of the Top 10 Specialist Contractors in Asia.

## What words of advice do you have for other young talents in the built environment?

Don't be contented with what we have achieved here in Singapore. There is always something special in other countries that can inspire us to change the way we build. So, let's internationalise and broaden our horizons.

Indeed, these YLPs will play a big part in transforming Singapore's built environment through the use of productive technologies and sustainable designs, or even extending our footprint beyond our shores. BCA will continue to look out for talents across all built environment disciplines and groom them to be our next generation of leaders.



# PLANTING HOPE, FOR A GREENER TOMORROW

Efforts to reduce the carbon footprint of the International Green Building Conference (IGBC) 2017 have taken root in the Kranji Marshes, a BCA Green Mark Platinum Park.



Despite rainy showers before the event, Guest of Honour Mr Alex Yam Ziming, BCA CEO Mr Hugh Lim together with the sponsors showed their commitment towards conserving the environment.

As a lead-up event to the Singapore Green Building Week (SGBW) 2017, BCA organised a tree planting event on 24 August 2017 and involved more than 100 participants, including representatives from BCA and the built environment sector. The occasion was graced by Mr Alex Yam Ziming, Chairperson of the Government Parliamentary Committee for National Development (GPC for ND) and Member of Parliament for the Marsiling-Yew Tee GRC.

The 50 trees planted will help to offset carbon emissions of the anchor event, IGBC 2017, enabling it to achieve carbon neutrality.

A big thank you to all our sponsors!



BCA Group Director Mr Ang Kian Seng (left), RSP Architects Planners & Engineers Managing Director Mr Lai Huen Poh (centre) and RELX President (South East Asia/ Australia) Ms Debbie Evans (right) plant and water a tree sapling.



Singapore Green Building Council (SGBC) President Mr Tan Swee Yow (left), Guest of Honour Mr Alex Yam Ziming (centre), and BCA CEO Mr Hugh Lim (right), planting a tree sapling.



Guest of Honour Mr Alex Yam Ziming (left) and BCA CEO Mr Hugh Lim (right) presenting an appreciation plaque to Ascendas-Singbridge Head of Engineering Support Services Mr Tony Choo (centre).

## About the IGBC in SGBW 2017

- Marina Bay Sands
- 12 – 14 September 2017

Organised by the BCA, IGBC is where international green building experts, policy-makers, academics, built environment practitioners, tenants, members of the public and students come together to achieve a shared vision of a greener planet through the green building movement.



Keppel Land representatives were glad to participate in this meaningful activity.





# NO PLACE LIKE DOME

A new record has been set at APSN Delta Senior School (DSS), where its students, BCA and members of the built environment community came together to build the largest single cardboard structure in Singapore!

This activity is part of BCA's corporate social responsibility collaboration with APSN DSS, the Association for Persons with Special Needs (APSN)'s post-secondary school.

### RECORD-BREAKING DOME-NATION

Measuring 5m by 5m by 3m, this dome-shaped cardboard structure is made from 101 triangular cardboard panels. It was announced as the "Largest Single Cardboard Structure" in Singapore by the Singapore Book of Records on 28 July 2017!



Featuring traditional Southeast Asian triaxial weaving patterns, the design symbolises the team's commitment to protecting heritage while embracing technology in the building and construction industry.



Inside the structure is a showcase of APSN Delta DSS students' art pieces and handicraft. This mobile "green gallery" can house up to 15 visitors.



Cleverly engineered for easy dismantling and reassembly, the structure can easily be used for future exhibitions at other locations.



We were extremely thrilled by this collaboration as it provided opportunities for our special needs students to interact and work with industry professionals. The students are very happy to complete the structure and are grateful to have learned from the volunteers during the activity.

**Mdm Aslinah**  
Principal of APSN DSS



The two-month project saw students and staff of APSN DSS, students from institutes of higher learning (IHLs), built environment young leaders, industry professionals and BCA working together to conceptualise and construct the structure.



Participants were divided into two teams, specialising in architecture and civil engineering respectively. The architectural team was led by Architecture Associate Ong Jian Liang, while BCA officer Vanessa Koh headed the civil engineering team.

Part of the school's Youth Day celebrations, this activity aimed to instil the value of resilience in its students.

### Special Thanks To...

This achievement would not have been possible without the initiative and dedication of students and staff of APSN DSS as well as volunteers from IHLs, industry and BCA, so thank you once again!



# YOUTH CAN DO IT!



Youths today are the future of tomorrow, and this is why BCA and Ngee Ann Polytechnic (NP) have been working to help them grow their talents. At the fourth NP-BCA Design Challenge, students around Singapore came together to innovate solutions for a sustainable built environment.

### NP-BCA Design Challenge 2017: Structure Illuminate

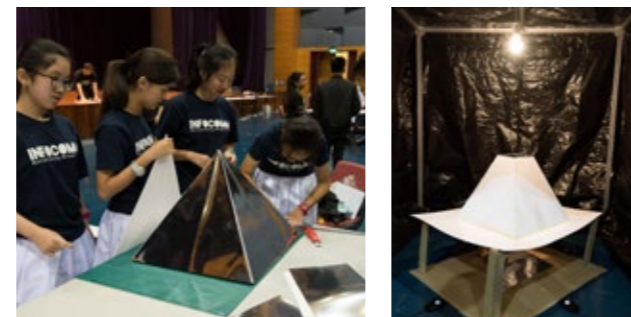
The annual Challenge aims to encourage creativity, innovation and awareness of environmental sustainability in secondary school students. The theme for this year's competition was "Structure Illuminate". Students were challenged to design indoor structures to maximise the use of daylighting in buildings. Structures were judged based on aesthetics and creativity, Learning Portfolio (a research, conceptualisation and design proposal) and lux (luminosity) reading scores. Through this Challenge, students get a taste of the real world considerations that design engineers have to take into account when designing similar structures.

When:  
**15**  
July 2017

Where:  
**Ngee Ann Polytechnic Convention Centre**

### The Building Begins...

Seventeen teams of students gathered at the Convention Centre in the morning, armed with their research on green building daylighting and their design plans. Using materials provided, they brought their construction plans to life within the four-hour time frame.



And for the final test: the structures were placed in a specially-constructed darkroom, where LED lights around the room mimicked natural light. The amount of light reflected throughout the room was then measured using lux meters – instruments for measuring brightness.

## And the Winners Are...



**Gold:**  
West Spring Secondary School (Team 4)  
**Prize:**  
\$1800 + trophy



**Silver:**  
Fuhua Secondary School (Team 5)  
**Prize:** \$1100 + trophy



**Bronze:**  
West Spring Secondary School (Team 1)  
**Prize:** \$500 + trophy

## BCA Shares!

Ms Tan Hoon Wee from BCA's Manpower Planning Division shared with students on various career options in the built environment sector.



Mr Low Giau Leong from BCA's Green Mark Department (New Development) gave insights on natural lighting in green buildings.



**Congratulations to these teams for winning merit awards and walking away with \$200 cash prize each!**

**Teams 11 and 8**  
(Nanyang Girls' High School)

**Team 6**  
(Fuhua Secondary School)

**Team 2**  
(West Spring Secondary School)

**Team 14**  
(Queenstown Secondary School)



# HARNESSING TECHNOLOGY FOR ENTERPRISE

BCA rallies behind businesses with transformative technologies that make work easier and faster for the built environment sector.

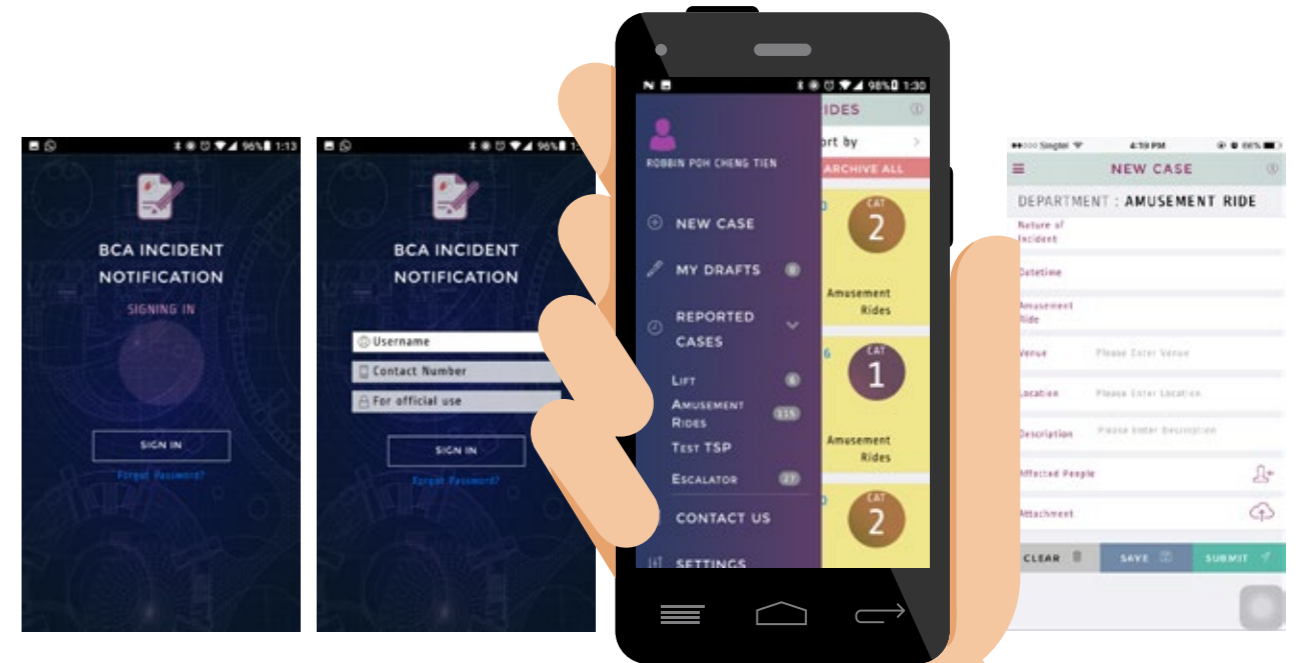


## SOLUTION 1: AN EASIER WAY TO “BUILD IT RIGHT”

**Background:** Did you know? Not all building-related works require plan submissions and approvals by BCA. These are termed “Insignificant Building Works” and listed in the First Schedule of the Building Control Regulations. Previously, project parties had to plough through the entire First Schedule to evaluate if their proposed building works had to be submitted to BCA for approval before construction could commence. This process could be tedious as they have to carefully sift through the long list of items that would apply to their projects. In addition, it might be difficult to understand the descriptions or terms used.

**Solution:** Our newly-developed “Build it Right” website allows users to find out about submission requirements by clicking on the pictorial illustrations of building elements relevant to their projects, where explanations are provided in simple terms for quick and easy understanding.

**Benefits:** Today, project parties can “Build it Right”, saving time while ensuring that they comply with BCA’s safety requirements. Plus, the website is mobile responsive, so users can conveniently check the submission requirements using their mobile phones or tablets even while on the go.



## SOLUTION 2: A FASTER WAY TO REPORT INCIDENTS

**Background:** Amusement ride operators are required to report adverse incidents to BCA. BCA’s Electrical and Mechanical Engineering Department (EMED) had received suggestions to improve the previous reporting process, which was mostly done via manual paperwork. The team also found out that some operators were unfamiliar with the reporting process, which could potentially affect the safety of their rides or lead to delays in resumption of ride operations.

**Solution:** A first-in-the-world, easy-to-use reporting mobile app now enables operators to submit incident reports anytime and anywhere. Users also have the option of doing live reporting.

**Benefits:** Operators can now reach BCA duty officers instantly – officers will receive notifications on their mobile phones once incident reports are submitted by the operators. Images and videos can be sent for better clarity of onsite incidents and users also save time on tedious paperwork. This simpler and quicker incident reporting process reduces the downtime of some rides due to the incidents, hence reducing monetary losses for businesses.

*Congratulations*

to EMED for winning a Bronze award at the Pro-Enterprise Panel – Singapore Business Federation (PEP-SBF) Awards 2016!

Download the BCA Incident Notification app here!

QR Code For Android Users



QR Code For iOS Users



Parliamentary Secretary for Education and Trade & Industry, Ms Low Yen Ling presenting the Bronze Award to BCA staff at the PEP-SBF Awards 2016.



BCA Academy - The University of Newcastle, Australia

# BACHELOR DEGREE PROGRAMMES



## Bachelor of CONSTRUCTION MANAGEMENT (Building) (Honours)

Every construction project combines a variety of complex challenges. The Bachelor of Construction Management (Building) (Honours) programme will equip you with the skills and knowledge to manage complexities in construction projects in Singapore and across the world. The programme incorporates content of Building Information Modelling teaching and projects which offer a niche specialty beyond the construction management discipline.

Graduates will embark on diverse and exciting career opportunities as BIM Managers, Construction Managers, Project Managers, Quantity Surveyors, Facilities Managers, Property Developers and self-employed Consultants.

STUDY MODE	COMMENCEMENT DATE	APPLICATION CLOSING DATE
Full-Time (10 <sup>th</sup> Intake)	26 February 2018	19 January 2018
Full-Time (11 <sup>th</sup> Intake)	12 March 2018	9 February 2018
Part-Time (5 <sup>th</sup> Intake)	12 March 2018	9 February 2018

For details on Bachelor of Construction Management (Building), please contact:  
Ms Bernice Ang Tel: 6248 9944 Email: bernice\_ang@bca.gov.sg

## Bachelor of ENGINEERING (Honours) (Civil) 2<sup>nd</sup> Intake

The development of mega infrastructure projects as well as the reshaping Singapore's city landscape will require highly-qualified engineers trained in civil discipline. As we build higher and dig deeper underground, there are high prospects for Civil Engineers to design, plan, build, manage and oversee the development of infrastructure/building projects.

This degree programme is designed to open a pathway for GCE 'A' Level and diploma graduates to pursue rewarding careers in the built environment.

DETAILS	4-YEAR PATHWAY (GCE 'A' Level; Non-Construction / Non-Civil Engineering Diploma)	ACCELERATED PATHWAY (Relevant Construction / Civil Engineering Diploma)
Application Closing Date	Early January 2018	Early March 2018
Commencement Date	February/March 2018	May 2018

For details on Bachelor of Engineering (Civil), please contact:  
Er Lim Yaw Shyan Tel: 6248 9915 Email: lim\_yaw\_shyan@bca.gov.sg

**SCHOLARSHIP / SPONSORSHIP AVAILABLE**  
(Applicable for locals & foreigners. T&Cs apply)

## NEWCASTLE RANKINGS

**TOP 200**

13 UON disciplines ranked in the top 200 in the world<sup>1</sup>

**OVER 90%**

of our research is 'at or above world standard'<sup>2</sup>

**TOP 10**

in Australia for research income<sup>4</sup>

**TOP 8**

in Australia for research 'well-above world standard'<sup>3</sup>

**TOP 1%**

universities in the world<sup>1</sup>

<sup>1</sup> QS World University Rankings 2017/18  
<sup>2</sup> QS World University Rankings by Subject, 2017  
<sup>3</sup> Excellence in Research Australia 2015  
<sup>4</sup> Higher Education Research Data Collection 2014

For Your Diary

# BCAA EVENTS

SkillsFuture Credit, SkillsFuture Study Awards, Mid-Career Enhanced Subsidy, Workfare Training Support (WTS), Skills Development Fund (SDF), Workforce Training and Upgrading Scheme (WTU) and other subsidies are available for BCAA courses!

### NOVEMBER 2017

9 Nov 2017 (9.00am - 5.00pm)

WSH Conference 2017  
WSH Excellence Through Advanced Technologies in Construction Industry

10 Nov 2017 (9.00am - 1.00pm)

Civil Defence Shelter Seminar 2017  
Design, Construction and Commissioning of Household and Storey Shelters

15, 16, 23 & 24 Nov 2017

Develop a Workplace Safety and Health Management System Implementation Plan (BizSAFE Level 4) (13th Run)

15 - 17 Nov 2017

Project Management (24th Run)

20, 21, 27 & 28 Nov 2017, evenings

Certification Course for Site Investigation Supervisors (19th Run)

20 & 21 Nov 2017 (2 days) (14th Run)

27, 29 Nov, 4 & 6 Dec 2017 (4 evenings) (15th Run)

Registered Earthworks Supervisor Course (15th Run)

20, 22 & 27 Nov 2017, evenings

Application for Extension of Time - Factors for Success (9th Run)

20, 23 & 27 Nov 2017, evenings

Site Management of Precast Concrete Construction (25th Run)

21 & 22 Nov 2017

Develop A Risk Management Implementation Plan (BizSAFE Level 2) (122nd Run)

27 & 28 Nov 2017

CP5 on Low Voltage Electrical Installations (7th Run)

27 & 28 Nov 2017

Efficient Building Envelope Design, ETTV and RETV (17th Run)

20 & 21 Nov 2017 (2 days) (14th Run)

27, 29 Nov, 4 & 6 Dec 2017 (4 evenings) (15th Run)

Registered Earthworks Supervisor Course

28-Nov-2017

The Basics of Design for Manufacturing and Assembly (DfMA) (2nd Run)

28, 30 Nov, 5 & 7 Dec 2017

Pile Foundations Design and Construction for Engineers (30th Run)

29 & 30 Nov 2017

BIM Scheduling & Process Management (4th Run)

30 Nov & 1 Dec 2017

Construction Contract Procurement & Negotiations (2nd Run)

5 & 6 Dec 2017

Behavioural Safety for the Construction Industry (21st Run)

13 Dec 2017

Workshop for Company CEO/Top Management (bizSAFE Level - 1) (45th Run)

11 Jan 2018 (Venue: Grand Copthorne Waterfront Hotel)

BCA-REDAS Built Environment and Property Prospects Seminar 2018 (NEW)

Starting on 8 Jan 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Virtual Design & Construction (3rd Run)

Starting on 9 Jan 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Underground Construction (NEW)

Starting on 9 Jan 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Construction Productivity (8th Intake)

Starting on 15 Jan 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Building Information Modelling (18th Intake)

Starting on 22 Jan 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Facility & Energy Management (32nd Intake)

Starting on 22 Jan 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Design for Manufacturing & Assembly (4th Run)

Starting on 22 Jan 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Lean Construction (4th Run)

Starting on 1 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Architectural Technology (8th Intake)

Starting on 1 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Building Cost Management (18th Intake)

Starting on 1 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Construction Management (23rd Intake)

Starting on 5 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in M&E Co-ordination (28th Intake)

Starting on 19 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Interior and Landscape Design (29th Intake)

Starting on 19 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Interior and Landscape Design (29th Intake)

Starting on 19 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Interior and Landscape Design (29th Intake)

Starting on 19 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Interior and Landscape Design (29th Intake)

Starting on 19 Feb 2018

(Application closing on 17 Nov 2017)

Specialist Diploma in Interior and Landscape Design (29th Intake)

(Full-time - 10th Intake)

Starting in Nov 2017

Bachelor of Construction Management (Building)(Honours)  
(Awarded by The University of Newcastle, Australia)

CONTACT

Ms Bernice Ang (Programme) / Ms Zhuo Xiuyun (Enrolment)  
Tel: 62489944 / 6248 9881  
Email: bernice\_ang@bca.gov.sg / zhuo\_xiuyun@bca.gov.sg

(Full-time - 2nd Intake)

Starting in Feb/Mar 2018

Bachelor of Engineering (Honours) (Civil)  
(Awarded by The University of Newcastle, Australia)

CONTACT

Er Lim Yaw Shan (Programme) / Ms Ang Geok Lung (Enrolment)  
Tel: 62489915 / 6248 9887  
Email: lim\_yaw\_shan@bca.gov.sg / ang\_geok\_lung@bca.gov.sg

New Intake: Starting on 5th Mar 2018  
Stage 1 Application Closing: 3 Dec 2017  
(for working professionals)

Master of International Construction Management with major in Construction Productivity (NEW)  
(Conferred by the University of Florida)

CONTACT

Dr Patrick Shi (Academic Consultant) / Ms Saraswathy (Admission Advisor)  
Tel: 6730 4537 / 6248 9968  
Email: patrick\_shi@bca.gov.sg / saeaswathy\_ramachandran@bca.gov.sg



For more information on BCA Academy courses, please visit [www.bca.edu.sg](http://www.bca.edu.sg)





BuildSmart Conference 2017

## EMBRACING INNOVATION, BUILDING OUR FUTURE

24-25 October 2017, Max Atria @ Singapore Expo, Level 2

- Design for Manufacturing and Assembly (DfMA)
- Mass Engineered Timber (MET)
- Prefabricated Prefinished Volumetric Construction (PPVC)
- Mechanical, Electrical & Plumbing (MEP)
- Virtual Design and Construction (VDC)
- Building Information Modelling (BIM)
- Internet of Things (IoT)

**PLENARY SESSION:**  
Innovation and Productivity:  
The Next Step

**buildSMART**  
Conference 2017



Workplace Safety and Health (WSH) Conference 2017

## WSH EXCELLENCE THROUGH ADVANCED TECHNOLOGIES IN CONSTRUCTION INDUSTRY

9 November 2017, BCA Academy

WSH experts and practitioners from Singapore and overseas will share on the following topics:

- Building Information Modelling (BIM) and Virtual Reality (VR) in respect of Health and Safety
- Managing Safety in Changi Airport Through the Use of Technology
- Workplace Safety in the Digital Age
- Safety Considerations in Design of Underground Structures
- Safety Initiative from CDL's perspective
- Sharing of Best WSH Practices from A WSH Award- 2017 Winning Contractor
- Introduction to Protective Security
- Intelligent Fire Alarm Detection Systems: Video Fire Detection System
- How drones can save you money, reduce risks, and limit delays to your projects
- BIM-VDC Framework, a Catalyst to Workplace Safety and Health



## Specialist Diploma in LEAN CONSTRUCTION

Course commencing on 22 January 2018

WTU Funding  
is available

Drawing from the lean principles originally applied in the manufacturing sector, lean construction adopts the production management approach to project delivery. It strives to optimise project delivery through continuous improvements to minimise waste and maximise value to all stakeholders. This programme aims to equip industry practitioners with knowledge of lean principles, lean construction approaches and methodologies for higher productivity.



## Specialist Diploma in UNDERGROUND CONSTRUCTION

Course commencing on 9 January 2018

WTU Funding  
is available

The Specialist Diploma in Underground Construction aims to equip contractors and consultants at the supervisory level with the knowledge in geotechnical design concepts, considerations and construction techniques so as to support increasingly complex and challenging underground construction projects.

