

The Green Mark scheme was introduced in 2005 to assess the environmental friendliness and water conservation measures which set them apart from other buildings. They have environmental quality is provided for their users.

# Green Mark Platinum



## Republic Polytechnic

Developer	: Republic Polytechnic
Architect	: DP Architects Pte Ltd
Structural Engineer	: Meinhardt (Singapore) Pte Ltd
M&E Engineer	: Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Landscape Consultant	: Ohtori Consultants Environmental Design Institute, Japan
Landscape Contractor	: Nature Landscape Pte Ltd
Acoustics Consultants	: Nagata Acoustic (Japan) & Acviron Acoustics Consultants Pte Ltd
Façade Consultants	: Meinhardt Façade Technology Pte Ltd
Main Contractor	: China Construction – Taisei Joint Venture

### Key Green Features

- Among first few projects to use thermal energy storage system in the region.
- “Campus in the Park” feeling. Inspiration for the lawn came from well known campus grounds around the world, such as the Harvard Yard in Harvard University and Mills Yard in Cambridge University.
- Multiple ventilation modes for sports hall facilitate natural ventilation during normal usage and air conditioning during special occasions.
- “Chemical Free” water treatment for central cooling plant and ionisation water treatment for swimming pool.
- Photovoltaic solar energy panel for general lighting and general power.
- Use of pneumatic waste conveyance system.



## Tan Tock Seng Hospital

Developer	: Tan Tock Seng Hospital (TTSH)
Project Manager	: TTSH In-house Facilities Engineering Department
Controls and Energy Specialist	: CNA Group Ltd

### Key Green Features

- Use of “clean and renewable hydrogen fuel cell technology” as emergency back-up power saves energy.
- Improved indoor air quality by applying “Bio-Kil” technology onto air-con filter to eliminate bacteria and virus .
- Redesigned operating theatre air-con control system to allow staff to switch from “full operation” mode to “economy” mode when operating theatres are not in use. This innovation won the SPRING Singapore Star Award in 2004 and could save TTSH more than \$120,000 per year.
- Installed heat exchanger to extract air-con package system’s waste heat to supply hot water to the kitchen.
- Use of dual sensor (CO<sup>2</sup> & temperature) system to control the basement carpark mechanical ventilation, saving more than \$290,000 per year on energy cost and prolong equipment life.
- Progressively replacing conventional T8 light fittings with recyclable and brighter T5 light fittings, hence reducing the number of tubes required.

ss of buildings. In general, Green Mark buildings have adopted energy efficient features also made substantial use of greenery in their projects and ensured that a good indoor

# Green Mark Gold<sup>PLUS</sup>



## City Square Residences

Developer	: City Developments Limited
Architect	: Ong & Ong Architects Pte Ltd
Structural Engineer	: Meinhardt (S) Pte Ltd
M&E Engineer	: Parsons Brinckerhoff Pte Ltd
Landscape Consultant	: Belt Collins International (S) Pte Ltd
Façade Consultant	: Connell Wagner (Pte) Ltd
Main Contractor	: Woh Hup (Pte) Ltd

### Key Green Features

- Construction using circular diaphragm wall utilises less manpower and strutting materials.
- Extensive use of solar powered light-emitting tiles, pole lights and bollard lights for its external landscaping.
- Dual Chutes Pneumatic Refuse Collection System to segregate recyclable and non-recyclable wastes.
- Extensive use of sunpipes to bring natural daylight to the 3 basement levels.
- Silt treatment and water recycling plant to recycle treated water for washing and cleaning purpose.



## St Regis Hotel & Residences

Developer	: City Developments Limited, Hong Leong Holdings and TID Pte Ltd JV
Architect	: RSP Architects Planners & Engineers (Pte) Ltd
Structural Engineer	: RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer	: Squire Mech Pte Ltd
Environmental Design Consultant	: CP Green
Main Contractor	: Kajima – Tiong Seng JV

### Key Green Features

- Ceramic Façade Cladding System – self cleaning properties, saves labour and water.
- Condensate water recycling results in water savings of up to 19,300 m<sup>3</sup> per year.
- Motion detection system integrated with lighting for private lift lobbies at apartments.
- Dual Chutes Pneumatic Refuse Collection System to segregate recyclable and non-recyclable wastes.
- “WetSep” Silt Water Treatment System saves 3,210m<sup>3</sup> of water per month.



## RiverGate

Developer	: Riverwalk Promenade Pte Ltd (JV between CapitaLand and Hwa Hong Corporation)
Architect	: RSP Architects Planners & Engineers (Pte) Ltd
Concept Architect	: Cox Architects & Planners
Structural Engineer	: Meinhardt (S) Pte Ltd
M&E Engineer	: Squire Mech Pte Ltd
Quantity Surveyor	: Davis Langdon & Seah Singapore Pte Ltd
Landscape Consultant	: Sitetectonix Pte Ltd
Main Contractor	: Shimizu Corporation

### Key Green Features

- Sprawling landscape on the ground level; green vista is extended vertically to the top of the residential towers.
- Water drip line systems, which operate via timers and rain sensors, are installed at the sky and roof gardens.
- All units are provided with dual flushing system water closets.
- All units are provided with inverter multi-split air-con systems.
- Guard houses use recycled water collected from integrated basins to flush toilets.

# Green Mark Gold



## Singapore Botanic Gardens (Tanglin Core Development)

Developer	: National Parks Board
Architect	: Urban Redevelopment Authority
Structural Engineer	: Urban Redevelopment Authority
M&E Engineer	: Urban Redevelopment Authority
Landscape Consultant	: Tropical Environment Pte Ltd
Main Contractor	: Sanchoon Builders Pte Ltd

### Key Green Features

- First usage of green roof system on a pitched roof in Singapore for the Green Pavilion.
- First usage of greening system on vertical walls in Singapore.
- Careful planning minimises the project encroachment into the green space of Botanic Gardens.
- Building was configured to integrate with the existing trees and to protect tree roots.



## The Exchange Beijing

Developer	: Onward Science & Trade Center Co Ltd
Architect	: The Institute of Building Design, China Academy of Building Research
Structural Engineer	: The Institute of Building Design, China Academy of Building Research
M&E Engineer	: The Institute of Building Design, China Academy of Building Research
Managing Agent	: Beijing PREMAS Property Services Co Ltd (A subsidiary of United PREMAS Limited)
Main Contractor	: Beijing Uni-Construction Group Co Ltd

### Key Green Features

- Recycling programme to encourage occupant recycling.
- Close monitoring of energy and water consumption on a monthly basis.
- Variable Speed Drive in escalators and chiller system.
- Well maintained huge landscape area irrigated by a large scaled reclaimed water system.



## The Tresor

Developer	: Keppel Land Realty Pte Ltd
Architect	: Ong & Ong Architects Pte Ltd
Structural Engineer	: KTP Consultants Pte Ltd
M&E Engineer	: Alpha Engineering Consultant
Landscape Consultant	: Tierra Design (S) Pte Ltd
Other Specialist Consultant	: CCW Associates Pte Ltd
Main Contractor	: Poh Lian Construction Pte Ltd

### Key Green Features

- Waterless urinal at clubhouse toilet.
- Ductless mechanical ventilation fans in basement carpark.
- Sunpipes to bring natural lighting into the basement carpark.
- Use of recycled plastic in children's playground equipment.



## ITE College East at Simei Avenue

Developer	: Institute of Technical Education
Architect	: RSP Architects Planners & Engineers (Pte) Ltd
Structural Engineer	: RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer	: Squire Mech Pte Ltd
Quantity Surveyor	: Davis Langdon & Seah Singapore Pte Ltd
Landscape Consultant	: Sitetectonix Pte Ltd
Main Contractor	: Kajima Overseas Asia Pte Ltd

### Key Green Features

- Sun-shades along the corridors, low-emissivity performance glazing and laminated double-glazed curtain-wall.
- Maximise day lighting into circulation spaces, multi-purpose rooms, classrooms and offices.
- Extensive planting with integrated themed landscape walks for nature conservation.
- Ceiling boards at all labs, classrooms, offices and toilets contain about 40% recycled content.



## King's Plot 3 Development

Developer	: City Developments Limited
Architect	: RSP Architects Planners & Engineers (Pte) Ltd
Structural Engineer	: RSP Architects Planners & Engineers (Pte) Ltd
M&E Engineer	: Squire Mech Pte Ltd
Quantity Surveyor	: Davis Langdon & Seah Singapore Pte Ltd
Landscape Consultant	: Belt Collins International (S) Pte Ltd
Lighting Consultant	: Parsons Brinckerhoff Pte Ltd
Acoustic Consultant	: Acvicon Acoustics Consultants Pte Ltd
Main Contractor	: Tiong Seng Contractors (Pte) Ltd

### Key Green Features

- All units are supplied with 4 ticks Energy Labeled air-cons.
- All units are provided with dimmer controls for living/dining and master bedroom.
- Rainwater collection tanks on fourth storey collect rainwater for watering plants on first storey by way of gravity fall.
- During construction, water treatment system is used to recycle treated water for washing and cleaning purposes.



## The Azure

Developer	: FCL View Pte Ltd
Architect	: ADDP Architects
Structural Engineer	: DE Consultants
M&E Engineer	: Squire Mech Pte Ltd
Landscape Consultant	: Site Concepts International
Main Contractor	: China Construction (South Pacific) Development Co Pte Ltd

### Key Green Features

- Solar powered light-emitting tiles, pole lamps, bollard lights at landscape areas and solar-powered water heater for clubhouse changing room showers.
- Sunpipes to bring daylight into basement carpark.
- Environmentally friendly lightweight plastic grid for turfing along fire engine access way.
- Pneumatic Refuse Collection System to segregate recyclable and non-recyclable wastes.

# Green Mark Gold



## The Sail @ Marina Bay

Developer	: City Developments Limited & AIG JV
Architect	: TEAM Design Architects Pte Ltd with Design Consultants NBBJ & Kiat Inc (USA)
Structural Engineer	: Meinhardt (S) Pte Ltd with Precast Design Consultants (USA)
M&E Engineer	: Meinhardt (S) Pte Ltd
Quantity Surveyor	: Davis Langdon & Seah Singapore Pte Ltd
Landscape Consultant	: Belt Collins International (S) Pte Ltd
Façade Consultant	: Connell Wagner (Pte) Ltd
Lighting Consultant	: LPA Lighting Planners Associates Inc
Main Contractor	: Dragages (S) Pte Ltd

### Key Green Features

- Staircase shelter – utilises less concrete and steel for construction and less materials for accessories.
- Construction using peanut-shaped diaphragm wall eliminates strutting, resulting in safer and cleaner working environment.
- Solar powered system for heated pool and aircraft warning lights.
- Dual Chutes Pneumatic Refuse Collection System to segregate recyclable and non-recyclable wastes.



## Singapore General Hospital (Bowyer Block A, B & C)

Developer	: Singapore General Hospital Pte Ltd
Project Manager	: Singapore Health Services Pte Ltd
Architect	: Urban 3 Architects
Structural Engineer	: TP Seow Consultants
M&E Consultant	: WN Consultant
Energy and Climate Consultant	: Temasek Polytechnic
Environmental Co-ordinator	: Yeo Lee Pin Registered Architect
M&E Contractor	: TAC Distribution Pte Ltd
Main Contractor	: Kwan Yong Construction Pte Ltd

### Key Green Features

- Refrigeration plants (chillers) are equipped with leak detection system.
- Design studies include 3D computer simulation to maximise the use of daylighting and natural ventilation at internal courtyard.
- Use of low-emissivity glass for windows, lift core and the roof canopy of the internal courtyard.
- Innovative use of reflective fins along all the office windows to enhance day lighting and reduce glare.



## Varsity Park Condominium

Developer	: CapitaLand Residential Singapore
Architect	: TSP Architects + Planners Pte Ltd
Structural Engineer	: P&T Consultant Pte Ltd
M&E Engineer	: P&T Consultant Pte Ltd
Quantity Surveyor	: Davis Langdon & Seah Singapore Pte Ltd
Landscape Consultant	: DLO Design Pte Ltd
Main Contractor	: Woh Hup Pte Ltd

### Key Green Features

- Building blocks are placed and oriented to reduce direct sunlight into the apartment units.
- Basement carpark is designed with about 20% opening for natural light and ventilation. This eliminates the need to provide full mechanical ventilation and water sprinkler fire fighting system.
- Gearless traction elevator.
- Extensive use of precast components.



## Neuros, Biopolis Phase 2 in One-North

Developer	: Ascendas (Tuas) Pte Ltd
Project Manager	: Ascendas Services Pte Ltd
Architect	: Architects Team 3 Pte Ltd
Structural Engineer	: Jurong Consultants Pte Ltd
M&E Engineer	: Jurong Consultants Pte Ltd
Quantity Surveyor	: WT Partnership
Landscape Consultant	: Peridian Asia Pte Ltd
Energy Consultant	: SuperSolutions Pte Ltd
Main Contractor	: ACP Construction Pte Ltd

### Key Green Features

- Solar system for security lighting on the roof.
- Electronic water sub-meter to do constant monitoring of water consumption.
- Luminance sensors to control the lighting level of walkway at first storey.
- Use of district cooling system.

# Green Mark Award



## 138 Depot Road

Developer	: Ascendas (Tuas) Pte Ltd
Project Manager	: Ascendas Services Pte Ltd
Architect	: Architects Team 3 Pte Ltd
Structural Engineer	: Arup Singapore Pte Ltd
M&E Engineer	: Parsons Brinckerhoff Pte Ltd
Quantity Surveyor	: WT Partnership
Landscape Consultant	: Geok Lan Landscape
Energy Consultant	: SuperSolutions Pte Ltd
Main Contractor	: ACP Construction Pte Ltd



## The Infiniti

Developer	: FCL Court Pte Ltd
Architect	: DCA Architects Pte Ltd
Structural Engineer	: DE Consultants (S) Pte Ltd
M&E Engineer	: United Project Consultants Pte Ltd
Landscape Consultant	: Belt Collins International (S) Pte Ltd
Acoustic Consultant	: CCW Associates Pte Ltd
Main Contractor	: Greatearth Construction Pte Ltd