

PILLARS |

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

Building and Construction  Authority



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PILLARS

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Mr Leong Tatt Man is an Associate at Architects 61. He was involved in the design of various Green Mark developments such as One Shenton and Volari Condominium. Tatt Man is committed to adopting eco-design in his projects, the latest being the Marina Waterfront Promenade, where Forest Stewardship Council-certified timber was used in the construction of the boardwalk.

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CEO's Message



Dear readers,

The past two months had been a fulfilling one for BCA. During the recently-concluded World Cities Summit, BCA chaired one of the Expert Panel Session entitled 'Shaping World-Class Built Environments', where three international speakers shared their views and strategies on creating a liveable and sustainable built environment. Their presentation papers are documented in this issue for the benefit of those who were not able to join us then. During the event, we also showcased BCA's initiatives at the exhibition and attracted a large crowd of local and foreign delegates who were keen to find out more about BCA's strategic thrusts and initiatives on creating a sustainable built environment.

With Productivity at the top of our agenda, we went on to organise the inaugural International Panel Experts (IPE) on Construction Productivity & Prefabrication Technology in August to review Singapore's approach on raising construction productivity. The panel members from Germany, the Netherlands, Britain, Japan, Australia, the United States, Hong Kong and Singapore, who are experts in their respective fields, engaged in insightful discussion with BCA officers, public agencies, association presidents and industry members, and shared with us the best practices from their home countries. More on the IPE will be featured in the next issue.

To boost productivity and to keep up with the demand on the industry, it is crucial to nurture our talents and build capabilities within the workforce. This year, BCA gave out a record number of 34 BCA-Industry Built Environment Scholarships to outstanding students, with the support of 20 leading industry firms. This is an encouraging sign which reflects the confidence in the sector's prospects, relevance and importance to the Singapore economy. We look forward to welcoming this new batch of young talents in the building sector in the near future. Apart from the scholarships, BCA also organised a retreat and dialogue session for 48 young industry professionals from the Built

Environment Young Leaders Programme (YLP). Ms Grace Fu, Senior Minister of State for National Development and Education, was present at the dialogue session to discuss ways and measures to drive and achieve greater productivity within the construction sector.

One noteworthy moment for BCA took place at the world renowned think tank, the Aspen Institute, in Aspen, Colorado, USA, where BCA was conferred the prestigious Energy and Environment Award (Government) by the Institute. This is in recognition of our holistic approach to create a sustainable built environment that spans across the entire life-cycle from design, construction, operation, maintenance and demolition. The judges had viewed that Singapore's entry was an innovation that disrupted the status quo way of addressing an issue and offered a compelling and game changing solution to tackle the important issue of emissions reduction and sustainability in the built environment. It was also the first time a government agency outside North America clinched the award. Following this win, we will be pressing on with our efforts to further raise the benchmark for green buildings in Singapore. After reviewing the Green Mark criteria in consultation with the industry, we will be implementing the new version of Green Mark with effect from December this year. I hope that with the revised Green Mark standards, we are a step closer to achieving our target of greening 80% of all our buildings by 2030.

Dr John Keung
Chief Executive Officer

World Cities Summit 2010

What makes a city liveable and sustainable? What should be factored into a built environment to improve the quality of life for future generations of city dwellers?

These questions were deliberated on when BCA's CEO Dr John Keung chaired one of 12 expert panel sessions at the recent World Cities Summit 2010. The panel of experts discussed the factors that contribute to a liveable world-class built environment. As a city grows, the authorities and the stakeholders would have to consider various needs of the changing demographics to ensure that the built environment is an inclusive and safe one, within a carbon-constrained environment.

BCA's panel of experts were Ms Jane Henley, CEO of the World Green Building Council; Professor Steffen Lehmann, UNESCO Chair in Sustainable Urban Development for Asia and the Pacific, and Professor of Sustainable Design, Director Research Centre sd+b, at the University of South Australia, and Mr Finn Petren, President of the European Institute for Design and Disability.

A corporate booth was also set up by BCA at the Expo and attracted crowds of visitors during the four-day event. The booth took the form of a collage-like display where different angled structures served as information panels, explaining BCA's initiatives and strategic thrusts to visitors.

To further help visitors understand its efforts towards a friendly built environment, BCA brought participating delegates on a Built Environment Learning Journey to the BCA Gallery, Zero Energy Building and IKEA Tampines, which was one of the Gold winners of the BCA Universal Design Award in 2008.

The World Cities Summit 2010, themed 'Liveable and Sustainable Cities for the Future' took place at Suntec City from 28 June to 1 July 2010. Over 1,000 delegates, including 200 high level officials, gathered to discuss and identify innovative solutions to the existing challenges that cities faced today.



(From left) Professor Steffen Lehmann, Ms Jane Henley, Dr John Keung and Mr Finn Petren.



BCA's corporate booth at the World Cities Summit Expo.



BCA staff answering visitors' queries at the corporate booth.



A delegate trying out the wheelchair simulator at the BCA Gallery.

Three international experts from the World Cities Summit 2010 share their views on creating a sustainable and liveable city.

Expert Citation:

Planning and Designing Cities for All

Most people live in cities. This is a universal phenomena. Therefore, all the growing cities around the world must be liveable. This is a universal challenge. The solutions however can not be universal. They must involve designers' and architects' creative skills, and they must be designed according to local conditions and requirements.

Accessibility is one of the main features of a liveable city, where legislation and standards are means to achieve physical accessibility and usability for all. This is where Universal Design (UD) comes into place. UD is a concept that was developed in the United States in the 90's. In practice, UD with its focus on principles, definitions, guidelines and standards is merely another way of expressing accessibility for certain groups of people, people with disabilities and elderly people.

The "Design for All" concept is making its way through Europe. It differs from Universal Design in some important aspects. It is a design concept belonging to the creativity agenda, not the legislative one. Its main focus is on decision-making and the process, not the end product, and it involves designers and architects. The "Design for All" approach goes beyond strict compliance to regulations, and the "Design for All" methodology includes the active involvement of all stakeholders in the design process.

The Stockholm example

Stockholm, the capital of Sweden, is an outstanding example of a comprehensive accessibility work from a traditional disability policy perspective. Some of the works that were carried out from 1999 to 2010 include some 5,000 pedestrian crossings, bus stops with high kerbs to reduce the difference in level between the bus and bus stop, as well as covered drains and concrete paths to enable wheelchair users to move around with ease. A number of public toilets are also made accessible to everyone.



Mr Finn Petré
President of EIDD Design for All Europe
(European Institute for Design and Disability)

Planning and designing "The City for All"

The Stockholm example is basically about repairing and compensating for earlier mistakes. The challenge ahead is about getting it right from the beginning, moving from a traditional perspective on accessibility as a special interest issue to a much broader and multi-faceted one.

Planning and designing cities for real people, that is human diversity, require holistic approaches. Today's focus on eco technologies and design must be combined with an equally strong focus on the human and social dimension of sustainable urban development.

Any sustainable city development must cater for both the ecological, social and economic dimensions. Planning and designing for human diversity at the outset is a good deal for the society as it saves money to get it right from the beginning. It is also a creative challenge for the decision makers, designers and architects to consider all aspects of usage and combine these factors during the design process.

In order to create an inclusive "City for All", we have to move from special interest focus to public interest. The "Design for All" approach, focusing on human diversity instead of the average person, represents a new paradigm for both social development and design. Accessibility, usability and attractiveness is a public interest and basically an issue of quality when enhancing the quality of life for everyone.

Expert Citation:

Green Urbanism and Resilient Cities



Professor Steffen Lehmann
*UNESCO Chair in Sustainable Urban Development for
Asia and the Pacific, and
Professor of Sustainable Design, Director Research Centre
sd+b, at the University of South Australia*

Designing low-carbon cities

Technology and design are drivers for any modern economy. Good urban design in particular, helps the society adopt new low-carbon technologies. Between 2010 and 2030, some 85 per cent of total global urban growth will take place in developing countries – projected to triple their entire urban area (UN-Habitat, 2008; The World Bank, 2009).

This unprecedented urban expansion poses a historic challenge to cities and the international development community. However, it also provides a once in a lifetime opportunity to design, develop, build and manage new type of low-to-no-carbon city districts that are environmentally and economically sustainable, and socially more inclusive.

By 2020, a variety of different kinds of full-scale eco-city demonstration projects will be realised, and will become the test bed for research, innovation and best practices. While at the micro-level, the formulation and orientation of a city's built form is mostly an outcome of architectural design, at the macro-level, the planning of the layout needs to take a whole range of forward-looking issues into consideration.

Taking a holistic approach

It is important to note, that a couple of innovative engineering solutions will not deliver a vibrant city. All the technologies in the world cannot achieve sustainability and vitality by itself. The challenge is not so much about 'projects', but about the long-term urban vision, holistic strategic thinking and changes to behaviour and long-held planning habits.

Local governments and municipalities are actively driving the push for more sustainable cities and rapid change, marshalling resources to address the problem,

orchestrating the input of the private sector; and community groups, responding boldly and leading by example in urban innovation initiatives, even in the face of obvious funding challenges. Clearly, environmental sustainability is now a top priority for all cities, which are acting in partnership with industry, business and community-based organisations.

Future-proofing existing cities

With all the technological progress, we should not lose sight of the fact that key components in any society's sustainability are more than its carbon footprint. The future of our societies is not just merely a technical matter of finding more eco-friendly energy solutions, but a question of holistic social sustainability and healthy community involvement.

Cities can and must become the most environmentally friendly model of inhabiting our earth. Therefore, it is more important than ever to re-conceptualise cities and their systems of infrastructure, to be compact and polycentric cities.

Good urban design is also crucial, as it helps the society to adopt new low-carbon technologies and lifestyles. The governments, however, need to be mindful of social challenges that may arise out of the rapid urbanisation.

Ultimately, the vibrant city needs both top-down as well as bottom-up strategies. It needs large-scale and small-scale initiatives, all at the same time. New situations do not necessarily have to be designed; they often develop by themselves out of the potential of authentic urban places and of what already exists.

Expert Citation:

Unlocking the Potential



Ms Jane Henley
CEO of the World Green Building Council

The core principles of green building are nothing new; in fact they are centuries old. For the past century or more, decision-making has become decentralised and companies have become specialised. This has caused economic models to evolve with green building principles fading into the background. Most cities now have an inefficient existing building stock that is locking in carbon emissions that could actually be reduced by 50% with existing technology.

Cities produce up to 80% of nations' Greenhouse gases (GHG) emissions, and it would be most cost-effective to target buildings to reduce this economic and environmental liability. The most current legislation only deals with new buildings, thus effort is needed to look at how we can retrofit our existing building stock. However, there are many challenges to overcome – from ownership and split incentives barriers, financial issues and inconvenience, to the logistics of work involved. All these would need to be addressed to realise the potential emission reductions from the built environment.

The globally accepted "Common Carbon Metrics" for measuring carbon emissions in buildings is now being piloted by the World Green Building Council (WGBC), Sustainable Building Alliance and United Nations Environment Programme - Sustainable Building & Construction Initiative (UNEP-SBCI). The aim is to provide building performance measurement protocols; to establish a consistent methodology for calculating baseline carbon emissions from buildings at the city, regional, and country level, and to provide solutions via a "supply side" approach, for carbon dioxide reductions to be monetised through complementary measures under the country's emissions trading schemes. Market activity would be stimulated by incentivising energy efficient buildings where actual savings are delivered.

A firm collaboration between the industry and the government is the only way to address the many challenges, and to turn them into new opportunities. In the Asia Pacific, governments have been working with the industry to unlock this potential.

The government of Singapore has set out a target under the Green Building Masterplan to green 80% of the buildings by 2030. In particular, all new government buildings are required to achieve the Singapore's Green Mark Platinum rating. In Malaysia, building owners who have obtained the Green Building Index (GBI) certificate from 24 October 2009 to 31 December 2014, will be given income tax exemption equivalent to the additional capital expenditure in obtaining the certification.

An assessment tool, the Comprehensive Assessment System for Built Environment Efficiency (CASBEE) was also developed in Japan to evaluate the environmental performance of buildings. The local authorities had subsequently introduced CASBEE into their building administration. Over at Australia, the government implemented a national scheme for the mandatory disclosure of the energy efficiency of commercial office buildings. Building owners are required to inform prospective buyers and tenants of the energy efficiency of the buildings. The objective is for buyers and tenants to have access to credible information when buying or leasing the property, with the hope that it would in turn stimulate investments in energy efficiency improvements.

While designing new buildings to be as green as possible is today's inspiration, understanding the actual performance of all buildings and pro-actively improving that, is tomorrow's imperative.

Hearing from Productivity Experts

BCA's inaugural International Panel Experts (IPE) on Construction Productivity & Prefabrication Technology convened to review Singapore's approach on raising construction productivity.



Over 110 local and international participants joined the inaugural BCA's International Panel of Experts for Construction Productivity and Prefabrication Technology in August. The meeting, which was co-chaired by Dr John Keung, CEO of BCA, and Mr Pek Lian Guan, BCA Board Member and Managing Director of Tiong Seng Contractors, was part of BCA's initiatives to lead the construction industry to greater productivity.

The Panel – comprising leading local and international experts from the Netherlands, Germany, the United Kingdom, Japan, the United States, Australia and Hong Kong – reviewed Singapore's policies and practices aimed at facilitating productivity within the industry.

During the four-day session, the Panel members did a review of the existing regulatory framework and deliberated on the upcoming Construction Manpower Development Masterplan. They also looked into key areas affecting construction productivity, such as manpower development, technology adoption and capability building. With inputs from the experts, Singapore would be able to benchmark local practices with international ones, and improve on the current work processes.

The Panel members also shared their expertise with local industry practitioners at a seminar, 'Enhancing Construction Productivity' on 20 August. Each of the seven international experts presented successful examples from their home countries and reiterated the importance of using precast materials and prefabrications to improve productivity on site. The adoption of mechanisation and information technology was also recommended to drive the industry forward.

Most importantly, they stressed that these measures would have to be backed up by a good productivity management plan that needed to be clearly communicated to the workers on-site, with the aim of enhancing and sustaining construction productivity growth in the medium and long term.

Look out for more features on the IPE in the next issue.

The Aspen Institute Honours BCA

BCA has been conferred the prestigious Energy and Environment Award (Government) from The Aspen Institute in recognition of its innovative and comprehensive green efforts in Singapore's built environment.



Dr John Keung receiving the award from Mr Bill Dirks.



Dr John Keung (extreme left) with the rest of the award winners.

The Aspen Institute honoured BCA for its comprehensive approach and efforts in steering the industry towards the development of green buildings and sustainable construction in Singapore. BCA was the first government agency outside North America to clinch the prestigious award, given out by the international non-profit organisation which focuses on fostering thought leadership in global issues.

Commenting on the win, BCA's CEO Dr John Keung said, "This is a strong endorsement of our policies and efforts in steering the built environment towards sustainable construction and 'green' buildings. I hope that with such international recognition from a renowned and respected organisation, it will spur us on to do more to guide the industry towards developing more green buildings in Singapore."

Based on the Aspen Institute's assessment criteria, BCA is recognised for its role in designing and implementing policy and programmes in promoting green buildings and sustainable construction, which were innovative, comprehensive and replicable by other cities.

"We were impressed with how BCA demonstrated leadership at the national level in this very critical area of renewable energy standards and green buildings," said Mr Bill Dirks, Co-

founder and Board Chair of the Aspen Institute Energy and Environment Awards.

He added, "In our evaluation of the government category, we had also considered efforts from cities in United States, Middle East and Central Europe, but we saw a clear outstanding example of disruptive innovation, creative and breakthrough solutions in Singapore's entry, which could be reproduced around the globe to tackle large scale energy and environment issues."

One of the judges for the government category, Mr Eric Pooley, also Deputy Editor of Bloomberg BusinessWeek in New York, said, "For the judges, BCA's top-to-bottom and comprehensive approach in tackling this important issue of emissions reduction and sustainability in the built environment was an innovative approach that had replication potential. We hope that by recognising Singapore's efforts through the Aspen Energy and Environment Award that other cities and municipalities could start moving in a similar direction."

Mr Dirks presented the award to Dr Keung on 26 July during the Aspen Institute's annual Energy and Environment Forum at its campus in Aspen, Colorado, USA.

Raising the Green Bar on New Buildings



Upcoming revisions to Green Mark criteria will improve the standards of environmentally friendly buildings in Singapore, a step towards fulfilling the Government's goal for 2030.

BCA has revised its Green Mark Criteria for new buildings, to raise the standards of green buildings in Singapore and guide the industry towards more sustainable and energy efficient practices in building design, construction and maintenance.

With the revisions, the minimum energy efficiency standard will be higher than that of the current building codes. Building professionals will thus be required to design buildings with an energy efficiency standard that is 28% higher than the 2005 building code level. This will represent an additional 10% energy savings over the current standard.

Some of the other key revisions include requiring building projects to have air-conditioning systems that are more energy efficient, with devices to measure and track their energy efficiency. There will also be greater emphasis on the use of sustainable construction practices, resource-efficient design as well as passive design, which reduces the need for air-conditioning and the integration of natural ventilation in building design.

Commenting on the revisions, BCA's CEO Dr John Keung, said, "While we have been given international recognition for our

efforts in fostering a sustainable built environment in Singapore, we have to press on to achieve our goal of greening at least 80% of our buildings by 2030. The added emphasis on energy efficient building systems, passive design and sustainable construction practices will gradually guide our industry towards more environmentally sustainable practices. We hope that in twenty years' time, all Singaporeans will live, work, play and learn in buildings that are sustainable and energy efficient."

In this review of the BCA Green Mark standards, BCA consulted the industry extensively over the past year. The revised draft was also disseminated to the industry for feedback earlier this year, receiving about 170 comments from practitioners.

Details of this latest revision to the Green Mark criteria were communicated to the industry via a circular in August. BCA will also be holding briefing sessions for industry practitioners before its implementation in December 2010.

More details on the criteria can be found at http://www.bca.gov.sg/EnvSusLegislation/other/GM_Certification_Std2010.pdf.



Fine Tunes to Green Mark Incentive Scheme for Existing Buildings

Having reviewed feedback from the industry, BCA introduced revisions to the Green Mark Incentive Scheme for Existing Buildings (GMIS-EB) with effect from 14 June this year. The Scheme was first launched in April 2009 to encourage private owners of existing buildings to undertake retrofitting works to achieve improvements in energy efficiency.

The scheme provides a cash incentive that co-funds up to 35% of the equipment cost for energy efficiency improvements. When it was implemented, the qualifying criteria for the co-funding were based on the Green Mark rating achieved and the level of energy savings.

The revised version of the scheme will introduce the following new criteria:

- Energy savings: Building owners have two options to compute energy savings; either based on the total building energy consumption or the landlord's energy consumption.
- Air-conditioning system efficiency: Building owners have to achieve the minimum requirement on the system efficiency of the central chilled water air-conditioning plant.

With these revisions, the qualifying criteria are now based on the Green Mark rating achieved, the air-conditioning plant system efficiency achieved and the level of energy savings computed from either the building's total energy consumption or the landlord's energy consumption.

In addition, the amount for the first disbursement has been raised. As BCA had removed the 'next lower tier principle', the first disbursement amount will be 50% of the co-funding amount of the qualifying tier or the corresponding absolute cap, whichever is lower.

The revised criteria were circulated to the industry on 14 June 2010. For more information on the Green Mark Incentive Scheme for Existing Buildings, please visit <http://www.bca.gov.sg/GreenMark/gmiseb.html>.



Revised Qualifying Criteria

Green Mark Rating	Aircon System Efficiency (kW/RT)	Energy Savings		Co-funding Rate (based on equipment cost)	Cap
		Based on Total Building Consumption	Based on Total Landlord's Consumption		
Certified	0.7	20%	25%	20%	\$150,000
Gold		15%	20%		
Gold ^{Plus}	0.65	30%	35%	30%	\$500,000
Platinum	0.6	35%	40%	35%	\$1,500,000

SMU Blazes the Green Trail

The Singapore Management University (SMU) Administration Building, which sits in the heart of one of Singapore's busiest districts, has shown how existing buildings can do their part to contribute to Singapore's green building movement.

As an educational institution, SMU was determined to demonstrate exemplary leadership in environmental sustainability. Therefore, in 2007, the 14-storey SMU Administration Building, which was barely two-year old then, embarked on a review of the building infrastructure services, to seek feasible measures to improve the environmental performance of the building. Since then, dedicated steps were taken to monitor the energy consumption of the building, with BCA's Green Mark used as a reference to review and improve the building's design and management.

Along the way, energy-saving technology and measures, where practical, were introduced. These initiatives were intended to improve the environmental performance and create a sustainable and conducive environment for the SMU community. Since these measures were adopted, they have yielded significant savings for the university. In addition, the SMU Administration Building has also earned the Green Mark Platinum Award from BCA for their commendable efforts.

With the success of its pilot project, the building management will be looking at implementing the energy-saving features to the rest of the SMU buildings.

Here are some of the green features found at the SMU Administration Building:



- **Inverters for Escalators**

Inverters are installed on escalators in the building. The speed of an escalator is automatically reduced when the installed motion sensors detect a prolonged absence of users. This implementation saves the building about \$25,000 per year.



- **Energy-Saving T5 Lights**

All existing T8 lights in the building have been replaced by energy-saving T5 lights. Compared to T8 lights, T5 lights consume 30% less electricity and generate less heat. Adopting T5 lights thus reduces the building's cooling load, with savings of about \$33,000 annually.

- **Motion Sensors for Pantries, Toilets and Staircases**

Lights in pantries, toilets and staircases are controlled by motion sensors and activated only when necessary. This initiative shaves more than \$27,000 off previous annual electrical bills.



- **Building Envelope**

The façade is clad with double and low-E glazing, which effectively reduces solar heat gains to the building while still providing a high level of daylight.

- **High Efficiency Chiller Plant**

One of the three chillers will be replaced by end 2010. The system efficiency of the new aircon plant is 0.64kw/RT or better.



- **Promotion and Education**

The SMU building management team believes that active participation of all building occupants is crucial to achieving its objective of creating a sustainable environment. As such, the students and staff of SMU are encouraged to adopt best energy-saving practices in their daily activities such as setting the air conditioning in an occupied room at 25 degree Celsius or higher. On top of providing recycling bins at common areas, the staff and students are also encouraged to reuse generic banners for different events.

Record Number of BCA-Industry Built Environment Scholarships Awarded

More than 200 applicants applied for the BCA-Industry Built Environment Scholarships offered this year. 34 scholarships were successfully awarded by 20 industry sponsors, a significant increase from the 19 scholarships that were awarded by 13 sponsors last year.



The record number of industry sponsors, scholarship applicants and scholarships conferred this year are all clear indicators of the confidence in the sector's prospects, relevance and importance to the Singapore economy.

"As our sector steadily progresses and transforms into one that is resilient and technologically advanced, more and more firms are seeing the need and importance of investing in young talents to help sustain innovation and growth in their own companies," commented BCA's CEO Dr John Keung.

He added, "The high number of applicants and award recipients this year reflects the growing aspirations and commitment among our youth to make a difference in Singapore's built environment. Such a development can only spell well for the industry's future, which lies in the hands of these future leaders."



The 34 scholarship recipients will pursue undergraduate courses related to the built environment, ranging from civil, electrical, mechanical and environmental engineering to architecture and project and facilities management. They received their scholarship awards from Senior Minister of State for National Development and Education, Ms Grace Fu, at the 2010 BCA-Industry Built Environment Scholarship Award Ceremony held at Orchard Hotel on 13 August. BCA's Chairman, Mr Quek See Tiat, also graced the ceremony and presented sponsorship deeds to this year's participating sponsors.

This year's ceremony also celebrated the success of seven graduating scholars. One of the graduating scholars, Ms Ho Xue Mei, has achieved academic excellence with three Gold Medals – The Singapore Contractors Association Limited (SCAL) Gold Medal, the Singapore Institute of Building Limited (SIBL) Gold Medal and the Sally Meyer Gold Medal. She delivered a brief graduating speech at the ceremony where she expressed her gratitude for the scholarship and the opportunities that came with it.

Launched in 1993, the scholarship programme is a partnership between BCA and leading firms in the industry to provide scholarships to outstanding youths who inspire to lead and shape the future of Singapore's built environment. To date, BCA has successfully partnered about 80 industry sponsors to offer more than 220 scholarships.



Firms who are keen to participate in the 2011 BCA-Industry Built Environment Scholarship programme can contact Ms Tan Hoon Wee at 6325 5027 or tan_hoon_wee@bca.gov.sg for more information.

Latest Happenings in Young Leaders Programme

One year since its introduction, the BCA Young Leaders Programme has been enhanced to be more attractive and relevant for our Young Leaders, with more effective channels for exchanging ideas and information.



Young Leaders were invited to BCA-led study trips to Australia and Japan.



The Young Leaders paid a technical site visit to HDB's Pinnacle@Duxton.

In 2010, the programme took the Young Leaders on a technical site visit to HDB's Pinnacle@Duxton, to learn about the challenging aspects of the project. They also received invitations to be part of BCA's delegations in overseas study trips to Japan and Australia where they got a better understanding of the productivity trends and practices in adopting more advanced technologies and efficient work processes.

The highlight of this year was the half-day Young Leaders Retreat and dialogue session with senior policy makers, including Guest of Honour, Senior Minister of State for National Development and Education, Ms Grace Fu, where our Young Leaders were able to hear and share their views on ways and measures to drive and achieve greater productivity for the construction sector.

Moving forward, BCA will be inviting nominations at the end of the year for more talented individuals who are passionate about their careers to join the programme. We will continue to engage these future leaders of the construction sector, as part of the journey of continuous leadership rejuvenation in steering the sector towards further progress and growth. Watch this space!

Productivity Ideas from Young Minds

Productivity is the current buzzword across various sectors in Singapore, including the building and construction sector. Questions on how to enhance productivity in the industry naturally became the hot topic of discussion at the inaugural Young Leaders Retreat. Ideas flowed freely as 48 Young Leaders brainstormed ways to enhance construction productivity. They then presented their key suggestions and recommendations to Ms Grace Fu, who was invited as the Guest of Honour at the retreat. Ms Fu also shared her thoughts on the national productivity drive and how the construction industry could move ahead in the next decade.



The Young Leaders, engrossed in discussion.



Ms Grace Fu sharing her thoughts with Young Leaders on productivity and how it impacts the construction sector.



Young Leaders presenting their recommendations to Ms Grace Fu.

Young Leaders and Their Contributions

An Eco-Designer for the Environment



Volari



One Shenton



*Leong Tatt Man
Associate
Architects 61*

Leong Tatt Man from Architects 61 discusses how embracing eco-design in architecture allows him to do his part for future generations.

According to the documentary 'An Inconvenient Truth', the current generation has caused irreversible environmental damages to our surroundings. Indeed, one cannot deny the fact that there have been many unpredictable weather patterns recently. If we do not address these issues quickly, we may be witnessing even greater climatic disasters in the near future.

Within the construction industry, we can do our part. From developers to facility managers, the industry can set goals as part of their corporate social responsibility efforts and adopt eco-strategies in the construction and maintenance of a building. There are also other eco-initiatives such as BCA's Green Mark scheme which serves as an important platform to educate and influence the public and stakeholders on green issues.

More importantly, the industry needs to adopt eco-design, instead of just eco-styling. Eco-design considers and incorporates sustainable features into the design, right from the start.

Architects 61, which I am part of, has always been committed to eco-design. I am fortunate to be able to work on projects that have received strong support from

sophisticated and environmentally conscious clients. Some of these projects include One Shenton and Volari Condominium which have attained the BCA Green Mark Gold and Platinum Awards respectively.

More recently, I was also involved in the development of the Marina Waterfront Promenade. Although there was no Green Mark certification scheme for infrastructure during the inception of the project, the Urban Redevelopment Authority and fellow consultants had shown laudable green initiatives during the development of the Promenade. These include the use of Forest Stewardship Council-certified timber for the boardwalk and energy-conscious design for the Marina Bay City Gallery.

The completion of Marina Waterfront Promenade is indeed testament to the increased green consciousness in construction industry. However, we are only at the beginning of a nationwide eco-journey, and we can be sure that more challenges would lie before us. But it is precisely with these challenges that the construction industry remains relevant and progressive. I am committed to being part of this meaningful journey, and encouraged by BCA visionary leadership in this aspect.

The Built Environment Young Leaders Programme (YLP) is one of BCA's key initiatives to retain and nurture young professionals with the potential and calibre to lead the growth and advancement of construction sector in the near future.

To kick-start the programme, BCA has worked closely with leading industry firms to identify a group of young and talented professionals who exude leadership qualities and passion in their work.

Besides engaging these Young Leaders in policy formulation and tapping on their experience and passion in BCA's career promotion efforts, the YLP also serve as a platform to facilitate the upgrading and career progression of the Young Leaders.

BCA-ECAC Executive Development Programme: Eco-Training for an Eco-City



The recent BCA-ECAC Executive Development Programme: Green Building Training for Managers from the Sino-Singapore Tianjin Eco-City, was one of the initiatives set out under the Memorandum of Understanding for collaboration in training and development between the partners.

Once the Green Building Evaluation Standards for the Tianjin Eco-City were finalised on 1 October last year, BCA and the Sino-Singapore Tianjin Eco-City Administrative Committee (ECAC) proceeded to arrange a joint training programme for the practitioners and officials working in the Eco-City.

The eight-day training was jointly developed by the BCA Academy and Tianjin Institute of Urban Construction and was conducted in two locations - Tianjin and Singapore. The inaugural run started in Tianjin and moved to the BCA Academy from 29 June to 2 July 2010.

At the BCA Academy, officers from the Urban Redevelopment Authority and National Environmental Agency joined BCA in sharing Singapore's experiences in various areas. The topics covered Urban Planning and Development Control, Environment Control of Construction Sites, Building Control System, Development Experience & Vision of Green Buildings, Green & Sustainable Construction, Green Building Technologies & Best Practices and Green & Gracious Builder Scheme.

To supplement the lectures, participants visited consultancy firms and exemplary Green Mark project sites such as the Zero Energy Building, Resort World Sentosa, Samwoh Eco Green Building, Marina Barrage and National Library Building.

At the graduation ceremony of the eight-day training programme, Mr Huang Yonghao, Chief of Construction Section, Construction Bureau, Sino-Singapore Tianjin Eco-City's Administrative Committee, spoke about the success of the training programme and of the plans for future collaboration. The four-day stint, though short, had allowed the delegates to bring home with them practical knowledge and valuable experiences from Singapore.



A guide explaining the use of precast concrete technology in Singapore's public housing at the HDB Building Research Institute.



Delegates viewing a mock-up of the Marina Barrage, a Green Mark District Gold^{plus} project.



A guide explaining that Pinnacle@Duxton is a good example of a uniquely designed high quality public housing in Singapore.

In High Demand: SURVEYORS AND VALUERS

BCA teams up with the Singapore Institute of Surveyors and Valuers to raise the profile and professionalism of quantity surveyors, land surveyors, valuers and property managers.

The recent surge in the number of new developments has resulted in an increase in demand for quantity surveyors, land surveyors, valuers and property managers. In particular, the industry faces a shortage of quantity surveyors and land surveyors due to the lack of qualified personnel in Singapore.

To address these challenges, BCA and the Singapore Institute of Surveyors and Valuers (SISV) joined hands to put in place a number of initiatives to build up and strengthen the pool of building professionals within the industry.

Firstly, both parties will be introducing more joint academic programmes at the BCA Academy to train new professionals and upgrade the skills sets of existing ones. These include diploma, specialist diploma and degree courses. In addition, BCA Academy will be working with SISV to initiate more dialogue sessions with firms to facilitate discussion on developing such capabilities.

BCA and SISV went further to sign a Memorandum of Understanding at the opening ceremony of the 7th International Cost Engineering Council World Congress and 14th Pacific Association of Quantity Surveyors Congress 2010 on 26 July. The guest of honour, Dr Amy Khor, Mayor of the South West District and Senior Parliamentary Secretary of Ministry of Environment and Water Resources, witnessed the signing of the agreement together with 250 participants from the Asia Pacific region.

This agreement formalised the collaboration to promote and advance the quantity surveying, land surveying, valuation and property management professions in Singapore. Under the agreement, BCA and SISV would share resources, promote educational programmes and jointly create and implement new products and services to drive the local building industry forward.

"I'm confident that this new collaboration will help elevate the occupational profile in the built environment," said Dr John Keung, BCA's CEO. "BCA looks forward to working with SISV to develop more programmes to train personnel at the technical and professional level to meet the needs of the industry."

This was the first time the two congresses, the 7th International Cost Engineering Council World Congress and the 14th Pacific Association of Quantity Surveyors Congress 2010, were held concurrently. The events, organised by SISV at the Resorts World Sentosa, took place from 23 to 27 July with the theme 'Sustainable Cost Management: Borderless Innovation'. They provided a platform for international and local Quantity Surveyors and Cost Engineers to share knowledge and expertise as well as to promote innovative services that would help enhance and value-add to services rendered to clients.



[From left] Mr Wong Wai Ching, Deputy MD, Training and Professional Development, BCA Academy; Mr Lam Siew Wah, Deputy CEO, Industry Development, BCA; Mr Goh Ngan Hong, President, Quantity Surveying Division, SISV; Mr Loi Hwee Yong, President, Land Surveying Division, SISV.

“ Every worker deserves a safe work environment ”



“... and all of us have the responsibility and duty to make our construction sites safe,” was BCA's CEO Dr John Keung's call to the industry in his opening address at the Workplace Safety & Health (WSH) seminar held at the BCA Academy on 21 July.

The seminar was organised by BCA Academy's Centre for WSH Training in Construction, in support of the National WSH Campaign, to heighten safety awareness in the construction industry. For the 280 construction and safety professionals who gathered at the seminar, speakers presented topics related to the theme 'Achieving Workplace Safety and Health Excellence in Construction'.

One of the keynote speakers was the Deputy Chairman of the WSH Council's Construction and Landscape Committee, Mr Chia Ngiang Hong. While sharing the national initiatives and strategic plans to improve safety in the construction sector, he elaborated on the Design for Safety programme. He urged building designers to assess safety risks during the design process to minimise safety hazards and prevent accidents later at the construction stage.

Another keynote speaker – Mr Andrew Khng, President of the Singapore Contractors Association Limited (SCAL) – addressed the builders' role in achieving WSH excellence. He stressed that both main and sub-contractors could better manage workplace safety and health by building a strong team of project managers who were highly competent in safety matters. Following his address, Mr Winson Lee from the Ministry of Manpower (MOM) explained the elements of a fall-protection plan and how it could be used effectively to prevent accidents of personnel falling while working at heights.

In addition, speakers representing the award-winning developer, City Developments Limited, and contractors, Gammon, Shimizu Corporation and Straits Construction, shared their success stories on how they adopted innovative and best practices to improve the safety performance in their building projects.

As a sign of pledging support and commitment to workplace safety and health, key representatives from BCA, WSH Council, MOM, Workforce Development Agency (WDA) and SCAL participated in a handprint stamping ceremony on stage. A similar mural was set up in the exhibition area which was held in conjunction with the seminar to showcase common safety hazards at construction sites and how such hazards could be managed.



BCA's CEO Dr John Keung stamping a hand-print on the mural as a sign of commitment to workplace safety and health.



(From left) Mr Wong Wai Ching, Deputy MD, BCA Academy; Mr Andrew Khng, President, SCAL; Dr John Keung, CEO, BCA; Mr Chia Ngiang Hong, Deputy Chairman, WSHC (Construction & Landscape) Committee; Mr Winson Lee, Group Head (Operation), MOM; Mr David Tan, Principal Manager, WDA; Mr Benedict Tan, MD, BCA Academy.



A participant at the exhibition showing her support for the Workplace Safety and Health campaign.

Let's Build A GREEN Future!

BCA's third Green Building Exhibition roved into Toa Payoh HDB Hub in July and attracted a large crowd with its informative exhibits and fun games!



Ms Josephine Teo, Member of Parliament, Bishan-Toa Payoh GRC, graced the opening of the exhibition, with Mr Choo Whatt Bin, Executive Director (Services), BCA.



The new "Help Beco Grow" Cube Stacking Challenge was an instant hit with the heartlanders! A total of 128 people signed themselves up for the nail-biting balancing challenge. The highest record set was 19 cubes, stacked all the way up to the roof!



BCA's adorable Green Building mascots Greco and Beco also made their appearance in an animation video which was shown at the exhibition.



Another fun attraction that drew crowds was the "Greco & Beco Matcho" contest on Facebook.

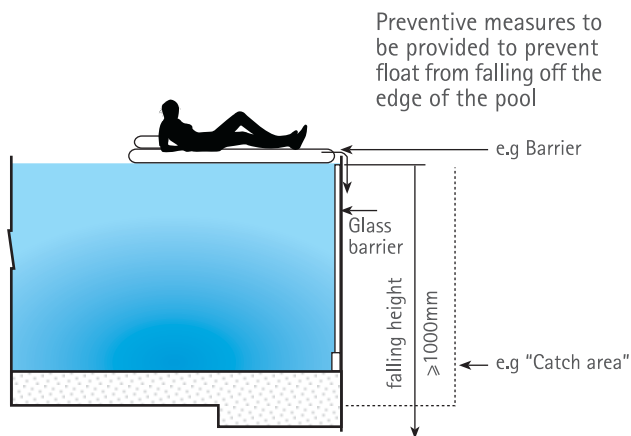


The Green Building Exhibition will be roving to Marina Square from 9 - 12 September!

Join us on <http://www.facebook.com/bcagreen> to get the latest updates!

Infinitely Safer for Swimmers

In recent years, infinity-edge pools have been gaining popularity in the design of condominiums, resorts and hotels. Some are even located at height such as the rooftop of developments. Here are some safety requirements in designing such pools.



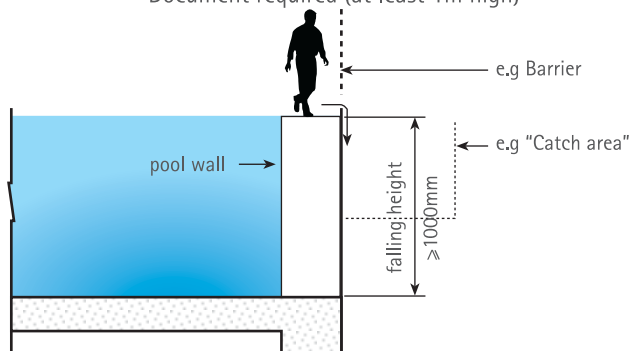
A. Section of Swimming Pool Located at Height

An infinity edge pool – also named negative edge, zero edge, disappearing edge or vanishing edge pool – is a swimming or reflecting pool which produces a visual effect of water extending to the horizon, vanishing, or extending to 'infinity'. When designing such pools, certain safety requirements should be built in to ensure the safety of swimmers.

Preventing floats from flowing over pool edge

Swimmers may sometimes lie on inflatable floats to rest and relax in a swimming pool. The use of such floats in an infinity edge pool can be dangerous especially if the pool is located at height and where there is no safety barrier to stop the float from flowing over the edge of the pool.

Measures complying with Clause H of Approved Document required (at least 1m high)



B. Section of Swimming Pool with Wide Pool Edge Which Allows People to Walk On

It is thus necessary to incorporate reasonable precautionary measures in the design to prevent the float from flowing over the pool edge. These could include raising the pool edge to be higher than the water level or providing a "buffer" or "catch" area beyond the pool, as shown in illustration A.

Preventing falling from height

Some infinity edge swimming pools are designed with a wide pool edge for people to walk on. This tends to encourage children to run along the pool perimeter, which could be dangerous should there be a drop in height beyond the edge.

In such circumstances, designers should refer to the section on 'Safety from Falling' in Clause H of the Building Control Regulations (Fifth Schedule). This clause will apply to any part of the pool perimeter where there is a drop in height of 1 metre or more.

For more information, please contact BCA's Building Plan Hotline at 6325 7159 or email to bca_enquiry@bca.gov.sg.

Make Your Mark in Construction Excellence

BCA calls for nominations for next year's Construction Excellence Award.

Is your project at the forefront of construction excellence? Will it serve as a benchmark of high standards for other builders to aspire to? If so, BCA invites you to nominate your project for the BCA Construction Excellence Award 2011.

The BCA Construction Excellence Award accords recognition to construction projects that have demonstrated the highest standards of construction excellence in Singapore. The Award aims to spur builders operating in Singapore to pay particular attention to high standards of project management, technical inputs and workmanship in their projects; and enhance competition for work excellence in the construction industry.

To qualify for the Award, a nominated building or utility project must have been completed in Singapore, including overseas projects which are built by Singapore builders. The buildings must have achieved its temporary occupation permit (TOP) between 1 January 2008 and 31 December 2009. A Civil Engineering project may refer to its certified completion date.

In addition, the building projects must have undergone the full CONQUAS assessment and have achieved minimum CONQUAS scores for nomination. However, buildings which fall under the "Small Buildings - \$3 million to \$10million" category, may also be classified under other categories where the minimum CONQUAS score differs. Retrofitting and upgrading projects may be considered for nomination as long as the project has been at least subjected to partial CONQUAS scoring on the completed architectural works.

Please visit www.bca.gov.sg/Awards/ConstructionExcellence/construction_excellence_awards.html for more information on the eligibility and full criteria of the BCA Construction Excellence Award.

BCA Construction Excellence Award

Award Categories	Minimum CONQUAS Scores Required for Nomination
Residential Buildings – Below \$1,200/sqm	81.0
Industrial Buildings	83.0
Institutional Buildings	83.0
Utilities Projects	83.0
Commercial /	85.0
Mixed Development Buildings	
Residential Buildings – \$1,200/sqm and above	88.0
Small Buildings – \$3 million to \$10 million	depending on classification of building
Civil Engineering Projects	-



Safe Structures, Safe Buildings

Building owners can now turn to a step-by-step guide to find out what they should do during periodic structural inspections.

Every year, more than 3,500 building owners have to go through periodic structural inspection to ensure that their building structures are properly maintained and safe for continued occupation. However, not all building owners are familiar with the procedures for facilitating such checks on their buildings.

BCA has published a handy brochure to guide building owners and structural engineers on their roles in these inspections. Within it, illustrations and easy-to-understand flow-charts will help building owners appreciate the objective of such inspections and to understand the entire process. With this understanding, the building owners and their appointed structural engineers will be able to play their roles in ensuring that their buildings remain safe for continued occupation.

The Building Control Act requires owners of all existing buildings – except bungalows, linked or terraced buildings which are used solely for residential – to engage a structural engineer to carry out periodic structural inspection and rectify any structural defects.

Please visit www.bca.gov.sg/psi to download the softcopy of the 'Safe Structures, Safe Buildings: Periodic Structural Inspection' brochure.

Site Condition for TOP Inspection

Building works must be completed before requesting for Temporary Occupation Permit (TOP) inspections from BCA.

Before requesting for TOP inspections, Qualified Persons (QPs) must ensure that the building works are completed to the regulatory requirements. Otherwise, they would need to schedule for a re-inspection. This would in turn deprive other developments of earlier TOP inspection dates.

Responsible declarations

Therefore, it is the duty of the QP, to supervise and inspect the building works to ensure that the works are carried out in accordance with the Building Control Act, regulations and approved plans, as it is an offence to make a false declaration when in fact works on-site are still incomplete.

During the request for TOP inspections, the QPs would have to submit the "Declaration by Qualified Person for the Application of Temporary Occupation Permit/Certificate of Statutory Completion for Building Works" and the "Certificate of Supervision of Building Works". These two documents are declarations from the QPs to certify that they have supervised and inspected the completed building works in accordance to the Act and stipulated regulations.

Safety provisions

From 1 August 2010, major safety provisions would need to be completed before any TOP inspection could be carried out. Some examples of incomplete safety provisions include any of the following conditions:

- Lack of safe and proper access to or within the development
- Incomplete building works related to:
 - > Safety from falling from height
 - > Treads, risers and safety barriers of staircases
- Incomplete basic finishing work which affects the measurements of:
 - > The width of corridors and staircases
 - > The height of safety barriers
 - > The ceiling height and headroom

For more information, please contact BCA's TOP Hotline at 6325 7160 or email to bca_enquiry@bca.gov.sg.

Understanding Storey and Staircase Shelters

BCA conducted a one-day Civil Defence Shelter Design Workshop on 14 July at the BCA Academy, attracting practising architects, engineers, developers and builders.

The workshop highlighted important technical requirements governing the design of storey and staircase shelters and the salient weapon effects such as the blast pressures that the shelters must withstand. For better understanding, several case studies were presented to illustrate the flexibility in the planning and design of storey and staircase shelters, in compliance with technical requirements.

The purpose of the workshop was to share with participants the essential planning and design considerations of staircase and storey shelters, and to allow them to better appreciate the flexibility of integrating storey and staircase in residential developments. More importantly, the participants were reminded that proper supervision would help ensure the quality of the civil defence shelters and would lead to an earlier commissioning of these shelters.



Participants at the Civil Defence Shelter Design Workshop.

Events

(Sep ~ Oct 2010)

Date	Event	Contact
1 Sep 2010	1-Day Experiential Workshop on Material Recycling for Sustainable Construction	<p>BCA Academy – Business Development Unit DID: 62489843/824 Email: bca_academy@bca.gov.sg</p>
6 ~ 7 Sep 2010	GMP Programme – ELECTIVE Module – Sustainable Acoustics	
14, 16, 21 & 23 Sep 2010	Supervision of Piling Works for Engineers & Supervisory Personnel	
19 ~ 23 Sep 2010	Vietnam National University-BCA Advanced Management Programme (Real Estate Development in Vietnam)	
23 ~ 24 Sep 2010 / 28 ~ 29 Oct 2010	Risk Management Course (BizSAFE Level 2)	
27 ~ 28 Sep 2010	2-Evening Course on Good Governance for Management Corporation	
28 Sep 2010	GMP Programme – ELECTIVE Module – Green Architecture & the Integrated Design	
1 Oct 2010	1-Day Seminar on Managing Complexity in Projects	
4 Oct 2010	GMP Programme – ELECTIVE Module – Maximising Green Design Through Building Automation	
4 ~ 5 Oct 2010	2-Day Course on BMSMA for Building Management Personnel	
8 Oct 2010	Code of Practice on Buildable Design	
10 ~ 17 Oct 2010	Tsinghua University-BCA Advanced Management Programme: Real Estate Development & Management in China	
12 Oct 2010	Good Industry Practices (Painting)	
14 ~ 15 Oct 2010	2-Day Workshop on "Behavioural Safety for the Construction Industry"	
18 ~ 19 Oct 2010	Project Management	
19 Oct 2010	Good Industry Practices (Aluminium Window)	
19 Oct ~ 4 Nov 2010	Internal Audit (QEHS) Course based on Quality ISO 9001, Environmental 14001 & Health OHSAS 18001	
20 ~ 22 Oct 2010	Certified QM/CONQUAS Managers Course	

Let's Build A

GREEN

Future!

THE BCA GREEN BUILDING EXHIBITION 2010



1 The Little Red Dot is turning Green

Learn more about how Singapore is greening its buildings!

2 Take a walk through a Green Home

Enjoy a tour in a green living room, bedroom, kitchen and bathroom!

3 Greening your world with the green professionals

More ways to a greener world as told by Architects, Developers, Engineers and other Industry Professionals!

FREEBIES GALORE!

WIN FANTASTIC PRIZES & GRAB GREAT GIVEAWAYS at our Gaming Booth and on Stage!

A Public Exhibition by:

Building and Construction Authority

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



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