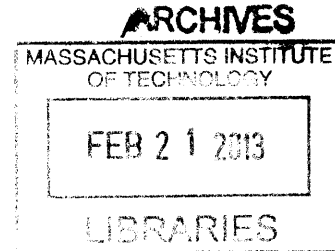


C.A.S.H. - COMMUNAL AFFORDABLE SINGLES HOUSING

A PLATFORM FOR PROACTIVE AFFORDABILITY IN HONG KONG

By Yan-Ping Wang



Bachelor of Arts, Architecture
College of Environmental Design | University of California, Berkeley, 2009

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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FEBRUARY 2013

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Submitted to the Department of Architecture on January 16th, 2013
In partial fulfillment of the requirements for the degree of
Master of Architecture

Abstract

In Hong Kong, young singles are left out of the affordable housing equation. They require much more space per person in comparison to those living in family housing, and the government is not willing to allocate a disproportionate amount of already limited public resources to house this demographic. Many young singles end up living in cramped conditions with their parents well into their 30s, lacking space and autonomy throughout their golden years. Conditions for elderly singles are more dire - with no family to look after them, many live in Hong Kong's notorious cage homes, stacked bed spaces within already tiny apartments in the city's poorer districts.

CASH transcends this housing deadlock by providing a new approach towards affordable housing – proactive affordability - for Hong Kong's singles population. The architecture acts as a platform that maximizes opportunities for tenants to generate extra revenue, allowing them to afford their own spaces. This is achieved by re-organizing private and communal space in such a way that allows for subletting and commercial activity to coincide with the residential space. The building positions itself to generate foot traffic, creating greater opportunities for its tenants. In doing so, the residents of CASH can live larger, dream bigger and work harder, on their own terms and within their own communities.

Thesis Advisor: Professor Tunney F. Lee
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Thesis Advisor: Professor Yung Ho Chang
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To my grandparents, for always being so proud of us. I hope to continue making you proud in the future. To Nainai, I've always wondered where my artistic side came from - now I know.

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“We need to work against poverty – not just by giving money, but by helping poorer people from relying upon social welfare. This is what it means to eradicate poverty.”

- Stephen Fisher, Hong Kong Oxfam’s Director General

Introduction

Achievements in Hong Kong Public Housing

It is without question that Hong Kong can look back on the past 50 years of its public housing program with pride. What began as a decisive response to the disastrous Shek Kip Mei fire of 1954, public housing Hong Kong now houses over 40 percent of its population¹. Perhaps even more notable is the dignity and sense of community these housing estates provide to their residents. In the past 50 years, the quality of living in Hong Kong public housing has steadily risen to become very desirable to live in such arrangements. The construction of massive public housing estates for tens of thousands of residents have created successful and vibrant communities, through sophisticated planning and design.

Today, the public housing program faces a new challenge - how to house the growing number of singles in Hong Kong. This thesis puts forth a number of ideas for providing affordable housing this demographic, culminating in a design proposal for a public housing building for single residents. It is the author's hope that this proposal will provide a fresh perspective and help generate discussion amongst professionals and decision-makers who are more closely involved in these issues.

¹ Yeung, Y.M. and Timothy K.Y. Wong. Fifty Years of Public Housing in Hong Kong: A Golden Jubilee Review and Appraisal.

A Demographic Shift towards Single Households

The developed world is undergoing a significant demographic change. Just as the extended family gradually made way for the nuclear family in the twentieth century city, there is now a shift towards a household size of only one or two people as the primary unit of living². Moving in parallel with this shift towards smaller households is the increasing densities and rising land values of urban areas. The combined transformation of demographics and urban density creates new pressures upon the development of the 21st century city. One of the most direct pressures will occur within the arena of urban housing - a demand for even more dwelling units for singles and other small households³.

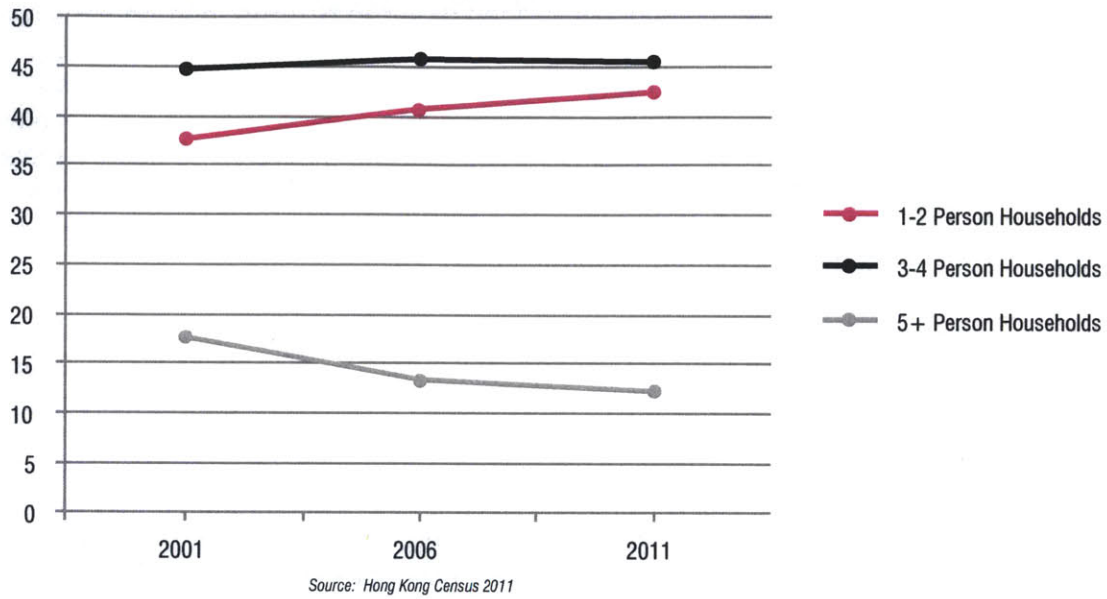
Hong Kong exemplifies these socio-spatial trends and the way major cities are beginning to adapt to them. Often referred to as the quintessential high-density small-footprint city, Hong Kong has a population of 7 million living on an area of 120km², which gives it a concentration of roughly 600 people per hectare. On this city-wide basis, Hong Kong is considered one of the densest places in the world, rivaled only by Mumbai and Dhaka. At the same time, Hong Kong is on a trajectory towards delayed marriage and smaller household size alongside other highly developed Asian regions such as Japan, Taiwan and South Korea. A recent study by the Asia Research Institute showed the average marriage age of women in Hong Kong was slightly over 30, surpassing even Japan⁴.

2 Shelton, Barrie, Justya Karakiewicz and Thomas Kvan. *The making of Hong Kong: From Vertical to Volumetric*. Routledge: December 22, 2010. Print. p22.

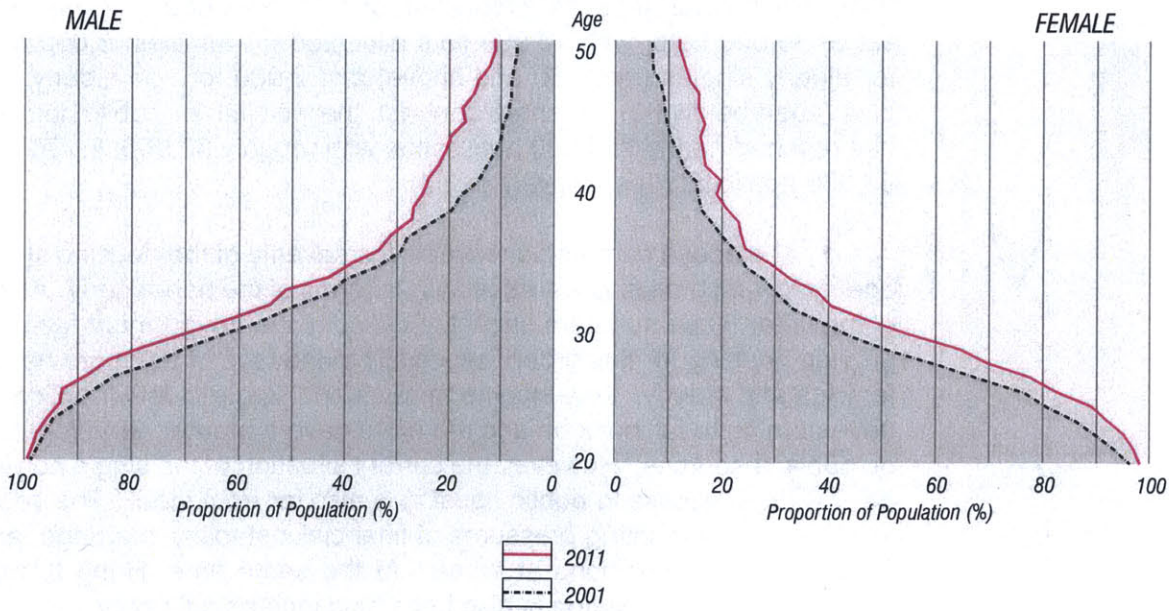
3 Shelton, Barrie. *The making of Hong Kong: From Vertical to Volumetric*. p23.

4 Anonymous. "The flight from marriage." *The Economist*. 20 August 2011. Web. 10 October 2012. <http://www.economist.com/node/21526329>

PERCENTAGE OF TOTAL POPULATION BY HOUSEHOLD SIZE: 2001-2011



PERCENTAGE OF UNMARRIED POPULATION: 2011-2011



The Difficulty of Housing Singles in Hong Kong

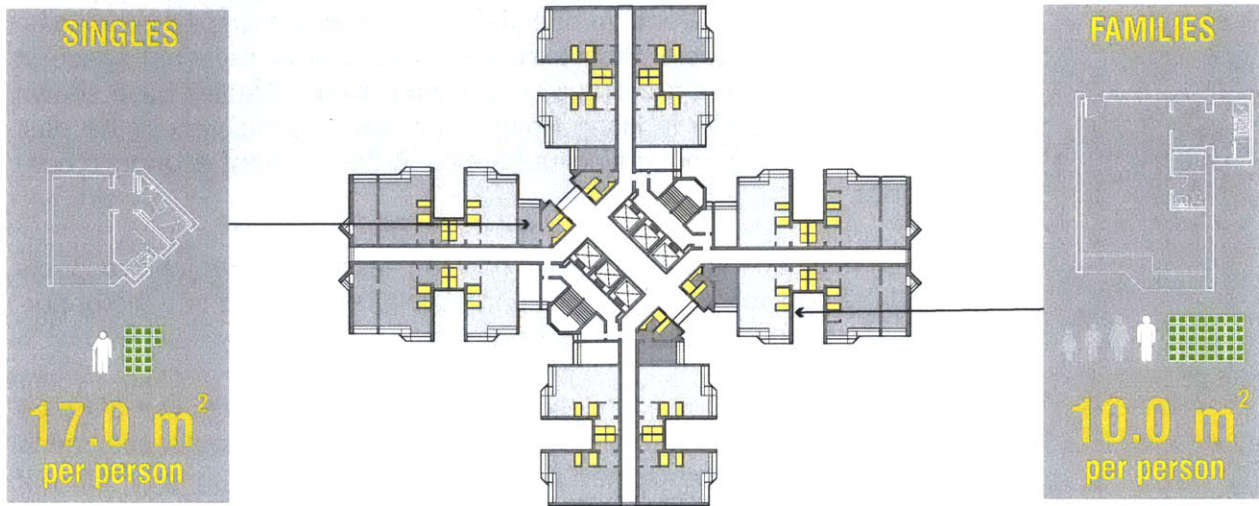
The affordable housing system in Hong Kong is designed for housing families as opposed to single tenants. This is due to the smaller percentage of singles in need of public housing, and perhaps more importantly, their inefficient use of space under the current public housing system. Hong Kong is one of the densest cities in the world, and the efficiency of space here is paramount. Presently, Hong Kong's public housing system is able to house families at roughly 10 square meters per person. However, in the case of single tenants, this number increases to 17 square meters per person due to the requirement of a kitchen and bathroom for each unit (fig. 1).

The demand for affordable housing for singles has increased dramatically within the past decade, rising from 31,000 applicants in 2005 to 99,000 applicants by the end of 2012⁵. This is largely caused by skyrocketing housing prices throughout Hong Kong. The average price of privately owned housing has increased over 70% since the year 2009. At present, Hong Kong is ranked as the least affordable city in terms of housing, with median housing prices at 13 times annual median incomes, far outpacing other notoriously high-priced cities such as London and New York (fig. 2). The limited availability of land and the increasing demand from mainland buyers are major factors driving this trend.

The combination of high demand and inefficient layout has created an uncomfortable situation where the government struggles to provide inefficient singles flats at a high cost. It is therefore no surprise that in 2012, the annual target for production of affordable housing units was set at 15,000 flats, with 10,000 flats allocated for families, 3,000 flats for elderly singles (aged 60 and above) and 2,000 for non-elderly singles (aged below 60). In sharp contrast, the wait list for public housing has reached nearly 200,000 applicants, with roughly 82,900, 6,100 and 93,000 applicants respectively (fig. 3).

The above comparison reveals the severity of the housing shortage for low-income singles, especially in terms of the non-elderly. At the same time, these numbers show the difficulty the government faces to provide housing for this group, especially in the face of the more needy families and elderly. Low-income families and single elderly applicants have nothing to fall back on and therefore have a greater need for limited public resources. However, the current situation of the single non-elderly without access to public housing is also far from ideal. The youth are facing the mounting pressures of financial instability, marriage, and cramped living conditions at home. At the same time, Hong Kong's growing elderly population is also becoming increasingly poor.

⁵ Ngo, Jennifer. "700,000 slip through Hong Kong's welfare net." *South China Morning Post*. 16 October 2012. Web. 18 October 2012.



1: Space Required Per Person: Singles vs. Families



2: Median Housing Price to Median Annual Income Ratio

Source: www.demographia.org



3: Public Housing Annual Production vs. Waitlist Length

Source: Hong Kong Housing Authority

Documentation of current living conditions

The younger singles who are unable to find affordable housing typically live with their parents in oftentimes unbearably cramped conditions. These young people often experience this lack of personal space in combination with a grueling 50+ hour work week. Studies have shown that social mobility in Hong Kong has slowed significantly in the past decade, leaving young singles trapped in their current economic conditions.

“With no space, such expensive housing, less promising job prospects and the population squeeze, young people feel trapped and the opportunities are not as plentiful as before.”⁶

Living at home in close proximity to one’s parents can often be in direct opposition with the professional and social lives of these young singles. In addition to their primary employment, as many as 40% of young singles work second jobs to cope with their difficult financial environment. Parents and their grown children end up living together in a tight space with very different circadian rhythms. Such living arrangements can create significant amounts friction within a household, adding to the sometimes already strained relationships between parents and their children.

“If I’m working the night shift, I come home at 2 o’clock in the morning... Once I open the door. If I’m working early in the morning, I need to be out the door by 4AM. It all disturbs the resting hours of my family. So I really want to move out. However, the current housing prices are just too high...” – *Respondent D*⁷

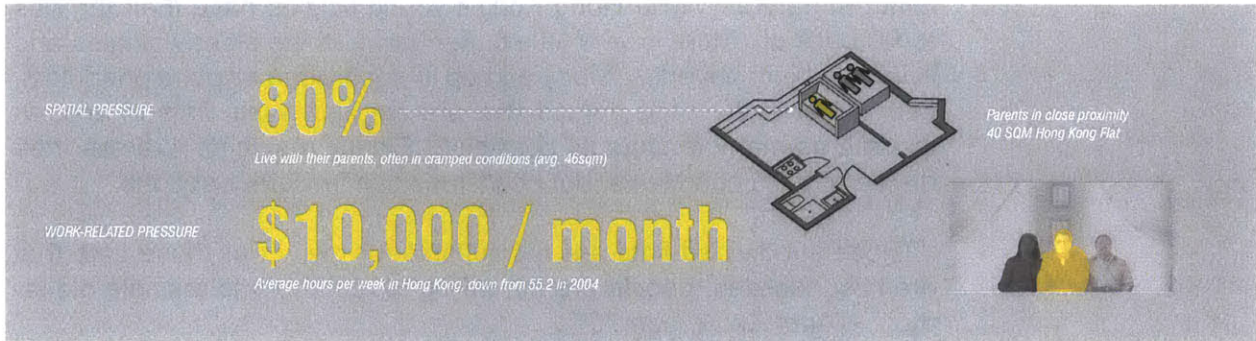
Furthermore, the proximity to one’s parents often inhibits the personal development and growth that accompanies living independently. One of the most common complaints is the difficulty of finding a significant other and developing romantic relationships given the lack of private space.

“Many [youth] feel helpless when they think about forming families... Their aspiration to live on their own (i.e., to move out from the family) underscores their strong and desperate desire for housing. This discrepancy leads to financial difficulty in the young geners’ golden years. They are getting more and more frustrated and upset with the current housing market.”⁸

6 Yip, Paul Siu Fai, Paul Wai Ching Wong and Frances Yik Wa Law. *A Study on Understanding our Young Generation*. Central Policy Unit. The Government of the Hong Kong Special Administrative Region. February 2011. Web. www.legco.gov.hk/ p30

7 Yip, Wong and Law. *A Study on Understanding our Young Generation*. p114

8 Yip, Wong and Law. *A Study on Understanding our Young Generation*. p92



Living Conditions, Income of Young Singles



Michael Wolf - 100x100 - Public Housing Units in Shek Kip Mei

Meanwhile, Hong Kong's elderly singles face difficulties of a very different nature. While Hong Kong's young singles have their families to fall back on, there is very little buffer between the elderly singles and living in abject poverty. Many end up in subdivided or partitioned flats, cubicles or even 'cage homes' that are stacked within flats to accommodate as many tenants as possible⁹. Elderly residents express their dislike of such conditions, but oftentimes see few other options:

"Those subdivided flats are not suitable for me... For those flats that aren't subdivided, people are not willing to rent them to a single old-lady..." – *Aunt Kwok, age 75*¹⁰

No one knows how many people are currently living in these inadequate conditions, but estimates have been as high as 90,000¹¹. With Hong Kong's elderly population growing rapidly, their lack of housing is becoming a serious issue. Many elderly singles do not have the resources or mobility to access the public housing system, and are often left unaccounted for.

The exacerbation of the housing situation for these elderly singles, as well as the lack of affordable housing for the younger singles have both become a highly politicized issue in recent years.

Singles Housing: An investment in the Future of Hong Kong

Rethinking housing for the singles population is an investment in Hong Kong's future. Providing today's youth the space to grow and develop will have a far-reaching positive impact upon the next generation of Hong Kong's leaders and communities. Similarly, creating dignified and healthy living conditions for the elderly population will lay the groundwork for the well-being of the city's aging population. The challenge then is to situate these emerging priorities within the framework of limited public resources and the existing mandates of family housing. Approaching this issue will require a fundamental reconsideration of how public resources can be best allocated to solve the problem of singles housing. The following section will discuss existing housing conditions, as well as characteristics of the singles population in Hong Kong and their particular housing needs.

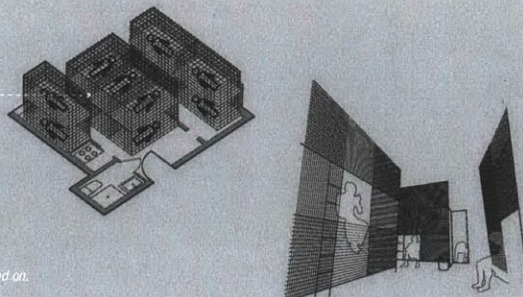
⁹ Yip, Paul S. F. "Disconnection in a Highly Connected City." *Cities Health and Well-Being*. November 2011: 28-29. Web. 8 August 2012. p28

¹⁰ Loh, Christine K.W. and Mike Kilburn. "The Costs and Benefits of High Density Urban Living." *Cities Health and Well-Being*. November 2011: 30-31. Web. 8 August 2012. p30

¹¹ Loh and Kilburn. *Cities Health and Well-Being*. p31

80,000
People living in "woefully inadequate conditions" such as cage homes and cubicles.

\$1,090 / month
Old age allowance given to those over 70. For many single elderly Hong Kongers, this is all they have to depend on.



Living Conditions, Income of Elderly Singles



Elderly living in "Cage Homes"



Shop Houses along Hong Kong Street, 1950s

Source: The Making of Hong Kong, From Vertical to Volumetric.

Context

The Beginnings of Hong Kong Housing

The evolution of Hong Kong's housing typology is a remarkable progression of responses to changes in urban density, technology, and building code. The following section seeks to delineate the factors that drive this transformation, and the rules govern its current forms. This abridged history draws heavily from "The Making of Hong Kong, From Vertical to Volumetric" by Barrie Shelton, Justyna Karakiewicz and Thomas Kvan, which can be referenced for a more detailed and comprehensive account of the development of Hong Kong's built form. For our purposes, an understanding of key parameters will help form the basis for design decisions in the following sections.

The Hong Kong Shop House

The Hong Kong shop-house is the first widespread housing typology in Hong Kong, which is variation on the shop-house form found in Taiwan, Malaysia, Singapore, and parts of Mainland China. Located on narrow and deep lots, the shop-house is composed of commercial space on the first floor with 1-4 floors of residential space above. What set the Hong Kong shop-house apart from its neighboring Asian variants is its occupation of the entire lot width – a dense configuration responding to the rapid population growth, which began as early as the mid-1800s.

The structure acts as a flexible residential space, warehouse, and commercial area suited for sub-tropical climates. Verandas on the upper levels reached out to the edge of the street, creating a continuous colonnade along the sidewalk. The ground floor shop and colonnade created a zone for commercial activity, which would often mix with domestic life.

“Typically, meals were had sitting around a table in the shop space or on the pavement outside... The sorting and storage of goods took place in the residential portion when stock levels were high.”¹⁰

Beginning in the mid-1800s, this blurring between commercial and domestic space was the dominant lifestyle in Hong Kong for roughly a century. While modern perspectives have romanticized the image of the traditional shop-house, these living conditions have often been documented as squatter settlements. The constant influx of migrants created a crushing demand for housing that created these cramped living conditions. A survey conducted in 1957 by the University of Hong Kong found an occupancy rate of eleven people per floor, with most households living in less than 11.15 m² of floor space (Mauder and Szczpanik, 1958). Overall, the study found that half of Hong Kong’s population was living in cubicles... However, Shelton, Karakiewicz and Kvan note that these squatter towns “were often places of enterprise and industry” and “were not necessarily in the category of extreme poverty,” with overcrowding being relative to the context and culture of Hong Kong.¹² In short, this form of housing and urbanism represents a natural conflation of shop and house in order to meet the demands of density and affordability. Subsequent housing types can be seen as iterations on this basic form and its relationship between public and private space.

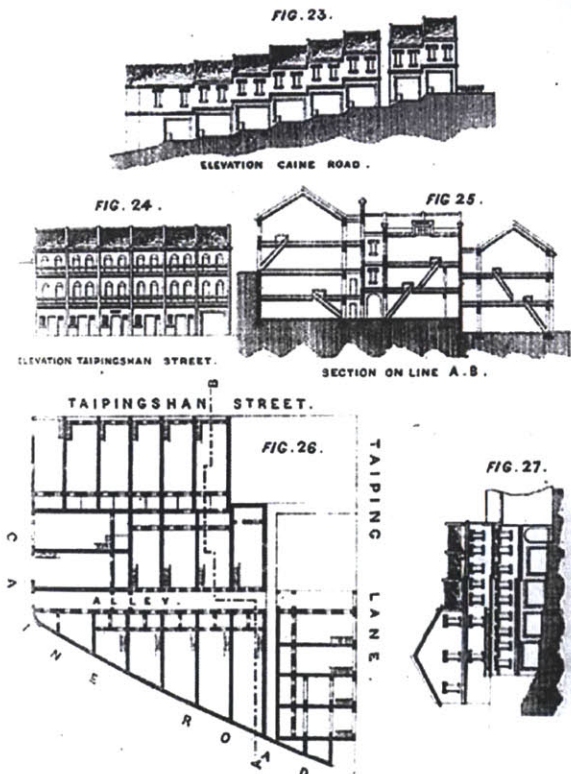
12 Shelton, Barrie. *The making of Hong Kong: From Vertical to Volumetric*. p46.

13 Shelton, Barrie. *The making of Hong Kong: From Vertical to Volumetric*. p78.

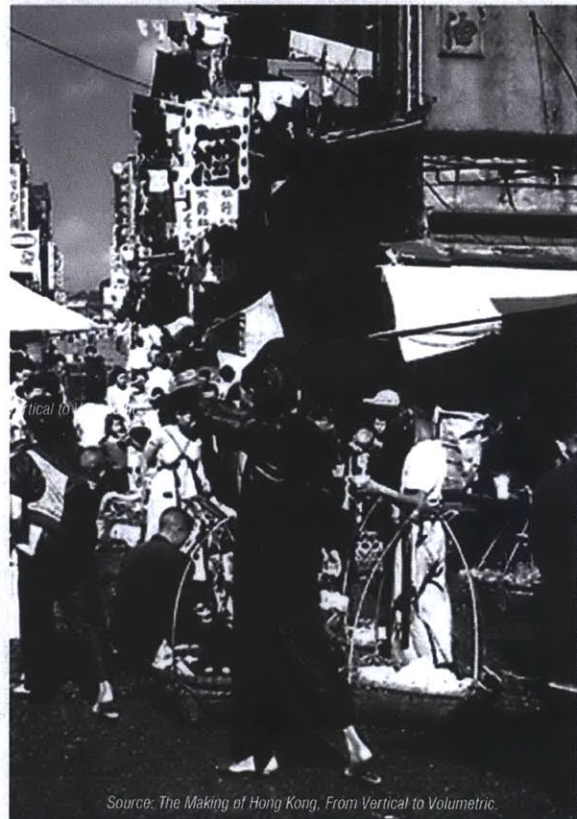


Source: *The Making of Hong Kong, From Vertical to Volumetric*

Shop Houses Negotiating Stepped Streets



Source: *The Making of Hong Kong, From Vertical to Volumetric*



Source: *The Making of Hong Kong, From Vertical to Volumetric*

Shop Houses Turning the Street Corner

High Density Variations on the Shop House

With the shop houses operating at full capacity, the Building Ordinance of 1956 relaxed height limits to allow for greater urban densities. This was followed by an enormous increase in building height across the territory. The resulting typologies were essentially extrusions of the shop-house into a mid-rise walkup. In some cases, adjacent lots were combined to form larger blocks of flats, which stepped back from the street at the upper levels. Yet another variation of the shop-house appeared in the form of the “massive block,” which occupied a large corner lot and rose up to 20 stories with the incorporation of elevators. These expanded forms allowed plot ratios to rise drastically – in some cases a ratio of 20:1¹⁴ was possible - while retaining the commercial space at street level or expanding it to two stories. However, these extreme densities overly burdened infrastructural networks while letting in little in the way of light and air, and by the early 1960s the regulations were under reconsideration.

14 Shelton, Barrie. *The making of Hong Kong: From Vertical to Volumetric*. p80



Source: *The Making of Hong Kong, From Vertical to Volumetric*

"Cantilevered" Typology



Source: *The Making of Hong Kong, From Vertical to Volumetric*

"Cantilevered and Curved" Typology



Source: *The Making of Hong Kong, From Vertical to Volumetric*

"Massive Block" Typology

Evolution of Hong Kong Public Housing

Coinciding with the emergence of high-rise private housing, the Shek Kip Mei fire of 1954 gave rise to the first of a series of ambitious public housing projects that redefined the landscape of housing options in Hong Kong. On Christmas Eve in 1953, a fire ripped through the squatter settlement in Shek Kip Mei, leaving 53,000 people homeless.¹⁵ The government reacted decisively, rapidly constructing a series of six-story buildings at the site of the fire to re-house residents as quickly as possible. This resulted in a unique form based upon an H-shaped plan, dubbed the “Mark I” block. The H-shaped block was made up of back-to-back single-room flats that were accessed through a continuous balcony along the perimeter, with common facilities such as bathrooms and kitchens in the center of the “H.” The space allocated per person was little more than 2.5 meters¹⁶ – a far cry from the **12.8 meters per person** of present-day public housing in Hong Kong.

While the building was originally intended to consist entirely of housing units, it was quickly realized that the ground level had to provide space for shops, and that some forms of light industry would take place in the upper levels. Rooftops provided space for much-needed schools and play spaces. Not long afterwards, hawkers and traders began taking over the open space around these public housing clusters. In response, the government constructed market shelters at ground level for the occupation of hawkers and small market stands.¹⁷ In such a way, the first public housing projects successfully integrated the shop house lifestyle of mixed residential and commercial spaces into a higher density form.

The following decades saw sustained economic growth throughout Asia, and not in the least in Hong Kong. With this increase in prosperity came greater government resources and expenditure, alongside higher expectations upon the public housing system from the public. The space allocation, infrastructure, community amenities and form of the public housing structures continued to shift, improving with each iteration of the design. The incorporation of elevator systems allowed for a much more efficient floor plan (in terms of space allocated to circulation vs. living space), which eventually led to the 40-story cruciform structures seen today.

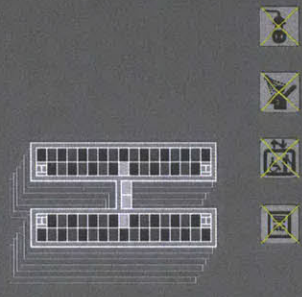
¹⁵ Yeung, Y.M. and Timothy K.Y. Wong. *Fifty Years of Public Housing in Hong Kong: A Golden Jubilee Review and Appraisal*. Hong Kong Housing Authority: 2003. Print. p20

¹⁶ Yeung and Wong. *Fifty Years of Public Housing in Hong Kong*. p48

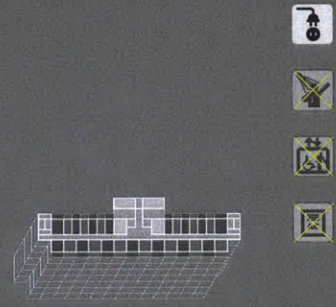
¹⁷ Shelton, Barrie. *The making of Hong Kong: From Vertical to Volumetric*. p81

Hong Kong Public Housing Development: 1950-1970

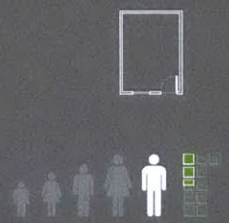
SPACE



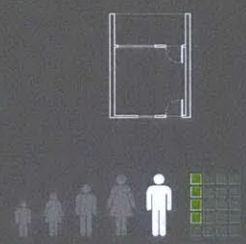
1950s - Mark I - 7 Stories



1960s - Mark III - 8 Stories

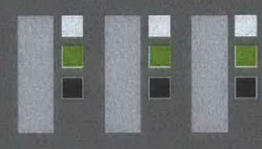
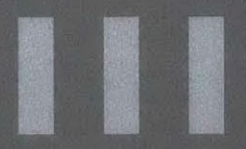


2.5 m² per person



4.0 m² per person

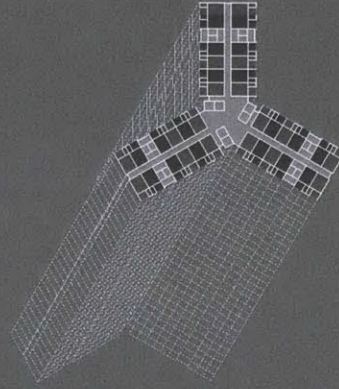
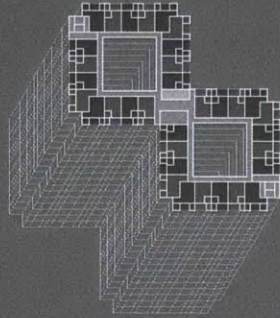
COMMUNITY



-  School
-  Playground
-  Open Space
-  Commercial Space

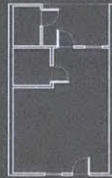
Hong Kong Public Housing Development: 1970 - 1990

SPACE



1970s - Twin Tower - 20 Stories

1960s - Trident - 30 Stories

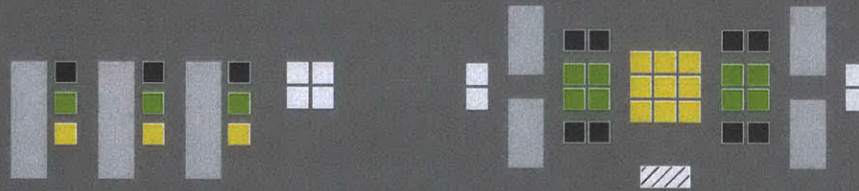


6.0 m² per person



7.0 m² per person

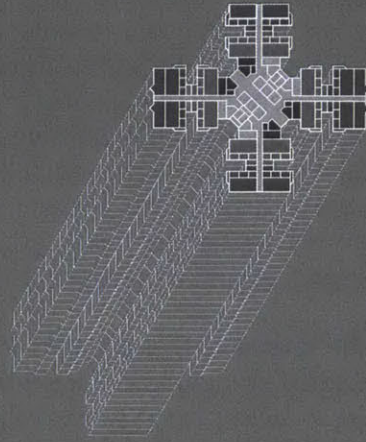
COMMUNITY



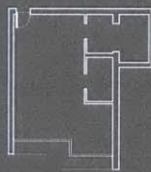
- School
- Playground
- Open Space
- Commercial Space

Hong Kong Public Housing Development: 1990 - Present


SPACE 

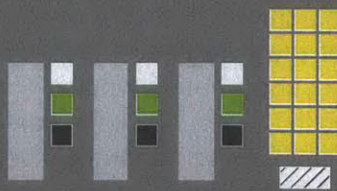


1990s - Harmony I - 40 Stories



10.0 m² per person

COMMUNITY 



-  School
-  Playground
-  Open Space
-  Commercial Space

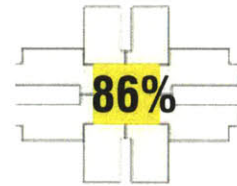
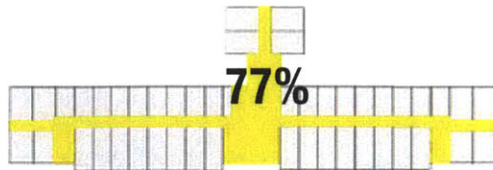
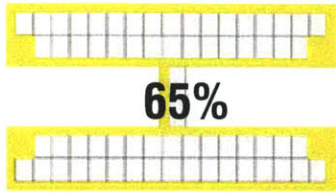
Tower and Podium - A Masterpiece of Efficiency

The development of Hong Kong's housing typology is primarily driven by the desire for ever-higher density and efficiency. Examples of present-day private housing design showcase the underlying cost-driven logic and rationale for the current form. The massing is first and foremost by the extremely high cost of land in Hong Kong. Land cost can often make up nearly 90% of the project budget, dwarfing the cost of construction. Therefore, it is critical to maximize the buildable area allowable by code upon such expensive plots of land. Next, the massing is split into towers sitting atop a multi-story commercial podium, which occupies the entire site. This allows the developer to split the financial risk between residential and commercial sectors, while providing easy access to shopping and amenities for residents.

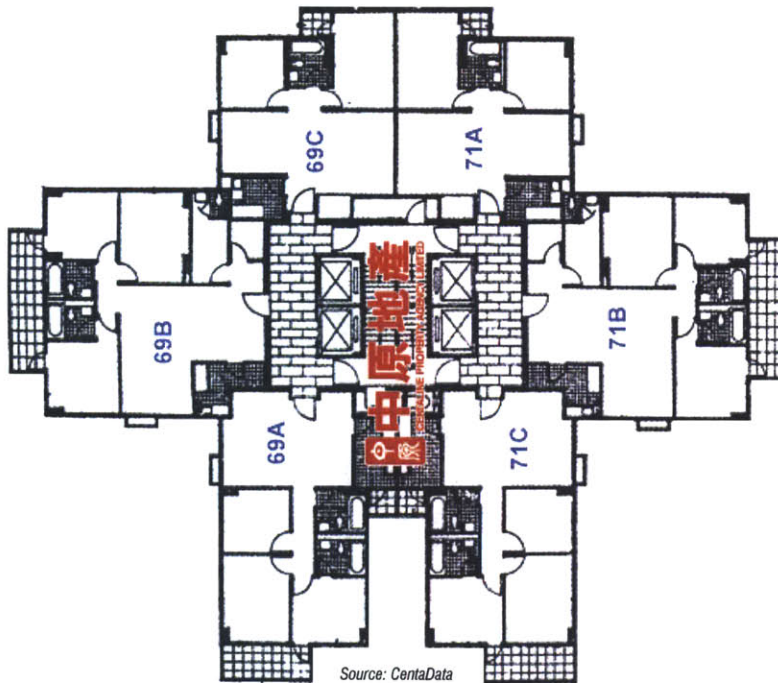
The cruciform shape of these towers is a result of large units (by Hong Kong standards) branching out from an efficient core, like petals of a flower. Due to Hong Kong's proximity to the equator, orientation of these towers negligible, and they can be seen positioned every which way depending on the relationship to the plot itself. The crenelated form results from building code, which requires kitchens and bathrooms to open to the exterior. This also allows the piping to be built along the exterior of these spaces. These service-oriented spaces and their unsightly external infrastructure are then hidden away in the indented portions of the exterior.

The internal layouts are a result of half a century of incremental improvements to efficiency of the residential floor plate. The larger units of private housing require fewer points of access, decreasing the proportion of circulation space, further raising the efficiency of the floor plan. The invention of the scissor stair, providing two separate paths of egress within one stairwell, allowed the circulation core to shrink to nothing more than a U-shape surrounding the elevators in many cases. The best examples of such towers can achieve efficiency ratios of up to 86%.

Yet, in order to achieve this level of efficiency, the point tower has sacrificed many of the qualities of the traditional Hong Kong lifestyle, as embodied in the shop-house typology. The towers, referred by Shelton as "cul-de-sacs in the sky," lack the connectivity and vitality of its predecessors. The increasing separation between the residential units and the commercial base weakens the relationship between residents and their street frontage. This diminished connectivity and lack of communal space may also adversely affect the formation of communities within these residential blocks. These factors may not be the most critical from the perspective of family housing. However, when designing housing for singles, they become a far more important consideration.



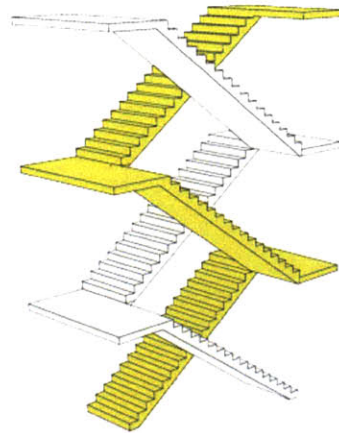
Evolution of the Efficient Floorplan
 Source: *The Making of Hong Kong, From Vertical to Volumetric.*



Mei Foo Tsuen Typical Floor Plan

Scissor Stair

Source: *The Making of Hong Kong, From Vertical to Volumetric.*



Mei Foo Tsuen Towers



Mei Foo Tsuen Podium

Observations

Singles and the Point Tower – a Fundamental Mismatch

While the point tower has a range of obvious benefits, it is a system designed around the nuclear household. This is most evident within two aspects of its spatial structure.

1. **Diminished efficiency for smaller units.** At the most fundamental level, the efficiency of its floor plate relies on its small number of large units, designed for residents of greater means. In designing for lower-income residents, the smaller unit size demands greater corridor access and thus lower efficiency, as shown in the Harmony I public housing tower floor plan. The even smaller units of single residents, would therefore reduce efficiency of the point tower closer to that of a slab building.

2. **Lack of connectivity and communal spaces.** Communal spaces give singles the space to connect with each other and form friendships, social networks, support groups and romantic relationships. For single residents, close family may be far away or even non-existent. Therefore, it is important to provide space that fosters a sense of community and mutual support.

Both factors of incompatibility relate to the high efficiency ratio of the point tower. Therefore, it is the author's conclusion that efficiency ratio, while important, should not act as the single determining factor when designing for single residents. Instead, it should be considered in con-

Differing Financial Needs

In addition to their unique spatial needs, low-income singles also have a financial profile that is drastically different from that of a low-income family. Taking the current allocation of 12.5m² as a starting point, the following discussion compares the financial needs of each of these low-income groups.

First, let us consider the family of four. Hong Kong Housing Authority sets the maximum income of 4-person household applicant at \$21,800 HKD a month¹⁸. Assuming a market rate of \$200 HKD per square meter per month, they will be hard-pressed to afford living in a 50 square meter apartment (at 12.5m² per person). To do this, they would be expending nearly half of their monthly income on rent. In this case, providing heavily subsidized housing, in the form of the current public housing model, makes sense.

Elderly singles also fit well within this model of financial assistance. These singles generally have little to no sources of employment income and largely depend on a very basic old-age allowance of a meager \$1,090 HKD a month. In their case as well, heavily subsidized housing makes sense.

Non-elderly singles, however, require considerably less assistance. Hong Kong Housing Authority sets a maximum income of 1-person household applicant at \$9,200 HKD a month in order to apply for public housing¹⁹. Similarly, singles aged 25-35 make on average 10000 HKD a month²⁰. Using the same assumptions on market rate rents, a single individual will spend roughly a quarter of their income on a 12.5 square meter space. This is largely due to the fact that single households have no dependents. Therefore, they are much more able to afford living on a similar square meter per person basis (fig. 2).

In summary, housing for the single person may not be worthy of public resources purely on a person for square meter basis, as defined by the current public housing model. However, they are much closer to living affordably in market-rate housing.

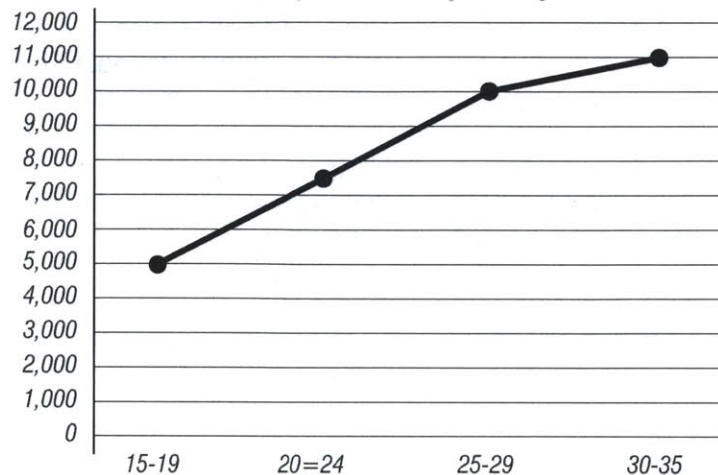
18 Hong Kong Housing Authority. "Housing in Figures: 2012." Hong Kong Housing Authority. The Government of the Hong Kong Special Administrative Region. Web. 8 Aug. 2012. <http://www.housingauthority.gov.hk/>

19 Hong Kong Housing Authority. "Housing in Figures: 2012."

20 Yip, Wong and Law. *A Study on Understanding our Young Generation*. p30

1. Average Median Income (HKD) Ages 15-35

Source: A Study on Understanding Our Young Generation



2. Household Income vs. Living Area vs. Rent to Income

Household Size	Waitlist Income Limits	Living Area (m2)*	Market Rate Rent*	Rent to Income Ratio*
1	\$8740	12.5	\$2500	28.6%
2	\$13410	25	\$5000	37.3%
3	\$17060	37.5	\$7500	44.0%
4	\$20710	50	\$10000	48.3%
5	\$23640	62.5	\$12500	52.9%
6	\$26590	75	\$15000	56.4%
7	\$29560	87.5	\$17500	59.2%
8	\$31620	100	\$20000	63.3%
9	\$35360	112.5	\$22500	63.6%
10+	\$37150	125	\$25000	67.3%

* Assuming 12.5m² per person, roughly the current average in Hong Kong Public Housing

** Assuming 200HKD / m² / month, roughly the current average in Kowloon

An Appropriate Urban Setting

Single residents of all ages have a stronger desire to live in centrally located areas, compared to the nuclear family. For elderly singles, the convenience, proximity to amenities and public transit options is something they rely heavily upon and are willing to pay dearly for. Many of the elderly who live in subdivided and inadequate conditions do so as a tradeoff for this convenience. Similarly, younger singles not only desire to be close to work, but also to the excitement of urban centers (fig. 2). Time is money in Hong Kong – and in this sense, living in a convenient location often outweighs the quality of one’s own living environment. This is particularly true for singles, who tend to spend more time away from home compared to individuals within a nuclear family.

Many of the new public housing estates beyond the mountains north of Kowloon. These “New Towns” boast of fresher air, better living environment and lower rents (fig. 1). However, for singles, these incentives are less important than the opportunities provided by living in the city, and not worth the hour-long commute into town. Affordable housing for singles therefore should be sited in a centrally located, convenient, and cost-effective location.



<http://bamboochutes.wordpress.com/>

1. New Territories



<http://commons.wikimedia.org/>

2. Kowloon

“Can-do Spirit” of Hong Kong

Hong Kong residents pride themselves their ability to cope with the intense conditions in which they live, through hard work and strength of will. In the face of soaring property prices, inflation, and the incredibly fast pace of life, Hongkongers persevere with a strong sense of dignity, doing their best to support themselves through their own means²¹. This is on clear display in figure 1, which shows over 40% young people taking on second jobs in the wake of the financial crisis.

The HKSAR often refers to this attitude towards hardship as the “Can-do Spirit” of Hong Kong. Public-private housing campaigns such as the recent rent-to-buy scheme have pointed towards this attitude as a potential means to bridge the gap between government assistance and self-reliance, between public and market-rate housing.

This is particularly relevant in the light of single households and their incompatibility with the current public housing system. Given that singles are relatively closer to living affordably in market-rate housing, can this gap be closed through this attitude of self-reliance rather than through government coffers? What if the building itself could channel this can-do spirit by providing opportunities for generating extra revenue, close to home? Could such a system lead to a proactive, and potentially lasting form of affordable living for singles?

“We need to work against poverty – not just by giving money, but by helping poorer people from relying upon social welfare. This is what it means to eradicate poverty.”²²

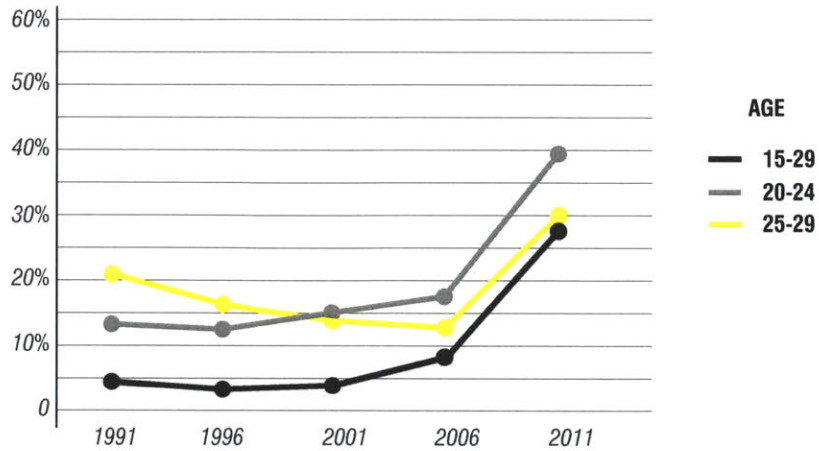
This thesis proposes a building design that acts as a platform for proactive affordability by creating a new dimension of affordability - opportunities for extra revenue- within the residential space (fig. 2)

21 Ngo, Jennifer. “700,000 slip through Hong Kong’s welfare net.” *South China Morning Post*. p1

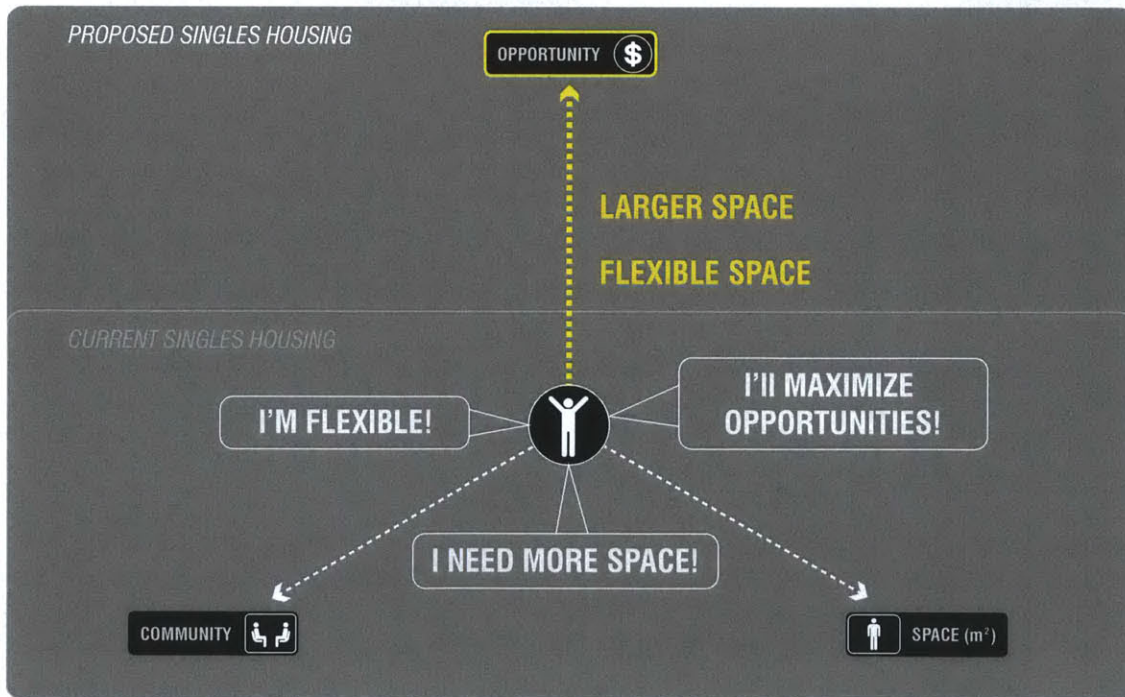
22 Ngo, Jennifer. “700,000 slip through Hong Kong’s welfare net.” *South China Morning Post*. p1

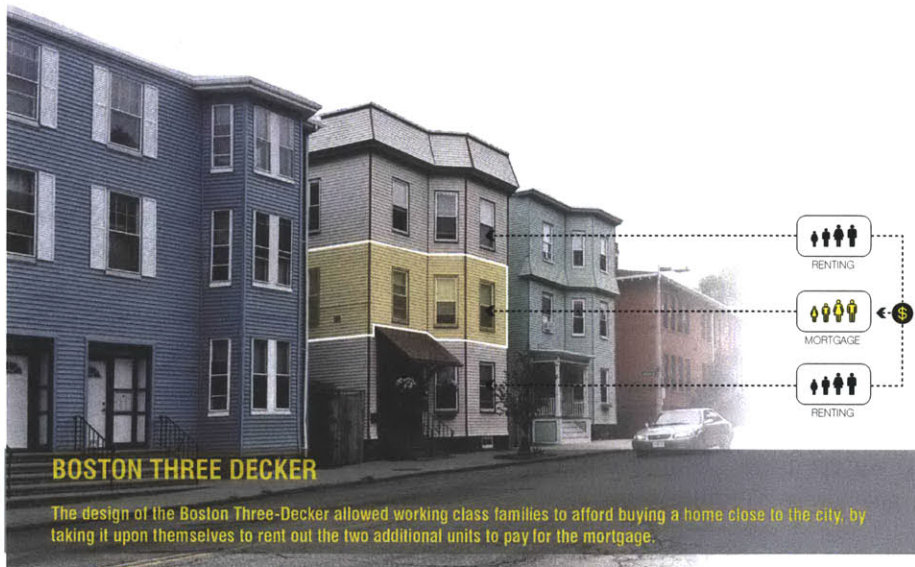
1. Secondary Employment Statistics

Source: A Study on Understanding Our Young Generation



2. A New Dimension of Affordability - Opportunity





Strategy

Platform for Proactive Affordability

The thesis proposes that singles housing should act as a platform upon which singles can earn extra revenue. These opportunities for “proactive affordability” help residents afford their living spaces with little expenditure of public resources, while encouraging a pattern of self-reliance. An extremely successful precedent of a housing typology performing this function is the Three-Decker.

The Three-Decker is a residential structure most commonly found in the New England region of the United States. It is a three-story light wood frame construction, consisting of three stacked residential units accessed through a common stair. These structures were primarily built to house working-class families near factories between 1870 and 1920. However, they regained popularity by the 1980s due to their proximity to major cities – the three-deckers in Dorchester and South Boston are one such example. The three-decker’s internal divisions of space allowed a family to buy the entire structure, live in one unit, and renting out the other two, thereby enabling them to pay the monthly mortgage. (fig. 1) This arrangement enabled middle-income families to afford owning a home close to their employment in the city.

The conceptual strategy of the design is to create a large-scale version of this platform that integrates with the context of Hong Kong. The building design intertwines three scales of design – the flexible unit, the interior street, and the activated base – that creates for a myriad of revenue generating opportunities for residents.

Site - Sham Shui Po

Sham Shui Po is a centrally located, low-income district in Hong Kong. It is often characterized by its cheap deals and central location on the northwestern part of the Kowloon Peninsula and along MTR Red line. In Cantonese, “Sham Shui Po” means “Deep Water Pier.” It was one of the earliest developed areas in Hong Kong, and formerly one of the main industrial and transportation hubs of the region. Today, the district has been rebuilt into large swathes of both public and private housing. The building stock is one of the oldest in Hong Kong, with a large number of residential buildings having exceeded their intended lifespans. This problem of urban decay is compounded with a high concentration of poorly managed and subdivided flats, which include many of Hong Kong’s notorious “cage homes.” Sham Shui Po also contains the highest percentage of elderly residents in all of Hong Kong, whose inadequate living conditions are an issue of concern for the government.

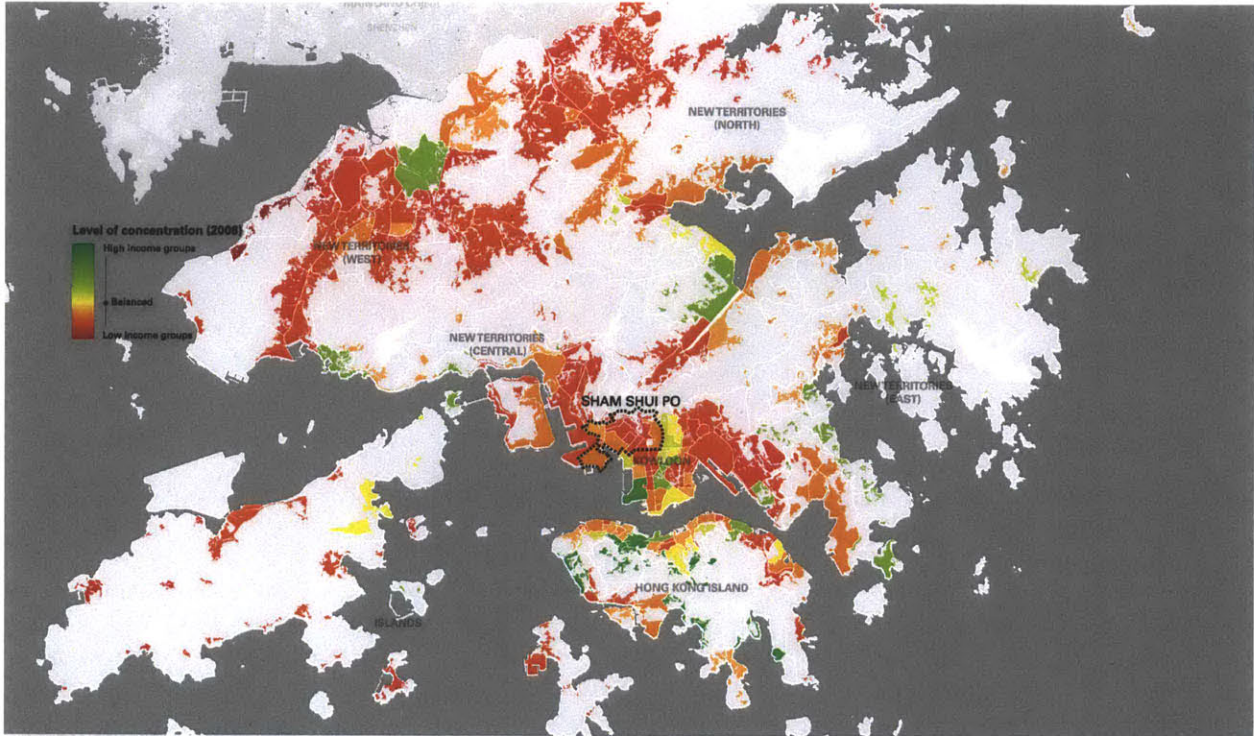
Public entities such as the Urban Renewal Authority have attempted to redevelop a number of sites within Sham Shui Po, with mixed levels of success. While the building stock is clearly in need of renewal, it is also home to a highly local and lively mix of residences, shops, and cultural institutions. This network provides amenities and connections that its low-income residents clearly value.²³ In addition, the colorful range of small shops, street markets and larger discount stores has highlighted Sham Shui Po as a primary destination for cheap goods and services within the larger context of Hong Kong.

“There are two main reasons to go to Sham Shui Po: to buy fabric or electrical components. Lace, thread, clasps, zips, buttons, and any other accoutrements of clothing manufacturing, can be purchased and lights, fuses, wiring, speakers, monitors and other technical gadgets can be bought in the market thoroughfare of Ap Liu Street.”²⁴

Sham Shui Po provides a fitting backdrop for the proposed “platform for proactive affordability.” The rich blend local, cheap goods and street market spaces create an ideal urban context for the proposed high-rise typology saturated with informal businesses. Furthermore, the lively urban surroundings, proximity to Hong Kong Island and availability of transit creates a very desirable location for singles both young and old.

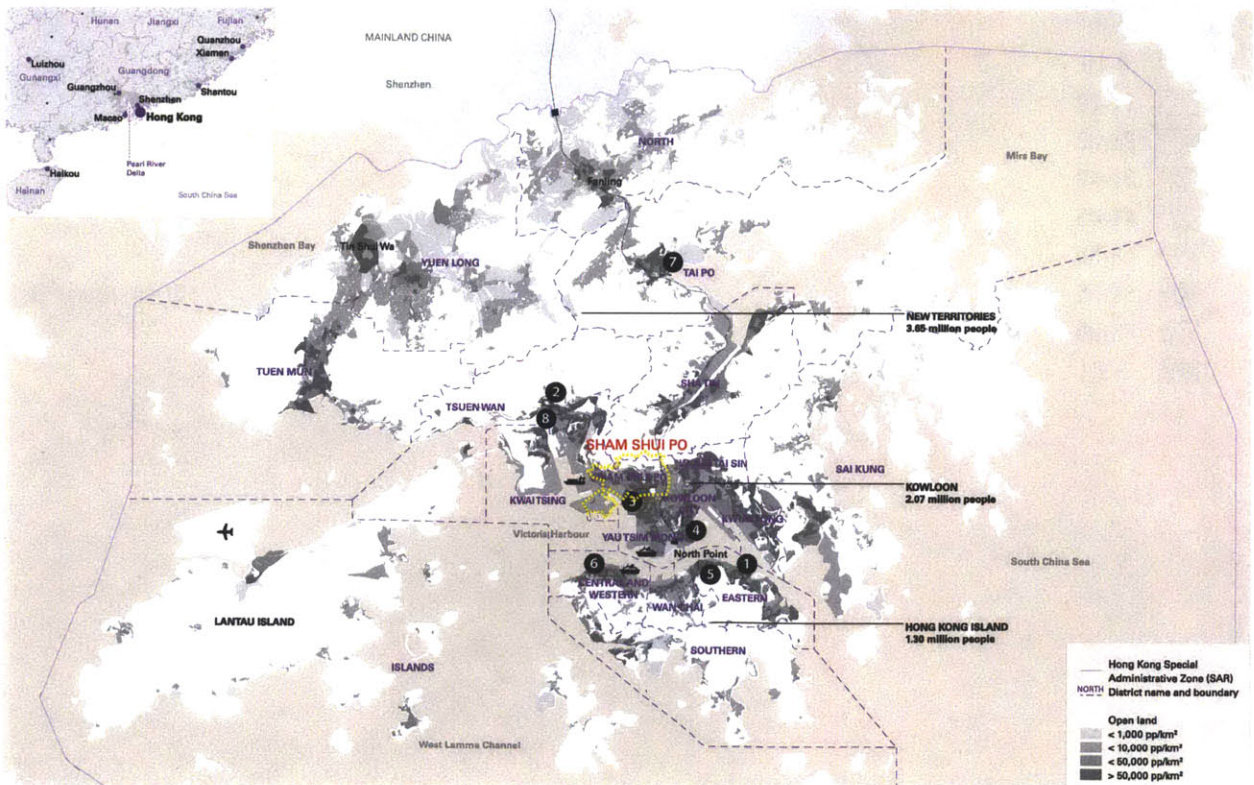
²³ Burdett, Ricky, Myfanwy Taylor, and Adam Kaasa. “Hong Kong’s Spatial DNA.” *Cities Health and Well-Being*. November 2011: 34. Web. 8 August 2012. p34

²⁴ Yip, Paul S. F. “Disconnection in a Highly Connected City.” *Cities Health and Well-Being*. p28



Source: www.urbanage.net

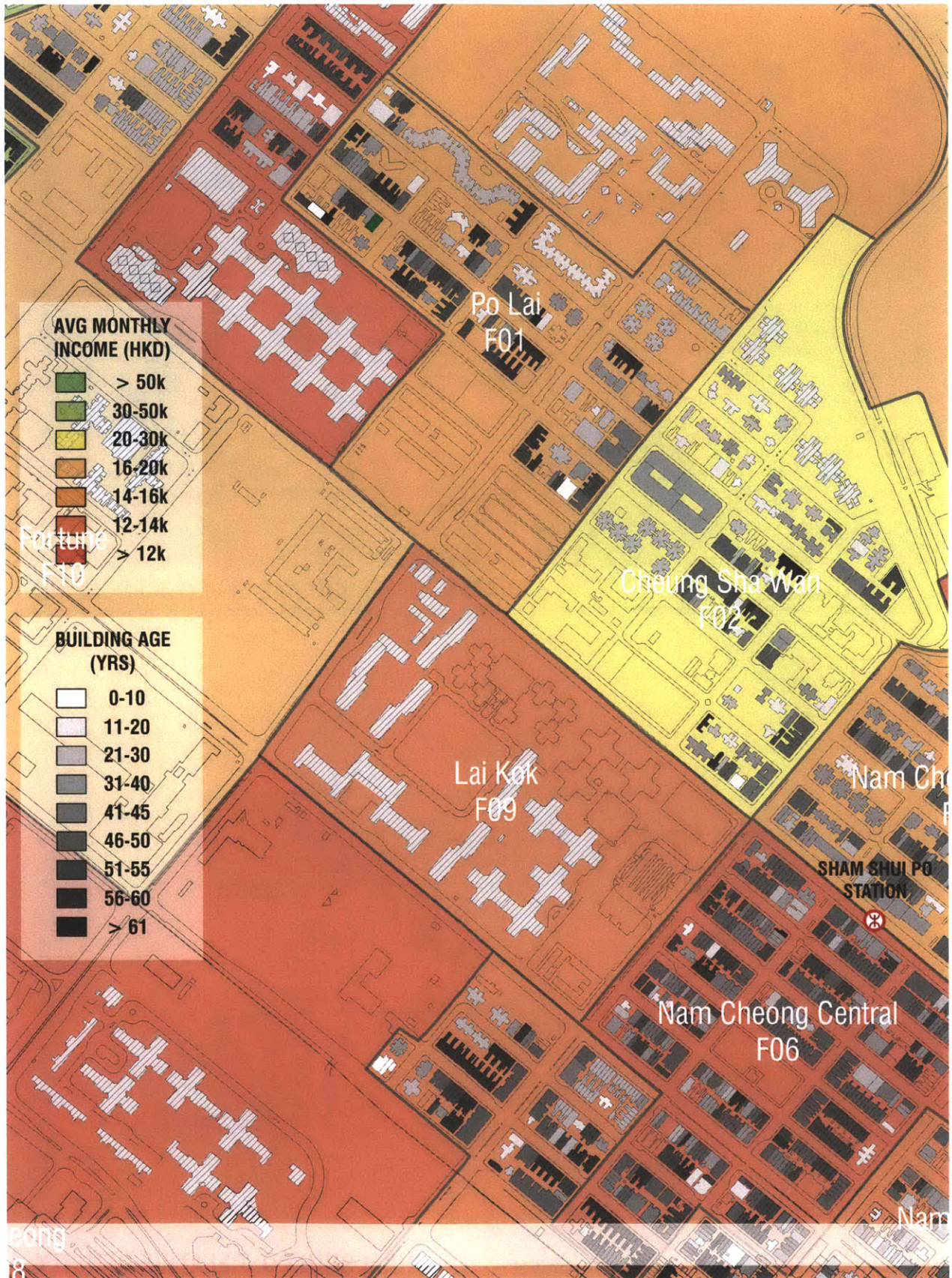
SHAM SHUI PO: INCOME LEVEL + LOCATION

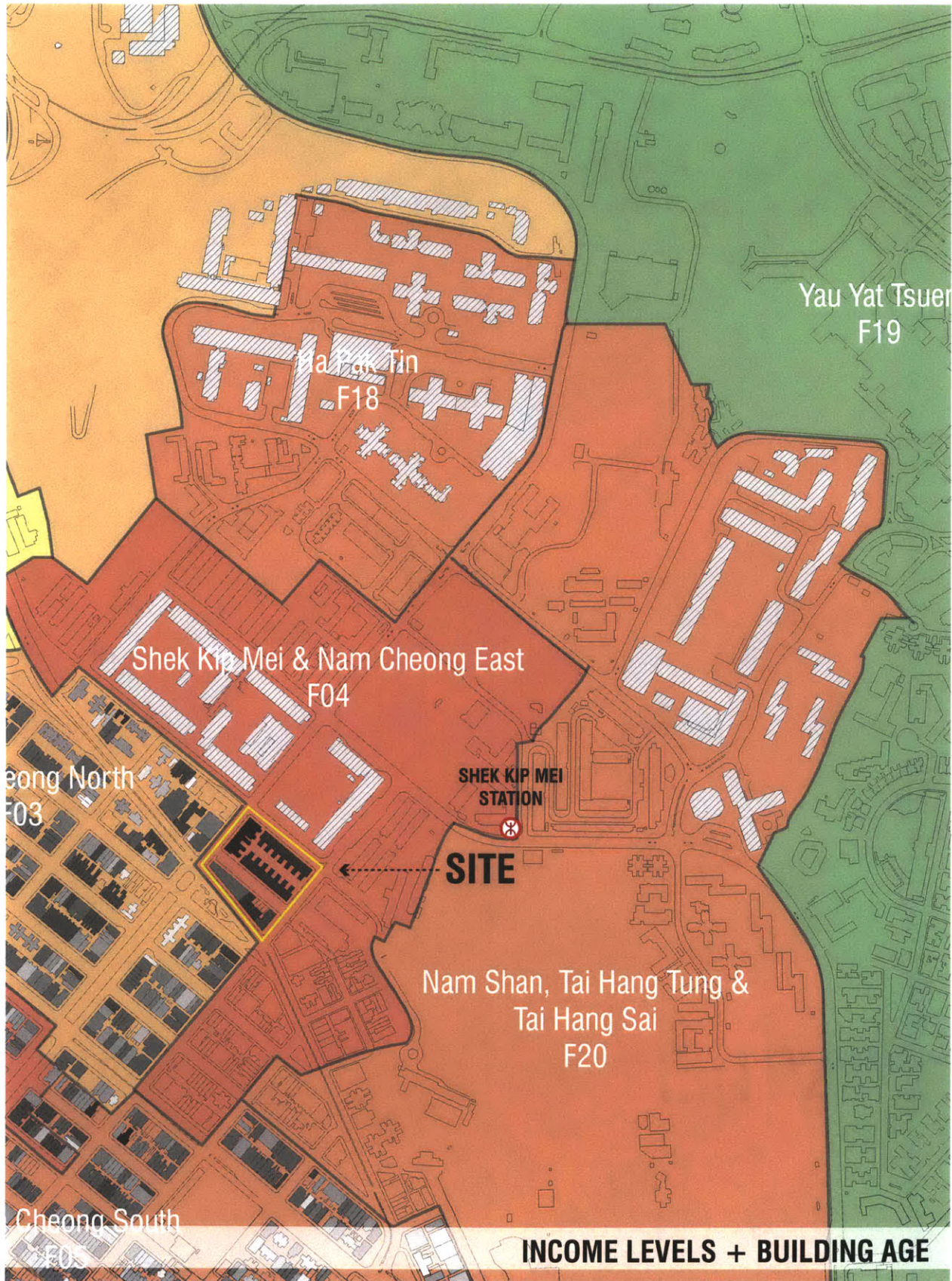


Source: www.urbanage.net

SHAM SHUI PO: RELATIVE DENSITY

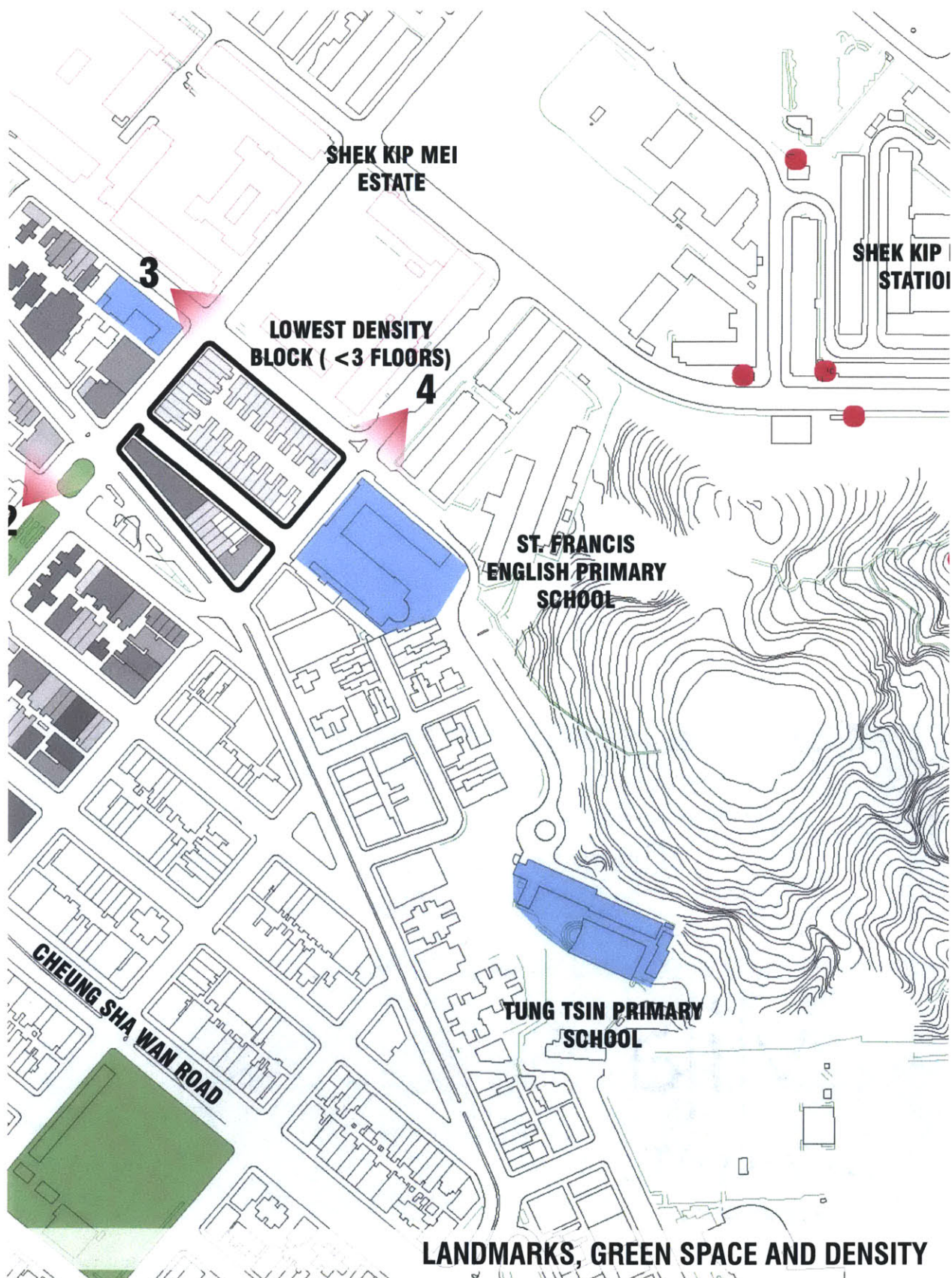
Source: Hong Kong Planning Department, Hong Kong Census and Statistics Department, University of Hong Kong



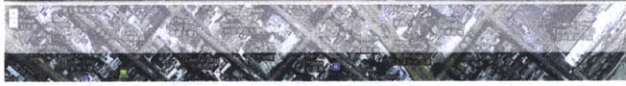
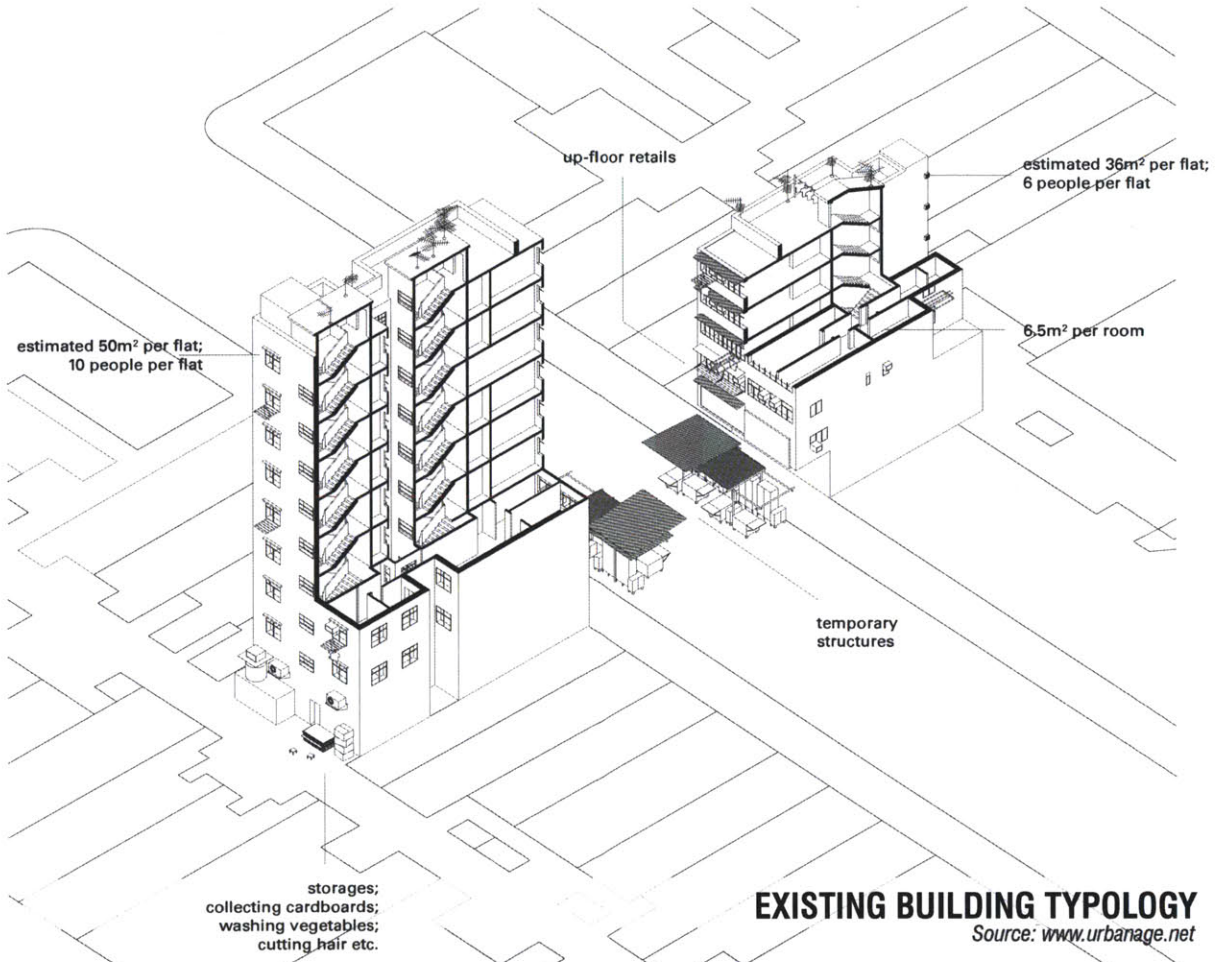


INCOME LEVELS + BUILDING AGE



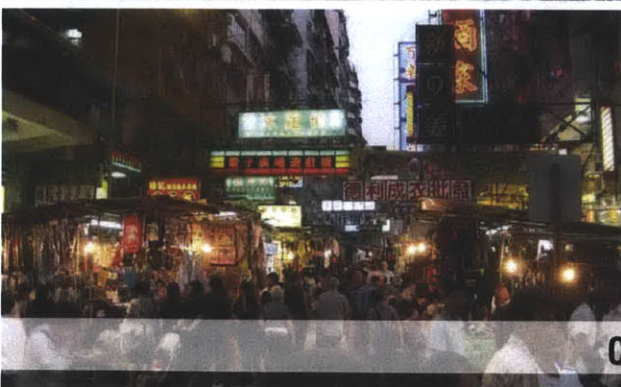


LANDMARKS, GREEN SPACE AND DENSITY





BLOCKS TO BE REDEVELOPED



CHEAP GOODS / MARKET STREETSCAPE

A Hidden Resource – Unused private space

The first step of creating the platform of proactive affordability involves activating a hidden resource – private space that is unoccupied at various times during the day. Singles flats, as opposed to family units, are often left empty during fixed hours of the day (fig. 1). This is especially relevant in Hong Kong, in consideration of the long working hours and vibrant urban setting that keeps singles out and about. Furthermore, even when occupied, the resident may desire the flat to serve a commercial rather than domestic function, much like the Hong Kong shop-house. **The design proposal seeks to enable the conversion this residual space into a variety revenue generating opportunities.**

Expanded Communal Space

Compared to nuclear families, single residents having a greater need for communal spaces and their associated activities. Limited unit size encourages the sharing of certain spaces and functions, such as kitchens, lounges, study areas and laundry. Furthermore, the provision of communal spaces encourages the formation of friendships, social groups, support networks and romantic relationships that are desirable for the lifestyle of a single resident. Additionally, this harmonizes with Hong Kong residents and their particular predisposition towards the concept of private space:

'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'²⁵

Cherry, an 18-year-old student living in Whampoa, said, 'it's like quarantining myself ... we do not bother each other even though we sit there next to each other ... no one can intrude'.²⁶

These personal accounts reveal the habit of making up for the lack of private space at home through the occupation of public space (fig. 2). **The design seeks to expand the proportion of communal space within the residence, allowing it to take on a wide array of shared functions.**

²⁵ Burdett, Ricky, Myfanwy Taylor, and Adam Kaasa. "Living at Density: Voices of Hong Kong Residents." *Cities Health and Well-Being*. November 2011: 44. Web. 8 August 2012. p44

²⁶ Burdett, Taylor, and Kaasa. "Living at Density: Voices of Hong Kong Residents." p44

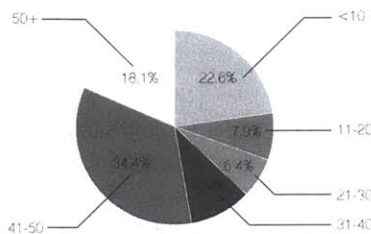
1. Unused Private Space

6 days

Hong Kong officially operates on a 6-day work week.

51.3 hrs

Average hours per week in Hong Kong, down from 55.2 in 2004



Source: A Study on Understanding Our Young Generation

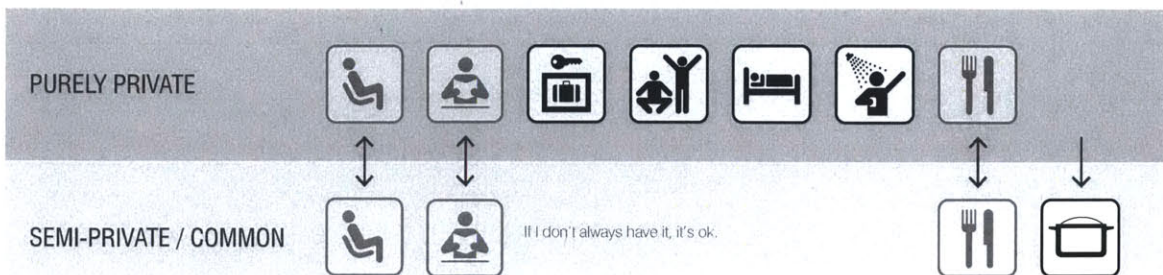


A Hidden Resource?

2. New Definition of Private Space



3. Redistributing Private Space



Youth + Elderly

The pairing of young and elderly singles within the same residential community is advantageous for a number of reasons. The single elderly residents have no family to look after them, and therefore may reach out to their younger neighbors to help them with more physically or technologically demanding tasks. Carrying heavy objects, mobility related issues, handiwork, and fixing the computer, are a few such possibilities. The young residents, on the other hand, are often busy and away from their homes. In return, the elderly may be able to offer convenience in terms of cooking, keeping an eye on things during the day, and voluntary matchmaking services, just to name a few. **The architecture creates mixed neighborhoods of the young and elderly, allowing them to help one another out (fig. 1).**

Shop + House – Viable Commercial Space Throughout

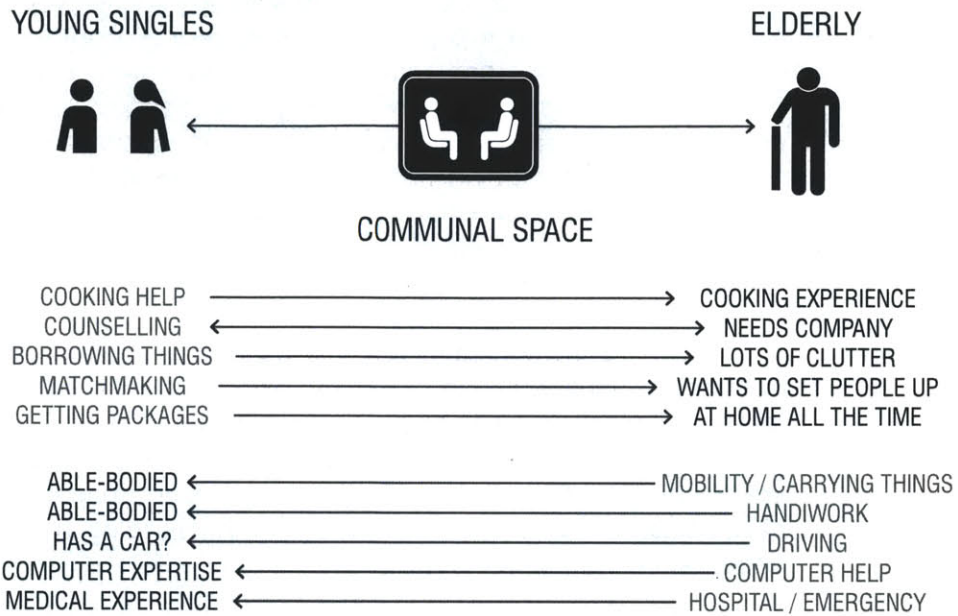
The “platform for proactive affordability” draws inspiration from the blurring of domestic and commercial space in the Hong Kong shop-house. Placing living and working opportunities in close proximity or even within the same space allows residents to take on opportunities for extra cash at their own doorstep and on their own terms. Bringing commercial viability into the upper reaches of the building also has the advantage of greatly reducing the cost burden of the space itself upon the resident (fig. 2).

Indeed the most substantial expense for a business in Hong Kong is not its employees’ wages but, in fact, ground rent, which can comprise up to 50 per cent of the total operating cost.”²⁷

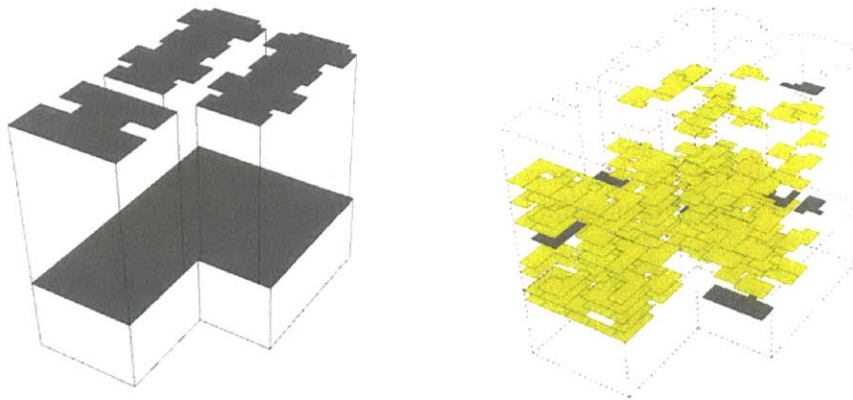
The challenge then is to create a viable environment for such small businesses and shops within a high-rise structure. **The building design creates a system of public circulation throughout the upper floors, and uses the clever arrangement of space to drive pedestrian flow.**

27 Shelton, Barrie. *The making of Hong Kong: From Vertical to Volumetric*. p59

1. Harmony Between Age Groups, Facilitated by Communal Space



2. Chunking Mansions - Massing and Retail Activity Diagrams



Source: *The Making of Hong Kong, From Vertical to Volumetric.*

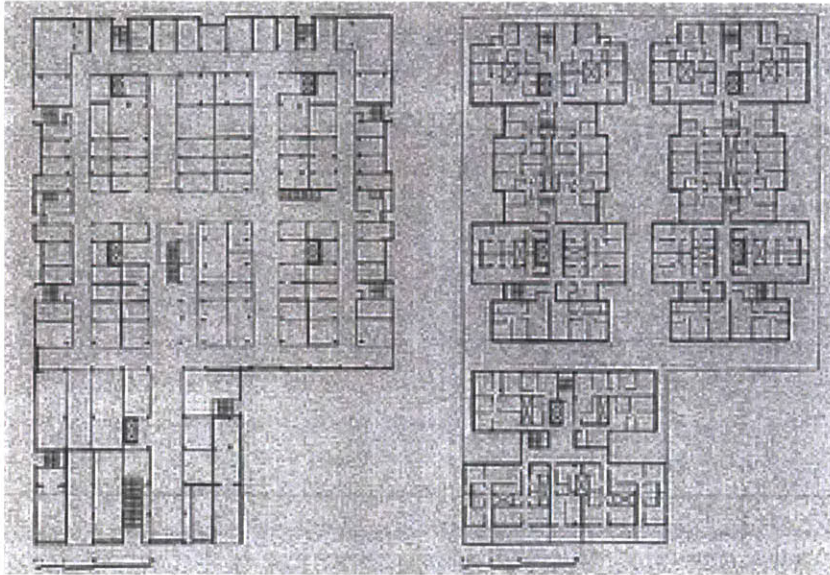
Building Management

The amalgamation of multiple uses throughout a high-rise building is made possible through effective building management. The author admits that this is not his area of specialty – however, it is important to recognize that this just as if not more important to the viability of this project as the architecture itself. Fortunately, Hong Kong has developed a robust industry of building management, in order to keep environments of such high population density up and running. Well-run building management has the ability to operate and to potentially enhance the vitality of such dense, multi-functional buildings environments. A famous example of one such arrangement is Chungking Mansions:

Chungking Mansions is a building located at 36-44 Nathan Road in Tsim Sha Tsui, Kowloon. From the exterior, it appears as a massive residential block rising up to 17 stories in height. The massing consists of a commercial podium below five “blocks” or towers of what seem like residential spaces. These towers are closely spaced and in some cases entirely fused together, rendering the building a truly massive appearance from street level.

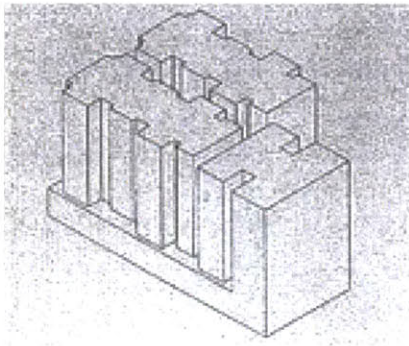
A pedestrian entering from the street would navigate through a multi-level mall consisting of rows of small shops and restaurants. Cheap trinkets, electronics, and clothing stores also dominate these lower levels. However, it is only a matter of time before hawkers and shop owners begin beckoning you to venture into the upper levels. Such individuals and advertisements are strategically placed close to the elevators, which whisk you into the upper levels. The upper levels are saturated with even more shops, restaurants and hotels, which have become very popular for backpackers and tourists seeking the cheapest accommodation in Hong Kong. Most of these commercial spaces are converted from what was initially designed as residential flats, and co-exist with private residences that still serve their original function. (fig 2, p49) The building as a whole negotiates a complex and fascinating set of relationships between this variety of users and uses across all levels. What are the critical factors that allow this type of building to grow and thrive?

The architecture of Chungking Mansions is decidedly unremarkable, with buildings of similar make throughout Hong Kong. What drives the vitality through the entire height of the building is in fact the tantalizing deals offered by the shops themselves, backed up by a well-run building management system. The building management in Chungking Mansions goes beyond collecting rent and taking out the trash. Among other things, the management must allow for the informality and flexibility of commercial space while preventing illegal and unsafe activities from occurring within the premises. Over 200 security cameras are installed throughout the building, presumably to serve this purpose.



Chunking Mansions - Podium and Tower Plans

Source: www.douban.com



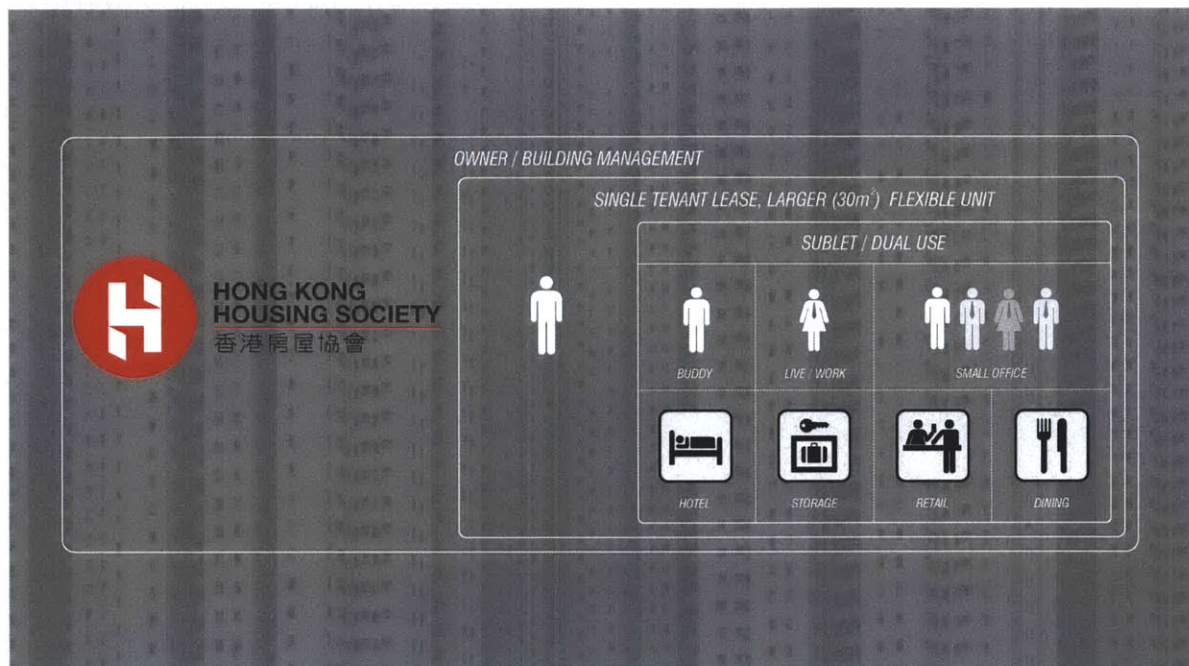
This thesis assumes the presence of an effective and comprehensive management solution that helps to ensure livability and commercial viability across the building. This will provide a robust framework within which a lifestyle of proactive affordability may occur, in combination with the architecture purpose-built for this kind of intense mixed use.

Hong Kong Housing Society

The Hong Kong Housing Society is known for its various experiments in affordable housing. Such projects and their successes and failures often inform the design of larger projects executed by the Housing Authority.

This thesis seems to fit within the scope of such an experimental housing project. The Housing Society normally receives a partial land subsidy from the government, while the rest of the project must be financially self-sustaining. Due to the innovative nature of this project and its market-rate basis, it may be a viable undertaking for the Housing Society within this financial framework. Other possibilities include public private partnerships between the society and private developers. The author is interested in engaging Hong Kong Housing Society and discussing the possibilities for affordable singles housing in Hong Kong as a potential future trajectory

LEASING MODEL DIAGRAM



EXAMPLES OF EXPERIMENTAL HKHS PROJECTS - ELDERLY HOUSING

Two photographs show modern high-rise apartment buildings designed for elderly housing. The left photo shows a building with a curved facade, and the right photo shows a taller building with a more traditional facade. Both are surrounded by other urban buildings.

Source: www.hkhs.com

Source: www.hkhs.com

- 5/F - 26/F (14/F & 24/F omitted)**
Senior Citizen Residences (SEN) units
- 3/F**
 - ▶ Fitness Room
 - ▶ Podium Garden
 - ▶ Indoor Swimming Pool
 - ▶ Hydropool
- 2/F**
 - ▶ Residential Care Home for the Elderly
 - ▶ Courtyard
- 1/F**
 - ▶ Main Library
 - ▶ Hobby Rooms
 - ▶ Grooming
 - ▶ Polyclinic / Nurse Centre
- G/F**
 - ▶ Multi-purpose Hall / Restaurant
 - ▶ Coffee Bar / Convenient Store
- B1-B4**
Car Park / Laundry

Design

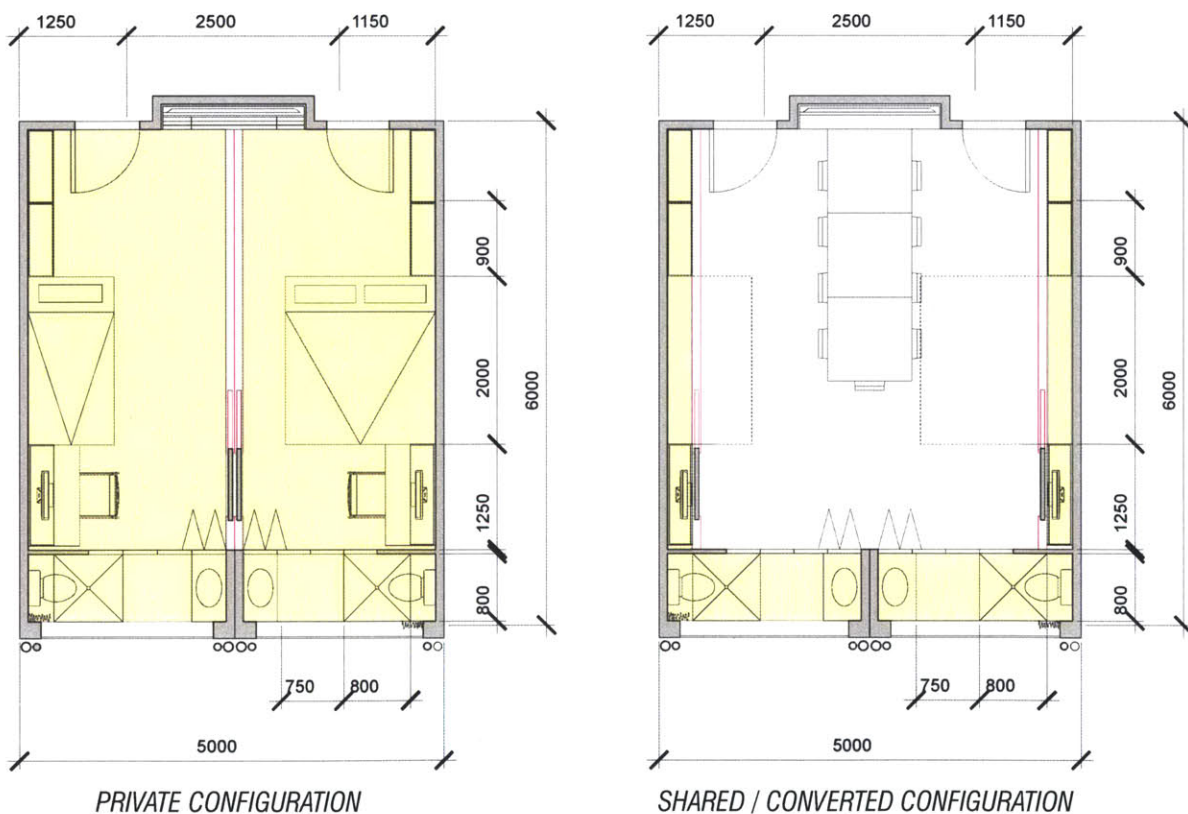
Sequence of Drawings

The following design is the manifestation of the previous strategies within the confines of the Sham Shui Po site. The sequence of drawings will show how these concepts take physical form, beginning at the unit level, then the communal cluster, and finally at the urban scale. Next, the circulation and programmatic diagrams show how these three scales work in concert to make possible the “platform of proactive affordability.” Finally, the renderings will show the structure in its occupied state, as envisioned by the author.

Unit Design

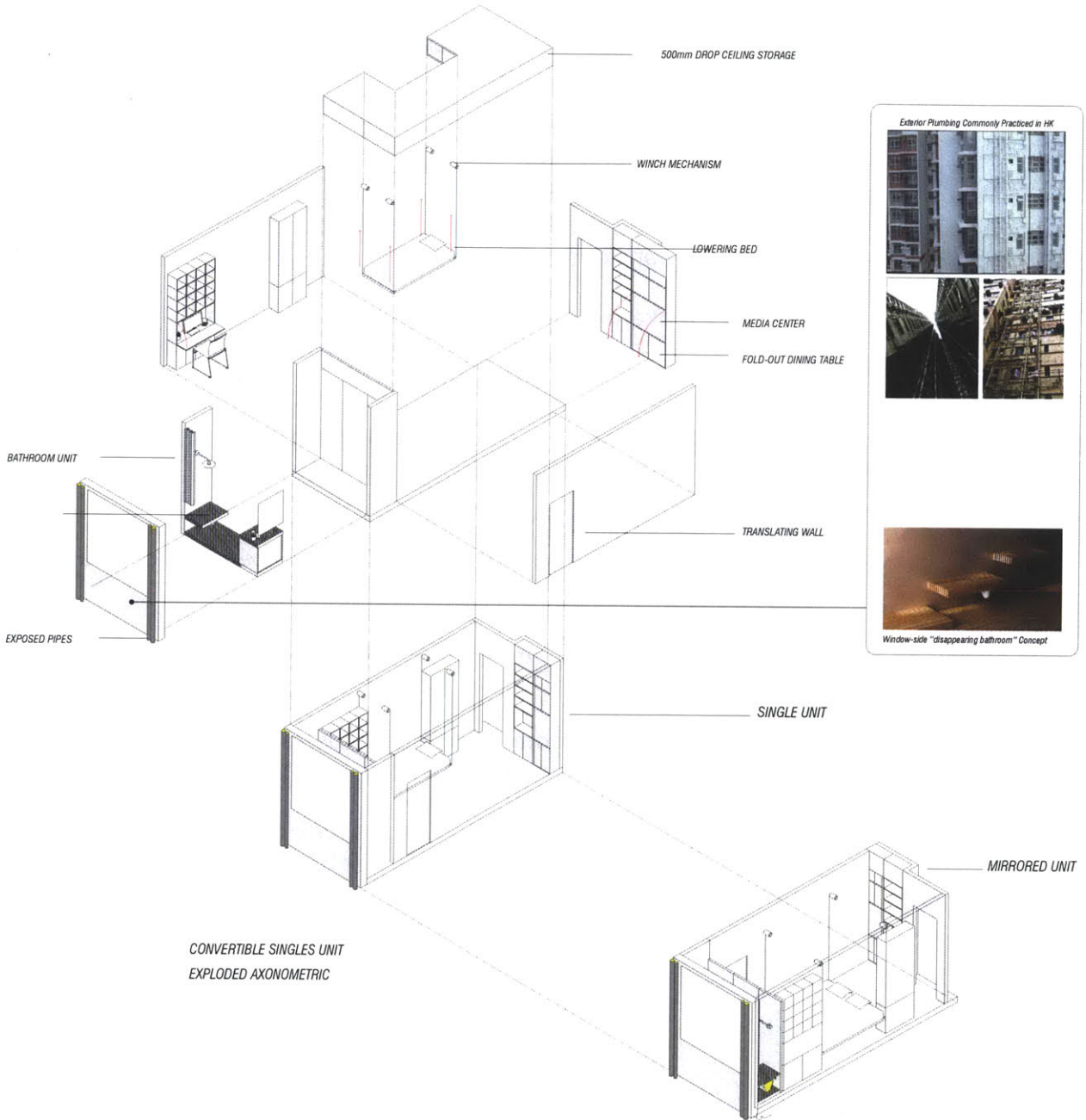
The design of the unit is based on the concept of temporarily “converting” private space into other uses at the will of the tenant. This allows the activation of the “hidden resource” - unused private space during certain times of day. As shown in the plans below, using a simple translating wall system, the private space (yellow) can be “packed” into a thin sliver around the perimeter. In doing so, this frees up a larger combined shared space between the two smaller units. At the very basic level, this can act as a living room shared by the two tenants.

Also, note that the bathrooms are located on the outside wall of the unit. This is required by Hong Kong building code, as to provide natural ventilation, and also for easy maintenance of the pipes (the temperature never dips below freezing in Hong Kong). Doing so frees up the wall facing the internal corridor and increases the spaciousness of the units.



30m² YOUNG SINGLES UNIT PLAN

UNIT EXPLODED AXONOMETRIC



Unit Components

From left to right, top to bottom:

15m² Transformable Bedroom: The 30m² unit is split into two 15m bedrooms, which can function independently with their own entry, storage, desk, bathroom, etc. The 6m depth allows for an higher net to gross ratio. Any thinner than 2.5m and it begins to feel like living in a hallway.

Window-side Bathroom: In Hong Kong, the pipes never freeze and much of the housing places kitchens and bathrooms on the window side, for ventilation maintenance. This considerably frees up the entry area for the transformable room.

500mm Thickened Ceiling: Items that are not used very often are stored in a thickened ceiling. Items that experience daily use are stored in cubby walls, closets and shelves.

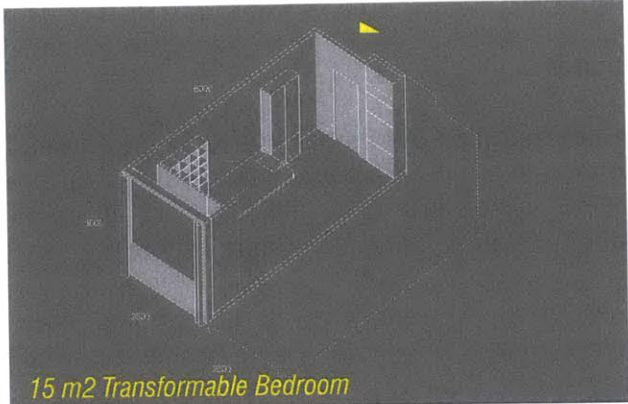
Disappearing Bed: Winches in the ceiling are attached to the four corners of the bed, allowing it to be raised into the ceiling

Raised Bed / Cleared Floor: With the bed (with or without rumpled sheets) is fully raised and the desk folded, the open floor can be used for exercise...

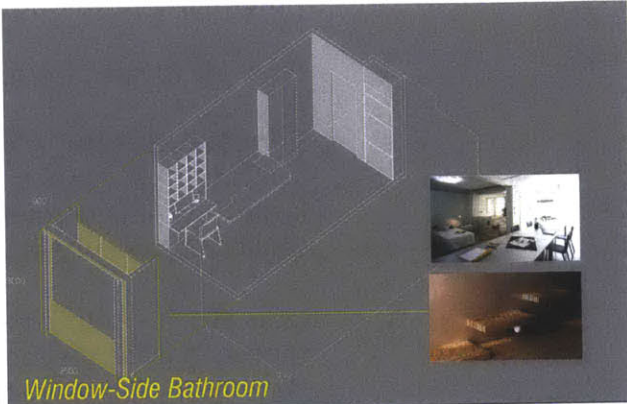
Translating Wall System: The two rooms are divided by two separate translating walls.

Combined Living Room: With the beds raised, the walls can be pushed back to create a larger communal living room.

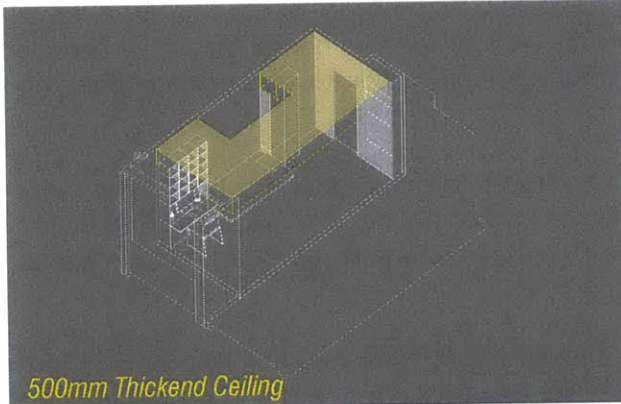
Fold-out Dining Table: Providing some form of a simple folding table allows the shared space to take on a variety of different functions.



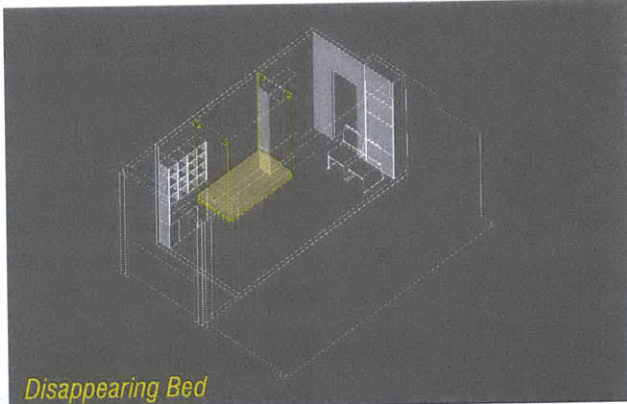
15 m2 Transformable Bedroom



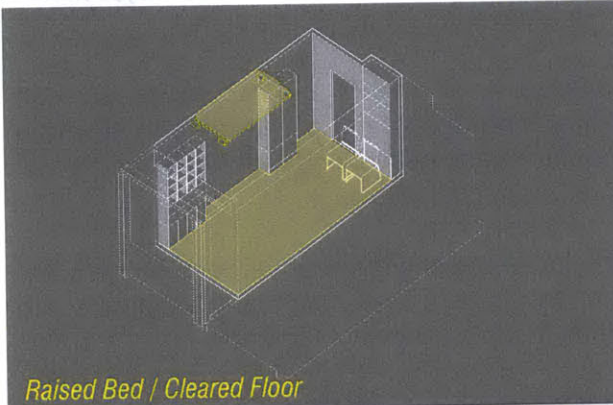
Window-Side Bathroom



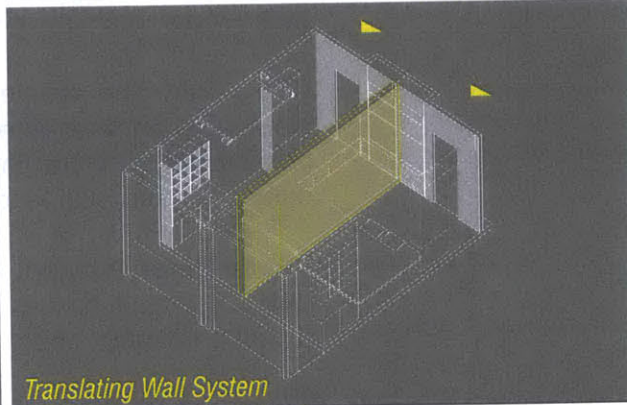
500mm Thickend Ceiling



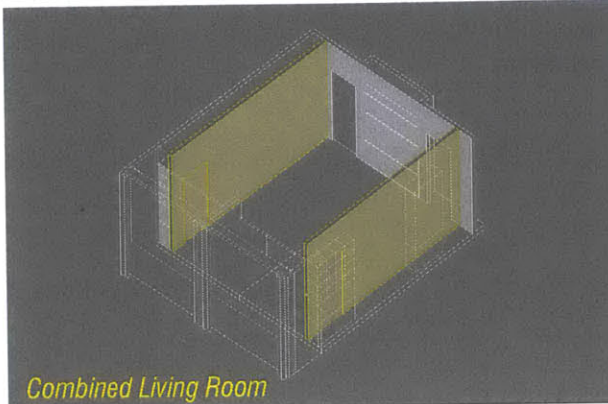
Disappearing Bed



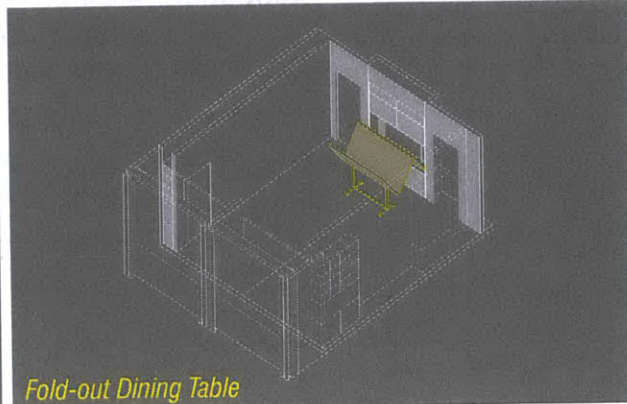
Raised Bed / Cleared Floor



Translating Wall System



Combined Living Room



Fold-out Dining Table

Potential Unit Configurations

From left to right, top to bottom:

Entertain Guests: This configuration allows the space to be entirely converted into a public zone, with all your personal mess stashed away. Invite your friends over! This is normally quite difficult to do in most small (and sometimes rather cluttered) Hong Kong apartments.

Live Work Coupling: Residents who work away from home may choose to lease the room out at a premium to live/work roommate, who may occupy the entire room during the day.

Small Office: If both tenants work away from home, they may choose to rent the space out to small startups or individuals seeking cheap office space.

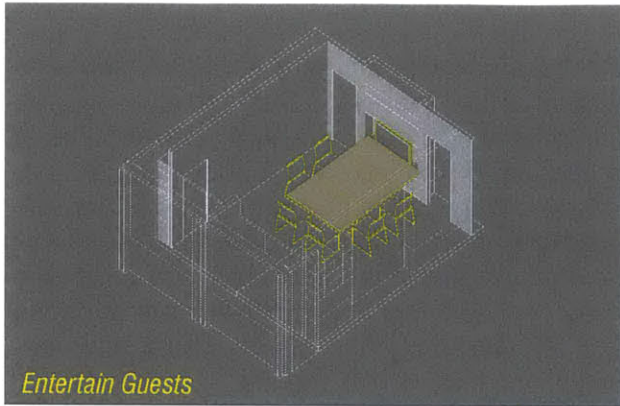
Small Shop: A tenant who wants to make an extra buck after work can advertise his cheap wares on the ground floor (after all, this is what Sham Shui Po is known for!) and bring tenants up to inspect his wares stashed in his room.

Cheap Hotel: Much like Chung King Mansion, tenants who want to rent their units out to deal-seeking backpackers and the like may convert their rooms to anything from a daybed to a full 30m² suite.

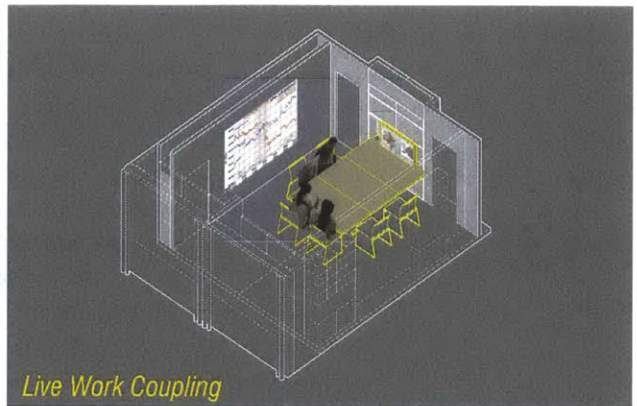
KTV / Bar: The simple availability of a table and AC equipment can allow a tenant interested in mixing drinks and bar tending to create a small scale bar in his home after work, networking with hotels and small offices in nearby units for potential customers.

Cheap Diner: A tenant who loves cooking may convert one of the bathrooms into a kitchen and moonlight as a chef, converting the space into a cheap sit-down of delicious foods for those in the know.

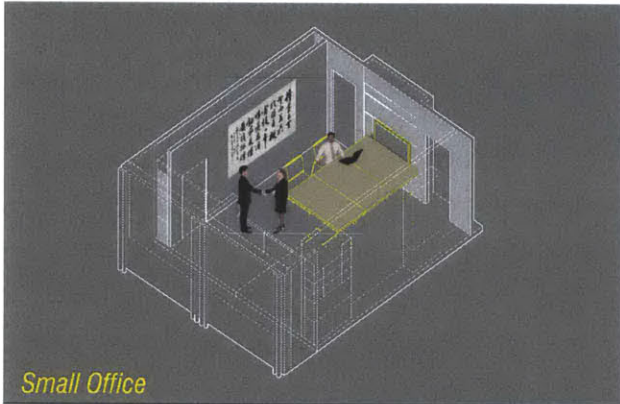
Acupuncture Clinic: Small double nicely as private clinics during the day. Office workers, live-work tenants and shoppers alike may want to drop by for treatment or relaxation.



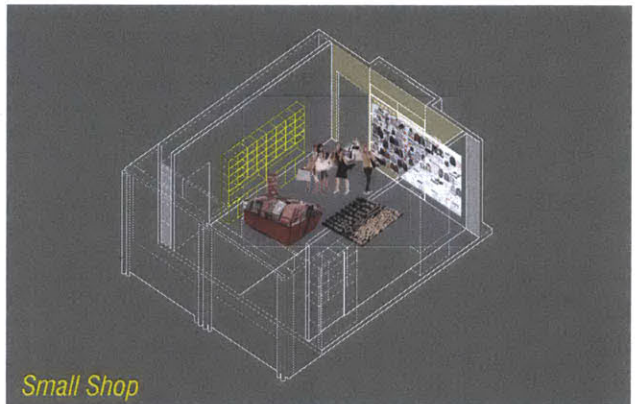
Entertain Guests



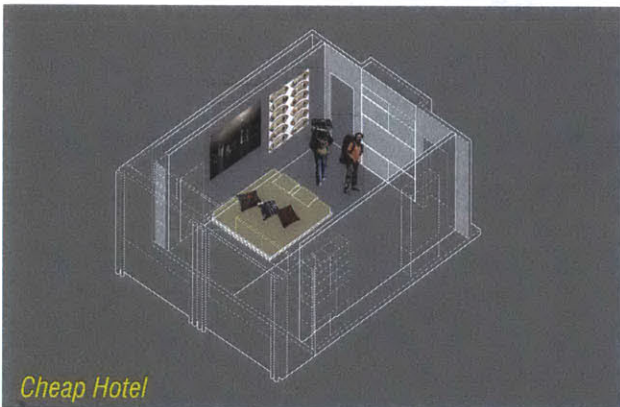
Live Work Coupling



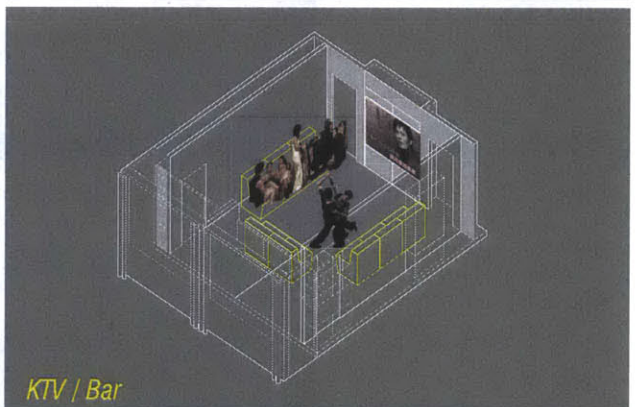
Small Office



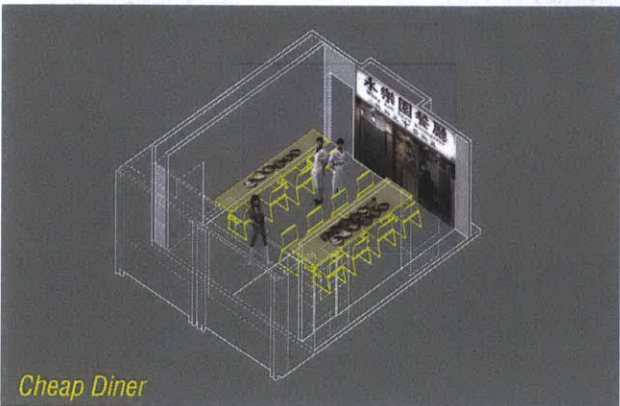
Small Shop



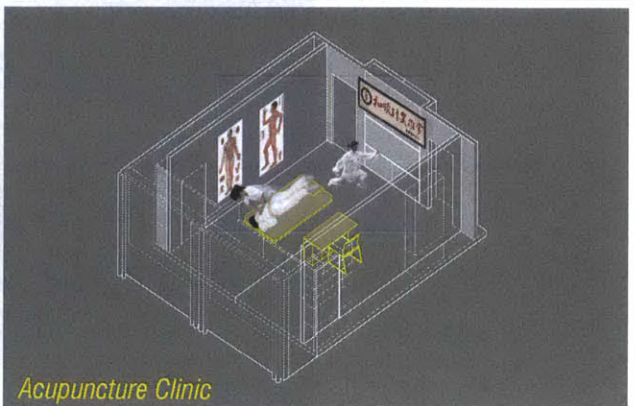
Cheap Hotel



KTV / Bar



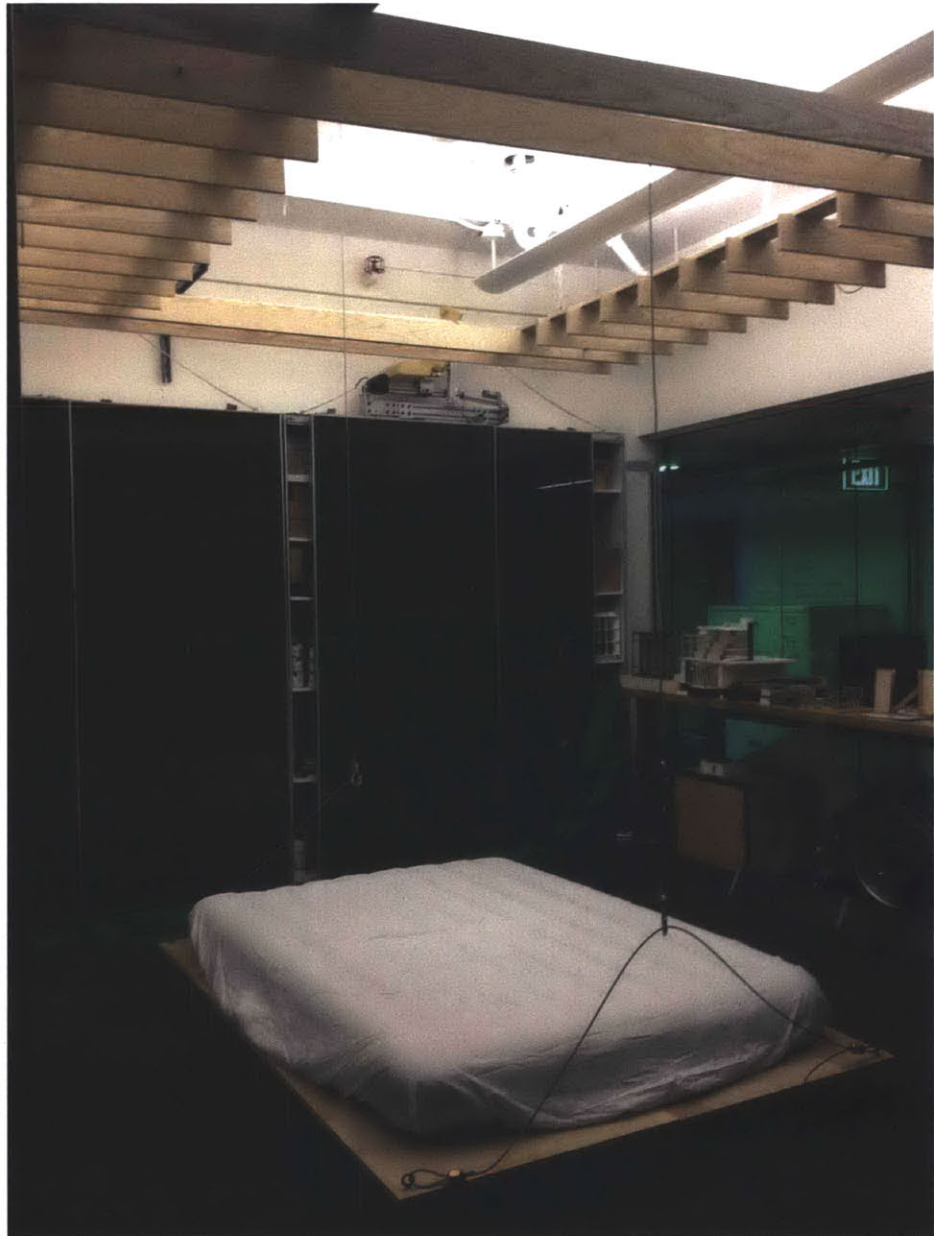
Cheap Diner

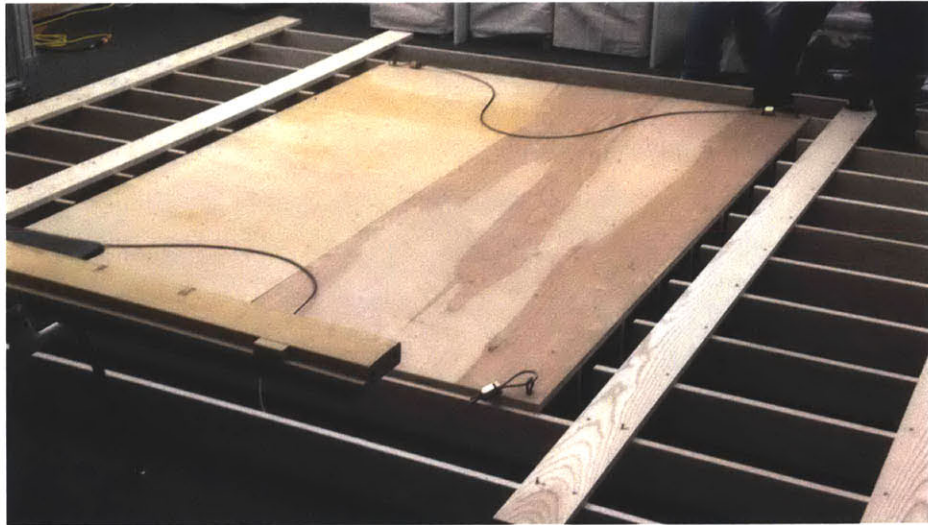
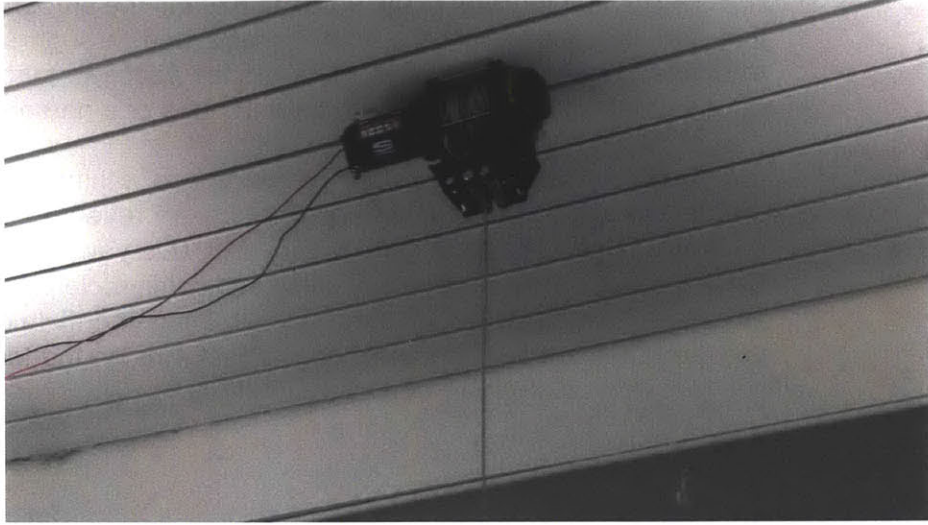


Acupuncture Clinic

1:1 Unit Prototype

Simply drawing the transformable unit in a series of diagrams made it seem too easy. As part of the Mobility On Demand class offered by Kent Larson, the cityhome team was able to build a 1:1 prototype of the drop ceiling, lowering bed and dining table in the medialab. A special thanks goes out to Tyrone Yang, Carlos Olabarri, David Rose, Siliang Fu, George Samartzopolous, Yuki Minoda, and Serena Tan in this effort. While the winches were creakier than expected, the prototype was an effective proof of concept showing how multiple work surfaces could be consolidated into one assembly and made available on-demand, transforming a small space into various modes.



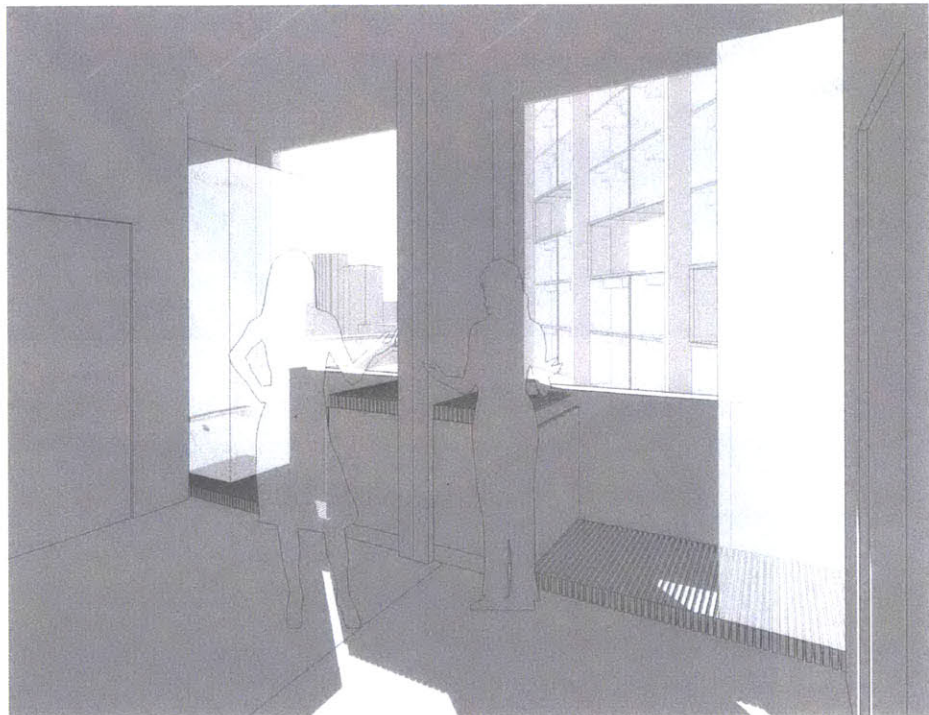


Unit Design Summary

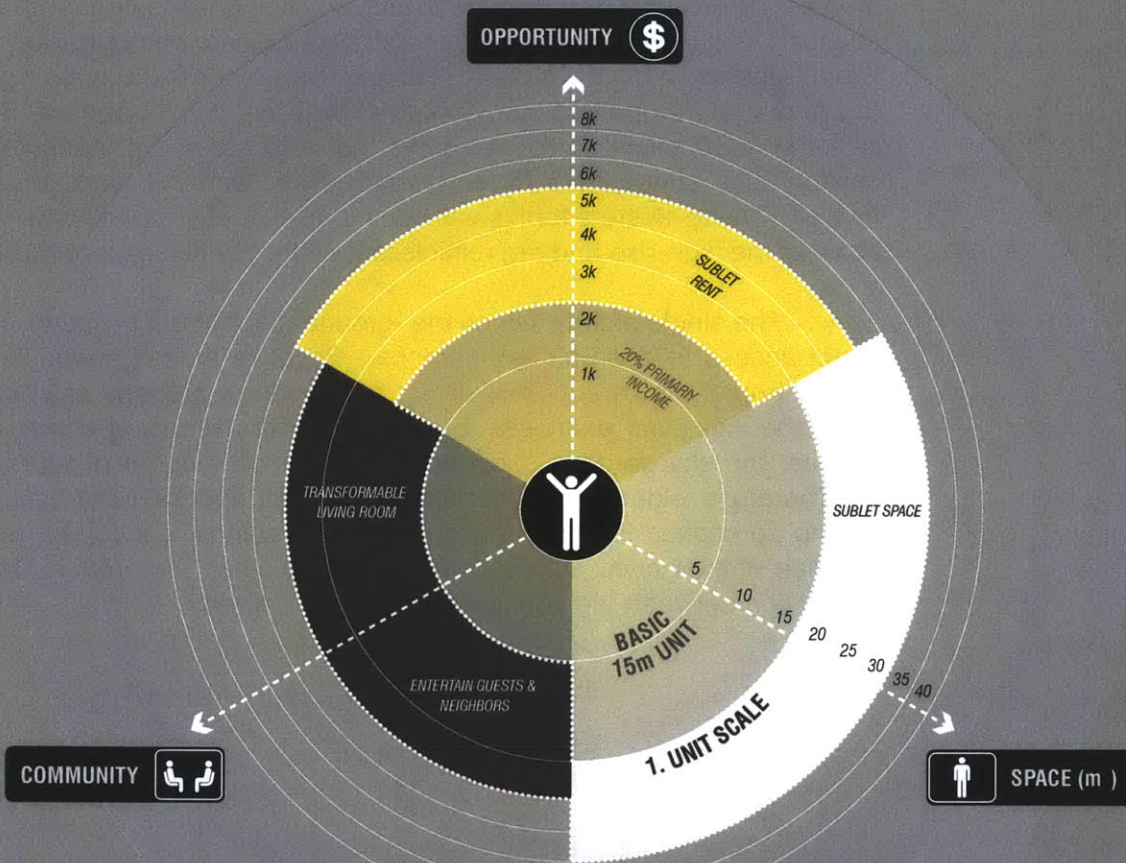
The first function of the unit is to expand the amount of activities that can take place within a small 15m² space through simple transformable systems. Such systems allow the space to take on multiple “modes,” taking advantage of the flexibility of a one-person household.

By activating the unused private space within the singles unit, the design allows the tenant to generate extra revenue to pay for the relatively large (15m² per person) space. This can be done through various modes of short-term subletting and commercial activities, which all can be facilitated through the building management. In doing so, the unit becomes a small economic engine that runs on the tenant’s ambition for living comfortably and affordably.

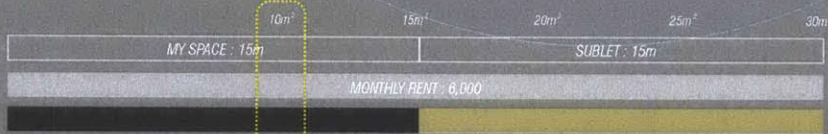
UNIT INTERIOR RENDERING



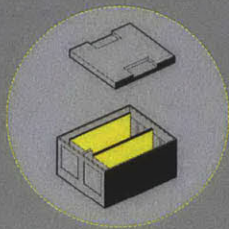
LIVABILITY AND AFFORDABILITY DIAGRAM - SCALE 1



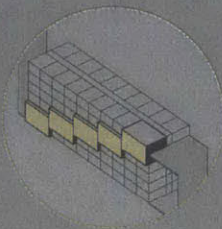
AFFORDABILITY WINDOW



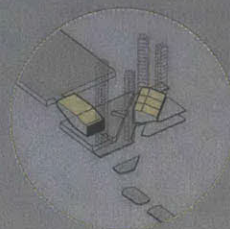
UNIT



CLUSTER



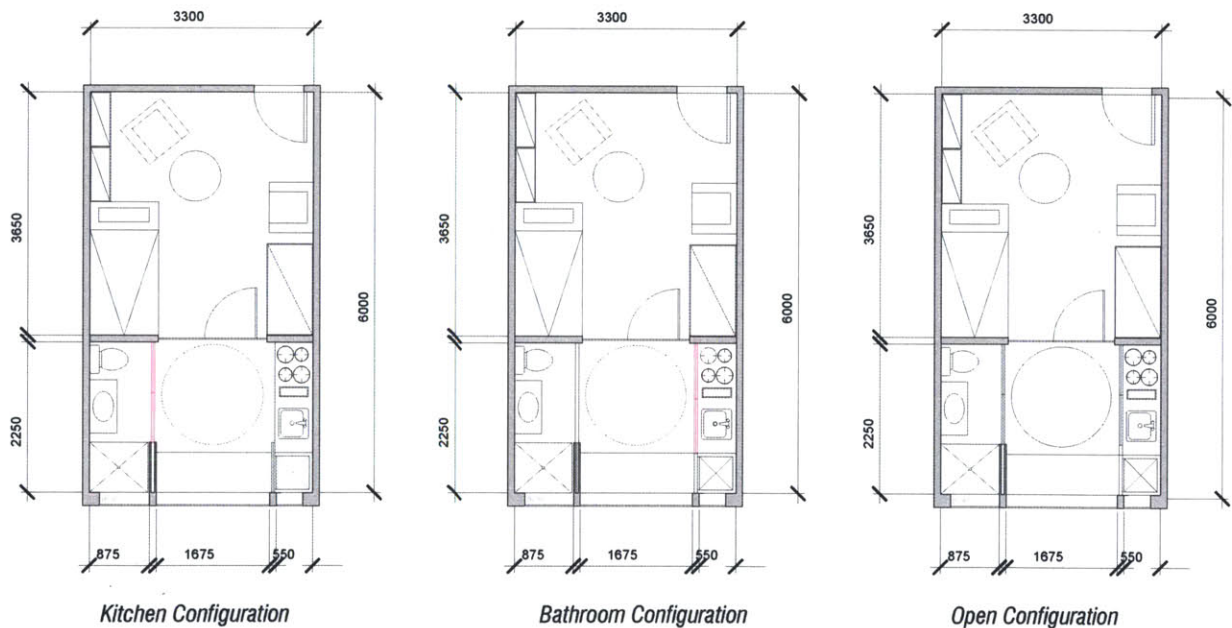
URBAN



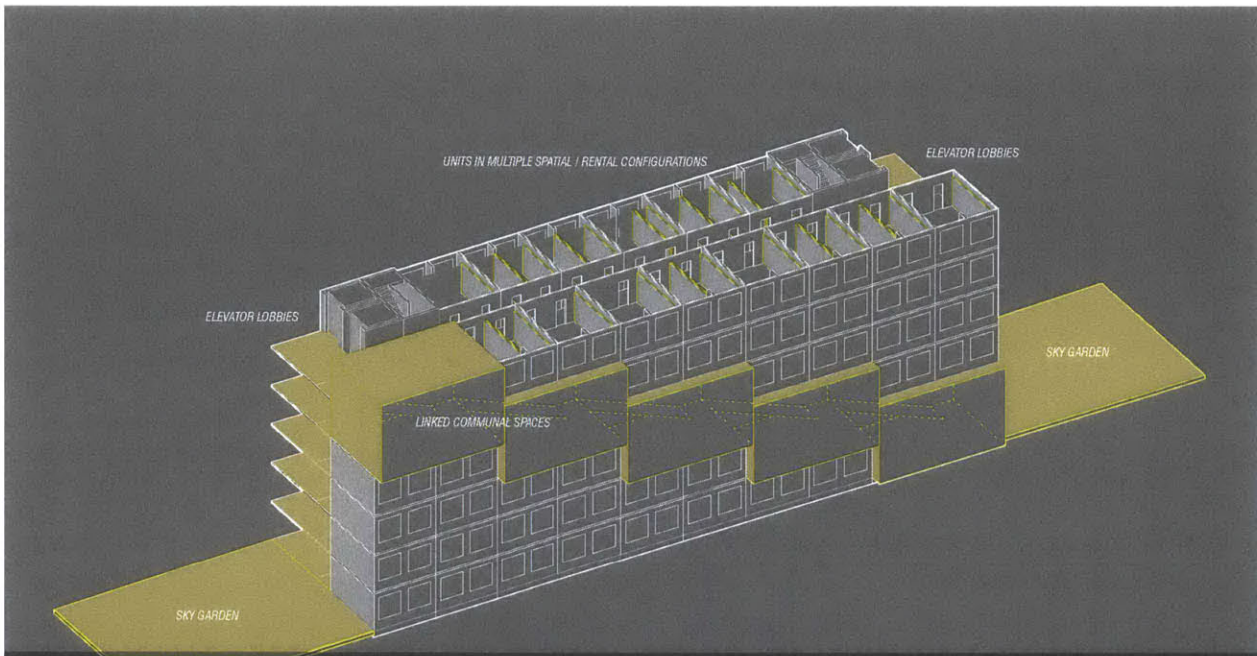
Cascading Communal Cluster Design

The transformable 30m² units are aggregated into 5-story “communal clusters” that are linked through a set of cascading communal spaces. The linking of adjacent floors encourages communication between tenants within the cluster, instead of being confined to their relative floors, while opening up the internal hallways to light and air. This is not only beneficial to the residents, but also creates a friendly and collaborative atmosphere for small businesses and live-work tenants as well. These clusters form small communities that breaking down the scale of the high-rise and are reminiscent of the traditional shop-house.

The single elderly live on the “ground” floor of each cluster, with direct access to open-air sky gardens. Because elderly spend more time at home, they are more likely to use these sky gardens as spaces for gatherings, and exercise. Book-ending the cascading communal spaces, the sky gardens experience a generous amount of foot traffic. Therefore, elderly may even use these very accessible spaces for setting up cooked food stalls and newspaper stands, generating extra revenue of their own. The connectivity to the other floors encourages interaction between the young singles and the elderly.

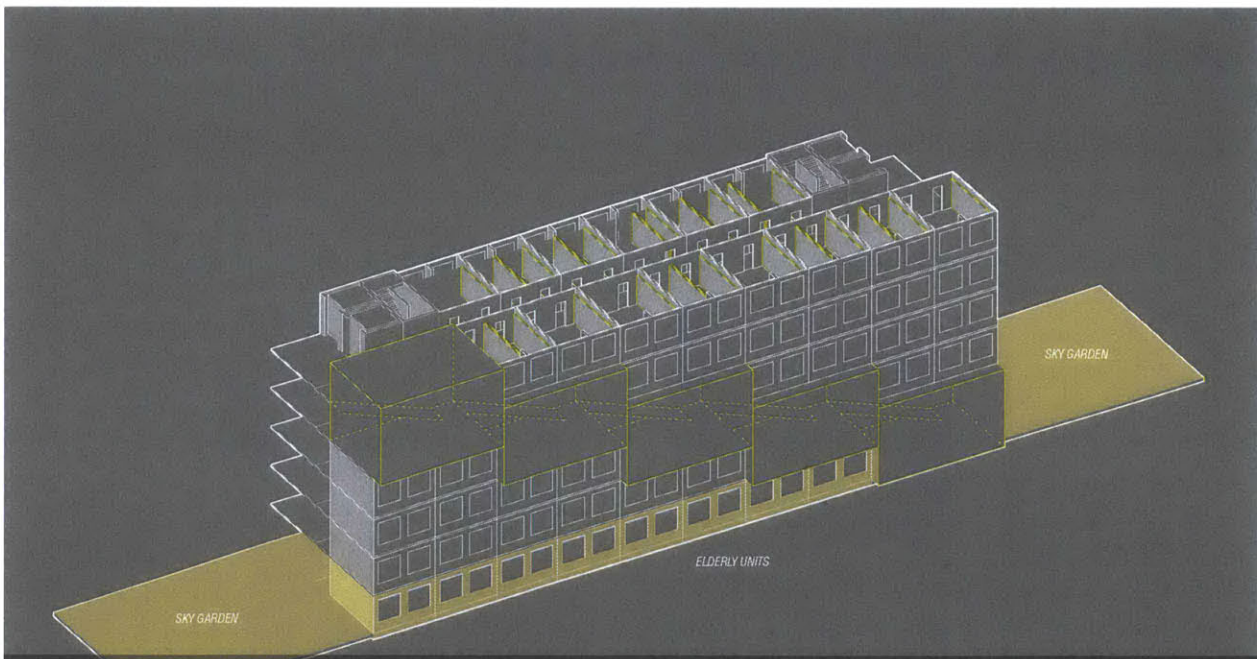


Elderly Unit Plans



Shop-House Cluster

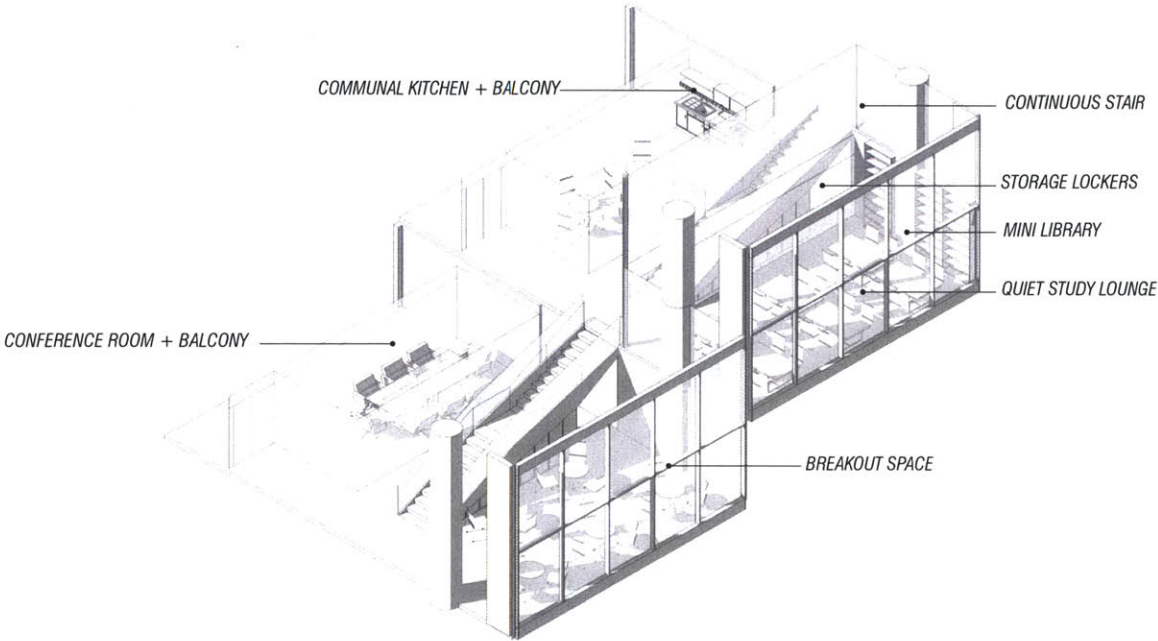
The series of communal spaces link together adjacent floors and down to a sky garden creating a 5 storey "community cluster" within the larger building.



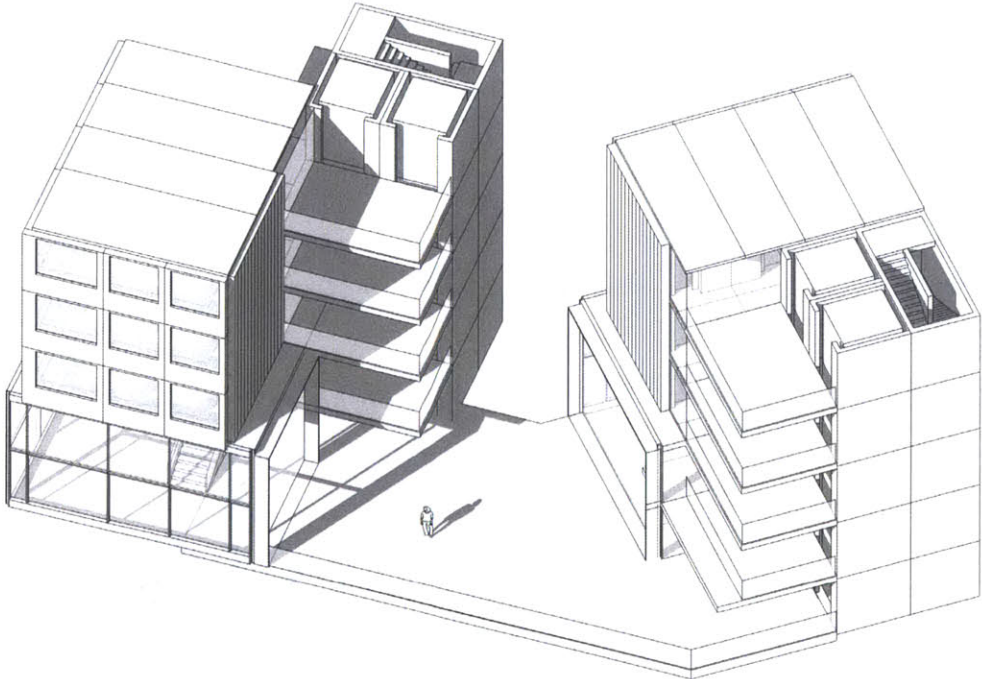
Elderly Units

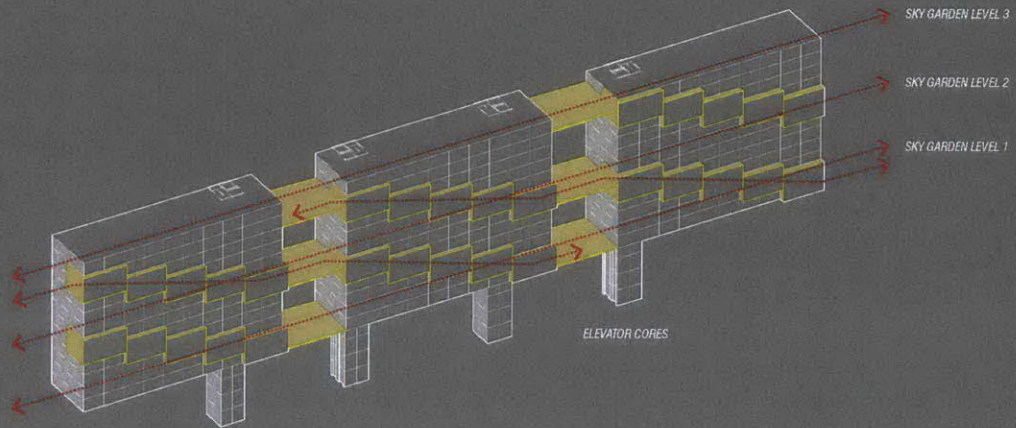
Units for the displaced elderly are situated on the sky garden levels.

CASCADING COMMUNAL SPACES LINKING ADJACENT FLOORS



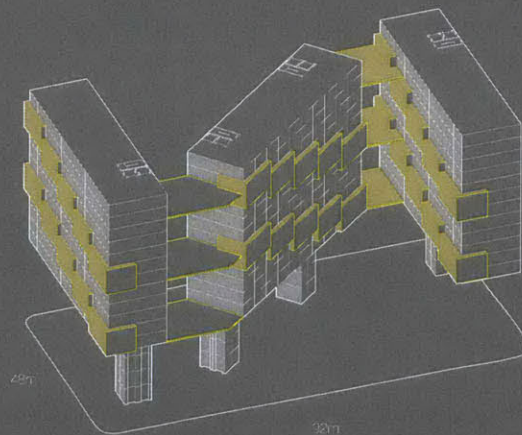
SKY GARDENS BRIDGING "COMMUNAL CLUSTERS" BETWEEN SLABS





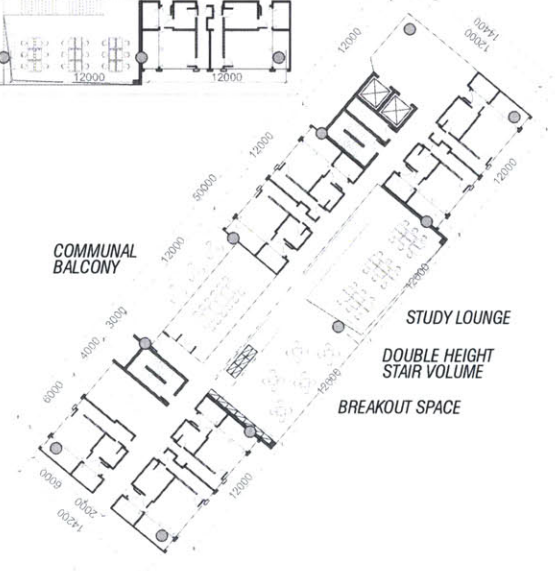
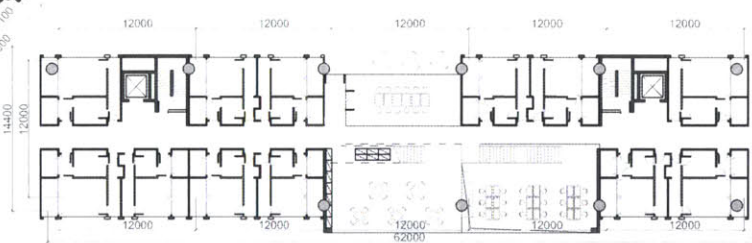
Linked Slabs

Linking the communal clusters to adjacent slabs via sky gardens creates continuous horizontal as well as diagonal streets within the building.



Fold onto site - typical Sham Shui Po Block

By folding the 12-story linked slabs onto a typical sham shui po block, the building achieves a residential FAR of 6.7 (Maximum is 7.5), with 500 units housing roughly 1,000 residents.



TYPICAL YOUNG SINGLES FLOOR PLAN

1:250



UNITS: 40

TENANTS: 80

TOTAL AREA: 2459m²

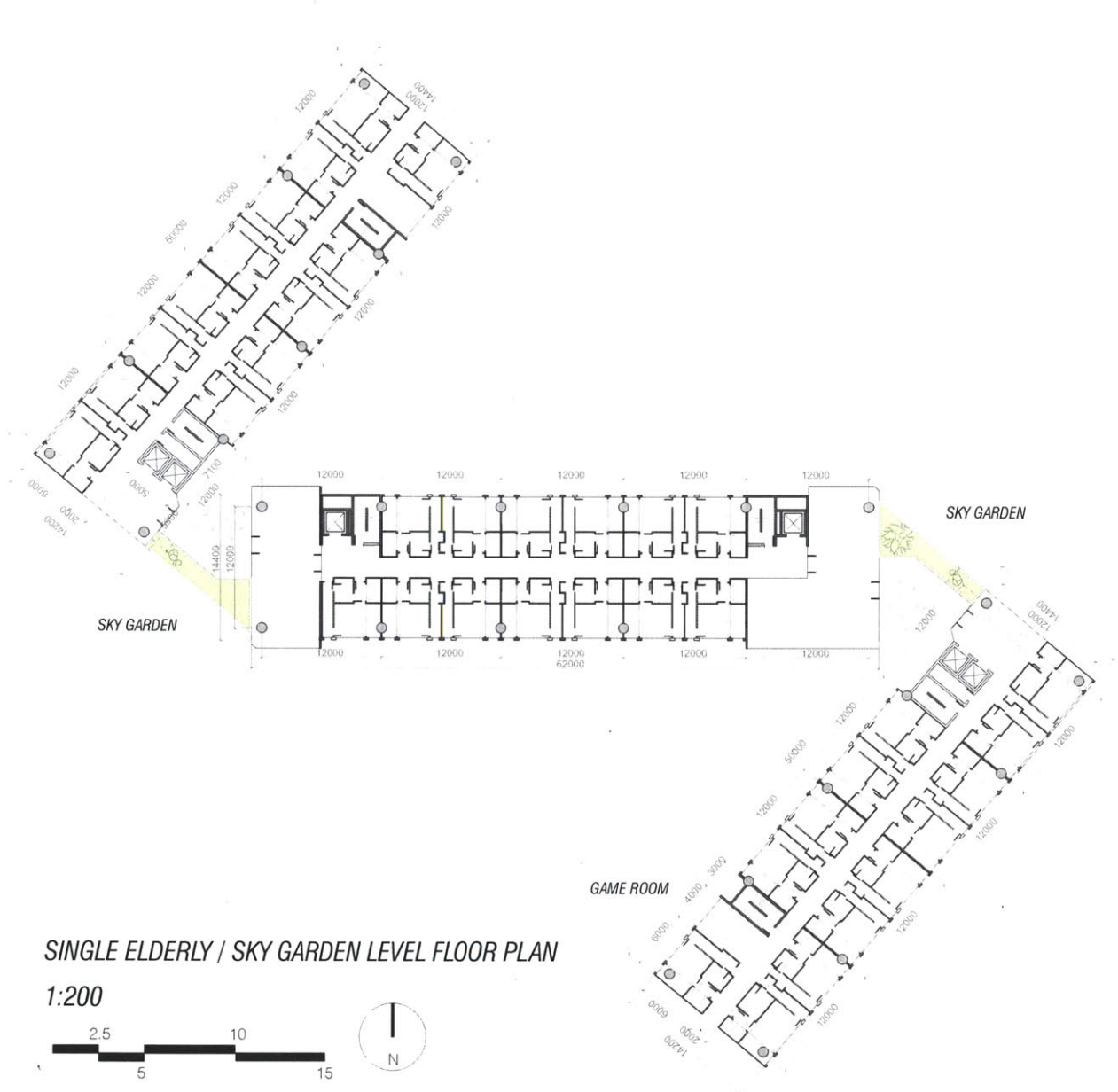
COMMUNAL SPACES: 474m²

COMMUNAL SPACE PER PERSON: 6m²

CIRCULATION: 703m²

EFFICIENCY: 71.4%

GROSS: 31m² per person



SINGLE ELDERLY / SKY GARDEN LEVEL FLOOR PLAN

1:200



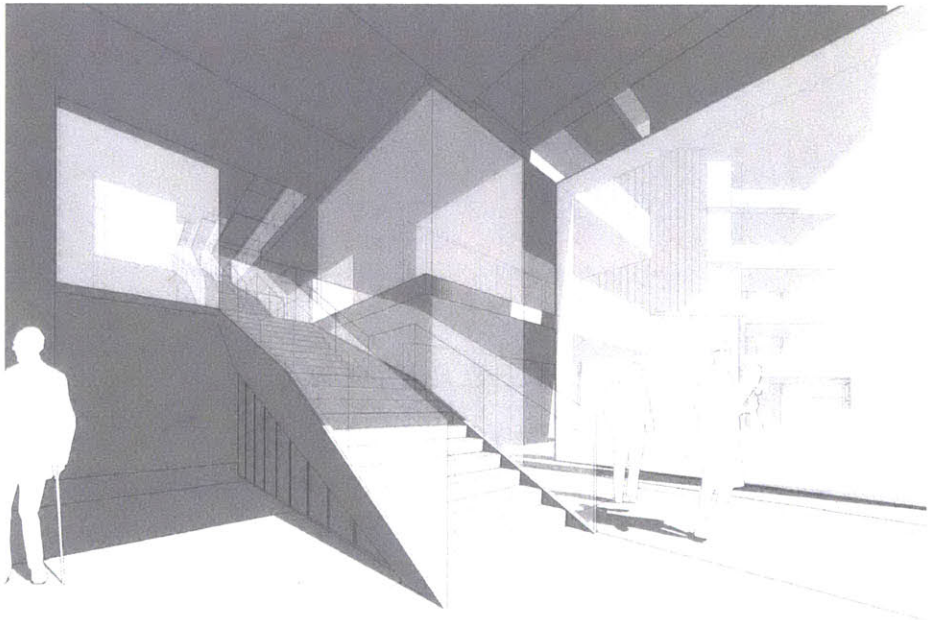
- UNITS: 68
- TENANTS: 68
- TOTAL AREA: 2459 m²
- COMMUNAL SPACES: 474m²
- COMMUNAL SPACE PER PERSON: 6m²
- CIRCULATION: 703m²
- EFFICIENCY: 71.4%
- GROSS: 35 m² per person

Communal Cluster Design Summary

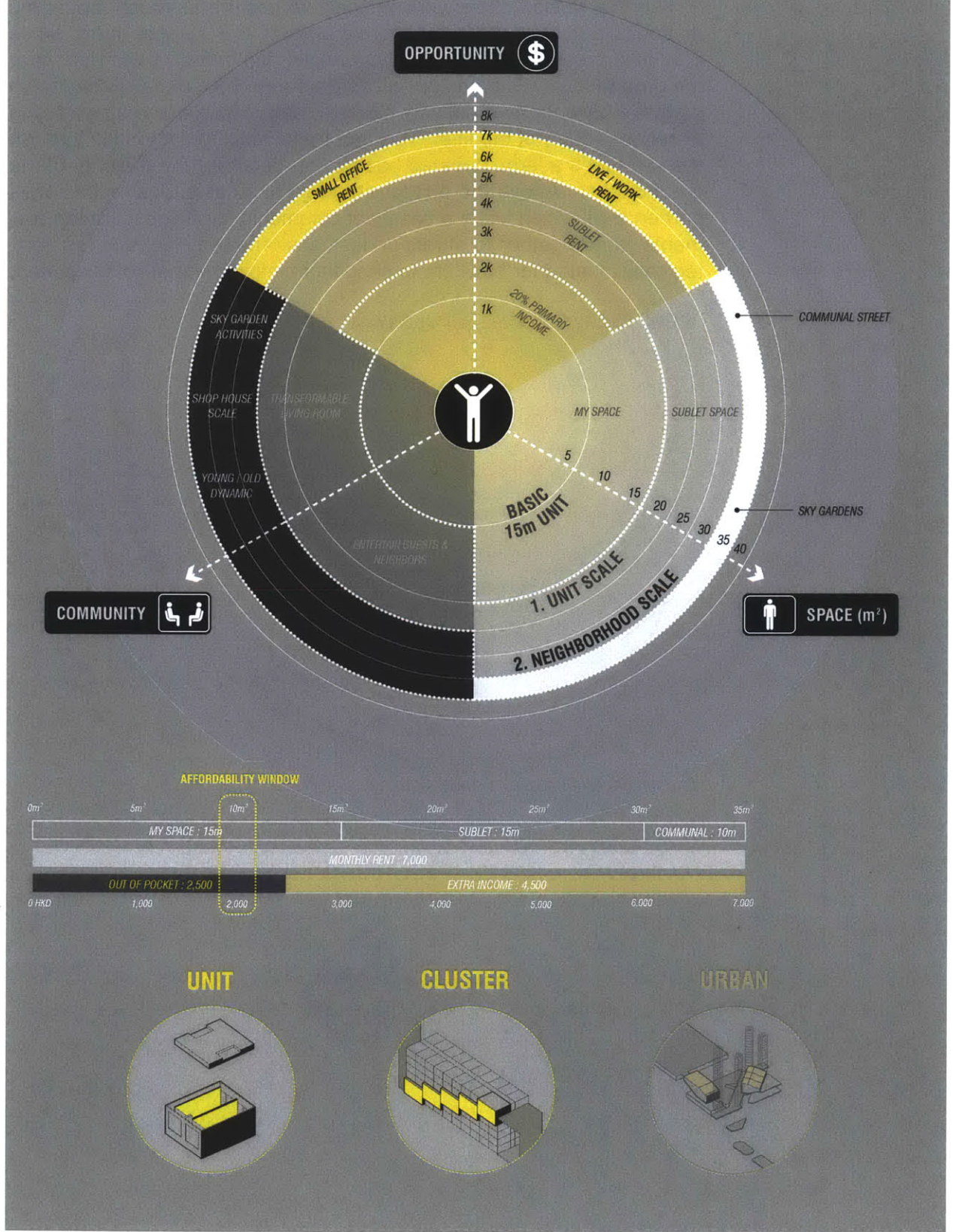
The community cluster design not only creates a connective and communally oriented residential environment but also expands the opportunities for tenants to create extra revenue. It reinforces the viability of the transformable unit for live work or small office use, and creates an “interior street” to channel foot traffic and encourage commercial activity. The sky gardens for the elderly are analogous to the transformable unit for the younger singles, giving the elderly an opportunity to earn a little extra money right outside their doorstep.

While the communal cluster design is less “efficient” of a layout than the point tower, one could argue that it can offer a greater number of low-income singles housed per public tax dollar. This is largely due to the combination of spatial organization and building management that enables tenants to contribute to the affordability of their own spaces. Simultaneously, this configuration creates opportunities for more connectivity and communal interaction that has become lacking in the more efficient housing types.

COMMUNAL STAIR AND SKY GARDEN



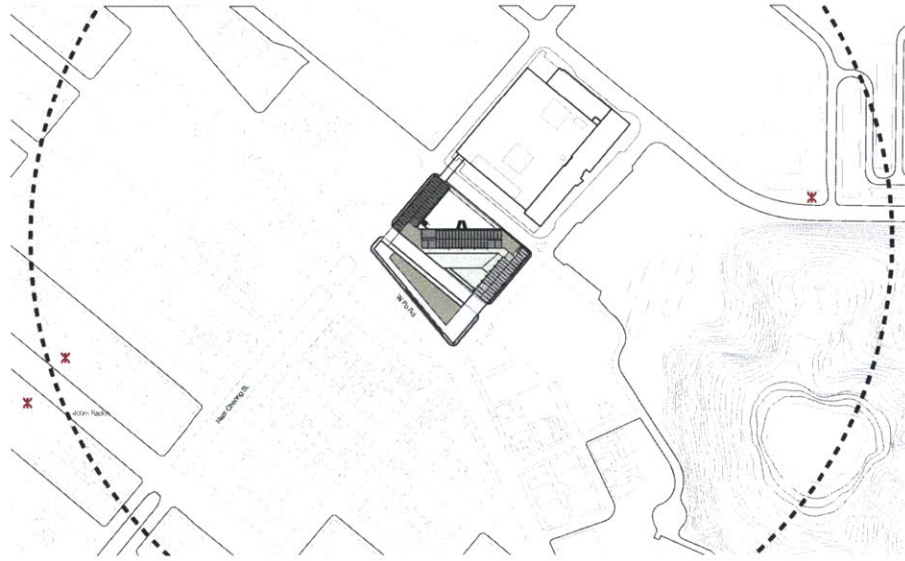
LIVABILITY AND AFFORDABILITY DIAGRAM - SCALE 1+2



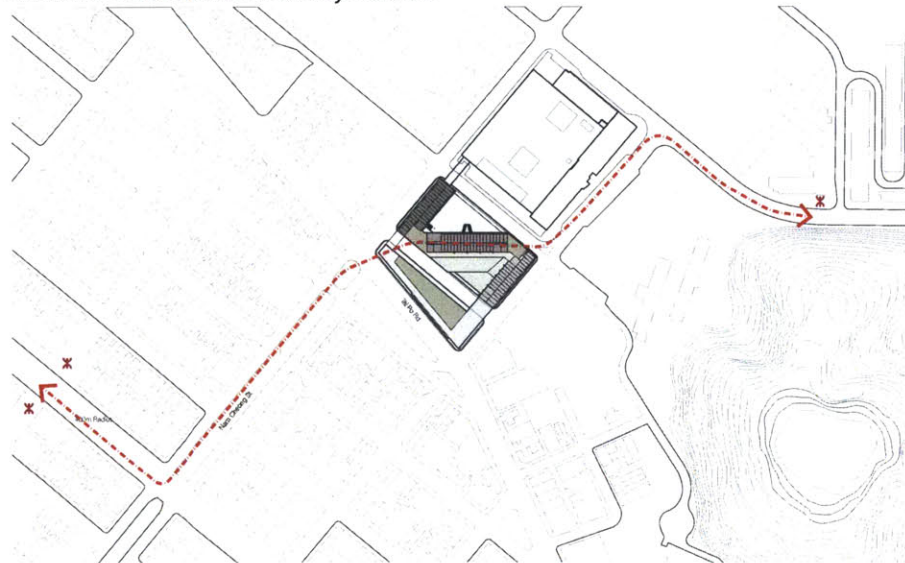
Podium Design

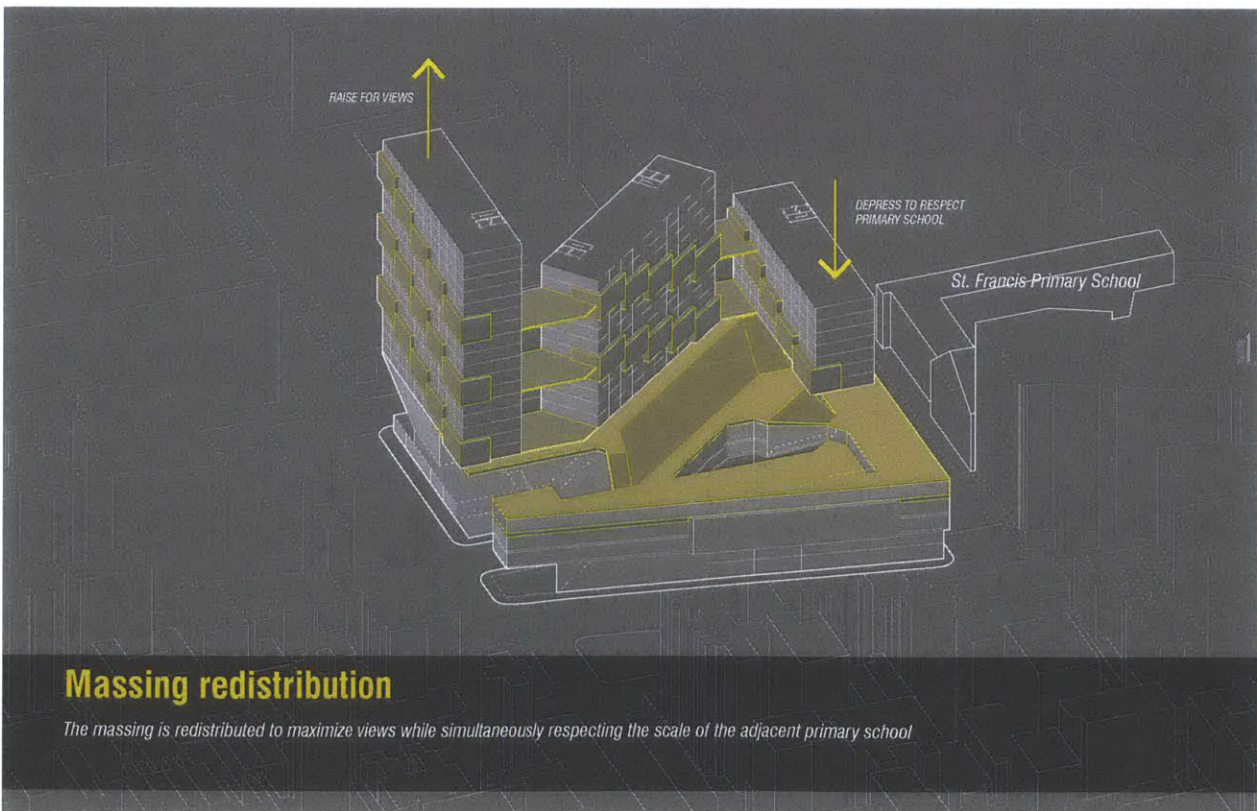
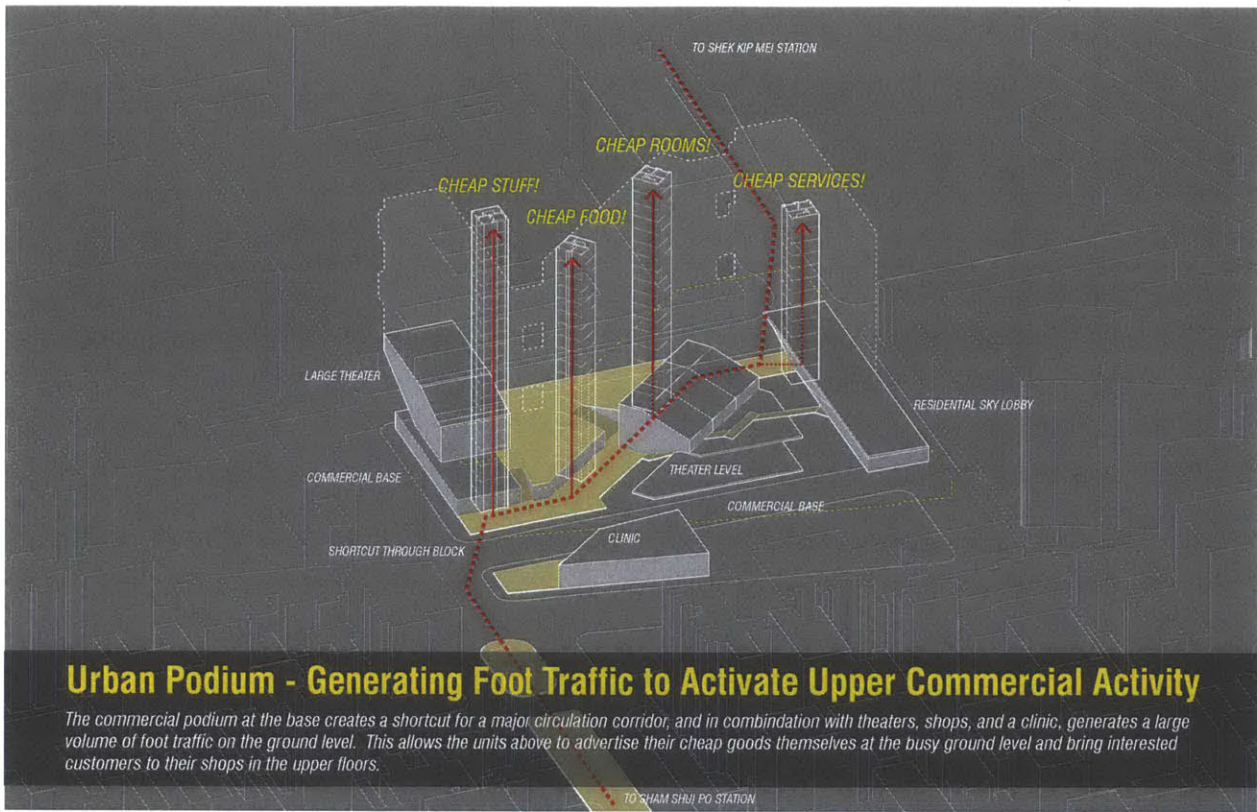
The design of the podium seeks to capture as much foot traffic as possible to enable the commercial viability of the upper floors, while providing greater connectivity and a pedestrian friendly environment at the ground level. The podium creates a shortcut for a major circulation pathway between two subway stations, both which are within walking distance (400m) of the site. This foot traffic moving diagonally through the site feeds a large covered bazaar that occupies the majority of the ground level. Above the bazaar are rings of small shops topped by a garden level which hosts a variety of community amenities. These elements work together to attract pedestrians, and the elevators are strategically located for hawkers to bring them into the upper retail spaces.

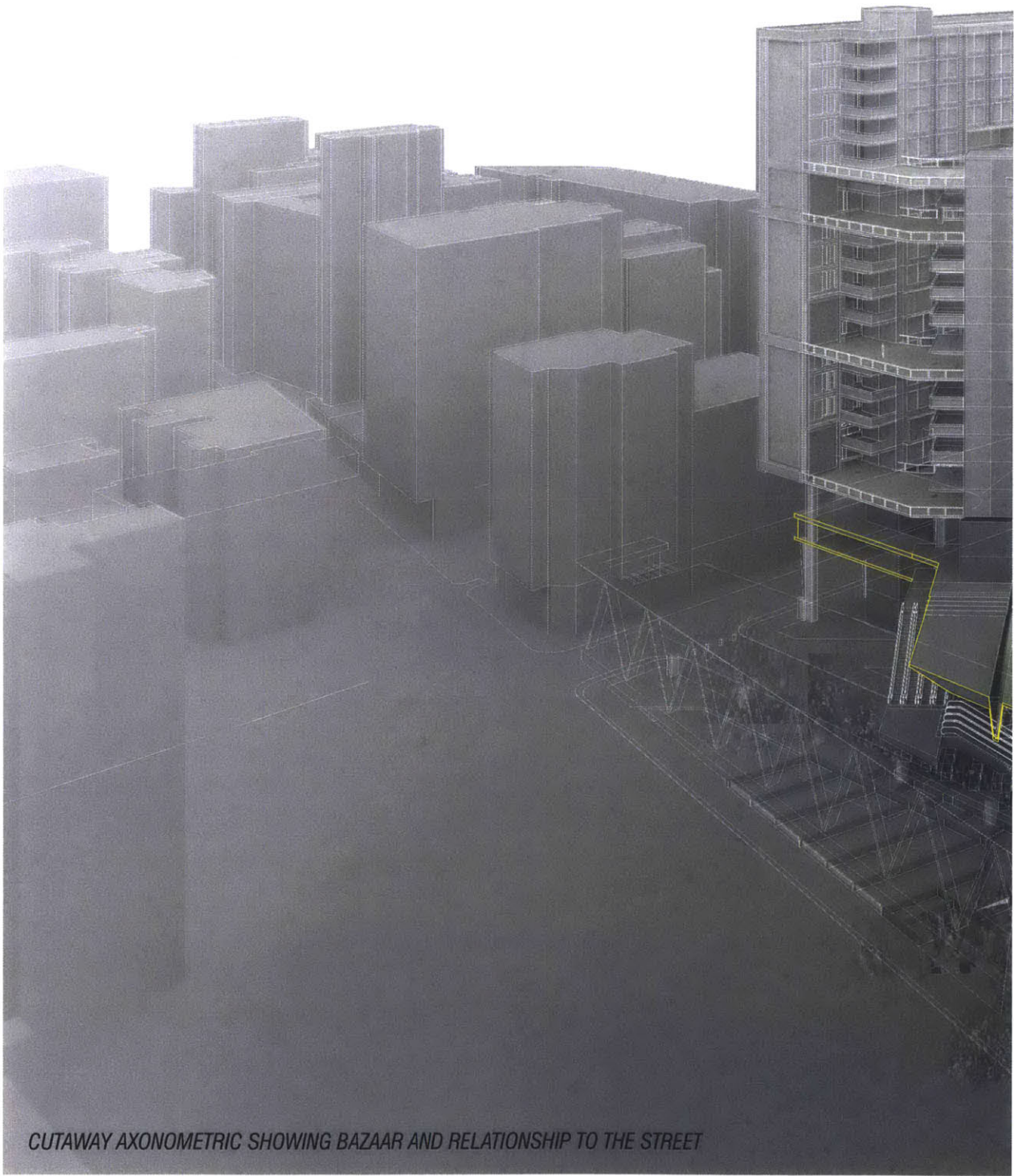
400m2 Walking Radius and Subway Stations



Site as Shortcut between Subway Stations

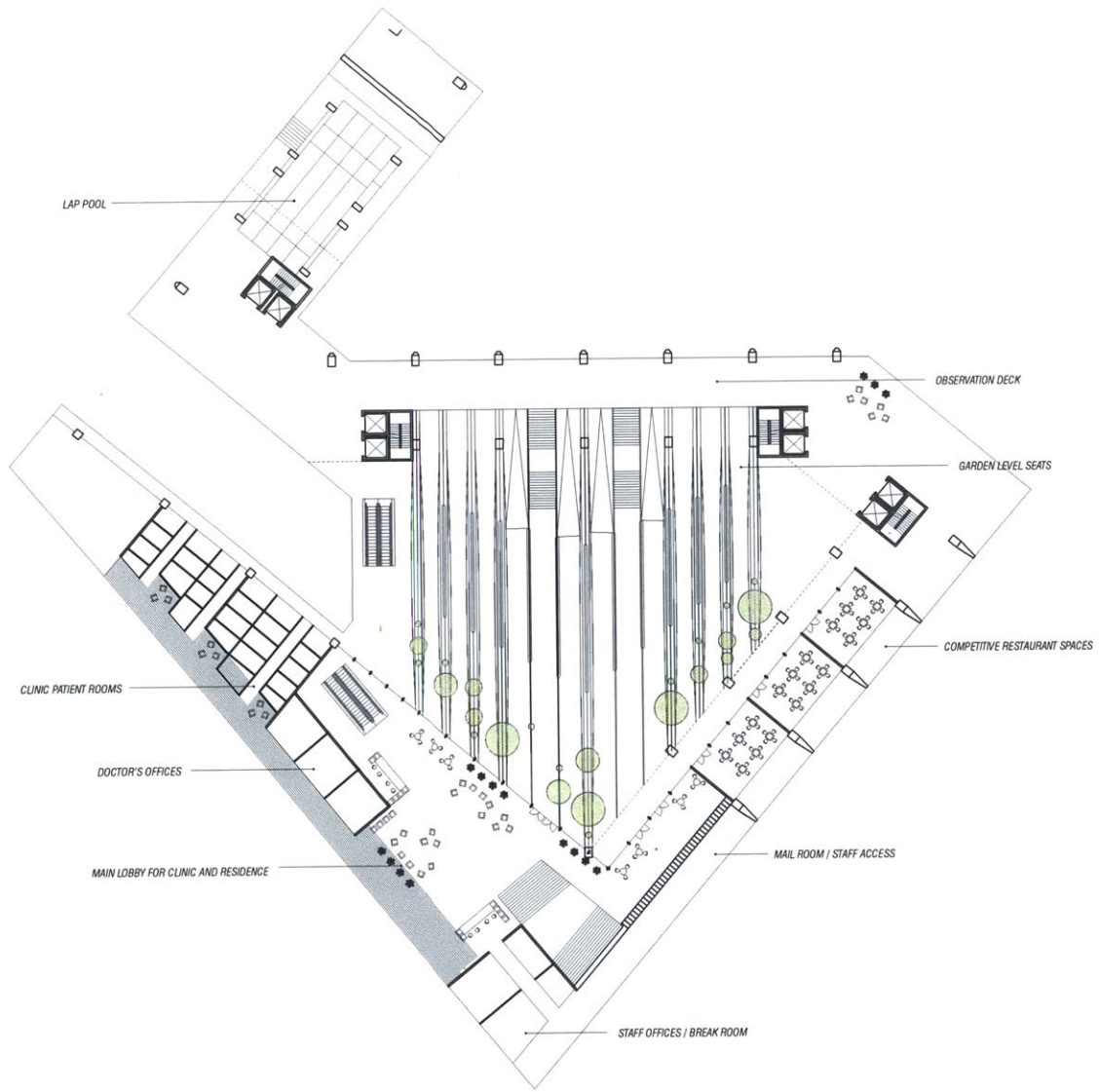






CUTAWAY AXONOMETRIC SHOWING BAZAAR AND RELATIONSHIP TO THE STREET

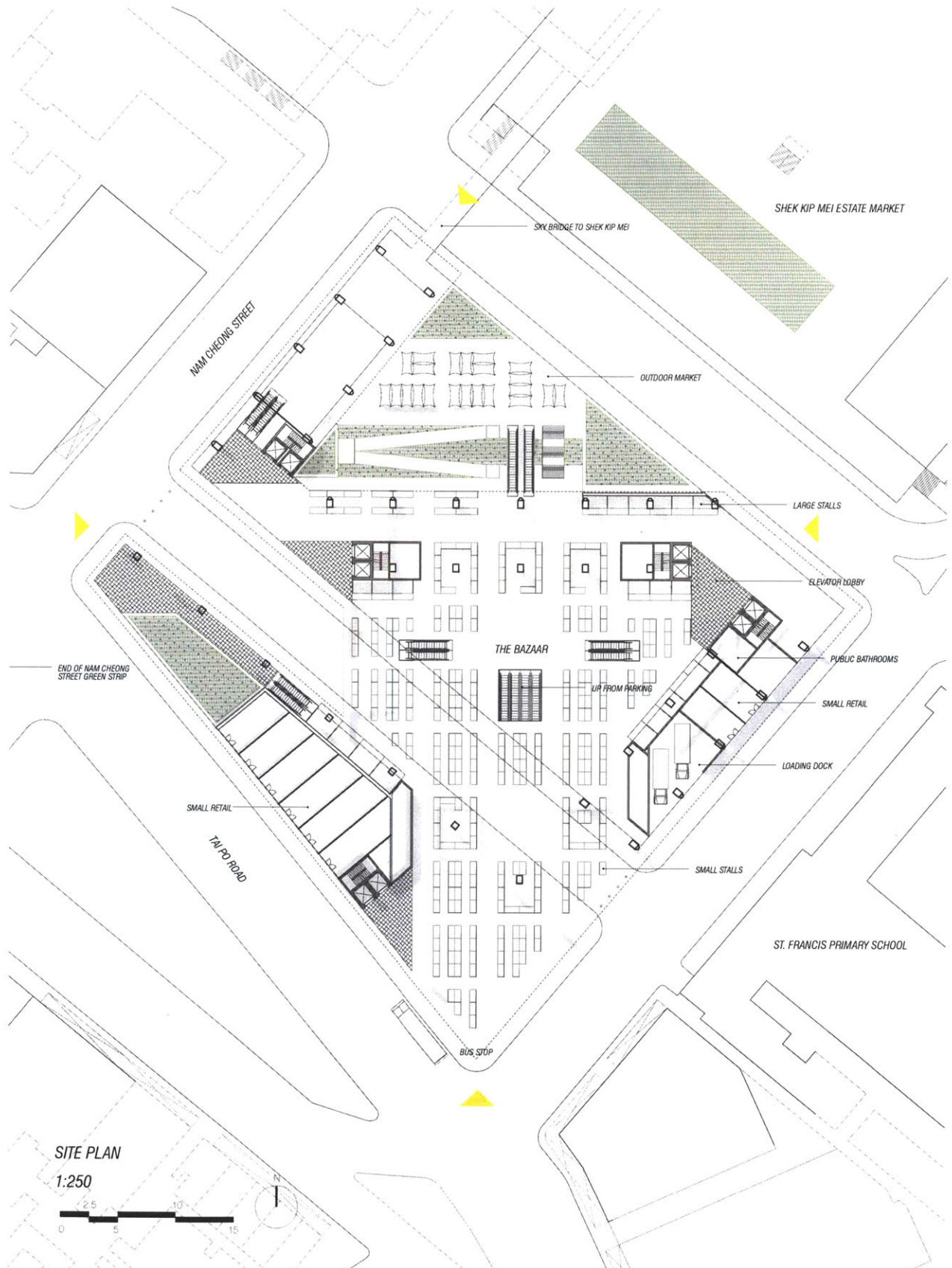




GARDEN LEVEL FLOOR PLAN

1:250





Podium Design Summary

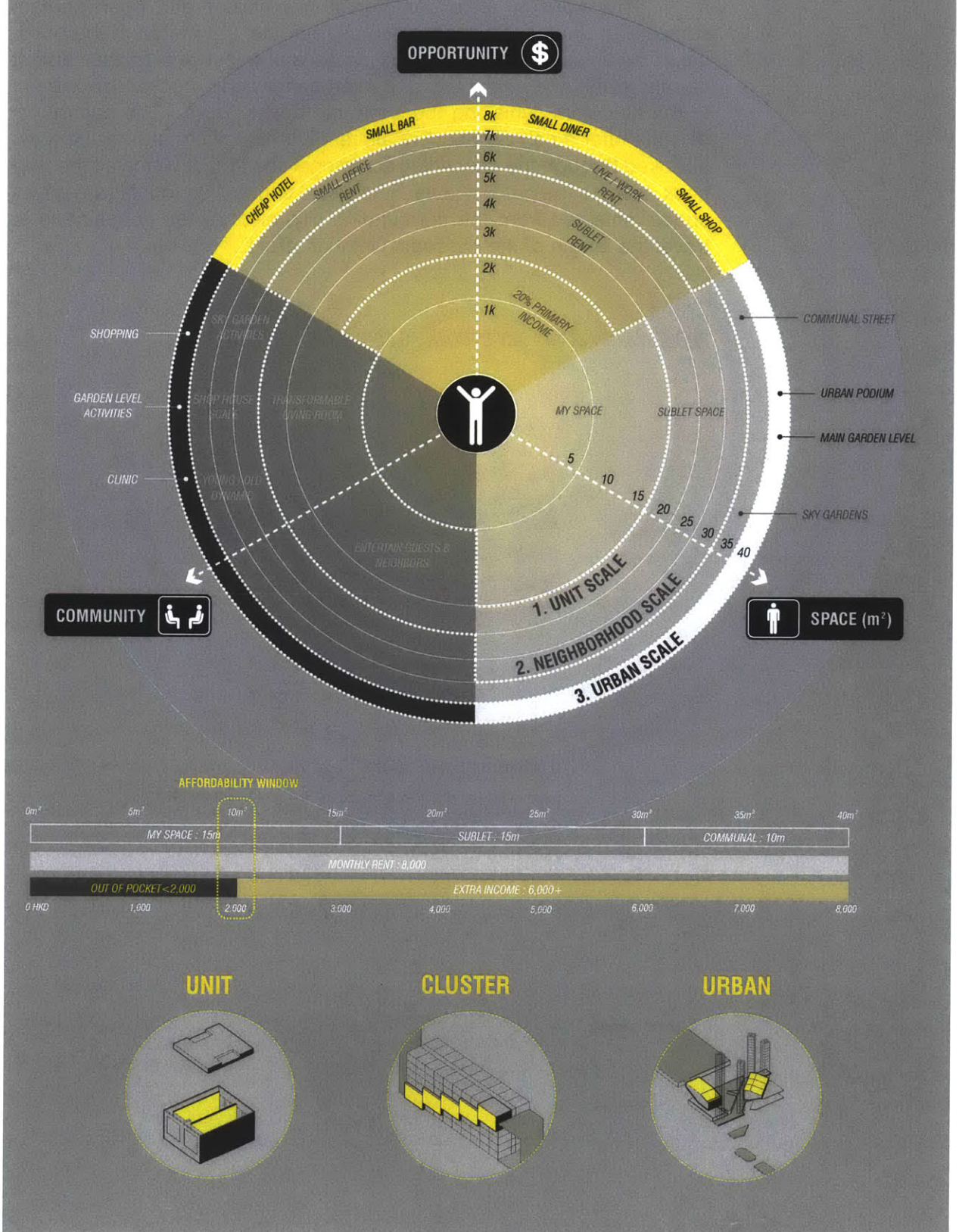
The podium design reinforces revenue generating opportunities while adding value to the community at the urban scale. With the bustling ground floor, tenants can take advantage of all aspects of the building as a platform for extra cash in whatever way they choose. Tenants can rent out a small stall on the ground floor, or choose to capitalize on the foot traffic and run a business from their flat at no extra cost.

Furthermore, the bazaar concept maintains the financially successful tower and podium typology without taking away from the lively street activity that is an essential part of the Sham Shui Po context. This is a more urbanistically friendly response to the current podium designs which have a tendency to suck up all street life into its massive, air conditioned interior.

GROUND LEVEL BAZAAR



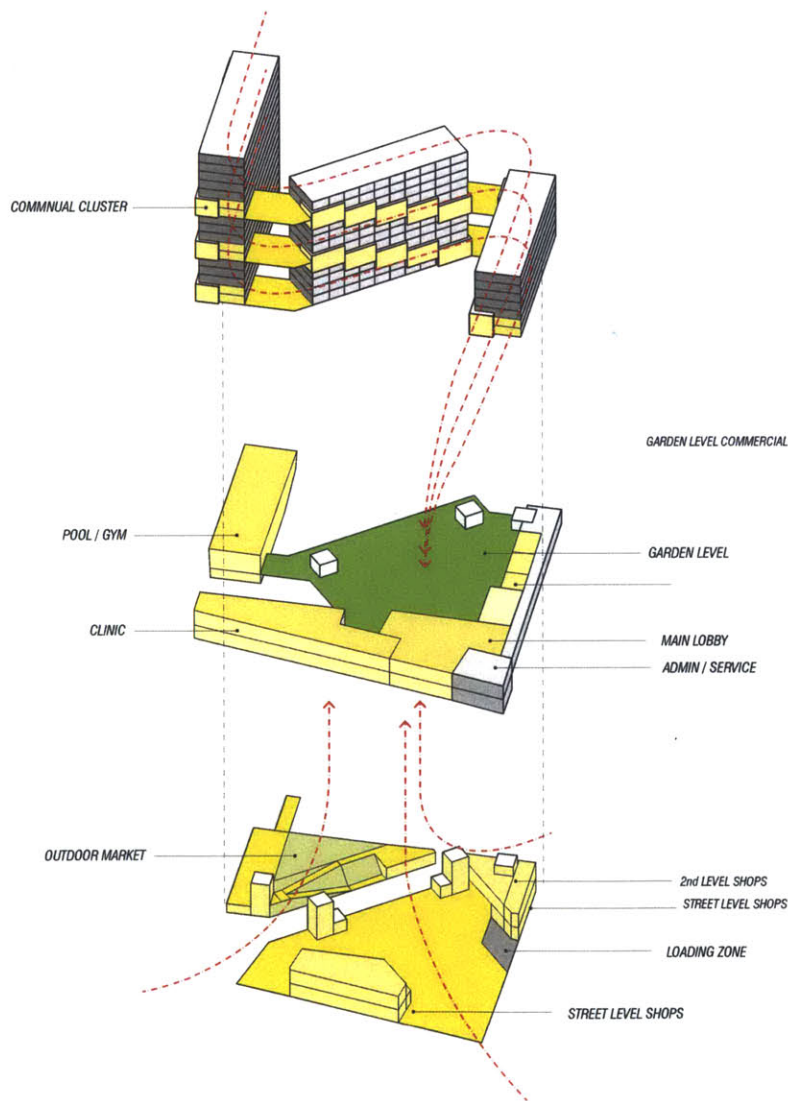
LIVABILITY AND AFFORDABILITY DIAGRAM - SCALE 1+2 +3

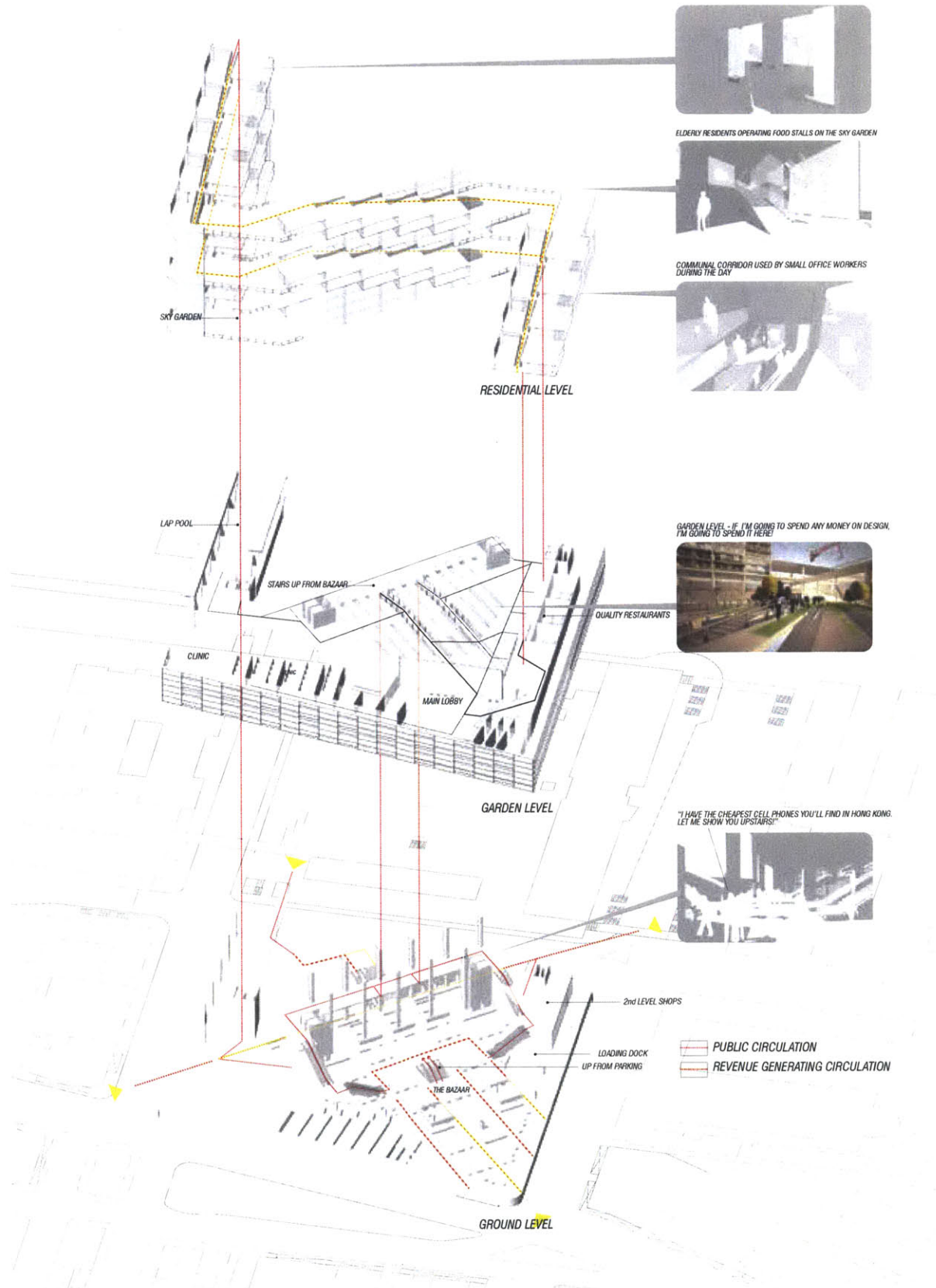


Circulation + Program - 3 Scales Working in Concert

The transformable unit, community cluster and open podium combine to drive a lot of circulation throughout the height of the building. The open podium with function as a shortcut and bazaar attract people to the site. Hawkers and even better deals beckon movement to the elevators, whisking them into the upper floors. The communal clusters offer a rich variety of retail, restaurants, office, and residences, all linked through the cascading communal space that winds all the way back down to the garden level. The visual connection to this rare green space, shielded from the surrounding city, also invites pedestrians to travel the length of the cascading interior street.

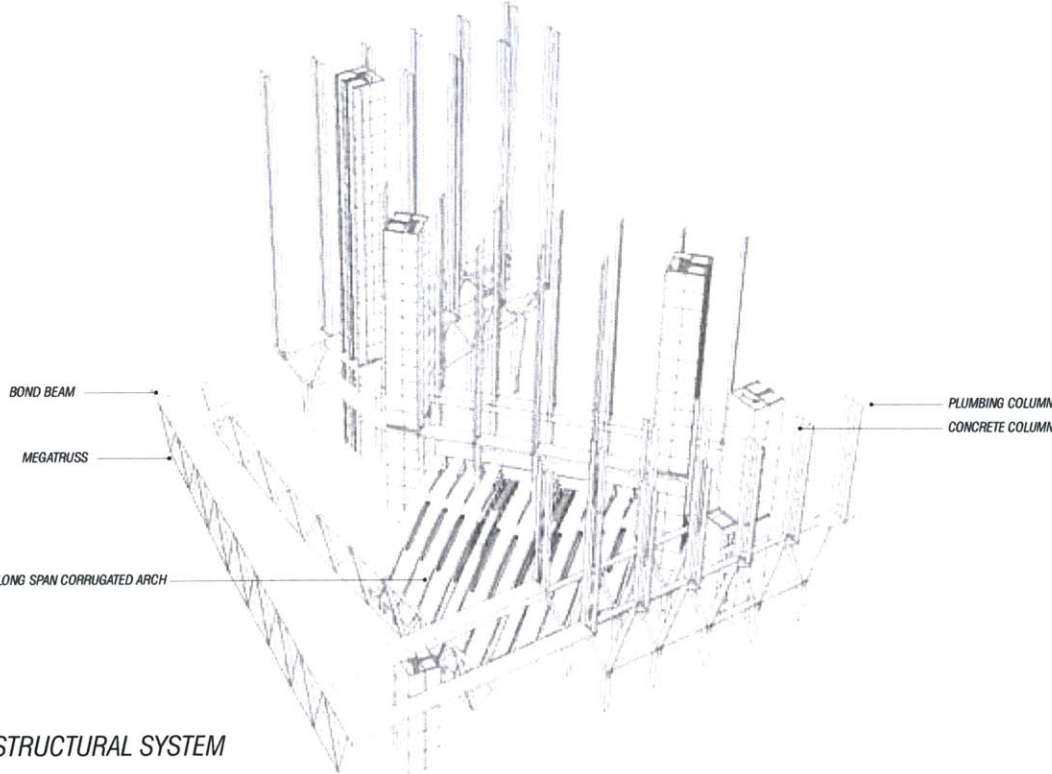
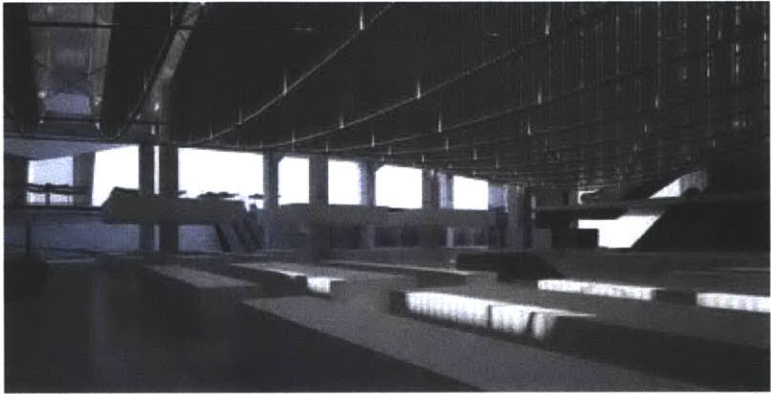
PROGRAM DIAGRAM - SKY GARDEN AS CIRCULATION DRIVER





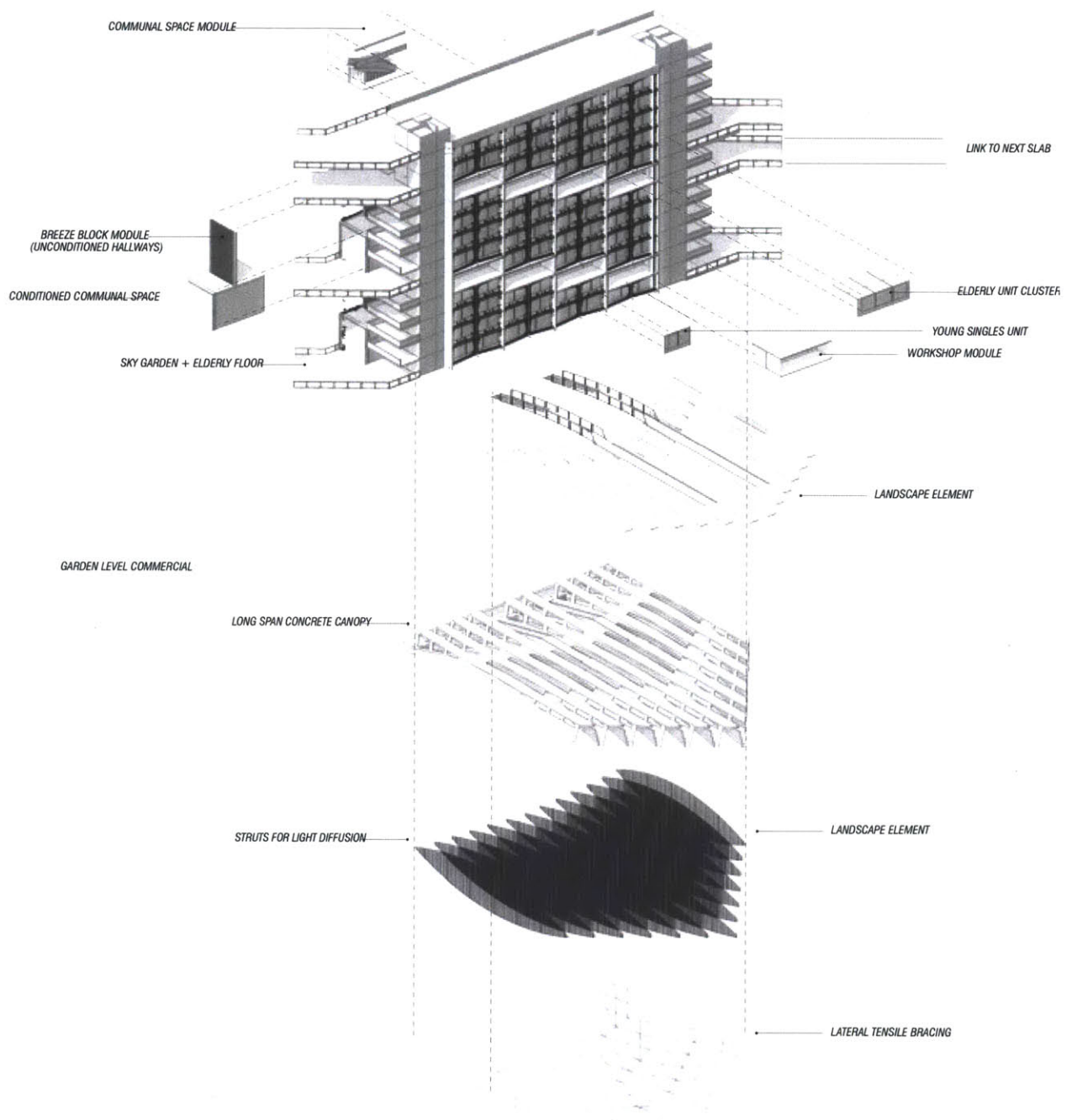
EXPLODED CIRCULATION DIAGRAM

BAZAAR LONG SPAN STRUCTURE



STRUCTURAL SYSTEM

SLAB SYSTEMS AXON



Programmatic Organization

The overall programmatic organization helps encourage the flow of pedestrians throughout the building. As is illustrated on the diagram at right, the bazaar occupies the bottom floor, while the upper floors are residential spaces linked by continuous strips of cascading communal spaces linked by sky gardens. Sandwiched in between the base and the upper levels is the garden level that houses the main residential lobby, clinic, athletic facilities, and other semi-public program. The garden level contains all the “good stuff” - not to mention the pristine greenscape, which is extremely hard to come by in Sham Shui Po - that attracts foot traffic from above and below.

BUILDING DATA

GROSS FLOOR AREA: 43317 m²

SITE AREA: 5904 m²

FAR: 7.3

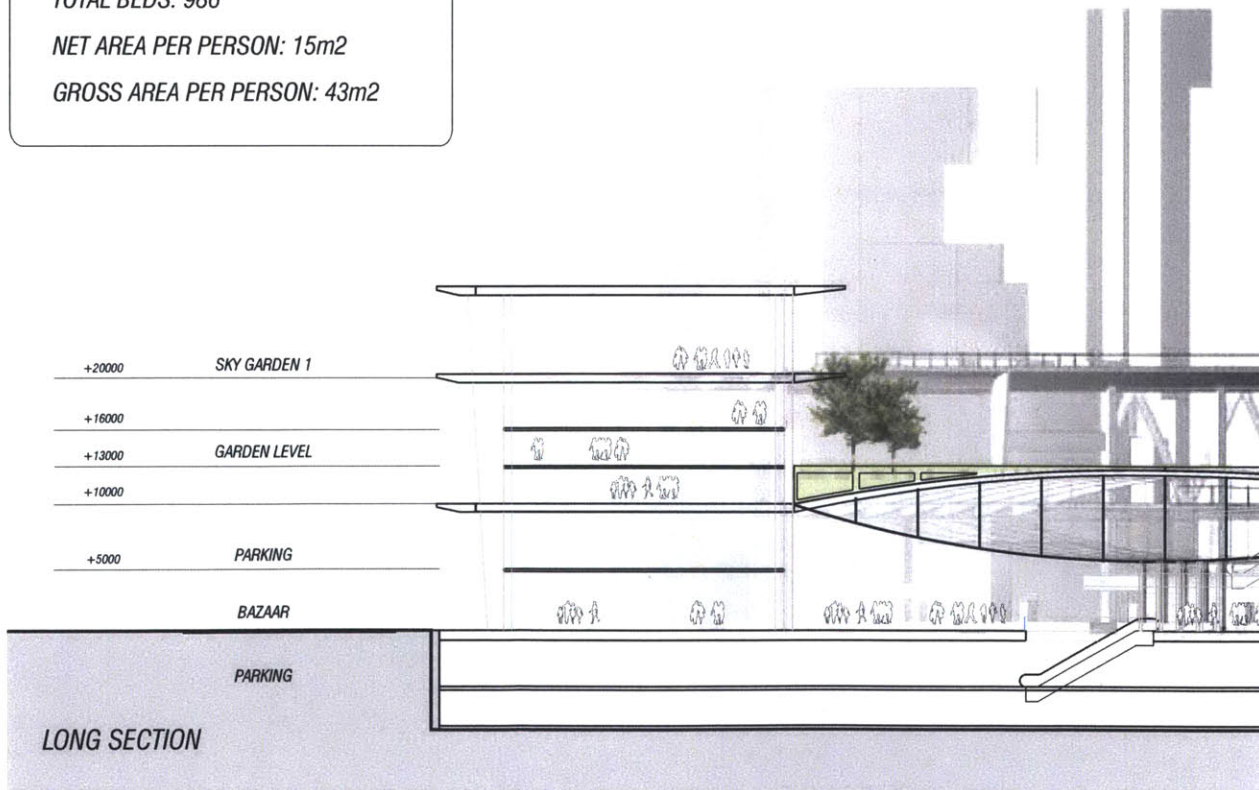
YOUNG SINGLES UNITS: 400

ELDERLY SINGLES UNITS: 186

TOTAL BEDS: 986

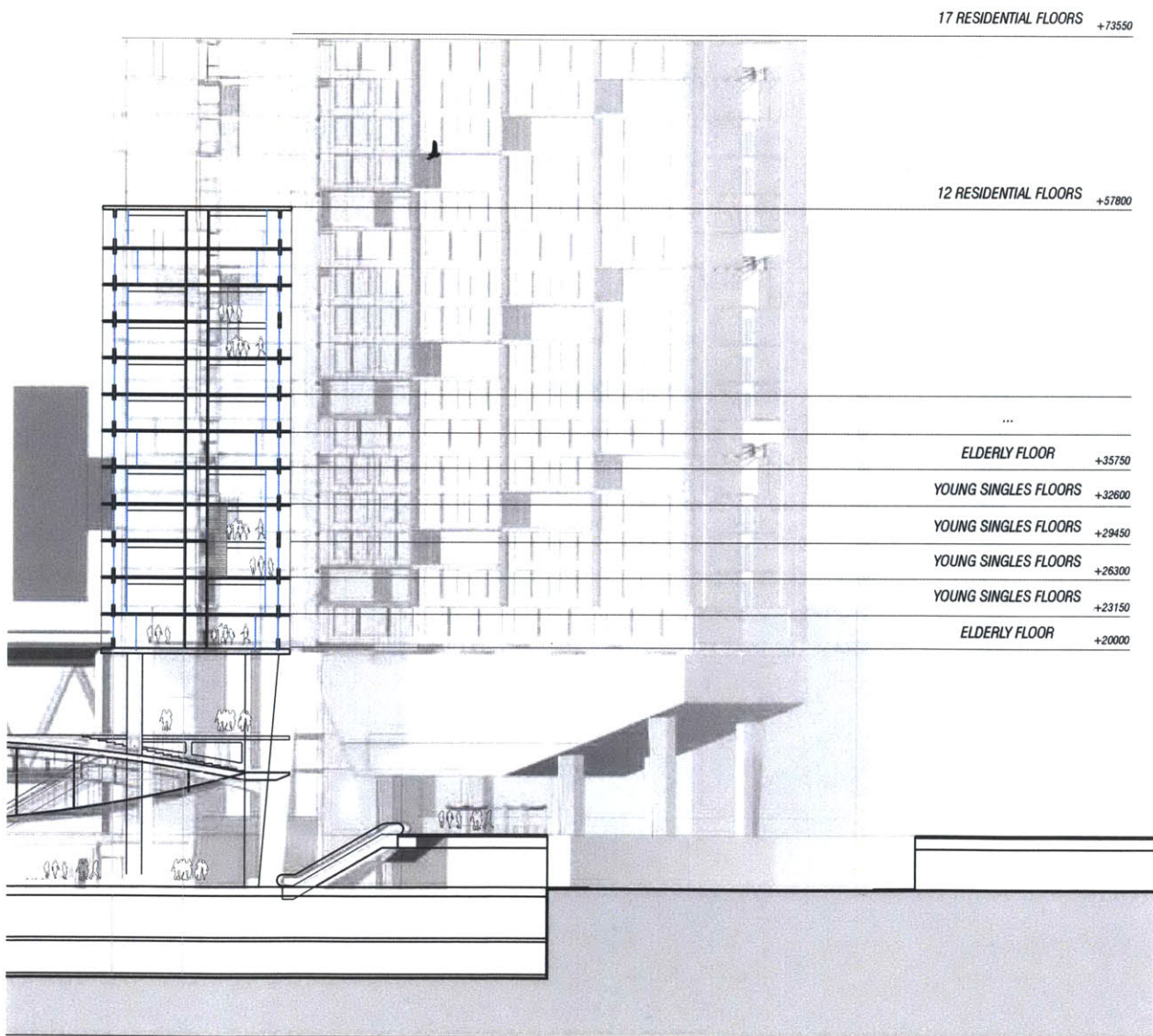
NET AREA PER PERSON: 15m²

GROSS AREA PER PERSON: 43m²





UNFOLDED PROGRAM DIAGRAM



APPROACH FROM NAM CHEONG STREET



UPPER LEVELS DURING DAY (TOP) AND NIGHT (BOTTOM)



THE BAZAAR





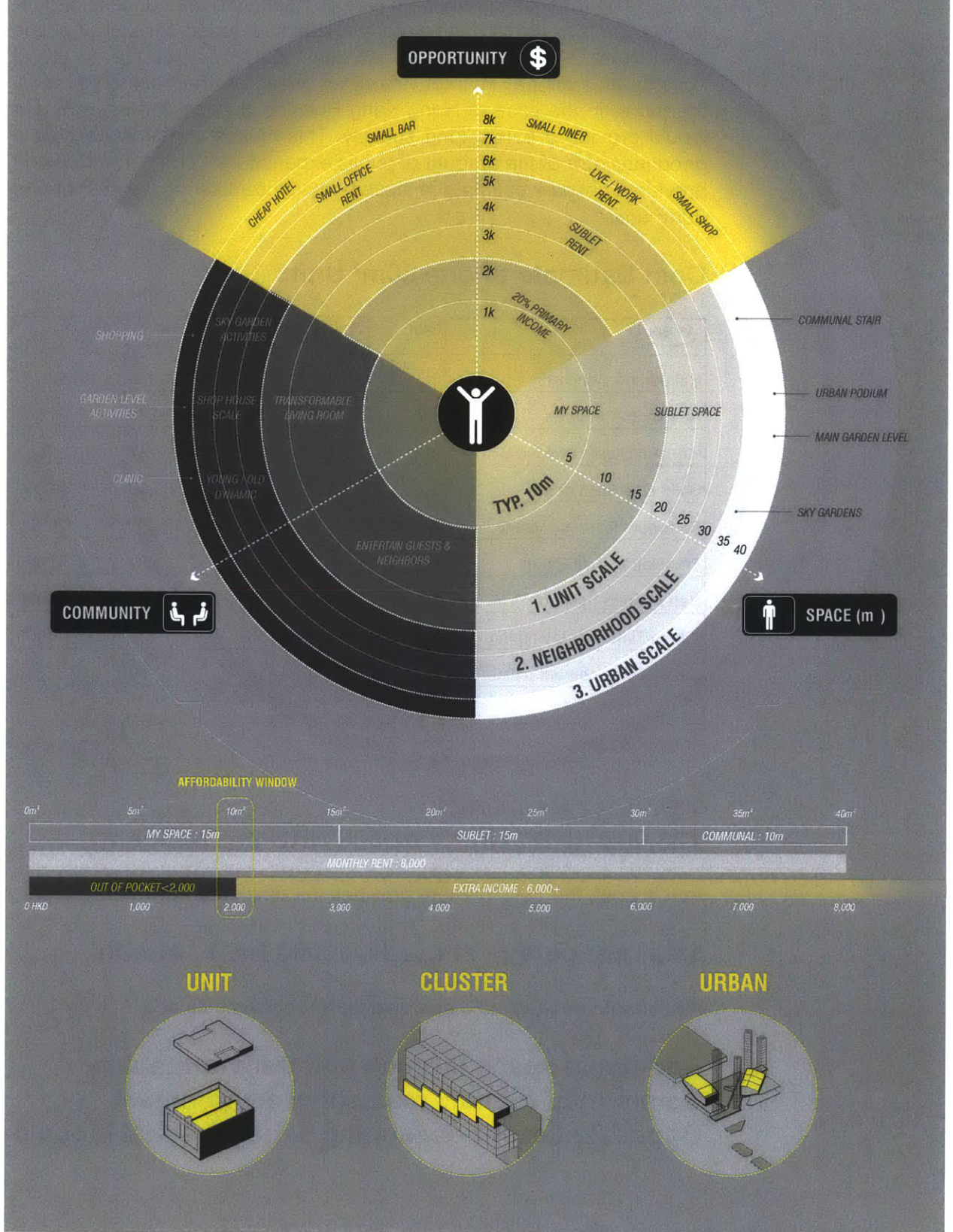
Overall Design Summary

The building design and program work together to create a highly active tower of multiple and shifting uses, giving it a distinctive quality unique to Hong Kong. This contextually sensitive solution of activating the entire volume of a high-rise residential building is at its core a response to the unique needs of single residents. Creating this kind of environment is crucial in providing singles a range of opportunities for making extra cash at their doorstep and on their own terms. Taken together, this environment reinforces the “Can-do Spirit” of Hong Kong, enabling tenants to achieve a level of self-sufficient affordability. As shown in the diagram on the right, this system goes beyond providing limited allowances for basic affordable living. The flexible nature of the building design allows for an infinite number of opportunities for adaptation and growth, allowing tenants to not only live affordably, but prosper.

GARDEN LEVEL



LIVABILITY AND AFFORDABILITY DIAGRAM - 3 SCALES WORKING IN CONCERT



Measures of Success

The most straightforward way of measuring the success of public housing is in terms of how many residents housed per unit of public expenditure. The design assumes that tenants will require no rental subsidy and will pay market rate rents based on the floor area. Furthermore, in the case of Hong Kong Housing Society, the government would provide a partial land subsidy. This makes construction cost a good indicator of the amount of public expenditure. The current design provide a ballpark estimate in these terms by calculating the cost of one 30m² unit.

Cost Estimate of one 30m² Unit

Material	Unit	Unit Quantity	Cost / Unit	Totals
Reinforced Concrete	m3	8.332	1,230	10248.36
Aluminum Windows	m2	8	2230	17840
General Steel / Welded Work	kg	200	37	7400
Solid core flush doors	#	4	5300	21200
Bathroom fixtures / Vanity	# baths	2	10,000	20000
Translating Wall Panel	m2	30	500	15000
Bed / Winch System	#	1	10000	10000
20mm Timber strip flooring	m2	30	600	18000
Internal lime cement plaster	m2	60	89	5340
TOTAL (1 UNIT)				125028.36

1 Unit = 2 Residents

125,000 HKD / Unit = 62,500 HKD per resident

At this cost, the development provides the residents:

15m² per person at roughly 3,000 HKD / month.

Additional unquantifiable and qualitative benefits include:

Additional space through unit transformability

Community-friendly residential environment

Opportunities for generating extra personal income

CONSTRUCTION COSTS IN HONG KONG, 2011-2012

Source: Rider Levett Bucknall

Description	Unit	Average Rates in HK\$			
		3Q2011	4Q2011	1Q2012	2Q2012
Reinforced concrete Grade 40	m ³	1,210.00	1,210.00	1,220.00	1,230.00
Sawn formwork	m ²	235.00	245.00	250.00	260.00
Deformed high yield steel bar reinforcement	kg	10.80	10.80	10.90	10.90
105 mm Solid concrete block wall	m ²	180.00	183.00	187.00	192.00
Mastic asphalt roofing overall 20 mm thick (2-coat work) on horizontal surfaces	m ²	126.00	128.00	131.00	134.00
20 mm (Finished) Timber strip flooring including plywood sub-floor, sanding and wax polishing	m ²	567.00	576.00	588.00	600.00
Timber skirting 100 mm high x 13 mm thick	m	77.00	78.00	79.00	81.00
50 mm Solid core flush door faced both sides with 5 mm timber veneered plywood including door frame, architrave, mouldings and painting (excluding ironmongery)	No.	5,030.00	5,100.00	5,200.00	5,300.00
Galvanised mild steel in balustrades, railings and general welded and framed work	kg	36.00	36.00	36.50	37.00
Structural steelwork - standard sections	kg	37.00	37.00	37.50	37.50
Fluorocarbon coated aluminium windows - frame and hardware including clear float glass and glazing (single-glazed windows)	m ²	2,110.00	2,140.00	2,180.00	2,230.00
20 mm Cement and sand (1:3) paving	m ²	58.00	59.00	60.00	61.00
Coloured unglazed ceramic mosaic floor tiling	m ²	210.00	213.00	217.00	222.00
Marble slab flooring (mid-range, European origin)	m ²	2,770.00	2,810.00	2,870.00	2,940.00
Two coat internal lime cement plaster to soffit and beams	m ²	85.00	86.00	87.00	89.00
Metal panel suspended ceiling	m ²	580.00	590.00	600.00	615.00
Ceramic / homogeneous wall tiling; internal work	m ²	482.00	490.00	495.00	505.00
Ceramic mosaic external wall tiling; adhesive fixed (45 x 45 or 45 x 95 mm tiles)	m ²	341.00	346.00	350.00	359.00
Alkali resistant primer and two coats of emulsion paint on plastered walls and ceilings	m ²	43.00	44.00	45.00	46.00

Further Discussions and Closing Remarks

It is clear that the issue of providing affordable housing for singles will be one of the challenges facing this generation. Not only are these needs increasingly clear in Hong Kong, many cities of the developed world are also following similar demographic trends. In the struggle against poverty, encouraging self-reliance as a means to affordability can play an important role in the long-term solution. It is the author's belief that the creation of living environments that foster this self-reliance is an area where architecture can play a critical role.

While the design provides a rather detailed proposal for addressing some of these issues, this is but one attempt at a problem that is unquestionably much greater in its breadth and depth. A broader perspective on the critical factors that define the architectural, financial and political solutions to this issue is a worthy endeavor. Looking through the different stages of the design process raises two questions of particular interest:

What are the factors that encourage a "proactive" behavior towards affordability? What role can architecture play within this endeavor?

Can this approach be applied to other parts of the developed world? What forms would proactive affordability take on in other contexts?

The author is interested in continuing this work in one form or another in pursuit of the answers to these questions.

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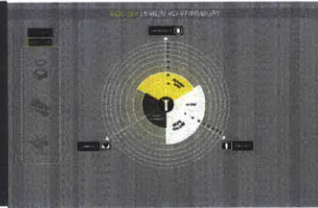
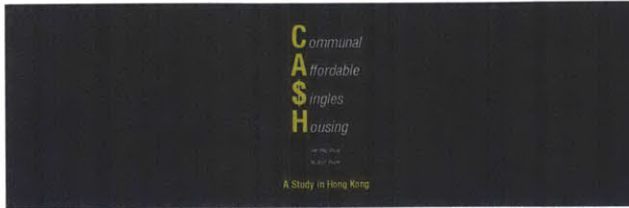
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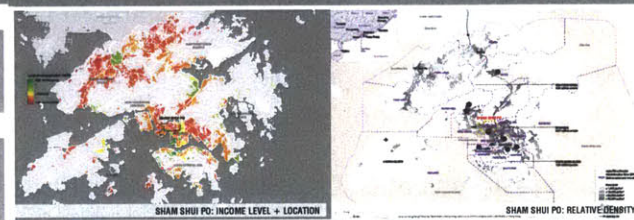
THESIS PRESENTATION | DECEMBER 20TH, 2012



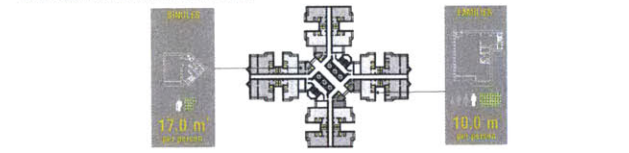
Hong Kong Singles - Left out of Affordable Housing



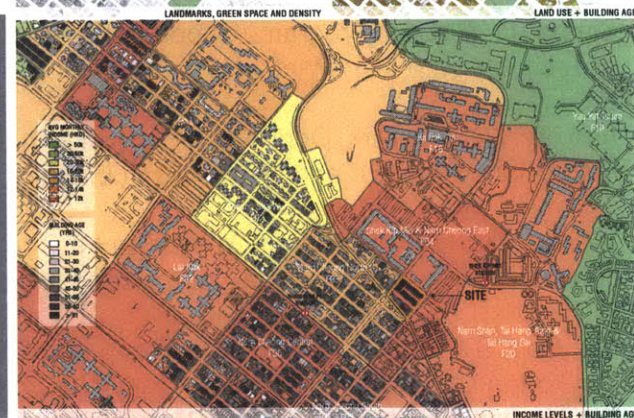
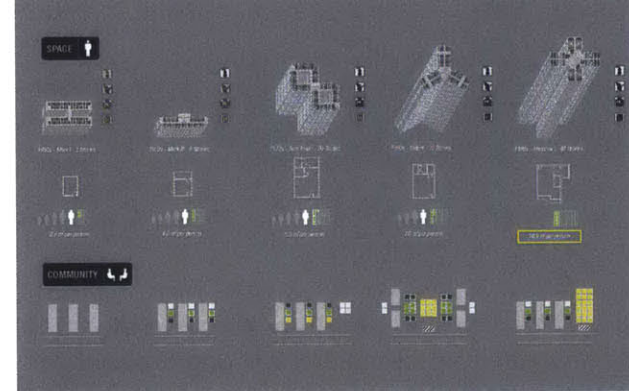
SITE - Sham Shui Po



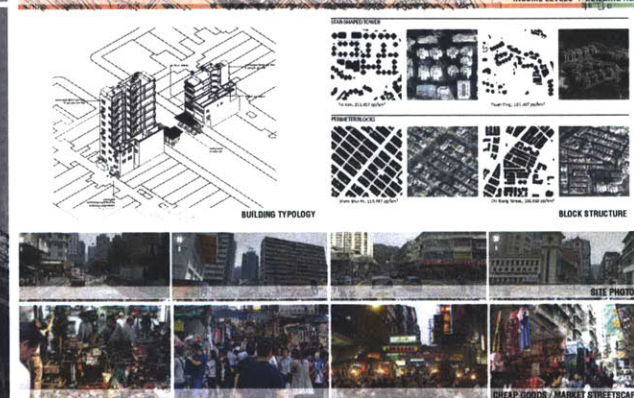
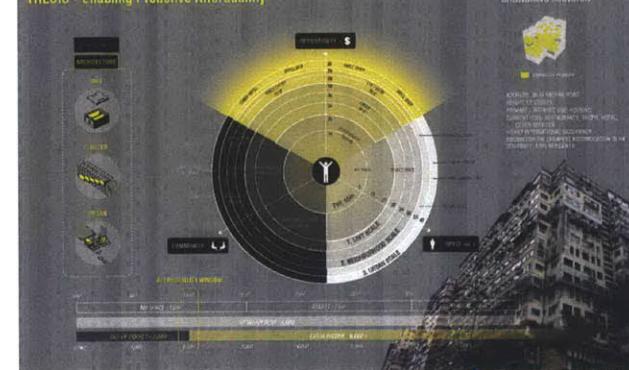
SPACE STANDARDS - INEFFICIENCY OF HOUSING SINGLES

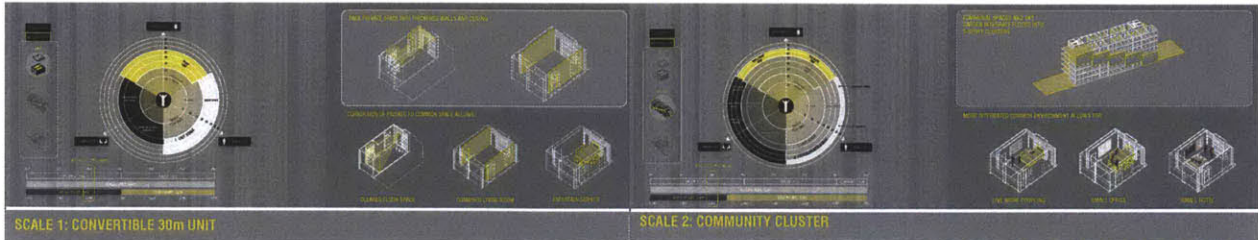


EVOLUTION OF HONG KONG PUBLIC HOUSING



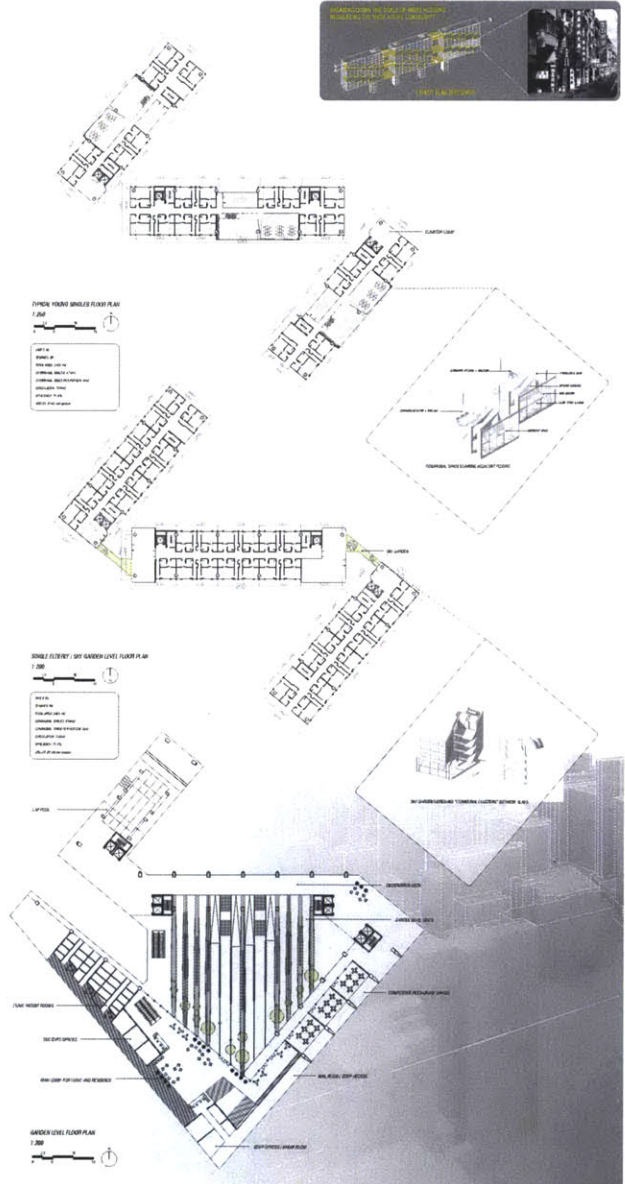
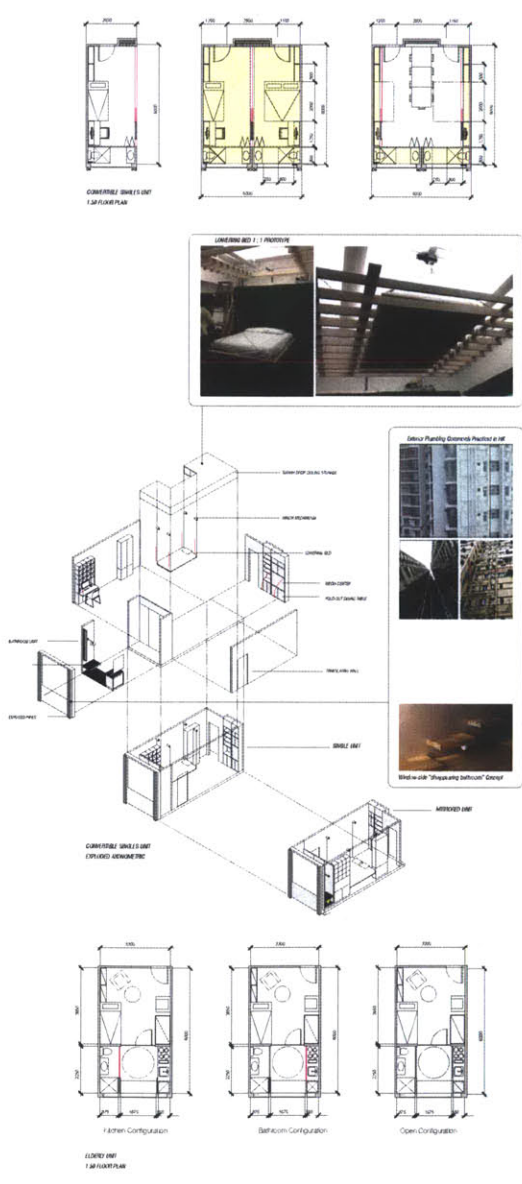
THESIS - Enabling Proactive Affordability

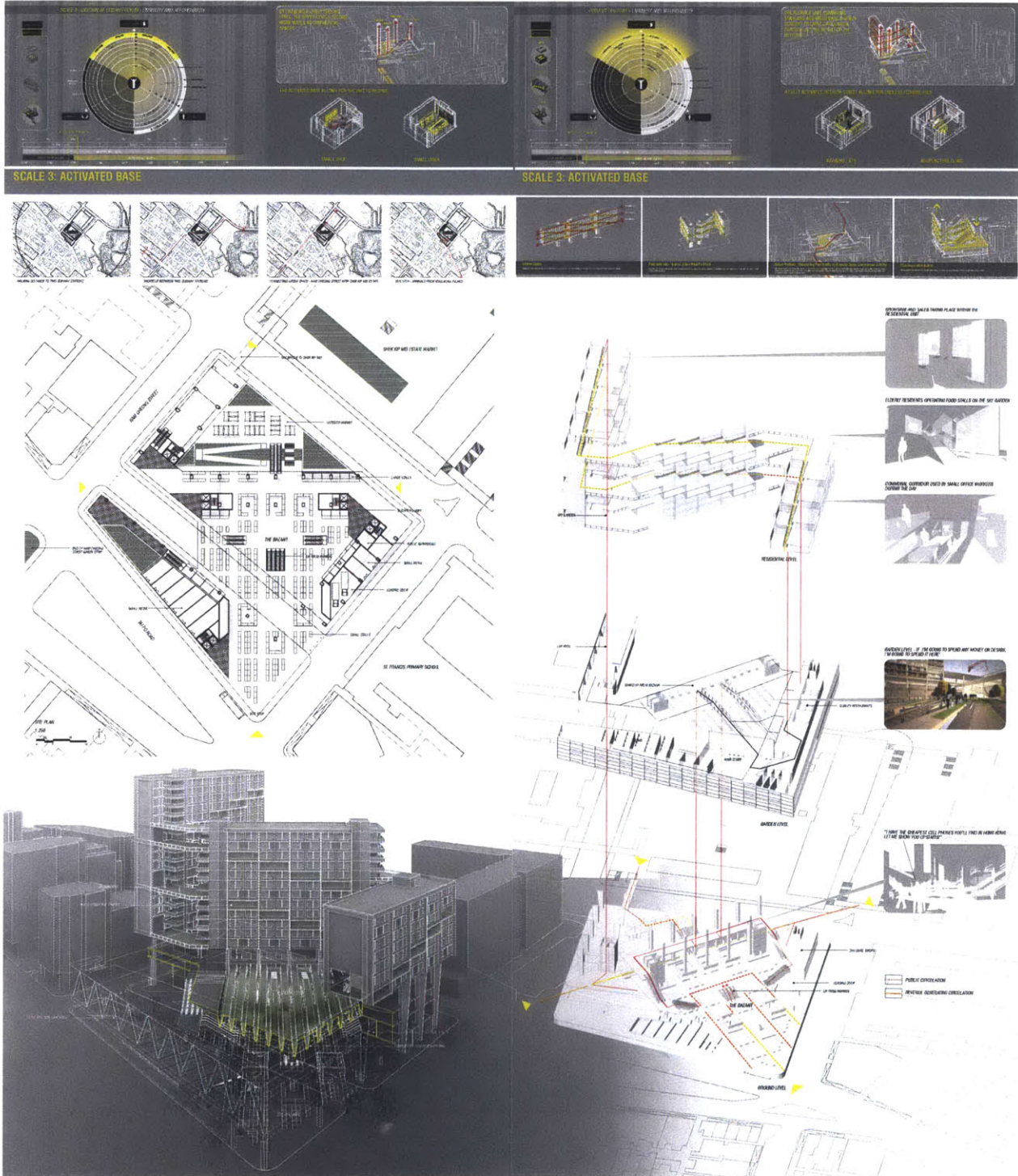




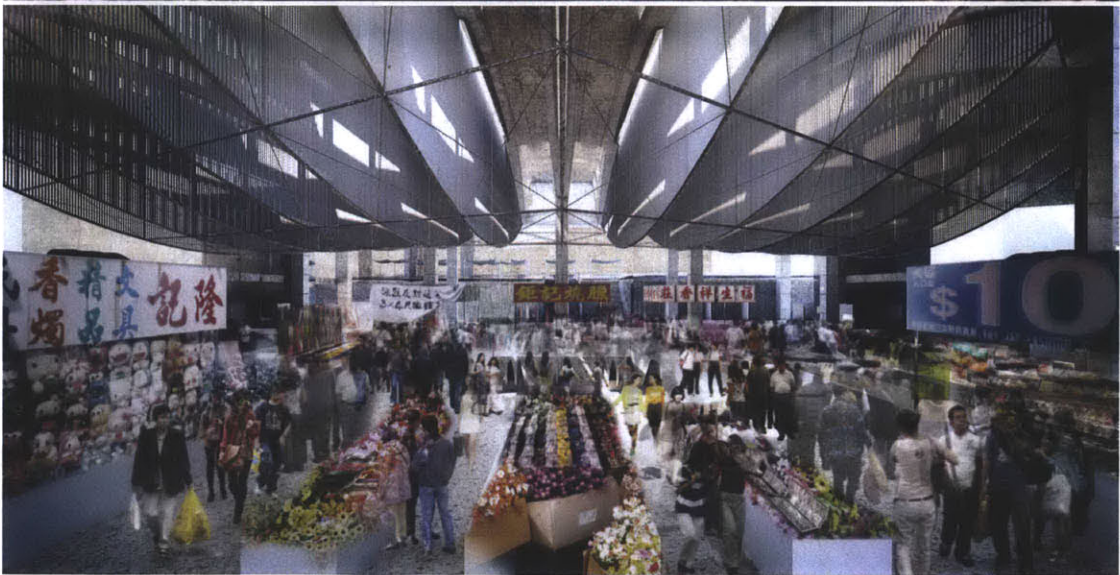
SCALE 1: CONVERTIBLE 30m UNIT

SCALE 2: COMMUNITY CLUSTER









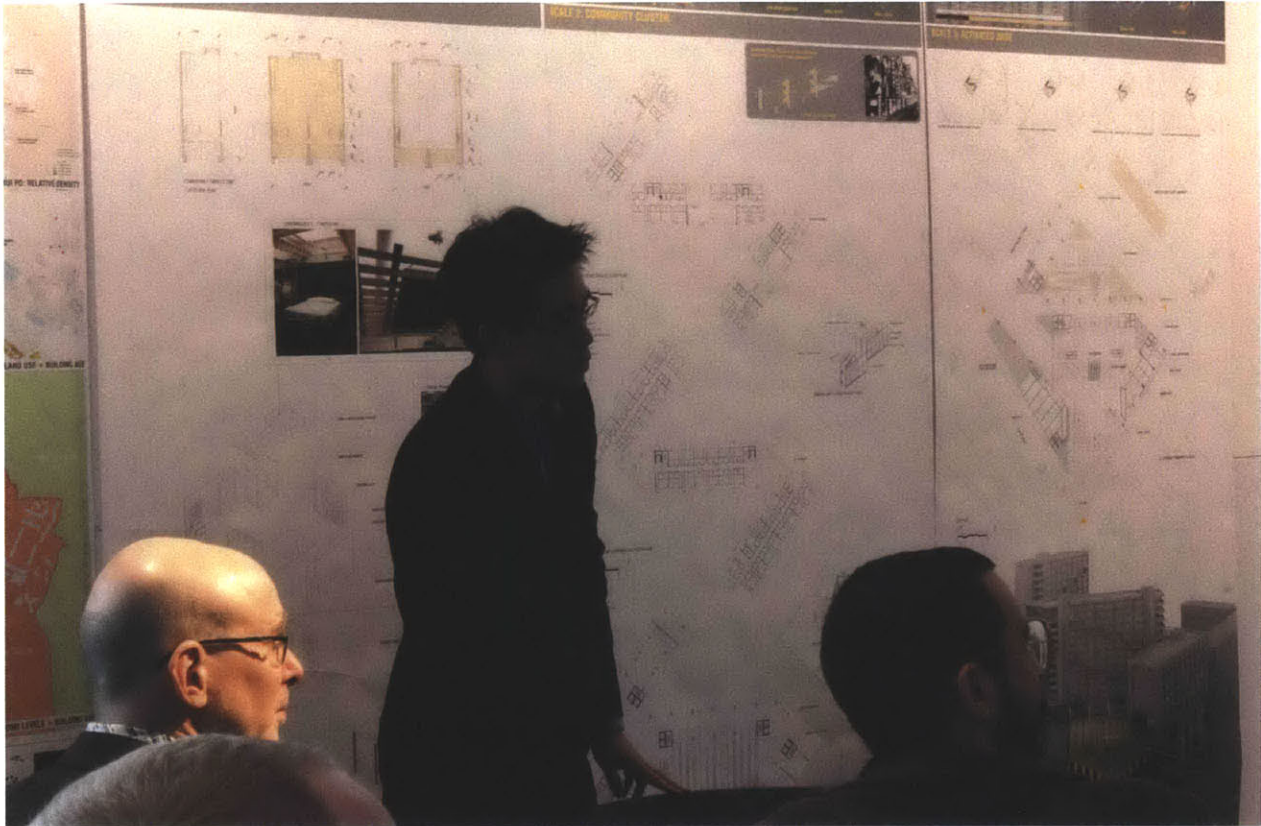
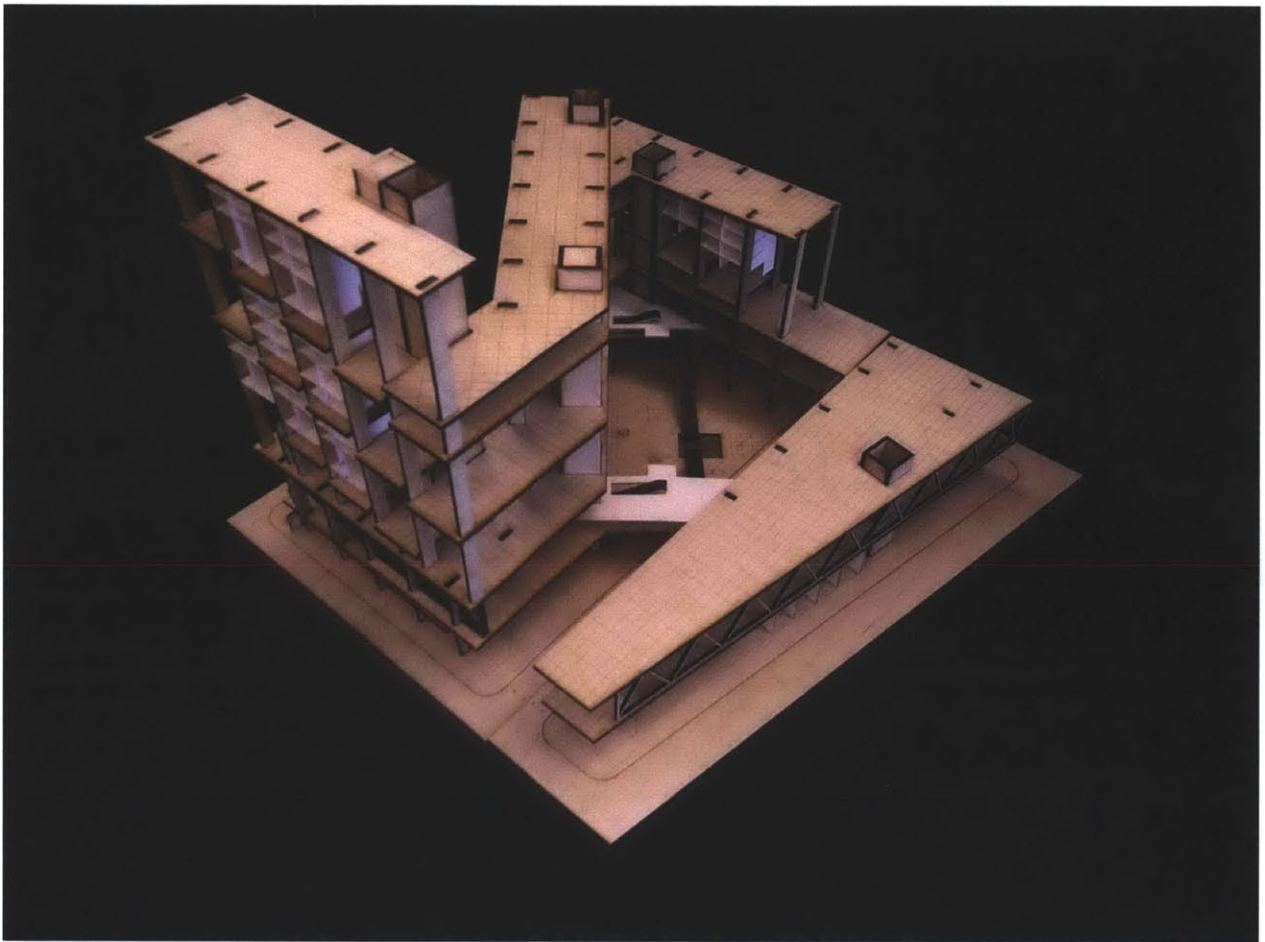


Photo Credits: Kevin Young

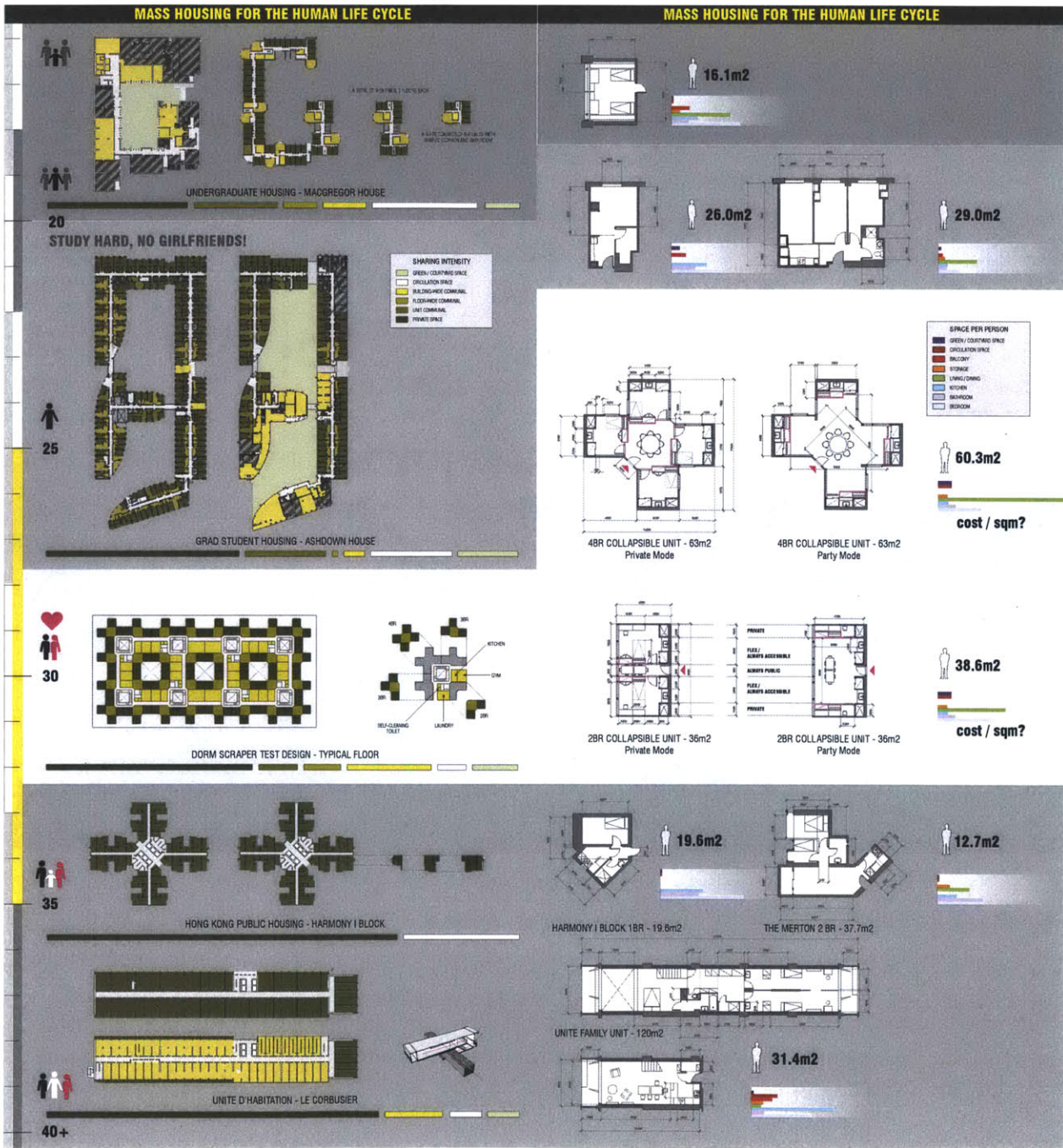




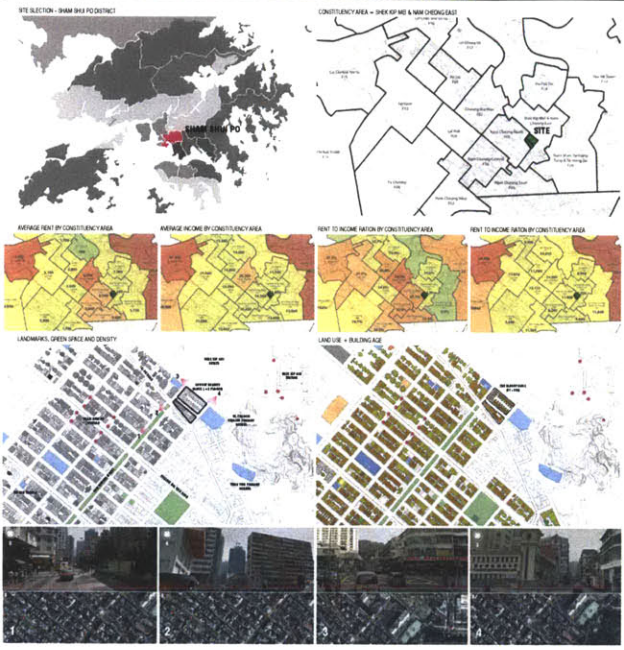


APPENDIX

DESIGN REVIEW 1: September 11, 2012



SITE SELECTION + PROGRAMMATIC DRIVERS



Hong Kong is a fast-paced and competitive environment. Private space allows young people to get away from it all, if only for a little while.



Most activities that take place in private don't require much room, but are very personal (work, internet, sleep, romance). Private spaces must be **SMALL, PROTECTIVE AND INSULATED**.

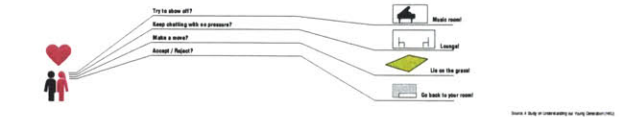
provide **COLLAPSIBLE PRIVATE SPACE** that lends area back to the common while the tenant is gone



spaces should be **HORIZONTALLY ORGANIZED** to maximize encounters between young singles (much like MIT)



provide **A VARIETY OF CHOICES** for a date to begin or for the conversation to continue after a day out in the city



MASSING SCHEMES

SCHEME 1 - SUPER MAT

744 Singles Units - 9114m²
 FAR: 5.4
 Floor Communal Area - 11310m²
 Ground Communal Area - 2050m²
 Courtyard Space - 3360m²
 Commercial Podium - 2050m²

SCHEME 2 - SINGLES MAT, LOVER'S SLAB

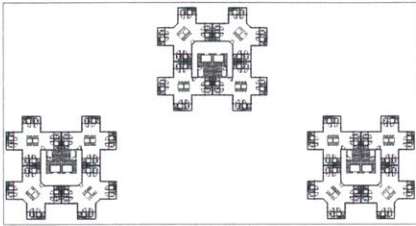
218 Couple's Units - 9114m²
 388 Singles Units - 4875m²
 FAR: 6.3
 Floor Communal Area - 11310m²
 Ground Communal Area - 2050m²
 Courtyard Space - 3360m²
 Commercial Podium - 2050m²

SCHEME 2 - SINGLES PODIUM, LOVER'S TOWER



754 Couples Units - 13850m²
 388 Singles Units - 4875m²
 FAR: 7.8
 Floor Communal Area - 7800m²
 Ground Communal Area - 2050m²
 Courtyard Space - 3360m²
 Commercial Podium - 2050m²

TARGET FAR: 7.5

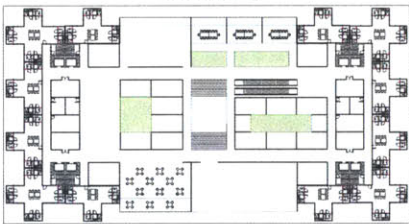
TOWER (EFFICIENT)





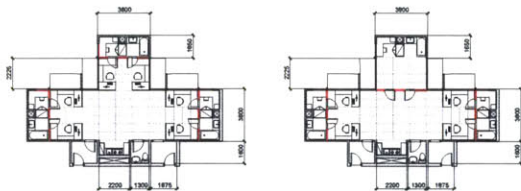
FAR: 7.5
STORIES: 23
EFFICIENCY: 83%
UNITS: 1024
NOTES:

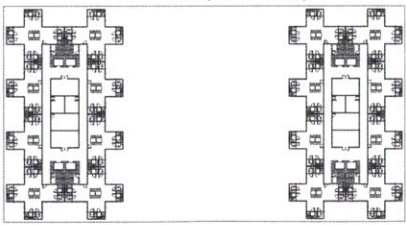

MAT (IDEAL)





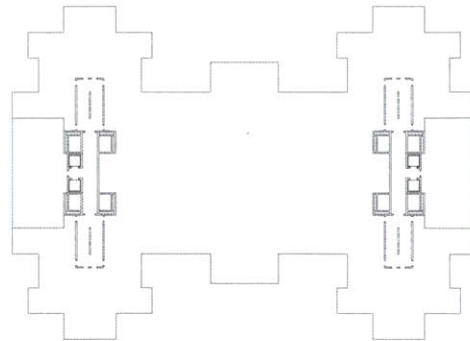
FAR: 7.5
STORIES: 4
EFFICIENCY: 40%
UNITS: 160
NOTES

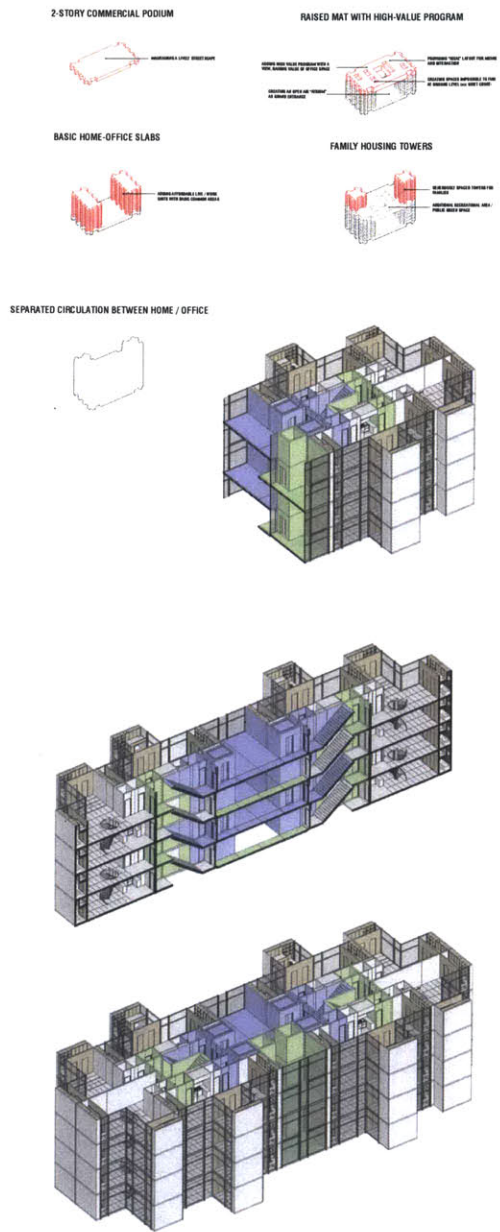
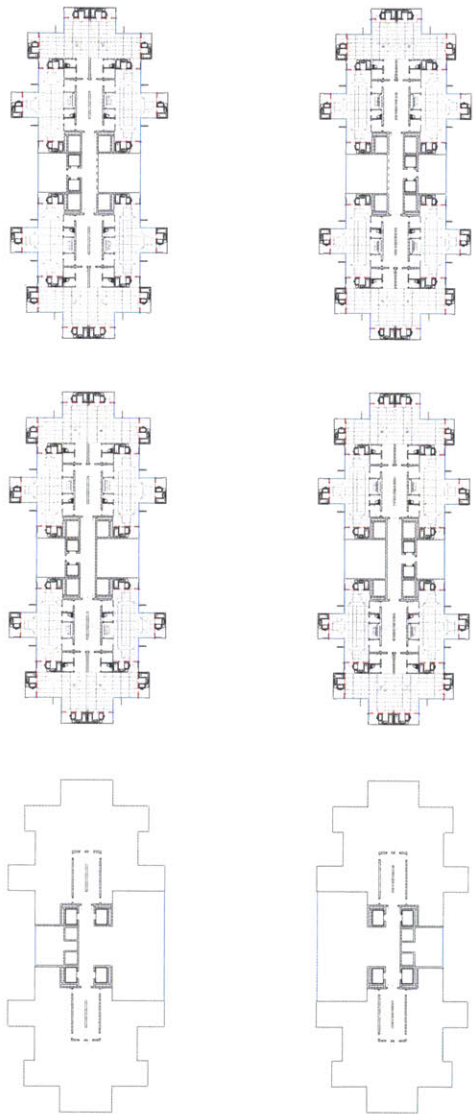




THICK SLAB (IN BETWEEN)



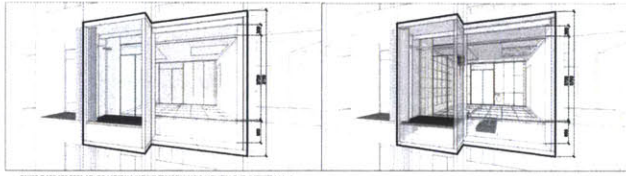
FAR: 7.5
STORIES: 14
EFFICIENCY: 65%
UNITS: 784
NOTES

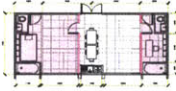
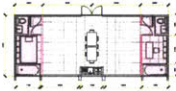
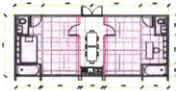


UNIT DESIGN | **FLOOR LAYOUT**

GOAL: TO ALLOW A SINGLE SPACE TO BE USED AS BOTH HOUSING AND OFFICE AT DIFFERENT TIMES OF THE DAY, IN ORDER TO CREATE AFFORDABLE LIVING SPACES FOR SINGLES AND A VIABLE PRIVATE HOUSING MODEL.



BASED FLOOR AND DRIP COULDS CONCEALS BARRING DISOCCUPYABLE ACTIVITIES THAT "ACTIVATE" 1 M²

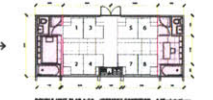


AFFORDABILITY

The unit must be affordable while maintaining the "net" of mixed uses.

NET AREA = 1.0 : 1

RENT OUT AS SMALL OFFICE



SHARED SPACES

The unit should provide all of a tenant's immediate needs, allowing to clearly separate, function as common spaces. Based on the proposed plan, it seems that sharing with one other residents is likely for this size space.

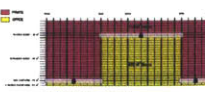
RETRACTABILITY

The unit must be fully retractable to its "house" or partial condition, for those who choose to stay at home or have their days off of work.

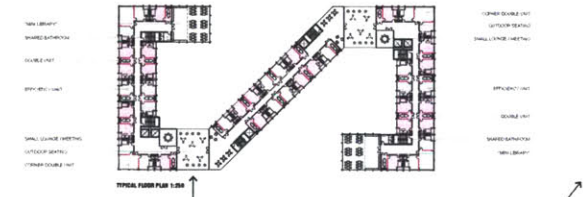
OFFICE SPACE YIELD

Small offices have many benefits to help us use our unit space as well. The typical small office ranges from 20m² to 30m².

UNIT AREA	30m ²	30m ²
OCCUPANTS	2nd	2nd
NET AREA / PERSON	15m ²	15m ²
OFFICE AREA / PERSON	10m ²	10m ²
OFFICE SPACE USAGE	71%	66%
OFFICE SPACE TIME	85%	85%



GOAL: TO CREATE A FUNCTIONAL OFFICE FLOOR ENVIRONMENT THAT CAN BE SHARED WITH RESIDENTS DURING THE DAY

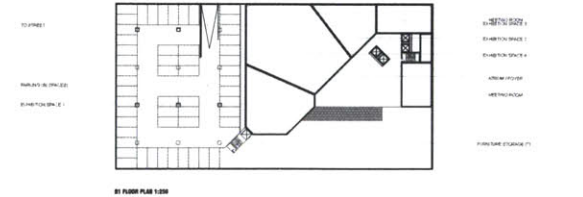
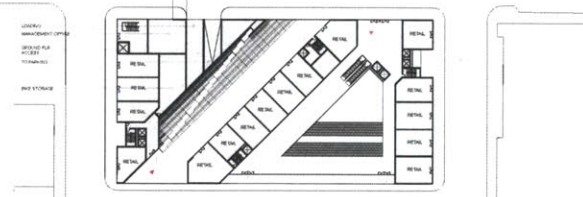
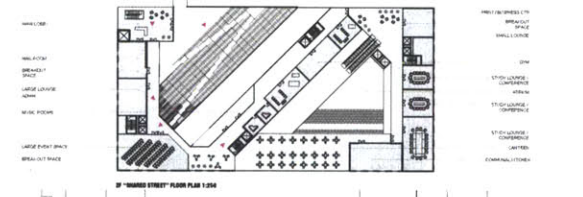


LINKED FLOORS

To maintain the availability and variety of on-floor amenities such as built-in storage, meeting rooms, telephones and fax machines, it is important to avoid elevators. The elevators are located away from floors by outdoor platforms.

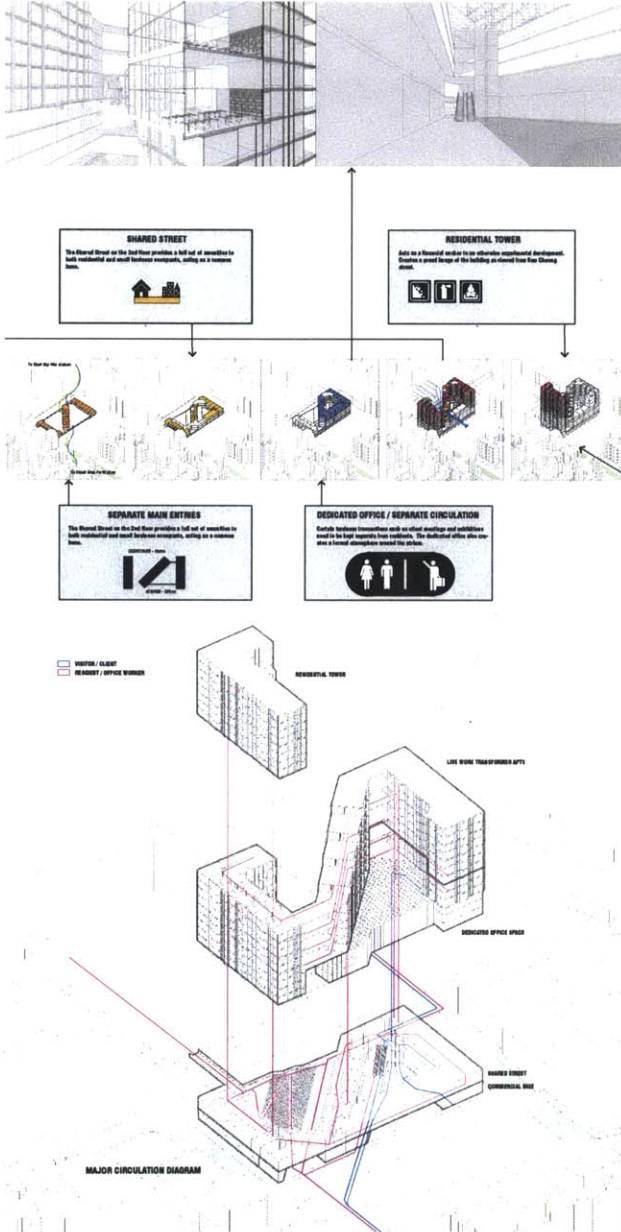
MINI LIBRARIES

To offer step-of-home residents a space environment to stay and relax in and share to have without getting in the way of other activities.



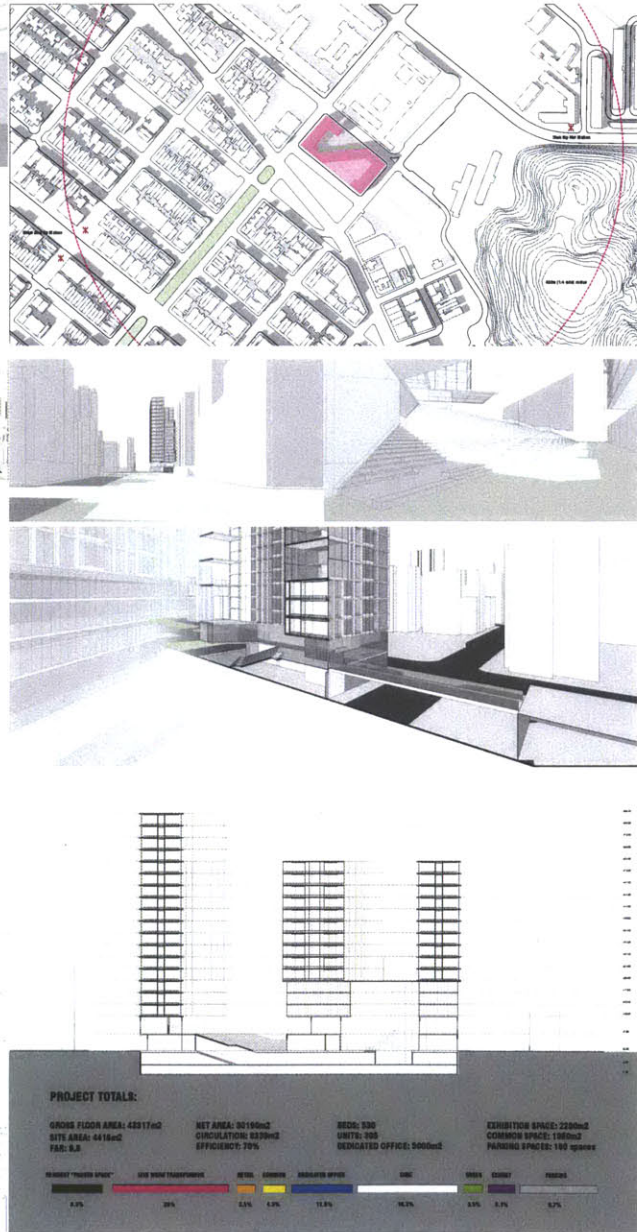
MASSING

GOAL: TO CREATE A SET OF BUILDING-WIDE SPACES THAT MEETS THE FULL RANGE OF NEEDS AND SERVICES FOR BOTH RESIDENTIAL AND OFFICE PROGRAMS



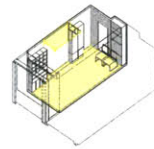
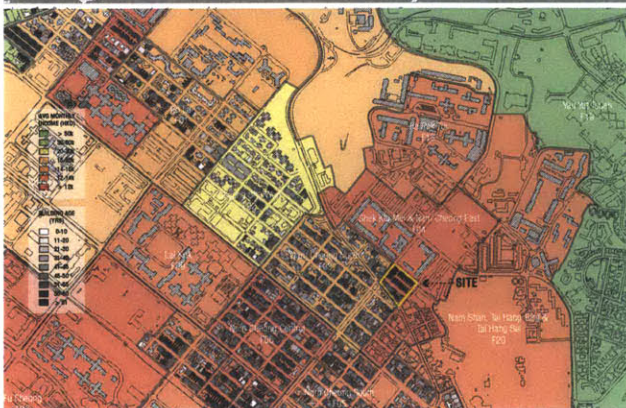
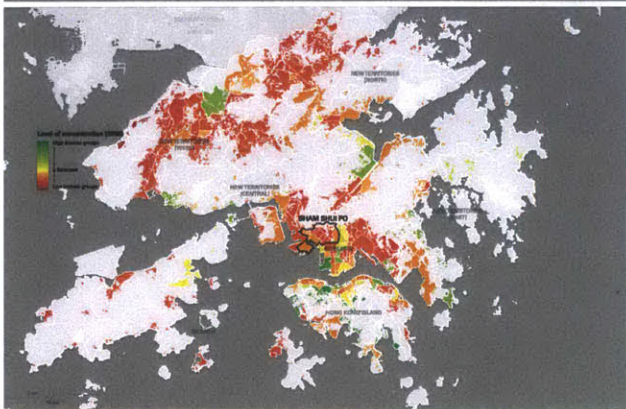
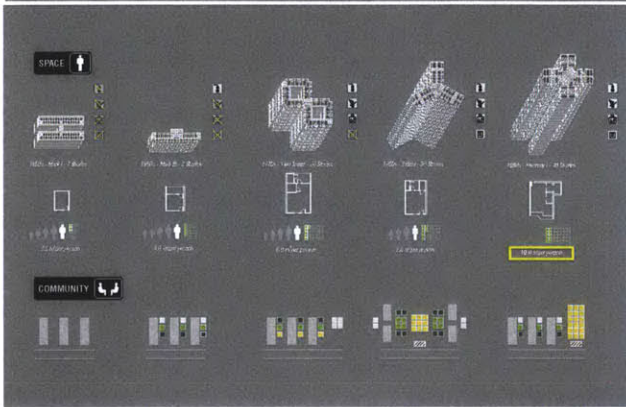
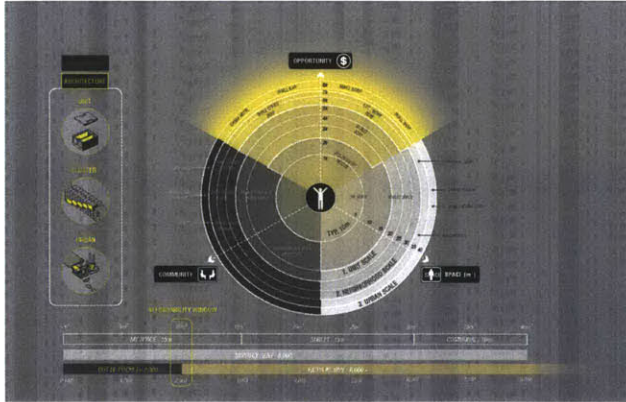
SITE STRATEGY

GOAL: TO INTEGRATE THE BUILDING WITH ITS IMMEDIATE CONTEXT BY BUILDING UPON LIMITED GREEN SPACE IN SHAM SHUI PO

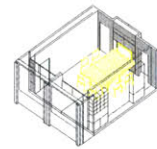


PENULTIMATE REVIEW: November 29, 2012 (Part 1)

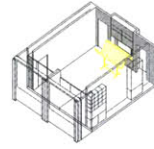
CASH - Communal Affordable Singles Housing
A Study In Hong Kong



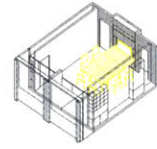
[LIVE] Retain Bed / Cleared Floor
This is the most traditional layout with a bed and a desk.



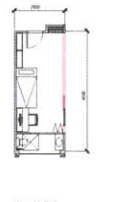
[COMBINE] Elevated Office
This is the most traditional layout with a desk and a bed, but the bed is elevated to create a living area.



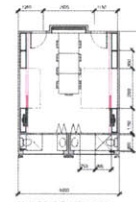
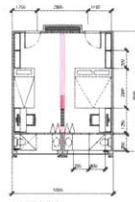
[EASE] Fold Out (Reversible, Small Office)
This is the most traditional layout with a desk and a bed, but the desk is foldable.



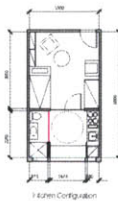
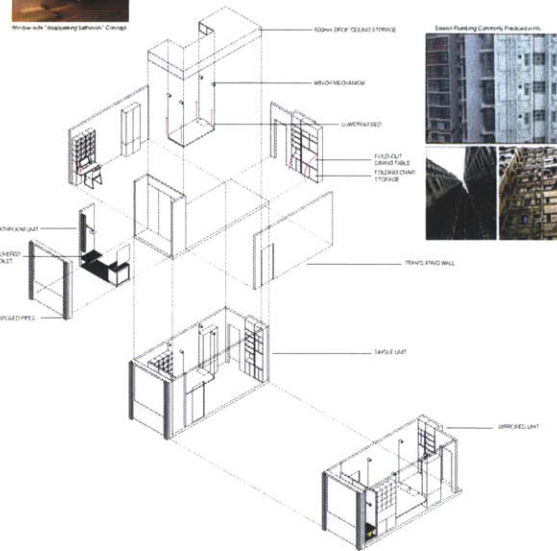
[FLEX] Change Room (PAPER/DESK STAGE)
This is the most traditional layout with a desk and a bed, but the desk is a changeable stage.



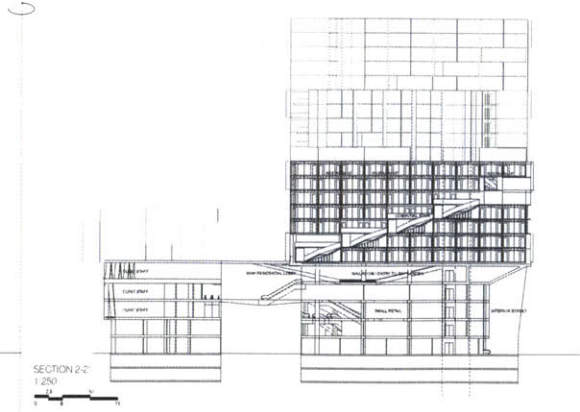
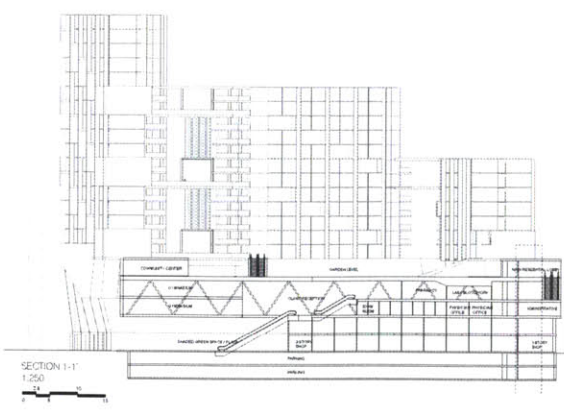
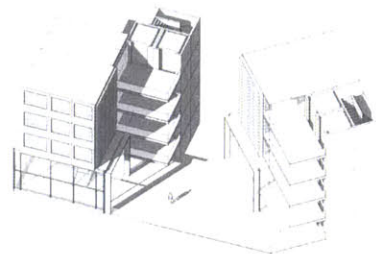
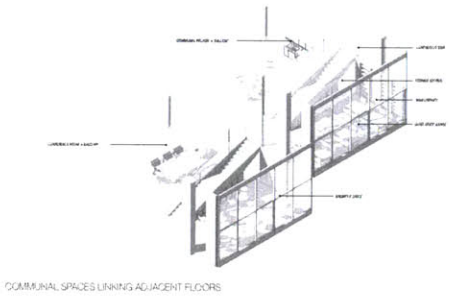
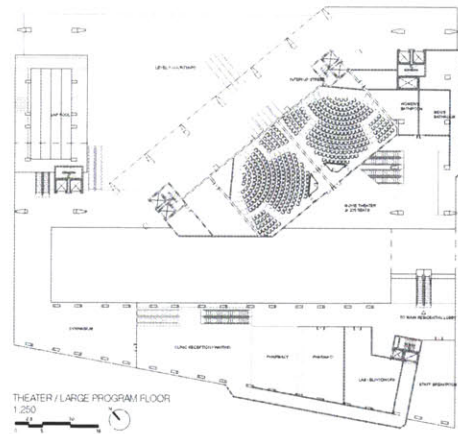
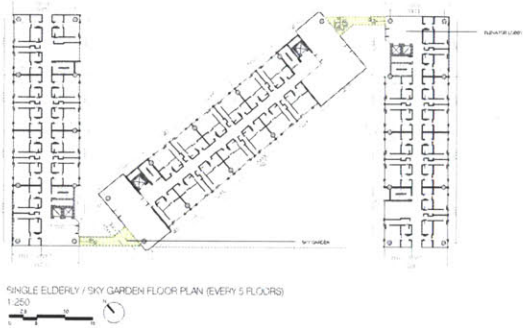
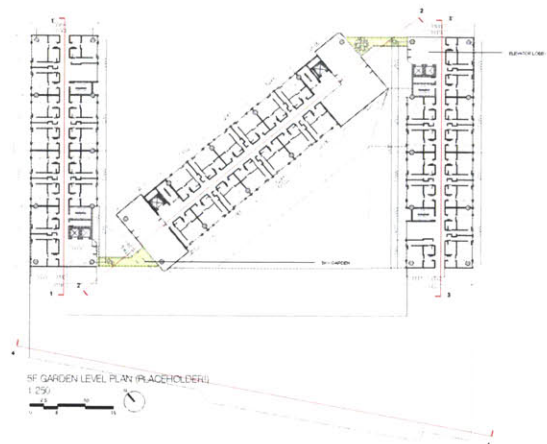
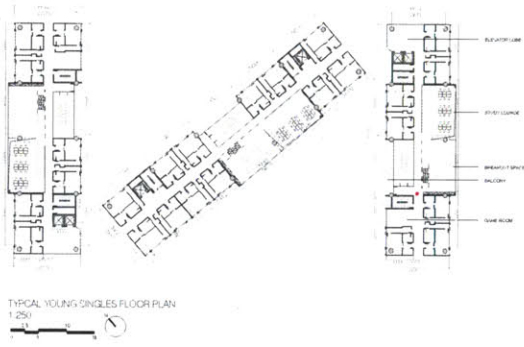
YOUNG SINGLES UNIT PLAN
1:30



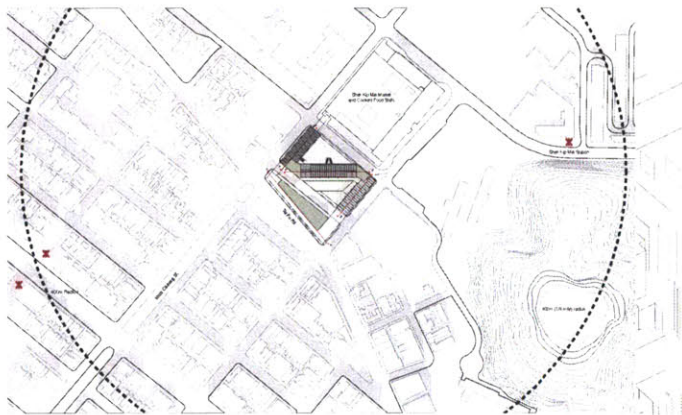
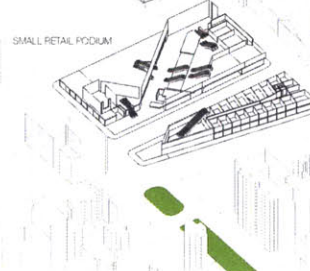
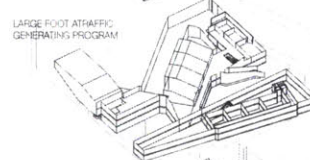
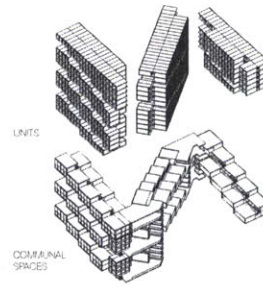
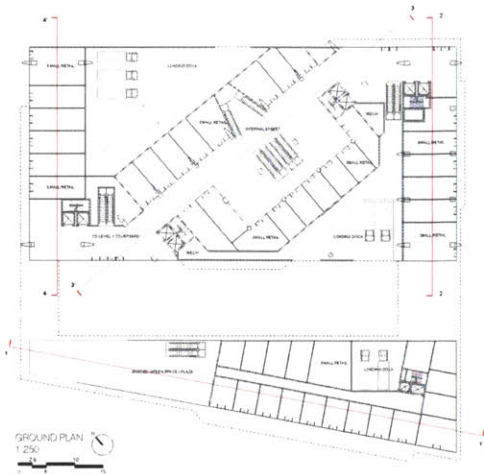
Work with 'teaching' common' concept



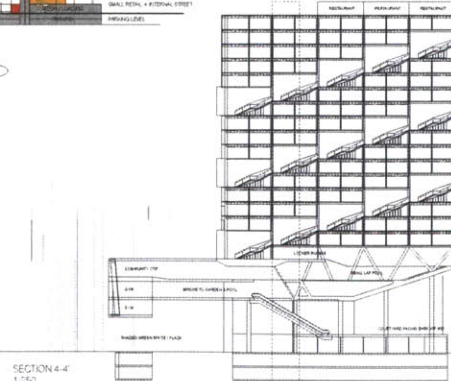
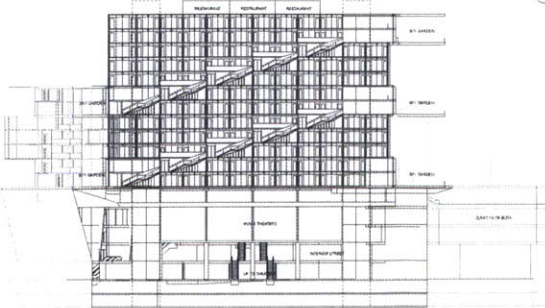
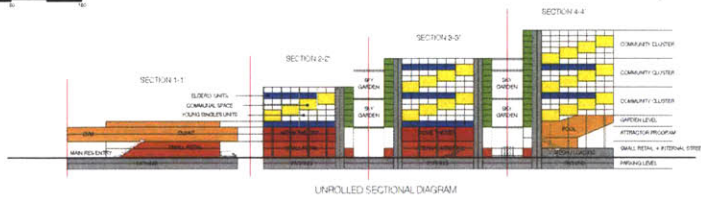
TYPICAL ELDERLY SINGLES UNIT PLAN (21m2)
1:30

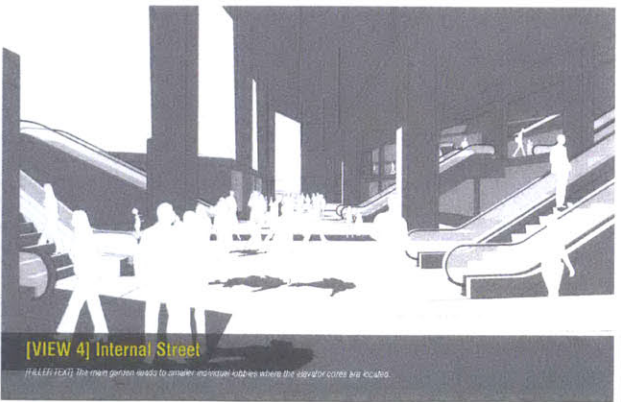
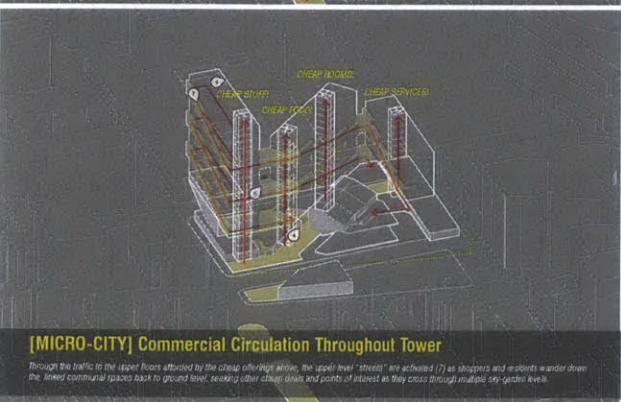
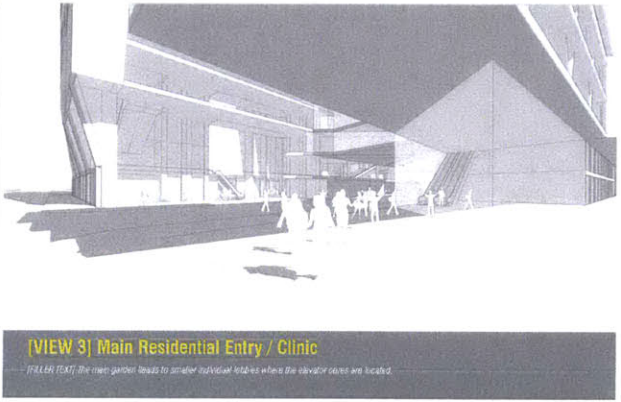
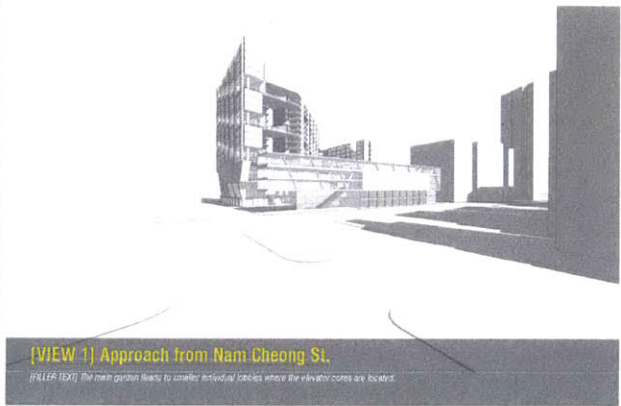
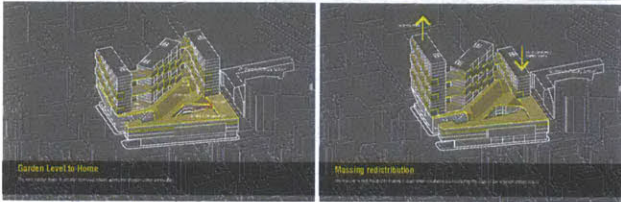
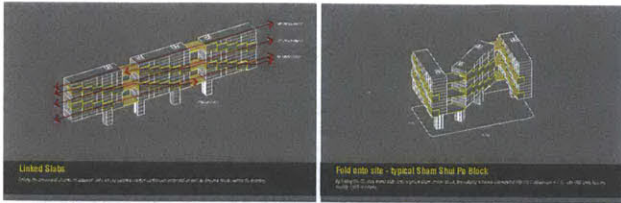


PENULTIMATE REVIEW: November 29, 2012 (Part 2)



EXPLODED AXONOMETRIC

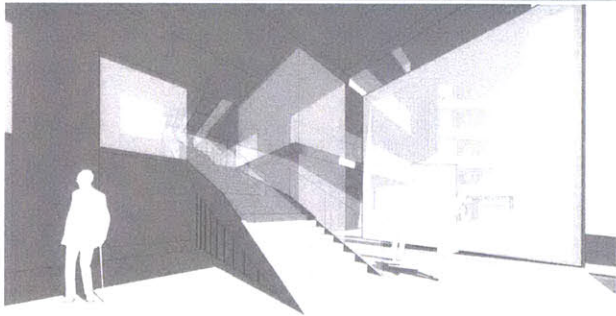






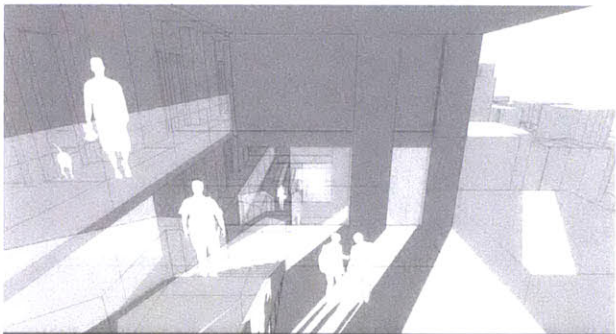
[VIEW 5] Garden Level

[FILLER TEXT] The main garden leads to smaller individual lobbies where the elevator cores are located.



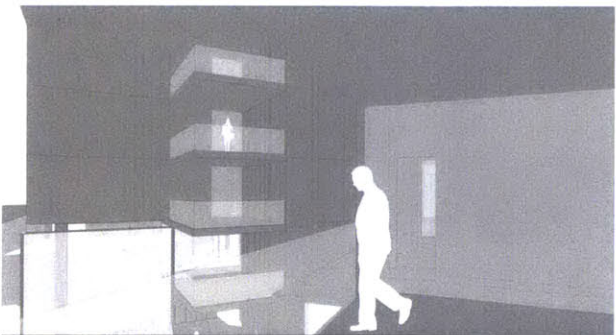
[VIEW 6] Elderly Level Lobby

[FILLER TEXT] The main garden leads to smaller individual lobbies where the elevator cores are located.



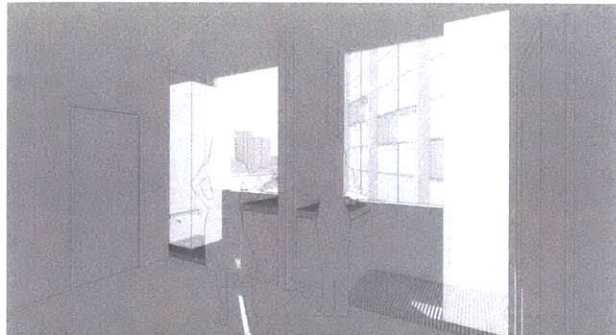
[VIEW 7] Linked Communal Spaces

[FILLER TEXT] The main garden leads to smaller individual lobbies where the elevator cores are located.



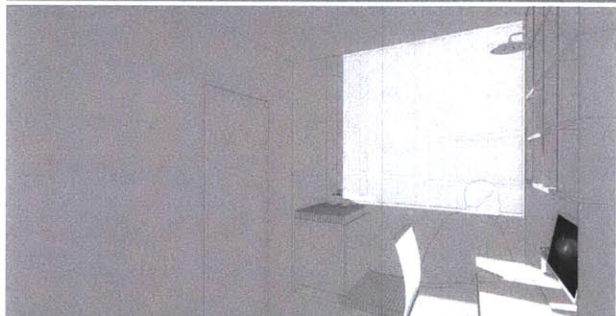
[VIEW 8] Typical Elevator Lobby

[FILLER TEXT] The main garden leads to smaller individual lobbies where the elevator cores are located.



[VIEW 9] Expanded 30 m Living Room

[FILLER TEXT] The main garden leads to smaller individual lobbies where the elevator cores are located.



[VIEW 10] Private 15m Bedroom

[FILLER TEXT] The main garden leads to smaller individual lobbies where the elevator cores are located.



[COST / CONCLUSION]

[FILLER TEXT] The main garden leads to smaller individual lobbies where the elevator cores are located.

