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Community Design For China’s Urban Elderly

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Community Design for China’s Urban Elderly

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ABSTRACT

Community Design for China’s Urban Elderly

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In China, the uneven development of urbanization makes the urban environment increasingly unsuitable for elderly living. By the impact of the one-child policy, the proportion of the elderly population keeps rising. Given the imperfect pension system and the lack of young people to support their parents, institutional care and serviced housing for the elderly will replace traditional in-home care and become the main elderly care mode. To deal with these problems, creating an ideal urban living environment for the elderly is urgently needed.

In Wuhan, where these problems are very prominent, an intensive community is proposed that considers both the physical and spiritual needs of the Chinese elderly, in particular the need to encourage a closer sense of community among the residents. The community is located near downtown and beside an arterial road. It has a group of connected apartment buildings including different types of units, health care stations, and activity rooms to meet residents’ different needs. A building with a restaurant, supermarket, fitness center, kindergarten and other everyday life amenities is located along the busy streets, connecting with the apartment buildings, enclosing a large courtyard in the middle, and giving a safe and uninterrupted internal environment. To maximize the outdoor spaces and provide the residents with various opportunities to
enhance their quality of life, the roof spaces of each building are fully used, as
gardens, walking paths, a dance square, and an open air swimming pool. A
continuous ramp-bridge gives the residents an easy access of the public park
across the expressway.
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Preface

Most of the memories from my childhood, as for many other children, are about staying with my grandparents, because our parents were too busy to take care of us. After graduating from junior high school, I entered a boarding high school, and during that time my grandpa suffered from Spinocerebellar Atrophy which gradually made him lose the ability to care for himself. So my grandma took care of him herself at home for about five years, because staying at his own home helped make my grandpa feel better, and at that time it was hard to find professional care in our city (a medium-sized city in China). After my grandpa passed away, my grandma still lived in their old apartment. Her children and grandchildren were either busy at work or school, and the chance for us to see her was quite limited. I can’t imagine how lonely her life is, the city doesn’t provide older people much freedom and opportunities to go outside and have fun like younger people. Most of the time, she just stays at home watching TV or doing some housework; the monotonousness gradually erodes her life. I hope I can do something to offer her an opportunity for a better lifestyle.

The story of my grandma is just a microcosm of the widespread social problem of aging in urban China. Many families have the same burden. This is no longer a problem that only concerns the older people themselves, and their families, it becomes a problem that affects the whole society economically, politically, culturally and in many other ways. Government policy makers have adopted “active aging” as a goal, in response to the challenge of the population aging, which signifies a paradigm shift from viewing old age as a “burden” to understanding aging as a life-course opportunity for further exploration and social participation. Yet even though these policies have come a long way to arrive at this point, they require the whole society’s concern and efforts.
Problem

Particularly in urban environments, elderly people are gradually marginalized from the mainstream urban life. The high-rise high-density apartments make their life inconvenient and unsafe, and also isolate them from others. The traffic problems and undeveloped accessibility systems limit their freedom of movement. The urban green space is limited, and the pollution causes serious negative impacts on their health. Few facilities that specifically meet the needs of the urban elderly have been built. In a word, the needs of elderly are neglected.

Since the traditional family-based support system has been destroyed by China’s one-child policy, and the tendency to delay childbearing, institutional care for the elderly has become an inevitable trend. However, the existing elderly care institutions, both public and private ones, have some obvious defects. First of all, most of them are designed for people with low-income and disabilities, and the quality of the facilities and services is always unsatisfactory. Only a few high quality institutions exist in some of the big cities in China, but it seems they are not going to be widely-accepted in a short period of time because of their high cost.

According to a survey, more than 90 percent of people still prefer in-home care, since compared with known alternatives, it’s the most affordable and comfortable way to spend their later life. However, there’s no doubt that the hidden danger of in-home care can not be ignored. First of all, the design of most standard apartments can not meet the elderly’s special needs and habits, some of the old apartments don’t even have an elevator. Secondly, because of the one-child policy, the number of empty nester households in Chinese cities keeps rising. Currently, about half of families in cities are empty nesters.
The upcoming new population of Chinese elderly born in 1950s and 60s, is a generation with relatively strong economic capacity and open consumption attitudes; they have more pressing needs and desires to improve the quality of their life both materially and spiritually.

**Background**

Urbanization in China has caused many problems that affect all aspects of people's lives. With urban population density increasing rapidly, per capita living space is shrinking, and traffic congestion is getting worse, pollution is getting more severe, and urban public infrastructure construction is lagging behind.

Aging occurs under such conditions. China had 121 million people aged 65 years old and above last year, or around 9.1% of the population. In 2020, that number is forecast to reach 171 million, or 12.4% of the population, according to data from the Economist Intelligence Unit and Monitor Deloitte Analysis. By comparison, there were 42.4 million seniors in the U.S. in 2012, and 30.1 million in Japan. Yet, the most recent investigation indicates that China’s per capita GDP is less than 1000 yuan, much lower than the average level in other countries. China’s undeveloped economy, inadequate employment, and the incomplete social security system are the main adverse factors that may impact older people’s quality of life. China is facing a chronic problem of unemployment with millions of youth entering the job market each year. To solve the problem, policy makers have lowered the age of retirement, so the average retirement age in China is now only 51.2. This has caused further problems in that the income of older people decreased accordingly, and the composition of aged people became more complex. A large number of middle-aged people are prematurely entering old age.

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The one-child policy inevitably has been a major cause of the change of family structure. And China's breakneck urbanization has meant that more and more youth left their hometowns and families to study, work, or settle down in other cities, where fulfilling their traditional filial duties is becoming more and more difficult. In an investigation conducted by China Youth Daily in 2010, 41.8 percent of 12,534 people polled said they do not live in the same city as their parents. Over 60 percent of those polled were born in the 1980s and 23.7 percent in the 1970s. Nearly 63 percent said the main reason for "living apart" was they couldn't afford to pay their parents' living expenses in big cities. Other reasons included parents being unwilling to leave their hometown, being unable to adjust
to life in a strange city, non-transferability of healthcare insurance, and younger people being unwilling to move back to the small towns where they were born.2

This complex problem shows the need for people to seek other ways of looking after their aging parents, or new ways in which the elderly can live more satisfactory independent lives.

The research is divided into three categories. The first is from the perspective of sociology to analyze the problems that need to be solved when aging meets urbanization. Through the comparison of the situations in developed countries those in China, we can find the connections and differences. The second research category is mainly about the studies of praxeology and psychology, focusing on the characters of aging people, especially those living in China’s cities, and deeply understanding what they are feeling, thinking and needing. The third category is the study of both conventional and modern living types, the valued precedents with their successes and defects, searching for a living type that may be suitable for modern urban China.

**Literature Review**

The book Aging Societies: A Comparative Introduction, written by Virpi Timonen3, provides a comprehensive introduction to the field of aging. With an optimistic attitude, she points out that aging is not boring, threatening, or depressing; the society and older people themselves should build up a healthier attitude toward aging. She introduces several factors that have the most significant impact on the quality of later life from the perspective of society, namely the economy and politics, including the pension and employment

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problems, and the sources that provide health care services, which means both family care and community or institutional care. Finally, she emphasizes that aging is a great human achievement, and that we should think about it positively, and yet achieving the goal of successful aging needs to be the whole society’s effort.

In addition, the book also introduces the social context and background of aging, discusses related developments, such as: changes in family structures, patterns of household formation, income and work in older age, health and social care of older people, and attitudes towards older people. It highlights the nature of aging as an individual and societal experience. Even though the age-related policies, practices and consequently the actual lived experience of aging are different between countries and regions of the world, the general law of aging development is the same, especially the changing of family structures and the impact of personal income and social security systems. Understanding the situation in Europe and North America, comparing with the situation in China, helps me to better understand the development of housing for the elderly in these areas, thus helps me to interpret the experiences from the precedents.

Although it’s just a comprehensive introduction about aging, and doesn’t focus on a specific area, it does provide an ideal framework for my research. She proposes the most basic aspects that compose the main problems brought by aging, which are generally adaptable to all the religions and societies which are facing these problems. These topics remain a useful guide, even as are the specific aspects of China’s aging urban populations.

Research by Jason L. Powell and Ian G. Cook, in their book Aging in Asia⁴ not only provides rich aging experiences across Asia, but also an important process in

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bringing together evocative, engaged, and comparative insights as to how we understand complex aging issues and social welfare. The discussion about the aging progress in China shows us a different perspective than in other countries, as the authors observe how increasing urbanization is having a major impact on older people’s experiences and lives, especially in domains of the family and social care. Their research about the “active aging” policy in China teases out the distances between social and economic goals on the one hand, and the actual experiences of older people on the other hand.

Based on the analysis of the different situations in different countries and religions, this book provides some more specific views about aging, in particular how the problems get more complex when the aging progress happens in the high population density areas in developing countries. For example the aging population grows faster because of the large population base, the underdeveloped economics constrain the quality and ability of elderly care, and by the impact of urbanization, the aging develops unevenly between urban and rural areas. These points provide me some direct information for my research. Moreover, the policy makers always play a crucial role; since policies are the most powerful solutions provided by the government, they directly affect the patterns of aging. So, through the analysis of the policies I can not only have a better understanding of the current situation, but also grasp the trends of the future. In recent years, the Chinese government continues to implement a pension system, but either the “Delay Retirement” or the new policy “Housing Endowment” has had very limited effect. The core issues are all about the income of the Chinese elderly, which is hardly able to support a satisfactory and independent later life. But at least, the government has become aware of the seriousness of the problem, and is trying to find an effective solution. And it’s worth mentioning that, the policy “Housing Endowment” encourages people to mortgage and lease their own houses and accept professional institutional care or senior apartments services,
which will change people’s traditional concept on elderly care and inevitably stimulate the development of housing for the elderly.

Fushun Huang, a scholar from Taiwan, did some research about the mental and behavioral characters of older people, especially the Chinese. In his essay Elderly People Mentality and Behavior Pattern, he suggests that the older people in different stages have different mental and behavioral states, and accordingly, their needs are different; we should draw distinctions among them. In contrast to the typical negative connotations about aging, that it means sick, burdensome, deteriorating mind and ability, he sets forward that the most obviously mental and behavioral characteristics are strong self-esteem, albeit low self-confidence, the demand for autonomy and independence, the need for friendship, physical health easily affected by emotion, slow response times, and conservative outlook.

Fushun indicates that with increasing age, some mental and behavioral characteristics of older people are generalizable, even though the personalities of people are diverse. And it is important to understand the gradual “levels of care” needs as older people progress in stages, and to make designs that meet their needs. Yet, as mentioned before, the lower retirement age in China makes the composition of the old-age population complex. The range of the older people expanded, which requires more studies in this area.

The book Design for Aging: Post-Occupancy Evaluations authored by the American Institute of Architects, divides the buildings for older people into several types according to the living and services provided: independent living apartments, continuing care retirement communities, assisted living, nursing care,


and community-based services. It reviews several existing projects under each category, and compares them with Scandinavian projects. Analysis of these cases considers whether the facilities are truly providing an environment for the aging that enhances their quality of life.

By taking a look at a variety of long-term care environments, this reference work shows how residents and staff interact within the built environment in these facility types. And by comparing the objective of the designers and the responses of the users, we can clearly see the successes and defects. It comprehensively covers almost all the types of the existing elderly care building types, although most of them are low density housing or health care institutions located in developed countries. So how to adapt this information for the specific situations in urban China, searching for innovative old age living patterns that are rooted in the high population density cities, is what needs to be explored in the next step.

The book Life Between Buildings: Using Public Space\(^7\) written by Jan Gehl discusses the importance of designing urban public space with the fundamental desires of people as guidelines. And Gehl also describes essential elements that contribute to people’s enjoyment of public spaces, such as the dimensions, the relationship with surroundings, and the quality of the spaces. He provides very clear and powerful guidance on public space design. The detailed data and diagrams demonstrate how the diverse dimensions of spaces impact people’s behavior. Since one key theme of my project is to rediscover the healthy interpersonal relationships in modern urban life, the public and community spaces for people to socialize is quite a crucial part of the entire project.

**Precedent Citations**

Tulou, which has been translated as Earthen Building, is a unique type of traditional communal residence found in Fujian, China. The building usually has 3 to 5 stories and is arranged as a circular configuration surrounding a central shrine or square; but in some regions, Tulou are rectangular. However, no matter what shapes they are, they all have the same in ward orientation. Each building functions like a semi-enclosed village. Families live in these buildings are very close to each other.

The inspiration from the Tulou is the contrast with modern high-density residences. Unlike the modern high-rise, high-density residences widely spread in Chinese cities, Tulou is more like a small community, the corridors string together each household; people share the nice public spaces and other amenities. They are closely related to each other rather than isolated from each other.

Similar to the Tulou, the Siheyuan, the well-known Chinese courtyard house, is another traditional type of residence. The name literally means a courtyard surrounded by buildings on all four sides. In ancient China, vernacular houses, temples, and even palaces were all composed of this basic pattern. Before, a unit of Siheyuan was usually occupied by a single large family, but after the founding of new China, most of the remaining Siheyuan are shared by several families, this special living form still makes unrelated people live together like a big family.

Today, these traditional residences are disappearing. With the boom of urban population, more and more people have to move into the modern high-density apartments. Without the shared living spaces and collective actions to maintain the close relationship between people, they are getting isolated from each other. Learning from the traditional communal buildings, how to build a healthier neighborhood is one of the goals or my project.
Figure 2 The Axonometrical Drawing of Fujian Tulou

Figure 3 Hand Drawing of Siheyuan
The Evidea Housing, which is located in Istanbul, Turkey, designed by EEA-EMRE Arolat Architects, and completed in 2006, is a private housing program with social facilities. With 473 apartments in the area of approximately 1,600,000 sq ft, it’s a typical high-density community.

The 473 units are divided into 4 blocks, which are oriented along the boundary of the site and all facing to the large courtyard in the middle. The well-designed uninterrupted courtyard has two different layers: private areas on the peripheries and communal areas in the lowered middle portion with swimming pool, tennis court, and other outdoor activity facilities. All vehicle circulation was kept away from this area by restricting to the road outside the building blocks and directing cars only to the garage below, which can provide people, especially children, a safe and quiet recreation space.

Compared with the Evidea Housing, this project for urban China will have 200 apartments in the area of approximately 106,800 ft², an even higher density community. However, different from a group of free-standing buildings which cut the space between buildings into pieces, the inward-turned structure can provide the residents one large piece of outdoor space and enclose an uninterrupted internal environment, which is more suitable for a relatively small piece of land.


Figure 4: Evidea Housing

Figure 5: Site plan of Evidea Housing
The Cronstetten House, located in Frankfurt am Main, Germany, designed by Frick. Reichert Architekten, was completed in 2006 and is conceived especially for the 60-plus generation. The floor plan is composed of several sections, such a smaller scale structure makes it possible to design a more flexible arrangement of different apartment types. The ground floor contains a variety of semi-public functions, such as a care station, events room, art room, gym, and club room. The center of the building is a courtyard, the garden can be crossed and is designed to be an attractive place to spend time. Figure 6 illustrates how the terrace on the fifth floor connects the different parts of the building and serves as a meeting place for residents. Since it’s a multi-functional building, it also includes a restaurant, shops and other rooms for supplementary services at the west end of the complex. And special attention was given to the design of the details; for example the choice of materials and colors adequately considered older people’s feeling, and underline a sense of quality.

This serviced apartment is categorized into assisted living. This concept comprises a wide range of housing for older people with the provision of care services. Comfort is quite clearly a central aspect of this typology. This building is a good example of making the maximum use of the urban space, to meet the demands of economic viability on one hand, and to include as many facilities as possible in a limited space without sacrificing comfort on the other hand. The economic and space problems are always the two big problems that one has to deal with when making a design in a high population density city. This project deals with these two problems ideally.

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Figure 6 Cronstetten House

Figure 7 Plan of the Cronstetten House
Background Summary

In addition to affecting total population size, the urbanization and birth control policies are increasing the proportion of the Chinese urban population that is above 60. Therefore, the lack of young people to take care of their aging parents is becoming a significant problem. Although the government has begun to pay attention and develop elderly services, these are still in the early stages, and have a long way to go. Combined with the deterioration of the urban environment these are the main obstacles to increasing the quality of aging people’s life in Chinese cities. In response to these situations, exploring a living type that adapts to people's current and future needs is very necessary.

At the same time, rapid economic development has undermined traditional ways of life and culture. Fast-paced urban life makes the relationship between individuals become indifferent. Loneliness becomes one of the biggest problems of elderly people living in cities and the prevalence of mental illness increases year by year. Among other innovations, any new living types should try to rediscover the essence of traditional group living, within the modern social context.

Proposition

The goal of this project is to create a multi-functional community that provides a broad solution to the problems of elderly living in modern Chinese cities, from the perspectives of both physical needs and psychological needs: commodious living spaces, health care groups to provide emergent and routine services, restaurant and grocery stores to facilitate everyday life, and different functions of public spaces to enrich people’s life.

As people get older, both their body and mind conditions are changing gradually. All the designs especially for aging people must strictly follow the specifications
to create a convenient, efficient and safe living environment for them. Besides of that, mental health is also a crucial aspect that influences people’s quality of life. Loneliness and insecurity are the most common negative emotions for the elderly. To overcome such emotions, encouraging social interactions is an effective way, and creating appropriate environment can lead people to meet and socialize with others. The inspirations could be found in some Chinese conventional collective residential buildings, such as the Tulou and the Courtyard House.

Since the project is located right in the downtown area of Wuhan one of the most important preconditions is the limited space. So the rational use of land, as well as providing high quality of services to as many people as possible is required. In this case, a high density community is preferred. However, to make it different from most of the existing high-rise and high-density residential buildings, it should give more consideration to people's spiritual and community needs.

In the urban environment, people always have a stronger desire to experience green and nature. To make full use of the limited space, giving people more sense of nature is one of the primary goals, which will could be achieved by exploring the possibilities in the vertical direction, like a roof garden, and hanging terraces.

Sustainable design is a long-term way to achieve economical efficiency, taking advantage of “nature,” like sunlight and solar energy. Establishing an efficient passive system can significantly reduce the cost of the mechanical heating, cooling, lighting and hot water supply.

Besides the inner community system, the interaction with surroundings, like roads, buildings and other facilities is also very important.
Figure 8 Inspiration - Grand Moma Beijing

Figure 9 Inspiration - Green space (Web source)
Outcome

This will be an inward oriented high-density community with multiple functions.

The residential group is the principle part of the project, other facilities are service for the residential groups and the scale of the facilities is based on the capacity of the community.

To meet the needs of families in different conditions, there are many different types of units organized in groups, each with its own health care station provide nursing services.

Each residential group also has its own lounge spaces and activity rooms. Other facilities like a supermarket, restaurant, and gym should be separate from, yet, convenient to the residential groups to ensure the quiet and private living environment. And there should be a diversity of scales and qualities of indoor and outdoor spaces for different purposes.

To introduce nature into the project, and help with sustainability, the roof tops of the buildings will be used as farms. People who are interested in planting and gardening are welcome to participate in building their own landscape.

A lot of older people take the responsibility to take care of their grandchildren during the day, so all activity spaces should give consideration to their suitability for both older people and kids.
CLIENT & CULTURE

Nowadays, in China, there are two main types of elderly care institutions: public ones and private ones. But the development of these two types is uneven. For example, in Wuhan, the fourth largest Chinese city, there are about 160 elderly care institutions, of which only 10% are public institutions funded by government, while other the 90% are all private institutions operated by cooperatives, social firms, or self-help groups. However about 80% of the elderly who choose institutional care would prefer the public institutions, and only 20% would choose the private institutions.

Figure 10 Distribution of nursing homes in Wuhan
Figure 11 Current situation 1

Figure 12 Current situation 2
The reason for this difference is obvious: The average acceptable cost for one person is about 1500rmb/month, and for the same price, the public institutions are able to provide a relatively stable quality of services including rental, food, commodities, and general health care, while for the private institutions it is almost impossible to make ends meet: to keep operating, they either have to raise the price or lower the cost which is inevitably to lower the quality of services.

Both types of institutions are also facing other difficulties. For the public ones, the quantities of the beds that they could provide now is far less than the demand, and the main obstacle to developing the public institutions further are financial constraints and the shortage of land resources. For the private ones, low occupancy rates may be the biggest problem. Generally, the lowest occupancy rate to keep normal operation is about 50%, yet many of the existing private institutions are at much lower levels, so most of them are facing deficits. For both types, a lack of professional nurses is another serious problem.

Although the demand for nursing home care is continuously increasing, currently, the prospect of spending later life in a care group or institution is not an ideal choice for most of the elderly in China.

According to the survey, only 5% would choose the institutional care, and this very small group of people is either almost disabled or in poverty; the other 95% still prefer in-home care. There are many reasons; the first is that the main purpose of the existing institutions, either public or private, is to ensure the basic life for lower-income residents, so for most people the quality of services is hardly satisfactory; the second is the conception problem that living in the nursing home may make the elderly feel that they are isolated from others and from their own family. Clearly it is much more comfortable for them to live at their own home close to their children. The third reason for the preference of in-home care is economic: housing is the largest investment for most of the families
in China, so the extra cost to rent a room or bed in a care institution is usually unacceptable.

But the dangers and problems of in-home care can not be ignored. Most elderly people living in Chinese cities live in high-rise buildings like those in Figure 13. Such barren, inconvenient, impersonal, alienating environments are not conducive to elderly people’s physical and mental health. People need professional care when they are getting old, especially given the increased proportion of the elderly population, and these urban high-rise complexes don’t provide it. And the upcoming new generation of elderly, mostly born in the 1960s, has more open minds and higher consuming capacities, and so generally have a higher requirement for the quality of their lives.

Figure 13 The widespread residential building in China
The purpose of the project is to provide an innovative urban building type able to provide the middle income families, which now account for the majority of the urban population, a relatively high quality of services and living environment, combining the institutional care and in-home care together. An attractive community with complete supporting facilities in the center city, with a high density urban mix, can be optimized for elderly living, not only in consideration of their physical needs, but also with a broader range of amenities to enhance their social and spiritual needs.

In recent years, the demands for apartments or other kinds of elderly care facilities has been increasing rapidly. Today’s middle-aged people are the main consumers, and have relatively strong economic capacity. In 10 to 15 years, they will demand a high quality of elderly care, together with vibrant urban living arrangements and the ability to “age-in-place” through all levels of care, as has been occurring in Europe and North America since the 1990s. Under this condition, the research about the project has more practical significance, not only to satisfy the needs of the users, but also concerns the expected profits for the investors.
Figure 14 Aging population growth in Beijing

Figure 15 Number of nursing home beds in Beijing
SITE & CONTEXT

Site Location
30°35’ 45”N, 114°19’55”E
It is in the downtown area in Wuhan, the capital of Hubei Province in China.
The total area is about 9922 m²

Wuhan, the capital city of Hubei province, is the fourth largest city in China. The permanent population there is over 8 million, which includes 1.37 million of elderly, making it a typical aging city. The large-scale city renovation construction program launched since 2006, and causes severe air and noise pollution, and makes the traffic problems worse.

Figure 16 Wuhan Map
Climate and natural conditions

Wuhan lies in a humid subtropical monsoon climate. Winter is short, wet and cold, with an average temperature of about 1°C. Summer is long and torrid; the maximum temperature exceeds 40 °C. Spring and autumn are not obvious. Besides the climatic zone factors, local large bodies of water make it moist all year; the total sunshine duration through the summer is up to 700 hours; windy weather appears more in the summer, with the wind usually coming from the southeast. And the terrain is quite flat.
Figure 18 Temperature range

Figure 19 Sun shading chart (summer)
Figure 20 Sun shading chart (winter)

Figure 21 Wind wheel
Figure 22 Psychrometric chart comfort zone

Figure 23 Psychrometric chart dry-bulb temperature
**Surroundings**

The site is adjacent to old and new residential areas next to a public park, and located right between two main commercial centers. There are two subway lines and one trunk road passing by, and two bus stops on both the east and south streets. In addition, there are plentiful neighborhood services and facilities, such as a hospital, restaurants, grocery stores, a university for the elderly, museums, parks, banks, and other facilities, all within a walkable distance. So the convenient public transit and social facilities are the most significant advantages of this site. Other communities around this area will provide opportunities for the residents to interact with other generations.

The main disadvantages here are the air and noise pollution generated by the heavy traffic.

*Figure 24 Business district and subway routes*
Figure 25 Site plan

Figure 26 Site analysis
Site Strategies

Considering the limited land area, the arrangement of each space is quite important. One of the main goals is to make the maximum reasonable use of the land. A building group composed by several medium-to-high-rise multi-functional buildings is preferred. Both of the east and south sides are open to the traffic, but the south side is more suitable to be the main access route since there is enough space for both motor vehicles, bicycles, and pedestrians, yet also less traffic. And the east side could be used as a secondary access. Some of the public amenities like the supermarket, restaurant, gym, and terrace could be arranged on the east and south sides to buffer the traffic noise and pollution. The residential groups should be pushed back to the north and west area. The massing of the entire community should open to the east and south side, in order to gain more natural light and heat, and to take full advantage of the beautiful natural views of the lake and park. However, for the northwest façade, the most important strategy is to isolate the wet and cold air in winter. In addition, shading, heating, cooling and soundproofing system should be used as the main strategies against the negative climate factors and urban environment, and to guarantee the comfort of the residents.

Figure 27 Site view sequence
Figure 28 Site strategies
Project 1
Name: Motoyasu Muramatsu - IDU Terrace Home\textsuperscript{11}
Location: Mishima, Japan
Client: Social Welfare Corporation
Type: Apartment for Elderly.

With consideration of the characteristics of the site and the surrounding environment, this five-story structure envelops an interior open space filled with green; terraces on each floor ensure a tranquil environment for the residents. From the north side of the building through the glass entrance to the lobby, the interior garden is visibly linked with external surroundings to form a sense of continuity. Similarly, from the terraces positioned at different locations, both external views and the interior garden can be enjoyed at the same time. And the open view also allows people see other fellow residents in the building, even when alone in the room, perhaps lying on the bed, the resident feels a sense of connection with the outside world through the windows that extend from the ceiling to the floor, which reminds people that they are not alone.

The residential units are all arranged facing the terrace, while a small portion of the corridor is allocated as a lounge area, for people to have a rest. The lounge space is pushed out a bit, providing a larger space and giving a better view to the terrace, so people can sit together, chat, and enjoy the scene.

Project 2

Name: New Bronx Music Heritage Center Combines Affordable Housing with Green Design

Location: New York City, United States

Type: Affordable Housing for Elderly

Design: Roger Marvel Architects.

In an effort to provide affordable housing and a performance venue for elderly musicians, The Bronx Music Heritage Center is a brand new 355,000 square foot, development center that offers a combination of mixed income housing, a small

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arts public high school, a performance venue, and a rooftop urban farm. And the building will have nearly 300 affordable apartments. The new building is strongly based on a philosophy grounded in advancing the arts, while also promoting environmental sustainability and development in an urban environment. Through artistic and environmental efforts, the project aims to restore the rich history and culture of the surrounding neighborhood. Along with a hydroponic green house, the development will also have open green space for recreation, and a public health and fitness community center.

The entire building will include sustainable design features, taking the rooftop gardens and greenhouse into consideration, the design will also use passive solar design features.
Figure 31 Section of the building
Activities and Functions

Drop off area; cars, buses
Parking area
Main entrance
Courtyard; terrace
Lobby; building orientation
Residential groups
Eating/ gathering space (indoor; outdoor)
Shop
Health care
Children’s care
Play ground
Communal; activities
Roof terrace
Staff offices
Mechanical equipment

Space Standards and Criteria

Entrance and exits: the minimum area is 1.5m ×1.5m for the wheelchair.
Corridor: the width of indoor corridor should be 1.8m or wider.

Residential suite: for the living room the minimum area is 14m², the bedroom should be 10m²or larger, no more than 3 people to share one suite, and the average area for each person should be 6m²or larger; for the kitchen, to allow wheelchair access, the minimum area is about 8m²; the minimum area for bath room is 5m²; the depth of the balcony no less than 1.5m.

Soundproofing: the noise level should less than 45dB.

Design for elderly people has more specific standards and dimension requirements to build a more convenient, comfortable and healthy living environment. It’s hard to list all the details here, but one purpose is constant, that is to imagine myself as an elderly person, to understand their difficulties and thus to make their life much easier.
Figure 32 Space standards and criteria examples
Organizational Relationships

This is a residential based complex which also includes health care groups, indoor and outdoor activity spaces, and all the necessary amenities for elderly people’s everyday life. The relationships among the activities and functions can be illustrated by the organizational relationship diagram showing in Figure 34 and Figure 35:
Figure 34 Space sequences and relationships

Figure 35 The size and proportion of each area
Qualitative Experiences

After going through the entrance there should be a well-designed courtyard enclosed by the buildings, where people can enjoy the sunshine and fresh air and social life with other people. It should be activated by adjacent functions such as shops, the restaurant, fitness centers, and kindergarten. The residential groups aligned on the west and north sides face to the east and south, both for the good view to the lake and park on east and the bright sunshine from south. Each residential group has its own activity rooms, such as media room and reading room, and a health care station for emergency needs. The store and restaurant should be arranged on the ground floor, and other spaces like communal room, children’s nursery, and staff offices are on the upper levels above the store and restaurant. Terraces are used as the bridges to connect the buildings, increasing the outdoor activity areas in the limited space.

Figure 36 Site area
DESIGN PRINCIPLES

Based on the research, an inward orientation community has many advantages, on one hand, the large courtyard in the middle can give people an ideal public space to take exercise, organize events, and be in the nature; on the other hand, it increases the visibility to the entire community which can naturally increase the residents’ participation in the community social life. In addition, the perimeter massing orientation is conducive to form a continuous circulation path throughout the whole community.

The community is divided into two main parts, one residential oriented part, and the other commercial. The two are connected but do not interfere with each other. The public building stands by the side of the main street because of it has less requirements for privacy and quiet, yet needs to be convenient to connect with the other facilities in the neighbourhood. On the contrary, the private parts are located away from the main street.

According to the average plot ratio and demand for the apartments in this zone, it can be estimated that about 300 to 400 units are needed on this site. If the area for each unit ranges from 60 square meters to 90 square meters, the total height of the building should be around 10 to 12 stories.

The facility has many different types of units and groups responding to the different needs of the residents, such as people living on their own and people living with their grandchildren. And, as one of the most important facilities, the health care stations distributed in the residential buildings are set up at a proportion that one health care station services 5 to 8 units. They take the responsibility to provide the residents everyday health care and emergency help.
The leisure spaces for people reading, chatting and entertainment are scattered inside and outside buildings. The public areas inside the buildings, like corridors, are enhanced in order to, make the usually very boring space more attractive, in order to achieve the goal of encouraging socializing. According to the activity level, the “hotspots” of inside and outside the building can also be subdivided in to several levels, by analysis of the internal logic between these hotspots, it can form an activity network, enhancing the socialization within the space.

Because of the limited space, to get more “green”, the design explores the potential in the vertical direction, such as the roof garden and hanging terrace. On one hand, it provides more green space for people to enjoy nature, on the other hand, since the summer in Wuhan is extremely humid and hot, the green roof helps reduce the temperature inside building, which can effectively reduce the energy consumption on cooling and ventilation. However, since the outdoor activities in summer can be very painful, to increase the time people stay outside their room, and increase the utilization of outdoor spaces, shading and adjustment of the micro-climate is very important.

The public park across the street, as the most valuable natural space, must be used rationally, not only by making the view to the park more open, but also by creating an easy access to the park directly. A bridge connect the community with the park and integrates with the entire building, providing the residents a safer and more convenient access to the green space outside the community.
Figure 37 Circulation

Figure 38 Building perspective
BIBLIOGRAPHY


