

PILLARS

We shape a **safe**, **high quality**, **sustainable** and **friendly** built environment | SEPTEMBER 2015

SHARING THE BCA ACADEMY EDGE

ORCHARD ROAD
IS OPEN TO ALL

DOCTORS TO OUR SHORES

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DEAR READERS,

In March this year, we bid farewell to Singapore's founding father, the late Mr Lee Kuan Yew. His imprint is no doubt everywhere around us, touching every aspect of our lives.

Mr Lee dedicated his entire life to shaping Singapore into the highly liveable and cosmopolitan city it is today. As a visionary leader, he paid a lot of attention to detail in building this city and its infrastructure to meet our immediate and long-term socio-economic needs. Our commitment to continue with the transformation of the built environment sector has been reaffirmed as we witnessed his drive and tenacity in his nation building efforts.

To transform the sector, BCA Academy is preparing to open its smart campus to students who will have the opportunity to not only learn and build a professional career when they join the sector, but leave a legacy behind through their contributions to the industry after their graduation. In fact,

as several Singapore firms including SMEs have extended their operations and services overseas, there will be plenty of opportunities for our built environment professionals overseas in the years to come.

In this issue of PILLARS, you will also read about BCA staff who safeguard our foreshore structures that are susceptible to damage and deterioration. Continuous effort and maintenance are a must to ensure the structural safety of these protective foreshore structures and the stability and integrity of our shoreline, so that we are able to enjoy our coastline with peace of mind.

Happy reading!

Dr John Keung
Chief Executive Officer



HOW TO MAKE THE BUILT ENVIRONMENT SECTOR MORE PRODUCTIVE

By investing in productive technologies and improving the quality of its workforce.

Based on an industry survey, more than half of the firms have embarked on their productivity journey to explore alternative ways to build smarter, as a result of measures under the first Construction Productivity Roadmap.

BCA's second Construction Productivity Roadmap – launched in March and which took effect in June 2015 – aims to keep the industry moving steadily toward the goal of higher productivity. This means introducing productive technologies that enable more to be done with less manpower, causing less pollution and disturbance, and even safer and of higher quality. For this to work, the industry needs a strong core of professionals, managers, executives and technicians (PMETs) to lead the sector, and a larger pool of higher skilled workers to anchor the workforce.

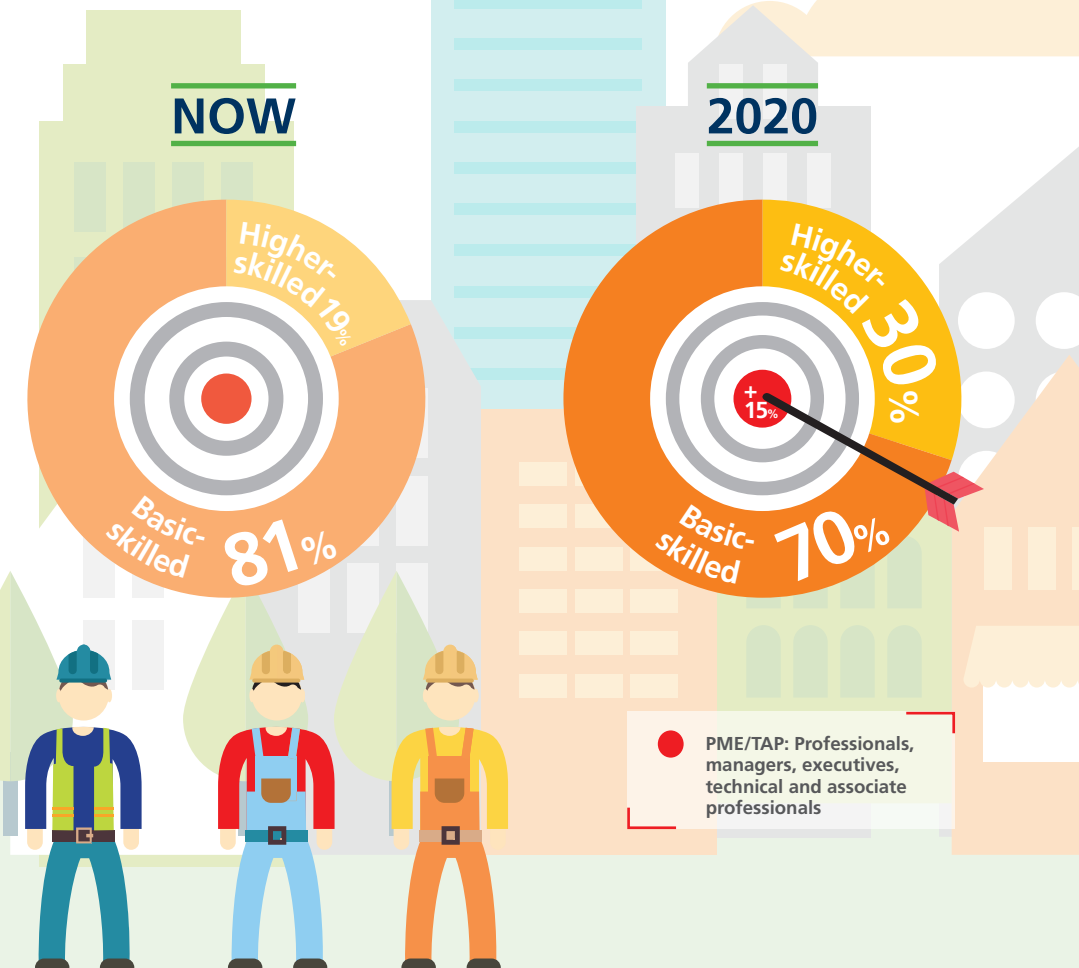
BCA will be making available \$450m over the next three years to achieve more significant productivity improvements from now until 2020. About 7,000 built environment firms are expected to tap on this funding – to be used for technology adoption, training and upgrading, as well as scholarships and sponsorships.

PROFILE OF A CHANGING WORKFORCE

Currently: 320,000 work permit holders (WPH) and 60,000 local PME/TAPs in the workforce.

By 2020 BCA targets:

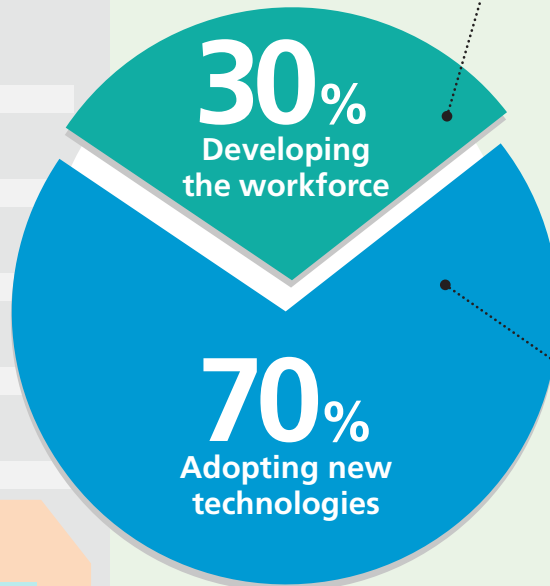
- 20-30% fewer WPHs to carry out the same amount of work
- Increase proportion of higher-skilled workers to at least 30%
- Increase the pool of local PMETs by 10-15%



2ND CONSTRUCTION PRODUCTIVITY ROADMAP

Intended for a three-year period from June 2015 to May 2018, the focus is on raising construction productivity to the next level with different initiatives. Among them is a tranche of funds for investing in impactful productive technologies and improving the quality of the workforce.

\$450m



to benefit
about
7,000
firms

\$135m
for developing
the workforce

Training and upgrading

- Higher funding support of up to 90% for locals
- More productivity-related courses

Scholarships and sponsorships

- Introduce part-time diploma and postgrad scholarships
- Introduce SkillsFuture Earn-and-Learn programme for ITE graduates

\$315m
for adopting new
technologies

- To continue to co-fund up to 70% of equipment cost for site mechanisation under the Mechanisation Credit (MechC) scheme, and 70% of technology/process improvement project costs under the Productivity Innovation Project (PIP) scheme.
- Both are continued from the 1st roadmap. For the PIP scheme, the funding cap is raised from S\$5m to S\$10m.

BCA AND A TANZANIAN FIRST

There was plenty to celebrate when Tanzania's first Green Mark building, the National Housing Corporation (NHC), opened its doors in 2014.

NHC, located in Dar es Salaam, is much like Singapore's HDB, its role being to provide quality public housing and other buildings for use by the general public.

The building is built with Solar PVs, an external glass spandrel façade that reduces the level of heat entering the building, naturally-ventilated restrooms and water-efficient fittings that have been labelled 'Excellent' by Singapore's national water agency, PUB. Plant and food waste and manure are composted and used as soil top-ups for the landscaped areas. Singapore-based Environmental Sustainable Design (ESD) consultants, Green A Consultants, provided advisory services to NHC on greening the project.

Said Ms Leong-Kok Su Ming, Director, Green Mark Department (New Development), BCA: "We were very heartened and impressed by the keenness of our Tanzanian partners to embrace new technologies and recommendations. For instance, our team had recommended the incorporation of the external glass spandrel during the project's very early stages of construction in 2013 and it was taken on board and implemented immediately. We had also made recommendations to the team on methodology to right size the air conditioning systems. They acted on this and chose the right air con unit size which resulted in more energy and capital cost savings for the development. This is the kind of responsiveness that is required in our shared cause of a sustainable and green built environment."

BCA representatives recently attended the first East African Green Building Conference in Tanzania, organised by the Tanzania Green

Building Council. They shared the Sustainable Singapore Blueprint (SSB) 2030 with policy-makers, developers, government officials, academics and key industry representatives from the architectural, engineering and building sectors. In conjunction with the conference, BCA's International Development Group made a trip to Tanzania led by Mr Choo Whatt Bin, Executive Director (Services), to explore business opportunities there.



Headquarters of National Housing Corporation Tanzania, the country's first Green Mark certified building.



Centre: Mr Choo Whatt Bin, BCA's Executive Director (Services), and Mr Alphayo J Kidata, Permanent Secretary, MLHSD, with members of the Singapore delegation.

CAMPUS OF TOMORROW

“Building Singapore over the years was not by luck, it was about building the infrastructure, and more importantly, the people behind it.”

BCA Academy’s Deputy Managing Director Cheng Tai Fatt discusses game-changing technologies in an experiential learning environment at the academy.



Q: What makes BCAA unique?

CTF: It is possibly the only institution in the world that provides such a comprehensive suite of programmes for the built environment (BE) sector, starting from basic skills training to supervisory training and all the way up to professional certification and executive training.

Q: How is BCAA gearing up to become a premier BE institution in the region?

CTF: There are three specific things we are putting in place. Firstly, we want the Academy to be a microcosm of BCA's initiatives. Whether it is Universal Design (UD), sustainability or Building Information Modelling (BIM), we want BCAA to be the place where people can see these at work through our gallery, Zero Energy Building (ZEB), sensory garden and so on. Through these facilities we educate and inspire individuals and industry about how things can be done.

Secondly, we want the Academy to be the place for experiential learning, a hands-on practice-oriented learning experience. At our new building, we have put in a lot of technology in such a way that students can observe up close technology at work. We want to move away from a controlled environment to a living one where people can see how things are being built.

Thirdly, we want it to be a knowledge and innovation hub, a repository of BE knowledge; and to work with industry partners to test-bed technologies so that the whole campus becomes a playground for innovative solutions.

Q: How successful are your outreach efforts proving to be?

CTF: We are making good progress, and seeing a lot of interest from the young in sustainable development. Young people are realising the importance of sustainability for Singapore. It is also a global issue. Singapore is fast ageing and this is

another area which the young need to be educated about – that a lot of infrastructure is needed to cope with this reality.

We are putting in a lot of effort to change the perception that the construction industry is about labour, workers, danger. Today it's much more than bricks and mortar; it's about knowing how to use advanced technologies. For instance, the use of advanced IT and BIM are rapidly changing the way buildings are



“
...we want the Academy to be the place for experiential learning, a hands-on practice-oriented learning experience.
”

designed, constructed and operated.

Q: Share examples of technology that are changing the industry.

CTF: There are two key examples. BIM is a 3D technology that allows people to digitally design and construct a building before a single brick is laid. It can be done on the computer, you can see the problems and rectify them before you go on site. Why this is so interesting, especially to the young, is that they are familiar with smartphones and gaming. It is easy to connect those with 3D visualisation. BIM allows a fundamental change in the building process, to be more efficient and productive.

Game-changing technologies such as prefabricated applications like Prefabricated Pre-finished Volumetric Construction (PPVC) and Cross-Laminated Timber (CLT), for instance, allow people to construct units off-site in a manufacturing environment. The work is done in a factory setting and this will change the mindset of what the construction industry is all about. With innovative thinking and new mindsets, you can transform the industry toward more assembly line processes, like a Lego set, where you build everything elsewhere, deliver on site and assemble. This is the trend that will emerge in Singapore.

Q: What is the most striking example of experiential learning?

CTF: Over the next few months, we are going to build a BIM studio. It will be an environment where professionals can practise and work on site as a team to better collaborate on a project. We want to simulate that environment in the BIM studio to enhance the training and learning experience for the industry as it moves toward better collaboration and integration in the whole value chain.

Q: What challenges do you foresee?

CTF: As with anything new, there will be some resistance, so we must calibrate the process of change. Doing it well is always about people and bringing up the competency level. Once you have higher competency, there is less resistance to change.

We want to give people a level of comfort, that BCAA will hand-hold them through the process; also, there is incentive funding, in which we support the cost of change. Such initiatives reduce the impediments to change.

The other vital component is continuous learning. We need to constantly review and improve our programmes and ensure we have the best instructors so that our students keep pace with directions we are promoting. Our teaching faculty is mainly from the industry, with some 30% in-house lecturers and 70% adjunct lecturers who bring with them current industry experience. In this way we can move the Built

Environment industry to the next level.

Q: How successful are efforts to change the BE industry's image?

CTF: Over the past few years we have seen an increase in the number of students. We had almost 1,000 graduates in the last batch, and we want to encourage more Singaporeans to be a part of the Built Environment sector.

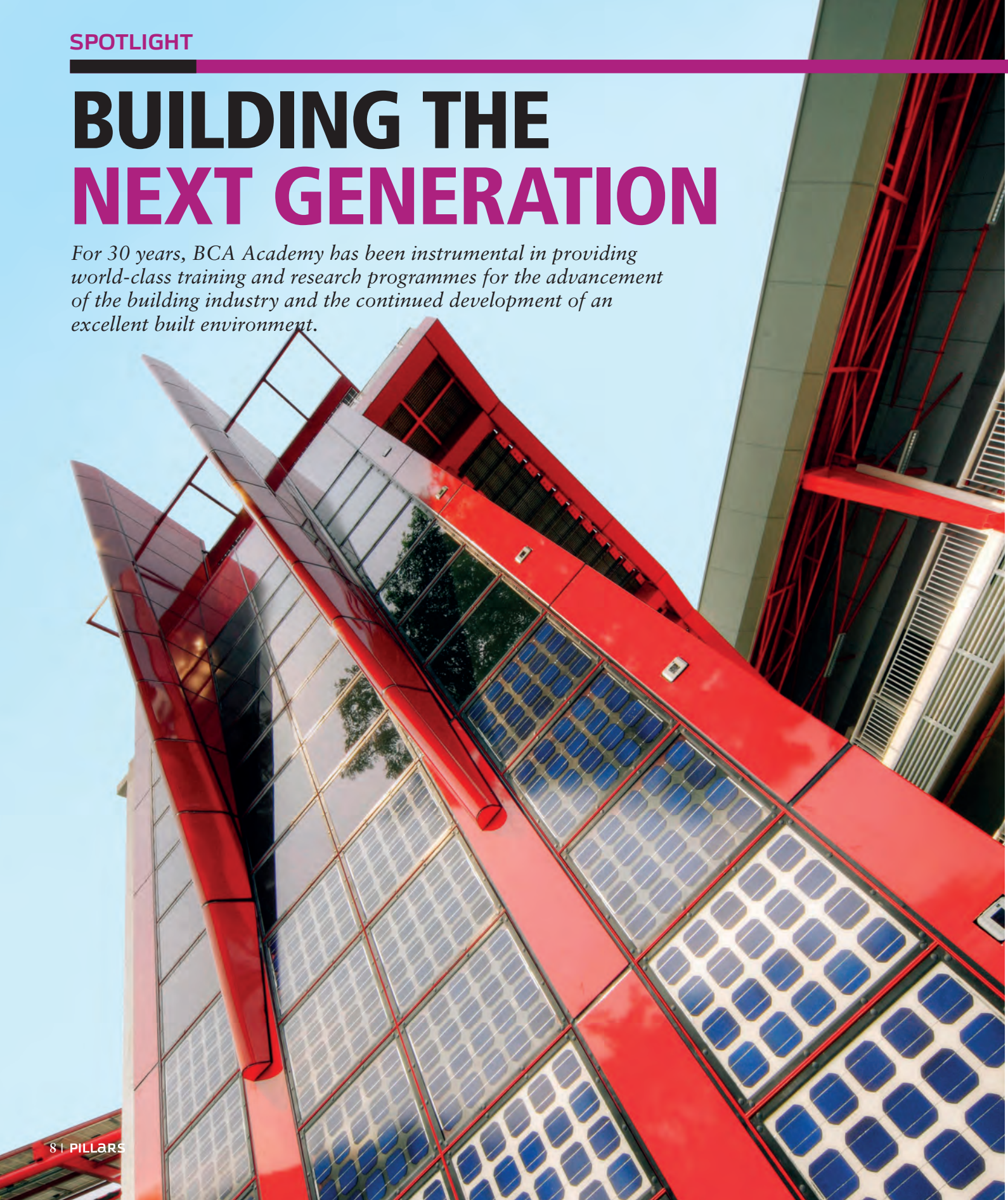
We must tell stories to inspire. When you listen to stories told by Singapore's pioneers, you can tell how proud they are of the iconic structures they helped build. These are the stories we must tell young people – to show them that they are not just building a professional career, they are leaving behind a legacy if they join this industry. A mindset change is needed; young people must realise that they can really contribute. Building Singapore over the years was not by luck – it was about building the infrastructure and more importantly, the people behind it.

“
...they are not just building a professional career, they are leaving behind a legacy if they join this industry.
”



BUILDING THE NEXT GENERATION

For 30 years, BCA Academy has been instrumental in providing world-class training and research programmes for the advancement of the building industry and the continued development of an excellent built environment.



Since 1984, the BCA Academy has been playing a key role in ensuring that the skills and expertise required to shape a safe, high quality, sustainable and friendly built environment are readily available.

As the Academy's Managing Director William Tan Yong Keh says: "The building and construction industry is a key pillar of the Singapore economy. It delivers the world-class buildings and infrastructure necessary to sustain our economic development and growth.

"The industry also provides employment for a large number of people in a wide range of jobs, professions and businesses...it is imperative for us to nurture and develop a professional, progressive and productive workforce, capable of delivering good quality projects at competitive prices, in a timely and safe manner."

Indeed, as BCA's education and research arm, BCAA plays a leading role in helping the industry to acquire new skills and capabilities. It offers a wide range of programmes for the training of personnel at all levels, from construction tradesmen and supervisors to technicians, managers and professionals.

To support the national agenda in areas such as raising construction productivity and promoting sustainable development, BCAA has also developed training frameworks to groom competent professionals and workers in these fields, such as 'green' professionals and BIM managers. The training programmes include Masters and Undergraduate Programmes (in collaboration with reputable universities), Diploma and Specialist Diploma Programmes, and Certification Courses.

Today, the Academy at Braddell Road provides a full range of training and education programmes tailored to meet the diverse needs of the built environment industry.



To make these options more accessible, BCA has developed a suite of scholarship, sponsorship and apprenticeship programmes for personnel at all levels in the workforce. As a result of these initiatives, more than 640 students and job-seekers have been drawn into the BE industry, either via BCAA or other routes.

In tandem with this is the need to ensure a skilled construction workforce, through certification courses for the various trades. Subsidies have made it more affordable for companies to send personnel for training. So far, more than 50,000 applications have been received for Workforce Training and Upgrading and more than 1,400 experienced construction personnel have been certified as supervisors.

True to the realisation that the

BE industry is a key pillar of the Singapore economy, BCAA continues to be a leader in education and research, for a future-ready built environment.

Sharing the Experience

Sharing Singapore's experience globally is another academic niche. Over the years, the Academy has developed many customised training programmes for overseas delegates from public and private institutions.

To date, more than 1,700 delegates from Asia, Middle East, Africa, Europe, Latin America and other regions had attended short-term customised courses to acquire knowledge in green building design, building control framework, urban planning and design, sustainable development practices and construction skills training.

THE GREEN COLLAR WORKFORCE

Two of the most important levers to success are skilled BE players and young people who care about the future. BCA is getting everyone on board.

Almost every other day, we see postings for jobs in the field of Environmentally Sustainable Design (ESD), green building consultants, solar engineers and others. As the world embraces energy efficiency, conservation, and green technologies, a growing green collar workforce is necessary. Today, Singapore companies are making themselves heard among global corporations in the corporate sustainability arena.

To maintain Singapore's green building success, a green collar workforce of about 20,000 is needed by the year 2020. This explains BCA's extensive green building training framework where courses will be conducted by the BCA Academy, its training and education arm located at Braddell Road.

Whether it is facilities management, M&E coordination or leadership in Environmental

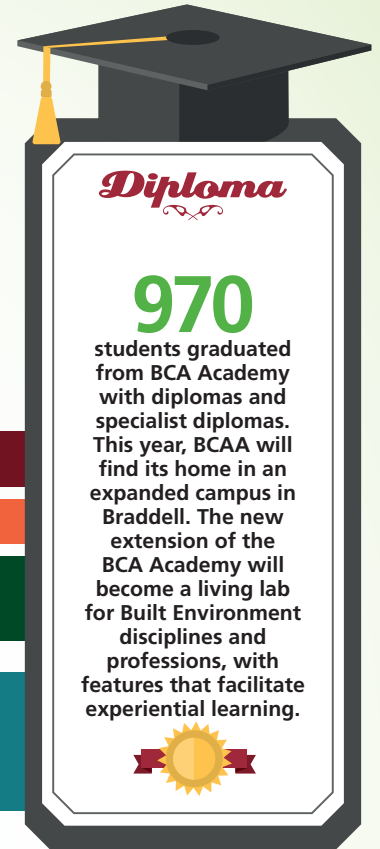
Sustainability, BCAA has it covered, with collaborations with overseas universities awarding specialist certificates, diplomas and degrees.

Recognising that passion is the essence that will help further Singapore's green agenda, the agency has been taking notice of committed and passionate individuals in Singapore as well.

Together with the Singapore Green Building Council (SGBC), it jointly launched the BCA-SGBC Green Building Individual Award in 2011, to recognise men and women for their outstanding, consistent and significant contributions toward environmental sustainability. Since then, 28 winners have made the cut for motivating our green workforce to constantly challenge their limits in developing innovative solutions for the green building sector.



MULTIPLE PATHWAYS TO UPGRADE FOR THE WORKFORCE



Diploma

970

students graduated from BCA Academy with diplomas and specialist diplomas. This year, BCAA will find its home in an expanded campus in Braddell. The new extension of the BCA Academy will become a living lab for Built Environment disciplines and professions, with features that facilitate experiential learning.



FOR GCE 'N' LEVEL STUDENTS

One-year pre-diploma Foundation Programme designed to better prepare students for entry into the relevant BCA Academy Diploma programmes.



FOR GCE 'O' LEVEL STUDENTS

Diploma programmes which are practice-oriented and tailored to the needs of the built environment.



FOR GCE 'A' LEVEL STUDENTS & DIPLOMA GRADUATES

Bachelor and other degree programmes by well-known overseas and local universities to nurture new industry entrants in the area of construction management, building and project management and facilities and environmental management.



FOR INDUSTRY PROFESSIONALS ASPIRING TO UPGRADE

Masters degree and specialist programmes to develop managerial and technical capability in areas such as sustainable building design and facility and environment management. These programmes focus on specialist knowledge in niche areas in the BE industry which include:

- Advanced Management Programme on Productivity and Leadership Development, jointly offered with the Singapore Management University.
- Executive Development Programme on Leadership in Environmental Sustainability jointly offered with Carnegie Mellon University.
- Executive Development Programme on Innovations in Sustainable Design & Technology jointly offered with HFT Stuttgart University of Applied Sciences/TU Braunschweig.
- Advanced Management Programme on Virtual Design & Construction, jointly offered with Stanford CIFE.

BCA ACADEMY'S CENTRES OF EXCELLENCE

To meet the future challenges of raising construction productivity and professionalism, BCA has created centres of excellence to propel the industry forward in different ways. Among them are the Centre for Construction Information Technology (CCIT), which spearheads the adoption of Building Information Modelling (BIM) to transform the way buildings are designed, analysed, constructed and managed; the Centre for Construction Skills Training (CCST) which trains workers in building trades and in the operation of construction plants and equipment; and the Centre for Workplace Safety and Health (CWSH) with training programmes to equip construction personnel with the knowledge to perform their duties safely.

THE ALL-IMPORTANT R&D

Given Singapore's climactic conditions of year-round heat and high humidity, it is common for households to be fitted with air conditioning units.

Similarly, on a larger scale, buildings use Air-Conditioning & Mechanical Ventilation (ACMV) systems which use a significant amount of energy, ranging from 40 to 60% for a typical air-conditioned building.

Considering that most of our time is spent indoors, a lot of energy is required to cool buildings without compromising comfort. Translate the energy used into dollars and cents, and that's a big chunk of costs which could be saved or put to better use.

Incentive schemes worth about

\$100m have been made available by BCA and other public sector research organisations and private companies since 2007.

Heralding more good news for building professionals in Singapore is the \$52m fund for the Green Buildings Innovation Cluster (GBIC). This makes way for more time and resources to develop, test, monitor and showcase new green building solutions, relevant to the tropics and sub-tropics (see related story on facing page).

Having greener buildings reduces energy consumption. This contributes

to local and global efforts to reduce the carbon emissions that cause climate change. And BCA is in the forefront of making it happen.

Today, there are ideas ready for adoption by the industry, while some have already been commercialised. For example, guidelines to achieving better natural ventilation at hawkercentres have been introduced, as have sandwich acoustic panels that absorb sound at all frequencies, and the use of recycled materials for roadworks and structures.

So if you have an idea or an invention that could benefit Singapore's built environment, visit www.bca.gov.sg/Professionals/Technology/technology.html for information about funding schemes.



TESTING, TESTING...

EASIER TO ADOPT GREEN TECHNOLOGIES

Energy-efficient buildings save costs for their owners in the long-run and benefit the earth. But in the initial stages, adopting new green technologies may incur extra costs for equipment and installation. To help mitigate these costs and make it adoption-friendly, BCA has put forward the GBIC-Building Energy Efficient Demonstrations Scheme (GBIC-Demo).

The **\$20m scheme** will spearhead the test-bedding of new energy-efficient technologies in fully operational buildings. The scheme is one of three key initiatives under the **\$52 million Green Buildings Innovation Cluster (GBIC) programme** launched by BCA in September 2014.

To push the boundaries of building energy efficiency, technologies to be test-bedded should achieve 20-40% improvement over the current best-in-class technologies. These technologies could come from successfully completed research and development projects or proven technology, either local or overseas, that have not been widely implemented in Singapore yet. Examples include innovative air conditioning technologies, such

as chilled ceilings and under-floor cooling systems.

The scheme will also cover the cost of removing the technology should the trial be deemed unsuccessful.

Testing the new technologies in a real-world setting will help

remove some of the barriers towards the adoption of cutting-edge technologies while providing opportunities for improving the technology, noted Mr Nilesh Y. Jadhav, Program Director of EcoCampus at Nanyang Technological University.



BUILDING OUT IN THE WORLD

Overseas markets beckon Singapore building and construction companies.

Looking to expand your business overseas? Be it India, China or Myanmar, Singapore companies have been making headway in Asian territories in the last few decades.

Some of these players went overseas decades ago. Woh Hup (Private) Limited, one of Singapore's oldest building and civil engineering contractors, took its expertise to Thailand in the early 90s, before expanding into Malaysia, Myanmar, Philippines and Sri Lanka. Also in the 90s, homegrown architecture, design and branding firm Ong&Ong entered China, Malaysia and Indonesia with mixed-use development projects. Its 40-plus years of experience in high-rise, high-density residential projects is its clear value-add. Others include Lee Kim Tah, Surbana and Jurong Consultants, and younger SMEs like sustainable building consultant, BSD.

While they are still in the minority, a change is on the way for more Singapore companies – large or small, old or young – to blaze a path overseas.

1 Surbana International Consultants: Planning cities

This building and urbanisation consultancy may be fairly new on the international scene, but its foundations were laid through decades of public housing and urban solutions for Singapore. Now it creates cities around the world.

Surbana offers full-service building consultancy solutions, including the full spectrum of services, from sustainable design solutions and coastal engineering, to infrastructure survey, building technology and city management.

Among its achievements is the crafting of a masterplan for the Chinese port city of Rizhao, to create an architectural feat that marries an industrial hub with a sustainable marine economy.

The landscape design for Rizhao International Ocean City earned Surbana the top prize at the 2014 Green Award – World Landscape Planning Design Competition, organised in China last October.

It is currently the master planner for the Andhra Pradesh (AP) new capital city and surrounding region, an urbanisation project that will impact almost 50 million people. Surbana is also leaving its mark in Africa. Its latest project there involves working with the local government to draw up masterplans for Arusha City and Mwanza City utilising emerging trends, including city structural land use, international and regional transport, infrastructure and utility services and environmental planning.



1

2 WOH HUP: Building partnerships

Established in 1927, Woh Hup (Private) Limited has a portfolio of major projects here and overseas. Its most recognisable Singapore projects include Gardens by the Bay, Orchard Central and The Interlace. A multiple winner of BCA's CONQUAS awards, it has projects in several Southeast Asian countries and also operates in Myanmar and Sri Lanka. Currently constructing the Sedona Hotel extension in Myanmar slated for completion in 2015, it also has – in strategic partnership with Lee Kim Tah Holdings Ltd – ventures in India including a luxury condominium development, 27 Park Avenue, and a commercial building, Amada Technical Centre, both in Bangalore.

3 BSD: Providing green solutions

This building consultancy firm works with town and city planners, developers and architects to develop comprehensive sustainable strategies for cities, towns and buildings. The company also provides advice and coordination for development projects targeting Green awards such as Singapore's Green Mark. Working with research institutions enables BSD to apply new technologies to commercial projects. Junction City, BSD's first project in Myanmar, comprises an office tower, premium serviced apartments, a five-star hotel and a state-of-the-art entertainment and shopping complex. The development is designed with sustainability and environmental consciousness in mind.

4 ONG&ONG: Making high-rise high-density work

Leveraging on Singapore's rapid progress and development in the last 20 years, ONG&ONG has accumulated experience in high-rise, high-density residential projects. It is known for its mixed-use development projects, with some work secured through its participation in BCA's overseas trade missions and exhibitions.

Today, 30% of its revenue comes from overseas projects, much higher than the industry average of 4.75%. Eventually this will rise to 50%. "The only way is globalisation," says Mr Tai Lee Siang, Ong and Ong's managing director, citing Singapore's limited land area and few local expansion opportunities.



2



3



4

GETTING SINGAPORE COMPANIES TO INTERNATIONALISE

BCA plays a multi-faceted role as business consultant, matchmaker and mediator, besides its business promotion efforts. This includes providing business intelligence, project leads, networking, seminars and mission trips.

Through mission trips, business seminars, MOUs, BCA can help you take the first step in prospecting for customers and projects overseas. If you would like to be on the mailing list for upcoming mission trips, drop us an email: jeantan@bca.gov.sg

SELLING GREEN BUILDING SOLUTIONS

Singapore-based companies specialising in green solutions are stepping out into the world.

BCA officials were invited to share the story of Singapore's green building journey at the 11th Beijing International Green and Energy-efficient Buildings Conference (IGIBC) held in March 2015.

The annual flagship event of the Chinese Ministry of Housing and Urban-Rural Development, IGIBC is the leading sustainable building event in China. This three-day expo was attended by more than 4,000 delegates and featured a high-level international conference of over 500 exhibitors.

The event's plenary speech was delivered by Executive Director (Services) Choo Whatt Bin. The event also provided a platform for networking and exploring business opportunities, and for profiling the work of BCA and seven Singapore companies at the Singapore Green Pavilion and Forum.

The companies described in the following pages were among the Singapore companies who participated to showcase a diverse range of businesses.

Clockwise from top left: Mr Koh Lin Ji, Group Director, International Development Group, BCA, speaks to delegates about the expertise of Singapore companies such as Anjels Pte Ltd, a specialist in wireless systems; a vertical garden project by Consis Group Pte Ltd; the kind of weathered, reclaimed wood promoted by Centennial Woods, LLC; and a China development by Green Mark winner Squire Mech.

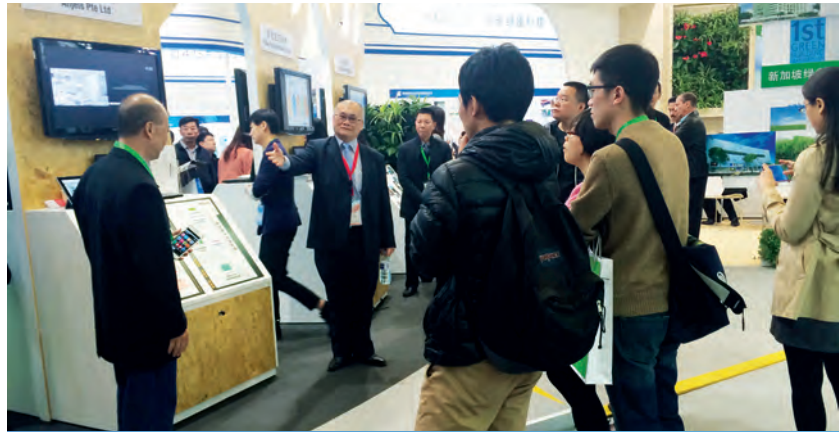




IMAGE: TERRA DESIGN

Consis Group Pte Ltd **Green walls rule!**

Given the towering skyscrapers that dominate the Singapore landscape, vertical gardens are a great solution to bridging the gap between concrete and nature. Consis is one vertical greenery system that is highly valued among industry experts for its fuss-free maintenance, natural look and durability. The system is fully integrated with automatic irrigation, drainage and fertilisation functions. These winning features have garnered the system a faithful following among architects since it was unveiled to the public in 2006. Its 10-storey high 'hanging garden' project at 158 Cecil Street clinched a series of awards in 2011. In March 29, 2014, Consis and Yijinghuanmei (Beijing) Engineering Co. Ltd established YJconsis Green Roof Engineering to engage in business in China.

Anjels Pte Ltd **Smart living solutions**

A specialist in producing wireless systems, the Anjels Intelligent System was conceptualised and developed based on Radio-Frequency (RF) technology. It creates a lifestyle ecosystem that consists of a smart home, security system, an energy monitoring and management system, as well as an elderly care and monitoring system. A pioneer in the industry, Anjels provides a convenient, energy-saving solution to clients which include hotels, schools, landed properties, condominiums and other buildings. Anjels has an established market presence in many countries, including China and Hong Kong SAR.

Centennial Woods, LLC **Weathered woods**

Snowfence wood, air-dried by the harsh Wyoming wind, is beautifully weathered reclaimed wood. Highly sought after by green builders the world over, Centennial Woods' products are free of chemicals, incorporate vibrant, natural colouring and are naturally weather resistant. They can be used in their natural weathered grey state complete with nail heads or de-nailed and surfaced to reveal fresh cut wood in combination with the beautiful patina. The company has become the premier provider of reclaimed wood to green builders all over the world.

Squire Mech **(Shanghai) Co. Ltd** **Green at the core**

This award-winning Mechanical and Electrical Engineering (M&E) consultancy boasts more than 30 years of history. Spanning the building design value chain, Squire Mech provides a spectrum of services ranging from air conditioning and lighting protection systems to electrical installation and water distribution systems. A corporate founder member of Singapore Green Building Council and the Lighting Association of Singapore, the company is a many-time awardee of the BCA Green Mark for Buildings (Platinum). With branch offices in China, Squire Mech has, to date, undertaken more than 200 large-scale high-end projects in China.

FORESHORE STRUCTURE DOCTORS

Going for an inspection of the coastlines is not a walk on the beach, as BCA officers explain the importance of foreshore structure maintenance and protection.

When low tide occurs, Building and Construction Authority (BCA) officers Sim Pau Long and Hakim Omar are in high spirits, at work in keeping a close eye on the foreshore structures.

They look forward to the six-hourly tide changes so that they can inspect the conditions of foreshore structures along Singapore's coastline and some offshore islands.

Mr Sim and Mr Hakim, both 38, are part of the BCA foreshore maintenance team which works like 'coastal guards', keeping a close eye out for any foreshore structural deterioration and hazards to public safety.

The structures under the team's maintenance vary from vertical seawalls and stone revetments, to geo-bag revetments and headlands. The team also maintains seven jetties.

Most of the foreshore structures under BCA's maintenance are located in popular coastal park areas such as those around Marina Bay, Labrador, East Coast, Pasir



Ris, Changi Beach, Sembawang Park and Punggol Park. These are frequented by the general public, which means that maintaining and keeping them structurally safe and sound is very important. The maintenance works include a spectrum of responsibilities, from regularly inspecting and monitoring the foreshore structures to ensure that they are in good condition and ensuring proper safety measures when repair work is being carried out, to keeping jetty and revetment steps clean. Warning signs are also erected at the entrances of jetty and revetment staircases for public safety purposes.

Left: BCA officers Sim Pau Long and Hakim Omar; facing page from left: Mr Lo Ming Rui, Project Coordinator, Oung Construction (S) Pte Ltd and Mr Ramesh Subramaniam, Civil Engineer, CPG FM Pte Ltd, BCA's Managing Agent; Mr Sim and Mr Hakim in red.

“
This job calls for a willingness to spend 40% of the time outdoors, travel to parts of Singapore not accessible by public transport, and sharp eyes to carry out effective inspections.

”
Mr Hakim Omar
Higher Project Management Associate, BCA



Besides visual inspection, BCA's team also sends out divers to inspect and diagnose the underwater portions of key structures.

With this level of proper maintenance, the lifespan of these structures can be prolonged to function effectively.

In addition to foreshore structure maintenance works, BCA also undertakes works to prevent beach erosion at East Coast Park and Pasir Ris Park using innovative methods. For example, at one section of East Coast, a stretch of geo-bag revetment structures for beach stabilisation purposes has been implemented. This is the first time that geo-bags have been used as an exposed shore protection system in Singapore. The system installed by BCA uses high quality material which is strong, durable and resistant to UV rays. The 'softness' and carefully selected colour of the material blend in completely with the beach environment and also allows the public easy access to the front beach area.

"The coastline is very precious to us. It is important that we make sure it is not seriously eroded," says Mr Sim, an executive project

manager. Mr Hakim, a higher project management associate who joined BCA in 2007, adds that with "properly designed restoration and erosion control measures, we ensure the stability and integrity of coastlines."

To date, about 70% of the coastlines are protected by hard structures such as sea walls and stone embankments, which help protect against erosion. With regular inspections, BCA believes these structures – which are designed to bring the public closer to the coasts – can protect against any sea-bearing phenomena in the near-term.

On a Wednesday afternoon, Mr Sim and Mr Hakim spend three hours at Pulau Ubin under the sweltering heat. They are inspecting repairs done at the jetty.

"The daytime checks during low tide are crucial because we have clear visibility and we can spot risk areas which need design restoration measures or erosion control measures," says Mr Hakim. They use simple measuring equipment during the inspection, noting the varying degrees of changes between inspections.

With 60% of the world's

“
The coastline is very precious to us. It is important that we make sure it is not seriously eroded, by ensuring regular repair and restoration works.

”
Mr Sim Pau Long
Executive Project
Manager, BCA

Geo-bags – which blend in with the beach environment – are one of the innovative methods used to prevent beach erosion while still allowing for public access.



population living along coasts, Singapore's situation is not unusual. Erosion is inevitable, hence the need for protection.

Most of the breakwaters or seawalls surrounding Singapore's shores are man-made structures built from granite and concrete, to withstand the varying physical forces, and to accommodate site-specific factors such as local climate, coastal position, wave regime, and value of landform.

Both Mr Sim and Mr Hakim take pride in their little-known responsibilities. They know that protecting coastal environments is as important as keeping Singapore clean and green.

BCA fosters the spirit of volunteerism among its staff through various initiatives.

While caring for the built environment is its primary role, BCA feels that giving back to the community is no less important. In fact, inculcating a spirit of volunteerism among its staff is something BCA regards as a core value.

Over the years, BCA's employees have been giving their time, skills and money to support various causes. Its corporate social responsibility practices were recognised in 2013 when it clinched the Prestigious HRM award for Best CSR Practices.

One of the social welfare organisations BCA actively volunteers with is the Society for the Visually Handicapped (SAVH). It supports SAVH through the collection of used clothing, sprucing up SAVH's premises through painting and cleaning, and by utilising the services of their mobile massage team. BCA volunteers have also taken the visually handicapped for outings on occasions like World Environment Day.

Other industry players are roped in for fundraising initiatives too. Since 2009, BCA, together with the industry, has donated a total of \$192,800 to SAVH.

BEACON OF LIGHT



From left:
Mr Tan Guan Heng, Vice President, SAVH;
Mr Quek See Tiat, Chairman, BCA;
Mr Lee Fook Sun, Deputy Chairman, BCA;
and Dr John Keung, CEO, BCA.

Left to right:
BCA staff and industry players in various CSR activities.



A FRIENDLIER ORCHARD

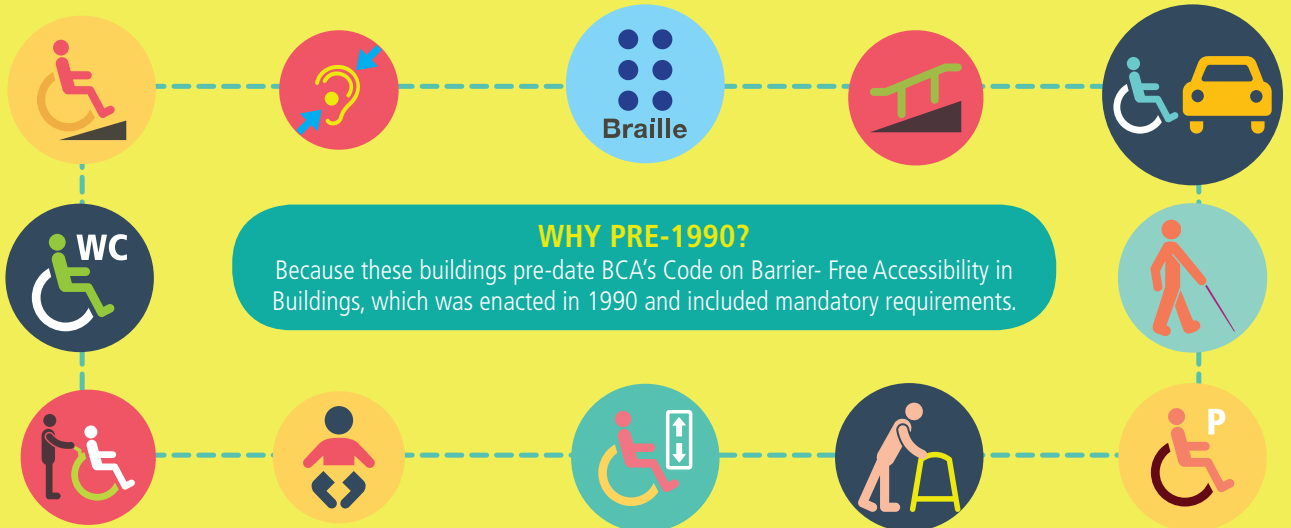
With 90% of buildings along Orchard Road being accessible, there are even more reasons to shop till you drop!

Thanks to the combination of BCA's Accessibility Fund (AF) and greater awareness of Universal Design, Orchard Road is close to being fully accessible.

But this wasn't the case for buildings that were built before 1990, the year the Code of Accessibility came into effect. At that time, older buildings were not required to be fitted with accessibility features.

Seeing the need for UD features, BCA launched the \$40m AF in 2007. This would make it more possible for owners of pre-1990 buildings to retrofit their buildings with features such as accessible entrances to the building, ramps & accessible toilets. The fund works by co-paying up to 80% of the construction costs.

To date, about 10 buildings along Orchard Road have tapped on this fund.



ROAD IS OPEN TO ALL

ACCESSIBILITY AT ITS BEST

313@Somerset, a BCA UD Award (Silver) winner, stands tall as an example of what is possible, with a host of features including accessible taxi stands, alighting and boarding bays, parking lots, toilets and family rooms.



LUCKY PLAZA

MT ELIZABETH

PARAGON

BIDEFORD ROAD

THE HEEREN



MIDPOINT ORCHARD

CENTREPOINT



CUPPAGE ROAD

ORCHARD POINT

KOEK ROAD

ORIENTAL PLAZA

CAVENAGH ROAD



PLAZA SINGAPURA

Another example is Plaza Singapura, a BCA UD Award (Bronze) winner, with its direct access to public transport options, baby nursing rooms, changing stations and child protection seats in women's restrooms.



ORCHARD ROAD

313@SOMERSET



PRE-1990 BUILDINGS CATCH UP

The AF made it possible for the owners of these buildings to provide basic accessibility features, enabling them to catch up with their newer neighbours along the street: Tanglin Shopping Centre, Orchard Hotel, Orchard Parade Hotel, Orchard Towers, Palais Renaissance, International Building, Far East Plaza, Lucky Plaza, Orchard Point and Plaza Singapura.

BCA has developed a portal for users to check on accessibility features of buildings, with an accessibility rating system depicted by the number of smiley sunflowers.



Looking for family-friendly and accessible malls? Check out BCA's friendly buildings portal:

www.friendlybuildings.sg

HERE'S TO UD

Each new BCA initiative brings Singapore a step closer to being a truly inclusive living environment. The second Singapore Universal Design Week (SUDW) is one such initiative.



This year's theme was *Shaping an Age-friendly Built Environment*. A series of events and activities helped raise awareness of the importance of creating an inclusive and senior-friendly built environment.

SUDW's main event was the UD Conference which saw industry stakeholders from the public and private sector address issues and challenges faced by the ageing population in our built environment. They also discussed policies and plans for implementation to improve accessibility and showcased examples of senior-friendly provisions.

The UD Explorers Art Exhibition featured works by primary school students who are members of BCA's UD Explorers programme. They toured shopping malls that are recognised for various UD features, which formed the focus of their artworks.

A novel dinner experience to raise \$50,000 for the President's Challenge 2015 charity was also held. See the World Differently UD Fundraising Dinner involved guests being led to their seats, where they consumed a full-course dinner in complete darkness, in order to experience what it means to live

without sight. This was an ideal experience that led guests to realise prejudices and stereotypes about the visually-impaired and for building owners and other stakeholders to begin incorporating UD concepts into their projects.

More details will be available in the next issue of PILLARS.



SUDW 2015 EVENT HIGHLIGHTS
 UD Conference
 27 July 2015, BCA Academy

See the World Differently UD Fundraising Dinner
 30 July 2015, Hotel Re! @ Pearl's Hill

UD Explorers Art Exhibition
 31 July - 2 August 2015, Westgate

UD Singapore Universal Design Week 2015

OCTOBER & NOVEMBER 2015

CERTIFICATION COURSES (PROFESSIONALS/SPECIALISTS)

Certification Course for Green Mark
Manager (Core module of GMP)
2 Oct 2015

Certification Course for Universal
Design Assessors **SDF**
19, 26*, 27, 30 Oct &
4, 11* Nov 2015 (assessment)

Certification Course in BIM
Management **WTU**
26 - 29 Oct 2015

Certification Course on Construction
Law & Contracts **SDF**
6 Oct - 26 Nov 2015

Certified QM/CONQUAS
Managers Course **SDF**
21 - 23 Oct 2015

Building Control Regulations for Site
Supervisors
7-Oct 2015

Essential Knowledge in Construction
Regulations & Management
for Licensed Builders **SDF**
19-21 Oct 2015 (Mandarin)

SEMINARS/CONFERENCES/ WORKSHOPS/EXECUTIVES PROGRAMMES

Buildsmart Conference 2015
13 - 14 Oct 2015

CERTIFICATION COURSES (SUPERVISORS/TECHNICIANS)

CoreTrade Supervisors
(Structural) **WTU**
5 Oct 2015 (Eve)
12 Oct 2015 (Day)

CoreTrade Supervisors
(Mechanical & Electrical) **WTU**
6 Oct 2015 (Eve)
19 Oct 2015 (Day)

CET for CoreTrade
Supervisor (Structural) **WTU**
15 Oct 2015 (Day)

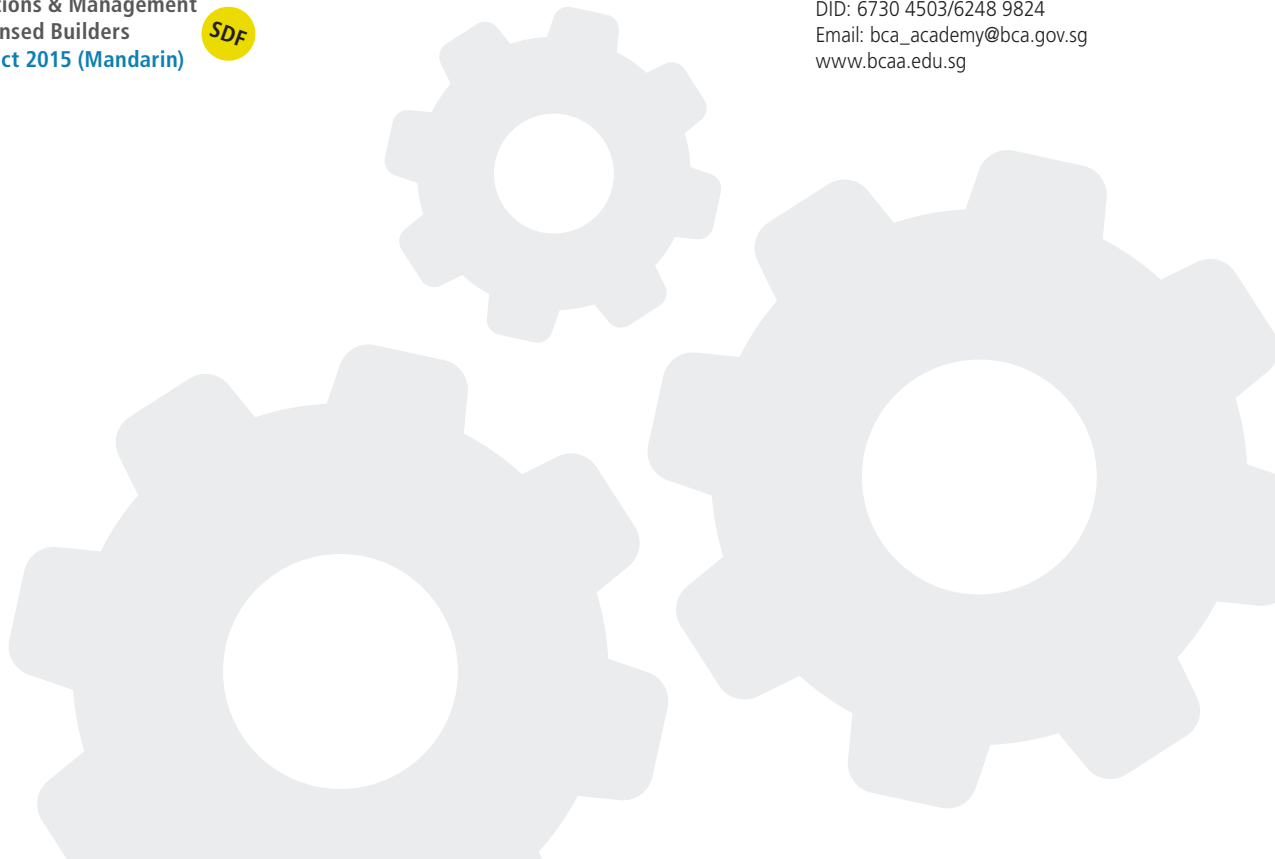
*denotes half-day

Note:

- 1) Funding for courses may be available.
Please refer to the course brochure or
log on to our website @ www.bcaa.edu.sg for details.
- 2) The courses/dates are strictly indicative
and subject to confirmation.

Contact

BCA Academy
Marketing & Business Development
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www.bcaa.edu.sg





- MODULE A:** Introductory Workshop (Singapore, 3rd week of Jun 2015)
- MODULE B:** VDC Advanced Management Program (USA, 9-16 Jul 2015)
- MODULE C:** 6-month Practicum (Singapore, in consultation with VDC experts, starting in Aug 2015)
- MODULE D:** Integration Experience Workshop (Singapore, Mar 2016)

Stanford CIFE-BCA Advanced Management Program on **VIRTUAL DESIGN & CONSTRUCTION** (2nd Run)

WTU FUNDING
IS AVAILABLE
FOR LOCALS

The use of Virtual Design and Construction (VDC) has been proven to improve performance, productivity and profitability in many projects by enabling more effective coordination process, minimizing changes, rework and requests for information, resulting in labour, time and cost savings. Learn from experts from the Center for Integrated Facility Engineering (CIFE) at Stanford University, and other VDC experts through lectures, site visits and practicum conducted in Singapore and the United States.

Register by 28 May 2015 to enjoy early bird discount.



27 & 28 JULY 2015
9am – 5pm

Universal Design Conference & Workshop 2015: **SHAPING AN AGE-FRIENDLY BUILT ENVIRONMENT**

This conference and workshop will address issues and challenges to creating an inclusiveness for our buildings, public spaces and infrastructure so that all, especially the seniors can enjoy living, working, learning and playing in a user-friendly environment. Renowned speakers and subject experts will be sharing the importance of addressing such needs.



3-5 AUGUST 2015
Marina Bay Sands, Singapore

Proactive Facility Management: **ANTICIPATE • PARTICIPATE • INNOVATE**

Building on the success of the Inaugural World Workplace Asia Singapore 2012, where close to 450 local and overseas delegates attended the two-and-a-half day event, World Workplace Asia Singapore 2015 will feature a well-rounded programme focussed on FM leadership, high performance FM solutions, international best practices, latest technology and innovation. Join us to benefit from this full educational programme presented by topic experts from around the world.

Register by 3 July 2015 to enjoy early bird discount.

