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# Reinvestigation of Culture

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Reinvestigation of Culture  
A Design of the Reconstruction of Welfare Houses in China

A Thesis Presented

by

YI ZHANG

Submitted to the Graduate School of the  
University of Massachusetts Amherst in partial fulfillment  
of the requirements for the degree of

MASTER OF ARCHITECTURE

September 2012

Department of Art, Architecture and Art History

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A Design of the Reconstruction of Welfare Houses in China

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## DEDICATION

To my parents and family for their endless love and support.

## ACKNOWLEDGMENTS

Special thanks to Kathleen Lugosch, Stephen Schreiber and Ray Kinoshita Mann for their  
academical advices and kind help.

## ABSTRACT

### REINVESTIGATION OF CULTURE

SEPTEMBER 2012

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Due to the culture revolution, inflation of economy and globalization, China has been suffering from mass unqualified products of architecture, loss of culture and traditions, also unaffordable real estate; causing the instability of the society, in which emptiness, anxiety, uncertainty of people are occupied. Burdens must be released. And culture need to be revitalized. By studying I-Ching and Taoism, the origins of Chinese civilization, finding the philosophy of Tao which can be carried into architecture, the equilibrium between culture and globalization is established. The nation-wide uniformed apartments built under the welfare oriented housing distribution system in the 1980's, are now either torn down or hidden behind the high rises and forgotten. The ones which are survived from the development of real estate, could be reconstructed to be a nice and affordable community where social interaction is encouraged, virtue of individual is cultivated and culture is renovated. In the philosophy of Tao, when one side is compelling and overwhelming, the counterpart could be perked up by yielding and returning. Therefore, in the design of the reconstruction, deduction is the motion of Tao. Introducing light scoops into the building to create horizontal and vertical courtyard, sunlight, rainwater and wind is able to come into the building. People is able to perceive the nature inside where balance of artificial and the nature is built. Also the light scoop divides the spaces into layers so that people have a private space to think as well as a semi-public space where social interactions are forced to happen. The space of light scoop is functionally blank, though. It is spiritually abundant.

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# CHAPTER 1

## FORM, OR A WAY OF THINKING

### Introduction

China is now experiencing the impact of globalization in all aspects. With its development of economy, technology and military, the world began to realize that every movement of China matters. Like parents fear on losing control of their teenage child. Therefore, they racked their brains to be pervasively involved into activities of China. By adding forces controlled by themselves, the reactions back on them from the forces, as they wish, would be foreseeable. Contrarily, in Chinese perspective, globalization is not a bad thing, that no one can survive as an isolated individual. However, the Cultural Revolution (1966-1976), which denied and erased almost all Chinese culture from the 5000 years' civilization, had made Chinese culture too vulnerable to resist the force of globalization. This dissertation is a process of reinvestigate the Chinese culture in an architectural way - finding the philosophies of traditional Chinese architecture which form the human behavior, social interactions, emotions, sensation and perception of the nature, values, etc, thus, reforming the houses based on those philosophies - in order to reinstall culture internally and essentially. Hence, an equilibrium of culture and globalization is built.

### Is Culture Dying

*'It is my hypothesis that the fundamental source of conflict in this new world will or be primarily ideological or primarily economic. The great division among humankind and the dominating source of conflict will be cultural'*

*(Samuel P. Huntington, The Clash of Civilization, Foreign Affairs, summer 1993)*

The world's economical and social transformation in recent years has made it so interrelated and interacted that the dominate culture, the westerns as at '*a peak of power*' (Samuel P. Huntington), is overwhelming the others. Chinese culture is surely the been dominated one, because of China having been weak in economic and militarily for decades, that '*it lost its orientation, self-awareness and intrinsic vitality*' (Wu Liang Yong, *Research Library of Chinese Architectural Culture*, 2002).

Does it mean that Chinese culture is dying, or it is just a state of imbalance in the cultural hybridization progress in Chinese civilization? It is true that economical, social and military invasion always accompany with cultural penetrations. But if you look back into the history, no matter in Tang, Song and Yuan dynasty (618 AD-1368 AD), when China was most powerful and prosperous, or in Qing dynasty (1644 AD-1911AD), when western world started the intrusion, Chinese culture has always been experiencing integration and assimilation within the subcultures in China, and from other cultures all over the world. On the other hand, however, you can barely find any trace of Chinese culture in the western world. Deductively, western culture can be described as conquering, while Chinese culture as obeying. Like 'Yang' and 'Yin', They perform as counterparts. That is to say, assimilation does not mean dying of culture. Yet, it is just one implicit character in Chinese culture. The failure of equilibrium from the absorbing was merely caused by the weakness in the basis, something demolished by Cultural Revolution.

### **Contemporary Chinese Architectural Culture**

The imbalance has caused Chinese people lacking of confident on their own culture. Therefore, they have been possessed in pursuing the western culture in recent years. For this reason, architectures were reformed to adapt this change of human behavior and lifestyle.

Thereafter, the population bomb, the flash of urbanization, the economical inflation boosted the westernization tremendously. Owing to the massive construction, concrete cubits of so called western modern architecture were piled up in the cities. The Chinese architects worked basically on producing qualified standardised outputs to hurry costumers, copying and pasting.

Here rises two phases. For one thing, those buildings look more like copies of shape and facade from their precedents in western world, whose idea, logic or concept had been ignored. Moreover, the architects had generated those buildings into moduls which has been copied and pasted all over the country. Even worse, some high-rises residential blocks boasting themselves European style houses, are just those moduls disguised by facades composed with Rome, Renaissance or Baroque symbols.



Figure 1: Typical Real Estate Apartment Buildings

For the other, governments, scholars and rich people are calling for traditions more and more recently, when they got bored with the masses of western style buildings and realized that rare Chinese style was an alternative way to flaunt. Thus, pseudo-traditional buildings are springing up. Western facade of residential moduls were out and replaced with Chinese symbols. The traditional residential areas were redecorated into boutique and tourism districts with bars, restaurants and luxury shops. Furthermore, shopping malls, government offices were dressed up with local traditional residential appearances.

### **Kuan Zai Alley**

Kuan Zai Alley is a historical preservation project in Chengdu. The Alley used to be a famous traditional residential area. Because of its fame, it escaped from being torn down and replaced by high-rises. However, residents were still forced to move out with a huge compensation from the government. And the Alley was reconstructed into a turist spot. When you walk into the Alley, you can never feel the cozy and warm neighborhood from the hustle and bustle of the bars and restaurants.



Figure 2: Kuang Zai Alley

## **Qing Pu**

Qing Pu is a new satellite city of Shanghai. In order to get a image of a city inherited the tradition of Shanghai. MADA s.p.a.m. designed the main shopping district and governmental building like photocopies of Shanghai Linong, a typical traditional residential style.

From those two phases, you can easily find out that the contemporary Chinese architecture put too much focus on form and appearances. While, the essence of architecture and design has been entirely neglected.



Figure 3: Shopping Mall in Qi Pu

### **Formalism**

Wu Liang Yong Argued this phenomenon for '*the architects, all educated from the western architectural system, being dominated by the system, had no comprehensive understanding on the western culture, while had no root in Chinese culture either*'.

*(Research Library of Chinese Architectural Culture, 2002)*



It is surely one of the reason, notwithstanding. From my perspective, the addiction to form comes from Confucian, an ideology had ruled China in Feudal period for thousands of years. Confucian originated in the time when morality was corrupted. It encouraged people to gain virtue and maintenance of ethics, through self-cultivation and self-creation. Afterwords, Confucianism was used gradually as a tool to consolidate the power of the empire by distorting the meaning of 'Ren', 'Yi' and 'Li' into altruism, loyalty and hierarchy, so as to constrain people's thoughts, emotions and behaviors. Owing to it, formation, the external performance, weighs enormously more than feelings, the internal perception.

A good example in architecture is the use of DouGong (cap and block of brackets) structure, started in 770 BC. It was an intelligent invention, introduced into the timber structural system of traditional Chinese architecture which jointed pillars and columns together, helping transfer a large area of horizontal force to the vertical. Till the period of Ming Dynasty when confucian was most flourishing, the use of DouGong was exaggerated into a symbol of status in hierarchy than its initial function in structure.

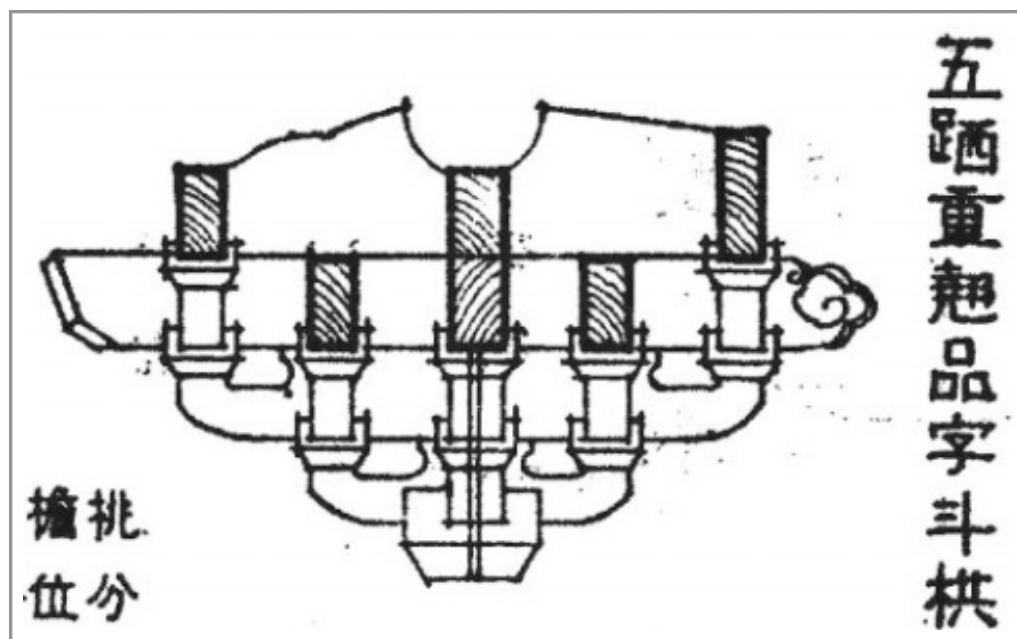


Figure 4: Section of Original Dou Gong



Figure 5: Dou Gong in Ming Dynasty

The pursuit of form lies largely in the influence of the ideology of Confucianism which has rooted in Chinese people's minds all along. Still, we can see its trace in the CCTV tower competition recently. Required by the owner, the CCTV tower has to be a landmark in Beijing CBD. Two designs were fighting for the final award. One was OMA's huge tower, an extreme way to present their metropolitan ideas on bigness and congestion, as they compressed a site for at least six skyscrapers into one tower. The other one was Toyo Ito's park. Ito's concept of landmark was not visual but spiritual. By providing an attractive parklike space which people would like to think about and talk about, the place is going to be a landmark in everyone's mind. With no doubt, the external formed landmark defeated the internal sense of landmark.



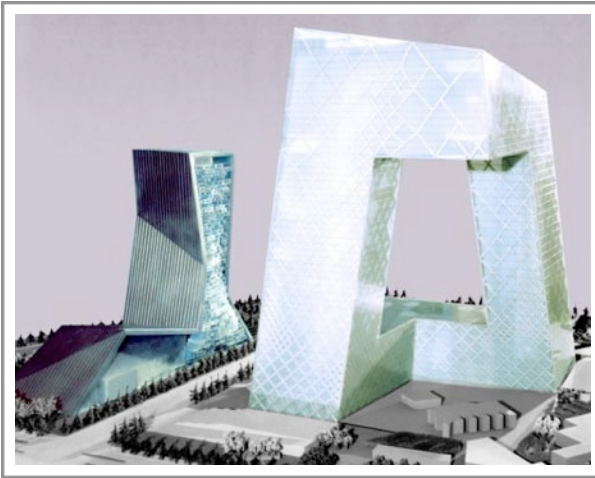


Figure 6: OMA's Design of CCTV Tower

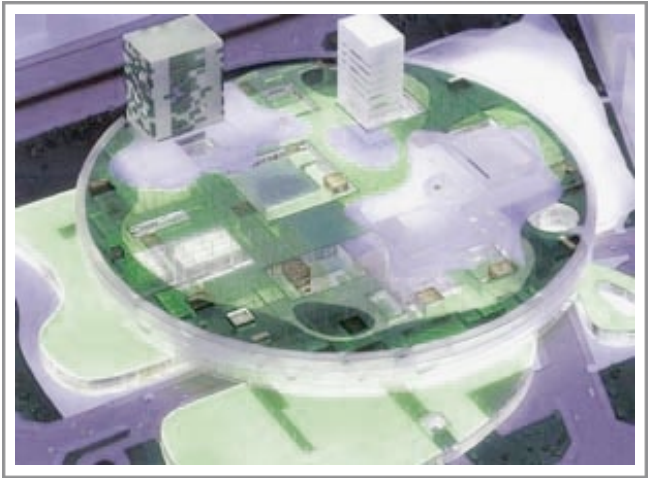


Figure 7: Toyo Ito's Design of CCTV Tower

### **Critical Regionalism**

Beyond the form, some architects did try to explore the traditions and regional culture from criticizing urbanization and globalization. The campus design of China Academy of Art was a dream of coexistence between people, architecture and nature, realized by Wang Shu, the winner of 2012 Pritzker Architecture Prize.

In order to get the sense of coexistence, Wang Shu started with a study on Chinese traditional landscape paintings. The concept of 'garden' or 'landscape' in Chinese culture is totally different as its western definition. It is more accurate to be explained as nature inserted into urban, making it half natural, half architectural status. Following this concept, all buildings on campus were reversed and deflected in order to coordinate the geometry of hills, rivers, farmlands in the site, in a poetic pastoral language. Subsequently, those buildings naturally produced eaves, caves, flying routes and courtyards, the typical scenarios of Chinese garden. What is more, he put his sarcastic criticism on facts of today's urban conditions into his design, by recycling and reusing over seven million tiles and bricks from building torn down in the neighbor city.

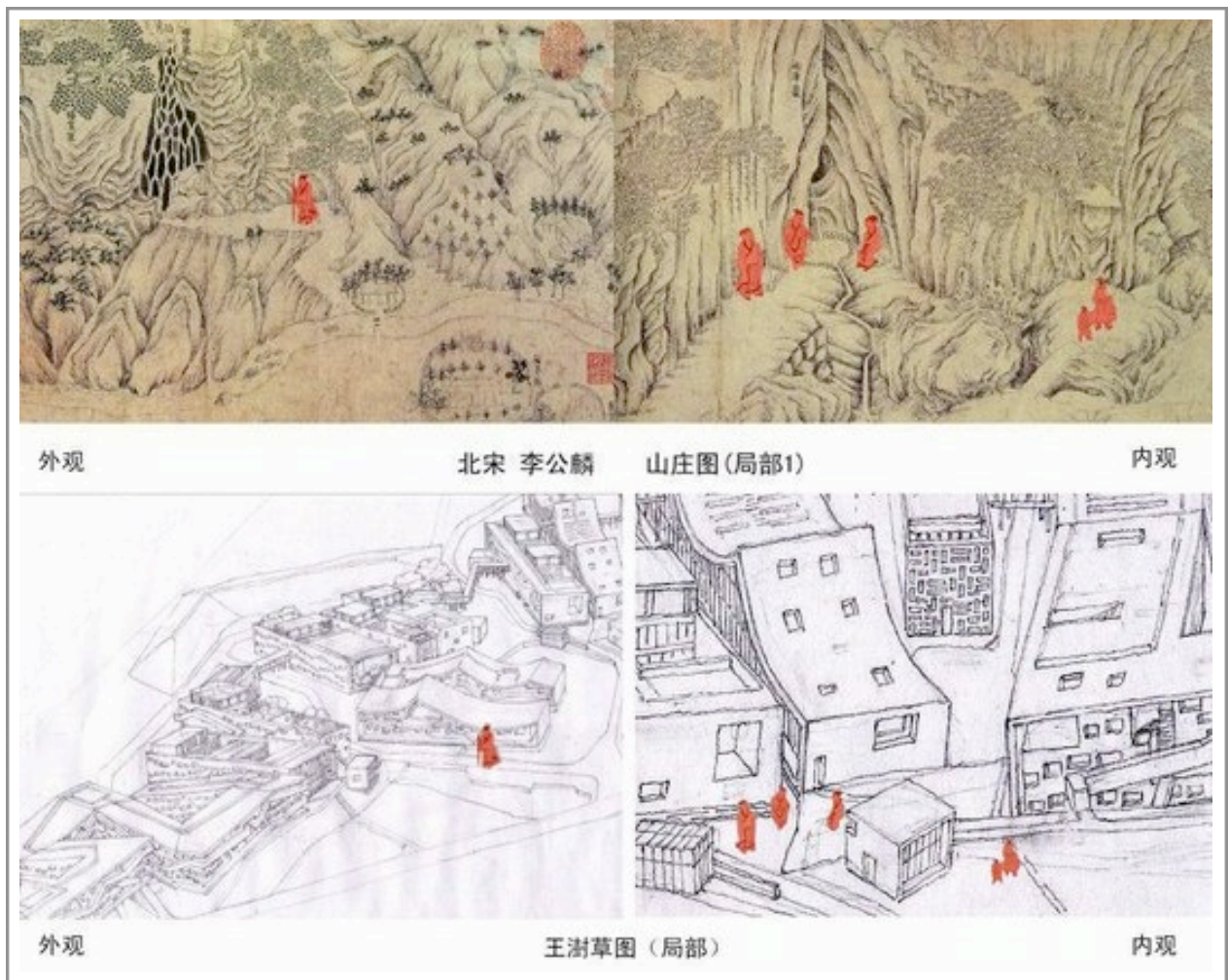


Figure 8: Design Concept of China Academy of Art



Figure 9: The Use of Recycled Bricks in China Academy of Art





Figure 10: Bridge of China Academy of Art

The two arguments on critical regionalism is that the concept is indeed beyond the form but never able to jump out of the form, as well as that the critical spirit on urbanism has driven it away from the urban context. No architecture can be isolated from physical or social interactions.

### **Is Architecture Dying**

#### **The Giant Machine**

The tremendous conflict between modern metropolitan and tradition brought us critical regionalism, who create an utopian world carrying peoples's ideals and dreams. In the realistic world, nevertheless, cities are transforming from an administrative, legal and religious center for settlement, to a machine trying to produce maximan profits. Buildings have been built, for one thing, so fast that more and more labors could move in and make this giant machine operate; for

the other, so efficient that peak productivity and benefits could be reached; and lastly, so smart that human behavior were sought for most work with least movement, least social interactions in other words.

*'The modern city is a thinly disguised mechanism for extracting productivity out of its inhabitants, a huge machine that destroys the very life it is meant to foster.'*

*(Mark Wigley, Constant's New Babylon, 1999)*

The urbanization process of China, where formalism was deeply rooted, architectural products are demanded for the gigantic population, economical outputs are the major consideration, is reasonably comprehended as a transformation into a 'smart' machine. So as to achieve the 'smart' idea, softwares were introduced and envolved increasingly into the designs. Engineers could use softwares to calculate and quickly built up an architectural modul which is most sustainable, efficient and profitable. Here we would like to ask, if architecture will be replaced by technology? The answer is certainly yes only if architecture is treated exclusively as form and function, it is dying to an obedient of money and technology.

### **A Way of Thinking**

In spite of the taking over of technology, we are living in a world full of changes. Nothing can be stably perfect, even through software's accurate calculation. In the case of real life, everything is to some extent, affected by emotions, sensations and uncertainties. As human-beings are not unsubstitutable parts of the urban machine, but are intellectuals desiring for ideas, attitudes and spiritual consolations. The progress of human civilization from thousands of years ago, is gradually digging to a deeper comprehension and realization of this world, from an object, to molecules, to atomis... ..to quark. Likewise, the architectural value system is inherent in

concepts which reach beyond the intrinsic value of discipline. Architecture is no longer the result of design, but is the result of analysis, and the uncertainty of the analysis results in the design. Thereupon, form is going to be unreadable. Because the form is generated from a lot of deep and critical thinkings, which make the tension in the form is even more powerful.

## CHAPTER 2

### CHINESE SPIRIT

#### I-Ching

‘雕梁画栋，绿荫满院，一夜之间夷为平地，不经为此黯然神伤’

‘残山剩水，失去昔日烟波浩淼的诗情画意’

*(Wu Liang Yong, Research Library of Chinese Architectural Culture, 2002)*

#### **Metaphysics**

While we are pitting about our losses in Chinese architecture, our ideas, aesthetic values and desires are experiencing assimilation from globalization simultaneously. When we looked back into the cultural hybridizations in Chinese history, we could find out there was a spirit, something like an anti-virus attached to the intruded culture spontaneously. It is the spirit that we are obliged to regain in the analysis of uncertainty and critical thinking in architecture design, so that the Chinese's ideas, attitudes and spiritual consolations would become irresistible tensions in the transforming forms, tensions that can be derived with more vitalities.

The spirit is I-Ching, Classic of Changes. It is a book about observing the moments and changes of the universe, analyzing the dynamic balance of the opposites, ‘Yin’ (negative) and ‘Yang’ (positive), in the determination of restituting to the incipient of origin, the instant before the starts of changes. Subsequently, subconsciousnesses of pursuing harmony and balance have rooted in the entire aspects of Chinese civilization, humanity, sociology, geography, climatology and medicine. Confucian have set a materialistic boundary to simplify and trivialize people's thoughts and behaviors, a cage named formalism. Contrarily, in I-Ching, a metaphysics of

diversity and uncertainty, people are seeking for awarenesses, sensations and feelings which incline to the naturest self. Therewith, the manipulation is in vain. This metaphysics from I-Ching is called Tao. The ideology from Tao is called Taoism.

## **Feng Shui**

I-Ching, as a spiritual guide book, when its Tao infiltrated into sociology, science and art, it transmuted into pragmatical. Divination is not prophesy, but analysis on the instant, on the composition of ‘Yin’ and ‘Yang’, so as to find the orientation to balance. The principle of practices in architecture according to the philosophy of I-Ching is Feng Shui.

*‘Feng Shui, also named Kan Yu, is an abstract term to represent the pseudo-physical science of climatology and geophysics. It is an art of placing, siting and orienting the buildings so that the building is in harmony with everything that surrounds it.’*

*(Evelyn Lip, Feng Shui, 2004)*

In traditional Chinese architecture, elements like roofs, columns and windows were placed; colors, materials and shapes were arranged; as well as wind direction, light or shadow, magnetic field were calculated to achieve harmony in Feng Shui.

## **GuGong**

Take GuGong, the Forbidden City, as an example. Situated in the heart of Beijing, GuGong has served 24 emperors since 1420. It enclosures of 1,005 meters by 758 meters area and is surrounded by a moat. The concept of the planning is ‘前朝后室，左祖右社’ (Placing the public audience halls at the front and the private halls for resting at the rear, having the ancestor worship hall on the left and the shrine for the god of earth on the right), consisting of 999 rooms. Speaking

of the number of rooms, it is strongly related to the laws of I-Ching. In I-Ching, the odd numbers, 1,3,5,7,9 are considered as ‘Yang’. On the other hand, 2,4,6,8 are ‘Yin’ numbers. The number ‘9’ is the supreme ‘Yang’, which can only be used on the emperors. As a result, the 999 rooms are symboling the ‘Yang’ of the emperor. Since in I-Ching, six ‘nines’ are explained as extreme ‘Yang’. And in I-Ching, extreme means unbalance. Although ‘nine’ symbols of ‘Yang’ stand for the emperor, you can never find more than five nines in GuGong. Also in I-Ching, front is considered as ‘Yang’, rear as ‘Yin’. On the main axial of GuGong, three halls of audiences were placed at the front, serving the emperor and the ministers. No matter the number, position and function of the halls all represent ‘Yang’. Correspondingly, the two halls of residential for the emperor and his wife at the rear are representing ‘Yin’.

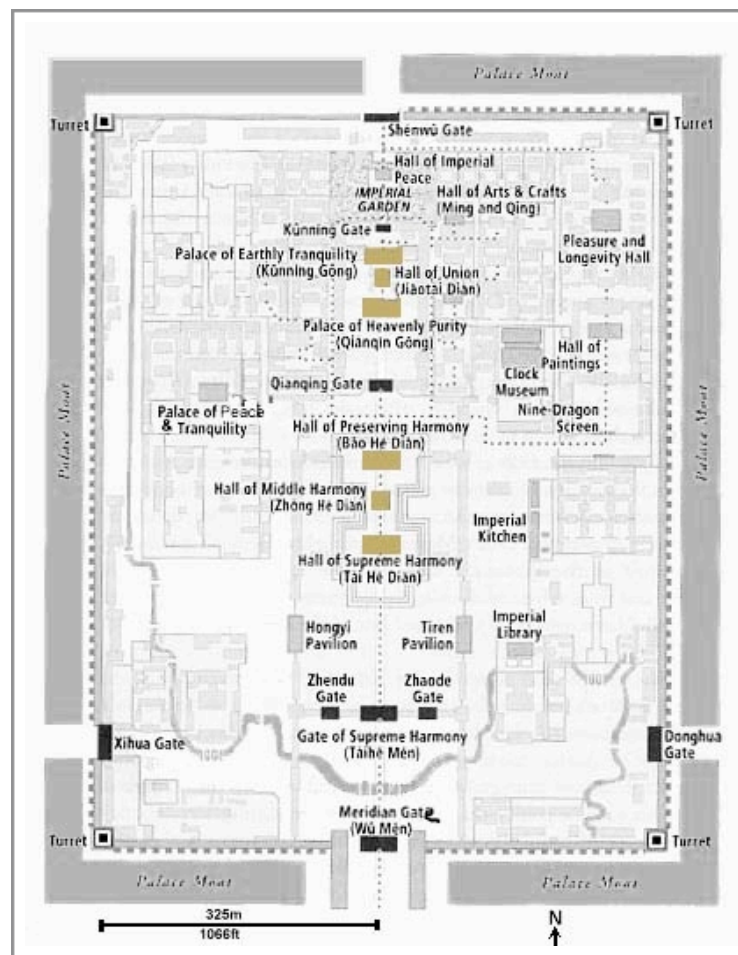


Figure 11: Map of GuGong



The geometry condition where GuGong is sited in is thought as in a good Feng Shui. The axial is from the north with hills behind and toward south with water in the front. Why is this good? Scientifically it can be explained that the mountain resists wind from the north in the winter and the water can bring fresh air in, in the summer. In ‘I-Ching, Feng Shui’, it is related to ‘五行’ (the five elements), Gold, Wood, Water, Fire, Earth. Gold is represented by west, Wood East, Water North, Fire South, Earth Central. The productive combination of the five elements is water with wood, wood with fire, fire with earth, earth with gold and gold with water. Meantime, the counter-productive combination is earth with water, water with fire, fire with gold, gold with wood and wood with earth. The colors of GuGong’s architecture tell the balance of the five elements. East is green, west white, south red, north black and the central yellow. The emperor is the ruler of this land, thus, the main element of GuGong is earth which is represented by the color of yellow and the shape of rectangular. Because of the productive combination of fire with earth, the walls of GuGong are painted red and the roofs are yellow. And since water is related to the north direction, the hills in the north should be shaped like the water element. At the same time, the water on the south is named ‘the golden water river’.

	<b>Yang</b>	<b>Yin</b>
<b>number:</b>	<b>1,3,5,7,9</b>	<b>2,4,6,8</b>
<b>position:</b>	<b>front</b>	<b>rear</b>
<b>function:</b>	<b>audience hall</b>	<b>residential</b>

Figure 12: Diagram of Yi and Yang



Figure 13: Roof of GuGong



Figure 14: Wall of GuGong

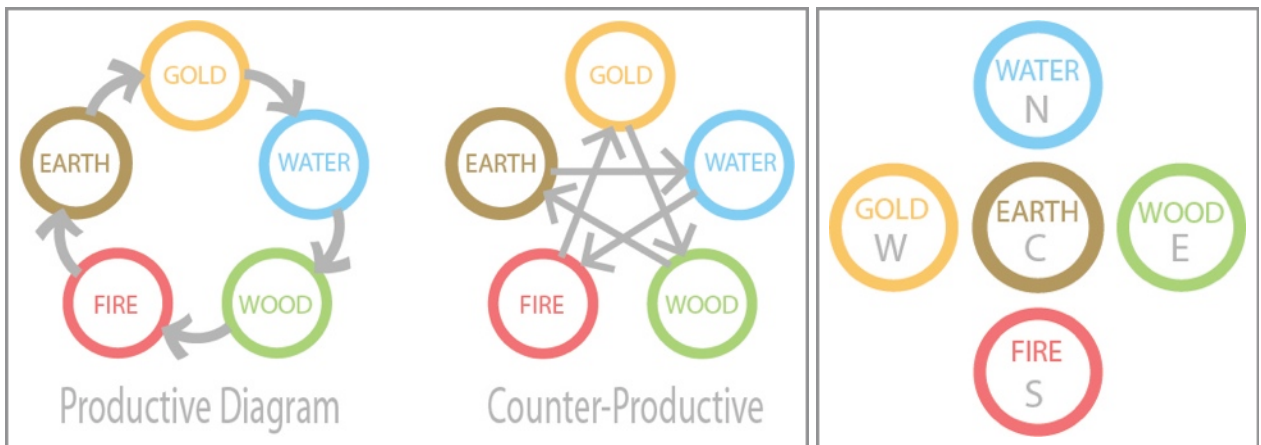


Figure 15: Diagram of Five Elements

Figure 16: Relationship between Directions and the Five Elements

## Balance

Feng Shui is such a praise of nature that a gigantic controversial with the modern city appears, as metropolitans are symbols of human's creativities. Is it inevitable that we deny globalization, urbanization in order to gain the harmony in Feng Shui? We crush down the machine, and start over again? We do make revolution, preventing culture and architecture from dying. But we don't repeat same things what Cultural Revolution did, devastating to innovate. The approach is balance. When one side is overwhelming, you perk up its counterpart.

## **Trace of Tao in Modernism**

Before we discuss how to arouse culture in modern architecture, it is indispensable to investigate the trends in modernization and urbanization, weigh the force and find out possibilities of coexistence.

### **Congestion**

In the book 'Delirious New York', Rem Koolhaas studied on the history of New York city and came up with the theory about bigness and congestion in metropolitans, considering the city and urban situations as a whole, instead of designing an isolated building, congesting the building and making it big. The methods is to integrate the fragmentation and chaos of nowadays' modern city. Congestion, a force on urbanization in acceleration, densification and proliferation, is a result of analysis on external forces of surroundings. While, Feng Shui is a result of internal force analysis of surroundings. In a word, the principle of Feng Shui is not conflicting but complementary on the process of urbanization.

### **National Art Museum of China Competition**

Most people are talking about how can culture be resistible from the congestion. So they segregate culture from urbanizing. Whereas, the design of National Art Museum of China by OMA proved that culture could be strengthened through congestion.

The initial concept of the design came from Koolhaas's theory of bigness and compression in metropolitan. In his explanation, the rapid growth of Beijing had created an entirely new skyline where art and culture had become the city's new icons. And the museum have been becoming larger and larger, more and more diverse that it implied an urban conditions in itself. in

other words, the museum became a compressed city. Bigness and compression are two distinct and complementary elements which are portrayed as vertical objects representing an integral part of a new urban fabric in Beijing and a horizontal plane compressed by Beijing's traditional urban fabric and culture in NAMOC.

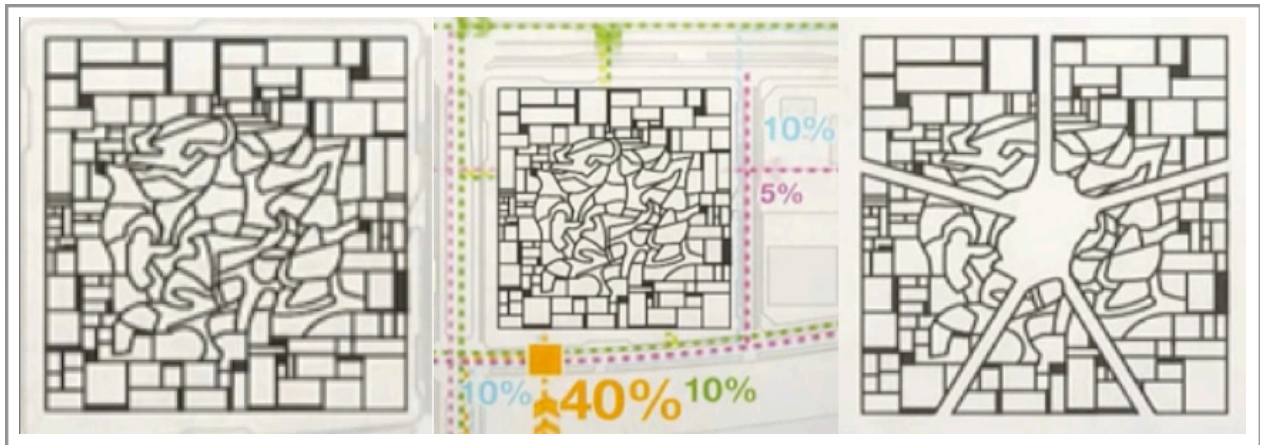


Figure 17: Congestion process of NAMOC by OMA

The plan has three layers. A star like path leads pedestrian and traffic flows around the museum city into the heart of NAMOC, like the main axes of GuGong, simple, clear and directional. The second layer is an orthogonal grid works as a perimeter of the plinth that continues the urban grid. A grid, in hierarchy sense, embodies the authority of the emperor. In addition, compression induced the third layer to be an artistic and free pattern. A meandering, spontaneous route, in which, visitors find their own path to contemplate and experience art. Very similar to serendipity, the soul of traditional Chinese garden, is that every instinctive movement unveils a surprising scenery.

In programming the exhibit areas, the mosaic-like space makes juxtaposition between interlocking boundaries possible that genres can grow or shrink or share spaces according to different installations.

Sudden spectacles in the museum are catalyzed by instancy and uncertainly, which means a space, as a result of the congestion of metropolitan, coincidentally, realizes the philosophy of I-Ching. Chaos and fragmentations are converted to balance unexpected incidents.

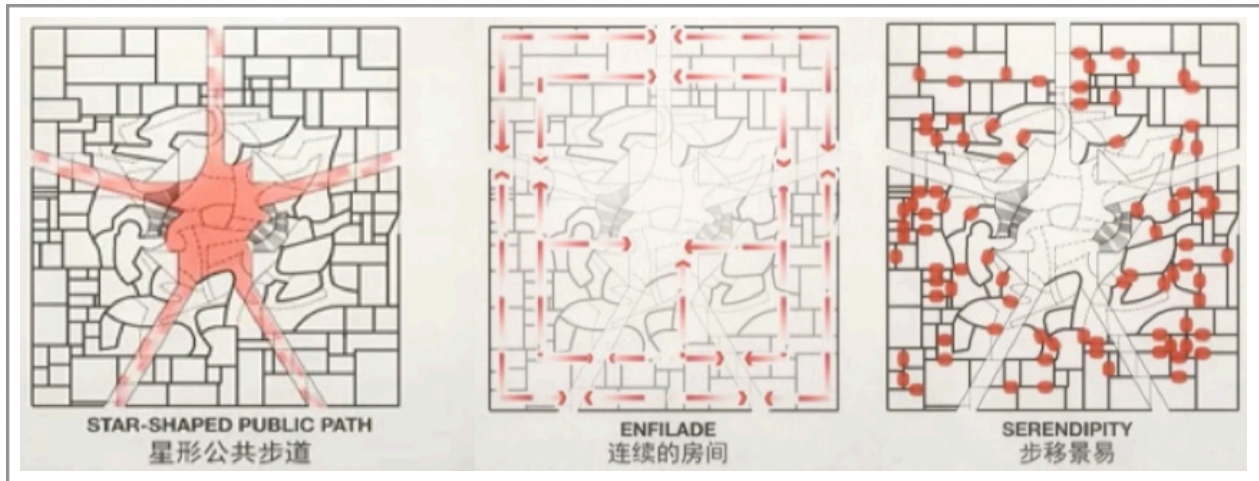


Figure 18: The Three Layers of NAMOC by OMA

## Sustainability

As people started to realize that the construction in modern architecture, the manufacture of architectural materials and also the energy consumption in building performance have caused huge issues for the environment, sustainability has been becoming a buzzword in architecture today. Wikipedia described sustainability as a long-term maintenance of the biological system's diversity and productivity with the management of the natural environment and the consumption of resources. As we can see, Feng Shui compasses the energy of the environment. The core principle is to find the harmony between human and nature, a wisdom that western civilization just realized. Again, it demonstrated that during urbanization and globalization, the gap between modernism and Chinese traditional culture, aside from expansion, merged.

## The Philosophy of Balance

Those traces showed possibilities that culture could be reinvestigated and reinforced in modernism. Though, the logic has to be inverted. With the belief that architecture is a way of thinking, a thinking which is a director, the one who sways emotions, sensations and subconsciousnesses, by those, behaviors of people are formed. Sequentially, culture, reflected from the behaviors, is stimulated and intensified. We can, notwithstanding, see compatibilities between tendencies in contemporary architecture design and philosophy of traditional Chinese architecture culture. The serendipity in NAMOC, however, was one of the random results from congestion, congestion from critical analysis. Moreover, the state of sustainability is one of the rational results calculated by carbon consumptions. The inherence of analysis and calculation is so indiscriminate and indifferent that culture is therefore going to be precarious, speculative and oscillating.

‘形而上者谓之道，形而下者谓之器’

*‘Above the form is called the Tao, subsequent the form is called implements.’*

*(I-Ching)*

Form has a comprehensive meaning in I-Ching than the formalism in Confucian. It involves anything that is perceivable and tangible. Either the analysis of the external forces so that a building can be fitted in the chaos and fragmentations of urban conditions, or the internal calculations of a building’s energy performance is implemental. It is an affirmation of the physical condition, an accomplishment.

‘反者，道之动。弱者，道之用’

*‘Returning is Tao’s motion. Yielding is Tao’s function.’*

*(Tao Te Ching, Chapter 40)*

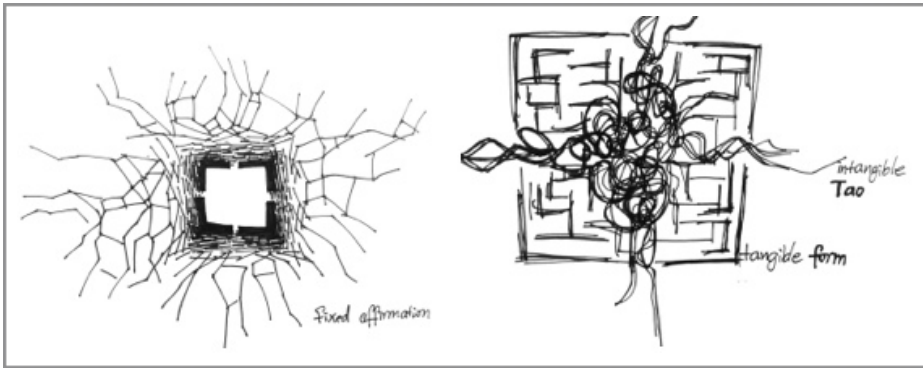


Figure 19: Diagram of Tao

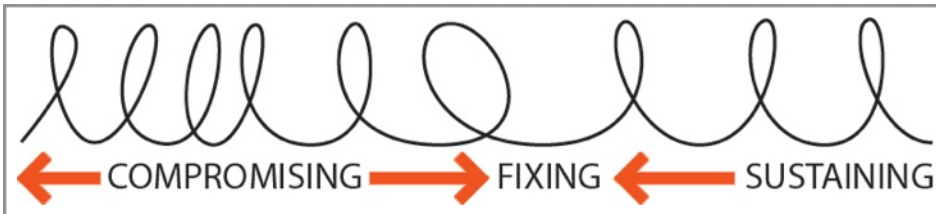


Figure 20: Diagram of Balance

However, all beings exist in a combination of a pair of two opposites. They are countering each other all the time. Balance is saying that neither pole can reach the point of fulfillment. When it is too strong that its counterpart fails, its growing potential exhausts at the same time. That is to say, balance is not only supplementing, but, sometimes yielding. Thereupon, the Tao of balance is dynamic, sustaining, fixing and compromising to approach equilibrium, other than assenting or achieving.

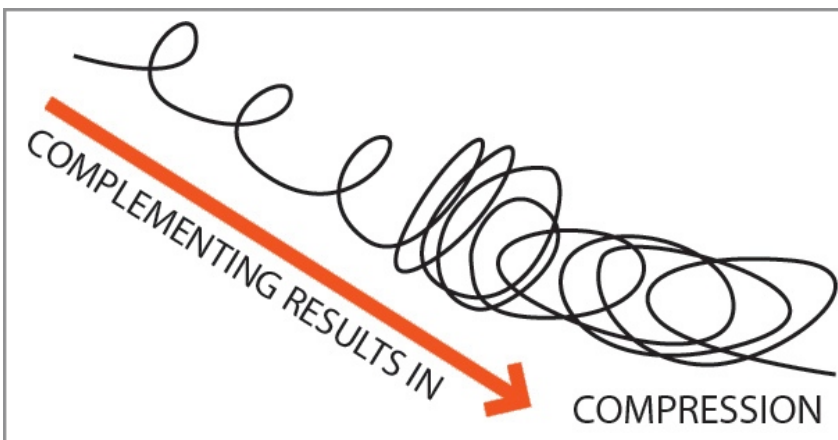


Figure 21: Diagram of Compression



## CHAPTER 3

### HOUSING

#### Intangibility in Imperfection

‘谷无以盈将恐竭，万物无以生将恐灭’

*‘Without being filled, the vale would dry out;*

*Without the power of living, creatures would perish.’*

*(Tao Te Ching, Chapter 40)*

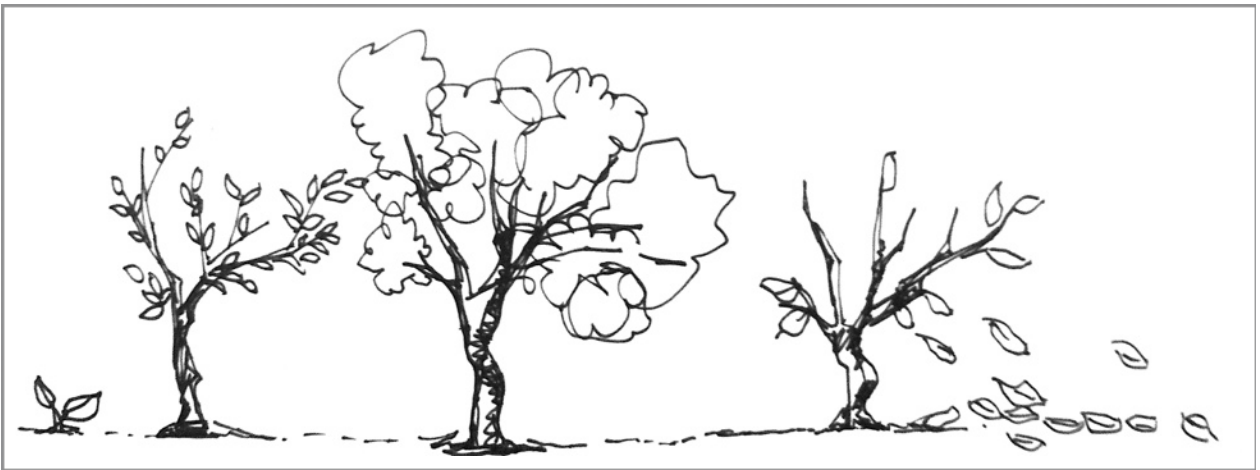


Figure 22: Diagram of Imperfection

The substance of architecture is determined and steady. Yet, balance never stands for constancy. *‘All things are springing from nothingness, growing from incompleteness toward their fullest maturities, and thereby becoming deteriorated.’* (The Tao of Architecture, Amos Ih Tiao Chang, 1981) Same in architecture, it is impossible to pursue a permanent fulfillment. Tao is to accept both the inevitable negative and positive side of any tangible being. Thereafter, the contradiction between architecture and Tao rises. For formally, it seems that architecture is a fixed object which could by no means be applied with Tao, the philosophy of changes.



‘井蛙不可以语于海者，拘于虚也；夏虫不可以语于冰者，笃于时也’

*(Autumn Flood)*

*‘Limited by space, a frog in a well cannot understand what is an ocean;*

*Limited by time, and insect in summer cannot understand what is ice.’*

*(Amos Ih Tiao Chang, translated by: The Tao of Architecture, 1981)*

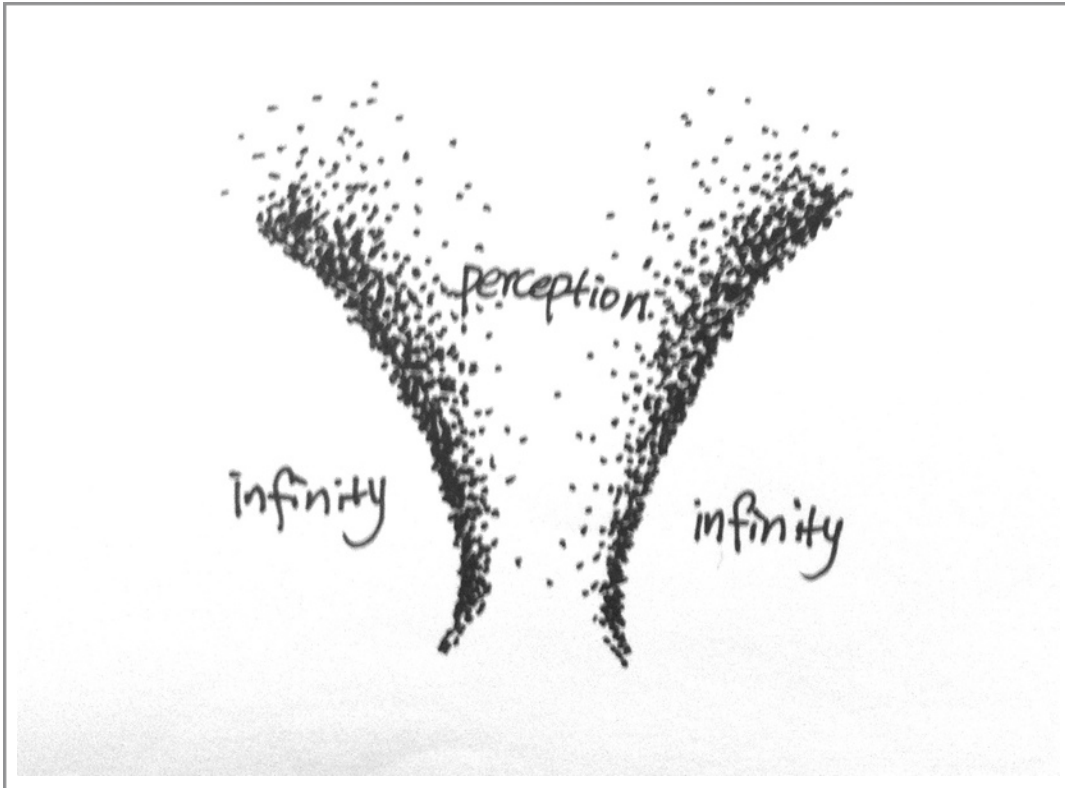


Figure 23: Diagram of the Limitation of Perception

So does human-being and every existant being, its physical capacity is limited. Objects beyond its physical limitation is mentally interpreted as something intangible. Ocean to the frog in a well, could be randomly imagined as anything. As well as the insect in summer, in its conception, winter is so unreachable that it is infinity. Thus, flexibility in architecture could be realized by taking use of the imperfection of human-beings. Setting the architectural boundaries beyond people's capability of perception, fixed objects are converted to something mentally adjustable.

### **Social Problems Caused by Loss of Culture**

Time is something formless but tangible. However, time of people is limited. Architects operate distances and movements to manipulate people's sensation of time so that people can feel tension, acceleration, relaxation, peace or emptiness. Nowadays, urban planners are building the city like a giant machine, the least inputs with the most outputs. Owing to the restraint of time, people's movement is constrained, giving way to efficiency. No matter the 'Smart City', 'MESH (Mobile, Efficient, Subtle, Heuristics) City' or 'URENIO (Urban And Regional Innovation)' are basically trying to program people's activities in order to get sustainability (cost oriented not nature oriented), and efficiency (productivity oriented); in which, people are educated to think, feel and behave the way they were programmed. Humanity is totally ignored. Social interaction is correspondingly prohibited. Culture is ruthlessly sabotaged.

China, the biggest source of labor forces to sustain the whole world, has no doubt absorbed great attentions to deviate its poetic land to a most efficient machine. Technologies can deal with the problems like energy consumption and waste emission. They are able to bring down the use of power, water, fuel and gas, as well as the pollution caused by CO<sub>2</sub>, SO<sub>2</sub> and dust. The biggest energy problem in China, whatsoever, is the labor forces. Urbanization in China is a power station transforming cheap labor forces into the machine. Urban planning is compressor squeezing the energy from each person to the most extent. Housing is a charger restoring that energy. The 1.5 billion population seems as a source that will never deplete. Therewith the inputting of love and caring, the outputting of emotions and ideas is fading. Culture, value and philosophy having been removed in Culture Revolution, Human sensation and emotion being obliterated in Urbanization, only emptiness left inside the Chinese.

Take the Chinese ipad factory as an example. When they started their new factory in Chengdu, they hired 20,000 people in three days. They were people from nearby suburban areas giving up their farmlands and coming to work in the factory. Later on, their farmlands were built up with new factories. It was a huge step of urbanization. However, a few month later, a sequence of suicides was reported from the factory as employees were treated like a part of the machine in the production line working day and night. They were psychologically depressed. Unfortunately, they couldn't go back to their farmlands anymore. The only way was giving up the lives for some solatia for their families.

In Koolhaas's 1972 Architectural thesis, EXODUS, he used a wall to divide London into two parts, a good part and a bad part. inhabitants from the bad part were so eager to get into the good part. They flocked to it. The good part was described as a place you can only be happy. Architecture in the good part was designed only for hedonistic purpose. Hospital in it did not heal physical diseases. Doctors only made sure patients' mental vitality and if they were happy. The wall was a prison, in which prisoners were mind controlled.

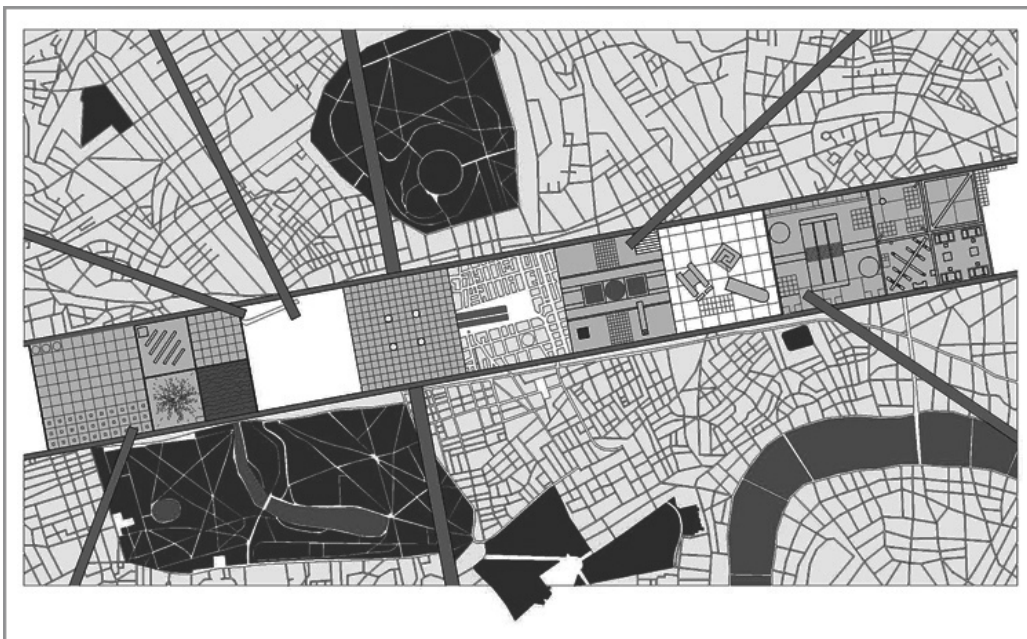


Figure 24: The EXODUS by Rem Koolhaas

Politically, people are concerning about human rights. Nevertheless, in today's urban design, the worst scenario is that it inhibits people to think freely. People are appreciated as tools. Infrastructures are serving for money and productivities. In spite of organic existences, people are living creatures with soul and spirit. They are social animals. But the spaces for social interactions were demolished. Furthermore, they were transmitted with ideas of individualism, the idea of privacy and self-fulfillment. The sense of insecure drives them isolated. In this case, human rights are glamorous outfits, inside of which are dictated minds. The more restriction they get, the more emptiness and anxiety they will have.

### **Housing Determines Culture**

Traditionally, housing was the most important thing for Chinese people. It was considered as roots of the clans. It tied the family together. It was a place where people get comforts, inspirations and cultivate morality.

‘山不在高，有仙则名。水不在深，有龙则灵。斯是陋室，唯吾德馨。苔痕街上绿，草色入廉清。谈笑有鸿儒，往来无白丁。可以调素琴，阅金经。无丝竹之乱耳，无案牍之劳形。南阳诸葛庐，西蜀子云亭。孔子云：何陋之有？’

*(Liu Yu Xi, An Eulogy on My Humble Abode)*

This essay was known as a metaphor of the character of a house for the virtue and dignity of the person who lives in. The first two sentences were describing mountains and lakes. No matter high or low, deep or shallow, if fairies dwell or dragons hidden, they are charmed. Therefore, the humble abode of the author, though this is, his virtues make it noble. Then he said that the house looked crude, in spite, it has a beauty of the nature. Stone-steps with the overgrown

moss made it verdant. The color of the grass reflected through the bamboo curtain turned the room green. In that house, he chatted only with erudite scholars in good spirits and had no intercourse with the ignorants. He enjoyed playing lute and reading sutras, without the disturbance of noise that jared on the ear and the burden of reading official documents. How can't it be humble?

Here we can see, the character of the house showed the spirit of the people who lives in. Also it is a place for people to have social interactions, to pursue the ideals, to develop ethics. Moreover, in your own house, you can hide away from the messy world, and enjoy your own hobbies.

‘古之欲明明德于天下者；先治其国；欲治其国者，先齐其家；欲齐其家者，先修其身；欲修其身者，先正其心’

*‘To put the world in order, we must first put the nation in order; to put the nation in order, we must put the family in order; to put the family in order, we must cultivate our personal life; and to cultivate our personal life, we must first set our heart right.’*

*(The Great Learning, Confucian)*

It is in our own home, where we set our heart right, cultivate our personal life. Family is another important element in the definition of home that houses represent the order of the family. Thus, housing is the root to establish a nation's culture.

### **Current Housing Situation**

What is the definition of ‘home’ in China now? If human labor is the main energy source for the modern city, the money making machine, to run, housing is the charger. Exhausted people go back to their cells, taking a rest, preparing the work for next day. Those accumulated small

cubits are the walls in EXODUS, physically and spiritually. Citizens are prisoners, isolated from social interactions, and no time for self cultivation and fulfillment.

### **Transformation of Housing**

When we look back into the history, the transformation of housing has been happening within forty years from the 1960's. Generally, there were four periods of housing after the New China. Before the 1960s, most families with multigenerations lived together in traditional buildings. People lived in Hutong in Beijing, Linong in Shanghai, etc. At that time, although people were in poverty, insecurity right after over a hundred years of war and colony, people still adhered to their old lifestyle, tied up with families, traditions and culture. Social interactions happened in the alleys, courtyards where people were hanging clothes to dry, playing Chinese chess with neighbors, selling small goods and gossiping. Nowadays, those traditional residential buildings were mostly torn down for new buildings. The preserved one's are now museums or homes of the richest. High and thick walls were built up, communication blocked.



Figure 25: Old Linong

At the period of the Cultural Revolution, from the late 1960s to the late 1970s, there was the misleading policy of Great Leap Forward, which encouraged mass production of everything, steels, crops, buildings and even the population. There came the Tongzilou (筒子楼), an unique type of building in that period, three to five stories, ten unites per story, twenty to thirty square meters per unite, each unite for one family consisted of two adults and kids instead of the multigeneration, a shared kitchen and a shared bathroom each floor, mostly designed by so called Soviet Union's experts. They were built by the government owned enterprises for their employees. Individuals could not have a house or apartment as their own property that they would be accused as capitalists. These buildings were all disappeared owing to their bad design and bad quality.



Figure 26: Tong Zi Lou

After the revolution, the reform and opening-up policy led the country walk out of poverty, when another type of uniform housing was born, the welfare housing. It was a housing policy in the 1980s and 1990s, that a family can buy an apartment as their own property, built by the



government enterprises where they worked, in a very low price, around 8,000-12,000 RMB for one apartment. The large demands of housing caused by the population bomb had made it impossible to have diversity in welfare houses. This uniform building was always a five-story north-south plate construction, with three unites per building, and two apartments each floor per unite. According to the policy, the size of the apartment is around 20 square meters per person. Averagely, there were three people for each family based on the one-child policy. Therefore each apartment was around 50-70 square meters, with two bedrooms, one living room, one kitchen and one bathroom and balconies. Nobody could distinguish which is which from the photos of those welfare houses in different cities, as they all looked the same. It was so easy to get lost in tons of those buildings. Numbers of welfare houses mushroomed in cities of China before the government called a stop in 1998. This was the beginning of the lost of identity in Chinese cities.



Figure 27: Welfare Apartment Building

Accordingly, real estate came into people's live. Bored by the uniform welfare houses, people were excited about the dazzling appearances of apartments and overwhelming advertisements. Unfortunately, people gradually realized that apart from the over decorated facade, their new apartments were cell unites, lacking fresh air, sunlight and communication.



High rises apartments were piled up in the progress of urbanization. In Tongzidou or welfare apartments, neighbors were colleagues. Though live in cubits, they still knew each other, talk to each other and help each other occasionally. As the rising sense of insecurity, people kept their doors shut, curtains closed all the time from their stranger neighbors in their new apartments. In order to fill up with more labors in the limited urban area, governmental policy required that ninety percent of the apartments in one building should be under ninety square meters. The only chain of interactions, families, were broken.

### **Urban TuLou**

Not only the quality of housing is perturbing, prices of the housing has casted a tremendous burden to the majorities. With labors flooded into the city, due to the essential value of housing rooted in traditions, the primary goal for them was buying an apartment. supply fell short of demand. The price of housing is now growing insanely. It is reported that the price of an ordinary 2 bedroom apartment in big cities in China, equals to the sum of 200 years' salary of an ordinary family in the same city. One third of the population in the city are not able to afford buying or renting apartments.

'Venke', one of the largest residential real estate developer in China, began to do experiment and study in affordable housing. 'Urban TuLou' was its first project. As the major reason of the unaffordable price in housing is the high price of land. They started the study with finding cheap land in cities. They found, between urban and suburban, right beside the crossovers, expressways, there were cheap and unused lands because of the noise and dirt created by the crossovers and expressways. So they began to think, if there is a form of residential building can be built on these lands which can be immunity to the exterior disturbs, and at the

same time, with good living environment. After a lot of researches and studies, they found our ancestor had already designed it. And it is TuLou. TuLou, literally means ‘rammed earth house’, which is a traditional type of village in Fujian province in the southeast China.

It is a centuries-old form of structures once used to protect villagers from invaders. Surrounded by walls of mud, which helps to inspect the surroundings and guard, units are evenly laid out along its perimeter, a courtyard centered around. Not only good for defending, this unique form also provides greater opportunities for social interaction. Often, in the center of the courtyard is the temple of the ancestor of theirs. The temple is a cohesion of the villagers.



Figure 28: Traditional TuLou

‘Venke’ found TuLou was a perfect type of living unit to transform into modern, urban residential prototype. For one thing, the centripetal and xenophobic form helps insulate the users from the chaos and noise of the outside environment. For another, it can preserve the community spirit, which is assumed by ‘Venke’ as a key point to prevent low-income housing from general bad impression of dirty and unsafe, by getting to know and gaining trust among neighbors in community.

The first study is the size of the TuLou. It has to be a certain large size so that there will be enough distance and void space to create a comfortable environment in this super condensed program. Traditional TuLou is about 50m in diameter and 3-4 stories high. ‘Venke’ preliminarily thought about the size of 120m in diameter and 9 stories high. But considering the limitations of the site, they decided to make it in 72m, 6stories.

Then they thought about the space patterns of ‘Urban TuLou’. Instead of simple circle form, they transformed it into an ‘e’ shape which has more dense and more opportunities for interaction by corridors go across. Speaking of the functions, to strengthen the concept of community, ‘Venke’ designed it as a small city, with a lot public functions like restaurant, supermarket, tea house to play cards and MaJiang, etc. As an low-income housing project, the first concerning is how cheap is it. ‘Urban TuLou’ has variety of types of apartments to rent, and it is for renting only. For the connivence of the costumers who have flexible job and moves a lot, there are different kinds of lease for them to choose.

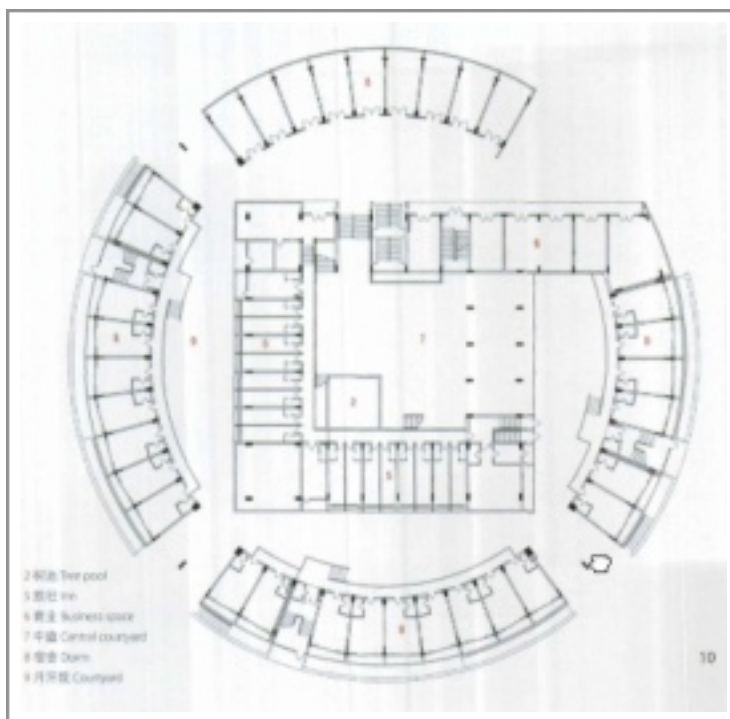


Figure 29: Plan of Urban TuLou

Following that, is the concerning of the living environment. Designed as an centripetal form, privacy can easily be interrupted. Wood grills on the baloney protect each living unites' privacy and also can bring sunlight into the room. The wall is paint in different colors to tell if it is privat residential unite or public space. All public hall ways and corridors are allowed to hang the laundries, and put other stuffs like traditional Chinese courtyard does. There are basket ball, badminton, table-tennis play grounds in the public space for residents to use. After work, they can go there, and when doing sports, it provides you opportunities to talk to people and make friends. Also, there is a small library in the community, you can also go there and read and relax after work. Small restaurants in the building open by the residents serving foods of the hometown style can gather residents from the same place. On weekend nights, there are outdoor movies shown on the courtyard.



Figure 30: Photos of Urban TuLou

As an example of copying form of the traditional architecture, economically and practically , it is an very successful project, by taking advantages of the unique features of TuLou, which just perfectly can be adapted to the cheap ‘conner’ sites of the cities, low-costing with

good communal environment. ‘Venke’ is planning to use it as a low-costing housing prototype and applying it all over China.

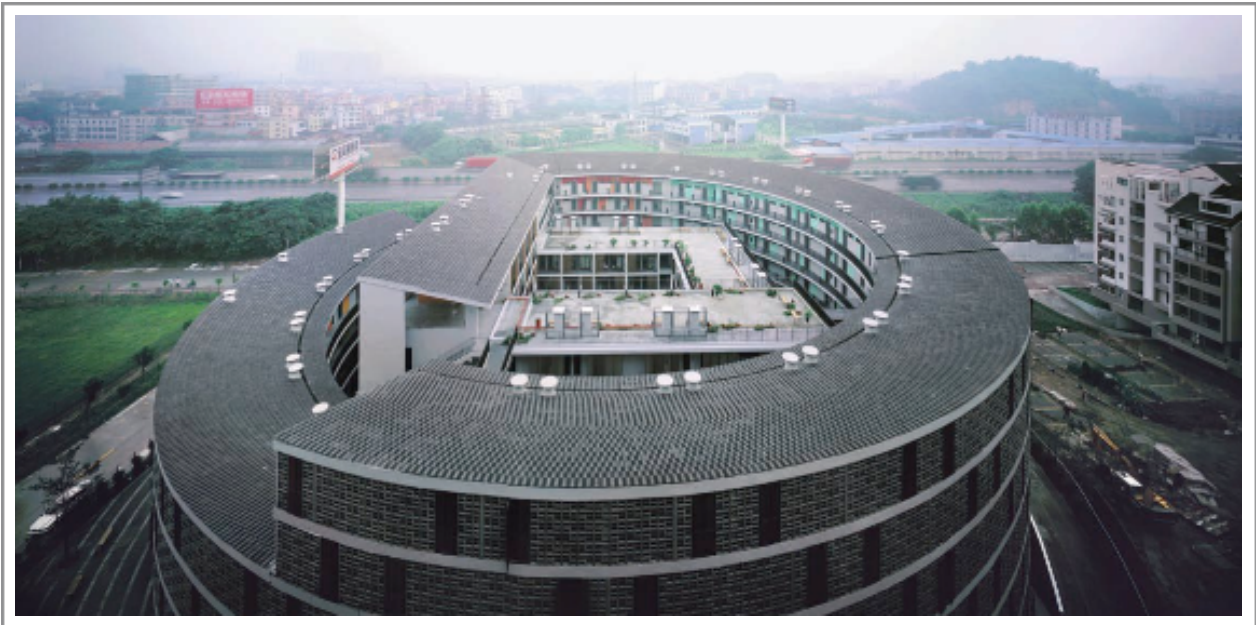


Figure 31: Bird View of Urban TuLou in Shenzhen

However, TuLou is a significant symbol of tradition and culture in Fujian province. If ‘Urban TuLou’ prototype were to be applied all over China, subsequently, the real Fujian TuLou would gradually lose its particular identity. What is more, the circle form of TuLou makes it easier to observe and defend in 360 degrees. Yet, is it suitable to the urban fabric also? Or the circle causes spatial inefficiency in the urban grids. After all, the ‘Urban TuLou’ was a good precedent in the study of combining traditions, urban lifestyle, economy and social concerns. Most importantly, people who lived there, loved it.



## CHAPTER 4

### RECONSTRUCTION OF WELFARE HOUSING

#### **The Reason for Reconstruction**

Above all, there are crucial problems in housing which are responsible for the inevitable cultural and social issues discussed previously. Therefore, solving those problems would realize the renovation of culture and reinforce the society from being collapsed. It is elementary that the project locates in the urban area and serves the majorities.

According to the statistics from the government, the 80's generation has occupied the major portion of the population who are obligatorily struggling for a house. The burdens are from the demands of the stereotypic society that a job, a car and an apartment are prerequisites for a marriage or even to be able to get into a relationship. The 80's are the generation who experienced property in their childhood. It was when jobs and apartments were assigned and guaranteed by the government. However, during the society being transforming, experiencing material prosperity, their degrees have just been not enough for them to find a job, nor have their salary just been enough for an apartment.

Moreover, though with a population of over 10 million, their burdens for housing are overwhelmed by the situation that 40 million farmers are going to be urbanized within five years. Trapped by how to solve the housing for those farmers, the government has no spare energy for the 80's. The heavy loads are transferred to the young adults and their parents. Additionally, these young adults, passionate, enthusiastic and most importantly, educated, are the backbones of the country in the future. That is to say, they are determinate in the revitalization of culture. Their houses, which influence and represent their spirit and virtue, should not be neglected.

The project goes to a design of apartments for the 80's generation, making the price reasonable and affordable; the space flexible so that it can be adjusted according to their needs, like marriage, birth of kids, in order to keep the family connected tight. Most essentially, it is going to be a design applied by the philosophy of Tao which infiltrates spiritual freedom and physical balance into the people who live in the building.



Figure 32: Chinese Painting of 'An Eulogy on My Humble Abode' by Huang Yi Bing

As the city expanding, the development of public transportation lagging, hours is wasted on the way to work. High price of apartments, to be blamed on, those new graduates could only afford to live even further. Packed like sardines in the train or bus for hours everyday, their time for social interactions, virtue cultivations is compressed and vaporized to none. Alleviation of transportation is demanded. In other words, the building should be preferably sat in an area with quick approachability to the urban, walking or by bike. Paradoxically, hardly is there any unoccupied land in the downtown area of any Chinese big cities, not to mention the price.

In Venke's Urban TuLou project, it was realized with the concept that site which was interrupted and disturbed by its surroundings, has comparatively lower price. Following that, not only the land disdained and neglected by the developers, there are also buildings in the old downtown area, discarded by people as the city developing. Those old buildings have become disliked for two reasons. Their neighborhood's constructions did not consider infects on the existing ones. Light, wind, thermal and acoustic environment has been contaminated. Consecutively, residents started to move out. Replaced by immigrants from the suburban areas, lacking of management, the apartments turned into slums. Nowadays, those buildings are even more abandoned. Due to new government policies, urbanized farmers got their own high-rise apartments.

In 1980, China was 19% urbanized. Thirty years later, in 2010, it grew ridiculously to 47% and is planning to be 59% urbanized in 2025. Obviously, with such an enormous speed, cities have been spreading out carelessly and roughly. We are not building cities, but manufacturing floor plates. In MVRDV's China-hills project, they stated that China's urban developments were rather monotonous and relying on external resources. Problems of the old districts, like the one discussed above, are coming up, yet, haven't drawn attention as much as the development of the new districts. Not following the force which is spreading out, reversely, we rewind the thinking back to the primitive place, and inject kaleidoscopic ideas into it. Namely, instead of building something new, the project is going to reconstruct and solve problems.

### **The Leftover of Welfare Housing**

The first task is to find a site. Cities in China are all working like a ruthless giant money making machine hiding behind its glamorous illusion of prosperity. Under this circumstance, an



XXL thing is needed to counter the negative inner force from the machine. Nevertheless, it controverts the idea of reconstruction. As the old town areas are in human scale, especially compared with the new developed ones. Could the reconstruction of one old town building, a tiny movement, be the open sesame to the revitalization of culture?

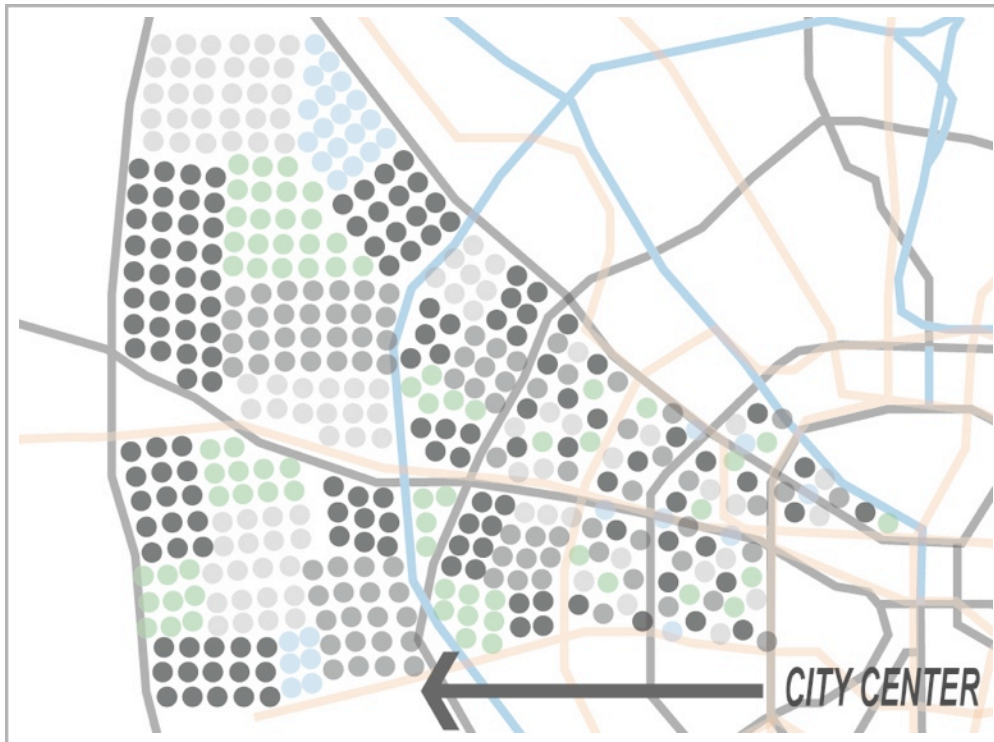


Figure 33: Diagram of Scale of City

The old downtown area in China's major cities is consisted with three residential types. One is the real estate developed residential, which is mostly less than ten years' old, new and expensive. The other one is the protected traditional residential type, which is very rare and reconstructed already. The last one is the leftover of welfare housing. Constructed in the 1980's to the 1990's, their owners have gradually moved out during the booming of the real estate. Though situated in the most convenient places of cities, the rent is comparatively very low. Its location and price fits perfectly to be the site of the project. The design and construction, done in a rush at the first place, had left problems for their residents. Along with their neighbors building up with

total ignorance of the bordering ones. As well as the buildings lack of management. Problems are accumulating everyday. The reconstruction of those welfare building can not only provide housing opportunities for the 80's generation. Also, it is a protection of the precious urban land, preventing it becoming slams, a correction of the improper process of urbanization.

Moreover, when you start to map the welfare houses in China's major cities to get an overall idea of the real current situation, the numbers of them are far beyond an individual's capability of counting and mapping. Because of the leftover of welfare houses are uniformed, the reconstruction could be a prototype which can be applied in all. Once one welfare building reconstructed, it is going to be positive energy, encouraging the ones nearby. Like an incubator, it will raise new ideas and possibilities to its inactive environment. Furthermore, with a group of welfare houses been reconstructed, those ones will act as a cluster, generating strong and positive energy to its surroundings and attracting more young adults to move back in. With more clusters of reconstructed welfare houses replacing the abandoned ones, the clusters turn to be notes in the urban fabric. The notes create a mega network with their invisible forces connected. Unexpectedly, one tiny movement of a prototype in a small building can actually generates a strong positive energy which counters the whole urban's negative forces.



Figure 34: Mapping of Remained Welfare Apartment Buildings

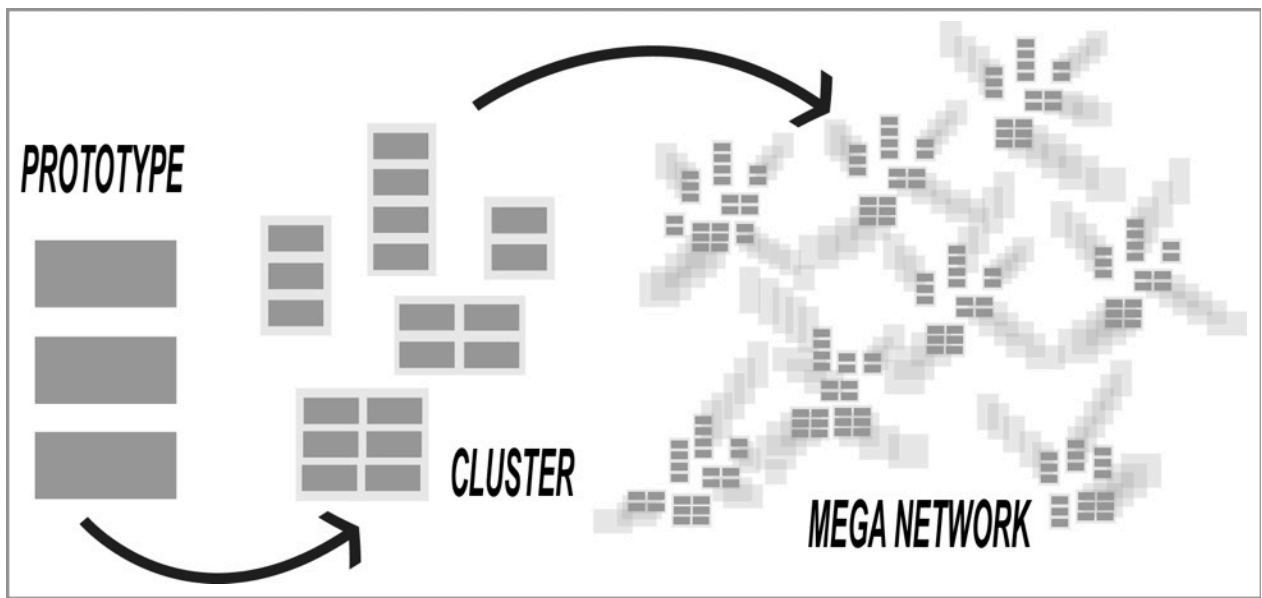


Figure 35: Development of Prototype

### Site Analysis

Prices of lands are growing up following the process of urbanization. In the initiative urbanizing stage, buildings were torn down when their land became more worthy, even ten times than the buildings themselves. Reasonably, higher sky scrapers which would bring much more profits replaced the old ones. Thereupon, thousands of traditional buildings, welfare houses were demolished, to broaden the roads, to develop business districts, and to overlap floor plates of residential.

Why are there still large amount of welfare houses stand in the old downtown, completely ignored by the government and developers? The reason still falls back to the rapid development. Far before the planning department came up to a comprehensive idea of how one district would be developed, eager developers recklessly occupied the sites. By all means, they wanted to make quick money and they did it. Parts of the old buildings were smashed down, willingly or unwillingly. Correspondingly, the remaining parts were blocked from the sun, wind, air and

accessibility by the new ones. Based on the building codes, as surrounded all by high rises, no more sky scrapers could be built on the site. Notwithstanding, developers of the neighbor buildings were thinking about buying those buildings, tearing them down and building parking lots to serve their own buildings. As well as the urban planners wanted to turn them into public green spaces as they started to recognize that not too many voids have left in the urban areas. Ironically, the owners of those apartments imperiously thought their properties worth the same values as their neighbors. The unreasonable price they asked for, make the government and the developers backed off. Like a frog in a well, both in metaphor and literally, the leftover of the welfare houses are getting rot.

## Locations

Leftovers of the welfare houses inlay in high-rise offices, apartments, shopping centers, etc. They have advantageous accesses to public facilities like hospital, public transportation, schools, libraries and markets. On the other hand, they have disadvantage of influences from the cities, like heat island effect, dust, light pollution, noises, and so on.



Figure 36: Development of Neighborhoods of Welfare Apartment Buildings

## **Transportation**

Since all in the downtown areas of China's major cities, the site has convenient public transportation, with easy approachability to subway stations, bus stations.

Back to the time when the houses were constructed, the major transportation methods were bikes and buses. Streets next to them were in a cozy human scale, twenty feet wide, with trees and pedestrians. They were broadened to satisfy the needs of the high rises. Heavy flows of cars broke the harmony. Luckily, the ones to the site still remain in the original size, which means the limitation of car access. Meanwhile, the original design had no consideration of parking. As a result, the site does not encourage cars at all. With walking distances to public facilities and public transportation, it is sustainable and still convenient not having any cars for the residents.

## **Green Spaces and Infrastructures**

In some welfare houses, trees and some shrubs are growing between the buildings. Also people are growing some vegetables of their own in the soil of the shrubs. But some of them have no green spaces at all. Street trees are on the small streets. As the buildings are more the twenty years' old, the trees are now tall and shade on the whole streets in the summer. Because of the unitary purpose when the houses were constructed, few infrastructures were introduced to the site. On the corners of the street, fitness facilities were placed by the government a few years ago.

In the beginning, the solely purpose of constructing welfare houses was containers for the growing population. No other function than living had been taken into consideration. With more people moving in, those who had apartments on the first floor, along the pedestrian of the roads, spontaneously reconstructed their balconies to shop fronts and started their businesses. Grocery



stores, restaurants, pharmacies, tea houses, etc were showing up on the streets. Once in a while, those districts were very energetic. Not allowed by the laws, they were forced to shut down when the roads were reconstructed and broadened by the government. The remaining ones which situate in areas undevelopable are now inertial as residents moving out and streets lacking of management.



Figure 37: Photo of Public Spaces



Figure 38: Photo of Fitness Facilities



Figure 39: Photo of Reconstructed Shops



Figure 40

## Natural Light

Hiding behind the high rise buildings, the leftover of the welfare houses are inevitably lacking of direct sunlight. Even worse, the curtain wall screens of the high rise offices reflect light pollutions to the site.

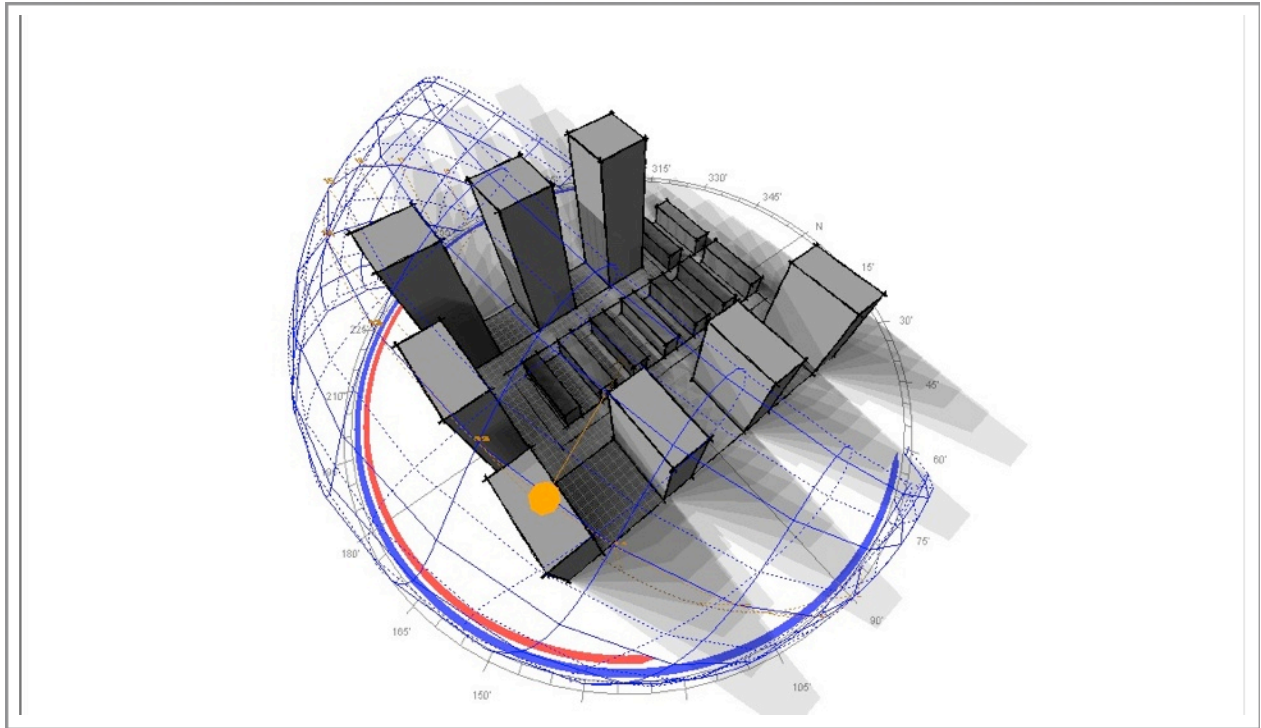


Figure 41: Annual Shadow

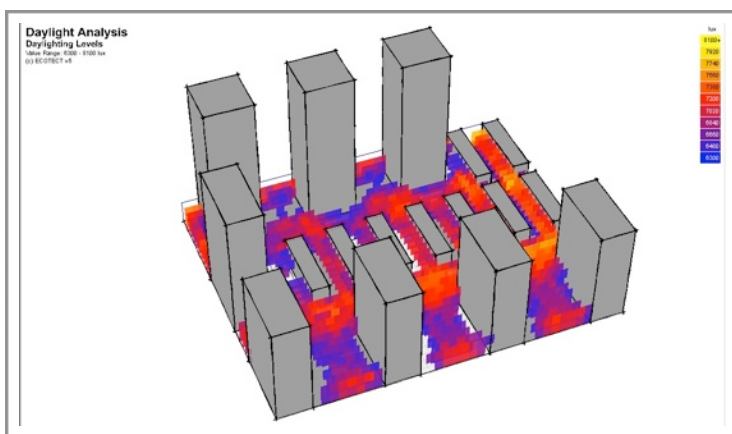


Figure 42: Natural Light of Site



Figure 43: Light Pollution

## Climate

Like a huge courtyard of the surrounded high-rises. The welfare houses have a microclimate influenced mainly by its neighbors. The heat island effect has caused the temperature on the site at least two degrees centigrade higher than the suburban areas. Designed without any sense of energy saving and sustainability in the past, the bordering buildings are emitting a lot of heat and CO<sub>2</sub>. Therefore, the temperature on the site is even higher. Not only polluted by the CO<sub>2</sub> emitting from the high scrapers, the air on the site consists of a huge amount of dusts too. Shape like a basin, the dusts from the construction site in the city come to the site, subsided and accumulated.

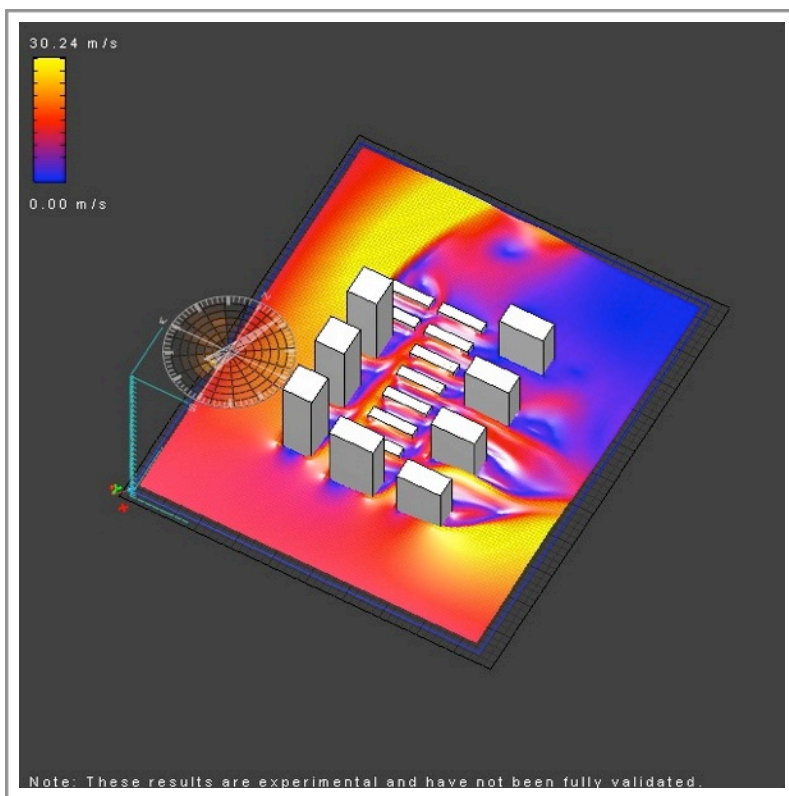


Figure 44: Wind Condition

The gap between two tall buildings creates a wind tunnel where strong wind is generated. This may influence a lot on the site in the winter. Severe and freezing wind comes directly from the gaps to the site and makes the site even colder.



## Original Condition of the Welfare House

### **Floor Plan**

Welfare houses were constructed in a group of four to six buildings, arrayed in north-south direction, gated. They are all four to six stories high, three stair wells in one building which serve three apartments each per floor. The typical plan of an apartment is consisted with two bedrooms, one living room, one kitchen and one restroom. The area is around 50-70 square meters. Because of the Slab-type, each apartment has good ventilation. Also on the south side, they will get good natural lighting.

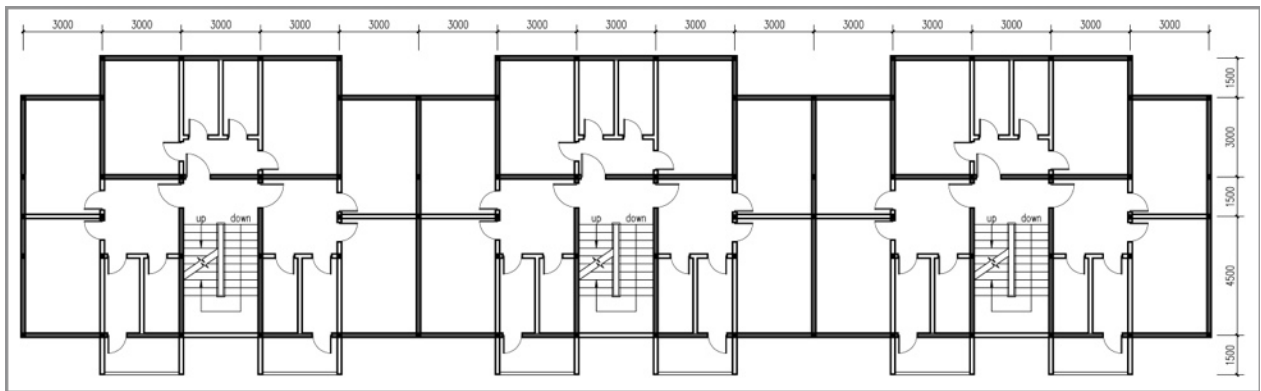


Figure 45: Original Floor Plan

### **Structure**

The major structure of the building is reinforced concrete beams and columns. Sectional dimension of the concrete columns is 200mm\*200mm, and of the beams is 200mm\*400mm. One span of the beam is 3000mm. External walls are red bricks without insulation. Floor plates are concrete slabs. On each side of the apartment, there is one balcony, cantilevered from the main structure.



Figure 46: The Original Structure

## Natural Light

Though the rooms facing the south gain good sunlight, the rooms in between the south and the north side of the apartment could hardly gain any natural light.

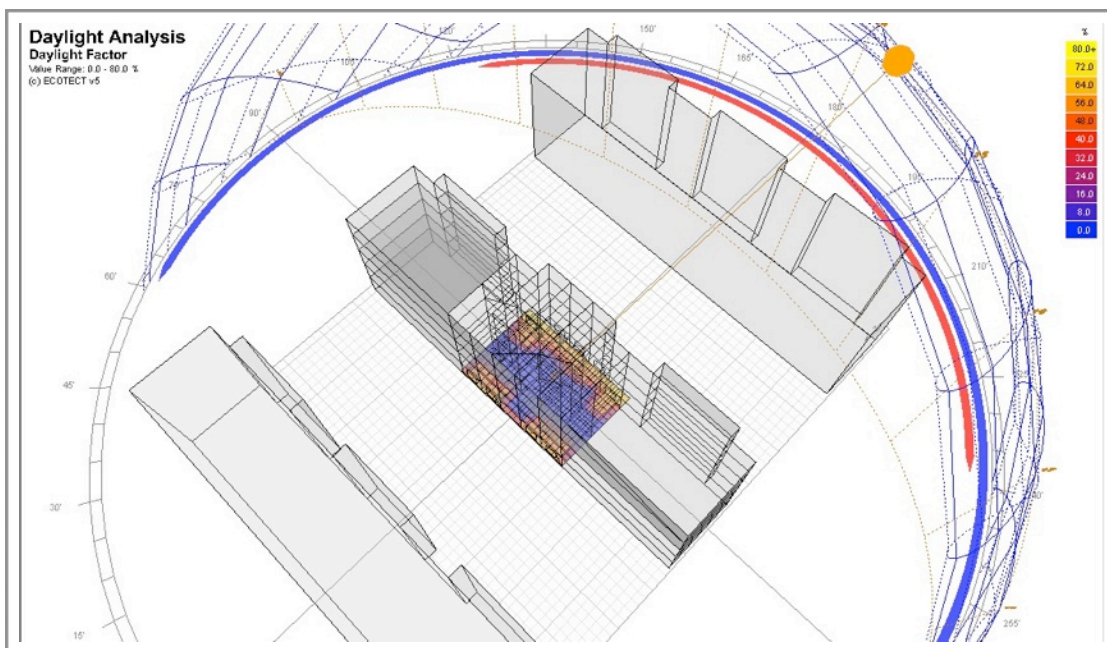


Figure 47: Natural Light of Each Unite

## **Thermal**

The thermal performance of the original welfare houses is not good at all. The uninsulated brick walls cause a lot heat loss in the winter and heat gain in the summer. The welfare houses situated in cities north of the Yellow River have been installed water-heating system by the government. The ones on south of the Yellow River could only install air conditioners individually.

## CHAPTER 5

### DESIGN CONCEPT

#### Tao in Traditional Chinese Housing

##### Qi

From the analysis of GuGong, Feng Shui is talking about balances of the internal and intangible forces between nature and artificial objects. This ineffable force, is called Qi (life energy, life-force or energy flow). It is believed that Qi permeates everything and links their surroundings together.

Feng Shui in the houses of ordinary people couldn't be calculated so accurately as the imperial's palace, GuGong. Like a prototype, however, they explored some indispensable element in housing which would let their houses in positive Qi.

##### Courtyard

Traditionally, no houses existed without horizontal courtyards. the courtyard is a very important way seeking for the spiritual harmony between interior spaces and the exterior nature. When you look from the inside out, the garden connects to the skyline, giving you the impression of being in the nature other than in an artificial city. It is a float of spaces, an extension of breathes, the contrast between solid and void, an infiltration to soul.

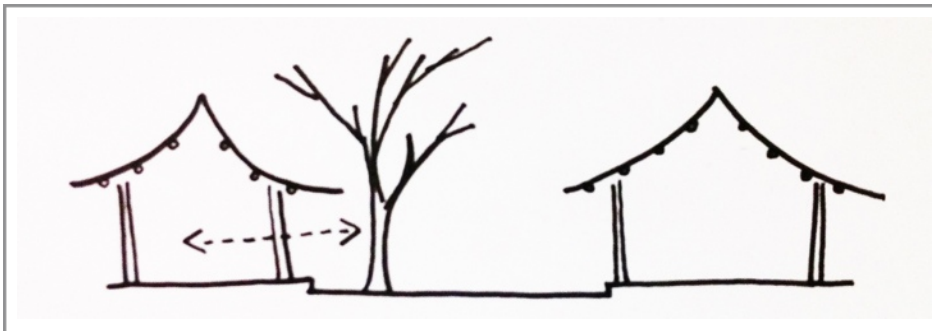


Figure 48: Courtyard

## The Roof

In traditional Chinese architecture, spaces are created by walls, windows and roofs. Walls are just plane walls painted white and with simple square window. But the roofs are always diverse and vivid. Because roofs psychologically give people the sense of connecting heaven and the earth. The arch shape of the roof creates an inner tension between the nature and human beings. At the same time, the curve which goes back up has a Gestalt which lead the power back to the sky. That is an expression to show the respect to the nature.

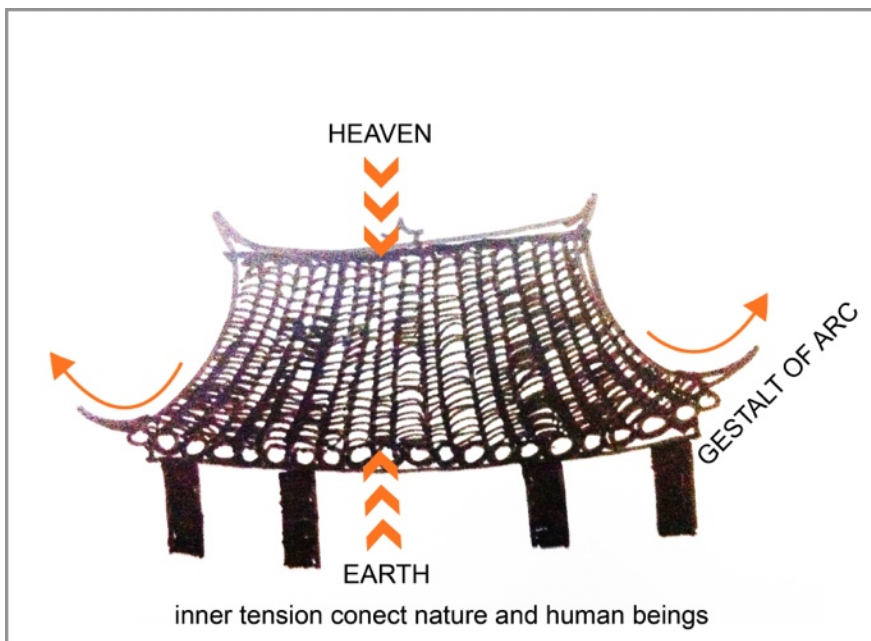


Figure 49: Diagram of Roof

## Blue Bricks

Blue bricks are used widely in Chinese Traditional Houses. Unlike the red brick, they are cooled by cold water instead of naturally. That is to say, in Feng Shui's five elements, red bricks are merely fire but blue bricks have a combination of both fire and water. Baked by fire and cooled by water, the material gets an inner balance. Thus, the blue bricks have permeability that can keep the room air humid and purify the room air. Most importantly, the color makes it melt into its natural surroundings.





Figure 50: Blue Brick Wall



Figure 51: House Made of Blue Bricks

## Tian Jing

Furthermore, Ting Jing (the vertical courtyard) is also a key element. The practical function of Tian Jing (literally means a well to the sky) is ventilation, drainage, and lighting. Spiritually, it is a connection between heaven and the earth. It leads people's view to the sky, gives people a n impression of respecting to the heaven.



Figure 52: Photo of Tian Jing

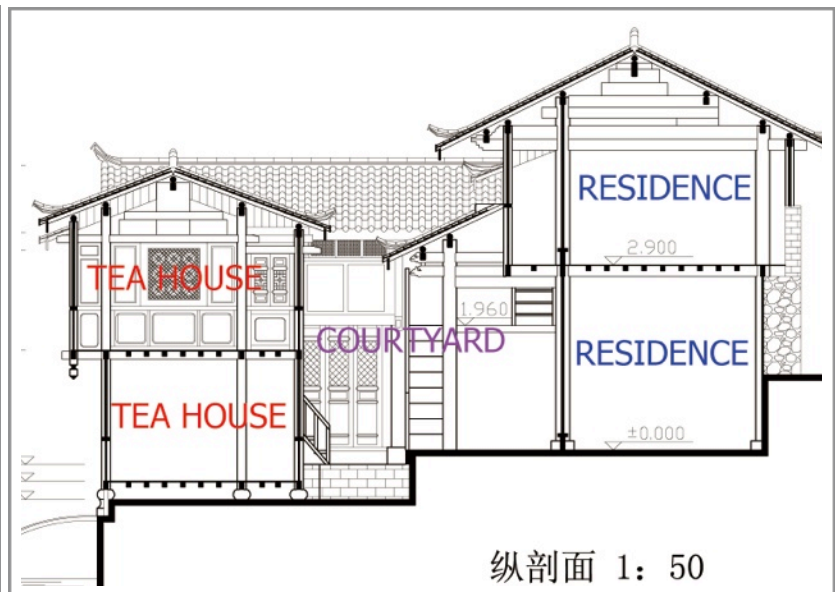


Figure 53: Section of Tian Jing

## **The Tao of Architecture**

The site, caged by the high rises, on one hand has no interaction with the beautiful nature, on the other has a lot negative influences from the artificial world. Overlapping the floor plates to get more profits is not the only reason that the city is building taller and taller. The natural instincts of human beings are pursuing for sunlight. Like trees in the forest which aggressively try their best to grow straight high to gain sunlight, buildings in the cities also do so.

‘挫其锐，解其纷，和其光，同其尘，所谓玄同’

*‘Temper the sharpness, simplify the dispute, soften the brightness, union the earthliness, and this is the Tao of sameness.’*

*(Tao Te Ching, Chapter 56)*

All things has two sides. They are usually too sharp to snap, too bright to be blind. The high rises go as high as possible to get their own sunlight. But sadly forgot if there is light, there is shadow. In consequences, the darkness will shade on their neighbors. No one wants to be in the shadow. The newer neighbors are going higher and higher. All in aggressive forces, disputes are intensifying and no balance is going further away.

‘天之道，损有余而补不足；人之道则不然，损不足以奉有余。孰能有余以奉天下，唯有道者’

*‘The Tao of heaven is to take from those who have too much and give to those who do not have enough. Man's way is different. He takes from those who do not have enough and give to those who already have too much. What man has more than enough and gives it to the world? Only the man of Tao.’*

*(Tao Te Ching, Chapter 77)*

The balance of nature is a process of complementation. If a site is overwhelmed by its neighbor, it is Man's way that you counter it with more power. You build your own building higher to cast the shadow back. However, Tao is talking about mutualism. Instead of doing the adding, stacking the floors up, we do subtraction. Similarly, when one side is overwhelming, you perk up its counterpart. The high rises next to the site are considered as 'Yang', positive and aggressive energy. Surrounded by them, buildings on the site should emphasis on 'Yin' to balance their environment.

### **Initial Concepts**

#### **Patio**

‘反者，道之动。弱者，道之用’

*‘Returning is Tao's motion. Yielding is Tao's function.’*

*(Tao Te Ching, Chapter 40)*

Already limited in spaces as a non-high-rise in the city, the density of the welfare houses is very low. notwithstanding, more spaces are going to be deduced so that patios (vertical courtyard) which would be able to bring light in, can be introduced into the building.

#### **Social Interactions and Virtue Cultivation**

A huge amount of the 80's generation are called Otaku. It is a name for a group of young people who do not like social interactions but only have hobbies like watching animations and play on-line game at home. The boxed cells of apartments have a lot to do with it. Traditionally, there used to be a lot senses of community. People lived in courtyards which provided layers of spaces, from the most private to the one share with neighbors where they chatted and



communicated. Thus, the fixed unites of the apartments should be broken, substituted with three layers of spaces, private, semi-private public and public. bedrooms are the most private space. bathrooms, kitchens and dinning rooms are the semi ones. The most public ones are living rooms, reading rooms, game rooms where social interactions are forced to happen.

## Qi

Qi is related to the usage of the rooms. Different rooms are in different Qi which is related to the size of the room, the color, material, natural light, ventilation, insulation and so on. Nowadays, people are seeking for big sizes of apartments as an accomplishment. Those bigger apartments are just scaled from the smaller ones, same composition with larger rooms. It won't be much more comfortable than the small ones as it does not perform good in Qi. Take the bedroom as an example, it is a place people take a rest and sleep. When people sleep, Qi from people is leaking. As a result, people need to be protect in a small space. An ancient Chinese bed could demonstrate it very well. As limited in spaces, the bedrooms could be small, facing the north, in warm color and highly insulated. Thus, people's Qi could be protected well when they sleep. As well as small in size, north without sunlight, people who live in are forced to go out in day time to the public rooms and to have social interactions.



Figure 54: Photo of Traditional Chinese Bed

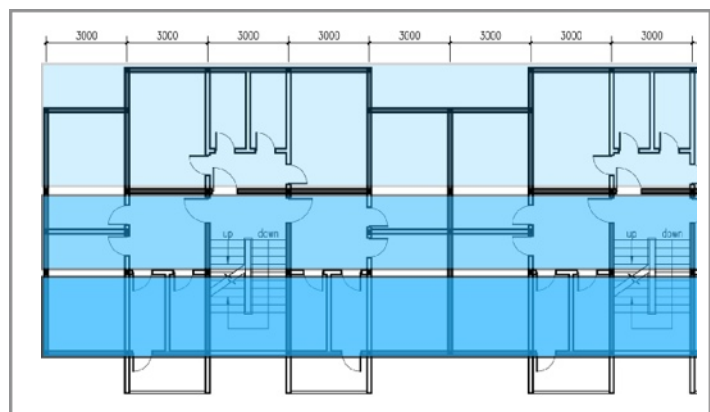


Figure 55: Diagram of the Layers of Plan

## **Sustainability**

Feng Shui of the house is also important. Traditionally, Feng Shui was talking about artificial houses obeying the surrounding natural conditions. However, the site of the welfare houses is surrounded by concrete and steel boxes which are abusing energy and releasing CO<sub>2</sub>. Reversely, the site needs to release productive energy to counter the negative one from the surroundings. In this case, the Feng Shui of the site is a self-sustained system. Also the self-sustaining could lower the costs for its future residents. So as to be self sustained, biogas, 'Kang', and some other traditional ways in passive energy saving could be applied in the design.

## **Development of Design**

### **Light Scoop**

*'Architecture is a spatial expression of human life and experience in time.'*

*(The Tao of Architecture, Amos Ih Tiao Chang, 1981)*

The imperfection of human beings consists of their physical capacity and their time. It is always the intension to make their time comparably extended. To do so, distance supplements the limitation in time. Things are compressed to get spatial efficiency. Superficially, time is saved yet life is restrained.

The process of the design is an affirmation of the philosophy of non-being in Tao. The universe came from nothingness. Emptiness is the most compatible and comprehensive. Being nothing does not mean passive or negative, for only nothing can generate to anything. The site, constrained by everything, though, is never going to be revitalized by congestion or aggression. *'Yielding is Tao's function.'* Whereupon, a blank space, unconstrained by time, is going to be the motion of the site.

Deducted by patios, spaces are left functionally blank. Spiritually on the other hand, the blank space is abundant. Firstly, it brings natural light, wind, rainwater into the building. It is a centripetal force that counteracts the negative force of the surroundings. Secondly, it give its residents a direct connection to feel the beautiful nature. Moreover, as the bedrooms are highly thermal and Qi protected space and public rooms are enclosed by air and humid permeable blue bricks, the patio is the space to breathe.



Figure 56: Model of Light Scoops



Figure 57: Model of Light Scoops

### **Feng Shui of Light Scoop**

Modern architecture, the concrete, steel, glass curtain wall cubits are considered as Yang. To balance the overpowered Yang, Yin must be introduced into the design. The process of deduction and yielding is Yin. Also, compared with angled, sharp shapes, curvy shapes are

considered as Yin. Furthermore, bended surface can reflect more soft light into the courtyard. As a result, like a scoop, curved white walls are inserted into the patio.

More than a Tian Jing, the light scoop works as an horizontal courtyard too. Horizontal courtyard is to provide a view of the flowers and trees to people who are inside and give them an impression of being in the nature. The light scoop is leading people's views to the roof of the other welfare building. Originally, people used their roof to grow some plants on those welfare buildings. The reconstruction keeps the green roof. Then from the scoop, people is able to see the green plants on the roof and feel like surrounded by the nature. Besides, like the traditional roofs, the curvy shape can spiritually give people a sense of tension, which confirms the sense of the nature. What is more, the green roof can absorb CO<sub>2</sub> and dust from the urban and protect the building from the heat of summer and the light pollution of the neighbor curtain walls.

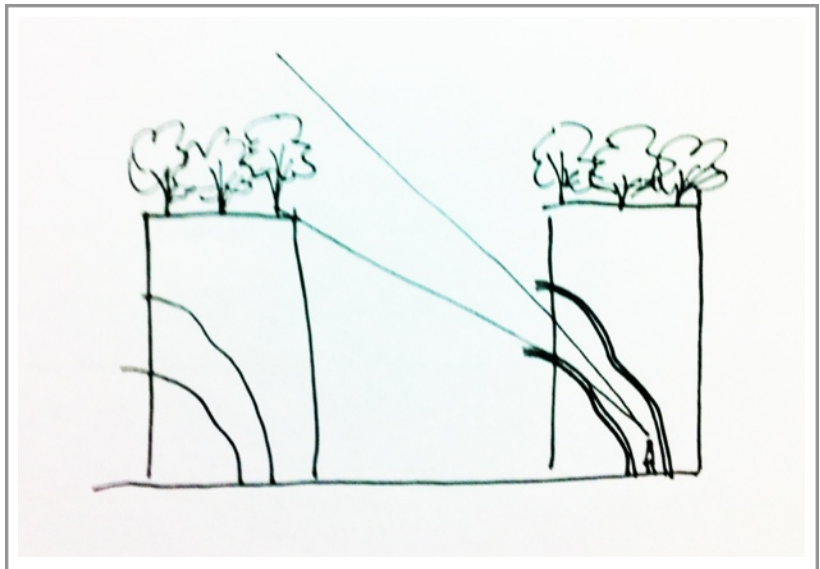


Figure 58: Photo of the Original Green Roof

Figure 59: Diagram of Concept of View in Light Scoop

## CHAPTER 6

### THE DESIGN OF RECONSTRUCTION

#### The Plans

Preserving the major concrete structure and stairs, reinforced concrete walls are added beside stairs and the vertical courtyards to strengthen the structure.

Spaces of the building are divided into three layers from south to north: public, semi-private public, and private. Public phase are consisted with shared bathrooms, kitchens, dinning, reading room, etc. Semi-private public phase are the patios and living commons where people think and communicate. Private rooms are individual bedrooms.

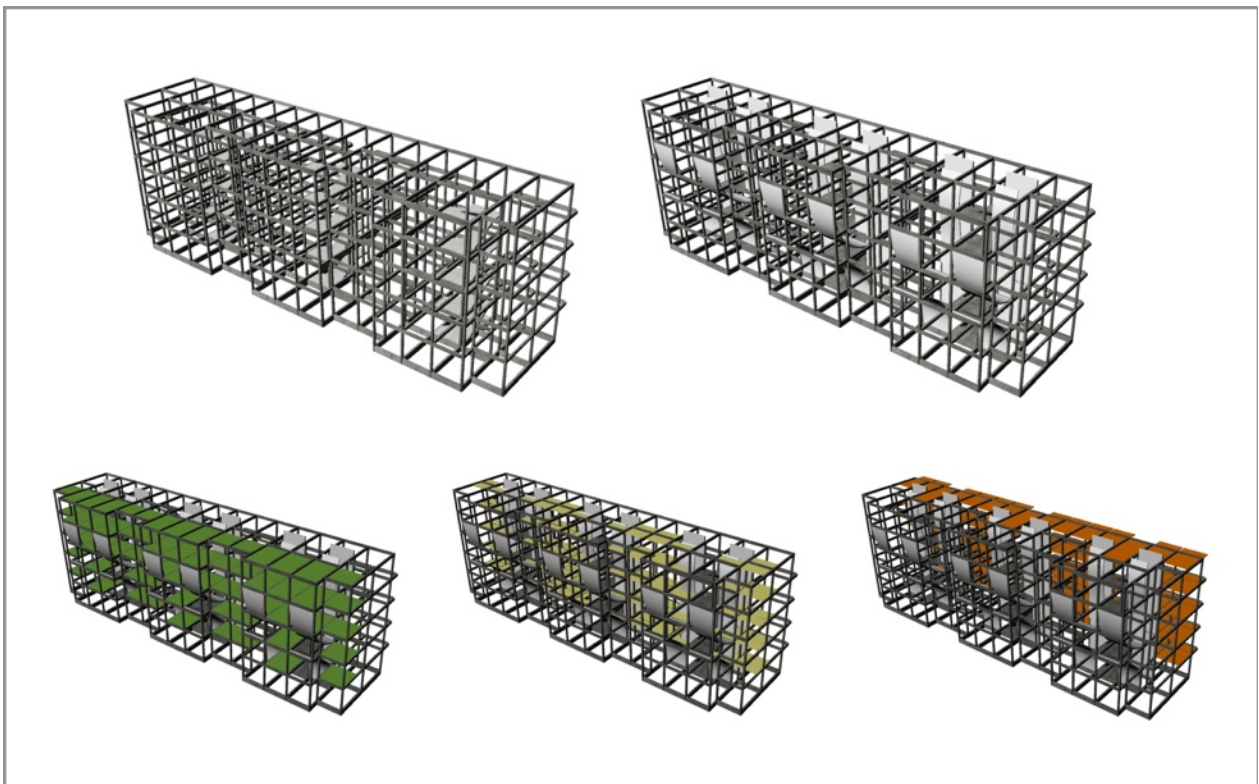


Figure 60: Reconstruction of Three Layers and Scoops



Apartments changing to shops on the first floor are inherited in the reconstruction design. For one thing, commercial can vitalize the community as a traditional hybrid living style. For the other, it can bring much more rents which could be used as fees to sustain the building.

Moreover, community rooms for games and parties, gym for health and other useful facilities are all placed on the first floor. As limited spaces in the private bedrooms, the first floor has storage rooms for people to rent if they need extra spaces.

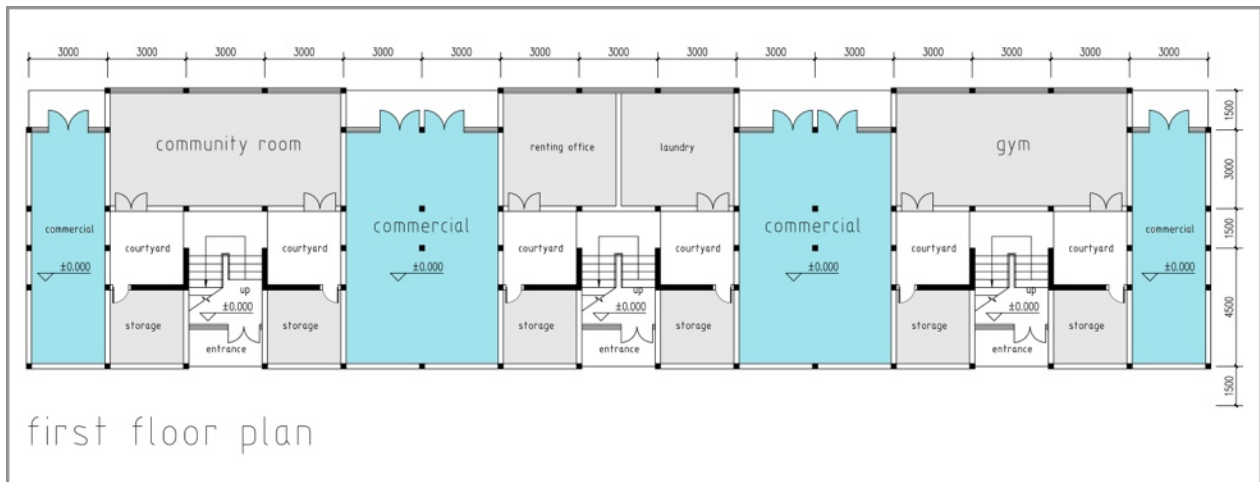


Figure 61: The First Floor Plan

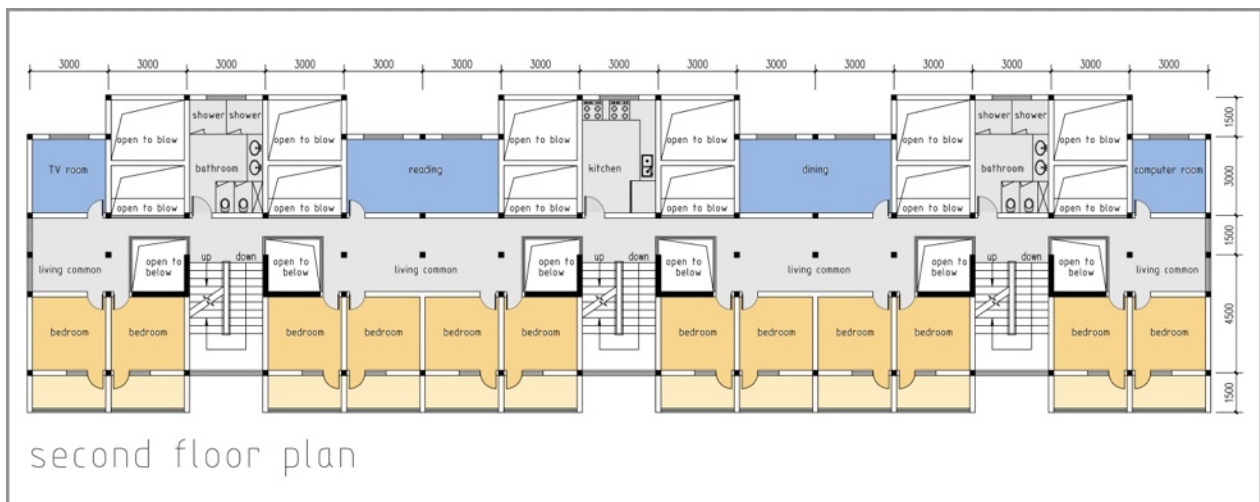


Figure 62: The Second Floor Plan



Figure 63: The Third Floor Plan



Figure 64: The Fourth Floor Plan



Figure 65: The Fifth Floor Plan

### **Rent calculation**

The average rent of a two bedroom apartment in a welfare building is around 800RMB per month. Comparatively, the average rent for a two bedroom apartment is 3000RMB per month in China's major cities. That is to say, 1500RMB per person or room. One original welfare building has 45 two bedroom apartments with 36,000RMB income per month. If it is assumed that the value of the building is doubled after the reconstruction, the income per month rises to 72,000RMB. As the reconstructed building contains 56 bedrooms, the average rent for each room is 1,285RMB per month. It is still 200RMB cheaper than the average rent. If compared with the apartments in downtown areas where the welfare apartments situated, the price difference is even more. The average salary of the 80's generation is about 3000-5000RMB per month. Obviously, the reconstructed welfare apartments are affordable to them.

### **The Details**

Situated on the south side, exterior walls of the public rooms are breathable blue brick walls. The blue brick are the naturist of all which can prevent heat lose in the winter, at the same time, bring humid into the room and make the interior environment more comfortable. And in the summer, fresh air can come through the bricks which ensures the air quality in the room where a certain amount of people are using at the same time.

Contrarily, the north bedrooms are insulated well. Double walls are widely used as an vernacular way in passive energy saving in China. It can resist heat lose in the winter and also in the summer, it can inspire ventilation which takes way heat. Originally, there are balconies on the north side of the building. The balconies are not pretty pleasant to use as facing the north. Therefore, in the design of the reconstruction, concrete slabs are added between the voids of the



balconies on each floor where triple glazed window are installed. The space between the window and the actual external wall could act as buffer zone of heat lose in winter and heat gain in summer.

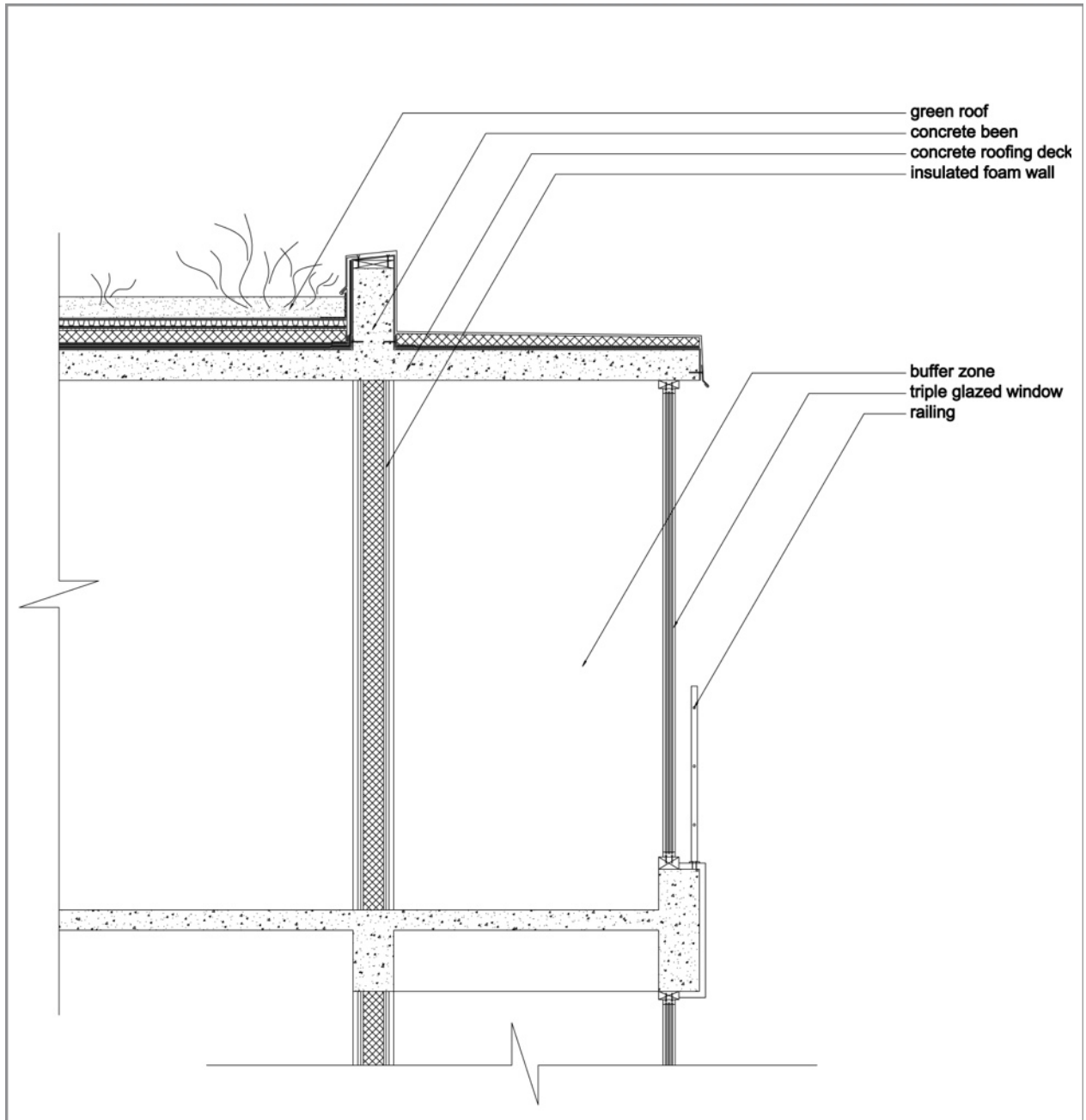


Figure 66: Section Detail of Bedroom Buffer Zone

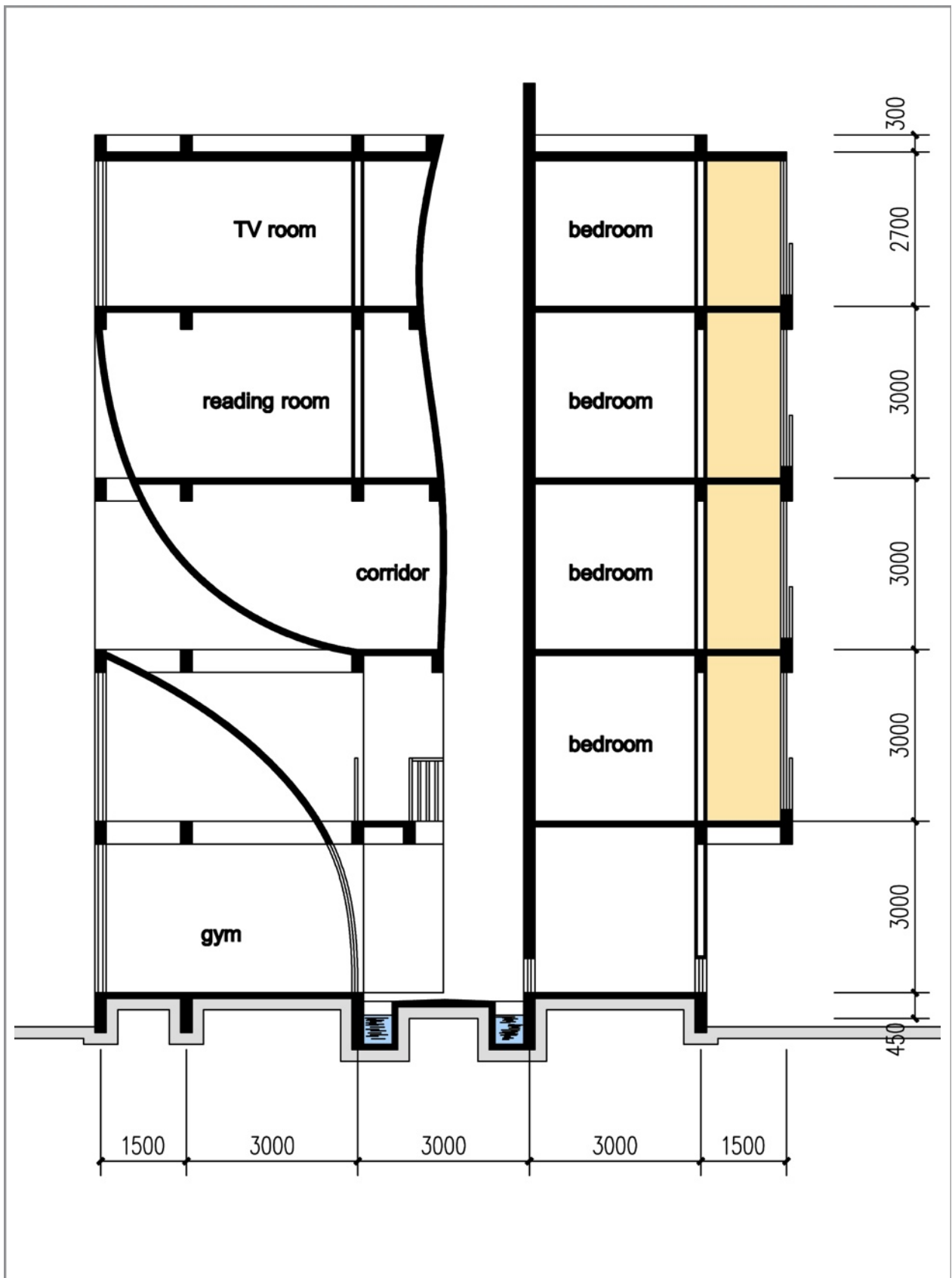


Figure 67: Section

The light scoops are coated with high reflective white coating. How light travel through the curvy shape of the light scoop is carefully studied. The courtyard will get most direct sunlight in the winter.

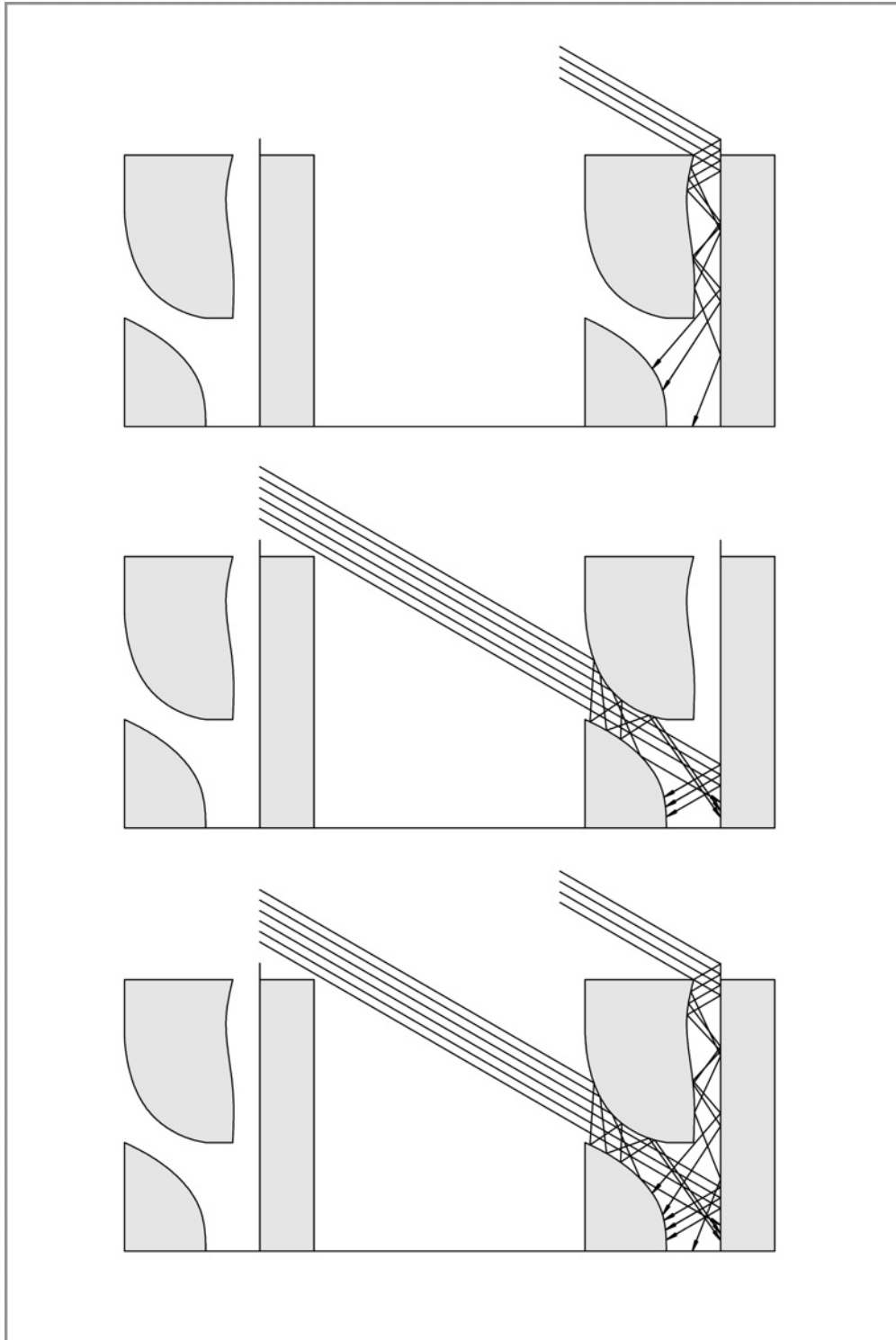


Figure 68: Study of Winter Light Reflection in Scoops

In the summer however, sunlight is not that favorable. Therefore, Shadovoltaic louvers are installed at top of the light scoops. The angle of the louver can reflect summer sun to the green roof and be absorbed, while winter light could travel directed into the light scoop when there is no leaves on the plants.

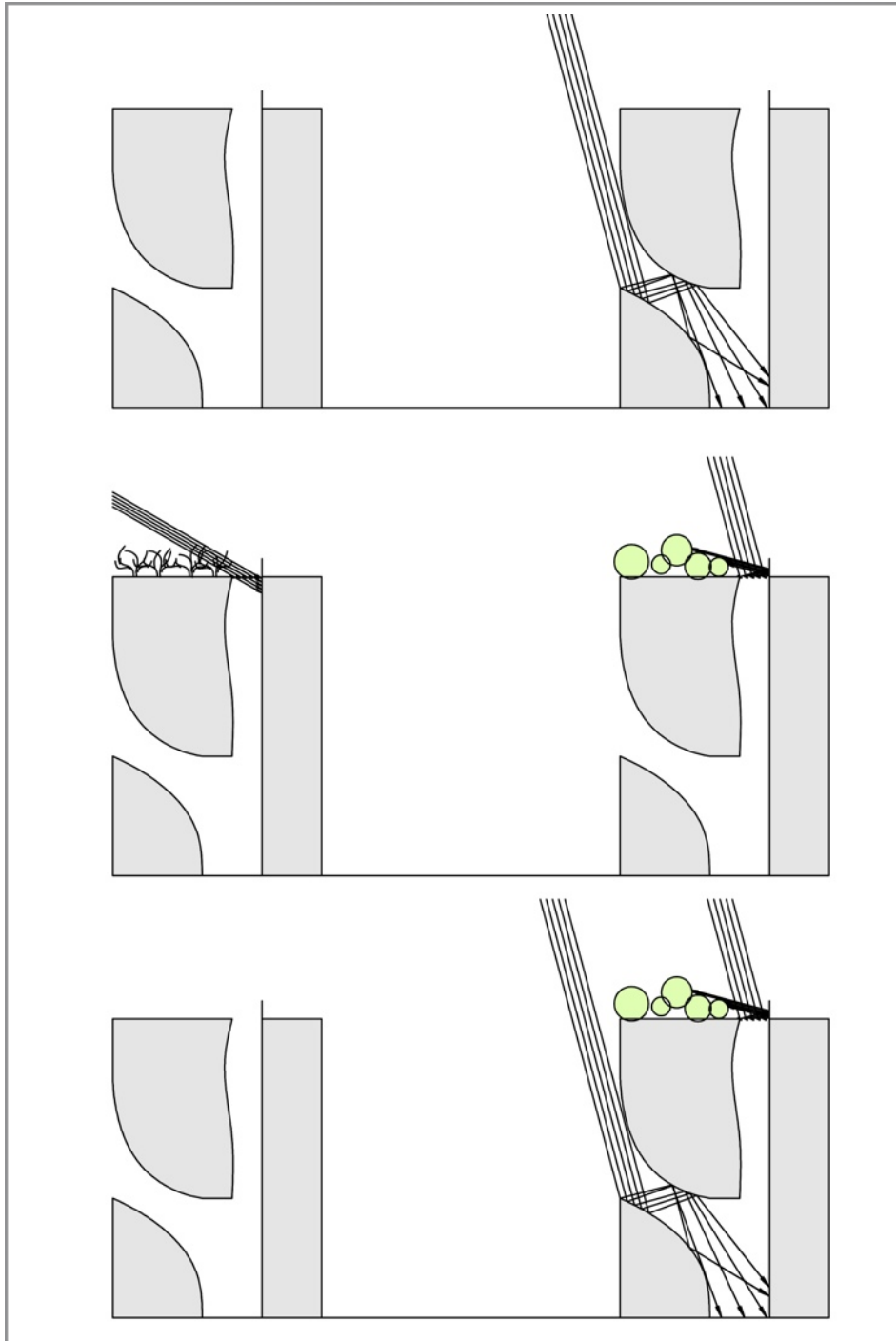


Figure 69: Study of Summer Light Reflection in Scoops

The roof of the reconstructed building is planted green. Visually, the greens are the only thing people can see from the light scoop. Functionally, it can consume the CO<sub>2</sub> and dust from the city and generate fresh air. Moreover, the light pollution from the nearby curtain walls will be reflected by the greens.

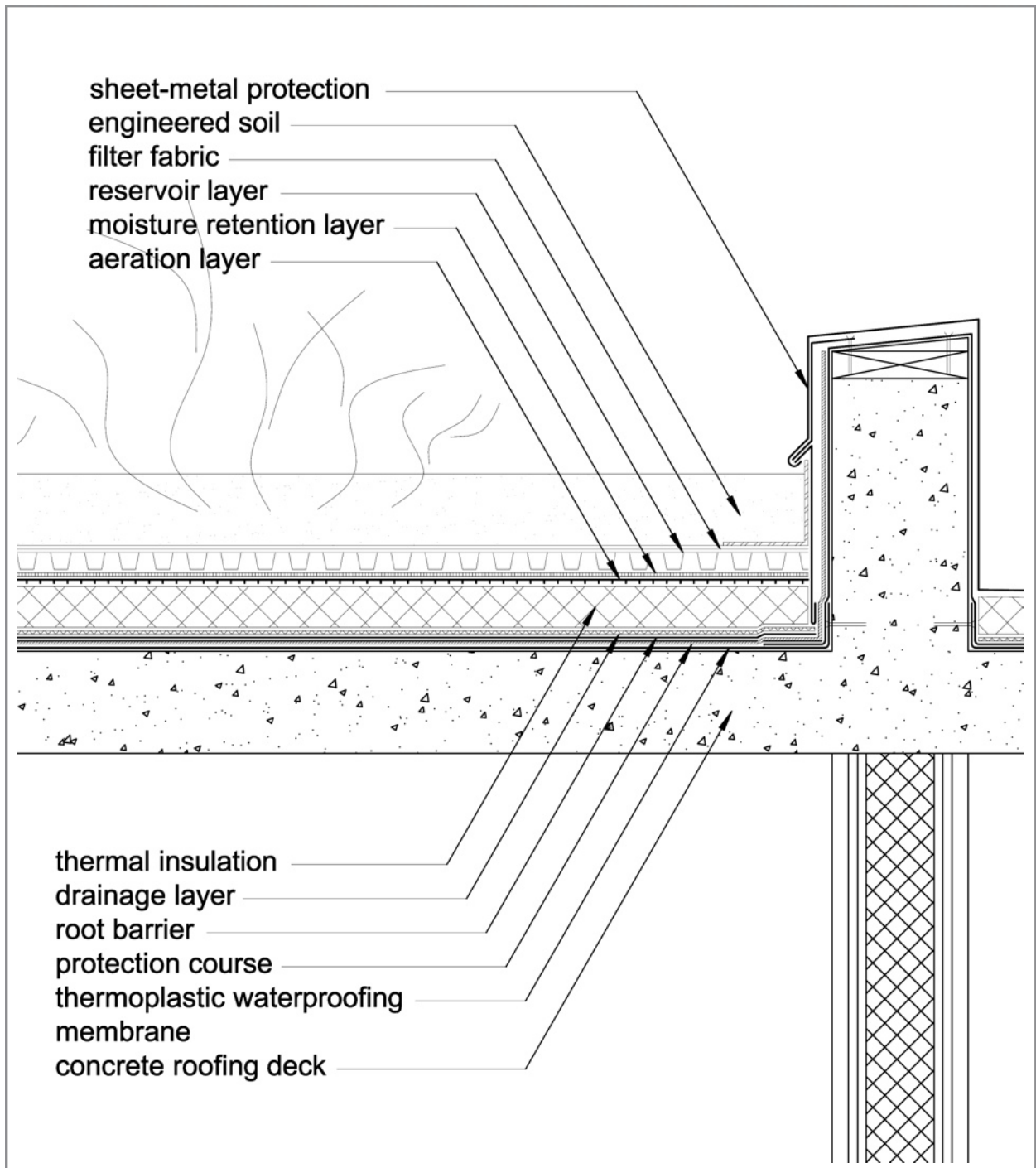


Figure 70: Detail of Green Roof

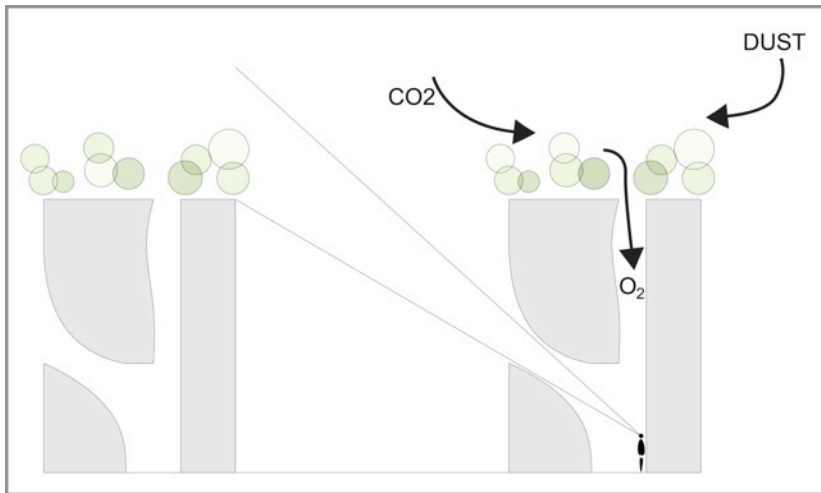


Figure 71: Function of Green Roof

Open to the air, rain water is able to come into the light scoop and accumulate in the courtyard. 600mm wide conduit goes around two courtyards of one stairwell which can preserve the rainwater. Same way as traditional architecture do for passive ventilation, the water conduit and the light scoop work together as a thermal flue. When it is warm and winds are weak, the water can help introducing ventilation into the scoop with the negative pressure created by the upwards motion of the air. Draw the fresh air through the light scoops so that the building is cooled.

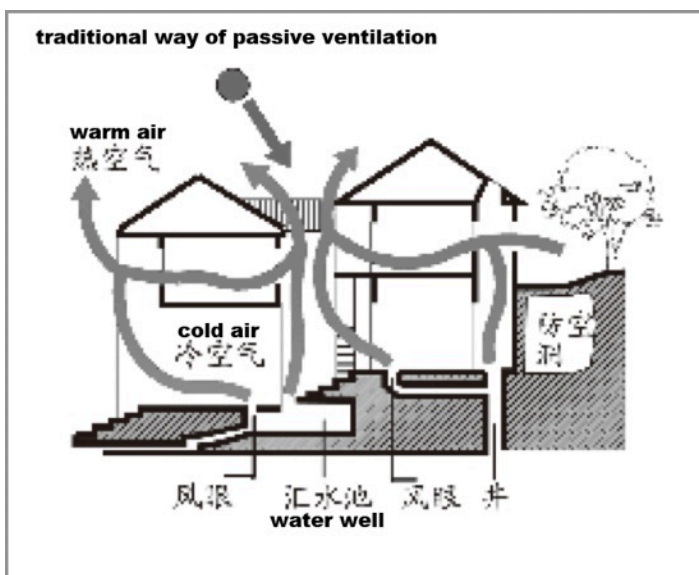


Figure 72: Traditional Way of Passive Ventilation



Figure 73: Diagram of Passive Ventilation in Scoops



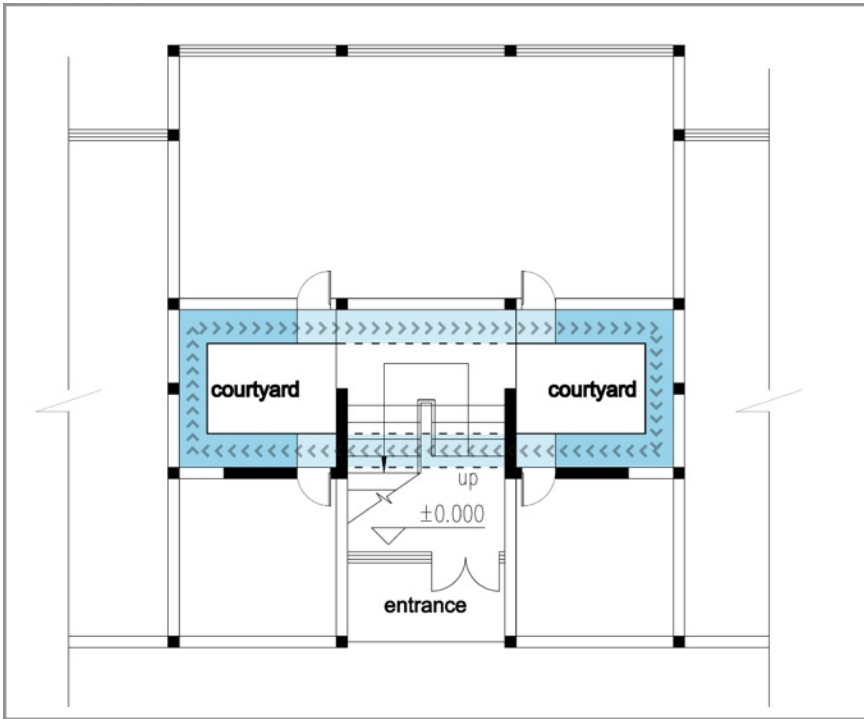


Figure 74: Plan of Conduits in Light Scoops



Figure 75: Section Model of the Light Scoops



Figure 76: Rendering of the Building



Figure 77: Rendering of the Building



Figure 78: Rendering of the Building

## CHAPTER 7

### CONCLUSION

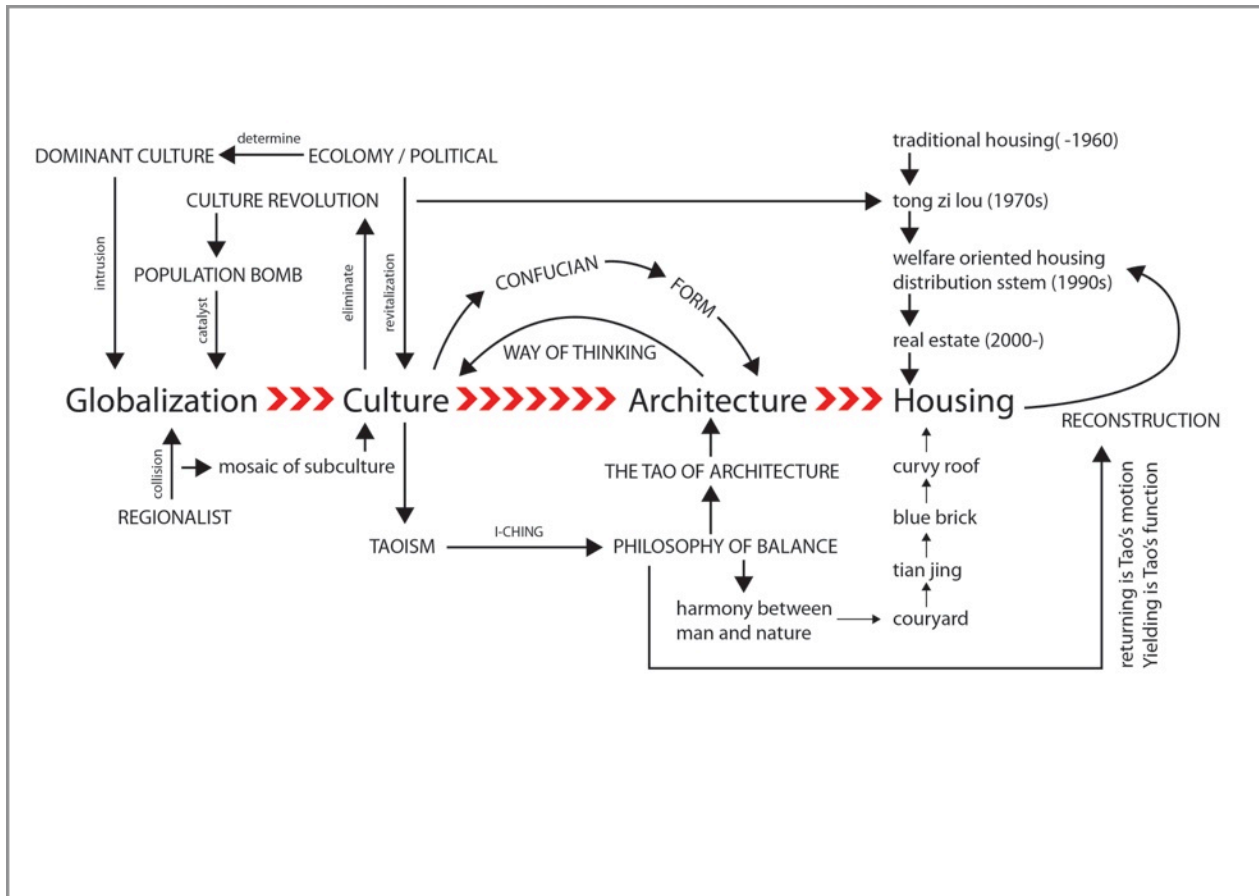


Figure 79: Diagram of the Research process

This dissertation is a progress of reinvestigation of culture. Started with the background of globalization which cause the loss of culture in China, with researches of the philosophy of Chinese culture, and influences of culture in architecture, housing came up to the key point to renovate the lost culture. By studying the transformation of housing in China, and current housing issues, the project was determined to be a design of apartment buildings, which were the leftovers in the welfare oriented housing distribution system.

Having applied the philosophy of Tao into architecture, the main thinking process was returning and the concept of the design was yielding which are both the motion and function of



Tao. Original space is deducted by the light scoops. Not as a compromise to the compelling environment, the blank of the scoops brings abundant of intangible spirit and Qi to its residents.

Practically, the design comprehensively incorporated the principle of Feng Shui into sustainability that the building is performing sustainably in balance of Qi with three layers: well-protected bedroom layer, semi-layer in between with open light scoops, and public layer with breathable blue brick walls.

Above all, culture is reinvestigated in the design. The reconstructed welfare building meets the balance of Feng Shui while generating positive Qi to counter the negative one from the neighbor and the urban. Moreover, the light scoop encourages individual thinking as well as social interactions so that residents have spiritual freedom and develop and cultivate the virtue of them. Thus, culture is going to be revitalized from the reconstruction.

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