

PILLARS

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

Building and Construction  Authority





Mr Allen Ang is the Assistant General Manager of the Projects Division and also the Head of Commercial Projects at City Developments Limited (CDL). As a green advocate, Allen is well-positioned to drive green innovations in CDL's commercial and residential developments. Some notable projects that Allen and his team have recently brought to fruition include City Square Mall, 7 & 9 Tampines Grande and The Solitaire – all of which are BCA Green Mark Platinum developments.

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PILLARS

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CEO's Message



Dear readers,

A very Happy New Year to all! This year promises many opportunities for the industry as well as job seekers within the built environment. At the BCA-REDAS Construction & Property Prospects 2010 Seminar, Ms Grace Fu, Senior Minister of State for National Development and Education, shared with us a positive projection of between \$21 and \$27 billion on the value of construction contracts to be awarded this year. Looking forward, we also expect to see a sustained level of construction demand over the next two to three years.

These growth prospects have to be backed up by moves to build capability in key growth areas such as Green Buildings. We will also have to explore new alternative technologies to improve the overall productivity of the industry. One such technology is the Building Information Modelling (BIM) that allows green building professionals to design, build, analyse and manage buildings efficiently and cost-effectively. After last year's successful BIM e-submission pilot, BCA is now ready to accept submissions of BIM architectural building plans starting from January 2010.

Following the launch of the 2nd Green Building Masterplan in April last year, the industry will need to train a new batch of specialised workforce to contribute to the green building movement. In this issue, you can find out more about a new degree related to Green Building and Sustainability offered by BCA Academy and its partners.

In order to attract potential students and new entrants into the industry, BCA, with the support of industry stakeholders, organised the 2nd Built Environment Scholarship, Training and Career Fair in conjunction with BCA Academy's Open House in January. The career fair proved to be a great platform for job seekers to get in touch with the industry and vice versa. Over 1,200 visitors turned up for the event, garnering positive feedback from industry partners who were present that day. We hope more industry partners will be able to join us next year.

For 2010, we will be enhancing the sponsorship for the BCA-Industry Built Environment Scholarship to attract more high-calibre students and groom them to join the industry. Undergraduates from built environment-related courses at our universities and polytechnics will also have the opportunity to get hands-on experiences under the new Built Environment Industrial Attachment Programme. This scheme will allow students to have a better idea of the workings of the industry and the opportunities that await them upon graduation.

Sustainable Living is a hot topic on Singapore's agenda. Therefore, as part of BCA's ongoing efforts to create more public awareness on green living and green professionals, we launched our first roving exhibition at City Square Mall last December. Competitions and interactive activities were tailored to engage the public at the exhibition while they learnt more about model "green" homes and the green professionals behind the green building movement. Do look out for the next exhibition at Suntec City from 11 to 14 March.

With 2009's green initiatives and achievements fresh in our minds, I am confident that 2010 will prove to be an even more fruitful one for the industry. I am also heartened to know that industry partners have been actively collaborating with BCA to develop expertise and capabilities over the year. I look forward to even more partnerships in 2010 as we gear towards our vision in shaping a truly safe, high quality, sustainable and friendly built environment for all.

Dr John Keung
Chief Executive Officer

Construction Demand to Stay in Singapore

BCA forecasts that the total construction demand in 2010 is likely to reach between \$21 billion and \$27 billion (Table 1). The mid-range of 2010 construction demand forecast (at \$24 billion) is anticipated to be higher than the \$21 billion demand in 2009 on the back of the improved economic outlook. These figures were revealed at the BCA-REDAS Construction & Property Prospects Seminar 2010 on 13 January 2010, where Senior Minister of State for National Development and Education, Ms Grace Fu shared with over 500 industry practitioners the industry's outlook for the new year.

Billion Dollars (\$)

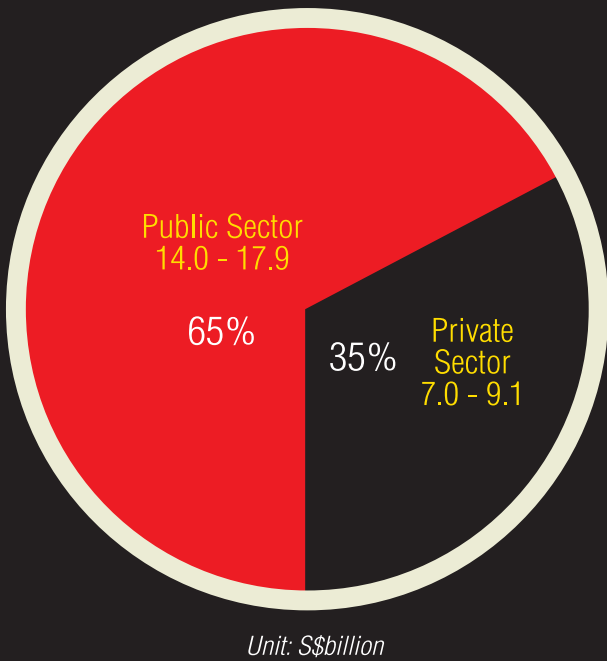
Table 1: Contracts Awarded (Excl. Reclamation) by Sector and Type of Work

	2008	2009 (Preliminary)	2010 (Forecast)
Both Sectors	35.7	21.0	21.0 - 27.0
Building Work	27.1	12.2	13.5 - 18.2
<i>Residential</i>	11.1	6.3	6.4 - 7.3
<i>Commercial</i>	8.5	1.3	1.7 - 2.1
<i>Industrial</i>	3.7	1.7	2.7 - 3.7
<i>Institutional & Others</i>	3.8	2.9	2.7 - 5.1
Civil Engineering Work	8.6	8.8	7.5 - 8.8
Public Sector	15.5	13.5	14.0 - 17.9
Building Work	7.8	5.4	7.0 - 9.8
<i>Residential</i>	4.7	2.8	3.3 - 3.7
<i>Commercial</i>	0.1	0.1	0.1 - 0.1
<i>Industrial</i>	0.1	0.2	1.5 - 1.7
<i>Institutional & Others</i>	2.9	2.4	2.1 - 4.3
Civil Engineering Work	7.7	8.1	7.0 - 8.1
Private Sector	20.2	7.5	7.0 - 9.1
Building Work	19.3	6.8	6.5 - 8.4
<i>Residential</i>	6.4	3.5	3.0 - 3.6
<i>Commercial</i>	8.3	1.2	1.6 - 2.0
<i>Industrial</i>	3.7	1.5	1.3 - 2.0
<i>Institutional & Others</i>	0.9	0.5	0.7 - 0.8
Civil Engineering Work	0.9	0.7	0.5 - 0.7

Source: BCA as at 12 February 2010

The public sector is likely to remain the key construction demand driver, contributing about 65% of the overall demand to between \$14.0 billion and \$17.9 billion. Buoyed by the strong take-up of Build-To-Order (BTO) flats, public residential construction demand is projected to increase amid growing demand. Industrial construction demand in 2010 is also anticipated to rise on the back of major strategic projects in the pipeline such as the first Liquefied Natural Gas (LNG) terminal by EMA and industrial facilities at Seletar Aerospace Park by JTC. Public institutional construction demand is expected to be strengthened with supports from MOE's school upgrading programme, campus expansion of various Institutes of Higher Learning (IHLs), development of new healthcare facilities, conversion of the former Supreme Court to the National Art Gallery and redevelopment of Victoria Theatre/Victoria Concert Hall. Civil engineering construction demand is likely to remain strong, led by LTA's Downtown Line Stage 3 MRT and road related projects.

2010 Public vs Private

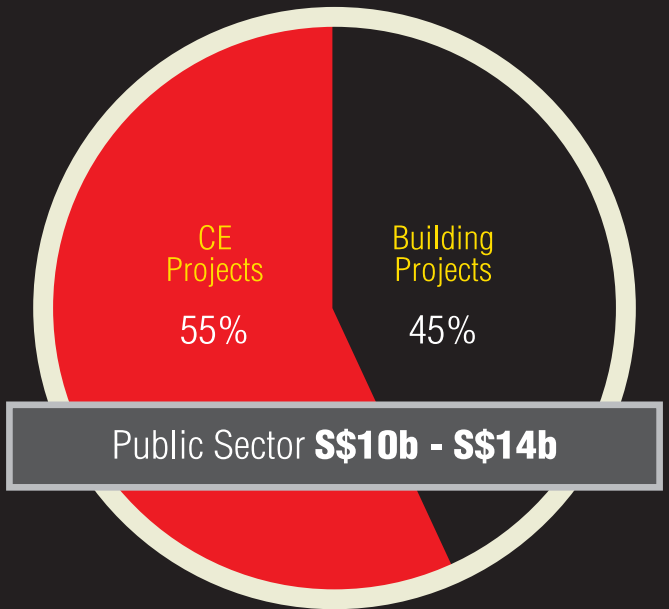


The private sector demand is also expected to be slightly more upbeat compared to the preceding year, amounting to between \$7.0 billion and \$9.1 billion. This is bolstered by the turnaround in market sentiment in response to improved economic fundamentals. Private residential construction demand is projected to increase in tandem with the improved market sentiment while commercial construction demand is likely to be firmed up by the planned commercial developments and several hotel developments. Industrial construction demand is expected to be similar to last year, but it could reach a more bullish level if the economy were to turnaround sharply in 2010.

CONSTRUCTION OUTLOOK FOR 2011-12

To facilitate the industry in project and resource planning for the medium term, BCA has started providing a 3-year construction demand projection on a rolling basis since 2009. Based on the BCA Construction Demand Forecast Model which factors in the projected GDP growth by MTI as well as prevailing market sentiments, the **average construction demand in 2011 and 2012** is projected to be between **\$18 billion and \$25 billion** per annum.

Outlook for 2011 - 2012



BCA's estimation based on public agencies' feedback indicates that the public sector construction demand is likely to reach between \$10 billion and \$14 billion a year in 2011 to 2012, with about 45% of it coming from building projects while the remaining 55% from civil engineering projects.

Construction Demand (Total value of Contracts Awarded)



Singapore Sees a Bumpy Recovery

Regional economist, Mr Song Seng Wun of CIMB-GK Research shares with us his projection of Singapore's economic outlook for 2010 at the BCA-REDAS Construction & Property Prospects Seminar 2010.

Singapore may enjoy 2-3 quarters of strong growth in the coming year. However a sluggish recovery in final demand in the advanced economies will moderate Singapore's growth prospects in 2010.

Key drivers for 2010

- **Global recovery**

Backed by massive global stimulus packages, global GDP growth in 2009 had surpassed even the most optimistic forecasts made a year ago. Given that governments around the world are not yet ready to withdraw monetary and fiscal stimulus, growth, especially in Asia, may again surprise on the upside, especially in the first half of 2010.

- **Net exports**

Singapore is largely dependent on external demand for growth, thus its key growth driver in 2010 will be net exports. Net exports dragged headline GDP in 2008 and 2009 but are expected to rebound in 2010 and contribute to headline GDP growth.

- **Private consumption recovery**

The Singapore government's expansionary bias in 2009 and the first half of 2010 will continue to support private consumption growth in the new year. However, a sustained recovery in private consumption and investment in OECD¹ economies would be needed to support the growth momentum going into the second half of 2010 and beyond.

- **Integrated resorts a new source of growth for the hospitality sector**

The completion of Singapore's two integrated resorts in 2010 will create several thousand new jobs and new sources of income for Singapore. The number of leisure or business travellers will depend on the state of regional economies and the global economy. The IMF expects the ASEAN-5 economy to expand 4% in 2010 versus 0.7% in 2009, and developing Asia to grow 7.3% from 6.2% in 2009. If these forecasts materialise, Singapore should be able to welcome a record number of visitors in 2010.



Mr Song Seng Wun speaking at the Prospects Seminar

Key risks for 2010

- **Slower global growth**

The risk of a double-dip recession exists but is low. It could occur in the second half of the year if the developed countries sink back into recession due to high unemployment rates and a fall in demand. A big positive is that Asian economies are likely to push ahead with growth, driven by domestic demand and improved intra-regional trade flows.

- **Sluggish growth in developed economies offsets stronger growth in Asia**

The recovery in advanced economies remains fragile and a return to pre-crisis levels of output is likely to be gradual. A sustained recovery in global demand, especially in OECD¹ countries, is needed to support the growth momentum into the second half of 2010. Weak household balance sheets and high unemployment rates, especially in the US, will continue to weigh on consumer demand. Other risk includes uncertainties over the withdrawal of monetary and fiscal stimulus. These issues advanced economies face will moderate Singapore's growth prospects in 2010.

¹ OECD refers to the Organisation for Economic Co-operation and Development. The OECD helps governments tackle the economic, social and governance challenges of a globalised economy.

Better Year for the Building Industry

Also on the panel of speakers was Mr Seah Choo Meng from Davis Langdon & Seah (DLS). He shares with us his views on the industry's prospects for 2010.



Mr Wong Wai Ching, Deputy MD, Training & Professional Development, BCA Academy, presenting a token of appreciation to Mr Seah Choo Meng (right).

Outlook for 2010

Prospects for the new year look hopeful and encouraging. The woes of the past year seem to have receded and the year 2010 has an aura of expectancy that promises sustainable construction demand levels for the industry.

Construction Activities

The construction demand of S\$35.7 billion for the year 2008 has established a new record high in comparison to the previous industry peak of S\$24 billion set in 1997.

Due to the global economic crisis, construction demand for 2009 declined drastically to a low of S\$21 billion, which is approximately 40% lower compared to 2008. Construction demand from the private sector, in particular, has also declined from S\$20.2 billion in 2008 to S\$7.5 billion in 2009.

BCA's forecast for this year shows that S\$21 to S\$27 billion worth of construction projects will be awarded. It is a manageable amount based on the construction industry's current available contracting resources and it is also generally comparable to 1997's level.

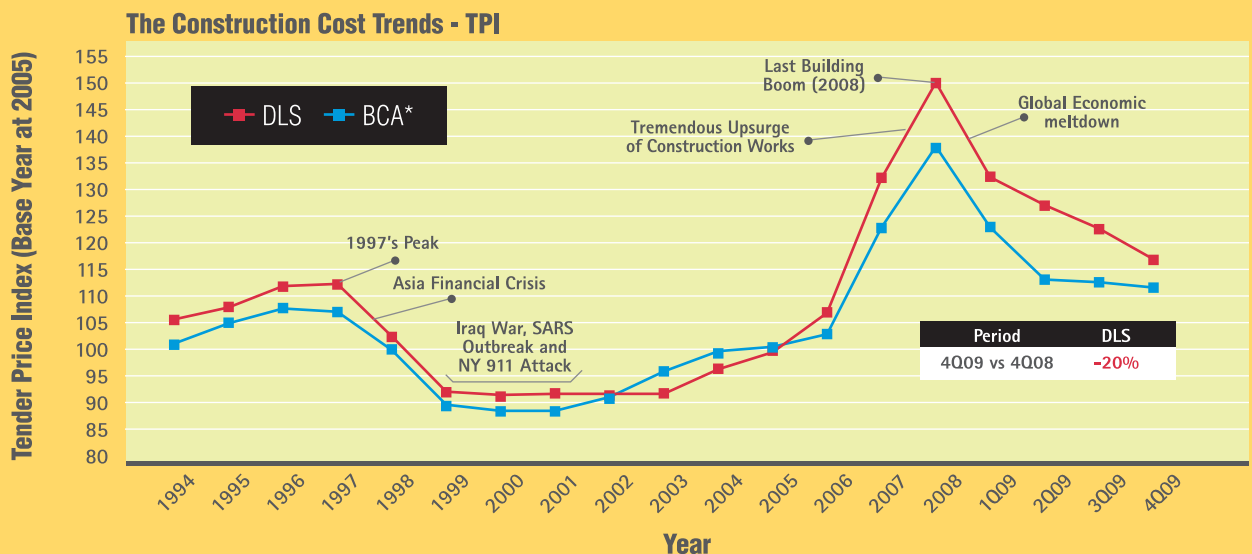
Construction Cost Trend

The public sector is likely to remain the key construction demand driver although construction demand from the private sector is anticipated to increase moderately – albeit from a very low level. As a result, more pronounced competitive pricing in private sector tenders would be the norm.

Supply prices of most basic construction materials are likely to remain stable with the exception of commodities such as copper, aluminium and steel, which may have bottomed-out in the last quarter of 2009. Current prices of these commodities appear to be on the upward trend.

In addition, the current Dubai Debt Crisis could also see a possibility of more foreign contractors concentrating in Asia and in Singapore, thereby resulting in more competitive pricing and giving a boost to more realistic tender prices.

Based on DLS's preliminary assessment, construction cost in 2010 is likely to increase moderately, possibly in the range of 3% to 5%.



Source: Building and Construction Authority

New Degree Blends Facilities and Events Management

BCA, SIM University (UniSIM) and the Singapore Polytechnic (SP) signed a Memorandum of Understanding (MoU) on 13 January 2010 at the Construction and Property Prospects Seminar 2010, to jointly offer the Bachelor of Science in Events and Sustainable Facilities Management programme. The degree is the first of its kind in Singapore that equips graduates with competencies in both facilities and events management.

To achieve the Inter-Ministerial Committee for Sustainable Development's (IMCSD) target for 80% of buildings to be Green Mark certified by 2030, Singapore needs about 6,000 facilities management professionals within the next ten years. This new undergraduate degree would help in meeting this demand by producing practitioners with the requisite knowledge, skill and competency to manage buildings effectively and optimise the use of resources (such as energy and water) in the operation of buildings.

The degree will be conferred by UniSIM which will oversee the overall development of the programme, offer its curriculum development expertise and develop the modules in management. Classes will be conducted on a part-time basis where students have up to eight years to complete their studies. This would appeal to working adults who are contemplating a career switch. Students will be able to gain from a firm foundation in leadership, planning, design, financial, communication and management skills together with essential specialised competencies in the areas of events and sustainable facilities management.

The classes will be conducted at the 3 partnering campuses through a combination of face-to-face lectures, laboratory works and blended e-learning, and be delivered by academic staff from the 3 institutions. The first intake will commence in July 2010.

Interested students can visit www.bcaa.edu.sg, www.unisim.edu.sg or www.sp.edu.sg for more information about the course.



Bottom photo: (From left) Mr Lim Cher Yam, Director, School of Architecture & the Built Environment, SP; Prof Chong Chee Leong, Dean, School of Science & Technology, UniSIM; Prof Cheong Hee Kiat, President, UniSIM; Ms Grace Fu, Senior Minister of State for National Development & Education; Mr Tan Hang Cheong, Principal, SP; Dr John Keung, CEO, BCA and Mr Benedict Tan, Managing Director, BCA Academy.

BCA Academy Open House 2010

For the 2nd year running, BCA Academy (BCAA) welcomed throngs of visitors and students to its annual Open House on 15 and 16 January 2010.



Students embarking on a tour around BCA Academy

Our friendly academic and administrative staff were on hand to answer queries regarding the diploma and specialist diploma programmes, while promoting BCAA's scholarship, bursary and preferential fee schemes.



Course Counsellors introducing the range of diploma courses offered by BCAA



ZEB tour guide explaining the Underfloor Air Distribution system at the Experimental Office

Visiting students took the opportunity to participate in the many interactive activities at each station.



Visiting students learning how to use an automatic level to measure ground level



A lecturer demonstrating how a wall is plastered



Secondary school students learning about the different strengths of concrete cubes



Students maneuvering a model excavator to ferry sand

A line-up of exciting programmes took place at the Event Area and kept the audience entertained throughout the day.



Visitors and students soaking in the excitement at the Event Area

Building Careers within the Built Environment

More than 1,200 visitors converged at the 2nd Built Environment Scholarship, Training and Career Fair at the BCA Academy on 16 January 2010. This annual event serves as a dedicated career fair to attract young talents and jobseekers seeking a fulfilling career in the built environment.

Demonstrating their strong support for BCA at the Fair were 29 industry associations, leading firms, Institutes of Higher Learning and government agencies, including 5 first-time participating associations. They were the Association of Consulting Engineers Singapore (ACES), the Institution of Engineers Singapore (IES), the Singapore Contractors Association Limited (SCAL) Academy, the Singapore Institute of Surveyors and Valuers (SISV) and the Singapore Institute of Building Limited (SIBL).

Other highlights of the Career Fair were the tours to the BCA Gallery, Sensory Garden and Singapore's first Zero Energy Building. These tours were conducted to help create greater awareness of the contributions made by the building professionals, as well as to enthuse new entrants to embark on fulfilling careers within the industry.

In conjunction with the Fair, BCA Academy also held its Open House, showcasing the wide range of training programmes and full-time diploma courses. These programmes will help equip potential candidates and those making career cross-overs with the necessary skills and qualifications, and will address the upgrading needs of the existing workforce at all levels.

What our stakeholders and visitors have to say?

"The fair was an excellent move by BCA to invite participation from professional bodies and institutions within the built environment. It certainly gave visitors an opportunity to gain a better understanding of the roles of the respective professional bodies, as well as the career advancement opportunities and routes to a professional qualification within each profession."

Mr Khoo Sze Boon
*Vice President (QS Division), Singapore Institute of Surveyors and Valuers
 & Executive Director, Davis Langdon & Seah Singapore Pte Ltd*



"Career fairs are an important platform for WDA to engage jobseekers and to share with them our knowledge of the dynamic labour market as well as how we are evolving the Continuing Education and Training (CET) landscape to meet the needs of industry and worker. The construction and built environment industry sector is a key stakeholder in our current efforts to manage climate change and support sustainable growth. We look forward to more of such collaborations with BCA to bring our programmes to those who are seeking employment and training opportunities in this industry."

Ms Julia Ng
*Director, Manufacturing & Construction Division
 Singapore Workforce Development Agency (WDA)*





"The BCA Career Fair is a good platform for us to reach out and engage prospective job seekers and scholarship applicants interested to pursue a career in the built environment industry and with an international real estate company. We were able to share CapitaLand's corporate culture, work environment, learning and growth prospects with them. BCA's efforts have continuously raised awareness of career opportunities and growth prospects in the built environment. CapitaLand is happy to partner BCA in raising the profile of the industry."

Mr Tan Seng Chai
Senior Vice President, Human Resource
CapitaLand Limited



"The Career Fair provided an excellent platform for undergraduates to heighten their knowledge of the industry and to explore various career and scholarship opportunities in the built environment. I am truly appreciative of the amount of effort placed in this initiative by BCA. No doubt students will be able to derive much benefit from the increased exposure. This event should definitely be a yearly affair."

Mr Ang Yu Qian
President, 20th Management Committee
Design and Environment Club
School of Design and Environment
National University of Singapore



2010 BCA-Industry Built Environment Scholarship Programme

The BCA-Industry Built Environment Scholarship Programme has been gaining interest among students and industry sponsors alike. Last year, 19 scholarships were awarded by 13 industry firms. Despite the economic downturn this year, it is encouraging to see that 18 industry sponsors have come forward to offer a total of 26 scholarships to outstanding graduating A-level and Polytechnic students, as well as NUS/NTU undergraduates under this Scholarship Programme. This is a very positive response from the industry, and it highlights the industry's continued support for our built environment scholarship scheme and their commitment in attracting young talents.

With the strategic intent of attracting, training and preparing more and high-caliber talents to join the industry and subsequently take on leadership roles in their respective fields, the scholarship programme has been enhanced this year. For local and Permanent Resident students, the value of the scholarships has been raised to at least S\$14,000 per year, up from the current S\$10,000 per year. We also hope that the enhancement will encourage more firms to partner BCA in this talent development programme to nurture more future industry leaders.

Our 2010 Industry Sponsors are:

CapitaLand Limited
 City Developments Limited
 CPG Corporation Pte Ltd
 DP Architects Pte Ltd
 Far East Organization
 Frasers Centrepoint Limited
 Keppel Land Limited
 KTP Consultants Pte Ltd
 Low Keng Huat (Singapore) Limited
 Meinhardt (Singapore) Pte Ltd
 Obayashi Corporation
 PM Link Pte Ltd
 Rider Levett Bucknall LLP
 RSP Architects Planners & Engineers (Pte) Ltd
 Singapore Structural Steel Society
 Straits Construction Singapore Pte Ltd
 Tiong Seng Contractors (Pte) Ltd
 Woh Hup (Private) Ltd

For more details on the scholarship programme, please visit www.buildingcareers.sg.

Let's Build A Green Future



BCA's first Green Building Exhibition gives a glimpse into "green" homes, "green" professions and educates Singaporeans to be "green" savvy.

Bringing Green Buildings to Life

Imagine a world where your home is built with the well-being of the environment in mind. Picture a future where buildings are designed intelligently to be green and energy efficient.

For the first time, thousands of Singaporeans got a feel of how the model "green" home of the future looks like, an overview of the green building movement and a better appreciation of how the built environment is gearing up towards a "green" Singapore by 2030 – all in one exhibition.

Launched by the Senior Minister of State for National Development and Education Ms Grace Fu, BCA's Green Building Exhibition was held from 10 – 13 December 2009 at Singapore's first eco-mall, City Square Mall.

Themed "Let's Build a Green Future", the exhibition will rove for two years at malls and other public areas. It aims to reach out to consumers and help them better understand what a green building or a green home actually means. This will also empower consumers to make intelligent, informed decisions on green buildings and inspire Singaporeans with the message that everyone plays an important part in the green building movement.



Green building professional and technology showcase

At the exhibition, visitors got up close with the faces behind green buildings and were provided with insights into the careers of green building professionals across the whole value chain.

Dr John Keung, Chief Executive Officer, BCA, said: "Through this exhibition, we want to emphasise the attractiveness of green building careers. It is indeed a meaningful career path for youths to consider as firstly, they will be involved in the worthy cause of mitigating climate change and secondly, they will be working with advanced technologies to produce creative solutions to achieve environmental sustainability."

Green building fun and games

Upon entry to the exhibition, visitors were given a game card with fun puzzles to solve. Besides interacting with the many exhibits through their quest for green building knowledge, visitors were also introduced for the first time to the lovable Green Building Mascots "Greco" and "Beco". Tall "Greco" represents green buildings while small "Beco" champions green homes!

Green building painting competition

BCA also organised its first Green building painting competition, "My Green City, My Green Home", which was opened to all secondary school students prior to the exhibition opening.

The 16 winners of the competition each received an award from SMS Fu at the exhibition's official launch ceremony and the winning entries, which depicted our youths' visions of a greener world, were showcased at the exhibition.



Join us on Facebook and be a fan of
"BCA Green Buildings"!

Our next stop will
 be at Suntec City
 from 11 to 14 March
 2010!



What our visitors say:

Unni Krishnan Ambady, Lecturer, Temasek Polytechnic

"The exhibition at City Square Mall was indeed an eye opener for the public who are unaware of the opportunities in this field as well as the advantages that they can gain by going green. The use of the Green Building Mascots, Greco and Beco, was an excellent plan. Very well executed. Keep it up!"

Janice Tay, Financial Planner

"I believe the exhibition was instrumental in increasing public awareness to being environmentally green. It certainly helped me understand green buildings more and I would want my future apartment to be green as well! I feel that the outreach via Facebook was really effective in connecting with tech-savvy youths!"

Lim Bee Lan, Senior Manager, 3P Partnerships, NEA

"The exhibition was nicely staged to help us better apprehend and appreciate the benefits of living in a green home and how we could help the environment. I was captivated by the interactive exhibits and I applaud the staff who earnestly explained the innovative green technology to the visitors."





Mr Allen Ang
Asst General Manager, Projects Division
Head (Commercial Projects)
City Developments Limited

Young Leaders and Their Contributions: At the Forefront of Greening Spaces

At City Developments Limited (CDL), Platinum winner of BCA's Built Environment Leadership Awards, going green is more than a business philosophy – it is also a personal conviction shared by many, including its nominated Built Environment Young Leader Mr Allen Ang.

Allen feels that climate change is a very real issue that the global community must pay heed to. "We each have a personal responsibility to contribute to change by rethinking our lifestyle and habits, whether at work or at home. As the buildings sector contributes about 16% of Singapore's greenhouse gases, industry players have a social responsibility to manage the environmental impact of their operations," he notes. "Our top management's foresight in identifying the need to develop green buildings, as well as inculcate and groom employees and suppliers towards the belief and competency in this area since the 1990s is the key enabler of our industry leadership today."

As the Assistant General Manager of the Projects Division and Head of Commercial Projects, Allen is well-positioned to drive green innovation in CDL's commercial and residential developments and make stride in CDL's integrated approach towards environmental sustainability. CDL believes in a three-pronged holistic approach to environmental management, namely: to develop quality properties, manage properties in a cost-effective and energy-efficient way, and influence the community.

In the development stage, the focus is on achieving an energy efficient building design, implementing sustainable construction methodology and responsible site management practices.

Some notable milestones that Allen and his team have recently achieved in environmentally sustainable development include:

- **City Square Mall**
Singapore's first Eco-Mall, first private commercial development to receive the Green Mark Platinum award
- **7 & 9 Tampines Grande**
Green Mark Platinum award winner, first completed building to achieve the LEED Gold certification from the US Green Building Council under the Core & Shell category
- **11 Tampines Concourse**
Green Mark Goldplus award winner, first CarbonNeutral® development in Singapore and the Asia Pacific
- **The Solitaire**
First completed Green Mark Platinum residential development

As a civil engineer by training, Allen's passion for the green cause has led him to contribute his time towards fostering environmental consciousness in the community, by serving on North West Community Development Council as Chairman of its Green Committee. Naturally, he also fits into the role of green advocate in the Built Environment Young Leaders Programme: "The Young Leaders Programme is a platform for greater public-private sector engagement and I look forward to building capacity with my peers in environmental sustainable development to support BCA in 'greening' Singapore's built environment."



7 & 9 Tampines Grande



11 Tampines Concourse

The Next Wave of Building Modelling

The Building Information Modelling (BIM) is the next wave of 3D parametric building modelling technology that has been globally reported as a key technology to transform the construction industry in terms of capability building and productivity. Using information technology and computer design, the BIM allows building professionals to develop building plans from the conventional two-dimensional drawings to computer-generated three-dimensional models.

To push for a sustainable built environment, BCA has set clear mandates for buildings to be more energy efficient and environmentally friendly. To achieve these, designers would be required to repeatedly evaluate the performance and test creative green concepts, solutions or features for buildings. With BIM technology, designers can now do analysis and make changes cost effectively. They would be able to visualise and simulate the performance and cost of new or retrofitted buildings before a single brick is laid. This would reduce abortive work due to wrong designs or the incorrect use of materials. Using BIM, firms can thus make more informed decisions and better manage construction risks. Owners can also seamlessly integrate BIM into their operations where they could easily identify building parts for replacement or repair.



*Rendered image (Left) vs as-built Revival Centre Church (Right)
Images courtesy of LAUD Architects Pte Ltd*

To encourage a wider adoption of the BIM technology, BCA took the lead and co-ordinated a multi-agency effort to mount a BIM e-submission pilot project in 2009. More than 10 architecture pilot sites were involved and their live projects have been submitted to various regulatory agencies, including BCA. Starting from January 2010, various agencies are now accepting architecture BIM from the industry upon the successful run and completion of the pilots.

Some of the architectural BIM e-submissions received during the pilot exercise



Top and Right: Images courtesy of Quek Swee Kiang, RIBA, MSIA, of Chartered Architects International

Bottom Left (left & right): Images courtesy of TWA

Construction and Precast Technologies in the Netherlands

The use of precast technology in construction is widely regarded as an economic, durable, structurally sound and architecturally versatile form of construction. Precast construction is cost-effective as it allows for better utilisation of manpower which eventually translates into enhanced site productivity. Over the past decade, BCA has been aggressively promoting precast construction as a superior option compared to conventional concrete construction.

The Netherlands is one of the leading countries in the European Union (EU) adopting precast technology. Firms in The Netherlands have also pioneered several state-of-the-art quality solutions in the country's drive for sustainable and resource-saving construction, one of which is the biaxial hollow slab concept (see excerpt below).

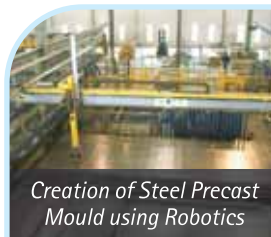
To learn from The Netherlands' experience, BCA led the industry on a study trip to various locations in the country from 13 to 21 October 2009.



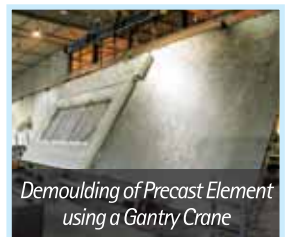
Members of the BCA-Industry Delegation

Highly Mechanised Precast Production

The highly-mechanised production system at Heembeton BV, one of the top precast manufacturers in the Netherlands, employs a combination of advanced robotics and casting technologies. The entire casting process is carried out over different stations which are linked seamlessly by a conveyor belt system.



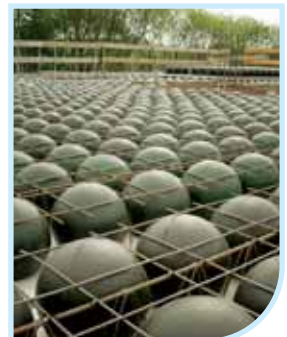
Creation of Steel Precast Mould using Robotics



Demoulding of Precast Element using a Gantry Crane

Innovative Biaxial Construction System

The biaxial hollow slab construction system involves the use of plastic balls as void formers to reduce as much as 30%-40% concrete usage in a flat plate system. The efficient usage of plastic void formers at appropriate locations to replace concrete reduces the self-weight of the slab while maintaining biaxial strength. This allows for exceptional degree of freedom in architectural design as well as large spans and long cantilevers without beam support. In addition, the plastic void formers can be manufactured from recycled plastic, which makes it an environmentally-friendly and sustainable construction method.



Notes from the Delegation

It was a very fruitful and well-organised trip for all of us. From the trip, we noticed that more powerful equipments, especially the lifting equipments, are being used. Much heavier and bigger structural elements are now being precast and less labour, both in construction sites and precast factories, is being used. All these methods, if adopted in Singapore, would allow us to reduce our dependency on foreign workers and deploy more skilled local workers instead.

Bailey Wong
Director
KTP Consultants Pte Ltd

Song Wee Ngee
Managing Director
KTP Consultants Pte Ltd

We have learnt a lot, especially on the projects using precast for both horizontal and vertical members. We also took the opportunity to share our experiences and technical skills amongst the delegates.

Cong Zhengxia (Ms)
Deputy Technical Manager
Woh Hup Pte Ltd

The first Singapore SS EN:206:2009 certified batching plant awarded to Pan-United. (Photo courtesy of Pan-United Concrete Pte Ltd)



Certifying Good Quality Concrete for Structural Use

Come 1 October 2010, BCA will require structural concrete for building and civil engineering structures to be supplied by batching plants that are certified by certification bodies accredited under Singapore Accreditation Council's Accreditation Scheme for Ready-Mixed Concrete (RMC) Certification. With this requirement, all on-site batching plants and plants supplying concrete for structural precast elements will also need to be certified.

This RMC certification will be based on the new Singapore Standards SS EN 206-1 (Concrete – Specification, performance, production and conformity) and SS 544 (Concrete – Method of specifying and guidance for the specifier). With this certification, there is assurance that good quality concrete will be produced for structural use.

To ensure a smooth transition, a grace period of 9 months starting from 1 Jan 2010, has been given to ready-mixed concrete producers to get their plants certified. Thereafter, builders and qualified persons must ensure that structural concrete for building and civil engineering structures are obtained from certified batching plants.

Qualified persons are advised to incorporate this new requirement in their technical specifications for future development projects.

For ease of reference to the qualified persons and the end-users of ready-mixed concrete, a list of all certified batching plants can be found at SAC's website:

<http://www.sac-accreditation.gov.sg/>

Events

(Mar 2010)

Date	Event	Contact
1, 2 & 3 Mar 2010	Essential Knowledge in Local Regulations and Construction Practices	<p>BCA Academy – Business Development Unit DID: 62489843/824 Email: bca_academy@bca.gov.sg</p>
2 Mar 2010	Workshop on Lightning Protection Systems for Buildings	
3 Mar 2010	Building Information Modeling (BIM) e-Submission Requirements	
3, 5, 10 & 12 Mar 2010	Geotechnical Instrumentation for Engineers	
4 Mar 2010	Good Industry Practices (Waterproofing for External Wall)	
5 Mar 2010	Recent Developments on Reusable Steel Strutting for Deep Excavation Support Works	
10 & 11 Mar 2010	Construction Contract Administration	
9, 11, 16 & 18 Mar 2010	Supervision of Piling Works for Engineers & Supervisory Personnel	
11 Mar 2010	Good Industry Practices (Marble/Granite/Ceramic Tiling)	
16 Mar 2010	bizSAFE Workshop for Company CEO / Top Management	
16 Mar ~ 22 Apr 2010	Certification Course for Structural Steel Engineer (StEr)	
18 Mar 2010	Good Industry Practices (Timber Flooring)	
23, 25, 29 & 31 Mar 2010	Pile Foundations Design and Construction for Engineers	
24 Mar 2010	Understanding the Green Mark Criteria for Existing Buildings and Office Interior	
31 Mar 2010	CORENET e-Submission System Training	

(Apr 2010)

6 Apr 2010	Good Industry Practices (Waterproofing for Internal Wet Areas)	<p>BCA Academy – Business Development Unit DID: 62489843/824 Email: bca_academy@bca.gov.sg</p>
12 & 13 Apr 2010	BMSMA for Building Management Personnels	
12 & 13 Apr 2010	Risk Management Course (BizSAFE Level 2)	
13 Apr 2010	Good Industry Practices (Painting)	
19 & 20 Apr 2010	Project Management	
20 Apr 2010	Good Industry Practices (Aluminium Window)	
20, 22, 27 & 29 Apr 2010	Site Investigation for Engineers	
21, 22 & 23 Apr 2010	Certified QM/CONQUAS Managers Course	

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