BCA AWARDS 2020
Recognising Excellence in the Built Environment

GREEN MARK AWARD
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ABOUT THE AWARD
Launched in 2008, the BCA Green Mark Champion Awards recognises developers who demonstrate strong commitment towards corporate social responsibility and who have achieved a substantial number of Green Mark buildings at Gold level or higher.

AWARD CATEGORIES
• BCA Green Mark Champion
• BCA Green Mark Platinum Champion
• BCA Green Mark PlatinumSTAR Champion

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CapitaLand is one of Asia’s largest diversified real estate groups. Its global portfolio spans across diversified real estate classes which includes commercial, retail; business park, industrial and logistics; integrated development, urban development; as well as lodging and residential. It has presence across more than 220 cities in over 30 countries. As a responsible global real estate company, CapitaLand places sustainability at the core of what it does by contributing to the environmental and social well-being of its communities as it delivers long-term economic value.

In Singapore, 97% of CapitaLand’s existing offices, malls, integrated developments and serviced residences (by m2) have achieved a green rating by 31 Dec 2019. Notably, LogisTech is Singapore’s first logistics building to receive BCA Green Mark Platinum Award. This is one of the highest accolades for energy efficiency in the BCA Green Mark Award scheme. Five other properties have received BCA Green Mark Award including retail malls Bugis+ and JCube; a data centre 9 Tai Seng Drive; an industrial property Corporation Place; and an upcoming integrated development Rochester Commons. Rochester Commons comprises a 17-storey Grade A office tower, hotel, 12 heritage bungalows and a Shared Executive Learning Centre. To date, CapitaLand has over 130 Green Mark Awards for its properties and sites in Singapore, Australia, China, Malaysia and Vietnam (including 24 Green Mark Platinum1 and 40 Green Mark GoldPLUS awards).

CapitaLand installed rooftop solar panels atop six Singapore properties, potentially avoiding over 4,300 tonnes of carbon emissions every year. The clean energy generated will enable it to power its corporate headquarters in Singapore with 100% renewable energy by 2020.

For its sustainability efforts, CapitaLand remains listed in the Global 100 Most Sustainable Corporations in the World 2020 and The Sustainability Yearbook 2020. It also retained listing on the Dow Jones Sustainability World Index for the 11th year and regained Global Sector Leader status in the Diversified sector for the Global Real Estate Sustainability Benchmark.

Reinforcing CapitaLand’s commitment towards responsible growth, the Group has raised S$2.82 billion through sustainable finance to date and has achieved interest saving as a result of meeting its sustainability targets. CapitaLand has also obtained S$1.2 billion in green loans to be used towards green building certifications pegged to BCA Green Mark ratings.

1This figure excludes properties which were subsequently divested.
THE NATIONAL ENVIRONMENT AGENCY (NEA)

BCA GREEN MARK CHAMPION AWARD

The National Environment Agency (NEA) is a statutory board under the Ministry of Sustainability and the Environment (MSE). Formed on 1 July 2002, NEA is responsible for ensuring a clean and green environment, and the sustainable development of Singapore. It is responsible for the planning, design and development of new hawker centres, after-death facilities and services as well as management of the facilities maintenance, cyclical repairs and redecoration works of MSE-owned hawker centres. NEA seeks to leverage and explore new technologies and innovation solutions in our development projects to ensure sustainability.

Senja Hawker Centre adopts design strategies to ensure energy efficiency and usage of sustainable products certified under the Singapore Green Labelled Scheme. The hawker centre also uses low carbon concrete and energy-efficient LED lightings, and features a rooftop garden that reduces heat gain into the building. This year, Senja Hawker Centre is pleased to receive BCA Green Mark Platinum Award for its environmentally sustainable design that leads to at least 30% in energy savings.

Choa Chu Kang (CCK) Columbarium houses some 147,000 niches across 18 four-storey blocks. Its design allows natural light into niche rooms and utilizes prevailing wind conditions to achieve ample ventilation within the buildings. Efforts have been put in place to reduce the total building energy usage. This includes setting realistic energy reduction targets and regular energy consumption monitoring each year as well as installation of solar panels to achieve the eventual target of 100% conventional energy source replacement. This year, CCK Columbarium is pleased to receive BCA Green Mark Platinum Award for its environmentally sustainable design and efforts in reducing the total building energy usage.

NEA is honoured to be recognised with the Green Mark Champion Award. We will continue our strong commitment to shaping a green and sustainable built environment in our existing and future developments.
The Singapore Police Force (SPF) is a uniformed organisation under the purview of the Ministry of Home Affairs. The mission of the SPF is to prevent, deter and detect crime to ensure the safety and security of Singapore. This is done through its focus on the five broad areas of Police work – Frontline Policing, Counter and E-services, Investigation, Community Engagement and Public Security & Order.

As a socially responsible organisation, the SPF actively promotes environmental sustainability in the development of Police infrastructure through the deliberate adoption of sustainable design methods and use of environmentally-friendly products.

The Woodlands Police Division Headquarters has been designed as an energy-conserving building. The façade design and materials include the use of sustainable and recycled materials certified by the Singapore Green Building Council and Singapore Green Labelling Scheme, which allow low heat transfer through the external walls and double glazed windows. Other key green features include an energy-efficient central chiller plant, LED lightings with motion sensors, water-efficient fittings and roof top greenery.

Energy and water efficiency measures have also been implemented at the Police Cantonment Complex. The central air-conditioning system has been retrofitted with energy efficient chillers, pumps, variable speed drives, auto-tube cleaning system and an Energy Management System. These measures help to improve energy efficiency and reduce carbon footprint.

SPF is honoured to receive the Green Mark Champion Award and will continue to play our part in building a sustainable future for Singapore.
UOL Group Limited (UOL) has a diversified portfolio of development and investment properties, hotels and serviced suites in Asia, Oceania, Europe and North America. Through hotel subsidiary Pan Pacific Hotels Group Limited, UOL owns three acclaimed brands namely “Pan Pacific”, PARKROYAL COLLECTION and PARKROYAL.

As a leading property and hospitality group, we recognise that we have a role to play in protecting and conserving the environment. We set energy and water reduction targets to manage our carbon footprint across all our commercial and hospitality properties in Singapore, and seek to improve their environmental performance through ongoing maintenance and fit-out. We also set target to attain Green Mark Gold for the development of new investment properties in Singapore. Green design has always been the hallmark of our development projects, as we recognise the well-being benefits that a green building brings to the occupiers, along with the energy and water savings. We also deploy building technologies such as Prefabricated Prefinished Volumetric Construction method to minimise the impact of construction to the environment and improve productivity.

To date, about 10 of our Singapore properties have been recognised by the BCA Green Mark scheme. More recently, our 347-key Pan Pacific Orchard, which is targeted to open in 2021, was awarded Green Mark Platinum in January 2020. The hotel will offer rooms with eco-friendly features, and its landscapes are designed to be self-sustaining with minimal reliance on energy and water resources.

Our existing property Novena Square underwent an extensive retrofitting to improve water and energy efficiencies. The mixed development was awarded Green Mark Gold Plus in 2018.

UOL is supportive of the Government’s vision to achieve a low-carbon and sustainable future Singapore. We are committed to improve the sustainability performance of the Group.
GuocoLand is known for its high-end residential projects and integrated mixed developments. Its projects are conceived with sustainability principles as the foundation. It was also one of the first real estate developers to receive the Green Mark Platinum award from the Building and Construction Authority.

Guoco Tower, GuocoLand’s flagship integrated development at Tanjong Pagar, is Singapore’s tallest building at a height of 290m. As “a vertical city” within the Central Business District, Guoco Tower brings together 890,000 sq ft of premium Grade A office space with exciting dining and retail options, an urban park and community space, a 5-star business hotel and the 181-unit Wallich Residence at the apex.

Guoco Tower has received two of the highest achievable certifications in the industry – the Green Mark Platinum award by BCA and the Leadership in Energy and Environment Design (LEED) Platinum certification label by the U.S. Green Building Council. Guoco Tower has brought a new level of sustainable designs and green performance building technology to the Tanjong Pagar district. It has also uplifted the image and offerings of the district, thereby contributing to its rejuvenation.

GuocoLand is now developing Guoco Midtown, another transformative project in the CBD. It will comprise 770,000 sq ft of premium Grade A office space with different retail and public spaces on the ground level and the Midtown Bay residential tower, as well as a new residential cum commercial development at Tan Quee Lan Street. Guoco Midtown will connect the three major office micro-markets of City Hall, Marina Centre and Bugis and introduce new concepts of live, work and play.

GuocoLand will continue to strive towards developing buildings that will take on innovative concepts and contribute to the sustainable development objectives of Singapore.
**BCA GREEN MARK FOR SUPER LOW ENERGY BUILDINGS**

The **SLE programme** is the next wave of Singapore’s green building movement. SLE buildings feature best-in-class energy efficiency, the use of onsite and offsite renewable energy and other intelligent energy management strategies.

**GREEN MARK SLE CERTIFICATION**

BCA is inviting industry practitioners and government agencies to strive to achieve at least one GM SLE project by 2023. The SLE Challenge applies to both new and existing non-residential buildings.

**GREEN MARK SLE CATEGORIES**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Super Low Energy Building (SLEB)</td>
<td>Best-in-class energy performing building that achieves at least 40%* energy savings based on prevailing code *(equivalent to 60% energy savings above the 2005 building code)</td>
</tr>
<tr>
<td>Zero Energy Building (ZEB)</td>
<td>Best-in-class energy performing building with all energy consumption, including plug load, supplied from renewable sources</td>
</tr>
<tr>
<td>Positive Energy Building (PEB)</td>
<td>Best-in-class energy performing building with 115% of energy consumption, including plug load, supplied from renewable sources</td>
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</tbody>
</table>
ADMINISTRATION BUILDING
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, ZERO ENERGY BUILDING (RE-CERT)

- Efficient Water-cooled chilled water system with efficiency of 0.59 kW/RT
- Extensive use of LED lighting
- Motion Sensors at all toilets and staircase
- Water sub-metering link to BMS for leak detection system
- PV generation within NTU offset the entire energy consumption to achieve zero energy building

Client/Developer
Nanyang Technological University

Facility Management
SMM Pte Ltd

ESD/Green Consultant
SMM Pte Ltd
BLOCK N1.1
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, ZERO ENERGY BUILDING (RE-CERT)

- Efficient water cooled plant
- High Efficient LED Lighting
- Certified PUB Water Efficient Buildings
- Naturally ventilated carpark
- Motion sensors at all toilets and staircases

Client/Developer
Nanyang Technological University

Facility Management
SMM Pte Ltd

ESD Consultant
SMM Pte Ltd
BLOCK N2
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING (RE-CERT)

- Efficient water cooled plant
- High Efficient LED Lighting
- Certified PUB Water Efficient Buildings
- Naturally ventilated carpark
- Motion sensors at all toilets and staircases

Client/Developer  Nanyang Technological University
Facility Management  SMM Pte Ltd
ESD Consultant  SMM Pte Ltd
BLOCK N3 (MAE)
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING (RE-CERT)

- Efficient water cooled plant
- High Efficient LED Lighting
- Certified PUB Water Efficient Buildings
- Naturally ventilated carpark
- Motion sensors at all toilets and staircases

Client/Developer: Nanyang Technological University
Facility Management: SMM Pte Ltd
ESD Consultant: SMM Pte Ltd
CALTEX JURONG SPRING
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

- 5 Ticks Unitary Air-conditioning System.
- 100% LED Lighting Fixtures.
- 41.2 kWp Solar PV System.
- 45.2% Replacement of Power Consumption with Solar Energy.
- 100% 3 Ticks WELs Rating Water Fittings.

Client/Developer
Chevron Singapore Pte Ltd

Architect
OGP Konsult Pte Ltd

M&E Engineer
Regional Engineering Pte Ltd

Structural Engineer
OGP Konsult Pte Ltd

Main Contractor
Wing Tuck Engineering Pte Ltd
CENTRAL LIBRARY AT NATIONAL UNIVERSITY OF SINGAPORE
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

Client/Developer  National University of Singapore
Project Manager  National University of Singapore Office of Estate Development
Architect  Architects 61 Pte Ltd
M&E Engineer  Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Structural Engineer  KCL Consultants Pte Ltd
Quantity Surveyor  CPG Consultants Pte Ltd
Main Contractor  Gennal Industries Pte Ltd

- Energy efficient chilled water plant (operating efficiency - 0.58 kW/RT)
- Energy efficient lighting system (>60% savings over baseline)
- Use of motion sensors for toilets and staircases
- Extensive greenery around main entrance foyer
- Extensive use of sustainable products
- Naturally-ventilated circulation space to adjacent buildings
- Provision of 460 kWp photovoltaic system

48% energy savings vs NRB 2015 reference
CHANGI NAVAL BASE ADDITION
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLD, POSITIVE ENERGY BUILDING

- 4.8 kWP Solar PV Panel at roof, annual production of electricity 58.43 MWh, more than double of the building annual power consumption
- Use of energy efficient Air-Conditioning system at 0.78 kW/RT
- Use of energy efficient LED lighting system at 4.8W/m²
- Use of water efficient water fittings
- Heat recover hot water system integrated with high efficiency VRV system
- Solar tube resting & dining area and Vertical Ventilator for toilet and laundrette Room

Client/Developer | Defence Science & Technology Agency
Architect | S A Chua Architects Pte Ltd
M&E Engineer | CCA & Partners Pte Ltd
Structural Engineer | Steen Consultants Pte Ltd
Main Contractor | Antara Koh Pte Ltd
**CHOA CHU KANG COLUMBARIUM**

**EXISTING NON-RESIDENTIAL BUILDING**

**GREEN MARK AWARD FOR BUILDINGS | PLATINUM, POSITIVE ENERGY BUILDING**

- Good natural ventilation with design of building layout that utilises prevailing wind conditions to achieve adequate cross ventilation
- Efficient lightings for common areas
- Awarded PUB Water Efficient building certificate
- Implementation of recycling programme, with provision of recycling bins and sustainability awareness messages within the vicinity
- Solar PV generates up to 189,216 kWh/yr
- Installation of solar panels to achieve 100% replacement

**Client/Developer** National Environment Agency

**Facility Manager** Fonda Global Engineering Pte Ltd

**ESD Consultant** Building System & Diagnostics Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM, POSTIVE ENERGY BUILDING

HANGAR COMPLEX @ CHANGI EAST
NEW NON-RESIDENTIAL BUILDING

Client/Developer: Defence Science and Technology Agency
Architect: 3HP Architects Pte Ltd
M&E Engineer: Bescon Consulting Engineers Pte Ltd
Structural Engineer: KTP Consultants Pte Ltd
Main Contractor: Sanchoon Builders Pte Ltd
ESD Consultant: GreenA Consultants Pte Ltd

- Estimated energy savings: 433,956 kWh/yr; Estimated water savings: 5,460 m³/yr; ETTV: 21.89 W/m²
- Low Heat Gain Facade with ETTV of 22W/m².
- Use of BIM and VR for development of virtual environment.
- Natural Ventilation of Hangar Complex with average wind velocity of 0.72m/s.
- Energy Efficient LED lighting with 66.6% savings and VRF air-conditioning design system efficiency of 0.71kW/RT.
- Use of solar panels at 980kWp as source of renewable energy.
- Rainwater Harvesting system with drip irrigation for green roof.
- Sustainable products and water fittings which are SGBC Leader certified and ‘Excellent’ WELS rated.
GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

Client/Developer: National University of Singapore

Project Manager: National University of Singapore Office of Facilities Management

Architect: AWP Architects Pte Ltd

M&E Engineer: CPG Consultants Pte Ltd

Structural Engineer: KCL Consultants Pte Ltd

Quantity Surveyor: Quants Associates

Main Contractor: Gennal Industries Pte Ltd

- Energy efficient air conditioning system (5 ticks VRF)
- Energy efficient lighting system (>40% savings over baseline)
- Use of motion sensors for toilets and staircases
- Extensive use of metering system for plug load management
- Extensive use of sustainable products
- Provision of a 108 kWp photovoltaic system
- 41.5% energy savings vs NRB 2015 Reference model
JTC SPACE @ TUAS BIOMEDICAL PARK
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS, SUPER LOW ENERGY BUILDING (RE-CERT)

- EEI is 6.7kwh/m2/yr
- Efficient VRF system
- High Efficient LED Lighting
- Extensive use of environmentally friendly products

Client/Developer: JTC
Facility Management: CBM Pte Ltd / CBRE
ESD Consultant: CBM Solutions Pte Ltd
LOGISTECH
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

- Chilled water plant with performance guaranteed of 0.62kW/RT.
- All AHUs installed with EC fans with estimated efficiency of 0.18kW/RT.
- LED light fittings for all common area with estimated saving of 42.6%.
- Adoption of solar energy generation with estimated solar generation of 2,006,215 kWh/yr.
- All AHUs installed with energy valve with function of energy monitoring and cloud optimization.
- Smart facilities management system for chilled water plant with smart sequencing and dynamic artificial intelligence control.
- Cooling tower installed with EC fans.

Client/Developer: CapitaLand Group
Facility Management: CapitaLand Singapore (BP&C) Pte. Ltd
ESD / Green Consultant: Evergreen Engineering and Construction Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

- ETTV - 43.99 W/m²
- Energy efficient chilled water plant (operating efficiency - 0.59 kW/RT)
- Energy efficient lighting system (>60% savings over baseline)
- Use of motion sensors for toilets and staircases
- Extensive use of sustainable products
- Provision of 150 kWp photovoltaic system
- 40.5% energy savings vs NRB 2015 Reference model
NANYANG HOUSE

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, ZERO ENERGY BUILDING (RE-CERT)

- Estimated energy savings: 0.555MWh/yr;
- VRF system with operating efficiency of 0.78kW/RT
- Energy efficient LED lighting
- Motion sensor control for staircases and toilets
- Water leakage detection system
- Green educational corners

Building Owner: Nanyang Technological University
Facility Management: SMM Pte Ltd
Consultant Firm: SMM Pte Ltd
ONE RAFFLES LINK

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

- Estimated energy savings: 1,000,000 kWh/yr
- Efficient overall cooling system with efficiency of 0.6 kW/RT
- Provision of Energy Efficient Lifts with Regenerative Drive
- Extensive use of LED lighting
- Achieve Super Low Energy Building

Building Owner       HKL (Esplanade) Pte Ltd
Facility Management   Hongkong Land (Singapore) Pte Ltd
ESD/Green Consultant  BMG Green Technology Pte Ltd
                      Building System & Diagnostics Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

- Estimated Energy Savings: 1,084,813 kWh/yr, Estimated Water savings: 14,781 m³/yr, ETTV: 37.86W/m²
- Energy efficient chilled water air conditioning system
  Total system efficiency of 0.75 kW/RT (0.58 kW/RT + 0.17 KW/RTAir)
- Energy efficient lighting system (>40% savings over baseline)
- Use of motion sensors for toilets and staircases
- Extensive use of WELS “Excellent” water fittings
- Extensive use of sustainable green products
- Smart and Integrated Building Management System

Client/Developer
National University of Singapore

Architect
LAUD Architects Pte Ltd

M&E Engineer
Alpha Consulting Engineers Pte Ltd

Structural Engineer
Ronnie & Koh Consultants Pte Ltd

Quantity Surveyor
Northcroft Lim Consultants Pte Ltd

ESD Consultant
Building System and Diagnosis Pte Ltd

Main Contractor
Kim Seng Heng Engineering Construction Pte Ltd
SMU A-SOUTH 3
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

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 Pte Ltd

Main Contractor
Lian Ho Lee Construction Pte Ltd

ESD Consultant
Web Earth Pte Ltd

- Self shading building form, shading devices, insulated building envelope with low-E double glazing resulting in an ETTV of 26.9 W/m²

- Innovative Enhanced Passive Displacement Cooling (EPDC) System for majority of air-con spaces with total system efficiency of 0.61kW/RT

- Optimised lighting design with daylight utilisation, dimming control, photocell & occupancy sensor and LED lighting

- SMART building control system to ensure the occupant thermal comfort & optimised energy consumption

- Mass Engineered Timber (MET) structure reduces embodied carbon of the building
GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

• Estimated energy savings: 399,193kWh/yr,
  Estimated water savings: 32,414m$^3$, ETTV: 37.82W/m$^2$
• Energy efficient chilled water air conditioning system
  Total system efficiency of 0.72 kW/RT (0.57 kW/RT + 0.15 kW/RT$_{Air}$)
• Over 80% of overall GFA are non air-conditioned space
• Energy efficient lighting system (>50% savings over baseline)
• Provision of 60kWp photovoltaic system
• 41.3% energy savings vs NRB 2015 reference model
• Extensive use of WELS “Excellent” water fittings
• Extensive use of sustainable green products

Client/Developer
National University of Singapore

Architect
Forum Architects Pte Ltd

M&E Engineer
CPG Consultants Pte Ltd

Structural Engineer
KCL Consultants Pte Ltd

Quantity Surveyor
Quants Associates

Main Contractor
Debenho Pte Ltd

ESD Consultant
GreenA Consultants Pte Ltd
TIONG BAHRU MARKET
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

• Estimated to achieve 49% energy savings with energy efficient LED lightings for common area, and the upcoming installation of solar panels

• Good natural ventilation with design of building layout that utilises prevailing wind conditions to achieve adequate cross ventilation

• Installation of Smart Feedback system outside the toilet for patrons to report any faults or feedback

• Awarded PUB water Efficient Building certificate

• Implementation of recycling programme, with provision of recycling bins and sustainability awareness messages within the vicinity

Client/Developer  National Environment Agency
Facility Manager  National Environment Agency
ESD Consultant  Building System & Diagnostics Pte Ltd
ULU PANDAN BUS DEPOT
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING

- Energy efficient unitary air-conditioning system with weighted efficiency of 0.7346 kW/RT
- Extensive use of energy efficient LED lighting system in offices, workshop and bus parking area.
- Naturally ventilated bus parking area.
- Use of water efficient fittings rated with ‘Excellent’ under WELS scheme and adopting water efficient flow rates.
- The first depot in Singapore to install with 700.26 kWp photovoltaic solar panel system on its rooftop to harvest renewable energy.
- Installed with NEWater system as non-portable uses for bus washing and irrigation for the rooftop garden.
- Provision of 3000 m2 surface area as rooftop greenery with the use of polyculture planting
- 49% energy savings vs NRB 2015 Reference model
UNITED WORLD COLLEGE OF SOUTH EAST ASIA

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING (RE-CERT)

- Estimated energy savings: 309,525 kWh/yr; Estimated water savings: 4811 m³
- Passive design and building layout to minimise heat gain and maximise natural ventilation. Depth of most classrooms is not more than 9.5m to allow for natural daylighting.
- Passive Chilled Beam for energy efficient office setup
- Solar Photovoltaic system of installed capacity 482.37kWp estimated to generate more than 550,000kWh of electricity a year
- Filtrated rainwater to water points for general washing and irrigation purposes.
- Motion sensor lighting at all private lift lobbies, changing rooms and common staircases. Day lighting sensors in classrooms.
- Rooftop garden, Building façades incorporate huge green walls to reduce the ambient temperature.

Client/Developer
United World College of South East Asia

Facility Manager
United World College of South East Asia

Energy & Sustainability Consultant
United World College of South East Asia
UNITED WORLD COLLEGE OF SOUTH EAST ASIA - EAST
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM, SUPER LOW ENERGY BUILDING (RE-CERT)

- Estimated energy savings: 278,940 kWh/yr; Estimated water savings: 5033 m³
- High efficiency chiller plant- 0.58kW/RT
- Extensive green wall
- Rainwater collection and filtration using rain garden for irrigation
- Depth of classroom not more than 9.5m to enhance daylight harvesting
- Motion sensor for lighting control for lift lobbies, changing rooms and common staircases

Client/Developer
United World College of South East Asia - East

Facility Manager
United World College of South East Asia - East

Energy & Sustainability Consultant
United World College of South East Asia - East
The Green Mark certification scheme was launched in January 2005. It is a green building rating system designed to evaluate a building’s environmental impact and performance. It provides a comprehensive framework for assessing the overall environmental performance of new and existing buildings to promote sustainable design, and best practices in construction and operations in buildings.

Green projects may enjoy these benefits over the long run:

- Meaningful differentiation of buildings in the real estate market
- Positive effect on corporate image, leasing and resale value of buildings
- Reduction in energy, water and material resource usage
- Reduce potential environmental impact
- Improvement in indoor environmental quality for better health and well being
- Provide clearer direction for continual improvement

Key criteria

- Climatic responsive design
- Building energy performance
- Resources stewardship
- Smart and healthy building
- Advance green efforts
30 RAFFLES PLACE
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer: Oxley Beryl Pte Ltd
Architect: DCA Architects Pte Ltd
M&E Engineer: J Roger Preston (S) Pte Ltd
Structural Engineer: RSP Architects Planners & Engineers (Pte) Ltd
Quantity Surveyor: Arcadis Singapore Pte Ltd
Main Contractor: Sunray Woodcraft Construction Pte Ltd
ESD Consultant: Building System & Diagnostics Pte Ltd
Landscape Consultant: Tinderbox Pte Ltd

- Installation of energy efficient water-cooled chilled-water plant with system design efficiency of 0.562 kW/RT
- Installation of 100% EC plug fan FCUs with air distribution efficiency of 0.19 kW/RT
- Use of 100% energy efficiency LED lightings to achieve 39.78% energy savings as compared to the baseline
- Conservation of existing structure and CUI of 0.156 m3/m2 for all new works
- Use of SGBC-certified 2-ticks and 4-ticks concrete and locally certified environmentally friendly products for the building
- Use of innovative and integrative features to optimise workflow and attain persistence of high performance and energy efficiency in building
- Green lease agreement to control lighting power density for tenanted areas
7 NORTH COAST
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Estimated energy savings: 2,222,701kWh/yr; Estimated water savings: 220161m$^3$, ETTV: 32.31 W/m$^2$
- Extensive use of Green Cover
- Use of EC Plug, Thermal Diffusers, Energy Valve, Heat Pumps etc
- Provision of Energy & Water Dashboard.
- Use of Water efficient fitting

Client/Developer | JTC Corporation
Architect | Aedas Pte Ltd
M&E Engineer | WSP Consultancy Pte Ltd
Structural Engineer | Arup Singapore Pte Ltd
Quantity Surveyor | Rider Levett Bucknall LLP
Main Contractor | Lum Chang Building Contractors Pte Ltd
CENTRAL BOULEVARD TOWERS
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Extensive greenery on Level 1, 5, 7 and at the rooftop of 16-storey tower (GnPR of 5.8)
• Rainwater harvesting and drip irrigation system to irrigate 100% of the landscape area
• 100% LED lighting with an overall energy saving of 42%, with installation of motion sensors for toilets, staircases and carparks
• Implementing Green Lease for tenants to ensure the targeted energy saving is achieved
• Estimated energy savings: 8,293,036.00 kWh/yr and water savings: 55,642.16 m3/yr
• Extensive use of environmentally friendly materials
• IGU glass and air-tight systems to reduce the heat gain through fenestration
FACULTY OF ENGINEERING BLOCK E7 AT NATIONAL UNIVERSITY OF SINGAPORE

NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Estimated energy savings: 1,242,248 kWh/yr;
  Estimated water savings: 9,984 m³/yr, ETTV: 37.08 W/m²
- Energy efficient chilled water air conditioning system
  Total system efficiency of 0.76 kW/RT
  \((0.57 \text{ kW/RT} + 0.19 \text{ kW/RT}_{\text{Air}})\)
- Energy efficient VRF system with operating efficiency of 0.66 kW/RT.
- Energy efficient lighting system (>40% savings over baseline)
- Use of motion sensors for toilets and staircases
- Extensive use of WELS “Excellent” water fittings
- Extensive use of green concrete sustainable green products
- Smart and Integrated Building Management System

Client/Developer: National University of Singapore
Architect: Architect 61 Pte Ltd
Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

M&E Engineer: KTP Consultants Pte Ltd
Arcadis Singapore Pte Ltd
Lian Soon Construction Pte Ltd

Structural Engineer: Coen Design International Pte Ltd

Quantity Surveyor: Alpha Acoustics Engineering Pte Ltd
Building System & Diagnostics Pte Ltd
GUOCO MIDTOWN
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Optimal building orientations are designed to minimize heat gain and achieve ETTV of 37.72 W/m². Sun shadings and performance glazing are provided to achieve maximum comfort.

- Extensive landscape areas with GnPR of 7.08 to enhance biodiversity and provide visual relief to staffs, residents and publics.

- Efficient Chiller Plant System of 0.575 kW/RT is designed.

- Efficient lighting design through the use of LED lightings and provision of motion sensors.

- Use of cooling tower water treatment system to increase the solubility of water and facilitate at least 7 cycles of concentration (CoC) of acceptable water quality.

- Use of “Excellent” Water Efficiency Labeling Scheme (WELS)-Certified fittings for all applicable areas.

- Recovery of condensate from AHUs for cooling tower make-up to reduce potable water usage.
HOMETEAMNS KHATIB

NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Low Heat Gain Facade
• Energy Efficient Air Conditioning Chilled Water Plant
• Use of LED Lightings
• Solar Photovoltaics System
• Rainwater Harvesting System
• Heat Recovery System for Heat Pumps
• Water Efficient Fittings
• Eco filtration system for Swimming Pool
• Use of low VOC paints
• Electric Car Charging Stations
• Engagement of Acoustic Consultant

Client/Developer

HomeTeamNS

Project Manager

SIPM Consultants Pte Ltd

Architect

DP Architects Pte Ltd

Landscape Consultant

DP Green Pte Ltd

M&E Engineer

WSP Consultancy Pte Ltd

Structural Engineer

KTP Consultants Pte Ltd

Green Mark Consultant

WSP Consultancy Pte Ltd

Quantity Surveyor

AECOM Cost Consulting And Project Management (Singapore) Pte Ltd

Main Contractor

CMC Construction Pte Ltd
LOGOS TUAS LOGISTICS HUB
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Features such as comprehensive wayfinding signages and security surveillance are provided to encourage bicycle usage.
- Extensive use of Green Label Products with higher recycled content and lower carbon footprint are used extensively throughout the development.
- Variable Refrigerant Flow (VRF) System with high efficiency of about 0.8kW/RT used in the development.
- Landscape is populated by lush native greenery and robust drought-tolerant plants which are convenient to maintain.
- 3-Ticks WELS water fittings are used extensively for maximum water savings in the development.
- Major water usage areas have private meters connected to building management system for leak detection.
- Dashboard with trending of water and energy consumption is installed at a high traffic area to encourage reduction and conservation of water and energy usage.

Client/Developer
LOGOS SE ASIA PTE LTD

Architect
ID Architects Pte Ltd

M&E Engineer
Bescon Consulting Engineers Pte Ltd
Thymn Pte Ltd

Structural Engineer
Northcroft Lim Consultants Pte Ltd

Quantity Surveyor
Building System & Diagnostics Pte Ltd

ESD Consultant
HPC Builders Pte. Ltd.
PAN PACIFIC ORCHARD
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Low E Double Glazed Glass with an ETTV Value of 37.7 W/m²
- Biomimicry design comprising 4 themed terraces achieving a Green Plot Ratio of (GnPR) 9.38 and incorporating usage of approximately 23% drought tolerant plants
- Energy Efficient Air Distribution System of 0.163 kW/RT with adoption of EC fans at all Fan Coil Units (FCU)
- Energy efficient LED lighting with lighting savings of approximately 38%
- Bio Digestor System for food waste recycling with greywater by product reused for system self sufficiency
- Installed solar photovoltaic (PV) capacity of 175 kWp
- Effective daylighting for 38% of occupied common areas

Client/Developer: UOL Claymore Investment Pte Ltd
Architect: WOHA Architects Pte Ltd
M&E & ESD Engineer: Beca Carter Hollings & Ferner (S.E.Asia) Pte Ltd
Structural Engineer: TEP Consultant Pte Ltd
Quantity Surveyor: Rider Levett Bucknall LLP
Main Contractor: Shimizu Corporation
PSA LIVEABLE CITY

NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer: PSA Corporation Pte Ltd
Architect: DCA Architects Pte Ltd
M&E Engineer: Surbana Jurong Consultants Pte Ltd.
ESD: Surbana Jurong Consultants Pte Ltd.
Structural Engineer: RSP Architects planners and engineers Pte Ltd
Quantity Surveyor: PSA Corporation Pte Ltd
Main Contractor: PSA Corporation Pte Ltd

- 28% reduction in Envelope Thermal Transfer Value. ETTV achieved - 36 W/m²
- Minimum 15% cooling load reduction
- High efficiency magnetic bearing chiller with plant efficiency of 0.56 kW/RT
- Use of high efficiency EC motor for Air-Distribution, minimum 50% energy savings.
- Use of Daily light and motion sensors for enhanced operational savings.
- Annual energy savings – 32.94% (excluding Renewables). Including renewables it is 36.76% savings
- Water sustenance via efficient fittings, condensate recovery etc.
- Live Energy and Water dashboard.
REDLION WAREHOUSE SINGAPORE
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Native plant species used for more than 50% of the landscape
• Chiller plant designed to meet efficiency of 0.58 kW/RT
• Energy efficient jet fans provided at carpark
• Locally certified sustainable products used extensively throughout development
• Solar photovoltaic panels with a capacity of more than 400 kWp will be installed on rooftop
• Post-tension slabs used for more than 75% of the development’s constructed floor area
• Open protocol controllers will be used as the network backbone for the Building Management System of the development

Client/Developer  Schenker Singapore (Pte) Ltd
Architect        HA Architects Pte Ltd
M&E Engineer     PDC Consulting Engineers
Structural Engineer YH Liew Consulting Engineers
Main Contractor  Boustead Projects E&C Pte Ltd
ESD Consultant   Building System & Diagnostics Pte Ltd
ROCHESTER COMMONS
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Chilled water chiller plant with efficiency of 0.610kW/ton.
- ~50% lighting savings through LED fittings.
- High façade performance and low window-to-wall ratio.
- Use of WELS 3 ticks water fittings.
- Provision of Courtyard garden and Rooftop garden.

Client/Developer: Ascendas Vista Property Pte Ltd acting as trustee of Ascendas Vista Trust
Architect: DCA Architects Pte Ltd
M&E Engineer: Mott Macdonald Pte Ltd
Structural Engineer: Mott Macdonald Pte Ltd
Quantity Surveyor: Rider Levett Bucknall LLP
Main Contractor: Hexacon Construction Pte Ltd
SENJA HAWKER CENTRE
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer: National Environment Agency
Architect: Tan + Tsakonas Architects
M&E Engineer: Conteem Engineers Pte Ltd
Structural Engineer: OGP Konsult Pte Ltd
Quantity Surveyor: PQS Consultants Pte Ltd
Main Contractor: Guan Ho Construction Co (Pte) Ltd

- Designed for Natural Ventilation- Spatial layout, HVLS fans and façade design were optimised following various CFD studies.
- Provision of Pneumatic Food Waste Conveyance System
- Use of low carbon concrete in place of regular concrete for superstructure.
- Provision of rainwater harvesting system to minimize potable water use for irrigation.
- Extensive greenery at rooftop garden reduces heat gain while providing biophilic communal space for residents to enjoy.
- Extensive use of sustainable products certified by SGLS.
- Use of energy-efficient LED lightings and water fittings with excellent WELS rating.
SHIMANO SINGAPORE INTELLIGENT PLANT
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Estimated energy savings: 2,990,000 kWh/yr; Estimated water savings: 4,180 m$^3$/yr, ETTV: 28.64 W/m$^2$.
• Water cooled chilled water plant with operating efficiency of 0.61kW/RT.
• High Efficient LED Lighting for the whole development
• Motion sensors installed in all toilets and staircases
• All water fittings installed are WELS 3-tick rated fittings.
• Extensive use of environmentally friendly products.
• Provision of roof garden covers 11,000 square meters and features a walking loop, grassland and trees and shrubs.
• 100% of the landscape area are served by drip irrigation system.

Client/Developer
Shimano (Singapore) Pte Ltd

Design Architect
Taro Ashihara Architects

Design Development
Takenaka Corporation

Main Contractor
Takenaka Corporation

Architecture QP
AWP Pte Ltd

Structural QP
KTP Consultants Pte Ltd

M&E QP
Surbana Jurong Consultants Pte Ltd

ESD Consultant
GreenA Consultants Pte Ltd
TIMMAC @ KRANJI

NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Enhanced overall thermal performance of building envelope achieving an ETTV of 38W/m² and below.

• Extensive greenery at a Green Plot Ratio of 4.5 and above are provided for nature connectivity and appreciation.

• Provision of energy efficient water-cooled chilled water system with an efficiency of 0.58kW/RT and lower.

• Development roof is designed for solar readiness in terms of structural, electrical and spatial aspects.

• More than 50% of the landscaped areas served by water efficient automated auto irrigation with rain sensor control.

• Water and Energy dashboard showing consumption trends of development common areas is provided to create awareness of the building users and visitors.

• Provision of collaborative BIM for clash detection purposes, 4D time information linkages and schedule tracking of Project.
313@SOMERSET
EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient chiller plant performance of 0.636kW/RT
- All lifts are equipped with variable voltage variable frequency motor drive and sleep mode function
- Use of energy efficient motion sensors and photo sensor for common corridors
- Use of car park guidance systems to divert traffic and avoid congestion of vehicles
- Achieved PUB Water Efficient Building Silver certification with water savings fitting installed and other water saving measures

Building Owner  Lendlease Global Commercial REIT
Facility Management  Lendlease Retail Pte Ltd
ESD/Green Consultant  Kaer Pte Ltd
BLOCK N1 (CEE)
EXISTING NON-RESIDENTIAL BUILDING

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

• Efficient water cooled plant
• High Efficient LED Lighting
• Certified PUB Water Efficient Buildings
• Naturally ventilated carpark
• Motion sensors at all toilets and staircases

Client/Developer: Nanyang Technological University
Facility Management: SMM Pte Ltd
ESD Consultant: SMM Pte Ltd
BLOCK N2.1
EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient water cooled plant
- High Efficient LED Lighting
- Certified PUB Water Efficient Buildings
- Naturally ventilated carpark
- Motion sensors at all toilets and staircases

Client/Developer: Nanyang Technological University
Facility Management: SMM Pte Ltd
ESD Consultant: SMM Pte Ltd
BLOCK N3.1 (MAE)
EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient water cooled plant
- High Efficient LED Lighting
- Certified PUB Water Efficient Buildings
- Naturally ventilated carpark
- Motion sensors at all toilets and staircases

Client/Developer: Nanyang Technological University
Facility Management: SMM Pte Ltd
ESD Consultant: SMM Pte Ltd
BLOCK N3.2 (MAE)
EXISTING NON-RESIDENTIAL BUILDING

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

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

- Efficient water cooled plant
- High Efficient LED Lighting
- Certified PUB Water Efficient Buildings
- Naturally ventilated carpark
- Motion sensors at all toilets and staircases
BLOCK N4 (SCSE)
EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient water cooled plant
- High Efficient LED Lighting
- Certified PUB Water Efficient Buildings
- Naturally ventilated carpark
- Motion sensors at all toilets and staircases

Client/Developer: Nanyang Technological University
Facility Management: SMM Pte Ltd
ESD Consultant: SMM Pte Ltd
BLOCK N4.1 (MSE)

EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient water cooled plant
- High Efficient LED Lighting
- Certified PUB Water Efficient Buildings
- Naturally ventilated carpark
- Motion sensors at all toilets and staircases

Client/Developer: Nanyang Technological University
Facility Management: SMM Pte Ltd
ESD Consultant: SMM Pte Ltd
BUGIS+
EXISTING NON-RESIDENTIAL BUILDING

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

- Chiller system efficiency of 0.64kW/RT.
- Naturally ventilated public toilets.
- Carpark guidance system is available in the carpark to minimise carbon monoxide emitted from unnecessary movement of cars.
- Lifts and escalators are equipped with variable speed drives (VSDs).

Client/Developer: CapitaLand
Facility Management: CapitaLand
ESCO: LJ Energy Pte Ltd
ESD /Green Consultant: LJ Energy Pte Ltd
BUKIT PANJANG HAWKER CENTRE & MARKET
EXISTING NON-RESIDENTIAL BUILDING

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

- Naturally ventilated design with adjustable louvres and Energy efficient MV fans
- Energy efficient light fittings
- Daylight sensor & motion sensor control for office spaces, toilets & staircases
- CO sensor with MV jet fan for car park
- Water fittings installed are “Excellent” under PUB WELS rating scheme
- Daylight design with daylight sensors
- Vertical green wall, rainwater harvesting system
- Sustainable certified products

Building Owner: National Environment Agency
Facility Management: NTUC Foodfare Co-operative Ltd
ESD/Green Consultant: Building System & Diagnostics Pte Ltd
CAMPUS CLUBHOUSE
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Efficient VRF system
- Extensive use of LED Light Fittings
- Naturally ventilated carpark
- Provision stormwater collection for irrigation

Building Owner: Nanyang Technological University
Facility Management: Sodexo Kim Yew Pte Ltd
ESD/Green Consultant: Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
CHINESE HERITAGE CENTRE
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Building Owner: Nanyang Technological University
Facility Management: SMM Pte Ltd
ESD/Green Consultant: Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

- Efficient Water-cooled chilled water system with efficiency of 0.59 kW/RT
- Passive Displacement Ventilation system is used
- Extensive use of LED lighting
- Motion sensors for artificial lighting control
COLLEGE OF MEDICINE BUILDING
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Estimated energy savings: 177,562 kWh/yr; Estimated water savings: 438 m3/yr
- Efficient chilled water plant with overall chiller plant efficiency of 0.653 kW/Rt
- Extensive of energy efficient LED lighting in the development.
- Use of lifts with variable voltage variable frequency motor drive and sleep mode.
- Use of water efficient fittings 2 ticks / 3 ticks under (WELS) rating and obtain Water Efficient Building Certification from PUB
- Natural ventilated carparks
- Extensive use of Singapore Green Building Products certified by Singapore Green Building Council

Client/Developer | Ministry of Health
Architect | SQFT Architects Pte Ltd
M&E Engineer | HPX Consulting Engineers Pte Ltd
Conservation Consultant | FranzWood Associates
Quantity Surveyor | OTN Building Cost Consultants Pte Ltd
Main Contractor | TEE International Ltd
ESD Consultant | Building System & Diagnostics Pte Ltd
CORPORATION PLACE
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer
HSBC Institutional Trust Services (Singapore) Limited as Trustee of Ascendas Real Estate Investment Trust (the Trustee)

Facility Manager
Ascendas Services Pte Ltd

ESD / Green Consultant
C&W Services (S) Pte Ltd

• Chiller plant system is under guaranteed performance contracting services to achieve 0.614 kW/RT or better.

• LED lightings are in use at common areas, achieving 62% improvement over baselines. Motion sensors are installed to optimise lighting energy usage.

• “Earth Hour” activity was conducted with participation by tenants. Health & wellness activities are also conducted regularly as part of HPB “Healthy Workplace Ecosystem” programme.

• Recycling facilities for common recyclables and for electronic wastes are available. CapitaLand is in partnership with NEA for the campaign - “Say Yes to Waste Less” to promote the use of reusables.
DAS SPEKTRUM @ CBP
EXISTING NON-RESIDENTIAL BUILDING

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

• North-West facing facade canted to reduce solar heat gain
• Use of sustainable material terracotta for louvers as shading devices
• Extensive greenery within development with Green Plot Ratio > 5
• Recycling of at least 50% AHU condensate as non-potable water source for landscape irrigation
• Use of chemical-free anti-termite treatment system

Client/Developer  Rohde & Schwarz Property Singapore Pte Ltd
Facility Manager  C&W Services (S) Pte Ltd
ESD / Green Consultant  Earth-In-Mind Private Limited
DUO TOWER AND DUO GALLERIA, PROPOSED MIXED-USE DEVELOPMENT AT OPHIR-ROCHOR, SINGAPORE (COMMERCIAL)

EXISTING NON-RESIDENTIAL BUILDING

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

- Hexagonal façade design with double glazed low-e glass
- Energy Efficient Central Chiller System at 0.59 kW/RT
- Heat pipe to recover energy from toilet to exhaust air to PAHU
- Lush green surroundings with 100% landscape replacement
- Carpark guidance system
- Rainwater harvesting system coupled with siphonic rainwater drainage piping from irrigation

Client/Developer: Ophir-Rochor Commercial Pte Ltd
ESD Consultant: G-Energy Global Pte Ltd
Facility Manager: MCST PLAN NO.4662
FUSIONOPOLIS ONE
EXISTING NON-RESIDENTIAL BUILDING

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

- Automatic control devices are used to regulate outdoor air flow rate to maintain the concentration of Carbon Dioxide (CO2)
- 49% improvement in air distribution system efficiency
- Carbon Monoxide (CO) monitoring system for control of car park mechanical ventilation fans
- Occupancy sensors are installed in all toilets and sky bridges to reduce energy consumption usage
- Use energy-saving lightings at landlord common areas and tenanted areas

Client/Developer: JTC Corporation
Facility Management: C&W Services (S) Pte Ltd
ESD Consultant: C&W Services (S) Pte Ltd
FUSIONOPOLIS TWO

EXISTING NON-RESIDENTIAL BUILDING

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

- Chill water system efficiency is 0.6kW/RT
- High Efficient LED Lighting
- High performance fan filter units with low power consumption DC motors
- Rainwater harvesting system and AHU condensate water used for toilet flushing
- Centralized pneumatic waste collection system

Client/Developer: JTC Corporation
Facility Management: C&W Services (S) Pte Ltd
ESD Consultant: C&W Services (S) Pte Ltd
GARDENS BY THE BAY (BAY SOUTH)
EXISTING NON-RESIDENTIAL BUILDING

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

- Biomass co-generation system with absorption chiller
- Provision of Photovoltaic system at the supertree top
- Natural water filtration using lake
- Provision of light shelve and skylight for gardens staff office
- Provision of green roof and vertical greenery

Client/Developer  Gardens by the Bay
Facility Manager  ST Synthesis
ESD / Green Consultant  Surbana Jurong Consultants Pte Ltd
Building Owner        Tamerton Pte Ltd
Facility Manager      Resorts World at Sentosa Pte Ltd
ESD/Green Consultant  G-Energy Global Pte Ltd

• Provision of automated parking to reduce the emission of carbon footprints, reduce lightings and maximum the open space.

• Extensive use of high efficiency LED lamps with lower wattage.

• High efficiency water-cooled chilled-water system with average operating system efficiency of 0.62 kW/RT.

• High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality.

• Efficient heat pump system to produce hot water for guest rooms, F&B and kitchen usage.
GREAT EASTERN CENTRE & NANKIN ROW SHOPHOUSES
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Building Owner  Great Eastern Life Assurance Company
Facility Management  MCST 2781
ESD/Green Consultant  Kaer Pte Ltd

- Energy efficient air conditioning system with system efficiency of 0.6kW/RT or better
- Involved in guarantee energy saving performance (GESP) to ensure chiller plant performance
- Installed energy efficient LED lightings for the offices and common area and motion sensors to control staircases and toilets lightings.
- Installed UVC lights in AHUs for better Indoor Air Quality
- Encourages tenants participation in energy saving and promotes waste recycling
- Carbon Monoxide detection to control Carpark Mechanical Ventilation fan.
- Achieved PUB Water Efficient Building certification with water savings fitting installed throughout the building
- Lifts are equipped with variable voltage variable frequency motor drive and sleep mode function
GREAT WORLD SERVICED APARTMENT

EXISTING NON-RESIDENTIAL BUILDING

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

- Use of eco-friendly cleaning chemicals for cleaning of apartments and common areas
- Using products certified by Green Label whenever feasible
- Took extra effort in recycling of Nescafe capsules as well as other wastes

Building Owner: GWC Serviced Apartments Pte Ltd
Facility Management: GWC Serviced Apartments Pte Ltd
ESD/Green Consultant: Johnson Controls (S) Pte Ltd
GUOCO TOWER
EXISTING NON-RESIDENTIAL BUILDING

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

- Water cooled chilled water plant with peak load efficiency of 0.639 kW/RT
- Use of T5 and LED lighting
- Integrated solar photo-voltaic panels
- Most water fittings with 3 tick WELS rating
- Extensive Greenery
- Integrated Storm Water Management System

Client/Developer  GuocoLand Singapore
Facility Manager  GuocoLand Property Maintenance Services Pte. Ltd.
HARBOURFRONT CENTRE
EXISTING NON-RESIDENTIAL BUILDING

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

• Efficient central chiller plant with system efficiency of 0.65 kW/RT
• Use of WELS-certified fittings and awarded as Water Efficient Building
• Use of NEWater for cooling tower make-up water consumption resulting to a reduction of potable water consumption
• Energy efficient LED lighting in use for common areas and motion sensors are installed toilets to optimize energy use

Client/Developer: HARBOURFRONT CENTRE PTE LTD
Facility Management: HARBOURFRONT CENTRE PTE LTD
ESD Consultant: C&W Services (S) Pte Ltd
HDB HUB
EXISTING NON-RESIDENTIAL BUILDING

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

- Estimated energy savings: 34,535.25kWh/yr; Estimated water savings: 273.72m³
- Energy efficient chiller plant system (0.626 kW/RT)
- LED lightings for common areas & carpark
- Solar Photovoltaic System (0.5 MWp) at rooftop
- Extensive greenery supplemented by vertical green walls

Building Owner: Housing & Development Board
Facility Management: CPG Facilities Management Pte Ltd
ESCO: Johnson Controls (S) Pte Ltd
ESD/Green Consultant: Johnson Controls (S) Pte Ltd
HEALTH PROMOTION BOARD
EXISTING NON-RESIDENTIAL BUILDING

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

• High performance water cooled chillers with efficiency of 0.617kW/RT and variable speed driver (VSDs) units installed to chilled water pumps, condenser pumps and cooling towers fan motor

• Refrigerant leak detection system installed in plant room and automatic tube cleaning system installed to condenser circuits of chillers

• Ultraviolet light C band (UV) emitters installed in AHUs to improve indoor air quality

• Energy-efficient LED lightings and carbon monoxide (CO) gas detection system installed at basement carpark.

• Motion sensors installed for all common toilets

Client/Developer: Health Promotion Board
Facility Manager: Indeco Engineers Pte Ltd
ESD / Green Consultant: CBM Solutions Pte Ltd
HEALTH SCIENCES AUTHORITY
EXISTING NON-RESIDENTIAL BUILDING

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

Client/Developer: Health Sciences Authority
ESD / Green Consultant: Indeco Engineers Pte Ltd
Facility Management: C&W Services (S) Pte Ltd
ESCO: C&W Services (S) Pte Ltd

- Guaranteed energy savings performance contract to achieve 0.62 kW/RT with chiller replacement.
- Extensive energy-efficient LED lightings, achieving 40% improvement over baselines.
- UV light emitters installed in AHUs to reduce infectious agents and improve IAQ.
- Photocell sensors are installed for lightings at Basement corridor & carpark, and motion sensors are installed in staircases & toilets.
HERITAGE CONSERVATION CENTRE
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer: National Heritage Board
ESD Consultant: Afogreen Build Pte Ltd
Facility Manager: Khoo Lor Nam
M&E Consultant: Bescon Consulting Engineers Pte

- Selection of high efficiency air distribution system that achieves 31% savings over baseline requirements
- Lighting power budget achieving 41% savings over baseline requirements
- Water efficient fittings that are already present on-site achieves excellent ratings for water conservation as well as an abundance of savings in order to target PUB Water Efficient Building Certificate
- Utilization of Cogeneration plant for cooling system.
- Comprehensive waste management programs.
- Renewable energy, Solar panels at the roof area which generating 4.53% of the total building energy.
ITE COLLEGE WEST
EXISTING NON-RESIDENTIAL BUILDING

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

- ETTV of 39 W/m²
- Efficient chiller plant system efficiency of 0.559 kW/RT, with CO₂ sensors in AHUs
- Certified PUB Water Efficient Building, with use of water-less urinals
- Extensive use of environmentally friendly products, including reinforced earth walls, eco-concrete, low-VOC waterproofing membranes and paints, recycled mineral fibre ceiling boards and partition boards
- Extensive greenery including rooftop gardens and vertical greenery, with use of compost recycled from organic matter
- Displacement ventilation at building auditorium and cross ventilation at Events Plaza
- Efficient hot water system with use of heat pumps and solar collectors

Client/Developer: PPP Infrastructure Management Pte Ltd
Facility Manager: C&W Services (S) Pte Ltd
ESCO: C&W Services (S) Pte Ltd
ESD/Green Consultant: C&W Services (S) Pte Ltd
JCUBE

EXISTING NON-RESIDENTIAL BUILDING

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

Owner            CapitaLand Mall Trust
Architect         RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer      Squire Mech Pte Ltd
Structural Engineer RSP Architects Planners & Engineers (Pte) Ltd
Main Contractor   Wee Hur Construction Pte Ltd
Energy Consultant LJ Energy Pte Ltd

- Estimated energy savings: NA ; Estimated water savings: NA, ETTV: NA
- Chiller system with operating efficiency of 0.649 kW/RT
- High Efficient LED Lighting for most of the building
- Extensive use of environmentally friendly products
JURONG POINT 1
EXISTING NON-RESIDENTIAL BUILDING

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

Building Owner: MCST 2693
Facility Management: Mercatus Epsilon Co-operative Ltd
ESD/Green Consultant: Qi Square Pte Ltd

- Implementation of Integrated Building Management System (iBMS) with adaptive control algorithm
- Energy efficient chiller plant with OSE of 0.623kW/RT
- Upgrading of existing light fittings to better performing LED lights for common areas, toilets and staircases
- Use of environmentally friendly products and practices through Green Guide for tenants
- Provision of charging point for electric vehicles
- Provision of Green Tenancy Fit-out Guide for tenants to incorporate sustainable operations and material selection
JURONG POINT 2
EXISTING NON-RESIDENTIAL BUILDING

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

- HVA-ECS System, a chemical free water treatment implemented for cooling tower to improve COC of up to 19
- Upgrading the existing light fittings with more energy efficient LED lights for toilets
- Car park provided with CO sensors and MV fans with VSD control
- All the lifts and escalators have been upgraded with VVVF and sleep mode
- Provision of charging point for electric vehicles
- Provision of Green Tenancy fit-out guideline for tenants to promote sustainable operations and material selection

Building Owner          Sub MCST 3586 (No.1)
Facility Management     Mercatus Epsilon Co-operative Ltd
ESD/Green Consultant    Qi Square Pte Ltd
JURONG TOWN HALL
EXISTING NON-RESIDENTIAL BUILDING

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

- Energy efficient water-cooled chiller system with chiller system efficiency of 0.587 kW/RT.
- Use of LED lightings in common areas such as lift lobbies, common corridors and staircases.
- Efficient air distribution system (AHU/FCU), with 56% improvement over the baseline.
- Use of lifts with provision of Variable Frequency (VVVF) drives and sleep mode.
- Provision of motion sensors to regulate the lightings in common areas, i.e. toilet, staircases.
- Provision of water sub-meters for major water usage such as cooling tower make-up water, domestic water usage.
- Extensive use of water efficient fittings with rating of 3 ticks and above under Water Efficient Labelling Scheme (WELS).
- Use of sustainable products certified by Singapore Green Council (SGBC) or Singapore Green Label Scheme (SGLS).

Client/Developer: JTC Corporation
Facility Management: CapitaLand Pte Ltd
ESCO: 6-Sigma Automation Pte Ltd
ESD / Green Consultant: 6-Sigma Automation Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- Energy efficient water-cooled chiller system with chiller system efficiency of 0.61 kW/RT
- Passive building design to reduce solar heat gain
- Minimised use of single pass AHUs in lab air distribution system
- Heat recovery using round around coil
- Under floor air distribution system in auditorium and learning studio
- Energy efficient lighting
- Use of green concrete

Client/Developer: Nanyang Technological University, Lee Kong Chian School of Medicine
ESD Consultant: Ecosavvy Pte Ltd
Facility Manager: Synergy FMI Pte Ltd
LEE KONG CHIAN SCHOOL OF MEDICINE (EXPERIMENTAL MEDICINE BUILDING)
EXISTING NON-RESIDENTIAL BUILDING

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

Client/Developer  Nanyang Technological University
Consultant/Contractor  6-Sigma Pte Ltd
Facility Manager  Synergy FMI Pte Ltd
ESCO  6-Sigma Pte Ltd

• Energy efficient air-conditioning system
• Passive building design to reduce solar heat gain
• Heat recovery using round around coil
• Minimised use of single pass AHUs in lab air distribution system
• Under floor air distribution system in learning studio
• Energy efficient lighting
• Use of green concrete
M SOCIAL SINGAPORE
EXISTING NON-RESIDENTIAL BUILDING

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

Client/Developer: Novel Developments Pte Ltd
Facility Management: Novel Developments Pte Ltd
ESCO: G-Energy Global Pte Ltd
ESD / Green Consultant: G-Energy Global Pte Ltd

- Efficient chiller plant with measured system efficiency of 0.573 kW/ton
- Extensively use of energy efficient LED light fittings for car parks and corridors.
- Use of Motion sensors linked to lightings for staircases.
- Extensive use of sustainable products certified by SGLS.
- Lifts equipped with energy efficient regenerative motors and sleep mode feature.
MAPLETREE ANSON
EXISTING NON-RESIDENTIAL BUILDING

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

Client/Developer: DBS Trustee Ltd as Trustee of MCT
Facility Management: Building Systems & Diagnostics Pte Ltd
ESD / Green Consultant: Mapletree Commercial Property Management Pte Ltd

- High efficiency central cooling plant – VSD screw chillers, VSD for chilled water and condenser water pump, VSD for cooling tower fan.
- Incorporated Heat Pipes technologies at the pre-cooled AHU to pre-cool the outdoor fresh air through cooled toilet exhaust air.
- Extensive use of energy efficiency T5 fluorescent lights with electronic ballast for office space. Occupancy sensor are installed in all staircases.
- CO2 sensors integrated demand control ventilation for office AHU to reduce fresh air intake when human occupancy is low hence reduce cooling load demand.
- CO sensor integrated with ductless MV jet fan for carpark - to activate the MV fans when the CO level is above the unacceptable limits hence reducing the electricity consumption.
- Motion detectors integrated with lighting control for all toilets.
- Indoor air quality (IAQ) audit conducted to ensure a good indoor air quality in office premises.
MAPLETREE BUSINESS CITY I
EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient Water-cooled chilled water system with efficiency of 0.6 kW/RT
- Extensive use of LED lighting
- CO2 sensors integrated demand control ventilation for all office AHUs
- Rainwater is harvested for non-potable uses
- Provision of heat recovery system to produce hot water for F&B and amenities use

Building Owner | DBS Trustee Limited (as Trustee of Mapletree Commercial Trust)
Facility Management | Mapletree Commercial Property Management Pte Ltd
ESD/Green Consultant | Building System & Diagnostics Pte Ltd
MAPLETREE BUSINESS CITY II
EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient Water-cooled chilled water system with efficiency of 0.59 kW/RT
- Extensive use of LED lighting
- CO2 sensors integrated demand control ventilation for all office AHUs
- Rainwater is harvested for non-potable uses
- Provision of 40 kWp onsite Solar PV of renewable energy

Building Owner: Mapletree Business City Pte Ltd
Facility Management: Mapletree Business City Pte Ltd
ESD/Green Consultant: Building System & Diagnostics Pte Ltd
MARINA BAY FINANCIAL CENTRE TOWER 1, TOWER 2 AND MARINA BAY LINK MALL

EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient air distribution system, with CO₂ sensor in AHUs
- Energy-efficient lifts with regenerative drive feature and lift destination control system
- Energy-efficient T5 and LED lightings with motion sensors in both landlord and tenanted spaces
- Achieved PUB WEB Gold (Mixed Development)
- Water leak detection system linked to BMS and installed at all HX/AHU rooms and risers
- Recycling facilities in place for common recyclables (carton, paper, can, plastic and glass) and specialised waste stream (light tubes and electronic wastes)
- Active landlord involvement in encouraging tenants to adopt the BCA Green Mark for Healthier Workplaces 2018 Certification

Client/Developer: BFC Development LLP
Facility Manager: Raffles Quay Asset Management Pte Ltd
ESCO: C&W Services (S) Pte Ltd
ESD/Green Consultant: C&W Services (S) Pte Ltd
MARINA ONE (EAST AND WEST TOWER AND RETAIL PODIUM)

EXISTING NON-RESIDENTIAL BUILDING

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

- Heat pipes for all PAHUs
- Electronic Air Filter (EAC) at AHU units
- CO Sensor with ductless Jet Fan for Carpark Ventilation
- Energy Savings for lighting, through the usage of energy efficient fixtures such as LED at carparks, retail, toilets etc and T5 Fluorescent at Office Spaces
- NEWater for Toilet Flushing and Facade Cleaning
- Provision of Green Chute & Pneumatic Chute System

Client/Developer: MS Commercial Pte Ltd
Facility Manager: MS Property Management Pte Ltd
ESD/Green Consultant: G-Energy Global Pte Ltd
MINISTRY OF MANPOWER
EXISTING NON-RESIDENTIAL BUILDING

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

Client/Developer: Ministry of Manpower
Facility Manager: Ministry of Manpower
ESD/Green Consultant: Johnson Controls (S) Pte Ltd

- Pre-cooled fresh air AHU on rooftop.
- Motion sensor control incorporated for escalators.
- Regenerative and gearless driven elevators.
- Extensive usage of LED lightings for offices, toilets, lift lobbies & corridors, and staircases.
- New Water for Cooling Tower water make up. Up to 85% replacement of potable water consumption.
- Collection of pre-cool AHU condensate.
- CO sensor for car park fans and CO2 for Air Handling Units.
MOUNT ELIZABETH NOVENA
EXISTING NON-RESIDENTIAL BUILDING

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

• Chiller plant system with operating efficiency of 0.65kW/RT
• Pre-cool AHU to improve IAQ and RH control
• Demand control ventilation CO sensors for car park
• Provision of energy efficient LED lighting design
• Lifts and escalators are installed with VVVF motor and sensors
• Extensive greenery at various levels
• 10kWp onsite PV energy generation

Client/Developer  Parkway Pantai
Facility Manager  Parkway Hospitals Singapore Pte Ltd
ESD/ Green Consultant  G-Energy Global Pte Ltd
NANYANG POLYTECHNIC
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- 45% NEWater replacement serving ponds, water features, irrigation and toilet flushing
- Promotion of environmental awareness to staff and students
- Continuous effort to innovate and implement green features to achieve energy and water savings
- Use of SGBC certified Chiller and Pumps
- PUB Water-Efficient Building Certified
- Vertical greenery and rooftop gardens to soften the hardscape

Client/Developer    Nanyang Polytechnic
Facility Manager    Nanyang Polytechnic
ESD/Green Consultant G-Energy Global Pte Ltd
NATIONAL DESIGN CENTRE
EXISTING NON-RESIDENTIAL BUILDING

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

- Energy Efficient Variable Refrigerant Volume (VRV) air-conditioning system
- Extensive use of energy efficient lightings achieving at least 40% energy savings compared to the baseline
- Implementation of Energy, Green Procurement and Environmental Policies and Water Efficient Improvement Plans
- Use of energy efficient lifts with Variable Voltage Variable Frequency (VVVF) Drive and sleep mode

Client/Developer: DesignSingapore Council Pte Ltd
Facility Manager: ENGIE Property Services Pte Ltd
ESD/Green Consultant: Building System & Diagnostics Pte Ltd
NATIONAL LIBRARY BUILDING
EXISTING NON-RESIDENTIAL BUILDING

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

- Efficient Water-cooled chilled water system with efficiency of 0.69 kW/RT
- High Efficient LED/T5 Lighting
- Naturally ventilated Atrium Events Plaza
- Efficient day lighting design with light shelves throughout perimeter of building
- Extensive greenery

Building Owner: National Library Board
Facility Management: Fonda Global Engineering Pte Ltd
ESD/Green Consultant: G-Energy Global Pte Ltd
NCS HUB
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Energy Efficient Chiller Plant System < 0.6kW/RT
• Extensive use of energy efficient lightings
• Implementation of Energy, Green Procurement and Environmental Policies and Water Efficient Improvement Plans
• CO2 sensors were installed to modulate fresh air intake for all buildings
• All lifts are also upgraded with VVVF drive
• Waste recycling program

Client/Developer NCS Pte Ltd
Facility Manager Koyo Engineering (S.E.Asia) Private Limited
ESD/Green Consultant 6-Sigma Pte Ltd
NEW PHOENIX PARK
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Energy saving is 3,412,780kwh/m²/yr
- Chill water system efficiency is 0.633kW/RT
- High Efficient LED Lighting
- Basement Carpark Equipped with CO sensor for Carpark Mechanical Ventilation Rate Control
- Guard House Roof Equipped with Solar Panel with capacity of 70 kWp

Client/Developer: Ministry of Home Affairs
Facility Management: C&W Services (S) Pte Ltd
ESD Consultant: EWC Engineers Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- Efficient Water-cooled chilled water system with efficiency of 0.59 kW/RT
- Extensive use of LED lighting
- Motion Sensors at all toilets and staircase
- Water sub-metering link to BMS for leak detection system

Building Owner: Nanyang Technological University
Facility Management: SMM Pte Ltd
ESD/Green Consultant: SMM Pte Ltd
OASIS @ SAKRA
EXISTING NON-RESIDENTIAL BUILDING

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

- Achieved 42.6W/m² with Low-E glass (1.85 U-Value and 0.3SC) and overhangs
- Efficient VRF AC system with efficiency of 0.73kW/RT
- T5 and LED luminaries give 59% improvement over baseline
- Cross-ventilation air flow in 8 levels of car park
- All water fittings are with 3-tick WELS Water Efficiency Label
- BMS tracking of water consumption and room temperature
- Management commitment in Waste Management and Post Occupancy Evaluation

Building Owner: JTC Corporation
Facility Management: Guthrie FMC Pte Ltd
ESD/Green Consultant: ES Management Pte Ltd
ONE RAFFLES PLACE (TOWER 2)
EXISTING NON-RESIDENTIAL BUILDING

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

- Energy efficient water-cooled chiller system with chiller system efficiency of 0.62 kW/RT
- Provision of CO2 sensor control for fresh air modulation of AHUs
- Use of LED lightings in common areas such as lift lobbies, common corridors and staircases
- Rainwater harvesting to replace potable water required for toilet flushing

Client/Developer: OUB Centre Limited
Facility Management: OUB Centre Limited
ESCO: 6-Sigma Automation Pte Ltd
ONE RAFFLES QUAY
EXISTING NON-RESIDENTIAL BUILDING

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

• Estimated energy savings: 1,084,820 kWh/yr; Estimated water savings: 375.5m³
• Provision of regenerative lift drive
• Provision of siphonic rainwater discharge system
• Provision of carpark guidance system
• Condensate water is collected for carpark washing
• Provision of LED floodlights

Client/Developer  One Raffles Quay Pte Ltd
Facility Manager  Raffles Quay Asset Management Pte Ltd
ESD/ Green Consultant  C&W Services (S) Pte Ltd
PARKROYAL ON KITCHENER ROAD
EXISTING NON-RESIDENTIAL BUILDING

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

• Energy efficient chiller plant system
• Efficient lighting system
• Usage of heat pumps
• Regenerative lifts with VVVF and sleep mode features
• Use of fertilizers recycled from horticultural waste

Building Owner
Parkroyal Kitchener Hotel Pte. Ltd.

ESD Consultant
G-Energy Global Pte Ltd
POLICE CANTONMENT COMPLEX
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer: Singapore Police Force
Consultant/Contractor: Johnson Controls (S) Pte Ltd
Facility Manager: C&W Services
ESCO: Johnson Controls (S) Pte Ltd

- High efficiency chiller plant system retrofitted with Energy Management System for control and monitoring
- Use of energy efficiency products, e.g. chillers, pumps, VSDs and autotube cleaning system
- Mechanically ventilated carpark installed with CO sensors for better control
- Awarded PUB Water Efficient Building
- Motion sensors installed for toilets
Police Coast Guard Headquarters

Existing Non-Residential Building

Green Mark Award for Buildings | Platinum

Image not to be disclosed

• Estimated energy savings: 2,356,720 kWh/yr
• High efficiency chiller plant system retrofitted with the control and monitoring of building’s Energy Management System
• Natural ventilation for carpark, staircases, corridors and toilets
• Use of energy efficiency products, e.g. chillers, pumps, VSDs and autotube cleaning system
• Motion sensors installed for all toilets

Client/Developer: Singapore Police Force
Facility Manager: C&W Services (S) Pte Ltd
ESD / Green Consultant: Johnson Control (S) Pte Ltd
ESCO: Johnson Control (S) Pte Ltd
RESORTS WORLD SENTOSA – RESORTS WORLD CONVENTION CENTRE
EXISTING NON-RESIDENTIAL BUILDING

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

Client/Developer  Resorts World at Sentosa Pte Ltd
Facility Manager  Resorts World at Sentosa Pte Ltd
ESD/ Green Consultant  G-Energy Global Pte Ltd

- Extensive use of high efficiency LED lamps with lower wattage
- Provision of smart remote metering system for water monitoring and leak detection
- High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality
- Provision of VSD and dedicated Proportional Integral Derivative (PID) control for Secondary Heat Exchangers Pumping System
- On-site food waste treatment system which turn food waste into liquid and safely discharged into the sewage system
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- Extensive use of high efficiency LED lamps with lower wattage
- Provision of VSD and dedicated Proportional Integral Derivative (PID) control for secondary heat exchangers pumping system
- 500 kWp Solar Photovoltaic System which harvest solar energy to generate electricity
- High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality
- Provision of smart remote metering system for water monitoring and leak detection

Building Owner: Resorts World at Sentosa Pte Ltd
Facility Management: Resorts World at Sentosa Pte Ltd
ESD/Green Consultant: G-Energy Global Pte Ltd
ROBINSON 112
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Estimated energy savings: 624,810kWh/yr
- Retrofitting of existing WCPU system to water-cooled energy efficient refrigeration (EER) system with certified green products such as high efficient pumps, cooling towers and VSD
- Replacement of energy efficient lightings for common facilities and tenants to achieve at least 29% improvement in lighting power budget
- Use of lifts with AC variable voltage and variable frequency (VVVF) motor drive and sleep mode features
- Use of energy efficient lights with motion sensors at staircases
- PUB certified water efficient building (WEB)
- Provision of recycling program to track, reduce, and recycle the waste
- Provision of energy performance contract and continuous energy & efficiency monitoring program
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- Estimated energy savings: 63.983MWh/yr
- Chilled water system with operating efficiency of 0.65kW/RT
- Automatic sash closer for lab fume hoods
- Energy efficient LED lighting
- Task lighting for work desks and lab benches
- Motion sensor control for staircase and toilets
- Intelligence energy management system to manage building consumption
- Machine Learning and artificial air-conditioning optimization
- Auto tube cleaning system & refrigerant leak detection system for the chiller plant
- Variable speed drives for pumps and cooling tower
- Green educational corners

Building Owner: Nanyang Technological University
Facility Management: SMM Pte Ltd
Consultant Firm: SMM Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

Building Owner: Nanyang Technological University
Facility Management: SMM Pte Ltd
Consultant Firm: SMM Pte Ltd

- Estimated energy savings: 88.199MWh/yr
- Chilled water system with operating efficiency of 0.65kW/RT
- Automatic sash closer for lab fume hoods
- Energy efficient LED lighting
- Task lighting for work desks and lab benches
- Motion sensor control for staircase and toilets
- Intelligence energy management system to manage building consumption
- Machine Learning and artificial air-conditioning optimization
- Auto tube cleaning system & refrigerant leak detection system for the chiller plant
- Variable speed drives for pumps and cooling tower
- Green educational corners
**SCHOOL OF CHEMICAL AND BIOMEDICAL ENGINEERING (CBE)**

**EXISTING NON-RESIDENTIAL BUILDING**

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

<table>
<thead>
<tr>
<th>Building Owner</th>
<th>Nanyang Technological University</th>
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<tbody>
<tr>
<td>Facility Management</td>
<td>SMM Pte Ltd</td>
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<tr>
<td>Consultant Firm</td>
<td>SMM Pte Ltd</td>
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</tbody>
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- Estimated energy savings: 40.421MWh/yr
- Chilled water system with operating efficiency of 0.65kW/RT
- Energy efficient LED lighting for all areas
- Task lighting for work desks and lab benches
- Motion sensor control for staircase and toilets
- Automatic sash closer for Fume Hoods
- Intelligence energy management system to manage building consumption
- Machine Learning and artificial air-conditioning optimization
- Auto tube cleaning system & refrigerant leak detection system for the chiller plant
- Variable speed drives for pumps and cooling tower
- Green educational corners
SCHOOL OF PHYSICAL AND MATHEMATICAL SCIENCES
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Estimated energy savings: 6,051,818 kWh/yr and ETTV: 36.4W/m²
• Upgrade thermal energy storage to highly efficiency chiller plant of 0.65 kW/RT
• Upgrade from fix speed fume exhaust fan to variable speed
• Upgrade to Passive Displacement Cooling System
• High efficiency LED lighting with motion sensor control
• Automatic sash closer for Fume Hoods
• Naturally ventilated carpark and staircases
• Machine Learning and Artificial intelligence air-conditioning optimisation
• Certified PUB Water Efficient Building

Client/Developer: Nanyang Technological University
Facility Manager: Nanyang Technological University
M&E Engineer: Becca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
ESD/Green Consultant: Becca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
SHERATON TOWERS SINGAPORE HOTEL
EXISTING NON-RESIDENTIAL BUILDING

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

- Estimated energy savings: 13,370 kWh/yr through chiller system optimisation
- Chiller plant system efficiency of 0.60 kW/RT
- Majority of lighting consists of LED-based luminaries
- Heat pump system providing hot water for showers
- Heat pipes for heat recovery for pre-cooled air units

Client/Developer  Sheraton Towers Singapore Hotel
Facility Manager  Sheraton Towers Singapore Hotel
ESD / Green Consultant  LJ Energy Pte Ltd
ESCO  LJ Energy Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- 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 T5/LED lighting for all areas
- Natural ventilation in study and common areas to minimize energy consumption
- Motion sensors for toilets and staircases
- Lifts with AC VVVF and sleep mode features

Building Owner: Singapore Institute of Technology
Facility Management: SMM Pte Ltd
ESD/Green Consultant: SMM Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- Efficient chiller plant with measured system efficiency of 0.62 kW/ton
- Extensively use of energy efficient T5 and LED light fittings for all areas.
- Use of Motion sensors linked to lightings for toilets and staircases.
- Atrium, corridors, and other common areas are naturally ventilated.
- Variable speed drives for pumps and cooling towers.
- Lifts have energy efficient AC VVVF motors and sleep mode feature.

Building Owner        Singapore Institute of Technology
Facility Management    SMM Pte Ltd
ESD / Green Consultant SMM Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- 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 T5/LED lighting for all areas
- Vast non air-conditioned area (Atrium, corridors, and other common areas) to reduce air-conditioning requirement
- Motion sensors for toilets and staircases
- Lifts with AC VVVF and sleep mode features
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- Efficient chiller plant with measured system efficiency of 0.574 kW/ton
- Extensively use of energy efficient T5 and LED light fittings for all areas.
- Use of Motion sensors linked to lightings for toilets and staircases.
- Atrium, corridors, and other common areas are naturally ventilated.
- Variable speed drives for pumps and cooling towers.
- Lifts have energy efficient AC VVVF motors and sleep mode feature.

Client/Developer: Singapore Institute of Technology

Facility Management: SMM Pte Ltd

ESD / Green Consultant: SMM Pte Ltd
ST. JAMES POWER STATION
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Central chilled water plant system with target efficiency of 0.619 kW/ton.
- Extensive use of LED lighting
- Harvested rainwater for irrigation.
- Extensive greenery
- Envelope Thermal Transfer Value (ETTV) of 41.15 W/m².

Client/Developer: The Harbourfront Pte Ltd
Facility Manager: Mapletree Investments Pte Ltd
ESD/Green Consultant: LJ Energy Pte Ltd
Architect: W Architects Pte Ltd
Builder: Lum Chang Interiors Pte Ltd
STAMFORD COURT
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Estimated energy savings: 522,634 kWh/yr
• Retrofitting of existing air cool system to chilled water system to achieve plant room efficiency 0.52kW/RT with certified green products such as chiller, high efficient pumps and VSD
• Replacement of existing AHU with EC fans to achieve 0.108 kW/RT
• Installation of energy saving LED lightings
• PUB certified water efficient building
• Provision of energy performance contract and continuous energy & efficiency monitoring program

Client/Developer: UIC Land Pte Ltd
Facility Manager: UIC Land Pte Ltd
ESCO: Comfort Management Pte Ltd
ESD/ Green Consultant: Comfort Management Pte Ltd/ Building System & Diagnostics Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | PLATINUM (RE-CERT)

- Provision of 96 kWp solar panel to harvest renewable energy.
- Extensively use of energy efficient T5 and LED light fittings and motion sensor for all office areas.
- Use of water efficient fittings rated with ‘Excellent’ under WELS scheme and adopting water efficient flow rates.
- Integrated grey water, condensate water ad rain water harvesting system for toilet flushing.
- Green Wall Corner provide educational Program featuring Educational Program featuring:- a) Endangered Plant Species b) Renewable energy harvested, electrical & water consumption of the Building c) Waste Management.

Client/Developer: Standard Chartered Bank (Singapore) Limited
Facility Management: CBRE GWS Holding (S) Pte Ltd
ESD / Green Consultant: Building System & Diagnostics Pte Ltd
STUDENT SERVICE CENTRE (SSC)  
EXISTING NON-RESIDENTIAL BUILDING  

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

- Efficient water cooled plant  
- High Efficient LED Lighting  
- Certified PUB Water Efficient Buildings  
- Naturally ventilated carpark  
- Motion sensors at all toilets and staircases  

Client/Developer  
Nanyang Technological University  

Facility Management  
SMM Pte Ltd  

ESD Consultant  
SMM Pte Ltd
THE ADELPHI
EXISTING NON-RESIDENTIAL BUILDING

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

Client/Developer Management Corporation Strata Title No.1614
Facility Manager Propmag Management Services Pte Ltd
ESD / Green Consultant Comfort Management Pte Ltd
ESCO Comfort Management Pte Ltd

- Existing chiller plant efficiency at 0.57kW/ton
- Use of energy efficient products, i.e. Chillers, Pumps, Cooling Towers & Variable Speed Drives
- Adoption of Building Management System (BMS) to monitor the operation condition for chillers, pumps, AHUs.
- Usage of energy efficient lighting and LED PLC lights to achieve energy savings at common facilities
- Use of environmentally friendly & sustainable products, i.e. Toilet Paper, Hand Soap, Washing Detergent
TRAFFIC POLICE HEADQUARTERS
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Chiller plant system is under guaranteed performance contracting services to achieve 0.643 kW/RT or better
- Air distribution system to be retrofitted to achieve 0.40 W/CMH, equipped with CO2 sensors to regulate fresh air intake, and at least MERV13 filters for good indoor air quality
- LED lightings are in use at common areas, achieving 35% improvement over baselines. Motion sensors are installed to optimise lighting energy usage
- Green corners with recycling facilities are available in various locations of the building
- Priority parking lots for hybrid vehicles are available

Client/Developer  Singapore Police Force
Facility Manager   CBM Pte Ltd
ESD / Green Consultant  C&W Services (S) Pte Ltd
TREETOPS EXECUTIVE RESIDENCES
EXISTING NON-RESIDENTIAL BUILDING

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

• Use of tri-generation system that produces electricity, chilled water for air-conditioning, and domestic hot water
• Extended usage of fluorescent and LED lightings at Common Facilities and Car Parks
• Demand ventilation at car park using CO sensors & variable speed drives
• Extensive greenery within in the premises
• UV system employed for Cooling Tower to reduce reliance on chemical treatment usage

Client/Developer  British Malayan Trustees Pte Ltd
Facility Manager  Edmund Tie & Company
ESD / Green Consultant  Hospitality Management Services
ESCO  Comfort Management Pte Ltd
VIVOCITY

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer  DBS Trustee Limited as Trustee of Mapletree Commercial Trust
ESD Consultant    LJ Energy Pte Ltd
Facility Manager  Mapletree Commercial Property Management Pte Ltd
Main Contractor   Measurement & Verification Pte Ltd

- Upgraded chiller plant system with VSD for chilled/condenser water pumps, and cooling tower fans achieving an efficiency of 0.60 kW/RT.
- Common area lighting intensity is 41% better than baseline using LED luminaries, light sensors and motion detectors.
- CO2 sensors are installed in AHUs to regulate the fresh air intake and reduce cooling load demand.
- Renewable energy generation is approximately 1.3 million kWh/year.
- Automatic irrigation system is used for outdoor greenery, including rain sensors to utilize rainwater for landscape irrigation.
- Carpark guidance system is used for minimizing vehicle movement, resulting in a reduction of CO production and carbon footprint.
MIDTOWN BAY
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer: GuocoLand
M&E Engineer: Meinhardt (Singapore) Pte. Ltd.
Structural Engineer: Meinhardt (Singapore) Pte. Ltd.
Quantity Surveyor: AECOM Cost Consulting and Project Management (Singapore) Pte Ltd
Main Contractor: China Construction (South Pacific) Development Co Pte. Ltd.
Landscape Contractor: Ortus Design Pte. Ltd.
ESD Consultant: DP Sustainable Design Pte. Ltd.

- Achieved RETV of 17.75 W/m²
- The residential development is designed with lush green landscape exceeding 4 GnPR
- The building configuration and site orientation promotes natural ventilation and day lighting
- Use of ceiling fan for all dwellings units to aid in natural ventilation
- Use of energy efficient LED lightings with sensors for the development
- Extensive use of SGBG 3-tick concrete with RCA and WCS replacement
- Extensive integration of biophilic elements within the common facilities to provide good wellbeing and connection to the nature for residents
GREEN MARK AWARD FOR BUILDINGS | PLATINUM

• Estimated energy savings: 50,954 kWh/yr
• Extensive use of motion sensors at toilets and amenity rooms
• Extensive use of LED
• Certified PUB Water Efficient Building
• Upgrade to energy efficient hot water heat pumps for toilets
• Natural ventilated car park, corridors and staircases
• Use of non-potable water for landscape irrigation
• Use of water efficient cleaning equipment
• Green educational corner

Client/Developer: Nanyang Technological University
Facility Manager: Nanyang Technological University
M&E Engineer: Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
ESD/Green Consultant: Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN – HOSTELS & FACULTY APARTMENTS

EXISTING RESIDENTIAL BUILDING

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

Client/Developer: Singapore University of Technology and Design (SUTD)
ESD Consultant: ENGIE South East Asia Pte Ltd
Facility Management: ENGIE Services Singapore

- Estimated energy savings: 2,306,762 kWh/yr; Estimated water savings: 20,412 m³/yr
- Energy Efficient Air Conditioning Units (4 ticks)
- Energy Efficient Lighting Design
- Energy Efficient Water Heater
INTEGRATED DEVELOPMENT OF POLYCLINIC, NURSING HOME AND SENIOR CARE CENTRE

HEALTHCARE FACILITIES

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- High façade performance and low WWR
- 30.8% energy savings with efficient chiller plant system
- 40% lighting savings through use of 100% LED
- Assisted ventilated nursing home to ensure thermal comfort
- 29.2kWp PV panels at the rooftop

Client/Developer: Ministry of Health Singapore
Architect: Surbana Jurong
M&E Engineer: Surbana Jurong
Structural Engineer: Surbana Jurong
Quantity Surveyor: Arcadis
Main Contractor: Teambuild Construction Group
GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Chiller Plant System High Operating Efficiency of 0.58kW/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 (ETTV) of 29.87 W/m²
- Conservation of 91% of the existing structure
WOODLANDS HEALTH CAMPUS (WHC)

HEALTHCARE FACILITIES

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer: Ministry of Health
Architect: SAA Architects Pte Ltd
M&E Engineer: SSMA

Structural Engineer: T.Y.Lin International Pte Ltd
Quantity Surveyor: Rider Levett Bucknall LLP
Main Contractor: SDK Consortium

Ministry of Health
SAA Architects Pte Ltd
SSMA
Surbana Jurong Consultants Pte Ltd
Squire Mech Pte Ltd
Alpha Consulting Engineers Pte Ltd
T.Y.Lin International Pte Ltd
Rider Levett Bucknall LLP
SDK Consortium

Ssangyong Engineering & Construction
Daewoo Engineering & Construction
Koh Brothers Building & Civil Engineering

- Estimated energy savings: 33,677,720 kWh/yr; Estimated water savings: 261,652 m3, ETTV: 33.62 W/m2
- Chiller plant efficiency: 0.567kW/Ton
- High Efficient LED Lighting
- Food Waste Recycling System
- Community Farm
- Water Source Heat Pump
- Integrated healing Garden Design
39 JALAN KAKATUA
LANDED HOUSES

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Good passive design implementation
- Use of efficient active system design
- Use of efficient sustainable construction method
- Extensive use of sustainable products
- Provision of solar PV system and solar hot water system

Client/Developer: Seletar View Pte Ltd
Architect: Bhatch Architects
M&E Engineer: Tham & Wong LLP
Structural Engineer: TW-Asia Consultants Pte Ltd
Main Contractor: Prelim Construction Pte Ltd
GREEN MARK FOR TRANSIT STATIONS

Globally, meeting the sustainability objectives will be increasingly important for transit facilities as they expand to meet the heightened demands due to urban development. It presents opportunities where transit stations can be designed, constructed and operated sustainably in contributing to the overall national efforts to mitigate climate change in tandem with rail network development.

In the move towards creating a more sustainable transit facilities and greener commuter experience, the Building and Construction Authority (BCA) has introduced a new addition to its suite of Green Mark schemes specifically for rail and light rail stations – The BCA Green Mark for Transit Stations.

This new scheme co-developed in consultation with Land Transport Authority (LTA) and industry practitioners was officially launched on 1 Nov 2019, to provide a holistic approach in evaluating and rating the environmental performance of station developments. Other than setting the pace for higher energy efficiency standard, this scheme also encourages the development of a sustainable, accessible and contextual response that supports reductions in per-capita transport energy use which would in turn, help minimises environmental impacts.
CANBERRA STATION

NEW TRANSIT STATIONS

GREEN MARK AWARD FOR BUILDINGS | PLATINUM

Client/Developer: Land Transport Authority
Project Manager: China State Construction Engineering Corporation Ltd (Singapore Branch)
Architect: RSP Architects Planners & Engineers Pte Ltd
M&E Engineer: Surbana Jurong Consultants Pte Ltd
Structural Engineer: Surbana Jurong Consultants Pte Ltd
Landscape Consultant: COEN Design International Pte Ltd
Main Contractor: China State Construction Engineering Corporation Ltd (Singapore Branch)

- Estimated energy savings: 155,160 kWh/yr; Estimated water savings: 4,464 m³/yr
- Energy efficient air-conditioning system and lighting provision
- Energy efficient lift and escalator system
- Biophilic design with edge planting, green roof and vertical greenery
- Automatic irrigation system with rain sensors
- Extensive use of environmentally friendly products
GREEN MARK AWARD FOR BUILDINGS | PLATINUM

- Estimated energy savings: 1,545,533 kWh/yr; Estimated water savings: 2,348 m³/yr
- Energy efficient air-conditioning system and lighting provision
- Provision of daylighting at entrance areas
- Optimisation of land uptake and accessibility
- Provision of sub-metering at system level
- Extensive use of environmentally friendly products
FRASER RESIDENCE PROMENADE, SINGAPORE
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLD^PLUS

- Enhanced overall thermal performance of building envelope achieving an ETTV of 38W/m^2 and below.
- Provision of energy efficient air-cooled Variable Refrigerant Flow (VRF) system with an efficiency of 0.68kW/RT.
- 100% of the landscaped areas served by water efficient automated irrigation with rain sensor control.
- Low Concrete Usage Index (CUI) of 0.38 for the development.
- Provision of collaborative BIM for clash detection purposes, 4D time information linkages and 5D cost and quantity tracking of Project.
GRAB HEADQUARTERS
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

Client/Developer: HSBC Institutional Trust Services (Singapore) Limited As Trustee Of Ascendas Real Estate Investment Trust

Architect: P&T Consultants Pte Ltd

M&E Engineer: Beca Carter Hollings & Ferner(S.E.A) Pte Ltd

Structural Engineer: Sterling C&S Consulting Engineer Pte Ltd

Quantity Surveyor: Northcroft Lim Consultants Pte Ltd

Main Contractor: HPC Builders Pte Ltd

- Estimated energy savings: 1,867,617 kWh/yr; Estimated water savings: 391.61m$^3$, ETTV: 33.54W/m$^2$
- Water cooled centrifugal chilled water system with Design system efficiency of 0.514 kW/RT
- Efficient AHU's with EC fans & Air distribution by thermal diffusers
- Energy valves to modulate the pump flow
- High Efficient LED Lighting
- Extensive use of environmentally friendly products
- Energy Sub metering & BMS monitoring
LYF ONE-NORTH SINGAPORE
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

• Extensive use of LED lightings to all areas to improve lighting efficiency with provision of motion sensors in staircases and common toilets with contribute 33% of energy savings.

• All apartment rooms are fitted with intelligent occupancy sensors which able to reduce usage of air-conditioning system and lights, which contribute 36% energy savings.

• Provision of sub shading fins and laminated low-e DGU to reduce façade solar heat gain

• Efficient VRF air-conditioning system, which contribute 27% energy saving.

• Efficient heat pump for hot water system, which contribute 17% energy saving.

Client/Developer: Ascott Residence Trust
Architect: WOHA Architects Pte Ltd
M&E Engineer: Squire Mech Pte Ltd
Structural Engineer: Mott MacDonald Singapore Pte Ltd
Quantity Surveyor: Arcadis Singapore Pte Ltd
Main Contractor: Nakano Singapore (Pte) Ltd
RAZER SEA HQ
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Extensive use of LED lightings in all areas to improve lighting efficiency with provision of motion sensors in staircases and all toilets
- Water efficient development utilising WELS 3-tick fittings in all areas
- Low ETTV value of 37.59 W/m2
- Lush greenery with Green Plot Ratio of 4
- Use of rain sensors and harvested rainwater for irrigation purpose

Client/Developer    SNAKEPIT - BP LLP
Architect           Surbana Jurong Consultants Pte Ltd
M&E Engineer        Squire Mech Private Limited
Structural Engineer RSP Architects Planners & Engineers (Pte) Ltd
Main Contractor     Boustead Projects E&C Pte Ltd
TEKKA PLACE
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 2,345,745 kWh/yr
- Efficient Chiller Plant Design System Efficiency – 0.63 kW/RT Total System Efficiency
- Extensive use of LED lighting to reduce energy consumption
- WELS rated Water Efficient Fittings used to promote water conservation.
- Extensive rooftop greenery and gardens.
- Lifts equipped with VVVF drive and Sleep mode features

Client/Developer  Corwin Holding Pte Ltd
Architect         ONG & ONG Pte Ltd
M&E Engineer      KTP Consultants Pte Ltd
Structural Engineer KTP International Pte Ltd
Quantity Surveyor Davis Langdon KPK (Singapore) Pte Ltd
Main Contractor   Lum Chang Building Contractors Pte Ltd
Landscape Consultant COEN Design International Pte Ltd
ESD/Green Consultant G-Energy Global Pte Ltd
WOH HUP TECHNICAL HUB
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Good building orientation, to reduce heat gain in air conditioned areas.
- Efficient lighting system.
- Use of Solar PV system for renewable energy.
- Use of Mass Engineered Timber Structure
- Usage of sustainable products in the external wall construction.

Client/Developer: Tanglin Corporation Pte Ltd
Architect: Lander Loke Architects
M&E Engineer: Neam Solutions
Structural Engineer: Ronnie & Koh Consultant Pte Ltd
Main Contractor: Woh Hup (Pte) Ltd
WOODLANDS BUS INTERCHANGE

NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

Client/Developer: Land Transport Authority
Architect: SD Architects & Associates Pte. Ltd
M&E Engineer: Elead Associates Pte. Ltd
Structural Engineer: Fong Consult Pte. Ltd
Main Contractor: CCECC Singapore Pte Ltd
ESD Consultant: G-Energy Global Pte Ltd

• Estimated energy savings: 788,290 kWh/yr; Estimated water savings: 10,512 m³/yr, ETTV: 37.74 W/m²
• 100% use of "Excellent" WELS rating water fittings.
• Extensive use of Sustainable Products within the development.
• Highly efficient lighting system with 52.8% improvement from baseline.
• Emphasis on Good indoor air quality with implementation of UVGI and MERV 14 rating filters at air distribution systems
79 ANSON ROAD
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Efficient chiller plant system with VSD for chilled/condenser water pumps, and cooling tower fans achieving an efficiency of 0.64 kW/RT.
- Use of energy efficiency lighting to minimize energy consumption from lighting.
- Use of lifts with provision of Variable Frequency (VVVF) drives and sleep mode.
- Provision of private-meters to monitor major water use.
- Promote and encourage waste minimization among occupants.

Client/Developer: MCST 2465
ESCO: G-Energy Global Pte Ltd
Facility Manager: UE ServiceCorp Singapore
AMK HUB
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 2,451,201kWh/yr
- Chiller plant system with operating efficiency of 0.61kW/RT
- Permanent measurement and verification instrumentation for the monitoring of chilled water plant efficiency and heat balancing
- Use of motion sensors with highly energy efficient LED & T5 lightings

Client/Developer  Mercatus Alpha Co-operative Pte Ltd
Architect         RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer     Squire Mech Pte Ltd
ASIAN CIVILISATIONS MUSEUM
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Efficient Chiller Plant
- Efficient Lighting
- Water Efficient Fitting

Client/Developer     National Heritage Board
Facility Manager     National Heritage Board
ESD / Green Consultant      Afogreen Build Pte Ltd
AYER RAJAH COMMUNITY CLUB
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Extensive use of LED lightings
- Air-cooled Variable Refrigerant Flow System with average operating efficiency of 0.82kW/RT
- Naturally ventilated corridors and lift lobbies
- Use of ‘Excellent’ WELS rating water fittings
- Water sub-meters for monitoring of water usage
- Recycling program that is closely monitored

Client/Developer  People’s Association
Facility Management  C&W Services (S) Pte Ltd
BUKIT PANJANG PLAZA
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

Building Owner
The MCST Plan No. 2533
Facility Management
Capitaland Retail Management Pte Ltd
ESD Consultant
W2Square Consultancy Pte Ltd

- Efficient air conditioning equipment
- More than 7 cycles of concentration for cooling tower
- Use of LED lights for the development
- Water Efficient Building Certification by PUB
- Good Indoor Air Quality achieved for the development
CROSS STREET EXCHANGE

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Energy efficient air-conditioning system
- Energy efficient lighting
- Use of water efficient fittings

Client/Developer  British and Malayan Trustees Limited as Trustee of Frasers Commercial Trust
Facility Manager     Frasers Property Commercial Management Pte Ltd
ESD / Green Consultant DP Sustainable Design Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Good natural ventilation with design of building layout that utilises prevailing wind conditions to achieve adequate cross ventilation
- Efficient Lightings for common areas
- Awarded PUB Water Efficient Building certificate
- Implementation of recycling programme, with provision of recycling bins and sustainability awareness messages within the vicinity

**Client/Developer**  National Environment Agency

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

**Facility Manager**  National Environment Agency
IMM BUILDING
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Water-Cooled chiller plant efficiency of 0.66 kW/RT
- Use of variable speed drive (VSDs) for pumps & cooling towers.
- Natural ventilated carpark with parking guiding system.
- Occupancy sensor are installed in all staircase.
- Sleep mode feature incorporated in lift system and variable speed drive available on escalator.

Client/Developer
HSBC Institutional Trust Services (Singapore) Limited as Trustee of CapitaLand Mall Trust

Facility Management
CapitaLand Retail Management Pte Ltd

ESCO
LJ Energy Pte Ltd

ESD / Green Consultant
LJ Energy Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 830,000 kWh/yr
- Retrofit of 2 chiller plants achieving combined efficiency of 0.66 kw/ton
- LED lighting for most of common area in building

Client/Developer: Mercatus Co-operative Limited
Facility Manager: CBRE Pte Ltd
ESD / Green Consultant: LJ Energy Pte Ltd
ESCO: LJ Energy Pte Ltd
INCOME CENTRE
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Energy efficient VRF system achieving around 0.63 kW/RT
- Extensive use of LED lightings
- Use of motion sensors to switch on and off the air-conditioning in nearly all the meeting rooms

Client/Developer  NTUC Income Insurance Co-operative Limited
Facility Manager  Knight Frank Property Asset Management Pte Ltd
ESD / Green Consultant  LJ Energy Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | **GOLD**PLUS (RE-CERT)

**Building Owner**  Ascendas-Citramas Pte Ltd
**Facility Management**  Ascendas Services Pte Ltd
**ESD Consultant**  Building System & Diagnostics Pte Ltd

- ETTV – ETTV of 29 W/m²
- Chiller Plant System Efficiency - A system efficiency of 0.647 kW/RT is achieved by the chiller plant system efficiency
- Efficient Water Fittings – All water fittings covered under WELS 3-tick
- CO sensors – Ductless fans linked to CO sensors for car park
- Automatic Condenser Tube Cleaning System – Use of automatic condenser tube cleaning system for chiller plants
INTERNATIONAL BUILDING
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Energy efficient chiller plant system
- Use of LED lightings for common corridors, lift lobbies and toilets
- Motion sensors at corridors, lift lobbies and toilets
- Recycling bins provided at strategic locations

Building Owner: Yat Yuen Hong Company Limited
Facility Management: Yat Yuen Hong Company Limited
ESD/Green Consultant: Johnson Controls (S) Pte Ltd
INTERNATIONAL PLAZA
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Two chiller plants achieving combined efficiency of 0.63 kw/ton
- EC fans and energy values for AHUs
- Water consumption monitoring system for public toilets and cooling towers

Client/Developer: The Management Corporation
Strata Title Plan No. 461

Facility Manager: The Management Corporation
Strata Title Plan No. 461

ESD / Green Consultant: C&W Services (S) Pte Ltd
LTA BEDOK CAMPUS
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- LED lightings for most functional spaces
- New Air conditioning is the high COP type (VRV system)
- Use Daikin monitoring system to ensure all air conditioning in order and rectify immediately when fault occurs
- Water feature are switched off after working hours
- Maintain temperature settings at 23 to 24 Deg C for all office air conditioning

Building Owner: Singapore Land Authority
Facility Management: Synergy FMI Pte Ltd
ESD/Green Consultant: Exergy Technologies Pte Ltd
NATIONAL GALLERY SINGAPORE

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Energy Efficient Air-Con System Design
- Energy Efficient Lighting
- 53.82 kWp Solar PV System
- Use of non-potable water for irrigation
- Provision of Eco-pond
- Landscape roof top greenery and vertical greenery system

Client/Developer  National Gallery Singapore
ESD Consultant  G-Energy Global Pte Ltd
NATIONAL MUSEUM OF SINGAPORE
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLD PLUS

• Estimated energy savings: 1,916,703 kWh/yr
• Efficient Water-cooled chilled water system with efficiency of 0.623 kW/RT
• High Efficient LED Lighting
• Excellent WELS rating of all water fittings

Building Owner: National Heritage Board
Facility Management: National Heritage Board
ESD/Green Consultant: Afogreen Build Pte Ltd
NGEE ANN POLYTECHNIC BLOCKS 4 TO 8, 23, 25, 27 & 31
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

Client/Developer: Ngee Ann Polytechnic
Facility Manager: Ngee Ann Polytechnic

- Facade replacement with Low-E DGU to achieve ETTV of 29.4W/m2
- Extensive usage of LED lighting at common areas, lift lobbies & toilets
- Replacement of sanitary fittings to water-efficient water fittings
GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

• Low ETTV of 35.3w/m² through passive design of building envelope and orientation
• High Efficient LED and T5 Lightings for all common areas
• Connection to Ascendas Operations Centre (AOC) for monitoring of system efficiency and energy consumption of major systems, analytics and fault detection diagnostics
• Awarded PUB Water Efficient Building certificate

Client/Developer: Ascendas Venture Pte Ltd
Consultant/Contractor: G-Energy Global Pte Ltd
Facility Manager: Ascendas Services Pte Ltd
ESCO: G-Energy Global Pte Ltd
ONE MARINA BOULEVARD
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Energy Portal and Dashboard, with sub-metering trending and reporting for major energy consuming equipment
- Integrated building management system (iBMS) with adaptive control algorithms
- LED-based luminaires for common areas, carpark, stairwells and toilets

Client/Developer  Mercatus Delta Co-operative Limited
Facility Manager  Mercatus Delta Co-operative Limited
ESD / Green Consultant  Singapore District Cooling Pte Ltd
Efficient chiller plant with system efficiency of 0.585 kW/RT.
Extensive Rooftop greenery.
Provision of CO sensors to regulate ventilation fans in basement carparks.
Provision of recycling bins and waste management programme to collect and monitor recyclable wastes.
Extensive use of green certified equipment by SGBC and SGLS.
PENINSULA HOTEL
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Energy efficient water-cooled chiller system with chiller system efficiency of 0.59 kW/RT
- Using LED lighting for all common areas
- Retrofit all PAHUs with MERV 14 filters
- Achieved PUB Water Efficient Building Certificate

Client/Developer: YTC Hotels Ltd
ESCO: G-Energy Global Pte Ltd
Facility Manager: YTC Peninsula Shopping Complex Pte Ltd
PENINSULA SHOPPING COMPLEX

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Energy efficient water-cooled chiller system with chiller system efficiency of 0.59 kW/RT
- Using LED lighting for all common areas
- Replacement Energy Efficient AHUs & FCUs in tenants areas
- Achieved PUB Water Efficient Building Certificate

Client/Developer
Management Corporation Strata
Title Plan No. 399

ESCO
G-Energy Global Pte Ltd

Facility Manager
YTC Peninsula Shopping Complex Pte Ltd
RESORTS WORLD SENTOSA - BEACH VILLAS
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

Building Owner  Resorts World at Sentosa Pte Ltd
Facility Management  Resorts World at Sentosa Pte Ltd
ESD/Green Consultant  G-Energy Global Pte Ltd

- Extensive use of high efficiency LED lamps with lower wattage
- Efficient heat pump system to produce hot water for guest bathrooms
- Provision of VSD and dedicated Proportional Integral Derivative (PID) control for secondary heat exchangers pumping system
- Provision of self-sustainable Eco-pond for the cultivation of biodiversity and Bio-swale which mitigates direct rainwater run-off and removes pollutants prior to depositing at the Eco-pond
- Extensive greenery to alleviate urban heat island effect
RESORTS WORLD SENTOSA – CROCKFORDS TOWER
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

Client/Developer: Resorts World at Sentosa Pte Ltd
Facility Manager: Resorts World at Sentosa Pte Ltd
ESD/ Green Consultant: G-Energy Global Pte Ltd

- Extensive use of high efficiency LED lamps with lower wattage
- Provision of smart remote metering system for water monitoring and leak detection
- High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality
- Efficient heat recovery system to produce hot water for guest rooms, F&B and kitchen usage
- Provision of VSD and dedicated Proportional Integral Derivative (PID) control for Secondary Heat Exchangers Pumping System
RESORTS WORLD SENTOSA – EQUARIUS HOTEL

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Extensive use of high efficiency LED lamps with lower wattage
- Provision of smart remote metering system for water monitoring and leak detection
- High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality
- Efficient heat recovery system to produce hot water for guest rooms, F&B and kitchen usage
- Provision of VSD and dedicated Proportional Integral Derivative (PID) control for Secondary Heat Exchangers Pumping System

Client/Developer
Resorts World at Sentosa Pte Ltd

Facility Manager
Resorts World at Sentosa Pte Ltd

ESD/ Green Consultant
G-Energy Global Pte Ltd
RESORTS WORLD SENTOSA - ESPA
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Extensive use of high efficiency LED lamps with lower wattage
- Efficient heat recovery system to produce hot water for SPA usage
- Provision of VSD and dedicated Proportional Integral Derivative (PID) control for Secondary Heat Exchangers Pumping System
- Extensive greenery to soften the landscape and alleviate urban heat island effect
- Provision of bio-swale which mitigates direct rainwater run-off and removes pollutants prior to depositing at the Eco-pond

Client/Developer  |  Resorts World at Sentosa Pte Ltd
Facility Manager  |  Resorts World at Sentosa Pte Ltd
ESD/ Green Consultant  |  G-Energy Global Pte Ltd
RESORTS WORLD SENTOSA – FESTIVE HOTEL

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

Client/Developer  
Resorts World at Sentosa Pte Ltd

Facility Manager  
Resorts World at Sentosa Pte Ltd

ESD/Green Consultant  
G-Energy Global Pte Ltd

- Extensive use of high efficiency LED lamps with lower wattage.
- Provision of smart remote metering system for water monitoring and leak detection.
- High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality.
- Efficient heat recovery system to produce hot water for guest rooms and kitchen usage.
RESORTS WORLD SENTOSA – HARD ROCK HOTEL
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Extensive use of high efficiency LED lamps with lower wattage
- Provision of smart remote metering system for water monitoring and leak detection
- High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality
- Efficient heat recovery system to produce hot water for guest rooms, F&B and kitchen usage
- Provision of VSD and dedicated Proportional Integral Derivative (PID) control for Secondary Heat Exchangers Pumping System

Client/Developer   Resorts World at Sentosa Pte Ltd
Facility Manager   Resorts World at Sentosa Pte Ltd
ESD/ Green Consultant   G-Energy Global Pte Ltd
RESORTS WORLD SENTOSA – HOTEL MICHAEL
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

Client/Developer
Resorts World at Sentosa Pte Ltd

Facility Manager
Resorts World at Sentosa Pte Ltd

ESD/Green Consultant
G-Energy Global Pte Ltd

• Extensive use of high efficiency LED lamps with lower wattage.
• Provision of smart remote metering system for water monitoring and leak detection.
• High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality.
• Efficient heat recovery system to produce hot water for guest rooms, F&B and kitchen usage.
• Provision of VSD and dedicated Proportional Integral Derivative (PID) control for Secondary Heat Exchangers Pumping System.
RESORTS WORLD SENTOSA – MARINE LIFE PARK
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

Client/Developer: Resorts World at Sentosa Pte Ltd
Facility Manager: Resorts World at Sentosa Pte Ltd
ESD/Green Consultant: G-Energy Global Pte Ltd

- Extensive use of high efficiency LED lamps with lower wattage.
- Provision of smart remote metering system for water monitoring and leak detection.
- High efficiency air filters (MERV 14) for AHUs to maintain good indoor air quality.
- CO sensor integrated demand control ventilation for Car Park.
- Rainwater and condensate water from air-conditioners are harvested for landscape irrigation.
RIVERVALE MALL
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Strategically located near the transport network, reducing environmental impacts from vehicle emission and pollution
- Average chiller plant room efficiency 0.7kw/ton
- Efficient T5/LEDs lightings within the building
- Widespread usage of environmentally friendly products within the premise

Client/Developer: RVM Holdings Pte Ltd
Facility Management: Jones Lang LaSalle Property Consultants Pte Ltd
ESCO: Comfort Management Pte Ltd
ESD / Green Consultant: Comfort Management Pte Ltd
SCIENCE CENTRE SINGAPORE
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 546,636 kWh/yr
- Science Centre Singapore is under GESP for Retrofitting and maintenance of chiller plant system
- Energy Efficient Products used are certified by approved local certification body (VSD, CHWP/CWP, Cooling tower, Auto tube cleaning system)

Client/Developer: Science Centre Board
Facility Manager: Science Centre Singapore
ESD / Green Consultant: Johnson Controls (S) Pte Ltd
ESCO: Johnson Controls (S) Pte Ltd
Centralised chilled water plant with system efficiency of 0.60kW/RT

Energy efficient lightings installed in all areas such as common corridors, offices and guestrooms

Motion sensors for lighting control in washrooms, common corridors and all staircases

Provision of recycling waste facilities with monthly monitoring of recyclable waste collected.

PUB certified Water Efficient Building

Client/Developer: Ministry of Education

Facility Manager: In-house

ESCO: Kaer Pte Ltd

ESD/Green Consultant: Kaer Pte Ltd
SENJA-CASHEW COMMUNITY CLUB
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Naturally ventilated corridors and lift lobbies
- Extensive use of LED lighting
- Provision of green roof

Client/Developer  People's Association
Facility Manager  SMM Pte Ltd
SINGAPORE LAND TOWER
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Highly efficient water-cooled chiller plant with efficiency of 0.642kW/RT
- Use of WELS 3-ticks water efficient fittings
- Use of environmentally friendly products
- Provision of facilities for the collection and storage of common recyclables such as paper, metal and plastic
- Provision of priority parking with electric vehicle charging points

Client/Developer  Singapore Land Limited
Facility Manager  SL Development Pte Ltd
ESD/Green Consultant  G-Energy Global Pte Ltd
SUN YAT SEN NANYANG MEMORIAL HALL
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Air conditioning system retrofit for greater energy efficiency
- Extensive use of LED lightings
- Water efficient fittings

Client/Developer: Sun Yat Sen Nanyang Memorial Hall
Facility Manager: Sun Yat Sen Nanyang Memorial Hall
ESD / Green Consultant: Afogreen Build Pte Ltd
TAMAN JURONG MARKET AND FOOD CENTRE

EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Good natural ventilation with design of building layout that utilises prevailing wind conditions to achieve adequate cross ventilation
- Efficient Lightings for common areas
- Awarded PUB Water Efficient Building certificate
- Implementation of recycling programme, with provision of recycling bins and sustainability awareness messages within the vicinity

Client/Developer  National Environment Agency
ESD Consultant  Building System & Diagnostics Pte Ltd
Facility Manager  National Environment Agency
TECHLINK
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Chiller plant system under guaranteed performance-based maintenance contract services to achieve 0.65 kW/RT or better
- LED lightings for all common areas and motion sensors in staircases and toilets
- PUB certified Water Efficient Building with private sub-meters for remote monitoring of major end-uses
- Use of environmentally friendly products for chiller plant system and building operations
- Recycling facilities for common recyclables and electronic wastes; and partnership with NEA for “Say Yes to Waste Less” campaign to promote use of reusable items

Client/Developer
HSBC Institutional Trust Services (Singapore) Limited as Trustee of Ascendas Real Estate Investment Trust

Facility Manager
Ascendas Services Pte Ltd

ESCO
C&W (S) Services Pte Ltd

ESD/Green Consultant
C&W (S) Services Pte Ltd
**GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS**

- Chiller plant system is under guaranteed performance contracting services to achieve 0.65 kW/RT or better
- LED lightings are in use at common areas, achieving 64% improvement over baselines. Motion sensors and photocell sensors are installed
- Landscape greenery and water feature are available, improving the occupants' physical and mental well-being. Health & wellness activities are regularly conducted as part of HPB "Healthy Workplace Ecosystem" programme
- Recycling facilities for common recyclables and for electronic wastes are available. CapitaLand is in partnership with NEA for the campaign - “Say Yes to Waste Less” to promote the use of reusables

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**Client/Developer**
HSBC Institutional Trust Services (Singapore) Limited as Trustee of Ascendas Real Estate Investment Trust (the Trustee)

**Facility Manager**
Ascendas Services Pte Ltd

**ESD/ Green Consultant**
C&W Services (S) Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | GOLD\textsuperscript{PLUS}

- Chiller plant system under guaranteed performance contracting services to achieve 0.62 kW/RT or better
- LED lightings for all common areas and motion sensors in staircases and toilets
- PUB certified Water Efficient Building with private sub-meters for remote monitoring of major end-uses
- Use of environmentally friendly products for chiller plant system and building operations
- Recycling facilities for common recyclables and electronic wastes; and partnership with NEA for “Say Yes to Waste Less” campaign to promote use of reusable items
UIC BUILDING
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS (RE-CERT)

- Building envelope designed with double glazed low emission glass achieving ETTV of 38.51 W/m²
- Chiller plant system with operating efficiency of 0.64kW/RT
- Efficient Lighting with T5s/ LEDs and motion sensors
- All lifts are fitted with regenerative drives to conserve energy

Client/Developer
Subsidiary Management Corporation
No. 1 Strata Title Plan No. 4626

Facility Manager
Knight Frank Property Asset Management Pte Ltd

ESD/ Green Consultant
Comfort Management Pte Ltd
YEW TEE COMMUNITY CLUB
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- PUB certified Water Efficient Building
- Air-cooled VRF system with average operating efficiency of 0.81kW/RT
- Energy efficient LED & T5 lighting system
- Skylight dome design over atrium
- Natural ventilation at building atrium

Client/Developer: People's Association
Facility Manager: C&W Services Pte Ltd
Green Consultant: CBM Solutions Pte Ltd
ESCO: CBM Solutions Pte Ltd
15 HOLLAND HILL
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 79,909.49kWh/yr; Estimated water savings: 5,560.44m³/yr; RETV: 21.08W/m²
- Extensive greenery GnPr >7
- Air-conditioning 5 ticks under the Singapore Energy Labelling Scheme
- 40% of crushed concrete waste from demolished building sent to approved recyclers
- Good acoustic design and planning

Client/Developer: Peak Opal Pte. Ltd
Project Manager: Peak Opal Pte. Ltd
Architect: P&T Consultants Pte Ltd
M&E Engineer: DP Engineers Pte Ltd
Structural Engineer: KCL Consultant Pte Ltd
Quantity Surveyor: Threesixty Cost Management Pte Ltd
Main Contractor: Thian Sung Construction Pte Ltd
Landscape Consultant: Ramboll Studio Dreiseitl
ESD/Green Consultant: DP Sustainable Design Pte Ltd
19 NASSIM
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 500,500.19kWh/yr; Estimated water savings: 11,665.4m³/yr, RETV: 21.82W/m²
- Good Residential Envelope Transmittance Value achieved for dwelling units
- 5-tick energy efficient air-conditioning system used for all dwelling units
- Use of energy efficient lighting for common areas
- Water efficient fittings used to promote water conservation
- Extensive greenery with fully automated irrigation system

Client/Developer
Keppel Land Singapore Pte Ltd

Project Manager
Keppel Land Singapore Pte Ltd

Architect
SCDA Architects PTE LTD

M&E Engineer
Squire Mech Pte Ltd

Structural Engineer
KCL Consultants Pte Ltd

Quantity Surveyor
Threesixty Cost Management Pte Ltd

Main Contractor
Unison Construction Pte Ltd

Landscape Consultant
SCDA Architects Pte Ltd

ESD/Green Consultant
G-Energy Global Pte Ltd
CAIRNHILL 16
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 527,468kWh/yr; Estimated water savings: 2,350.3m³/yr, RETV: 21.54W/m²
- 5 tick Energy Efficiency Labelled Air Conditioning
- Water Efficient Labeling Scheme for all applicable fittings
- Roof gardens and water feature
- Good passive design with natural ventilation
- Good well-being design with natural color, fin, way finding, etc

Client/Developer: TSky Cairnhill Pte Ltd
Architect: LAUD Architects Pte Ltd
M&E Engineer: United Project Consultants Pte Ltd
Structural Engineer: LSW Consulting Engineers Pte Ltd
Quantity Surveyor: Aecom Singapore Pte Ltd
Landscape Consultant: STX Landscape Architects Pte Ltd
ESD/Green Consultant: Afogreen Build Pte Ltd
FOURTH AVENUE RESIDENCES
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

Client/Developer
Allgreen Properties Limited

Architect
RSP Architects Planners & Engineers (Pte) Ltd

M&E Engineer
J.Roger Preston (S) Pte Ltd

Structural Engineer
KTP Consultants Pte Ltd

Quantity Surveyor
Arcadis Singapore Pte Ltd

Main Contractor
Tiong Aik Construction Pte Ltd

Landscape Consultant
Coen Design International Pte Ltd

ESD/Green Consultant
Afogreen Build Pte Ltd

- Estimated energy savings: 3,002,141.23kWh/yr;
  Estimated water savings: 48,281.42m³/yr, RETV: 20.58W/m²
- Use of efficient air-con system for all FCU and CU with 5-ticks label
- Extensive greenery with GnPR 10.21
- All landscape area served by drip irrigation system
- Reduction of heat gain by achieving RETV lower than 22 W/m²
- Extensive use of LED lights to reduce energy consumption
HAUS ON HANDY
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Use of >80% 5 ticks air-conditioners for all dwelling units
- Use of 100% LED lighting
- Use of VVVF and sleep mode lifts
- Use of auto-irrigation with rain sensor for 50% of landscape
- Use of sustainable building system- precast concrete for >50% of constructed floor area

Client/Developer: CDL Regulus Pte Ltd
Architect: Architects 61 Pte Ltd
M&E Engineer: Rankine & Hill Pte Ltd
Structural Engineer: LSW Consulting Engineers Pte Ltd
Quantity Surveyor: Threesixty Cost Management Pte Ltd
JUNIPER HILL
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

Submit to the BCA Green Mark Award and you could win a Gold Award!

• Extensive greenery with GnPR of 6.76
• Provision of 5-ticks high energy efficiency air-conditioning systems
• Achieved RETV of 19.14 W/m²
• Extensive use of environmentally friendly products
• Provision of facilities for horticulture/wood waste recycling

Client/Developer
Allgreen Properties Limited

Architect
P&T Consultants Pte Ltd

M&E Engineer
Belmacs Pte Ltd

Structural Engineer
Aurecon Singapore (Pte) Ltd

Quantity Surveyor
Rider Levett Bucknall LLP

Landscape Consultant
COEN Design International Pte Ltd

Main Contractor
Tiong Aik Construction Pte Ltd
MIDWOOD
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

Client/Developer: Hillview Rise Development Pte. Ltd.
Project Manager: Hillview Rise Development Pte. Ltd.
Architect: DP Architect Pte Ltd
M&E Engineer: United Project Consultants Pte Ltd
Structural Engineer: KCL Consultant Pte Ltd
Quantity Surveyor: AECOM Cost Consulting and Project Management (Singapore) Pte. Ltd.
Main Contractor: Kimly Construction Pte Ltd
Landscape Consultant: Tinderbox Pte Ltd
ESD/Green Consultant: DP Sustainable Design Pte Ltd

- Estimated energy savings: 174,110.11kWh/yr; Estimated water savings: 98.55m³/yr; RETV: 20.44W/m²
- Integrative Building Information Modeling.
- Naturally Ventilated Car Park
- Sustainable Building System of >50% Coverage
NORTHSHORE EDGE
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Extensive Greenery
- Efficient Lighting Design Equipped with Smart Control
- Extensive Usage of Certified Green Products
- Layout Design that Optimize Cross Ventilation
- Adoption of Sustainable Building System

Client/Developer: Housing & Development Board
Architect: HDB Building & Research Institute
M&E Engineer: HDB Building & Research Institute
Structural Engineer: HDB Building & Research Institute
Quantity Surveyor: Surbana Jurong Consultants Pte Ltd
Main Contractor: Teambuild Engineering & Construction Pte Ltd
GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 1,870,872kWh/yr; Estimated water savings: 6,863m³/yr, RETV: 20.15W/m²
- Low window-to-wall ratio and integrated facade screens reduces solar heat gain
- Units with north and south facing windows allowing natural ventilation
- Extensive greenery coverage with green roofs, sky decks and communal gardens
- Use of 5-ticks energy efficient air-conditioners
- Use of highly efficient lighting fixtures

Client/Developer: HarbourFront Three Pte Ltd (JV b/w Mapletree Investments & Keppel Group)
Project Manager: Keppel Land
Concept Architect: KCAP Architects and Planners
Architect: DCA Architects Pte Ltd
M&E Engineer: Alpha Consulting Engineers Pte Ltd
Structural Engineer: T.Y.Lin International Pte Ltd
Quantity Surveyor: Arcadis Singapore Pte Ltd
Landscape Consultant: Grant Associates
ESD/Green Consultant: Arup Singapore Pte Ltd
RIVIÈRE
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLD PLUS

- Enhanced overall thermal performance of building envelope achieving a RETV of 20W/m² and below.
- Extensive greenery of a Green Plot Ratio of 4.5 and above are provided for nature connectivity and appreciation.
- Up to 97% of the energy efficient air-conditioners in the development are 5-ticks rated under the Singapore Energy Labelling Scheme.
- Up to 88% of the landscaped areas served by water efficient automated irrigation with rain sensor control.
- Provision of collaborative BIM for clash detection purposes, 4D time information linkages and 5D cost and quantity tracking of Project.

Client/Developer
Frasers Property Singapore
Frasers Property Corporate Services Pte Ltd
SCDA Architects Pte Ltd

Project Manager
P&T Consultants Pte Ltd
J Roger Preston (S) Pte Ltd
KTP Consultants Pte Ltd
SCDA Architects Pte Ltd
Threesixty Cost Management Pte Ltd

Design Architect
Woh Hup (Private) Limited

Submission Architect
Sald Pte Ltd
P&T Consultants Pte Ltd
J Roger Preston (S) Pte Ltd
KTP Consultants Pte Ltd
SCDA Architects Pte Ltd
Threesixty Cost Management Pte Ltd

M&E Engineer
SCDA Architects Pte Ltd

Structural Engineer

Interior Design

Quantity Surveyor

Landscape Consultant

ESD Consultant

Main Contractor
ROYALGREEN
NEW RESIDENTIAL BUILDING

GOLDPLUS

Client/Developer: Allgreen Properties Limited
Architect: ADDP Architects LLP
M&E Engineer: Alpha Consulting Engineers Pte Ltd
Structural Engineer: KTP Consultants Pte Ltd
Quantity Surveyor: Threesixty Cost Management Pte Ltd
Main Contractor: Woh Hup (Private) Limited
Landscape Consultant: Tinderbox Pte Ltd
ESD/Green Consultant: G-Energy Global Pte Ltd

- Estimated energy savings: 1,711,566.23kWh/yr; Estimated water savings: 35,944.56m³/yr; RETV: 16.87W/m²
- All residential blocks are north-south facing with low RETV achieved for reducing solar heat gain
- 5-tick energy efficient air conditioning system used for all apartment units
- Extensive use of LED lighting for common areas to reduce energy consumption
- Extensive greenery with roof garden connecting all blocks with auto irrigation used
- Certified water efficient fittings used to promote water conservation
THE ESSENCE
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLD^{PLUS}

- Estimated energy savings: 228,374kWh/yr; Estimated water savings: 23,783m$^3$/yr, RETV: 20.39W/m$^2$
- Use of energy efficient air-conditioning system certified with 5-ticks rating AC system
- Use of certified green and sustainable products for residential units and common areas
- Use of WELS certified water efficient sanitary fittings for residential units and common areas
- 40% improvement in the lighting power budget by using energy saving light fittings
- Provision of separate centralized recycling chutes for each block on every level

Client/Developer
CHONG KUO Development Pte Ltd

Architect
Park + Associates Pte Ltd

M&E Engineer
United Project Consultants Pte Ltd

Structural Engineer
ECAS Consultants Pte Ltd

Quantity Surveyor
Northcroft Lim Consultants Pte Ltd

Main Contractor
Lian Soon Construction Pte Ltd

Landscape Consultant
COEN Design International Pte Ltd
THE GAZANIA
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Estimated energy savings: 491,288.9 kWh/yr; Estimated water savings: 46,869.65 m³, RETV: 19.46W/m²
- Use of low-E laminated glass to reduce solar heat energy gain through external façade.
- Energy efficient air-conditioning inverter system of 5-ticks are used for all apartments units.
- LED light fittings or T5 fluorescent tube and PL lamps with high frequency ballasts that are more energy efficient are used for all luminaires.
- Timers or motion sensors are used to control lightings at common area and facilities to minimize electricity consumption.
- Lifts with regenerative system are used in all towers to reduce electricity consumption.
- Water fittings of at least WELS 2-ticks are used for all apartment units.
- Ductless jet fan with CO sensor is used in basement carpark ventilation.
- Rainwater Harvesting System that supplies to landscape auto-irrigation system.

Client/Developer
Singhaiyi Huajiang Sun Pte. Ltd

Architect
RSP Architects Planners & Engineers (Pte) Ltd

M&E Engineer
Alpha Consulting Engineers Pte Ltd

Structural Engineer
KCL Consultants Pte Ltd

Quantity Surveyor
Rider Levett Bucknall LLP

Main Contractor
China Construction (South Pacific) Development Co Pte Ltd

Landscape consultant
COEN Design International Pte Ltd
THE LILIUM
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLD^{PLUS}

- Estimated energy savings: 263958 kWh/year; Estimated water savings: 20986 m³/year; RETV: 20.07 W/m².
- Use of low-E laminated glass to reduce solar heat energy gain through external façade.
- Energy efficient air-conditioning inverter system of 5-ticks are used for all apartments units.
- LED light fittings or T5 fluorescent tube and PL lamps with high frequency ballasts that are more energy efficient are used for all luminaires.
- Timers or motion sensors are used to control lightings at common area and facilities to minimize electricity consumption.
- Lifts with regenerative system are used in all towers to reduce electricity consumption.
- Water fittings of at least WELS 2-ticks are used for all apartment units.
- Ductless jet fan with CO sensor is used in basement carpark ventilation.
- Rainwater Harvesting System that supplies to landscape auto-irrigation system.

Client/Developer
Singhaiyi Huajiang Amber Pte. Ltd.

Architect
RSP Architects Planners & Engineers (Pte) Ltd

M&E Engineer
Alpha Consulting Engineers Pte Ltd

Structural Engineer
KCL Consultants Pte Ltd

Quantity Surveyor
Rider Levett Bucknall LLP

Main Contractor
China Construction (South Pacific) Development Co Pte Ltd
WOODLEIGH GLEN
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Solar Ready Roof for provision of Solar PV system
- Extensive use of LED light fittings for common areas
- Provision of Solar Tubes
- Provision of regenerative lifts
- Retention of existing site ecology and topography

Client/Developer: Housing and Development Board
Architect: Housing and Development Board
M&E Engineer: Housing and Development Board
Structural Engineer: Housing and Development Board
Quantity Surveyor: Surbana Jurong Consultants Pte Ltd
Landscape Consultant: Housing and Development Board
Project Manager: BECA Carter Hollings & Ferner (S.E.Asia) Pte Ltd
Main Contractor: Chip Eng Seng Contractors Pte Ltd
ANGSANA PRIMARY SCHOOL
EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

• Provision of recycling bins at strategic locations within the school (e.g. Canteen) and recycling poster, do’s and don’t’s poster to educate users on recycling.

• Provision of an educational, fun and engaging green hub equipped with adequate learning materials on environmental sustainability for both student and staff.

• 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.

Client/Developer Ministry of Education
Facility Management Chemicrete Enterprises Pte Ltd
ESD /Green Consultant ES Management Pte Ltd
BLANGAH RISE PRIMARY SCHOOL

EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLD\textsuperscript{PLUS}

- The school is built with minimal west and east facing facades
- Provision of energy efficient lightings and task lightings
- Provision of recycling bins at strategic locations within the school
- Provision of twin bins in classrooms to encourage recycling among students

Client/Developer: Ministry of Education

Facility Manager: C&W Services (S) Pte Ltd

ESD/ Green Consultant: C&W Services (S) Pte Ltd
BUKIT BATOK SECONDARY SCHOOL

EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Attained PUB Water Efficient Building certification
- Provision of green corner with adequate learning materials on environmental sustainability for both students and staff
- Horticulture waste is recycled
- Provision of eco-pond with education facilities

Client/Developer: Ministry of Education
Facility Manager: C&W Services (S) Pte Ltd
ESD/ Green Consultant: C&W Services (S) Pte Ltd
The east-west façade was taken into consideration when designing, thus the heat gains and solar glare was highly minimized.

Trends of energy and water usage are monitored and documented to encourage staff and students to reduce consumption if necessary.

Provision of a green corner equipped with adequate learning materials on environmental sustainability for both students and staff.
COMPASSVALE SECONDARY SCHOOL
EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

• Environment champions are appointed in each class to ensure that green practices are carried out in the school and to influence their peers to adopt environmentally friendly habits

• Education framework on sustainability are tailored to different levels, which include topics injected in the curriculum to teach the students on the environment factors, habitats and plants.

• Recycling efforts include the provision of recycling bins at strategic location within the school and recycling posters

• Energy and water usage are monitored, and these trends are communicated to both staff and students to encourage them to reduce consumption if necessary

Client/Developer  Ministry of Education
Facility Manager  Chemicrete Enterprises Pte Ltd
FIRST TOA PAYOH PRIMARY SCHOOL
EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Use of energy efficiency air-conditioning system with average system efficiency of 0.99 kW/ton.
- The school is built with minimal west and east facing facades.
- Provision of a green corner with adequate learning materials on environmental sustainability for both students and staff.
- Provision of recycling bins at strategic locations within the school.
- Extensive greenery with a range of native plants planted in the school and labels to display the information of each plant.

Client/Developer: Ministry of Education
Facility Management: C & W Services (S) Pte Ltd
ESD/Green Consultant: C & W Services (S) Pte Ltd
A range of native plants are planted in the school and labels are displayed for each plant to provide students with information and knowledge on these native plants.

The school also has animal enclosures for fish, water snails, rabbits, roosters, terrapins, stick insects and birds. All these help to introduce to students the wonders of nature. They learn more about and appreciate nature.

Environment badge programme is a school-wide programme with different activities for students from Primary 1 to Primary 6. 6 sets of environment-related activities are designed for the student to complete during their 6 years in Hougang Primary.
JUYING PRIMARY SCHOOL
EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- The school is built with minimal west and east facing facades.
- The installation of LED lights along the corridor outside the canteen to reduce electricity consumption.
- Use of motion sensors for toilets.
- Rainwater Harvesting system which collects rainwater to water plants in the garden as an effort to conserve water.
- Monitoring food waste and composting of horticulture waste through food digester system.
- Hydroponics facility that makes use of recirculated water to grow vegetables, as an effort to save water. The facility also uses a solar panel to power the mechanism that helps it function.
- Provision of a green corner with adequate learning materials on environmental sustainability for both students and staff.
- A range of native plants are planted in the school and labels are displayed on the information of each plant.

Client/Developer: Ministry of Education
Facility Management: C & W Services (S) Pte Ltd
ESD /Green Consultant: C & W Services (S) Pte Ltd
KENT RIDGE SECONDARY SCHOOL
EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

• Use of energy efficiency air-conditioning system
• The school is built with minimal west and east facing facades
• Attained PUB Water Efficient Building certification
• Provision of vertical greenery

Client/Developer  Ministry of Education
Facility Manager  C&W Services (S) Pte Ltd
ESD/ Green Consultant  C&W Services (S) Pte Ltd
NANYANG PRIMARY SCHOOL
EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

King’s Road Campus
Coronation Road Campus

• Our Green Procurement Policy seeks to consider the environmental sustainability and impacts during our procurement process for goods and services.

• Provision of an eco-garden and outdoor experiential learning environment to encourage students to have an appetite for learning and cultivate responsibility for the environment.

• Hydroponic gardening is another area to build the students’ knowledge on biodiversity as well as allowing them to play a part in the upkeep of the garden.

• Environment Monitors are appointed and trained in each class to promote and ensure green practices are carried out.

• Monthly water and energy usage monitoring with reasons for change in consumption has been documented. The consumption trends are also shared among staff and students to raise their awareness.

• A Green Corner has been incorporated as an outdoor learning for all students.

• A Green Club has also been formed to allow students to participate in green projects that include raising awareness on environmental sustainability among staff and fellow students through assembly talks, and external engagement programme to share and encourage neighbouring residents and pre-school students to support waste minimisation and recycling.

Client/Developer
Ministry of Education/ Nanyang Primary School

Architect
Ong & Ong Architects Pte Ltd and LT & T Architects Pte Ltd

M&E Engineer
Rankine & Hill (S) Pte Ltd and William Ng Consultants Pte Ltd

Structural Engineer
DE Consultants (S) Pte Ltd and ECAS-EJ Consultants Pte Ltd

Quantity Surveyor
Davis Langdon & Seah (S) Pte Ltd and OTN Building Cost Consultants Pte Ltd

Main Contractor
Straits Construction Co. Pte Ltd and Guan Ho Construction Co. Pte Ltd
PRINCESS ELIZABETH PRIMARY SCHOOL
EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Attained PUB Water Efficient Building certification
- Participates yearly in the Green Schools @ South West programme which is organised by NEA and South West CDC
- Extensive greenery with GnP of 1.57
- Provision of zero waste corner to educate student on the importance of recycling

Client/Developer Ministry of Education
Facility Manager C&W Services (S) Pte Ltd
ESD/ Green Consultant C&W Services (S) Pte Ltd
RADIN MAS PRIMARY SCHOOL
EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- The school is built with minimal west and east facing facades.
- Energy efficient lighting for all areas and task lighting for working area.
- Provision of a green corner with adequate learning materials on environmental sustainability for both students and staff.
- Provision of recycling bins at strategic locations within the school.

Client/Developer  Ministry of Education
Facility Management  C & W Services (S) Pte Ltd
ESD /Green Consultant  C & W Services (S) Pte Ltd
RAFFLES GIRLS PRIMARY SCHOOL

EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

- Use of energy efficiency air-conditioning system
- Provision of energy efficient LED lightings and task lightings
- Provision of green corner with learning materials on environmental sustainability
- Provision of recycling bins at strategic locations within the school and twin bins in classrooms to encourage recycling among students

Client/Developer  Ministry of Education
Facility Manager  C&W Services (S) Pte Ltd
ESD/ Green Consultant  C&W Services (S) Pte Ltd
TAMPINES SECONDARY SCHOOL

EXISTING SCHOOL

GREEN MARK AWARD FOR BUILDINGS | GOLDPLUS

Client/Developer       Ministry of Education
Facility Manager      SMM Pte Ltd

- High Efficient LED with motion sensors are installed in the school compound
- Recycling efforts include the provision of recycling bins at strategic location within the school and recycling posters
- 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
- School’s Applied Learning Programme (ALP) incorporates environmental education themes such as water and energy conservation as well as renewable energy in its curriculum. Through a problem based learning approach, the ALP aims to develop a showcase of environmentally friendly inventions.
# GREEN MARK AWARD FOR BUILDINGS | GOLD

<table>
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<tr>
<th>PROJECT NAME</th>
<th>CATEGORY</th>
<th>CLIENT/DEVELOPER/BUILDING OWNER</th>
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</thead>
<tbody>
<tr>
<td>3 Tuas Ave 2</td>
<td>New Non-Residential Buildings</td>
<td>AIMS AMP Capital Industrial Reit</td>
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<tr>
<td>Kolam Ayer Community Club</td>
<td>New Non-Residential Buildings</td>
<td>People's Association (PA)</td>
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<td>Pioneer Encapsulation Plant</td>
<td>New Non-Residential Buildings</td>
<td>Givaudan Singapore Pte Ltd</td>
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<tr>
<td>Punggol Fire Station &amp; Neighbourhood Police Centre</td>
<td>New Non-Residential Buildings</td>
<td>Ministry of Home Affairs (Singapore Police Force)</td>
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<tr>
<td>ST Engineering Electronics</td>
<td>New Non-Residential Buildings</td>
<td>ST Engineering Electronics Ltd</td>
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<tr>
<td>TÜV SÜD @ IBP</td>
<td>New Non-Residential Buildings</td>
<td>Pension Real Estate Singapore Pte. Ltd</td>
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<td>28, Teban Gardens Crescent</td>
<td>Existing Non-Residential Buildings</td>
<td>Carrier Corporation</td>
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<td>55 Market Street</td>
<td>Existing Non-Residential Buildings</td>
<td>AEW Asia Pte Ltd</td>
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<tr>
<td>5B Toh Guan</td>
<td>Existing Non-Residential Buildings</td>
<td>Mapletree Investments Pte Ltd</td>
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<tr>
<td>Admirax</td>
<td>Existing Non-Residential Buildings</td>
<td>ADM PRIZE SG (SINGAPORE) PTE LTD</td>
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<tr>
<td>Ang Mo Kio Police Division Headquarters</td>
<td>Existing Non-Residential Buildings</td>
<td>Ministry of Home Affairs (Singapore Police Force)</td>
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# GREEN MARK AWARD FOR BUILDINGS | GOLD

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<td>Existing Non-Residential Buildings</td>
<td>ASM Pacific Technology Ltd</td>
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<tr>
<td>Bedok Point</td>
<td>Existing Non-Residential Buildings</td>
<td>Frasers Property Singapore</td>
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<tr>
<td>BNP PARIBAS Campus Asia Pacific</td>
<td>Existing Non-Residential Buildings</td>
<td>Singapore Land Authority</td>
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<td>Botany Centre at Singapore Botanic Gardens</td>
<td>Existing Non-Residential Buildings</td>
<td>National Parks Board</td>
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<tr>
<td>Centre for Climate Research Singapore (CCRS)</td>
<td>Existing Non-Residential Buildings</td>
<td>National Environment Agency</td>
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<td>Compass One</td>
<td>Existing Non-Residential Buildings</td>
<td>MCST 2762</td>
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<td>Family Link @ Lengkok Bahru</td>
<td>Existing Non-Residential Buildings</td>
<td>Ministry of Social and Family Development</td>
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<tr>
<td>Geylang Serai Market</td>
<td>Existing Non-Residential Buildings</td>
<td>National Environment Agency</td>
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<tr>
<td>Goldbell Towers</td>
<td>Existing Non-Residential Buildings</td>
<td>Chua Chuan Leong Contractors Pte Ltd</td>
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<td>Grand Hyatt Singapore</td>
<td>Existing Non-Residential Buildings</td>
<td>Borneo Properties Sdn Bhd</td>
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<tr>
<td>HarbourFront Tower One and HarbourFront Tower Two</td>
<td>Existing Non-Residential Buildings</td>
<td>Mapletree Investments Pte Ltd</td>
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</tbody>
</table>
# GREEN MARK AWARD FOR BUILDINGS | GOLD

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>CATEGORY</th>
<th>CLIENT/DEVELOPER/BUILDING OWNER</th>
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<tbody>
<tr>
<td>Holiday Inn Singapore</td>
<td>Existing Non-Residential Buildings</td>
<td>Harilela Hotels (S) Pte Ltd</td>
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<tr>
<td>Orchard City Centre</td>
<td>Existing Non-Residential Buildings</td>
<td>Hotel Royal Queens Singapore</td>
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<tr>
<td>Hotel Royal @ Queens</td>
<td>Existing Non-Residential Buildings</td>
<td>People's Association (PA)</td>
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<tr>
<td>Hougang Community Club</td>
<td>Existing Non-Residential Buildings</td>
<td>NTUC Income Insurance</td>
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<tr>
<td>Income @ Prinsep</td>
<td>Existing Non-Residential Buildings</td>
<td>Co-operative Ltd</td>
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<tr>
<td>Jurong Island Check Point</td>
<td>Existing Non-Residential Buildings</td>
<td>JTC Corporation</td>
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<tr>
<td>Lot One Shoppers' Mall</td>
<td>Existing Non-Residential Buildings</td>
<td>CapitaLand Group</td>
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<tr>
<td>Lucky Chinatown</td>
<td>Existing Non-Residential Buildings</td>
<td>Far East Square Pte Ltd</td>
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<tr>
<td>M1 (Annex) at 9 IBP</td>
<td>Existing Non-Residential Buildings</td>
<td>M1 Ltd</td>
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<td>Mandarin Orchard Singapore</td>
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<td>OUE Hospitality Trust</td>
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<tr>
<td>Manulife Tower</td>
<td>Existing Non-Residential Buildings</td>
<td>8 Cross Street PADREF Investments Ltd</td>
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<tr>
<td>MYP Centre</td>
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<td>Salveur Pte Ltd</td>
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<td>PROJECT NAME</td>
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<tr>
<td>Nee Soon East Community Club</td>
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<td>People's Association (PA)</td>
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<td>Parkroyal Collection Marina Bay, Singapore</td>
<td>Existing Non-Residential Buildings</td>
<td>UOL Group Ltd</td>
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<tr>
<td>Plaza Singapura</td>
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<tr>
<td>Radin Mas Community Club</td>
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<td>People's Association (PA)</td>
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<td>Raffles Building</td>
<td>Existing Non-Residential Buildings</td>
<td>National Parks Board</td>
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<tr>
<td>Sim Lim Square</td>
<td>Existing Non-Residential Buildings</td>
<td>The Management Corporation - Strata Plan Title No. 1440</td>
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<tr>
<td>Singapore American School</td>
<td>Existing Non-Residential Buildings</td>
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<td>StarHub Green</td>
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<td>Ubitech Hub Pte Ltd</td>
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<td>Management Corporation Strata Title Plan No 2197</td>
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<td>Suntec Singapore Convention &amp; Exhibition Centre</td>
<td>Existing Non-Residential Buildings</td>
<td>Suntec Singapore Convention &amp; Exhibition Centre</td>
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<td>Tampines West Community Club</td>
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<tr>
<td>The Atrium @ Orchard</td>
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<td>The Beach View Southern Transport Complex</td>
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<td>Sentosa Development Corporation</td>
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<td>The Pan Pacific Hotel Singapore</td>
<td>Existing Non-Residential Buildings</td>
<td>Hotel Marina City Pte Ltd</td>
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<td>The Signature</td>
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<td>Mapletree Investments Pte Ltd</td>
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<td>The Star</td>
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<td>Valley Point</td>
<td>Existing Non-Residential Buildings</td>
<td>Frasers Property Singapore</td>
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<td>York Hotel</td>
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<td>Elizabeth Khoo</td>
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<td>Clementi Primary School</td>
<td>Existing Schools</td>
<td>Ministry of Education (MOE)</td>
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<tr>
<td>Compassvale Primary School</td>
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<td>Fernvale Primary School</td>
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<td>Frontier Primary School</td>
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## GREEN MARK AWARD FOR BUILDINGS | GOLD

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<tr>
<td>Guangyang Primary School</td>
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<td>Holy Innocents' High School</td>
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<tr>
<td>Junyuan Secondary School</td>
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<td>Juying Secondary School</td>
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<td>Loyang View Secondary School</td>
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<td>New Town Primary School</td>
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<td>Seng Kang Primary School</td>
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<td>Shuqun Primary School</td>
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<td>St Hilda's Primary School</td>
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<td>Teck Ghee Primary School</td>
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<tr>
<td>Telok Kurau Primary School</td>
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<td>Xinmin Primary School</td>
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## GREEN MARK AWARD FOR BUILDINGS | CERTIFIED

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<tr>
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<th>CATEGORY</th>
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<tr>
<td>1 Changi Business Park Avenue 1</td>
<td>Existing Non-Residential Buildings</td>
<td>Ascendas</td>
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<tr>
<td>1 Jalan Kilang</td>
<td>Existing Non-Residential Buildings</td>
<td>Ascendas</td>
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<tr>
<td>13 Blocks of 2-Storey Terrace Factory @ Pioneer Road North</td>
<td>Existing Non-Residential Buildings</td>
<td>JTC Corporation</td>
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<tr>
<td>Bras Basah Complex</td>
<td>Existing Non-Residential Buildings</td>
<td>Housing and Development Board (HDB)</td>
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<tr>
<td>Clarke Quay</td>
<td>Existing Non-Residential Buildings</td>
<td>CapitaLand Group</td>
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<td>CSC @ Bukit Batok Clubhouse</td>
<td>Existing Non-Residential Buildings</td>
<td>Civil Service Club</td>
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<tr>
<td>CSC @ Tessensohn Clubhouse</td>
<td>Existing Non-Residential Buildings</td>
<td>Civil Service Club</td>
</tr>
<tr>
<td>Duke-NUS Medical School, Singapore</td>
<td>Existing Non-Residential Buildings</td>
<td>National University of Singapore (NUS)</td>
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<tr>
<td>Four Seasons Hotel Singapore</td>
<td>Existing Non-Residential Buildings</td>
<td>Hotel Properties Limited</td>
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<tr>
<td>Hansapoint</td>
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<td>Ascendas</td>
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<td>Honeywell Building</td>
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<td>PROJECT NAME</td>
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<tr>
<td>Marina Square</td>
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<td>Maxwell Chambers Suites</td>
<td>Existing Non-Residential Buildings</td>
<td>Ministry of Law</td>
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<tr>
<td>National University of Singapore - Yong Siew Toh</td>
<td>Existing Non-Residential Buildings</td>
<td>National University of Singapore (NUS)</td>
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<tr>
<td>Conservatory of Music</td>
<td>Existing Non-Residential Buildings</td>
<td>HSBC Institutional Trust Services (Singapore)</td>
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<tr>
<td>NORTHTECH</td>
<td>Existing Non-Residential Buildings</td>
<td>Limited as Trustee of AIMS APAC REIT</td>
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<td>Pacific Tech Centre</td>
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<td>Ascendas</td>
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<td>PSA Vista</td>
<td>Existing Non-Residential Buildings</td>
<td>Vista Real Estate Investments Pte Ltd</td>
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<td>Raffles Hospital</td>
<td>Existing Non-Residential Buildings</td>
<td>Raffles Hospital Properties Pte Ltd</td>
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<tr>
<td>Single Storey Eating House @ Tuas Ave 1</td>
<td>Existing Non-Residential Buildings</td>
<td>JTC Corporation</td>
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<tr>
<td>SOUTHPOINT</td>
<td>Existing Non-Residential Buildings</td>
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<td>The Aries</td>
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<td>The Gemini</td>
<td>Existing Non-Residential Buildings</td>
<td>Ascendas</td>
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</tbody>
</table>
GREEN MARK AWARD FOR BUILDINGS | CERTIFIED

PROJECT NAME
The Tanglin Club

CATEGORY
Existing Non-Residential Buildings

CLIENT/DEVELOPER/BUILDING OWNER
The Tanglin Club
YUNNAN GARDEN @ NTU

NEW PARKS

GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM

Client/Developer
Nanyang Technological University (Office of Development & Facilities Management)

Landscape Consultant
STX Landscape Architects

Architectural QP
RSP Architects Planners & Engineers (Pte) Ltd

C&S Consultants
Fong Consult Pte. Ltd.; ECAS Consultants Pte Ltd (New Road only)

M&E Consultants
Aurecon Singapore (Pte) Ltd; BESCON Consulting Engineers Pte (New Road only)

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

ABC Consultant
Greenology Pte Ltd

• ABC Waters for treatment of 100% of site’s catchment
• Use of Energy Efficient LED Light Fittings
• Use of Water Efficient Water Fittings
• Use of Non-Potable water for irrigation and water features
• Extensive use of Sustainable Products and Products with Recycled Content
• On-site Tree Milling
• Use of recycled wood to make Park Benches
• Provision of Solar Panels at Street Lighting along the main road
GREEN MARK AWARD FOR NON-BUILDINGS | PLATINUM

- Energy efficient LED street lighting for whole campus
- Provision of motion sensors for artificial lighting control
- Improvement in Green Plot Ratio
- Use of WELS rated fittings and achieved Water Efficient Building Certificate for whole campus
- Extensive use of sustainable products for whole campus
- Renewable energy from solar photovoltaic cells located at campus
- Sustainable operation with sustainable policies, green procurement policies, energy and water improvement plans

Client/Developer: Nanyang Technological University
M&E Engineer: Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
ESD Consultant: Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Facility Management: Nanyang Technological University
TUAS WATER RECLAMATION PLANT

INFR USTRUCTURE

GREEN MARK AWARD FOR INFRASTRUCTURE | PLATINUM

- At 800,000 m³/day treatment capacity, it will be the largest membrane bioreactor facility in the world when completed
- One of the most compact used water treatment plants in the world (30% more compact than conventional plant)
- More than 85% NEWater recovery & increases overall NEWater production capacity. As a first in Singapore, Industrial Water is produced from industrial used water
- 30% more energy efficient than the international benchmark for membrane bioreactor plants and more than double the energy recovered for used water treatment.
- 100% powered by renewable, green energy (biogas, sludge, solid waste and solar)
- Maximise resource recovery through synergies with NEA’s Integrated Waste Management Facility to form the Tuas Nexus
- Environmental Impact Assessment and Statements prepared early in the project implementation to identify and manage construction and operational environmental risks.
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
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 Health Promotion Board (HPB) to develop the new BCA-HPB Green Mark for Healthier Workplaces scheme (GM HW: 2018).

With international studies indicating that 90% of the business operating costs are related to human capital costs, staffs productivity would be of paramount interest and concern to any company. The new GM HW would appeal to companies that place emphasis on both health and well-being in addition to environmental sustainability in the office. GM HW 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.
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- Air distribution system for meeting rooms controlled by motion sensors and thermostats
- Energy efficient LED lighting system controlled by motion sensors and daylight sensors
- Extensive use of SGBC “Very Good” rated green products during renovation
- Acoustical considerations were made to minimize unwanted noise to adjacent spaces
- Extensive greenery within office areas
- Internal staircase to encourage physical activity within occupants when moving between L17 and 18
- Submetering of energy uses to facilitate better understanding of energy usage patterns
CSUITES
HEALTHIER WORKPLACES

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- Ultra-low power lighting of 4.3 W/m², more than 50% reduction vs SS530:2014
- All water fittings in the project are rated 3 ticks under PUB Water Efficiency Labelling Scheme
- Acoustical Treatment – All office suites and meeting rooms are soundproofed and feature noise-cancelling duct works to ensure maximum privacy and minimal distraction
- Base building is awarded Green Mark Platinum
- Active Workspace Elements - csuites features height-adjustable desks, high quality ergonomic furniture and fixtures, and a diverse workplace typology to meet the needs of today's dynamic workforce
- Biophilic Design – Full glass ceiling-to-floor facades provide an abundance of natural lighting, while natural elements such as wood and ample plants create a healthy, green and well-ventilated space
- Extensive use of materials certified by Singapore Green Building Council and Singapore Green Labelling Scheme

Client/Developer  Space Lab One Pte Ltd
Architect       Hassell Design (Singapore) Pte Ltd
M&E Engineer    WSP Consultancy Pte Ltd
Green Mark Consultant WSP Consultancy Pte Ltd
Acoustic Consultant Alpha Acoustics Pte Ltd
Main Contractor   Lendlease Singapore Pte Ltd
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- Extensive BMS energy monitoring and tracking system
- Integrative personalized health & fitness portal/app
- Sustainable low VOC materials used in office
- Extensive free coverage in fitness and health seminars/workshops for employees
- Layout designed to influence user towards sustainability and fitness oriented
- Incentive for sustainability and health/fitness challenge
- Ergonomic system furniture and VC meeting rooms to enhance working experience

Client/Developer: DBS Bank Ltd
Facility Management: DBS Bank Ltd
Design Consultant: Wolf Studio
M&E Engineer: Bescon Consulting Engineer Pte Ltd
Main Contractor: Facility Link Pte Ltd
ESD consultant: Building System & Diagnostics Pte Ltd
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

• Energy efficient lighting system with lighting power budget below 9W/m²
• Photo and motion sensors to control staircase, meeting room and office perimeter lighting
• Meeting room equipped with occupancy sensor to control the chilled water motorized control valve
• Deployment of Variable Air Volume system for on-demand cooling
• Green wall installation behind level 1 reception counter
• Internal staircase from level 4 to 7 in the building
• Extensive use of environmentally friendly products

Client/Developer: DNV GL Singapore Pte Ltd
Architect: Aedas Pte Ltd
M&E Engineer: WSP Consultants
Main Contractor: Ngai Chin Construction Pte Ltd
INTELLECTUAL PROPERTY OFFICE OF SINGAPORE

HEALTHIER WORKPLACES

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

Client/Developer
Intellectual Property Office Of Singapore

Project Management
JLL Property Consultants Pte Ltd

Architecture
Architects Team 3 Pte Ltd

M&E Engineer
Hitech Engineering Management Consultants

Main Contractor
New Art Interior Pte Ltd

ESD Consultant
GreenA Consultants Pte Ltd

• Normalized EEI of 25.48% improvement beyond the Platinum baseline
• Use of energy efficient LEDS, dimmers and motion sensors
• Monitoring the lighting and plug load consumption separately
• Provision of green walls and planter boxes
• Provision of energy efficient IT equipment
• Substantial green and health activities
• Engagement of mental health management programme
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

• Submetered utilities and indoor environment parameters can be monitored and analysed through FMS (facility management system)

• Biophilic design and >1,100 live plants that connects elements of nature with the way we work, live, and operate within the office

• Self-tuning sound masking system that provides the most balanced and privacy-protecting sound background in open office setting

• Wellness performance studio combined with regular active and meditation sessions to promote healthier life style

• 15 indoor IAQ monitors that provides continuous readings of five different indoor air quality parameters that’s accessible through physical displays and staff hand phones via the JLL application

• Dimmable LED lighting design with 100% occupancy sensor control in general work areas and all meeting rooms

• Customized functional spaces and ergonomic design that allows our staffs to maximize productivity while reducing risks of work hazards

• Digital signage for all messaging

Client
Jones Lang LaSalle Property Consultants Pte Ltd

Interior Designer
Jones Lang LaSalle Property Consultants Pte Ltd

M&E Engineer
WSP Consultancy Pte Ltd

Facility Manager Company
Jones Lang LaSalle Property Consultants Pte Ltd

Green Mark Consultant
Jones Lang LaSalle Property Consultants Pte Ltd

Renovation Contractor
YDL Construction Pte Ltd
MAPLETREE INVESTMENTS PTE LTD

HEALTHIER WORKPLACES

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

Increase sustainability drive such as phased out Single Use Plastic Bottled Water for all Guests and Meetings since January 2019 and sharing of green knowledge with tenants and employees through our quarterly newsletter, Mapping.

Use efficient lighting system with zonings and controls. Install occupancy and photocell sensors to reduce wastage.

Use LED lightings extensively.

Use UV light and heat recovery for air-conditioning handling unit.

Install building management system to monitor and control air-conditioning set points.

Use energy efficient office equipment such as IT computers, multi-functional devices, shredders etc.

Use sustainable products in office fit out work. This includes furniture made using green electrical energy.

Have an extensive waste recycling program. This included e-waste.
PUB, SINGAPORE’S NATIONAL WATER AGENCY JOINT OPERATIONS CENTRE AND OFFICE SPACE ON LEVEL 18 ENVIRONMENT BUILDING HEALTHIER WORKPLACES

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- Normalised EEI: 57.52kWh/year.
- Use of energy efficient LED lighting with lighting density 6.3W/m².
- Use of motion sensors for the common areas corridors and pantry.
- Active workplace with consideration of office ergonomics for 24 hour Joint Operations Centre and exercise equipment available for use.
- Substantial health and green activities conducted for office occupants.
- Use of sustainable products which are SGBV Very Good and Leader certified and low VOC products for interior fittings and finishes.
- Provision of energy efficient Energy Star IT equipment.

Client/Developer: PUB, Singapore’s National Water Agency
Project Manager: ENGIE Property Service Pte Ltd
Main Contractor: Trendbuild Contracts Pte Ltd
ESD Consultant: GreenA Consultants
CENTRAL PROVIDENT FUND BOARD

HEALTHIER WORKPLACES

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

• Use of energy efficient lighting design with an impressive lighting Power Density of 4.9W/m²
• Holds regular staff engagement programs (bonding events, health, safety, fitness and sustainability)
• Improve wellbeing of staff with a good spread greenery within the office
• Minimised wastage by conserving more than 50% of the existing ceiling and flooring for the entire office
• Good quality of indoor environment for staff wellbeing with yearly periodic IAQ test

Tenant/Owner: Central Provident Fund Board
Renovation Contractor: D’Perception Singapore Pte Ltd
Facility Manager Company: Chambers Property Management Services Pte Ltd
ESD Consultant: Building System and Diagnostics Pte Ltd
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

- Use of green labelled and sustainable renovation products ensuring good indoor air quality in office
- Use of energy efficient LED lights and water efficient water fittings
- Use of energy efficient Energy Star labelled for more than 80% of the office equipment
- Office is furnished with facilities that supports communal eating such as fridge and reheating facilities and non-disposable utensils and cutlery
- Staff wellbeing are well taken of with frequent fruits distribution, healthy snacks and drinks provided in pantry and Nursing Room for mothers

Tenant/Owner: Cyber Security Agency
Renovation Contractor: P&A Link Pte Ltd
Facility Manager Company: ENGIE Property Services Pte Ltd
M&E Consultant: ENGIE Property Services Pte Ltd
ESD Consultant: Building System and Diagnostics Pte Ltd
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

- Extensive greenery to enhance indoor air quality
- Use of motion sensors to control lightings in common areas
- Relative Humidity, temperature and VOC display
- Provision of flicker-free LED lights
- Use of SGLS/SGBC certified products with low VOC content

Tenant/Owner: O2Work Pte. Ltd.
Renovation Consultant/Contractor: ID21 Pte Ltd
Facility Manager Company: UOL Group Ltd
Green Mark Consultant: Earth-In-Mind Private Limited
<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>CATEGORY</th>
<th>CLIENT/DEVELOPER/BUILDING OWNER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amozonia Pte Ltd</td>
<td>Healthier Workplaces</td>
<td>Amozonia Pte Ltd</td>
</tr>
<tr>
<td>Lidl Singapore Pte. Limited</td>
<td>Healthier Workplaces</td>
<td>Lidl Singapore Pte. Limited</td>
</tr>
</tbody>
</table>
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

v. Other Green Features
SMRT CORPORATION LTD

OFFICE INTERIOR

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES| PLATINUM

• Strong commitment to improve energy, water and waste reduction through policies and monitoring consumptions
• Intelligent energy efficient lighting system with motion sensor integration
• Spacious office design that includes open offices, shared spaces and internal stairs for better collaboration and optimization
• Sustainable and environmentally friendly procurement and purchasing policies
• Use of energy efficient office equipment to save energy
• Waste reduction through recycling facilities, waste improvement plan and monitoring
• Design incorporates a greater use of greenery to create a more conducive office environment

Client/Developer
SMRT Corporation Ltd

Interior Designer
FARM

Main Contractor
Gennal Industries Pte Ltd

M&E Consultant
Aurecon Singapore (Pte) Ltd

Managing Agent
Lendlease Singapore Pte. Ltd.

ESD Consultant
Aurecon Singapore (Pte) Ltd
INFO-COMMUNICATIONS MEDIA DEVELOPMENT AUTHORITY

OFFICE INTERIOR

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

- Usage of energy efficient lighting fixture which contributes to a high energy saving of 46.33% for lighting
- Provision of toggle switches and motion sensors in entire office to reduce energy wastage
- 89% of the IT equipment are Energy Star certified
- Provision of internal BMS monitoring of energy and water consumption within IMDA offices
- Provision of internal staircase and green wall

Tenant/ Owner

Renovation Consultant/ Contractor

M&E Consultant

Managing Agent/ Maintenance Contractor

ESD Consultant

Info-communications Media Development Authority

D’perception Singapore Pte Ltd

Building System & Diagnostics Pte Ltd

D’perception Singapore Pte Ltd

C&W Services (S) Pte Ltd
SINGAPORE ENVIRONMENT INSTITUTE

OFFICE INTERIOR

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

Provision of motion sensors to reduce energy wastage.

Usage of energy efficient lighting fixture which contributes to high energy saving of 59.0% for lighting.

94% of office equipment area Energy Star Certified. Use of carpet and paint certified under Singapore Green Building Council and Singapore green Labelling Scheme.

Provision of teleconferencing facilities to reduce SEI's carbon footprint.

Use of printing access control, digitalised processes like e-invoice and e-payment, and usage of e-notes in our courses to minimise printing.

Client/Developer
Singapore Environment Institute

Renovation Contractor
D’perception Singapore Pte Ltd

Facility & Project Manager Company
National Environment Agency

ESD Consultant
Building System & Diagnostics Pte Ltd
SINGAPORE LAND AUTHORITY, GEOWORKS

OFFICE INTERIOR

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

- Energy efficient lighting system with zoning and motion sensor control
- Over 94% of office equipment with energy star label
- Open office layout for optimal space usage with movable workstation, movable partition and hot desks
- Provision of greenery inside office
- Provision of electrical and water sub-meter in the office to enable continuous monitoring of usage

Client/Developer: Singapore Land Authority
Renovation Consultant/Contractor: D’Perception Singapore Pte Ltd
M&E Engineer: D’Perception Singapore Pte Ltd
ESD Consultant: TÜV SÜD PSB Pte Ltd
Main Contractor: D’Perception Singapore Pte Ltd
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

- 100% use of ‘Excellent’ WELS rated water fittings
- 38% savings from baseline for Artificial Lighting
- Extensive use of environmentally friendly products
- Sky garden at levels 4 and 6
- Extensive use of Sustainable Products
TRAINING VISION INSTITUTE PTE LTD

OFFICE INTERIOR

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

• Use energy efficient LED & T5 light fittings for the entire office space, with manual switches for zonal controls.
• Open office layout with minimal partitions to reduce the lighting quantity required.
• Indoor plants are incorporated to create a conducive work environment and improve the indoor air quality.
• Electrical and water sub-meters are installed to enable continuous monitoring of usage and allow intervention should there be abnormalities.
• Extensive teleconferencing facilities to reduce travel.
• Temperature of office is controlled at 24°C
TWITTER ASIA PACIFIC PTE. LTD.
OFFICE INTERIOR

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

- Energy efficient lighting system with zoning and scheduling control
- Provision of Energy Star certified IT equipment
- Motion sensors to control lighting for office spaces
- Extensive reuse of existing furniture and finishes
- Water leak detection system equipped with SMS alerts to monitor water wastage

Tenant/Owner: Twitter Asia Pacific Pte. Ltd. / CapitaGreen
Renovation Consultant/Contractor: Jones Lang LaSalle Property Consultant Pte Ltd
Facility Manager Company: HSBC Institutional Trust Services (Singapore) Ltd
ESD Consultant: Earth-In-Mind Private Limited
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

- Use of energy efficient lighting
- Extensive motion sensors controlled lightings
- More than 90% of office equipments are energy star certified
- Use of VAV system to varies cooling
- Implementation of sustainable policy

Client/Developer: Visa Worldwide Pte. Limited
Facility Management: CBRE
M&E Engineer: J Roger Preston Limited
Managing Agent: Engine Services Singapore
ESD Consultants: Building System & Diagnostics Pte Ltd
## Project Name

<p>| Central Provident Fund Board Bishan Service Centre | Office Interior | Central Provident Fund (CPF) |
| Centre for Climate Research Singapore | Office Interior | National Environment Agency |
| FM Global | Office Interior | FM Global Group of companies |
| Government Technology Agency of Singapore (GovTech) | Office Interior | Government Technology Agency of Singapore |
| Hilton International Asia Pacific Pte Ltd | Office Interior | Hilton |
| Ministry of Culture, Community &amp; Youth | Office Interior | Ministry of Culture, Community and Youth |
| National Environment Agency | Office Interior | National Environment Agency |
| PUB WaterHub, Singapore Water Academy and Office Block | Office Interior | Public Utilities Board (PUB) |
| Salesforce.com Singapore Pte Ltd | Office Interior | Salesforce.Com Singapore Pte Ltd |
| SGX office at The Metropolis Tower 2 | Office Interior | SGX Singapore Exchange |</p>
<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>CATEGORY</th>
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<tbody>
<tr>
<td>Singapore Food Agency</td>
<td>Office Interior</td>
<td>Singapore Food Agency</td>
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</tbody>
</table>
### Green Mark Award for Office Interior | Certified

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Category</th>
<th>Client/Developer/Building Owner</th>
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<tbody>
<tr>
<td>Bank Of China (Levels 1, 3 and 5)</td>
<td>Office Interior</td>
<td>Bank Of China</td>
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</tbody>
</table>
BCA GREEN MARK FOR SUPERMARKETS

The BCA Green Mark for Supermarkets, launched in 2012, is an initiative by BCA to promote and recognize 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$^2$ to 4,500 m$^2$. 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 SUPERMARKET AT TRIPLE ONE SOMERSET

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | GOLDPLUS

Client/Developer: NTUC Fairprice Co-operative Ltd
Designer: NTUC Fairprice Co-operative Ltd
Architect (Project): Brenton Fong Architects
M&E Engineer: CCA & Partners Pte Ltd
Main Contractor: Logistics Construction Pte Ltd
Refrigeration Contractor: D-Logic Refrigeration Pte. Ltd.

- Energy-efficient Refrigeration system.
- High Energy-Efficient LED Lighting & control.
- Extensive use of environmentally-friendly building material.
- Reduction in the use of paper by adopting electronic price label.
- Integrated Pharmacy service as part of Organic & Wellness concept.
# GREEN MARK AWARD FOR SUPERMARKETS | GOLD

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>CATEGORY</th>
<th>CLIENT/DEVELOPER/BUILDING OWNER</th>
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</thead>
<tbody>
<tr>
<td>FairPrice Finest at Jewel Changi Airport</td>
<td>Supermarkets</td>
<td>NTUC</td>
</tr>
<tr>
<td>FairPrice Xtra hypermart at Ang Mo Kio Hub</td>
<td>Supermarkets</td>
<td>NTUC Fairprice Co-operative Ltd</td>
</tr>
</tbody>
</table>
The BCA Green Mark for Retail was launched in 2012 to recognize 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 CHOA CHU KANG BRANCH

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- 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
- Provision of water meter for water usage monitoring and leak detection to arrest leakages
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Use of environmentally friendly carpets with SGBC Product Certification
- Use of reusable tableware for eating and drinking in the back-of-house office
- Provide potted plants within the main welcome hall to create a more biophilic environment

Client/Developer: DBS Bank Ltd
Renovation Consultant: AI Associates 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: Yongway Contract & Construction Pte Ltd
DBS CLEMENTI CENTRAL BRANCH

RETAIL

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

• 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
• Provision of water meter and leak detection system for monitoring and leaking detection
• Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
• Use of environmentally friendly carpets with SGBG Product Certification
• Use of environmentally friendly consumable materials such as dishwashing liquid
• Provision of plants within the main banking hall to create a more biophilic environment

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
Yongway Contract & Construction Pte Ltd
DBS KOVAN BRANCH

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

Client/Developer: DBS Bank Ltd
Renovation Consultant: I2 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 64% improvement over baseline lighting power budget
- 94% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provision of water meter for water usage monitoring and leak detection to arrest leakages
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Use of environmentally friendly carpets with SGBC Product Certification
- Use of reusable tableware for eating and drinking in the back-of-house office
- Provide potted plants within the main welcome hall to create a more biophilic environment
DBS TREASURES AT BUKIT TIMAH

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- High-efficiency lighting with 67% improvement over baseline lighting power budget
- 89% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provision of water meter for water usage monitoring and leak detection to arrest leakages
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Use of environmentally friendly carpets with SGCC Product Certification
- Use of reusable tableware for eating and drinking in the back-of-house office
- Provide potted plants within the main welcome hall to create a more biophilic environment

Client/Developer | DBS Bank Ltd
Renovation Consultant | Tarkus Interior Pte Ltd
Facility Manager | Jones Lang LaSalle Property Consultants Pte Ltd
M&E Contractor | CCA & Partners Pte Ltd
Green Mark Consultant | Jones Lang LaSalle Property Consultants Pte Ltd
GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- High-efficiency lighting with 68% improvement over baseline lighting power budget
- 87% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provision of water meter for water usage monitoring and leak detection to arrest leakages
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Use of environmentally friendly carpets with SGB Product Certification
- Use of reusable tableware for eating and drinking in the back-of-house office
- Provide potted plants within the main welcome hall to create a more biophilic environment
POSB WATERWAY POINT BRANCH

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- High-efficiency lighting with 69% improvement over baseline lighting power budget
- 95% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provision of water meter for water usage monitoring and leak detection to arrest leakages
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Use of environmentally friendly carpets with SGBC Product Certification
- Use of reusable tableware for eating and drinking in the back-of-house office
- Provide potted plants within the main welcome hall to create a more biophilic environment

Client/Developer: DBS Bank Ltd
Renovation Consultant: I2 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: Yongway Contract & Construction Pte Ltd
POSB YISHUN WEST BRANCH

RETAIL

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- High-efficiency lighting with 35% improvement over baseline lighting power budget
- 79% of office equipment used (by rated power) in the branch is Energy Star certified product
- Provision of water meter for water usage monitoring and leak detection to arrest leakages
- Green Branch Operations Guide and regular workshops to facilitate responsible operations and behaviors
- Use of environmentally friendly carpets with SGBC Product Certification
- Use of reusable tableware for eating and drinking in the back-of-house office
- Provide potted plants within the main welcome hall to create a more biophilic environment

Client/Developer | DBS Bank Ltd
Renovation Consultant | I2 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 | Milan Decoration & Construction Pte Ltd
BCA GREEN MARK FOR DATA CENTRES

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

In this technological era, the growth of cloud-based services, online media and transactions is fueling 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
AIRTRUNK DATA CENTRE SGP1
NEW DATA CENTRE

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- Efficient cooling system with efficiency of 0.8 kW/RT
- Indirect evaporative cooling technology is used in cooling system
- High Efficient LED Lighting
- Efficient transformer and modular UPS
- Recycling of FCU condensate water to cooling tower’s make up water
- Use of CFD simulation to improve air management design

Client/Developer
AirTrunk Singapore Pte Ltd

Architect
AWP Pte Ltd

M&E Engineer
Red Engineering Asia Pacific Pte Ltd

Structural Engineer
Meinhardt (Singapore) Pte Ltd

Quantity Surveyor
Linesight

Main Contractor
Obayashi Singapore Pte Ltd

ESD Consultant
Afogreen Build Pte Ltd
**BCA ACADEMY DATA CENTRE**

**NEW DATA CENTRE**

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**GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM**

- Efficient water cooled chilled water system with efficiency of 0.6 kW/RT
- Full fitted with energy efficient in-row air conditioning system
- High Efficient LED Lighting
- Provision of cold aisle containment
- Use of modular UPS

<table>
<thead>
<tr>
<th>Client/Developer</th>
<th>Building and Construction Authority</th>
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</thead>
<tbody>
<tr>
<td>Main Contractor</td>
<td>Pro-Matrix Pte Ltd</td>
</tr>
<tr>
<td>ESD Consultant</td>
<td>Building System and Diagnostics Pte Ltd</td>
</tr>
</tbody>
</table>
CHINA MOBILE INTERNATIONAL SG1
NEW DATA CENTRE

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

Client/Developer  China Mobile International Infrastructure (SG1) Pte Ltd
Architect        Scott Brownrigg
M&E Engineer     DSCO Group Pte Ltd
Structural Engineer Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
ESD Consultant   DSCO Group Pte Ltd
Main Contractor  China Construction (South Pacific) Development Co Pte Ltd

• Achieved design Power Usage Effectiveness (PUE) of 1.40
• Chiller plant system with efficiency of 0.55kW/RT
• Modular design of M&E services to minimise system losses
• Provision of high efficiency M&E systems (UPS, Transformer, Chiller system and CRAH)
• Provision of WELS-certified ‘Excellent’ water-savings fittings
• Provision of DCIM system to comprehensively monitor M&E systems power consumption and efficiency
DATA CENTRE AT 9 TAI SENG DRIVE

NEW DATA CENTRE

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- Efficient water cooled system with efficiency of 0.44 kW/RT
- High Efficient LED Lighting
- Efficient transformer and modular UPS
- Recycling of FCU condensate water to cooling tower’s make up water
- The use of Lithium Ion Batteries for UPS system

Client/Developer: CapitaLand Ltd
Architect: ID Architects Pte Ltd
M&E Engineer: DSCO Group Pte Ltd
Structural Engineer: JS Tan Consultant Pte Ltd
Quantity Surveyor: WT Partnership (S) Pte Ltd
ESD Consultant: DSCO Group Pte Ltd
DIGITAL LOYANG 2 (SIN12)
NEW DATA CENTRE

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- Estimated Energy savings: 86,329,800 kWh/yr
- ETTV: 27.5 W/m²
- Dedicated Dual Temperature Chilled Water Plant with dedicated hydronic and shared Cooling tower with overall chiller efficiency of 0.442 kW/Rt
- Highly efficient Single Module Static UPS with Intelligent Parallel features
- Dedicated PAHU for latent removal and pressurization of Data Hall
- Extensive Power and Water consumption Monitoring and Reporting using DCIM System

Client/Developer  Digital Realty
Architect         Greenbox Architecture
M&E Consultant   Arup Singapore Pte Ltd
FACEBOOK SINGAPORE DATA CENTRE

NEW DATA CENTRE

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

• Low PUE of 1.29
• Energy Efficient cooling system of 0.583 kW/RT
• Water efficient and alternative source for non-potable use
• Waste management and recycle facility
• Energy efficient lighting design and demand control
• Facebook’s data center-wide power management system - Dynamo
• State Point Liquid Cooling (SPLC) system

Client/Developer  Facebook
Architect  Aedas Pte Ltd
M&E Engineer  Cundall Singapore Pte Ltd
Structural Engineer  Arup Singapore Pte Ltd
Quantity Surveyor  Turner & Townsend Pte Ltd
Main Contractor  Fortis Construction Pte Ltd
SIGMA DATA CENTRE

NEW DATA CENTRE

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- InRow Cooling System
- Symmetra Modular UPS
- Hot Air Containment with blanking panel
- LED lighting with occupancy sensors

Client/Developer  
JTC Corporation

Facility Manager Company  
Ascendas Services Pte Ltd

DC Infrastructure Consultant  
Schneider Electric Pte Ltd

ESD Consultant  
Kaer Ptd Ltd
STT LOYANG
NEW DATA CENTRE

GREEN MARK AWARD FOR OCCUPANT-CENTRIC SCHEMES | PLATINUM

- Efficient cooling system with efficiency of 0.583 kW/RT
- Full Hot Aisle Containment
- High Efficient LED Lighting
- Efficient transformer and modular UPS
- Provision of Solar PV with generation up to 373.46kWh/yr

Client/Developer: STT Loyang Pte Ltd
Architect: BK Consulting Engineers Pte Ltd
M&E Engineer: Plan One Pte Ltd
Structural Engineer: BK Consulting Engineers Pte Ltd
ESD Consultant: Building System and Diagnostics Pte Ltd
Main Contractor: Acme Associates Pte Ltd
<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>CATEGORY</th>
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<tbody>
<tr>
<td>NUS SoC Computer Room 1</td>
<td>Existing Data Centres</td>
<td>National University of Singapore (NUS)</td>
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</tbody>
</table>
As restaurants utilize 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 recognize 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
<table>
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<tbody>
<tr>
<td>McDonald's Buangkok Square (BSQ)</td>
<td>Restaurants</td>
<td>Hanbaobao Pte Ltd</td>
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## GREEN MARK AWARD FOR LABORATORIES | GOLD

<table>
<thead>
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<tbody>
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<td>Bioprocessing Technology Institute (BTI)</td>
<td>Laboratories</td>
<td>Agency for Science, Technology and Research (A* Star)</td>
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<tr>
<td>Genome Institute of Singapore (GIS)</td>
<td>Laboratories</td>
<td>Agency for Science, Technology and Research (A* Star)</td>
</tr>
<tr>
<td>Institute of Materials Research and Engineering (IMRE)</td>
<td>Laboratories</td>
<td>Agency for Science, Technology and Research (A* Star)</td>
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<tr>
<td>Institute of Medical Biology (IMB)</td>
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<td>Institute of Microelectronics (IME)</td>
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<td>Institute of Microelectronics (IME) at Science Park</td>
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<td>Agency for Science, Technology and Research (A* Star)</td>
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<td>Institute of Molecular &amp; Cell Biology (IMCB)</td>
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<td>Singapore Bioimaging Consortium (SBIC)</td>
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<tr>
<td>Singapore Institute for Clinical Sciences (SICS)</td>
<td>Laboratories</td>
<td>Agency for Science, Technology and Research (A* Star)</td>
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<tr>
<td>Singapore Institute of Manufacturing Technology (SIMTech)</td>
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<td>Skin Research Institute of Singapore (SRIS)</td>
<td>Laboratories</td>
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</tbody>
</table>
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 recognized 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 customized 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
UOB (THAI) – PHETKASEM BUILDING A & B
EXISTING NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | PLATINUM

- Efficient chiller plant with system efficiency of 0.56 kW/RT.
- Extensive vertical greenery on façade of multi-storey car park.
- LED lightings with motion sensors in Staircases and Toilets.
- Provision of energy portal and dashboard for monitoring of building’s major energy consumption.
- Extensive usage of green products certified by local and international green certifications.
- Lift Destination Control System which increases the efficiency of the lift operation and reduces waiting times by directing and categorised passengers to the designated lift.
- Maximize use of natural lighting in the lift lobbies for Tower B to reduce reliance on artificial lightings.

Facility Management: UOB (Thai) Public Company Limited
ESCO: G-Energy Global Pte Ltd
ESD / Green Consultant: G-Energy Global Pte Ltd
## PARK AVENUE HEIGHTS

### NEW RESIDENTIAL BUILDING

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

<table>
<thead>
<tr>
<th>Client/Developer</th>
<th>Keppel Heights (Wuxi) Property Development Co Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager</td>
<td>Keppel Land China Ltd</td>
</tr>
<tr>
<td>Architect</td>
<td>Shanghai City Architectural Design Co Ltd</td>
</tr>
<tr>
<td>M&amp;E Engineer</td>
<td>Shanghai City Architectural Design Co Ltd</td>
</tr>
<tr>
<td>Structural Engineer</td>
<td>Shanghai City Architectural Design Co Ltd</td>
</tr>
<tr>
<td>Quantity Surveyor</td>
<td>AECOM Cost Consulting (Shenzhen) Limited Shanghai Branch</td>
</tr>
<tr>
<td>Main Contractor</td>
<td>Shanghai Construction No 1 (Group) Co Ltd</td>
</tr>
<tr>
<td>Landscape Consultant</td>
<td>Ong &amp; Ong Pte Ltd</td>
</tr>
<tr>
<td>ESD Consultant</td>
<td>Earth-In-Mind Private Limited</td>
</tr>
</tbody>
</table>

- Use of Low-E double glazed glass windows for all dwelling units to reduce heat gain/loss through fenestration system.
- Use of solar energy harnessed from photovoltaic system to reduce dependency on grid power.
- Use of river canal as rainwater collection tank and thereby using non-portable water collected for irrigation.
- Extensive use of construction materials such as fly ash hollow block, aerated concrete block and plasterboard, which are eco-labelled or contain substantial amount of recycled content.
- Use of energy efficient lifts.
WATERFRONT RESIDENCES
NEW RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLDPLUS

- Use of Low-E double glazed glass windows for all dwelling units to reduce heat gain/loss through fenestration system.
- Use of solar energy harnessed from photovoltaic system to reduce dependency on grid power.
- Use of rainwater harvested as non-potable water for irrigation.
- Extensive use of construction materials such as fly ash hollow block, aerated concrete block and plasterboard, which are eco-labelled or contain substantial amount of recycled content.
- Use of energy efficient lifts.

Client/Developer
Keppel Lakefront (Wuxi) Property Development Co Ltd
Keppel Land China Ltd
Shanghai City Architectural Design Co Ltd
M&E Engineer
Shanghai City Architectural Design Co Ltd
Structural Engineer
Shanghai City Architectural Design Co Ltd
Quantity Surveyor
AECOM Cost Consulting (Shenzhen) Limited Shanghai Branch
Main Contractor
Jiangsu First Construction Installation Co Ltd /Shanghai Construction No 1 (Group) Co Ltd
Landscape Consultant
Earth-In-Mind Private Limited
ESD Consultant
B+H Consulting International Inc.
CAPITAMALL TIANGONGYUAN, CHINA
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD

- Estimated energy savings: 5,401,508 Wh/yr; Estimated water savings: 12,644 m³/yr,
- Water cooled chilled water plant with efficiency of 0.78 kW/RT
- High Efficient LED Lighting
- Provision of electric charging car paring lots

Client/Developer: CapitaLand Ltd
Architect: Laguarda Low Architects
M&E Engineer: China IPPR International Engineering Co Ltd
Structural Engineer: China IPPR International Engineering Co Ltd
Quantity Surveyor: Sweet (Beijing) Limited
Main Contractor: China Construction Eighth Engineering Division Corp Ltd
GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD

• Chiller plant operating efficiency of 0.613 kW/RT
• Heat recovery from heat pump to heat water for hotel’s open-air swimming pool
• Regenerative drive for lifts
• Standalone soil and waste-water treatment Membrane Bio Reactor (MBR) plant with sludge dewatering system and grey-water recycling rate of 40m$^3$ per day
• Internationally certified sustainable building products used extensively throughout development
• Auto condenser tube cleaning system to allow the chiller to maintain good heat transfer with constant cleaning of the condenser tubes, hence improving efficiency of the chillers.
• Native plant species used for more than 50% of the landscape
• Non-chemical cooling tower water treatment
• Covered link bridge from development to bus stop provided with disabled-friendly facilities such as chair/handicap lift
JUNCTION CITY (OFFICE) < YANGON MYANMAR

NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD

- Chiller plant operating efficiency of 0.642 kW/RT
- Energy efficient jet fans coupled with CO sensor provided in basement carparks
- Regenerative drive for lifts
- Standalone soil and waste-water treatment Membrane Bio Reactor (MBR) plant with sludge dewatering system and grey-water recycling rate of 40m³ per day
- Internationally certified sustainable building products used extensively throughout development
- Auto condenser tube cleaning system to allow the chiller to maintain good heat transfer with constant cleaning of the condenser tubes, hence improving efficiency of the chillers.
- Native plant species used for more than 50% of the landscape
- Covered link bridge from development to bus stop provided with disabled-friendly facilities such as chair/handicap lift

Client/Developer: Shwe Taung Junction City Development Co., Ltd
Architect: DP Architects Pte Ltd
M&E Engineer: J Roger Preston (S) Pte Ltd
Structural Engineer: DP Engineers Pte Ltd
Main Contractor: Shwe Padonmar Pwint Co., Ltd.
ESD Consultant: Building System & Diagnostics Pte Ltd
JUNCTION CITY (RETAIL), YANGON, MYANMAR

NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD

Client/Developer
Shwe Taung Junction City Development Co., Ltd

Architect
DP Architects Pte Ltd

M&E Engineer
J Roger Preston (S) Pte Ltd

Structural Engineer
DP Engineers Pte Ltd

Main Contractor
Shwe Padonmar Pwint Co., Ltd.

ESD Consultant
Building System & Diagnostics Pte Ltd

- Chiller plant operating efficiency of 0.612 kW/RT
- Energy efficient jet fans coupled with CO sensor provided in basement carparks
- Light well at atrium to harvest daylight for reduced artificial lighting load during daytime
- Internationally certified sustainable building products used extensively throughout development
- 117 kWp Polycrystalline PV panels were installed to generate around 125,000 kWh of energy yearly
- Standalone soil and waste-water treatment Membrane Bio Reactor (MBR) plant with sludge dewatering system and grey-water recycling rate of 40m³ per day
- Auto condenser tube cleaning system to allow the chiller to maintain good heat transfer with constant cleaning of the condenser tubes, hence improving efficiency of the chillers.
- Covered link bridge from development to bus stop provided with disabled-friendly facilities such as chair/handicap lift
GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD

- Dwelling units are well ventilated
- Use of water efficient fittings that are certified under the PUB WELS rating
- Extensive greenery with high green plot ratio
- Low Concrete Usage Index

Client/Developer: South Rach Chiec Limited Liability Company
Concept Architect: A61 Singapore Pte Ltd
Local Architect: International Construction & Investment Consultancy Co. , Ltd
M&E Engineer: International Construction & Investment Consultancy Co. , Ltd
Structural Engineer: International Construction & Investment Consultancy Co. , Ltd
Quantity Surveyor: Rider Levett Bucknall Co. , Ltd
ESD Consultant: Building System & Diagnostics Pte Ltd
Main Contractor: An Phong Construction Co. Ltd
THE PINNACLE
NEW NON-RESIDENTIAL BUILDING

GREEN MARK AWARD FOR BUILDINGS (OVERSEAS) | GOLD

• Good ETTV 41.93 W/m2.
• Chiller plant system efficiency of 0.73 kW/ton
• Extensively use of energy efficient T5 and LED light fittings for all areas.
• Use of Motion sensors to optimize lightings consumption.
• Use of CO sensors for carpark mechanical ventilation system.
• Lifts have energy efficient AC VVVF motors and sleep mode feature.

Client/Developer
Sunway Pinnacle Sdn Bhd

Architect
Perunding Alam Bina Sdn Bhd

M & E Engineer
KTA Tenaga Sdn Bhd

Structural Engineer
T Y Lin International Sdn Bhd

Quantity Surveyor
Arcadis (Malaysia) Sdn Bhd

Main Contractor
Sunway Construction Bhd

ESD Consultant
G-Energy (M) Sdn Bhd
<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>CATEGORY</th>
<th>CLIENT/DEVELOPER/BUILDING OWNER</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHUBB Square</td>
<td>Existing Non-Residential Buildings</td>
<td>PT. Wisma Kartika</td>
</tr>
<tr>
<td>Eco Sanctuary</td>
<td>District</td>
<td>Eco Sanctuary Sdn Bhd</td>
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<tr>
<td>Indosurya Life Center</td>
<td>Existing Non-Residential Buildings</td>
<td>PT. Puri Adhimelati</td>
</tr>
<tr>
<td>Macao Olympic Sports Centre (Main, Indoor Stadium &amp; Aquatic Centre)</td>
<td>Existing Non-Residential Buildings</td>
<td>Sports Bureau of Macao SAR</td>
</tr>
<tr>
<td>Nusajaya Tech Park</td>
<td>District</td>
<td>Ascendas</td>
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<tr>
<td>Oasis Business Centre</td>
<td>New Non-Residential Buildings</td>
<td>Grand Infinite Development Sdn Bhd</td>
</tr>
<tr>
<td>Somerset Alabang Manila</td>
<td>New Non-Residential Buildings</td>
<td>Star Anise Properties Corporation</td>
</tr>
</tbody>
</table>
Organiser

Building and Construction Authority

An Initiative Under

BuildSG