



MEDIA RELEASE

New Museum and Gallery to be developed at the Singapore Botanic Gardens

- *CDL Green Gallery to be Singapore's first zero energy gallery, using eco-innovative technologies introduced to Singapore for the first time*

Singapore, 10 May 2013 – From end 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 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 on 50 Years of Greening Singapore.

Director of SBG, Dr. Nigel Taylor, said: "With a rich history of over 150 years, the Singapore Botanic Gardens has played a key role in the greening of Singapore, as well as the development of the region. The Gardens has also been an integral part of our social history, as it has played host to important milestones in people's lives, be it weddings, marriage proposals, and other celebrations. In fact, it was the neutral meeting place for arranged marriages in the past. As visitors learn more about SBG's rich heritage through the Heritage Museum, we hope it would foster a greater sense of pride and ownership of the Gardens. The SBG Heritage Museum will also support the Gardens' nomination bid as Singapore's first UNESCO World Heritage Site."

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 Mr 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. *(Please refer to Factsheet for more information on the Gardens' 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 19th



century. Oral recordings of Ridley during his 100th 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.

Visitors will be able to participate in guided tours of the SBG Heritage Museum when it opens at the end of the year.

CDL Green Gallery @ SBG Heritage Museum

Developed and donated in-kind by CDL, the 314sqm CDL Green Gallery is a new eco-friendly building to be sited Holtum 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 first exhibition held there will showcase Singapore's greening journey, to commemorate 50 Years of greening our island.

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 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. Dr John Keung, Chief Executive Officer of the Building and Construction Authority, said, “The CDL Green Gallery @ SBG Heritage Museum combines environmentally conscious green design with advanced modular construction technology in an innovative way. And even though full air-conditioning is needed to ensure low temperature and humidity for sensitive botanical and historical artefacts, the team still found ways to meet the challenge through using highly energy efficient building systems and renewables. That allowed the building to be self-sustaining in terms of energy consumption, making it Singapore’s first zero energy green gallery to garner the prestigious BCA Green Mark Platinum award. With the seamless integration of a modern green building into the natural environment as well as the Heritage Museum, this building has placed itself in a unique position to galvanise and promote both environmental and cultural sustainability. I am confident that the gallery will inspire many to be more environmentally-conscious and instill in them a sense of ownership in greening Singapore.”

Ms Esther An, CDL’s Head of Corporate Social Responsibility and General Manager (Corporate Affairs) said, “Developing green spaces has been our passion for over a decade now. In commemoration of CDL’s 50th Anniversary and 50 Years of Greening Singapore this year, this project was a golden opportunity to push the “e-envelope” and create a green masterpiece not only for the community to enjoy but to add another legacy worthy of SBG and Singapore. We hope that this outstanding Gallery with its sustainable infrastructure and nature-related exhibitions will capture the eco-imagination and raise the appreciation of nature amongst the visitors of SBG.”

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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 and 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 and 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.

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.



Media Factsheet

SINGAPORE BOTANIC GARDENS

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 34 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.

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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.

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Media Factsheet

CDL GREEN GALLERY @ SBG HERITAGE MUSEUM

The CDL Green Gallery @ SBG Heritage Museum is developed and donated in-kind by property developer City Developments Limited (CDL). Designed to be an innovative and cutting-edge sustainable building, it will be Singapore's First Zero Energy Green Gallery that is new and purposefully built. It is conceptualised as an extension to the Museum at the Singapore Botanic Gardens (SBG).

This community initiative by CDL is in celebration of its 50th Anniversary milestone this year. As a leading Singapore property pioneer and a champion of green building, CDL believes in tapping on its experience and expertise to transform both public and private spaces into sustainable masterpieces for the community to live, play and work in. This year also marks 50 Years of Greening Singapore.

For this project, CDL brought together its like-minded partners, who are leaders in their own fields of expertise, to help develop Singapore's first Zero Energy Green Gallery that would cause least disruption to the SBG site; cognisant of the need to preserve the conditions on the site and conserve all the trees. The Gallery itself also needs to be resource and energy efficient.

10 supporting partners were brought in for this project. They include DP Architects, one of the largest local building consultancy practices with strong emphasis on green sustainable design for the built environment as well as Swee Hong, a listed construction firm that advocates the use of innovative sustainable technology for construction, just to name a few.

Sustainable Attributes of the CDL Green Gallery

Designed to be a new green icon, the creation of this Gallery has been envisioned to be sustainable from the start. All aspects from conceptualisation, design, construction, material selection and maintenance will support principles of sustainability and environmental protection. This project's design has been conceptualised using Building Information Management (BIM) system from preliminary planning to construction for better coordination and more precise execution of works.

CDL Green Gallery will be a revolutionary new and purposefully built Zero Energy Building as the Gallery's solar photovoltaic (PV) cladded roofs are expected to generate an annual energy yield that exceeds its estimated usage based on its forecasted operational requirements.

The Gallery also boasts of two eco-innovative features introduced in Singapore for the first time, namely, the use of a fully-complete Prefabricated Modular System and an inventive biomaterial known as Hempcrete (largely made from the hemp plant).

Fully-complete Prefabricated Modular System – The Gallery is designed to be fully modular for ease of transportation to site. It will be built using a unitised form of building with its steel components prefabricated and assembled in the factory then craned into position onsite to minimise environmental disruption at SBG. Like building blocks, they will be pieced together onsite to form a whole structure. The benefits include its flexibility, easy-to-build modular system which results in shortened construction period, superior quality and lower environmental impact.

Hempcrete – It is a plant-product material used as the external wall cladding of the Gallery. It is a mixture of hemp core (shiv), lime binders and water, with very good thermal performance ideal for this air-conditioned gallery. It complies with international fire resistant standards and non-combustibility and is pest, mould and mildew resistant. Hempcrete also has good acoustic properties. Used in green passive building design, it has a sound track record of durability.

This innovative material has the flexibility to be precast onsite or offsite into bricks, blocks or panels, depending on the project requirements. In this case, the wet works onsite will be eliminated as the Hempcrete walls for the Gallery will be precast in a factory. Again, this will help minimise environmental impact at SBG and to preserve the existing grassy site.

Other eco-aspects for this CDL Green Gallery include the incorporation of passive and low energy architectural designs as well as features including:-

- **Energy efficient interior fittings** – The building will be fitted with LED lights and highly energy efficient air-conditioning system
- **Green Walls** – Purposefully cladded on suitable façades, with butterfly attracting plant species selected to encourage biodiversity onto the building;
- **Green Roof** – Selection of drought resistant plant species are incorporated to mitigate the Urban Heat Island effect around the building

Please refer to:

Annex 1 for artist impressions of the gallery

Annex 2 for list of supporting partners and their contributions

ANNEX 1: ARTIST'S IMPRESSIONS OF VISUAL FEATURES



Singapore's First Zero Energy Gallery – CDL Green Gallery @ SBG Heritage Museum.



At the state-of-the art CDL Green Gallery, visitors can enjoy artistic displays of Singapore rich natural heritage.

** Images above are all artist's impressions only*

ANNEX 2: SUPPORTING PARTNERS

1. DP Architects Pte Ltd

- To develop the design and obtain all planning / building approvals



Founded in 1967, DP Architects was one of the firms responsible for the urban landscape of Singapore. Now a leading architecture practice in Asia with over 1,200 staff and 12 offices worldwide, the firm provides a 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 Esplanade-Theatres on the Bay, Resorts World Sentosa and The Dubai Mall.

Current landmark projects include Sengkang General Hospital and Singapore Sports Hub. 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

2. DP Engineers Pte Ltd

- To provide and coordinate 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 a satisfied client. 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.

DPE's design integration techniques devise safe, economical and energy-efficient building solutions that benefit clients.

Creativity is the key to DPE's exploratory business approach. DPE embraces a convergence of engineering skills and adaptation in a rapidly evolving world; and establishment of a synergetic working relationship with other building professionals that balances the creative design process with practical technical building solutions.

www.dpe.com.sg

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

- To supply all light fittings with LED light



The lighting business, with its roots in the manufacture of original light fixtures, lies at the very core of Endo. We propose advanced sustainable lighting 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. Our 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 along with hotels, medical and welfare facilities, redevelopment projects, landscapes, and offices and warehouses.

www.endo-lighting.com

4. Langdon & Seah Singapore Pte Ltd

- To provide cost consultancy services and contract administration support



Langdon & Seah Singapore Pte Ltd (L&S) is the most established quantity surveying practice with numerous experience and background of a variety of specialist skills acquired from more than 80 years of experience. We are well placed to provide expert financial, contract and project management services in traditional contracting arrangements, design-and-build or develop-and-construct as well as various hybrid custom-made procurements of construction projects. We leverage knowledge, skills and experience from our international market, into our local environments where we operate, offering our 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

5. LSW Consulting Engineers

- To provide 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

6. Schneider Electric

- To provide 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

7. SolarGy Pte Ltd

- To supply and install 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 enthuse 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

8. Swee Hong Limited

- To supply and install 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 tunnelling 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 our expertise, we will continue to help developing countries in their aspirations to become First World Cities.

We strive to build a first class company with a first class workforce deploying innovative techniques and technology. Through this, we will achieve our vision to be Builders of First World Cities For First World Living.

www.sweehong.sg

9. Uniseal Singapore Pte Ltd

- To supply and install green wall



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

10. VisualMediaWorks

- To provide perspective renderings



VMW Group specializes in the field of visual communication since 2000. As part of the VMW Group, the four entities are comprised of VisualMediaWorks, Attic Films, Blanct and Obilia. We deliver optimal results through our forte in computer graphics imagery, creative design & branding, video production as well as interactive media.

Our works are visually stunning, intuitive and cutting-edge representations of commercial, residential architecture projects and interior spaces. We provide a comprehensive array of services for a clientele base within the shores of Singapore and beyond to countries like China, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia, India, and the Middle East. As the largest visualization studio in Singapore, we have more than 50 dedicated and highly-skilled designers and professionals.

www.vmw.com.sg