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BCA Awards 2008



The BCA Awards was held at the Raffles City Convention Centre on 22 May 2008. This is an annual event to honour and give recognition to displays of excellence in the built environment in the areas of safety, quality, sustainability and user-friendliness. Some 1,000 guests attended the event. National Development Minister Mah Bow Tan was the Guest-of-Honour. Altogether, 97 award winners were honoured at the event.

UNIVERSAL DESIGN SHAPING LANDMARKS



National Museum of Singapore



Ramped access into Monument Building



Bridge between old and new buildings



Automated doors for easy accessibility

Universal design is progressively shaping the landmarks of Singapore that we are familiar with. One such example is the National Museum of Singapore, one of the silver award winners of the 2nd BCA Universal Design Award. The building underwent redevelopment works from 2003 to 2006, where the existing building was integrated with an extension that included a glass rotunda.

The National Museum is an exemplary landmark that shows it is possible to think out of the box and work around constraints to inject universal design elements to enhance user experience and comfort. Despite the constraints of a monument building, many thoughtful designs were sensitively incorporated in the planning and design stage to make the museum and its artefacts more friendly and accessible to all users.

“It has indeed been a challenge working on this project. On one hand, we aim to retain the character of the original building, while at the same time, ensuring the final product would cater to users of different abilities,” said Ms Deidre Claire Lee, Principal Architect of CPG Consultants.

“For instance, wide and comfortable ramps are integrated all through the museum to mitigate level changes. Family rooms are distributed throughout the building for users’ convenience. A new concourse and bridge were designed to provide seamless access between the old and new buildings, and inter-connectivity with its park-like surroundings was also provided for.”

Other user-friendly features include:

- Accessible lifts
- Ramps, escalators and automatic doors
- Child-friendly sanitary fittings and fixtures
- Self-ticketing machines of varying heights to cater to children and wheelchair users
- Lockers for visitors

MORE CONSTRUCTION EXCELLENCE AWARD PROJECTS WITH QUALITY MARK



Seven out of nine private residential projects that attained this year's BCA Construction Excellence Awards had obtained the BCA Quality Mark (QM) for Good Workmanship. Besides quality, the Construction Excellence Awards also assess the builder's technical capability and innovations and the overall management of the project.

Local builder, Woh Hup Pte Ltd, which clinched two Construction Excellence Awards for The Shaughnessy and Baywater Condominium this year, sees clear benefits from the QM Scheme.

Mr Yong Mee Him, Woh Hup's Director, explaining how the Scheme has helped the firm said, "BCA's Quality Mark Scheme is an efficient tool to assist in the improvement and consistency of quality in building works. Quality Mark also reinforces the commitment and concentration throughout the chain of supervision and the implementation of the works itself."

Mr Thiam Boon Siong, a homeowner at The Shaughnessy, commented "I am very pleased with Allgreen Properties' overall quality standard achieved in the development. For such a sizeable floor area of more than 3,000 sq ft, I have not detected any substantial defects findings. This is indeed a very pleasant surprise, given my past experience with other developments. I am sure I am not alone with these comments."

Another award winner, Butterworth 33, constructed by Juho Construction, also received praise from homeowner, Mr Chua Cheng Hai, "I am happy that a lot of attention was paid to the construction details, workmanship quality and material used. Settling down in this new house was made easier without the usual headaches from dealing with shoddy workmanship."

Butterworth 33 is no stranger to awards, having previously achieved the BCA Best Buildable Award in 2007 and BCA Green Mark Award in 2005.

The QM Scheme was introduced in July 2002 to help the industry deliver residential homes of consistently high quality and give assurance to homebuyers that the workmanship quality attained is the best achievable in the industry. The Scheme comprehensively assesses the workmanship quality of EVERY apartment unit's internal finish against prescribed standards. To attain the Quality Mark, each apartment has to achieve a score of at least 80 marks, with no major defects. In addition watertightness tests are conducted on all bathrooms to minimise the occurrence of defects and leakage problems in bathrooms/toilets due to poor workmanship. To date, some 21,000 residential units have been committed or assessed under the QM Scheme. Last year, about 34% of units launched were committed to the Scheme.



Changi Airport Terminal 2

Safety Ambassadors Honoured

The winners of the inaugural Design and Engineering Safety Excellence Award were honoured at the BCA Awards. Changi Airport Terminal 2 stood out from the competition.

Amidst the hustle and bustle of Terminal 2's 24-by-7 operations, the upgrading project team worked tirelessly in the background to overcome site constraints like limited working spaces, minimising disturbance to the terminal's operational environment and maintaining Changi Airport's image as one of the best international airports in the world, and yet ensuring safety.

So when the project was completed successfully, it was no wonder the Changi Airport Terminal 2 upgrading project took top honours in the BCA Design and Engineering Safety Excellence Awards.

"Among the many quality nominations received, the Terminal 2 upgrading project stood out for its efforts and overall dedication towards high standards of safety for every task undertaken while the terminal is still functioning," noted Mr Pek Lian Guan, Chairman of the Design and Engineering Safety Excellence Award assessment committee.

To achieve these objectives, the structural engineer, Mr Lai Huen Poh of RSP Planners, Architects and Engineers (Pte) Ltd used several innovative solutions in the design and construction process.

- The creative use of steel structures fabricated offsite and erected at the airport premises ensured safe and swift construction with minimal interference to the day-to-day activities at the terminal.
- In many areas, the combined use of movable working platforms with cranes kept the construction away from airport users.
- For existing structures that need to be strengthened, methods that created less noise, dust and debris, such as carbon fibre-wrapping and post-tensioned cables and bracings were adopted.

Mr Lai explained, "In keeping with safety as well as to maintain an incident-free operational airport, we have adopted the approach of major invasive surgery whilst keeping the heart pumping and with the patient alive and mobile."

Mr Ong See Ho, Deputy CEO of Building Control, BCA added, "BCA hopes that in giving recognition to professionals for their engineering achievements, the award will inculcate a strong safety culture among building professionals in developing Singapore's built environment."

Design and Engineering Safety Excellence Award

The Award aims to recognise and applaud the efforts taken by the Qualified Person and his or her project team members in overcoming challenges and ensuring safety in the design and construction of a building. The project team is also commended for their efforts in construction best practices, such as quality control procedures and measures to ensure public safety.

Invitations for the nominations in the inaugural award commenced in November 2007 and closed in February 2008. A total of 15 nominations were received, 13 for the building category and two for the civil engineering category. The Assessment Committee selected seven winners, consisting of one Award winner and six Merit Awards.

List of winners at BCA Awards 2008

BCA GREEN MARK AWARDS (GMA)

No.	Project	Type of Award	Developer/ Owner
1	The Solitaire	Platinum	City Developments Ltd
2	Office Building at Tampines Grande	Platinum	Fairsteps Properties Pte Ltd
3	Ocean Financial Centre	Platinum	Ocean Properties Pte Ltd
4	313@ Somerset	Platinum	Lend Lease Retail Investments 1 Pte Ltd
5	Cliveden At Grange	Platinum	City Developments Ltd
6	Goodwood Residence	Platinum	Fasidon Holdings Pte Ltd
7	Shelford Suites	Gold Plus	City Developments Ltd
8	Tokio Marine Centre	Gold Plus	TM Asia Insurance Singapore Ltd
9	Riveria Gardens	Gold Plus	I. Contemporary Living Pte Ltd
10	The Regent Singapore	Gold Plus	The Regent Singapore
11	Wilkie Studio at 86 Wilkie Road	Gold Plus	City Developments Ltd
12	Clementi Woods Condominium	Gold Plus	FCL Loft Pte. Ltd.
13	AALTO	Gold Plus	Hong Leong Holdings Ltd
14	The UE Square Shopping Mall, Park Avenue Suites & Shell House @ UE Square	Gold	United Engineers Limited
15	One Shenton	Gold	CDL Land Pte Ltd
16	Hong Wen School	Gold	Hong Wen School
17	Paterson Suites	Gold	Bukit Sembawang View Pte Ltd
18	The Vermont on Cairnhill	Gold	Bukit Sembawang View Pte Ltd
19	Verdure	Gold	Bukit Sembawang View Pte Ltd
20	L'VIV	Gold	Winnorth Investment Pte Ltd
21	The Riverine By The Park	Gold	Wintree Investment Pte Ltd
22	Helios Residences	Gold	Winnvest Investment
23	Philips Electronics Singapore Pte Ltd - Toa Payoh Complex	Gold	Philips Electronics Singapore Pte Ltd
24	Office Renovation at Apple Operations Europe, Singapore Branch	Gold	Apple Operations Europe, Singapore Branch
25	8 Nassim Hill	Gold	Tennessee Pte Ltd
26	71 Robinson Road	Gold	Kajima- Lehman (Robinson) Development Pte Ltd
27	Latitude	Gold	Phoenix Realty Pte Ltd
28	Fuji Xerox Towers	Gold	Hong Leong Properties Pte Ltd
29	City House	Gold	Lingo Enterprises Limited
30	The Turquoise	Gold	Ho Bee Cove Pte Ltd
31	Urban Resort Condominium	Gold	Jubilee Realty Pte Ltd
32	Applied Materials Building	Gold	Applied Materials South East Asia Pte Ltd
33	The URA Centre	Gold	Urban Redevelopment Authority
34	River Valley High School	Gold	Ministry of Education
35	Fort Canning Park	Gold	National Parks Board
36	Sungei Buloh Wetland Reserve	Gold	National Parks Board
37	BFC Phase 1 (Commercial Development)	Gold	BFC Development Pte Ltd
38	The Orange Grove	Gold	Ho Bee Developments Pte Ltd
39	Reflections@ Keppel Bay	Gold	Keppel Bay Pte Ltd
40	Canadian International School @ Jurong West Street 41	Gold	Canadian International School Pte Ltd
41	Casa Merah	Gold	Choice Homes Beta Pte Ltd
42	Halia	Gold	Maylands Investment Pte Ltd
43	Capitaland Institute of Management & Business (CLIMB) @ Sentosa	Gold	CapitaLand Ltd
44	St. Thomas Suites	Gold	FCL Tower Pte Ltd
45	Duke-NUS Graduate Medical School Singapore	Certified	Duke-NUS Graduate Medical School Singapore
46	Physical and Mathematical Sciences Building, Nanyang Technological University	Certified	Nanyang Technological University
47	Humanities & Social Sciences Building at Nanyang Technological University	Certified	Nanyang Technological University
48	Trilights	Certified	Pacific Rover Pte Ltd
49	Crowne Plaza Changi Airport	Certified	LC Airport Hotel Pte Ltd
50	Naval Base Secondary School	Certified	Project Development & Management Office, Ministry of Education
51	Shimei East Kitchen	Certified	Housing & Development Board
52	Gourmet East Kitchen	Certified	Housing & Development Board
53	Army Museum of Singapore	Certified	Defence Science & Technology Agency
54	Palais Renaissance	Certified	Citydev Real Estate (Singapore) Pte Ltd
55	Central Mall Office Tower	Certified	City Developments Ltd
56	Starhub Centre	Certified	HSBC Institutional Trust Services (S) Ltd as Trustee of CapitaCommercial Trust
57	Robinson Point	Certified	HSBC Institutional Trust Services (S) Ltd as Trustee of CapitaCommercial Trust
58	Kim Tian Green	Certified	Housing & Development Board
59	Punggol Vista	Certified	Housing & Development Board
60	Clementi N4 C8	Certified	Housing & Development Board
61	Chinese Garden	Certified	JTC Corporation
62	Sage	Certified	Hong Leong Holdings Limited
63	Anchorvale Community Club	Certified	People's Association Singapore
64	Memories at Old Ford Factory	Certified	National Heritage Board
65	Hillcrest Villa	Certified	MCL Land Realty Pte Ltd
66	Market Street Car Park	Certified	HSBC Institutional Trust Services (S) Ltd as Trustee of CapitaCommercial Trust
67	Golden Shoe Car Park	Certified	HSBC Institutional Trust Services (S) Ltd as Trustee of CapitaCommercial Trust
68	UE Print Media Hub	Certified	United Engineers Developments Pte Ltd



BCA CONSTRUCTION EXCELLENCE AWARDS (CEA)

No.	Project	Type of Award	Award Category	Builder	Client
1	The Shaughnessy	Award	Residential Buildings - \$1200/m ² & above	Woh Hup (Pte) Ltd	Yishun Residency Pte Ltd (a subsidiary of Allgreen)
2	Baywater Condominium	Award	Residential Buildings	Woh Hup (Pte) Ltd - \$1200/m ² & above	Bedok Properties Pte Ltd (a subsidiary of Allgreen)
3	The Pier @ Robertson	Award	Residential Buildings - \$1200/m ² & above	Sumitomo Mitsui Construction Co.,Ltd	City Developments Limited
4	Botanic on Llyod	Award	Residential Buildings - \$1200/m ² & above	Nakano Singapore (Pte) Ltd	CRL Realty Pte Ltd
5	Le Crescendo	Merit	Residential Buildings - \$1200/m ² & above	Woh Hup (Pte) Ltd	Everian Holdings Pte Ltd (a subsidiary of GuocoLand Ltd)
6	The Nexus	Merit	Residential Buildings - \$1200/m ² & above	Tiong Aik Construction Pte Ltd	Orwin Development Ltd
7	Mimosa Terrace (Phase 5)	Merit	Residential Buildings - \$1200/m ² & above	Seah Construction Pte Ltd	Singapore United Estates Pte Ltd (a subsidiary of Bukit Sembawang)
8	deRoyale	Award	Residential Buildings - Below \$1200/m ²	Straits Construction Co.(Pte) Ltd	Hoi Hup Holdings Pte Ltd
9	Punggol East Contract 31	Award	Residential Buildings - Below \$1200/m ²	Poh Lian Construction Pte Ltd	Housing & Development Board
10	Butterworth 33	Award	Small Buildings - \$3 million to \$10 million	Juho Construction Pte Ltd	City Developments Limited
11	Deep Tunnel Sewerage System (DTSS) - Changi Water Reclamation Plant Contract C2B	Award	Civil Engineering Projects	Lum Chang Building Contractors Pte Ltd	Public Utilities Board
12	Design and Construction of Fort Canning Tunnel and Realignment of Stamford Road	Merit	Civil Engineering Projects	Sato Kogyo (S) Pte Ltd	Land Transport Authority

BCA UNIVERSAL DESIGN AWARDS (UDA)

No.	Project	Type of Award	Award Category	Owner/Developer/ Retail Mall Manager	Architect
1	Passenger Terminal Building 3 @ Singapore Changi Airport	Silver	Commercial Building Category	Civil Aviation Authority of Singapore	CPG Consultants Pte Ltd - CPGAirport
2	National Museum of Singapore	Silver	Institutional Building Category	National Heritage Board	CPG Consultants Pte Ltd
3	Mandai Crematorium & Columbarium	Bronze	Institutional Building Category	National Environment Agency	CPG Consultants Pte Ltd
4	Xilinx Asia Pacific Headquarters	Silver	Open Category	Xilinx Asia Pacific Pte Ltd	RSP Architects Planners & Engineers (Pte) Ltd
5	Ang Mo Kio Bus Interchange	Bronze	Open Category	Land Transport Authority	AT3 + ATA Architects
6	Thr Coris	Bronze	Residential Building Category	Housing & Development	BoardSurbana International Consultants Pte Ltd
7	Main Upgrading Programme (Batch 15) @ Ghim Moh Gardens	Bronze	Refurbished Building Category	Housing & Development Board	Surbana International Consultants Pte Ltd
8	IMM Building	Bronze	Refurbished Building Category	Capitaland Retail Ltd	DCA Architects Pte Ltd
9	Plaza Singapura	Bronze	Refurbished Building Category	Capitaland Retail Ltd	-

BCA DESIGN & ENGINEERING SAFETY EXCELLENCE AWARDS (DESEA)

No.	Project	Type of Awards	Award Category	Qualified Person	Builder
1	Changi Airport T2 Upgrading	Award	Building	RSP Architects Planners & Engineers (Pte) Ltd	Takenaka Corporation Lai Huen Poh
2	One Raffles Quay	Merit	Building	Meinhardt (Singapore) Pte Ltd	Obayashi Corporation Dr Shahzad Nasim
3	Central	Merit	Building	KTP Counsultants Pte Ltd	Hexacon Construction Pte Ltd Soh Seng Siong
4	Lasalle College of the Arts	Merit	Building	RSP Architects Planners & Engineers (Pte) Ltd	Takenaka Corporation Lai Huen Poh
5	ITE College East	Merit	Building	RSP Architects Planners & Engineers (Pte) Ltd	Kajima Overseas Asia Pte Ltd Lai Huen Poh
6	Fort Canning Tunnel	Merit	Civil Engineering	TY Lin International Pte Ltd	Sato Kogyo (Singapore) Pte Ltd Tan See Chee
7	Bishan SMRT Depot Underpinning	Merit	Civil Engineering	MWH Consultants (Singapore) Pte Ltd	Zap Piling Pte Ltd Yeoh Kiang Meng

Green Mark Platinum

for Lend Lease's 313@Somerset project



The 313@Somerset project by Lend Lease has been awarded BCA's Green Mark Platinum, the highest green building recognition in Singapore.

In this project, Lend Lease Retail, Bovis Lend Lease and Lend Lease Investment Management are working together to create the most sustainable shopping centre in Asia. In fact, the project boasts many pioneering and innovative initiatives in sustainability:

- Greater than 30% reduction in energy consumption compared to code compliant building through intelligent design and investment in more energy efficient equipment selection.
- Generation of renewable energy for sustainable car park operations.
- Detailed carbon footprint analysis and reduction strategy.
- Retailer sustainability initiatives and commitments.
- Recovery of waste heat for use within the centre.
- Education strategies on sustainability for communities, retailers and customers.

"The 313@Somerset retail project demonstrates Lend Lease's commitment to Sustainable and Responsible Investment," said Mr Ooi Eng Peng, CEO of Lend Lease Investment Management. **"By investing in sustainability, Lend Lease integrates social, safety and environmental factors into the investment process and generate long-term value for our investment partners, the Lend Lease Asian Retail Investment Fund."**

With direct frontage to both Orchard and Somerset Roads, the Somerset retail project showcases eight levels of retail, five above and three below the ground, encompassing over 180 retailers in the prestigious Singapore retail precinct. The project will be completed by the last quarter of 2009.

The BCA Green Mark is part of BCA's initiative to promote environmental sustainability in buildings. The Green Mark Platinum, the highest tier under the scheme, is awarded to the exemplary green project that demonstrates a minimum of 30% savings in energy and water usage, as well as environmentally sustainable building practices and innovative green features.



GREEN MARK CHAMPION AWARD

The BCA Green Mark Champion Award was launched at BCA Awards 2008. This new award recognises developers with strong commitment towards corporate social responsibility and outstanding achievements in environmental sustainability. It is given to developers who achieve a substantial number of Green Mark buildings at Gold level and higher.

There are two categories for the award:

- BCA Green Mark Champion
- BCA Green Mark Platinum Champion

Besides demonstrating strong commitment towards corporate social responsibility and environmental sustainability, developers must meet these criteria to qualify:

Criteria	BCA Green Mark Champion	CDL's achievements	BCA Green Mark Platinum Champion
Total no. of projects rated BCA Green Mark Gold and above Including:	At least 10	(21)	At least 50
• BCA Green Mark Gold ^{Plus}	At least 3	(5)	At least 15
• BCA Green Mark Platinum	At least 3	(5)	At least 15



CDL's Managing Director, Kwek Leng Joo, receiving the award from National Development Minister Mah Bow Tan.

City Developments Limited (CDL) is the sole winner for the BCA Green Mark Champion Award this year, having met all the requirements for the Award.

CDL has adopted a three-pronged approach to being an eco-champion:

- (1) Develop eco-friendly properties
- (2) Manage buildings in a cost-effective and energy-efficient way
- (3) Influence stakeholders to be more environmentally-conscious

CDL's GREEN CORPORATE PHILOSOPHY

The three areas of "Develop, Manage and Influence" encapsulate CDL's life-cycle approach to environmental sustainability.

Beyond incorporating eco-friendly features in its developments, CDL has in place a rigorous environmental management system (EMS) when it comes to environmental, health and safety practices.

CDL was the first developer in Singapore to achieve ISO certification for Property Development and Property Management in 2003 and 2007 respectively. More recently, all corporate management and operations functions at CDL's headquarters have been certified to the international ISO 14001 standard.



(1) DEVELOPING Quality Properties

- Environment, Health and Safety (EHS) Policy
- CDL EHS Excellence Awards
- Environmentally Sustainable Developments



(2) MANAGING Buildings in a Cost-Effective and Energy-Efficient Way

- Environmental Management System



(3) INFLUENCING the Community

- Project Eco-Office
- Let's Live Green! - A CDL Eco-Home Initiative
- Let's Work Green - A CDL Staff Initiative
- National Environment Agency's Corporate and School Partnership Programme
- Green Living Exhibition
- CDL Nature Series Calendar



Parks go Green Mark

BCA and NParks have introduced a new Green Mark for Parks to inspire and promote improvements in parks and create public recognition for such parks in Singapore. Find out how parks can earn this prestigious recognition and which parks in Singapore have made it there already.

The BCA/NParks Green Mark for Parks looks at the sustainability of parks, focusing on resource management, quality and environmental friendliness of parks. A park that achieves a certain level of sustainability is recognised as a Green Mark Park and is also a benchmark for other parks in Singapore.

In designing and operating the programme, both agencies have jointly provided a comprehensive framework for assessing parks' sustainability, performance and environmental friendliness, community involvement and conservation. Parks are awarded the Green Mark for Parks based on waste and material management, water efficiency, energy efficiency, park management, conservation and heritage, as well as other green features.

At present, the programme is in place to assess existing regional parks, conservation and nature parks, public theme parks, playgrounds, neighbourhood parks, and park connectors. Full pilot assessments of three selected diverse regional parks have been successfully conducted with three awards going out to Sungei Buloh Wetland Reserves, Fort Canning Park and Chinese Garden.

The development of sustainability criteria for new parks design is underway.

Singapore's first Green Mark Parks

- Fort Canning Park – Green Mark Gold
- Sungei Buloh Wetland Reserves – Green Mark Gold
- Chinese Garden – Green Mark Certified

Fort Canning Park – Green Mark Gold



Beyond being just an urban green space, Fort Canning Park is committed to creating a greener and cleaner environment. Its efforts range from turning horticultural waste into art pieces, garden ornaments and furniture, to converting Fort Canning Centre into a more energy efficient building.

Recycling is greatly encouraged through awareness messages during events and through all park programmes. Recycling points are made available at Fort Canning Centre. The use of potable water is also reduced with the installation of irrigation tanks. Water collected from rain and run-off is channelled into these tanks for use in the maintenance of plants and cleaning of park facilities.

Conservation of both natural and built heritage is another aspect of green initiatives in the park. There are nine heritage trees in the park, numerous relics and an actual display of an archaeological dig site and monuments that are conserved like the Cupolas, the two Gothic Gates and the Fort Canning Centre.

Finally, the park also engages in community outreach activities. Its Adopt-A-Park programme, tree planting efforts and guided heritage walks are some avenues for the park to spread the message on caring for the environment.

Green Mark gives out *more incentives*

Smaller new developments will now be encouraged to go green, with the enhanced **Green Mark Incentive Scheme**.

Under the enhanced scheme, cash incentives will be disbursed to new developments and retrofitting works with gross floor area of just 2,000 square metres or more that succeed in attaining the BCA Green Mark Gold rating or higher.

The Green Mark Incentive Scheme originally set aside \$20 million in December 2006 to help accelerate the adoption of environmentally-friendly green building technologies and building design practices so as to achieve a sustainable built environment.

The scheme also aims to provide incentives to project architects and M&E engineers whose workloads and responsibilities have gone up substantially for developments with Green Mark Gold or higher rating.

The enhanced scheme is applicable for new Green Mark certifications from 23 May 2008. The amount of cash incentive for developments with BCA Green Mark Gold rating or higher is shown in Table 1 below.

Table 1: Enhanced Green Mark Incentive Scheme

Green Mark Rating ⁽¹⁾	Green Mark Incentive (for developers/building owners)		Green Mark Incentive (for architects and M&E engineers)		Minimum Energy Savings ⁽⁴⁾
	Rate (per 1,000 m ²)	Cap	Rate (per 1,000 m ²)	Cap	
Gold	\$3,000 for new GFA ⁽²⁾ & \$1,200 for existing GFA ⁽³⁾	\$300,000 or 0.2% of construction/retrofitting cost, whichever is lower	\$500 each	\$50,000 each	-
GoldPLUS	\$5,000 for new GFA ⁽²⁾ & \$2,000 for existing GFA ⁽³⁾	\$2,500,000 or 0.33% of construction/retrofitting cost, whichever is lower	\$800 each	\$80,000 each	25%
Platinum	\$6,000 for new GFA ⁽²⁾ & \$2,400 for existing GFA ⁽³⁾	\$3,000,000 or 0.4% of construction/retrofitting cost, whichever is lower	\$1,000 each	\$100,000 each	30%

Note:

1. The prevailing version of the BCA Green Mark Criteria for New Buildings will apply. Please see BCA website for details.
2. These rates apply to new buildings and the new GFA added to existing buildings.
3. These rates apply to upgrading works for existing GFA.
4. The minimum energy savings requirements are only applicable for air-conditioned buildings (exclude residential buildings). The energy saving must be demonstrated by energy modeling and validated on completion.

The cash incentive will be disbursed in two stages: 50% upon successful certification to the required Green Mark standards during design or construction stage; and the remaining 50% after validation, to be undertaken one year after TOP.

Full details of the enhanced Green Mark Incentive Scheme can be found at www.bca.gov.sg. For more information, please contact Mr Wong Ngian Chung at 6325-5007/ email: wong_ngian_chung@bca.gov.sg or Ms Grace Cheok at 6325-7588/ email: grace_cheok-chan@bca.gov.sg.

BCA Gallery officially opens

On 25 April 2008, the new BCA Gallery, the first showcase of the development of Singapore's built environment, was officially opened by Senior Minister of State for National Development and Education, Ms Grace Fu. The four key pillars of an excellent built environment – safety, quality, sustainability and friendly – are highlighted collectively in the multi-sensory treat of interactive exhibits, model showcases and pull-out panels.



Zone 1- Dimensions of Growth

This zone showcases the development of the built environment from the post-war period to the present and how it has impacted society, economy and the use of technology.

Zone 2- Building for Safety and Excellence

Zone 2 displays the bolts and nuts of the construction process from start to finish.

Zone 3- Towards Our Vision

In Zone 3, the focus is on looking ahead, where there will be an integration of ideas and innovations for the built environment of the future.

For example, a simulated floor allows first-hand experiences of the difficulties facing a wheelchair user as he or she manoeuvres the wheelchair on different types of floorings. Another example is the use of the laser beam method to check the verticality of buildings. The use of the laser leveller provides a more accurate and reliable alternative to traditional manual tools. At the touch of a button, visitors will be able to get a better feel of how technology plays a big role in ensuring quality construction where precision is of utmost importance. Other highlights in zone 3 include the Zero Energy Building Model and the Solar Panel displays.

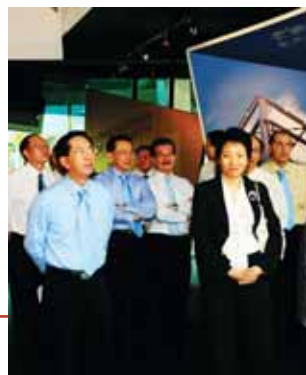


Sensory Garden

The Sensory Garden serves many functions, including teaching, socialising, healing and horticultural therapy, with special attention to elderly, children and individuals with disabilities. It is built with the objective of incorporating these functions using Universal Design Concept as the guiding principal. This is in line with one of BCA's key objectives in shaping a friendly built environment that meets the diverse needs of all users.

The design and layout of the Sensory Garden promotes Universal Design by providing a simulating journey to heighten visitors' awareness through the five senses, namely sight, smell, sound, touch and taste. There are benches around the pathway for resting, to listen to the sounds and take in the sights. There are also tactile pathways and information panels in Braille to cater to the specific needs of the visually impaired.

The launch of the Gallery and the Sensory Garden is an important part of BCA's effort in raising the profile of the industry and to educate the public and our young on the importance of the building and construction industry in shaping our built environment. For more details on the BCA Gallery, please visit http://www.bca.gov.sg/bca_gallery.html



How they do it in CHINA

What better way to learn about recent industry developments in China than to organise a delegation visit? On 21 April, BCA led an industry delegation for a four-day visit to China. The delegation comprised 18 developers, architects, structural engineers, builders and officers from public agencies including the Ministry of Education and the Land Transport Authority. Led by BCA's Director of Technology Development Division Mr Tan Tian Chong, the delegation gained insights into structural steel design, fabrication and applications in the country.

During their time there, the delegation visited steel fabrication plants, a tertiary institution, a residential building and two commercial projects constructed using structural steel. These are located in Shanghai, Shijiazhuang and Beijing. Here are some highlights of the visit.



The eight-storey Department of Building Engineering in Shanghai Tongji University was an interesting building constructed using exposed steel. It was intended to be used as a teaching aid to showcase steel application in institutional development and enable undergraduates to appreciate steel construction. Explanatory notes were displayed at strategic locations around the building to elaborate on structural details. The visit also included a tour of a seismic laboratory housed in the University where scaled models were tested at the high-performance shaking table to estimate the seismic resistance of actual buildings.

The Kaiyuan Huayuan project in Shijiazhuang was a development comprising both commercial and residential buildings. It offered the delegation insights into how steel can be used not only for commercial project but for residential projects as well. As the delegation learnt, the use of structural steel is gradually gaining acceptance in the construction of mid to high-end residential developments in China. This is because steel is a highly recyclable building material and is perceived to have better seismic resistance. According to the developer, construction cost for such steel construction was comparable to conventional concrete construction due to savings in foundation, shorter construction time and better productivity.

Apart from residential projects, the group also visited two commercial steel developments – the 101-storey Shanghai World Financial Center in Shanghai and the CCTV Building in Beijing. Apart from learning from the respective builders on overcoming construction challenges in these two highly regarded structures, the delegation was also treated to magnificent views from the top of these buildings.



Seminar and Exhibition on Innovative Systems and Technology in Construction

At the seminar on “Innovative Systems and Technology in Construction”, held on 30 April 2008, CEO of BCA, Dr John Keung announced that in 2007, there was a threefold jump in the number of applications for the Investment Allowance Scheme (IAS), since 2004.



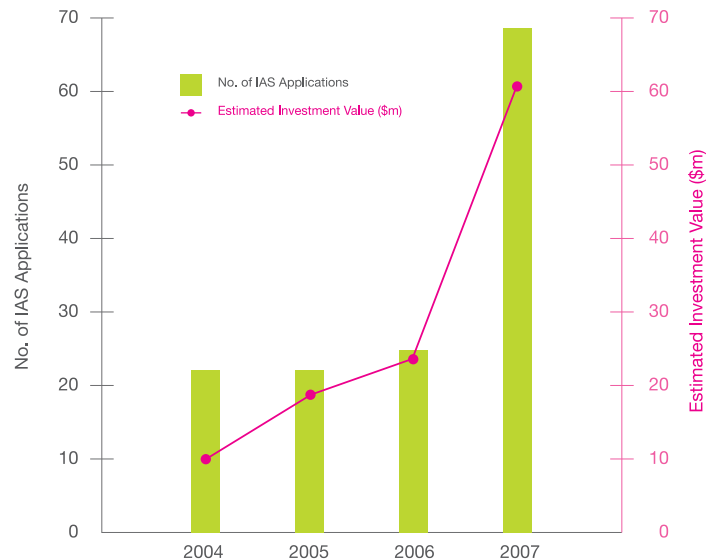
IAS is one of several financial assistance programmes that the government has set up to help the construction industry stay competitive and ready for new challenges and opportunities.

It encourages capital investment in technologically advanced construction equipment. Firms investing in modern technologies to upgrade their capability and increase productivity and quality would be able to enjoy a tax rebate of up to 50% of the approved fixed capital expenditure. Equipment which result in at least 20% improvement to the project or work trade in terms of higher level of quality, productivity, safety or better environment, will be supported at 50% of the investment cost.

To date, IAS has supported technologies such as:

- lifting and handling equipment
- special formwork systems
- steel cutting machines
- 3D modeling software
- recycling equipment
- concreting and demolition equipment

In conjunction with the seminar, an exhibition was also held to showcase some of the latest innovative technologies and systems that were successfully implemented in construction projects. Exhibits included industrialised formwork systems, construction equipment, prefabricated drywalls systems and digital technologies.



crushed

ROCK SAND ALTERNATIVE

Crushed rock sand is generated from aggregate crushing and is an alternative to natural sand. Can it replace natural sand completely in the production of concrete?

Recent surveys have shown that crushed rock sand in the form of granite dust is often used as fine aggregate in concrete by controlled blending with natural sand.

The blended sand now being used comprises as much as 60% crushed rock sand and 40% natural sand. While it is feasible to use 100% crushed rock sand as fine aggregates for concrete, the total replacement of natural sand with crushed rock sand has yet to gain widespread acceptance in the local construction industry.



Natural Sand



Crushed Rock Sand

However, with the rapid growth of construction development in the region, natural sand may not be readily or widely available. Hence, a committee comprising representatives from BCA, the Housing & Development Board, local universities and a ready-mixed concrete supplier was formed to assess the suitability of crushed rock sand as a total replacement of natural sand in the production of concrete.

Results from studies and test trials conducted by this committee have shown that crushed rock sand is a good alternative to natural sand. With some adjustment to the concrete mix and appropriate use of ad-mixtures, it is still feasible to produce concrete that meets the required strength and workability requirements. The use of crushed rock sand for production of concrete is also permitted in the Singapore Standard SS 31 Specification for Aggregates from Natural Sources for Concrete.



Slump test conducted during trial mix

The Shelter Keepers



A little known, but dedicated, crack team of professionals from BCA and its partner agencies have been looking after the operational health of the MRT civil defence shelters' infrastructure and equipment.

In the early hours of some mornings, a team from BCA Transit Shelter Engineering Department joins its counterparts from the Singapore Civil Defence Force and the two MRT operators. They will inspect and witness the functioning of civil defence equipment at MRT station shelters.

The testing of most civil defence equipment has to be done during the early hour shift before the stations are packed with commuters during operating hours. Besides, the time allowed for such inspections is only between two to three hours as the stations need to be checked and prepared for the next day's operations.

It is indeed a critical task. On several occasions, defective equipment or system malfunctions became apparent only after visual checks and operating the equipment such as blast doors, generators, fans and condensate pumps. The MRT shelter is the largest in the entire spectrum of civil defence shelters, which also cover small shelters within HDB flats and private residential developments and medium-sized communal shelters at some HDB void decks, schools and community centres.

In 1987 when the first MRT trains started operations, there were just nine MRT stations with built-in Civil Defence sheltering capabilities. Now, 21 years on, the civil defence equipment such as the sliding blast doors at station entrances and tunnels that shield people from outside explosions still continue to function well. This is due, in no small part, to the annual maintenance framework established among BCA and its partner agencies to ensure that the civil defence systems and equipment are kept operationally ready throughout the year.

At each inspection, a standard checklist is used to assess the operational health of the shelter infrastructure and equipment. Any shortcomings detected from the inspections would be forwarded to the MRT operator for remedial action. This process ensures that the shelters are kept at a high standard of maintenance and performance to address emergency situations.

When any civil defence equipment has exceeded its economic life span, it has to be overhauled or replaced. Before any overhauling or major replacement works commence, BCA's officers advise on the need and extent of these works. Once the overhaul or replacement has been completed, the civil defence system or equipment is subject to further trial runs and tests to ensure functionality and reliability.

Best Practices for Building Owners

BCA encourages building owners and facility managers to adopt similar measures used in maintaining MRT civil defence shelters.

- Maintain and upkeep your building equipment and services through regular servicing and maintenance.
- Keep in mind that reducing the level of maintenance may save money now but will result in severe consequences in future, for example in situations of failure of essential or life-saving equipment.
- Consult suppliers and technical specialists on developing a comprehensive equipment maintenance strategy that includes equipment performance monitoring for safety, reliability and energy efficiency.
- Incorporate green building technologies, such as the recovery of air-conditioning condensate water for use in cooling towers as done in all MRT shelters.

upcoming events

Date	Event	Contact
28, 29 & 30 July'08	Essential Knowledge in Local Regulations and Construction Practices	Marketing Dept DID: 62489843/824 Email: bca_academy@bca.gov.sg
4 & 5 Aug'08	Practical Design and Construction of Steel-Concrete Composite Structures	Marketing Dept DID: 62489843/824 Email: bca_academy@bca.gov.sg
4 & 5 Aug'08	Indoor Air Quality Solutions for Sustainable Buildings (The Green Mark Professional - Elective Module)	Marketing Dept DID: 62489843/824 Email: bca_academy@bca.gov.sg
4 - 18 Aug'08	The "Friendly Built Environment" Roving Exhibition Series <i>HDB Branch Office @ Sengkang Blk 118 Sengkang Drive, #02-01 (540118)</i>	Joan Mok DID: 63258651 Email: joan_mok@bca.gov.sg
12 & 13 Aug'08 or 19 & 20 Aug'08	Green Architecture and the Integrated Design Process (The Green Mark Professional - Elective Module)	Marketing Dept DID: 62489843/824 Email: bca_academy@bca.gov.sg
14 & 15 Aug'08	Efficient Building Envelope Design, ETTV & RETV (The Green Mark Professional - Core Module)	Marketing Dept DID: 62489843/824 Email: bca_academy@bca.gov.sg
15 & 18 Aug'08	Sustainable Facility Management Solutions	Marketing Dept DID: 62489843/824 Email: bca_academy@bca.gov.sg
18, 20, 25 & 27 Aug'08	Design of Deep Excavation Temporary Earth Retaining Structures	Marketing Dept DID: 62489843/824 Email: bca_academy@bca.gov.sg
18 Aug - 5 Sep'08	The "Friendly Built Environment" Roving Exhibition Series <i>Jurong Town Council main office Blk 255 Jurong East Street 24, #01-303, Singapore 600255</i>	Joan Mok DID: 63258651 Email: joan_mok@bca.gov.sg
21 Aug'08	BCA-REDAS Quality Seminar	Wong Chee Hong DID: 63255006 Email: wong_chee_hong@bca.gov.sg

Contest

- 1. What is City Developments Limited's three-pronged approach to being an eco-champion?**
- 2. How many award winners were honoured at the BCA Awards 2008?**
- 3. Name any 2 technologies that the Investment Allowance Scheme has supported to date.**

Send in your answers by 7 August 2008 to Editor Pillars, Building and Construction Authority, 5 Maxwell Road, #16-00, Tower Block MND Complex, Singapore 069110. Or e-mail: bca_enquiry@bca.gov.sg or fax to 63254800. Please indicate your name, designation, company, phone number and address. Selected entries will stand to win attractive shopping vouchers.

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