



## **MEDIA RELEASE**

### **SBG Heritage Museum and CDL Green Gallery Open**

*Singapore, 29 November 2013* – The Singapore Botanic Gardens (SBG) Heritage Museum, the City Developments Limited (CDL) Green Gallery featuring the ‘Living in a Garden’ exhibition will be officially opened tomorrow by Prime Minister Lee Hsien Loong. Through the interactive exhibits at the two new amenities, visitors will be able to learn more about the rich history of the 154-year old Gardens and Singapore’s greening journey over the last five decades. To mark the opening, more than 50 activities will be organised from 30 November to 15 December 2013 at the SBG for visitors to commemorate 50 Years of Greening Singapore. The new amenities and slew of activities are part of National Parks Board’s (NParks) efforts to raise awareness on Singapore’s green heritage and our City in a Garden.

Mr Poon Hong Yuen, CEO, NParks, said: “While the government is committed to sustaining our green environment, our City in a Garden would only flourish if the community is actively involved. Through the exhibits, we hope that more Singaporeans will better appreciate our green heritage, and join us in creating our City in a Garden.”

#### **‘Living in a Garden’ exhibition**

The ‘Living in a Garden’ exhibition on Singapore’s greening journey is the first exhibition to be held at the CDL Green Gallery. Open from 30 November 2013 to 30 June 2014, the exhibition features different themes of green Singapore, from its historical landscapes, to the rich biodiversity. Visitors will have the opportunity to create their own city through an interactive game. The exhibition also gives a glimpse into future developments in our City in a Garden, such as Destination Parks and Round Island Route.

The three Destination Parks, Admiralty Park, Jurong Lake Park, and East Coast Park are estimated to be completed by end 2015, end 2016, and end 2017 respectively. The three large regional parks were identified earlier to be redeveloped thematically to attract Singaporeans from all over the island. They will feature recreational elements not usually found in public parks.



### **SBG Heritage Museum and CDL Green Gallery**

The SBG Heritage Museum at Holttum Hall and CDL Green Gallery are located next to Botany Centre in the Tanglin Core of the Gardens. The SBG Heritage Museum features interactive exhibits and panels that share little known facts of the Gardens' rich heritage, as well as rare artefacts including botanical books, paintings, and more. *(Please refer to Annex A for more information on the Gardens' heritage and Annex B for information on the Museum).*

Developed as an extension to the SBG Heritage Museum on Holttum Lawn by CDL, the CDL Green Gallery is Singapore's first purposefully built zero energy Green Gallery, making the gallery self-sufficient. It is built with several eco-friendly technologies, including two innovative features introduced in Singapore for the first time – the biomaterial known as Hempcrete (largely made from the hemp plant) and a prefabricated modular system. The Building and Construction Authority (BCA) has accorded this Gallery with the BCA Green Mark Platinum status – the highest tier of green buildings in Singapore. Clad with vertical green walls, the building is planted with selected species that attract butterflies such as the Plain Tiger and Chocolate Pansy. After the 'Living in a Garden' exhibition, the CDL Green Gallery will feature other exhibitions on the cultural use of plants, botanical art, and orchids *(See Annex C on CDL Green Gallery's sustainable attributes, Annex D on visuals of the Gallery and Annex E on the Gallery's supporting partners).*

"In celebration of CDL's 50<sup>th</sup> anniversary this year and in support of the Gardens' nomination bid as Singapore's first UNESCO World Heritage Site, we are delighted to leverage our green building expertise and gather like-minded partners to contribute to the development of these green icons as our gift to the nation. Singapore has won many accolades on our economic success, we sincerely hope to do our part to help Singapore win international recognition of our cultural heritage," said Mr Kwek Leng Joo, Managing Director, CDL.

Both the exhibits in the Museum and the completed Green Gallery are supported by CDL, at a value of over S\$2 million, in cash and in kind, through the Garden City Fund, a registered charity and institution of public character established by NParks.



### **Free Activities for public**

To commemorate 50 Years of Greening Singapore and celebrate the Gardens' rich heritage, more than 50 free activities will be organised at SBG from 30 November until 15 December 2013. The public can participate in activities including heritage guided walks, outdoor movie screenings, musical performances by the Bandstand, and more. Old photographs submitted by the public of their memories in parks as part of the 'irememberParks' initiative have also been incorporated into a photo wall exhibition displayed in the Tanglin Core of the Gardens.

CDL is also presenting the 'Heritage in Green' photographic exhibition which features the rich heritage of the Gardens by Mr Kwek Leng Joo, an avid photographer. Through his lens, colourful stories behind the heritage trees, historical features and architectures as well as the beautiful Orchid collection will come to life. The exhibition is held at The Botany Centre, Function Hall from 30 November to 8 December 2013 from 9.00am to 7.00pm.

Details of the activities are available at [www.sbg.org.sg/heritage](http://www.sbg.org.sg/heritage)

- End -



### **Media Contact**

Jean Louise Lee

64717815

[Jean\\_Louise\\_Lee@NParks.gov.sg](mailto:Jean_Louise_Lee@NParks.gov.sg)

National Parks Board

Belinda Lee

6428 9315

[BelindaLee@CDL.com.sg](mailto:BelindaLee@CDL.com.sg)

City Developments Limited

### **About National Parks Board (NParks)**

National Parks Board (NParks) is responsible for providing and enhancing the greenery of our City in a Garden. Beyond building green infrastructure, NParks is actively engaging the community to enhance the quality of our living environment.

NParks manages over 300 parks and 4 nature reserves. Adding to this is the extensive streetscape, or roadside greenery, that forms the backbone of our City in a Garden. An island-wide Park Connector Network is also being developed to link major parks, nature areas and residential estates.

As the lead agency on biodiversity conservation, NParks has developed an urban biodiversity conservation model, which aims to conserve representative eco-systems in land-scarce Singapore. NParks also monitors and coordinates measures to enhance the presence of biodiversity in our urban landscape.

NParks is working closely with partners in the landscape and horticulture industry to increase productivity, and provide training for all levels of the workforce. Enhancing competencies of the industry will support Singapore's vision of being a City in a Garden.

For more information, visit [www.nparks.gov.sg](http://www.nparks.gov.sg) and [www.facebook.com/nparksbuzz](https://www.facebook.com/nparksbuzz)

### **About Singapore Botanic Gardens (SBG)**

Established in 1859, the Singapore Botanic Gardens played an important historical role in the introduction and promotion of many plants of economic value to Southeast Asia, including the Para rubber tree. Over the years, the Gardens has continued to introduce and rejuvenate its horticultural attractions while continuing its mission of connecting plants and people.

Today, the 74-hectare Gardens is a key civic and community space, and an international tourist destination. Attracting an annual visitorship of more than 4 million, it is also an



important institution for tropical botanical and horticultural research, education and conservation.

The Gardens showcases the best and most spectacular of tropical flora, including more than 10,000 types of plants and the region's most significant living collection of documented palms, orchids, cycads and gingers. Its historic 19th century garden landscape is well preserved and includes the earliest ornamental designed lake in Singapore. Home to numerous heritage trees and a tract of primary rainforest, the Gardens is less than a 10-minute walk from the shopping belt in Orchard Road. The Gardens is Singapore's first nomination as a UNESCO World Heritage Site.

In 2012, the Singapore Botanic Gardens clinched the inaugural *Garden of the Year Award* by the Canadian Garden Tourism Council. In 2008, it was awarded the Michelin three-star rating and selected by Time Magazine as Asia's Best Urban Jungle.

The Singapore Botanic Gardens is managed by the National Parks Board. For more information, visit [www.sbg.org.sg](http://www.sbg.org.sg) and [www.facebook.com/singaporebotanicgardens](http://www.facebook.com/singaporebotanicgardens)

### **About City Developments Limited**

As Singapore's property pioneer, City Developments Limited (CDL) is a listed international property and hotel conglomerate with over 30,000 luxurious and quality homes to its name. CDL has been leading the industry with green building innovation since the 1990s and awarded the Green Mark Platinum Champion Award in 2011 and the Built Environment Leadership Platinum Award in 2009 by Building and Construction Authority (BCA) for its commitment to sustainable development and Singapore's built environment. Globally, CDL is the first Singapore corporation to be listed on the Dow Jones Sustainability Indexes (since 2011), FTSE4Good Index Series (since 2002) and the Global 100 Most Sustainable Corporations in the World (since 2010).

For more information on CDL, please visit [www.cdl.com.sg](http://www.cdl.com.sg).

### **About the Garden City Fund**

The Garden City Fund is a registered charity and Institution of Public Character (IPC000104) established by the National Parks Board in 2002. The Fund works with corporations, organisations and individuals to better engage members of the public through conservation efforts, research, outreach and education. In doing so, we hope to cultivate a love for the environment, promote a sense of ownership, and encourage the community to play its part in preserving Singapore's legacy as a lush and vibrant City in a Garden. For more information please visit [www.gardencityfund.org](http://www.gardencityfund.org).

## Annex A

### MEDIA FACTSHEET

#### **Rich Heritage of the Singapore Botanic Gardens (SBG)**

Established in 1859, the Singapore Botanic Gardens played an important historical role in the introduction and promotion of many plants of economic value to Southeast Asia, including the Para rubber tree. In 1877, Kew Gardens gifted the Singapore Botanic Gardens with 22 rubber seedlings which was the catalyst for the rubber industry's revolution in Southeast Asia and an economic boom across the region

In the 1960s, then Prime Minister Lee Kuan Yew envisioned Singapore as a Garden City. The Singapore Botanic Gardens, through actively supplying plants for streetscapes and parks, contributed significantly towards the realisation of this vision. A School of Ornamental Horticulture was set up in 1972 to provide trained personnel for the Garden City cause and this established the skills base upon which the modern Gardens are founded.

The Gardens also has been at the centre of Singaporean culture since its foundation. It was the 'neutral' meeting place for families to introduce partners in former arranged marriages, whilst in 1959 it was the venue for a multi-cultural concert where for the first time, Malay, Chinese and Indian performances shared the stage. This was followed by a 3-month series of events that shaped the formation of the multi-racial culture as the island prepared for independence.

The Gardens also houses a number of historic buildings constructed between 1867 and 1930, which include Ridley Hall (1882), Burkill Hall (1867), the Swan Lake Gazebo (1850s), Holttum Hall (1921) and the Bandstand (1930). There are also 44 heritage trees in SBG, the oldest of which is over 200 years old.

Over the years, the Gardens has continued to introduce and rejuvenate its horticultural attractions while continuing its mission of connecting plants and people.

Today, the 74-hectare Gardens is a key civic and community space, and a national tourist destination. Attracting an annual visitorship of more than 4.4 million, it is also an important institution for tropical botanical and horticultural research, education and conservation. The continual development of the Gardens is a key thrust of Singapore's City in a Garden vision.

The Gardens showcases the best and most spectacular of tropical flora, including more than 10,000 types of plants and the region's most significant living collection of documented palms, orchids, cycads and gingers. Its historic 19th century garden landscape is well preserved and includes the earliest ornamental designed lake in Singapore. Home to a tract of primary rainforest, the Gardens is less than a 10-minute walk from the shopping belt in Orchard Road.

In 2012, the Gardens edged out others in Canada, Europe and the USA to clinch the inaugural International Garden Tourism - Garden of the Year Award by the Canadian Garden Tourism Council. It also joined the ranks of renowned international attractions when it was awarded the Michelin three-star rating in 2008. In the same year, the Gardens was selected by Time Magazine as Asia's Best Urban Jungle.

The Gardens is Singapore's first nomination as a UNESCO World Heritage Site. It is managed by the National Parks Board.

## SINGAPORE'S BID TO LIST THE SINGAPORE BOTANIC GARDENS AS A UNESCO WORLD HERITAGE SITE

### 1 UNESCO WORLD HERITAGE SITE INSCRIPTION PROCESS

A World Heritage Site is a place that has been inscribed by UNESCO (the United Nations Educational, Scientific and Cultural Organisation) on its World Heritage List. To qualify, a site must be of outstanding universal cultural or natural value (or both). The List is maintained by the World Heritage Centre administered by UNESCO

- a. To nominate a World Heritage Site, a State Party must first submit a Tentative List to UNESCO, a national list of candidate natural and/or cultural properties which a country intends to nominate within a given time period
- b. It is an important step since the UNESCO World Heritage Committee cannot consider a nomination for inscription on the World Heritage List unless the property has already been included on the State Party's Tentative List.
- c. Once a site has been selected for nomination, the key pieces of work are the development of a Nomination Document and a Management Plan. A Nomination Dossier is then submitted to UNESCO to indicate a State Party's formal World Heritage Site nomination. The World Heritage Committee may then vote on the nomination, to approve the nomination, defer it pending further information requested from the state party, or reject the nomination.

#### Criteria for Selection

- d. To be inscribed as a World Heritage Site, sites must be of Outstanding Universal Value and meet at least one out of ten selection criteria.

### 2 SINGAPORE'S SITE SELECTION AND LISTING PROCESS

- a. In 2010, a study was commissioned by then Ministry of Information, Communications and the Arts (MICA) to identify sites that would potentially fulfil UNESCO's criteria as a World Heritage Site (WHS). Targeted consultation was also done with members of the Singapore Heritage Society who consist of academia, heritage advocates and heritage experts.
- b. Of the sites identified, the Singapore Botanic Gardens was considered to be the strongest candidate. The Singapore Botanic Gardens is proposed for inscription on the World Heritage List under Criteria (ii) and (iv) of the World Heritage Convention.:
  - i. criterion (ii) – exhibiting an exchange of human values on developments in landscape design, and
  - ii. criterion (iv) – outstanding example of landscape which illustrates significant stage in human history
- c. In June 2012, Singapore ratified the World Heritage Convention and in December 2012, submitted its World Heritage Tentative List to UNESCO to indicate interest in inscribing the Singapore Botanic Gardens as a World Heritage Site.



National  
Heritage  
Board

20

YEARS of  
HERITAGE  
with YOU  
1993–2013



Singapore  
Botanic Gardens

- d. A formal Nomination Dossier will subsequently be submitted to the World Heritage Committee by February 2014. Members of the public are invited to provide their feedback on the documents at [www.sbg.org.sg/unesco](http://www.sbg.org.sg/unesco)

### Criteria for Assessment of Outstanding Universal Value for World Heritage

Sites may be nominated for World Heritage listing under cultural, natural or mixed criteria<sup>1</sup>. Nominated sites must demonstrate that they satisfy one or more of the 10 Outstanding Universal Values (OUVs). These OUVs are:

- i. To represent a masterpiece of human creative genius
- ii. To exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town planning or landscape design
- iii. To bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared
- iv. To be an outstanding example of a type of building, architectural or technological ensemble or landscape with illustrates (a) significant stage(s) in human history
- v. To be an example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change
- vi. To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should be preferably used in conjunction with other criteria)
- vii. To contain superlative natural phenomena or areas of exceptional beauty and aesthetic importance
- viii. To be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features
- ix. To be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals
- x. To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation

---

<sup>1</sup> 'Natural Heritage' includes natural features consisting of physical and biological formations (aesthetic and scientific point of view) and geological and physiographical formations (habitats from scientific and conservation point of view). 'Cultural Heritage' includes monuments (i.e., man-made) and sites which are the result of the combined efforts of men and nature. 'Mixed' properties satisfy the definitions of the previous two.



Singapore  
Botanic Gardens



**Annex B**

## **MEDIA FACTSHEET**

### **New Museum and Gallery at the Singapore Botanic Gardens**

From 30 November 2013, visitors to the Singapore Botanic Gardens (SBG) will be able to explore the new SBG Heritage Museum and CDL Green Gallery. The SBG Heritage Museum, to be located within the existing Holttum Hall, will feature interactive exhibits that detail the Garden's rich history. The CDL Green Gallery, to be developed on Holttum Lawn by City Developments Limited (CDL), will have the distinction of becoming Singapore's first purposefully built zero energy Green Gallery. It will also incorporate, for the first time in Singapore, two eco-innovative technologies - a fully-complete prefabricated modular system for quick construction, and the use of Hempcrete (largely made from the hemp plant), a highly durable biomaterial. The Gallery, conceptualised as an extension to the Heritage Museum, will showcase botanical- and greening-related exhibits, starting with a large scale exhibition 'Living in a Garden' on Singapore's greening journey.

#### **SBG Heritage Museum**

The 240sqm SBG Heritage Museum will be located in Holttum Hall, which is next to Botany Centre in the Tanglin Core of the Gardens. Built in 1921 to serve as the Director of Gardens' office and laboratory, the two-storey building has been designated as an Urban Redevelopment Authority conservation building. This was where Professor Eric Holttum, the Gardens' Director from 1925 to 1949, developed the innovative orchid breeding technique which enabled the efficient production of healthy seedlings in sterile flasks from a hybrid seed. This technique, which is still used today, was a key factor that stimulated thriving orchid industries throughout the region then.

The SBG Heritage Museum will feature interactive and multimedia exhibits and panels that detail the Gardens' rich heritage. Historical items that will be displayed include old photographs, artefacts, plant specimens, rare botanical books and botanical paintings that date back to the early 19<sup>th</sup> century. Oral recordings of Ridley during his 100<sup>th</sup> birthday will also be integrated into an interactive display. The exhibits in the Museum are supported by CDL through the Garden City Fund, a registered charity and institution of public character established by the National Parks Board.

#### **CDL Green Gallery @ SBG Heritage Museum**

Developed by CDL, the 314sqm CDL Green Gallery is a new eco-friendly building to be sited Holttum Lawn. It is conceptualised as an extension of the Heritage Museum, and will feature botanical- or greening-related exhibits that will be changed every six to nine months.

The gallery will be Singapore's first zero energy Green Gallery. A key feature of the building is the solar photovoltaic (PV) cladded roof panels that are expected to harvest all the energy



Singapore  
Botanic Gardens



required for the building's operations. The solar panels are expected to generate an annual energy yield of over 31,000 kWh, which is more than the Gallery's estimated annual energy consumption of about 30,000 kWh/year.

Using innovative design, the development will cause minimal disruption to the site as it will use two eco-innovative features that are introduced in Singapore for the first time – the biomaterial known as Hempcrete (largely made from the hemp plant), and a prefabricated modular system.

A mixture of hemp core (shiv), lime binders, and water, Hempcrete will be used for the external wall cladding of the Heritage Museum. The high thermal material is ideal for Singapore's humid climate as it creates good indoor air quality. It is also highly durable, and naturally pest, mould, mildew and fire resistant.

Another advantage of using Hempcrete is that it can be precast into sections at an external site using a prefabricated modular system and brought to the Gardens for installation. This eliminates massive wet works usually required in building developments, and results in faster construction time with a lower impact on the environment.

Other eco-friendly features at the CDL Green Gallery @ SBG Heritage Museum include:

- **Green Walls** – the East and West façade will be cladded with butterfly-attracting plant species to encourage biodiversity
- **Green Roof** – the selection of drought resistant plant species will be incorporated to lower the Urban Heat Island effect around the building
- **Energy efficient interior fittings** –the building will be fitted with LED lights and energy efficient air-conditioning systems

The Building and Construction Authority (BCA) has accorded this Gallery with the **BCA Green Mark Platinum status** – the highest tier for green buildings in Singapore.

- End -



Singapore  
Botanic Gardens



### **About National Parks Board (NParks)**

National Parks Board (NParks) is responsible for providing and enhancing the greenery of our City in a Garden. Beyond building green infrastructure, NParks is actively engaging the community to enhance the quality of our living environment.

NParks manages over 300 parks and 4 nature reserves. Adding to this is the extensive streetscape, or roadside greenery, that forms the backbone of our City in a Garden. An island-wide Park Connector Network is also being developed to link major parks, nature areas and residential estates.

As the lead agency on biodiversity conservation, NParks has developed an urban biodiversity conservation model, which aims to conserve representative eco-systems in land-scarce Singapore. NParks also monitors and coordinates measures to enhance the presence of biodiversity in our urban landscape.

NParks is working closely with partners in the landscape and horticulture industry to increase productivity, and provide training for all levels of the workforce. Enhancing competencies of the industry will support Singapore's vision of being a City in a Garden.

For more information, visit [www.nparks.gov.sg](http://www.nparks.gov.sg) and [www.facebook.com/nparksbuzz](https://www.facebook.com/nparksbuzz)

### **About Singapore Botanic Gardens (SBG)**

Established in 1859, the Singapore Botanic Gardens played an important historical role in the introduction and promotion of many plants of economic value to Southeast Asia, including the Para rubber tree. Over the years, the Gardens has continued to introduce and rejuvenate its horticultural attractions while continuing its mission of connecting plants and people.

Today, the 74-hectare Gardens is a key civic and community space, and an international tourist destination. Attracting an annual visitorship of more than 4 million, it is also an important institution for tropical botanical and horticultural research, education and conservation.

The Gardens showcases the best and most spectacular of tropical flora, including more than 10,000 types of plants and the region's most significant living collection of documented palms, orchids, cycads and gingers. Its historic 19th century garden landscape is well preserved and includes the earliest ornamental designed lake in Singapore. Home to numerous heritage trees and a tract of primary rainforest, the Gardens is less than a 10-minute walk from the shopping belt in Orchard Road. The Gardens is Singapore's first nomination as a UNESCO World Heritage Site.

In 2012, the Singapore Botanic Gardens clinched the inaugural *Garden of the Year* Award by the Canadian Garden Tourism Council. In 2008, it was awarded the Michelin three-star rating and selected by Time Magazine as Asia's Best Urban Jungle.



Singapore  
Botanic Gardens



The Singapore Botanic Gardens is managed by the National Parks Board. For more information, visit [www.sbg.org.sg](http://www.sbg.org.sg) and [www.facebook.com/singaporebotanicgardens](http://www.facebook.com/singaporebotanicgardens)

### **About City Developments Limited**

As Singapore's property pioneer, City Developments Limited (CDL) is a listed international property and hotel conglomerate with over 30,000 luxurious and quality homes to its name. CDL has been leading the industry with green building innovation since the 1990s and awarded the Green Mark Platinum Champion Award in 2011 and the Built Environment Leadership Platinum Award in 2009 by Building and Construction Authority (BCA) for its commitment to sustainable development and Singapore's built environment. Globally, CDL is the first Singapore corporation to be listed on the Dow Jones Sustainability Indexes (since 2011), FTSE4Good Index Series (since 2002) and the Global 100 Most Sustainable Corporations in the World (since 2010).

For more information on CDL, please visit [www.cdl.com.sg](http://www.cdl.com.sg).

### **About the Garden City Fund**

The Garden City Fund is a registered charity and Institution of Public Character (IPC000104) established by the National Parks Board in 2002. The Fund works with corporations, organisations and individuals to better engage members of the public through conservation efforts, research, outreach and education. In doing so, we hope to cultivate a love for the environment, promote a sense of ownership, and encourage the community to play its part in preserving Singapore's legacy as a lush and vibrant City in a Garden. For more information please visit [www.gardencityfund.org](http://www.gardencityfund.org).

# CDL Green Gallery

## @ SBG Heritage Museum

*Designed, constructed and managed with environmental sustainability in mind, the CDL Green Gallery is expected to achieve zero energy for self-sufficiency. It was accorded the Building and Construction Authority Green Mark Platinum award - the highest tier for green buildings in Singapore - for its cutting-edge innovative green design and features.*

### Prefabricated Modular System

Introduced in Singapore for the first time, it is a unitised form of building with steel components prefabricated and assembled in an offsite production facility, then hoisted by a crane into position onsite. Like building blocks, they are pieced together onsite to form the entire structure.

**Benefits:** Easy-to-build, flexible modular system that took less than 24 hours to be installed into their final positions. The structure is of superior quality and there is better site protection and lower environmental impact. The modular elements are also modifiable for adaptive reuse in future.

### Sustainable Materials

Includes green building materials and finishes, low volatile organic compound paints and adhesives with no formaldehyde. No concrete was used for this building structure. Hempcrete - a durable plant-product was used for the first time in Singapore, as cladding on the building.

**Benefits:** Enhanced environmental protection and indoor environmental quality.

### Passive Architectural Design

The design, layout and orientation takes into consideration the site's natural attributes.

**Benefits:** The building envelope, which consists of green walls and eco-materials, helps to enhance thermal insulation of the gallery, hence reducing solar heat gain.



## SINGAPORE'S FIRST ZERO ENERGY GREEN GALLERY



**31,000 kWh**  
Estimated Annual  
Solar Energy Generated



**30,000 kWh\***  
Estimated Annual  
Energy Use

The CDL Green Gallery uses zero energy for its daily operations.

Presented by:



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



In Commemoration of:



### 01 Vertical Green Walls

Purposefully clad façades with butterfly attracting plant species.

**Benefits:** Extensive green coverage of over 25% while encouraging biodiversity. It also improves the thermal insulation of the gallery.

### 02 Environmental Management System

Active monitoring and management of energy generation and consumption. Environmental performance shared in real time to gallery visitors.

**Benefits:** Promotes environmental awareness to the community at large.

### 03 Air-Conditioning System

Installation of high energy-saving air-conditioning system.

**Benefits:** Reduced consumption of electricity as the inverter air-conditioning system, coupled with an integrated building control system, consumes 50% less energy compared to conventional types.

### 04 Green Roof

Installed with a selection of drought resistant plant species.

**Benefits:** Lower maintenance and mitigates the Urban Heat Island effect around the building.

### 05 Lighting Design

Only highly energy efficient, dimmable LED lights have been used.

**Benefits:** It uses approximately 57% less energy than conventional lighting.

### 06 Solar Photovoltaic Panels

105 units of solar panels generate renewable and clean energy of an estimated 31,000 kWh per year.

**Benefits:** The energy generated is estimated to off-set the electricity needed to operate\* the gallery, making it self-sufficient.

### 07 Hempcrete

An eco-friendly bio-material used for the first time in Singapore. Made from a mixture of hemp core (shiv), lime binders and water, it is used as the external wall cladding.

**Benefits:** Very good thermal performance; superior acoustic properties; non-combustible; pest-, mould- and mildew-resistant; and durable.

\*Excludes energy used for customised exhibition installations.

**ANNEX D: VISUALS FOR CDL GREEN GALLERY @ HERITAGE MUSEUM  
- SINGAPORE'S FIRST ZERO ENERGY GREEN GALLERY**



## **ANNEX E: SUPPORTING PARTNERS OF THE CDL GREEN GALLERY**

### **1. DP Architects Pte Ltd**

- Developed the design and obtained all planning / building approval:



Founded in 1967, DP Architects, one of the firms responsible for the urban landscape of Singapore, is a leading architecture practice in Asia with over 1,200 staff and 12 offices worldwide. The firm operates as the heart of the DP group of companies – comprising DP Architects, DP Consultants, DP Design, DP Engineers, DP Green, DP Healthcare, DP Infrastructure and DP Sustainable Design – to provide a comprehensive range of services from architecture, urban planning, interior design, project management, sustainable design, landscape consultancy to engineering. DP Architects has a long history in a wide variety of projects with a particular expertise in vast undertakings such as Singapore Sports Hub, The Dubai Mall, Resorts World Sentosa and Esplanade – Theatres on the Bay. The firm was founded with a deep concern for the built environment and the need to create architecture of excellence that enriches the human experience and spirit.

[www.dpa.com.sg](http://www.dpa.com.sg)

### **2. DP Engineers Pte Ltd**

- Provided and coordinated all M&E related services



DP Engineers (DPE), established in 2010, offers cohesive engineering solutions that are effectively integrated with the design intent of the architect, ultimately delivering a product of excellence to satisfied clients. Services include civil and structural engineering; mechanical, electrical and plumbing engineering; fire and hydraulics consultancy programmes to support architecture, interior design, landscape, project management and sustainability design works. Balancing the creative design process with practical technical building solutions, DPE's design integration techniques devise safe, economical and energy-efficient building solutions that benefit clients.

[www.dpe.com.sg](http://www.dpe.com.sg)

### **3. ENDO Lighting Corporation (Singapore Representative office)**

- Supplied all light fittings with LED light



Endo Lighting Corporation manufactures and propose advance sustainable lighting products and solutions that increase the value of spaces in every architectural field, including shopping centers, overseas brand boutiques, restaurants, commercial complexes such as amusement parks, and public facilities. Its high-quality products and lighting plans incorporate state-of-the-art optical technologies. Today, the range of spaces in which you can find Endo Lighting is expanding as never before to include public facilities such as train stations and airports along with hotels, medical and welfare facilities, redevelopment projects, landscapes, offices and warehouses.

[www.endo-lighting.com](http://www.endo-lighting.com)

#### **4. Langdon & Seah Singapore Pte Ltd**

- Provided cost consultancy services and contract administration support



Langdon & Seah Singapore Pte Ltd (L&S) is a well-established quantity surveying practice with vast experience and a variety of specialist skills acquired from more than 80 years of experience. It is well placed to provide construction cost consultancy, contract and project management services in traditional contracting arrangements, design- and-build or develop-and-construct as well as various hybrid procurements of construction projects. The company leverages knowledge, skills and experience from its international market, into its local environments where it operates, offering its clients the combined benefits of working with a firm which can provide international expertise (for solutions, experience, skills) and deliver locally (market knowledge, resources, support). This unique combination of international expertise and local delivery, offers clients the reassurance that their risk is being managed by a firm that is set and structured to support their interests and value drivers – at home and abroad.

[www.langdonseah.com](http://www.langdonseah.com)

#### **5. LSW Consulting Engineers Pte. Ltd.**

- Provided accredited checking services to evaluate and review the structural design



LSW is one of Singapore's leading consultancy for civil and structural engineering, with unparalleled expertise in building cost-efficient, environmentally friendly and safe infrastructure projects. The company's capabilities include residential, commercial and industrial buildings, drainage, foundation and temporary works. Founded in 1990 by Singaporean civil engineer Lauw Su Wee, the company has grown from strength to strength having contributed to the built environment in Singapore with innovative design processes to support their clients' needs. With construction excellence as their mission, LSW has clinched BCA awards for Cliveden at Grange, The Arte in their provision of robust solutions that enabled contractors to manage projects within budget and schedule. A key driver in sustainable building practices, LSW was most recently awarded with the BCA Green Mark Platinum Award for residential building Cliveden at Grange and non-residential building Tiong Seng Prefab Hub, Tampines Grande and Tampines Concourse.

[www.lswce.com.sg](http://www.lswce.com.sg)

#### **6. Schneider Electric**

- Provided an integrated platform with intelligent building automation and energy management system



As a global specialist in energy management with operations in more than 100 countries, Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in Utilities & Infrastructure, Industries & Machines Manufacturers, Non-residential Building, Data Centres & Networks and in Residential. Focused on making energy safe, reliable, efficient, productive and green, the Group's 140,000 plus employees achieved sales of 24 billion euros in 2012, through an active commitment to help individuals and organizations make the most of their energy.

[www.schneider-electric.com](http://www.schneider-electric.com)

## 7. SolarGy Pte Ltd

- Supplied and installed Photovoltaic (PV) panels



SolarGy Pte Ltd is one of the leading professional system integrators of solar PV systems based in Singapore. The founder of SolarGy, Albert Lim, has been a practising M&E consulting engineer for more than 25 years. Leveraging on the founder's background knowledge and experience, SolarGy deliver optimum solutions to Clients from a designer's perspective. The result is a PV system that is not only high in performance but integrates seamlessly into the building architecture. Since its incorporation in 2007, SolarGy has successfully undertaken several key PV projects for Clients such as Resorts World at Sentosa, Keppel Land, CapitaLand, SingTel, Singapore Polytechnic, National Environmental Agency, NParks, HDB, etc.

It is the company's vision that by designing effective and creative solar energy solutions, they will enthrall and attract more building owners to consider solar energy as an alternative or to supplement their energy needs. In turn, this strategy will help to cut down carbon emissions from our home country and to the world at large.

With the above sustainable business model in place, SolarGy became the first company in Singapore to receive the prestigious Frost and Sullivan Award for Leadership In Solar PV Market Penetration in 2010.

In February this year (2013), SolarGy broke their previous track record by completing the single largest PV system at the Keppel Seghers NEWater Plant – a 1 MW solar PV project with more than 4000 solar panels sprawling over about 10,000 sq m of roof space.

[www.solargy.com.sg](http://www.solargy.com.sg)

## 8. Swee Hong Limited

- Supplied and installed prefabricated building structure, install and co-ordinate Building related works



Founded in 1962 and incorporated as a civil engineering works company in 1980, Swee Hong is today registered with the Building and Construction Authority (BCA) as an A1 civil engineering contracting firm.

Swee Hong's core strengths lie in its civil engineering roots, and this has allowed the company to grow from strength to strength through the years. Swee Hong's spectrum of construction services covers tunneling in both micro and macro forms; parks and services in the architectural, mechanical and electrical, civil and structure, soil improvement and landscaping sectors; and infrastructure construction services which includes roads, bridges, flyovers and canals. By leveraging on its expertise, it will continue to help developing countries in their aspirations to become First World Cities.

Swee Hong has begun to develop capabilities in modular pre-fabrication construction which can be used in building construction to accelerate on-site and off-site construction programs and improve construction productivity in the construction sector, which is in line with the government's initiatives.

It strives to build a first class company with a first class workforce deploying innovative techniques and technology. Through this, Swee Hong will achieve its vision to be Builders of First World Cities For First World Living.

[www.sweehong.sg](http://www.sweehong.sg)

## 9. Uniseal Singapore Pte Ltd

- Supplied and installed green walls and green roofs



Uniseal is a Singapore based knowledge and intellectual property driven enterprise providing waterproofing and urban greenery solutions for new constructions and retrofitting's markets within the building and construction sector. Established in 1998, the company has developed and patented its very own products and evolve to be one of the leading companies in the field of Sustainable Greenery.

Uniseal is engaged in the design, development, manufacture, marketing, distribution and installation of a comprehensive range of proprietary products, peripherals and services for the protection of buildings against the weathering elements and to provide a green environment within the urban landscape. The company is founded in its principle and commitment to build a sustainable environment.

[www.uniseal.com.sg](http://www.uniseal.com.sg)

## 10. VisualMediaWorks

- Provided perspective renderings



VisualMediaWorks crafts architectural renderings with a combination of professional artistry and an avant-garde attitude towards technology.

Having more than a decade of experience in 3D computer graphics and animation, its visuals communicate technical expertise and a great deal of creative instincts. Today, the organisation has more than 50 designers and professionals engaged on Singapore projects as well as overseas collaborations.

VisualMediaWorks is part of the VMW Group, a collective of specialised entities comprised of Attic Films, blanct and Obilia. As a group, it collaborates to facilitate a comprehensive range of architecture-related services.

[www.vmw.com.sg](http://www.vmw.com.sg)