HONG KONG

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PROLOG

From the European perspective, the focus on the Asian metropolis Hong Kong is especially interesting due to its urban setup which is mostly generated because of area limitation and migration influx. Therefore, an unique dense urban structure grew out of necessity and formed one of the most densely populated cities in the world.

It is expected that by 2050 at least 70 per cent of the human population will be living in urban conditions, but we already live in an urban era today. If we follow the path of densification instead of urban sprawl, we should draw our attention to cities where density is already a part of daily life. For us, Hong Kong represents such an archetype. Here we can spot and investigate problems and solutions in the context of urban density, which other cities will probably face in the future. Hong Kong can be a laboratory of utopian troubleshooting for problems and needs which will arise in the urban future of the world.

In order to understand the urban structure of Hong Kong it is necessary to investigate the various influences which have created and shaped the city and the parameters that are guiding the direction towards the future. In our opinion, one of these factors is the human need for open space and the relationship to nature. Many people dream of having their own house with plenty of open space and fresh air, but due to economic pressure and the vision of a better future, the majority of humankind decides to move to urban areas. The anomaly of urban sprawl in developed countries is one of the results of this conflict. In Hong Kong we try to find a mediator for these colliding interests.

In this thesis the relationship between density, privacy and public space will be illustrated. The aim is to investigate the role and function of public spaces in Hong Kong in order to find new ideas for future developments in a hyper dense environment. Two correlated projects with the mutual topic of public space will investigate different approaches of such an intention. The designs will cover innovative and comprehensible proposals as well as visionary and utopian projections.

Method

Different methods have been chosen to understand Hong Kong and its underlying concept better. A 1:2000 city model was the first step towards a detailed analysis of the city structure of Hong Kong Island. Rebuilding the city was the first comprehensive attempt to generate and explore urban density in a three dimensional way. Furthermore, that approach makes it easier to find non-activated potential spaces in the urban structure in order to reinterpret and reuse these areas. The next step was to carry out an in-depth study about Hong Kong which forms the foundation of a new spatial journey towards the future of the city.

Structure

The thesis is divided into three books of mutual dependency. The first one is the *theoretical part* and the following two are the *practical parts* with investigations of potential future developments for Hong Kong. The theoretical book is written by Christine Sohar and illustrated by Philipp Kramer. Conclusions and outlooks to the practical parts are developed together.

The *theoretical study* can be defined as analysis of Hong Kong's urban structure in written and illustrated form. For us, these two ways of analysing a city are important as Hong Kong needs to be understood in different dimensions. For the reader of this book a visual and verbal impression supports the understanding of the city and the issues associated with it. Design relevant topics, which are analysed and interpreted, are divided into four parts: XL Density, L Megastructure, M High rise and S Habitat. This structure was chosen to investigate the city from its largest to its smallest components.

XL Density

The first chapter deals with the extensive term of density. How is it measured and what are the indicators and effects that come along with dense urban conditions? We compare various urban areas to develop a sense for the issue and make references to diverse approaches in different parts of the world.

L Megastructure

In the second chapter the term megastructure is examined closer as large scale developments and structures can be found all over the territory of Hong Kong. They are a form to deal with the extraordinary density, and are therefore important to investigate as in these megastructures different kinds of functions are integrated. These functions are mostly related to efficiency and consumption but such structures also help to create open space and recreational areas.

Different types of infrastructure networks, public space networks and building structures which emerged in Hong Kong will be investigated in order to uncover potentials of adapting these structures as basis for future developments of spatial evolution in Hong Kong.

M High-rise

One of the first things that comes to one's when thinking of Hong Kong is the unique accumulation of high-rise developments. Again, they grew out of necessity to accommodate the growing population on a limited area of land. In contrast to western attitudes to high-rise living, it is well accepted and even desired among Hong Kong residents. We investigate reasons for that acceptance and explore new opportunities for a community that is already detached from natural ground.

S Habitat

The last chapter deals with the smallest part of urban fabric for people in Hong Kong. Private space combined with privacy is the rarest and most expensive element for the majority of citizens. The roots of our statement that open space should be the major parameter for developing Hong Kong's urban future can be found here.

After the theoretical part, the reader should have an overview of the different components and qualities which form the urban structure of Hong Kong. Now the theory with our interpretations and assumptions will be translated into future visions for the city. Each of us created one book to develop the theoretical findings to practical solutions and follow our fields of interest related to the topic.

The *practical part* is also divided into four chapters and therefore refers to the theoretical part. Based on the findings and hypothesis made in the theoretical section of the thesis, implementations in the existing urban structure of Hong Kong are conducted. In order to make this possible, an urban model of Hong Kong was constructed which forms the basis for the proposals. Different potential spaces were detected and are elaborated in this part of the thesis.

XL Making of Hong Kong

The first chapter of the practical part describes the development and evolution of our 1:2000 city model. It provides an overview how such a model can be made and what kind of different materials and tools are necessary for such an enterprise.

L

The second chapter of the practical part contains the first design proposal based on the comprehensive research. In order to find new ways of providing open space, it is a vision of activating already existing spaces, transform them and encourage an evolutional growing that results in a widespread network of diverse functions and possible utilisations.

M

The third chapter deals with the public space underneath the Island Eastern Corridor in North Point. This highway forms a visual and physical barrier for existing developments and prohibits the appropriate use of public space. As public space is rare in North Point the design project aims to overcome this barrier and encourage the utilization of the waterfront by introducing appropriate programs underneath and along the highway.

S

The fourth chapter deals with the question how to enhance the existing housing situation. It represents an attempt to deal with open space in a different way than it is the case today in order to find a new approach of integrating open and communal spaces into hyper dense housing developments.

"What is the city but the people" [1]

1 The Tragedy of Coriolanus, Shakespeare 1623, 3 Act 1 Szene.

PHOTO ESSAY


富麗華髮型


XL


XL


M


XL

DENSITY

Density in most cases grew out of the human necessity to settle the growing amount of the city's population and to accommodate the increasing amount of functions which appear because of our prosperity and technical progress. But growth had to occur within its city walls, or within its topography as it is the case in Hong Kong. This forms a limit to the city's expansion and related to the necessity in building higher and deeper. With this evolution the loss of certain qualities came hand in hand, but at the same time it produces a city of diversity and urban dynamism, a city that is even more efficient in the use of land.

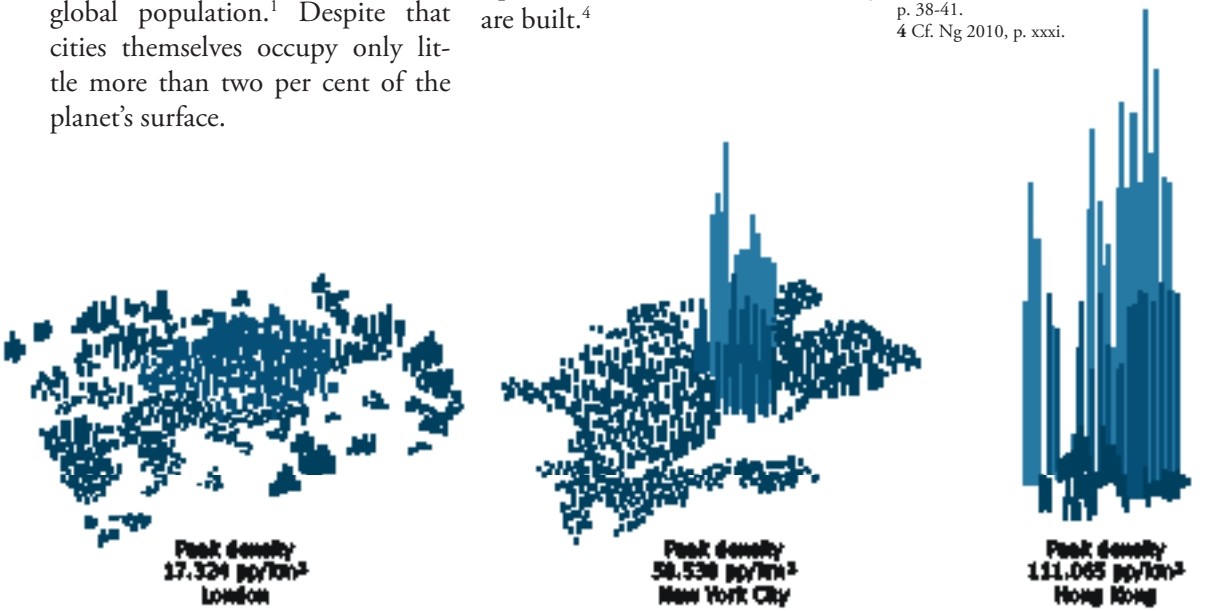
The year 2006 was a memorable year. According to the United Nations in this year the number of people who inhabit the world's cities exceeded half of the world's global population.[1] Despite that cities themselves occupy only little more than two per cent of the planet's surface.

"The number of cities and megacities has continued to grow. There are now more than 20 so-called megacities (cities with a population of more than 10 million) and even more than 400 cities with a population in excess of 1 million people."[2]

It is expected that by 2050 the world population will surpass nine billion, and urban dwellers will reach beyond six billion people. That means two out of three people born in the next thirty years will live in cities.[3]

For better visualising it's important to take a look at different densities in urban areas. New York for example, has an urban population density$_{note1}$ of only 1.750 inhabitants per square kilometre; London has 5.100; whereas Hong Kong has a very high urban density of 29.400 people per square kilometre, which is due to the fact that only 261 square kilometres of the territory are built.[4]

1 Cf. Ng 2010, p. xxxi.
2 Ibid., p. xxxi.
3 Cf. Scientific American (Ed.) 2011, p. 38-41.
4 Cf. Ng 2010, p. xxxi.



001 Residential density comparison

With this background, the issue of density in urban planning developed to an important instrument. By facing this significant demographic transformation we have to consider a change in lifestyle and need to think about new urban structures and dwelling types. For this reason, an evaluation of density and therefore the city Hong Kong[note2] is interesting, in order to find new solutions and get a feeling how density really works.

Different ways and indicators of measuring density can be found. In this chapter we investigate these different terms of density in order to understand Hong Kong and its underlying urban concept. It is important to deal with the meaning of the term '*urban density*' as it is one of the first things that comes to one's mind by thinking of Hong Kong as one of the densest places on earth. The fact that a lot of people live together within a small area makes it interesting to see how people deal with such circumstances, how it impacts their living conditions and how people hande space. It creates an inimitable living concept and constructs a unique urban tissue.

Chapter Megastructure p.81

002 Pedestrians in Causeway Bay

003 Pedestrians in Mong Kok

In Hong Kong, density can be experienced every day in the crowded streets and markets, by looking out of the window into other buildings and down at rooftops, in elevators or in elevated walkways. High density is basically a normal way of life in Hong Kong.

Around 45 per cent of Hong Kong's population live in areas with densities of more than 50,000 people per square kilometre. This is approximate to the peak densities found in New York (58,500 people per square kilometre) and Mexico City (49,000 people per square kilometre). Only 6 per cent of Hong Kong's population live in areas with less than 5,000 people per square kilometre, compared to 36 per cent in London.[5]

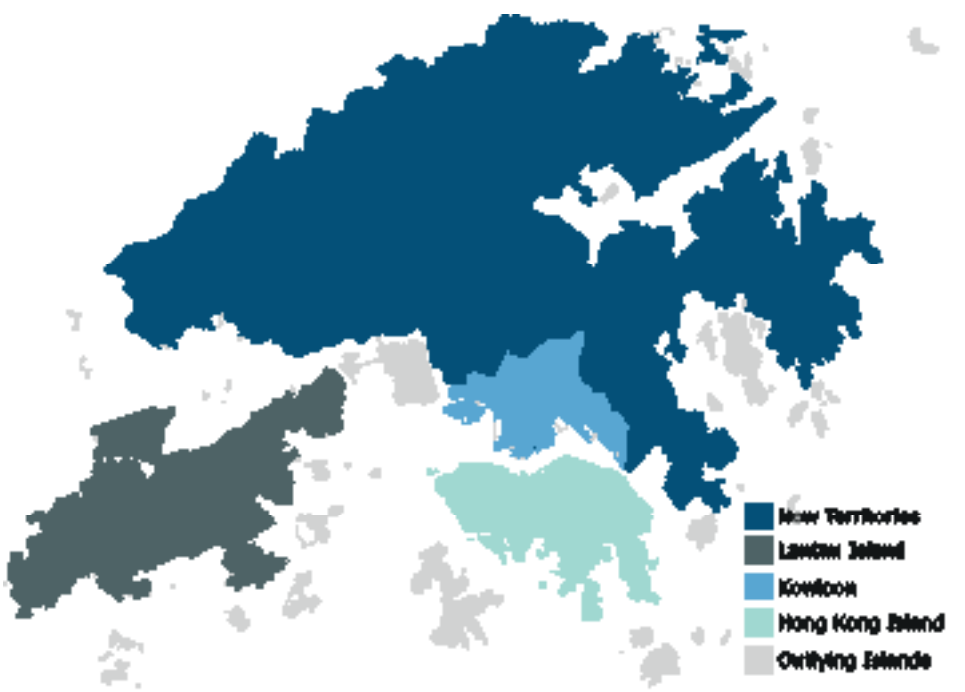
Hong Kong's high-density neighbourhoods are made up of different building types and megastructures which are examined in the next two chapters. This chapter concentrates on the reasons why Hong Kong has developed to such a dense and compact urban form.

In order to fully understand the urban fabric of Hong Kong it is interesting to explain the various influences which led to this high density and created a unique quality in the city.

"Hong Kong is the built manifesto of extreme density"[6]. – Emanuel Christ

5 Kandt 2011, p.34.
6 Christ/Gantenbein 2010, p.6.

004 Hong Kong topography



005 Hong Kong areas

TOPOGRAPHY

Hong Kong is situated on the southeast coast of China, next to the Guangdong Province. It is part of the Pearl River Delta, which is one of the most densely urbanised regions in the world, with an estimated population of 120 million people.[7]

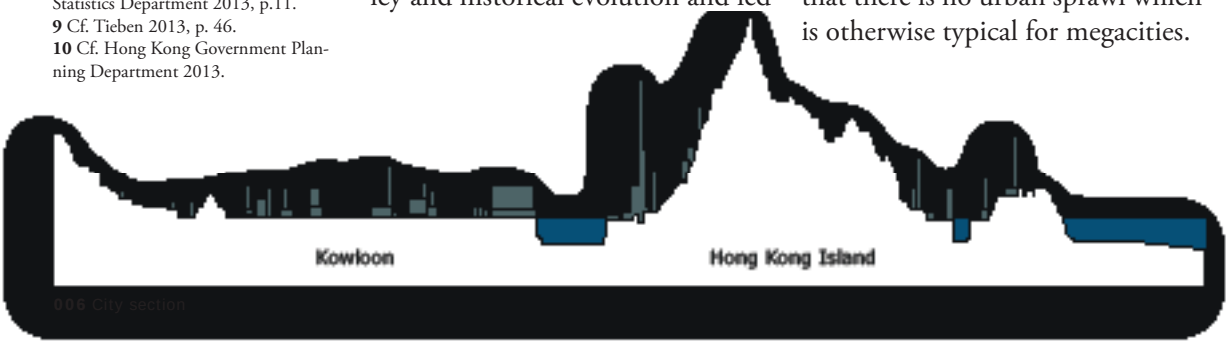
The urban area of Hong Kong has one of the highest population densities in the world. There are over seven million people for its 1.104 square kilometres of land. Considering that only 23.7 percent of its typography are developed, this makes a cumulative built-up area of only 261 square kilometres. The built-up area is mainly concentrated on the coastal strip of northern Hong Kong Island and the triangular tip of Kowloon.

In 2012 the overall territorial population density was 6.620 persons per square kilometre. The population densities in Hong Kong Island, Kowloon and the New Territories are 16.020, 45.730 and 3.910 persons per square kilometre. In some areas of Kowloon the population density reaches even more than 56.200 people per square kilometre.[8] This hyper-density is a result of Hong Kong's topography, land policy and historical evolution and led to a hyper-concentrated high-rise environment. Hong Kong's natural geographical condition is one of the main reasons why the city developed to such a compact urban form. The topography consists of over 250 islands, steep hills and the sea. This barely buildable landscape contributes to the highly compact settlement which is connected by an efficient linear infrastructure along the coast line.[9] The compactness of the built-up area leads to the protection of mountainous areas, country parks and wetlands.

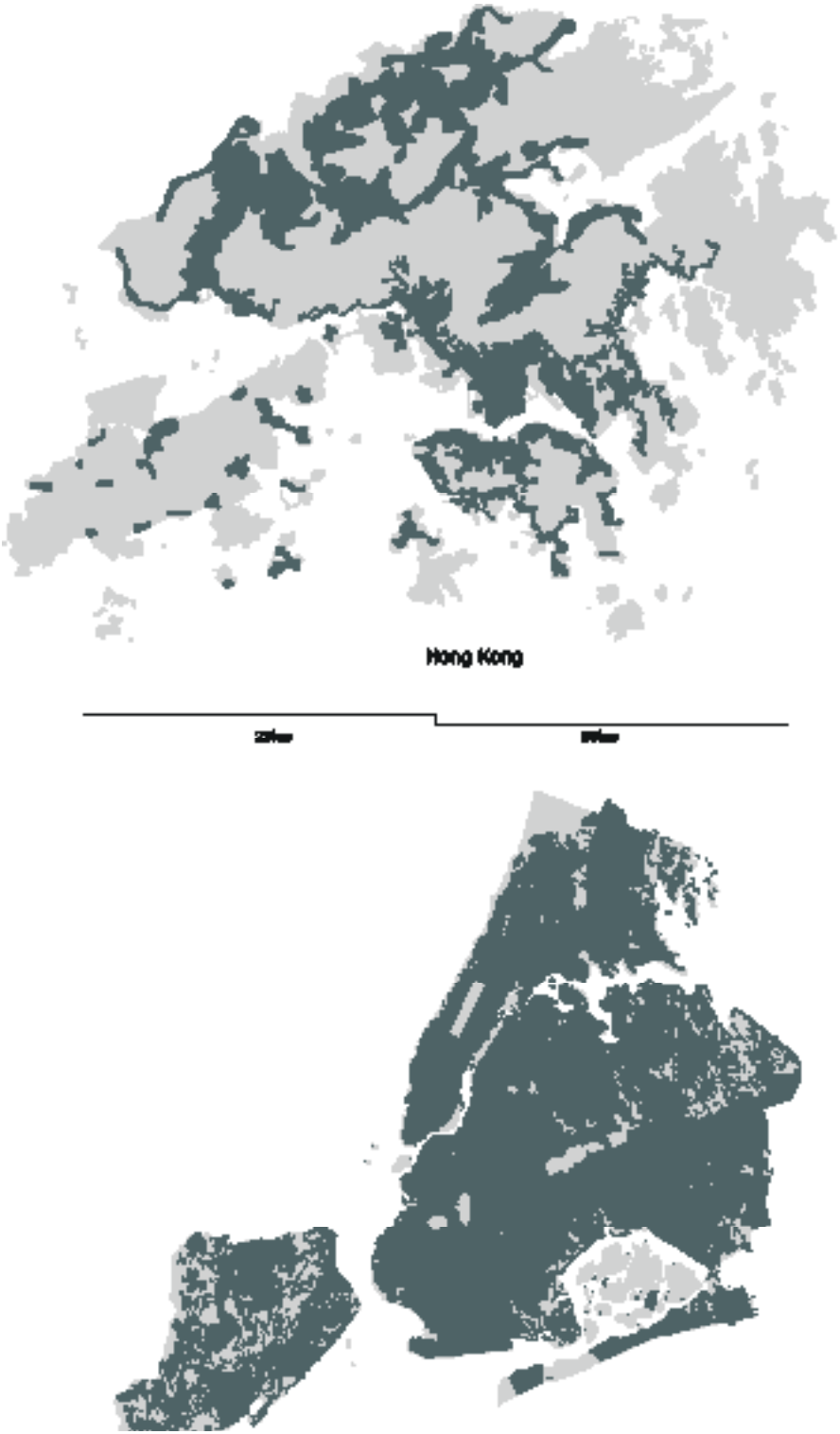
By looking at the surface distribution it is visible that the territory comprises of 66.6 per cent of woodland, wetland, shrubland and grassland compared to 6.9 per cent of residential use. This leads to a total area of 738 square kilometres of green space[10] which is due to its natural topographic condition as Hong Kong's terrain is hilly and mountainous.

This conservation of green space is due to the fact that this rocky and steep land cannot be used as building ground but it is also an intended outcome of the government's tight land regulation policy and contributes at the same time to the fact that there is no urban sprawl which is otherwise typical for megacities.

7 Cf. Vidal 2010.
8 Hong Kong Government Census and Statistics Department 2013, p.11.
9 Cf. Tieben 2013, p. 46.
10 Cf. Hong Kong Government Planning Department 2013.

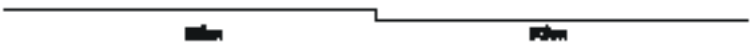


006 City section



007 Built up area comparison

Vienna



Graz

LAND POLICY

In Hong Kong, land[note3] is owned by the government. It is subdivided before it is leased to the highest bidder through a public auction. In the past the leasing period varied, ranging from short term agreements to the longest lease of '999-years', which is nearly equivalent to a freehold. Nowadays new leases of land are granted for a maximum term of 50 years from the date of grant on.

Efficient land-related development is a major concern as the sale/lease of land is one of the major sources of income for the government. It provides 23 per cent of the government's annual income which for Hong Kong means, the higher the ratio, the greater will be the value of the site.[11] Only small parcels are gradually released. This is one of the major reasons for the high land price and hyper-density, leading to developments and residential buildings with over 50 storeys.

"A pleasant side-effect of this policy is that one can leave the city (though not the crowds) and be in idyllic woods within half an hour – there is none of the endless urban sprawl typical of other megacities." [12]

Property market

Flats change hands up to 15 times during construction, increasing the price every time till completion.[13] The influx of money from Mainland China also changed the property market in Hong Kong. Now many new luxury properties are bought by rich Mainland Chinese, who want to secure their wealth. This also leads to an increase of property prices and makes Hong Kong to one of the world's most expensive real estate markets in the world.

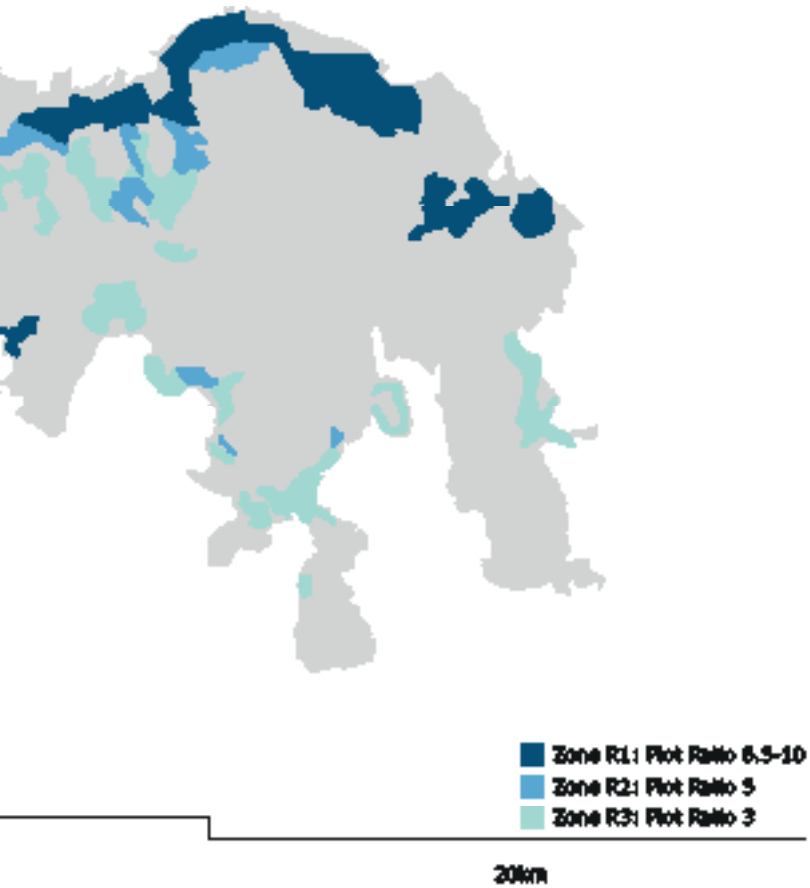
"Home prices in Hong Kong have risen about 45 percent since the end of 2008 due to record low interest rates, tight supply and interest from the mainland. Chinese buyers are estimated to have bought more than a third of upmarket properties sold in the first half of the year 2010 compared with a fifth last year and 15 percent in 2008. Under a programme launched in 2003, investors have been able to gain residency in Hong Kong by investing HK$ 6.5 million in real estate, equities or other assets. Residency attracts interest from overseas investors given the city's low income tax rate and, especially for mainland Chinese, access to quality public medical services and schools."[14]

In 2012, Hong Kong's priciest apartment – in the Frank Gehry designed residential project Opus – sold for 58 million Hong Kong Dollars (5.6 million Euros).[15] To prevent the increase of buyers from the Mainland, the Hong Kong government announced in November 2012 a 15 per cent property tax on all home purchases by non-permanent Hong Kong residents. Another tax of 20 per cent was introduced which will be imposed on properties resold within six months of purchase. This should lead to a three per cent drop in the number of mainland Chinese investors and should cool down the overheated real estate market.[16]

11 Cf. Lai 1997, p.21.
12 Wong 2000, p.88.
13 Cf. Ibid., p.88.
14 Yiu 2011, p.66.
15 Cf. Inocencio 2013.
16 Cf. Inocencio 2012.

Residential density[note4] planning policy

Regarding the limited land resources in Hong Kong there is a need to strike a balance in land utilisation. Before the Second World War, Hong Kong's buildings were governed by the Building Ordinance Regulations, which limited the height of buildings to five storeys. Together with the site coverage clauses, it resulted in a plot ratio of about three. This changed in 1963 as the concept of density zoning was introduced which is still in use today. This concept divides Hong Kong into three different Density Zones (R1,R2,R3), depending on the type of the area and its location. For every Density Zone, different maximum domestic plot ratios are in force. At Hong Kong Island the maximum plot ratio in the existing urban area varies between eight and ten. In Kowloon the plot ratio is only six to seven and a half. But the main purpose for this density zoning was to maximize the intensity of land use. People should work and live within close proximity to the high efficient transport system, which resulted in the high density of Hong Kong's urban form.[17]



008 Residential density zones

17 Cf. Zaman/Lau/Mei 2004, p.259.

HONG KONG IS A COMPACT CITY

The combination of rapid population growth and limited land resources led to a high-rise and high-density development approach within a compact urban form. Hong Kong is a good example for a compact urban city model. It combines almost all the theoretical attributes of a compact city – an urban pattern with high density, mixed land use, conservation of the countryside, efficient public transport system, short distances between home and work, better access to facilities and a high floor-to-area ratio which is called plot ratio. Due to the compactness of the city, open space and countryside are within walking distance. Also, a rich array of urban amenities, recreational and natural environments are within easy reach and contribute to the quality of life in the city.[18]

But also the negative effects of compact cities as described in Elizabeth Burtons essay: "*The compact city: Just of Just Compact"* can be found in Hong Kong. The reduced living space and the lack of affordable housing are main problems. Research also claims that compact cities suffer from a perceived lack of greenery, open spaces and parks.[19] This is a fact which applies to half, as Hong Kong has due to its natural geographical condition a lot of greenery. It lacks, on the other hand, of sufficient open spaces in the old urban district which is due to its densely built environment and the land policy of the government.

Reclamation

"What appears to be terra firma was likely water not so long ago…"[20]

Today it is possible that you sit, work or live in Hong Kong on a piece of land reclaimed from the ocean. Due to the lack of available buildable land, the narrow north shore and the increasing population on Hong Kong Island, it became necessary to reclaim land from the harbour. Started in the early 1850s, several reclamation projects took place, most of them on the shores of Victoria Harbour. Since then, more than 60 square kilometres of land have been reclaimed from Hong Kong's waterways, an area greater than Kowloon and nearly as large as the whole of Hong Kong Island.[21]

In the period from the 1950s to the 1970s the government shifted the focus toward urban decentralisation through the development of *New Towns* and started to reclaim land, mainly in the New Territories and Kowloon. From the 1980s onward, reclamation has concentrated again on the shores of Victoria Harbour.

This raises the question if the main objective of harbour reclamation is to encourage economic growth rather than improving the quality of life? Since the land premium and value of urban areas is higher at Victoria Harbour than at the New Territories[22] the government earns a lot, which certainly brings a financial benefit.

Chapter High-rise p.154

009 Land reclamation

010 Reclamation in Central

18 Cf. Zhang 2004, p.249.
19 Cf. Lau 2011, p.36.
20 Frampton/Solomon/Wong 2012 p.13.
21 DeWolf 2011.
22 Cf. Zaman/Lau/Mei 2004, p.257.

011 Reclaimed land

Due to public concerns and the growing awareness of the environment a new policy has been implemented to protect Victoria Harbour from any further land reclamation. Since then, the land created by reclamation has significantly declined.

New ways to meet the demand for land have to be elaborated, as the population still grows. It's estimated that Hong Kong will reach 8.9 million by 2039. Land is therefore one of the most valuable assets of Hong Kong. The city already expands to the mountains by levelling mountain slopes. These tower podium developments on slopes are designed to protect the buildings and infrastructure from landslides and simultaneously create an artificial landscape. Another form of reclamation in Hong Kong is to place facilities such as Sewage Treatment Works into rock caverns to release land for housing or other uses. The rezoning of land and the reuse of for example ex-quarry sites is also a way to secure land supply for Hong Kong. As well as redevelopments of older urban areas or individual buildings are getting more common nowadays.[23]

Urban renewal

In the older urban parts of Hong Kong the renewal or demolishing of old blocks is the only option to gain space in the existing urban fabric. In this case, low, medium, and high-rise developments are converted into high-density high-rise buildings. Urban renewal intensifies development by increasing the plot ratio through the high-rise built form thereby achieving efficient land use. Urban renewal started in the early 1960, when the government carried out a pilot redevelopment scheme in *Sheung Wan* with the aim to redevelop older buildings and improve the congested conditions of old residential areas. These redevelopments took up a long time to complete because of the difficulties in land acquisition since there are multiple ownerships and because of the relocating process of the affected residents and businesses.

Nevertheless, the existing housing stock is aging rapidly and the Urban Renewal Authority is planning to speed up the process. The way how the Urban Renewal Authority redevelops older districts in Hong Kong raised also major concerns about how urban renewal is practised, because there is no preference to preserve buildings because of its historical or architectural value. The consequence is that there remains little in the city which can provide evidence of Hong Kong architectural past. So is Hong Kong becoming a *Generic City*?

012 Graham Street urban renewal site

013 Graham Street URA proposal

23 Cf. Development Bureau 2012, p.4-9.

HONG KONG, A GENERIC CITY?

Rem Koolhaas asked in his text 'The Generic City', "*What is left after the identity is stripped? The Generic?*"[24] This is a question which someone could also ask about Hong Kong, as today a lot of Hong Kong's history and culture has already been erased. Today Hong Kong is a city with less historical trace, a city which is built to enjoy oneself.

Even the description of global cosmopolitans who feel equally at home in every city can be applied to Hong Kong. So is Hong Kong, a generic place that can be *'British'* at one moment and *'Chinese'* the next with no discernible crisis of identity? As for Koolhaas the issue of identity is passé. Identity is merely a "*mousetrap in which more and more mice have to share the original bait, and which on closer inspection, may have been empty for centuries."* [25] In his view a person or a whole city should never be trapped in one identity, since all of us now have multiple identities, he even goes so far in his text that the generic city is without history, it is *'superficial'* as it produces a new identity every Monday morning, like a Hollywood studio.[26]

So is this going to be the case for Hong Kong as well, a place in which history and culture is meaningless? Ironically an increasing number of people in Hong Kong, particularly young activists are rising to the defence of the few historical monuments which still remain in the city. Nearly every urban renewal project has been challenged with protest, as it was the case with the old Star Ferry terminal or the old Queen's Pier, but both failed. Hong Kong systematically erases its built form and with it its cultural character leaving behind a generic city. This can be already found in Kowloon with a random mixture of buildings and streets without any semblance of a centre or an urban plan, all of it is designed for consumption as you pass by malls, shops and hotels.[27]

So could it be that Rem Koolhaas had Hong Kong in mind when he established his concept? As he describes a real urban phenomenon in Asia which is situated *"in a warmer than usual climate; it is on its way to the south – toward the equator - away from the mess the north made of the second millennium."* [28] He further observed that the Generic City is on its way from horizontal toward 'verticality'– *"the 'skyscraper' looks as if it will be the final, definitive typology, it has swallowed everything else. It can exist anywhere in a rice field, or downtown - it makes no difference anymore. Density in isolation is the idea."*[29]

Hong Kong already fulfils the three basic requirements in Koolhaas's scheme: *the airport,* which is designed by Sir Norman Foster and considered by many as the best in the world, is in itself a characterless generic city, a perfect space for 'transit', *the hotels,* which are some of the region's best, and *the malls,* where Hong Kong is certainly the largest mall city in the world.[30] By observing this it can be said that Hong Kong has indeed become Koolhaas' model of a generic city, but will it face the same end?

014 Skyline buildings

24 Koolhaas 1995, p.1248.
25 Koolhaas 1995, p.1248.
26 Cf. Koolhaas 1995, p.1250.
27 Cf. Lee 2008, p.141.
28 Koolhaas 1995, p.1262.
29 Koolhaas 1995, p.1253.
30 Cf. Lee 2008, p.239.

AGRICULTURAL LAND

Almost all of Hong Kong's agricultural land has been converted into building land, making it dependent from importing resources such as drinking water and food from Mainland China. In 1998 less than three per cent of the land in Hong Kong was used for agricultural production and only 13.9 per cent of fresh vegetables were produced in Hong Kong. Given the age of this data and the pace of development, the amount of locally grown food has probably decreased. It can be said that a high density city is necessarily a consumer city. With more than seven million inhabitants, Hong Kong has a built area of 261 km² and 843 km² of open space. For its food production though, Hong Kong would need roughly 400 times the built area or 100 times its total area.[31]

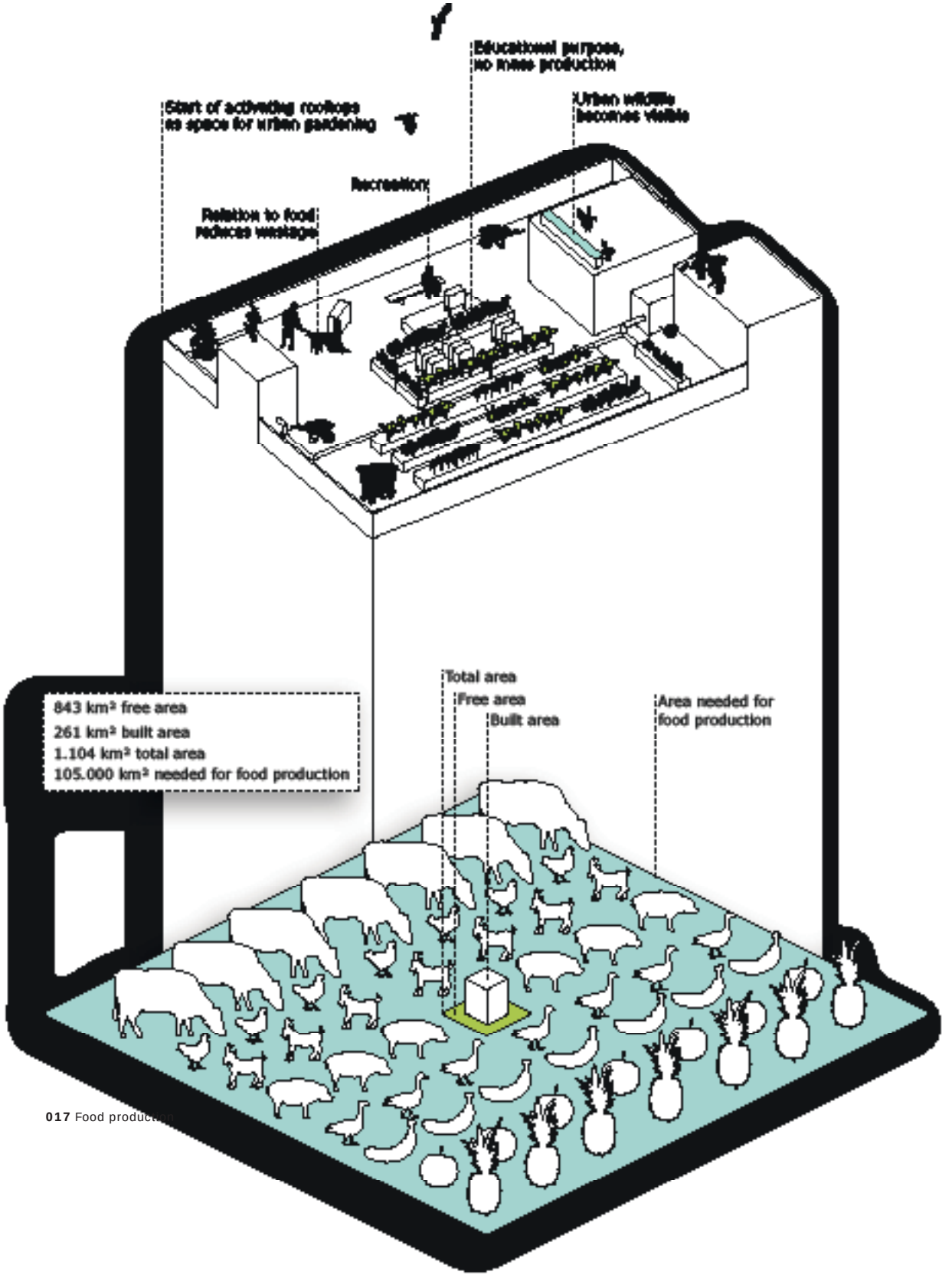
Rooftop farming

Today a new way of farming in Hong Kong is now on the rise - *the roof top farm*. One of the first of these farms is situated on a roof top of an empty industrial building in the urban area of Ngau Tau Kok in Kowloon. This project is called *HK Farm*, it shows a way to grow sustainable and local food in the city. As Hong Kong is ideal for growing fruits and vegetables due to its humid subtropical climate conditions it is possible to harvest food all year around. It is also better for the environment as it reduces carbon emissions and helps to collect rain water. This project encourages people to see the value of rooftop farming and collaborates with local communities, schools and organisations to make this way of farming more popular.[32] The aim is that people know how to grow fruits and vegetables which could be start of a movement to bring agriculture back to Hong Kong even if it cannot cover the whole consumption. The relation to self-planted food could help to reduce food wastage and lead to a more sustainable habit of consuming.

015 Rooftop farming in Yau Ma Tei

016 Fig tree on rooftop

31 Cf. Vale/Vale 2010, p.21.
32 Cf. HK Farm 2013.


Start of activating rooftops as space for urban gardening
Educational purpose, no mass production
Urban wildlife becomes visible
Recreation
Relation to food reduces wastage
843 km² free area
261 km² built area
1.104 km² total area
105.000 km² needed for food production
Total area
Free area
Built area
Area needed for food production

SHAPING THE CITY

Hong Kong was barely inhabited until the mid-19th century. With only sixteen villages, it offered little settlement area, but due to its location at the Pearl River and because of its deep water and - due to surrounding hills, it was of great strategic importance.

This was one of the main reasons why the British founded the city 'Victoria' after the First Opium War on Hong Kong Island in 1841. Maps and sketches from that time show a compact urban form with densely packed two to three storey buildings on the slope of the Victoria Peak. In May 1841 over 7.400 Chinese lived on the Island and the population grew so fast, that in the same year the number of inhabitants nearly reduplicated.[33]

"Perhaps no place in the history of ages can boast of such a rapid rise as the town of Hong Kong. In August 1841, not one single house was yet built, not a portion of the brush-wood had been cleared away from this desolate spot. By June 1842, the town was considerably more than two miles long, containing store-houses and shops, here called godowns (warehouse) in which almost every article either Eastern or European could be procured and most of them at not very unreasonable prices."[34]

There were no elaborated plans for creation of housing for the immigrants, which came mainly from Mainland China. Houses were built with the intention to create as much living space as possible, as cheap as possible.

For that reason, houses were built back-to-back to deal with the ground as economical as possible. These houses are known as shop-houses or *Tong Lau*. In 1856 the first Building Ordinances was put in place, fourteen years after Hong Kong had become British colony. This set the minimum standards in the construction of buildings but did not address other issues such as lighting or ventilation.[35] To provide better defence for the harbour and because building land became scarce, the British colony expanded their boundaries in the year 1860 after the Second Opium War and the Peninsula Kowloon became part of the colony. In 1878 further legislation for building safety and structural stability were put in place and the shop-house with masonry colonnades became the dominant urban typology, which remained for almost eighty years.[36]

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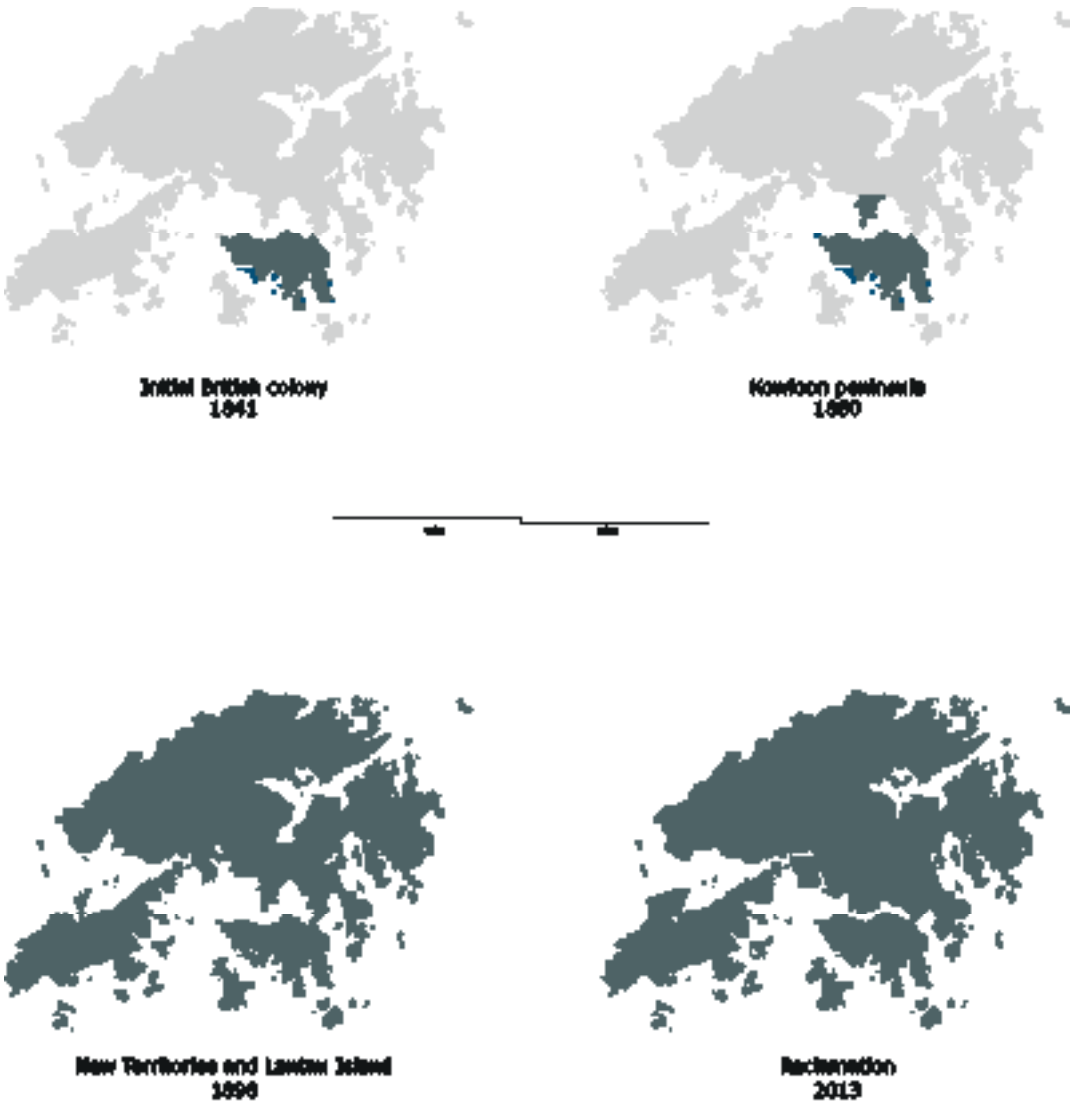
After 40 years of growth the city was in a very bad hygienic situation. In 1894, the bubonic plague broke out. Because of urban expansion pressure, Britain leased the New Territories and Lantau Island from China in 1898 for a period of 99 years. Thereby the land increased about 933 square kilometres. This expansion should lead to an increased construction work but little was done until the Kowloon-Canton Railway opened in 1916.[37]

018 City of Victoria drawing from 1841

33 Cf. Lampugnani 1993, p. 98.
34 Ibid., p. 98.
35 Cf. Shelton/Karakiewicz/Kvan 2011, p.36.
36 Cf. Ibid., p.46.
37 Cf. Lampugnani 1993, p. 98-103.

AREA EXTENSIONS



019 Area extentions over the time

In 1903 a Building and Health Ordinance was enacted, which set new standards for the design of buildings. In 1911 457.000 people were living in Hong Kong but between the Chinese Revolution in 1911 and the beginning of the Sino-Japanese War the population increased by more than one million, and after the end of the war it rose to one and a half million. This influx of people worsened the living conditions for people in Hong Kong. In 1940 the population had even reached 1.9 million, of whom half a million slept in the streets.

From 1941 to 1945 Hong Kong was occupied by Japan. In those years the city emptied rapidly like it had filled up before. By the end of the war in 1945 the population of Hong Kong shrunk to 600.000, less than half of the pre-war population. After the Japanese surrender, the population raised again and the communist revolution in China 1949 also led to another population boom in Hong Kong. Thousands of refugees emigrated from Mainland China to Hong Kong and the population rose to more than a million, which led once again to a dramatic increase in the number of people per residential unit namely 21.4.[38]

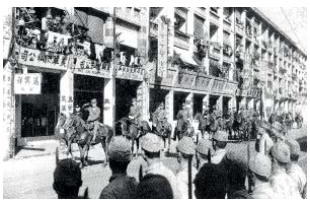
The uncertainties in China promoted not only an influx of refugees, it also led to the relocation of businesses and capital mostly from Shanghai. That was - together with the cheap labour force of the immigrants - the foundation of Hong Kong's economic miracle.

Under British rule, Hong Kong was known for its laissez faire economics and minimum government intervention. Hong Kong transformed from an entrepôt trade territory into an industrial and manufacturing centre.

By the mid-1950s Hong Kong had increased its population to more than 2.2 million, which led to a housing shortage, squatting, high density and poor living conditions.

In 1950 Hong Kong had nearly 25.000 primarily domestic buildings with an average of three-and-a-half storeys in height. 90 per cent of those were Chinese shop-houses, dating mostly from before World War II.[39] People were living on illegal dwellings, on the roofs of shop houses and the city form was more volumetric with a common gross density of 2.000 persons per hectare, in some areas even 4.000 persons per hectare.

For the first time this promoted substantial changes to the building regulations and an urban housing policy, which brought fundamental changes to Hong Kong's building typologies and overall urban morphology.[40]



020 Japanese soldiers 1941

021 Wan Chai, Hong Kong 1950

022 Connaught Road shop houses

38 Cf. Wong 2000, p.90.
39 Cf. Shelton/Karakiewicz/Kvan 2011, p.83.
40 Cf. Ibid., p.63.

From then onwards, a massive resettlement scheme for squatters and a public housing program were initiated to accommodate the wave of immigrants after the creation of the People's Republic of China in 1949 and to improve the city's situation. With the start of the government's resettlement and housing program, new building forms emerged in Hong Kong and increased the density of buildings and people per existing city block even more.

After a devastating fire in 1953 that destroyed a densely populated squatter settlement and left 53.000 people homeless, the Hong Kong Housing Authority was set up in 1954. The public housing production began with the Shek Kip Mei resettlement estate. *"New higher and particularly more massive buildings were now the dominant visual components of Hong Kong's urban landscapes."*[41] The multi-storey building was introduced as common building form, which was the beginning of the high-rise buildings in Hong Kong. The idea was to house as many people as possible, as fast as possible in order to deal with the housing shortage.

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In 1956 and 1962 new building regulations were designed to reduce the building density, but were not officially introduced for another three years. Because of that background, the cityscape changed radically between those years and turned from a horizontal to a vertical plan. Developers rushed to take advantage of their earlier and more generous development provision. Older buildings of four to five storeys which had been the predominant building type, were demolished and replaced by new significantly taller high-rise buildings. These buildings were made out of concrete and steel and designed to achieve a minimum of costs and a maximum of returns.[42] This rush of construction flooded the market with residential buildings and slowed further developments down until 1970.

The high-rise, high density vertical city was formed as a solution to accommodate the increasing population. It was the beginning of a new era, with the *Podium and Tower* form, which combined a large footprint at ground level, and a smaller tower footprint at podium level.[43]

In the 1960s the manufacturing industry employed a large number of the population. The label *'Made in Hong Kong'* turned from a cheap low-grade product to a marked high-quality product and most of the manufactured products have been exported. Industrial estates were now often built next to housing estates using similar design. The use of reinforced concrete allowed the construction of vertical factories which were reaching up to 23 floors and were situated west to Tsuen Wan and east to Kwun Tong.[44]

023 Shek Kip Mei resettlement estate

41 Ibid., p.83.
42 Cf. Lampugnani 1993, p. 109.
43 Cf. Shelton/Karakiewicz/Kvan 2011, p.82.
44 Christ/Gantenbein 2010, p.40.

During the 1960s and 1970s Hong Kong experienced a baby boom and an increase in population size from more than three million in 1961 to more than four million in 1970[45], which was also due to hundred thousands of illegal immigrants who entered Hong Kong from Mainland China.

This put tremendous stress on housing demands and was the main reason for accepting such a high density approach in Hong Kong.

After a review of land demand for industry and housing in the mid-1950s, the government studied the possibilities of building *New Towns* in the rural areas of Hong Kong. In 1964 the government began with the first construction of satellite towns, which were large scale urban developments to accommodate the growing population. But this was just the beginning. In 1973 the government implemented a New Town Programme which took the experience of the British 'Garden City' for guidance and the first generation of New Towns, such as Sha Tin, Tsuen Wan and Tuen Mun[46] were built, mainly on reclaimed land in the New Territories. Travelling in Hong Kong's urban area was still all above ground and the heavily used ferries, which were the connection between Hong Kong Island and Kowloon Peninsula, were a defining characteristic.

In 1978 the People's Republic of China initiated the 'Open Door Policy', in which Hong Kong became the main source of foreign investments to the mainland. A Special Economic Zone was established the following year in the Chinese City of Shenzhen to attract investment and know-how from Hong Kong, located immediately north of the mainland's border. While the manufacturing industries moved and expanded to the Pearl River Delta, the city started to transform into a global financial services centre. With this role, Hong Kong joined New York to embrace the skyscraper. The construction of an impressive skyscraper skyline began as different trading and banking companies competed to create key landmark projects.

"But unlike New York, which has taken the building type as an instrument for concentration in and towards a centre, Hong Kong has taken it as an instrument for dispersal – both concentration and scattered dispersal." [47]

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025 Shatin 1979

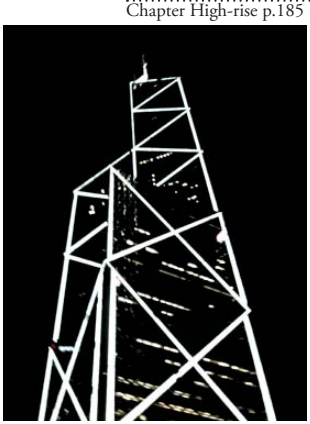
026 Shatin 2008

45 Cf. Circosta 2013.
46 Hong Kong Government Census and Statistics Department 2012, p. 1.
47 Shelton/Karakiewicz/Kvan 2011, p. 101.

027 Sino-British talks 1984

028 Hand-over ceremony 1997

Chapter High-rise p.185



029 Bank of China building

In 1984 Great Britain and China signed the Sino-British-Joined-Declaration agreeing to transfer the sovereignty of Hong Kong to the People's Republic of China in 1997. This created uncertainty among the population about their future and led to migration of Hong Kong natives. It is estimated that nearly one million Hong Kong locals migrated during that period, notably to Commonwealth countries such as Canada, Australia, the United States and the United Kingdom.[48]

This time also led to new kinds of architectural developments:

- The *Pencil Towers* which are built on narrow lots and allow the private developers fast returns without the risk of long and complicated negotiations with multiple owners for land resumptions. Since the 1980s Hong Kong has emerged as a major commercial and financial centre in Asia, office space in Central district has increased and new buildings on reclaimed land have been constructed.[49]

- The construction of key *landmark buildings* such as the New Hong Kong International Airport by Norman Foster and Ieoh Ming Pei's Bank of China Building as political intended symbols for economic stability and dynamic in a time of change.[50]

In 1998 the Kai Tak Airport on the Kowloon Peninsula was closed, which led to a removal of the height limit of 60 metre at this area, which ensures that new high-rise buildings are going to be built in that area.

After the handover in 1997, the branding of Hong Kong as *'Asia's World City'* became important by building integrated infrastructure hubs, theme parks and shopping malls, which should attract foreign investment and tourists.

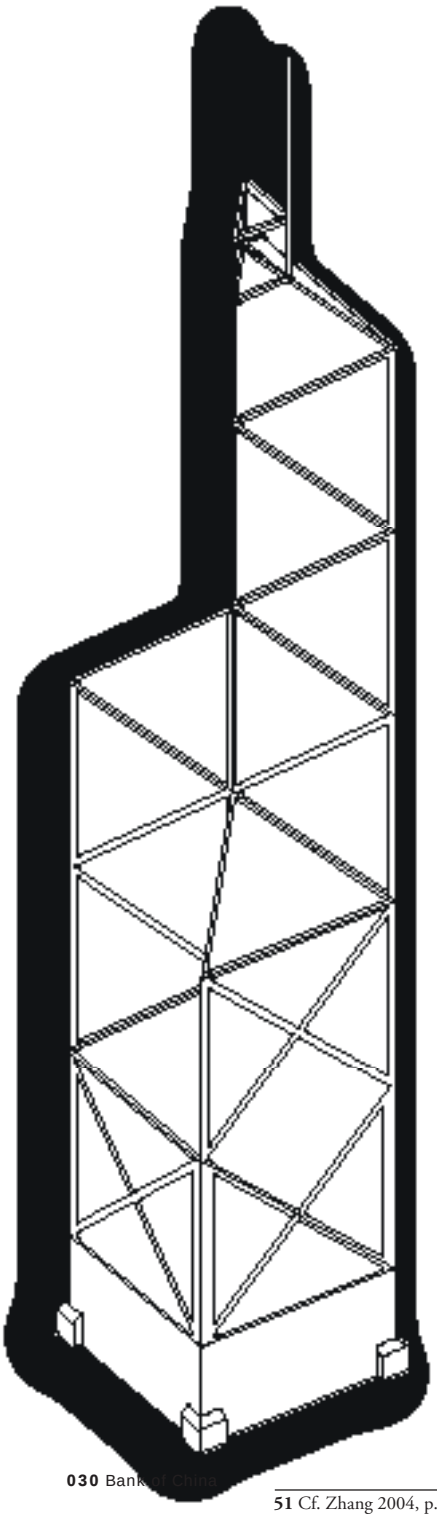
Today Hong Kong is a Special Administrative Region of the People's Republic of China that underlies the principle of *'one country, two systems'*. This means that it has a different political system than mainland China with independent judiciary functions under the common law framework. It will retain its laws and a high degree of autonomy for at least fifty years after the handover.

48 Circosta 2013.
49 Cf. Yeh 2011, p.32.
50 Christ/Gantenbein 2010, p.43-44.

ECONOMIC TRANSFORMATION

Hong Kong has witnessed dramatic economic developments, which may take centuries in other places. Due to Hong Kong's unique geographical location and the deep bay harbour, it began as a trading port that acted as a cultural and economic intersection between East and West. As most of the manufacturing and industry have been relocated to Mainland China, especially to Shenzen, Hong Kong has transformed into a global financial capital. Due to the scarcity of land and its hilly topography, Hong Kong cannot adopt a land-rich economic policy based on industry and agriculture; it is an economy which is based on the accumulation of capital through service sectors such as trade, finance and tourism.[51]

Hong Kong is now known as a finance and logistics centre. It is the third largest financial centre in the world, which employs now 82.4 per cent in the service sector while only 7.1 per cent work in the manufacturing sector. There are still some industrial areas which are mostly situated on the coastal areas of Kowloon and the New Territory. But a lot of the factories were turned down and replaced by commercial buildings. Today the commercial area of Hong Kong can be found on the northern waterfront of Hong Kong Island as well as on the Kowloon sea front.



030 Bank of China

51 Cf. Zhang 2004, p.249.

POPULATION

031 Population distribution

032 Foreign nationalities

Since the end of World War II Hong Kong has experienced a rapid rate of urban population growth caused by a high rate of natural increase and large-scale immigration, mainly from Mainland China. Until today, Hong Kong's population increases, in 2012 per 1.2 per cent and has a total population of 7.154.6000 people. This is not only due to births, as Hong Kong has one of the lowest birth rates with only 1.11 children per woman.[52] It's actually due to the influx of immigrants from Mainland China with a 'one-way permit', which contributes significantly to the population growth, as 150 migrants enter Hong Kong from mainland China every day.

It is not only the physical city which makes Hong Kong so interesting, also the interplay of two different cultures and ideologies, the British colonialism and traditional Chinese culture, which shaped the history in Hong Kong.

Characterized by its Chinese ethnic and the British influence during the 150 years of Crown Colony, the inhabitants developed an own Hong Kong identity and culture. It combines traditional Chinese values with western ideas to a new value system, which influenced and shaped Hong Kong.

Hong Kong's inhabitants are primarily immigrants from different provinces from Mainland China, and refer to themselves as *Hèung Góng Yàhn* (Hong Kong people).

Within the population about 6.8 per cent are foreign nationals, who came from various places in Asia, Europe and North America. 93.2 per cent of the population are of Chinese descent.[53]

Hong Kong has a number of minority ethnics; numerically the largest groups are the foreign domestic helpers which mainly come from the Philippines and Indonesia making up four per cent of the total population. These ethnic minorities are noticeable everywhere, especially on Sunday when the foreign domestic workers gather in public spaces. But they have not become an integral part of Hong Kong's population as they are not allowed to apply for a Hong Kong residency.

Hong Kong is a highly cosmopolitan and tolerant society, it can be seen as a meeting point between East and West and is also visible in the multilingual practice as there can be found three spoken languages, Cantonies, Mandarin and English.

However Hong Kong faces the same problem as other developed countries as its population is aging. The proportion of the population over 65 has risen steadily over the last 30 years and stands now at 12 per cent. Today, young people under 20 make up just 20 per cent of the population.[54]

52 Hong Kong Government Census and Statistics Department: Hong Kong in Figures 2013, p.10.
53 Cf. Hong Kong Government Census and Statistics Department: Population Census 2011.
54 Burdett/Tylor/Kaasa 2011, p. 36.

RESEARCH INTO DENSITY IN HONG KONG

Research into density and crowding has been based in most parts on studies of Western habitats and the behaviour of Western people. For that reason it is interesting to take a look at studies on Hong Kong's density.

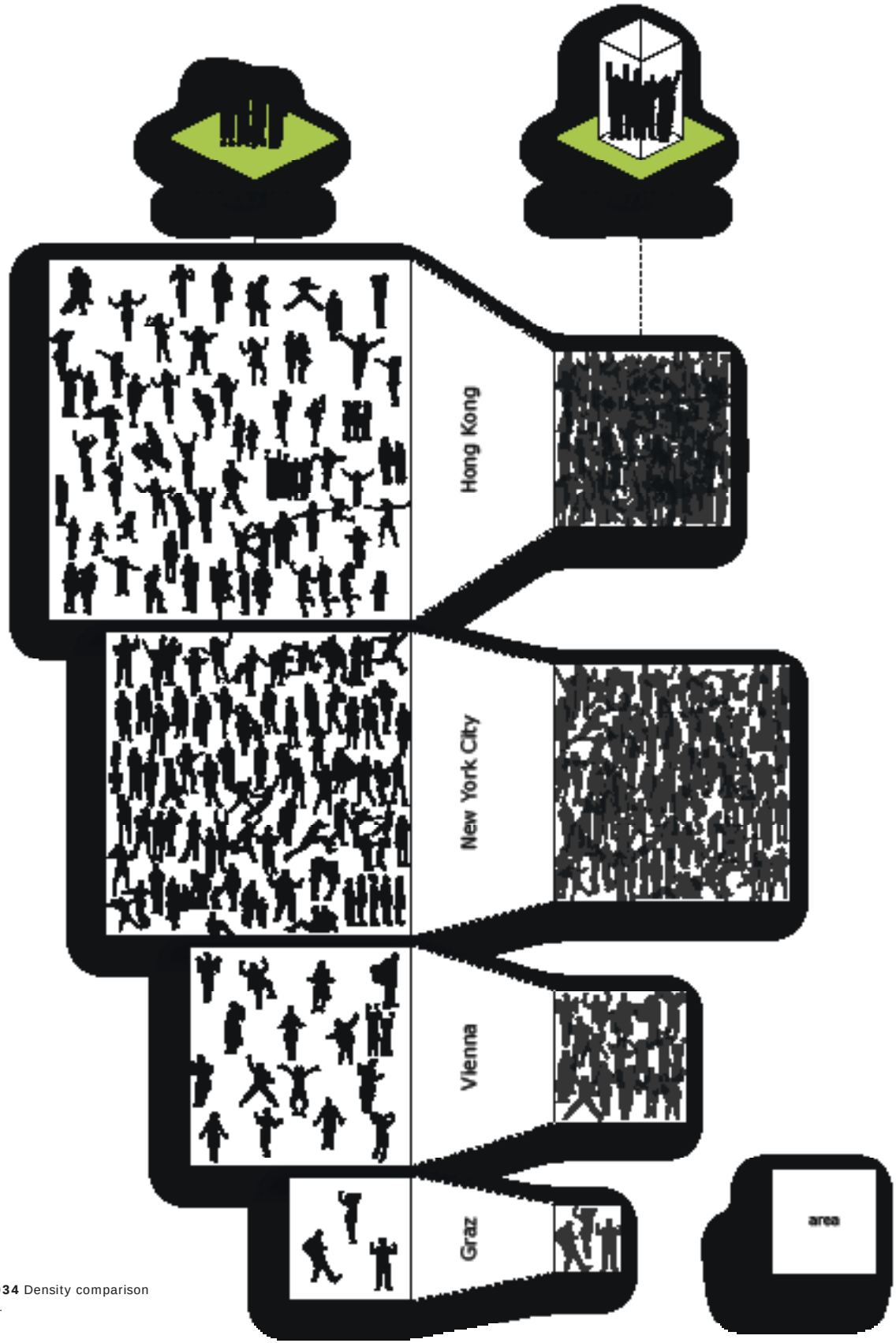
In the Journal of the American Institute of Planners 1963 Robert Schmitt, an American scholar, published his article *'Implications of Density in Hong Kong'*, where he compared the aspects of Hong Kong and American urbanism. He was impressed by the fact that although Hong Kong was more densely populated than many cities in the United States, it had lower rates of death, disease, and social disorganization.[55] Schmitt also drew attention to density figures that were unimaginable to most Western professionals and acknowledged that the tolerance of high densities was tied to a long established Chinese cultural tradition of close living. He even pointed out that Hong Kong had a high number of vehicles for its length of road but it had very few vehicles for the size of its population. His conclusion was that urban planners should *'re-examine'* their attitudes to urban density, and that urban planners had to free themselves from certain prejudices about urban density.[56]

In 1971 Robert Edward Mitchell, published his article "*Some social implication of high density housing*", he investigated the effects of household densities on emotional health and family relationships in urban Hong Kong. From his survey data he estimated that the median size of dwelling units in the urbanized areas was 400 square feet (37 square meters) and the median number of square feet per person was 43 square feet (3.9 square meters). Mitchell found out that density does not necessarily lead to social, mental or physical pathologies.[57] Stress in Hong Kong may be more likely due to inadequate income or forced social interaction between non-relatives in shared flats than density itself.[58]

Both articles were written at a time when most city planners were either planning low-density suburbs or building towers and slab blocks that stood apart from each other in sheer green space. Many studies show that a substantial proportion of the urban population in Hong Kong does not see high density as a problem, many even preferred the presence of a large number of people e.g. for safety reasons.[59]

033 Architecture of density

55 Cf. Lee 1981, p.8.
56 Cf. Shelton/Karakiewicz/Kvan 2011, p. 8.
57 Lee 1981, p.8.
58 Cf. Yeh 2011, p. 31-32.
59 Cf. Ibid., p. 31-32.



034 Density comparison
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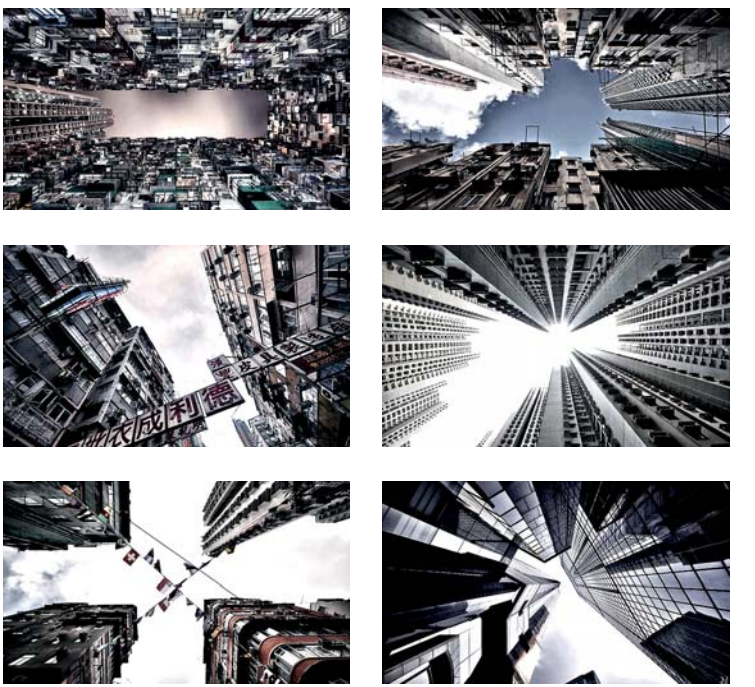
PERCEPTION OF URBAN DENSITY

A study on perception of urban density examined people's cognition and satisfaction in Hong Kong, by developing two methods to obtain feedback (responses to photographs of real urban scenes, and responses in actual urban locations) and selecting eight different sites with a wide range of urban built-form characteristics.

Two study sites with a similar plot ratio of about five but with a very different urban form (low-rise development and high site coverage and high-rise area with low site coverage) were compared. The high-rise development was considered having lower density and rated more satisfactorily than the other study subject. Another measuring tool was the sky view factor-[note5] which is much higher at the high-rise development than at the compared low-rise area. According to the study, the perception of density decreased with the increasing sky view factor. This concludes that the high-rise development is a more desirable place for people due to its spatial openness. It has to be emphasized that it doesn't implicate that only quantity of open space is important, it is also about a balance between quality and quantity of open space.

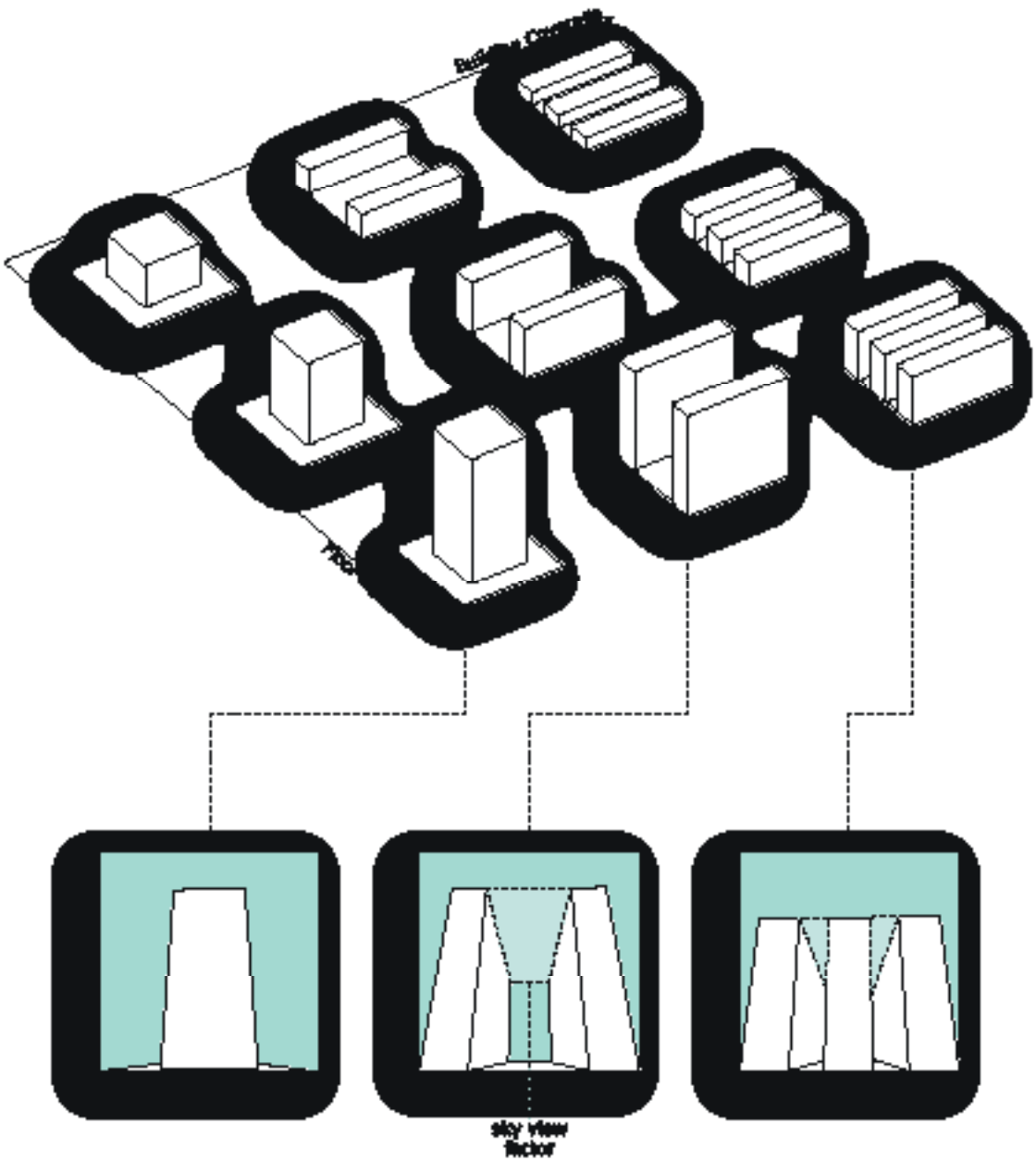
This study also looked into the effect of vegetation in urban space, which normally appears to reduce the sense of density, but in this case some participants expressed their concerns that vegetation would take up more of the already scarce urban pedestrian space and would make the street even denser. The effect relating to public urban art was similar. The results generally show that public art is not widely appreciated, with much commenting that the streets in Hong Kong are too narrow and congested.[60]

Hong Kong is an urban laboratory of density and verticality. It shows how we can achieve the maximum outcome with the minimum of space. It is a good example for high density living and therefore worth drawing attention on it. It is a paradigm that cannot and should not be adopted in every detail in other cities, but it should be studied carefully, so that we may learn from its downsides and benefits.



035 Skyviews in Hong Kong

60 Cf. Cheng/Steemer 2010, p.476-481.



036 Parameters for perception of density

HONG KONG'S CITY PATTERNS

To understand density in Hong Kong better it is important to take a look at different city patterns. In this thesis we concentrate on six city patterns on Hong Kong Island as both projects are situated there.

The urban fabric of Hong Kong Island has not been guided through urban planning it is a grown structure of global roads and local streets which established the basic city grid. This can still be experienced today in the Central District in a slightly widened and greatly elongated form. It was a string of districts that formed the beginning of Hong Kong which expanded only slightly across its north-south belt through reclamation but became extremely elongated from west to east. The main body of this string like city was made up of narrow streets flanked by *Shop Houses* which were the dominant building typology of that time.[61]

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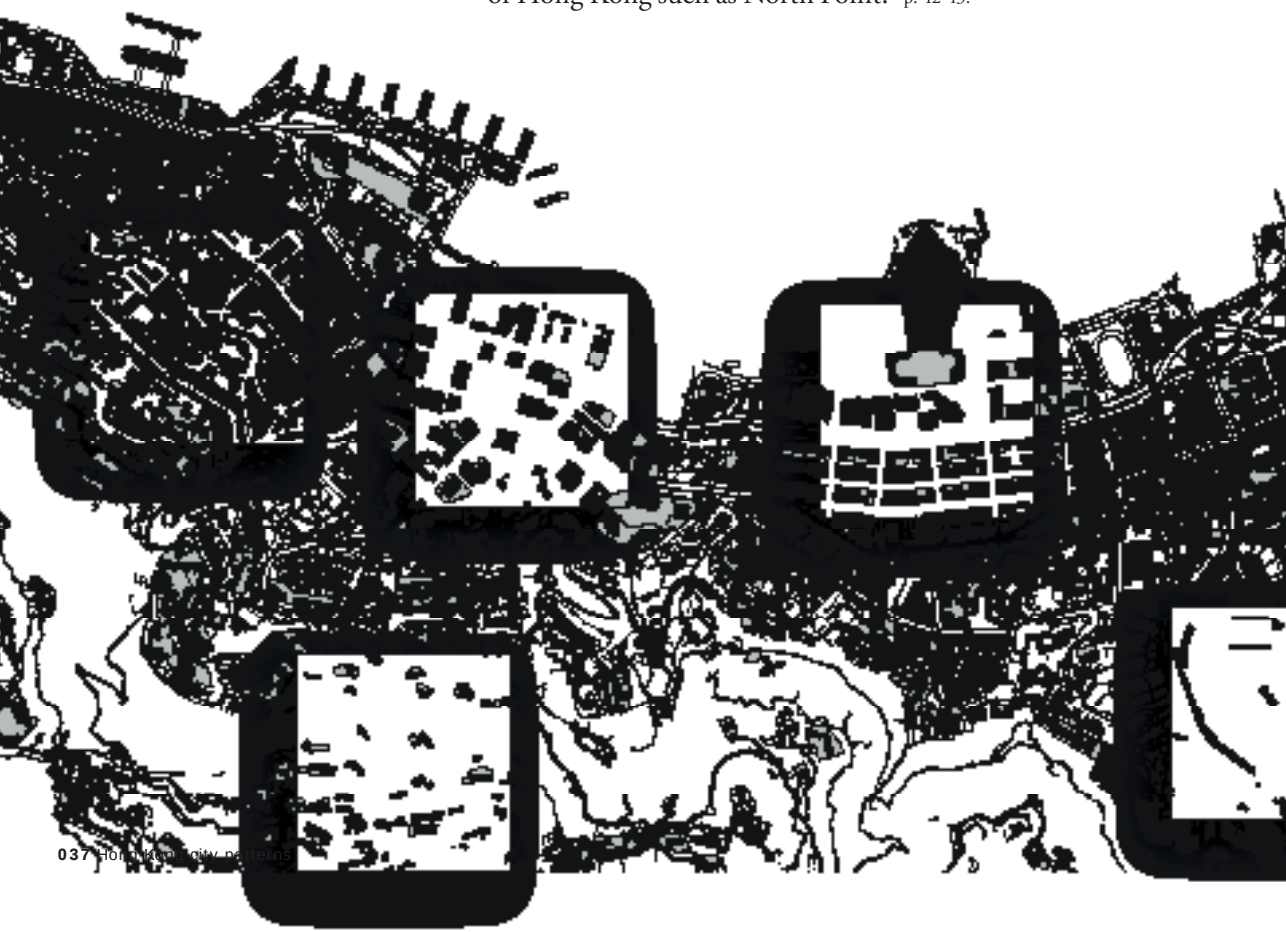
Today this building form has changed and a mix of different typologies can be observed in these streets, which are examined closer in the chapter 'High-rise'.

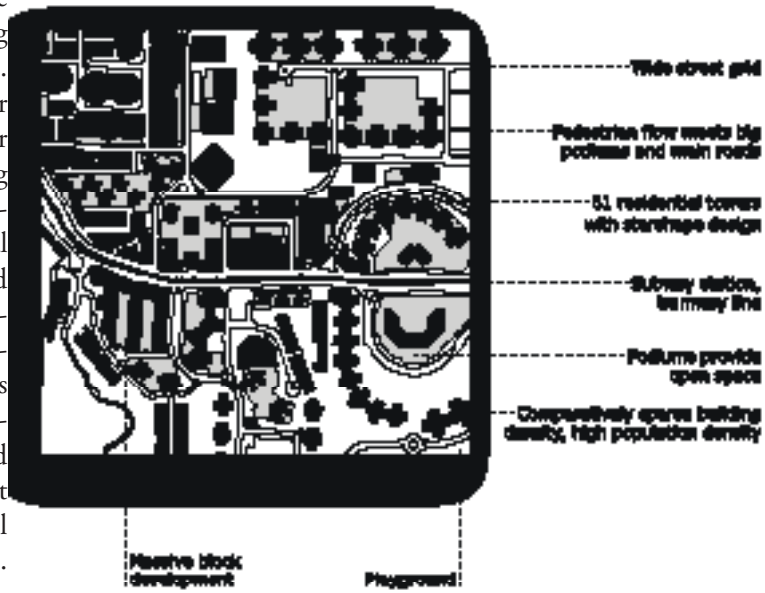
These *eight city patterns* have been selected as they are the most significant quarters, which form the cityscape. Some even form their own microcosm within the urban fabric of Hong Kong such as North Point.

61 Cf. Shelton/Karakiewicz/Kvan 2011, p. 42-43.



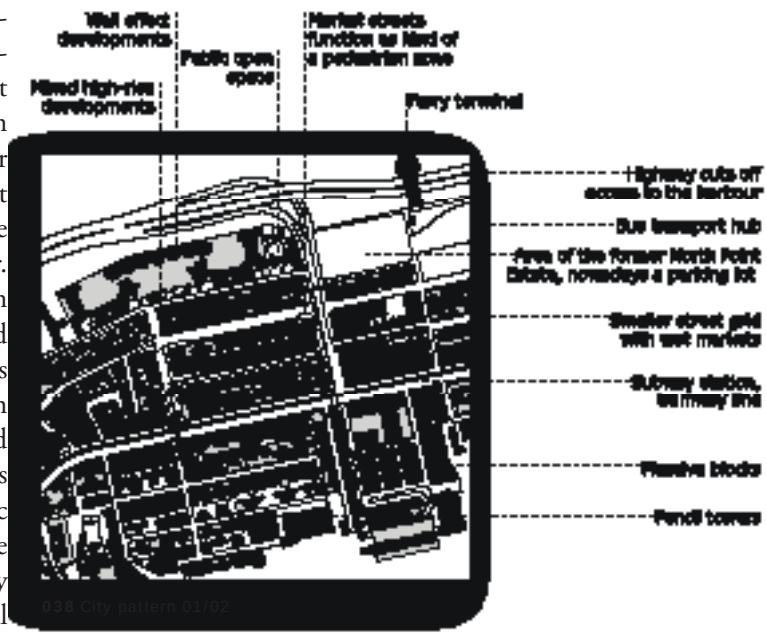
Taikoo Shing

Taikoo was originally the Chinese name for the shipping and trading company Butterfield and Swire. The area was former used as a sugar refinery as well as a dry dock, for the construction and maintaining of ships[62] but in 1972 a redevelopment scheme for a new residential community with a shopping and entertainment centre was proposed. The concept for the development was that cruciform towers were clustered together at extremely close quarters, designed around ground level open space with sport facilities for the residents. It is well connected to public transportation.



North Point

It is named North Point because it was once situated at the most northern point on Hong Kong Island. Today the area along the waterfront is one of the city's densest spaces. It is a mixed used urban area defined by large scale linear blocks, some with tall wall effect developments that take advantage of the views of Victoria Harbour. The mixed high-rise block form is arranged along a distorted grid street pattern, which generates some of the densest typologies in Hong Kong with residential and commercial activities. Obvious is the absence of well-designed public open space at ground level,[63] as the ground is completely sealed. Only one area close to the ferry terminal stands out, the site of the former North Point estate, which has been abandoned since 2003.

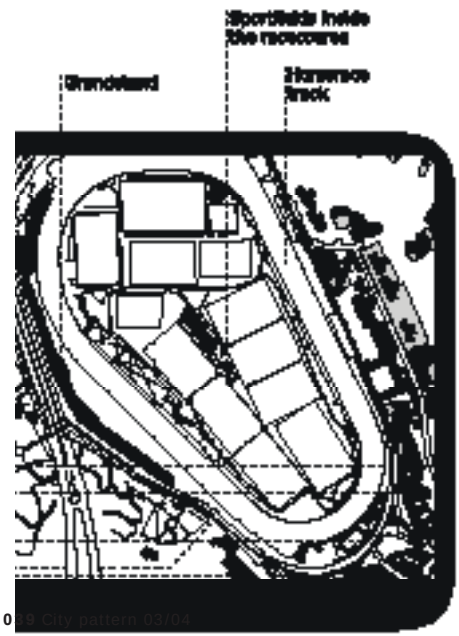


62 Cf. Lee 2008, p.104.
63 Cf. Kandt 2011, p.34.

Victoria Park

The Park is situated in Causeway Bay, which is also known as Copper Gong Bay, which is the Chinese name referring to the shape of the district. In this area several major reclamation projects were carried out, as the park was formerly a typhoon shelter, better known as Causeway Bay Typhoon Shelter.[64] It was the first typhoon shelter in Hong Kong and home for a large population of boat people and fishermen who were there until the 1950s, when it was reclaimed and Victoria Park was built there. Today the park is a gathering place for domestic workers on Sunday and a large area with different sports facilities. Next to the Park the Central Public Library is located, which is the main library of the territory.

Happy Valley

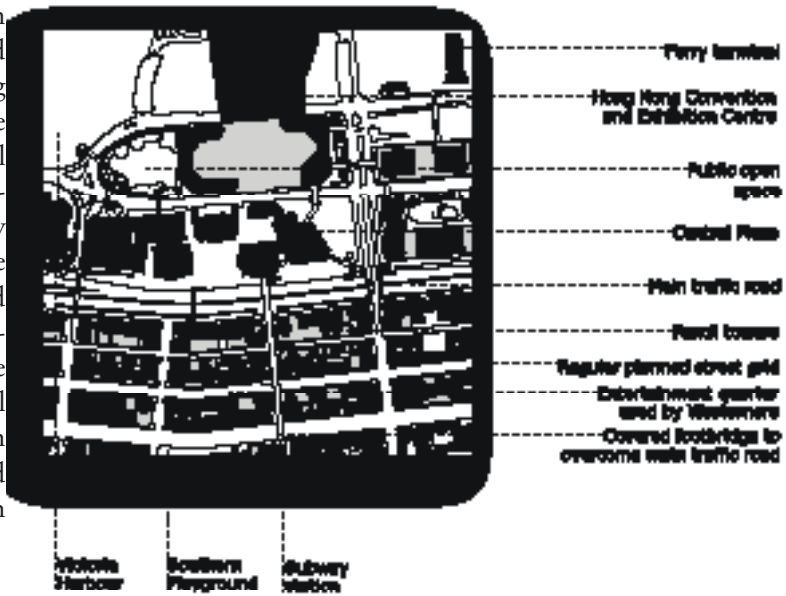


Happy Valley was called Wong Nei Chong and was renamed in the 1840s by the British. It is situated in the Wan Chai district and was the centre of colonial recreation. The area was the only conceivable place to build a racecourse on Hong Kong Island in 1846 as it was not far from Victoria City and was sparsely populated at that time.[65] Today Happy Valley is well connected by tram and offers not only a place for recreation as it is also a place for sports activities with different playgrounds situated in the middle of the horse race field. The race track is surrounded by private residential high-rises and a hillside cemetery.

64 Cf. Lee 2008, p.79.
65 Cf. Ibid., p.97.

Wan Chai

Wan Chai means small harbour in Cantonese and is the most crowded and bustling area on Hong Kong Island. This district is one of the main commercial areas and is well known for shopping and entertainment, but is also heavily used by automobile traffic.[66] Most of the land where Wan Chai is situated has been gained through reclamation which is even visible at the street grid. In recent years several urban renewal projects have taken place in this area, replacing the old streets, markets and buildings with new high-rise developments.



Central Business District

The Central Business District can be referred to as 'downtown' or 'city centre' of the city, it is the heart of modern Hong Kong. In this area mainly multinational companies have their headquarters, most of them are based in the financial service sectors. This area is also home of the high-rise towers which form the famous Hong Kong skyline, designed by world-famous architects such as Norman Foster or I.M. Pei. Together with the eastern part of Central it forms the area where the British landed in 1841 and was once named Victoria City.[67] Today the historical way of life in this district is already replaced by high-rises which are connected by walkways leaving the street walks clear from pedestrian movement.

66 Cf. Ibid., p.77.
67 Cf. Ibid., p.43.

Old Central District

This is the eastern area of Victoria City where the British first settled. It is home to some of the oldest streets and street markets in Hong Kong. Pottinger Street, for example, is a steep stone paved passageway which was a major street with different hawkers and roadside vendors a century ago. Today it is the starting point of the Mid-Level Escalator and one of the major shopping streets. A lot of these old streets, also known as 'ladder streets', can be found in this district reminding fractionally of Hong Kong's history.[68] There are many different uses in these small streets making it one of the main tourist attractions and one of the most vibrant places in the city.

Victoria Peak

Victoria Peak is the highest point on Hong Kong Island and is connected by the Peak Cable Tram to the Central District. It is the area where the British colonials once settled in free standing mansions overviewing the City of Victoria. Since the end of the nineteenth century an address on the Peak has been the most exalted status symbol the city has to offer[69], which is valid until today, as one of the most expensive private housing estate – the Opus - is situated there. The Peak is also known as the main viewpoint to look over the Victoria Harbour towards Kowloon Peninsula.

68 Cf. Ibid., p.14.
69 Cf. Ibid., p.107.

042 Measuring density

There can be found different ways of measuring density, as Churchman pointed out in 'Disentangling the Concept of Density', *"there is no one accepted measure of density between or within countries. In general, density measurement varies. Density itself refers either to the number of people per given area (population density), or by the number of dwelling units or the building mass related to the land surface (residential density)."*[70]

Living density is another kind of density, which is related to the number of persons per room in a dwelling. It is important to point out that it is a relative benchmark, and for that reason it is very difficult to compare the density of different cities.[71]

For instance, density expressed as ratio of population to land area can vary significantly with reference to different scales of geographical unit. By taking Hong Kong as an example: if the land area of the whole territory is taken into account, the overall population density in Hong Kong is about 6.620 persons per square kilometre. However, only about 23.7 per cent of the total land in Hong Kong is built-up area. Therefore, if the geographical reference is confined to built-up land, then the population density will be about 25,900 individuals per square kilometre, which is four times the overall density of the territory.[72]

"One of the problems of defining density in operational terms is the relatively weak relationship between density and building type. The same density can be obtained with radically different building types, and the same type can be used to obtain different densities".[73]

Crowding

The term '*high density*' is often associated with crowding, but it is important to distinguish between '*density*' and '*crowding*'.

"While 'density' is used to refer to the physical limitation of space, 'crowding' is the actual psychological perception of the limitation of space. Social pathology is caused by the stress and social conflict of crowding, but high density does not necessarily lead to a perception of crowding or stress."[74]

It is also interesting that studies have shown that Asians and Chinese people were found to have a high adaption and tolerance related to crowding.[75]

Perception of density

It is important to understand that the physical density which is measured, not always corresponds to our perception of density. Every inhabitant will react differently to density, depending on socio-cultural background and influence. Crowding in this case represents the negative analysis of perceived density. By dealing with the definition of density it is interesting to illustrate several different interpretations of density in history, but also to take a look at current projects to define the dimensions of this term.

70 Churchman 1990, p. 390.
71 Cf. Ibid., p. 408.
72 Cf. Cheng 2010, p.3.
73 Lozano 2007, p.312.
74 Yeh 2011, p. 31-32.
75 Cf. Ibid., p. 31-32.

DENSITY IN HISTORY

Density as a concept in urban planning did not exist until the second half of the 19th century. In the late 19th century the rapid population growth led to problems with overcrowding in the industrialised city. At that time high density was named to be the main reason for spreading diseases, poverty, crime or social turmoil.[76] As a result, planning controls were put in place that prescribed the maximum allowed density.[77]

The situation in the city produced a growing desire to escape and there was a strong movement toward lower-density housing outside the city, which took place in form of moving to suburbs. In this case density was used as an ideological proposal, aiming for a 'Healthy City' (Baumeister), a more 'Beautiful City' (Sitte) and more 'Social City' (Ebenezer Howard). The *Garden City* movement was a shift in urban concepts in order to create certain qualities of urban living and should offer a higher quality of life. For Ebenezer Howard the Garden City was the vision of connecting the best of the town and the country side in order to create a healthy living environment.

During the post-war period massive housing developments took place in the divested cities which were guided by the principles of modernist planning through the Congrès International d'Architecture Moderne (CIAM) movement. It was the idea of planners such as Walter Gropius and Le Corbusier to design high-rise developments in a green and functional organised city.

Le Corbusier demonstrated his vision of a healthy city by creating a vertical variant of the Garden City, which was the *Ville Radieuse*. His vision was to demolish the entire existing city and rebuild it with high-rise towers in a park which provides decent housing. People should move freely in their cars along the motorways and enjoy their free time in parks and gardens around the development.

Chapter High-rise p.199

In the 21st century the compact city model develops to a sustainable urban form with the idea to construct the urban elements in an efficient way but within compact limits. In order to achieve this, high-rise or tall buildings are seen as one of the best solutions.[78]

"The compact city has a relatively high residential density with mixed land uses. It is based on an efficient public transport system and has an urban layout which encourages walking and cycling"[79] rather than driving cars. It also supports low energy consumption and therefore reduced pollution. There are many opportunities for social interaction because of the large residential population which also provides a feeling of safety. The compact city can be seen as an alternative development pattern to urban sprawl. It has emerged primarily to find a more sustainable model for cities with high population growth.

Chapter High-rise p.192

76 Cf. Berhauser/Haupt 2009, p.15-16.
77 Cf. Churchman 1990, p. 392.
78 Shin 2010, p.293.
79 Dempsey Nicola 2010, p.5.

These are examples for different concepts in combination with the term density in history. It is important to understand that density itself depends on a number of factors. It is not possible to just look at density numbers themselves because it always depends on the time and its society.

OMA Point City / South City 1995

OMA produced in their project Point City/South City two radically diverse models for Holland to investigate different manipulations of density. The first model, the so called *Puntstadt* (Point City) creates a city centre in the middle of the country. It would have all the advantages of concentration (highly developed planning; efficient infrastructural networks; sense, truly urban conditions) but at the same time it creates emptiness – a reservoir of void – in the rest of the country.

043 OMA Point City

In the other model – Zuidstad (South City) all new construction and its following (resulting) density is concentrated in the southern half of the country, which shifts urban Holland to the most active zone of Europe – the so-called banana.[80] Both models are investigated with different extreme densities, a low density like Los Angeles and a hyper-density like Manhattan. This project aims to illustrate a radical respond to the urban sprawl in Holland.

044 OMA South City

When dense, when lite?

In the book FARMAX, MVRDV urges to increase the density of our current living space by horizontal and vertical agglomeration with maximum concentrations of various functions, for pastoral landscape from being totally suburbanized. For MVRDV the discussion about density is not the question of high- versus low-density, neither a conflict between car and public transport, but a question of providing more options in our daily life.[81] Furthermore MVRDV argues that *"Density is the city's third dimension and a vehicle for provocative statements."*[82] It's important to see the stronger meaning behind rather than just the stacking of housing on top of each other. It is the concept of mixed uses and densification which is essential to create an attractive city.

These are a few different planned or built concepts of density in history, it is important to understand that there are diverse ways of dealing with the term. There can even be found some grown examples in history, one of these examples is the Kowloon Walled City, which was once the densest place on earth with over 50.000 people on just 2.7 hectares. It is an archetype for density which has developed over the years to a megastructure, a mixed used city within a city which will be closer examined in the next chapter, as density in Hong Kong is made possible by a complex network of such interconnected megastructures.

80 Koolhaas 1995, p. 891.
81 Cf. Maas/Rijs/Koek 1998, p. 127.
82 Ibid., p.126.

CONCLUSION

„Die Architektur der Dichte wird überall anders sein, flächendeckend oder aufgetürmt, einheitlich oder gegliedert, geometrisch oder diffus. Die Notwendigkeit der Dichte steht nicht zur Debatte, weil sie funktional, ökonomisch, ökologisch gesellschaftlich und kulturpolitisch unvermeidlich ist; ihre Umsetzung hingegen wohl."[83]

Dense environments have always dual association; both positive and negative. On the one hand many factors support densification: the compact city model, which is more sustainable in terms of energy consumption and efficiency, the reduction of mobility costs, short distances between working and living space, and the reduction of wasting land resources. There is also the assumption that areas which contain high numbers of people become sources of diversity and intensity themselves and provide a very rich exchange of ideas.

On the other hand, densification can also reach its limits, demonstrated by Asian megacities where the growth of population leads to migration to cities and emptying the back-country, which is then no longer cultivated. But also the increased noise pollution and the lack of intimacy or crowding, which is identified by a number of sociological studies as a source of stress, are potential negative implications of density.

Density on its own doesn't guarantee a liveable city, nor is it the answer to all challenges. It would be mistaken to define density only by its quantity, because in the end the qualitative criteria matter. By creating high density urban tissues it is important to focus on a higher quality of public space, well designed floor plans, community interaction, etc.

"Without sufficient quality, density does not work - it is even dangerous"[84]

It is interesting to see, that a lot of cities now move toward high-density developments. Today high density or the compact city model is often seen to provide the requirements for sustainable urbanisation and economic growth. It has also become an important agenda in the urban planning policy and a topic of increasing interest around the world.

While the European cities are searching for a way to use densification as a strategy to act against suburbanisation, Asian cities in contrast use it to accommodate the growing population.

For Hong Kong, density is not an instrument to create urbanity and livability, or avoid urban sprawl, it is a necessity because of its unique condition. It shows how it is possible to live in dense urban areas with all its positive and negative effects.

But how dense shall we go? There is and will be no guideline how to deal with the topic of density. The demand for higher urban density exists, but it must be determined for each city and each project how to deal with it and with the resulting negative and positive impact.

83 Lampugnani/Keller/Buser 2007, p.18.
84 Uytenhaak 2008, p. 11.

For Hong Kong people, density is part of their everyday life. They have learned to make the most out of it and learned to transform almost any kind of spatial arrangement into a useful space, e.g. building shops under staircases or highway structures.

For this thesis, density is a possibility to form and design a vibrant and active city space which should not lead to crowding or discomfort. In Hong Kong undetermined spaces can work because of the high density of people and functions. As research shows that density is accepted in Hong Kong, there is still the need to provide people with alternative space which should give them the possibility to escape and find their personal private space in the urban tissue, because housing space is extremely limited as further investigated in the following chapters.

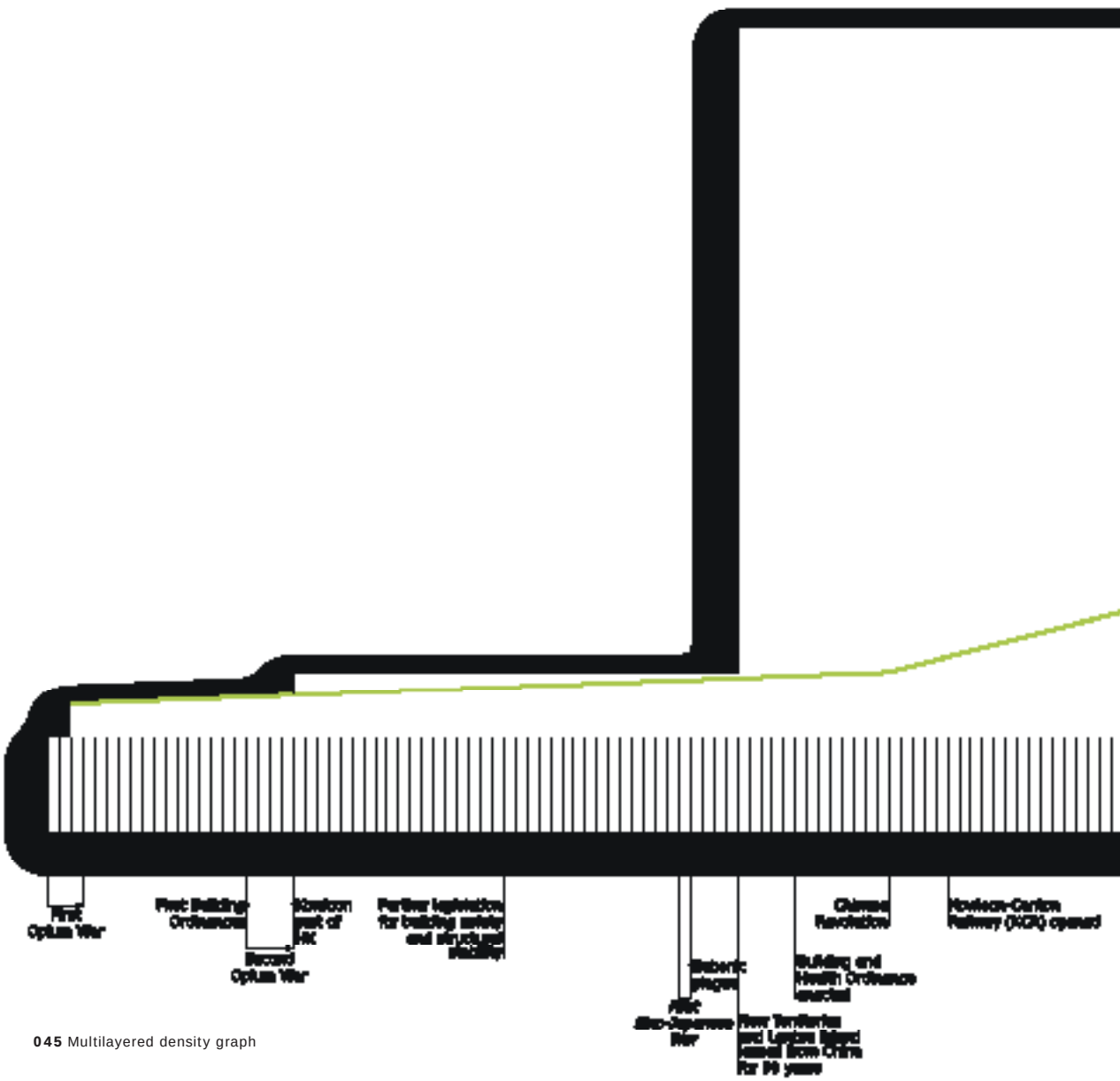
Especially elderly people need open space and recreation space, but also for the diverse range of residents who live in such a dense environment these spaces are crucial. There should be no need to predetermine the whole space of a project as history shows that people in Hong Kong know how to make the most out of their given space.

Both designs should contribute to the relief of the existing infrastructure and public space. They should form various approaches of dealing with density, therefore it is important that some attempts in these projects are realizable and buildable and some remain visions and utopia. An impulse to challenge the creativity of people is often more helpful that a city itself advances. A compact development is desirable as space in Hong Kong is rare. For that reason both projects will be kind of a new way of reclamation as one project will use the neglected rooftops of the urban fabric on Hong Kong Island and the other will make use of the space underneath the Island Eastern Corridor. This way of reclamation can be referred to as a new form of urban renewal, as there is not always the need to destroy an existing urban fabric in order to promote development and transformation.

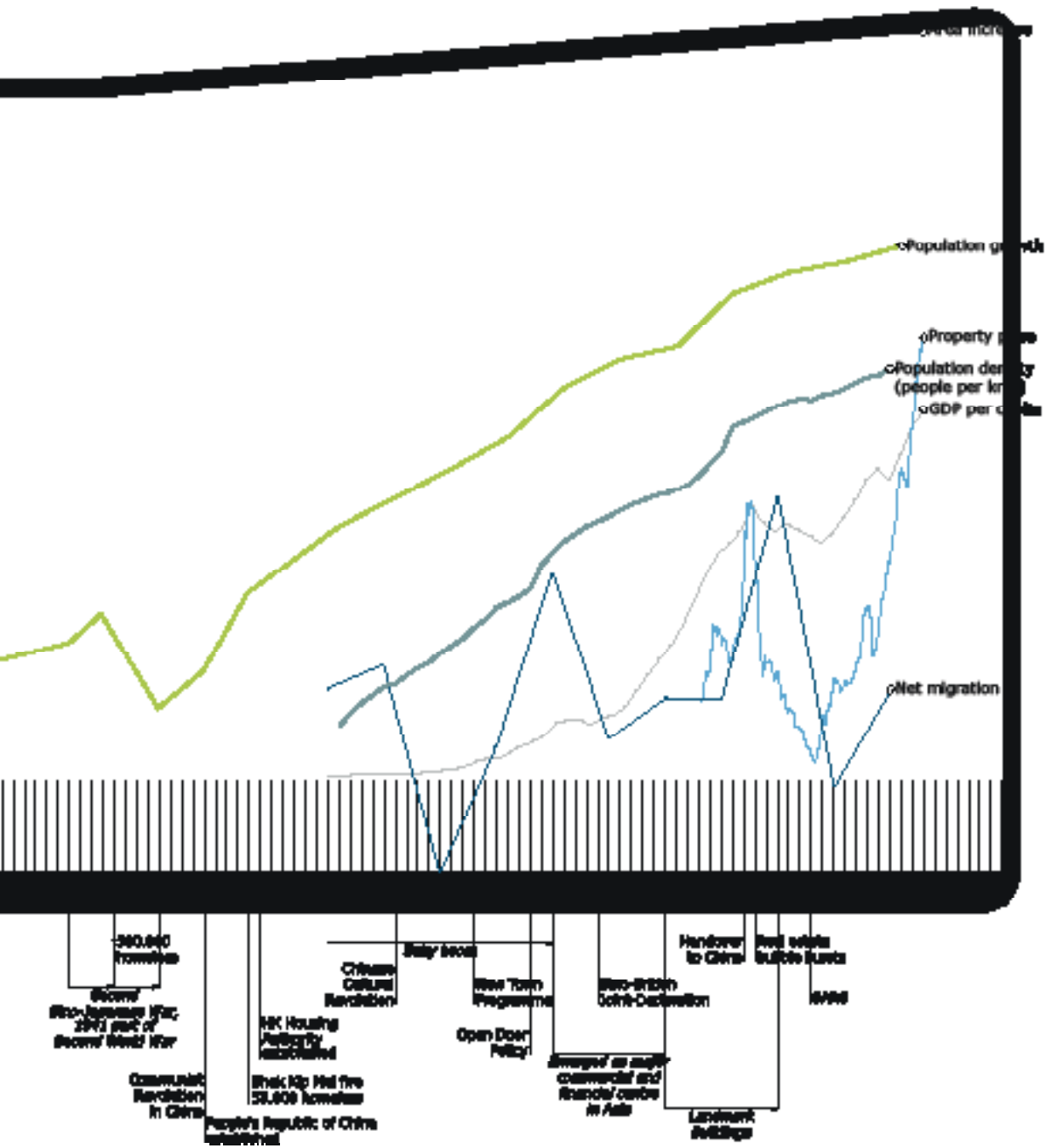
Furthermore, new ways of dealing with urbanisation and the segregation of fundamental processes of nature must be found for an urban society. One way is to make one step back and explore the roots of humankind, even in a dense megacity environment. Therefore the agricultural approach is important for the projects as people in Hong Kong should regain the relation to food, which should lead to a more sustainable habit in the consumption and reduction of food wastage.

Public space in Hong Kong is often generated by urban megastructures. *What kind of public space do they provide and how has it developed over the time?* This will be observed in the next chapter, where building and infrastructure megastructures will be investigated.

GRAPH DENSITY



045 Multilayered density graph


Population growth
Property price
Population density (people per km²)
GDP per capita
Net migration
Baby boom
Chinese Cultural Revolution
New Town Programme
Open Door Policy
Emergence as major commercial and financial centre in Asia
Handover to China
Sino-British Joint-Declaration
Asian financial crisis
Landmark buildings
Communist Revolution in China
People's Republic of China established
HK Housing Authority established
Shek Kip Mei fire 53,600 homeless

L

MEGASTRUCTURE

Different ways of defining a megastructure can be found, some would say a megastructure is an enormous man-made self-supporting construction such as the Great Wall in China or the Three Gorges Dam, on the other hand some people would define a megastructure only as architectural concept which was discussed and defined in the 1960s and 1970s. Megastructure can be considered in different ways and throughout time there is a long history of designing or constructing such structures. In recent years megastructure have been favoured again, especially in Asian cities, as those cities have to cope with rapid urbanisation and fast population growth. Therefore it is also interesting to examine different forms of such structures for a city like Hong Kong as it could be an efficient solution to deal with various problems of its high density urban form.

Megastructures have been theoretically explored first by Le Corbusier, followed by the Metabolists movement in Japan, Archigram and other visionary architects of time. Only a few of these theoretical ideas have succeeded to be built, most of them remained on paper.

But how can someone define a megastructure?

In this chapter we deal with three different definitions of megastructures which have been developed over the time.

Fumihiko Maki is the first person who gave an architectural definition of the term *'megastructure'* in his publication *'Investigations in Collective Form'* in 1964. From his point of view there are three structural principles involved in making collective urban forms: compositional form, mega-structure form and group-form.[1] He defined the megastructure 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 the landscape, it is like a great hill on which Italian towns were built."*[2] Maki remains relatively general with his description since he mainly uses it to distinguish between the three architectural compositions.

Wilcoxon on the other hand defines megastructures four years later in his Short Bibliography on Megastructure alongside its size with four major characteristics: *"1) constructed of modular units; 2) capable of great or even 'unlimited' extension; 3) a structural framework into which smaller structural units (for example rooms, houses, or small buildings of other sorts) can be built - or even 'plugged-in' or 'clipped-on' after having been prefabricated elsewhere; 4) a structural framework expected to have a useful life much longer than that of the smaller units which it might support."*[3]

Wilcoxon defines the term megastructure more detailed than Maki as he distinguishes between unit and structure. For him the possible prefabrication is part of the requirements.

1 Cf. Maki 1964, p.5.
2 Ibid., p.8.
3 Wilcoxon zit. n. Ley/Richter 2008, p.28.

Another definition for megastructures was established by *Reyner Banham* in his Book *'Megastructure: Urban Futures of the Recent Past'* in 1976, where he starts: *"Megastrukturen ihrer Zeit waren immer große Gebäude – aber nicht alle großen Gebäude der Zeit sind gleich Megastrukturen."*[4] Often large bridges or buildings which are assembled of prefabricated parts are used to describe the term megastructure. For Banham such buildings are no megastructures, even if they are the biggest of their kind. In most cases they only have one function and they occur as a single building structure. This results in the conclusion that a building must meet at least several functions which should be visually recognizable to qualify as megastructure. Usually after this definition shopping malls are the typical megastructure as they offer a constructive shell in which different kinds of shops and other functions are integrated. But for Banham megastructures can also be railway stations or whole city districts which meet various coherent functions.

Can we find megastructures in the built environment of Hong Kong today?

For Hong Kong the only way to cope with the rapid population growth and the scarce buildable land was to develop the city vertically. High-rises developments can be found all over the territory as they are a solution to produce enough living and working space. In most cases these high-rises are hybrid buildings such as mixed use developments with shopping malls, leisure activities and public transportation.

In this thesis we consider this high-rises as megastructure, which is more oriented towards the definition made by Reyner Banham, as he considers megastructures as a structure where different kinds of functions are integrated. But also highway superstructures and transportation infrastructures as well as sky streets and public space infrastructure are valued as megastructures, as these structures are important components of Hong Kong's city fabric which are interwoven into a very complex and multiple layer network-structure.

In the first part of the chapter we define two different possible megastructure forms which exist in Hong Kong and examine more closely how these megastructures are organized and how they work. But can these buildings really be called a megaststructure?

In the second part of the chapter we want to examine the existing megastructures in history in order to understand the megastructures we observed in Hong Kong better. Further we compare them with each other to figure out if these buildings could be really classified as megastructure and if these forms are a possible solution to cope with rapid urbanisation and high density.

4 Banham zit.n. Düesberg 2013, p.27.

MEGASTRUCTURES IN HONG KONG

Megastructures in Hong Kong developed over the time due to the lack of space and buildable land combined with the need to accommodate an ever increasing number of people. High-density and high-rise living became the norm. Different kinds of buildings and structures emerged over the time which we observed and classified as megastructures. They are categorized into two different types: *network and building megastructure*. This differentiation of these types was made by us and the content doesn't claim to be complete.

Network megastructure

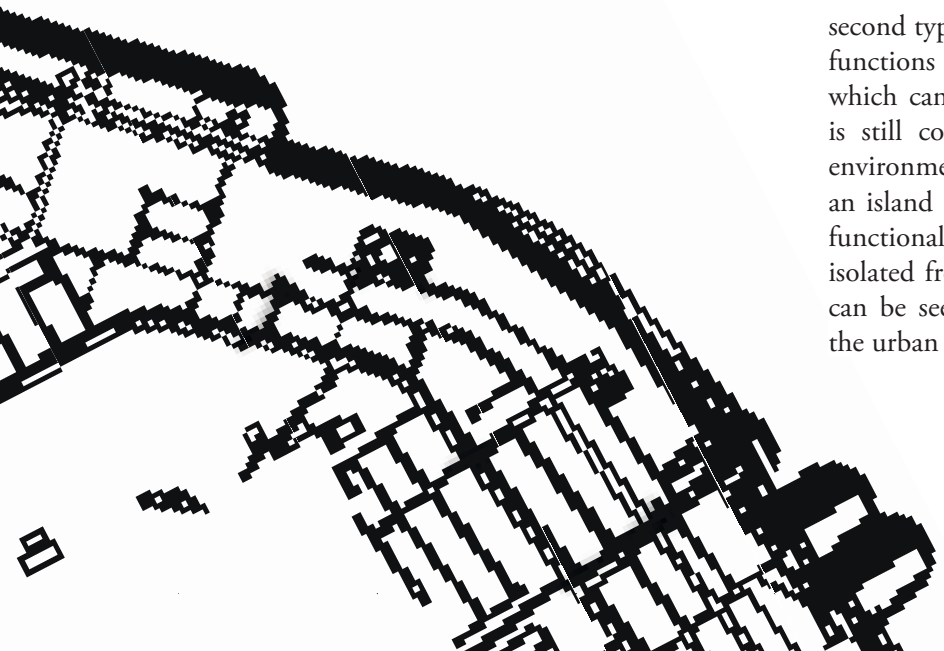
Networks in this thesis are defined as a system which interconnects people and things in a vertical or horizontal way. Two different forms of network megastructures can be observed in Hong Kong.

The *transportation infrastructure,* which is the first type of megastructure, deals with the movement of people in the city. For Hong Kong it is an important element as these structures are connecting different functions of the urban fabric and making life a lot easier. The second form is the *public space infrastructure*, which is a three-dimensional vertical network, which is interwoven with multiple levels. Ground level as well as podiums, rooftops, walkways, footbridges and large shopping malls can be included and together they form a moving network, which is also used for recreation and leisure.

Building megastructure

In this chapter we distinguish between three different types of *building megastructures.* The first one is a megastructure which connects different parts of the city, it has a wide mix of functions and works well in the urban pattern of the city. The second type is a megastructure that functions like an urban island, which can survive on its own but is still connected to the existing environment. The last type is like an island in the sea, it is a monofunctional megastructure which is isolated from the surrounding and can be seen as autonomic part of the urban fabric.[5]

5 Cf. Karakiewicz 2005, p.142-147.



Transportation Infrastructure

Transportation infrastructure is a critical factor for the urban form of the city as it enables the centralisation of economic functions and the accommodation of a growing population.[6] At the beginning of the twentieth century, Victoria was long, thin and dense. It consisted largely of a narrow band of flat reclaimed land and steep foothill slopes with an extremely tight street network.[7] Today Hong Kong has one of the most efficient transportation networks in the world, where most places in the city are easily accessible within an hour.

Hong Kong is characterised by a diverse public transport system, thanks to the highly efficient transportation grid, most 12 million passenger journeys[8] are made by using public transport every day. Only 6 per cent of the population use private cars. Nearly 90 per cent take boats, trams, buses, trains or walk, surpassing New York and London, where 58 per cent and 63 per cent use public transport.[9] That shows that Hong Kong has one of the most accepted transportation systems in the world.

Hong Kong's public transport system is operated by private and public operators. This mainly started in 1967,when there was an unrest which led to a strike of the transportation workers. As most people were relying on public transport, particularly buses, people started to form a spontaneous and informal public transport system to replace the formal one. After the standard bus system was back in operation, the illegal network was still used. Finally the government co-opt the mini-buses as part of the transport infrastructure, which from now on were called 'Public Light Buses'.[10]

The efficiency of Hong Kong's public transport is possible by a dense net of different transport modalities such as railways, trams, buses, minibuses, taxis and ferries with all of them having a high operating frequency. With a road network of 2.090 kilometres, there are only 306 licensed vehicles for every kilometre of road and the topography makes it even increasingly difficult to provide additional road capacity in the built up areas of Hong Kong.

One of the main public transport modes in Hong Kong are buses with an average capacity of above 100 passengers. Bus services have a long history in Hong Kong and in 1949 double decker buses were introduced to cope with the huge amount of passengers. The Public light buses, which run at areas where the standard bus lines cannot or do not reach, are limited to a maximum of 16 passengers.

The double decker tram is also really popular in Hong Kong as the price is considerably lower than that of the other transport modalities. It is one of the earliest forms of public transport and began operation in 1904.[11]

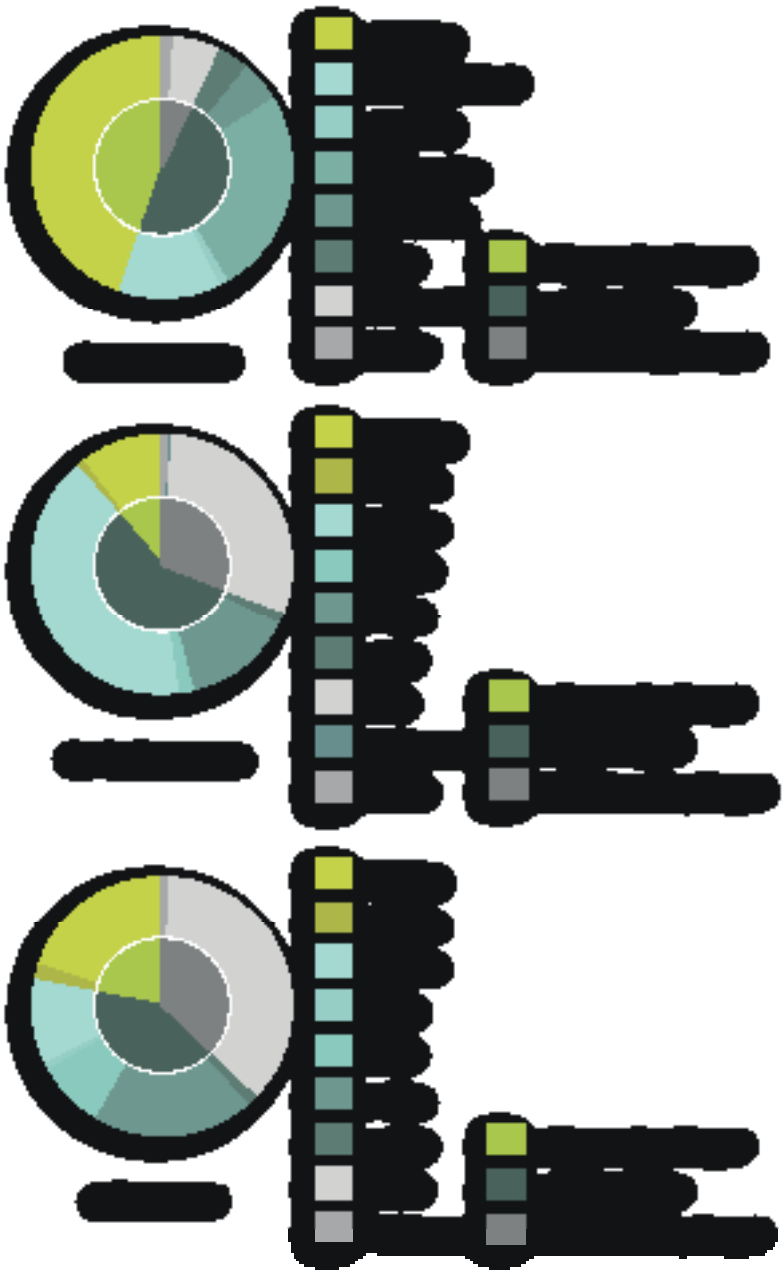
047 Double decker tram

048 Public buses

049 MTR entrance

6 Cf. Burdett/Nowak 2011, p.18.
7 Cf. Shelton/Karakiewicz/Kvan 2011, p.49.
8 Hong Kong Government Census and Statistics Department: Hong Kong in Figures 2013, p.40.
9 Burdett/Nowak 2011, p.3.
10 Cf. Shelton/Karakiewicz/Kvan 2011, p.93.
11 Hong Kong Government: Transport 2012, p.3.

How people travel[14]



050 Transportation comparison

The tramway runs 13.5 kilometres on Hong Kong Island between Shau Kei Wan and Kennedy Town with a side road to Happy Valley. Today Hong Kong's trams are the world's narrowest with just 1.98 metre in width. It is the only all double-decker tram system in the world. They are slim-line vehicles for a slim-line city designed to move the most people on the minimum mobile footprint. The electric tram is also a major tourist attraction but provides at the same time mobility for the poorest people in Hong Kong as the fare is only HK$2.3.

In a city built around a harbour ferries have been important, as until 1972 they provided the only means of crossing the harbour. Multi-deck ferries were introduced before the end of the nineteenth century to carry the increasing number of cars and passengers across the harbour. Until the opening of the cross-harbour tunnel, from Hong Kong Island to Kowloon Peninsula in 1972, ferries were the only means of transportation for a car to travel from Hong Kong to Kowloon.[12]

Public transportation is very important for Hong Kong and due to its efficiency the average travel time between home and work in Hong Kong ranges from 30 minutes to one hour per journey, this can be compared to Tokyo which has an average travel time of 90 minutes or more per journey.[13]

12 Cf. Shelton/Karakiewicz/Kvan 2011, p.150.
13 Cf. Lau/Wang/Giridharan/Ganesan 2005, p.155.
14 Cf. Burdett/Nowak 2011, p.19.

MTR MASS TRANSIT RAILWAY

When the Mass Transit Railway was established in 1979, the transportation was built with three goals in mind: to react to the fast population growth, to build up connections to the new housing estates in the New Towns and to eliminate the traffic congestion of Hong Kong. In the 1960s the government carried out Mass Transit studies to find solutions to the growing traffic problem caused by the expansion of the territory's economy.

Hong Kong's metro network is comparably young, the construction of the MTR began in 1972 and the first line opened in Kowloon 1979. The MTR was immediately popular with residents of Hong Kong and over the time, the system was progressively extended: beneath Victoria Harbour to Hong Kong Island in 1980, to Tsuen Wan in 1982, with a second underwater tunnel in 1984, and the Hong Kong Island mainline in 1985.[15]

Until 1998 these four urban lines formed the MTR core network, then the line to Hong Kong Airport and Tung Chung was added. The MTR was originally a government-owned statutory corporation but in 2000 the MTR was partially privatized. Today the MTR has grown and represents a highly networked globalized interconnected multitasking infrastructure that connects commercial zones, buildings, shopping malls, transportation hubs, airports and Shenzhen, the Chinese cities across the border. The route length of the system is about 247 kilometres with ten lines and further extensions planned.

The MTR network comprise a total of 84 stations and carry an average of about 4.15 million passengers per day, and is the primary mode of transportation for most of the city's inhabitants.[16] What is also interesting is that 70 per cent of Hong Kong's residents live within seven minutes of a railway station.[17] This is due to the development of housing blocks at strategic infrastructure nodes on the transportation network in Hong Kong.

051 MTR instructor

15 Hong Kong Government: Transport, 2012, p.3
16 Ibid., p.2.
17 Cf. Shelton/Karakiewicz/Kvan 2011, p.104.

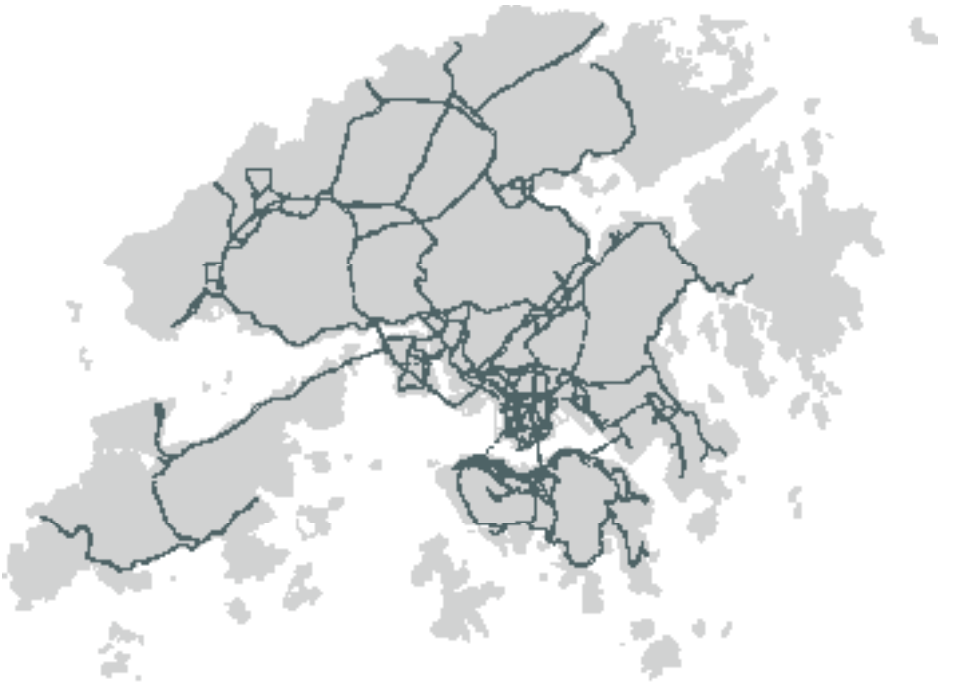
052 Mass Transit Railway (MTR) network

The node network began in the 1980s when the MTR was established and the construction of the urban network started. These nodes represent the major string of transportation and are of an enormous importance for the urban life in the city as the pedestrian flow is remarkably high there. These nodes are also of strategically interest for developers as they can be seen as concentrated exchange points in the urban landscape and as places with the highest mobility in the city. Along those main transport axes the phenomena of megastructure can be observed, in fact it is an interaction between real estate developments and transportation. Housing, office-towers and shopping malls are located at the crossing of these transport infrastructure nodes.

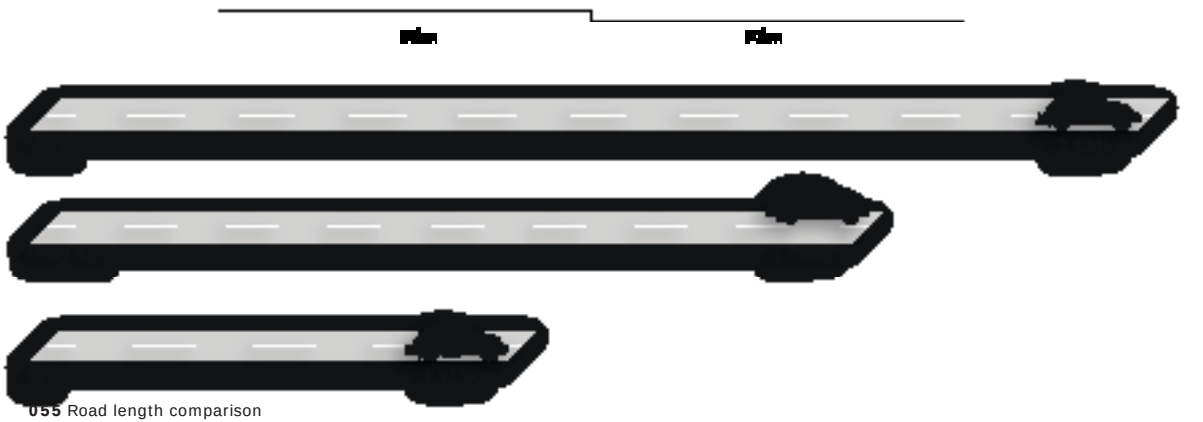
Since the privatization of the MTR in 2001 it became one of the major property developers in Hong Kong, and developed large commercial properties on and around its stations which are known as the MILU typology. But these strategies of developing large commercial properties have also raised public concerns, as some projects, such as the Olympian City, isolate themselves from the city and are targeted only for extremely rich residents. These developments often disrupt existing areas and contribute to the degeneration of the surrounding neighbourhood. But this compactness of Hong Kong's urban development around these public transportation nodes has also helped to concentrate urban growth, protect country parks and keep private vehicular miles at a minimum.[18]

18 Cf. Tieben 2013, p.46.

053 Node network



054 Road and highway network



055 Road length comparison

056 Cars per person comparison

The roads in Hong Kong are among the most heavily used in the world, with over 640.000 vehicles on 2.090 kilometres of road – 444 kilometres on Hong Kong Island, 462 kilometres in Kowloon and 1.184 kilometres in the New Territories. There are 445.000 licensed private cars in Hong Kong, accounting for 69 per cent of all vehicles in Hong Kong.[19] Owning a car is quite expensive, as the territory is even known for having the most expensive parking spaces in the world. The price paid for a parking spot in Tai Wai has reached up to HK$ 1.3 million.[20] As home prices have nearly doubled since 2009 and the Hong Kong government has now introduced a 15 per cent stamp duty which is levied from non-permanent Hong Kong residents, now people invest their money in parking spaces, where the new duty does not apply. This led to an enormous increase in the price and contributed to five times higher parking space transactions compared with a year earlier.[21]

Although Hong Kong has a comparatively low number of vehicles for its population the need to move them through the densely built city area with its challenging topography led to inventive solutions. Overpasses or flyovers were constructed in the 1970s to solve congestion problems at intersections. Roadways and Highways built on top of columns elevated from the street have become an elegant solution to build roads across the topography. One of the most extreme can be found between Hill Road and Connaught Road. It is a single elevated lane which is extremely curvaceous and steep as it threads its way between buildings to take traffic from the hillside to the waterfront.[22]

Highways are also an essential element of the urban fabric in Hong Kong. Ten expressways have been constructed all over the territory which makes this highway system one of the most important elements for an efficient bus and taxi network. In the urban fabric those highways and flyovers create a covered space underneath which is rarely used and sometimes highways even cut the visual connection to the harbour like the Island Eastern Corridor in North Point.

Another important milestone for the transportation network in Hong Kong was the cross-harbour tunnel, from Hong Kong Island to Kowloon Peninsula, which took its first traffic in 1972. Within eleven years since opening it has become the world's busiest four-lane highway carrying over 110.000 vehicles per day. And another tunnel was to be added a few years later, which was part of the new underground Mass Transit Rail line and connected Central and Kowloon.[23]

057 Glouchester Road traffic

19 Hong Kong Government: Hong Kong The Facts p.1.
20 Cf. Ray 2012.
21 Cf. Pierson 2013.
22 Cf. Shelton/Karakiewicz/Kvan 2011, p.140-141.
23 Cf. Ibid., p.96.

058 Footbridge network of Hong Kong Island

FOOTBRIDGE NETWORK

FOOTBRIDGE SYSTEM

In Hong Kong events and activities do not only take place on ground level. Density caused by population moving through the area sometimes reaches an intensity that can easily overwhelm the capacity of carrying the flow on the surface of the streets. An obvious response to this demand is to duplicate the ground in order to provide different means of access to distribute the population.

One of the earliest examples of this method is the bridge construction from Wan Chai MTR station to the Immigration Tower constructed in the early 1990s. This bridge is 300 metres long and replicates the streets below with regular exits to the ground. On the pedestrian bridge it is common to find vendors illegally hawking their wares, people walking slowly as they observe the views within nearby buildings, friends stopping to speak, or domestic helpers sitting and chatting.[24]

There are also other types of pedestrian links in Hong Kong, for example the bridge from Mong Kok East station to Mong Kok MTR station with a distance of 400 metres. It is a pedestrian bridge which provides fewer access to the ground running at one point even 150 metres without exit. These are long elevated walkways which are built on the principle of elevated motorways, just to keep pedestrians moving by avoiding the congested ground below. It is a high-speed route for pedestrians, which can be found all over the city, where densities are high and distances long. For example in Central District a pedestrian bridge is running from the Shun Tak Centre, which is the departure point for the Macau ferry, to Exchange Square.[25]

Today pedestrian footbridge networks or skywalks can be found throughout the city in commercial and residential developments. This system grew fragmentary, built by different parties at different times to serve different immediate needs. It became a prevailing development model for the city's large scale urban projects.[26]

Hong Kong is a city where you can enter at one level and leave on a different one by passing five different floors. It's possible to go from one building to another, one even without going outside. Today, more than 90 major office buildings in Central Business District are linked to each other or to other public walkway networks, most of them are accessible 24 hours a day.[27] Hong Kong has connectivity, as on the North Shore of Hong Kong Island it is possible to walk from the Macau Ferry at Shun Tak Centre through Central and Admiralty to Pacific Place Three on the edge of Wan Chai without ever having to leave a continuous network of elevated or underground pedestrian passageways and interconnected malls and office lobbies.[28] It is an extensive deck and bridge system which enables the pedestrian to walk on an upper level across an area of almost

059 Footbridge over Kings Road

060 Pedestrian highway in Kowloon

24 Cf. Ibid., p.132.
25 Cf. Ibid., p.140.
26 Cf. Frampton/Solomon/Wong 2012, p.6.
27 Cf. Lau/Wang/Giridharan/Ganesan 2005, p.157.
28 Cf. Frampton/Solomon/Wong 2012, p.25.

two kilometres in length and over one kilometre wide.[29] These footbridges form elevated bands which make efficient use of low-rise roof elements over car-park blocks or shopping malls, creating a framework which is largely independent from the ground level. This network ties informal connections together between neighbouring buildings and reinforces the three dimensional pattern of the city.[30]

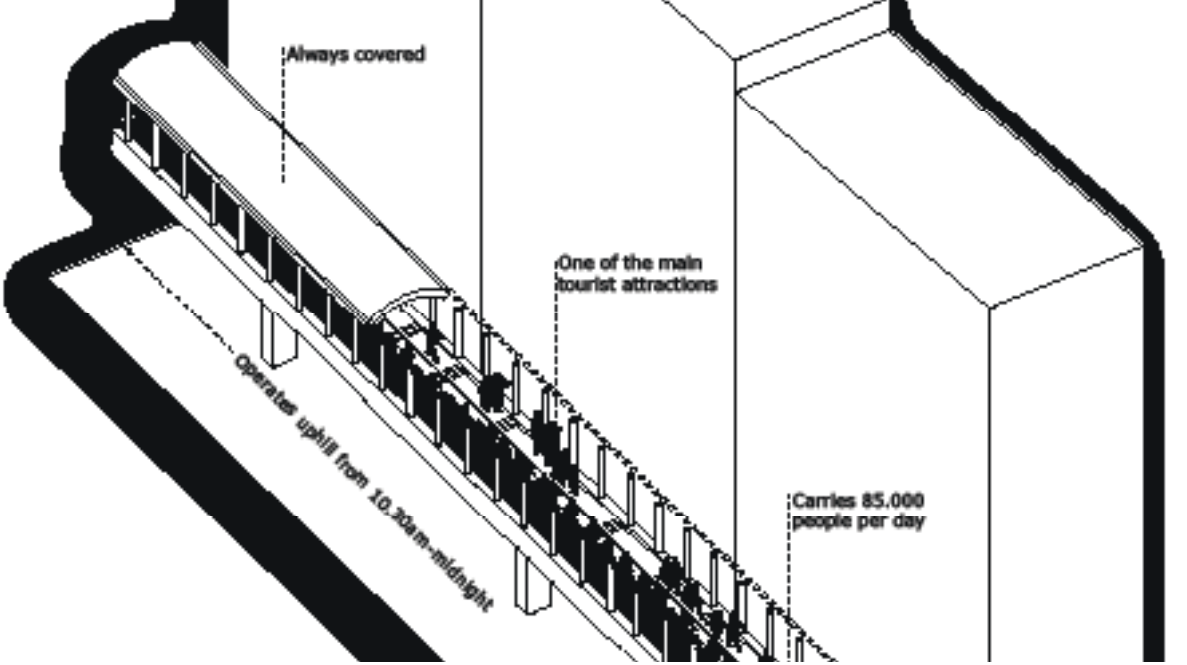
But it is important to note that these pedestrian walkways do not prevent street level activities, the ground level is as busy, active and vibrant as the skywalks, so it seems that connectivity on all levels is important to function effectively for a city like Hong Kong.

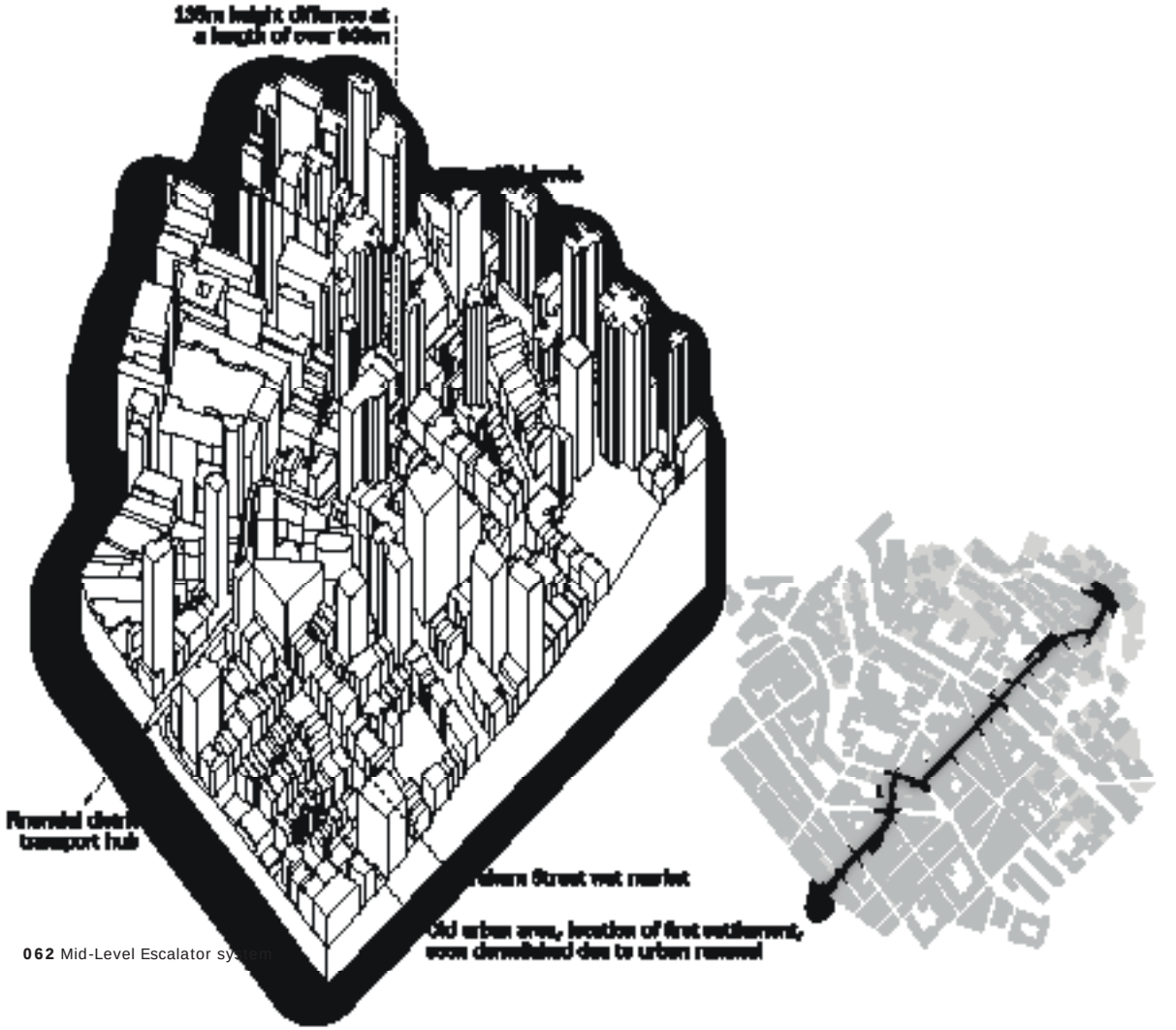
Street level

In Hong Kong due to its high density, the traditional spaces of streets, alleys and terraces are the closest places to the everyday life in the urban districts. They remain the most accessible open spaces even when compared to Hong Kong's country parks or urban parks. These street spaces are something special, they allow the experience of Hong Kong's particular culture and history, which is strongly related to the vibrant street scenes with their small shops, street markets, tea houses and eateries. Due to Hong Kong's topography these spaces were developed on a narrow stretch of land and on steep slopes. They create a three-dimensional space network, which makes even use of various mechanical devices such as escalators and elevators, both within private developments or outside in the street.[31]

29 Cf. Shelton/Karakiewicz/Kvan 2011, p.106.
30 Cf. Smith 2011, p.125.
31 Cf. Tieben/Govada 2013, p.190.

061 Elevated pedestrian system in Central


Always covered
One of the main tourist attractions
Operates uphill from 10.30am-midnight
Carries 85.000 people per day


135m height difference at a length of over 800m
Peel Street wet market
Old urban area, location of first settlement, soon demolished due to urban renewal

MID-LEVEL ESCALATOR

The Mid-Level Escalator is the most public example of such mechanical device. The escalator enables the user to experience the city from a different perspective and to read the city's three-dimensional movement network while it is elevated between buildings in the height of the second floor.

063 Mid-Level Escalator

064 Inside the the Mid-Level Escalator

065 Structure from above

The system opened in 1993 and consists of a series of eighteen reversible one-way escalators and three reversible one-way travelators (essentially escalators that move up gentle slopes without forming steps) linked by covered walkways and access stairs. Today the system carries 85.000 people per day and is the longest outdoor covered escalator system in the world.[32] In the morning it carries workers downwards to the central business district and after half past ten it carries people upwards. For moving in both directions there are stairs beside to complement the technical devices.

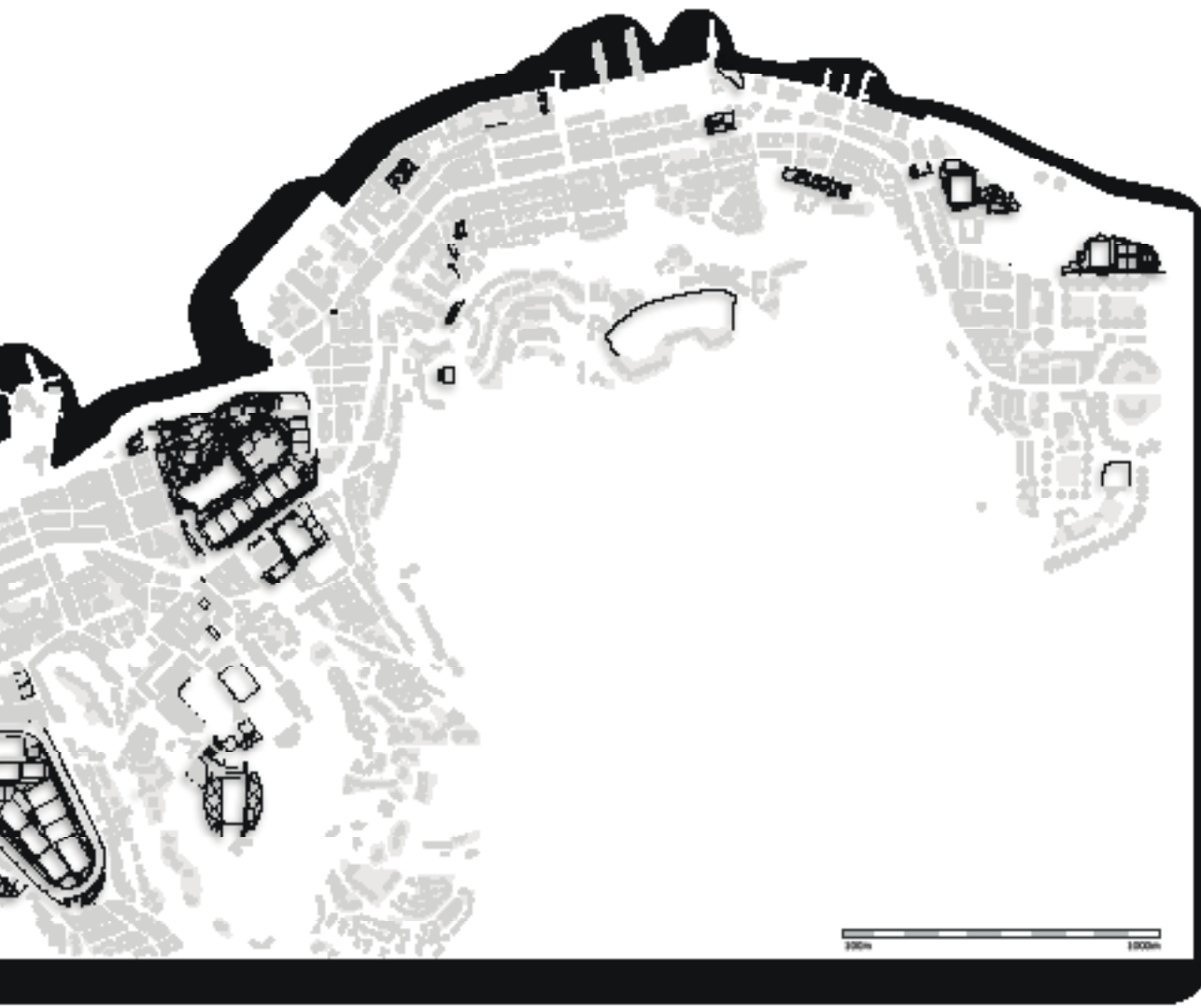
The entire system covers over 800 metres in distance and climbs over 135 metres in height linking the downtown Central District, up to Conduit Road into the Mid-Levels. It was initiated as a means of reducing vehicular traffic on the congested streets accessing the lower slopes on Hong Kong Island and the Mid-Levels. The project was even officially labelled a failure in 1996 by the Hong Kong Government Director of Audit because it overran budgets and there was no recognisable reduction in traffic on the roads. But another type of success was visible, the introduction of the escalator carrying a large number of pedestrians through sections which were normally difficult to reach increased commercial activities in those areas up the hill, attracted life to the area and stimulated private investment.[33]

This area around the escalator was one of the first settlements on Hong Kong Island and is home to the oldest wet market of the city. Since 150 years this market has been running day in day out in two streets called Graham and Peel Street. The market is also one of the major tourist attractions in Central Hong Kong and for local residents and chefs the market provides them with fresh products every day. As this quarter grows in popularity the government saw a chance to raise their economic profit through redevelopment. The Urban Renewal Authority has announced plans to demolish this area to make space for four new high-rises - two residential towers, one hotel and one office tower[34]. This reveals the approach concerning conservation of cultural heritage in Hong Kong. Instead of maintaining a functional diversity of mixed uses the historical environment will be erased and replaced by standardised and anonymous construction. In place of the stalls where hawkers were selling fresh fish, meat, vegetables and fruits new small, two storey buildings should give an '*authentic feeling*' of the historical wet market.

32 Hong Kong Government: Transport 2012, p.2.
33 Cf. Shelton/Karakiewicz/Kvan 2011, p.139.
34 Cf. Yeung/Lui 2007.

066 Public space network of Hong Kong Island

PUBLIC SPACE NETWORK



PUBLIC SPACE INFRASTRUCTURE

According to the Hong Kong Planning Standards and Guidelines the concept of *public space* is illustrated by the term '*open space*'. It is defined as a statutory land use zone for the provision of open space and recreation facilities. *"It means any land with the minimum of building structure which has been reserved for either passive or active recreation and provides major or minor recreational facilities, which may be of local or district significance, which is for the use and enjoyment of the general public."*[35] Here it is visible that the concept of open space in Hong Kong focuses more on the minimum of building structure and recreation. But public space is a place which can be provided in buildings or even on podiums, it can be part of a development. For that reason the definition of open space by the government is not adequate for use.

In this thesis we define it as a public space which can be accessed and used by all kind of people regardless of their social and economic condition, a space where no tickets or admission fee is needed.

Urban public space is crucial for people who live in high density cities such as Hong Kong. In Hong Kong different kinds of open space can be found. By looking at the surface distribution (land areas analysis) it is visible that the territory comprises of 66.6 per cent of woodland, wetland, shrubland and grassland, that is a total area of 738 square kilometres. This large amount of green space still exists due to its natural topography, as Hong Kong's terrain is hilly and mountainous, which also contributes to the compact urban form of the city.

This also leads to the conservation of country parks as this rocky and steep land cannot be used as building ground. Country parks are not far from the city centre and are even easily accessible via public transportation. The country parks are green spaces for recreation and relief, spending a day in the countryside walking or hiking is regarded as one of the favourite recreational choices by many people. This makes them very popular and in 2012 over 13 million visitors were recorded. Country parks cover a total area of 442 square kilometres which are designated for the protection of nature and are used for recreation.[36] These open spaces and green surfaces are indispensable for improving the urban environment and at the same time enable a better life for the inhabitants of the city.

In Hong Kong urban parks are also very important for the people as they are a place where people can escape from the stress of their daily lives. Urban parks have a particular importance to elderly people, who are the most frequent users. The early morning sight of elderly people practicing Tai Chi or walking for exercises in Hong Kong's parks and gardens is omnipresent. Playing with children, enjoying the space and social activities are other significant uses. The parks are so-

067 Footbridge used as public space

068 Pocket park as sitting out area

069 Public space under footbridge

070 Public space alongside footbridge

35 Town Planning Board 2013.
36 Cf. Hong Kong Government: Country Parks and Conservation 2013, p.1.

cial spaces as well as spaces for exercise and play an important role for people to relax.[37] But in the dense built-up environment of Hong Kong there is currently not much space designated as open space. Only 25 square kilometres, that are 2.5 per cent of the urban fabric of the city is open space.[38] This shows that there is a lack of providing enough public space in the urban area of the city.

The lack of public space

New Planning Standards and Guidelines were introduced in 1981 and are still valid today, which contained requirements for recreation and open space in Hong Kong. These standards determine 2 square metres of open space per person, 1 square metre of Local Open Space and an additional square metre per person as District Open Space.

Open Space can be provided primarily for what is defined as *'passive'* use which refers to recreation open space providing landscape facilities like parks, gardens, children's playgrounds or sitting out areas (these are small roadside parks, often providing benches and exercise machines for elderly) or *'active'* use which refers to recreation open space containing outdoor facilities such as game courts and pitches.[39] Passive open spaces in sitting out areas are the most popular form of open space among the residents in Hong Kong, according to a survey done on recreation habits. The demand for passive recreation is far higher than for active open space and it is especially high among the lower income groups and the elderly population in Hong Kong.[40]

Public and comprehensive residential developments are required to provide the minimum Local Open Space, but in most of its cases the developer makes use of every metre of ground to build for profit, so open space is provided on podiums or rooftops where access is been restricted for local residents in the neighbourhood.

Some densely populated areas fall short of this minimum planning guidelines. Yau Tsim Mong District (Yau Ma Tei, Tsim Sha Tsui and Mong Kok) has 11 hectares of open space compared to Wan Chai with only 4 hectares and Western district with 11 hectares.

But not only some parts of Hong Kong are short of public open space, much of the open space that the city offers is lacking international standards and far below compared to other Asian cities.[41]

Due to recent efforts Hong Kong's open space has increased but the main increase occurs in the New Towns, the old urban districts of the city still suffer from inadequate provision.[42]

This raises the question how much space has been created and returned to the public in the urban areas of Hong Kong?

37 Cf. Burdett/Taylor 2011, p.7.
38 Cf. Hong Kong Government: Country Parks and Conservation 2013, p.1.
39 Cf. Hong Kong Government: Planning Standards and Guidelines 2011.
40 Cf. Coorey 2007, p.73.
41 Cf. Wong 2012.
42 Cf. Yeh 2011, p.32.

Since the Urban Renewal Authority, which is responsible for redeveloping and rehabilitation in older urban areas, was established in 2001, 48 redevelopment projects with a total of 1.6 million square metres of residential and commercial space[43] compared to just 26.000 square metres of open space or 1.6 per cent of the total redevelopment area have been created.[44] It shows that not much open space can be found in this development, with the background that this space doesn't bring financial returns. The government is more anxious to preserve its land revenue and they would be reluctant to replace a profit making building by a large public park.

Since the government is unwilling to renounce its revenue of land transactions and equally unwilling to pay the high prices that it determines for land, it does not fulfil even its own standards for public space. Therefore, private developers who provide public space are allowed to build even higher than usual, with the result that every metre of ground is built for profit, that's why open space is often put on the podium.[45] In Central on the other side, new buildings have been designed to include public space or public passageways. That is why Central is interconnected by a large and sophisticated pedestrian system that separates pedestrians from vehicle traffic, making travelling from one place to another more comfortable and less stressful.[46]

The change in the use of public space

In Hong Kong merely walking around, relaxing and enjoying oneself without buying anything is considered a pure waste of time. The residents of Hong Kong consider just doing nothing as strange, even enviable and unaffordable.[47] People in Hong Kong are encouraged to consume. In order to enter MTR stations in some districts people are forced to pass through malls and shopping arcades as these corridor spaces are the only connection to the public transportation network.

Since the Hong Kong government tries to improve the situation of public space in the urban fabric by allowing the extension of the gross floor area for the development site in return of public space, a trend of privatization of public space is measurable. These so called privately owned public spaces (POPS) are communal spaces which are designed and controlled by commercial developers. This concept was first invented in the 1960s in New York City and was later adopted in Hong Kong in the 1980s. Around 70 per cent of this POPS in Hong Kong have a size less than 50 square metres. Many of this POPS serve as connection between different properties, so they are only circulation space and cannot provide the expected recreation. Only in some cases this space serves as enjoyable space for the public. In most cases these developments create an internalized, homogeneous and controlled public space.[48]

071 POPS Time Square

43 Cf. Urban Renewal Authority 2013, p.23.
44 Cf. Ibid., p.60.
45 Cf. Wong 2000, p.88.
46 Cf. Yeh 2011, p.31.
47 Cf. Wong 2000, p.89.
48 Cf. Luk 2009, p.2.

But how public are these spaces and how are they used? Some of them are not accessible for the public and in nearly all of them the rights of the users are restricted. Most of these privately owned public spaces that are publicly accessible are highly regulated and activities such as loud noises, dog walking, noxious fruits, smoking, sitting and dancing are all likely to be prohibited.[49] A lot of these public spaces can be found in Central and Western District on Hong Kong Island, where most of the shopping malls are located. The appearance of these shopping malls in the 1980's marked the beginning of the fall of public space in the city. Public space turned into a consumer space and the number of shopping malls generally increased. Although the buildings are well organized within themselves, the relationship to the surrounding is improvable as the main result around this development is that informal activities in public streets disappear.

The massive environmental degradation of potential public space, the use of public space in private developments and the step-by-step privatization of leisure continue to limit the possibilities that residents have.[50] The concept of public space has been perverted. Now shopping is the new way of recreation and leisure. Consuming has become the main part of public life.

Chapter High-rise p.167

072 Restrictions at public spaces

Alexander Cuthbert, an urban planner formerly from Hong Kong University, wrote: *"It is without a doubt one of the great world cities, but he [!] is disturbed by the absence of any of the characteristics usually associated with world cities of this size and importance. There are no beautiful squares, parks or boulevards in Hong Kong, hardly any grandiose public, religious or cultural buildings, and not even any pleasant residential quarters."*[51] His statement might be a little hard, but Hong Kong is different. The way how most European people see and experience space is different to the way Hong Kong people use and live space. Cursorily one could say Hong Kong is a capitalist city, but people find a way to acquire space in order to make the most out of their environment.

Function of the street

It was always common in Hong Kong to extent private space into public area, for example at the *Shop House* typology it was common that a variety of functions took place in the street including socializing, cooking, washing, drying and playing. Even the introduction of back lanes in order to provide better ventilation and cooking space away from the main street did not change much of the functions of the street. Private life was carried out into the street due to the cramped living conditions in the shop houses.

49 Cf. Frampton/Solomon/Wong 2012, p.30.
50 Cf. Wong 2000, p.89.
51 Cf. Ibid., p.83.

"Most Hong Kong people do not have enough private space for their needs, therefore public space becomes private space. Private acts happen in public places: laundry, even vegetables are dried on fences surrounding the housing estates, house plants are raised in back alleys, shoes are jammed under outside water pipes because there is no space inside for them, washed gloves are hung to dry on barbed wire. If there is no more space inside, something must go out: mops, shovels, pots and pans are hung on hooks on the walls outside of apartments. In order to survive in this dense environment, one must be able to adapt. In comparison to the ordered and well-planned European cities, Hong Kong is almost like a plant – it grows organically, making space for itself wherever possible. The face of a newly built public housing estate is a blank slate – several years later its façade reflects the improvisational talents of its inhabitants." [52]

073 Back streets in Hong Kong

074 Gathering at covered back lane

These patterns of use of space were also acknowledged in the planning and design of the early public housing estates. The location of cooking facilities in the Mark I resettlement housing in the public outdoor passage reflects the street for domestic use.

As planning regulations had developed, a common purpose was to bring order and regulation to the street, but these regulations have striven to replace the complexity, diversity and adaptability of the traditional street by the clean and orderly image of a modern city, where diversity is replaced by homogeneity and where private is clearly segregated from public.[53]

"As a result of demographic and economic forces these anonymous buildings packed with repetitive housing units, floor plans and facades, are taking over Asian cities with relentless speed. But the public space surrounding them lacks the traditional Asian city's qualities of diversity, intimacy and richness. "[54]

Nowadays one has to look closely to see how people use and treat public space, but you can still find places where people treat public space as private space and use it sometimes even as urban living room, because the space in their flats is too little.

As observed by Michael Wolf's photographs, he captures and explores the individual improvisations and adaptations of this lack of private domesticity.

There is, for sure, more order and cleanness in Hong Kong's streets, but people will always find a way to use their space for various functions. Hong Kong's inhabitants have demonstrated creativity in creating home, work and public space in such a dense urban environment. Large and small public spaces are interwoven on ground level, while rooftops and large shopping malls activate a three dimensional vertical public ground. There is a need for such flexible public spaces in Hong Kong's vertical density.

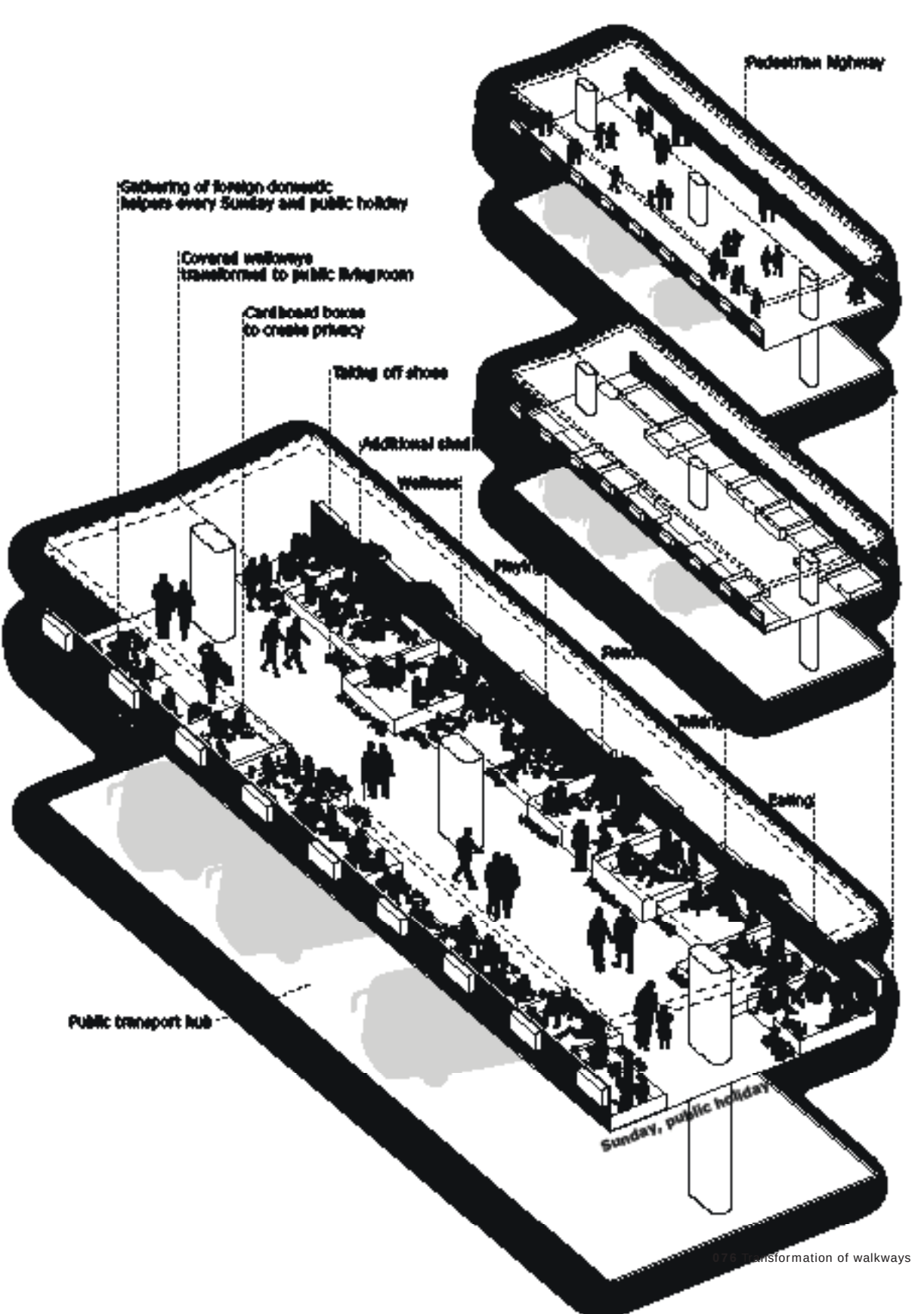
Varied examples how people use public space can be found in Hong Kong, in this thesis we examine three different places in order to understand public space and the way how people behave in these spaces.

52 Michael Wolf, zit.n. Yiu 2011, p.65.
53 Cf. Shelton/Karakiewicz/Kvan 2011, p.11.
54 MVRDV and The Why Factory 2012, p.10.

075 Graham Street wet market

STREET MARKET

The streets in Hong Kong assume a traditional role as market place and meeting place. Some streets in Hong Kong change to temporary trading zones, the construction of stands and stalls for the *wet market* or the night market happens only in twenty minutes but change the landscape of the street completely. The wet markets in Hong Kong have a long tradition and are an essential character of the city. Licensed street hawkers occupy fixed positions along pedestrian streets selling fresh food, flowers, vegetables, meat, fish and fruits. The stalls are extended into the street space and encourage purchasing goods but provide space for social and cultural interaction at the same time. It is a vibrant urban part of the city which faces tremendous changes in some areas nowadays. These markets become target of the urban renewal as described before. This long established public space with its vibrant, active and flexible way of using space is going to be gradually replaced by shopping malls. This development changed the urban pattern of Hong Kong and a lot of these informal spaces, which provided opportunities for the citizens to participate as both players and audience, have already disappeared.


Pedestrian highway
Gathering of foreign domestic helpers every Sunday and public holiday
Covered walkways transformed to public living room
Cardboard boxes to create privacy
Taking off shoes
Additional shelter
Walkway
Playfield
Park
Toilets
Parking
Public transport hub
Sunday, public holiday

WALKWAYS

In Hong Kong the walkways and footbridge network allows to accommodate changing needs and temporary uses. On a working day the links serve as fast connection between two destinations but on one day at the weekend the space transforms into an outdoor living room. It changes into a living space in the densest shopping district in Central, where domestic workers gather on their day off.

This phenomenon is due to the fact that most of the female domestic workers live in small rooms in the employer's homes, where they have no space to meet friends or family. As a result a large number of foreign domestic workers gather in public spaces around the city to socialize and enjoy a brief moment of privacy.

077 Domestic helper on their day off

078 Use of walkway

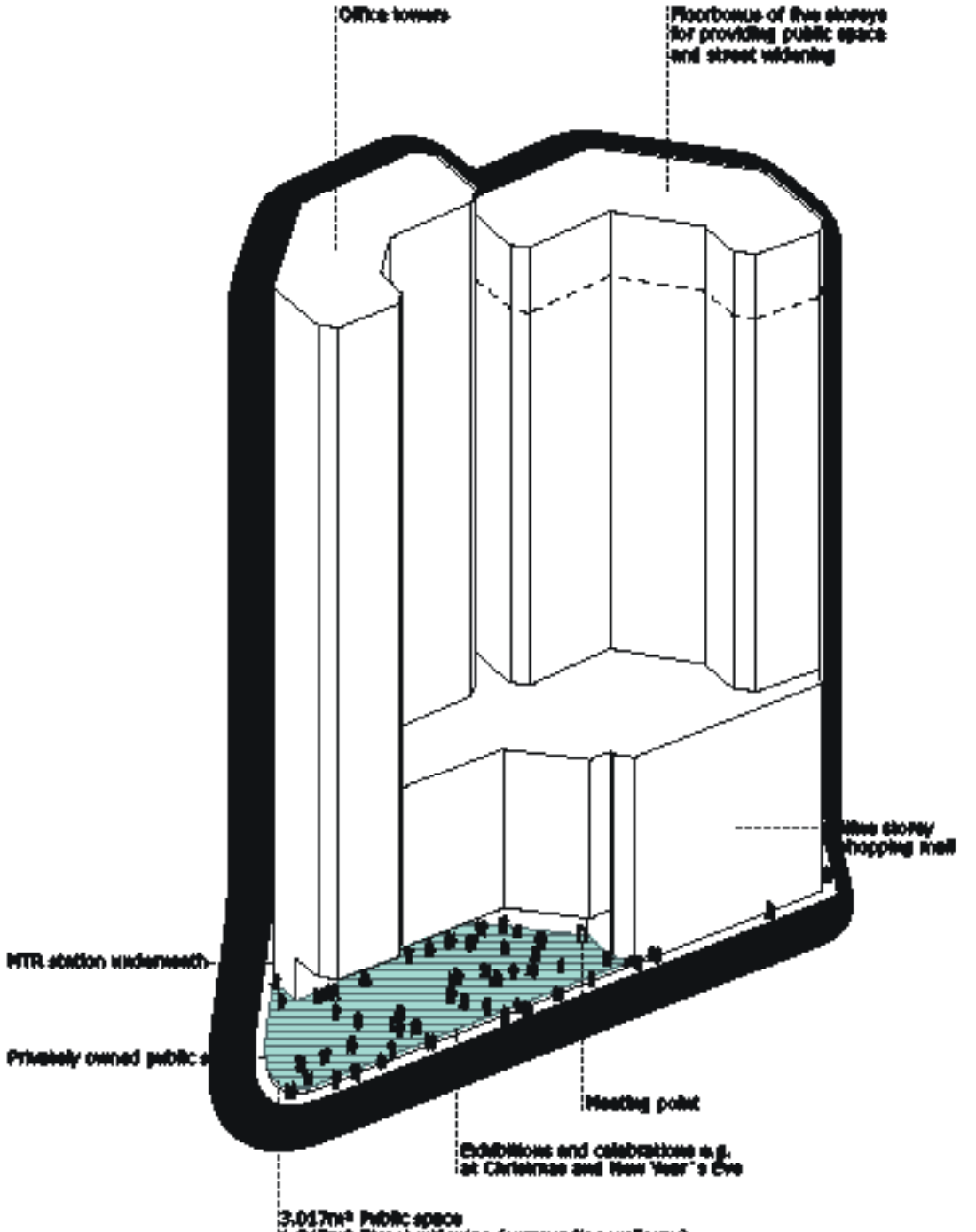
079 Cardboard boxes form community

These spaces become salons, libraries, picnic places or playing grounds at the weekend. It is interesting to observe that not all activities take place on the same type of ground as the areas in Central are subdivided into different user zones. Walkways are more likely to be used for chatting and gathering as well as playing cards, picnic and beauty activities, as these functions need a covered shaded area with a hard surface. While other activities such as praying and dance performances take place in large open spaces such as the Victory Park. Walking through these areas on a Sunday is always a pleasant experience as it transforms the 'grey' financial district into an active, colourful space full of vibrance.

Starting in the morning the domestic workers pack their personal belongings into large suitcases and head to Central. The mainly Filipino community built up their encampment with cardboard boxes in order to get some privacy. It is a good way for them to spend the day off inexpensively as most of them bring along their home cooked food and other gadgets to entertain themselves. In the evening everything is packed up again and the domestic helpers are saying goodbye until the next weekend. Unfortunately this use of public space is often seen by local citizens as an offence which causes sometimes tension and conflicts between locals and foreign workers, mostly because of congestion and littering. In the past there were also some attempts to ban this way of using public, but until today without success.

The way how the domestic workers use the space is a more informal way and it is different from the way Chinese people use such spaces. For most Chinese people these walkways and connection bridges are the fastest connection between two destinations, it is not a place to stay. Only in some areas, for example in North Point, Hong Kong residents use a pedestrian bridge as recreation space to play Mah-jong. Normally Hong Kong residents prefer to stay at declared public spaces such as sitting out areas or promenades where they enjoy their free time.

PRIVATELY OWNED PUBLIC SPACE



080 Times Square POPS

The Times Square shopping mall situated in Causeway Bay was built in 1994 as major shopping mall redevelopment from a former tramway depot. The public space at Times Square serves as a node for the pedestrian network as it connects different streets and the MTR stations. It provides a plaza of approximately 3.017 square metres and street widening of approximately 1.347 square metres and is a good example for a privately owned public space (POPS). It is a space which is located on the private property of the developer and is managed by the private sector, but the general public has the right to use it. As a return for the provision of this public space in the city centre a floor area bonus of 120.000 square metres, which is about five storeys, was added on top of the towers.

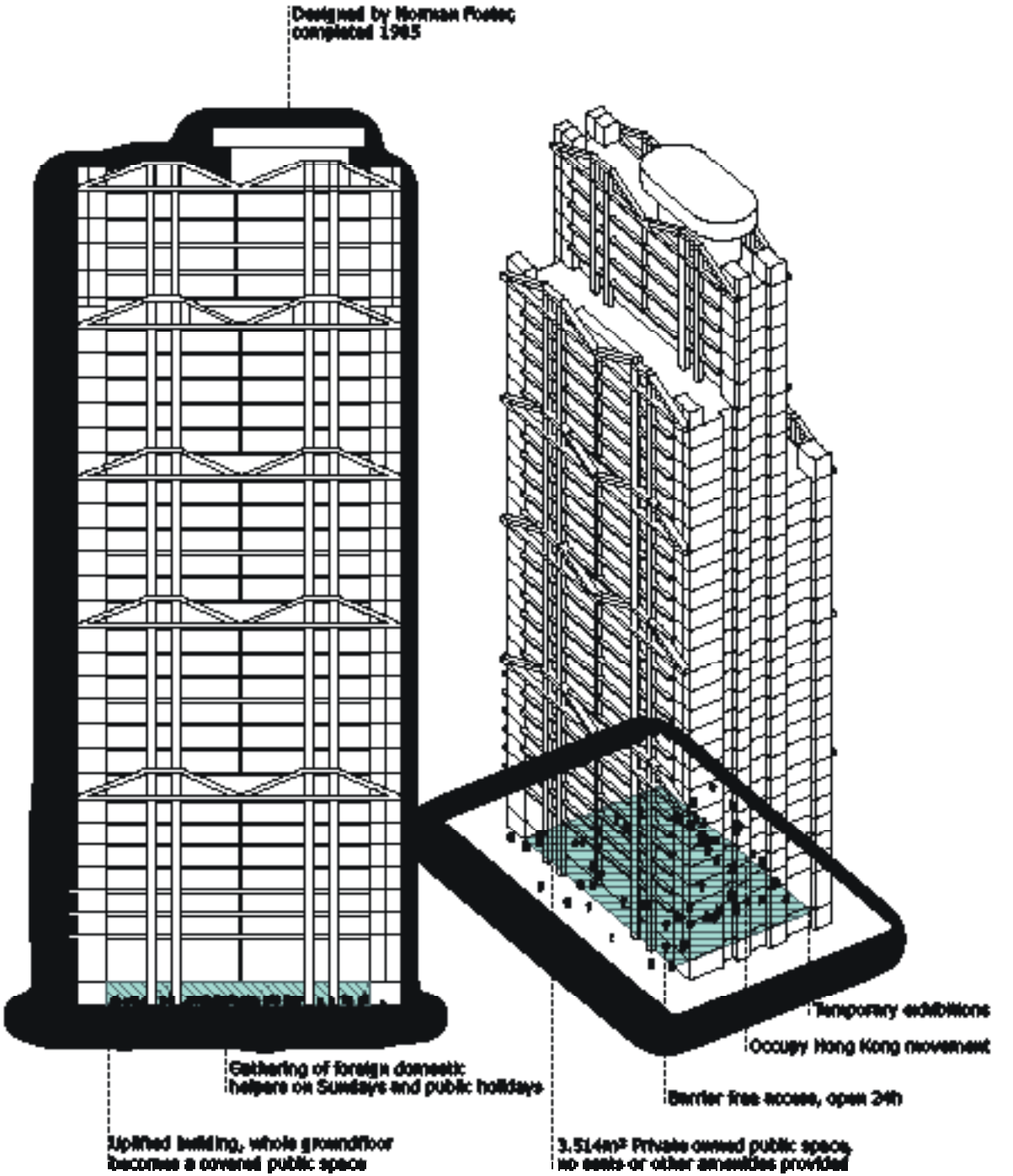
The plaza is surrounded by a high density urban fabric and serves as a meeting point due to its good connection. Various activities such as exhibitions, festival celebrations and public events can take place in front of the building.

In 2008 there were controversies about the inappropriate management of this privately owned public space, as the corporation prevented people from sitting or performing in this public space.[55] The property owner made even profit from renting the open plaza to a café, and people were strictly prohibited to bring along their own food. This abuse of power by the private sector was the reason for public demonstrations and made the people aware of the use of public space in Hong Kong.

The urban environment of Hong Kong has changed, the expansion of shopping centres and privately owned public spaces have become more and more the dominant form of public spaces. These spaces are no longer places for recreation it is a space which is largely profit-driven combined with a lot of restrictions and even opening hours.

081 Times Square plaza

55 Cf. Luk 2009, p.699.



082 HSBC POPS

Another interesting use of public space is the free space underneath the Hong Kong and Shanghai Bank from architect Norman Foster. His idea was to uplift the building, allowing the whole ground floor to become a public plaza as well as a pedestrian passage.[56] This non-commercial space on street level connects two of the most expensive business streets in Central, and was an incredible gesture to the city. Today this public space is known as a non-commercial sheltered space on street level and has become a lively picnic spot at the weekend for domestic helpers.

Mary, a Filipino domestic helper in Hong Kong for almost 12 years, says about the HSBC plaza: *"I can say the HSBC is very useful for us, domestic helpers, and especially to us Filipinos. It is our meeting place… During holidays, it is our habit to come here, to wait for our group like relatives, friends and different organisations. It is where we chat, share food, ideas and even problems if one of us needs help. It is a convenient place for us to practice some activities; to present a new program when we have one. Sometimes when it is raining and there is no place to go, we're just staying there spending our time chatting, some of us playing cards, manicuring, reading and eating. Before we depart, we always set the time when we will all gather again. Otherwise, a majority of us are going to church, to sports festivals, like volleyball and basketball. Some of us are also going to a skill training, like cooking, hair cutting, sewing, computer and much more. Few are even pursuing their unfinished studies, studying hard the entire Sunday afternoon. In the evening most of us are buying food from a restaurant or food chain take out, to eat in HSCB in-group. That's how we enjoy our holiday till the time to go back home to our working place."*[57]

083 Gathering under HSBC

084 Occupy Hong Kong protest

Occupy Hong Kong

The HSBC plaza was also the location for another phenomenon which started in the middle of October 2011. As the Occupy Wall Street movement also spread to Hong Kong the public plaza beneath the bank became a campsite, to draw attention to the grievance in Hong Kong. Protesters all around the world joined the movement which demonstrated against social and economic inequality. The protest began in Hong Kong with about 200 people living in the occupied space. At its height in tents with set-up couches, desks and bookshelves aiming to create an ideal equal community. The protest came to an end in September 2012 after a judge ruled that the activists' occupation of the space goes beyond the designated use of the public space in the heart of the city's financial district.[58]

56 Cf. Hong Kong Public Space Initiative 2013.
57 Chu/Howeler 2005, p.164-165.
58 Cf. The Guardian 2012.

085 Performance under flyover

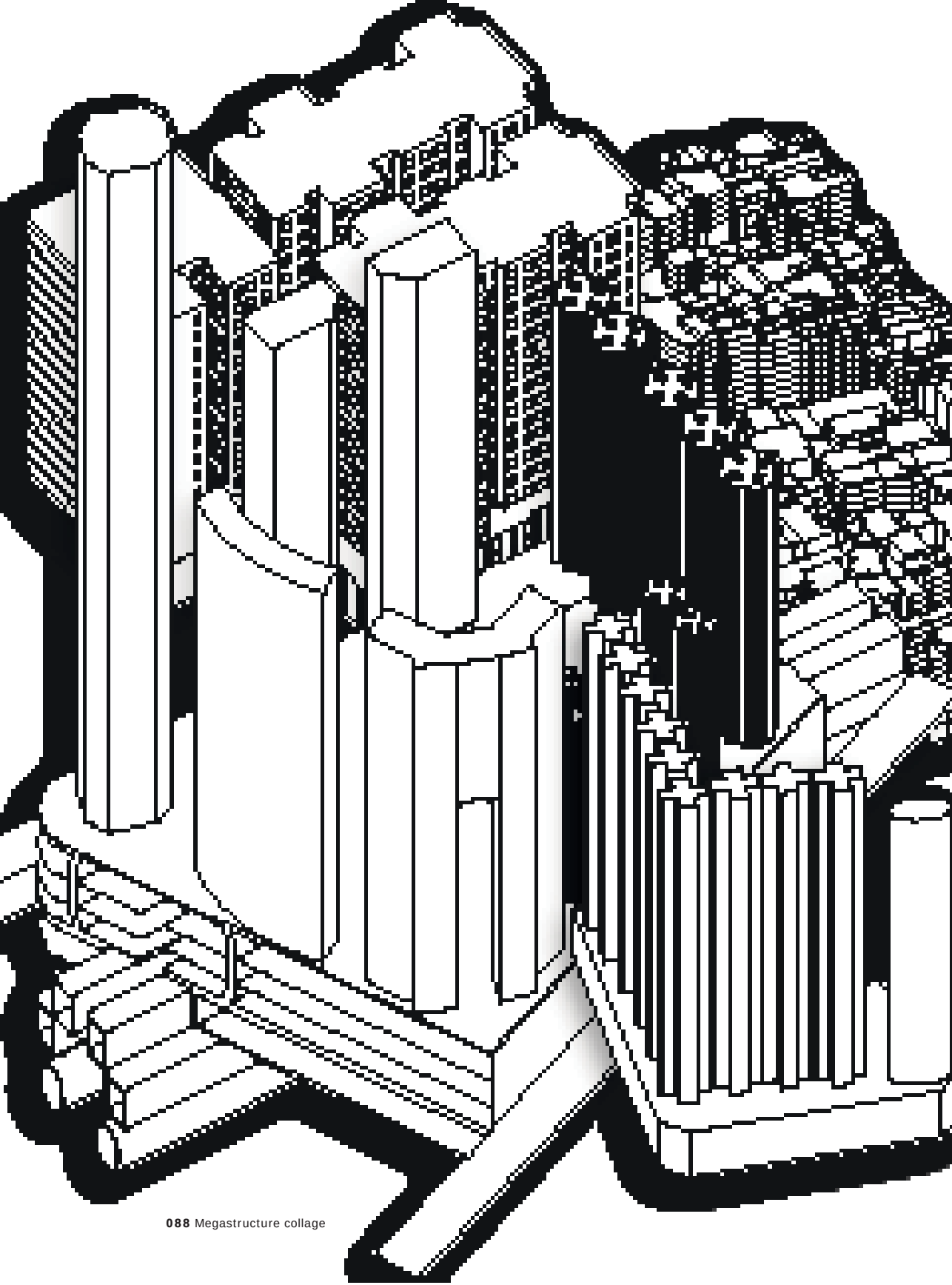
086 Fly the Flyover Operation project in Kwun Tong

1.325 vehicle flyovers and 1.197 pedestrian overpasses[59] can be found in Hong Kong, most of these sites have potential for further development. One of these developments is a place-making project in Kowloon. It aims to open up the fenced-off, vacant government land underneath the Kwun Tong Bypass to transform it into an informal cultural and performance venue for various activities, including music, cultural and arts performances as well as exhibitions. This venue opened to the public in January 2013 and is now a public space for people to relax and visit freely. There are basic facilities provided in the venue, for example, a performance stage, a dressing room, general lighting and toilets. This redevelopment of the space under the flyover should boost the change in the neighbourhood of Kowloon East, which should transform into an energetic and vibrant place with an artistic touch. The venue is well used with different activities and shows how such transformations can be done.[60]

This is a very simple and effective way of providing flexible space and a much more human approach than placing concrete cones to restrict access for people. Given the vast number of flyovers in Hong Kong, there is a great potential for innovatively providing public open space by activating the areas underneath.

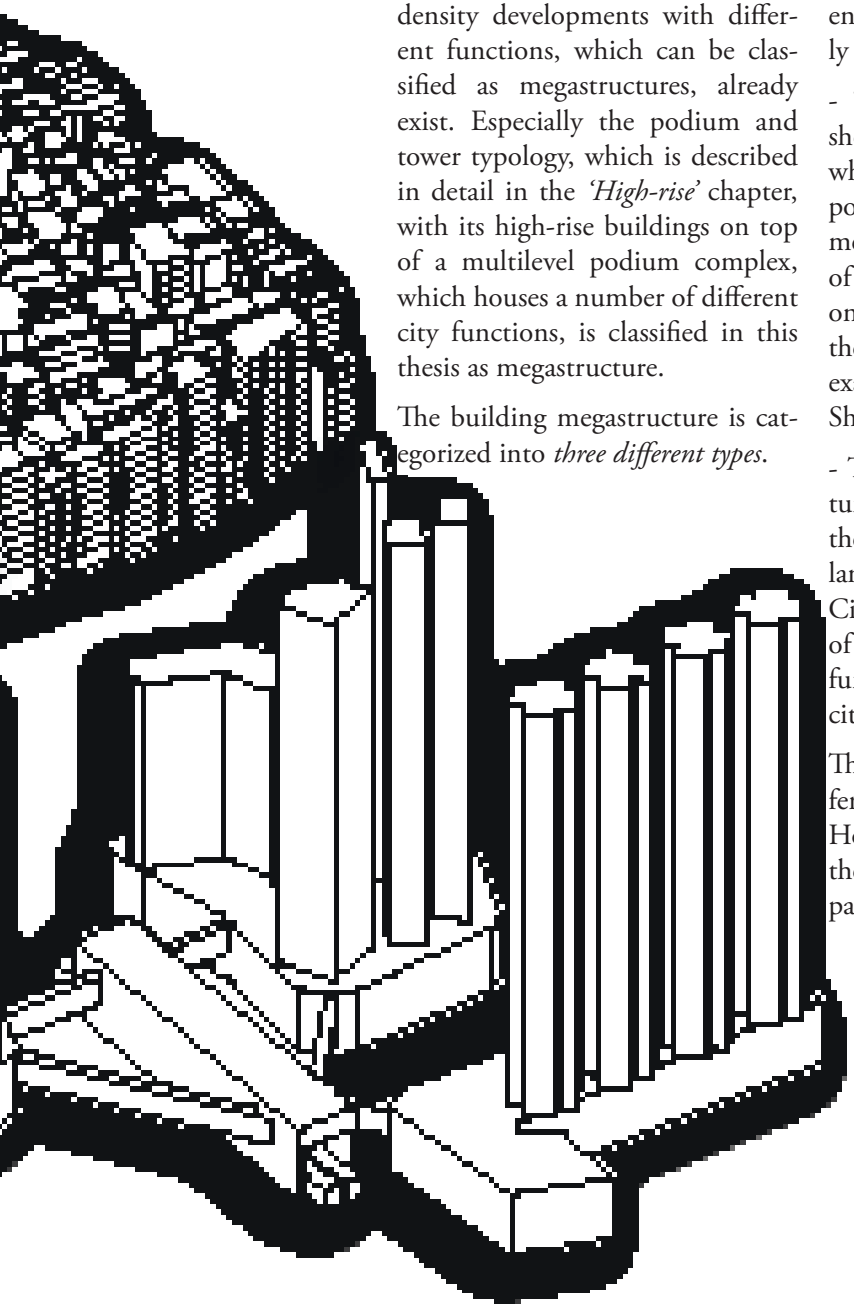
59 Cf. Hong Kong Government: Hong Kong The Facts Highways 2012, p.1.
60 Cf. Energizing Kowloon East 2013.

087 Concrete cones under highway in Hong Kong



088 Megastructure collage

BUILDING MEGASTRUCTURE



According to Maki a megastructure can contain an extremely high population density on a small piece of land, and can provide all or part of the functions of an ordinary city. Defined in this way we observed that in Hong Kong various high density developments with different functions, which can be classified as megastructures, already exist. Especially the podium and tower typology, which is described in detail in the *'High-rise'* chapter, with its high-rise buildings on top of a multilevel podium complex, which houses a number of different city functions, is classified in this thesis as megastructure.

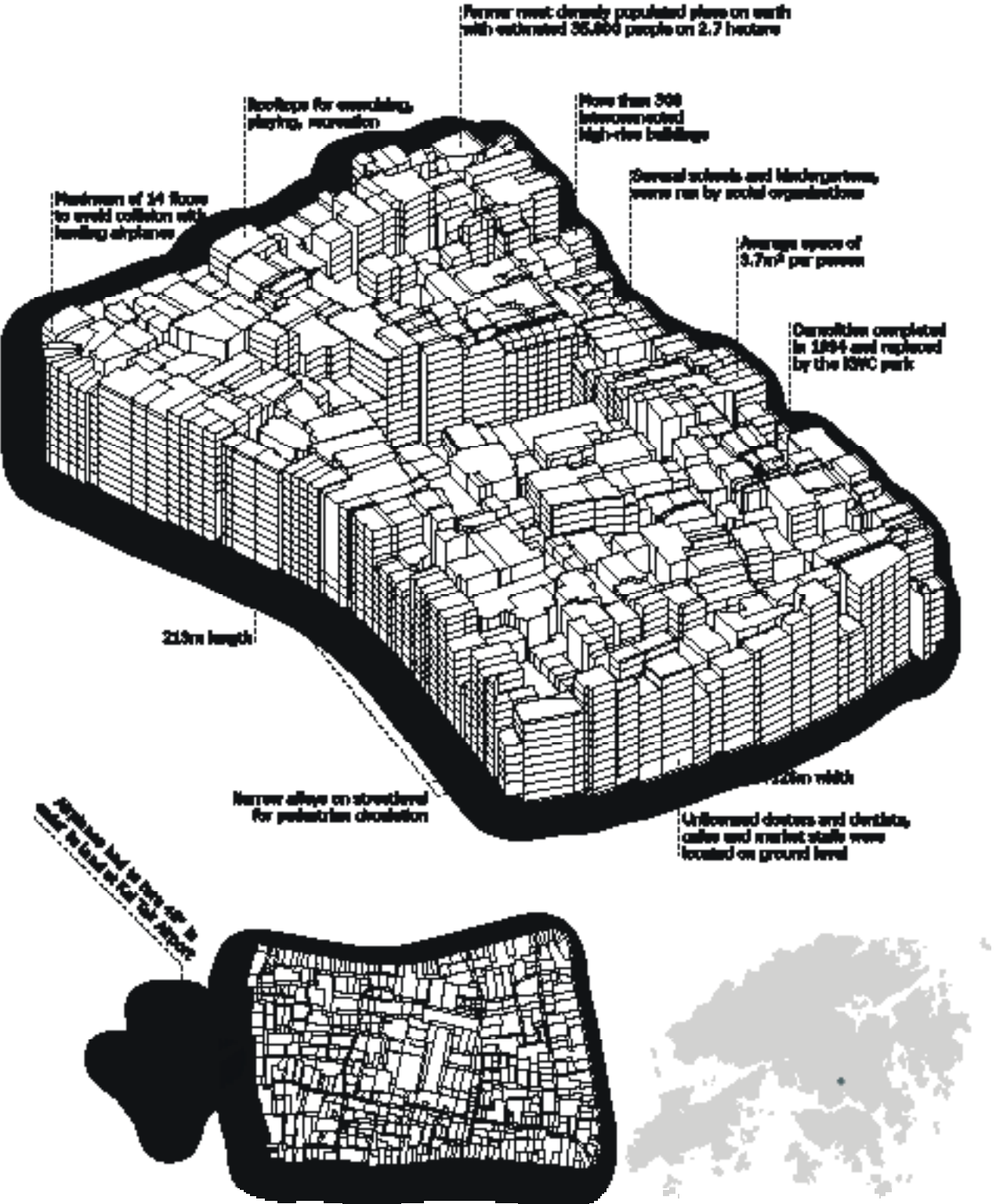
The building megastructure is categorized into *three different types*.

- The historical one, which consists of a widely mix of overlapping functions such as the Kowloon Walled City or the Chungking Mansion or the modern one, which is, for example, the Pacific Place. It is a megastructure that connects different parts of the city, and successfully facilitates pedestrian movement.

- The office, housing-towers and shopping mall megastructures, which can usually be found at transportation infrastructure nodes, is a megastructure that takes the form of an urban island and can survive on its own, but is still connected to the urban fabric of the city. A good example for this type is Tai Koo Shing or Kowloon Station.

- The mono-functional megastructures, which are often isolated from the surrounding such as Disneyland, Ocean Park or Olympian City, can be seen as autonomic part of the city pattern. They do not function as an integral part of the city.

This chapter investigates the different building megastructures in Hong Kong and takes a look at their interacting within the city pattern.



089 Kowloon walled city

KOWLOON WALLED CITY

The most complex expression of a three dimensional urbanism in Hong Kong was the Kowloon Walled City. It was an organically grown structure and developed over the years to a megastructure by becoming denser and creating overlapping functions.[61]

In Cantonese it is known as the city of darkness and was once thought to be the most densely populated place on earth with 35.000 people on just 2.7 hectares. There were a few tiny apartment blocks and more than 300 interconnected high rise buildings, all constructed without contributions from a single architect.

The history of the Kowloon Walled City dates back to the Sung Dynasty of 960 – 1297, when it began as a small fort for the imperial soldiers who controlled the salt trade. In the second half of the 19th century the Chinese were facing the invasion by the British, who then held Hong Kong Island. The Chinese authorities then expanded the fort into a proper garrison town.

In 1898 it became the only part of Hong Kong that China unwillingly ceded to Britain under the 99 years lease of Kowloon and the New Territories. Britain agreed that China could keep the walled city until the colonial administration of this area was established. But China never dropped its claim of jurisdiction and the sovereignty fight remained unsolved until 1987. The result was that it became a lawless enclave.

When the Japanese invaded Hong Kong during the Second World War, parts of the walls of the Walled City were demolished and used to extend the airport runway of the Kai Tak airport. After the war refugees started to flee from China and many of them stayed on the site of the Walled City. Rents were low, and there were no concerns about visas or taxes and by 1947 over 2.000 squatter camps were on the site. Permanent buildings followed and by the 1971 census over 10.000 people were reported to be living in the 2.185 dwellings in the Walled City. In the mid-1980s the population was estimated at 35.000 people and the structure had risen to twelve to fourteen storeys. The government tried to clear the city several times, but riots broke out in Canton and Shanghai, where the British Consulate was set alight. But the city was still part of China and to avoid damaging the Sino-British relations, the British government adopted a hand off policy and simply ignored the area. The city again became an area of criminal activities with brothels, gambling, drugs dens, dog restaurants and criminal societies known as the triads. It was a city within a city; there were no laws, no taxes, no light acting as an in-between space.

The height of the Walled City rose with the rest of Hong Kong. In the 1950s housing usually consisted of wooden and stone low-rises, known as shop houses.

090 Bird's eye view 1987

61 Cf. Shelton/Karakiewicz/Kvan 2011, p.157.

In the 1960s concrete buildings of four or five storeys were built, and in the 1970s many were replaced by blocks of 10 storeys or more. The site became chaotically cramped, with buildings so close to each other that it was sometimes not possible to open a window. Even the circulation space had to be moved to the third or fourth floor, which allowed continuous horizontal circulation and relieved the pressure from the lower movement system. This created a network of three dimensional streets allowing multiple accesses on different levels. The boundaries between inside and outside, between one building and another and between private and public became more and more blurred. The roof tops even offered the possibility for continuous movement across the whole structure.

The Kowloon Walled City was not only a great example of three-dimensional movement but also of intensive mixed use and adaptability. The minimal space in the structure was under constant transformation, for example a tea shop would transform into a bordello or mah-jong parlour and then into a dormitory. No room in the Kowloon Walled City could afford to satisfy just one function, it had to accommodate many functions during a 24 hour period. Low rents also meant that many small factories such as textiles, toys and food, especially fish balls, where placed within this structure.

Wells supplied water for the residents and electricity was taken illegally from the main city supply (until 1970s).

The result was an impressive megastructure with a height limit of 45 metres due to the proximity to the Kai Tak airport. If this had not been the case it would perhaps have led to an even more innovative volumetric structure. Initial structures were extended so that a ten storey building might grow with two more levels. Without adequate foundation and additional extensions buildings were not able to stand on their own. They were held up by their adjacent structures.

When the Sino-British Joint Declaration was signed in 1984 and the British and Chinese government agreed that the special territorial position of the Walled City was no longer relevant, both agreed to its demolition in January 1987.

At the time of the demolition, it was estimated that the Walled City had accommodated 8.800 apartments and 1.045 commercial establishments, on a site of 126 x 213 metres.[62]

62 Cf. Ibid., p.29.

091 Remains of the fort 1898

092 Shops inside the Walled City 1972

093 Walled City during it's peak

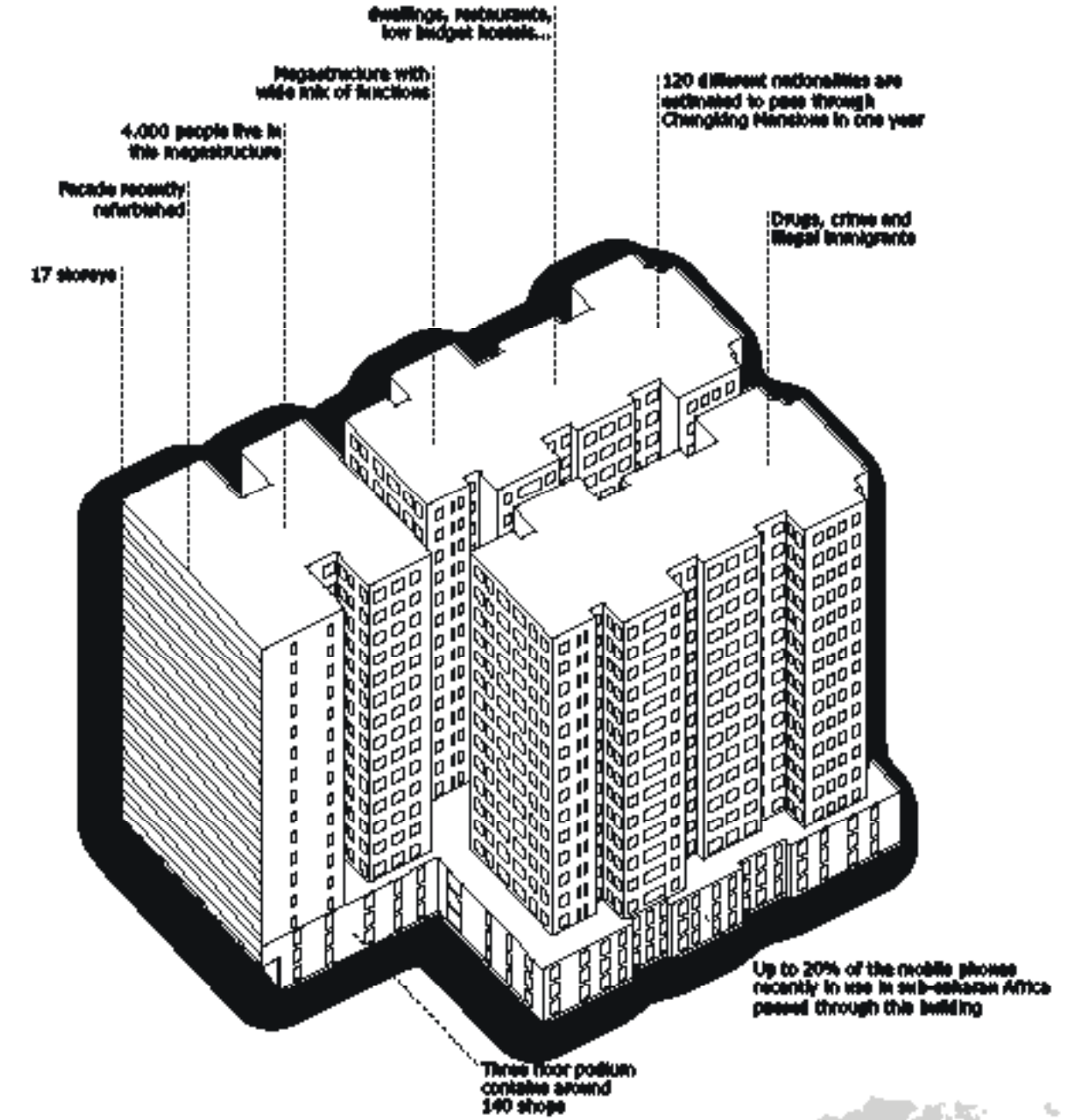
In March 1993 the last residents fully accepted the governments rehousing terms and the demolition began and was completed in April 1994. On the site the Kowloon Walled City Park opened in December 1995. But while it was demolished, the memories and the spirit of the Walled City still live on in the hearts of many Hongkongers.

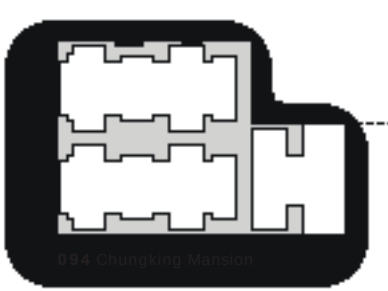
"When you ask former residents what they miss most about the Walled City most of them say the friendship.

It could be argued that the Hong Kong people today have lost some of the sense of community and social solidarity that could once be seen there."[63]

The streets and alleyways of the Kowloon Walled City were progressively incorporated into private space, Roof surface was regularly enclosed to serve as extensions of habitable space or co-opted to serve as access pathways, playground, schools, aviaries or gardens. The boundaries between private and public space was vague and readily renegotiated.[64]

63 Carney 2013.
64 Cf. Shelton/Karakiewicz/Kvan 2011, p.110.





Built in 1962 as high-end residential development, transformed over the years to a multifunctional megastructure

094 Chungking Mansion

CHUNGKING MANSIONS

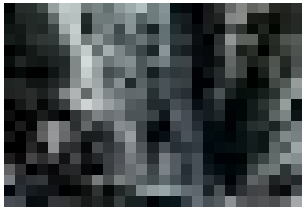
The closest development to the Kowloon Walled City that still exists in Hong Kong is Chungking Mansions. It is an example for a historical megastructure built in 1962 as a high-end residential development in Tsim Sha Tsui Kowloon with three towers on a three floor podium. It developed from a chic residential building into a megastructure with a wildly mix of functions. Today it accommodates a variety of low-budget hotels, shops, restaurants and other services.

There are estimated 4.000 people living in the seventeen-story structure in the heart of Hong Kong today, most of them from ethnic minorities. Mathew Gordon, who wrote the book '*Ghetto at the Center of the World: Chungking Mansions Hong Kong*', estimated in 2007 that members of at least 120 different nationalities had passed through Chungking Mansions in one year, it is one of the most culturally diverse locations in Hong Kong. Similar to the Kowloon Walled City, Chungking Mansions has been a centre for drugs, crime and illegal immigrants. It can be considered as a complete city within one structure, it managed over the span of forty years to transform from a singular residential monolith city block to a place of multiple programs.[65]

Approximately 140 shops are located in Chungking Mansions; among them are eateries, phone card stalls, groceries, newsstands, packing and shipping stores, Internet cafés and shops selling retail and wholesale mobile phones, clothing, watches, and electronics.[66]

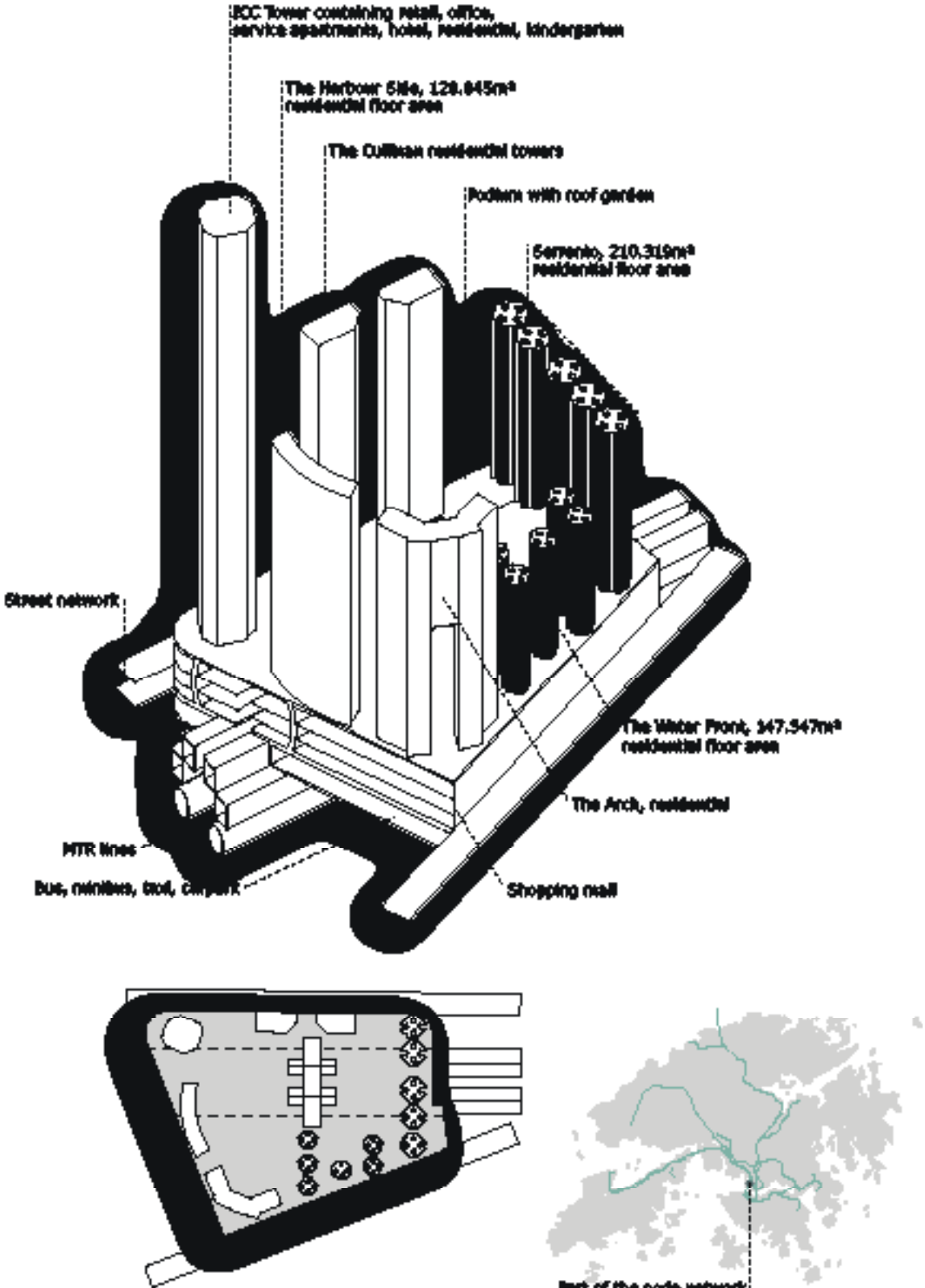
"Chungking Mansions is not part of Hong Kong, but an island of the developing world in Hong Kong's heart." [67]

095 Facade of the Chungking Mansion



096 Narrow gap for lighting

65 Cf. Ibid., p.31.
66 Cf. Beerman 2011.
67 Mathews 2011, p.91.



097 Kowloon station development

KOWLOON STATION DEVELOPMENT

The Kowloon Station is a Mass Transit Railway Corporation (MTRC) owned property, designed as major transport interchange, connecting the new International Airport to the existing urban centre by the Airport Express. It is a development consisting of 16 residential towers ranging from 30 to 60 stories in height, a single 118 storey landmark building (the International Commerce Centre) accommodating office space and a business hotel and two mixed use towers of 64 storeys each with hotel, service apartments and residential accommodation. The whole development is totally built on reclaimed land and will be even extended into the future West Kowloon Cultural District, a government financed venture that will feature 17 arts and culture venues including performing arts theatres, concert halls, museums and a 15.000 seat outdoor performance venue along a waterfront park.

Chapter High-rise p.189

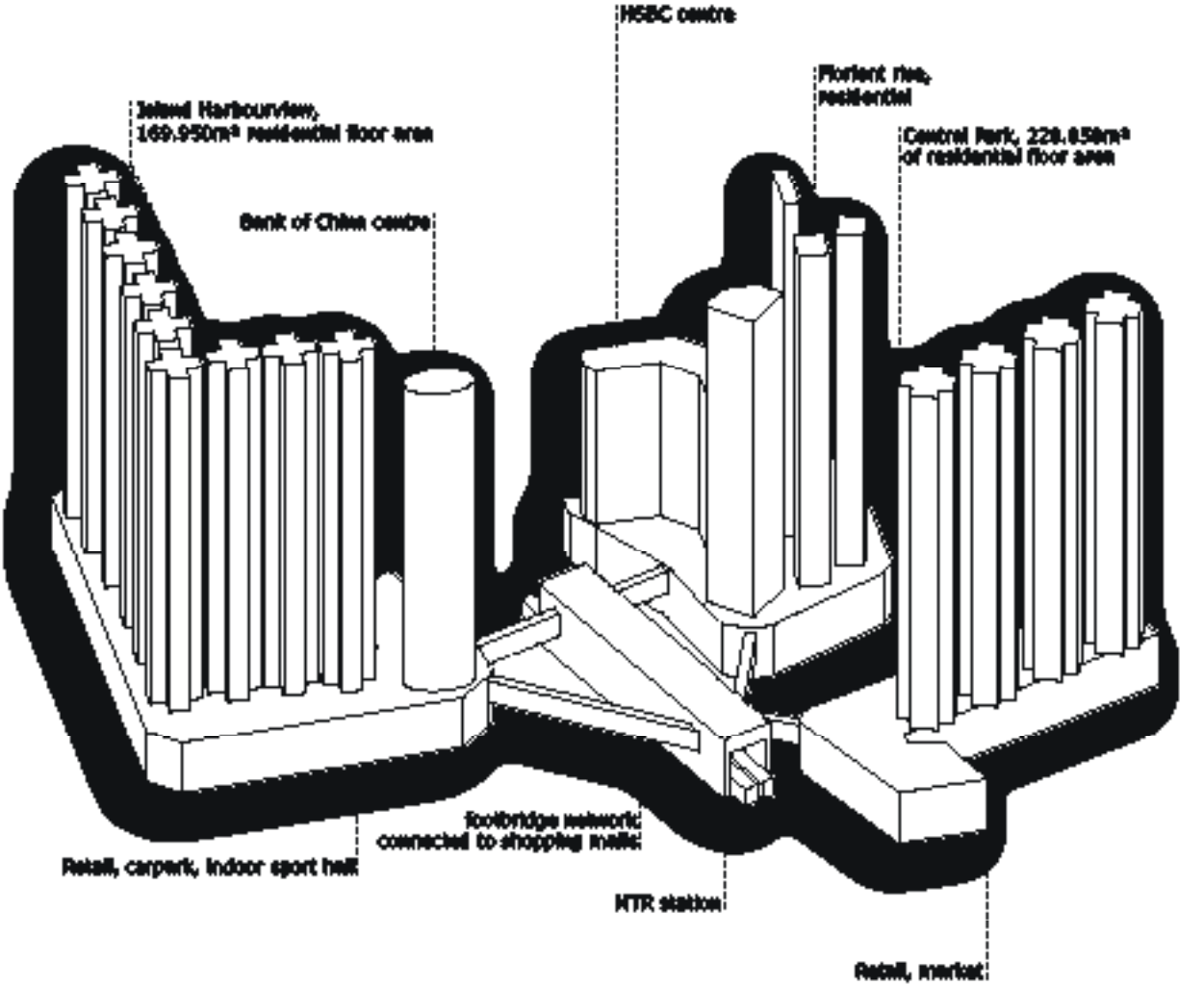
All towers of the development sit on a massive podium which includes a shopping centre, a multi-level car park, which has space for 6000 cars, and the Kowloon station, a transportation interchange for public buses, minibuses, taxis and the MTR with a huge urban park on the roof.[68] But because the podium is lifted off the road and forms a wall creating an undefined space and no shop openings are found on the street level, the pedestrian zone around the podium remains lifeless and empty. The podium separates the residents from the urban fabric of the city.

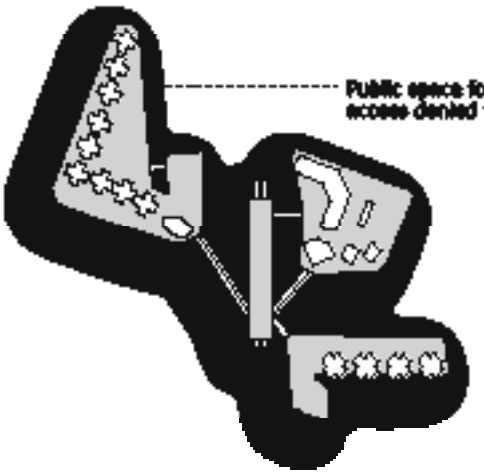
The Kowloon Station represents the most recent urban experiment in high-density mixed use in Hong Kong. It is an advanced evolution of the MILU typology (Multiple Intensive Land Use) that combines living, working and leisure in a high-quality urban setting, supported by high efficient transportation. The efficiency of the transportation itself makes a significant contribution to the overall sustainability of the project. This is one of the most intensively used spaces with 43.500 passengers arriving and departing from the platforms.[69]

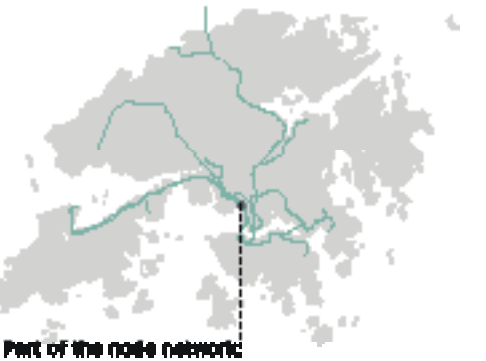
The Kowloon Station project is a vertical megastructure, which isolates itself from the surrounding and takes the form of an island in the city fabric. Nevertheless, the development has a well used shopping centre and an excellent connection to the city by public transport. The future extension to the West Kowloon Cultural District will integrate the Kowloon station even more so that it will function as an integral part of Hong Kong.

098 Area overview of Kowloon Station

68 Lau/Wang/Giridharan/Ganesan 2005, p.160-161.
69 Dempsey/Jenks 2005, p.424.


HSBC centre
Island Harbourview,
169,950m² residential floor area
Bank of China centre
Central Park, 228,650m²
of residential floor area
Retail, carpark, indoor sport hall
MTR station
Retail, market


Public space for residents on podiums,
access denied for general public


Part of the node network

The site for Olympian City was the result of a public transport infrastructure project developed by the MTRC in the late 1990s. The development occupies 13.1 ha and was built in three stages totally on reclaimed land.

The Olympian city consists of the Island Harbourview, which has nine forty-storey towers and provides 2.314 apartments, estimated to accommodate almost 7.000 residents, Central Park, which has four fifty-storey towers with 1.344 apartments for around 4.000 residents, and Park Avenue, which has five fifty-storey towers with 1.592 apartments for some 4.800 residents. In total the project was planned to accommodate around 15.750 people. As with other comprehensive developments, it has its own clubhouse and even two shopping malls and extensive sports facilities. There is even a large private open space located on the podium, which is separated from the public space so that the residents can enjoy their free time without any distraction from the public. This is special for the recent private residential developments as they provide large private open areas especially for their own user.

100 Linkage system

101 Vacant street level

The MTR station is located within the complex, which in theory should encourage people to go through the shopping centre to make their daily shopping on their way home. But there are no supermarkets or grocery stores located inside the shopping complex so people just use the mall to walk through. The consequence is that the shopping complex remains empty for most of the day, it only becomes busy later in the afternoon and during the holidays. The shiny-shopping centre appears out of place, not only because of its scale and proportion (it is one of the largest shopping complexes in the district) but also by its functions which are contrary to the local community. The development is well connected via the rail network but not via foot as the movement on foot between Olympian City and the old districts is neither easy nor pleasant.

The *podium and tower typology* is a type that has the capacity to knit elements of the city together, but it can also lead to divisions as it can be observed at the Olympian City development. This podium form is scaled up and takes over several blocks. It takes on an introverted, monolithic form that excludes the surrounding area and becomes an urban island.

The Olympian City is an isolated megastructure and in competition with its surrounding, in this case the old district of Kowloon and its very dense communities of You Ma Tei and Tai Kok Tsui. The development offers expensive housing in an area that is dominated by old-public housing. It offers a lifestyle that is not familiar to the people living in the area.[70]

70 Cf. Shelton/Karakiewicz/Kvan 2011, p.124-125.

DISCOURSE ON MEGASTRUCTURE

"Die europäische Stadt hat das 19. Jahrhundert geprägt, die nordamerikanische Stadt das 20. Jahrhundert, die asiatische Stadt wird die Maßstäbe für das 21. Jahrhundert setzen"[71]

To define the term megastructure and its underlying principles it is interesting to investigate different projects which use the term megastructure or can be classified as megastructure in history. It's also important to see the different meaning in the way, what megastructures were intended to be and what they are in an actual form. Throughout time there is a long history of designing or constructing structures of an enormous scale. In this chapter we intend to look back on those megastructures in history in order to understand the megastructures we observed in Hong Kong better and evaluate, if those networks and buildings could be really classified as megastructures.

Among them is the *Tower of Babel*[note6], a painting of 1563 by Pieter Bruegel. Babel was interpreted as a high-rise complex, a vertical city with multiple layers of structures within a city's walls. The significance of this painting was enormous and it highlights important aspects of city design that even has important relevance today. Bruegel shows the tower at various stages of completion and some sections are already decayed. It represents the city as a product that is never finished.[72]

102 Construction of the Tower of Babel

71 Ribbeck 1995, p.96.
72 Cf. Karakiewicz 2005, p.149.

Le Corbusier

The *Plan Voisin* by Le Corbusier could arguably be seen as the first step in exploring the high-rise megastructure in the modern area. He planned to redesign parts of the right bank of the Seine in Paris. Only five monuments would be preserved as evidence of the past. The quarters as a whole would be replaced with a sterometric system of axes punctuated with tower blocks. The towers were organized in a highly efficient layout, and in the centre they even shared an urban terrace with the traffic passing underneath. The terrace connected the towers and served as the collective space for public activities.[73]

103 Draft for Rio de Janeiro 1929

104 Draft for Sao Paulo 1929

105 Plan Obus, Algiers 1931-32 model

106 Plan Obus facade

In 1929 Le Corbusier observed Rio de Janeiro from an Airplane and was appalled. For him the city seemed to be an unbroken chaos from the sea to the mountain. He started to make drafts for projects in Buenos Aires, Montevideo, Sao Paulo and Rio de Janeiro. New urban elements could be found in these sketches such as inhabited viaducts and housing slabs on pillars, with public highways on rooftops. And also his approach to an existing urban pattern was different, as the thirty metres pillars intervene with the old city pattern, and apart from that the two urban organisms remained separated. In contrast to his early plans such as Plan Voisin and Ville Radieuse he did not recommend the destruction of the existing urban structure, instead he planned a partial over building of the existing city.

In this plan there was no longer any surface grid, no centre to which the architect can orient by.

In 1931 Le Corbusier began to design an idea for the North African city Algiers, the *Plan Obus*. Algiers was a '*descordre effrayant*' an appalling chaos that should be completely erased. He designed a plan for a linear city on the flat coastal landscape, individual residential modules could be inserted into the highway-crowned megastructure.

It is structured into three main elements, the Cite des affaires, which is a double skyscraper next to the sea side, a connected group of curved blocks with dwellings for the average income bracket and a miles long viaduct for 180.000 low income inhabitants, which are designed as fourteen square metres living cell. The construction of this linear megastructure, with a five metre height between floors, form stacked houses which should be constructed in the style of each particular resident.[74]

Le Corbusier designed a large-scale grid, in which the inhabitants built two-storey houses to suit their own taste. It is deduced from the *Maison Dom-ino*, but in this case each stacked house should be constructed in the style of each particular resident. His project represents a departure from the classical ideal city; instead of an urban structure with squares, streets and buildings, a continuous monument appears, a linear city which can be extended

73 Xue/Zahi/Roberts 2010, p.4.
74 Cf. Maruhn 2008, p.44-47.

as required, snaking through the North African landscape. The Plan Obus was never put into practise, but the concept of this structure affected different architects after World War II, such as Yona Friedman and Nicholas Habraken.[75]

Two requirements of urban megastructures were fulfilled. On the one hand there was the possibility for the inhabitants of the city to shape their own life-world in an overarching tectonic system independent from the architect. On the other hand, there was the rejection of the hierarchy within the shape of the city. It can be said that Le Corbusier's project for Algiers had produced an urban design concept already displaying many characteristics of a megastructure.[76]

Le Corbusier started the search for new forms shortly after the Second World War. He developed and designed structures and systems, which in their additive quality and serial orientation appear like a presentiment of the coming storm of megastructure. In fact, those projects mark a new beginning, they present the first proposal for megastructures, at a time when the term megastructure did not even exist.[77]

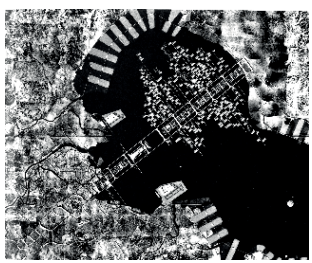
Unlike the architectural avant garde of the 1920s to 1930s the new megastructure movement didn't require the extensive demolition of existing quartiers or districts, instead the projects such as Constant's *New Babylon*, Archigram's *Plug-in City* or Friedmans's *Ville Spatiale* were floating above the historic city or aimed to connect existing cities in form of the linear city.[78]

Japanese Metabolists

In the 1960s urbanization in Japan came to the forefront as after World War II a lot of Japanese cities were destroyed and the nation faced problems of scarce land and increasing urban population. The situation urged Japanese architects and urbanists to rethink urban structure and architectural form and search for new possible solutions. The Metabolists[note7] in Japan were one of the first to acknowledge the potential of these vast structures which led to several megastructure proposals. They are considered as the *"fathers of megastructures"*, as they were the first who formulated and published the principle according to Maki and later Wilcoxon.

Japanese architects and theorists developed an immense amount of ideal models and concepts for megastructres such as Arata Isozaki's *City in the Air* or urban planning proposal such as Kenzo Tange's *Tokyo Bay* project.[79]

The Metabolists believed in the idea that the cities should be designed to grow and change and only the underlying structure should be permanent. The other element, the unit should be attached to the permanent structure and should be easily replaceable.



107 Kenzo Tange Tokyo Bay 1960

75 Lampugnani Band 1 2011, p.399.
76 Cf. Maruhn 2008, p.45.
77 Cf. Maruhn 2008, p.44-47.
78 Cf. Ley/Richter 2008, p.28-29.
79 Xue/Zahi/Roberts 2010, p.4.

The Metabolists rejected the modernist concept of the city as mechanical object and saw it as an organic process instead.[80] This way of thinking shows the *Plan for Tokyo* by Kenzo Tange.

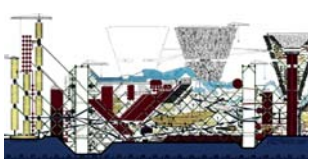
A bay spanned by gigantic steel beams which hold high rises, highways and hanging gardens. That was how the future should look like in the plans presented at the World Design Conference in 1960. It is a linear city, or a large scale architectural frame, where the primary structure are two parallel highways across the Tokyo bay and the secondary structure is an industrially produced room cell, which is the mobile fraction of the city.[81] His expansion of the city was designed over a period of twenty years and should grow out of the existing city to accommodate ten million people. The traffic system is a central axis with two freeway bridges and a massive suspension railway which runs parallel. *"The basic idea lies in breaking open the radial concentric city structure and introducing a linear growth process."*[82]

His project received a lot of international attention in the architectural press and the Japanese stepped out of the shadow of their European contra parts.

Archigram

The idea of a permanent supporting structure with interchangeable units, which can be plugged in or removed, had a very significant influence on the work of the British architectural group *Archigram*. As the designs of the Metabolists represented themselves as projects which can be built, Archigram's work were hypothetical projects that never presented themselves as buildable. The Archigram projects were designed to shock, to question and to challenge the pattern of living. This challenge was reflected in the name 'Archigram' as it was an abbreviation for the words Architectural Telegram, suggesting that the projects carried an urgent message. Although Archigram emerge in the 1960s in Britain and influenced many architects and planners, the British megastructure could never compare in scale with the Japanese ones.[83]

In 1964 Archigram published the design for a megastructure in form of the *Plug-In City*. It was a megastructure with no buildings, just a massive framework in which units in form of prefabricated standardised components could be plugged in. But soon after this publication Archigram turned away from the concept of megastrucutres and devoted their attention to the element of small-scale residential capsule. The interests changed to mobile manageable units such as the *Blow-Out Village*, *Tuned Suburbs* or *Instant City*. Archigram served as a source of inspiration for later works such as the Centre Pompidou by Richard Rogers and Renzo Piano.[84]



108 Archigram's Plug-In City

80 Cf. Lin 2007, p.110.
81 Cf. Hilpert 2008, p.59-63.
82 Ibid., p.59-63.
83 Cf. Karakiewicz 2005, p.138-141.
84 Cf. Ley/Richter 2008, p.28-29.

Yona Friedman

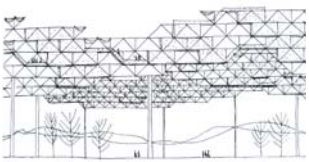
Yona Friedman, who had been in touch with the Metabolists via Otaka, was on a similar path. His *Ville Spatiale* scheme was a large-scale modular canopies that could be suspended above towns, cities and landscapes. His vision for the Spatial City canopies was to house capsules, habitable nodes nestled within the framework.[85] In *L'Architecture mobile* Yona Friedman proposed a moving city. A geometric grid structure which is elevated on pillars that span over the existing urban fabric covering it almost completely. The upper city is theoretically infinitely extendable. Instead of 'skyscraper' as seen in Le Corbusier's cities of Algiers Friedman designed 'groundscrapers' whose grid forms were oriented equally to breadth as well as length covering sections of the city or even the entire city. Friedman's project created an all-over system, where everything and everyone, rich or poor, must submit to his overall framework.

Constant Nieuwenhuys

Constant Nieuwenhuys's *New Babylon* stands also on top of high vertical supports, raised above the earth's surface. Everything original remains below, the new is elevated. It is a post-revolutionary city which growes on an elevated framework. He presents a series of linear arranged patterns, which are connected to each other, some at random, some out of a functional perspective. He even covers the entire world with the surface in which the human being largely abandons his privacy in order to live in public space.[86] New Babylon aimed to *"put an end to the separation between city and landscape. The landscape continues and the city is placed on a different level. It is a network, rather than a core."*[87]

Arata Isozaki

Arata Isozaki develops a new kind of megastructure which is probably closer to the Archigram's ideas than to those of his Metabolists colleagues in Japan. In his project *City in the Air,* designed in 1961, appears to have a basic treelike structure. It is a joint core system with branches growing off in different directions, creating a network of buildings. With *Clusters in the Air,* which is a more radical solution for Tokyo, he varied the joint core system allowing habitation that begins only at the height of 31 metres. Isozaki used a megastructure even as a tool of protest as developers began to demolish the historic business district of Tokyo. He designed a network at 45 metres above ground of interlocking tetrahedrons over the existing buildings rather than destroying them.



109 Yona Friedman Ville Spatiale

110 New Babylon by Constant

111 Arata Isozaki Cluster in the air

85 Cf. Koolhaas/Obrist 2011, p.20.
86 Cf. Ibid., p.44-47.
87 Cf. Koolhaas/Obrist 2011, p.19.

Superstudio and Archizoom

At the end of the 1960s, far from the hot spots of the international architecture scene, two architectural groups developed two utopian projects. Between 1969 and 1972 several versions of the projects *Il Monumento Continuo* by the Superstudio group and *No-Stop City* by the group Archizoom were published. There concepts were designed as a theoretical statement in form of a collage not as a design that will actually be built.[88]

112 Superstudio Il monumento continuo

113 Il monumento continuo in the Alps

114 Buckminster Fuller

115 Moshe Safdie Habitat

116 Brunswick Centre in London

Archizoom writes about No-Stop City: *"Such a model for the city does not represent the alternative to present-day reality, but rather that of the current reality on the level of a new critical consciousness."*[89] It can be concluded that in those two utopian city projects architectural utopias, their history, their social and political contexts, as well as the megastructures as a specific form of this are being discussed and are all being subjected to irony. It appears that neither one of these city utopias proposes concrete solutions to problems, but that both function to point out problems, both groups didn't create a model of the future but a critique of contemporary society and its architecture.[90]

Expo Montreal 1967

At the Expo in Montreal in 1967 the typical formal elements of megastructures had become accepted even more. Some would even say that megastructures had reached the climax of their diversity. Such as *Buckminster Fuller's* construction of an enormous Dome for the US Pavilion or *Frei Otto's* free swinging network structure for the Federal Republic of Germany. But one of the greatest megastructures was the *Habitat* by *Moshe Safdie*, which is a housing complex with a mixture of classic A-frame '*Terrassenhäuser*' and labyrinthine concrete block plug-ins.[91] At his residential structure Safdie applied the system of prefabrication, he was stacking accommodation units on top of each other so that the optical effect of a megastructure accrue. But there was no differentiation between structural framework and unit, which would have led to problems with the interchange ability or expandability of the structure.

The Brunswick Centre

At that time more and more ideas for futuristic architecture appeared, with a more conceptual approach than solutions to real problems. The designs became more abstract and less realizable. In the following years further implementations were developed which include at least partial mega structural concepts. The Brunswick Centre in London designed by Patrick Hodgkinson is a shopping mall that keeps up the idea of a megastructure. After completion in 1972 it failed to attract sufficient private buyers and the residential section was used as a council housing. Today, after renovation, the centre contains 560 flats, various shops, cafes and restaurants, a supermarket and a cinema.

88 Cf. Ley/Richter 2008, p.221.
89 Archizoom, zit.n. Ley/Richter 2008, p.214.
90 Cf. Ley/Richter 2008, p.214.
91 Cf. Ibid., p.28.

117 West Kowloon Cultural District by Foster + Partners, proposed large scale interconnected cultural development in Hong Kong

It contains several different functions in a big structure. Also the construction of the Centre Pompidou by Richard Rogers and Renzo Piano can be seen as an implementation of a megastructure.[92]

If the concept of the megastructure should fulfil the social need for mobility and flexibility, it seems that at this point the macrostructure stands in the way of the megastructure as monumental structures suggest little mobility. The living capsule should be the sustainable new symbol of the mobile society and put the megastructure concept, as previously thought, into question.

In 1973 Reyner Banham gave a series of lectures under the title *"Megastructure is dead. It is thus high time to place it within the history of architecture."*[93] For Banham the high point of the megastructure movement was already over and he began to question the megastructure movement. For Banham it began as a critique and alternative to the academic phase of CIAM's modernism, and now it turned into another academicism of the avant garde.[94] What had once seemed like an opportunity to transform the whole configuration of society became a memorial to an ideal and unreachable destiny.[95]

Megastructure is dead

But instead of thinking that megastructure is dead, a new way of thinking has emerged. The continually growing megacities of Asia, South America and Africa are predestined to develop megastructures adapted to their local needs. For example Foster and Partner have already designed such a megastructure for Moscow which is called Crystal Island but had to be postponed because of the economic crisis. Amazed by such megastructures also a lot of Chinese developers explore new visions for such vertical megastructure cities which should accommodate up to 120.000 people. For example the Beijing based Vantone Real Estate is planning to build such vertical communities in Chengdu and Xi'an.[96] It is interesting to see what the future will bring as due to the fast urbanisation process cities have to find new solutions to cope with increasing population and new concepts of megastructures can play a crucial role to deal with this challenge.

92 Düesberg 2013, p.174.
93 Ley/Richter 2008, p.28.
94 Cf. Riley 2003, p.30.
95 Cf. Ibid., p.24.
96 Cf. Want China Times.

CONCLUSION

In Hong Kong megastructures did not arise as the result of any urban theory, it is a development process which is due to the lack of available buildable land and an ever increasing population.

An obvious response to the demand of land was to duplicate the floor area by stacking flats on top of each other creating vertical megastructures for living. For the transportation infrastructure this also meant that there was a need to respond to the demand as the population moving was steadily increasing. In order to duplicate the means of access, footbridges were created which connect buildings and even whole blocks or districts with each other. This also encouraged multiple uses of buildings as it was now possible to enter a building not only from the ground level as second access was available. It extended the buildable space of the city not only horizontally but also vertically. A rich mix of activities became possible and a movement between buildings and streets without ever having to leave the continuous network of elevated or underground pedestrian passageways has been achieved.

By comparing the historical megastructure concept and ideas with the built-up form of Hong Kong it is obvious that those buildings and networks are not immediately comparable, as the visual expression is somewhat different. Interesting to observe is that the idea behind the concept is something that can be compared. Hong Kong's infrastructure network can be understood as a framework in which gradually '*units*', in this case skyscrapers, are '*plugged-in*'. When those units are no longer needed they get removed and replaced. The flexible part of these units is in this case not the dwelling-box but the human being, when he loses his flat he has to move and his '*unit*' will be replaced by another, newer one. The timespan plays an important role here as the city structure has not developed simultaneously, it is a continues changing process in which buildings usually survive only sixty years. After that they will be replaced.

This is similar to some of the concepts and ideas of the megastructure movement, where further developments and continuous change were desired.

In a lot of concepts in history megasturctures are usually used to replace the whole city or at least overspan the existing city. It raises the question of what should happen with the existing parts of the city. Different approaches could be found in history, megastructures were designed on pillars as they should not impact or damage the existing underlying structure, alternative designs want to provoke the demolition which should lead to the regeneration of existing cities. Other designs like *'The Tower'* by Bruegel shows a tower in various stages of completion with some sections already decayed, which represents the city as a product that is never finished.

This arises the question whether large-scale design projects in a city should ever be finished as cities never stand still, they are in a continual process of change and reinvention. Today different master plans can be found which provide fully solutions for entire districts and quarters. The megastructure provides a way to defy such efforts and gives the city space to refine itself by the changing building structure and the diversity of its inhabitants.

In the designs of these megastructure projects the structural part seems to be accepted as a collective structure, but who owns it and therefor organizes or manages it remains unsolved. While the state would probably resume all these functions at the Metabolism concepts, a computer system should provide the organisation of the megastructure in the designs from Archigram. The different ownership structure of a city makes a collective conceptual planning or reorganization difficult and almost impossible as to redesign or reorganize a whole city or quarter private and public property owners need to be brought together.

Most of the designs which have been examined in this thesis assume a rapid increase in population and therefore a rising urbanisation. These factors can still be found in Hong Kong and are even the reason why in our view there are plenty of megastructures located all over the territory. Although they are not always corresponding to the megastructure concepts which evolved from history, they contain in the majority of cases different functions and for us they can only be classified as megastructures by their sheer size.

For the continual growing Asian megacities, megastructures might offer a good way to rethink a city, but they also provide a lot of discussion material. The question arises if megastructures are a way to further developing the livability and vitality of Hong Kong's cityscape.

Megastructures in Hong Kong are an important part of the city fabric, as there already exits a complex network of transportation infrastructure and building megastructure.

The infrastructure networks are heavily used and often overcrowded. This often results in footpaths, walkways and footbridges that operate on their limits. In order to avoid an overflow of the footpaths even fences have been installed to keep people 'on track' and prevent collisions with the heavy traffic. Walkways and footbridges are often an outcome of efficiency which only guide people in specified directions, in most cases to the next shopping mall. They work as 'pedestrian highways' in order to overcome a heavy used road. Leisure walks are only possible at designated spots in the city.

A ‘slow’ recreational walk is mainly impossible, even at the harbour front on Hong Kong Island. Walking in the city is in most cases combined with consumption, which could be defined as the new leisure activity for Hong Kong’s residents. Easy walking from one district to the other is merely impossible as in most cases someone finds himself in a labyrinth of walkways and pedestrian bridges or in overcrowded pathways.

Street level as open space still exists in Hong Kong, but these diverse spaces are more likely to diminish over the time as they are replaced by megastructures such as the Olympian City, where uses are completely defined and predetermined. These uses in most cases exclude the street and the existing urban city fabric. In these cases, even in Hong Kong, an empty pathway occurs. For that reason megastructures in Hong Kong should work as connectors not as isolator as a megastructure can only be sustainable if it is a truly interconnected part of the city structure. The connection between private and public boundaries in the city fabric were blurred for a long time in the past but today this blurred edges become a sharp border and this related public space disappears. For that reason it can be observed that since recent years the public space infrastructure in new developments and in infrastructure projects has been neglected, and less undefined public spaces can be found.

If there are tolerances, people in Hong Kong are very creative in using their given space. Therefore it is not necessary to define and predetermine all of the spaces and functions in a design project. For that reason the aim of our projects is to discover and diagnose non-activated potential spaces, reinterpret or reuse them and create a flexible public space.

The Mid-Level Escalator is a good example for an infrastructure megastructure in combination with public space. This megastructure has enhanced and further developed the existing urban pattern of the district. The initial purpose was to connect the central business district with the mid-level housing area.The side effect was a tremendous upgrade of the area surpassed by the structure as it also became more accessible. The escalator enables an elevated way of exploring the city and is highly interwoven with the existing urban fabric.

Another way of experiencing and enjoying Hong Kong, namely riding a bike, has almost disappeared from the cityscape in recent years. This is an interesting aspect as the Chinese were formerly known to be a ‘bicycle society’. Today roads in Hong Kong are too crowded and dangerous for riding a bike. Only some gas delivery men use the bicycle every day in between the tram tracks for the transportation of gas tanks.

All humans strive for individual mobility, in western countries it is the car, in Hong Kong it could be the bicycle if there were sufficient inner city bike tracks.

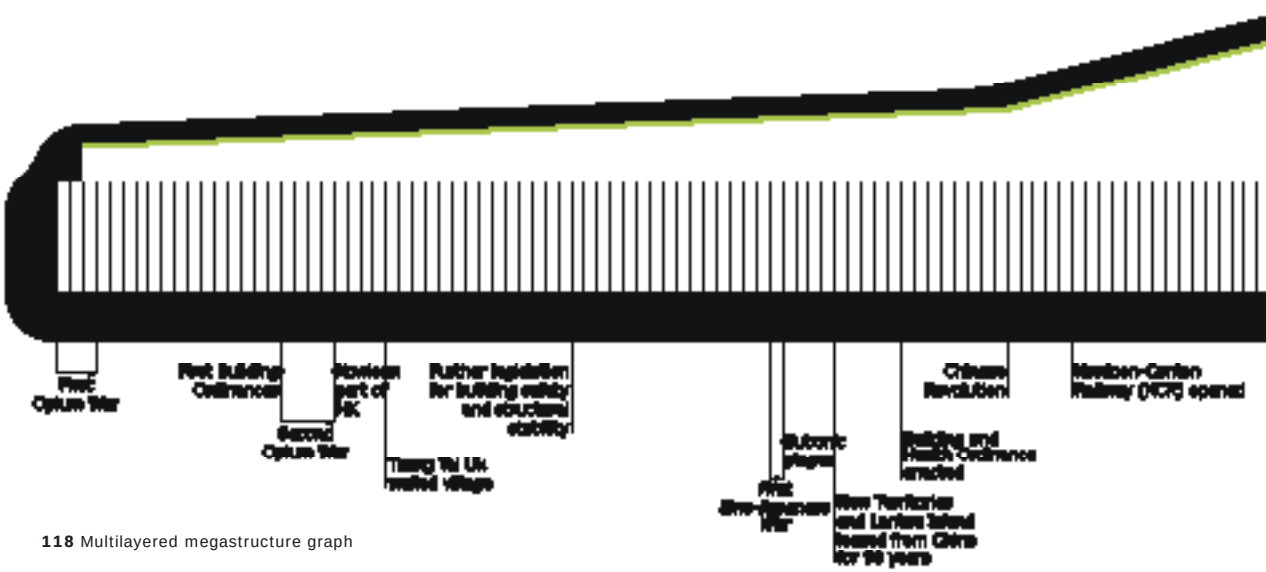
Hong Kong is a city which tries to head towards a sustainable and healthy living approach. In order to implement different ways to experience and enjoy the city it is important to maintain different ways of mobility and make use of different kind of spaces. To make megastructures work in Hong Kong it is important that there is always a possibility that these structures can develop further. For that reason it is necessary to create smaller interventions in the existing urban fabric, challenge people's creativity and let the structure grow in a sustainable and user oriented way.

A mix of functions and uses is essential in order to make space in different ways usable and accepted by all kind of people.

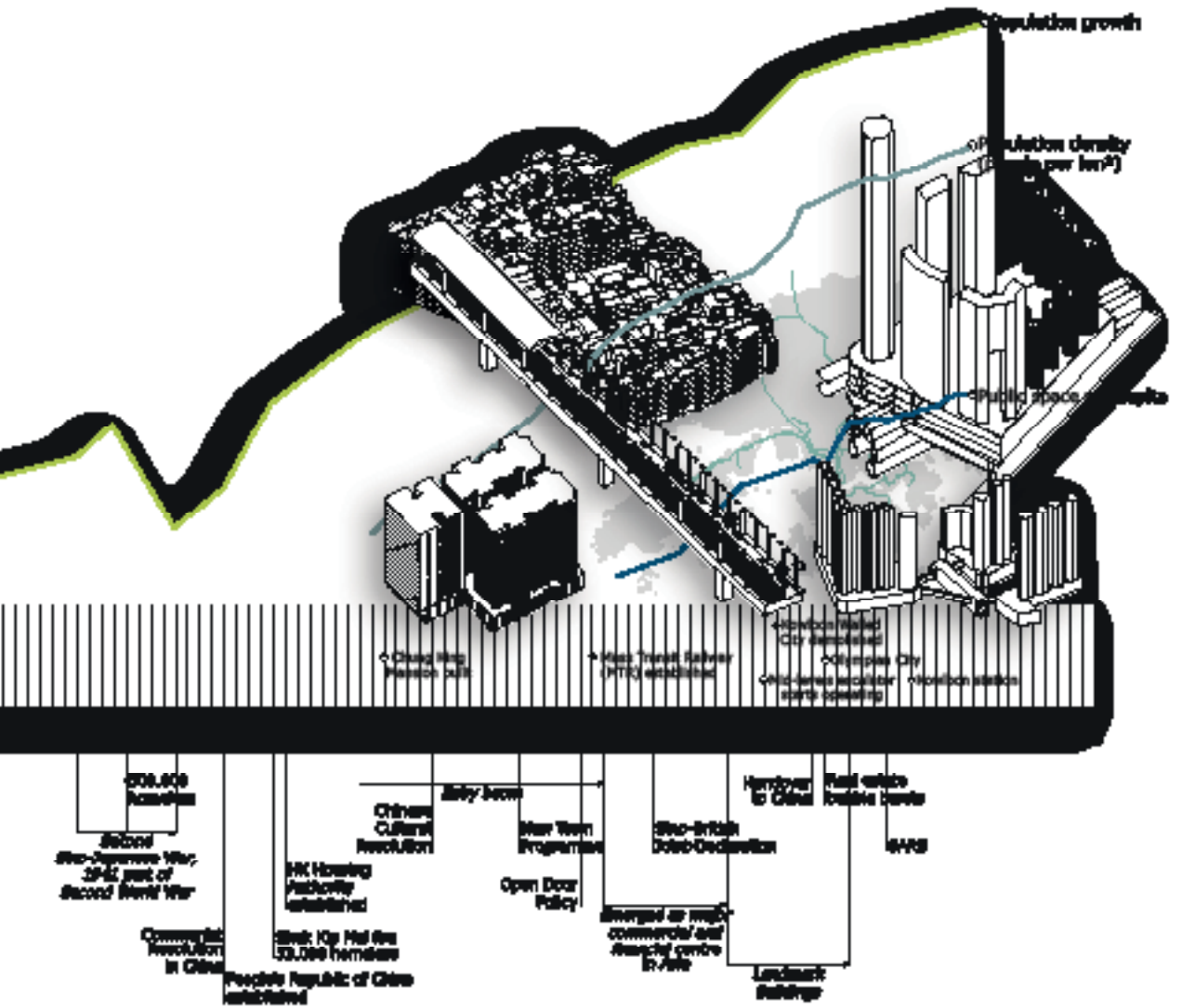
To create this mix of functions some guidelines will be necessary but to enable consistent and user oriented growth, only a direction with many tolerances and possibilities should be defined.

Due to Hong Kong's unique built environment and density it is possible to explore new ways of dealing with the needs of its citizens. Problems which Hong Kong is facing today could be problems of cities in the future all over the world as urbanisation is exploding and solutions which are found here could be solutions for urbanism in the future.

GRAPH MEGASTRUCTURE



118 Multilayered megastructure graph


Population growth
Public Place
Harbour Road
City Redeveloped
Kowloon City
Open Door
Policy
Landmark
Buildings

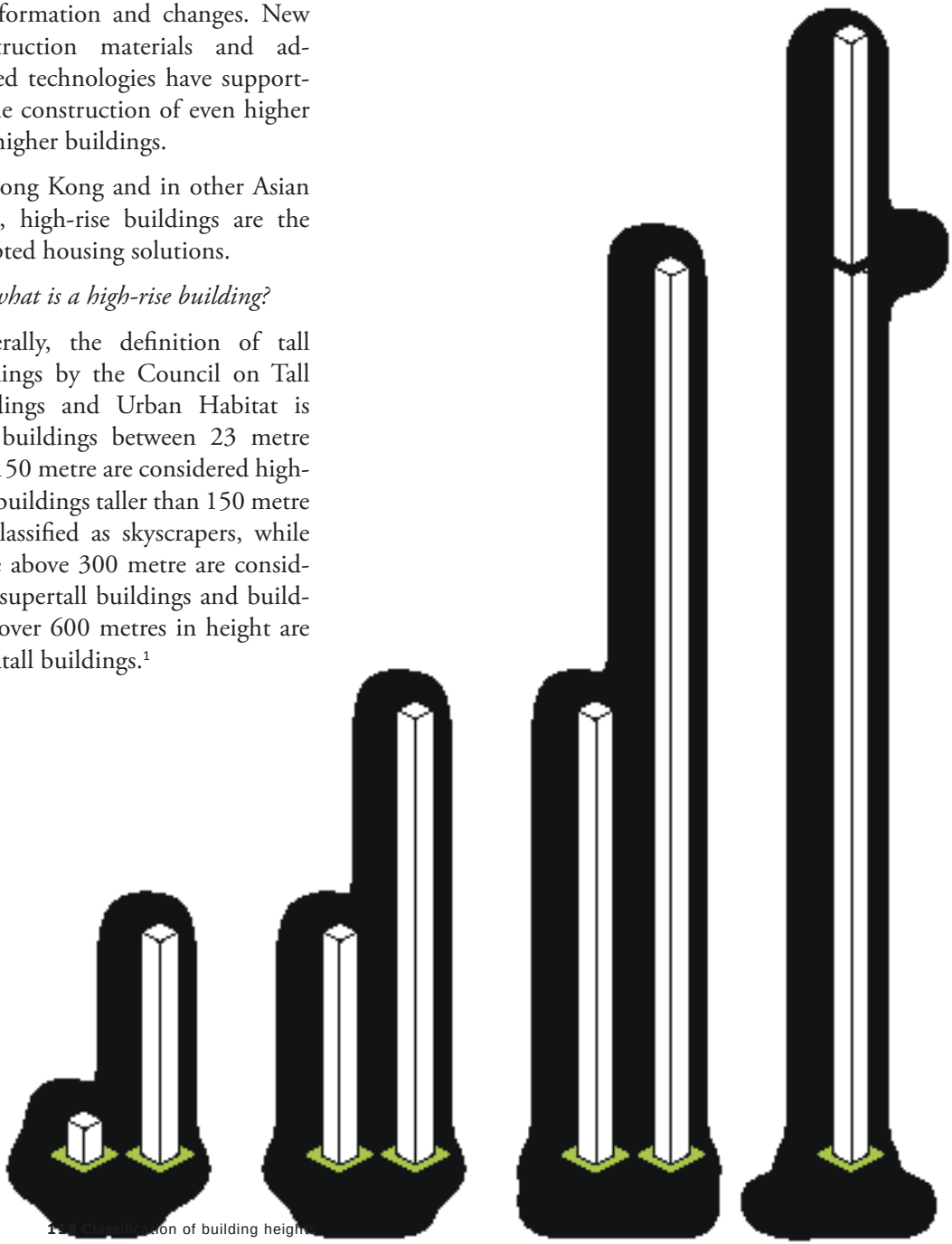
HIGH RISE

Since the first modern skyscraper was built in the United States of America in 1884, urban high-rise has gone through a wide range of transformation and changes. New construction materials and advanced technologies have supported the construction of even higher and higher buildings.

In Hong Kong and in other Asian cities, high-rise buildings are the accepted housing solutions.

But what is a high-rise building?

Generally, the definition of tall buildings by the Council on Tall Buildings and Urban Habitat is that buildings between 23 metre and 150 metre are considered high-rise, buildings taller than 150 metre are classified as skyscrapers, while those above 300 metre are considered supertall buildings and buildings over 600 metres in height are megatall buildings.[1]



1.9 Classification of building height

INTRODUCTION

Hong Kong represents an extreme case of a tall residential building environment, as a total of 6.594 high rise buildings can be found. Therefore this urban phenomena and the development of tall buildings and high density can be understood a little bit better. It is also intriguing to investigate the qualities of high-rise housing and observe its positive and negative effects. In Hong Kong high-rise developments grew out of necessity as there was barely buildable land to accommodate the growing population. The vertical stacking of people was the only possibility to provide enough living space. In most cases the building form is a consequence of economical, technical or functional constraint. This building evolution is therefore based on the technical progress, with the main aim to increase the efficiency and the financial returns. The transformation of the building typology in Hong Kong is worth drawing attention to it, therefore a typology catalogue can be found in this chapter, which should give an overview of the buildings typologies in Hong Kong and investigate different characteristics of the building forms, in order to form the foundation for the design process.

The high-rise urban form of Hong Kong bares close similarity to certain utopian projects from the past. There are shapes like *Le Corbusier's* slab blocks and cruciform towers with the indentation to increase light and ventilation; *Ludwig Hilbersheimer's* podium topped by tall residential blocks; or the Garden City concept from *Ebenezer Howard,* which was taken as guidance for the first generation of New Towns. These utopian projects are maybe linked to some developments of Hong Kong. This chapter aims to investigate these urban models in order to understand if Hong Kong's urban form is based on these ideas or not.

Another difference to these urban utopian projects is that the majority of the authors of Hong Kong's high-rise architecture remain anonym; no architectural signature is recognizable in the buildings. The design is determined by the optimization of space and material usage. For architecture this opens the possibility to experiment with different forms and densities and it enables to give new ideas a trail, which is what this thesis intends to do.

There are many drivers to build upwards, including economics, sustainability, housing shortage or image, but it is still important to bear in mind that tall buildings are not the only building option.

"Throughout Asia, urban villages have formed the fabric of cities for centuries. But now, an invasion of towers and blocks is obliterating them: THE BLOCK ATTACK"[2]

These anonymous buildings are taking over Asian cities with relentless speed, public space surrounding them lacks the traditional Asian city's qualities of diversity, intimacy and richness.[3]

120 Block attack in Central

1 Cf. Council on Tall Buildings and Urban Habitat 2013.
2 MVRDV and The Why Factory 2012, p.10.
3 Cf. Ibid., p.10.

HIGH RISE IN HONG KONG

Hong Kong is a metropolis with a dense population and the need to cope with rapid growth under the constraint of limited amount of buildable land, which has resulted in a concentrated development of high-rise buildings. Its skyscrapers are that define Hong Kong. Buildings have been constructed to maximum heights and form the image and identity of Hong Kong. The urban landscape along the harbour ,which is characterized by high-rise buildings set against a mountainous backdrop, forms one of the best skylines in the world.[4]

Within the space of four decades, the city form has been turned from a horizontal to a vertical plane; older buildings of five or six storeys have been replaced by high-rise building made out of concrete and steel, which are designed to achieve minimum costs and maximum returns.[5] The continuous increase in building heights is a direct result of the cities provision for an ever-growing population, increase in gross domestic product GD), and a shortage of land. The UN in 2000 claimed that the vertical urban planning approach of Hong Kong, stacking floors with different usages on top of another, produces one of the most energy efficient urban built forms in the world.[6]

Hong Kong has become an experimental ground for high density vertical environments. Mixed use has always been an important instrument in Hong Kong's typology development, only the scale has changed over the years. Starting with the traditional shop house where commercial and residential uses could be found under one roof, but with the increasing densification and modernization of the city the typology of the shop house has developed and built the foundation for the mixed use development that can be found all over Hong Kong today.

High-rise and high-density developments are very successful in Hong Kong. This approach helps to meet the urgent need to house the fast growing population. As the government provides community facilities and commercial centres within the housing estates, these high-rise and high-density public housing developments are very attractive for the citizen.[7] But it is also important to point out that there are some environmental problems which are related with the over concentration of high-rise high density developments, which includes poor air quality, noise, excessive waste production, heat islands and poor lighting and ventilation.

Hong Kong is urban. Hong Kong is dense. Hong Kong is beautiful. Hong Kong is a modern city, built with modern architecture. High-rise apartment buildings, factories and office buildings: monofunctional, large-scale, and freely placed according to a Modernist idea of the city. And all that against the backdrop of a lush tropical landscape. An orthodox modern city, but with a crucial modification: the density is extremely high.[8] - Emanuel Christ

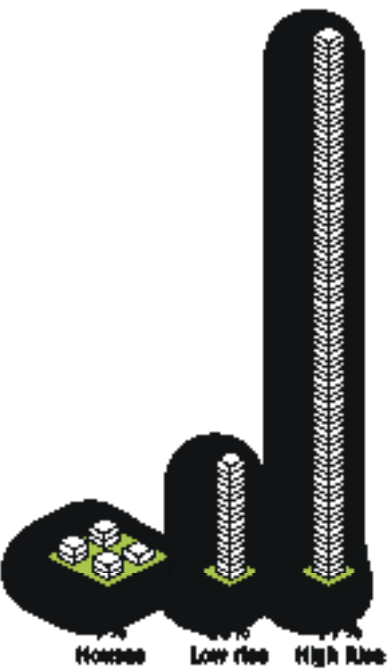
4 Cf. Emporis 2013.
5 Wong Kam-Sing 2010, p.322.
6 Lau/Wang/Giridharan/Ganesan 2005, p.156.
7 Cf. Zhang 2004, p.251.
8 Christ/Gantenbein 2012, p.9.

Skyscrapers in Hong Kong

Hong Kong remained surprisingly low-rise, although always dense, for many decades. For that reason the history of skyscraper in Hong Kong dates back to 1935 with the construction of the Shanghai Bank. With thirteen floors and 70 metres it was significantly higher than any other building in the city. It was the highest building in Hong Kong for fifteen years and was then overtaken by its rival, the Bank of China.

The rise in heights of tall buildings didn't proceed smoothly, over seven years from 1966 to 1973 Hong Kong's tallest buildings shifted through a modest six storeys, from twenty eight to thirty-four floors reaching the memorable 100 metre mark, which was due to the implementation of a new Building Ordinance. After that time Hong Kong's tallest building rose steadily but very consistently over exactly thirty years to reach 415 metre in 2003 and 484 metre in 2010 with the International Commerce Centre, which is today the tallest building in Hong Kong.[9]

Toady clusters of very tall towers can be seen anywhere in the city, at the centre or in scattered New Towns and beyond, and there would be even more had not the old Kai Tak airport been attached to the Kowloon Peninsula, where aircraft movements limited building heights until 1998 when it was closed and replaced by the new Hong Kong International Airport at Chek Lap Kok.



121 Preferred housing type in Hong Kong

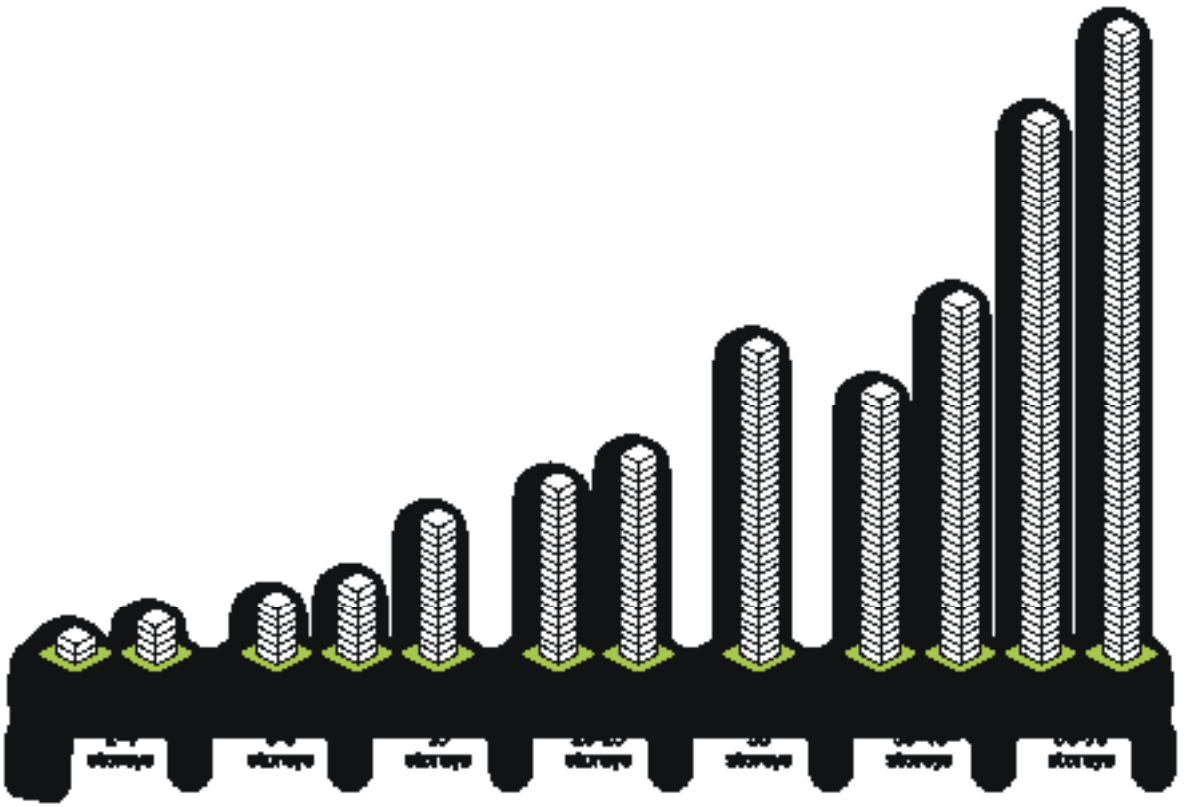
Living in super tall high-rise residential buildings with more than 40 storeys high is quite common in Hong Kong. At the moment the tallest completed all-residential building in Hong Kong is the 'The Cullinan I' with 68 floors (270 m). From the economic point of view, high rises are the most efficient way to develop land in Hong Kong, and the optimal height for Hong Kong high-rise buildings is 60 storeys with sea view and 57 storeys without sea view.[10]

Hong Kong has even surpassed New York City in terms of number of high-rises. There are a total of 6.594 high-rise buildings in all over Hong Kong[11], compared to New York[12] with just 5.849 high-rise buildings, and even the number of skyscrapers in Hong Kong is more than twice as high as in New York.

Another interesting aspect of Hong Kong skyscrapers is that most of them are built with the help of a bamboo scaffolding structure. This bamboo structures are around 30 per cent cheaper than the metal one, and dates back around 1.500 years. The method uses only bamboo poles and plastic ties to hold the scaffolding in place before they are covered in nylon fabric.

9 Cf. Shelton/Karakiewicz/Kvan 2011, p.100.
10 Cf. Yuen/Yeh (Ed.) 2011, p. 21.
11 Cf. Emporis: Hong Kong 2013.
12 Cf. Emporis: New York 2013.

BUILDING HEIGHT CHANGE



122 Change of average building height

LIVE AS HIGH AS POSSIBLE

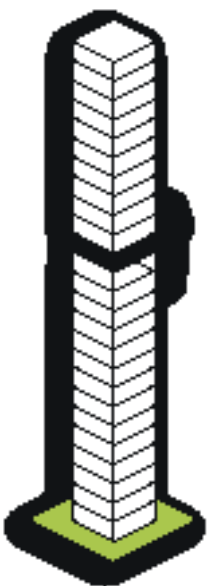
123 Reasons for high-rise living

Although Hong Kong has one of the highest density as well as the tallest residential building environment in the world, the residents who live in these tall buildings are generally quite satisfied with their living environment. In Western cities, floors higher than the 5th floor are considered to be very high, but in Hong Kong they are considered to be too low. For Hong Kong the average highest preferred floor level is about 29.3. The preference for living in higher floors reflects the relation between flat price and height. Because the house price and rentals for higher floors are much higher than for lower floors, especially for those with sea view, there is a strong desire to live as high as possible, which implicit a higher social status. But also better view, less noise and better air quality are one of the main reasons why people in Hong Kong prefer living on higher floors.[13]

The same survey also investigated concerns about psychological damage to young children growing up in high-rise apartments. The majority of mothers who were asked about the effect replied positively (98 per cent) and noted that the artificial ground which is a common feature on the roof of most podium decks on which the high-rise residential towers are built, offer a welcome and safe place for their children.[14]

Advantages of high-rise living[15]

More people live or work above the 14th floor than anywhere else in the world, making Hong Kong the world's most vertical city.[16] But not only housing is organized vertically, there is an impressive range of '*stacked*' and '*sky*' phenomena: stacked cemeteries, drive in multi-level flatted factories, warehouses and port storage with stacked transport depots, multi-level markets and even high-rise horse stables. As well as an extensive use of roof levels can be observed in Hong Kong; schools, churches, gardens, sport pitches and other cultural and educational facilities can be found above buildings.[17]



124 40% live or work above the 14th floor

13 Cf. Yuen/Yeh (Ed.) 2011, p. 20.
14 Ibid., p. 157.
15 Lau/Wang/Giridharan/Ganesan 2005, p.157.
16 Cf. Shaw 2013.
17 Cf. Shelton/Karakiewicz/Kvan 2011, p.107.

At the same time Hong Kong has to cope with environmental implications, such as living in busy urban centres with high air and noise pollution, poor lighting and ventilation in individual housing units, urban heat islands and wind tunnel effects, extremely limited urban open space and poorly ventilated street canyons. Due to the poor ventilation and the weather conditions, air conditioning accounts for one-third of the total power consumption of Hong Kong each year.[18]

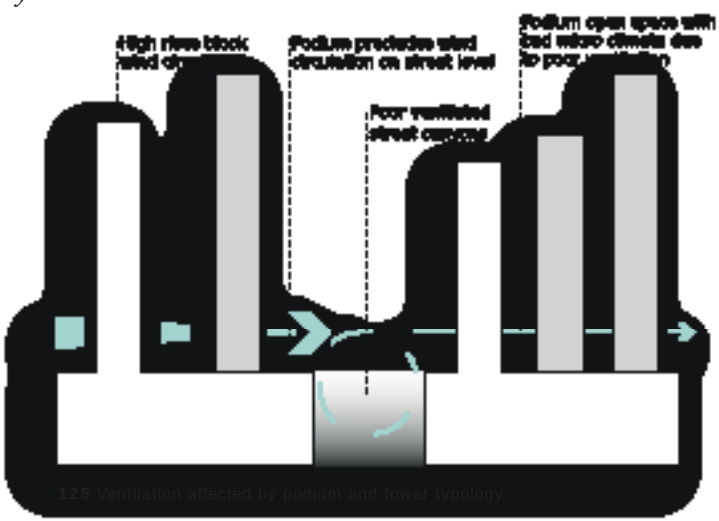
Hong Kong also faces two major air pollution issues: local street-level pollution, caused by motor vehicles including large numbers of diesel powered buses, trucks, large fleets of taxis and minibuses as well as regional smog pollution caused by motor vehicles, power plants and industry in Hong Kong and in the Pearl River Delta.[19] These buses and taxis are part of the efficient public transport system and operate under transport franchises which ensure that the service provided is cheap, plentiful and roadworthy – but not necessarily environmentally friendly. The other problem is that between the tall buildings along the street the emissions are trapped. These tall stacks of towers create urban walls which form street canyons which makes it much more difficult for the street level pollution to disperse. But also the low provision of public open space and the excessive height and width of buildings, which take up every square foot of available land in order to maximise the economic returns, intensifies the situation.[20]

Open space in residential buildings

With the world's third-most expensive housing market, many of the city's lower-income residents can only afford to live in high-rise buildings with small apartments. In these tall residential buildings open living space is important. The design of open space within estates is mainly placed on podiums which create a barrier from the environment at road levels, and segregate the open space from the cityscape. There are measures taken to provide better qualities for this open spaces but the lack of trees, greenery, high use of hard landscaping, and being surrounded by walls of high rise towers, which are blocking wind circulation, create poor micro climatic conditions in these open spaces.[21]

"For the sake of easy maintenance, our places have little grass and few seasonal flowering trees. Wooden fences are replaced by more durable material such as steel."[22]

18 Cf. Lau 2011, p.31.
19 Cf. Ibid., p.32.
20 Cf. Loh/Kilburn 2011, p.30.
21 Cf. Coorey 2007, p.74.
22 Wong 2012.



125 Ventilation affected by podium and tower typology

The open spaces in Hong Kong obviously fail in giving its users the full benefits of being in contact with greenery and nature, which is important for the human well-being and the quality of life.[23] The other factor is, that *"Developers make use of every inch of ground to build for profit, so open space is often put on podiums".* This is unsustainable, said Mr Patrick Lau, a member of the Harbourfront Enhancement Committee.

"Pedestrians cannot see and feel the greenery, which could have been planted at street level to purify the air we breathe."[24]

Such open spaces play an important role in the daily lives of residents who live in high-rise towers as they are their only means of escape from the otherwise built up urban setting and it is even more important for elderly and low-income groups. A study of open space satisfaction within high density public housing in Hong Kong shows, that satisfaction of open space depends primarily on the physical qualities as opposed to its social qualities.

The study shows that an increase of satisfaction with the climatic comfort in open spaces can be reached when the number of trees, the percentage of shading elements and th percentage of greenery is incre Also a reduced sky view f identified as descriptors for u climatic comfort which is critic for satisfaction of the users and is important for the success of open space design.[25]

Wall effect developments[note8]

Wall effect developments, which are caused by uniform high-rise developments, have become controversial, because of the negative impact on air circulation which intensifies the heat island effect and contributes to air pollution, but also blocks the vista in the city. These wall-like developments can be found in various urban areas in Hong Kong especially near the harbour front, in order to provide maximum sea view, which increases the price per square meter, or in New Towns such as West Kowloon and Tseung Kwan O, and also on the site in North Point, where private developers seek to maximise revenues. New building strategies have been considered to design a greener and more liveable urban environment, including lowering the development intensity of sensitive sites, especially near the harbour front or on top of railway stations, controlling building height and introducing strategic bree ays.[26] These strategies should i he living conditions in th ly in the dense ur Kong.

23 Cf. Coorey 2007, p.74.
24 Wong 2012.
25 Cf. Coorey 2007, p. 203.
26 Wong, Kam-Sing 2010, p.326.

NEW TOWNS

As buildable land was scare in the old urban districts in Hong Kong the government began to examine the possibilities of a long term New Town programme in the 1960s and in 1973 the Territorial Development Department was set up, which marks the start of the New Town Programme.[27] To cope with the increase in population and to improve the living environment by de-centralising the population from the over-crowded urban districts, Hong Kong has developed nine New Towns. The first New Town Tsuen Wan started working in the early 1970s and was targeted to accommodate a population of 1.2 million by 1978 in a high-rise, high-density and compact urban form. In fact Tsuen Wan didn't reach the 1.2 million residents but respectively 0.75 million over the period of twenty years. As these developments were separated from the city centre by the mountains, the extension of the transportation system, with highways, tunnels, bridges and railways was necessary to improve the accessibility of these areas.

But the downside of these New Town developments is that despite the good transportation network in Hong Kong the distance of the New Towns to the city centre and consequently the greater travel cost for travelling between them means that low-income groups living in these areas such as Tung Chung and Tuen Mun are more isolated.[28]

This also leads at the same time to the *Cage Home* phenomena as these people cannot afford to travel to work from the outskirts of Hong Kong into the city centre every day.

Chapter Habitat p.215

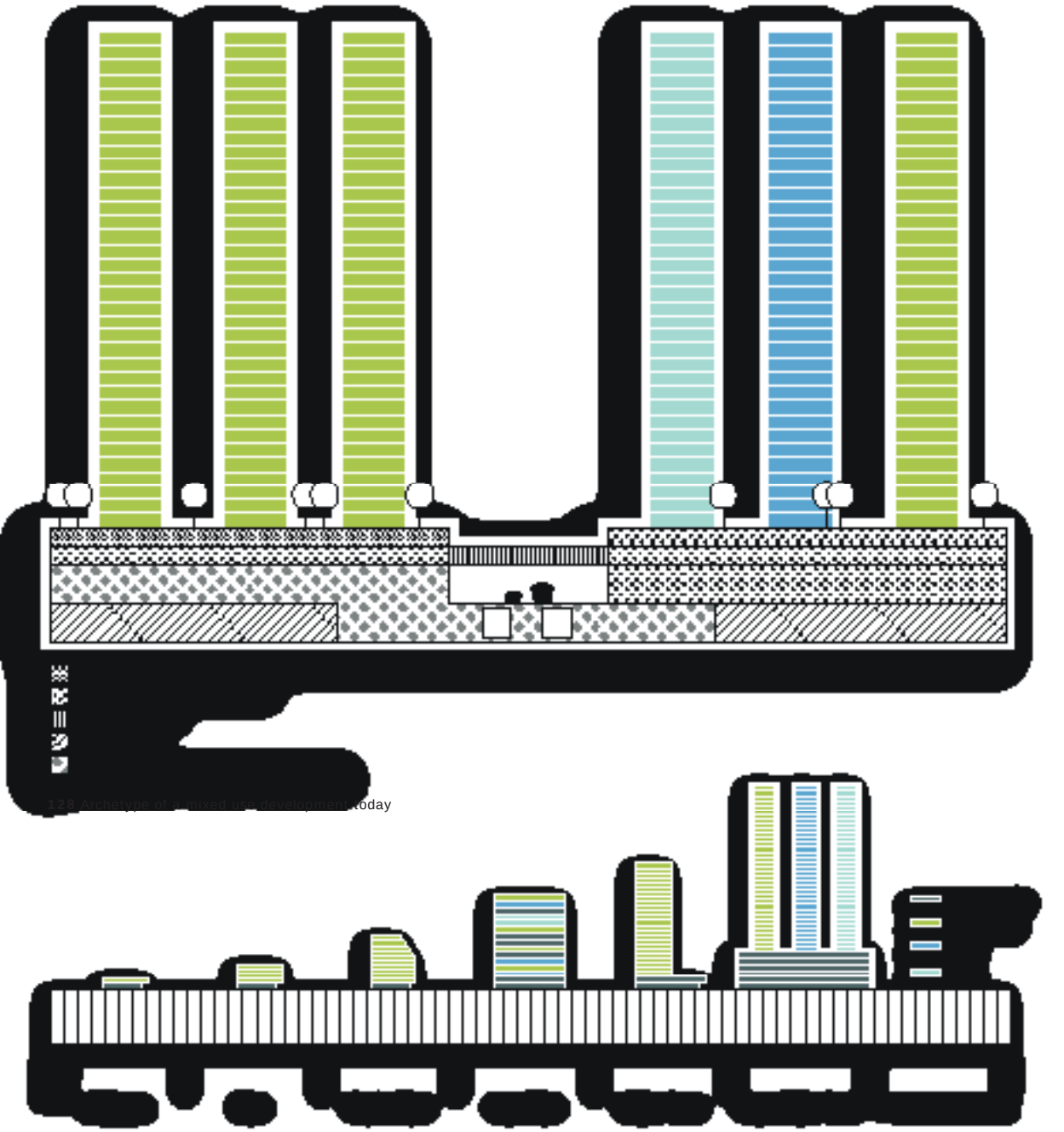
The basic concept of these New Town developments is to provide a balanced and self-contained community by the provision of infrastructure and community facilities.[29] Today the concept remains the same but only the building form has changed over the time.

The rail stations of the New Towns today are more like a mega-structure, a city within a city. The form is usually a massive volume of shops, commercial and professional services, car parks, rail stations at an underground level, recreation facilities and cinemas – topped by a forrest of very large towers that contains homes, offices and hotels.[30] This generic structure can have variations of uses and configurations, and is commonly known as MILU.

Today about 3.3 million people, more than 45 per cent of the total population of Hong Kong live in these nine New Towns and it is expected to rise to 3.5 million until 2017.

27 Cf. Hong Kong Government Census and Statistics Department: New Towns 2012, p.1.
28 Cf. Yip 2011, p.28.
29 Cf. Hong Kong Government Census and Statistics Department: New Towns 2012, p.1.
30 Cf. Shelton/Karakiewicz/Kvan 2011, p.102.

127 Location of New Town developments



128 Archetype of a mixed use development today

129 Evolution of mixed use developments in Hong Kong

Since land is a scarce resource in Hong Kong, it is sustainable to reduce the demand on land by building high rise developments which also accommodate different uses. Multiple use of space has a long history of practice in Hong Kong and forms the unique character of the city. As the model of vertical organization of land use increases the development intensity and enlarges the accommodation capacity of housing sites, the Hong Kong government and investors show increasing interest in developing typologies with mixed use.

Traditionally most western mixed-use housing developments are planned horizontally with integrated community and retail facilities in the neighbourhood. But in Hong Kong more and more residential mega structures are designed as vertical cities which accommodate in most cases multiple uses.[31] Mixed use in Hong Kong comprises almost all the attributes of a compact city, and can be even seen as city within the city.

There are usually four vertical components which together form the podium and tower typology. At the top there are the residential floors, below there is usually a massive podium designed as green open and social space for the exclusive use of the residents. The podium also effectively blocks street noise and dust, but at the same time it creates a poor microclimate as explained in the previous paragraph. The amenity floors are below the podium level, comprising one to three levels of retail facilities (e.g. shops, restaurant), community facilities (e.g. community centre, kindergarten) and sometimes a public transport interchange. These commercial floors reduce the need to travel and furthermore, these facilities could be shared by other users living or working in the district. In Hong Kong commercial floors of housing projects are often linked with each other, by footbridges and pedestrian walkways which create a network where a fast and uncomplicated locomotion is possible. Subway and car parks can be found on the basement level, which is divided into residents' and shoppers' sections.[32] In Hong Kong different variations can be found to organize the vertical land use, for example the MILU typology or the star shape tower typology, which are specified in the typology catalogue of this thesis.

31 Cf. Yuen/Yeh (Ed) 2011, p.53.
32 Cf. Ibid., p.53-54.

SPACE OPTIMISATION[33]

The overheated real estate market, the tremendous demand for housing for the growing population and the restricted availability of building sites which is controlled by the government, seem to be the reason for the optimisation of space. The construction costs should be reduced to the minimum and the design of the residential high rise is more about cost efficiency than about diversity. So it can be said that the appearance of the city has little to do with architectonic principles of form, it's more a by-product of optimisation, economic decisions, immigration and building guidelines.

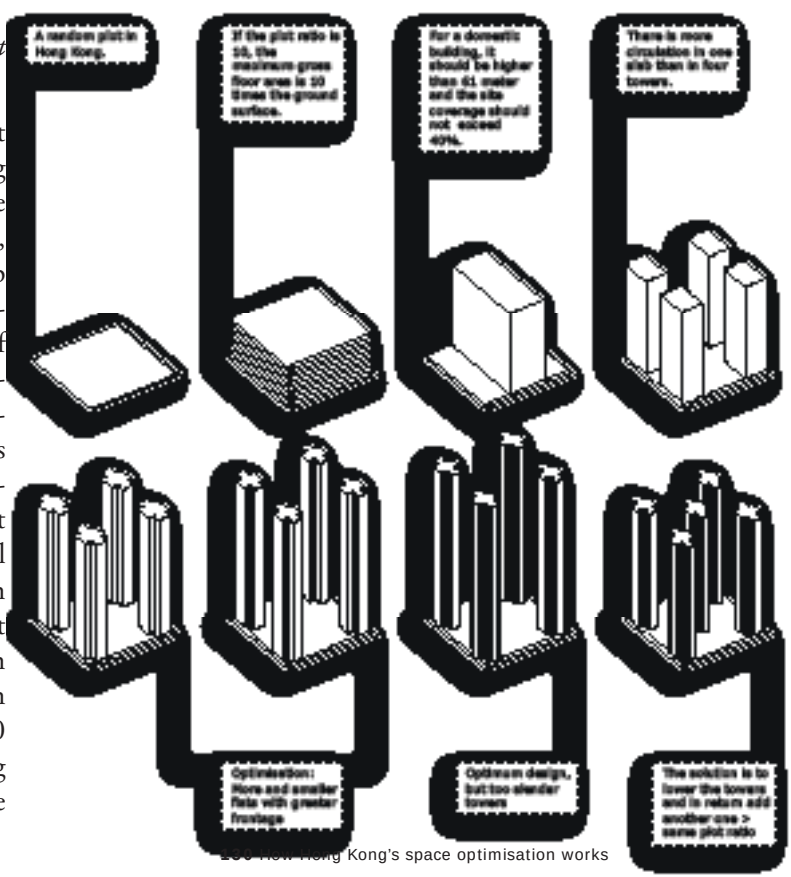
But how do building guidelines affect Hong Kong's building form?

Three aspects are important: plot ratio, site coverage and building height. The plot ratio is a measure of the acceptable density on site, the maximum number of built-up square meters. Site coverage indicates the maximum percentage of land to be developed, this combined with the maximum building height to define the contours of the built development. A maximum of houses per hectare is not given, which results in many small dwellings and efficient circulation space. The greatest permissible plot ratio for housing developments in Hong Kong is 10, combined with the maximum site coverage of 40 per cent and a minimum building height of 61 meters, towers are the unavoidable outcome.[34]

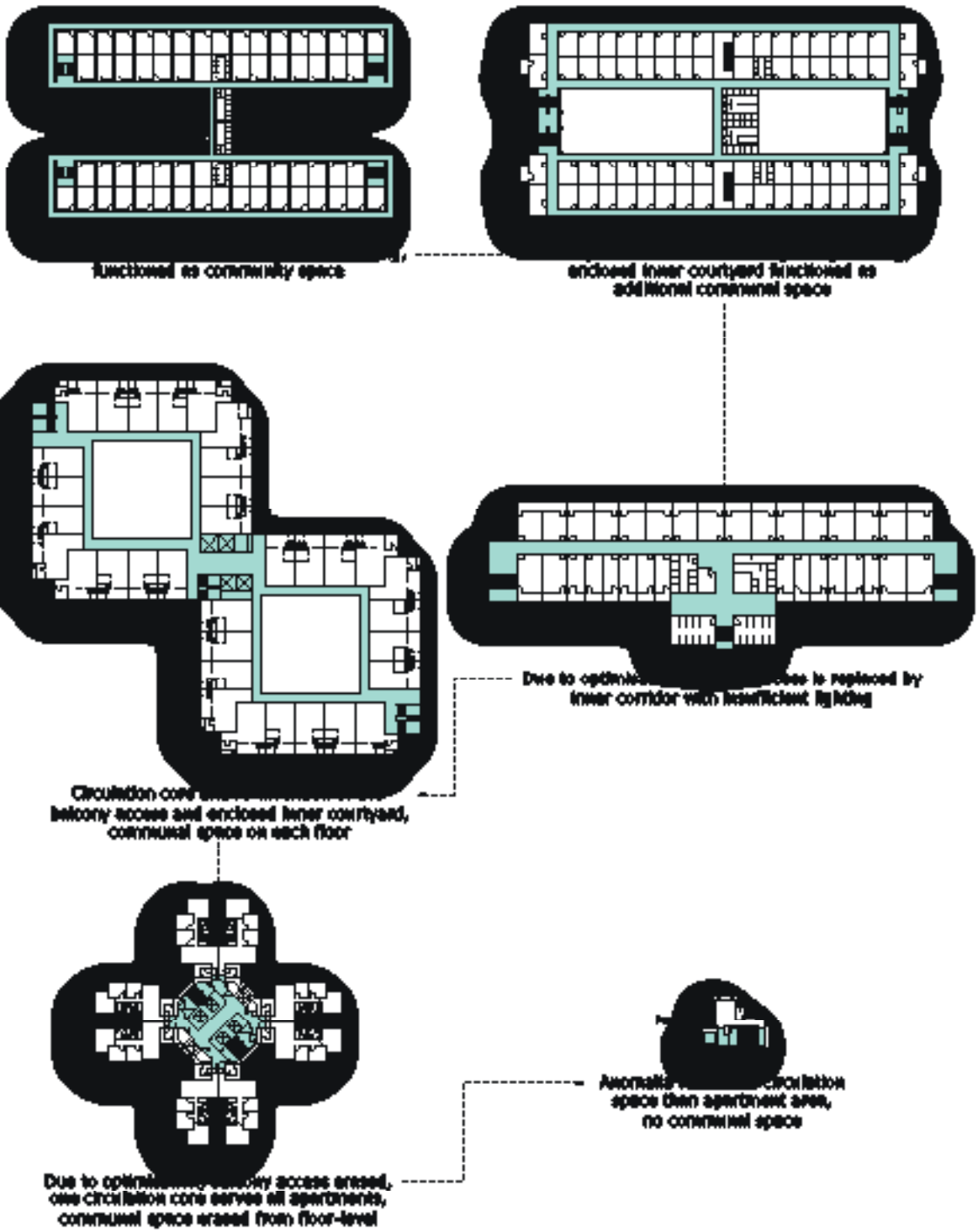
Optimisation is also visible in form of the informal and often illegal sub-division of flats into smaller flats and cubicles. These sub-divided flats and cage homes provide relatively affordable but in most cases poor living spaces. In public housing flats the situation is better as the minimum standards of living space is set. Here the optimisation of circulation space was the main evolution over the time which also formed the shape of the typologies and is a reason for the creation of efficient and affordable public housing.

Chapter Habitat p.219

33 Cf. Maas/Rijs/Koek 1998, p.182-183.
34 Cf. Ibid., p.177.



158 How Hong Kong's space optimisation works


functioned as community space
enclosed inner courtyard functioned as additional communal space
Due to optimi ss is replaced by inner corridor with insufficient lighting
Circulation core
balcony access and enclosed inner courtyard, communal space on each floor
Due to optimi balcony access erased, one circulation core serves all apartments, communal space erased from floor-level
Anomalie circulation space than apartment area, no communal space

HIGH-RISE LIVING IN HONG KONG

Hong Kong did not have a housing policy until the 1950s, before that time the house prices were determined by the location, demand and quality, which was a free market economy approach. As the demand has increased and the prices in the metropolitan area of Hong Kong have risen, the low-income and middle income households have been displaced from the urban areas to the urban fringe or to rural areas. The massive immigration from mainland China after World War II has led to a large number of squatters. In order to control the spread of squatters the government intervened by providing affordable housing for the low income households.[35]

Housing in Hong Kong is truly a phenomenon of density. Considering that 23.7 per cent of Hong Kong's territory is developed, only 6.8 per cent is occupied for housing use, this makes only 76 square kilometres of land which is designated to housing.

Hong Kong's housing today is mainly classified into three categories, public rental housing, subsidized sale flats and private permanent housing. The private permanent housing type is respectively the highest housing stock. In 2012 more than half of the population (53 per cent) was living in private housing compared to public housing$_{note10}$ with 46.5 per cent and temporary housing with 0.5 per cent.[36]

Private housing

The private housing sector has to play an important role in meeting the housing needs of the community in Hong Kong. At the end of March 2013 the private residential stock was about 1.4 million units. The housing market of Hong Kong is among the most expensive in the world. In recent months the prices for reselling private flats hit a record height and lately a flat in Kornhill Gardens in the Eastern District sold for a record of more than HK$8,000 a square foot.[37]

The private housing estates in Hong Kong are usually characterised with a cluster of high-rise buildings, which include residential, offices, hotels that are built on a podium that includes recreation, community and commercial facilities. One of the main 'private' developers of such housing estates is the MTR, which develops residential estates in combination with public infrastructure.

Public Housing

The Hong Kong government is renowned as the second largest public housing provider in the world after Singapore. Public housing makes up 46.5 per cent of the overall housing stock in Hong Kong, which is the result of the substantial housing-program of the government. 29.6 per cent of the public housing are public rental housing the other 16.9 per cent are subsidized home ownership housing, which is a subsidized sale program where

35 Cf. Zhang 2004, p.249.
36 Hong Kong Housing Authority 2013, p.1.
37 Cf. Ma 2013.

the government sells flats to eligible public housing tenants and low income residents with a price below market level.[38]

The public housing program started with the Shek Kip Mei resettlement estate, which was built after a devastating fire on Christmas Day 1953 that had destroyed a densely populated squatter settlement, making 53.000 people homeless in just one night.

133 Shek Kip Mei fire 1953

The Hong Kong Housing Authority was set up to develop low-cost housing that provided a better living environment. The Hong Kong Housing Authority became the key actor in shaping the urban and social landscape of Hong Kong, as the public housing sector expanded rapidly.[39] It is the only public institution being responsible for the public housing provision and gaining financial support from the government by free land and continuous loans.[40]

High-density developments in Hong Kong have not been accompanied by the problems of social dysfunction and physical deterioration as it is associated with high-rise estates in western countries. This encouraged policy makers to continue to produce high-rise and high-density developments. High-rise and high-density public housing development are also demanded from a financial perspective as the government needs to increase the density and to incorporate commercial facilities in residential blocks to compensate the financial loss due to the low rent policy of public housing.[41]

At the end of March 2013 the Hong Kong Housing Authority houses about 2.1 million people that are 30 per cent of the population. The public housing stock was about 766.300 units with a monthly rent ranging from HK$290 to HK$3.880, which is significantly lower than those for private housing, because they are heavily subsidized by the government. In 2012 there were about 116.900 general applicants and 111.500 one-person applicants on the Waiting List for public housing with an average waiting time of around 2.7 years.[42] Public housing estates are typically built in remote or less accessible parts of the territory, which leads to greater travel costs for lower-income residents. So it is evident that the supply for public housing in Hong Kong is inadequate. For that reason it is necessary to provide more public flats, but here the politic has to take action.

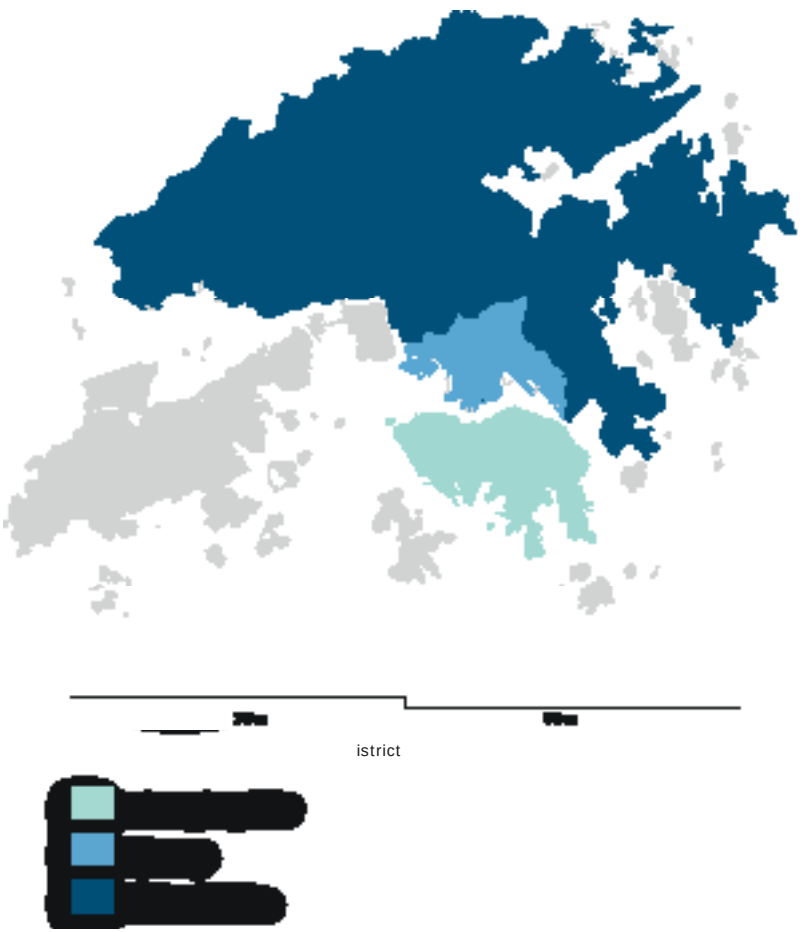
38 Cf. Hong Kong Housing Authority 2013, p.1.
39 Christ/Gantenbein 2012, p.12.
40 Cf. Hui/Wong 2013.
41 Cf. Zhang 2004, p.250.
42 Cf. Hong Kong Government: The Facts Housing 2013, p.1.

PUBLIC HOUSING

The concentration of public housing is much higher in Kowloon and the New Territories than on Hong Kong Island[43], which is the result of the decision to create the majority of public housing by the construction of New Towns.

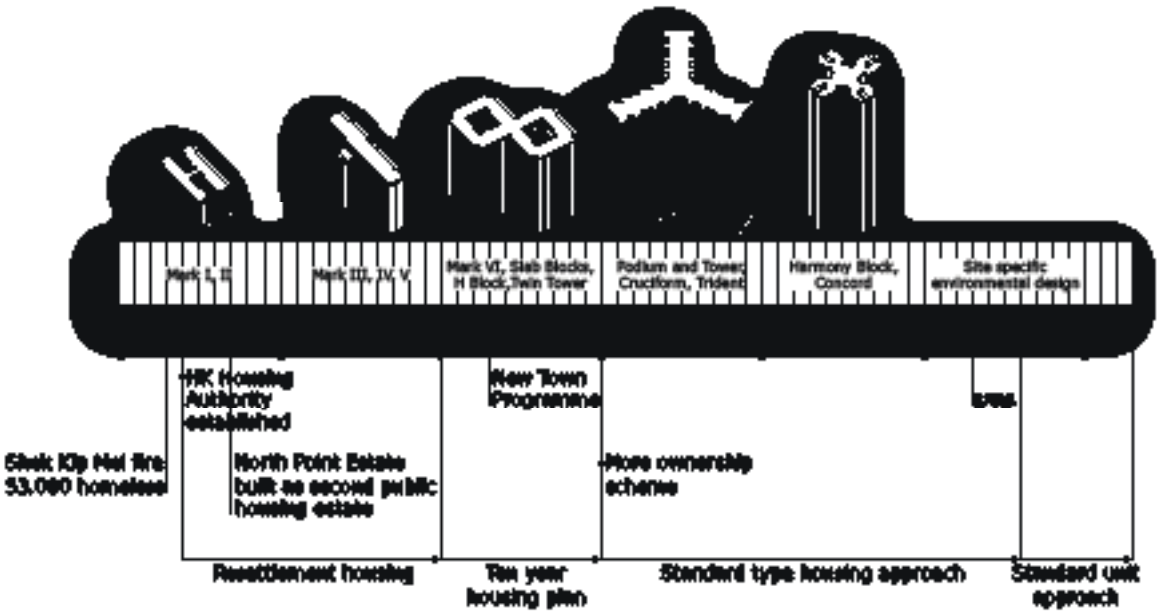
The building form of public housing has changed in time; older developments were designed as slab composition, whereas more star shape towers can be found at building estates. It is important to understand that Hong Kong's public housing can be divided into three different stages. There first one is the resettlement housing, which started after the devastating fire of Shek Kip Mei and includes all Mark typologies. The second one is the standard type housing, which started with the announcement of the government to establish a ten-year plan for public housing. It created a various quantity of typologies where each one has its own character. These types could be applied everywhere and can be found all over the territory today. And the third one which started in 2006 can be called the standard unit a proach, as the overall form of hou ing is adapted to the environme conditions of the site and only t units design remains the same.

In the next part of the thesis v investigate these different stages of housing typologies in order to find out more about the special qualities of these buildings that shape Hong Kong's urban cityscape.

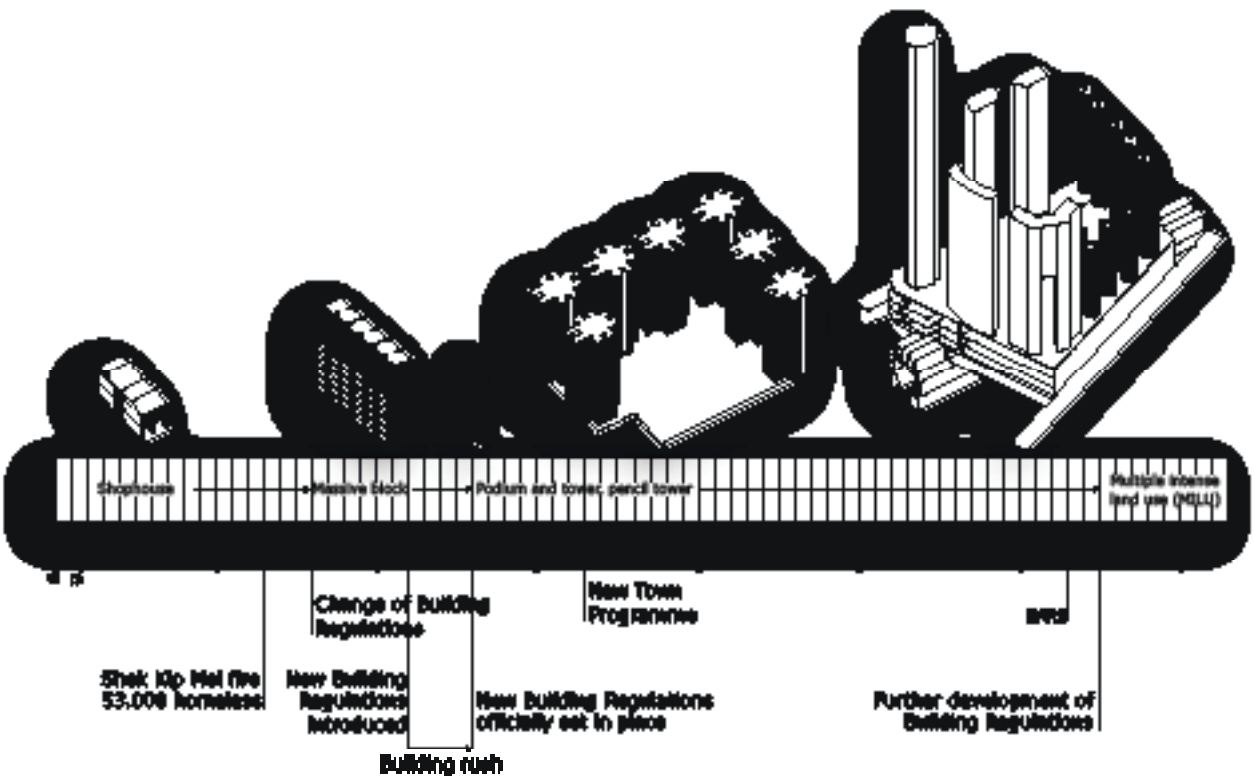


43 Hong Kong Housing Authority 2013, p.2.

HOUSING TIMELINES



135 Public housing timeline



136 Private housing timeline

137 ...nology collage

High density housing has been shaped over the years, it is possible to find a lot of different typologies in Hong Kong, which are the traces of different influences; population growth, rare building space, optimisation, high efficiency planning, economic considerations etc.

Each building type provides advantages and disadvantages to their residents in terms of room and apartment size, access to daylight and fresh air, public space and other amenities. These different building types reflect the architectural tastes, technical and material capacities of successive development cycles from the early twentieth century onward: from the earlier perimeter block, to the post-World War II slabs and double-tube towers and the more recent star-shaped towers.[44]

In Hong Kong it is common practise to stack similar floor plans on top of each other, share vertical access elements and use prefabricated modules to reduce construction time. Surface materials are selected for minimal maintenance needs, which also operate in a humid and hot climate. An entire estate can be built by repetition of only one or two types such as the Taikoo Shing Estate in North Point. It led to unique solution such as the Double Tube Towers or the scissor stairs. Also the height of these buildings has changed over the time, grown from the shop house with 2-4 storeys, to the present 60-70 storey buildings.

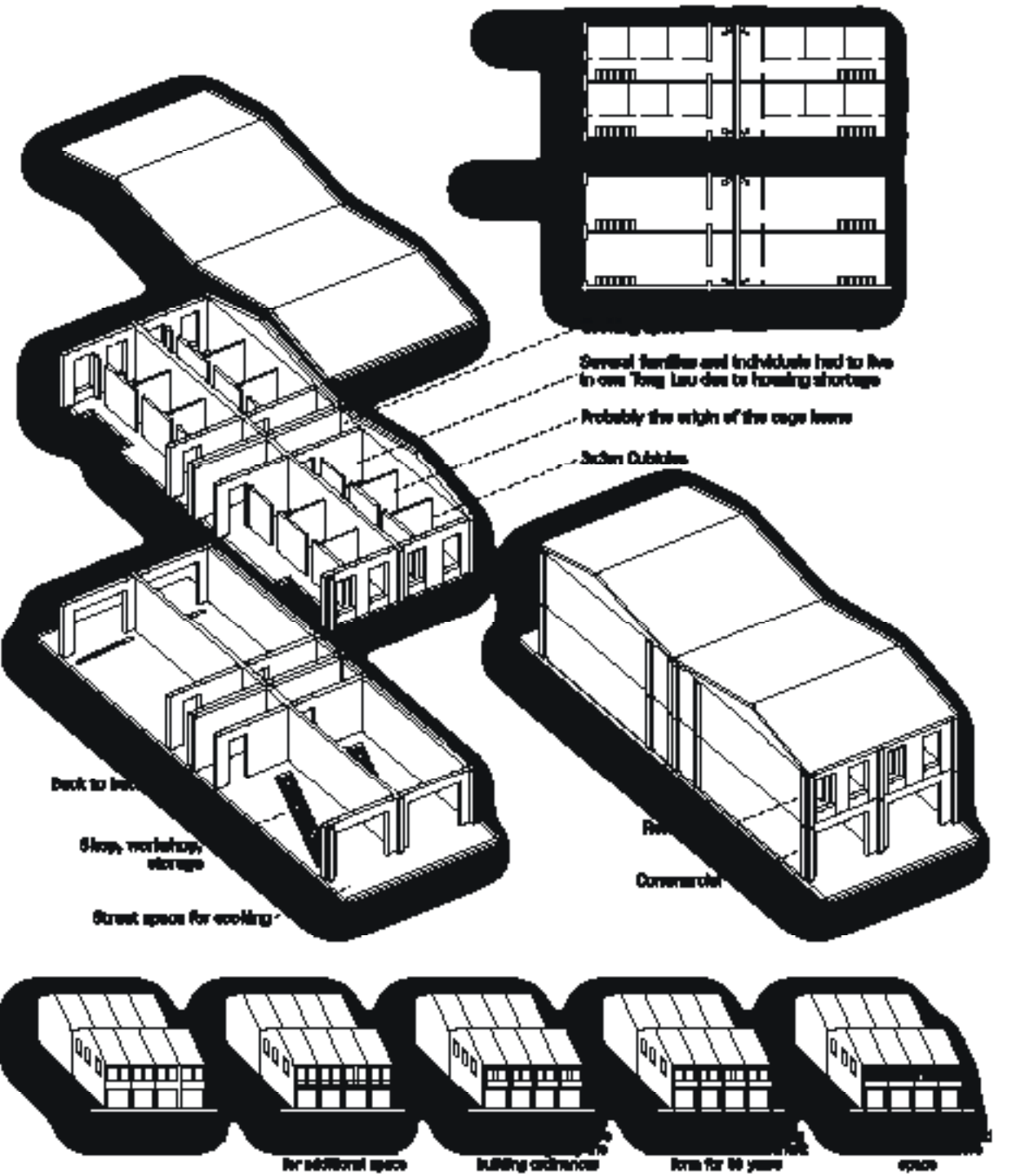
For this thesis it is important to understand these different typologies as it is not possible to design a building or structure in the city of Hong Kong without considering the city and its underlying patterns and buildable forms. It is necessary to study the city architecture and its buildings in its urban setting, which have been constructed over time. For this study six different typologies which are repeated throughout the territory in multiple variations have been chosen. All building typologies are of equal importance and this catalogue does not claim to be complete.

The order of the typologies is chronological; it begins with the Chinese shop house, continues to the linear buildings (Gallery Building), to the massive block, the composition of volumes (Slab Composition), the double-tube towers and the podium and tower type, where several shapes of building forms can be observed. Each building type is characterized by with a description, a ground plan and an axonometric. This representation should allow an immediate understanding of each example, as the ground plan shows the typological and structural organisation and the axonometric gives a three dimensional overview of the typology.

This research forms the foundation for the design process, in order to find a '*new*' typology and a '*new*' way of combining open space with living for the thesis site in North Point. Further the different typologies form the basis for a visionary approach of creating new open space in Hong Kong. It is based on the books *'Hong Kong Typology'* and *'The making of Hong Kong'*.

44 Kandt 2011, p. 34.

TYPE 1



138 Tong Lau shop house in Hong Kong

CHINESE SHOP HOUSE TONG LAU

The Chines shop house forms a key typology in Hong Kong's urban development and has experienced only minor changes over the years. It is a residential architecture before the introduction of the modern housing concepts and it is crucial for an understanding of contemporary housing in Hong Kong. Four types of traditional housing existed in Hong Kong before the beginning of public housing construction. There were the houseboats, which were situated in Victorian Harbour and the free standing mansions belonging to British colonials and wealthy Chinese, which are not that much relevant for current housing developments. The two other types, the village shop house structure in rural areas with a combination of living quarters, commercial storage and retail shop front, and the fourth housing type, the urban shop house which was a far denser version of the village model with additional floors and an increase in depth, are the significant types for the development of current housing.

139 Shop house balcony type

140 The Blue House in Wan Chai

The basic shop house, originally known as *Tong Lau* in Hong Kong, often appeared across South East Asia and can be found from Taiwan, through Fujian province to Malaysia and Singapore. The shop house evolved from the common need to provide cost-effective housing and commercial trading space. Distinctive for the southern Chinese form is a two to four storeys structure on relatively narrow and deep lots, sharing party walls with its neighbours and full opening on the ground floor to the fronting street.[45] The *Tong Lau* in Hong Kong was also referred to as '*tenement house*' and emerged in the late 19th century in Hong Kong but most were built after the mid-1950s to house a wave of post-war mainland migrants.

The traditional shop-house was built to house only one family, arranged with the shop or workshop on the ground floor and residential use on the upper floors, but the severe shortage of housing and the rapidly increasing population and the topologically prescribed shortage of land led to the problem that these structures quickly had to cope with accommodating several families and individuals.[46]

The usual height for Tong Lau's was two to four storeys, with variable depths of between 9–18 meters and 4–6 metres width, which were determined by the typical lengths of the Chinese fire poles, which were used to support the floors. Two rows of buildings were built back to back with a common back wall and no space in-between, this changed with the post-plaque Public Health and Building Ordinance in 1903, which reduced the building depth and introduced a service back lane.[47] The inside of the floors was designed as free space, which allowed cubicles to be constructed in lines along each floor. These cubicles measured approximately 3 x 3 metres plus another metre for circulation and were rented for

45 Shelton/Karakiewicz/Kvan 2011, p.32-33.
46 Ibid., p.36.
47 Cf. Ibid., p.38-39.

occupation by singles, families or other groups. At the rear of each floor was a two or three metres space for cooking, although this activity was commonly performed in the street, on the roof or balcony, which offered better conditions – more space, better air and greater hygiene. This cramped conditions established the high density and multi-level living in Hong Kong.[48]

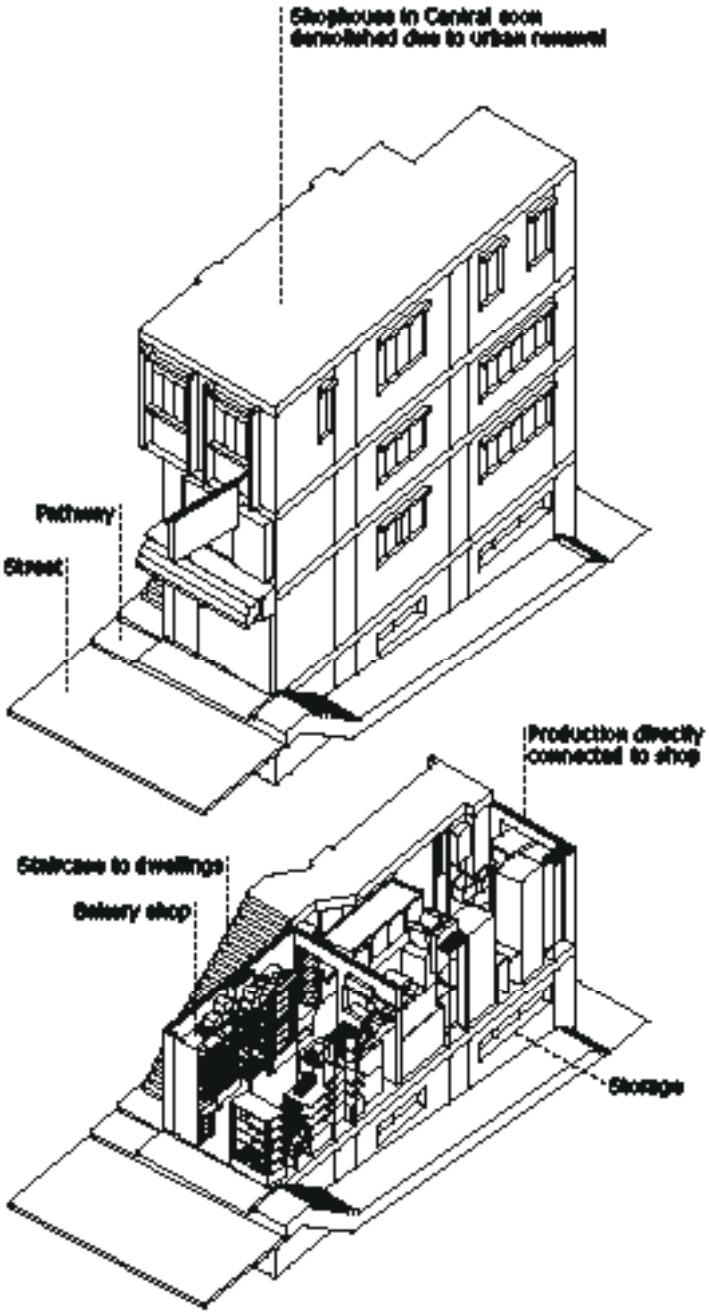
The need for space was addressed by the addition of illegal extensions to the street façade, which was in form of wooden constructed verandas, to provide additional habitable space. The buildings were largely unregulated through the nineteenth century, but after fourteen years after settlement the government put different Building Ordinances into place in order to ensure fire safety and structural stability. For these reasons, wooden verandas were declared illegal and all verandas had to be supported on the ground level by a colonnade along the pavement and for eighty years the majority of buildings in Hong Kong was built in this colonnade type. As the demand for accommodation continued, long airless corridors were lined with rented beds: which is probably the origin of the cage dwellings, which still can be found in Hong Kong.

In recent years the shop-house has been glamorized, and the real situation for the tenants in these intensely inhabited buildings has been forgotten.

In Chadwicks's Report on the *Sanitation Condition of Hong Kong* of 1882 a description of the conditions at that time can be found. The report mentioned that the buildings were without ventilation and light except the front façade and activities were elevated to the roof, which soon became a community space.

In 1903 a Public Health Ordinance was enacted, which set new standards for the design of Tong Lau's. Provision of open space and a service back lane, to help improve sanitary conditions. Building depth limited to 12 metres and building height was limited to the width of the fronting street with a four storey limit, which noticeably reduced the habitable space on a site. For that reason illegal extensions began to emerge on the roofs of buildings and activities such as cooking and washing appeared in the streets and back alleys. The shop house took another step towards the modern built form of Hong Kong when 1935 a new Ordinance was set in place. In this Ordinance the permissible depth of a building was further reduced to 10.7 metres, verandas were transformed into enclosed inhabitable space and by 1956 the supporting arcades were removed. With this reduction of the building footprint and the increasing population the preference for building higher was initiated, and it was allowed to build up to nine floors without provision for a lift.[49]

48 Cf. Ibid., p.44.
49 Ibid., p.39.



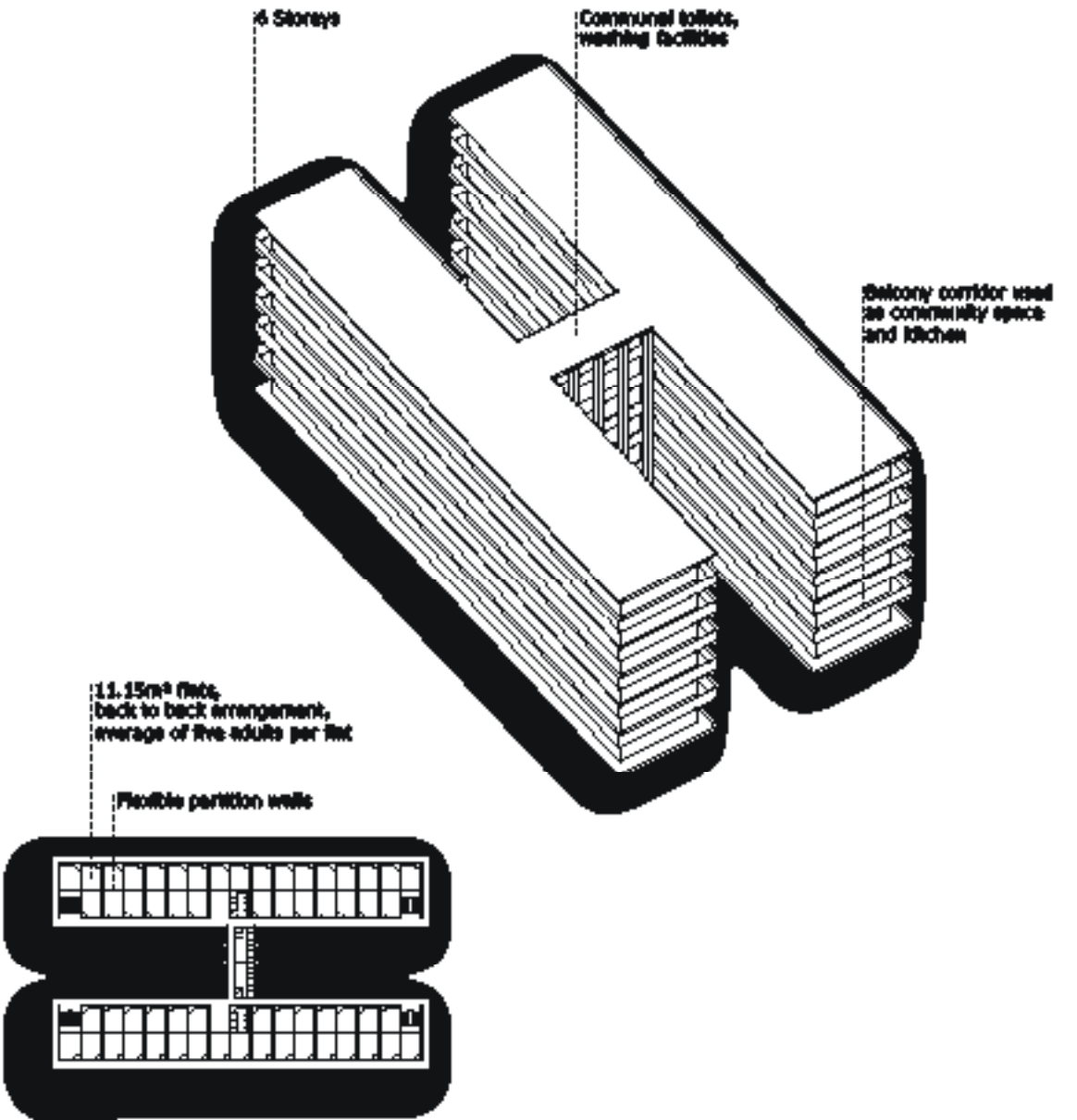
141 ABC Bakery in Gage Street

The 1935 Building Ordinance set minimum standards for accommodations with 3.25 square metres of habitable floor area, which was reduced from the earlier 4.25 square metres with the justification that many Chinese were used to live in compact communities where sanitary arrangements were very basic and overcrowding merely a way of life.

Different types of shop-houses can be found in Hong Kong: the Veranda Type, Recessed Balcony Type, Flat Façade Type, Cantilevered Balcony Type and the Reinforced Concrete Type.[50] Most of these shop houses were constructed in the late nineteenth and early twentieth century on Hong Kong Island and part of Kowloon, but only few of these buildings have remained today. Unlike Macau and Singapore, where entire streets and even neighbourhoods with these building types have been preserved. In Wanchai a small block of such buildings has been rescued from demolition, and has been now turned into a restaurant.[51]

50 Lee Yin 2010, p.12-16.
51 Shelton/Karakiewicz/Kvan 2011, p.31.

TYPE 2



142 Mark I resettlement typology

GALLERY BUILDING MARK I

143 Shek Kip Mei resettlement Estate before demolishion

144 Preserved Mei Ho house 2009

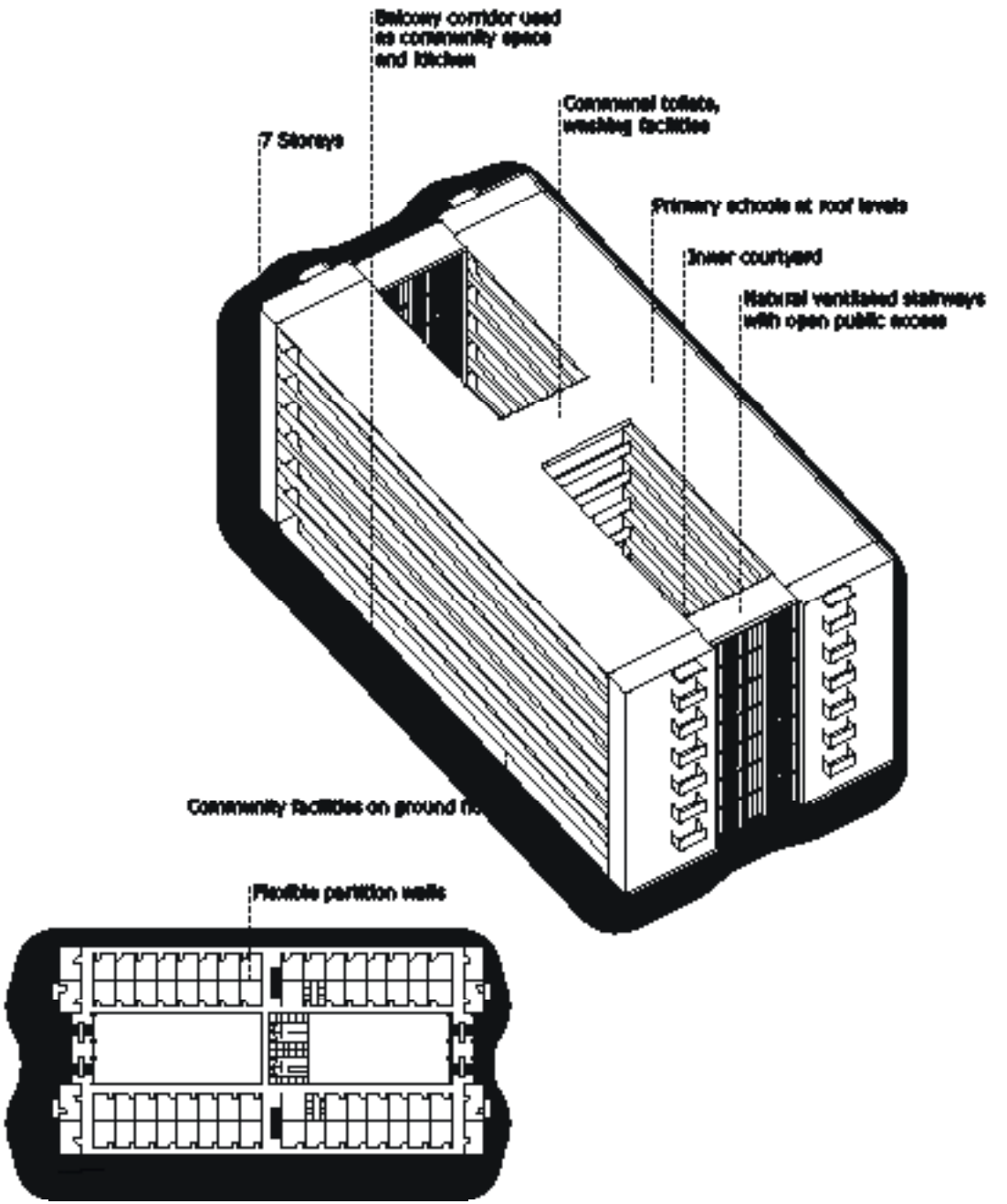
145 Refurbished Mei Ho House in 2013

In 1953 after a devastating fire in Shek Kip Mei the first stage of public housing emerged. This settlement blocks were planned by the government in reaction to the bad living conditions and were an example for many later residential and industrial buildings, which could accommodate around 15.000 people. The earliest building type with an H-shaped plan rose six or seven storeys. There was no electricity or running water, communal toilets and washing facilities were located in the cross bar of the H blocks. The individual units were arranged back to back and were very similar to the former shop house cubicles but with direct access via a balcony corridor, which was also used as an outdoor space and as kitchen.

The goal for the resettlement scheme was to provide residents with a fire proof, typhoon proof and reasonably hygienic shelter, as fast as possible. Most flats had a floor area of 11.15 square metres to accommodate five adults, which meant that one adult had an average space of just 2.23 square metres, and even half of that for children with the explanation that the urgent situation warranted such a reduction.[52] These Mark I buildings set five precedents: substandard buildings construction, grossly minimized space assigned in individual flats, separation of housing from other activities, extremely dense land use and an isolated relationship of dwellings to the city.[53] Between 1954 and 1964, the government constructed over 140 Mark I blocks on Hong Kong Island and Kowloon.[54]

52 Cf. Hong Kong Housing Authority 2012, p.3.
53 Crisman 2009, p.4.
54 Hong Kong Housing Authority 2012, p.6.

TYPE 2.1



146 Mark II typology

GALLERY BUILDING MARK II

The first Mark I type block was completed in 1954 and the Mark II type followed between 1961 and 1964, but offered only minor changes; they included an extra level and stairways at the ends of the H. By the early 1960 the H-blocks and slab blocks were the dominant form in the districts of the old urban area of Hong Kong.

The first blocks were intended to be for residentials only but it was realized quickly that the ground level would better serve as shops, or industrial activities. But some of the industries in the residential units proved either too noisy or to noxious and so the government built similarly shaped but more spacious five-storey industrial blocks dedicated to small scale industries, which were inspired by the residential Mark II building type.[55]

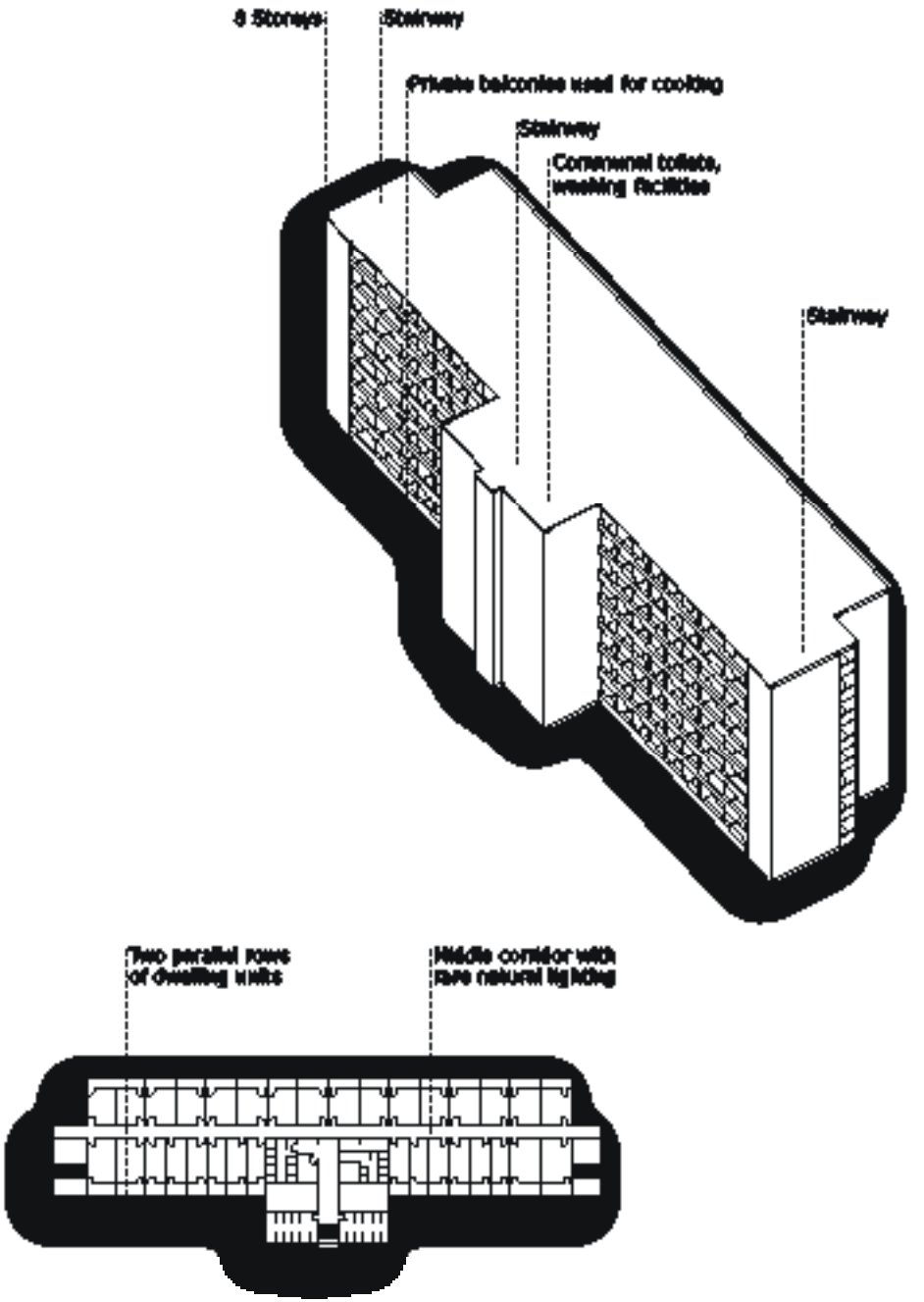
147 Mark II balconies as communal space

The Mark I and II residential and the first-generation factory block is a unique meeting of the cubicled Chinese shop house with a Modernist structure. Traces of Le Corbusier's community facilities on ground and roof level can be found in this typology, for example primary schools were situated on the flat roof terraces of the apartment blocks.[56]

With little or no theoretical background the shop-house had been transformed from a traditional to a Modernist form. The traditional street had evaporated according to the Corbusian principles, but the congestion associated with the street replaced Corbusian greenery in the space between buildings. The result was dense living incorporating shopping, industry, markets, schools and play areas in new building types, on seven or eight levels, with open public access. It was a city of multiple grounds, multiple uses and enormous vitality. It was intense urbanism of a kind that Modernist visions had never quite anticipated – with some irony, a Modernist 'culture of congestion', to borrow a Koolhaas term.[57]

55 Cf. Shelton/Karakiewicz/Kvan 2011, p.73.
56 Cf. Ibid., p.74.
57 Cf. Ibid., p.75.

TYPE 3



148 Mark III typology

SLAB COMPOSITION

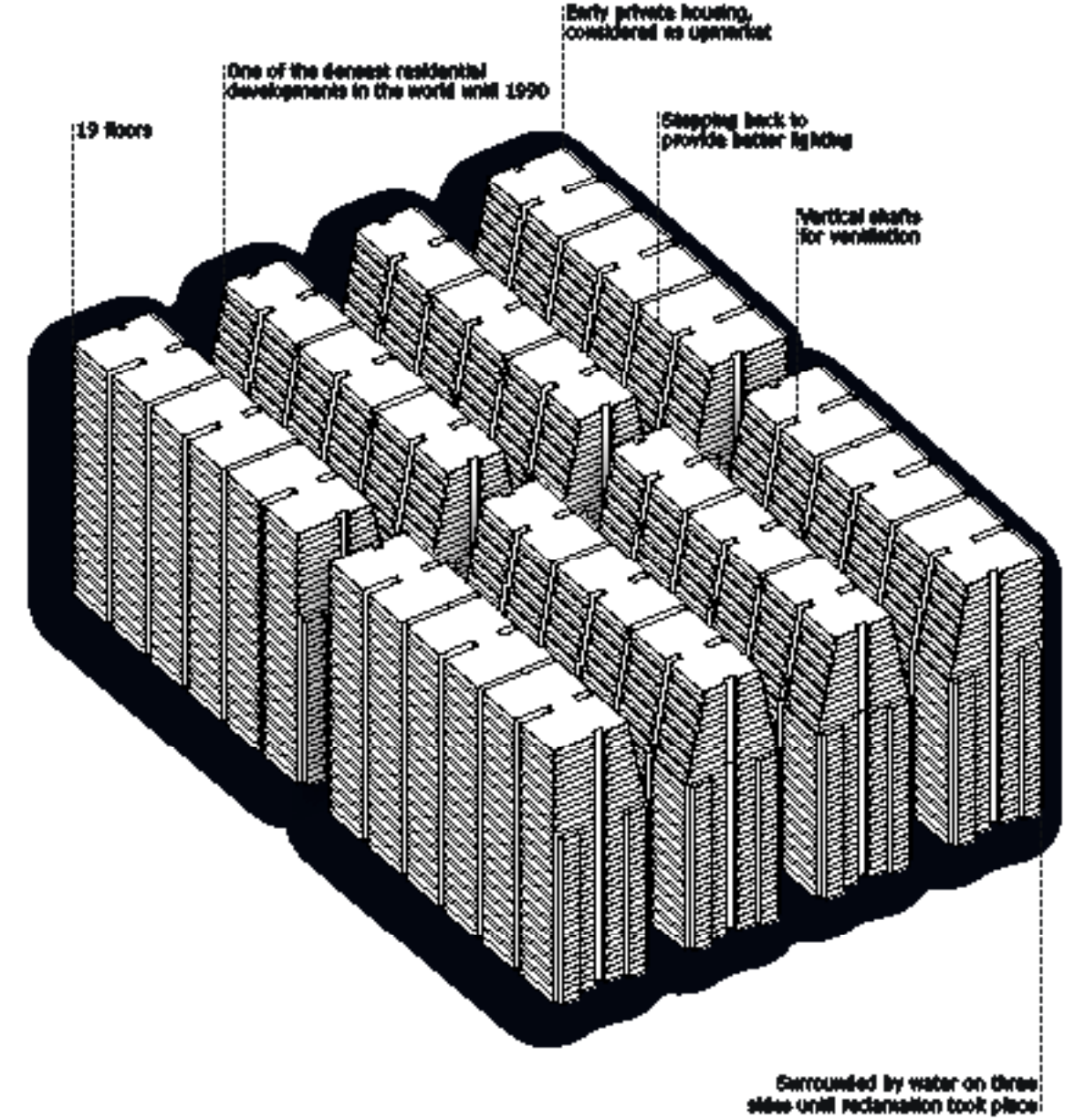
The slab composition presents the second stage of public housing in Hong Kong. It was a move towards better living conditions instead of just proving a place to stay. Each unit was designed with a bathroom and cooking area situated on the private balcony. It was also important to provide better lighting and ventilation and each housing estate had supported facilities within its neighbourhood such as supermarkets and even schools. These estates were called Mark III, and were introduced in 1961. They were completely different from the earlier resettlement typologies as they were composed essentially of slab blocks with parallel rows of dwelling units accessed from a central corridor, each with own balconies. In 1965 this typology was doubled in height to sixteen storeys, given lift-access and changed from the usually L-shaped block into E-shaped blocks, and was then known as Mark IV with the main difference that they were the first resettlement block flats with private lavatories, which were located on the balcony. Two more Mark typologies followed, but with only slight variations in room sizes as there was more space per inhabitants (3.25 square metres) enabled.[58]

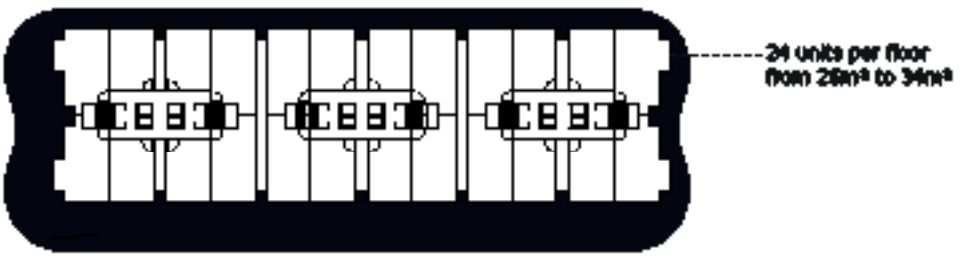
149 Lower Ngau Tau Kok Estate built 1969

150 Inner corridor

58 Cf. Hong Kong Housing Authority 2012, p.9.

TYPE 4





151 Massive Block typology

The massive block as new building typology emerged due to the change of the Building Regulations in 1956. The new regulations allowed a greater floor area and building mass to be built on the site. Private developers were allowed to provide more accommodation for a site, which was due to the pressure of housing needs which came hand in hand with the influx of new immigrants from mainland China. With the new Building Ordinance the building height was doubled from previous 21.3 to 24.4 and a plot ratio increase was possible to 18:1 and 20:1 and even lifts in high-rises were becoming more affordable. This together with the general investment climate brought a strong intensification of land use and a vertical extrusion of the urban fabric which changed the city space rapidly.[59]

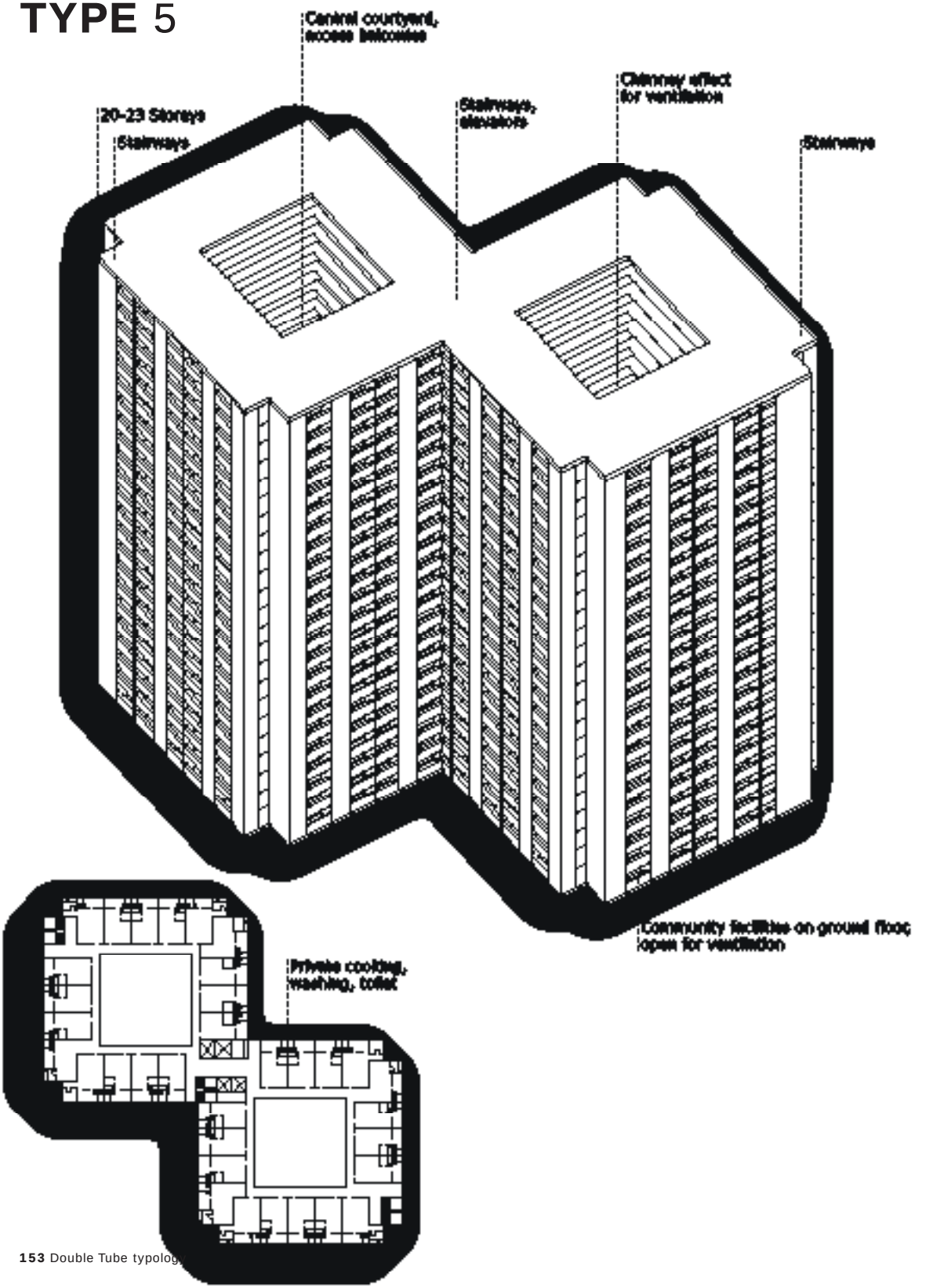
But the increased building height further reduced the amount of light in the streets, to counteract against that, some requirements for setbacks on the upper floors defined in order to ensure better lighting and ventilation conditions for the units and the streets. New building materials particularly reinforced concrete was getting more popular as it was safer as the former wooden beams.

This new typology provided a substantial increase in new housing for Hong Kong. At the same time it increased the density of the city, which placed a tremendous pressure on the need for infrastructure and neighbourhood facilities. Therefore the Building Ordinance was reviewed by the government in 1962, which led to fundamental changes.[60] The massive block typology can be seen as an extruded shop house as it developed from the old Tong Lau type. It is one of the typologies which can still be found in the old urban areas such as Sham Shui Po, Mong Kok or Tai Kok Tsui.

152 Man Wah Sun Chuen Estate in Kowloon

59 Christ/Gantenbein 2012, p.33.
60 Ibid., p.16.

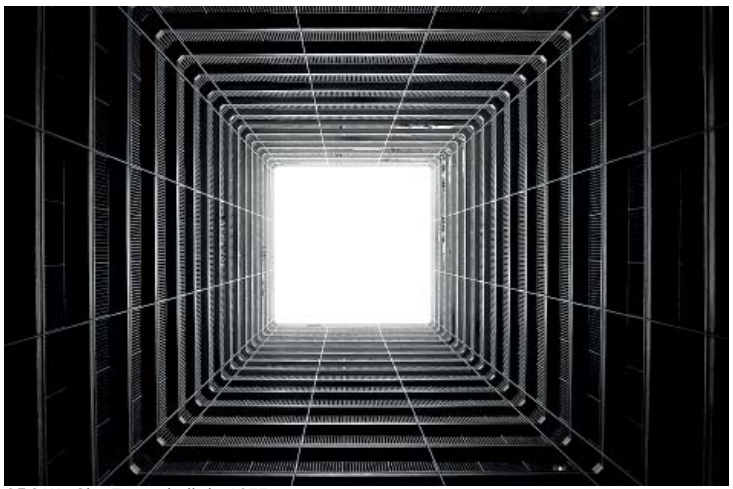
TYPE 5



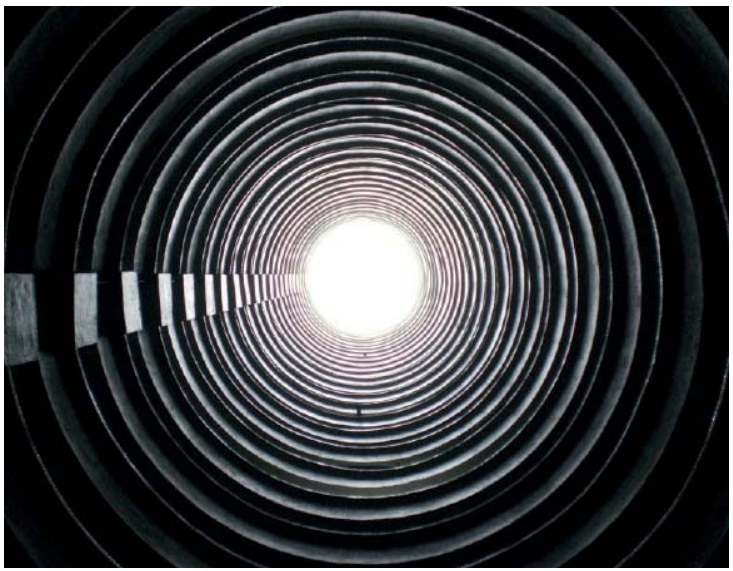
153 Double Tube typology

DOUBLE TUBE

This type is also called *'Twin Tower'* and used to be well known for improving social housing standards in the 1970s. The blocks are formed of two square towers with different heights trimmed by a central courtyard with access balconies leading to the apartments. The pairing of the two volumes at their corner allows both buildings to use the same staircase. The inner courtyard provides the ventilation for the flats, as it is designed as a wind chimney with entrances on the open ground floor. It is also the heart of the building and is surrounded by the access balconies, which form the public gathering space. This area enhanced the communication within the community and was the reason why people in this typology had in most cases a good relationship with each other. The blocks were equipped with commercial facilities and each estate had its own shopping mall. The flat sizes in these 20 to 23 storey blocks ranged from 36 to 46 square metres for a family of four to eight people.[61] The main argument against this typology was the inefficient land use due to the large footprint of the housing estate. This and the change in the building regulations was one of the main reasons why this typology was no longer built.



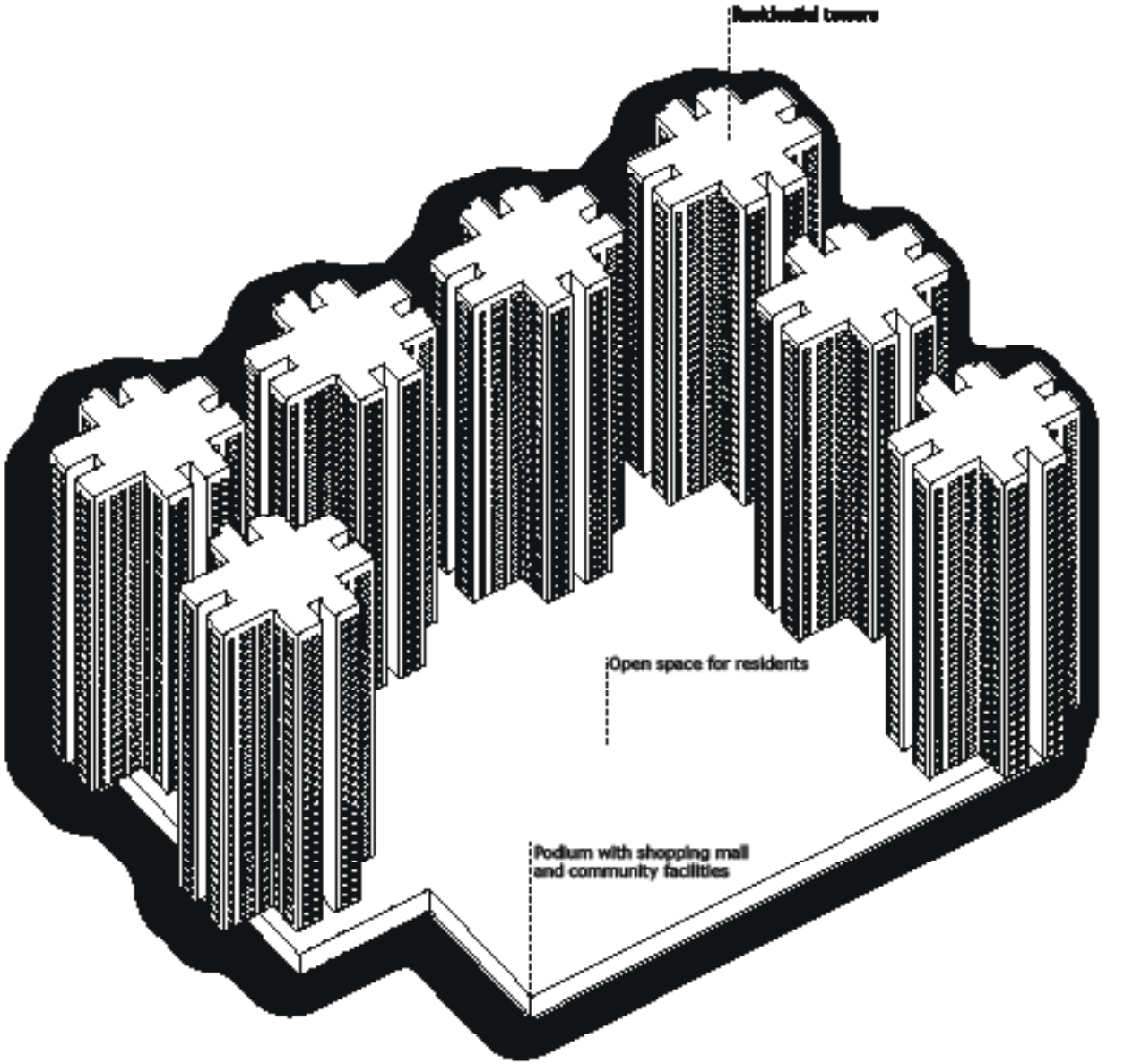
154 Wo Che Estate built in 1977

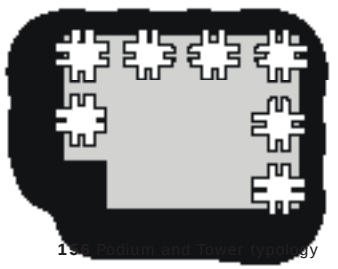


155 Lai Tak Tsuen built in 1975

61 Cf. Ibid., p.39.

TYPE 6





1.3.4 Podium and Tower typology

This building type was introduced in Hong Kong in 1962 with a private sector building designed by architect Andrew Lee King Fun. The podium emerged as a consequence of a fundamental change of the Building Regulations allowing complete site coverage on the lower floors for commercial uses or buildings services, placing towers on top and resulting in roof space or podium space which was provided as open space.

The Podium and Tower form had been foreshadowed in several Modernist schemes in the 1920s before it became an important strategy for Hong Kong's town planner. *Ludwig Hilbersheimer* conceived a 'vertical city' of street block podia and high slab-blocks in 1924 where the ground streets were used for traffic and the podia provided a bridge-connected pedestrian 'raised ground'.[62]

Two years later, Van Eestern went further with a model that included ground streets, and perimeter block buildings surrounding a raised court: slab-and-tower components rose from both the court and perimeter blocks, and the court levels were connected over the streets at intersections and mid-block. Elbert Peets had proposed a similar scheme to that of van Eestern in America earlier – albeit a one-block civic centre within a city.[63]

In Hong Kong the form emerges from regulatory requirements, to provide unbuilt space on a building lot to ensure ventilation and access to light while accommodating valuable street frontage. There was no theoretical postulation to separate pedestrians from traffic. And although it might be understood as a case of modern urban theory meeting Eastern traditions, the reality is more pragmatic, because it was not consciously derived from the modern utopian models and theory.[64]

In 1962 a new building regulation was introduced which reduced the permitted development area compared with the one of 1956. But it was not officially set in place before 1966; this delay induced a building rush, as developers wanted to take advantage of the earlier, more generous building regulation. The change of the 1962 legislation allowed open space to be provided in domestic buildings depending on the lot (corner, middle, through, end lot), one quarter to a half of the roofed area couldn't be covered in order to avoid big floor plates, and the lower floors were allowed for non-domestic purposes and could fill 100 per cent of the plot and up to a height of 15 metres. This change was introduced to overcome the perceived problem of deep floor plates which were the consequences of the 1956 legislation that resulted in residential space with little or no light or ventilation.[65]

62 Cf. Shelton/Karakiewicz/Kvan 2011, p.112.
63 Cf. Ibid., p.112.
64 Cf. Ibid., p.113.
65 Cf. Ibid., p.114.

The legislation was the reason for the prototype of the podium and tower form, and in the 1960s shops aligned on street level with towers above emerge as the main typology. As the podia expanded to cover more than one building lot, larger buildings were realized which led to larger building masses with longer access corridors.

As the form developed, the pressure for financial returns led architects to focus their attention more on the efficiency of the floor plan and to balance the costs of the development. As the space used for circulation was counted in the plot ratio consequentially usable net area was lost. Consideration was then given to the 'net to gross' ratio, and with that in mind the private sector developed the first tower block in 1962 with an efficiency of 86 per cent. The reason for the efficiency of these floor plans was a new stair system for the escape routes. Any building with more than six floors needed two escape stairs on each floor which was required by law, but was the most space consuming element. The idea emerged to integrate two within one footprint, in a form known as the *scissor stair*[note11] was the solution to create a minimal circulation space and better value for money. [66]

The podium roof was first not well used and offered little for the residents above. But the Mei Foo development changed this condition by 'translating the urban street' onto the platform. The podium includes shopping and commercial services as well as public functions on both ground and deck level, with residential towers above.[67] By the last quarter of the twentieth century, the podium and tower form had become the common building type in both residential and commercial developments as it means using a site to the full and was then adapted as an urban planning strategy to connect isolated parts of the urban fabric.[68] But when the podium form is scaled up and spreads over several blocks it can also take on an introverted, monolithic form that excludes the surrounding area and becomes a megastructure like an urban island.

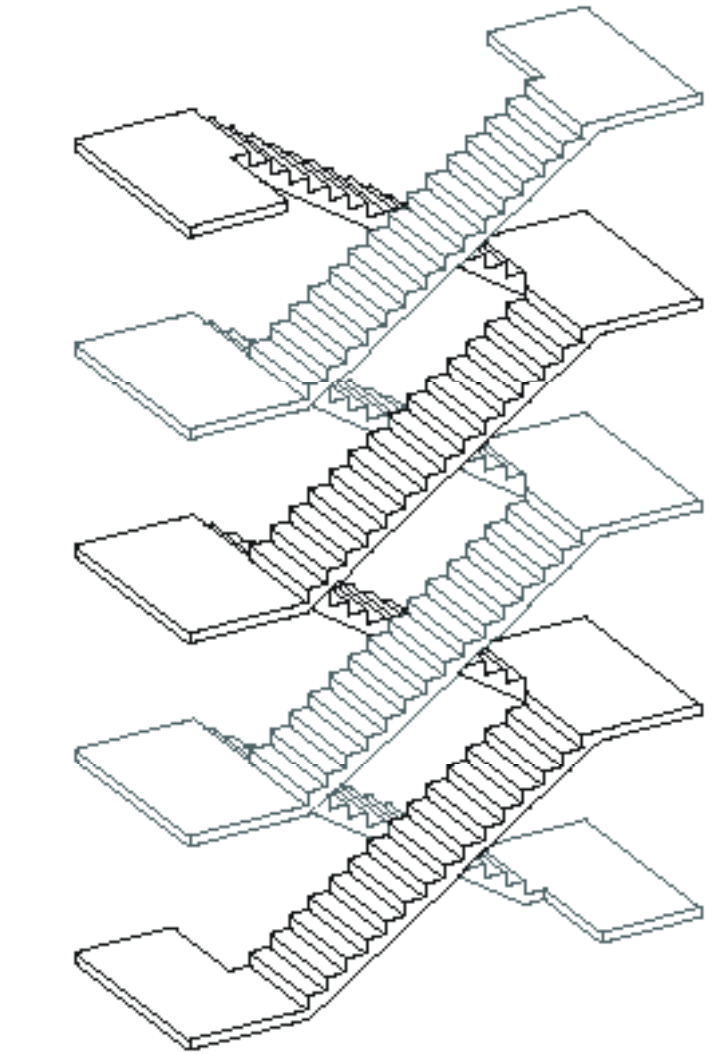
The Olympian City is such a mega-structure that is isolated and in competition with its surrounding, it can be evaluated as a negative example of the podium and tower typology.

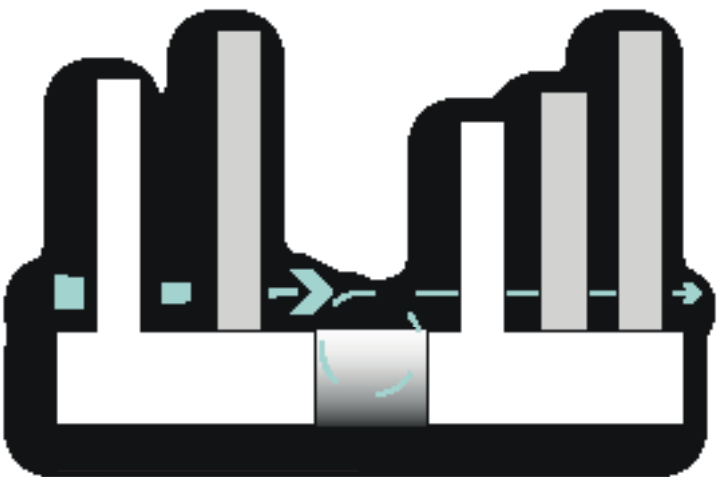
Chapter Megastructure p.127

The podium tower form has some essences of the shop-house, although within different form and at an exploded scale. As the podium was permitted to expand to several floors, activities that had been carried out on the street were now subject to tighter oversight by the landlord and disappeared. The inside of the podium was more and more considered as space only for residents of the towers above.[69]

The podium and tower typology has even a negative effect on the urban climate in Hong Kong, as it increases the overheating of the city due to the heat island effect

66 Cf. Ibid., p.116.
67 Cf. Ibid., p.120.
68 Cf. Ibid., p.123.
69 Cf. Ibid., p.126.





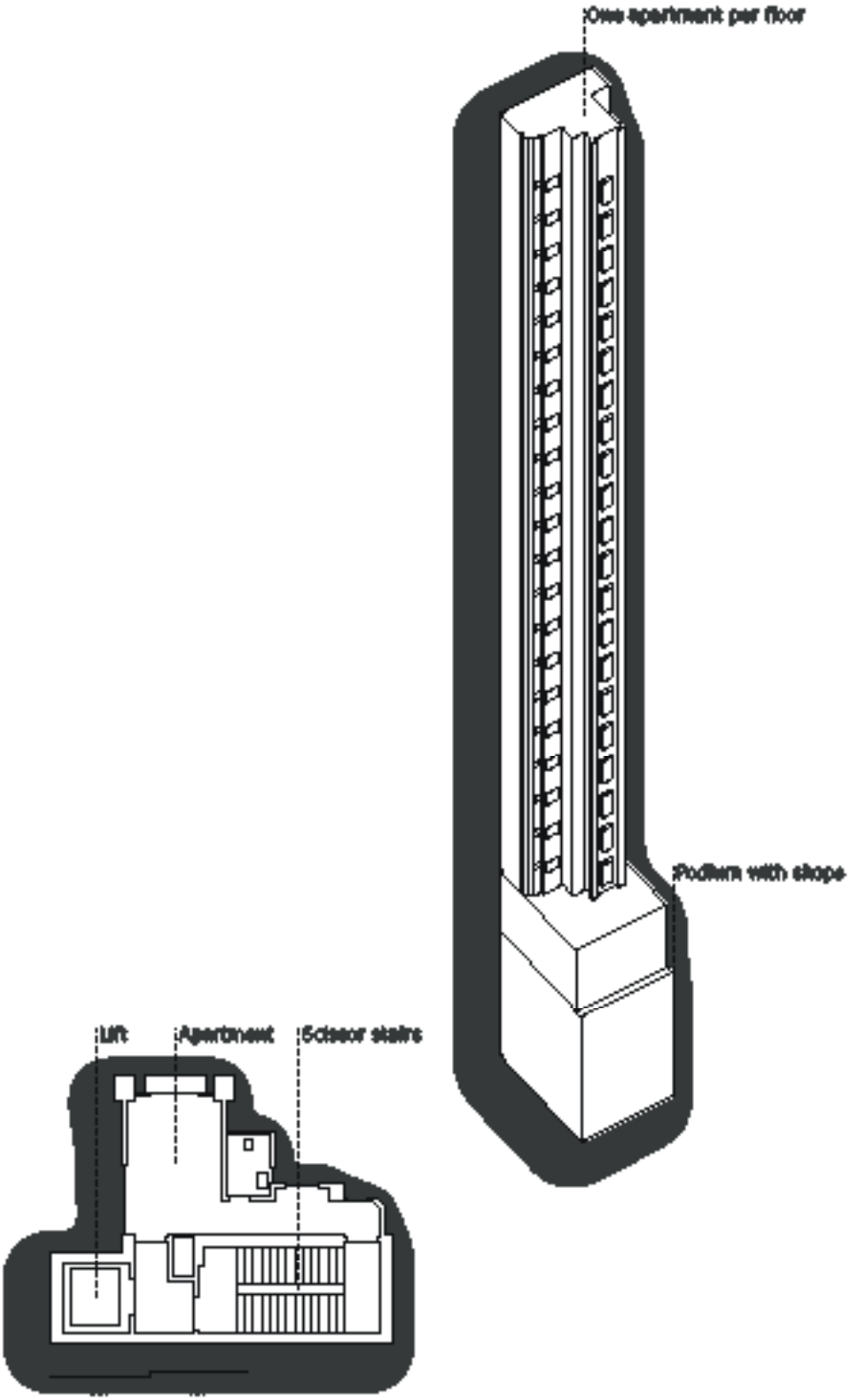
and causes road side pollution due to the street canyon effect. So is the current way of designing podium tower typologies counterproductive for the city as the temperature in the city due to nightly heat radiation is rising. The most affected areas are districts with a high density of mixed use podium and tower buildings, where the air cannot circulate and breezeways are blocked due to towers which form a barrier.

Podium structures are now seen as a solution for much needed recreation and social space in the city and have gained further favour in recent years as the roof offers additional space for planting, as the city wants to become greener. The volume in which a variety of functions is linked together has become a strategy to maximize site development potential for both private and public developments and has even pervaded most of Asia. In China, for example, where massive renewal projects occur, the podium and tower typology replaces even whole neighbourhoods.

In Hong Kong the podium form can be successfully implemented within the urban structures, as it can join previously disconnected parts, but at the same time it can emerge as an urban island that inverts attention and captures all street activity into an air-conditioned interior and effectively sucks out the life from the surrounding streets. The podium therefore needs to be engaged with the city and not treated as an enclosed property.[70]

70 Cf. Ibid., p.130.

TYPE 6.1



159 Pencil tower typology

Pencil towers are a result of the 1962 Building Ordinance, which required open space to be provided in domestic buildings. It is a cultural phenomenon and an architectural reaction towards the notion to plan a minimum housing prototype for affordable human habitat. This typology is part of the podium and tower typology but with the difference that most of these towers consist of one or two apartments per floor, with a usable floor area ranging from 25 square metres to 40 square metres, which is then replicated for another thirty storeys. The load bearing structure of this typology is typically reinforced concrete and can be found all over Hong Kong, especially in the older parts of the city.[71] Hong Kong now has more pencil towers than any other city.

These slender residential towers have been profitable projects for developers with minimal investments and high outcomes, as the floor plan takes up the maximum allowed density. The plots are owned by private developers who need to build and maximize profits on small pieces of land which is the reason why Hong Kong has now more pencil towers than any other city. It is one of the most extreme expressions of private housing in Hong Kong, where the dwelling unit per floor is sometimes less than the circulation space. This building typology provided a new way of living in Hong Kong and is marketed between deluxe private housing and low-income residential housing. The main target group is the young middle income class. Part of the reason is that this group of people can afford living conditions that are better than low-income public housing, but are not yet able to purchase a deluxe private apartment. The pencil tower cannot provide the generous space that the high-income group demand, and as a result the best opportunity for the developers to gain the maximum sale revenue is marketing towards the young professional group.[72]

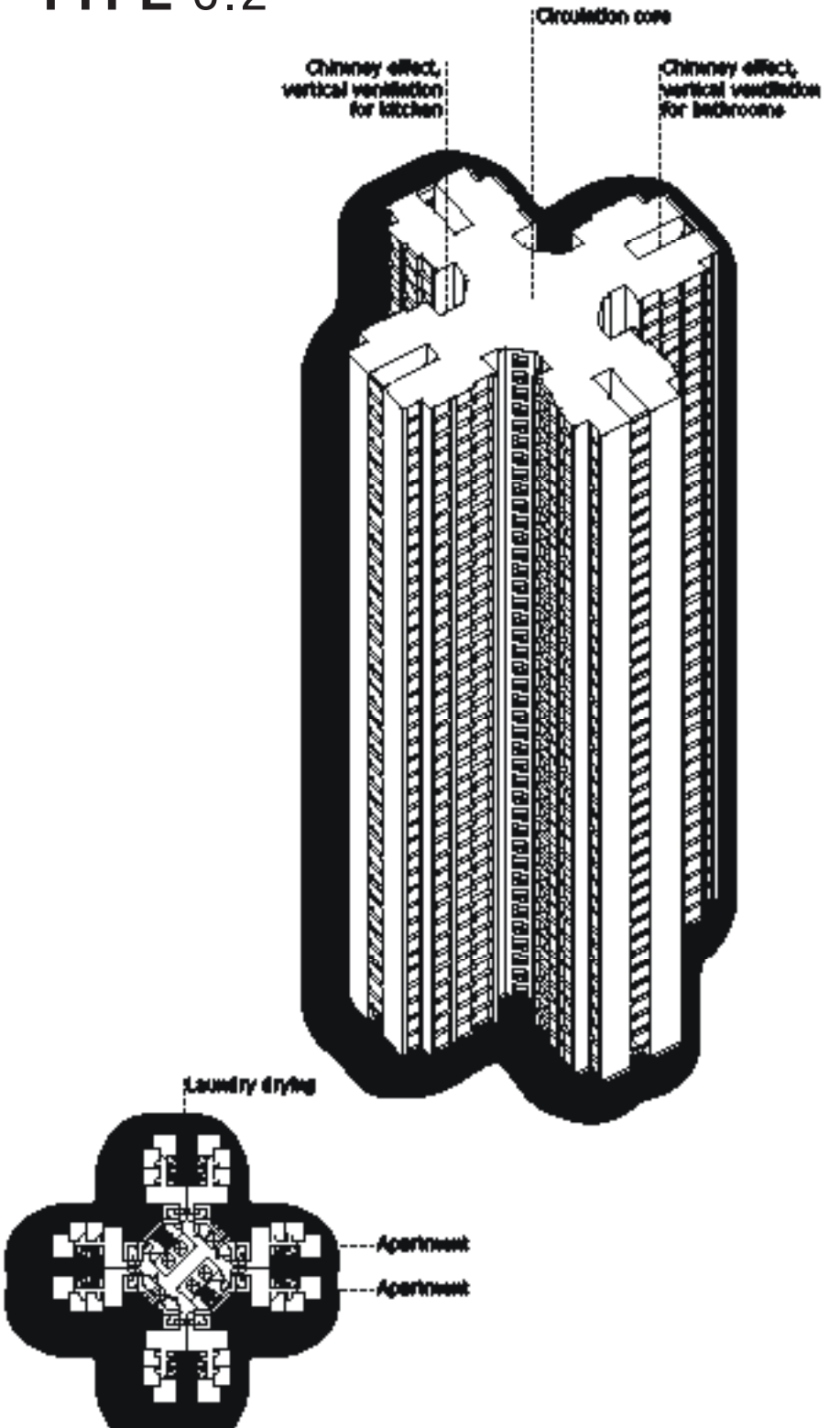
One of the most slender residential skyscraper in the world is also situated in Hong Kong and is called the Highcliff. It is a luxury residential development which rises 72 storeys (252 meters) on the south slope of Happy Valley.[73]

There is no set definition for a Pencil Tower; however, *"one definition could be the relationship of the usable floor area of one floor to the height of the building. This could be an aspect ratio. Utilizing this to define the pencil tower yields a border value of about 1.00. That means that any tower that has a ratio of height in meters divided by usable floor area in square metres, that is equal or greater than one, is a pencil tower."*[74]

160 Pencil tower

71 Cf. Christ/Gantenbein 2012, p.23.
72 Kian 2012, p.31.
73 Cf. The Skyscraper Museum 2009.
74 Yiu 2011, p.64.

TYPE 6.2



161 Star shaped tower typology

STAR SHAPE TOWER

The cruciform design was introduced in 1984 with the first blocks completed in 1987. Cruciform design is like a cross with four arms extending from a central core containing lifts, services and stairs, with ten flats on each floor situated on top of a non-domestic podium. This typology is an enhancement of the podium and tower typology. It is the city's most distinctive architectural form reaching 35 storeys in height which marks the skyline of many central areas in Hong Kong and Kowloon.

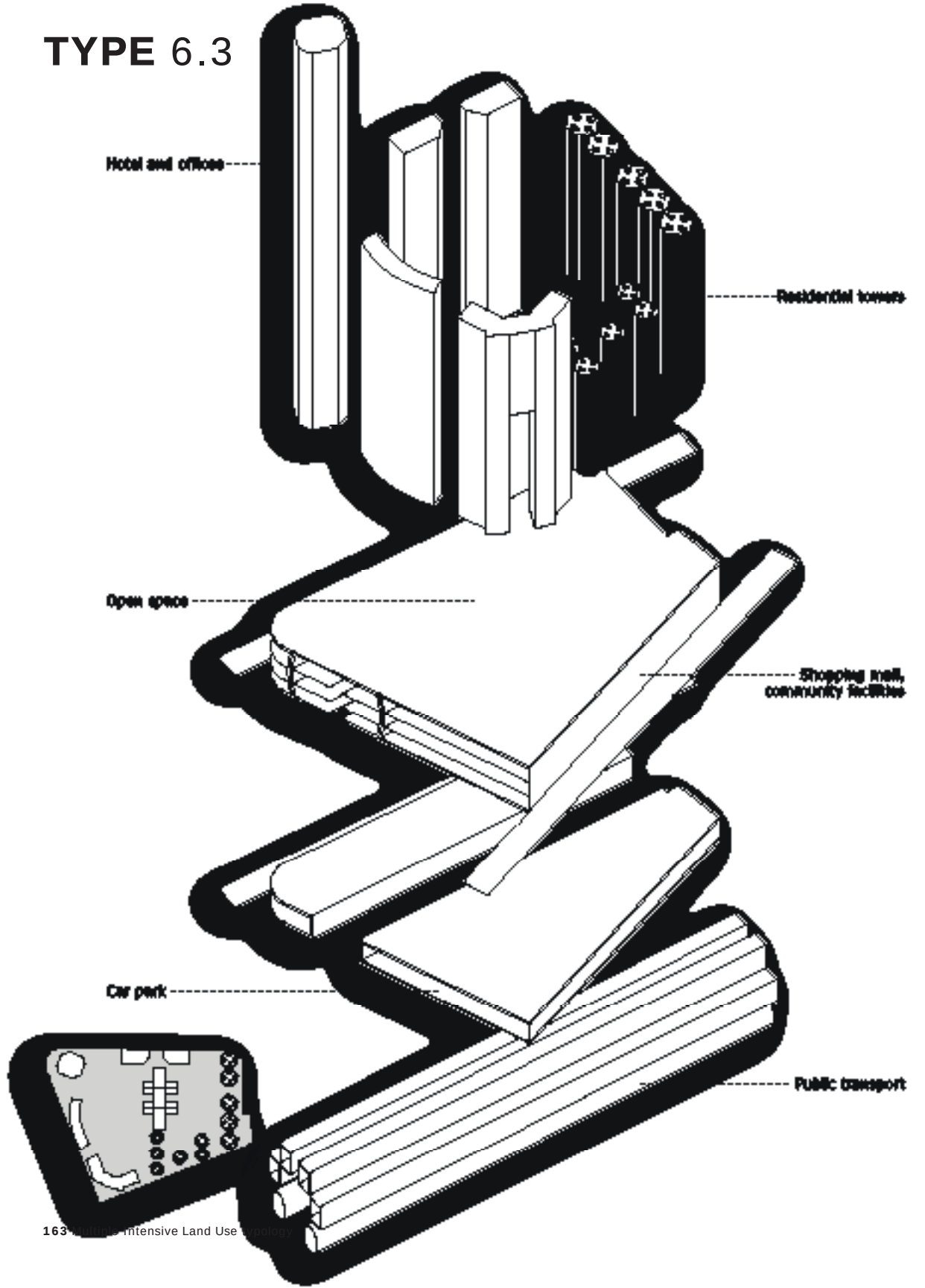
The living space is mostly densely packed and arranged around a central core, which results in forming very narrow semi-enclosed external spaces in between flats. Such narrow, vertical chimney-like spaces are commonly called *'re-entrance spaces'*, which is a design trick for allowing natural lighting and ventilation into the kitchen and bathroom of each apartment unit with a view to meet the minimum prescriptive requirements under the building regulations. These re-entrants can be as narrow as 1.5 metre, while its depth is several metres that leads to very narrow and high spaces which can be very dark and stuffy. This re-entrant spaces that run vertically like a semi-enclosed chimney in between each pair of apartment wings, bring in minimal light and ventilation in these high-rise towers.[75] This type of building typology is also the shape of the Amoy Gardens Residential Development[note12] in Kowloon where the outbreak of SARS occurred in 2003.

Although the cause of the SARS outbreak remains unclear in the eyes of many researchers and professionals, it represents also a turning point in order to design a healthy and liveable living environment for Hong Kong. After the year 2003 new layout plans, with different re-entrant shapes have been created and are now the common building form for new housing estates.

162 Star shape tower

75 Cf. Wong 2010, p.324.

TYPE 6.3


Hotel and offices
Residential towers
Open space
Shopping mall, community facilities
Car park
Public transport

MULTIPLE INTENSIVE LAND USE note13

The Multiple Intensive Land Use development (MILU) consists of high rise towers, which are built over 3-4 level podiums with a site coverage of one hundred per cent. This podium generally incorporates public functions such as commercial, recreational, government, institutional, transportation and community land uses while the primary residential, office or hotel apartments are located above. This typology has a Floor Area Ratio or Plot Ratio of up to 15 for commercial uses and up to 10 for residential uses and led to buildings with up to 80 storeys built in close proximity to public transport hubs. Such high density, mixed use developments are defined as Multiple Intensive Land Use (MILU) and can be mainly found along the main rail lines of the mass transit railway (MTR).[76] The MTR appears in this case as property developer and combines transportation with commercial and residential activities along its subway stations, as examined at the Kowloon Station development.

Chapter Megastructure p.125

This building type emerges in the mid-2000s and was mainly envisioned by Jerde Design, which had already reinvented shopping malls in the US in the late 1970s. With the Hong Kong projects such as Langham Place in 2005 and Megabox in 2007 a reorganisation of the mixed use programme into a vertical form was possible which at the same time reduced the urban footprint of the building in order to integrate the projects better into the existing urban fabric.

This vertical typology was further developed in other commercial projects and can be seen as counter-examples for the generic shopping mall. Two different MILU structures can be found today in Hong Kong, as the typology has evolved over the time from a horizontal development, which is integrated in the urban structure of the city, to a vertical mega-structure which is more like an urban island and does not function as an integral part of the city pattern.[77] These different MILU structures are closer examined in the chapter megastructure as they are specified in this thesis as building megastructures.

164 Kowloon Station development

76 Cf. Yuen/Yeh (Ed.) 2011, p. 27.
77 Cf. Tieben 2013, p. 46.

DISCOURSE ON HIGH-RISE

Since the first modern skyscraper was constructed, the urban high-rise has gone through a wide range of transformations. By a series of technical innovations, tall buildings were made possible. Elisha Graves Otis invented the elevator in 1852, allowing people to move rapidly skywards within buildings. Secondly there was the use of iron or steel structural frames, which allowed the building to rise without the necessity for thick load-bearing walls and with a repetitive stack of identical floor plates. The third invention was the mechanical ventilation and Willis H. Courier's air conditioning of 1902, which allowed buildings to be both, high and expand their girths. As Chicago was in need to redevelop quickly after the great fire of 1871 it became the most significant early player in the vertical urbanism – starting with the ten-storey Home Insurance Building in 1885 which was considered as the first skyscraper. New York was quick to overtake as the tall building capital, reaching seventy-seven storeys in 1929 with the Chrysler Building at 241 metres, surpassed by the Empire State at 381 metres two years later. Since that time buildings have reached greater height and have gone through a wide range of transformation, both in development and research.[78]

Until today the topic *'high-rise'* provokes a passionate debate in many places. Especially the sustainability of skyscrapers is often put into question. The construction of a skyscraper is sometimes justified by the land price. To use the land in an economic way building upwards is seen as solution, as it minimizes the cost of land for the floor area of a building. Sustainability is often the answer why high-rises are built, but the concept of the skyscraper with the large amount of concrete, steel and glass is not always environmentally friendly considering the grey energy embodied in these materials.

Also the energy consumption must be questioned. In some high rises the operation energy can cause high costs as a lot of energy is used to pump water even to the highest floor, operate elevators all day, use mechanical ventilation for better air quality and the use of artificial lighting as natural light cannot reach every room in the building. But there are also positive effects which can be observed when looking at high rise buildings. The compact form of high-rises minimizes the footprint of the building, which preserves land for other uses or creates recreational space. Also the mixed use in skyscrapers can lead to minimization of travel distances and lower resource consumption.

Today there are a lot of innovative ways to design and build energy efficient skyscrapers that reduce energy costs by supporting natural effects by their shape and design, using the most efficient materials on the market or even producing the needed energy by themselves.

165 Home Insurance Building

78 Cf. Shelton/Karakiewicz/Kvan 2011, p.100.

Over the years the skyscraper has even developed to a symbol of power and wealth and is seen as a modern cultural expression. Today they are often a significant representative symbol for a city as seen at the Empire State Building or the Burj Khalifa. Since towers and skyscrapers have been engineered, there is an unofficial competition for constructing the highest building in the world.

But there was also a time where high-rises were criticised as it was common to fill entire quarters of cities all over Europe with standardised housing monoliths after the Second World War. These housing blocks sometimes created very bad social conditions, which was one of the reasons why these post war high-rises have often been demolished.

Over recent decades there was again a move towards tall buildings in the city. As the suburban growth continues, high-rises are seen as the answer to decrease the urban sprawl and to create sustainable cities. For China the shortage of land resources becomes a major constraining factor in the urban development. To solve the land crisis, high-rise high density developments have become the norm in many cities. The situation gets even more delicate when the land value raises way above the construction costs. For that reason the skyscraper or the vertical city is the urban answer to cope with the situation of increasing population and urban density.

166 Chrysler Building

For that Hong Kong is a good example. As the buildable space in Hong Kong is limited, building vertically was the only solution for the government. This often creates a homogenous space which is linked to vertically stacked buildings. This sometimes leads to design standardisation and monotony that can be observed in Hong Kong.

So can we do better?

The high-rise was often seen as a symbol for a new world and a new way of living. For most architects it is a dream to once design a skyscraper. Famous architects designed all different kinds of urban models for skyscraper cities. Some of them remain utopian, some of them were built, and some of them are already demolished. In this part of the chapter some of these urban utopian projects are described in order to find analogies in Hong Kong. As these models are searching for urban alternatives to enable a healthier and modern lifestyle, can these utopian projects perhaps be seen as archetypes for some developments in Hong Kong? Three different urban concepts have been chosen because of their conceptual similarities as well as their formal commonalities with the intention to understand Hong Kong and its underlying urban structure a little bit better.

EBENEZER HOWARD GARDEN CITY

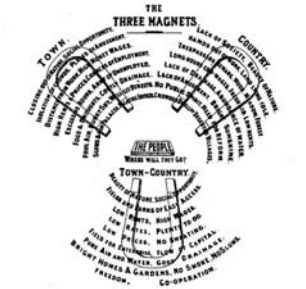
The Garden City concept was initiated in 1898 by Sir Ebenezer Howard in the United Kingdom as he published the book '*To-morrow: A Peaceful Path to Real Reform',* as an ambitious program for a comprehensive reform of the settlement policy. Like the socialutopists and communists he criticised the unregulated growth of large cities, and the resulting land destruction. The Garden City should stop the growth of the large industrial cities, in favour for a global system of garden cities.

The Garden City model is a self-contained community surrounded by a greenbelt with 32.000 inhabitants on a site of 2.400 ha, five kilometres away from its Central City with 58.000 inhabitants. Its purpose is to relieve the Central City and create a healthy living environment. For Ebenezer Howard the Garden City was the vision of towns free of slums and enjoying the benefits of the town at the countryside. Beyond that, the Garden City cannot grow; when it reaches full population it must disaggregate, so that a new Garden City can develop in its immediate neighbourhood.

Howard did not develop a specific urban plan for the Garden City. It was obvious for him that it must be adapted to local conditions, so he presented a largely abstract scheme. The Garden City concept is based on a concentric circle where all Garden Cities are arranged around the Central City in a radius of one kilometre. They are connected with each other as well as with the central city by highways and railways. In the centre there is a large green space where all the public buildings are arranged. Further away residential buildings are located, almost all with large gardens, and on the outskirts the industrial buildings, markets and warehouses are situated. Only two English towns were built with the Garden City concept in mind, Letchworth and Welwyn, but these cities couldn't keep up with Howard's ideal scheme of the Garden City.[79]

The Garden City movement emphasized the need for urban planning policies all over the world and Howard's book attracted attention in the United Kingdom and beyond its borders, with an influence as far as Hong Kong.

167 Ebenezer Howard



168 The Three Magnets 1898

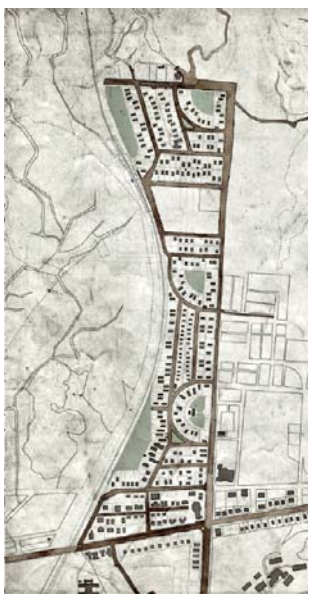
169 Scheme for the Garden City

79 Cf. Lampugnani 2011 Bd.1, p.24-30.

GARDEN CITY IN HONG KONG

The New Town idea of Hong Kong is originated in the Garden City concept. It is based on the vision that a city growth should involve the gradual transformation of existing centrally concentrated cities into decentralized towns. The concept mutated into so called New Towns or Satellite Towns in Hong Kong. The major difference in Hong Kong is that these New Towns are bigger and couldn't be designed with single family houses with surrounding gardens, as the government had to supply more housing needs. The houses were built at higher density and included stacked apartments instead of individual houses with a collective open space.

170 Kowloon Tong Garden City 1935



171 Plan of Kowloon Tong Garden City

In Hong Kong Kowloon Tong is well known to be developed according to the Garden City concept. It was developed in 1921 with the aim to provide a healthy, suburban living environment affordable to Hong Kong's emerging middle class. The project was the first major attempt at modern town planning in Hong Kong. The area covered one hundred acres and included 250 detached garden houses, as well as public parks and playgrounds. It originally consisted of four main housing types with standardized layouts. The district was close to the city centre and became an exclusive residential district for the upper-middle class instead of a comprehensively developed community as espoused by Ebenezer Howard.

Today only few houses remain while many of them have been demolished or redeveloped into high-rise residential blocks.[80]

In the West the vision was just partly realized and some ideas can be found in concepts even today. The Garden City movement nowadays has even a major relevance in China, as people get wealthier and well educated, they are more concerned about their environment. For this reason many people want a better quality of living and the garden city model can satisfy these needs.

80 Cecilia 2013.

L. HILBERSEIMER HOCHHAUSSTADT

In the 1920s Ludwig Hilberseimer focused on the skyscraper cities of America rather than looking at the garden town movement. He studied different concepts for the American traffic problems and proposed solutions such as the upper floor street which was later part of the High-rise City. He was attracted by the beauty of American cities and saw something magical in the skyscrapers of these cites, on the other hand he also criticised the town planning of European cities of that time.

In 1923 Hilberseimer published the essay *'Vom städtebaulichen Problem der Großstadt'*, where he identified the *Großstadt* as own urban type. In the same year he participated in a competition of the *'Bauwelt'* journal, where he proposed a satellite town. This *Wohnstadt* was based on an accurate rectangle with 78 rectangular blocks. This housing block, which was the base element of the ideal city, was transformed over the years.

In 1924 Ludwig Hilberseimer designed the *Hochhausstadt,* which is probably the most well-known but also most criticised project. It even seems to be a direct response to Le Corbusier's Ville Contemporaine, which was published two years before. In his *Hochhausstadt* Hilberseimer adopted the architectural type of the skyscraper and modified it according to functional and hygienic aspects. Traffic was one of his main concerns; thereby he tried to solve the problem by stacking two cities above each other. Below the working city, above the living city, in that way every citizen could live above his working place as horizontal and vertical circulation systems were going from home to work. The architecture of the city was reduced to blocks and slabs in which all activities such as production, living and commerce are vertically integrated, all of it projected on an infrastructural geometrical grid.

The project which was first published 1925 in '*Großstadtbauten*' and later in his book '*Großstadtarchitektur*' exposed his new principles on city planning. For Hilberseimer the *Hochhausstadt* was considered as a real vertical city with slim rectangular 15-storey residential blocks situated on five storey working blocks. From the dimension differences of these two stacked blocks, ten metres wide sidewalks were resulting, which were connected with each other at regular intervals. To solve the traffic problem Hilberseimer separated the city from the traffic, by planning a six metre wide roadway on the ground level and the railway and the subway were situated underneath.

For Hilberseimer the utopian project *Hochhausstadt* was always ambivalent and in his book '*Entfaltung einer Planungsidee',* which was published 1963, he even refused the concept of the *Hochhausstadt*.[81]

„Als Ganzes gesehen, war das Konzept dieser Hochhausstadt bereits als Gedanke falsch. Das Resultat war mehr eine Nekropolis als eine Metropolis, eine sterile Landschaft von Asphalt und Zement, unmenschlich in jeder Hinsicht. "[82]

172 Ludwig Hilberseimer

173 Hochhausstadt 1924

81 Cf. Lampugnani 2011 Bd.1, p.293-296.
82 Ibid., p.296.

HOCHHAUSSTADT IN HONG KONG

The *Hochhausstadt* is expressed on an infrastructural grid which is fitted with architectural program. By this grid the city appears very homogeneous which is even emphasised by the endless repetition of the slabs. Especially the first housing estates, known as slab blocks Mark I to Mark IV, show close similarity to the Hochhausstadt. These typologies were adapted as mixed use buildings by the residents, as Hilberseimer had it designed for his city. Most notably is the formal similarity of the slab compositions which also reflects the efficiency of the urban concept which is the reason why Hilberseimer's urban model is probably widely accepted all over Asia.

The development of New Towns in Hong Kong is also similar to Hilberseimer's vision of the vertical city. These are extensive volumetric systems with a multilevel movement and wide areas of a second ground with high rise towers instead of slabs. The monotony which is designed by assembling skyscrapers in Hilberseimer's city is generated in Hong Kong by stacking flats on top of each other whereby the façade gets a monotone character.

In Hilberseimer's *Hochhausstadt* the traffic is one of the main concerns. The city is developed on this grid which is similar in Hong Kong as normally the transport infrastructure is built first.

An analogy can also be found in the approach of the segmentation of the buildings. In Hong Kong typologies developed from the slab block into a tower and podium typology, where functions such as shopping and recreation are assigned to the podium. In Hilberseimer's concept the podium was already placed underneath the housing blocks which should function as working and commercial zone.

174 Hilberseimer's Hochhausstadt

175 Hochhausstadt in Hong Kong

LE CORBUSIER VILLE CONTEMPORAINE

In 1914 Charles-Édouard Jeanneret-Gris or better known as Le Corbusier developed the project *Maisons Dom-ino*. This model is proposed on an open floor plan consisting of concrete slabs supported by a minimal number of reinforced concrete columns on each edge and with a stairway providing access to each floor on one side of the floor plan. This standardized framework or skeleton design became the foundation for most of his architecture, as it was possible to produce it serial by industrialisation. It was the start for the cellular systems and the vertical city concepts, as the mass production allowed higher density by stacking modules.[83]

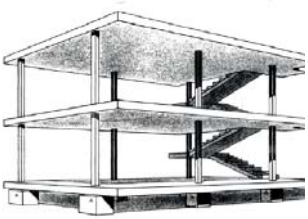
With the *Maison Citrohan,* which was a pun on the name of the French Citroen car manufacture, Le Corbusier and Pierre Jeanneret (his cousin with whom he had a partnership) designed in 1920 a three floor structure which he referred to as a machine for living. It was a house that was a universal architectural element which could be produced in mass production and transformed into a housing block and be even assembled into a city.[84]

In 1922 Le Corbusier was invited to display his architectural work in the Parisian Salon d'Automne, where he showed a further development of the Maison Citrohan and a theoretical scheme for a housing block with 96 two storey dwelling units. It displaced a twelve metres long *Ville contemporaine de trois millions d'habitants*, a Contemporary City for three million inhabitants, at that time a city for the former population of Paris. It was an efficient way to house large numbers of people in response to the urban housing crisis. He believed that this new modern architectural form would provide a healthy solution and would raise the quality of life.[85]

The plan which is designed for an area of about four to six and a half kilometres exists of 24 cruciform skyscrapers which should provide conditions for ideal air and light, with 60 storeys. These skyscrapers form the centre of the city and are only for business purposes. At the base of the skyscrapers and round them there is a great open space, which is occupied by gardens, parks and avenues. In these parks around the skyscraper, restaurants and cafés as well as luxury shops are situated. The skyscrapers are capable of housing 400.000 to 600.000 inhabitants. This part should be compact, rapid, lively and concentrated; it is a city with a well-organized centre.[86]

At the centre of the city a huge transportation hub is located in a subterranean building, which houses a railway station, an aerodrome, highways, tubes and buses.[87] Around the centre the residential quarters are arranged with twelve storeys set-back or cellular blocks which are designed for 600.000 inhabitants.

176 Le Corbusier



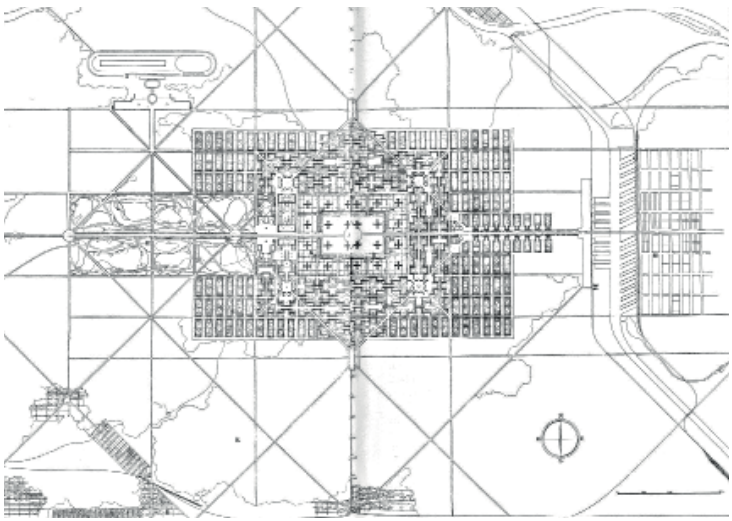
177 Maison Dom-ino 1914-15

83 Cf. Ibid., p.384.
84 Cf. Ibid., p.388.
85 Cf. Ibid., p.389.
86 Cf. Le Corbusier 1971, p.162.
87 Cf. Ibid., p.166.

All around the city a protected zone of woods and green fields is situated which is reserved for the further growth of the city. Further beyond at the periphery, Garden Cities are located which are designated to house 2.000.000 inhabitants, most of them employees.[88]

The transportation takes place on several levels and is based on the separation of pedestrian and vehicular traffic: below ground there are streets for heavy traffic, the tube and the railway on the ground floor, ordinary streets with 400 yards (365.76 metres) apart crossroads can be found and above a cross of highways which form the axes of the city for the fast one-way traffic. These are built on immense reinforced concrete bridges, like viaducts with a width of 120 to 180 yards (109.73 to 164.59 metres). The pedestrian circulation is segregated from the roadways and takes place by a fine-meshed paths' network through park-like open space. With this idea Le Corbusier glorified the use of the automobile, as he writes: *"A city made for speed is made for success."*[89]

1923 Le Corbusier published his book *Vers une architecture,* which is a collection of essays and articles of journals, which represented his personal architectural position. It started a new era of architectural theory and served as architectural manifesto for a generation of architects. [90]



178 Ville contemporaine layout plan 1922

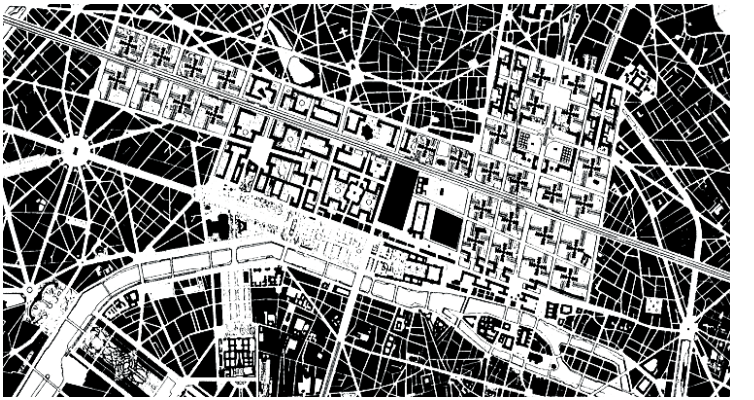
179 Ville contemporaine bird's eye view 1922

88 Cf. Ibid., p.168.
89 Ibid., p.179.
90 Cf. Lampugnani 2011 Bd.1, p.388.

PLAN VOISIN

To find sponsorships for his pavilion which was part of the E*xposition international des Arts Décoratifs et industriels modernes* in 1925 in Paris Le Corbusier asked different car manufactures such as Peugeot, Citroen and Voisin to support him with his Pavilion de L'Esprit Nouveau. For Le Corbusier it was a chance to show his provocative ideas on architecture and urbanism as he was working on a new scheme for the city of Paris. In return of the sponsorship he wanted to name the new plan after the supporting company. He even developed an advertising slogan, with the idea in mind that the future of the city will be determined from the automobile: *"Das Automobil hat die Metropole getötet, das Automobil muss die Metropole retten"*[91]. The company Voisin supported Le Corbusier and the Plan Voisin that radically redesigned the right bank of the Seine in Paris was developed.[92]

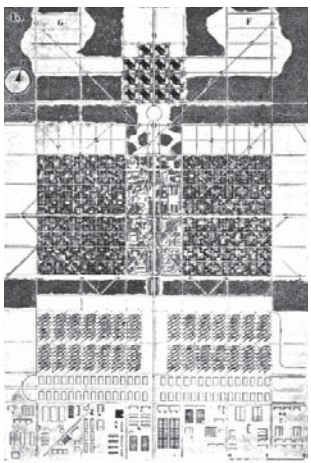
For the first time, Le Corbusier applied his model of the *Ville Contemporaine* in a real context. He proposed to remove most of the residential areas of the quarters, only five monuments were preserved, though detached from their context. Eighteen 200 metres cruciform skyscrapers and apartment blocks were placed within an orthogonal street grid and park-like green space, next to the contextless monuments. The towers were organized in a highly efficient layout connected by a terrace which served as the collective space for public activities. In the centre they even shared an urban terrace with the traffic passing underneath and an airport on top. Completely in the dark remains the political and economic mechanism and how it should lead to realisation. In his opinion only densification means valorisation.[93]



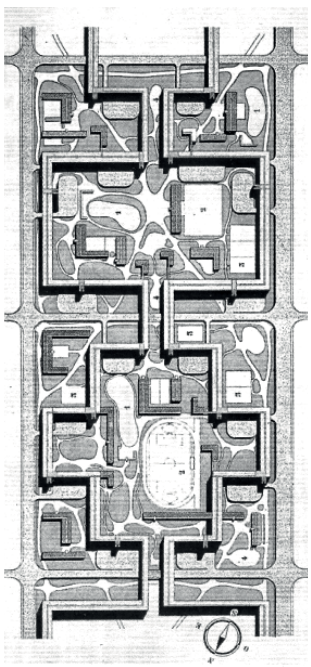
180 Plan Voisin layout plan 1925

181 Plan Voisin model 1925

91 Ibid., p.393.
92 Cf. Ibid., p.393.
93 Ibid., p.394.



182 Ville radieuse layout plan 1930



183 Ville radieuse. la ville verte 1933

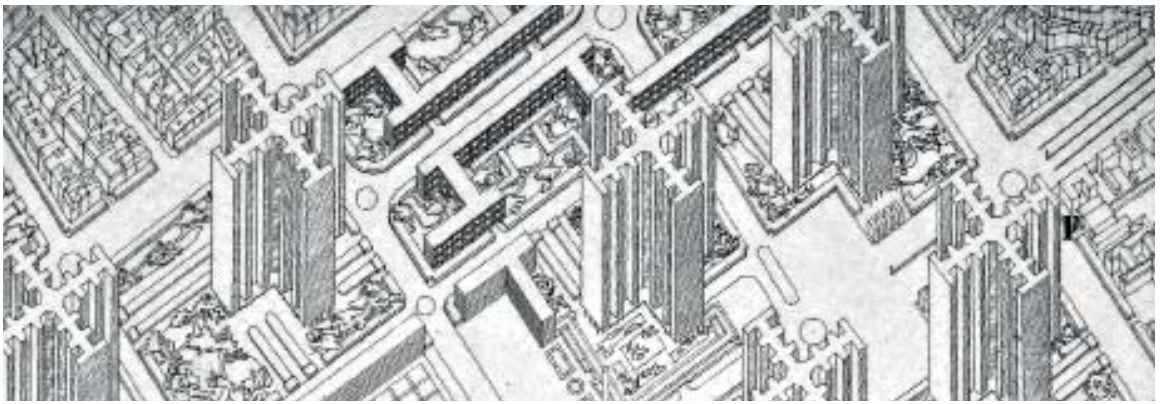
The *Congrès Internationaux d'Architecture Moderne* and the urban models of the Soviet architectural avantgarde resulted in a significant change of Le Corbusier's urban visions. The hierarchical and self-contained Ville Contemporaine developed into a classless and continuous extendable *Ville Radieuse.* The generous Citrohan-apartments evolve into a simple living cell which allows each resident only fourteen square metres living space. Ville Radieuse was designed for a questionnaire of the Moscow municipality which asked different architects from around the world to comment on the urban problems of the capital of the USSR in 1930.

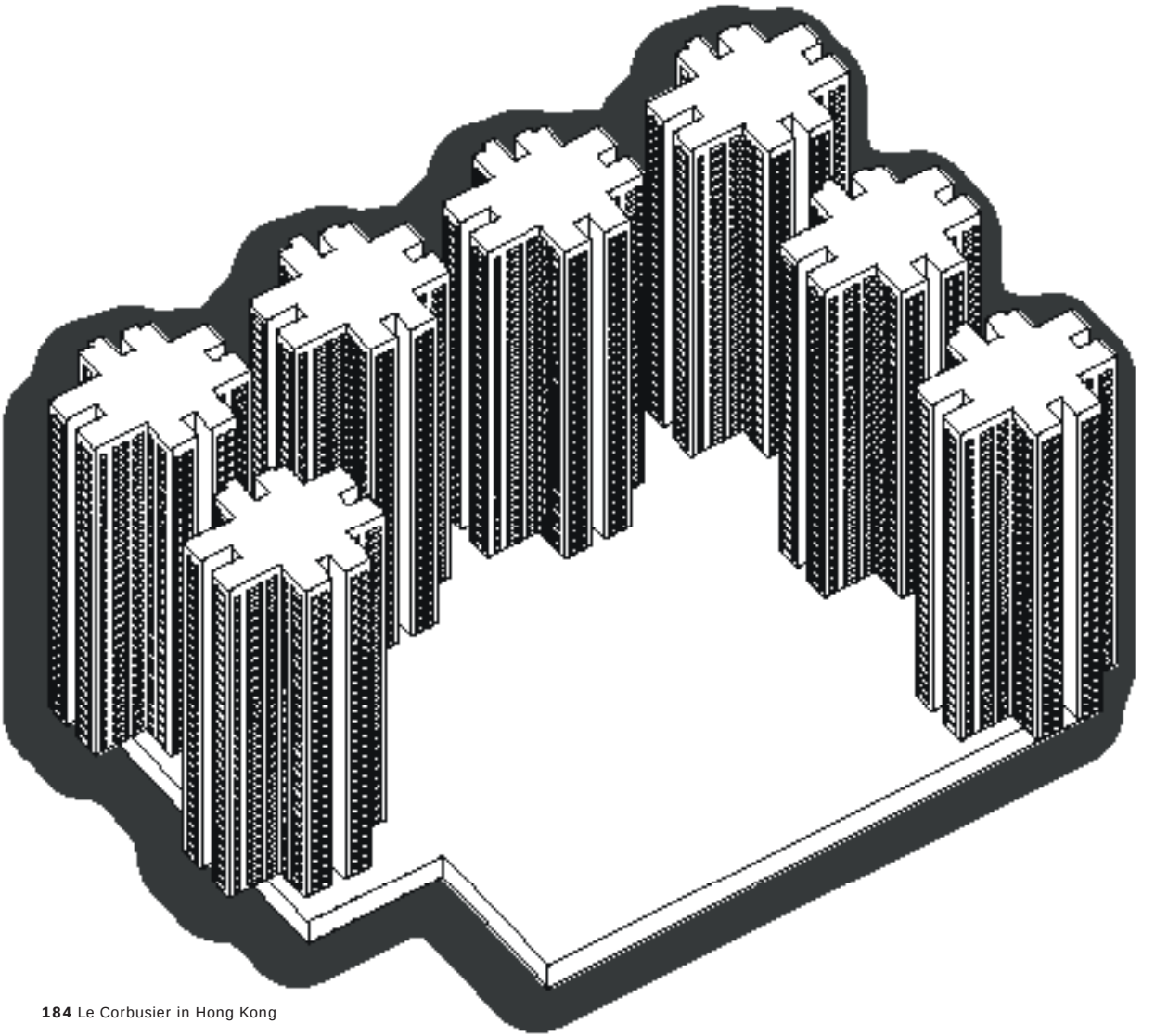
The Ville Radieuse is a city that can be theoretically endlessly extended, it is separated by its functions which underlays the principle of zoning. The space was clearly separated between different uses: housing, business centre, hotels, factories, warehouses, heavy industry and satellite cities. Unlike the radial design of the Ville Contemporaine, the Ville Radieuse was a linear city, placed on an orthogonal urban grid of highways.[94]

The Ville Radieuse is the consequent continuation urbanism research which started with the Ville Contemporaine and has a density of 1000 inhabitants per ha (at the Ville Contemporaine there were only 300 inhabitants per ha) designed with the modern approach of hygienic and quality of life. The entire residential city is standing inclusively on pillars, so that at the ground floor a free circulation and abundant green space can accrue.[95]

Already in 1929 made Le Corbusier first sketches for Rio de Janeiro were new urban elements could be found such as viaducts and housing slabs on pillars. It was a different approach and stays in contrast to his early plans, for that reason this designs and ideas are closer examine in the chapter megastructure as these designs fulfil requirements to classify them as megastructures.

94 Ibid., p.396.
95 Ibid., p.398.





184 Le Corbusier in Hong Kong

Le Corbusier's concepts of urban form and his ideas concerning high density and urban living are worth studying as similar approaches in Hong Kong can be found. The Hong Kong housing estates are probably the most extreme realization of Corbusier's Ville Radieuse. For Hong Kong it was the necessary consequence to cope with the housing shortage which was the result of the growing population.

For Le Corbusier on the other hand it was a question of sustainability and the desire to create a healthy living environment at that time. It was criticised by urban theorists for being unsuitable in terms of urban microclimate. As the drawings show the shadow which the sun would cast on the 21st of June at noon, the layout of the residential blocks would create a lot of overshadowing zones, so that the residents would not receive any sunlight for a long period, especially in winter. But what was not predictable at first, was that exactly this concept would work ideal in a tropical and sub-tropical climate zone, such as in Hong Kong. These shadow zones and wind channels create public spaces and living conditions which are a relief from the hot climate, they create an even more ideal microclimate. The *Ville Radieuse* with its skyscrapers and residential blocks was designed to increase the sunshine, fresh air and greenery for the city dwellers and has the same background as the podium and tower typology in Hong Kong, which was created with the same intention to increase the lighting and ventilation of the flats.

Also the development of the underground transportation infrastructure, like Le Corbusier's *Ville Contemporaine*, changed the urban form of Hong Kong, even though the glorification of automobiles does not apply. The *Ville Contemporaine* could have been used as a possible role model for Hong Kong's town planning. With its cruciform profile which shows close similarity to the existing housing developments in Hong Kong. But these cruciform buildings are not the real key components of the urban concept by Le Corbusier, it is more the space between the towers and the openness of the ground plan. This is the crucial element which is missing in Hong Kong's town planning, which at the same time kind of denies the comparison with the concept of *Ville Contemporaine*.

The *Plan Voisin* that erases most of the residential areas on the right bank of the Seine in Paris, leaving only monuments behind which even lost their meaning with the context, can also be observed in Hong Kong, where whole street blocks were demolished and replaced by 'more efficient' towers and podiums. Although some buildings, such as small Tong Lau's remain as monuments, most of them isolated in the middle of the city. But also Le Corbusier's towers in the park, which are placed amongst gardens, develop to towers in a dense urban environment in Hong Kong, which are sometimes even disconnected islands in the existing urban structure.

CONCLUSION

Some of this utopian projects may be linked to developments in Hong Kong but it can be noticed that it is not based on these ideas and concepts. For Hong Kong it was necessary to find prompt solutions to accommodate the growing population, and as land is scarce there was no other possibility than to build vertical. This urban forms and movements were probably not used directly as theoretical references, but as possible role models.

Hong Kong's New Towns are based on the concept of the English Garden City but have developed over the years and can now be seen as own way of Hong Kong urbanization. These New Towns in Hong Kong are closely related to the infrastructure network as new housing estates are usually built above or in close proximity to MTR stations.

The most evident impact on the urban development of Hong Kong in terms of typology can be seen in the Ville Radieus even though there is no explicit reference to Le Corbusier's theory or model, the similarity is highly astonishing. But also parallels in the way how the Plan Voisin deals with the existing urban structure of Paris and the way how the Urban Renewal Authority today develops quarters in Hong Kong can be observed.

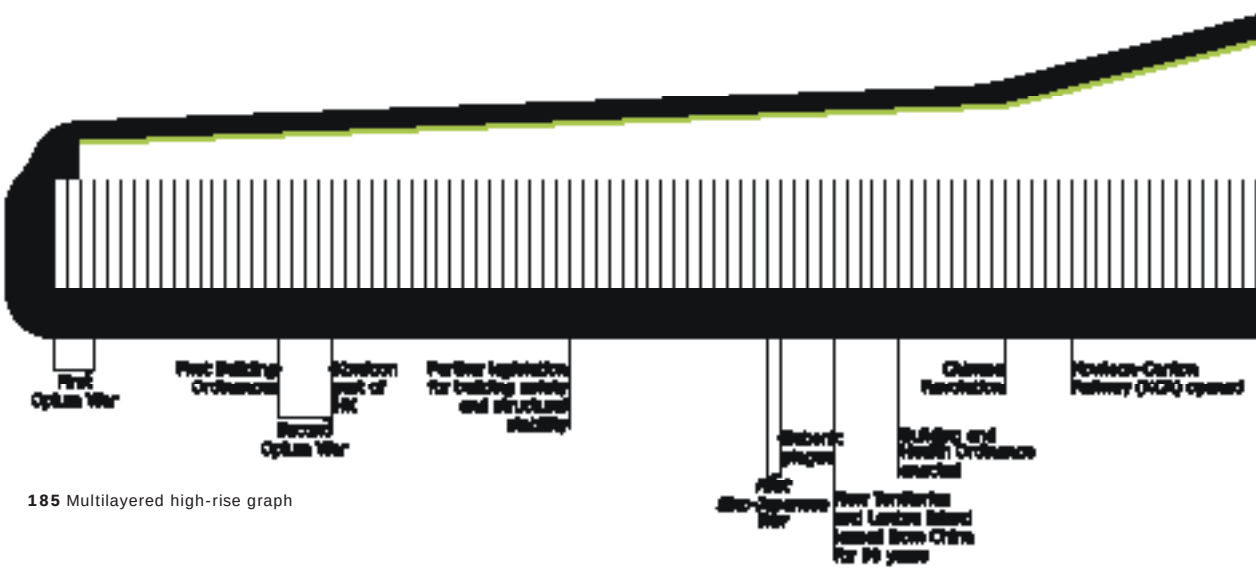
Today high-rise housing is reconsidered as a suitable design solution in the current context of population growth. It is evident that traditional design methods are no longer suitable under these current conditions, and it is necessary to find a new way to design high-density living environment. It should be possible to combine the dream of a rural house with private space and the necessity and reality of living in a dense urban area.

For that reason we want to find a new way to combine public and community space with housing developments. High-density and high-rise living is becoming the norm in Hong Kong and also for our projects it is the way to handle space. For one project this high-rise developments form the pillars for a public community space in the sky, for the other project high-rise buildings form the framework for a new way of combining public space and living near the harbour front. Both projects aim to integrate and combine housing and public space, one towards the sky, the other towards the water.

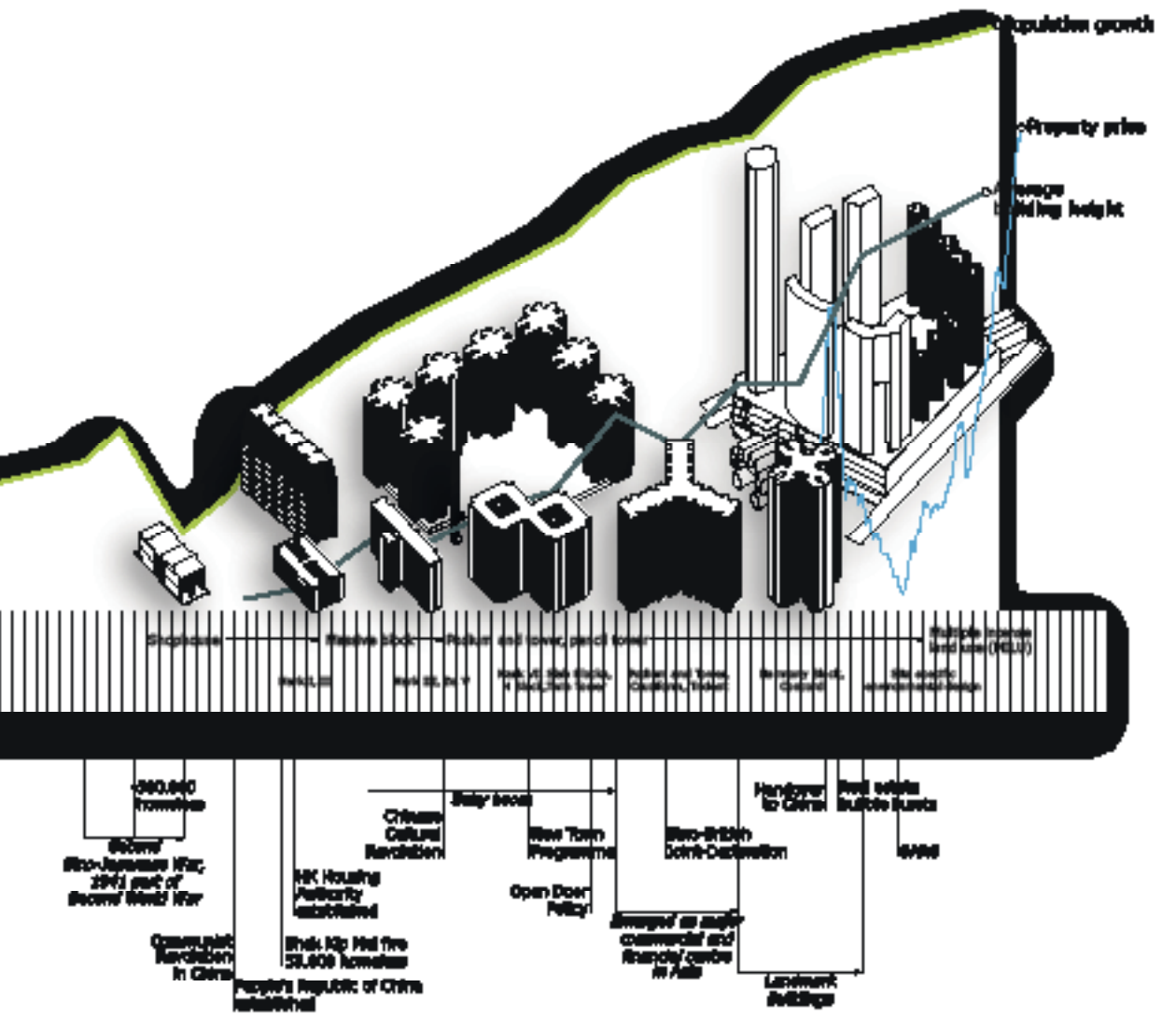
In most housing estates today community or open space is only provided in one large area, mostly at the podium, as it is more efficient and less expensive. For most developers this is more important than livability and social cohesion, but in our projects we want to provide different smaller spaces instead of only one communal space to enhance neighbourhood, form smaller communities and step back to former social bonds of Chinese society.

For that reason it is important to investigate the different ways of living in Hong Kong which were common in the past and which can be found today.

GRAPH HIGH-RISE



185 Multilayered high-rise graph


Population growth
Property price
Average building height
Baby boom
Chinese Cultural Revolution
New Town Programme
Open Door Policy
Sino-British Joint-Declaration
Handover to China
Asian crisis
Landmark buildings

S

HABITAT

The city and its underlying structure is the visible part which is for most visitors the only space they can observe while being in Hong Kong. The private living space on the other hand remains in most cases unseen, but it is this space where a fundamental understanding of the culture is possible. For architects the way how people inhabit their living space is always interesting in order to learn more about culture, lifestyle, preferences and approach of living.

The Chinese relationship to space is different than the European one. Therefore it is important to understand how and why people live under these circumstances. In the previous chapter we already investigated that Chinese people are used to cope with crowded living conditions and high density. We analysed high-rise buildings and their surrounding environment, but what does the smallest unit – the flat – look like in Hong Kong? Due to the mass housing approaches the living environment and with it the related space changed over the time, today the key issues are efficiency and affordability.

In order to find new architectural solutions for Hong Kong we compare the way of living before the British occupied the territory to the way how people live today in the territory. The main aim is to understand the people of Hong Kong and see how they live in their private space. For that we concentrate on different types of accommodations even on anomalies.

Due to the shortage of buildable land and the government land sale policy, housing prices in Hong Kong are extremely high. Comparing Hong Kong's and New York's rent prices with each other it reveals that the price is 14.75 per cent[1] higher. This also indicates the housing price index, where Hong Kong leads the statistic as in 2012 the housing prise rose 23.6 per cent.

Another statistic even reveals that the real estate prices in Hong Kong have risen over 45 percent since 2008, which also indicated that Hong Kong has maybe the biggest housing bubble in the world. The main influx of money comes from mainland Chinese investors as for them Hong Kong has the most attractive real estate market in the region. As the government introduced a new tax duty experts assume that the prices will cool down in 2013 and return to a more muted growth.[2]

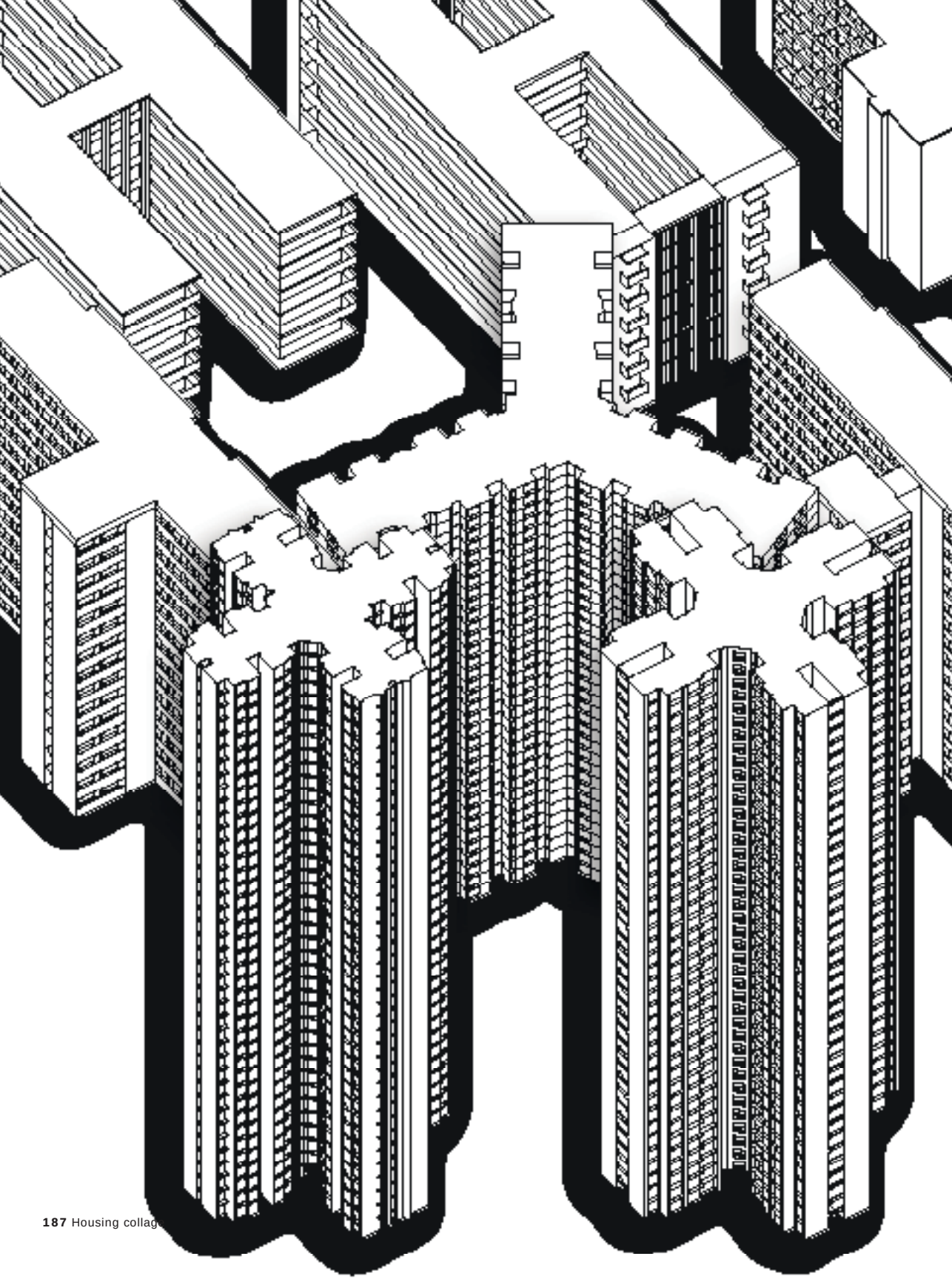
But not only housing is at its premium, the Gini coefficient[note14] shows that Hong Kong has statistically one of the highest income disparities in the Asia Pacific region, with a Gini coefficient of 0.537 in 2011.[3] This emphasizes the facts that there are social inequalities and unfairness in the distribution of resources. Another report of 2012 shows, that about 1.3 million people or 19.6 per cent of the population live below the poverty line.[4] These general conditions make it quite difficult and sometimes even impossible for people to afford decent accommodations.

But how does that affect the housing market?

There are different anomalies which emphasize the unequal conditions of Hong Kong's residents. In this chapter the aim is to investigate these in order to get an overview of the housing issue in Hong Kong.

186 Flat of a married couple

1 Cf. Numbeo 2013.
2 Cf. Rapoza 2013.
3 Cf. Hong Kong Government: Half-yearly Economic Report 2012, p. 1.
4 Cf. Hong Kong Government: Hong Kong Poverty Situation Report 2012, p.ix.



187 Housing collag

The Public Rental housing stock in 2013 was 766.300 units which houses about 2.1 million people, these are about 30 per cent of the population.

But not all residents are eligible to rent or buy a public housing flat. The applicants and their family members must undergo comprehensive means of tests covering both, income and assets. It is also important that at the time of allocation, at least half of the family members included in the application must have lived in Hong Kong for seven years and all family members must still live in Hong Kong.[5] That means that new immigrant families may have to wait seven years because they are regarded as non-permanent residents, while non-elderly single people have to wait for even more than ten years. This is the result of the government's effort to control demand by limiting the supply of public housing for single people. Although the housing authority has promised to house public housing applicants within three years, many of them have to wait much longer.[6]

The demand for public housing is enormous. In 2012 there were around 116.900 applications and in total around 300.000 people waiting for public housing. At the same time the government only promises to build 15.000 public housing units per year but in 2012 only 10.000 units were constructed, all of them in Kowloon.[7]

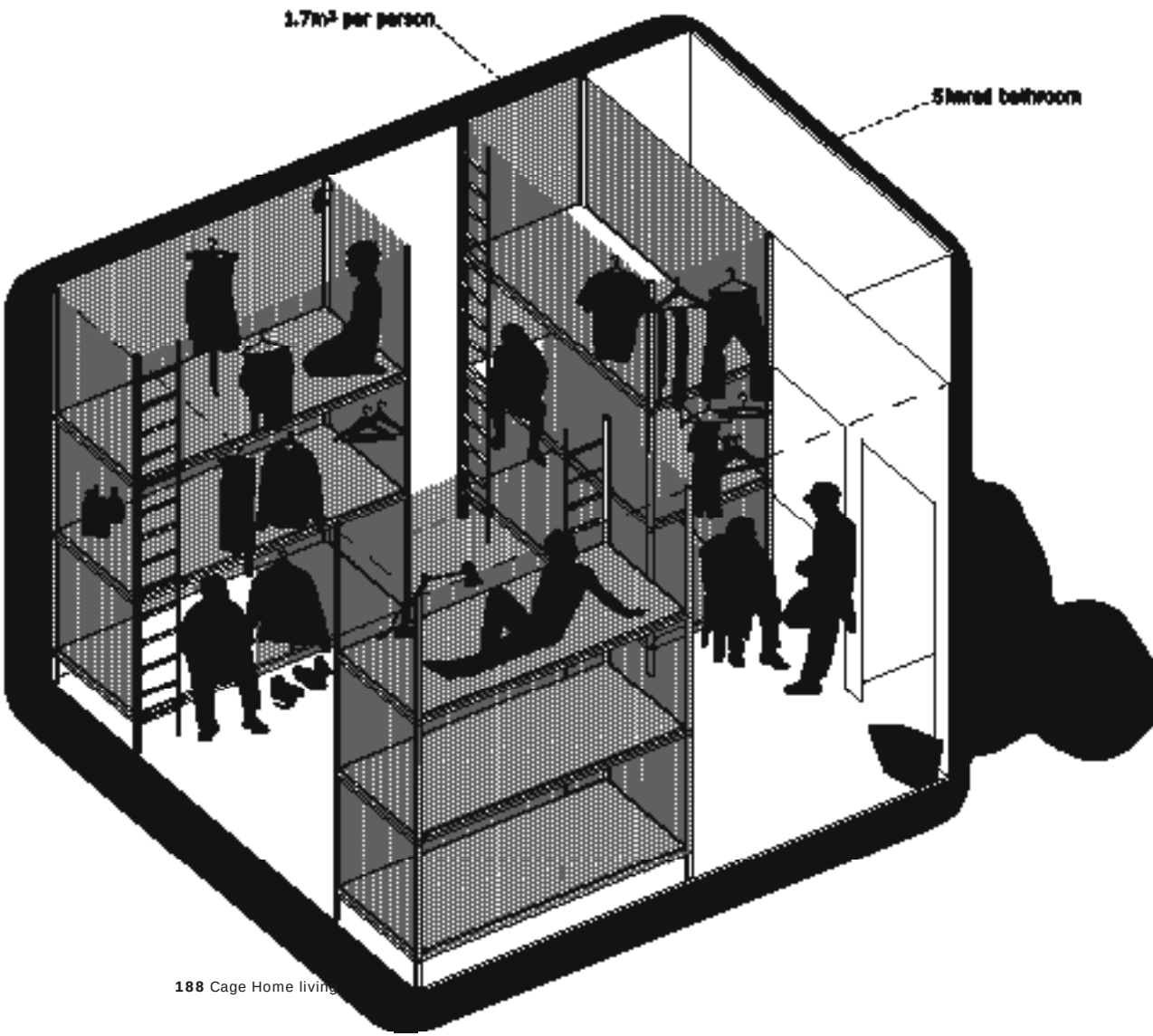
This suggests that a large part of the population in Hong Kong does not have the possibility to obtain public housing. This forces residents to live for a long period of time in poor living environments while they wait for public housing.

But where do these people stay?

Different means of accommodation facilities are available in Hong Kong, depending on how much money someone has. Different anomalies have been formed over the time due to housing shortage. One of the most famous and arguably most extreme and inhumane is the cage home.

5 Cf. Hong Kong Government: The Facts Housing 2012, p.1.
6 Cf. Society for Community Organization 2011, p.10-11.
7 Cf. Hong Kong Housing Authority 2013, p. 4-6.

Mr and Mrs Wu live in a small cubicle in Sham Shui Po in Kowloon, which gets extremely hot in the summer. As Mr Wu said, *"There is only one window, but I dare not open it, as it is full of rubbish outside. The temperature is well over 30 degrees now. I have to go up to the rooftop to sleep every night. It is just too hot to sleep inside."*[8]



188 Cage Home living

It can be said that those are the urban slum dwellers, the underprivileged group who live in dire conditions, in cages of only 1.7 square metres. Two or three enclosed iron mesh cages are stacked on top of each other. These bunk beds are a portion of an apartment that people share with up to 20 other men, for HK$1.300 a month. Most of these residents are the working poor, low-income and low-skilled people, mainly male. Also elderly as well as children of new immigrants, or people suffering from mental illnesses and other socially excluded groups. Beyond the small size of the dwelling, residents have to cope with poor hygienic conditions, poor ventilation, and extreme heat during the humid summer months. Small apartments are partitioned into small cubicle dwellings, many of them with shared toilet and shower. There is not even a cooking facility and often very poor electric installations with wires hanging down from the ceiling. Most of the cage homes are located in the old urban districts of Hong Kong such as Sham Shui Po, To Kwa Wan, Mong Kok and Tai Kok Tsui.[9]

189 Man sleeping in his 1.7m² cage

190 Shared living with strangers

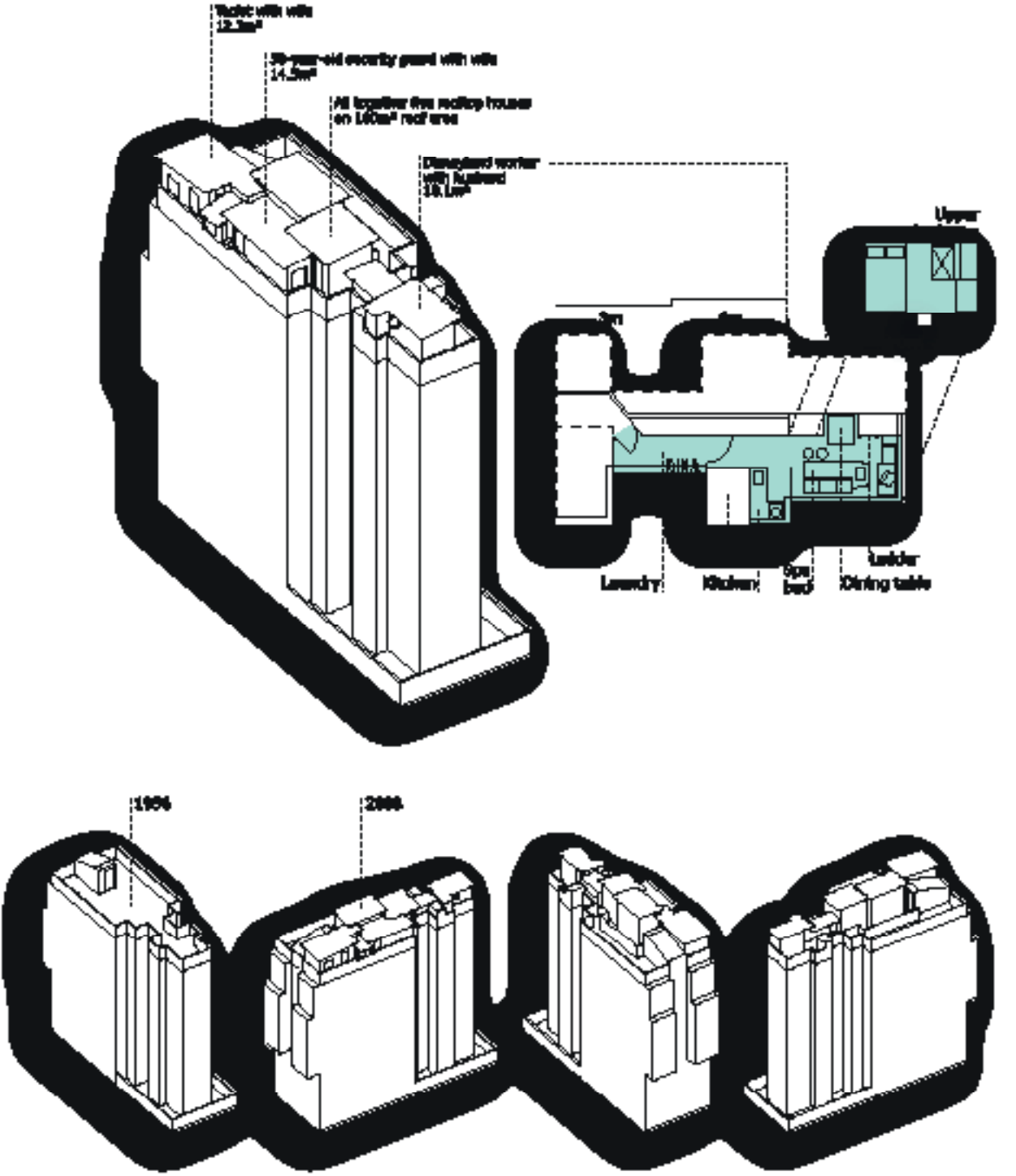
Cage dwellings first started to appear in the 1950s to 1960s, as immigrants from mainland China flooded the region following the Chinese Civil War, creating a demand for low cost, bed space for low wage earners. The Census of 1961 reports how the conditions were at that time. 3.1 million were living in Hong Kong, *"of whom a million were homeless: 511.000 slept in temporary structures, 140.000 people shared beds in shifts, 69 000 slept on verandas, 56.000 on roofs, 56.000 in garages and stairways, 26.000 in boats, 20.000 on the street, 12.000 further down in cellars and a further 10.000 even deeper down in caves – altogether a quarter of the urban population"*.[10]

At the same time the government started to build public housing estates, but this increase in population by Chinese migrant workers could not be handled. As landlords wanted to make more money per square metre, two to three of the iron cage bunk beds were put into the apartments. Fifty years later they are still part of Hong Kong.

In 2011 it was estimated that around 90.000 people in Hong Kong live in inadequate housing according to a study published by the government. This involved a total of 201.000 people or about three per cent of the total population who live in poorly housing conditions. These poor housing conditions include cubical apartments, cage homes, rooftop houses and small sub-divided and partitioned units.[11]

Sixteen-year-old Wing lives in a neighbouring cubicle with his parents and younger sister which costs them HK$ 1.500 per month of the household's monthly income of HK$ 4.000. Wing says, *"After School, we bring two chairs up to the rooftop and do our homework. We don't have a desk at our home, so we use the chairs as desks. My mum, sister and I stay up at the roof to eat and chat every evening. Sometimes, we play games up there too, and then go back to our cubicle after 11pm to sleep. Yes the roof is full of trash, as long as you don't look at it, it's no problem."*[12]

8 Society for Community Organization 2011, p.10.
9 Cf. Thomas 2009.
10 Wong 2000, p.90.
11 Cf. Society for Community Organization 2011, p.10.
12 Ibid., p.10.



191 Five rooftop dwellings on an idle shop house roof

Rooftop structures are temporary structures built without the formal approval of the government. Most of these buildings are located on old dilapidated tenement buildings, built by people who either intend to live in them or to sell or rent them for profit. Some are built of concrete or bricks, but others are merely constructed of wood, metal sheets and other flimsy materials. These structures are illegal and disapproved by the government, but simultaneously they were for a long period of time tolerated and recognized. The government even charged property taxes and water charges from the residents. In a way the government has basically adopted a policy or strategy of tolerance toward the existence of these illegal structures, as they can actually serve as a buffer to the housing shortage.

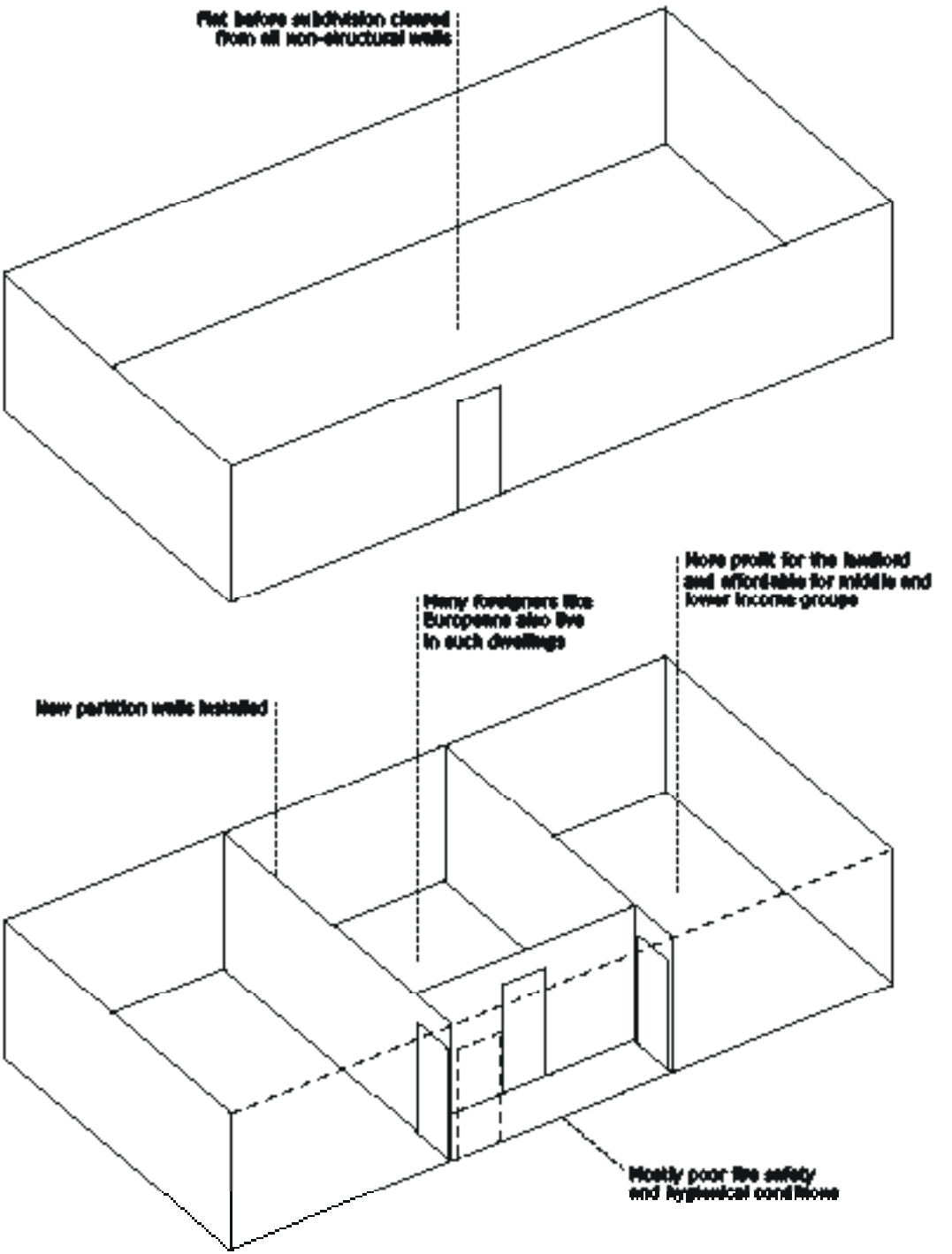
But who lives in such rooftop houses?

The main resident groups are likely to be migrants who have yet to be integrated into Hong Kong society.[13] These migrants include those who come from Mainland China, India and Pakistan, who make up the majority of the rooftop population. According to the most recent statistic in 2011 there were some 1.207 rooftop structures. This statistic also indicates that the rooftop dweller had a monthly median per capita income of HK$5.500 and they paid a monthly median rent of HK$2.200. The monthly household incomes of rooftop households are below the general median income for the whole territory, which is HK$10.000. This indicates that the economic status of these residents is generally quite low. Many of these rooftop structures are located in the urban areas of Hong Kong for example Sham Shui Po, Kwung Tong and Tai Kok Tsui. These areas have also a high concentration of old dilapidated tenement buildings, with a low rent for the flats/rooms and are therefore affordable for low-income families.[14] But many of these rooftop dwellers have been creative and make the best out of their limited physical space.

The numbers of squatter structures have been gradually reduced in the recent years by rehousing and clearance programmes initiated by the government. A lot of these illegal structures have been demolished, especially when they received any complaints by third parties or reports of potential dangers caused by these structures. In 1982 the government started to relocate a majority of rooftop residents into public housing and those who did not meet all the criteria were provided with temporary housing in rural areas of the New Territories. But many of the low-income residents prefer to live in the old urban districts instead of moving to the New Towns, where there are less employment opportunities, and they might have to pay higher costs in terms of travelling. This explains why people continue to live in rooftop dwelling, thereby falling out of the public housing *'safety net'* offered by the government.[15]

192 Rooftop dwellings in Sham Shui Po

13 Cf. Wu/Canham 2009, p.246-255.
14 Cf. Legislative Council Secretariat 2012, p.6-10.
15 Cf. Wu/Canham 2009, p.255-258.



193 System of subdividing flats

Another phenomena in Hong Kong are subdivided flats, which emerged due to the rising flat rentals and long waiting list for public housing. In this case flat units are divided into separate units for rental purpose. Commonly involved is the removal of the original non-structural partition walls which are replaced by new partition walls, and are followed by other construction work such as new drain pipes, toilets or kitchen facilities. These works can cause a negative impact on the building safety and hygienic conditions as this building works are often not properly carried out. Due to this circumstances and hygiene problems, structural danger and fire hazards, these flats are considered illegal by the government.

Unfortunately there have already been several tragic fires where subdivided flats have been involved. One of the most recent fires broke out in November 2011 where nine people were killed and 34 injured.[16] But a lot of people in Hong Kong think that such flats have an existence value as they provide affordable accommodation for low-income groups who are not eligible or are on the waiting list for public housing and wish to stay in the urban area close to their place of work or their children's place of study. In recent years the demand for subdivided flats was increasing and now these constructions can also be found in industrial buildings which are not designed for accommodating housing needs.

194 Cramped apartment

16 Cf. Legislative Council Secretariat 2012, p.1.
17 Cf. Ibid., p.1-5.
18 Taylor/Valadez/Yip/Leung 2011, p. 44.

In the first quarter of 2013 the government has engaged an independent research organization to conduct a survey on subdivided flats in Hong Kong. According to this research there are some 18.800 subdivided flats in the territory and it was estimated that on average each flat was subdivided into 3.6 units. Based on this survey there were 66.900 subdivided units in Hong Kong with 171.300 residents. A lot of these units did not have essential facilities such as kitchen facilities, independent toilets or water supply.[17]

"All those rooms have two raised-levels [in order to hide the re-adjusted pipes and ducts], I cannot raise my legs [to move from one level to another]… For those flats that aren't subdivided, people are not willing to rent them to a single old lady" [18] said Aunt Kwok a 73-year-old lady.

But rehousing such a big group of residents is difficult as there are not enough housing units provided by the housing authority and a ban on such subdivided flats would make many people homeless and would bring along a greater challenge. For this reason a new licensing system could be installed as an interim measure but a decent and affordable housing should still remain the goal for the government.

FLOATING COMMUNITIES

The boat based living was common a long time before the British arrived. Floating communities and structures built above the sea which provided accommodation for the Tanka people, who were one of the earliest residents of Hong Kong. Today only remnants of this water based communities are visible. While the large floating communities, which could be found in bays such as Aberdeen Harbour or Causway Bay Typhoon Shelter, have disappeared, there still remains one traditional way of placing activities to the sea, the stilt house. In Tai O a small fishing village located on Lantau Island, this way of housing still exists.[19]

Today Tai O is one of the main tourist attractions in Hong Kong, but before that it was a village traditionally specialised in fishing and salt production. The houses are built elevated above the sea on bamboo stilts making each of these structures unique. It is a different way of living in this remote area, far away from the hustle and bustle of the urban area of Hong Kong.

195 House on stilts in Tai O

19 Cf. Shelton/Karakiewicz/Kvan 2011, p.136.

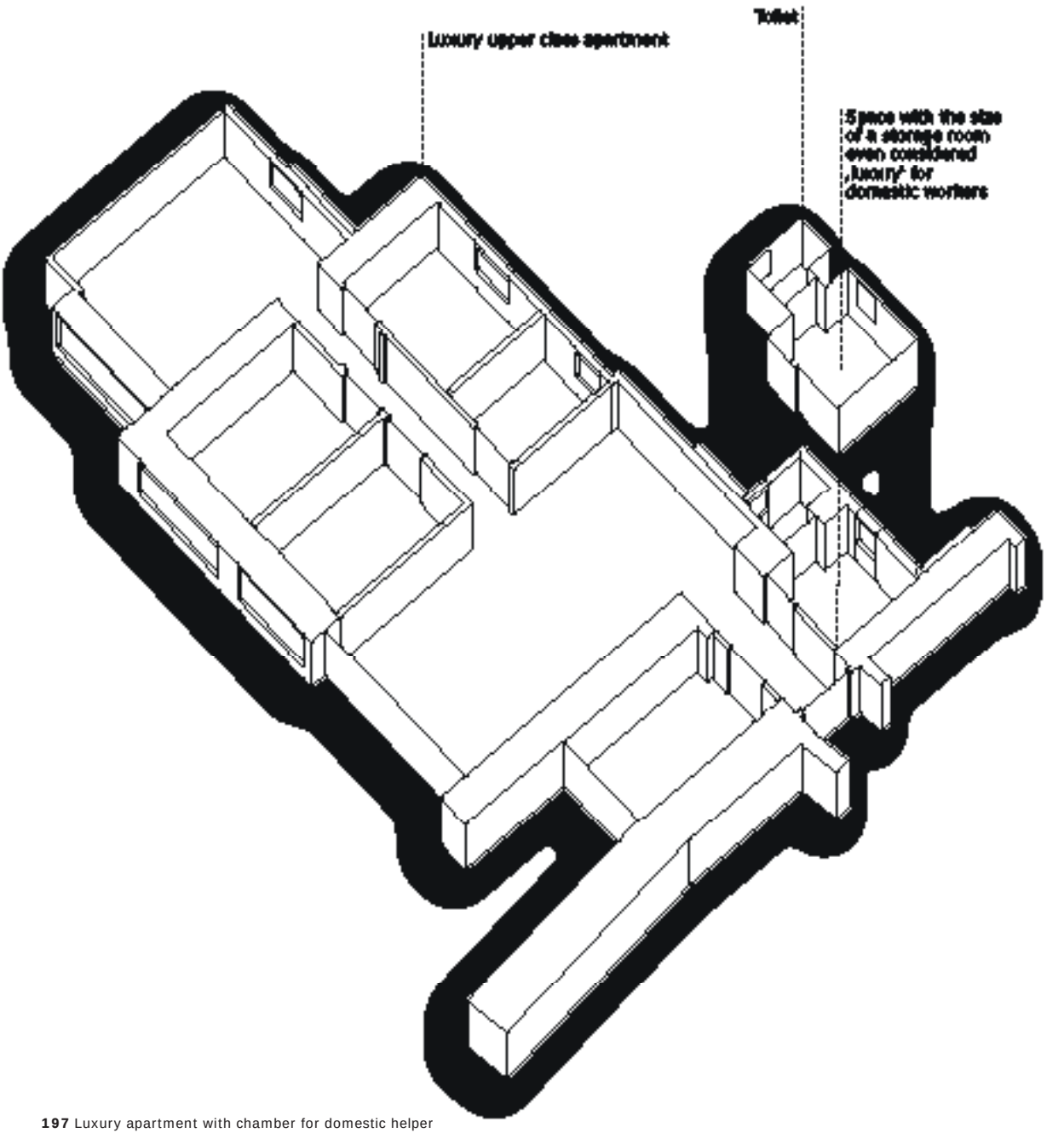
HOMELESS

196 Homeless man sleeping on a footbridge in North Point

"It has been said that in Hong Kong only multi-millionaires and the homeless live on the ground floor." [20]

Sadly enough there are still some people living or sleeping in the streets. No one knows for sure how many people live in the streets of Hong Kong but social workers estimate that there are around 1.000 people who have been reduced to sleeping in cardboard boxes on the pavement. Many of those people cannot afford to pay their rent, or they have personal problems such as drug or alcohol addiction and mental illnesses and many of them even prefer sleeping in the streets rather than living in cubicles, cage homes or remote areas. These people can usually be found in Tsim Sha Tsui, Mongkok and Sham Shui Po and remain *'invisible'* most of the time.[21]

20 Wong 2000, p.92.
21 Cf. Ngo 2013.



197 Luxury apartment with chamber for domestic helper

Hong Kong is home to one of the richest men and women in Asia. There live about 114.000 millionaires in Hong Kong and the Forbes Magazine listed even 50 billionaires who are Hong Kong citizens.[22] These people live in luxury apartments, most of them situated on Hong Kong Island where the majority of them employ foreign domestic helpers.

The majority of these domestic workers are women making up approximately three per cent of Hong Kong's population. Around 292.000 foreign domestic helpers, mainly from Indonesia, Philippines and Thailand, work and live in Hong Kong. These women are working six days a week and are not even paid the minimum wage, they currently receive a minimum of HK$4.010 per month.[23]

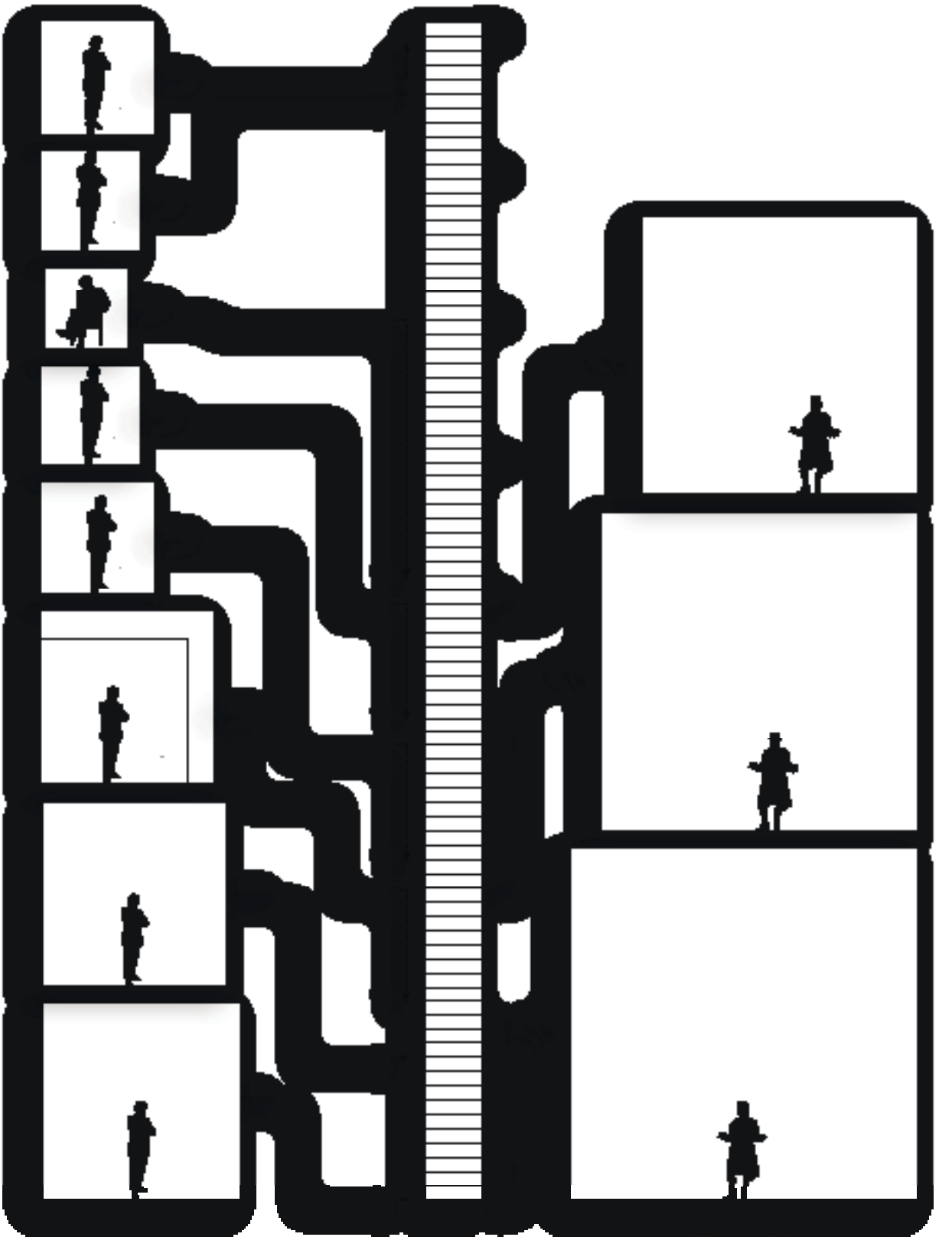
The domestic workers are most likely to live in the employer's home, some of them have their own small room but as living space is rare in most cases they either need to sleep in the living area, kitchen or they share a room with the children. This shows that they don't really have a personal space, for a lot of them the bathroom is the most private area, into which they can retreat themselves.

So it's not surprising that these women use the public space on their day off in order to meet friends and share news as the employer's residence cannot fulfil the basic need for private space.

"You can be woken up any time of the night just to get a glass of water, living outside is what all domestic helpers want - it means you can finally get some rest" [24] said Marie Reyes, a domestic worker in Hong Kong.

198 Domestic worker protesting

22 Cf. Forbes Magazine 2013.
23 Cf. Shadbolt 2013.
24 Ibid. 2013.



199 Average living space comparison

Not only foreign domestic workers have limited space. In Hong Kong dense living is the normal course of life. This is not only visible when walking in the crowded streets, it's even more apparent when looking at the average living space. In 2013 the average living space in Hong Kong was 13 square metres per person[25] this is lower than in most parts of the developed world. In lots of these households the whole family live in one apartment, as the average household size is 2.9 people[26], which indicates that there is only minimal privacy.

"Maybe people in Hong Kong are used to not having a private space, so we don't mind not having one… and we're not desirous of it… when you really need a private space you can actually create one… even a 24-hour Cha Chaan Teng (Chinese eatery) can be a private space."[27]

According to C.Y. Leung, the Chief Executive of Hong Kong, in 2010 85 per cent of apartments in Hong Kong were less than 56 square metres. A statistic of 2013 reveals that 46.2 per cent of the population who live in public rental housing were living in flats with 30 to 39.9 square metres and only 18.5 per cent had an internal floor area of more than 40 square metres. This is different to the private market as 39.1 per cent of the owners live in 50 to 59.9 square metre apartments and 30.6 per cent were living in 40 to 49.9 square metre flats.[28]

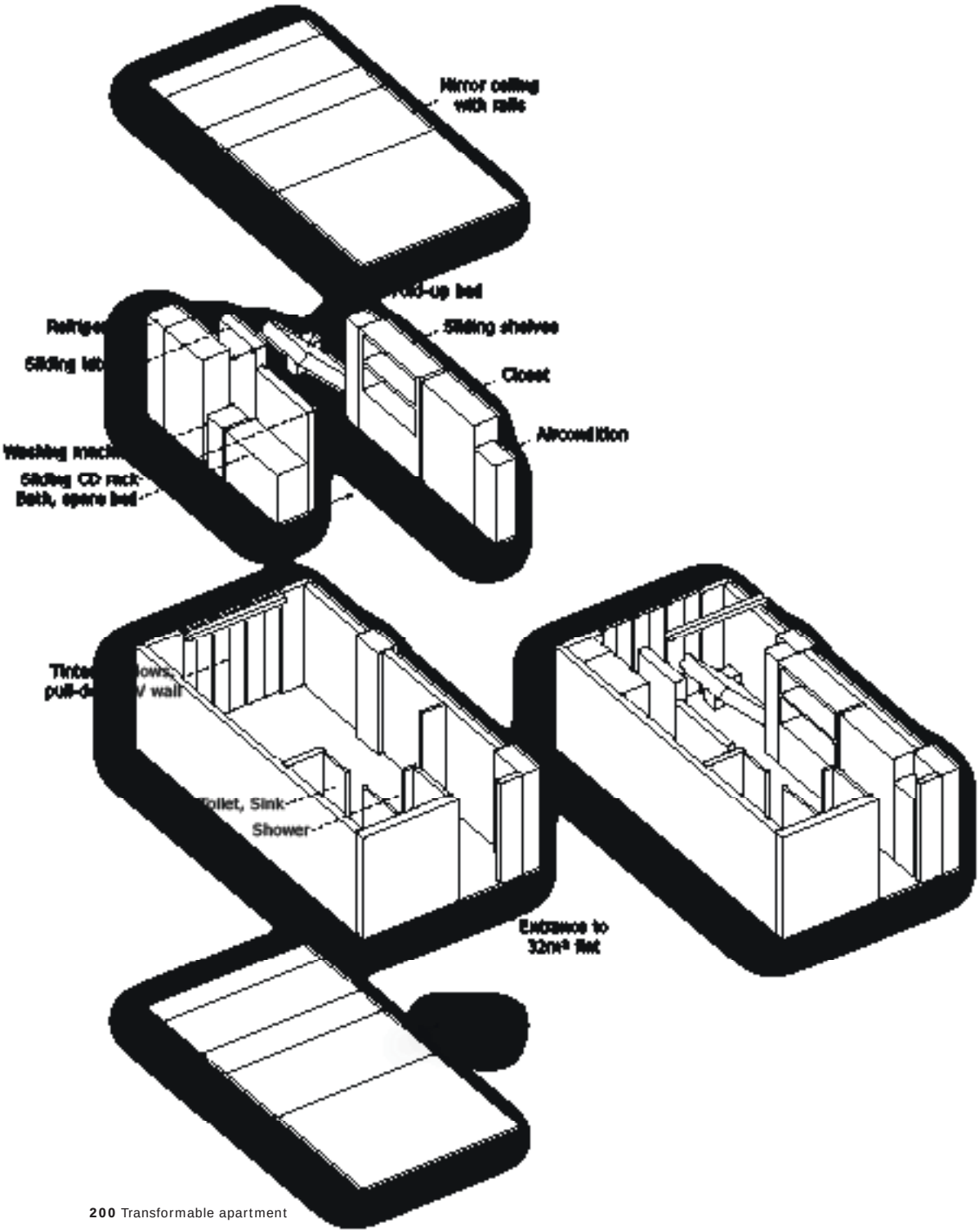
On average a Hong Kong family now moves into a 40 square metre flat in a relocation area, in the New Territories with at least three people but in most cases this number is much higher. This impacts also the sexual life of the residents, where social and sexual restrictions are a daily basis. For this reason sociologists consider Hong Kong as one of the most sexually repressed places on earth. This is unveiled at Lantau Island, where rooms are rented by hour to young couples, office workers or even married couples who lack their own private space.[29]

For most of the Hong Kong people the flat is only a place to sleep, as many of them busily work the whole day and don't spent that much time at home. As space is already narrow people compensate for their limited privacy by creating their own private space within the public realm, making use of the streets, restaurants, shopping malls and sport facilities both for meeting friends and for having time for themselves. The public space becomes their living room, as at home there is not even enough space to invite friends.

"I wasn't experienced and I was so happy that I invited my colleagues to my home. The gross floor area was merely 300 feet (27.8 square metre), it was so cramped that … everyone sat in rows as if they were at the cinema… they said I had overestimated myself because I invited my friends to such a tiny flat, so since then I've never invited anyone to my home." [30]

In order to understand Hong Kong it is important to recognize that this city has a vibrant street space and is full of life and activity. This occurs because of its density and the lack of private space at home.

25 Hong Kong Housing Authority 2013, p.6.
26 Ibid., p.3.
27 Taylor/Valadez/Yip/Leung 2011, p. 46.
28 Cf. Hong Kong Housing Authority 2013, p.3-6.
29 Wong 2000, p.92-93.
30 Taylor/Valadez/Yip/Leung 2011, p. 45.



200 Transformable apartment

201 People and their homes

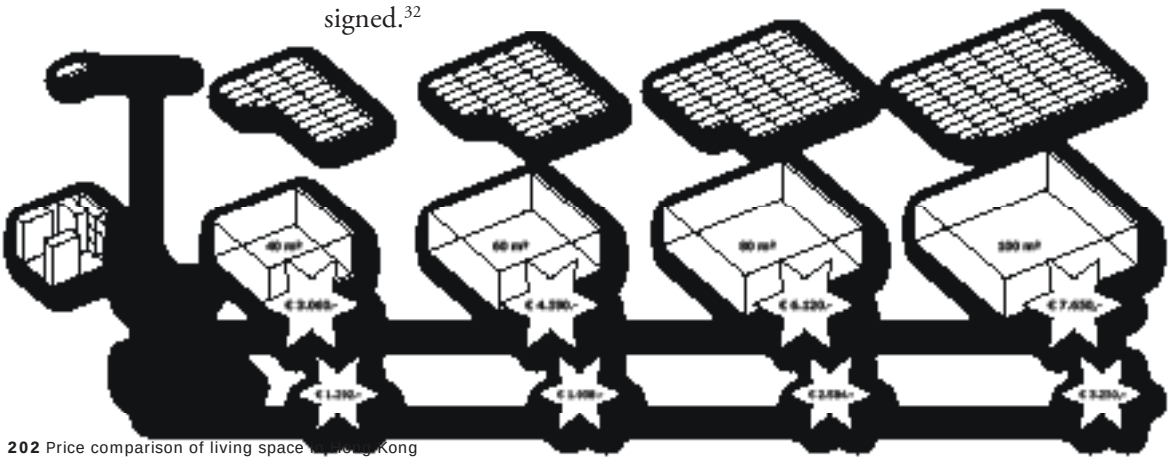
Space is used well in Hong Kong; even in the smallest apartment people have different multifunctional and flexible furniture in order to make the most out of their living space. For example, the dining table is not something that is fixed in a lot of flats, as it would occupy too much space. For that reason a folding table is the most popular choice. But also different kinds of storage space and dual uses can be found in apartments, especially at low-income households. In most of these apartments nearly every single centimetre is used for storage.[31]

One of the best known ways of adapting and transforming small space is architect Gary Chang's apartment. His flat has only 32 square metres but 24 different configurations, all possible by sliding panels and walls. It is the high-end variation of a metamorphic apartment which offers endless variations and shows how flexible and multifunctional space can be designed.[32]

Flexibility and the multiple way of using space is really important in Hong Kong, it's a way how people themselves make density work, by adapting their behaviour and negotiating their given space.

Rent prices

But not only the relationship between the sizes of apartments is interesting, also the comparison between the prices per square metre reveals a disproportion. By comparing the cots per square metre, the rent price for a cage home with only 1.7 square metres, which is HK$ 1.300, can often surpass the price of a luxury apartment. As cage homes are HK$765 m²/month and private flats are HK$189-323 m²/month.[33] This reveals that the price for a cage home is not justified as it is more than twice as much than the price for a private apartment.



202 Price comparison of living space in Hong Kong

31 Cf. Rooney 2003, p.158.
32 Cf. Designboom 2013.
33 Cf. Hong Kong Housing Authority 2013, p.3-6.

203 Peace for the deceased in Hong Kong

Despite Hong Kong has such a high density, people have a high degree of social well-being as Hong Kong has some of the best indicators of population health among wealthy megacities.

For example life expectancy at birth is 82.5 years compared to 80.6 years in Greater London and 80.9 years in New York.[34] Hong Kong is also one of the safest cities in the world with a murder rate of only 0.7 homicides per 100.000 inhabitants recorded in 2009.[35] A reason for this could be the high density, as in an environment like Hong Kong you are always seen by various people and therefore never unattended. Hong Kong is not only one of the safest and most peaceful cities, it has also one of the happiest inhabitants, which is based on the Lingnan annual happiness index.[note15]

To die in Hong Kong

In a city with more than seven million people and a limited land area handling the dead is a delicate matter. For that reason the government decided to locate cemeteries and columbaria on steep hillsides which are otherwise unusable. These places are consistent with the principles of Feng Shui, even the Christian cemeteries are nested into hillsides typically offering views across the sea.

204 Terraced cemetery

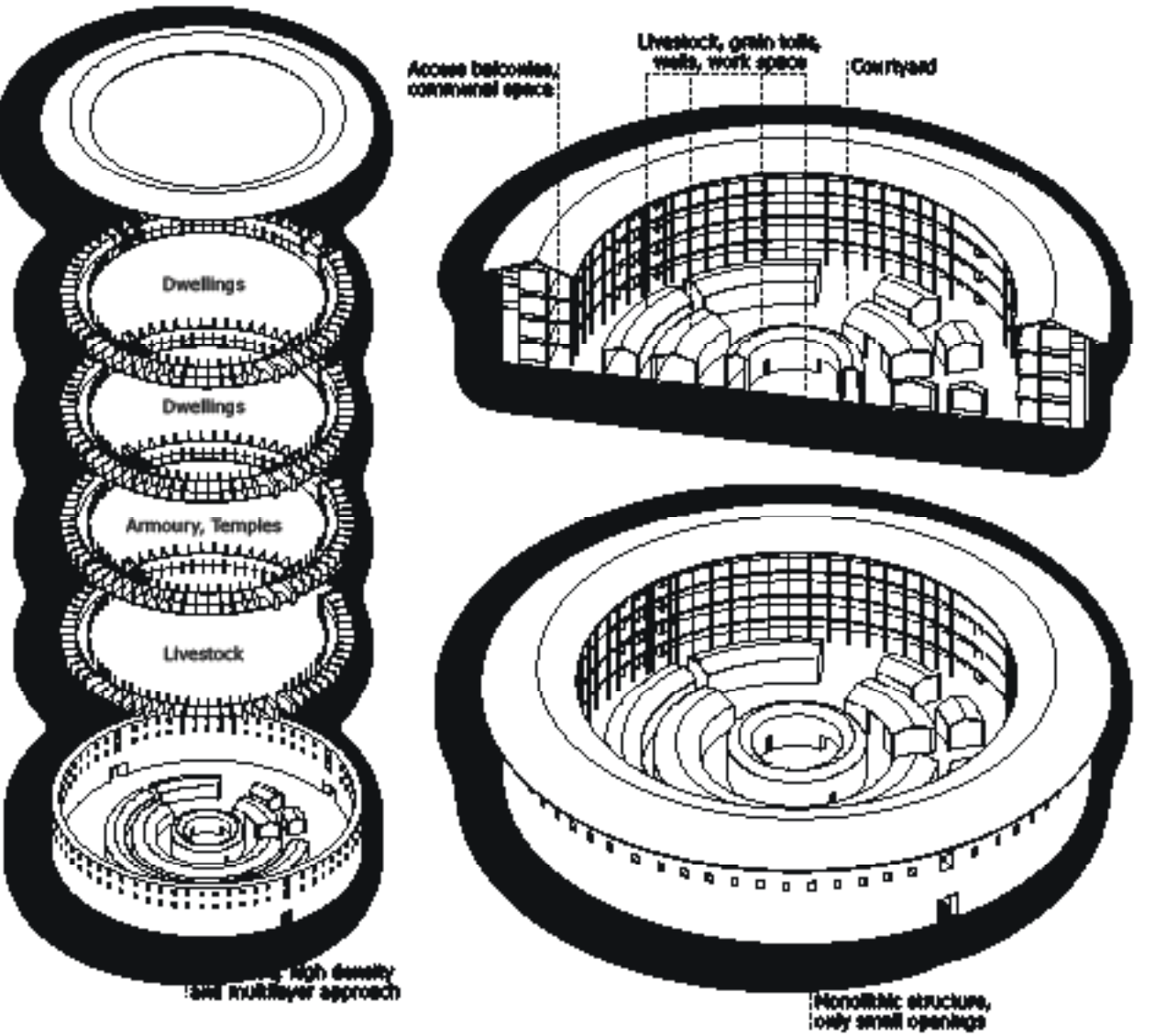
205 Aberdeen Cemetery

In Hong Kong there is no permanent public grave space available, for that reason the bones will be transferred after six or seven years followed by a cleaning or cremation of the remains, in order to free up the grave.[36]

Cremation has been heavily encouraged by the government since the 1960s, many people in Hong Kong were forced to abandon burials due to land shortage, but now even the space for cremated ashes is getting scarce. At the moment around 90 per cent of all dead people are getting cremated but it's even not enough space to bury your beloved family member. It is estimated that around 50.000 families preliminary store their relative's remains in funeral homes while they wait for a free space in one of the city's public columbaria.[37]

In Hong Kong a columbaria is a high-rise building designed to house the cremation urns in niches, these buildings have a capacity for more than 90.000 urns. But by comparing the figures of deaths it is obvious that the space may not be enough as in 2012 43.300 people[38] died in Hong Kong. That is maybe the reason why the cemetery authority even made a film where they advertise to strew the ash instead of cremating.

34 Burdett/Tylor/Kaasa 2011, p. 12-13.
35 Ibid., p. 20-21.
36 Cf. Shelton/Karakiewicz/Kvan 2011, p.142-143.
37 Liu 2009.
38 Hong Kong Government Census and Statistics Department 2013.



206 Tulou, Fujian

To understand the habitat of Hong Kong better it is interesting to investigate the past of Hong Kong's settlements. Chinese or better the Hong Kong perspective is important as the understanding of habitat diversifies to that of the Western approach. Different ways of settlements can be found all over China, but there are two predominant forms, the Chinese courtyard house and the walled settlement. In this thesis the walled settlement is closer observed as it was the common form in southern China and Hong Kong.

Walled Settlements

Walled towns and houses have been a part of Chinese culture ever since, as the traditional form of the dwelling in China is that of a courtyard house. An arrangement of enclosures arranged on two or four sides of a rectilinear courtyard, typically accessed on the southern edge by an opening to the outside world. These courtyard houses, with their enclosing walls and single openings, are itself a prototypical form of a walled village themselves. Concentrated together in clusters, house forms, for example, the *hutong,* which is the traditional Beijing neighbourhood, long, largely anonymous walls punctured by periodic openings which gain access to family courtyards.

In southern China the courtyard house was less common. As in the south-eastern coastal region the walled villages were the common form, perhaps reflecting the prevalence of pirate activity.

The village house was often a single rectilinear structure with openings mostly on the southern side. These houses formed villages with defensive edges even if not surrounded by formal walls. These villages and neighbourhoods are important social units in Chinese society, in addition to being defensive structures, walled villages were also self-managed social units.

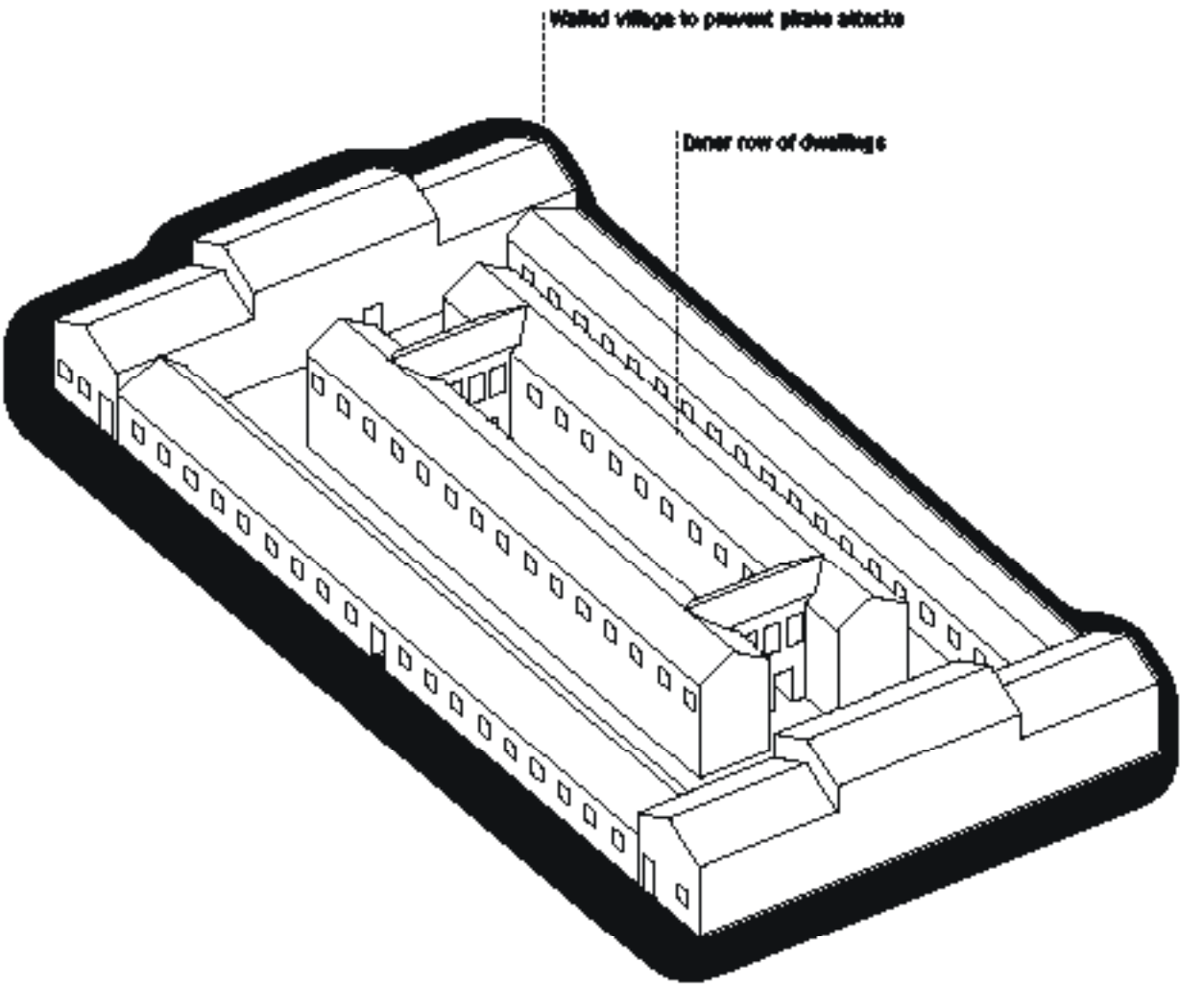
The village elders and the *kaifong* (a term used in Hong Kong for the village committee) maintained customs, organized education, administered basic justice, regulated commerce and oversaw ritual duties. A distinctive form of a walled village that emerged in southern China is that of the Hakka people. The Hakka immigrated to the region and found themselves in conflicts with the indigenous population. For that reason the Hakka built defensive structures to live in and store their goods. Rather than building a wall around individual dwellings, the Hakka created a monolithic structure of three or more storeys in which the whole clan could live, today better known as *Tu Lou*. Their tenement structures accommodated the artefacts of subsistence on the lowest levels: livestock, grain, tools, wells and workspaces, on the upper levels temples, armouries and dwellings were situated. Embraced by thick walls formed in circular or rectilinear plans with only few opening to the outside, the structure comprised inner courtyards that were lined by balconies providing an open communal space.[39]

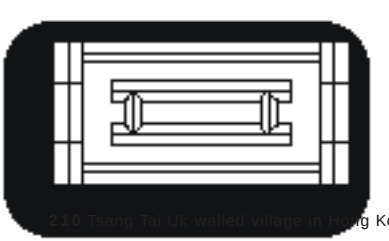
207 Hutong in Beijing

208 Tu Lou settlements

209 Hakka community

39 Cf. Shelton/Karakiewicz/Kvan 2011, p.23-24.





2.10 Tsang Tai Uk walled village in Hong Kong

WALLED SETTLEMENTS IN HONG KONG

In Hong Kong walled villages were common, most of them located in the New Territories. It is estimated that twenty-three walled villages existed within the territories' boundaries before the Second World War. The area that is Hong Kong today was first settled in the tenth century CE (Christian Era) and by the sixteenth century CE the area was already well settled. In 1661 the Qing government evacuated coastal areas for security reasons. Residents were allowed to return to those areas after 1669. At this time the Manchu tribe forced the Hakka people to migrate again. This time towards the coastal areas of Guangdong, where a lot of these walled settlements have remained until today. Hong Kong became home to many Hakka people as well, who then erected their walled villages. During the Ming and Qing Dynasties the shore of Guangdong suffered from pirates and the villages built walls to secure themselves against attacks. As piracy diminished after the reign of Qianlong (1735-1795 AD) the massive walls became less common in southern China, but in Hong Kong the practice of piracy continued through to the nineteenth century, due to its location.

211 Hakka community in Sha Tin

212 Lane inside Tsang Tai Uk

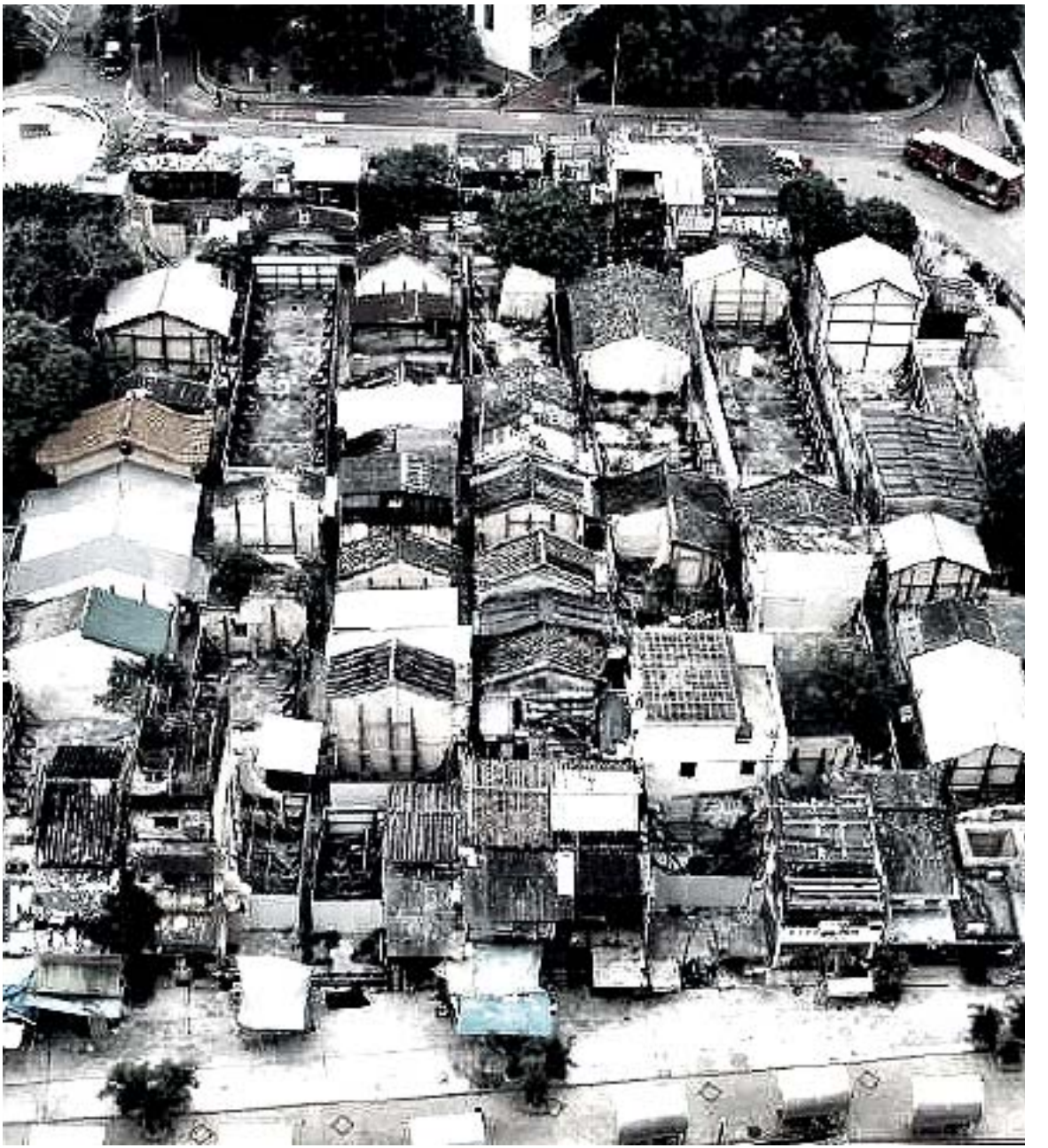
Walled Villages in Hong Kong

Smaller villages are typical clan settlements where everyone is related by patrilineal heritage to mutual ancestors. For that reason villages were sometimes named for the family lineage of the occupants. Most of these villages include the word *Wai* which is the term used for a walled village in Hong Kong and means also defence and surround.

Thus, one of the extant walled villages in Hong Kong is known as *Tsang Tai Uk* – the Large House of the Tsang, the name reflects here the monolithic nature of these villages. This example can be found in Sha Tin, which is a rectilinear inhabited wall built in 1864 that enclosed additional rows of dwellings within its structure. It is one of the best preserved walled villages in Hong Kong, and is built with grey bricks, granite and solid timber.

In contrast to this single clan, the nearby *Tai Wai* structure was occupied by sixteen family lineages and was built in 1574 during the Ming Dynasty and was known in the past as Chik Chuen Wai.[40]

40 Cf. Ibid., p.24-25.



213 Nga Tsin Wai Village before demolition

Another walled village was the *Nga Tsin Wai Tsuen* in Wong Tai Sin, New Kowloon. It was the only village that was left in the urban area of Hong Kong but in 2007 the government announced its plans to redevelop this area and for that reason the village was demolished. It was built in the mid-14th century and occupied an area of approximately 0.4 hectare. There were about 100 village houses separated by three narrow streets and six side lanes in a rectangular layout. But today instead of the village a conservation park with preserved elements can be found.[41]

Villages were seldom open to the public; normally they were occupied by a single lineage or multiple lineages. The membership of the villages was protected by custom, the admission to the village was given usually after extended acquaintance.[42] This characteristic way of protection and exclusion was a principle which was also common in the infamous Kowloon Walled City, which is described in detail in the chapter megastructure.

Chinese settlements were generally laid out according to cosmological and geomantic belief, their plans were governed by a primary north-south axis. This and other conventions guided also the walled villages of Hong Kong. The villages were usually constructed of rammed earth, stones or bricks. The external wall was typically one metre in thickness. Where defence was primary, the walls were even thicker and were used to house animals, farming, and defensive functions. The primary entrance is centred on the southern edge and on occasion an ancestral temple is located at the northern end of the central axis. Inside the streets align east to west, allowing most dwellings to have their entrance on the southern side in keeping with Chinese traditions and norms.[43]

Walled villages can be seen as an organic megastructure without design or planning, constantly morphing to accommodate changes in population, opportunity and demand. These structures have remained in some areas until today and prove how life was possible in a community, they also indicate that Chinese people are used to live in a community or together with their family clan.

The shop house also known as *Tong Lau* was the next evolution of living in southern China. It is a typology which can be found in particular in urban centres, towns and cities starting in the 19th century. This way of combining living and working together was different to the way of walled villages as it was only built to house one family. This indicates also a shift in Hong Kong's society away from community living towards a commercial and more isolated approach.

The *Chinese Shop House* is a key typology in Hong Kong and has been examined closer in the chapter *High-rise*, as it forms the base for all future housing developments.

Chapter High-rise p.167

41 Cf. Uran Renewal Authority 2013.
42 Cf. Shelton/Karakiewicz/Kvan 2011, p.25-26.
43 Cf. Ibid., p.25-26.

CONCLUSION

The way of living has changed over the time in Hong Kong and all over China. The older form of housing couldn't cope with the demand of the ever increasing population and as land shortage was one of the main problems in Hong Kong a more efficient way of housing had to be found. High-rises use a lot less buildable land but together with this evolution the former way of living has disappeared. People today, even if they live together in a cubicle or cage home, often do not even talk to each other, maybe due to the burden of their lives. The support by the community has changed and a lot of people fall out of the public 'safety net' and are often even neglected by society. For Hong Kong the collective approach is important. For that reason it is necessary to integrate different community facilities into the housing high-rises in order to lift the quality of life and strengthen the community.

The Double Tube Tower or Twin Tower is one of these typologies which kind of adopt the idea of Hakka villages and offer a similar approach. Here the courtyard is the heart of the building and access balconies form the entrance to the apartments and provide open communal space at the same time. It is a housing type which has certain qualities in social aspects as it offers the possibility to gather in front of the flat or in the common space in the centre of the courtyard.

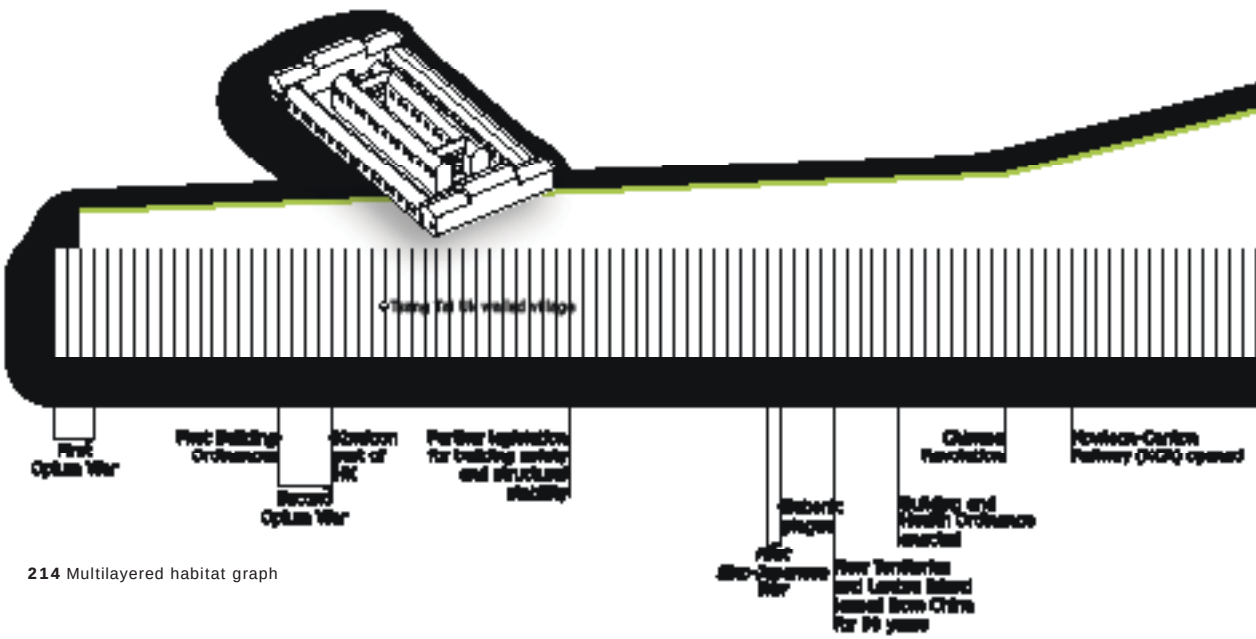
This common area enhanced the neighbourhood and made it possible that people built up a close relationship. These different qualities of communal space are missing in most public housing projects today. Life only happens in the flat or in public spaces such as shopping malls and restaurants. Only podium spaces are provided which usually lack the diversity and quality of these communal spaces.

For that reason it is important to bring different qualitative communal spaces back to Hong Kong's housing estates. Different sizes of open space should be provided in order to encourage people to follow different activities. Today people normally head straight from the public street space via the elevator to their private space. Our projects on the other hand aim to enable additional ways of 'coming home', it should be a smooth transition from public to private with a semi-public space that provides different kinds of uses. The shortest way of reaching the private space should still exist but these semi-public spaces which are provided on different floors can help to split up a huge amount of people into several smaller communities. The former way of blurred edges should be reinvented in order to create a more livable and diverse way of living and enable a closer relationship within the neighbourhood.

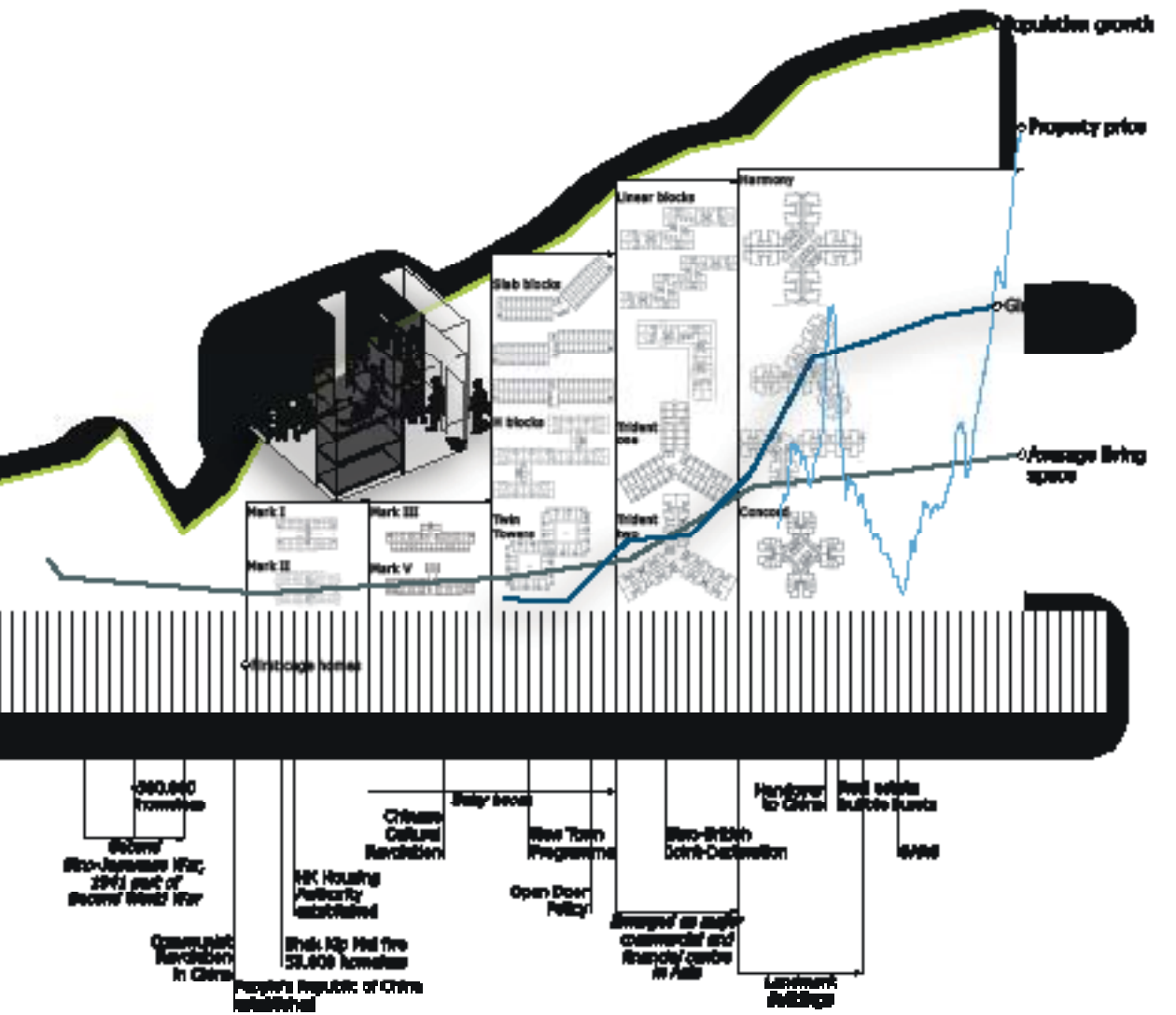
For the second project the possibility to reach a network of recreational walkways, community spaces and bicycle tracks directly from your dwelling is given. If the growing process is continued, a network develops where you can reach your destination anywhere in the city, by a pleasant and recreational locomotion.

Today living in a high density environment is common and accepted by most Hong Kong residents. The different and unequal forms of accommodations reveal that there is a wide social span which even indicates the inequalities and unfairness of the distribution of resources in Hong Kong. Private space and living space for poor and half-inferior people is proportionally even more expensive than for rich people.

Housing types are still changing over the time. There cannot be found one perfect solution to house all different individuals of one city. For architects this is where they get involved, as this profession should observe the lifestyle of people and try to understand them in order to propose new ways of living.



214 Multilayered habitat graph


Population growth
Property price
Harmony
Linear blocks
Slab blocks
Trident one
Trident two
Twin Towers
Concord
Mark I
Mark II
Mark III
Mark V
Average living space
First-stage homes
Hardship to China
Anti-white bulletin boards
Chinese Cultural Revolution
Baby boom
New Town Programme
Open Door Policy
Sino-British Joint-Declaration
NK Housing Authority established
Developed as major commercial and financial centre in Asia
Landmark buildings
People's Republic of China established

APPENDIX

NOTES

Chapter XL

Note 1 Urban population density is the density in urban areas. Here the population is compared to the cumulative urban built up area.

Note 2 The exact origin of the name Hong Kong (Fragrant Harbour) has been lost, but legends and interpretations can be found. One version is that Hong Kong was the port where fresh (fragrant) water was available for ships. According to another hypothesis, sailors stopping for fresh water on the south side of the island asked local boat people (Tankas) what the name of their harbour was and they answered 'Heung', which means incense, since the port exported a fragrant incense made from local trees called 'kuan heung', but in Tanka dialect it was pronounced 'hong'.[1]

Note 3 The land system that has been in existence in Hong Kong since 1842 is leasehold, with the government being the landlord of virtually all land. The government distributes parcels of land to individuals by private treaty grant or competitive auction and tender. The property rights of the landowner are defined explicitly by the 'conditions of sale'. An example is that the lessee must carry out development for a specified use within a given period of time.[2]

Note 4 Residential density is a significant factor in land use planning. Residential density is a quantitative measure of the intensity with which land is occupied by either development or population. Residential density controls the distribution of population, which in turn determines the planned provision of infrastructure such as transport, utilities and community facilities.[3]

Note 5 The sky view factor is the proportion of visible sky to the total sky dome from a single point.[4]

Chapter L

Note 6 The Tower of Babel is one of the powerful stories in the Book of Genesis in the Bible. It was a tower built by a unified monolingual humanity as a mark of their achievement. The narration of that peculiar building, with its top into heaven, as a symbol of human omnipotence didn't turn out well, as commonly known. The Babylonians attempted to build a tower to reach God, but the hubris to be more than human kind turned back on them and created a confusion of languages so that the heaven-storming building remained unfinished.[5]

Note 7 At the World Design Conference 1960 in Tokyo the manifesto Metabolism: The Proposals for New Urbanism was published. In this book Metabolism as name of the group was defined. The book featured four essays: Kikutake's "Ocean City",Kawazoe's "Material and Man" Kurokawa's "Space City", Otaka and Maki's "Toward Group Form".[6]

1 Lee 2008, p.104.
2 Lai 1997, p.20.
3 Hong Kong Government Planning Department: Residential Density 2003.
4 Cf. Cheng/Steemer 2010, p.476-481.
5 Cf. Mansbach 1982, p.43.
6 Cf. Koolhass, Obrist 2001, p.19.

Chapter M

Note 8 Various uniform large-scale residential estates that are developed in the form of huge multi-storey podiums covering the entire site and a long row of continuous towers above for maximizing possible sea views.[7]

Note 9 Mixed use developments have been categorised as mixing revenue producing uses i.e. commercial, residential, government, institutional and community, recreation and industrial uses including different types of housing public and private, as well as efficient public transport and pedestrian networks.[8]

Note 10 Public rental housing flats sold by the Housing Authority are classified as subsidised sale flats.[9] Subsidised sale flats include quarters sold by the Housing Authority and Hong Kong Housing Society that cannot be traded in the open market. Those flats that can be traded in the open market are classified as private permanent housing.[10]

Note 11 The origins of the Scissor Stairs can be traced back to the wooden staircase in the Big Swallow Temple in Sian China in the Tang Dynasty. It is a set of two interlocking stairways providing two separate paths of egress located within one stairwell enclosure. It was used first in Hong Kong in the 1960s and has been credited as a key invention to solving Hong Kong's housing problems and was also chosen to represent Hong Kong at the 2006 Venice Biennale. The Scissor stairs have been adopted by other national building agencies, for example in New York City Construction Code.[11]

Note 12 The Amoy Garden with its densely packed cruciform tower blocks on top of a podium represents the most common form of high-rise apartment buildings in the private sector development throughout Hong Kong during the 1980s to 1990s.[12]

Note 13 MILU (Multiple Intensive Land Use) is a mixed use (multi-functional) and high-density (intensive) development. The concept is formulated to tackle the twin problems of urban sprawl and the development dysfunctions of urban, suburban and rural areas.[13]

Chapter S

Note 14 Gini Coefficient, being a statistic commonly used by many economies to analyse income disparity. The value of the Gini Coefficient ranges from 0 to 1. In general, the higher the Gini Coefficient, the more the disparity it implies.[14]

Note 15 The Lingnan annual happiness index has been designed and conducted annually by the Centre for Public Policy Studies of Lingnan University since 2005, the Hong Kong Happiness Index Survey is a systematic study of the happiness of Hong Kong residents and reports the overall average happiness index on a scale of 0-100. In 2012 Hong Kong was between 70 and 71 out of 100.[15]

7 Wong 2010, p.326.
8 Coupland 1997, p.7.
9 Hong Kong Government Census and Statistics Department: Hong Kong in Figures 2013, p.32.
10 Ibid., p.32.
11 Cf. Shelton/Karakiewicz/Kvan 2011, p.137.
12 Wong 2010, p.324.
13 The International Institute for the Urban Environment 2009.
14 Hong Kong Government Census and Statistics Department: Census and Statistics 2012.
15 Lingnan University 2012.

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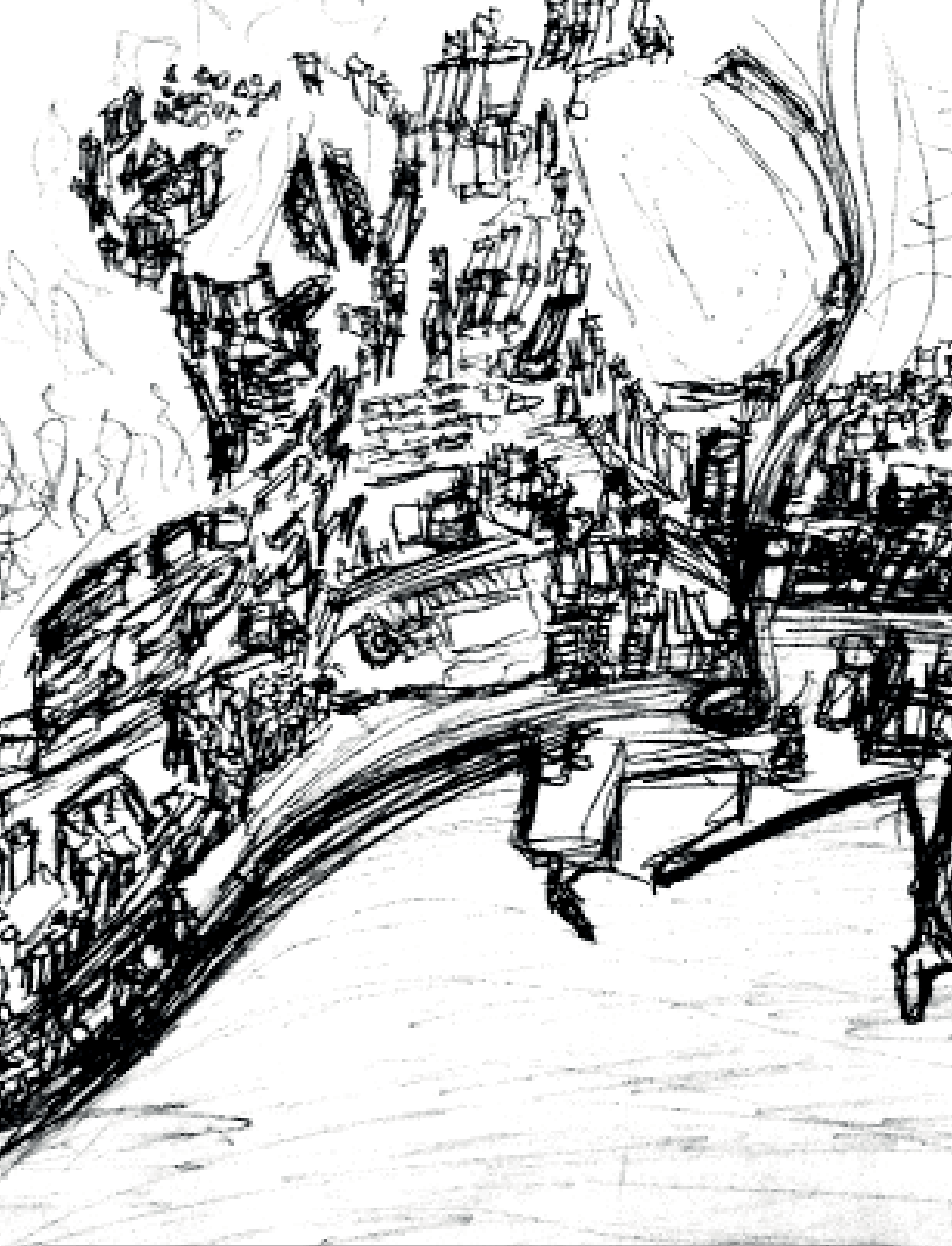
XL



MAKING OF **HONG KONG**

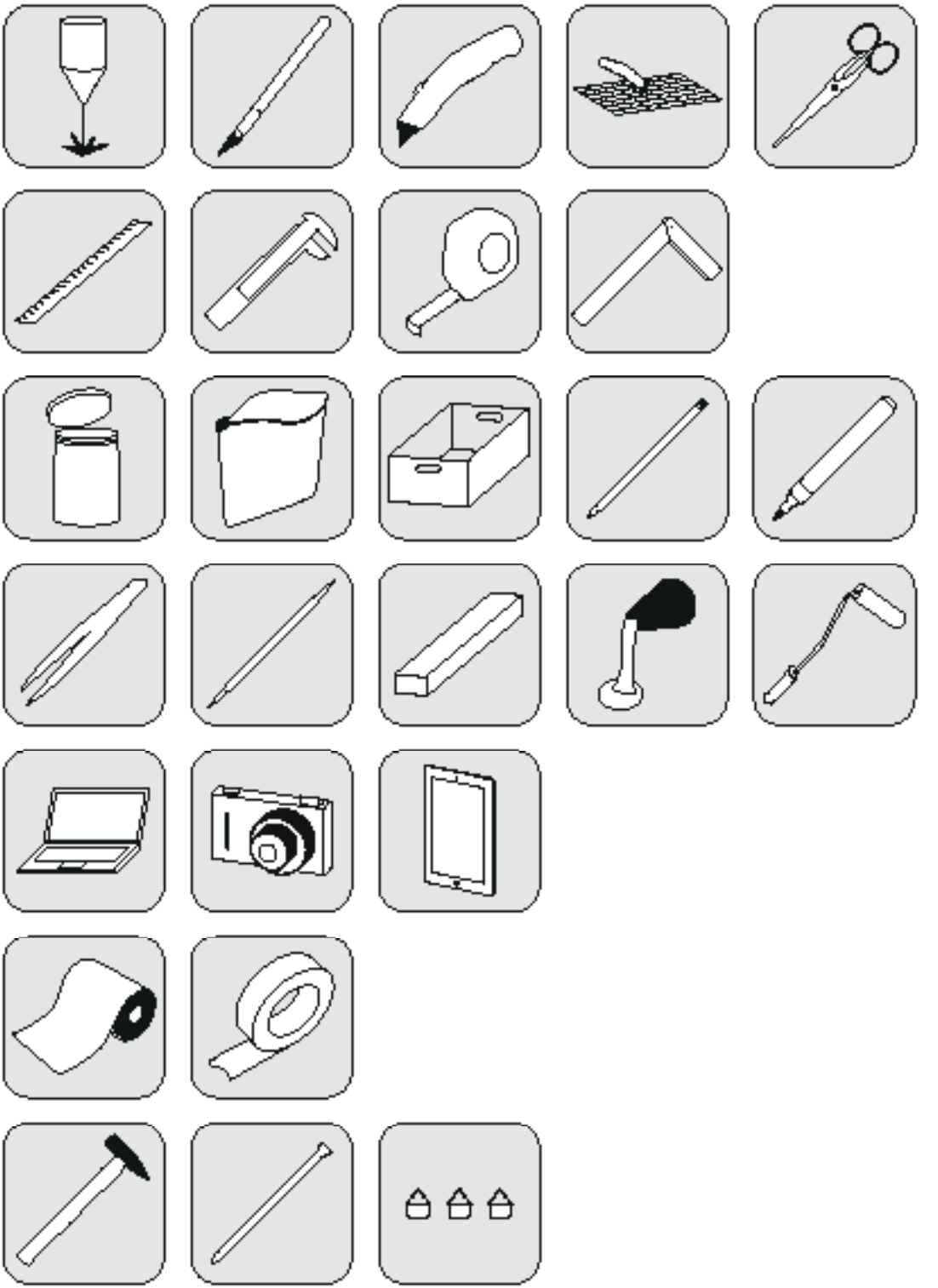
How can anyone understand a city like Hong Kong with its highly dense areas, skyscrapers, steep hills, older low rise settlements, elevated roads and footbridges? The best approach is to live in it and experience the urban fabric yourself. Ride the buses, light buses, tramway, MTR and taxis and walk on elevated footbridge networks, crowded walkways and bright shopping streets. On the street level, the needs of the people can be identified and chances to improve the urban fabric and therefore the livability within the city can be discovered. Visions are born here, at the heartbeat of the city.

For understanding the whole complexity of the urban fabric though, it is helpful to get another angle. Digital planning material is one way to get the urban arrangement visualized in order to get an overview and idea of the built up area. To get a real sense for an extremely three dimensional city like Hong Kong, a two dimensional plan should be only the starting point to develop a city scale project.

Since existence of architects and planners, models are used for learning, understanding, trying, exploring, discussing, visualising and visionizing. Especially for a visionary city like Hong Kong a three dimensional embodiment can help to discover chances and proof and improve ideas.
Representing this point of view and with the intention of an urban infrastructure project ahead, a city scale model is what we desired.

To build a model of this dimensions and complexity, a lot of idealism and power of endurance is not inappropriate, especially because if it is all done, the project only kicks off. If it would have been a question of time or rationality, we probably wouldn't have done it.
You must be careful that such thoughts will not throw you off the track, otherwise you resign before the actual project begins.
However, the decision to create a model with the scale of 1:2000 was made. That means, according to the given planning material, the dimensions are 180 to 360 centimetres with a maximum height of 22.8 centimetres. Furthermore, Hong Kong Island is not only highly populated, it is additionally very hilly and steep. Only at that area, which is approximately 20 square kilometres of Hong Kong Island, there are 3331 buildings, mostly towers on 913 podiums partly on very steep hills and nearly always densely accumulated.
To handle a challenge like this we used a lot of different techniques. Some of them are obvious and standard, some maybe creative and non-standard. However, in a world of increased sharing, we do not want to hide our path to the final result. For colleagues, who have the intention to build a similar model, we hope that there are some helpful solutions and ideas to develop their own project. For us, the most important thing was that the final outcome matches our expectations and shows the city we experienced in an authentic manner.

The following chapter is meant to document our one year journey to build the model with all decisions, working steps, techniques and tools required for such a challenge. Not shown is passion, doubt, struggle and success but for close observers, we hope this is naturally inherent.



Cutting

Laser cutter / scalpel / stanley knife / cutting pad / scissors

Depending on the material you use you can choose your cutting tools. For cardboard these tools are the most suitable for a multitude of working steps. For complex forms or a big number of items use CNC controlled cutting machines like lasercutters.

Measuring

Metal ruler / vernier calliper / rolling meter / angle

Exact measuring is important for good model building. Use a ruler out of metal to simultaneously use it as a cutting ruler. For very accurate measurement of thicknesses a vernier calliper is an essential tool and for fast measurement use a rolling meter.

Item storing

Closable canister / zip bag / stackable box / pencil / marker

If you build a model with a big number of parts it is very helpful to have a sophisticated storage system with labelled canisters, bags and boxes. If you have limited space always try to establish a stacking system.

Assembling

Tweezers / toothpick / wooden bar / glue / paint roller

To assemble your ready made parts to a model you need to use various tools for different working steps. This is a premium selection of very useful tools for placing, bursting out, sticking together and aligning of items.

Preparing, documenting

Computer / photo camera / smartphone, tablet

For preparing all plans, labelling cutting files etc. use a computer with the appropriate software. Do not forget to make a good documentation of your working steps. Use photos, videos and time-lapse. For easy time-lapse documentations there are various apps for smartphones and tablets.

Finishing

Sand paper / masking tape

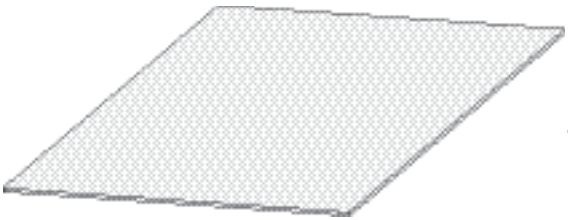
In order to get clean surface finishing some laser cut materials have to be sanded because there are burned areas especially when using cardboard. Masking tape can be used to protect surfaces during the cutting process.

Storage system

Hammer / nails / hooks

For the finished model you need to think of an ultimate storing space. There will be an instruction for a very simple but spacial effective and representative solution.

MATERIAL CHARACTERISTICS

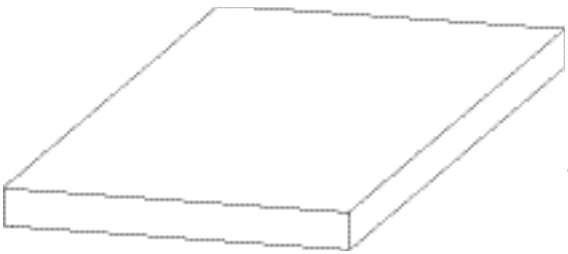


Grey board 0.5-2.5mm

+ Laser cut, knife cut, low priced, wide range of dimensions
— Slow laser cut, sooty lasered edges

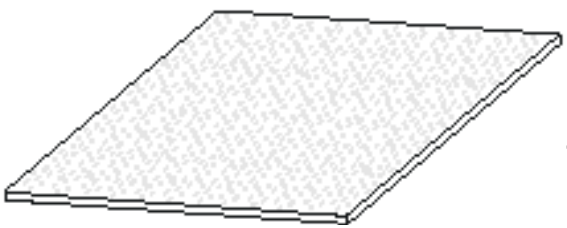
Finn board 0.9-3.0mm

+ Fast laser cut, knife cut, medium priced, wide range of dimensions
— Burned lasered edges, become yellow



Polystyrene 0.3-80mm

+ Laser cut, knife cut, hot wire cut, no burned edges, light, impact resistant, wide range of thicknesses
— Can melt while cutting, difficult to engrave



depron 3-10mm

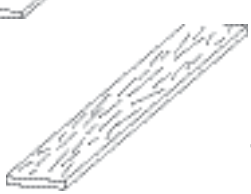
+ Laser cut, knife cut, hot wire cut, no burned edges, light, shiny
— Can melt while cutting, difficult to engrave

Paper

+ Laser cut, knife cut, wide range of colours, flexible, low priced
— Weak stiffness, not tearproof

Acryl board 0.5-30mm

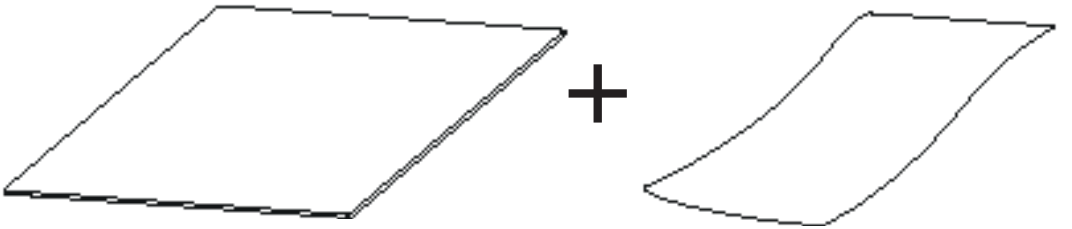
+ Laser cut, wide range of thicknesses, transparent, translucent, various colours, clean lasered edges
— Limited hand cut, expensive



Balsa board 0.8-25mm

+ Laser cut, knife cut, light, wooden finish, wide range of thicknesses
— Expensive, limited size, fracturable

MATERIAL DECISION



Finn board 0.9-3.0mm

It is a multifunctional material with a wide range of possible applications.

For the building of height layers for the landscape it is suitable because there are boards in dimensions of 700x1000mm available. This is convenient to make use of the whole cutting area of a laser cutter.

Furthermore the surface of the material is very natural and it is possible to produce the landscape, highways, footbridges and buildings out of one material.

It is easy to cut and for perfect finishing it can be sanded with sand paper.

For a city scale model all parts have to be labelled and engraved in order to keep track of the assembly plan. Engravings are easy to see on this material.

Used for

landscape
buildings
highways
footbridges
side parts
base

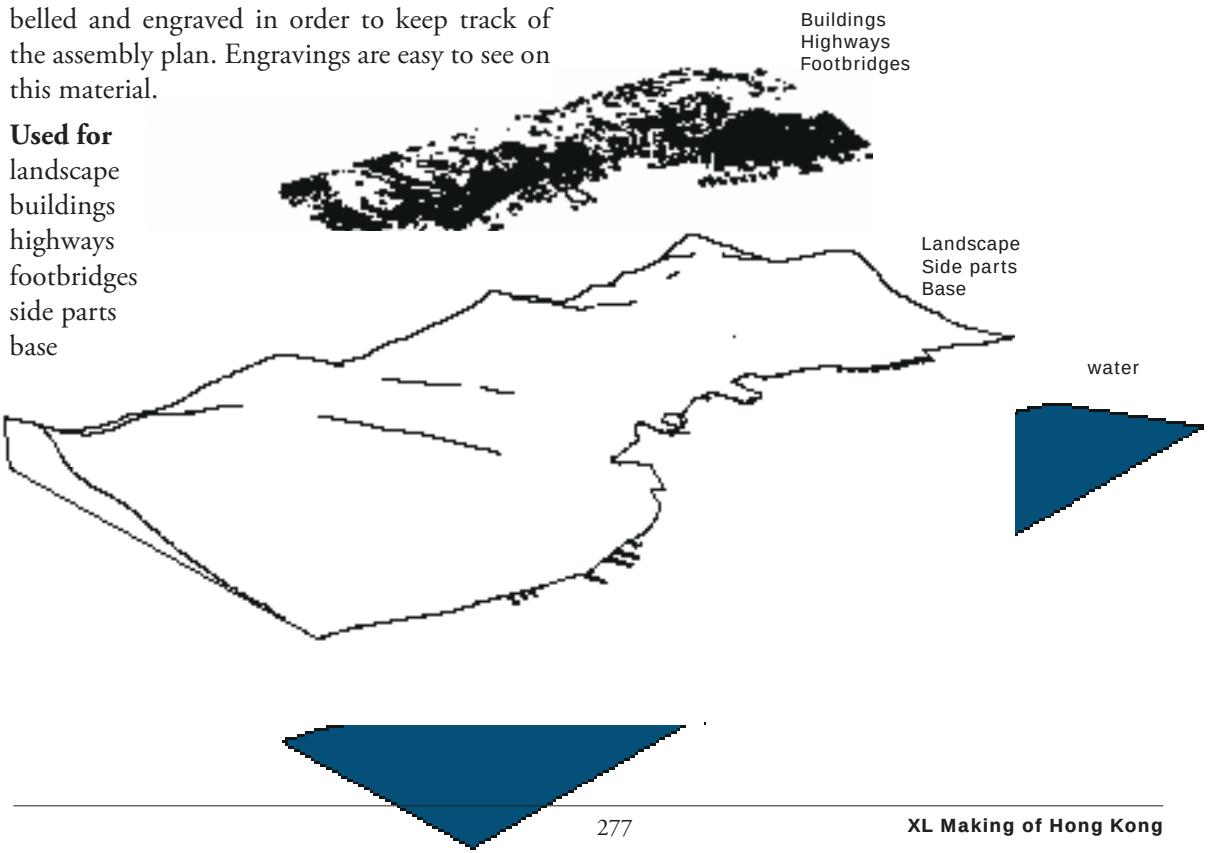
Paper

Because paper is available in all colour variations it is suitable to show colour intensive surfaces.

In this project we used it for the water surface of Victoria Harbour and show the contrast to the built up area of Hong Kong Island.

Used for

water



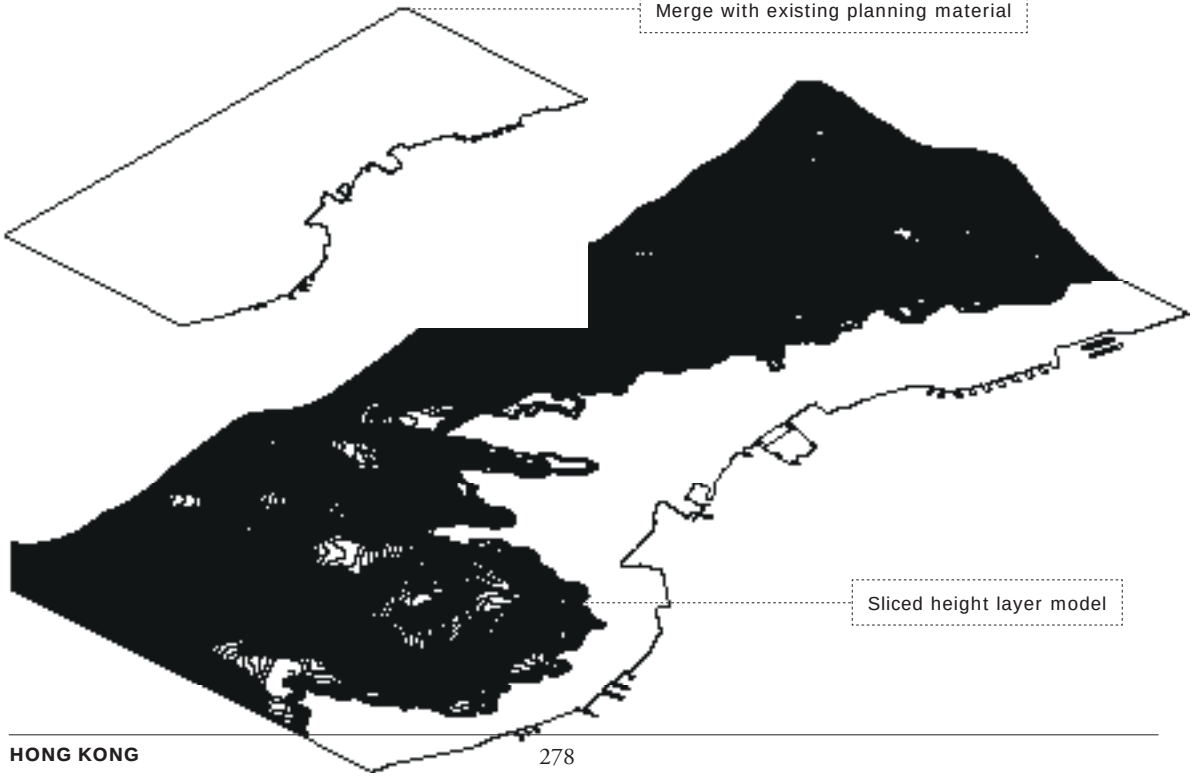
PREPARATION LANDSCAPE

For landscaping there must be plans with continuous height layers to produce a stacked layer landscape. If suitable planning material is missing, GoogleEarth can be used to get a rough idea of the landscape. With SketchUp the 3D surface can be extracted and mixed with available segments.

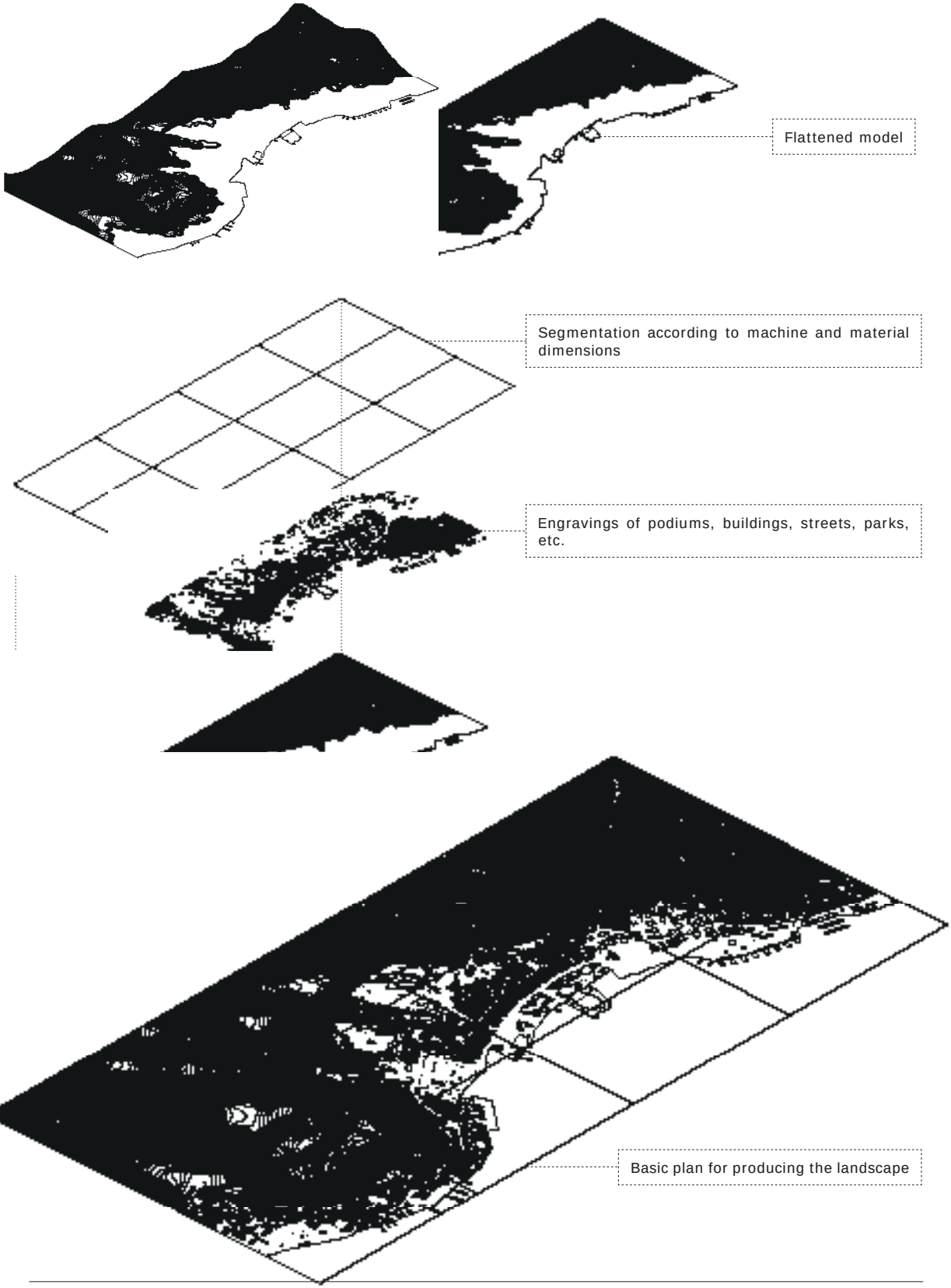
Landscape extracted with SketchUp

Adapted surface

Merge with existing planning material

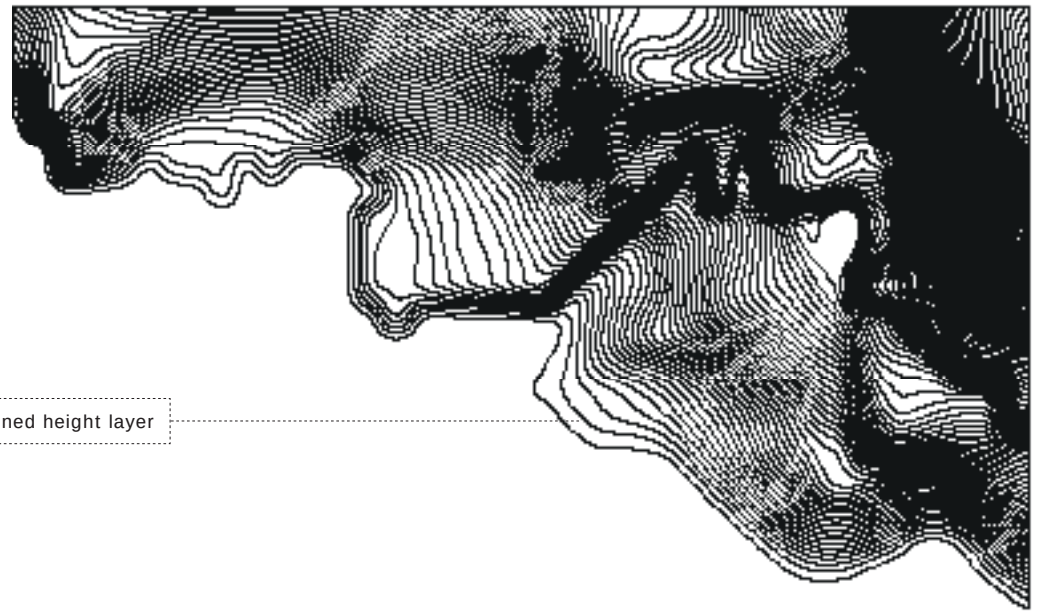


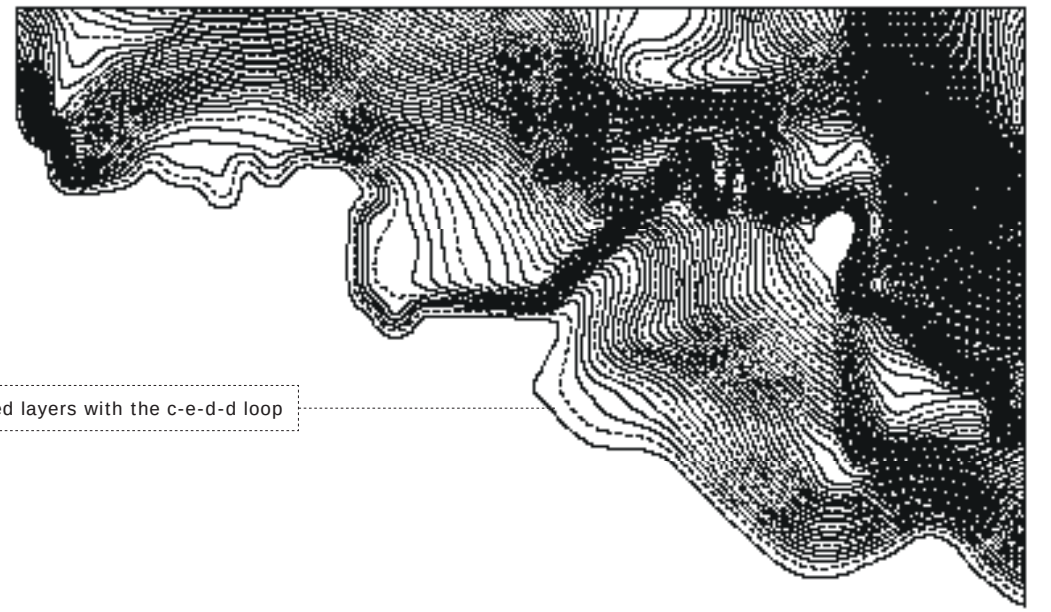
Sliced height layer model

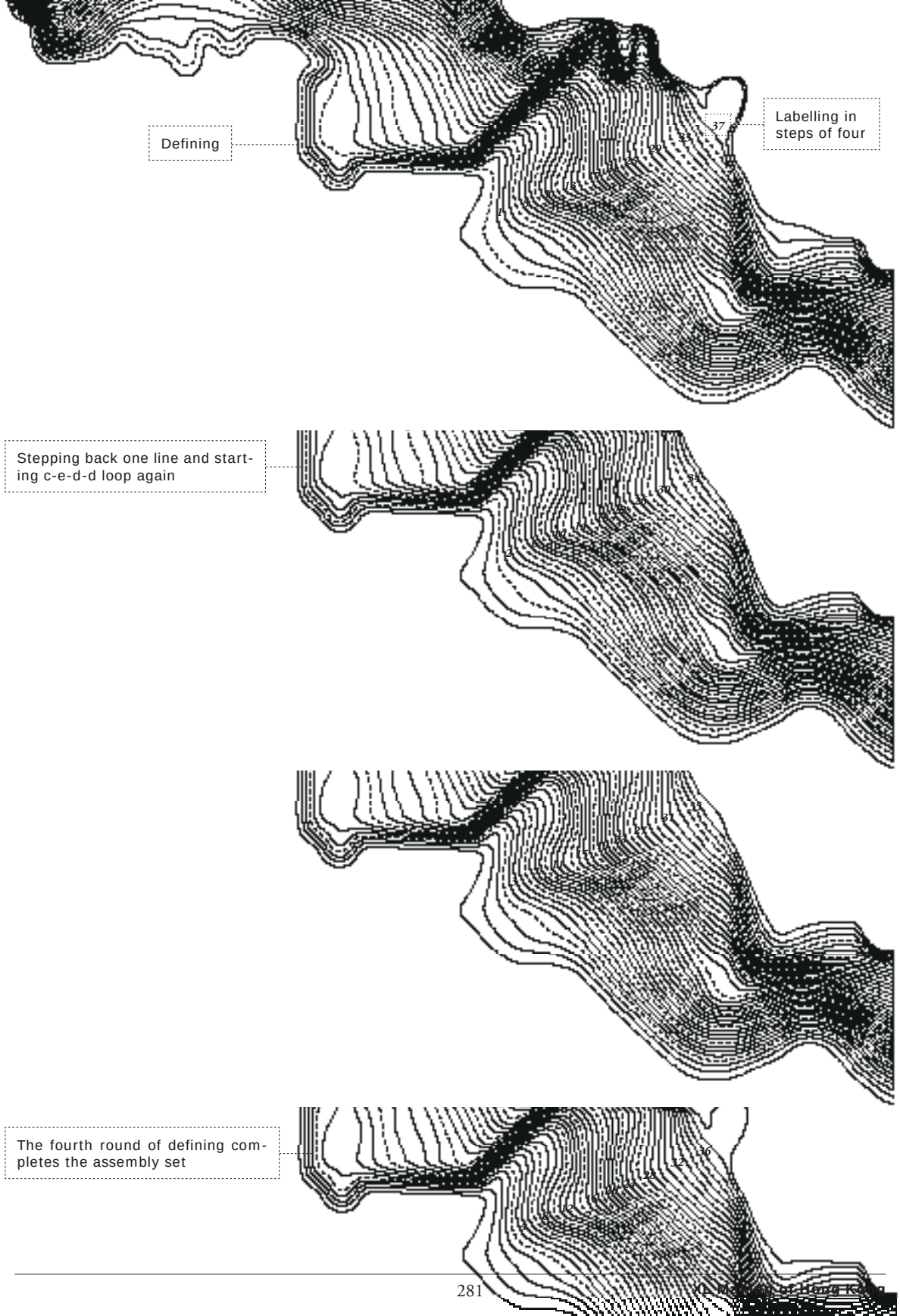

Flattened model
Segmentation according to machine and material dimensions
Engravings of podiums, buildings, streets, parks, etc.
Basic plan for producing the landscape

LABEL ITEMS

The produced height layers have to be split up for the production process. There must be cut lines, engraved lines and space to stick them together. We used a c-e-d-d loop to produce our files. That means defining the lines as cut-engrave-delete-delete in a loop. If this is done four times per segment by always stepping back one line, the results are layer strings with an engraved line for the next layer and space for the glue.

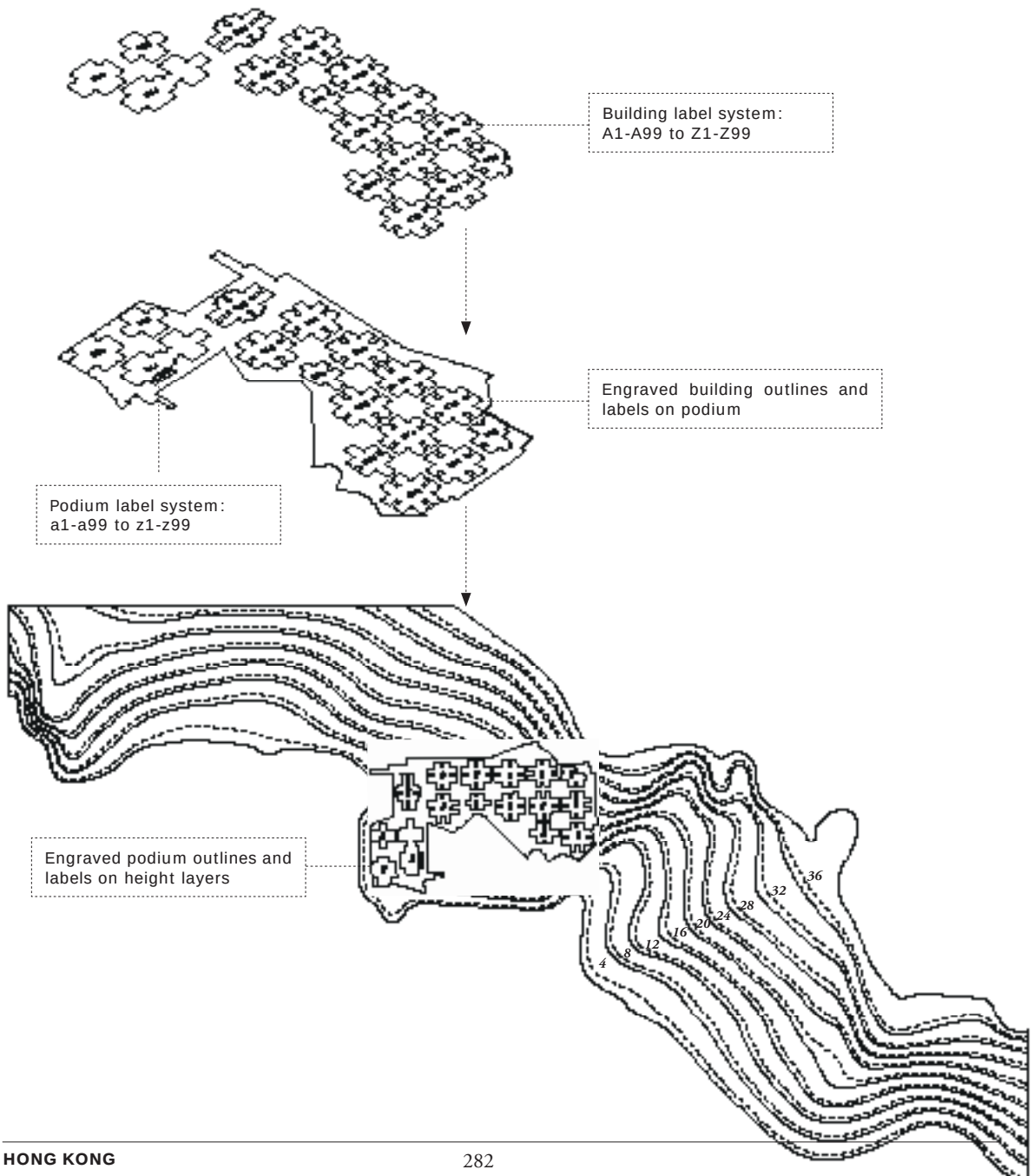





Defining
Labelling in steps of four
Stepping back one line and starting c-e-d-d loop again
The fourth round of defining completes the assembly set

MERGE ITEMS

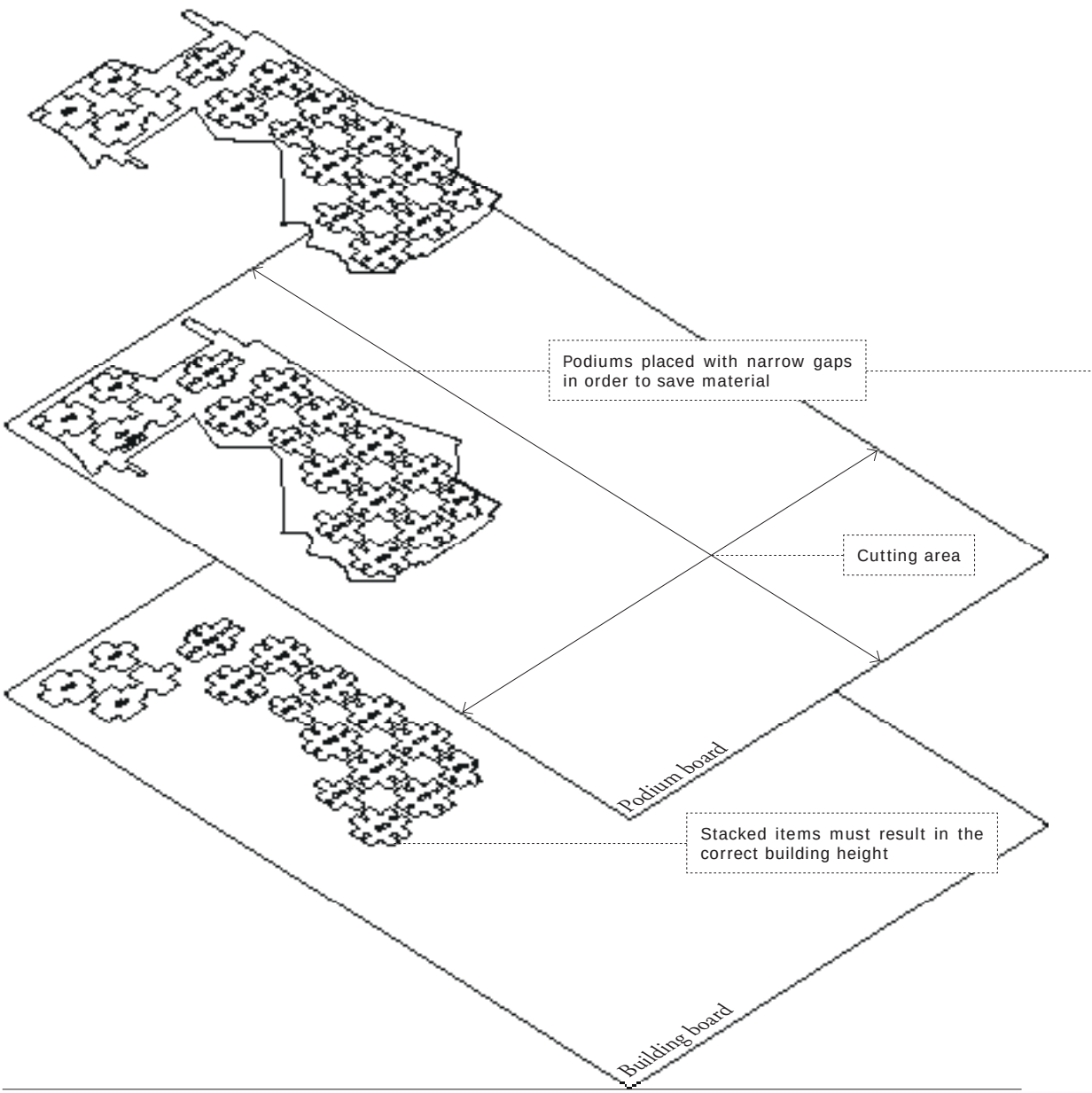
To label the podiums and buildings we used a mixed system of capital and small form letters and numbers. This produces a wide range of possible labelling that is needed for this large amount of items. For podiums there is a small form letter and a number starting with “a1” and ending with “z99”. For buildings there is a capital letter replacing the small form letter.
To complete the landscape assembly set, the labeled podiums, buildings and all other desired arrangements have to be placed as engravings at the height layer file.

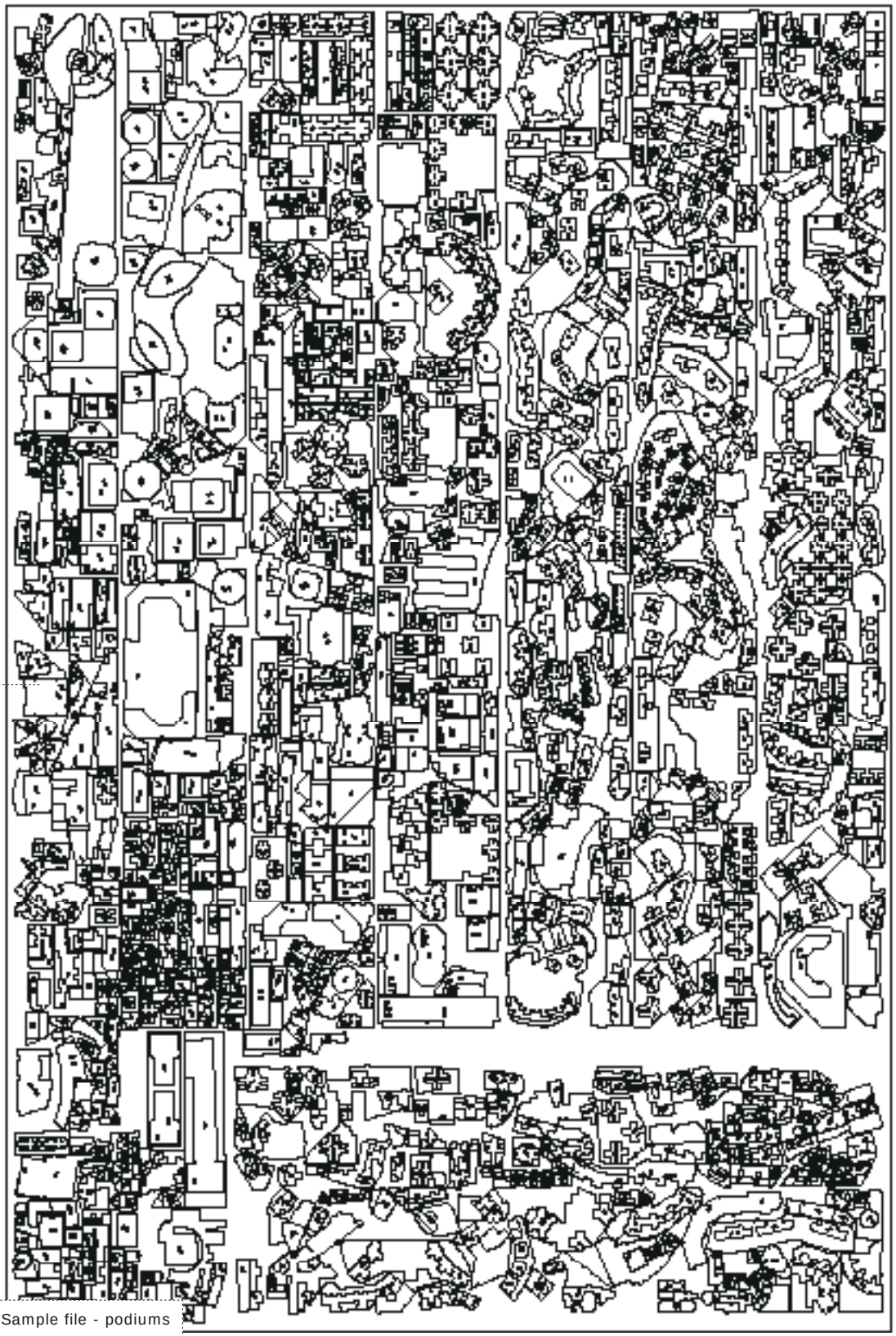


Height layer board sample file

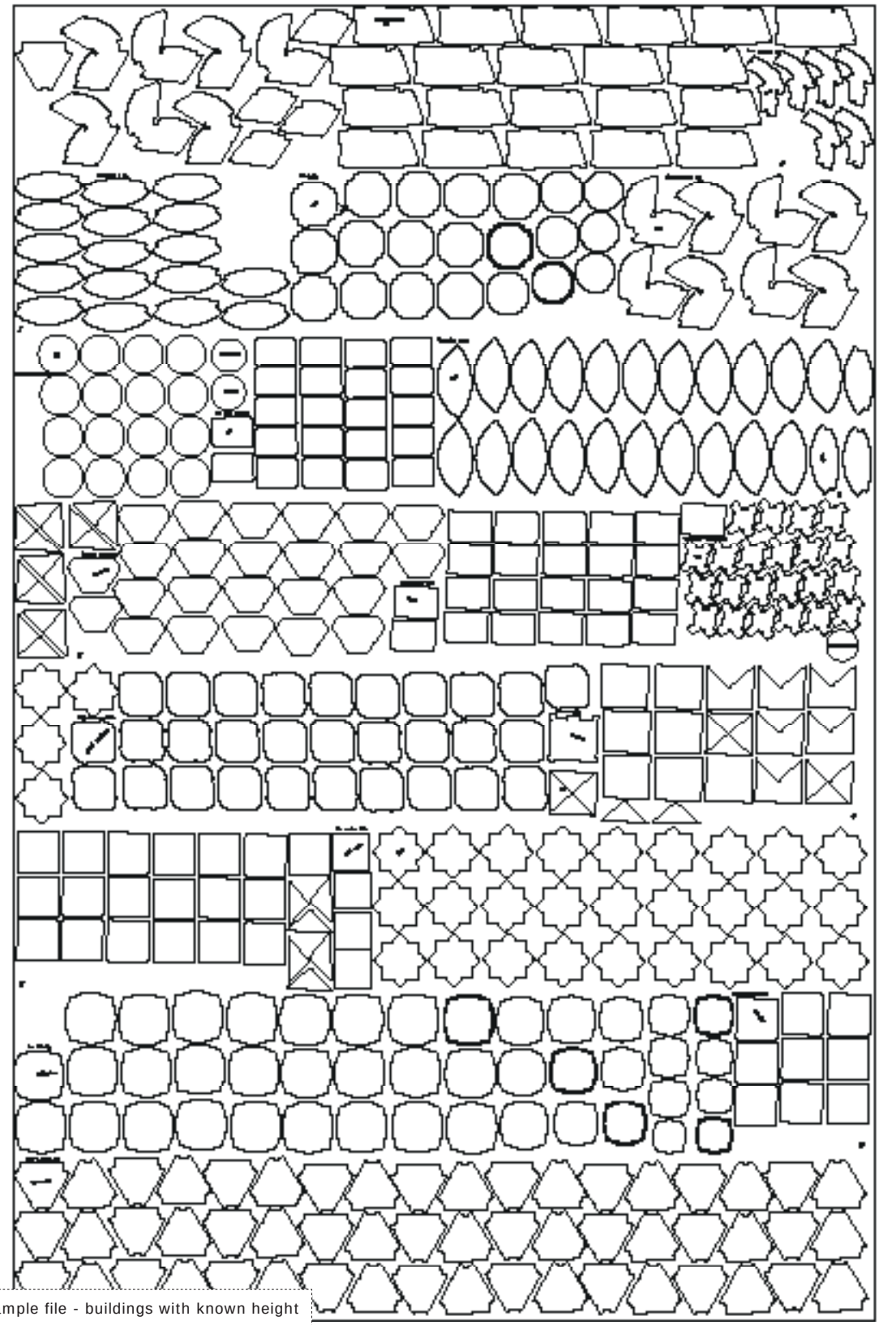
PODIUMS, BUILDINGS

According to the material size and the dimensions of the cutting machine the podiums and buildings are placed. In order not to waste too much material, gaps between items should be as narrow as possible.
The podium boards must contain the cutting edge of the podium and the engraved number. Furthermore there must be the tower shape and number engraved on the podium.
In order to produce the correct heights, the building board has to contain the right number of stackable items of every building. For recorded buildings, the right heights can be found out through research. For unknown buildings, GoogleStreetView can be used to get estimated heights.





Sample file - podiums

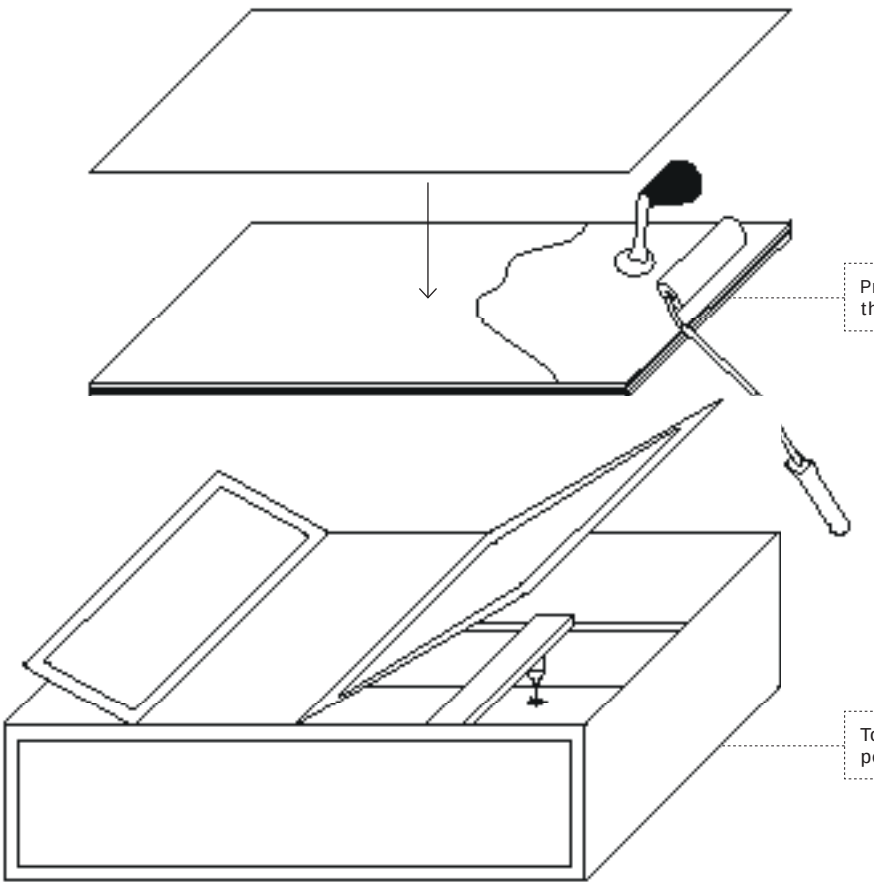


Sample file - buildings with known height

Sample file - buildings with unknown height

LASER CUT

The actual production of the model can be done by a CNC milling machine or a lasercutter. In order to get the highest precision we decided to use a laser cut machine.
In order to save time and utilise the cutting capacity of the laser, boards can be pre-agglutinated.



Pre-agglutinate boards to get thicker parts

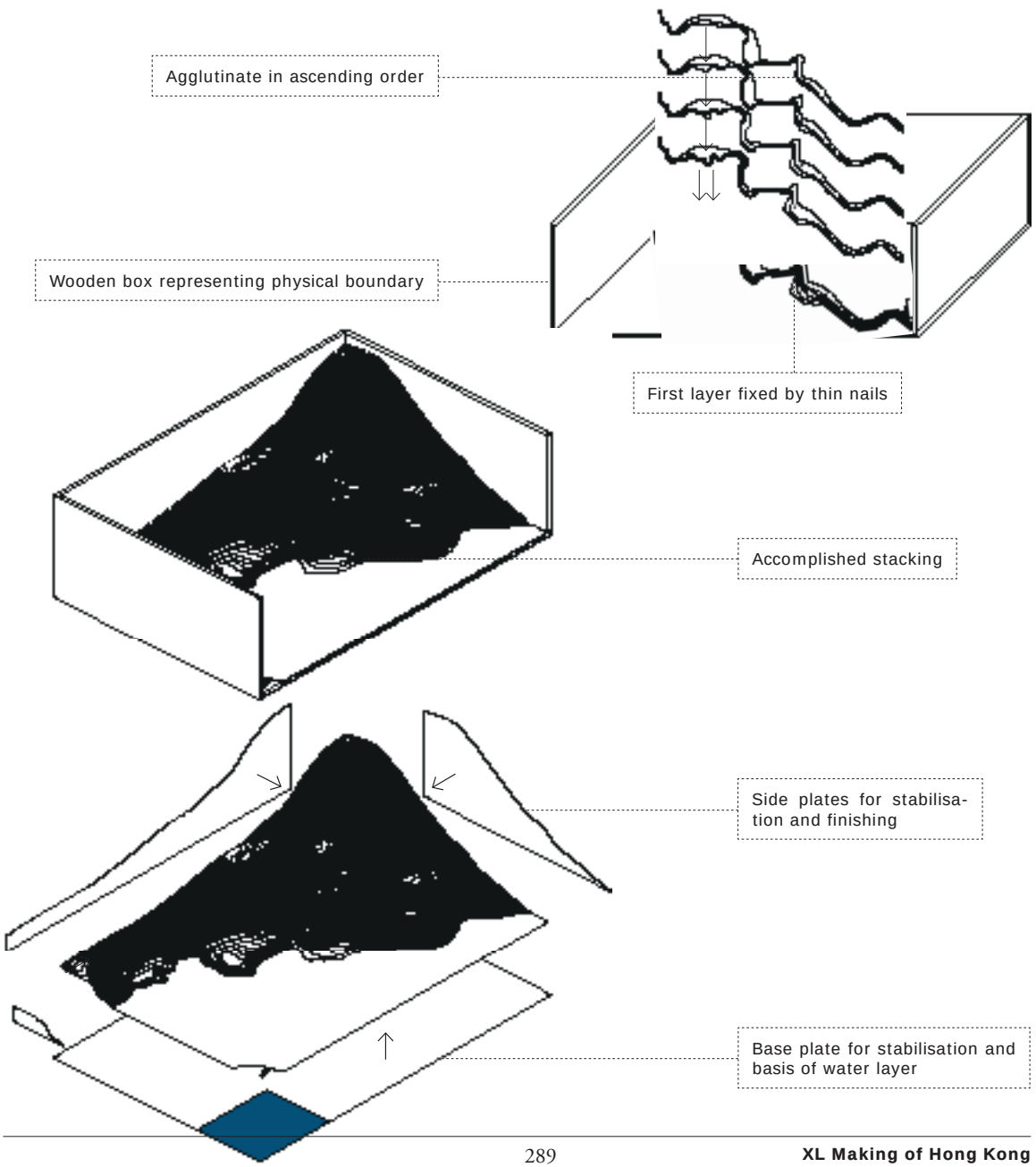
Tool to produce accurate and super precise parts

Thicker single pieces

Masking tape to hold parts in place

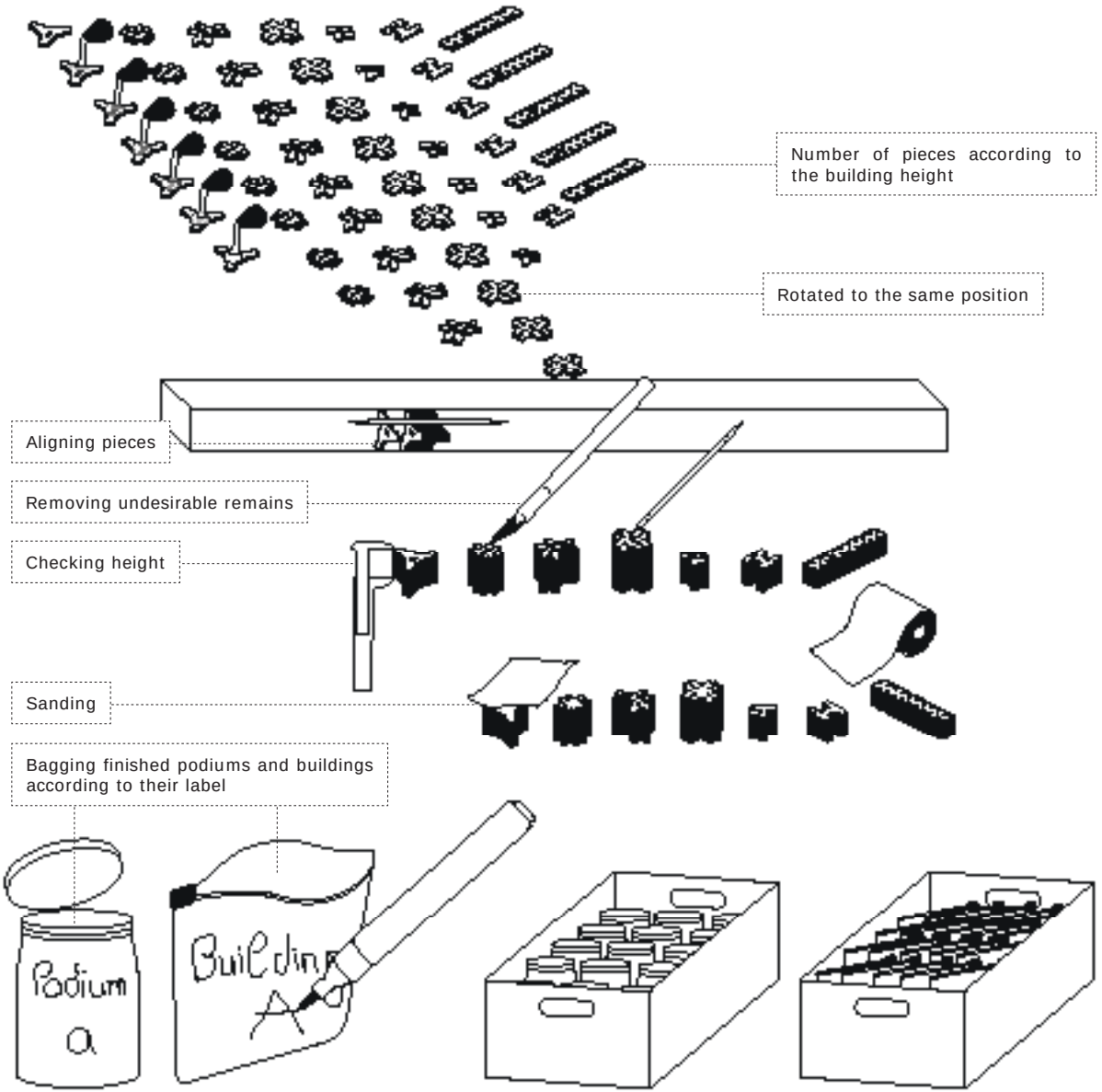
ASSEMBLE LANDSCAPE

To assemble the landscape it is very helpful to have equipment that helps to work accurate. For the height layer assembly we used a self-made wooden box which represents the physical border of our model segment. Some nails are holding the first layer in place. Stick the layers together in ascending order. The engraved lines of the next layer and the physical boundary of the wooden box helps to get a precise result.
When the segment is done, the retentive nails can be removed and the segment can be taken out of the wooden box. Side plates and base plates finish the landscape segment of the model.

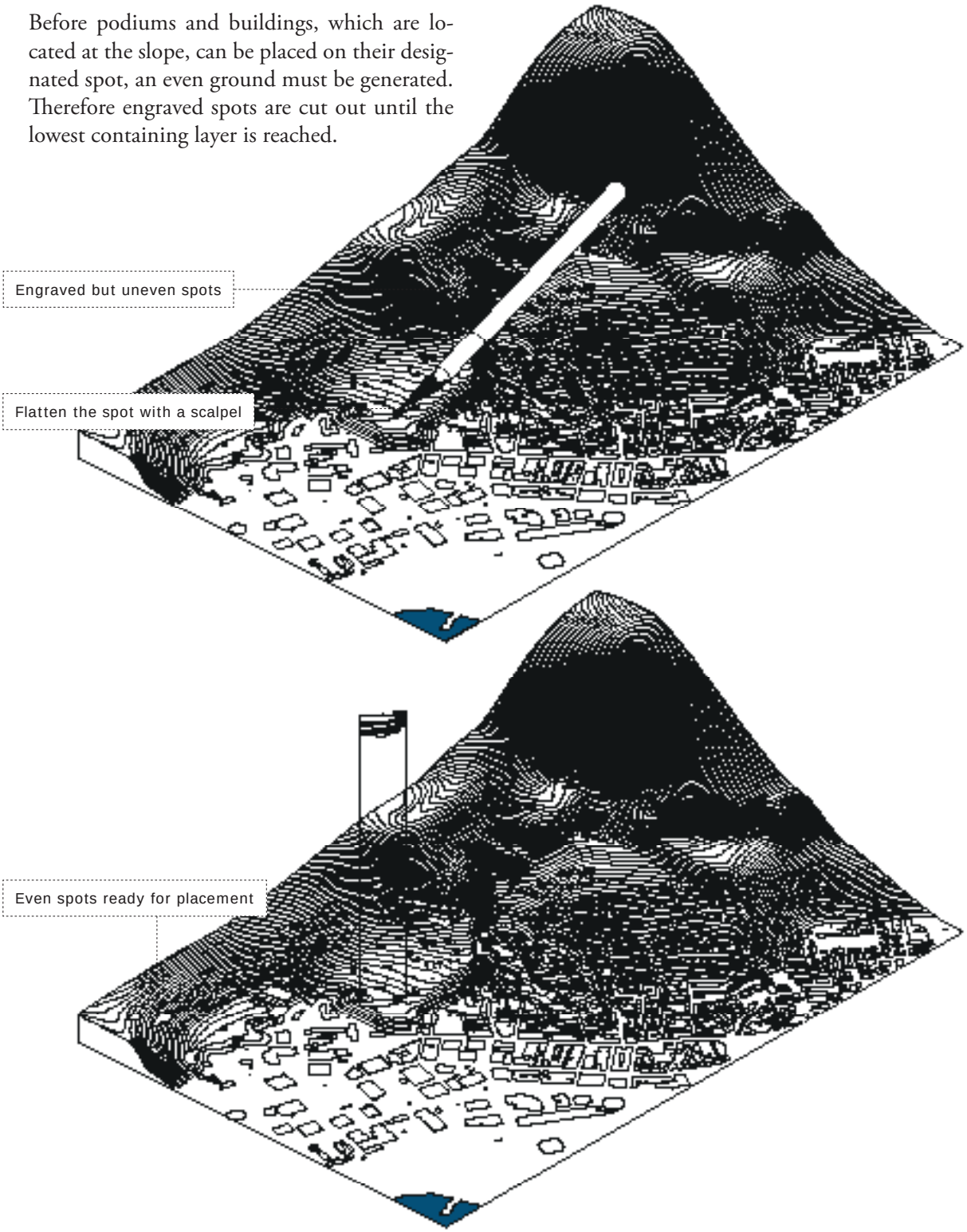


ASSEMBLE BUILDINGS

To assemble the buildings there is a clear progression of working steps. The single pieces of the respective label are strung in a row and rotated to the same position. After coating the surface with glue, the pieces can be stacked. For straight layered pieces a wooden bar and a toothpick is used to align the layers with some pressure. The heights of the buildings are checked with a vernier calliper. For finishing a scalpel and a toothpick can remove residues. Furthermore sand paper can remove burned top or bottom sides.
For nerve and timesaving purposes, a sophisticated storage system is highly recommended.

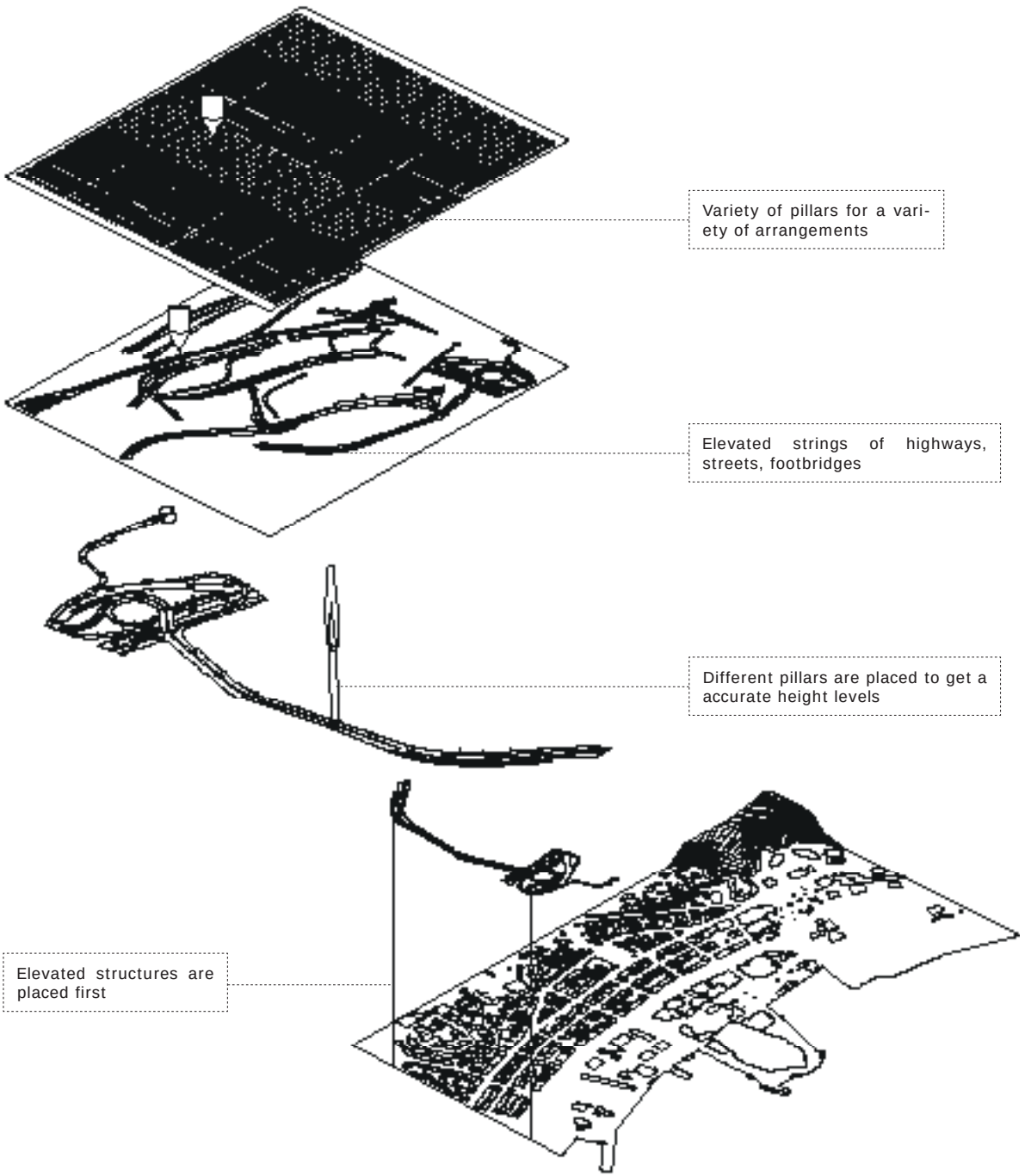


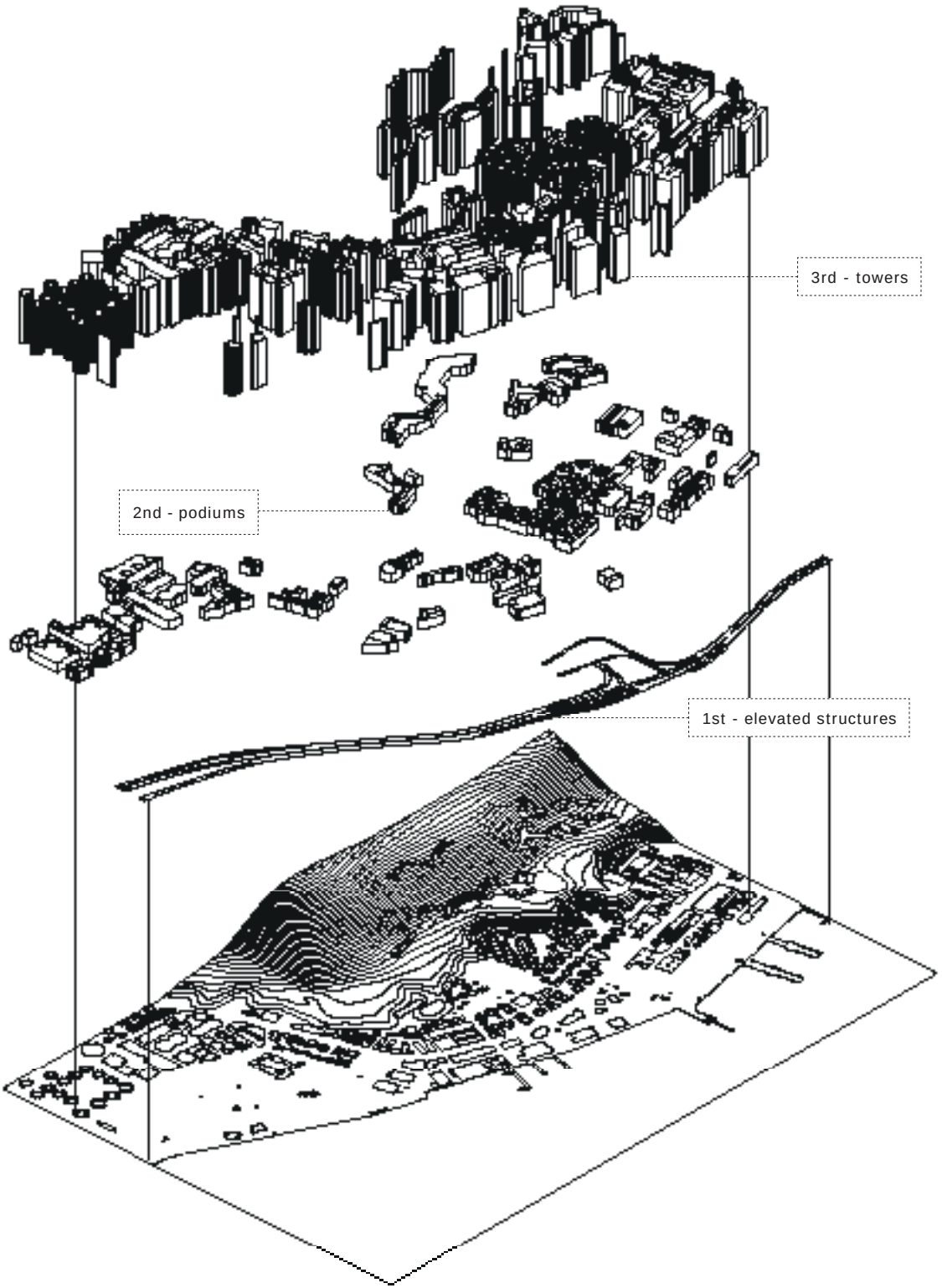
Before podiums and buildings, which are located at the slope, can be placed on their designated spot, an even ground must be generated. Therefore engraved spots are cut out until the lowest containing layer is reached.



ELEVATED ITEMS

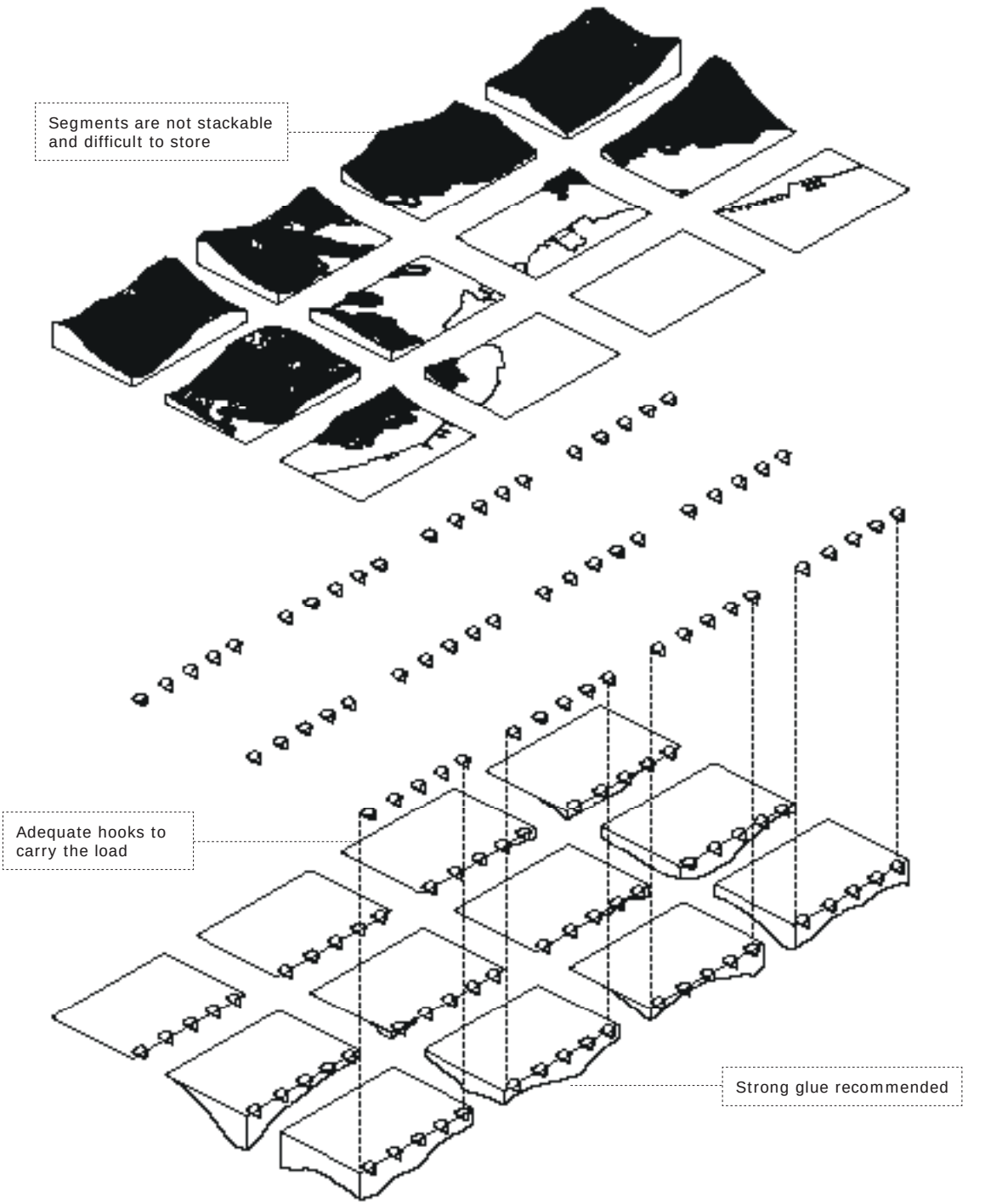
Strings of elevated streets, highways and footbridges are placed before the buildings. To construct all different structures, a variety of all different pillar forms are cut in different sizes. For very complex crossroads it is helpful to check the course twice, firstly with the height notations in plan and secondly at GoogleStreetView to make sure that all the under- and overpasses are accurate.

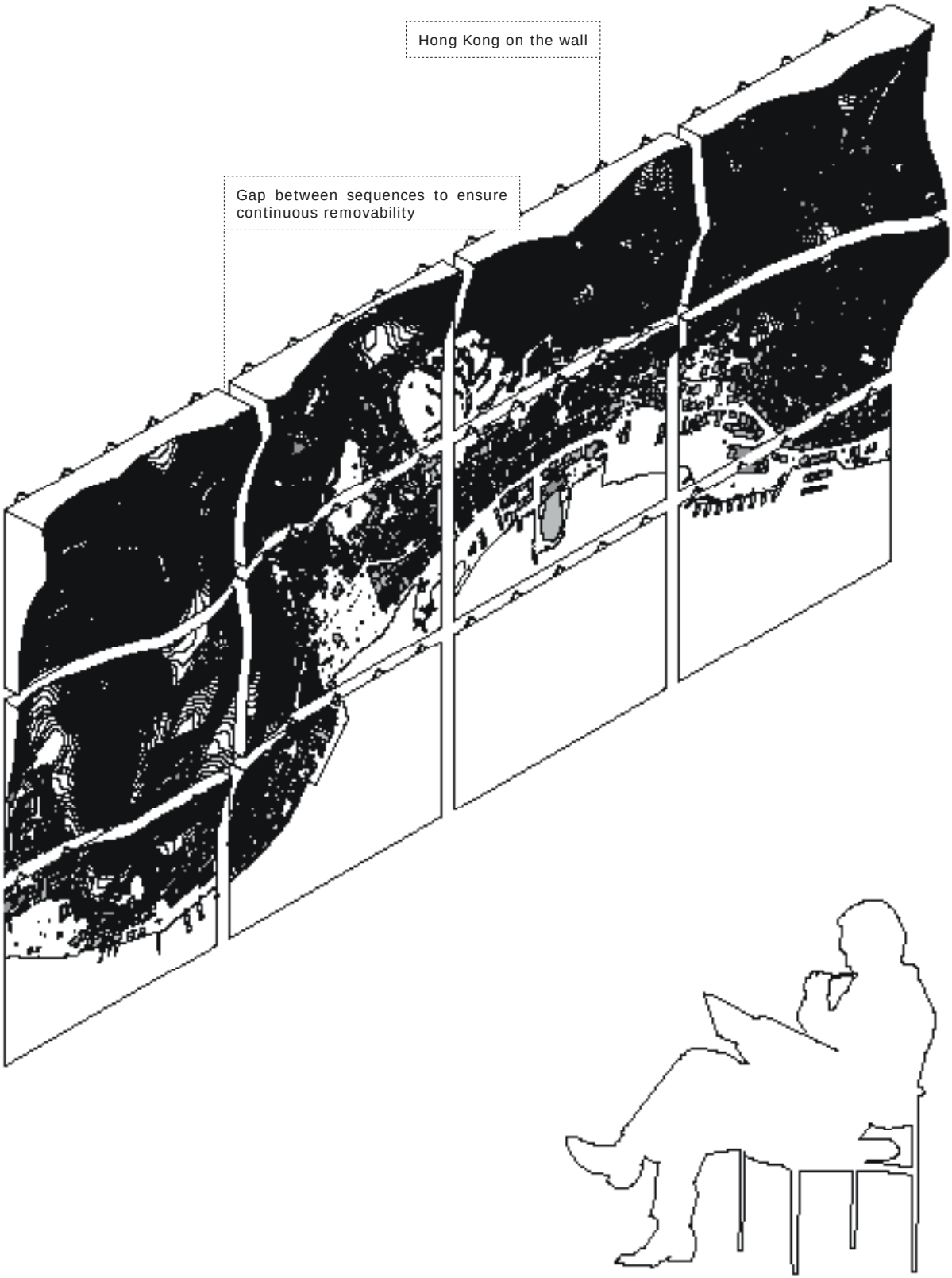



3rd - towers
2nd - podiums
1st - elevated structures

STORAGE SYSTEM

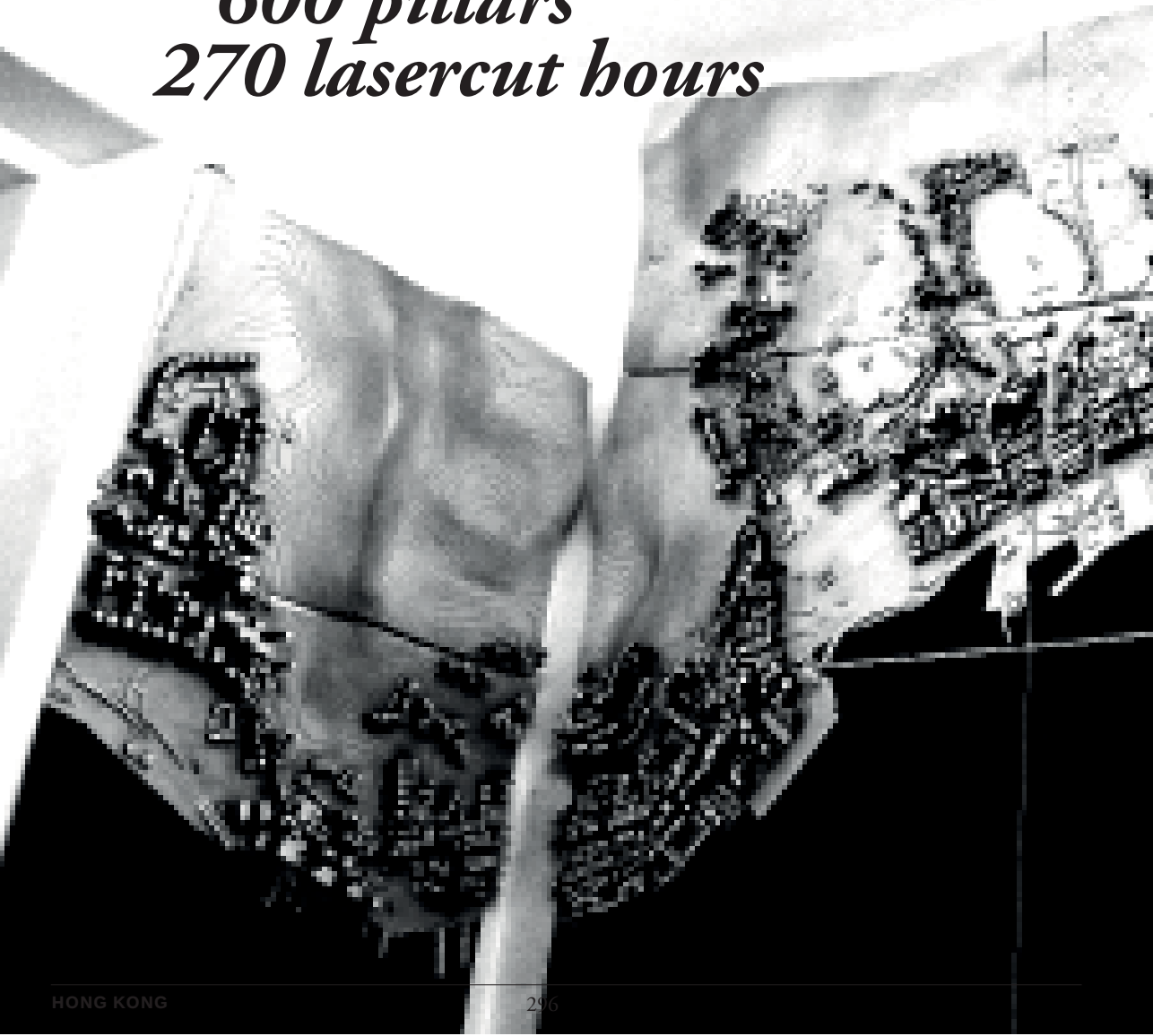
A big scale model, even if it is split into several segments demands a lot of storage space which many students do not have. Here is one idea how to solve that problem and simultaneously put the whole model on display. Like so many things in Hong Kong, our model went vertical too.

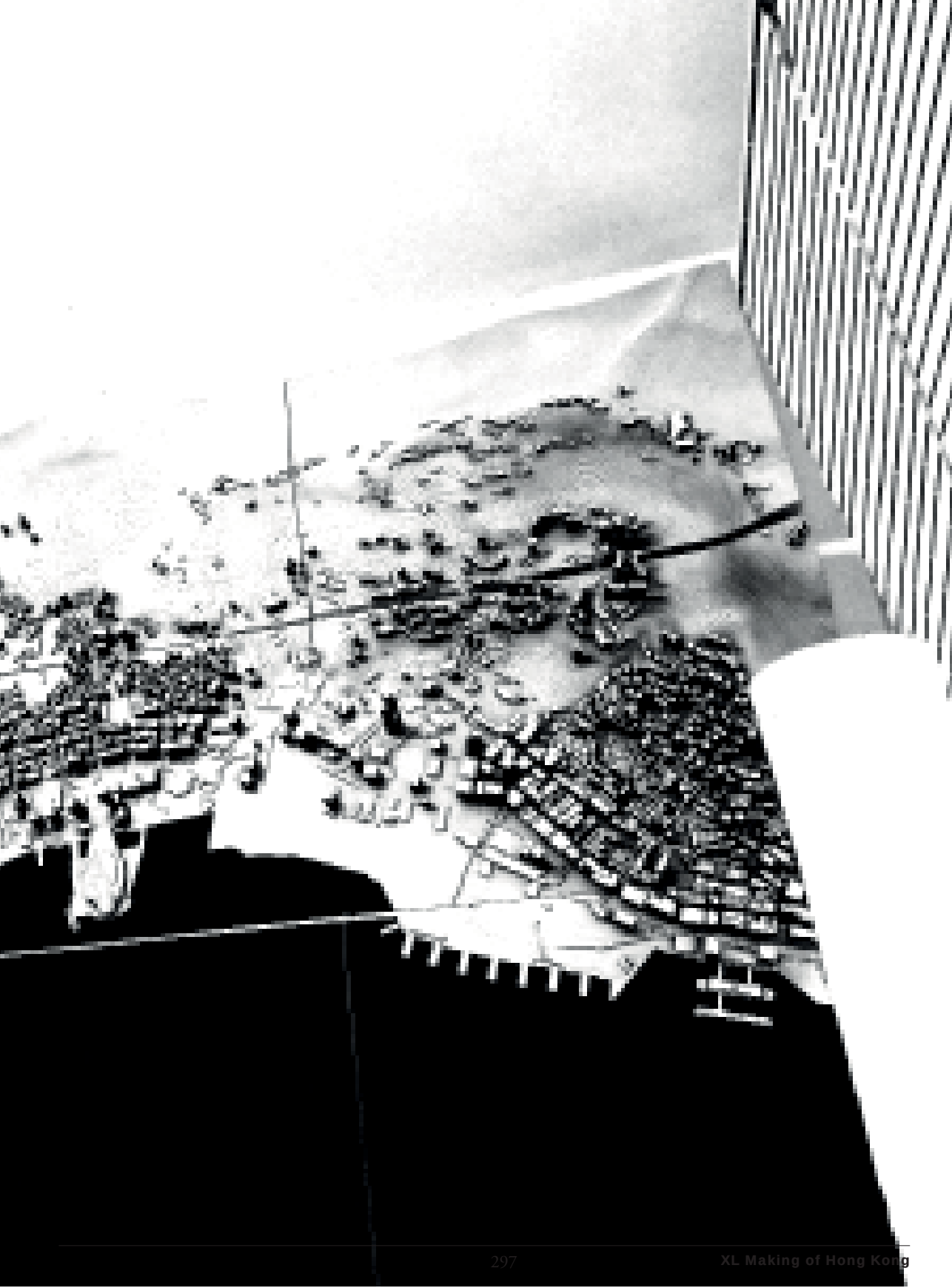


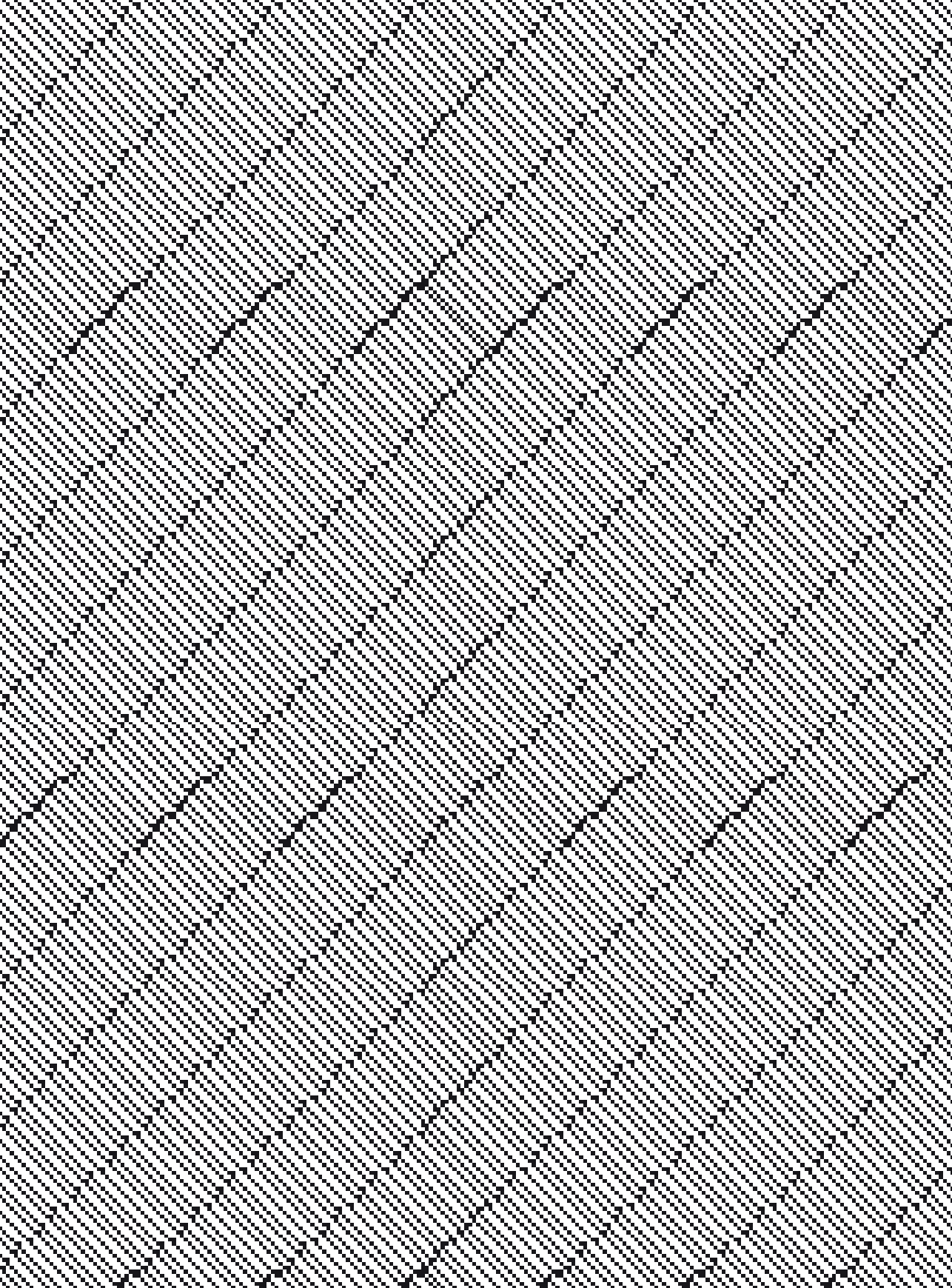

Hong Kong on the wall
Gap between sequences to ensure continuous removability

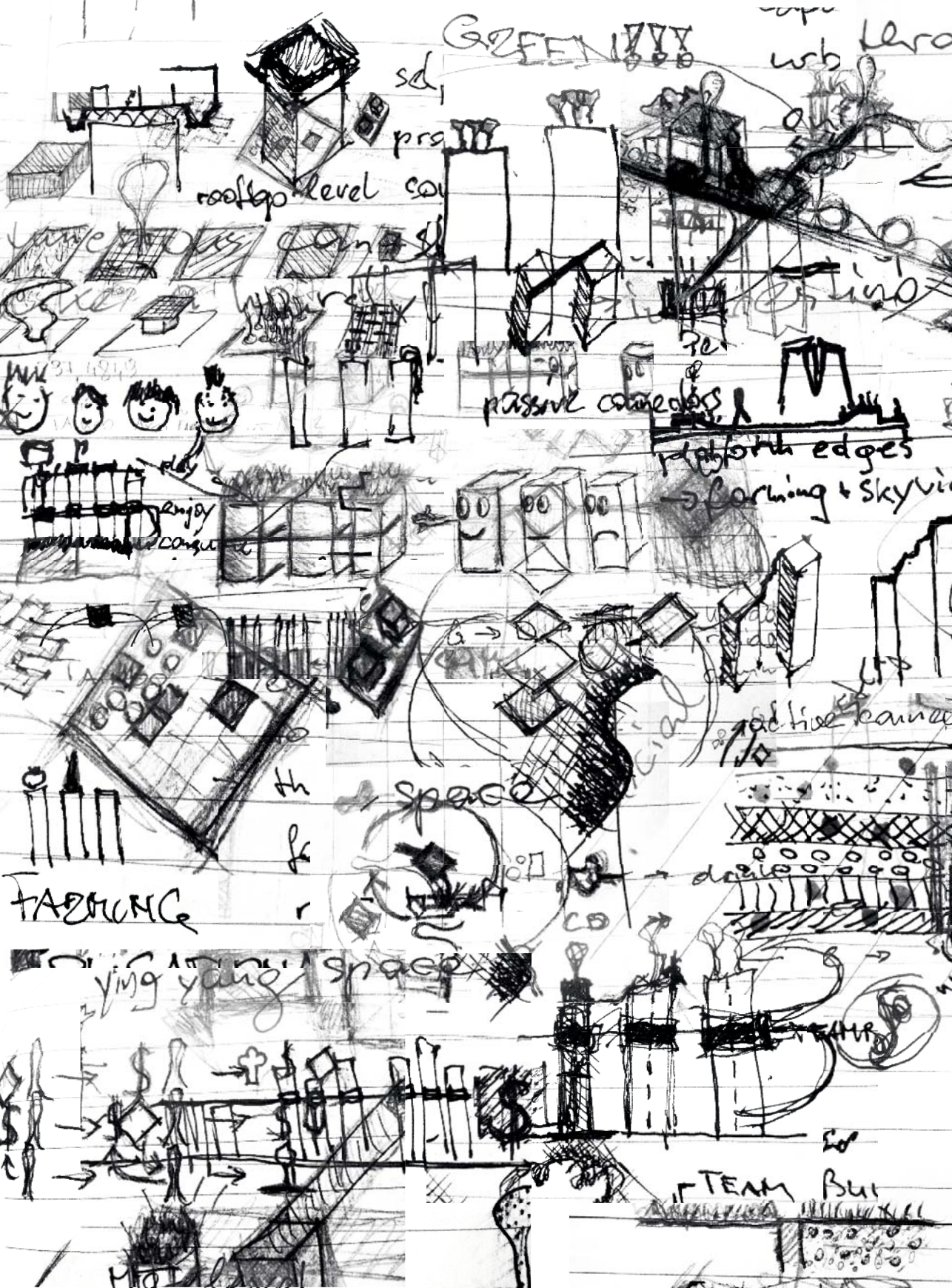
MODEL FIGURES

940 podiums
3331 buildings
34000 building parts
1416 landscape layers
94 footbridges
600 pillars
270 lasercut hours

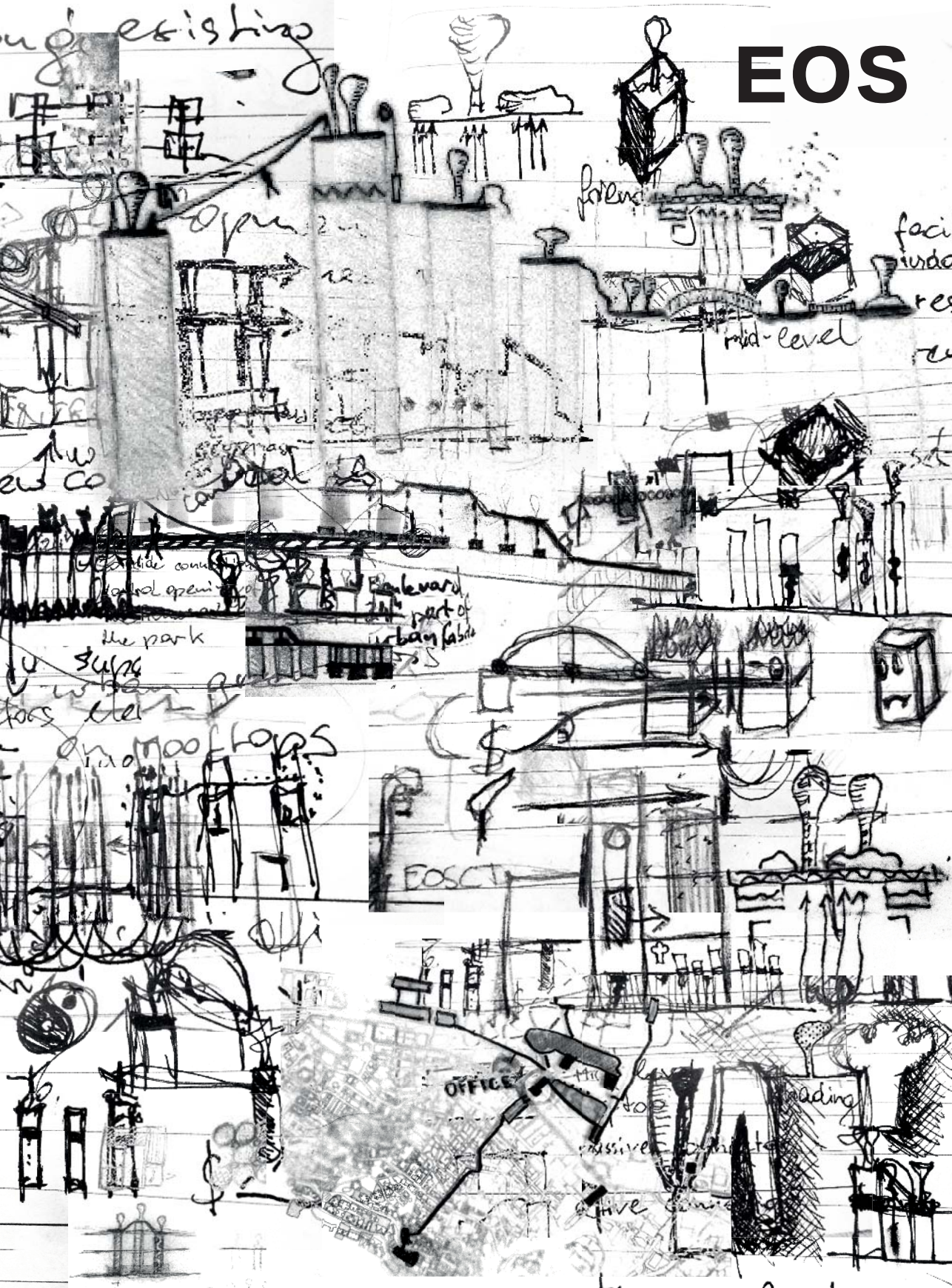







rooftop level
passive
edges
space
TEAM BUI

EOS



To deal with the task of providing open space in the hyper dense environment of Hong Kong is always a delicate issue. Where should we draw the line between optimization and livability? Why should someone take a valuable asset like 'space' in Hong Kong and use it as a non-profitable open public space? One reason for doing this is because of prescriptions by law, another is because of floor bonuses for developers.

In this chapter a new approach of providing open space in Hong Kong is investigated which expands the current conventional idea of how such a space can be created and how it has to look like. It should create a future perspective and excite the imagination to rethink the predominant trivial.

It is always a sensitive issue to provide future visions because of the frivolous liberation from traditional approaches. To not detach too much from reality, the invented hypothesis with its conceptual elements is combined with down-to-earth questions of marketing and financing. Furthermore, an investigation of different appearances of open spaces on street and podium levels examines the current situation.

For the initial intervention of the hypothesis three urban fields with different utilisation intensities are investigated to discover their potentials. With this results, possible scenarios for the open space explore the chances and qualities of the invention.

For the 'design' part of the project, the proposal is examined from its smallest elements to its widespread growing process. Furthermore, the role of the user is redefined as people should get the chance to step out of the constraint of being just a passive overruled consumer of predetermined open spaces like it is the predominant case today. As already explored in the theoretical part, people in Hong Kong are highly creative of using their given space if they have the opportunity to do so.

The program of these spaces should function as a social barometer of desired utilisation and therefore the possibility of transformation and individual determination is implied.

The project with its elements can be seen as a proposal how to discover urban spaces and explore their potential in order to further develop and enhance the livability within the city.

STREET LEVEL

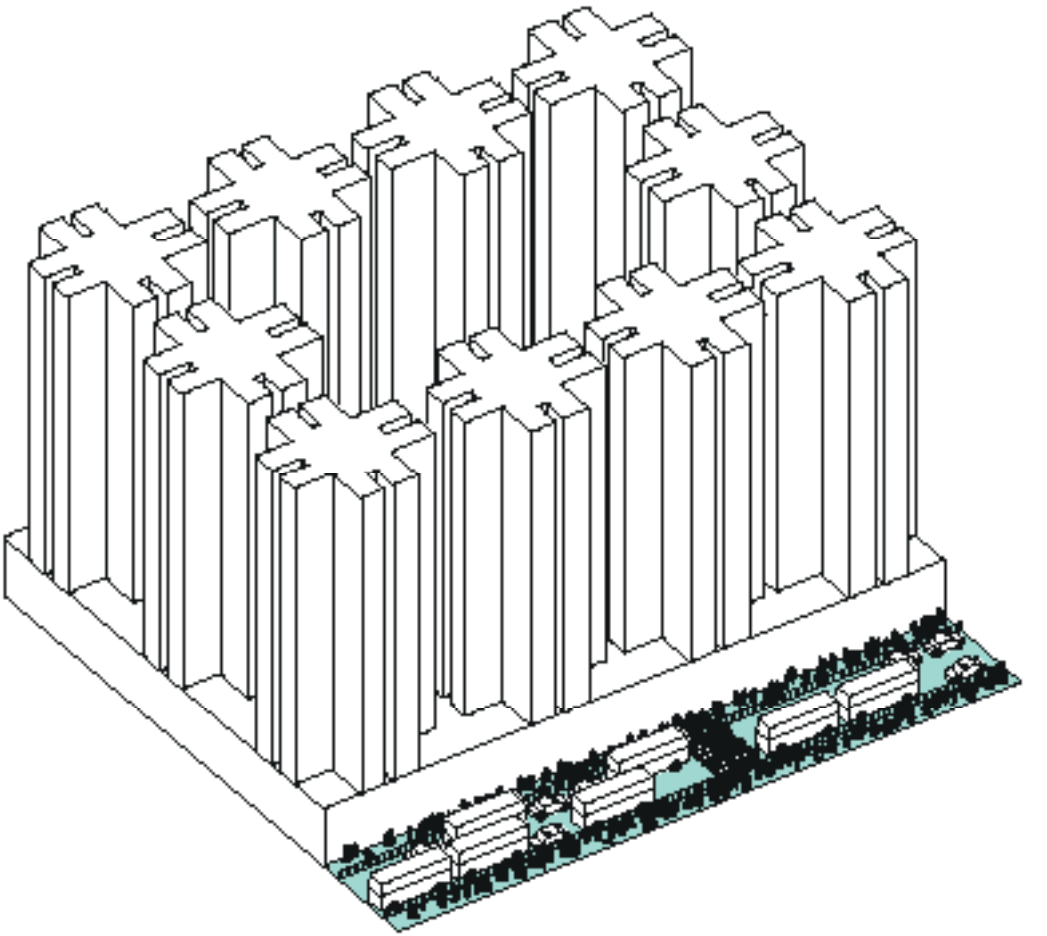
The first focus for the analysis of different levels of open space on Hong Kong Island is on the street level. Depending on the surrounding utilisation of the podium and ground floor level, its pedestrian frequentation varies. For areas with commercial dedication the pathways are congested, while areas with no commercial uses have much less pedestrian flow.

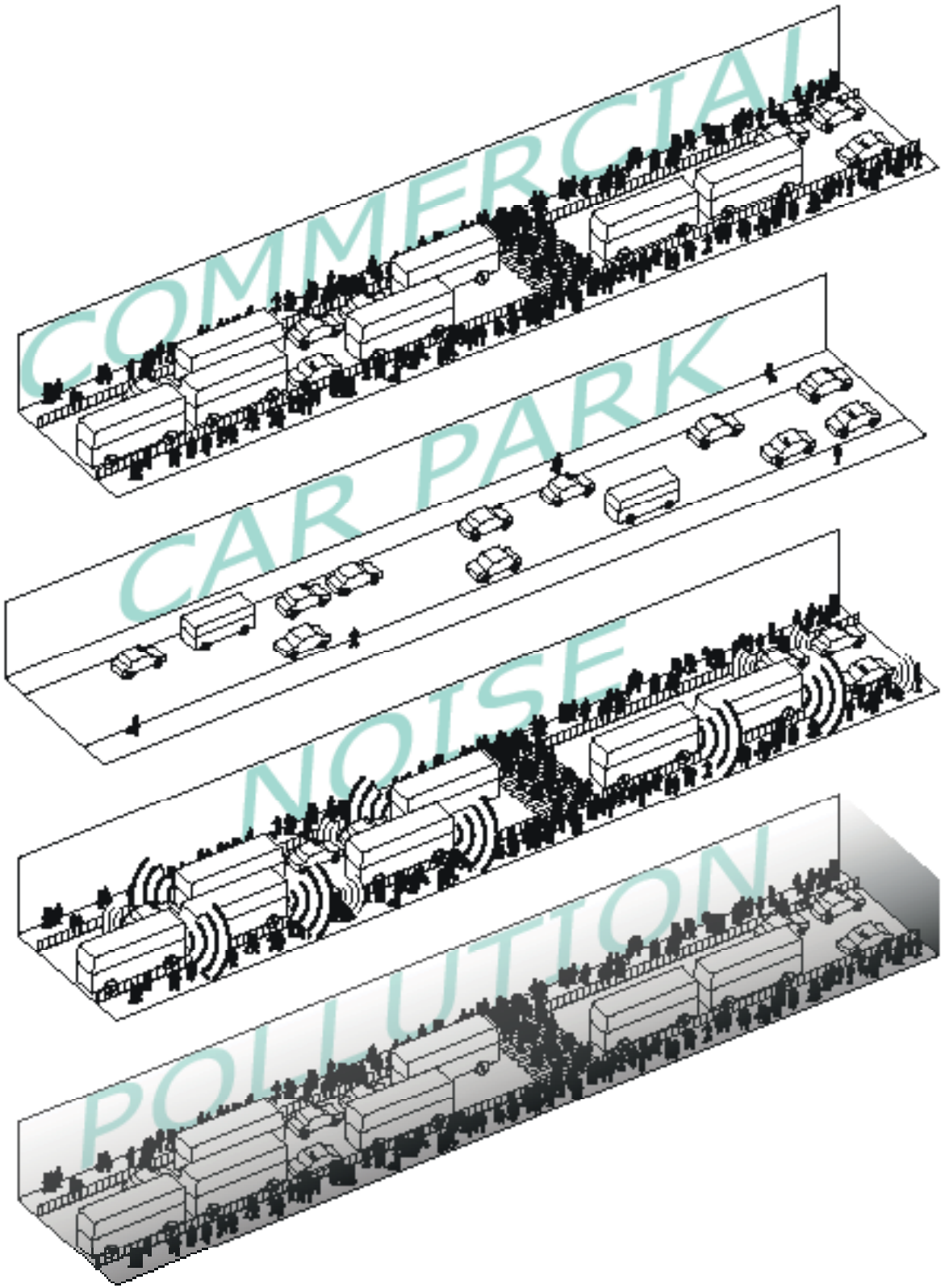
Two major problems arise when looking at the street level. These are the noise as well as the air pollution due to the heavy vehicular traffic. The noise pollution is mainly caused by double-decker buses and the sound reflecting effect of the street canyons.

The heavy traffic also causes air pollution on street level which is further intensified by the lack of natural ventilation due to the widespread podium and tower typology.

Chapter High Rise p.152

Chapter High Rise p.153




COMMERCIAL
CAR PARK
NOISE
POLLUTION

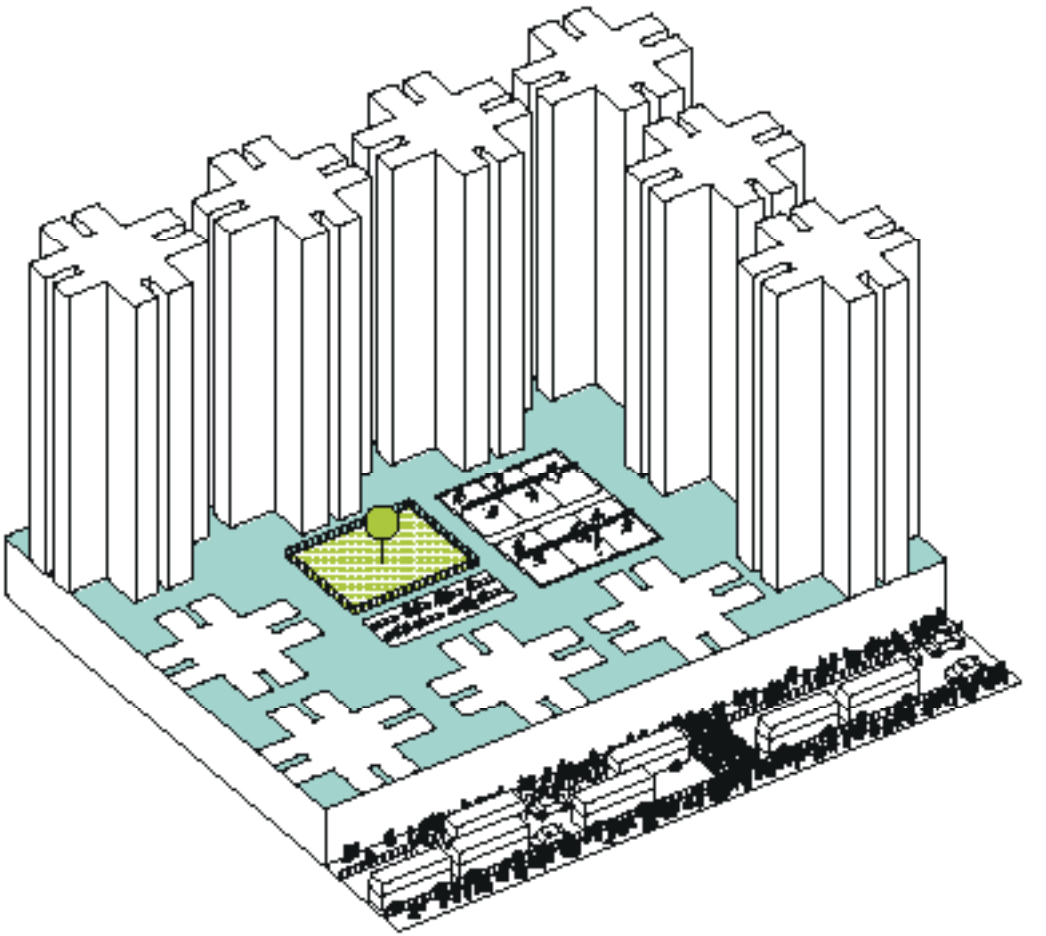
PODIUM LEVEL

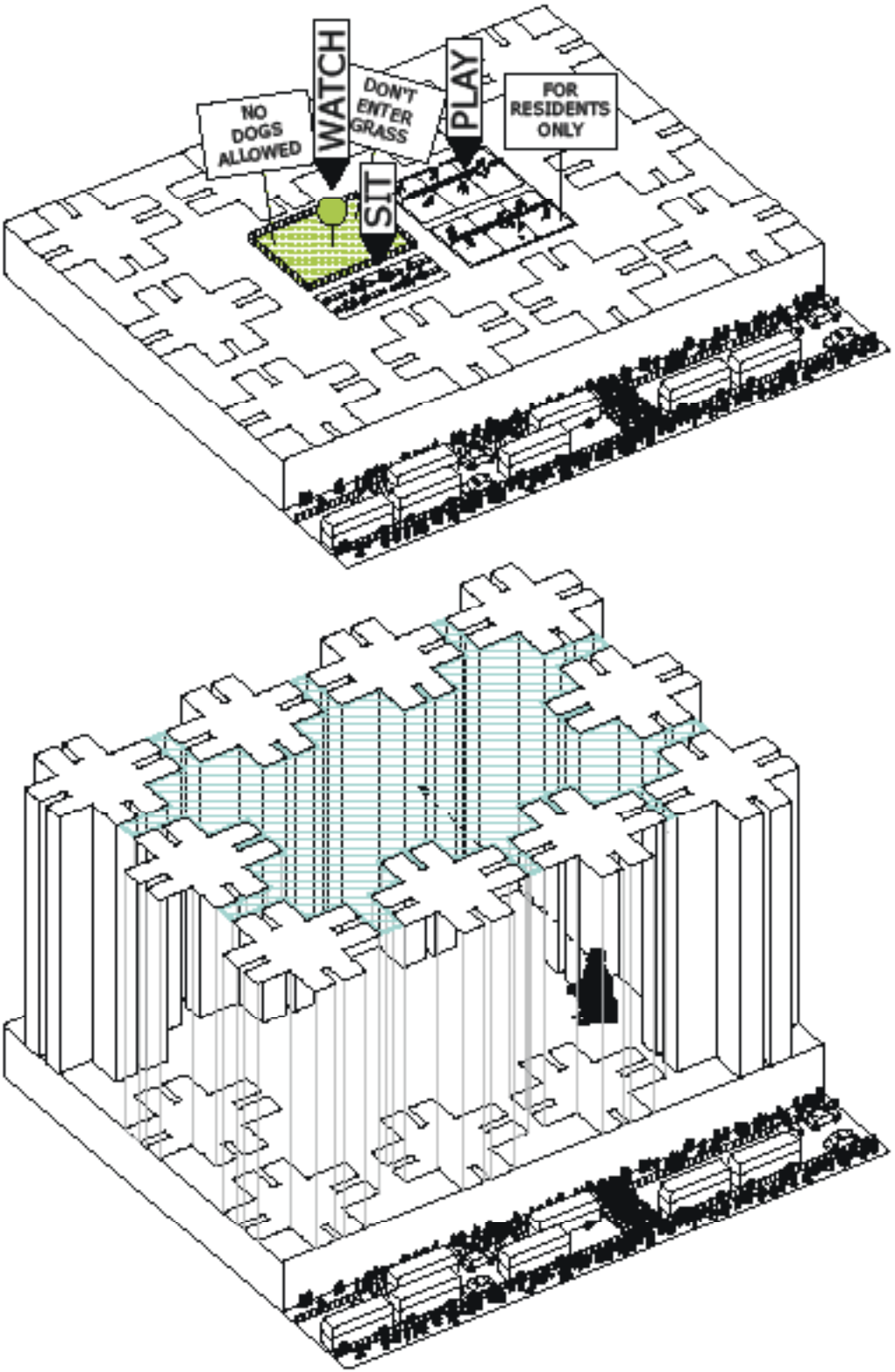
Podium levels are often equipped with sport and recreational facilities and are frequented mostly by residents of the surrounding housing estates. These spaces have a high degree of predetermination and restrictions but are nevertheless heavily used and an important open space for social and communal contacts. The space often appears like an inner courtyard of a perimeter block development. Due to the massive height of the surrounding towers, the sky view is reduced to an abstract shape, formed by the bordering tower edges.

Chapter High Rise p.181

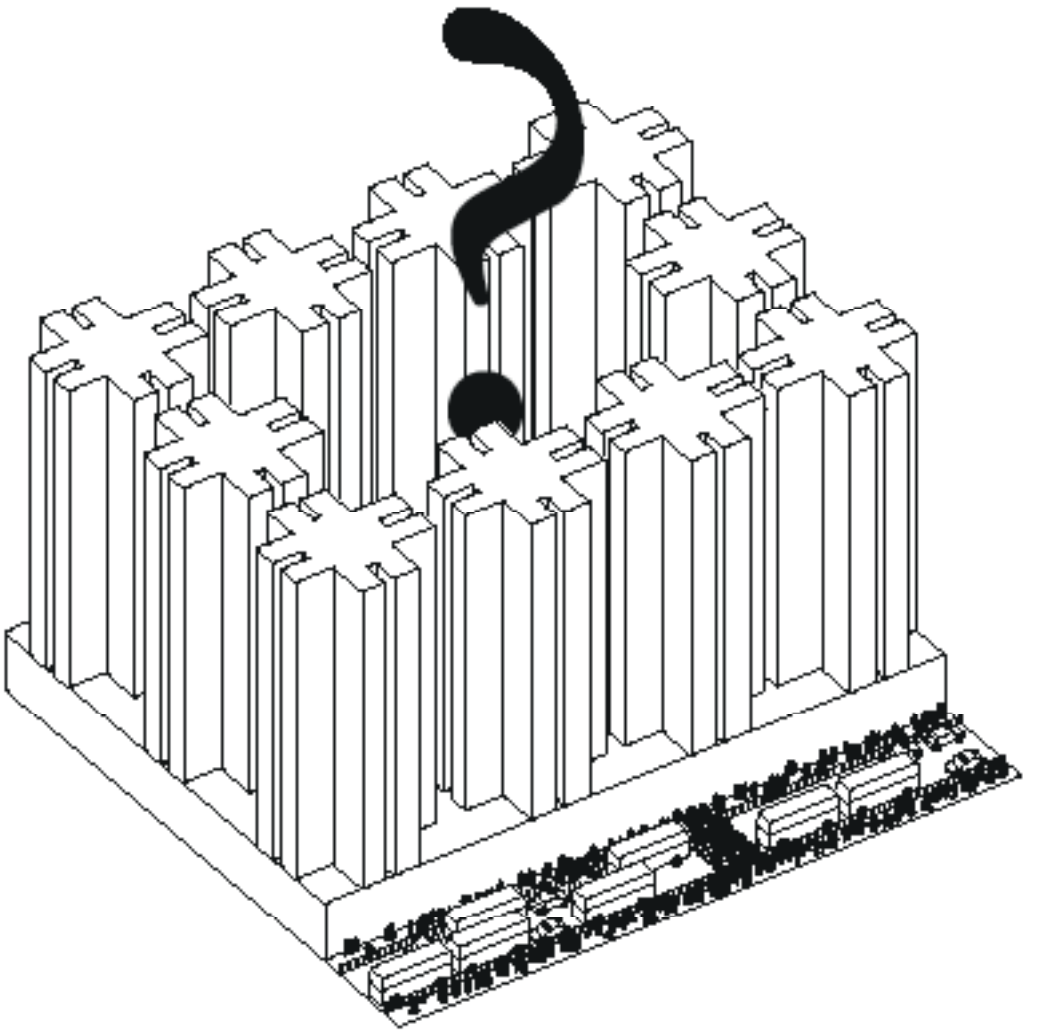
Chapter Density p.62

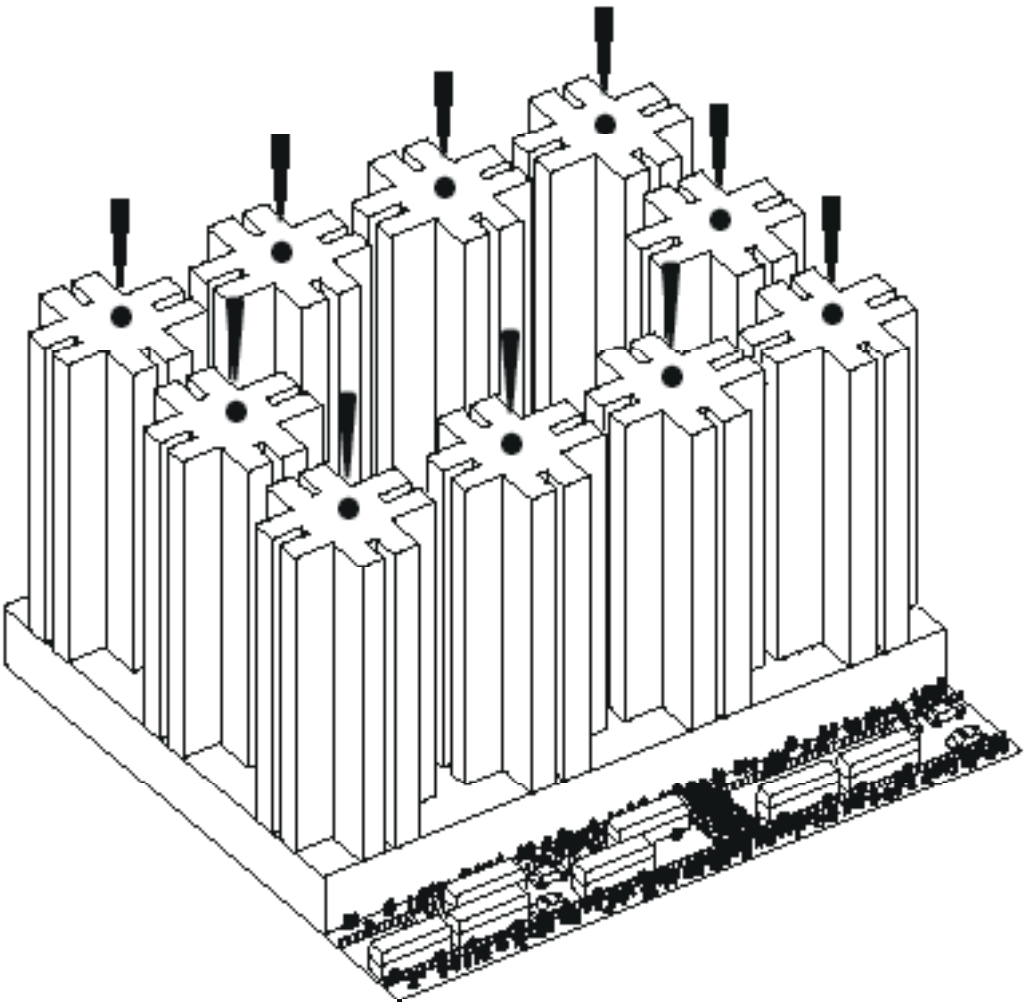
Urban green often functions as a passive element because of restricted access and its placement as prettifying fill-ins.




NO DOGS ALLOWED
WATCH
DON'T ENTER GRASS
PLAY
FOR RESIDENTS ONLY
SIT

SO WHAT





ROOFTOP LEVEL

Nowadays, rooftop levels in Hong Kong represent a vast inactivated space which is either occupied by technical devices and water tanks or empty undetermined space with prohibited access. At our project area alone, which is a seven kilometre long intersection of Hong Kong Island, there are some 1.830.880m^2 of rooftop area.

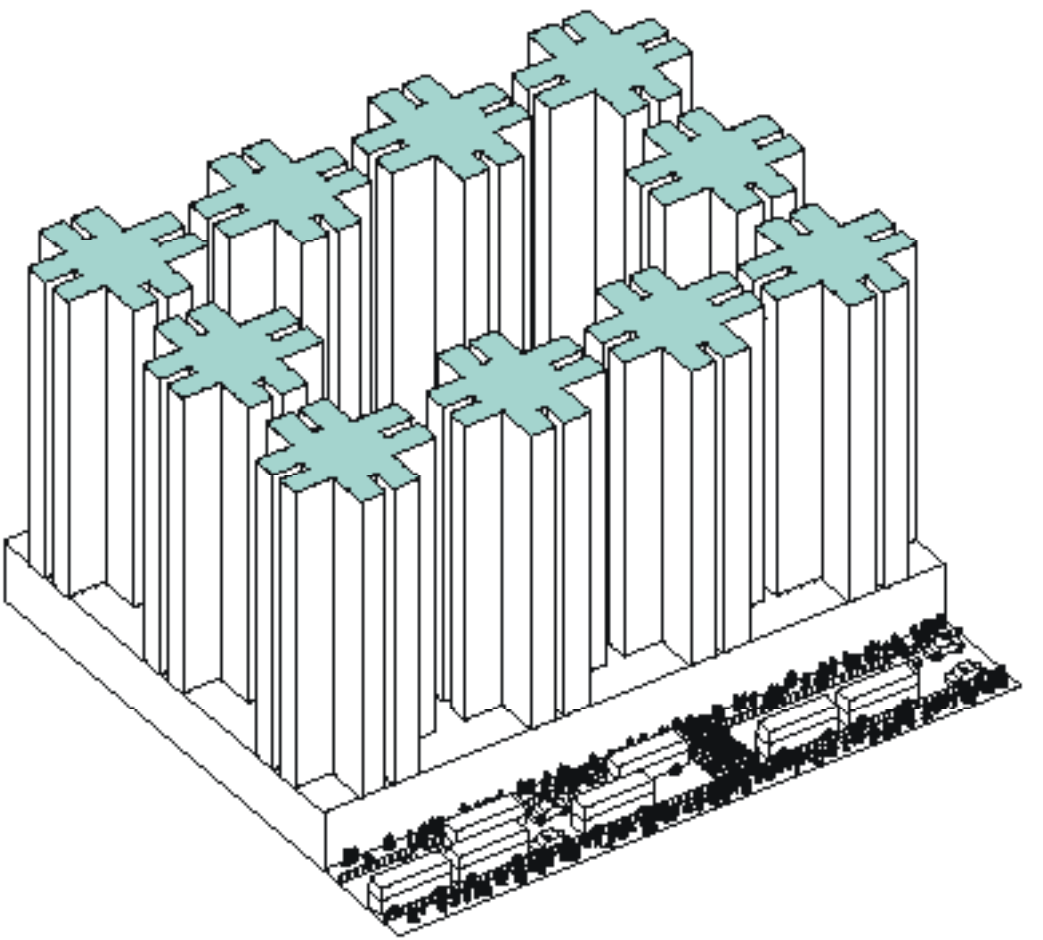
As a logical result, some of those spaces have been used for illegal structures such as rooftop houses until recently, but they mostly disappeared due to governmental action taken against those self erected structures.

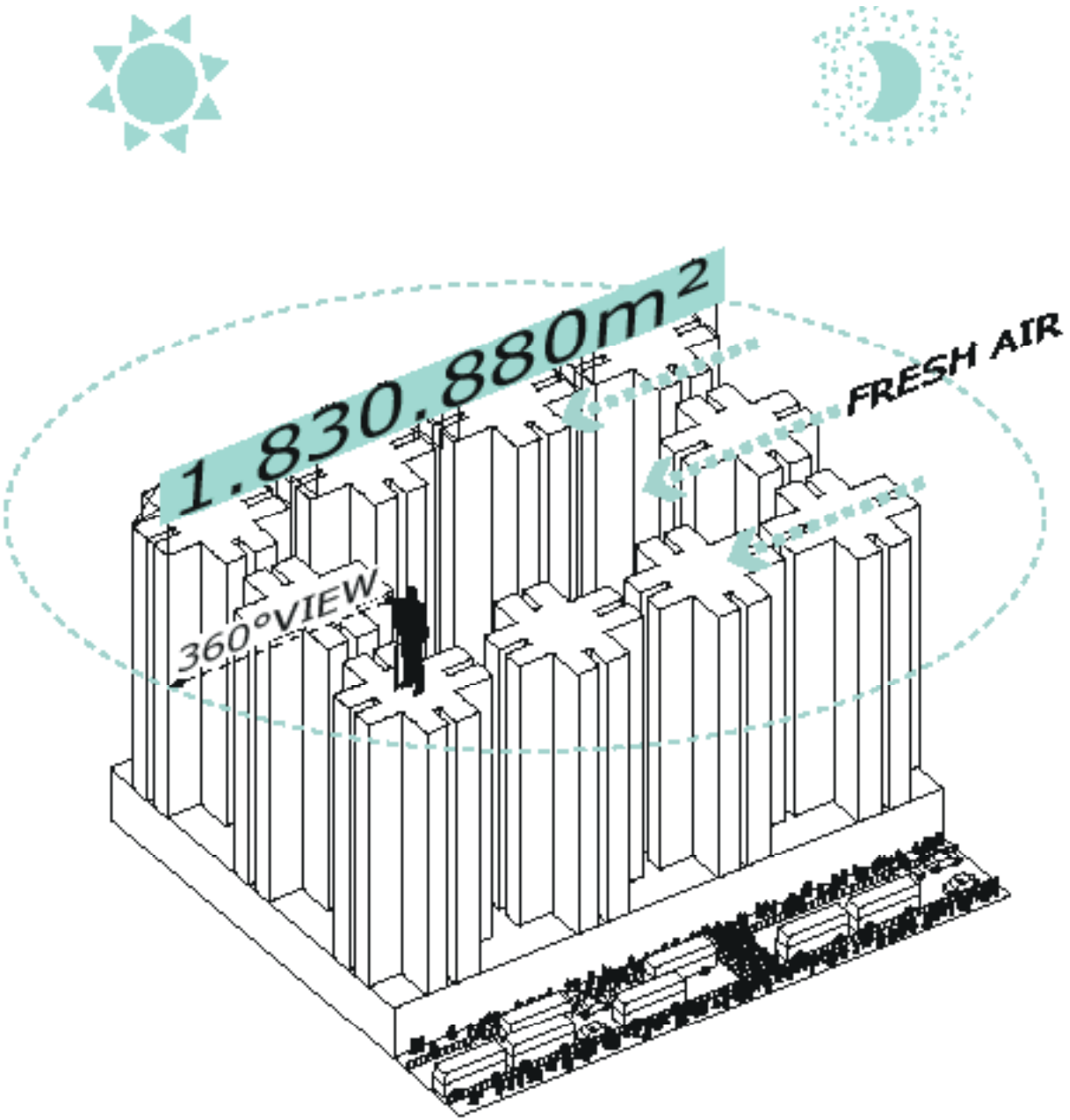
Furthermore, in former housing estates like the Mark II, rooftop areas have been used for schools, as cooking space and communal area. In the Kowloon Walled City, the rooftop level was the only recreational space due to its benefits of fresh air, good view and the possibility of experiencing elements of nature in an otherwise densely packed build up environment.

Chapter High-rise p.173

Chapter Megastructure p.119

Chapter Habitat p.217




1.830.880m²
FRESH AIR
360°VIEW

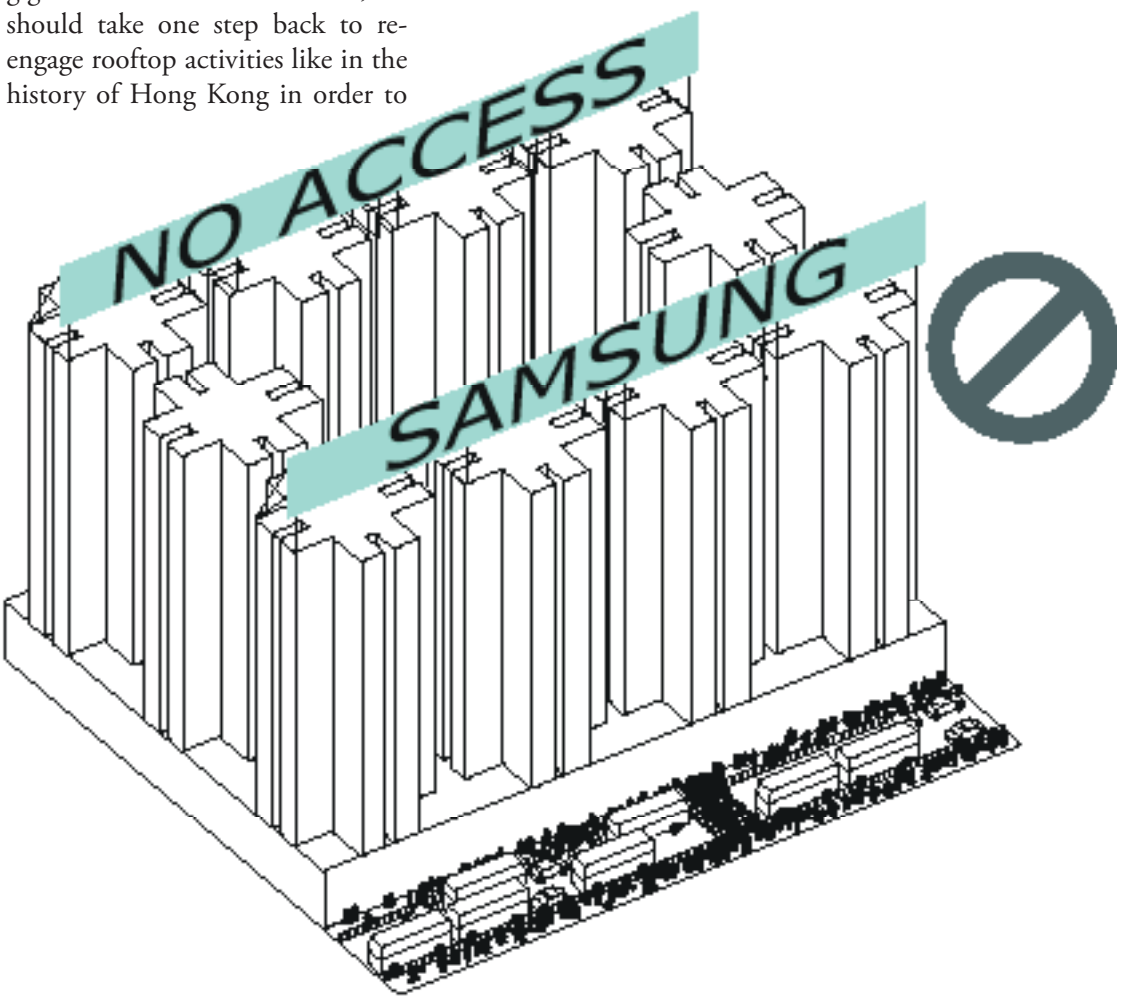
INITIAL HYPOTHESIS

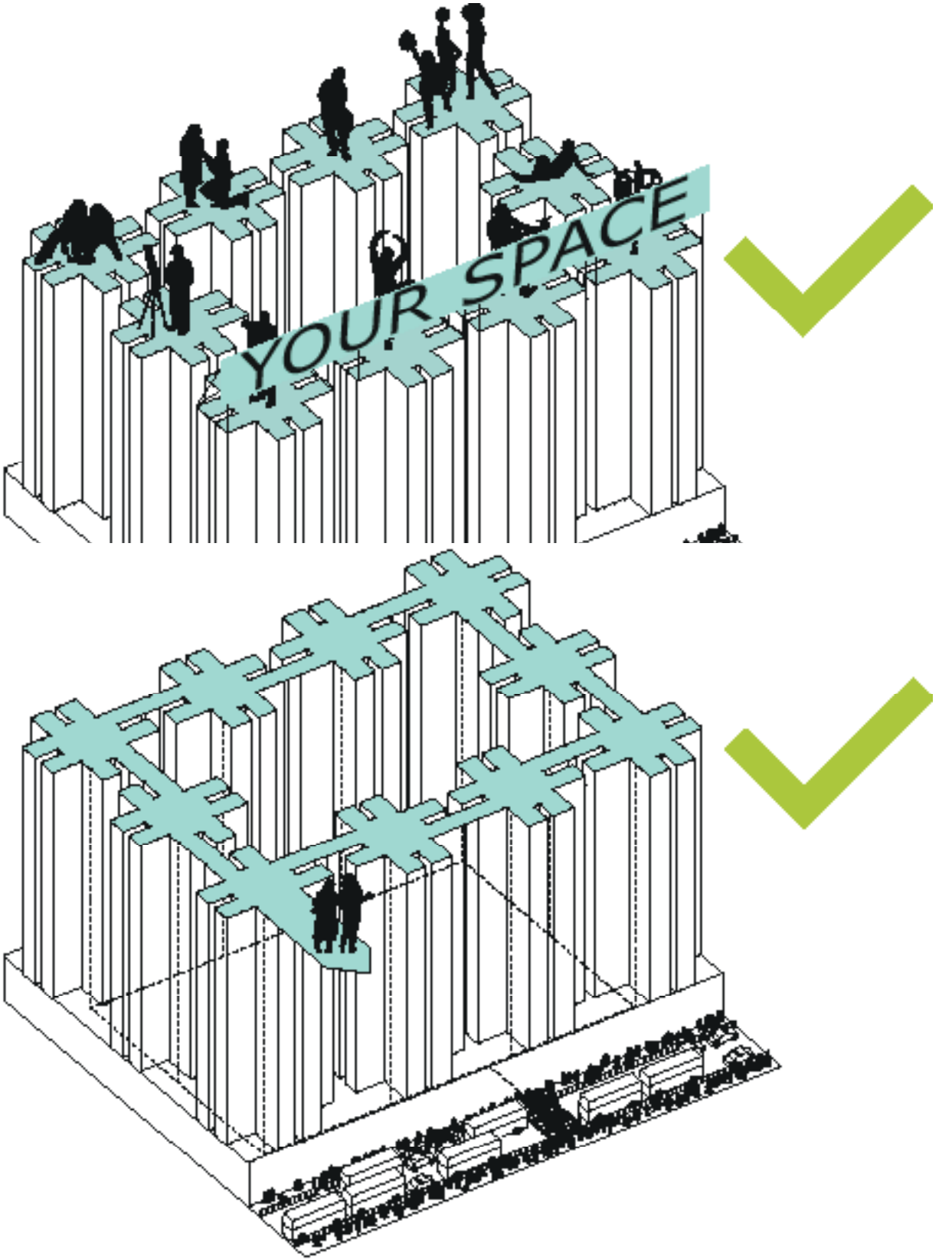
Land reclamation and doubling of ground has a long history in Hong Kong and led to a vast increase of usable land. Due to environmental concerns and public awareness, land reclamation in Hong Kong has significantly declined recently. This fact in interaction with the lack of self determined open spaces and congested street levels are a chance of thinking about new ways of reclaiming inactive urban spaces.

Instead of denying access to rooftop levels and abusing them for gigantic commercial billboards, we should take one step back to reengage rooftop activities like in the history of Hong Kong in order to further develop possibilities of creating open space in a hyper dense environment. Therefore, the project aims to investigate different solutions for reclaiming rooftop levels and gives a forecast of possible future developments.

Chapter Density p.47

Furthermore, to contribute to an interconnected urbanity and to increase the experienceable spaces, networking and bridging is the key to a new form of recreational, self-determined and community building open space with a revived connection to the elements of nature.




YOUR SPACE

PROGRAM AND SPINE

To achieve the aspired effect of a vibrant, multifunctional and self determined open space towards the sky different strategies are invented and a rethinking of the conventional is indispensable.

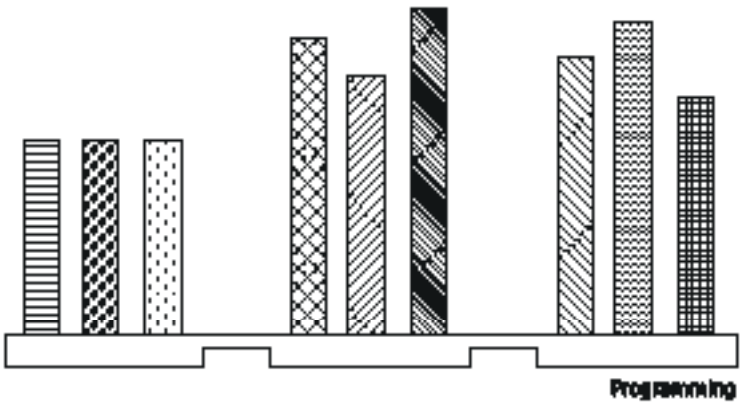
The towers are seen as individual stripes dedicated to a certain program which is defined by its users. This determination should undergo a regular metabolism.

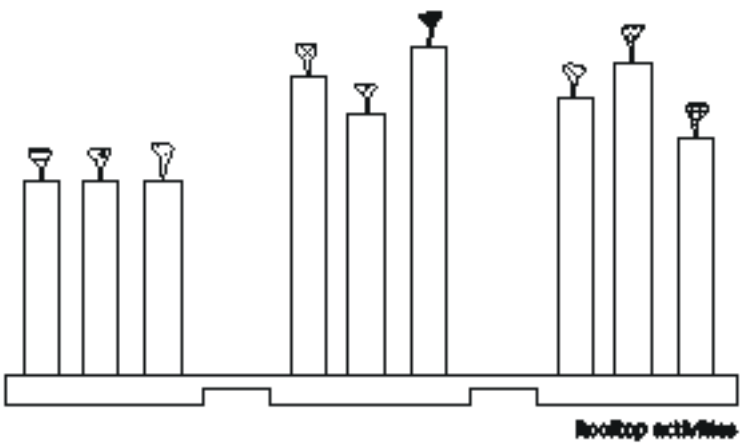
The different activities are carried out at the rooftop level and transform every spot into a unique place of social interaction.

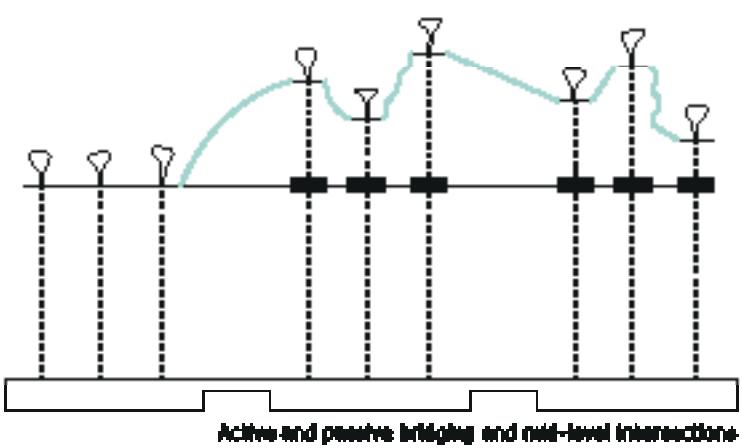
Bridging allows a linkage of activities and social communities. Active and passive connections form different possibilities of experiencing the space and the existing elevator and staircase system functions as vertical connector to the street level. The intersection between the passive circulation and the tower contains service facilities complementing the rooftop level.

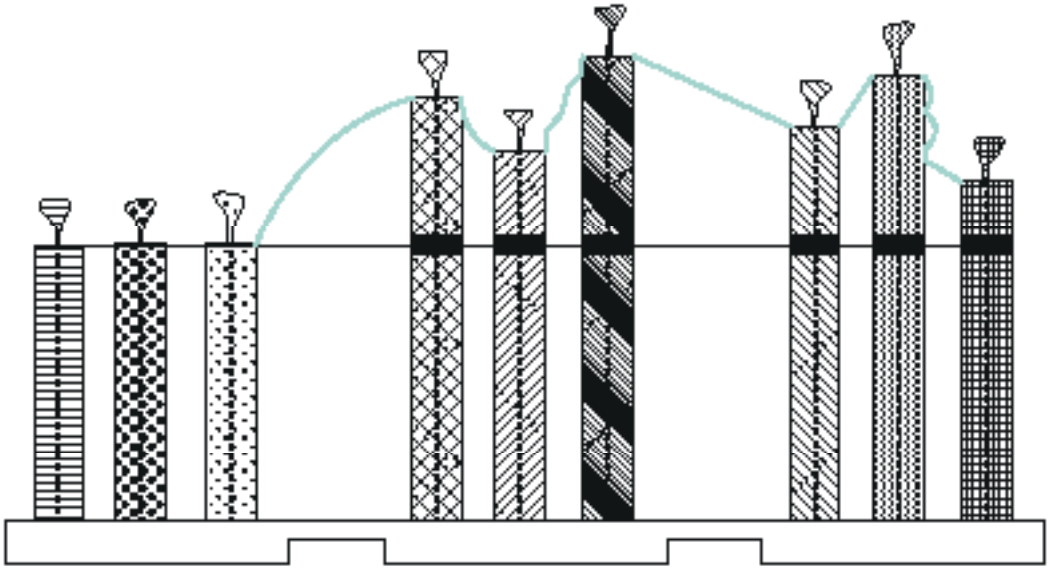
The transformation of one layer within the tower also allows possible commercial activities which can furthermore function as another meet and greet spot for residents and visitors.

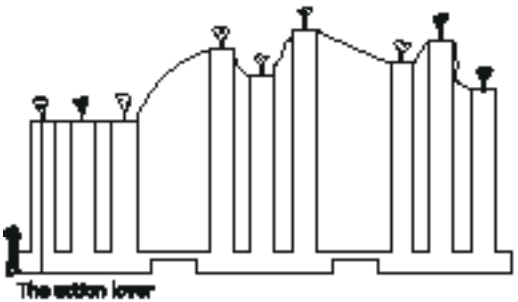
This approach also breaks up the monotony of the towers and the heterogeneous connections allow multiple individual ways of experiencing the provided space.



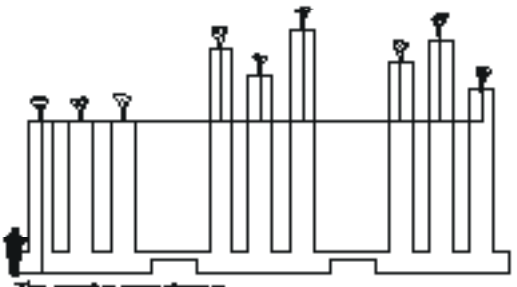




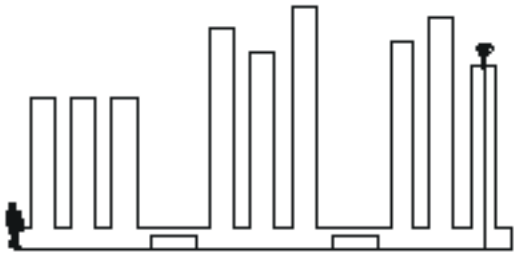




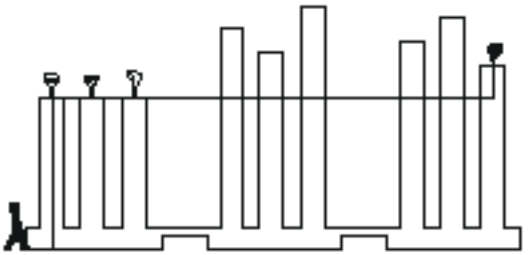
The action lover



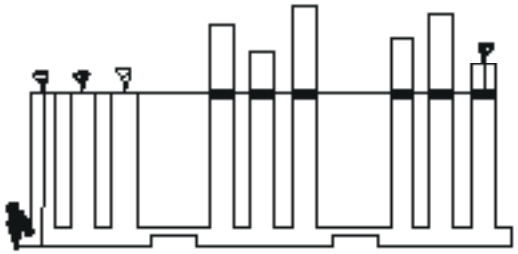
The passive connaisseur



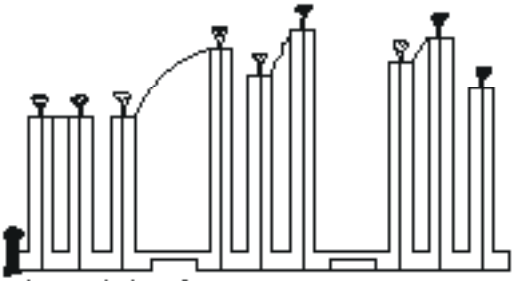
The down to earth, one liner observer



The straight forward seller



The facility user



The one who lost a bet

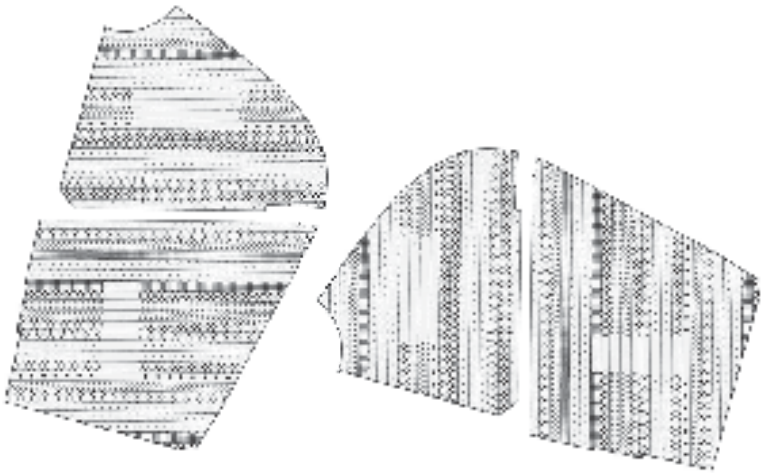
The *Parc de la Villette* (Paris) proposal from Rem Koolhaas deals with the task of providing open space in form of a park, which has the possibility to adjust and change its programme constantly. Instead of seeing it as a definitive design proposal, it is much more a framework which provides the possibility of a metabolism process of its determination.

The strips contain the initial programmatic categories, but there is no clustering or concentration and it is open to readjustment and programmatic mutations.

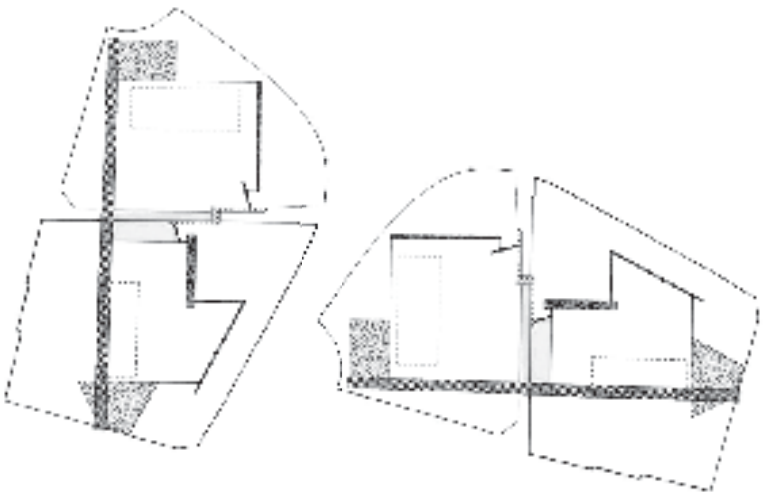
The major elements of the access and circulation system are the so called *Boulevard* and *Promenade*. The *Boulevard* is a straight path that intersects the different stripes. The *Promenade* is a more eventful path with turns and the appearance of plazas with special apparatuses.[1]

Assuming that the *Parc de la Villette* proposal goes vertical, its approach can be linked to the objectives of the Hong Kong project.

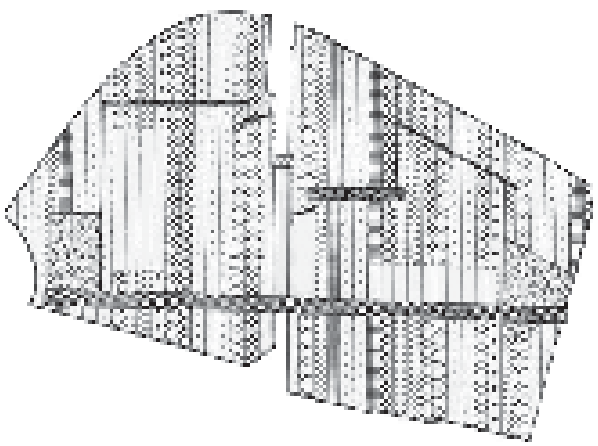
The *Boulevard* could be seen as the street level and the passive connections, which are intersecting the towers (strips) with their different programming. The active connections with their turns and twists form the *Promenade*. Both are connected through the existing elevator and staircase system. All elements should undergo a constant metabolism and therefore the 'design' can be seen as a framework which enables a perpetual state of revision.



001 Parc de la Villette, Strips



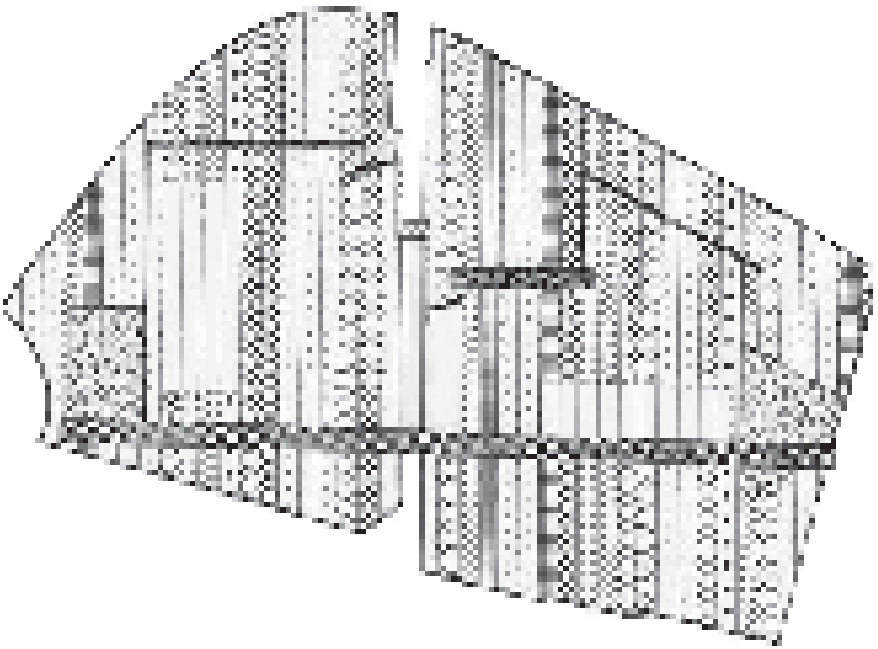
001 Boulevard and Promenade

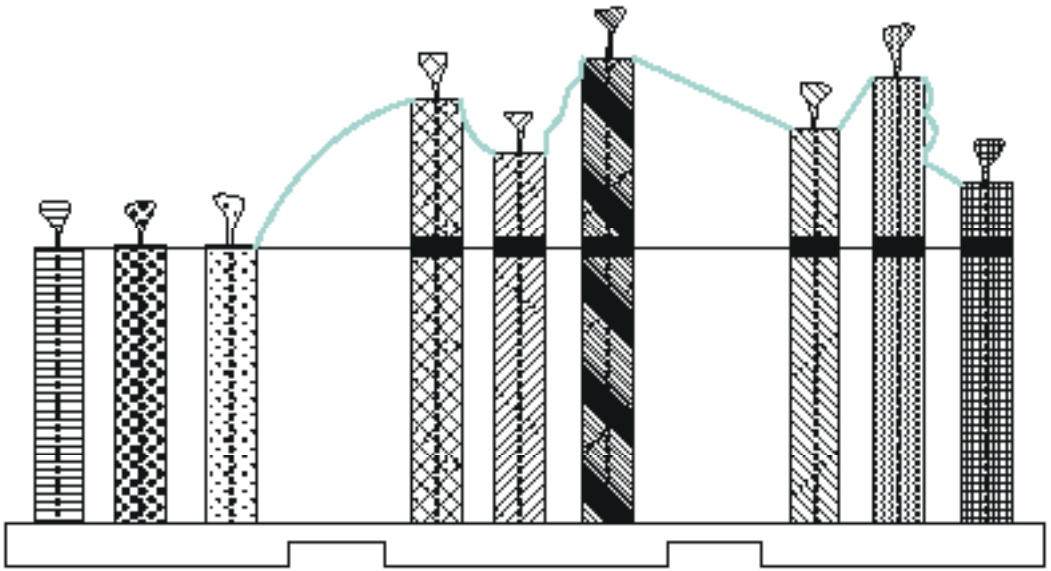


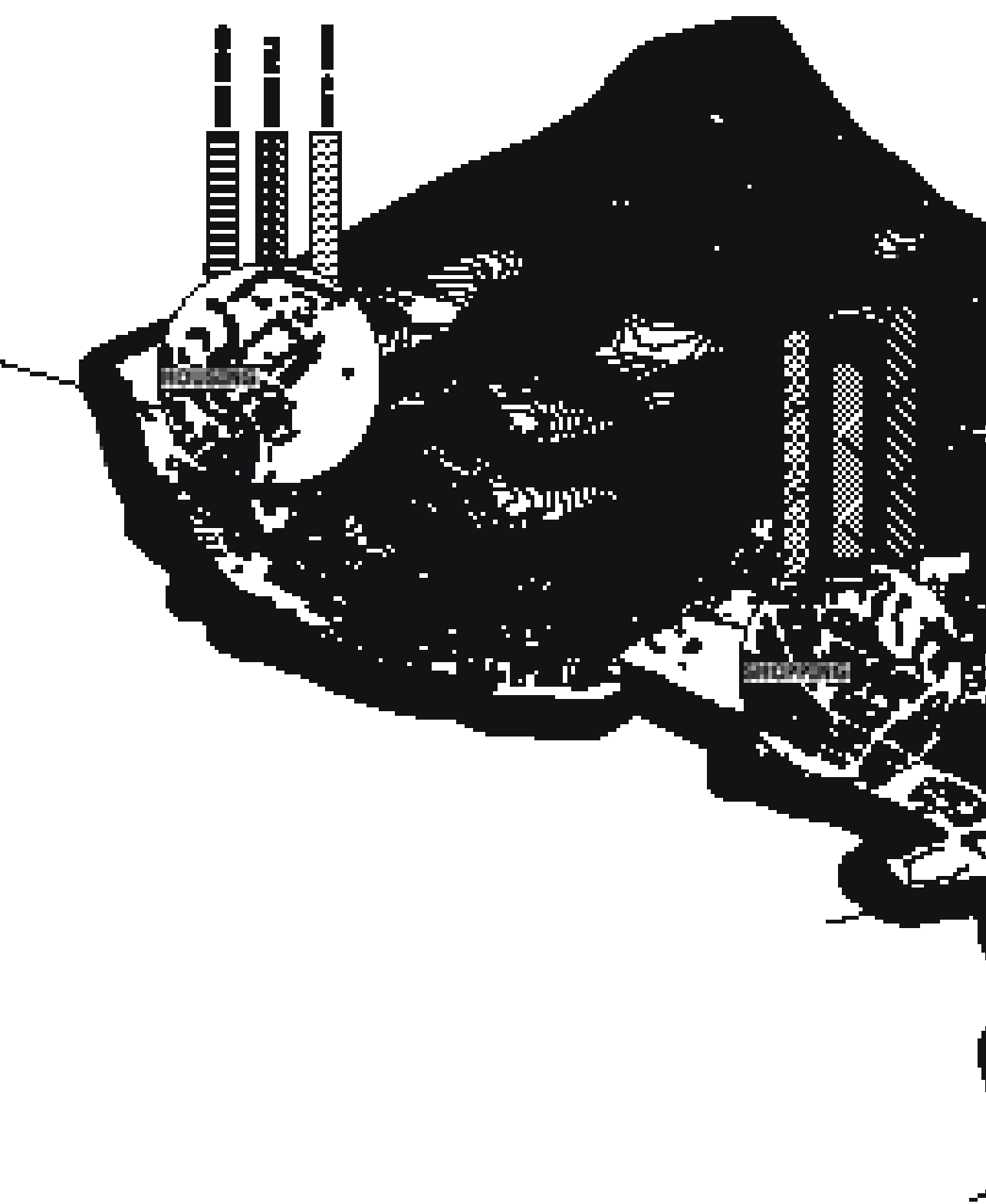
001 Circulation & Strips

1 Cf. Koolhaas 1995, p. 921-927.

LA VILLETTE GOES VERTICAL





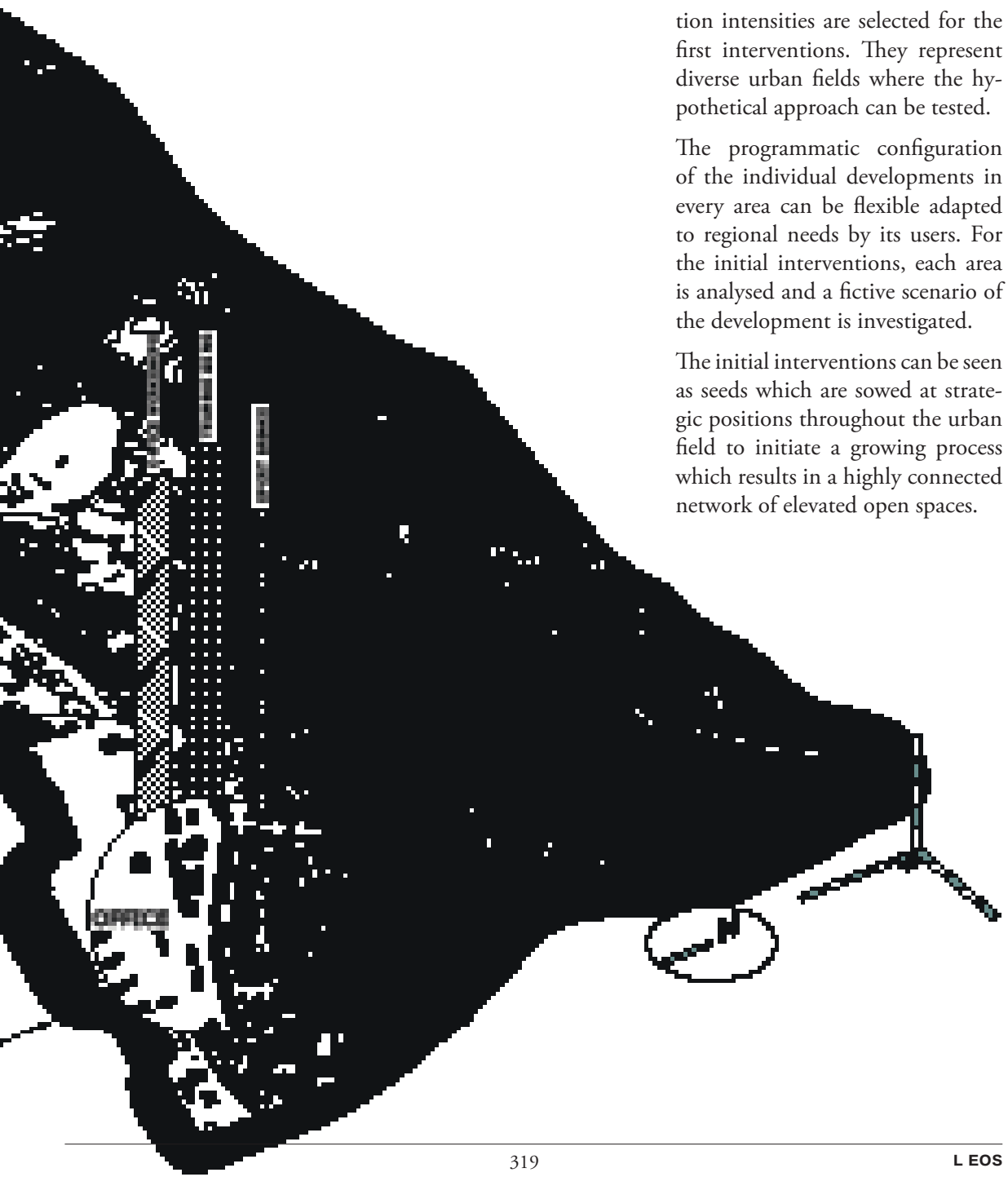


AREAL UTILISATION INTENSITIES

The urban laboratory for the initial hypothesis is a seven kilometre intersection of Hong Kong Island. Three areas with different utilisation intensities are selected for the first interventions. They represent diverse urban fields where the hypothetical approach can be tested.

The programmatic configuration of the individual developments in every area can be flexible adapted to regional needs by its users. For the initial interventions, each area is analysed and a fictive scenario of the development is investigated.

The initial interventions can be seen as seeds which are sowed at strategic positions throughout the urban field to initiate a growing process which results in a highly connected network of elevated open spaces.

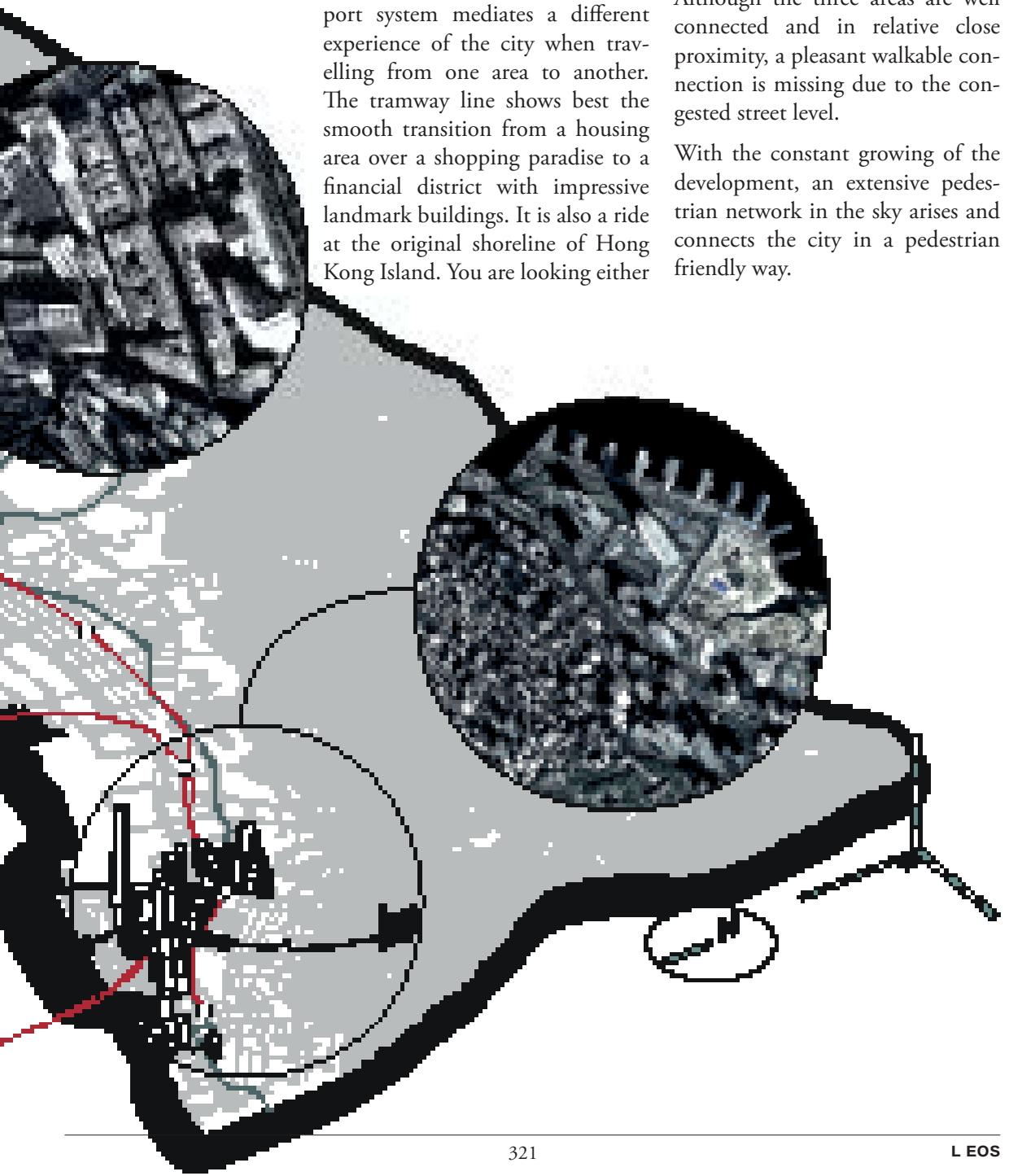


TRANSPORT AND TRANSFORMATION

The existing connection between the three chosen areas are the tramway line, the road network and different MTR lines. Each transport system mediates a different experience of the city when travelling from one area to another. The tramway line shows best the smooth transition from a housing area over a shopping paradise to a financial district with impressive landmark buildings. It is also a ride at the original shoreline of Hong Kong Island. You are looking either on reclaimed land or on natural land, depending on which side you choose.

Although the three areas are well connected and in relative close proximity, a pleasant walkable connection is missing due to the congested street level.

With the constant growing of the development, an extensive pedestrian network in the sky arises and connects the city in a pedestrian friendly way.

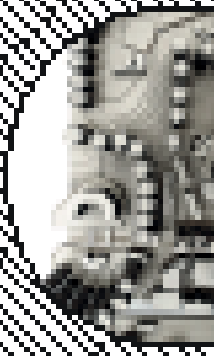


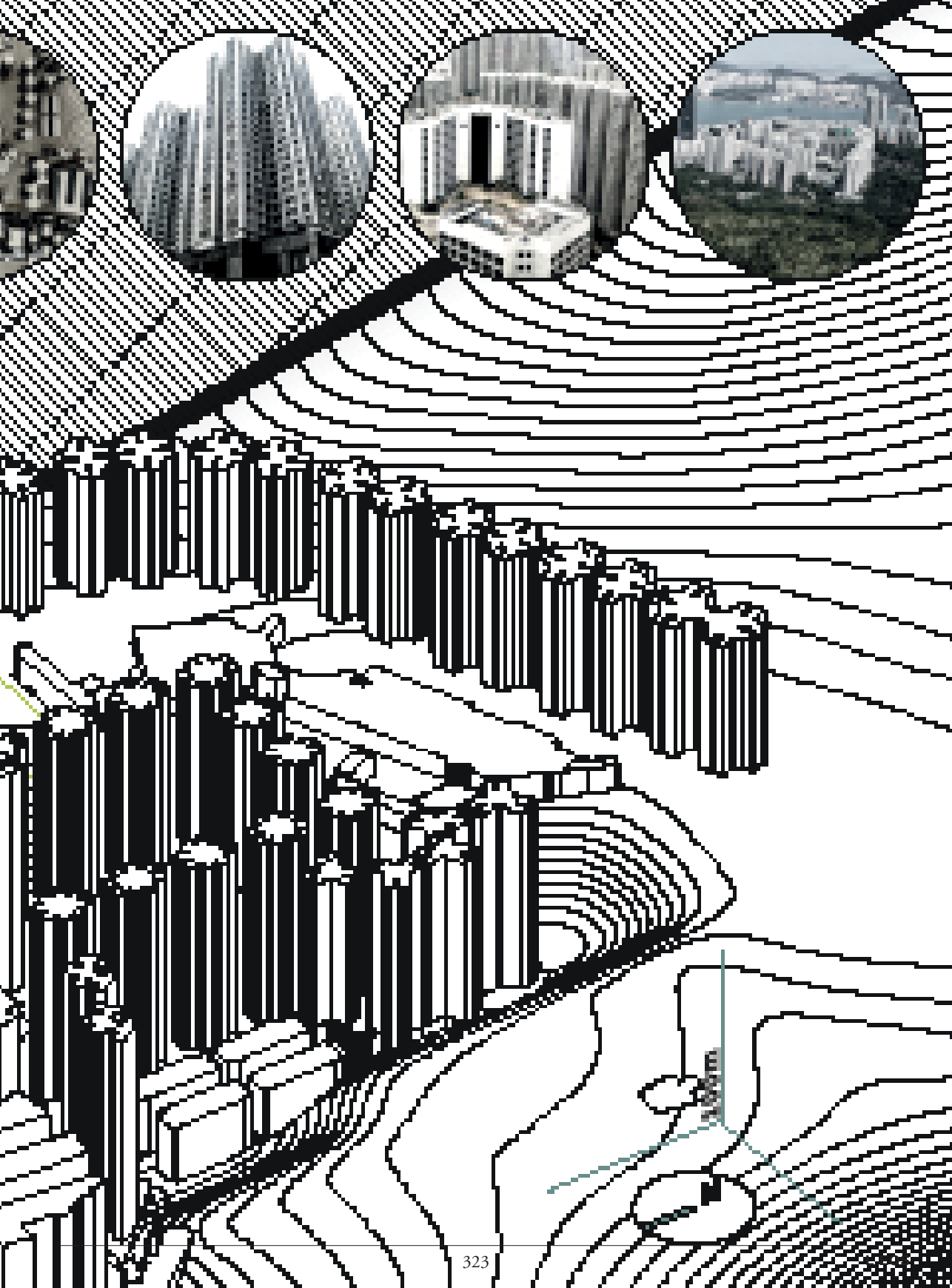
NEIGHBOURHOOD CITY

Tai Koo Shing and Kornhill form massive private housing developments in Quarry Bay at the east end of our project area.

Many schools are located in close proximity to the housing towers. The area is also equipped with sport facilities and functional predefined spatial arrangements, but open space is lacking of self determined creative areas and initiative vibrancy.

The housing towers are in close proximity to the green lush landscape of the hinterland and therefore provide great potential to be connected with the already existing Quarry Bay Tree Walk to reestablish an environmental awareness and relation to nature.



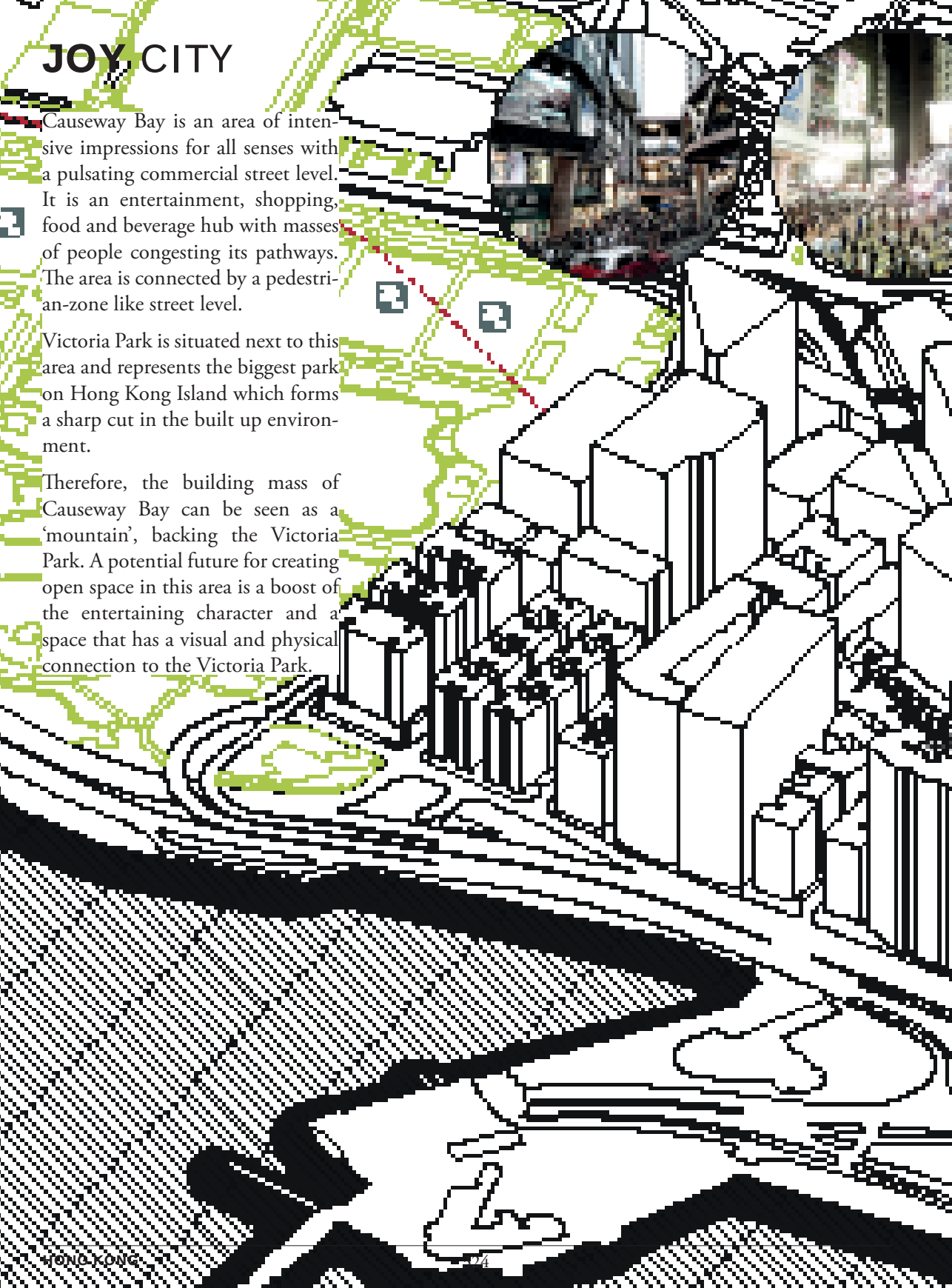


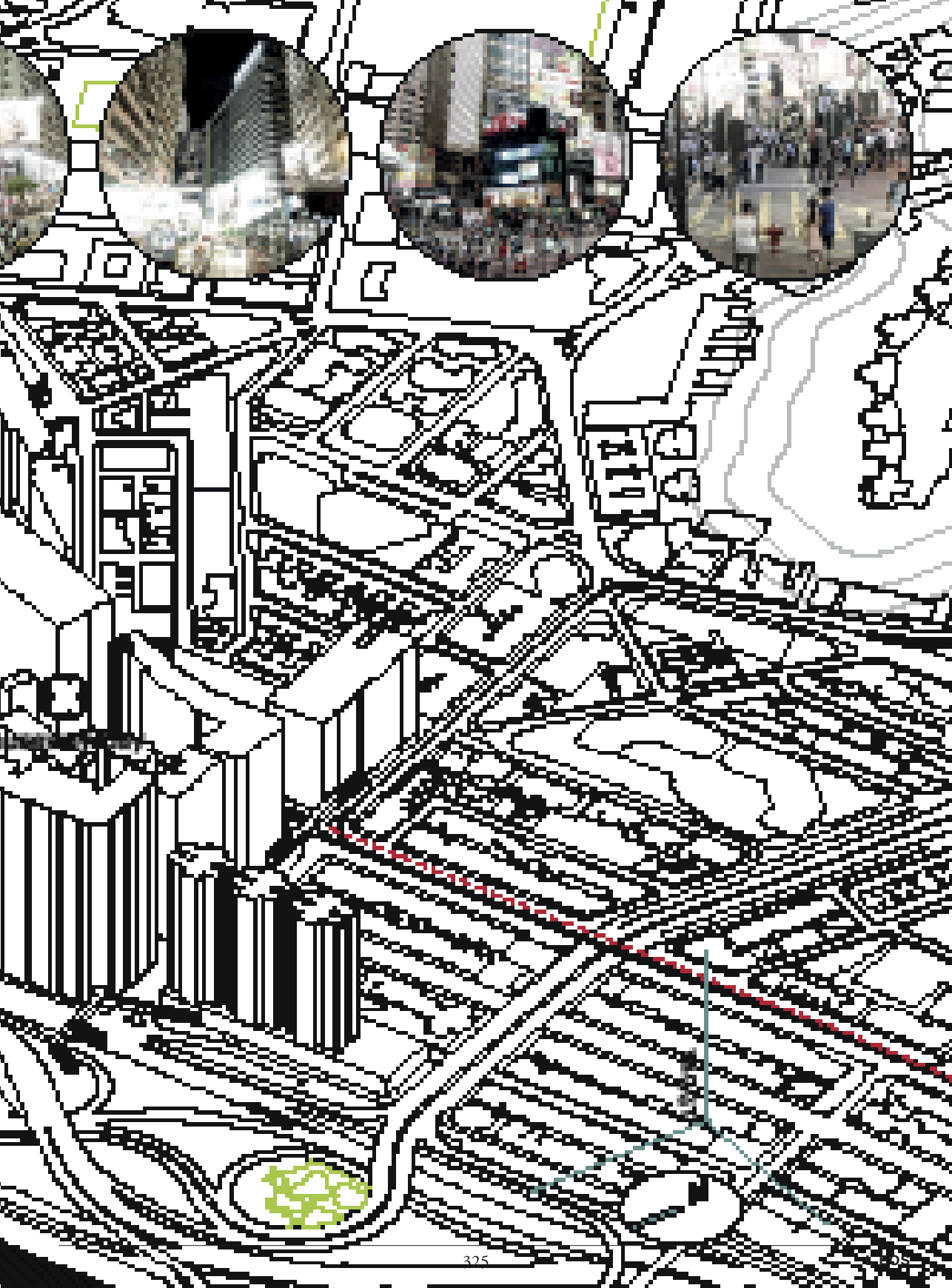
JOY CITY

Causeway Bay is an area of intensive impressions for all senses with a pulsating commercial street level. It is an entertainment, shopping, food and beverage hub with masses of people congesting its pathways. The area is connected by a pedestrian-zone like street level.

Victoria Park is situated next to this area and represents the biggest park on Hong Kong Island which forms a sharp cut in the built up environment.

Therefore, the building mass of Causeway Bay can be seen as a 'mountain', backing the Victoria Park. A potential future for creating open space in this area is a boost of the entertaining character and a space that has a visual and physical connection to the Victoria Park.





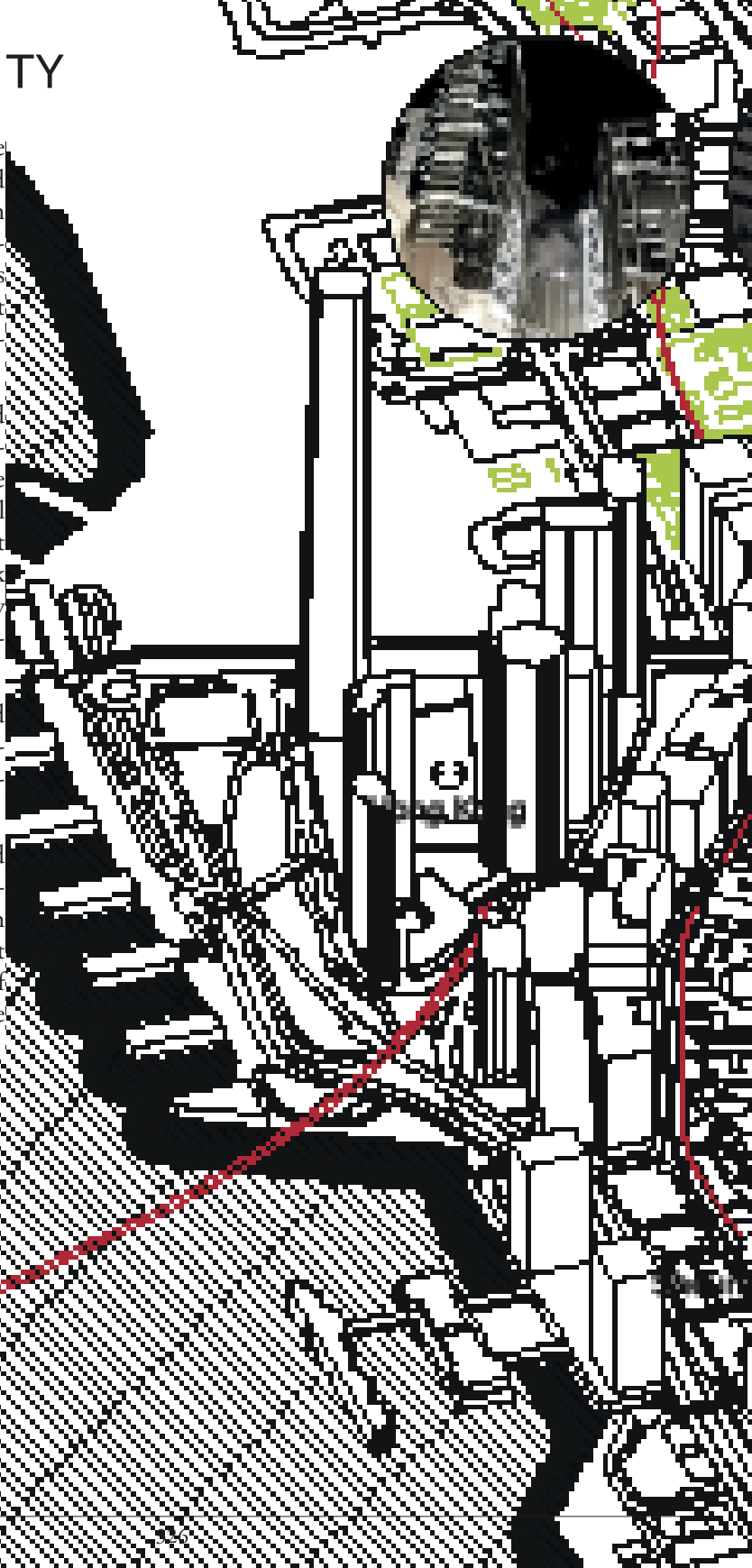
CONTRAST CITY

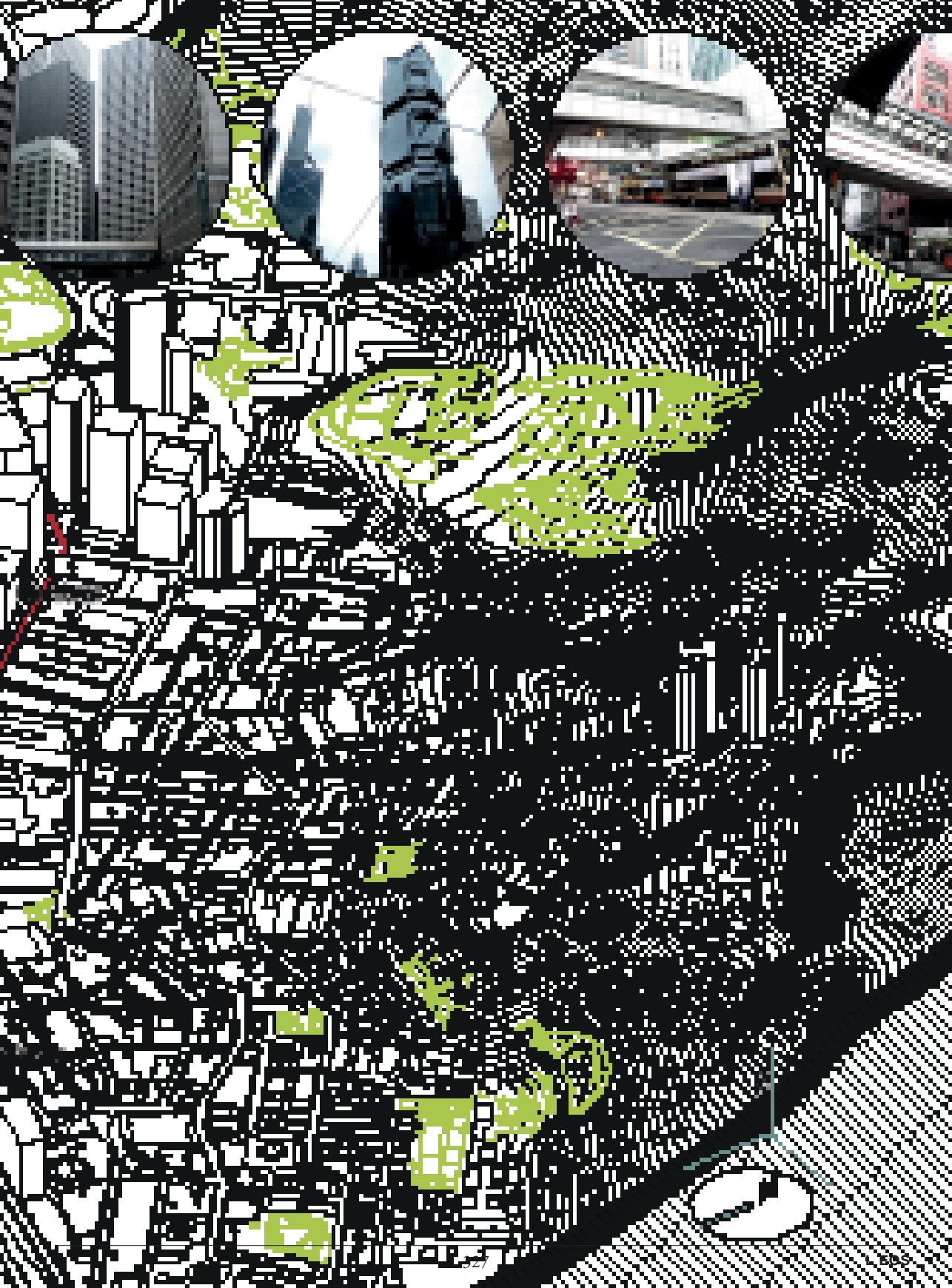
The Central business district is the core of the financial stronghold which Hong Kong represents in Asia and the world. A massive agglomeration of landmark buildings are situated in front of the oldest settlement area of Hong Kong Island.

Pedestrian movement is supported by several facilities like the Mid-Level Escalator which connects the business district with the uphill housing developments. It is part of an extensive pedestrian network reaching from the Central Ferry Piers to the Mid-Levels, all on artificial elevated ground.

The sealing of the natural ground led to an environment where walk-on-able green space literally disappeared.

In this interesting area of old and new Hong Kong, the lack of accessible open green space and the clash of social classes forms the greatest challenge and highest potential of further developing this part of the city.

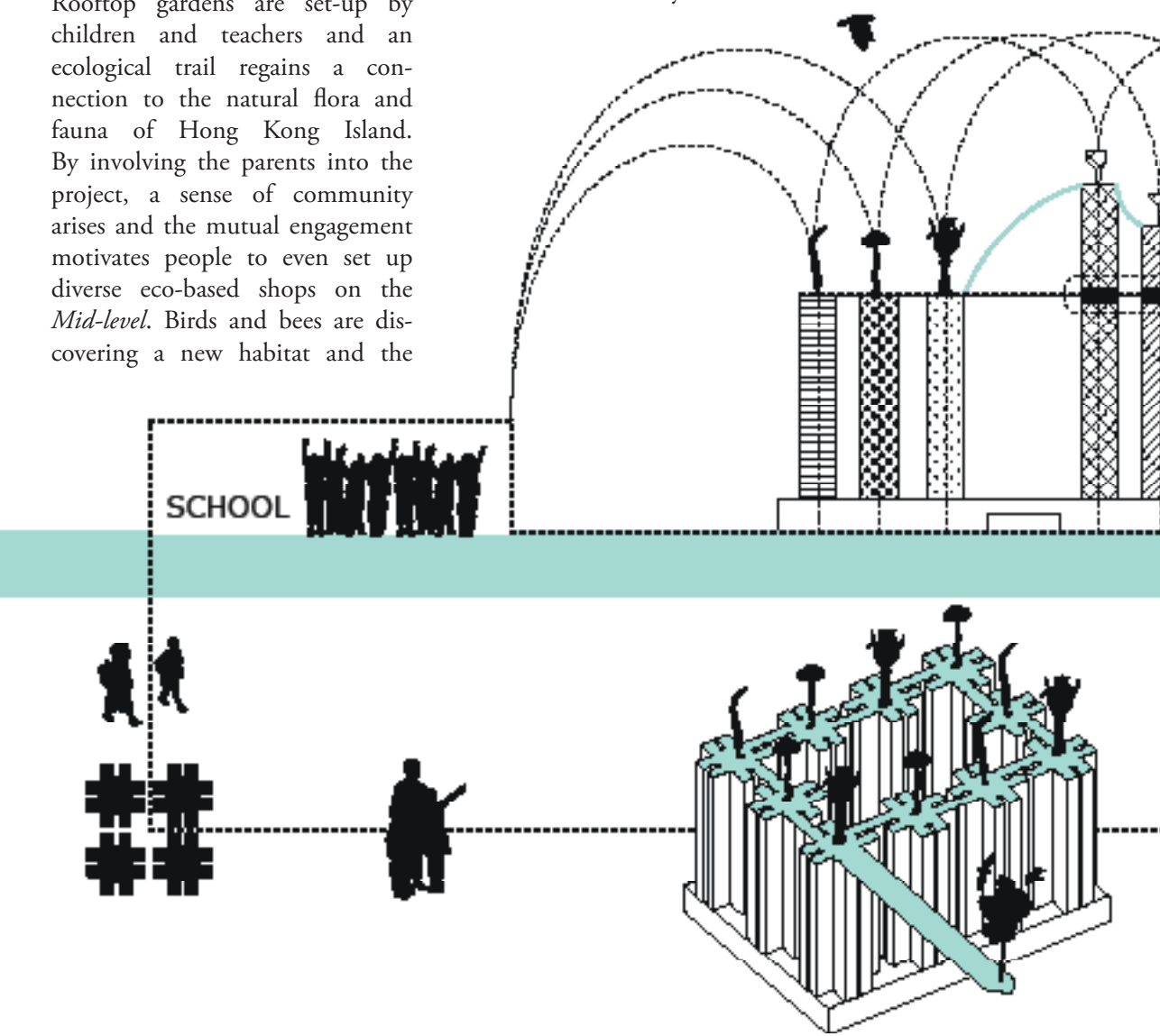


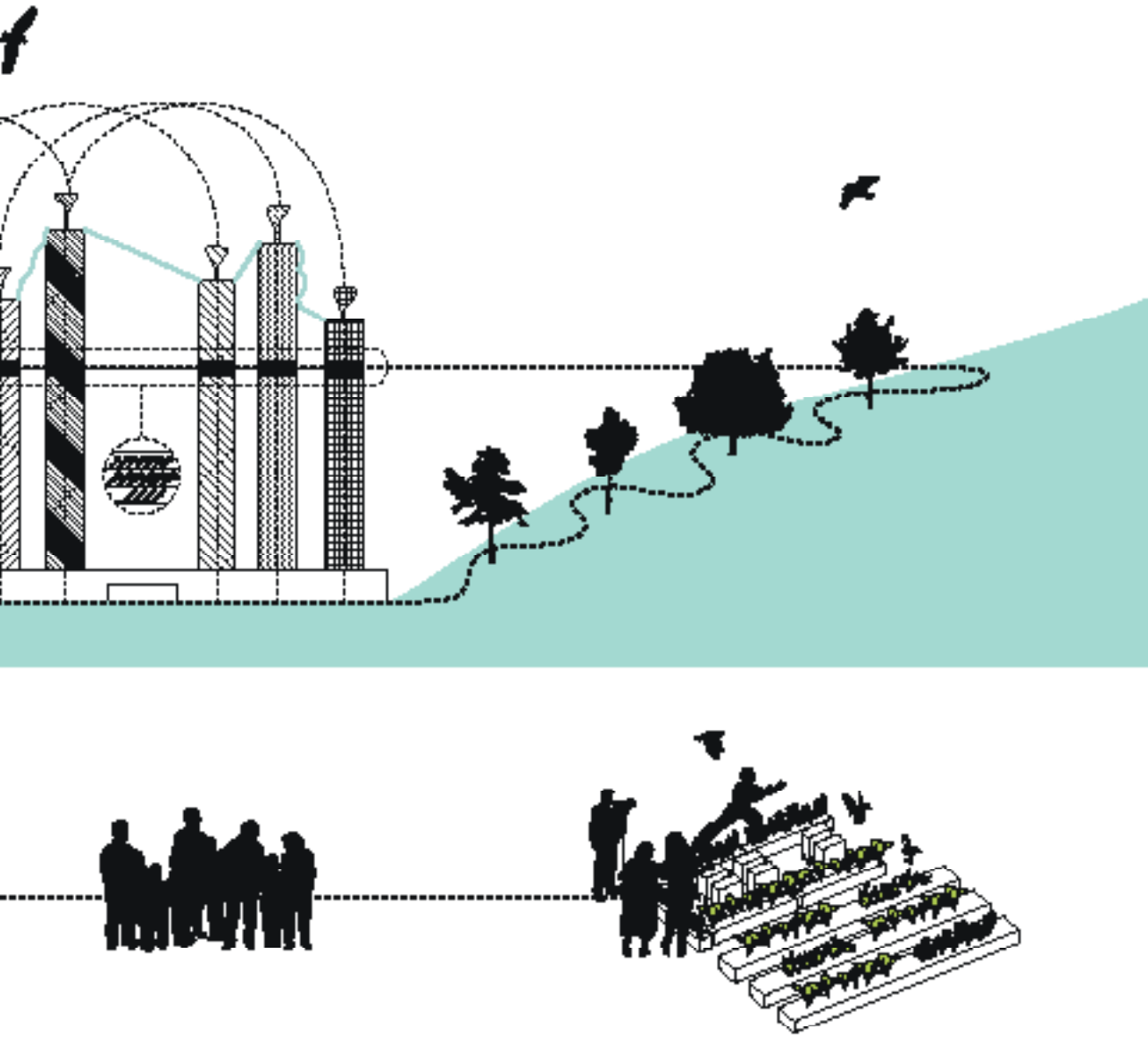


NEIGHBOURHOOD CITY SCENARIO

As ecological concerns are arising and the awareness of people develop towards a more sustainable future, schools are taking responsibility of reviving the understanding of our ecological system, especially in a hyper consumer-oriented mega city.

Rooftop gardens are set-up by children and teachers and an ecological trail regains a connection to the natural flora and fauna of Hong Kong Island. By involving the parents into the project, a sense of community arises and the mutual engagement motivates people to even set up diverse eco-based shops on the *Mid-level*. Birds and bees are discovering a new habitat and the children together with their parents can observe domestic species which they never spotted before. The environment at the new garden community in the sky attracts recreational walker, interested like-minded persons, tourists, photographer and starts to become a possible model for close-by estates.





JOY CITY SCENARIO

Hin takes a walk at Victoria Park when he recognizes a sound coming from the rooftops of Causeway Bay. Annice is sitting at her office and spots that there is a new crazy action going on at the rooftop of the Sogo shopping centre. Hin knows that there are urban stages on the sky level but he never had the boldness of showing his guitar skills, but today he is in a different mood.

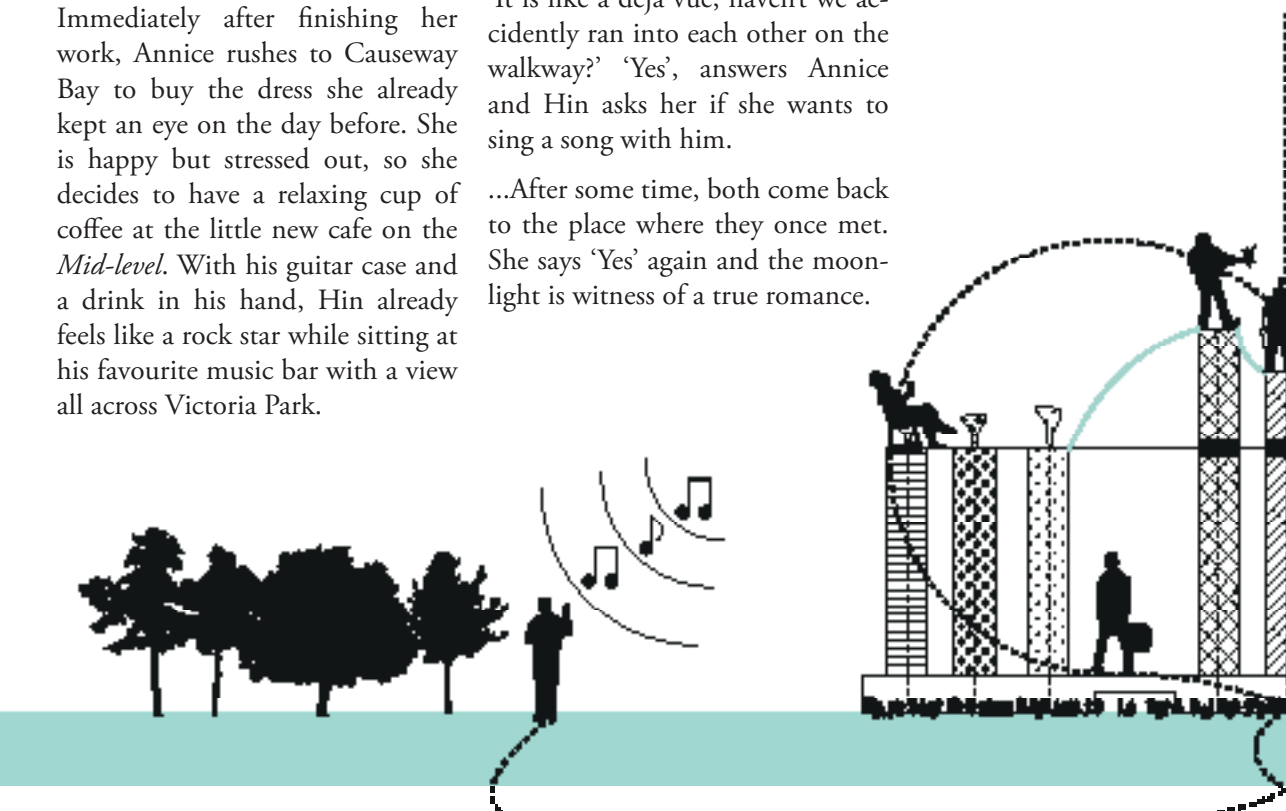
Immediately after finishing her work, Annice rushes to Causeway Bay to buy the dress she already kept an eye on the day before. She is happy but stressed out, so she decides to have a relaxing cup of coffee at the little new cafe on the *Mid-level*. With his guitar case and a drink in his hand, Hin already feels like a rock star while sitting at his favourite music bar with a view all across Victoria Park.

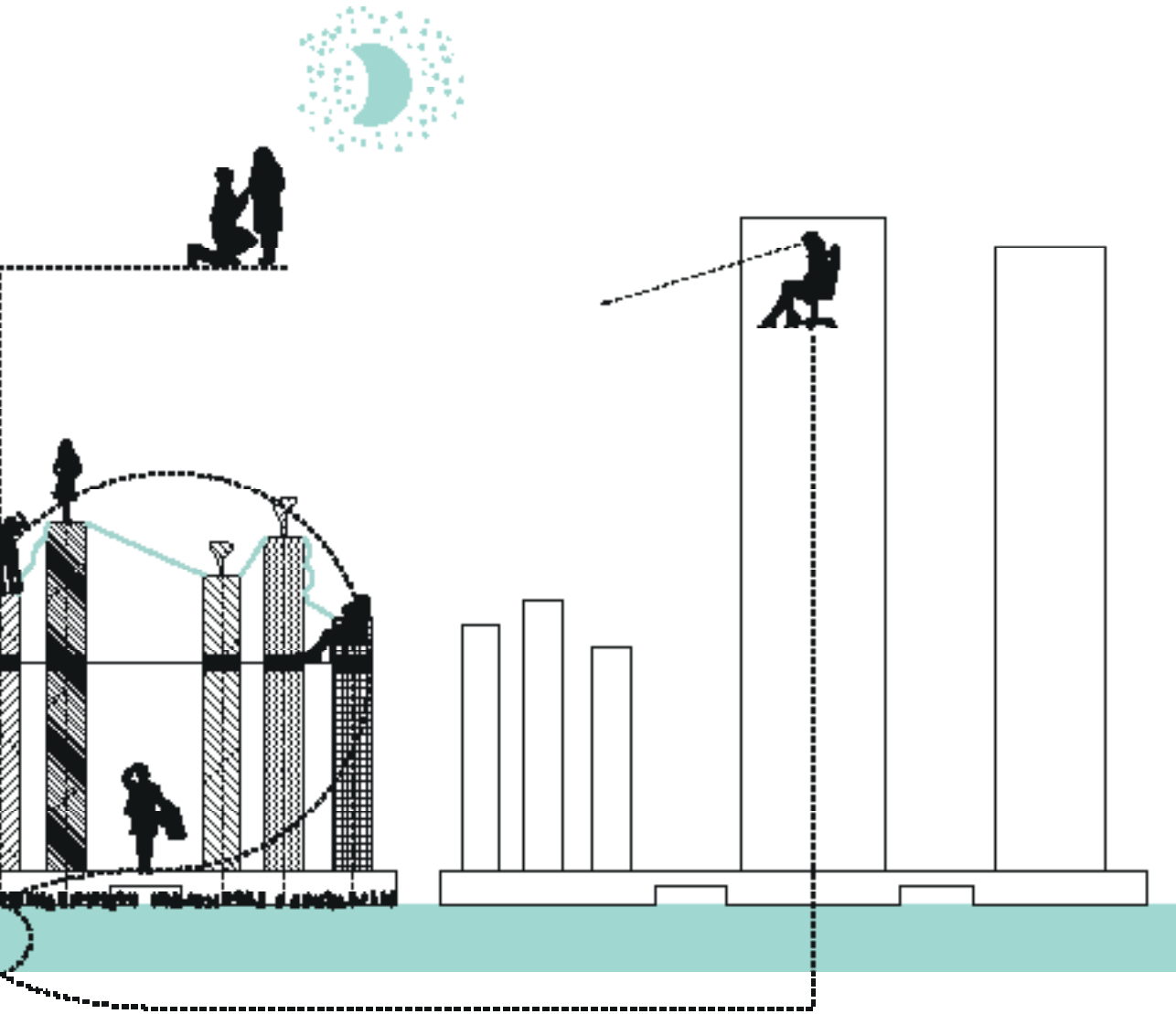
After finishing the cup of coffee, Annice remembers what she saw when looking out of her office window earlier. She decides to try out her new dress and show it at the rooftop catwalk. She feels like a star, equal to Hin who rocks the urban stage for the first time.

After such an experience, the karaoke corner seems to be the right place to fade out such a night.

'It is like a deja vue, haven't we accidently ran into each other on the walkway?' 'Yes', answers Annice and Hin asks her if she wants to sing a song with him.

...After some time, both come back to the place where they once met. She says 'Yes' again and the moonlight is witness of a true romance.

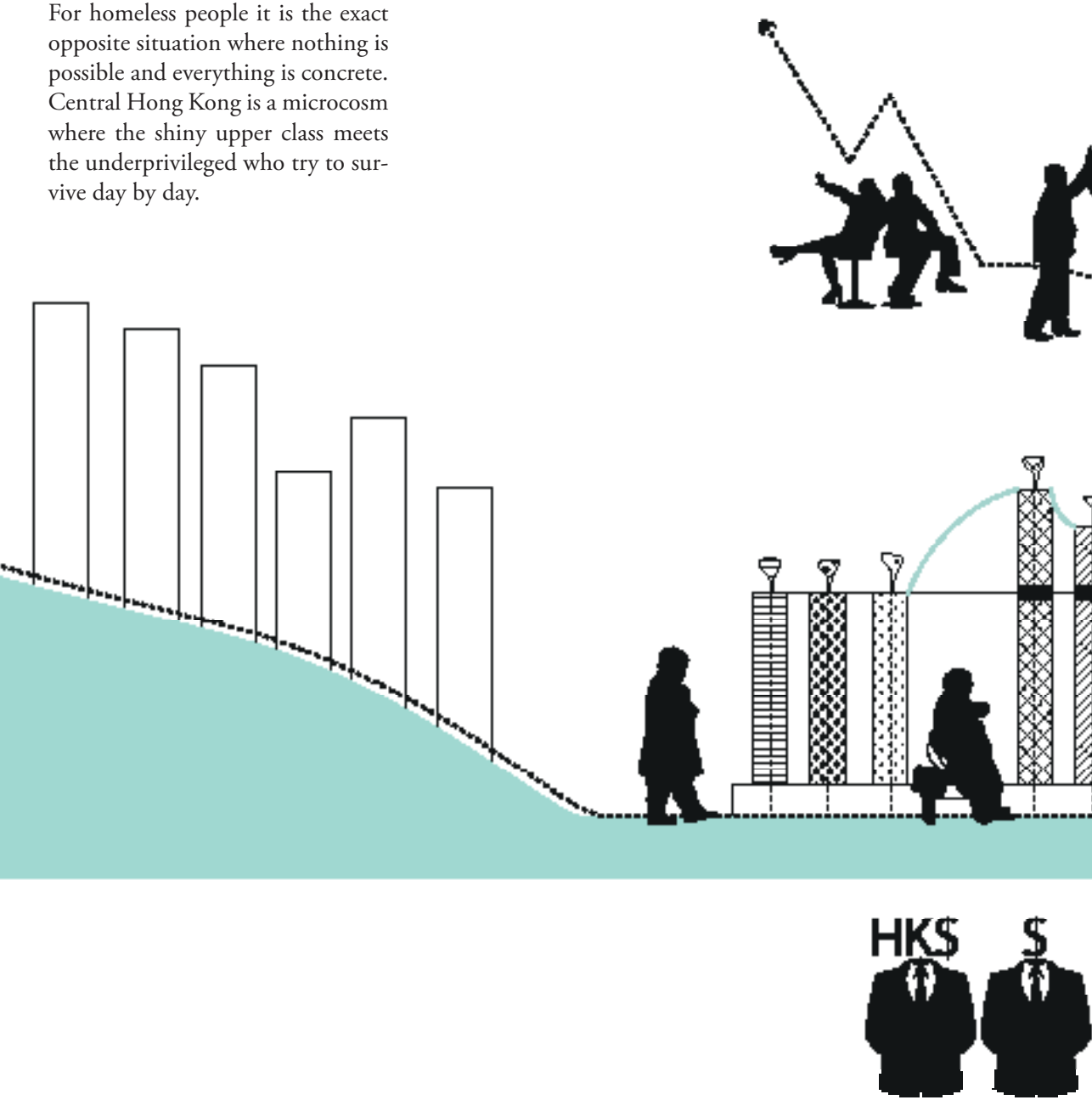


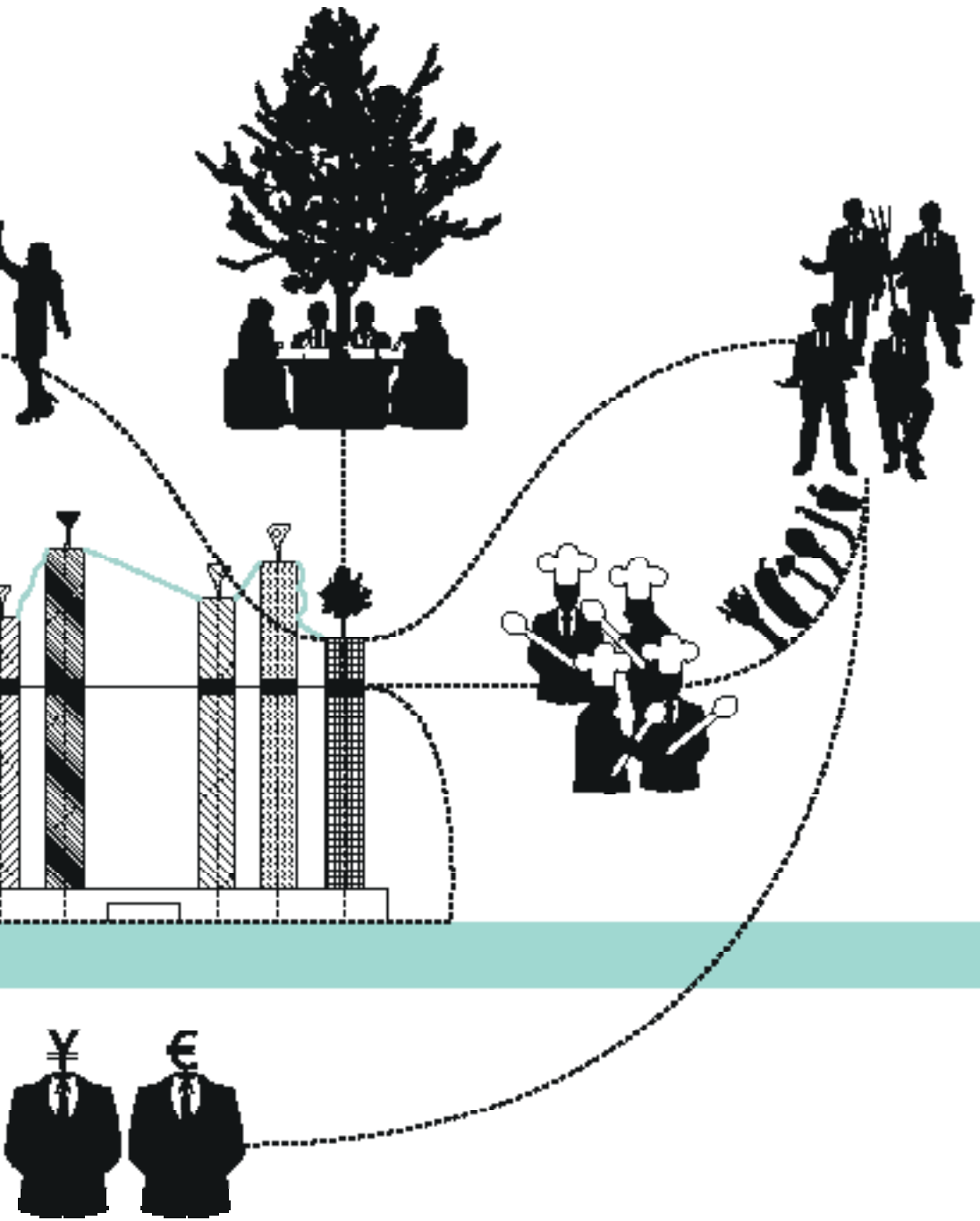


CONTRAST CITY SCENARIO

The problem of the financial system today is that it is a speculative construct which creates fictional values. In the exciting world of an investment banker, everything is possible, but nothing is concrete. For homeless people it is the exact opposite situation where nothing is possible and everything is concrete. Central Hong Kong is a microcosm where the shiny upper class meets the underprivileged who try to survive day by day.

A new social program combines team building seminars with cooking workshops for homeless. Self grown rooftop vegetables are pro-

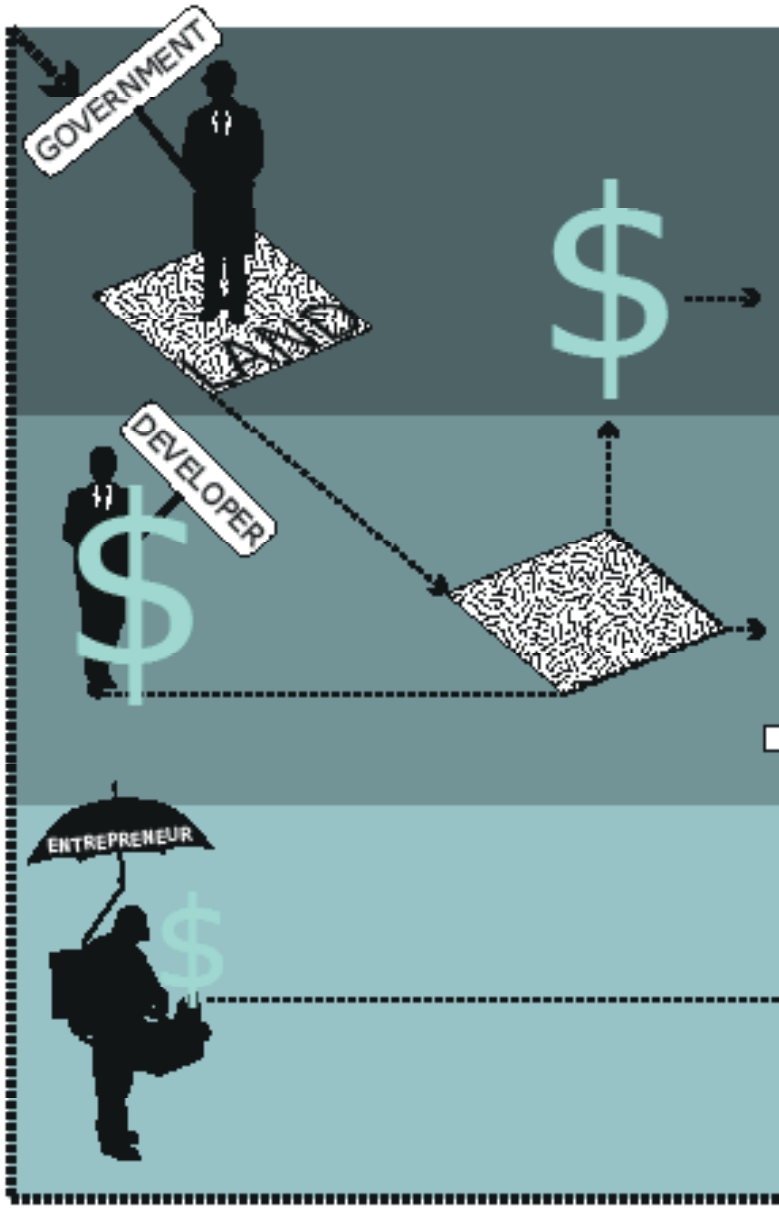


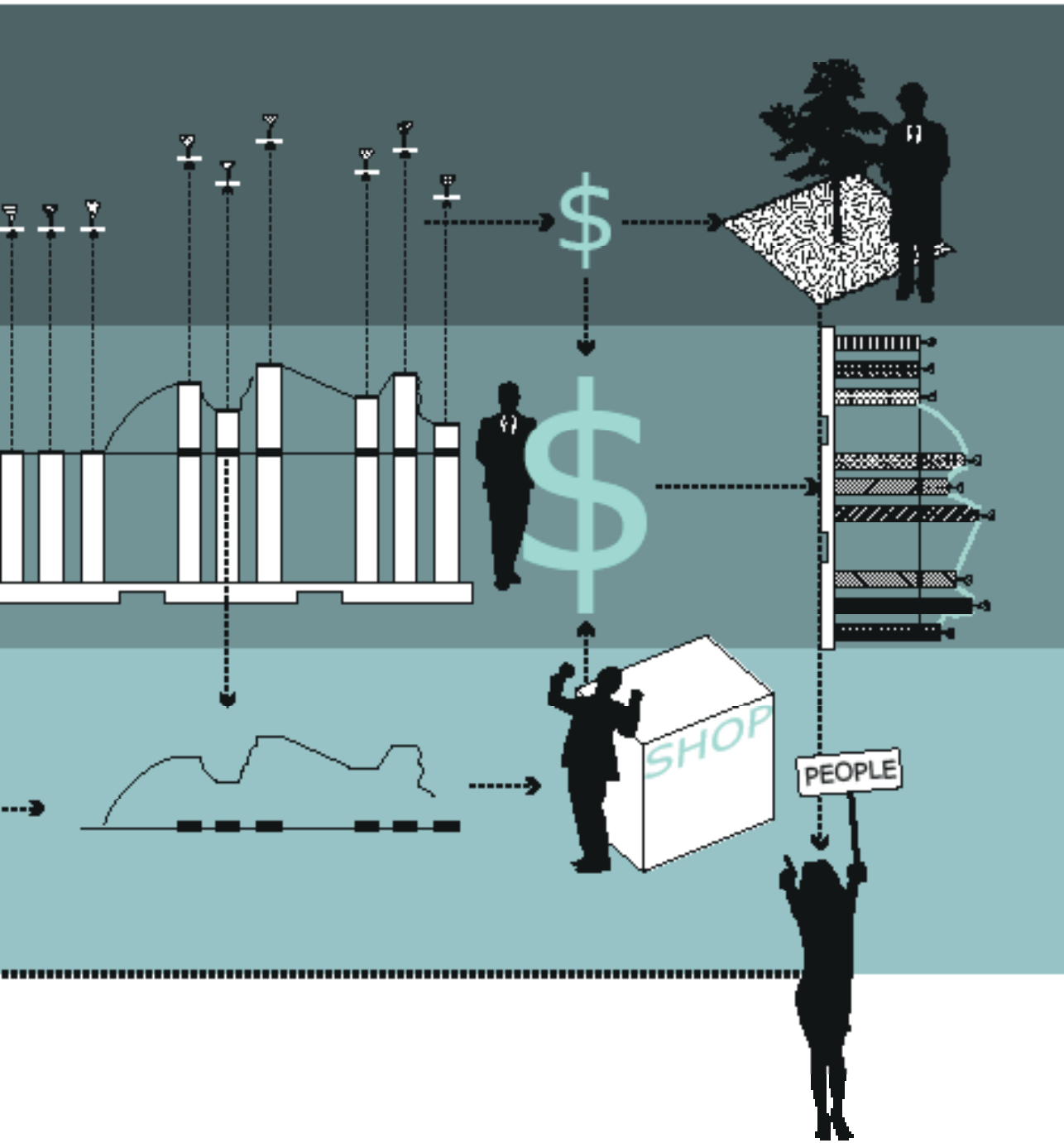


FINANCING SYSTEM

Land in Hong Kong is owned by the government. Developer can only rent it for a certain period of time. Therefore, all buildings are standing on borrowed land with regular payments of loans. The government receives payments from developers, but they are running out of space to provide sufficient open space for the people. Here is the clue for the financing system. Developers get the chance to pass back unused rooftop space to the government and in return, pay proportionally less loans for the land rental. Now the government has reclaimed land in form of vacant rooftops and can provide open space for its citizens. Developers can invest the saved money of the reduced down-payment in the construction of the *Mid-level* zone where they get the chance to transform one level to a communal and commercial space that upgrades their development and kickstarts entrepreneurship.

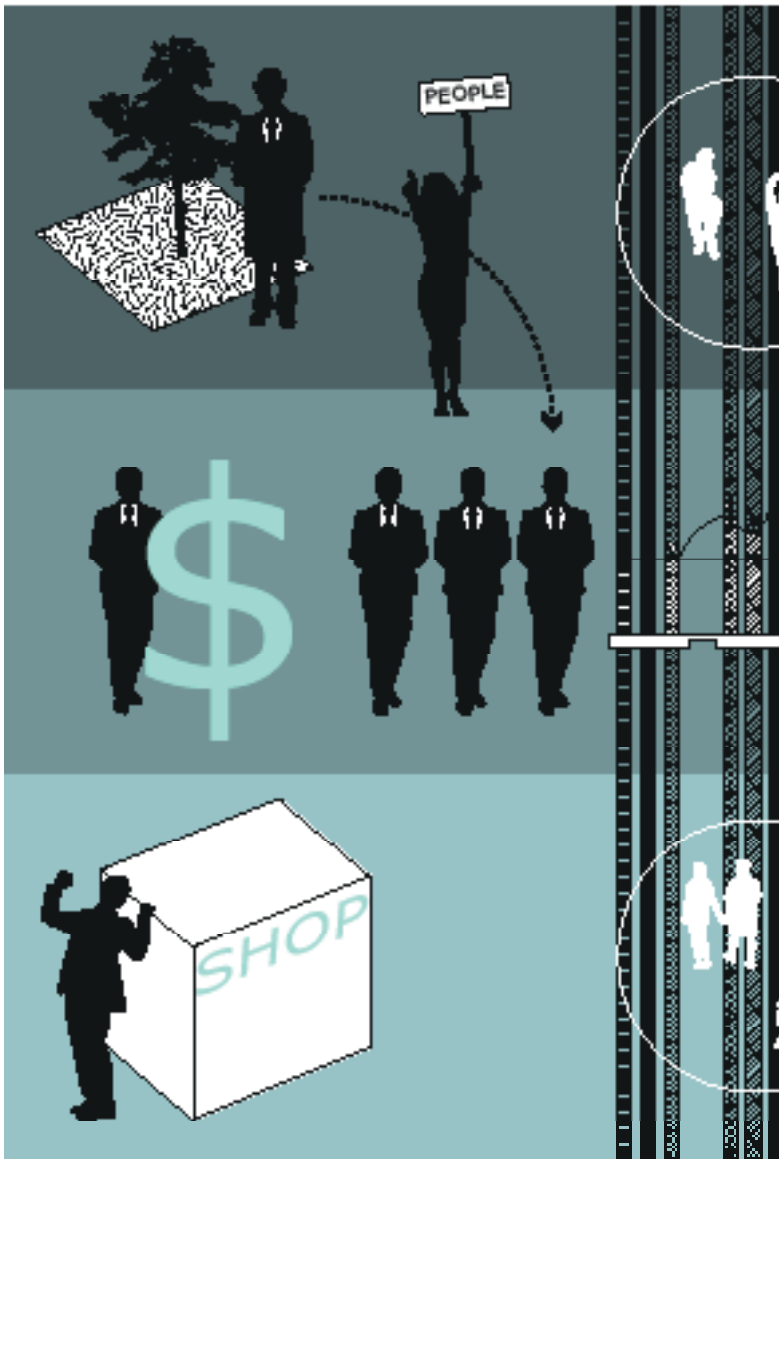
Residents and the general public get an improvement of their living conditions and therefore support the course of action of the government.

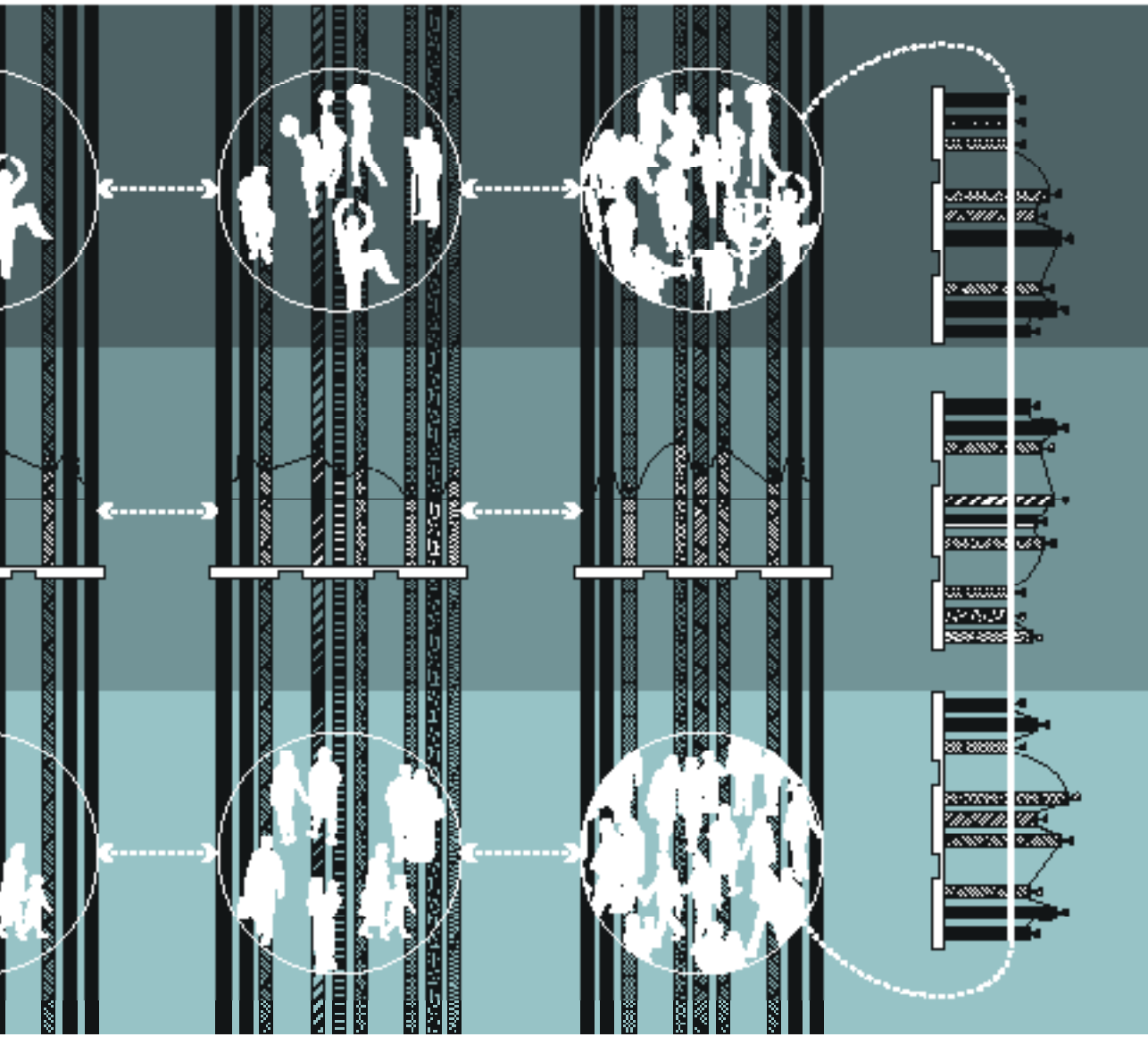



$
$
SHOP
PEOPLE

NETWORKING SCENARIO

The government is satisfied with the outcome and people are happy to have a new form of open space with fresh air, breathtaking view, quiet environment and creative potential. Furthermore, other developers showing interest to participate. More and more such developments are popping up in close proximity to each other. The initial idea of connecting is jumping over because for developers it is interesting to create more circulation for the *Mid-level* zones and user of the open spaces support the bridging because of the increase of possible activities and diverse environments to explore. Simultaneously, the developments evolve to a widespread pedestrian and recreation network released from street level noise and air pollution.



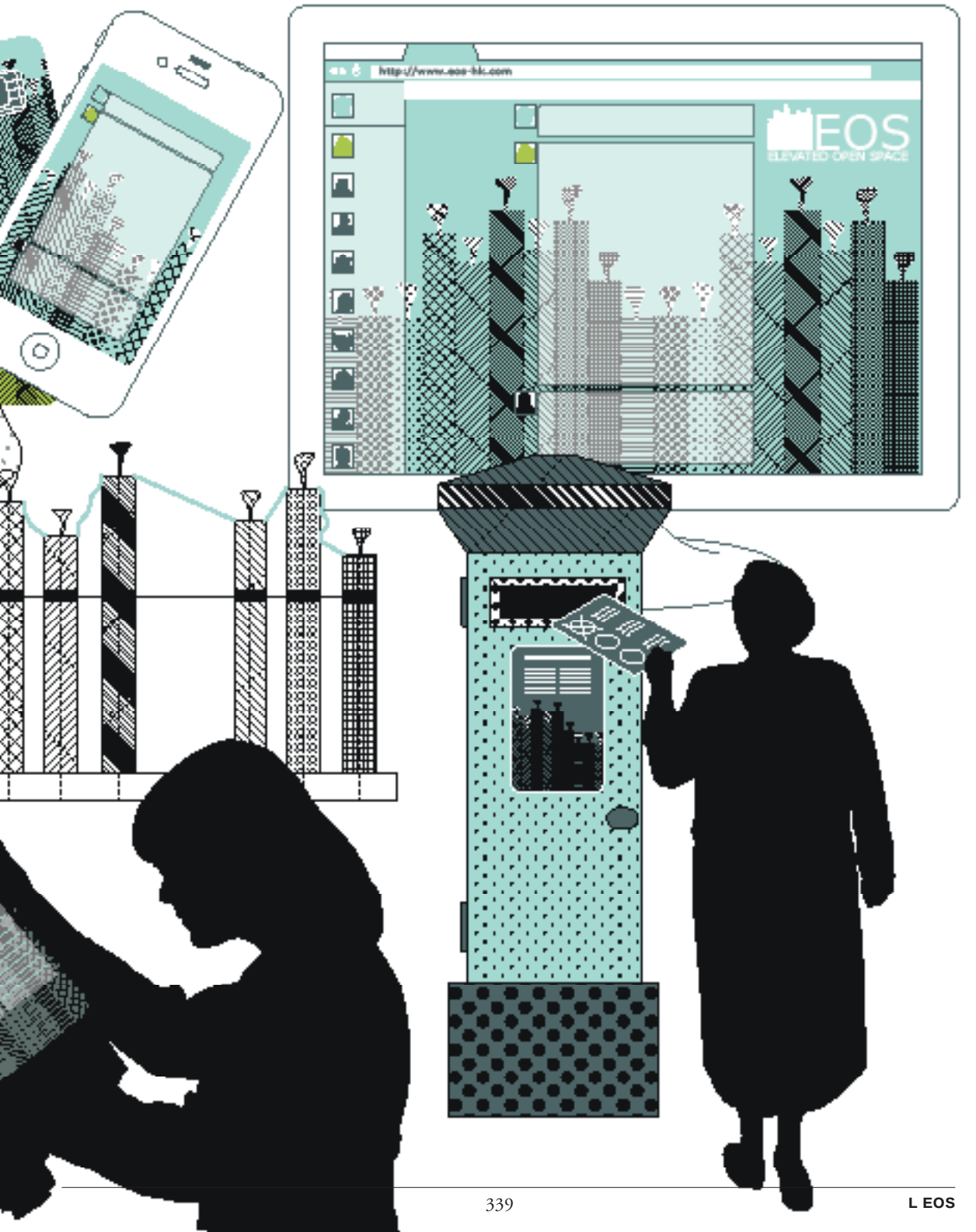


EOS CALLING FOR YOU

There is little need for open spaces to catch peoples attention in Hong Kong, but this space stands for a bigger idea. It is called *EOS* (*Elevated Open Space* network) and provides an opportunity of self-dedication, adaption and creativity. To kickstart such activities, it needs a communicating and brainstorming group of people. Social networking is the key to activate the power of peoples creativity and create a dynamic and growing community.

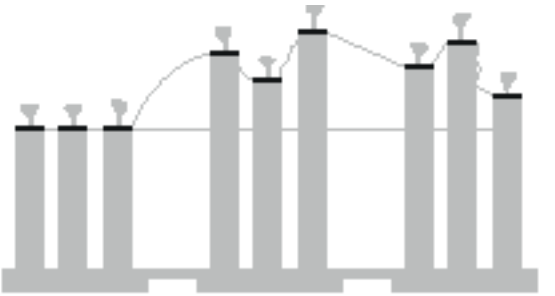
An online social network as well as print media and reactivated letter boxes are forming a platform of interchanging ideas and decision making mechanisms. It enables an ever changing pool of activities and helps to find the spot of your interest at the right time.

In Hong Kong, spinning barber polls are marking barber shops which are often located at upper floor levels. These unique devices always form an eye-catcher in the otherwise confusing sign-jungle of the city. With an homage to this ingenious branding, the redesigned *EOS* spinning polls are marking connections on street level to reach the *Elevated Open Space* network.

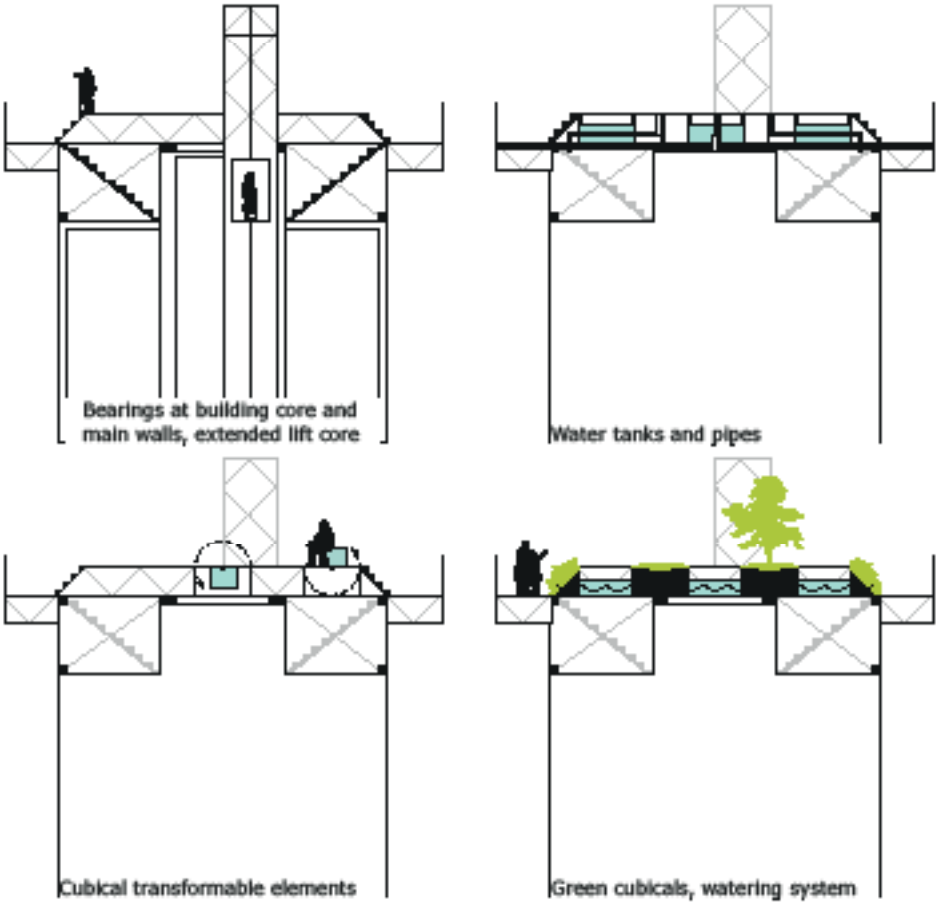

http://www.eos-hk.com
EOS
ELEVATED OPEN SPACE

SHAPING ELEMENTS

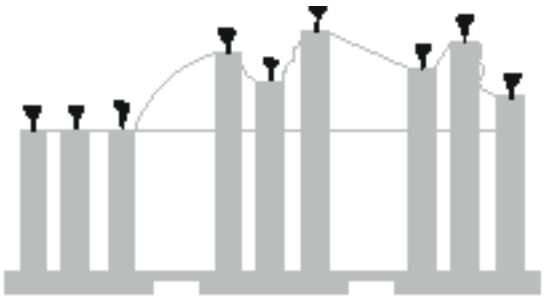
The rooftop layer functions as self-dedicated multifunctional space. Therefore, the structure has to be transformable and flexible for extensions and reductions. It performs like an encasing layer which contains technical equipment and cubical elements for programming the space. Furthermore, down stepping skywalks allow an interesting experience and are linked to the staircase of the circulation core.



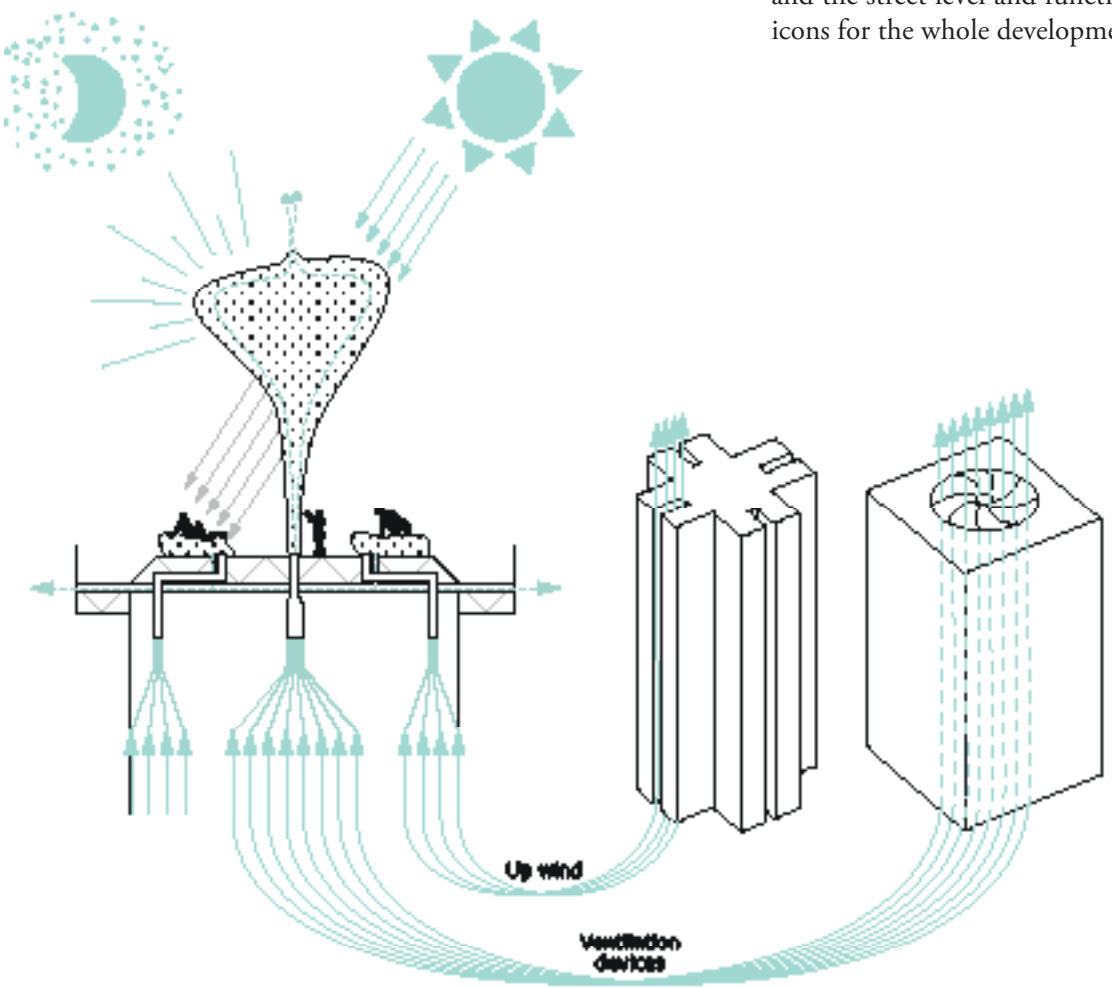
The former rooftop level underneath the new layer contains storage space and function as starting point for the active connections.



FRIENDLY GUYS

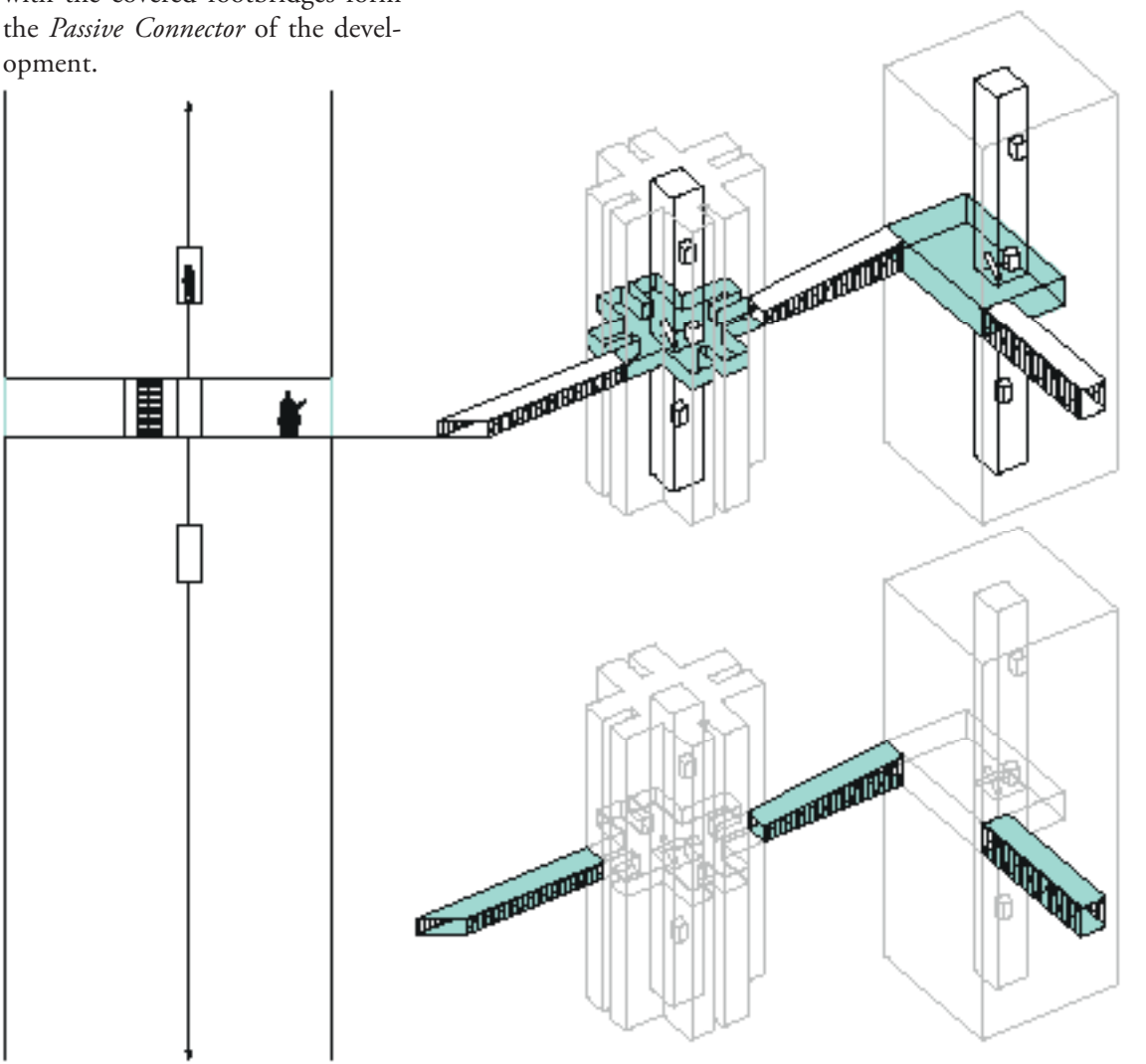


In most cases, rooftops are occupied by technical devices such as massive ventilation systems. This huge airflow in combination with up wind is channelled and used for inflating *Friendly Guys* to ensure good air quality. Thereby the waste air is collected and exhausted trough an outlet at the top of the balloon-like elements. Additionally, they provide shading at daytime and lighting during night-time, form a visual connection between rooftops and the street level and function as icons for the whole development.



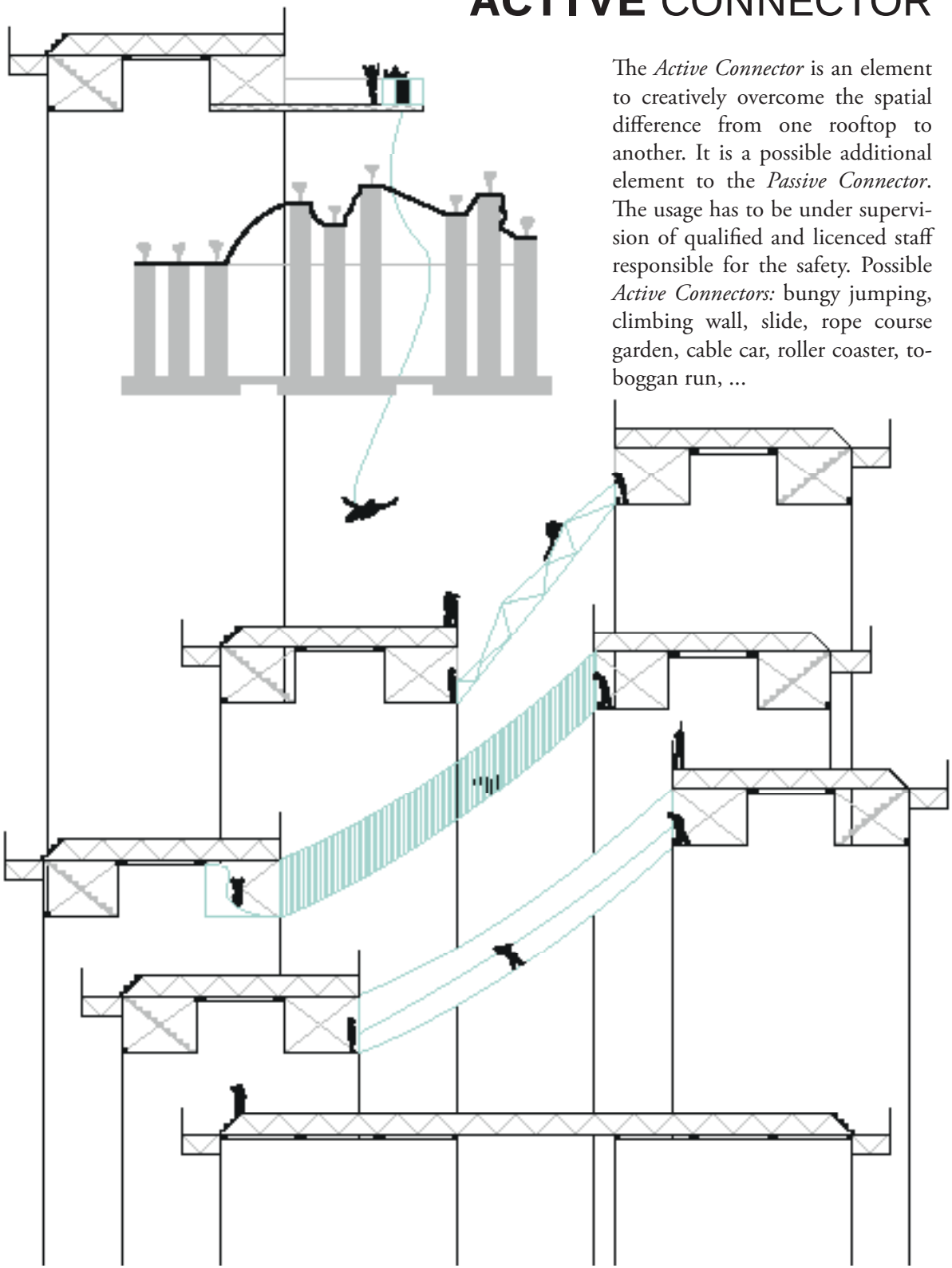
MID LEVELS & PASSIVE CONNECTOR

The *Mid-levels* are the covered supplementing axis for the rooftop levels. They provide community as well as commercial spaces. The *Mid-levels* always have a connection to the circulation core and to each other. For the landlord the space can be a possible source of reinvestment and for the residents, a store within the tower can be a real convenient-store and place of encounter. The *Mid-levels* in combination with the covered footbridges form the *Passive Connector* of the development.



ACTIVE CONNECTOR

The *Active Connector* is an element to creatively overcome the spatial difference from one rooftop to another. It is a possible additional element to the *Passive Connector*. The usage has to be under supervision of qualified and licenced staff responsible for the safety. Possible *Active Connectors:* bungy jumping, climbing wall, slide, rope course garden, cable car, roller coaster, toboggan run, ...



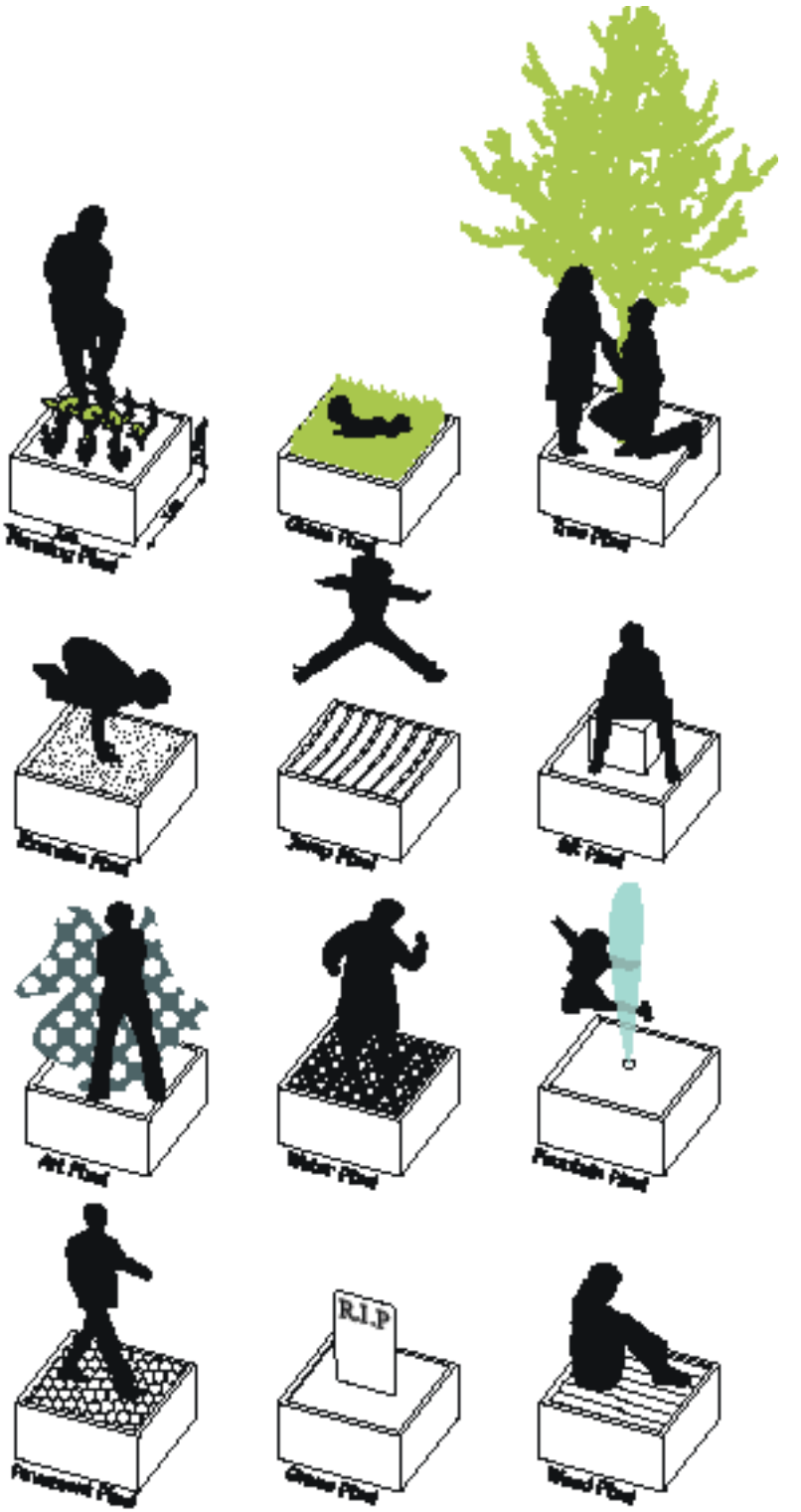
PIXEL CUBES

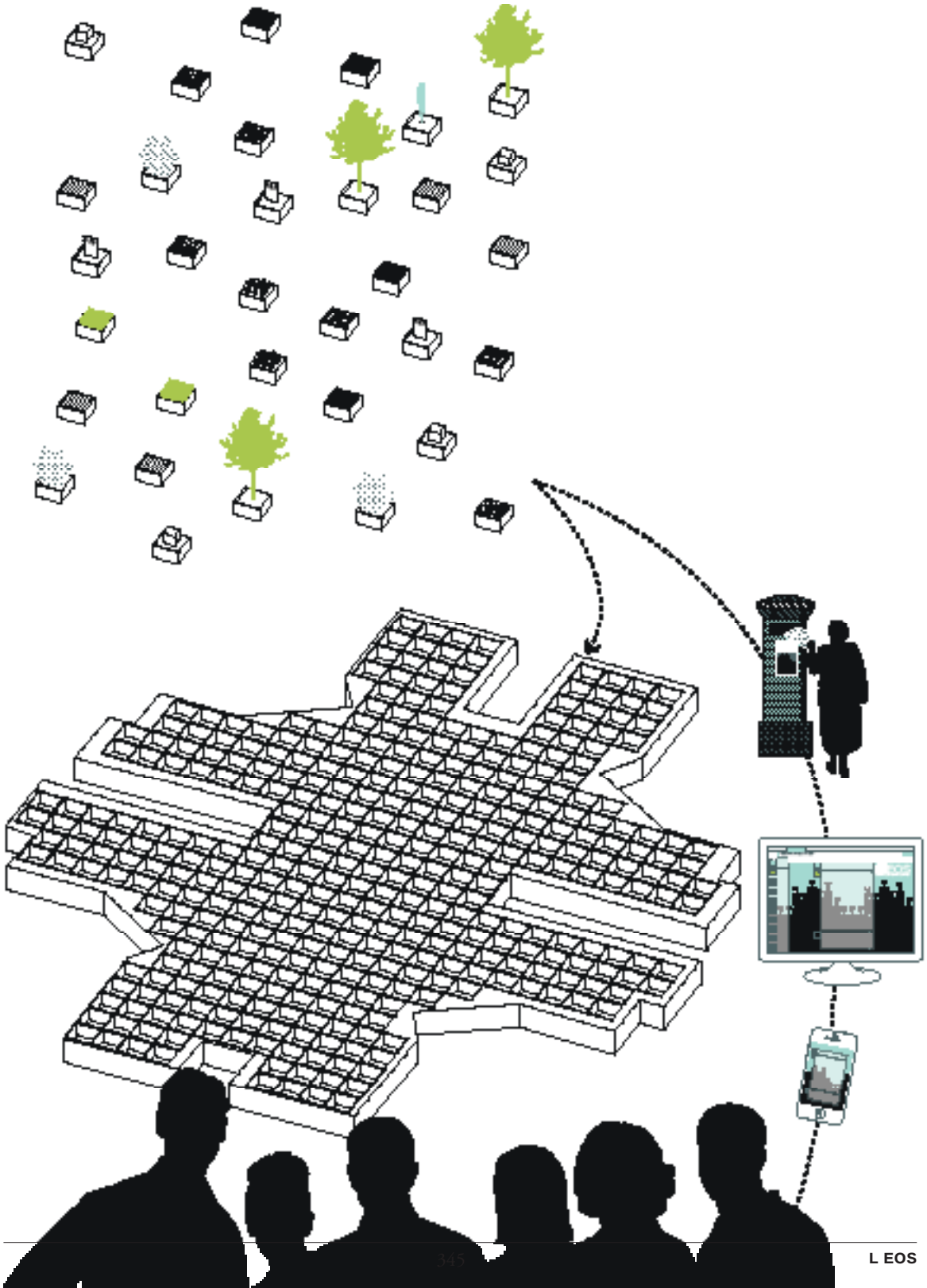
For a self determined and transformable open space, a system of individual *Pixel Cubes* allows people to become creative and form their spaces themselves. This approach is in contrast to the current provided predetermined open spaces with little room for personal or communal expression.

Some examples, how such a *Pixel Cube* can be designed are shown, but there should be school and community workshops, design competitions, public engagement, artist projects or individual inventive genius which creates a diverse cloud of different insertable elements.

Proposals will be proofed and then added to a *Pixel Cube Cloud* where people can vote for its actual implementation.

For the three scenarios of the first *EOS* developments, the most likely programming of the space will be assumed, but in fact, it could turn out to gain a different momentum in reality.



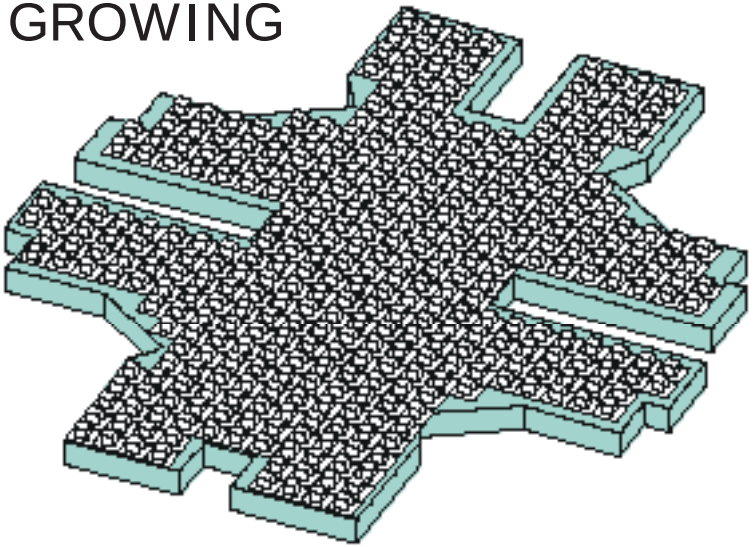


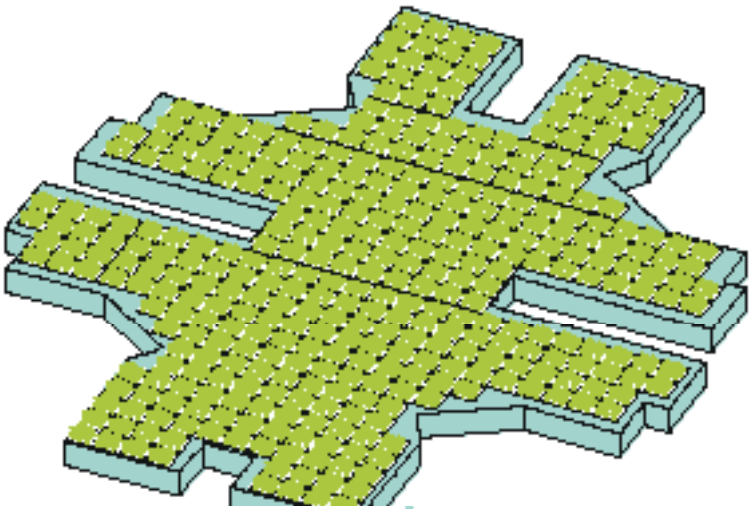
DEMOCRATIC GROWING

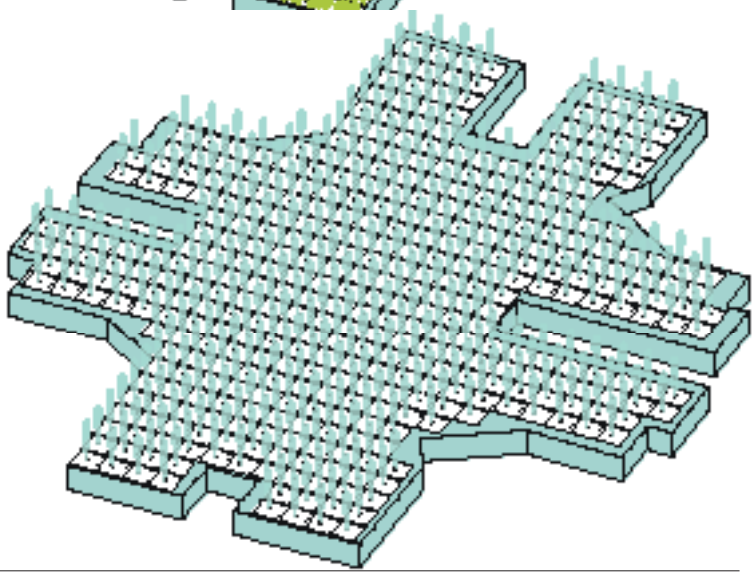
The programming process underlies the principles of a democratic allocation of *Pixel Cubes*.

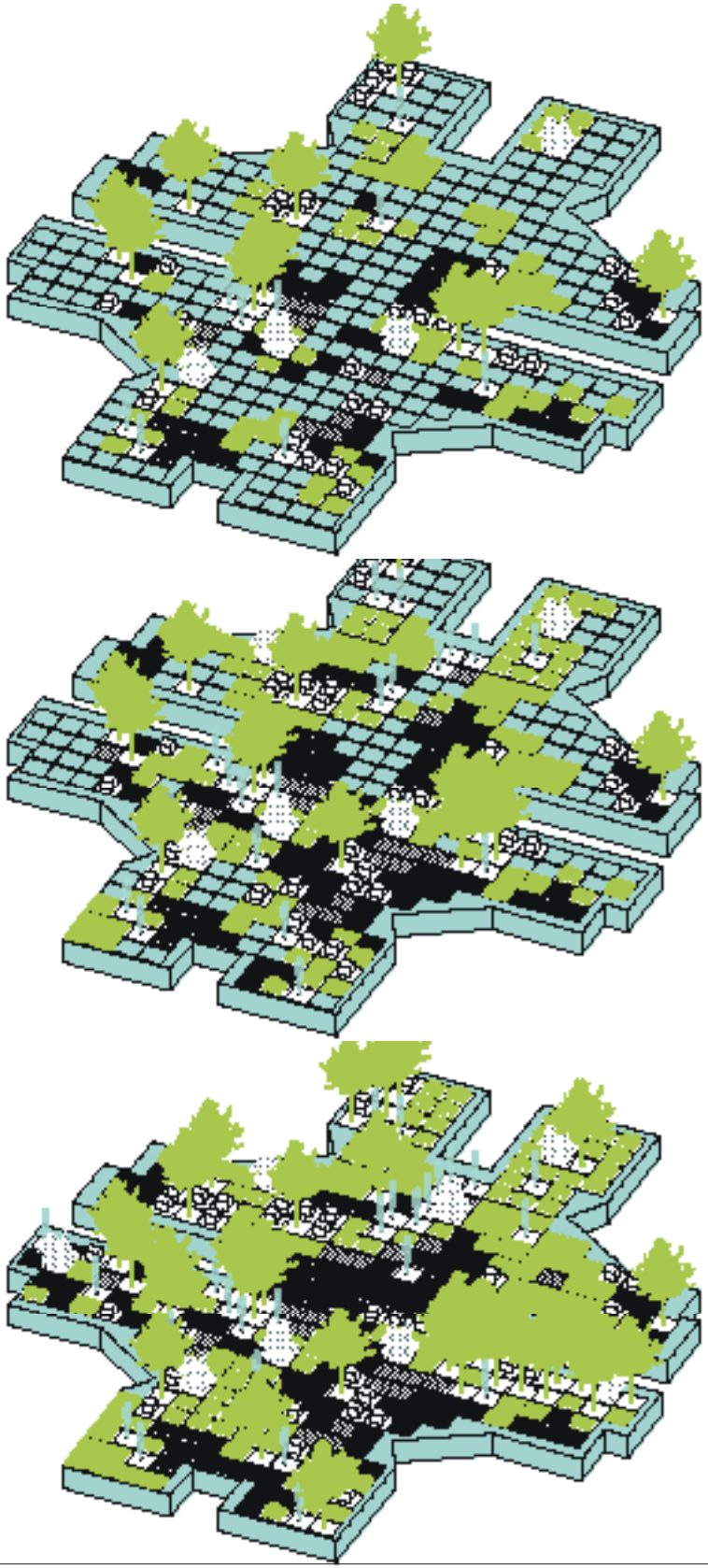
Therefore, it is almost impossible that a certain rooftop receives a single function. It is much more likely, that a mix of different programs occur side by side, because all people have different preferences and ideas how to generate their space. At some areas with strong community activities, a certain function - for example farming - could occur as a predominant program.

The first voting starts with a tabula rasa *EOS*. Every slot can receive a program. People can place a certain number of *Pixel Cubes* from the existing range. Slots with no votes stay unprogrammed. At slots with more than one vote, the *Pixel Cube* with the majority of votes will be inserted. After several periodic 'elections', the *EOS* gets more and more programmed. Even already occupied slots are not protected from being replaced.





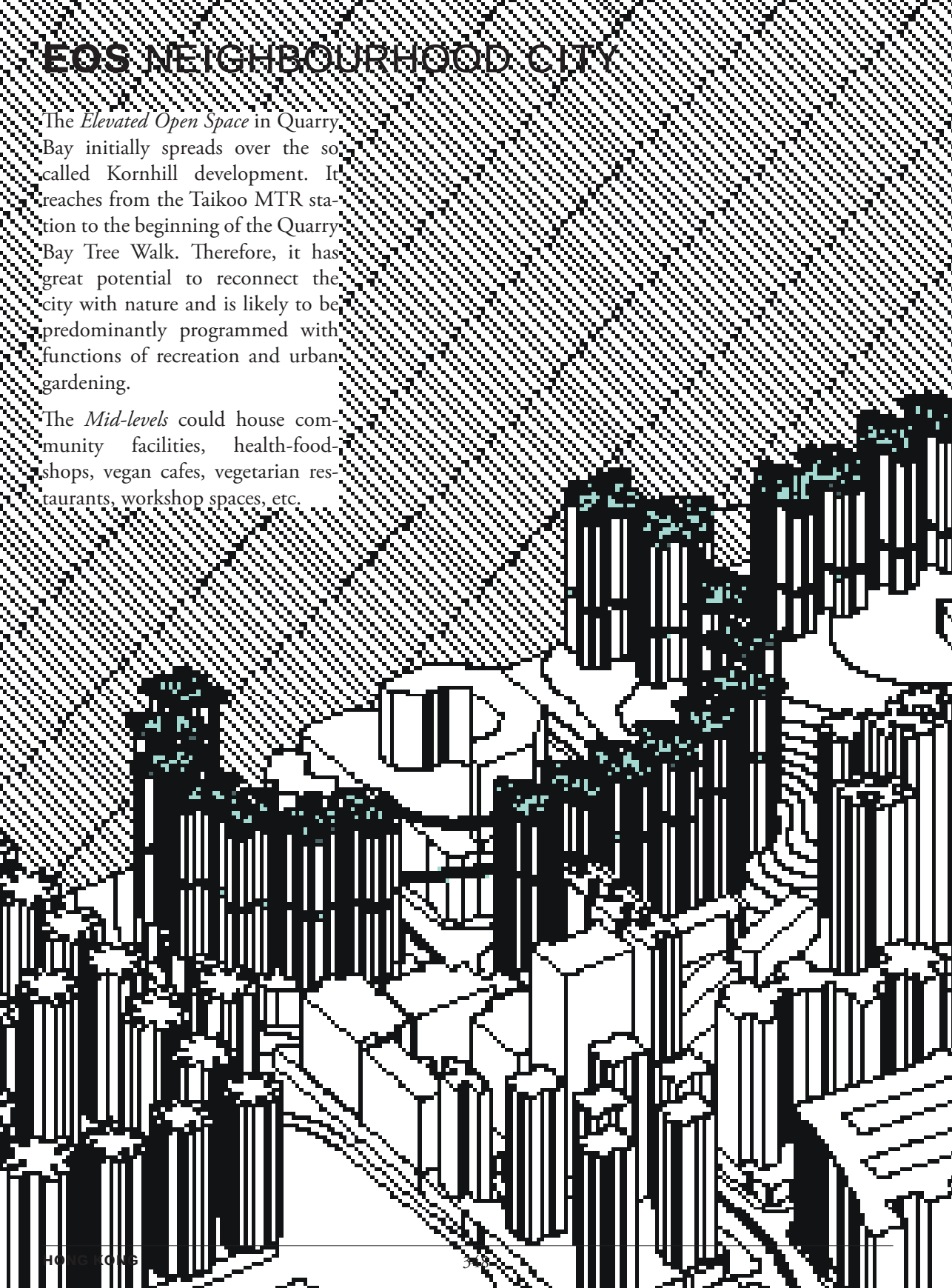


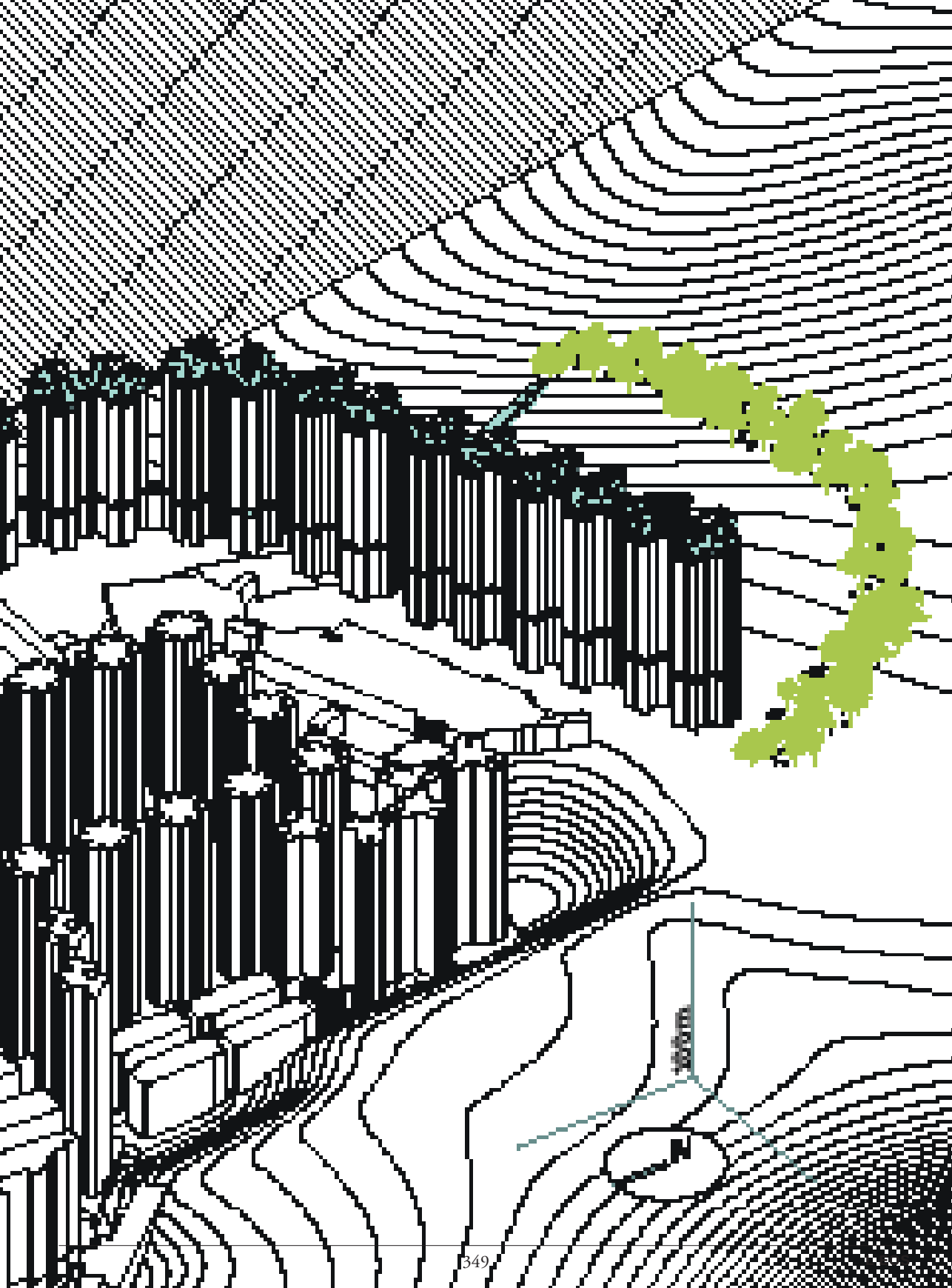


EOS NEIGHBOURHOOD CITY

The *Elevated Open Space* in Quarry Bay initially spreads over the so-called Kornhill development. It reaches from the Taikoo MTR station to the beginning of the Quarry Bay Tree Walk. Therefore, it has great potential to reconnect the city with nature and is likely to be predominantly programmed with functions of recreation and urban gardening.

The *Mid-levels* could house community facilities, health-food-shops, vegan cafes, vegetarian restaurants, workshop spaces, etc.

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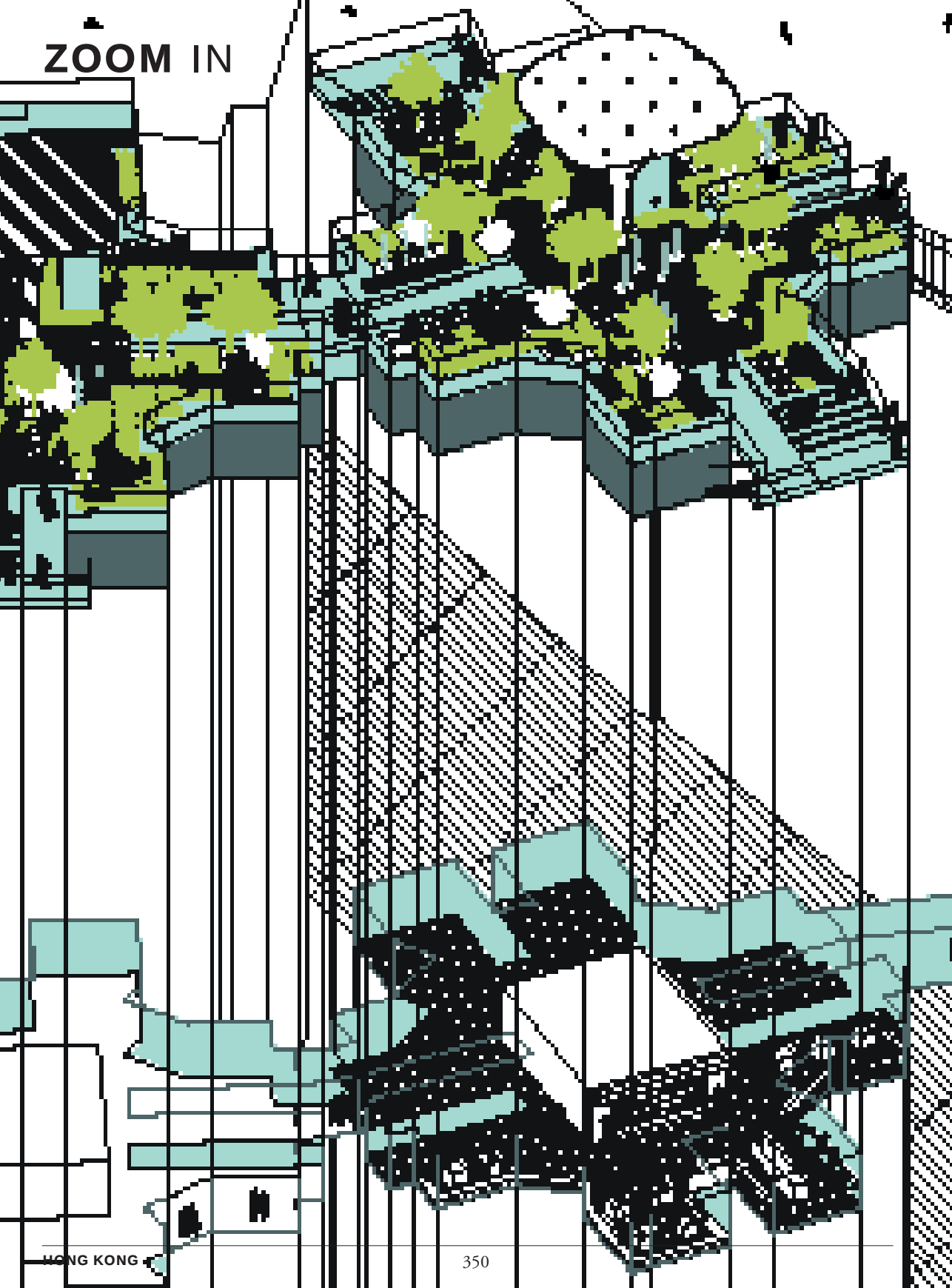

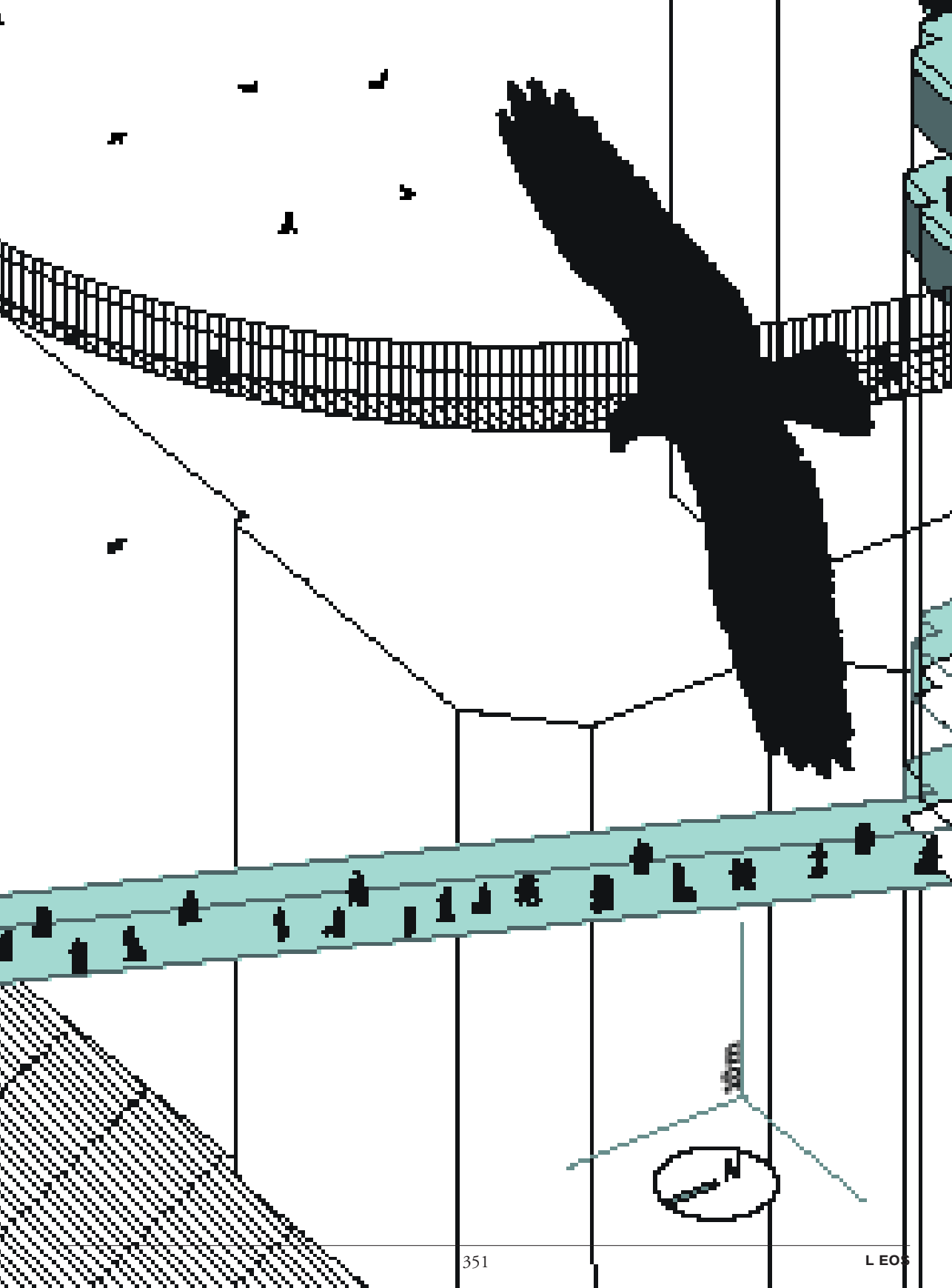
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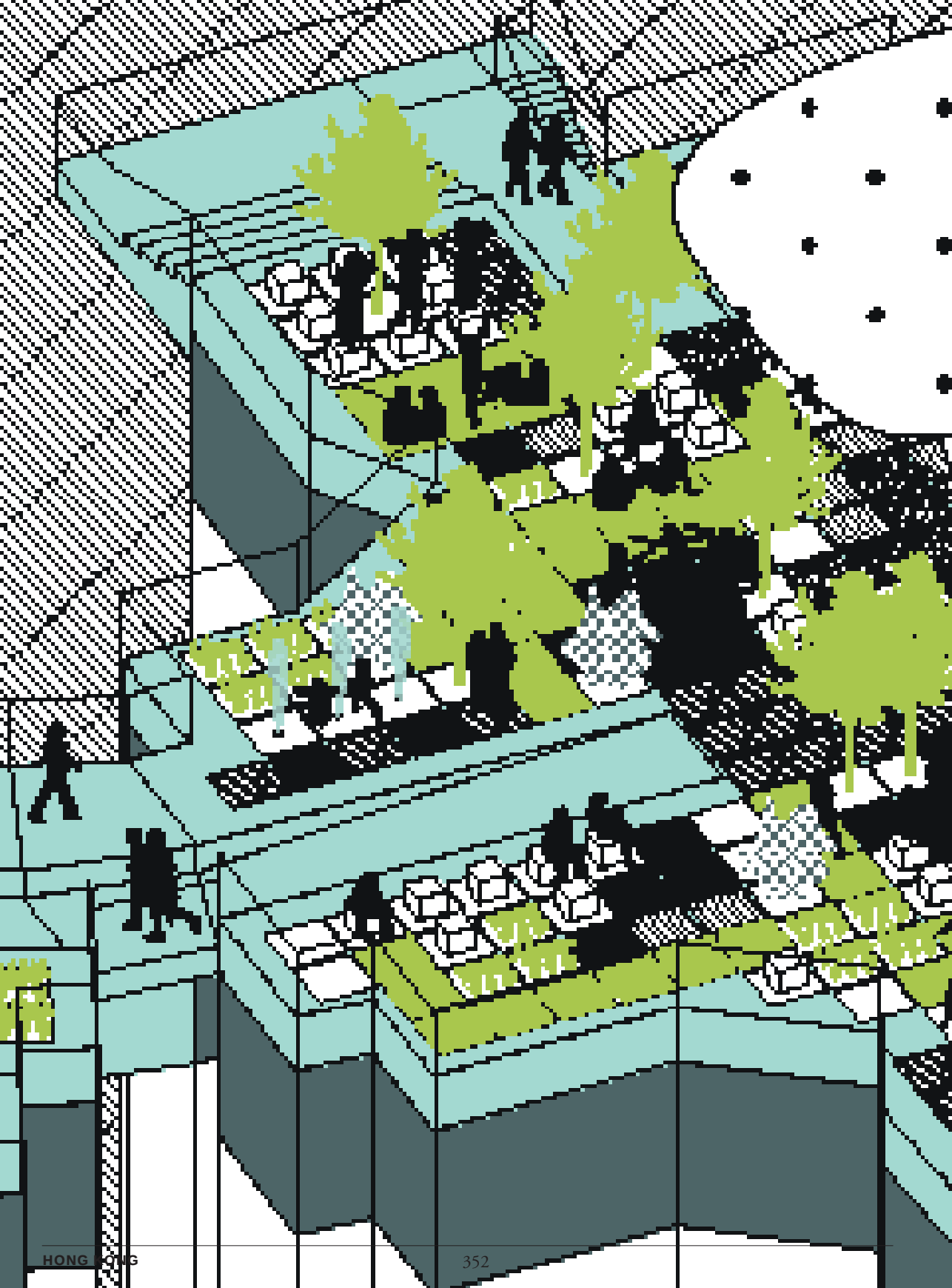
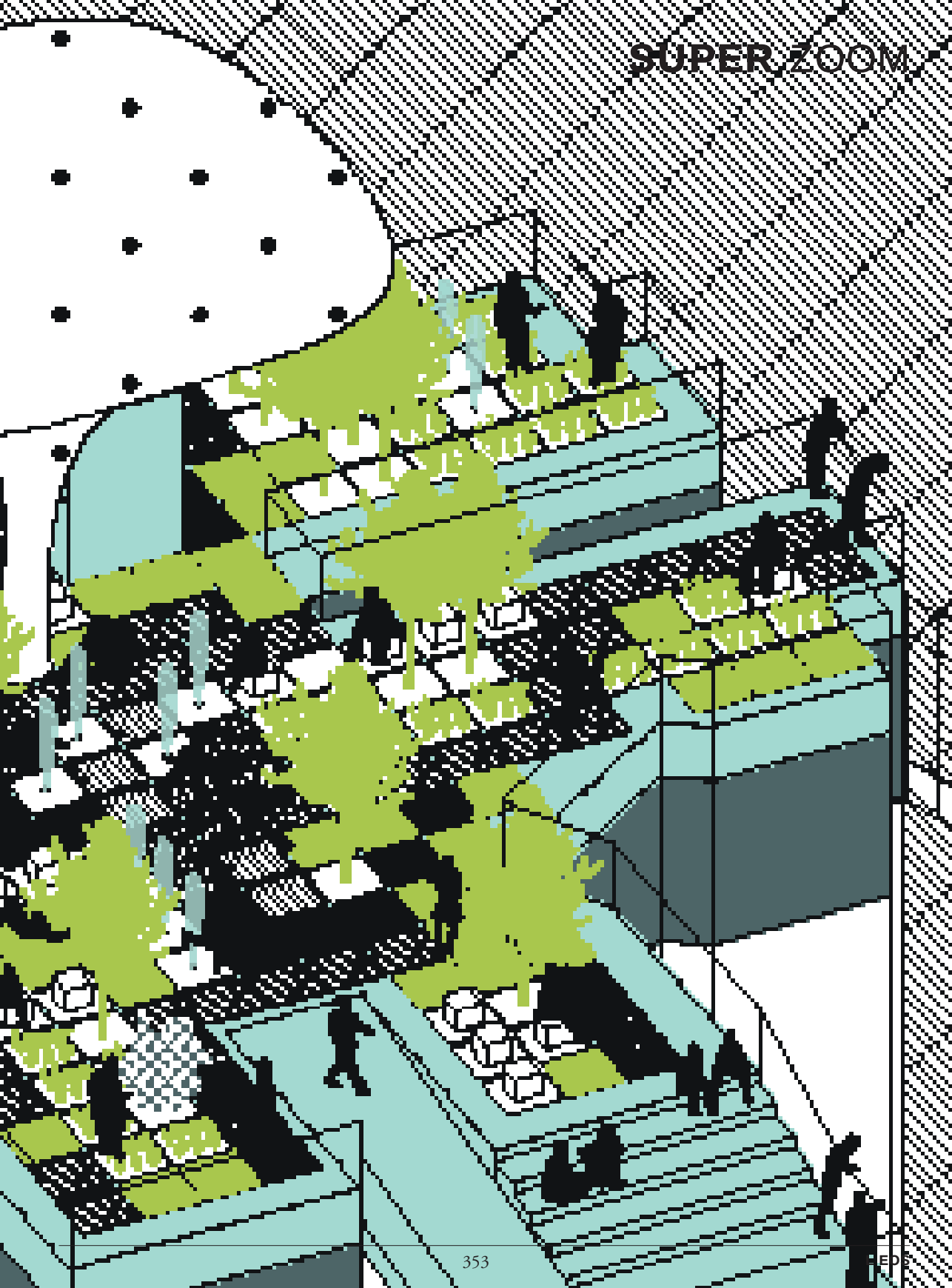
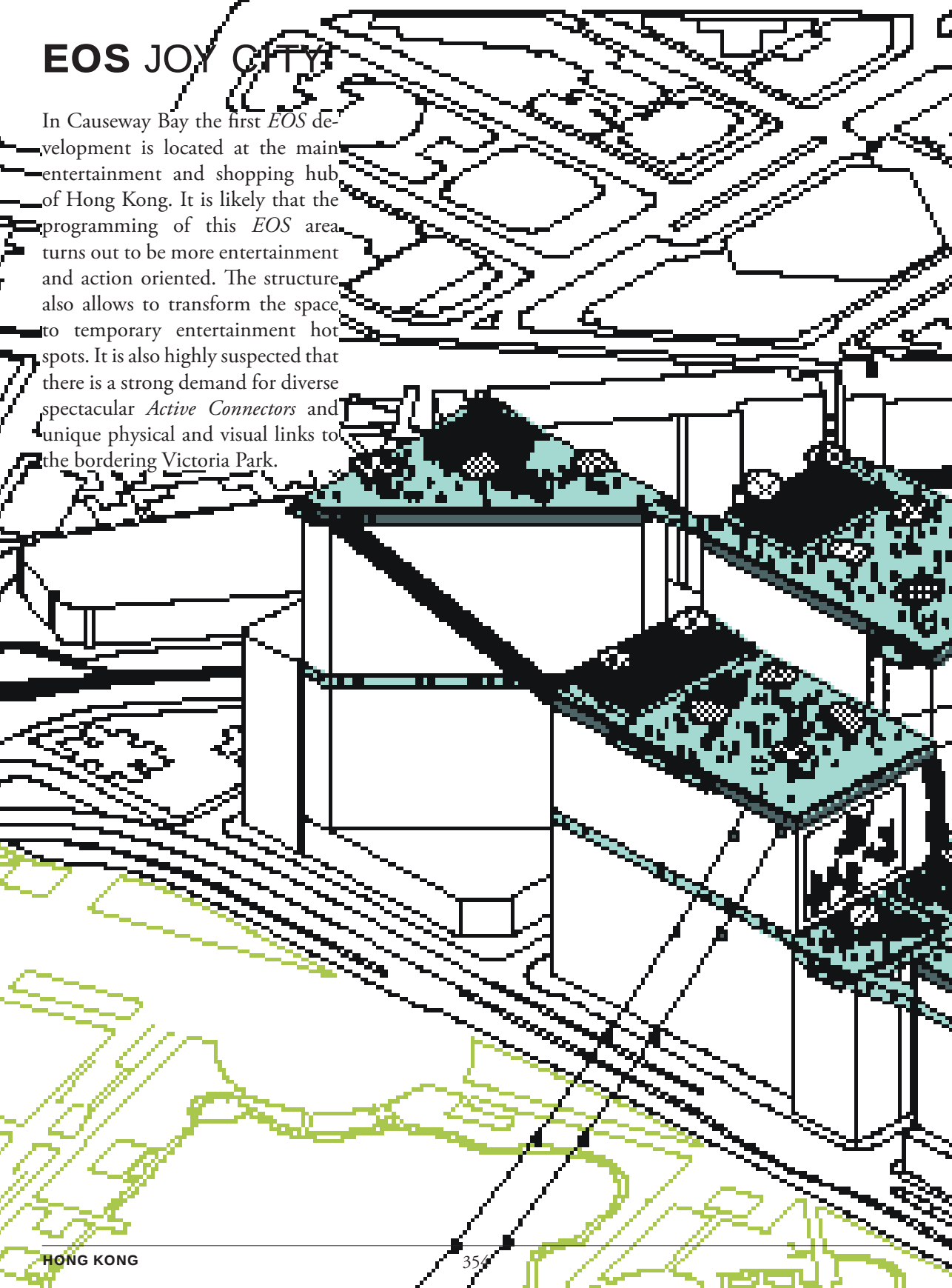
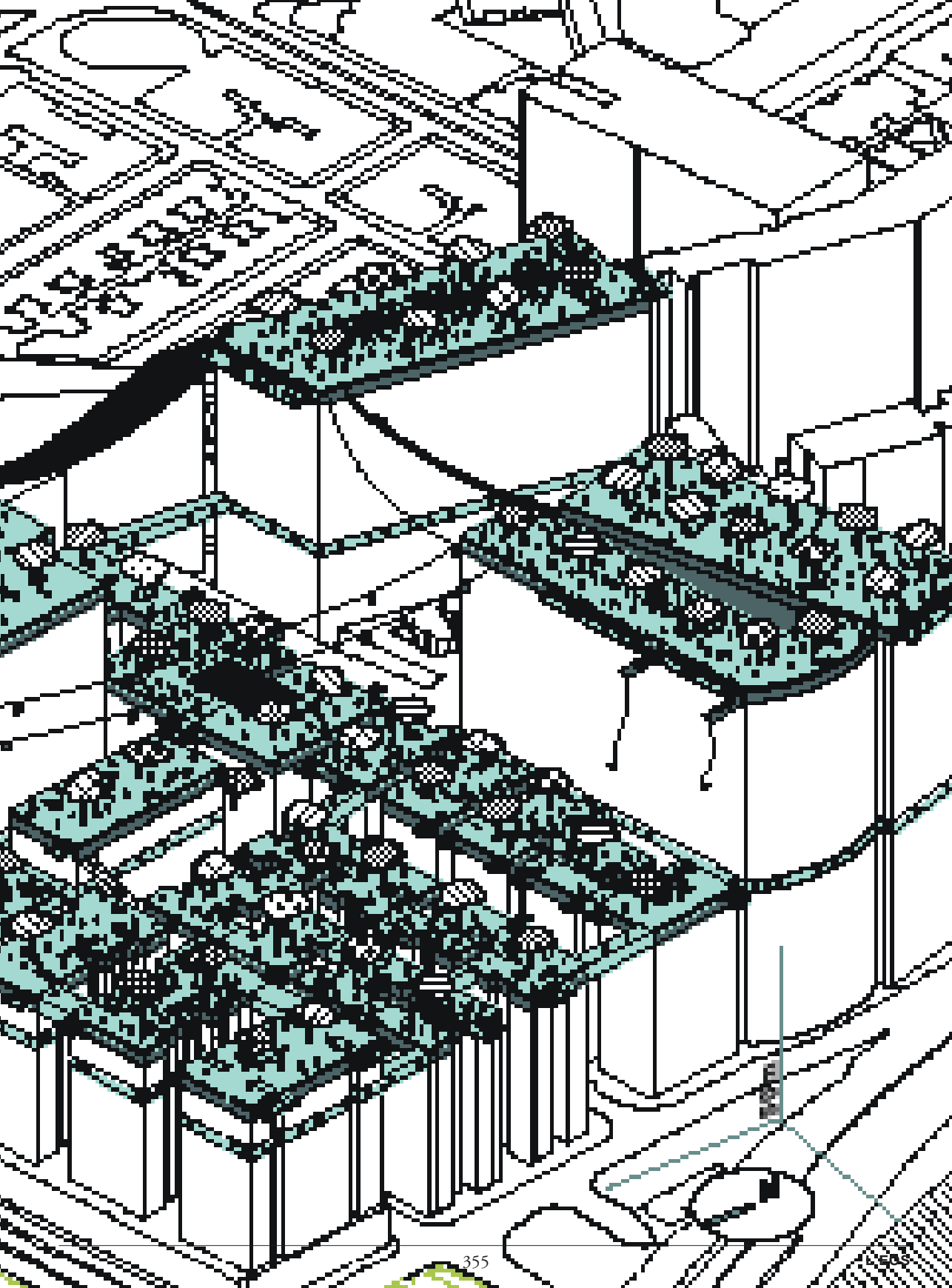




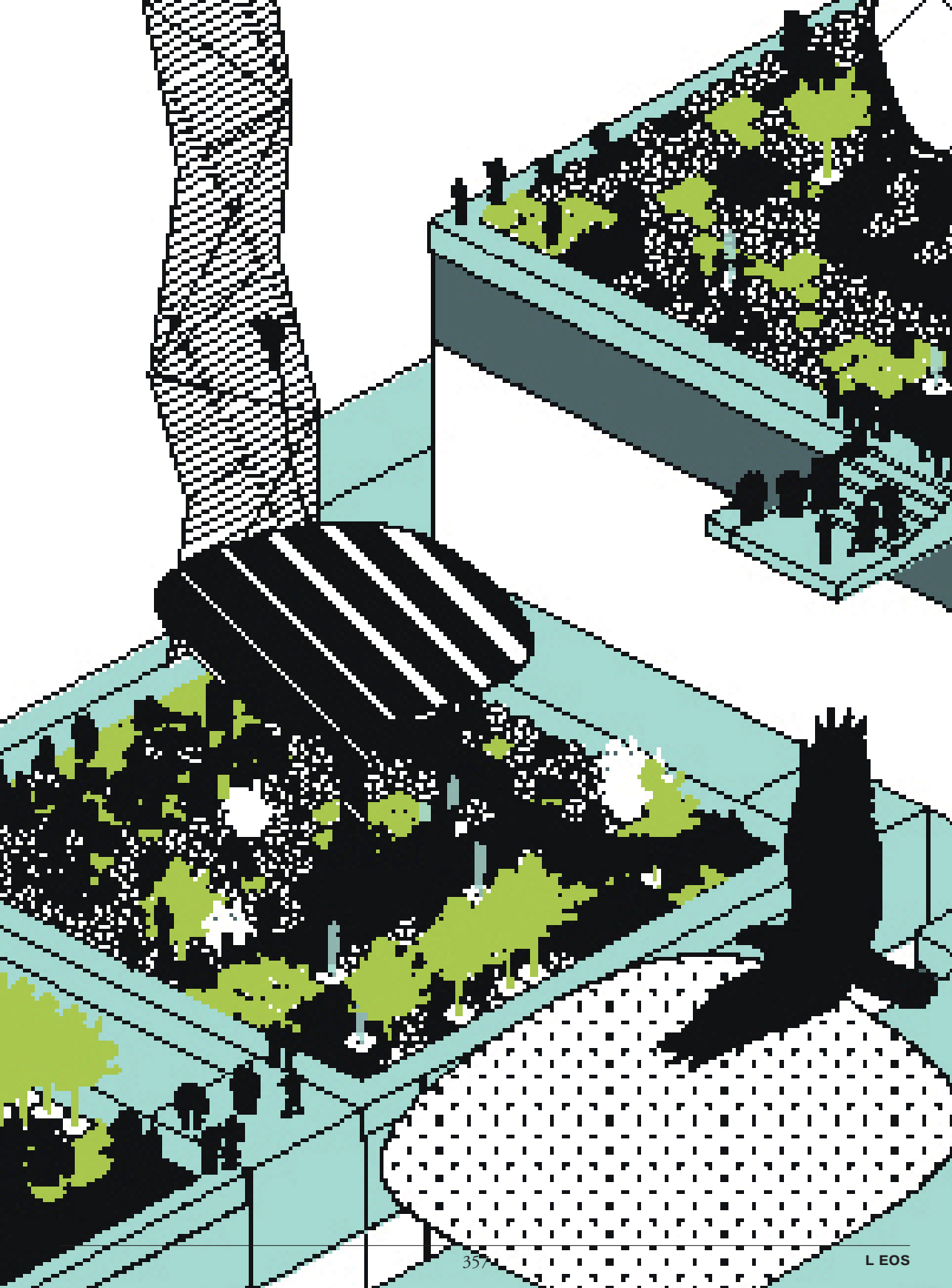
EOS JOY CITY

In Causeway Bay the first *EOS* development is located at the main entertainment and shopping hub of Hong Kong. It is likely that the programming of this *EOS* area turns out to be more entertainment and action oriented. The structure also allows to transform the space to temporary entertainment hot spots. It is also highly suspected that there is a strong demand for diverse spectacular *Active Connectors* and unique physical and visual links to the bordering Victoria Park.





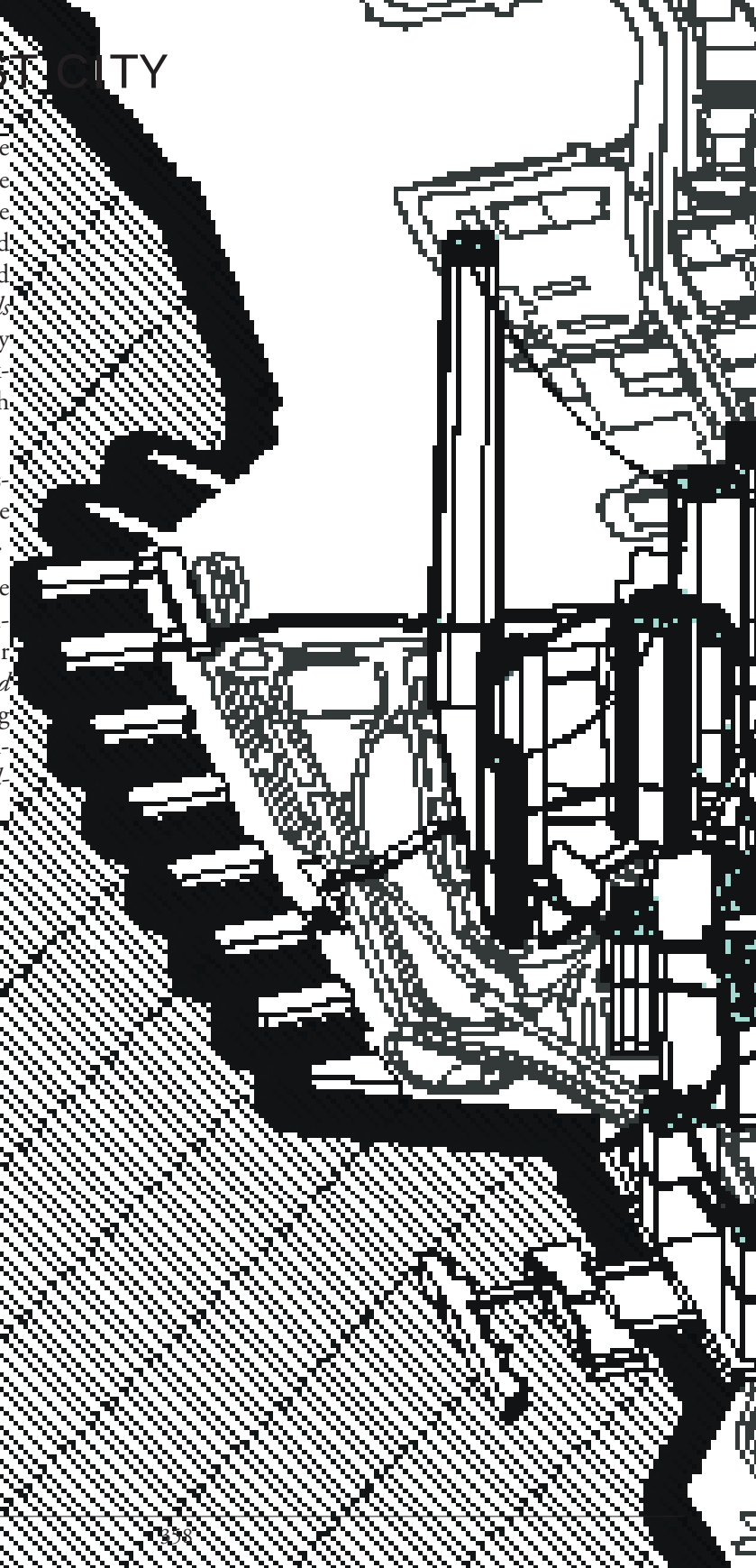
ZOOM IN

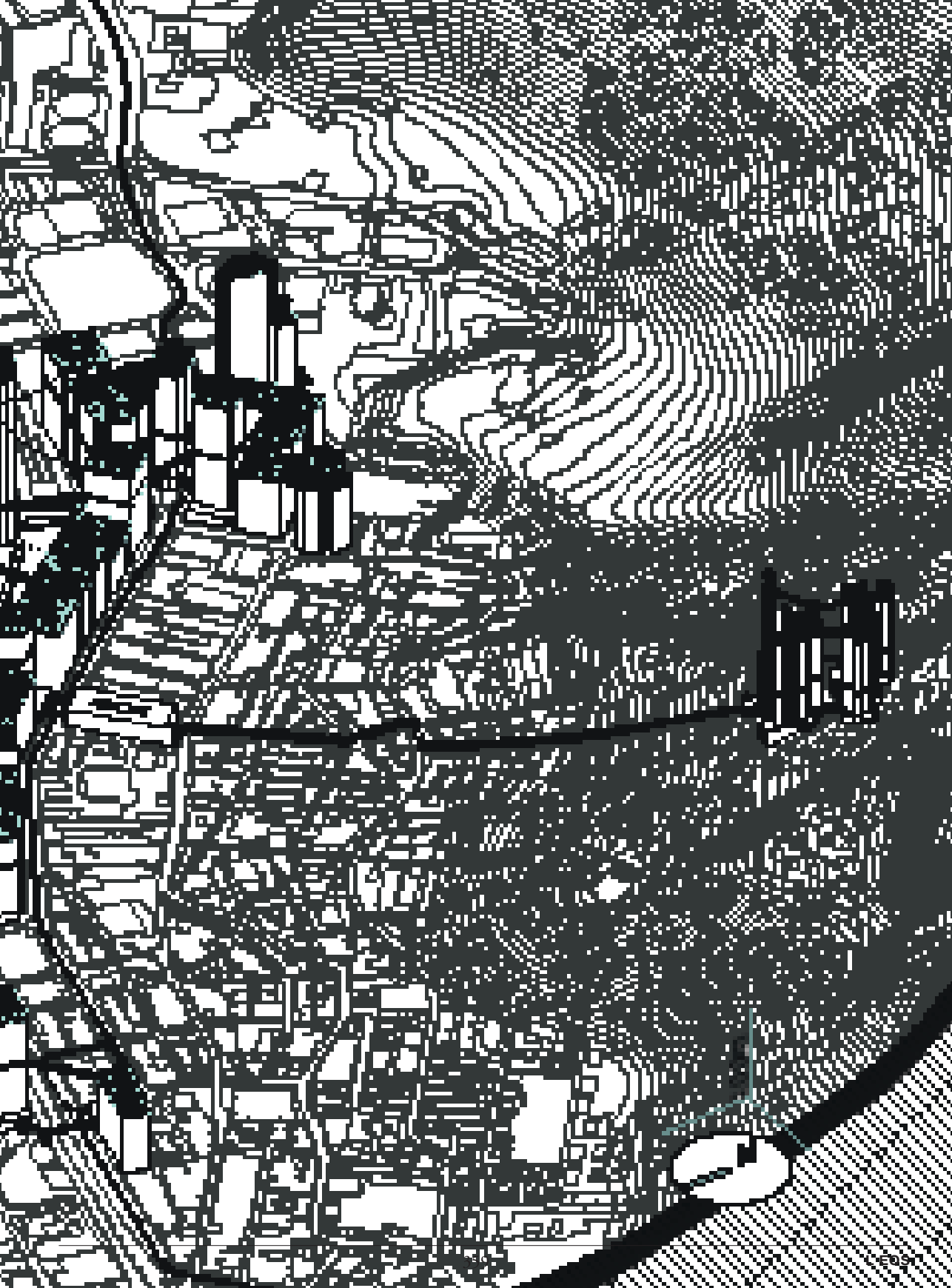


Because of the extreme shortage of urban green in this area and the need for recreational breaks, the *EOS* is likely to be programmed with a high percentage of green and relaxing *Pixel Cubes*. The *Mid-levels* of the *EOS* development is likely to house team building and workshop premises and to contain lunch-break friendly facilities.

As a main tourist area, it is also suspected that *Active Connectors* are designed to attract foreign visitors.

The existing connection to the housing area and the natural hinterland by the Mid-Levels-Escalator is used to set up an uphill *Elevated Open Space*. It forms an interesting link which also interweaves the oldest area of Hong Kong into the *Elevated Open Space* network.





GROWING SCENARIO

Designs create objects, visons create the future.

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Koolhaas, Rem: Congestion Without Matter, Parc de la Villette, 1982, in O.M.A./Koolhaas, Rem/Mau, Bruce: S, M, L, XL, New York 1995.

List of Illustrations

All unnumbered plans and illustrations are made by Philipp Kramer.

001 Parc de la Villette, Strips; Koolhaas, Rem: Congestion Without Matter, Parc de la Villette, 1982, in O.M.A./Koolhaas, Rem/Mau, Bruce: S, M, L, XL, New York 1995, p. 923; **p.281**

002 Boulevard and Promenade; Koolhaas, Rem: Congestion Without Matter, Parc de la Villette, 1982, in O.M.A./Koolhaas, Rem/Mau, Bruce: S, M, L, XL, New York 1995, p. 927; **p.281**

003 Circulation & Strips; based on: Koolhaas, Rem: Congestion Without Matter, Parc de la Villette, 1982, in O.M.A./Koolhaas, Rem/Mau, Bruce: S, M, L, XL, New York 1995, p. 923, 927; Graphic by Philipp Kramer; **p.281-282**