Original Article

An urban island floating on the MTR station: A case study of the West Kowloon development in Hong Kong

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Abstract This article examines the West Kowloon development in Hong Kong by considering the Kowloon Mass Transit Railway (MTR) station and its attached properties in the form of a megastructure. It begins by reviewing the socio-political and economic background of the project in its historical context, which has ultimately given the urban development project its unique characteristics. For a clearer understanding, various types of megastructure prototypes are analysed in comparison to the Kowloon MTR station and the properties in the West Kowloon development. The article describes the entire process of the megastructure, from the formation of the architectural design concept to its final realization. A final part concludes with a consideration of the project as a megastructure and as a significant node along the metro network in Hong Kong. Through the case study of the West Kowloon development, this article aims to assess the spatial characteristics and configurations of the megastructure project, and to establish the criteria by which to critique it in an architectural context.
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Introduction

The Hong Kong Airport Core Programme (HKACP) has continually and significantly pushed forward the urban development of Hong Kong since the early 1990s, as well as giving shape to the urban area alongside the Airport Express Line (Figure 1). Starting with the construction of the new international airport at Chek Lap Kok as its central project, this programme included a series of infrastructural works organized by the Hong Kong Special Administrative Region (SAR) government. Along with the new railway connections to the city, the corresponding projects have extensively reshaped the downtown area, especially West Kowloon. In the West Kowloon development project alone, 4 out of the 10 core constructions in the HKACP are tightly connected or directly integrated, namely the West Kowloon reclamation, the new airport railway and stations, the West Kowloon Expressway and the Western Harbour Crossing.

The most challenging questions of Hong Kong's urban development are those of limited buildable land and the rapidly increasing population. This fact is evident in the existing high-density and high-rise urban forms of Hong Kong's urbanized area, with land-filling, or reclamation, being the most direct and feasible way to increase the buildable land for future development since the nineteenth century (Figure 2). Although land reclamation constantly receives criticism from environmental interests and sustainable development supporters, it has been adopted in the HKACP as a key solution to provide the necessary usable land, which in turn ensures the possibility of all other projects. Consequently though, the high cost of land-filling also requires much denser constructions than usual to offset and balance the much larger than typically needed budget of the total investment.

Figure 1: The distribution of the 10 core projects in the Hong Kong Airport Core Programme.
Source: New Airport Projects Co-ordination Office, Government Secretariat, Hong Kong Special Administrative Region (HKSAR) Government.

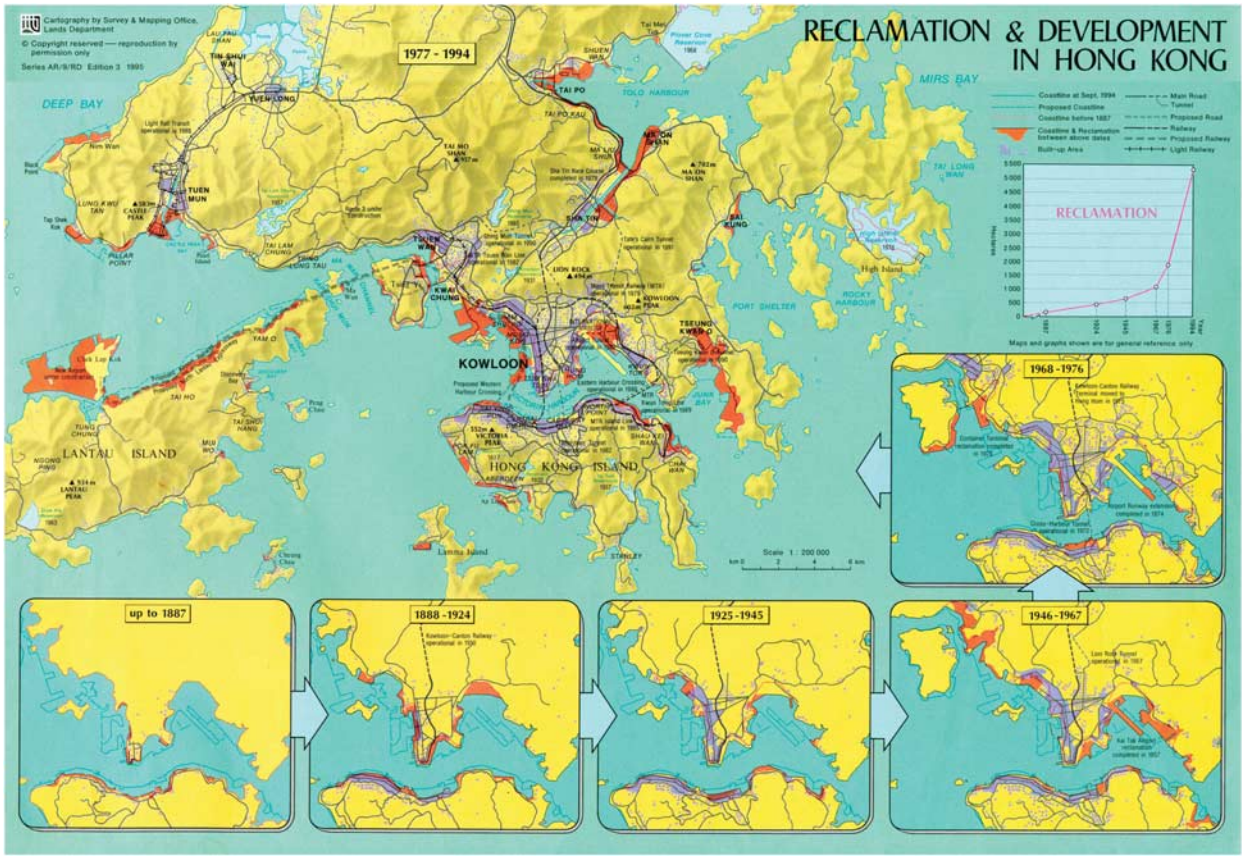

Figure 2: Reclamation and development in Hong Kong.
Source: Surveying and Mapping Office, Lands Department, HKSAR Government.

The extreme high density of the development also challenges the efficiency of the urban transit systems. Scarce land used for public transportation facilities naturally demands good integration between different transportation modes, public spaces and housing. In Hong Kong, however, the Mass Transit Railway Corporation (MTRC hereafter) has accumulated much experience in building through its past projects of metro lines and stations. These experiences have led to the following conclusions:

- the MTRC provides a well-organized metro network with many, if not all, stations integrated into local commercial centres, public facilities and residential blocks; and
- the MTRC has also developed a strong capability to fund grand projects that are served by the metro network and connected to the stations, that is, it organizes and co-ordinates these projects between the government, investors, developers and public realms.

Before and during the West Kowloon development, the MTRC successfully realized several examples that could be considered quite comparable to the concept of a megastructure in terms of sheer size and complexity. Typical cases include New Town Plaza in Sha Tin (1986), Taikoo Shing (1986), Pacific Place in Admiralty (1987), Plaza Hollywood (1997), Lam Tin (1987), Po Lam (1997), Kowloon Tong (1998), Kowloon Bay (1988), Ma On Shan (2004) and Kwun Tong (2005). In her essay 'The City and the Megastructure', Karakiewicz demonstrated different types of megastructures 'in the form of extremely tall towers, on the top of podiums which include clubhouses, leisure and sports facilities, car parking, shops and transportation'. Developments that could be classified as megastructures include Sha Tin, Tai Koo Shing and Pacific Place, all characterized by a high degree of integration with the metro network (Karakiewicz, 2005).

In 1992, a consortium led by Terry Farrell & Partners was appointed by the MTRC to move the design from the feasibility stage to its realization – the main task being the airport railway station design in West Kowloon. Based in London, Terry Farrell & Partners not only had a wealth of experience in designing transportation buildings, but they also had been deeply involved in many Hong Kong projects. Although the main task was the Kowloon Station, which links the city to the new airport, the assignment also comprised the master plan for the surrounding area. Kowloon Station was thus established as the largest station on the Tung Chung Line to serve as a fully integrated interchange between the railway and other forms of transportation. The station also provides in-town check-in services to 'bring the airport back into the city' (Terry Farrell & Partners, 1998).

However, MTR's ambition was far more than just building a super transportation node. In one giant urban block, with the station occupying the central core and the metro line passing underground, 1.7 million square meters of buildings was planned in 13.5 ha of land area, with a plot ratio that would reach 12:1. The service apartments, offices, hotels and all community facilities are interconnected by an above-ground air-conditioned shopping arcade that also contains various public spaces and transport facilities. The ground is elevated to accommodate circulation of vehicles and pedestrians, and all public places and semi-public gardens that could be found inside the traditional urban blocks appear on the podium floor. Considering the self-sufficiency in this condensed micro-city and its isolation from the rest of Kowloon's urban areas, the West Kowloon development project could be regarded as an urban island floating on the MTR station. This analogy is critical in comprehending the spatial characteristics and configurations of the West Kowloon development project in the form of a megastructure (Figure 3).

Well-designed landmark developments bring lasting value to cities (Worpole, 2000). They act as a permanent advertisement for the city, attracting media attention, cultural activities, tourists and business alike (Carmona, 2006). During the period of the West Kowloon project's realization, some other comparable projects in Asian cities were also underway, such as Keppel Bay in Singapore, Roppongi Hills in Tokyo, Olympian City in Hong Kong and the Hongqiao Transport Hub in Shanghai (Table 1). Like these comprehensive developments, the West Kowloon project aimed to become a distinctive landmark along the waterfront of Victoria Harbour.

Historical Sources and Origins of the Megastructure Concept

The term 'megastructure' itself contains evident hints of the great size of the projects and the strong reliance on modern building technology. Throughout time, there is a long and established

Figure 3: Panorama of Victoria Harbour. The ICC tower in the West Kowloon project surpassed the International Finance Centre tower with a new height record in Hong Kong of 483 m; both projects were developed by Sun Hung Kai properties. Photographs by Hailin Zhai.

history of constructing structures on surreal or superhuman scales, among which the Tower of Babel would be an obvious example. In Pieter Bruegel's painting of 1563, Babel was interpreted as a high-rise complex in the ancient Western architectural language. Although the idea of the physical form is highly indebted to the Roman Colosseum and Roman engineering, the creative image undeniably presents viewers with the provocative possibilities of a vertical city developed in multiple layers of structures (Figure 4).

If Bruegel's interpretation still displays a certain distance from the modern concept of megastructures, the projects of Le Corbusier could arguably be seen as the first step in exploring the high-rise megastructure in the modern era. In 'le Plan Voison 1925 of Paris', the historical centre was replaced by a matrix of similar towers. Quite different from the previous urban tissue, these towers were organized in a highly efficient layout. In the centre they even share an urban terrace with the traffic passing underneath. The terrace connected the towers and served as the collective space for public activities or even as an airport (Figure 5). The urban structure was also transformed by deconstructing the traditional block-street mode. While Le Corbusier's plan exists only on paper, his lofty ideas on urbanism were to be largely absorbed in La Défense in Paris, and perhaps more significantly in developing countries several decades later (Figure 6).

In the 1960s urbanization in Japan came to the forefront, as the nation faced problems of scarce land and increasing urban population, issues remarkably similar to the challenges facing Hong Kong at present. The situation pushed Japanese architects and urbanists to rethink urban structure and architectural form and search for new possible solutions. The metabolists were the first to acknowledge the potential of vast structures in addressing aspects of Asia's urbanism, and they were responsible for several megastructure proposals (Kikutake *et al*, 1960). Fumihiko Maki's *Investigation in Collective Form* in 1964 defines a 'Mega-Structure' as 'a large frame in which all the functions of a city or part of a city are housed. It has been made possible by present day technology. In a sense it is a man-made feature of a landscape. It is like the great hill on which Italian towns were built' (Maki, 1964).

Japanese architects and theorists developed a myriad of ideal models for megastructures, such as Arata Isozaki's *City in the Air* (Figure 7), or urban planning proposals such as Kenzo Tange's *Tokyo Bay project*. However, in Hong Kong the megastructure concept finds its most practical application in responding to a challenging urban development. In Hong Kong, just 20.3 per cent of the buildable land area of the 1104 square kilometre territory accommodates 7 million people (Hong Kong Yearbook 2008, www.yearbook.gov.hk,), with half of the population living in the small inner city. In urban areas, density reaches up to 25 350 people per square kilometre, 4 times higher than that of Shanghai, 8 times higher than that of Paris, 15 times higher than that of New York, and 36 times higher than that of Atlanta (based on data from Demographia, www.demographia.com, retrieved in November 2009).

Table 1: Comparison of comprehensive development projects in Asian cities

	Brief introduction	*Contributions to the local city*	*Density and size*
Keppel Bay in Singapore (2000)	The Keppel Bay development is a super large-scale project with a site area of 773 600 square meters in Singapore. The romance and rare opportunity of living by the sea have driven a large demand for waterfront houses recently, and Keppel Bay seems a small city that includes high- and low-rise residential buildings, MRT connections, a bus terminal network, a golf club, a shopping mall, an international cruise centre, commercial towers, greenery, parks and other community facilities.	It successfully attracted many quality users and buyers but also tourists, combining the best in waterfront and urban lifestyles. Keppel Bay redefines premier waterfront living befitting Singapore's position as a vibrant global city.	Medium density
Roppongi Hills in Tokyo, Japan (2003)	The Roppongi Hills project is a huge, multi-use complex, including offices, residences, a hotel, a broadcasting centre, a museum, an observation deck, a cinema complex, restaurants and a shopping mall. Extra greenery and public transport services were strengthened to encourage full-day activities.	It changed the living quality of the local quarter in Tokyo, and provides public spaces and cultural facilities with an approach similar to a mega-structure, and also brings back the vitality to the city, especially during the night.	High density with high-rises
Olympian City in Hong Kong (2001)	Close to the historical zone in Kowloon, Olympian City was constructed entirely in a land-reclamation area, and it is highly serviced by the MTR network. As with other comprehensive developments, it includes a shopping mall, cinema, residential towers, commercial arcades, schools and sports facilities.	It extended the historical zone to the seaside and provided multiple choices to those who want to live in high-class houses at the centre of the Kowloon Peninsula.	High density with a total Gross Floor Area of 3 000 000 square meters
Hongqiao Transport Hub in Shanghai, China (2010)	Comprising the Hongqiao Airport, high-speed railway station, Maglev train station, metro lines, bus terminals, hotels, commercial and some other estate projects nearby, the Hongqiao Transport Hub in Shanghai will occupy a land area of 26.34 square kilometres, the same as the territorial area of the Macau Special Administrative Region. It is still under construction, and is expected to open in time to serve the Expo in 2010.	Probably the largest transport hub in the world, it is hoped that Hongqiao Transport Hub will improve the linkages between Shanghai and other cities in China, especially within the Yangtze River Delta area.	Medium density

Additionally, the real estate, property and construction industries have continued to lead the industrial and economic development in Hong Kong, and account for a quarter of Gross Domestic Product (GDP). Thus, a model of high density became the most profitable architectural outcome driven by financial forces, which was vividly rendered by the building of megastructures such as towers. Looking at the constituent stocks of the Heng Seng Index of Hong Kong, half of the dominating share stocks come from the real estate industry sector, and four of them have participated in the West Kowloon project, such as Hang Lung Group and Sun Hung Kai Properties. The rest are share stocks of large banks, which finance the development and construction. On the one hand, the government has long adopted a policy of high land premiums, and on the other,

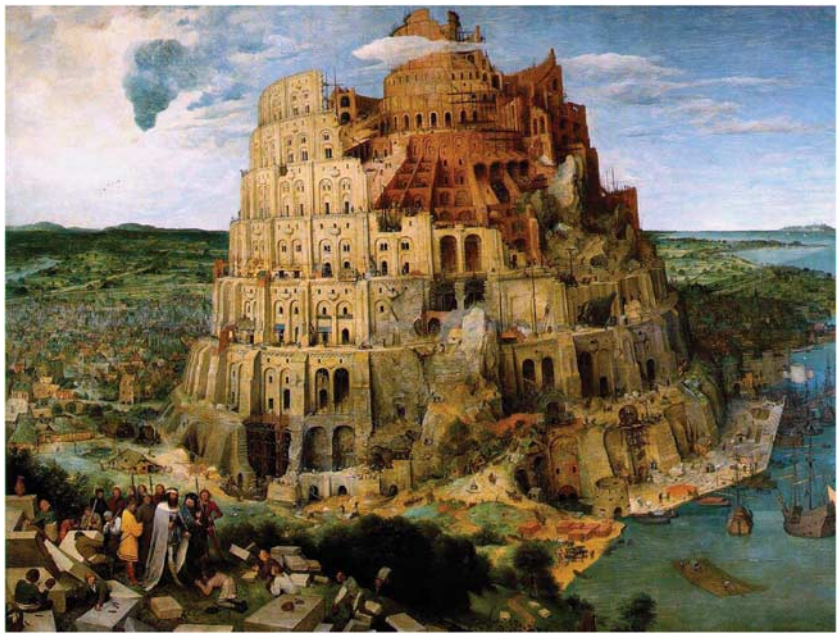

Figure 4: The Tower of Babel painted by Pieter Buregel in 1563.
Source: Kunsthistorisches Museum, Vienna.

Figure 5: Le Plan Voison 1925 of Paris by Le Corbusier.
Source: Fondation Le Corbusier.

the developers shift the burden to the end-users. The mutual actions of government, developers and speculators push housing prices in Hong Kong to astronomical figures. In this situation, the developers have to bargain for a higher plot ratio with the government, and then fully utilize the plot ratio and maximize the saleable areas. Because of these conditions, Hong Kong architecture presents a special landscape of 'no art, few comforts' – built to serve the commercial purpose of the developers. All of these factors lead to two directions for urbanization: multiple uses of space and vertical intensification (Lau *et al*, 2005). Considering all these constraints in Hong Kong,

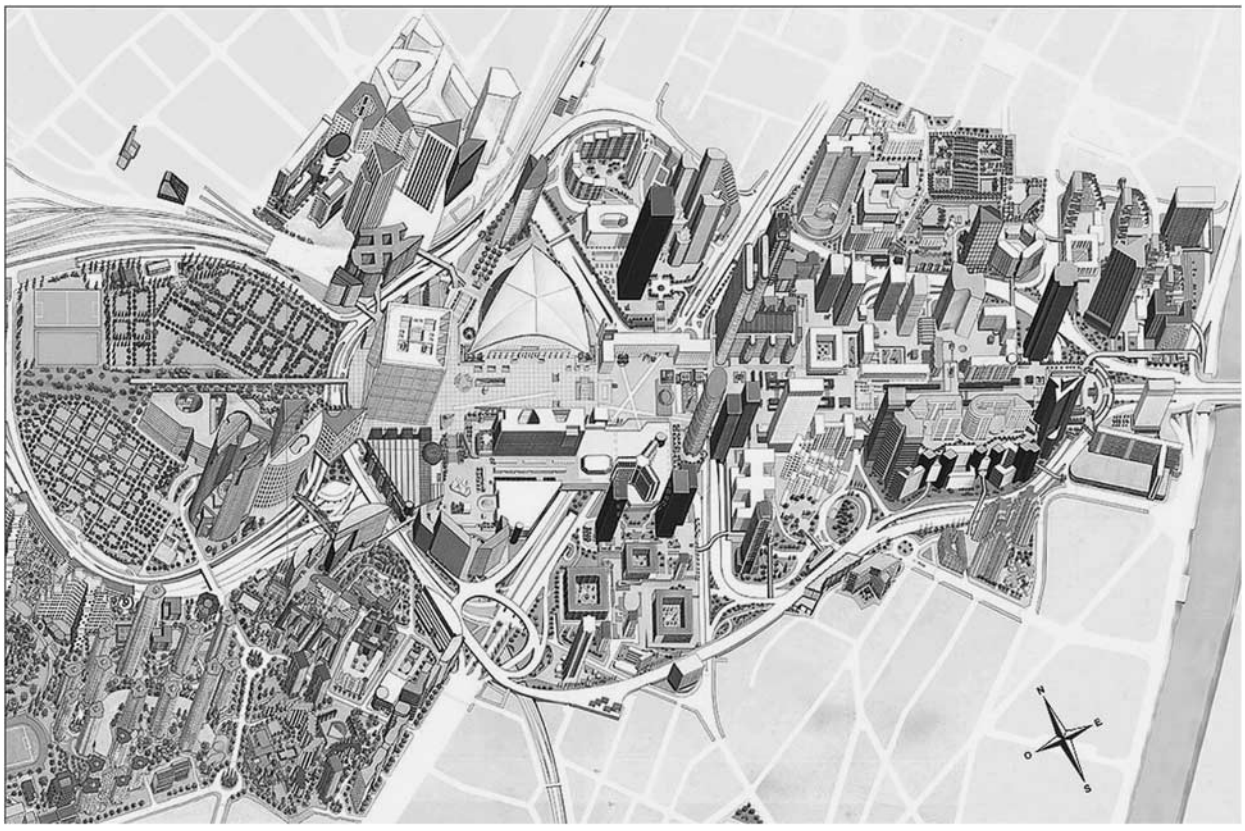

Figure 6: The plan of La Défense.
Source: Conseil régional d'Île-de-France, www.iledefrance.fr.

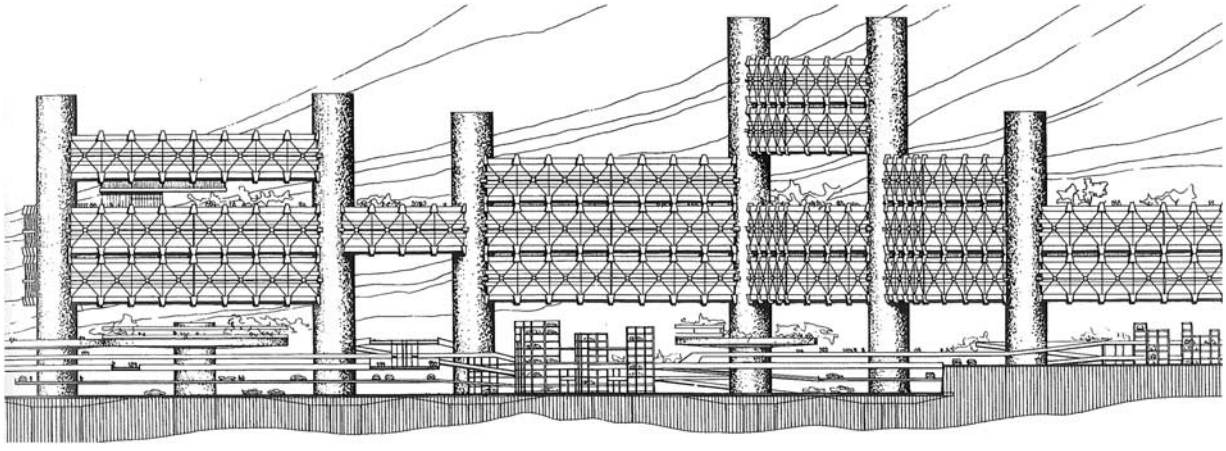

Figure 7: City in the Air by Arata Isozaki.
Source: Arata Isozaki & Associates.

high-rise megastructures seem the most practical and feasible option for Hong Kong and the West Kowloon development (Table 2).

The advent of modern technologies, such as the invention of the elevator and air-conditioning equipment, ensures the possibilities of convenient vertical connections and large-scale interior spaces, and as a result provokes the appearance of skyscrapers and large, enclosed malls. The West Kowloon project could be regarded as an application of such a prototype, or, in other words, a megastructure. 'Exteriors and interiors of such structures belong to two different kinds of architectures. The first – external – is only

Table 2: West Kowloon development data

Construction start date	May 1996
Construction period	14 years (approx.)
Design period	1992 – ongoing
Gross floor area	1.09 million m^2
Total circumference	1465.8 m
Total construction area (underground included)	1 679 552 m^2
Site area	135 417 m^2
Dimensions	369 m × 503 m
Car parking spaces	6590
Bus station area	14 945 m^2
Landmark Tower height	483 m
Number of towers	22
Number of storeys	range 35–110
Residential towers	18
Residential units/size	5225 units/average 115.4 m^2
Service apartments	68 098 m^2 (approx. 600 units)
Private residents' club facilities	18 192 m^2
Commercial area	414 676 m^2
Public open space	min. 1.7 ha

Source: Terry Farrell & Partners.

concerned with the appearance of the building as a more or less serene sculptural object, while the interior is in a constant state of flux – of themes, programs, iconographies – in which the volatile metropolitan citizens, with their over-stimulated nervous systems, combat the perpetual threat of ennui' (Koolhaas, 1994). This argument by Koolhaas in his chapter '*Life in the Metropolis*' or '*The Culture of Congestion*' could arguably be considered the best description of the spatial considerations of the West Kowloon project.

The West Kowloon Development Block Shaped by its Urban Context

In Kowloon, Yau Ma Tei, Mong Kok and Tsim Sha Tsui were the earliest developed areas, and as such they have been the most crowded areas in Hong Kong since the early twentieth century. Located in the heart of the Kowloon Peninsula and surrounded by Victoria Harbour, the growing population in this area has dramatically exhausted the land resources, and has caused massive traffic problems for continued urban development. In the key projects of the HKACP, the West Kowloon reclamation has a direct objective to provide the needed land area for the expansion of the Yau Tsim Mong quarter. The development of this reclamation area has largely been led by the metro lines, and therefore also by the distribution of stations, and Kowloon Station was planned as an important local node with a certain density and mixture. The same can be said of the conditions for the other stations alongside the metro lines, such as Olympic Station and Tsing Yi Station (Figure 8).

Although developments encircling the station are connected to each other by roads and metro lines, these developments are mainly accessed through the metro stations, owing to the scarce pedestrian routes in between. The well-organized elevated pedestrian bridges, which connect the train station to the nearby housing and commercial arcades, also encourage users to travel by underground metro, and as a result the ground is left almost entirely for vehicular use. This urban design strategy has shaped the expansion of West Kowloon into an isolated urban form, in stark contrast to the continuous 'mat-like' urban blocks of the Yau Tsim Mong areas and even more notably the International Finance Centre and Pacific Place developments on Hong Kong Island, which benefited from their connections to a network of pedestrian sky bridges, the Mid-Levels Escalator and the Central Ferry Piers. In an interview with Edward Wong, chief project manager of the MTRC, he also acknowledged the present situation of Kowloon Station, and agreed that the maturity of a comprehensive project would require a certain period of time, which could be several years in the case of the West Kowloon project. However, it was deemed quite necessary to create a self-sufficient community in the first phases.

The urban fabric in West Kowloon has also been transformed in three levels, in comparison with the older parts of Kowloon. First, the road systems are designed for the purpose of fast transport, regardless of the relations between or within the blocks. In essence, the typical street-block pattern of Yau Tsim Mong entirely disappears in West Kowloon. Second, the size of the street-block is vastly enlarged, much more so than those of the older section of Kowloon, and the huge dimension encourages urban life to take place inside the block instead of outside on the public streets. The metro station was designed and constructed together with the entire block, and its location in the centre of the block undoubtedly intensifies the activities in the air-conditioned commercial spaces. Third, as the traditional street-block building mode has been replaced by a superblock-megastructure-towers

Figure 8: The location of the historical area of Kowloon Peninsula and the West Kowloon project.
Source: Prepared by the authors, based on satellite map from planning department of HKSAR.

mode, the high-rise buildings are left freely standing atop the podium, with little to no respect to the distribution of roads at ground level.

As far as the planning concepts are concerned, the theory of transit-oriented development (TOD) can be utilized to comprehend the West Kowloon development. Newman concludes that the four strategic planning tools for TOD are as follows (Newman, 2009):

- a strategic policy framework that asserts where centres need to occur and at what kind of density and mix;
- a strategic policy framework that links centres with a rapid transit base, almost invariably electric rail;
- a statutory planning base that requires development to occur at the necessary density and design in each centre, preferably facilitated by a specialized development agency; and
- a public-private funding mechanism that enables the transit and the TOD to be built or refurbished through a linkage between the transit and the centres it will service.

Each planning strategy could be confirmed and verified in the West Kowloon development. As key projects in the HKACP, Kowloon Station's position was decided in the planning of the Tung Chung Line, and was determined to be developed into a local city centre with large estate projects. Thus, the MTRC, as a 'specialized development agency', played an essential role in the entire development process. It represented the government's realm, constructed the metro lines as the fundamental infrastructure for the attached projects, and then coordinated and participated in the developments connected to the stations, and as such certainly received profitable benefits in providing this service as an 'agency' (Figures 9 and 10).

Figure 9: The planned urban blocks in reclaimed land of South-West Kowloon, with the black one representing the West Kowloon project.
Source: Prepared by the authors, based on outline zoning plan for South-West Kowloon, from planning department of HKSAR.

The formation of the megastructure

The main objectives of the West Kowloon development can be outlined as follows:

- to build a modern MTR station and integrate transport interchange; and
- to conduct a highly self-sufficient real estate development project.

The real estate development, entitled Union Square, attached to Kowloon Station, was contracted to four main developers, Hang Lung Group, Sun Hung Kai Properties, Wharf Holdings and Wing Tai Asia, all organized by the Hong Kong SAR government through the coordination and participation of the MTRC. Owing to the good professional reputation and positive feedback related to previous projects in Hong Kong,

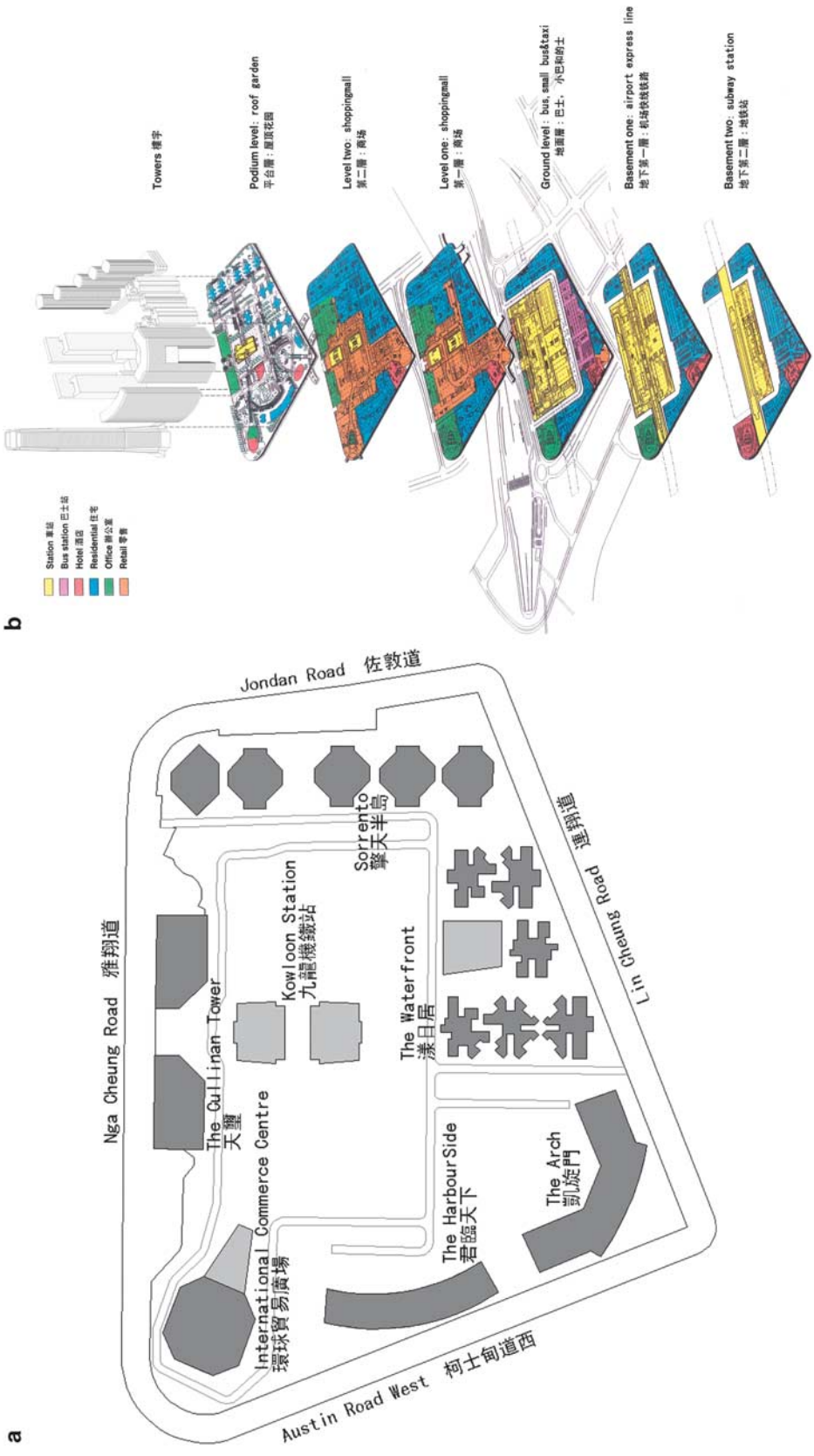

Figure 10: The distribution of towers in the West Kowloon project. *Source:* Union square.

Terry Farrell & Partners was appointed to carry out the design for the station and a workable master plan for the whole block. Based on the studies of the literature on the projects and analysis of built form in the historical context, the design strategy could be summarized as follows:

- A 3-dimensional city – containing different functions spreading out in diverse layers to reach a maximum of density and mixtures without sacrificing the efficiency of transportation. The main traffic circulation routes were organized along the ground floor, to facilitate easy access from the roads surrounding the development while also maintaining preferred connections with the stations underground. Shopping arcades and pedestrian routes can be found on the first and second floors, mainly to avoid conflicts with ground traffic at peak times. Additionally, bridges extended the pedestrian routes to the blocks and other interchanges nearby. On the podium floor, 18 m above ground, the towers share a common terrace, which serves as a traditional ground floor with controlled access for vehicles and pedestrians.
- A diverse mix of functions – reflecting all the uses that are needed to grow into a complete and self-sufficient city. Located on reclaimed land far away from the older urban areas of Kowloon Peninsula, the success of the real estate development depends largely on the capability and performance of the project, that is, whether it can provide the correct or proper diversity of uses while still meeting the needs of all types of inhabitants and visitors, and thereby performing as a micro-city.
- High-rise towers – these represent the factual protagonists in the real estate development projects. It is well known that the skyline of Hong Kong is characterized by contiguous high-rises of iconic value, and it is hoped that the towers of the West Kowloon project will help to contribute to creation of new landmarks for Kowloon and Hong Kong overall. For quite some time, the towers along Hong Kong Island's waterfront have been an icon of the Asian metropolis, whereas on the opposite side of Victoria Harbour, owing to the height limit restrictions necessitated by the old Kai Tak Airport's location in the city centre, there was no such comparable urban scenario in Kowloon until the arrival of the West Kowloon project.

The specific discussion on the formation of a new prototype of megastructure in relation to the West Kowloon project will be developed into four sub-topics, which range from the analysis of the prototype to the verification of its elements (Figure 11).

Adapted megastructure prototype

Ralph Wilcoxon offers a helpful definition of a megastructure (Wilcoxon, 1968) as constructed modular units that are capable of great or even 'unlimited' extension. Utilizing this definition, a 'megastructure' should be a structural framework into which smaller, modular units can be built or added – or even 'plugged in' or 'clipped on' after having been prefabricated elsewhere – into a structural framework expected to have a useful life much longer than that of the smaller units that it might support. Wilcoxon's definition reveals the central concepts of a 'megastructure' as an architectural organism that exists somewhere at the margins between permanence and temporariness, and between simplicity and complexity. Based on these concepts, a variety of projects have emerged, typified by Habitat 67 in Montreal by Moshe Safdie, Centre Pompidou in Paris by Richard Rogers and Renzo Piano, and the Yamanishi Centre in Kofu by Kenzo Tange among other examples. Most were constructed with certain standard modules for the structure and had the capability of further adjustment. However, significantly, none of them has ever truly been modified in ways such as the 'plug-in' of volumetric extensions or replacement of the attached units.

Driven by the land scarcity economy of Hong Kong, the West Kowloon development certainly deploys all the concepts of the megastructure as elucidated by Maki as 'a large frame in which all the functions of a city or part of a city are housed'. Therefore, the development can be considered in these terms as a 'mega-structure', albeit one that differs significantly from the historical precedents owing to the unique constraints and local context that gave it shape. For example, as the block has been subdivided into several plots, each given over to different developers, the architectural and structural grids that should be uniform for successive design and construction have been abandoned. The current dimension of grids does not welcome any further modular design.

Furthermore, the West Kowloon development does not fully comply with Wilcoxon's definition

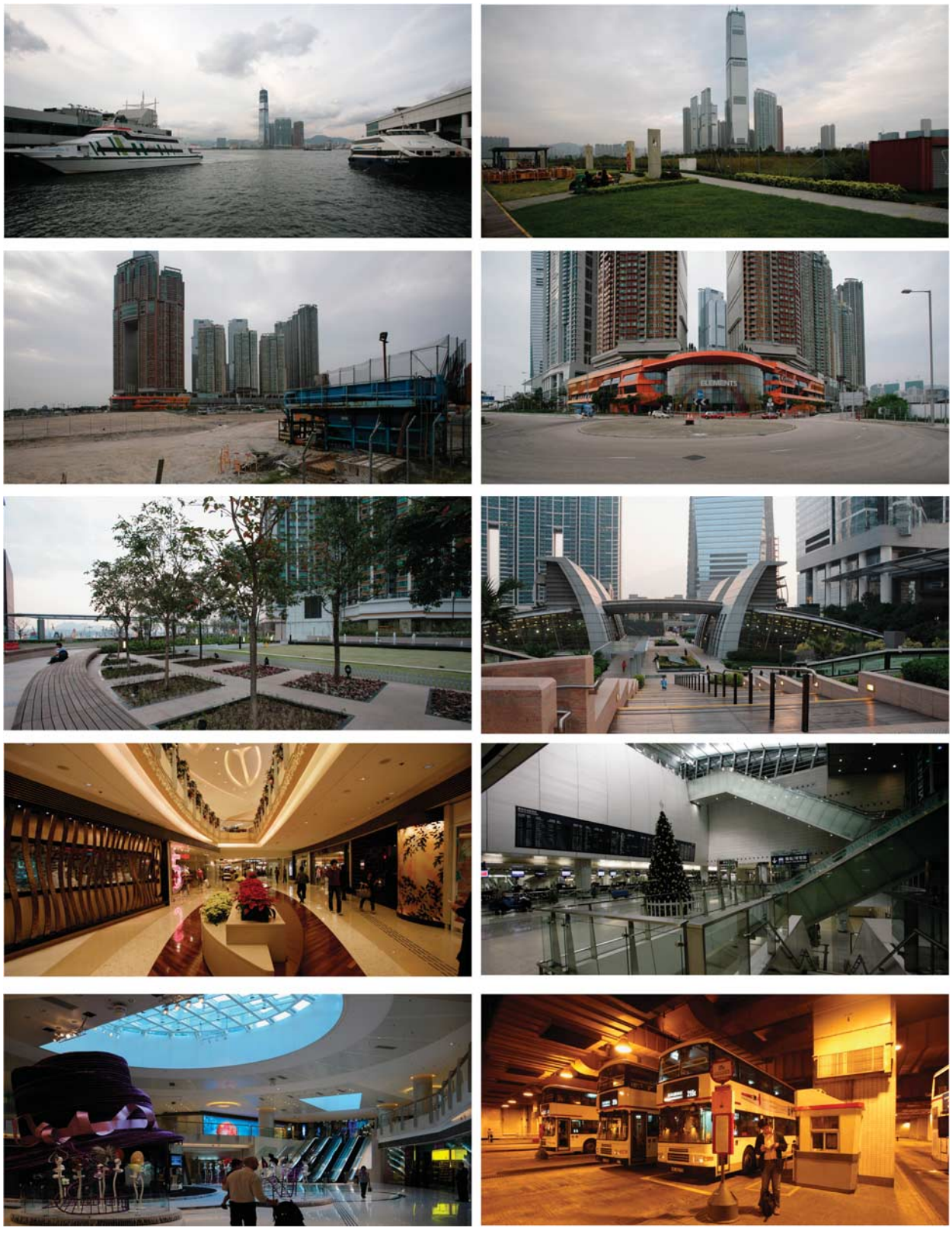

Figure 11: Photographs of the West Kowloon development project, exteriors and interiors. photographs by Hailin Zhai.

of a megastructure in several respects. First, the whole structure was finished in a one-off manner. This megastructure in question will not, and fundamentally is unable to, change, and therefore to alter or impact the traditional urban development of the 'block and street' mode in an evolutionary manner. Further, the limited boundary of the block makes its extension impossible and unnecessary. Second, closer observation of the grids shows that the structure is not totally indifferent to its supporting units. Some columns are enlarged for extra loads, and within the boundary area the grid also meets with variations in order to better accommodate loads of the upper towers. In short, the structural framework has largely been personalized for the specific location of contents inside. Last, the 'inserted' units, including the towers and stations, are expected to have the same useful life as the supporting structure. If the towers could be understood as the 'plugged-in' or interchangeable parts of the classical megastructure model, in the West Kowloon development, they are of the same importance as the supporting structure. Evidently, once built they can neither be 'plugged in/clipped on' easily owing to the engineering difficulty nor modified easily owing to the high expenses.

Therefore, the West Kowloon development is best understood as the application of an adapted megastructure concept, which is a direct response to its local context in Hong Kong. The project is large, and most importantly it frames a micro-city by means of infilling houses and public facilities into a vast anonymous structure.

Station as integrated transport interchange

The Union Square complex and Kowloon Station constitute the essential part of the West Kowloon development. Run by the MTRC, the station was the main function that the design team considered in terms of coordination among the various parts of the project. As the biggest station on the Airport Express Line and Tung Chung Line, the principal aim of the design is to bring the airport back to the city. Hong Kong used to enjoy a high level of convenience as the older Kai Tak Airport was located along the harbour and almost directly in the centre of the city. Kowloon Station aims to provide an extended service similar to what you may find in a remote airport, complete with in town check-in and an express train that takes passengers to the terminals in just 20 min. Based on this groundbreaking idea, Kowloon Station was designed and built in a manner far removed from the usual image of the modern train station. Serving as an integrated transport interchange, the station is well organized in different layers to maximize efficiency. Instead of a giant plaza in front of the station to collect the flow of passengers from all directions, the giant foyer on the ground floor has direct access to traffic nodes such as taxi areas, coaches, franchises and public bus stops. Pedestrians enter the foyer from the upper floor where the commercial arcades and pedestrian networks are integrated. Underground, the Airport Express Line and Tung Chung Line are separated into overlapping platforms that share some vertical connections for direct interchanges. Owing to the clear zoning of the different modes of transport, Kowloon Station provides maximum convenience for the maximum number of passengers.

Kowloon Station not only provides the best experience for travellers to depart, but it is also a new gateway for those arriving in Hong Kong. Highly efficient MTR trains gather passengers underground, and it works as an extension of the plane to take them directly downtown. Compared with the well-integrated transport modes, the pedestrian routes from the ground floor are limited and leaving on foot is not encouraged. Cut off by adjacent vehicular traffic and vacant blocks, the West Kowloon development continues to retain its appearance as a floating island served only by some shuttle boats. The chief project manager of the MTRC has explained that preliminary studies show that most passengers choose private vehicles or taxis for further destinations after arriving at the station, a factor that led to the elevated pedestrian network design strategy. He expects that the pedestrian system will become more efficient when it is connected with future projects such as the West Kowloon Cultural District and the Guangzhou-Shenzhen-Hong Kong Express Rail Link.

Elevated ground floor

Connected only to the podium top of the West Kowloon development, the entrance level of the towers in the development is quite similar to many typical blocks in Hong Kong. The towers share closed-circulation routes for vehicles and pedestrians, and the entrances are connected to different levels according to their specific requirements in terms of privacy. Additionally,

semi-private gardens and squares are inserted on top of the station in an attempt to create a coherent relationship between the private properties and the public realm.

The reality, of course, is that the podium level is elevated 18 m high from the ground (which is the maximum height the building regulations of Hong Kong allow for 100 per cent coverage of the site). Although it still serves the towers as the traditional ground floor, the megastructure that has been lifted to the top of this podium level has been fundamentally changed in regard to its spatial structure and relationship with the elevated public streets and vehicular traffic on the ground.

Towers and real estate properties

As an urban development project involving several of the biggest real estate investors, housing in the form of towers became the main means by which the design was sensitive to the market's requirements. Beginning in the 1990s, the centrosymmetric, 8-unit cruciform plan became popular, and now dominates high-rise housing layouts and design. Compared with high-rise 'slab' buildings, centralized-plan high-rises possess more advantages in terms of ventilation and daylight, a crucial consideration for the warm, humid climate of Hong Kong. During our interview, the chief project manager of the MTRC also confirmed this as one of the decisive considerations in the planning phase of the West Kowloon project. As a result, several towers with such a design approach were inserted into the North and West sides of the West Kowloon project, with the entrance lobbies connected to the commercial arcades and podium floor. Situated alongside Victoria Harbour, these towers form the silhouette of the skyline in Hong Kong, and can be considered the 'smaller units plugged in or clipped on' as opposed to the main structural framework, according to Wilcoxon's definition of a megastructure (Figure 12).

Conclusion

In 1989, the decision to build the new airport and airport railway was made; in 1992 the design process started and in 1996 the construction of the West Kowloon development commenced. After 13 years, the majority of buildings have been completed and Kowloon Station is open to the public, while the 490-m-high International Commercial Centre (ICC) remains under construction, expected to be finished in 2010. Once built, the ICC tower will surpass the existing highest building in Hong Kong with a new record. Undoubtedly, the West Kowloon development is one of the largest and most significant building complex projects in Hong Kong's recent urbanization process. It will change explicitly the urban form and the spatial structure of Kowloon Peninsula, and furthermore the urban landscape of Victoria Harbour. Whether it is positive or negative for the city remains to be seen, but one thing is certain: a building of such scale and density is rarely seen in other cities of the world.

From the formulation of the architectural design concept to the final realization, some conclusions can be drawn based on the critical rethinking of the megastructure as it relates to Hong Kong:

- The feasibility of the project and the successful economic rewards mainly depend on the local socioeconomic and political context of Hong Kong. Certainly each case is unique and in its essence shaped by the totality of local characteristics; however, the approach in the West Kowloon development can hardly be copied or applied extensively to other cities in East Asia or even in China. It can only be accomplished in Hong Kong, where the population is so condensed, the urban environments so congested and land price so high, and where the capital flows yield to maximize the profit of properties' investment, by fully utilizing the lease condition in construction, which hence results in the arguably highest plot ratio.
- The compact form is shaped by the market pressure rather than an urban planning mechanism. The Hong Kong government adopted a *Laissez-faire* policy before 1997, and it encouraged the market forces to play a highly active role in the projects to pursue the maximum benefit for the economic interests of the parties involved. In the West Kowloon development, the building form, which is characterized by a full-coverage urban block and high-rise volumes, is a crystallization of the urgent desire of the estate market.
- Pragmatism, rather than any ideal theory from urbanism or architecture, has directed the building practice, built form and urbanization process of the West Kowloon development.

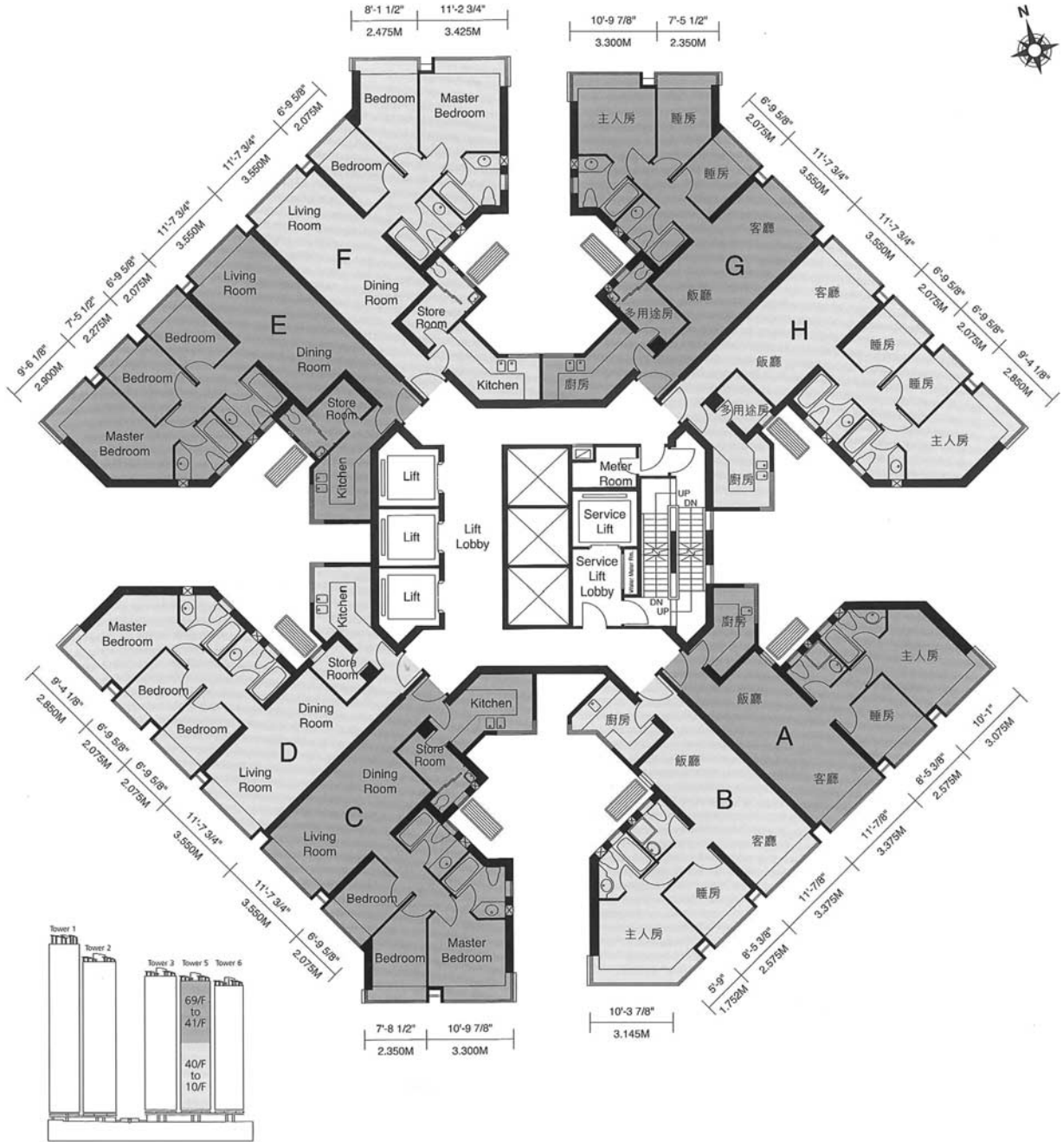

Figure 12: Typical layout of residential towers in the West Kowloon project.
Source: Development information of Sorrento, developed by the Wharf Group and MTRC.

It is difficult to assess how the development has applied the principles of a 'classical' megastructure. Rather, the West Kowloon development actually contributes to a new understanding of the megastructure, and provides an example of the feasibility of future iterations of this adapted megastructure prototype.

- Certainly with its vast size and intensity of functions and programmes the West Kowloon development resembles 'classical' megastructures as a self-contained micro-city. But with its fixed nature and one-off construction process it remains to be seen how this micro-city will relate to the larger urban context and city. Currently cut off from the urban blocks of Yau

Tsim Mong and surrounded by vacant land, the project is at present destined to remain a floating island. Only once it becomes more connected with future projects such as the West Kowloon Cultural District and the Guangzhou-Shenzhen-Hong Kong Express Rail Link will the viability and fate of this adapted mega-structure prototype become fully clear.

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