



## Welcome to the BCA Awards 2011

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. This year, it marks a few firsts in the building and construction industry; BCA introduced new award categories such as The Green Building Individual Awards and the Construction Productivity Awards to mark the evolution of the industry, and collectively the industry attained a record number of 261 awards in the following categories:

- 164 Green Mark Awards**
- 4 Green Building Individual Awards**
- 13 Universal Design Awards**
- 28 Construction Excellence Awards**
- 8 Design and Engineering Safety Excellence Awards**
- 10 Green and Gracious Builder Awards**
- 31 Construction Productivity Awards**
- 3 Built Environment Leadership Awards**

BCA congratulates all the winners, for their unwavering commitment to excellence and dedication in driving the building and construction industry to greater heights.

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# BCA GREEN MARK CHAMPION AWARD

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

## **Types of Award**

- BCA Green Mark Champion
- BCA Green Mark Platinum Champion



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

## Key Assessment Criteria

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

# BCA GREEN MARK PLATINUM CHAMPION AWARD



Artist's impressions

## City Developments Limited

City Developments Limited (CDL) is the first winner of the BCA Green Mark Platinum Champion Award since it was launched in 2008. CDL is the clear industry leader in green buildings, having also been the first to win the Green Mark Champion Award in 2008.

As a developer and landlord, CDL takes a holistic life-cycle approach towards environmental sustainability. CDL has adopted a three-pronged approach to being an eco-champion that addresses each phase of a building's life-cycle:

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

### Key Achievements

- 50 projects awarded Gold and above (including 16 Platinum and 16 Gold<sup>Plus</sup> awards)



**CITY DEVELOPMENTS LIMITED**  
Conserving the Environment. Caring for the Community.

# BCA GREEN MARK CHAMPION AWARD



Artist's impressions

## Housing & Development Board

The leading property developer and owner in Singapore, the Housing & Development Board (HDB) is committed to providing homes of quality and value through innovative and sustainable housing.

Environmentally-friendly designs, cost-efficient, sustainable practices and solutions for its public housing projects have enhanced residents' lifestyles and living space.

For its innovative sustainable development efforts with wide-ranging national impact, HDB is the first public sector agency to be awarded the BCA Green Mark Champion Award.

### Key Achievements

- 14 projects awarded Gold and above (including 5 Platinum and 1 Gold<sup>Plus</sup> awards)



# BCA GREEN MARK FOR BUILDINGS AWARD

## 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 from efficient use of key resources such as energy and water, leading to lower operation and maintenance costs. Other less tangible benefits include enhanced occupant productivity and health due to good indoor environmental quality.

Green Mark for Buildings Award includes the following categories:

- Non-Residential Buildings (New & Existing)
- Residential Buildings (New & Existing)
- Landed Houses
- Overseas projects for above categories

# Green Mark Advisory Committee

## Chairman

**Mr Lee Chuan Seng**

Chairman

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

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**Mr Richard Hassell**

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**Mr Allen Ang**

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**Mr Cheong Yew Kee**

2B Architects

**Mr Vincent Low**

G-Energy Global Pte Ltd

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National University of Singapore

**Mr Vincent Tong**

AECOM Singapore Pte Ltd

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National Environment Agency

**Mr Chin Chi Leong**

Building and Construction Authority

**Prof Raymond Wong**

Nanyang Technological University

**Mr Tan Tian Chong**

Building and Construction Authority

**Mr Russell Cole**

Arup Singapore Pte Ltd

# BCA GREEN MARK FOR BUILDINGS AWARD



★ Platinum

## Campus for Research Excellence and Technological Enterprise – CREATE

(New Non-Residential Buildings)

### Client / Developer

National Research Foundation

### Project Manager

Jurong Consultants Pte Ltd

### Architect

Perkins & Will / DP Architects Pte Ltd

### M&E Engineer

Arup / Lincolne Scott Ng Pte Ltd

### Structural Engineer

Arup Singapore Pte Ltd

### Quantity Surveyor

Faithful + Gould Pte Ltd

### Main Contractor

Obayashi Corporation

### Landscape Consultant

SWA / Site Tectonix Pte Ltd

### ESD Consultant

Arup Singapore Pte Ltd

### Key Features

- Estimated energy savings: 9,000,000 kWh/yr; Estimated water savings: 66,000 m<sup>3</sup>/yr; ETTV (Envelope Thermal Transfer Value): 37.61 W/m<sup>2</sup>.
- Heat recovery and efficient laboratory ventilation system.
- PV and BIPV with 300 kWp.
- Extensive use of green concrete - Washed Copper Slag (WCS) and Ground Granulated Blastfurnace Slag (GGBS).
- Vertical greenery, rooftop greenery and sky gardens designed for efficient chilled beams system.



★ Platinum

## CleanTech One

(New Non-Residential Buildings)

### Client / Developer

JTC Corporation

### Project Manager

Surbana International 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

Kaylim Construction & Trading Pte Ltd

### Landscape Consultant

Surbana International Consultants Pte Ltd

### Façade Consultant

Arup Singapore Pte Ltd

### ESD Consultant

Surbana Technologies Pte Ltd

### Key Features

- Estimated energy savings: 9,345,210 kWh/yr; Estimated water savings: 11,217 m<sup>3</sup>/yr; ETTV: 30.81 W/m<sup>2</sup>.
- Passive building design that utilises natural lighting and ventilation.
- 50% energy savings through harvesting of renewable energy.
- LED light fittings as the major light fittings.
- Energy Monitoring System (EMS) with mini weather station on the rooftop to provide better measurement and analysis in addition to the standard Building Management System (BMS) provision.
- 1 MWp of fuel cell to be installed in the development.
- Harvesting of rain water and recycling of grey water for irrigation and toilet flushing.
- Water sensitive urban planning with extensive provision of bioswales, biotopes, and rain garden.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## Grundfos Singapore

(New Non-Residential Buildings)(Special)

### Client / Developer

Grundfos (Singapore) Pte Ltd

### Project Manager

COWI

### Architect

W Architects Pte Ltd

### M&E Engineer

Bescon Consulting Engineering Pte Ltd

### Structural Engineer

Mega Consult

### Quantity Surveyor

Bovis Lend Lease Projects Pte Ltd

### Main Contractor

Bovis Lend Lease Projects Pte Ltd

### ESD Consultant

Cofely SEA Pte Ltd

### Key Features

- Estimated energy savings: 727,934 kWh/yr; Estimated water savings: 1,832 m<sup>3</sup>/yr; ETTV: 28.26 W/m<sup>2</sup>.
- Office building highly insulated from external heat with double-layer wall with insulation and double glazed low-E window.
- High efficiency small water-cooled chiller plant (<150RT of cooling loads) to operate at <0.70 kW/RT when operates at High-EFF mode.
- The factory is 100% naturally ventilated with staff provided with adiabatic cooling vests for the enhancement of natural ventilation.
- High air tightness building design.
- Workstations installed with energy saving USB EcoStrip for better electricity conservation management.



## JCube

(New Non-Residential Buildings)

### Client / Developer

CapitaMall Trust

### Project Manager

Capitaland Retail Project Management 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

Davis Langdon & Seah Singapore Pte Ltd

### Main Contractor

Wee Hur Construction Pte Ltd

### Landscape Consultant

DLQ Design Pte Ltd

### ESD Consultant

Aurecon (Singapore) Pte Ltd

### Key Features

- Estimated energy savings: 8,793,984 kWh/yr; Estimated water savings: 3,419 m<sup>3</sup>/yr; ETTV: 38.06 W/m<sup>2</sup>.
- Air-conditioning system with an efficiency of 0.66 kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency.
- Use of energy efficient lighting, implementation of green lease for tenants and provision of education corners.
- Photovoltaic panels on rooftop with system capacity of about 50 kWp to harvest solar energy for production of electricity.
- Rainwater harvesting system for landscape irrigation.
- Recycling of waste heat and AHU condensates.
- Green demolition.

★ Platinum

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## Land Transport Authority Customer Service Centre

(New Non-Residential Buildings)

**Client / Developer**  
Land Transport Authority

**Project Manager**  
QingJian Group Co. Ltd  
Singapore Branch

**Architect**  
ADDP Architects LLP

**M&E Engineer**  
Rankine & Hill (S) Pte Ltd

**Structural Engineer**  
KTP Consultants Pte Ltd

**Main Contractor**  
QingJian Group Co. Ltd  
Singapore Branch

**Landscape Consultant**  
Exklusive Landscape Pte Ltd

**ESD Consultant**  
Green Dot Consulting Pte Ltd

### Key Features

- Estimated energy savings: 400,151 kWh/yr; Estimated water savings: 1,778 m<sup>3</sup>/yr; ETTV: 39.23 W/m<sup>2</sup>.
- High performance façade and green roof to reduce heat gain.
- High efficiency chiller plant with system performance of 0.69kW/RT.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Heat recovery for hot water used in showers.
- Renewable energy from solar panels to run the lifts in the building.

★ Platinum



## Max Atria Annex

(New Non-Residential Buildings)

**Client / Developer**  
Singapore Tourism Board

**Project Manager**  
Rider Levett Bucknall LLP

**Architect**  
Surbana International Consultants  
Pte Ltd

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

**Structural Engineer**  
Surbana International Consultants  
Pte Ltd

**Quantity Surveyor**  
Rider Levett Bucknall LLP

**Main Contractor**  
Fonda Global Engineering Pte Ltd

**Landscape Consultant**  
Surbana International Consultants  
Pte Ltd

### Key Features

- Estimated energy savings: 857,839 kWh/yr; Estimated water savings: 420,480 m<sup>3</sup>/yr; ETTV: 37.85 W/m<sup>2</sup>.
- Double glazed low-E glass in combination with fritted and spandrel glass as well as two layers of effective sun shading devices were used to maximise natural daylighting.
- Use of photo sensors and extensive use of LED light fittings.
- Siphonic rain water discharge system.
- Auto condenser tube cleaning system.
- Emulsion diesel for building standby generators.
- Biodegradable insulating dielectric fluid for transformers.
- Automatic drip irrigation system with rain sensors.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## Metropolis

(New Non-Residential Buildings)

**Client / Developer**  
Ho Bee (One-North) Pte Ltd

**Project Manager**  
Ho Bee Investment Ltd

**Architect**  
DCA Architects Pte Ltd

**M&E Engineer**  
KTP International Pte Ltd

**Structural Engineer**  
KTP Consultants Pte Ltd

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

**Main Contractor**  
Lum Chang Building Contractors Pte Ltd

**Landscape Consultant**  
Cicada Private Limited

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

### Key Features

- Estimated energy savings: 13,198,213 kWh/yr; Estimated water savings: 2,784 m<sup>3</sup>/yr; ETTV: 38.5 W/m<sup>2</sup>.
- Façade optimisation and verification through the use of simulation tools.
- Excellent chiller plant system operating at 0.597 kW/ton with instrumentation to monitor the efficiency of the central chilled-water plant.
- Solar panels of 50 kWp to harness and generate clean energy.
- Extensive greenery provision of 8.20 consisting of sky and roof gardens.
- Storm water management system.

★ Platinum



## Ministry of Manpower, Bendemeer Service Centre

(New Non-Residential Buildings)

**Client / Developer**  
Ministry of Manpower

**Project Manager**  
Davis Langdon & Seah Singapore Pte Ltd

**Architect**  
ADDP Architects LLP

**C&S Consultant**  
SCE Consultants (Pte) Ltd

**Landscape Architect**  
Martin Lee Studio Pte Ltd

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

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

**Interior Design**  
FD Chapman Pte Ltd

**Main Contractor**  
Santarli Construction Pte Ltd - Zheng Keng Engineering & Construction Pte Ltd Joint-Venture

**Total Building Performance Consultant**  
ZEB-Technology Pte Ltd

### Key Features

- Estimated energy savings: 2,113,616 kWh/yr; Estimated water savings: 12,846 m<sup>3</sup>/yr; ETTV: 35.32 W/m<sup>2</sup>.
- Chiller plant with efficiency of 0.58kW/ RT - Guaranteed Energy Savings Performance Contract Project (GESp).
- Under floor air-conditioning for general offices, through proprietary carpet with micro pores discharge.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Passive displacement ventilation for customer service hall and multi-purpose hall.
- LED lighting system for the entire development, use of motion sensors for toilets and staircases and use of photo sensors to control office periphery lighting.
- Extensive landscaping, porous paving to reduce the urban heat island effect and bio swales to prevent flooding by filtering rainwater through surface vegetation.
- 35kWp of onsite energy generated through photovoltaic cells.
- Use of water efficient fittings that are rated Excellent under WELS and recycling of grey water for toilet flushing.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## **Ngee Ann Poly seventy3** (New Non-Residential Buildings)

**Client / Developer**  
Ngee Ann Polytechnic

**Architect**  
3HPArchitects Pte Ltd

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

**Structural Engineer**  
DE Consultants (S) Pte Ltd

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

**Main Contractor**  
V3 Construction Pte Ltd

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

### **Key Features**

- Estimated energy savings: 876,566 kWh/yr; Estimated water savings: 7,727 m<sup>3</sup>/yr; ETTV: 39.46 W/m<sup>2</sup>.
- Efficient chiller plant system with performance of 0.65 kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Natural ventilation for corridors, staircases, toilets and atrium.
- Installation of renewable energy solar photovoltaic panel with 20kWp to replace 1.5% of the total building energy consumption.
- Extensive use of environmentally friendly materials such as dry wall partitions, ceiling boards, water proofing membrane and low-VOC paints.

★ Platinum



## **One Raffles Place Tower 2** (New Non-Residential Buildings)

**Client / Developer**  
OUB Centre Limited

**Project Manager**  
OUB Centre Limited

**Architect**  
SAA Architects Pte Ltd

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

**Structural Engineer**  
TEP Consultants Pte Ltd

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

**Main Contractor**  
Sato Kogyo – Hitachi Plant Joint Venture

**Landscape Consultant**  
Belt Collins International (S) Pte Ltd

**Design Architect**  
Tange Associates Asia Pte Ltd

**ESD Consultant**  
Kaer Pte Ltd

### **Key Features**

- Estimated energy savings: 3,262,321 kWh/yr; Estimated water savings: 12,091 m<sup>3</sup>/yr; ETTV: 38.69 W/m<sup>2</sup>.
- Efficient chiller plant system with performance of 0.645kW/ton.
- 0.58% of total building energy consumption replaced by solar energy harvested from 53kWp of solar PV panels.
- Concrete Usage Index (CUI) of 0.39 m<sup>3</sup>/m<sup>2</sup>.
- Extensive rainwater harvesting to replace portable water needs for toilet flushing.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## Quayside Isle

(New Non-Residential Buildings)

### Client / Developer

City Developments Limited

### Architect

Axis Architects Planners Pte Ltd

### M&E Engineer

Meinhardt (Singapore) Pte Ltd

### Structural Engineer

KTP Consultants Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Main Contractor

Ssangyong Engineering  
& Construction Co., Ltd

### Landscape Consultant

Cicada Pte Ltd

### Lighting Consultant

Meinhardt Light Studio Pte Ltd

### Energy Modeling Consultant

Building System and Diagnostics  
Pte Ltd

### Acoustic Consultant

Acviron Acoustics Consultants  
Pte Ltd

### Key Features

- Estimated energy savings: 1,365,392 kWh/yr; Estimated water savings: 10,684 m<sup>3</sup>/yr; ETTV: 39.54 W/m<sup>2</sup>.
- Extensive shade provided to enhance ETTV.
- Common areas are all naturally ventilated.
- Heat recovery system to produce hot water to F&B.
- Extensive use of solar photovoltaic panels (50 kWp).
- Provision of pneumatic waste collection system for F&B.

★ Platinum



## Rolls-Royce Achord

(New Non-Residential Buildings)  
(Special)

### Client / Developer

Rolls-Royce Singapore Pte Ltd

### Project Manager

CH2M Hill Singapore Pte Ltd

### Architect

Hwang Architects Pte Ltd

### M&E Engineer

Shinsung Eng Co., Ltd  
Nylect Engineering Pte Ltd

### Structural Engineer

B.C. Koh & Partners Pte Ltd

### Quantity Surveyor

CH2M Hill Singapore Pte Ltd

### Main Contractor

Boustead Projects Pte Ltd

### Landscape Consultant

Earthscape Concepts Pte Ltd

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 13,939,724 kWh/yr; Estimated water savings: 32,555 m<sup>3</sup>/yr; ETTV: 19.21 W/m<sup>2</sup>.
- Green architectural design resulting in low ETTV.
- Efficient chiller plant system with performance of 0.605 kW/ton and lighting using T5 fluorescent tubes.
- Heat recovery system for control of temperature and humidity.
- Rainwater for toilet flushing and landscape irrigation.
- Stormwater management system to filter rainwater.
- 100% recycling of AHU condensates and use of permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Green corner to showcase the monitoring of energy and water consumption.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## Rolls-Royce Project Red Dot (Hub/SATU)

(New Non-Residential Buildings) (Special)

### Client / Developer

Rolls-Royce Singapore Pte Ltd

### Project Manager

Turner & Townsend Pte Limited

### Architect

Architect Team 3 Pte Ltd

### M&E Engineer

Megatrends Consulting Engineers

### Structural Engineer

Longrove Associates Pte Ltd

### Quantity Surveyor

Turner & Townsend Pte Limited

### Main Contractor

Sato Kogyo (S) Pte Ltd

### Landscape Consultant

Earthscape Concepts Pte Ltd

### M&E Contractor

Hitachi Plant Technologies, Ltd

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 7,955,685 kWh/yr; Estimated water savings: 29,617 m<sup>3</sup>/yr; ETTV: 19.24 W/m<sup>2</sup>.
- Low ETTV.
- Efficient chiller plant system with performance of 0.590kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Heat pump system.
- Fabric duct air distribution system.
- Extensive use of sustainable construction materials and products.
- Collection of food waste by third party for electricity generation.
- Collection of used cooking oil by third party for conversion to bio-diesel.
- Replacement of conventional transformer silicon oil with bio-fuel.

★ Platinum



## Rolls-Royce Test Bed Facility

(New Non-Residential Buildings) (Special)

### Client / Developer

Rolls-Royce Singapore Pte Ltd

### Project Manager

Turner & Townsend Pte Limited

### Architect

Archi-Theme Partnership

### M&E Engineer

Bescon Consulting Engineers Pte

### Structural Engineer

Chong & Lee Consultants Pte Ltd

### Quantity Surveyor

Turner & Townsend Pte Limited

### Main Contractor

Cenco International

### Main Builder

Boustead Projects Pte Ltd

### Landscape Consultant

Earthscape Concepts Pte Ltd

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 1,459,000 kWh/yr; Estimated water savings: 11,858 m<sup>3</sup>/yr; ETTV: 8.79 W/m<sup>2</sup>.
- Efficient chiller plant system with performance of 0.590kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Good orientation of the building without direct West-facing façade.
- Extensive use of environmentally friendly products for interior and exterior.
- Collection of 100% AHU condensates for flushing.
- Used up to 30% Recycled Concrete Aggregates (RCA) and Wash Copper Slag (WCS) to replace fine and course aggregate for the construction of the Control Block.
- Use of Ground Granulated Blast Furnace Slag (GGBS) to replace up to 40% Ordinary Portland Cement (OPC) in structural construction of the super-flat floors and structural walls.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## Tiong Seng Prefab Hub

(New Non-Residential Buildings)

### Client / Developer

Tiong Seng Contractors Pte Ltd

### Project Manager

Tiong Seng Contractors Pte Ltd

### Architect

LOOK Architects Pte Ltd

### M&E Engineer

HPX Consulting Engineers Pte Ltd

### Structural Engineer

LSW Consulting Engineers Pte Ltd

### Quantity Surveyor

Tiong Seng Contractors Pte Ltd

### Main Contractor

Tiong Seng Contractors Pte Ltd

### ESD Consultant

Greenbuilders Pte Ltd

### Key Features

- Estimated energy savings: 577,500 kWh/yr; ETTV: 38.58 W/m<sup>2</sup>.
- Eco facade for superior envelope thermal performance and vertical greenery at air-conditioned facade areas.
- High efficiency VRV air-conditioning system.
- Cool roof design with extensive greenery and urban farming.
- Monsoon windows with passive stack for natural ventilation.
- Metal perforated façade to enhance natural day lighting.
- Rainwater harvesting and good irrigation system with drip sensors and rain control sensors.
- Good environmental management with dust curtains, wood wool panel and dust monitoring system.
- Automated pre-cast manufacturing for increased productivity.

★ Platinum



## Causeway Point

(Existing Non-Residential Buildings)

### Building Owner

HSBC Institutional Trust Services  
(Singapore) Limited As Trustee of Frasers  
Centrepont Trust

### Facility Management

Frasers Centrepont Property  
Management Services Pte Ltd

### ESCO

LJ Energy Pte Ltd

### ESD Consultant

AL Consulting Engineers /  
LJ Energy Pte Ltd

### Key Features

- Estimated energy savings: 3,126,513 kWh/yr; Estimated water savings: 5,400 m<sup>3</sup>/yr.
- Low-E glass façade achieving ETTV of 39.8 W/sqm.
- Use of efficient air conditioning system with performance of 0.65 kW/ton.
- Use of efficient light fitting for common areas and car parks.
- Installation of regenerative lifts system.
- Recycling of condensates from air-conditioning system for flushing of toilets and irrigation.



## Environment Building

(Existing Non-Residential Buildings)

### Client / Developer

Ministry of the Environment and Water Resources

### Facility Manager

Keppel FMO Pte Ltd

### ESD consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 549,701 kWh/yr; Estimated water savings: 26,927 m<sup>3</sup>/yr.
- New chiller plant achieving efficiency of 0.6kW/ton.
- Replaced fluorescent tubes with LED lighting.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Waterless urinal flushing system.
- Collection system for rainwater and condensates.
- Titanium dioxide coating for all toilets.
- Bio-composting system for horticulture waste.



## Fuji Xerox Towers

(Existing Non-Residential Buildings)

### Building Owner

City Developments Limited / Hong Leong Properties Pte Ltd

### Facility Management

City Developments Limited / Hong Leong Properties Pte Ltd

### ESCO

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 2,998,596 kWh/yr; Estimated water savings: 65,106 m<sup>3</sup>/yr.
- Chiller plant with efficiency of 0.62 kW/RT.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Heat pipe system for pre-cooled air for AHUs.
- Automatic condenser tube cleaning system.
- Energy Monitoring and Analysis Services (EMAS) for remote monitoring, analysis, performance tracking & evaluation and report generation.
- Recycling of all AHUs condensates for cooling towers and sprinkler tank.
- Motion sensors to control lighting in toilets and staircases.
- Roof top garden and carpark guidance system.



## Furama RiverFront, Singapore

(Existing Non-Residential Buildings)

### Client / Developer

Furama RiverFront, Singapore

### M&E Engineer

Chan Han Chong Consulting Engineers

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 2,360,202 kWh/yr; Estimated water savings: 905 m<sup>3</sup>/yr.
- Chiller plant system with efficiency of 0.60 kW/ton.
- LED lighting for common areas.
- Heat recovery system for hot water.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Environmentally friendly enzymes cultivated to use for cleaning purposes.



## HarbourFront Centre

(Existing Non-Residential Buildings)

### Building Owner

Mapletree Investments Pte Ltd

### Managing Company

HarbourFront Centre Pte Ltd

### ESCO

LJ Energy Pte Ltd

### ESD Consultant

LJ Energy Pte Ltd

### Key Features

- Estimated energy savings: 7,032,000 kWh/yr; Estimated water savings: 11,000 m<sup>3</sup>/yr.
- Efficiency of air-conditioning improved from 1.27 kW/RT to 0.65 kW/RT after retrofitting, resulting in over 30% reduction of energy consumption for the landlord.
- Upgrading of cooling tower system improves water efficiency resulting in a reduction of over 11,000 m<sup>3</sup> of water each year.
- Automatic temperature set-back controls for AHUs to regulate and avoid overcooling indoor space temperature when outdoor ambient temperature is low.
- Naturally ventilated carpark with T5 lamps. Perimeter lamps are controlled by photo sensors. T5 lamps for all staircases and retail cove lighting.
- Green lease for new and future retail and office tenants.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## Millenia Walk

(Existing Non-Residential Buildings)

**Building Owner**  
Millenia Private Limited

**Building Management**  
Marina Properties Pte Ltd /  
Pontiac Land Group

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

**ESD Consultant**  
Kaer Pte Ltd

### Key Features

- Estimated energy savings: 2,660,421 kWh/yr; Estimated water savings: 1,074 m<sup>3</sup>/yr.
- New chillers and pumps in district cooling plant. The efficiency of the system is 0.67 kW/RT.
- Auto condenser tube cleaning system for the chillers in the District Cooling System (DCS) plant.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing. These instruments are linked to the Building Maintenance System (BMS).
- Extensive use of LED lighting throughout carpark and common areas and use of T5 fluorescent lighting in staircases.
- Installation of motion sensors to control operation of escalators.
- Condenser auto tube cleaning system used for new chillers in the DCS plant.
- Grease and cooking oil are collected in the Grease Interceptor System and recycled by a service provider and made into bio fuels.
- 15 pyramidal roof top design structures to bring in natural daylight into the main shopping walkways.

★ Platinum



## Ministry of Manpower HQ Building

(Existing Non-Residential Buildings)

**Client / Developer**  
Ministry Of Manpower

**Energy Consultant**  
Honeywell Pte Ltd

**ESCO**  
Chesterton Suntec International  
Pte Ltd / Honeywell Pte Ltd

### Key Features

- Estimated energy savings: 1,634,436 kWh/yr; Estimated water savings: 11,796 m<sup>3</sup>/yr.
- Efficient chiller plant system of 0.65 kW/RT - Guaranteed Energy Savings Performance Contract Project (GESp).
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Motion sensors for toilet lighting and photo sensor for office peripheral lighting.
- VVVF & regenerative drive for lifts and motion sensor for escalators.
- 100% recycled carpet and system furniture.
- Collection of condensates from Pre-Cool AHU.
- UVC emitters at AHUs for IAQ improvement.





## School of Art, Design and Media, Nanyang Technological University

(Existing Non-Residential Buildings)

**Building Owner**  
Nanyang Technological University

**Facility Management**  
Office of Facilities Planning  
and Management

### Key Features

- Estimated energy savings: 119,134 kWh/yr; Estimated water savings: 1,171 m<sup>3</sup>/yr.
- Air-conditioning plant system with efficiency of 0.67 kW/ton.
- Motion sensors for all toilets and corridors.
- CO<sub>2</sub> sensor installed at all AHUs to modulate fresh air intake.
- Extensive greenery with 100% green roof.
- Refrigerant leak detection system and auto condenser tube cleaning system.
- Collection system for rainwater and condensates to top up cooling tower.



## SMU Administration Building

(Existing Non-Residential Buildings)

**Client / Developer**  
Singapore Management University

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

**Maintenance Contractor**  
Propell Integrated Pte Ltd

### Key Features

- Estimated energy savings: 1,062,796 kWh/yr; Estimated water savings: 11,520 m<sup>3</sup>/yr.
- Efficient chiller plant at 0.64 kW/RT and chiller plant optimization.
- AC Variable Voltage Variable Frequency (VVVF) Lifts.
- Electronic air filters for all AHUs.
- Collection system for AHU condensates.
- Autotube cleaning system for chiller plant.
- Non- chemical treatment system for cooling tower.
- Green roof.



## The Heeren

(Existing Non-Residential Buildings)

### Owner

The Management Corporation  
Strata Title Plan No. 2713

### ESD Consultant

Mott MacDonald (S) Pte Ltd

### Managing Agent

Swee Cheng Management Pte Ltd

### Technical Support Company

13 Engineering Pte Ltd

### Key Features

- Estimated energy savings: 2,142,306 kWh/yr; Estimated water savings: 14,201 m<sup>3</sup>/yr.
- High efficiency chiller plant system (0.66 kW/RT) with series counter flow, variable speed chiller arrangement.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Primary AHU with heat recovery and CO<sub>2</sub> sensors.
- LED lighting for basement car parks.
- UVC emitters installed for AHUs.
- LTA carpark guidance system and hybrid carpark lot.
- Reuse of sprinkler drainage water.



## 368 Thomson

(New Residential Buildings)

### Client / Developer

City Developments Limited

### Project Manager

DP Architects Pte Ltd

### Architect

DP Architects Pte Ltd

### M&E Engineer

Squire Mech Pte Ltd

### Structural Engineer

LSW Consulting Engineers Pte Ltd

### Quantity Surveyor

KPK Quantity Surveyors (Singapore) Pte Ltd

### Main Contractor

Dragages Singapore Pte Ltd

### Landscape Consultant

COEN Design International Pte Ltd

### Interior Designers

DP Design Pte Ltd

### Acoustic Consultants

ZEB-Technology Pte Ltd

### ESD Consultants

ZEB-Technology Pte Ltd

### Key Features

- Estimated energy savings: 921,674 kWh/yr; Estimated water savings: 9,096 m<sup>3</sup>/yr; RETV (Residential Thermal Transmittance Value): 19.85 W/m<sup>2</sup>.
- High performance glazing for better RETV and optimum indoor noise levels.
- Ventilation simulation is carried out to aid in the design of the dwelling units for good natural ventilation.
- Use of cool paint for the entire east and west façades.
- Energy efficient air-conditioners that are rated with 4 ticks under SELS.
- Rain water harvesting and drip irrigation system. WELS water fittings result in 22% savings.
- Extensive greenery on Level 1 and 3 (GnP of 5.995).
- Pneumatic waste collection system.
- Non-chemical termite treatment system.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## Belysa

(New Residential Buildings)

### Client / Developer

NTUC ChoiceHomes Co-operative Ltd /  
CEL Development Pte Ltd

### Project Manager

ChoiceHomes Investments Pte Ltd

### Architect

ADDP Architects LLP

### M&E Engineer

Belmacs Pte Ltd

### Structural Engineer

RSP Architects, Planners  
and Engineers (Pte) Ltd

### Quantity Surveyor

KPK Quantity Surveyors (Singapore)  
Pte Ltd

### Main Contractor

Chip Eng Seng Engineering  
& Construction Pte Ltd

### Landscape Consultant

COEN Design International Pte Ltd

### Acoustic Consultant

Acviron Acoustics Consultants  
Pte Ltd

### ESD Consultant

Building System and Diagnostics  
Pte Ltd

### Key Features

- Estimated energy savings: 1,260,515 kWh/yr; Estimated water savings: 7,955 m<sup>3</sup>/yr; RETV: 18.5 W/m<sup>2</sup>.
- Passive design with North-South orientation to minimise solar heat gain; provision of external shading and balconies.
- CFD simulations are conducted to ensure good natural ventilation.
- Use of air-conditioners rated with 4 ticks under SELS, for all units.
- Provision of energy efficient light fittings in common areas.
- Provision of 9kWp PV system.
- Extensive use of environmentally friendly materials.
- Provision of extensive greenery integrated with bioswale and eco-pond.

★ Platinum



## Canberra Residences

(New Residential Buildings)

### Client / Developer

MCC Land (Singapore) Pte Ltd

### Project Manager

MCC Land (Singapore) Pte Ltd

### 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

### Main Contractor

China Jingye Engineering  
Corporation Limited  
(Singapore Branch)

### Landscape Consultant

Tulin Designs Pte Ltd

### ESD Consultant

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

### Key Features

- Estimated energy savings: 1,901,500 kWh/yr; Estimated water savings: 13,000 m<sup>3</sup>/yr; RETV: 18.95 W/m<sup>2</sup>.
- Wide passive design includes natural daylighting and ventilation to reduce the energy required to mechanically ventilate or cool common areas such as lift lobbies.
- Ventilation Simulation is carried out to aid in the design of the dwelling units for good natural ventilation within the units.
- A 30kWp photovoltaic system installed at the rooftop trellis.
- Greenery provision with conservation of matured tree.
- SGLS certified low Volatile Organic Compound (VOC) paint for the internal surfaces of the dwelling units and SGLS certified low formaldehyde emission adhesives for composite wood products within the dwelling units.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## H<sub>2</sub>O Residences

(New Residential Buildings)

### Client / Developer

City Developments Limited

### Architect

DP Architects Pte Ltd

### M&E Engineer

United Project Consultants Pte Ltd

### Structural Engineer

DE Consultants (s) Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Interior Designer

ADDP Architects LLP

### Landscape Consultant

SALD Pte Ltd

### Acoustic Consultant

Acviron Acoustic Consultants Pte Ltd

### ESD Consultant

Building System & Diagnostic Pte Ltd

### Key Features

- Estimated energy savings: 2,379,622 kWh/yr; Estimated water savings: 41,161 m<sup>3</sup>/yr; RETV: 19.98 W/m<sup>2</sup>.
- Passive and low energy architecture, North-South orientation to minimise solar heat gain.
- Ventilation simulation is carried out to aid in the design of the dwelling units for good natural ventilation within the units.
- Use of air-conditioners rated with 4 ticks under SELS.
- Provision of extensive energy efficient light fittings and LED for common areas.
- Provision of rainwater collection system.
- Extensive landscape and greenery for the development.
- Provision of dual refuse chutes with pneumatic waste collection system.

★ Platinum



## Hundred Trees

(New Residential Buildings)

### Client / Developer

City Developments Limited

### Architect

ONG&ONG Pte Ltd

### M&E Engineer

Squire Mech Pte Ltd

### Structural Engineer

KTP Consultants Pte Ltd

### Quantity Surveyor

KPK Quantity Surveyors (Singapore) Pte Ltd

### Main Contractor

Tiong Seng Contractors (Pte) Ltd

### Landscape Consultant

SALD Pte Ltd

### Acoustic Consultant

Acviron Acoustic Consultants Pte Ltd

### ESD Consultant

Building System and Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 3,995,413 kWh/yr; Estimated water savings: 15,912 m<sup>3</sup>/yr; RETV: 19.88 W/m<sup>2</sup>.
- Ventilation simulation is carried out to aid in the design of the dwelling units for good natural ventilation within the units.
- Gas Water Heater.
- Ductless fan for basement ventilation.
- Thermal insulation paint.
- Electric car charging point.
- Precast toilets.
- Pneumatic chute.
- Double chutes for recyclable/ non-recyclable.
- Siphonic rainwater discharge system.
- Cobiax slab system.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Platinum



## The Glyndebourne

(New Residential Buildings)

### Client / Developer

City Developments Limited /  
Cophorne Orchid Hotel Singapore Pte Ltd

### Project Manager

CDL Management Services Pte Ltd

### Architect

Team Design Architects Pte Ltd

### M&E Engineer

Parsons Brinkerhoff Pte Ltd

### Structural Engineer

Parsons Brinkerhoff Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore  
Pte Ltd

### Landscape Consultant

Cicada Pte Ltd

### Interior Designers

Axis.ID Pte Ltd

### ESD Consultant

ZEB-Technology Pte Ltd

### Key Features

- Estimated energy saving: 2,406,576 kWh/yr; Estimated water savings: 14,608 m<sup>3</sup>/yr; RETV: 18.63 W/m<sup>2</sup>.
- Ventilation simulation is carried out to aid in the design of the dwelling units for good natural ventilation within the units.
- All apartment units will be provided with air-conditioners rated with 4 ticks under SELS.
- Extensive use of LED lights.
- Gas heaters for all apartment units.
- Harvesting of rain water and recycling of condensates for irrigation.
- Extensive restoration of onsite trees.
- Pneumatic waste collection system.

★ Platinum



## Tomlinson Heights

(New Residential Buildings)

### Client / Developer

Yarra Investments Pte Ltd

### Project Manager

HPL Properties Pte Ltd

### Architect

Architects 61 Pte Ltd

### M&E Engineer

Squire Mech Pte Ltd

### Structural Engineer

HCE Engineers Partnership

### Quantity Surveyor

KPK Quantity Surveyors (Singapore) Pte Ltd

### Main Contractor

Chang Hua Construction Pte Ltd

### Landscape Consultant

Cicada Pte Ltd

### ESD Consultant

Squire Mech Pte Ltd

### Key Features

- Estimated energy savings: 1,412,117 kWh/yr; Estimated water savings: 15,344 m<sup>3</sup>/yr; RETV: 15.08 W/m<sup>2</sup>.
- Passive and low energy architecture with North-South oriented building layout.
- Ventilation simulation is carried out to aid in the design of the dwelling units for good natural ventilation within the units.
- Energy efficient air-conditioners with 4 ticks to be provided to all units.
- Eco plug is to be provided to every dwelling unit.
- Collection of rainwater for irrigation and automatic drip irrigation system for landscape.
- Extensive use of environmentally friendly products and low VOC paint to ensure good indoor air quality.
- Provision of lush greenery in the whole development.
- Pneumatic refuse collection system is used to ensure good environmental quality.



## Waterway Terraces I

(New Residential Buildings)

### Client / Developer

Housing & Development Board

### Project Manager

Housing & Development Board

### Architect

Aedas 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 & Seah Singapore Pte Ltd

### Landscape Consultant

ICN Design International Pte Ltd

### Lighting Specialist

Bo Steiber Lighting Design

### ESD Consultant

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

### Key Features

- Estimated energy savings: 1,578,200 kWh/yr; Estimated water savings: 39,500 m<sup>3</sup>/yr; RETV: 17.86 W/m<sup>2</sup>.
- Building designed with deep overhangs, horizontal and vertical fins to reduce the solar heat gain into the dwelling units.
- Ventilation simulation is carried out to aid in the design of the dwelling units for good natural ventilation within the units.
- Selection of energy efficient light fittings that could provide up to 59.8% energy savings for the lighting in the common area.
- Clothes drying facilities within all dwelling units.
- Provision of motion sensors in corridors.
- PV panels installed on the roof would be used to generate 300 kWp of solar power which can be used to offset the daytime electrical load at the common areas.
- Dual refuse chute to encourage residents to separate recyclable from non-recyclable waste at source.



## Waterway Terraces II

(New Residential Buildings)

### Client / Developer

Housing & Development Board

### Project Manager

Housing & Development Board

### Architect

Aedas 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 & Seah Singapore Pte Ltd

### Landscape Consultant

ICN Design International Pte Ltd

### Lighting Specialist

Bo Steiber Lighting Design

### ESD Consultant

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

### Key Features

- Estimated energy savings: 1,305,500 kWh/yr; Estimated water savings: 30,000 m<sup>3</sup>/yr; RETV: 18.0 W/m<sup>2</sup>.
- Ventilation simulation is carried out to aid in the design of the dwelling units for good natural ventilation within the units.
- Dual refuse chute to encourage residents to separate recyclable from non-recyclable waste at source.
- Siphonic rainwater drainage system which uses fewer raw materials as compared to the conventional rain downpipes would be installed.
- Membrane water filtration system to reduce water consumption by recycling the water on site during the construction stage.
- Rain gardens would be incorporated as part of the landscape to allow pre-treatment of rainwater before the hardscape run-off is discharged into the storm water.



## 36BTrd

(Landed Houses)

**Client / Developer**  
Mr Daniel Ong Eu Wee

**Architect**  
DP Architects Pte Ltd

**Structural Engineer**  
GNG Consultants Pte Ltd

**Main Contractor**  
Lay Construction

**ESD Consultants**  
DP Architects Pte Ltd

### Key Features

- Low-E single glazing to minimise heat gain to building.
- Sunpath and CFD analysis to optimise building orientation and indoor thermal comfort.
- Energy efficient air-conditioning system and lighting.
- BIPV system with capacity of about 8 kWp.
- Solar charging station for bicycle.
- Provision of solar thermal collectors to function as hot water heating system and to enhance air-conditioning system efficiency.
- Energy monitoring devices.
- Greenery provision with auto drip irrigation system for vertical green wall.



## 68 Binjai Park

(Landed Houses)

**Client / Developer**  
Mr George Lim

**Architect**  
Designshop.Architects LLP

**M&E Engineer**  
HY M & E Consultancy Services Pte Ltd

**Structural Engineer**  
MSE Consultants Pte Ltd

**Quantity Surveyor**  
1MH & Associates

**Main Contractor**  
As-Built Pte Ltd

**Landscape Consultant**  
Amozonia Landscape

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

★ Platinum

### Key Features

- Good building orientation and cross ventilation.
- Double glazing and external roller shade to minimise heat gain to building.
- Sunpath analysis and passive design strategies to optimise building orientation and indoor thermal comfort.
- Energy efficient air-conditioning system and LED lighting.
- Home automation system with energy monitoring devices.
- PV technologies with system capacity of 50.29 kWp.
- Extensive greenery provision with auto drip irrigation system and rain sensors.
- Rainwater harvesting system and stormwater management system.
- Non-chemical treatment for swimming pool.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold<sup>Plus</sup>



## Aquatic Science Centre

(New Non-Residential Buildings)(Special)

### Client / Developer

PUB/SDWA/NUS/DELTA RES

### Project Manager

Surbana International 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

C.P. Ong Construction Pte Ltd

### Landscape Consultant

Surbana International Consultants Pte Ltd

### Key Features

- Estimated energy savings: 700 kWh/yr; Estimated water savings: 723 m<sup>3</sup>/yr.
- A well-ventilated, non air-conditioned research area with minimum west facing façade.
- Use of T5 lighting, high frequency ballast & motion sensors to minimize energy consumption.
- Rain water harvesting for research.
- Stormwater management system to filter rainwater.
- Use of low VOC paint at research area (indoor & outdoor) and use of titanium dioxide to remove odour at toilet.
- Bicycle racks and aesthetic wall using wood from tree fell on site are placed at strategic location to raise awareness. 100% AHU condensate recycling and M&V instrumentation system for monitoring of chiller plant efficiency.
- Green corner to showcase the monitoring of energy and water consumption.

★ Gold<sup>Plus</sup>



## Choa Chu Kang Polyclinic

(New Non-Residential Buildings)

### Client / Developer

National Healthcare Groups Polyclinics

### Architect

Context Consultants International Pte Ltd

### M&E Engineer

PDC Consulting Engineers Pte Ltd

### Structural Engineer

NCK Associate Pte Ltd

### Quantity Surveyor

BKG Consultants Pte Ltd

### Main Contractor

Gennal Industries Pte Ltd

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 220,238 kWh/yr; Estimated water savings: 63,455 m<sup>3</sup>/yr; ETTV: 37.89 W/m<sup>2</sup>.
- 100% conservation of existing structure.
- Extensive use of SGLS products and recycled products.
- Eco-concrete for all additional areas.
- Vertical greenery.
- Internal courtyard.
- Bio-kill surface treatment solutions for all Fan Coil Units (FCUs).





## CWT Logistics HUB 3 (New Non-Residential Buildings)

**Client / Developer**  
SM Integrated Transware Pte Ltd

**Project Manager**  
Precise Projects Pte Ltd

**Architect**  
ACE Architects & Associates

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

**Structural Engineer**  
Aston Consulting Engineers

**Main Contractor**  
Precise Development Pte Ltd

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

### Key Features

- Estimated energy savings: 1,343,594 kWh/yr; Estimated water savings: 6,807 m<sup>3</sup>/yr.
- Passive and low energy architecture, North-South orientation to minimise solar heat gain and use of skylight louver.
- Ventilation simulation is carried out for the design of good natural ventilation.
- Use of motion sensors in common areas such as toilets and staircases.
- Solar PV with capacity of 6kWp.
- Use of materials certified under SGLS such as precast concrete road kerbs, drainage channel, waterproofing for toilets and roof, cool paint and Recycled Concrete Aggregate for non-structural construction.
- Titanium dioxide (TiO<sub>2</sub>) coating in toilets to improve air quality.



## Development of Camp facilities at Kranji Camp III for CSSCOM

(New Non-Residential Buildings)

**Client / Developer**  
MINDEF / DSTA

**Architect**  
HCF and Associates

**M&E Engineer**  
Rankine & Hill (S) Pte Ltd

**Structural Engineer**  
Tham & Wong LLP

**Quantity Surveyor**  
Lian Beng Construction (1988) Pte Ltd

**Main Contractor**  
Lian Beng Construction (1988) Pte Ltd

**Landscape Consultant**  
Tulin Design Pte Ltd

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

### Key Features

- Estimated energy savings: 1,094,067 kWh/yr; Estimated water savings: 6,600 m<sup>3</sup>/yr; ETTV: 38.86 W/m<sup>2</sup>.
- Building is designed to minimise East-West exposure and maximise openings facing prevailing wind directions for optimum ventilation.
- Energy efficient air-conditioning system with average efficiency of 0.74 kW/RT.
- Energy efficient T5 fluorescent lightings.
- Use of sun pipes and solar PV panels.
- Collection of rainwater and recycling of water for vehicle washing.
- Use of sustainable construction materials.



## Graduate Residence

(New Non-Residential Buildings)

### Client / Developer

National University of Singapore  
Office of University Town Development

### Architect

AWP 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 & Seah Pte Ltd

### Main Contractor

Shimizu Corporation

### Landscape Consultant

Sitetectonix Pte Ltd

### ESD Consultant

Arup Singapore Pte Ltd

### Key Features

- Estimated energy savings: 1,915,479 kWh/yr; Estimated water savings: 31,956 m<sup>3</sup>/yr; ETTV: 35.20 W/m<sup>2</sup>.
- Proper design of building layout to enhance natural ventilation.
- Highly insulated external walls to achieve good ETTV.
- Smart meter card based air-conditioning system to positively influence user behaviour.
- Motion sensors to control lighting in common spaces including corridors and staircases.
- Minimum car parking lots and sufficient bicycle lots to encourage low carbon transportation.
- Dual refuse chutes to make recycling more convenient for users.



## Resorts World Sentosa - Festive Hotel

(New Non-Residential Buildings)

### Client / Developer

Resorts World at Sentosa Pte Ltd

### Project Manager

DP Consultant Pte Ltd

### Architect

DP Architects Pte Ltd

### M&E Engineer

Meinhardt (Singapore) Pte Ltd

### Structural Engineer

AECOM Singapore Pte Ltd

### Quantity Surveyor

DLS/KPK IR Pte Ltd

### Main Contractor

Kajima - Tiong Seng Joint Venture

### Landscape Consultant

ICN Design International Pte Ltd

### Lighting Consultant

Light Cibles Pte Ltd

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 2,724,736 kWh/yr; Estimated water savings: 7,929 m<sup>3</sup>/yr ; ETTV is 33.66 W/m<sup>2</sup>.
- Heat pump system.
- Collection of AHU condensate for use.
- Pneumatic waste system.
- Efficient irrigation system (root watering system).

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold<sup>Plus</sup>



## Resorts World Sentosa - Hard Rock Hotel

(New Non-Residential Buildings)

### Client / Developer

Resorts World at Sentosa Pte Ltd

### Project Manager

DP Consultants Pte Ltd

### Architect

DP Architects Pte Ltd

### M&E Engineer

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

### Structural Engineer

AECOM Singapore Pte Ltd

### Quantity Surveyor

DLS/KPK IR Pte Ltd

### Main Contractor

Low Keng Huat (Singapore) Pte Ltd

### Landscape Consultant

ICN Design International Pte Ltd

### Lighting Consultant

Light Cibles Pte Ltd

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 3,183,938 kWh/yr; Estimated water savings: 28,387 m<sup>3</sup>/yr; ETTV: 29.22 W/m<sup>2</sup>.
- Heat pump system and heat recovery system.
- Efficient irrigation system (root watering system).
- Collection of AHU condensate for use.
- Pneumatic waste system and self-contained grease separator.
- Green roof and siphonic rainwater drainage system.

★ Gold<sup>Plus</sup>



## CapitaLand Institute of Management and Business (CLIMB)

(Existing Non-Residential Buildings)

### Building Owner

CapitaLand Limited

### Facility Management

CapitaLand Limited

### Key Features

- Estimated energy savings: 14,835 kWh/yr; Estimated water savings: 300 m<sup>3</sup>/yr.
- Efficient lighting via good multi-lighting lighting layout, use of dimmer control, motion sensors, photocell and high frequency ballast.
- Harvesting of rainwater for landscape irrigation and general cleaning to offset use of potable water.
- Extensive greenery.
- PUB-certified water efficient building.



## Centennial Tower

(Existing Non-Residential Buildings)

### Building Owner

Millenia Private Limited

### Building Management

Marina Properties Pte Ltd /  
Pontiac Land Group

### ESCO

Johnson Controls (S) Pte Ltd

### ESD Consultant

Kaer Pte Ltd

### Key Features

- Estimated total energy savings: 2.7 GWh/yr; Estimated water savings: 872 m<sup>3</sup>/yr.
- Energy efficient chiller plant system at 0.65 kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Extensive use of LED lighting throughout carpark and common areas.
- Use of photo sensors and motion sensors.
- Provision of hybrid car parking lot.



## King's Centre

(Existing Non-Residential Buildings)

### Building Owner

City Developments Limited

### Facility Management

City Developments Limited

### ESCO

CBM Solutions Pte Ltd

### ESD Consultant

CBM Solutions Pte Ltd

### Key Features

- Estimated energy savings: 849,912 kWh/yr; Estimated water savings: 100 m<sup>3</sup>/yr.
- Chiller plant system efficiency of 0.70 kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Replacement of T8 to T5 lighting.
- CO monitoring and control system for carpark MV at basements.
- NEWater for cooling tower.
- Use of solar PV panel on the roof and green roof.





## Millenia Tower

(Existing Non-Residential Buildings)

**Building Owner**  
Millenia Private Limited

**Building Management**  
Marina Properties Pte Ltd /  
Pontiac Land Group

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

**ESD Consultant**  
Kaer Pte Ltd

### Key Features

- Estimated energy savings: 2,625,569 kWh/yr; Estimated water savings: 1,074 m<sup>3</sup>/yr.
- New chillers and pumps in District Cooling Plant (DCS), total system efficiency is 0.67 kWh/RT.
- Auto condenser tube cleaning system for the chillers in the DCS plant.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing. These instruments are linked to BMS.
- Replacement of T8 fluorescent tubes to T5 fluorescent tubes in the staircases, replacement of lighting to efficient LED lighting at other common areas and installation of motions sensors and photo sensors.
- Lifts motors are installed with regenerative drive to reduce lifts' energy consumption.
- Carpark guidance system and electric car parking lot.



## One George Street

(Existing Non-Residential Buildings)

**Building Owner**  
CapitaCommercial Trust

**Facility Manager**  
CapitaLand Commercial Management Pte. Ltd.

**ESCO**  
G-Energy Global Pte Ltd

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

★ Gold<sup>Plus</sup>

### Key Features

- Estimated energy savings: 1,322,959 kWh/yr; Estimated water savings: 9,497 m<sup>3</sup>/yr.
- Double glazed low-E glass with aluminium sun shading louvers and natural ventilation at first level lobby.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Extensive landscape with roof gardens and sky gardens.
- Carpark guidance system.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold<sup>Plus</sup>



## One Raffles Link

(Existing Non-Residential Buildings)

**Building Owner**  
HKL (Esplanade) Pte Ltd

**Project Manager**  
Hongkong Land (S) Pte Ltd

**Maintenance Contractor**  
Johnson Controls (S) Pte Ltd

**ESD Consultant**  
LJ Energy Pte Ltd

### Key Features

- Estimated energy savings: 1,680,000 kWh/yr; Estimated water savings: 35,640 m<sup>3</sup>/yr of potable water by using NEWwater, 8,165 m<sup>3</sup>/yr of potable water by using water efficient fittings.
- Chiller system performance optimised by removing balancing valves and installing VSDs for the chilled water and condenser water pumps to achieve chiller plant efficiency at 0.74kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- CO and CO<sub>2</sub> sensors are used to control fans.
- Motion and photo sensors are installed to control lightings.
- Use of water efficient fittings with 3 ticks and NEWater for cooling towers to reduce consumption of potable water in the building by 60%.
- Cooling towers and AHU fans are VSD operated. Water consumption is minimised by incorporating water treatment system with cycle of concentration (COC) about 10.

★ Gold<sup>Plus</sup>



## Plaza By The Park

(Existing Non-Residential Buildings)

**Building Owner**  
City Developments Limited

**Facility Management**  
Elishan Investments Private Limited

**ESCO**  
G-Energy Global Private Limited

### Key Features

- Estimated energy savings: 1,509,077 kWh/yr; Estimated water savings: 104,949 m<sup>3</sup>/yr.
- Energy efficient chiller plant system at 0.65 kW/RT.
- Permanent instrumentation for measurement and verification of chiller plant system efficiency and heat balancing.
- Heat pipe and anti corrosion coating for PAHU.
- Water collection system for AHU condensates.
- Green roof.



## The URA Centre

(Existing Non-Residential Buildings)

### Building Owner

Urban Redevelopment Authority (URA)

### Facility Management

Urban Redevelopment Authority (URA)

### ESCO

G-Energy Global Pte Ltd

### M&E Engineer

Lincolne Scott Ng Pte Ltd

### ESD Consultant

Lincolne Scott Ng Pte Ltd

### Key Features

- Estimated energy savings: 1,056,922 kWh/yr; Estimated water savings: 20,420 m<sup>3</sup>/yr.
- Energy efficient air conditioning plant of 0.71kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Use of efficient T5 lighting for common areas and tenant areas.
- Use of PV panel at 50 kWp and use of ultraviolet C (UVC) emitter for all AHUs.



## Boon Lay Meadow

(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

Master Contract Services Pte Ltd

### Landscape Consultant

Surbana International Consultants Pte Ltd

### Key Features

- Estimated energy savings: 653,496 kWh/yr; Estimated water savings: 6,429 m<sup>3</sup>/yr; RETV: 18.0 W/m<sup>2</sup>.
- Good building façade design and orientation.
- Sub soil percolation tank as rain water collection tank, infiltration trenches, and efficient irrigation system.
- Low VOC paint in all residential units.
- Provision of greenery at landscape area and provision of intensive landscape at rooftop of multi-storey carpark.
- RCA for concrete non-structural items.
- Provision of recycling bins at every residential block.



## 9-11 Buckley

(New Residential Buildings)

### Client / Developer

City Developments Limited

### Architect

RSP Architects Planners & Engineers (Pte) Ltd

### M&E Engineer

Parsons Brinckerhoff (Pte) Ltd

### Structural Engineer

RSP Architects Planners & Engineers (Pte) Ltd

### Quantity Surveyor

KPK Quantity Surveyors (Singapore) Pte Ltd

### Landscape Consultant

Site Concepts International Pte Ltd

### Interior Designer

INDEX Design Pte Ltd

### Key Features

- Estimated energy savings: 490,129 kWh/yr; Estimated water savings: 15,829 m<sup>3</sup>/yr; RETV: 19.25 W/m<sup>2</sup>.
- Incorporation of sun pipes in basement car park.
- Green demolition.
- Conservation of the existing heritage bungalow.
- Extensive landscaping.
- Pneumatic and dual chute waste collection system.



## Condominium at Leonie Hill Road

(New Residential Buildings)

### Client / Developer

City Developments Limited

### Architect

ADDP Architects LLP

### Overseas Design Architect

Skidmore, Owings & Merrill LLP

### M&E Engineer

Squire Mech Pte Ltd

### Structural Engineer

KTP Consultants Pte Ltd

### Quantity Surveyor

KPK Quantity Surveyors (Singapore) Pte Ltd

### Landscape Consultant

Belt Collins International (Singapore) Ltd

### Key Features

- Estimated energy savings: 1,852,265 kWh/yr; Estimated water savings: 4,666 m<sup>3</sup>/yr; RETV: 20.78 W/m<sup>2</sup>.
- 4-tick air-conditioning.
- Extensive use of LED lighting for most of the common areas and the carpark.
- Ductless jet fan with CO sensor for ventilation of basement carpark.
- Gas water heater for all apartments.
- Dual pneumatic refuse collection system.
- Rainwater harvesting with drip irrigation system.





## Condominium at Pasir Ris Grove (Parcel 3)

(New Residential Buildings)

### Client / Developer

City Developments Limited /  
Hong Leong Holdings Ltd /  
Hong Realty (Private) Ltd

### Project Manager

CDL Management Services Pte Ltd

### Architect

AXIS Architects Planners Pte Ltd

### M&E Engineer

Meinhardt (Singapore) Pte Ltd

### Structural Engineer

Parsons Brinckerhoff Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Landscape Consultant

Sitetectonix Pte Ltd

### ESD Consultant

Arup Singapore Pte Ltd

### Key Features

- Estimated energy savings: 3,969,199 kWh/yr; Estimated water savings: 21,600 m<sup>3</sup>/yr; RETV: 20.28 W/m<sup>2</sup>.
- Application of low-emission, double glazing to all West-facing façades to minimise heat gain into the building.
- Energy efficient 4-tick air-conditioners to be provided to all units.
- Use of environmentally friendly products and low VOC paint to ensure good indoor air quality.
- Provision of eco pond and lush greenery in the whole development.



## Leedon Residence

(New Residential Buildings)

### Client / Developer

Leedon Residence Development  
Pte Ltd

### Project Manager

GuocoLand Project Management  
Pte Ltd

### Architect

SCDA Architects Pte Ltd

### M&E Engineer

Rankine & Hill (S) Pte Ltd

### Structural Engineer

TEP Consultants Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Landscape Consultant

SCDA Architects Pte Ltd

### Interior Design Consultant

SCDA Architects Pte Ltd

### Lighting Consultant

The Lightbox Pte Ltd

### Acoustic Consultant

Acvicon Acoustics Consultants Pte Ltd

### ESD Consultant

Building System & Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 5,848,426 kWh/yr; RETV: 21.58 W/m<sup>2</sup>.
- Provision of energy efficient air-conditioning and artificial lighting.
- Installation of motion sensors for lighting at all private lift lobbies.
- Provision of 9kWp PV system.
- Provision of water efficient fittings.
- Provision of rainwater collection system.
- Provision of green wall with recycled contents painted with low VOC paint.
- Provision of dual refuse chutes with pneumatic waste collection system.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold<sup>Plus</sup>



## My Manhattan

(New Residential Buildings)

### Client / Developer

CEL Development Pte Ltd

### Project Manager

CEL Development Pte Ltd

### Architect

LAUD Architects Pte Ltd

### M&E Engineer

United Project Consultants Pte Ltd

### Structural Engineer

KTP Consultants Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Main Contractor

CES Engineering & Construction Pte Ltd

### Landscape Consultant

COEN Design International Pte Ltd

### ESD Consultant

ZEB-Technology Pte Ltd

### Key Features

- Estimated energy savings: 249,798 kWh/yr; Estimated water savings: 12,763 m<sup>3</sup>/yr; RETV: 19.98 W/m<sup>2</sup>.
- Deep balconies as a form of passive strategy to reduce RETV.
- T5 light fitting with high frequency ballasts.
- Dedicated car parking provided with charging point for electric vehicles.
- Provision of eco-plug for all residential units to promote energy savings.
- On-site renewable energy from solar photo voltaic cells with capacity of 18 kWp.

★ Gold<sup>Plus</sup>



## Privé

(New Residential Buildings)

### Client / Developer

NTUC ChoiceHomes Co-operative Ltd /  
CEL Development Pte Ltd

### Project Manager

ChoiceHomes Investments Pte Ltd

### Architect

ADDP Architects LLP

### M&E Engineer

Belmacs Pte Ltd

### Structural Engineer

RSP Architects Planners  
& Engineers (Pte) Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Main Contractor

CES Engineering & Construction Pte Ltd

### Landscape Consultant

COEN Design International Pte Ltd

### Key Features

- Estimated energy savings: 4,061,171 kWh/yr; Estimated water savings: 140,298 m<sup>3</sup>/yr; RETV: 21.95 W/m<sup>2</sup>.
- Passive and low energy architecture with 97% of the units facing North-South orientation.
- Energy efficient 4-tick air-conditioners to be provided to all units.
- Energy efficient lighting design and use of motion sensors.
- Eco-plug to be provided to every dwelling unit.
- Attained PUB ABC (Active-Beautiful-Clean) Certification for the development.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold<sup>Plus</sup>



## Terrene At Bukit Timah

(New Residential Buildings)

### Client / Developer

Premier Land Development Pte Ltd  
(Jointly developed by UOL Group Ltd  
and LaSalle Investment Management)

### Project Manager

UOL Project Management Services  
Pte Ltd

### Architect

Consortium 168 Architects Pte Ltd

### M&E Engineer

Alpha Consulting Engineers Pte Ltd

### Structural Engineer

KTP Consultants Pte Ltd

### Quantity Surveyor

KPK Quantity Surveyors (Singapore)  
Pte Ltd

### Main Contractor

Unison Construction Pte Ltd

### Landscape Consultant

Peridian Asia Pte Ltd

### Key Features

- Estimated energy savings: 1,967,298 kWh/yr; Estimated water savings: 8,720 m<sup>3</sup>/yr; RETV: 21.79 W/m<sup>2</sup>.
- Buildings layout facing North-South orientation with extensive provision of balconies, planters, ledges overhang and cool paint to East-West gable end wall to minimise heat gain.
- Extensive use of high efficiency energy saving lighting with electronic ballast.
- Energy efficient air-conditioning inverter system with SELS 4-tick are used in all apartment units and common areas.
- Extensive use of environmentally friendly products certified under SGLS with more than 30% recycled content.
- Provision of extensive greenery and eco-pond to collect rainwater for landscape irrigation.
- Adopt guidelines for pre-demolition audit, demolition and site waste management plan for demolition of existing building.

★ Gold<sup>Plus</sup>



## The Canopy

(New Residential Buildings)

### Client / Developer

MCC Land (Singapore) Pte Ltd

### Project Manager

Surbana International 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

China Jingye Construction Engineering  
(Singapore) Pte Ltd

### Landscape Consultant

Surbana International Consultants  
Pte Ltd

### Key Features

- Estimated energy savings: 635,886 kWh/yr; Estimated water savings: 62,254 m<sup>3</sup>/yr; RETV: 20.77 W/m<sup>2</sup>.
- Low-E glass.
- Heat recovery for hot water used in club house.
- Provision of water efficient fittings for all residential units.
- Recycle content for non-structural items and structural items.
- High green plot ratio.
- Provision of recycling bins and bicycle racks at every block.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold<sup>Plus</sup>



## The Nassim

(New Residential Buildings)

### Client / Developer

CapitaLand Residential Singapore Pte Ltd

### Project Manager

CapitaLand Residential Singapore Pte Ltd

### Architect

W Architects Pte Ltd

### M&E Engineer

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

### Structural Engineer

P & T Consultants Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Landscape Consultant

ICN Design International Pte Ltd

### ESD Consultant

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

### Key Features

- Estimated energy savings: 1,324,000 kWh/yr; Estimated water savings: 4,700 m<sup>3</sup>/yr; RETV: 21.21 W/m<sup>2</sup>.
- Extensive user-operable sun shades integrated with the façade help improve the comfort of internal spaces.
- Design to enhance natural daylighting and use of energy efficient lighting, motion sensors and sun pipes.
- Photovoltaic (PV) system of 30kWp capacity will supplement the electrical consumption within the common areas.
- Collection of rainwater for irrigation and automatic drip irrigation system for landscape.
- Extensive use of environmentally friendly products and low VOC paint to ensure good indoor air quality.
- Reuse of existing site pile caps and use of non-chemical termite baiting system.

★ Gold<sup>Plus</sup>



## 16A Leedon Park

(Landed Houses)

### Client / Developer

Mr George Lim

### Architect

Designshop.Architects LLP

### M&E Engineer

HY M & E Consultancy Services Pte Ltd

### Structural Engineer

MSE Consultants Pte Ltd

### Quantity Surveyor

1MH and Associates

### Main Contractor

As-Built Pte Ltd

### Landscape Consultant

Amozonia Landscape

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Double glazing and external roller shades to minimise heat gain to building.
- Sunpath analysis to optimise building orientation and indoor thermal comfort.
- Energy efficient air-conditioning system and lighting.
- Home automation system with energy monitoring devices.
- PV technologies with system capacity of about 34kWp.
- Extensive greenery provision with auto drip irrigation system and rain sensors, rainwater harvesting system and stormwater management system.
- Non-chemical treatment for swimming pool.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold<sup>Plus</sup>



## The Green House at Jalan Sejarah

(Landed Houses)

### Architect

Aamer Architects

### M&E Engineer

ACMECON Engineers

### Structural Engineer

J S Tan & Associates

### Quantity Surveyor

BKG Consultants Pte Ltd

### Main Contractor

Lead Builders Pte Ltd

### Landscape Consultant

Nyee Phoe Flower Gardens Pte Ltd

### ESD Consultant

Dr Uma Maheswaran

### Key Features

- Sunpath analysis along with on-site measurement of the wind flow to optimise building orientation and indoor thermal comfort.
- Energy efficient air-conditioning system and lighting.
- PV technologies with system capacity of about 10kWp and solar hot water system.
- Extensive greenery provision with vertical green wall.
- Rainwater harvesting and stormwater management system.
- Non-chemical treatment for swimming pool.
- Eco pond.

★ Gold



## Alcon Singapore Manufacturing – ASM01

(New Non-Residential Buildings)

### Client / Developer

Alcon Singapore Manufacturing Pte Ltd

### Project Manager

Bovis Lend Lease Pharmaceutical Pte Ltd

### Architect

Jacobs Engineering Singapore Pte Ltd

### M&E Engineer

Jacobs Engineering Singapore Pte Ltd

### Structural Engineer

Jacobs Engineering Singapore Pte Ltd

### Quantity Surveyor

Bovis Lend Lease Pharmaceutical Pte Ltd

### Main Contractor

Bovis Lend Lease Pharmaceutical Pte Ltd

### Landscape Consultant

Nature Landscapes Pte Ltd

### Qualified Person

Engineers 9000 Pte Ltd

### Key Features

- Estimated energy savings: 1,811,488 kWh/yr; Estimated water savings: 30,266 m<sup>3</sup>/yr; ETTV: 29.40 W/m<sup>2</sup>.
- Efficient air-conditioning system.
- Use of environmentally friendly products.
- Use of non-potable or recycled water.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Alexandra Retail Centre (New Non-Residential Buildings)

### Client / Developer

Heliconia Realty Pte Ltd

### Project Manager

Mapletree Investments Pte Ltd

### Architect

P&T Consultants Pte Ltd

### M&E Engineer

Alpha Consulting Engineers Pte Ltd

### Structural Engineer

HCE Engineers Partnership

### Quantity Surveyor

WT Partnership (S) Pte Ltd

### Main Contractor

Shimizu Corporation

### Landscape Consultant

Peridian Asia Pte Ltd

### ESD Consultant

The Lightbox Pte Ltd

### Landscape Consultant

Meinhardt Façade Technology(S) Pte Ltd

### ESD Consultant

Building Systems & Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 1,455,812 kWh/yr; Estimated water savings: 2,705 m<sup>3</sup>/yr; ETTV: 42.57 W/m<sup>2</sup>.
- Efficient central cooling plant – Use of centrifugal and screw chillers, VSD for chilled water and condenser water pump, VSD for cooling tower fan.
- Incorporated heat pipes at PAHU to pre-cool the outdoor fresh air.
- Extensive use of energy efficient lighting such as LED and T5 fluorescent lamp for common areas.

★ Gold



## Bedok Point (New Non-Residential Buildings)

### Client / Developer

Frasers Centrepoint Limited

### Project Manager

Frasers Centrepoint Development and Properties

### Architect

Architects 61 Pte Ltd

### M&E Engineer

Squire Mech Pte Ltd

### Structural Engineer

DE Consultants Pte Ltd

### Quantity Surveyor

Northcroft Lim Consultants Pte Ltd

### Main Contractor

China Construction (South Pacific) Dev. Co. Pte Ltd

### Key Features

- Estimated energy savings: 569,697 kWh/yr; Estimated water savings: 36,989 m<sup>3</sup>/yr; ETTV: 47.77 W/m<sup>2</sup>.
- Use of double-glazed glass for the building façade.
- Use of energy efficient air-conditioning system, lifts and escalators.
- Use of water efficient fittings and green label products.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Biopolis Phase 3

(New Non-Residential Buildings)

### Client / Developer

Crescendas Bionics Pte Ltd

### Project Manager

Crescendas Bionics Pte Ltd

### Architect

Jurong Consultants Pte Ltd

### M&E Engineer

Jurong Consultants Pte Ltd

### Structural Engineer

Parsons Brinckerhoff Pte Ltd

### Quantity Surveyor

Jurong Consultants Pte Ltd

### Main Contractor

Jurong Primewide Pte Ltd

### Landscape Consultant

Tinderbox Landscape Studio Pte Ltd

### ESD Consultant

Building System and Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 810,627 kWh/yr; Estimated water savings: 14,400 m<sup>3</sup>/yr; ETTV: 41.80 W/m<sup>2</sup>.
- Energy efficiency lighting such as T5 fluorescent and LED light.
- Provision of all water efficiency fittings with "Excellent" rating.
- Extensive use of materials under Singapore Green Label Scheme such as drywall, plaster board, mineral fibre board, timber decking, laminates and adhesive.

★ Gold



## Changi Business Park Phase Three

(New Non-Residential Buildings)

### Client / Developer

HSBC Institutional Trust Services (S)  
Ltd as Trustee of Ascendas Real Estate  
Investment Trust (A-REIT)

### Project Manager

Ascendas Services Pte Ltd

### Architect

ADDP Architects LLP

### M&E Engineer

J Roger Preston (S) Pte Ltd

### Structural Engineer

KTP Consultants Pte Ltd

### Quantity Surveyor

WT Partnership (S) Pte Ltd

### Main Contractor

Lum Chang Building Contractors Pte Ltd

### Landscape Consultant

Martin Lee Designs

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 1,591,519 kWh/yr; Estimated water savings: 8,460 m<sup>3</sup>/yr; ETTV: 36.58 W/m<sup>2</sup>.
- Rainwater harvesting for landscape.
- Green roof.
- Siphonic rainwater drainage system.



## Cinnamon & Tembusu Residential Colleges

(New Non-Residential Buildings)

### Client / Developer

National University of Singapore  
Office of University Town Development

### 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

Rider Levett Bucknall LLP

### Main Contractor

Kim Seng Heng Engineering  
Construction Pte Ltd

### Landscape Consultant

Sitetectonix Pte Ltd

### Lightning Design

Bo Steiber Lightning Design

### ESD Consultant

Arup Singapore Pte Ltd

### Key Features

- Estimated energy savings: 667,400 kWh/yr; Estimated water savings: 20,000 m<sup>3</sup>/yr; ETTV: 49.2W/m<sup>2</sup>.
- Pay-per-use air-conditioning system for dormitories.
- High-volume, low-velocity fans in dining hall and multi-purpose halls.
- Roof garden and green roof above dining hall and multi-purpose halls.
- Triple-chute waste system.



## City Square Shophouses at Jalan Besar

(New Non-Residential Buildings)

### Client / Developer

City Developments Limited

### Architect

ONG&ONG Pte Ltd

### M&E Engineer

Parsons Brinckerhoff Pte Ltd

### Structural Engineer

LSW Consulting Engineers Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Key Features

- Estimated energy savings: 48,883 kWh/yr; Estimated water savings: 6,581 m<sup>3</sup>/yr; ETTV: 45.50 W/m<sup>2</sup>.
- Energy efficient VRV air-conditioning system and lighting.
- Provision of gas water heater and electric charging point.
- Thermal insulation paint.
- Vertical green wall.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Lonza Bioscience Singapore - Cell Therapy Project (New Non-Residential Buildings)

### Client / Developer

Lonza Bioscience Singapore Pte Ltd

### Project Manager

Lend Lease Project Management & Construction Pharmaceutical Asia Pte. Ltd.

### Architect

Jacobs Engineering Singapore Pte Ltd

### M&E Engineer

Jacobs Engineering Singapore Pte Ltd

### Structural Engineer

Jacobs Engineering Singapore Pte Ltd

### Quantity Surveyor

Lend Lease Project Management & Construction Pharmaceutical Asia Pte. Ltd.

### Main Contractor

Lend Lease Project Management & Construction Pharmaceutical Asia Pte. Ltd.

### Qualified Person

RSP Architects Planners & Engineers (Pte) Ltd

### Key Features

- Estimated energy savings: 1,234,040 kWh/yr; Estimated water savings: 214 m<sup>3</sup>/yr; ETTV: 22.01 W/m<sup>2</sup>.
- High efficiency chiller plant at 0.76kW/ton.
- Use of T5 energy-saving lighting.
- Application of titanium dioxide solution to all toilets to improve IAQ.

★ Gold



## MCE Ventilation Building 1 (Marina East) (New Non-Residential Buildings)

### Client / Developer

Land Transport Authority

### Project Manager

Land Transport Authority

### Architect

Parsons Brinckerhoff Pte Ltd

### M&E Engineer

Parsons Brinckerhoff Pte Ltd

### Structural Engineer

Mott Macdonald Singapore Pte Ltd

### Quantity Surveyor

Land Transport Authority

### Main Contractor

Samsung C&T Corporation

### Key Features

- Estimated energy savings: 648,653 kWh/yr; Estimated water savings: 2,046 m<sup>3</sup>/yr; ETTV: 31.75 W/m<sup>2</sup>.
- Double-skinned louvered facades to provide extensive sun shading.
- Motion sensors for lighting at all common areas.
- Use of environmentally friendly materials and acoustic treatment to provide good quality indoor environment for users.
- Extensive landscape including green roofs and vertical walls.



## MCE Ventilation Building 2 (Marina South)

(New Non-Residential Buildings)

**Client / Developer**  
Land Transport Authority

**Project Manager**  
Land Transport Authority

**Architect**  
Parsons Brinckerhoff Pte Ltd

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

**Structural Engineer**  
Mott Macdonald Singapore Pte Ltd

**Quantity Surveyor**  
Land Transport Authority

**Main Contractor**  
Samsung C&T Corporation

### Key Features

- Estimated energy savings: 282,585 kWh/yr; Estimated water savings: 745 m<sup>3</sup>/yr; ETTV: 27.06 W/m<sup>2</sup>.
- Double-skinned louvered facades to provide extensive sun shading.
- Motion sensors for lighting to all common areas.
- Use of environmentally friendly materials and acoustic treatment to provide good quality indoor environment for users.
- Extensive landscape including green roofs and vertical walls.



## Orchard Emerald

(New Non-Residential Buildings)

**Client / Developer**  
218 Orchard Private Limited

**Project Manager**  
United Engineers Developments Pte Ltd

**Concept Architect**  
Tange Associates Asia Pte Ltd

**Architect**  
AWP Pte Ltd

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

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

**Façade Consultant**  
Meinhardt Façade Technology (S) Pte Ltd

**Lightning Consultant**  
Tokyo Shomei Consultant

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

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

### Key Features

- Estimated energy savings: 507,761 kWh/yr; Estimated water savings: 80,300 m<sup>3</sup>/yr; ETTV: 43.59 W/m<sup>2</sup>.
- Energy efficient light fittings, LED façade lighting and provision of motion sensors in all toilets.
- Use of water fittings that are rated "Excellent" and SGLS-certified products.
- Anti-termite soil system and grease separator.



## **SIM Extension Building** (New Non-Residential Buildings)

**Client / Developer**  
Singapore Institute of Management

**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**  
Rider Levett Bucknall LLP Pte Ltd

**Main Contractor**  
Keong Hong Construction Pte Ltd

**Landscape Consultant**  
DP Architects Pte Ltd

**Qualified Person**  
G-Energy Global Pte Ltd

### **Key Features**

- Estimated energy savings: 1,327,722 kWh/yr; Estimated water savings: 45,142 m<sup>3</sup>/yr; ETTV: 48.63 W/m<sup>2</sup>.
- LED lights for 50% of courtyard, roof and landscape lighting.
- Jet fan ventilation system for basement carpark reduces the need for a ducted network of mechanical exhaust fans.
- Fully automated irrigation drip system for all of the landscaped areas.
- Siphonic roof drainage system reduces the number of downpipes.



## **The Atrium @ Orchard (Retail)** (New Non-Residential Buildings)

**Client / Developer**  
CapitaMall Trust

**Project Manager**  
CapitaLand Retail Ltd

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

**M&E Engineer**  
Lincolne Scott Ng Pte Ltd

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

**Quantity Surveyor**  
Davis Langdon and Seah Singapore  
Pte Ltd

**Main Contractor**  
Obayashi Corporation

### **Key Features**

- Estimated energy savings: 1,868,563 kWh/yr; Estimated water savings: 48,975 m<sup>3</sup>/yr; ETTV: 47.0 W/m<sup>2</sup>.
- High-performance glass to be installed at 2nd and 3rd storey. The glazing system implemented comprises double-glazed laminated glass with low-E coating.
- Efficient chiller plant system at 0.7 kW/ton.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Extensive use of SGLS-certified building products and provision of siphonic rainwater system.



## Alexandra Point

(Existing Non-Residential Buildings)

### Building Owner

FCL Alexandra Point Pte Ltd

### ESCO

Kaer Pte Ltd

### ESD Consultant

Kaer Pte Ltd

### Key Features

- Estimated water savings: 48,101 m<sup>3</sup>/yr.
- VSD control for most of the AHUs and pumps.
- Use of daylighting in the building entrance and motion sensors for toilets and carpark lightings.
- Use of NEWater for cooling tower and irrigation.
- Building automation system to monitor and regulate the temperatures of the air-conditioning daily and equipment scheduling.



## Botany Centre at Singapore Botanic Gardens

(Existing Non-Residential Buildings)

### Building Owner

National Parks Board

### ESD Consultant

CPGreen @ CPG Consultants Pte Ltd

### Key Features

- Estimated energy savings: 6,217 kWh/yr; Estimated water savings: 54,347 m<sup>3</sup>/yr.
- Use of water from Swan Lake for irrigation.
- Green roof, rooftop garden and green walls to cool down building temperature.
- Provision of daylight and natural ventilation in corridors and staircases.





## Bugis Junction & Bugis Junction Towers (MCST 2137)

(Existing Non-Residential Buildings)

### Building Owner

The Management Corporation Strata  
Title Plan No. 2137

### ESCO

Kaer Pte Ltd

### ESD Consultant

Kaer Pte Ltd

### Building Management

CapitaMall Trust for Bugis Junction  
K- REIT Asia for Bugis Junction Towers

### Key Features

- Estimated energy savings: 619,244 kWh/yr; Estimated water savings: 2,190 m<sup>3</sup>/yr.
- Collection of AHU condensate to irrigate tank for watering of landscape surrounding the development.
- Online environmental tracking system to set annual energy and water reduction targets.
- Sustainable purchasing policy in place to encourage use of Green Label items.
- Garden at 4th, 14th and 15th storeys of office tower and extensive full grown rainforest trees with large shading areas surrounding the entire perimeter of the development creating naturally shaded walkways.



## Central Mall Office Tower

(Existing Non-Residential Buildings)

### Building Owner

City Developments Limited

### ESCO

CBM Solutions Pte Ltd

### Facility Management

City Developments Limited

### ESD Consultant

CBM Solutions Pte Ltd

### Key Features

- Estimated energy savings: 579,067 kWh/yr.
- Upgraded BMS and chiller plant system, with installation of Variable Speed Drives (VSD) to chilled water pumps, condenser water pumps and cooling tower fans.
- T5 lighting with electronic ballasts in carpark and staircases.
- Extensive green roof occupying 95% of available roof space.



## Changi Prison Complex Main Entrance

(Existing Non-Residential Buildings)

### Building Owner

Singapore Prison Services

### Building Management

CPG Facility Management Pte Ltd

### Key Features

- Estimated energy savings: 964,778 kWh/yr; Estimated water savings: 1,104 m<sup>3</sup>/yr.
- VRF air-conditioning system with average COP of 4.1.
- T5 fluorescent lightings with high frequency ballasts are installed for the offices and common areas.
- Solar photovoltaic panels with installed capacity of 30.24 kWp generating estimated 24.5 MWh of power per annum.
- Provision of motion sensors, photo sensors and sun pipes.



## City House

(Existing Non-Residential Buildings)

### Building Owner

City Developments Limited

### ESCO

CBM Pte Ltd

### Building Management

City Developments Limited

### Key Features

- Estimated energy savings: 860,437 kWh/yr; Estimated water savings: 4,989 m<sup>3</sup>/yr.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Provision of motion sensors and photo sensors.
- Water fittings in the toilets with PUB WELS "Excellent" rating; and dual flushing system with WELS "Very Good" rating.
- Provision of Green Guide for tenants and roof garden to reduce the heat transmitted into the buildings.



## Equity Plaza

(Existing Non-Residential Buildings)

### Building Owner

DL Properties Ltd

### Facility/ Property Management

Keppel FMO/ Keppel Land International

### ESCO

Kaer Pte Ltd

### ESD Consultant

Kaer Pte Ltd

### Key Features

- Estimated energy savings: 819,405 kWh/yr.
- Natural ventilation at level one concourse.
- CO sensors to control carpark mechanical fans.
- Motion sensors to control lighting in toilets.



## Golden Village Yishun Multiplex

(Existing Non-Residential Buildings)

### Building Owner

Golden Village Multiplex Pte Ltd

### Facility Management

Golden Village Multiplex Pte Ltd International

### ESCO

Equation Energy Ltd

### Architect

SC3 Design + Architects

### Main Contractor

TKC Builders Pte Ltd

### M&E Consultants

PCA Consulting Engineers

### ESD Consultant

Green Dot Consulting Pte Ltd

### Key Features

- Estimated energy savings: 361,515 kWh/yr; Estimated water savings: 986 m<sup>3</sup>/yr.
- Mistig technology to improve efficiency of air-cooled package unit by 10% to 30% and use of Gelair to kill viruses, mould and bacteria in the air-conditioning system.
- Use of LED lights in the foyer and seat markers, motion sensors in toilets and CO<sub>2</sub> sensors for demand based ventilation.
- Implementation of ticketless ticketing and use of electronic poster boards to reduce the use of paper.
- Provision of WELS rated "Excellent" water fittings and recycling facilities.



## Grand Copthorne Waterfront Hotel

(Existing Non-Residential Buildings)

### Building Owner

CDL Hospitality Real Estate Investment Trust

### Facility Management

Grand Copthorne Waterfront Hotel Engineering Team

### ESCO

Kaer Pte Ltd

### ESD Consultant

Kaer Pte Ltd

### Key Features

- Estimated energy savings: 2,522,926 kWh/yr; Estimated water savings: 128,362 m<sup>3</sup>/yr.
- Use of heat pump system.
- VSD control for most of the AHU.
- Motion sensors for common toilets.
- NEWater for cooling towers and laundry equipment.



## Jurong Point 1

(Existing Non-Residential Buildings)

### Building Owner

The Management Corporation Strata Title Plan No. 2693

### Facility Management

Jurong Point Realty Limited

### ESCO

United Premas Limited

### ESD Consultant

United Premas Limited

### Key Features

- Estimated energy savings: 3,408,760 kWh/yr; Estimated water savings: 96 m<sup>3</sup>/yr;
- Self cleaning façade.
- Use of low-E glass.
- UV-emitter for kitchen exhaust hoods.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Jurong Point 2

(Existing Non-Residential Buildings)

### Building Owner

Prime Point Realty Development  
Pte Ltd

### Facility Management

Starmall Property Management  
Pte Ltd

### ESCO

United Premas Limited

### ESD Consultant

United Premas Limited

### Key Features

- Estimated energy savings: 2,587,768 kWh/yr; Estimated water savings: 96 m<sup>3</sup>/yr;
- Low-E laminated glass façade.
- Use of jet fans in the car park.
- Carpark guidance system.
- Installation of capacitor banks.

★ Gold



## Keppel Datahub

(Existing Non-Residential Buildings)

### Building Owner

Keppel Datahub Pte Ltd

### Facility Manager

Keppel Datahub Pte Ltd

### Main Contractor

ACME Associates Pte Ltd

### ESD Consultant

G-Energy Global Pte Ltd

### Key Features

- Estimated energy savings: 2,522,926 kWh/yr; Estimated water savings: 128,362 m<sup>3</sup>/yr.
- Efficient chiller plant system of 0.7kW/ton.
- Energy sub-meters are installed for each level and linked with BMS.
- Energy efficient T5 lighting for most areas in the building.
- Motion sensors for all toilets and staircase.



## Keppel Towers and GE Tower

(Existing Non-Residential Buildings)

### Building Owner

Mansfield Developments Pte Ltd

### Project Manager

Keppel Land International Ltd

### Facility Management

Keppel FMO Pte Ltd

### ESCO

Kaer Pte Ltd

### Key Features

- Estimated energy savings: 1,025,856 kWh/yr.
- Naturally ventilated car park.
- "Excellent" WELS rating for all water taps.
- Extensive greening from sky garden and landscaping podium.



## M Hotel Singapore

(Existing Non-Residential Buildings)

### Building Owner

Hong Leong Holdings Pte Ltd

### Facility Management

M-Hotel Engineering Team

### ESCO

Kaer Pte Ltd

### ESD Consultant

Kaer Pte Ltd

### Key Features

- Estimated energy savings: 736,147 kWh/yr; Estimated water savings: 1,209 m<sup>3</sup>/yr.
- Heat pump system and VSD control for most of the AHUs and pumps.
- Motion sensor for common walkway and gym.
- Solar window film on lobby windows and guestroom windows.
- Refrigerant leak detection system in chiller plant room.



## Mitsubishi Electric Building

(Existing Non-Residential Buildings)

### Building Owner

Mitsubishi Electric Asia Pte Ltd

### Building Management

Mitsubishi Electric Asia Pte Ltd

### ESD Consultant

Building System & Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 552,954 kWh/yr; Estimated water savings: 576 m<sup>3</sup>/yr.
- Extensive replacement of existing T8 to T5 fluorescent lightings for the offices, warehouses, showroom and car parks.
- Poly-crystalline solar PV panels of 8.88 kWp installed, energy generated was measured at 9,917 kWh/yr.
- Extensive use of digital power meters linking with BMS.



## National Parks Headquarter

(Existing Non-Residential Buildings)

### Building Owner

National Parks Headquarter

### ESD Consultant

CPGreen @ CPG Consultants Pte Ltd

### Key Features

- Estimated energy savings: 271,240 kWh/yr.
- Replacement of air cooled chiller to water cooled chiller.
- PV panel to generate alternative energy for charging of lighting and battery.
- High green plot ratio and green wall.
- UV lamp for AHU.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## New Supreme Court Building

(Existing Non-Residential Buildings)

**Building Owner**  
Supreme Court of Singapore

**Building Management**  
ST Synthesis Pte Ltd

**ESCO**  
United Premas Limited

**ESD Consultant**  
United Premas Limited

### Key Features

- Estimated energy savings: 639,013 kWh/yr; Estimated water savings: 30,848 m<sup>3</sup>/yr.
- The building was built with low E-glass and sunshades to reduce the solar heat gain through the facade.
- Efficient chiller plant system at 0.73 kW/RT and chiller plant optimisation with the installation of VSD and feedback controls for condenser water pumps and cooling tower fans.
- Use of CO sensors for carpark and CO<sub>2</sub> sensors for all AHU.
- NEWater is used for irrigation and cooling tower make-up. This alternative water source has achieved a 68% reduction in potable water use for the building.

★ Gold



## OCBC Centre

(Existing Non-Residential Buildings)

**Building Owner**  
OCBC Square Private Limited

**Facility Manager**  
OCBC Property Services Private Limited

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

### Key Features

- Estimated energy savings: 2,656,790 kWh/yr; Estimated water savings: 16,640 m<sup>3</sup>/yr.
- Efficient chiller plant at 0.68 kW/RT.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Motion sensors at all toilets.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## OCBC Centre South

(Existing Non-Residential Buildings)

### Building Owner

OCBC Square Private Limited

### Building Management

OCBC Property Services Private Limited

### ESCO

United Premas Limited

### ESD Consultant

United Premas Limited

### Key Features

- Estimated energy savings: 580,000 kWh/yr; Estimated water savings: 2,620 m<sup>3</sup>/yr.
- New chiller plant system, achieving efficiency of 0.67 kW/RT.
- Use of CO<sub>2</sub> sensor to regulate fresh air intake.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Building Automation System (BAS) was upgraded to monitor and trend log the performance of the building system including heat balance.

★ Gold



## Palais Renaissance

(Existing Non-Residential Buildings)

### Building Owner

City Developments Limited

### Facility Management

City Developments Limited

### Key Features

- Estimated energy savings: 125,495 kWh/yr; Estimated water savings: 2,550 m<sup>3</sup>/yr.
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.
- Implementation of policy to adjust temperature up by 1 °C.
- Water efficient cleaning method for domestic tank.
- Green roof and roof top garden.



## Panasonic Factory Solutions Asia Pacific

(Existing Non-Residential Buildings)

### Building Owner

Panasonic Pte Ltd

### Facility Management

CPG Facility Management Pte Ltd

### ESCO

CPG Consultants Pte Ltd

### ESD Consultant

CPGreen @ CPG Consultants Pte Ltd

### Key Features

- Estimated energy savings: 287,368 kWh/yr; Estimated water savings: 10,857 m<sup>3</sup>/yr.
- Solar film on all external windows and cool paint on all external walls.
- LED lighting for canteen, T5 and LED lighting for offices.
- Use of water tap fittings that are rated "Excellent".
- Motion sensors for staircases and toilets.



## Prudential Tower (MCST 2340)

(Existing Non-Residential Buildings)

### Building Owner

The Management Corporation Strata Title Plan No. 2340

### Building Management

Keppel Land International Ltd

### ESCO

Kaer Pte Ltd

### ESD Consultant

Kaer Pte Ltd

### Key Features

- Estimated energy savings: 591,663 kWh/yr; Estimated water savings: 8,000 m<sup>3</sup>/yr.
- Chiller plant optimisation was performed to optimise chilled water circulation, re-balance AHU air circulation, optimise condenser water circulation and improve operating efficiency of chiller.
- The neon lighting for the signage were replaced with LED lighting.
- Use of motion sensors to control the lighting in the toilets and staircases and use of carbon monoxide cum temperature sensors to control the ventilation fans in the carpark.
- Prudential Tower has established and adopted Environmental Friendly Purchasing Policy to procure products and services which have no adverse impact on the environment.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Raffles City Singapore

(Existing Non-Residential Buildings)

### Building Owner

CapitaCommercial Trust /  
CapitaMall Trust

### Building Management

HSBC Institutional Trust Services  
(Singapore) Limited as  
Trustee-Manager of RCS Trust

### ESCO

Kaer Pte Ltd

### ESD Consultant

Kaer Pte Ltd

### Key Features

- Estimated energy savings: 142,960 kWh/yr; Estimated water savings: 164,450 m<sup>3</sup>/yr;
- Solar films installed on windows of office floors help to reduce up to 23% heat gain.
- Variable speed drives installed to optimise the chilled water and condenser water pumps as well as the cooling towers' fans.
- Use of motion sensors, photo sensors and CO sensors as well as extensive replacement of halogen to LED lightings in common areas.
- Use of NEWater for cooling tower, landscape irrigation and toilet flushing system as well as collection of AHU condensates to be used as make-up water for cooling tower.



## Singapore Changi Airport Terminal 2

(Existing Non-Residential Buildings)

### Building Owner

Changi Airport Group (S) Pte Ltd

### Facility Management

Changi Airport Group (S) Pte Ltd

### ESCO

United Premas Limited

### ESD Consultant

United Premas Limited

### Key Features

- Estimated energy savings: 2,671,948 kWh/yr; Estimated water savings: 96,141 m<sup>3</sup>/yr.
- Heat recovery system for domestic hot water supply.
- Photocells sensors for skylight areas and motion sensors for offices and toilets.
- UV emitters and Bio-kill products at all Air Handling Stations (AHSs).
- Use of carpark guidance system.

★ Gold

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Singapore Management University - City Campus

(Existing Non-Residential Buildings)

### Building Owner

Singapore Management University  
– City Campus

### ESCO

Johnson Controls (S) Pte Ltd

### Facility Management

Singapore Management University

### Key Features

- Estimated energy savings: 4,350,757 kWh/yr; Estimated water savings: 12,000 m<sup>3</sup>/yr.
- Electronic air filters for all AHUs.
- Use of high efficient T5 lighting in buildings.
- Auto tube cleaning system for chillers.

★ Gold



## 8 @ Woodleigh

(New Residential Buildings)

### Client / Developer

FCL Homes Pte Ltd

### Project Manager

FCL Homes Pte Ltd

### Architect

Consortium 168 Architects Pte Ltd

### M&E Engineer

Rankine & Hill (Singapore) Pte Ltd

### Structural Engineer

P&T Consultants Pte Ltd

### Quantity Surveyor

Davis Langdon & Seah Singapore Pte Ltd

### Main Contractor

Keong Hong Construction Pte Ltd

### Landscape Consultant

Peridian Asia Pte Ltd

### Key Features

- Estimated energy savings: 2,959,681 kWh/yr; Estimated water savings: 48,098 m<sup>3</sup>/yr; ETTV: 20.44 W/m<sup>2</sup>.
- Good orientation of residential towers.
- Provision of air conditioning rated with 4 ticks under SELS, water efficient fittings and sun pipes.
- Use of siphonic rainwater discharge system.
- Extensive greenery and provision of ductless fan system for basement carpark.



# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Amber Residences

(New Residential Buildings)

### Client / Developer

Voda Land Pte Ltd

### Architect

AKDA Architects

### M&E Engineer

Bescon Consulting Engineers Pte Ltd

### Structural Engineer

RSP Architects Planners & Engineers Pte Ltd

### Quantity Surveyor

Northcroft Lim Consultants Pte Ltd

### Main Contractor

Lian Beng / L.S.JV.

### Landscape Consultant

Peridian Asia Pte Ltd

### ESD Consultant

Cynosure Design Pte Ltd

### Key Features

- Estimated energy savings: 902,953 kWh/yr; Estimated water savings: 66,719 m<sup>3</sup>/yr; RETV: 19.81 W/m<sup>2</sup>.
- Double glazed glass to improve the RETV.
- Efficient air conditioning in dwelling units.
- Sun pipes to reduce the use of artificial lighting.

★ Gold



## Commonwealth 10

(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

Sim Lian Construction Co (Pte) Ltd

### Landscape Consultant

Surbana International Consultants Pte Ltd

### Key Features

- Estimated energy savings: 839,287 kWh/yr; RETV: 18.79 W/m<sup>2</sup>.
- Good building façade and orientation.
- Naturally ventilated common areas and adequate provision of openings for cross ventilation within residential unit.
- Use of energy efficient light fittings and water efficient fittings.
- Internal clothes dry rack for 2-room units and external clothes dry rack for 3 to 5-room units.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Dew Spring @ Yishun N4C9

(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

Singapore Piling & Civil Engineering Pte Ltd

### Landscape Consultant

Surbana International Consultants Pte Ltd

### Key Features

- Estimated energy savings: 1,157,793 kWh/yr; Estimated water savings: 60,511 m<sup>3</sup>/yr; RETV: 16.6 W/m<sup>2</sup>.
- Use of energy efficient lighting and water efficient water fittings.
- Use of recycled content for non-structural items and use of low VOC paints.
- Extensive greenery.
- Provision of bicycle racks.

★ Gold



## Optima @ Tanah Merah

(New Residential Buildings)

### Client / Developer

TID Pte Ltd

### Architect

ADDP Architects LLP

### M&E Engineer

Bescon Consulting Pte Ltd

### Structural Engineer

KTP Consultants Pte Ltd

### Quantity Surveyor

KPK Quantity Surveyors (Singapore) Pte Ltd

### Main Contractor

Nakano Singapore (Pte) Ltd

### Landscape Consultant

DLQ Design Pte Ltd

### Key Features

- Estimated energy savings: 347,673 kWh/yr; Estimated water savings: 17,980 m<sup>3</sup>/yr; RETV: 20.00 W/m<sup>2</sup>.
- Use of energy efficient T5 light fittings for applicable areas and use of motion sensors for staircases.
- Provision of ductless fan with CO sensors for basement carpark.
- Extensive greenery.
- Provision of electric charging points.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## Punggol Breeze

(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

Qingjian Group Co. Ltd. Singapore Branch

### Landscape Consultant

Surbana International Consultants Pte Ltd

### Key Features

- Estimated energy savings: 1,102,754 kWh/yr; Estimated water savings: 40,262 m<sup>3</sup>/yr; RETV: 21.21 W/m<sup>2</sup>.
- Use of energy efficient lighting and water efficient water fittings.
- Use of recycled content for non-structural items and use of low VOC paints.
- Extensive greenery.
- Bio-swale system at Common Green.

★ Gold



## The Nautilus @ Punggol

(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

Sim Lian Construction Co (Pte) Ltd

### Landscape Consultant

Surbana International Consultants Pte Ltd

### Key Features

- Estimated energy savings: 670,977 kWh/yr; Estimated water savings: 62,700 m<sup>3</sup>/yr; RETV: 15.81 W/m<sup>2</sup>.
- Use of energy efficient lighting and water efficient water fittings.
- Internal and external clothes dry rack.
- Use of recycled content for non-structural items and use of low VOC paints.
- Provision of bicycle racks.

# BCA GREEN MARK FOR BUILDINGS AWARD

★ Gold



## The Waterline

(New Residential Buildings)

### Client / Developer

Waterline Development Pte Ltd

### Architect

Team Design Architects Pte Ltd

### M&E Engineer

Rankine & Hill (S) Pte Ltd

### Structural Engineer

DE Consultants (S) Pte Ltd

### Quantity Surveyor

WT Partnership (S) Pte Ltd

### Landscape Consultant

Site Concepts International Pte Ltd

### Interior Consultant

CUBE Associate Design Pte Ltd

### Key Features

- Estimated energy savings: 889,848 kWh/yr; Estimated water savings: 9,947 m<sup>3</sup>/yr; RETV: 20.75 W/m<sup>2</sup>.
- North and South facing facades.
- Use of air conditioning system rated with 4 ticks under SELS.
- Provision of heat recovery system and green roof.
- Use of T5 lamps, motion sensors, water fittings under WELS and low VOC paint.

★ Gold



## 94 Cove Drive

(Landed Houses)

### Client / Developer

Mr Fritz Horlacher & Mdm April Hu

### Architect

Eddie Wee Architects

### Structural Engineer

PKP Consultants

### M&E Engineer

AE&T Consultants

### ESD Consultant

G-Energy Global Pte Ltd

### Landscape Consultant

Watermount Gardens Pte Ltd

### Main Contractor

Huat Builders Pte Ltd

### Quantity Surveyor

CST Consultants

### Key Features

- Double glazed external blind system at strategic locations to minimise building heat gain.
- Energy efficient air-conditioning system and lighting.
- PV technologies with about 40kWp system capacity and use of solar hot water system.
- Rainwater harvesting coupled with ultra-filtration system.



Project Name	Category	Client / Developer / Building Owner
Bukit Panjang Sports Complex with Community Club	New Non-Residential Buildings	Singapore Sports Council / People's Association
Grace Orchard School	New Non-Residential Buildings	Grace Orchard School Management Committee / Ministry of Education
AutoBay @ Kaki Bukit	Existing Non-Residential Buildings	Housing & Development Board
Dawson Place	Existing Non-Residential Buildings	Housing & Development Board
Kovan 209 Market & Food Centre	Existing Non-Residential Buildings	Aljunied Town Council / National Environment Agency
PSA Tanjong Pagar Complex	Existing Non-Residential Buildings	PSA Tanjong Pagar Complex Pte Ltd
School of Chemical and Biomedical Engineering (Block N1-2)	Existing Non-Residential Buildings	Nanyang Technological University
UbiPlex 1	Existing Non-Residential Buildings	Housing & Development Board
Luxus Hills (Phase 2 & 3)	Landed Houses	Singapore United Estates (Pte) Ltd (A subsidiary of Bukit Sembawang Estates Ltd)
Luxus Hills (Phase 4)	Landed Houses	Singapore United Estates (Pte) Ltd (A subsidiary of Bukit Sembawang Estates Ltd)
Luxus Hills (Phase 5)	Landed Houses	Singapore United Estates (Pte) Ltd (A subsidiary of Bukit Sembawang Estates Ltd)

# BCA GREEN MARK FOR EXISTING RESIDENTIAL BUILDINGS AWARD

Greening the existing building stock is a key national priority. The Inter-Ministerial Committee on Sustainable Development (IMCSD) has set a vision for the built environment - "at least 80% of the buildings in Singapore to be green by 2030".

To recognise the eco-conscious efforts of town councils, managing agents and even residents towards reducing the environmental footprint of residential buildings, BCA has developed a new Green Mark assessment system for Existing Residential Buildings, which applies to both private and public developments.

The assessment system for Existing Residential Buildings was developed through numerous consultation sessions with stakeholders including managing agents, town councils and relevant government agencies, covering aspects such as:

- Energy Efficiency,
- Water Efficiency,
- Sustainable Operation & Management,
- Community & Wellbeing, and
- Other Green Features (which are innovative and have positive environmental impact)

The BCA Green Mark scheme for Existing Residential Buildings is an evaluation framework for the stakeholders keen to green existing residential buildings. This scheme will also identify environmentally-friendly residential buildings as exemplars for the industry. This scheme also recognizes the collective efforts of home owners and residents that are crucial towards transforming the built environment towards environmental sustainability.

# BCA GREEN MARK FOR EXISTING RESIDENTIAL BUILDINGS AWARD

★ Gold<sup>Plus</sup>



## Block 246, 247, 248 and 249 Jurong East Street 24

(Existing Residential Buildings)

**MCST / Town Council**

Jurong Town Council

**Developer**

Housing & Development Board

**Managing Agent**

Esmaco Township Management  
Pte Ltd

### Key Features

- Solar panels with 132kWp power generation.
- LED lighting for all common areas.
- Extensive greenery surrounding the precinct.
- Four green activities held annually to increase Green awareness among residents.
- Gearless lifts equipped with VVVF and sleep mode.



## Block 370, 371, 372, 373, 373A, 373B, 374 and 375 Hougang Street 31

(Existing Residential Buildings)

**MCST / Town Council**

Aljunied Town Council

**Developer**

Housing & Development Board

**Managing Agent**

CPG Facilities Management Pte Ltd

### Key Features

- Solar panels with 65kWp power generation.
- Five LED PV lamps at the multi-storey carpark (MSCP) roof top.
- Installed T5 lightings with high frequency ballast for all common areas.
- Power saving device installed at Blk 373A's MSCP.
- Four green activities held annually to increase Green awareness among residents.



# BCA GREEN MARK FOR EXISTING RESIDENTIAL BUILDINGS AWARD

★ Gold



**Block 234, 234A, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244 and 245 Bukit Panjang Ring Road**  
(Existing Residential Buildings)

**MCST / Town Council**  
Holland-Bukit Panjang Town Council

**Managing Agent**  
EM Services Pte Ltd

**Developer**  
Housing & Development Board

## Key Features

- Solar panels with 185kWp power generation.
- Installed T5 lighting with high frequency ballast for all common areas.
- Lifts equipped with VVVF and sleep mode.

★ Gold



**Block 3, 3A, 5, 5A, 5B, 30 and 30A Holland Close**  
(Existing Residential Buildings)

**MCST / Town Council**  
Holland-Bukit Panjang Town Council

**Managing Agent**  
EM Services Pte Ltd

**Developer**  
Housing & Development Board

## Key Features

- Installed T5 lighting with high frequency ballast for all common areas.
- Lifts equipped with VVVF and sleep mode.
- Extensive greenery.

# BCA GREEN MARK FOR EXISTING RESIDENTIAL BUILDINGS AWARD

★ Gold



## Block 334, 335, 336 and 337 Ang Mo Kio Avenue 1

(Existing Residential Buildings)

**MCST / Town Council**

Ang Mo Kio – Yio Chu Kang Town Council

**Managing Agent**

CPG Facilities Management Pte Ltd

**Developer**

Housing & Development Board

### Key Features

- Rooftop 100% covered with greenery to reduce ambient temperature.
- Installed T5 lighting with high frequency ballast for all common areas.
- Extensive greenery.
- Gearless lifts equipped with VVVF and sleep mode.

★ Gold



## Block 390, 390A, 391 and 392 Tampines Avenue 7

(Existing Residential Buildings)

**MCST / Town Council**

Tampines Town Council

**Managing Agent**

EM Services Pte Ltd

**Developer**

Housing & Development Board

### Key Features

- Solar panels with 115kWp power generation.
- Energy efficient lighting with high frequency ballast.
- Lifts equipped with VVVF and sleep mode.

# BCA GREEN MARK FOR EXISTING RESIDENTIAL BUILDINGS AWARD

★ Gold



## Block 658, 660, 661 and 662 Hougang Avenue 8

(Existing Residential Buildings)

**MCST / Town Council**  
Aljunied Town Council

**Developer**  
Housing & Development Board

**Managing Agent**  
CPG Facilities Management Pte Ltd

### Key Features

- Installed T5 lighting with high frequency ballast for all common areas.
- Three green activities held annually to increase Green awareness among residents.
- Gearless lifts equipped with VVVF and sleep mode.

★ Certified

## Ardmore Park

(Existing Residential Buildings)

**MCST / Town Council**  
The Management Corporation Strata Title Plan  
No. 2645

**Managing Agent**  
Knight Frank Estate Management Pte Ltd

### Key Features

- Use of variable speed pumps for water features.
- Use of pond water for landscape irrigation and undergravel biofiltration system for ponds.
- Use of regenerative lift systems.



# BCA-NPARKS GREEN MARK FOR NEW PARKS AWARD

BCA–NParks Green Mark for New Parks Award is joint initiative by the Building and 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 Award scheme is specifically developed for civic landscape areas examining social and economic sustainability with strong emphasis on environmental sustainability. This environmental assessment framework also articulates in compatibility with BCA–NParks Green Mark Park scheme for existing parks.

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

- Material Resource
- 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 and neighbourhood parks, conservation and nature parks as well as public theme parks, can be assessed under this scheme.





★ Platinum

## JTC's CleanTech Park Green Core

### **Client / Developer**

JTC Corporation

### **Project Manager**

JTC Corporation

### **Landscape Consultant**

Atelier Dreiseitl Asia Pte Ltd

### **Key Features**

- Provision of wildlife corridor which allows the animals to inhabit and travel between the site and the larger surrounding green environment.
- Re-creation of freshwater swamp forest to restore the site's historical ecohabitat as well as to conserve the site's unique ecological values.
- Creation of swales for conveyance and slowing down of stormwater on site.
- Cleansing Biotope for on-site treatment of stormwater to be recycled to flush toilets and irrigate green roof.
- Retention ponds for permanent/temporary retention of stormwater to slow down the rainwater flow in an event of heavy rainfall.
- Use of energy efficient LED outdoor lights.
- Design of sheltered structures with the integration of passive energy systems.
- Use of environmentally friendly products and recycled materials.

# BCA GREEN MARK FOR OFFICE INTERIOR AWARD

The BCA Green Mark for Office Interior is an initiative of the Building and Construction Authority (BCA) to promote and recognizes environmentally friendly and sustainable practices and features in office tenants. It complements NEA's Energy Smart Office Label and BCA Green Mark for Building Schemes which assess the building whereas BCA Green Mark for Office Interior assesses the office tenant of buildings. The offices are evaluated based on the following five criteria:

- Energy Efficiency
- Water Efficiency
- Sustainable Management & Operation
- Indoor Environment Quality
- Other Green Features

Under the assessment system, points are awarded for incorporating environment-friendly features which are better than normal practice. The assessment identifies designs where specific targets are met. Meeting one or more indicates that the tenant's office is likely to be more environmental friendly than office where the issues have not been addressed. The total number of points obtained provides an indication of the environmental friendliness of the office design. Offices are awarded Platinum, Gold<sup>Plus</sup>, Gold or Certified rating depending on the points scored.

The assessment process consists of a preliminary meeting with the project team or office's management team to brief on the assessment criteria and request for relevant reports and documentary proofs to substantiate the subsequent submissions. After that an assessment will be conducted which leading to the award of the BCA Green Mark. Subsequently, offices are required to have triennial assessment. This is to ensure that the Green Mark Certified office continues to be well-maintained.

# BCA GREEN MARK FOR OFFICE INTERIOR AWARD



★ Platinum

## Credit Suisse Regional Data Centre - Level 2 & 3 Offices

(Located at Serangoon North)

**Tenant/ Owner**  
Credit Suisse AG

**Project Manager**  
Confluence Project Management Pte Ltd

**Architect/ Contractor**  
AWP Pte Ltd

**Facility Manager Company**  
Credit Suisse AG

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

**Managing Agent/ Project Manager**  
Jardine Engineering (S) Pte Ltd

**ESD Consultant**  
Kaer Pte Ltd

### Key Features

- LED lighting installed throughout office, with motion sensor controls for all office areas, photocell controlled dimmable LED lighting for building perimeter and task lights for all staff to allow for adjustment of lighting levels to suit individual task needs.
- All water fittings in the building are WELS "Excellent" certified with ZeroFlush urinals installed in all male toilets. Rainwater and NEWater are used for toilet flushing.
- Usage of SGLS certified carpets, laminates, waterproofing system, vinyl flooring and dry-wall partitions. System furniture is made up of more than 30% recycled content.
- Electrically operated perimeter blinds linked to photoelectric cells for optimal interior lighting levels for staff.
- Energy and water usage for each floor displayed on the Green Building Monitor in the main lobby, with continuous comparison to benchmarks and targets.
- Zoned air-conditioning and temperature control throughout the office to provide efficient cooling where required.
- Integrated CO<sub>2</sub> monitoring to automatically regulate fresh air intake.



★ Platinum

## Jurong Consultants Pte Ltd

(Located at The JTC Summit)

**Tenant/ Owner**  
Jurong Consultants Pte Ltd

**Renovation Consultant/ Contractor**  
Jurong Consultants Pte Ltd /  
Mui Interior Pte Ltd

**Facility Manager Company**  
JTC Corporation

**M&E Consultant**  
Jurong Consultants Pte Ltd

**Managing Agent/ Maintenance Contractor**  
JTC Corporation

### Key Features

- More than 25% office energy performance improvement.
- Excellent controllability of air conditioning system with VAV zones, thermal diffuser zones and occupancy controlled air conditioning for meeting rooms.
- Artificial lighting efficiency fulfilling more than 40% of code requirements, with extensive zoning and controls with timer switches, motion sensors and photo sensors.
- 98% of office equipment is Energy Star rated energy efficient.
- All water fittings are WELS "Excellent" certified.
- Barrier free, excellent glare-free outdoor view with utilisation of natural lighting for workstation layout arrangement.
- Extensive use of environmentally sustainable materials in renovation and use of SGLS certified and high recycled content products in office operations.
- Green Mark Championing Program aims for 5% of staff to be trained under the Green Mark Manager program.



# BCA GREEN MARK FOR OFFICE INTERIOR AWARD

★ Platinum



## **Kaer Pte Ltd**

(Located at Solaris)

### **Tenant/ Owner**

Kaer Pte Ltd

### **Renovation Consultant/ Contractor**

DIS Pte Ltd

### **ID Consultant**

Merge O+R Pte Ltd

### **ESD Consultant**

Kaer Pte Ltd

### **Key Features**

- Replacement of conventional GI duct system with fabric duct system to reduce fan speed and fan power consumption by 6% annually.
- Use of energy efficient light fittings in the office, such as LED, with zoning and scheduling controls and motion sensors for meeting rooms.
- Eco-plugs provided to groups of workstations to monitor power consumption as well as providing visible information to users to encourage more good practice of efficient energy usage.
- Use of WELS "Excellent" rated sink tap and refrigerator rated with 3 ticks under SELS.
- Use of 100% recycled content papers and SGLS certified correction pens.
- Open office layout design with flexibility for future manpower expansion of at least another 30% without the need for major renovation or relocation.
- Extensive provision of potted plants around office window perimeters and all staff are encouraged to adopt a tabletop plant, including the use of horticultural compost.
- Provision of recycling bins at strategic locations throughout the office instead of individual dustbins to staff ensures recycling is practiced.

★ Platinum



## **Mapletree Investments Pte Ltd**

(Located at Mapletree Business City)

### **Tenant/ Owner**

Mapletree Investments Pte Ltd

### **Renovation Consultant/ Contractor**

DB & B Pte Ltd /  
D'Perception Singapore Pte Ltd

### **Facility Manager Company**

Mapletree Investments Pte Ltd

### **M&E Consultant**

T.Y Lin International Pte Ltd

### **ESD Consultant**

Building System & Diagnostics  
Pte Ltd

### **Key Features**

- Use of energy efficient lighting system with zoning and controls.
- Provision of BMS for office to monitor and control air conditioning set point.
- Extensive use of LED lighting.
- Use of UV light and heat recovery for AHU.
- Use of energy efficient office IT equipment.
- Use of sustainable products in office fit out work.
- Extensive waste recycling program.

★ Platinum



## The Hongkong and Shanghai Banking Corporation Limited

(Located at Mapletree Business City)

### Tenant/ Owner

The Hongkong and Shanghai Banking Corporation Limited

### Project Manager

Faithful+Gould Pte Ltd

### Quantity Surveyor

Faithful+Gould Pte Ltd

### Renovation Contractor

Jim & Hall's Pte Ltd

### Facilities Management Company

CB Richard Ellis (Pte) Ltd

### MEP Consultant

Parsons Brinckerhoff Pte Ltd

### Managing Agent/

### Maintenance Contractor

CB Richard Ellis (Pte) Ltd

### Interior Designer

Broadway Malyan Limited

### Workplace Strategist

DEGW Asia Pte Ltd

### Key Features

- High efficiency from adopting the hot desking principle, with an open plan office, hub spaces, ad hoc meeting rooms, breakout meeting spaces and centralised storage space and lockers.
- High lighting efficiency with zoning and scheduling.
- All office equipment is Energy Star rated.
- Extensive use of sustainable material selection under the SGLS scheme including ceiling panels, vinyl flooring, carpet flooring, bamboo flooring and raised floor systems.
- Extensive green and vertical wall on all floors.
- Shuttle bus services provided to 3 locations in the morning and evening for HSBC employees and service providers.
- Extensive teleconferencing facilities to reduce travelling which cuts down on carbon footprints.

★ Platinum



## Unilever Asia Private Limited

(Located at Mapletree Business City)

### Tenant/ Owner

Unilever Asia Private Limited

### Main Contractor

Facility Link Pte Ltd

### Facility Manager Company

Johnson Controls (S) Pte Ltd

### M&E Contractor

DLE M&E Pte Ltd

### M&E Consultant

Parsons Brinckerhoff Pte Ltd

### Interior Designer & QP

Simon Chrisandra Associates Pte Ltd

### C&S Engineering Consultant

P&T Consultants Pte Ltd

### AV & Acoustic Consultant

Hewshott International

### Landscape Consultant/Contractor

Ban Nee Chen Pte Ltd

### Landscape Consultant/ Contractor

Island Landscape & Nursery Pte Ltd

### Key Features

- Motion sensors in meeting rooms able to sense space use and adjust air conditioning temperature accordingly.
- Automatic dimmers based on surrounding conditions reduce perimeter lighting usage.
- LED desk lights installed on individual work desks allow greater controllability of the lighting system.
- Energy Star rated electronic office equipment uses less energy, saves costs and decreases negative environmental impacts.
- The online Building Management System tracks and monitors monthly consumption of electricity, water and gas.
- Green walls and potted plants help achieve the right balance of office workspace and indoor green space.
- Office furniture is made from recycled content and can be easily recycled.
- The video conferencing system helps to reduce work-related travel and reduces carbon footprints.

# BCA GREEN MARK FOR OFFICE INTERIOR AWARD

★ Gold<sup>Plus</sup>



## American Express International Inc.

(Located at Mapletree Business City)

### Tenant/ Owner

American Express International, Inc.

### Client Representative

CB Richard Ellis Singapore Pte Ltd

### ID Consultant

Geyer Environments Pte Ltd

### Project Manager

Confluence Project Management Pte Ltd

### Facility Manager Company

CB Richard Ellis Singapore Pte Ltd

### M&E Consultant

DSCO Group Pte Ltd

### Cost Consultant

WT Partnership (S) Pte Ltd

### ESD Consultant

Building System and Diagnostics Pte Ltd

### Key Features

- Energy efficient air conditioning system and lighting system with zoning and control.
- Provision of energy efficient IT equipment.
- Flexible open office design with provision of hot desks.
- Extensive use of environmentally friendly products to promote a healthy indoor environment.
- Extensive recycling facilities and good waste management.

★ Gold<sup>Plus</sup>



## City Developments Limited

(Located at City Square Mall)

### Tenant/ Owner

City Developments Limited

### Managing Agent/

### Maintenance Contractor

CBM Pte Ltd

### Other specialist consultant/ Contractor

SETSCO Services Pte Ltd

### Key Features

- Resides in City Square Mall, BCA's Green Mark Platinum Building.
- Use of zoned air-conditioning and energy efficient lighting.
- Sets weekly targets to achieve & monitors electricity and water consumption.
- Has an inter-department recycling chart.
- Use of hardware such as drinking glass for visitors.
- Has a designated green corner.

# BCA GREEN MARK FOR OFFICE INTERIOR AWARD

★ Gold<sup>Plus</sup>

## Greenviron Eco Pte Ltd

(Located at 376 River Valley Road)

### Tenant/ Owner

Greenviron Eco Pte Ltd

### Renovation Consultant/ Contractor

Project Eco Solution Pte Ltd

### M&E Consultant

Primeflux Engineering Pte Ltd

### Managing Agent/

### Maintenance Contractor

Primeflux Engineering Pte Ltd

### Other specialist consultant/ Contractor

IAQ Consultants Pte Ltd

### Key Features

- Use of LED for all interior light fittings with zoning and scheduling control for office and showroom areas.
- 2.76 kWp solar panel on building's roof.
- Solar water heater with capacity of 300 litres and sun tunnel to illuminate pantry area.
- Rainwater harvesting system for watering of interior green wall garden and area cleaning as well as using greywater system for toilet flushing.
- Open and flexible office layout with foldable and movable furniture for flexibility of conversion from showroom to office layout.
- Provision of compost bin to generate compost for interior greenery.

★ Gold<sup>Plus</sup>

## Kraft Foods Asia Pacific Services Pte Ltd

(Located at Keppel Bay Tower, Level 5)

### Tenant/ Owner

Kraft Foods Asia Pacific Services Pte Ltd

### Renovation Consultant/ Contractor

D'Perception Singapore Pte Ltd

### M&E Consultant

D'Perception Singapore Pte Ltd

### ESD Consultant

Building System & Diagnostics Pte Ltd

### Key Features

- Provision of energy efficient lighting system with zoning and control, coupled with photo-cell sensors and motion sensors to reduce the use of artificial lightings.
- Design layout optimised for space efficiency.
- Extensive usage of energy efficient office and IT equipment.
- Use of sustainable and environmentally friendly products to promote a healthy indoor environment.
- More than 2% of office GFA is greened.
- Provision of video conference facility helps to reduce the need for international business trips and therefore reduce carbon footprints.



# BCA GREEN MARK FOR OFFICE INTERIOR AWARD

★ Gold<sup>Plus</sup>



## Murex Southeast Asia Pte Ltd

(Located at Marina Bay Financial Centre)

### Tenant/ Owner

Murex Southeast Asia Pte Ltd

### Renovation Consultant/ Contractor

Facility Link Pte Ltd

### M&E Consultant

DLE M&E Pte Ltd

### Project Manager

Jones Lang Laselle Property Management Pte Ltd

### Designer

M Moser Associates (S) Pte Ltd

### IT Consultant

7-Network Pte Ltd

### Key Features

- Timers for air conditioning and lightings.
- Use of energy efficiency lightings and water efficient fittings.
- Use of green label and energy efficient office equipment.
- Extensive greenery such as live orchids and plants in office premises.
- New furniture made from sustainable materials.
- 2 recycle bins and recycling posters located inside the pantries.

★ Gold<sup>Plus</sup>



## Ogilvy & Mather (S) Pte Ltd

(Located at Robinson Road)

### Tenant/ Owner

Ogilvy & Mather (S) Pte Ltd

### Renovation Contractor

Shanghai Chong Kee Furniture & Construction Private Limited

### Project Manager Company

CB Richard Ellis Pte Ltd

### M&E Consultant

Parsons Brinckerhoff Pte Ltd

### Interior Designer

WOHA Architects Pte Ltd

### Key Features

- Provision of energy efficient lighting system with zoning and control as well as photo-cell sensors and motion sensors to reduce the need for artificial lighting.
- Design layout optimised for space efficiency.
- Provision of Energy Star and SGLS- labelled office and IT equipment.
- Use of sustainable and environmentally friendly products and maintained at least 50% of existing furniture and suspended ceilings.
- Provision of internal vertical green wall.
- Provision of extensive recycling facilities and good waste management.

★ Gold<sup>Plus</sup>



## Singapore Green Building Council

(Located at Bosch South East Asia Regional Headquarters)

### Tenant/ Owner

Singapore Green Building Council

### Renovation Consultant / Contractor

Skillplan Designer & Builder Pte Ltd

### Facility Manager Company

Robert Bosch (SEA) Pte Ltd/  
Facility Management

### M&E Engineer

Skillplan Designer & Builder Pte Ltd

### Managing Agent/ Maintenance Contractor

Exceltec Property Management Pte Ltd

### Environmental Sustainable Consultant

Building System & Diagnostics Pte Ltd

### Key Features

- High efficiency T5 fluorescent tubes.
- Daylight and motion sensor controlled system.
- Individual task lights.
- Auto shading system.
- Sustainable products used in office renovation.

# BCA GREEN MARK FOR OFFICE INTERIOR AWARD

★ Gold



## American Express International Inc.

(Located at Marina Bay Financial Centre)

### Tenant/ Owner

American Express International, Inc.

### Client Representative

CB Richard Ellis Singapore Pte Ltd

### ID Consultant

Geyer Environments Pte Ltd

### Project Manager

Confluence Project Management Pte Ltd

### Facility Manager Company

CB Richard Ellis Singapore Pte Ltd

### M&E Consultant

DSCO Group Pte Ltd

### Cost Consultant

WT Partnership (S) Pte Ltd

### ESD Consultant

Building System and Diagnostics Pte Ltd

### Key Features

- Energy efficient air conditioning and lighting system with zoning and control.
- Provision of energy efficient IT equipments.
- Flexible open office design with provision of hot desks.
- Extensive use of environmentally friendly products and recycling facilities with good waste management.

★ Gold



## City Developments Limited

(Located at City House, Levels 3, 4 and 22)

### Tenant/ Owner

City Developments Limited

### Key Features

- Extensive use of energy efficient LED lights.
- Use of WELS rated water efficient fittings.
- Maintained existing furniture.
- Provision of extensive recycling facilities and good waste management.

★ Gold



## City Developments Limited

(Located at Republic Plaza level 36)

### Tenant/ Owner

City Developments Limited

### Key Features

- Extensive use of energy efficient LED lights.
- Use of WELS rated water efficient fittings.
- Maintained existing furniture of over 10 years.
- Provision of extensive recycling facilities and good waste management.

# BCA GREEN MARK FOR OFFICE INTERIOR AWARD

★ Gold



## DNA Solutions (S) Pte Ltd

(Located at Amoy Street)

### Tenant/ Owner

DNA Solutions (S) Pte Ltd

### Renovation Consultant/ Contractor

DNA Solutions (S) Pte Ltd

### Key Features

- Emphasis on reducing light power density without compromising illumination at desktop level. Key strategies include using low wattage ceiling lamps and daylight harvesting.
- Mitigation of potable water consumption by retrofitting with verifiable labelled low flow-rate and flush water fixtures.
- Reducing carbon footprints at equipment level by procuring Energy Star rated appliances with power management features, use of zoned and individual controlled HVAC system with timer control and monitoring of carbon use with a monthly report.
- Recycle and source for building materials locally to reduce carbon footprints.

★ Gold



## Energy Market Authority

(Located at Alexandra Road)

### Tenant/ Owner

Energy Market Authority

### Other specialist consultant / Contractor

Johnson Controls (S) Pte Ltd

### Key Features

- LED energy efficient lightings in corridors and meeting rooms and energy efficiency equipment for office use.
- Use of CO<sub>2</sub> sensor in the office to regulate fresh air and motion sensors to control lights in toilets and the pantry.
- Open layout office design with extensive indoor greenery.
- Extensive recycling facilities and good waste management.

★ Certified

## Azure Pte Ltd

(Located at Joo Chiat Road)

### Tenant/ Owner

Azure Pte Ltd

★ Certified

## Kyoob – ID Pte Ltd

(Located at Genting Lane)

### Tenant/ Owner

Kyoob – ID Pte Ltd

★ Certified

## Human Capital Leadership Institute

(Located at Nepal Park)

### Tenant/ Owner

Human Capital Leadership Institute

★ Certified

## Sky Creation Design Pte Ltd

(Located at Kim Keat Lane)

### Tenant/ Owner

Sky Creation Design Pte Ltd

# BCA-LTA GREEN MARK FOR RAPID TRANSIT SYSTEMS AWARD

The Building and Construction Authority (BCA) in collaboration with the Land Transport Authority (LTA) has developed the BCA-LTA Green Mark for Rapid Transit Systems (RTS). It was officially launched in Oct 2010 along with the conferment of the first Green Mark Gold Award to the Circle Line for its environmentally friendly design and features.

The BCA-LTA Green Mark for RTS Award sets out a practical and sustainable way forward in the development of rapid transit systems and networks. It comprises three key strategies namely:

- **Effective Use of Energy**

Promote efficient use of energy through better design and provisions of electrical and mechanical systems and regenerative energy equipment to enhance the operational performance of RTS networks.

- **Environmental Protection and Sustainable Development**

Promote utilisation of environmentally friendly designs, materials and construction practices.

- **Water Conservation**

Promote the use of innovative water saving technologies and devices to reduce water consumption and to recycle waste water for non-potable use

The scheme effectively integrates various sustainability strategies in the planning, design, construction and operational aspects of the RTS, providing a holistic approach in evaluating and rating the environmental impact and performance of rapid transit systems of existing and future lines.



# BCA-LTA GREEN MARK FOR RAPID TRANSIT SYSTEMS AWARD



★ Gold

## Circle Line

### Client / Developer

Land Transport Authority

### Key Features

- Regenerative braking in RTS where energy can be harvested from the train during braking and channeled back to the electrical network for other uses. Estimated 1% reduction in energy usage which is equivalent to about 433 MWh/year.
- Use of effective drift eliminator in its air-conditioning units reduces drift loss of the cooling tower with estimated water savings: 13,550 m<sup>3</sup>/yr.
- Energy efficient lighting, lift system and escalators.
- Use of innovative construction methodology and design for recyclability of materials for environmental protection and sustainable development.

# BCA GREEN MARK FOR DISTRICTS AWARD

The Green Mark for Districts Awards is an initiative by the Building and Construction Authority (BCA) to promote and recognise environmentally-friendly and sustainable practices in the planning and implementation of district developments. An extension of the popular BCA Green Mark for Buildings Award scheme, the Green Mark for Districts Awards 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 Management
- Material & Waste Management
- Environmental Quality & Protection
- Green Building & Other Green Features

By moving beyond buildings and implementing Green Mark at the district level, the scheme will make more significant contributions to reductions in waste, carbon emissions, energy and water consumption.

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

Green Mark for District projects show a 10%-40% of energy savings and more than 40% of water savings.

# BCA GREEN MARK FOR DISTRICTS AWARD



★ Gold<sup>Plus</sup>

## Mediapolis

**Client / Developer**  
JTC Corporation

**Master Planner/ Architect**  
Bernard Tschumi Architects/ CPG Consultants Pte Ltd

**ESD Consultant**  
CPG Consultants Pte Ltd

### Key Features

- Holistic master planning done from Day 1 helped to lay the foundation of many passive design and district level green features.
- LED or energy-saving street lighting provided for Mediapolis.
- Bio-retention swales to treat stormwater.
- Sky gardens and terraces for each individual plot to ensure extensive greenery throughout the district.

# OVERSEAS BCA GREEN MARK PROJECTS

BCA International Pte Ltd is a wholly-owned subsidiary of BCA. It provides a multitude of services in developing excellent built environments worldwide. 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.

The Green Mark scheme is not limited to buildings but also encompass districts by assessing the environmental sustainability of eco-precincts, eco-business parks and eco-infrastructure.

BCA has customised a Green Mark for Buildings scheme for China to be suited the country's climatic conditions. In addition, BCA has also developed a Green Mark for Central Business District (CBD) Scheme which will be implemented in Tianjin Eco-City.





More developers are using Green Mark to provide meaningful differentiation of their buildings in the building and real estate market. Benefits of having a Green Mark building include:

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

As of April 2011, there are 120 overseas project applications for Green Mark certification across the ASEAN region, China, India, Middle East and Africa.

# BCA GREEN MARK FOR BUILDINGS AWARD (OVERSEAS)

★ Platinum



## ST Diamond Building, Malaysia

(New Non-Residential Buildings)

### Client / Developer

Energy Commission of Malaysia/  
Senandung Budiman Sdn. Bhd.

### Project Manager

Senandung Budiman Sdn. Bhd.

### Architect

NR Architects Sdn. Bhd.

### M&E Engineer

PrimeTech Engineers Sdn. Bhd.

### Structural Engineer

Perunding SM Cekap

### Quantity Surveyor

ARH Jurukur Bahan Sdn. Bhd.

### Main Contractor

Putra Perdana Construction Sdn. Bhd.

### Landscape Consultant

KRB Enviro Design Sdn. Bhd.

### Interior Design

NR Interior Design

### Planner

GDP Planners Sdn. Bhd.

### Sustainability Consultant

Ecosys Co. Ltd Thailand  
IEN Consultants Sdn. Bhd.

### Key Features

- Estimated energy savings: 874,082 kWh/yr; Estimated water savings: 3,552 m<sup>3</sup>/yr; ETTV: 35.6 W/m<sup>2</sup>.
- Good passive envelope design to minimise the external heat gain to the building.
- Slab cooling system (cooling the slab at night to absorb the heat during the day).
- Daylight design to minimise the use of artificial lighting.
- Consideration of the glare issue in daylighting design.
- 71.5 kWp photovoltaic system.



## Idea House, Malaysia

(Landed Houses)

### Client / Developer

Sime Darby Property Berhad

### Architect

Alizar Architect

### Design Architect

BroadwayMalyan<sup>BM</sup>

### M&E Engineer

Perunding Eagles Engineers Sdn Bhd

### Structural Engineer

Asbi Associates

### Quantity Surveyor

KPK Quantity Surveyor  
(Semenanjung ) Sdn Bhd

### Main Contractor

Shimizu Corporation

### Landscape Consultant

Clouston Design (M) Sdn Bhd

### ESD Consultant

Aurecon Singapore (Pte) Ltd

### Key Features

- Various passive design strategies and environmental analysis were carried out to ensure better indoor thermal comfort and cross ventilation.
- Use of low e-glass double glazing to enhance overall thermal comfort.
- Energy efficient air-conditioning system and lighting.
- PV technologies with system capacity of 15.3 kWp.
- Provision of building management system with effective monitoring of energy and water consumption.
- Rainwater harvesting, grey water recycling systems and stormwater management system.
- Extensive greenery provision.

# BCA GREEN MARK FOR BUILDINGS AWARD (OVERSEAS)

★ Gold



## Gandaria 8, Indonesia

(New Non-Residential Buildings)

### Client / Developer

PT Artisan Wahyu

### Project Manager

Noel Morrow

### Architect

Cadiz International / PT Arkipuri International

### M&E Engineer

Beca International Ltd / PT Hantaran Prima Mandiri

### Structural Engineer

Beca International Ltd / Suradjin Sutjipto Inc.

### Quantity Surveyor

Davis Langdon & Seah

### Main Contractor

PT Acset Indonusa

### Landscape Consultant

Oemardi Zain Landscape Consultants

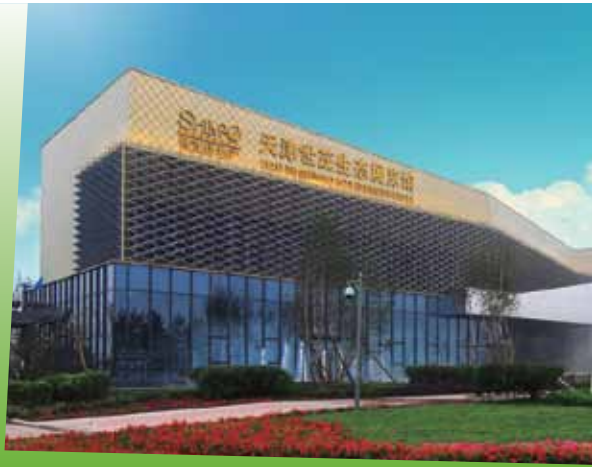
### Special Lighting Consultant

Litac Consultant

### Key Features

- Estimated energy savings: 1,145,520 kWh/yr; Estimated water savings: 45,000 m<sup>3</sup>/yr; ETTV: 44.79 W/m<sup>2</sup>.
- Energy efficient air-conditioning system and lighting system, water efficient fittings and VVVF lifts.
- CO sensors and jet fans for basement carpark ventilation system and provision of hybrid carpark lots.
- Green corner with green feature display system.

★ Gold



## Sino-Singapore Tianjin Eco-City

## Shimao Eco-Exhibition Centre, China

(New Non-Residential Buildings)

### Client / Developer

Tianjin Eco-city Shimao New Century Investment and Development Co., Ltd.

天津生态城世茂新纪元投资开发有限公司

### Architect

北京建筑设计研究院

### Main Contractor

中建三局第三建设工程有限责任公司

### ESD Consultant

Building System & Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 294,000 kWh /yr; Estimated water savings: 703 m<sup>3</sup>/yr.
- Use of low-E double glazed with Argon gas.
- Provision of ground source heat pump for cooling and heating.
- Overall extensive use of energy efficiency features such as, light pipes (to light up the corridors of the first and second floor), radiant floor heating, solar water heaters, solar bollard lights, fibre optic lighting, solar-wind powered street lights.
- Provision of renewable energy, solar photovoltaic panel, to replace 7.6% of the total building consumption.

# BCA GREEN MARK FOR BUILDINGS AWARD (OVERSEAS)

★ Gold



## Eco Gallery of Setia Eco Gardens, Malaysia

(Existing Non-Residential Buildings)

### Client / Developer

SP Setia Sdn Bhd

### ESD Consultant

Building System & Diagnostics Pte Ltd

### Key Features

- Estimated energy savings: 15,626 kWh /yr; Estimated water savings: 740 m<sup>3</sup>/yr.
- Extensive greenery and green wall at office building front.
- Rainwater harvesting pond for irrigation.
- Energy efficient T5 lightings in office.
- Implementation of Environmental Management System for building operation.

★ Gold



## Graha CIMB Niaga, Indonesia

(Existing Non-Residential Buildings)

### Building Owner

PT GrahaNiaga TataUtama

### Building Management

PT GrahaNiaga TataUtama

### ESD Consultant

Dr. Ir. J.J. Luthan

### Main Contractor

Shimizu Corporation

### Landscape Consultant

Clouston Design (M) Sdn Bhd

### ESD Consultant

Aurecon Singapore (Pte) Ltd

### Key Features

- Estimated energy savings: 447,000 kWh/yr; Estimated water savings: 36,000 m<sup>3</sup>/yr.
- Extensive greenery including roof gardens and vertical greening and manufacture of own compost.
- Use of motion sensors, CO sensors and CO<sub>2</sub> sensors.
- Recycling of grey water, rainwater harvesting and collection of condensates from AHU.
- Optimisation of chiller plant equipment and permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing.



## BCA GREEN MARK FOR BUILDINGS AWARD (OVERSEAS)

★ Gold



### Jakarta Garden City (Residential), Indonesia (New Residential Buildings)

**Client / Developer**  
PT. Mitra Sindo Sukses (A subsidiary of Keppel Land Limited)

**Project Manager**  
Keppel Land International Limited

**Architect**  
PT. Bias Tekno Art Kreasindo

**M&E Engineer**  
PT. Meltech Consultindo Nusa

**Structural Engineer**  
PT. HAERTE Widya Konsultan

**Quantity Surveyor**  
PT. Davis Langdon & Seah Indonesia

**Main Contractor**  
20 local housing contractors

**Landscape Consultant**  
PT. Citra Pesona Hijau

**Interior Design Consultant**  
Suying Design Pte Ltd

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

#### Key Features

- Estimated energy savings: 1,982,652 kWh/yr; Estimated water savings: 12,775 m<sup>3</sup>/yr; RETV: 19.63 W/m<sup>2</sup>.
- Energy efficient lighting.
- Rainwater for landscape irrigation.
- Biopore cylinders to provide nutrients to soil.

## BCA GREEN MARK FOR DISTRICTS AWARD (OVERSEAS)

★ Gold



### BSD Green Office Park, Indonesia

**Client / Developer**  
PT. Bumi Serpong Damai

**Architect**  
Aedas Pte Ltd, Singapore

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

**Infrastructure Engineer**  
PT. BITA Enarcon Engineering, Indonesia

**Landscape Consultant**  
Aedas Urban Design and Landscape Limited

**ESD Consultant**  
Aedas Pte Ltd, Singapore

#### Key Features

- Estimated energy savings: 46,720 kWh/yr; Estimated water savings: 50,406,301 m<sup>3</sup>/yr.
- 80% of the buildings with north-south orientation within 22.5 degrees of east/west axis and aerodynamically shaped to catch the prevailing west and south-west wind.
- The use of LED for street lighting.
- Large green-open landscape spaces between buildings and green roofs on most buildings to reduce heat island effect.
- Lake used for rainwater retention and irrigation.