

# CapitaGreen: The Green Jewel of the Central Business District

Text by secretariat of Council on Tall Buildings and Urban Habitat, with assistance from CapitaLand Limited, Takenaka Corporation, Toyo Ito & Associates, Architects, and RSP Architects Planners & Engineers

Images courtesy of CapitaLand

Additional images as credited

## Project Credits

Location 138 Market Street, Singapore  
Client CapitaLand Limited, CapitaLand Commercial Trust and Mitsubishi Estate Asia  
Completion Date 2014  
Design Architect Toyo Ito & Associates, Architects  
Project Architect/Structural Engineer RSP Architects Planners & Engineers Pte Ltd  
Structural Engineer (Concept) Sasaki and Partners  
Main Contractor Takenaka Corporation  
Quantity Surveyor Langdon & Seah (Singapore) Pte Ltd  
Mechanical & Electrical Engineer Squire Mech Pte Ltd  
Landscape Architect Sitetectonix Pte Ltd  
Façade Consultant/ESD Consultant Arup Singapore Pte Ltd  
Lighting Consultant Lighting Planners Associates (Singapore) Pte Ltd  
Interior Designer Mitsubishi Jisho Sekkei Inc  
Site Area 5,478.5m<sup>2</sup> GFA 82,003m<sup>2</sup>



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シンガポールはかつて森が茂った。  
私は新しい建築によって森を  
再生したい。

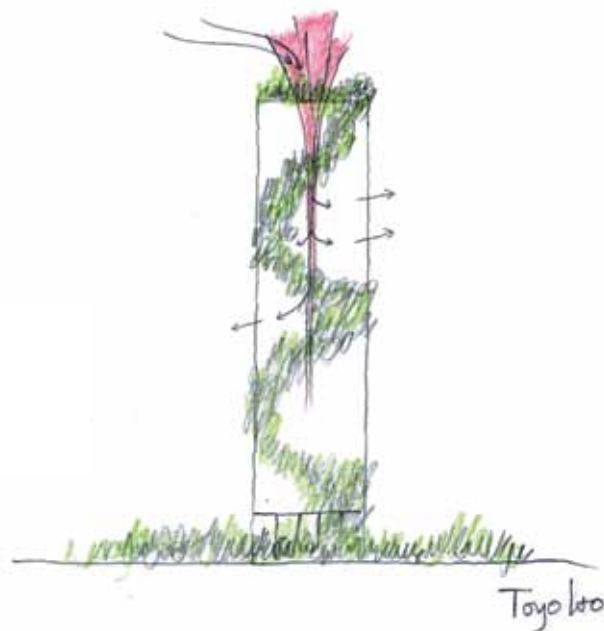
私は生命体のように  
呼吸する建築をつくりたい。

空に向かって上昇する植物の  
ような建築。それがMSTである。

Singapore was once a sumptuous forest.  
I wish to resurrect this forest by means of  
new architecture.

My aim is to create architecture that  
breathes like a living organism.

MST (Market Street Tower) is a piece of  
architecture that is like a plant growing  
towards the sky.



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CapitaGreen, a high-rise office tower jointly developed by CapitaLand Limited, CapitaLand Commercial Trust and Mitsubishi Estate Asia, is located within Singapore’s Central Business District and in close proximity to downtown Marina Bay. Its distinctive features are its lush greenery and expansive space, designed to reconnect people to nature. The tower endeavours to reintroduce the kind of lush greenery on the site in the past, before intense urbanisation took over. It is an unconventional and welcome addition to Singapore’s Central Business District. Conceptualised as a living, breathing tree, CapitaGreen lives up to its name as a green icon, not just through its plant-covered façade, but also through its many eco-friendly features, from its structural and interior design to its construction methods.

The building rises like a plant growing towards the sky. Verdant vegetation covers more than half of the perimeter of its façade, giving the building its iconic green appearance. Its double-skin façade features an outer layer of frameless glass and an inner envelope of double glazed floor-to-ceiling glass that reduces solar heat gain by up to 26 percent. The vegetated façade, placed within the double skin, provides potential for environmental and psychological benefits, as well as solar shade. The high-performance glass façade, coupled with the cooling effect from the surrounding greenery, results in less energy required to keep the building cool.

Greenery can be found throughout the building, including the sky gardens on three separate levels. The “living wall” joins an array of communal gardens, culminating in the impressive

Sky Forest for a thoroughly botanical experience. Located on levels 5, 14, and 26, these sky terraces bring the outdoors into the building, offering tenants a quiet reprieve from the bustling city below.

One of the building’s key concepts lies in a large and highly distinctive petal-like structure that crowns the tower. Resembling a vivid red tropical flower, it acts as a wind scoop to draw in the cooler, cleaner air from above the building and channels it into an inner duct called the “Cool Void”. This mechanism then supplies fresh cool air to the building’s air conditioning system, resulting in less energy that is required to cool the building. Local tropical plants within the Sky Forest on the rooftop also create a cooler microclimate around the wind scoop and helps cool the surrounding air to be drawn into the building.

Greeting those entering the structure is an expansive lobby that has a triple-height ceiling and handcrafted *kakiotoshi* (earth plaster) walls. An

1. CapitaGreen stands out with its striking green façade.

2. Toyo Ito’s concept sketch of CapitaGreen, which was designed as a plant growing towards the sky (Image: Toyo Ito & Associates, Architects).




artwork installation by world-renowned artist, Olafur Eliasson, integrates with the architecture to create a sheltered public plaza. In the offices, tenants are afforded uninterrupted views of the Marina Bay and Singapore skyline. High ceilings, with a raised floor-to-ceiling height of 3.2 meters, provide tenants flexible workspaces, and the large windows allow natural light to stream into the building. This gives the offices a sense of openness and reduces the need for artificial lighting. The typical floor plate ranges from 20,000 to 25,000 square feet.

Visitors and tenants who use the office premises will be delivered to their destination floors through an energy-efficient elevator service. The elevator integrates a strategic selection of destination control services and regenerative drive technologies, which greatly benefit the building's crowd management by delivering visitors to their destinations in the quickest and most energy-efficient way possible.

The tower also employed various innovations in technology to achieve a shorter construction timeline. It was built using the top-down construction method, which means the building's basement and superstructure can be constructed simultaneously. A special Grade 100 ultra-high strength concrete that sets quickly, "Supercrete", was used, significantly reducing the amount of concrete needed and resulting in an overall savings in energy, labour, and

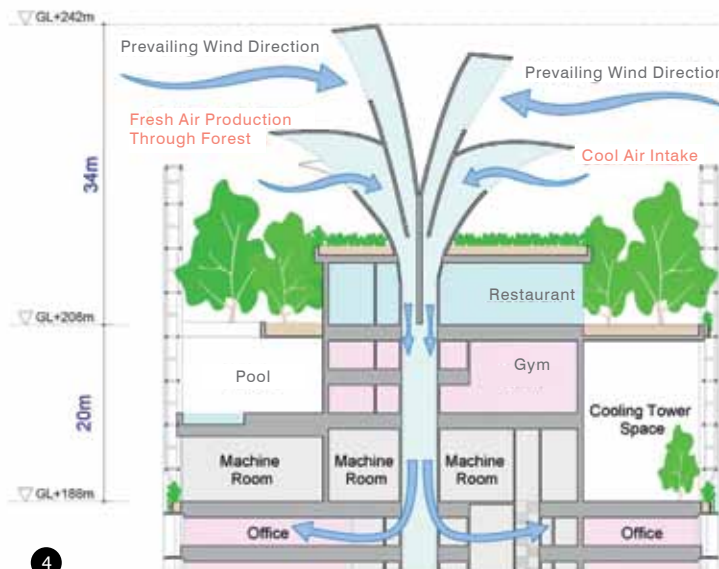
time. "Supercrete" was used for the precast columns in the middle section of the tower and was employed in the construction of 29 columns per floor across 6 floors of the building.

The upper section of the tower uses precast columns of Grade 80 concrete, while the lower section uses a composite steel-concrete structure. Thus, the peripheral columns can be of a constant size from the base to the top of the tower. The use of a hybrid of steel and precast construction technology, coupled with the extensive training of workers, reduced the typical floor cycle time from nine days to six days per floor.

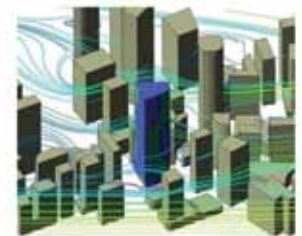
CapitaGreen's environmentally conscious design earned it a Green Mark Platinum Award in 2012, the highest grade awarded by the Building and Construction Authority of Singapore. 

**Sky Forest Section**

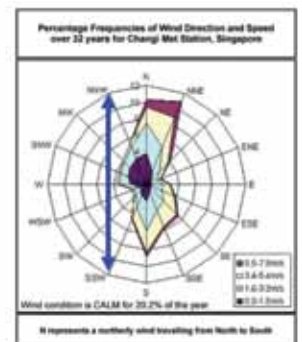
The principle is that a jet of air is produced by the upper funnel and sky forest air will be entrained in from the lower openings.



**Wind Analysis**



**Characteristic Wind Flow**



- 3. The building façade is clad with perimeter planters filled with shrubs (Image: Takenaka Corporation).
- 4. A diagram of the "Cool Void", which channels cooler air from above the building to its lower levels (Image: Toyo Ito & Associates, Architects).
- 5. Sky terraces on levels 5, 14, and 26 offer a quiet space of reprieve for tenants.
- 6. A view of CapitaGreen at night.
- 7. A wind funnel on the rooftop draws cool air into the building, which results in energy savings.
- 8. An artwork installation by Olafur Eliasson is integrated into the architecture.

