



**BCA** AWARDS  
2013

Recognising Excellence in the Built Environment

Building and Construction  Authority

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



### **Welcome to the BCA Awards 2013**

The BCA Awards is an annual event to honour and pay tribute to displays of excellence in the built environment in the areas of safety, quality, sustainability and user-friendliness. For this year, the industry received a total of 293 awards:

#### **Award categories**

- 1 Green Mark Champion Award
- 177 Green Mark Awards
- 8 Green Building Individual Awards
- 26 Universal Design Mark Awards
- 31 Construction Excellence Awards
- 6 Quality Excellence Awards
- 7 Design and Engineering Safety Excellence Awards
- 22 Green and Gracious Builder Awards
- 14 Construction Productivity Awards
- 1 Built Environment Leadership Award

**\*Details of the awards are in the accompanying CD.**

BCA congratulates all the winners, for their unwavering commitment to excellence and dedication in driving the built environment sector to greater heights.

# Contents

<b>BCA GREEN MARK CHAMPION AWARD</b>	17
JTC Corporation	18
<b>BCA GREEN MARK AWARD FOR BUILDINGS</b>	19
CET East Campus	21
Changi DCS Plant Expansion	22
Crest Secondary School	23
Devan Nair Institute for Employment and Employability	24
DUO Tower and DUO Galleria, Mixed-Use Development at Ophir-Rochor, Singapore (Commercial)	25
FairPrice Hub	26
Four Acres Singapore	27
Holiday Inn Express Singapore Clarke Quay	28
ITE Headquarters and ITE College Central @ Ang Mo Kio	29
M Social Hotel	30
Marina One East Tower, Marina One West Tower	31
Mediacorp Complex at Mediapolis @ One-North	32
National University of Singapore - Ventus (University Campus Infrastructure)	33
New Primary School at Prince Charles Crescent	34
Nexus @ one-north	35
Ng Teng Fong General Hospital and Jurong Community Hospital	36
Ngee Ann Polytechnic Block 51	37
Ngee Ann Polytechnic Block 58	38
NUH Medical Centre	39
Primary School at Bukit Panjang Site 16	40

## BCA GREEN MARK AWARD FOR BUILDINGS

Singapore Institute of Technology @ NP Building	41
Singapore Institute of Technology @ TP Building	42
South Spine Learning Hub	43
Spectra Secondary School	44
Tanjong Pagar Centre	45
Westgate & Westgate Tower	46
Yale-NUS College	47
AXA Tower	48
Capital Tower	49
Furama City Centre and Furama Singapore Hotel & Shopping Centre	50
Health Promotion Board	51
JTC Summit	52
National University of Singapore - Yong Loo Lin School of Medicine, MD4/ MD4A	53
National University of Singapore - Yong Loo Lin School of Medicine, MD9	54
Robert Bosch SEA HQ	55
Standard Chartered @ Changi	56
Swissôtel Merchant Court, Singapore	57
Echelon	58
Eco Sanctuary	59
Marina One Residences	60
Nanyang Technological University Residential Halls 17 and 18 along Nanyang Crescent	61
16B Leedon Park	62
3 Leedon Park	63
3A Leedon Park	64

## BCA GREEN MARK AWARD FOR BUILDINGS

ACE The Place - Our Community Club @ Admiralty	65
Capitol Development (Retail/ Hotel/ Theatre)	66
DNV Technology Centre	67
DSM Dyneema APAC Technical Center	68
DSO National Laboratories	69
DUO, Mixed-Use Development at Ophir-Rochor, Singapore (Hotel)	70
MDIS Block A	71
Paya Lebar Square Mall	72
School of Science and Technology, Singapore	73
The Academia	74
V Hotel	75
Biopolis Phase 1	76
Fusionopolis Phase 1	77
Novotel Singapore Clarke Quay	78
Singapore Pools Building	79
UOB Plaza 1	80
Victoria Theatre and Victoria Concert Hall	81
Jewel @ Buangkok	82
Capitol Development (Residential)	83
Corals at Keppel Bay	84
D'Nest	85
DUO Residences, Mixed-Use Development at Ophir- Rochor, Singapore (Residential)	86
Golden Peony	87
Marine Parade Condominium Development	88

## BCA GREEN MARK AWARD FOR BUILDINGS

Mixed Development at 15 Cairnhill Road (Residential)	89
Punggol Topaz (Punggol West C28)	90
Skies Miltonia	91
Twenty One Richards	92
Waterbay	93
Waterway Banks	94
Waterway Woodcress	95
Woodlands Peak	96
Green House @ Astrid Hill	97
Greenville @ King Albert Park	98
978 & 988 Toa Payoh North	99
Administration Building	99
Greenhub	99
Halliburton Completion Tools Manufacturing Plant	99
JABIL @ TAMPINES	99
Mahabodhi Monastery	99
Marina Bay Fire Station & Neighbourhood Police Centre	99
New 2-storey changing room facilities at Changi Prison Complex (Cluster A)	99
New International Headquarters Building for BreadTalk Group	99
OneKM	99
Pratt & Whitney SCR	99
SingHealth Polyclinics - Geylang	99
Tanglin Trust School (New Senior School Annex)	99
15 Changi Business Park Central 1	99

## BCA GREEN MARK AWARD FOR BUILDINGS

55 Market Street	100
71 Robinson Road	100
8 on Claymore	100
Bukit Panjang Plaza	100
Bukit Timah Plaza	100
Century Square	100
China Square Central	100
Earth Arts Building	100
HarbourFront Tower One and Two	100
MediaCorp (MSCP)	100
Naumi Hotel	100
Office @ Scotts Road	100
One Raffles Quay	100
Royal Plaza on Scotts	100
Sembawang Shopping Centre	100
Singapore American School	101
Valley Point	101
VivoCity	101
Bartley Residences	101
Eight Courtyards	101
Floral Spring @ Yishun	101
Golden Carnation	101
Hedges Park	101
One Balmoral	101

<b>BCA GREEN MARK AWARD FOR BUILDINGS</b>	
Punggol Parcvista	101
Segar Meadows	101
<hr/>	
The Luxurie	101
Watercolours	101
<hr/>	
Temasek Junior College	101
Modern Eco Home @ Chatsworth Park	101
<hr/>	
Charlton 27	101
30 Toh Guan Road (Annexed New Warehouse)	102
<hr/>	
Cookhouse at Gurkha Contingent	102
Duke-NUS Graduate Medical School Singapore	102
<hr/>	
North Academic Complex (North Spine Building, Block N1, N1.1, N2, N2.1, N3, N4, Admin Building, AWS1, MW2, MW3) Nanyang Technological University	102
<hr/>	
Singapore Prison Service Transit Centre	102
Tung Centre	102
<b>BCA GREEN MARK AWARD FOR BEYOND BUILDINGS</b>	103
<b>BCA GREEN MARK AWARD FOR DISTRICTS</b>	104
CleanTech Park	105
<b>BCA-NPARKS GREEN MARK AWARD FOR NEW PARKS</b>	106
Firefly Park @ Clementi	107
<b>BCA GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES</b>	108

<b>BCA-IDA GREEN MARK AWARD FOR DATA CENTRES</b>	109
Credit Suisse Asia Pacific Regional Data Centre	110
Equinix SG2 Data Centre	111
<hr/>	
Abbott Laboratories - GIS Asia Pacific Regional Facility	112
Singapore Tourism Board Data Centre	113
<hr/>	
<b>BCA GREEN MARK AWARD FOR OFFICE INTERIOR</b>	114
American Express International Inc	115
BHP Billiton Marketing Asia Pte Ltd	116
<hr/>	
Australia and New Zealand Banking Group Limited	117
BP Singapore Pte Ltd	118
<hr/>	
City Developments Limited	119
Facility Link Private Limited	120
<hr/>	
McGraw-Hill Financial	121
NetApp Singapore Pte Ltd	122
<hr/>	
Novartis Asia Pacific Pharmaceuticals Pte Ltd	123
Aegis Media Asia Pacific	124
<hr/>	
AkzoNobel	124
Ashurst LLP	124
<hr/>	
Clifford Chance Pte Ltd	124
DBS Bank Ltd	124
<hr/>	
Kajima Overseas Asia Pte Ltd Development Division	124
Raffles Quay Asset Management Pte Ltd	124
<hr/>	
Ricoh (Singapore) Pte Ltd	124
United Technologies International Operations, Inc	124

**BCA GREEN MARK AWARD FOR OFFICE INTERIOR**

Visa Worldwide Pte Ltd (Level 7 and 10, Singapore Post Centre) 124

BNP Paribas Singapore Branch 125

---

BNP Paribas Wealth Management 125

Kyoob-ID Pte Ltd 125

---

One Marina Property Services Pte Ltd 125

Raymond Construction Pte Ltd 125

**BCA GREEN MARK AWARD FOR RETAIL**

126

J's Hair Studio 127

Euraugo (Formerly named as 'Dressaday') 128

---

Royal Silver 129

**BCA GREEN MARK AWARD FOR SUPERMARKETS**

130

FairPrice Finest Supermarket at Zhong Shan Park 131

FairPrice Finest Supermarket at myVillage at Serangoon Garden 132

---

Giant Hyper at Suntec City Mall 133

FairPrice Supermarket at Ang Mo Kio 712 134

---

Cold Storage - Jelita 135

**BCA GREEN MARK AWARD OVERSEAS**

136

Sinarmasland Plaza, Indonesia 137

QI Tower, Malaysia 138

---

28 Mont'Kiara, Malaysia 139

Hill Crest Residence, China 140

## **BCA GREEN MARK AWARD OVERSEAS**

Ken Rimba Legian, Malaysia 141

The Estella, Vietnam 142

---

Riviera Cove Villa Development Project, Vietnam 143

Kami Builders Sdn Bhd, Malaysia (Located at Level 3A 7-15, QI Tower) 144

---

Wisma Panasonic 145

Riverside Ville 145

## **BCA-SGBC GREEN BUILDING INDIVIDUAL AWARDS 2013** 146

Green Engineer of the Year Award 147

Green Advocate of the Year Award 148

---

Young Green Building Individual Awards 149

Commendation Awards 151

## **BCA UNIVERSAL DESIGN MARK AWARDS** 155

Reflections at Keppel Bay 156

United World College of South East Asia (East Campus) 157

---

Changi Airport Terminal 1 158

JCube 159

---

Mapletree Business City 160

Pasir Ris Sports & Recreation Centre 161

---

My Waterway@Punggol 162

Casa Clementi 163

---

Helios Residences 164

Livia 165

# BCA GREEN MARK CHAMPION AWARD

## The Award

The BCA Green Mark Champion Award was launched at BCA Awards 2008. This 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:

## Key Assessment Criteria

Total no. of buildings rated	BCA Green Mark Champion	BCA Green Mark Platinum Champion
Green Mark Gold & above	At least 10	At least 50
Green Mark Gold <sup>Plus</sup> & above	At least 6	At least 30
Green Mark Platinum	At least 3	At least 15



## JTC Corporation

### Sustainability at the Heart of JTC's Development Projects

As Singapore's leading industrial infrastructure specialist and a socially responsible corporate citizen, JTC Corporation (JTC) creates value for customers by developing sustainable and future-ready industrial infrastructure solutions that will differentiate Singapore as an investment location. Landmark projects by JTC customised for industry clusters include CleanTech Park, Jurong Island, Seletar Aerospace Park, water fabrication parks, Tuas Biomedical Parks, and Biopolis, Fusionopolis and Mediapolis at one-north. Other key projects in JTC's portfolio include Tukang Innovation Park, MedTech Park, business parks, as well as logistics hubs. Today, these industrial estates and business parks are home to a host of renowned global companies and promising local enterprises.

Sustainability is a key driver of JTC's innovative culture, and is recognised as the way forward for industrial developments. Green building strategies and eco-friendly features are actively being incorporated in JTC's developments, and innovative technologies and initiatives are being test-bedded by JTC to optimise resources. JTC also strives to explore creative space solutions to increase land productivity in land-scarce Singapore with groundbreaking projects such as the Jurong Rock Caverns, Southeast Asia's first subterranean storage facility for liquid hydrocarbons.

### KEY ACHIEVEMENTS

- 10 projects awarded with BCA Green Mark (including 6 Platinum and 3 Gold<sup>Plus</sup> awards. One of the Platinum awards is given to CleanTech Park for its green district design).



CleanTech One at CleanTech Park

The JTC Summit

Biopolis Phase 1 at one-north

Fusionopolis Phase 1 at one-north

BCA

# GREEN MARK

## ADVISORY COMMITTEE

### Chairman

**Mr Lee Chuan Seng**  
Emeritus Chairman  
BECA CARTER HOLLINGS  
& FERNER (S.E. ASIA) PTE LTD

### Deputy Chairmen

**Mr Kevin Wong**  
Group CEO  
KEPPEL LAND LIMITED

**Mr Richard Hassell**  
Co-founding Director  
WOHA ARCHITECTS PTE LTD

**Mr Lam Siew Wah**  
Deputy CEO (Industry Development)  
BUILDING AND CONSTRUCTION  
AUTHORITY

### Members

**Mr Alan Tan Hock Seng**  
HOUSING & DEVELOPMENT BOARD

**Mr Allen Ang**  
CITY DEVELOPMENTS LIMITED

**Mr Cheong Yew Kee**  
2B ARCHITECTS

**A/Prof Lee Siew Eang**  
NATIONAL UNIVERSITY OF SINGAPORE

**Dr. Nirmal Kishnani**  
NATIONAL UNIVERSITY OF SINGAPORE

**A/Prof Raymond Wong**  
NANYANG TECHNOLOGICAL  
UNIVERSITY

**Mr Russell Cole**  
ARUP SINGAPORE PTE LTD

**Mr Tay Leng Chua**  
UNITED PREMAS LIMITED

**Mr Vincent Han**  
VINCENT HAN & ASSOCIATES

**Mr Vincent Low**  
G-ENERGY GLOBAL PTE LTD

**Mr Vincent Tong**  
AECOM SINGAPORE PTE LTD

**Mr Wong Hooe Wai**  
THE ASCOTT LIMITED

**Mr Ram Bhaskar**  
NATIONAL ENVIRONMENT AGENCY

**Mr Chin Chi Leong**  
BUILDING AND CONSTRUCTION  
AUTHORITY

**Mr Tan Tian Chong**  
BUILDING AND CONSTRUCTION  
AUTHORITY

# BCA GREEN MARK AWARD FOR BUILDINGS

## The Award

The BCA Green Mark scheme was launched in 2005 as a key strategic programme to raise the awareness of sustainable and environmentally friendly buildings. It evaluates buildings for their environmental impact and performance. The benefits of Green Mark buildings include cost savings resulting from efficient use of key resources such as energy and water, leading to lower operational and maintenance costs. Other less tangible benefits include enhanced occupant productivity and health due to good indoor environmental quality.

### **Buildings are assessed under the following criteria:**

- Energy Efficiency
- Water Efficiency
- Environmental Protection
- Indoor Environmental Quality
- Other Green Features

Under the assessment system, points are awarded for incorporating environmentally friendly and sustainable features which are better than normal practice. The total number of points obtained translates to the respective award ratings of Certified, Gold, GoldPlus, and Platinum in ascending order of merit.

### **The BCA Green Mark Award for Buildings covers the following categories this year:**

- BCA Green Mark Award for Non-Residential Buildings (New and Existing)
- BCA Green Mark Award for Residential Buildings (New and Existing)
- BCA Green Mark Award for Existing Schools
- BCA Green Mark Award for Landed Houses

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## CET East Campus

New Non-Residential Buildings



**Client / Developer**  
Singapore Workforce  
Development Agency

**Project Manager**  
Singapore Workforce  
Development Agency

**Architect**  
SAA Architects Pte Ltd

**M&E Engineer**  
Beca Carter Hollings &  
Ferner (S.E.Asia) Pte Ltd

**Structural Engineer**  
Beca Carter Hollings &  
Ferner(S.E. Asia) Pte Ltd

**Quantity Surveyor**  
Rider Levett Bucknall LLP

**ESD Consultant**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Landscape Consultant**  
Mace Studio Pte Ltd

### Key Features

- Estimated energy savings: 2,513,950 kWh/yr;  
estimated water savings: 5,806 m<sup>3</sup>/yr;  
ETTV: 38.9 W/m<sup>2</sup>.
- Efficient facade design with double glazed  
low-e glass.
- Low flow, high delta-T chilled water plant system.
- Displacement ventilation system for lecture theatre.
- Provision of ductless jet fan system.
- Majority of water fittings rated WELS 'Excellent'.
- Non-chemical termite baiting system.
- Automatic condenser tube cleaning system for  
chiller plant.

## Changi DCS Plant Expansion

New Non-Residential Buildings



**Client / Developer**  
Keppel DHCS Pte Ltd

**Project Manager  
/ Main Contractor**  
Taikisha (Singapore)  
Pte Ltd

**Architect**  
CK&A Consultancy  
International Pte Ltd

**M&E Engineer**  
Alpha Consulting  
Engineers Pte Ltd

**Structural Engineer**  
JHA Partnership

**Landscape Consultant**  
3fP Landscape Atelier  
Pte Ltd

**Interior Design Consultant**  
DB&B Pte Ltd

**ESD Consultant**  
Kaer Pte Ltd

**BIPV Contractor**  
PV World Pte Ltd

### Key Features

- Estimated energy savings: 762,034 kWh/yr; estimated water savings: 193 m<sup>3</sup>/yr; ETTV: 33.8 W/m<sup>2</sup>.
- Low ETTV value with minimal glass façades.
- High efficiency chiller plant.
- Automatic cleaning system for condenser tube.
- Provision of sun pipes.
- Energy efficient LED lighting in offices.
- Extensive array of solar panels.
- Provision of sky garden.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Crest Secondary School

New Non-Residential Buildings



**Client / Developer**  
Ministry of Education

**Project Manager**  
Parsons Brinckerhoff  
Pte Ltd

**Architect**  
CPG Consultants Pte Ltd

**M&E Engineer**  
AECOM Singapore Pte Ltd

**Structural Engineer**  
Aurecon Singapore  
(Pte) Ltd

**Quantity Surveyor**  
Barton Bruce Shaw Pte Ltd

**Main Contractor**  
Santarli Construction Pte Ltd

**ESD Consultant**  
CPGreen – CPG Consultants  
Pte Ltd

### Key Features

- Estimated energy savings: 377,354 kWh/yr; estimated water savings: 20,604 m<sup>3</sup>/yr; ETTV: 36.0 W/m<sup>2</sup>.
- Air-cooled VRF air-conditioning system with efficiency of 0.74 kW/ton.
- Use of ventilation simulation software to optimise natural ventilation, with common areas and classrooms being naturally ventilated.
- Photo sensors in classrooms and special teaching rooms.
- Motion sensors in toilets.
- Photovoltaic cells on the multi-purpose hall roof.
- Use of green cement and sustainable products.
- Conservation of existing building structure.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Devan Nair Institute for Employment and Employability

New Non-Residential Buildings



**Client / Developer**  
Singapore Workforce  
Development Agency

**Project Manager**  
Singapore Workforce  
Development Agency

**Architect**  
RSP Architects Planners  
and Engineers (Pte) Ltd

**M&E Engineer**  
Squire Mech Pte Ltd

**Structural Engineer**  
RSP Architects Planners  
and Engineers (Pte) Ltd

**Quantity Surveyor**  
Rider Levett Bucknall LLP

**Main Contractor**  
V3 Construction Pte Ltd

**Acoustics Consultant**  
Acvicon Acoustics  
Consultants Pte Ltd

**Landscape Consultant**  
Grant Associates Singapore  
Pte Ltd

**Façade & ESD Consultant**  
Aurecon Singapore (Pte.) Ltd

### Key Features

- Estimated energy savings: 2,215,828 kWh/yr; estimated water savings: 5,256 m<sup>3</sup>/yr; ETTV: 33.9 W/m<sup>2</sup>.
- Passive design features such as low e double glazed glass, vertical window fins and a central open courtyard.
- An estimated 30% of the gross floor area is naturally ventilated.
- Smaller chillers achieving efficiency of 0.65 kW/ton at 25% part load condition.
- Use of WELS water fittings rated 'Excellent' and NEWater for cooling tower make up tank.
- Extensive greenery with a six-storey perforated green wall at North-West façade and green plot ratio of 3.0.
- Extensive use of environmentally friendly sustainable building products.
- Provision of car park lots and charging points for hybrid and electric vehicles.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**DUO Tower and DUO Galleria, Mixed-Use Development at Ophir-Rochor, Singapore (Commercial)**

New Non-Residential Buildings



**Clients / Developers**

M+S Pte Ltd

Ophir-Rochor Commercial Pte Ltd

Ophir-Rochor Hotel Pte Ltd

Ophir-Rochor Residential Pte Ltd

**Project Managers**

CapitaLand Commercial Project Services Pte Ltd

Sunrise MS Pte Ltd

**Architects**

Buro Ole Scheeren Limited

DP Architects Pte Ltd

**M&E Engineer**

Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

**Structural Engineer**

Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

**Quantity Surveyor**

Davis Langdon KPK (Singapore) Pte Ltd

**Landscape Consultant**

COEN Design International Pte Ltd

**ESD Consultant**

Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

**Lighting Consultant**

International Lighting Architecture Bureau Pte Ltd

**Key Features**

- Estimated energy savings: 5,379,108 kWh/yr; estimated water savings: 16,000 m<sup>3</sup>/yr; ETTV: 36.7 W/m<sup>2</sup>.
- Hexagonal façade design with double glazed low-e glass.
- Low flow, high delta-T efficient chilled water plant system.
- Heat pipe to recover energy from toilet exhaust air to PAHU.
- Lush green surroundings with 100% landscape replacement.
- Carpark guidance system.
- Rainwater harvesting system coupled with siphonic rainwater drainage piping for irrigation.
- Automatic condenser tube cleaning system for chiller plant.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## FairPrice Hub

New Non-Residential Buildings



**Client / Developer**

NTUC FairPrice  
Co-operative Ltd

**Architect**

ADDP Architects LLP

**M&E Engineer**

United Project  
Consultants Pte Ltd

**Structural Engineer**

SCE Consultants (Pte.) Ltd

**Quantity Surveyor**

ST Architects & Engineers  
Pte Ltd

**Main Contractor**

Tiong Seng Contractors (Pte)  
Ltd

**Landscape Consultant**

O2X Studio Pte Ltd

**ESD Consultant**

G-Energy Global Pte Ltd

**Façade Consultant**

Tange Associates  
Asia Pte Ltd

### Key Features

- Estimated energy savings: 4,362,098 kWh/yr; estimated water savings: 83,762 m<sup>3</sup>/yr; ETTV: 39.5 W/m<sup>2</sup>.
- Use of low-e double glazed glass façade.
- Efficiency of 0.58 kW/ton for chiller plant with permanent monitoring instrumentation in place.
- Demand-controlled ventilation using carbon dioxide sensors.
- Energy efficient LED lighting system for most of the common areas and carpark.
- Carpark lighting controlled by photocells.
- Photovoltaic cells to generate renewable energy onsite with 200 kWp system efficiency.
- Lifts installed with variable voltage variable frequency motor drive, sleep mode features and motion sensors for escalator.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Four Acres Singapore**  
New Non-Residential Buildings



**Client / Developer**  
HSBC Institutional Trust  
Services (S) Ltd as Trustee  
of Ascendas Real Estate  
Investment Trust

**Project Manager**  
Ascendas Services Pte Ltd

**Architect**  
DP Architects Pte Ltd

**M&E Engineer**  
Gims & Associates Pte Ltd

**Structural Engineer**  
KTP Consultants Pte Ltd

**Quantity Surveyor**  
Rodney Chng & Associates  
Pte Ltd

**Main Contractor**  
Wee Hur Construction  
Pte Ltd

**Landscape Consultant**  
DP Green Pte Ltd

**Acoustics Consultant**  
Acviron Acoustics  
Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 622,512 kWh/yr; estimated water savings: 15,477 m<sup>3</sup>/yr; ETTV: 39.2 W/m<sup>2</sup>.
- Chiller plant efficiency of 0.57 kW/ton at operating condition.
- Permanent M&V for monitoring of chilled water plant efficiency and heat balancing.
- Daylighting for toilets, staircases and corridors.
- Energy efficient LED and T5 lighting.
- Photovoltaic panel with 10kWp system capacity.
- Salvaging of felled trees from site.
- Green gallery as an avenue to educate building users' on the environment.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Holiday Inn Express Singapore Clarke Quay

New Non-Residential Buildings



**Client / Developer**  
RB Capital Hotels Pte Ltd

**Architect**  
RSP Architects Planners &  
Engineers (Pte) Ltd

**M&E Engineer**  
Squire Mech Pte Ltd

**Structural Engineer**  
RSP Architects Planners &  
Engineers (Pte) Ltd

**Quantity Surveyor**  
Rider Levett Bucknall LLP

**Main Contractor**  
Santarli Construction Pte Ltd

**Landscape Consultant**  
Ong & Ong Pte Ltd

**Interior Design Consultant**  
Wilson Associates LLC

**Lighting Consultant**  
Project Lighting Design

**Façade Consultant**  
BFG-HCCH Consulting Pte  
Ltd

**ESD Consultant**  
Building System and  
Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 2,140,927 kWh/yr; estimated water savings: 11,900 m<sup>3</sup>/yr; ETTV: 32.2 W/m<sup>2</sup>.
- Tilting façade design.
- Naturally ventilated guest corridors with natural daylighting.
- Naturally ventilated carpark.
- High efficiency chilled water plant.
- Provision of heat recovery system.
- Provision of heat pump.
- Energy efficient LED light fittings.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**ITE Headquarters  
and ITE College Central  
@ Ang Mo Kio**  
New Non-Residential Buildings



**Client / Developer**  
Institute of Technical  
Education

**Architect**  
RSP Architects Planners &  
Engineers (Pte) Ltd

**M&E Engineer**  
Squire Mech Pte Ltd

**Structural Engineer**  
RSP Architects Planners &  
Engineers (Pte) Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**  
Kajima Overseas Asia Pte Ltd

**Landscape Consultant**  
Grant Associates Singapore  
Pte Ltd

**Lighting Consultant**  
Lighting Planners Associates  
(S) Pte Ltd

**Acoustic Consultant**  
Acvicon Acoustics  
Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 3,989,431 kWh/yr; estimated water savings: 102,085 m<sup>3</sup>/yr; ETTV: 39.7 W/m<sup>2</sup>.
- Use of passive design strategies to minimise solar heat gain to building and to facilitate cross ventilation and thermal comfort in naturally ventilated spaces.
- Provision of photovoltaic panels with system capacity of 200 kWp.
- Provision of rainwater harvesting system to minimise potable water use for irrigation.
- Extensive provision of green roof and vertical greenery on the west facing facades.
- Provision of environmental canopy and daylight reflectors to maximise daylighting usage.
- Real time energy display board to inculcate better environmental awareness of the energy consumption levels and patterns among users.
- Eco tours for educational purposes.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## M Social Hotel

New Non-Residential Buildings



**Client / Developer**

City Developments Limited

**Architect**

Axis Architects Planners  
Pte Ltd

**M&E Engineer**

Parson Brinckerhoff Pte Ltd

**Structural Engineer**

LSW Consulting Engineers  
Pte Ltd

**Quantity Surveyor**

Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**

Sumitomo Mitsui  
Construction Co., Ltd.

**Landscape Consultant**

Tinderbox Landscape Studio  
Pte Ltd

**Lighting Consultant**

Light Cibles Pte Ltd

**ESD Consultant**

Arup Singapore Pte Ltd

### Key Features

- Estimated energy savings: 1,281,222 kWh/yr; estimated water savings: 22,558 m<sup>3</sup>/yr; ETTV: 37.2 W/m<sup>2</sup>.
- High performance double glazed facade to reduce building cooling load.
- Extensive vertical louvers to shade building façade.
- Extensive use of LED lighting to conserve energy with 40% savings over code baseline.
- Regenerative drive lifts with sleep mode features.
- Gravity fed irrigation tank to reduce water and energy consumption.
- Use of construction materials which are SGLS certified or have more than 30% of recycled content.
- Electrical vehicle charging units and bicycle parking lots to promote green transport usage.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Marina One East Tower, Marina One West Tower

New Non-Residential Buildings



### Client / Developer

M+S Pte Ltd  
(MS Commercial Pte Ltd)

### Project Manager

Mapletree Project  
Management Pte Ltd  
Sunrise MS Pte Ltd

### Architect

Ingenhoven Architects  
Architects 61 Pte Ltd

### M&E Engineer

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

### Structural Engineer

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

### Quantity Surveyor

Langdon & Seah Singapore  
Pte Ltd

### Landscape Consultants

Gustafson Porter  
Bowman Ltd

ICN Design International  
Pte Ltd

### ESD Consultant

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

### Key Features

- Estimated energy savings: 12,965,159 kWh/yr; estimated water savings: 186,075 m<sup>3</sup>/yr; ETTV: 38.1 W/m<sup>2</sup>.
- Horizontal expanded mesh shading elements and high performance glazing reduce direct solar radiation into building.
- Heat pipe for all PAHUs.
- NEWater for toilet flushing.
- Rainwater harvesting system.
- Lush greenery which will serve as a Biodiversity Garden.
- Good access to public transport and provision of electric car charging stations.
- Pneumatic chute system.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Mediacorp Complex at  
Mediapolis @ One-North**

New Non-Residential Buildings



**Client / Developer**  
MediaCorp Pte Ltd

**Project Manager**  
Jurong Consultants Pte Ltd

**Architects**  
DP Architects Pte Ltd

Maki and Associates

**M&E Engineer**  
Parsons Brinckerhoff Pte Ltd

**Structural Engineer**  
Web Structures Pte Ltd

**Quantity Surveyor**  
Rider Levett Bucknall LLP

**Main Contractor**  
Kajima + Tiong Seng JV

**Façade Consultant**  
HCCH Consulting Pte Ltd

**Theatre and Acoustic Consultant**  
Arup Singapore Pte Ltd

**Lighting Consultant**  
Lighting Planners Associates (S) Pte Ltd

**ESD Consultant**  
AECOM Singapore Pte Ltda

**Key Features**

- Estimated energy savings: 6,180,712 kWh/yr; estimated water savings: 8,277 m<sup>3</sup>/yr; ETTV: 39.5 W/m<sup>2</sup>.
- Use of low-e glazed glass.
- Use of low temperature air supply system for AHUs.
- Use of task lights and energy efficient light fittings for offices.
- Photocells coupled with dimming controls for office perimeter lighting.
- Regenerative drive lifts.
- Provision of UV emitters for all AHUs to improve indoor air quality.
- Carpark guidance system to reduce carbon emissions.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**National University  
of Singapore - Ventus  
(University Campus  
Infrastructure)**

New Non-Residential Buildings



**Client / Developer**  
National University of  
Singapore

**Project Manager**  
Office of Estate and  
Development, National  
University of Singapore

**Architect**  
MKPL Architects Pte Ltd

**M&E Engineer**  
J Roger Preston  
(Singapore) Pte Ltd

**Structural Engineer**  
KTP Consultants Pte Ltd

**Quantity Surveyor**  
KPK Quantity Surveyors  
(Singapore) Pte Ltd

**Main Contractor**  
BSI (1990) Pte Ltd

**Landscape Consultant**  
ICN Design International Pte  
Ltd

**Acoustic Consultant**  
Arup Singapore Pte Ltd

**ESD Consultant**  
Arup Singapore Pte Ltd

**Key Features**

- Estimated energy savings: 146,017 kWh/yr; estimated water savings: 2,263 m<sup>3</sup>/yr; ETTV: 38.5 W/m<sup>2</sup>.
- Passive design from first principles.
- Windscoop design.
- Naturally ventilated semi-outdoor space providing comfort and connectivity.
- Self-shading structure.
- 47% of existing trees saved and no Tembusu trees felled for this project.
- Daylighting for corridors and atriums.
- Performance monitoring and display.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## New Primary School at Prince Charles Crescent

New Non-Residential Buildings



**Client / Developer**  
Ministry of Education

**Project Manager**  
Davis Langdon KPK  
(Singapore) Pte Ltd

**Architect**  
ID Architects Pte Ltd

**M&E Engineer**  
AECOM Singapore Pte Ltd

**Structural Engineer**  
DE Consultants S Pte Ltd

**Quantity Surveyor**  
CPG Consultants Pte Ltd

**Main Contractor**  
Kwan Yong Construction Pte  
Ltd

**Landscape Consultant**  
ID Architects Pte Ltd

**ESD Consultant**  
Parsons Brinckerhoff Pte Ltd

### Key Features

- Estimated energy savings: 366,168 kWh/yr; estimated water savings: 5,304 m<sup>3</sup>/yr; ETTV: 29.8 W/m<sup>2</sup>.
- Designed for extensive daylighting provision.
- Motion sensors for toilets and staircases and photosensors for classrooms.
- Photovoltaic panels with system capacity of 50 kWp.
- Over 90% of water fittings rated WELS 'Excellent', reducing water consumption by 26% from baseline.
- Extensive use of environmental friendly and sustainable products in construction.
- Reduction of heat conduction into the building by application of cool paint on facades and provision of green roof.
- Educational information display integrated with features such as renewable energy generation and monitoring display.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Nexus@one-north

New Non-Residential Buildings



**Client / Developer**

HSBC Institutional Trust Services (Singapore) Ltd as Trustee of Ascendas Real Estate Investment Trust

**Development Manager**

Ascendas Funds Management (S) Ltd

**Architect**

ADDP Architects LLP

**M&E Engineer**

J Roger Preston (Singapore) Pte Ltd

**Structural Engineer**

Fong Consult Private Limited

**Quantity Surveyor**

WT Partnership (Singapore) Pte Ltd

**Main Contractor**

Wee Hur Construction Pte Ltd

**Landscape Consultant**

Earthscape Concepts Pte Ltd

**Façade Consultant**

Aurecon Singapore (Pte.) Ltd

**ESD Consultant**

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 2,685,173 kWh/yr; estimated water savings: 115 m<sup>3</sup>/yr; ETTV: 38.6 W/m<sup>2</sup>.
- Window-to-wall ratio of 0.46.
- Chiller plant system with efficiency of 0.59 kW/ton.
- Basement carpark with openings to promote natural ventilation and daylighting.
- Photovoltaic panels with 50kWp system capacity to harness renewable energy.
- All water fittings in the development with WELS 'Excellent' rating.
- 100% auto irrigation of all landscape areas including roof gardens.
- Lush greenery with green plot ratio of 1.9

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Ng Teng Fong General  
Hospital and Jurong  
Community Hospital**  
New Non-Residential Buildings



**Client / Developer**  
Ministry of Health

**Project Manager**  
PM Link Pte Ltd

**Architect**  
CPG Consultants Pte Ltd

**M&E Engineer**  
Parsons Brinckerhoff Pte  
Ltd

**Structural Engineer**  
CPG Consultants Pte Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**  
GS Engineering &  
Construction Corporation

**Landscape Consultant**  
Peridian Asia Pte Ltd

**Façade Consultant**  
HCCH Consulting Pte Ltd

**Acoustic Consultant**  
ZEB Technology Pte Ltd

**ESD Consultant**  
ZEB Technology Pte Ltd

**Design Consultant**  
Studio 505 Pty Ltd

**Hospital Planning  
Consultant**  
HOK International  
(Singapore) Pte Ltd

**Interior Design Consultant**  
Bent Severin & Associates  
Pte Ltd

**Key Features**

- Estimated energy savings: 19,835,944 kWh/yr; estimated water savings: 68,350 m<sup>3</sup>/yr; ETTV: 36.6 W/m<sup>2</sup>.
- Efficient façade design and shading.
- Ward design and layout that enhances natural ventilation for user comfort.
- Careful space planning to harness day lighting for a healthy healing environment, with lush green and glare-free window views.
- Simulation tools for facade optimisation and verification of heat gain, daylighting, glare and acoustics.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Heat recovery for spaces with air-conditioning run for 24 hours.
- Extensive greenery such as landscape sky terraces, rooftop and ground level gardens, thus achieving a green plot ratio of 4.7

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## **Ngee Ann Polytechnic Block 51**

New Non-Residential Buildings



**Client / Developer**  
Ngee Ann Polytechnic

**Architect**  
DP Architects Pte Ltd

**M&E Engineer**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Structural Engineer**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**  
Kwan Yong Construction Pte  
Ltd

**Landscape Consultant**  
Ong & Ong Pte Ltd

### **Key Features**

- Estimated energy savings: 2,809,629 kWh/yr; estimated water savings: 32,559 m<sup>3</sup>/yr; ETTV: 34.5 W/m<sup>2</sup>.
- Water cooled air-conditioning system with system efficiency of 0.61 kW/ton.
- Computational Fluid Dynamics (CFD) simulations carried out to optimise natural ventilation in the development.
- Energy efficient LED and T5 lighting coupled with motion sensors for toilets and staircases.
- Innovative façade design with perforated metal screen and low e glass to reduce solar heat gain.
- Non-chemical water treatment system in cooling tower.
- Non-chemical anti-termite treatment.
- UV light emitters for all AHUs to improve indoor air quality.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## **Ngee Ann Polytechnic Block 58**

New Non-Residential Buildings



**Client / Developer**  
Ngee Ann Polytechnic

**Architect**  
DP Architects Pte Ltd

**M&E Engineer**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Structural Engineer**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**  
Kwan Yong Construction Pte  
Ltd

**Landscape Consultant**  
Ong & Ong Pte Ltd

### **Key Features**

- Estimated energy savings: 421,148 kWh/yr; estimated water savings: 4,208 m<sup>3</sup>/yr; ETTV: 38.1 W/m<sup>2</sup>.
- Water cooled air-conditioning system with system efficiency of 0.61 kW/ton.
- Computational Fluid Dynamics (CFD) simulations carried out to optimise natural ventilation in the development.
- Energy efficient LED and T5 lighting coupled with motion sensors for toilets and staircases.
- Greenery at places such as the eco deck to help reduce urban heat gain.
- Non-chemical water treatment system in cooling tower.
- Non-chemical anti-termite treatment.
- UV light emitters for all AHUs to improve indoor air quality.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## NUH Medical Centre

New Non-Residential Buildings



**Client / Developer**

National University  
Hospital Singapore  
Pte Ltd

**Project Manager**

Consultants Incorporated  
Architects + Planners

**Architect**

Consultants Incorporated  
Architects + Planners

**M&E Engineer**

Parson Brinckerhoff Pte Ltd

**Structural Engineer**

T.Y. Lin International  
Pte Ltd

**Quantity Surveyor**

Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**

Penta-Ocean Construction  
Co., Ltd

**Landscape Consultant**

Peridian Asia Pte Ltd

**Hospital Planners**

Kahler Slater

**ESD Consultant**

Parsons Brinckerhoff Pte Ltd

### Key Features

- Estimated energy savings: 12,657,449 kWh/yr; estimated water savings: 32,441 m<sup>3</sup>/yr; ETTV: 34.3 W/m<sup>2</sup>.
- Chiller plant efficiency of 0.6 kW/ton.
- Measurement and verification instrumentation.
- Demand controlled ventilation system coupled with carbon dioxide sensors.
- LED lighting system for common corridors and façade lighting.
- Motion sensors for toilets and staircases.
- Regenerative lift installed with Variable Voltage Variable Frequency motor drive and sleep mode features.
- All taps and sanitary devices rated WELS 'Excellent'.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Primary School at Bukit Panjang Site 16

New Non-Residential Buildings



**Client / Developer**  
Ministry of Education

**Project Manager**  
Project Innovations Pte Ltd

**Architect**  
CPG Consultants Pte Ltd

**M&E Engineer**  
CPG Consultants Pte Ltd

**Structural Engineer**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Quantity Surveyor**  
CPG Consultants Pte Ltd

**Main Contractor**  
Hytech Builders Pte Ltd

**ESD Consultant**  
IGnesis Consultants Pte Ltd

### Key Features

- Estimated energy savings: 208,620 kWh/yr; estimated water savings: 18,880 m<sup>3</sup>/yr; ETTV: 39.3 W/m<sup>2</sup>.
- Air-cooled VRF air-conditioning system efficiency of 0.71 kW/ton.
- Use of ventilation simulation to optimise natural ventilation, with a large number naturally ventilated facilities.
- Photo sensors for lighting in classrooms and special teaching rooms.
- Motion sensors for lighting in toilets.
- Photo-voltaic cells on flat roof of classroom block.
- 91% of water fittings rated WELS 'Excellent'.
- Use of green cement, green concrete and certified sustainable construction products.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Singapore Institute of Technology @ NP Building

New Non-Residential Buildings



**Client / Developer**  
Singapore Institute of  
Technology/  
Ngee Ann Polytechnic

**Project Manager**  
PM Link Pte Ltd

**Architect**  
DP Architects Pte Ltd

**M&E Engineer**  
Beca Carter Hollings &  
Ferner (SE Asia) Pte Ltd

**Structural Engineer**  
Beca Carter Hollings &  
Ferner (SE Asia) Pte Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**  
V3-LHL Joint Venture

**Landscape Consultant**  
Ong & Ong Pte Ltd

### Key Features

- Estimated energy savings: 1,094,672 kWh/yr; estimated water savings: 3320 m<sup>3</sup>/yr; ETTV: 36.8 W/m<sup>2</sup>.
- Efficient water-cooled air-conditioning system with system efficiency of 0.59 kW/ton.
- Energy efficient LED and T5 lighting with provision of motion sensors for toilets and staircases.
- Computational Fluid Dynamics (CFD) simulations carried out to achieve efficient natural ventilation.
- Siphonic rainwater discharge.
- Green Educational Corner with LCD display of building energy and water consumption.
- UV light emitters for all AHUs.
- Automatic condenser tube cleaning system.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Singapore Institute of Technology @ TP Building

New Non-Residential Buildings



**Client / Developer**  
Singapore Institute of  
Technology/  
Temasek Polytechnic

**Project Manager**  
Langdon & Seah Project  
Management Pte Ltd

**Architect**  
Forum Architects Pte Ltd

**M&E Engineer**  
T.Y. Lin International Pte  
Ltd

**Structural Engineer**  
RSP Architects Planners &  
Engineers (Pte) Ltd

**Quantity Surveyor**  
Faithful+Gould Pte Ltd

**Main Contractor**  
V3-LHL Joint Venture

**ESD Consultant**  
T.Y. Lin International Pte Ltd

### Key Features

- Estimated energy savings: 925,666 kWh/yr; estimated water savings: 3,037 m<sup>3</sup>/yr; ETTV: 32.2 W/m<sup>2</sup>.
- Low window to wall ratio and high performance glazing.
- Chiller plant room with efficiency of 0.62 kW/ton.
- Vast non-air conditioned area consisting of atrium, corridors, and other common areas to reduce air conditioning requirement.
- High efficiency lighting design with 37% savings over baseline.
- Eco kiosk with interactive media for staff and students to learn about SIT campuses' green features.
- Cradle-to-cradle 100% recyclable carpet and carpet adhesive system covering half of the gross floor area.
- Extensive use of SGLS certified building materials.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## South Spine Learning Hub

New Non-Residential Buildings



**Client / Developer**  
Nanyang Technological  
University

**Architect**  
CPG Consultants Pte Ltd

**Design Consultant**  
Heatherwick Studio

**M&E Engineer**  
Bescon Consulting  
Engineers Pte

**Structural Engineer**  
T.Y. Lin International Pte  
Ltd

**Quantity Surveyor**  
Davis Langdon KPK  
(Singapore) Pte Ltd

**ESD Consultant**  
CPGreen - CPG Consultants  
Pte Ltd

**PDV Consultant**  
ME(TCS) Consulting  
Engineers

**Fire Consultant**  
LKH Fire Engineering Pte Ltd

**Landscape Consultant**  
Perfect Sense

**Acoustic Consultant**  
CCW Associates Pte Ltd

### Key Features

- Estimated energy savings: 612,946 kWh/yr; estimated water savings: 9,680 m<sup>3</sup>/yr; ETTV: 39.8 W/m<sup>2</sup>.
- High efficiency chilled water system with variable speed drives for chilled water pumps, condenser water pumps and cooling towers.
- Use of passive displacement ventilation throughout the development.
- Energy efficient T5 lighting for tutorial rooms.
- Vertical greenery, green roof and conservation of 6 existing trees.
- Hydrophylic polymer used for planting eliminates need for irrigation system.
- Use of Ground Granulated Blast Furnace Slag, recycled concrete aggregates and other certified sustainable products in construction.
- Water efficient urinals, basin, sink and bib taps rated WELS 'Excellent'.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Spectra Secondary School

New Non-Residential Buildings



**Client / Developer**  
Ministry of Education

**Project Manager**  
SIPM Consultants Pte Ltd

**Architect**  
Architects Vista Pte Ltd

**M&E Engineer**  
Mott MacDonald  
Singapore Pte Ltd

**Structural Engineer**  
Ecas-EJ Consultants Pte Ltd

**Quantity Surveyor**  
Barton Bruce Shaw Pte Ltd

**Main Contractor**  
Kwan Yong Construction Pte  
Ltd

**ESD Consultant**  
Parsons Brinckerhoff Pte Ltd

### Key Features

- Estimated energy savings: 466,072 kWh/yr; estimated water savings: 2,984 m<sup>3</sup>/yr; ETTV: 39.75 W/m<sup>2</sup>.
- 80.6% of hardscape areas with high SRI above 29 to mitigate the urban heat island effect.
- Highly optimised VRF air-conditioning system.
- Use of LED lighting for all corridors.
- Photovoltaic panels with system capacity of 90 kWp.
- PUB ABC Waters design features such as bio-retention pond to treat stormwater run-off before discharge into public drain.
- Extensive use of environmentally friendly sustainable products.
- Use of cool paint for external wall.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Tanjong Pagar Centre

New Non-Residential Buildings



**Client / Developer**  
GuocoLand (Singapore)  
Pte Ltd

**Project Manager**  
GuocoLand Property  
Management Pte Ltd

**Architect**  
Architects 61 Pte Ltd

**M&E Engineer**  
Meinhardt (Singapore)  
Pte Ltd

**Structural Engineer**  
Arup Singapore Pte Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Landscape Consultant**  
Cicada Pte Ltd

**ESD Consultant**  
Arup Singapore Pte Ltd

### Key Features

- Estimated energy savings: 12,556,501 kWh/yr; estimated water savings: 85,247 m<sup>3</sup>/yr; ETTV: 34.4 W/m<sup>2</sup>.
- Use of high performance double glazed low e glass.
- Chilled water plant with system efficiency of 0.61 kW/ton.
- Energy efficient T5 and LED lighting.
- Integrated solar photovoltaic panels with system capacity of about 300 kWp.
- Provision of rainwater harvesting system and recycling of air-conditioning condensate water to reduce potable water usage.
- Provision of extensive greenery.
- Green lease for tenants.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Westgate & Westgate Tower

New Non-Residential Buildings



**Client / Developer**

CapitaMalls Asia/  
CapitaMall Trust/  
CapitaLand

**Project Manager**

CapitaMalls Asia

**Architect**

RSP Architects Planners &  
Engineers (Pte) Ltd

**Design Consultant**

Benoy Ltd

**M&E Engineer**

J Roger Preston  
(Singapore) Pte Ltd

**Structural Engineer**

RSP Architects Planners &  
Engineers (Pte) Ltd

**Quantity Surveyor**

Langdon & Seah Singapore  
Pte Ltd

**Design and Build**

**Contractor**

Shimizu Corporation

**Landscape Consultant**

COEN Design International  
Pte Ltd

**Façade Consultant**

Building Façade Group  
HCCH Consulting Pte Ltd

**Lighting Consultant**

The Lightbox Pte Ltd

**Acoustic Consultant**

Acvicon Acoustic  
Consultants Pte Ltd

### Key Features

- Estimated energy savings: 10,004,645 kWh/yr; estimated water savings: 56,085 m<sup>3</sup>/yr; ETTV: 37.5 W/m<sup>2</sup>.
- Chiller plant system with efficiency of 0.51 kW/ton.
- Naturally ventilated fine grain area with localised mechanical ventilation.
- Regenerative lifts with saving 0.52% of total energy consumption.
- 100% auto drip irrigation system.
- Substantial usage of green concrete.
- Paper recycling chute for office tower.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Yale-NUS College

New Non-Residential Buildings



**Client / Developer**  
Yale-NUS College

**Architect**  
Forum Architects Pte Ltd  
Pelli Clarke Pelli Architects

**M&E Engineer**  
Meinhardt (Singapore) Pte  
Ltd

**Structural Engineer**  
Meinhardt (Singapore) Pte  
Ltd

**Quantity Surveyor**  
Rider Levett Bucknall LLP

**Main Contractor**  
Ssangyong Engineering &  
Construction Co., Ltd

**Landscape Consultant**  
Lekker Design Pte Ltd

**ESD Consultant**  
Arup Singapore Pte Ltd

**Acoustic / Theatre Design  
/ AV Consultant**  
Arup Singapore Pte Ltd

**Façade Consultant**  
Arup Singapore Pte Ltd

**Lighting Consultant**  
Lighting Planners Associates  
Pte Ltd

**Lab Consultant**  
SKM Singapore Pte Ltd

### Key Features

- Estimated energy savings: 2,809,629 kWh/yr; estimated water savings: 32,559 m<sup>3</sup>/yr; ETTV: 34.5 W/m<sup>2</sup>.
- Courtyards within the campus designed to provide good shade and breezeways.
- Students' apartments designed to have good wind velocities.
- Sports hall, dining halls, student bedrooms and classrooms designed to be mixed mode to reduce cooling load.
- Living rooms in student apartments, external corridors and lift lobbies designed to be naturally ventilated and daylit.
- Occupancy sensors to control lighting and air-conditioning in faculty offices.
- Extensive greenery in courtyard, green roofs and sky garden to reduce urban heat gain effect.
- Reduction of stormwater runoff through water sensitive urban design features such as bioswales and an ecopond.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## AXA Tower

Existing Non-Residential Buildings



**Building Owner**  
MGP Raffle Pte Limited

**Facility Management**  
CBRE Pte Ltd

**Energy Consultant**  
Comfort Management Pte Ltd

**Green Mark Consultant**  
Comfort Management Pte Ltd

### Key Features

- Energy savings: 2,047,985 kWh/yr; water savings: 45,025 m<sup>3</sup>/yr.
- Chiller plant system efficiency of 0.67 kW/ton.
- Energy monitoring system to monitor total building energy usage and equipment usage such as AHU, chillers and pumps.
- Long term performance based contract which monitors energy usage on a daily basis.
- PUB Water Efficient Building.
- Recovery of AHU condensate water and harvesting of rain water.
- Automatic cleaning system for condenser tube.
- Reduction in carbon emissions by 1054 tons.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Capital Tower

Existing Non-Residential Buildings



**Client / Developer**  
CapitaCommercial Trust

**Facility Management**  
CapitaLand Commercial  
Management Pte Ltd

**ESCO**  
G-Energy Global Pte Ltd

**ESD Consultant**  
G-Energy Global Pte Ltd

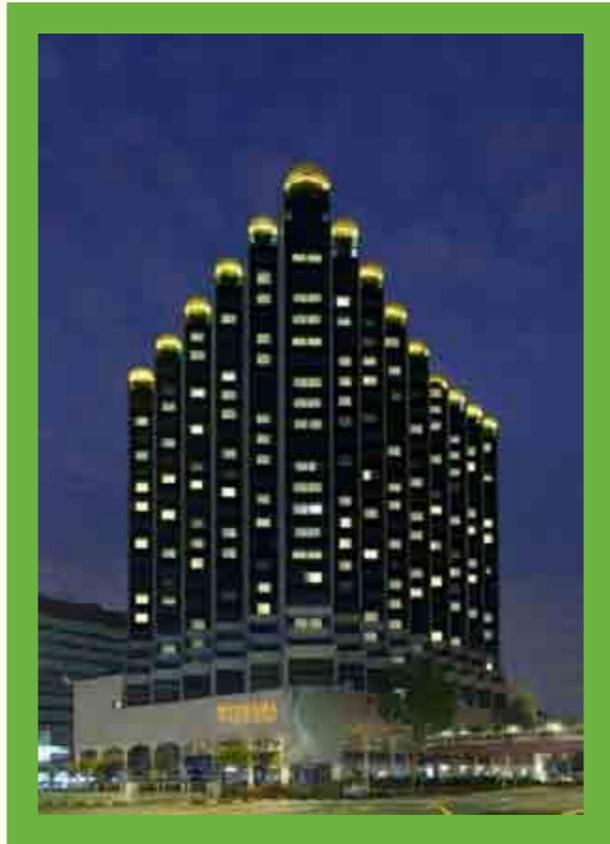
### Key Features

- Estimated energy savings: 3,016,869 kWh/yr; estimated water savings: 7,527 m<sup>3</sup>/yr.
- Proposed retrofitting work to achieve chiller system efficiency of 0.64 kW/ton.
- Measurement and verification system and heat balancing to monitor chiller plant efficiency.
- Heat recovery wheel for pre-cooling fresh air intake into building.
- Heat pump for swimming pool.
- Motion sensors coupled to lighting for all toilets and staircases.
- Recycling of AHU condensate water for cooling tower makeup.
- Automatic condenser tube cleaning system for chiller plant.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Furama City Centre and Furama Singapore Hotel & Shopping Centre

Existing Non-Residential Buildings



**Building Owner**

Management Corporation  
Strata Title Plan No 1246

**Facility Management**

Furama Hotel Singapore

**ESCO**

G-Energy Global Pte Ltd

**ESD Consultant**

G-Energy Global Pte Ltd

**Key Features**

- Estimated energy savings: 1,062,809 kWh/yr; estimated water savings: 17,161 m<sup>3</sup>/yr.
- Efficient chiller plant system of 0.63 kW/ton.
- Hot water heating using heat recovery from Air-Conditioning and Mechanical Ventilation system.
- Energy efficient T5 lighting for most areas and LED lighting for guest rooms, corridors and lifts.
- Motion sensors coupled to lightings for toilets and staircases.
- NEWater as alternative water supply for various sources of usage.
- Eco-Wiz food waste processor.
- Super-capacity grease trap.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Health Promotion Board

Existing Non-Residential Buildings



**Building Owner**  
Health Promotion Board

**Facility Management**  
One Marina Property  
Services Pte Ltd

**Technical Consultant**  
Siemens Pte Ltd

### Key Features

- Estimated energy savings: 1,084,337 kWh/yr; estimated water savings: 21,230 m<sup>3</sup>/yr.
- Efficient chiller plant system of 0.61 kW/ton.
- Variable speed drives installed for chilled water pumps, condenser pumps and cooling towers.
- Automatic cleaning system for condenser tube.
- LED lighting at basement carpark and various office areas as well as motion sensors for all toilets.
- All water fittings in toilets rated or equivalent to WELS 'Excellent' rating.
- Use of compost recycled from horticulture waste.
- Roof top garden accessible to all staff.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## JTC Summit

Existing Non-Residential Buildings



**Developer**  
JTC Corporation

**Facility Management**  
JTC Corporation

**ESCO**  
Johnson Controls (S) Pte Ltd

**ESD Consultant**  
CPG Consultants Pte Ltd

### Key Features

- Estimated energy savings: 1,500,000 kWh/yr; estimated water savings: 13,111 m<sup>3</sup>/yr.
- Daylighting and vertical greening at lobby.
- Efficient chiller plant system of 0.65 kW/ton and light fittings as well as water efficient fittings.
- Test beddings of technologies such as chilled ceilings and passive displacement cooling.
- UV emitters in AHUs to improve indoor air quality.
- Solar film on building facades.
- Smart power plugs for power management at individual office workstations.
- Motion sensors for all office meeting rooms.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**National University of Singapore -  
Yong Loo Lin School of Medicine,  
MD4/ MD4A**

Existing Non-Residential Buildings



**Building Owner**  
National University of  
Singapore

**Facility Management**  
Office of Estate and  
Development, National  
University of Singapore

**ESD Consultant**  
CPG Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 359,319 kWh/yr; estimated water savings: 44,643 m<sup>3</sup>/yr.
- ETTV of 31.5 W/m<sup>2</sup>.
- Naturally ventilated toilets, staircases, lift lobbies and corridors.
- Energy efficient T5 and LED lighting.
- Motion sensor coupled to lighting in all toilets.
- Majority of water fittings in development rated 'Excellent'.
- NEWater for cooling towers.
- Comprehensive campus wide recycling program.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**National University of Singapore -  
Yong Loo Lin School of Medicine,  
MD9**

Existing Non-Residential Buildings



**Building Owner**  
National University of  
Singapore

**Facility Management**  
Office of Estate and  
Development, National  
University of Singapore

**ESD Consultant**  
CBM Solutions Pte Ltd

**M&E Engineer**  
AUP Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 1,668,712 kWh/yr; estimated water savings: 5,428 m<sup>3</sup>/yr.
- Natural ventilation at common areas.
- Carbon dioxide sensors at AHUs and heat recovery unit.
- Energy efficient LED and T5 lighting.
- Photo and motion sensors for lighting in toilets and small rooms.
- Tap and sink fittings rated WELS 'Excellent'.
- Automated smart metering for water monitoring and leak detection.
- Low VOC paint and environmentally friendly adhesives used for interior areas.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Robert Bosch SEA HQ

Existing Non-Residential Buildings



**Building Owner**

Robert Bosch (South East Asia) Pte Ltd

**Facility Management**

Robert Bosch (South East Asia) Pte Ltd

**ESCO**

G-Energy Global Pte Ltd

**ESD Consultant**

G-Energy Global Pte Ltd

**Key Features**

- Estimated water savings: 788 m<sup>3</sup>/yr.
- Low ETTV value with usage of double-glazed and single-glazed low-e glass.
- Automated sun-shading blinds to lower building cooling load.
- Efficient chiller plant system of 0.59 kW/ton.
- Use of energy efficient T5 tubes for all florescent lighting and motion sensors at toilets and staircases.
- Provision of photovoltaic panels to harvest renewable energy.
- Siphonic rainwater discharge system.
- Provision of car park lots and charging points for electric and hybrid vehicles.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Standard Chartered @ Changi

Existing Non-Residential Buildings



**Building Owner**

Standard Chartered @  
Changi

**Facility Management**

Jones Lang LaSalle

**ESCO**

G-Energy Global Pte Ltd

**ESD Consultant**

G-Energy Global Pte Ltd

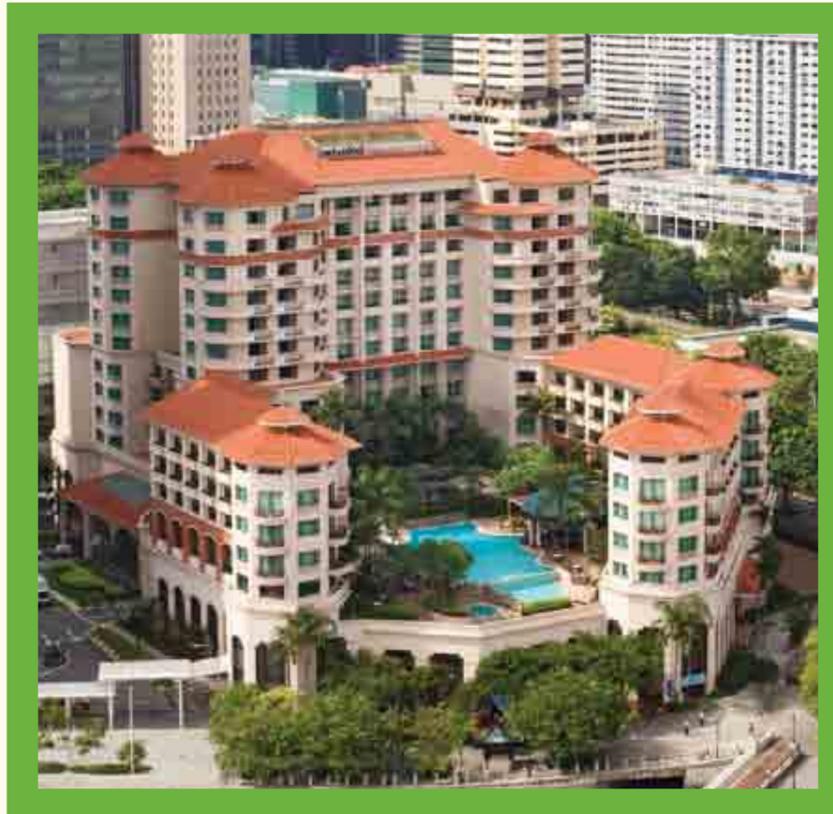
### Key Features

- Estimated energy savings: 98,438 kWh/yr; estimated water savings: 14,715 m3/yr.
- Use of energy efficient T5 lighting coupled with photocell sensors and motion sensors for office areas.
- Photovoltaic panels with system capacity of 96 kWp to harness renewable energy.
- Integrated grey water, condensate water and rain water harvesting system for toilet flushing.
- Green Wall corner provides educational information on environmental awareness, energy and water savings.
- Provision of numerous drought tolerant plants at first storey landscape and roof top garden.
- Extensive usage of environmentally friendly sustainable products.
- Carbon dioxide sensors and efficient air filters used in AHUs to ensure good indoor air quality.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Swissôtel Merchant Court, Singapore

Existing Non-Residential Buildings



### Building Owner

Merchant Court Ptd Ltd  
trading as Swissôtel  
Merchant Court, Singapore

### Facility Management

Merchant Court Ptd Ltd  
trading as Swissôtel  
Merchant Court, Singapore

### ESCO

Cofely South East Asia Pte  
Ltd

### ESD Consultant

Cofely South East Asia Pte  
Ltd

### Key Features

- Estimated energy savings: 2,277,206 kWh/yr; estimated water savings: 6,460 m<sup>3</sup>/yr.
- Efficient chiller plant system of 0.6 kW/ton.
- Automatic cleaning system for condenser tube.
- Heat pump system for hot water.
- Motion sensors for lighting at staircases.
- Extensive greenery provision.
- Recycling of cooking oil.
- Eco-Wiz system which helps to break down food waste.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Echelon

New Residential Buildings



**Client / Developer**

City Developments Limited/  
Hong Realty (Pte) Limited/  
Hong Leong Holdings Limited

**Project Manager**

CDL Management Services Pte Ltd

**Architect**

SCDA Architects Pte Ltd

**M&E Engineer**

Squire Mech Pte Ltd

**Structural Engineer**

KTP Consultants Pte Ltd

**Quantity Surveyor**

Rider Levett Bucknall LLP

**Landscape Consultant**

SCDA Architects Pte Ltd

**ESD Consultant**

Building System & Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 2,998,060 kWh/yr; estimated water savings: 87,089 m<sup>3</sup>/yr; ETTV: 18.2 W/m<sup>2</sup>.
- Energy efficient T5 and LED lighting.
- Use of cool paint for West and East facades.
- Provision of ductless fans for basement ventilation.
- Provision of gas water heaters.
- More than 50 motion sensors for lighting at staircases.
- Extensive use of sustainable products in construction.
- Pneumatic waste collection system.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Eco Sanctuary

New Residential Buildings



**Client / Developer**

S P Setia International (S)  
Pte Ltd

**Project Manager**

ADDP Architects LLP

**Architect**

ADDP Architects LLP

**M&E Engineer**

CPG Consultants Pte Ltd

**Structural Engineer**

P&T Consultants Pte Ltd  
WT Partnership (S) Pte Ltd

**Main Contractor**

JCWill & Associates Pte Ltd

**Quantity Surveyor**

WT Partnership (S) Pte Ltd

**Landscape Consultant**

COEN Design International  
Pte Ltd

**ESD Consultant**

CPG Consultants Pte Ltd

### Key Features

- Estimated energy savings: 1,994,935 kWh/yr; estimated water savings: 84,140 m<sup>3</sup>/yr; RETV: 18.3 W/m<sup>2</sup>.
- At least 80% of typical units with good ventilation.
- Lifts with gearless drive.
- Rainwater harvesting and siphonic rainwater discharge system.
- Energy efficient lighting with motion sensors at common areas.
- Automatic water efficient irrigation system with rain sensor.
- Use of eco-plugs in all units.
- Use of energy efficient refrigerators and washer dryers in all units.

## Marina One Residences

New Residential Buildings



### Client / Developer

M+S Pte Ltd  
(MS Residential 1 Pte Ltd  
and MS Residential 2 Pte  
Ltd)

### Project Managers

Mapletree Project  
Management Pte Ltd  
Sunrise MS Pte Ltd

### Architect

Ingenhoven Architects  
Architects 61 Pte Ltd

### M&E Engineer

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

### Structural Engineer

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

### Quantity Surveyor

Langdon & Seah Singapore  
Pte Ltd

### Landscape Consultants

Gustafson Porter Bowman  
Ltd  
ICN Design International Pte  
Ltd

### ESD Consultant

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

### Key Features

- Estimated energy savings: 11,483,743 kWh/yr; estimated water savings: 35,245 m<sup>3</sup>/yr; RETV: 17.3 W/m<sup>2</sup>.
- Innovative sunshading and high performance glazing.
- Rainwater harvesting and water efficient irrigation system.
- Lush greenery which will serve as a Biodiversity Garden.
- Energy efficient hot water system utilising heat recovery from air conditioning units.
- Extensive use of sustainable products.
- Electric vehicle charging stations.
- Pneumatic waste collection system.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Nanyang Technological University  
Residential Halls 17 & 18 along  
Nanyang Crescent**  
New Residential Buildings



**Client / Developer**  
Nanyang Technological  
University

**Project Manager**  
Office of Development &  
Facilities Management,  
Nanyang Technological  
University

**Architect**  
RSP Architects Planners &  
Engineers (Pte) Ltd  
(in association with Toyo  
Ito Associates, Architects)

**M&E Engineer**  
Mott MacDonald  
Singapore Pte Ltd

**Structural Engineer**  
KTP Consultants Pte Ltd

**Quantity Surveyor**  
WT Partnership (S) Pte Ltd

**Landscape Consultants**  
Sitetectonix Pte Ltd

**ESD Consultant**  
Building System &  
Diagnostics Pte Ltd

**Acoustic Consultant**  
Alpha Acoustics Pte Ltd

**PUB-ABC Water Features  
Consultants**  
Greenology Pte Ltd  
CPG Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 1,820,675 kWh/yr; estimated water savings: 14,062 m<sup>3</sup>/yr; RETV: 14.5 W/m<sup>2</sup>.
- All units with double glazed windows.
- Good ventilation with average wind speed of 0.6 m/s for 70% of units.
- Solar water heater for showers.
- Photovoltaic panels.
- Extensive use of precast elements and hollow core slabs.
- Extensive stormwater management system.
- Provision of dual refuse chutes to facilitate recycling.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## 16B Leedon Park

Landed Houses



**Client / Developer**  
Mr Lim Chin Huat

**Architect**  
K2Ld Architects Pte Ltd

**M&E Engineer**  
PTA Consultants Pte Ltd

**Structural Engineer**  
MSE Consultants Pte Ltd

**Quantity Surveyor**  
Ian Chng Cost Consultants  
Pte Ltd

**ESD Consultant**  
Arup Singapore Pte Ltd

### Key Features

- Sunpath analysis and passive design strategies to maximise shading and indoor thermal comfort.
- Energy efficient air-conditioning system and mechanical fans for all habitable spaces.
- Solar photovoltaic panels with 6 kWp system capacity and provision of solar water heater.
- Provision of self-cleaning facades.
- Provision of electric car charging point.
- Non-chemical water treatment system for swimming pool.
- Real-time energy consumption display and eco-plugs for energy monitoring purposes.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

### 3 Leedon Park

Landed Houses



**Client / Developer**

Mr George Lim

**Project Manager**

designshop.architects LLP

**Architect**

HY M&E Consultancy  
Services Pte Ltd

**M&E Engineer**

MSE Consultants Pte Ltd

**Main Contractor**

As-Built Pte Ltd

**Key Features**

- Sunpath analysis and passive design strategies to optimise shading provision and indoor thermal comfort.
- Energy efficient air-conditioning system and mechanical fans for all habitable spaces.
- Use of air purifiers for better air quality.
- Home automation system with energy monitoring devices.
- Use of cool paint as well as eco-friendly construction materials and products.
- Rainwater harvesting system and automatic irrigation drip system with rain sensors.
- Provision of water filtration system at entry point and non-chemical water treatment system for swimming pool.
- Photovoltaic grid tied system with 42 kWp system capacity.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

### 3A Leedon Park

Landed Houses



**Client / Developer**

Mr George Lim

**Project Manager**

designshop.architects LLP

**Architect**

HY M&E Consultancy  
Services Pte Ltd

**M&E Engineer**

MSE Consultants Pte Ltd

**Main Contractor**

As-Built Pte Ltd

**Key Features**

- Sunpath analysis and passive design strategies to optimise shading provision and indoor thermal comfort.
- Energy efficient air-conditioning system and mechanical fans for all habitable spaces.
- Use of air purifiers for better air quality.
- Home automation system with energy monitoring devices.
- Use of cool paint as well as eco-friendly construction materials and products.
- Rainwater harvesting system and automatic irrigation drip system with rain sensors.
- Provision of water filtration system at entry point and non-chemical water treatment system for swimming pool.
- Photovoltaic grid tied system with 45 kWp system capacity.

## ACE The Place - Our Community Club @ Admiralty

New Non-Residential Buildings



**Client / Developer**  
People's Association

**Architect**  
Architects Team 3 Pte Ltd

**M&E Engineer**  
William Ng Consultants  
Pte Ltd

**Structural Engineer**  
Aston Consulting Engineers

**Quantity Surveyor**  
Franklin + Andrews Pte Ltd

**Main Contractor**  
OKH Holdings Pte Ltd

**Landscape Consultant**  
GreenEarth Landscape  
Designers & Planners Pte Ltd

### Key Features

- Estimated energy savings: 169,606 kWh/yr; estimated water savings: 4,737 m<sup>3</sup>/yr.
- Overall air-conditioning system efficiency of 0.70 kW/ton.
- Large mechanical ventilation fan in multi-purpose hall to reduce dependency on air-conditioning.
- Use of energy efficient T5 fluorescent lamps coupled with motion sensors.
- Extensive greenery, with high green plot ratio of 5.5.
- Vertical greenery as well as landscaped ramp and roof.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Capitol Development  
(Retail/ Hotel/ Theatre)**

New Non-Residential Buildings



**Client / Developer**

Capitol Retail Management Pte Ltd  
(As Trustee-Manager of Capitol Retail Trust)/

Capitol Hotel Management Pte Ltd  
(As Trustee-Manager of Capitol Hotel Trust)

**Project Manager**

Capitol Investment Holdings Pte Ltd

**Architects**

Richard Meier & Partners Architects LLP

Architects 61 Pte Ltd

**M&E Engineer**

Arup Singapore Pte Ltd

**Structural Engineer**

Arup Singapore Pte Ltd

**Quantity Surveyor**

Langdon & Seah Singapore Pte Ltd

**Main Contractor**

Shimizu Corporation

**Landscape Consultant**

Grant Associates

**ESD Consultant**

Arup Singapore Pte Ltd

**Lighting Consultants**

Lighting Planners Associates Inc.

Komara & Partner Ltd

**Key Features**

- Estimated energy savings: 6,156,605 kWh/yr; estimated water savings: 739 m<sup>3</sup>/yr ; ETTV: 41.0 W/m<sup>2</sup>.
- Overall energy savings of 26.4% for the development.
- Design of new ACMV system with high efficiency of 0.60 kW/ton at frequent operating load condition.
- Fan coil units with overall average efficiency of 0.14 W/CMH.
- Adaptive reuse and conservation of façades of Stamford House, Capitol Building and Capitol Theatre.
- Chemical-less filtration system for all swimming pools.

## DNV Technology Centre

New Non-Residential Buildings



**Client / Developer**

Ascendas Land (Singapore)  
Pte Ltd

**Project Manager**

Ascendas Services Pte Ltd

**Architects**

DCA Architects Pte Ltd

**M&E Engineer**

Parsons Brinckerhoff Pte  
Ltd

**Structural Engineer**

T.Y. Lin International Pte Ltd

**Quantity Surveyor**

Northcroft Lim Consultants  
Pte Ltd

**Main Contractor**

Lum Chang Building  
Contractors Pte Ltd

**Landscape Consultant**

ICN Design International Pte  
Ltd

### Key Features

- Estimated energy savings: 495,837 kWh/yr; estimated water savings: 6,315 m<sup>3</sup>/yr; ETTV: 35.8 W/m<sup>2</sup>.
- Efficient chiller plant system of 0.64 kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled water plant efficiency and heat balancing.
- Energy efficient lighting system with 33.8% savings beyond code compliance.
- Extensive greenery with a green plot ratio of 5.5.
- 39% of crushed concrete recovered and sent for recycling during demolition of previous building.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## DSM Dyneema APAC Technical Center

New Non-Residential Buildings



**Client / Developer**

DSM Singapore Industrial  
Pte Ltd

**Project Manager**

Malayan Daching  
Company Pte Ltd

**Architects**

CWM Consulting Engineers

**M&E Engineer**

William Ng Consultants Pte  
Ltd

**Structural Engineer**

CWM Consulting Engineers

**ESD Consultant**

GreenA Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 60,817 kWh/yr; estimated water savings: 4,358 m<sup>3</sup>/yr; ETTV: 38.5 W/m<sup>2</sup>.
- Low-e glass with SC value of 0.25 and U value of 1.5 W/m<sup>2</sup>.
- Provision of energy efficient LED and T5 lighting as well as photosensors.
- All water fittings in the development rated WELS 'Excellent'.
- Extensive use of sustainable building products in construction.
- Use of solar reflective paint.

## DSO National Laboratories

New Non-Residential Buildings



**Client / Developer**

Ascendas Land (Singapore)  
Pte Ltd

**Project Manager**

Ascendas Services Pte Ltd

**Architects**

DCA Architects Pte Ltd

**M&E Engineer**

Parsons Brinckerhoff Pte  
Ltd

**Structural Engineer**

T.Y. Lin International Pte Ltd

**Quantity Surveyor**

Northcroft Lim Consultants  
Pte Ltd

**Main Contractor**

Lum Chang Building  
Contractors Pte Ltd

**Landscape Consultant**

ICN Design International Pte  
Ltd

### Key Features

- Estimated energy savings: 1,964,400 kWh/yr; estimated water savings: 13,625 m<sup>3</sup>/yr; ETTV: 37.5 W/m<sup>2</sup>.
- Efficient chiller plant system of 0.63 kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Energy efficient lighting system with 37% savings beyond baseline code compliance.
- Rainwater harvesting with automatic drip irrigation system for landscape.
- 39% of crushed concrete recovered and sent for recycling during demolition of previous building.

BCA  
**GREEN MARK AWARD**  
 FOR BUILDINGS

**DUO, Mixed-Use  
 Development at Ophir-  
 Rochor, Singapore (Hotel)**

New Non-Residential Buildings



**Clients / Developers**

M+S Pte Ltd

Ophir-Rochor Commercial  
 Pte Ltd

Ophir-Rochor Hotel Pte Ltd

Ophir-Rochor Residential  
 Pte Ltd

**Project Managers**

CapitaLand Commercial  
 Project Services Pte Ltd

Sunrise MS Pte Ltd

**Architects**

Buro Ole Scheeren Limited

DP Architects Pte Ltd

**M&E Engineer**

Beca Carter Hollings &  
 Ferner (S.E. Asia) Pte Ltd

**Structural Engineer**

Beca Carter Hollings &  
 Ferner (S.E. Asia) Pte Ltd

**Quantity Surveyor**

Davis Langdon KPK  
 (Singapore) Pte Ltd

**Landscape Consultant**

COEN Design International  
 Pte Ltd

**ESD Consultant**

Beca Carter Hollings &  
 Ferner (S.E. Asia) Pte Ltd

**Lighting Consultant**

International Lighting  
 Architecture Bureau Pte Ltd

**Key Features**

- Estimated energy savings: 3,060,963 kWh/yr; estimated water savings: 3,300 m<sup>3</sup>/yr; ETTV: 37.4 W/m<sup>2</sup>.
- Hexagonal façade design with double glazed low-e glass.
- Water-cooled efficient chiller plant system of 0.60 kW/ton and heat recovery from toilet exhaust.
- LED lighting for basement carpark.
- Lush green surroundings with 100% landscape replacement.
- Rainwater harvesting system coupled with siphonic rainwater drainage piping used for irrigation.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## MDIS Block A

New Non-Residential Buildings



**Client / Developer**

Management  
Development Institute of  
Singapore

**Project Manager**

Management  
Development Institute of  
Singapore

**Architect**

Ong & Ong Pte Ltd

**M&E Engineer**

WSP Ng Pte Ltd

**Structural Engineer**

PEC Civil Consultant Pte Ltd

**Quantity Surveyor**

Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**

MA Builders Pte Ltd

**Landscape Consultant**

Ong & Ong Pte Ltd

**Key Features**

- Estimated energy savings: 309,140 kWh/yr; estimated water savings: 17,349 m<sup>3</sup>/yr; ETTV: 39.0 W/m<sup>2</sup>.
- Optimisation of natural ventilation for all lift lobbies and staircases.
- Energy efficient LED lighting.
- Solar panels with system capacity of 28.8 kWp.
- Conservation of existing structure and furniture.
- Extensive roof greenery.

## Paya Lebar Square Mall

New Non-Residential Buildings



**Client / Developer**

Paya Lebar Development  
Pte Ltd

**Project Manager**

Guthrie Consultancy  
Services Pte Ltd

**Architect**

DP Architects Pte Ltd

**M&E Engineer**

Squire Mech Pte Ltd

**Structural Engineer**

KTP Consultants Pte Ltd

**Quantity Surveyor**

Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**

Low Keng Huat (Singapore)  
Ltd

**Landscape Consultant**

DP Green Pte Ltd

**Key Features**

- Estimated energy savings: 4,561,904 kWh/yr; estimated water savings: 33,945 m<sup>3</sup>/yr ; ETTV: 36.5 W/m<sup>2</sup>.
- Efficient chiller plant system of 0.56 kW/ton.
- Carbon dioxide sensors for regulation of pre-cooled air supply to AHUs.
- Motion sensors for lighting at staircases and toilets.
- Photocell sensors coupled to lighting at skylight area of the atrium.
- Regenerative lifts serving the offices.

## School of Science and Technology, Singapore

New Non-Residential Buildings



**Client / Developer**  
School of Science and  
Technology, Singapore

**Project Manager**  
DP Architects Pte Ltd

**Architect**  
DP Architects Pte Ltd

**M&E Engineer**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Structural Engineer**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**  
Sanchoon Builders Pte Ltd

**Landscape Consultant**  
DP Green Pte Ltd

**ESD Consultant**  
G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 624,421 kWh/yr; estimated water savings: 131,517 m<sup>3</sup>/yr; ETTV: 39.7 W/m<sup>2</sup>.
- Photovoltaic grid-tied system to harvest renewable energy and offset energy consumption.
- Siphonic rainwater discharge system.
- Educational green corner to display real time information on the school's energy consumption.
- Provision of green roof, bioswale and eco-pond.
- Solar reflective paint for sports hall and classroom roof to reduce heat gain into the building.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## The Academia

New Non-Residential Buildings



**Client / Developer**  
Ministry of Health

**Project Manager**  
PM Link Pte Ltd

**Architect**  
CPG Consultants Pte Ltd

**M&E Engineer**  
CPG Consultants Pte Ltd

**Structural Engineer**  
CPG Consultants Pte Ltd

**Quantity Surveyor**  
CPG Consultants Pte Ltd

**Main Contractor**  
Kajima Overseas Asia Pte Ltd

**Landscape Consultant**  
CPG Consultants Pte Ltd

**ESD Consultant**  
CPGreen - CPG Consultants  
Pte Ltd

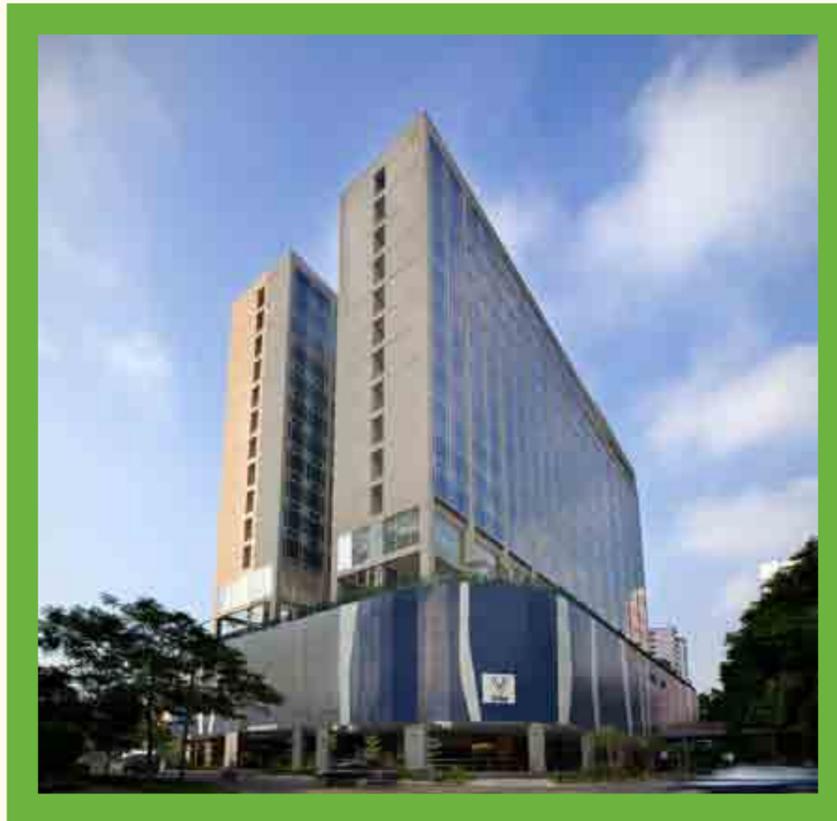
### Key Features

- Estimated energy savings: 13,589,363 kWh/yr; estimated water savings: 621,229 m<sup>3</sup>/yr; ETTV: 40.3 W/m<sup>2</sup>.
- High efficiency chilled water system with heat recovery.
- Natural ventilation and daylighting at lift lobbies and atriums from Level 7 to 13.
- Energy efficient LED lighting.
- Extensive use of SGLS rated green products in construction.
- Condensate water recycling.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## V Hotel

New Non-Residential Buildings



**Client / Developer**  
Citywide Land Pte Ltd

**Architect**  
Archiwave Architects

**M&E Engineer**  
CMP Consultants Pte Ltd

**Structural Engineer**  
KH Consultants

**Quantity Surveyor**  
1MH & Associates

**Main Contractor**  
V3 Construction Pte Ltd

**Landscape Consultant**  
Nyee Phoe Flower Garden  
Pte Ltd

**ESD Consultant**  
G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 2,472,842 kWh/yr; estimated water savings: 307,914 m<sup>3</sup>/yr; ETTV: 39.7 W/m<sup>2</sup>.
- Condenser auto-tube cleaning system to maintain chiller efficiency and reduce chiller down time for manual tube cleaning.
- Measuring instruments for monitoring of chilled water plant efficiency.
- Heat balance substantiating test for verification of chilled water plant instrumentation.
- Non-chemical cooling tower treatment.
- Provision of parking lots for hybrid cars to encourage environmentally-friendly transport usage.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Biopolis Phase 1

Existing Non-Residential Buildings



**Building Owner**  
JTC Corporation

**Facility Management**  
UGL Services Premas  
Operations Limited

**ESCO**  
UGL Services Premas  
Operations Limited

**Green Consultant**  
UGL Services Premas  
Operations Limited

### Key Features

- Estimated energy savings: 679,694 kWh/yr; estimated water savings: 48,185 m<sup>3</sup>/yr.
- Variable speed controls for all secondary chilled water pumps.
- Provision of solar hot water system and photovoltaic cells.
- Artificial lighting coupled with occupancy sensors and photosensors.
- Awarded PUB Water Efficient Building.
- Provision of vertical and roof top greenery.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Fusionopolis Phase 1

Existing Non-Residential Buildings



**Building Owner**

JTC Corporation

**Facility Management**

CPG Facilities Management  
Pte Ltd

**ESCO**

UGL Services Premas  
Operations Limited

**ESD Consultant**

UGL Services Premas  
Operations Limited

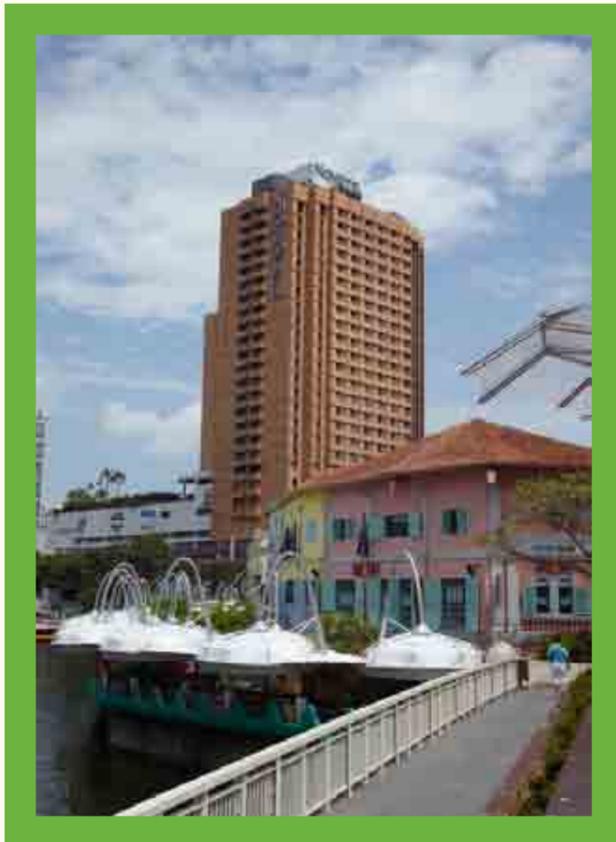
### Key Features

- Estimated energy savings: 456,238 kWh/yr.
- Provision of variable speed controls for all secondary chilled water pumps.
- Occupancy sensors coupled to lighting for sky bridges and toilets to reduce lighting power consumption.
- Lifts and escalators with AC variable voltage and variable frequency motor drive and sleep mode features.
- Carbon monoxide monitoring system for control of car park mechanical ventilation fans.
- Water fittings for common toilets all rated WELS 'Excellent'.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Novotel Singapore Clarke Quay

Existing Non-Residential Buildings



**Building Owner**

DBS Trustee Limited as trustee of CDL Hospitality Real Estate Investment Trust

**Facility Management**

Novotel Singapore Clarke Quay

**ESCO**

Cofely South East Asia Pte Ltd

**ESD Consultant**

Cofely South East Asia Pte Ltd

**Key Features**

- Estimated energy savings: 2,839,852 kWh/yr.
- Efficient chiller plant system of 0.65 kW/ton.
- Energy efficient LED lighting.
- Heat pump system for hot water.
- Planet 21 sustainability program in place.
- Tree planting program in place.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Singapore Pools Building

Existing Non-Residential Buildings



**Building Owner**

Singapore Pools (Private)  
Limited

**Facility Management**

Singapore Pools (Private)  
Limited

**ESCO**

CPG Consultants Pte Ltd

**ESD Consultant**

CPG Consultants Pte Ltd

**M&E Consultant**

CPG Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 1,000,180 kWh/yr; estimated water savings: 4,745m<sup>3</sup>/yr.
- Efficient chiller plant system of 0.65 kW/ton.
- Variable speed drives for chilled water and condenser water pumps.
- Energy efficient T5 lighting coupled with motion sensors for all toilets and staircases.
- NEWater for cooling tower make-up.
- Comprehensive paper recycling program in place.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## UOB Plaza 1

Existing Non-Residential Buildings



**Building Owner**

United Overseas Bank Limited

**Facility Management**

UOB Property & General Services Division

**ESCO**

Kaer Pte Ltd

**ESD Consultant**

Kaer Pte Ltd

**M&E Consultant**

Belmacs Pte Ltd

### Key Features

- Estimated energy savings: 6,252,940 kWh/yr; estimated water savings: 27,815 m<sup>3</sup>/yr.
- Efficient chiller plant system of 0.65kW/ton.
- Variable speed drives for pumps and cooling towers.
- Heat recovery system for PAHUs.
- Energy efficient LED lighting for carpark.
- Carbon monoxide sensors for carpark mechanical ventilation.

## Victoria Theatre and Victoria Concert Hall

Existing Non-Residential Buildings



**Building Owner**

National Arts Council/  
Singapore Symphonia Co.  
Ltd

**Client**

Ministry of Information,  
Communications and the  
Arts

**Architect**

W Architects Pte Ltd

**ESD Consultant**

Arup Singapore Pte Ltd

**M&E Consultant**

T.Y. Lin International Pte Ltd

**Key Features**

- Estimated energy savings: 627,931 kWh/yr; estimated water savings: 1,722 m<sup>3</sup>/yr.
- Under floor cooling system at theatre and concert hall.
- Variable speed drive for all pumps and cooling towers which lead to efficient chiller plant system of 0.74 kW/ton.
- Passive design with naturally ventilated atrium space.
- Natural daylighting for foyers.
- Usage of recycled existing cast iron for theatre balustrades and existing timber floor boards for new dance and drama rehearsal rooms.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Jewel @ Buangkok

New Residential Buildings



**Client / Developer**

City Developments Limited

**Architect**

DCA Architects Pte Ltd

**M&E Engineer**

Squire Mech Pte Ltd

**Structural Engineer**

LBW Consultants LLP

**Quantity Surveyor**

Rider Levett Bucknall LLP

**Landscape Consultant**

Tinderbox Landscape Studio  
Pte Ltd

**Interior Design**

Axis ID Pte Ltd

**CFD Consultant**

Building System &  
Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 2,018,193 kWh/yr; estimated water savings: 38,124 m<sup>3</sup>/yr; RETV: 21.7 W/m<sup>2</sup>.
- Energy efficient T5 and LED lighting.
- Gas water heaters for all apartments.
- Use of water efficient fittings in all bathrooms.
- Landscape green area with rain-water harvesting and auto-irrigation system.
- Effective environmental management practice and use of green cement, pre-cast toilets and pre-cast panels in construction.

## Capitol Development (Residential)

New Residential Buildings



**Client / Developer**  
Capitol Residential  
Development Pte Ltd

**Project Manager**  
Capitol Investment  
Holdings Pte Ltd

**Architects**  
Richard Meier & Partners  
Architects LLP  
Architects 61 Pte Ltd

**M&E Engineer**  
Arup Singapore Pte Ltd

**Structural Engineer**  
Arup Singapore Pte Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Main Contractor**  
Shimizu Corporation

**Landscape Consultant**  
Grant Associates

**ESD Consultant**  
Arup Singapore Pte Ltd

**Lighting Consultants**  
Lighting Planners Associates  
Inc.  
Komara & Partner Ltd

### Key Features

- Estimated energy savings: 723,433 kWh/yr; estimated water savings: 739 m<sup>3</sup>/yr; RETV: 15.6 W/m<sup>2</sup>.
- Use of energy efficient DX split units rated '4 ticks' in all dwelling units.
- Good building envelope design with high performance glazing and effective shading provision.
- Chemical-less filtration system for all swimming pools.
- Water consumption monitoring for all major sources of water usage.
- Extensive greenery covering 30% of the roof top area.

## Corals at Keppel Bay

New Residential Buildings



**Client / Developer**

Keppel Bay Pte Ltd

**Project Manager**

Keppel Land International  
Ltd

**Architect**

DCA Architects Pte Ltd

**M&E Engineer**

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Structural Engineer**

T.Y. Lin International Pte  
Ltd

**Quantity Surveyor**

Langdon & Seah Singapore  
Pte Ltd

**Landscape Consultant**

ICN Design International Pte  
Ltd

**ESD Consultant**

ZEB-Technology Pte Ltd

**Façade Architect**

R.A. Heintges & Associates

**Key Features**

- Estimated energy savings: 1,500,303 kWh /yr; estimated water savings: 34,243 m<sup>3</sup>/yr; RETV: 15.0 W/m<sup>2</sup>.
- Efficient shading device design.
- Provision of air-conditioning and refrigerators rated '4 ticks' for all units.
- Efficient design for daylighting and natural ventilation for apartment units and common areas.
- Extensive use of sustainable products in construction.
- More than 50% of the site covered by water and greenery.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## D'Nest

New Residential Buildings



### Client / Developer

City Developments Limited  
Hong Realty (Pte) Limited  
Hong Leong Holdings  
Limited

### Project Manager

CDL Management Services  
(Pte) Ltd

### Architect

Architects 61 Pte Ltd

### M&E Engineer

Parsons Brinckerhoff Pte Ltd

### Structural Engineer

Parsons Brinckerhoff Pte Ltd

### Quantity Surveyor

Langdon & Seah Singapore  
Pte Ltd

### Landscape Consultant

COEN Design International  
Pte Ltd

### Key Features

- Estimated energy savings: 3,526,431 kWh/yr; estimated water savings: 41,849 m<sup>3</sup>/yr; RETV: 14.9 W/m<sup>2</sup>.
- Gas water heaters for majority of residential units.
- Photovoltaic cells with system capacity of 110 kWp to harness renewable energy.
- Green walls and communal sky terraces.
- Prefabricated bathroom units.
- Double refuse chute system to facilitate recycling.

## DUO Residences, Mixed-Use Development at Ophir-Rochor, Singapore (Residential)

New Residential Buildings



### Clients / Developers

M+S Pte Ltd  
Ophir-Rochor Commercial Pte Ltd  
Ophir-Rochor Hotel Pte Ltd  
Ophir-Rochor Residential Pte Ltd

### Project Managers

CapitaLand Commercial Project Services Pte Ltd  
Sunrise MS Pte Ltd

### Architects

Buro Ole Scheeren Limited  
DP Architects Pte Ltd

### M&E Engineer

Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

### Structural Engineer

Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

### Quantity Surveyor

Davis Langdon KPK (Singapore) Pte Ltd

### Landscape Consultant

COEN Design International Pte Ltd

### ESD Consultant

Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

### Lighting Consultant

International Lighting Architecture Bureau Pte Ltd

### Key Features

- Estimated energy savings: 3,600,000 kWh/yr; estimated water savings: 8000 m<sup>3</sup>/yr; RETV: 19.0 W/m<sup>2</sup>.
- Hexagonal façade design with double glazed low-e glass.
- Provision of energy efficient refrigerators and water efficient washing machines.
- Rainwater harvesting system coupled with siphonic rainwater drainage piping for irrigation.
- Lush green surroundings with 100% landscape replacement.
- Electric car charging station to promote the use of environmentally friendly transport.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Golden Peony**  
New Residential Buildings



**Client / Developer**  
Housing & Development Board

**Project Manager**  
SIPM Consultants Pte Ltd

**Architect**  
Surbana International Consultants Pte Ltd

**M&E Engineer**  
Surbana International Consultants Pte Ltd

**Structural Engineer**  
Surbana International Consultants Pte Ltd

**Quantity Surveyor**  
Surbana International Consultants Pte Ltd

**Main Contractor**  
Jian Yu Construction Pte Ltd

**Landscape Consultant**  
Surbana International Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 139,483 kWh/yr; estimated water savings: 21,107 m<sup>3</sup>/yr; RETV: 18.8 W/m<sup>2</sup>.
- Good building orientation with optimum window-to-wall ratio.
- Good provision for natural ventilation and daylighting.
- Extensive greenery provision.
- Optimal use of environmentally friendly sustainable materials in construction.
- High buildability score.

## Marine Parade Condominium Development

New Residential Buildings



**Client / Developer**  
CapitaLand Singapore

**Project Manager**  
CapitaLand Residential  
Singapore

**Architect**  
MKPL Architects Pte Ltd

**M&E Engineer**  
Squire Mech Pte Ltd

**Structural Engineer**  
KTP Consultants Pte Ltd

**Quantity Surveyor**  
Davis Langdon KPK  
(Singapore) Pte Ltd

**Landscape Consultant**  
Shma Company Limited

**ESD Consultant**  
Arup Singapore Pte Ltd

**Acoustic Consultant**  
Arup Singapore Pte Ltd

### Key Features

- Estimated energy savings: 377,542 kWh/yr; estimated water savings: 7998 m<sup>3</sup>/yr; RETV: 19.5 W/m<sup>2</sup>.
- Energy efficient '4-ticks' air-conditioners for all residential units.
- Motion sensors for lighting at private lift lobbies, staircases and common toilets.
- Water efficient washing machines rated WELS 'Good' for all residential units.
- Use of non-potable water including rainwater for landscape irrigation.
- Vertical green wall.

## Mixed Development at 15 Cairnhill Road (Residential)

New Residential Buildings



**Client / Developer**  
CapitaLand Singapore

**Project Manager**  
CapitaLand Residential  
Singapore

**Architect**  
RSP Architects Planners &  
Engineers (Pte) Ltd

**Structural Engineer**  
AECOM Singapore Pte Ltd

**M&E Engineer & ESD  
Consultant**  
Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Quantity Surveyor**  
Langdon & Seah Singapore  
Pte Ltd

**Lighting Consultant**  
WSP Ng Pte Ltd

**Landscape Consultant**  
COEN Design International  
Pte Ltd

### Key Features

- Estimated energy savings: 1,617,846 kWh/yr; estimated water savings: 5,238 m<sup>3</sup>/yr; RETV: 20.0 W/m<sup>2</sup>.
- Provision of energy efficient refrigerators rated '3 Ticks'.
- Use of sun pipes to bring in daylight into the development.
- Provision of green roof, rooftop gardens and Butterfly Garden.
- Non-chemical anti termite treatment.
- Pneumatic waste collection system.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Punggol Topaz**  
**(Punggol West C28)**

New Residential Buildings



**Client / Developer**  
Housing & Development Board

**Architect**  
Surbana International Consultants Pte Ltd

**Structural Engineer**  
Surbana International Consultants Pte Ltd

**M&E Engineer**  
Surbana International Consultants Pte Ltd

**Main Contractor**  
Expand Construction Pte Ltd

**Quantity Surveyor**  
Surbana International Consultants Pte Ltd

**Landscape Consultant**  
Surbana International Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 1,360,822 kWh/yr; estimated water savings: 108,947 m<sup>3</sup>/yr; RETV: 19.1 W/m<sup>2</sup>.
- Well-ventilated with 85 to 90% of units having windows facing North and South.
- All lifts with Variable Voltage Variable Frequency motor drive and sleep mode feature.
- 70% of water fittings in the development rated WELS 'Very Good'.
- Extensive greenery provision and Community Garden.
- Good environmental management during construction.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Skies Miltonia**  
New Residential Buildings



**Client / Developer**  
TG Master Pte Ltd

**Architect**  
Surbana International  
Consultants Pte Ltd

**Structural Engineer**  
Tham & Wong LLP

**M&E Engineer**  
Elead Associates Private

**Landscape Consultant**  
Surbana International  
Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 3,129,436 kWh/yr; estimated water savings: 134,834 m<sup>3</sup>/yr; RETV: 22 W/m<sup>2</sup>.
- Block layout designed to maximise ventilation.
- Provision of water efficient washing machines rated WELS 'Good'.
- Siphonic rainwater discharge at roof.
- Use of environmentally friendly products in construction of building and landscaping.
- Provision of 5 compost bins to recycle organic waste.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Twenty One Richards**  
New Residential Buildings



**Client / Developer**  
Aurum Land Pte Ltd

**Architect**  
Park + Associates Pte Ltd

**Structural Engineer**  
TEP Consultants Pte Ltd

**M&E Engineer**  
NEAM Solutions

**Main Contractor**  
Tanglin Corporation Pte Ltd

**Quantity Surveyor**  
LCH Quantity Surveying  
Consultant

**Key Features**

- Estimated energy savings: 39,149 kWh/yr; estimated water savings: 68.8 m<sup>3</sup>/yr; RETV: 21.2 W/m<sup>2</sup>.
- 47% reduction in power consumption for artificial lighting in common areas from minimum code requirements.
- Use of renewable energy with 125% replacement of electricity for common areas.
- Extensive use of certified sustainable construction products for residential units and common areas.
- Lush greenery with high green plot ratio of 5.3.
- Demolition protocol adopted with 30% of concrete waste being recovered and recycled.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Waterbay

New Residential Buildings



**Client / Developer**

Qingjian Realty (Edgefield Plains) Pte Ltd

**Architect**

ADDP Architects LLP

**Structural Engineer**

KCL Consultants Pte Ltd

**M&E Engineer**

KTP International Pte Ltd

**Main Contractor**

Qingjian International (South Pacific) Group Development Co. Pte Ltd

**Quantity Surveyor**

Landgon & Seah Singapore Pte Ltd

**Landscape Consultant**

Mace Studio Pte Ltd

### Key Features

- Estimated energy savings: 1,883,694 kWh/yr; estimated water savings: 233 m<sup>3</sup>/yr; RETV: 20.3 W/m<sup>2</sup>.
- Provision of natural daylighting and ventilation for common areas and wet areas within units.
- 47 % improvement in lighting power budget.
- Motion sensors for lighting at lift lobbies, staircases and common toilets.
- Extensive use of eco friendly and sustainable materials.
- Extensive greenery with green plot ratio of 5.2.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

## Waterways Banks

New Residential Buildings



**Client / Developer**  
Housing & Development  
Board

**Architect**  
ADDP Architects LLP

**Structural Engineer**  
KTP Consultants Pte Ltd

**M&E Engineer**  
United Project Consultants  
Pte Ltd

**Main Contractor**  
Sunhuan Construction Pte  
Ltd

**Quantity Surveyor**  
Landgon & Seah Singapore  
Pte Ltd

**Landscape Consultant**  
Martin Lee Designs

### Key Features

- Estimated energy savings: 1,841,681 kWh/yr; estimated water savings: 133,490 m<sup>3</sup>/yr; RETV: 18.6 W/m<sup>2</sup>.
- Rainwater collection system for washing common corridors.
- Enhanced landscaping with ABC water design features such as rain gardens for stormwater management.
- Green roofs and sky terraces at multi-storey car park and various residential blocks.
- Centralised refuse chutes for recyclable waste.
- Sheltered bicycle parking lots provided to promote cycling around Punggol Town.

## Waterway Woodcress

New Residential Buildings



**Client / Developer**  
Housing & Development  
Board

**Architect**  
ADDP Architects LLP

**Structural Engineer**  
KTP Consultants Pte Ltd

**M&E Engineer**  
United Project Consultants  
Pte Ltd

**Main Contractor**  
Rich Construction Company  
Pte Ltd

**Quantity Surveyor**  
Landgon & Seah Singapore  
Pte Ltd

**Landscape Consultant**  
Martin Lee Designs

### Key Features

- Estimated energy savings: 1,218,370 kWh/yr; estimated water savings: 31,845 m<sup>3</sup>/yr; RETV: 20.9 W/m<sup>2</sup>.
- Provision of energy efficient LED lighting as well as motion sensors.
- Energy efficient regenerative lifts.
- Rainwater collection system for washing common corridors.
- Bioswale at precinct landscape to help clean stormwater before discharge to public drain.
- Centralised refuse chutes for recyclable waste for all residential blocks.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS

**Woodlands Peak**  
New Residential Buildings



**Client / Developer**  
Housing & Development Board

**Project Manager**  
SIPM Consultants Pte Ltd

**Architect**  
Surbana International Consultants Pte Ltd

**Structural Engineer**  
Surbana International Consultants Pte Ltd

**M&E Engineer**  
Surbana International Consultants Pte Ltd

**Main Contractor**  
Jian Yu Construction Pte Ltd

**Quantity Surveyor**  
Surbana International Consultants Pte Ltd

**Landscape Consultant**  
Surbana International Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 211,082 kWh/yr; estimated water savings: 31,051 m<sup>3</sup>/yr; RETV: 17.9 W/m<sup>2</sup>.
- Good building orientation with optimum window-to-wall ratio.
- Extensive provision for natural ventilation & daylighting.
- Extensive greenery provision with high green plot ratio of 5.6.
- Optimal use of environmentally friendly materials.
- High buildability score.

## Green House @ Astrid Hill

Landed Houses



**Client / Developer**  
Mr Harry Chua Wah Eng

**Project Manager**  
HC Design Pte Ltd

**Architect**  
Strategic Design  
International Architects  
LLP

**Structural Engineer**  
PAL Consultancy Pte Ltd

**M&E Engineer**  
PTA Consultants Pte Ltd

**Main Contractor**  
Huat Builders Pte Ltd

**Quantity Surveyor**  
Oliver Ho & Associates

**Landscape Consultant**  
HC Design Pte Ltd

**ESD Consultant**  
ZEB-Technology Pte Ltd

### Key Features

- Energy efficient air-conditioning system and mechanical fans for all habitable spaces.
- Use of energy efficient appliances and LED lighting for internal and external spaces.
- Solar photovoltaic panels with 6 kWp system capacity.
- Extensive provision of green roof and vertical greenery.
- Automatic irrigation drip system and rainwater harvesting with rain sensors.
- Home automation system with energy monitoring devices.
- Non-chemical treatment for swimming pool.

## Greenville @ King Albert Park

Landed Houses



### **Client / Developer**

Mdm Yeoh Kheng Sooi

### **Architect**

Strategic Design  
International Architects  
LLP

### **Structural Engineer**

BK Consulting Engineers  
Pte Ltd

### **M&E Engineer**

Progressive Engineering &  
Management

### **Main Contractor**

TSF Building Construction  
Pte Ltd

### **Quantity Surveyor**

BKG Consultants Pte Ltd

### **ESD Consultant**

ZEB-Technology Pte Ltd

### **Key Features**

- Energy efficient air-conditioning system and mechanical fans for all habitable spaces.
- Provision of double glazing with low e-glass to minimise heat gain to the building.
- Use of energy efficient appliances and LED lighting for internal and external spaces.
- Home automation system with energy monitoring devices.
- Provision of fresh-air intake and enhanced filtration media for all bedrooms.
- Non-chemical treatment for swimming pool.
- Solar photovoltaic panels with 5 kWp system capacity and provision of solar water heater.

**BCA  
GREEN MARK AWARD  
FOR BUILDINGS**

<b>Project Name</b>	<b>Category</b>	<b>Client/ Developer/ Building Owner</b>
978 & 988 Toa Payoh North	New Non-Residential Buildings	Mapletree Industrial Trust Management Ltd
Administration Building	New Non-Residential Buildings	Tuaspring Pte Ltd
Greenhub	New Non-Residential Buildings	Greenpac (S) Pte Ltd
Halliburton Completion Tools Manufacturing Plant	New Non-Residential Buildings	Halliburton Completion Tools Manufacturing Plant Pte Ltd
JABIL @ TAMPINES	New Non-Residential Buildings	BP-JCS Pte Ltd
Mahabodhi Monastery	New Non-Residential Buildings	Mahabodhi Monastery
Marina Bay Fire Station & Neighbourhood Police Centre	New Non-Residential Buildings	Ministry of Home Affairs
New 2-storey changing room facilities at Changi Prison Complex (Cluster A)	New Non-Residential Buildings	Singapore Prison Service
New International Headquarters Building for BreadTalk Group	New Non-Residential Buildings	BreadTalk Group Ltd
OneKM	New Non-Residential Buildings	UOL Residential Development Pte Ltd/ UOL Property Investments Pte Ltd
Pratt & Whitney SCR	New Non-Residential Buildings	Ascendas (Tuas) Pte Ltd
SingHealth Polyclinics - Geylang	New Non-Residential Buildings	SingHealth Polyclinics
Tanglin Trust School (New Senior School Annex)	New Non-Residential Buildings	Tanglin Trust School Ltd
15 Changi Business Park Central 1	Existing Non-Residential Buildings	JTC Corporation

**BCA  
GREEN MARK AWARD  
FOR BUILDINGS**

<b>Project Name</b>	<b>Category</b>	<b>Client/ Developer/ Building Owner</b>
55 Market Street	Existing Non-Residential Buildings	BMT Limited as Trustee for Frasers Commercial Trust
71 Robinson Road	Existing Non-Residential Buildings	CR – 71 Robinson Road Singapore Pte Ltd
8 on Claymore	Existing Non-Residential Buildings	Sajahtera Investments (S) Pte Ltd
Bukit Panjang Plaza	Existing Non-Residential Buildings	HSBC Institutional Trust Services (Singapore) Limited as Trustee of CapitaRetail BPP Trust
Bukit Timah Plaza	Existing Non-Residential Buildings	The Management Corporation Strata Title Plan No. 568
Century Square	Existing Non-Residential Buildings	Century Square Holding Pte Ltd
China Square Central	Existing Non-Residential Buildings	BMT Limited as Trustee for Frasers Commercial Trust
Earth Arts Building	Existing Non-Residential Buildings	Earth Arts Pte Ltd
HarbourFront Tower One and Two	Existing Non-Residential Buildings	Mapletree Investments Pte Ltd
MediaCorp (MSCP)	Existing Non-Residential Buildings	MediaCorp Pte Ltd
Naumi Hotel	Existing Non-Residential Buildings	Hind Group
Office @ Scotts Road	Existing Non-Residential Buildings	Sun Venture (S) Pte Ltd
One Raffles Quay	Existing Non-Residential Buildings	One Raffles Quay Pte Ltd
Royal Plaza on Scotts	Existing Non-Residential Buildings	Sajahtera Investments (S) Pte Ltd
Sembawang Shopping Centre	Existing Non-Residential Buildings	CapitaMall Trust

**BCA  
GREEN MARK AWARD  
FOR BUILDINGS**

<b>Project Name</b>	<b>Category</b>	<b>Client/ Developer/ Building Owner</b>
Singapore American School	Existing Non-Residential Buildings	Singapore American School Limited
Valley Point	Existing Non-Residential Buildings	River Valley Tower Pte Ltd
VivoCity	Existing Non-Residential Buildings	Mapletree Commercial Trust
Bartley Residences	New Residential Buildings	Bartley Development Pte Ltd
Eight Courtyards	New Residential Buildings	Yishun Gold Pte Ltd
Floral Spring @ Yishun	New Residential Buildings	Housing & Development Board
Golden Carnation	New Residential Buildings	Housing & Development Board
Hedges Park	New Residential Buildings	Tripartite Developers Pte Ltd
One Balmoral	New Residential Buildings	Hong Leong Holdings Limited
Punggol ParcVista	New Residential Buildings	Housing & Development Board
Segar Meadows	New Residential Buildings	Housing & Development Board
The Luxurie	New Residential Buildings	Keppel Land Realty Pte Ltd
Watercolours	New Residential Buildings	HUGE Development Pte Ltd
Temasek Junior College	Existing Schools	Ministry of Education
Modern Eco Home @ Chatsworth Park	Landed Houses	Ms Goh Chiat Jin
Charlton 27	Landed Houses	Surindipity Pte Ltd

**BCA  
GREEN MARK AWARD  
FOR BUILDINGS**

<b>Project Name</b>	<b>Category</b>	<b>Client/ Developer/ Building Owner</b>
30 Toh Guan Road (Annexed New Warehouse)	New Non-Residential Buildings	RBC Investor Services Trust Singapore Limited (as trustee of Cambridge Industrial Trust)
Cookhouse at Gurkha Contingent	New Non-Residential Buildings	Singapore Police Force
Duke-NUS Graduate Medical School Singapore	Existing Non-Residential Buildings	Duke-NUS Graduate Medical School
North Academic Complex (North Spine Building, Block N1, N1.1, N2, N2.1, N3, N4, Admin Building, AWS1, MW2, MW3) Nanyang Technological University	Existing Non-Residential Buildings	Nanyang Technological University
Singapore Prison Service Transit Centre	Existing Non-Residential Buildings	Singapore Prison Services
Tung Centre	Existing Non-Residential Buildings	Guocoland Pte Ltd

# BCA GREEN MARK AWARD FOR BEYOND BUILDINGS

The BCA Green Mark Award for Beyond Buildings – an extension of the BCA Green Mark Award for Buildings - aims to recognise good practices in the built environment beyond the building level, in order to ensure an all-rounded sustainable and high quality built environment.

**This year, projects awarded under the BCA Green Mark Award for Beyond Buildings are classified under the following:**

- BCA Green Mark Award for Districts
- BCA-NParks Green Mark Award for New Parks

# BCA GREEN MARK AWARD FOR DISTRICTS

## The Award

The BCA Green Mark for Districts, launched in 2009, is an initiative by BCA to promote and recognise environmentally-friendly and sustainable practices in the planning and implementation of district developments. The BCA Green Mark for Districts seeks to achieve a holistic and integrated approach in the planning and design of multiple buildings and infrastructure within the district from the initiation stage.

### **The districts are evaluated based on the following five criteria:**

- Energy Efficiency
- Water Efficiency
- Material and Waste Management
- Environmental Planning
- Green Buildings and Green Transport
- Community and Innovation

Green districts help individual buildings leverage on a more sustainable district platform, leading to better environmental performance and cost effectiveness.

By moving beyond buildings and implementing Green Mark at the district level, the scheme will allow larger scale contributions to the built environment in terms of reduction in waste, carbon emissions, energy and water consumption.

## CleanTech Park



**Client / Developer**  
JTC Corporation

**Project Manager**  
JTC Corporation

**Master Planner**  
JTC Corporation

**Infrastructure Planners**  
JTC Corporation

Jurong Consultants Pte Ltd

Surbana International  
Consultants Pte Ltd

**Main Contractors**  
Eng Lam Contractors Co  
Pte Ltd

Horti-Flora Services Pte Ltd

**Landscape Consultant**  
Atelier Dreiseitl Asia Pte  
Ltd

### Key Features

- Estimated energy savings: 116,618 kWh/yr.
- Masterplan ring-road layout works with the natural topography and minimises need to cut-and-fill.
- Energy efficient LED lighting resulting in more than 40% energy savings from code baseline.
- District level energy monitoring and automatic control system through iEMS.
- Holistic stormwater management with 64% of overall area within central wetland natural cleansing catchment.
- Conservation and enhancement of freshwater wetland forest habitat in the central green core, with design for wildlife corridors and animal crossings.
- Jurong Rock Cavern rocks used as sub-base for the roads.
- Green trellis linking buildings to provide shade and reduce heat gain.

# BCA-NPARKS GREEN MARK AWARD FOR NEW PARKS

## The Award

The BCA–NParks Green Mark Award for New Parks, launched in 2010, is a joint initiative by the Building Construction Authority (BCA) and the National Parks Board (NParks). It aims to inspire and promote sustainable park design as well as to identify best practices in park design, construction, management and maintenance planning. The BCA–NParks Green Mark for New Parks is specifically developed for civic landscape areas, examining social and economic sustainability with a strong emphasis on environmental sustainability. This environmental assessment framework also complements the BCA–NParks Green Mark for Existing Parks.

### **Under a comprehensive assessment system, parks are evaluated based on seven criteria:**

- Material Resources
- Water Efficiency
- Energy Efficiency
- Greenery and Urban Ecology
- Design for Ease of Maintenance and Accessibility
- Parks Development and Construction Management
- Other Green Initiatives

All new parks, including regional, neighbourhood, conservation, nature and public theme parks, can be assessed under this scheme.

## Firefly Park @ Clementi



**Owner**  
 Housing & Development Board

**Park Manager**  
 Bukit Panjang Holland Town Council

**Green Mark Team**  
 Surbana International Consultants Pte Ltd

Housing & Development Board

**Main Contractor**  
 Yong Hup Seng Mesh Co Pte Ltd

**Landscape Consultant**  
 Surbana International Consultants Pte Ltd

### Key Features

- Conservation of 172 existing mature trees and palms as well as introduction of 139 native trees and 6,346 native shrubs on site.
- Extensive use of sustainable finishes and construction materials on site.
- ABC features such as bioswale and rain garden for stormwater management and to minimise the use of concrete drains.
- Provision of community gardening spaces to encourage residents to farm and harvest their own crops.

# BCA GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES

The BCA Green Mark Award for Occupant-Centric schemes is catered for the multi-tenanted and multi-functional aspect of the diverse buildings which make up the built environment. A single building may be occupied by different tenants, who each have different operational functions. The various schemes under the BCA Green Mark Occupant-Centric schemes allow appropriate sustainability benchmarks and criteria to be tailored for the various core operations of tenants within buildings.

**This year, the BCA Green Mark Award for Occupant-Centric schemes includes the following categories:**

- BCA-IDA Green Mark Award for Data Centres (Pilot)
- BCA Green Mark Award for Office Interior
- BCA Green Mark Award for Retail (Pilot)
- BCA Green Mark Award for Supermarkets (Pilot)

# BCA-IDA GREEN MARK AWARD FOR DATA CENTRES

## The Award

The BCA-IDA Green Mark for Data Centres, launched in 2012, is a joint collaboration between BCA and the Infocomm Development Authority of Singapore (IDA) to drive data centres in Singapore to be more energy efficient.

In this technological era, the growth of cloud-based services, online media and transactions is fuelling a rapid increase in global demand for data centres. This is resulting in a growing energy footprint for data centres as they are prodigious consumers of energy. According to IDA, it is estimated that in Singapore, the 10 largest data centres consume energy equivalent to that produced by 130,000 households. The local commercial data centre operational capacity is projected to increase by 50% from 2010 to 2015 with a corresponding increase in energy consumption.

The scheme covers both new and existing data centres. It is also applicable to both buildings specifically built for data centres as well as data centres within office buildings.

### **The scheme assesses data centres on the following criteria:**

- Energy Efficiency
- Water Efficiency
- Sustainable Construction / Operation and Management
- Indoor Environmental Quality
- Other Green Features

BCA-IDA  
**GREEN MARK AWARD**  
FOR DATA CENTRES

## Credit Suisse Asia Pacific Regional Data Centre

Located At 1 Serangoon North Avenue 6  
Existing Data Centre



**Client / Developer**  
Credit Suisse AG

**Project Manager**  
Meinhardt (Singapore)  
Pte Ltd

**Architect**  
AWP Pte Ltd

**M&E Engineer**  
Meinhardt (Singapore)  
Pte Ltd

**Structural Engineer**  
Parsons Brinkerhoff Pte Ltd

**Quantity Surveyor**  
Turner & Townsend Pte Ltd

**Main Contractor**  
Obayashi Corporation

**Landscape Consultant**  
Stephen Caffyn Landscape  
Design Pte Ltd

**ESD Consultant**  
Kaer Pte Ltd

### Key Features

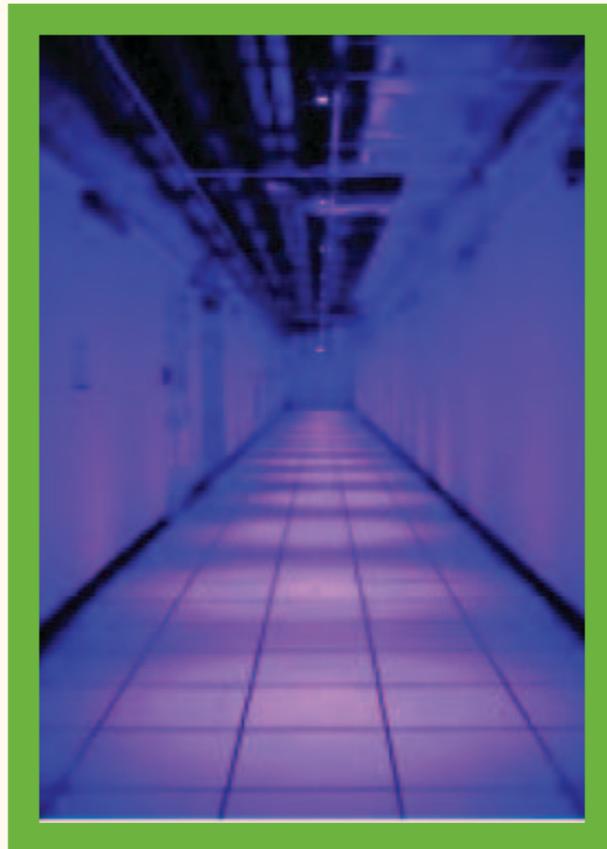
- Highly energy efficient data centre facility.
- Air-conditioning system efficiency of 0.67 kW/ton.
- CRAC unit air management system with Return Temperature Index (RTI) above 90%.
- Extensive monitoring of ICT equipment and virtualization to optimise power utilization.
- Continuous and ongoing M&E plant monitoring and optimization to achieve energy savings beyond the original design.
- Bi-level lighting for lighting sensor control at each row of server racks.
- Rain water harvesting and NEWater connection to reduce water consumption.
- Multi-layered façade system providing extensive insulation and sun shading.

BCA-IDA  
**GREEN MARK AWARD**  
FOR DATA CENTRES

## Equinix SG2 Data Centre

Located at #02-02, Pioneer Hub

Existing Data Centre



**Client / Developer**  
Equinix Singapore Pte Ltd

**Project Manager**  
Confluence Project  
Management Pte Ltd

**Architect**  
AWP Pte Ltd

**M&E Engineer**  
DSCO Group Pte Ltd

**Structural Engineer**  
Tham & Wong LLP

**Quantity Surveyor**  
WT Partnership (S) Pte Ltd

**Main Contractor**  
Wah Loon Engineering  
Pte Ltd

### Key Features

- Chiller plant system efficiency of 0.70 kW/ton.
- Implementation of green features resulted in 10% reduction in electricity usage for SG2, translating to energy savings of 4.3 million kWh/yr.
- Cold aisle containment infrastructure, which helps lower energy consumption and increase cooling efficiency, to support higher power density installations on-site.
- Automated system of electrically commutated fans installed to improve air flow and air distribution as well as to reduce noise levels.
- Use of energy efficient motion-activated LED lighting across the entire SG2 site.
- NEWater used for ACMV system.

BCA-IDA  
**GREEN MARK AWARD**  
FOR DATA CENTRES

## Abbott Laboratories - GIS Asia Pacific Regional Facility

Located at 26 Tuas South Avenue 10  
New Data Centre



**Data Centre Owner**  
Abbott Laboratories  
– Global Information  
Services

**Data Centre Consultant**  
Abbott Laboratories  
– Global Information  
Services (GIS) & Global  
Engineering Services (GES)

**Managing Agent/  
Maintenance Contractor**  
Abbott Manufacturing  
Singapore (AMS) Facilities  
Team

**M&E Engineers**  
Jacobs Engineering  
  
Abbott Global Engineering  
Services (GES)

### Key Features

- Use of monitoring tools to monitor IT equipment utilisation and server virtualisation.
- Data centre equipped with energy metering to measure total facility power, energy usage and total IT equipment power for determination of the Power Usage Effectiveness (PUE) number.
- Modular approach to IT capacity expansion through phase expansion.
- Future IT capacity expansion cooling requirements to be managed by the Cooling Distribution Unit and Rack Rear Door Heat Exchanger.

BCA-IDA  
**GREEN MARK AWARD**  
FOR DATA CENTRES

## Singapore Tourism Board Data Centre

Located at Tourism Court, 1 Orchard Spring Lane  
Existing Data Centre



**Data Centre Owner**  
Singapore Tourism Board

**Data Centre Consultant**  
Hewlett-Packard Singapore  
(Sales) Pte Ltd

**Managing Agent/  
Maintenance Contractor**  
Hewlett-Packard Singapore  
(Sales) Pte Ltd Team

**M&E Engineer**  
Emerson Network Power  
(Singapore) Pte Ltd

### Key Features

- Fulfilled requirements under the SS564 certification 'Singapore Standard for Green Data Centres'.
- Power train efficiency - a measure of the ability of the electrical power supply system to provide the required level of redundancy while maintaining high load factors - of 90% .
- Data centre equipped with energy metering to measure total facility power, energy usage and total IT equipment power for determination of the Power Usage Effectiveness (PUE) number.
- Carbon dioxide monitoring for occupied areas.

# BCA GREEN MARK AWARD FOR OFFICE INTERIOR

## The Award

The BCA Green Mark for Office Interior is BCA's initiative to promote and recognise environmentally-friendly and sustainable practices of office tenants.

Office buildings make up a significant percentage of the building stock in Singapore. Such buildings may be multi-tenanted, hence the way individual tenanted spaces are operated and maintained may not always be under the control of the building owner. The BCA Green Mark for Office Interior complements the BCA Green Mark for Buildings by encouraging individual office tenants within buildings to be sustainable. The scheme is applicable to both existing and new offices that have or have not undergone renovation.

**The scheme, launched in 2009, has since been gaining momentum with the industry, with its take-up rate being on the rise each year. Offices are evaluated under the following criteria:**

- Energy Efficiency
- Water Efficiency
- Sustainable Management and Operation
- Indoor Environmental Quality
- Other Green Features

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## American Express International Inc.

Located at #08-02, Hyflux Innovation Centre



**Tenant/ Owner**  
American Express  
International Inc.

**Renovation Consultant / Contractor**  
Ngai Chin Construction  
Pte Ltd

**Facility Manager Company**  
American Express  
International Inc.

**M&E Consultant**  
J. Roger Preston  
(Singapore) Pte Ltd

**Managing Agent/ Maintenance Contractor**  
Cushman & Wakefield  
(Singapore) Pte Ltd

**ESD Consultant**  
Building System &  
Diagnostics Pte Ltd

**Interior Design Consultant**  
Ai Associates Pte Ltd

**Cost Consultant**  
WT Partnership (Singapore)  
Pte Ltd

### Key Features

- Located in Hyflux Innovation Centre, a BCA Green Mark Platinum Building.
- Energy efficient air-conditioning system with zoning and controls.
- Extensive use of energy efficient LED Lighting.
- Motion sensors for lighting in meeting rooms and other infrequently used areas.
- 98% of office equipment rated 'Energy Star'.
- Water efficient water fittings all rated WELS 'Excellent'.
- Extensive use of sustainable materials for office fit out and operation.

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## **BHP Billiton Marketing Asia Pte Ltd**

Located at #50-01, Marina Bay  
Financial Centre Tower 2



**Tenant/ Owner**  
BHP Billiton Marketing Asia  
Pte Ltd

**Project Manager**  
Merx Construction  
Management Pte Ltd

**Renovation Consultant**  
Facility Link & DLE J.V.

**Facility Manager**  
Colliers International  
Consultancy & Valuation  
(Singapore) Pte Ltd

**M&E Engineer**  
Arup Singapore Pte Ltd

**ESD Consultant**  
Arup Singapore Pte Ltd

**Designer**  
Geyer Environments  
Pte Ltd

**Cost Manager**  
Turner & Townsend Pte Ltd

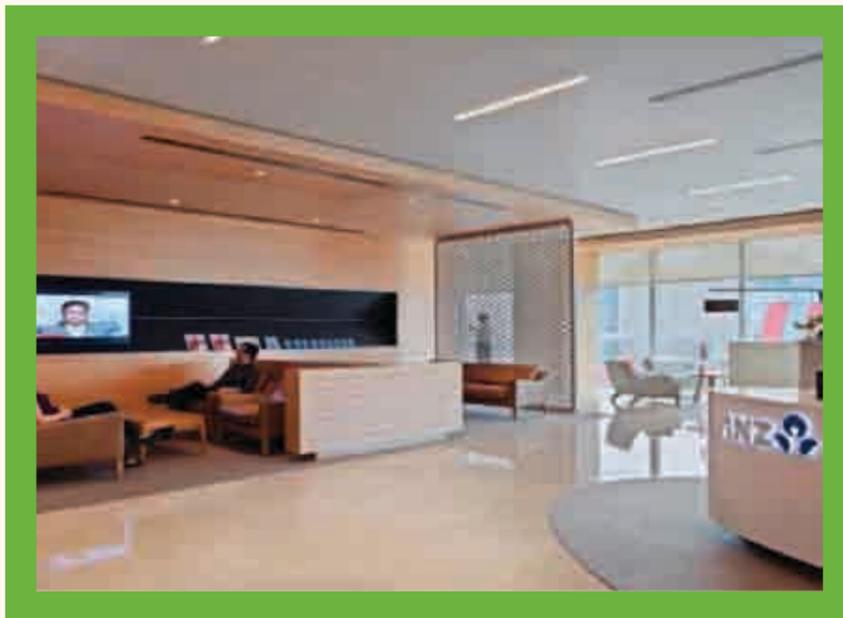
### **Key Features**

- Energy efficient lighting design with power savings of 56% from code requirements.
- Integrated BFMS for real time monitoring of energy and water consumption.
- Energy efficient office equipment.
- Water efficient fittings.
- Furniture and carpets with recycled and recyclable contents.
- Indoor green wall.
- Centralised waste management design with no personal bins provided to staff.

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## Australia and New Zealand Banking Group Limited

Located at #30-00, Ocean Financial Centre



**Tenant/ Owner**  
ANZ Banking Group  
Limited

**Main Contractor**  
ISG Asia (Singapore)  
Pte Ltd

**Facility Manager**  
Jones Lang LaSalle  
Property Consultants Pte  
Ltd

**M&E Consultant**  
J Roger Preston  
(Singapore) Pte Ltd

**Interior Designer**  
Geyer Environments  
Pte Ltd

### Key Features

- Low lighting power budget outperforming the energy efficiency performance specified by the Singapore Standard by 37%.
- Adoption of various lighting and air-conditioning control strategies such as scheduling and extensive zoning to improve energy efficiency.
- More than 90% of office equipment by design power input are Energy Star certified.
- Reuse of more than 1,700 office chairs from the consolidated offices.
- Inter-floor staircase to connect the various business units closer together vertically and reduce reliance on lifts.

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## BP Singapore Pte Ltd

Located at #02-01, Keppel Bay Tower



**Tenant/ Owner**  
BP Singapore Pte Ltd

**Facility Manager  
Company**  
Johnson Controls Global  
WorkPlace Solutions

**Energy Management  
Consultant**  
Global Facility  
Management Pte Ltd

**Lighting Supplier**  
ES-Team Lighting Pte Ltd

### Key Features

- Replacement of T8 lighting with energy efficient LED lighting throughout the office resulting in a halving of lighting power bills.
- SMARTRoom Check-in System for meeting rooms resulting in 30% reduction in booking wastage, hence ensuring optimal usage of office space.
- Task lights equipped with individual occupancy sensors.
- GoGreen committee formed in 2007 to plan environmental activities for the organisation. Green measures implemented by the GoGreen committee achieved estimated operational cost savings of \$450,000 annually compared to the base year of 2007.
- Promoting the safe use of fire escape staircases to reduce lift usage.

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## City Developments Limited

Located at #02-00 and #05-00, City House



### Tenant/ Owner

City Developments Limited

### Key Features

- Extensive use of energy efficient LED lights.
- Use of energy-saving lighting system resulting in 50% reduction in lighting consumption.
- All water fittings rated either WELS 'Very Good' or 'Excellent'.
- Long-lasting existing office furniture used since 2006.
- Extensive recycling facilities and waste management.

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## Facility Link Private Limited

Located at 4 Sungei Kadut Crescent



**Tenant/ Owner**  
Facility Link Pte Ltd

**Renovation Contractor**  
Motivo Inc Pte Ltd

**M&E Consultant**  
DLE M&E Pte Ltd

**Managing Agent/  
Maintenance Contractor**  
Facility Link Pte Ltd

**ESD Consultant**  
Building System &  
Diagnostics Pte Ltd

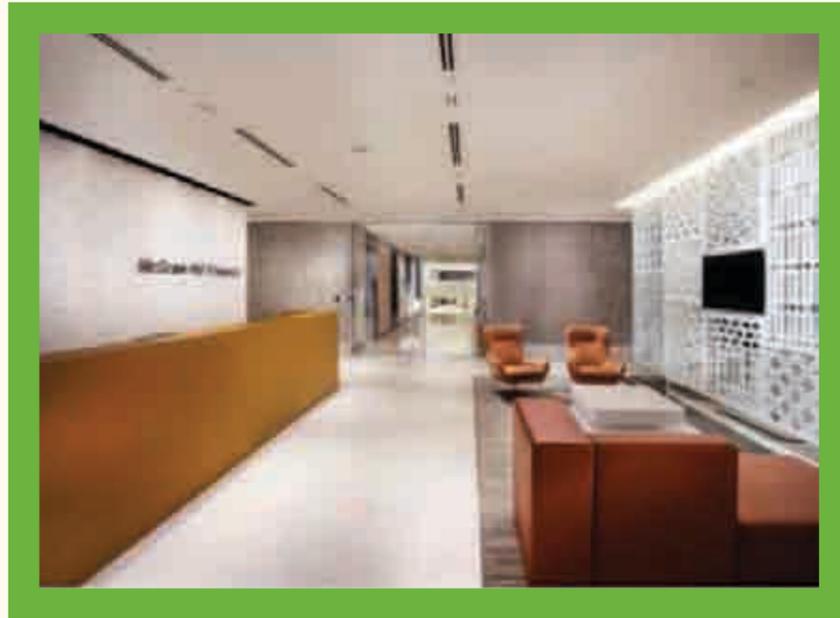
### Key Features

- Use of photocell sensor to optimise use of daylighting.
- Provision of motion detector for lighting.
- 96 % of office equipment with energy efficient label.
- All water fittings rated WELS 'Excellent'.
- Use of certified sustainable materials and products containing at least 30% recycled content.

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## McGraw-Hill Financial

Located at #23-00, Marina Bay  
Financial Centre Tower 3



**Tenant/ Owner**  
McGraw-Hill Financial

**Renovation Contractor**  
Ngai Chin Construction Pte  
Ltd

**Facility Manager  
Company**  
CB Richard Ellis Pte Ltd

**M&E Consultant**  
Meinhardt (Singapore) Pte  
Ltd

**Managing Agent/  
Maintenance Contractor**  
CB Richard Ellis Pte Ltd

**ESD Consultant**  
Kaer Pte Ltd

**Interior Design  
Consultant**  
BBFL Pte Ltd

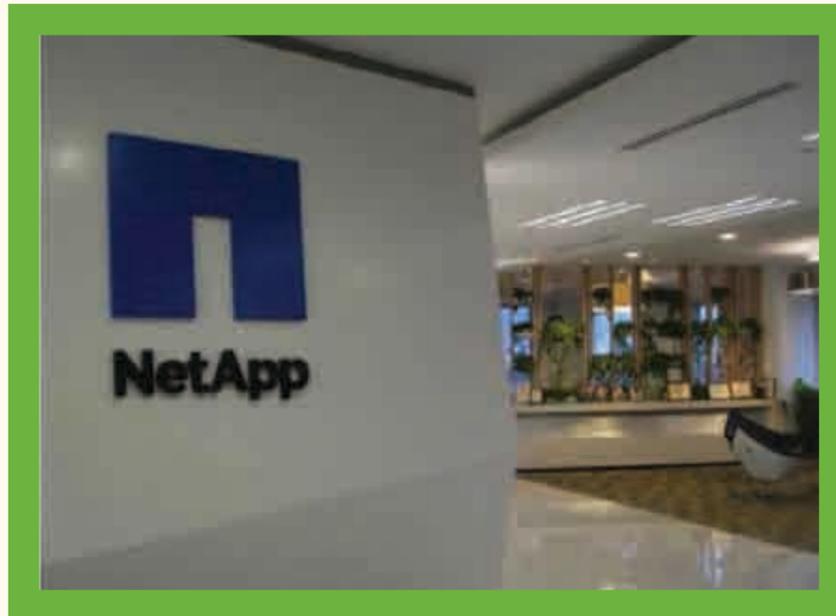
### Key Features

- Use of energy efficient lighting throughout the office space, such as LED lights and T5 tubes which have high frequency ballasts.
- Extensive lighting zoning and controls with 24-hour operated motion sensors to reduce lighting energy consumption.
- Extensive use of environmentally sustainable materials for office renovation.
- ID access printing control to reduce paper wastage.
- Water-leak detection system in pantry.

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## NetApp Singapore Pte Ltd

Located at #08-01, Millenia Tower



**Tenant/ Owner**

NetApp Singapore Pte Ltd

**Renovation Contractor**

Jim & Hall's Pte Ltd

**M&E Consultant**

D'Perception Singapore  
Pte Ltd

**Other specialist  
consultant**

Building System &  
Diagnostics Pte Ltd

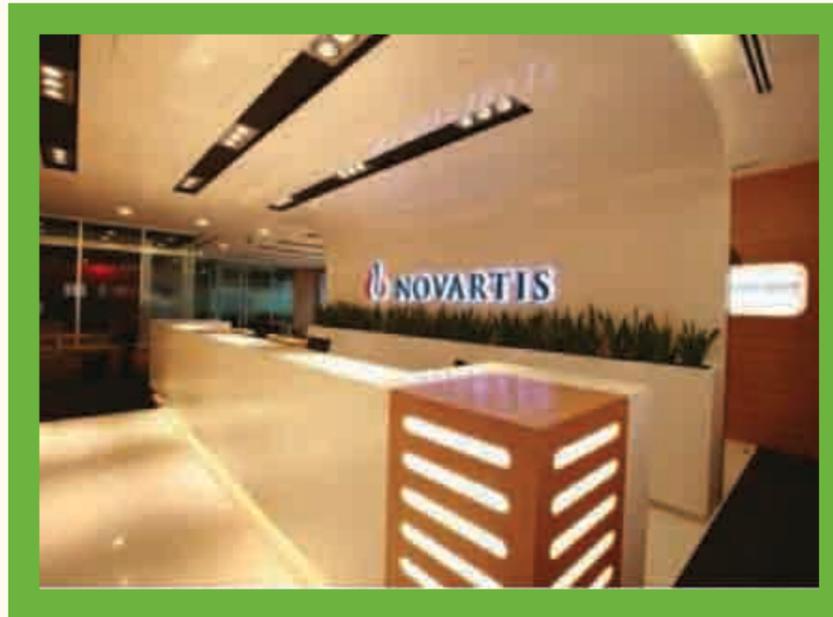
### Key Features

- Scheduling and zoning of lighting and air conditioning for better control of energy usage.
- Motion sensors for all rooms with inconsistent occupancy rate.
- Extensive use of sustainable products for office fit-out.
- Extensive greenery provision in office to improve indoor air quality and employee productivity.
- Ergonomic lessons and flexible working hours for the welfare of NetApp employees.

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR

## Novartis Asia Pacific Pharmaceuticals Pte Ltd

Located at #10-25/28, Mapletree Business City



**Tenant/ Owner**  
Novartis Asia Pacific  
Pharmaceuticals Pte Ltd

**Project Manager**  
Jones Lang LaSalle  
Property Consultants Pte  
Ltd

**M&E Consultant**  
T.Y. Lin International Pte  
Ltd

**M&E Contractor**  
LSK Engineering  
(Singapore) Pte Ltd

**Renovation Contractor**  
New Art Interior Pte Ltd

**Interior Design**  
SCA Design Pte Ltd

### Key Features

- Energy efficient LED lighting for reception, breakout areas, boardroom and meeting rooms.
- Photo-cell sensors along the internal office perimeter to optimise daylighting usage.
- Motion sensors coupled to lighting in internal meeting rooms.
- Video-conferencing facilities for communication with global branches to reduce fuel consumption from travelling.
- Novartis Green Committee formed to raise environmental awareness among staff and promote educational green activities.

BCA  
**GREEN MARK AWARD**  
 FOR OFFICE INTERIOR

**Project**

**Owner / Client / Developer**

**Aegis Media Asia Pacific**

*(Located at Levels 28 and 29, 1 Raffles Place Tower 2)*

**Aegis Media Asia Pacific**

**AkzoNobel**

*(Located at 3 Changi Business Park Vista)*

**Akzo Nobel Paints (Asia Pacific) Pte Ltd**

**Ashurst LLP**

*(Located at Level 24, Marina Bay Financial Centre Tower 3)*

**Ashurst LLP**

**Clifford Chance Pte Ltd**

*(Located at Level 25, Marina Bay Financial Centre Tower 3)*

**Clifford Chance Pte Ltd**

**DBS Bank Ltd**

*(Located at Levels 3,5,6, 8 to 15 and Levels 40 to 46, Marina Bay Financial Centre Tower 3)*

**DBS Bank Ltd**

**Kajima Overseas Asia Pte Ltd Development Division**

*(Located at Level 19, Parkway Parade)*

**Kajima Overseas Asia Pte Ltd Development Division**

**Raffles Quay Asset Management Pte Ltd**

*(Located at Level 4, Marina Bay Financial Centre Tower 1)*

**Raffles Quay Asset Management Pte Ltd**

**Ricoh (Singapore) Pte Ltd**

*(Located at Level 4, Mapletree Business City)*

**Ricoh (Singapore) Pte Ltd**

**United Technologies International Operations, Inc**

*(Located at Level 9, Anson House)*

**United Technologies International Operations, Inc**

**Visa Worldwide Pte Ltd**

*(Located at Levels 7 and 10, Singapore Post Centre)*

**Visa Worldwide Pte Ltd**

**BCA  
GREEN MARK AWARD  
FOR OFFICE INTERIOR**

**Project**

**Owner / Client / Developer**

**BNP Paribas Singapore Branch**

*(Located at Levels 31 to 34, Ocean Financial Centre)*

**BNP Paribas Singapore Branch**

**BNP Paribas Wealth Management**

*(Located at Levels 25 and 26, Ocean Financial Centre)*

**BNP Paribas Wealth Management**

**Kyoob-ID Pte Ltd**

*(Located at Level 1, Platinum 28)*

**Kyoob-ID Pte Ltd**

**One Marina Property Services Pte Ltd**

*(Located at Level 15, One Marina Boulevard)*

**One Marina Property Services Pte Ltd**

**Raymond Construction Pte Ltd**

*(Located at 57 Kaki Bukit Place)*

**Raymond Construction Pte Ltd**

# BCA GREEN MARK AWARD FOR RETAIL

## The Award

The BCA Green Mark for Retail was launched in 2012 to recognise the sustainable efforts of individual retail tenants. It provides recognition of retailers' commitment to reduce their environmental impact.

The retail sector is one of the highest consumers of energy per floor area. Data collected from retail buildings assessed under the Green Mark for Buildings showed that approximately 50% of the total building energy is consumed by the retail tenants. The tenant loads within such buildings also lead to high air-conditioning load within the retail mall.

As the Green Mark for Buildings is catered for building owners, it may not directly address the way building tenants consume energy. Hence, the BCA Green Mark for Retail complements the Green Mark for Buildings scheme by addressing specific areas within the tenant space such as the sustainable fit-out and operation, with a strong focus on assessing efficiency of installed light fittings and plug load energy consumption - both which are within the control of the tenant. These criteria are developed to guide and encourage tenants to fit out their shops in a sustainable manner that reduces the operating costs, energy consumption, cooling load whilst maintaining the required aesthetic.

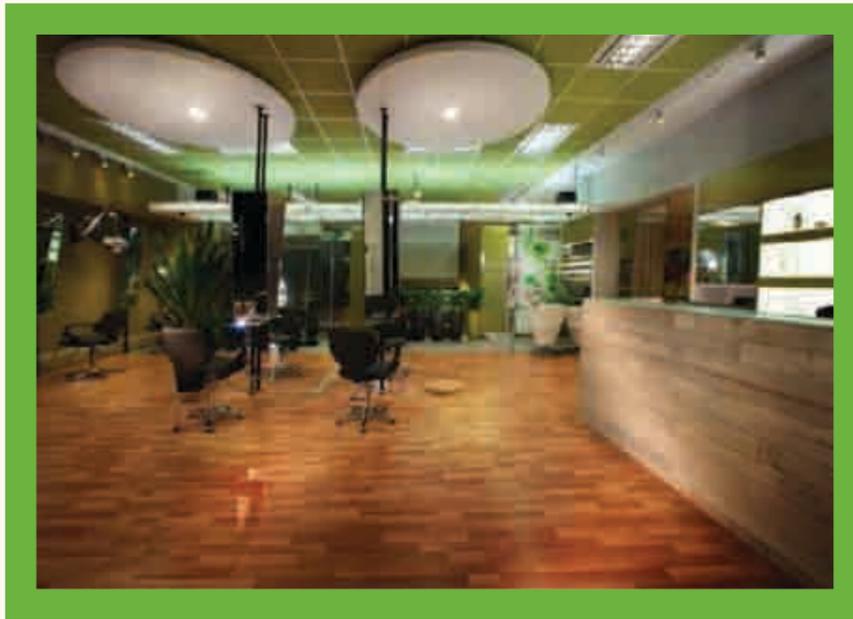
### **The scheme assesses retail tenants under the following five criteria:**

- Energy Efficiency
- Water Efficiency
- Sustainable Awareness and Operation
- Indoor Environmental Quality
- Other Green Features

BCA  
**GREEN MARK AWARD**  
 FOR RETAIL

## J's Hair Studio

Located at #B1-01, ITE College East



**Tenant/ Owner**  
 Mr Johnny C.P. Tan  
 Ms June Ng

**Landlord/ Retail Mall**  
 ITE College East (Simei)

**Renovation Consultant / Contractor**  
 I D 95 Interior, Singapore

**Other Specialist Consultant / Contractor**  
 Mr Benn Ng Beng Chye

### Key Features

- Low lighting power budget due to use of energy efficient T5 and LED lighting.
- Full control of lighting circuits based on zone spaces.
- Conservation of existing walls, flooring, ceiling including light fixtures during fit-out.
- Reuse and recycling of wood, aluminium panels and chairs from previous outlet.
- Environmentally friendly products included as part of sales product lineup.
- Provision of dedicated recycling bin and promotion of recycling via incentives for customers.
- Provision of potted plants to create a more conducive indoor environment.

## **Euraugo (formerly named 'Dressaday')**

Located at #03-03, 313@Somerset



**Tenant/ Owner**  
Ms Pauline Ong

**Landlord/ Retail Mall**  
313@Somerset

### **Key Features**

- Replacement of halogen decorative lighting with LED fittings.
- 30% improvement over baseline for lighting power budget.
- Lighting zoning control for fitting rooms.

BCA  
**GREEN MARK AWARD**  
FOR RETAIL

## Royal Silver

Located at #B1-38A, 313@Somerset



**Tenant/ Owner**  
Mr William Soh

**Landlord / Retail Mall**  
313@Somerset

### Key Features

- Maximal use of energy efficient LED for display lighting.
- Extremely low plug loads.
- Retaining and conservation of existing walls, flooring and ceiling.

# BCA GREEN MARK AWARD FOR SUPERMARKETS

## The Award

The BCA Green Mark for Supermarkets, launched in 2012, is an initiative by BCA to promote and recognise environmentally friendly as well as sustainable practices and features in supermarket outlets.

Within commercial buildings, tenants - including supermarket operators - have a significant impact on the total building energy consumption. There are about 300 supermarkets in Singapore, and each outlet's floor area can range from 90 m<sup>2</sup> to 4,500 m<sup>2</sup>. Refrigeration, required to keep the goods and produce fresh, accounts for up to 50% of the total supermarket energy consumption. The rest of the energy is consumed by lighting, plug loads and air-conditioning. By incorporating green features, supermarkets can reduce the total energy consumed by as much as 10%.

The BCA Green Mark for Supermarkets aims to encourage supermarket operators to adopt energy efficient design, equipment and green practices at their outlets. Such measures can help supermarket operators reduce their energy consumption and utilities costs. Green supermarkets also have the power to educate and motivate supermarket patrons to be environmentally responsible.

### **The scheme assesses supermarkets based on the following five criteria:**

- Energy Efficiency
- Water Efficiency
- Environmental Protection
- Indoor Environmental Quality
- Other Green Features

BCA  
**GREEN MARK AWARD**  
FOR SUPERMARKETS

## FairPrice Finest Supermarket at Zhong Shan Park

Located at #02-01, Zhong Shan Park



**Owner**  
NTUC FairPrice  
Co-operative Ltd

**M&E Consultant**  
HY M&E Consultancy  
Service Pte Ltd

**M&E Contractor**  
Victor Engineering &  
Trading Pte Ltd

**Main Contractor**  
Teamsystem Construction  
Pte Ltd

**Refrigeration Contractor**  
VSD Engineering  
Enterprises Pte Ltd

### Key Features

- Carbon dioxide refrigerant for refrigeration system to reduce carbon footprint and conserve energy.
- Centrally-controlled energy efficient refrigeration showcases fitted with doors, electronic expansion valves, anti-sweat control and electronically commutated (EC) fans.
- LED for all light fittings as well as auto zonal lighting controls and occupancy sensors installed.
- Energy Management System with remote monitoring from headquarters to monitor in-store energy consumption.
- Taps for sinks and basins rated 'Excellent' and private water meters installed to monitor consumption and detect leakages.
- Collection of recyclables and conversion of organic waste into nutrient liquid by in-store bio-helper.
- Numerous sustainable SGBC green products used for fit-out.

BCA  
**GREEN MARK AWARD**  
FOR SUPERMARKETS

**FairPrice Finest Supermarket  
at myVillage at Serangoon  
Garden**

Located at #B1-11 to #B1-K09  
Serangoon Garden Village



**Owner**  
NTUC FairPrice  
Co-operative Ltd

**M&E Consultant**  
HY M&E Consultancy  
Service Pte Ltd

**M&E Contractor**  
Victor Engineering &  
Trading Pte Ltd

**Main Contractor**  
Success Forever  
Construction &  
Maintenance Pte Ltd

**Refrigeration Contractor**  
VSD Engineering  
Enterprises Pte Ltd

**Key Features**

- Energy efficient refrigeration system using variable speed drives for compressor, electronically commutated (EC) fans for condensers, and transducers.
- Centrally controlled energy efficient refrigeration showcases installed with doors, electronic expansion valves, anti-sweat control and electronically commutated (EC) fans.
- All lights in the shop are energy efficient LED, including the lighting for display cabinets.
- Auto zonal lighting controls and occupancy sensors to further conserve energy.
- Energy Management System with remote monitoring from headquarters to track in-store refrigeration, lighting, receptacle, air conditioning and delicatessen consumption.
- Taps for sinks and basins rated 'Excellent'.
- Collection of recyclables.

BCA  
**GREEN MARK AWARD**  
FOR SUPERMARKETS

## Giant Hyper at Suntec City Mall

Located at #B1-150-159, Suntec City Mall)



**Owner**  
Cold Storage Singapore  
(1983) Pte Ltd

**M&E Consultant**  
AECOM Singapore Pte Ltd

**Green Consultant**  
Energiz Singapore

### Key Features

- Electronically commutated (EC) fan for all refrigeration cases.
- Variable speed drives for fans and compressor motors.
- 85% of display cabinets are enclosed.
- Energy efficient LED for store lighting and all refrigeration cases.
- Energy Monitoring System.
- Display of posters describing Giant's 'GO GREEN' values and policies.

## BCA GREEN MARK AWARD FOR SUPERMARKETS

### FairPrice Supermarket at Ang Mo Kio 712

Located at Blk 712, Ang Mo Kio Avenue 6



**Owner**  
NTUC FairPrice  
Co-operative Ltd

**M&E Consultant**  
HY M&E Consultancy  
Service Pte Ltd

**M&E Contractor**  
Victor Engineering &  
Trading Pte Ltd

**Main Contractor**  
Success Forever  
Construction &  
Maintenance Pte Ltd

**Refrigeration Contractor**  
VSD Engineering  
Enterprises Pte Ltd

#### Key Features

- Energy efficient refrigeration system using variable speed drives for compressor, electronically commutated (EC) fans for condensers, and transducers.
- Centrally controlled energy efficient refrigeration showcases installed with doors, electronic expansion valves, anti-sweat control and electronically commutated (EC) fans.
- All lights in the shop are energy efficient LED, including the lighting for display cabinets.
- Auto zonal lighting controls and occupancy sensors to further conserve energy.
- Energy Management System with remote monitoring from headquarters to track in-store refrigeration, lighting, receptacle, air conditioning and delicatessen consumption.

## Cold Storage Jelita

Located at #01-01, Jelita Shopping Centre



### Owner

Cold Storage Singapore  
(1983) Pte Ltd

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Refrigerated display cabinets and showcases fitted with doors and LED lighting.
- Energy efficient LED lighting for trading area and back-of-house.
- Energy Management System (EMS) to monitor and trend log major sources of energy consumption.
- Sustainable programmes in place for recycling and reusing of cardboard.
- Informative and educational posters displayed at trading area.

# BCA GREEN MARK AWARD OVERSEAS



BCA International Pte Ltd is a wholly-owned subsidiary of BCA. It provides a multitude of services to help develop excellent built environments worldwide. The Green Mark certification is among one of the most popular services offered by BCA International.

## The Success Of Green Mark Overseas

As one of the more than 20 Green Building rating systems recognised by the World Green Building Council (WGBC), Green Mark has gained popularity in the region as it is developed especially for the tropical climate. Green Mark can be customised to suit various countries' climatic conditions. There are more than 190 applications as of 1 March 2013.



The Green Mark scheme is not limited to buildings but also encompass landed houses and office interior, as shown by the respective award winner under these categories.

### More developers are using Green Mark to provide meaningful differentiation of their buildings. Benefits of a Green Mark building include:

- Reduction in water and energy bills;
- Improvement in indoor environmental quality;
- Reduction in potential environmental impact.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS (OVERSEAS)

**Sinarmasland Plaza, Indonesia**  
New Non-Residential Buildings



**Client / Developer**

PT Bumi Serpong Damai  
Tbk

**Architect**

Aedas (Singapore) Pte Ltd

**M&E Engineer**

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

**Structural Engineer**

PT Haerte Widya Konsultan

**Landscape Consultant**

Aedas Landscape Ltd

**ESD Consultant**

Beca Carter Hollings &  
Ferner (S.E. Asia) Pte Ltd

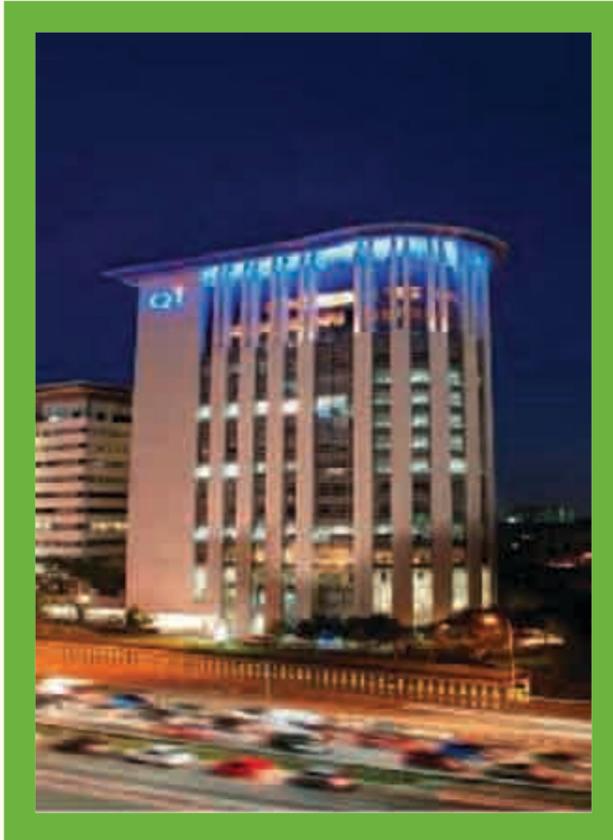
**Key Features**

- Estimated energy savings: 1,200,216 kWh/yr; estimated water savings: 19,134 m<sup>3</sup>/yr; ETTV: 42.0 W/m<sup>2</sup>.
- Energy efficient chiller plant system.
- Naturally ventilated atrium.
- Grey water recycling.

GOLD

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS (OVERSEAS)

**QI Tower, Malaysia**  
Existing Non Residential Buildings



**Building Owner**

Wawasan QI Properties Sdn  
Bhd

**ESD Consultant**

GreenA Consultants Pte Ltd

**Key Features**

- Estimated energy savings: 324,453 kWh/yr; estimated water savings: 3,159 m<sup>3</sup>/yr.
- Energy efficient T5 and LED lighting as well as water efficient fittings.
- Use of sustainable building materials in construction as well as low VOC paint.
- Corporate environmental policy and green procurement policy in place, and provision of green guide for building users.

# BCA GREEN MARK AWARD FOR BUILDINGS (OVERSEAS)

## 28 Mont'Kiara, Malaysia New Residential Buildings



### Client / Developer

Lucky Bright Star Sdn Bhd

### Project Manager

Akitec Habitas

### Architect

Liu & Wo Architects Pte Ltd

### M&E Engineer

J Roger Preston (Malaysia)  
Sdn Bhd

### Structural Engineer

SLP Perunding Sdn Bhd

### Quantity Surveyor

JUB Padu Sdn Bhd

### Main Contractor

Aston Star Sdn Bhd

### Landscape Consultant

Malik Lip & Associates Sdn  
Bhd

### ESD Consultant

Building System &  
Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 7,917,740 kWh/yr; estimated water savings: 32,000 m<sup>3</sup>/yr; RETV: 21.2 W/m<sup>2</sup>.
- Energy efficient air conditioners rated '4-Ticks'.
- More than 50 motion sensors installed to reduce lighting energy consumption.
- High green plot ratio 7.9 with roof top gardens extensively comprising more than 50% of the roof area.

BCA  
**GREEN MARK AWARD**  
 FOR BUILDINGS (OVERSEAS)

**Hill Crest Residence, China**  
 New Residential Buildings



**Developer**  
 Keppel Land China Ltd

**Client**  
 Spring City Golf & Lake  
 Resort

**Architect**  
 Palmer & Turner  
 Consultants (Shanghai) Ltd

**M&E Engineer**  
 Kunming Architectural  
 Design & Research Institute  
 Co.,Ltd

**Structural Engineer**  
 Kunming Architectural  
 Design & Research Institute  
 Co.,Ltd

**Quantity Surveyor**  
 Northcroft Lim Consultants  
 Pte Ltd

**Contractor**  
 Fu Jian Jiu Long Group

**Landscape Consultant**  
 Site Concepts International  
 Pte Ltd

**ESD Consultant**  
 Earth-In-Mind Pte Ltd

**Interior Design  
 Consultant**  
 Bent Severin & Associates  
 Pte Ltd

**Property Management**  
 Spring City Estate  
 Management Department

**Key Features**

- Estimated energy savings: 311,594 kWh/yr;  
 estimated water savings: 43,800 m<sup>3</sup>/yr.
- Construction of sewage treatment plant so treated  
 sewage water can be used as a non-potable water  
 source.
- In-house nursery to replace and nurture plants for  
 the developments' usage.
- Motion sensors coupled to lights at apartment lift  
 lobbies, adjoining corridors and staircase landings.

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS (OVERSEAS)

**Ken Rimba Legian, Malaysia**  
New Residential Buildings



**Client / Developer**  
Ken Holdings Berhad

**Project Manager**  
Ken Holdings Berhad

**Architect**  
K.H. Tan Architects

**M&E Engineer**  
LMC Consult Sdn Bhd

**Structural Engineer**  
JPS Consulting Engineers  
Sdn Bhd

**Landscape Consultant**  
Landarc Associates Sdn  
Bhd

**ESD Consultant**  
Building System &  
Diagnostics Pte Ltd

**Key Features**

- Estimated water savings: 5,900 m<sup>3</sup>/yr; .  
RETV: 16.4 W/m<sup>2</sup>.
- Designed for natural ventilation with favourable building orientation and 92.7% of units with windows facing North and South direction.
- Planted an extensive amount of 931 trees and 65 palms at site.
- Skylight roof in every unit with internal green planters to improve indoor environmental quality.

BCA  
**GREEN MARK AWARD**  
 FOR BUILDINGS (OVERSEAS)

**The Estella, Vietnam**  
 New Residential Buildings



**Client / Developer**  
 Estella Joint Venture Co.  
 Ltd  
*(A joint development by  
 Keppel Land International  
 Ltd and Tien Phuoc Co. Ltd)*

**Project Manager**  
 Estella Joint Venture Co.  
 Ltd  
*(A joint development by  
 Keppel Land International  
 Ltd and Tien Phuoc Co. Ltd)*

**Architects**  
 AWP Pte Ltd  
  
 International Construction  
 & Investment Consultancy  
 Co., Ltd

**Quantity Surveyor**  
 Langdon & Seah Vietnam  
 Company Ltd

**M&E Engineers**  
 Roger Preston (Singapore)  
 Pte Ltd  
  
 J Roger Preston (Vietnam)  
 Co. Ltd

**Structural Engineers**  
 International Construction  
 & Investment Consultancy  
 Co., Ltd  
  
 DE Consultants (Singapore)  
 Pte Ltd

**Landscape Consultant**  
 Site Concepts International  
 Pte Ltd

**ESD Consultants**  
 Aurecon Singapore  
 (Pte.) Ltd

**Key Features**

- Estimated energy savings: 5,069,429 kWh/yr; estimated water savings: 33,945 m<sup>3</sup>/yr.
- Performance of air conditioning units equivalent to '3 ticks' rating under Singapore's Energy Efficiency Labelling Scheme.
- Majority of water fittings in the development rated WELS 'Very Good' and non-potable water used for landscape irrigation.
- Use of titanium dioxide self-cleaning facade in all toilets within clubhouse.

BCA  
**GREEN MARK AWARD**  
 FOR BUILDINGS (OVERSEAS)

**Riviera Cove Villa  
 Development Project,  
 Vietnam**  
 Landed Houses



**Client / Developer**  
 Riviera Cove Joint Venture  
 Limited Liability Company

**Project Manager**  
 Riviera Cove Joint Venture  
 Limited Liability Company

**Architect**  
 P&T Consultants Pte Ltd

**Quantity Surveyor**  
 Langdon & Seah Vietnam  
 Company Ltd

**M&E Engineers**  
 International Construction  
 & Investment Consultancy  
 Co.,Ltd

**Structural Engineers**  
 International Construction  
 & Investment Consultancy  
 Co., Ltd

DE Consultants (Singapore)  
 Pte Ltd

**Landscape Consultant**  
 Site Concepts International  
 Pte Ltd

**ESD Consultants**  
 Aurecon Singapore (Pte.)  
 Ltd

**Main Contractors**  
 Tuan Le Construction  
 Company Limited

COMA 9 Construction  
 Company Limited

**Key Features**

- Solar photovoltaic panels which harness renewable energy to power up clubhouse.
- Stormwater treatment and provision of ecopond.
- Extensive greenery with rainwater collection and use of lagoon water to minimise use of portable water for irrigation.
- Drip system and rain sensor for efficient water irrigation.

GOLD

BCA  
**GREEN MARK AWARD**  
FOR OFFICE INTERIOR (OVERSEAS)

**Kami Builders Sdn Bhd,  
Malaysia**

Located at Level 3A 7-15, QI Tower



**Tenant**  
Kami Builders Sdn Bhd

**Building Owner**  
Wawasan QI Properties  
Sdn Bhd

**Renovation Consultant /  
Contractor**  
Axis Interior Contracts Sdn  
Bhd

**M&E Consultant**  
ISD Consultants Sdn Bhd

**Managing Agent /  
Maintenance Contractor**  
Jones Lang Wootton  
(Singham Sulaiman Sdn  
Bhd)

**ESD Consultant**  
GreenA Consultants Pte  
Ltd

**Key Features**

- Use of energy efficient LED and T5 lighting.
- Use of water efficient WELS rated taps and mixers.
- Carbon dioxide sensor at AHU with motorised damper.

CERTIFIED

BCA  
**GREEN MARK AWARD**  
FOR BUILDINGS (OVERSEAS)

<b>Project</b>	<b>Catergory</b>	<b>Owner / Client / Developer</b>
Wisma Panasonic	New Non-Residential Buildings	Panasonic Malaysia Sdn Bhd
Riverside Ville	New Residential Buildings	CapitaLand China