

Title: **Oasia Hotel Downtown, Singapore: A Tall Prototype for the Tropics**

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A Tall Prototype for the Tropics



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Mun Summ Wong is the co-founding director of WOHA. He graduated from the National University of Singapore (NUS) in 1989 and is now a Professor in Practice at his alma mater. He has mentored students under NUS' Embedded Studio in Practice program and anchored the University's MSc in Integrated Sustainable Design Masterclass since 2011. WOHA's Platinum Green Mark-rated Parkroyal on Pickering has become one of Singapore's most iconic buildings, receiving the 2015 CTBUH Urban Habitat Award. Four monographs have been published on WOHA's projects to date. "Garden City Mega City", a summation of the firm's template for rethinking architecture and cities for the 21st century, was published in 2016, followed by an exhibition tour.

Richard Hassell is the co-founding director of WOHA. He graduated from the University of Western Australia in 1989, and was awarded a Master of Architecture degree from RMIT University, Melbourne, in 2002. He has served as a Board Member of DesignSingapore Council, the Board of Architects, as well as the Building and Construction Authority of Singapore. He has lectured at many universities, and served as an Adjunct Professor at the University of Technology Sydney, and the University of Western Australia.

Hong Wei Phua joined WOHA upon graduation from National University of Singapore in 2006. He was promoted to Associate in 2014 and made Director in 2018. Hong Wei has been involved in a variety of projects, notably Crowne Plaza Changi Airport Hotel, Kampong Admiralty, Oasia Hotel Downtown and Enabling Village. He is currently working on a 340-room hotel and a 730-unit condominium building, both in Singapore.

Abstract

Oasia Hotel Downtown (see Figure 1) is a prototype of land use intensification in the tropics. Unlike the sleek and sealed skyscrapers that evolved in the temperate West, this tropical "living tower" is designed to soften the hardness of the city and to reintroduce biodiversity into the urban jungle.

Responding to the client's requirement for distinct offices, hotel and club rooms, the tower comprises lushly landscaped sky terraces, inserted in naturally ventilated breezeway atria between room blocks. These provide guests and occupants generous amenity spaces throughout the high-rise with dynamic internal views that frame, soften and distance the surrounding dense urban fabric.

Keywords: Green Walls, Mixed-Use, Sustainability, Urban Habitat

From Vertical City ...

The relentless tide of rapid urbanization and overcrowding in cities has caused green, open and civic spaces to shrink at an unprecedented rate, while chronic traffic congestion and pollution further compound the city's environmental conditions. Cities have become harsh concrete jungles with densely-packed vertical structures and reduced green spaces. Buildings are in a constant race to extend vertically. This pressure is exacerbated by the short-term, superficial requirements of private capital and investment, which mostly translates to inward-looking towers with a diminished public realm, or glossy sculptures that vie for height and symbolic status.

The modern tower has evolved as a suite of engineered solutions and financial efficiencies – maximized volume-to-surface-area ratios, compact centralized core, open-plan floor plates and high-performance, shiny skins. Inhabitants are kept comfortable by mechanical means. While boasting efficient structures and systems, buildings still account for nearly 40% of global energy consumption; of this, up to 60% is consumed by the common areas in buildings.

In a "vertical city," people are stratified and confined, leading increasingly insular lives, with minimal contact with nature.

... To Garden City

Since 1994, the authors have produced a series of projects that explore reintroducing nature into buildings and cities, not only for human comfort, but also to improve the quality of the environment.

"Re-greening" is vital to address the problem of urban heat islands and global warming. Re-greening can make cities net positive contributors to the environment and for climate stabilization. Re-greening also restores biodiversity into cities and keeps the natural balance of ecosystems and wildlife habitats.

The modern tower, as a building block of cities, can be reinterpreted as infrastructure, with greenery and amenities that support and contribute to the overall urban environment. It can be systemically incorporated as part of the master plan and an overall urban design for reinvigorating cities. By incorporating greenery beyond the ground plane, buildings can become biophilic environments that visually and emotionally engage the inhabitants and public. Research into biophilia shows that there is an innate relationship between humans and nature, and that humans have a fundamental need to be continually connected to nature in order to maintain a sense of positive well-being, productivity, creativity and delight. The availability and



Figure1. Oasia Hotel Downtown, Singapore. © K Kopter

experience of green environments make cities more humane, healthy and livable.

Imagine cities filled with high-rise greenery and public amenities in the sky. Imagine Ebenezer Howard's Garden City principles hybridized with the megastructures and organic growth patterns championed in the Metabolism movement. Threads of this alternative conception can be found in the tropical city of Singapore.

“With the cores located in the corners, the sky terraces allow a unique 360-degree view through gardens to the city, which would not have been possible with a typical center-core tower.”

Singapore, A City in A Garden

Singapore has over the last 50 years continued to reinvent itself relentlessly, evolving from the early nation-building aspiration of becoming a “Garden City” (i.e. having gardens in a city) to a vision of a modern “City in a Garden” (i.e., a city nestled within a large garden).

According to Treepedia, a collaboration between the Massachusetts Institute of Technology (MIT) Senseable City Lab and the World Economic Forum’s Global Future Council on Cities and Urbanization, Singapore has the highest density of greenery based on a list of 17 cities (see Figure 2) and is the only Asian city on the list (Treepedia 2018). Treepedia uses Google

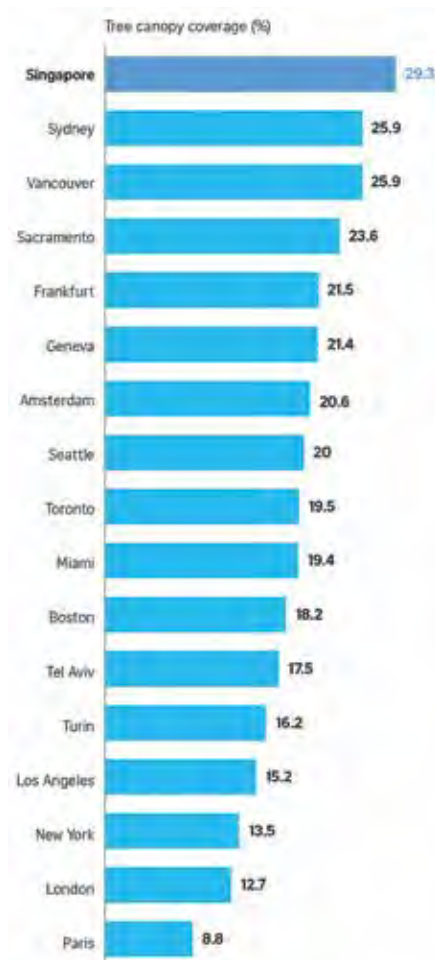


Figure 2. Cities surveyed by Treepedia on green canopy coverage. © The Straits Times, February 22, 2017. Source: Treepedia.

Street View data to measure the above-ground portion of trees and vegetation.

The greening effort has extended beyond the ground plane to vertical and skysrise greenery. Amongst the many guidelines and mechanisms to incorporate more greenery, Singapore’s Urban Redevelopment Authority (URA) introduced the LUSH (Landscaping for Urban Spaces and High-Rises) program in 2009 to “capitalize on development as a means to inject more greenery into the city”, based on the premise of “replacing the greenery which has been taken away as a building is developed or redeveloped”. In its latest version, it introduces a Green Plot Ratio (GPR) standard as a “measure of the density of greenery within a site” (URA 2018).

The island currently boasts 182 high-rise greenery developments, achieving 80 hectares in area. This is expected to increase to 200 hectares by 2030.

The city’s urban fabric and architectural realm have seen interesting and iconic developments that blend artificial and natural greenery. The garden momentum has never relented, enabling Singapore to attain sustainable green coverage and to stay ahead of the curve in creating a livable city in a garden. In this light, the high-rise typology in Singapore has been evolved from the western model to better acclimatize to the culture and climate of the tropics.

Oasia Hotel Downtown: An Oasis

Located in the heart of Singapore’s Central Business District (CBD) and overlooking the historic Tanjong Pagar district, Oasia Hotel Downtown is distinctive in its expression, forming a spectacle of architectural design and engineering.

Hemmed in by high-rises, the 191-meter tower rises up from the tree-lined streets as a verdant tower of green, presenting an alternative imagery against the concrete and glass cityscape. It offers a vision of a new typology for the tropical skyscraper – one that is suited to the local climate, with

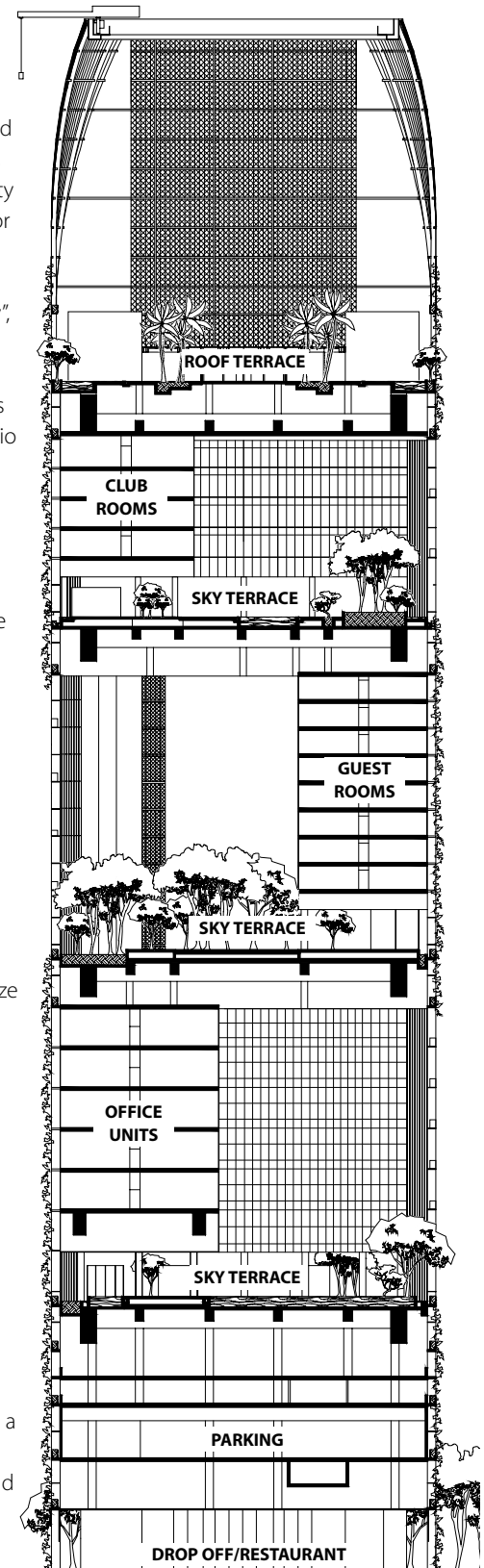


Figure 3. Oasia Hotel Downtown, Singapore – section.

internal breezeway atria, multiple sheltered terraces, sky gardens and vertical greening.

Opened in April 2016, the tower has quickly become a beacon of nature and an oasis in the city's dense surroundings.

Integrating Mixed Uses

The brief called for three distinct components – strata-titled offices, standard hotel guest rooms, and club guest rooms – within a single tower on a tight 47-by-47-meter site. Although housed within a single building, the office and hotel/club components needed to be separated from each other for security, as they cater to different user groups. The hotel and club operate separately under the Oasia brand, with a shared back-of-house.

The conventional solution would have been to deploy a central core with an apron of exterior-facing offices and guest rooms. This arrangement inevitably puts pressure on the separation of vertical circulation paths to serve the office, hotel/club, hotel back-of-house, and services.

Instead, to free up the ground plane, the design elevates the hotel back-of-house to the third story, and the car park to the fourth and fifth stories. In doing so, much of the ground is given to the drop-off, arrival lobby, all-day-dining restaurant, bar, and concierge, so as to activate the public realm along three of the four frontages.

The design resolved the programmatic segregation issue, simply by splitting the cores, sending the vertical circulation and services to the four corners and stacking the three programs in separate L-shaped blocks. The “elbow” of each block is flipped to the opposite corners to orientate to different parts of the city. Each block is served vertically at the corners. This opens up the center of each block as a breezeway atrium. Sky terraces, equivalent in area to the building footprint, are inserted between each stack, offering generous landscaped and amenity decks (see Figure 3).

Sky Terraces

With the cores located in the corners, the sky terraces allow a unique 360-degree view through gardens to the city, which would not have been possible with a typical center-core tower. Despite the limited footprint, public areas the size of the ground plane are multiplied four times throughout the tower. The planting that surrounds and stretches all the way to the edge of each sky terrace reinforces the impression of the ground.

A dedicated core next to the drop-off on the ground level brings the occupants directly up to the sky terrace on the sixth story and the offices at the seventh through 11th story. The sky terrace is an open-plan living room shared by the offices with casual and formal meeting spaces, lounge, gym, and lap pool (see to Figure 4).

Another dedicated core brings the guests to the sky terraces at the 12th and 21st stories respectively. Guests check in at these two sky terraces instead of at the ground level. Here, guests navigate horizontally across the length of the sky terrace to another set of

lifts to transfer to the hotel and club guest rooms located on the 13th–20th and 22nd–26th stories respectively. This horizontal transfer within landscaped sky terraces gives the guests a unique garden experience in the dense CBD.

The sky terrace at the 12th story is a garden veranda, with an activity courtyard bordered by a patio with a pergola, lounge seating and a function room, and surrounded by greenery (see Figure 6).

The sky terrace at the 21st story is designed as an urban resort in the city, with a stepping deck connecting an infinity pool, executive lounge, open hall, water gardens, and planter beds (see Figure 7).

The roof terrace at the 27th story is anchored by a specialty restaurant, flanked on both sides by sun decks and lap pools (see Figures 8 and 9). Mechanical and electrical equipment typically found at the rooftop is instead fitted along two sides and below the floor.

By dividing the tower into vertical segments, the sky terraces provide not only multiple



Figure 4. The sky terrace at the sixth floor provides a porous urban living room for the office floors.
© Patrick Bingham-Hall



Figure 6. The sky terrace at the 12th story, serving the hotel, forms an urban veranda. © Patrick Bingham-Hall



Figure 7. The sky terrace at the 21st story serves the hotel floors, and features a large pool. © Patrick Bingham-Hall

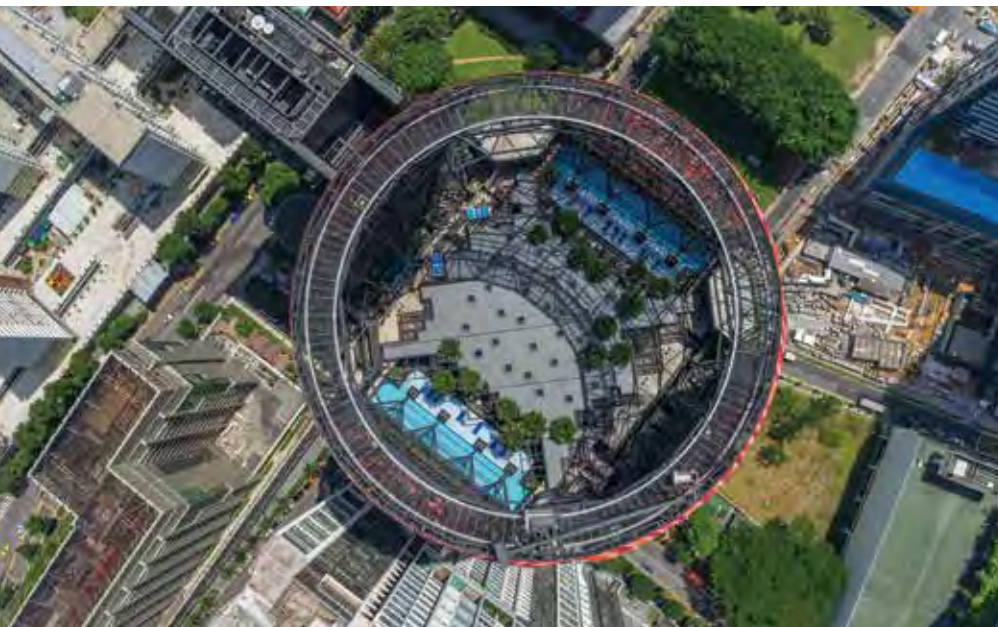


Figure 8. View of rooftop pool deck and enclosure from above. © K Kopter

elevated grounds for greenery and amenity, but also create legible human-scale environments in the sky.

Breezeway Atria

The L-shaped blocks, set onto a square plan, result in 21-to-35-meter-tall breezeway atria at each sky terrace. The sky terraces also serve as huge overhangs, directly shading the terrace below. Open-sided, the atria are cross-ventilated from all directions, aided by a natural funneling effect.

Each atrium achieves an approximate 1:1 height-to-depth ratio, affording a bright and airy environment with daylight and cross breezes, coupled with evaporative cooling from water and shading from greenery. The atria also carve out spaces that offer dynamic internal garden views, while framing, softening, and screening the surrounding dense urban fabric.

Instead of being enclosed, air-conditioned and artificially-lit spaces, the atria are comfortable, sheltered volumes with natural light and fresh air, in contrast to the hermetically sealed buildings elsewhere in the CBD (see Figure 10).

Living Screens

The tower has neither a solid mass nor a full-height curtain wall. The stacked blocks and terraces are enveloped by 25,000 square meters of expanded aluminum mesh screens. About 1,800 prefabricated fiberglass planters are located on every story, abutting the screen so that creeping vines are only required to climb three to five meters before overlapping with the next tier of planters. Over time, the vines will spread over every surface (see Figure 11).

Landscaping is used as the architectural environment filter and material palette, not as a cosmetic add-on. As an envelope, the greenery and the screen function as filters that provide shade, reduce heat, dampen noise, cut out glare and dust, and improve air



Figure 9. The roof terrace at the 27th story supports sun decks and pools, and is surrounded by a tapering enclosure, extending the green skin of the tower.
© Darren Soh

quality. As a finish, the screen is a composition of five colors – red, dark red, pale pink, fuchsia, and orange – a range that mimics the natural color variation in plants as they shoot, mature, and die off. The screen will eventually recede behind greenery and will appear as a background of varying color accents, like flowers within the vertical foliage.

The color and texture of the façade change with light and shade, rainfall, and natural cycles of plant life. Through this, the tower becomes a living artwork of nature.

Man-Made Ecosystems

Twenty-one species of creepers were selected and distributed across the façades, based on their sunlight requirements, rate of growth,

density of coverage, texture, and color. Some species produce colorful flowers that attract birds and insects at different times of the year. With the façade coming close to existing roadside trees and landing at ground level, the building extends those existing roadside habitats vertically (see Figure 12). Together with 33 different species of trees and shrubs planted on the sky terraces, there are a total of 54 species of plants within this living tower. The variety of plants also provides natural resilience against disease-carrying and destructive insects.

To ensure the practicality and ease of maintenance of the greenery, cat ladders, and catwalks are incorporated alongside the planters so that there is safe and direct access, without the need for ropes, maintenance personnel and gondolas (see



Figure 10. Oasia's open-sided, cross-ventilated breezeway atria contrast with the hermetically sealed towers in the immediate neighborhood. © K Kopter

Figure 13). All planters are watered by an automatic irrigation system to avoid wastage.

Like a tree, the tower breathes, metabolizes and photosynthesizes. It protects and shelters, creating natural habitats and attracting biodiversity. And by doing so, it hosts ecosystems as well as programmatic spaces, allowing nature to co-exist with buildings.

A Prototype for Livability and Sustainability

With all green and blue surfaces amalgamated, the tower achieves an unprecedented overall GPR of 1,100%. Put another way, it provides 10 times as much greenery to the plot as was originally on the

undeveloped site. It effectively compensates for the lack of green in 10 additional sites of equivalent area.

Beyond this, the tower demonstrates generosity and good citizenship by giving back to the city. Within the building, people are surrounded by nature. Around the building, the vertical green screens and landscaped sky terraces provide a welcome respite to the built urban environment. The tower is a biophilic three-dimensional environment that heightens the human experience of nature – within the building interior or as the next-door neighbor, up close at the urban street level, from afar at the city level – bringing a sense of beauty, poetry, surprise, discovery, and delight to everyday life.

Conclusion

It is important to see architecture as more than a collection of seductive forms and façades and to bring the attention back to architecture's capacity to create human-centric environments. Oasia Hotel Downtown is a striking spectacle, yet it is also environmentally friendly, culturally appropriate, and climatically sustainable.

It is a prototype that reimagines a tall building as a responsible, livable and sustainable high-rise environment that contributes to the city on different levels.

At the building scale, it makes land-use intensification beneficial, with its high-rise



Figure 11. Creeper vines, planted in 1,800 fiberglass planters along the building's exterior, have grown steadily over less than two years, covering several of its surfaces. © Patrick Bingham-Hall

tropical spaces, garden-facing layout and porous living skin. It sets new precedents by integrating and maximizing vegetation within high-rises. It demonstrates the possibility of a more balanced coexistence between city and nature, engaging and benefitting people both within and outside the building.

At the urban scale, it shows that tall buildings can offer meaningful and fulfilling urban habitats beyond the ground plane (see Figure 13). It demonstrates that buildings can be important components in improving

the quality of green open space, community space and biodiversity in cities. It provides a template by which private real-estate interests can contribute to the common good of the people, the city, and the climate.

With cities in the tropics continuing to intensify in order to accommodate population growth, their amenities are reliant on the contributions of each new development. Oasia Hotel Downtown offers a prototype for the interaction of the high-rise and the urban habitat with adaptability, resiliency and generosity, and shows that density can be open, green and social (see Figure 14).

Oasia Hotel Downtown was the winner of the **Best Tall Building Worldwide** at the 2018 CTBUH Awards Ceremony and Dinner. Find out more at: <http://awards.ctbuh.org/winners/>. It will also be featured in the upcoming CTBUH Urban Habitat Technical Guide *The Space Within*. ■

Unless otherwise noted, all photography credits in this paper are to WOHA Architects.

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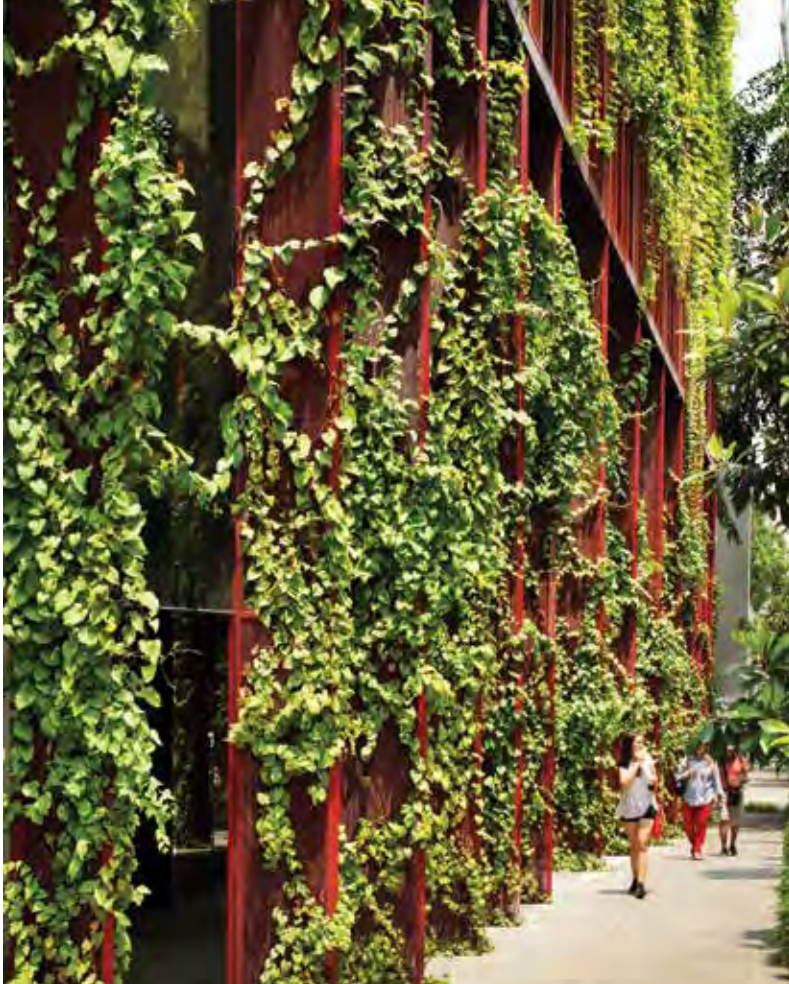


Figure 12. The tower's greenery extends to street level, connecting it with existing urban and natural habitat. © Patrick Bingham-Hall



Figure 13. The façade structure consists of a maintenance catwalk, fiberglass planters and an expanded mesh screen.

References

TREEPEDIA. 2018. "Treepedia: Exploring the Green Canopy in Cities around the World." Accessed May 2018. <http://senseable.mit.edu/treepedia>.

URBAN REDEVELOPMENT AUTHORITY (URA). 2017. "Updates to the Landscaping for Urban Spaces and High-Rises (LUSH) Programme: LUSH 3.0." <https://www.ura.gov.sg/Corporate/Guidelines/Circulars/dc17-06>.

Project Data

Completion Date: April 2016

Height: 191 meters

Stories: 27

Area: 19,416 square meters

Primary Functions: Hotel / SOHO

Owner: Far East SOHO Pte Ltd

Developer: Far East Organization

Architect: WOHA Architects (design)

Structural Engineer: KTP Consultants Private Limited (design)

MEP Engineer: Rankine & Hill Consulting Engineers (design)

Main Contractor: Woh Hup Pte Ltd

Other CTBUH Member Consultants: Rider Levett Bucknall (quantity surveyor); Windtech Consultants Pty Ltd (wind)



Figure 14. The building represents an intersection of three Singapore typologies: The modern skyscraper, the tropical environment, and the thriving life of the streets lined by shophouses. © Darren Soh