

“**Building Senses**: A Fresh Look at a Meaningful Retirement Community for the People of Zhengzhou, China”

By Zhe Liu



**“BUILDING SENSES”
A Fresh Look at a Meaningful Retirement
Community for the People of Zhengzhou, China”**

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

By **Zhe Liu**

In Partial Fulfillment of the Requirements
for the Degree of

Master of Architecture

 5/7/2013

Primary Thesis Adviser:
Steve C. Martens, Architect
Associate Professor

 May 8th, 2013

Thesis Committee Chair

May 2013

Fargo ND

Table of Contents

1. Thesis Abstract	7
2. Thesis Problem Statement	9
3. Statement of Intent	11
1. Typology/Claim/Premise	12
2. Theoretical premise/ Project justification	13
4. Proposal	14
1. Narrative	15
2. A User/Client Description	17
3. Major Project Elements	18
4. Site Information	20
5. Project Emphasis	24
6. Plan For Proceeding	25
7. Thesis Schedule	26
8. Previous Studio Experience	28
5. Program Document	29
1. Theoretical premise/unifying idea research	30
2. Typological research	44
3. Historical context	65
4. Goals for thesis	72
5. Site analysis	76
6. Space allocation	84
7. Design	88
1. Design process	89
2. Final design solution	94
3. Presentation	106
4. Project installation and model	116
8. Reference List	117
9. Personal Information	118

List of Tables and Figures

Figure 4.1	Site location in China	20
Figure 4.2	Site location in Zheng Zhou	20
Figure 4.3	Site Map	21
Figure 4.4	Site surrounding google map image	21
Figure 4.5	View of Hongzhuan street	22
Figure 4.6	View if Honngzhuan street	22
Figure 4.7	View of Jingqi Street	23
Figure 4.8	View of surrounding shopping mall	23
Figure 5.1	Human factor 1	39
Figure 5.2	Human factor 2	40
Figure 5.3	Human factor 3	40
Figure 5.4	Human factor 4	40
Figure 5.5	Santa Teresa Retirement Home exterior	45
Figure 5.6	Building facade with louver	46
Figure 5.7	Dining space perspective	47
Figure 5.8	Street view	48
Figure 5.9	Plan to elevation	49
Figure 5.10	Massing	49
Figure 5.11	Hierarchy.....	49
Figure 5.12	Natural light	49
Figure 5.13	Circulation	50
Figure 5.14	Geometry	50
Figure 5.15	Structure	50
Figure 5.16	Residential building in Slovenia street view	51
Figure 5.17	Exterior perspective 1	52
Figure 5.18	Sun shading device	54
Figure 5.19	Exterior perspective 2	54
Figure 5.20	Plan to section	55
Figure 5.21	Geometry	56
Figure 5.22	Structure	56
Figure 5.23	Circulation	56
Figure 5.24	Natural light	57
Figure 5.25	Hierarchy.....	57
Figure 5.26	Massing	57
Figure 5.27	Day-care island exterior perspective.....	58
Figure 5.28	Bridge view	59
Figure 5.29	Interior perspective	60
Figure 5.30	Hierarchy.....	60
Figure 5.31	Massing	60
Figure 5.32	Natural light.....	60
Figure 5.33	Geometry	61
Figure 5.34	Structure	61
Figure 5.35	Circulation	61
Figure 5.36	Plan to section	61

Figure 5.37	Original site view	77
Figure 5.38	Sun path	80
Figure 5.39	Wind Direction	80
Figure 5.40	Wind speed	80
Figure 5.41	Cloudiness	81
Figure 5.42	Temperature	81
Figure 5.43	Rainfall	81
Figure 5.44	Humidity	82
Figure 5.45	Traffic, noise and shading study	82
Figure 5.46	Topo and slope	83
Figure 6.1	Matrix space	85
Figure 6.2	Net space relation	87
Figure 7.1	Exterior perspective	94
figure 7.2	Site Plan	96
Figure 7.3	First floor plan	96
Figure 7.4	Second floor plan	97
Figure 7.5	Third floor plan	97
Figure 7.6	Fourth floor plan	97
Figure 7.7	Section	99
Figure 7.8	South elevation	100
Figure 7.9	Back door drop-off	100
Figure 7.10	Roof outdoor space	101
Figure 7.11	Sun room	101
Figure 7.12	Cafateria	102
Figure 7.13	Apartment	102
Figure 7.14	Living unit analysis 1	103
Figure 7.15	Living unit analysis 2	103
Figure 7.16	Structure	104
Figure 7.17	Foundation detail	104
figure 7.18	Roof detail	104
Figure 7.19	window detail	104
Figure 7.20	HVAC	105
Figure 7.21	Building skin	105
Figure 7.22	Final model	116
Figure 7.23	Structure model	116
Figure 7.24	Project installation	116

Thesis Abstract

Thesis Abstract

This thesis will rethink elderly people's needs and according to that, design a building that responds to the physical and psychological aspects of the elderly population in the urban setting.

The typology of this building is a Retirement Community, located in Zhengzhou, China. The building is a mixed-use mid-rise that includes the elderly center in the first two floors and the elderly apartments units for the rest. Human is the main aspect of the project. The architecture improves elderly life quality by analyzing the human behavior and create sense of place. China is stepping into the aging society rapidly and the project will help to explore a new way for the elderly support.

Keywords:

**sense of place, interact, human behavior
urban, senior, communities, China, details.**



Problem Statement



Problem Statement

In 2036, the number of elderly people (ages over 65) will make up 20% of the total population in China. With the number growing rapidly, the traditional idea for elderly support is not well-suited to the situation. So how could architecture help set up a better living style for seniors in the aging society?

Statement of Intent

Typology

Retirement Community

Claim

The design of the Retirement Community will improve life quality for seniors by fulfilling their physical and psychological needs.

The Actor: The design of the Retirement Community

The Action: Improves life quality and fulfills

human needs

The Object: Seniors in the city

Premises

Premise 1: “The form of the building represents the significance of civilization”(Perkins, 2004). The design of the Retirement Center will connect the architecture to the people by bringing them in.

Premise 2: The design helps shape people’s behavior and enhance people’s relationship.

Premise 3: People is the main element in the architecture. This new living style will fulfill people’s needs and set up a sense of place for the building.

Theoretical Premise/Unifying idea

By the design, the retirement architecture will create a sense of place responding to the needs of seniors and improving their quality of life. In this design, the architecture also wants the society to rethink the elderly needs and to reconnect with the elderly .

The Project Justification

Through the thesis design, the project will remind society to rethink senior care and help change people's mind from the traditional methods for elderly support to a new approach that is more economical, sustainable and meaningful.



The Proposal



Narrative

The aging population is a serious problem in the world, especially in China. Since 1999, China started running into “aged society” and in the next 40 years, the total elderly population will reach to 437 million.

However, it seems that China is not ready for this situation. For example, in Zhengzhou, the capital of Henan(the 3rd most populous province in China), there are about one million senior citizens while there are only 39 senior apartment buildings which have about 8000 beds. Meanwhile, are those apartments good quality and user friendly? The answer is not always “Yes.”

There is an old saying that “raising children is preparation for one’s old age.” Filial relationships and piety are the traditional culture rooted deeply in Chinese minds. Therefore, one does not want to send his/her parents to elderly apartment because he/she is afraid of his/her neighbor or other family members would blame them for not taking care of their parents by themselves, even if the next generation does pay the rent and fees for their parents to the elderly apartment. This makes a lot of “421” family types happen in China. That means two young couples each from single-child family are responsible for their own child(1) and both of their parents(4). The result is that elderly could not get adequate care

and become “empty nested seniors”, this means their middle-generation child works non-locally and the elderly people feel lonely and helpless. So is there anything that architecture could do to respond to this problem?

Elderly should not be neglected by society, and architecture has the social responsibility to improve the situation. Therefore, a retirement community is the typology this project focuses on. Design for humane quality of life will bring all the elderly living nearby to the center as well. The project will explore the new life style for elderly in China. In order to do this, it is important to consider elderly physical and psychological needs and create a sense of belonging and warm feeling. It is also important to focus on the sense of human physical scale to create a more comfortable living environment that is economical, sustainable, and meaningful.

The Retirement Community is not simply an apartment. It is more like a “center” that interacts with seniors as well as the surrounding community.

A User/Client Description

The main users are the seniors. There are two types of seniors who could be the potential users of the architecture.

The first type is the elderly who live in the building. They could have the options to get the daily service(for example, dinning service, laundry service...), or they could choose to live independently.

The second type is the seniors who live in their own home in the surrounding neighborhood and prefer to come to the retirement center to join other people to have social activities.

Since the architecture is a mixed use building, there will be some stores on the first floor that open to the public pedestrian and connect the retirement facility to the rest of the community.

The other users include retailers, nurses, office workers and librarians who make sure the system operating correctly.

Major Project Elements

Living Space

The Living space has 3 models: efficiency units, one-bedroom units and two-bedroom units. On every three levels of the residential floor, there will be an assistance station and outdoor balcony to encourage the elderly to go out. On each three levels, there will also be a public activity space.

Complementary Service Space

The service space provides convenience to people's life and provides consulting services. Service space includes storefronts(barber, copy shop, pharmacy, post office, grocery), office space (office, reception, conference room, staff break room) and health service space (massage room, nutrition room, clinic room and psychological counseling).

Activity Space

Unlike the normal retirement facility in China, this building will provide different activities space to enrich people's life and enhance communication and connection among the people. The proposed architecture will provide a multipurpose room, an art studio (calligraphy, painting), a fitness room, indoor croquet, a cafeteria (to provide meals for the elderly and provide private eating space so the

elderly is able to share dinner with family or friends), outdoor green space, a tea shop(for playing cards as well), a reading room, class rooms(for continuing education) and a computer cluster.

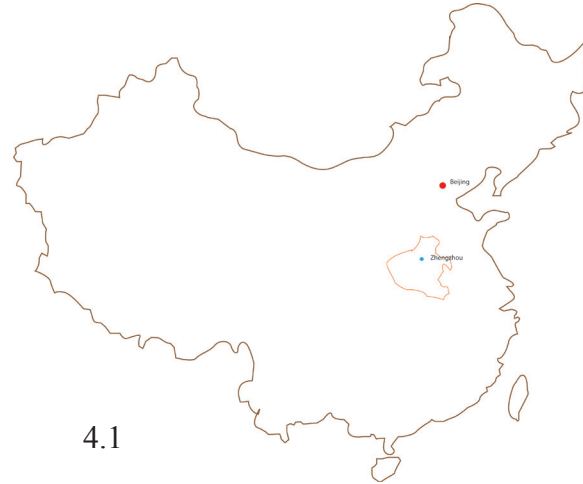
Maintenance space

Maintenance spaces include laundry, mechanical room,storage and janitor rooms.

Site Information

Regional

The site is in Zhengzhou, Henan, China. The area is located in the center of China which is part of North China Plain. This region is one of the most populous regions in China. This area is considered as the origin of Chinese civilization. The Yellow River passes by this area. There are four seasons in this area and they differ from each other, as shown on page 80 to 81 in this booklet.



Site location in China

City

Zhengzhou is the capital and the largest city of Henan province. The city is on the south bank of the Yellow River. Zhengzhou is called “Green City” because of its beautiful landscape. The population is 8,626,505 and Zhengzhou is one of the biggest railway transportation centers in China. The city is the crossing of the two main rail roads in China, Jing Guang line and Long Hai line. The city is the economical, educational and political center of Henan province with almost 3000 years history(Luan, 2011).



Site location in Zheng zhou

Site

The site is located at the centre part of the city Zhengzhou. North of the site is the campus of the Henan labor union school. Currently, the site is cutting off Hongzhuan Street to two separate parts. However, in the proposed design by the government, Hongzhuan Street will reconnect after the development. So the site will be located at the south of the Hongzhuan Street and East of Qingqi Street.



The proposed site is located in Jinshui district which is considered as the cultural and commercial district in the city of Zhengzhou. The site is 0.5 mile south of Henan Worker Hospital. Several school campuses are in the walkable distance including Zhengzhou University, Henan Agriculture University, Zhengzhou female middle school, No.40 middle school and Henan Labor Union School.



- | | |
|--|---|
| Main street | Site |
| School campus | Urban village |
| Hospital | |

4.4
Site
surrounding
From google
earth



View of Hongzhuang street

4.5



Site view

4.6



View if Jingqi street

4.7



Surrounding shopping mall

4.8

Project Emphasis

The project emphasis will be how sense of place affects people's behavior and improves life quality.

Plan For Proceeding

Research Direction

Research will be conducted to see what is needed for the elderly in terms of physical and psychological aspects. For example, how sense of scale improve living quality, how sense of place will change people's behavior to make them not feel isolated. Several case studies will be conducted to see the definition of a good sense of place and how to design a good sense of place. Meanwhile, this thesis will explore the current elderly living situation in China and know more about their needs. The other research such as historical context, site analysis and programmatic will be conducted as well.

Design Methodology

Concurrent Transformative Strategy will be used in the research. Qualitative data will be gathered from statistical areas like weather and demographic information.

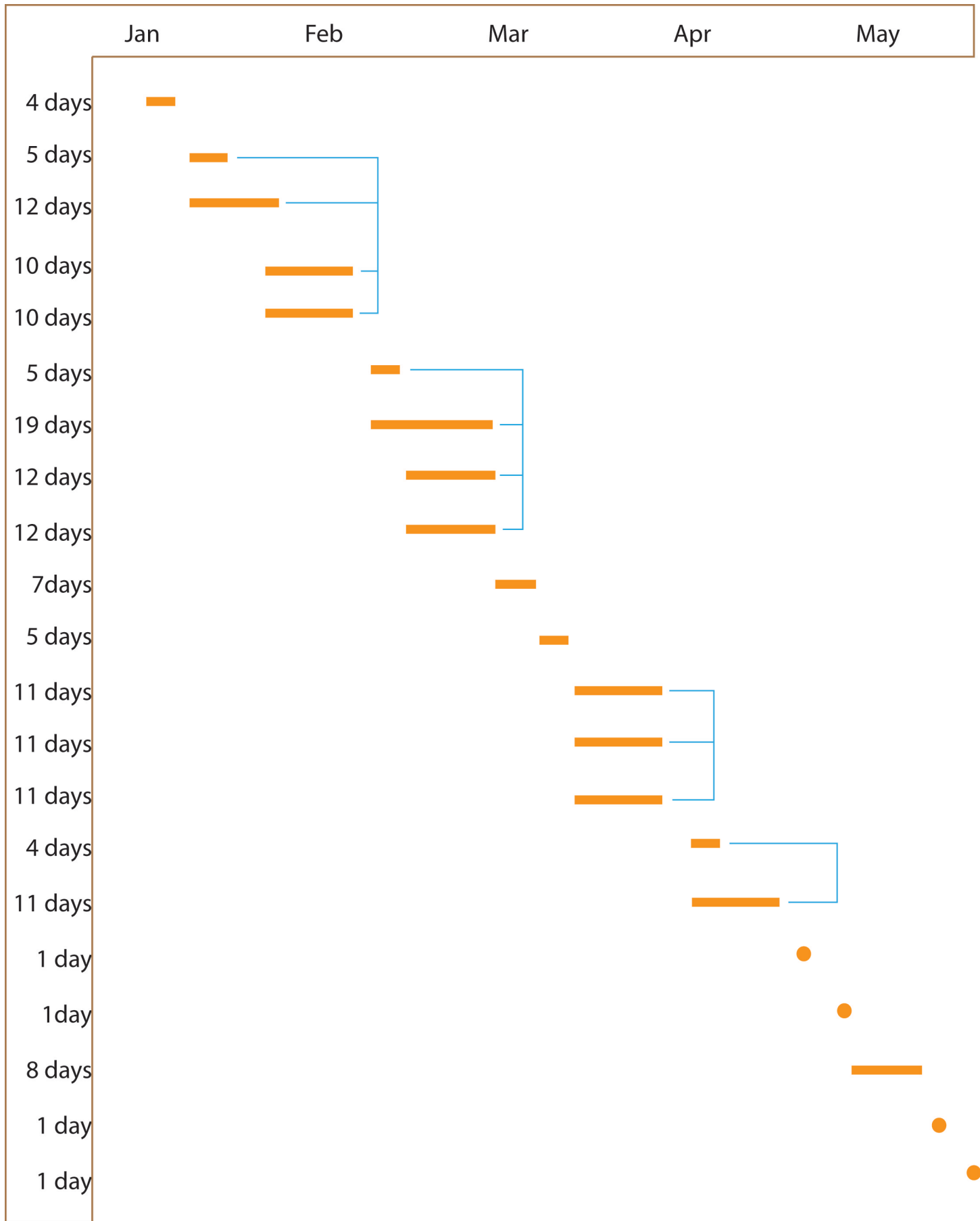
Qualitative data will be gathered from theoretical papers and case studies published in books and online journals,

Documentation Process

All the information including process, text, design, model, digital work and research will be selected and updated weekly. The work will be both put into the thesis book and uploaded online for safe keeping.

Spring 2013 Thesis Schedule

Context Development	1/8/2013 - 1/11/2013
Concept Design/Bubble Diagram	1/14/2013 - 1/18/2013
Passive Design Analysis	1/14/2013 - 1/25/2013
Space Development	1/23/2013 - 2/1/2013
Structure Design	1/23/2013 - 2/1/2013
Building Envelope Design	2/4/2013 - 2/8/2013
Materials Analysis	2/4/2013 - 2/22/2013
Floor Plan Development	2/11/2013 - 2/22/2013
Section	2/11/2013 - 2/22/2013
Active System Analysis	2/25/2013 - 3/1/2013
Mid-term Review	03/04/13 - 03/08/13
Project Redevelopment	03/18/2013 - 03/28/2013
Context Redevelopment	03/18/2013 - 03/28/2013
Structure Redevelopment	03/18/2013 - 03/28/2013
Rendering	04/02/2013 - 04/05/2013
Presentation Layout	04/02/2013 - 04/12/2013
Thesis Project CD Due	4/15/2013
Physical Exhibition Due	4/22/2013
Final Thesis Review	4/25/2013 - 5/2/2013
Final Thesis Documents Due	5/6/2013
Commencement	5/11/2013



Previous Studio Experience

2nd Year Studio(2009-2010)

Spring Semester - Heather Fisher

Tea House

Boat House

Fall Semester - Joan Vordenbruggen

Montessori School

Bird House

Small Dwelling

3rd Year Studio(2010-2011)

Spring Semester - Cindy Urness

Food Co-op

Downtown Wellness Center

Fall Semester - Regin Schwaen

Design Competition(Homeless Apartment)

4th Year Studio(2011-2012)

Spring Semester - Frank Kratky

San Francisco High-rise

KKE /DRL Re-use Competition

Fall Semester - Frank Kratky, Don Faulkner

Urban Design for Kindred

5th Year Studio(2012-2013)

Spring Semester - Paul Gleye

21 Century City Center

The Program Document

Theoretical Premise/Unifying
Idea Research

Theoretical Premise/Unifying Idea of Research

Design for humans

Design for humans is the key. "Design is difficult because it must satisfy several criteria. These design (and evaluation) criteria constitute a hierarchy. First a space must be safe and healthy. A space must enable users to perform their functions. A design should not cause discomfort. Finally, a design should be aesthetically pleasing." (Bennett, 1977). Architecture is supposed to fulfill people's physical and mental needs. Physical needs are the primary elements for architecture and that is the main reason we build. The design for physical needs determines the building details

Definition of the Elderly

Typically, the entering age of the elderly is 65 years old(UN definition). With the age increase, every aspect of the body function starts to degenerate. Therefore, typically the elderly do not have strong sensations that include the sense of touch, taste, smell and hearing. According to the book Senior Living Design written by Xiaozheng, Zhao, the elderly can be defined from the social aspects. The elderly are the ones who retreat from the social and family activities. (Zhao, 2010).

In terms of the family structure change, there are two stages .First is when children grow up and separate from their parents, so the original family splits up to two

families. The second stage is when the spouse dies and the other has to live alone. (Zhao, 2010).

Rethink elderly needs

The general rules of Chinese culture about how to treat the elderly are rooted deeply in people's minds. In the book Analact written by Kong Fuzi, the author describes the general rule: "the young bear the burden of the work and the elders enjoying the first choice of food and wine, but this can be considered as filial piety" (Kong, BC221). Conducting filial piety does not mean doing something according to the rules or general concepts. People are supposed to really think about what their parents need, especially psychologically. The real filial piety is taking care of parents in the parents' perspective rather than conducting the filial piety action only by general ethics. Therefore, human needs need to be rethought.

Physiological Needs

The elderly body's biological function system may not be as good as it used to be, so it requires higher external environmental quality in order to fulfill the physical needs of the elderly. The requirements of sound, light, temperature, humidity, and universal design should be considered in the project.

Sound. According to the standard sound quality regulation from China, the sound volume

is ranked at four levels. Level one is the sound volume in rehabilitation areas, patient rooms and some other spaces where zero or minimum sound is desired. Level two is the sound volume from the normal residential, education and hospitality areas. Level three is the sound volume from commercial and marketing areas, and level four is the sound requirements of industry and railroad areas. For elderly living space, the sound level is better at level one or level two(Zhao, 2010).

Therefore, in the proposed design, ceramic curtain panel will be used as the exterior material because it has good acoustic insulation features. Meanwhile, the building will be located at the quiet part of the street to receive minimum sound all of the living space will be designed above second floor to make sure the influence of the outside sound level is as low as possible

Light

Sunlight is the energy of the earth and one of the most important elements in people's lives. According to the book Senior Living Design, light can be categorized into natural light and artificial light (Zhao, 2010). Natural light means any light generated by the sun (direct or indirect). Artificial light means the light not from the sun and normally it is generated from electricity. Adequate natural light could make people feel less tired, relaxed and happier, so for a building, it is important to

design a natural light friendly environment. In the proposed design, residential space and major activities space will be on the south side of the building to get more natural light.

In terms of artificial light, since the eyesight of the elderly starts to decline, trying to provide more artificial light is crucial as well. Zhao(2010) suggested that “Soft light is usually applied in the interior design (soft light will not have a strong reflection light into people’s eyes) as well as some certain spots need to be lighted up. For example, a floor that has a height difference, a dead end or a turning corner”(Zhao, 2010).

Temperature and Humidity

Physiologically, the elderly mechanical system and immune system is not as strong as before, so according to the book Senior Living Design written by Xiaozheng Zhao, good design for elderly architecture is to keep different rooms’ at a balanced temperature. The average temperature in the comfort zone for the elderly is higher than the young people. (Zhao, 2010). In addition, it is important to let the elderly be able to control the room temperature. So in each room, a temperature controlling system will be installed for elderly use. Good natural ventilation is also important

because some people prefer stay inside longer than outside.

Universal Design

Universal design requires the building to be fully accessible and useable by people who with or without disabilities.

Universal environment will help people travel independently and enhance the social connection between them.

Therefore, the design of entrances, elevators, handrails, and rest room should fulfill the needs of disabled people. Meanwhile, in elderly architecture, all the human scales from the elderly should be considered during the process of design.

According to the book Senior Living Design, the author states that the most obvious change for the elderly is the height difference. Typically, the elderly body height will become shorter 2.5% to 3% compared to their youth when they reach 60(Zhao, 2010). Therefore, architecture focusing on the human scale makes the external environment adapt to human behavior instead of humans trying to get used to the building functions. The strategy of universal design is convenient for the users and reduces discomfort while people have activities in the architecture

Psychological needs and sense of place

Sense of Place

In terms of psychological needs, it is important to create the sense of place for the elderly. First, one should know the definition of the place: "A concrete term for environment is place. It is common usage to say that acts and occurrences take place. In fact, it is meaningless to imagine any happening without reference to a locality. Place is evidently an integral part of existence... In general a place is given as such a character of atmosphere." (Norberg-Schulz, 1980). Basically, a place is a space with meaning. For example, one specific land is not meaningful until someone plays football on it. Then it could be called a football field.

Sense of Security

Elderly people often feel vulnerable and seek a greater sense of self-protection and self-reliance. Therefore, sense of security is the most important need for the elderly when they experience one space.

Sense of Belonging

Human lives in the society with family and friends. Everyone is scared of loneliness. People always hope they belong to one or more specific groups. For example, people are the members their own families and in school, they are the members of a

specific department and specific major. The people in the group could help each other and share happiness.. Plus people can get feedback from the group and then feel the sense of self-awareness.

Before the elderly retired, they were almost certainly active members of the society. However, after retirement, the elderly are no longer the dominant power of the society and retreat from the society. This is not an excuse to isolate one self from the society. On the contrary, the elderly still need to participate in some social activities to make them feel they are still belonging to the society.

Sense of being Respected

The third need is the sense of being respected and feeling cared for by others. In the book Senior Living Design, Zhao(2010) divides human life into three stages. Stage one is from 0 to 25 years old. She said this stage is for knowledge gaining, studying and absorbing. Stage two is from age 25 to 65; this stage is for working, striving for good life and supporting family. Stage three is the age after 65 which means the life after retirement. People in this stage have more time to do what

they want to and accomplish some dreams that they could not achieve when they were young. (Zhao, 2010). Therefore, the architecture should consider people's different activities and create space to encourage the elderly to develop their own interests to enrich the elderly life. In the building, social spaces like art studio, reading room, croquet court and fitness room will be designed to offer a colorful life to the elderly.

Sense of Family of Community

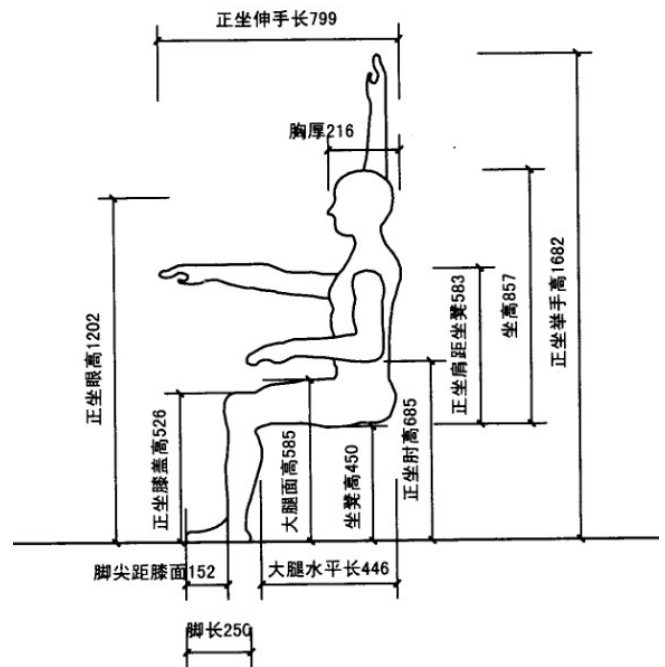
The final psychological need is the sense of family and sense of community. After retirement, the elderly will stay at home with family and neighbors for most of the time. The family life becomes the main part of the elderly life. Therefore, when the elderly are choosing to stay in the retirement facility, architects should create the sense of family and community to make sure the elderly get the same warmth feeling continuously.

In the book Senior Living Design, Zhao(2010) suggested that during the design of the retirement facility, we should design some space that sets up the sense of warmth that lets the elderly come across one another.(Zhao, 2010). For example, the building should have some rest area in the lobby or at the end of the hall way, a delicate exterior space to encourage the elderly to get together and enjoy the outdoor environment and some public meeting space to create chance that people will have activities together.

For the interior design, the warm color should be applied to make the space home-feeling and so on.

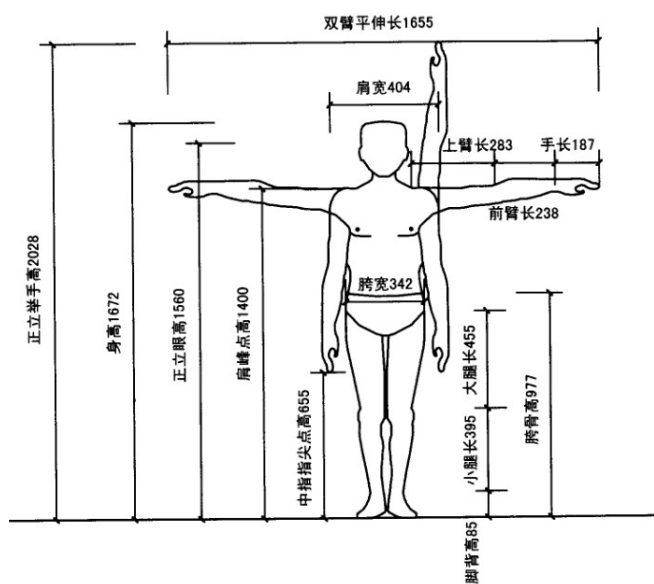
Ergonomic and the human factor

The human factor is another important issue in retirement facility design. Ergonomic means designed to minimize physical effort and discomfort, and hence maximize efficiency. Therefore, the dimension of the space should fulfill different activities in different scales. All of the details of the design come from the study of elderly dimension.

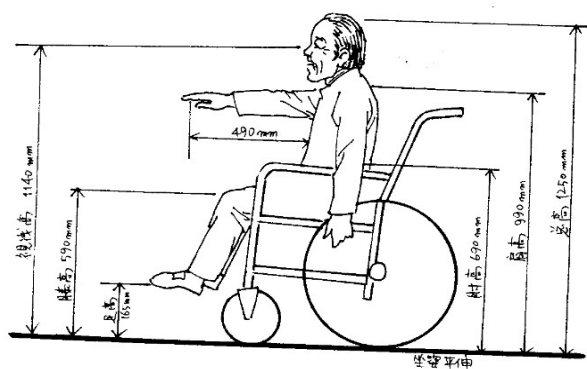


5.1

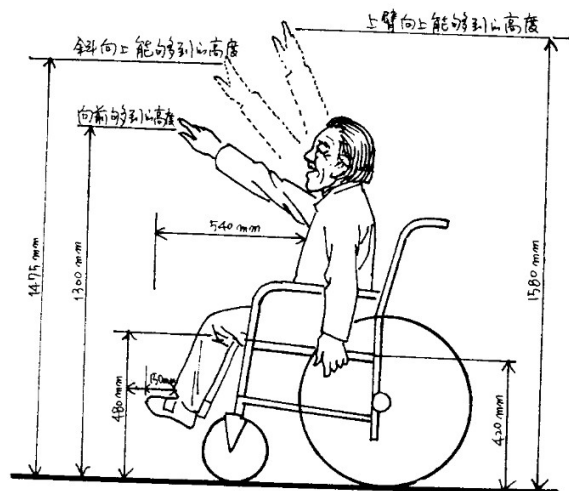
Human factor 1



5.2
Human factor 2



5.3
Human factor 3



5.4
Human factor 4

Theoretical Premise/ Unifying Idea Research Sum- mary

Three main elements

Overall there are three primary elements the designers should be aware of when they design the retirement home.

The first element is safety. In the book Building Type Basics for Senior Living, the author talks about the elderly feeling the increasing importance of the life after they become old and feel not as strong as they used to be. So it is not only crucial to create a physical safe environment, but also important to create a sense of feeling that the place is safe to live in and enjoy life. (Perkins, 2010).

Second element is assistance. The difference between elderly people's living space and other residential space is the requirements of professional service to help the elderly. For example, offering nursing station service, housekeeping service and laundry service.

Third element is comfort and enjoyment. A human-based, mixed use architecture should be designed and the design should focus on human scale. The needs from the professions are always important because they are the users of the building as well.

Inter generational

Most of the elderly facilities in China are constructed in the suburb area.

The designer thinks the elderly do not like the city life and are tired of being around the young people. This is too bad because it make the elderly isolated.

In the proposed design for thesis, the location of the retirement home is close to the city downtown, rather than the suburb. The location makes the architecture have direct connection with the shopping mall, library, school and civic center. Meanwhile, the proposed elderly facility should be blended into community and help the community as well.

Aging in place

Aging in place means the elderly stay in one place for several years or as long as they can. Normally, old people do not want to move around from one place to another. Since the current elderly facility is simplex in function, people would move to another place if they get older and older or just need special care. Therefore, the proposed building will create the independent life style as well as assisted life style for different needs. The elderly could live in the same place, receive the same service and hang out with same friend year after year.

Private and Public Space

According to Building Type Basics for Senior Living, for people who

are older than 50, there are only 4% of totally tend to share the same living area with others. Actually, when people choose their retirement home, all of the female and more than one third male rank “living with strangers”

second most important issue next to the “quality of the service”. (Perkins, 2004). The author points out a very interesting fact that in terms of living space, people prefer smaller space rather than bigger space.

In the proposed design, the space is divided into three different parts: private space, shared space and public space. Private space is the space for personal use. For example: bedroom. Shared space means the two or more people, usually they are the people you know like friends or neighbors use the space at the same time. For example, the activities space and balcony in the residential floors. Public space is the place open to anyone. For example, the storefront or the fitness room will be considered as public space.



Typological Research



Case Study One

Santa Teresa Retirement Home / BmesR29 Arquitectes

Architect: BmesR29 Arquitectes

Location: C / Pica D'Estats, 4 – Lleida
(25,006). Lleida (Segrià)

Project Area: 1107.31 sqm

Project Year: 2009



5.5
Santa Teresa Retirement Home exterior

Santa Teresa Retirement Home is the expansion of the original architecture. The location of the building is Spain. The existing building is an isolated three stories building and the west façade is facing to street Pica d'Estats. Due to the needs of function, the size of new part of is almost as same as the original building.

One of the design challenges is to design the new expansion as a whole and match the existing building. The architects avoid adding too much volume to the old architecture, so people would not think the expansion is too artificial feeling. In floor plan, they did a good job in dealing with the continuous flow from the existing building to the new one. In terms of exterior, the architects use the similar material and create one intact façade. They use louver as well to match the building material and make the whole building look as one unit. The vertical louver also solves the sun shading problem of the old building. With the louver, it provides the neutral and softer light for interior by filtering the strong sun light.

This case study is very interesting because this architecture is blend into the community and tries to join the surroundings with a harmonious



5.6
Building fasade
with louver

relationship. In the present time, architects tend to make their design standing out and be regarded as something “huge”. However, in this design, architecture tries to make the building be “low Profile” and minimum people’s vision of the changing. Therefore, I will analyze the context and surrounds well and design a building that is specific to the site, rather than any other place because a good design is regionalism and have a positive response to the surrounding environment. The other thing the project was designed successfully is the way the louver applied: the using of louver plays three important roles to enhance the architecture: aesthetic, functional and sustainable.

. This case study some unsuccessful aspects :First is the interior design. The designer paints some room with pure color to make it nice and clean. However, it also gives people a feeling of cold that is less welcoming. Another example is the design of dinning room: the elderly prefer warm feeling environment because it would provide a sense of family and sense of belonging. However, in the dining room, the designer

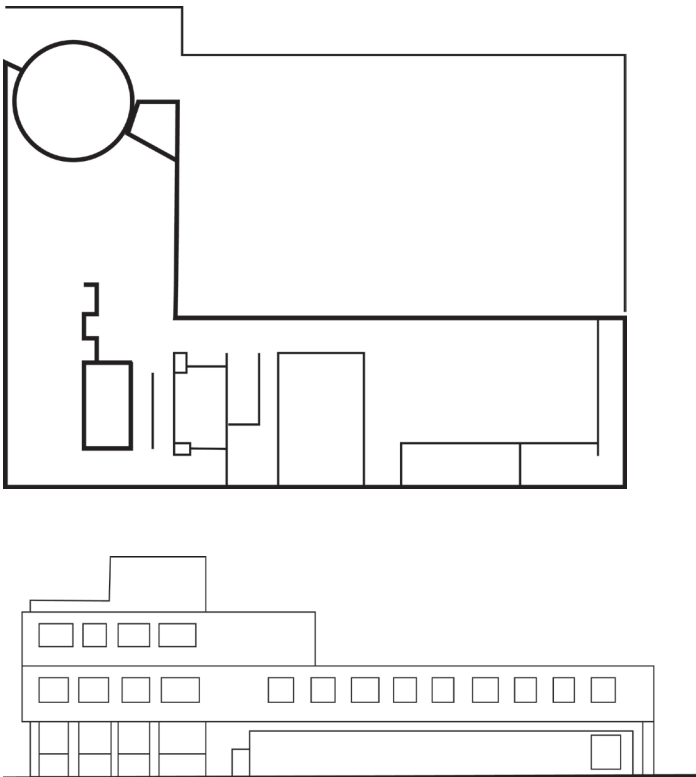


5.7
Dinning space perspective

applies white painting for walls, grey concrete for floors and dark blue painting for windows. The environment makes people lose the appetite of eating. The third aspect can be improved is the façade design. It is an urban architecture. A good urban architecture is able to create walkable space and draw people attention when they walk in the sidewalks. However, the façade is too simple and solid. It does not create opportunities for people walking along the walls.

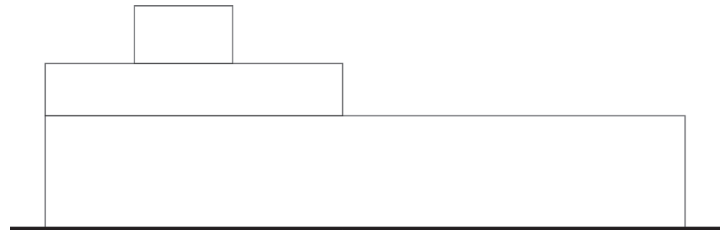


5.8 Street view

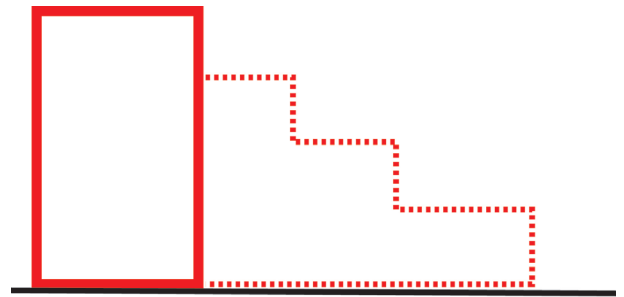


5.9 Plan to/Elevation

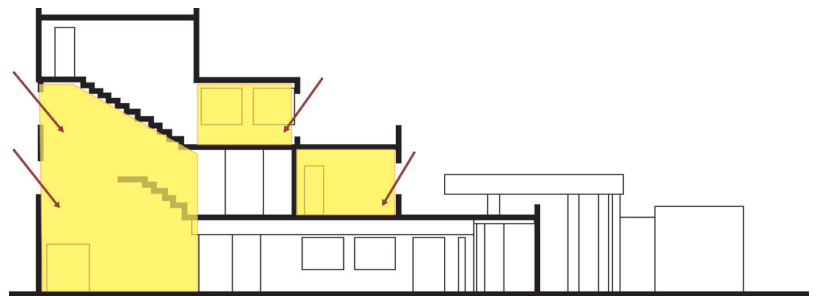
5.10
Massing

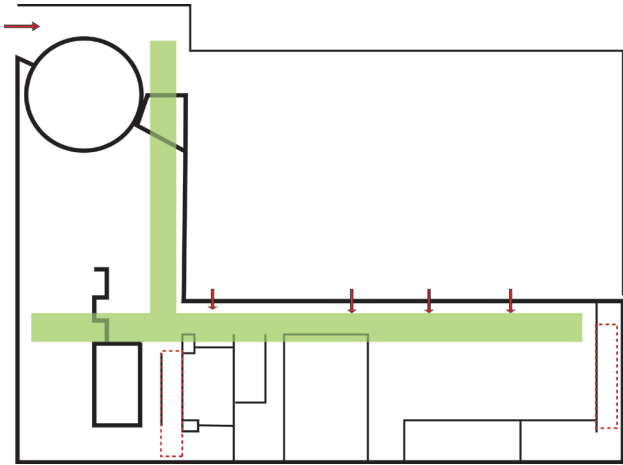


5.11
Hierarchy

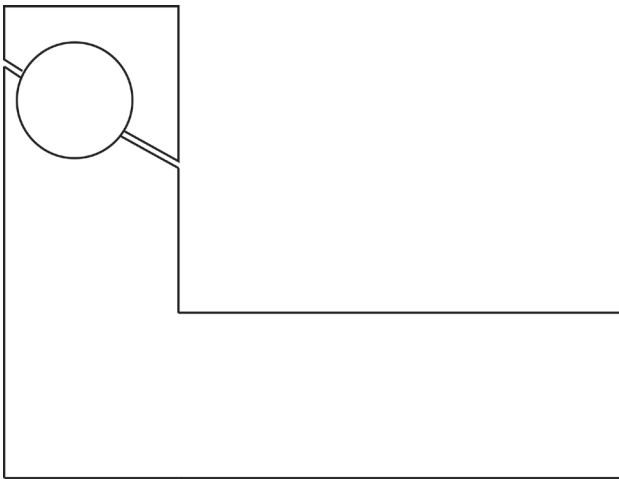


5.12
Natural Light

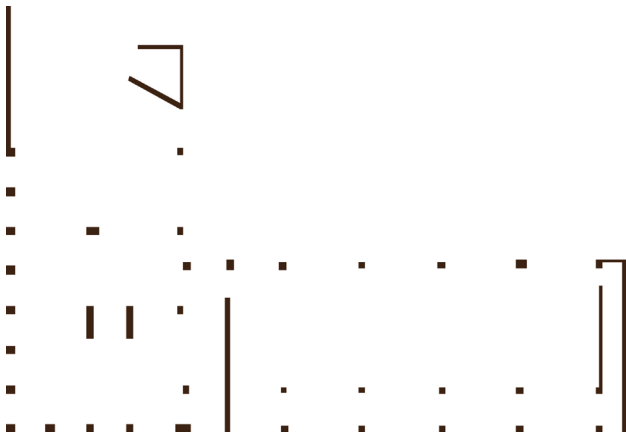




5.13
Circulation



5.14
Geometry



5.15
structure

Case Study Two

Residential Building In Slovenia / Ravnikar Potokar Arhitekturni

Architects: Ravnikar Potokar Arhitekturni

Project area: 8,200 sqm

Project year. 2007 – 2010



5.16 street view

Case 2 is a residential building near the train station of Nova Gorica. The project is belonging to train station area development and the current construction is in phase 2. There are totally number of three towers will be built within this phase. All of the three towers are designed along the Prvomajska Street. The idea of the design is to layer two different stories by displacing their floor plans and moving the square floor plans around the core. Therefore, the non-overlap floor plan creates an overhang space as a public space and green space as well. The vertical line of the building is cut by the displacing floors to make the elevation more interesting and create the feeling of dynamic.

This architecture is a mixed use building. There are 11 floors in the building plus two stories basement. First floor is public space. There is a gallery space in the first floor which can be used as office area or other service as well. There are also some small grocery stores located at the first level. Therefore, the public space not only can be used for residents living inside of the building but also is available for travelers. Since the area is closed to the train station, the service space is convenient to the community.



5.17
Exterior perspective

The floors above the ground are designed for living units. The tenth floor is two-storey duplex flats. There are two basements for the building, one is for underground parking and the other is for maintenance and storage.

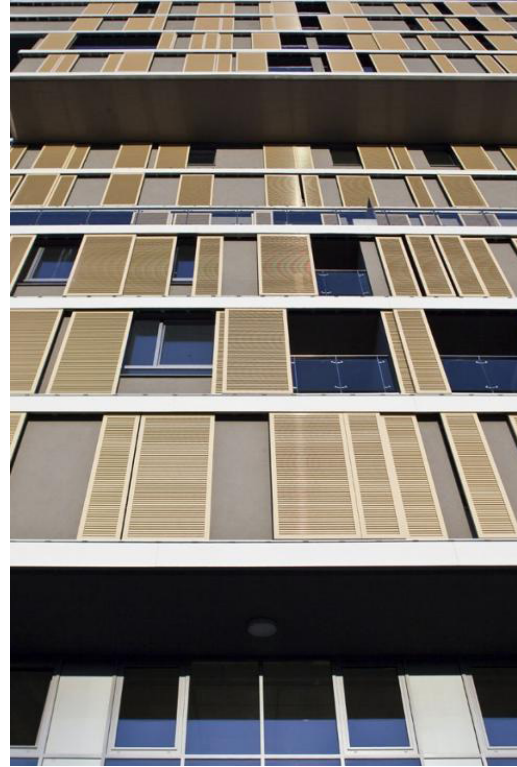
The architecture is made of several blocks and after pushing and pulling, it creates a very dynamic effect. The location of the building is in the city of Nova Gorica. As an urban building, design for density is always important. The concept of the architecture is to design for the vertical density. The living units have been compact into the building. But it does not mean the residents' life quality is lower. Mixing usage of the space provides difference service and creates different chance for people to have activities. The misplacing of the two stories creates an overhanging space as balcony and green place. So in the building the people are still able to experience the nature but in another perspective.

The biggest difference between urban architecture and suburban architecture is that urban building should "lock" the street corner.

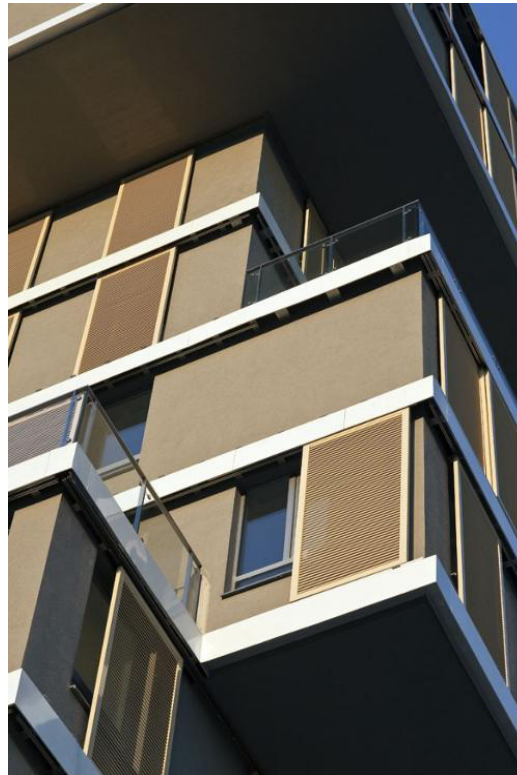
This architecture successfully accomplished this goal by occupying the corner space and plus, since the material of the first floor is

glass. It shows the activities in the building and blending the interior with exterior to create a sense of welcome. When people walk by the building, they feel safe because they could know what is happening inside.

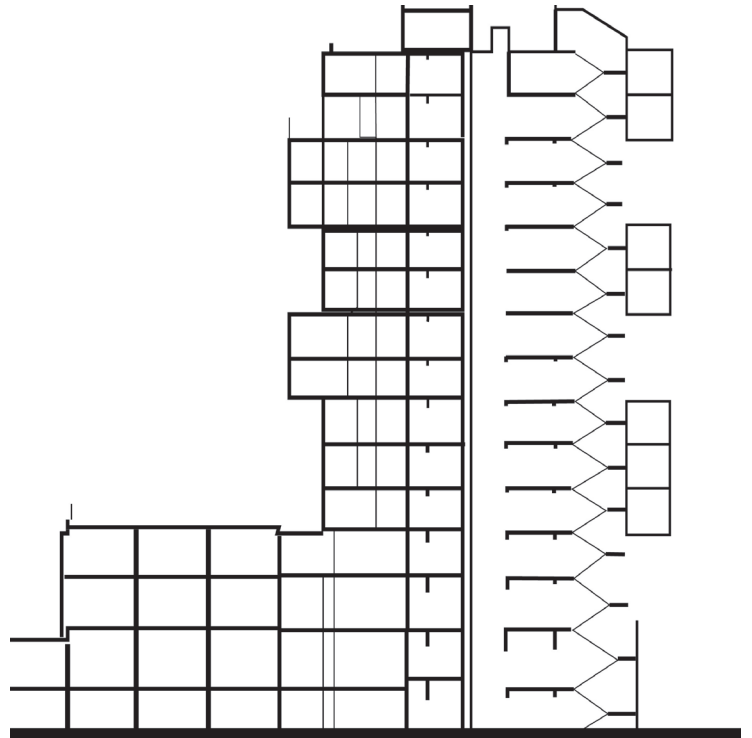
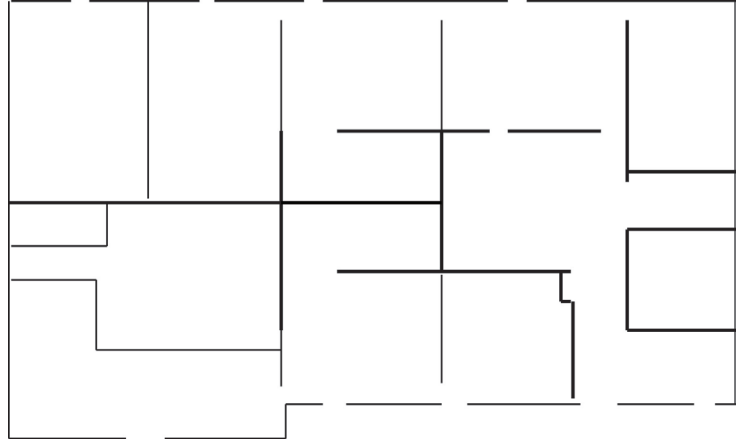
Except the first floor, all the other stories are the same square blocks. The exterior materials and the sun shading devices has been re-applied and repeat over and over and again. The repetition makes the architecture as a whole but different in details.



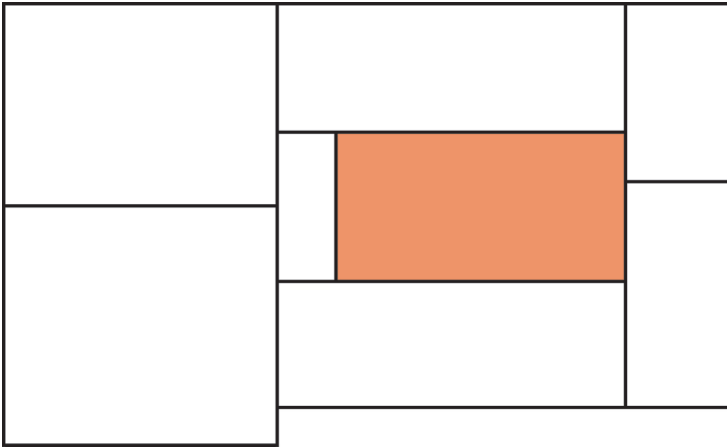
5.18
Sun shading device



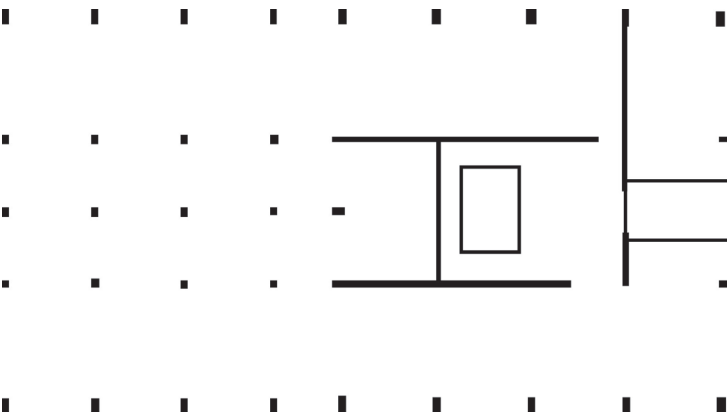
5.19
Exterior perspective 2



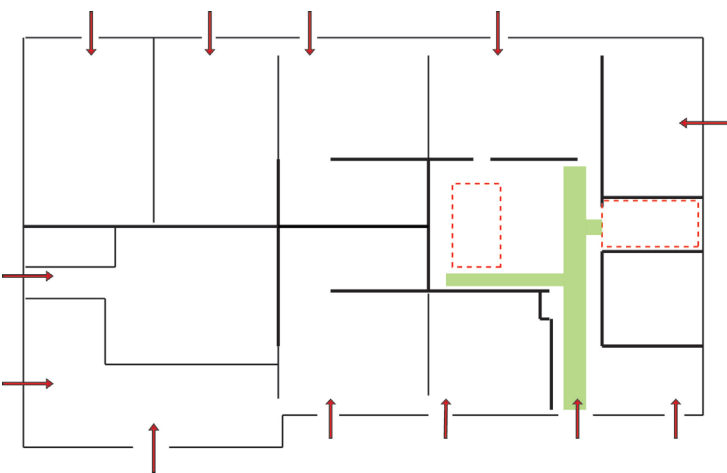
5.20 Plan to/Section



5.21 Geometry



5.22 Structure

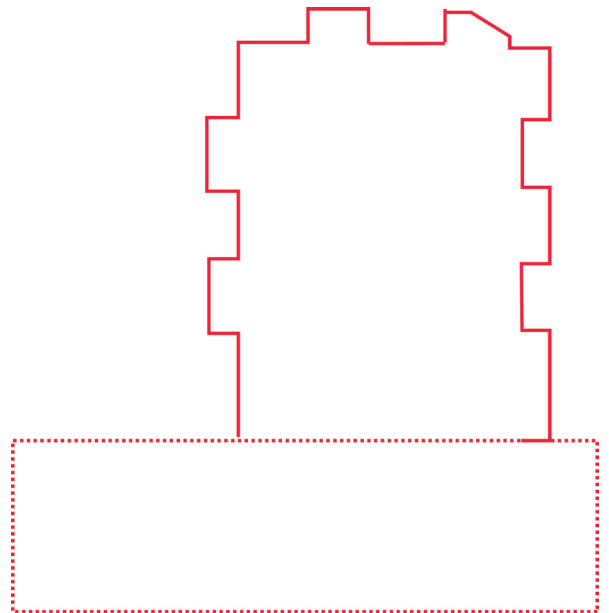


5.23 Circulation

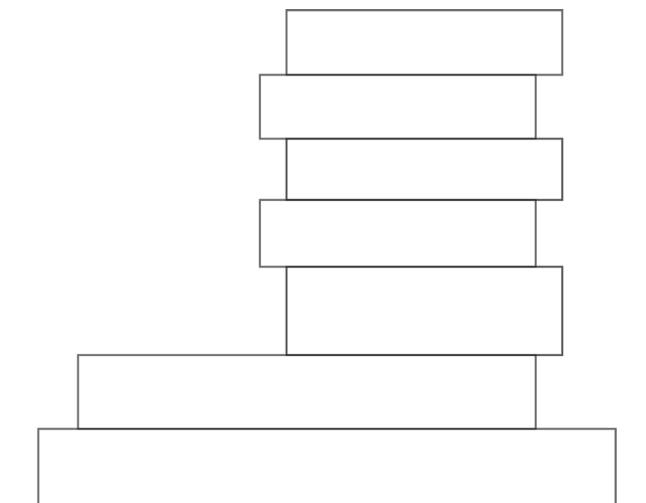
5.24 Natural Light



5.25 Hierarchy



5.26 Massing



Case Study Three

Day-care Island Craeyenburch / Möhn + Bouman

Architects: Möhn + Bouman Architekten

Location: Nootdorp, The Netherlands

Project Area: 1,140 sqm

Budget: 2,050,000 Euro

Project Year: 2006

2.8



5.27 Daycare island exterior perspective

Case study 3 is a day care center which is designed and built for serious mentally disabled people. Mentally, the patients' intelligence is equal to the babies whose ages are between 1 to 18 month. In addition, most of the patients have physical and vision disability. So it requires the architecture have extraordinary sensory effects because light, color and texture will have direct influence on patients' psychological aspects.



5.28 Bridge view

The day care center is located in a small island at Nootdorp, Netherlands. This island is part of expansion of the city. From the urban perspective, architecture is supposed to have multi-stories volume. However, according to the function requirements of the building, the clients ask for single floor architecture. In order to solve this problem, the architect designs the building in an urban style by intergrading the roof and walls. Meanwhile, the island and the architecture are developed together. There are two bridges that connect the island with the main land. Architect designs the bridge as part of building deck so that make the island and the architecture as a whole. The material of the roof is grey rubber and the material of the façade is plastic textile. The roof and the façade form a folded plane and extended out as a cantilever. By

doing this, the design creates a warm and protective feelings.

In terms of the floor plans, the walls do not form a pure rectangle or square shape to create a dynamic flow effect. For the lighting issue, the architect use high windows to bring sunshine into the building, which lights the interior up and void the problem of overheating.

The building has a lot of good details: Architects offset the roof and create a sky light with the reveal of the beam. The sun light and the beam could create an interesting shadow. The architect also paints the beam to a light yellow color to match the overall atmosphere. For the interior design, the architect choose wood, plastic panels to create a relax environment. Along the walls, there are handrails to assist the patient.

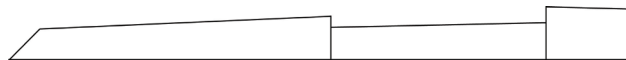
In this design, the designer tries to bring the patient to the nature as close as possible. From the floor plan, the building is surrounded by several decks and all of the decks are closed to water. Meanwhile, the designer uses sky-light to bring the sun light in. Since the patient in the building has intelligence disability, they are lacking of communication skills and natural environment could help them refresh their mood and enjoy the life.



5.29
Interior perspective



5.30 Hierarchy

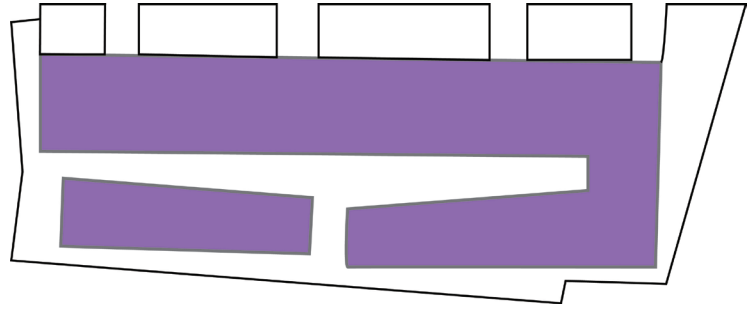


5.31 Massing

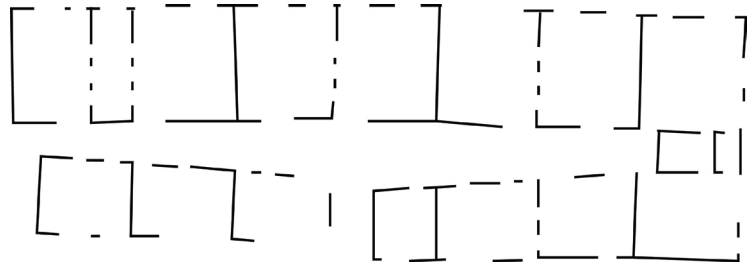


5.32 Natural Light

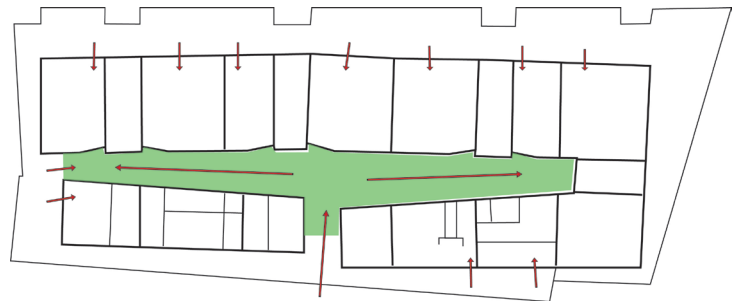
5.33 Geometry



5.34 Structure



5.35 Circulation



5.36 Plan to/Section



Summary of case study

The first case study is Santa Teresa Retirement Home. The typology is similar to the proposed thesis project. It would be helpful to look at how people design the similar building in terms of the floor plan layout, programs and how they consider the elderly as part of the architecture. The site of the architecture is in Spain and since Europe is the first continent to enter the aging society, studying the concept for elderly architecture might suggests some lessons for the similar project located in China.

The second case study is a mixed- use residential architecture. It is middle-rise architecture. with an urban setting. Although the city is not in China, the culture and social context is not the same. However, urban residential buildings need to deal with “design for density”, either vertically or horizontally.

The third case study is a day care building for mental disability. The designer creates a space that for people who need special sensory stimuli but lacking other communication skills. He use the natural elements like sun light, water involve in the design to make the people get close to the nature.

These three cases are different typologies, in a different site and designed by

different architects with different forms. However, there are still some similarities. One similarity is they all fit in the neighbor environment. The first architecture which is the retirement home use similar materials and use sun shading device to match the existing architecture and try to blend in the community. The second architecture use first floor as public space for mixed use functions. Meanwhile, the first floor façade is using glass to show what is going on inside. The transparency materials blend the interior and exterior and give people a welcome feeling. In the third case, the architect develops the island and architecture at the same and use part of the infrastructure (bridge) as part of the building (deck). In addition, the deck is very open to the water to make the building surrounded by the water. Architect also brings the sun light in the building by using the high window. By doing this, there is no direct strong light and create a feeling that makes people relax and delighted.

Another similarity is all the three architecture are using simple form but create interesting space. In the first design, the building is constructed as L shape with a court yard in the middle, which creates a warm feeling. In the second design, the architects repeat and place the floors layer by layer but offset. So the offset

parts create dynamics effects visually and be a balcony space functionally. The third architecture makes the roof and façade intergraded together as a plate wrap a rectangle box in it.

The final similarity is focus on the details. The first building uses louvers to make the façade like a whole and deal with the overheating problem. The third architecture provides the handrail to assist the patient well.

The typology research is very important because it provide direct information that how to start the program, design the building form and solving the design problems.



Historical context Research

The good virtue

There is an old Chinese proverb said: “there is an old, there is a treasure”, which points out the importance of the elderly in the society. The reverence for old people dates back to Zhou dynasty (Xiao, 2001). The famous philosopher Kong Fuzi has ever stated in his book Xiao Jing that “Of all (creatures with their different) natures produced by Heaven and Earth, man is the noblest. Of all the actions of man there is none greater than filial piety.” (Kong, BC 400). Since then, the idea of “filial piety”, which means respect and treat well our own parents has been inherited and conducted from generation to generation. In Han Dynasty (206BC- 220AD), “Xiao”, the Chinese word for filial piety is the basic national strategy that helped the emperor control the kingdom.

China, from what we know, as an agrarian country, is fully depending on the land. The family as a unit is working on the same land year after year to make living. So, the old people, especially men, who has already gained lots of experience from working in the farm is always been admired and followed by the other family members. Therefore, the elderly is always being seen as the family leader and learning model. They played a very important role of helping constructing the Chinese social structure (Ganshaw, 1978).

In this society, the social norm requires the elderly passing the knowledge and experience to their offspring and as the reward; the children have the responsibilities to give their parents support when their parents get old.

In Chinese culture, respecting the elders is the general social norms and people need to respect other people who are not your family members as well. Yang(1959) states in his book: “while the functioning of filial piety was limited to relationship between parents and children, their veneration of age was traditionally a means of inspiring respect and obedience by the young toward all the other senior members of the family and society as a whole.”(Yang, 1959).

The Chinese ancient philosopher Mengzi(372-289 BCE) said “in the harmony society, people are supposed to respect and support any elder and love every child no matter they are belong to our own family or not.” He explained the basic social responsibility and create beautiful ideal world which is still can be advocated in the current world.

Frail elderly

In the 21st century, with the fast development of China, the average of life spanning increases a lot and due to the one child policy, China is stepping into the aging society. Meanwhile, with the urbanization of China,

people are not only making a living based on the farming. More and more people moved into cities. The society system becomes more complex and various. People are educated in school and they do not have to stay where their family at and learn from father.

When people start moving around, the traditional “big family” has been broken into single units and it reduces the family size. So the bounding among family member is not as tight as it used to be. This big shift causes a lot of problems in terms of elderly support. First, health problem is an issue. Elderly has more chance to be sick than the young people and some just need assistance because of the age. However, if the children are not stay with the parents, who will take care of them?

Second is the psychological aspect. The elderly would feel lonely and even commit suicide. In the modern society, people are lacking communication and social activities. The elderly have been isolated from the society after retirement because they feel no one really need them and they cannot get feedback from the external world (Wang, 2012). However, family support for elderly is still the majority methods currently.

Three types of elderly

In the book Senior Living Design written by

Xiaozheng Zhao, she pointed out that specific to China; there are three types of elderly who is willing and the potential user of the retirement facility.

The first is “empty nested” elderly. Literally, empty nest describe the nest after bird leaving. Now it is become a metaphor that shows the loneliness of elderly who are already retired and their children are no longer live with them. It includes single elderly family as well. In modern Chinese society, the speed of the life is fast and young people are facing to a big chengleng and heavy working pressure, or because they just live and work in a different city of their parents. They do not have enough time to take care of their parents. In China, there are 49.7% family in the city empty nested family (Zhao, 2010).

The second type is people older than 80. Normally, we believe that people who is younger than 75 still full of energy and in good overall health. However, after 80, the mechanic system of the body decline rapidly. In china, the amount of elderly (older than 80) is increasing by the annual rate of 5.4%. up to the 2020, the total number will reach 27.8 million and the number will keep increasing to 100 million by 2050.

The third type is the elderly from one-child family. Since one child policy

implements in China at 1979, it is already 33 years till 2012. That means the first generation of parents who follow the policy enter the old age. Their family structure is “421” type so that the elderly support system is very weak. Plus, the society is still short for the suitable retirement facility for those people. This is largest client for the new type of retirement facility.

Facts about Zhengzhou

The beginning of the city dates back to 3600 years ago. The Chinese second dynasty “Shang” built the capital in Zhengzhou area and after that, five dynasties set Zhengzhou as their capital city. With the development of 3600 years, Zhengzhou has lots of culture heritage and considered as one of eight historical capital cities in China(Luan 2011).

Currently, Zhengzhou is the capital city of Henan province and be divided to six districts which are Jinshui district, Zhongyuan district, Guancheng district, Erqi district, Huiji district and Shangjie district. Zhengzhou has two economical districts two. One is located in west part of the city and is developed as “higher education” district. Another is located at the east part of the city which regarded as central business district. According to the proposed plan by government, the east district will become the new downtown of Zhengzhou in the future. Zhengzhou is a rapidly growing city which

expands towards the east direction. In the future, the city of Zhengzhou and city of Kaifeng will become a megalopolis and twin city. The current land size of Zhengzhou is 764 square miles.(Luan. 2011)

Historically, the architecture is made of wood and now, the buildings usually use steel, concrete, glass, bricks. The building focus on the international style and function is everything.

History about elderly facility

China is stepping into the aging society recently, However, United States and some countries from Europe have been become aging society for decades, it is always helpful to look at the those experience. I will talk about American experience.

Elderly apartment started from northern Europe country and start develops in America in 1960s. According to different functions, there are five types of the elderly apartment. They is independent living, congregate housing, assisted living, nursing homes and Alzheimer's' care. The two types are for elderly with good health condition and usually there are about 100 to 200 apartment in one facility.

The other three types require more professional service and the amount of living units is from 80 to 120 in one facility.(Perkins 2010)



Goals for the Thesis

Thesis goals

Academically, thesis project is the capstone of the school study. Currently

I am a graduate student of North Dakota State University and trying to get my Master of Architecture degree. So the thesis is the summary of what I learned from school and the demonstration of my design skills.

In this thesis, I am going to explore and looking for the best way of elderly support system in China and in order to do a good design, I need to consider follows as my design goals:

First the architecture is a humanizing architecture. Since the typology is a retirement facility and the client will be the elderly, try to design a practical, functional and comfortable space for the elderly is the primary key.

Elderly, this group is so unique and their reaction of the external world is not something I familiar with. So I did a lot of research about what elderly need in terms of physical aspect and psychological aspect. Therefore I am able to analysis the behavior of the elderly and create space that specific to them.

Second, my goal is doing a sustainable. The idea of sustainable is huge and I really want to achieve the goal at social level and architecture level. For social level, I want to bring

the new concept of retirement facility into people's mind and make it run as a system to form a virtuous cycle. For architecture level, I want to use passive techniques to design an eco-friendly building. I also want to design some space that people are able to get closed to the nature and enjoy the harmony relationship with the nature.

Third I want to design a building that is specific to the context. I believe that the architecture is supposed to fit in the surrounding environment and then play a positive role to enhance the surrounding. Meanwhile, i do want to focus both economical and comfortable aspect for the design. So i propose a building with "module" design method. This design strategy could help save time and money to construct .

Professionally, I believe architects should undertake some social responsibilities to help solving some social problems .In China, the aging society has become a serious issue so this is how I come up with this thesis topic.

Personally, I like design and I want to use my design to solve problems and create interesting place. I started to think about my topic since third year and since I grow up in Zhengzhou, China. I really

want to do something for my hometown.
I had my primary education in China and
came to United States to receive college
education. I really want to use the
knowledge I learned here and combine
with the Chinese culture background to
design.



Site analysis



5. 37 Original site view

Site History

The site is used by a community called Shenggang Village. We called it “urban village” because it is a village in the city rather than the rural area. Shenggang village is the one that is closest to downtown area and Huayuan Street commercial Circle. 90% of the residents in the village are non-locals. They are young workers and most of them just start their job career. Because of the cheap rent, they regard the area as their first and temporary home in the city of Zhengzhou.

The villagers built the buildings by themselves and rent them out. So most buildings are dark, small concrete boxes and built with low quality. The buildings are mostly 2-4 floors and built in a very high density. The turnover of the people is fast, heavy and the public security is bad. The overall environment and condition is dirty and in disorder.

In the summer of 2012, Zhengzhou government started to demolish the whole community and wanted to renovate the area. They proposed the site be a commercial, retail, green land and residential area. Currently, the deconstruction is in progress.

View and light quality

From the site, the north view is the campus of Henan Labor Union School. The west view is some commercial stores and restaurants. Since the proposed

site is at the corner of a large demolished land, the west and east view is all flat land waiting for further development. According to the proposed plan by the government, the land will be planned as a mixed use of residence and commercial with green space in it. Other than the land, the rest of the area is occupied by different buildings.

The light is sufficient since there is no building built at south closed to my proposed site. The closest architecture from the north of the site is 160 feet away. It is a mixed use mid-rise with 25 floors. Surrounding area of the site is the mixed use space of apartments, retails, grocery stores and small commercial stores.

Traffic

Hongzhuan Street is a double-way street and the traffic is very light. Jingqi Street is a one way street that cars are only allowed to drive from south to north. The traffic is very heavy but the speed is relatively slow. The average speed for car on Jingqi Street is 15 miles to 20 miles per hour. Both Hongzhuan Street and Jingqi Street are connecting the major street.

Pedestrian

Both Jingqi street and Hongzhuan street have a good pedestrian accessibility. Along west part of Hongzhuan Street,

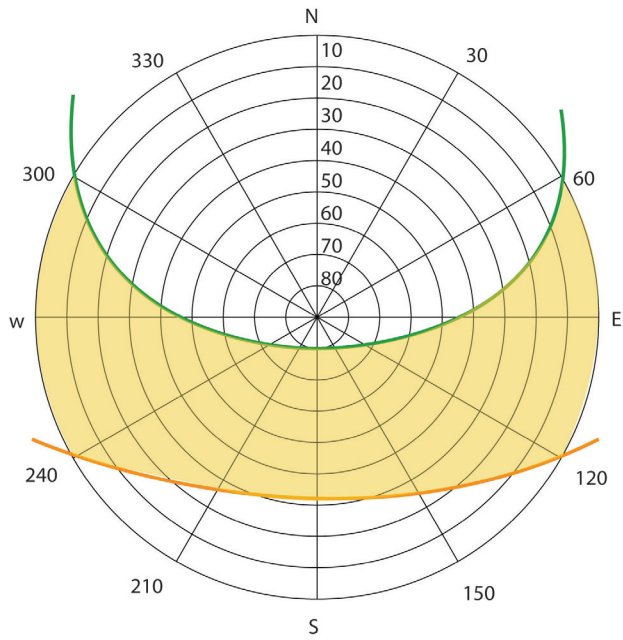
there are mostly apartment, so the street is relatively quiet. There are flower beds and green space built along the street as well. Therefore, people could go for a stroll with family after dinner. However, in Jingqi Street, it is very busy. There are lots of grocery stores, small retail and restaurants along both sidewalks. It encourages people to walk. The street is full of activities and became very noisy from 8am to 10pm every day.

Plants and Soil

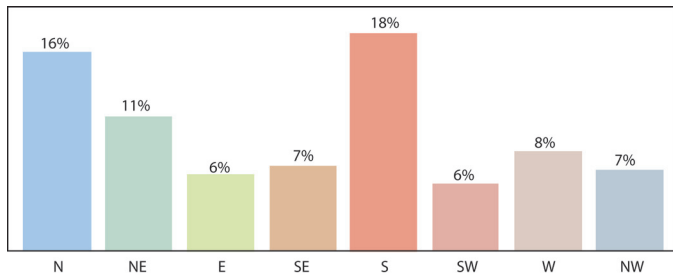
The current site is bare. There is not any landscape covering on the land. The type of the soil is yellow soil. Yellow soil is the soil with fine silt and clay. It is be able to grow cotton, sorghum, corn and wheat. Along Jingqi Street, there are lots of platan trees. The trees have been grown for many years and the sky is covered by their crown when you walk in Jingqi Street. The surrounding area of the site is all covered by pavement.

Water table and slope

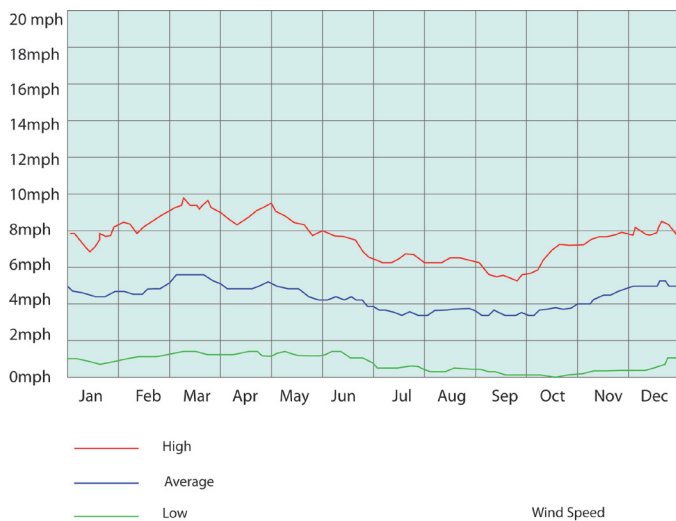
Zhengzhou is relatively dry city. The under-ground water level is -45 feet(Wang, 2007).The slope of the site is 0.028.



5.38 Sun Path



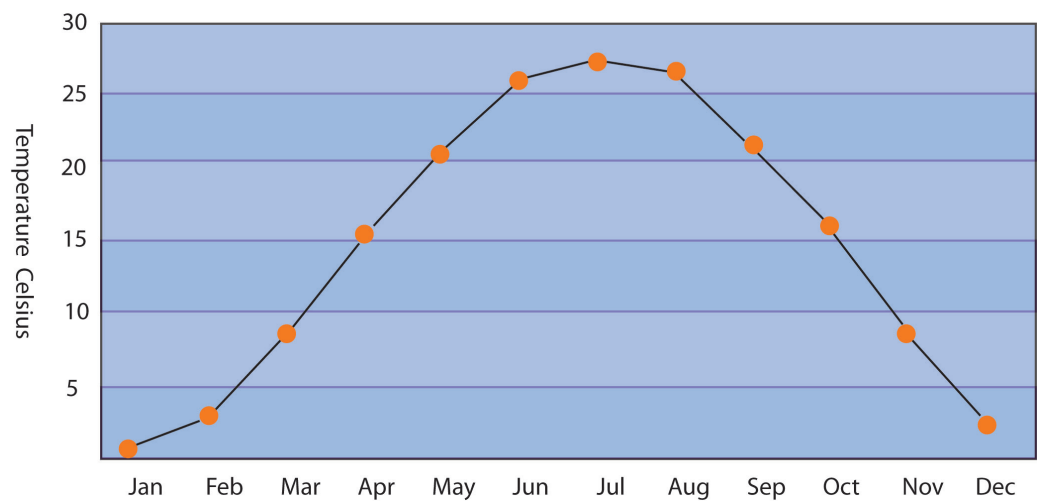
5.39 Wind Direction



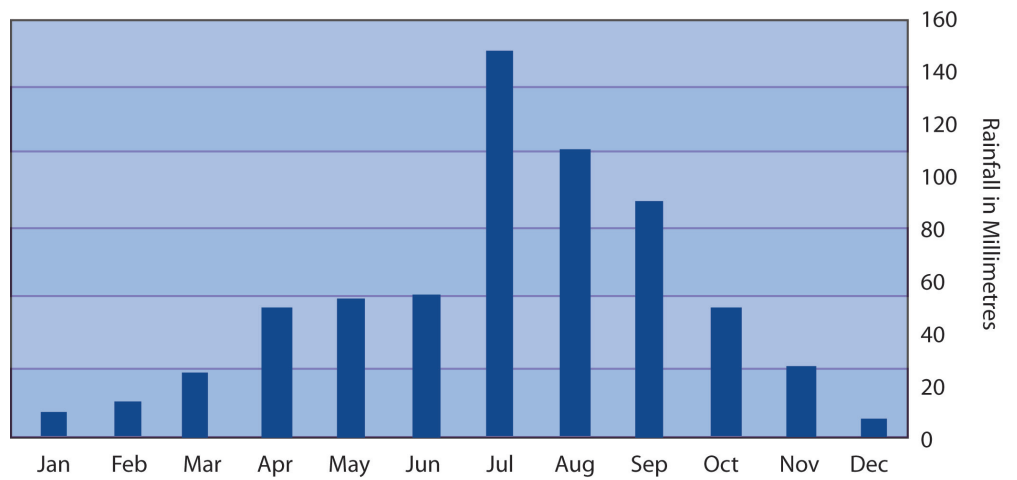
5.40 Wind Speed



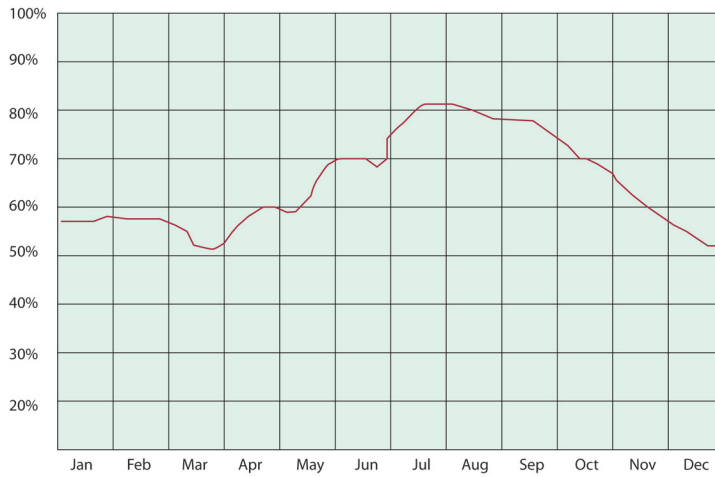
5.41 Cloudness



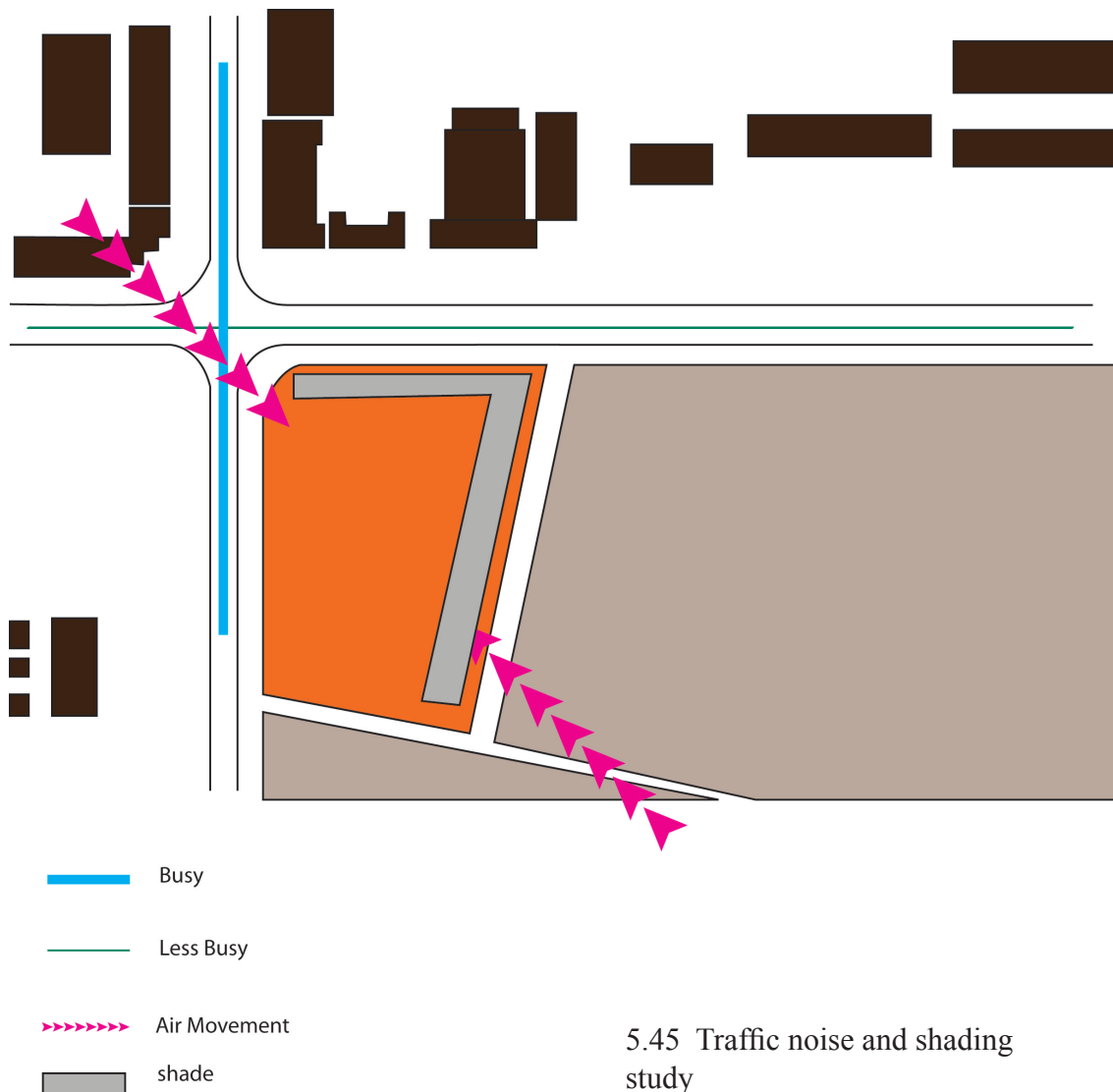
5.42 Temperature



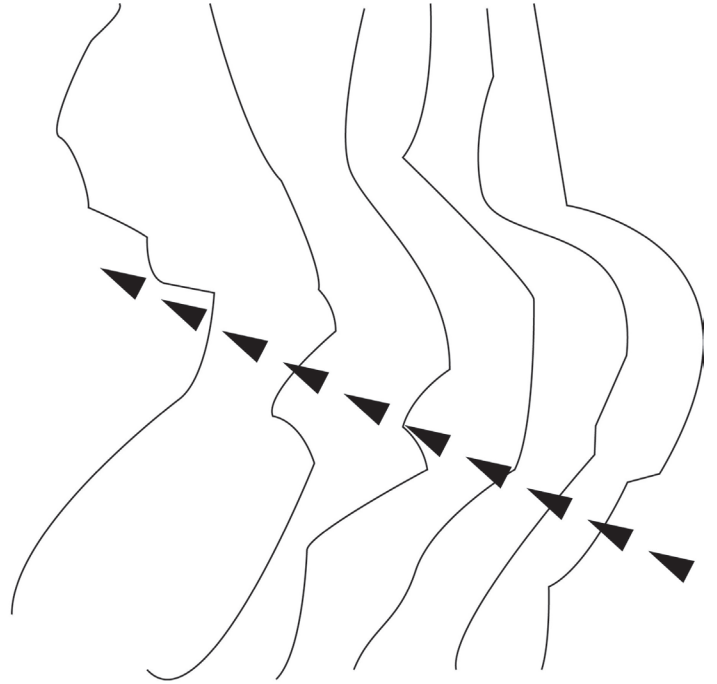
5.43 Rainfall



5.44 Humidity



5.45 Traffic noise and shading study

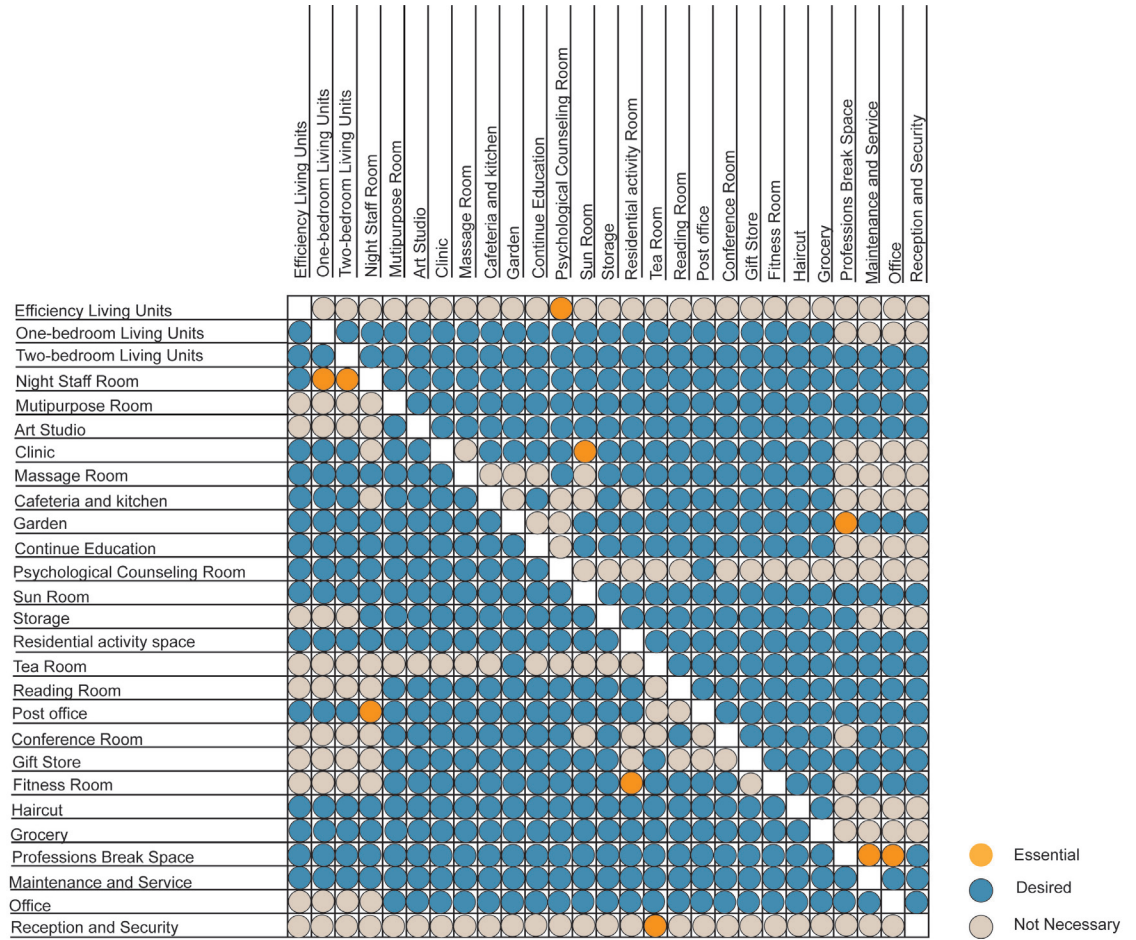


5.46 Topo and Slope



space Allocation





6.1 Matrix space

CAFETERIA

1. PUBLIC DINNING SPACE 340 Sq. m
2. PRIVATE DINNING SPACE 29 Sq. m
3. COOKING AND FOOD PREPARATION 200 Sq. m
4. BAR
5. STORAGE 14 Sq.m
6. LOCKER 10 Sq.m
7. OFFICE 15 Sq. m
8. STAFF BREAK -ROOM 8.8 Sq.m
9. STAFF RESTROOM 6.5 Sq.m

HEALTH SERVICE

1. CLINIC 20 Sq.m
2. PSYCHOLOGICAL CONSULTING ROOM 20 Sq.m
3. MASSAGE 24 Sq. m

ACTIVITY SPACE

1. SUN ROOM 340 Sq. m
2. ART STUDIO 132 Sq. m
3. READING ROOM 132 Sq. m
4. FITNESS ROOM 132 Sq. m
5. TEA ROOM 132 Sq. m
6. MULTIPURPOSE ROOM 35 Sq.m
7. RESIDENCE ACTIVITY ROOM 40 Sq.m

CONTINUE EDUCATION

1. CLASSROOM 40 Sq.m
2. COMPUTER CLUSTER 33 Sq.m

SUPPORTING SPACE

1. SECURITY 15 Sq.m
2. RECEPTION 15 Sq.m
3. MECHANICAL ROOM 10 Sq.m
4. GENERAL OFFICE 11 Sq.m
5. NIGHT STAFF ROOM 23 Sq.m
6. STORAGE 12 Sq. m
7. JANITOR 3 Sq.m
8. GENERAL SERVICE ROOM 40 Sq. m

LIVING UNITS

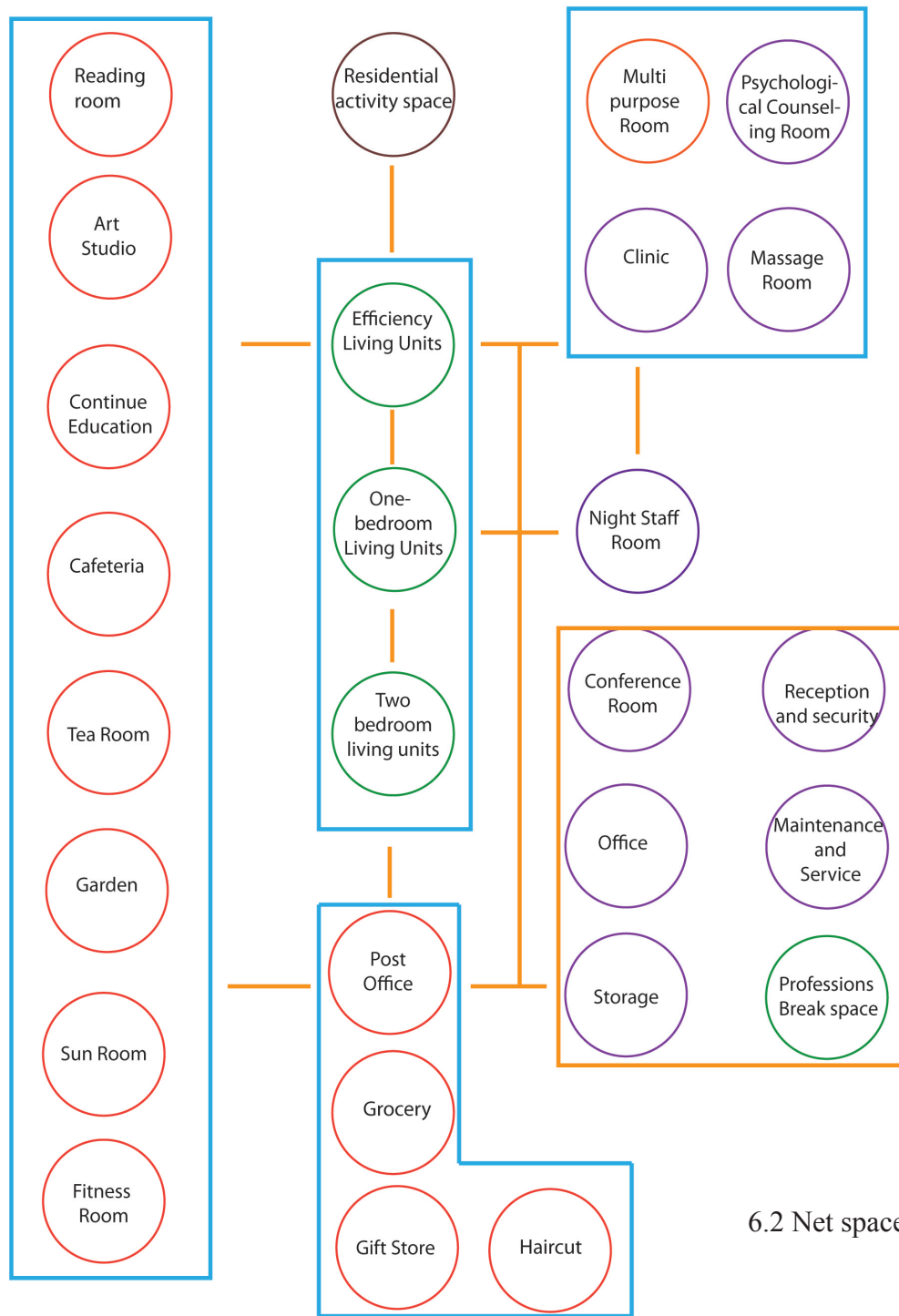
Efficiency 40 Sq. m

One-bed room apartment 64 Sq.m

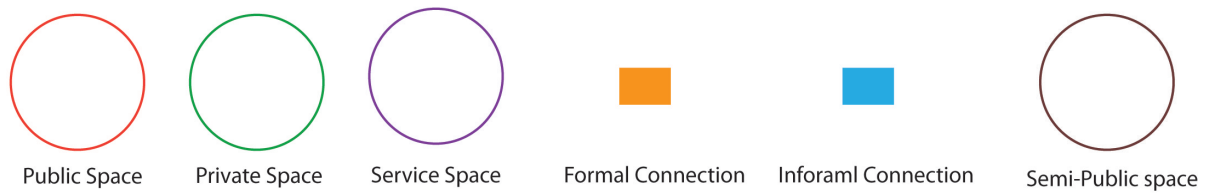
Two-beds room apartment 64-80 Sq.m

STOREFRONT

1. GROCERY 32 Sq.m
2. HAIRCUT 32 Sq. m
3. POST OFFICE 32 Sq.m
4. BANK 28 Sq.m
5. GIFT STORE 30 Sq.m



6.2 Net space relation

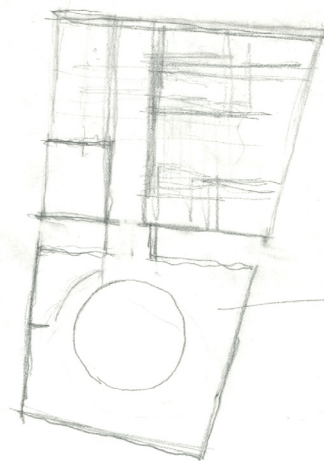
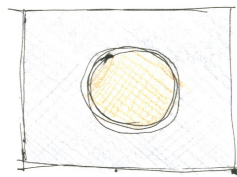
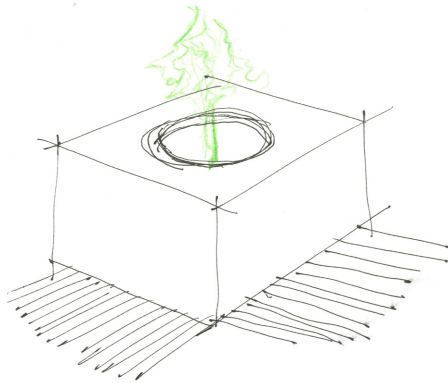




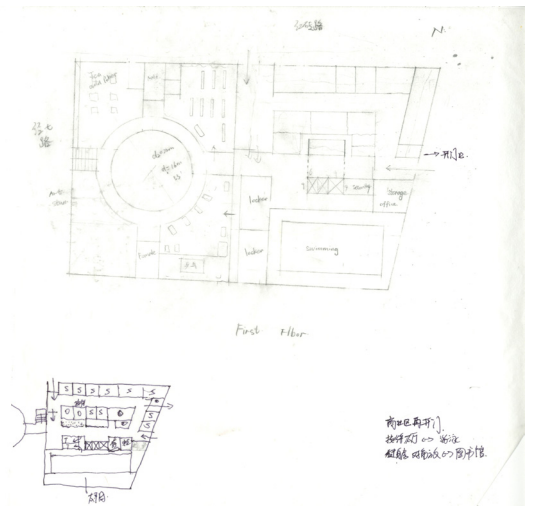
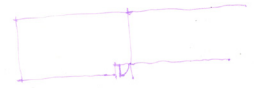
Design



Design Process



dining

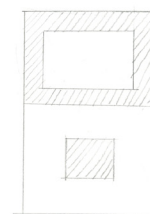


- A. Mixed used building (private space, gathering space (semi), public space)
- B. will be mid-rise.
- C. building response to human behavior (physical and psychological).
- D. Architecture create sense of place (security, belonging, family)
- E. Physical needs: sound, light, universal design.

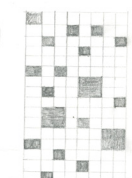
~~High Density / High Quality / High Price / High Quality~~
 Independent Living Units: $70m \times 100 = 7000m^2$ (100 Units)

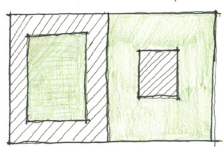
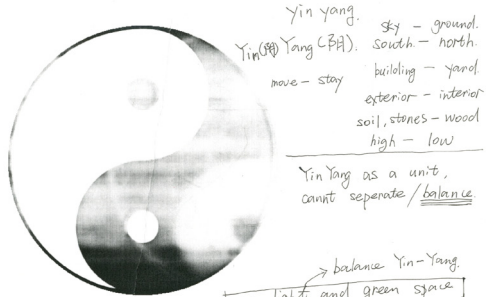
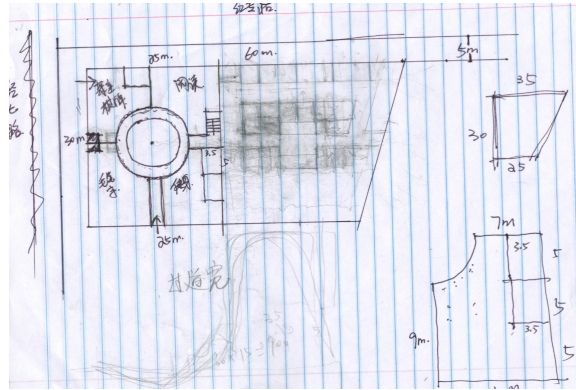
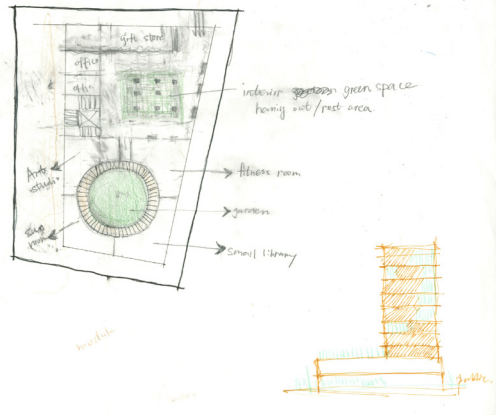
~~Assisted Living Units~~
 Assisted Living Units: $55 \times 80 = 4400m^2$ (80 Units)

Living space for special needs: $20 \times 80 = 1600m^2$

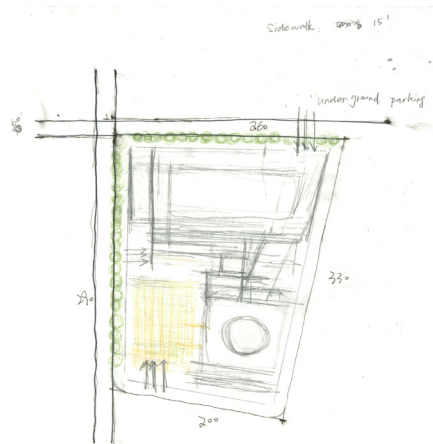
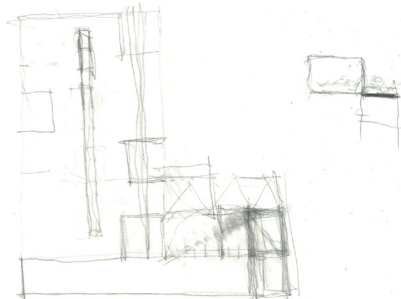
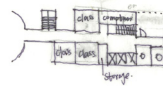
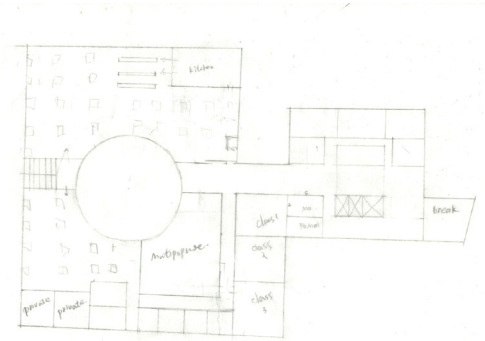


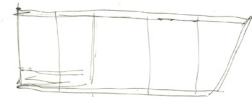
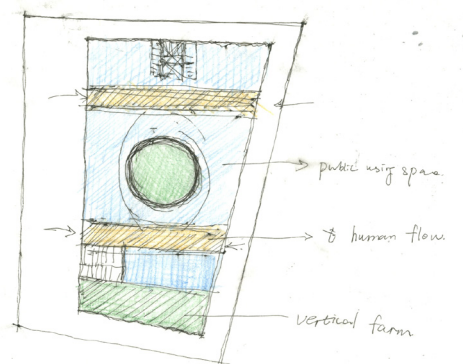
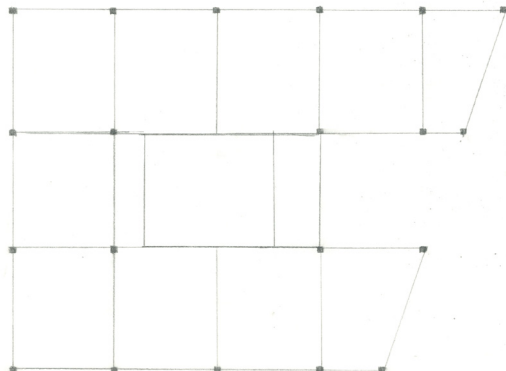
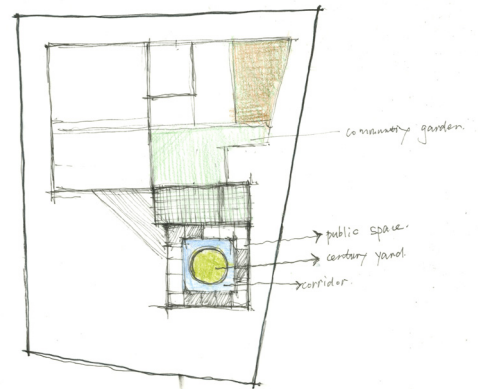
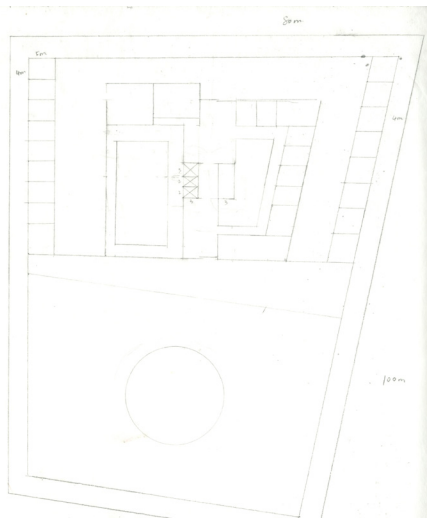
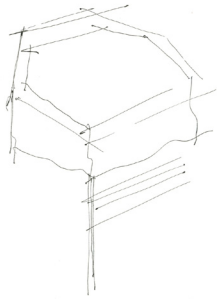
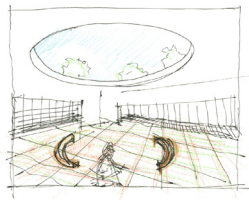
Yin yang
 阴阳

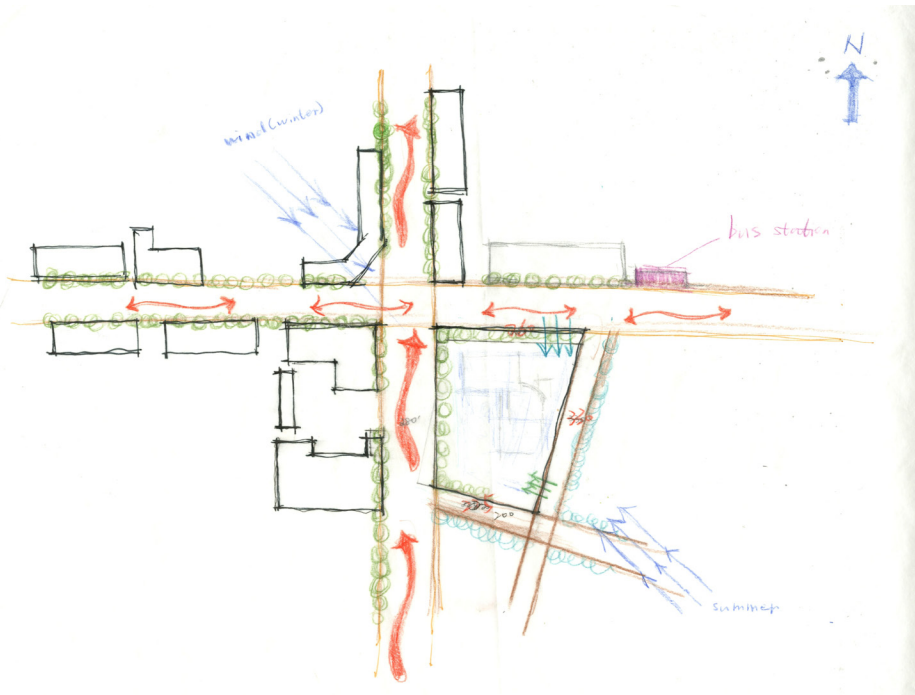




Sense of security, floor no height different







floor deck

beam

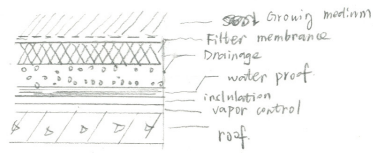
CMU

panel

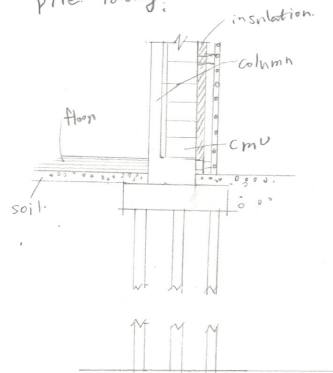
Aluminum

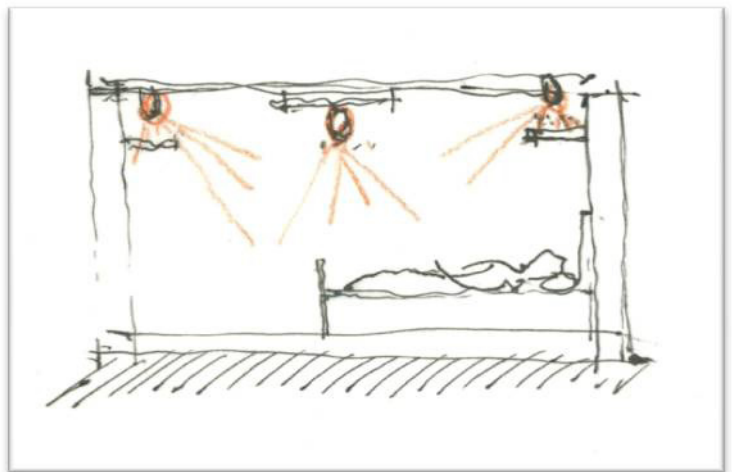
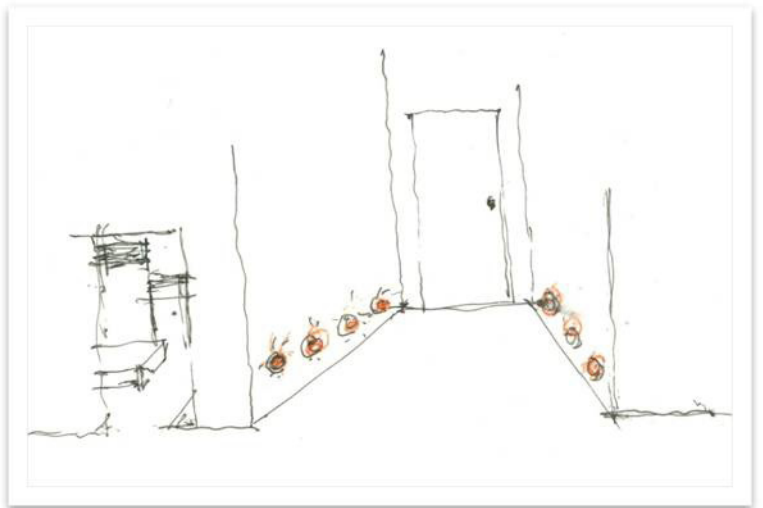
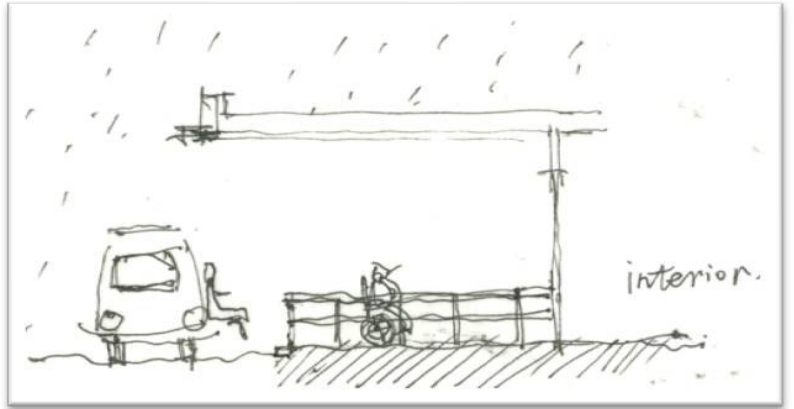
insulation

green roof



pile footing





Final Design solution



7.1 Exterior Perspective

This thesis will rethink elderly care in accordance to, designing a building that responds to the physical and psychological needs of the elderly population in the urban setting. The architecture will analyze human behavior in order to create a sense of place. The typology of the building is a retirement community, located in zhengzhou, china.

Sense of community

Before the original site's demolition in the summer of 2012, there was a low income community on the site. Most buildings were compact concrete boxes with two to four floors. The low rise community creates an opportunity for people interact with the street level promoting socialization. In keeping the sense of community, every 3 floors are grouped to create a community that shares outdoor spaces and a communal activity room.

Sense of belonging and enjoyment

The proposed building is mixed use architecture. An elderly center is designed within the first two floors to let people join each other for activities.

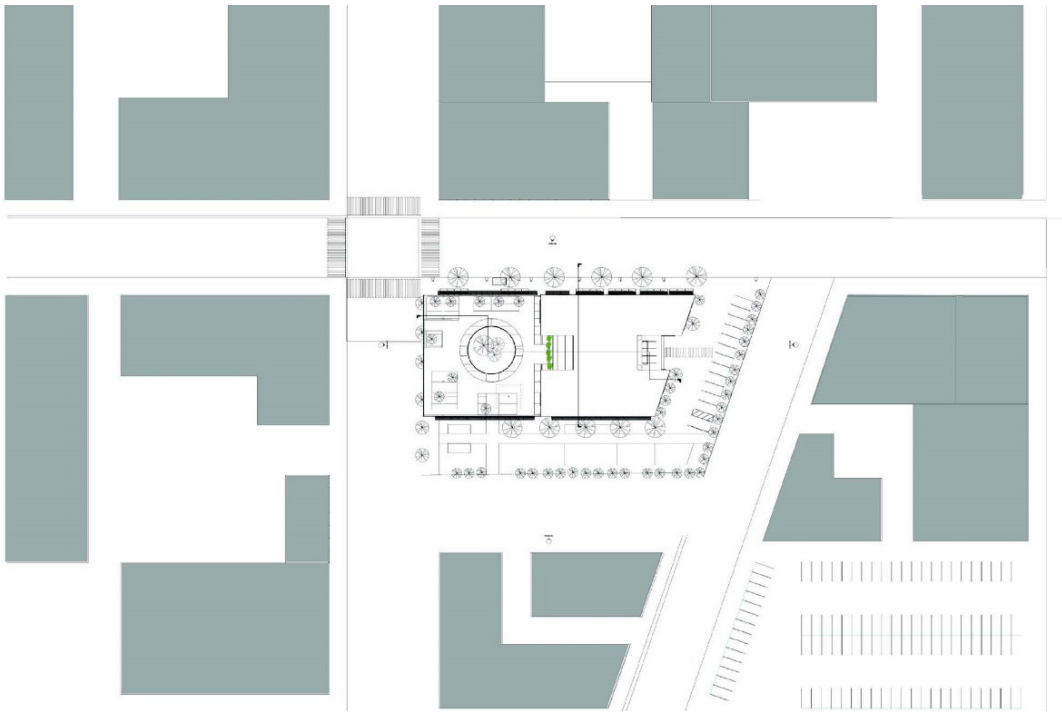
Sense of security and assistance

In order to create a sense of security, the building is divided into private spaces, semi public spaces and public spaces to separate people.

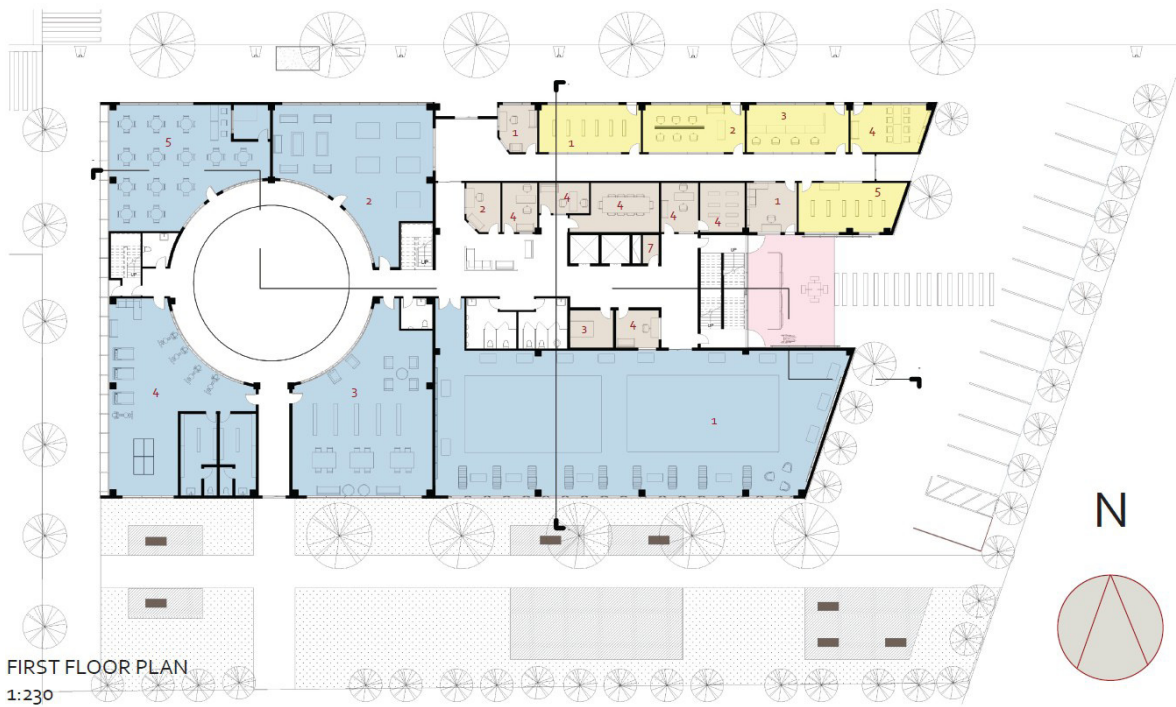
Safety design methods are used in designing the living units to create a safe living environment(details show in "apartment perspective"). The hvac filtration system allows one to escape from the polluted environment while still utilizing natural ventilation systems.

Design for human

The goal of the design is to improve elderly life quality. Human is the key in the design. Therefore, the spaces, especially the living units, are designed specifically with elderly need and human scale in mind.



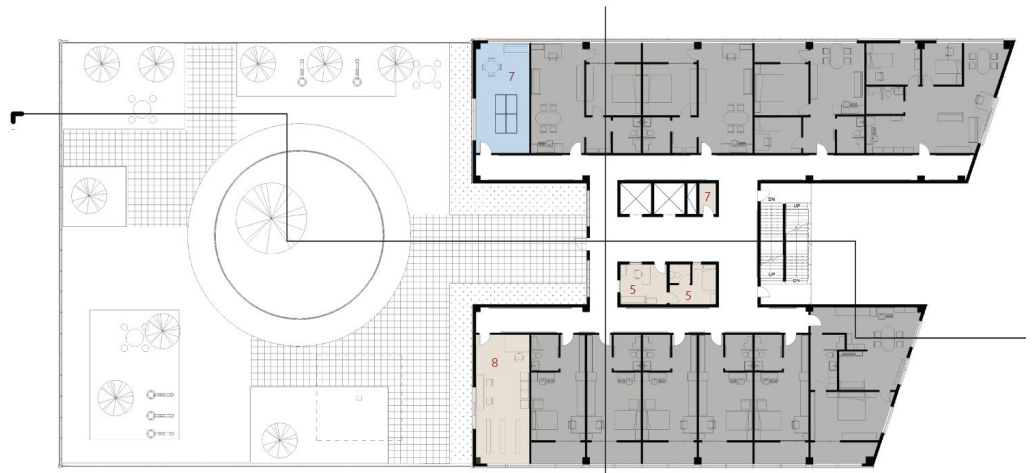
7.2 Site plan



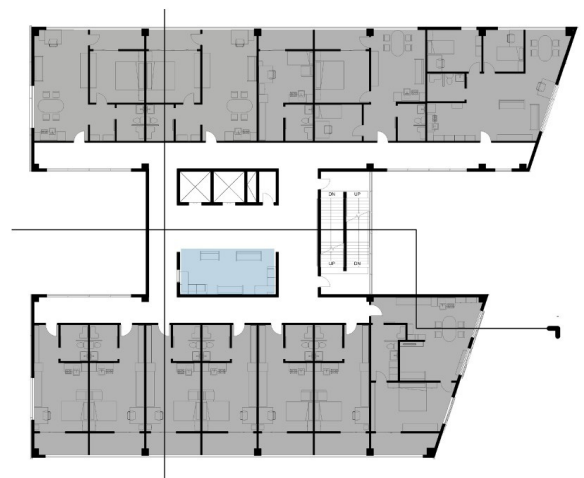
7.3 First floor plan



7.4 Second floor plan



7.5 Third floor plan



7.6 Fourth floor plan

CAFETERIA

1. PUBLIC DINNING SPACE 340 Sq. M
2. PRIVATE DINNING SPACE 29 Sq. M
3. COOKING AND FOOD PREPARATION 200 Sq. M
4. BAR
5. STORAGE 14 Sq.M
6. LOCKER 10 Sq.M
7. OFFICE 15 Sq. M
8. STAFF BREAK -ROOM 8.8 Sq.M
9. STAFF RESTROOM 6.5 Sq.M

HEALTH SERVICE

1. CLINIC 20 Sq.M
2. PSYCHOLOGICAL CONSULTING ROOM 20 Sq.M
3. MASSAGE 24 Sq. M

CONTINUE EDUCATION

1. CLASSROOM 40 Sq.M
2. COMPUTER CLUSTER 33 Sq.M

STOREFRONT

1. GROCERY 32 Sq.M
2. HAIRCUT 32 Sq. M
3. POST OFFICE 32 Sq.M
4. BANK 28 Sq.M
5. GIFT STORE 30 Sq.M

SUPPORTING SPACE

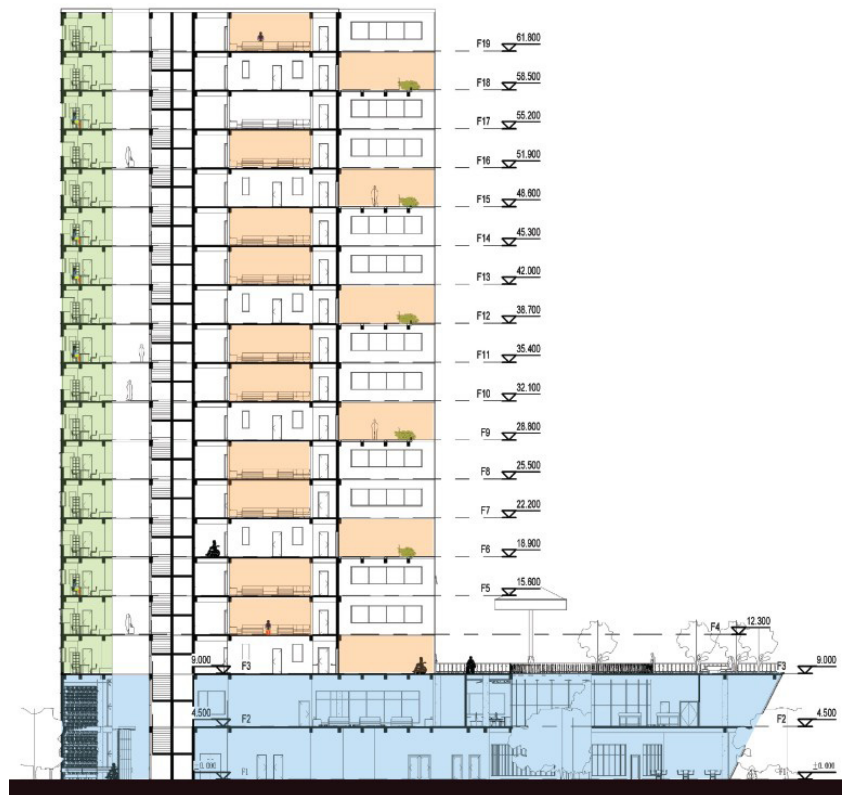
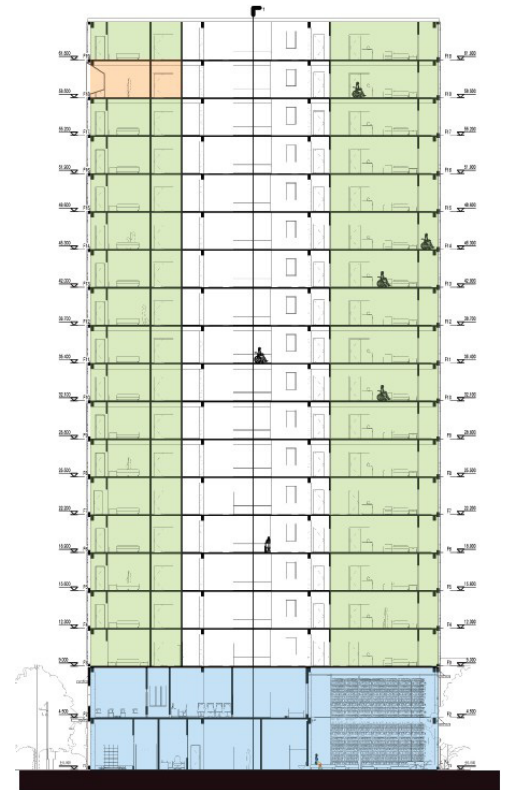
1. SECURITY 15 Sq.M
2. RECEPTION 15 Sq.M
3. MECHANICAL ROOM 10 Sq.M
4. GENERAL OFFICE 11 Sq.M
5. NIGHT STAFF ROOM 23 Sq.M
6. STORAGE 12 Sq. M
7. JANITOR 3 Sq.M
8. GENERAL SERVICE ROOM 40 Sq. M

LIVING UNITS

- EFFICIENCY 40 Sq. M
- ONE-BED ROOM APARTMENT 64 Sq.M
- TWO-BEDS ROM APARTMENT 64-80 Sq.M

ACTIVITY SPACE

1. SUN ROOM 340 Sq. M
2. ART STUDIO 132 Sq. M
3. READING ROOM 132 Sq. M
4. FITNESS ROOM 132 Sq. M
5. TEA ROOM 132 Sq. M
6. MULTIPURPOSE ROOM 35 Sq.M
7. RESIDENCE ACTIVITY ROOM 40 Sq.M



7.7 section



7.8 South Elevation



7.9 Backdoor drop-off

7.10 Roof outdoor space

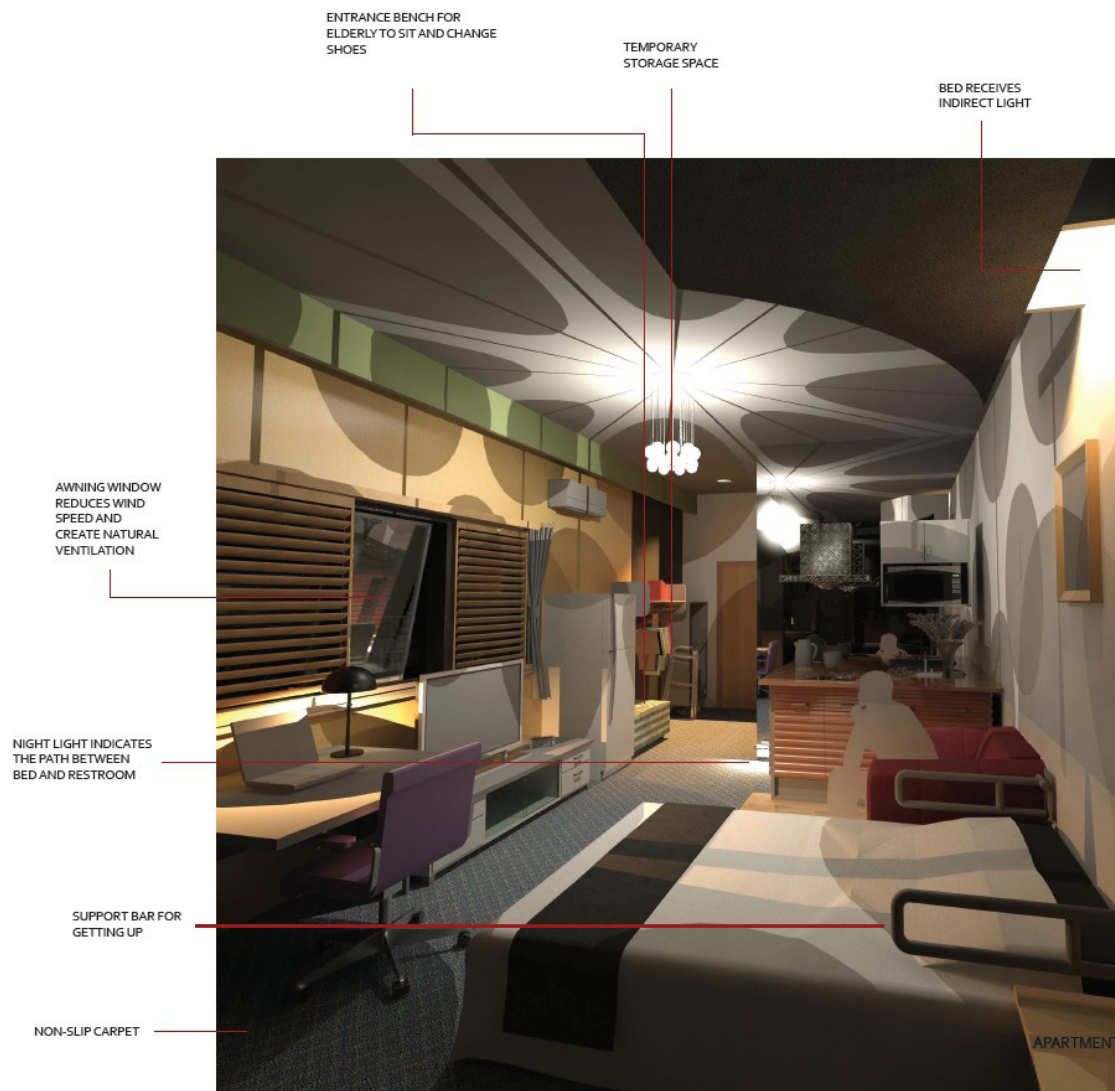


7.11 Sun room

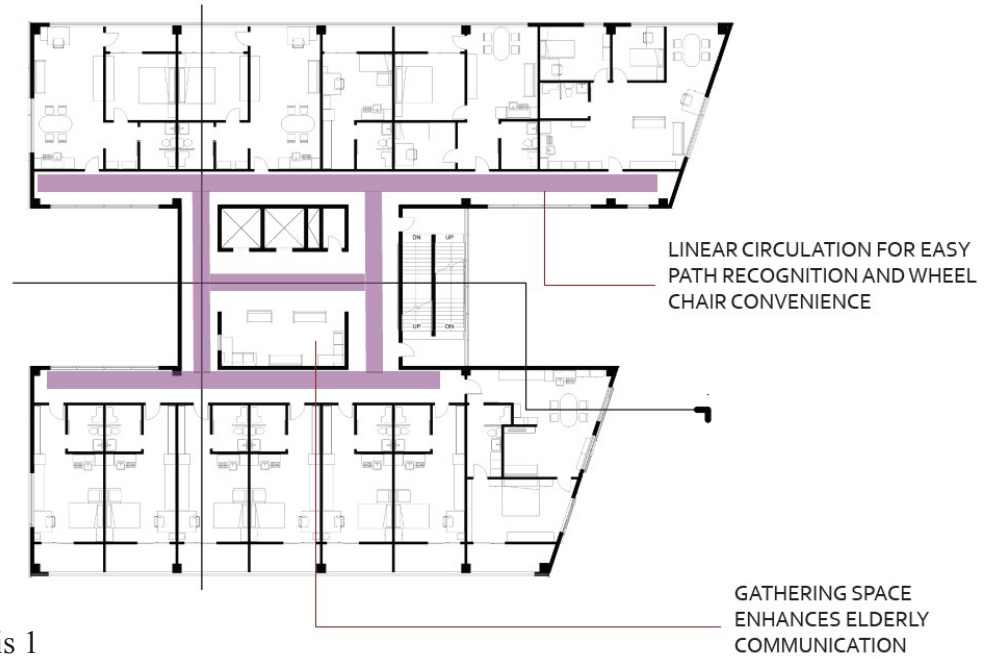




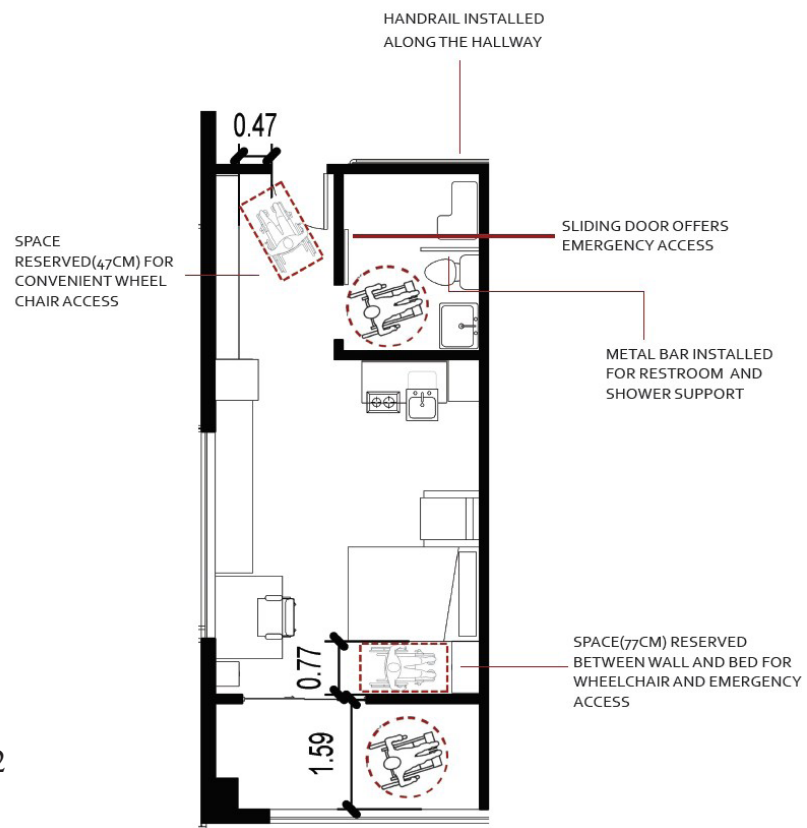
7.12 Cafateria



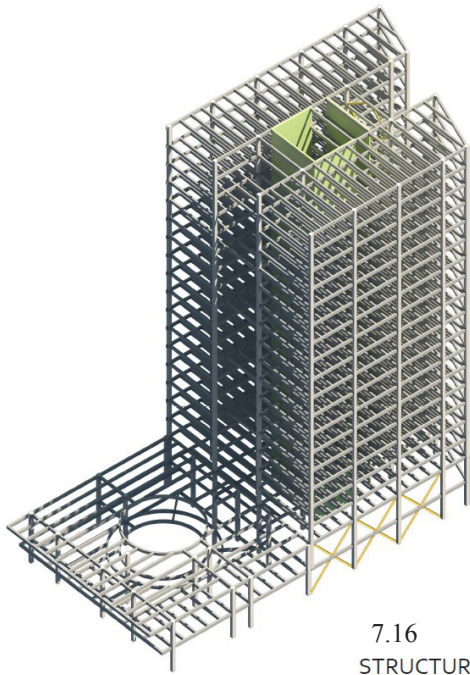
7.13 Apartment



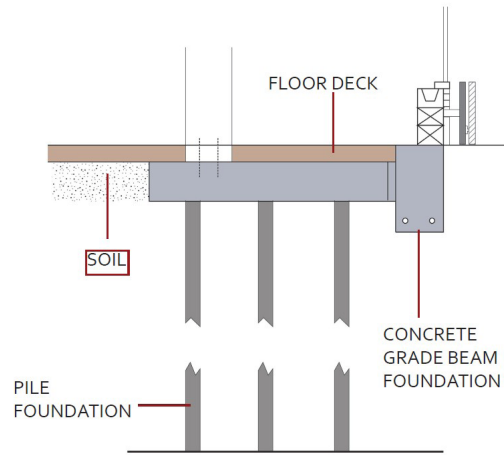
7.14 Living unit analysis 1



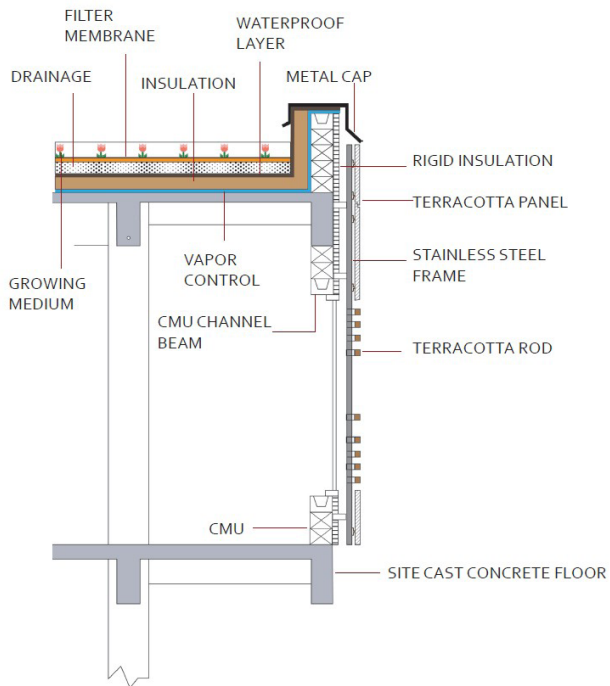
7.15 Living unit analysis 2



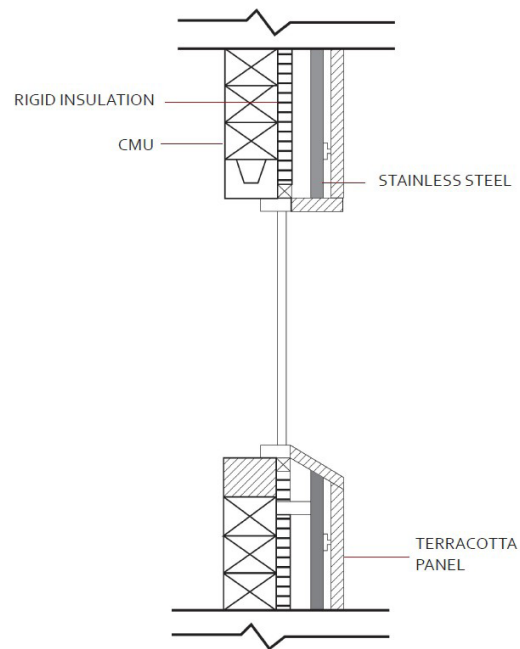
7.16
STRUCTURE



7.17 Foundation detail



7.18 Roof detail

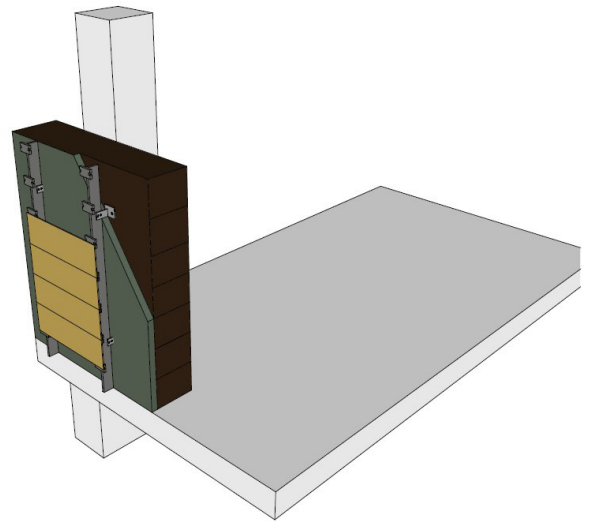


7.19 Window detail

7.20 HVAC System

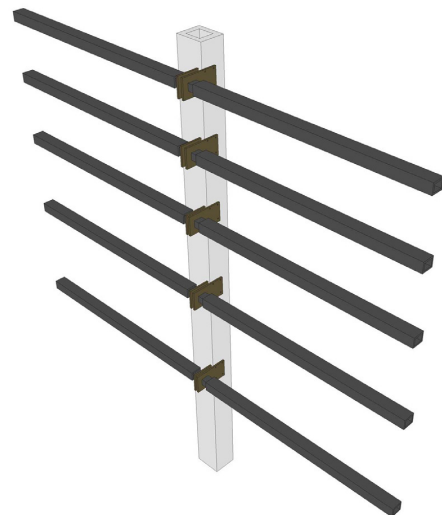


7.21 Building skin



Using terracotta as building skin (panels and rods):

1. Environment friendly
2. light weight with good acoustic insulation
3. good fire-proof and anti-freezing property
4. Self cleaning



Digital presentation

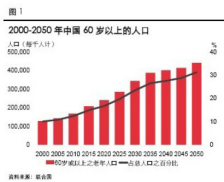
Building Senses

a Fresh Look at a Meaningful Retirement
Community for the People of Zhengzhou, China"

Zhe Liu

The traditional family structure?

Aging society in China



- Aging population is a serious problem in the world, especially in China. Since 1999, China started running into "aged society" and in the next 40 years, the total elderly population will reach to 437 million, which makes up 30% of the entire population.

Family structure shifting

- There is an old Chinese proverb said: "there is an old, there is treasure". As an agrarian country, the family as a unit is working on the same farm land year after year to make living. Therefore, the old people, who has already gained lots of experience from working in the farm is always been admired and followed by the other family members. Therefore, the elderly is always being seen as the family leader and learning model. (Ganshaw, 1978).
- In the society, the social norm requires the elderly passing the knowledge and experience to their offspring and as the reward; the children have the responsibilities to give their parents support when their parents get old.

Senior support in China

- Depend on where the senior lives:
 1. Social support: elderly facility.
 2. Family support: lives at home.
- Disadvantages:
 - Elderly facility: 1. Locate in the suburb (isolation, forget by the society).
 - 2. Bad living quality (charitable project, only fulfill the minimum requirement)
 - 3. Consider less human factor
 - 4. Boring and less activities (a place waiting for "death".)
 - 5. the amount of elderly facility is not enough
- Family support: need to know the family structure shifting

However

Family structure shifting

- With the modernization process taking place in China, people are not only making living based on the farming. More and more people moved into cities. The society system becomes more complex and various.
- People receive education in school and they do not have to stay where their family at and learn from their last generation.

When people start moving around, the traditional "big family" has been broke into single units and it reduces the family size. So the bounding among family member is not as tight as it used to be.

The new type "4-2-1" family

- Two young couples each from single-child family are taking care and responsible for their own child(1) and both of their parents(4).
- In modern Chinese society, the speed of the life is fast and middle generation have a heavy working pressure. And they have to live and work in a different city far from their parents. Therefore, they do not have enough time to take care of their parents.
- Empty nest family

Empty nest family

- Definition
Empty nest family is the stage in the parents' life after their children left home.
In China, there are 49.7% families in the city are empty nest family (Zhao, 2010).
- Effects depression, stress, worry, sense of lost....
- Health: Elderly has more chance to be sick than the young people and some just need assistance because of the age.
- Elderly Life becomes even harder after the death of their spouse

Conclusion:

Either social support or family support is suited well.

Problem Statement

So how could architecture help set up a better living style for seniors in the aging society?

Statement of Intent

- Claim
The design of the Retirement Community will improve life quality for seniors by fulfilling their **physical** and **psychological** needs.

The new typology is a exploration of community based elderly support. The architecture not only serves the people who lives in it. It is also open to the nearby community and serves the elderly nearby.

Design for human

- "Design is difficult because it must satisfy several criteria. These design (and evaluation) criteria constitute a hierarchy.
- First a space must be safe and healthy. A space must enable users to perform their functions.
- Second a design should not cause discomfort.
- Finally, a design should be aesthetically pleasing." (Bennett, 1977).
- Design for human is the **key**.

Statement of intent

- **Premise 1:** "The form of the building represents the significance of civilization" (Perkins, 2004). The design of the Retirement Community will **connect the architecture to the people** by bringing them in.
- **Premise 2:** The design helps shape people's behavior and **enhance people's relationship**.
- **Premise 3:** People is the main element in the architecture. This new living style will fulfill people's needs and set up a **sense of place** for the building.

What does elderly need?

Statement of intent

- The project justification
Through the thesis design, the project will remind society to **rethink** senior care and help change people's mind from the traditional methods for elderly support to a new approach that is more **sustainable** and **meaningful**.

Elderly needs

- Typically, the entering age of elderly is 65 years old (based on UN's definition). With the age increase, every aspect of the body function starts to degenerate.
- Physiological needs: consider the need of sound, light, temperature, humidity, human behavior, universal design.
- Psychological needs: based on "sense of place"

Sense of place

- Sense of place

"A concrete term for environment is place. It is common usage to say that acts and occurrences take place. In fact, it is meaningless to imagine any happening without reference to a locality. Place is evidently an integral part of existence... In general a place is given as such a character of atmosphere." (Norberg-Schulz, 1980).

Definition: People's feeling or perception of a space

- Sense of be respected

Feel cared by other people and live in dignity

- Sense of community

After retirement, usually the elderly will stay at home with family and neighbor. The community life becomes main part of the elderly life. In the book "Senior living, the author suggested that during the design of the retirement facility, we should design some space that helps the elderly set up the sense of warmth and space that let the elderly come across. (zhao, 2010).

The elderly needs:

- sense of security
- sense of belonging
- sense of community
- sense of be respected

Site



The site is in Zhengzhou, Henan, China. The area is located in the center of China which is part of North China Plain. This region is one of the most populous regions in China. Zhengzhou is capital and the largest city of Henan province. The population is 8,626,505. The city is the economical, educational and political center of Henan province

- Sense of Security

Elderly people often feel vulnerable and seek a greater sense of self-protection and self-reliance.

- Sense of Belonging

We live in the society with Family and friends. We always hope we are belonging to one or more specific groups. people could communicate in the group and then have the sense of self-worth and self-existing. Before the elderly retired, they are the active member of the society and after retirement, the elderly retreat from the society. Sometimes they feel lost. Therefore, the elderly need to involved in the group and interact with other people to get the sense of belonging.



The area is closes to downtown area and Huayuan Street commercial Circle. Before it is demolished, the area was a low income community. Most buildings on the site are concrete blocks with 2-4 floors. The construction quality is poor.



Some comments about the site

- It is composed of overcrowded multi-stories buildings and narrow alleys, which are difficult for vehicles to pass through.
- They are surrounded by skyscrapers, transportation infrastructures, and other modern urban constructions.
- They have become the breeding grounds for social problems such as crime, drug addiction.
- Looks ugly and dirty
- However, since low rise building encourage people go to the street level and interact. The area provides sense of community and neighborhood.

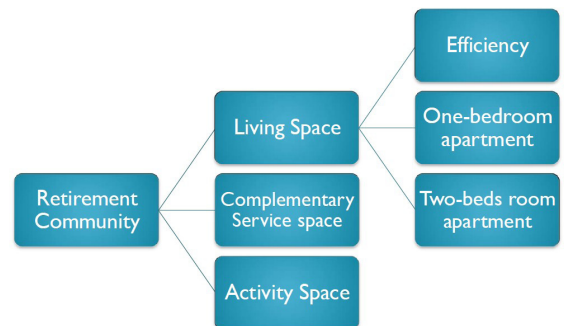
- The proposed building is mixed use architecture. An elderly center is designed within the first two floors to let people join each other for activities. The rest floors are residential space.

Site

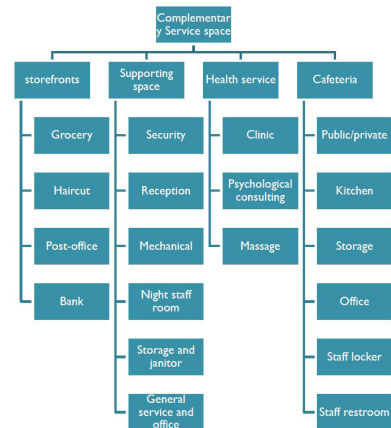
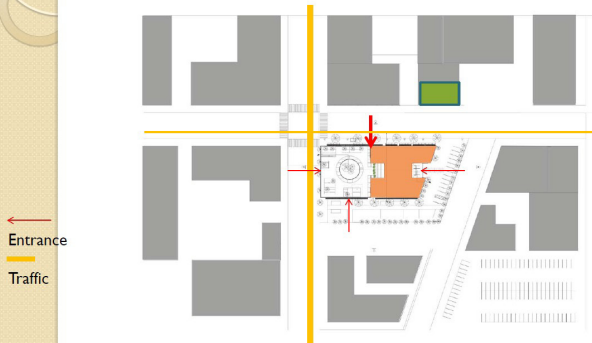
In the summer of 2012, Zhengzhou government tear down the whole community and want to renovate the area. They proposed the site be a commercial, and residential mixed use area.

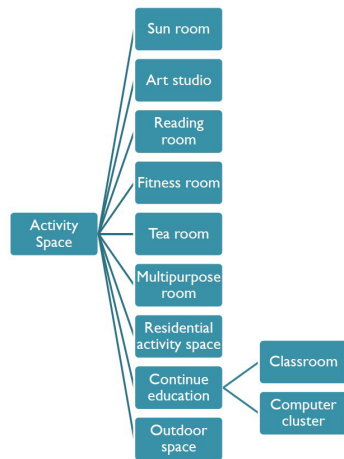
- Bus station
- Proposed site
- Area future development
- School area
- Hospital
- Original site
- Shopping center
- Connection

Program



Site plan





Second floor plan

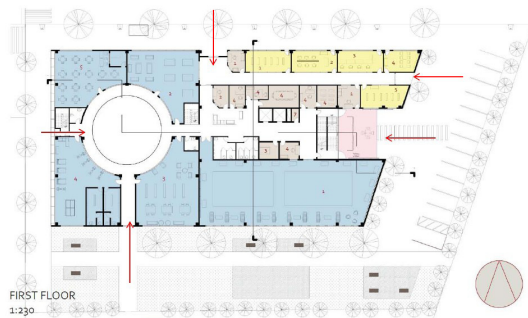


The low rise community creates an opportunity for people interacting at the street level and promoting socialization. In keeping the sense of community, every 3 floors are grouped to create a community that shares outdoor spaces, a communal activity room and a staff room.

Third floor plan



First floor plan



Apartment floor plan



CAFETERIA	1. PUBLIC DINING SPACE 340 Sq. M	SUPPORTING SPACE	1. RECEPTION 40 Sq. M
	2. PRIVATE DINING SPACE 40 Sq. M		2. RECEPTION 40 Sq. M
	3. COOKING AND FOOD PREPARATION 200 Sq. M		3. MECHANICAL ROOM 40 Sq. M
	4. BAR		4. NURSING OFFICE 10 Sq. M
	5. STORAGE 40 Sq. M		5. NIGHT STAFF ROOM 10 Sq. M
	6. LOBBY 40 Sq. M		6. STORAGE 40 Sq. M
	7. OFFICE 40 Sq. M		7. JANITORY 10 Sq. M
	8. STAFF BREAK ROOM 80 Sq. M		8. GENERAL SERVICE ROOM 40 Sq. M
	9. STAFF RESTROOM 40 Sq. M		
HEALTH SERVICE	1. CLINIC 40 Sq. M	LIVING UNITS	1. EFFICIENCY 40 Sq. M
	2. PHYSIOLOGICAL CONSULTING ROOM 40 Sq. M		2. One-bed room apartment 60 Sq. M
	3. MASSAGE 40 Sq. M		3. Two-bed room apartment 80 Sq. M
CONTINUE EDUCATION	1. CLASSROOM 40 Sq. M	ACTIVITY SPACE	1. GYM ROOM 400 Sq. M
	2. COMPUTER CLUSTER 100 Sq. M		2. ART STUDIO 400 Sq. M
STORAGE/PAINT	1. WORKSHOP 40 Sq. M		3. REPAIRS ROOM 100 Sq. M
	2. WORKSHOP 40 Sq. M		4. FITNESS ROOM 100 Sq. M
	3. WORKSHOP 40 Sq. M		5. TECH ROOM 400 Sq. M
	4. BARR 40 Sq. M		6. MUSIC AND DANCE ROOM 400 Sq. M
	5. GIFT STORE 40 Sq. M		7. RESIDENCE ACTIVITY ROOM 400 Sq. M

Cafeteria



Sun room



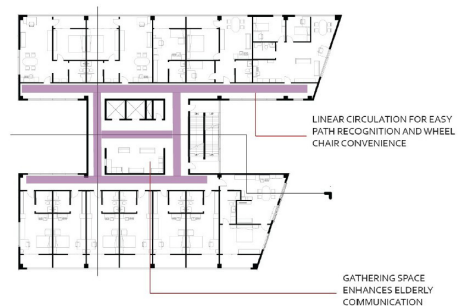
Backdoor drop-off



Outdoor space on roof



In the core of the building, create semi-public space (rest area) for the elderly socializing and interacting with each other.

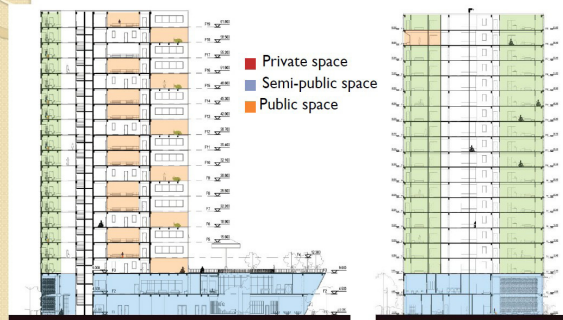


- In the book “Building Type Basics for Senior Living”, the author talks about the elderly feel increasingly importance of the life after they become old and feel not as strong as used be. So it is not only crucial to create a physical safe environment, but also important to create a sense of feeling that the place is safe to live and enjoy life. (Perkins, 2010).

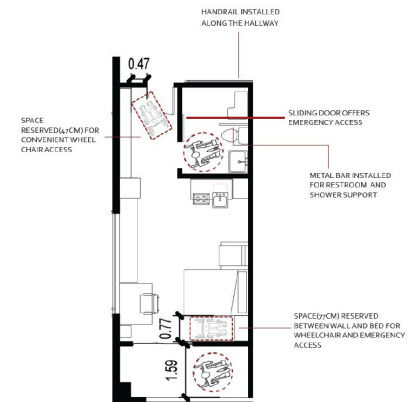
Living space design

- Living space is where the elderly spent most time for daily life. Assistant living environment is highly recommended for designing the living unit.

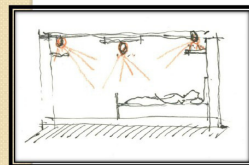
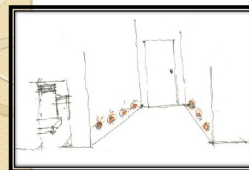
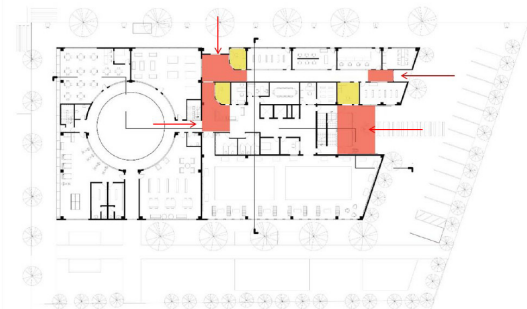
The building is divided into private spaces, semi public spaces and public spaces to separate people.

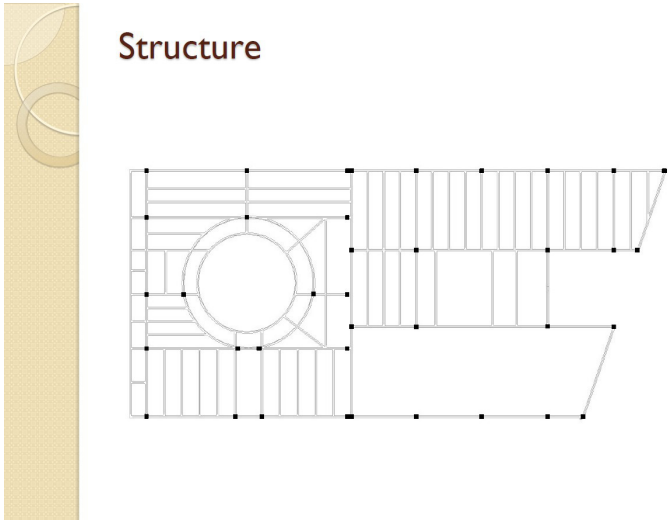
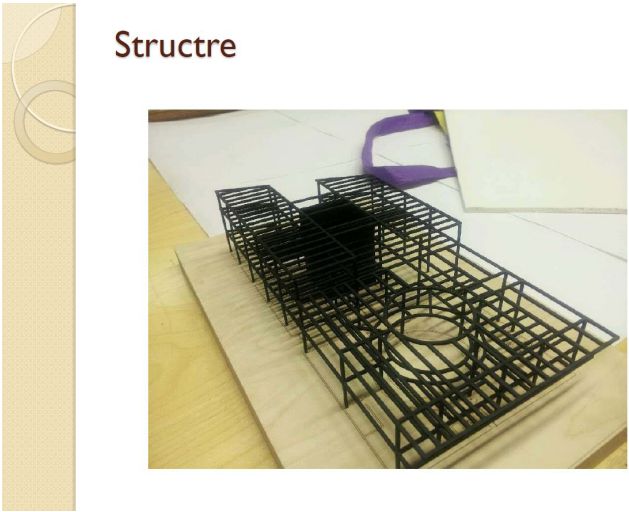
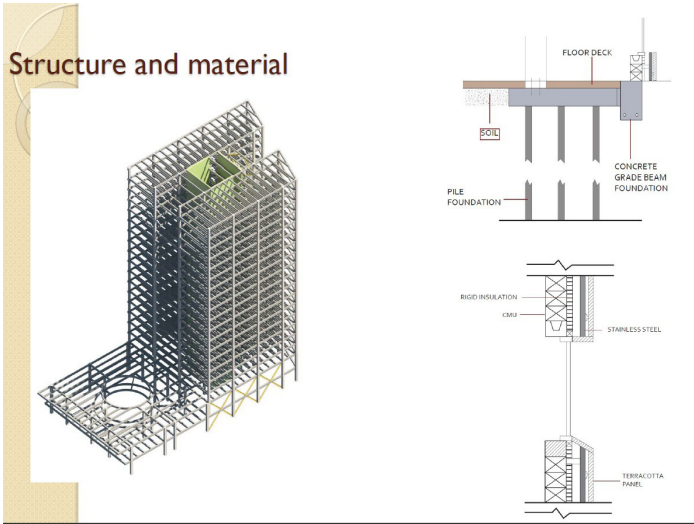
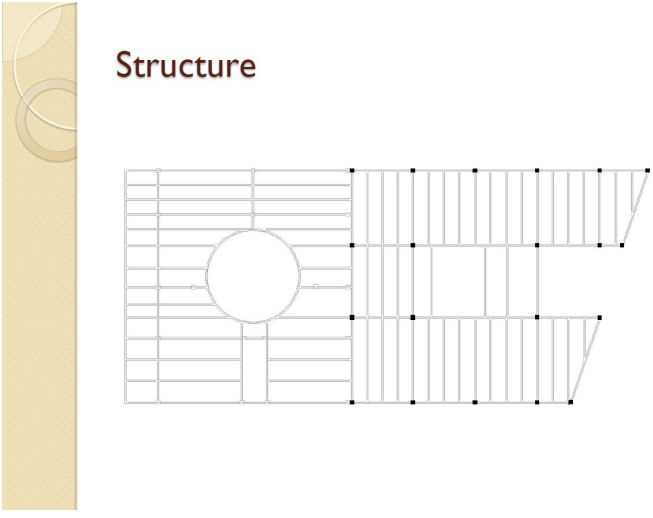
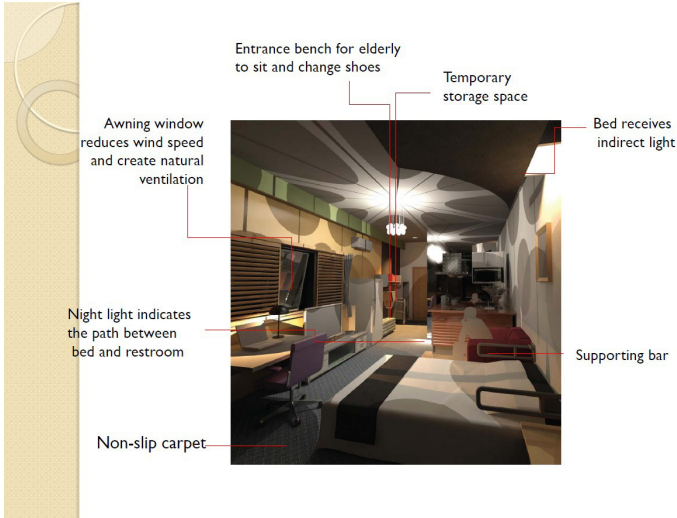


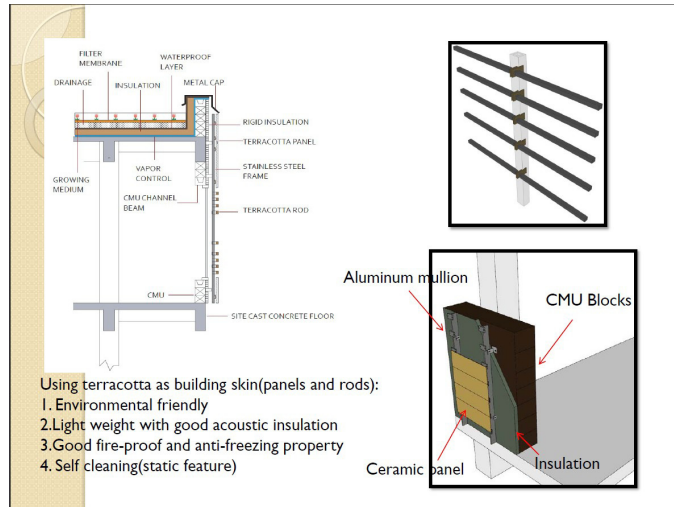
According to research, for living space people prefer smaller room than larger room



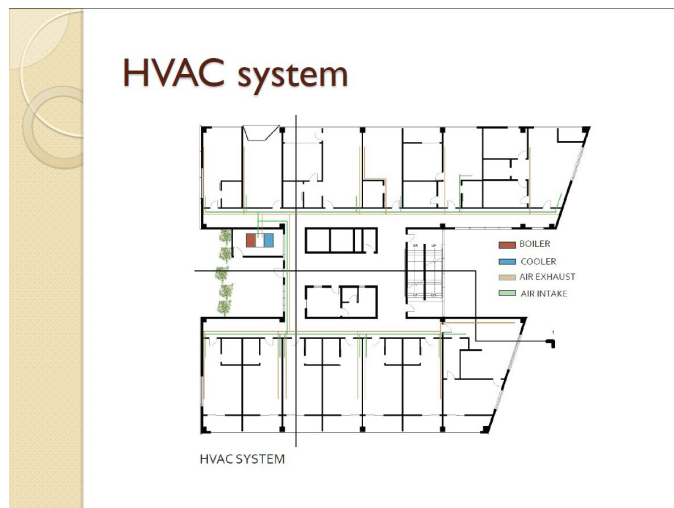
Controlled entrance for the open floor







• Thank you.

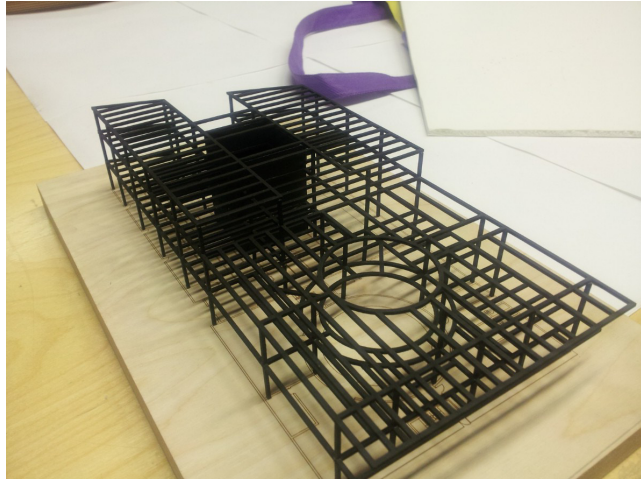


Question ?

Project installation and model



7.22 Final model



7.23 Structure model



7.24 Project Installation

Reference List

- Perkins, B. (2004). Building Type Basics for Senior Living. Hoboken, NJ. John Wiley & Sons
- Xiaozheng, Z. (2010). Senior Living Design. Beijing. China Architecture & Building Press.
- Xiao, Q. (2001). Chinese culture and filial piety. Beijing: People's publishing house.
- Kong fuzi (BC 400). Xiaojing.
- Ganshaw, T. 1978, "The Aged in A Revolutionary Milieu: China." In Aging and the Elderly: Humanistic Perspectives in Gerontology, edited by S. Spicker, K. Woodward, and D. Van Tassel. Atlantic Highlands, NJ: Humanities.
- Yang, C.K (1959). The Chinese family in the communist revolution. Cambridge, MA: Harvard University Press
- Wang, J. (2012). Aging society in china. The Youth Writers.
- Kong fuzi (BC 400). Analact.
- Bennet, C. (1977). Spaces for people. Englewood Cliffs, N.J.: Prentice-Hall, Inc.
- Norberg-Schulz , C. (1991). Genius loci: towards a phenomenology of architecture. Academy Editions
- Luan, S. (2011, 07 01). History and development of Zhengzhou. Retrieved from http://newspaper.dahe.cn/hnrb/html/2011-07/01/content_536234.htm

Wang, Y. (2007, 5 29). Zhengzhou underground water level rises up. Retrieved from http://news.xinhuanet.com/society/2007-05/29/content_6169035.htm

Santa teresa retirement home / bmesr29 architectes. (2011, 04 07). Retrieved from <http://www.archdaily.com/125600/santa-teresa-retirement-home-bmesr29-architectes/>

Residential building in slovenia / ravnika potokar arhitekturi. (2011, 02 18). Retrieved from <http://www.archdaily.com/111496/residential-building-in-slovenia-ravnikar-potokar-arhitekturi/>

Daycare island craeyenburch / möhn bouman. (2009, 12 05). Retrieved from <http://www.archdaily.com/42821/daycare-island-craeyenburch-mohn-bouman/>



Personal Information

Name : Zhe Liu.
Address: 26 Roberts. St. N. apt. 416
Phone: 701-361-9088
Email: zhe.liu.1@my.ndsu.edu

I go to school the youth to learn the future.

by Robert Frost

Home town: Zhengzhou, Henan, China.