

# The Healing Oasis

Nearby hospital in Frihamnen

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ARK262 Healthcare Architecture

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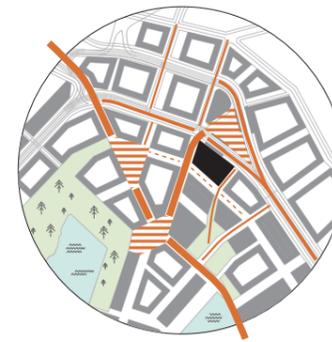
# Frihamnen and a new hospital



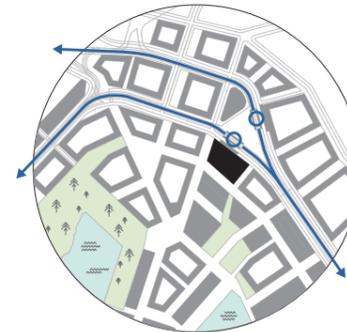
Gothenburg is planning to build a new city district in the old harbour area, Frihamnen, across the river from the city centre. Centrally located in this new district there will be a new “nearby hospital”.

The concept of nearby hospitals is quite new. In Gothenburg one nearby hospital exist today, in the suburb of Angered. The idea is to in the future have several of these smaller specialist hospitals spread out across the city. They will relieve the bigger hospitals of today so they in the future can focus more on high specialist care. The nearby hospitals will have different kinds of daycare services like imaging, day surgery and other more examination focused departments. In total it is expected to be made about 100.000 doctors visits to the Frihamnen hospital every year.

# The site



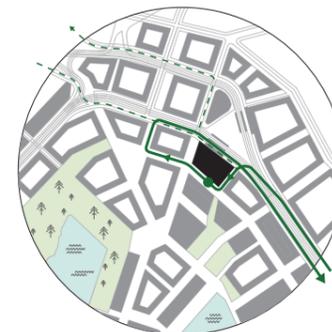
The orange lines shows how we imagine the movement of pedestrians around the hospital site, marked as black. “Squares” are marked with stripes. Larger amount of flows are marked with thicker lines. These flows builds on the plans for a new pedestrian crossing west of the new car bridge.



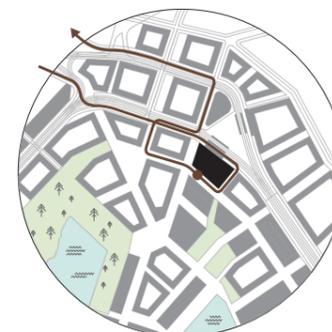
This diagram shows the tram and bus lines. The two local stops are situated at the square in front of the hospital. To get more space in front of the hospital the buses will stop at the same place as the trams.



The yellow lines shows some alternative routes of taxis and cars leaving or picking up patients in front of the hospital.



The nearby hospital does not have an emergency department, which means that in case of any medical emergencies the patient must quickly be transported to one of the hospitals equipped for this. An ambulance, most likely coming from the ambulance terminal in Gårda, can pick up patients on the back of the building. The likeliest route is over the new bridge, but the ambulance can also come from, or leave, through other routes.



This diagram shows the route of trucks delivering goods to the hospital. The trucks arrives from the highway to the north and drives around the building to the goods reception at the back side. We see this as the least busy street and it therefore fits these functions that needs to be more hidden.

# Site plan

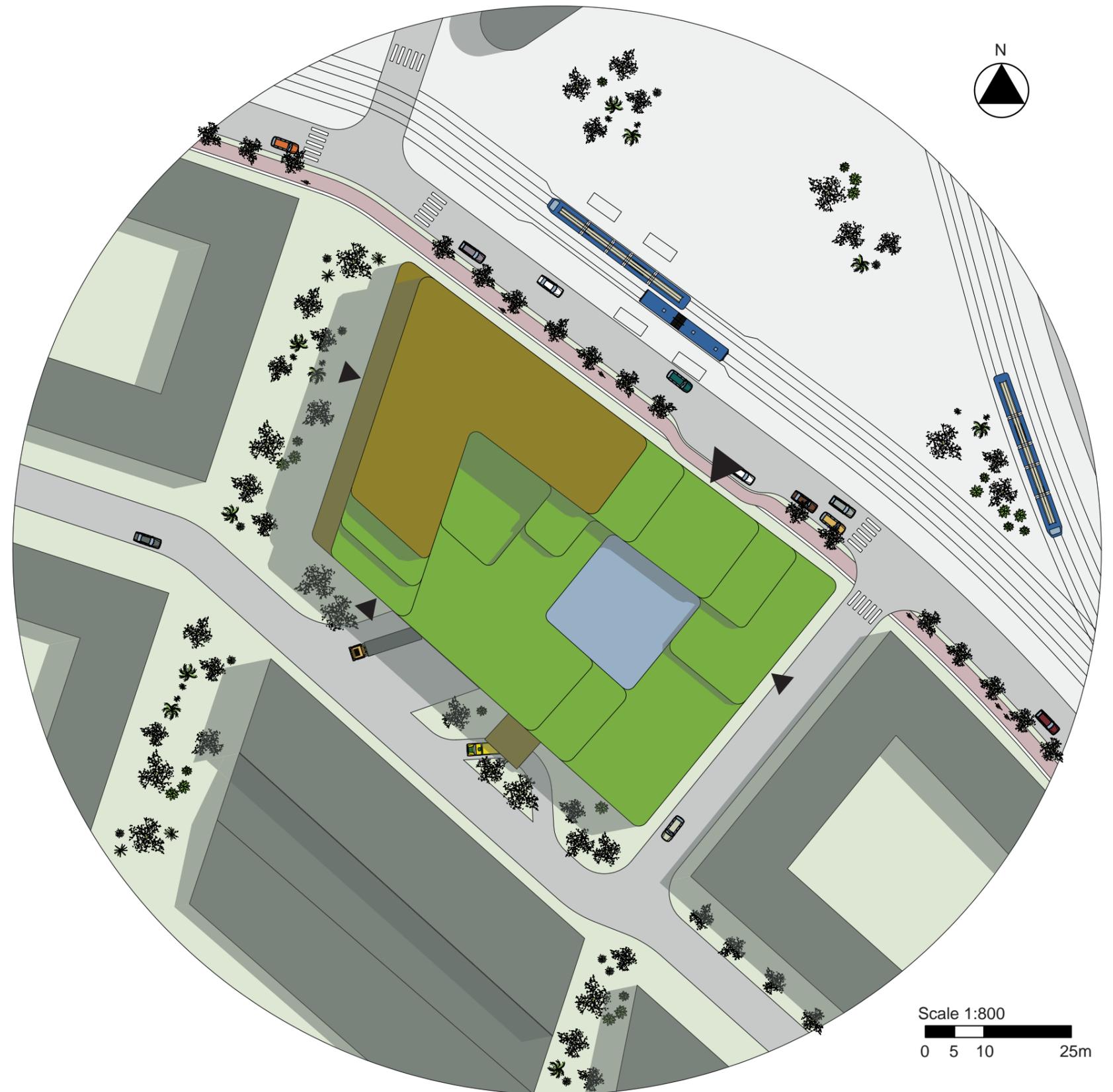
The hospital is situated next to a new large triangular shaped square. This square is where the tram and bus lines from the city centre divides between those going towards Lindholmen and those going towards Backaplan, Biskopsgården and further into Hisingen. This makes the square a major hub for public transportation. Because of the square and it's flow of people we have chosen to place the main entrance of the hospital on this side of the building. A gap in the line of trees along the road marks the entrance. A drop of zone for cars and taxis is placed here.

The street to the west of the hospital connects the square with the rest of Frihamnen, the piers, the river and the new jubilee park. This street will have a big flow of pedestrians and will therefore be free from car traffic. The width of the street will be filled with trees and greenery. A secondary entrance is placed along this street.

To the southeast a smaller less lively street will have some flow of people towards the square. Facing this street there will also be a smaller entrance.

The back side of the hospital, towards the south will be the least busy area as it is parallel to the square and not as many people will take this route. This side of the building will be more closed and filled with functions needed for the hospital. The staff entrance, goods reception and ambulance pick up point is placed here.

Along the three more public sides of the building there will be an arcade surrounding the building at street level. This is done to give the quite big building a more human scale and to relieve citizens of the sometimes very wet Gothenburg weather.



# Themes

In the beginning of this course we were introduced to four themes about healthcare architecture and how to work with it. Some of what we learned is summed up here. These are what we viewed as most interesting and what we have focused on with in the project. During this phase we found our vision and it builds on things we learned when working with the themes.



## 1. Healthcare + Architecture

The first theme was mostly about the history of healthcare architecture. What have been the main focus through different times and what is the future development we, as architects, need to keep in mind? We took with us the idea that **nature and daylight** can have a healing effect which was forgotten during the 60s and 70s. We also want to work with how **e-health** can be implemented, and **patient centred care**.



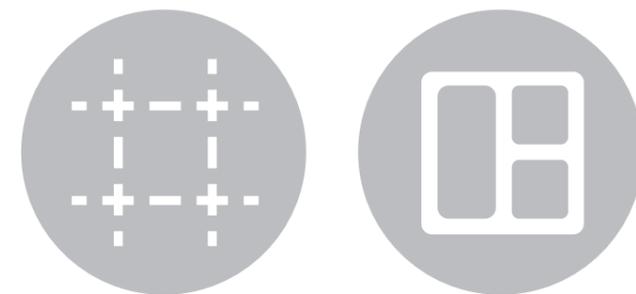
## 3. Health promoting

This theme taught us about how designing buildings can either make peoples daily life healthier or unhealthier. How accessible we make things in the city and within buildings affect what choices people make, for example choosing between stairs and elevators or walking or taking the car. **This is health promoting and active design**. From this theme we also brought with us how **garden work** can help reducing stress and improve peoples health. The last thing is that being in nature can help us **restore our minds** which is needed in a world full of impressions that we live in today.



## 2. Healing Architecture and Evidence-based design

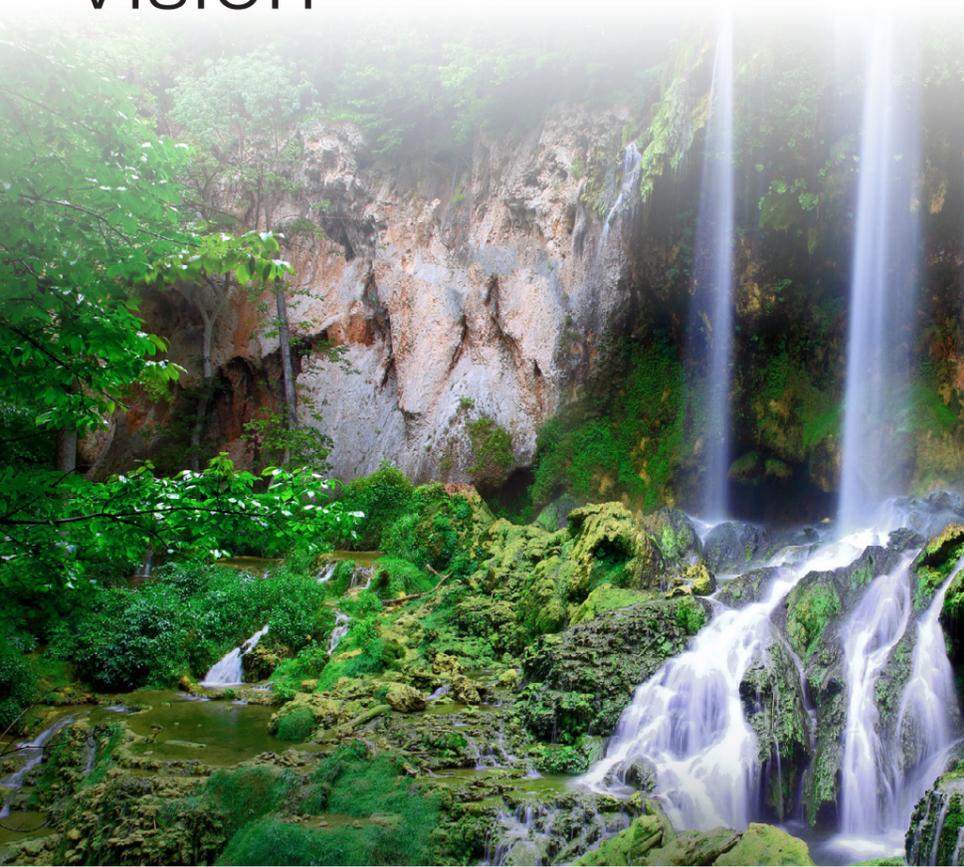
Theme two was about how the architecture of healthcare buildings can contribute to better health for patients, and also for the staff. Evidence-based design, EBD, is a process where results of studies of healthcare architecture creates a base for future design. For example, if studies shows that something architectural improves the result of a hospital that thing is developed further in future projects. What we bring with us is how architecture and nature can help in **reducing pain** and **reducing stress**. How architecture can improve **communication between patient and staff**. How **clearness** and **easy flows** improve the work of the staff and how the patients experiences the healthcare. Finally we bring with us the importance of **preventing diseases** from spreading and how this can be done, for example in the use of single patient rooms.



## 4. Future Proofing – structuralism, flexibility and generic space

The last theme taught us to structure the building in a general way so that it can change over time. As the technology and way of working with healthcare changes fast, the building needs to be able to change as well. Working with a clear **structural grid** and **general sized rooms or modules** can make the building work long into the future.

# Vision



Our vision for the new hospital in Frihamnen is a hospital where nature and greenery plays a big role in improving the healthcare. Research shows that greenery can be beneficial in many different ways, some of which are illustrated and explained more thoroughly here.

The way we want to bring nature to the new hospital is mainly to work with green terraces, onto which patients, staff and others can move around and benefit from the healing powers that nature brings. The views over these terraces will also have good impact on both patients and staff. We have also worked with bringing greenery in to the hospitals public areas and waiting areas as well as trying to maximise access to natural daylight. Natural materials, mainly wood is used both on the facade and in the interior.

We also envision our hospital to be green in the aspect of sustainability, the way it is built and the materials used. It is important that public buildings promote and lead the way in sustainable building.



## Reduce stress

Research suggest that being in nature or just having views of nature from your window reduces your stress level. This can improve patients recovery as well as the staffs performance.



## Reduce pain

Views of nature do not only reduce stress but also pain. Research done by professor Roger Ulrich shows that patients who had views over greenery experienced less pain and could leave the hospital earlier than those who did not.



## Restorability

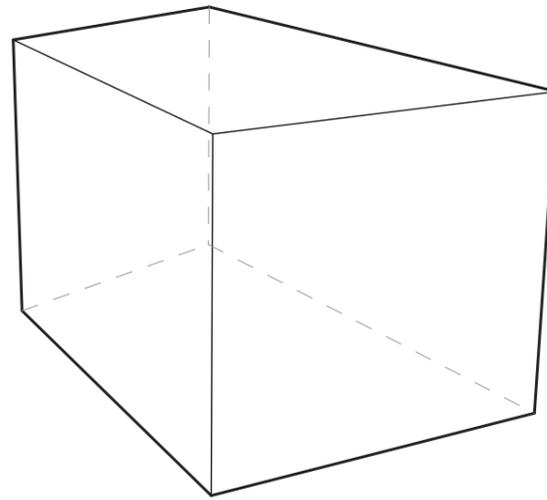
In today's world people get a lot of impressions every day. This can sometimes be too much. To relax and to recharge your batteries is good for your health, and research says that this is done more effectively if you are surrounded by nature.



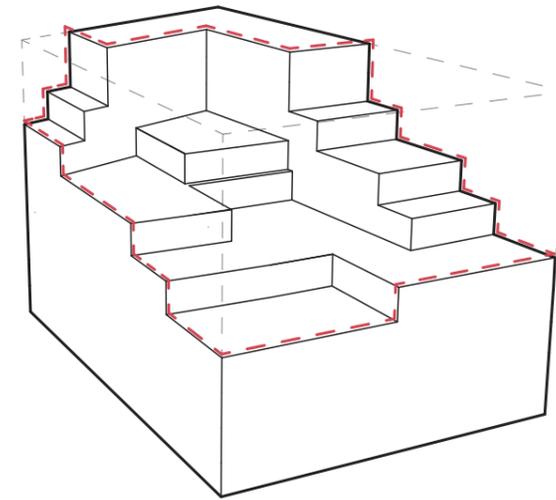
## Cooling

Urban environment tend to be warmer than the surrounding nature. This is due to the hard, heat storing materials like asphalt and concrete. To ad greenery within the urban context creates a cooler area in the city. At the same time the plants helps cleaning the air from different pollutions.

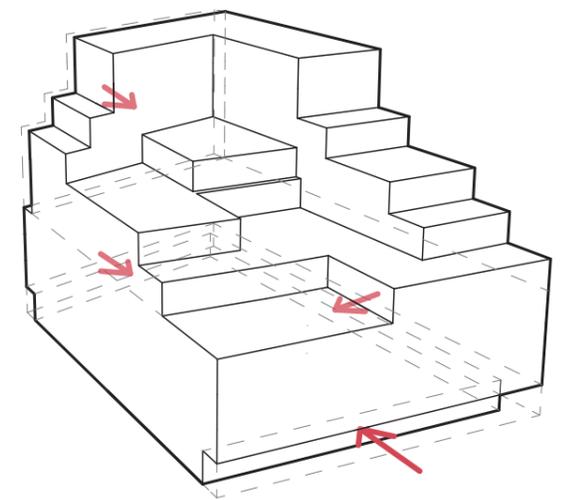
# Building concept



1. Filling the whole site with a big volume.

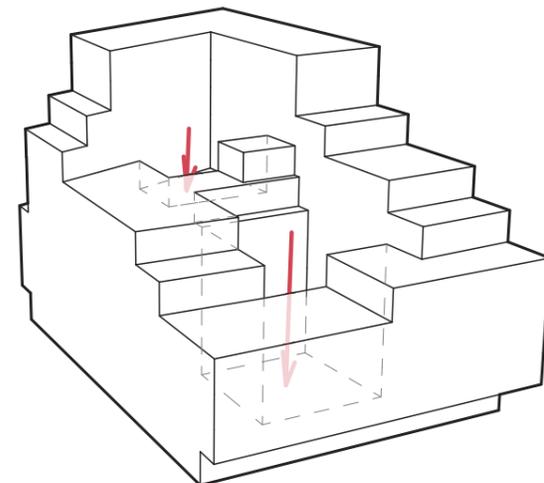


2. Stepping the volume down towards the south and creating terraces.

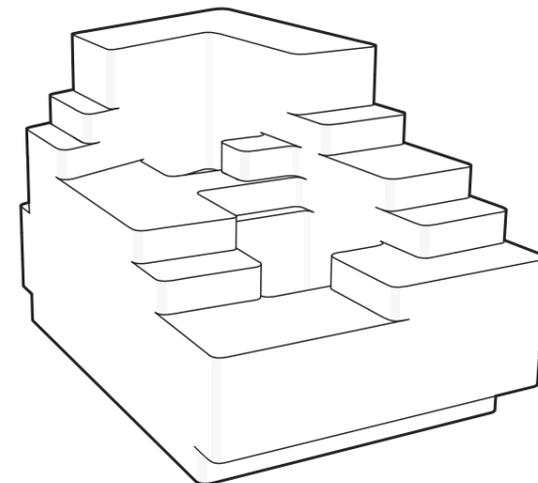


3. Creating a more human scale towards the streets by cutting of pieces of the volume.

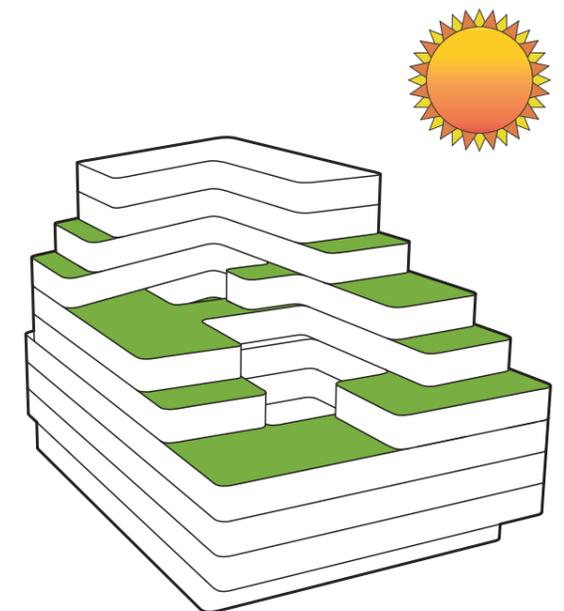
Our concept is to orient the building towards the sun to provide ample natural daylight. We do this by letting the building volume step down towards the south, creating a number of different sized terraces. These terraces are to some extent inspired by traditional Asian rice field terraces.



4. Cutting out courtyard and atrium to get daylight to the centre of the building.



5. Giving the corners a rounder shape to make the building feel more soft and caring.

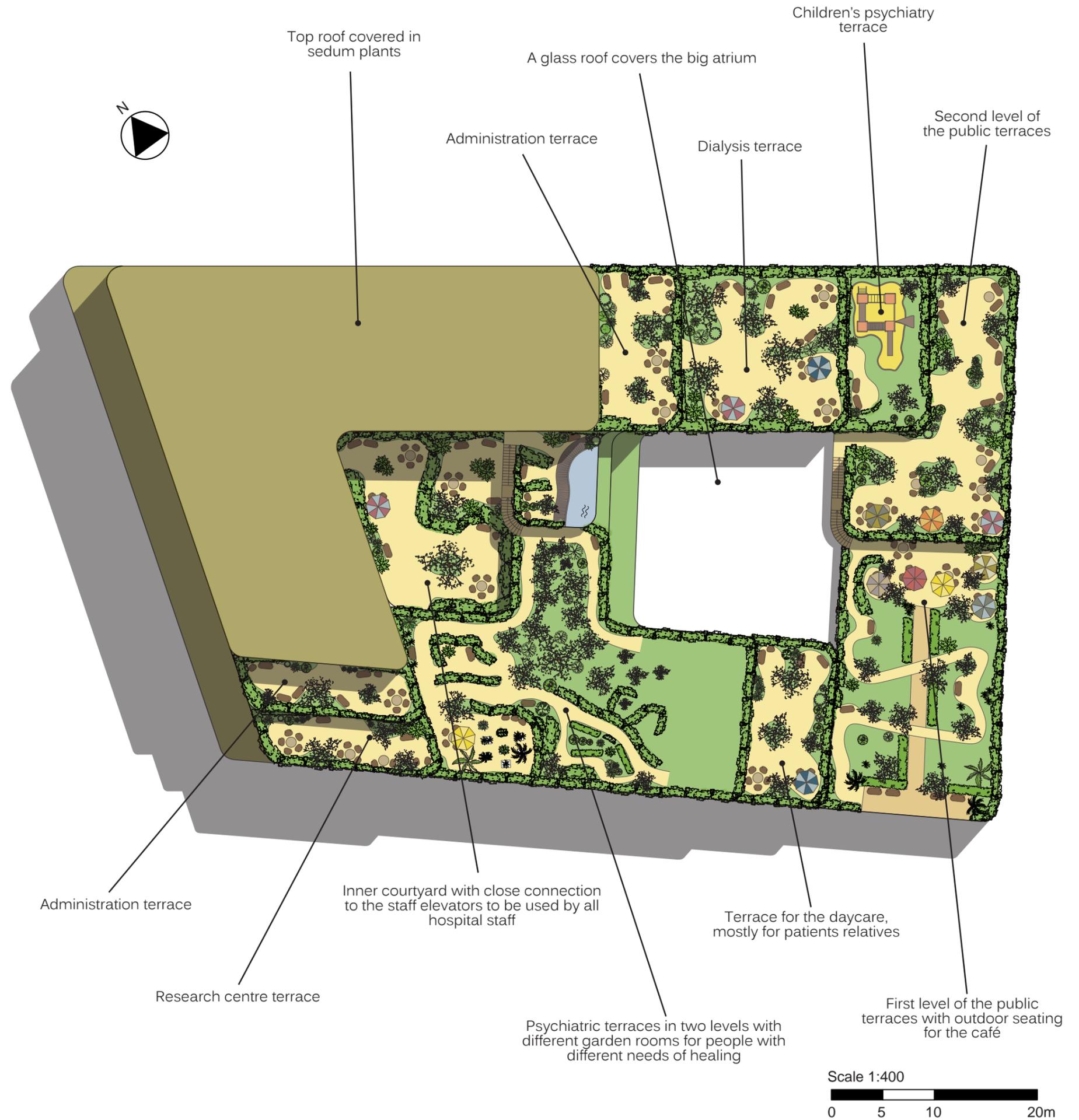


6. Adding greenery on the terraces.

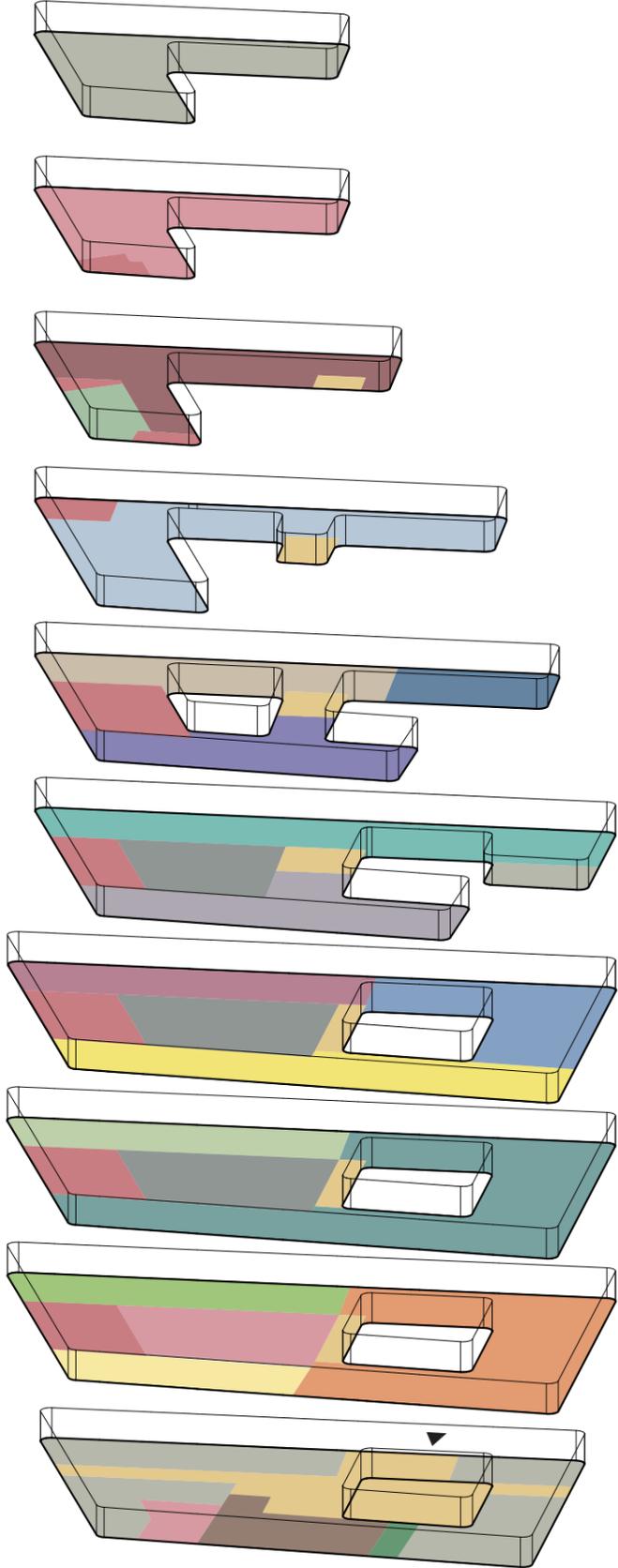
# Terraces



A total of eleven terraces, all with different design, will cover the hospital in nature and life. The building have been designed in a way that makes the terraces able to cooperate with the departments inside, for example the largest terrace is connected to the psychiatric department due to the psychiatric patients having the most use of the terraces. Two terraces are public and can be reached from the entrance floor. To be able to escape the hectic city is a chance for people to improve their own health and thereby reducing the cost of the Swedish healthcare system. The terraces will not only benefit humans but also animals in Gothenburg. Creating spaces for animals, such as birds, will make them more visible for us and they can work as distressing factors in our daily life. To have a green view that is always changing throughout the year will hopefully make the staff of the hospital more alert and more effective in their work. All these things are reasons to pay that extra cost that these terraces will be. It will pay for itself in the long run.



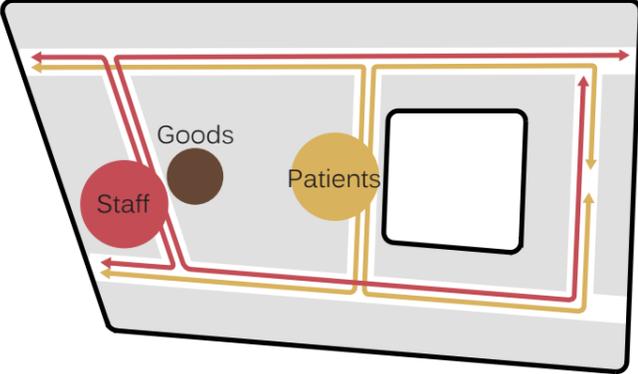
# Program distribution



Floor 9	Restaurant and conference	880 m <sup>2</sup>
Floor 8	Administration	880 m <sup>2</sup>
Floor 7	Dialysis Research centre	780 m <sup>2</sup> 240 m <sup>2</sup>
Floor 6	Psychiatry	1420 m <sup>2</sup>
Floor 5	Pain centre Endoscopy Daycare	650 m <sup>2</sup> 330 m <sup>2</sup> 690 m <sup>2</sup>
Floor 4	Surgery Pre- and post operation	1040 m <sup>2</sup> 800 m <sup>2</sup>
Floor 3	Rehabilitation Children specialist Imaging	680 m <sup>2</sup> 840 m <sup>2</sup> 940 m <sup>2</sup>
Floor 2	Orthopaedics Adult specialist	550 m <sup>2</sup> 1860 m <sup>2</sup>
Floor 1	Sampling Primary care Ear nose and throat	530 m <sup>2</sup> 1450 m <sup>2</sup> 410 m <sup>2</sup>
Entrance	Commercial area Lobby Goods reception	1480 m <sup>2</sup> 1050 m <sup>2</sup> 470 m <sup>2</sup>

## Logic of the program

The total floor area of the building is 23.130 m<sup>2</sup> divided onto ten floors. The program is distributed in a way that the departments with the biggest flows of patients are situated close to the bottom of the building. For example primary care and sampling will have many short visits. Higher up in the building are departments with less flows to them and also departments that are more likely to benefit from the greater views. One example is the dialysis department where patients will stay for many hours. Other considerations was that the departments should be placed so that similar ones are close together making cooperation between staff easier.

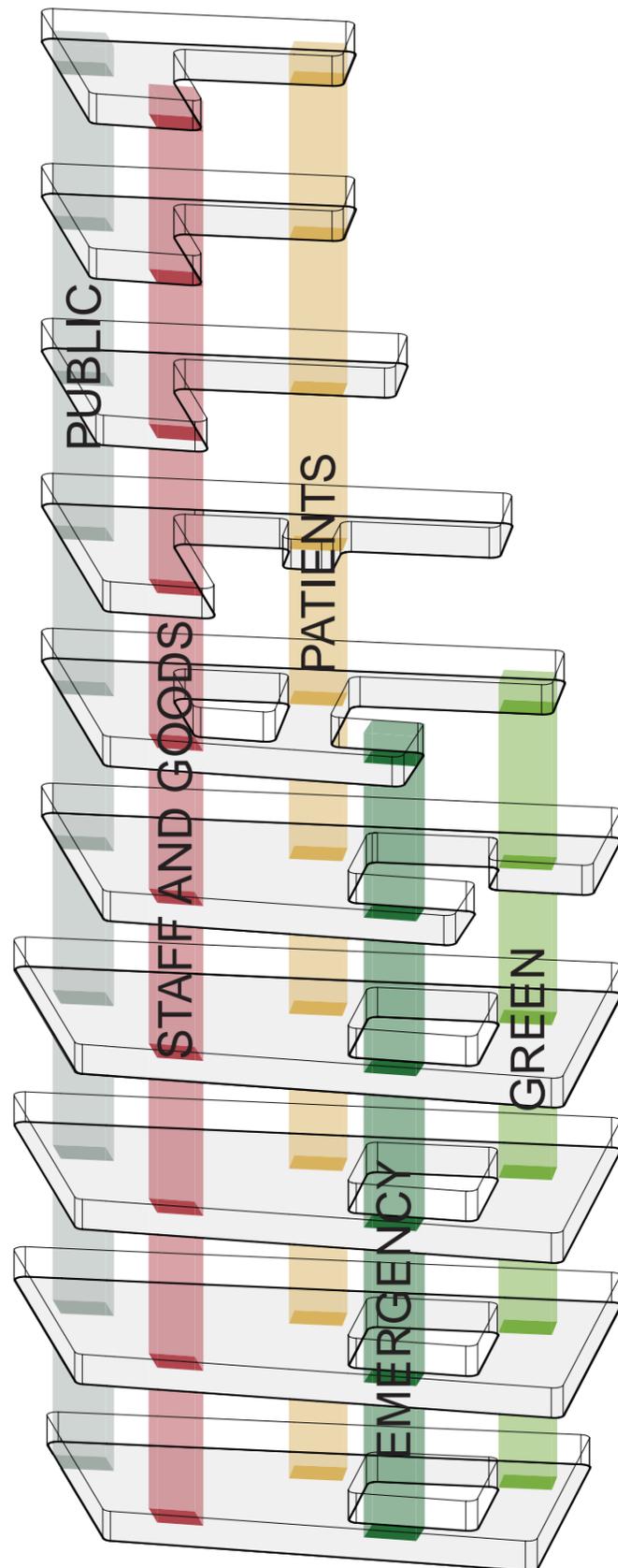


## Staff, patients and goods

The raspberry red and sandy beige that can be seen on almost every floor represent staff areas and waiting areas. The staff areas include the main lunch room for the staff on every floor as well as the offices for that floors departments administration. These areas are placed in close contact with the staff elevators. The goods use the same elevators as the staff, and a storage room is always placed next to these elevators.

The waiting rooms are always placed in direct connection to the patient elevators on each floor. This is to make way-finding easy for the patients who won't be able to get lost. In the main reception the patient gets directed to a specific floor, in which waiting room he or she will be picked up by the doctor. The waiting rooms are furnished in a way that both big families and lonely patients can find a secure place to sit.

# Vertical flows



The building has five vertical shafts containing stairs and elevators. They are evenly spread out which solves fire evacuation requirements everywhere in the building. Having spread out vertical flows is also good in a flexibility perspective, in the future some part of the building might become something else than a hospital and then separated flows are needed. As for now all elevators have their own area of use.

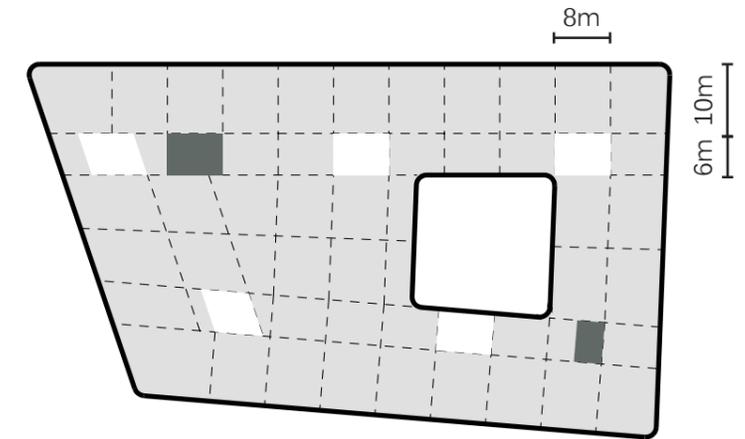
The patients use the most centrally located elevators which shortens their path through the building, making it easy for them to find their way.

Staff and goods shares elevators which starts by the goods reception and the staff entrance on the bottom floor and goes all the way to the top of the building.

The “public” elevators are for non-patients visiting the roof top restaurant and conference. The public elevators can also be used by administration staff to reach the second highest floor. This is the safest stairs and elevators which can be used by rescue services during a fire.

The emergency elevator is used for transporting patients in beds between imaging, surgery and daycare. It will also be used for emergencies, if a patient needs to take the ambulance to another hospital.

The “green” shaft is for people visiting the public terraces, where there is a café. These stairs can also be used by staff going between floors.



## Structural grid

This grid shows the load bearing structure of the building. Where the grid lines cross there are pillars that carry the weight of the building. The grid is made to make the inside of the building flexible. The five vertical communication shafts (marked in white) contain stairs and elevators and also stabilise the structure. The dark grey squares show the location of the shafts for ventilation and other technical functions. The main technical areas in the building are situated on floors 2-4.

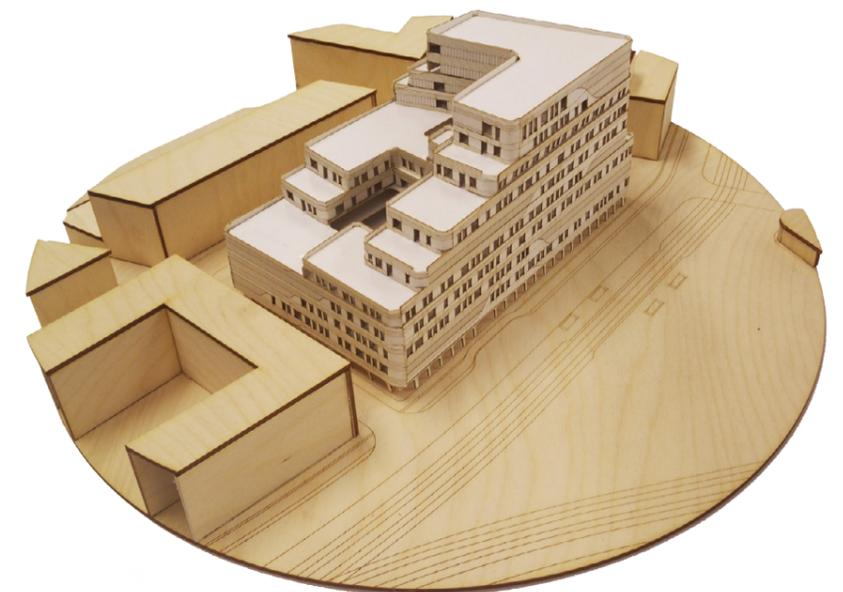


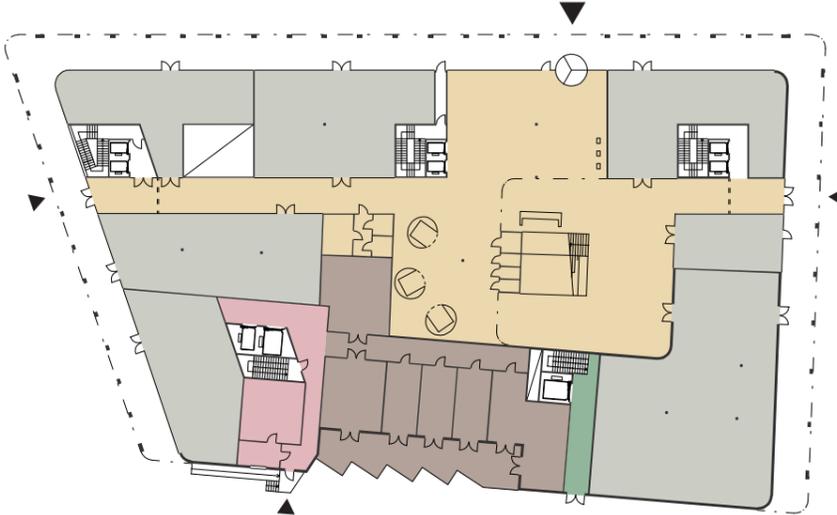
Photo of physical building model.

# Plans



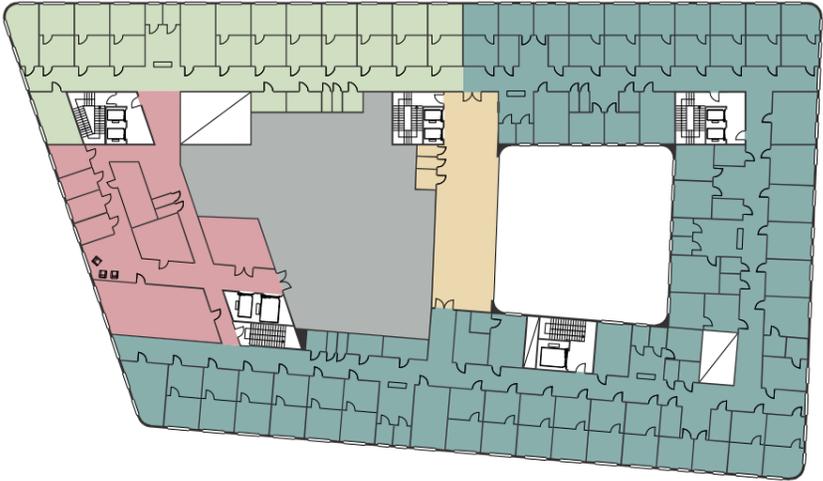
Most departments in the hospital look similar. A general design makes the hospital flexible. Departments can easily move around without any big changes to inner walls. Some departments need to look different, for example the surgery and rehabilitation because of their need for more specialised rooms. We have managed to solve this while still keeping the rooms within our structural grid. Some of the most general rooms can also be found in these otherwise different departments.

Entrance floor



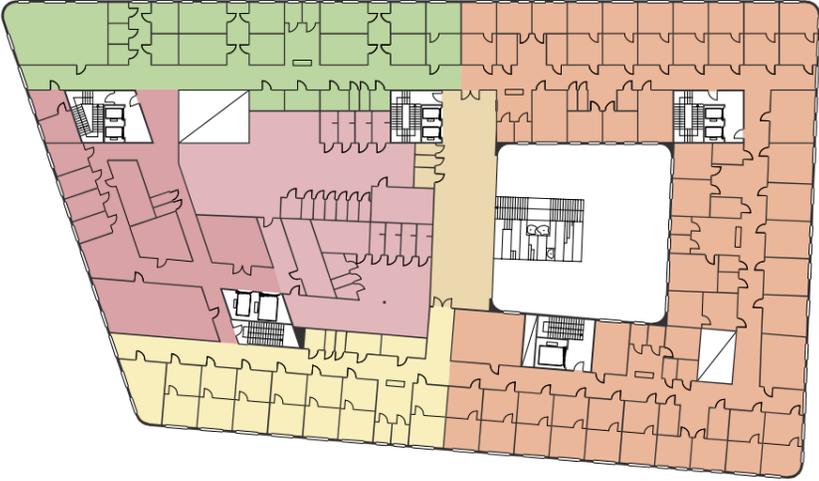
- Commercial areas
- Lobby
- Goods
- Staff entrance
- Exit to ambulance

2nd floor



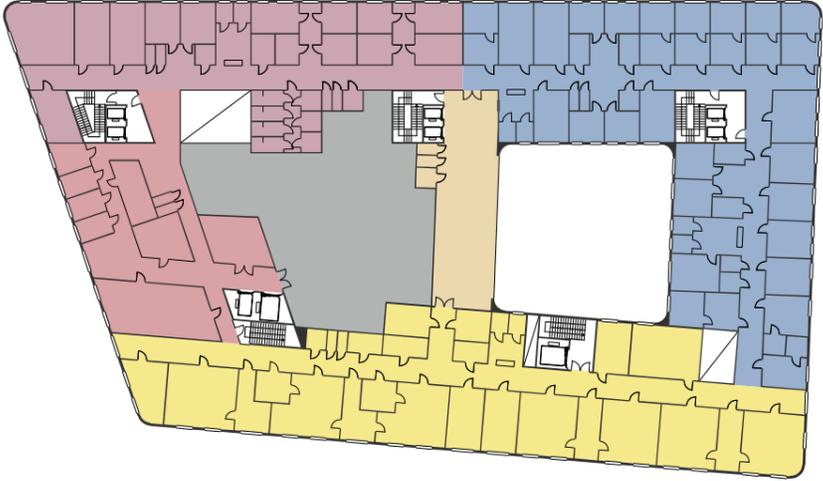
- Orthopaedics
- Adult specialist
- Staff area
- Technical area
- Waiting room

1st floor



- Sampling
- Primary care
- Ear, nose and throat
- Staff area
- Changing rooms
- Waiting room

3rd floor



- Rehab
- Children specialist
- Imaging
- Staff area
- Technical area
- Waiting room

4th floor



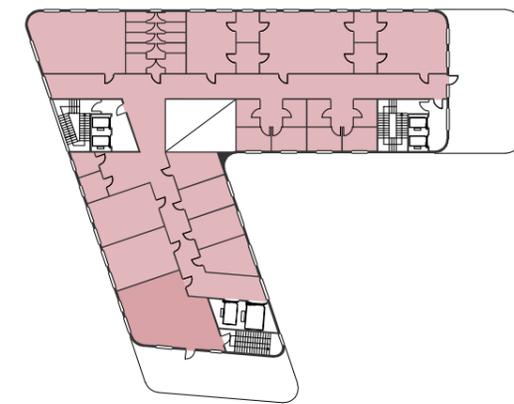
- Surgery
- Pre- and post- operation
- Café
- Staff area
- Technical area
- Waiting room

6th floor



- Psychiatry
- Staff area
- Waiting room

8th floor



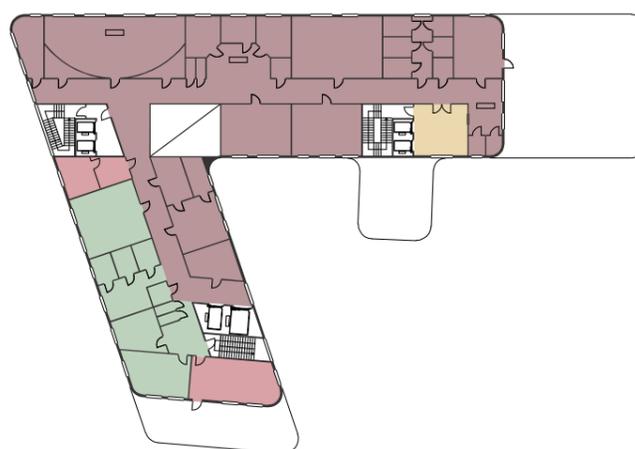
- Administration
- Staff area

5th floor



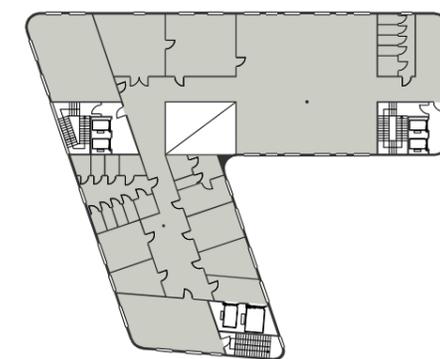
- Pain centre
- Endoscopy
- Daycare
- Staff area
- Waiting room

7th floor



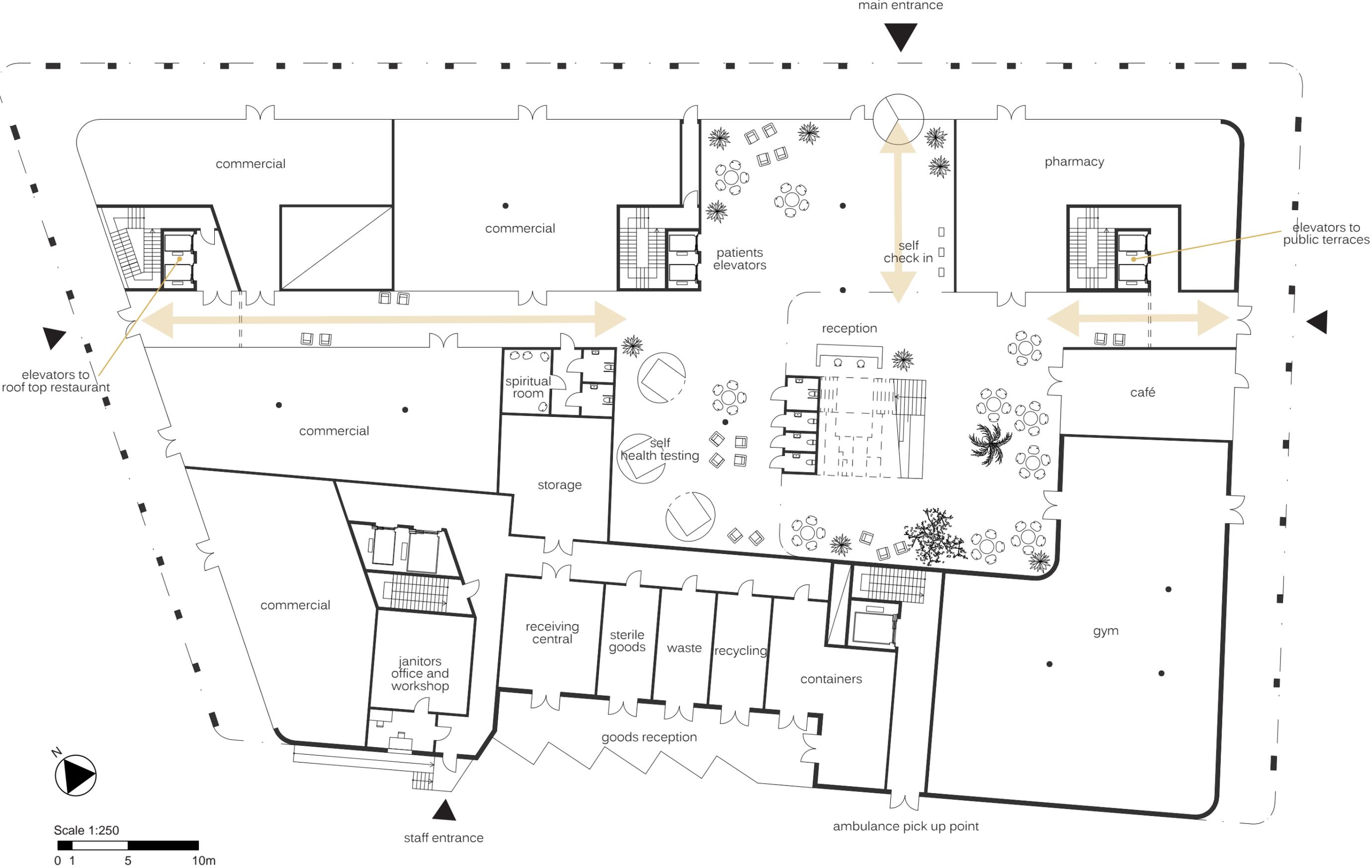
- Dialysis
- Research centre
- Staff area
- Waiting room

9th floor



- Restaurant and conference

# Entrance floor



## The green lively lobby

The lobby is situated centrally on the buildings entrance floor. Daylight comes down through the atrium, and plants and trees welcomes the guests. Visible from the main entrance is the reception, the patient elevators and the self check in stations where you as a patient can check in without going to the reception. In the atrium there is a wide stair with seating leading up to the first floor where the primary care, sampling and ear, nose and throat departments are situated. We imagine the largest flow of patient to these departments and therefore we placed them on the first floor. This also promotes a healthy use of the stairs. Behind the big stair are three self health testing booths. These are also health promoting in the sense that they encourage ordinary people to take easy tests of their health.

The lobby can also be reached through the passage that runs through the entrance floor. This passage connects all the three elevator shafts that can be used by the public.

The idea behind the open easily accessible and very public lobby is to make the hospital less intimidating. This is further implemented by letting commercial stores have entrances towards the inner passage. The hospital lobby becomes a public part of the city that you regularly meet in your daily life, not only as a patient.

## Staff and goods

Hospital staff have their entrance on the back side of the building. Here they can easily reach the stairs that takes them to their changing rooms on the next floor. The goods, that uses the same elevators as the staff but during different hours of the day, also have the reception at the back of the building. Next to the goods reception is the ambulance pick up point outside the emergency elevator.



View from from the lobby towards the main entrance.

# Surgery floor

3. Surgery room with preparation room



4. Post operational area

2. Pre operational area



Scale 1:250  
0 1 5 10m

## The surgery floor

The surgery floor is made up of the clinical surgery area on one side of the building and the more busy pre- and post-operational department on the other side. A wide corridor connects the two departments. Both departments have direct connection to the shared staff area. If a patient for some reason needs extra care or a longer stay after surgery the bed-sized emergency elevator connects the pre- and post-operation with the daycare department on the floor above. This elevator can also take the patient down to the imaging department on the floor beneath if any kind of x-ray is needed before or after the surgery. This elevator will also be used if there is any complications and a patient needs to be taken to a bigger hospital.

## The patients way

The flow for a patient doing some kind of surgery is as follows. The patient arrives to the waiting room and gets welcomed by staff from the reception (1). Here the patient changes her clothes and can have a private conversation with the doctor that will do the surgery. Then the patient goes to the pre-operation area where she will get different kinds of preparations for the surgery done (2). From here the patients will be carried in a bed or walk to the surgery. She passes the toilets where she will do an obligatory visit. Before the patient enters the surgery room she comes to a smaller preparation room where, for example, anaesthesia will be made if needed (3). After the surgery the patient gets carried in her bed to the post operation area (4). Here the patient will be supervised by staff while waking up. When the patient is ready she goes back to the reception area where she can change back to her own clothes (1). Before she leaves the staff needs to see that she can use the bathroom and eat something. The patient will also have a final conversation with her doctor and after that she can go home. The fact that the patient meets the same staff when she is welcomed and when she leaves gives her a big feeling of security.

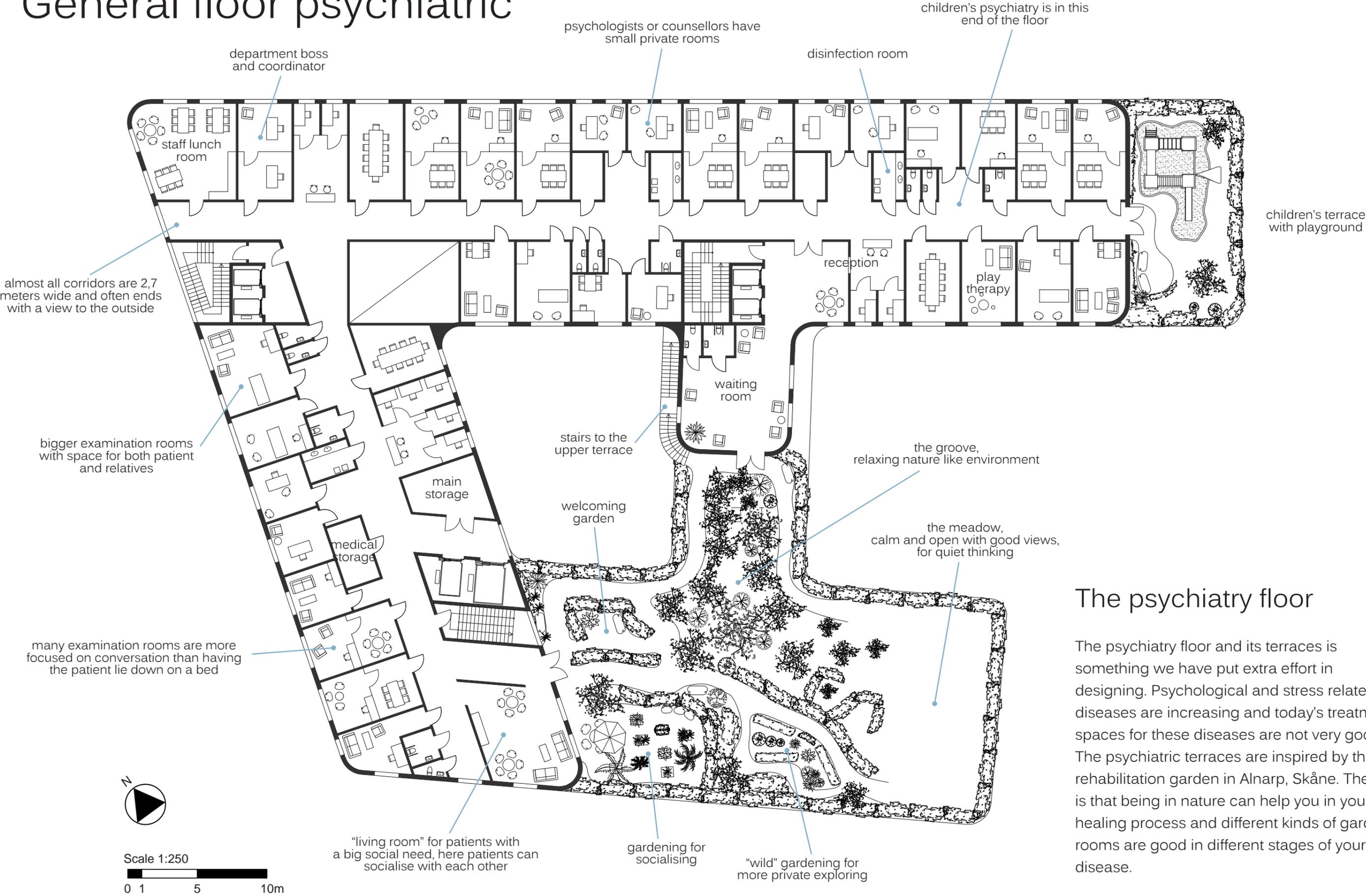


▲ View of the staff area.

▼ View from the children's psychiatry department.



# General floor psychiatric



## The psychiatry floor

The psychiatry floor and its terraces is something we have put extra effort in designing. Psychological and stress related diseases are increasing and today's treatment spaces for these diseases are not very good. The psychiatric terraces are inspired by the rehabilitation garden in Alnarp, Skåne. The idea is that being in nature can help you in your healing process and different kinds of garden rooms are good in different stages of your disease.

# General department

All rooms in the hospital fits into the structural grid. The diagram to the right shows how the rooms in a general outpatient department are fitted in to this grid.

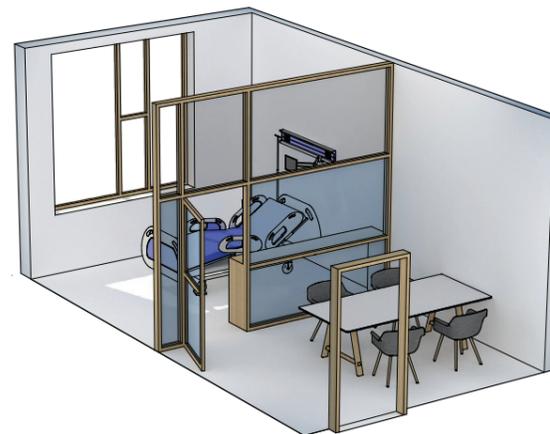
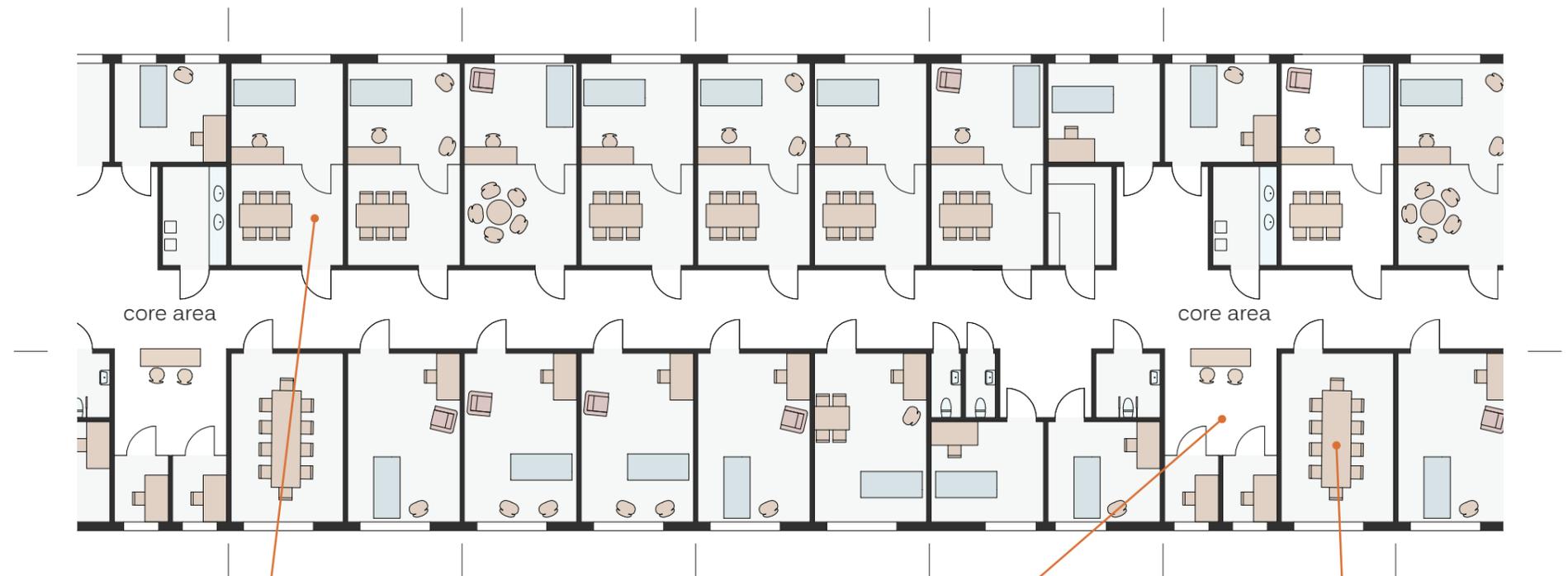
Each department has one or more administration cores. This is the hub for staff working in the surrounding examination rooms. The administration cores are evenly placed within the departments so the staff won't have to walk too long distances. The core is surrounded by supporting functions such as a meeting room, medical storage, disinfection and toilets. The idea is that one multi professional staff group of doctors and nurses occupies each core area.

## Interior architecture

The design of the interior spaces builds on the vision that nature and daylight is good for people. The colours of the interior are mostly white and other light colours. To avoid making the hospital feel clinical and intimidating to patients details in wood are used to create a more familiar feeling. Wood is of course also a natural material and it connects the interior with the nature on the terraces and the wood used on the façades. The inner ceilings are made of sound absorbing materials to keep the noise level down. This is important both for patients but most of all for staff who get stressed and sick of being to long in a noisy environment.

Scale 1:200

0 1 5 10m



The standard examination room has one examination area and one conversation area. The conversation area is big enough for accompanying relatives. After a meeting with a patient the doctor can stay in the room to do necessary computer work.



The administration core has two private rooms for when a bit of seclusion is needed. Glass walls lets daylight in to the more open staff meeting place. This is the natural meeting place between staff.

One administration core on every floor also works as a reception for the waiting room.



One bigger meeting room is always situated next to the administration core, this room can be used both for meetings between the staff and bigger meetings with patient groups or relatives.

# Façade

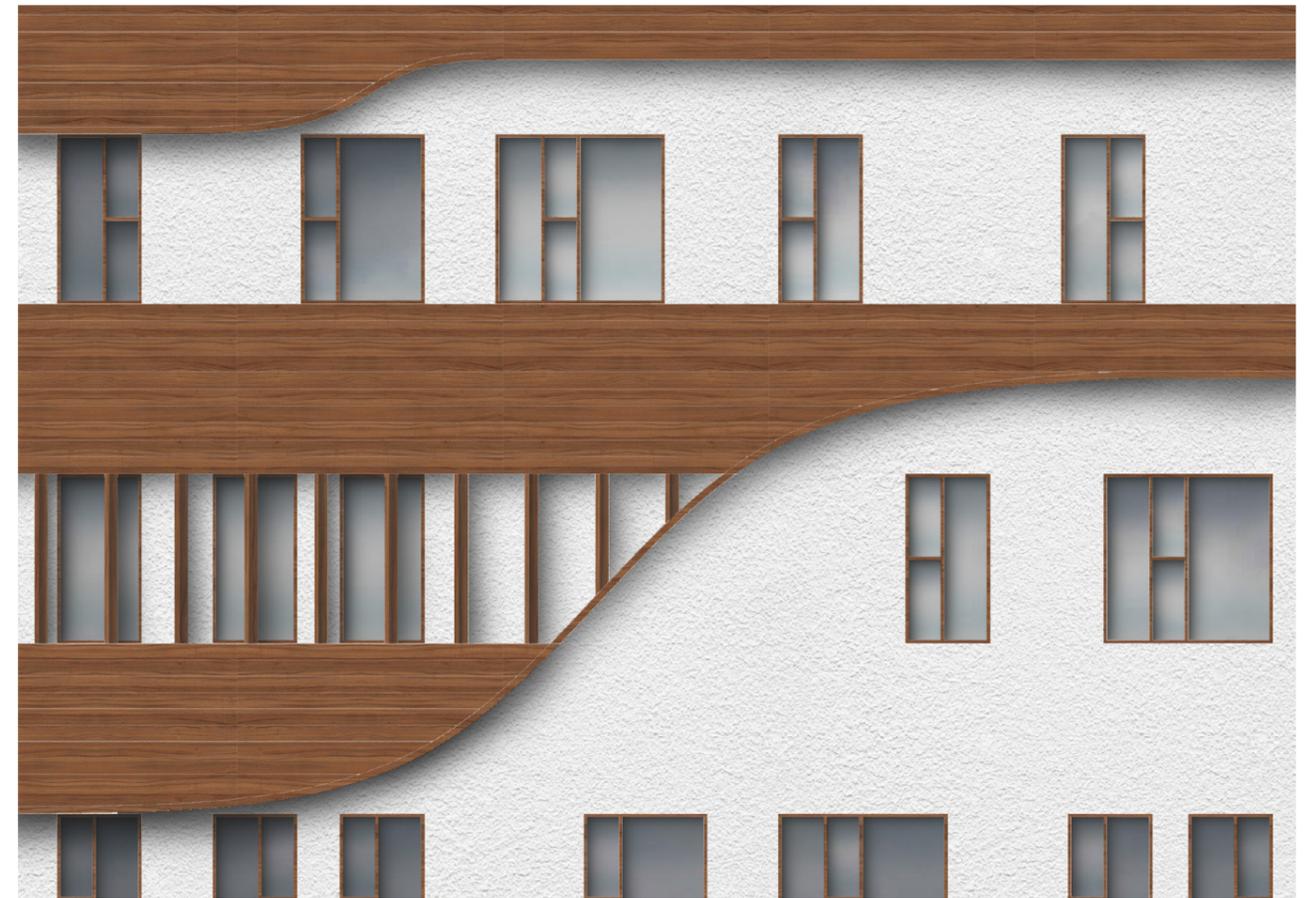
The façades are made of white concrete partly covered with wooden panels. The inspiration comes from both the curvy, organic shapes of nature and the design of the ships that once was lying along the quays of Frihamnen. The vertical wooden panels works as sun shading and rotates to follow the angle of the sun. To make the most of this the façades towards the south have more wooden panels than the more open and white façades to the north. The main entrance is effectively marked by the white areas of the facade and the opening in row of pillars along the arcade.



Wood



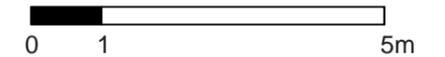
White concrete



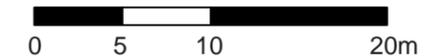
▼ Façade towards the square

▲ Zoomed in area of the façade

Scale 1:100

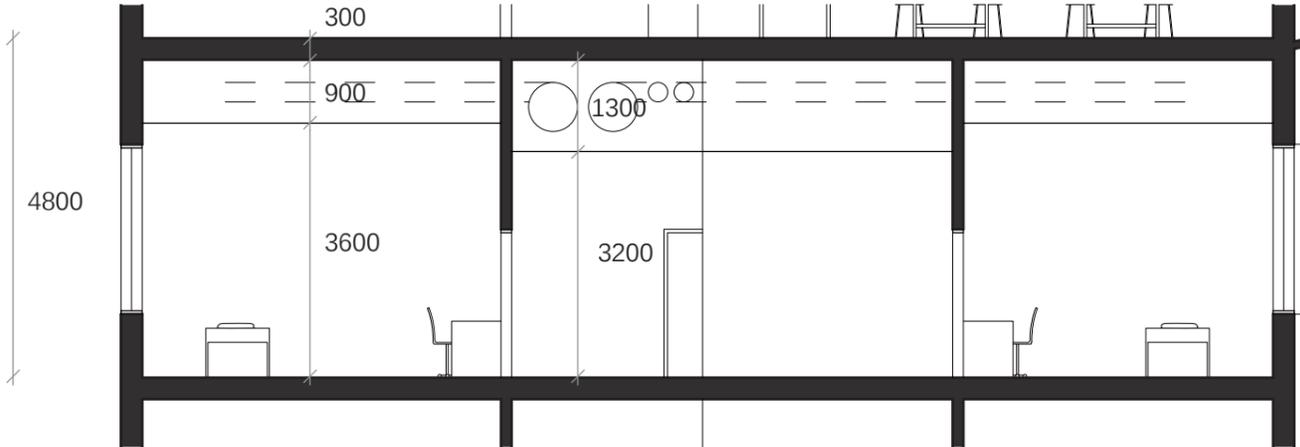


Scale 1:400

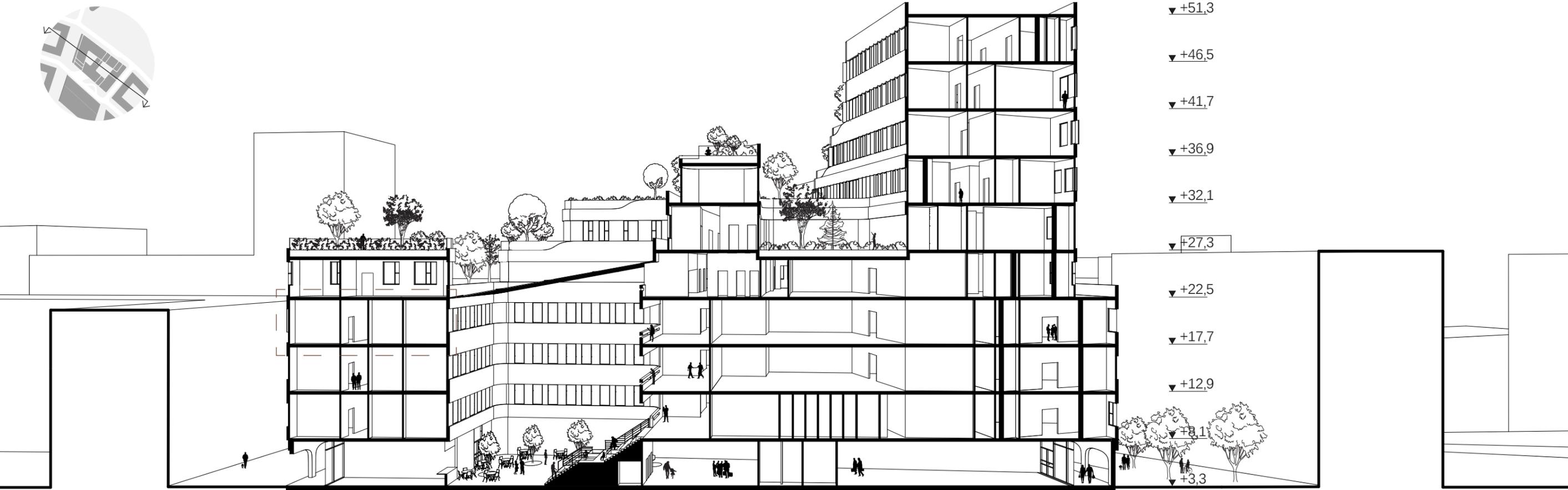
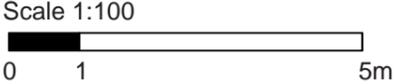


# Sections

The building is designed to fit in to the urban context by having its heights adjusted to the surrounding buildings. The highest point of the building is about the same height as the other tall buildings planned in Frihamnen.

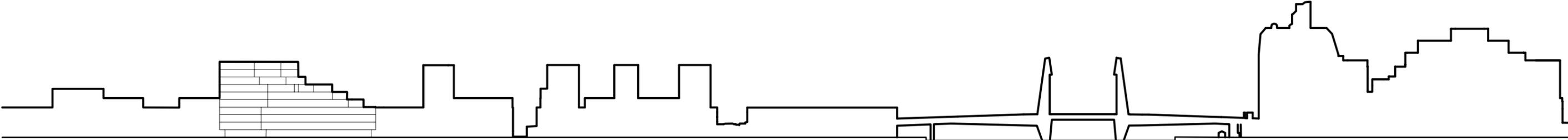


▲ Section from façade to atrium



▲ Section through the length of the building

▼ City scale section showing the hospital in relation to the city



View over terraces from the top floor.

