

THE AMETHYST

A new gem for Västervik



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ARK263- HEALTH CARE ARCHITECTURE

This year's studio task was to develop a range of interpretations and alternative proposals for a New Psychiatry building in Västervik for the client Kalmar County Council. The program-area of approx 9000 m² consisted of one adult outpatient ward, BUP and ABC, one emergency ward, one inpatient ward and two forensic wards.

Part of the assignment was to specify the task at hand and translate that into a design vision and proposal. There were two sites to choose from; the urban site on the current hospital area and the rural one by the lake of Kvännaren.

Psychiatric facilities are healthcare facilities where people work and where people come when they experience problems with their mental health. There is a wide range of mental status among the patients affecting their perception and sensitivity to different expressions in the environment. Some patients are also here against their own will, and might be dangerous to themselves and others, thus the psychical environment needs to support them and help them to heal, making sure no one is psychically hurt.

During the course we have learned that the environment in psychiatric care is as important as the medical equipment is in somatic care, and that it should contribute to feelings of safety and well-being.



DESIGN CONCEPT

What is the patient perspective in psychiatry?

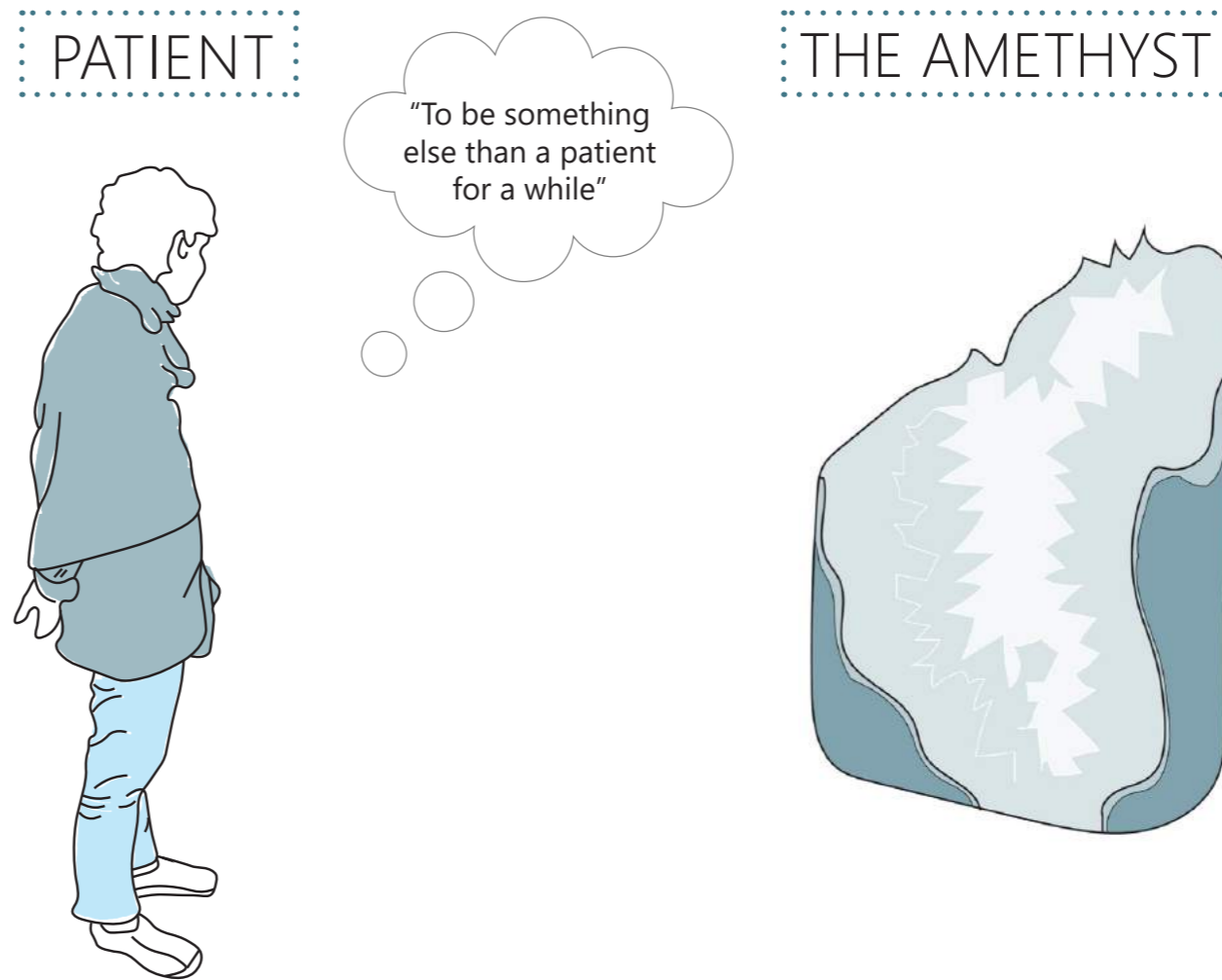
As every person is unique, every patient is unique. Tackling a mental illness can make you feel like you are all alone with your thoughts and feelings. These thoughts could be very personal and something you would want to hide to the rest of the world. Mental illness does not show on the outside, it is an inner battle with your own mind, a battle that can be very hard to win. So knowing if a person is fighting a constant war on the inside could be hard for other people to understand. To deal with the thoughts some patients put up a hard barrier around themselves, others become aggressive, angry or just retreat into their own soul and turn the world off. Just like there is a wide range of feeling and emotions in every one there is a range of mental issues.

To symbolize the patient in our building we have chosen the amethyst crystal. The amethyst crystal stands for balance, protection and spiritual wisdom. It is said to help to remove and replace negative energy with positive energy. (Lotusblomman 2015) The stone is unique just like a patient. It is hard on the outside but hollow on the inside where thousands of crystals are hidden from the observer. Just like a patient that is hiding a wide range of emotions on the inside, that does not show on the outside. There is a transition from the hard dark surface to the light and transparent crystal, symbolizing the range of patients and their different emotions.

So how can we represent this in our building?

Design a two sided building with different expressions, to represent the different sides of in the patients. Have transitions in the building; between inside and outside and private and public, to be able to meet the range of different patients that will use the building

To make sure that the environment can aid the healing of the patients we believe it is important to be generous; to have wider corridors that does not only function as a walkway, but a space to activate.



How can we use the concept of the amethyst to create strategies for the building ?



TWO SIDED BUILDING



PRIVATE PUBLIC PRIVATE



GENEROUS

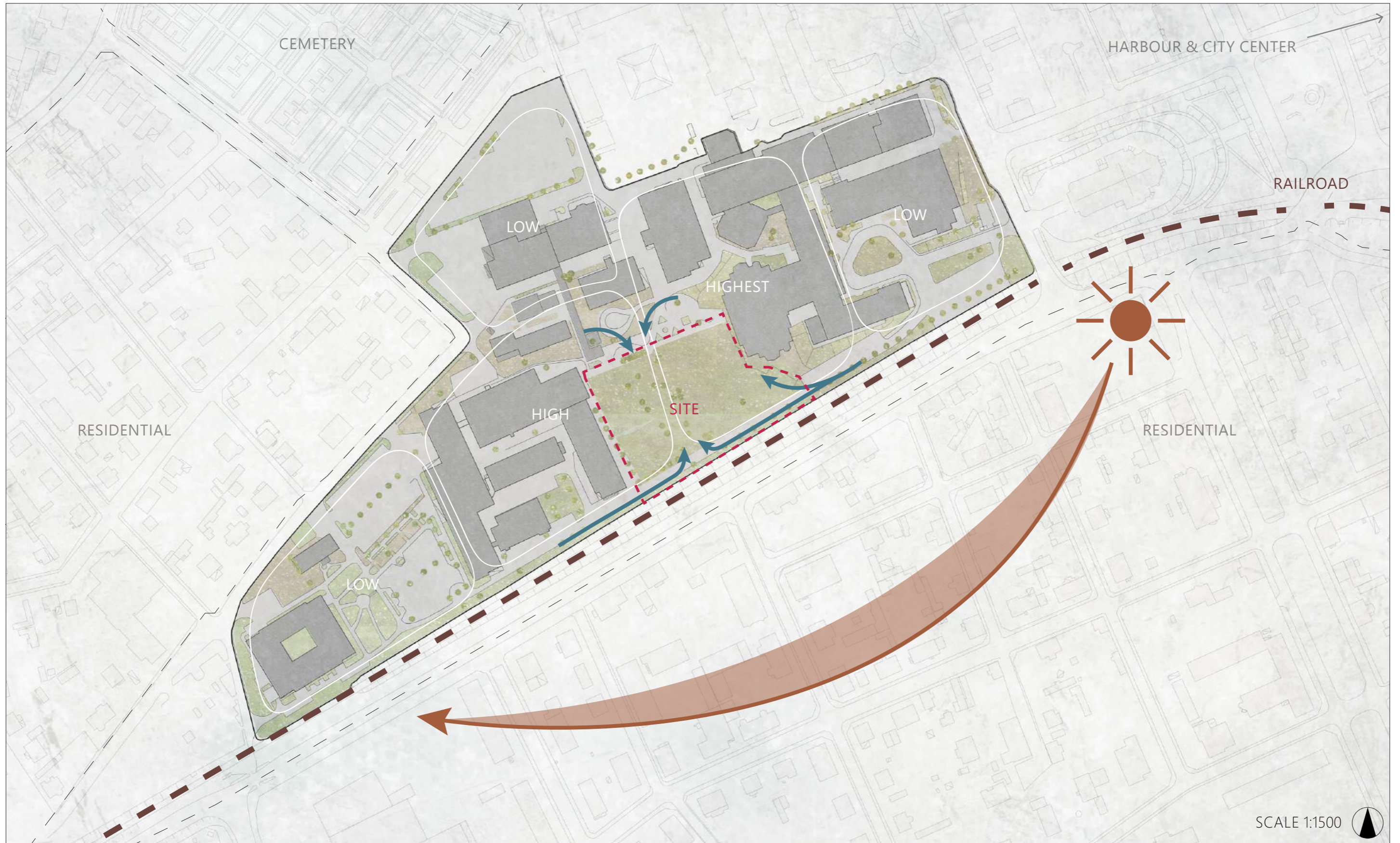


TRANSITIONS



SITE CONTEXT

New psychiatric building in Västervik on current hospital area. Site analysis:

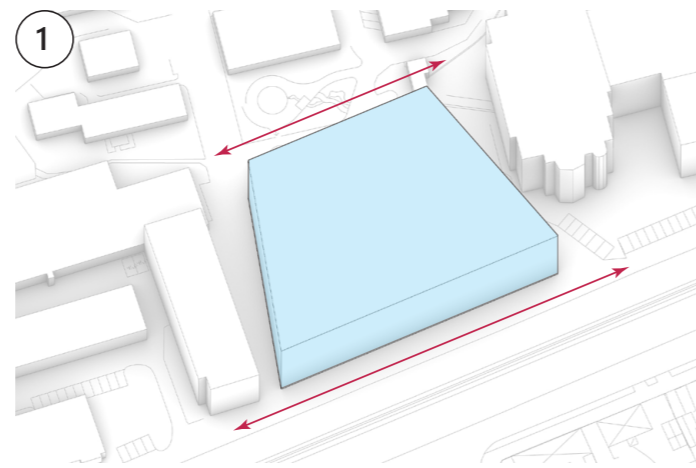
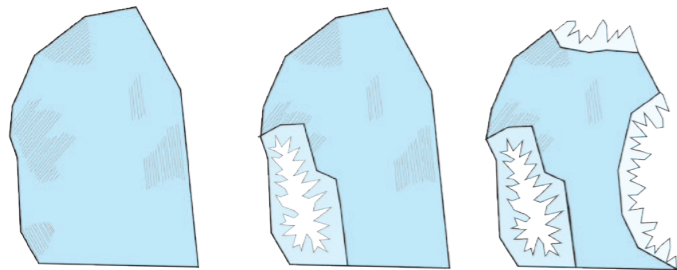


FORM STRATEGY

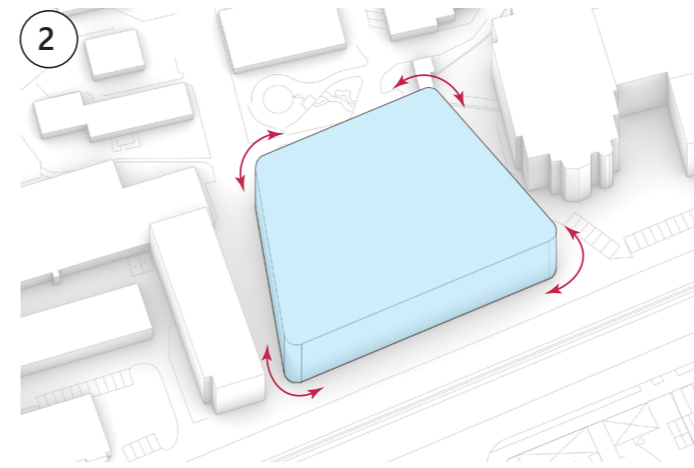
To form the building we have used the analysis of the site; the urban fabric, the flows and the path of the sun.

To apply the concept of the amethyst stone we have looked at the characteristics that the crystal has. We started with a form that could resemble a mass, more organic in its original shape, and then we excavated this volume. The spaces that were cut out are sharp, as cuts are, in contrast to the round outside of the volume. To break up the volume and to match the more irregular shape of the stone we used three different heights for the building. The amethyst crystal is also hollow, but this is not something you see from the outside, thus, we have light atriums on the inside of the building where we can work with the facade to create a crystal like feeling. Balconies in the excavated spaces also resemble the crystals of the stone.

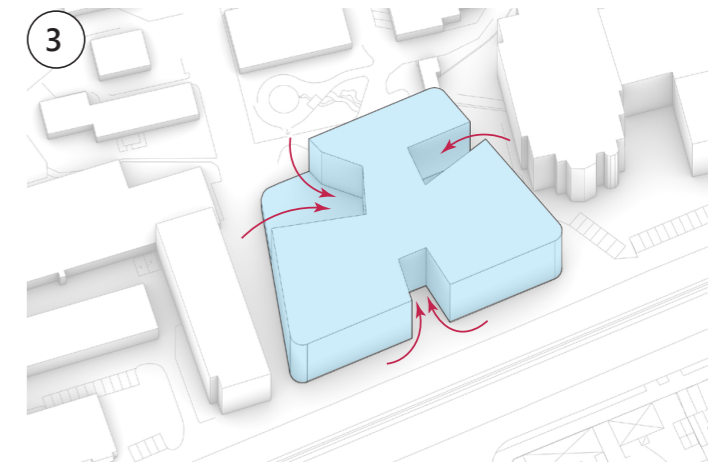
The contrasts of the amethyst stone are visible in the two sided building that is created, as well as the round corners and sharp cuts.



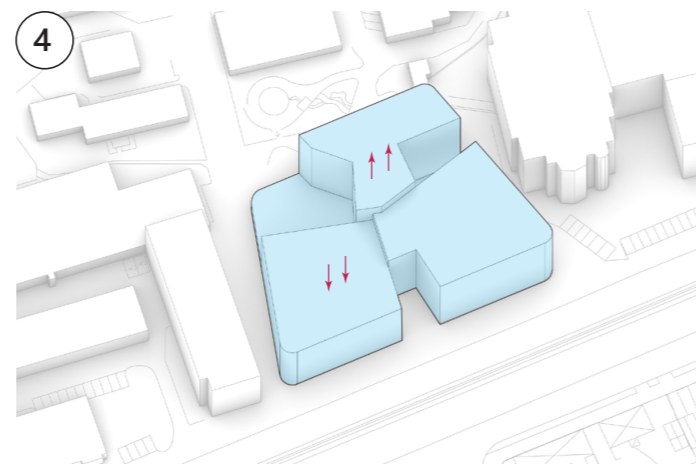
Starting with a solid volume. Closing of the site more towards the south and enabling the largest surface of the building to face the sun. Smaller footprint towards the centre of the site to create more outdoor spaces.



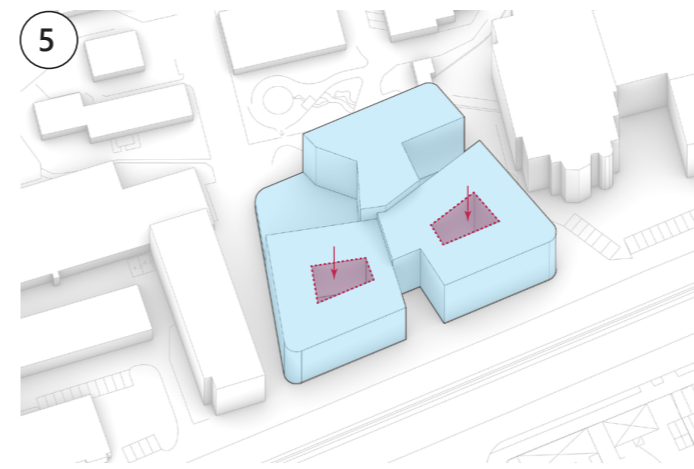
Softening the corners to resemble the outside of the amethyst crystal, that has no sharp corners.



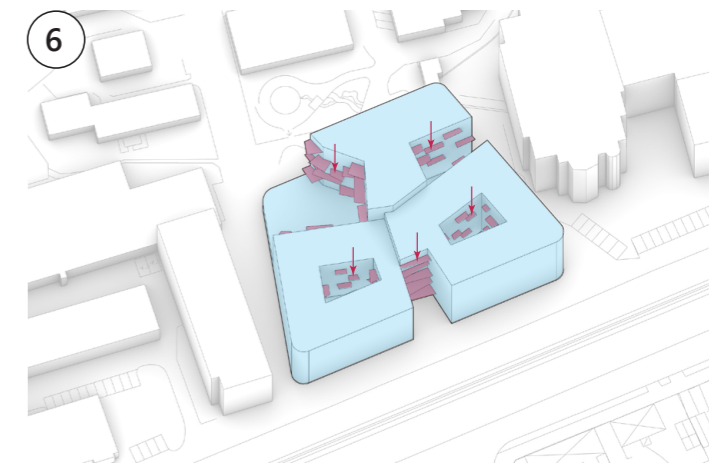
Excavating the solid volume to open it up and create entrances.



Dividing the volume in three parts with different heights, since the stone has an irregular shape.

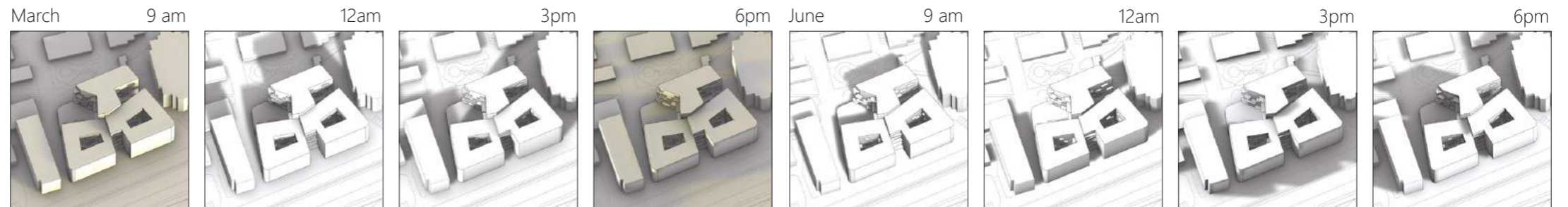


Introducing daylight to the inside of the building by light atriums. This also reassembles the hollow but hidden inside of the amethyst crystal.



To create the amethysts atmosphere, balconies are added in the excavated areas to resemble the crystals.

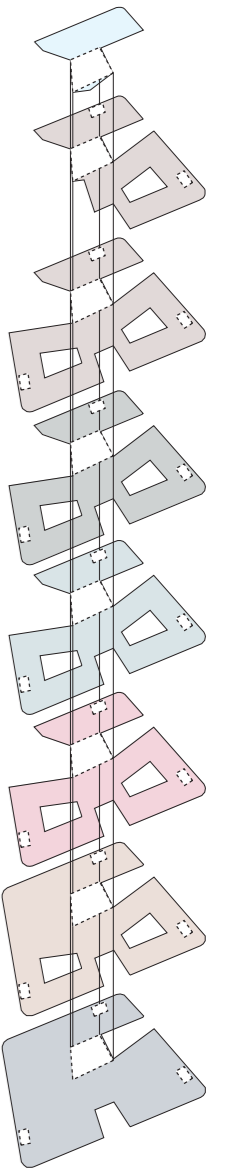
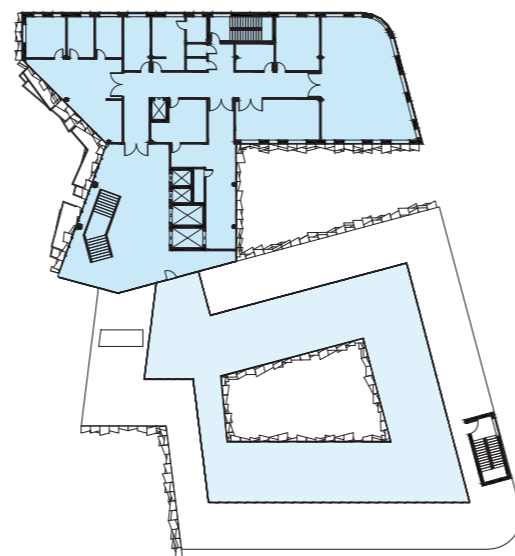
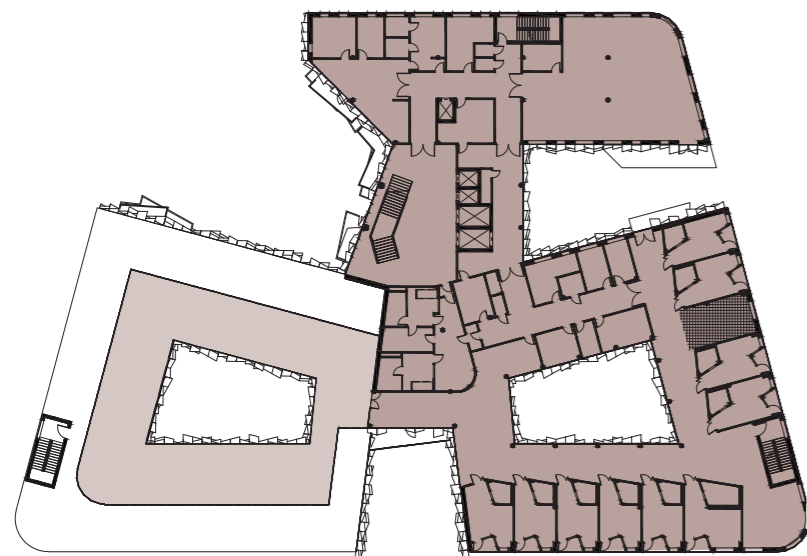
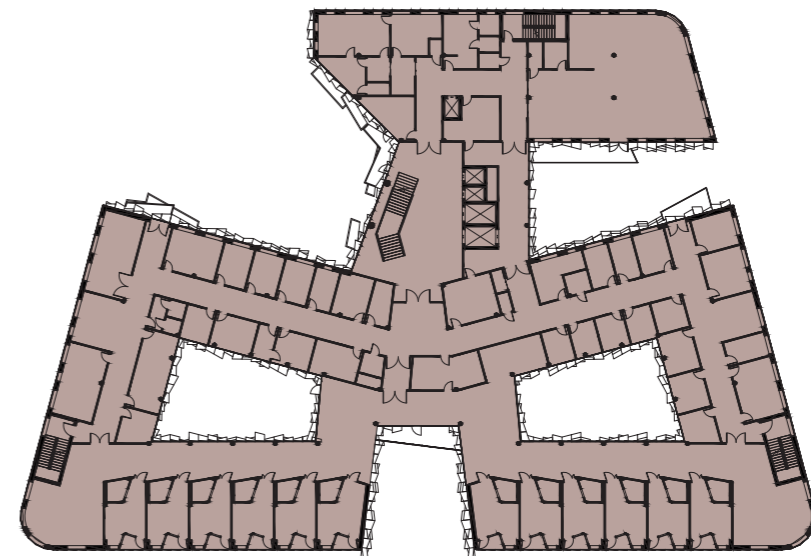
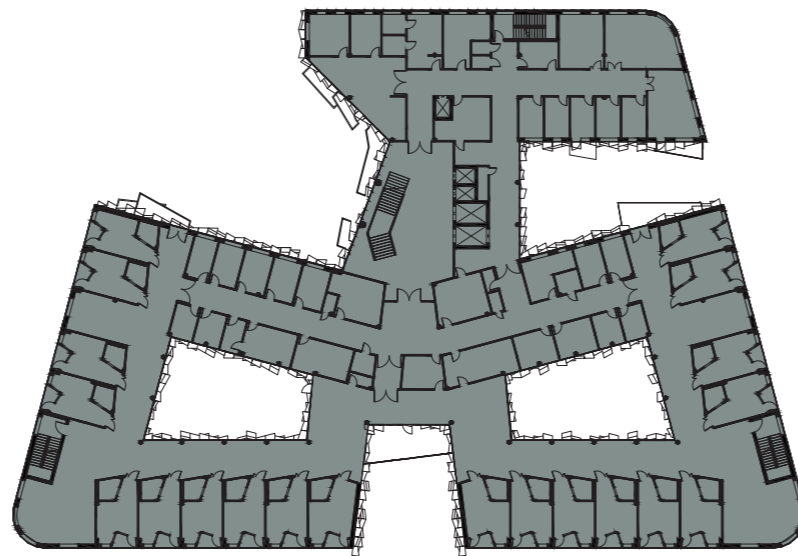
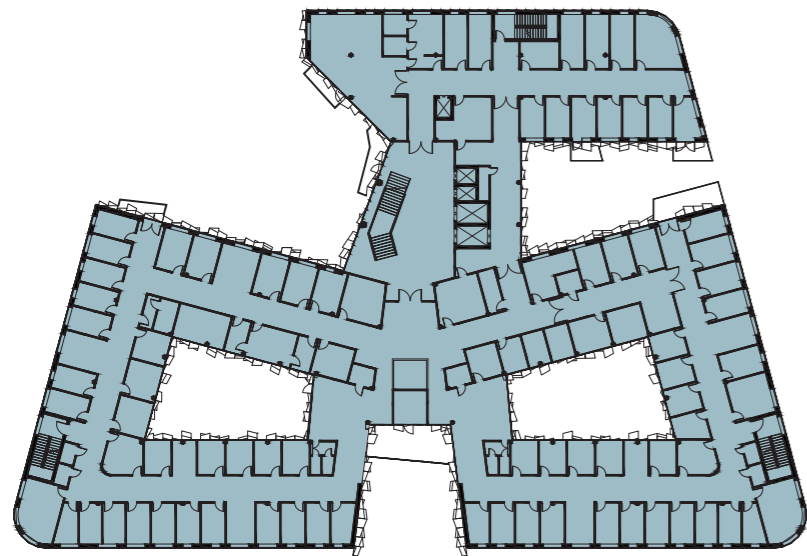
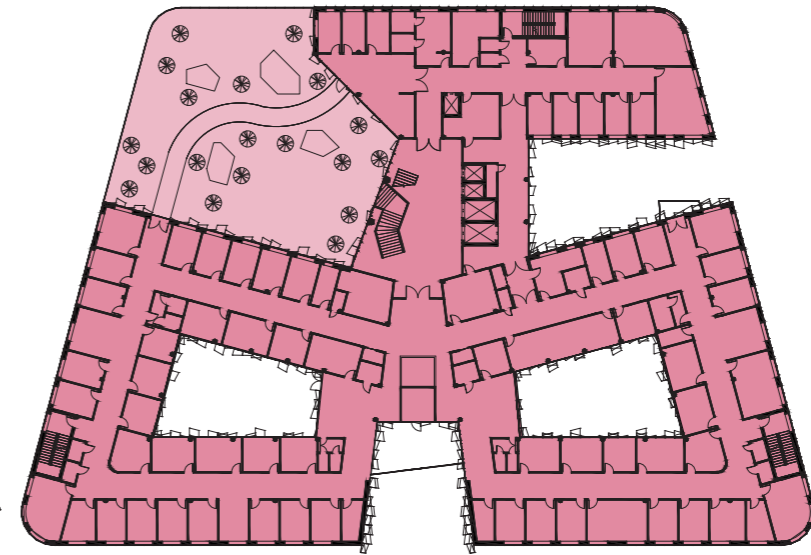
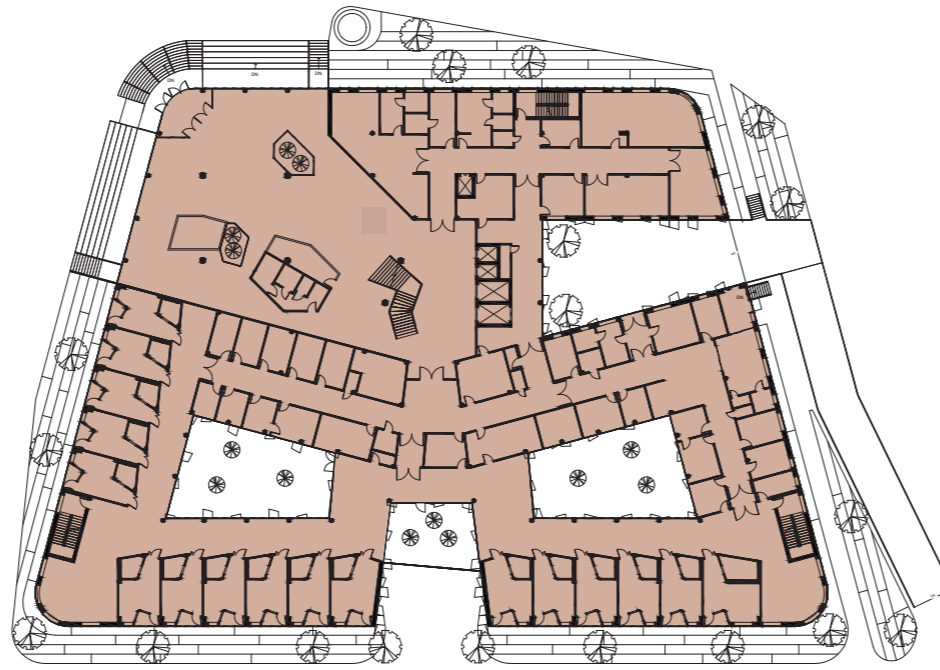
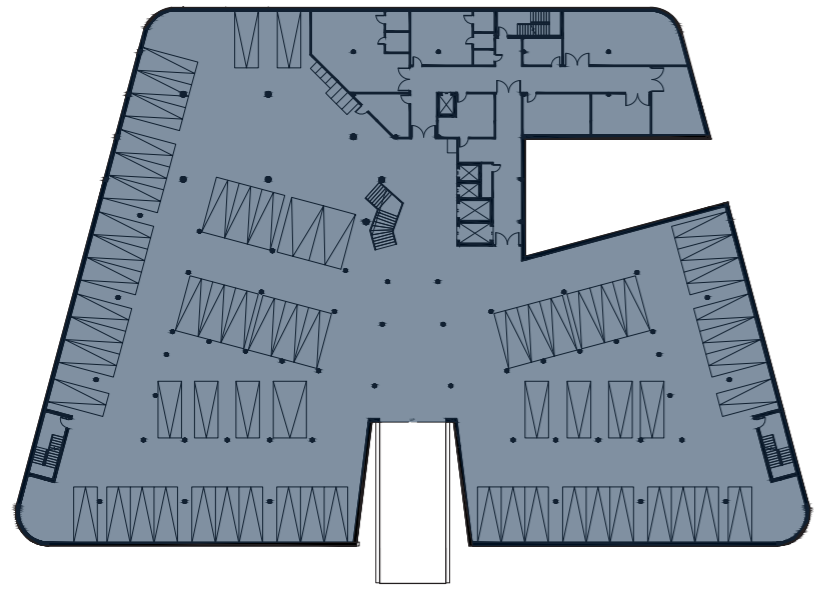
SUNSTUDY



SITE PLAN



PROGRAM LAYOUT



- Shared facilities
- Forensic ward 22 & 23
- Inpatient ward 24
- Outpatient adult
- Outpatient BUP & ABC
- Emergency ward 21 main entrance
- Parking floor

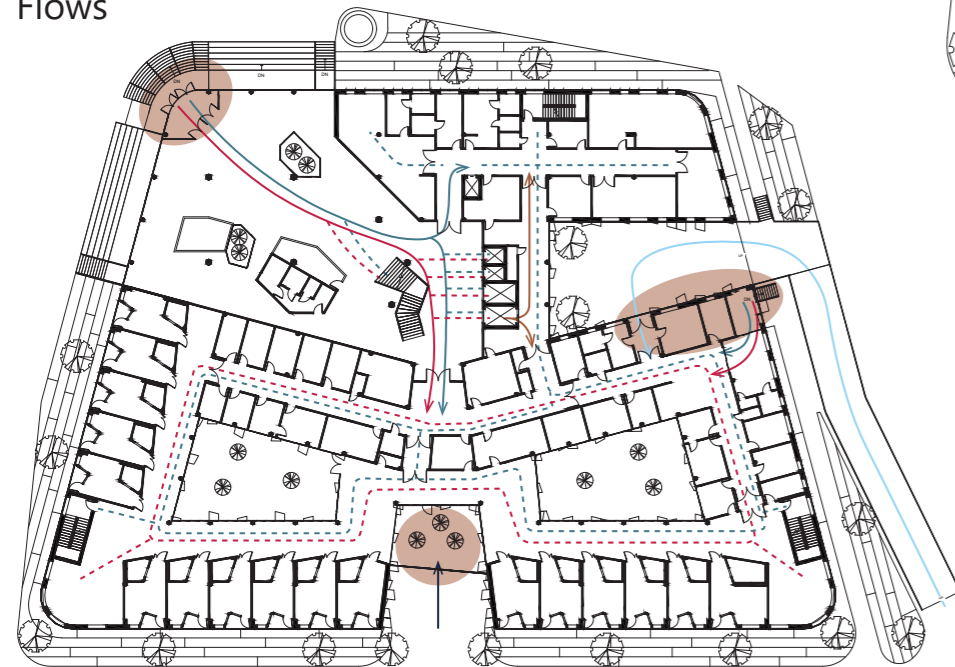
SCALE: 1:800












ENTRANCE FLOOR


Ground floor
Main entrance hall
Emergency
Ward 21
Staff

You enter the building in the corner of the ground floor in the main cut of the building. From the entrance in the main hall you clearly see the reception and the main staircase leading you up in the building. There is a café where you can sit down and relax before your appointment or visit. A large staircase/theatre is located on the outside to provide seating with views to the pond and park. To introduce greenery inside we have placed glassed rooms, containing plants and flowers going up to the terrace above. These will be illuminated and become lanterns of light on the terrace during the night. On the cut in the south facade we have the entrance for the parking floor, and in the cut on the east facade we have the emergency entrance and ambulance hall. The emergency unit and ward is placed on the ground floor and contains 17 patient rooms.

Flows



- | | | |
|---|---|--|
|  Entrance |  Staff patient interaction |  Staff |
|  Staff |  Logistic |  Function space, laundry, storage |
|  Staff |  Patient |  Patient room |
|  Ambulance |  Patient | |

SCALE: 1:400 

ENTRANCE HALL

Main entrance hall with reception and a café to the right. Behind the reception you see the main staircase. Skylights give natural light and greenhouses descend like crystals from the terrace above, introducing green to the inside.



OUTPATIENT WARD

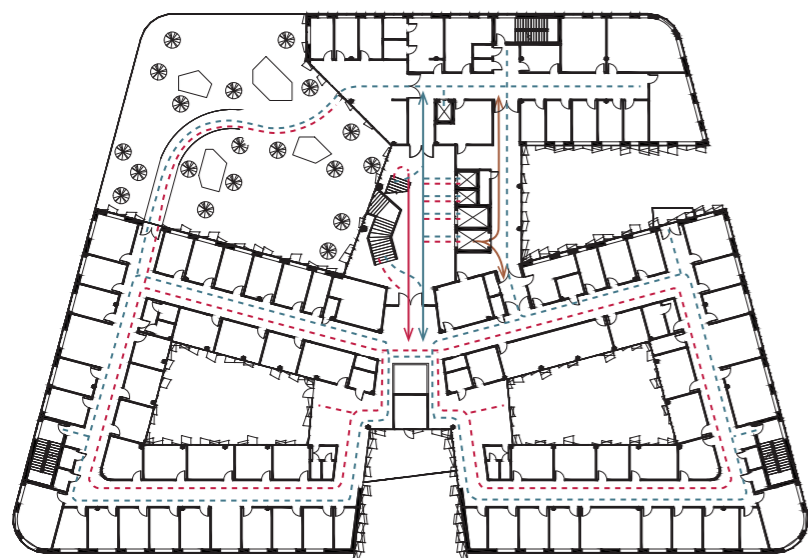
First floor
 BUP
 ABC
 Staff

This is a type floor of an outpatient ward. It consists of double corridors arranged around the courtyards, where bathrooms are placed in corners. Overview /reception is placed in the middle visible when you enter the ward. Waiting areas have views to the light atrium or through the cut in the south facade. Corners on the facade are reserved for common patient areas like day-rooms and activity spaces. To reduce the feeling of long corridors we create open common areas

One emergency staircase is placed in each wing

The first floor contains the BUP unit on the left wing and the ABC unit on the right. The terrace is public and can be used by everyone, it contains playgrounds and a walking path between the patient unit and the staff wing.

Flows



- | | | | | | | | |
|--|-----------|--|----------|--|---------------------------|--|----------------------------------|
| | Staff | | Logistic | | Staff patient interaction | | Staff |
| | Staff | | Patient | | Patient common area | | Function space, laundry, storage |
| | Ambulance | | Patient | | Patient common area open | | |

SCALE: 1:400

TERRACE

Large public terrace to the west, with playground and areas to sit. Balconies on staff wing are visible as well as the large central stair case in the core.



INPATIENT WARD

Third floor

Ward 24

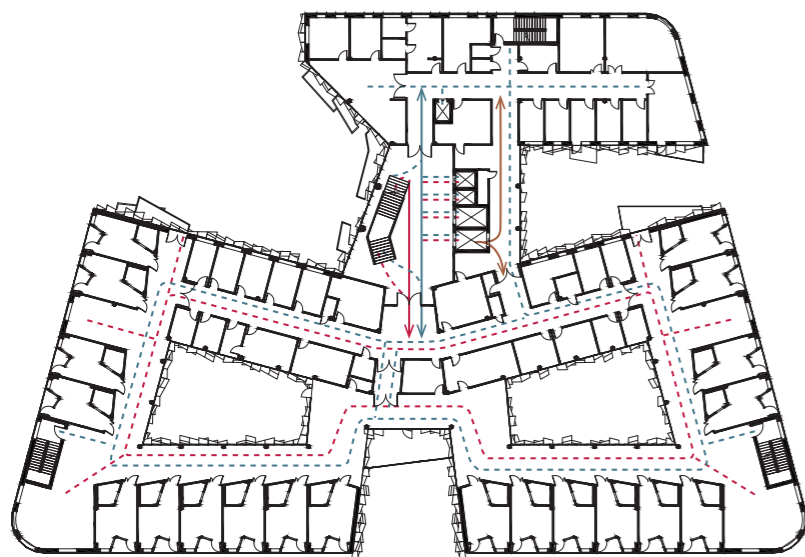
Staff

This is a type floor for an inpatient ward. It consists of single corridors in the patient area and double corridors in the area where consultation rooms, examination rooms and other functions like laundry, medicine room and storage are located. The corridors in the patient area are wider to create a more generous space and to be able to use the corridor as a function space. This creates a transition between the private room, the common corridor and the larger common activity spaces.

Similar to the outpatient ward the inpatient ward has a staff office in the middle, this is for better overview. In the inpatient ward there are two additional office with overview to support the staff.

The inpatient ward has several balconies, one larger to the south that is less public than the one in the larger courtyard. This also gives the patient the option to choose the level of interaction they are ready for.

Flows



- | | | |
|-----------|---------------------------|----------------------------------|
| Entrance | Staff patient interaction | Staff |
| Staff | Patient common area | Function space, laundry, storage |
| Staff | Patient room | |
| Ambulance | Patient | |
| Logistic | | |

SCALE: 1:400


INPATIENT UNIT

Third floor
Ward 24

This is an example of an inpatient ward unit, showing the room relation and material choices.

-  Tiles
-  Tiles
-  Terrazzo
-  Wood



SCALE: 1:200 

COMMON AREA

Showing the dining area with the light atrium in the background proving natural light. Behind we see the patient area with patient rooms, the wood and green facade works as a filter. To the left we see the common balcony to the south that patients can share.

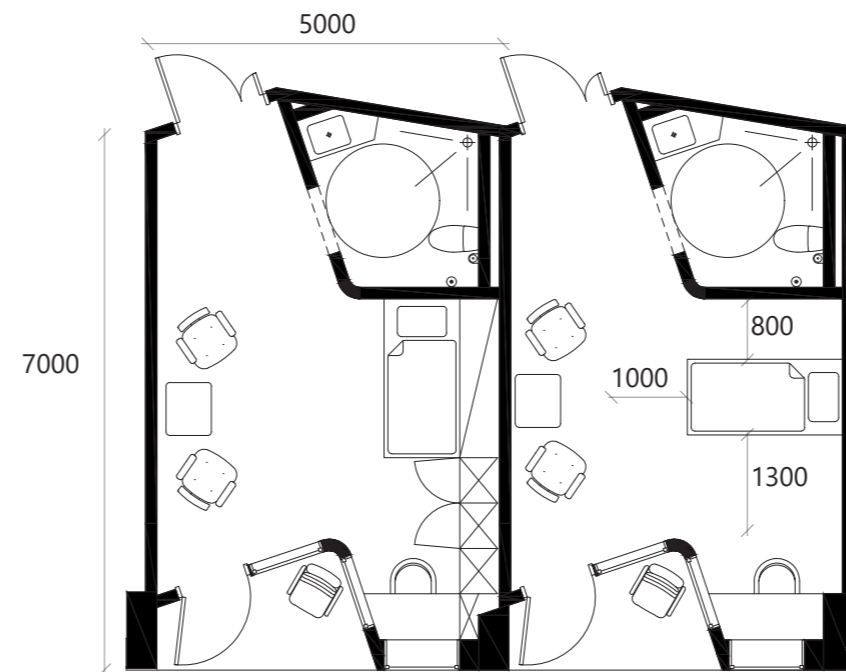


PATIENT ROOM

This patient room is used for all inpatient wards.

The entrance to the room is diagonal, this creates a nice rhythm to the corridor. The bathroom wall is also diagonal to create better overview for the staff. The bed however can be placed in the niche created by the bathroom to increase privacy. Each patient room has its own balcony to provide the patient with good daylight and fresh air. In front of the window is a small desk that the patient can use to study/write or just sit.

The room is furnished for psychiatric care but the measurements are according to the standard somatic requirements, which means that if the function of the unit changes the rooms can be used for somatic care.



SCALE 1:100



SCALE 1:50



..... Hallway towards light atrium Patient room Private balcony ...

PATIENT ROOM

View of the patient room, showing how the light enters the room from the glassed balcony. In front of the window we have the small desk area and to the left the built-in storage.



FACADE

Butong green biotope facade



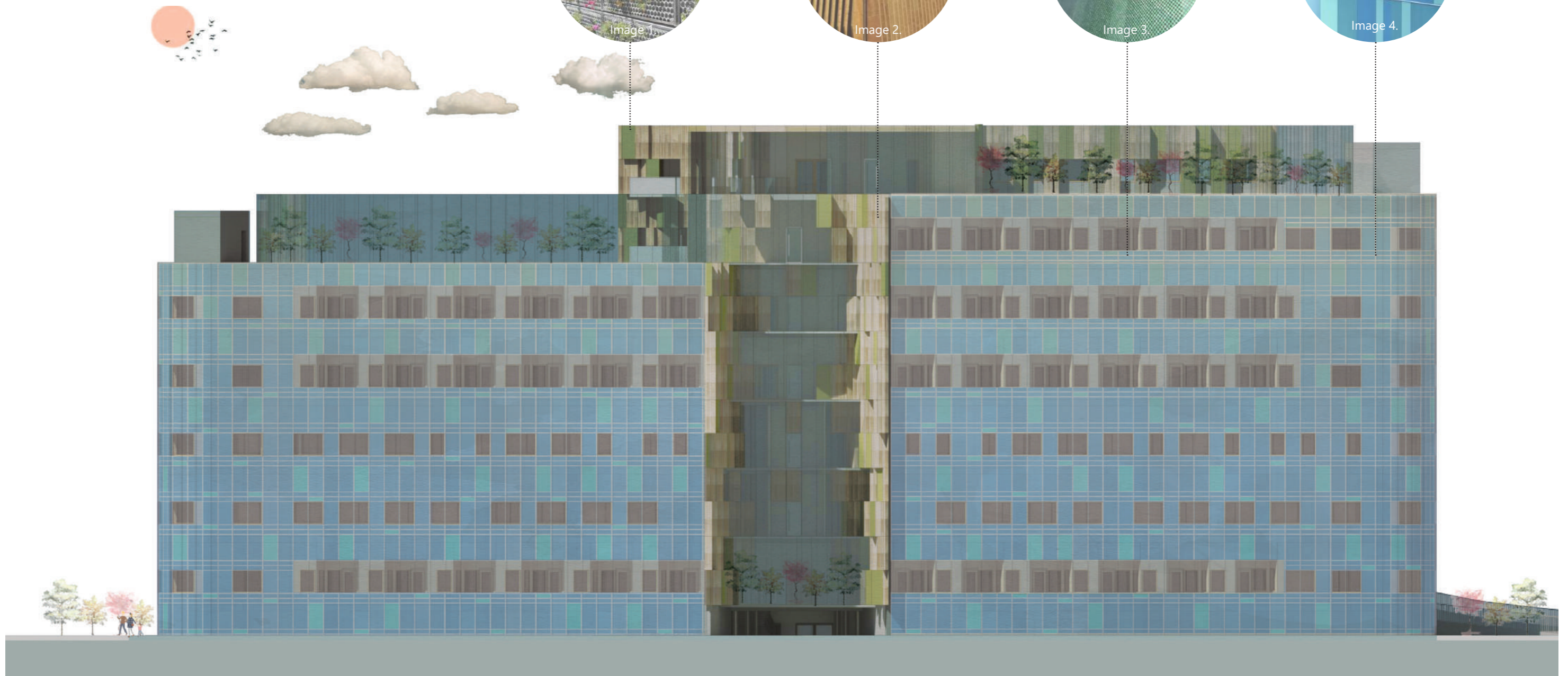
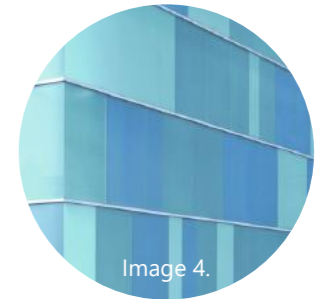
Wood facade



Coloured building integrated solar panels



Coloured glass panel facade

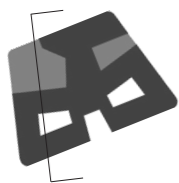



SCALE 1:300

LIGHT ATRIUM



SECTION



SCALE 1:200 

EVIDENCE BASED DESIGN

Evidence based design is a method of integrating knowledge from different research disciplines in order to create measurable relationships between the physical environment and its different effects. During this semester we have been working with research informed design which essentially means making use of the current best research to form design decisions. Having evidence to proof that a certain care effort has a positive outcome will help to build arguments and improve health care facilities. For example having a room with view to nature has proven to have an impact on the recovery of patients; shorter stay, less painkillers and reduced stress. Calculating the payback time for refurbishment and new design solutions, that has a higher initial cost, has also shown that investment is often paid back rather quickly since the length of stay for patients is reduced. (Ulrich, R 2008)

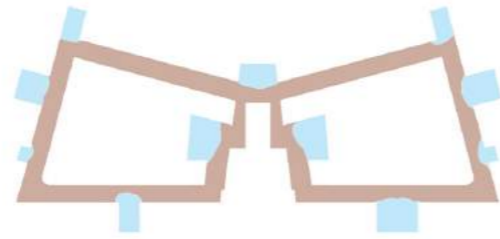
During the CVA-days at Chalmers in October 2018, Ingmarie Wieslegren (doctor and specialist in psychiatry) said: "Good and appropriate facilities for psychiatry are as important as advanced medical technology equipment in somatic are."

Roger Ulrich, the founder and researcher of EVB in health care facilitates, discussed several care efforts that are essential to think about when designing new psychiatry buildings:

- Think about the design of the corridors.
- Low social density, rather many smaller rooms than few large rooms
- Accessible gardens our outdoor areas
- Daylight - but also privacy, it is important to think of views into rooms
- Positive distractions
- Single bed patient rooms
- Good staff overview
- Reduction of noise

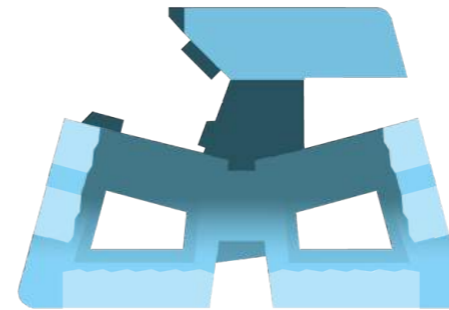
These efforts will reduce stress for patients and staff, reduce aggressive behaviour, improve working environment and as a result; shorten the stay at the hospital.

Breaking up corridors



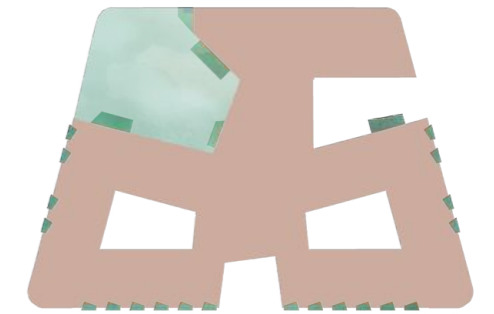
Wider corridors and open areas to break up the corridor. Leave room for patients to meet and avoid aggressive behaviour.

Gradients of privacy



private public
Patients can choose the level of interaction they are ready for.

Connection to nature



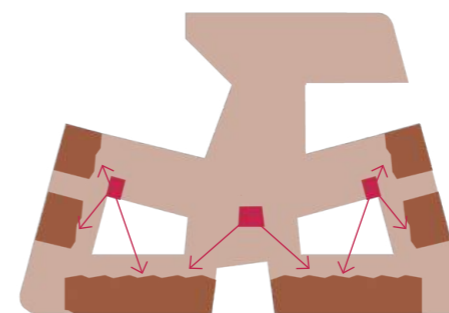
From patient side with small balconies to public side with larger green areas. There is also two roof top gardens, one for forensic and one for inpatients. Staff have their own balconies for breaks to reduce stress at work.

Single patient room



Every patient has a single bedroom for privacy.

Good overview



Staff areas in wards are centrally located and spread out for best overview.

Daylight and views



Patient rooms on the south, west and east, all facing outwards.

HEALTH PROMOTION

Definition: health promotion enables 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. (World Health Organization 2016)

There are several themes that can be addressed, It can be about public participation, social and culture aspects, equity and social justice, intersection collaboration and all dimensions of health. But essentially it is about enhancing health not just preventing problems.

In any architecture project it is necessary for us to create an environment that can promote health for all the users. It can give people a feeling of welcome not only from the physical facilities but also from a spiritual layer. If you want someone to do something, you should motivate them. Health promotion can be a way to attract people's attention and motivate them to make certain decisions. In a health care facility, a clear entrance, making people feel welcome is important. When you are inside you can find interesting and positive distractions in different spots, reducing stress before or after an appointment.

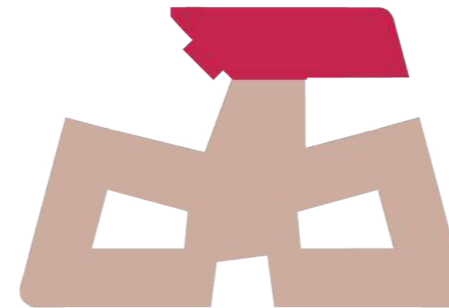
In our proposal we have worked with both mental and psychical health promotion. For example, the building welcomes you with a nice seating area outside in the sun, when you enter you see the reception and the central staircase leading you up in the building. There are plenty of areas to sit and go outside. Walks are promoted throughout the building and there is a gym hall on the top floor.

Central staircase



To promote walking over taking the elevator, a large central staircase is located on the facade visible from the outside.

Separate staff area



Reduce stress among the staff, as they have space separated from the patients to take their breaks and prepare for a shift.

Playground and roof garden



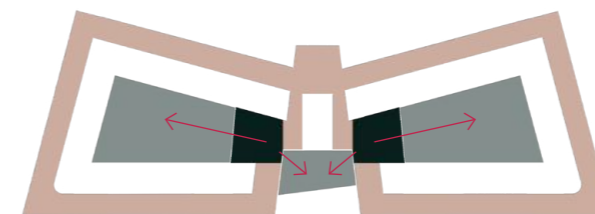
There is a playground on the first floor terrace for the children to use while visiting the building. On the terrace you can go out to get some fresh air before or after an appointment, and reduce some stress. The two roof top gardens can be used by inpatient and forensic wards.

Feeling of welcome



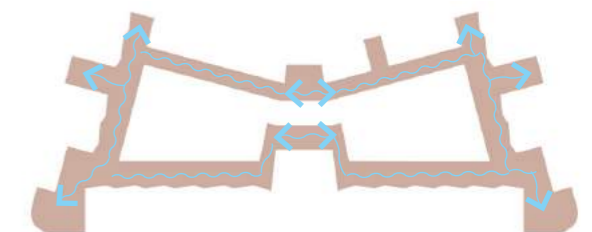
Accessible, clear and welcoming entrance and a large entrance hall with reception and information to guide the visitor. A café and seating outside to make the visitor feel welcome and reduce stress before an appointment.

Waiting with a view



Waiting rooms that have natural daylight and views outside or in the light atrium. Reduce stress before an appointment.

Promote walks



The wings are connected with an outdoor passage to promote taking walks outside. The corridors go around the whole ward so that patient that no not want to go outside can still move around and get some exercise.

FUTURE PROOFING

Future proofing is part of sustainability, thinking ahead and making sure that decisions today will be the best for the future. But since the future is unknown we have to design for some level of uncertainty. Future proofing is an investment for the future. Making sure that the building will be in use for as long as possible and be able to adapt to any changes that may occur.

There are different change drivers to think about:

- Physical: climate change
- Function: user
- Legal: politics, property owner/ stakeholder
- Economy
- Technology: research findings
- Social : lifestyle / trends

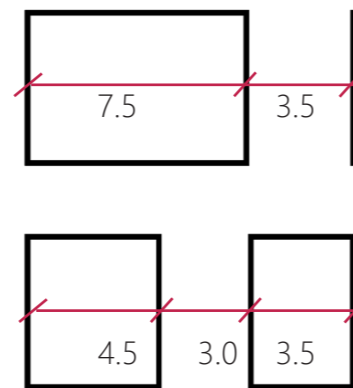
During a workshop we tried to think of as many buildings solutions as possible, that we can apply today, that could face a change in the future. Everything from managing storm-water and floating homes to durable materials suitable for catastrophes and movable buildings.

The strategies for our proposal are, however, not as crazy, but rather straight forward. Dealing with room layout, measurements, grid systems and energy.

Applying future proofing to a hospital is important since the design and development of health care facilities are very long processes, usually up to 20 years. Not having a level of uncertainty applied when planning the building means that when the building is done, the technology of the future might not work, or even fit in that building. Regulations and legislations may change and without flexibility the care facilitates might not be approved for health care standards.

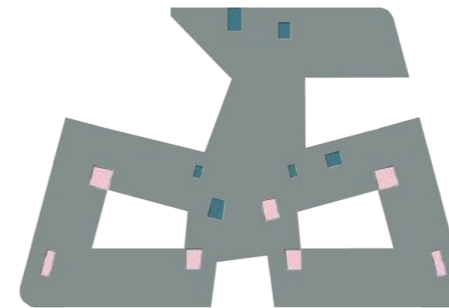
The current hospital in Västervik will be completely rebuild, and new buildings will replace the current ones. Today's health care does not fit in the current buildings, and it is hard to renovate since the footprint of the buildings are too small.

Grid system



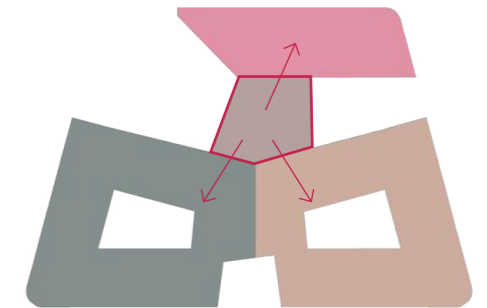
The layout of the rooms is based on a grid system. This system works for a larger room (patient room) plus single corridor or a double corridor with rooms on both sides, like the outpatient unit.

Function layout



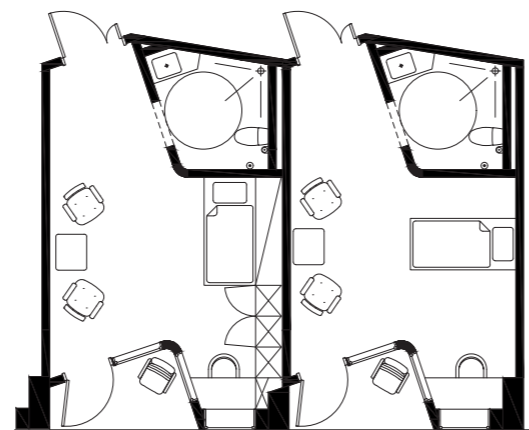
The layout of the building is, as much as possible, similar on each floor. This helps staff to locate themselves on each floor. It also helps with construction as piping for bathrooms and kitchens are above each other.

Central core



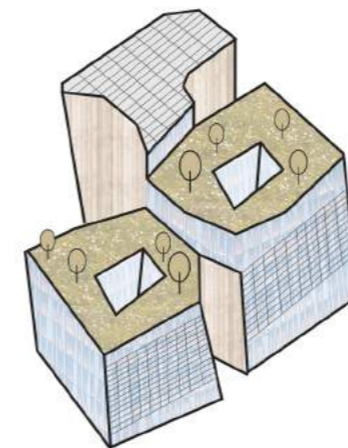
The central core of the bulging is located in its own wing in-between the three main wings. If the functions in the building changes, this makes it possible to have three different tenants in each wing, sharing main entrance and communication

Flexible patient room



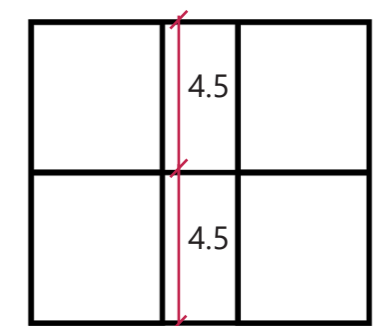
All patient rooms in the inward units are planned according to the measurement standards of a somatic care patient room.

Solar energy



The building has building integrated solar panels on the facade and roof. This provides the building with solar energy, making it more resilient

Floor to floor height



The building floor height, 4.5 m, ensures space for future technical equipment.

SUSTAINABILITY

Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UN 2015)

Thus, designing a sustainable building means we have to minimize the negative environmental impacts it has on the environment. A sustainable building should be energy-, material- and space-efficient and it should support our ecosystems not destroy them.

Energy efficiency is an important goal of sustainable architecture that we should consider. The most common methods are to increase the ability of our project to generate its own energy and reduce its energy needs. The sun is the infinite resource that we can use to create energy, this we do by solar panels that generate electricity to our buildings. We have also used a second skin facade of glass and solar-panel, this combined with thicker insulation in outer walls help to improve energy performance.

Using wood, that stores carbon dioxide instead of releasing it into the atmosphere, decreases carbon dioxide emission. Wood is also a local material and transports can thus be reduced.

Using local biotopes adapted to the Nordic climate, in the green facade promotes biodiversity, and increases the chance that the plants survive the winter. The green facade also helps to reduce noise and it improves the air quality in urban settings. Green roofs and facades help to manage storm water, and collecting rainwater on the roof is a good way to provide the plants with water, instead of using tap water.

Using the existing infrastructure on site decreases the use of new material.

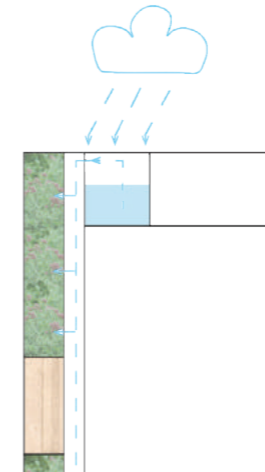
Green facade



Image 1.

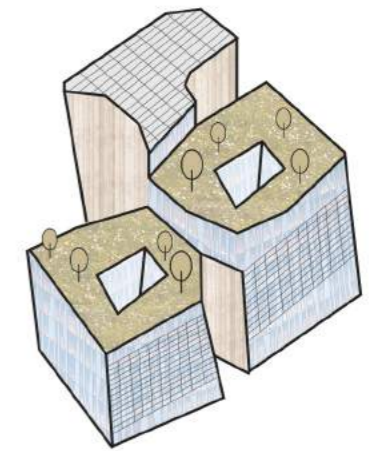
Parts of the facade are green, this helps to absorb rainwater, improves the air quality and reduces noise. It also insulates and is aesthetically beautiful

Rain water collection



Rain water could be collected on the roof and stored, then distributed on the green facade.

Solar energy



Parts of the Roof and facade are covered with building integrated solar panels. Roughly 2700 sqm of solar panels, providing the building with approx 400 MWh of solar energy annually. The same amount of energy can heat 30 villas for a year. (calculated with PVWatts)

Wood



For the structure of the building we have used as much wood as possible, as well as for the facade. This is sustainable as it stores carbon dioxide

Biodiversity



Image 5.

On the green roof and green facade we use local biotope suitable for the Nordic climate. These, instead of using exotic plants, increases the chances of a green facade all year round. It also promotes biodiversity

Site selection



By staying on the hospital site we can use existing infrastructure and avoid exploiting a new site that is today a natural recreation area. It is important to keep nature sites free to promote biodiversity.

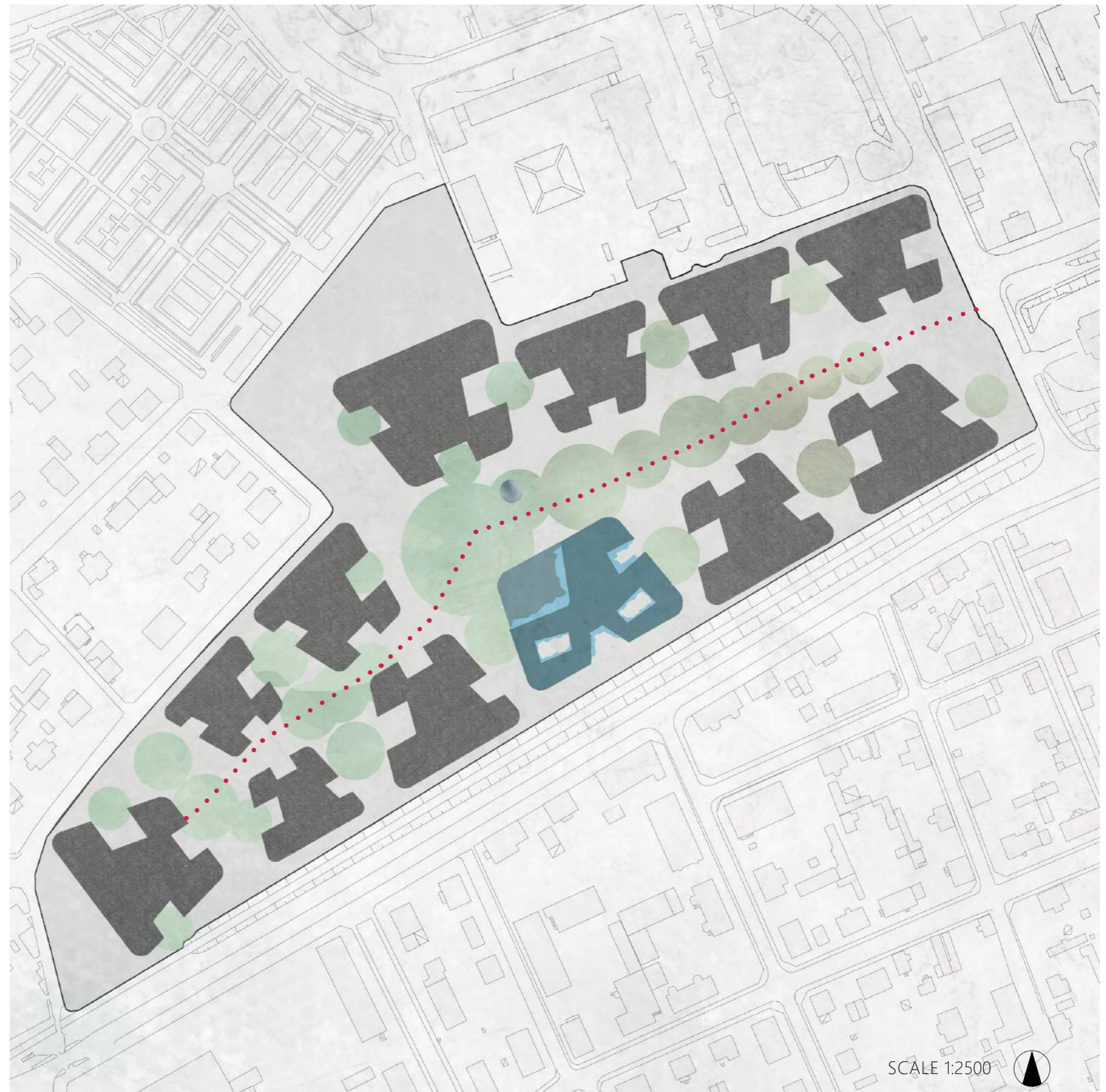
MODEL PICTURES



FUTURE MASTER PLAN

The future of Västervik hospital is exciting. The whole area is supposed to be revitalized in order to better suit health care today and in the future. When designing our proposal for the new psychiatry building we have had this in mind; imagining a new layout and vision for the whole hospital.

By continuing the same way of forming the volumes according to the site, the volumes open up more toward the center of the site. Here the courtyards facing each other create bigger public plazas. Each volume could have its own smaller cuts for more private courtyards. The placement of the future volumes create an inner street for pedestrians and bikes in the central part of the hospital and keeps cars on the outside. The inner street is surrounded by green paths and parks.



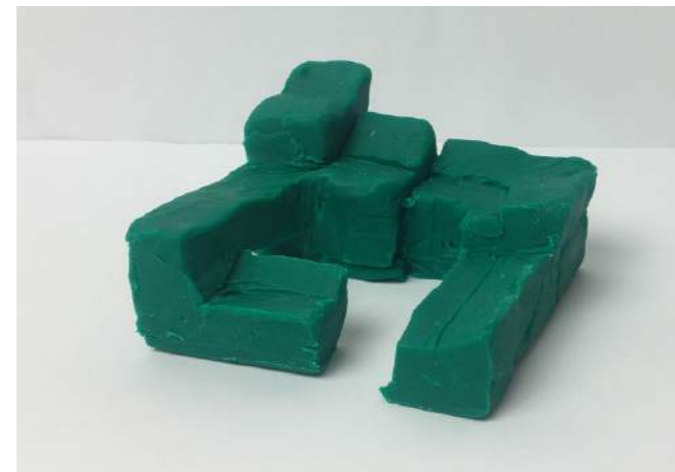
PROCESS

The first part of our design process was to experiment with different volumes and compositions to test how they influence the site and its character. These volume models were very conceptual and gave us an impression of what form strategy we could further develop in the context of the room program and which forms that are rather unsuitable.

We chose to work with a more solid volume that has excavated spaces, since it works better than spread out and combined volumes on this very dense site.



Stacking volumes
Height differences
One volume divided



Loosened structure- avoid massive high rise
Incorporate green areas in between
Using natural resources



solid vs void
Volume height in relation to existing
Organic vs sharp edges - what spaces are created in between?



Cut out organic
Combing/stacking volumes
Spaces in between



Cut out from volume sharp
One volume
Spaces outside



Excavating
Organic and square shape



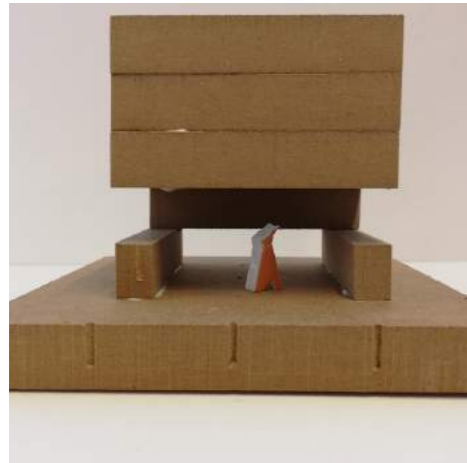
Repetitive unified outside
Organic asymmetric inside
Square block shape



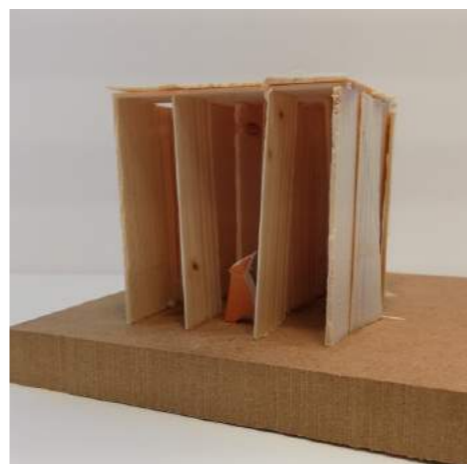
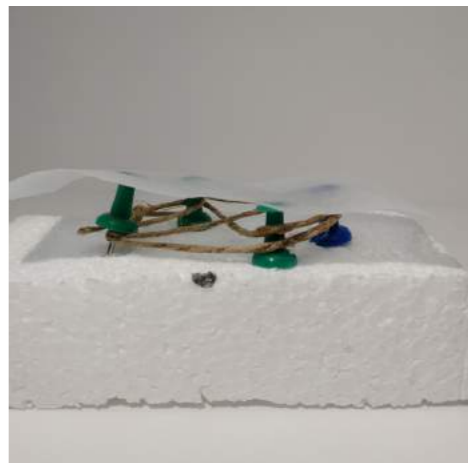
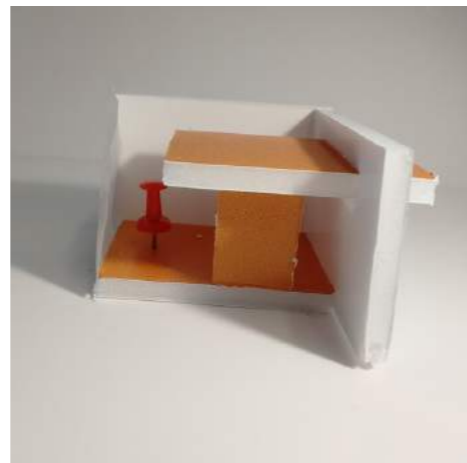
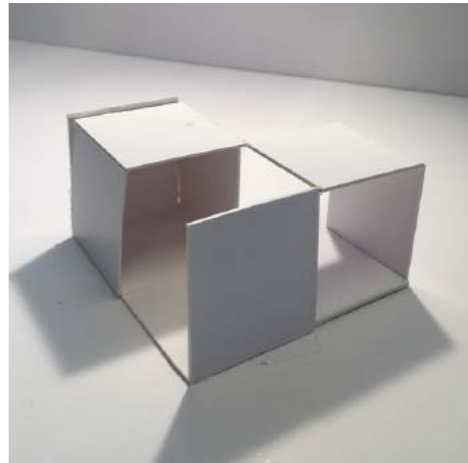
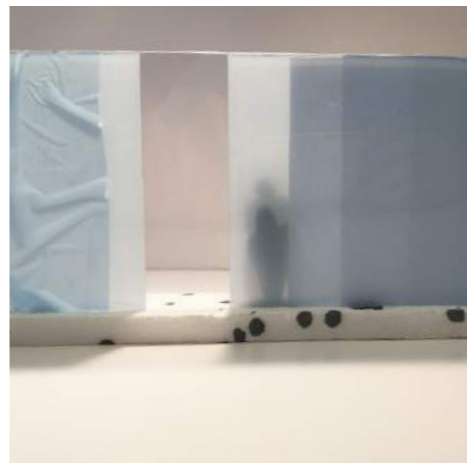
Sculptural solid volume
Open space by excavating

PROCESS

Models experimenting with different atmospheres that could be applied in the building



OPEN
LIGHT
OUTDOOR
TRANSPARENCY

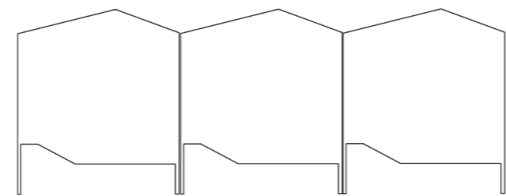


CLOSE
DARK
INDOOR
SOLID

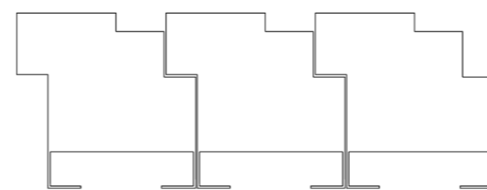
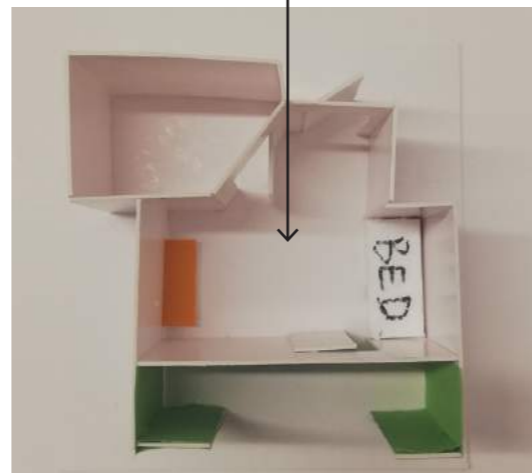


PROCESS

Working with models in 1:50 to develop the patient room layout. We knew we wanted to have a room with a private balcony since the hospital site is so dense and it is a challenge to create larger outdoor areas. By providing each patient with their own balcony, they all have the same access to fresh air and views.



Diagonal wall for clear observation
Diagonal bathroom with window
Wider and shorter room
Sliding doors

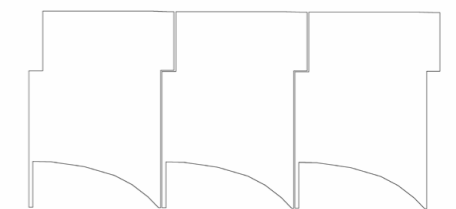


Diagonal wall on WC for observation
Room with possibility to add a second bed if wanted
Balcony with green filters for privacy

More narrow with, toilet "outside" of room
Diagonal balcony shape



Rounded balcony
Less view for observation
Double doors for access

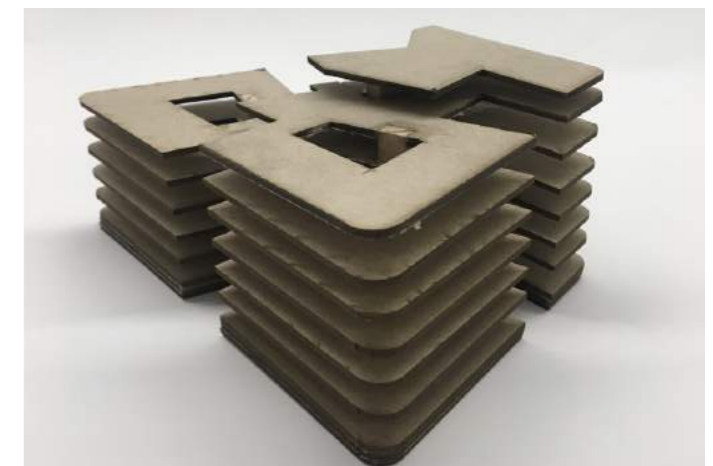
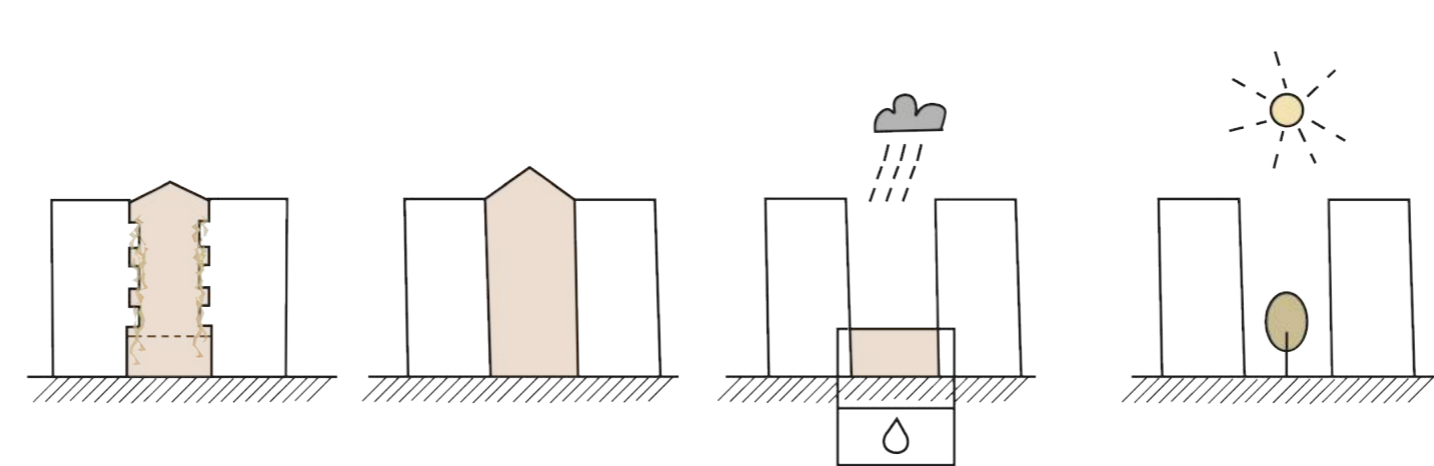
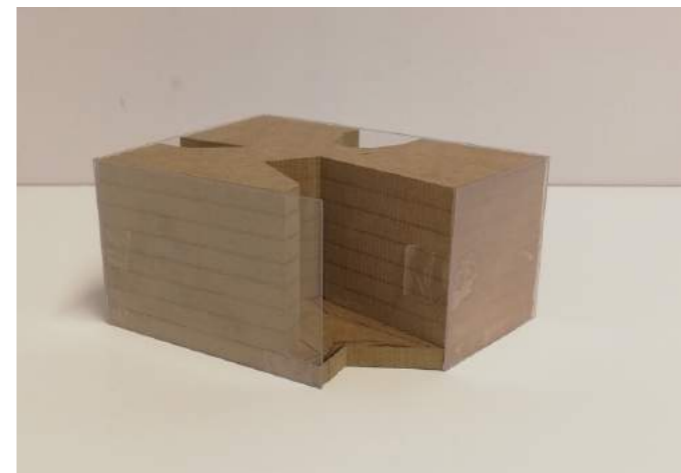
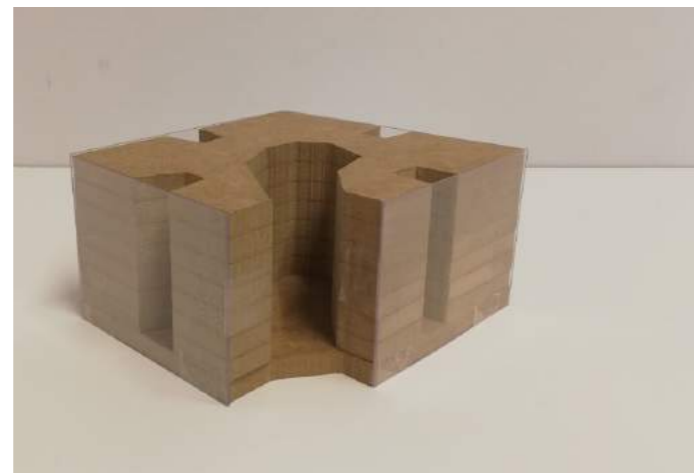


Wider bathroom, shifted towards the other room to create a desk area
Rounded balcony

PROCESS

These models shows some of the later design, after deciding on the concept of the amethyst stone. Here we started working more on the layout of a ward to see what form best suited the programs. As well as the vertical communication and flows to an from the building.

After testing the layout of the ward units we wanted to introduce light atriums. We tried different shapes and different ideas for their function.



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