

# STUDENT HOUSING TO PROMOTE HEALTH

Mater Thesis  
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**CHALMERS**





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## ABSTRACT

Amount of university student is increasing rapidly, especially international students. So the demand for student housing is also increasing. In general opinion, student housing is temporary housing. So how to provide more room for students, making it more economical and practical is the subject of general concern, and the concept of health has not been taken seriously.

However, the health status of students is not optimistic, especially mental health. Many of them are suffering from stress, anxiety, and depression.

The building environment, as a place where people live in, directly affects lifestyles and is closely related to health. The building can make a positive influence on health, which is already come into consideration in architecture design. Student housing also has the potential and responsibility to promote healthy living for students. On the one hand, Students need health support in their daily life. On the other hand, they have an equal right to enjoy a healthy environment and a healthy life. From the perspective of design, this thesis found strategies through research about student housing and health promotion, and then implement them in a specific design.

This housing work from two perspective:equal healthy environment and healthy behaviour promotion.Through strategies of site,unit and building programming,the housing provide plenty of sunlight and different public space,easy access to nature and exercise facilities.In this way,stress and depression can be reduced efficiently.It also support the sustainability of students` living and learning.

This research help the designers, students and student housing managers pay more attention to the healthy living environment of students, and get inspiration from the proposal.

Key word:

Student housing,Health promotion,Mental health

# 1

## **INTRODUCTION**

- 1.1 Student background**
- 1.2 Student housing**  
the challenge and potential
- 1.3 Focus question**
- 1.4 Aim&limite**
- 1.5 Limitation**
- 1.6 Research method**

## 1.1 STUDENT BACKGROUND

The author is a double degree student of Chalmers University of Technology and Tongji University.

In my banchlar study and master study in China,I once did a residential community project, which was concentrated on community life and high density housing. I never connect with healthcare and health promoting.

During study period in Chalmers,I chosed the healthcare architecture studio,in which designed a psychiatric hospital project.I`m impressed by health promoting concept in design process,as well as evidence based design.This project make me start thinking about the meaning of health for human and society.

As a student,I spend a lot of time in dorm. In China,the dorm usually is shared by 4-6 people,which is high density.Although master students can live in double room,my domitory is lack of sunshine and activity area.But it`s also very cheap.

As international student in Sweden,I think the student housing here is more privacy and independent,and meet many daily requirement which provide a comfortable living enviroment .I also noticed that they have some good consideration about health like having exercise facility and bike path.However,at same time I also found that the sunlight and social promoting is still not enough.

As an architect,it is really important to think about how to change this situation and try to promot student health in daily life.That`s why I decide to do this project.

## 1.2 STUDENT HOUSING THE CHALLENGE AND POTENTIAL

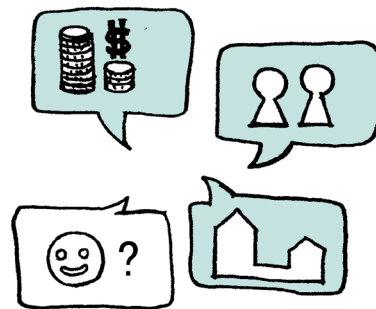
Nowadays, amount of student is increasing rapidly, especially international students. So demand for student housing is also increasing. Take Gothenburg as example, it's need almost 28 months queuing time for a corridor room at SGS Studentbostäder, which is 3-4 months longer than last year. Under this situation, more than 500 new student housing will be build by SGS Studentbostäder and Chalmers Studentbostäder in the coming year (Studentbostads företagen, 2018).

In general opinion, student housing is temporary housing. So how to provide more room for students, making it more economical and practical is the subject of general concern, and the concept of health has not been taken seriously.

In 2013, four student housing companies in Sweden had a group discussion, they talked about economy and feasibility of building, proposed to reduce the noise requirements of the student housing in order to make it easier to establish a project (Studentbostads företagen, 2013). In the Swedish regulations, it has indeed been implemented (Boverket, 2016). In a research of future student housing by Studentbostads företagen, White Arkitekter and Stockholms Studentbostäder (n.d.), the discussion also didn't contain health topic.

However, the health status of students is not optimistic, especially mental health.

Reports and research on students' mental health problems show that students' mental health crisis is gradually increasing. (Center for Collegiate Mental Health, 2018).



The factors contributing to the mental health can be academic pressure, financial burden, increased accessibility, the female to male ratio, advances in technology, and lifestyle choices.(Flatt,2013).Student feel pressure to succeed on their study.The increase in tuition and living costs can also increased their stress. At same time, More and more students are receiving higher education, which means that the demand for mental health support is increasing.

Excessive use of electronic devices can have a huge negtive impact on the physical and mental health of students. The habits of students who start living independently, such as eating, exercising, and socializing, can affect their mental health as well.In addition, loneliness is also an important factor as a student who lives alone from his parents. (Richardson et al., 2017)

Some health problems are invisible or appear shortly, even many students have taken this health stress for granted.Actually,many of them can be solved in daily life. On the other hand,most mental health problems develop in early life , so students without problem also should enjoy a healthy life style.

The building environment, as a place where people live in, directly affects lifestyles and is closely related to health.

Building can make positive influence on health ,which is already come into consider in design. So as an important living space,like ordinary housing and elder healthcare housing, student housing also have the potential and responsibility to promote healthy living for students.

What factors influence their health?How to consider from health promotion perspect?

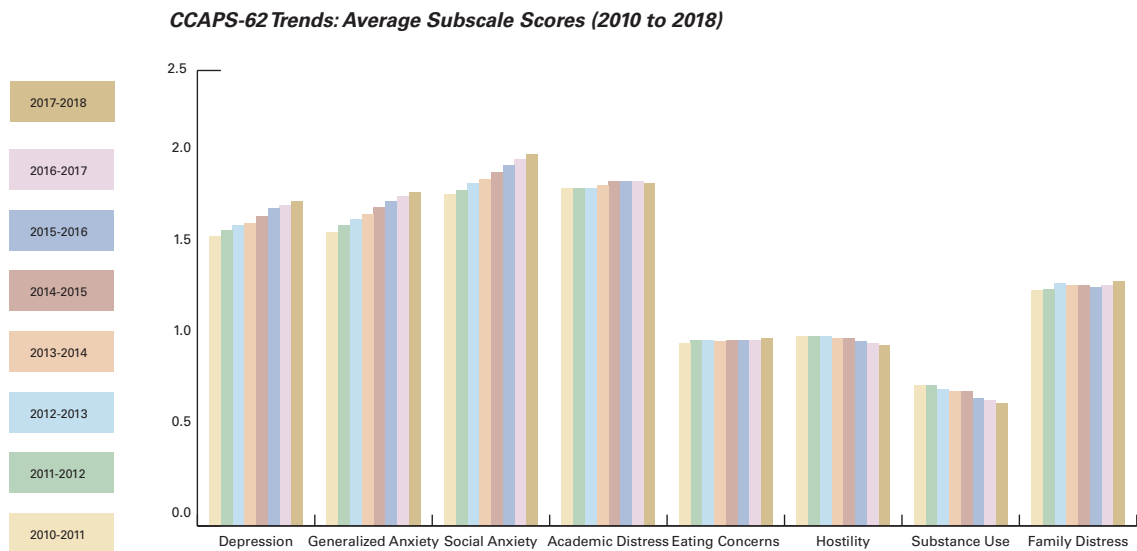


Figure:Center for Collegiate Mental Health.(2018)

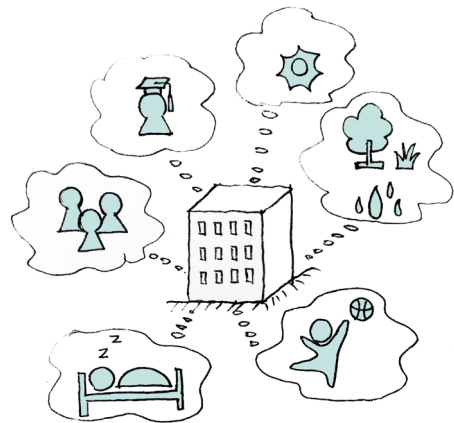
### **1.3 FOCUS QUESTION**

How to promote student health  
through student housing design?

## 1.4 AIM&LIMITE

From the perspective of healthy design, it is important to find out how can student housing affect students' health and rethinking which environmental factors are important in the design of student housing. It will encourage designers, students and student housing managers pay more attention to the healthy living environment of students.

Find strategies through health promotion design research and student needs surveys, and implement them in a specific design. The goal is to provide students with an environment that promotes health, reduces stress and depression, and supports the sustainability of student living and learning.

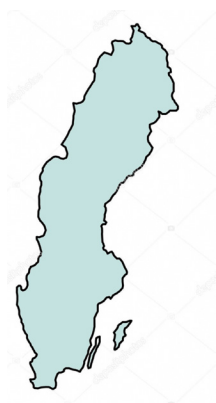


## 1.5 DELIMITATION

The student housing in the world are different according to population density, urban environment, cultural background, economic conditions, construction regulations, etc. This study is mainly limited to the student housing in the Swedish context.

The student group will be limited to university student, which composition will be complicated.

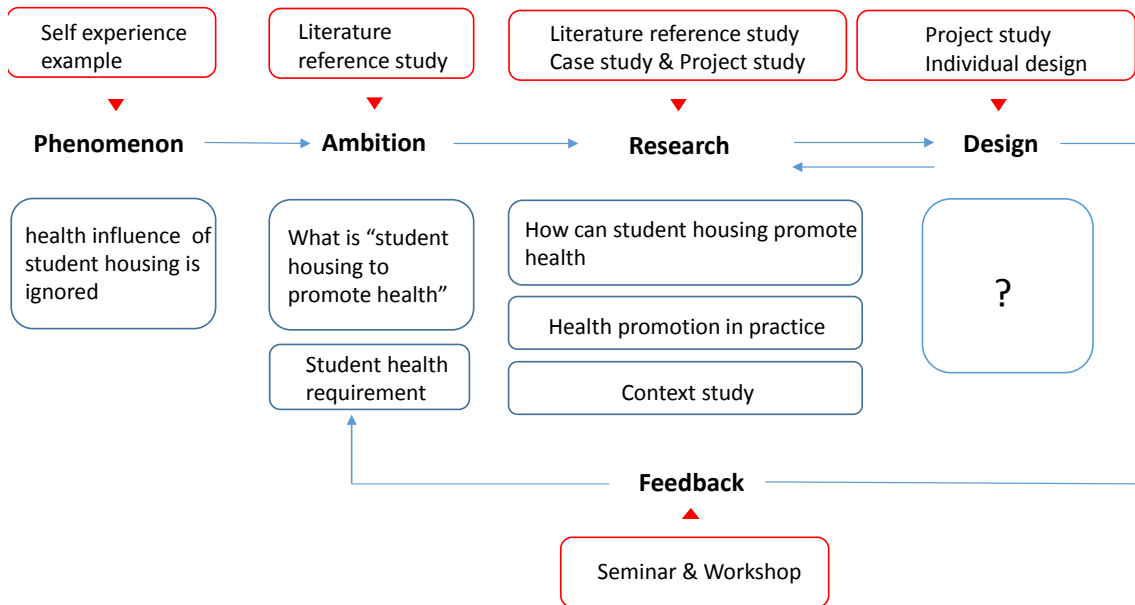
Because it's difficult to separate physical and mental health, the health promoting concept will be related to both physical health and mental





## 1.6 PROJECT PLAN

This project is mainly composed of two parts: research and design. The research section includes discussions on health promotion perspective and how the built environment affects health. The design section attempts to apply the strategy found in the study to a specific case.



# 2

## **RESEARCH**

**2.1 What is "student housing to promote health"**

**2.2 How can student housing promote health**

**2.3 Health promotion in practice**

## 2.1 WHAT IS “STUDENT HOUSING TO PROMOTE HEALTH”

*"a state of complete physical, mental and social well-being and not simply the absence of disease or infirmity."(WHO, 1946)*

*"Health promotion is enabling people to increase control over their own health. It covers a wide range of social and environmental interventions that are designed to benefit and protect individual people's health and quality of life by addressing and preventing the root causes of ill health, not just focusing on treatment and cure".(WHO, 2016)*

*"- Encouraging public participation by individuals and communities  
-Taking a social and cultural perspective in understanding and responding to health issues and problems  
- Emphasizing equity and social justice  
- Fostering intersectional collaboration  
- Including physical, mental, social, and spiritual dimensions of health  
- Focusing on enhancing health, not just preventing problems.(Poland et al ,1999)*

This thesis concentrate on student housing from health promotion perspective. So the first thing is understanding the perspective.

Health promotion can be understood as "enhancement of health".(Miedema, forthcoming)

In definition of health by WHO, two aspects are emphasized. One is multi-dimensional of health [physical, mental and social well-being]. The other is positive view on health (not simply the absence of disease or infirmity).

Health promotion is also a broad and evolving definition. But according to research on these definitions. (Miedema, forthcoming) and the criteria for health promotion proposed by Poland et al (1999), there are some highlight point about health promotion perspective.

- The context of health promotion encompasses a wide range of natural, social, and building environments. The target group ranging from individuals to society.

- It contained "benefit and protect" at same time, but different from health prevention and other health approaches, health promotion is part of a salutogenic approach. (Miedema, forthcoming)

- Everyone have the fundamental right to be as healthy as possible. (WHO, 2009) Empowerment is important in health promotion, such as providing an equitaty enviroment or increasing people's control about their health.

So there are many perspective of health promotion, which related to the context and purpose. Like health promotion perspective in healthcare building design. (Miedema, forthcoming)

Student health can be promoted through different ways in different contexts, including social support, school education and so on. As a living setting, student housing mainly influences students' living environment and individual lifestyles.

As mentioned before, students are under the pressure of mental health problems. Many problems stem from daily living habits or stress in life. Different from patients, for most students it's more important to provide a supportive environment than a cure.

So it mainly starts from a salutogenic perspective and concentrates on individual behavior.

*"Supportive environments for health offer people protection from threats to health, and enable people to expand their capabilities and develop self-reliance in health. They encompass where people live, their local community, their home, where they work and play, including people's access to resources for health, and opportunities for empowerment." (WHO, 1998)*

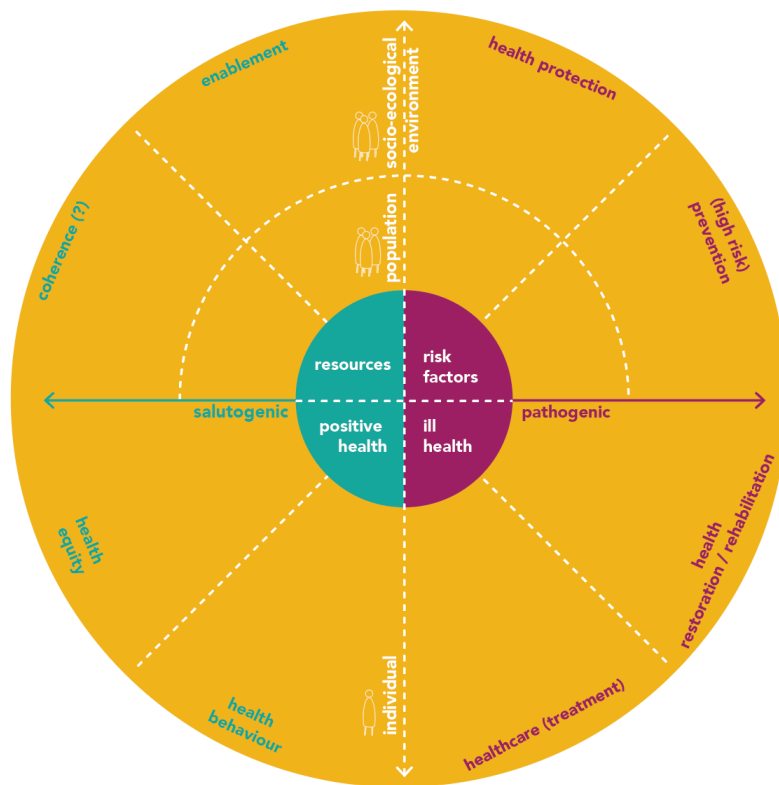
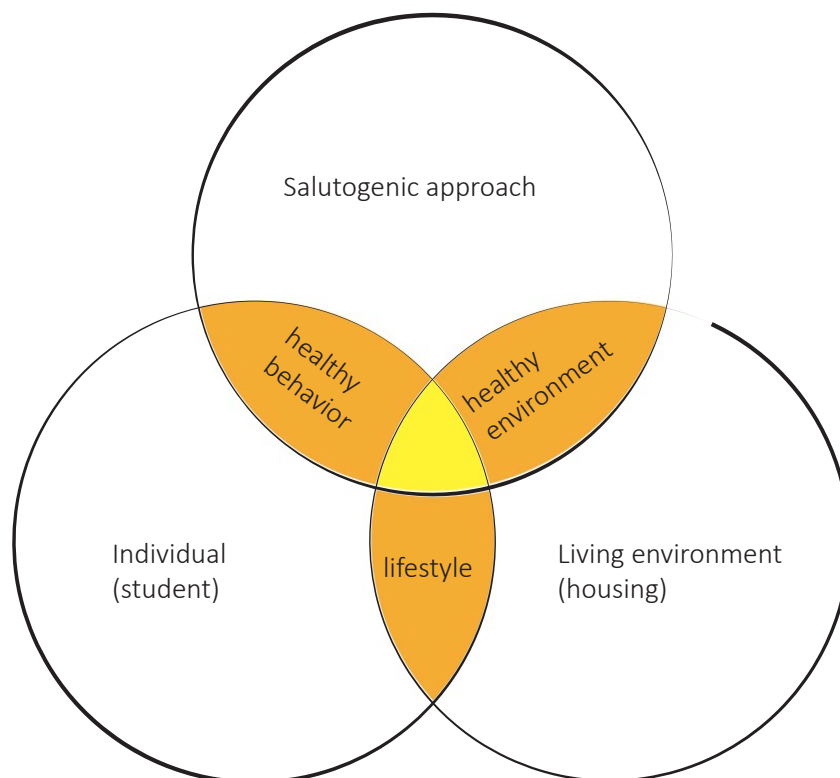


Figure: Illustration of multiple health promotion perspectives as found in relation to healthcare building design. (Miedema, forthcoming)

From this demention,the student housing in this thesis can be considered through these perspective:

- **A housing with equal healthy environment**  
Provide the equal right to have a healthy environment ,no matter who you are and how long you stay.
- **A housing promote healthy behaviour**  
Promote students` healthy behaviour and make healthy choice.
- **A housing promote long-term control**  
Help student form a healthy lifestyle and find their own way to control their mental health.

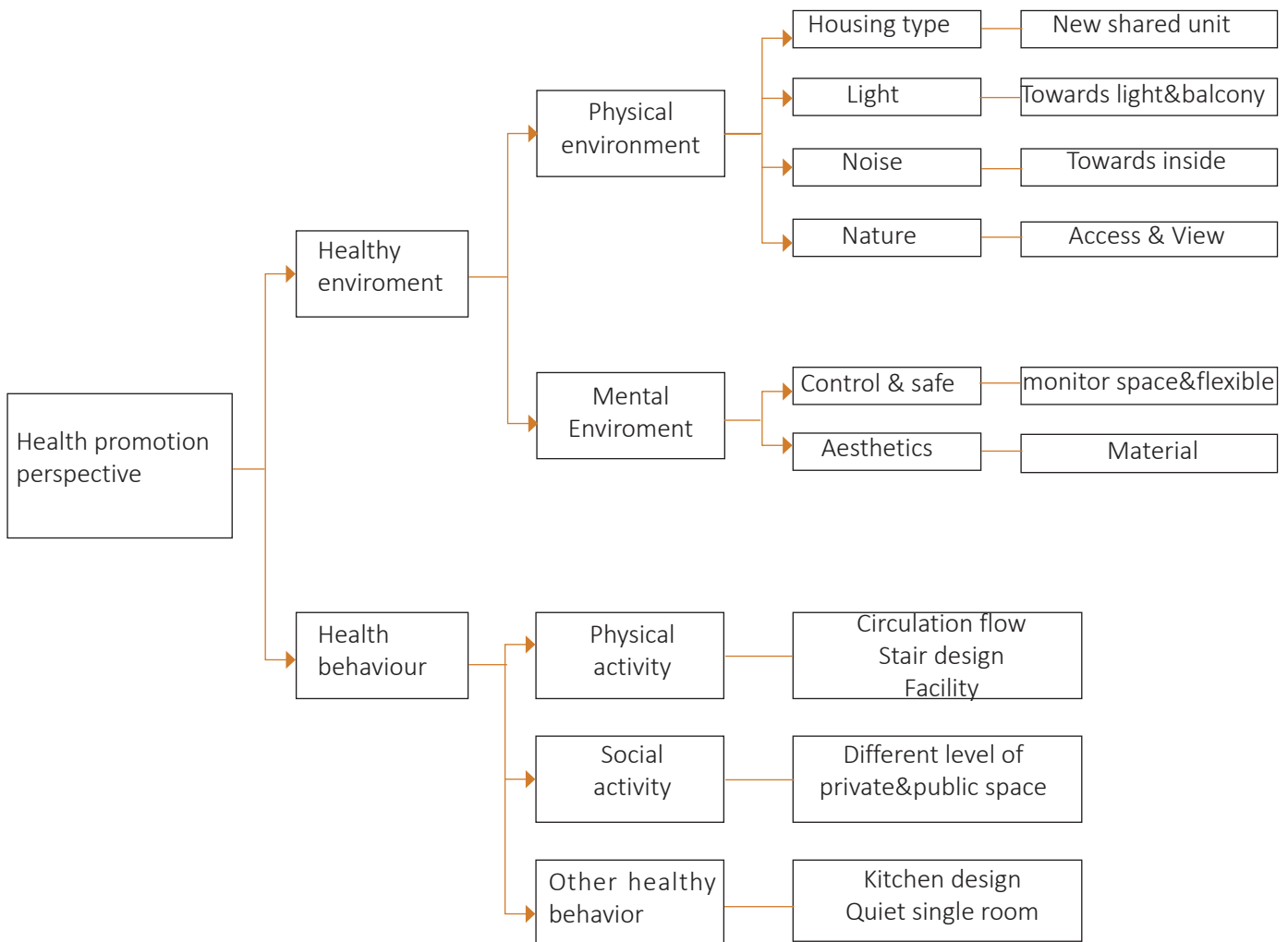


## 2.2 HOW CAN STUDENT HOUSING PROMOTE HEALTH

There are a lot factors in built environment that can promote the mental health, some of them also influence physical health.

This chapter is going to review some important factors of student housing and find out potentials.

This thesis regard healthy enviroment as the basement, mainly focus on health behaviour promotion.



## HEALTHY ENVIRONMENT

### **Housing type**

There are many types of student residences, the most typical types are corridor room and apartment.

Students living in apartment rooms pay more attention to the apartment itself and its functions. It provide more privacy and space.

The existence of cohabitation roommates has an impact on the students and brings pressure to the crisis. There is risk of conflict.

Students living in corridor type rooms are more concerned with people and socializing(Studentbostads företagen,n.d.), and cheap rents also help to reduce students' psychological stress. However, corridor rooms can reduce the feeling of home, lack of control(Studentbostads företagen,n.d.), increase students' loneliness, and improper design of social places will reduce sociality.

### **Light**

The amount of daylight exposure will impact psychological well-being. Individuals who accept short hours of sunshine will complain more sadness, depression, etc.(Evans,2003) Normal circadian rhythms of cortisol of school student will also be influenced by daylight from windows.(Kuller,Lindster,1992)

### **Noise**

Noise can affect people's sleep and work, which in turn affects people's mental health. Research shows that with noise come from outside or neighbor will make people feel annoy,anger,nervous and mental instable. (Bronzaft,2002) Student housing are generally located in urban environments and are susceptible to outside noise.

At the same time, as a high-density residence, the noise generated by different households from inside is also easy to disturb others.

### **Sence of control and safe**

When people feel that they can control the surrounding environment, they feel safer and healthier,otherwise they feel helpless.

College students living in corridor rooms are more likely to produce multiple indices of helplessness.(Evans,2003)Uncontrollable social interaction and long corridors can be the reason.

Tall buildings, long corridors, lack of small group spaces and unmonitored entrances can also affect people's fear of crime.(Evans,2003)

### **Nature**

The natural environment plays an important role in restoring people's negative emotions and promoting health psychology than urban environments. (Berto,2014)

Trees, water and natural landscapes can reduce stress and cognitive fatigue and help with psychological recovery.

## HEALTHY BEHAVIOR

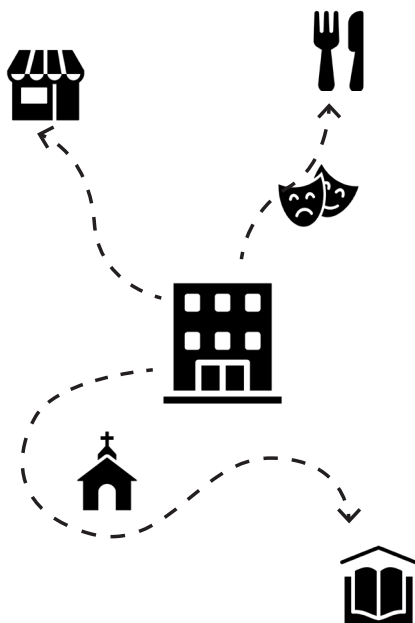
### Physical activity

Physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure (WHO, 2012). It not only means excersice activity,but also include walking, climbing stairs, and any movement in daily life.

Physical activity is an effective means of promoting physical and mental health of students. It has a positive impact on mental health and reduces negative psychology such as depression and anxiety. (Asztalos, Bourdeaudhuij&Cardon,2010) Some study of college student also shown that physical activity have inverse association with mental health and perceived stress. Students with vigorous physical activity recommendations were less likely to meet poor mental health problem.(VanKim&Nelson,2013)

Most of physical activity happend in daliy life.Local pavements or streets was the environment most commonly used regularly for physical activity, followed by home/ garden.Both indoor and outdoor physical activity contribute to mental health.Natural environments such as woods and parks have a greater impact on mental health. (Mitchell,2013)

So according to environment design,there are potentials to promote more physical activity in student life.



There are a lot of strategies in design process to promote physical activity.

As the fundation of building,site choice and design impact health promotion a lot.

Having public transit,shop,restaurant or school nearby can promote student walking or riding bike to these destination.

Nearby physical activity facilities can provide support for building.Active sitting design like outdoor spaces,street connectivity,path,can have an impact on activity.

Safe and comfortable enviroment make walking around become more attractive.

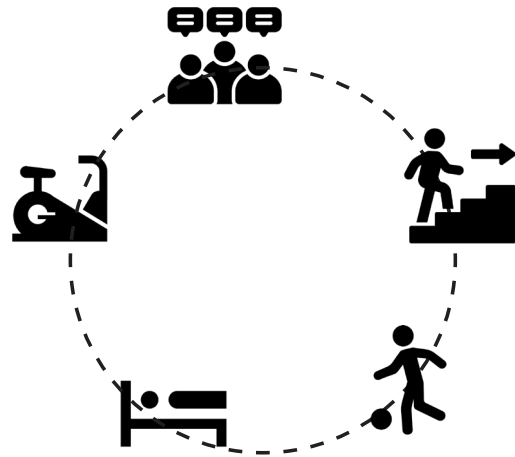


For building programming, a circulation system in building is the most popular type to promote walking.

So by organizing building program carefully, student can be encouraged walk more in their regular travel (like from room to laundry).

Creating an appealing environment and experience for path of travel will make walking process more attractive.

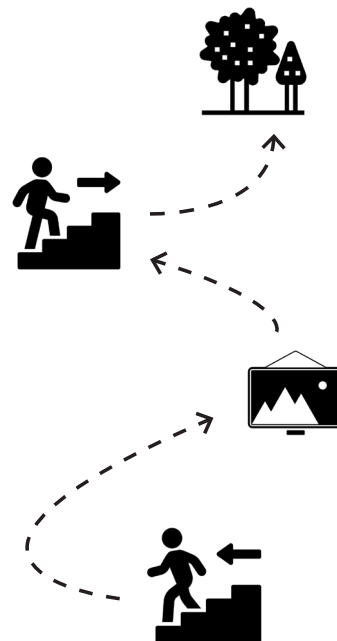
Provide physical activity space is also important in programming. Views from these spaces to outside and views into these spaces can increase use them. Located exercise and activity areas in central will also promote usement.



The design of those elements in system, like stair, elevator, exercise rooms, outdoor area, can help to promote activity through their safety, access convenience and attractive elements.

For example, increasing daily stair climbing by hiding elevator and locate staircase visible near the entrance is common way. Some interesting design of stair atmosphere will promote traveling around. Including the stair in main circulation system of building will also help.

Well equied excersice room will be more attractive. If it has access to greenery will promote activity better. (Zimring, Joseph, Nicoll & Tsepas, 2005)



### **Social activity**

socialization has a certain degree of mediation on physical activity and mental health.

(Vankim&Nelson,2013) In an Irish report, in the face of stress and anxiety, most students choose to chat with others and social pressure to relieve stress. (Hope,Dring&Dring,2005)

Students' needs for the social activity in student housing are particularly obvious, and it's also the reason why many students prefer corridor rooms.

However,creat a series of space for different level of social activity is important to balance privacy and public in student housing. Being alone and unactivite space also help people relax.

### **Other healthy behavior**

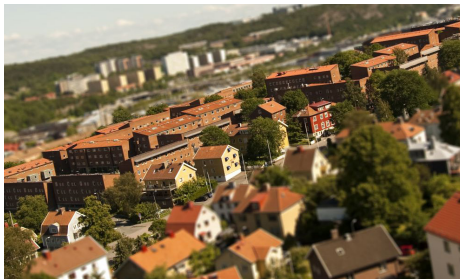
Studies have shown that students' sleep and mental health effect each other. Sleep difficulties are one of the predictors of student stress, and students' academic stress and anxiety are one of the causes of poor sleep. (Milojevich&Lukowsk,2016).Students promote their sleep by open the window (adjust the appropriate sleep temperature, but open the window will increase the risk of noise), do some activities to relax and calm themselves (reading books, listening to music), etc.In the student's sleeping environment, light, noise, and temperature can affect the quality of sleep.(Qin&Brown2017).So provide a relaxing and comfort sleeping space will benefit their sleep quality.

An open kitchen with enough area to use and store food helps students socialize and helps promote healthy diet.

## 2.3 HEALTH PROMOTION IN PRACTICE

There are very few student housing projects that are specifically designed from a health perspective, but the strategy of many projects promote health in some way.

Therefore, this part includes two aspects: A) Case study: the health measures and use situation in the existing student housing; B) Reference project study: learn from some housing project and summarize effective design strategies.



OLOFSHÖJD  
Company:SGS  
Year: 1969-1971  
Location: Gothenburg,Sweden  
Units: 1410 units



SL11024  
Architects:Lorcan O`Herlihy Architects  
Year: 2015  
Location: Los Angeles,CA,USA  
Category:Student housing  
Area: 5000 m<sup>2</sup>  
Units: 31units for 80 tenants



BIKUBEN KOLLEGIET  
Architects:AART architects  
Year: 2007  
Location: Copenhagen, Denmark  
Category: Student housing  
Area: 7000 m<sup>2</sup>  
Units: 107 dorm rooms



MULTIBO  
Architects:White architects  
Category: Research of student housing  
Area: 120 m<sup>2</sup>  
Units: 6 rooms

## OLOFSHÖJD

The community is not far from the city center and has convenient transportation. The Chalmers University of Technology and the Humanities Library of the University of Gothenburg are easily accessible from the community.

Because it's located on a hill, the buildings are distributed according to the terrain, it conveys a sense of small scale community. And it's surrounded by greenery, which provide a healthy outdoor environment. On the courtyard and on the hillside, there are tables and chairs for students to barbecue and sunbathe. A large number of gardens provide convenience for keeping pets, and birds and hares are often found in the community.

Due to the large terrain fluctuations in the community, the use of stairs is necessary. Circulating paths make it easy to walk up and down in the community. Various ramps for bicycles are designed in the community to enable bicycles to reach every part of the community. The bicycle parking space is combined with the entrance space of each unit, which promote the use of bicycles.

In this case, using small-scale buildings is a very effective strategy. Make it easier for students to participate in outdoor physical activities and increase opportunities to contact with natural.





There are some outdoor volleyball courts, underground badminton courts and gyms in the community. The gym is located in the room on the first floor of a building. The space is small, closed and difficult to notice. The badminton court is located underground and has a small area without windows. And the volleyball court is located in the courtyard next to the garbage collection station.

Although these facilities do not provide a pleasant and healthy atmosphere, they still in short supply. And some student will chose facilities outside for better environment.

Many student housing will provide excersice facilities in comunity. But if they can pay more attention to the environment quality, these facilities will be more attractive and promote health better.

Olofshöjd has a small public café and a study room for all tenants, except that there is no public social space in each unit. The only public room is the kitchen, so group learning activities and party sometimes carried out in the kitchen, which interrupt others a lot.

The kitchen is usually located in a separate room or in a top floor room for four to eight people. The dining table is in the kitchen, so it is difficult for others to continue using the kitchen when someone is having a dinner or study. Many people will not choose to eat in the kitchen.

That shows students demand of social space in unit. If the social space, kitchen space and dining space can be seperated, it will provide a more positive social environment.



### SL11024

This project is characterized by its active travel routine.

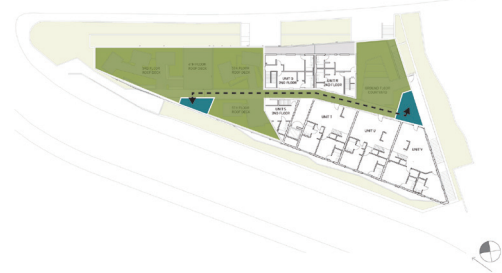
This student housing located at a cross of streets, so it has two entrances facing different streets. By splitting the building into two volumes, the entrances got their own space, the open stairs are arranged closest to the entrance, and the elevator is hidden in the building, which promotes the students to use the stairs.

The flow in both directions pass through the building, forming a circulating streamline, and passing through the roof garden that falls down in layers. When students walk along the corridor and stairs, they can see what happens on the roof garden as well as the city skyline, which makes the walking experience richer.

The gym and communal living room are placed on the entrance level and connected to the entrance platform. Students can easily see the gym and the gym can also get a garden view.

The short interior corridors make each room closer to the external environment, promoting and introducing good ventilation. It is easy for students to go outside and enjoy the roof garden, from which you can have a good city view and get plenty of sunshine.

This is an environment open to the city, instead of closed and long, which weakens the crowdedness and monotony of high-density homes. Outdoor gardens of different sizes, types, and privacy encourage social activities to happen here.







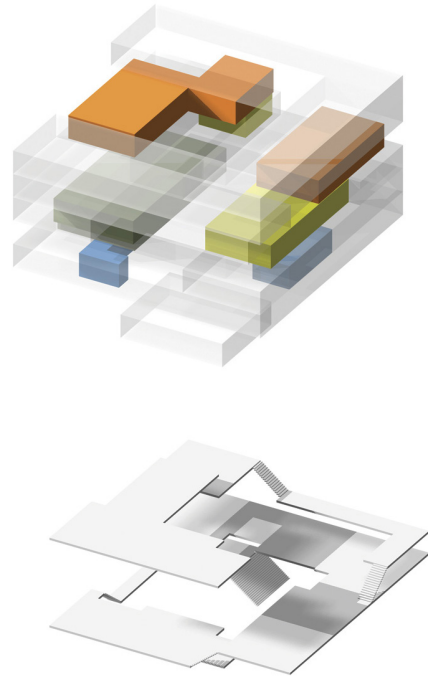
### BIKUBEN KOLLEGIET

With the concept of a street, the main public functions are distributed on different floors of the building and can be covered from the city streets through outdoor stairs to different floors.

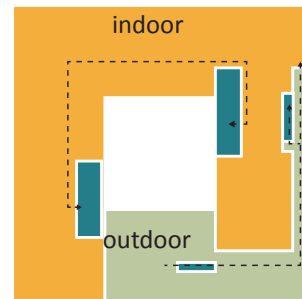
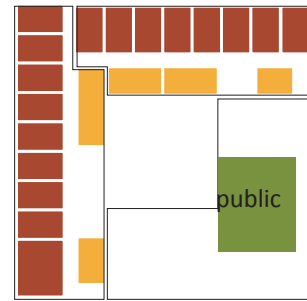
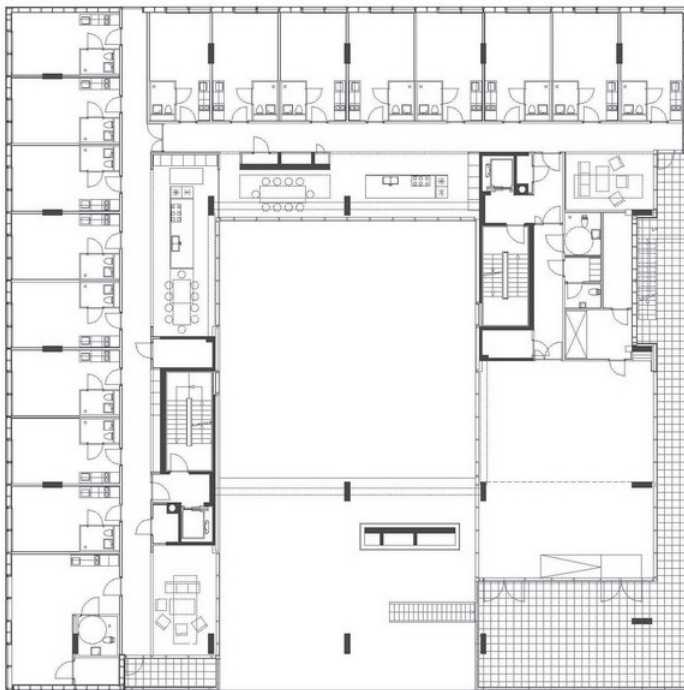
The interior is a variant of the basic form of the corridor room. One side is the room and the other side is the kitchen and dining room, which combined with center garden, as the central space, enhancing the social activities.

The interesting part of this project is that it creates a circulation flow between different floor, and every floor has different public space. So it promotes the student to walk indoor and outdoor. It also breaks boring corridor space, makes the kitchen and dining space more open and active.

This project really worked and reduced 10% loneliness of students. However, according to the architect introduction, the public area in this project is too much, so some space are wasted.





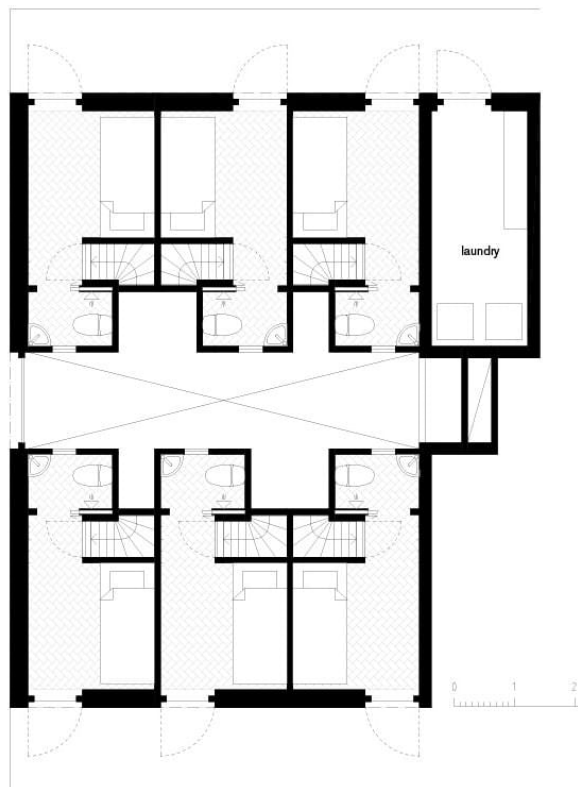
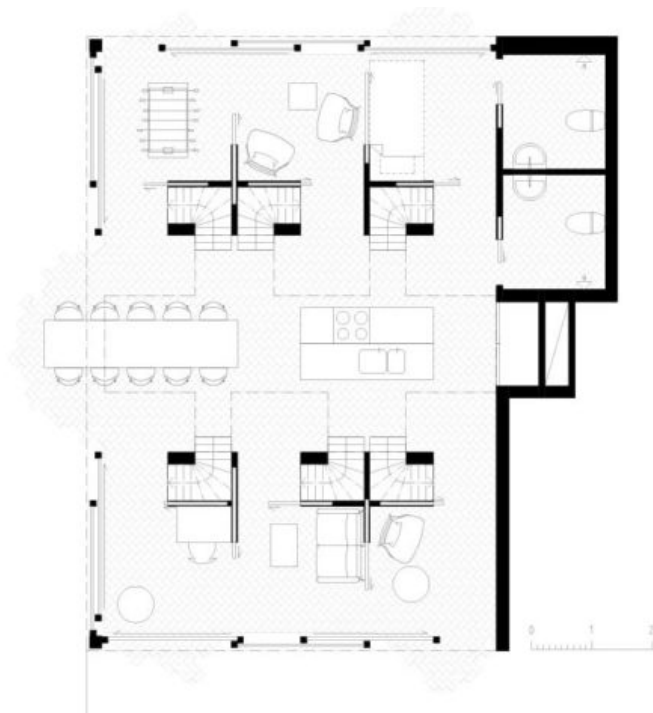


## MULTIBO

Based on a survey of Swedish student accommodation expectations, a type of dormitory that combines corridor rooms and apartment rooms was designed. It is similar to the deformation of a corridor room, with a homogeneous single room on the second floor and a common space shared by six people on the first floor.

The flexible division allows one layer of space to be used both as an open space and as a single space. It provides ample social and home atmosphere, reduces student loneliness, and reduces the possibility of roommate conflicts. This promotes the social behavior of the residents in the unit, providing a sense of privacy and control.





# 3

## **PROPOSAL**

**3.1 Context**

**3.2 Site design**

**3.3 Building programming**

**3.4 Unit design**

**3.5 Health promotion**

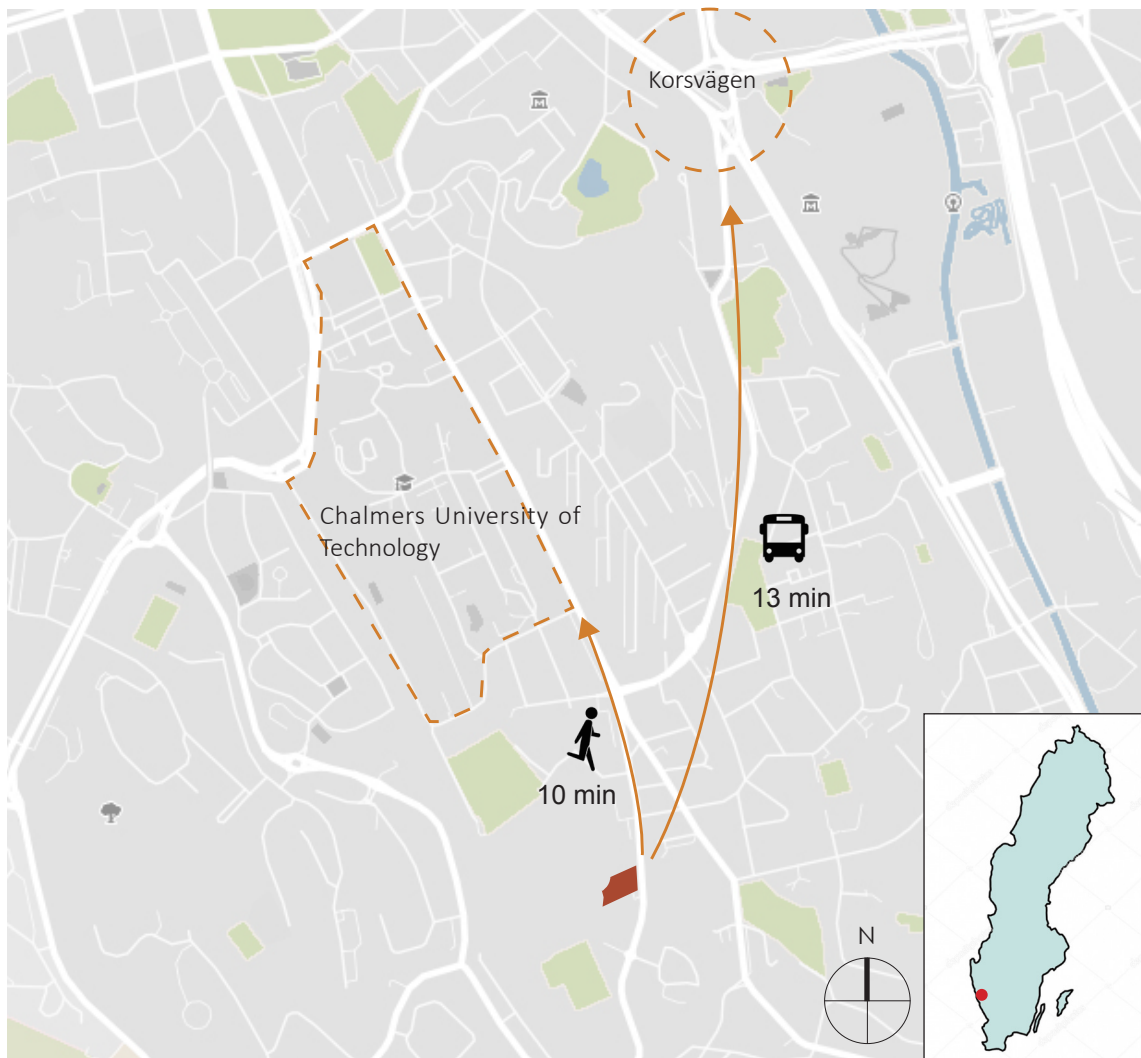
### 3.1 CONTEXT

The project is under Sweden context,so I chosed a site in Gothenburg,the second biggest city in Sweden.

The selection of site is based on the concept of health promotion.

The area is adjacent to the southern part of Gibraltargatan within the district of Krokslätt and consists of parking areas and gravel areas with simple building.It`s just over 3 kilometers from the site to Gothenburg Central Station,also near by Chalmers area,which inhencing go out on foot.

Site area: 5000 m<sup>2</sup>





The site is also surrounded by factors support health. Starting from the west side of the site, there are two playgrounds on the south and north. A big exercise facility Fysiken is next to the south side of the site. A circulation walking path in woods passes the site on the west. There is also a bike parking area next to the site.



walking path

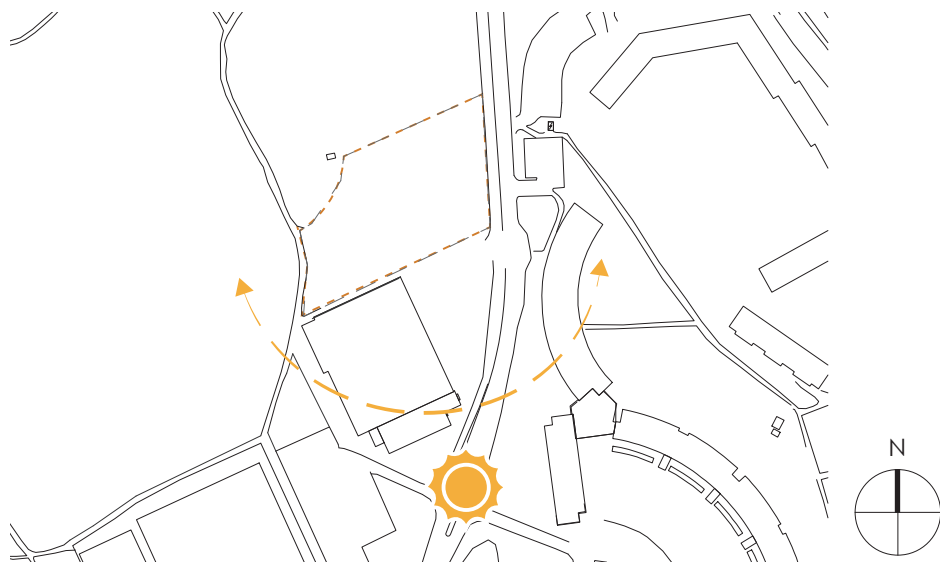


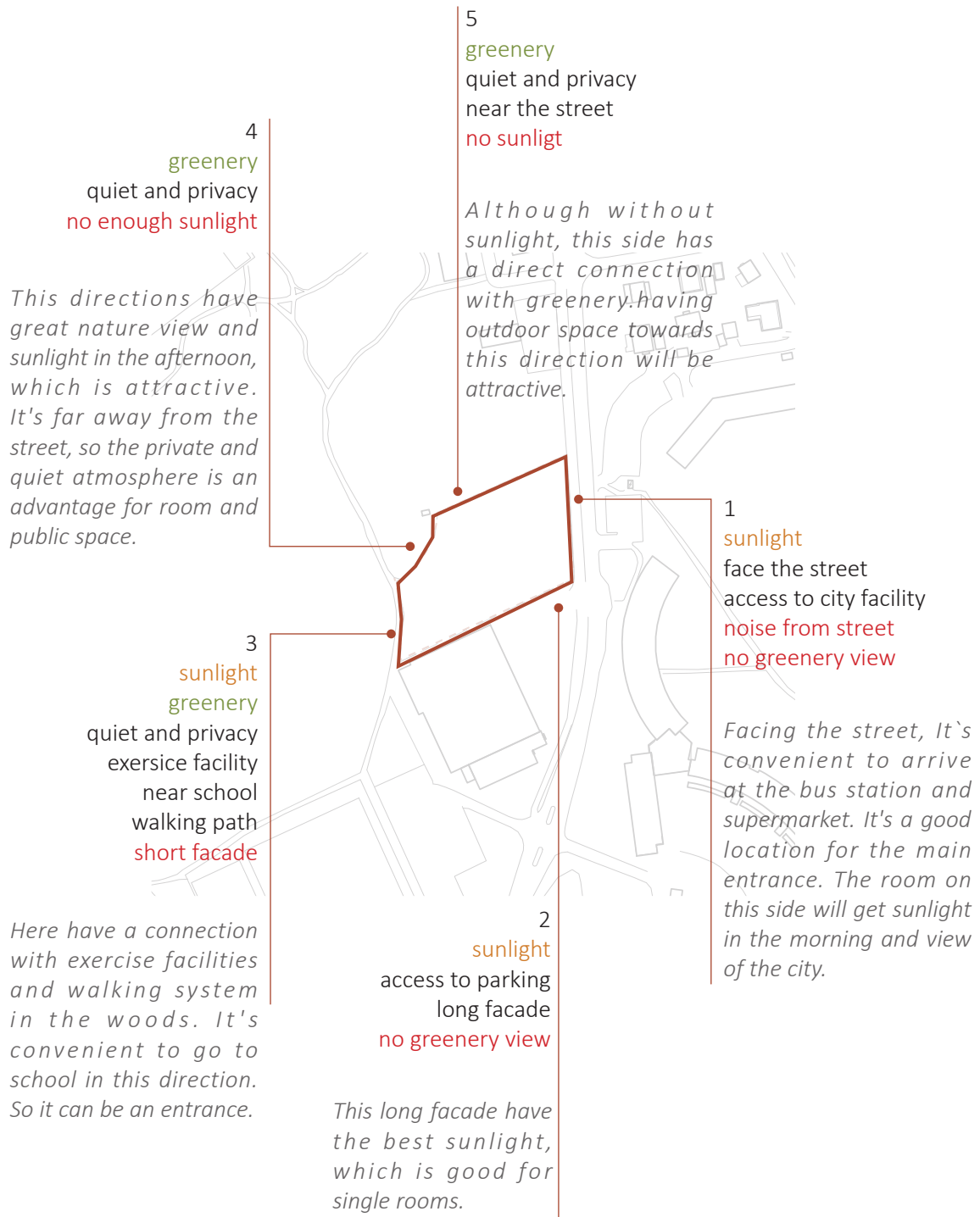
playground



Fysiken

The west and north side is surrounded by Mossen's nature, which provides great access to greenery. The woods also keep noise away from the site. The main noise comes from the road on the east. East side of the site is residential and student housing area, which provide a safe feeling environment. There are no high buildings near the site so it has good potential for sunlight exposure.





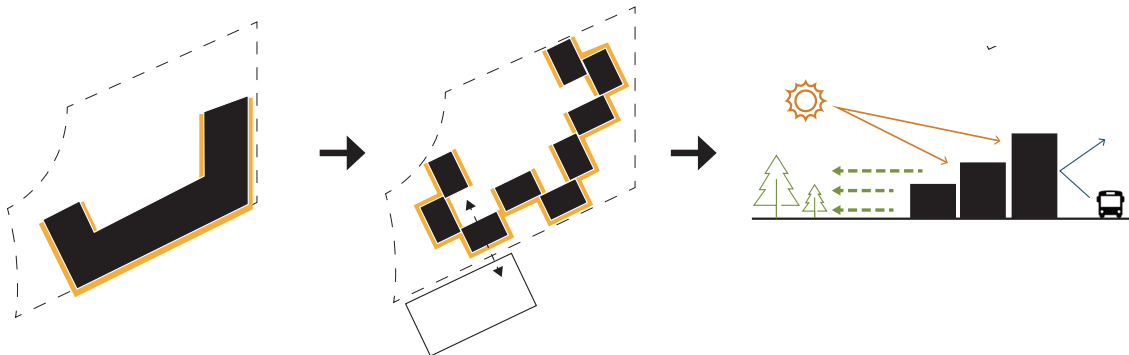
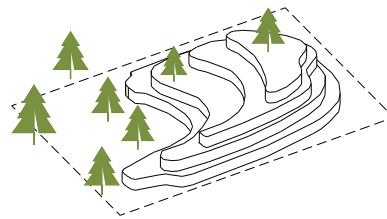


## 3.2 SITE DESIGN

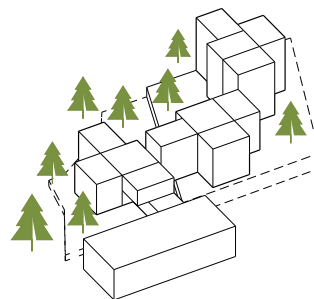
### Site strategy:

- Use the surrounding healthy factors
- Maximize the use of sunlight
- Maximize the use of greenery view
- Avoid adverse factors like noise

The concept of volume is a valley in woods. According to the site analysis, the main volume is arranged along the direction of sunlight, facing the greenery. Then break the large volume into small volumes to get more facade for sunlight. And like a valley, the surrounding woods extend into the center of the site, closer to the building. Through these small moving volumes, the interface between the building and the Fysiken is more active and can be connected to each other.



Lower the volumes near the forest and raise the volumes closer to the side of the street. It helps to get more sunlight and scenery from west and isolate the noise from east. Roof platforms of different heights allow the user to move up and down as if they were walking in a valley.





site plan 1:1000

Area: 5651 m<sup>2</sup>  
Room:150  
average area:37.7 m<sup>2</sup>

### 3.3 BUILDING PROGRAMMING

**Building strategy:**

Make use of two direction entrance,create circulation flow

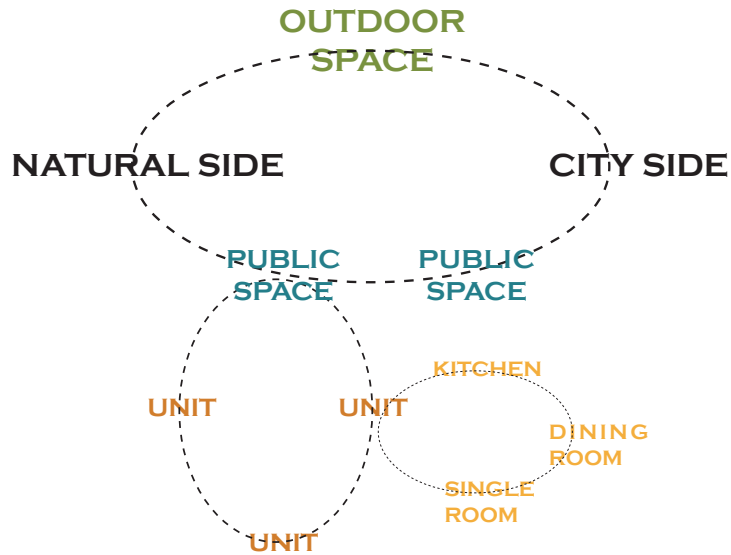
Put public functions on different floor to promote walking

Provide different attractive factors in every unit to keep an equal healthy environment



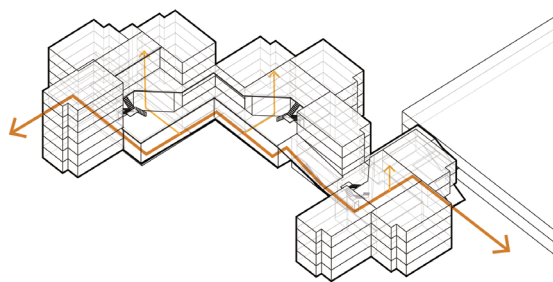




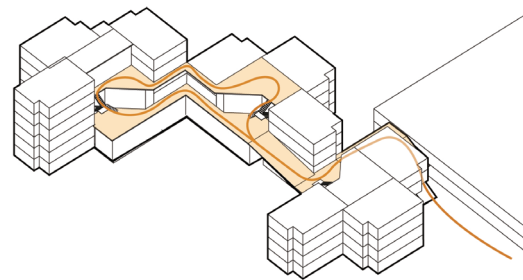


The building can be reached from the direction of the woods near the school and the street near the station, so it has the advantage of two entrances. From one entrance students can pass through the entire building to another one. They will cross several public space, landuray, recycle room, and then come to their unit. Along the road, one side is the activity space and the other side is the glass wall facing the woods. The green landscape makes the process of walking more attractive.

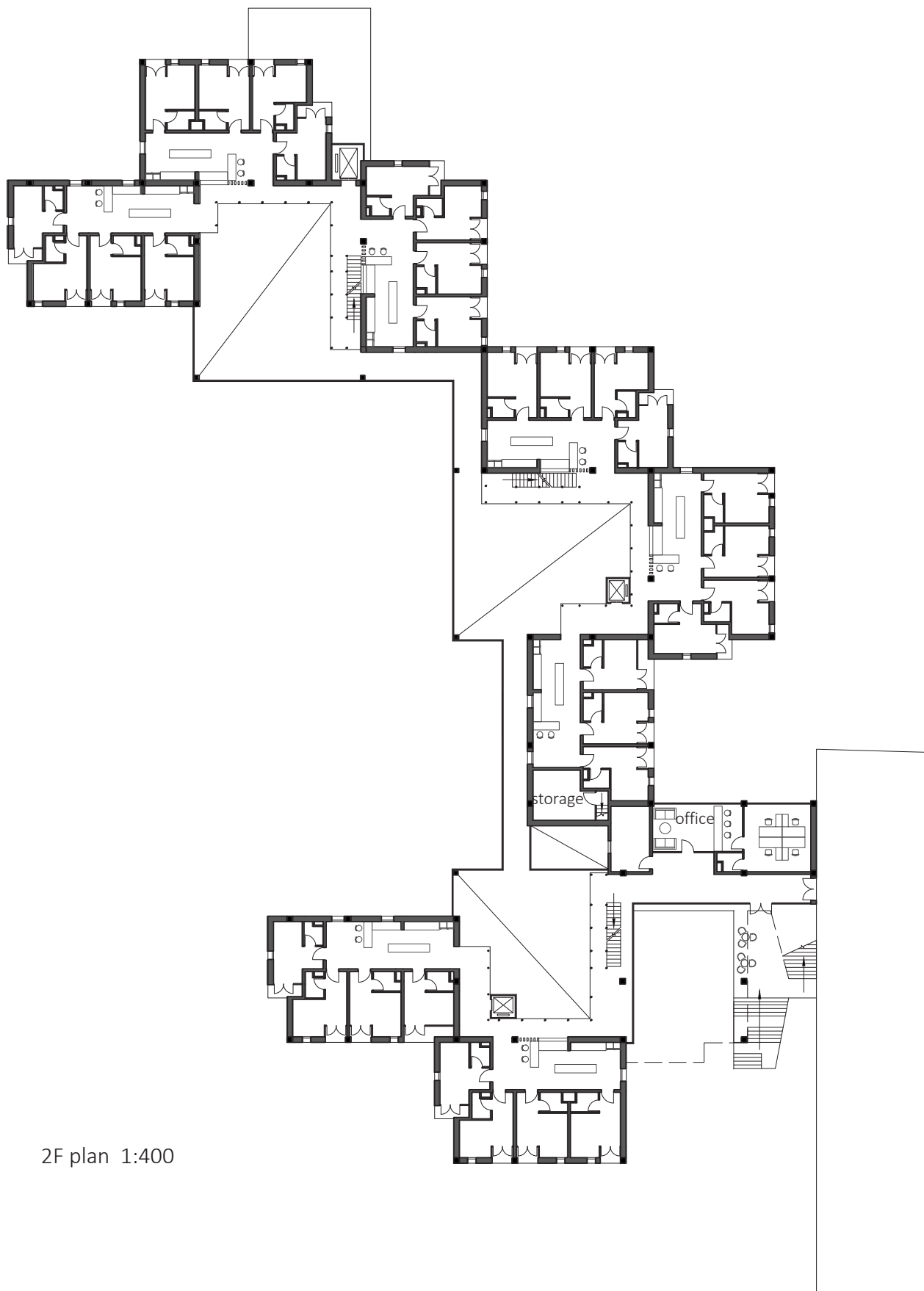
Every unit have indoor stairs and elevator up to every floor. Students can also walk along the stairs to outdoor platform on third floor, where they can go into the units or climb up and down by external stairs. Both the internal and external flows are circular, and they composed a large circulation in building, which allowed users walk around with different routine.



Internal flow



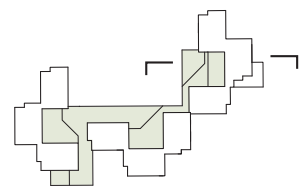
External flow

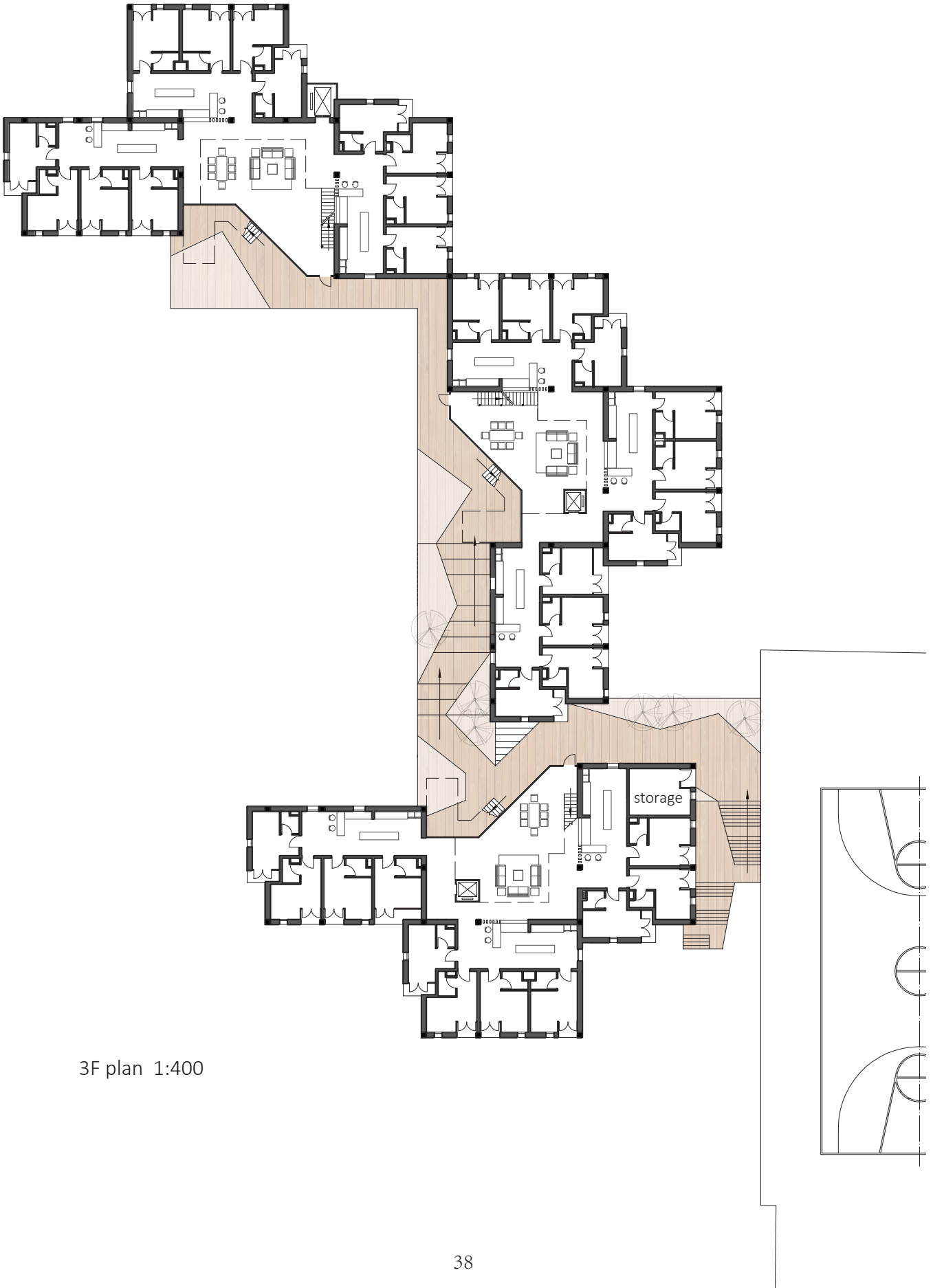


2F plan 1:400



The high public space allows the sun and view of greenery to enter the student's living environment more and provide a healthy environment. The relationship between the indoor space and the outdoor environment can be seen from the sectional perspective.



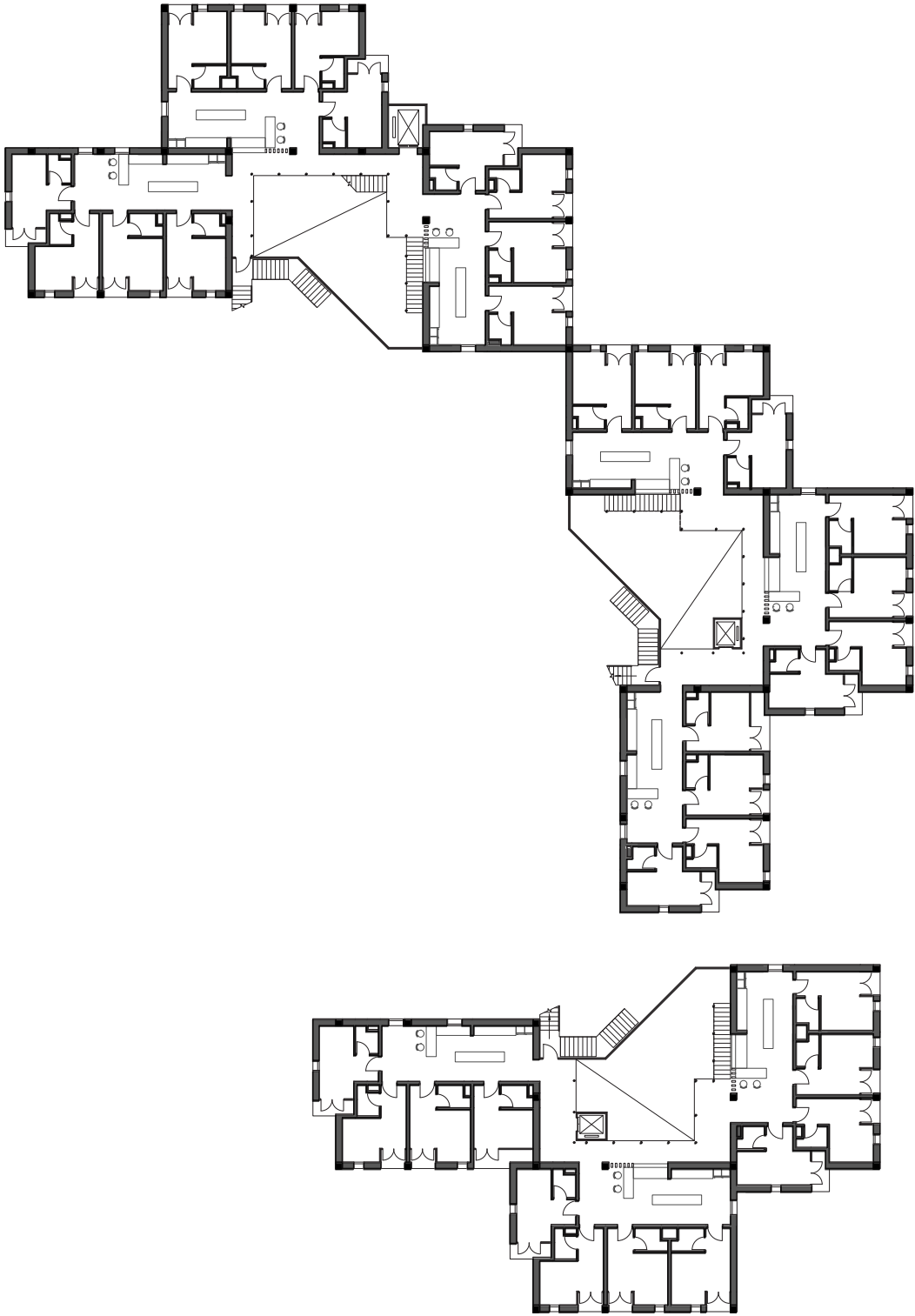






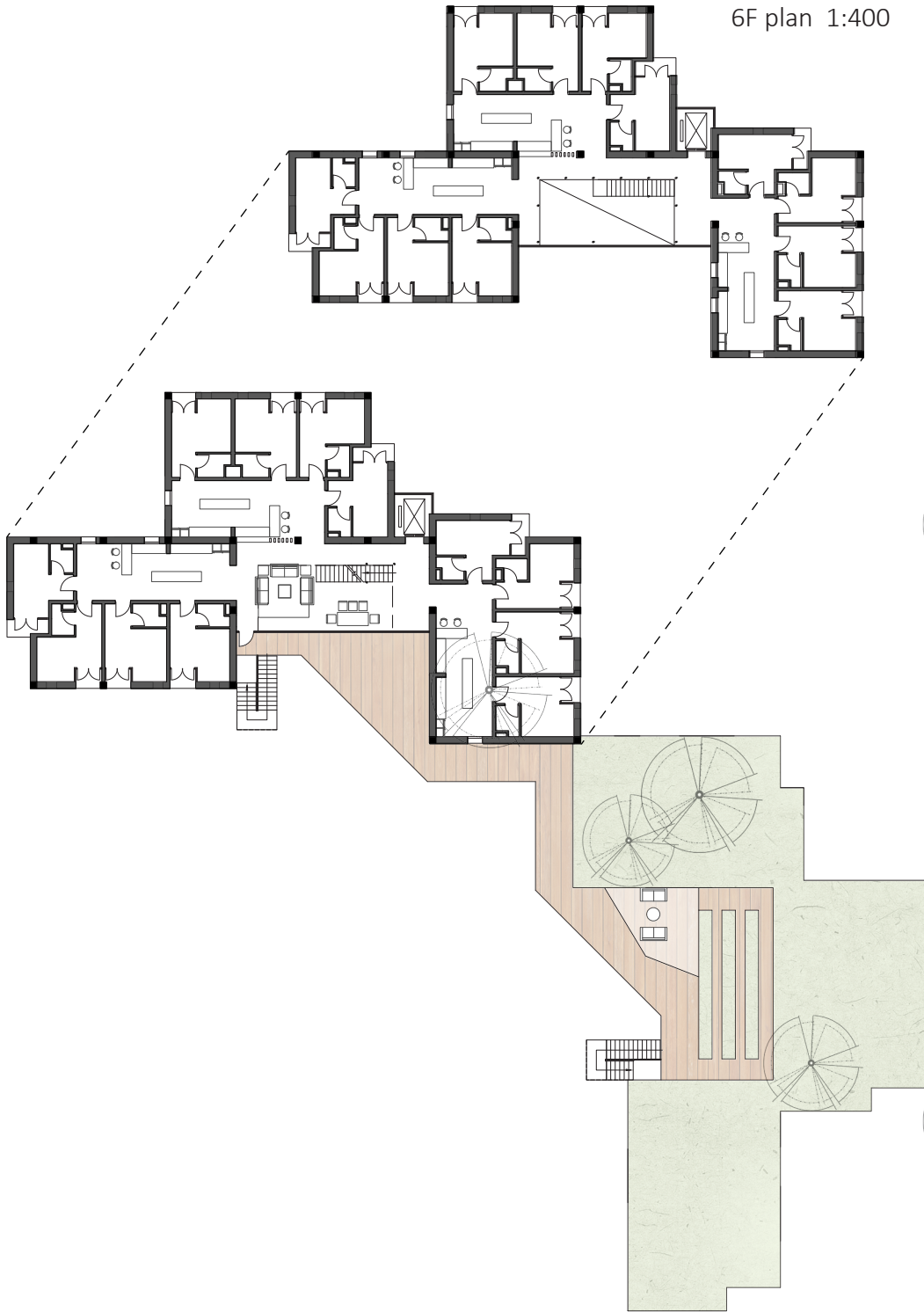
### Outdoor perspective

From west entrance, students can follow the large stairs to the outdoor platform and then enter each unit on the third floors. The platform space can receive more sunshine, suitable for leisure, sunbathing, watching basketball activities below. The brightly coloured external staircase attracts students to the roof garden.

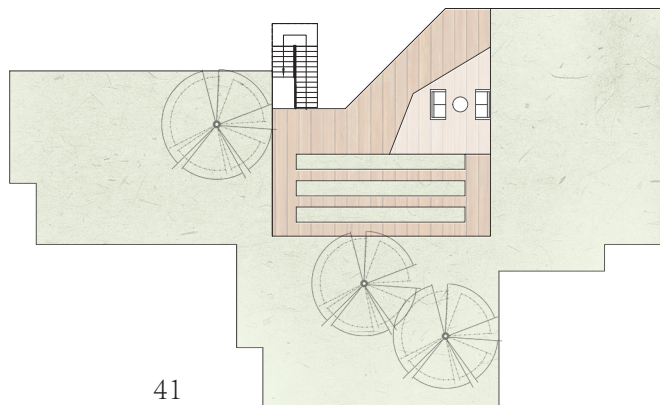


4F plan 1:400

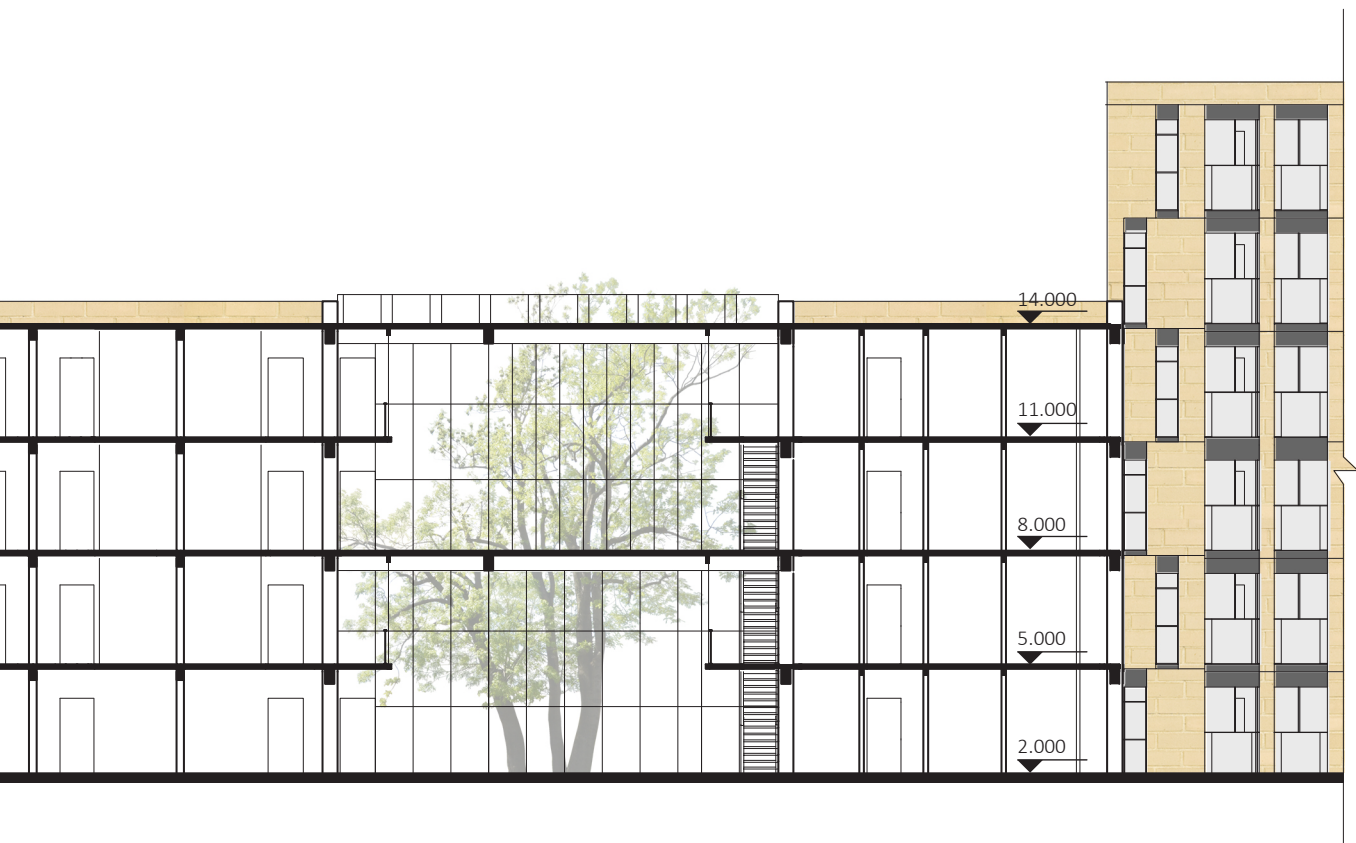
6F plan 1:400



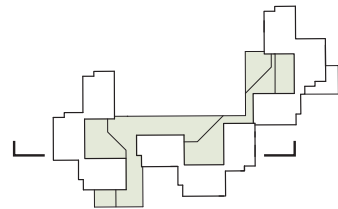
5F plan 1:400





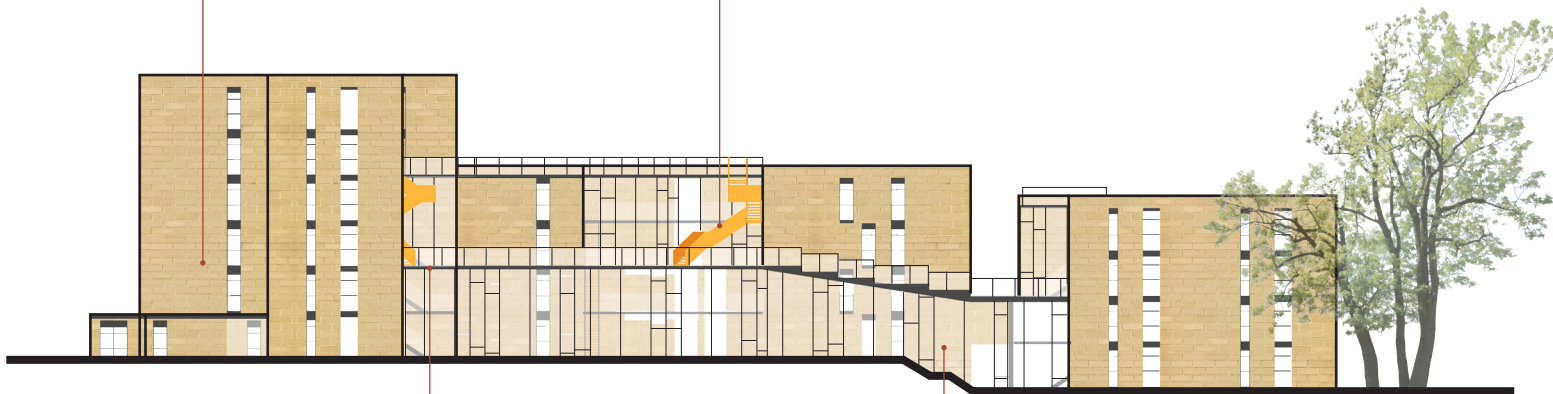


Section 1:200



The exterior wall is made of light yellow bricks, which create a solid, enclosed atmosphere in living area.

The external staircase made of bright orange steel plate is a high light element in space. The different material will help to attract students' attention.



North Elevation

materials that are textured and easy to touch will help to relax. The floor of the public area is made of dark wood and the living area is made of light wood.

public space is open and light, so the public space is enclosed by glass and steel. Smooth and delicate material contrast with other materials, which highlight the different atmosphere between spaces.

### 3.4 UNIT DESIGN

**Unit strategy:**

Promote physical activity like walking around and climb the stair

Promote using public space and social activity

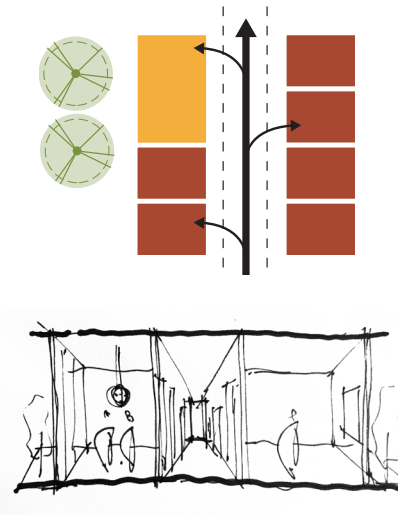
Different level of private and public

Provide sunlight and easier access to the outside environment

Traditional corridor-style student housing are generally distributed on either side of a corridor, and the kitchen and public spaces are arranged as separate spaces, beside single rooms.

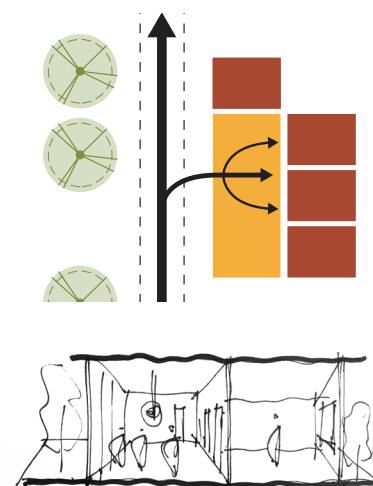
This form of living is very efficient, saving corridors and making rents cheaper. However, the space experience is more monotonous, there is no attraction in the corridor to attract students, and the public space and kitchen alongside the room are also independent, which reduces the possibility of students leaving the room for other activities.

Long corridors also makes it's difficult for students to have a sense of control over space.



In the case of Bikuben Kollegiet and Multibo, the corridor was deformed, such as expanding the corridor or placing it on the first floor.

It combines the advantage of shared space in the apartment room. The public space that is shared by several rooms from the corridor will promote social interaction more effectively, because people can access public areas in daily life. This approach also makes one side of the corridor wall more flexible, allowing it to face the outdoor landscape, introducing light and greenery into the interior.



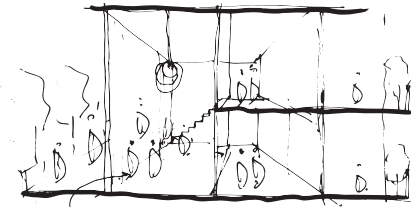
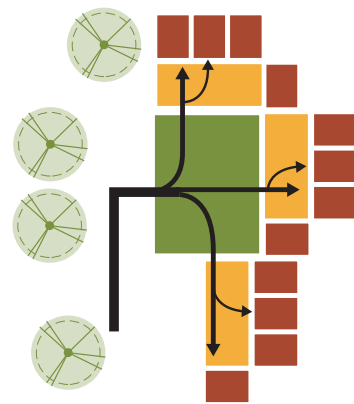


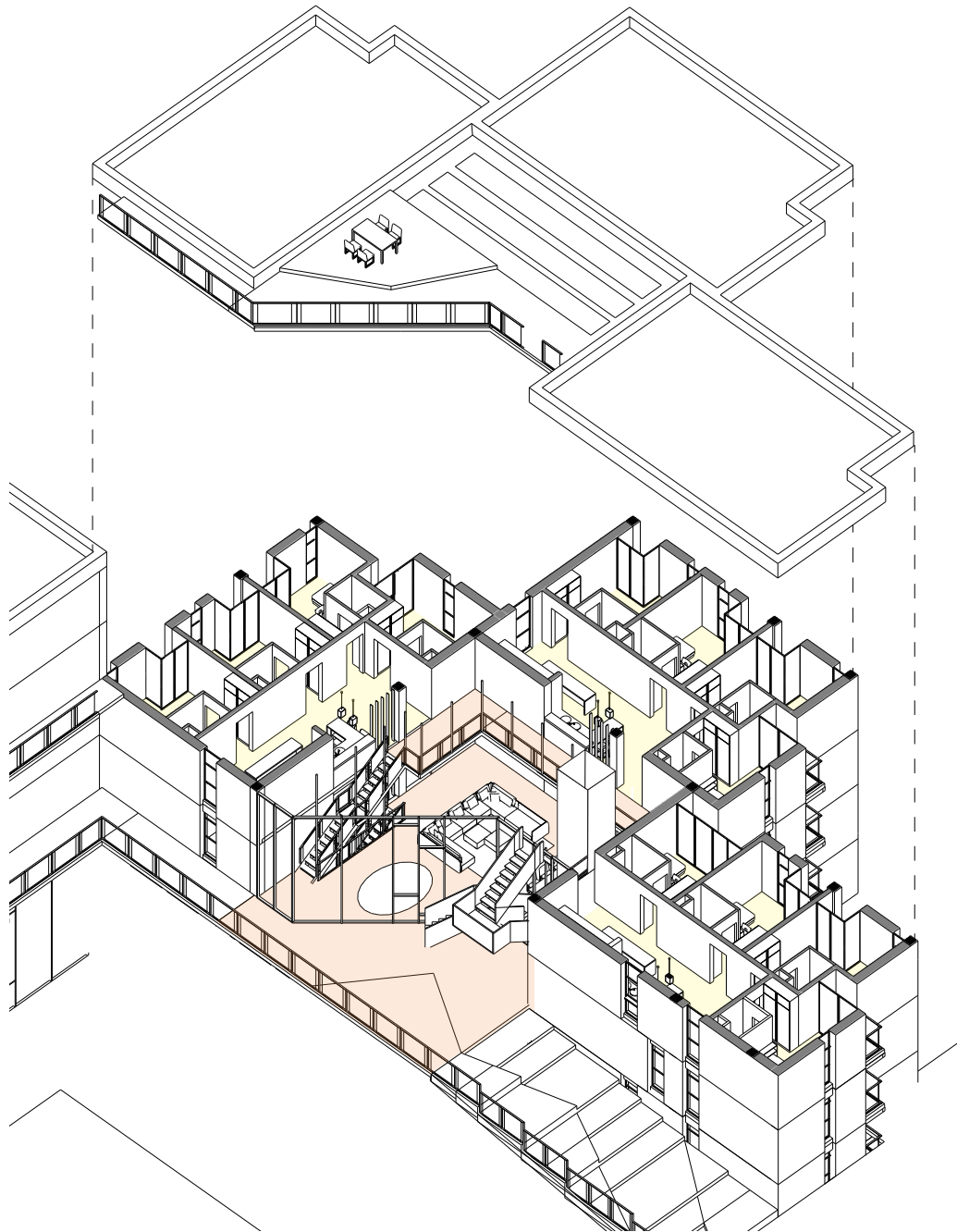
In the case of Bikuben Kollegiet, they combined kitchen with corridor, but main public functions such as exercise room and study room are still independent from living area. From their survey, having different public space did help to reduce loneliness of student. But these public area is not active enough.

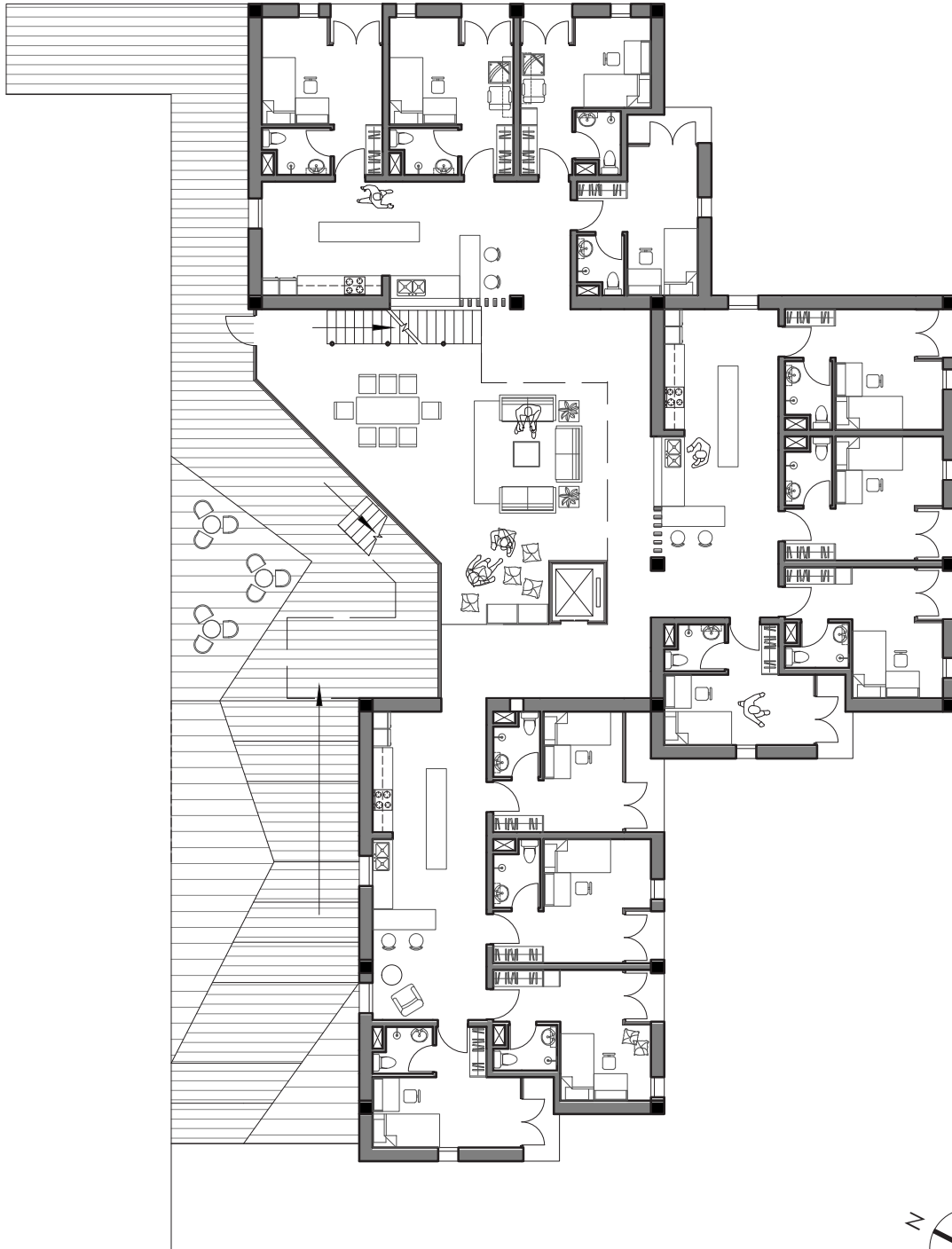
If we regards the previous unit as the single room, combined several rooms together will enclose another shared activity space, just like the living room and bedroom in home. It combined the big public area with living area, so the central space can also be used more actively. Bigger unit also allowed students walk around in the housing.

This approach reduces the distance of each unit and the outside environment, which make public living area more attractive.

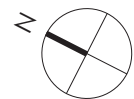
High space will allowed more light and scenery come into the building, and provide more community chance. So the public living area in center is shared by two floors. It also make the housing more economical, making the rent cheaper for every student.

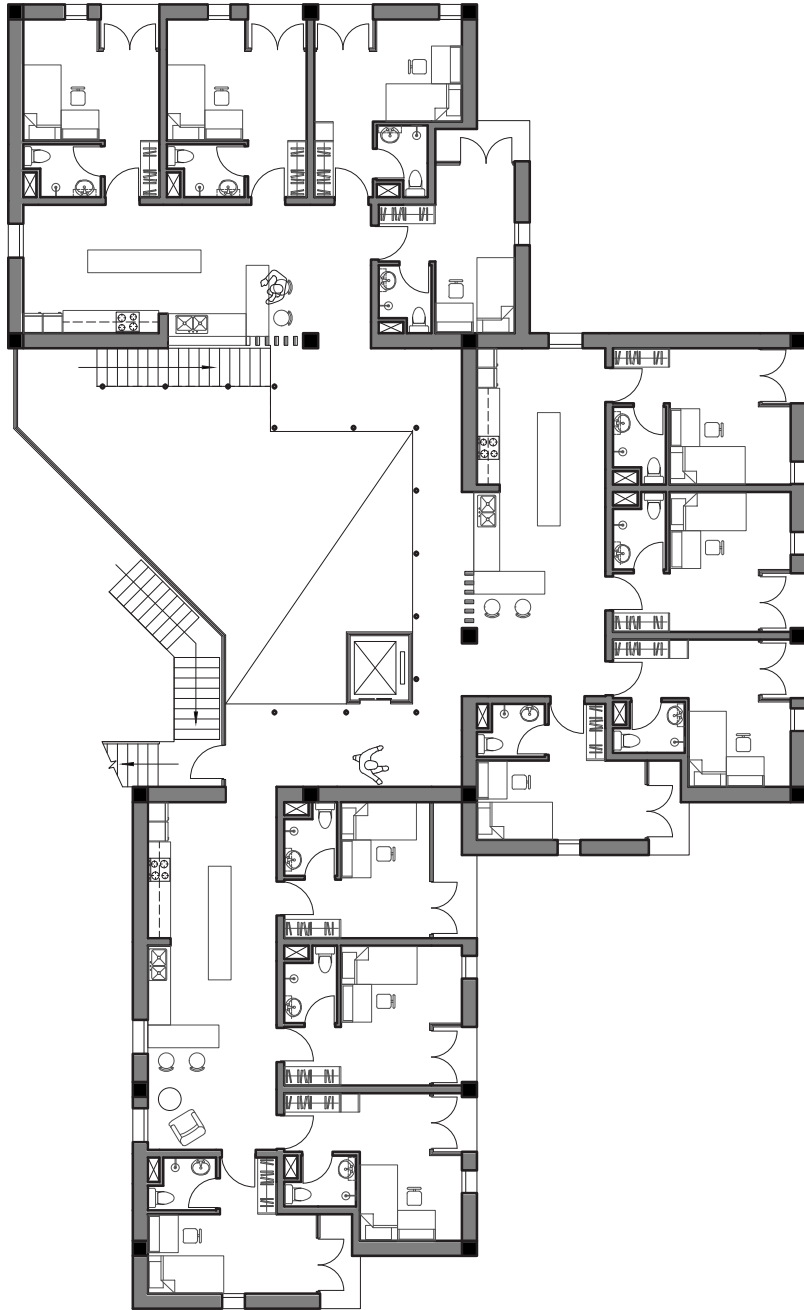






Unit plan 1 1:200





Unit plan 2 1:200

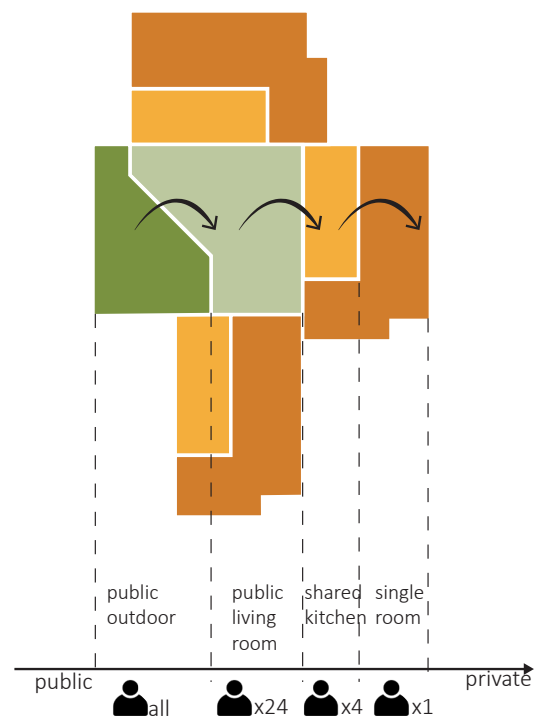
In addition to the more active public spaces and sunlight, the advantage of this unit is dividing the different public and private levels, from the outside to the inside. They serve different range of users, and promote different types of activities.

The most public space is the public outdoor area, which is connected to the natural environment. Everyone in the building will pass or use this area, so it is the most open and public part. The indoor public living room serves small units or other users around. Although indoors, transparent glass allows the interior space to communicate with the outdoor area, so the living area feels more public.

Entering the unit from the living area will first pass through the transition of the shared kitchen. The kitchen combines with the corridor between four rooms and is shared only in the small unit of four people. So the private atmosphere becomes stronger.

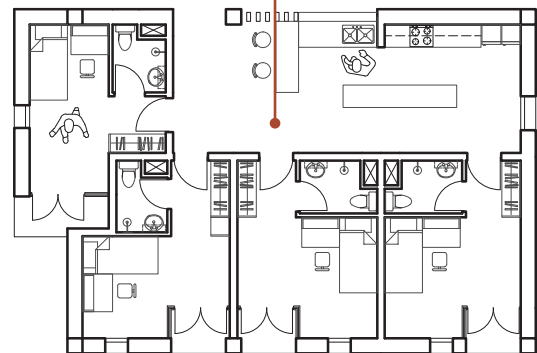
Then students will enter their single rooms from the small unit. That's the most private part.

Such a level transition can reduce public disturbances and noise layer by layer, ensure the open feeling of public areas and the security feeling of private areas, and meet the different needs of students.

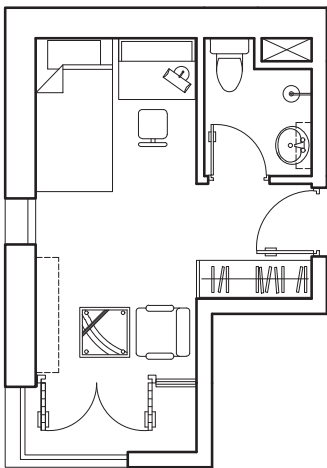
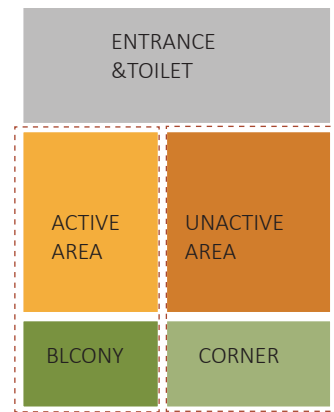


Through the observation of the kitchen in which I live and the student interview, the kitchen shared by more than 8 people is considered too many. The hygiene condition is difficult to guarantee. Students do not have a public activity area, they can only party in a large kitchen, and it is inconvenient for others to use. The kitchen for 4 people is in good condition, but the kitchen area is too small. Four people have a stronger sense of privacy and a lower density of living.

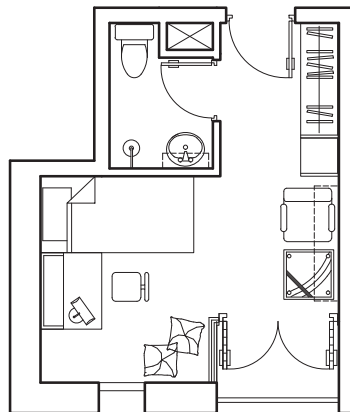
Therefore, in the small unit, 4 people live together and shared one open kitchen, which combined with the corridor. The kitchen is closer to the room, like the bedroom and kitchen of their home. The centrality of the public also prompted the students of the same small unit to meet and communicate here. The kitchen includes a fridge, storage, cooking station and a small dining area. This can meet the individual daily dining needs of the students and avoid the party to disturb others in the small unit. If they want to eat with friends, they can use the living area of the large unit.



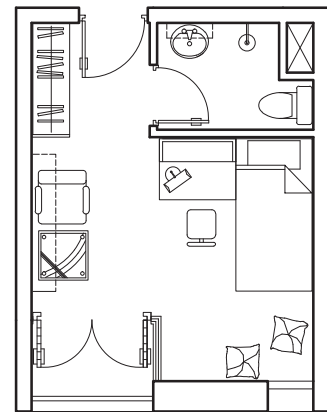
The highlight of the single room is the relationship between the balcony and the interior space. In order to make students enjoy the sunlight and the outdoor scenery better, every room has an independent concave balcony. The large glass door which can be opened completely introduce more daylight and creates another quiet corner inside. In mental health promotion, quiet solitude is equally important as social interaction. Therefore, the room provides students with a high-quality small corner, where students can flowering, playing guitar, drinking coffee, and playing with pets.



Room 1 1:100  
Area: 18 m<sup>2</sup>



Room 2 1:100  
Area: 18.1 m<sup>2</sup>



Room 3 1:100  
Area: 18.6 m<sup>2</sup>





Indoor perspective

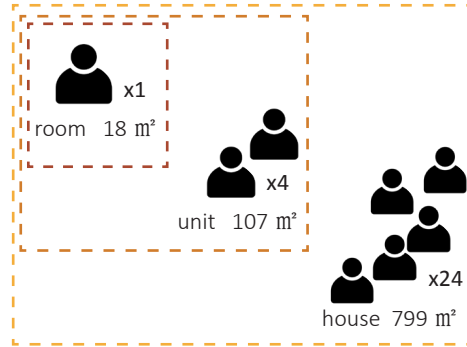
When the weather is fine, the balcony can be opened to extend the indoor space to the outside.

### 3.5 HEALTH PROMOTION

#### Living in my house

Although each student's single living area is as economical as possible, the living area is expanded by a shared kitchen of four people and a shared living room between the units. The small unit consisting of four people will not make students feel crowded, and the 24 people living in a large space will also reduce the density of living and balance the loneliness of small units.

It helps to create the feeling of home, every student is like having the whole house.



STUDENT HOUSING TO PROMOTE HEALTH

Area:5651 m<sup>2</sup>  
 Resident:150  
 Room Area:18-18.6 m<sup>2</sup>  
 Per capita:37.7 m<sup>2</sup>



INTERNATIONAL STUDENT HOUSE  
 Delft, Netherlands  
 Area:14,913 m<sup>2</sup>  
 Resident:350  
 Room Area:18.5 m<sup>2</sup>  
 Per capita:42.6 m<sup>2</sup>



SMILEY ZEEBURGEREILAND  
 APARTMENTS  
 Amsterdam, Netherlands  
 Area:12.700 m<sup>2</sup>  
 Resident:364  
 Room Area:25 m<sup>2</sup>  
 Per capita:34.9 m<sup>2</sup>



BIKUBEN KOLLEGIET  
 Copenhagen, Denmark  
 Area:7000 m<sup>2</sup>  
 Resident:107  
 Room Area:22 m<sup>2</sup>  
 Per capita:65.4 m<sup>2</sup>

Delft International Student House and Smiley Zeeburgereiland Apartments are corridor type. Delft have similar room area with mine and had public area on first floor. The quality is mainly focus on public area. Smiley have a lot of outdoor public space but no indoors to make it cheaper. Bikuben Kollegiet have high quality public space because it combined corridor with kitchen. But per capita is more than others.

So compared with other student housing projects, my project guaranteed economy while providing high quality interior space.

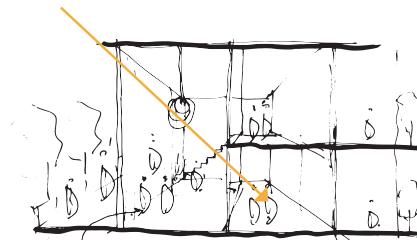
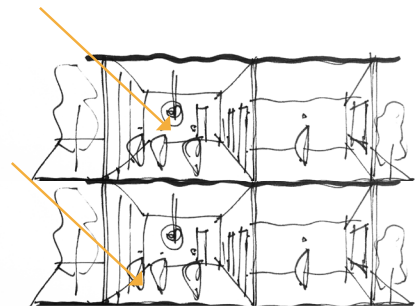
### Enjoy the light

Light and landscape are key elements in determining the plan.

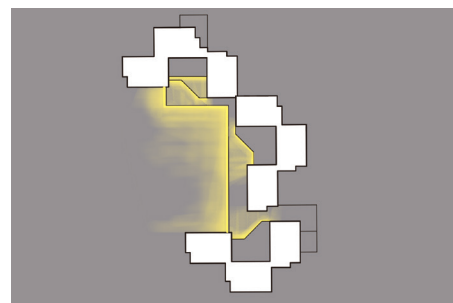
Enough sunlight in all rooms is a basic requirement. So the rooms are all placed on the daylight direction, with separate recessed balconies and windows providing plenty of light.

The indoor public space is considered to receive morning and afternoon sunshine, which coincides with the student's activity time.

The double-height space allows more light to enter the interior of the building.



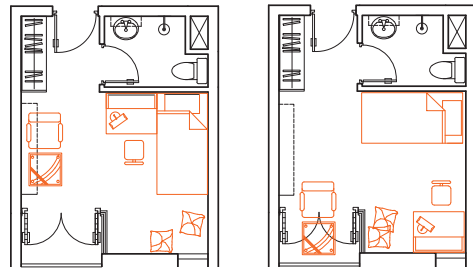
The transparent public space provides light for indoors and outdoors in the night and winter, enabling the community to have an active atmosphere even without sunlight.



### Sense of control and safe

Through the high space, students can always monitor the corridors and entrances, see the activities happening indoors and outdoors, and master the surrounding environment. This helps them feel safe.

Separate rooms can be modified to suit the student's preferences, increasing their sense of control over the living environment.



### Celebrate the material

Materials that can be touched can promote psychological relaxation. Light yellow bricks, wood are used in building. The more modern dark gray steel and smooth glass are used to enclose the public space and contrast with other materials.

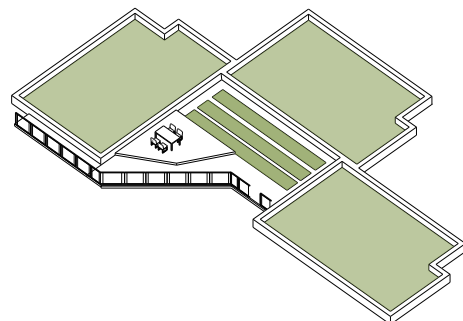
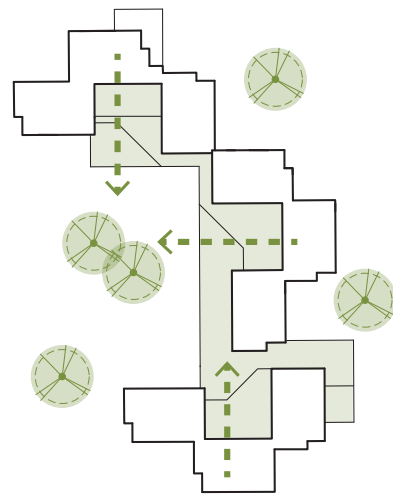
### Closer to nature

How to make the green environment more involved in student life has affected the design more.

The outdoor space is integrated with the original wood space, and the ground activity space is distributed in the woods according to the terrain. Place the rest of the outdoor activity on the terrace or on the roof .

Every large unit has direct access to an outdoor floor or roof platform. They are all facing the garden and the woods, so you can see the green landscape view even indoors. Walking between the units or on the roof terrace and stairs, student can be surrounded by woods.

The roof that can be used is also covered with grass, providing a relaxing and comfortable environment for the roof space.

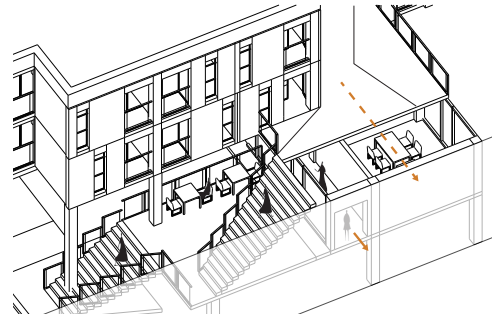


## Let`s excersice!

The entrance to the student dormitory is close to the surrounding playground and fitness facilities for students to use. The building is connected to the Fysiken, accessible through the indoor space, and accessible through an outdoor staircase.

The roof platform connects to the roof of the gym, making it possible to develop into a larger sports venue in the future.

Both entrances have a larger area of underarm space and bicycles are available for parking.



## Climb up and down

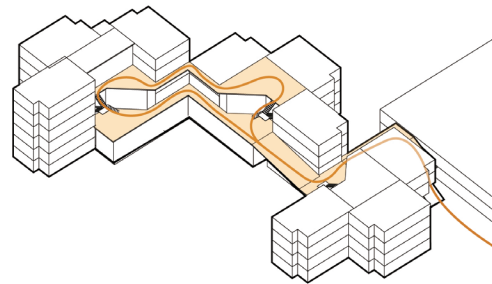
Increasing the chances of moving around the building is an effective way to promote everyday exercise.

Encourage students to walk inside the building by using two entrances and a roof terrace to form an indoor and outdoor circular flow.

Public spaces arranged in different floors of different units encourage students to move up and down. The visual relationship between the various spaces encourages people to move forward and use. For example, standing on the first floor can see the second floor corridor, and in the coffee area, you can see the activities of the game area through the courtyard and glass.

Although every unit has elevator, the stairs are near to the door. For students, it is more convenient to use the stairs daily. The two floor height design allows the stairs inside the unit to be used daily.

The brightly coloured outdoor staircase attracts students with visual highlights and also shows its functional difference from the interior staircase.

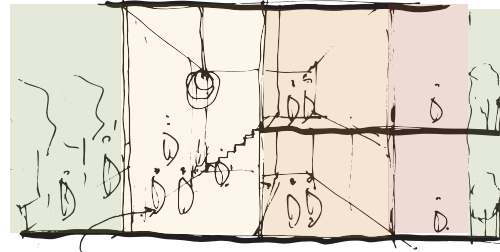




### Stay with friends or alone?

Space is divided into different levels of privacy, from completely public outdoor to indoor public spaces, shared spaces between units, single rooms and small corners in room . Different levels of environment provide different social atmosphere.

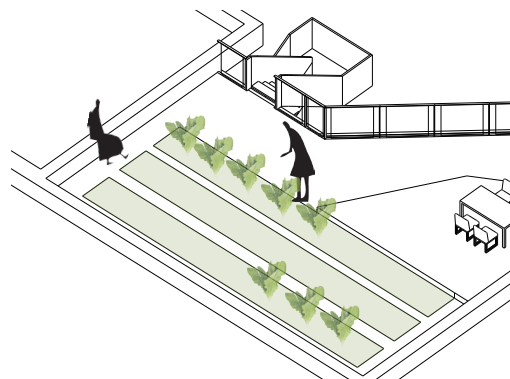
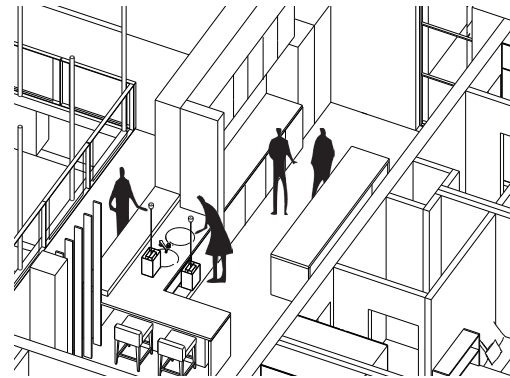
Open space promotes communication and interactive behavior among students and contributes to social activity.



### Eat healthy

A more open kitchen promotes kitchen hygiene, promotes food sharing and mutual learning, and allows healthy eating habits to influence each other.

The roof provides planting sites where students can grow their own healthy vegetables.



# 4

## **DISCUSSION & CONCLUSION**

- 3.1 Users feedback**
- 3.2 Discussion**
- 3.3 Conclusion**



## 4.1 USERS FEEDBACK

In order to get feedback from the potential users of the project, I organized a small group discussion. I invited three Chalmers students from different countries and different academic backgrounds, and introduced the project to them to learn their feelings about living in this house.

While the discussion, in addition to their helpful feedback, I was very happy to hear that through my project, they began to understand the importance of healthy elements in student housing, and discussed with me how does the student housing influence their health. This is the original intention of my project.

### **Gandhi Rajamani**

Chemical engineering student

It's a interesting project. I lived in India, and my student housing is facing the north so I don't have sunlight at all. So it's important to consider health problem in student housing.

I really like your housing has connection with Fysiken. When I feel stress, I will do some excersice to release. So it will be very convient to have access to these place.

And I think live with greenery is attractive.

### **Franziska Fletemeyer**

Architecture student

It's interesting and the problem about health is important. I like your atmosphere in student single room, with sunlight and view of greenery.

Walking around in building sounds interesting .

I also think connect with Fysiken is attractive. I will spend a lot time on sport.

### **Hyunmyung Lim**

Applied acoustics student

I like your public space. We can spend a lot of time out of single room.

Especially in winter, there is dark outside. If you want to buy artificial light by yourself, it will be really expensive. But if your public space can provide light in winter night, I would like to stay here for a long time.

Walking on the platform is interesting for me.

The problem is if the open kitchen will have problems about smell and noise? Because people have different diet, if it is closed with transparent wall will be better.

## 4.2 DISCUSSION

In the research, the definition of health-promoting student housing was difficult. Health promotion is currently widely used in the field of healthcare architecture and there is no definition about student housing settings. Health promotion is a broad definition, I chose mainly for the promotion of a healthy environment and healthy behavior. There are many other omitted aspects, such as social and educational support can influence health promotion in housing.

In the process, I always thinking about the balance between quality and economy, public and private. Student residences should provide a healthy living environment for students, while also taking into account economic and high-density needs. One the one hand, providing more public space will reduce the economics

of the dormitory, but it provide space quality. One the other hand, if these space can be use frequently? Who pay for these space? How to guarantee the economy? I solved this problem by several unit. I think in health perspective, it's an important aspect. However, my project also meet some questions like, if open kitchen is proper or not.

After the research, I found it will be better if the health promotion of student housing can be measured in specific impact. Now we have health evaluation project like WELL. As small apartment, the student housing should meet more specific requirements. It will be more useful in quantifying the effectiveness of these building strategies and promote more healthy student housing.

## 4.2 CONCLUSION

In this project, I discovered the problems in student residences and the potential to promote health. In the field of theoretical research, there have been many theoretical achievements in building health promotion. In practice, student housing design is also paying attention to students' physical and mental health.

There are many ways to promote health, healthy environments and healthy behaviors are important components. So I applied some of the theoretical strategies I learned in these aspects to the design.

Through site selection, buildings can have better health potential. The circular flow in building programming is a very effective way to promote exercise. Through some space design and unit design, the traditional student housing type can be changed into a more healthy one to get more qualities.

From the results of the design and discussion, user feedback, etc., it is verified that the student housing can become a health-promoting environment through the construction strategy, while taking into account the quality of living and economy.

5

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