



# BCA AWARDS 2018

Recognising Excellence in the Built Environment



# BCA Green Mark

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# BCA GREEN MARK CHAMPION AWARD



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

In 2016, BCA introduced a new sub-category called BCA Green Mark PlatinumSTAR Champion in recognition of the efforts of those who have achieved 50 or more building projects with Green Mark Platinum rating.

There are two categories for this award:

- BCA Green Mark Champion
- BCA Green Mark Platinum Champion
  - BCA Green Mark Platinum<sup>STAR</sup> Champion
  - BCA Green Mark Platinum Champion

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

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

# HOUSING & DEVELOPMENT BOARD (HDB)

## BCA GREEN MARK PLATINUM CHAMPION AWARD

### The Future of Heartland Living: Smart and Sustainable HDB Towns & Estates

As the largest master planner and housing developer in Singapore, HDB constantly pushes the frontiers of technology and carries out extensive R&D to build sustainable and smart towns. To further HDB's efforts in sustainable development, HDB developed an overarching Sustainable Development Framework to guide the development of new HDB towns and projects, so as to push the boundaries of design, sustainability and liveability.

The framework drives sustainability in the environmental, social and economic spheres, and defines the 10 outcomes that HDB aims to achieve (i.e. reduce carbon footprint, better waste, water and electricity management, enhance greenery and biodiversity, encourage cleaner and greener transportation, build inclusive and vibrant communities, and plan for sustainable growth etc.). This is also fully aligned with the national Singapore Sustainability Blueprint. For example, in both new and existing housing estates, HDB consciously plans to incorporate lush greenery and sustainability-driven features in the estate. These environmental features such as LED lighting with motion sensor controls, centralised chutes for recyclables, energy regenerative lifts, dual bicycle racks, eco-pedestals in the bathrooms of all flats and so on, focus on effective energy, water and waste management, so as to provide a cleaner and better living environment for residents.

Furthermore, in tandem with Singapore's 'Smart Nation' vision, HDB capitalises on the latest information and communication technology to advance the 'science' behind how we plan, design and manage our towns and estates. The focus is on the development of smart applications in five key dimensions — smart planning, smart environment, smart estate, smart living and smart communities.

HDB plans with the environment in mind, designing blocks to minimise heat gain and harness air movement to provide good air circulation and reduce reliance on air-conditioning. To advance the planning of our towns, HDB uses smart technology. Using three-dimensional town modelling software and environmental simulation tools, HDB can better understand how environmental conditions interact with the layout and design of the town to derive configurations that will create a comfortable living environment for our residents. Complex decision making modelling tools help us to select the most cost effective and optimal initiatives for our towns to achieve our sustainability goals.

HDB is also piloting smart technologies to optimise the functions of key estate services, such as through the introduction of smart pneumatic waste collection systems, smart lighting and smart fans to optimise energy consumption. Within the home, we are augmenting the infrastructure of flats to allow smart home technologies to be incorporated seamlessly, giving residents a better quality of life.

HDB has also been building capabilities to tap on solar energy as a source of renewable energy. Solar PV systems installed on the rooftops of apartment blocks can generate clean energy for common services such as lighting, lifts and water pumps. This also contributes to the reduction of our carbon footprint in the long-run. With close to 10,000 apartment blocks located island-wide, HDB is currently the largest stakeholder and forerunner in the installation of solar PV system in Singapore. By 2020, we target to have solar PV panels installed on about 5,500 of these HDB apartment blocks. This will help to generate around 265GWh of clean energy annually.

HDB will continue to provide a highly sustainable and liveable environment for our citizens, through well designed, sustainable and community-centric towns. Even as our towns evolve, with bolder, more distinctive designs and use of innovative technology, they will continue to remain a good 'home' for Singaporeans.



Floating Wetlands along Punggol Waterway



Waterway Cascadia



# FRASERS PROPERTY SINGAPORE

## BCA GREEN MARK CHAMPION AWARD

Frasers Property Singapore has built and sold more than 18,000 homes in Singapore. It oversees a portfolio of 12 shopping malls, and 11 office and business properties.

Through the years, Frasers Property Singapore has been committed to building sustainable developments through conscientious and pioneering designs, and delivering positive value for people through the spaces we create and manage.

Every property we develop has internationally-recognised standards of environmental design and performance, with the aim of reshaping environmental impact, improving indoor air quality and reducing energy, water, and material usage.

We uphold clear guidelines and policies in all our properties, to help improve energy efficiency, and to reduce water consumption and waste generation in operations.

This is exemplified by Causeway Point and the upcoming Frasers Tower on Cecil Street, both recipients of the Green Mark Platinum-award. Frasers Tower is a highly anticipated Premium Grade-A development and boasts environmentally-friendly features such regenerative high-speed lifts, energy-efficient air-conditioning, and intelligent lighting systems complete with motion sensors and photocell sensors. These features are expected to achieve more than 30 percent in energy savings.

To date, more than 20 of our properties have been recognised with various Green Mark awards. Most recently, Waterway Point and Watertown received the Universal Design Mark Gold Plus award, while Seaside Residences and Northpoint City each attained the Green Mark Gold Plus award. Northpoint City strives for healthier, greener spaces with a high-efficiency chilled water plant, recycled water for toilet flushing, and efficient heating and cooling systems for cleaner air.

Frasers Property Singapore is honoured to join a distinguished list of awardees as a Green Mark Champion. We are a conscientious developer, with an ongoing commitment to a sustainable future for Singapore.



Northpoint City

# MINISTRY OF HOME AFFAIRS (MHA)

## BCA GREEN MARK CHAMPION AWARD

As we pursue our mission to keep Singapore safe and secure, the Ministry of Home Affairs (MHA) and Home Team Departments are also committed in playing our part in the national effort to build a sustainable future for Singaporeans. Our buildings and infrastructure facilities not only serve operational requirements but are also environmentally sustainable. We are honoured to have been recognised for our efforts through the BCA Green Mark scheme, having achieved Seven Green Mark Platinum awards, one Green mark Gold<sup>plus</sup> Award and eight Green Mark Gold awards to date.

The Sentosa Fire Station was the first fire station to attain the Green Mark Platinum award in 2015. We adopted passive and active design strategies in the building design such as using cool paint to reduce solar heat gain; achieving a low ETTV value through the choice of material and glass; optimising natural ventilation; installing photovoltaic panels and a solar thermal system on the rooftop and 100% LED lighting for the entire development.

The Singapore Prison Service's Selarang Park Complex and Singapore Police Force's Woodlands Division Headquarters are other examples of projects that have achieved the Green Mark Platinum award. These projects adopt a green approach in their design, taking into consideration energy and water efficiency, environmentally-friendly products and improved indoor air quality. The Selarang Park Complex was designed to achieve energy savings of up to 30% through the use of a highly efficient air-conditioning system, LED lights, a heat pump for hot water generation and passive design of the building façade to reduce heat. The Woodlands Division Headquarters includes a high efficiency chiller plant which was made possible with intelligent controls and variable speed drives.

The Tuas and Woodlands checkpoints achieved the Green Mark Platinum award in 2018 through the retrofitting of central chiller plants and introduction of other green features. Both checkpoints were retrofitted with high efficiency chiller plants under the Guaranteed Energy Savings Performance contract. The use of energy efficient LED lights was progressively introduced to replace all the existing non-LED lights. Photovoltaic panels under the HDB's SolarNova leasing scheme are also progressively being installed at both checkpoints. The checkpoints are also certified water efficient under PUB's Water Efficient Building Certification.

Moving forward, all MHA buildings will be gradually retrofitted with energy efficient LED lightings through our upcoming MHA-wide re-lamping exercise. MHA is also working with the National Environment Agency (NEA) and Housing Development Board (HDB) respectively to implement the Guaranteed Energy Saving Performance (GESp) contract to enhance the performance of chiller plants and to install solar panels across our Home Team facilities. These showcase MHA's strong and long-term commitment to contribute to Singapore's environmental sustainability.





# BCA GREEN MARK PEARL AWARD



**The BCA Green Mark (GM) Pearl Award** is a prestigious Award that recognises the strong commitment of building owners/landlords and tenant organisations of the same project or building working in tandem to achieve greater environmental sustainability.

Held annually, the Award is given to landlords who have helped their tenants to secure Green Mark certification for their tenanted premises. To be eligible for this Award, one of the key requirements is for at least 50% of the tenanted space within the building to be Green Mark Certified, within a base building which is GM Gold<sup>PLUS</sup> or higher. There are two tiers of the Award namely:

- **Green Mark Pearl Award**
- **Green Mark Pearl Prestige Award**

The Awards are given out for the following three building types:

- i. Commercial offices
- ii. Retail malls
- iii. Business park developments



# CITY SQUARE MALL



## BCA GREEN MARK PEARL PRESTIGE AWARD

Developed and managed by CDL, City Square Mall, the first mall to receive Green Mark Pearl Prestige Award, is Singapore's first Eco-Mall. Completed in 2009, it is also the first mall in Singapore to achieve Green Mark Pearl Award in 2017 and Green Mark Platinum Award in 2007 (recertified in 2018).

Located at the junction of Serangoon Road and Kitchener Road, City Square Mall is a 66,045 sqm 11-storey development comprising about 200 tenants.

Its prominent green features include: light motion sensor at the carpark, energy-efficient LED and T5 lights; daylighting provisions; designated recycling corners; recycling programme for electronic waste products; food waste EcoDigester for its F&B tenants; and eco-messages at various parts of the mall.

Under CDL's recycling programme, City Square Mall has been tracking the paper recycling rate amongst its tenants since 2009. It also recycles lamp tubes, which resulted in over 940 kg of lamp tubes being diverted from landfills. In addition, water-efficient fittings have been installed at all toilets and pantries to conserve water, enabling City Square Mall to become a Public Utilities Board (PUB) Water Efficient Building.

As at 1 January 2017, under CDL's Green Lease Partnership programme, 100% of the mall's tenants have committed to adopting green practices within their premises.

To date, more than 71% of the Net Lettable Area received the Green Mark certification, with more than 22% achieving Green Mark Gold<sup>Plus</sup> and above. Some of our Green Mark tenants include Decathlon, Cotton On Singapore Pte Ltd (Cotton On, Cotton On Kids and Rubi Shoes), Starbucks, Aston Food & Beverage Specialities Pte Ltd (Astons Specialities, Manle Hotspot and Chic-A-Boo Fried Chicken), Q&M Dental Centre Pte Ltd and Newstead Technologies Pte Ltd.

Landlord/Owner:



**CITY  
DEVELOPMENTS  
LIMITED**



# CAPITAL TOWER

## BCA GREEN MARK PEARL AWARD

Capital Tower is a 52-storey Grade A office development located in Tanjong Pagar. It features a landscaped urban plaza and a suite of business facilities such as auditorium and meeting room facilities, a club fitness centre, and choice of F&B and retail outlets.

Some green features include an upgraded chiller plant, use of NEWater in the cooling towers, water and carbon dioxide monitoring sensors, car park guidance system and an electric vehicle charging station. Capital Tower was recertified to BCA Green Mark Platinum Award in 2017 and conferred the BCA Universal Design Mark Gold Award in 2017.

CapitaLand actively engages its stakeholders. Green tips are shared via a quarterly newsletter and social media. Tenants are encouraged to take part in green activities such as e-waste collection and recycling programme and also participate in the annual Earth Hour campaign. A signature event is the CapitaLand Commercial Trust (CCT) Eco Race to promote environmental sustainability and healthy lifestyles amongst its tenants. It organises relevant talks to further encourage its tenants to green their office space. CapitaLand also developed a green fit-out guide to encourage office tenants to implement environmentally friendly features and sustainable usage patterns.

Through CapitaLand's efforts, four key tenants, CapitaLand Group, GIC, IINO Shipping, and Simmons & Simmons - over 50% of the building's total tenanted area - have successfully attained the BCA Green Mark Office Interior awards.

Landlord/Owner:



# REPUBLIC PLAZA TOWER 2

## BCA GREEN MARK PEARL AWARD

As Asia's leading eco-developer, for over two decades, CDL has adopted a company ethos to 'Conserve as we Construct', remodelling its operations around a triple bottom line strategy focused on financial, environmental, and social performance. From design, construction, procurement, maintenance and even stakeholder engagement, the entire life cycle of its buildings are aligned with environmental sustainability.

Republic Plaza II, a recipient of this year's Green Mark Pearl Award, was recertified Green Mark Platinum in 2018. Completed in 1996, Republic Plaza, one of Singapore's tallest skyscrapers, is a Grade A office building located in the heart of Singapore's Central Business District.

Republic Plaza is directly connected to the Raffles Place MRT station via a pedestrian tunnel and 3-5 minutes' walk away from Telok Ayer MRT Station. CDL's flagship building, Republic Plaza 1 is a 66-storey office building while Republic Plaza 2 is a 23-storey tower with multi-storey carpark.

One of the major retrofitting works that Republic Plaza underwent involved the replacement of its 15-year-old chiller system which was no longer operating at its optimal level. Two existing chiller plants were combined into a smaller but more efficient system which is expected to help save close to 4,000,000 kWh of energy, translating to an annual savings of approximately \$870,000.

As at 1 January 2017, under CDL's Green Lease Partnership programme, 100% of the tenants at Republic Plaza have committed to adopting green practices within their premises. One such example is IPC Information Systems (Singapore) Ptd, which has adopted the use of energy-efficient office equipment and lightings. As part of the well-bring of their employees, ergonomics monitor stands are provided for all staff. Biophilia wallpapers and furniture can also be found in pantry and reception corner.

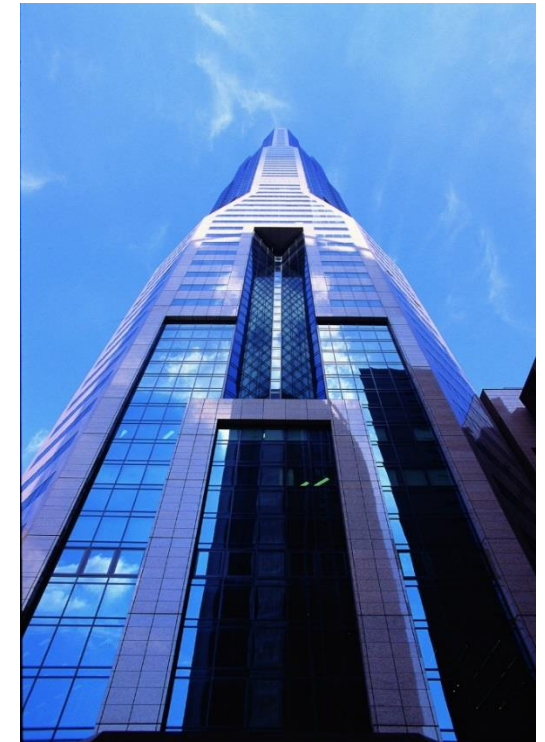
As an incentive to encourage greater energy conservation amongst tenants, CDL also introduced a 1% electricity rebate for those who attain 2% savings over the previous quarter's bill.

IPC, along with City Services Offices, Republic Plaza City Club, Golftec and Air China Limited have achieved Green Mark certification.

Landlord/Owner:



**CITY  
DEVELOPMENTS  
LIMITED**





# MANULIFE CENTRE



## BCA GREEN MARK PEARL AWARD

Developed and managed by CDL, Manulife Centre, a Green Mark Pearl Award building in 2015, is again awarded with Green Mark Pearl Award this year.

Situated along the Orchard corridor and within the Cultural Civic District, Manulife Centre is an 11-storey office building with retail units on the ground floor. It is directly linked to Bras Basah MRT Station and Bencoolen MRT Station via a pedestrian tunnel and a 5-minute walk to Dhoby Ghaut and City Hall MRT Stations. Manulife Centre was recertified the BCA Green Mark Platinum rating in 2017.

Some of the environmentally friendly features include highly efficient air-conditioning system, energy savings lighting at common areas and water efficient water fittings. Tenants were also able to access to a digital monitoring portal that provides real-time half hourly updates of energy consumption. It is conveniently accessible via mobile devices, enabling them to better track and manage their electricity usage.

All new tenants receive green fitting out kits comprises of guidelines and checklists pertaining to fitting out works, and during the tenants' operation at the premises. Posters and stickers reflecting eco-messages are also distributed to tenants. One of the Green Mark tenants, Twentieth Century Fox, not only use energy and water efficient fittings, they also encourage efficient use of space by having open office concept and hot desking with movable pedestals. Instead of high cubicle partitions, planter boxes were used.

To inculcate a sustainability culture amongst its tenants, CDL has been engaging tenants through this green journey. Tenants are encouraged to participate in green and health-related events such as movie screening or workshops on environmental-related issues. As part of a healthier workplace, Manulife Centre also partners with Health Promotion Board and Singapore Management University to conduct workouts for tenants.

Landlord/Owner:



**CITY  
DEVELOPMENTS  
LIMITED**





# BCA GREEN MARK FOR BUILDINGS



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

Buildings are assessed under the following criteria:

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

The Awards will be given out for the following build types:

- i. Non-Residential Buildings (New & Existing)
- ii. Residential Buildings (New & Existing)
- iii. Schools
- iv. Landed Houses
- v. Healthcare Facilities

# 5 SCIENCE PARK DRIVE

## New Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Science Park Property Trustee Pte Ltd (as Trustee of Science Park Property Trust 1)
Project Manager	Ascendas Services Pte Ltd
Architect	Multiply Architects LLP Series Architects
M&E Engineer	J Roger Preston (S) Pte Ltd
Structural Engineer	TW-Asia Consultants Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	Nakano Singapore Pte Ltd
Landscape Consultant	ICN Design International Pte Ltd
Other	Building Systems & Diagnostics Pte Ltd, Limelight Atelier Pte Ltd, Serie Architects

- Estimated energy savings: 1,575,124kWh/yr; Estimated water savings:12,985.58m3,
- Water cooled chiller system efficiency of 0.57 kW/RT
- Use of Regenerative Lifts with Variable Voltage, Variable Frequency (VVVF) & Sleep Mode Functions
- Low ETTV by using double glaze low-e glass for building facade
- Using T5 and LED Lightings to reduced energy consumption by 58%
- Installation of 3-ticks WELS rating water efficient fittings in the building
- Use of Green cement and concrete as the sustainable construction material
- Extensive Usage of Environmentally friendly products certified under SGBP & SGLS



# 9 PENANG ROAD

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Park Mall Pte Ltd
Architect	P & T Consultants Pte Ltd
M&E Engineer	WSP Consultancy Pte Ltd
Structural Engineer	P & T Consultants Pte Ltd
Quantity Surveyor	Davis Langdon KPK (Singapore) Pte Ltd
Main Contractor	China Construction Co Pte Ltd
Project Manager	SingHaiyi Development Pte Ltd
Landscape Consultant	COEN Design International Pte Ltd
ESD Consultant	WSP Consultancy Pte Ltd

- High energy efficient chilled water plant, 0.57 kW/ton
- Minimize solar heat gain through good orientation of building, use of spandrel glass with rock wool insulation and provision of sun shading
- Extensive use of sustainable product with high ratings under Singapore Green Building Council (SGBC)
- Provision of energy recovery ventilation to recover energy from exhaust air to pre-cool fresh air
- Extensive use of energy efficient lighting fittings to achieve more than 40% improvement for Lighting Power Budget (LPB)
- CO2 sensor control to regulate fresh air demand for AHU's and CO sensor control to regulate fresh air demand for car park mechanical ventilation system
- Recycle more than 20% of demolition waste on site and send to approved recyclers

# ADMIN OFFICE

## New Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

Chong Pang Citizen's Consultative Committee

Architect

APdS Architects

M&E Engineer

iCONS Engineering

Structural Engineer

JS Tan Consultants

Quantity Surveyor

BCM Consultants

Main Contractor

Builder265

ESD Consultant

Building System & Diagnostics Pte Ltd

- Energy efficient variable refrigerant flow system with design system efficiency of 0.7 kW/RT
- Use of PUB WELS water efficient fittings
- Extensive use of LED lightings
- Sustainable construction with CUI of 0.22 m<sup>3</sup>/m<sup>2</sup>
- Extensive use of environmentally friendly construction materials
- Green education



# AFRO-ASIA i-MARK

## New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Robinson Development (Pte.) Ltd.
Project Manager	Shimizu Corporation
Architect	Architects 61 Pte Ltd
M&E Engineer	Alpha Consulting Engineers Pte Ltd
Structural Engineer	KK Lim & Associates Pte Ltd
Quantity Surveyor	Three Sixty Consulting Ltd
Main Contractor	Shimizu Corporation
Landscape Consultant	Tinderbox Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd

- Estimated energy savings: 1,475,468 kWh/yr; Estimated water savings: 8203 m<sup>3</sup>, ETTV: 39.27W/m<sup>2</sup>
- Installation of efficient chilled water plant with operating efficiency of 0.61kW/RT
- Usage of efficient LED lighting to enhance energy saving of up to 57%
- Design considerations to minimize building direct west facing facades
- Provision of energy savings active chilled beams in office spaces
- Usage of energy efficient lift and escalators with ACVVVF and standby mode functions
- Aesthetically pleasing and extensive greenery provision

# ALICE @MEDIAPOLIS

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	BP-DOJO LLP
Project Manager	Boustead Projects E&C Pte Ltd
Architect	Point Architects Pte Ltd
M&E Engineer	ProDesign Engineers Pte Ltd
Structural Engineer	BC Koh & Partners LLP
Main Contractor	Earthscape Concepts Pte Ltd
Landscape Consultant	Earthscape Concepts Pte Ltd
ESD Consultant	Kaer Pte Ltd

- Estimated energy savings: 1,683,229kWh/yr; Estimated water savings: 4,390m<sup>3</sup>, ETTV: 34.59W/m<sup>2</sup>
- High performance facade with ETTV of 34.59W/m<sup>2</sup>
- Mobile application based energy and water usage monitoring dashboard for building users
- 80.8% of constructed floor area uses sustainable prefabricated building system and prefabricated volumetric construction applies to bathroom units
- 53.88% savings of lighting energy consumption in comparison to SS530:2014 baseline

# ASB TOWER

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Southernwood Property Pte Ltd
Project Manager	Ascendas Services Pte Ltd
Architect	DCA Architects Pte Ltd
M&E Engineer	J. Roger Preston (S) Pte Ltd
Structural Engineer	P&T Consultants Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	Shimizu Corporation
ESD Consultant	Building System & Diagnostics Pte Ltd

- Estimated energy savings: 4,428,081kWh/yr; Estimated water savings: 5,937m<sup>3</sup>, ETTV: 38.56W/m<sup>2</sup>
- Design to achieve state of art chilled water plant efficiency of 0.58 kW/RT
- Use of AHU with multiple EC/DC plug fans to improve air-side efficiency
- Harness the free cooling energy from condensate water for space cooling in non-air conditioning space
- Low concrete usage, and extensive use of environment friendly products
- Building with 100% of LED lighting
- Heat recovery devices will be installed to recover the "coldness" from toilet exhaust air for pre-cool fresh air

# BEDOK FOOD CITY

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	JTC Corporation
Architect	Surbana Jurong Consultant Pte Ltd
M&E Engineer	Surbana Jurong Consultant Pte Ltd
Structural Engineer	Surbana Jurong Consultant Pte Ltd
Quantity Surveyor	Northcroft Lim Consultants Pte Ltd
Main Contractor	Soil Build Pte Ltd

- Enhanced daylighting
- Greenery Provision/Social Interaction of Spaces
- Water efficient fittings
- Energy efficient lighting and air-con system
- Pneumatic waste disposal system
- Integrated facility management system
- Rainwater harvesting

# BUANGKOK SQUARE NEIGHBOURHOOD CENTRE

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Housing and Development Board
Project Manager	Surbana International Project Managers
Architect	Surbana Jurong Consultants Pte. Ltd.
M&E Engineer	Surbana Jurong Consultants Pte. Ltd.
Structural Engineer	Surbana Jurong Consultants Pte. Ltd.
Quantity Surveyor	Surbana Jurong Consultants Pte. Ltd.
Main Contractor	Expand Construction Pte Ltd
Landscape Consultant	Surbana Jurong Consultants Pte. Ltd.

- Extensive use of Low E Double Glazing to improve ETTV
- Energy efficient Air-Conditioning system
- Daylighting and Natural Ventilation of Carpark, Stairs and Lift Lobbies
- Extensive use of energy efficient lights and water efficient sanitary fittings
- Use of Green Cement with GGBS
- Extensive use of sustainable products



# CUSTOMS OPERATIONS COMMAND AT JALAN BAHAR

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Singapore Customs
Project Manager	PM Link Pte Ltd
Architect	CPG Consultants Pte Ltd
M&E Engineer	CPG Consultants Pte Ltd
Structural Engineer	CPG Consultants Pte Ltd
Quantity Surveyor	CPG Consultants Pte Ltd
Main Contractor	Newcon Builders Pte Ltd
ESD Consultant	Surbana Jurong Consultants Pte Ltd

- Estimated energy savings: 1,303,790kWh/yr; Estimated water savings: 7,575.7m<sup>3</sup>
- High performance facade with an ETTV of 34.76W/m<sup>2</sup>
- Efficient Chiller Plant Design with a design system efficiency of less than 0.6 kW/RT
- Extensive use of LED and energy efficient lighting system in the development
- Use of Auto Tube Cleaning System and Non-Chemical Termite Treatment
- Jet Fans integrated with CO Sensors for improved energy savings and better IAQ in carparks
- Use of “Excellent” WELS rated water fittings
- Ultra Violet (UVC) Lamps for all AHU's within the development for improved heat transfer and IAQ
- Extensive use of Sustainable Green Products

# DEFU INDUSTRIAL CITY

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- Estimated energy savings: 21,913,221 kWh/yr; Estimated water savings: 53,981 m<sup>3</sup>, ETTV: 37.74W/m<sup>2</sup>
- Full LED lighting building
- Embodied carbon foot print reporting
- Extensive solar PV to be used on site
- Extensive greenery provision

Client/Developer	JTC Corporation
Project Manager	JTC Corporation
Architect	AC Consortium Pte Ltd
M&E Engineer	Aurecon Singapore Pte Ltd
Structural Engineer	Ronnie & Koh Consultants Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Lian Beng Construction (1988) Pte Ltd
Landscape Consultant	Zarch Collaboratives Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd

# EAST COAST INTEGRATED DEPOT (RAIL DEPOT)

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Land Transport Authority, Singapore
Project Manager	WSP Consultancy Pte Ltd
Architect	HASSELL Architecture (Singapore) Pte Ltd
M&E Engineer	WSP Consultancy Pte Ltd
Structural Engineer	WSP Consultancy Pte Ltd
Main Contractor	GS Engineering & Construction Corp
Landscape Consultant	HASSELL Architecture (Singapore) Pte Ltd
ESD Consultant	WSP Consultancy Pte Ltd

- Estimated energy savings: 23,132,093kWh/yr; Estimated water savings: 105,222m<sup>3</sup>, RETV: 23.93W/m<sup>2</sup>
- Buildings are designed with predominant natural ventilation spaces
- Energy efficient water-cooled chilled water plant (0.598 kW/Rton) coupled with solar absorption chiller
- Energy efficient lighting system with 40% improvement in lighting power budget
- Rooftop solar photovoltaic (PV) system, 1MWp
- Train wash water recycling and reuse
- MERV 14 air filter and UV light for Air Handling Units (AHUs)



# EUNOIA JUNIOR COLLEGE

## New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Ministry of Education
Architect	CPG Consultants Pte Ltd
M&E Engineer	CPG Consultants Pte Ltd
Structural Engineer	CPG Consultants Pte Ltd
Quantity Surveyor	CPG Consultants Pte Ltd
Main Contractor	Kimly – Lian Ho Lee Joint Venture
ESD Consultant	CPG Consultants Pte Ltd

- High Performance water cooled system with design system efficiency of 0.58 kW/RT and VRV system of 0.7kW/RT
- Usage of high efficiency LED and T5 lighting with energy savings of 51.09%
- No west facing façade for non-air conditioned areas
- Extensive greenery with rooftop garden
- Rainwater harvesting for irrigation
- Extensive use of environmentally friendly construction materials such as Recycled Concrete Aggregates and Washed Copper Slag
- CFD Simulations to ensure adequate ventilation for natural ventilated classrooms

# HOUGANG RIVERCOURT NEIGHBOURHOOD CENTRE

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Housing & Development Board
Architect	ADDP Architects LLP
M&E Engineer	United Project Consultants (S) pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	CKR Contract Services Pte Ltd
Landscape Consultant	Earthscape Concepts Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd

- Estimated energy savings: 1,418,612 kWh/yr; Estimated water savings: 480.42 m<sup>3</sup>, ETTV: 38.23 W/m<sup>2</sup> with the use of double-glazed glass and horizontal shading
- Use of energy efficient water-cooled chilled-water plant system with design system efficiency of 0.578 kW/RT
- Use of energy efficiency LED lightings to achieve 53.78% energy savings
- Extensive installation of 3-ticks WELS rating water efficient fittings in the building
- Extensive use of locally certified environmentally friendly products for the building
- Use of lifts and escalators with variable voltage variable frequency motor drive and sleep mode features
- Green lease agreement to control lighting power density for tenanted areas

# JTC LAUNCHPAD @ JURONG INNOVATION DISTRICT

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	JTC Corporation
Architect	Kyoob Architects Pte Ltd
M&E Engineer	Conteem Engineers Pte Ltd
Structural Engineer	Thymn Pte Ltd
Quantity Surveyor	Oliver Ho & Associates
Main Contractor	Meida Construction Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd

- Excellent envelope insulation (ETTV = 34.75 w/m<sup>2</sup>)
- High efficiency DC FCU for all tenanted units
- LED lights for all tenanted units
- Green roof which covers 70% of total roof area
- 100% natural ventilated toilets, corridors and staircases
- Extensively use of green label products
- Low Concrete Usage Index of 0.35



# JTC LOGISTICS HUB

## New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	JTC Corporation
Architect	AWP Pte Ltd
M&E Engineer	Meinhardt Singapore Pte Ltd
Structural Engineer	Meinhardt Singapore Pte Ltd
Quantity Surveyor	WT Partnership Pte Ltd
Main Contractor	Kimly Construction Pte Ltd
Landscape Consultant	AWP Pte Ltd
Logistics Consultant	BMT Asia Pacific Pte Ltd
Traffic Consultant	Aurecon Group
Fire Safety Consultant	Leong Poon & Associates Pte Ltd

- Estimated energy savings: 3,377,887kWh/yr; Estimated water savings: 13,498m<sup>3</sup>, ETTV: 25.28W/m<sup>2</sup>
- Optimised Building Form and Space planning to effectively minimise direct solar exposure of air conditioned spaces. (ETTV – 25.28W/m<sup>2</sup> & minimum west facing window opening of 5.41%)
- Triple banked Louvers to improve natural ventilation (assisted with MV fans) potential along with effectively controlling Wind Driven rain inside the warehouse spaces
- Optimising daylighting and control glare on the office spaces through design of light shelves (internal & external)

# JTC POULTRY PROCESSING HUB @ BUROH

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- Estimated energy savings: 1,670,278kWh/yr; Estimated water savings: 31,974m<sup>3</sup>, ETTV: 37.94W/m<sup>2</sup>
- Innovative two-loop cooling system dedicated for low temperature production area and normal temperature office area respectively
- Energy efficiency lighting system design with 52% improvement on Lighting Power Density (LPD)
- Provision of photocell sensors for the daylight control at open corridors and loading/unloading bay at L2-L5
- Provision of motion sensors for staircase and toilets
- Use of regenerative lift to harvest the gravitational energy

Client/Developer	JTC Corporation
Architect	Surbana Jurong Consultants Pte Ltd
M&E Engineer	Surbana Jurong Consultants Pte Ltd
Structural Engineer	Surbana Jurong Consultants Pte Ltd
Quantity Surveyor	Surbana Jurong Consultants Pte Ltd
Main Contractor	HPC Builders Pte Ltd
ESD Consultant	Surbana Jurong Consultants Pte Ltd

# KIM CHUAN DEPOT EXTENSION

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Land Transport Authority
Project Manager	T.Y. Lin International Pte Ltd
Architect	DP Architects Pte Ltd
M&E Engineer	Arup Singapore Pte Ltd
Structural Engineer	T.Y. Lin International Pte Ltd
Main Contractor	Woh Hup (Private) Ltd
Landscape Consultant	DP Green Pte Ltd
ESD Consultant	DP Sustainable Design Pte Ltd

- Estimated energy savings: 18,408,855.73kWh/yr; Estimated water savings: 20,144.68m<sup>3</sup>, ETTV: 14.71W/m<sup>2</sup>
- Passive building design to reduce solar heat gain
- Energy efficient air-conditioning system with system efficiency of 0.556 kW/RT
- Energy efficient lighting
- Energy efficient mechanical ventilation system
- Photovoltaic system of about 600 kWp
- Use of green concrete
- Extensive use of sustainable products

# LOGOS - YANG KEE WAREHOUSE

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Diamond Land (S) Pte Ltd
Project Manager	LMO & Associates Pte Ltd
Architect	RSP Architects Planners & Engineers (PTE) LTD
M&E Engineer	Aurecon Singapore (Pte.) Ltd
Structural Engineer	Sterling C&S Consulting Engineer Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	HPC Builders Pte Ltd
ESD Consultant	GreenA Consultants Pte Ltd

- Estimated energy savings: 1,766,270.46 kWh/yr; Estimated water savings: 19,846.88m<sup>3</sup>, ETTV: 36.65W/m<sup>2</sup>
- Efficient air-conditioning system designed to meet design system efficiency of 0.73kW/RT
- High Efficient LED Lighting for warehouse
- Extensive use of environmentally friendly products
- Biophilic design with accessible sky garden and internal courtyard
- Well adapted native draught tolerant plants provides less maintenance and upkeep to the development while enhances the wellbeing and surrounding
- Water fittings in the building are rated “Excellent” under the WELs rating to ensure water conservation



# NATIONAL UNIVERSITY CENTRE FOR ORAL HEALTH, SINGAPORE (NUCOHS)

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	National University Hospital (S) Pte Ltd
Project Manager	Arcadis Project Management Pte Ltd
Project Manager	Arcadis Project Management Pte Ltd
Architect	Architects 61 Pte Ltd
M&E Engineer	Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Structural Engineer	AECOM Singapore Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Main Contractor	Obayashi Singapore Pte Ltd
Landscape Consultant	ICN Design International Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd

- Installation of highly efficient chilled water plant to reduce energy consumption
- Aesthetically pleasing greenery provision of a GNPR of up to 3.9 to encourage nature appreciation
- Extensive usage of environmentally friendly construction materials such as Recycled Concrete Aggregates and Washed Copper Slag
- Provision of Photocell and Motion sensors to reduce energy consumption
- Usage of energy efficient lighting fixtures which ensures the health and well-being of staff and community
- Usage of energy efficient lifts with VVVF and sleep mode
- Provision of water efficient fittings to reduce water consumption



# NATIONAL UNIVERSITY OF SINGAPORE, SCHOOL OF DESIGN AND ENVIRONMENT, SDE 4

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	National University of Singapore
Architect	Serie + Multiply Consultants Pte. Ltd / Surbana Jurong Consultants Pte. Ltd.
M&E Engineer	Surbana Jurong Consultants Pte. Ltd.
Structural Engineer	Surbana Jurong Consultants Pte. Ltd.
Quantity Surveyor	Surbana Jurong Consultants Pte. Ltd.
Main Contractor	Kajima Overseas Asia Pte. Ltd.
Landscape Consultant	Surbana Jurong Consultants Pte. Ltd.
ESD Consultant	Surbana Jurong Consultants Pte. Ltd. / TRANSSOLAR Energietechnik GmbH

- Estimated energy savings: 292,900kWh/yr; Estimated water savings: 6,607m<sup>3</sup>, ETTV: 39.6W/m<sup>2</sup>
- First Institute of Higher Learning net-zero energy building in Singapore
- Hybrid ventilation system to provide pre-conditioned air with elevated air speed.
- Highly efficient chiller plant system with efficiency of 0.57 kW/RT.
- With daylight utilisation maximised through architectural design, energy savings are further enhanced through a network of photocell and occupancy sensors
- Extensive roof top coverage of solar PV array allows SDE 4 to generate all its energy requirement within the building footprint
- Water saving features including rainwater harvesting, condensate water recycling, and greywater recycling

# PANALPINA WAREHOUSE

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- Estimated energy savings: 2,605,423kWh/yr; Estimated water savings: 69,300m3, ETTV: 19.5W/m2
- Chilled water system design system efficiency of 0.58kW/RT
- Extensive use of façade thermal insulated panel walls
- High Efficient LED Lighting for warehouse
- Extensive use of environmentally friendly products

Client/Developer	Panalpina World Transport (S) Pte Ltd
Architect	AC Consortium Pte Ltd
M&E Engineer	PDC Consulting Engineers
Structural Engineer	Engineers Alliance Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	SH Design and Build Pte Ltd

# PUNGGOL TOWN HUB

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- High Performance Glass to achieve ETTV – 32.88 W/m<sup>2</sup>
- High Efficient Water-Cooled Air-Conditioning System with System Efficiency of 0.58kW/ton
- Large Implementation of LED fittings

Client/Developer	People's Association
Project Manager	SIPM Consultants Pte Ltd
Architect	DP Architects Pte Ltd
M&E Engineer	Bescon Consulting Engineers Pte Ltd
Structural Engineer	Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Quantity Surveyor	Threesixty Cost Management Pte Ltd
Landscape Consultant	DP Green Pte Ltd
ESD Consultant	DP Sustainable Design Pte Ltd

# SELARANG PARK COMPLEX

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- Good façade design with ETTV of 38 W/m<sup>2</sup>
- Building designed which minimal west-facing façade and windows
- Building Information Modeling (BIM) is implemented for coordination and design integration
- Chiller plant system with targeted efficiency of 0.55 kW/ton
- Use of NEWater for cooling tower make up water tank
- All water fittings are rated “Excellent” under PUB WELS
- Extensive use of sustainable products and low VOC paints

Client/Developer	Singapore Prison Service
Project Manager	PM Link Pte Ltd
Architect	CPG Consultants Pte Ltd
M&E Engineer	Surbana Jurong Consultants Pte Ltd
Structural Engineer	CPG Consultants Pte Ltd
Quantity Surveyor	CPG Consultants Pte Ltd
Main Contractor	Tiong Seng Contractors (Pte) Ltd
ESD Consultant	ZEB-Technology Pte Ltd



# SELETAR AIRPORT PASSENGER TERMINAL

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Civil Aviation Authority of Singapore
Developer Agent	Changi Airport Group (Singapore) Pte Ltd
Architect	3HPArchitects Pte Ltd
M&E Engineer	Gims & Associates Pte Ltd
Structural Engineer	Surbana Jurong Consultants Pte Ltd
Quantity Surveyor	Surbana Jurong Consultants Pte Ltd
Main Contractor	Takenaka Corporation Singapore Office
Landscape Consultant	PDAA Design Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd

- Estimated energy savings: 1,495,361kWh/yr; Estimated water savings: 865.5m<sup>3</sup>, ETTV: 30.12W/m<sup>2</sup>
- Installation of energy efficient water-cooled chilled-water plant with system design efficiency of 0.57 kW/RT
- Low ETTV of 30.12 W/m<sup>2</sup> with the use of low-e and laminated glass
- Use of energy efficiency LED and T5 lightings
- Extensive installation of 3-ticks WELS rating water efficient fittings for the building
- Extensive use of green concrete and locally certified environmentally friendly for the building
- Use of automatic condenser tube cleaning system for chillers
- Use of direct driven multi-plug fans for Air Handling Units (AHUs)

# SINGAPORE WATER EXCHANGE

## New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	PUB Singapore's National Water Agency
Architect	Forum Architects Pte Ltd
M&E Engineer	BECA Carter Hollings & Ferner (SEA) Pte Ltd
Structural Engineer	BECA Carter Hollings & Ferner (SEA) Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Main Contractor	Wee Hur Construction Pte Ltd
Landscape Consultant	COEN Design International Pte Ltd
ESD Consultant	ZEB-Technology Pte Ltd

- Estimated energy savings: 303,595kWh/yr; Estimated water savings: 8236m<sup>3</sup>, ETTV: 37.46W/m<sup>2</sup>
- Chilled water system with operating efficiency of 0.54kW/RT
- Water Management Focused
- Extensive use of BIM
- Green Tenancy Lease
- Complementary certificates – GM Office Interior (PUB office level 2 and 6)
- “Meet the requirements of ABC and WEB certification”

# SOLARIS @ KALLANG 164

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	SB (Waterview) Investment Pte Ltd
Architect	AC Consortium Pte Ltd
M&E Engineer	Bescon Consulting Engineers Pte
Structural Engineer	TC Sin Consultants Pte Ltd
Quantity Surveyor	Oliver Ho and Associates
Main Contractor	Soilbuild Construction Engineering Pte Ltd

- Use of high performance DGU to meet ETTV of 39W/m<sup>2</sup>
- Centralized cooling system using water-cooled chilled water plant with efficiency of 0.60 kW/RT
- 100% usage of LED lightings for all common area lightings
- 100% AHU condensate recycling and NEWater is used for cooling tower make-up, eliminating use of potable water
- 89% of concrete used for construction is green concrete, using environmentally friendly cement and concrete such as GGBS, RCA and WCS
- With Green Leasing and Green Building User Guide, tenants' will be aware of sustainability features of building and aid in environmental protection
- Besides the good accessibility with 2 bus stops within 500m, building users are encouraged to adopt green transport with electrical car charging stations available and bicycle parking facilities
- MERV 6 filters are used for all Air Handling Units, with dedicated outdoor air units with additional MERV 14 filters to ensure good indoor air quality for occupants even under haze conditions

# STATE COURTS TOWERS

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	State Courts of Singapore
Project Manager	PM Link Pte Ltd
Architect	CPG Consultants Pte Ltd
M&E Engineer	CPG Consultants Pte Ltd
Structural Engineer	CPG Consultants Pte Ltd
Quantity Surveyor	CPG Consultants Pte Ltd
Main Contractor	Samsung C&T Corporation
Landscape Consultant	Plantwerkz Pte Ltd
ESD Consultant	Surbana Jurong Consultants Pte Ltd

- Estimated energy savings: 7,072,021kWh/yr; Estimated water savings: 28,696m<sup>3</sup>, ETTV: 35.04W/m<sup>2</sup>
- Good building orientation with ETTV of 35.04 W/m<sup>2</sup>
- Water-cooled chiller plant system of 0.60 kW/RT
- 99.8% LED to achieve 45% improvement in lighting performance
- Green plot ratio of 2.95
- 49% water savings over code compliance building
- Sustainable construction to achieve CUI of 0.50
- Siphonic Drainage System



# TCOMS DEEPWATER OCEAN BASIN

An A\*STAR – NUS Joint Venture

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	National University of Singapore
Architect	CPG Consultants Pte Ltd
M&E Engineer	WSP   Parsons Brinckerhoff Pte Ltd
Structural Engineer	CPG Consultants Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Main Contractor	Lian Soon Construction Pte Ltd

- Estimated energy savings: 332,805 kWh/yr; Estimated water savings: 21,028m<sup>3</sup>, ETTV: 36.87W/m<sup>2</sup>
- VRF system with operating efficiency of 0.75kW/RT
- Largest solar PV system in NUS
- Biophilic design
- Tree recycling into biofuel
- Use of green concrete for superstructure and extensive use of SGLS labelled green products
- Use of high efficiency LED lightings and excellent WELS rating water fittings

# TEAMBUILD ICPH

## New Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Teambuild (ICPH) Pte Ltd
Architect	P & T Consultants Pte Ltd
M&E Engineer	iCON Consulting Engineers Pte Ltd
Structural Engineer	P & T Consultants Pte Ltd
Main Contractor	Asiabuild Construction Pte Ltd
ESD / Fire Safety Engineer	IGnesis Consultants Pte Ltd

- Estimated energy savings: 1,421,168kWh/yr; Estimated water savings: 10,517m<sup>3</sup>, ETTV: 38.43W/m<sup>2</sup>
- Naturally Ventilated Factory
- Dormitory achieved good thermal comfort (PMV) through Natural Ventilation and Wall Mounted Fans
- Energy Efficient LED Lighting System
- Energy Efficient VRV System
- “Excellent” WELS rating - All Applicable Water Fittings
- Extensive Use of Recycled Aggregates

# THE SINGAPORE EDITION

## New Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	City Developments Limited/Hong Leong Holdings Limited/Lea Investments Pte Ltd
Project Manager	CDL Management Services Pte Ltd
Architect	DP Architects Pte Ltd
M&E Engineer	Squire Mech Pte Ltd
Structural Engineer	Meinhardt Pte Ltd
Quantity Surveyor	Arcadis (Singapore) Pte Ltd
Main Contractor	Kajima Overseas Asia Pte Ltd
Landscape Consultant	Sitetectonix Pte Ltd
Others	DP Sustainable Design Pte Ltd

- Estimated energy savings: 2,649,550kWh/yr; Estimated water savings: 42,407.62m<sup>3</sup>, ETTV: 38.98W/m<sup>2</sup>
- Unique building orientation and architectural design that make use of the permanent shading from high rise residential and sky bridge
- Efficient lighting design by use of LED, T5 lighting and the provision of motion sensors
- Chiller plant system with efficiency of 0.61 kW/ton
- Use of high efficiency DC fan coil units
- Carbon Monoxide sensors in car parks

# WET SCIENCE BUILDING

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	National University of Singapore
Architect	CPG Consultants Pte Ltd
M&E Engineer	Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Structural Engineer	CPG Consultants Pte Ltd
Quantity Surveyor	CPG Consultants Pte Ltd
Main Contractor	Kim Seng Heng Engineering Construction Pte Ltd
ESD Consultant	CPG Consultants Pte Ltd

- Estimated energy savings : 9,196,060 kWh/yr ; Estimated water savings: 440 m<sup>3</sup>/yr
- Base building ventilation system supports fume hood with auto sash control and heat recovery system
- Use of hybrid ventilation and passive cooling system at level 1
- Extensive usage of power meters and air flow measurement devices
- Smart Sensors for demand control in air-conditioning and lighting systems
- Usage of high efficiency LED Lighting with over 50% savings above baseline
- Use of sustainable products such as low VOC paints, interior finishes and furniture



# WOODLANDS DIVISION HEADQUARTERS

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Singapore Police Force (Ministry of Home Affairs)
Project Manager	PM Link Pte Ltd
Architect	CPG Consultants Pte Ltd
M&E Engineer	CPG Consultants Pte Ltd
Structural Engineer	CPG Consultants Pte Ltd
Quantity Surveyor	CPG Consultants Pte Ltd
Main Contractor	China Construction (South Pacific) Development Co Pte Ltd

- Estimated energy savings: 4,184,015 kWh/yr; Estimated water saving: 9,454 m<sup>3</sup>/yr; RETV/EETV: 39.16W/m<sup>2</sup>
- Energy efficient chilled water plant
- VSD for pumps & cooling tower fans
- CO sensors for regulating the car park MV fans
- Use of NEWater for cooling tower make up water tank
- Energy efficient LED lighting system
- Use of water efficient fittings
- Use of siphonic rainwater discharge system

# ALOHA LOYANG

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Public Service Division
Facility Management	ST Electronics (e-Services) Pte Ltd
ESD / Green Consultant	Earth-In-Mind Pte Ltd
Others	Toh Kim Bock C-E Contractor Pte Ltd

- Estimated energy savings 267,642kWh/yr; Estimated water savings: 17,441m<sup>3</sup>
- NEA 4 tick and 5 tick air-conditioner at bungalows and administrative block
- Solar photovoltaic system
- All water fittings are at least Wels “Very Good” rating or equivalent flow rate
- Extensive usage of sustainable construction materials
- Motion sensor at BBQ pit and car porch area
- Green Corner at administrative block

# ASIA SQUARE TOWER 1

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Asia Square Tower 1 Pte Ltd
Facility Management	Jones Lang LaSalle Property Management Pte Ltd
ESD/Green Consultant	Building System & Diagnostics Pte Ltd

- Passive Low Energy Design for building façade to achieve ETTV of 35.1W/m<sup>2</sup>. Natural ventilating the cube instead of by means of active system
- Enthalpy heat recovery wheel to recover cooled exhausted air for fresh air pre-cooling at PAHU
- Integrated heat pipes design for cooling coil at PAHU for efficient dehumidification and temperature control
- Sun pipes to harvest daylighting into car park podium and the cube
- Incorporated 192KWp of Solar Photovoltaic panel to harvest solar energy for electricity production at roof

# ASIA SQUARE TOWER 2

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Asia Square Tower 2 Pte Ltd

Facility Management

Jones Lang LaSalle Property Consultants  
Pte Ltd

ESD/Green Consultant

Building System & Diagnostics Pte Ltd

- 65 kWp Solar PV Generation at roof
- Enthalpy heat recovery wheel to provide pre-cooling at PAHU
- Integrated heat pipes design for cooling coil at PAHU
- Photocell sensors integrated with perimeter lighting for all office floors
- Sun pipes for daylighting harvesting into car park podium
- Low-e double glazing for building façade to achieve ETTV of 37.01 W/m<sup>2</sup>



# BCA Academy (For Block B, C, F, G and H)

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Building and Construction Authority

ESD/Green Consultant

Building and Construction Authority

- SolarNova phase 3 project
- Expected EEI after PV installation is 40.42kWH/m<sup>2</sup>/yr
- 35.6% energy from recyclable source
- Committed to achieve air-conditioning of 0.72 kW/RT

# BEDOK MALL

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	CapitaLand Mall Trust
Facility Management	CapitaLand Group
ESD/Green Consultant	G-Energy Global Pte Ltd

- High efficient chiller plant system with VSD control
- Extensive use of energy efficient lightings
- Motion sensors equipped for staircases' lighting
- Recycling AHU condensate for cooling tower
- Use of UVC emitters in AHUs to improve air quality
- Use of Car park Guidance System
- Photovoltaic cell integrated into canopy laminated glass design

# BUGIS JUNCTION & BUGIS JUNCTION TOWERS (MCST 2137)

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

ESD/Green Consultant

ESCO

Facility Management

Management Corporation Strata Title No. 2137, CapitaLand Group, Keppel REIT and Frasers Hospitality Trust  
Kaer Pte Ltd

Kaer Pte Ltd

Keppel Land Real Estate Services Pte Ltd

- Chiller plant design system efficiency at 0.6 kW/ton with performance guaranteed
- Solar photovoltaic panels of 181 kWp capable of recovering 0.6% of the total annual building energy consumption
- Use of skylight in the retail mall spaces to introduce daylighting to the indoor spaces
- Energy efficient T5 fluorescent and LED lightings in common areas
- Strong tenant and occupant centric green initiatives such as Go Green committee, lunch-time talks on sustainability and recycling efforts
- Sub-meters provided to monitor major water consumption

# CAPITAGREEN

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

EPC Firm/ ESCO

Facility Management

HSBC Institutional Trust Services  
(Singapore) Limited as Trustee of MSO Trust

Kaer Pte Ltd

CapitaLand Commercial Management Pte  
Ltd

- Cool Void to reduce power consumption
- Vertical Greenery, sky terrace and roof garden
- Double skin façade
- Rainwater harvesting for irrigation

# CAPITAL TOWER

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

HSBC Institutional Trust Services (Singapore)  
Limited as trustee of CapitaLand Commercial  
Trust

Facility Management

CapitaLand Commercial Management Pte Ltd

ESD/Green Consultant

Johnson Controls (S) Pte Ltd

- Remote monitoring system for live monitoring of plant room efficiency
- Carbon dioxide and carbon monoxide monitoring are used to maintain air quality levels in the office and car park areas
- Recycling of AHU condensate water to top up cooling tower make-up water tank
- Condenser auto tube cleaning system for all chillers
- Heat recovery wheel for pre-cooled fresh air intake to the building
- Motion sensors for all toilets and staircases



# CARLTON CITY HOTEL SINGAPORE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Carlton City Hotel (Singapore) Pte. Ltd.
Facility Management	Carlton City Hotel (Singapore) Pte. Ltd.
ESD/Green Consultant	Afogreen Build Pte Ltd

- Estimated energy savings: 3,653,132.6kWh/yr; Estimated water savings: 12,800m3
- High efficient chiller
- Extensive use of LED light
- Regenerative Drive Lift
- Electric vehicle charging station
- AHU and FCU condensate water recycling system
- Non chemical anti termite system
- Air purification system

# CAUSEWAY POINT

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- Chiller plant system efficiency of 0.688 kW/RT
- VSDs for all chilled water and condenser water pumps
- Provision of NEWater for Cooling Towers
- Motion sensors for car park perimeter lightings
- Provision of car park guidance system
- Provision of green Lots at Level 2 car park

Building Owner	HSBC Institutional Trust Services (Singapore) Limited as trustee of Frasers Centrepoint Trust
Facility Management	Frasers Centrepoint Property Management Services Pte. Ltd.
ESD/Green Consultant	LJ Energy Pte Ltd

# CENTURY SQUARE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	The Management Corporation Strata Title 2193
Facility Manager	AsiaMalls Management Pte Ltd
ESD/Green Consultant	Building System & Diagnostics Pte Ltd
Architect	DCA Architects Pte Ltd

- Performance guarantee for chiller plant and air side equipment on monthly basis
- Innovative thermal storage system for low night load condition
- Measurement and monitoring of outdoor fresh air rate at dedicated outdoor air system
- Use of EC Plenum fans for all PAHUs and AHUs for better part load efficiencies
- Use of smart valves at all PAHUs and AHUs for monitoring and controls
- 100% use of efficient LED lightings at all common areas and back-of-house areas
- Indoor bicycle parking with adjacent showering facilities



# CITY SQUARE MALL

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	City Developments Ltd
Facility Management	City Developments Ltd
ESCO	G-Energy Global Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd

- ETTV of 42.17 W/m<sup>2</sup> with the use of low-emissivity double glazing
- Highly efficient chiller plant efficiency of 0.634kW/RT with VSDs for pumps and cooling towers
- Use of motion sensors for all staircases and toilets, dimmer system for lighting at B4 car park, as well as daylight sensors at corridors to optimise the use of natural daylight
- Provision of solar photovoltaic cells as renewable energy source
- Provision of car park guidance system and electric/ hybrid lots with charging station
- Use of tenant green lease, coupled with incentive schemes, for continued performance at BCA Green Mark Platinum level
- Use of rainwater harvesting with automatic irrigation system and rain sensors for landscaping

# DAIKIN AIRCONDITIONING (SINGAPORE)

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Daikin Airconditioning (Singapore) Pte Ltd
Facility Management	Daikin Airconditioning (Singapore) Pte Ltd
ESCO	C&W Services Pte Ltd
ESD/Green Consultant	C&W Services Pte Ltd

- High efficiency VRV system and air distribution system
- Use of natural ventilation design for factory warehouse and car park
- Use of energy efficient LEDS
- Smart metering to monitor private water-meters usage
- Use of water efficient fittings
- Provision of recycling bins and proper storage area
- Extensive vertical and roof top greenery

# DBS ASIA HUB

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	DBS Bank Ltd
Facility Management	Jones Lang LaSalle
ESD/Green Consultant	Afogreen Build Pte Ltd

- Employs a district cooling plant that supplies the chilled water required for air-conditioning. This high efficiency air-distribution system equipment selection has helped achieve 41% savings over the baseline requirements
- A 1,200 solar panel installation on the rooftop with a total capacity of 460MWh per year
- Building envelope designed with double glazed low emission glass achieving an ETTV of 40.75 W/m<sup>2</sup>
- Use of lighting sensor for all toilets. Energy efficient LED lights are also used for the common area basement car park and office spaces
- Selection of water efficient fittings that achieve over 29% savings over baseline requirements
- Comprehensive energy efficiency improvement programs that target measurable savings on a yearly basis
- Comprehensive IAQ and waste management programs

# ENVIRONMENT BUILDING

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Ministry of The Environment & Water  
Resources

Facility Management

ENGIE Services Singapore / CPG Facilities  
Management Pte Ltd

ESD/Green Consultant

G-Energy Global Pte Ltd

- Estimated energy savings: 274,576.68kWh/yr; Estimated water savings: 6807m<sup>3</sup>/yr
- Guaranteed Energy Savings Performance contract and highly efficient chiller plant with system efficiency of 0.546 kW/RT
- All lifts come with regenerative drive and sleep mode features
- Extensive use of energy efficient LED lightings
- Use of NEWater and harvested rainwater for irrigation
- Use of automatic irrigation system with rain sensor for landscape
- Extensive collection of recyclables including e-waste, ink cartridges and cooking oil
- Continuous usage of sustainable products upon addition & alteration works



# ESPLANADE – THEATRES ON THE BAY

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Ministry of Culture, Community and Youth
Facility Management	The Esplanade Co Ltd
ESCO	Trane Distribution Pte Ltd
ESD/Green Consultant	Building System and Diagnostics Pte Ltd

- Estimated energy savings: 2,626,671 kWh/yr; Estimated water savings: 5,452 m³/yr
- Performance-based Procurement Contract for Chiller Plant Retrofitting and Maintenance (6-years) with guaranteed monthly average system efficiency of 0.615 kW/RT
- Extensive use of energy efficiency T5 fluorescent and LED lights at common areas, car park and offices
- CO2 sensors integrated with demand control ventilation for AHUs to modulate fresh air intake
- PUB certified Water-Efficient Building which signifies the installation of water efficient fittings with reduced flow rates
- High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality
- CO sensors integrated with mechanical ventilation fans to monitor the CO levels in the basement car parks for better energy conservation

# FUJI XEROX TOWERS

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Hong Leong Properties Private Limited
Facility Manager	City Developments Limited
ESCO	CBM Solutions Pte Ltd
ESD/Green Consultant	CBM Solutions Pte Ltd
Others	CBM Pte Ltd (Engineering)

- Energy Efficient Chiller Plant with Guaranteed Efficiency of 0.6 kW/RT
- Energy Efficient Lightings
- Green Roof Top and Natural Ventilation at Atrium
- Motion Detection for Lightings at Common Toilets and Staircases
- Car park Guidance System
- Heat Pipe System for 3 Pre-cool AHUs
- Carbon Monoxide Detection and Control System at Car park
- Regenerative Lift

# FURAMA CITY CENTRE AND FURAMA SINGAPORE HOTEL & SHOPPING CENTRE

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Management Corporation Strata Title Plan no. 1246
Facility Management	Furama Hotel Singapore
ESCO	G-Energy Global Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd

- Efficient chiller plant system of 0.584 kW/ton
- T5 fluorescent lighting used for most areas and LED lighting for guest rooms, corridors and lifts
- Motions sensors are linked to the lightings in all staircases and toilets
- Provision of hot water using heat recovery system from air-conditioning system. An estimated 5.87% energy savings is achieved
- Attained PUB Water Efficient Building certification
- Provision of water sub-meters for monitoring consumption for cooling tower make-up water tank, irrigation, laundry room and swimming pool
- NEWater is used in the make-up water tank for cooling tower, irrigation, fire sprinkler, laundry, and washing of public areas. This contributes a 18.59% replacement of potable water

# FURAMA RIVERFRONT SINGAPORE

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Furama Pte Ltd
Facility Management	Furama Pte Ltd
ESCO	G-Energy Global Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd

- Chiller plant system efficiency of 0.638 kW/RT (Day) and 0.600 kW/RT (Night)
- LED lighting for common areas
- Heat recovery system for hot water provision
- Measurement and verification monitoring system
- PUB Water Efficient Building Certification
- Recycling program to promote segregation of waste
- Recycling of AHU condensate



# GERMAN CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	German Centre for Industry and Trade Pte Ltd
Facility Manager	German Centre for Industry and Trade Pte Ltd
ESCO	LJ Energy Pte Ltd
ESD/Green Consultant	LJ Energy Pte Ltd

- Chiller System efficiency is  $\leq 0.61$  kW/RT; variable speed drives (VSDs) for all pumps and cooling towers serving the chiller plant and upgraded permanent M&V system
- Variable speed drives for all AHUs
- Automatic controls to regulate the fresh air intake for all AHUs based on carbon dioxide (CO<sub>2</sub>) level.
- Modulating valves for all FCUs to modulate the chilled water flow
- High efficient LED tubes for entire building including tenants.
- Motion sensors for the toilets

# GSM BUILDING

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	The Management Corporation Strata Title Plan No. 753
Facility Management	N Mohan Raj
ESD/Green Consultant	Building System and Diagnostics Pte Ltd
ESD/Green Consultant	Comfort Management Pte Ltd

- Estimated energy savings: 206,964kWh/yr; Estimated water savings: 511.2m<sup>3</sup>
- High efficiency water-cooled chilled water plant - Optimised chilled water plant with design system efficiency of 0.6kW/Rton at operating load condition
- Use of energy efficient LED light fitting to achieve, on average, 35% energy savings
- CO sensors in car park to activate MV fans when CO level is at high
- Auto-tube condenser cleaning system to prolong lifespan of chillers and maintain chiller efficiency
- PUB certified Water Efficient Building which signifies the installation of water efficient fittings and adopting water efficient flow rates
- Air filters for PAHU are of MERV 13 filter to maintain good indoor air quality

# HIGH STREET CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Facility Manager

ESCO

ESD/Green Consultant

Management Corporation Strata Title Plan  
No. 608

Corporate Real Estate Management  
Services Pte Ltd

Building System & Diagnostics

Comfort Management Pte Ltd

- Estimated energy savings: 2,549,390kWh/yr; Estimated water savings: 4,615m<sup>3</sup>
- Retrofitting of existing WCPU system to chilled water system to achieve plant room efficiency 0.6kW/RT with certified green products such as chiller, high efficient pumps and VSD
- Replacement of existing WCPU with New AHU to achieve 0.22W/CMH
- Optimised lighting design - Installation of energy saving LED lighting and engage 22% of tenant in lighting retrofitting
- Natural Ventilated Car park
- PUB certified water efficient building which signifies the installation of water efficient fittings and adopting water efficient flow rates/flush volumes
- Use of sustainable products certified by SGLS ( hand soap, toilet paper and floor detergent)
- 8 years Energy Performance Contract and continuous energy & efficiency monitoring program

# HOLIDAY INN EXPRESS, CLARKE QUAY

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- Energy Use Intensity = 271.94 kWh/m<sup>2</sup>/yr
- ETTV = 32.18 W/m<sup>2</sup>
- Air conditioning system with operating efficiency of 0.64 kW/RT
- Energy efficient Heat pump for hot water system
- Fully naturally ventilated guest corridors
- Hotel's exterior with angled windows to mitigate direct sunlight

Building Owner	RB Capital Hotels Pte Ltd
Facility Management	Sodexo Pte Ltd
ESCO	5-Sigma Pte Ltd
ESD/Green Consultant	6-Sigma Pte Ltd



# ITE COLLEGE EAST

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Institute of Technical Education
Facility Manager	Institute of Technical Education
ESCO	Johnson Controls (S) Pte Ltd
ESD/Green Consultant	Johnson Controls (S) Pte Ltd

- Efficient chiller plant with operating system efficiency of 0.583 kW/RT
- Sustainable O&M including EMS policy, green guide, ISO 14001 certification & in-house GMFM
- Open staircases and circulation spaces minimize energy consumption
- Use of sun-shades along the corridors, low-E glazing and laminated double-glazed curtain-wall
- Extensive planting with integrated themed landscape walks for nature conservation
- Ceiling boards at all labs, classrooms, offices and toilets contain about 40% recycled content
- Building design enhances physical permeability between the 3 blocks to facilitate cross ventilation and daylight

# JUNCTION 8

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

CapitaLand Mall Trust

Managing Agent

CapitaLand Group

ESD/Green Consultant

G-Energy Global Pte Ltd

- High efficient chiller plant of 0.650 kW/RT
- Auto Condenser tube cleaning system
- LED lightings for car park and common area
- Vertical Greenery at roof terrace and green column at level 1
- Water efficient fittings with WELs ratings
- Recycling bins for office tower and retail mall
- Car park guidance system

# LUMILEDS SINGAPORE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Lumileds Singapore Pte Ltd.
Facility Management	Lumileds Singapore Pte Ltd.
ESD/Green Consultant	Barghest Building Performance Pte Ltd

- Recipient of 'Excellence in Energy Management' award from NEA and 'Water Efficient Building (Gold)' Certification from PUB
- Estimated energy savings: 4,445,560 kWh/yr; Estimated water savings: 290,026 m<sup>3</sup>/yr
- Performance Contract to optimise the chiller plant efficiency for 0.63 KW/RT with Variable speed drives for cooling towers and auxiliary pumps. Permanent instrumentation for Measurement and Verification; Building Management System for Monitoring, data analytics, auto reporting and alarm/SMS. Cloud based remote monitoring that facilitates remote root cause analysis in case of performance deterioration
- LED lights installed in production plant and office areas, achieving 57.72% improvement in Lighting Power budget compared with code requirements
- Water Recycling Plant installed to recycle AHU Condensate Water, Production Waste water and RO Reject water to achieve water savings
- Reduction in GHG emission by 94% through Perfluorinated Carbon (PFC) gas treatment before final emission
- Green Corner with posters, EHS carnival, training courses etc. for employee awareness on the importance of Energy & Water Conservation, Waste Management and recycling



# MAPLETREE BENOI LOGISTICS HUB

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	HSBC Institutional Trust Services (Singapore) Limited as Trustee of Mapletree Logistics Trust
Facility Manager	Mapletree Property Management Pte Ltd
ESCO	C&W Services (S) Pte Ltd
ESD/Green Consultant	C&W Services (S) Pte Ltd

- Estimated energy savings: 149,817kWh/yr; Estimated water savings: 685.8m<sup>3</sup>
- Efficiency lighting layout and fittings with motion sensor control
- Minimum west facing façade and warehouse units able to receive prevailing North/South cross wind
- All water fittings rated WELS ‘Excellent’
- Building constructed using sustainable materials and recycled concrete aggregates
- Adoption of flat slab design resulting in low concrete usage index of 0.48 m<sup>3</sup>/m<sup>2</sup>
- Extensive recycling of demolition materials from existing site

# MARINA BAY SANDS

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Marina Bay Sands Pte Ltd
Facility Manager	Marina Bay Sands Pte Ltd
ESD/Green Consultant	Building System & Diagnostics Pte Ltd
IAQ Auditor	TÜV SÜD PSB Pte Ltd

- Implemented diagnostic IT software for continuous performance management and abnormalities or fault detection
- Automatic scheduling of M&E services in meeting space with the Event Business Management System
- Installation of 148 kW<sub>p</sub> Solar Photovoltaic system
- Extensive use of high efficiency LED lamps of lower wattage
- Comprehensive waste diversion tracking and management program
- Implement Sands ECO360° Global Sustainability Program
- Green Lease guidelines and management plan for tenants

# MAXWELL HOUSE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

The Management Corporation Strata Title  
Plan No. 822

EPC Firm/ESCO

Comfort Management Pte Ltd

ESD/Green Consultant

Building System & Diagnostics Pte Ltd

- Estimated energy savings: 495, 026 kWh/yr
- Chiller Plant system with operating efficiency of 0.602 kW/RT
- High Efficient LED Lighting to achieve close to 38% energy savings
- Extensive waste recycling effort

# MINISTRY OF EDUCATION

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Ministry of Education
Managing Agent	C&W Services (S) Ltd
ESCO	Siemens Pte Ltd
ESD/Green Consultant	ENGIE Services Asia-Pacific Pte Ltd

- High efficiency chiller plant under GESP contract
- Motion sensors at toilets, pantries, lobbies and stairs
- AC VVVF lifts and escalators with sleep mode
- Certified PUB Water Efficient Building
- Use of NEWater for toilet flushing and cooling tower
- Underfloor air-conditioning system
- Pneumatic waste paper collection system

# NATIONAL INSTITUTE OF EDUCATION

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	National Institute of Education
M&E Engineer	WSP Consultancy Pte Ltd
Facilities Management	Synergy FMI Pte Ltd
Cleaning Contractor	Campaign Complete Solutions Pte Ltd
Contractor (Chiller)	Trane Distribution Pte Ltd

- Air-conditioning plant system efficiency minimum 0.6 kW/ton
- Strong promotion on green initiatives and policy to Staff/Students/Users
- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing
- Use End control through Card Access, Facilities booking and Integrated Building Management System (Total Solution System) controls the locking device, lighting and air-conditioning according to the booking hours
- Integration of variable air volume (VAV) and motion sensors with the booking system to control air-conditioning
- Rain Water harvesting System to collect and channel the rain water for irrigation
- Green data centre
- Lighting retrofits
- Addition of 380 RT standby chiller
- Building management system upgrade



# NATIONAL UNIVERSITY OF SINGAPORE ENGINEERING BLOCK E6

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	National University of Singapore
Architect	CPG Consultants Pte Ltd
M&E/ Structural Engineer	Aurecon Singapore Pte Ltd
Facility Management	National University of Singapore
ESD/ Green Consultant	Earth-In-Mind Pte Ltd
Main Contractor	Lian Soon Construction Pte Ltd

- Provision of Building Energy Monitoring Dashboard
- Energy efficient chiller plant to be operated at an efficiency of 0.62kW/RT
- Provision of room temperature displays in all functional spaces and common areas
- Use of energy efficient LED lighting
- Use of sustainable products with SGBC/SGLS Certificate
- Use of water fittings with WELS-certified "Excellent" rating
- Use of high efficiency MERV 14 secondary filters in AHUs

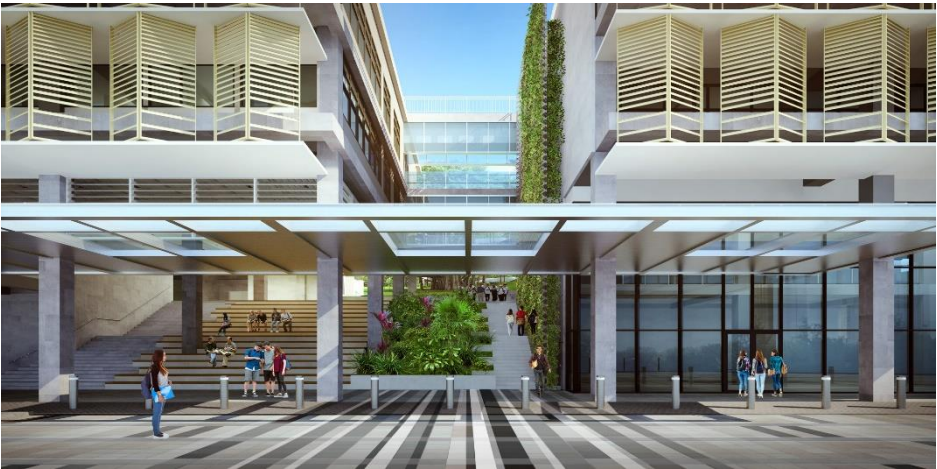


# NATIONAL UNIVERSITY OF SINGAPORE, SCHOOL OF DESIGN AND ENVIRONMENT, SDE 1 & 3

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	National University of Singapore
Facility Manager	National University of Singapore
ESD/Green Consultant	WSP Consultancy Pte Ltd & IEN Consultants
Architect	CPG Consultants Pte Ltd
MEP	WSP Consultancy Pte Ltd

- Estimated energy savings: 605,596.61kWh/yr; Estimated water savings: 1,550.4m<sup>3</sup>, ETTV: 39.06W/m<sup>2</sup>
- Use of extensive sun shading with double glazed windows attributing to an ETTV of 39.1 W/m<sup>2</sup>
- Hybrid ventilation system to provide pre-conditioned air with elevated air speed
- Highly efficient chiller plant system with efficiency of 0.57 kW/RT
- Use of 100% LED lighting
- Provision of occupancy sensors in all staircases and toilets
- Use of water fittings rated "Excellent" under the PUB, Water Efficiency Labelling Scheme (WELS)

# NEW INNOVATION CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Nanyang Technological University
ESD/Green Consultant	Building System and Diagnostics Pte Ltd
Facility Management	NTU Office of Development & Facilities Management
Architect	ADDP Architects LLP
Consultants	Mott Macdonald Singapore Pte Ltd

- Estimated energy savings: 278,178 kWh/yr; Estimated water savings: 3,917 m<sup>3</sup>/yr
- New central water-cooled chiller plant expected to achieve 0.62 kW/RT system efficiency. Variable speed drives are installed for chilled water and condenser water pumps and cooling towers
- Use of Passive Displacement Ventilation system to cool the spaces throughout the building. This system uses smaller sized air-distribution which resulted in energy savings
- Extensive use of energy efficient LED lightings to achieve estimated 54% energy savings compared to SS 530 baseline
- Use of highly efficient MERV 15 air filters for the air distribution equipment to maintain good indoor air quality
- Extensive use of certified environmental friendly products
- Installation of new water efficient fittings with 3-ticks Excellent PUB WELS rating

# PALAIS RENAISSANCE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Citydev Real Estate (S) Pte Ltd
Facility Manager	City Developments Limited
ESCO	CBM Solutions Pte Ltd
ESD/Green Consultant	CBM Solutions Pte Ltd

- Chiller plant system upgrade to achieve an overall plant efficiency of 0.59kW/RT
- Use of LEDs at common area, staircases and car park achieved 5W/m<sup>2</sup>, 1W/m<sup>2</sup>, 1W/m<sup>2</sup> respectively
- Use of CO sensors for car park mechanical ventilation system
- Use of motion sensors at toilets and staircases
- Use of SGBC certified epoxy flooring coating system at car park area
- Engagement in Global Lamp Recycling Program
- Natural ventilation at staircases
- Use of tap and sink fittings complying to 'Excellent' WELS rating. Also awarded PUB Water Efficient certificate

# PARKROYAL ON PICKERING

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Pan Pacific Hotels Group Limited (PPHG)

Facility Manager

PARKROYAL on Pickering

ESCO

LJ Energy Pte Ltd

- Chiller plant system efficiency of 0.633 kW/RT
- VSDs for all chilled water and condenser water pumps
- NEWater for Cooling Towers
- Photosensors installed along the open-air hotel guest corridors
- Car park guidance system
- Green Lots and Charging Station at Car park
- Green Plot Ratio of 12, extensive greenery and landscaping



# REPUBLIC PLAZA

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	CDL Properties Limited
ESCO	CBM Solutions Pte Ltd
ESD/Green Consultant	CBM Solutions Pte Ltd
Facility Manager	City Developments Limited

- Estimated energy savings: 242,060 kWh/yr
- Efficient water-cooled chiller plant system better than 0.60 kW/RT.
- Use of WELS-certified fittings and awarded as Water Efficient Building
- Use of LED lightings for car park and staircases
- Use of motion sensors for control of lightings at staircases and toilets
- All AHUs are equipped with high efficiency MERV 13 air filter
- Installation of auto tube cleaning system for the chiller plant

# REVENUE HOUSE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | Platinum



Building Owner

Inland Revenue Authority of Singapore

Facility Management

CPG Facilities Management Pte Ltd

ESD/Green Consultant

BMG Green Technology Pte Ltd

- Installation of high Performance variable frequency chiller systems using environmentally friendly refrigerant, with an efficiency of less than 0.65kW/RT
- Installation of smart monitoring and leak detection for main and sub-water system
- Installation of CO2 monitoring and control system and electronic air cleaners for Air Handling Units
- Installation of LED Lighting for car parks and staircase
- Installation of Photocell sensors for all office levels and motion sensors in toilets
- Installation of Rainwater collection system for grey water usage and rain-sensor for auto-irrigation system
- Recycling of plastic, aluminium electronic waste, cans, waste papers, toners, printer cartridges



# SCHNEIDER ELECTRIC BUILDING

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Schneider Electric
Facility Manager	Schneider Electric
ESCO	C&W Services (S) Pte Ltd
ESD/Green Consultant	C&W Services (S) Pte Ltd
M&E Consultant	D'Perception Singapore Pte Ltd

- LED lighting are used in the entire building
- Recycling programmes and specialised waste streams such as E-waste fluorescent lamps etc.
- Occupancy sensors for common areas and workspace areas
- Using energy efficient magnetic-bearing chillers
- PV panels are installed to generate onsite solar power
- Analytic systems in building BMS to monitor reliability of installed sensors (Power Advisor and Building Advisor)
- Priority parking lots for electric vehicles with EV charging points provided

# SIX BATTERY ROAD

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	CapitaLand Group
Facility Manager	CapitaLand Group
ESD/Green Consultant	Johnson Controls (S) Pte Ltd

- Efficient Chiller Plantroom System – Use of efficient plantroom system, thermal storage tank and auto tube cleaning system to achieve 0.65 kW/ton
- Green Wall - 2,000 sq ft interior green wall located at the main lobby to absorb environmental pollutants, add oxygen to the air and also refresh the building's lobby
- Water Efficient Features – Use of 'Excellent' PUB WELS (Water Efficient Labeling Scheme) rating for all water fittings and harvesting of rainwater in an automatic irrigation system for the green wall
- Occupancy Demand Features such as motion sensors, CO2 and CO sensors to monitor and regulate the usage
- Education – Educational corner with display of energy and water savings and green features to share the importance of water and energy conservation

# SWISSÔTEL MERCHANT COURT, SINGAPORE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Merchant Court Private Limited trading, as  
Swissôtel Merchant Court, Singapore

ESD / Green Consultant

ENGIE Services Asia-Pacific Pte Ltd

ESCO

ENGIE Services Asia-Pacific Pte Ltd

Facility Management

Merchant Court Private Limited trading as  
Swissôtel Merchant Court, Singapore

- Maintain efficient chiller plant system at 0.609 kW/ton
- Efficient Heat Pump System for hot water provision
- Condenser Auto Tube Cleaning System for chillers
- Provisions of motion sensors linked to lightings in the toilets
- Extensive greenery provision
- ECO-Wiz Food Waste System which recycle solid food waste into reusable water for irrigation.
- Replacement to efficient LED lightings

# TAMPINES GRANDE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	T-Grande Property Holding Pte Ltd
Facility Management	City Developments Limited
ESD/ Green Consultant	CBM Solutions Pte Ltd
Others	CBM Solutions Pte Ltd (Building Maintenance)

- Estimated energy savings: 210,820kWh/yr
- Use of photovoltaic cells (100kWp) and Building Integrated Photovoltaic at the west façade (7 kWp)
- Adopt natural lighting design at basement car park
- Use of PAHU condensate
- NEWater for toilet flushing
- Use of Rainwater Harvesting System
- Use of motion sensors in staircases and toilets



# THE HEEREN

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

The Management Corporation Strata Title  
Plan 2713

Facility Manager

Swee Cheng Management Pte Ltd

ESD/Green Consultant

C&W Services (S) Pte Ltd

IAQ Auditor

C&W Services (S) Pte Ltd

- High efficiency central water-cooled chiller plant and air distribution system
- Other energy-efficient features include exhaust fan control via CO sensors in basement car park, LEDs at common areas
- Private water meters and smart metering to monitor water usages
- PUB WEB-certified
- Provision of recycling bins and proper storage area
- Vertical greenery
- Provision of green guide and environmental policy

# THE METROPOLIS

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Ho Bee (One North) Pte Ltd
Managing Agent	Ho Bee (One North) Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd

- Energy efficient chiller plant with a system efficiency of 0.578kW/RT
- Lifts and escalators are equipped with VVVF drive and sleep mode features
- 50.2 kWp solar panel to harness and generate clean energy
- Motion sensors for all staircases and all toilets
- Carbon monoxide (CO) sensors at car parks basement 1 to 3
- Water fittings certified under PUB “Excellent” and “Very Good” WELS rating
- Recycling chute for paper recycling



# THE URA CENTRE & THE URA CENTRE EAST WING

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Urban Redevelopment Authority
Facility Management	Urban Redevelopment Authority
ESCO	SAC Energy (S) Pte Ltd
ESD / Green Consultant	Johnson Controls (S) Pte Ltd

- Estimated energy savings: 1,078,780.04 kWh/yr; Estimated water savings: 26,056.62 m<sup>3</sup>
- High efficiency chiller plant system with efficiency of 0.63 kW/ton guaranteed under GESP arrangements.
- Provision of permanent instrumentation to monitor the chiller plant system operating efficiency.
- Awarded Water Efficient Building for both buildings. Water fittings comply with PUB Water Efficiency Labelling and Standards (WELS).
- Green guides are disseminated to staff to create environmental awareness as well as to promote & encourage waste minimisation and recycling.
- Lifts are installed with variable voltage variable frequency motor drive and equipped with sleep mode features.
- Automatic condenser tube cleaning system is installed for chiller plant.
- Extensive use of environmentally friendly products
- Motion sensors are installed at all toilets, staircases and lift lobbies

# TUAS CHECKPOINT

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Immigration & Checkpoints Authority Singapore  
(Ministry of Home Affairs)

Facility Management

Cushman & Wakefield Services (S) Pte Ltd

ESCO

Trane Distribution Pte Ltd

ESD/Green Consultant

Building System and Diagnostics Pte Ltd

- Estimated energy savings: 10,435,301 kWh/yr; Estimated water saving: 9,641 m<sup>3</sup>/yr
- Guaranteed Energy Savings Performance Contract and High efficiency water-cooled chilled water plant - Optimised chilled water plant with operating system efficiency of 0.589 kW/Rton
- Extensive replacement to energy efficient LED lightings
- 3299 kWp of photovoltaic installation estimated to generate 3,230,380 kWh/yr of Clean Energy
- Auto-tube condenser cleaning system to prolong lifespan of chillers and maintain chiller efficiency
- PUB certified Water Efficient Building which signifies the installation of water efficient fittings and adopting water efficient flow rates.

# TWENTY ANSON

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

HSBC Institutional Trust Services (Singapore)  
Limited as Trustee of CapitaLand Commercial  
Trust

Facilities Management

CapitaLand Commercial Management Pte Ltd

- Grey Water System
- Light Shelves and Light sensors
- Rainwater Harvesting System
- Recycling Program for Tenants
- Bicycle Parking Provision
- Efficient Air-conditioning System – System efficiency at 0.633kW/RT
- Motion sensor for staircase and toilets

# WATERHUB

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Public Utilities Board

Facility Management

UEMS Solutions Pte. Ltd.

ESD/ Green Consultant

SAC Energy (S) Private Limited

- Estimated energy savings: 691,903kWh/yr; Estimated water savings: 3,960m<sup>3</sup>, ETTV: 33.19W/m<sup>2</sup>
- Energy Efficient VRF Plant Efficiency 0.762kW/RT
- Provision of LED lighting for all internal areas such as offices and common areas
- Lifts equipped with variable voltage variable frequency motor drive and sleep mode function
- Solar System on the roof of Office Block 149.5 kWp
- PUB Water Efficient Building certification with the use of toilet fittings that are certified 3-ticks (Excellent) WELS rating

# WESTGATE & WESTGATE TOWER

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

The Management Corporation Strata Title  
Plan No. 4355

Facility Management

CapitaLand Retail Management Pte Ltd

ESD/Green Consultant

Johnson Controls (S) Pte Ltd

- Chiller plant system with efficiency of 0.51 kW/RT
- Naturally ventilated fine grain area with localized mechanical ventilation
- Regenerative lifts with saving 0.52% of total energy consumption
- 100% auto drip irrigation system
- Substantial usage of green concrete
- Paper recycling chute for office tower



# WOODLANDS CHECKPOINT

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Immigration & Checkpoints Authority  
(Ministry of Home Affairs)

Facility Management

Cushman & Wakefield Services (S) Pte Ltd

ESCO

Trane Distribution Pte Ltd

ESD/Green Consultant

Building System and Diagnostics Pte Ltd

- Estimated energy savings: 8,312,593 kWh/yr; Estimated water saving: 17,231 m<sup>3</sup>/yr
- Chiller plant replacement under Guaranteed Energy Savings Performance contract and achieved 0.559 kW/RT system efficiency after the replacement
- Extensive replacement to energy efficient LED lightings
- Installation of solar photovoltaic panels under HDB's SolarNova Project with 535kWp capacity, a 2.8% replacement of the total building energy consumption
- Recyclable waste collection
- Attained PUB Water Efficient Building certification which signifies the installation of water efficient fittings and adopting water efficient flow rates.



# PREMIUM RESIDENTIAL DEVELOPMENT AT 2 DRAYCOTT PARK

New Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Swire Properties Pte Limited
Architect	RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer	Squire Mech Pte Ltd
Structural Engineer	RSP Architects Planners & Engineers (Pte) Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Main Contractor	Unison Construction Pte Ltd
Landscape Consultant	COEN Design International Pte Ltd

- Achieved RETV value of 14.12W/m<sup>2</sup>
- Demand Control Ventilation with CO sensors for car park
- Regenerative power for lifts serving the residential unit
- Ductless fan for basement car park ventilation
- Use of automatic irrigation system coupled with rain sensors
- Provision of gas water heater
- Provision of building management system to monitor and control the power consumption of the common facilities

# SKYRESIDENCE @ DAWSON

New Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Housing & Development Board
Project Manager	Surbana Jurong Consultants Pte Ltd
Architect	Surbana Jurong Consultants Pte Ltd
M&E Engineer	Surbana Jurong Consultants Pte Ltd
Structural Engineer	Surbana Jurong Consultants Pte Ltd
Quantity Surveyor	Surbana Jurong Consultants Pte Ltd
Main Contractor	Surbana Jurong Consultants Pte Ltd
Landscape Consultant	Surbana Jurong Consultants Pte Ltd

- Estimated energy savings: 1,717,507.5kWh/yr; Estimated water savings: 177,158.16m<sup>3</sup>, RETV: 13.27W/m<sup>2</sup>
- Provision of green roof top garden of at least 57% of all the roof areas with automatic water efficient irrigation system with rain sensor
- Use of sustainable and recycled products in the development
- Use of sustainable and recycled materials for construction
- Provision of lush greenery and trees conservation
- Daylighting in common areas
- Naturally ventilated design – dwelling units are designed for cross ventilation
- Provision of good access to bus stop, network of covered link way to facilitate connectivity and use of public transport

# THE TAPESTRY

## New Residential Building

### GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

Bellevue Properties Pte Ltd (a fully owned subsidiary of City Developments Limited)

Project Manager

Bellevue Properties Pte Ltd (a fully owned subsidiary of City Developments Limited)

Architect

ADDP Architects LLP

M&E Engineer

Belmacs Pte Ltd

Structural Engineer

P&T Consultants Pte Ltd

Quantity Surveyor

Threesixty Cost Management Pte Ltd

Main Contractor

Woh Hup Pte Ltd

Landscape Consultant

Tinderbox Pte Ltd

ESD Consultant

Building System and Diagnostics Pte Ltd

- Use of 100% 5 ticks air-condition for all dwelling units
- Use of ceiling fan for all dwellings units to aid in Natural Ventilation
- Use of Variable Voltage, Variable Frequency (VVF) and Sleep Mode Gearless Lifts
- Use of motion sensors and jet fans with carbon monoxide (CO) sensors
- Use of Prefabricated Prefinished Volumetric Construction (PPVC) technology
- Use of Pneumatic Waste Collection and Disposal System with double refuse chutes for recyclables and non-recyclables
- Provision of Smart Home Solutions and Completed Environmental Impact Study

# THE WOODLEIGH RESIDENCES

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Elara 1 Pte Ltd & Callisto 1 Pte Ltd
Project Manager	Kajima Development Pte Ltd
Architect	DP Architects Pte Ltd
M&E Engineer	Beca Carter Hollings & Ferner (S.E.Asia) Pte Ltd
Structural Engineer	Meinhardt (Singapore) Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Landscape Consultant	Sald Pte Ltd
Other	Lighting Planners Associates (S) Pte Ltd

- Estimated energy savings: 2,868,000 kWh/yr; Estimated water savings: 48.000 m<sup>3</sup>, RETV: 18.81 W/m<sup>2</sup>
- Energy efficient appliances (Minimum 2-ticks and above) for all units
- Electric vehicle lots and recharging stations
- Precast concrete volumetric prefabricated construction for apartment units

# KENT VALE 2 RESIDENCES

Existing Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

National University of Singapore (Office of Housing Services)

Facility Management

National University of Singapore (Office of Housing Services)

ESD/Green Consultant

Building System and Diagnostics Pte Ltd

- Extensive use of energy efficient LED and T5 lighting fixtures coupled with motion sensors
- Provision of WELL certified water fittings and water efficient washer/dryer
- Extensive vertical greenery, which decreases the solar heat gain, reducing the amount of energy needed to cool the building
- Provision of Eco Pond and Rain Garden
- Provision of Community Garden with Green Activities regularly organised
- Provision of Post Occupancy Survey and Feedback Channel & Evaluation Channel to ensure wellbeing of residents and building occupants
- Provision of recyclable and non recyclable double chute system to create green awareness through sorting of waste



# OUTRAM COMMUNITY HOSPITAL

Healthcare Facility



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Ministry of Health
Architect	CIAP Architects Pte Ltd
M&E Engineer	Surbana Jurong Consultants Pte Ltd
Structural Engineer	Arup Singapore Pte Ltd
Quantity Surveyor	Arcadis Quantity Surveyor Pte Ltd
Main Contractor	Penta-Ocean Construction Co Ltd
ESD Consultant	Surbana Jurong Consultants Pte Ltd

- Modelled energy savings of 31%, ETTV of 34.6 W/m<sup>2</sup> and chiller plant efficiency of 0.58 kW/RT
- Efficient electrical services with detailed sub-metering
- Maximise energy recovery opportunities in chilled water loop, CSSD discharge and other sources
- Installed rooftop PV of 87 kW<sub>p</sub>
- Energy efficient features include auto condenser tube cleaning system, regenerative Lift
- M&V for heat pump hot-water system to keep track of its performance
- Self-cleaning façade system



# FACI ASIA PACIFIC ANCILLARY BUILDING

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	FACI ASIA PACIFIC PTE. LTD.
Architect	ADX Architects Pte Ltd
M&E Engineer	Aurecon Singapore Pte Ltd
Structural Engineer	WM Leow & Associates
Main Contractor	Streamline Engineering Pte Ltd
Landscape Consultant	Meod Pte Ltd

- Estimated energy savings: 125,102kWh/yr; Estimated water savings: 263.64m<sup>3</sup>, ETTV: 25.19W/m<sup>2</sup>
- Use of Efficient Glazing for the facade
- Extensive adoption of environmentally friendly products(SGLS/SGBC certified)
- Use of green wall and sky terrace
- Extensive Site Analysis and impact assessment studies
- Location of all the offices along periphery for daylighting
- All LED light fittings for the artificial lighting
- Solar thermal and Solar PV Panels

# FUNAN

## New Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	CapitaLand Mall Trust
Project Manager	CapitaLand Retail Project Management Private Limited
Architect	RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer	Alpha Consulting Engineers Pte Ltd
Structural Engineer	RSP Architects Planners & Engineers (Pte) Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Woh Hup - Obayashi Joint Venture (Funan)
Landscape Consultant	Grant Associates
ESD Consultant	Building System & Diagnostics Pte Ltd

- Estimated energy savings: 6,447,787kWh/yr; Estimated water savings: 12,775m<sup>3</sup>, RETV: 41.84W/m<sup>2</sup>
- Use of Next-Gen refrigerant (R1233zd) to achieve state of art plant efficiency of 0.549 kW/RT (First to be used in retail mall).
- Use of EC/DC Fan Coil Units for all the retail shops, office & SR to improve air-side efficiency
- Green Lease will be implemented to ensure tenant's involvement in achieving the energy savings committed during operation stage
- Rainwater harvesting to irrigate extensive greenery at roof top garden & urban farming
- Promote green transport by introducing a underground linkway connecting to City Hall MRT, fast charge EV charging stations and electrical bike charging stations

# HOTEL mi

## New Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



- Use of energy efficient lights
- Use of energy efficient DC fan coil units
- Heat Pumps to provide hot water for guestrooms
- Low ETTV value of 39.32 W/m2
- High efficiency chiller plant system

Client/Developer	Greensea Estates Pte Ltd
Project Manager	Greensea Estates Pte Ltd
Architect	Archiwave Architects
M&E Engineer	Design & Management Services Consulting Engineers
Structural Engineer	KH Consultants
Quantity Surveyor	1MH & Associates
Main Contractor	V3 Construction Pte Ltd
ESD Consultant	G-Energy Global Pte Ltd

# MFA STANDALONE BUILDING

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



- High Efficient VRF Air-Conditioning System with System Efficiency of 0.69kW/ton
- Large Implementation of LED fittings
- 20% Green Cement & 10% RCA and WCS replacement rate
- Use of products that are rated very good and excellent under local certification body
- Greenery Provision = 4.02

Client/Developer	Ministry of Foreign Affairs
Project Manager	Arcadis Project Management Pte Ltd
Architect	DP Architects Pte Ltd
M&E Engineer	J Roger Preston (S) Ptd Ltd
Structural Engineer	Meinhardt (Singapore) Pte Ltd
Quantity Surveyor	Davis Langdon KPK
Landscape Consultant	DP Green Pte Ltd
ESD Consultant	DP Sustainable Design Pte Ltd

# NORTHPOINT CITY

## New Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Frasers Centrepoint Limited
Project Manager	FCL Management Services Pte Ltd
Architect	SAA Architects Pte Ltd
M&E Engineer	AECOM Singapore Pte Ltd
Structural Engineer	AECOM Singapore Pte Ltd
Quantity Surveyor	Arcadis Project Management
Main Contractor	Lum Chang Building Contractors Pte Ltd
Landscape Consultant	COEN Design International Pte Ltd
ESD/Green Consultant	Building System & Diagnostics Pte Ltd

- Use of good performance glazing to reduce heat gain through the façade
- Energy Efficient Air Conditioning System whereby the combined Chilled Water Plant system for Commercial and Bus Interchange achieve less than 0.582 kW/RT and the overall air distribution system achieve at least 40% savings.
- Guaranteed Energy Savings Performance (GESp) contract for the Northpoint City Shopping Centre - Air Conditioning System efficiency and savings.
- All internal circulation areas are fitted with LED lightings or energy efficient T5 lightings. Occupancy sensors are installed to control the common areas such as staircases lighting when they are not in used.
- Water is conserved through the use of PUB WELS water efficient fittings for all restrooms.



# SINGAPORE BOYS' HOME

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Juvenile Homes Branch (JHB), Rehabilitation & Protection Group (RPG), Ministry of Social and Family Development (MSF)
Architect	CPG Consultants Pte Ltd
M&E Engineer	CPG Consultants Pte Ltd
Structural Engineer	CPG Consultants Pte Ltd
Quantity Surveyor	CPG Consultants Pte Ltd

- Estimated energy savings 416,478.58kWh/yr; Estimated water savings: 7,260m<sup>3</sup>, RETV: 37.88W/m<sup>2</sup>
- High efficiency VRV system of 0.77KW/RT
- Energy efficient LED lighting
- Extensive use of SGLS and SGBC labelled green products and excellent WELS rating products.
- Green concrete
- Low VOC interior painting



# TECH-LINK CENTRE

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Tech-Link Storage Engineering Pte Ltd
Architect	ID Architects Pte Ltd
M&E Engineer	PDC consulting Engineers
Structural Engineer	Longrove & Associates Pte Ltd
Main Contractor	Range Construction Pte Ltd
Others	Building System & Diagnostics Pte Ltd

- Estimated energy saving of 242,618 kWh/year, water saving of 303 m<sup>3</sup>/year
- Passive building design to maximise ventilation and daylighting
- Highly efficient Air Con system
- Energy-efficient LED lighting system
- Building using green concrete and having CUI of 0.63

# WOODS SQUARE

## New Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Sekisui House Limited, Far East Orchard Limited, Far East Organization
Architect	DP Architects Pte Ltd
M&E Engineer	Alpha Consulting Engineers Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	Davis Langdon KPK Singapore
Main Contractor	Woh Hup (Private) Ltd
Others	ZEB-Technology Pte Ltd

- Estimated energy savings 5,677,692.12kWh/yr; Estimated water savings: 101,156.1m<sup>3</sup>, RETV: 41.01W/m<sup>2</sup>
- All water fittings are rated excellent under WELS except showerhead
- Extensive use of Green Concrete with recycled aggregates (RCA & WCS)
- At least 50% of the total roof area is provided with landscaping
- Implement landlord-tenant green lease initiatives

# ALOHA CHANGI

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Public Service Division

Facility Management

Public Service Division

Other

Liu & Wo Architects Pte Ltd

- Natural ventilation and maximum daylighting to reception area, corridors and rooms
- Efficient Air-Con System
- Extensive use of energy efficient LED lighting and T5 for all the units/rooms
- Water is conserved with PUB WELS (Excellent rating) fittings to all the units/ rooms
- Use of low VOC paints to reduce indoor air pollutant

# CENTENNIAL TOWER

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Millenia Pte. Ltd.

ESCO

Johnson Controls (S) Pte Ltd

ESD/Green Consultant

Kaer Pte Ltd

- Chiller plant was replaced and the new system efficiency is 0.704 kW/RT
- Achieve PUB water efficient building certificate (basic)
- Using NEWater as cooling water source
- Using LED Lighting, T5 fluorescent lights
- Installation of motion sensor for toilet

# FAR EAST SHOPPING CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Facility Management

ESD/Green Consultant

Management Corporation Strata Plan No.  
397

Newman & Goh Property Consultants Pte  
Ltd

G-Energy Global Pte Ltd

- Estimated energy savings: 1,111,370kWh/yr
- Highly efficient chiller plant with system efficiency of 0.65kW/RT
- Provision of carbon dioxide sensors with modulating outdoor air dampers for all AHUs
- Comprehensive use of LED Lighting at all M&E rooms and common areas
- Provision of recycling bins at all levels



# HOLIDAY INN SINGAPORE ATRIUM

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	Holiday Inn Singapore Atrium
Facility Management	Holiday Inn Singapore Atrium
ESCO	SAC Energy (S) Pte Ltd
ESD/Green Consultant	SAC Energy (S) Pte Ltd
M&E Engineer	Wistec Engineers & Associates

- Day lighting for hotel main lobby and corridors
- High efficiency chiller plant of 0.61 kW/RT with new green refrigerant R-1233zd
- Participate in hotel sector sustainability movement by Earth Check and Singapore Hotels Association
- PUB WEB-certified
- Other energy efficient measures include VVVF lifts and auto tube-cleaning system for chillers



# HOTEL JEN TANGLIN SINGAPORE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	Cuscaden Properties Pte Ltd
Facility Management	Cuscaden Properties Pte Ltd
ESCO	G-Energy Global Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd

- Efficient chiller plant of 0.66 kW/RT
- Efficient LED Lighting in guestrooms
- PUB WEB-certified and ISO-14000 certified
- Other energy efficient features include VVVF lifts and heat pumps for hot water
- Activities to promote staff well-being and environmental sustainability awareness

# INTERCONTINENTAL SINGAPORE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	BCH Hotel Investment Pte Ltd
Facility Management	InterContinental Singapore
ESCO	G-Energy Global Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd

- Highly efficient chiller plant efficiency of 0.63kW/RT with VSDs for pumps and cooling towers
- Extensive use of energy efficient LED lightings in guest rooms and staircases
- Use of heat pumps to produce hot water for guest rooms and kitchen
- Provision of all water fittings with WELS-certified 'Very Good' rating, and digital water sub-meters to F&B outlets, cooling towers and steam boilers for comprehensive water consumption monitoring and leak detection
- Use of SGLS-certified low-VOC paints for interior wall applications

# M HOTEL SINGAPORE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Millennium Hotels and Resorts

Facility Management

M Hotel Singapore

ESD/Green Consultant

G-Energy Global Pte Ltd

- Efficiency of chiller plant system targets to achieve an overall plant efficiency of 0.65 kW/RT or better
- Use of LEDs at hotel's restaurants and bar, guest lift lobbies, hotel corridors/walkways and guest rooms and suites
- Use heat pump that provides thermodynamic heating
- All lifts and escalators are equipped with variable voltage variable frequency motor drive and sleep mode function
- 100% natural ventilation design multi-storey Car park
- Achieved PUB Water Efficient Building (Basic) Certification
- Waste management program involving recycling of paper, metal, plastic, glass products and cooking oil

# MERRILL LYNCH HARBOURFRONT (MLHF)

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

DBS Trustee Limited as Trustee of  
Mapletree Commercial Trust  
Mapletree Commercial Property  
Management Pte Ltd

Facility Management

ESD/Green Consultant

Building System & Diagnostics Pte Ltd

- Efficient chiller plant of 0.66 kW/Rt
- Efficient T5 and LED Lighting
- PUB WEB-certified
- Automated water irrigation with rain sensors
- Good O&M practices to monitor waste collection, energy and water consumption

# NATIONAL UNIVERSITY BUILDING (NUH) – MAIN BUILDING (MB)

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	National University Hospital (Singapore) Pte Ltd
Facility Management	Synergy FMI Pte Ltd
ESCO	C&W Services (S) Pte Ltd
ESD/Green Consultant	C&W Services (S) Pte Ltd

- Chilled water is supplied from the central Utility Plant (NUH-UP) which has been certified Platinum
- PUB WEB and ISO-14001 certified
- UV Emitter in PAU
- Energy efficient measures include VVVF lifts and gradual replacement to T5 and LED. Used light tubes are sent to recycling facility for proper disposal
- Staff engagement activities include Water Audit Challenge, World Water Day and game-like wall posters to encourage use of stairs



# NOVENA SQUARE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	MCST 4298
Facility Management	UOL Management Services Pte Ltd
ESCO	Measurement & Verification Pte Ltd
ESD/Green Consultant	ENGIE Services Asia-Pacific Pte Ltd

- Estimated energy savings: 3,372,991kWh/yr
- Chiller plant under EPC with operating efficiency of 0.63kW/RT
- High Efficient LED Lighting for office and some retail areas
- Provision of smart water metering for monitoring and leaking detection
- Provision of car park guidance system
- Provision of priority parking lots for hybrid / electric vehicle
- Certified PUB Water Efficient Building



# NOVOTEL SINGAPORE CLARKE QUAY

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

DBS Trustee Limited As Trustee Of CDL  
Hospitality Real Estate Investment Trust

Facility Management

Novotel Singapore Clarke Quay

ESCO

Cofely South East Asia Pte Ltd

ESD/Green Consultant

Cofely South East Asia Pte Ltd

- High Efficiency Water Cooled Chiller Plant System (0.624kW/RT)
- Green Chiller
- LED Lightings
- Heat Pump System for Hot Water
- Planet 21 Sustainability Program
- Tree Planting Program
- Green Label Product and Green Procurement Policies

# ONE GEORGE STREET

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

One George Street LLP

Facility Management

CapitaLand Commercial Management Pte  
Ltd

- High efficiency chiller plant (Proposed retrofitting work to achieve system efficiency of 0.71 kW/ton system efficiency)
- Extensive landscape with roof gardens at 5<sup>th</sup> and 22<sup>nd</sup> storey and sky gardens at 12<sup>th</sup> and 15<sup>th</sup> storey. One George Street achieve a Greenery Provision of 7.3
- Siphonic rainwater discharge system
- Double glazed low E glass with aluminum sun-shading louvers and wind tunnel effect at 1<sup>st</sup> level lobby
- Motion sensors for all toilets and staircases

# ONE RAFFLES LINK

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	HKL (Esplanade) Pte Ltd
Facility Management	HongKong Land (Singapore) Pte Ltd
ESD/Green Consultant	BMG Green Technology Pte Ltd

- Use of high performance air filters such as MERV 13
- CO<sub>2</sub> and temperature sensors display
- Stormwater collection for irrigation system and water landscape
- Water fittings with “excellent” ratings
- Extensive use of environmentally friendly products such as hygiene paper, low VOC paints and adhesives

# ORCHARD PLAZA

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

The Management Corporation Strata Title  
Plan No. 628

Facility Management

The Management Corporation Strata Title  
Plan No. 628

ESCO

Comfort Management Pte Ltd

ESD/Green Consultant

Comfort Management Pte Ltd

- Highly efficient chiller plant efficiency of 0.512kW/RT with VSDs for pumps and cooling towers and auto tube cleaning system
- Highly efficient air handling units with efficiency of 0.16kW/RT and the use of electrostatic filters
- Adoption of continuous energy and efficiency monitoring programme over 7 years with an Energy Savings Performance Contract
- PUB-certified Water Efficient Building with digital water monitoring and leak detection system integrated with the building management system
- Adoption of recycling programme to track, reduce, recycle and/or reuse out-going waste

# PRUDENTIAL TOWER

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	The Management Corporation Strata Title Plan No. 2340
Facility Manager	CBRE Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd

- Estimated energy savings: 552,386 kWh/yr
- Highly efficient chiller plant
- Occupancy sensors used for toilets & staircases
- LED lightings used at staircases and car parks
- Green Education Corner
- Gelair block used in AHU
- Lamp Recycling Programme



# PSA BUILDING & ALEXANDRA RETAIL CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	DBS Trustee Limited As Trustee Of The Mapletree Commercial Trust
Architect	P&T Consultants Pte Ltd
M&E Engineer	Alpha Consulting Engineers Pte Ltd
Structural Engineer	HCE Engineers Partnership
Main Contractor	Shimizu Corporation

- Estimated energy savings: 17,888kWh/yr; Estimated water savings: 69,614m<sup>3</sup>/yr
- Water-cooled chiller plant system with operating efficiency of 0.69kW/RT
- Siphonic drainage system
- Automatic water efficient irrigation dripper system with rain sensor
- Non-chemical termite treatment system
- High efficiency air filters in all AHUs to enhance indoor air quality
- Use of heat pipes in Pre-cool AHUs
- Rooftop & vertical greenery are available
- Natural ventilation in car parks and staircases minimise the need for mechanical ventilation
- Incorporation of natural daylight in building design reduces energy consumption from artificial lightings
- Use of environmental-friendly products including SGLS-certified low VOC paints, hygiene paper and compost recycled from horticultural waste



# SAMSUNG HUB

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

The Management Corporation Strata Title  
Plan No. 3129

Facility Management

CBRE Pte Ltd

ESCO

Comfort Management Pte Ltd

ESD/Green Consultant

Comfort Management Pte Ltd

- Chiller plant system efficiency of 0.619 kW/ton
- Variable speed drives on existing chilled water pumps, condenser water pumps and cooling towers
- Usage of CO2 sensors to regulate outdoor air flow rate
- Usage of energy efficient tubes and LED PLC lights at common facilities
- Usage of Water Sub-Meters at Cooling Tower Make-Up Water Tanks and Domestic Water Tank linked to leak detection system

# TAMPINES CONCOURSE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	Glades Properties Pte Ltd
Facility Management	City Developments Limited
ESD/Green Consultant	CBM Solutions Pte Ltd
Others	CBM Solutions Pte Ltd (Building Maintenance)

- Use of pre-cool mechanical ventilation system – EcoCool System for office lobby and lift
- Adopt natural lighting design at atrium and use of sun pipes at 3rd storey toilets
- Green roof and vertical greenery – use of Trellis and Creepers
- Use of energy efficient lifts
- Use of 'Very Good' and 'Excellent' WELS rating tap fittings

# THE STRATEGY

## Existing Non-Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

DBS Trustee Limited As Trustee of  
Mapletree Industrial Trust

Facility Management

Mapletree Facilities Services Pte Ltd

ESCO

LJ Energy Pte Ltd

ESD/Green Consultant

LJ Energy Pte Ltd

- Chiller plant replacement for a better system efficiency by combining the existing two plant rooms into one as well as converting the chilled water pumping system to a primary only system. Achieved 0.62 kW/RT system efficiency with approximately 21% reduction in the annual total building electricity consumption
- Installation of variable speed drives for all chilled water pumps, condenser water pumps and cooling towers and also permanent measuring and verification instrumentations
- Installation of variable speed drives and new control valves for all AHUs
- All water fittings are rated “Excellent” under PUB WELS rating
- Provision of water sub-meters linked to remote monitoring system for monitoring of the water consumption in the building
- Installation of motion sensors linked to lightings in the toilets and staircases

# UE BIZHUB EAST (COMMERCIAL)

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	Viva Industrial Trust Management Pte Ltd
Property Manager	Viva Real Estate Asset Management Pte Ltd
ESD/Green Consultant	CPG Consultants Pte Ltd

- Use of Double Glazed Low-E Glass
- Vertical Green & Sky garden
- Heat Exchange Wheel to Cool Down Fresh Air Intake
- Use of District Cooling System
- Use of LED Downlight for Passenger Lift Lobbies
- Motion Sensors for Common Toilets and Staircases Half Landing
- Ductless System for Basement Ventilation

# UOB PLAZA 1

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	United Overseas Bank Limited
Facility Management	UOB Property & General Services Division
ESCO	Kaer Pte Ltd
ESD/Green Consultant	Kaer Pte Ltd

- Heat Recovery System for PAHUs
- VSD Controls for Pumps & Cooling Towers
- LED for Car park lighting
- CO Sensor for Car park MV Fan
- PUB Certified Water Efficient Fittings



# 396 ALEXANDRA ROAD (UOB TOWER BLOCK)

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	United Overseas Bank Limited
Facility Manager	United Overseas Bank Limited
ESCO	G-Energy Global Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd
M&E Consultant	Belmacs Pte Ltd

- Efficient chiller plant system of less than 0.6kW/ton
- Measurement and verification system and heat balancing to monitor chiller plant efficiency
- High efficiency air handling units complete with variable speed drives, carbon dioxide sensors and MERV 13 air filters
- Energy efficient LED lighting for office, basement car park and common areas
- SGBC-certified chillers and switchboards
- PUB Water Efficient Building
- Remote energy monitoring system for live updates on energy consumption of building



# WINSLAND HOUSE II

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Winmax Investment Pte Ltd
Facility Manager	Winmax Investment Pte Ltd
ESCO	G-Energy Global Pte Ltd
ESD/Green Consultant	G-Energy Global Pte Ltd

- Efficient chiller plant system of 0.652 kW/ton
- High efficiency air handling units with VSD, CO<sub>2</sub> sensors, MERV-13 air filters and UVC emitters
- Energy efficient LED lighting for lift lobbies, service corridors and basement car park
- SGBC-certified auto tube cleaning system and switchboards
- PUB Web-certified

# ALKAFF COURTVIEW AND ALKAFF LAKEVIEW

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



- Regenerative Lift
- Extensive use of Water Efficiency Fittings
- Extensive use of high efficiency energy saving light fittings (LED) with alternate circuiting, timer control and energy monitoring device to manage/minimize energy consumption.

Client/Developer	Housing & Development Board
Architect	MKPL Architects Pte Ltd
Project Manager	MKPL Architects Pte Ltd
M&E Engineer	Alpha Consulting Engineers Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	Davis Langdon KPK, An AECOM Company
Main Contractor	Rich Construction Company Pte Ltd
Landscape Consultant	ICN Design International Pte Ltd

# ALKAFF VISTA

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Housing & Development Board
Architect	ADDP Architects LLP
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	Chiu Teng Construction Co Pte Ltd

- Estimated energy savings: 1,001,502kWh/yr; Estimated water savings: 35,514m<sup>3</sup>, RETV: 16.98W/m<sup>2</sup>
- Use of energy efficient LED lightings
- Luxuriant greenery provision
- Extensive use of environmentally friendly products

# BUANGKOK EDGEVIEW

New Residential Building



## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



- Estimated energy savings: 774,498kWh/yr; Estimated water savings: 35,727m3, RETV: 14.23W/m2
- Use of energy efficient LED lightings
- Luxuriant greenery provision
- Extensive use of environmentally friendly products

Client/Developer	Housing & Development Board
Architect	Surbana Jurong Pte Ltd
M&E Engineer	Surbana Jurong Pte Ltd
Structural Engineer	Surbana Jurong Pte Ltd
Quantity Surveyor	Surbana Jurong Pte Ltd
Main Contractor	Expand Construction Pte Ltd



# DAWSON C5

## New Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Housing & Development Board
Architect	Design Link Architects Pte Ltd
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	DE Consultants (S) Pte Ltd
Quantity Surveyor	Davis Langdon KPK
Main Contractor	Stephen Caffyn Landscape Design
Landscape Consultant	Progressive Builders Pte Ltd

- Estimated energy savings: 51,734.37kWh/yr; Estimated water savings: 177,981.3m<sup>3</sup>, RETV: 18.54W/m<sup>2</sup>
- Provision of Bioswales/ Eco corridor and educational corners helps to collect rainwater for mass irrigation and promote green education
- Use of energy efficient equipment such as energy efficient lightings in common areas helps to minimise energy consumption
- Extensive use of natural landscaping throughout the site encourages greenery usage to reduce heat island effect
- Use of water efficient fittings for common areas and residential units ensures minimal wastage of water and higher cost savings
- Extensive use of sustainable/ recycled products within the development helps to promote sustainability and stay environment friendly

# FOREST WOODS

## New Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	City Developments Limited/Hong Leong Holding Limited/TID Pte Ltd
Architect	DCA Architects Pte Ltd
M&E Engineer	Squire Mech Pte Ltd
Structural Engineer	LSW Consulting Engineers Pte Ltd
Main Contractor	Ssangyong Engineering & Construction Co., Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Landscape Consultant	SALD Pte Ltd

- North-South orientation for 90% of units (out of 519)
- Use of better performance 16.76mm and 14.76mm thick low-e laminated glass to obtain good RETV Value (17.97)
- Extensive landscape green area with rain-water harvesting and auto-irrigation
- Use of water efficient fittings in all bathrooms
- Use of Green Concrete (with GGBS, RCB & WCS), Pre-Cast Toilets (more than 80%) and Pre-Cast Panels



# GOLDEN GINGER

## New Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Housing & Development Board
Architect	CSYA Pte. Ltd.
M&E Engineer	Beca Carter Hollings & Ferner (S.E.Asia) Pte Ltd
Structural Engineer	WEB Structures Pte Ltd
Quantity Surveyor	Faithful+Gould Pte. Limited
Main Contractor	Ho Lee Construction Pte Ltd

- Estimated energy savings: 147,800kWh/yr; Estimated water savings: 14,810m3, ETTV: 18.46W/m2
- Provision of centralised dual refuse chutes to separate recyclable from non-recyclable waste
- Provision of lifts with Variable Voltage Variable Frequency (VVF) drives and regenerative component
- Extensive usage of energy efficient lighting such as LED lights and high performance fluorescent lights
- Use of water efficient fittings and integrated basin/cistern pedestal water closet

# iNz RESIDENCE

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



- Estimated energy savings: 1,356,023kWh/yr; Estimated water savings: 225,395 m3, RETV: 20.08W/m2
- Use of energy efficient LED lightings
- Extensive adoption of Prefabricated Bath Units (PBU)
- Extensive use of environmentally friendly products

Client/Developer	Qingjian Realty (Choa Chu Kang) Pte Ltd
Architect	ADDP Architects LLP
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	Engineers Alliance Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Qingjian International (South Pacific) Development Group Co. Pte Ltd

# LE QUEST AT BUKIT BATOK STREET 41

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



- Extensive use of PPVC and PBU
- 59.8% energy savings for lighting at common area, through the use of energy-efficient fixtures such as LED and T5 fluorescent lights
- Gearless drive lifts with AC VVVF motor drive and sleep mode
- Usage of SGBC certified 4 ticks energy saving air-conditioning system
- Provision of pneumatic waste collection system.

Client/Developer	QINGJIAN REALTY (BBR) PTE LTD
Architect	ADDP ARCHITECTS LLP
M&E Engineer	Rankine & Hill (Singapore) Pte Ltd
Structural Engineer	TW-ASIA Consultants Pte Ltd
Main Contractor	Qingjian International (South Pacific) Group Development Co. Pte Ltd
Quantity Surveyor	Davis Langdon KPK (Singapore) Pte Ltd
Landscape Consultant	Ecoplan Asia Pte Ltd
Interior Design	Ong & Ong Pte Ltd

# PARC BOTANNIA

New Residential Building



## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer

FERNVALE GREEN PTE LTD (JV of Sing Development Pte Ltd & Wee Hur Development Pte Ltd)

Architect

P&T CONSULTANTS PTE LTD

M&E Engineer

TRITONT CONSULTING LLP

Structural Engineer

P&T CONSULTANTS PTE LTD

Quantity Surveyor

THREESIXTY COST MANAGEMENT PTE LTD

Main Contractor

WEE HUR CONSTRUCTION PTE LTD

Landscape Consultant

COEN DESIGN INTERNATIONAL

- High Efficiency Thermal Performance with an RETV of 19.34 W/m<sup>2</sup>
- Naturally Ventilated Design with the Use of High efficiency Air Conditioning System (4 Ticks)
- Efficient Water Fittings
- High Utilization of Environmentally Friendly Products (e.g. Laminates , Waterproofing, Vinyl Flooring , EPDM and more)
- Efficient Construction with the use of Prefabricated Precast Volumetric Construction and Prefabricated Bathroom Units



# SEASIDE RESIDENCES

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



- Use of energy efficient features such as motion sensors, energy efficient lift and ventilation systems
- Use of water fittings that are certified under WELS with mostly excellent and very good rating
- Extensive use of sustainable and environmental friendly products approved by Singapore Green Label Scheme
- Extensive greenery with green plot ratio of 6.0
- Provision of covered walkway to facilitate connectivity and use of public transport (bus & MRT)

Client/Developer	EAST VUE PTE. LTD.
Architect	ADDP Architects LLP
M&E Engineer	Rankine & Hill (Singapore) Pte Ltd
Structural Engineer	P&T Consultants Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Keong Hong Construction Pte Ltd
Landscape Consultant	Tinderbox Pte Ltd

# THE ASANA

## New Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Aurum Land (Private) Ltd
Architect	Park + Associates Pte Ltd
M&E Engineer	Belmacs Pte Ltd
Structural Engineer	TEP Consultants Pte Ltd
Quantity Surveyor	PQS Consultants Pte Ltd
Main Contractor	Woh Hup (Private) Ltd

- Estimated energy savings: 40,314kWh/yr; Estimated water savings: 7,120m<sup>3</sup>, RETV: 21.33W/m<sup>2</sup>
- 6.57% percentage replacement of electricity by renewable energy
- 47.16% improvement in lighting, power budget by using energy saving light fittings
- Use of energy efficient Air-conditioning system certified by SELS with 4-ticks AC system
- Use of certified green and sustainable products for residential units and common areas
- Use of WELS certified water efficient sanitary fittings for residential units and common areas



# THE ORIENT

## New Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Aurum Land (Private) Limited
Architect	Formwerkz Architects LLP
M&E Engineer	NEAM Solutions
Structural Engineer	TEP Consultants Pte Ltd
Quantity Surveyor	PQS Consultants Pte Ltd
Main Contractor	Woh Hup (Private) Limited

- Natural ventilation and daylighting at lift lobbies, corridors and car parks
- Use of solar panels as renewable energy source
- Provision of greenery with high Green Plot Ratio
- Provision of double refuse chutes to separate recyclable from non-recyclable waste
- Provision of 65% Prefabricated Bathroom Units (PBUs)

# THE VISIONAIRE

## New Residential Building

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Qingjian Realty (Sembawang) Pte Ltd
Architect	Surbana Jurong Pte Ltd
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	KCL Consultants Pte Ltd
Quantity Surveyor	Langdon & Seah Pte Ltd
Main Contractor	Ecoplan Asia Pte Ltd
Landscape Consultant	Qingdao Construction (Singapore) Pte Ltd

- Estimated energy savings: 2,488,691kWh/yr; Estimated water savings: 220,806m<sup>3</sup>, RETV: 21.88W/m<sup>2</sup>
- Sustainable products that are environmentally friendly
- Natural ventilation and daylighting in wet areas such as kitchens
- Good access to nearest bus stops
- Carbon monoxide sensors with mechanical ventilation to be used in the car park
- Low volatile compounds paints are used for internal areas

# WEST ROCK @ BUKIT BATOK

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Housing & Development Board
Architect	Ong&Ong Pte Ltd
M&E Engineer	Rankine & Hill (Singapore) Pte Ltd
Structural Engineer	Rankine & Hill (Singapore) Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	Hock Guan Cheong Builder Pte Ltd

- Estimated energy savings: 817,600kWh/yr; Estimated water savings: 16,107m<sup>3</sup>, RETV: 15.23W/m<sup>2</sup>
- LED lighting in common areas
- Motion Sensors in Staircase Landing
- Double Refuse Chute

# WEST TERRA @ BUKIT BATOK

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Housing & Development Board
Architect	P&T Consultants Pte Ltd
M&E Engineer	Rankine & Hill (Singapore) Pte Ltd
Structural Engineer	P&T Consultants Pte Ltd
Quantity Surveyor	Acardis Singapore Pte Ltd
Main Contractor	Teambuild Engineering & Construction Pte Ltd

- Estimated energy savings: 686,499kWh/yr; Estimated water savings: 59,165m<sup>3</sup>, RETV: 15.59W/m<sup>2</sup>
- Use of Precast Volumetric Construction (PVC) System, Prefabricated Bath Units (PBU) for all dwelling units and Cross Laminated Timber (CLT)
- Use of energy efficient LED lightings
- Extensive use of environmentally friendly products



# BEDOK GREEN SECONDARY SCHOOL

Existing Schools

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	Ministry of Education
Facility Management	CPG Facilities Management Pte Ltd
Green Consultant	Abdul Rahman (Back to School Programme)

- Minimal East-West façade to reduce heat gain and solar glare into building
- Energy and water usage are monitored and documented. The trending data is communicated to both staffs and students to encourage reduction in consumption
- Environment advocates are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits
- Provision of a green corner equipped with adequate learning materials on environmental sustainability
- Provision of recycling bins at strategic locations within the school

# BUKIT PANJANG PRIMARY SCHOOL

Existing Schools

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	Ministry of Education
Facility Management	Guthrie FMC Pte Ltd
ESD/Green Consultant	Jacelyn Oh Qian Ru

- Air-conditioners are set to 25 degrees Celsius
- A green corner is set up and updated regularly to educate students and staff on matters related to environmental sustainability
- Students and teachers embark on a newspaper recycling initiative twice a month
- Recycling bins and education posters are provided at strategic location within the school
- A science trail was developed within the school to educate students on different type of plants and their uses



# BUKIT VIEW SECONDARY SCHOOL

Existing Schools

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	Ministry of Education
Facility Management	Guthrie FMC Pte Ltd
ESD/Green Consultant	Johnson Controls (s) Pte Ltd

- Joules Smart Centre in partnership with SGBC uses materials and fixtures certified by SGBC to educate students and guests on the functionalities of green products and how they can be co-deployed to create an innovative green space
- The school is practicing rainwater harvesting for toilet washing
- High volume low speed fans are installed within the school
- The eco garden is installed with an eco-pond and a few other component for school and educational purposes
- Organised various sustainable awareness and management programme including water saving poster, talks about recycling around the school and tour around the rooftop solar panels (student involvement)

# CORPORATION PRIMARY SCHOOL

Existing Schools

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner	Ministry of Education
Facility Management	Guthrie FMC Pte Ltd
Green Consultant	Tang Sze Tong

- A schedule for air-conditioning is formulated to reduce unnecessary usage of AC system
- The school is built with minimal west and east facing facades and adequate provision of effective sun shading devices on the aforementioned facades to minimise heat gain within the building
- Energy and water usage are monitored and documented with reasons for high and low consumption. These information on trends of energy and water utilisation are communicated to both staff and students to encourage them to reduce consumption if necessary
- Environmental ambassadors are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits
- Provision of a green corner at green hub and at each classrooms equipped with adequate learning materials on environmental sustainability for both students and staff. They carry out activities and regularly update the board with the latest update on green activities and information
- Provision of recycling bins at strategic locations within the school (eg. Canteen, classrooms and Staff room) and posters recycling do's and don'ts poster to educate users to recycle correctly
- Eco-pond with educational facilities will be installed for education purposes. A range of native plants line the walkway of the school. Labels displaying information of each plant are placed next to each plant to provide students with knowledge on these native plants

# CHANGKAT CHANGI SECONDARY SCHOOL

Existing Schools

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Ministry of Education

Facility Management

CPG Facilities Management Pte Ltd

Green Consultant

Ms Lim Zhi Yin

- Achieved 24% savings in lighting as compared to the baseline
- Attained PUB Water Efficiency Building Certification
- Has a school wide sustainability awareness and education framework to promote sustainability among the students.
- Provision of recycling bins and recycling storage area

# KUO CHUAN PRESBYTERIAN PRIMARY SCHOOL

Existing School

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Ministry of Education
Facility Management	CPG Facilities Management Pte Ltd
Green Consultant	Marcus Quek Jun Yee

- School designed with minimal east-west façade, thus greatly minimising the heat gain and solar glare
- Energy and water consumption trends are monitored and communicated to both staff and students to raise awareness of school's consumption patterns
- Environment envoys appointed within each class
- Provision of green corner with learning materials on environmental sustainability for both staff and students
- Provision of twin bins in classroom to promote recycling
- Water Efficiency Index for school is 6.78 litres/person/year
- Installation of several learning corners such as biotope aquarium and an eco-garden with solar panel



# MARSILING PRIMARY SCHOOL

Existing Schools

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Ministry of Education

Facility Management

Guthrie FMC Pte Ltd

- The school has low Energy Utility Index (EUI) at 26.90kW/m<sup>2</sup>/year, top 20% benchmark against other primary schools
- Provision of a green corner in every classroom equipped with adequate learning materials on environmental sustainability (e.g. Energy and water conservation, waste management) for both students and staff
- School has 2 tiers of environmental envoys which are the Environmental Champions and Green Monitors to ensure the green practices are carried out. They spread environmental messages as well as lead the class in recycling and bring the recyclables to the centralized bins weekly at the Recycling Point
- Primary schools in Singapore are invited to Marsiling Primary School to learn about green innovation as well as attend workshops for both educators and students during the Green Symposium
- School has always been working in partnership with external organisations. WWF – Planet Defenders & Project Water Harvesting. NEA – Project Buddy Clean (2014). Singapore Turf Club and The New Paper – SG50 School Gardening Project. PA & AVA – SG50 Green Harvest

# NAN CHIAU PRIMARY SCHOOL

Existing School

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	Ministry of Education
Facility Management	Mr Chan Keng Wee
Green Consultant	Ellie Yee Wen Na (Back to School Programme)

- Air-conditioning is set at the temperature of 25°C to prevent users from resetting it
- LAN Rooms' temperature is set at the optimal temperature of 24°C
- The school is built with minimal west and east facing facades and adequate provision of effective sun shading devices on the aforementioned facades to minimise heat gain within the building
- Energy and water usage are monitored and documented with reasons for high and low consumption. These information on trends of energy and water utilisation are communicated to both staff and students to encourage them to reduce consumption if necessary
- Majority of lights in block A1, A2 and A3 has been changed to T5 fluorescent fittings to improve efficiency of lighting systems and reduce energy consumption
- The school is committed to purchasing air-conditioning units with NEA's energy efficiency rating of 'Good' (or at least 3 ticks).
- Recyclables collected weekly by students are recorded and monitored before being collected by Sembcorp
- Recycling bins are provided at strategic locations within the school (e.g. Canteen) and posters to educate users on recycling
- Two recycling boxes are placed in classrooms to encourage recycling amongst students
- A range of native plants line the walkway of the school. Labels displaying information of each plant are placed next to each plant to provide students with knowledge on these native plants



# UNITY PRIMARY SCHOOL

## Green Mark for Existing Schools

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Ministry of Education

Facility Management

Guthrie FMC Pte Ltd

- School has relatively good Energy Utility Index (EUI) of 33.23 kWh/m<sup>2</sup>/year and Energy Index of 411.20 kWh/person/year.
- Provision of Eco Garden, Central Garden and Urban Farm with informational and educational facility.
- Each class has 2 environmental envoys, Green Monitors, to spread environmental messages and to conduct checks that all the lights, fans, visualizer, projector are switched off before leaving the classroom.
- The school has a group of LLP Ambassadors to spread environmental messages beyond the school such as at PCFs, Elder Care Centres, National Libraries and Clean and Green Carnivals.
- School has partnered with several external agencies; NParks – Biodiversity 5 Day Challenge, Green Wave; PCF Kindergarten – Termly Estate Collection, Litter Picking at Pang Sua Waterway, Upcycling Crafts, Green Carnival@UPS; Public Utilities Board(PUB) – adoption as part of the ABC Waterway Adopter initiative; North West CDC – Bright Spots Programme; Sembcorp – Weekly Mass Recycling, Termly Estate Collection; NEA – Buddy Clean.

# WESTWOOD SECONDARY SCHOOL

Existing Schools

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Ministry of Education

Facility Management

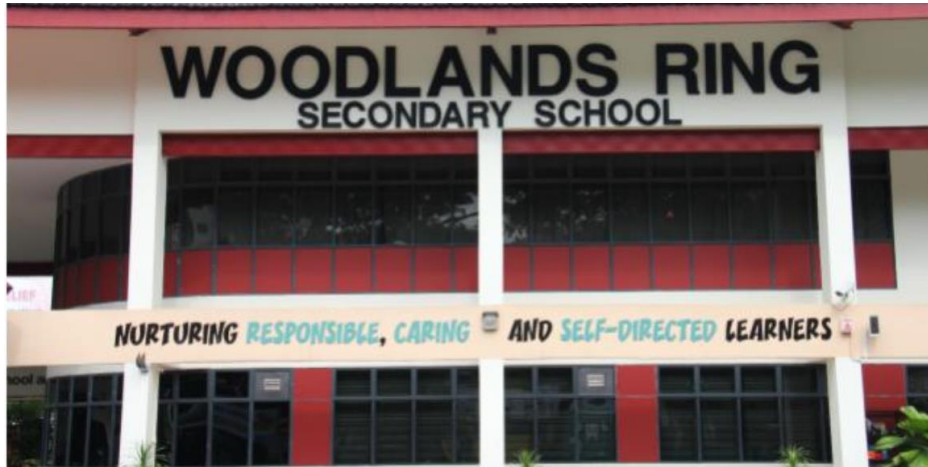
Guthrie FMC Pte Ltd

- Energy and water usage are monitored and documented with reasons for high and low consumption. This information on trends of energy and water utilisation are communicated to both staff and students to encourage them to reduce consumption where possible
- Low VOC paints are used to paint 100% of the school exterior and interior walls
- Extensive values-in-actions programmes are tailored to environmental sustainability topics such as Recycling Drive, Adopt a Plant, School Herbs Garden and Mozzie Project
- Environmental Champions are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits
- Environmental Teacher Committee is set up to spur the environmental movement in the school. They will attend environmental workshops and conduct sharing sessions with other schools pertaining to environmental programmes

# WOODLANDS RING SECONDARY SCHOOL

Green Mark for Existing Schools

## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Building Owner

Ministry of Education

Facility Management

Guthrie FMC Pte Ltd

- Energy and water usage are monitored and documented with reasons for higher and lower consumption. These information on trends of energy and water utilisation are communicated to both staff and students to encourage them to reduce consumption if necessary
- LAN Rooms' temperature is set at the optimal temperature of 24 °C
- Provision of twin bins in classrooms, Emerald City, staff rooms and general office to encourage recycling amongst staff and students
- Students Councillor's environmental committee lead the planning and execution of Green Carnival annually to organise exhibitions related to environmental causes for secondary 2 classes
- School Staff participate in the cleanup of waterways at Marina Reservoir and students are involved in the cleanup of mangrove at Pasir Ris annually. Students also participated in the Annual National Environment Quiz

# NIM COLLECTION

## New Landed Houses

### GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



- Provision of NEA Labelled 5 Ticks Energy Efficient Air-conditioning Split Units per household unit
- Provision of Solar Panels per household unit up to 1.035kWp
- Provision of two Electric Car Charger per household unit
- Extensive usage of eco-friendly cement for structural and non-structural components
- Provision of lift with ACVVVF inverter and sleep mode functions per household unit

Client/Developer	Bukit Sembawang Estates Limited
Architect	W Architects Pte Ltd
M&E Engineer	T.Y. Lin International Pte. Ltd.
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	TPS Construction Pte Ltd
Landscape Consultant	Mace Studio Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd



# KHOO TECK PUAT-NATIONAL UNIVERSITY CHILDREN'S MEDICAL INSTITUTE PAEDIATRIC AMBULATORY CENTRE

Healthcare Facility



## GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup>



Client/Developer	National University Hospital (S) Pte Ltd
Architect	Forum Architects Pte Ltd
M&E Engineer	Belmacs Pte Ltd
Structural Engineer	Ronnie & Koh Consultants Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	Kienta Engineering Construction Pte Ltd

- Efficient water-cooled chiller plant with 0.58 kW/RT
- ETTV of 34.5 kW/m<sup>2</sup>
- Utilise shading and facilitate natural ventilation in atrium space
- Energy Efficient LED & T5 lighting
- Good environmental practices during construction to monitor resource use, engage GGBA builder and ISO14000-certified firms



## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
2 Pandan Avenue	New Non-Residential Building	FOH FOH CO. PTE LTD
30A Kallang Place	New Non-Residential Building	DBS Trustee Limited as Trustee of Mapletree Industrial Trust
Adult Disability Home+Day Activity Centre	New Non-Residential Building	Ministry of Social & Family Development
Bus Terminal and Stabling Yard at Gali Batu Depot	New Non-Residential Building	Land Transport Authority
Control Centre Facility Building	New Non-Residential Building	Land Transport Authority
Dormakaba Factory at Tukang Innovation Drive	New Non-Residential Building	Dorma Production Gmbh & Co Kg
East Coast Integrated Depot (Bus Depot)	New Non-Residential Building	Land Transport Authority
EMSEA E310 & B100	New Non-Residential Building	Evonik Methionine SEA Pte Ltd

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Evonik- Me6	New Non-Residential Building	EVONIK METHIONINE (SEA) PTE LTD
FM Global Centre	New Non-Residential Building	Singapore Science Park Ltd
Geylang Neighbourhood Police Centre	New Non-Residential Building	Singapore Police Force
Jalan Besar Community Club	New Non-Residential Building	People's Association
Jurong Town Play Field (Wet)	New Non-Residential Building	Sport Singapore (SportSG)
Jurong West Hawker Centre	New Non-Residential Building	NATIONAL ENVIRONMENT AGENCY
Kallang Fire Station	New Non-Residential Building	Singapore Civil Defence Force
Kebun Baru Community Club	New Non-Residential Building	People's Association

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Marsiling Mall	New Non-Residential Building	National Environment Agency
MEGA@Woodlands	New Non-Residential Building	WEE HUR (WOODLANDS 12) PTE LTD
Multi-Storey Vehicle Storage (Block 601)	New Non-Residential Building	Defence Science and Technology Agency (DSTA)
Nee Soon Camp	New Non-Residential Building	Defence Science and Technology Agency (DSTA)
Selarang MEC	New Non-Residential Building	Defence Science and Technology Agency (DSTA)
Selarang Park Complex, Phase 1	New Non-Residential Building	Singapore Prison Service
SoilBuild Innovation Hub	New Non-Residential Building	SOILBUILD PTE LTD
SP Group Logistics Centre	New Non-Residential Building	SP Powerassets Ltd

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Teck Ghee Community Club	New Non-Residential Building	PEOPLE'S ASSOCIATION
Yishun Park Hawker Centre	New Non-Residential Building	National Environment Agency
*SCAPE	Existing Non-Residential Building	*SCAPE Co. Ltd
78 Shenton Way	Existing Non-Residential Building	CG-78 Shenton Way Singapore Private Limited
Administration Building	Existing Non-Residential Building	Tuaspring Pte Ltd
Alexandra Technopark A & B	Existing Non-Residential Building	British and Malayan Trustees Limited as trustee of Frasers Commercial Trust
Boeing Singapore Training Centre and Flight Services	Existing Non-Residential Building	Boeing Singapore Training and Flight Services Pte Ltd
Carrier Transicold	Existing Non-Residential Building	Carrier Transicold

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Changi Airport Terminal 1	Existing Non-Residential Building	Changi Airport Group (S) Pte Ltd
Changi Airport Terminal 1 (Finger Piers C & D)	Existing Non-Residential Building	Changi Airport Group (S) Pte Ltd
Four Points by Sheraton Singapore, Riverview	Existing Non-Residential Building	Keck Seng Hotel Pte Ltd
Lam Soon @ Marsiling	Existing Non-Residential Building	Lam Soon Singapore Pte Ltd
Mandarin Oriental Singapore	Existing Non-Residential Building	Mandarin Oriental Singapore
Millenia Tower	Existing Non-Residential Building	Marina Properties Pte Ltd
Millenia Walk	Existing Non-Residential Building	Millenia Private Limited
Ministry of Foreign Affairs Headquarters	Existing Non-Residential Building	Ministry of Foreign Affairs



## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
NEX	Existing Non-Residential Building	Gold Ridge Pte Ltd
OCBC Tampines Centre One	Existing Non-Residential Building	Oversea-Chinese Banking Corporation Limited
OCBC Tampines Centre Two	Existing Non-Residential Building	Oversea-Chinese Banking Corporation Limited
Office @ 50 Scotts Road	Existing Non-Residential Building	Sun Venture (S) Investments Pte Ltd
OrchardGateway@Emerald	Existing Non-Residential Building	218 Orchard Private Limited
People's Park Complex	Existing Non-Residential Building	The Management Corporation - Strata Title Plan No. 473
Pixel Red	Existing Non-Residential Building	Teckwah Industrial Corporation Ltd
Proposed 6 Storey New Building at Ang Mo Kio-Thye Hua Kwan	Existing Non-Residential Building	ANG MO KIO - THYE HUA KWAN HOSPITAL LTD

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Rendezvous Hotel Singapore	Existing Non-Residential Building	Rendezvous Hotel Singapore
SDC Office	Existing Non-Residential Building	Sentosa Development Corporation
Shangri-La Hotel, Singapore	Existing Non-Residential Building	Shangri-La Hotel Limited
Shaw Centre	Existing Non-Residential Building	MCST 617
Shaw House	Existing Non-Residential Building	Shaw House Pte Ltd
Studio M Hotel Singapore	Existing Non-Residential Building	Republic Iconic Hotel Pte Ltd
Sultan Plaza	Existing Non-Residential Building	MCST 902
Tang Plaza	Existing Non-Residential Building	MANAGEMENT CORPORATION STRATA TITLE PLAN NO. 1673

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
The Plaza (Block A)	Existing Non-Residential Building	MCST 717
The Seletar Mall	Existing Non-Residential Building	The Seletar Mall Pte Ltd
UE Bizhub East (Hotel & Convention Centre)	Existing Non-Residential Building	Perpetual (Asia) Limited as Trustee of VI-REIT
Wheelock Place	Existing Non-Residential Building	Everbilt Developers Pte Ltd
Anchorvale Parkview	New Residential Building	Housing & Development Board
Anchorvale Fields	New Residential Building	Housing & Development Board
Blossom Spring @ Yishun	New Residential Building	Housing & Development Board
Buangkok Tropica	New Residential Building	Housing & Development Board

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Bukit Gombak Vista	New Residential Building	Housing & Development Board
Dawson C7	New Residential Building	Housing & Development Board
Dawson Vista	New Residential Building	Housing & Development Board
Geylang C43B + Park	New Residential Building	Housing & Development Board
HDB Bukit Panjang N6C12	New Residential Building	Housing & Development Board
HDB Choa Chu Kang N1 C15	New Residential Building	Housing & Development Board
Marsiling Greenview	New Residential Building	Housing & Development Board
Wandervale	New Residential Building	SIM LIAN (STARLIGHT) PTE LTD

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
West Crest @ Bukit Batok	New Residential Building	Housing & Development Board
Yung Ho Spring I	New Residential Building	Housing & Development Board
Yung Ho Spring II	New Residential Building	Housing & Development Board
Yung Kuang Court (Jurong West N1 C31)	New Residential Building	Housing & Development Board
Ai Tong School	Existing Schools	Ai Tong School
Catholic Junior College	Existing Schools	Ministry of Education
Chong Boon Secondary School	Existing Schools	Ministry of Education
Chung Cheng High School (Yishun)	Existing Schools	Chung Cheng High School (Yishun)



## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Damai Secondary School	Existing Schools	Damai Secondary School
Dunman Secondary School	Existing Schools	Dunman Secondary School
Elias Park Primary School	Existing Schools	Elias Park Primary School
Fuchun Primary School	Existing Schools	Ministry of Education
Gan Eng Seng Primary School	Existing Schools	Ministry of Education
Gan Eng Seng School	Existing Schools	Gan Eng Seng School
Hua Yi Secondary School	Existing Schools	Ministry of Education
Jurong Secondary School	Existing Schools	Jurong Secondary School

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Jurong West Primary School	Existing Schools	Jurong West Primary School
Keming Primary School	Existing Schools	Keming Primary School
Kong Hwa School	Existing Schools	Ministry of Education
Ngee Ann Secondary School	Existing Schools	Ngee Ann Secondary School
Queensway Secondary School	Existing Schools	Ministry of Education
Red Swastika School	Existing Schools	Ministry of Education
Regent Secondary School	Existing Schools	Regent Secondary School
St Andrew's Secondary School	Existing Schools	St Andrew's Secondary School

## GREEN MARK FOR BUILDINGS AWARD | GOLD

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Tampines North Primary School	Existing Schools	Tampines North Primary School
Tampines Primary School	Existing Schools	Tampines Primary School
West View Primary School	Existing Schools	Ministry of Education
Yu Neng Primary School	Existing Schools	Yu Neng Primary School
Zhangde Primary School	Existing Schools	Ministry of Education

## GREEN MARK FOR BUILDINGS AWARD | CERTIFIED

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
3 Storey Prefab Building	New Non-Residential Buildings	Ministry of Education
35 & 36 North Canal Road A&A	New Non-Residential Buildings	JMD Commercial (NCR) Pte Ltd
AM1	New Non-Residential Buildings	NEWTEC DRYMIX PTE LTD
Le Quest - Commercial Podium	New Non-Residential Buildings	QINGJIAN REALTY (BBC) PTE LTD
AIA Alexandra	Existing Non-Residential Building	AIA Singapore Private Limited
AIA Tampines	Existing Non-Residential Building	LC Ventura (Tampines) Pte Ltd
Denis Group HQ Singapore	Existing Non-Residential Building	Denis Asia Pacific Pte Ltd
HP INC. , 3 Tuas Link 4	Existing Non-Residential Building	HP Singapore Private Limited

## GREEN MARK FOR BUILDINGS AWARD | CERTIFIED

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Keck Seng Tower	Existing Non-Residential Building	Keck Seng Tower Pte Ltd
National University of Singapore - University Cultural Centre (UCC)	Existing Non-Residential Building	National University of Singapore
NPS International School	Existing Non-Residential Building	NPS International School Pte Ltd
PacificLight Power Plant Jurong Island	Existing Non-Residential Building	PacificLight Power Pte Ltd
The Octagon	Existing Non-Residential Building	MCST 1521
YewTee point	Existing Non-Residential Building	HSBC Insitutional Trust Services (Singapore) Limited as Trustee of Frasers Centrepont Trust





# BCA GREEN MARK OCCUPANT-CENTRIC SCHEMES



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

This year, the BCA Green Mark Award winners for Occupant-Centric schemes are grouped into the following categories:

- i. BCA Green Mark Award for Office Interiors
- ii. BCA Green Mark Award for Supermarkets
- iii. BCA Green Mark Award for Retail
- iv. BCA-IMDA Green Mark Award for Data Centres
- v. BCA Green Mark Award for Laboratories
- vi. BCA Green Mark Award for Restaurants



# BCA GREEN MARK FOR OFFICE INTERIOR



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

The scheme, launched in 2009, has since been gaining momentum with the industry, with its take-up rate being on the rise each year.

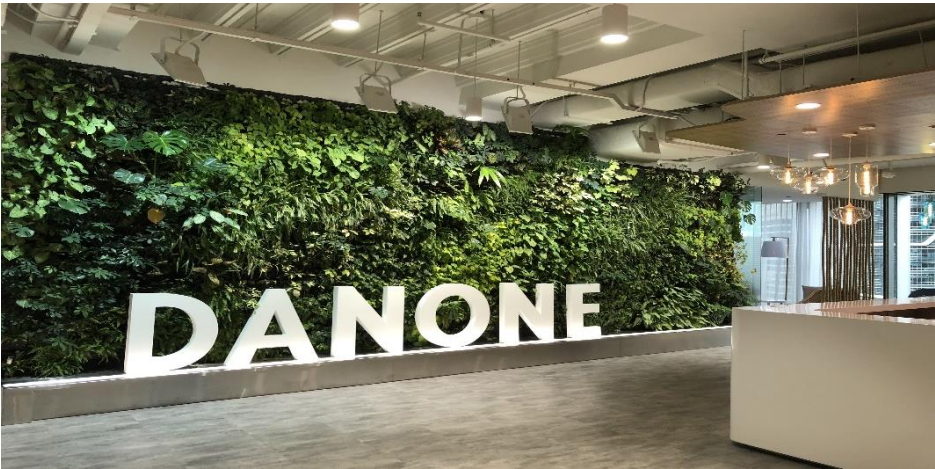
Offices are evaluated under the following criteria:

- i. Energy Efficiency
- ii. Water Efficiency
- iii. Sustainable Management and Operation
- iv. Indoor Environmental Quality
- v. Other Green Features

# DANONE ASIA PTE LTD

## Office Interior

### GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



Tenant/Owner	Danone Asia Pte Ltd
Architect	DB & B Pte Ltd
M&E Engineer	THK Engineering Pte Ltd
Main Contractor	Ngai Chin Construction Pte Ltd
ESD Consultant	GreenA Consultants Pte Ltd

- Energy efficient lighting system with zoning and control
- Provision of photo sensors for the perimeter office area
- Extensive use of environmentally friendly products
- Provision of energy efficient IT equipment
- Open office design with provision of hot desks
- Annual sustainable reporting
- Video conference room for carbon footprint reduction

# DCA ARCHITECTS OFFICE

## Office Interior



### GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



Tenant/Owner	DCA Architects Pte Ltd
Renovation Contractor	Sunray Woodcraft Construction Pte Ltd
Facility Manager Company	Engie Services Singapore Pte Ltd
Managing Agent / Maintenance Contractor	Harbourfront One Pte Ltd / Sunray Woodcraft Construction Pte Ltd
Others	Greenology Pte Ltd (Green Wall)

- Environmental friendly policies and guidelines to improve energy, water and waste reduction and actively monitor the environmental performance of the office, inclusive of a green team
- Care for indoor environmental quality and occupant comfort with green-certified products and provision of HEPA Air filters
- Open office layout for optimal space usage with dedicated recycling corner and green message corner
- Use of LED, T5 lighting, motion sensors and task lighting to optimise energy consumption
- Faucets and fitting rated WELS Excellent to reduce water consumption
- Over 94% of IT equipment rated energy star, with video conference rooms and hot desks
- Extensive reuse of office furniture with award-winning green-label ergonomic chairs for all staff

# GIC @ Capital Tower

## Office Interior



### GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



Tenant/Owner	GIC Private Limited
Renovation Interior Design Consultant	SCA Design Pte Ltd, Square Peg Design Pte. Ltd.
Renovation Contractor	Jim & Hall's Construction Pte. Ltd.
M&E Consultant	J Roger Preston (S) Pte. Ltd.
ESD Consultant	Kaer Pte. Ltd.

- Installed “24/7 Presence Sensing System” to dim and switch off the light fittings at open office areas and meeting rooms, and to automatically roll up blinds in meeting rooms when unoccupied
- Put in place “Daylight Harvesting System” to dim light fittings at the office façade’s perimeter when there is sufficient daylight coming through
- Expanded and extended internal staircases across three corporate levels to encourage collaboration, staff wellness and reduce lift traffic
- Removed more than 80% existing office cabinets through “ Paper-less Programme” to digitise storage and automate paper-related processes
- Installed electronic and height-adjustable workstations to encourage a more agile and healthy lifestyle in the office
- Set up cloud PC and cloud printing to enable staff to work anywhere, anytime securely, facilitating the adoption of a smaller workstation footprint and activity-based workspace
- Installed AHU-based electronic air cleaners and also increased number of plants for cleaner and healthier office environment



# KEPPEL CAPITAL

## Office Interior

## GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



Tenant/Owner

Keppel Capital

Facility Manager Company

Keppel Land

- Achieved EEI of 64 kWh/m<sup>2</sup>/yr, almost 10% better than Platinum
- Extensive use of LED lightings with timer control
- Use of occupancy sensors for all meeting rooms
- Extensive use of Energy Star office equipment
- Implemented Green procurement and purchasing policy with extensive use of sustainable products
- Promoted recycling by adopting recycling facilities and recycling points within the office
- Voluntary Green Lease
- Incorporated features to promote and support health and well-being of employees

# LENDLEASE RETAIL PTE. LTD.

## Office Interior

### GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



- Energy-efficient LED lightings
- Motion sensors, dimmers and timers for lighting control
- Energy-efficient office equipment
- Greenery inside office
- Low energy usage (EUI = 63 kWh/m2/year)
- Use of computer power management software
- SGLS-certified carpet

Tenant/Owner	Lendlease Retail Pte Ltd
Facility Manager Company	Lendlease Retail Pte Ltd
ESD Consultant	C&W Services (S) Pte Ltd

# MINISTRY OF THE ENVIRONMENT AND WATER RESOURCES

Office Interior



## GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



Tenant/Owner  
Renovation  
Consultant/Contractor  
ESD Consultant

Ministry of the Environment and Water Resources  
Aspacio Design Associates Pte Ltd  
Building System & Diagnostics Pte Ltd

- Lighting power density improvement of more than 60% compared to Singapore code
- Extensive lighting control using dimmers and motion sensors for all lighting within the project space
- Use of >90% IT Equipment with Energy Star Label
- Implementation of sustainable purchasing policy in order to “green” the procurement policy within the local office branches
- CO2 sensor for fresh air control for office space
- Flexi-hour / remote working policy for all employees

# OFFICE SUITES @ TWENTY ANSON

## Office Interior

### GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



Tenant/Owner

HSBC Institutional Trust Services (Singapore) Limited as Trustee of CapitaLand Commercial Trust-Twenty Anson

Renovation Consultant/  
Contractor  
Facility Manager  
Company

Tarkus Interiors Pte. Ltd.  
CapitaLand Commercial Management Pte. Ltd.

- Light Shelves as a green feature, designed with ceiling slope to allow natural daylight to penetrate through the building.
- Photocell Sensors are placed at the perimeter of the office to circuits in response to the amount of available natural daylight and control corresponding lighting
- Energy efficient LED lighting
- Use of water efficient fittings complying with Water Efficiency Labelling Scheme (WELS) excellent rating
- Extension use of recycled furniture, carpet and paint that are certified under the Singapore Green Building Council and Singapore Green Labelling Scheme
- Motion sensors to control the power consumption
- Dimmer in meeting rooms to control the lighting intensity

# RAFFLES QUAY ASSET MANAGEMENT PTE. LTD.

## Office Interior



### GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



Tenant/Owner	RQAM Pte. Ltd.
Facility Manger Company	RQAM Pte. Ltd.
Others	C&W Services (S) Pte Ltd

- Use of T5/LED lamps and tubes, individual task lights, timers and motion sensors for the entire office for more efficient power consumption
- Facilities for collection and storage of common recyclables and specialised waste stream such as shredded P&C papers, used light tubes and E-waste in place
- Installation of water leak detector sensor and module beneath the wash basin to control the solenoid valve system to cut off water supply in the presence of water leakage
- Committed in Green Advocacy such as the annual participation of Earth Hour and iLight Marina Bay Festival
- Use of tele-conferencing tools readily available at meeting rooms
- Advocate disposing waste materials at common recycling area, eliminating the use of individual trash bins
- Use of non-disposable cups widely used by staff to reduce waste generated by the use of disposable cups



# SWEE CHENG MANAGEMENT PTE LTD

## Office Interior



### GREEN MARK AWARD FOR OFFICE INTERIOR | PLATINUM



- Energy efficient lighting.
- Use of energy efficient office equipment.
- Greenery for staff recreation indoor and outdoor.
- Efficient air conditioning system
- IAQ management and Occupancy survey
- Provision of recycling bins at pantry and common printing areas. No individual bin is provided
- A Green Committee initiative to monitor green

Tenant/Owner	Swee Cheng Management Pte Ltd
Renovation Consultant/Contractor	OTH Construction and Engineering (S) Pte Ltd
Facility Manger Company	Swee Cheng Management Pte Ltd
M&E Consultant	WSP Pte Ltd
ESD Consultant	Afogreen Build Pte Ltd
Interior Consultant	APSA Pte Ltd

# ABBOTT LABORATORIES (SINGAPORE) PTE LTD

## Office Interior

## GREEN MARK AWARD FOR OFFICE INTERIOR | GOLD<sup>PLUS</sup>



- Extensive use of enlightened system for saving energy in the office and space usage evaluation
- Air Harvesting for better indoor air quality in meeting rooms
- Internal staircases between floors
- Use of jet diffusers for double volume central breakout area
- Smart locker system

Tenant/Owner	Abbott Laboratories (Singapore) Pte Ltd
Renovation Consultant/Contractor	M Moser Associates (S) Pte Ltd
Facility Manger Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Ong Hun Kok, Anthony
Others	M Moser Associates (S) Pte Ltd

# AIR LIQUIDE INDUSTRIAL SERVICES PTE LTD

## Office Interior

## GREEN MARK AWARD FOR OFFICE INTERIOR | GOLD<sup>PLUS</sup>



Tenant/Owner  
Renovation  
Consultant/Contractor  
Others

Air Liquide Industrial Services Pte Ltd  
Mi2 Pte Ltd  
ENCY Green Solutions LLP (Green  
Consultant)

- Low EEl: 39.78 kWh/m<sup>2</sup>/yr
- Project is in Green Mark Platinum building
- 33% savings from energy efficient building
- Poster for education/ raise awareness at strategic locations
- Adopt follow-me printing system

# CPG FACILITIES MANAGEMENT PTE LTD

## Office Interior

### GREEN MARK AWARD FOR OFFICE INTERIOR | GOLD<sup>PLUS</sup>



Tenant  
Renovation Consultant/  
Contractor

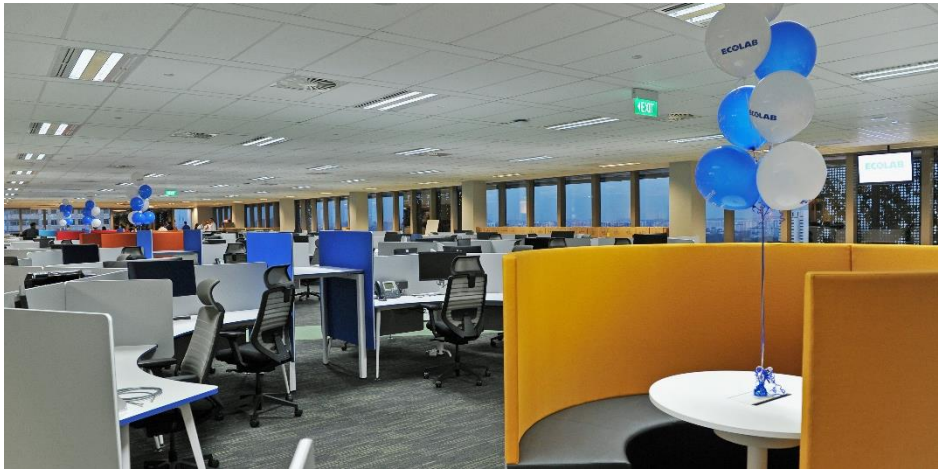
CPG Facilities Management Pte. Ltd.  
Wk Builders Pte. Ltd.

- Use of high C.O.P model VRV units
- Full LED lightings
- Water fixtures with Water Efficiency Labelling Scheme (WELS) rating 2 ticks or higher
- Office supplies (e.g. paper, stationery, etc.) certified green or with Eco-label.
- Zonal control of office lightings through motion sensor.

# ECOLAB PTE LTD

## Office Interior

### GREEN MARK AWARD FOR OFFICE INTERIOR | GOLD<sup>PLUS</sup>



Tenant/Owner

Tripartite Alliance Limited

Renovation  
Consultant/Contractor

PDM International Pte Ltd

Facility Manger Company

Chambers International

- All office lighting are using energy efficient T5 or LED lighting
- Greenery is available
- Office is selected to be in a Green Mark Platinum Building



# HKS ASIA PACIFIC DESIGN CONSULTING PTE. LTD.

## Office Interior



### GREEN MARK AWARD FOR OFFICE INTERIOR | GOLD<sup>PLUS</sup>



- Sub-meter for water and electrical internally
- All lighting are in LEDs
- Temperature of office is controlled at 24°C
- All equipment are energy star
- SGBC & SGBP are used widely
- Sub-meters for water and electric internally
- Conserved all existing surfaces if possible & recycle furniture from previous tenant

Tenant/Owner	HKS Asia Pacific Design Consulting Pte Ltd
Renovation	JP Renovators
Consultant/Contractor	
Facility Manger Company	HKS Asia Pacific Design Consulting Pte Ltd



# MASTERCARD ASIA / PACIFIC PTE LTD

## Office Interior

### GREEN MARK AWARD FOR OFFICE INTERIOR | GOLD<sup>PLUS</sup>



- 38.2% savings from baseline for artificial lighting
- Good indoor air quality achieved base on NEA guidelines
- Internal staircase that connects the office and reduces the reliance on lifts
- Extensive teleconferencing facilities to reduce travel
- Extensive use of sustainable materials certified by SGLS/SGBC

Tenant/Owner	Mastercard Asia / Pacific Pte Ltd
Renovation Consultant/Contractor	Facility Link Pte Ltd
Facility Manger Company	Cushman & Wakefield (S) Pte Ltd
M&E Cosnultant	J Roger Preston (S) Pte Ltd
Others	ZEB-Technology Pte Ltd (ESD Consultant)

# ONE GEORGE STREET TENANT SERVICE CENTRE

## Office Interior

## GREEN MARK AWARD FOR OFFICE INTERIOR | GOLD<sup>Plus</sup>



Tenant/Owner  
Renovation Consultant/  
Contractor  
Facility Manager  
Company

One George Street LLP  
B K Civil & Construction Pte. Ltd.  
CapitaLand Group

- Use of energy efficient LED light fittings for the entire office space, with manual switches for zonal controls to minimise energy wastage
- Open office layout with minimal partitions to reduce the lighting quantity required
- Use of motion sensors for areas with infrequent usage and dimmers to control the lighting intensity
- More than 90% of the office equipment are Energy Star certified
- Use of Singapore Green Building Council and Singapore Green Labelling Scheme certified carpet, ceiling boards and paint for the office during fit-out
- Indoor plants are incorporated to create a conducive work environment and improve the indoor air quality
- Electrical and water sub-meters are installed to enable continuous monitoring of usage and allow intervention should there be abnormalities

## GREEN MARK FOR OFFICE INTERIOR | GOLD

### PROJECT NAME

Anadarko Singapore Pte Ltd

CPF Provident Fund Board Maxwell  
Service Centre

IDA @ Sandcrawler

Nomura Singapore Limited

S&P Global Asian Holdings Pte Ltd

Simmons & Simmons JWS Pte Ltd

SkillsFuture Singapore Agency

Strategy Group, Prime Minister's  
Office

### CLIENT/DEVELOPER/BUILDING OWNER

Anadarko Singapore Pte Ltd

Central Provident Fund (CPF) Service Centre

INFOCOMM DEVELOPMENT AUTHORITY  
OF SINGAPORE

Nomura Singapore Limited

S&P Global Asian Holdings Pte Ltd

Simmons & Simmons Asia LLP

SkillsFuture Singapore Agency

Prime Minister's Office - Strategy Group

## GREEN MARK FOR OFFICE INTERIOR | GOLD

### PROJECT NAME

Tripartite Alliance Limited

Wilkie Edge

### CLIENT/DEVELOPER/BUILDING OWNER

Tripartite Alliance Limited

HSBC Institutional Trust Services  
(Singapore) Ltd as Trustee of CapitaLand  
Commercial Trust

## GREEN MARK FOR OFFICE INTERIOR | CERTIFIED

### PROJECT NAME

AEW Asia Pte Ltd

Air China Limited (Singapore Branch)

China International Capital  
Corporation (Singapore) Pte. Limited

City Serviced Offices

CRH Asia Pacific Pte. Ltd.

Intralinks Asia Pacific Pte Ltd

IPC Information Systems (S) Pte Ltd

Newstead Technologies Pte Ltd

### CLIENT/DEVELOPER/BUILDING OWNER

AEW Asia Pte Ltd

Air China Limited (Singapore Branch)

China International Capital Corporation  
(Singapore) Pte. Limited

City Serviced Offices

CRH Asia Pacific Pte Ltd

IINO SINGAPORE PTE LTD and IINO  
SHIPPING ASIA PTE LTD

IPC Information Systems (S) Pte Ltd

Newstead Technologies Pte Ltd



## GREEN MARK FOR OFFICE INTERIOR | CERTIFIED

### PROJECT NAME

Republic Plaza City Club (Singapore)  
Pte Ltd

Twentieth Century Fox International

### CLIENT/DEVELOPER/BUILDING OWNER

Republic Plaza City Club (Singapore) Pte  
Ltd

Twentieth Century Fox International





# BCA GREEN MARK FOR SUPERMARKETS



The **BCA Green Mark for Supermarkets**, launched in 2012, is an initiative by BCA to promote and recognise environmentally friendly as well as sustainable practices and features in supermarket outlets. It aims to encourage supermarket operators to adopt energy efficient design, equipment and green practices at their outlets. Such measures can help supermarket operators reduce their energy consumption and utilities costs.

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

The scheme assesses supermarkets based on the following five criteria:

- i. Energy Efficiency
- ii. Water Efficiency
- iii. Environmental Protection
- iv. Indoor Environmental Quality
- v. Other Green Features

# FAIRPRICE SUPERMARKET AT SINGPOST CENTRE

Supermarkets

## GREEN MARK AWARD FOR SUPERMARKETS | PLATINUM



Owner	NTUC FairPrice Co-operative Ltd
M&E Consultant	HY M&E Consultancy Services Pte Ltd
M&E Contractor	Victor Engineering & Trading Pte Ltd
Others	Carrier Singapore (Pte) Limited (Refrigeration Contractor)

- Centrally-controlled energy-efficient refrigeration system with display showcases fitted with doors, electronic expansion valves, anti-sweat control, & electronically commutated (EC) fans motor for the condensers & evaporators
- 100% LED lighting, inclusive of refrigerated display showcases, with zonal control & occupancy sensors to conserve energy
- Energy Management System with remote monitoring capability to track energy consumption
- Sinks & basins are fitted with water-efficient taps. Private water meters are installed to track consumption of various usage & for leak detection
- Collection of cardboards, paper, plastic & metal cans for recycling. Contribution to Food Donations
- Numerous sustainable SGBC Green Building products used for fit-out e.g. laminates, low VOC paints, plaster board, etc
- Use of technology to reduce waste & resources - Electronic shelf label, SCAN2GO Personal Shopper System, fully Self-checkout, in-store navigation app, self-serve collection from lockers

## GREEN MARK FOR SUPERMARKETS | GOLD

### PROJECT NAME

Cold Storage The Centrepont

Cold Storage Compass One

Cold Storage West Coast Plaza

FairPrice Supermarket at Orchard  
Grand Court

### CLIENT/DEVELOPER/BUILDING OWNER

Cold Storage Singapore (1983) Pte Ltd

Cold Storage Singapore (1983) Pte Ltd

Cold Storage Singapore (1983) Pte Ltd

NTUC FairPrice Co-operative Limited



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## GREEN MARK FOR SUPERMARKETS | CERTIFIED

### PROJECT NAME

Cold Storage Anchorpoint

### CLIENT/DEVELOPER/BUILDING OWNER

Cold Storage Singapore (1983) Pte Ltd



# BCA GREEN MARK FOR RETAIL



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

The retail sector is one of the highest consumers of energy per floor area. Data collected from retail buildings assessed under the Green Mark for Buildings showed that approximately 50% of the total building energy is consumed by the retail tenants.

The tenant loads within such buildings also lead to high air-conditioning load within the retail mall.

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

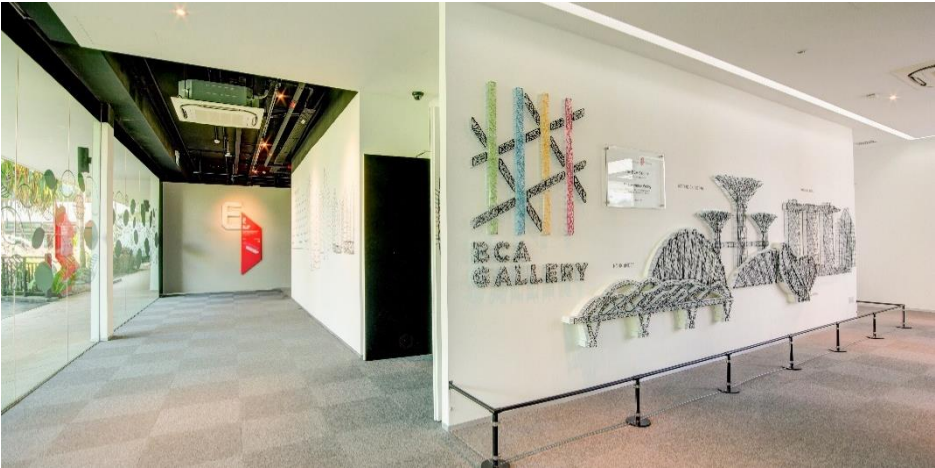
The scheme assesses retail tenants under the following five criteria:

- i. Energy Efficiency
- ii. Water Efficiency
- iii. Sustainable Awareness and Operation
- iv. Indoor Environmental Quality
- v. Other Green Features

# BCA GALLERY

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Tenant/Owner	Building and Construction Authority
Renovation Consultant/Contractor	Pico Art International Pte Ltd
Facility Manger Company	Building and Construction Authority
M&E Cosultant	Bescon Consulting Engineers Pte
Managing Agent/Maintenance Contractor	Pico Art International Pte Ltd
Others	Building System & Diagnostics Pte Ltd

- Usage of energy efficient lighting which contributes up to 50% energy savings
- Provision of piezoelectric mats for educational purposes
- Provision of green wall to facilitate nature connectivity and allow visitors to learn about its benefits
- Extensive usage of environmentally friendly materials during construction.
- Provision of smart controls for air-conditioning, lighting and IT equipment
- All marketing outreach to schools and organizstions are conducted electronically without any form of waste contribution
- Provision of motion sensors for air-conditioning units and lighting



# DBS BISHAN BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Tarkus Interiors Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants
M&E Consultant	Bescon Consulting Engineers Pte
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) Design Base Pte Ltd (Interior Design) Wah Loon Enigneering Pte Ltd (MEP Contractor)

- High-efficiency lighting with 61% improvement over baseline lighting power budget
- 93% of office equipment used (by rated power) in the branch is Energy Star certified product
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Taken tenancy within a base building with Green Mark Platinum certification
- Provision of potted plants within the retail banking hall
- Default setting of 'no dispensing of paper receipt' option for all ATMs
- SMS-Q system, which greatly reduces the use of paper for queue tickets

# DBS HARBOURFRONT BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Kingsmen Projects Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
ESD Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Others	PDM International (Interior Design)  DLE M&E Pte Ltd (MEP Contractor)

- High-efficiency lighting with 60% improvement over baseline lighting power budget
- 94% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Taken tenancy within a base building with Green Mark Platinum certification
- Provision of potted plants within the retail banking hall
- Use of energy efficient zip tap water dispenser for staff

# DBS PLAZA SINGAPURA BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Tarkus Interiors Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Bescon Consulting Engineers Pte
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) DE Exclusive Interior Group Pte Ltd (Interior Design) DLE M&E Pte Ltd (MEP Contractor)

- High-efficiency lighting with 69% improvement over baseline lighting power budget
- 91% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Video Teller Machines (first of its kind in Singapore), which provide the option of virtual teller assistance via live-video streaming.
- Friendly human-shaped robot as part of an innovative programme to explore new technologies to enhance banking experience
- Biophilic design through provision of wall paper with motifs of nature at the back-of-house office

# SINGAPORE SUSTAINABILITY ACADEMY

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Tenant/Owner	City Developments Limited
Renovation Consultant/Contractor	Wup Hup (Private) Ltd
M&E Cosnultant	Rankine & Hill (Singaproe) Pte Ltd
Others	Ong & Ong Pte Ltd (Architect)

- Energy efficient VRV air-conditioning system with at least 0.78 kW/RT
- Extensive use of LED lightings which helps to achieve 43% savings
- Zoning of lighting and air conditioning to serve different usage
- Provision of CO<sub>2</sub> sensors to improve indoor air quality; Use of motion sensors for classrooms
- Energy dashboards provided to raise awareness of energy consumption for the building users
- 100% replacement of energy consumption with solar PV panels, achieving zero energy building
- Extensive use of environmentally-friendly renovation materials and products



# DBS BUKIT TIMAH BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 60% improvement over baseline lighting power budget
- 98% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall

Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Kingsmen Projects Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) PDM International (Interior Design) DLE M&E Pte Ltd (MEP Contractor)

# DBS CHOACHU KANG BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 68% improvement over baseline lighting power budget
- 91% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall

Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Kingsmen Design Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Chee Choon & Associates Pte Ltd
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) Steven Leach + Associates Pte Ltd (Interior Design) Golden Air-Conditioning Engineering Co. Pte Ltd (ACMV Contractor) Hi-Light Electrical Pte Ltd (Electrical Contractor)



# DBS CLEMENTI BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Space Logic Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) Design Base Pte Ltd (Interior Design) Primeflux Engineering Pte Ltd (MEP Contractor)

- High-efficiency lighting with 59% improvement over baseline lighting power budget
- 83% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall
- SMS-Q system, which greatly reduces the use of paper for queue tickets
- Use of energy efficient zip tap water dispenser for staff

# DBS JURONG POINT BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 58% improvement over baseline lighting power budget
- 88% of office equipment used (by rated power) in the branch is Energy Star certified product
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Taken tenancy within a base building with Green Mark Gold certification
- Provision of potted plants within the retail banking hall

Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Mastron Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) Design Base Pte Ltd (Interior Design) M-Tech Air-con & Security Engineering Pte Ltd (ACMV Contractor)

# DBS PARKWAY PARADE BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner

DBS Bank Ltd

Renovation Consultant/  
Contractor

Benpak Waterwise Singapore Pte Ltd

Facility Manager Company

Jones Lang LaSalle Property Consultants  
Pte Ltd

M&E Consultant

J. Roger Preston (S) Pte Ltd

- High-efficiency lighting with 65% improvement over baseline lighting power budget
- 84% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Taken tenancy within a base building with Green Mark Platinum certification

# DBS SOUTH BRIDGE BRANCH

Retail



## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Tarkus Interiors Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Bescon Consulting Engineers Pte
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) Design Base Pte Ltd (Interior Design) DLE M&E Pte Ltd (MEP Contractor)

- High-efficiency lighting with 81% improvement over baseline lighting power
- budget
- 91% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall



# DBS SUTD BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner

DBS Bank Ltd

Renovation Consultant/  
Contractor

SPACElogic Pte Ltd

Facility Manager Company

Jones Lang LaSalle Property Consultants  
Pte Ltd

M&E Consultant

Alpha Consulting Engineers Pte Ltd

- High-efficiency lighting with 54% improvement over baseline lighting power budget
- 44% of office equipment used (by rated power) in the branch is Energy Star certified product
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Tapping from high efficiency chiller plant with average operating efficiency of 0.585 kW/TR
- Taken tenancy within a base building with Green Mark Platinum certification

# DBS THOMSON BRANCH AND DBS TREASURES AT THOMSON

Retail



## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 68% improvement over baseline lighting power budget
- 89% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall

Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Tarkus Interiors Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Bescon Consulting Engineers Pte
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultants) Design Base Pte Ltd (Interior Design) Wah Loon Engineering Pte Ltd (MEP Contractor)



# DBS TOA PAYOH BRANCH

Retail



## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 73% improvement over baseline lighting power budget
- 91% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall

Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Kingsmen Projects Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultants) PDM International (Interior Design) DLE M&E Pte Ltd (MEP Contractor)

# DBS TOWNER ROAD BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	SPACElogic Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Bescon Consulting Engineers Pte
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultants) Design Base Pte Ltd (Interior Design) DLE M&E Pte Ltd (MEP Contractor)

- High-efficiency lighting with 64% improvement over baseline lighting power budget
- 93% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall

# DBS TREASURES AT BUKIT TIMAH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 64% improvement over baseline lighting power budget
- 94% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall

Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Kingsmen Projects Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultants) PDM International (Interior Design) DLE M&E Pte Ltd (MEP Contractor)

# DBS TREASURES AT Ngee Ann City Branch

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



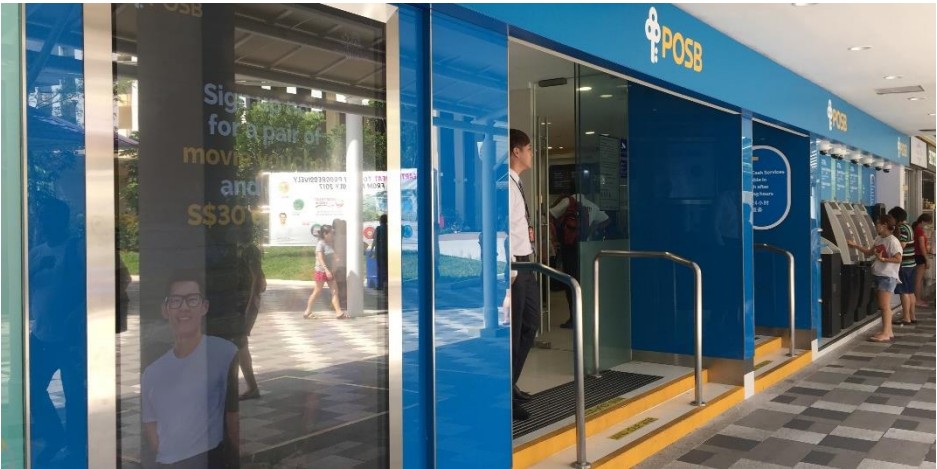
Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	SPACElogic Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd

- High-efficiency lighting with 66% improvement over baseline lighting power budget
- 74% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Taken tenancy within a base building with Green Mark Platinum certification

# POSB BEDOK CENTRAL BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 71% improvement over baseline lighting power budget
- 90% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall

Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Milan Decoration & Construction Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Alpha Consulting Engineers Pte Ltd
ESD Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Others	3iStudio Consultants Pte Ltd (Interior Design) Mastron Pte Ltd (Electrical Contractor)



# POSB BUKIT BATOK CENTRAL BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Bornwin Engineering Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Leong Chong Yew (EMA Licensed Electrical Worker)
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) Kingsmen Design Pte Ltd (Interior Design)

- High-efficiency lighting with 62% improvement over baseline lighting power budget
- 88% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- SMS-Q system, which greatly reduces the use of paper for queue tickets



# POSB BUKIT PANJANG BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Sunray Woodcraft Construction Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Choone Seong Wai (PE1115)
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) Dangarch Consultants(Interior Design) General Thermal Engineering Co. (ACMV Contractor) Li Ming Electrical Engineering (Electrical Contractor)

- High-efficiency lighting with 68% improvement over baseline lighting power budget
- 91% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- SMS-Q system, which greatly reduces the use of paper for queue tickets

# POSB BUONA VISTA BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner

DBS Bank Ltd

Renovation Consultant/  
Contractor

Yongway Contract & Construction Pte Ltd

Facility Manager Company

Jones Lang LaSalle Property Consultants  
Pte Ltd

M&E Consultant

Alpha Consulting Engineers Pte Ltd

ESD Consultant

Jones Lang LaSalle Property Consultants  
Pte Ltd

Others

3iStudio Consultants Pte Ltd (Interior  
Design)

Mastron Pte Ltd (Electrical Contractor)

- High-efficiency lighting with 56% improvement over baseline lighting power budget
- 92% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of potted plants within the retail banking hall

# POSB HEARTLAND MALL BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 64% improvement over baseline lighting power budget
- 93% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- SMS-Q system, which greatly reduces the use of paper for queue tickets

Tenant/Owner

DBS Bank Ltd

Renovation Consultant/  
Contractor

Yongway Contract & Construction Pte Ltd

Facility Manager Company

Jones Lang LaSalle Property Consultants  
Pte Ltd

ESD Consultant

Jones Lang LaSalle Property Consultants Pte  
Ltd

Others

Yongchen M&E Pte Ltd (MEP Contractor)

# POSB JURONG WEST BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner

DBS Bank Ltd

Renovation Consultant/  
Contractor

Sunray Woodcraft Construction Pte Ltd

Facility Manager Company

Jones Lang LaSalle Property Consultants  
Pte Ltd

Others

Jones Lang LaSalle Property Consultants Pte  
Ltd (ESD Consultant)

Dangarch Consultants (Interior Design)

Primeflux Engineering Pte Ltd (MEP  
Contractor)

- High-efficiency lighting with 61% improvement over baseline lighting power budget
- 99% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Sms-Q system, which greatly reduces the use of paper for queue tickets



# POSB SERANGOON CENTRAL BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner

DBS Bank Ltd

Renovation Consultant/  
Contractor

Kingsmen Projects Pte Ltd

Facility Manager Company

Jones Lang LaSalle Property Consultants  
Pte Ltd

Others

Jones Lang LaSalle Property Consultants Pte  
Ltd (ESD Consultant)  
Hi-Light Electrical Pte Ltd (Electrical  
Contractor)

Leong Chong Yew (LEW)

- High-efficiency lighting with 57% improvement over baseline lighting power budget
- 90% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- SMS-Q system, which greatly reduces the use of paper for queue tickets

# POSB SQUARE 2 BRANCH

Retail



## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Sunray Woodcraft Construction Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	PrimeFlux Pte Ltd
Others	Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant) Space.Nouveau Pte Ltd (Interior Design)

- High-efficiency lighting with 61% improvement over baseline lighting power budget
- 99% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Sms-Q system, which greatly reduces the use of paper for queue tickets



# POSB TIONG BAHRU BRANCH

Retail



## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Mastron Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd

- High-efficiency lighting with 60% improvement over baseline lighting power budget
- 68% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Taken tenancy within a base building with Green Mark Platinum certification

# POSB TOA PAYOH CENTRAL BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner

DBS Bank Ltd

Facility Manager Company

Jones Lang LaSalle Property Consultants Pte Ltd

Others

Jones Lang LaSalle Property Consultants Pte Ltd (ESD Consultant)

- High-efficiency lighting with 79% improvement over baseline lighting power budget
- 86% of office equipment used (by rated power) in the branch is Energy Star certified product
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Default setting of 'no dispensing of paper receipt' option for all ATMs
- SMS-Q system, which greatly reduces the use of paper for queue tickets
- Provision of daylighting, which reduces energy use for artificial lighting and optimises health and wellbeing through modulation of the human circadian cycle
- Provision of potted plants within the retail banking hall

# POSB WATERWAY POINT BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



- High-efficiency lighting with 62% improvement over baseline lighting power budget
- 85% of office equipment used (by rated power) in the branch is Energy Star certified product
- Install 3-Tick WELS water fittings
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Taken tenancy within a base building with Green Mark Gold Plus certification

Tenant/Owner	DBS Bank Ltd
Renovation Consultant/ Contractor	Mastron Pte Ltd
Facility Manager Company	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd

# PRO GOLF SG PTE LTD

Retail

## GREEN MARK AWARD FOR RETAIL | GOLD<sup>PLUS</sup>



Tenant/Owner	Pro Golf SG Pte Ltd
Renovation	D'concepto Pte Ltd
Consultant/Contractor	SCA Design Pte Ltd
Others	Kaer Pte Ltd

- LED luminaire fittings with Lighting Power Budget of 10.83 W/m<sup>2</sup>
- Extensive usage of environmentally-friendly materials and products including use of low-VOC paints and adhesives for renovation works
- PUB WELS Very Good rating water efficient fittings
- Motion sensors for low usage areas such as store room and changing room

## GREEN MARK FOR RETAIL | GOLD

### PROJECT NAME

Cotton On

Cotton On Kids

DBS Ang Mo Kio (Basement 1)  
Branch

DBS Ang Mo Kio Ave 3 and DBS  
Treasures at Ang Mo Kio

DBS Causeway Point Service Centre

DBS Holland V Branch

DBS Raffles Place Branch

DBS Scape Branch

### CLIENT/DEVELOPER/BUILDING OWNER

Cotton On Singapore Pte Ltd

Cotton On Singapore Pte Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

## GREEN MARK FOR RETAIL | GOLD

### PROJECT NAME

DBS Tampines One Branch

Perfect Pitch

POSB Bukit Batok West Branch

POSB Compass One Branch

POSB Eastpoint Branch

POSB Hougang Central Branch

POSB Marine Parade Branch

POSB Newton Branch

### CLIENT/DEVELOPER/BUILDING OWNER

DBS Bank Ltd

Perfect Pitch

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd



## GREEN MARK FOR RETAIL | GOLD

### PROJECT NAME

POSB Rivervale Plaza Branch

POSB Tampines East Branch

POSB Toa Payoh North Branch

POSB Yew Tee Branch

POSB Yishun Central Branch

POSB Yishun North Branch

POSB Yishun West Branch

Rubi Shoes

### CLIENT/DEVELOPER/BUILDING OWNER

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

Cotton On Singapore Pte Ltd



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## GREEN MARK FOR RETAIL | GOLD

### PROJECT NAME

The Singapore Mint

### CLIENT/DEVELOPER/BUILDING OWNER

The Singapore Mint



## GREEN MARK FOR RETAIL | CERTIFIED

### PROJECT NAME

ACME Taekwondo

Best Denki (S) Pte Ltd

CMA Mental Arithmetic Centre

DBS Treasures Raffles Place Branch

DBS Woodlands Civic Centre Branch

Farm Fresh Foods

Fleur Scalp Care

Hong Leong Finance Ltd

### CLIENT/DEVELOPER/BUILDING OWNER

ACME APTOS SPORTS PTE LTD

BEST Denki (Singapore) Pte Ltd

CMA Mental Arithmetic Centre (City Square Mall)

DBS Bank Ltd

DBS Bank Ltd

Farm Fresh Foods Pte Ltd

FLEUR SCALP CARE

Hong Leong Finance Limited

## GREEN MARK FOR RETAIL | CERTIFIED

### PROJECT NAME

Levi's

NAV Hub

Owndays

POSB Account Services Centre  
KBRC Branch

POSB Bedok North Branch

POSB Boon Lay CC Branch

POSB Centrepont Branch

POSB Nee Soon South CC Branch

### CLIENT/DEVELOPER/BUILDING OWNER

Levi's

NAV Hub

OWNDAYS

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

DBS Bank Ltd

## GREEN MARK FOR RETAIL | CERTIFIED

### PROJECT NAME

Q & M Dental Centre Pte Ltd / Q & M  
Medical & Aesthetic Clinic (Farrer  
Park) Pte Ltd

Spring Rolls

Tang Shan TCM

The Roof Top

Timezone

V. Hive

### CLIENT/DEVELOPER/BUILDING OWNER

Q & M Dental Centre Pte Ltd

Spring Rolls (Rochester) Pte Ltd

TANG SHAN TCM

Seven Stars Production Pte Ltd

Timezone

V.Hive Pte Ltd



# BCA GREEN MARK FOR DATA CENTRES



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

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

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

The scheme assesses data centres on the following criteria:

- i. Energy Efficiency
- ii. Water Efficiency
- iii. Sustainable Construction/ Operation and Management
- iv. Indoor Environmental Quality
- v. Other Green Features



# DODID DATA CENTER

New Data Centres



## BCA-IMDA GREEN MARK FOR DATA CENTRES | PLATINUM



Tenant/Owner	Dodid Pte. Ltd
Architect	Scott Brownrigg
M&E Engineer	DSCO Group Pte Ltd
Structural Engineer	Beca Carter Hollings & Ferner (S.E.Asia) Pte. Ltd
Quantity Surveyor	WT Partnership (S) Pte. Ltd
Main Contractor	Magnificent Seven Corporation Pte. Ltd

- Design PUE of 1.41
- Chiller plant system with efficiency of 0.56kW/RT
- Permanent measurement and verification instrumentation for the monitoring of chilled water plant efficiency
- Modularity design of M&E services to minimise system loss
- Achieved 7 COC and WELS excellent fittings
- Committed to attain SS564 certification
- High efficiency UPS, transformer and CRAH

# ONE DC @ THE TREASURY

New Data Centres



## BCA-IMDA GREEN MARK FOR DATA CENTRES | PLATINUM



- Design PUE of 1.390 at 100% IT load
- Energy efficient water-cooled chilled water plant with an overall chiller plant efficiency of 0.633kW/RT
- Fully fitted with energy efficient In-row air conditioning system with an overall efficiency of 0.14 W/CMH
- Data Centre is fitted with energy efficient LED lightings. Occupancy sensors are installed to control the data centre halls when they are not in use.
- Management commitment for SS564 certification.

Tenant/Owner	Ministry of Finance
Managing Agent	Ministry of Finance
Main Contractor/ Maintenance Contractor	Pro-Matrix Pte Ltd
ESD / Green Mark Consultant	Building System & Diagnostics Pte Ltd

# SECURE AND GREEN DC

## New Data Centres

### BCA-IMDA GREEN MARK FOR DATA CENTRES | PLATINUM



Tenant/Owner	ST Electronics (Data Centre Solutions) Pte Ltd
Facility Manager Company	ST Electronics (Data Centre Solutions) Pte Ltd
M&E Consultant	DSCO Group Pte Ltd
Managing Agent/Maintenance Contractor	ST Electronics (Data Centre Solutions) Pte Ltd

- Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing
- Chiller plant system with efficiency of 0.565kW/RT
- Passive Energy Enhancement Rack
- Design PUE < 1.5
- DCIM for Energy Management
- Management Commitment for SS564 certification
- Flywheel UPS

# STATE COURTS TOWERS NETWORK ROOM

New Data Centre

## BCA-IMDA GREEN MARK FOR DATA CENTRES | PLATINUM



Tenant/Owner

State Courts

M&E Engineer

CPG Consultants Pte Ltd

- Provision of Scalable Modular High Efficiency UPS System
- Provision of Blanking Panels for better thermal efficiency
- Use of software virtualization for IT equipment to minimise energy utilisation
- Efficient CRAC system with variable speed control for better part load performance
- Use of Energy Efficient LED Lightings with motion sensor controls
- Use of environmental friendly fire suppressant NOVEC 1230
- Efficient chiller plant design which performs at 0.604 kW/RT

# KEPPEL DC SINGAPORE 3 LLP

Existing Data Centres



## BCA-IMDA GREEN MARK FOR DATA CENTRES | PLATINUM



Tenant/Owner	KEPPEL DC SINGAPORE 3 LLP
Facility Management	Keppel DCS3 Services Pte Ltd
ESD/Green Consultant	Building System & Diagnostics Pte Ltd

- Energy Efficient Data centre with an operating PUE of 1.59
- Energy efficient chiller plant system with an operating efficiency of 0.608 kW/RT
- Motion sensor and zone control for data centre suites
- Flywheel-powered DRUPS for Data Centre
- Extensive energy and environmental certification (ISO 50001, ISO 9001 and SS564)
- Water efficient building (SS557 Certification and PUB WEB certification)





# BCA GREEN MARK FOR LABORATORIES



The new **BCA Green Mark for Laboratories** recognises the sustainable efforts and commitment of laboratory owners and operators to reduce the environmental impact of laboratory operations.

Laboratories are characterised by having high receptacle load due to the specialised need, the need for fresh air dilution to meet safety requirements, and long operating hours. These result in laboratories being highly energy-intensive, typically consuming about 3 to 5 times more energy than a typical office space.

The BCA Green Mark for Laboratories complement the Green Mark for Buildings scheme by encouraging laboratory operators to adopt best practices, optimise the operations of laboratory equipment and systems, while addressing the safety requirements for laboratories.

The scheme assesses laboratories under the following five criteria:

- i. Sustainable Design
- ii. Laboratory Energy Performance
- iii. Resource Stewardship
- iv. Smart and Healthy Laboratory
- v. Advanced Green Efforts





## GREEN MARK FOR LABORATORIES | GOLD

### PROJECT NAME

Singapore Immunology Network  
(SIgN)

### CLIENT/DEVELOPER/BUILDING OWNER

Agency for Science, Technology and  
Research A-Star - Singapore Immunology  
Network



# BCA GREEN MARK FOR RESTAURANTS



As restaurants utilise high levels of energy and water resources on a daily basis, this provided a good opportunity to introduce the Green Mark for Restaurants in 2011, specially tailored for restaurants to promote corporate responsibility as well as to recognise environmentally friendly and sustainable practices in restaurants, taking sustainability beyond commercial and residential infrastructure.

Restaurants are evaluated under the following criteria:

- i. Energy Efficiency
- ii. Water Efficiency
- iii. Sustainable Management and Operation
- iv. Indoor Environment Quality
- v. Other Green Features

## GREEN MARK FOR RESTAURANTS | GOLD

### PROJECT NAME

McDonald's Clifford Centre (CLIF)

McDonald's Gardens by the Bay  
(GBTB)

McDonald's Metropolis (MPS)

McDonald's Regal (REGAL)

McDonald's Resorts World Sentosa  
(RWS)

### CLIENT/DEVELOPER/BUILDING OWNER

McDonald's Restaurants Pte Ltd

McDonald's Restaurants Pte Ltd

McDonald's Restaurants Pte Ltd

McDonald's Restaurants Pte Ltd

McDonald's Restaurants Pte Ltd

## GREEN MARK FOR RESTAURANTS | CERTIFIED

### PROJECT NAME

Astons Specialities

Chic-A-Boo Fried Chicken

Just Dough

Lai Lai Taiwan Casual Dining

MANLE Hotpot

McDonald's Compass One (CP1)

McDonald's Fairprice Hub (FH)

McDonald's Sun Plaza (SUN2)

### CLIENT/DEVELOPER/BUILDING OWNER

Astons Specialities

Chic-A-Boo Fried Chicken

Just Dough

Lai Lai Family Restaurant Pte Ltd

MANLE Hotpot

McDonald's Restaurants Pte Ltd

McDonald's Restaurants Pte Ltd

McDonald's Restaurants Pte Ltd

## GREEN MARK FOR RESTAURANTS | CERTIFIED

### PROJECT NAME

McDonald's V-Hotel (VH)

Mizu Cafe

On The Grill

Starbucks

Streets Hong Kong Cafe

### CLIENT/DEVELOPER/BUILDING OWNER

McDonald's Restaurants Pte Ltd

Mizu Cafe

On the Grill

Starbucks Coffee Singapore Pte Ltd

Streets Hong Kong Cafe



# BCA GREEN MARK BEYOND BUILDINGS



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

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

- i. BCA Green Mark Award for Districts
- ii. BCA-NParks Green Mark Award for New / Existing Parks





# BCA GREEN MARK FOR PARKS



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

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

- i. Material Resources
- ii. Water Efficiency
- iii. Energy Efficiency
- iv. Greenery and Urban Ecology
- v. Design for Ease of Maintenance and Accessibility
- vi. Parks Development and Construction Management
- vii. Other Green Initiatives

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

# WINDSOR NATURE PARK

## New Parks

## GREEN MARK AWARD FOR PARKS | PLATINUM



Owner	National Parks Board
Park Manager	National Parks Board
Architect	Zarch Collaboratives Pte Ltd
Structural Engineer	Millenniums Consultants Pte Ltd
M&E Engineer	HY M&E Consultancy Services Pte Ltd
Quantity Surveyor	QS Consultants Pte Ltd
Contractor	Landscape Engineering Pte Ltd
Landscape Consultant	Land Design One Pte Ltd
Environmental Engineer	Enviro Pro Green Innovations Pte Ltd

- Green Roof at Visitor Pavilion
- Solar Panel at Workspace Office
- Naturally Ventilated, Lit Toilet
- Site Planning and Construction protection around Mature Trees
- Usage of Naturally occurring native plant species for the new development
- Minimal Disturbance to Nature Reserve during construction; usage of lightweight materials for boardwalks; no usage of machineries within the Nature Reserve
- Wetlands at entrance node; enhancing existing hydrology (catchment area for storm-water runoff) and increasing biodiversity from existing stream



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## GREEN MARK FOR PARKS | GOLD

### PROJECT NAME

Keat Hong Garden

### CLIENT/DEVELOPER/BUILDING OWNER

Housing & Development Board



# BCA GREEN MARK OVERSEAS

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

## The Success Of Green Mark Overseas

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

More developers are using Green Mark to provide meaningful differentiation of their buildings.

Benefits of a Green Mark building include:

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



# HOLIDAY INN EXPRESS HONG KONG SOHO

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | PLATINUM



Client/Developer	Million Wealth Enterprises Limited
Architect	Chau Ku & Leung Architects & Engineers Limited
M&E Engineer	REC Engineering Company Limited
Structural Engineer	T.K. Tsui & Associates Limited
Main Contractor	Yau Lee Construction Co. Limited
Landscape Consultant	Plantwerkz Pte Ltd
ESD Consultant	Surbana Jurong Consultants Pte Ltd

- Estimated energy savings: 768,100 kWh/yr; ETTV: 39.55W/m<sup>2</sup>
- Energy optimisation solution by using full optimisation control algorithms to reduce the energy consumption of HVAC Plants
- High COP water cooled variable speed chiller
- Intelligent fan coil unit
- Integrated hot water, heat pump and solar panel system
- Building energy monitoring analysis system
- Use of environmental friendly products

# SOMERSET HO CHI MINH CITY

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD<sup>PLUS</sup>



Building Owner

CapitaLand Group

ESD Consultant

W2square Consultancy Pte Ltd

- Efficient air-conditioning system
- Use of water efficient fittings
- Use of energy efficient features
- Use environmental friendly products
- Green corner for interaction and promoting recycling with the residents



# ARAGREENS RESIDENCES

## New Residential Building

### GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD<sup>PLUS</sup>



Client/Developer	HSB Development Sdn Bhd (HSB)
Project Manager	Asia Pacific Engineering Consortium Sdn. Bhd (APEC)
Design Architect	WOW D.lab Pte Ltd (WOW)
Submitting Architect	Redd Design Office Sdn. Bhd. (RDO)
M&E Consultant	Li-Zainal Sdn Bhd (LZ)
C&S Consultant	Asia Pacific Engineering Consortium Sdn. Bhd (APEC)
Main Contractor	Putra Perdana Construction Sdn Bhd
Quantity Surveyor	Baharuddin Ali & Low Sdn Bhd (BAL)
Landscape Architect	Wein Designs Sdn Bhd (WD)
ESD Consultant	Building System & Diagnostics Pte Ltd (BSD)

- Use of 60 kWp Photovoltaic panels in development
- Use of energy-efficient LED lighting system
- Use certified green building products.
- Rain water harvesting for landscape
- Provision of EV charging stations per block

# KEN RIMBA CONDOMINIUM 1

New Residential Building



## GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD<sup>PLUS</sup>



- Building Layout utilises prevailing wind conditions to achieve cross ventilation.
- Provision of Covered link way to nearest train station
- Relocation and replanting of Existing Trees
- Provision of Herb and vegetable garden to promote social and community interaction
- Provision of energy efficient lighting and lifts

Client/Developer	KEN Rimba Sdn Bhd
Architect	K.H. Tan Architects
M&E Engineer	LMC Consult Sdn Bhd
Structural Engineer	SNA Consult Sdn Bhd
Landscape Consultant	Landarc Associates Sdn Bhd
Main Contractor	KEN Grouting Sdn Bhd

# AMARI JOHOR BAHRU

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD



- Estimated energy savings: 1,871,330.64kWh/yr; Estimated water savings: 2,252m<sup>3</sup>, ETTV: 44.37W/m<sup>2</sup>
- ETTV of 44.37 W/m<sup>2</sup> with window-to-wall ratio of 0.29
- Chiller plant system with efficiency of 0.65kW/ton
- Extensive usage of LED lighting

Client/Developer	Exquisite Mode Sdn Bhd
Project Manager	United Malayan Land Berhad
Architect	Akibina Chartered Akitek
M&E Engineer	Meinhardt (Malaysia) Sdn Bhd
Structural Engineer	Asia Pacific Engineering Consortium Sdn Bhd
Quantity Surveyor	Baharuddin Ali & Low Sdn Bhd
Main Contractor	Umland Builders Sdn Bhd
Landscape Consultant	Veritas Landscape Sdn Bhd
ESD Consultant	G Energy (M) Sdn Bhd
Lighting Consultant	The Lightbox Pte Ltd

# CAPITAMALL XINDUXIN, CHINA

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD



- Estimated energy savings 3,234,531,.62kWh/yr; Estimated water savings: 54,677m<sup>3</sup>
- Chiller plant system with efficiency of 0.781 kW/ton and boiler efficiency of 92%
- High efficiency chilled water system with heat recovery. Use of heat plate exchanger to recover heat from toilet exhaust to pre-cool/pre-heat the fresh air intake for PAHU
- Energy efficient T5 lighting coupled with motion sensors for all staircases
- Car park guidance system
- LED lighting for public area and car park

Client/Developer	CapitaMalls Asia Limited
Project Manager	CapitaMalls Asia Limited
Architect	Laguarda.Low.Architects
M&E Engineer	Tengyuan Design Institute Co.,Ltd.
Structural Engineer	Tengyuan Design Institute Co.,Ltd.
Quantity Surveyor	Langdon & Seah
Main Contractor	China Construction Eighth Engineering Division.Corp.Ltd
Landscape Consultant	Aoya

# MENARA BINJAI

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD



Building Owner	Khor Joo Saik Sdn Bhd
ESD / Green Consultant	LJ Energy Pte Ltd
ESCO	LJ Energy Pte Ltd
Facility Management	Knight Frank Malaysia

- Energy monitoring system and building management system (BMS) are used to monitor, control and report on the building facilities system performances such as chiller system, AHUs, CO sensors and lighting
- Electrical sub-meters installed for all tenants and building systems (such as car park mechanical ventilation system and chiller system), to track and monitor energy consumption
- Use of energy efficient T5 and LED lightings in landlord common areas and corridors
- Use of environmentally friendly products and environmentally friendly refrigerant
- Recycling program, green guide and posters used as an avenue to promote and encourage recycling and waste minimisation, to building occupants
- Other Energy Efficient features include occupancy sensors installed in staircases and toilets, ductless fans for basement car parks, heat recovery using heat pipes and regenerative drives for lifts



# H40 RESIDENTIAL PROJECT – BRUNEI

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | GOLD



- High Efficient Street LED Lighting
- Rain Water Harvesting for irrigation
- Good passive design to encourage natural ventilation

Client/Developer	Ministry of Development, Brunei Darussalam
Architect	Gemilang Latif Associates
M&E Engineer	Jurutera Perunding RCS Sdn Bhd
Structural Engineer	Jumin Marsal Perunding Consultants
Quantity Surveyor	DARA Construction Sdn Bhd
Main Contractor	DARA Construction Sdn Bhd



# PARK AVENUE HEIGHTS (CHENGDU, CHINA)

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD



- Use energy-efficient T5 lighting integrated with motion sensors for common areas
- Energy-efficient air-conditioning system
- Gas water heater for all units

Client/Developer	Keppel Land China Ltd/ Chengdu Hillstreet Development Co. Ltd
Project Manager	Keppel Land China Ltd
Architect	AWP Pte Ltd/ China Southwest Architectural Design and Research Institute Corp. Ltd
M&E Engineer	China Southwest Architectural Design and Research Institute Corp. Ltd
Structural Engineer	China Southwest Architectural Design and Research Institute Corp. Ltd
Quantity Surveyor	Langdon & Seah Consultancy (Chengdu) Co. Ltd
Main Contractor	Sichuan No. 6 Construction Co. Ltd
Landscape Consultant	Site Concepts International Ltd
ESD Consultant	Building system & Diagnostics Pte Ltd

# SHESHAN RIVIERA

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD



Client/Developer	Shanghai Jinju Estate Development Co.,Ltd
Architect	Beijing Dahlin Construction Planning and Design Consulting Co.,Ltd
M&E Engineer	Shanghai Urban Construction Design Institute Co.,Ltd
Structural Engineer	Shanghai Urban Construction Design Institute Co.,Ltd
Quantity Surveyor	Gleeds (Shanghai) Construction Consultant Co.,Ltd
Main Contractor	Lonsin Construction Group Co.,Ltd
ESD Consultants	Building System and Diagnostics Pte Ltd

- Estimated energy savings: 194,816kWh/yr
- Designed with good building and window orientation for optimum cross-ventilation
- Provision of light wells which brings about good natural lighting and enhanced visual comforts to the units' basement areas
- Provision of energy efficient air-conditioning system, radiant floor heating and fresh air heat recovery system for show units
- Use of self cleaning paint systems for external walls
- Extensive use of sustainable Green Product (with at least 30% recycled content and locally certified)

# KAMPUNG LUGU NATIONAL HOUSING SCHEME-PHASE 1A

Landed Houses



## GREEN MARK AWARD FOR BUILDINGS | GOLD



Client/Developer

Architect

M&E Engineer

Structural Engineer

Quantity Surveyor

Main Contractor

JABATAN KEMAJUAN PERUMAHAN  
KEMENTERIAN PEMBANGUNAN  
Asmadee Adbullah Bumi Architect & Shah  
Architect

Othman & Associates

Sepakat Setia Perunding Sdn Bhd

Bina Puri (B) Sdn Bhd

Bina Puri (B) Sdn Bhd

- Use of performance glass and WWR of 0.3 reduces heat transfer.
- Provision of fan for all rooms and use of natural ventilation to cool down the building
- High Efficient LED Lighting for is provided for all spaces



## GREEN MARK FOR OVERSEAS AWARD | CERTIFIED

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Dolce Vita (B Zone)	New Non-Residential Building	Guangzhou Beautiwin Real Estate Development Co Ltd
Riverfront	New Non-Residential Building	CapitaLand Xinye (Hangzhou) Real Estate Development Co Ltd