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The Hansar, Bangkok

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Case Study: The Hansar, Bangkok



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Wong Mun Summ & Richard Hassell

The architecture of WOHA, founded by Wong Mun Summ and Richard Hassell in 1994, is notable for its constant evolution and innovation. A profound awareness of local context and tradition is intertwined with an ongoing exploration of contemporary architectural form-making and ideas, thus creating a unique fusion of practicality and invention. WOHA conceptualizes all aspects of the architectural process, and environmental principles have always been fundamental to the work of the practice, which is guided by a commitment to responsive place-making and to the creation of an invigorating and sustainable architecture.

WOHA's built projects – throughout Southeast Asia, China, and Australia – range from apartment towers to luxury resorts, mass-transit stations, condominiums, hotels, educational institutions, and public buildings. WOHA has won an unprecedented amount of architectural awards for a Southeast Asian practice: they received the Aga Khan Award for Architecture in 2007 for One Moulmein Rise, they collected four awards in the RIBA International Awards of 2011 and 2010 for Alila Villas Uluwatu, School of the Arts, The Met and Bras Basah MRT Station, and they won the 2011 RIBA Lubetkin Prize and the 2010 International High-rise Award for The Met. As an emphatic indication of WOHA's versatility and global recognition, the practice won two titles in two consecutive years (in four separate categories) at the World Architecture Festival: WOHA are the only architects to have achieved such a distinction. Both Wong Mun Summ and Richard Hassell have lectured at universities in Singapore, Australia, Hong Kong, the USA, and the United Kingdom, and they have served on various design advisory panels in Singapore.

“The concept of a tropical tall building as a naturally ventilated, perforated, indoor-outdoor, fully shaded furry green tower is central to tropical living and a necessary alternative to the temperate models of sealed, glazed curtain wall buildings being erected across tropical regions.”

High-rise, high-density living has been embraced as a positive housing solution for many millions of people living in Asia's growing urban metropolises. WOHA has designed a series of buildings for South-East Asia that expand the way high-rise, high-density living is conceived. Based in equatorial Singapore, WOHA has designed the following completed tropical skyscrapers: The Met, The Hansar, The Pano, 1 Moulmein Rise and Newton Suites. Approaching the design from lifestyle, climate and passive energy strategies, the towers are radical yet simple. This paper focuses on The Hansar, a 45-story hotel and residential development that embodies principles of sustainable and tropical living within dense urban cities.

Bangkok, Thailand

Bangkok, the capital city and main port of Thailand, is a major economic and growing financial center in Southeast Asia with a population of nearly nine million people within a city area of 1,569 square kilometers (605.7 square miles). With the highest volume of vehicular ownership in Asia, Bangkok is one of the most congested cities in the world with notorious traffic jams and high levels of vehicular exhaust emissions resulting in severe air pollution.

A rapidly modernizing community, Bangkok has one of the fastest rates in the world for erecting high-rise buildings, but its construction industry still relies intensively on manual labor and the use of locally available materials, which are far cheaper than imported alternatives. Most existing buildings in Bangkok are designed to resist lateral wind loads only. In the wake of the 9.1 magnitude Great Andaman Earthquake on December 26, 2004 and the subsequent tsunami tragedy, the first seismic design regulations were



enforced in 2007 mandating that buildings above 15 meters (49 feet) tall be designed to accommodate for seismic movement.

Bangkok is situated on a low flat plain of the Chao Phraya River which extends to the Gulf of Thailand. Geographically located 13°45' North (latitude), and 100°28' East (longitude) of the equator, the city's climate is hot and humid with temperatures ranging from 26 to 31°C (78 to 90°F). A normal year is defined by three main seasons, with the cool season occurring from November to February; the hot season from April to May; and the rainy season from June to October. In this environment, being high up where there is more privacy, better views, lower humidity, stronger breezes, better security, less insects, less noise and less dust make external high-rise spaces pleasant, comfortable and desirable. A typical overcast sky also means diffused lighting and many hours of sunlight

that generally reaches into buildings at a height-to-depth ratio of 1:2, which needs to be countered with sufficient shading.

Introduction and Site Context

The Hansar is a "crown property" located in the heart of Bangkok adjacent to the Four Seasons Hotel, just off Sukhumvit Road, which is the city's leading commercial, retail and entertainment district. It is surrounded by major shopping areas, a large city park, high end condominiums and luxury hotels (see Figure 1). The development, conveniently located within walking distance of the Rajdamri BTS Station, encourages a practical way of dealing with Bangkok's urban sprawl and severe traffic jams by permitting higher use of the city's existing public transport infrastructure, its privately run elevated walkways and an improved pedestrian



Figure 1. The Hansar, Bangkok © WOHA

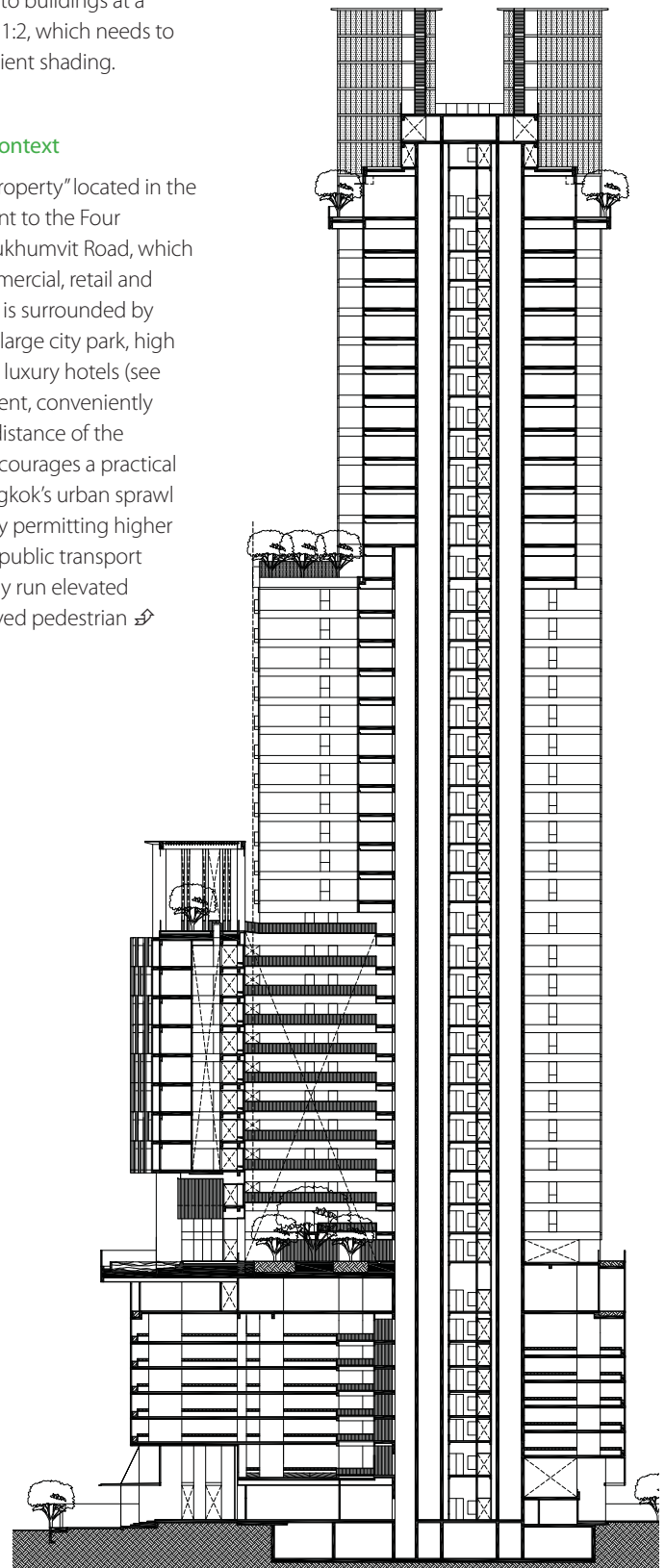


Figure 2. Typical section © WOHA



Figure 3. High-rise landscaping – the sky gardens © WOHA

network. Achieving a building plot ratio of 1:10 on a small and irregular site, the design maximizes the building's area while contributing to the urban environment with its lively street retail. Frontage at ground level engages pedestrians, encourages walking about the city and entices passers-by into its restaurant, bar and outdoor dining garden terrace.

A Humanist Response

Tall buildings in the temperate west evolved as a type that embedded its technological solutions in its DNA. The harsh climate of Chicago and the economic pressures of New York created the modernist tower as an engineered solution, compact cantilevered columns with maximized volume to surface

area ratios, wrapped in smooth shiny skins, with inhabitants kept comfortable mechanically. Aesthetically, culturally and philosophically, these are heroic corporate structures that jostle for height, status and domination of nature through technology. As tall buildings' scale and human scale are vastly different, the challenge of high-rise residential towers is to address the alienation of tall buildings by emphasizing the individual in terms of human scale, choice and comfort, while opening up to the climate, community spaces and nature.

The Hansar was initially conceptualized as a hospitality and residential development. The program was changed mid-way through the design into a fully residential building, but due to its short lease of 30 years and the advantages of its central location, it was ultimately a better business investment to revert to the original brief comprising hotel and condominium (with concierge) components. Under this final direction, the two coexisting programs were eventually developed as clearly distinct components in their planning and operations, but unified in their architectural treatment and form.

The perceived scale of The Hansar was reduced by dividing the 45-story high building into low, mid and high zones and by stepping the towers back against an angled setback from the street level (see Figure 2). The low-rise zone was designed as a slab block; the mid rise zone as a courtyard block; and the high-rise zone was articulated as four individual slender towers surrounding a central service core. The scale of the building was further divided horizontally through the

introduction of sky gardens at every fifth floor, staggered across both the east and west elevations. Creating more stable proportions through these building divisions helps to evoke feelings of comfort rather than the dizzy dynamism of soaring high-rises.

Landscaping was additionally employed to introduce visual cues to scale. Every apartment unit within the rear square residential tower was designed with either a private lift lobby that comes with an entry to the sky garden, or a living room with sky garden views. These cantilevered sky gardens are common spaces that project off the lift lobbies at five-story intervals and are planted with mature frangipani trees that frame the city views and create dramatic yet human-scaled external spaces in the sky (see Figure 3). They also serve as a delightful physical buffer between the apartments thoughtfully designed with windows that focus the gaze into the sky gardens and prevent overlooking into the neighboring unit, thus enhancing the privacy and exclusiveness of the residences. This landscaping device was adopted from the design of Newton Suites, a 36-story condominium in Singapore where sky gardens with fountains, planting and sitting areas were projected off naturally ventilated common lift lobbies every four stories, turning the wait for the lift into delightful daily encounters with fresh air, trees and sky views.

Response to Climate

The Hansar is designed according to the concept that a naturally ventilated, perforated, indoor-outdoor, fully shaded furry green tower is central to tropical living and a necessary alternative to the temperate models of sealed, glazed curtain wall buildings being erected across tropical regions. Many private sector apartment developers, in replicating glossy temperate models, traded sensible low-technology solutions after the 1980s for curtain walled apartments requiring air conditioning and mechanical ventilation to achieve comfort, resulting in a loss of sensible climatic design across the region.

The Hansar rejects this model and instead transforms and adapts vernacular and passive responses to climate into the high-rise form

... expensive

“The most expensive housing in the country, and not just New York City, is in high-density, pedestrian-friendly neighborhoods.”

*Christopher B. Leinberger, professor of practice in urban and regional planning at the University of Michigan on tendencies of people want to settle in “a walkable urban downtown.”
From “Treasuring Urban Oases,” NY Times, December 2, 2011*

and contemporary technologies with the same aim of creating comfort without the need for mechanical systems. The challenge is to open up the high-rise and bring fresh air and nature into a building. That would enable it to breathe within an extremely dense mega-city so that quality living in high-rise buildings is achieved in an imaginative and sustainable way that is authentic to the context of its region, climate and locality.

Therefore, rather than adopting the strong separation of interior and exterior that is characteristic of temperate models, The Hansar explores how aspects of low-rise tropical housing can be applied to create outdoor-indoor spaces in the sky. By organizing the units around a central core and courtyard, coupled with cutting vertical slots with pockets of sky gardens throughout the building height (see Figure 4), cross-ventilation of all apartments and natural ventilation of most bathrooms is achieved. This block arrangement gives all apartments access to light and air on all sides, making it possible to live without the need for air-conditioning. Most apartments are also designed with balconies provided across their frontage. This works in combination with delicate sunshades to keep the interior cool at all times. The condominium apartments and hotel rooms are all accessed off naturally ventilated and naturally lit corridors, reducing the energy use of the building substantially. Six stories of carpark levels are contained within the low-rise block to service the development. These carpark levels are elevated to avoid Bangkok's frequent floods and represent a more sustainable approach than building deep basements. Concealed behind porous breathable walls of draping green, cross-ventilation and natural lighting through the carpark levels are simply and effectively achieved.

The Hansar is orientated facing the best views east towards Lumpini Park and west towards the Turf Club. To negotiate between the desire for views and the need to provide shading, a double layer envelope system was devised. As high-rise buildings in the tropics gain almost their entire solar load from vertical surfaces, rather than its roof, shading of walls is much more effective than insulating the roof.

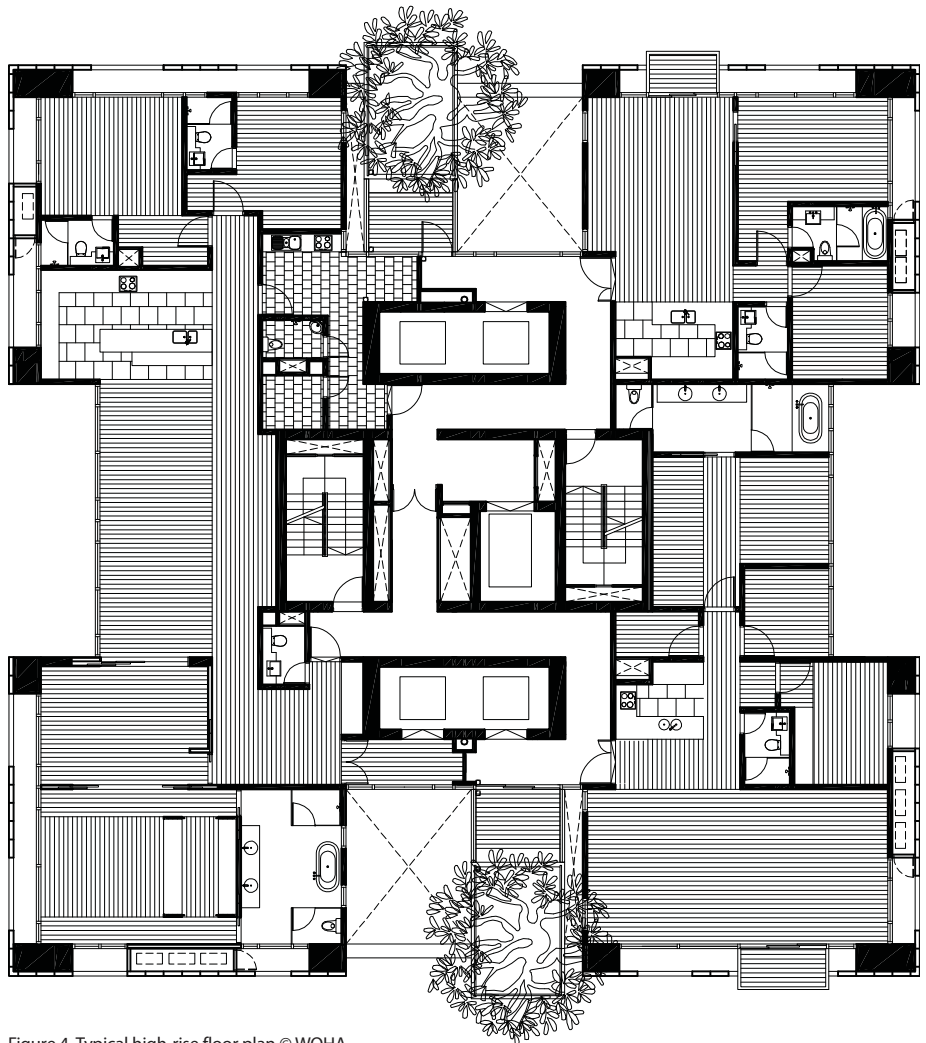


Figure 4. Typical high-rise floor plan © WOHA

The Hansar adopted Newton Suites' use of inexpensive metal mesh, but applied it to its vertical surfaces instead. A porous façade in the form of a metal mesh screen was designed to hang off projected ledges at every floor serving as the building's outer skin regulating light and air throughout its fully shaded vertical surfaces. These external sun screens overlap with the inner window layer of the apartments and also function as privacy screens creating a foreground that frames the city views from within the units and reduce dependency on interior window dressing. Its staggered placement generates visual interest from the exterior while neatly concealing air-conditioning condenser units and services in the background (see Figure 5). The sun screens are specially coated in a metallic bronze color; its golden sheen and floating greenery alluding to the glimpses of



Figure 5. External sun screens © WOHA

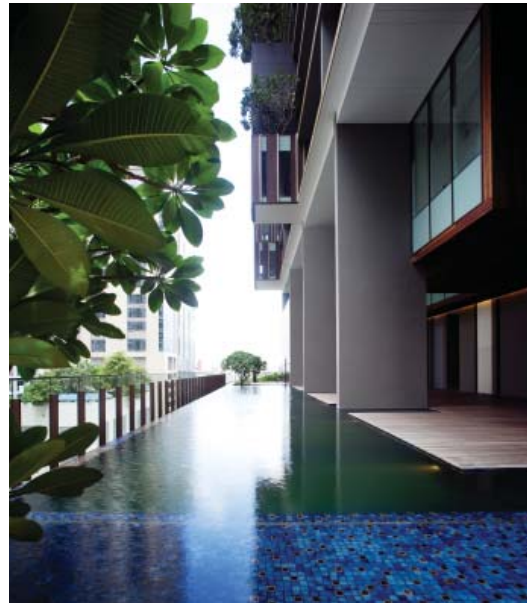


Figure 6. The 8th floor communal recreational terrace © WOHA

gilded Thai temples and luxuriant gardens that hide amongst the concrete jungle of Bangkok. This strong juxtaposition against Bangkok's backdrop of dull colored buildings and grey skies gives the development a uniquely distinct character and is a refreshing addition to the city skyline.

High-rise External and Community Spaces

Given the increased stress on the ground level caused by the rapid growth of urban densities, the design approach treats the ground plane as a duplicable layer of the city

that needs to be replicated at strategic horizontal locations within buildings. This involves the introduction of intermediate levels comprising social and community functions serving as multiple ground levels in the sky. The layering arrangement also creates opportunities to achieve dynamic visual links between buildings and generates multiple covered tropical outdoor spaces.

In The Hansar, inhabited external spaces were developed as both public and private spaces in the sky. An elevated ground level is introduced as a communal recreational terrace on the 8th story comprising a gym and

yoga room, a function deck and a cantilevered swimming pool (see Figure 6). An event terrace is also introduced on the 19th story crowning the hotel. A matrix of private balconies and communal gardens interspersed throughout the tower height further provide residents with personal spaces for reflection and social spaces for interaction, weaving nature into the tapestry of the tropical high-rise.

Incorporation of Nature

Landscape is an important element both from a sustainability point of view and for the end-user's enjoyment. Vegetation is an important part of the material palette for WOHA's high-rise buildings, both internally and externally, thus improving the environmental quality on both the local and city scale.

As the small site limited the potential green areas on the ground level, sky gardens equivalent to 30% of the site area were introduced in The Hansar. Landscaping is incorporated in all the common areas throughout the building. Lower level units have private cantilevered gardens that create a rhythm of green elements running vertically throughout the whole development. Sky gardens, sky pavilions and green walls have been created all the way up the building to increase the landscape area and interaction between interior and exterior. At the hotel, cantilevered sky pavilions project from the



Figure 7. Cantilevered sky pavillion inside every hotel room © WOHA

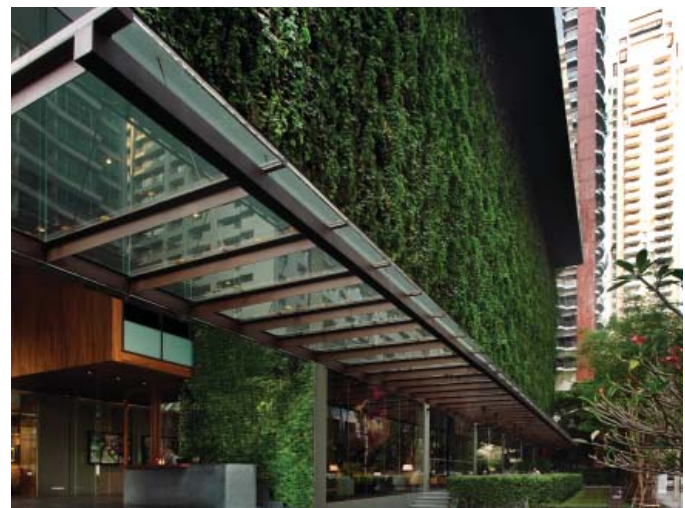


Figure 8. Green screens wrapped around the podium © WOHA

rooms (see Figure 7). These are topped with sky gardens which can be enjoyed by the nearby rooms. Internal light wells are planted with green walls and give private garden views to every hotel room. At the condominium, sky gardens are placed at every fifth floor with staggered sky pavilions to enjoy the garden. These sky gardens not only serve to bring cool and natural relief to the dull concrete of central Bangkok, but also structurally tie together the four individual slender tower blocks at regular intervals. At the podium, bands of creeper screens with hanging drapes of green wrap around the building, concealing six levels of car park within (see Figure 8). It visually invigorates the city with its refreshing vertical parkscape and physically eases the urban heat island effect.

Structural System

The Hansar's tower structure is comprised of a simple concrete reinforced frame around a rigid central core. Connected to the hotel slab block at the low-rise zone, a broad and stable base is achieved for the residential tower that steps back as it rises. Structural engineering is fully integrated with architectural design. To maximize space within the apartments, all columns are externalized on the face of the tower. These columns which reduce in size as they rise are strategically positioned within the unit's utility zone (AC ledge) and are fully screened from public view by the architectural mesh screens (see Figure 9). Sky

gardens not only serve to bring green relief, but also structurally tie together the four individual slender tower blocks at every fifth floor increasing the overall rigidity of the building.

The building structure gains its lateral stability from a cantilever shear wall core system; comprised of a main core in the high-rise, residential tower and a satellite core in the low-rise hotel wing. Post tensioned flat slabs with perimeter columns on a 10-meter (33-foot) grid provided ease and speed of construction with further advantages of the clear inter-floor zone providing flexibility for fit-out and unencumbered views.

The cantilever shear cores were detailed for wind and following the Great Andaman Earthquake of 2004, seismic resistance equivalent to Universal Building Code (UBC) Zone 1 was provided with detailing for ductile energy dissipation in a lower plastic hinge zone.

Conclusion

The Hansar presents an innovative solution to the issues of density in tropical Asian cities and offers a new model for tall building design that is sustainable and suitable for high-density tropical living. A refreshing urban oasis nestled amidst a congested metropolis with its calm draping green façades; hanging sky gardens; floating sky pavilions; and delightful golden screens glimmering

... unofficial

“The unofficial test is to put a coin on its edge [in the lift] and see if it falls over.”

Daniel Abraham, a project manager for KONE on installing the elevators at the Princess Tower in Dubai. From "An Up and Down Industry," The National, December 6, 2011

iridescent in sunlight; The Hansar lifts not only the blanket of Bangkok's polluted grey but also the spirits of its urbanites as evidenced by the many commendations it has received to date. ■

Project Data

Completion Date: 2011

Height to Architectural Top: 173 m (567 ft)

Stories: 43

Total Area: 46,167 sq m (496,937 sq ft)

Building Function: Residential/Hotel

Owner: Somhansar Company Limited

Project Developer: Ativa Hospitality Corp.

Design Architect: WOHA Architects

Associate Architect: Tandem Architects

Structural Engineer: Warnes Associates

MEP Engineer: WSP Lincolne Scott

Project Manager: EMS Consultants Company

Main Contractor: Ritta Co. Ltd.

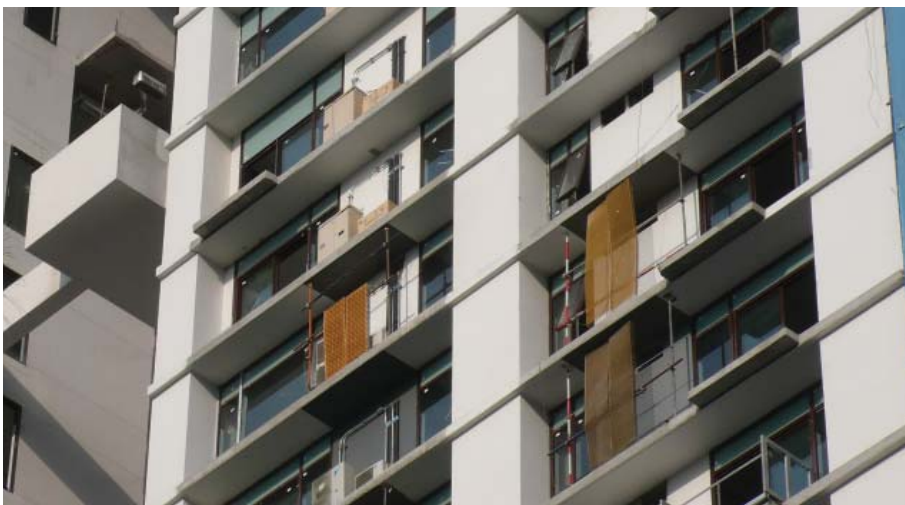


Figure 9. External columns integrated within the utility zone with the sky garden as the ties © WOHA