

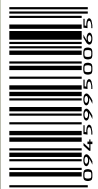
# LANDSCAPE FORUM

NATURE & LIVING

## GREEN INITIATIVE IN THE CBD

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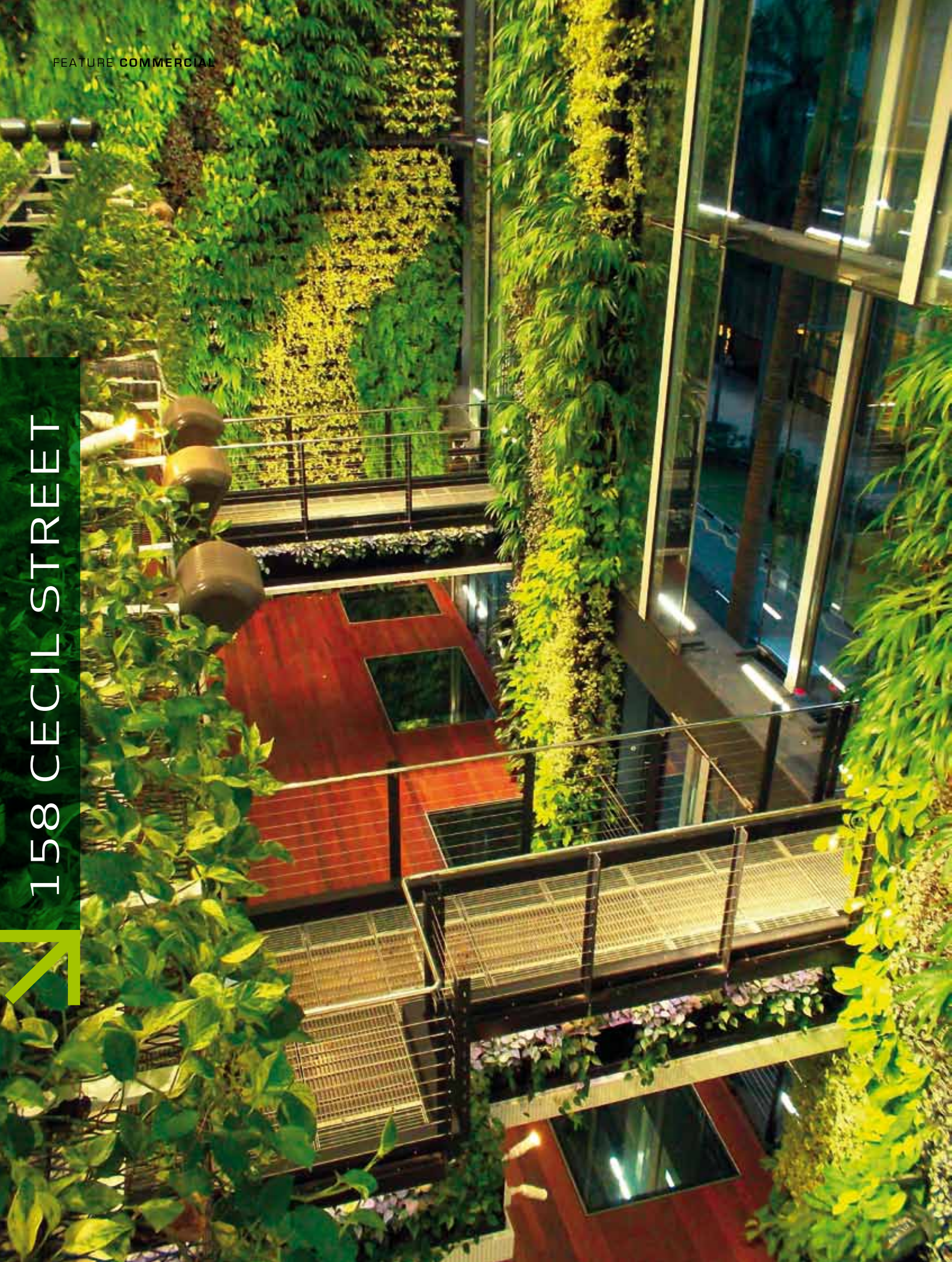


**THE GARDEN OF EDEN**  
Paradise in Gardens & Water Features

**PANORAMIC SHOWCASE OF LANDSCAPE WATER FEATURES**  
By The Landmark Group

**YOUR PERSONAL TERRARIUM**  
Making a terrarium in less than an hour





158 CECIL STREET



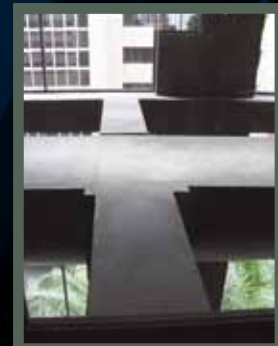
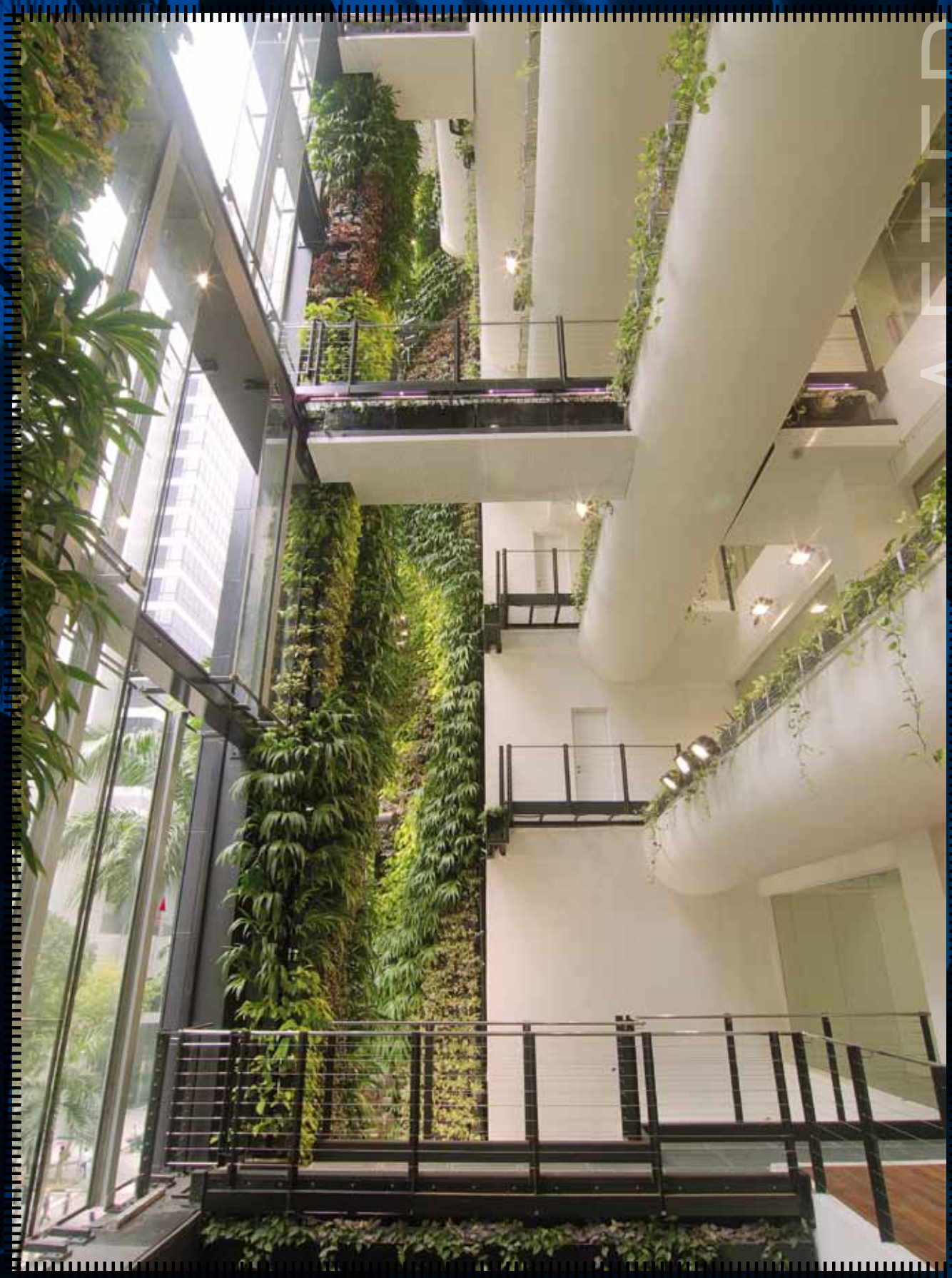
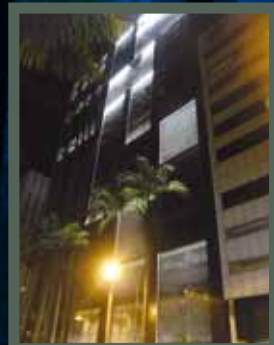
# A CHALLENGING GREEN INITIATIVE IN THE CBD

The greenery and 'hanging garden' certainly created an interesting façade and ambience to this commercial building in the Central Business District (CBD). I envisaged that I will enjoy working in such an office in the building. I am sure you will too. I can imagine sipping my favourite cup of aromatic coffee while working on my computer amidst the garden landscape, my boss will be impressed with my sudden boost in productivity!

WE HAVE SEAMLESSLY INTEGRATED ALL SURFACES, CAMOUFLAGING EXISTING STRUCTURAL ELEMENTS AND DESIGNED A UNIQUE 'LAYERED-FACADE' THAT ALLOWS NATURAL VENTILATION AND SMOKE TO DISPERSE.

KELVIN KAN  
Principal Architect at AgFacadesign





ONE OF THE MAJOR CHALLENGE WAS ACCESS TO THE THEN EXISTING MESH FAÇADE FOR DISMANTLING WORK. THIS WAS MADE POSSIBLE ONLY AFTER THE FABRICATION OF A MAINTENANCE WALKWAY THAT INCORPORATED THE BRACKETS FOR THE GONDOLAS, AND WE HAD TO WORK FROM TOP DOWN.

PATRICK LAI  
Managing Director, Lai Yew Seng Pte Ltd

#### IN THE BEGINNING – BORING AND UNINVITING

Four months before the building had a banal façade with an uninviting, stark and bland atrium. The architect, working with relevant contractors and engineers, had orchestrated the task of transforming the façade into a ‘Duality Façade’ – reflective glass exuding a mystical and cryptic look by day, and a total crystal-like transparency presenting a ‘glowing lantern’ of hanging garden by night.

#### HOLIDAYS ON SITE!

“The project was scheduled to span 16 weeks (20<sup>th</sup> October 2010, commencement date of the project, to 8<sup>th</sup> February 2011, the hand over date of the project), we spent the Deepavali, Hari Raya Haji, Christmas, New Year and the Lunar New Year holidays working and celebrated these festive seasons on site!” said Victor Tan, Project Manager of Lai Yew Seng Pte Ltd, the main contractor for the refurbishing work to the building named ‘158 Cecil Street’. The building fronts the busy Cecil Street and with the occupancy of the building, “makes day work almost impossible, and we were confined to doing preparatory and setting-up work, and most of the work was done at night. The situation was further augmented with a surprise – a row of brickwall from level four to level nine turned out to be reinforced concrete wall which required four weeks to demolish instead of the two weeks that was initially scheduled,” added Patrick Lai who is the Managing Director. Another major challenge was access to the then existing mesh façade for dismantling work, “This was made possible only after the fabrication of a maintenance walkway that incorporated the brackets for the gondolas, and we had to work from top down.”





### THE GARDEN OF TRANSFORMATION

From the pavement and road levels, you can somewhat ‘see’ that the hanging garden and atrium are visually linked via the glass floor and physically interconnected creating aesthetic interests and presenting a ‘cathedral-like spatial’ atrium space when viewed from the pavement. The water feature at the entrance of this 14-storey building to the atrium beckons welcome as I entered the now lively and inviting atrium. The building was first completed in 1984 and was environmentally non-responsive. “We have seamlessly integrated all surfaces, camouflaging existing structural elements and designed a unique ‘layered-façade’ that allows natural ventilation and smoke to disperse,” said Kelvin Kan, Principal Architect at AgFacadesign as he ushered me into the lift to begin my tour of 158 Cecil Street. “And the view of the façade at night can be quite stunning,” added Kelvin, a Chartered Architect in UK and Singapore, who has ventured into structural glass design and the curtain wall industry.

The hanging garden, the lush foliage and green walls have become a haven of biodiversity where the birds, butterflies and insects have come to visit. “Some birds have even decided to set-up home on one of the green wall! But the nest had to be removed for cleanliness and safety concerns,” said Kelvin.

WE TOOK TWO MONTHS TO PRE-GROW THE PLANTS, AND THE 14 SPECIES OF PLANTS HAD TO BE SELECTED IMMEDIATELY AFTER THE CONTRACT WAS AWARDED TO US. WHAT ADDED TO THE CHALLENGE OF THE PROJECT WAS THE NEED FOR DIFFERENT SOIL MIX REQUIREMENTS FOR DIFFERENT PLANTS.

COLLEEN WU  
Managing Director, Consis Engineering Pte Ltd

### CAPACIOUS IRRIGATING TASK AUTOMATED

A total of 14 species of plants in 13,000 potted plants are used to install the green walls and green columns, which take up 135% of the atrium floor plate area with another 70 m<sup>2</sup> comprising of 2,500 hanging plants in horizontal planter beds. The plants are watered by water tanks situated on level 10 via individual drip tubes controlled by an automated irrigation system. There are 32 irrigation zones installed with precision drip system catering to each pot of plant, and programmed to deliver precise amount of water according to the water needs of each species of plant. The green walls and green columns that expanded the spatial connectivity of the building are strategically placed to visually permeate the glass floors to link the 7<sup>th</sup> storey hanging garden to the road pavement below. Access for

maintenance is provided by concealed platforms and ladders behind the green walls and green columns.

“We took two months to pre-grow the plants, and the 14 species of plants had to be selected immediately after the contract was awarded to us. What added to the challenge of the project was the need for different soil mix requirements for different plants,” said Colleen Wu, the Managing Director of Consis Engineering Pte Ltd, the company responsible for installation of the vertical green walls, green columns, planting of the hanging plants as well as the commissioning the irrigation system which is a patented product proprietary to Consis Engineering.



THERE WERE MANY CHALLENGES THAT WE HAD TO OVERCOME WHEN INSTALLING LIGHTINGS FOR THIS BUILDING. KEY CONCERNS WERE ENERGY CONSUMPTION – THE LIGHTING FIXTURES HAD TO BE HIGHLY EFFICIENT WITH LOW ENERGY CONSUMPTION, WE HAD TO ACHIEVE GOOD LIGHTING PERFORMANCE WITH MINIMAL GLARE AS WELL AS SELECTING SUITABLE LAMPS TO MIMIC THE SUNLIGHT TO SUPPORT PLANT GROWTH.

RAYNE ANG  
Director, Illum-Tec Pte Ltd



#### BRING IN THE LIGHTS!

Contributing to the growth of the plants are the plant growth lightings that are programmed to switch on daily from 8 am to 7 pm, with accents lightings roster to take over from 7.30 pm to 10 pm to create the 'glowing lantern' of hanging garden by night. "There were many challenges that we had to overcome when installing lightings for this building. key concerns were energy consumption – the lighting fixtures had to be highly efficient with low energy consumption, we had to achieve good lighting performance with minimal glare as well as selecting suitable lamps to mimic the sunlight to support plant growth," explained Rayne Ang, Director of Illum-Tec Pte Ltd, the company that designed and supplied the lights, when I asked him what challenges he faced with the lightings of the green walls, green columns and the hanging garden.

Despite the constraints posed by the very tight spaces amidst the unique and irregular layout of the plant troughs (stacked up diagonally from the fifth to the ninth floors), a slanted green wall and the walkways spanning across even floors, mounting of the lights were done in an aesthetically pleasing manner. A total of 103 pieces of floodlights with 53 pieces of linear fluorescent were used as growth lightings. The accent lightings were created using 40 spotlights, 12 pieces of linear fluorescent, 90 pieces of linear LED fixtures and 536 pieces of individual LED nodes.

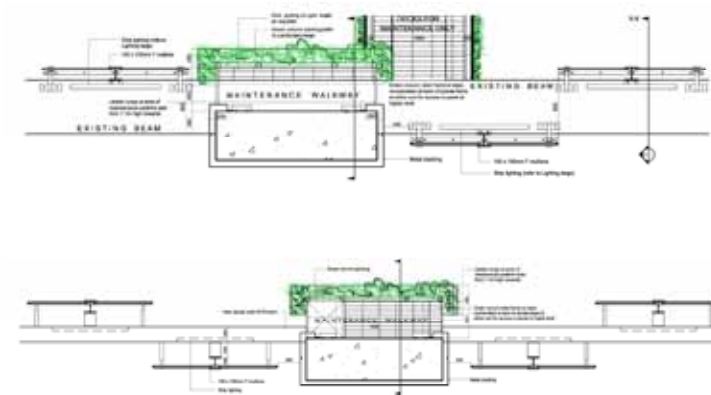






IT TOOK US FOUR MONTHS TO COMPLETE THE PROJECT AND TRANSFORM THIS ORIGINALLY STARK AND BORING BUILDING INTO A GREEN AND GARDEN-LANDSCAPED BUILDING WITH A FRESH AND VIBRANT AMBIENT. IT IS ONE OF THE SIMPLEST BUT CREATIVE FACADE I HAVE DESIGNED TO FACILITATE A "HANGING GARDEN" AS A STRUCTURAL GLASS, FAÇADE CONSULTANT AND ARCHITECT.

**KELVIN KAN**  
Principal Architect at AgFacadesign



### BIRTH OF THE 'HANGING GARDEN'

With no horizontal landscape area within the building but only for the existing half-round planters stretching across 7-storeys, Kelvin conceived the idea of a 'hanging garden' within the existing architectural void completing the design of a 'layered-glass' façade.

The challenge then was to provide for natural elements that are essential for plant growth and plant survival in the building. The layered-glass façade was the innovative solution to meet this particular challenge.

Spaced 900 mm apart, alternating glass panels were clipped onto the sides of the central I-Mullion and extended to adjacent bays on every floor over the facade, to enable the necessary ventilation and for rain to drizzle through but not too excessively to damage the plants and wet the floors.

And, to avoid the requirements for sprinklers, fire fighting or smoke extraction systems, the external atrium space needs to be naturally ventilated to meet local authorities' fire, smoke and ventilation regulations. "Although the existing open metal mesh did satisfy the authorities, aesthetically it did not meet the new owner's specifications," explained Kelvin on his innovative solution to meet regulations of the relevant authorities and at the same time to keep his client happy.

### A FAIRY TALE REPEATED – THE UGLY DUCKLING

Kelvin answered with beaming pride when I asked how long it took for him to complete the project. "It took us four months to complete the project and transform this originally stark and boring building into a green and garden-landscaped building with a fresh and vibrant ambient. Thanks to a professional and competent team I worked with, we overcome the challenges and created this masterpiece of biodiversity and eco-friendly and sustainable façade, transforming a once ugly duckling to a graceful swan!"

I must say it was an amazing feat to have completed the project in four months. This is about the only impressive green and garden-landscaped building along the financial and business district of Singapore. I hope more building owners, and developers, will follow suit to garden-landscape their respective buildings in the CBD to give workers a more vibrant, fresh and rejuvenating environment to work in.



### LAI YEW SENG PTE LTD


Established for more than four decades, Lai Yew Seng Pte Ltd is a dynamic and professionally experienced multi-discipline engineering company with structural steel fabrication and erection as its core business. The company has achieved a respectable and reputable track record in the market place by meeting customer needs and exceeding expectations.

### ILLUM-TEC PTE LTD

Helm by a professional lighting supplier and creative lighting designer of twenty years experience, Illum-Tec Pte Ltd has competently managed turnkey lighting projects for both commercial and industrial projects. With a business strategy of direct-to-market, and prompt time-to-market processes, projects are delivered with substantially lower costs but never compromising on the quality of the lighting installations.

### CONSIS ENGINEERING PTE LTD

With OHSAS 18001:2007 Certification and a patented, proprietary precision irrigation system for green walls and green columns, Consis Engineering Pte Ltd is well poised to provide quality and innovative solutions to green wall and green column installations. Committed to ensuring a sustainable environment, Consis Engineering also provides cost-effective maintenance of green walls and green columns.

 The Editor thanks Kelvin Kan of **AgFacadesign** ([www.agfacadesign.com](http://www.agfacadesign.com)) for providing the information for this article. Photographs courtesy of: Ben Kan/Amir Sultan/Faradilla Zakaria/Kelvin Kan.