13 August 2014

MEDIA FACT SHEET

12 LEAF-certified Developments

Outstanding Projects (LEAF-Certified)

1) ADANA @ Thomson (Condominium)

Development Project	:	ADANA @ Thomson
Developer	:	Fortune Properties Pte Ltd
Team Members	:	JGP Architecture (S) Pte Ltd PDAA Design Pte Ltd EPM Consultants Elead Associates Private
Project Completion	:	March 2018

Introduction

ADANA @ Thomson has been conceived as 3 blocks of 5 storey apartments interlinked as one. In doing so, the architectural ingenuity frees up more space for lush landscape and lifestyle provisions on the 3,715.9 sqm site. As its name Adana denotes, the development's earthy beauty nestled by the edge of Lower Peirce Reservoir, seeks to inspire a healthy outdoor lifestyle that brings its residents closer to nature. Just approximately 150m away from the reservoir, Adana @ Thomson is also located near the Central Catchment Nature Reserve. All 74 apartments are also carefully angled to ensure that it is enveloped within spectacular views of either the verdant surrounding or central communal landscape.

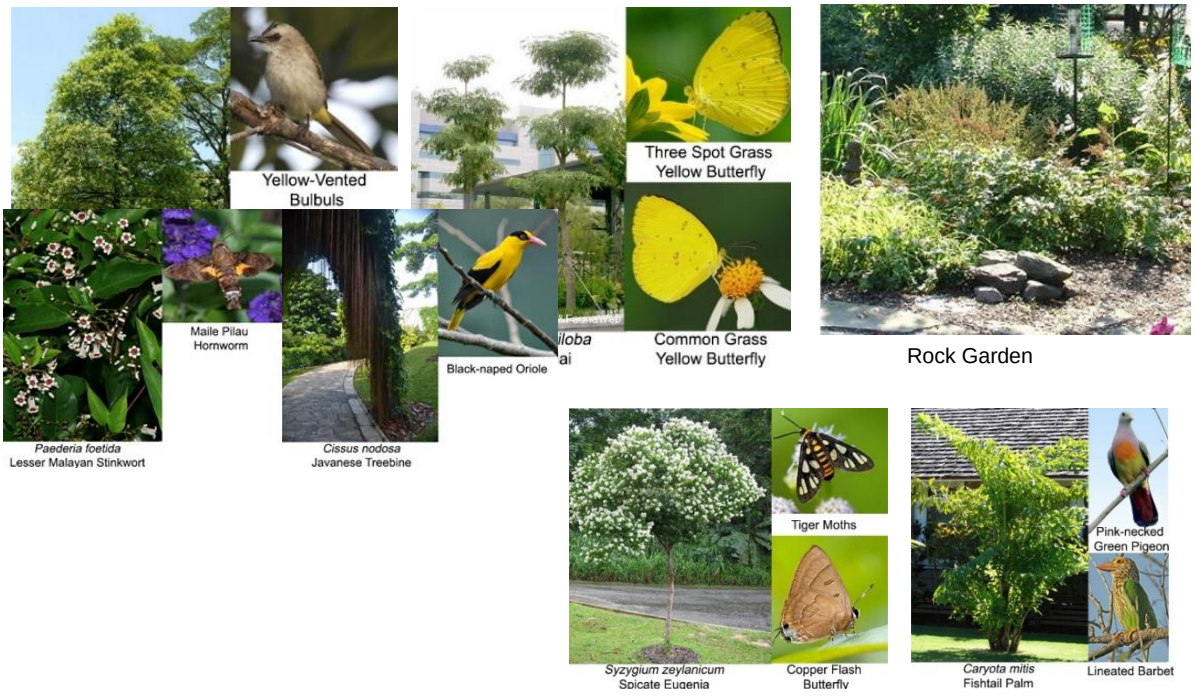
Enhancing the natural surroundings, a green gardenscape covers the entire rooftop of the development, interweaved with walkways, a jogging track and BBQ areas. When viewed from the sky, the entire site resembles a 'corridor' linking the Peirce Reservoir area to the Thomson area.

<u>Greenery Provision</u>

Adana @ Thomson achieved 100% usage of native plants (from ground to roof) which will be sourced locally and from Malaysia. Softscape layout is simple but emphatic where necessary. The creeper *Cissus nodosa* welcomes you as you enter the development.

Cissus nodosa - Green Welcome Curtain at Entrance

Native trees such as *Alstonia angustiloba* (Common Pulai) and *Fagraea fragrans* (Tembusu) grace the front and back of the development to symbolise and celebrate posterity. Creepers envelop the west elevation for sun screening and the roof edges to soften the concrete roof perimeter. A Rock Garden, mimicking rusticity, strengthens the setting for this bio-diversity.



Singapore is richly endowed with a vibrant and diverse range of indigenous shrubs, trees, creepers which naturally attract a diversity of insects and birds. Since this development is near the nature reserve, it is possible that some forest edge animals such as butterflies, birds, etc. that will find this development a new habitat.

The rooftop manifests the design via a playful juxtaposition of shrubs, trees, water, stones/rocks, and composite timber (maintenance-free) to mimic the forms of the local

environment even though it sits on a concrete platform but still poses as an extension of fauna habitat. The active and passive activity areas seamlessly blend with the landscape thus allowing co-existence.

Landscape management

As all plants used are native, availability and maintenance will not be a major issue. The mortality rate will not be a constant concern. However, conscientious maintenance procedures will still be implemented to ensure lushness and effectiveness.

Provision of composting and recycling bins will be in the primary agenda to promote sustainability. Composted materials can be used for landscape maintenance and soil conditioning.

Other areas

The culinary garden strategically located bear the BBQ area (you harvest…you cook) encourages community involvement. The residents can propagate herbs, vegetables, spices organically to inculcate a healthy lifestyle. Signages of plant species will be provided to encourage outdoor learning and local story telling.

Quote

Mr Richard Tan, Managing Director, Fortune Properties Pte Ltd, said, “Built upon a foundation of Singapore’s natural landscape, we aim to integrate modern lifestyle aspirations with environmental needs to create a greener future for generations to come.”

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Outstanding Projects (LEAF-Certified)

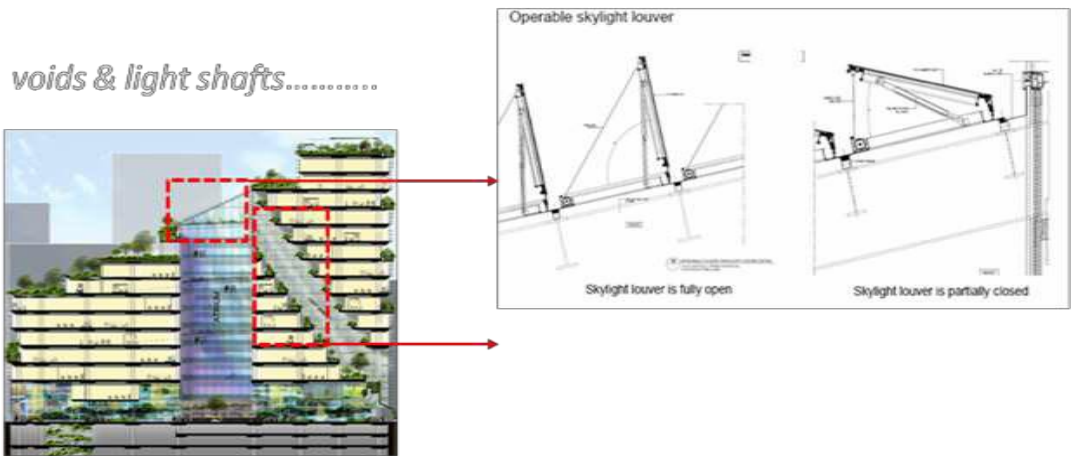
2) SOLARIS (Commercial Building)

Development Project	:	SOLARIS
Developer	:	SB (Solaris) Investments Pte Ltd.
Team Members	:	CPG Consultants Pte Ltd (Architect) Tropical Environment Pte Ltd (Landscape Architect) TR Hamzah & Yeang (Design Consultant) CPG Consultants Pte Ltd (M&E Engineers) ARUP (C&S Engineers)
Project Completion	:	2011

Introduction

Tropical Forest Facade
The building responds to the abundant natural light and the need for shading with a façade that features both sky terraces and a 'cloak of louvres' at the same time. This greatly reduces solar heat gain while allowing a sequence of spaces that benefit from both green landscaping (consisting of indigenous species) and adequate sunshading. Service cores and toilets are located at the periphery of the building, allowing natural light and natural ventilation.

Natural light and ventilation from Tower to Basement
The development consists of two towers with an atrium that is naturally ventilated due to the use of actuated louvres with rain sensors. Natural light, ventilation and greenery are brought into the two basement levels via the 'eco- cell': an extension of the spiral green planters on the upper levels.



Work, Break & Play

The design encourages occupants to surround their office with green landscaping that is alive with biodiversity and animated with filtered natural light. It has a homely atmosphere that allows for breaks between intensive work and has both daytime vibrancy and night time resort living characteristics. This encourages workers to stay and work comfortably for longer periods of time.

Free Plan, Free Clusters

The free plan with a flexible raised floor encourages creation of 'creative clusters' and dynamic work-groups that enjoy access to a sky-garden and a meeting room surrounded by open work stations. We envision communities forming around such work clusters, expanding to communal floors around pantries/break rooms and finally sharing the vibrant communal art-atrium at the ground level.

Greenery Provision

Solaris' 1.5km spiral garden is designed to be a new biotope that increases green surfaces by 1.5 times. It provides a haven for wildlife, screens and shades the façade and collects rainwater. The garden is accentuated with sky terraces as outdoor breakout spaces and sky gardens for larger gatherings. This integrated bio-swale extends to the basement, bringing light and ventilation. Micro-climate selected native-species planting was proposed for organic growth and minimal maintenance while supporting a flourishing eco-system.

Landscape management

The design of the spiral garden allows for maintenance paths and access from every floor. An efficient fertigation system with rain detectors is used to ensure efficient water usage. Tree species are selected for height control and a less aggressive roots system.


Other areas

Natural daylight provision and ample direct solar radiation shading via a louvre and light shelf design.

Quote

Kuan Chee Yung, Senior Vice President, CPG Consultants Pte Ltd, said, “Solaris represents the office of the future that goes beyond sustainable design. It sets the stage where the restorative power of daylight, natural ventilation, verdant flora and vibrant fauna can be brought in the work environment.”

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Outstanding Projects (LEAF-Certified)

3) Tree House (Condominium)

Development Project	:	Tree House
Developer	:	City Developments Limited
Team Members	:	ADDP Architects LLP (Architect) COEN Design International Pte Ltd (Landscape Architect) Tiong Seng Contractors (Main Contractor) Scenic Landscape (Landscape Contractor)
Project Completion	:	July 2013

Introduction

Created by leading green developer City Developments Limited, Tree House has caught the imagination of many with its stunning 24-storey 2,289 sqm facade that recently entered Guinness World Record for the largest vertical garden[1].

The one-of-its-kind vertical garden is a key feature of Tree House's design, which was inspired by the surrounding vast greenery. Tranquil and serene, Tree House has defined a new era of living harmoniously with nature in Singapore's densely built-up urban environment. In addition to the lush greenery within Tree House, residents can enjoy fresh air and picturesque views of nearby Bukit Timah Nature Reserve, Upper Peirce Reservoir, Dairy Farm Nature Park and Zhenghua Park.

Greenery Provision

Designed with environmental sustainability in mind, Tree House's vertical garden is more than just a unique architectural structure. It functions as a 'bio-shield' and natural insulation that reduces the estate's carbon footprint by filtering pollutants and carbon dioxide out of the air. Notwithstanding that majority of the apartments are north-south facing, the vertical garden reduces heat absorption and lowers the energy needed to cool indoor spaces. This is expected to achieve air-conditioning energy savings of between 15% and 30%, or a total of approximately between S$12,000 and

[1] As of April 2014

S$24,000 annually for the 48 west-facing master bedrooms that are insulated by the vertical wall.

Moreover, the base of the vertical garden is sloped to create a green canopy and its frame functions as a channelling device that controls water drainage. This aids rainwater harvesting for irrigation of the vertical garden and extensive landscape in Tree House.

Besides the vertical garden, there are sky gardens on the 7th, 13th and 19th floors at every apartment block to maximise greenery. The sky gardens also provide communal spaces for residents and shade for internal spaces in Tree House.

Landscape Management

To reduce reliance on potable water, Tree House uses rainwater harvesting for irrigation. Channelled and directed to a harvest tank, the rainwater collected is used to irrigate the landscaped deck on the entire ground floor via a system of pipes, tubing and drippers. Excess water is discharged from the planter and directed back to the harvest tank for further recycling.

Leveraging the natural sloped terrain which Tree House sits on, bio-swales were also incorporated into the drainage system to aid rainwater harvesting. The bio-swales treat surface runoff water through cleansing and filtration of pollutants before the water is used for irrigation.

Other Areas

Chestnut Tree Houses
Pavilions in the shape of a chestnut are another unique design feature of Tree House. Linked to the Tree Top Walk within the development, they provide residents the feeling of being back to nature and enhance the aesthetic appeal of the development's landscaping.

Herb Garden
The garden, which grows herbs such as Basil, Mint and Rosemary, promotes community gardening, healthy living and bonding between families and residents.

Jogging Track
The track which flanks a row of greenery is ideal for a relaxing jog – right at the residents' doorstep.

Discovery Pond
Instead of chlorine, water in the pond is treated with a bio-filter. This supports biodiversity in the pond which enables residents to discover and learn more about ecology.

Quote
Mr Allen Ang, Senior Vice President, Projects, and Head of Green Building, City Developments Limited, said: “Greenery plays a very important part in CDL’s sustainable developments. Besides enhancing a development’s aesthetic appeal, greenery creates a better environment by reducing heat, improving air quality, and filtering carbon dioxide. We take great pride that CDL’s eco-inspired Tree House has been awarded Outstanding Project in the LEAF Certification Award. We will continue to innovate, invest in and improve the way our buildings sustain life.”

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New Developments (LEAF-Certified)

1) Clementi Cascadia – Homes Amidst Cascading Gardens (HDB estate)

Development	Clementi Cascadia
Developer	Housing & Development Board
Team Members	P&T Consultants Pte Ltd (Architects & C&S Engineers) Sitetectonix Pte Ltd (Landscape Architects) United Project Consultants Pte Ltd (M&E Engineers) Sunhuan Construction Pte Ltd (Main Contractor)
Project Completion	3rd Quarter 2017

Aerial Perspective showing stepped profiles of the blocks

Clementi Cascadia is bounded by Commonwealth Avenue West and Clementi Avenue 3. The development consists of 3 residential blocks, ranging from 28 to 40 storeys, and a multi-storey car park. With 502 units comprising a mix of 2-, 3-, 4- and 5- room flats, the project is estimated to complete in 3rd Quarter 2017. The name Clementi Cascadia reflects its terracing garden decks which cascade from the third storey roof level of the multi-storey car park to the ground level.

Perspective of Landscape deck

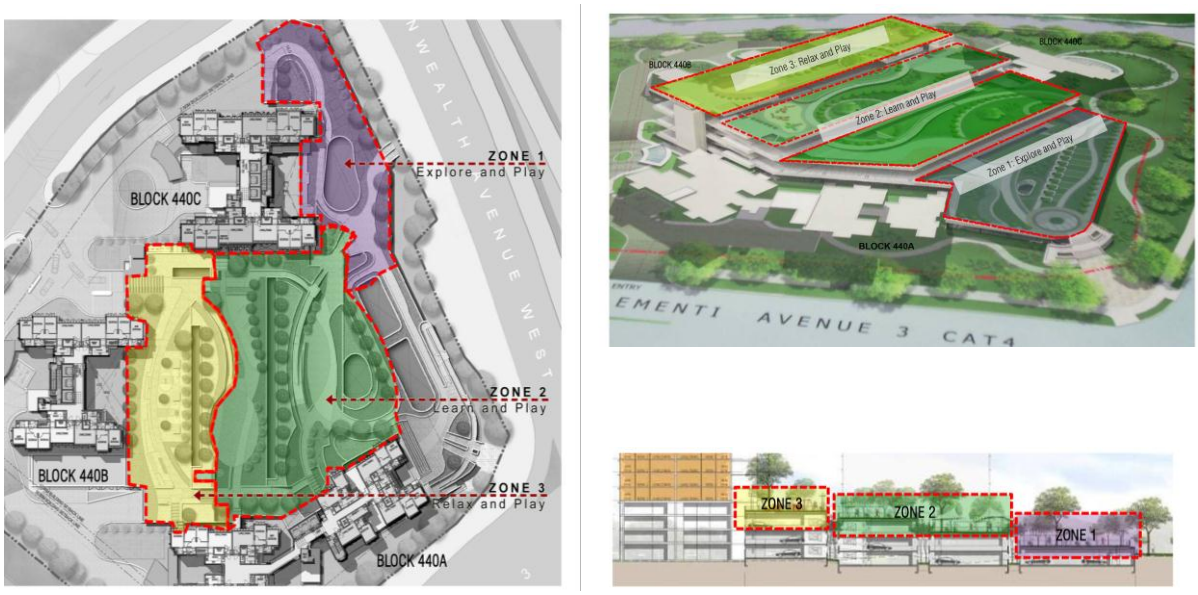
Landscape Strategy - The Green Carpet

The development's landscape design seeks to achieve the following objectives:

a) Establish a green connection between the development and the Clementi Town Centre;
b) Enhance Clementi's townscape by 'marking' the prominent street junction between Commonwealth Avenue West and Clementi Avenue 3; and
c) Enhance the terracing effect of the roof gardens by providing lush greenery.

Inspired by rice terraces, the roof garden terraces feature lush greenery that flows seamlessly, to soften the building edges. The aim is to create a *'Green Carpet'* that extends from the street level to the roof deck of the third-floor car park.

On the highest level of the terraced roof garden, 3-generation facilities are provided, including adult and elderly fitness corners, and a playground. An exercise deck on the intermediate level provides residents with a lush outdoor environment to exercise. Seating areas are scattered throughout the terraced roof gardens to encourage neighbourly interaction. Designed to provide barrier-free accessibility, residents can enjoy a leisurely stroll along the roof garden.



Terraced landscape decks which provide a cascading greenery effect

Design Strategies

- A seamless integration of the ground level landscape with the terraced deck provides an expansion of greenery for residents to enjoy

- The themed landscape decks provide residents with varied park experiences

- With each level gradually transitioning from an active public recreation space at the street level to a more private recreational space for residents at the highest level, varying layers of public space will be created.

- Continuous greenery links the terraces, allowing for enjoyment of the lush surroundings

- The way the development is designed expresses the site's natural swirling topography, with stepped block profiles that are further accentuated by the sloped roof profiles of each block.

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New Developments (LEAF-Certified)

2) Eco Sanctuary (Condominium)

Development Project	:	Eco Sanctuary
Developer	:	S P Setia International (Singapore) Pte Ltd
Team Members	:	ADDP Architects LLP (Architect) COEN Design International Pte Ltd (Landscape Architect) CPG Corporation Pte Ltd P & T Consultants Pte Ltd
Project Completion	:	Mid 2016

Introduction

"In every walk with nature one receives far more than he seeks…" This shall be your everyday experience at Eco Sanctuary – Inspired by Nature.

The landscape design of this development draws inspiration from the rich diversity of the verdant Upper Pierce reservoir, emulating the natural setting and at the same time extending the local ecology into Eco Sanctuary.

Aerial View of Eco Sanctuary

The design reflects the intimate intricacy of the endemic butterflies and celebrates its beauty by embodying it within its architecture. By observing the minutiae of the butterfly wing and the layers of its iridescent scales, the development showcases a rich interlay of curvilinear and oblique patterns.

Eco Sanctuary captures the metamorphosis of the butterfly from the egg to the Papillion stage. Standing tall by Singapore's largest green area of the Central Water Catchment reservoirs and nature reserve, the development concepts are inspired by nature, ensuring a transformation that few can rival.

Greenery Provision

Prior to development works on site, a Biodiversity Impact Assessment (BIA) was commissioned and conducted to ensure that ecological considerations are incorporated into site planning and layout. The undulating terrain is used to its advantage, hence minimising the cut-and-fill impact on the ground.

Developing a Green Landmark

On the higher grounds of Chestnut Avenue, you will marvel at Eco Sanctuary's generous green buffer up to 7 metres enriched by series of habitats creation as well as garden collections that serenade and welcome you home.

Entrance roundabout of the development

View from ZhengHua Park

Bio-mimicry Approach

Eco Sanctuary embraces bio-mimicry architecture inspired by nature. The hexagonal shape which is derived from the structural form of a beehive, plays a significant role not only as a distinctive façade, but also acts as sun-shading device in passive architecture.

Architecture design for Eco Sanctuary

Integrating Landscape

Eco Sanctuary's entire landscape is specifically designed to integrate seamlessly with the adjoining ZhengHua Park while the installation of a Butterfly Gate grants convenience access of manicured pathways lined with greenery.

Feature Butterfly Gate access to ZhengHua Park

Accessing Panoramic Central Nature Reserve

Eco Sanctuary is carefully designed to ensure that there are sufficient vantage points to enjoy the panoramic views of central nature reserve, the sunset and the sunrise while gazing from the sky-walk bridge, belvederes and sky-clubs accessible at the high-volume level 14 which breathtakingly offer swinging hammocks, spa pools and sky gym.

The Belvedere

Sky Walk

Creating Natural Ecosystem

The landscape design serves to transport nature to where you live. On top of harvesting rain water for future use, the ecologically-attuned bio-pond plays home to lotus plants and dragonflies.

Bio-Pond

Butterfly Trail

Landscape management

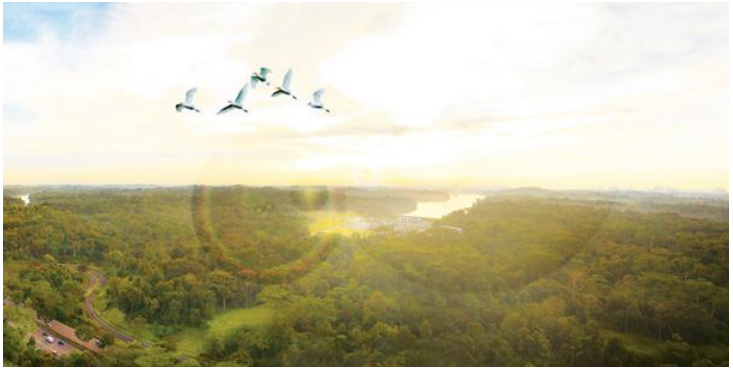
At Eco Sanctuary, the emphasis is on sustainability and efficiency in landscape management during implementation as well as maintenance thereafter.

Automated Irrigation System and Rain Water Harvesting Tank

Sustainable systems adopted include the automated irrigation system where controlled timer and rain sensor will satisfy the plant care demand efficiently while reducing the reliance on manpower. The provision of rain water harvesting tank seek to maximise the collection of natural water resources for the development.

Plants Selection

The selection of native plant species allows easy acclimatisation while ensuring the ease of maintenance during the long term. Horticulture waste produced during the maintenance of landscape will be recycled through compost bins.



Quote

Neo Keng Hoe, General Manager of S P Setia International (S) Pte Ltd, quoted that "We created Eco Sanctuary based on our belief that today's living experience should not be defined by what is within the walls of your home, but also by the relationship

you can build together with nature and its offerings. Eco Sanctuary is designed specifically to not supersede the surrounding natural environment, but to complement it proactively."

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New Developments (LEAF-Certified)

3) Highline Residences (Condominium)

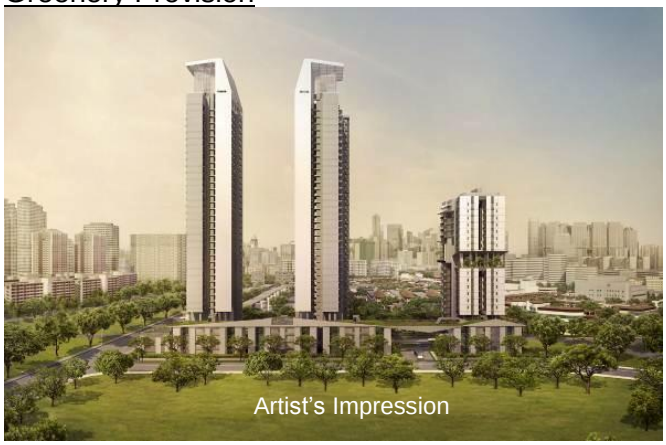
Development Project	:	Highline Residences
Developer	:	Keppel Land
Team Members	:	Keppel Land Limited (Project Manager) W Architects Pte Ltd (Project Architect) COEN Design International Pte Ltd (Landscape Architect)
Project Completion	:	Estimated completion in 2018

Introduction


Artist's Impression

Highline Residences is located at Kim Tian Road, right at the city's fringe in Tiong Bahru. Served by an excellent network of roads and public transportation, it is less than a 10-minute drive to Orchard Road, the Central Business District as well as Integrated Resorts in Marina Bay and Sentosa. The development is also conveniently located within a short stroll to Tiong Bahru MRT and the future Havelock MRT station on the Thomson line.

Greenery Provision


Artist's Impression


Artist's Impression

Highline Residences features a generous 7-meter green lawn along Kim Pong Road, which provides a great picnic spot for residents. Adding to the experience is a heritage-themed spice garden with local plants such as nutmeg and wild betel.

The landscape integrates seamlessly with the architecture, substation and bin centre, camouflaged by a continuous green wall. The development also features an elevated

green ridge on level five which spans an impressive 180 metres with a wide range of recreational and communal facilities. The green ridge with the cascading water feature connects seamlessly with the landscape on the ground floor, providing a green sensory trail for residents.

Landscape Management

A proactive approach is adopted for environmental protection and sustainability. An automated irrigation system with timer and rain sensor ensures efficiency in landscape maintenance Native plant species which fare better in Singapore's hot climate are chosen to ensure ease of maintenance. Horticulture waste produced will also be recycled into compost.

Others

Rooftop Community Farming

Highline Residences also features a rooftop communal garden facility to encourage urban farming and healthy lifestyles. Residents can enjoy growing their own harvest of herbs, spices and fruits.

Sky terraces

Highline Residences features two landscaped sky terraces located on levels 12 and 13 where residents can enjoy serene outdoor living spaces amidst lush greenery and panoramic views of the city.

Quote

Mr Tan Swee Yiow, President (Singapore), Keppel Land, said, "At Keppel Land, we are committed to designing, building and operating properties that harmonise with the environment as well as enhance the quality of life of the communities in which we operate. That is why we adopt a proactive approach towards environmental management.

"We are honoured to have been conferred the LEAF award by NParls for The Glades at Tanah Merah and Highline Residences. This follows the recognition for Corals at Keppel Bay and 158 Cecil Street – Keppel Land developments which were conferred the inaugural awards last year. Greening a development provides both tangible and intangible value to a property as it not only improves energy efficiency, but also enhances the well- being of our residents with better air quality, clean water as well as a healthy environment. "

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New Developments (LEAF-Certified)

4) Sky Habitat (Condominium)

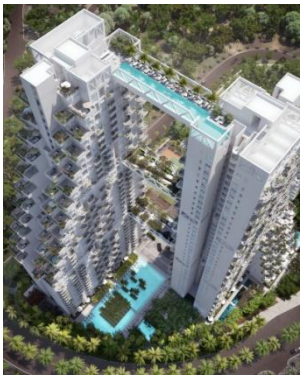
Development Project	:	Sky Habitat
Developer	:	CapitaLand Singapore Mitsubishi Estate Asia Shimizu Corporation
Partners	:	Landscape Architect: COEN Design International Pte Ltd Landscape Design Architect: Coen + Partners Architect: DCA Architects Pte Ltd Design Architect: Safdie Architects Main Contractor: Shimizu Corporation Landscape Contractor: Garden Beau Pte Ltd
Project Completion	:	1Q 2016

Introduction

Located in Bishan, a significant residential area in the suburban heartland of Singapore, this 38-storey residential development explores the balance of high density living with humanistic concepts of community, landscape, gardens and daylight. Jointly developed by CapitaLand Singapore, Mitsubishi Estate Asia Pte Ltd and Shimizu Investment (Asia) Ltd, Sky Habitat features the dramatic stepping architectural design by internationally-renowned architect Moshe Safdie.

Breaking down the scale of typical singular tower residential developments, the community-based solution of Sky Habitat is a three-dimensional matrix of homes with private terraces, balconies and common gardens, bringing about skyrise greenery and landscaping, while maintaining wide spaces throughout the development, offering stunning views of the skyline.

The strong stepping form of the complex can be likened to the community texture of ancient hillside developments and provides for lush vertical greenery, multiple orientations relative to the sun, naturally ventilated units, and generous views, all without compromising planning or structural efficiency.



Greenery Provision

Maximum Greenery on the Ground
A landscape deck is raised above two basements, separating vehicular traffic to provide maximum greenery on the ground. More than 65% of the ground level is devoted to greenery, swimming pools and water features.

Communal amenities are designed to integrate with lush gardens and water features. Lush peripheral planting has replaced part of the boundary walls for a seamless extension of greenery complementing the public space.

Vertical Greenery
Two stepping towers are linked by three bridging sky gardens, creating a series of interconnected streets, gardens and terraces in the sky which facilitate social interaction and offer opportunities for recreational activities. Each sky bridge offers a different experience of the outdoors. The sky bridge on the 14th level is designed with landscape features like ample-shaded outdoor seating that creates a contemplative environment, while the sky bridge on 28th level promotes social interaction through features like playful landscape mounds. In addition, the sky bridge on the 38th level is designed around health and wellness amenities, including an infinity leisure pool that offers dramatic views of the surroundings.

Stepping Terraces & Alternating Balconies
More than a quarter of the total units come with outdoor spaces for their private gardens in the sky. These are generously-sized stepping terraces outfitted with tree planters. Plants and trees are provided for the outdoor garden terraces to encourage skyrise greenery within private units.

Balconies swing in different directions on every floor to create higher outdoor volumes for sunlight and taller planting, promoting ‘gardens in the sky’.

Landscape Management

In order to ensure plants specification and quality, all planting specimens were sourced from accredited sources. In addition, these plants are undergoing a 24-month pre-grown period in a local nursery to achieve maximum lushness upon completion.

More than 50% of the planting areas will be irrigated with an automated drip irrigation system. This automated irrigation system is supported with a rainwater harvesting system, which will greatly contribute to sustainable landscape management.

All landscape features and facilities within the estate are designed to be universally accessible. With a series of ramps strategically placed around the estate to mitigate changes in gradients and single-level access throughout the estate, residents will be able to enjoy barrier-free and uninterrupted pathways to all landscape facilities within the development.

Other Areas

Lily Ponds with Linear Wetland System
Lily ponds with linear wetland system are designed to fit the compact site, bringing residents closer to nature. The linear wetland system aims to cleanse water runoff from surrounding hard paved surfaces. Water runoff from the surrounding hard pavement will be detained and re-circulated through the multiple wetland cells in order to simulate the flow of a conventional constructed wetland. Plants such as water lilies and *Cyperus* will enhance the level of biodiversity within the estate and provide a habitat for wildlife.

Bio-Retention Basin
The unique integration of the bio-retention basin located at the north-western corner of the development blends seamlessly into the site surrounding, allowing both the residents and public to benefit from the educational and visual value of this feature. This bio-retention basin aims to gather water run-off from the swimming pool deck, social pavilion and green buffer and channel it to the bio-retention basin for cleansing prior to discharging further to main drainage networks. Waterlogged-tolerant plants will be planted within the bio-retention basin to suit the site condition.

Community Gardening
A community garden resides within the development in which residents are encouraged to plant their own vegetables, fruits and herbs. Initial planting will be undertaken by the developer, but it is envisaged that once the residents move in, they will contribute to the ongoing management and planting choices for the garden.

Quote
Mr Wong Heang Fine, Chief Executive Officer, CapitaLand Singapore (Residential), said, “CapitaLand Singapore is proud to receive LEAF Certification by NParks for our iconic project – Sky Habitat – that is designed by star architect Moshe Safdie. With its expected completion in early 2016, Sky Habitat will dramatically change the skyline of the popular Bishan estate with its three-dimensional matrix of homes with private terraces, balconies and common gardens, offering stunning views of the surroundings. Lush greenery will be interwoven and seamlessly integrated with the facilities throughout the development.

Besides offering residents the experience of skyrise living and greenery, we will be introducing a good variety of plant species as well as a community garden where residents will be encouraged to carry out their planting with initial planting undertaken by us."

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New Developments (LEAF-Certified)

5) The Glades (Condominium)

Development	:	The Glades
Project Developer	:	Keppel Land and China Vanke
Team Members	:	Keppel Land Limited (Project Manager) P&T Architects (Project Architect) Peridian International Inc. (Landscape Architect)
Project Completion	:	3Q 2017

Introduction

Keppel Land and Vanke, China's foremost property developer, are the joint developers of The Glades, which comprises 726 premier residences on a sprawling 3.2-ha site at Tanah Merah in the eastern region of Singapore.

Located just next to Tanah Merah MRT interchange, The Glades is situated within an established private housing estate and seamlessly connected to the city and various parts of Singapore via major expressways. It is also close to a host of amenities and facilities including prestigious schools, quality business hubs and the international Changi Airport.

Greenery Provision

The Glades synergises the site's natural undulating terrain with innovative design features, creating a peaceful oasis amidst the urban bustle. Residents can take delight in the series of cascading water features and plantings along the contours of the terrain.

The theme of a tropical paradise and relaxed resort living is also created with multiple levels of extensive greenery, waterfalls, high tree-like pavilions, also known as skypods, as well as infinity pools and bio-swales.

Lush 12-metre tall tropical trees are also conserved at the corner of Bedok Rise. Vertical green walls grow lush and verdant within pockets of voluminous sky terraces, providing a continuous green experience as one ascends to the upper floors. Visible from beyond the boundary of the development, these huge green spaces act as tranquil green lungs for the surroundings.

Individual gardening plots will also be set aside for eco-lovers to dabble in horticulture. Together with on-site amenities and lush green spaces, they create a natural resort-living environment for residents.

Landscape Management

Sustainability is a key feature at The Glades. The development features modern facilities and unique architecture, complemented by natural terrains and interesting water features.

Quote

Mr Tan Swee Yiow, President (Singapore), Keppel Land, said, “At Keppel Land, we are committed to designing, building and operating properties that harmonise with the environment as well as enhance the quality of life of the communities in which we operate. That is why we adopt a proactive approach towards environmental management.

“We are honoured to have been conferred the LEAF award by National Parks Board for The Glades at Tanah Merah and Highline Residences. This follows the recognition for Corals at Keppel Bay and 158 Cecil Street – Keppel Land developments which were conferred the inaugural awards last year. Greening a development provides both tangible and intangible value to a property as it not only improves energy efficiency, but also enhances the well-being of our residents with better air quality, clean water as well as a healthy environment. ”

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New Developments (LEAF-Certified)

6) Yale National University of Singapore (Educational Institution)

Development Project	:	**Yale National University of Singapore (Yale-NUS)**
Developer	:	**Yale-NUS College**
Team Members	:	**Forum Architects Pte Ltd** **Pelli Clarke Pelli Architects** **Lekker Design Pte Ltd** **SsangYong Engineering & Construction Co. Ltd** **Nature Landscapes Pte Ltd**
Project Completion	:	**Q1 2015**

Introduction

Envisioned as an educational landscape, the Yale-NUS campus is designed to bring learning beyond the classroom to the surrounding green spaces. The Campus Green and Residential College gardens expand on the concept of an arboretum, where a diverse selection of plants is cultivated for their botanic and cultural significance. With ample vertical greening and an innovative stormwater treatment system, the campus grounds are home to a large selection of over 200 species.

Special care was taken to conserve existing trees and to ensure that 20% of all species are native. With both biodiversity and native planting, the campus has an overall green plot ratio that achieves 2 Green Mark points.

Greenery

The Campus Green is the college's central green space, accessed directly from the main entrance. Conceptualised as an "Evolved Tropical Forest," different layers of plantings mimic the multi-layered strata of a tropical forest. Six existing mature trees of 18-22 metre height have been conserved on site, forming the outermost canopy layer.

Anchored by these six trees, smaller regional trees and native shrubs act as new infills that parallel the understory and undergrowth layers of the forest. Plantings consist primarily of species native to the region, such as the Malayan Cherry, Common Pulai, and Gustavia Superba.



The Residential Colleges (RCs) have been deliberately designed to integrate green spaces with residential architecture. Each RC has a central courtyard with a large flat central lawn, providing space for event tentage as well as outdoor recreation. Anchored by 1-2 signature trees as visual focal points, each RC Courtyard offers a lush tropical landscape, with its own distinctive plantings creating a sense of place. Expanding on the educational nature of the campus, the plantings are organised according to the following themes:

RC 1 Courtyard: a collection of plants that are significant in the historical context of Singapore and the region

RC2 Courtyard: a collection of palms, cycads and ferns that are common and well adapted to the Singapore environment

RC 3 Courtyard: a collection of plants that have contributed to the region's economic development



Skyrise Greenery

Vertical greening is maximised with thirty sky gardens and eighty-five roof gardens across three Residential Colleges. Sky gardens create communal spaces and pockets of greenery that are tightly integrated with the architecture. The same planting themes of each RC tower inform the composition of their respective high-rise landscapes, allowing the sky gardens and roof gardens to act as vertical extensions of each central courtyard. Each sky garden is two to three storeys high, comprising specific trees within each theme that are well-adapted to drought or wind conditions.

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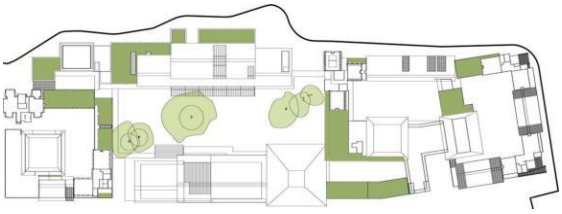

Green roofs have been used extensively across all three RCs, creating visual interest with colour-themed planting. Patterned patches of purple, pink, and yellow distinguish the roofs of the three RCs respectively. Together with the sky gardens and roof gardens, the green roofs contribute significantly to passively cooling down each block of residential buildings.

Stormwater Treatment System

Four bioswales and an eco pond form a stormwater treatment system, with ecotope plants used to cleanse water of various pollutants. With this system, more than 11% of the surface runoff from the campus is treated before it enters public drains, exceeding the requirements for PUB's ABC Waters certification. Roof run-off is channelled through rainwater downpipes and underground drains to the eco pond, which houses two filtration systems, bio-filtration and vegetation filtration. Fibrous-rooted shrubs have also been planted to speed up water filtration back into the ground. As part of the vision of a learning landscape, the eco pond also features educational signage that explains the workings of this system, increasing awareness of the role of nature in the campus.

Irrigation System

All sky gardens, roof gardens, and green roofs within each RC are auto-irrigated, allowing for easy maintenance. NEWater is used to water 94% of landscaped areas.

Other areas

Education

The gardens of the RCs function as outdoor classrooms, where students can learn experientially from their interaction with nature. Terraces are located at wind corridors to provide spaces for outdoor teaching and social gathering. Besides making use of passive design strategies to maximise natural ventilation, these terraces extend the classroom into the garden, integrating the natural and built environment.

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Existing Developments (LEAF-Certified)

1) Casa Clementi – Housing in a Garden (HDB Estate)

Existing Development	Casa Clementi
Developer	Housing & Development Board
Team Members	Surbana International Consultants Pte. Ltd. (Architects) Surbana International Consultants Pte. Ltd. (Landscape Architects) Surbana International Consultants Pte. Ltd. (M&E Engineers) Surbana International Consultants Pte. Ltd. (C&S Engineers) Straits Construction Singapore Pte Ltd. (Main Contractor)
Project Completion	3rd Quarter 2012

Introduction

Casa Clementi is one of the largest HDB developments, with 2,234 residential units in 10 tower blocks with various heights of 20-, 28- & 40-storeys. Residents in this precinct enjoy generous green spaces, a myriad of recreational facilities and a landscaped area on the car park roof garden. Commercial and communal facilities are also integrated in a 2-storey block for the convenience of the residents.

Roof Garden with a 'Tree-top Walk'

A key design feature of the housing project is the large landscape deck of about 15,460 sqm that is designed as a roof garden, which connects to all the residential blocks. This roof garden is divided into east and west zones, with a large spiral ramp designed as a 'tree-top walk' in the middle.

Several playgrounds, adult and elderly fitness corners, spread across the two zones, with paved open plazas and trellised seats for residents to enjoy. A footpath looping around the entire roof garden also doubles up as a jogging route of about 660 m in length. An additional elderly fitness area and space for a community garden, are also provided.

In addition, about 48% of the roof garden is devoted to planters of various soil depths to create lush greenery. The elevated position of the roof garden functions like the ground level, and provides additional community spaces for the residents.

Greenery Provision

Working closely with HDB Landscape Architects and the Town Council Horticulture Team, durable and long lasting shrubs, such as the *Sansevieria trifasciata, Caesalpinia pulcherrima,* and *Philodrendron eruibescens* were thoughtfully selected based on their drought resistance characteristics and aesthetic merits. Trees that require minimal maintenance such as *Hopea Odorata* and *Bucida molinetti* were provided to create canopy and shade.

As Singapore is a land scarce and high density island, the increase in greenery enhances liveability, and provides a welcome respite from the tropical heat. This development creates a quality living environment and better homes through diversified landscaping.

Greenery at Casa Clementi

Philodendron erubescens 'Gold'

Family Name : Araceae

Hopea odorata Roxb.

Family Name : Dipterocarpaceae

Common Names : Ironwood, Chengal Kampong, Chengal Pasir, Cengal Pasir, Cengal Pulau, Merawan Siput Jantan, Telshur, Takhian-yai

Terminalia molinetii M. Gómez

Family Name : Combretaceae

Synonyms : *Bucida molinetii*, *Bucida spinosa*

Common Names : Spiny Black Olive, Dwarf Geometry Tree, Spiny Bucida, Ming Tree

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Existing Developments (LEAF-Certified)

2) Punggol Breeze – A Green Oasis (HDB estate)

Existing Development	Punggol Breeze
Developer	Housing & Development Board
Team Members	Surbana International Consultants Pte. Ltd. (Architects) Surbana International Consultants Pte. Ltd. (Landscape Architects) Surbana International Consultants Pte. Ltd. (M&E Engineers) Surbana International Consultants Pte. Ltd. (C&S Engineers) Qingjian International (South Pacific) Group Development Co Pte Ltd (Main Contractor)
Project Completion	2nd Quarter 2013

Introduction

Punggol Breeze is a premium Build-To-Order (BTO) project comprising 964 units of 4- and 5-room flats in 12 blocks. Completed in December 2012, the development incorporates several green concepts such as the lush greening of Multi-Storey Car Park roof gardens, and enhanced connectivity to green spaces.

Functional and Pleasing Landscape Design

The project incorporates functional, yet aesthetically-pleasing designs to create a quality living environment for residents. Residents enjoy one of the longest linear roof gardens (at 270 m) to be found in any HDB development. This roof garden is situated in the middle of the precinct, allowing residents a panoramic view of the lush greenery from their homes.

Located at the heart of the development, this 8,160 sqm roof garden is like a new 'ground level' which seamlessly connects all the blocks for the convenience and enjoyment of residents. A variety of outdoor communal facilities such as seating corners, fitness stations, playgrounds, pavilions, and pergolas, decked with lush native landscaping, makes the roof garden a welcoming and tranquil "green lung" for all. Such spaces encourage interaction and bonding not just within the family but also among the community.



In addition, the extensive greening also helps to reduce heat and glare. Within the adjacent common green area of 7,000 sqm, a bio-retention swale is purposefully-created to retain and cleanse rainwater runoff. Pockets of outdoor learning and interaction space for the community are provided for residents to mingle and learn about the different types of plants in their estate.

On the ground level, the design draws inspiration from the concept of a “gateway” – residents walking along the pedestrian boulevard from the LRT station to Punggol Breeze are greeted by a “gateway” framed by four distinctive blocks which leads them seamlessly to the precincts, amenities, and facilities beyond. Within the residential units, balconies of about 4 sqm enable residents to set up their own gardens.

From the roof garden to the adjacent Common Green and balconies provided for greening, Punggol Breeze demonstrates an infusion of greenery on several different levels for the enjoyment of its residents.

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Existing Developments (LEAF-Certified)

3) Vacanza @ East (Condominium)

Development Project	:	Vacanza @ East
Developer	:	Hoi Hup Sunway Property Pte Ltd
Team Members	:	JGP Architects (S) Pte Ltd (Architect) Sitetectonix Pte Ltd (Landscape Architect) Straits Construction Singapore Pte Ltd (Main Contractor) BC Koh and Partners LLP (Structural Engineer) Elead Associates (M&E Consultant) Expression Galleries (Interior Designer)
Project Completion	:	January 2014

Introduction

Located at the premises of Lengkong Tujoh, Vacanza @ East, a spectacular freehold condominium features an abode of affluent resort lifestyle.

Nestled within a landed enclave, the 207,365 sq ft development is surrounded by soothing sound of trickling water, refreshing scent of lush greenery and enchanting sight of cascading waterfalls.

The landscape design at Vacanza @ East seeks to create a resort style ambiance for outdoor living and lifestyle. The landscape layout is a combination of balanced formality and relaxed, naturalistic approaches.

Greenery Provision

The pools and water feature network in this development are more than visual features or places to swim, it forms the design skeleton, and the resort theme emerges as result of outdoor spaces embracing water elements. By integrating ABC features at first storey and roof garden, the entire water bodies network is enhanced with environmental and educational value.

To further accentuate the contemporary tropical resort character of Vacanza @ East, clusters of feature palms are spread out across the central areas according to spatial rhythms. The placement order of the palms indicates the character of the various spaces, in linear rows at formal areas like the pool deck area and in clusters where the spaces are more naturalistic and organic in intent. Besides the aesthetics, the landscape design also contributes to environmental sustainability.

Rain Gardens and Biological Pond

Rain gardens were planned near the first storey plaza and roof top multipurpose lawn to detain and cleanse storm water runoff. The rain garden at first storey is designed to complement family gathering areas such as water jet platform & BBQ pit. At the car park rooftop, the undulating rain gardens with grassy plants form an interesting visual contrast with the rectilinear manicured lawns. Educational and interpretative signage are strategically located within the rain garden area to provide a platform for outdoor learning to the residence.

The biological pond with water plants located next to the clubhouse and playground stimulates curiosity to learn about aquatic ecological system.


Multi Storey Car Park Roof Garden

To maximise the land use of the Vacanza @ East, the roof level of the car park building is fully utilised for landscape facilities. Facilities such as BBQ area, a series of plazas, seating, pavilion and trellis are oriented as an architectural extension of the clubhouse upper level, which makes a perfect ambiance for outdoor dining and functions. Other facilities of this multi storey car park roof includes terrace lawns which can be used as informal amphitheatre seating, two multipurpose lawns, rain gardens, reflexology gardens, fitness trail and tennis court.


Vertical Greenery

Vertical greenery was introduced in this project. Car park building walls forming the backdrop to the clubhouse are designed as green walls and water wall features vertical strips to beautify the high wall and reduce building heat.


Plant Material

A total of 98 lush tropical plant species were used to contribute extensive greenery to this project. 44% of the plant species are native plants, which helps to bring a taste of wilderness to the urban setting by attracting a variety of birds, butterflies and other animals.

Landscape management

The building was designed and built according to the existing earth profile. In order to achieve this, the landscape was designed in a series of terrace gardens. The terrace gardens start at a higher platform between Block 36 and the car park building towards the other end of Block 46 & 48.

Dense buffer planting and screen planting helps to create soft boundaries which are friendly to the neighbouring sites. Dense screen planting also help to provide a visual privacy buffer as the project is located next to the Pan Island Expressway. Large trees with broad canopies were proposed at sunny areas to provide shade and comfort.

In consideration of several shady areas in the development, a wide variety of shade-tolerant plants were selected that can thrive in such an environment, and provide sufficient screening between public and private spaces.

Most of the new trees and shrubs are sourced from local and Malaysian nurseries. Soil tests are carried out prior to works to ascertain the quality of soil meets the highest standards.

Quote

Mr Wong Swee Chun, Director of Hoi Hup Sunway Property Pte Ltd, said, “We are happy and proud to have received our very first LEAF award for Vacanza @ East. The

development is also ABC-waters certified. Gearing towards a sustainable building, other than the construction materials, we also take pride in promoting a clean and green environment for the residents."

"The development is here to stay for a long time. We try our best to make it right during the construction stage so the environmental issues could be addressed and improved, and its benefits everyone. We are pleased with the results".

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