

# BCA AWARDS 2019

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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



# The Land Transport Authority (LTA)

## BCA GREEN MARK CHAMPION AWARD

The Land Transport Authority (LTA) is a statutory board under the Ministry of Transport which spearheads land transport developments in Singapore. LTA is responsible for planning, designing, building and maintaining a land transport infrastructure and system that is connected and sustainable, and meets diverse transport needs. It explores and develops new technologies and innovative solutions to cater to the varied transport needs and lifestyles of commuters. LTA also supports the economic development of Singapore by providing a reliable and connected transport network, and promotes a safe, gracious and inclusive transport system. LTA also aims to provide a greener public transport system.

The Kim Chuan Depot Extension (KCDE) adopts design strategies to ensure energy efficiency and the usage of sustainable products certified under the Singapore Green Labelled Scheme. The KCDE, which will expand the capacity of Kim Chuan Depot when the Circle Line 6 is completed, received the BCA Green Mark Platinum Award for its environmentally sustainable design that leads to at least 30% in energy savings.

The East Coast Integrated Depot (Rail Depot) also received the BCA Green Mark Platinum Award for its energy and water saving features. The depot has an energy efficient water-cooled chilled plant, a solar absorption chiller, and an energy efficient lighting system that improves the lighting power budget by 40%. The depot's other features include the use of a rooftop solar photovoltaic system, MERV 14 air filter and UV light for air handling units, recycling and reusing of train wash water, and buildings designed with natural ventilation spaces.

LTA is honoured to be recognised with the Green Mark Champion Award, which is a validation that we have carefully considered the environmental impact of our work, and put in various measures to promote environmental sustainability.



Kim Chuan Depot Extension (KCDE)



East Coast Integrated Depot (Rail Depot)





# BCA GREEN MARK PEARL AWARD

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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



# REPUBLIC PLAZA TOWER 1

## BCA GREEN MARK PEARL AWARD

In line with its ethos of 'Conserving as We Construct', for over two decades, Asia's leading eco-developer CDL has remodelled its operations around a triple bottom line strategy focusing 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.

CDL's flagship building, Republic Plaza Tower 1, 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 development 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 a three to five minutes' walk from Telok Ayer MRT Station. Republic Plaza comprises a 66-storey office building and an annexed 20-storey podium block.

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 2018, under CDL's Green Lease Partnership programme, 100% of the tenants at Republic Plaza have committed to adopting green practices within their premises. For example, Distrii Singapore Pte Ltd, adopted the use of 100% LED lightings and achieved more than 50% improvement in their lighting power density. Bank of Singapore Limited, implemented proper zoning and scheduling control with toggle switches to minimise energy consumption during after-office hours for their air conditioning and lightings. A mini gym, ergonomics monitor stands, healthier snack choices and weekly fruits' day are also provided to enhance staff well-being.

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.

Distrii, Bank of Singapore Limited, Latham & Watkins LLP, Clearstream Banking S.A, China Construction Bank Corporation, Singapore Branch and 17 other office tenants have achieved Green Mark certification.



Landlord/Owner: City Developments Limited (CDL)



# MARINA BAY FINANCIAL CENTRE TOWER 3

## BCA GREEN MARK PEARL AWARD

Marina Bay Financial Centre (MBFC) Tower 3 is a 46-storey Grade A office building with a total GFA of approximately 151,000 square metres. It obtained TOP and CSC on 21<sup>st</sup> March 2012 and 18<sup>th</sup> September 2012 respectively, and is owned by DBS, Keppel REIT and Hongkong Land through Central Boulevard Development Pte Ltd.

MBFC Tower 3 which is managed by Raffles Quay Asset Management (RQAM) is part of the larger MBFC development which comprises three premium office towers, a subterranean retail mall that connects all three office towers, and a luxury residential building that was jointly developed by CK Asset Holdings Limited, Hongkong Land and Keppel Land.

From architecture blueprint to ongoing building operations, MBFC Tower 3's design, facilities and operations prioritise safety, security, occupant comfort, environmental impact and sustainability. The building's green features include an outdoor weather station that measures external temperatures to be used as set-point for indoor air conditioning; a system to collect condensate water for general purpose cleaning; and green building monitors that publish energy and water consumption.

RQAM adopts green leases and green fit-out guides, and works collaboratively with tenants to ensure that they fit-out and operate in accordance with the agreed standards. To supplement its green efforts, RQAM actively engages stakeholders through various channels, from regular meet-ups to leveraging digital platforms to regularly disseminate energy and water conservation tips.

Fostering a green community within the properties it manages is one of RQAM's key objectives. Hence, the asset manager strongly supports green initiatives and is relentless in promoting awareness and adoption of green practices. RQAM's sustained efforts have enabled MBFC Tower 3 to be awarded the BCA Green Mark Pearl Award for the second time.



Landlord/Owner: Central Boulevard Development Pte Ltd





# BCA GREEN MARK FOR BUILDINGS

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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





# BCA GREEN MARK FOR SUPER LOW ENERGY BUILDINGS

BCA introduced the **BCA Green Mark for Super Low Energy (GM SLE) Buildings** during International Green Building Conference 2018 (IGBC 2018) on 5 September 2018. This voluntary certification framework targets new and existing non-residential buildings such as offices, commercial/retail, industrial, institutions and schools, including demonstration projects from Research & Innovation efforts. The new scheme aims to encourage industry to push boundaries on energy efficiency to achieve best-in-class building energy performance in a cost effective manner. It is applicable for new and existing non-residential buildings including commercial, industrial and institutional buildings as well as schools.

Green Mark Gold rating is the minimum requirement for SLE and ZE buildings in order to meet the holistic environmental sustainability indicators, such as greenery, indoor environmental quality and other non-energy aspects. This ensures the overall environmental sustainability performance indicators are being looked at holistically, while pushing the boundaries in terms of building energy performance.

Under BCA Green Mark for SLE, there are two building categories: (a) Super Low Energy buildings and (b) Zero Energy Buildings (refer to Table 1)

*Table 1. GM SLE Building Categories*

<i>SLE/ZE certification</i>	<i>Requirement</i>
Super Low Energy	To achieve at least 60% energy savings through adopting energy efficient measures and onsite renewable energy based on 2005 building code level.
Zero Energy	Use of onsite and off-site renewable energy to generate more than 100% of energy needed for building operation including plug load.





# HOME TEAM ACADEMY

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (SUPER LOW ENERGY)



Client/Developer

Ministry of Home Affairs

ESD Consultant

SAC Energy Pte Ltd

Facility Management

C&W Services (S) Pte Ltd

- Estimated energy savings: 3,179,331.67 kWh/yr
- Water-cooled Chiller System efficiency less than 0.62 kW/RT
- Building with 100% of LED lighting
- Daylighting and Natural Ventilation of Carpark, Stairs



# KRANJI CAMP III FOR OES

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Client/Developer	Defence Science & Technology Agency (DSTA)
Architect	ID Architects Pte Ltd
M&E Engineer	PDC Consultant Engineers
Structural Engineer	E2000 Pte Ltd
Main Contractor	Quek Hock Seng Construction Pte Ltd
ESD / Green Consultant	GreenA Consultants Pte Ltd

- Estimated energy savings: 112,784.33 kWh/yr;  
Estimated water savings: 4,496.54 m<sup>3</sup>; ETV: 28.42 W/m<sup>2</sup>
- Use of energy efficiency air-conditioning system with design system efficiency of 0.68 kW/RT
- Efficient lighting with the use of LED
- All water fittings are rated excellent under WELS
- Extensive usage of sustainable products and low VOC paints
- CFD simulations are conducted to ensure good ventilation
- Installation of 220kWp PV system that generate sufficient energy greater than the building energy consumption of 245,000kWh/yr.



# NANYANG TECHNOLOGICAL UNIVERSITY – ADMINISTRATION BUILDING

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Building Owner	Nanyang Technological University
Facility Management	SMM Pte Ltd
ESCO	-
ESD / Green Consultant	SMM Pte Ltd

- Efficient water-cooled air-conditioning system with operating system efficiency
- Variable speed drives for pumps and cooling towers
- Energy efficient LED lighting for all areas and task lighting for working area
- Attained PUB Water Efficient Building certification
- Provision of solar photovoltaic panels that offsets 100% of total building energy consumption
- Use of motion sensors for toilets and staircases
- Intelligence energy management system to manage building energy consumption and smart ACMV optimization
- Water leakage detection system
- Passive Displacement Cooling system



# NANYANG TECHNOLOGICAL UNIVERSITY – BLOCK N1.1

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Building Owner	Nanyang Technological University
Facility Management	SMM Pte Ltd
ESCO	-
ESD / Green Consultant	SMM Pte Ltd

- Efficient water-cooled air-conditioning system with operating system efficiency
- Variable speed drives for pumps and cooling towers
- Energy efficient LED lighting for all areas and task lighting for working area
- Attained PUB Water Efficient Building certification
- Provision of solar photovoltaic panels that offsets 100% of total building energy consumption
- Use of motion sensors for toilets and staircases
- Intelligence energy management system to manage building energy consumption and smart ACMV optimization
- Water leakage detection system
- Passive Displacement Cooling system



# NANYANG TECHNOLOGICAL UNIVERSITY – BLOCK N3

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (SUPER LOW ENERGY)



Building Owner	Nanyang Technological University
Facility Management	SMM Pte Ltd
ESCO	-
ESD / Green Consultant	SMM Pte Ltd

- Efficient water-cooled air-conditioning system with operating system efficiency
- Variable speed drives for pumps and cooling towers
- Energy efficient LED lighting for all areas and task lighting for working area
- Attained PUB Water Efficient Building certification
- Provision of solar photovoltaic panels that offsets 100% of total building energy consumption
- Use of motion sensors for toilets and staircases
- Intelligence energy management system to manage building energy consumption and smart ACMV optimization
- Water leakage detection system
- Passive Displacement Cooling system



# NANYANG TECHNOLOGICAL UNIVERSITY - NANYANG AUDITORIUM

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Building Owner

Nanyang Auditorium

Facility Management

SMM Pte Ltd (A member of Surbana Jurong)

ESD / Green Consultant

SMM Pte Ltd (A member of Surbana Jurong)

- High Water-cooled chilled water system with efficiency of 0.642 kW/RT
- High Efficient LED Lighting
- Provision of PV system with generation of 700,000 kWh electricity per year
- Obtain PUB water efficient building certification



# NANYANG TECHNOLOGICAL UNIVERSITY - NANYANG HOUSE

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Building Owner	Nanyang Technological University
Facility Management	SMM Pte Ltd
ESCO	-
ESD / Green Consultant	SMM Pte Ltd

- Energy efficient LED lighting for all areas and task lighting for working area
- Attained PUB Water Efficient Building certification
- Provision of solar photovoltaic panels that offsets about 100% of total building energy consumption
- Use of motion sensors for toilets and staircases
- Intelligence energy management system to track and manage building energy consumption



# NANYANG TECHNOLOGICAL UNIVERSITY - SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Building Owner	Nanyang Technological University
Facility Management	SMM Pte Ltd
ESCO	-
ESD / Green Consultant	SMM Pte Ltd

- Efficient water-cooled air-conditioning system with operating system efficiency
- Variable speed drives for pumps and cooling towers
- Energy efficient LED lighting for all areas and task lighting for working area
- Attained PUB Water Efficient Building certification
- Provision of solar photovoltaic panels that offsets about 100% of total building energy consumption
- Use of motion sensors for toilets and staircases
- Intelligence energy management system to track building energy consumption
- Water leakage detection system
- Passive Displacement Cooling system



# NANYANG TECHNOLOGICAL UNIVERSITY - THE WAVE

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Building Owner	Nanyang Technological University
Facility Management	SMM Pte Ltd
ESCO	-
ESD / Green Consultant	SMM Pte Ltd

- Passive Displacement Cooling System (Induction Air Distribution System)
- Sustainable construction using Engineered Wood System for whole building minimizing heat gain and improving work productivity
- Energy efficient Chiller Plant System
- Extensive use of LED lights and energy efficient lighting system
- Operable façade design for maximum natural ventilation and sunlight effect.
- Waste heat recovery for hot water shower
- Extensive use of photo and motion sensor for lighting control
- Water efficiency building awarded by PUB and extensive use WELS "excellent" water fittings.



# NANYANG TECHNOLOGICAL UNIVERSITY - WEE KIM WEE SCHOOL OF COMMUNICATION AND INFORMATION

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Building Owner	Nanyang Technological University
Facility Manager	SMM Pte Ltd
ESCO	-
ESD / Green Consultant	SMM Pte Ltd

- Efficient water-cooled air-conditioning system with operating system efficiency of 0.642 kW/RT
- Use of variable speed drives for pumps and cooling towers
- Use of energy efficient LED lighting for all areas and task lighting for working area
- Attained PUB Water Efficient Building certification
- Provision of solar photovoltaic panels that offsets about 100% of total building energy consumption
- Use of intelligence energy management system to track building energy consumption
- Provision of water leakage detection system
- Use of Passive Displacement Cooling system



# NATIONAL UNIVERSITY OF SINGAPORE, FACULTY OF ENGINEERING BLOCK EA

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (SUPER LOW ENERGY)



Client/Developer	National University of Singapore
Project Manager	NUS Office of Estate Development
Facility Manager	NUS Office of Facilities Management
Architect	CPG Consultants Pte Ltd
M&E Engineer	Aurecon Singapore Pte Ltd
ESD / Green Consultant	C&W Services (S) Pte Ltd

- Estimated energy savings: 699,395kWh/yr;
- Highly efficient chiller plant system with efficiency of 0.57 kW/RT
- Energy-efficient air distribution system achieving 41% improvement over baselines, with CO<sub>2</sub> sensors available to regulate fresh air intake to AHUs.
- Smart water sub-meters are installed for remote monitoring of water consumption at laboratories & toilets.
- Use of water fittings rated "Excellent" under the PUB, Water Efficiency Labelling Scheme (WELS)
- Extensive use of environmental-friendly products certified by SGBC & SGLS for A&A works.
- Power meters installed for monitoring of energy consumption by individual AHUs, FCUs & MV fans.



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

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (SUPER LOW ENERGY)



Client/Developer	National University of Singapore
Architect	CPG Consultants Pte Ltd
M&E Engineer	WSP Consultancy Pte Ltd
Project Manager	NUS Office of Estate Development
Facility Manager	NUS Office of Facilities Management
ESD / Green Consultant	WSP Consultancy Pte Ltd & IEN Consultants

- Estimated energy savings: 605,596.61kWh/yr;  
Estimated water savings: 1550.4m<sup>3</sup>, ETTV: 39.06W/m<sup>2</sup>
- Use of extensive sun shading with double glazing attribute to an ETTV of 39.06W/sqm
- Highly efficient chiller plant system with efficiency of 0.57kW/RT
- Use of 100% LED lighting
- Hybrid ventilation system to provide tempered air with elevated air speed.
- Motion sensors for staircases and toilets
- Use of water fittings rated "Excellent" under the PUB, Water Efficiency Labelling Scheme (WELS)



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

New Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Client/Developer	National University of Singapore
Architect	Surbana Jurong Consultants Pte. Ltd.
M&E Engineer	Surbana Jurong Consultants Pte. Ltd.
Structural Engineer	Surbana Jurong Consultants Pte. Ltd.
Main Contractor	Kajima Overseas Asia Pte. Ltd.
Landscape Consultant	Surbana Jurong Consultants Pte. Ltd.
Project Manager	NUS Office of Estate Development
ESD/ Green Consultant	Surbana Jurong Consultants Pte. Ltd.

- 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 0.57kW/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
- Harvesting of rainwater for use in toilet flushing and irrigation



# SAMWOH SMART HUB

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (POSITIVE ENERGY)



Client/Developer	Samwoh Corporation Pte. Ltd.
Architect	AC Consortium Pte Ltd
M&E Engineer	BELMACS Pte Ltd
Interior Designer	A.C. Design Associates
Structural Engineer	Engineers Alliance Pte Ltd
Landscape Consultant	Earthscape Concepts Pte Ltd
Quantity Surveyor	E S Tang Consultants
ESD Consultant	ZEB-Technology Pte Ltd
BIM Manager	ZEB-Technology Pte Ltd
Main Contractor	Hua Siah Construction Pte Ltd

- Estimated energy savings: 879275.8kWh/yr;  
Estimated water savings: 1434,45m<sup>3</sup>, ETTV: 35.01W/m<sup>2</sup>
- Glazing is minimized in the East and West facing facade
- FM operations enhanced through adoption of 6D BIM
- State-of-the-art Chiller come with integrated DC/AC inverter for direct electrical feed by Solar Panels.
- Smart DC-motor fan coil units with programmable AI controller to ensure efficient operation.
- DC motor cooling tower with low drift loss.
- Solar driven pump for domestic water.
- Energy efficient measures has been adopted in the building to achieve an overall energy savings of 47.55% from baseline.
- Solar PV used to replace at least 110% of total building energy consumption
- EMS/iBMS system is enhanced with smart AI features that will ensure building performs optimally to corresponding demand.



# BLOCK 1337 SELETAR CAMP

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | GOLD<sup>PLUS</sup> (ZERO ENERGY)



Client/Developer

Defence Science & Technology Agency

Facility Manager

DSTA-FM / CMB Pte Ltd

ESD / Green Consultant

Rankine & Hill (Singapore) Pte Ltd

- Predominantly designed with natural ventilation
- 240 kWp solar panels for harnessing renewable energy
- 4-ticks air-cooled air-conditioning system with 0.81 kW/ton
- Use of Excellent rating water fittings



# SURBANA JURONG CAMPUS

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (SUPER LOW ENERGY)



Client/Developer	Surbana Jurong Capital (JID) Pte Ltd
Architect	Surbana Jurong Consultants Pte Ltd
Principal Design Consultant	Safdie Architects
Landscape Architect	Surbana Jurong Consultants Pte Ltd
ESD Consultant	Surbana Jurong Consultants Pte Ltd
M&E Engineer	Surbana Jurong Consultants Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd (a member of Surbana Jurong)
Quantity Surveyor	Threesixty Cost Management Pte Ltd (a member of Surbana Jurong)
Main Contractor	Boustead Projects E&C Pte Ltd

- Estimated energy savings: 4,831,720kWh/yr;  
Estimated water savings: 36,508m<sup>3</sup>, ETTV: 35W/m<sup>2</sup>
- Super Low Energy Building (>40% improvement in Energy Efficiency)
- High efficiency Air conditioning system (0.55kW/RT) with use of Under Floor Air Distribution system (0.15kW/RT) with a resultant total system efficiency of 0.7kW/RT
- Onsite renewable energy generation of 430MWh/year – equivalent to 4% of total building consumption
- Smart and integrated building management system
- Optimised building massing for biophilic design, quality views, access to daylight and self shading
- Live energy and water monitoring dashboard



# TAHIR FOUNDATION CONNEXION

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (ZERO ENERGY)



Client/Developer	Singapore Management University
Architect	MKPL Architects Pte Ltd
M&E Engineer	Meinhardt (Singapore) Pte Ltd
Structural Engineer	Meinhardt (Singapore) Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Main Contractor	Lian Ho Lee Construction Pte Ltd
Landscape Consultant	Salad Dressing
ESD Consultant	Web Earth Pte Ltd

- On-site net-zero energy building with Energy Usage Index (EUI) of 58.5 kWh/m<sup>2</sup>/year.
- Self shading building form, shading devices, insulated building envelope with low-E double glazing resulting in an ETTV of 25.6 W/m<sup>2</sup>
- Optimized lighting design with daylight utilisation, dimming control, photocell & occupancy sensor and LED lighting
- Highly efficient Chiller plant system with efficiency of 0.53 kW/RT
- Innovative Enhanced Passive Displacement Cooling (EPDC) System; saving 92% of air distribution energy
- SMART building control system controls lighting, chilled water, fresh air, plug loads, and AV equipment at each zone of the building
- Mass Engineered Timber (MET) structure reduces embodied carbon of the building



# 1 NORTH COAST

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	JTC Corporation
Architect	Aedas Pte Ltd
M&E Engineer	WSP Consultancy Pte Ltd
Structural Engineer & ESD Consultant	Arup Singapore Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Main Contractor	Lum Chang Building Contractors Pte Ltd

- High performing building envelope with an ETV of 27.63 W/m<sup>2</sup>
- Energy efficient water-cooled chilled water plant with design system efficiency of 0.58kW/RT
- 100% LED lighting fixtures resulting to energy savings of 50.7%
- Adequate ventilation for collaboration spaces demonstrated through computational fluid dynamics
- Water efficient use through 100% "Excellent" WELS rated water fittings
- Courtyard integrated with rain garden for rainwater attenuation and harvesting
- Sustainable materials resourcing through extensive use of environmental friendly products



# A&A TO EXISTING BUS ZONE OF TUAS CHECKPOINT

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- Energy-efficient chilled water plant – 0.622 kW/RT (kilowatt/Refrigeration Ton)
- Variable Frequency Drives (VFD) for Pumps & Cooling tower fans
- Extensive use of Green Concrete with recycled aggregates [Recycled Concrete Aggregates (RCA) & Washed Copper Slag (WCS)]
- Use of Excellent Water Efficiency Labelling Scheme (WELS) rated water fittings
- Extensive use of locally certified environmentally friendly products for the building

Client/Developer

Immigration & Checkpoints Authority

Architect

Design International Architects LLP

M&E Engineer

IGnesis Engineering Pte Ltd

Structural Engineer

ATC Consulting Pte Ltd

Quantity Surveyor

OTN Building Cost Consultants Pte Ltd

Main Contractor

Union Contractors Pte Ltd

Project Manager

CESMA International Pte Ltd



# ALLIUM CARE SUITE

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Allium Healthcare (Singapore) Pte Ltd
Architect	Metaphor Design + Architecture Pte Ltd
M&E Engineer	Elead Associates Pte Ltd
Structural Engineer	AA Engineering Consultants
Main Contractor	Tokyu Construction Co. Ltd
ESD Consultant	Earth-In-Mind Private Limited

- Estimated energy savings: 528,676kWh/yr;  
Estimated water savings: 11,666m<sup>3</sup>, ETTV: 32.65W/m<sup>2</sup>
- Energy efficient VRV air conditioning system Total System Efficiency of 0.79kW/RT (0.67kW/RT + 0.12kW/RT<sub>Air</sub>)
- Onsite renewable energy generation of 29,184kWh/year – equivalent to 3% of total building consumption
- Care suites designed to allow for either natural ventilation or air conditioning – smart control system automatically shuts off AC when windows are opened
- Lush and verdant integrated landscape to promote health and wellbeing



# BIDEFORD HILLS

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	SC Aetas Holdings Pte. Ltd.
Architect	RSP Architects Planner & Engineers (Pte) Ltd.
M&E Engineer	Squire Mech Pte. Ltd.
Structural Engineer	RSP Architects Planner & Engineers (Pte) Ltd.
Main Contractor	Dragages Singapore Pte Ltd
ESD Consultant	Atelier Ten (Asia) Pte. Ltd.
Landscape Consultant	Nikken Sekkei Ltd
Lighting Designer	Nipek Pte Ltd
Quantity Surveyor	ThreeSixty Cost Management Pte. Ltd.

- Spectrally selective glazing with low heat gain and higher daylight penetration.
- Optimized façade with Extensive shading, with ETTV of 33.84 W/m2.
- Use of 100% LED lighting for entire development.
- Extensive use of sustainable green products and water efficient fittings.
- 99.5% of total demolition Waste diverted from landfill, during demolition of existing building.
- Solar Hot water for 100% Service Apartment Hot water requirements.



# BLUE HUB

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Bollore Logistics Singapore Pte Ltd
Architect	HA Architects Pte Ltd
ESD Consultant	IGnesis Consultants Pte Ltd
Main Contractor	Boustead Project E&C Pte Ltd

- Efficient chiller plant system with performance of 0.576kW/RT
- High Efficient LED Lighting for warehouse
- Smart Building Management System with fault detection and diagnostics sensors
- Use of Excellent WELS rated water efficient fittings
- Collection and storage of recyclable waste, food waste and horticulture waste for recycling
- Use of SGBC-certified green concrete and sustainable products
- Lifts with VVVF & regenerative drive and sleep mode features



# CAPITASPRING

New Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Developer	Capitaland Limited, Capitaland Commercial Trust and Mitsubishi Estate Co., Ltd
Architect	Bjarke Ingels Group / Carlo Ratti Associati / RSP Architects Planners & Engineers Pte Ltd
M&E Engineer	Beca Carter Hollings & Ferner (S. E. Asia) Pte Ltd / Squire Mech Pte Ltd
Structural Engineer	Arup Singapore Pte Ltd / Meinhardt (Singapore) Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Dragages Singapore Pte Ltd
Project Manager	Capitaland Project Management Pte Ltd
ESD Consultant	Arup Singapore Pte Ltd / Afogreen Build Pte Ltd

- Green Oasis features four-storeys of lush greenery and trees for rejuvenation and active living. Extensive greenery throughout the development with GnPR > 14.
- Car-lite facilities to promote a healthy lifestyle through the provision of cycling path, bicycle lots and end-of-trip facilities.
- Laminated DGU and external shading device to reduce façade solar heat gain.
- Water cooled chilled water plant with efficiency of 0.58kW/RT.
- Extensive use of energy efficient LED lighting for front of house and back of house.
- Smart building analytical system to optimize building operations in areas including energy and water usage, maintenance and security.
- Construction innovations that include prefabrication, digital construction, BIM flythrough and use of drones for site monitoring, to ensure environmental sustainability while optimizing productivity, construction quality and cost.
- Use of skylight in serviced residence spaces to introduce daylighting to indoor spaces.



# CITY GATEWAY

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Gardens by the Bay
Architect	JGP Architecture Pte Ltd
M&E Engineer	PDC Consulting Engineers
Structural Engineer	TW-Asia Consultants Pte Ltd
Main Contractor	Prelim Construction Pte Ltd
ESD Consultant	Meinhardt (Singapore) Pte Ltd

- Provision of greenery to enhance biodiversity and visual spectacle to visitors, with Green Plot Ratio of 6.
- Reservation of existing lattice structure which provided great shading effect.
- Use of 100% LED lighting for entire development.
- Extensive use of sustainable green products and water efficient fittings.
- High efficient irrigation system with link of weather station and moisture sensors.



# LOGOS FOOD21

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Logos SE Asia Pte Ltd
Architect	Thymn Pte Ltd
M&E Engineer	Aurecon Singapore Pte Ltd
Structural Engineer	Engineers 2002 Pte Ltd
Quantity Surveyor	BKG Consultants Pte Ltd
ESD Consultant	GreenA Consultants
Main Contractor	Precise Development Pte Ltd

- Reduced Solar Heat Gain through good orientation and high performance facade system with ETTV of 33.58 W/m<sup>2</sup>
- Efficient ACMV system with Design System Efficiency of 0.77 kW/RT
- Energy efficient lighting system to achieve 61% energy savings by using 100% LED and motion sensors
- Renewable energy generation on site through Solar PV system
- 46% water savings achieved through usage of efficient water fittings, more than 50% of landscape plant species are drought tolerant and native to Singapore
- Usage of green concrete, environmental friendly construction materials and products
- Biophilic design (sky gardens, terrace garden) for well-being, healing, and positive environment



# MICRON FAB 10A

New Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Micron Semiconductor Asia Pte Ltd
Architect	ID Architects Pte Ltd
M&E Engineer	C2D Solutions Pte Ltd
Structural Engineer	Rankine & Hill (Singapore) Pte Ltd
Quantity Surveyor	Currie & Brown (Singapore) Pte Ltd
Main Contractor	Exyte Group
ESD Consultant	ZEB-Technology Pte Ltd

- Facade ETV= 33.19W/m<sup>2</sup>
- All motors are IE3 rated or better
- All water fittings are excellent rated
- Process water is recycled to reduce total building water consumption
- Internal shuttle bus is provided to promote green transportation



# RAFFLES GIRL'S SCHOOL (SECONDARY)

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Raffles Girls' School (Secondary)
Architect	DP Architects Pte Ltd
M&E Engineer	Meinhardt (Singapore) Pte Ltd
Structural Engineer	Meinhardt (Singapore) Pte Ltd
Quantity Surveyor	Faithful + Gould Pte Ltd
Main Contractor	Sunray Woodcraft Construction Pte Ltd

- Estimated energy savings: 932,650kWh/yr;  
Estimated water savings: 4,834m<sup>3</sup>, ETTV: 30.6W/m<sup>2</sup>
- Energy efficient water cooled chilled water air conditioning system  
Total system efficiency of 0.74kW/RT  
(0.56kW/RT + 0.18kW/RT<sub>Air</sub>)
- Passive design strategies for thermal comfort of the classrooms and naturally ventilated areas with wind driven rain simulations to minimise the impact of rain within these spaces.
- Extensive landscape areas and preservation of most of the existing trees to enhance biodiversity and provide visual relief to the students
- Provision of LED light fittings throughout the school



# TEMASEK POLYTECHNIC SPORTS & ARTS CENTRE (BLK 26A)

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Temasek Polytechnic
Architect	Forum Architects Pte Ltd
M&E Engineer	T.Y.Lin International Pte Ltd
Structural Engineer	RSP Architects Planner & Engineers Pte Ltd
Quantity Surveyor	Faithful+Gould Pte Ltd
Main Contractor	Logistics Construction Pte Ltd
Project Manager	Arcadis Project Management Pte Ltd
ESD Consultant	ZEB-Technology Pte Ltd

- Estimated energy savings: 332,749 kWh/yr;  
Estimated water savings: 3300 m<sup>3</sup>
- Water cooled chiller plant system with operating efficiency of 0.60 kW/RT,
- Good building envelope design with ETV of 24.84 W/m<sup>2</sup> with optimal window to wall ratio
- Provision of CO<sub>2</sub> sensor control for fresh air modulation of AHUs
- Extensive use of environmentally friendly products and recycled materials for construction
- Provision of excellent WELS rating water efficient fittings
- Energy efficient lighting and motion sensors for common areas like staircase and toilets.



# TEMASEK TOURISM ACADEMY (BLK 29A)

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Temasek Polytechnic
Architect	Forum Architects Pte Ltd
M&E Engineer	T.Y.Lin International Pte Ltd
Structural Engineer	RSP Architects Planners & Engineers Pte Ltd
Quantity Surveyor	Faithful+Gould Pte Limited
Main Contractor	Incorporated Builders Pte Ltd
ESD Consultant	ZEB-Technology Pte Ltd

- Estimated energy savings: 267, 494kWh/yr;  
Estimated water savings: 30, 066m<sup>3</sup>, ETV: 36.65W/m<sup>2</sup>
- Water cooled system with operating efficiency of 0.62kW/RT
- Provision of energy efficient features such as motion sensors for staircases and toilet, photo sensors for lift lobbies and atrium
- High adoption of Sustainable Construction
- Extensive use of environmentally friendly products



# VEOLIA SINGAPORE OFFICE @ TVC

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Veolia ES Singapore Ind. Pte Ltd
Architect	ID Architect Pte Ltd
ESD Consultant	IGnesis Consultants Pte Ltd
Main Contractor	Boustead Project E&C Pte Ltd

- Energy Efficiency LED&T5 Lighting System
- Eco restrooms with “excellent” fittings under PUB’s Water Efficiency Labeling Scheme (WELS)
- Low VOC Paints and Environmentally Friendly Adhesive certified by SGLS/SGBC
- NEWater for toilet flush
- Use of Environment Friendly Products



# ALEXANDRA POINT

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

Frasers Property Alexandra  
Point Pte Ltd

Facility Manager

Frasers Property Alexandra  
Point Pte Ltd

ESD / Green Consultant

G-Energy Global Pte Ltd

ESCO

G-Energy Global Pte Ltd

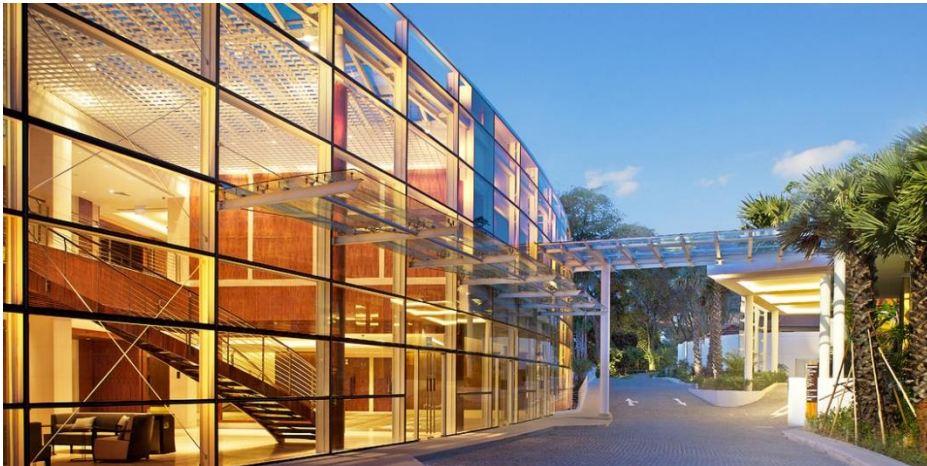
- Chiller system efficiency of 0.59 kw/ton by the use of VSD for chillers, pumps and cooling tower and through efficient maintenance and monitoring
- Real-time display for continuous remote monitoring of building's chiller plant performance
- Use of LED lightings in common areas such as lift lobbies and staircases with addition of motion sensors for toilets, staircases and carparks
- Use of Excellent rating water fittings
- Waterless urinal system and smart water metering connected to BMS for effective monitoring of water consumption



# AMARA SANCTUARY RESORT SENTOSA

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Amara Sentosa Investments Pte Ltd

ESCO

Comfort Management Pte Ltd

ESD/Green Consultant

Comfort Management Pte Ltd &  
Building System & Diagnostics Pte Ltd

- Estimated energy savings: 1,654,754 kWh/yr;
- High Water-cooled chilled water system with efficiency of 0.564 kW/RT
- Energy Efficient LED Lighting
- Extensive greenery
- Attained PUB Water Efficient Building Certification
- Use of sustainable products certified by SGLS



# APERIA

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

HSBC Institutional Trust Services (Singapore) Limited  
As Trustee of Ascendas Real Estate Investment Trust

Facility Management

Ascendas Services Pte Ltd

ESCO

-

ESD / Green Consultant

C&W Services (S) Pte Ltd

- Highly efficient water-cooled air-conditioning systems with operating system efficiencies for various plants ranging from 0.555 to 0.589 kW/RT
- Low Envelope Thermal Transfer Value (ETTV) of 35W/m<sup>2</sup> incorporating shading devices and low-e glazing
- Use of UVC-emitters for AHUs and passive wrap around dehumidification heat pipes in PAHUs
- Extensive use of LED lightings
- Provision of extensive greeneries and sky gardens at courtyards
- Provision of daylighting with skylight at retail atrium
- Use of rainwater harvesting for irrigation and condensate recovery for cooling tower



# ASCENT

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Ascendas Land (Singapore) Private Limited
Facility Management	Ascendas Services Pte Ltd
ESCO	-
ESD / Green Consultant	Building System & Diagnostics Pte Ltd

- Highly efficient water-cooled air-conditioning system with operating system efficiency of 0.589 kW/RT
- Adoption of Green Lease to increase tenants' awareness to go green and protect the environment
- 24,700 kWh is generated annually through the installation of Building Integrated Photovoltaic (BIPV) on the Eastern Façade
- Extensive use of thermal diffusers to replace AHU VAV system for improved thermal comfort, energy savings and maintainability
- Extensive use of T5 and LED lightings which helps to achieve 48% savings
- Use of water efficient fittings with WELS rating
- Collection of AHU condensate for cooling tower make-up



# CITY HOUSE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Lingo Enterprises Limited

Facility Management

City Developments Limited

ESCO

CBM Solutions Pte Ltd

ESD / Green Consultant

CBM Solutions Pte Ltd

- Efficient central chiller plant with system efficiency of 0.58 kW/ton
- LED lightings for common areas and washrooms.
- Use of motion sensors linked to lightings for toilets and staircases half-landings.
- Natural ventilation for staircases
- Provision of drought tolerant plants and roof top garden



# CLEANTECH ONE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	JTC Corporation
Facility Management	SMM Pte Ltd
ESD Consultant	Johnson Controls (S) Pte Ltd

- Use of passive design strategies to minimize solar heat gain to building and to facilitate cross ventilation and thermal comfort in naturally ventilated spaces.
- Provision of photovoltaic panels with system capacity of 230 kWp.
- Provision of rainwater harvesting system to minimize potable water use for irrigation.
- Extensive provision of greeneries to reduce heat gain for the building.
- All lightings served within the buildings are LEDs for energy efficiency.
- Provision of greywater recycling system for the building.
- Eco corner & signage for educational purposes.



# COPTHORNE KING'S HOTEL SINGAPORE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

DBS Trustee Limited

Facility Management

Millennium & Copthorne  
International

ESCO

-

ESD / Green Consultant

G-Energy Global Pte Ltd

- Highly efficient water-cooled air-conditioning system with operating system efficiency of 0.566 kW/RT
- Use of variable speed drives for chilled water pumps, condenser water pumps, cooling towers and AHUs
- Extensive use of energy efficient lightings
- Use of efficient heat pump for hot water generation
- Use of auto condenser tube cleaning system to improve heat transfer efficiency in the chillers



# DEFENCE SCIENCE & TECHNOLOGY AGENCY TOWER A

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Defence Science & Technology Agency
Facility Manager	Defence Science & Technology Agency
ESCO	-
ESD / Green Consultant	DP Engineers Pte Ltd
M&E Consultant	DP Engineers Pte Ltd
Main Contractor	Sunray Woodcraft Construction Pte Ltd

- Highly efficient water-cooled air-conditioning system with operating system efficiency of 0.586 kW/RT
- Use of VAV thermal diffusers
- Use of food waste digester in Canteen
- 39.2 % energy savings from efficient air-conditioning airside design
- Use of CO<sub>2</sub> sensors to regulate AHU fresh air supply
- Use of CO sensors for carpark mechanical ventilation
- 46.5 % improvement in lighting consumption by the use of LED for majority of lighting
- Use of non-potable water for cooling tower make-up water
- Use of sustainable materials and products for architectural finishes
- Wide use of water efficient fittings
- Waste management programme which encourages recycling through emails
- Wide use of Green Label products



# DEFENCE TECHNOLOGY TOWER B

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | Platinum



Client/Developer

Defence Science and Technology  
Agency/MINDEF

Architect

-

M&E Engineer

-

Structural Engineer

-

ESD Consultant

G-Energy Global Pte Ltd

Main Contractor

D-Team Engineering Pte Ltd

- Estimated energy savings: 1,474,555 kWh/yr;  
Estimated water savings: 3,065 m<sup>3</sup>/yr.
- Use of Guaranteed Performance Contracting with the guaranteed chiller plant efficiency at 0.58 kW/RT (day and night).
- Operating chiller plant efficiency of 0.521 kW/RT and air side efficiency of 0.15 kW/RT.
- Implemented automatic tube cleaning system and vacuum degassing system to improve the heat exchange properties within the chilled water network and prolong the life span of the chilled water pipes.
- More than 70% of the AHUs' condensate water were recovered to allow top up into the cooling tower basins via gravity feed.
- Provision of energy savings LED lightings for all major office spaces.
- Use of energy efficient lifts with AC VVVF and sleep mode features.
- Use of motion sensors in carpark to regulate the use of artificial lightings during non-peak working hour period.



# DSTA ANNEX

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

Defence Science & Technology Agency

Facility Management

C&W Services Pte Ltd

ESCO

Building System & Diagnostics Pte Ltd

ESD / Green Consultant

G-Energy Global Pte Ltd

- Highly efficiency Chiller plant system
- Chiller Plant Automation system, Heat Balancing and Measurement & Verification
- Chilled beam for offices
- Displacement Ventilation for the lobby
- Energy efficient LED lightings for offices, meeting room and canteen.



# EASTPOINT MALL

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	NTUC Income Insurance Co-Operative Ltd
Architect	LT&T Avid Architects Pte Ltd
M&E Engineer	Acetech Design Pte Ltd , Ms Fok
Structural Engineer	Mega Consult
Quantity Surveyor	Rodney Chng
Main Contractor	Vigcon Construction Pte Ltd

- Certified Water Efficient Building
- M&V System equipped with heat balance feature and VSD
- Lift & Escalators installed with VVVF Mode
- Waste recycling program is ongoing for East Point Mall
- East Point Mall is under the Chiller Efficiency Smart Portal by BCA
- Green lease are in place for tenants



# GALAXIS

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Ascendas Fusion 5 Pte Ltd
Facility Management	Ascendas Services Pte Ltd
ESD / Green Consultant	Ascendas Services Pte Ltd

- Efficient chiller plant with system efficiency of 0.598 kW/RT.
- Heat Pipe Recovery Unit to recover the cool air from toilet exhaust for the pre-cool AHU unit on the roof top.
- Remote monitoring dashboard with fault detection and diagnostic analytic function.
- The lighting system in the common toilets and staircases are controlled by motion sensors.
- Extensive greenery located at roof terrace serve as green communal spaces for building occupants and provides environmental and ecological benefits.



# GEK POH SHOPPING CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | Platinum



Building Owner

Housing & Development Board

Facility Management

CPG Facilities Management Pte Ltd

ESCO

C&W Services (S) Pte Ltd

ESD / Green Consultant

C&W Services (S) Pte Ltd

- Highly efficient water-cooled air-conditioning system with operating system efficiency of 0.644 kW/RT.
- Natural ventilation design for multi-storey carpark, lift lobbies and staircases.
- Green publicity efforts such as Green Corner, Energy-Saving Challenge, health promotion roadshow to create awareness for tenants and shoppers.
- Green lease for tenants.
- Extensive use of energy-efficient LED lightings and water fittings with excellent WELS rating at common areas.
- Use of environmentally friendly products for facilities management.



# GRAND COPTHORNE WATERFRONT HOTEL SINGAPORE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

DBS Trustee Limited

Facility Management

Millennium & Copthorne International

ESCO

G-Energy Global Pte Ltd

- Efficient water-cooled chilled water system with efficiency of 0.61 kW/RT
- Efficient LED/T5 Lighting
- Use of efficient heat pump system
- Use of eco-digester to convert food waste to water



# HOLIDAY INN EXPRESS SINGAPORE ORCHARD ROAD

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Valeside Pte Ltd
Facility Management	Swee Cheng Management Pte Ltd
ESCO	C&W Services (S) Pte Ltd
ESD/Green Consultant	C&W Services (S) Pte Ltd

- Efficient chiller plant system with operating system efficiency of 0.533 kW/RT.
- Efficient LED lighting are installed at common areas and hotel guest rooms.
- Provision of vertical greenery and rooftop greenery.
- Recycling of FCU condensate water to cooling tower's make up water.



# IKEA ALEXANDRA

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

Ikano Pte Ltd

ESD / Green Consultant

W2square Consultancy Pte Ltd

- Estimated energy savings: 2,126,916kWh/yr;  
Estimated water savings: 10,846m<sup>3</sup>
- Chilled water system with operating efficiency of 0.61kW/RT
- Use of absorption chiller to complement with the chilled water system
- Extensive use of LED lights throughout the building
- Innovative waste management and recycling programme



# ISEAS –YUSOF ISHAK INSTITUTE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	ISEAS – Yusof Ishak Institute
Facility Management	ISEAS – Yusof Ishak Institute
ESCO	C&W Services (S) Pte Ltd

- New efficient chiller plant with system efficiency of 0.653 kW/RT.
- Guaranteed Energy Savings Performance contract with committed combined efficiency of 0.97 kW/RT for chiller plant and air distribution system, including 5 years comprehensive maintenance.
- Heat Recovery Unit and Heat Pipes in AHUs for Special Rooms with library materials.
- Chiller Plant and AHU measured data are remotely monitored via Remote Operation Centre owned by the GESP consultant.
- Biophilic features such as koi ponds and greenery.
- Low carbon footprint through natural ventilation in common areas, extensive recycling practices, and use of motion sensors, LED lightings, and Singapore Green Building Council certified products.



# JEM

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

Lendlease Commercial Investments Pte Ltd  
Lendlease Retail Investments 3 Pte Ltd

Facility Manager

Lendlease Retail Investments 3 Pte Ltd

ESD Consultant

Kaer Pte Ltd

- The air-conditioning system operates with a system efficiency of 0.544 kW/RT with a high efficiency “multi-tier” chilled water plant
- Innovative 2-stages fresh air treatment and infiltration controls
- Demand responsive airside and mechanical ventilation system
- Extensive use of LED lighting technology
- Light sensor to enhance the daylighting within the building
- Green Lease and Green Mark Certification for retailers
- Landscaped terrace and green wall



# JTC SUMMIT

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | Platinum



Client/Developer	JTC Corporation
Architect	-
M&E Engineer	-
Structural Engineer	-
Quantity Surveyor	-
Main Contractor	-

- Efficient chiller plant design
- Use of smart power sockets
- Efficient water fittings used
- AHUs with UV emitters
- Test beddings items such as Chilled Ceiling & Passive Displacement Ventilation
- Solar film on building facades



# JURONG POLICE DIVISION HEADQUARTERS

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Singapore Police Force
Facility Manager	Cushman & Wakefield Facilities & Engineering (S) Ltd
ESCO	Kaer Pte Ltd
ESD/Green Consultants	Kaer Pte Ltd

- Replaced existing air-cooled chiller plant with water-cooled chiller plant with targeting system efficiency of 0.600 kW/RT
- Using LED light for building lighting retrofit
- Over 20% of roof top greenery accessible for occupants
- Obtained PUB Water-Efficient Building certificate
- Retrofitting existing AHUs to improve indoor environment



# KEPPEL BAY TOWER

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

HarbourFront One Private Limited

Facility Management

ENGIE Services Singapore

ESD Consultant

Johnson Controls (S) Pte Ltd

- Chiller plant system efficiency of 0.65 kW/RT and better
- Provision of permanent instrumentation to monitor the chiller plant operating system efficiency
- Use of WELS-certified fittings and awarded as Water Efficient Building
- LED lightings for car park and staircases and Motion Sensors control of lighting at staircases and toilets
- All AHUs are equipped with high efficiency MERV 14 air filter
- Auto tube cleaning system for the chiller plant
- Collection and recycling of used lights fittings and printer cartridges



# LIFELONG LEARNING INSTITUTE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Lifelong Learning Institute Pte Ltd

Facility Management

SMM Pte Ltd (A member of Surbana Jurong)

ESD/Green Consultant

SMM Pte Ltd (A member of Surbana Jurong)

- High Water-cooled chilled water system with efficiency of 0.65 kW/RT
- High Efficient LED Lighting
- Ductless jet fan system for basement car park ventilation
- Use of WELS rated "Excellent" water efficient fittings



# LUCKY PLAZA SHOPPING CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	MCST Plan No. 651
Facility Management	MCST Plan No. 651
ESCO	Johnson Controls (S) Pte Ltd
ESD/Green Consultant	Johnson Controls (S) Pte Ltd

- High Water-cooled chilled water system with efficiency of 0.6 kW/RT
- High Efficient LED Lighting for common area
- Provision of UVC emitter for all AHU
- Collection and recycling of used fluorescent tubes



# MARINA BAY FINANCIAL CENTRE TOWER 3

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Central Boulevard  
Development Pte Ltd

Facility Management

Raffles Quay Asset  
Management Pte Ltd

ESD / Green Consultant

C&W Services (S) Pte Ltd

- Estimated energy savings: 8,394,100 kWh/year;
- Estimated water savings: 6,384 m<sup>3</sup>/year
- Low-E coating for glass façade
- Efficient air distribution system with VSDs and VAV boxes
- Extensive use of LED lightings with motion sensors and photocell sensors
- Motion sensor control of the carpark LED lightings.
- Certified PUB Water Efficient Building.
- Weather station in use to adjust AHU set point in accordance with climate.
- Progressively bring up the office space temperature from 24 deg.C to 25 deg.C, half of the space have been completed.
- Committed in Green Advocacy such as the annual participation of Earth Hour, iLight Marina Bay Festival and PUB Singapore World Water Day.



# MAX ATRIA @ SINGAPORE EXPO

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Singapore Tourism Board

Facility Management

SingEx Venues Pte Ltd

ESD Consultant

C&W Services (S) Pte Ltd

- Energy Efficient Water-Cooled Chilled Water Plant Air Conditioning System
- Automatic tube cleaning system for chiller
- Energy Efficient LED Lighting System
- Lifts and escalators are equipped with ACVWF drives and sleep mode feature
- Water sub-meters are available to measure potable and NEWater use
- NEWater is used for cooling tower make-up supply
- A refrigerant leak detection system is available at both plant rooms
- Core area provides natural daylighting



# MINISTRY OF MANPOWER SERVICES CENTRE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

Ministry of Manpower

Facility Manager

ST Synthesis Pte Ltd

ESD / Green Consultant

AeX Consulting & Training Pte Ltd

ESCO

6-Sigma Automation Pte Ltd

- Energy efficient chiller plant system (0.545 kW/RT) with thermal energy storage
- LED lightings for most functional spaces
- Use of high performance air filter (MERV 14)
- Solar Photovoltaic System (35 kWp) at rooftop
- Extensive greenery with drip irrigation system



# NANYANG EXECUTIVE CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Nanyang Technological University
ESD Consultant	SMM Pte Ltd
Facility Management	SMM Pte Ltd

- Efficient chiller plant system of less than 0.65 kW/ton
- Measurement and verification system and heat balancing to monitor chiller plant efficiency
- Variable speed drives for pumps and cooling towers
- Energy efficient LED lighting for all areas



# NATIONAL UNIVERSITY OF SINGAPORE – FACULTY OF ENGINEERING BLOCK E8

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	National University of Singapore
Project Management	NUS Office of Estate Development
Facility Management	NUS Office of Facilities Management
Architect	CPG Consultants Pte Ltd
M&E Engineer	WSP Consultancy Pte Ltd
ESD / Green Consultant	Afogreen Build Pte Ltd

- Estimated energy savings: 764,443 kWh/yr;  
Estimated water savings: 3,255 m<sup>3</sup>/yr.
- Use of Energy Dashboard & Reporting Tool (EDART) program to monitor water usage, electricity consumption and cooling load of the building.
- New air distribution system that achieves 29% savings over baseline requirements.
- Dedicated power meters on each level to monitor energy usage for air-conditioning system, lightings and receptacle loads.
- Extensive LED lightings with 35% improvement from code requirements.



# NEXUS @ ONE-NORTH

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	HSBC Institutional Trust Services (Singapore) Limited As Trustee of Ascendas Real Estate Investment Trust
Facility Management	Ascendas Services Pte Ltd
ESCO	-
ESD / Green Consultant	Building System & Diagnostics Pte Ltd

- Highly efficient water-cooled air-conditioning system with operating system efficiency of 0.627 kW/RT
- Low Envelope Thermal Transfer Value (ETTV) of 38.61W/m<sup>2</sup> with Window-to-Wall ratio of 0.455
- Provision of solar photovoltaic panels with 50 kW peak
- Use of water efficient fittings with 3-ticks "Excellent" WELS rating
- Lushful greenery with Green Plot Ratio of 1.93
- 100% auto irrigation for all landscape areas and use of rainwater harvesting system to reduce potable water usage for irrigation purposes
- Provision of openings at basement carpark to promote ventilation and daylighting



# NGEE ANN CITY

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

The Management Corporation Strata Title  
Plan No. 2929

Facility Management

Ngee Ann Property Management Pte Ltd

ESCO

Comfort Management Pte Ltd

ESD / Green Consultant

Comfort Management Pte Ltd

- Highly efficient water-cooled air-conditioning system with operating system efficiency of 0.602 kW/RT
- Use of variable speed drives for chilled water pumps and condenser water pumps
- Performance monitoring of AHUs and use of podium AHU cooling coils and efficient blowers for better air side efficiency
- Attained PUB Water Efficient Building certification
- Extensive use of NEWater for approximately 33% of total building usage
- Recycling program in place to track, reduce and recycle out-going waste
- Allocation of car park lots for Hybrid / Electric Vehicles



# OCEAN FINANCIAL CENTRE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Ocean Properties LLP

Property Management

Keppel REIT Property  
Management Pte Ltd

ESCO

G-Energy Global Pte Ltd

ESD / Green Consultant

G-Energy Global Pte Ltd

- Efficient chiller plant with system efficiency of 0.595 kW/RT.
- Provision of 75 kWp solar panels installed on the roof.
- Regenerative Drive System coupled with VVVF features for lifts and escalators are installed with Motion Sensors
- Heat Recovery for hot water and heat recovery wheel for pre-cool fresh air
- Extensive Green Wall and Roof Terraces
- Paper Recycling Chute System



# PARKWAY PARADE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Management Corporation Strata Title No. 1008

Facility Management

Lend Lease Retail Pte Ltd

ESD / Green Consultant

C&W Services (S) Pte Ltd

- Estimated energy savings: 1,953,617kWh/yr; Estimated water savings: 65,105m<sup>3</sup>,
- Chiller plant system with operating efficiency of 0.66kW/RT
- High Efficient LED Lighting
- Extensive use of motion sensors, photocell sensors and CO sensors
- Rainwater harvesting
- Greenlots charging station for electric vehicles
- Carpark guidance system



# RESEARCH TECHNO PLAZA

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Nanyang Technological University
Facility Management	SMM Pte Ltd
ESD / Green Consultant	SMM Pte Ltd

- Efficient water-cooled air-conditioning system with operating system efficiency
- Variable speed drives for pumps and cooling towers
- Energy efficient LED lighting for all areas and task lighting for working area
- Attained PUB Water Efficient Building certification
- Use of motion sensors for toilets and staircases
- Intelligence energy management system to manage building energy consumption and smart ACMV optimization
- Water leakage detection system
- Passive Displacement Cooling system



# ROBERT BOSCH (SEA) HQ

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Robert Bosch S.E.A Pte Ltd
Facility Management	Robert Bosch S.E.A Pte Ltd
ESD Consultant	GreenA Consultants

- Estimated energy savings: 779,202 kWh/yr ; Estimated water savings: 3,605 m<sup>3</sup>/yr, EETV: 41.87w/m<sup>2</sup>
- Water-Cooled Chiller system with operating efficiency of 0.59kW/ton and Variable Speed Drive (VSD) controls
- Extensive use of T5 for all fluorescent lighting and motion sensors at toilets and staircases
- Roof of building fully covered with solar panels to harvest renewable energy and test-bed for photovoltaic research
- Use of automated external blinds, double-glazed and single-glazed low emission glass lowers building cooling load
- Electric/hybrid vehicle charging station and priority parking lots
- Siphonic rainwater discharge system



# SANDCRAWLER

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Lucas Real Estate (S) Pte Ltd

Facility Management

Lucas Real Estate (S) Pte Ltd

- Efficient air distribution system with efficiency of 0.23 kW/RT
- High Efficient LED Lighting for common area
- Provision of PV system with generation of 200,000 kWh per year
- Extensive greenery



# SCHOOL OF ART, DESIGN AND MEDIA

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Nanyang Technological University
ESD Consultant	SMM Pte Ltd
Facility Management	SMM Pte Ltd

- Efficient chiller plant system of 0.65 kW/ton
- Measurement and verification system and heat balancing to monitor chiller plant efficiency
- Variable speed drives for pumps and cooling towers
- Energy efficient LED lighting for all areas



# SENTOSA FAMILY ENTERTAINMENT CENTRE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | Platinum



Client/Developer

Sentosa Development Corporation

M&E Service Provider

Midas Engineering & Services Pte Ltd

ESD / Green Consultant

G-Energy Global Pte Ltd

- Highly efficient chiller plant with system efficiency
- Extensive use of LED lighting
- All water fittings in the development rated WELS 'Excellent'
- Extensive use of SGLS certified products
- Provision of intensive and extensive green roof
- Use of harvested rainwater for irrigation
- Green educational corners and eco-trail to showcase green features within the development



# SENTOSA GOLF CLUB

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Sentosa Golf Club
Facility Management	Sentosa Golf Club
ESD / Green Consultant	C&W Services (S) Pte Ltd

- Provision of efficient VRF cooling system
- High Efficient LED Lighting
- Efficient heat pump for hot water system
- Extensive greenery



# SINGAPORE AVIATION ACADEMY

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Civil Aviation Authority of Singapore
Facility Management	Civil Aviation Authority of Singapore
ESCO	Kaer Pte Ltd
ESD Consultant	Kaer Pte Ltd

- Efficiency of chiller plant system was designed to achieve 0.65 kW/RT under a GESP contract
- The building uses energy efficient T5 and LED lightings for common lobbies, corridors and classrooms
- All lifts are equipped with variable voltage variable frequency motor drive and sleep mode function
- Adoption of day lighting in the main lobby, common corridors and link way
- Greenery with GnPR of 0.7
- PUB Water Efficient Building Certified with water saving fittings installed throughout the building
- All classrooms is integrated with Intelligent Classroom System for monitoring and control of the indoor lighting and air-conditioning system



# SINGAPORE MANAGEMENT UNIVERSITY - CITY CAMPUS

Existing Non-Residential Building



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Singapore Management University

Facilities Management

Office of Campus Infrastructure and Services

ESD Consultant

Johnson Controls (S) Pte Ltd

- Chiller plant system efficiency of 0.53 kW/RT
- High efficiency T5 & LED lightings with electronic ballast
- All AHUs are designed with the implementation of electronic air cleaner
- Motion sensors control the cooled air supply to study rooms, meeting rooms, staff lounges and faculty offices
- Use of WELS-certified fittings and awarded as Water Efficient Building
- CO<sub>2</sub> sensors are used to regulate outdoor air flow rate
- Priority green lots for Hybrid/CNG/Electrical vehicles



# SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN (SUTD) ACADEMIC FACILITIES AND SPORTS COMPLEX

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



- Low Urban Heat Island effect through generous Landscaping and Green Roof.
- Generous Comfortable Outdoor Naturally Ventilated Study Areas
- Ideal Building Orientation to Lower Solar Heat Gain
- Good Thermal Performance to Building Envelope

Client/Developer

Singapore University of Technology and Design  
(SUTD)

ESD Consultant

ENGIE South East Asia Pte Ltd

Facility Management

ENGIE Services Singapore



# SMU ADMINISTRATION BUILDING

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Singapore Management University

Facilities Management

Office of Campus Infrastructure and Services

ESD Consultant

Johnson Controls (S) Pte Ltd

- The façade is clad with double & low E glazing, which effectively reduce solar heat gains to the building
- Chiller plant system efficiency of 0.56 kW/RT
- Use of WELS-certified fittings and awarded as Water Efficient Building
- High efficiency T5 & LED lightings with electronic ballast
- All AHUs are designed with the implementation of electronic air cleaner
- Auto tube cleaning system for the chiller plant
- Priority green lots for Hybrid/CNG/Electrical vehicles



# SMU PRINSEP STREET RESIDENCES

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Singapore Management University
Facility Management	SMU Office of Campus Infrastructure & Services (OCIS)
Architect	MKPL Architects Pte Ltd
M&E Engineer	Meinhardt Singapore Pte Ltd
Structural Consultant	Meinhardt Singapore Pte Ltd
ESD Consultant	N/A

- Estimated energy savings: 274,824 kWh/yr;
- New chiller plant with system efficiency of 0.6 kW/RT.
- Efficient Passive Displacement Cooling (PDC) for cooled air distribution.
- Energy Smart Integrated System for controlling, monitoring, tracking the operations of all building services, e.g. PDC, lights, fans, plug loads and power meters.
- Efficient Dimmable LED Lighting System.
- Extensive use of sustainable products certified by SGBC and SGLS.
- Lightings in staircases are controlled based on motion detection.



# SOLARIS BUILDING

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Soilbuild Business Space REIT

Facility Management

SB Property Services Pte Ltd

ESD/Green Consultant

Building System & Diagnostics Pte Ltd

- Naturally ventilated and day lit grand atrium
- Solar shaft to provide daylight to the building
- High Efficient LED/T5 Lighting for common area
- Continuous perimeter landscape ramp
- Roof garden and corner sky terrace
- Climate Responsive Facade
- Pocket Park / Plaza
- Extensive Sun-Sharing Louvers
- Eco-cell



# SOUTH ACADEMIC COMPLEX (MAIN SOUTH SPINE, BLOCK S1, S2, S2.1, S2.2, S3, S3.1, S3.2, S4)

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Nanyang Technological University
ESD Consultant	SMM Pte Ltd
Facility Management	SMM Pte Ltd

- Efficient chiller plant system of 0.65 kW/ton
- Measurement and verification system and heat balancing to monitor chiller plant efficiency
- Variable speed drives for pumps and cooling towers
- Energy efficient LED lighting for all areas





# THE CONCOURSE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

Management Corporation  
Strata Title Plan no. 4218

Facility Management

Management Corporation  
Strata Title Plan no. 4218

ESCO

Johnson Controls (S) Pte Ltd

ESD / Green Consultant

Johnson Controls (S) Pte Ltd

- Efficient chiller plant with system efficiency of 0.646 kW/RT.
- Energy and water monitoring with Intelligent Building management System
- Motion sensors control of lightings at common corridors, staircase and toilets
- Auto tube condenser cleaning system for chillers
- Energy efficient LED lightings and T5 lightings with electronic ballast
- Priority green car park lots for hybrid / CNG / electric vehicles



# THE GALEN

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

HSBC Institutional Trust Services as Trustee of AREIT

Facility Management

Ascendas Services Pte Ltd

ESD Consultant

Building System & Diagnostics Pte Ltd

- Air -Conditioning plant system efficiency: 0.562kW/RT.
- PUB WEB certified
- Lushly landscaped grounds that create an ideal green ambience that motivate innovation and creativity.
- Integration of critical building operation data to Central Operation Centre for utilities monitoring, data analytics and fault detection diagnostic.
- Waste segregation and monitoring of recyclable waste
- Activities that promote healthy life style and environmental sustainability awareness



# TIONG BAHRU PLAZA & CENTRAL PLAZA

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

The Management Corporation - Strata Title Plan  
No. 2634

Facility Manager

The Management Corporation - Strata Title Plan  
No. 2634

ESD / Green Consultant

Barghest Building Performance

- Chiller system efficiency of 0.61 kw/ton with VSDs for pumps and cooling towers
- Use of efficient LED lightings in common areas
- UV lamps in all AHUs to improve Indoor Air Quality and energy savings by improved cooling coil surface heat transfer
- Conversion of existing AHU to EC motor driven AHU to conserve energy
- Use of WELS excellent rating water fittings



# TOURISM COURT

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)



Building Owner

Singapore Tourism Board

Facility Management

ENGIE Services Singapore

ESCO

-

ESD / Green Consultant

Johnson Controls (S) Pte Ltd

- Chiller plant system efficiency of 0.65 kW/RT or better
- Provision of permanent instrumentation to monitor the chiller plant operating system efficiency
- Variable Speed Drives for all Chilled & Condenser water pumps, Cooling Tower fans, and AHU fans
- 95% of lighting used T5 with electronic ballast, PLC & LED lightings
- New AHUs which are designed with the implementation of Merv 14 rating air filters
- Use of WELS-certified fittings and awarded as Water Efficient Building
- Motion sensors control lightings at all toilets, and staircases
- Lighting sensors (based on lux levels) at common areas such as corridors
- Priority green lots for Hybrid/CNG/Electrical vehicles
- Installation of double tier bicycle racks



# VILLAGE HOTEL ALBERT COURT

Existing Non-Residential Buildings

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)



Building Owner

DBS Trustee Limited (as Trustee of Far East  
Hospitality Real Estate Investment Trust)

Facility Management

Village Hotel Albert Court

ESCO / ESD Consultant

G-Energy Global Pte Ltd

- Highly efficient chiller plant performing at an efficiency of 0.60 kW/RT
- Provision of recycling practices to collect and monitor recyclable waste
- Provision of automatic tube cleaning system
- Provision of heat pump



# WHITESANDS SHOPPING CENTRE

Existing Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	ARMF (Whitesands) Pte Ltd
Facility Management	AsiaMalls Management Pte Ltd
ESCO	-
ESD / Green Consultant	-

- Highly efficient water-cooled air-conditioning system with operating system efficiency of 0.617 kW/RT
- Energy Management System in place to control and monitor the chiller plant performance with remote monitoring features
- Use of LED lightings for common areas and continuous improvement to energy efficient lighting system
- Carpark ventilation system in place with CO sensor and fans with variable speed drive (VSD)
- All escalators and lifts fitted with variable voltage frequency (VVF) & sleep mode features
- Use of water efficient fittings with 3-ticks "Excellent" WELS rating
- VSD drives for chillers and pumps are certified under the Singapore Green Building Product certification scheme



# YALE-NUS COLLEGE

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Yale-NUS College
Facility Management	Yale-NUS College
M&E Term Consultant	TW International Counsel Pte Ltd
ESD/Green Consultant	Beca Carter Hollings & Ferner (S.E Asia) Pte Ltd

- ETV: 33.2 W/m<sup>2</sup>
- Use of energy efficient lightings such as LED and T5 fluorescent to achieve 38.9% improvement over the baseline
- Occupancy sensors such as motion sensors are used for the offices, toilets and staircase half landings
- Photocell sensors to modulate lighting levels at the perimeter of classrooms
- Use of water efficient "Very Good" and "Excellent" WELs rated water fittings



# PIERMONT GRAND

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Pavo Properties Pte Ltd (Joint venture between City Developments Limited & TID Pte Ltd)
Architect	P&T Consultants Pte Ltd
M&E Engineer	Belmacs Pte Ltd
Structural Engineer	P&T Consultants Pte Ltd
Quantity Surveyor	Davis Langdon KPK (S) Pte Ltd
Landscape Consultant	TinderBox Pte Ltd
ESD/ Green Consultant	DP Sustainable Design Pte Ltd

- Good building orientation which allows for good natural ventilation in the common areas and dwelling units
- Building façade designed with high performance glazing to lower solar heat gain
- Smart water monitoring system with leak detection algorithm
- Water harvested from rainwater used for landscape irrigation
- Efficient lighting design by use of LED with motion sensors and NEA 5 ticks energy efficient air conditioning system for all the units
- Use of native plant species for extensive yet sustainable landscaping
- Smart home with smart community system for occupant comfort and convenience



# CRESCENT AND PIONEER HALL (HALL OF RESIDENCE 17 AND 18)

New Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner                      Nanyang Technological University

Managing Agent /  
Maintenance Contractor              SMM Pte Ltd

Facility Management                      Office of Development & Facilities Management

- Use of double Glazing for all units – Good Residential Thermal Transfer Value (RETV) of 14.50 W/m<sup>2</sup>
- State-of-the-art double louvre system to promote room ventilation
- Extensive use of precast elements and hollow core slab
- ABC storm water management system in place
- Use of solar water heater plus heat pump for showers
- Provision of solar photovoltaic panels on the roof with 188.70 kW peak
- Use of dual refuse chute
- Electric charging station for parking lots



# KALLANG POLYCLINIC AND LONG TERM CARE FACILITY

Healthcare Facility

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Ministry of Health
Architect	RDC Architects Pte Ltd
M&E Engineer	WSP Consultancy Pte Ltd
Structural Engineer	Arup Singapore Pte Ltd
Main Contractor	Tiong Seng Contractors Pte Ltd
ESD Consultant	WSP Consultancy Pte Ltd

- Integrated design approach
- Use of building performance simulation to improve design for NV wards
- Use of 100% LED lighting for entire development.
- High Energy Efficient air conditioning system
- Demolition protocol
- Extensive use of PPVC



# NATIONAL CANCER CENTRE

Healthcare Facility

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Ministry of Health (MOH), MOH Holdings Pte Ltd (MOHH)
Operator	National Cancer Centre Singapore
Project Management	AECOM Cost Consulting and Project Management (S) Pte Ltd
Architect	CIAP Architects Pte Ltd
M&E Engineer	Aecom Singapore Pte Ltd
Structural Engineer	Arup Singapore Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Shimizu Corporation
ESD Consultant	ZEB-Technology Pte Ltd

- Chiller Plant System High Operating Efficiency of 0.549kW/RT
- Air Distribution System High Operating Efficiency of 0.13kW/RT
- Extensive use of alternative water sources for replacement of potable water for major water uses
- Excellent Envelope Thermal Transfer Value of 26.83W/m<sup>2</sup>



# POLYCLINIC AND SENIOR CARE CENTRE AT CHIN CHENG AVENUE

Healthcare Facility

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Ministry of Health
Project Manager	IMO & Associates Pte Ltd
Architect	Forum Architects Pte Ltd
M&E Engineer	Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Structural Engineer	Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Quantity Surveyor	CPG Consultants Pte Ltd
Main Contractor	CMC Construction Pte Ltd
Landscape Consultant	Coen Design International Pte Ltd
ESD Consultant	Web Earth Pte Ltd

- Insulated façade with low-E laminated glazing, ETTV of 24.90 W/m<sup>2</sup>
- Efficient water-cooled chiller plant with efficiency of 0.512 kW/RT
- LED light fittings in the entire development
- Water efficient development using WELS 3 tick fittings
- Renewable energy generation – Rooftop photovoltaic (PV) system
- Sustainable materials and construction
- Dedicated Sub-metering for each energy end use
- Energy efficient features include Regenerative Lift, Auto Tube Brushing System for chiller



# TTSH INTEGRATED CARE HUB (TTSH-ICH)

Healthcare Facility

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Ministry of Health (MOH), MOH Holdings Pte Ltd (MOHH)
Operator	Tan Tock Seng Hospital (TTSH)
Project Management	Arcadis Pte Ltd
Architect	CIAP Architects Pte Ltd
M&E Engineer	CPG Consultants Pte Ltd
Structural Engineer	Meinhardt (Singapore) Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Kajima Overseas Asia (Singapore) Pte Ltd
ESD Consultant	ZEB-Technology Pte Ltd

- Chiller plant system high operating efficiency of 0.524kW/RT
- Extensive use of alternative water sources for replacement of potable water for major water uses
- 100% Use of WELS “Excellent” rated water fittings
- Excellent envelope thermal transfer value of 37.52W/m<sup>2</sup>
- Provision of photovoltaic system with a system capacity of 97.44 kWp



# YISHUN COMMUNITY HOSPITAL (YCH) & GERIATRIC EDUCATION & RESEARCH INSTITUTE (GERI)

Healthcare Facility



## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner	Yishun Health Campus
Facilities Management	Yishun Community Hospital Pte Ltd
ESD Consultant	ZEB-Technology Pte Ltd

- Building envelope to achieve ETTV of 38 W/m<sup>2</sup> while harnessing day-light and providing a glare free environment.
- Optimized ward layout and façade design through simulation support to enhance natural ventilation for user comfort.
- The actual operating chiller plant efficiency is 0.590 kW/RT during daytime, and 0.577 kW/RT during night-time.
- Meticulous facade design through wind-driven rain (WDR) analysis for naturally ventilated wards and corridors to minimize impact from rain.
- Extensive greenery through provision of meditative/rehabilitative gardens, green spaces for horticultural therapy, staff gardens and roof-top greenery achieving a green plot ratio greater than 5.0.
- 100% hot-water system to address hot-water demand of wards and kitchen with heat-pump back-up system
- Pre-cooled AHU with IAQ improvement (TiO<sub>2</sub> coating and UVC emitters) for enhanced indoor air quality.



# MARSILING SECONDARY SCHOOL

Existing School

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer

Ministry of Education

- All classroom lights has been changed to LED fittings to improve efficiency of lighting systems and reduce the energy consumption.
- There is a 6m vertical farm that is used for lessons in science and national education.
- 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. They also work hand in hand with the school's environmental policy.
- Provision of a green corner, the Environmental Education Hub, is equipped with adequate learning materials on environmental sustainability for both students and staff.
- Has strong emphasis on environmental education, with a conceptualised sustainable Environmental Education Programme framework. The framework offers a robust interdisciplinary curriculum for students to engage in inquiry and research and exposes the environmental education to the students through the provision of environment modules that focuses on science, technology, engineering, and mathematics in real time to real situations



# ANGEL SINGAPORE HEADQUARTERS

New Non-Residential Building

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



Client/Developer	ANGEL SINGAPORE PTE. LTD.
Architect	RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer	Squire Mech Pte Ltd
Structural Engineer	RSP Architects Planners & Engineers (Pte) Ltd
Main Contractor	Obayashi Singapore Private Limited

- Good ETTV value of 31.49 w/m<sup>2</sup>
- Fully installed with LED light fittings
- Chilled water plant efficiency of 0.582kW/RT
- Extensive use of sustainable green products and water efficient fittings.



# EXPANSION OF YIO CHU KANG BUS INTERCHANGE

New Non-Residential Building

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



Client/Developer	Land Transport Authority
Architect	Shing Design Atelier Pte Ltd
M&E Engineer	Elead Associates Pte Ltd
Structural Engineer	ST Chew & Assoc Pte Ltd
Quantity Surveyor	CPC Construction Pte Ltd
Main Contractor	CPC Construction Pte Ltd
ESD Consultant	GreenA Consultants Pte Ltd

- Green roof with water efficient irrigation, rainwater sensors and drought tolerant plants
- 152 sheltered bicycle lots with CCTV coverage
- Structural system is mainly comprised of a steel frame structure that lowers the Concrete Usage Index to 0.16 m<sup>3</sup>/m<sup>2</sup>
- 100% use of high efficient LED lighting, achieving a 67% improvement in Lighting Power Budget compared with local code requirements
- Unitary Air Conditioning system achieving a 32.8% improvement over baseline requirements
- Extensive use of water efficient water fittings with 3-tick WELs rating



# WOODLEIGH VILLAGE HAWKER CENTRE

New Non-Residential Building

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



Client/Developer	National Environment Agency
Architect	MKPL Architects Pte Ltd
M&E Engineer	Alpha Consulting Engineers Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Main Contractor	China Construction (South Pacific) Development Co Pte Ltd

- Creating a unique dining experience amongst verdant greenery, right next to a Heritage Walk.
- Efficient planning to facilitate separation of back-of-house activities from dining experience resulting in a more hygienic and comfortable environment for all.
- Food Centre is designed to be naturally ventilated, with optimized orientation to capitalize on local prevailing wind.
- Environmental Deck above the Food Centre reduces solar heat gain.
- Use of sustainable products during construction of the Food Centre.
- Pneumatic waste collection system improves overall hygiene and odour compared to conventional waste collection.
- Kitchen exhaust systems fitted with air cleaners and filters remove odour before air is exhausted.



# AMARA SINGAPORE AND 100AM MALL

Existing Non-Residential Building

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



Client/Developer

Amara Hotel and Properties Pte Ltd

Facility Manager

Amara Singapore and 100AM Mall

ESD Consultant

G-Energy Global Pte Ltd

- Chiller plant system efficiency of 0.625 kW/ton
- Variable speed drives on existing chilled water pumps, condenser water pumps and cooling towers.
- Use of energy efficient tubes and LED lighting
- Rooftop and Vertical Greenery
- Usage of Water Sub-Meters for Cooling Tower and Swimming Pool



# BLOCK E1A, BLOCK E2, NUS IT AND CELC IN NUS

Existing Non-Residential Building

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



Building Owner

National University of Singapore

Facility Management

Office of Facility Management (OFM), NUS

- Energy efficient chiller plant with operating efficiency of 0.57 kW/RT
- Energy efficient LED lighting
- VVVF and sleep mode lifts
- PUB certified water efficient building
- Energy / Water / BTU consumption monitoring dashboard



# CAPITAL SQUARE

Existing Non-Residential Building

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



Client/Developer

ARA Asset Management Ltd

Facility Manager

CBRE Pte Ltd

ESD Consultant

CBRE Pte Ltd

- Use of efficient central chiller plant system: at least 0.68 kW/RT
- Use of variable speed drives for MVAC system to optimize part load condition
- Demand ventilation using CO sensors for car park
- Installation of water sub-meters to monitor CT, domestic, etc water usage.
- Recycling program to track, reduce and recycle out-going waste



# CINTECH I

Existing Non-Residential Building

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



Building Owner

HSBC Institutional Trust Services (Singapore) Limited  
As Trustee of Ascendas Real Estate Investment Trust

Facility Manager

Ascendas Services Pte Ltd

ESD / Green Consultant

Building System & Diagnostics Pte Ltd

- Efficient chiller plant with system efficiency of 0.614 kW/RT.
- Adopted Energy Performance Contract for chiller plant maintenance with guaranteed chilled water system efficiency.
- Extensive LED lightings for common areas.
- The BMS is connected to the Ascendas Operations Centre at HQ for utilities monitoring, data analysis and advance fault detection diagnostic.
- CO<sub>2</sub> sensors – integrated demand control ventilation for office AHU to reduce fresh air intake when human occupancy is low hence reduce cooling load demand.



# CINTECH II

Existing Non-Residential Building

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



Building Owner

HSBC Institutional Trust Services (Singapore) Limited  
As Trustee of Ascendas Real Estate Investment Trust

Facility Manager

Ascendas Services Pte Ltd

ESD / Green Consultant

Building System & Diagnostics Pte Ltd

- Efficient chiller plant with system efficiency of 0.614 kW/RT.
- Adopted Energy Performance Contract for chiller plant maintenance with guaranteed chilled water system efficiency.
- Extensive LED lightings for common areas.
- The BMS is connected to the Ascendas Operations Centre at HQ for utilities monitoring, data analysis and advance fault detection diagnostic.
- Natural Ventilation - Natural ventilation in car parks, toilets and staircases



# CINTECH III

Existing Non-Residential Building

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



Client/Developer	HSBC Institutional Trust Services (Singapore) Limited As Trustee of Ascendas Real Estate Investment Trust
Facility Manager	Ascendas Services Pte Ltd
ESD / Green Consultant	Building System & Diagnostics Pte Ltd

- Chilled water system with operating efficiency of 0.61kW/RT
- Chiller plant system efficiency is guaranteed under a performance guarantee maintenance contract for 10 years
- Extensive use of LED lightings in common area
- Provision of electrical sub-metering at the AHU units and they are connected to the BMS system for energy monitoring



# CINTECH IV

Existing Non-Residential Building

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



Client/Developer	HSBC Institutional Trust Services (Singapore) Limited As Trustee of Ascendas Real Estate Investment Trust
Facility Manager	Ascendas Services Pte Ltd
ESD / Green Consultant	Building System & Diagnostics Pte Ltd

- Chilled water system with operating efficiency of 0.61kW/RT
- Chiller plant system efficiency is guaranteed under a performance guarantee maintenance contract for 10 years
- Extensive use of LED lightings in common area
- Provision of electrical sub-metering at the AHU units and they are connected to the BMS system for energy monitoring
- BMS is connected to the Ascendas Operations Centre system at HQ, and will alert the facility manager and building owner to be alerted of any faulty sensors or equipment



# CONCORDE SHOPPING CENTRE

Existing Non-Residential Building

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



Client/Developer

The MCST Plan No. 1143

Facility Manager

Savills Property Management Pte Ltd

ESCO

Johnson Controls (S) Pte Ltd

- High efficiency chiller plant system with efficiency of 0.55 kW/ton
- Variable speed drives on new chilled water pumps, condenser water pumps and cooling towers.
- Provision of permanent instrumentation to monitor the chiller plant system operating efficiency
- Awarded Water Efficient Building. Water fittings comply with PUB Water Efficiency Labelling and Standards (WELS).
- Motion sensors are installed at all staircases and carpark



# HOMES @ HONG SAN

Existing Non-Residential Buildings

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



Client/Developer

Ministry of Social and Family Development

Facility Management

C&W Services (S) Pte Ltd

Green Mark Consultant

C&W Services (S) Pte Ltd

- Energy efficient air-conditioning system.
- High efficient LED lighting system.
- Water Efficient Devices.
- Photovoltaic system.
- Rainwater harvesting system.



# ICON @ IBP

Existing Non-Residential Building

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



Building Owner

Ascendas (Tuas) Pte Ltd

Facility Management

Ascendas Services Pte Ltd

ESD Consultant

G-Energy Global Pte Ltd

- Air-Conditioning plant system efficiency: 0.686 kW/RT.
- Use of VSD for chillers, pumps and cooling tower
- Collection and monitoring of recyclable waste
- Passive design is incorporated through the use of double glazing, day lit atrium, and naturally ventilated carpark to minimize energy demand
- Extensive use of LED light fittings



# NATIONAL PARKS BOARD (HEADQUARTERS)

Existing Non-Residential Building

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



Client/Developer	National Parks Board
Facility Manager	National Parks Board
ESD / Green Consultant	G-Energy Global Pte Ltd

- Naturally ventilated common areas including carparks, corridors, and lift lobbies
- Chiller system efficiency of 0.72 kw/ton with VSDs for pumps and cooling towers
- Predominant use of LED lightings
- PUB Water Efficient Building certificate
- Provision of CO<sub>2</sub> sensors and UV lamps at all AHUs.



# NATIONAL UNIVERSITY HOSPITAL (NUH) - KENT RIDGE WING (KRW)

Existing Non-Residential Building

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



Client/Developer	National University Hospital (Singapore) Pte Ltd
Facility Manager	Synergy FMI Pte Ltd
ESCO	C&W Services (S) Pte Ltd
ESD/Green Consultant	C&W Services (S) Pte Ltd

- Commitment to achieve chiller plant system efficiency of 0.68 kW/RT or better via optimisation & retrofitting measures.
- PUB Water Efficient Building certification has been achieved. NEWater is in use for the cooling towers' make-up. Cooling tower water treatment system is achieving  $\geq 7$  cycles of concentration
- Environmental-friendly practices for energy and water conservation & waste recycling, are encouraged among the building occupants using Green Guide. SGLS-certified paper towel & toilet paper, and compost recycled from horticultural waste are in use
- Rooftop greenery at Level 5. Kent Ridge MRT station is in close proximity, connected via sheltered walkways
- AHUs are equipped with MERV14 air filters. Low-VOC paints and adhesives certified by SGBC are also in use



# NORDIC EUROPEAN CENTRE

Existing Non-Residential Building

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



Client/Developer

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

ESD Consultant

Building System & Diagnostics Pte Ltd

Facility Management

Ascendas Services Pte Ltd

- Estimated energy savings: 96596 kWh/yr; Estimated water savings: 510 m<sup>3</sup>
- High efficiency water-cooled chilled water plant - Optimized chilled water plant with design system efficiency of 0.574 kW/Rt at operating load condition.
- Use of energy efficient LED light fitting for Common Areas
- Auto-tube condenser cleaning system to prolong lifespan of chillers and maintain chiller efficiency.



# NUHS TOWER BLOCK

Existing Non-Residential Building

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



Building Owner	National University Hospital (S) Pte Ltd
Facility Management	Synergy FMI Pte Ltd
ESD Consultant	G-Energy Global Pte Ltd

- High efficient chiller plant with system efficiency of 0.66kW/ton.
- Motion and photocell sensors for all toilets, staircases and office corridor.
- Usage of NEWater for irrigation and cooling tower make-up.
- Provision of rooftop garden and vertical greenery.
- Extensive usage of sustainable products for all office levels.



# ONE@CHANGI CITY

Existing Non-Residential Building

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



Building Owner

HSBC Institutional Trust Services (S) Ltd as a trustee  
of Ascendas Real Estate Investment Trust

Facility Management

Ascendas Services Pte Ltd

ESD/Green Consultant

G-Energy Global Pte Ltd

- High efficient chiller plant with system efficiency of 0.581kW/RT
- High Efficient LED Lighting
- Provision of AHU condensate for cooling tower make up water
- Provision UVC emitters at all AHU
- Integration of critical building operation data to Central Operation Centre for utilities monitoring, data analytics and fault detection diagnostic.



# SEBBAWANG MART

Existing Non-Residential Building

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



Building Owner

Housing Development Board

Facility Management

Bintai Kindenko Pte Ltd

ESCO

-

ESD / Green Consultant

Johnson Controls (S) Pte Ltd

- All common areas, corridors and staircases are naturally ventilated
- Extensive use of natural daylighting in building
- Attained PUB Water Efficient Building certification
- Waste recycling in place for plastic, paper and metal
- Use of cleaning products certified under the Singapore Green Labelling Scheme (SGLS)



# SHOPHOUSE

Existing Non-Residential Building

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



Building Owner  
Facility Management

Temasek Trustees Pte. Ltd. (as trustee of Temasek Trust)

ESD/Green Consultant  
Architect

Surbana Jurong Consultants Pte Ltd

M&E Engineers  
C&S Engineers

KTP International Pte Ltd

Interior Design Architect

Asylum Creative Pte Ltd

Landscape Architect

Greenology Pte Ltd

- Estimated energy savings: 140,300 kWh/yr;  
Water savings: 809 m<sup>3</sup>/yr
- Natural ventilated atrium
- Provision of efficient VRF cooling system
- Efficiency LED Lighting
- Motion sensor controlled lighting in common areas
- Extensive outdoor and indoor greenery with efficient automated irrigation system
- Excellent WELS rated water fittings & sustainable finishes & fittings



# SIM LIM TOWER

Existing Non-Residential Buildings

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



Building Owner

The Management  
Corporation Strata Title Plan  
No. 587

Facilities Manager

The Management  
Corporation Strata Title Plan  
No. 587

ESD Consultant

Comfort Management Pte Ltd

ESCO

Comfort Management Pte Ltd

- High efficiency central chilled water plant system of 0.594KW/RT or better
- Sub-metering for building systems to track energy consumption of major building uses and individual equipment
- Adopted the usage of Energy Savings tubes and LED lights at common facilities
- Awarded PUB Water Efficient Building certificate
- Auto tube cleaning system and refrigeration leak detection system
- Implementation of recycling program, recycling bins and usage of sustainable products
- Performance based Maintenance Contract and continuous energy efficiency monitoring system
- Auto tube cleaning system and refrigeration leak detection system



# SINGAPORE EXPO

Existing Non-Residential Building

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



Building Owner	Singapore Tourism Board
Facility Management	SingEx Venues Pte Ltd
M&E Engineer	Squire Mech Pte Ltd
Architect	RSP Architects Planners & Engineers (Pte) Ltd
ESD Consultant	Ignesis Consultants Pte Ltd

- Energy Efficient Water-Cooled Chilled Water Plant Air Conditioning System
- Energy Efficient LED Lighting System
- Lighting Demand Control using Motion Sensor at Staircases and Toilets
- PUB Water-Efficient Building Certificate with “Excellent” rated fittings
- Use of Low VOC Paints and Environmentally Friendly Adhesive



# SINGAPORE POLYTECHNIC WORKSHOP 5A

Existing Non-Residential Building

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



Client/Developer	Singapore Polytechnic
Architect	Context Architects Pte Ltd
M&E Engineer	Kunda Consulting Engineers
Structural Engineer	JIB Specialist Consultants Pte Ltd
Quantity Surveyor	Infield Projects Pte Ltd
Main Contractor	QXY Resources Pte Ltd

- Estimated energy savings: 258,209 kWh/yr;  
Estimated water savings: 290.6 m<sup>3</sup>/yr.
- Energy Efficient Air-conditioning
- Water Efficient Fittings
- Vertical Greenery



# SINGAPORE SPORTSHUB

Existing Non-Residential Building

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



Client/Developer	Sportshub Pte Ltd
Architect	DP Architects Pte Ltd
M&E Engineer	Squire Mech Pte Ltd
Structural Engineer	Arup Singapore Pte Ltd
Main Contractor	Dragages Singapore Pte Ltd
ESCO/Green Consultant	C&W Services (S) Pte Ltd

- Efficient chilled water system
- Extensive use of energy efficient lightings & sensors
- 707kWp Solar PV Generation with measure Solar Energy output of 892MWh per year
- Use of NEWater for Cooling Towers
- Energy-saving lifts and escalators
- Extensive smart sub-metering to monitor individual venues water consumption through IBMS
- Rainwater harvesting for irrigation complimented with advanced pitch soil sensors
- Hot water using chiller's heat recovery system



# TAMPINES 1

Existing Non-Residential Building

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



Building Owner	ARMF II (Tampines) Pte Ltd
Facility Management	AsiaMalls Management Pte Ltd
ESCO / EPC Firm	Barghest Building Performance
ESD / Green Consultant	G-Energy Global Pte Ltd & Barghest Building Performance

- Measured chiller plant system efficiency of 0.67 kW/RT with EPC contract to maintain at this performance for 5 years.
- Provision of motion sensors for the lightings in the staircases and toilets.
- Provision of CO<sub>2</sub> sensor display on each floor.
- Provision of recycling bins and programme to collect and monitor recyclable wastes.
- Achieved PUB Water Efficient Building certification



# TANAH MERAH 1

Existing Non-Residential Building

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



Client/Developer	Singapore Prison Service
Facility Manager	CBM Pte Ltd
ESD / Green Consultant	Building System & Diagnostics Pte Ltd

- Estimated energy savings: 61,456 kWh/yr and estimated water savings: 953 m<sup>3</sup>/yr
- Energy efficient unitary air-conditioning system with target efficiency of 0.797 kW/ton
- Use of water efficient fittings and PUB Water Efficient Building (Gold)
- Green guides are disseminated amongst users to create environmental awareness as well as to promote and encourage waste minimization and recycling among users
- MERV 13 filter ready mechanical ventilation to maintain good indoor air quality



# TANAH MERAH 2

Existing Non-Residential Building

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



Client/Developer	Singapore Prison Service
Architect	-
M&E Engineer	-
Structural Engineer	-
Quantity Surveyor	-
Main Contractor	-

- Estimated energy savings: 24,967 kWh/yr.
- Energy Efficient Unitary Air-conditioning with target efficiency of 0.85 kW/Rt
- Use of Water Efficient Fittings and PUB Water Efficient Building (Gold)
- Green guides are disseminated amongst users to create environmental awareness as well as to promote and encourage waste minimization and recycling among users.



# TELETECH PARK

Existing Non-Residential Building

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



Client/Developer	Teletech Park Pte Ltd
Facility Management	Ascendas Services Pte Ltd
ESD Consultant	Johnson Controls (S) Pte Ltd

- High efficient chiller plant with system efficiency of 0.56kW/RT
- Motion sensor for staircases and toilets
- Green guide and green lease in place for sustainable operation
- Energy efficient LEDs are used in the premises of the building
- Waste segregation and monitoring of recyclable waste
- Use of SGLS certified products (tissue paper, garbage bag)
- Activities that promote staff well being and environmental sustainability awareness



# THE ALPHA

Existing Non-Residential Building

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



Building Owner

HSBC institutional Trust Services (S) Ltd as Trustee of  
Ascendas Real Estate Investment Trust

Facility Management

Ascendas Services Pte Ltd

ESCO

Johnson Controls (S) Pte Ltd

ESD/Green Consultant

Johnson Controls (S) Pte Ltd

- Estimated energy savings: 12,617.32kWh/yr
- Chiller plant system with operating efficiency of 0.63kW/RT
- High Efficient LED Lighting
- Green guide and green lease in place
- Ongoing waste recycling program



# THE CAPRICORN

Existing Non-Residential Building

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



Building Owner	HSBC Institutional Trust Services (S) Ltd as Trustee of Ascendas Real Estate Investment Trust
Facility Management	Ascendas Services Pte Ltd
ESD/Green Consultant	Johnson Controls (S) Pte Ltd

- High efficient chiller plant with system efficiency of 0.573 kW/RT
- Integration of critical building operation data to Central Operation Centre for utilities monitoring, data analytics and fault detection diagnostic.
- Natural ventilated foyer at 1<sup>st</sup> floor
- Priority green lots for Hybrid / Electrical vehicles



# THE SAF WARRANT OFFICERS AND SPECIALISTS CLUB (THE CHEVRONS)

Existing Non-Residential Building

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



Building Owner

Defense Science & Technology Agency

Facility Management

The SAF Warrant Officers And Specialists Club

ESD/Green Consultant

Surbana Jurong Consultants Pte Ltd

- Estimated energy savings: 199,972 kWh/yr;  
Water savings: 441 m<sup>3</sup>/yr
- Provision of efficiency VRF cooling system
- Efficient LED Lighting in common area
- Natural ventilated atrium, corridors and lift lobbies



# THE SIEMENS CENTRE

Existing Non-Residential Building

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



Client/Developer

HSBC Institutional Trust  
Services (Singapore)  
Limited As Trustee of  
Ascendas Real Estate  
Investment Trust

Facility Manager

Ascendas Services Pte Ltd

ESD / Green Consultant

Building System &  
Diagnostics Pte Ltd

- Estimated energy savings: 1,091,607kWh/yr
- Chilled water system with operating efficiency of 0.61kW/RT
- Chiller plant system efficiency is guaranteed under a performance guarantee maintenance contract for 10 years
- Extensive use of LED lightings in common area
- Provision of electrical sub-metering at the AHU units and they are connected to the BMS system for energy monitoring
- BMS is connected to the Ascendas Operations Centre system at HQ, and will alert the facility manager and building owner to be alerted of any faulty sensors or equipment



# ALKAFF OASIS (CONTRACT 6)

New Residential Building

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



Client/Developer	Housing Development Board
Architect	Surbana Jurong International Consultants Pte Ltd
M&E Engineer	Surbana Jurong International Consultants Pte Ltd
Structural Engineer	Surbana Jurong International Consultants Pte Ltd
Quantity Surveyor	Surbana Jurong International Consultants Pte Ltd
Main Contractor	Chip Eng Seng Corporation Pte Ltd

- Estimated energy savings: 862108.69kWh/yr;  
Estimated water savings: 90130.32m<sup>3</sup>, RETV: 17.35W/m<sup>2</sup>
- Motion controlled energy efficient lighting at staircases to reduce energy consumption.
- Regenerative lifts to reduce energy consumption
- Separate chutes for recyclable waste.
- Use of sustainable and recycled products in development.
- Bicycle stands to encourage cycling as an environmentally friendly form of transport.



# ALKAFF OASIS (CONTRACT 7)

New Residential Building

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



Client/Developer	Surbana Jurong International Consultants Pte Ltd
Architect	Surbana Jurong International Consultants Pte Ltd
M&E Engineer	Surbana Jurong International Consultants Pte Ltd
Structural Engineer	Surbana Jurong International Consultants Pte Ltd
Quantity Surveyor	Surbana Jurong International Consultants Pte Ltd
Main Contractor	Chip Eng Seng Corporation Pte Ltd

- Estimated energy savings: 1288845.76 kWh/yr;  
Estimated water savings: 113768.64m<sup>3</sup>, RETV: 18.35W/m<sup>2</sup>
- Motion controlled energy efficient lighting at staircases to reduce energy consumption.
- Regenerative lifts to reduce energy consumption.
- Use of sustainable and recycled products in development.
- Separate chutes for recyclable waste.
- Bicycle stands to encourage cycling as an environmentally friendly form of transport.



# AMBER PARK

New Residential Building

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



Client/Developer	Aquarius Properties Pte Ltd (Joint venture between City Developments Limited and Hong Realty Pte Ltd)
Architect	SCDA Architects Pte Ltd
M&E Engineer	Squire Mech Pte Ltd
Structural Engineer	LSW Consulting Engineers Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Landscape Consultant	SCDA Architects Pte Ltd
ESD/ Green Consultant	DP Sustainable Design Pte Ltd

- Estimated energy savings: 3,460,557.23 kWh/yr;  
Estimated water savings: 116,720.9 m<sup>3</sup>/yr; RETV: 21.35W/m<sup>2</sup>.
- Optimal building orientations are designed to minimize heat gain and improve RETV. Sun shadings and performance glazing are provided to achieve maximum comfort.
- Efficient Air Conditioning System with the provision of 5-tick air conditioners.
- Use of Water Efficiency Labeling Scheme (WELS)-Certified fittings with a minimum of two ticks.
- Use of Energy Efficient lightings e.g. LED & T5 and Occupancy Sensors for Staircases & Toilets. Energy saving strategy to meet 58.41% improvement from baseline.
- Singapore Green Label products are used extensively in this development.



# BEDOK BEACON

New Residential Building

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



Client/Developer	Housing & Development Board
Architect	MKPL Architects Pte Ltd
M&E Engineer	J Roger Preston(s) Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
Main Contractor	Chiu Teng Construction Co Pte Ltd

- Estimated energy savings: 81,213kWh/yr;  
Estimated water savings: 5,906m<sup>3</sup>, RETV: 15.62W/m<sup>2</sup>
- Use of energy efficient features such as LED lights and energy efficient lift
- High adoption of sustainable construction
- Extensive greenery
- Extensive use of environmentally friendly products



# BEDOK NORTH WOODS

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	Welltech Construction Pte Ltd

- Estimated energy savings: 285,758.2kWh/yr;  
Estimated water savings: 217,532.7m<sup>3</sup>, RETV: 16.26W/m<sup>2</sup>
- Good North - South orientation of the units within the precinct to reduce thermal transfer to internal spaces
- Provision of LED lighting to common areas, reducing energy consumption. Staircases mid-landings LED lights come with motion sensors, to reduce wastage of electricity
- All lifts are energy saving, with sleep mode and energy recovery features



# BOULEVARD 88

New Residential Building

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



Client/Developer

City Developments Limited /  
Hong Leong Holdings Limited  
/ Lea Investments Pte Ltd

Architect

DP Architects Pte Ltd

M&E Engineer

Squire Mech Pte Ltd

Structural Engineer

Meinhardt (Singapore) Pte Ltd

Quantity Surveyor

Arcadis Singapore Pte Ltd

Main Contractor

Kajima Overseas Asia Pte Ltd

Landscape Consultant

STX Landscape Architects

ESD Consultant

DP Sustainable Design Pte Ltd

- The residential development offers lush green landscaped areas
- Effective lighting design by use of LED and the provision of motion sensors
- The provision of energy efficient air-conditioning system for all units contributes in energy savings for the development
- Extensive use of environmental friendly and sustainable materials certified by Singapore Green Labelling Scheme
- Provision of effective sun-shading for windows



# BUANGKOK SQUARE

New Residential Building

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



Client/Developer	Housing & Development Board
Architect/ Project Manager	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

- Extensive use of passive design strategies including good building orientation
- Extensive use of energy efficient features and water-saving sanitary fittings
- Extensive use of sustainable products



# CLEMENTI GATEWAY

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	Davis Langdon KPK (Singapore) Pte Ltd
Main Contractor	Koon Seng Construction Pte Ltd

- Estimated energy savings: 1,117,430kWh/yr; Estimated water savings: 9,995m<sup>3</sup>, RETV: 16.28W/m<sup>2</sup>
- Use of energy efficient features such as LED lights, energy efficient lift and sun pipes
- Extensive use of water efficient fittings
- Extensive greenery
- Extensive use of environmentally friendly products



# DAKOTA BREEZE (HDB GEYLANG C15)

New Residential Building

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



Client/Developer	Housing and Development Board
Architect	ADDP Architects LLP
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Progressive Builders Pte Ltd
Landscape Consultant	Earthscape Concepts Pte Ltd

- Motion sensor lighting control, regenerative lifts for all residential blocks & fuel cell system for lifts for all residential blocks
- Use of approved sustainable products & recycled products
- Eco-pedestal to all Bath/ WC of flats
- Provision of double refuse chute to separate recyclable from non-recyclable waste; Centralised Chute for Recyclables (CCR) for all residential blocks
- Provision of compost bins to recycle organic waste



# GHIM MOH EDGE

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	Davis Langdon KPK (Singapore) Pte Ltd
Main Contractor	Kay Lim Construction & Trading Pte Ltd

- Estimated energy savings: 2,849,896 kWh/yr; Estimated water savings: 42,388 m<sup>3</sup>, RETV: 17.35 W/m<sup>2</sup>
- Use of energy efficient features such as LED lights and energy efficient lift
- Extensive greenery
- Extensive use of environmentally friendly products



# HDB CLEMENTI N8C1

New Residential Building

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



Client/Developer	Housing and 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	Greatearth Corporation Pte Ltd

- Estimated energy savings: 464,708.51 kWh/yr;  
Estimated water savings: 38,496.37 m<sup>3</sup>,  
RETV: 17.22 W/m<sup>2</sup>
- Motion controlled energy efficient lighting at staircases to reduce energy consumption.
- Regenerative lifts to reduce energy consumption.
- Use of sustainable and recycled products in development.
- Separate chutes for recyclable waste.
- Covered bicycle stands to encourage cycling as an environmentally friendly form of transport.



# HDB SENGKANG N4C41

New Residential Building

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



Client/Developer	Housing and 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	Hock Guan Cheong Builder Pte Ltd
Landscape Consultant	Len-Til Pte Ltd

- Motion sensor lighting control, regenerative lifts for all residential blocks & fuel cell system for lifts for all residential blocks
- Use of approved sustainable products & recycled products
- Eco-pedestal to all Bath/ WC of flats
- Provision of double refuse chute to separate recyclable from non-recyclable waste; Centralised Chute for Recyclables (CCR) for all residential blocks
- Provision of compost bins to recycle organic waste



# INTEGRATED DEVELOPMENT AT SENGKANG CENTRAL / COMPASSVALE BOW (RESIDENTIAL)

New Residential Buildings

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



Client/Developer	Siena Residential Development Pte. Ltd. (A Joint-Venture between Capitaland Limited and City Developments Limited)
Design Architect	MKPL Architects Pte Ltd
Project Architect	SAA Architects Pte Ltd
M&E Engineer	BEIMACS Pte Ltd
Structural Engineer	Mott MacDonald Singapore Pte Ltd
Quantity Surveyor	Threesixty Cost Management Pte Ltd
ESD/Green Mark Consultant	Atelier Ten (Asia) Pte Ltd

- All residential units use energy efficient (5-ticks) air-conditioning systems.
- Optimized building orientation to reduce the solar heat gain and efficient building façade for a low RETV of 19.69 W/m<sup>2</sup>.
- The public realm is interweaved with green features to achieve a high GnPR of 5.49.
- Sustainable construction by means of Prefabricated Prefinished Volumetric Construction (PPVC) technology.
- Waste disposal for all Residential Units by means of a double chute PWCS (Pneumatic Waste Conveyance System), with separate chutes for recyclables and non-recyclables.



# JURONG EAST VISTA

New Residential Building

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



Client/Developer	Housing and Development Board
Architect	P&T Consultants Pte Ltd
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	P&T Consultants Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Kindly Construction & Services Pte Ltd
Landscape Consultant	Ecoplan Asia Pte Ltd

- Estimated energy savings: 371,138.45kWh/yr; Estimated water savings: 17,123.06m<sup>3</sup>/yr; RETV: 16.46W/m<sup>2</sup>
- Most of the Residential units are having North/South orientation, having plenty of daylight to the units as well as public areas.
- Regenerative lifts are used to reduce energy consumption.
- Bicycle stands are provided to encourage cycling as an environmentally friendly form of transport.
- Pneumatic Waste Collection System centralize refuse for convenient refuse collection.



# MARTIN MODERN

New Residential Building

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



Client/Developer	Martin Modern Pte Ltd
Architect	ADDP Architects LLP
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	KCL Consultants Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Lian Beng Construction (1988) Pte Ltd

- Estimated energy savings: 957477.47kWh/yr;  
Estimated water savings: 437857.69m<sup>3</sup>, RETV: 21.06W/m<sup>2</sup>
- Use of energy efficient features such as motion sensors, energy efficient lift and ventilation systems etc.
- Use of water fittings that are certified under WELS with mostly excellent and very good rating
- Extensive greenery with green plot ratio of 6.0



# MATILDA SUNDECK

New Residential Building

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



Client/Developer	Housing & Development Board
Project Manager	P&T Consultants Pte Ltd
Architect	P&T Consultants Pte Ltd
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	P&T Consultants Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	China Construction Realty Co Pte Ltd
Landscape Consultant	Site Concepts International Pte Ltd

- Estimated energy savings: 458742.59kWh/yr;  
Estimated water savings: 64028.3m<sup>3</sup>/yr; RETV: 15.01W/m<sup>2</sup>
- Most of the Residential units are having North/South orientation, having plenty of daylight to the units as well as public areas.
- Motion sensor controlled energy efficient lighting is installed at common staircases to reduce energy consumption.
- Regenerative lifts are used to reduce energy consumption.
- Bicycle stands are provided to encourage cycling as an environmentally friendly form of transport.
- Provision of recyclable refuse chute allow convenient disposal of refuse for residents.



# NORTHSHORE COVE

New Residential Building

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



Client/Developer	Housing and Development Board
Architect	Kyooob Architects Pte Ltd
M&E Engineer	Bescon Consulting Engineering Pte Ltd
Structural Engineer	LSW Consulting Engineers Pte Ltd
Quantity Surveyor	WT Partnership Quantity Surveyors & Construction Cost Co
Main Contractor	Right Construction Pte Ltd

- Estimated energy savings: 283,808.31kWh/yr;  
Estimated water savings: 172,513.69m<sup>3</sup>, ETTV: 19.34W/m<sup>2</sup>
- High Efficient VVVF motor system regenerative lift
- High Efficient LED Lighting and motion detector
- Extensive use of environmentally friendly products
- High Efficient glass for façade
- High Efficient CO sensor at basement carpark
- High Efficient rainwater harvesting system for irrigation and non-portable uses
- High Efficient water irrigation system for landscape deck and sky terraces
- High Innovative pneumatic waste collection system



# NORTHSHORE RESIDENCES I & II

New Residential Building

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



Client/Developer	Housing & Development Board
Project Manager	SIPM Consultants Pte Ltd
Architect	Building Research Institute (HDB)
M&E Engineer	Building Research Institute (HDB)
Structural Engineer	Building Research Institute (HDB)
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	KEN-PAL (S) Pte Ltd
Landscape Consultant	Building Research Institute (HDB)

- Estimated energy savings: 2024000kWh/yr;  
Estimated water savings: 90930m<sup>3</sup>/yr; RETV: 19.53W/m<sup>2</sup>
- Regenerative Lifts to reduce energy consumption
- Rainwater harvesting system to store rainwater for common area washing
- ABC water design features to clean rainwater and beautify the landscape
- Separate Chutes for recyclable waste
- Eco-pedestals in bathrooms to encourage water conservation
- Provision of pneumatic waste collection system



# NORTHSHORE STRAITSVIEW

New Residential Building

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



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

- Estimated energy savings: 512983.78kWh/yr;  
Estimated water savings: 55663.44m<sup>3</sup>/yr; RETV: 17.78W/m<sup>2</sup>
- Separate chutes for recycle waste
- Eco-pedestals in bathrooms to encourage water conservation
- Bicycle stands to encourage cycling as an environmentally friendly form of transport
- Rainwater harvesting system to store rainwater for washing of common areas
- Regenerative lifts to reduce energy consumption



# NORTHSHORE TRIO

New Residential Building

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



Client/Developer

Housing & Development Board

Architect

Design Link Architects

M&E Engineer

United Project Consultants Pte Ltd

Structural Engineer

KTP Consultants Pte Ltd

Quantity Surveyor

WT Partnership (S) Pte Ltd

Main Contractor

BHCC Construction Pte Ltd

- Estimated energy savings: 279,490kWh/yr; Estimated water savings: 22139.6m<sup>3</sup>, RETV: 16.15W/m<sup>2</sup>
- Extensive use of natural landscaping throughout the site encourages greenery usage to reduce heat island effect
- Extensive use of higher tier SGBC sustainable/recycled products within the development helps to promote sustainability and stay environment friendly
- Use of energy efficient equipment such as energy efficient lightings in common areas helps to minimize energy consumption



# PARC RIVIERA

New Residential Building

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



Client/Developer	EL Development (West Coast) Pte. Ltd.
Architect	ADDP Architects LLP
M&E Engineer	Conteem Engineers Pte Ltd
Structural Engineer	KCL Consultants Pte Ltd
Main Contractor	Evan Lim & Co Pte Ltd
Landscape Consultant	Salad Dressing
Interior Design Consultant	Design Inck Pte Ltd

- Estimated energy savings: 1,067,100kWh/yr;  
Estimated water savings: 43,335.72m<sup>3</sup>; RETV: 21.99W/m<sup>2</sup>
- Blocks are orientated to take advantage of prevailing winds and minimise solar heat gain.
- Use of energy efficient features such as motion sensors, ventilation systems etc.
- Use of water fittings that are certified under WELS including water efficient washing machine.
- Energy re-generative lift provision to reduce power consumption for all lifts.
- Eco-friendly materials for dry wall panels, ceiling panels and paintings are used to minimize environmental impact.



# PROPOSED RESIDENTIAL DEVELOPMENT AT PEARL BANK

New Residential Building

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



Client/Developer	Capitaland Limited
Design Architect	Serie + Multiply Consultants Pte Ltd
Project Architect	RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer	BEI/MACS Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	Threesixty Cost Management Pte Ltd
Landscape Architect	Ramboll Studio
ESD Consultant	BEI/MACS Pte Ltd / ZEB-Technology Pte Ltd

- Estimated energy savings: 3371759.75kWh/yr; Estimated water savings: 144229.75m<sup>3</sup>/yr; RETV: 20.87W/m<sup>2</sup>
- Extensive landscape with Green Plot Ratio (GnPR) of 13.
- Landscape has been designed to achieve NParks Landscape Excellence Framework (LEAF) and PUB Active, Beautiful, Clean (ABC) Water Programme Certification.
- LED lighting and efficient lighting design has been implemented to achieve 40% energy savings in common area lighting.
- Regenerative lifts are installed for all lifts.
- Building has been designed to incorporate passive design strategies such as staggering blocks, void decks at ground and mid-floor sky terraces to promote airflow.



# SENJA RIDGES

New Residential Building

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



Client/Developer	Housing and 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 Ltd
Main Contractor	Greatearth Corporation Pte Ltd
Landscape Consultant	COEN Design International Pte Ltd

- Estimated energy savings: 232,917.5kWh/yr;  
Estimated water savings: 48,984m<sup>3</sup>/yr;  
RETV: 16.53W/m<sup>2</sup>
- Provision of centralized dual refuse chutes to separate recyclable from non-recyclable waste
- Provision of lifts with Variable Voltage Variable Frequency (VVVF) drives and regenerative component
- Use of water efficient fittings and integrated basin/cistern pedestal water closet
- Motion sensors are introduced at staircases to provide on-demand lighting



# SKY VISTA @ BUKIT BATOK

New Residential Building

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



Client/Developer	Housing and Development Board
Architect	P&T Consultants Pte Ltd
M&E Engineer	United Project Consultants Pte. Ltd
Structural Engineer	P&T Consultants Pte Ltd
Quantity Surveyor	WT Partnership (S) Pte Ltd
Main Contractor	Greearth Construction Pte Ltd
Landscape Consultant	Len-Til Pte Ltd

- Building orientation is predominantly North-South (RETV: 18.14W/m<sup>2</sup>).
- Use of LED lights for common areas.
- Use of Integrated wash basin WC.
- Provision of extensive green roofs.
- Provision of dual refuse chutes with separated recyclable chute.



# SUN BREEZE

New Residential Building

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



Client/Developer	Housing and 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
Main Contractor	LC&T Builder Pte Ltd

- Extensive mscp landscape greenery
- Led lighting for common areas
- Installation of Precast Bathroom Units
- Extensive use of sustainable products



# TAMPINES GREEN FOLIAGE

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	Ho Lee Construction Pte Ltd
Landscape Consultant	Ong&Ong Pte Ltd

- Estimated energy savings: 5445443.76kWh/yr;  
Estimated water savings: 19486m<sup>3</sup>/yr; RETV: 17.23W/m<sup>2</sup>
- Pneumatic Waste Collection System
- Motion Sensors in Staircase landing
- Double Refuse Chute
- Integrated Basin Cistern Pedestal System
- Pre-cast Toilets



# TAMPINES GREENVERGE

New Residential Building

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



Client/Developer	Housing and Development Board
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	Kay Lim Construction & Trading Pte Ltd
Landscape Consultant	Surbana Jurong Consultants Pte. Ltd.

- Good building facade design and orientation (RETV=16.27 W/m<sup>2</sup>; with minimum direct west facing facade)
- Generous greenery provision on landscaped deck
- Use of water efficient fittings (with PUB approved WELS rating) and adequate water sub-metering provision at common areas
- Use of energy efficient lifts with sleep mode
- Motion sensor lights are installed at common staircases to reduce energy consumption



# TAMPINES GREENVIEW

New Residential Building

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



Client/Developer	Housing and Development Board
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	Ho Lee Construction Pte Ltd
Landscape Consultant	Surbana Jurong Consultants Pte. Ltd.

- Estimated energy savings: 386,268.55kWh/yr;  
Estimated water savings: 87,315.84m<sup>3</sup>; RETV: 18.04W/m<sup>2</sup>
- Motion sensor controlled energy efficient lighting is installed at staircase to reduce energy consumption.
- Regenerative lifts are used to reduce energy consumption.
- Eco-pedestals are used in bathrooms to encourage water conservation.
- Bicycle stands to encourage cycling as an environmentally friendly form of transport
- Pneumatic Waste Conveyance System to provide cleaner waste disposal



# TAMPINES GREENVINES

New Residential Building

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



Client/Developer	Housing & Development Board
Project Manager	Arcadis Project Management Pte Ltd
Architect	LAUD Architects Pte Ltd
M&E Engineer	Alpha Consulting Engineers Pte Ltd
Structural Engineer	ECAS Consultants Pte Ltd
Quantity Surveyor	LCH Quantity Surveying Pte Ltd
Main Contractor	Wee Poh Construction Co. (Pte.) Ltd.
Landscape Consultant	Ong & Ong Pte Ltd
Design Consultant	G8A Singapore Pte. Ltd.
ESD Consultant	Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

- Estimated energy savings: 1,354,000 kWh/year;  
Estimated water savings: 108,000 m<sup>3</sup>/yr; RETV: 20.99W/m<sup>2</sup>
- Extensive provision of Greenery around the development.
- Use of Regenerative Lifts with VVVF Drives.
- Use of Smart Lighting Control System for LED lights with motion sensors.
- The building orientation, mostly facing North-East and South-West, minimises direct East and West facing units to reduce solar heat gain into the dwelling units.



# TAMPINES GREENWEAVE

New Residential Building

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



Client/Developer	Housing & Development Board
Architect	Surbana Jurong Consultants Private Limited
M&E Engineer	Surbana Jurong Consultants Private Limited
Structural Engineer	Surbana Jurong Consultants Private Limited
Quantity Surveyor	Surbana Jurong Consultants Private Limited
Main Contractor	CNQC Engineering & Construction Pte Ltd

- Building blocks are designed to minimise heat gain through walls and windows
- Building design encourages the use of daylighting to reduce energy use for artificial lightings
- Provision of extensive greenery with high Green Plot Ratio
- Extensive use of environment friendly products
- Use of Pneumatic Waste Collection and Disposal System



# THE GARDEN RESIDENCES

New Residential Building

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



Client/Developer	Gardens Development Pte Ltd
Project Manager	Keppel Land (Singapore) Pte Ltd
Architect	ADDP Architects LLP
M&E Engineer	WSP Consultancy Pte Ltd
Structural Engineer	TW-Asia Consultants Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Dragages Singapore Pte Ltd
Landscape Consultant	COEN Design International Pte Ltd
ESD Consultant	ZEB-Technology Pte Ltd
Interior Designer	Index Design Pte Ltd

- Estimated energy savings: 1084061.23kWh/yr;  
Estimated water savings: 179097m<sup>3</sup>/yr; RETV: 20.11W/m<sup>2</sup>
- Use of energy efficient air-conditioning units that are rated with 5 ticks.
- Rain water harvesting and drip irrigation system. WELS water fittings result in 23% savings.
- Use of cool paint for the entire east and west facades.
- Extensive greenery with GnP of 5.90 with facilities and nature integrated into the design greatly focusing on the occupants' wellbeing.
- 100% use of LED light fittings. Lighting at staircase and common toilets are controlled by motion sensors.



# THE POIZ RESIDENCES & THE POIZ CENTRE

New Residential Building

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



Client/Developer	MCC Land (Potong Pasir) Pte Ltd
Architect	ADDP Architects LLP
M&E Engineer	DP Engineers Pte Ltd
Structural Engineer	DP Engineers Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	China Jingye Engineering Corporation Limited (Singapore Branch)

- Estimated energy savings: 521,117kWh/yr;  
Estimated water savings: 52,113m<sup>3</sup>, RETV: 20.28W/m<sup>2</sup>
- Use of energy efficient features such as motion sensors, energy efficient lift and ventilation systems.
- Extensive use of water efficient fittings
- Extensive greenery
- Extensive use of environmentally friendly products



# TWIN VEW

New Residential Building

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



Client/Developer	CSC LAND GROUP (SINGAPORE) PTE LTD
Architect	P&T Consultants Pte Ltd
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	TW-Asia Consultants Pte Ltd
Quantity Surveyor	Surbana Jurong Consultants Pte Ltd
Main Contractor	China Construction (South Pacific) Development Co Pte Ltd
Landscape Consultant	Ecoplan Asia Pte Ltd
Interior Designer	Index Design Pte Ltd

- Estimated energy savings: 432638kWh/yr;  
Estimated water savings: 163m<sup>3</sup>/yr; RETV: 21.39W/m<sup>2</sup>
- Provision of Energy Efficient air-conditioners, Energy Efficient lifts, Energy Efficient light fittings at communal facilities and the use of motion sensors at staircases
- Extensive Greenery
- Provision of Water Efficient Products
- Provision of Facilities for Storage and Composting of Horticultural Waste at Common Area
- Low Volatile Organic Compound (VOC) paint.



# VALLEY SPRING @ YISHUN

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	Surbana Jurong Consultant Pte Ltd
Main Contractor	Teambuild Engineering & Construction Pte Ltd

- Pneumatic Waste Conveyance System with double refuse chutes at each residential blocks are provided for separating recyclable from non-recyclable waste
- Motion sensor-controlled energy efficient lighting at staircases to reduce energy consumption
- Use of regenerative lifts to reduce energy consumption
- Provision of eco-pedestals in bathroom to encourage water conservation
- Provision of bicycle stands to encourage cycling as an environmentally friendly form of transport



# WATERFRONT I & II @ NORTHSORE

New Residential Building

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



Client/Developer	Housing & Development Board
Project Manager	Tan Ee Ping Consultants
Architect	Building Research Institute (HDB)
M&E Engineer	Building Research Institute (HDB)
Structural Engineer	Building Research Institute (HDB)
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	China Construction (South Pacific) Development Co Pte Ltd
Landscape Consultant	Building Research Institute (HDB)

- Estimated energy savings: 2,982,440.59kWh/yr; Estimated water savings: 207760m<sup>3</sup>/yr; RETV: 19.69W/m<sup>2</sup>
- Lush greenery and roof gardens throughout the site helps to minimize ambient temperature and cools environment as well as reduces heat island effect
- Use of energy efficient equipment such as energy efficient lightings in common areas helps to minimize energy consumption
- Use of efficient fittings for common areas and residential units ensures minimal water wastages
- Use of green and recycled products within the development helps to promote sustainability and stay environmentally friendly
- Good access to amenities like bus stop and comprehensive network of covered link ways promotes use of public transport and facilitates pedestrian connectivity within the development



# WATERWAY SUNRISE I

New Residential Building

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



Client/Developer	Housing and Development Board
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	Rich-Link Construction Pte Ltd
Landscape Consultant	Surbana Jurong Consultants Pte. Ltd.

- Estimated energy savings: 6,817,675.62kWh/yr;  
Estimated water savings: 143,331.84m<sup>3</sup>; RETV: 16.44W/m<sup>2</sup>
- Excellent Natural Day-lighting Within Residential Units and Common Area
- Provision of Energy Efficient Lifts for all Residential Blocks
- Automatic Irrigation System for more than 50% of all Landscape Area
- Provision of Lush Greenery and Landscape at Environmental Deck and Roof Gardens



# WATERWAY SUNRISE II

New Residential Building

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



Client/Developer	Housing & Development Board
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	Lian Ho Lee Construction (Private) Limited

- Building blocks are designed to minimise heat gain through walls and windows, with a low RETV Value of 18W/m<sup>2</sup>
- Building design encourages the use of daylighting within residential units and common areas
- Use of energy efficient lifts for all residential blocks
- Use of automatic irrigation system for >75% of all landscape areas
- Provision of lush greenery and landscape at environmental deck and roof gardens



# WHISTLER GRAND

New Residential Building

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



Client/Developer	CDL Pegasus Pte Ltd
Architect	ADDP Architects LLP
M&E Engineer	United Project Consultants Pte Ltd
Structural Engineer	TW-Asia Consultants Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd
Main Contractor	Woh Hup Pte Ltd
Landscape Consultant	COEN Design International Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd

- Estimated energy savings: 2745906.3kWh/yr;  
Estimated water savings: 186849m<sup>3</sup>/yr;  
RETV: 20.39W/m<sup>2</sup>
- Use of >80% 5 ticks air con for all dwelling units
- Use of 100% LED Lighting
- Use of VVVF and sleep mode lifts Regenerative lifts are installed for all lifts.
- Integrated within a lush landscape of nature and water to encourage the desired lifestyle living.
- Smart home solutions have been implemented to promote a smarter and more efficient living habits



# WOODLEIGH VILLAGE

New Residential Building

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



Client/Developer	Housing & Development Board
Architect/ Project Manager	MKPL Architects Pte Ltd
M&E Engineer	Alpha Consulting Engineers Pte Ltd
Structural Engineer	KTP Consultants Pte Ltd
Quantity Surveyor	Rider Levett Bucknall LLP
ESD Consultant	Building System & Diagnostics Pte Ltd
Landscape Consultant	Sitetectonix Pte Ltd
Main Contractor	China Construction (South Pacific) Development Co Pte Ltd

- Green plot ratio of 6.58
- Good access to Woodleigh MRT station and Bus Interchange
- Adoption of daylighting for more than 80% of corridors and lobbies
- Use of low VOC paint for at least 90% of internal wall areas
- Adoption of pneumatic waste collection system
- Provision of double refuse chutes to separate recyclable from non-recyclable waste
- Provision of lifts with regenerative drive



# ANCHOR GREEN PRIMARY SCHOOL

Existing Schools

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



Client/Developer	Ministry of Education
Architect	-
M&E Engineer	-
Structural Engineer	-
Quantity Surveyor	-
Main Contractor	-

- Provision of an educational, fun and engaging green hub (i.e. eco garden with water filtration system, EE gallery, Anchor Glade) equipped with adequate learning materials on environmental sustainability for both students and staff.
- Provision of recycling bins at strategic locations within the school (e.g. canteen, general office) and recycling do's and don'ts poster to educate users to recycle correctly.
- Vertical greenery wall as part of school's efforts to expand the greenery in the school.
- Green Ambassadors are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits.
- LAN Rooms' temperature is set at the optimal temperature of 24 °C
- Air sterilizers are installed in the HOD and staff rooms.
- 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 minimize heat gain within the building.
- Energy and water usage are monitored and documented with reasons for high and low consumption. These trends of energy and water utilization are communicated to both staff and students to encourage them to reduce consumption.
- Environmental Sustainability topics are integrated into the school's education framework and activities, including environment and green procurement policies.



# CANBERRA PRIMARY SCHOOL

Existing Schools

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



Client/Developer	Ministry of Education
Facility Management	Guthrie FMC Pte Ltd
Green Consultant	ES Management Pte Ltd

- Green Ambassadors are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits.
- A range of native plants lines 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.
- Provision of an educational, fun and engaging green hub equipped with adequate learning materials on environmental sustainability for both students and staff.
- Provision of recycling bins at strategic locations within the school (eg. Canteen) and posters recycling Do's and Don'ts posters to educate users to recycle correctly.



# EDGEFIELD SECONDARY SCHOOL

Existing Schools

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



Client/Developer	Ministry of Education
Architect	-
M&E Engineer	-
Structural Engineer	-
Quantity Surveyor	-
Main Contractor	-

- Green Ambassadors and Student Advocates are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits.
- The school is built with minimal west and east facing facades and adequate provision of effective sun shading devices on the aforementioned facades to minimize heat gain within the building.
- The school's LAN Rooms' are set at the optimal temperature of 24°C.
- Provision of an educational, fun and engaging green environment equipped with adequate learning materials on environmental sustainability for both students and staff.
- Provision of recycling bins at strategic locations within the school (e.g. Canteen, Green Corner) and recycling do's and don'ts poster to educate users to recycle correctly.
- Energy and water usage are monitored and documented with reasons for high and low consumption. These information on trends of energy and water utilization are communicated to both staff and students to encourage them to reduce consumption if necessary.



# FUHUA PRIMARY SCHOOL

Existing Schools

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



Client/Developer	Ministry of Education
Architect	-
M&E Engineer	-
Structural Engineer	-
Quantity Surveyor	-
Main Contractor	-

- Fuhua Primary School offers a wide spectrum of well structured & comprehensive environmental programmes for staff & students alike.
- A list of air-conditioning inventory list and documentations were completed to identify less efficient air-conditioning units. The average system efficiency of the air conditioning system is 0.90kW/RT.
- 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.
- Recycling efforts include the provision of recycling bins at strategic locations within the school and recycling posters with do's and don'ts poster to educate users on recycling. The recyclables collected are then placed in the Makers Studio for students to construct their makers projects.
- 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.



# GREENWOOD PRIMARY SCHOOL

Existing Schools

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



Client/Developer	Ministry of Education
Architect	-
M&E Engineer	-
Structural Engineer	-
Quantity Surveyor	-
Main Contractor	-

- Provision of educational, fun and engaging green hub equipped with adequate learning materials on environmental sustainability for both students and teachers.
- Provision of twin bins in classrooms to encourage recycling among students.
- Provision of recycling bins at strategic location within the school (e.g. canteen) and recycling do's and don'ts poster to educate users on recycling.
- A range of native plants are planted in the school and labels are display on the information of each plant to provide student with knowledge on these native plants.
- Green Ambassadors are appointed to ensure that green practices are carried out in the school and to influence their peers to adapt environmentally friendly habits
- Energy and water usage are monitored and documented with reasons for high and low consumption. These trends on energy and water utilization are communicated to both staff and students to encourage them to reduce consumption.
- The school is built with minimal west and east facing facades and adequate provision of effective sun shading devices on the aforementioned facades to minimize of heat gain within the building.



# HILLGROVE SECONDARY SCHOOL

Existing Schools

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



Client/Developer

Ministry of Education

- Implemented a collaborative project, Soak Away Rain Garden, with the Public Utilities Board (PUB) which provides authentic learning opportunities for students to learn about the importance of having a clean and safe water.
- Collaborated with the National Environmental Agency (NEA) to install a food waste recycling set-up to convert discarded food into compost, which is used to fertilise soil on the school grounds.
- Together with the students, created a green fence using recycled bottles, and is in the process of setting up a herbs garden.
- Installed a Water Wall and Environmental Wall to showcase the importance of water and the 4 national taps, climate change and its impact to Singapore, as well as waste minimisation and energy conservation
- Implemented the Green@Hillgrove. This program, which started in 2010, has been reaching out to the residents in Bukit Gombak Constituency about the importance of conservation and 4Rs (Reduce, Reuse, Recycle and Refuse).



# MEE TOH SCHOOL

Existing Schools

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



Client/Developer

Ministry of Education

- Environment Champions and Captain Rs are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits.
- A rainwater harvesting tank is also located outside the General Office to collect rainwater and use it for irrigation purposes.
- LED lightings are installed at the first level of Block A (eg. General Office, Library).
- Provision of an educational, fun and engaging green corners equipped with adequate learning materials on environmental sustainability for both students and staff.
- The school has a range of native plants at the eco-garden of the school. There are also labels displaying information of each plant are placed next to each plant to provide students with knowledge on these native plants.



# MERIDIAN PRIMARY SCHOOL

Existing Schools

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



Client/Developer

Ministry of Education

Facility Manager

CPG Facilities Management Pte Ltd

- Built with east and west facing facades which are occupied by staircase and corridors
- Monitoring of energy and water consumption. Trending information are communicated to both staff and students to encourage sustainable behaviour
- Provision of recycling bins at strategic locations within the schools such as canteen, classroom , 3R corner and staff room
- Provision of high volume low speed fan in the hall
- Winner of Vanda Miss Joaquim Award in 2018



# PEI HWA SECONDARY SCHOOL

Existing Schools

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



Building Owner

Ministry of Education

Facilities Manager

Guthrie FMC Pte Ltd

- Green Ambassadors are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits.
- Recycling efforts include the provision of recycling bins at strategic location within the school and recycling posters to educate the school on recycling.
- Energy and water usage are monitored, and these trends are communicated to both staff and students to encourage them to reduce consumption if necessary
- The school is built with minimal west and east facing facades and adequate provision of effective sun shading devices on the aforementioned facades to minimize heat gain within the building
- Schedule for air-conditioning is formulated to reduce unnecessary usage of AC system.
- LAN Rooms' temperature is set to optimal temperature of 24 degrees Celsius.



# YUHUA SECONDARY SCHOOL

Existing Schools

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



Client/Developer	Ministry of Education
Architect	-
M&E Engineer	-
Structural Engineer	-
Quantity Surveyor	-
Main Contractor	-

- Provision of an educational, fun and engaging green hub equipped with adequate learning materials on environmental sustainability for both students and staff.
- Provision of recycling bins at strategic locations within the school (e.g. canteen) and recycling do's and don'ts poster to educate users to recycle correctly.
- Provision of twin bins in classrooms to encourage recycling amongst students.
- A range of native plants lines 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.
- Green Ambassadors are appointed to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits.
- Energy and water usage are monitored and documented with reasons for high and low consumption. These information on trends of energy and water utilization are communicated to both staff and students to encourage them to reduce consumption if necessary.
- The school is built with minimal west and east facing facades and adequate provision of effective sun shading devices on the aforementioned facades to minimize heat gain within the building.



# 44 SPRINGLEAF RISE

New Landed House

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Owner	Mr Von Lee
Architect	A D Lab Pte Ltd
M&E Engineer	CCA Partners Pte Ltd
Structural Engineer	CMP Consultants Pte Ltd
Quantity Surveyor	-
Main Contractor	Expand Construction Pte Ltd

- Estimated energy savings: 69, 638kWh/yr;  
Estimated water savings: 195m<sup>3</sup>
- Use of double glazed Low-E glass panels
- Use of energy efficient LED lighting
- 15.37KWp Solar PV system at Roof
- Provision of Solar water heater with Energy saving heat pump
- Extensive use of environmentally friendly products
- Extensive landscape green area with rain-water harvesting and auto-irrigation
- Creative design for cross and natural ventilation



# LUXUS HILLS (PHASE 16)

New Residential Building

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



Client/Developer	Bukit Sembawang Estates 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	Arcadis Singapore (Pte) Ltd
Main Contractor	Seah Construction Pte Ltd

- Estimated energy savings: 236,322.25kWh/yr;  
Estimated water savings: 3513.13m<sup>3</sup>/yr
- Provide PV Panels to collect solar energy to offset electrical consumption
- Provide clothes drying facilities to discourage use of dryer
- Use of heat recovery system for water heaters
- Use of home lift with >95% of the parts recyclable and with energy class A rating (VDI 4707)
- Underground Rainwater Harvesting Tank collects rainwater for irrigation





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

Jurong Fire Station

Mandai MRT Depot and Mandai Bus Depot

Sembcorp Marine Corporate Office

Tuas Desalination Plant

158 Cecil Street (2nd Re-Certification)

51 Cuppage Road (2nd Re-Certification)

71 Robinson Road (3rd Re-Certification)

Akzonobel House (2nd Re-Certification)

Animal Breeding Facility at 9 Perahu Road

Beauty World Centre

CSC @ Changi Clubhouse

### CATEGORY

New Non-Residential Building

New Non-Residential Building

New Non-Residential Building

New Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

### CLIENT/DEVELOPER/BUILDING OWNER

Singapore Civil Defence Force

Land Transport Authority

Jurong Shipyard Pte Ltd

Public Utilities Board

ISKM Investment Pte Ltd

Frasers Property Cuppage Pte Ltd

CR-71 ROBINSON ROAD SINGAPORE PTE LTD

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

InVivos Pte Ltd

The Management Corporation Strata Title Plan No.  
2121

Civil Service Club





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

DNV GL LABORATORY

EM@Redhill

FoodAxis @ Senoko

Fortune Centre (MCST1001)

Grundfos Singapore

HDB Mall - 888 Plaza

HDB Mall - Elias Mall

HDB Mall - Pioneer Mall

HDB Mall - Woodlands Mart

HDB Mall - Yew Tee Square

Hotel Miramar Singapore

### CATEGORY

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Building

Existing Non-Residential Buildings

### CLIENT/DEVELOPER/BUILDING OWNER

DNV GL Singapore Pte Ltd

EM Services Pte Ltd

HSBC Institutional Trust Services (S) Ltd as trustee of  
Ascendas Real Estate Investment Trust

Management Corporation Strata Title Plan No. 1001

Grundfos (Singapore) Pte Ltd

Housing & Development Board

Housing & Development Board

Housing & Development Board

Housing & Development Board

Housing & Development Board

Hotel Miramar Singapore Limited





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

HSL Waterfront@Penjuru

Hyflux Innovation Centre

Keppel Distripark Block 511

Kitchener Complex

LASALLE College of the Arts

Liat Towers

Marina Bay Cruise Centre Singapore

Neuros & Immunos

New Bridge Centre

Orchard Building

### CATEGORY

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

### CLIENT/DEVELOPER/BUILDING OWNER

Verdeland Pte Ltd

HSBC Institutional Trust Services (S) Ltd as a trustee of  
Ascendas Real Estate Investment Trust

PSA Corporation Ltd

Housing & Development Board (HDB)

LASALLE College of the Arts Limited

Goldvein Pte Ltd

Singapore Tourism Board

HSBC Institutional Trust Services (Singapore) Ltd as  
Trustee of AREIT

Housing & Development Board

Allsland Pte Ltd





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

OUE Bayfront

OUE Downtown 1&2

P&G Singapore Innovation Center

Pasir Panjang Terminal Building

Peninsula Plaza

Plaza 8 @ CBP

Ramada Singapore At Zhongshan Park

Robinson 77

Tampines Mall

The Clementi Mall

West Mall

### CATEGORY

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

### CLIENT/DEVELOPER/BUILDING OWNER

DBS Trustee Limited as Trustee of OUE Commercial Real Estate Investment Trust

Alkas Realty Pte Ltd c/o Jones Lang LaSalle Property Consultants Pte Ltd

Procter & Gamble International Operations SA Singapore Branch

PSA Corporation Limited

The Management Corporation - Strata Title Plan No. 1031

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

HH Properties Pte Ltd

77R Investments Pte. Ltd.

HSBC Institutional Trust Services (Singapore) Limited as Trustee of Capitaland Mall Trust

SPH Retail Property Management Services Pte Ltd

Alprop Pte. Ltd.





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

yo:HA Commercial @ Tampines

Admiralty Flora

Anchorvale Plains

Ang Mo Kio Court

ARTRA

Bedok North Vale

Bedok South Horizon

Buangkok Woods

City Vue @ Henderson

Clementi Crest

Clementi NorthArc

### CATEGORY

Existing Non-Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

### CLIENT/DEVELOPER/BUILDING OWNER

E M Real Estate Pte Ltd

Housing & Development Board

Housing & Development Board

Housing & Development Board

FEC SKYLINE PTE LTD

Housing and Development Board

Housing and Development Board

Housing & Development Board

Housing and Development Board

Housing & Development Board

Housing & Development Board





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

Clementi Peaks

Daintree Residence

Eastcreek @Canberra

Fernvale Woods

Forest Spring @ Yishun

Golden Lavender

Hougang RiverCourt

Meadow Spring @ Yishun

Melody Spring @ Yishun

Senja Valley

Sun Natura (Sembawang N3C8)

### CATEGORY

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

### CLIENT/DEVELOPER/BUILDING OWNER

Housing & Development Board

Setia (Bukit Timah) Pte Ltd

Housing and Development Board

Housing and Development Board

Housing and Development Board

Housing and Development Board

Housing and Development Board

Housing and Development Board

Housing and Development Board

Housing and Development Board

Housing and Development Board





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

Tampines GreenBloom

Tampines GreenEdge

Tampines GreenFlora

Teck Whye View (HDB Choa Chu Kang N1C16)

The Crest

West Edge @ Bukit Batok

West Plains @ Bukit Batok

West Quarry

West Scape @ Bukit Batok

Yishun N6 C17-18 Ferngrove

Admiralty Primary School

### CATEGORY

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

New Residential Buildings

Existing Schools

### CLIENT/DEVELOPER/BUILDING OWNER

Housing & Development Board

Housing & Development Board

Housing & Development Board

Housing & Development Board

WINGCROWN INVESTMENT PTE LTD

Housing & Development Board

Housing & Development Board

Housing & Development Board

Housing & Development Board

Housing & Development Board

Ministry Of Education





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

Anderson Secondary School

Broadrick Secondary School

Bukit Panjang Government High School

Canberra Secondary School

Clementi Town Secondary School

Eunos Primary School

Evergreen Secondary School

Fuhua Secondary School

Henry Park Primary School

Junyuan Primary School

Naval Base Secondary School

### CATEGORY

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

### CLIENT/DEVELOPER/BUILDING OWNER

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education





## GREEN MARK FOR BUILDINGS AWARD | GOLD

### PROJECT NAME

North Vista Primary School

Qifa Primary School

Rivervale Primary School

Seng Kang Secondary School

Springfield Secondary School

Yangzheng Primary School

Yuhua Primary School

### CATEGORY

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

Existing Schools

### CLIENT/DEVELOPER/BUILDING OWNER

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education

Ministry Of Education





## GREEN MARK FOR BUILDINGS AWARD | CERTIFIED

### PROJECT NAME

The Rutherford & Oasis

AIA Tower

KA Centre

KA Place

The RiverWalk

Concorde Hotel Singapore

88 International Road

Paragon

Chinatown Point

HSBC Building

Hotel Re!

### CATEGORY

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

Existing Non-Residential Buildings

### CLIENT/DEVELOPER/BUILDING OWNER

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

AIA Singapore Private Limited

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

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

MCST no.1302

LUXURY HOTELS (1989) PTE LTD

Mr. Edwin Ho

SPH Retail Property Management Services Pte Ltd

MCST 1789

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

Hotel Re! Pte Ltd





# BCA GREEN MARK OCCUPANT-CENTRIC SCHEMES

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






# BCA-HPB GREEN MARK FOR HEALTHIER WORKPLACES

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The health and well-being of building occupants is increasingly becoming a major value proposition for the adoption of green buildings and interior spaces. This awareness is echoed by business leaders and companies that place growing emphasis on employee health and well-being to differentiate themselves as the employer of choice. In line with global trend and increasing demand for green and healthy buildings, the BCA Green Mark has been placing greater emphasis on the quality of indoor environments as well as the health, comfort and well-being of the users and occupants.

To strengthen the business case for energy-efficient, resource efficient and healthier interior spaces, BCA collaborated with the Health Promotion Board (HPB) to develop the new **BCA-HPB Green Mark for Healthier Workplaces scheme** (GM HWV: 2018).

With international studies indicating that 90% of the business operating costs are related to human capital costs, staff's productivity would be of paramount interest and concern to any company. The new GM HWV would appeal to companies that place emphasis on both health and well-being in addition to environmental sustainability in the office. GM HWV aims to provide a clearer and stronger business case for office sustainability by placing occupants health, well-being and comfort at the forefront of office design and daily operations. It also seeks to create a supportive environment through the establishment of workplace health structures, policies and programmes. With the inclusion of criteria that also looks at the health and well-being, we hope that this will make the value proposition for green interior more compelling and personal from the users angle.





# ARUP SINGAPORE PTE LTD

Healthier Workplaces

## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/Owner	Arup Singapore Pte Ltd
Structural Consultant	Arup Singapore Pte Ltd
M&E Consultant	Arup Singapore Pte Ltd
ID Consultant	HASELL
Lighting Consultant	Arup Singapore Pte Ltd
Acoustic Consultant	Arup Singapore Pte Ltd
ESD Consultant	Arup Singapore Pte Ltd
Renovation Consultant/ Contractor	Ngai Chin Construction Pte Ltd

- Flexible open office design for Activity Based Working (ABW) environment
- Encourage physical mobility through internal staircase connection, sit-to-stand desks and ergonomic office furniture
- Support health and well-being of staff with provision of multiple water points, library, wellness room, nursing room and multi-faith room.
- Optimize dimmable lighting system integrated with motion sensors and daylight harvesting capabilities
- Enhance thermal comfort and indoor air quality through the use of swirl diffuser and fabric duct
- Reduce greenhouse gas emission from business travel and digitalized internal communication
- Internal Building Management System (BMS) to monitor energy usage, water usage and indoor air quality



# C&W SERVICES (S) PTE LTD

Healthier Workplaces

## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant

C&W Services (S) Pte Ltd

Energy Services Company  
(ESCO)

C&W Services (S) Pte Ltd

Green Mark Consultant

C&W Services (S) Pte Ltd

- Green Firm (ISO 14001, SGBC L4 Energy Performance Contracting and SGBC L4 Green Facilities Management)
- Environmental dashboard for performance and indoor air quality monitoring
- Energy efficient LED lightings resulting in 32% improvement / better than baseline
- Lighting controls for optimized usage (timer, motion sensors, mobile application)
- Staff engagement programs (social bonding events, health, safety, fitness and sustainability)
- Biophilic features (indoor and wall greenery and geometric furniture)
- Energy Star office equipment, extensive use of SGLS certified products and facilities for collection of common recyclables



# CITY DEVELOPMENTS LIMITED (#10-01 TO #12-01 REPUBLIC PLAZA) Healthier Workplaces

## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/Owner	City Developments Limited
Renovation Consultant/ Contractor	Facility Link Pte Ltd
M&E Consultant	Squire Mech Pte Ltd
ID Consultant	SCA Design Pte Ltd
Quantity Surveyor	Arcadis Singapore Pte Ltd

- Internal staircase connects staff across 3 floors through easy accessibility, promotes interaction, better communication and encourage more exercise through walking
- Green walls that creates alluring and inviting environment bringing occupants close to nature, improving air quality and reduces noise level
- Multiple touch down areas for hot-desking staff, impromptu discussion, ad-hoc meetings, private workspace and encourages staff collaboration
- Follow-me-print with secured scan-fax-copying functions allowing reduction of missing or uncollected copies anywhere in the office.
- Multi-function interactive board with annotation functions, enables document to be sent during meeting and with up to 4 wireless sharing.
- Writable walls (from floor to ceiling) gives you unlimited, boundless space to brainstorm and share your ideas with one another
- Ergonomic chairs that reduces backache for prolonged sittings with adjustable height, base, armrest, lumbar support and in-turn improves productivity



# CITY DEVELOPMENTS LIMITED (#36-01 REPUBLIC PLAZA)

Healthier Workplaces

## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/Owner	City Developments Limited
Renovation Consultant/ Contractor	db & b Pte Ltd
Facility Manager Company	CDL Properties Ltd
Acoustic Consultant	Arup Singapore Pte Ltd

- Maximise use of workspace to increase number of staff from 32 (before renovation) to 52 (after renovation)
- Planter boxes among workdesks to create alluring and inviting environment bringing occupants close to nature, improving air quality and reduces noise level
- Multiple touch down areas for hot-desking staff, impromptu discussion, adhoc meetings, chill-out, private workspace and encourages staff collaboration
- Follow-me-print with secured scan-fax-copying functions allowing reduction of missing or uncollected copies anywhere in the office.
- Multi-function interactive board with annotation functions, enables document to be sent during meeting and with up to 4 wireless sharing.
- Ergonomic chairs that reduces backache for prolonged sittings with adjustable height, base, armrest, lumbar support and in-turn improves productivity
- Sound proofing meeting rooms to give users privacy to focus during discussions through elimination of exterior noise.



# DBS ASIA CENTRAL

Healthier Workplaces

## GREEN MARK AWARD FOR NON - BUILDINGS | PLATINUM



Client/Developer

DBS Bank Ltd.

Facility Manager Company

Jones Lang LaSalle Property Consultants Pte Ltd

Green Mark Consultant

C&W Services(s) Pte Ltd

- Extensive health and green activities conducted yearly.
- Extensive direct and indirect nature experience.
- Energy Efficient LED Lighting provision with timer control and zones in office spaces.
- Extensive waste recycling practice with provision of recycling bins on every floor.
- Office is located in a Green Mark Platinum base building.
- Office previously achieved GM Platinum under the Green Mark for Office Interiors scheme
- Open plan office concept with access to daylight, provision of collaborative spaces and biophilic design for offices.



# DBS ASIA HUB

Healthier Workplaces

## GREEN MARK AWARD FOR NON - BUILDINGS | PLATINUM



Client/Developer

DBS Bank Ltd.

Facility Manager Company

Jones Lang LaSalle Property Consultants Pte Ltd

Green Mark Consultant

C&W Services(s) Pte Ltd

- Extensive health and green activities conducted yearly.
- Extensive direct and indirect nature experience.
- Energy Efficient LED Lighting provision in office and common areas.
- Extensive waste recycling practice with provision of recycling bins on every floor.
- Base building is Green Mark "Platinum" rating.
- Solar panels installed on-site and generated energy for building usage.
- Open plan office concept with height adjustable desks and uses environmentally sustainable materials for office premises.



# FACILITY LINK PTE LTD

Healthier Workplaces

## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/ Owner

Facility Link Pte Ltd

Renovation Contractor

Facility Link Pte Ltd

ESD Consultant

Building System & Diagnostics Pte Ltd

- Extensive usage of photocell sensors, motion sensors and toggling arrangement to reduce energy wastage
- Adequate operable glare controls and matt wall finishes are provided for occupant comfort
- Up to 97% of the IT equipment is energy star certified
- Nursing room with assistive provision, catered for expectant mothers in the office
- Up to 83% of the pantry snacks and beverages are healthier choice certified
- Extensive indoor greenery provision constituting up to 2% of the office area
- Periodic health screening, workout sessions and smoking cessation supports are provided for all staff to promote on healthier lifestyle



# HONGKONG LAND (SINGAPORE) PTE LTD

## Healthier Workplaces



### GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/ Owner	Hongkong Land (Singapore) Private Limited
Renovation Consultant/ Contractor	ISG Asia (Singapore) Pte Ltd
Facility Manger Company	Hongkong Land (Singapore) Private Limited
M&E Consultant	AT Advanced Technologies Asia Pacific Pte Ltd
Architect/ID Consultant	Aplusi Asia Pte Ltd
ESD Consultant	BMG Green Technology Pte Ltd
Lighting Consultant	KLD Klaasen Lighting Design

- Use of high energy efficient LED lights and better lighting control systems.
- Use of SGBC certified products for fit outs and use back existing ceiling, tables and chairs etc. for better sustainability.
- Usage of daylight sensors for better lighting control.
- Use of Motion sensors at meeting rooms .
- Better air distribution by zoning and temperature control for better thermal comfort
- Implemented Workplace Health and well being programs
- Promote mental well being – participation in Jardine Mindset program

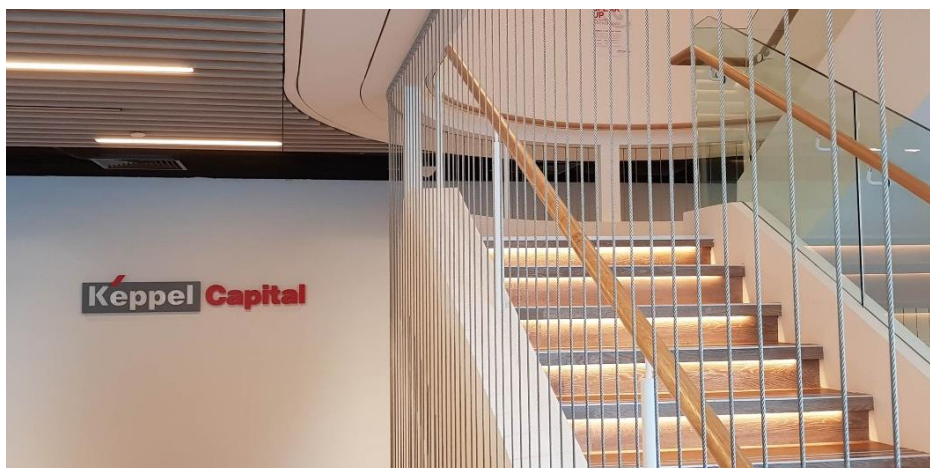


# KEPPEL CAPITAL INTERNATIONAL PTE LTD

Healthier Workplaces



## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/ Owner	Keppel Capital International Pte Ltd
Renovation Consultant/ Contractor	Tarkus Interiors Pte Ltd
Facility Manager Company	Engie Services Singapore
M&E Consultant	VHA Consultants Pte Ltd
Managing Agent/ Maintenance Contractor	-
ID Consultant	Woods Bagot
Project Manager	Jones Lang LaSalle Property Consultants Pte Ltd

- Energy efficiency index (EEI) < 50 kWh/m<sup>2</sup>/yr;
- 100% powered by off-site solar energy
- Occupancy based smart LED lighting system, Lighting power density < 5 W/m<sup>2</sup>
- Agile, open, flexible workplace with sit-stand desks
- IAQ display for monitoring and trending
- Provision of healthier food options such as fruits, filtered water, etc.
- Comprehensive waste recycling program including secure printing, paper recycling



# KEPPEL CORPORATION LTD

## Healthier Workplaces

### GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/ Owner	Keppel Corporation Ltd
Renovation Consultant/ Contractor	Tarkus Interiors Pte Ltd
Facility Manager Company	Engie Services Singapore
M&E Consultant	VHA Consultants Pte Ltd
Managing Agent/ Maintenance Contractor	-
ID Consultant	Woods Bagot
Project Manager	Jones Lang LaSalle Property Consultants Pte Ltd

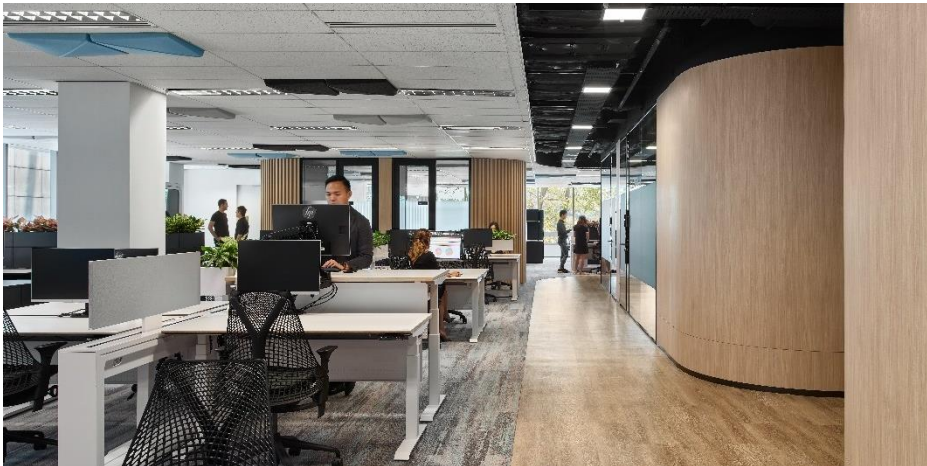
- Energy efficiency index (EEI) < 50 kWh/m<sup>2</sup>/yr;
- 100% powered by off-site solar energy
- Occupancy based smart LED lighting system, Lighting power density < 5 W/m<sup>2</sup>
- Agile, open, flexible workplace with sit-stand desks
- IAQ display for monitoring and trending
- Provision of healthier food options such as fruits, filtered water, etc.
- Comprehensive waste recycling program including secure printing, paper recycling



# KEPPEL LAND LTD

## Healthier Workplaces

### GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/ Owner	Keppel Land
Renovation Consultant/ Contractor	Tarkus Interiors Pte Ltd
Facility Manager Company	Engie Services Singapore
M&E Consultant	VHA Consultants Pte Ltd
Managing Agent/ Maintenance Contractor	-
ID Consultant	Woods Bagot
Project Manager	Jones Lang LaSalle Property Consultants Pte Ltd

- Energy efficiency index (EEI) < 50 kWh/m<sup>2</sup>/yr;
- 100% powered by off-site solar energy
- Occupancy based smart LED lighting system, Lighting power density < 5 W/m<sup>2</sup>
- Agile, open, flexible workplace with sit-stand desks
- IAQ display for monitoring and trending
- Provision of healthier food options such as fruits, filtered water, etc.
- Indoor urban farming



# PRUDENTIAL SINGAPORE

## Healthier Workplaces

### GREEN MARK AWARD FOR HEALTHIER WORKPLACES | PLATINUM



Client/Developer	Prudential Singapore
Facility Manager Company	MS Developments
Main Contractor	Space Matrix
ESD Consultant	GreenA Consultants Pte Ltd

- Green wall with motion sensors triggering nature sounds on level 6 as well as a water feature tunnel on level 7 that leads to a Zen garden helps improve spatial awareness of occupants
- In-house and external subsidized fitness programs, employee assistance program with 24-hr help hotline, health and mental talks as the allocation of quiet relaxation zones helps improve the mental and physical wellness of employees
- Food and drinks menus designed by a nutritionist, well stocked pantry with unsweetened/ fruit infused drinks and fresh fruits and visual reminders on tips for healthier eating habits
- Active Workplace Design with multi functional spaces and activity based workstations as well as strategically placed internal stairs to encourage collaboration and movement
- Environmental programmes such as recycling campaigns and provision of personal electronic waste collection bins. Environment Policy and guidelines to improve energy, water and waste reduction.
- Lighting with zoning controls, timer controls, use of LED and T5 lighting, as well as a separate monitoring system for lighting and plug loads ensure energy efficiency optimization
- Use of sustainable materials for interior walls, ceiling and flooring



# RAFFLES QUAY ASSET MANAGEMENT

Healthier Workplace

## GREEN MARK AWARD FOR HEALTHIER WORKPLACES | PLATINUM



Client/Developer	Raffles Quay Asset Management Pte Ltd
Architect	Wolf Studio Pte Ltd
M&E Engineer	WSP Consultancy Pte Ltd
ESD / Green Consultant	C&W Services (S) Pte Ltd
Quantity Surveyor	Wolf Studio Pte Ltd
Main Contractor	Facility Link Pte Ltd

- Energy-efficient LED lightings with majority motion sensor control
- Open office layout enabling daylight provision, with enclosed rooms located away from windows
- Extensive use of environmental-friendly products certified by SGBC & SGLS for renovation fit-out & office operations
- Waste minimisation through use of non-disposable utensils & cups, digitalised HR processes & email circulars for info dissemination
- Committed in Green Advocacy such as the annual participation of Earth Hour, iLight Marina Bay Festival and PUB Singapore World Water Day
- Green & Wellness Workplace Committee to organize activities covering active living, mental well-being & active living
- Height-adjustable sit-stand desks provided for all staff to encourage active lifestyle at workplace



# CAMFIL SINGAPORE PTE LTD

Healthier Workplaces

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



Tenant/Owner

Camfil Singapore Pte Ltd

ESD Consultant

BMG Green Technology Pte Ltd

- Usage of energy efficient tubes and LED light
- Extensive use of environmentally friendly products
- Use natural daylight for rooms with windows
- Greenery is inside the office
- Provision of twin bins in office to promote recycling





# BCA GREEN MARK FOR OFFICE INTERIOR

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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



# CAPITAL TOWER – TENANT SERVICE CENTRE

Office Interior

## GREEN MARK OFFICE INTERIOR AWARD | PLATINUM



Client/Developer	Capitaland Commercial
Architect	N.A.
M&E Engineer	N.A.
Structural Engineer	N.A.
Quantity Surveyor	N.A.
Main Contractor	Comms Square Creative Pte Ltd

- Tenant Service Centre of area 132m<sup>2</sup>
- Lighting power budget: 5.64W/m<sup>2</sup>
- Occupant density: 11m<sup>2</sup> / Pax
- High Efficient LED Lighting used
- Extensive use of environmentally friendly products
- Open office layout and hot desking with minimal partitions, flexible spaces with operable walls used for meeting rooms
- More than half of office furniture recycled
- Over 1% of floor area with greenery



# ING BANK N.V., SINGAPORE BRANCH

Office Interior

## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant	ING Bank N.V., Singapore Branch
Interior Designer	Siren Design Group (Singapore) Pte Ltd
M&E Consultant	Hurley Palmer Flatt Ltd
ESD Consultant	G-Energy Global Pte Ltd
Main Contractor	Facility Link Pte Ltd

- 44.4% savings from baseline for artificial lighting
- Motion sensor controlled light fittings within the open office space
- Internal staircase that connects the office and reduces the reliance on lifts
- Annual sustainability reporting
- Extensive use of sustainable materials and products certified by SGLS/SGBC
- Good indoor air quality achieved based on NEA guidelines
- 1.7% of office space covered with potted plant to improve IAQ



# MINISTRY OF COMMUNICATIONS AND INFORMATION (MCI)

Office Interior

## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



- Usage of energy efficient lighting fixture which contributes to a high energy saving of 43.03% for lighting.
- Provision of motion sensors to reduce energy wastage
- Usage of timer socket for cold and hot water to reduce energy waste after office hour
- 96% of the IT equipment are energy star certified
- Provision of teleconferencing facilities to reduce on MCI carbon footprint

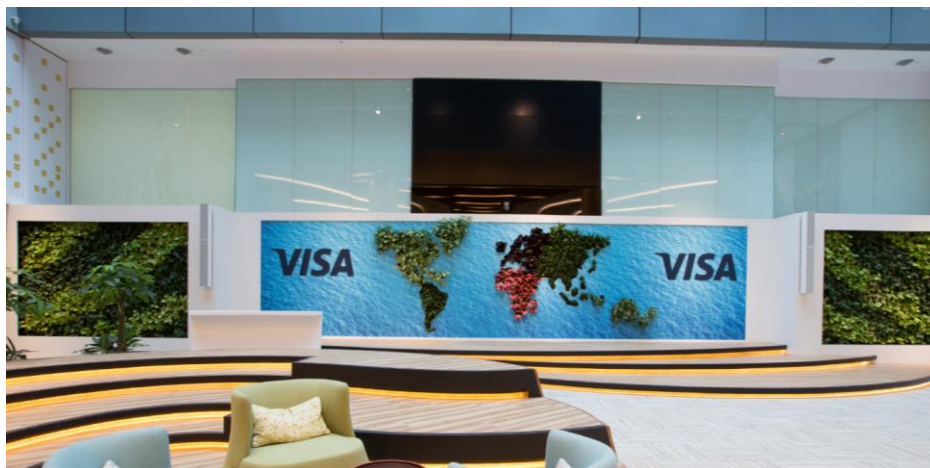
Tenant/Owner	Ministry of Communications and Information
Renovation Contractor	Perform Industries Pte Ltd
Facility & Project Manager Company	ENGIE Property Services
M&E Consultant	CCA & Partners Pte Ltd
Managing Agent/ Maintenance Contractor	ENGIE Property Services
ESD Consultant	Building System & Diagnostics Pte Ltd



# VISA WORLDWIDE PTE. LIMITED

Office Interior

## GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM



Tenant/Owner	Visa Worldwide Pte. Limited
Renovation Consultant/ Contractor	AD Incorporation Pte Ltd
Facility Manager Company	ENGIE Services Singapore
M&E Consultant	J Roger Preston (S) Pte Ltd
ESD Consultant	Faithful+Gould Pte Ltd

- Daylight sensors in the atrium and motion sensors throughout the office to minimise energy usage
- High efficient lighting design giving a low lighting power budget of less than 10 W/m<sup>2</sup>
- Greenery coverage of more than 1% of the office floor area with a sky garden accessible to all staff
- Procurement of Energy Star office equipment
- Sustainable procurement policy in place with extensive use of environmentally friendly office products
- Auxiliary air-con provided for after-hours usage with timer set for two hours when toggle switch is pressed
- Office desk equipped with height adjustable feature to provide people-oriented work environment



# CPG Consultants Pte Ltd Office @ Westgate Tower

Office Interior



GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLD<sup>PLUS</sup>



- Extensive use of T5 & LED lighting along with the use of Power over Ethernet (PoE) technology
- Energy efficient office equipment
- UV lights installed in AHU to reduce viable bacterial, so that enhance air quality and staff health
- Individual power & water meter at each levels

Client/Developer	CPG Consultants Pte Ltd
Renovation Consultant/ Contractor	D'perception Singapore Pte Ltd
Facility Manager Company	CPG Facilities Management Pte Ltd
M&E Consultant	CPG Consultants Pte Ltd
Managing Agent/ Maintenance Contractors	CBRE Pte Ltd
ESD Consultant	CPG Consultants Pte Ltd



# DBS ASIA GATEWAY

Office Interior

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



Tenant/Owner

DBS Bank Ltd.

Facility Management  
Company

Jones Lang LaSalle

ESD Consultant

Aurecon Group Singapore

- Energy efficient air-conditioning and lighting system with zoning and timer controls
- 95% of office equipment rated "Energy Star"
- Water savings features such as WELS Excellent rated water fittings and water leak detection system
- Open office plan with sustainable materials
- Courtyard with trees and plants for occupants well-being



# MUREX SOUTHEAST ASIA PTE LTD

Office Interior

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



Tenant/ Owner	Murex Southeast Asia Pte Ltd
Renovation Consultant/ Contractor	Tarkus Interior Pte Ltd
M&E Consultant	J Roger Preston (S) Pte Ltd
Project Manager	Jones Lang LaSalle Property Consultants Pte Ltd
ID Consultant	Sennex Consultants Pte Ltd
ESD Consultant	Building System & Diagnostics Pte Ltd

- Provision of teleconferencing facilities for each meeting room to reduce operational carbon footprint
- Provision of toggle switches and motion sensors to reduce energy wastage
- 94% of the IT equipment are Energy Star certified
- Provision of aesthetically pleasing moss walls in breakout areas to promote nature connectivity
- Provision of innovative user operable walls for adaptability of office spaces



# REED SMITH PTE LTD

Office Interior

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



Tenant/Owner

Reed Smith Pte Ltd

Renovation  
Consultant/Contractor

Jones Lang LaSalle Property Consultants Pte Ltd

ESD Consultant

Earth-In-Mind Pte Ltd

- Extensive use of energy efficient office equipment
- Secured printing as a waste management strategy
- Extensive use of SGBC/SGLS certified products during construction and operations
- Provision of WELS 3 tick excellent water fittings
- Vertical greenery at reception



# VINDA SINGAPORE PTE LTD

Office Interior

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



Tenant/Owner

Vinda Singapore Pte Ltd

Renovation  
Consultant/Contractor

CD Plus A Pte Ltd

Others

ENCY Green Solutions LLP

- Low EEI : 44.85 kWh/m<sup>2</sup>/yr
- Project is in Green Mark Platinum building
- 51% savings from energy efficient lighting
- Poster for education/ raise awareness at strategic locations
- Sustainability report is issued annually





## GREEN MARK FOR OFFICE INTERIOR | GOLD

### PROJECT NAME

Bank of Singapore Limited

BURBERRY (S) DISTRIBUTION CO. PTE LTD

Child Protective Service, Ministry of Social and Family Development

Cyber Security Agency of Singapore

DBS Asia X

Government Technology Agency (GovTech Hive 9)

Government Technology Agency of Singapore

KBC Bank NV Singapore Branch

Level 3 Office @ Infineon Technologies Asia Pacific Pte Ltd

Lombard Odier (Singapore) Ltd

Ministry of Education (MOE Prefab Office at 51 Grange Road))

### CLIENT/DEVELOPER/BUILDING OWNER

Bank of Singapore Limited

Burberry

Child Protective Service

Ministry of Communications and Information (Cyber Security Agency)

DBS

Infocomm Development Authority (IDA)

Government Technology Agency of Singapore

KBC Bank NV Singapore Branch

Infineon Technologies Asia Pacific Pte Ltd

Lombard Odier (Singapore) Ltd

Ministry of Education





## GREEN MARK FOR OFFICE INTERIOR | GOLD

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### PROJECT NAME

Mitsubishi UFJ Financial Group

### CLIENT/DEVELOPER/BUILDING OWNER

The Bank of Toyko-Mitsubishi, UFJ, Ltd., Singapore Branch





## GREEN MARK FOR OFFICE INTERIOR | CERTIFIED

### PROJECT NAME

Anderson Mori & Tomotsune (Singapore) LLP

Axis Bank Limited, Singapore Branch

Bank of China

Bright Ruby Resources Pte Ltd

Bryan Cave Leighton Paisner LLP

CDL Properties Limited

China Construction Bank Corporation Singapore Branch

City Serviced Offices

Clearstream Banking S.A

Distrii Singapore Pte Ltd

EC World Asset Management Pte Ltd

### CLIENT/DEVELOPER/BUILDING OWNER

Anderson Mori & Tomotsune (Singapore) LLP

Axis Bank Limited, Singapore Branch

Bank Of China

Bright Ruby Resources Pte Ltd

Bryan Cave Leighton Paisner LLP

CDL Properties Limited

China Construction Bank Corporation Singapore Branch

City Serviced Offices Pte Ltd

Clearstream Banking S.A

DISTRII SINGAPORE PTE. LTD.

EC World Asset Management Pte Ltd





## GREEN MARK FOR OFFICE INTERIOR | CERTIFIED

### PROJECT NAME

Genesys Telecommunications Laboratories Asia Pte. Ltd.

ICICI Bank Limited

Jeppesen Asia/Pacific Pte Ltd

K&L Gates Straits Law LLC

Latham & Watkins LLP

Lloyds Bank Corporate Markets plc, Singapore Branch

National Bank of Kuwait S.A.K.P., Singapore Branch

Network Architects Pte Ltd

POSB Newton Office

Rhodium Resources Pte Ltd

Tokyo Gas Asia Pte Ltd

### CLIENT/DEVELOPER/BUILDING OWNER

Genesys Telecommunications Laboratories Asia Pte. Ltd.

ICICI Bank Limited

Jeppesen Office

Straits Law Practice LLC

Latham & Watkins LLP

Lloyds Merchant Bank Asia Ltd

National Bank of Kuwait S.A.K.P., Singapore Branch

Network Architects Pte Ltd

DBS Bank Ltd.

Rhodium Resources Pte Ltd

Tokyo Gas Asia Pte Ltd





# BCA GREEN MARK FOR SUPERMARKETS

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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 FINEST AT ZHONGSHAN MALL

Supermarket

## GREEN MARK AWARD FOR SUPERMARKET | PLATINUM



Client/Developer

NTUC Fairprice Co-operative Ltd

Refrigeration System Specialist

Epta Asia Pte Ltd

- Energy-efficient refrigeration system using Variable Speed Compressors, EC fan motor & Electronic Expansion valves.
- CO<sub>2</sub> refrigerant with a GWP of 1 being used for freezer system.
- More than 75% of the refrigeration showcases are fitted with doors to conserve energy.
- 100% LED lighting with zonal control & occupancy sensors are installed at low traffic areas.
- Extensive use of environmentally-friendly building material & water-efficient fittings.
- Dedicated area for Organic/Wellness product.





## GREEN MARK FOR SUPERMARKETS| GOLD

### PROJECT NAME

FairPrice Supermarket at Kampung Admiralty

FairPrice Supermarket at Punggol Oasis

FairPrice Supermarket at Toa Payoh A

### CLIENT/DEVELOPER/BUILDING OWNER

NTUC Fairprice Co-operative Ltd

NTUC Fairprice Co-operative Ltd

NTUC Fairprice Co-operative Ltd





## GREEN MARK FOR SUPERMARKETS| CERTIFIED

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### PROJECT NAME

FairPrice Supermarket at Ang Mo Kio Blk 712

FairPrice Finest Supermarket at Serangoon Garden myVillage

### CLIENT/DEVELOPER/BUILDING OWNER

NTUC Fairprice Co-operative Ltd

NTUC Fairprice Co-operative Ltd





# BCA GREEN MARK FOR RETAIL

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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



# DBS TREASURES AT SUNTEC CITY AND DBS SUNTEC CITY BRANCH

Retail



## GREEN MARK AWARD FOR RETAIL | PLATINUM



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Design Base Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Tarkus Interiors Pte Ltd

- High-efficiency lighting with 60% improvement over baseline lighting power budget
- 89% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring
- Provide SGLS certified dishwashing liquid and paper towel as part of DBS' green procurement policy
- Sensible Air-conditioning zoning with automatic scheduling control



# POSB ITE COLLEGE CENTRAL BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Spacelogic Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Contractor	Wong Huat Engineering Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

- High-efficiency lighting with 70% improvement over baseline lighting power budget
- 89% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring
- Provide SGLS certified dishwashing liquid and paper towel as part of DBS' green procurement policy
- Sensible Air-conditioning zoning with automatic scheduling control



# POSB NGEE ANN CITY BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Design Base Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Team Design Consultants
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

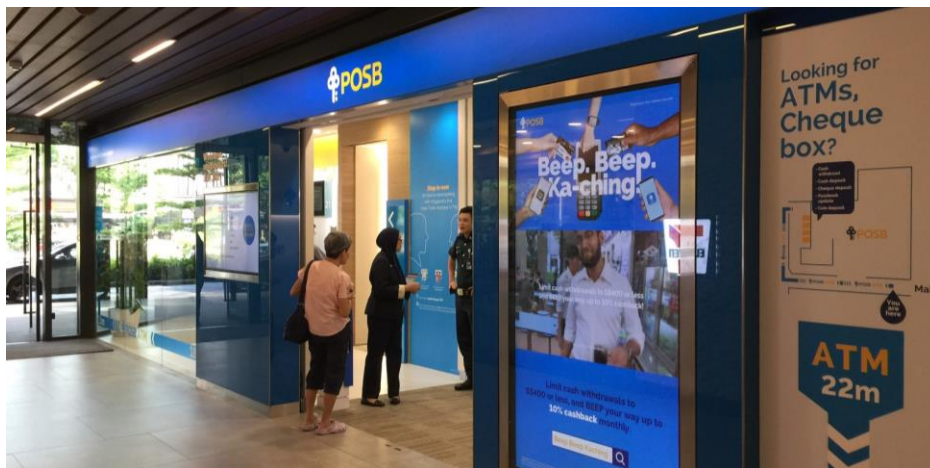
- High-efficiency lighting with 60% improvement over baseline lighting power budget
- 88% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring
- Provide SGLS certified dishwashing liquid and paper towel as part of DBS' green procurement policy
- Sensible Air-conditioning zoning with automatic scheduling control



# POSB PAYA LEBAR BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Client/Developer  
Renovation Consultant  
Facility Manager  
M&E Consultant  
Green Mark Consultant

DBS Bank Ltd.  
Milan Decoration & Construction Pte Ltd  
Jones Lang LaSalle Property Consultants Pte Ltd  
Alpha Consulting Engineers Pte Ltd  
Jones Lang LaSalle Property Consultants Pte Ltd

- High-efficiency lighting with 56% improvement over baseline lighting power budget
- 85% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring
- Provide SGLS certified dishwashing liquid and paper towel as part of DBS' green procurement policy
- Sensible Air-conditioning zoning with automatic scheduling control



# POSB SELETAR MALL BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Design Base Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Tarkus Interiors Pte Ltd

- High-efficiency lighting with 60% improvement over baseline lighting power budget
- 89% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring
- Provide SGLS certified dishwashing liquid and paper towel as part of DBS' green procurement policy
- Sensible Air-conditioning zoning with automatic scheduling control



# POSB TANJONG PAGAR BRANCH

Retail

## GREEN MARK AWARD FOR RETAIL | PLATINUM



Client/Developer	DBS Bank Ltd.
Renovation Consultant	AI Associates
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Milan Decoration & Construction Pte Ltd

- High-efficiency lighting with 50% improvement over baseline lighting power budget
- 91% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring
- Provide SGLS certified dishwashing liquid and paper towel as part of DBS' green procurement policy
- Sensible Air-conditioning zoning with automatic scheduling control



# DBS ANG MO KIO CENTRAL BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	DE Exclusive ID Group Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Mastron Pte Ltd

- High-efficiency lighting with 53% improvement over baseline lighting power budget
- 94% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# DBS ASIA TREASURES LOUNGE AT SINGAPORE CHANGI AIRPORT TERMINAL 2 BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	PDM International
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Mastron Pte Ltd

- High-efficiency lighting with 25% improvement over baseline lighting power budget
- 90% of office equipment used (by rated power) in the branch is Energy Star certified product
- Taken tenancy within a base building with Green Mark Gold certification
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# DBS BEDOK BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Design Base Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Mastron Pte Ltd

- High-efficiency lighting with 56% improvement over baseline lighting power budget
- 88% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# DBS HOUGANG BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	DNA Solution(s) Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Alpha Consulting Engineers Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

- High-efficiency lighting with 62% improvement over baseline lighting power budget
- 94% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# DBS NUS REMIX BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	AD Incorporation Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Chee Choon & Associates Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Comm Interior Pte Ltd

- High-efficiency lighting with 49% improvement over baseline lighting power budget
- 90% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# DBS RAFFLES LINK BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Spacelogic Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

- High-efficiency lighting with 52% improvement over baseline lighting power budget
- 93% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# DBS TREASURES AT SERANGOON GARDEN AND DBS SERANGOON GARDENS BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Design Base Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Alpha Consulting Engineers Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Yongway Contract & Construction Pte Ltd

- High-efficiency lighting with 47% improvement over baseline lighting power budget
- 93% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# DBS TREASURES EXCLUSIVE SAFEKEEPING CENTRE AND DBS TREASURES AT SIGLAP BRANCH

Retail



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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Steven Leach + Associates Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Chee Choon & Associates Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Kingsmen Projects Pte Ltd

- High-efficiency lighting with 69% improvement over baseline lighting power budget
- 92% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# POSB CLEMENTI CENTRAL BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Kingsmen Design Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Belmacs Consulting Engineers Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

- High-efficiency lighting with 63% improvement over baseline lighting power budget
- 91% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# POSB JURONG EAST CENTRAL BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Design Base Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	CCA & Partners Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

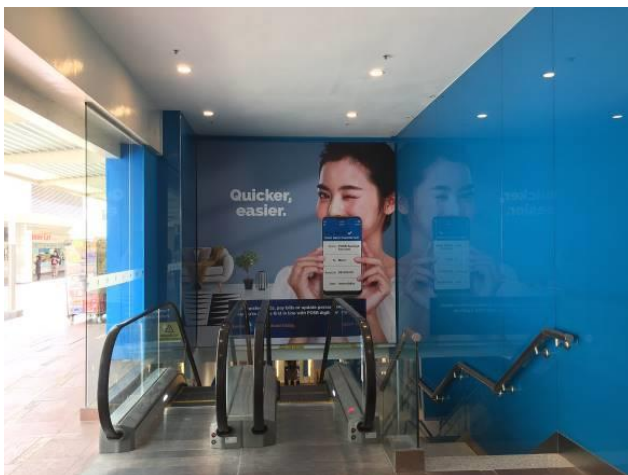
- High-efficiency lighting with 26% improvement over baseline lighting power budget
- 90% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# POSB JURONG POINT BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Design Base Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Bescon Consulting Engineers Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Mastron Pte Ltd

- High-efficiency lighting with 26% improvement over baseline lighting power budget
- 90% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# POSB KAMPUNG ADMIRALTY BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	3iStudio Consultants Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Alpha Consulting Engineers Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd
Main Contractor	Grand Build Interior Pte Ltd

- 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
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# POSB PASIR RIS EAST BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Contractor	Tarkus Interiors Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	J. Roger Preston (S) Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

- High-efficiency lighting with 42% improvement over baseline lighting power budget
- 83% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# POSB TAMPINES CENTRAL BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Kingsmen Design Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
Electrical Contractor	Hi-light Electrical Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

- High-efficiency lighting with 56% improvement over baseline lighting power budget
- 98% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring



# POSB WOODLANDS WEST BRANCH

Retail

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



Client/Developer	DBS Bank Ltd.
Renovation Consultant	Kingsmen Design Pte Ltd
Facility Manager	Jones Lang LaSalle Property Consultants Pte Ltd
M&E Consultant	Belmacs Pte Ltd
Green Mark Consultant	Jones Lang LaSalle Property Consultants Pte Ltd

- High-efficiency lighting with 66% improvement over baseline lighting power budget
- 87% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provide potted plants within the main banking hall
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Provision of water meter for water usage monitoring





## GREEN MARK FOR RETAIL | GOLD

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### PROJECT NAME

DBS Asia Treasures Lounge at Singapore Changi Airport Terminal 3

DBS Treasures at Gleneagles

### CLIENT/DEVELOPER/BUILDING OWNER

DBS Bank Ltd.

DBS Bank Ltd.





# BCA GREEN MARK FOR DATA CENTRES

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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



# DIGITAL REALTY

## New Data Centre

### GREEN MARK AWARD FOR DATA CENTRE | PLATINUM



Client/Developer	Digital Singapore Jurong East Pte Ltd
Consultant/Contractor Facility Manager Consultant	Digital Singapore Jurong East Pte Ltd
M&E Consultant	LSW Consulting Engineers Pte Ltd
Managing Agent/ Maintenance Contractor	NA
ESD/ Green Mark Consultant	Building System and Diagnostics Pte Ltd Measurement & Verification Pte Ltd

- Chiller Plant System with Efficiency of 0.634kW/Rton
- Dynamic Rotary UPS with efficiency greater than 95%
- Individual Battery Monitoring System
- Static Pressure Control for CRAH operations
- Humidity Control, Side Stream Filtration
- Continuous Energy Improvement works – LED Lights Installation, Cold Isle Containment, Blanking Panels.
- Achieved below full load design PUE at 40% partial load.



# GLOBAL SWITCH SINGAPORE WOODLANDS

New Data Centre

## GREEN MARK AWARD FOR DATA CENTRE| PLATINUM



Client/Developer	Global Switch (Property) Singapore Pte. Limited
Architect	AWP Pte. Ltd
M&E Engineer	Aurecon Singapore Pte. Ltd
ESD Consultant	Kaer Pte. Ltd
Main Contractor	Gammon Pte Ltd

- Modular and scalable design for optimum energy efficiency
- High efficiency cooling systems 0.53 kW/RT at 100% IT Load
- Smart control lighting system at data halls
- Use of DRUPS
- Reduce of construction waste with using Prefabricated MEP systems
- Use of MERV 14 filtration media
- Provision of treated Fresh Air with CO<sub>2</sub> sensors demand control



# STT DEFU 2

New Data Centre

## GREEN MARK AWARD FOR DATA CENTRE | PLATINUM



Client/Developer	STT Defu 2 Pte Ltd
Client's PM and Engineers	Hurley Palmer Flatt Pte Ltd
D&B Contractor	Acme Associates Pte Ltd
D&B Contractors Architectural QP	BK Consulting Engineers Pte Ltd
D&B Contractors Structural QP	BK Consulting Engineers Pte Ltd
D&B Contractors M&E QP	Plan-One Engineering Services
ESD Consultant	Building System & Diagnostics Pte Ltd

- High efficiency water cooled chillers with elevated chilled water temperatures to minimise energy consumption.
- A chiller management system dynamically adjusts the mechanical system setpoints to optimise the performance of the chillers, cooling towers and pumps.
- Dedicated PAHU for latent removal and pressurization of data hall, fed from a high efficiency low temperature circuit that is separate to the circuit feeding the IT load
- Dual coil CRAC units with EC fans. Control system minimizes energy by matching air flow to load.
- Highly efficient DRUPs and modular static UPS during conditioning mode
- Enlarged pipework to ensure minimal pumping energy
- Extensive power meter monitoring using DCIM system.
- Extensive use of motion sensor friendly products
- Dedicated operational team managing the facility 24/7 to minimise energy consumption while ensuring the highest resilience



# EQUINIX SG3 DATA CENTRE

Existing Data Centre

## GREEN MARK AWARD FOR DATA CENTRE | PLATINUM



Tenant / Owner	Equinix Pte Ltd/ DBS Trustee Ltd (as Trustee of Mapletree Industrial Trust)
Consultant/Contractor	IJ Energy Pte Ltd
M&E Consultant	NA
Managing Agent/Maintenance Contractor	NA
Others : Other specialist Consultant/Contractor	NA

- Permanent measurement and verification, policies and SS 564 certification for operational performance.
- VSD chiller plant at 0.567 kWRT with permanent measurement and verification instrumentation for the monitoring of chilled water plant efficiency.
- Photovoltaic panels generating about 301,000 kWh/year, motion sensors, rack-level LED, and real-time energy display
- 95% potable water savings using NEWater and >7 COC for cooling tower make-up water. Rainwater harvesting for landscape water usage and WELS excellent fittings.
- Operational PUE of 1.64.
- Monitoring and trending of performance metrics such as PUE, Utilization, IT loading, Chiller Plant and Air Management
- Novec fire suppression system
- Air distribution fan power limitation is 22% better than baseline





## GREEN MARK FOR DATA CENTRES| GOLD

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### PROJECT NAME

PCS Security - T9 Data Centre

Singapore Tourism Board Data Centre

### CLIENT/DEVELOPER/BUILDING OWNER

PCS Security Pte Ltd

Singapore Tourism Board





# GREEN MARK FOR DATA CENTRES| CERTIFIED

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## PROJECT NAME

Equinix SG1 Data Center

## CLIENT/DEVELOPER/BUILDING OWNER

Equinix Singapore Pte Ltd





# BCA GREEN MARK FOR RESTAURANTS

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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| CERTIFIED

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### PROJECT NAME

PastaMania

Tower Club

### CLIENT/DEVELOPER/BUILDING OWNER

Commonwealth Retail Concepts Pte. Ltd.

Republic Plaza City Club (S) Pte Ltd



# 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





# INTERNATIONAL FINANCIAL CENTRE TOWER 2, JAKARTA

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	PT Kepland Investama
Design Architect	NBBJ LP
Project Architect	PT Pandega Desain Weharima
M&E Engineer	T.Y.Lin International Pte. Ltd
Structural Engineer	T.Y.Lin International Pte. Ltd
Quantity Surveyor	Langdon & Seah Indonesia pt.
Main Contractor	Samsung C&T Corporation
Landscape Consultant	PT. Citrapersona Hijau
Lighting Consultant	PT. Hadi Komara & Associates
Façade Consultant	Meinhardt Façade Technology (S) Pte Ltd
ESD Consultant	Kaer Pte Ltd / Afogreen Build Pte Ltd

- Estimated energy savings: 2,815,262 kWh/yr;  
Estimated water savings: 62,482.8m<sup>3</sup>,  
ETTV: 39.1 W/m<sup>2</sup>
- Chiller plant system efficiency of 0.605 kW/RT
- Instrumentation for monitoring and verification (using heat balance-substantiating test) of central chilled-water plant efficiency
- Regenerative lifts & destination control system
- Zero run off system with infiltration trenches, green wall and skygarden rainwater runoff capture & drought tolerant plants
- Lighting Power Density 54.53% savings
- High performance self-cleaning façade
- LCD live display and trending of building energy & water consumption breakdown



# MENARA KEN TTDI

New Non-Residential Building

## GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Client/Developer	Ken TTDI Sdn Bhd
Architect	SA Architects Sdn Bhd
M&E Engineer	EMD Consult Sdn Bhd
Structural Engineer	Pakatan Runding Raja Anna Sdn Bhd
Main Contractor	Ken Grouting Sdn Bhd
ESD Consultant	BSD Consultancy Sdn Bhd

- Estimated energy savings: 2,113,862 kWh/yr;  
Estimated water savings: 15,867 m<sup>3</sup>/yr,  
ETTV: 39.85 W/m<sup>2</sup>
- Thermal Energy Storage system with capacity of 3,000 RTon Hours
- Efficient Water-cooled chilled water system with efficiency of 0.55 kW/RT
- Substantial rainwater harvesting via a 75 m<sup>3</sup> tank installed below the roof slab
- Use of regenerative, gearless driven, ACVWF lift and VSD driven escalator coupled with sleep mode feature
- Condensate recovery to be reused for cooling tower make up



# GRAHA CIMB NIAGA BUILDING

Existing Non-Residential Buildings

GREEN MARK AWARD FOR BUILDINGS | PLATINUM



Building Owner

PT GrahaNiagaTataUtama

Facilities Manager

PT GrahaNiagaTataUtama

- Exhaust air is recycled via the rotary heat exchanger and ducted to provide better air circulation to the cooling tower areas
- Storm water and AHU condensate water are recycled to reduce water consumption
- Composting from organic waste to produce liquid and solid composts for the greenery
- Extensive greeneries around the building, vertical greening, gardens at lower and upper roof
- CO sensors linked to MV fans for ventilation system in basement carpark



# KEN HOLDINGS BHD & CommonGround @ MENARA KEN TTDI

Office Interior



## GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES (OVERSEAS) | PLATINUM



- Located in a LEED (USA) Platinum/ GreenRE (Malaysia) Platinum/ BCA Green Mark (Singapore) Platinum Base Building.
- Renewable Energy Generation from PV Panel.
- Open and flexible layout with minimum enclosed space.
- Use of sustainable and environmental-friendly products.
- Furniture re-use.
- Sky and Roof Garden as recreation areas.
- Near bus-stop and have bicycle parking facilities.

Client/Developer	Ken Holdings Bhd & Common Ground TTDI Sdn Bhd
Renovation Consultant/ Contractor	Ken Grouting Sdn Bhd
ESD Consultant	BSD Consultancy Sdn Bhd
Facility Manager Company	Ken TTDI Sdn Bhd
ACMV Consultant	Measurement & Verification Sdn Bhd
Managing Agent/Maintenance Contractors	Ken TTDI Sdn Bhd
BAS Consultant	Optergy Sdn Bhd



# EXCHANGE TOWER

Existing Non-Residential Building

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



Building Owner

Exchange Tower Limited

Facility Management

CBM Facilities & Security Management (Thailand)  
Co. Ltd

ESCO

CBM Solutions Pte Ltd

- Chiller plant system achieve an overall plant efficiency of 0.737 kW/RT.
- Use of LEDs at basement carpark and passenger lift lobbies.
- Use of CO sensors for carpark mechanical ventilation system.
- Use of motion sensors at common toilets
- Use of CO<sub>2</sub> sensors to regulate fresh air intake at AHUs.



# SINARMAS LAND PLAZA TOWER 2

Existing Non-Residential Building

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



Building Owner	P.T. Royal Oriental
Facility Management	P.T. Royal Oriental
ESD / Green Consultant	G-Energy Global Pte Ltd
ESCO	G-Energy Global Pte Ltd

- Measured chiller plant system efficiency of 0.652 kW/RT
- Provision of permanent measuring & verification instrumentations in chiller plant room and linked to Building Management System.
- Provision of CO<sub>2</sub> sensor to regulate fresh air in Air Handling Units.
- Provision of CO sensor to regulate ventilation fans in basement car parks.
- Lifts have Variable Voltage and Variable Frequency (VVVF) motor drive and sleep mode features.
- Energy efficient LED lights for lift lobbies, corridors, toilets, pantry and staircases.
- Provision of motion sensors for the lightings in the staircases.
- Increase in recycled water capacity by 80 m<sup>3</sup> per day to supply for flushing requirement of toilets



# ECOSKY (Commercial)

New Non-Residential Building

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



Client/Developer	Eco World Development S/B
Architect	Asima Architects Sdn Bhd
M&E Engineer	SSP (E&M) Sdn Bhd
Structural Engineer	Jurutera Perunding Tekamaju S/B
Quantity Surveyor	Unitech QS Consultancy Sdn Bhd
Landscape Consultant	Praxis Design Sdn Bhd
Green Consultant	Bgreen Design Sdn Bhd; GreenA Consultants

- Water savings through high efficient water fittings
- Use of rainwater harvesting system for landscape irrigation
- Low concrete usage index
- Compost bin is used to produce compost recycled from horticulture waste



# EXCHANGE SQUARE PHNOM PENH

New Non-Residential Building

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



Client/Developer	Hongkong Land Holdings Ltd
Architect	Aedas (Cambodia) Ltd
M&E Engineer	Ove Arup & Partners Ltd (Hong Kong)
Structural Engineer	Ove Arup & Partners Ltd (Hong Kong)
Quantity Surveyor	WT Partnership (HK) Ltd
Main Contractor	Posco Engineering & Construction Co Ltd

- Estimated energy savings: 11,962,379 kWh/yr; Estimated water savings: 24,002 m<sup>3</sup>, ETVV: 44.03 W/m<sup>2</sup>
- Water-cooled chiller system with operating efficiency of 0.664 kW/RT
- Extensive use of LED lighting system for whole development



# CAPITAMALL WESTGATE AT QIAOKOU DISTRICT, HUBEI

New Non-Residential Building

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



- Chiller plant system with efficiency of 0.786 kW/ton
- Daylighting
- Extensive use of LED lighting in the common areas
- Use of Non-portable or Recycled Water
- Use of Environment Friendly Products

Client/Developer

Capitaland Retail

Architect

The Buchan Group

M&E Engineer

Central Institute of Architecture Design and Research Co., Ltd

Main Contractor

China Construction Third Engineering Bureau Co., Ltd

Quantity Surveyor

Rider Levett Bucknall Ltd



# PT WIK FAR EAST BATAM PHASE 2

New Non-Residential Building

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



- Estimated energy savings: 1,761,282 kWh/yr;  
Estimated water savings: 8,809.48 m<sup>3</sup>/yr,  
ETTV: 37.31 W/m<sup>2</sup>
- Water-cooled chiller system with operating efficiency of 0.696 kW/RT
- Extensive use of LED lighting system for whole development

Client/Developer	PT WIK Far East Batam
Architect	Advanced Engineering (Asia) Pte Ltd
M&E Engineer	Advanced Engineering (Asia) Pte Ltd
Structural Engineer	Advanced Engineering (Asia) Pte Ltd
Main Contractor	PT Harapan Jaya Sentosa
ESD Consultant	GreenA Consultants Pte Ltd



# RESIDENSI VOGUE 1

New Residential Building

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



Client/Developer	SP Setia Berhad
Architect	BEP Akitek Sdn Bhd
M&E Engineer	J Roger Preston (M) Sdn Bhd
Structural Engineer	TY Lin International Sdn. Bhd
Quantity Surveyor	JUBM Sdn. Bhd.
Main Contractor	Ireka Engineering & Construction Sdn. Bhd.
ESD Consultant	IEN Consultants Sdn. Bhd.

- Estimated energy savings: 1,868,644 kwh/year; Estimated water savings: 5,737 m3/year, RETV: 19.92W/m<sup>2</sup>
- Use of energy efficient features such as air-conditioning system, lighting and energy efficient lift
- 40KWp Solar PV system
- Extensive greenery
- Extensive use of environmentally friendly products
- Rain harvesting for irrigation and provision of Electrical Vehicle Charging stations



# SAIGON CENTRE PHASE 2 & 3 - COMMERCIAL TOWER

New Non-Residential Building

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



Client/Developer	Keppel Land Watco II & III Co., Ltd
Architect	NBBJ (New York)& HTT Architect & Associates
M&E Engineer	J. Roger Preston (S) Pte Ltd & J. Roger Preston (VN) Co Ltd
Structural Engineer	AECOM Singapore Pte Ltd & AECOM Vietnam
Quantity Surveyor	Davis Langdon & Seah Vietnam Co., Ltd
Main Contractor	Hoa Binh Construction Real Estate Corporation
ESD Consultant	Building System & Diagnostics Pte Ltd

- Well insulated façade with low E double glazed glass. Highly energy efficient chiller plant, air distribution system and lighting, lifts and escalators. Use of refrigerants leak detection system, heat recovery wheel and recycling of AHU condensate
- Permanent measurement and verification of chiller plant system using Building Management System (BMS). Monitor energy and water consumption via BMS
- Use of WELS 3 ticks “excellent” water fittings; environmental friendly and certified construction products



# SAIGON CENTRE PHASE 2 & 3 – RETAIL PODIUM

New Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD



- Well insulated façade with low E double glazed glass. Highly energy efficient chiller plant, air distribution system and lighting, lifts and escalators. Use of refrigerants leak detection system, heat recovery wheel and recycling of AHU condensate
- Permanent measurement and verification of chiller plant system using Building Management System (BMS). Monitor energy and water consumption via BMS
- Use of WELS 3 ticks “excellent” water fittings; environmental friendly and certified construction products

Client/Developer	Keppel Land Watco II & III Co., Ltd
Architect	NBBJ (New York)& HTT Architect & Associates
M&E Engineer	J. Roger Preston (S) Pte Ltd & J. Roger Preston (VN) Co Ltd
Structural Engineer	AECOM Singapore Pte Ltd & AECOM Vietnam
Quantity Surveyor	Davis Langdon & Seah Vietnam Co., Ltd
Main Contractor	Hoa Binh Construction Real Estate Corporation
ESD Consultant	Building System & Diagnostics Pte Ltd



# SINARMAS LAND PLAZA BSD

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS)| GOLD



Building Owner	PT. Bumi Serpong Damai, Tbk.
Architect	AEDAS Pte Ltd, Singapore
M&E Engineer	Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
ESD / Green Consultant	G-Energy Global Pte Ltd
Main Contractor	PT. Total Bangun Persada
Facility Management	PT. Bumi Serpong Damai, Tbk.

- Atrium and lift lobbies are naturally ventilated.
- Provision of CO<sub>2</sub> sensor to regulate fresh air in Air Handling Units.
- Provision of CO sensor to regulate ventilation fans in basement carparks.
- Lifts have Variable Voltage and Variable Frequency (VVVF) motor drive and sleep mode features.



# SINARMAS LAND PLAZA TOWER 3

Existing Non-Residential Building

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD



Building Owner	P.T. Royal Oriental
Facility Management	P.T. Royal Oriental
ESD / Green Consultant	G-Energy Global Pte Ltd
ESCO	G-Energy Global Pte Ltd

- Measured chiller plant system efficiency of 0.656 kW/RT
- Provision of permanent measuring & verification instrumentations in chiller plant room and linked to Building Management System.
- Provision of CO<sub>2</sub> sensor to regulate fresh air in Air Handling Units.
- Lifts have Variable Voltage and Variable Frequency (VVVF) motor drive and sleep mode features.
- Energy efficient LED lights for lift lobbies, corridors, toilets, pantry and staircases.
- Provision of motion sensors for the lightings in the staircases.



# SOUTHBAY PLAZA

New Residential Building

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



- Estimated energy savings: 1,285,000 kWh/yr;  
Estimated water savings: 31,000 m<sup>3</sup>/yr,  
RETV: 20.88 W/m<sup>2</sup>
- Unitary air-conditioning system for all residential units with operating weighted COP more than 3.72
- Extensive use of energy efficient products such as LED lamps, regenerative lifts and water heaters

Client/Developer	Vienna View Development Sdn. Bhd.
Architect	Arkitek H Sun
Design Architect	OI Design
Landscape Architect	Landart Associates Sdn. Bhd.
M&E Engineer	I-Consultancy
Structural Engineer	Perunding KAA Sdn. Bhd.
ESD Consultant	BSD Consultancy Sdn. Bhd.
Quantity Surveyor	Kuantibina Sdn. Bhd.
Land Surveyor	Jurukur Pinang
Main Contractor	Builttech Project Management Sdn. Bhd.



# WATERFRONT RESIDENCE

New Residential Building

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



Client/Developer	Tianjin Fulong Property Development Co. Ltd
Architect	Tenio Tianjin Architecture and Engineering Co., Ltd
M&E Engineer	Tenio Tianjin Architecture and Engineering Co., Ltd
Structural Engineer	Tenio Tianjin Architecture and Engineering Co., Ltd
Quantity Surveyor	Gleed (Shanghai) Construction Co., Ltd
Main Contractor	The Third Construction Co., Ltd of China Construction Third Engineering Bureau
Landscape Consultant	ANG ATELIER
ESD Consultant	Earth-In-Mind Pte Ltd

- Estimated energy savings : 91,939 kWh/yr;  
Estimated water savings: 63,656 m<sup>3</sup>
- Designed with good building orientation which facilitate true cross ventilation for all dwelling units
- High performance double glazed glass with low emissivity coating for all dwelling units
- Use of greywater for toilet flushing for all dwelling units
- Provision of energy efficient air conditioning system in clubhouse and show units
- Provision of radiant floor heating for show units
- Use of non potable water for irrigation
- Extensive use of environmentally friendly products that are green labelled.



# WORLD TRADE CENTRE 3

New Non-Residential Building (Overseas)

GREEN MARK AWARD FOR BUILDINGS | GOLD



Client/Developer

PT Jakarta Land (jointly owned by CCM and Hongkong Land)

Architect

Aedas Pte Ltd

M&E Engineer

Beca Engineering NZ Ltd and PT BimateknoKaryatama Konsultan

Structural Engineer

PT Davy Sukamta Konsultan

Quantity Surveyor

WT Partnership and PT WolferstanTrower Indonesia

Main Contractor

PT Balfour Beatty Sakti Indonesia

Landscape Consultant

Sheils Flynn Asia

Façade Consultant

Meinhardt Façade Technology (S) Pte Ltd

Lighting Consultant

PT Klaasen Lighting Design

- High performance facade with ETV of 37.6W/m<sup>2</sup>
- Extensive use of environmental friendly products
- Provision of water efficient fittings with 'Excellent' and 'Very Good' WELS ratings



# PALM RESIDENCE

Landed Houses

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



- Solar photovoltaic system
- Use of drip irrigation for landscape areas
- Extensive usage of construction materials with high solar reflectance index value

Client/Developer

South Rach Chiec City Limited Liability Company

Architect/ M&E Engineer  
/Structural Engineer

International Construction & Investment Consultancy  
Co. Ltd

Project Manager

Flemington Investments Pte Ltd

Main Contractor

Mechanical work and construction investment joint  
stock company No. 9

Quantity Surveyor

FPS Vietnam Company Limited

Landscape Consultant

Land Sculptor Studio Vietnam Co. Ltd

ESD Consultant

Earth-In-Mind Private Limited



# GREEN OFFICE PARK

## DISTRICT

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



Client/Developer	PT. Bumi Serpong Damai, Tbk
Architect	AEDAS Pte Ltd, Singapore
M&E Engineer	Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
ESD Consultant	G-Energy Indonesia
Facility Management	PT. Bumi Serpong Damai, Tbk
Main Contractor	PT. Total Bangun Persada

- Good connectivity within the District and easy to reach facilities
- Energy Efficient LED for all street lighting within the district
- Large green-open landscape spaces between buildings and green roofs on most buildings to reduce heat island effect
- Use Non-potable water for irrigation and PV for street Lighting





## GREEN MARK FOR OVERSEAS AWARD | CERTIFIED

PROJECT NAME	CATEGORY	CLIENT/DEVELOPER/BUILDING OWNER
Chengdu Century Park (Residential)	New Non-Residential Buildings	Chengdu Hong Hu Zhan Real Estate Co., Ltd
Citadines Millennium Ortigas Manila	New Non-Residential Buildings	CDC Holdings Inc
Eco Sanctuary	District	Eco Sanctuary Sdn Bhd
EcoNest	New Non-Residential Buildings	Eco Botanic Development Sdn Bhd
Gongyuan Yihao Guangchang	New Non-Residential Buildings	Shenzhen Municipal Golden Property Development Ltd
M-City	New Non-Residential Buildings	Mah Sing Group Berhad
Pulau Muara Besar Bridge, Road and Utilities	Infrastructure	The Brunei Economic Development Board (Changed to Darussalam Enterprise)
Seasons Avenue	New Residential Buildings	Capitaland - Hoang Thanh Investment Co Ltd
Vista Verde	New Non-Residential Buildings	Capitaland - Thien Duc Co Ltd