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# Architecture for Housing: Multi-Function Transitional Space of Housing in China

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ARCHITECTURE FOR HOUSING:  
MULTI-FUNCTION TRANSITIONAL SPACE OF HOUSING IN CHINA

A Thesis Presented

by

ZHAOQING 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 2015

Department of Architecture

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## DEDICATION

To my beloved family for their endless love and support.

## ACKNOWLEDGMENTS

Thanks to happy time with all people I ever met during the two years.

A special thanks to Kathleen Lugosch and Max Page for their academic advice and kind help.

## ABSTRACT

### ARCHITECTURE FOR HOUSING: MULTI-FUNCTION TRANSITIONAL SPACE OF HOUSING IN CHINA

SEPTEMBER 2015

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This dissertation defines and develops transitional space of housing, which is adaptable to the Chinese environment. It is the integration of community, culture element and sustainable development. Although the lifestyle is changing today, the concept of courtyard which comes from the Chinese vernacular building remains in peoples' minds. It's not only a form but also an expression of national culture and a sense of space. There are some attempts for Chinese architects to renovate or reconstruct the "courtyard", but most of them are low-rise buildings. Facing with the high density, high volume urban living environment, Chinese architects only set

the first floor yard and roof garden in multi-story or high-rise buildings. To improve the community environment, various levels courtyard space, such as the courtyard among units, community courtyard, are set. These courtyards are regarded as public space which not only plays the role of landscaping but also make people feel comfortable. However, there are still some problems, such as sustainable development, privacy. While there are some good attempts for foreign architects to design courtyard in terms of sustainable technology, the housing they design lack the Chinese culture character. So the design of multi-function transitional space raises the interesting questions for future research and development.



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# CHAPTER 1

## INTRODUCTION

China is in a period of rapid urbanization and people not only beginning to pursue material needs but also require better living environments, including such improvements as a sense of security , belonging, identity. In Chinese traditional housing, the application of transitional spaces had already reached a very mature stage, providing an ideal space for nuanced social interaction and multi-generation family. However, under the trend of globalization, the Chinese traditional transitional space is increasingly being replaced by Western concepts, which performs at the gradual replacement of the living form and the change of the residential concept. The ideal transitional space in Chinese minds is the courtyard mode, but during high-density, high- volume urban living environment, people have very little experience to this model as well as the culture and customs it contains.

Facing with the phenomenon of increasing residential homogeneity in real estate and the destruction of the traditional architectural culture during

large urban construction, the author conducts an analysis and research on traditional residential transitional space to understand cultural and technical implications. Moreover, the author discusses the supporting point of the traditional residential transitional space and designing concept. Also, the author analyzes the problems of transitional space in modern housing considering sociology and the study of urban trends. By using the method of field research, the author fully takes into account the different levels of psychological needs of the residents as consumers, choosing a variety of treatment methods to create a transitional space that people are satisfied with. Besides that, integrating theoretical analysis and case studies to make it feasible, the author explores and excavates the transitional space form which is rich in humanistic connotation from the Chinese traditional housings. And the author makes the form adapt to the contemporary living lifestyle, which can recall the loss of traditional Chinese culture. At the same time, the author takes into account the sustainable development to the transitional space in terms of resource and energy issues. Considering all above, the transitional space can play a role in multiple aspects, which can be regarded as a priority in a building design in the future.

## CHAPTER 2

### BACKGROUND

#### 2.1 The transitional space in vernacular building in China

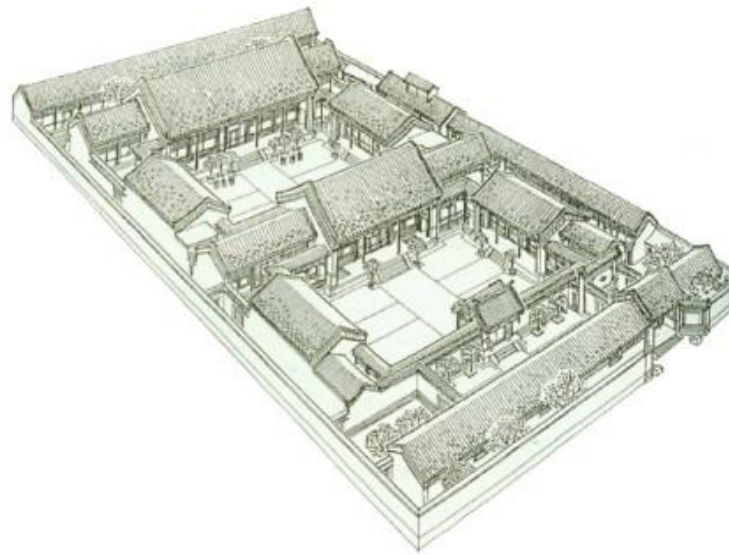


Figure 2.1 Traditional courtyard building

Transitional spaces have been widely used in Chinese traditional courtyard building (Figure 2.1). Courtyards, patios, verandas, gates, doorways, screen walls in traditional buildings all can be seen as the expressions of transitional space. Courtyards (Figure 2.2) and patios are main body of Chinese traditional buildings, which are transitional space between the exterior space and interior. Compared to the interior, they are the exterior space. While compared to the broader outside space, they become interior space in the building. Thus, courtyards and patios as the intermediary space

between the indoor and outdoor spaces, change the properties of space themselves.



Figure 2.2 Traditional courtyard in China

Because of the equal relationship between indoor and outdoor spaces, and duality of courtyard as an intermediary space between building and nature, the continuity of indoor space or outdoor space tends to continue to go to the other side. It provides a good way for the introduction of the natural environment and breaks the binary opposites between architecture and nature to obtain the symbiotic development between human and nature. Veranda is another form of transitional space, which is a space between the



interior and the courtyard, more closely making the relationship between indoor space and outdoor space.

In vernacular building in northern China, there is a gatehouse or a doorway at the entrance, which is not only a sign or symbol as the inner and outer space, but also a transitional space for people from public streets into the private areas. People will spontaneously feel at home when moving through the transitional space by sensing the change of light, sound, direction, vision. The set of screen wall enhances the feeling. Behavioral architecture told us that people will behave more casually when coming back home in contrast to those formal public behavior.

In Chinese traditional building, doors and windows can also be seen as a manifestation of transitional space. The settings of them can strengthen exchanges between the natural and indoor space. On the one hand, due to open windows and doors, the lighting and landscape are introduced into the room to broaden their horizons. On the other hand, buildings become flexible because of those windows and doors. For instance, in the garden of south China, the settings of windows and doors and the use of framing view

and view borrowing (Figure 2.3) enrich the building façades, which provide a lot of interests and charms.



Figure 2.3 Framing view & View borrowing

## 2.2 Current transitional space of housing in China

With the rapid economic development and urbanization process accelerated significantly, the development of multi-family building become the major means of solving the housing needs in China. However, people pay much more attentions to design the public space or private space. The transitional space which is between the public space and private space was ignored for a long time. The following describes some inherent disadvantages of multi-units housing.

(1) It's hard for people to set up a connection with the outside. They rely more on vertical transportation. The communication among people is restricted, causing children's health problems and the elderly activity issues.

(2) Anonymity – In some multi-family buildings, neighborhoods even have not known the name each other after they live here for a long time. The relationship among them seems indifferent. They can't establish a way to care for and protect each other.

(3) There are some attempts for Chinese designers to create courtyards, but most of them are on the ground floor. With the building height increasing, people leave the earth, separated from nature and courtyard experience. At best, in most current design, each unit has a glazed room that is cut off from nature. In this way people's activities are restricted to the interior.

(4) The design of courtyard in building is mainly for children and elder people. It can't meet the young people's demands.

(5) The windows are opened to the central courtyard which locates on the first floor. The people in this courtyard feel uncomfortable.

## CHAPTER 3

### CASE STUDY

#### 3.1 Residential building ingolstadt- Hollerstauden



Figure 3.1 Residential building  
Ingolstadt - Hollerstauden

The precedent I choose is called residential building ingolstadt – Hollerstauden (Figure 3.1) designed by Behnisch Architekten, Stuttgart. My topic focuses on multi-function transitional space of multi-family housing in China, which embraces not only the strengths and peculiarities of local cultures and traditions but also spatial, social and environmental justice. I think this example makes some response to the thesis.

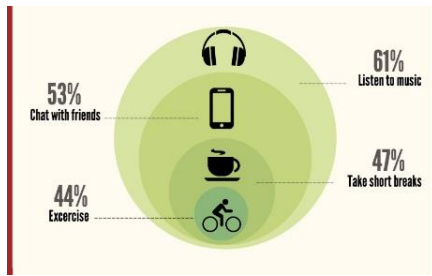


Figure 3.2 Survey about lifestyle



Figure 3.3 Master plan of Hollerstauden

The building establishes a fascinating dialogue between different concepts of lifestyle (Figure 3.2) as well as different ecological approaches. We can see the red line (Figure 3.3) as the main path connecting the different places, meeting points and playgrounds.



Figure 3.4 The central atrium of Hollerstauden

A central atrium (Figure 3.4) with a glazed roof is shaped, which is enclosed by the apartments in the building. The atrium offers a public space for all

residents who live there. According to the survey in China, 80% people prefer to keep silence when at home after working. It becomes a psychological illness among people. So they need a gathering space to relax, which becomes a lively neighbourhood. The red rectangle (Figure 3.3) on the plan provides several different spaces (Figure 3.5) considering this idea. Besides that, the form of building is similar to the form of quadrangle courtyard in China. So it inspires me to combine the strengths of local traditions and cultures in China into the design. The vernacular building provides several possibilities for people to communicate with each other. For many Chinese people in the past, there is only one room to speak of, but with many shared amenities, such as the bathroom, kitchen, corridor, stairs, living room and garden. Also the atrium serves as a generous winter garden, which is a buffer for solar heat gains. It also emphasizes on natural



Figure 3.5 Various public spaces of Hollerstauden

environment, which combines with surrounding environment conditions and local climate.

The building also gives us some ideas. The transitional space plays an important role in connecting. Besides that, apartments can be combined and separated according to changing family requirements. Because of the garden, there is reduction of the hearing energy to 20kWh/m<sup>2</sup>per year.

### 3.2 Rokko housing



Figure 3.6 Perspective of Rokko housing

One of the precedents I choose is Rokko Housing (Figure 3.6) designed by Tadao Ando. Rokko housing located at the foot of Rokko Mountain with a south-facing slope of 60 degrees, where has a panoramic view from Osaka Bay to the Port of Kobe.

Transitional space as a community space

(1) People & people

Rokko housing not only ensures adequate living privacy but also creates different scales of outdoor space by using combinations of terraces.

Therefore, there are various transitional spaces between private space and the outdoor space. “Little square” is the center of the living room and every family can be seen as one unit. Among units “middle square” (Figure 3.7) is

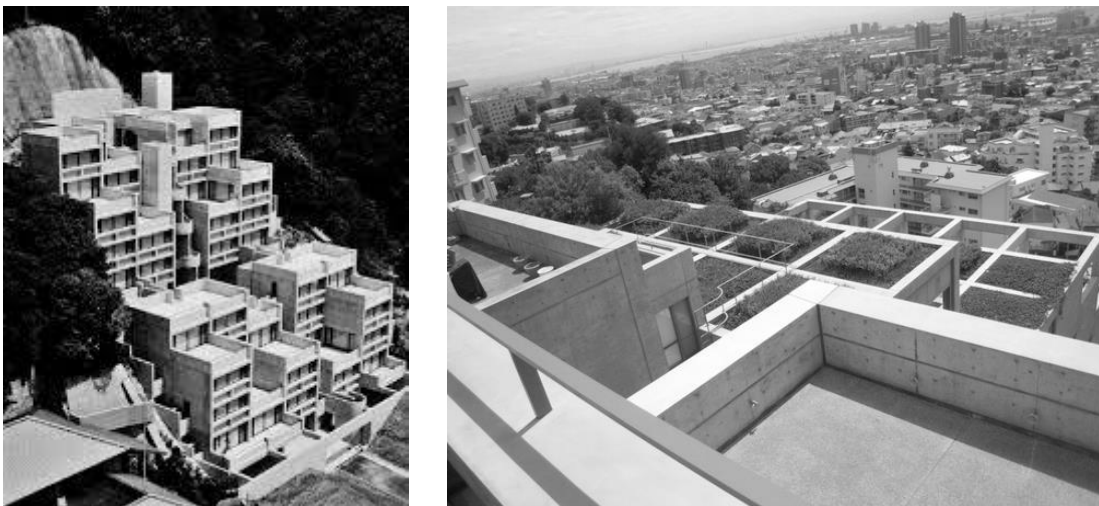


Figure 3.7 “Middle square” in Rokko housing



set which is the heart of the neighborhood. The large square as a whole which is the park of entire residential area, is also the center of all residents. In this way from the inside to the outside square, the public sense strengthens gradually. And privacy dies out at the same time. Facing with the different transitional space, people change the contents of communication.

## (2) People & nature

Each residential unit has different form and scale (Figure 3.8). On the hillside all the units are composed like the terraces. Each unit has a broad perspective. Designing like this makes people who live in these units get to the roof garden to see different landscape, to communicate with nature. In the platform of each unit, people can view the Kobe's urban landscape and beautiful scenery. When people stand on the balcony, they can also communicate with nature. Each room has a window which can communicate with outside nature. People can freely move up and down in nature although they are at home. There are a lot of opportunities for contacting with nature. Tadao Ando achieved the goal that established a

connection between people and nature. The design method comes from the Yayoi culture which is a traditional Japanese culture. It's a good example to make use of local culture.

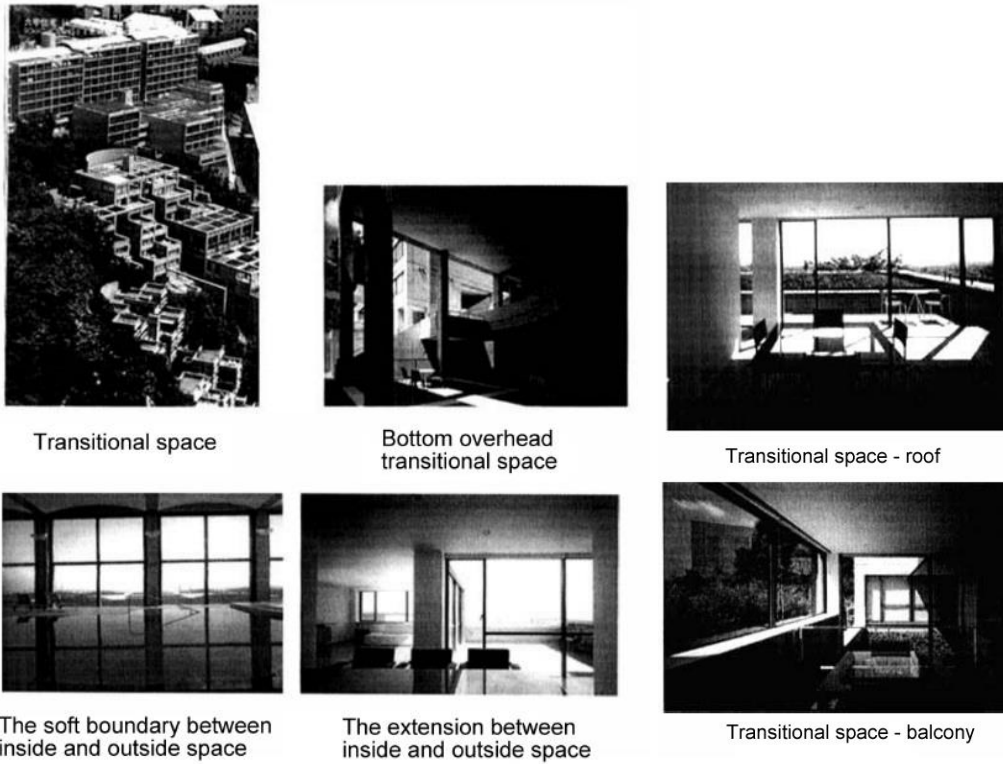


Figure 3.8 Various transitional spaces in Rokko housing

### 3.3 “Heaven and Dwellings” residential building

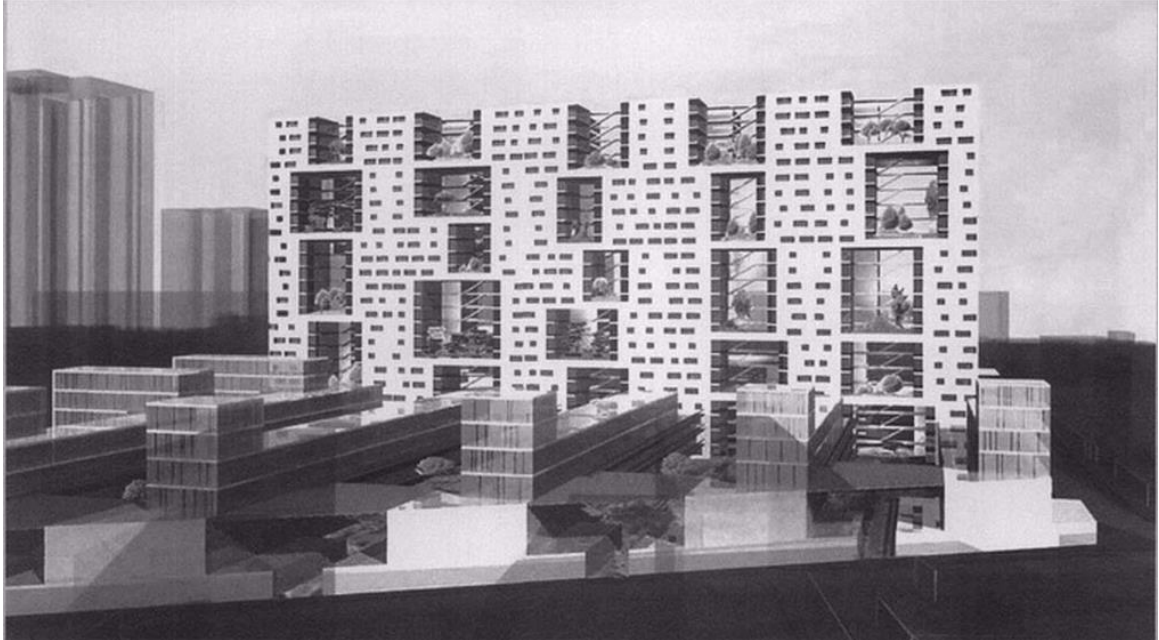


Figure 3.9 Perspective of “Heaven and Dwellings”

Beijing's “Heaven and Dwellings” residential building (Figure 3.9) is an ordinary commercial housing projects. The reason why I choose it as an example is because the designers take account of critical regionalism within the field of architecture in order to develop large numbers of commercial housings. They are trying to show the spirit of the region in modern high-rise design, the continuation of local traditions, maintaining cultural

characteristics, so that the architectural theory of regionalism has a broader social significance.

The land use of the project is 3.4 hm<sup>2</sup>, and the building covers a total area of 87,000 m<sup>2</sup>. The site located in a rapid restructuring and changing environment. So the design of residential building not only meets the basic functional requirements but also show the image of Beijing.

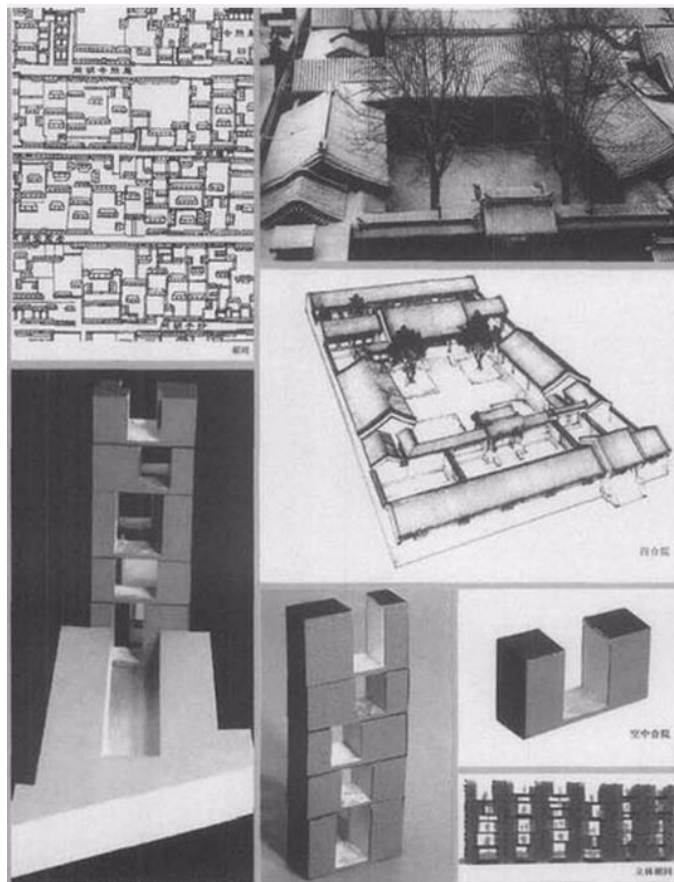


Figure 3.10 The translation process of traditional courtyard building

As the new home of Peking people, designer are trying to make it possess the feature of traditional living space (Figure 3.10). People can recall the life situations of the past years, resulting in a warm sense of belonging. On the other hand, the location of the project is very specific so that the building should demonstrate Beijing's unique cultural image. Therefore, the design of this housing chose the most representative traditional Beijing residential building hutong and courtyard as the design prototype. For traditional inheritance, they don't take the imitation of form and reproduction for granted. Instead, the architects using the idea of alienation re-integrate hutong and courtyard. That is to say, the two prototypes were abstract reproduction. Future buildings will allow residents to develop a dialogue with the traditional. The results can also produce good memories of the past years.

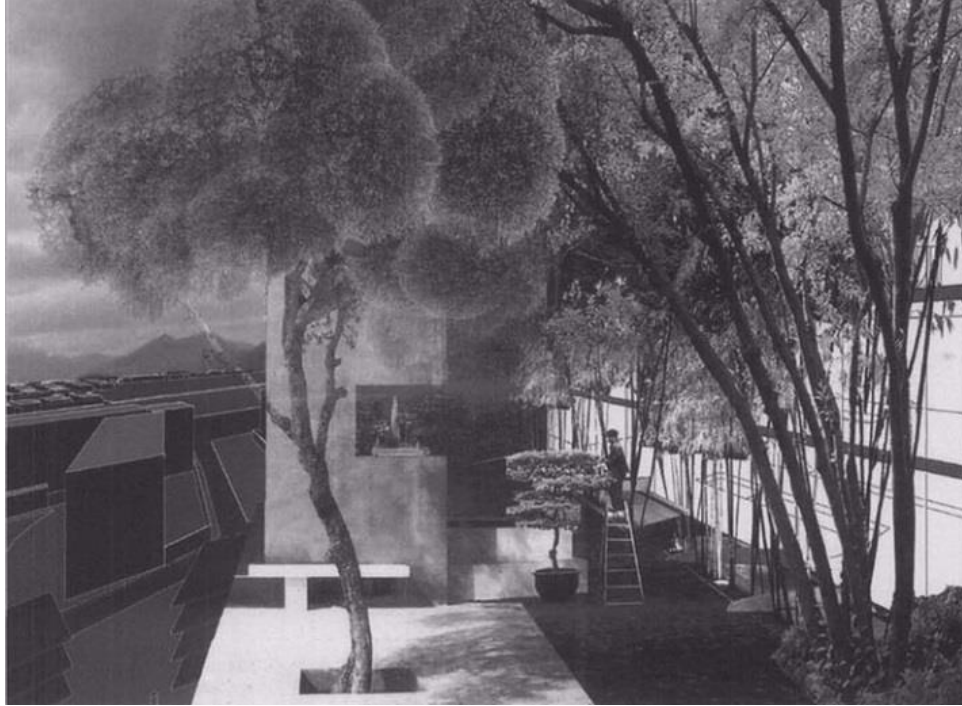


Figure 3.11 Aerial courtyard in “Heaven and Dwellings”

These ideas are reflected by the 24-storey residential buildings: each plan consists of a group of four residential units, which are connected by a north-south corridor. Between unit and unit, corridor east and west, each of them has an aerial courtyard which is 4-6 stories height. From the façade, we can see each aerial courtyard (Figure 3.11) forms a public space among neighborhood units, where the residents could gather, relax and chat with each other. 24 corridors are abstract expressions of the tradition hutong, while the aerial courtyard is a reflection of abstraction and

variability of traditional courtyard. Both in the modern high-rise residential space also plays a similar function with the traditional space.

Facing the high density of the population in China, this precedent gives us some enlightenments to continue the traditional culture in modern buildings by the variability of the traditional form. However, all the function of the spaces remains unchanged.

## CHAPTER 4

### FUNCTION ELEMENTS

#### 4.1 Culture

Chinese traditional culture has experienced a long term development and integration for thousands of years, culminating in profound cultural forms. Chinese traditional building as the carrier of culture will inevitably reflect this spirit.

Under the influence of Confucianism, Chinese vernacular building tends to be the centripetal cohesion state, forming transitional spaces such as courtyards, patios, which are the most basic form. Apparently, the formation of an architectural form is not affected by a single ideology and culture, but through a variety of ideological and cultural integrations. For instance, some flowers and trees are planted in the courtyard, patio and other space. By this way nature can be introduced and rebuilt, forming the image of the scene and making space with beauty and interest. Naturally, this is also very consistent with the pursuit of the living environment in Taoist viewpoint.



Chinese traditional buildings are also affected by the ideas of yin and yang. The relationship between the broader outdoor space and building constitute the relationship like external emptiness and internal entity, which is yin and yang. Courtyard is enclosed by peripheral houses, which forms the external entity and internal emptiness. Moreover, gatehouse or doorways and courtyard compose another external entity and internal emptiness, which is also consistent with the ideas of yin and yang. As these combinations of yin and yang in objective phenomena make Chinese traditional buildings being the beauty with art and life.

Besides that, a basic environmental principle is “Heaven”, which means the harmonious relationship between man and nature. Under the influence of this view, a lot of traditional spaces which are neither indoor space nor outdoor space appear in Chinese vernacular building, resulting in the flexibility of spaces.

Although in the contemporary world, social norms and values have to constantly face the threat of being uprooted and destabilized by the new

culture, traditional culture still has an influence on people. So, it is vital to keep alive the historical essence of our culture, while recognizing the all-encompassing role of the traditional impacts. It highlights the real issues facing preservation of old fabric with a new form in cities today and it should be taken to mean all issues concerning collective memory and identity, the rehabilitation of the original culture and livelihood.

## 4.2 Community

The courtyard of traditional architecture is the center area of family life, daily living activities, such as for children playing, for the elderly basking under the sun and other activities every day. Therefore, community became an important factor considering transitional space. The family who like outdoor activities, often set the number and the size of the courtyard based on the number of people in their family. The more members are, the greater the size of the courtyard is, also the more the number is. Even in some places courtyards were divided according to different activity spaces for different family members, each with different characteristics. On the contrary, for those do not emphasize on the outdoor activities, the courtyard tended to be very little, addressing only the basic functions such

as lighting, ventilation and drainage, losing the meaning of courtyard as the interior space.

The development of residential building in China today is too fast, with too much openness and chaos causing complaints from residents. When complaining, people often referred to those old buildings' courtyard spaces which have a pleasant scale and create a harmony relationship among people. So as architects, we need to create many different scales of social interaction spaces to accommodate public demands.

### 4.3 Sustainability

For the contemporary buildings, most architects consider to replace the traditional building techniques with high technology. Traditional architectural techniques contain a lot of "green" components, including using local materials such as stone, wood, adobe, grass and other natural materials. There is no negative impact on the ecological environment while it also saves costs. The advantage on high-tech is precision and high efficiency, controlling energy and material exchange between architecture

and external ecosystem to create a comfortable indoor environment. In addition, it enables the building to have a certain intelligence, by using less physical materials to meet the same functional requirements. Meanwhile, the bioclimatic theory should be applied to transitional space, operating passive low-energy technology and using the combination with site weather and meteorological data. In this way a micro-climate can be formed to reduce building energy consumptions.

## CHAPTER 5

### CONCEPTUAL DESIGN

#### 5.1 The site

##### 5.1.1 Background

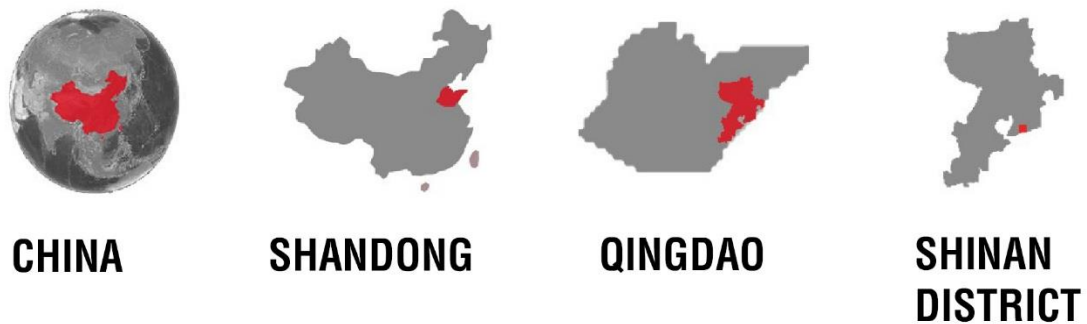


Figure 5.1 Location of site

I choose my hometown – Qingdao (Figure 5.1) as my site of final program, which locates in eastern Shandong Province, China. Qing in Chinese means “green”, while dao means “island”. I think the city name reflected the original city condition well. An old saying described Qingdao as a city of “red tiles green trees, blue sky and blue sea.” (Figure 5.2) So people who live there from generation to generation always have the special desire and affection on green plants and blue sea.



Figure 5.2 “red tiles green trees, blue sky and blue sea”

According to the 2010 census (Figure 5.3), the built-up area made up of 6 urban districts and Jimo City had 5,764,384 inhabitants, while the total population of the city is up to 8.71 million within around 5100 km<sup>2</sup> land area. Especially for the Shinan district where the site locates, the population density is up to 18153.95/km<sup>2</sup>.

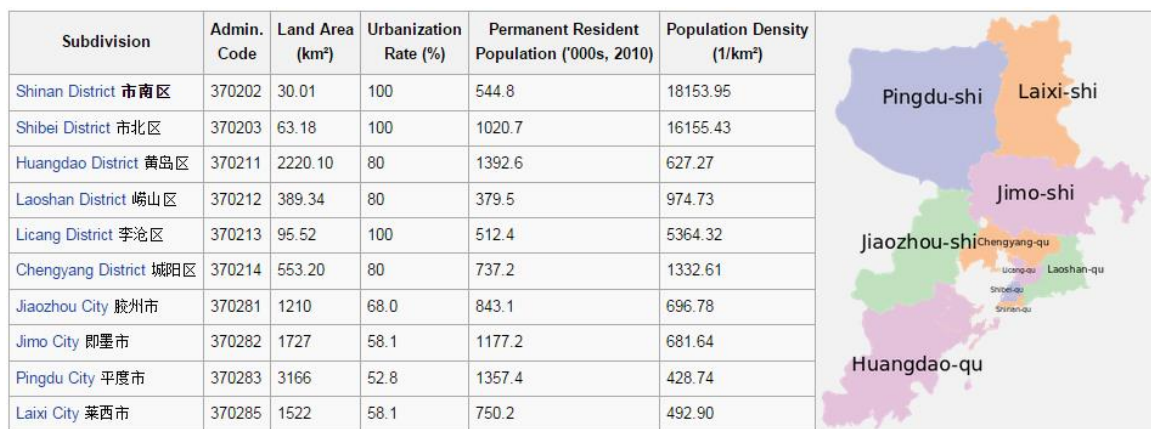


Figure 5.3 The result of the 2010 census

Considering the city master planning, the western part of Qingdao could be viewed as the old town, where it still retains many traditional Chinese courtyard residences. However, the new city located in the eastern part is under large-scale reconstruction.



Figure 5.4 The skyline of the site

The reason I select this site is that it has the first high-rise residential buildings standing there in Qingdao in 1990, which is seen as the representative of modern high-rise residential buildings. Before development, this area was full of traditional courtyard buildings. After that, as an area with intense development pressure, the skyscrapers (Figure

5.4) were built rapidly replacing courtyard buildings. The original inhabitants who prefer to stay in the courtyard buildings were placed into the new concrete towers. Consequently, the connection with nature and communication among neighbors has disappeared. The transformation of the city is the inevitable step of urbanization process, while people are eager to get the same benefits which courtyard buildings bring to them. That's what I want to find a way out of the dilemma.

#### 5.1.2 Site Analysis

I choose the site in the new town of Shinan District. They are three existing high-rise buildings standing there. (Figure 5.5) The surrounding buildings except south part locate in high-rise building area, while south part is low-rise area and lawn. The south of site is facing the beautiful sea, which has the best views. And the landmark sculpture – May Wind situated on Wusi Square comes from the southwest of site (Figure 5.6).



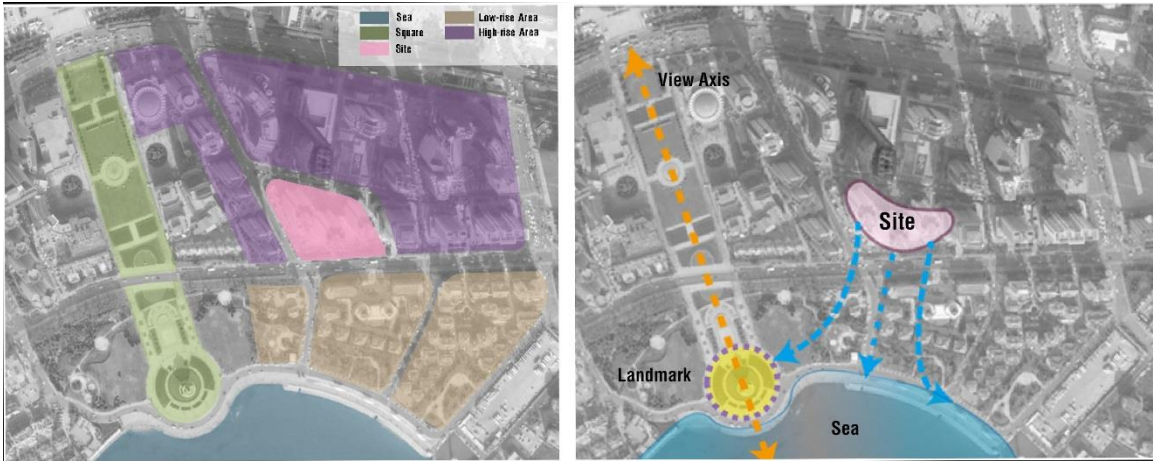


Figure 5.5 Site analysis



Figure 5.6 The bird view of the site

## 5.2 Three different courtyards in vernacular building in China

Based on the common Chinese traditional courtyard residences, there are three different courtyards (Figure 5.7) including outer courtyard, first-step courtyard and second step courtyard. Each of them has different characters, such as quiet or live, open or closeness, independence or interactiveness. It is because the combination of them that the traditional

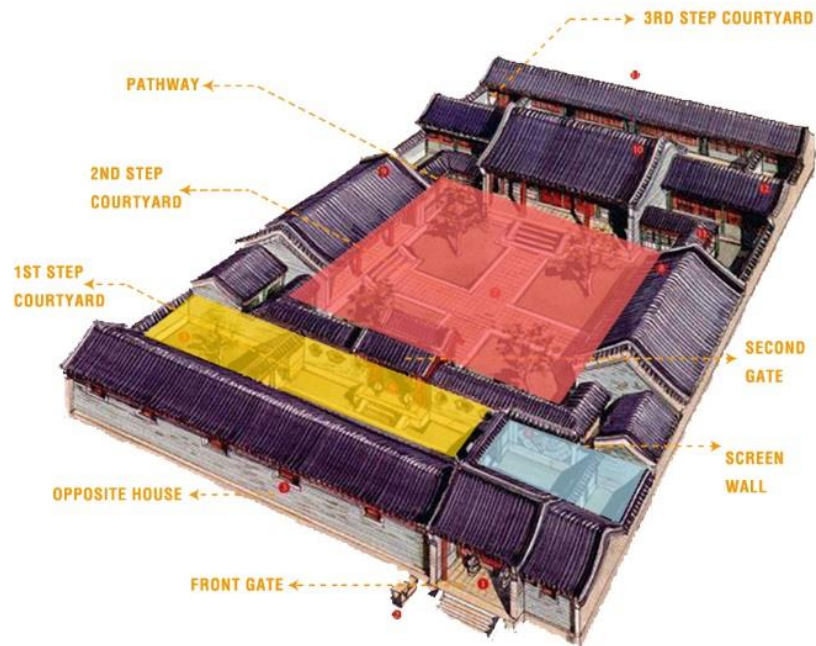


Figure 5.7 Three courtyards in traditional courtyard building

courtyard residences have met the multiple needs of people who lived there.

### 5.2.1 Outer courtyard

Considering the layout of Chinese traditional courtyard residences, most scholars regard the three courtyards residence as a typical residential form. When people enter the front door, they face to a screen wall, which is close to the southern gable of the east house.



Figure 5.8 Various screen wall patterns

The culture meaning of outer courtyard is to protect the privacy more.

While people coming in, they cannot see a more private space directly. At the same time, because the screen wall pattern (Figure 5.8) is exclusive

based on different family. When people see their familiar screen wall, a sense of security and belongingness come about subsequently. The scale of the outer yard is the smallest among three courtyards. It mainly plays a very important part in transitional space. Also small activities occur in the space, such as children playing, the elder basking (Figure 5.9) or playing chess.



Figure 5.9 The elder basking in the outer courtyard

### 5.2.2 First-step courtyard

The first-step courtyard (Figure 5.10) is enclosed by opposite house and inner walls. The floral-pendant gate becomes the demarcation point between the first-step courtyard and second-step courtyard.

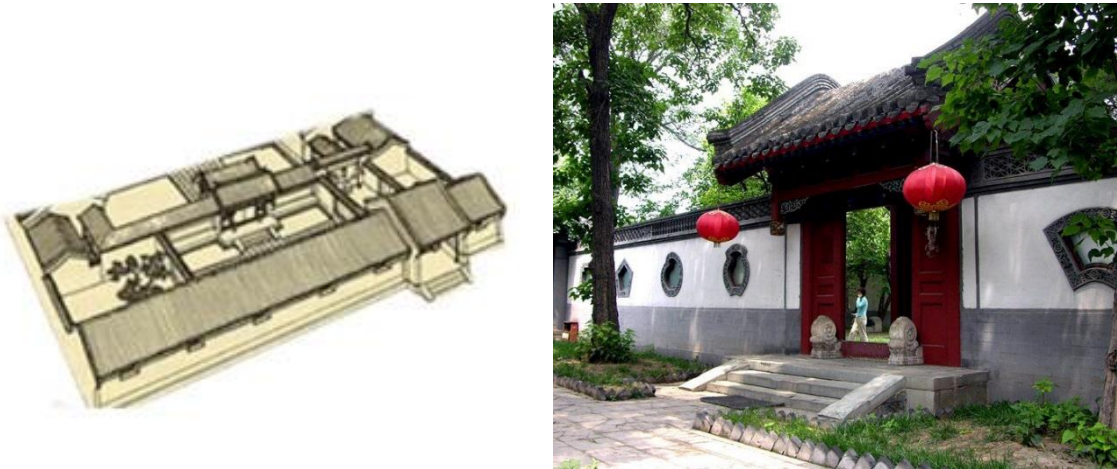


Figure 5.10 The first step courtyard

During the past time, the first-step courtyard is the main space for visitors to gather. Only after the owner's approval, visitors could enter into the second-step courtyard. But for welcoming them, guests are assigned into the opposite house where they could drink tea and wait for the owner. What's more, there is an additional courtyard connecting with the first-step courtyard. This courtyard is the main space to be planted, as a garden. These flowers and grasses make people pleased and the courtyard lively.

On the other hand, the integration between people, building and nature creates a space full of green, which reflects Chinese's respect for nature and the culture meaning of "heaven-man unity".

### 5.2.2 Second-step courtyard

The second-step courtyard (Figure 5.11) is the main courtyard among the three courtyards, which is enclosed by several independent houses. All the houses are connected by the pathway. The doors of them are facing to the central courtyard uniformly, which reflects the centrality coming from the Chinese traditional philosophy.

The spacious courtyard is the center of the courtyard layout, which serves various activities for people, such as transitional space, communication space, resting space. Besides that, the surroundings of courtyard are closed, which can prevent the outside interference factors effectively. The courtyard is filled with the fresh air and quiet environment because of the green plants. Also the courtyard plays an important role in sunlight,

ventilation and thermal behavior, which provide a very comfortable physical environment.



Figure 5.11 The second-step courtyard

## 5.3 The translations of three different courtyards

### 5.3.1 The challenge of translations

Chinese courtyard house has been the ideal dwelling form for Chinese. But under the current social condition, the traditional courtyard layout is impossible to be applied extensively. It seems that people have a tendency about owning a spacious courtyard desire is contrary to the urban housing extending in the vertical direction. However, we have to admit that the traditional courtyard building is far away from satisfying the needs of society. What's worse, it can not improve the living quality of life. This is mainly reflected in the following aspects.

#### (1) The change of population

Due to increasing population mobility, the population density in big cities is growing. Therefore, the volume ratio becomes an important economic indicator of residential design. Subsequently, a large number of residential districts and the high-rise residential buildings are built up. However, considering traditional courtyard buildings, due to their low volume ratio, its dominant position has given way to a variety of tower style residential building.



## (2) The change of family composition

Traditional courtyard building is adapt for a traditional Chinese-style extended family. In a traditional building, each sub-family of extended family surrounds the courtyard which becomes community space.

Courtyard space could meet the needs of traditional extended family.

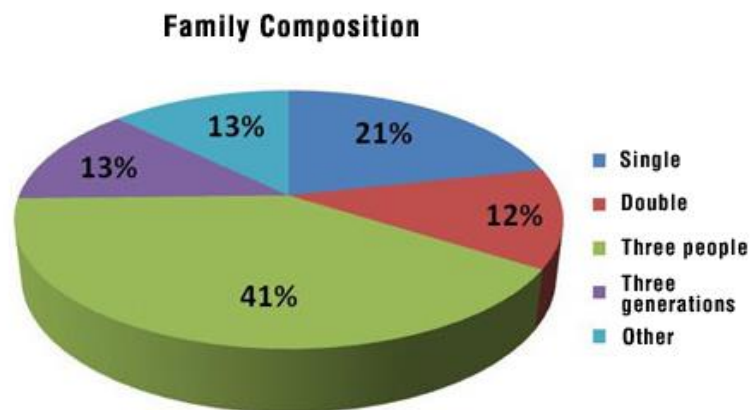


Figure 5.12 The family composition in today's China

However, in today's society, four generations living together has occurred less and less, being replaced by three people families. (Figure 5.12) And in the major cities, the proportion of the Dink family or single-parent family is also increasing. The scale of family is getting smaller, which is more obvious in large cities. At the same time from the census data, we can see the three people family being the majority in the family composition. New family

composition need new form housing to be designed. A new community space is needed among the families.

### (3) The change of lifestyle

Courtyard buildings are open to the inside, while they are closed to the outside. The intense centripetal sense strengthens the cohesion of family members but also makes home become a battlefield in a sense. With the more competitive society, the home has become a haven for people. A survey shows that after work, people are more willing to go to some places (Figure 5.13) where they could release the pressure and relieve their mood. It can be proved that the home of the modern is a place which is a relaxing environment. Meanwhile, the network has become an important part of life. Virtual life and real life are intertwined. A new lifestyle is emerging constantly. All these needs should be taken into consideration in today's urban housing design.



Figure 5.13 The places where people prefer to stay in after working

Through the analysis of the various problems faced by traditional courtyard building and the rethinking of the modern way of life and family composition, the re-invention of the traditional courtyard is needed to satisfy today's Chinese peoples' living habits.

### 5.3.2 The new forms of three courtyards

For the translation of three courtyard, I want to use the design approach called “imitation courtyard”. That doesn’t mean to recovery traditional courtyard but apply the composition rule of traditional courtyard prototype into the design, to simulate a new kind of community space similar to the traditional courtyard. It’s not the courtyard for single extended family but for several families sharing it. Here is the existing floor plan for the three high-rise buildings. (Figure 5.14)

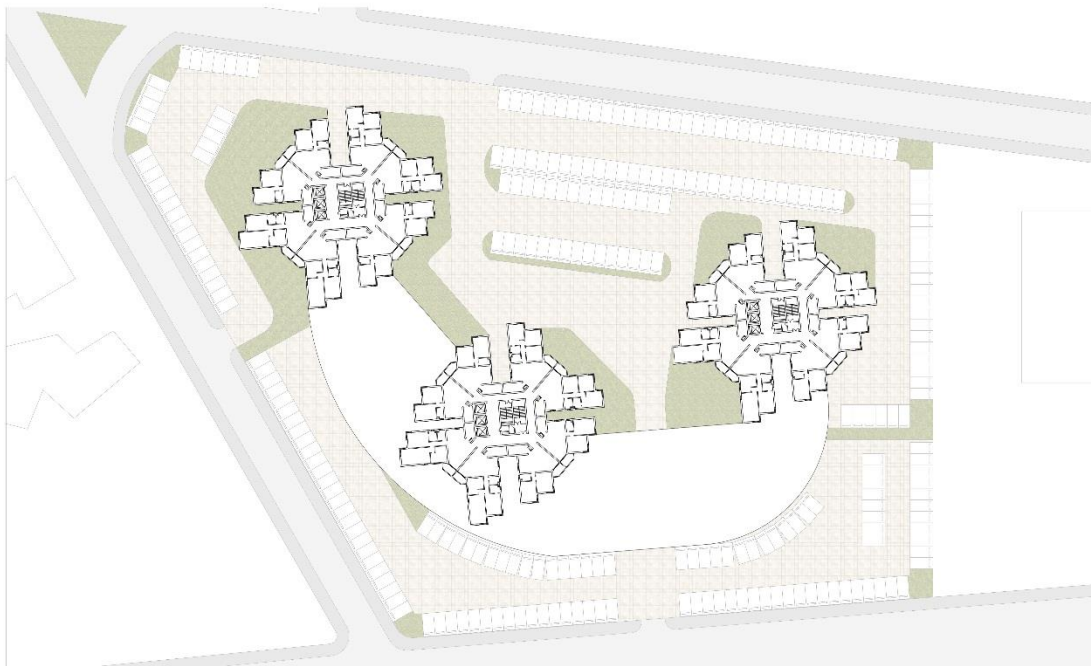


Figure 5.14 Existing floor plan

### (1) Outer courtyard to new outer courtyard

Firstly, the outer courtyard could be translated into a space serving as a small courtyard at the apartment entrance (Figure 5.15). I make use of the space between the four apartments to form the double-height space which not only strengthens the visual connection among neighbours but also provides them a small activity space, like the traditional outer courtyard. Also based on the culture meaning, a door is set to secure the small courtyard, which gives people the sense of security.

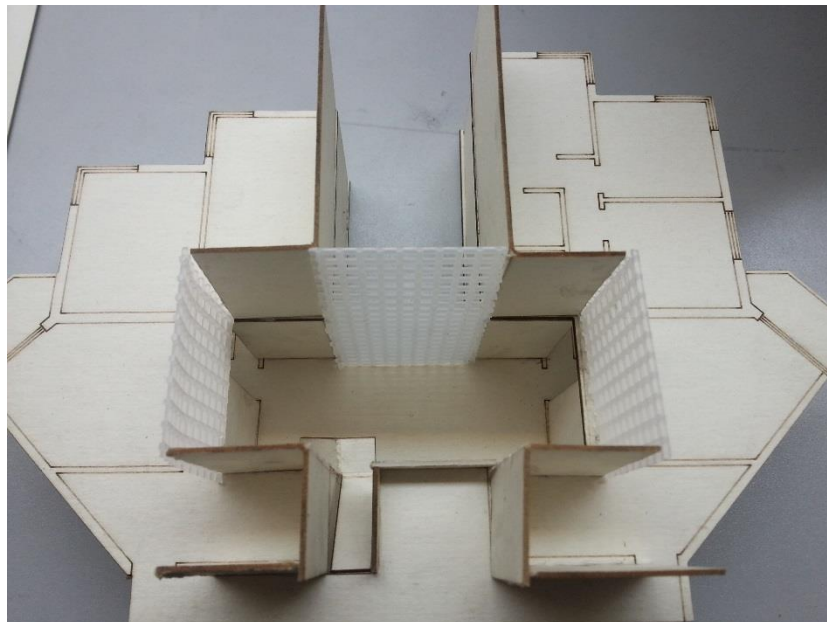


Figure 5.15 Conceptual diagram & model of new outer courtyard

## (2) First-step courtyard to semi-public space

The first-step courtyard can be regarded as the semi-public space which is for more public, but medium-scale gatherings (Figure 5.16). This courtyard is the main space for people to connect with nature. That is to say, plants and fresh air should be introduced into this area. Considering the scale of the courtyard and numbers of people living there, each eight story could be seen as a stack which the semi-public space serve to. The semi-public space is assigned in the middle two story of each stack. In other words, around 180 people will share the double-height aerial garden with some spaces, such as card room, child care room, café.

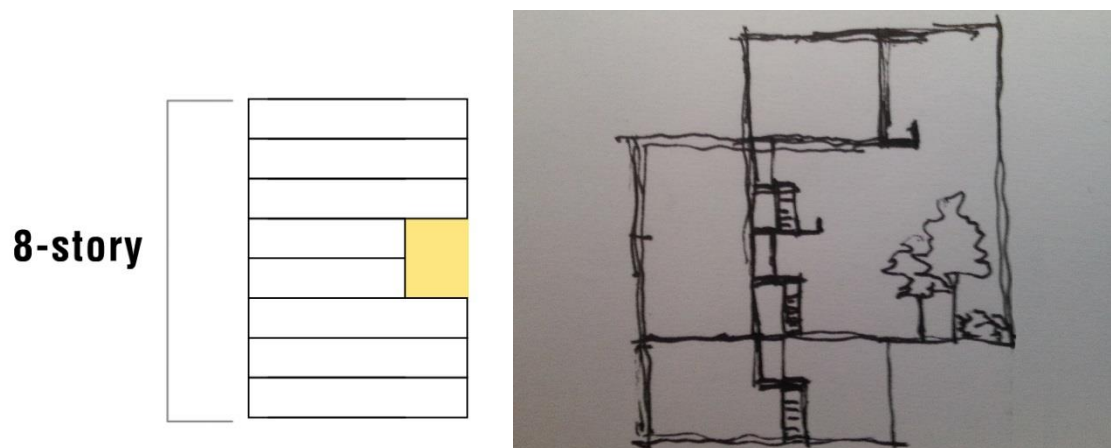


Figure 5.16 Conceptual diagram & sketch of semi-public space

### (3) Second-step courtyard to public space

Finally, the second-step will be translated into the fully public space for gathering of the whole community. Use several floating blocks (Figure 5.17) to connect these three existing high-rise buildings to become one large complex. By this way, all residents living in the three buildings could have opportunity to be linked together. Also influenced by the culture of traditional courtyard, people prefer to enter into the centralized courtyard, which will increase the utilization of space.

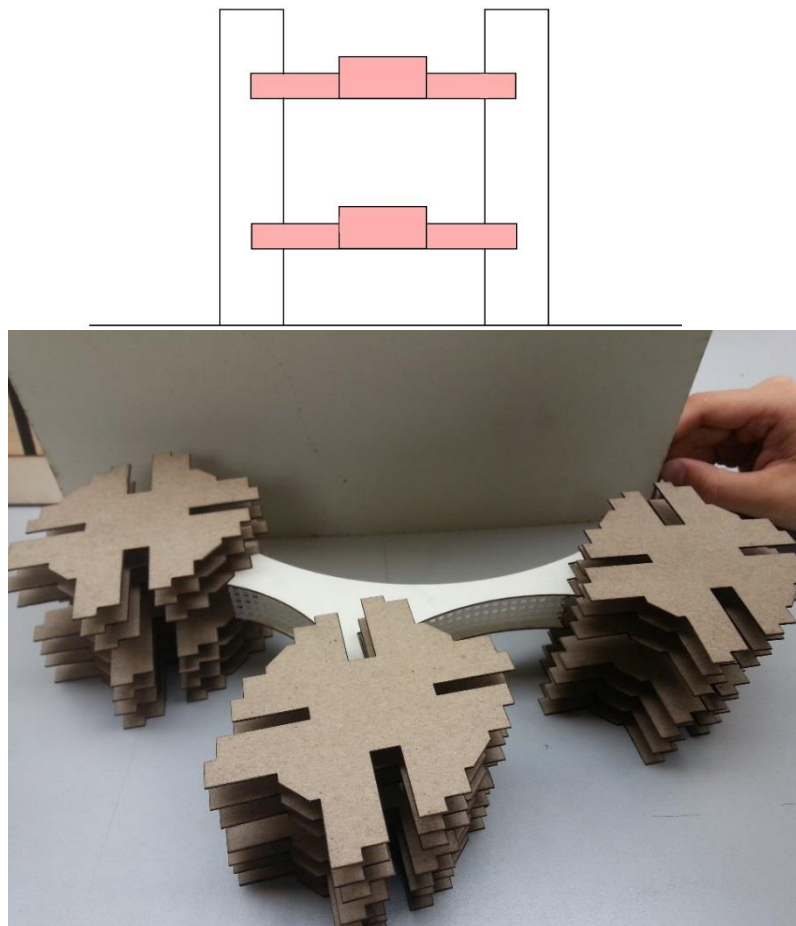


Figure 5.17 Conceptual diagram & model of public space

## CHAPTER 6

### DESIGN PROPOSAL

#### 6.1 New outer courtyard

Double-height space is applied into this new outer courtyard, which is serving for four apartments with around 12 people. By this way it not only meets the basic spatial scale requirement but also makes the courtyard space not too low to produce a sense of oppression. Each apartment sacrifices some areas to form the outer courtyard. (Figure 6.1) The dot line means demolished wall, while the grey wall means new added wall.

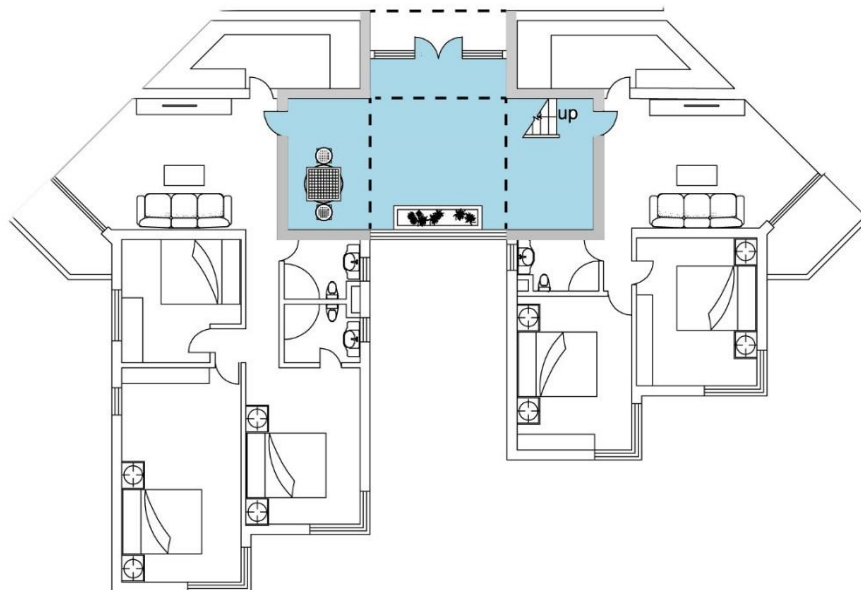


Figure 6.1 The change of existing floor plan



Each two floor is divided into four new outer courtyard (Figure 6.2). The design makes people walk through the courtyard before entering their home, which enhances the privacy of interior space and spatial layer. At the same time, the organization of space makes people communicate with each other in a very casual and natural state, bringing more belongingness.

(Figure 6.3)

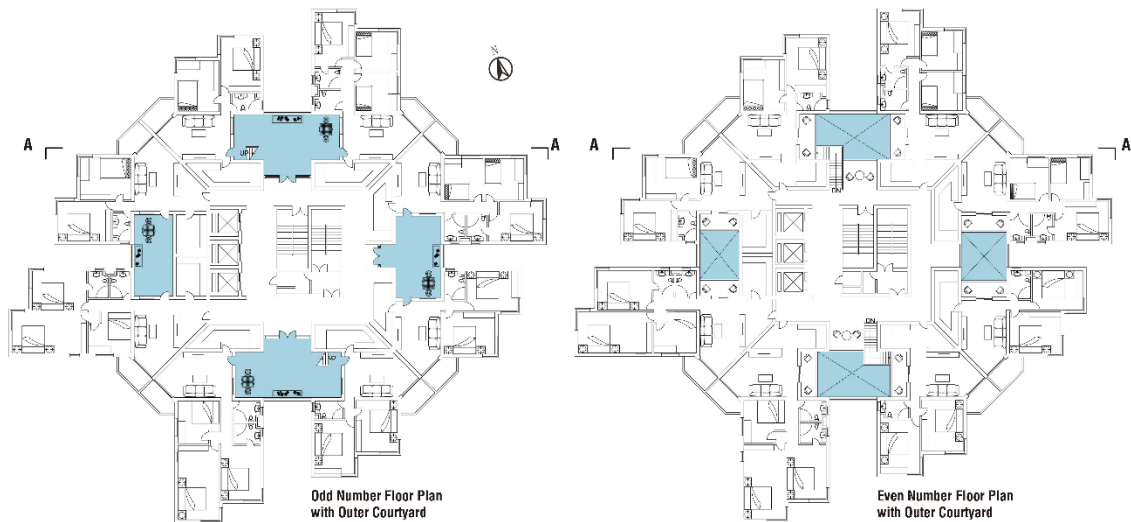


Figure 6.2 Standard floor plans with new outer courtyard

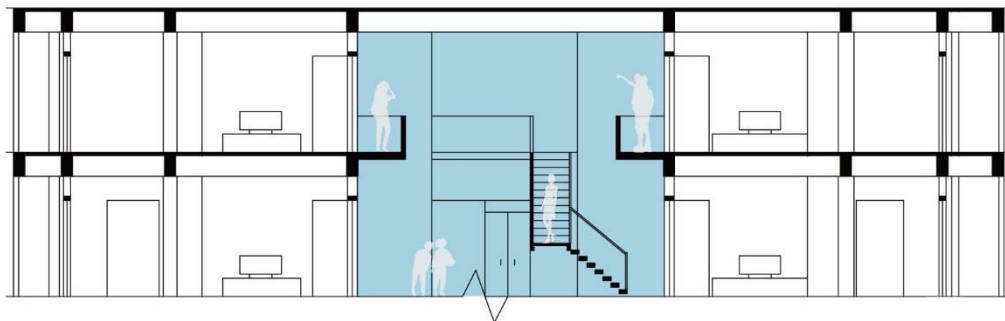


Figure 6.3 Section plan of new outer courtyard

Based on the culture meaning of outer courtyard, the new outer courtyard still give people the sense of security. A door is set on each new outer courtyard. Besides that, when you enter the space, the view from the curtain wall which is exclusive by each outer courtyard is like a dynamic screen wall, which gives people intense identity. (Figure 6.4)



Figure 6.4 Interior perspective of new outer courtyard

## 6.2 Semi-public space

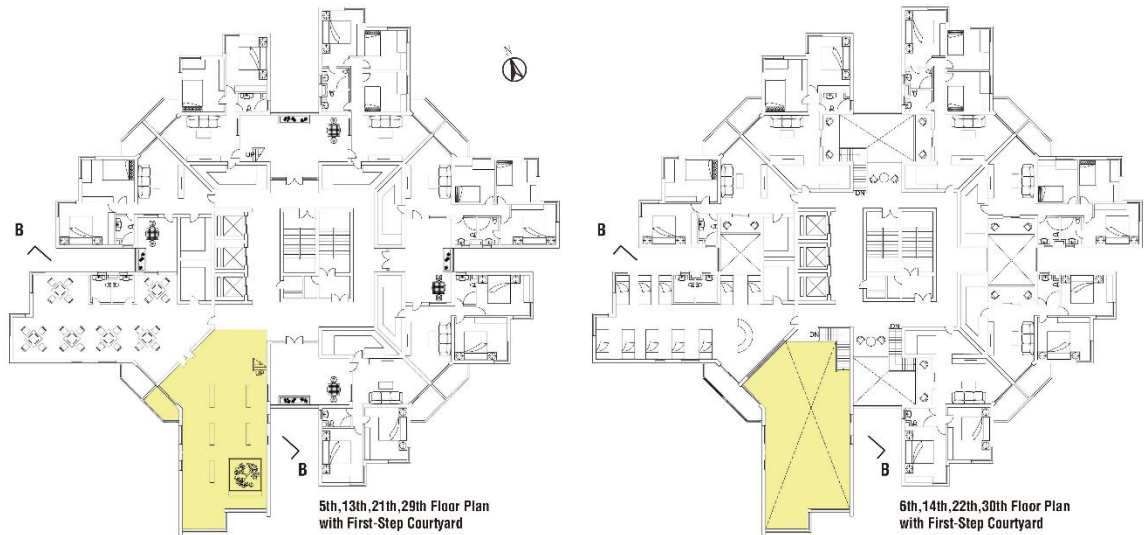


Figure 6.5 Floor plans with semi-public space

As the most important space for people to contact with nature, how to organize the relationship between space and nature is what we need to solve. According to preliminary analysis, eight floor could be seen as a stack which has one semi-public space. In order to make minimal change to the existing buildings, all the demolition or additions are based on each original apartment. That is to say, when we renovated a new space, all other apartments still keep work. (Figure 6.5) So depending on the scale of semi-public space which should meets the activity requirement for around 180

people, two apartments each floor are selected to be renovated. All the other apartments are unaffected.

In the semi-public space, people not only have opportunity to enjoy the fresh air and best views but also establish the connection with nature directly, which people look forward to. (Figure 6.6) At the same time, some rooms, such as card room, childcare room are set to attract people gathering here, forming a medium-scale community space.

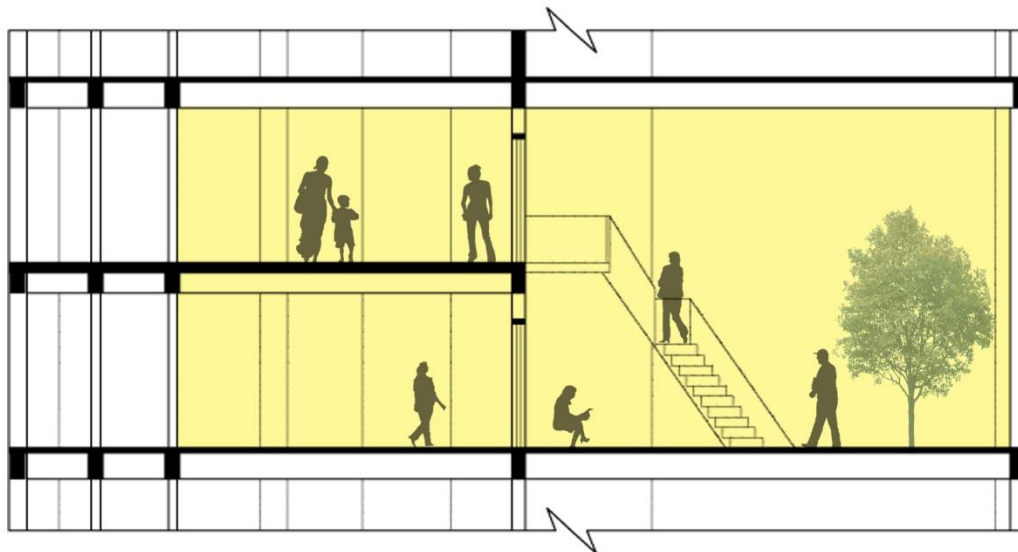


Figure 6.6 Section plan of semi-public space

### 6.3 Public space

Similar to the traditional second-step courtyard, the public space should provide an area to various activities (Figure 6.7), which could enrich people's lives. According to the preliminary research, people prefer to stay in the place where they could release their pressure after work. Based on the survey, the top three of most welcomed place for urban residents are gym, library and theater, which provides a reference for my final project.

Like the renovated of semi-public space, the change for public space (Figure 6.8) is also based on each apartment. The purpose to set the float blocks like this is to obtain the best views for people. When inhabitants enjoy the pleasure from activities, they could also feel cozy the beautiful views bring to.

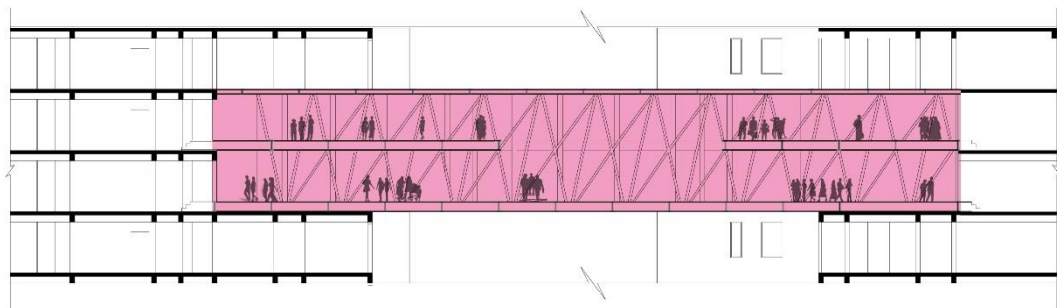


Figure 6.7 Section plan of public space

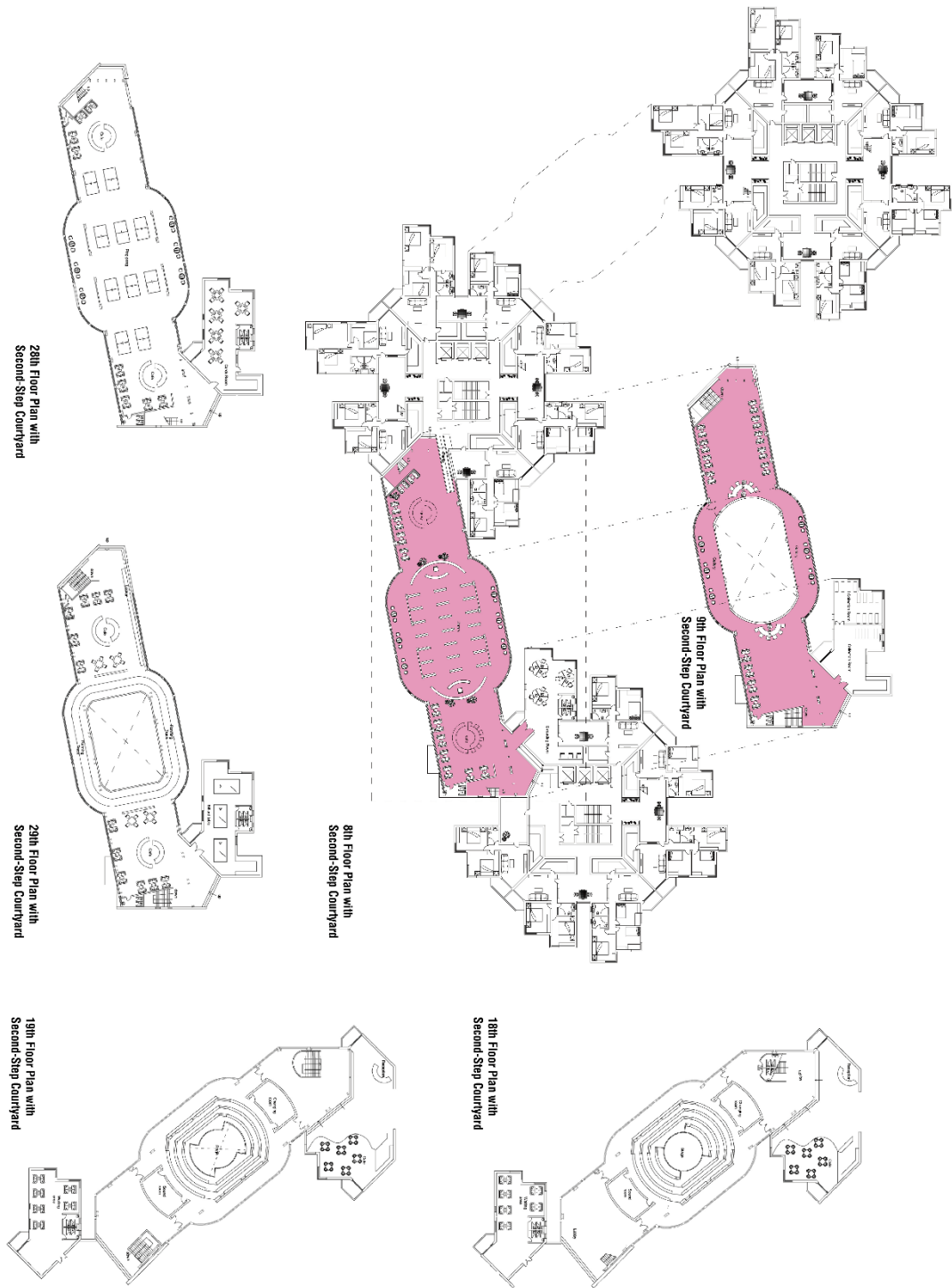


Figure 6.8 Floor plans with public space

The structure of the floating blocks is also taken into consideration. Because the concept of them is coming from the bridge, I did some research about it (Figure 6.9), especially for the double-deck bridge, which may be similar to the two stories public space. Based on the research, I developed two bracing and truss systems (Figure 6.10) which might be adapt to the floating block.



Figure 6.9 Double deck bridge structure

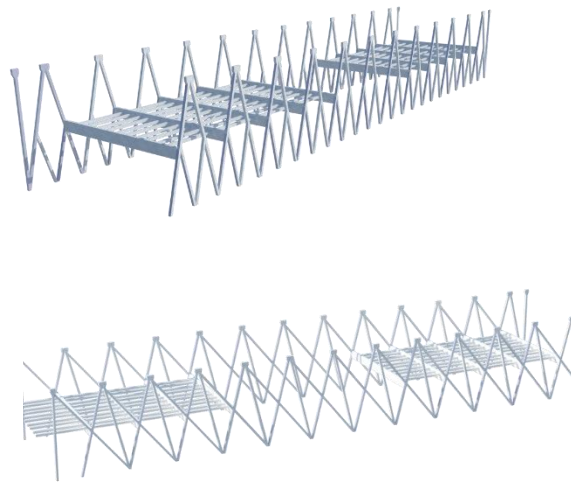


Figure 6.10 Two possible structures of the floating block

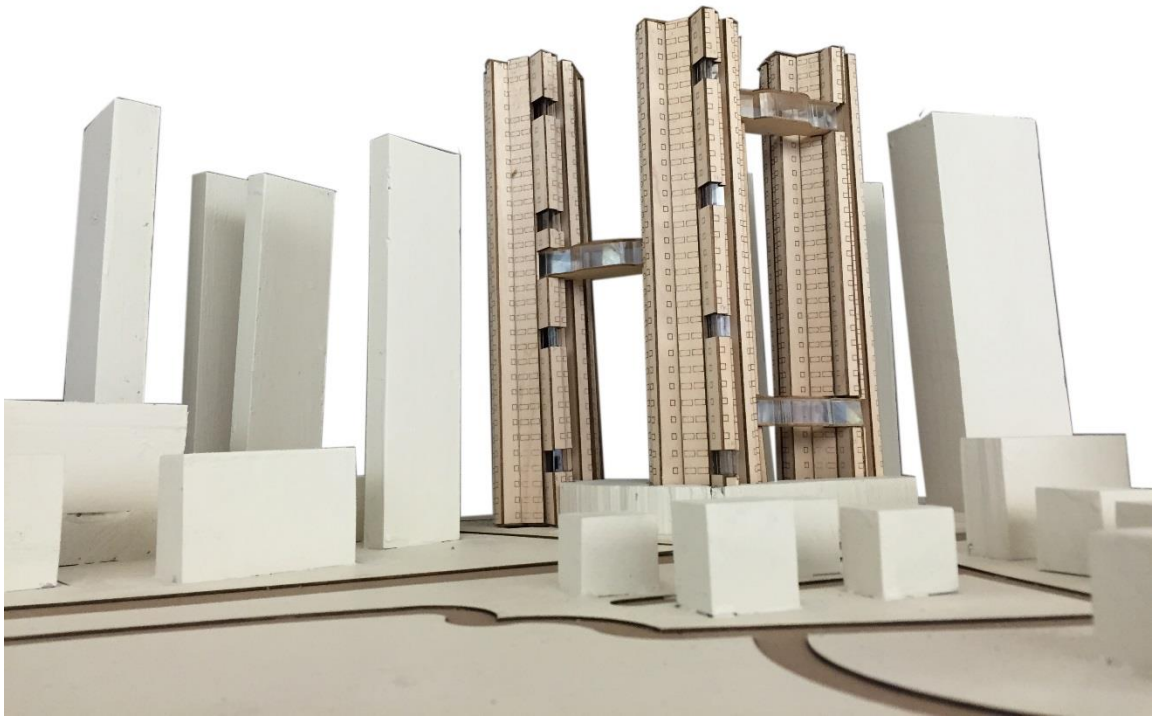


Figure 6.11 Final model of the renovated project



Figure 6.12 Perspective of the renovated project



## CHAPTER 7

### CONCLUSION

For this thesis, I try to design multi-function transitional space in terms of culture, community and sustainability. For the final project, three new community spaces translated from traditional courtyard successfully improve the current limited living condition. The three existing high-rise buildings are full of various community spaces, which makes the space of complex more interesting. Besides that, culture meaning of traditional courtyard seems to be recalled into the modern building, which most people living there before look forward to. I hope my design process and strategy could be applied into more building renovation or new building design.

Further design considerations could include the following improvements:

- (1) More considerations on the structure of floating block.
- (2) More researches to determine the scale of public space, the quantity of them and the form of them.
- (3) Outside space should be taken into consideration.

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