

PILLARS

We shape a **safe**, **high-quality**, **sustainable** and **friendly** built environment | SEPTEMBER 2017

BIG DAY OUT 2017

BCA'S ON-GROUND EVENT INSPIRES PEOPLE TO BETTER APPRECIATE THE GREEN BUILT ENVIRONMENT

Guest of Honour
Desmond Lee

Minister, Prime Minister's Office
Home Affairs and National Development
23 June 2017

REWARDING EXCELLENCE

**USE DURABLE
CLADDING MATERIALS
FOR BUILDING FACADES**

**DEPLOYING
FOREIGN WORKERS**



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BIG DAY OUT 2017

A review of an on-ground event to inspire young people to understand the importance of a green built environment.



BiG Day Out, BCA's annual event designed to inspire Singaporeans young and old, celebrates Singapore's efforts to build a greener and more sustainable built environment. After all, 'BiG' is an acronym for 'build it green'.

This year's edition, the third time the event has been organised, was held at Bedok Town Square from 23–25 June. Jointly organised by BCA and the Singapore Green Building Council, BiG Day Out 2017 was firmly supported by both the public and private sectors.

Greco and Beco's journey

This year's BiG Day Out was themed 'Super-Sized Wonders' — a play on the word 'BiG' — and featured BCA's Green Building mascots, Greco and Beco. The educational and interactive stations

[see sidebar] scattered throughout Bedok Town Square represented the duo's journey to understand the built environment better; in particular, the principles behind green buildings. Apart from these stations, there were also various green-themed stage games for visitors.

The event also saw the launch of the second book in the storybook series, *The Adventures of Greco and Beco*. Entitled *The School in the Glass City*, the book was also the source material for a musical, which premiered on the first day of BiG Day Out 2017. Present at the unveiling of both the book and musical was Guest-of-Honour Mr Desmond Lee, Minister for Social and Family Development and Second Minister in the Ministry of National Development.

Above: (from left) BCA CEO Mr Hugh Lim, Second Minister for Ministry of National Development Mr Desmond Lee and BCA Chairman Mr Lee Fook Sun launching *The School in the Glass City*, the second book in the series, *The Adventures of Greco and Beco*.



Left: Participants at the Green Garden Tower game station throwing balls into 'buildings' to encourage the use of energy-efficient appliances in offices and homes.



Far Left: Mr Desmond Lee joining participants at the Open Sesame game station to shoot at targets in order to switch off unnecessary appliances in homes and offices.



Left: Young visitors engaging in various activities, such as hand painting and caricature drawing.



Left: BiG Day Out 2017 attracting visitors young and old to understand the principles behind green buildings through interesting activities and games.

Although the book is available in all public libraries, copies of it will also be distributed to primary schools and kindergartens. To reinforce the green messages in the book, the musical will be performed in all primary schools in Singapore by 2019 — Jiemin Primary School, St Nicholas Girls' Primary School and Elias Park Primary School have been scheduled to watch it first in July 2017. The musical serves as a good platform for BCA to connect with the young and their schools — the former to convey the importance of going green, the latter to help kick-off their journey towards achieving the BCA Green Mark.

Beyond BiG

Another BCA initiative that targets young people is its Greenovate programme, where tertiary students conduct gap analysis for secondary schools guided by an industry expert,

Johnson Controls. These results are then shared with the students of these schools, who will then propose ways to improve on the results. A survey of 50 Republic Polytechnic students who had taken part in Greenovate showed that 76% of them were keen to pursue further education or a career in the green built environment.

"We are heartened by how our youths are not only embracing the green message but have gone a step further to actively create a more sustainable environment for their schools. A greener built environment is more than just changing the way we build. It is also about how we can make our habits and choices in our schools, offices and homes contribute towards a green built environment for Singapore," said BCA CEO Mr Hugh Lim, commenting on the value of this programme.

HIGHLIGHTS OF BIG DAY OUT

Game and activity stations at BiG Day Out each highlighted a specific aspect of energy conservation and allowed participants to learn more about the advantages of green buildings so that they can become green ambassadors at home and at school.

District Solaria

At this station, visitors matched solar panel puzzle pieces to buildings, which heightened awareness about rooftop solar panels. They also got to find out what other features, apart from solar panels, made up a green building.

Green Garden Tower

This was where visitors learnt how roof gardens can help to cut down energy usage in buildings. A ball-throwing game, where visitors filled up buildings with green balls (depicting green energy), ultimately forming a roof garden, encouraged visitors to 'fill up' their offices and homes with as many green-energy items as possible.

Millennium Techpark

A push-button game showed visitors that more energy is needed to power up appliances with a lower energy rating compared to one with a higher energy rating. This visually reinforced to visitors the need to choose appliances with higher energy ratings.

Open Sesame

Natural ventilation and light help to reduce energy consumption and electricity bills. Visitors shot at targets to switch off unnecessary appliances and open up the windows, thus allowing fresh air and sunlight in.

Green Academy

Visitors were quizzed on how they could be green in school, using magnetic darts to indicate their answers.

Giant Greco and Beco

At this station, visitors picked up tips on how to be green at home and at work. Through interactive components, they also learnt what was required of architects, mechanical engineers and other related jobs.

REWARDING EXCELLENCE

Leading developers and builders feted at BCA Awards ceremony for exemplary work.

The BCA Awards recognises firms for construction and quality excellence, design and engineering safety, universal design, construction productivity and green buildings.

New category

To mark the 15th year since BCA's Quality Mark (QM) scheme was introduced, a new Quality Star Champion Award was launched at this year's BCA Awards ceremony on 13 June 2017. The award recognises leading developers and builders that have been committing to QM and are consistently delivering high workmanship quality in their projects.

City Developments Limited and Woh Hup (Private) Limited were the first developer and builder, respectively, to win this prestigious new award for each receiving a total of five Quality

Excellence Platinum Awards. That night also saw 12 other awards on quality excellence being handed out. See the table below for the full list of winners.



Category	Company (developer)	Company (builder)
Quality Star Champion	City Developments Limited	Woh Hup (Private) Limited
Quality Champion (Platinum)	City Developments Limited	Woh Hup (Private) Limited Dragages Singapore Pte Ltd Hyundai Engineering & Construction Co. Ltd Lian Beng Group Ltd Tiong Aik Construction Pte Ltd
Quality Champion (Gold ^{PLUS})	CapitaLand Limited Hoi Hup Realty Pte Ltd	Straits Construction Singapore Pte Ltd China Construction (South Pacific) Dev Co Pte Ltd
Quality Champion (Gold)	Allgreen Properties Limited Keppel Land Limited	



Some of the winners of the BCA Awards, an annual event that is deemed as the Oscars of the local built environment sector.

Award Evaluation Criteria

DEVELOPERS

- 1 Number of residential units committed and certified under Quality Mark
- 2 Quality Mark tiered rating performance
- 3 CONQUAS performance

BUILDERS

- 1 Number of residential units committed and certified under Quality Mark
- 2 Quality Mark tiered rating performance
- 3 CONQUAS performance
- 4 Number of residential units committed and certified under Quality Mark as a result of the builder's initiative

Emphasis on quality

In his speech, Minister for National Development and Second Minister for Finance Mr Lawrence Wong acknowledged that the industry is facing challenging times, but it should not compromise on the quality of its projects. Instead, Mr Wong urged the industry to treat the challenges as opportunities to restructure and upgrade its capabilities, so that it can emerge stronger when the market turns around.

Mr Wong also announced that the Government will be reviewing public sector procurement processes to place more emphasis on quality for both consultancy and contractor services. These include looking into raising the weightage of quality in the overall evaluation for public sector projects, having a more robust and rigorous quality assessment by examining the performance of firms in previous projects, and recognising firms that are prepared to build capabilities. The quality assessment aspect could also be subject to greater transparency so firms are aware where they fall short and can benchmark themselves against best-in-class quality performers.



CapitaLand received the Quality Mark Award for The Interlace Project in 2014.

Building capabilities in the built environment sector

In addition to handing out awards to deserving winners, BCA also launched a human resource (HR) guidebook to help firms in the built environment sector improve their HR practices to attract, retain and develop talent.

Developed in consultation with industry stakeholders, the book contains industry best practices, HR templates, self-assessment tools and resources. This will help firms improve their HR practices in the following areas: performance management and training, recruitment and on-boarding, communication, rewards and compensation, and wellness and support schemes.

Built environment firms that sign the 'Pledge for a Better Built Environment Workplace', thus committing to adopting good HR practices, can download the guidebook from BCA's Building Careers Portal (www.buildingcareers.gov.sg) for free.

To support the industry transformation and ensure graduates are equipped with the necessary skills when they join the sector, BCA is also planning to set up a joint taskforce with industry associations and Institutes of Higher Learning (IHL) to identify relevant content that can be incorporated into the curricula of built environment-related courses at IHLs.

In addition, BCA will be working with IHLs to explore the idea of introducing a capstone programme for graduating students to help them attain deeper industry knowledge, and better prepare them for work upon graduation.

"We expect to see steady growth in Singapore's built environment over the next decade, with more quality buildings and infrastructure," said Mr Hugh Lim, CEO of BCA. "The ongoing transformation of the built environment sector will create good jobs for Singaporeans entering and in the sector."

We expect to see steady growth in Singapore's built environment over the next decade, with more quality buildings and infrastructure.

Mr Hugh Lim, CEO, BCA

GOING GREEN: ENGAGING THE YOUTHS

The BCA Build Green: Student Edition Workshop this year featured an Amazing Race-style contest to keep the young participants engaged and excited while learning about the green built environment.

You are probably familiar with the Singapore Green Building Week (SGBW), but did you know that the SGBW has an affiliate event especially for students? The Build Green: Student Edition Workshop is designed to reinforce among the young participants the importance of a green built environment. The workshop was first organised in 2014.

Themed 'Envisioning Smart Retail Living', this year's workshop



Left: BCA CEO Mr Hugh Lim and Guest-of-Honour Mr Tai Lee Siang mingling with student participants at one of the 11 game stations of the *Topographic Amazing Race*.

took place on 22 July 2017 at the Administration Building of the Singapore Management University. The event saw participation from 200 students from institutes such as the BCA Academy, polytechnics, universities and ITE colleges [see sidebar]. This workshop sought to familiarise participants with

the concept of environmental sustainability in retail malls — spaces that they would be well acquainted with.

The interactive workshop brought the participants to visit a number of green venues [see other sidebar]. There were also game stations set up along a *Topographic Amazing Race*, which stretched as far away as Wheelock Place. The activities were aimed at providing a platform for the students to learn about sustainability in the built environment through fun and interactive games, and cultivating their awareness of how their day-to-day behaviour and practices could impact the environment.

BCA CEO Mr Hugh Lim and Guest-of-Honour Mr Tai Lee Siang, Chair, World Green Building Council, flagged off the race. They later joined the students at the 'Unpic Me' game station, which introduced different ways of how end-users can contribute to environmental sustainability.

Left: Mr Hugh Lim and Mr Tai Lee Siang flagging off the *Topographic Amazing Race*.



INSTITUTES OF HIGHER LEARNING

The 200 students at the workshop came from the following institutes of higher learning:

- National University of Singapore
- Nanyang Technological University
- BCA Academy
- Ngee Ann Polytechnic
- Singapore Polytechnic
- Temasek Polytechnic
- Republic Polytechnic
- ITE College Central
- ITE College East
- ITE College West

GREEN BUILDINGS VISITED

The workshop participants were taken on a journey to learn more about the following green buildings:

- Bugis Junction
- VivoCity
- BCA Gallery
- Philips Lighting Singapore
- City Square Mall

MORE THAN \$125,000 RAISED TO SUPPORT A MORE INCLUSIVE SOCIETY

In July 2017, BCA organised a charity dinner to benefit SPD, which supports people with disabilities.



As part of its corporate social responsibility, BCA organised a dinner for about 300 guests on 20 July 2017 at Gardens by the Bay to raise funds for SPD, a local charity organisation for adults, youth and children with disabilities. BCA raised more than S\$125,000 through the event with support from its partners [see sidebar] in the built environment sector.

SPD serves more than 5,000 persons with disabilities, supporting them with programmes to help them be more self-reliant and independent so that they can play a more active role in society. These programmes can now be enhanced, thanks to the generous amount raised through the charity dinner.

Called 'Building Bridges: A BCA Universal Design Charity Dinner', the gastronomic event saw the premiere of four animation videos on Universal Design put together by students from ITE College Central, Nanyang Academy of Fine Arts, and Temasek Polytechnic. The significance of the event is

underscored by the fact that, by 2030, one in every four Singaporeans will be 65 years or older. Hence, an inclusive built environment will empower everyone to live a barrier-free life.

These videos were made available on communication platforms such as Facebook and YouTube to promote the importance of Universal Design. For their efforts, the creative students were presented with certificates of appreciation by Guest-of-Honour Mr Tan Chuan-Jin, then Minister for Social and Family Development.

"Through this fundraising event, I hope that the amount raised will boost SPD and its clients on their journey to become more active and independent members of our society, contributing in their own way to Singapore's progress," says BCA CEO Mr Hugh Lim. "At the same time, I hope these animation videos can spread the important message about Universal Design among Singaporeans, including

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Lum Chang Building Contractors Pte Ltd

Samwoh Corporation Pte Ltd

Sembcorp Design and Construction Pte Ltd

Singapore Pools (Pte) Ltd

Specialists Trade Alliance of Singapore

Teambuild Engineering & Construction Pte Ltd

TOTO Asia Oceania Pte Ltd

United Engineers Limited

Woh Hup (Pte) Ltd

WT Partnership (Singapore) Pte Ltd

our young, as we work together towards a more inclusive Singapore. I want to thank our partners from the built environment for their overwhelming and generous support."

Top left: Guest-of-Honour Mr Tan Chuan-Jin and BCA CEO Mr Hugh Lim handing a cheque of \$125,000 to SPD.

Left: Mr Tan witnessing SPD President Ms Chia Yong Yong handing a plaque to Mr Lim as a token of appreciation for BCA's contributions.

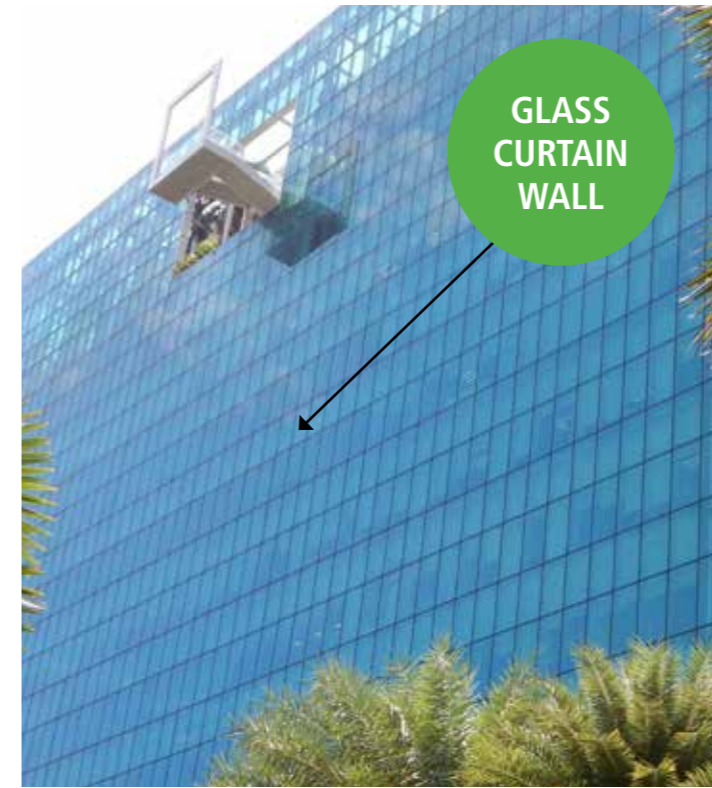


USE DURABLE CLADDING MATERIALS FOR BUILDING FACADES

Regular inspection, maintenance and longer-lasting materials help ensure that claddings are securely fastened.

Cladding materials, usually found on the exterior of buildings, are constantly exposed to weather conditions and may deteriorate over time. As such, the industry should use more durable materials as well as inspect and maintain claddings more frequently to ensure that they remain secured to the building and do not pose a risk to public safety.

Cladding fixings, such as bolts and screws, are also subject to wear and tear. To ensure that claddings remain properly fastened, the fixings should be made of corrosion-resistant stainless steel that comply with industry standards mentioned in *BS EN ISO 3506: Mechanical properties of corrosion-resistant stainless-steel fasteners*. Other factors that may cause claddings to fall are inadequate number of fixings and poor workmanship resulting in the fixings not being properly secured to the frames. This is why it is vital to ensure proper selection, design and installation of fixings, especially in high-rise claddings.



WE ARE GOING DIGITAL!

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GREENING THE BUILT ENVIRONMENT

The built environment sector plays a vital role in helping Singapore meet its COP21 commitments. Here is how BCA's Green Mark scheme has helped move Singapore in the right direction.

As the gatekeeper of the internationally recognised BCA Green Mark scheme, BCA is committed to transform Singapore's built environment sector into a model of sustainability. This is further driven by Singapore's commitment at the COP21 climate conference in Paris to reduce emissions and have at least 80% of all buildings in Singapore 'greened' by 2030.

Rolled out in stages

Launched in 2005, the BCA Green Mark scheme is a rating system designed to evaluate the environmental impact and performance of a building. It is energy-centric and verifies the building's environmental performance upon completion. It also takes into account Singapore's tropical setting.

Various initiatives were rolled out under the Green Building Masterplans, targeting new buildings, then existing buildings and building occupants. The BCA Green Mark schemes were also tailored to look into new and existing buildings, spaces within buildings, as well as spaces beyond buildings.

From almost zero base in 2005, we now have 'greened' more than one-third of the building stock (by gross floor area) in Singapore.

Testament to the efficacy of the scheme is the fact that it has, to date, been adopted in 14

countries. About 300 projects in these countries have applied for BCA Green Mark certification.

Success factors

BCA attributes the success of the BCA Green Mark scheme to four main factors:

1 GOVERNMENT TAKING THE LEAD

The Singapore government has been supportive of the BCA Green Mark scheme by taking out leases in buildings that rate higher under the BCA Green Mark scheme. Even the office interior has to meet the BCA Green Mark standards.

Another way the government has shown support is by investing in research and innovation, which was how the BCA SkyLab and Zero Energy Building came to

be. The former is a purpose-built, rotatable, state-of-the-art facility to test and develop energy-efficient building technologies; the latter is a retrofitted existing building used to test-bed green building technologies.

2 SPURRING THE PRIVATE SECTOR

BCA has made the business case for green buildings. Even at the highest BCA Green Mark Platinum rating, developers need to spend only an additional 3-5% of the total cost of a conventional building of similar scale and type. This is offset by the more than 2% increase in capital value for retrofitted commercial buildings (according to a 2011 study done by the National University of Singapore and leading real estate consultancy firms). Moreover, electricity consumption in BCA Green Mark offices and retail buildings are

roughly half of non-Green-marked buildings. There are currently five incentive and financing schemes under the BCA Green Mark Incentive Schemes that developers can draw from.

3 IMPOSING MINIMUM STANDARDS

New and existing buildings are subject to minimum environmental sustainability standards: 28% and 25% improvement in energy efficiency, respectively, compared to a code-compliant building. In addition, building owners must conduct an energy audit every three years and voluntarily disclose their energy consumption data.

4 CAPABILITY BUILDING

There is a need to have a competent green-collared workforce to support our green building initiatives. Besides providing courses for students and working professionals, BCA also organises numerous events — sometimes in collaboration with other agencies — towards this objective.



The Adelphi, a 36-year-old building, is one of the BCA Green Mark Platinum winners this year.

For example, it organises the Singapore Green Building Week, which hosts international green building experts, policymakers, academics, built environment practitioners, tenants and end users. Meanwhile, the International Tropical Architectural Design

Competition is jointly organised with the Singapore Institute of Architects (SIA) and Singapore Green Building Council (SGBC). The competition is open to students from institutes of higher learning around the world — 131 entries from 14 countries were submitted during last year's competition.

To learn more about Singapore Green Building Week 2017, visit <https://www.bca.gov.sg/events/sgbw/index.html>



A networking event during the Singapore Green Building Week.



BCA SkyLab is a purpose-built, rotatable, state-of-the-art facility to test and develop energy-efficient building technologies.

BCA GREEN MARK SCHEMES

BCA GREEN MARK SCHEMES FOR NEW BUILDINGS

- BCA Green Mark for Non-Residential Buildings
- BCA Green Mark for Residential Buildings
- BCA Green Mark for Landed Houses
- BCA Green Mark for Healthcare Facilities

BCA GREEN MARK SCHEMES FOR EXISTING BUILDINGS

- BCA Green Mark for Non-Residential Buildings
- BCA Green Mark for Residential Buildings
- BCA Green Mark for Existing Schools

BCA GREEN MARK SCHEMES (BEYOND BUILDINGS)

- BCA-NParks Green Mark for Existing Parks
- BCA-NParks Green Mark for New Parks
- BCA Green Mark for Infrastructure
- BCA Green Mark for Districts
- BCA-LTA Green Mark for Rapid Transit System

BCA GREEN MARK SCHEMES (WITHIN BUILDINGS)

- BCA Green Mark for Office Interior
- BCA Green Mark for Restaurants
- BCA Green Mark for Supermarkets
- BCA Green Mark for Retail
- BCA-IMDA Green Mark for Data Centre
- BCA Green Mark for Laboratories

MORE BUILT ENVIRONMENT INDUSTRY FIRMS HEADING ABROAD

According to BCA's Construction Export Survey, not only are more Singapore contractors and consultants venturing beyond the Lion City, they also secured more overseas projects, which nearly doubled from 2014 to 2015.

For the 2016 edition of the survey, the 13th time that it has been conducted, more than 1,400 construction and consultancy firms in Singapore were canvassed.

One key finding was that 594 overseas projects were secured in 2015, an increase from the 289 in 2014. Also, more firms made inroads into foreign markets in 2015 (100) than 2014 (48). Of these 100 firms that ventured out of the country in 2015, a majority of them (62%) worked in consultancy.

Construction

Over the last five years, Singapore construction firms that went overseas secured an average total export value of S\$1.7 billion annually.

In 2015, S\$1.74 billion of contract value was secured in overseas markets such as Myanmar, India, Malaysia, Thailand, Indonesia and the United Arab Emirates. The bulk (41%) of overseas construction projects involved Renovation/Interior Works, followed by Building Construction (12%), especially in the residential and hospitality sectors. Mechanical & Electrical Works and Engineering, Procurement & Construction were next at 10% each.

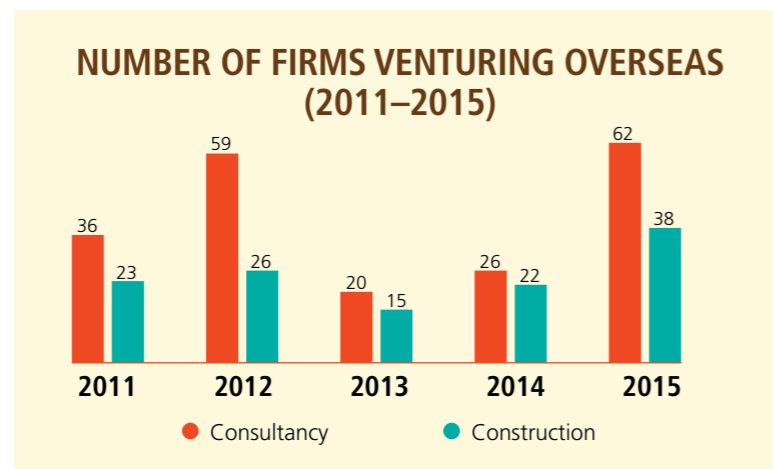
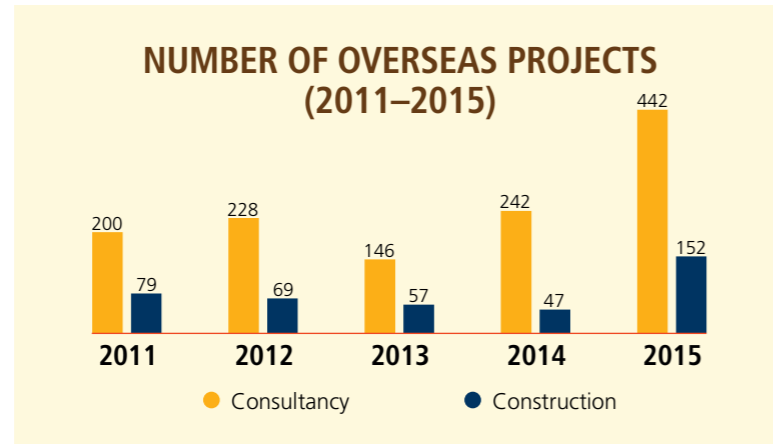
One thing to note is that, despite the increase in the number of projects in 2015 compared to 2014, the value from both years remained stable, indicating that the projects in 2015 were mainly of smaller value.

Consultancy

On the consultancy side, a majority (87%) of the overseas projects in 2015 came from seven countries: China, India, Cambodia, Indonesia, Malaysia, Myanmar and Vietnam.

The top four areas that our consultancy firms worked on overseas

for that year were Architectural (38%), Civil & Structural Engineering (38%), Master/Town Planning (10%) and Mechanical & Electrical Engineering (10%). Furthermore, these services were provided for mostly mixed developments and residential developments.



It is encouraging to see that Singapore consultancy companies have adapted to meet the demands of the international markets, as can be seen by the rise in new Consultancy Services (7%), especially in areas such as Feasibility Studies and Consultancy Training.

Helping more firms go international

To encourage even more local firms to go overseas, BCA has been:

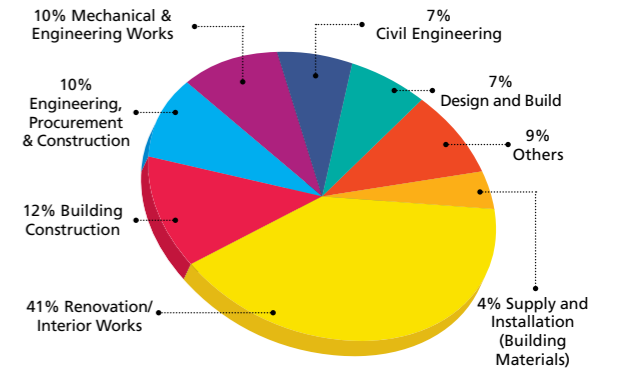
- providing market sensing and business intelligence;
- conducting market familiarisation mission trips;
- facilitating business matching between Singapore companies and potential overseas partners; and
- profiling Singapore companies through overseas exhibitions and forums.

These measures are targeted to allay the concerns faced by companies that have gone abroad, such as uncertainty of payment collection, economic and political risks, lack of market information, and difficulties in finding overseas partners. "BCA understands that breaking the initial barrier is crucial for subsequent internationalisation efforts," says Mr Koh Lin Ji, BCA Group Director for International Development. "Hence, we actively reach out to established players as well as small and medium enterprises in achieving their first steps in internationalisation."

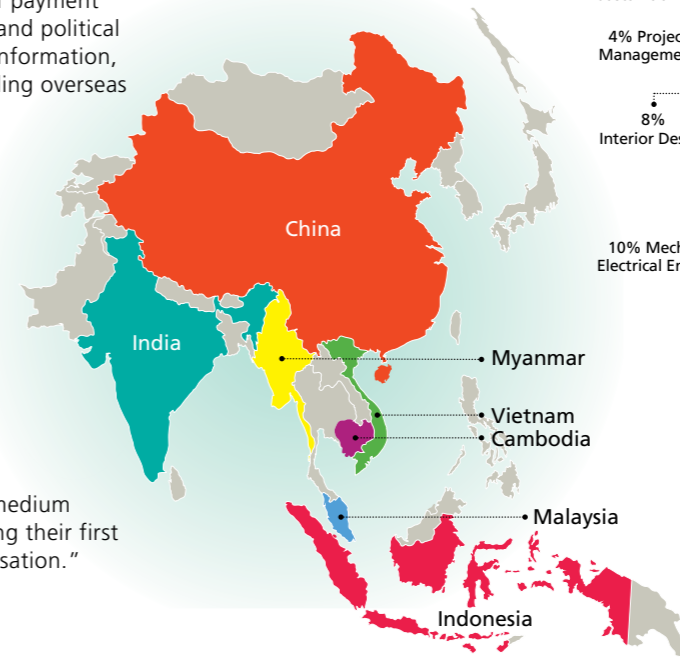
AVERAGE ANNUAL VALUE OF OVERSEAS CONSTRUCTION PROJECTS (2011-2015)



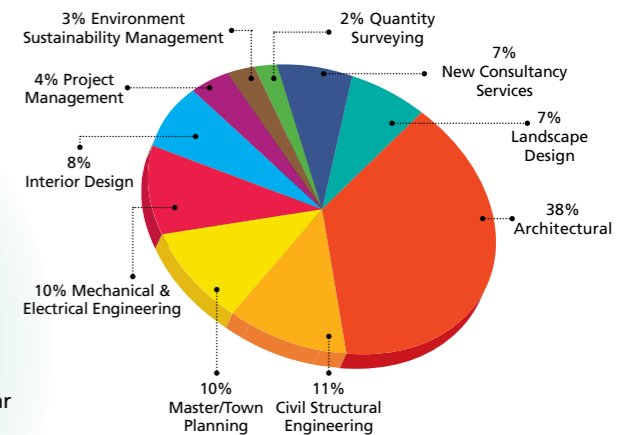
OVERSEAS CONSTRUCTION PROJECTS IN 2015: BREAKDOWN BY SECTOR



OVERSEAS CONSULTANCY PROJECTS IN 2015: 87% OF THESE PROJECTS WERE FROM THE COUNTRIES INDICATED



OVERSEAS CONSULTANCY PROJECTS IN 2015: BREAKDOWN BY SECTOR



TAKING AN INTERDISCIPLINARY APPROACH TO SUSTAINABILITY

At a sustainability congress, Minister for National Development Mr Lawrence Wong announced a new programme to enhance a sustainable urban ecosystem in Singapore.

The fourth Urban Sustainability R&D Congress was held from 29–30 June 2017 at the Suntec Singapore Convention & Exhibition Centre. Co-organised by the Ministry of National Development and partner agencies such as BCA, EDB and HDB, the congress, a biennial event that first took place in 2011, is a platform for government agencies, the research community and industries to discuss their research and development projects that could solve the sustainability challenges Singapore faces.

Themed ‘Green City, Best Home’, this year’s event focused on the Urban Solutions and Sustainability (USS) Domain, an interdisciplinary approach through R&D that addresses Singapore’s lack of resources while enhancing the environment.

Distinguished speakers

Besides a packed programme, the 2017 congress also featured distinguished speakers such as Professor Alberto L Sangiovanni-Vincentelli (University of California, Berkeley), Mr Brian Gerkey (Chief Executive Officer and Founder, Open Source Robotics Foundation), Mr Tan

Kok Yam (Deputy Secretary, Smart Nation and Digital Government Office, and Strategy Group, Prime Minister’s Office) and Professor David Chan (Director, Behavioural Sciences Institute, Singapore Management University).

Visual treat

Another highlight of the congress was an exhibition by a selection of academia, research institutes and industry players that showcased their products and capabilities.

Under the Sustainable City section, three of Singapore’s universities — Singapore University of Technology and Design, National University of Singapore and Nanyang Technological University — presented projects. The Resilient Infrastructure section saw participation by Eutech Cybernetic and AkzoNobel. Surbana Jurong and Aerolion Technologies were just two of the companies that took part in the Advanced Construction section. Finally, the Urban Environment Analytics section featured projects by Telepod and ST Electronics.

Government support

In his opening address, Guest-of-Honour Mr Lawrence Wong, Minister for National Development and Second Minister for Finance, revealed, “The government has been investing more in R&D efforts across disciplines and along the entire value chain of research — upstream as well as downstream research.”



Top: Guest-of-Honour Mr Lawrence Wong delivering the opening address at the fourth Urban Sustainability R&D Congress.



Left: Mr Wong at the ‘Green City, Best Homes’ integrated exhibition booth, where participants can learn about the government’s key focus areas in research.

He added that the government has budgeted \$150 million of the \$900 million set aside for the USS domain to implement a new Cities of Tomorrow Programme. “The Cities of Tomorrow Programme will prioritise and focus our R&D efforts on critical areas of national concern, so that we can achieve our vision of a highly liveable and people-centric city with a sustainable urban ecosystem.”

A CHAT WITH A YOUNG LEADER

Meet Alina Yeo, a member of the BCA-Industry Young Leaders Programme and an associate with architecture firm WOHA.

What attracted you to work in the built environment sector?

I was initially interested in Interior Design. But to have a greater impact on people's lives, I felt I needed to broaden my horizon, which was why I pursued a degree in Architecture instead. I have a Masters of Architecture from the National University of Singapore.

In the past three to four years, I have been working on master plans, which widened my exposure to urban design. It made me profoundly aware of the need to integrate infrastructure, urbanism, architecture and landscape in city planning, and the high-level policies necessary to effect meaningful and positive changes.

Did you have an idea of WOHA's emphasis on sustainability before you joined?

I joined WOHA as an intern in 2002 and became highly conscious of the firm's sustainability emphasis when I worked on the Church of St Mary of the Angels.

Early in my professional life, my idea of sustainability was limited to environmental issues. Since then, I've come to appreciate the correlation between sustainability and density, and the consequential importance of social sustainability.

When WOHA hosted the BCA Young Leaders on 5 May 2017, you showed them the Garden City Mega City project. Tell us more about it.

It is actually WOHA's manifesto for 21st-century cities, as well as a plea to rethink the world's mega cities in light of unprecedented urbanisation and accelerated climate change.

Another project I shared was WOHA's Permeable Lattice City. This was a research exercise in urban densities based on a population density of 100,000 people within a 1km² site. In today's context, sustainability and density go hand in hand. The challenge is finding innovative solutions for living well on an increasingly crowded planet. We must address quality-of-life needs: green spaces, community spaces and civic spaces within large developments.

This requires switching from planning cities as 2D grids to 3D matrices. A dense and vertical — yet sociable and sustainable — city can be achieved by weaving

nature and community spaces through multiple layers of porous architectural structures.

What made you join the BCA Young Leaders programme?

I joined the BCA YLs programme because I'm keenly aware that changing the way cities function requires collective efforts across all sectors of the built environment, and it is an ideal cross-industry platform. There are developers, engineers, builders, planners and fellow architects in my group, and we've had opportunities to exchange ideas on the future of cities over the past year.

It was an honour to host the YLs and Minister for Social and Family Development and Second Minister for National Development; sharing WOHA's projects and philosophy, and showing them around the office and our rooftop urban farm.



Top: Ms Alina Yeo (in red top) leading Second Minister for National Development Mr Desmond Sim (second from left) and a group of BCA Young Leaders on a tour of WOHA.

“
I joined the BCA Young Leaders programme because I'm keenly aware that changing the way cities function requires collective efforts across all sectors of the built environment, and it is an ideal cross-industry platform.
 ”

Ms Alina Yeo

BALD STATEMENT

BCA staff, family and friends lopped off their lovely locks at an event organised by the CSR Committee.



One side effect of cancer treatment for many patients is losing their crowning glory. Hair For Hope was conceived 15 years ago by the Children's Cancer Foundation as a way for the public to show solidarity with such cancer patients and raise funds for the foundation at the same time.



As part of its Corporate Social Responsibility (CSR) efforts, BCA helped to raise awareness for childhood cancer and canvassed for donations for affected families by holding a head shaving session on 15 June 2017 for staff, family and friends in the Multi-Purpose Studio of its premises on Level 7 of JEM.

A total of 29 people stepped up to the challenge, including Mrs Christine Keung, wife of former CEO Dr John Keung. "It pains me greatly to see children suffering and going through the trauma of cancer," she said, explaining her motivation for taking part.

Mrs Christine Keung playing her part in this fundraising event.



Above: Ms Delfin Yeo is all smiles after getting the clean-shaven treatment.

Left: Group shot of participants in the obligatory head-rubbing pose.

She was also proud to see numerous staff from BCA and BCA Academy participating, particularly Ms Delfin Yeo, who was cutting her hair for the second time. "Participating in Hair For Hope this year is especially meaningful because cancer recently struck someone dear to me," revealed Ms Yeo, a senior manager in the Manpower Planning department.

Although more than S\$46,000 was raised that day, you can still make an online donation at www.hairforhope.org.sg/donation/2/235 until 30 September 2017.



DEPLOYING FOREIGN WORKERS

Are foreign construction workers placed in jobs that they trained for?

In 2015, BCA conducted a survey to track the way foreign construction workers are deployed in Singapore. The findings showed that there is a significant proportion of new construction workers who are not being deployed according to their areas of competency.

When it comes to productivity, the person tasked to perform a particular function has to have the right skills — a foreign construction worker thus can be deployed immediately upon his arrival instead of going for training.

To help firms that employ overseas construction workers in this aspect, BCA has appointed Overseas Testing Centres in Bangladesh, China, India, Myanmar, Philippines, Sri Lanka and Thailand that offer skills training and certification in 31 trades. According to their manpower needs, local firms hiring graduates from these centres can be sure they possess the requisite skills.

This BCA initiative encourages small firms to keep up with the



Above and left: Enhanced System Formwork Installation incorporated with Work-At-Heights Theory Test.



Below: Aluminium Doors and Windows Installation.

big boys of the industry: as can be seen from the pie charts, small firms have a larger proportion of foreign construction workers in jobs that they were not initially trained for.

For more information, visit www.bca.gov.sg/otc/otc_main.html.

DEFINITIONS

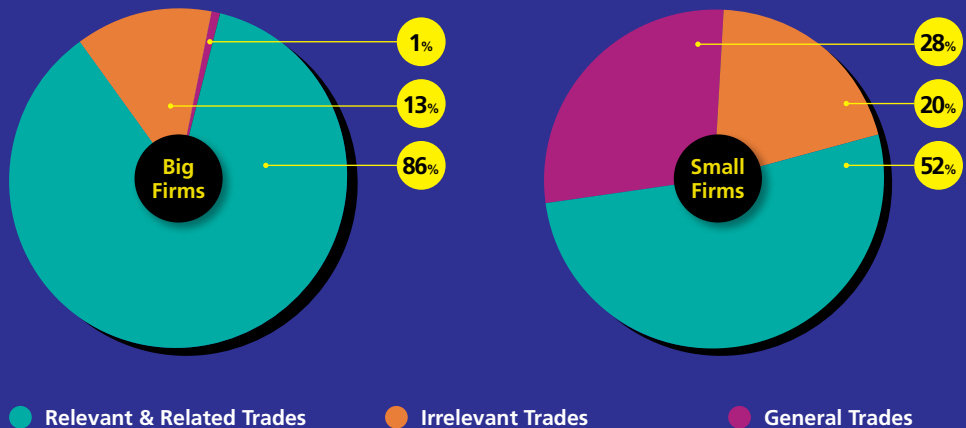
Big firms are firms registered with BCA's Contractors Registration System (CRS) under the construction work heads of A1, A2 or B1, and/or construction-related work head of L6.

Small firms are firms registered with BCA's CRS under the construction work heads of B2 and below, and/or construction-related work head of L5 and below.

Relevant trades refer to workers who are deployed in trades reflected on their skills certifications; for example, workers certified in tiling and were deployed in tiling works.

Related trades refer to workers who are deployed in trades different from those stated on their skills certification, but of the same trade category; for example, workers certified in tiling and were deployed in plastering works — both tasks are in the same trade category, that is, architectural.

TRADE DEPLOYMENT vs SKILLS CERTIFICATION



BCA'S PRO-ENTERPRISE INITIATIVES

Covered in this issue are new initiatives to ensure amusement ride safety and the push for construction productivity and sustainability with the use of high-strength materials for composite column, as well as a self-service portal for BCA Academy course applicants.

Making amusement rides safe

Amusement rides in Singapore come under the purview of the Amusement Rides Safety Act (ARSA) of 2011, which means each ride must come with the requisite permit.

To obtain such a permit, the operator of the ride has to ensure that the design, maintenance and operating procedures comply with recognised safety standards. As many small and medium enterprises operating these amusement rides lacked the expertise and knowledge in managing safety, it often took much effort and time for these firms to build up their safety regime.

In order to help these enterprises level up their safety standards quickly in a more efficient manner, BCA has developed an Amusement Rides Safety Management System (ARSMS), the first of its kind in the world. It contains comprehensive guidelines on the lifecycle of the ride, from design and installation to operation and maintenance.

With this system, operators enjoy the following benefits:

- Provides a comprehensive guide for setting up a proper system to manage safety;



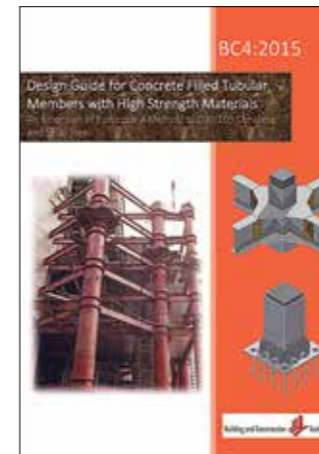
The construction of Robinson Tower required less steel and welding work, thanks to the use of thinner steel tubes.

PHOTO OF ROBINSON TOWER FROM A+I ASIA WWW.A+IASIA.COM/PROJECTS/ROBINSON-TOWER/

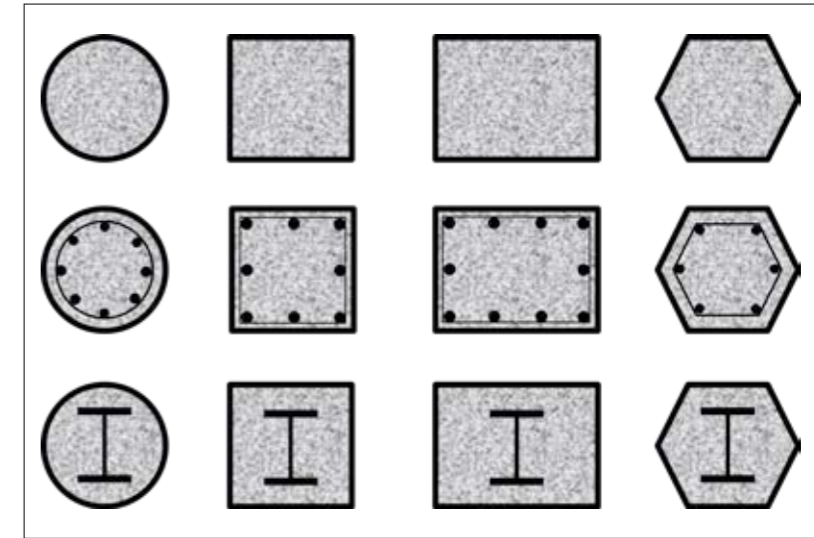
- Guide offers suggestions with examples on how to manage the different aspects of safety (for example, in dealing with safety incidents)
- Enhances clarity on compliance with the regulatory requirements (for a quicker approval process)
- Company enjoys a higher level of credibility with a proper safety system in place.

New design guideline enhances Eurocode 4

In another world's first, BCA has published a manual of design guidelines incorporating high-strength concrete (i.e. cylinder strength up to grade C90/105) and high tensile steel (i.e. yield strength up to grade S550) for concrete-filled tubular (CFT) members. The publication, *BC4: 2015 Design Guide for Concrete Filled Tubular Members with High Strength Materials*, developed in collaboration with the National University of Singapore and Singapore Structural Steel Society, enhances the design scope of Eurocode 4.



These guidelines are useful for Singapore, a nation of skyscrapers with limited land area. The use of high-strength materials in CFT members helps improve construction productivity and sustainability because of its three main advantages, which are:



Various types of CFT members as composite columns.

Reduced column size

The adoption of high-strength materials allows columns to be 30–40% smaller, saving building construction material and freeing up more usable space for developers and owners. Woodlands Nursing Home is one of the projects that has benefited from using CFT members with high-strength concrete to achieve optimal column size for its PPVC modules without compromising structural safety.

Reduced steel tube thickness and weight

The use of high-strength materials means that welding and lifting works can be reduced by up to 40%, leading to higher productivity in fabrication and erection. The construction of Robinson Tower required less steel and welding work, thanks to the use of thinner steel tubes.

Reinforcement-free, formwork-free and scaffolding-free

Constructing such columns needs neither formwork nor scaffolding. This leads to shorter construction time and higher construction productivity. One project that benefited from this was V-Shenton, which had its construction cycle time reduced by up to two weeks.

And we have further 'sweetened' this initiative by incorporating real examples to facilitate your learning experience!

Self-service portal

BCA Academy has a self-service portal that enables current and former trainees, students and course applicants to look up their training records. The customer self-service portal removes the need for alumni and students to write in or call BCA Academy to retrieve past training records, which are used for submissions to regulatory authorities for tenders and work permits, request for replacement of certificates, job applications, enrolment in educational institutions etc.

BCA Academy fills an average of 30,000 training places annually. With the implementation of this portal in May 2014, there is no need to contact our enrolment officers to enquire course information anymore. Neither would there be a need to enquire during office hours only, as the portal is accessible 24/7 all year round with instantaneous retrieval of information. This is a win-win situation as our customers are empowered, while our staff can strive for higher productivity at work.

Why not give it a go? Visit www.bcaa.edu.sg/self_help_portal/selfhelp/login.aspx

NOV 2017

1, 2, 3 & 6 Nov 2017
Certificate in Façade Inspection

1, 2, 9 & 10 Nov 2017
Certification Course in BIM Modelling (MEP Track)

2, 3, 6, 7 & 24 Nov 2017
Certification Course for Green Mark Manager (GMM)
Core module of GMP

3 Nov 2017
Requirements for Environmental Sustainability in Buildings and The Green Mark Scheme

6–9 Nov 2017
Certification Course in BIM Management

7, 9, 14, 16 & 21 Nov
Geotechnical Design using Eurocode 7

9 Nov 2017
44082 Workplace Safety and Health (WSH) Conference 2017
WSH Excellence Through Advanced Technologies in Construction Industry

9 Nov 2017
Refresher Course for Licensed Electrical Workers (Electricians)

9 Nov 2017
Best Practices for Green and Gracious Builder — Improving Performance and Site Practices

9 & 10 Nov 2017
Sustainable Facility Management Solutions

10 Nov (am) 2017
Civil Defence Shelter Seminar 2017
Design, Construction and Commissioning of Household and Storey Shelters

13 Nov 2017
Refresher Course for Licensed Electrical Workers (Technicians & Engineers)

15 Nov 2017
Basic Concept in Construction Productivity Enhancement (BCCPE)

20, 21, 27 & 28 Nov 2017
Certification Course for Site Investigation Supervisors

22 Nov 2017
Building Control Regulations for Site Supervisors

22–24 Nov 2017
Certified QM/CONQUAS Managers Course

28, 30 Nov 2017
Pile Foundations Design and Construction for Engineers

29 & 30 Nov 2017
BIM Scheduling and Process Management



Contact
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Bachelor of Construction Management (Building)
University of Newcastle, Australia

2 intakes per year (part-time)
Bachelor of Building & Project Management
Singapore University of Social Sciences, in collaboration with BCA Academy

2 intakes per year (part-time)
Bachelor of Science in Facilities & Events Management
Singapore University of Social Sciences, in collaboration with BCA Academy & Singapore Polytechnic