

# THE INSIDE STREET

A new health care center in Örebro, combining primary and specialist care



Healthcare Architecture, autumn 2017  
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Group 4: Emma Asplund, Irmeli Magnusson, Nicolas Berenbach  
Tutors: Christine Hammarling, Elke Miedema, Peter Fröst, Saga Karlsson

# ÖREBRO & THE COMMISSION

## THE COMMISSION

- New health care center in Örebro to meet increased demand for local outpatient medical care
- 50 000 listed patients
- Primary care, specialist care, psychiatry, emergency care, research & education
- Estimated area: 15 000 m<sup>2</sup>

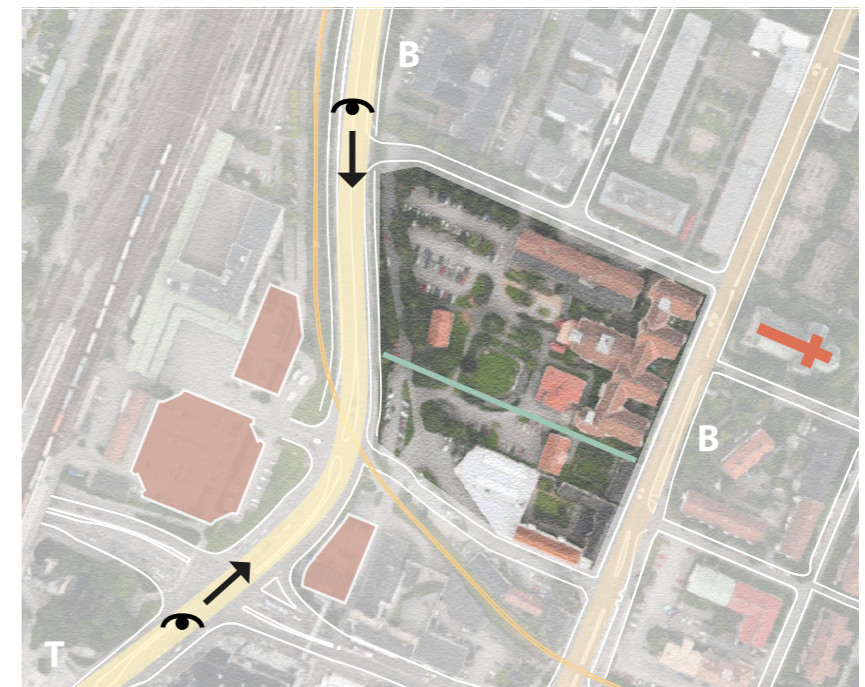
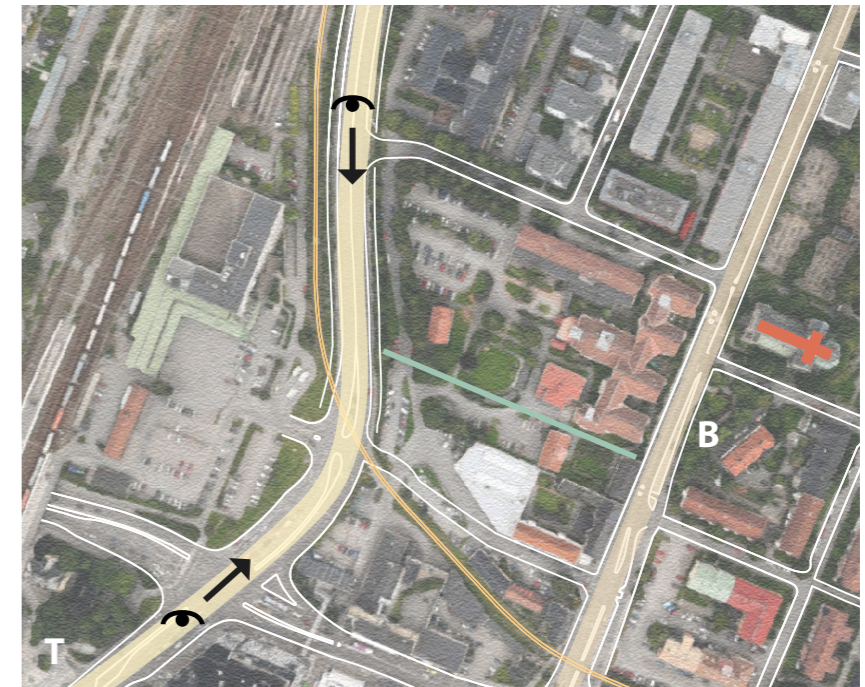
Client: Fastigheter Regionservice,  
Region Örebro län.

## THE SITE

The site assigned for the project is located just north of the city center, where the existing health care center Olaus Petri today (marked with red dot on the map). On site are also buildings linked to the healthcare history of Örebro, now regarded as cultural landmarks.

Close by is both the train station, bus stops for main bus lines and busy roads. Across the street is the church whose tower can be recognized from many places in the city.

The site is part of a larger plan to develop this area with more housing, offices and service spaces. The today very busy street Östra Bangatan will be transformed into a more urban street, lowering the speed to 40 km/h with bike paths, pedestrian sidewalks and trees along the sides. When doing this, the roads bordering the site to the north and to the south will extend and connect to Östra Bangatan. Plans to build more along this street and the train tracks exist and for the purpose of this project we relate to all these plans as being built. Closest to our site the new developments will be much higher than existing buildings.



## OPPORTUNITIES

- The existing greenery
- The location being the entrance to the central city from the north
- The sight-line from the south to the church tower

## CHALLENGES

- Bridging the gap between the new development and the existing buildings
- Making Östra Bangatan feel like an urban street
- Connecting to the irregular placements of the existing buildings on site

# THE 4 THEMES

The healthcare architecture studio at Chalmers this year had the layout of introducing us students with 4 themes to start tackle healthcare architecture. We had one week of lectures, literature reading and a workshop per theme. Below we show what we as a group thought was most important and what we brought with us in the development of our project.

## THEME 1: HEALING ARCHITECTURE & EVIDENCE BASED DESIGN

Using Evidence based design to ensure that the architecture:

- Promotes health
- Reduces time for treatment
- Decreases need for medication
- Reduces stress

## THEME 2: HEALTHCARE + ARCHITECTURE

Trying to take the best from each era of healthcare architecture and combine it:

- Healing environment: air, daylight, access to nature
- A flexible structure
- Incorporated into the surrounding urban fabric
- Healthcare of today should support the co-production of health and care between patients, their relatives, the healthcare staff and others in society

## THEME 3: HEALTH PROMOTION

Using architecture and planning as a strong health promoting factor in the new health care center, focusing on:

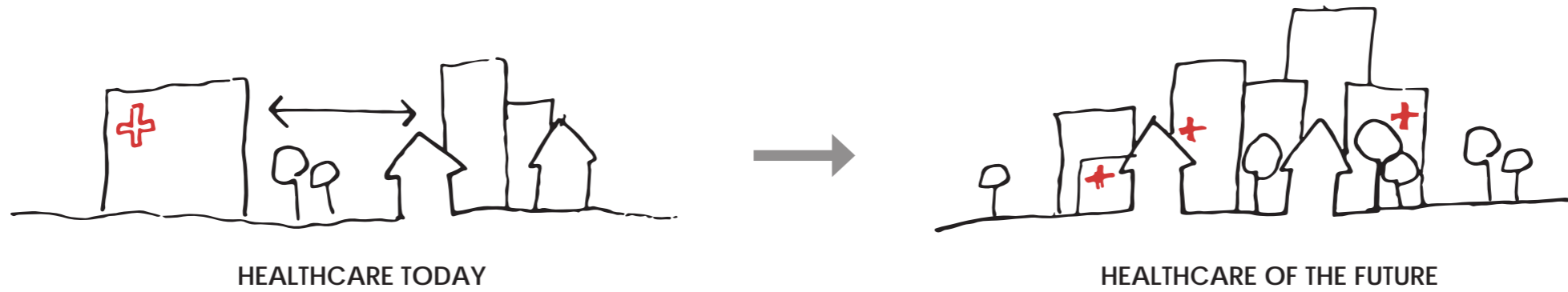
- Patient centered care
- Access to nature and providing for restorative gardens
- Accessibility

## THEME 4: FUTURE PROOFING

Maximizing the long time effectiveness for the life of the facility by:

- Having a general, robust structure adapted for many different uses
- Having flexible floor plans to enable rooms to switch functions without rebuilding

# VISION: Healthcare integrated into daily life

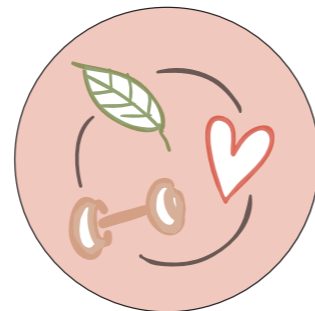


**HEALTHCARE TODAY**

The healthcare today is often very separated from the city, both mentally and physically, with the architecture. We want to challenge this with our project.

**HEALTHCARE OF THE FUTURE**

This new health care center will be both mentally and physically integrated in the daily life of the surrounding city, both for patients and neighbours. Below are our key aspects to achieve this:



**HEALTH PROMOTION:**  
Not only focusing on treating disease



Patient centered care



People are in control of their own health and care



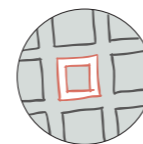
People feel comfortable and welcome when visiting the building



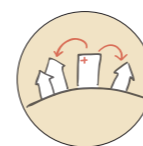
**SUSTAINABILITY:**  
Having a future proof and sustainable architecture



Building in a human scale



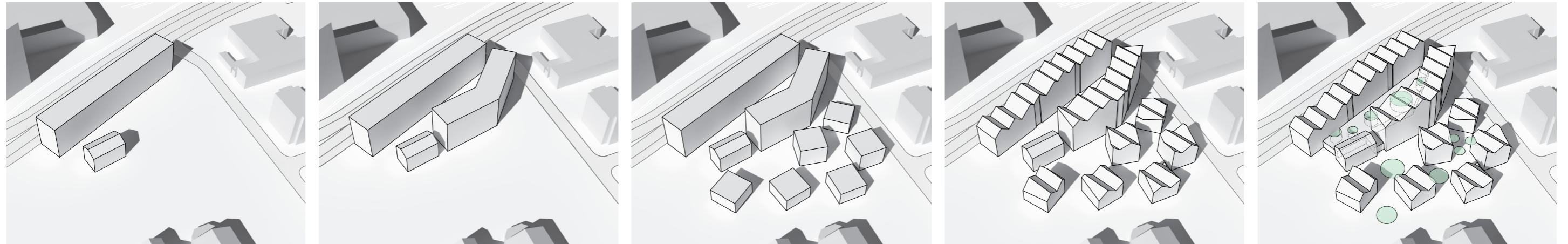
Integrating the buildings with the surrounding urban fabric



Creating additional values for the surrounding city

# ARCHITECTURAL CONCEPT

## 3 LEVELS OF HEALTH CARE - CONNECTED WITH ARCHITECTURE



1. Primary care

2. Specialist care

3. Lighter care

4. Connecting the buildings with one shape for the roof

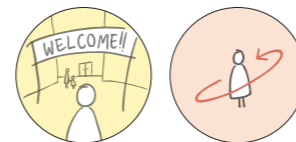
5. Connecting the spaces in between with equal treatment of gardens

### FROM VISION TO ARCHITECTURAL CONCEPT

1. To translate our vision into an architectural concept we began by placing the primary care close to Östra bangatan, aiding in the transformation of it to an urban street. By doing this we adapt to the existing city grid and help bring down the scale from the enormous houses across the street.



2. To divide the specialist care from the primary care we place it in a different building across from it, saving space inside of it to create a park. Between these volumes we now create an entrance street helping in the way-finding for visitors.



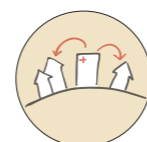
North and south of these buildings we create entrance squares, emphasized by the placement of the buildings.

3. The lighter care we place in separate buildings in the park, providing a health promoting environment surrounded by greenery.



4. To ensure that it still feels like one and the same health care center we connect all the buildings with one type of roof and similar facades.

5. The spaces in between the buildings are also connected with an equal treatment of the gardens.



# THE SITE

## PLACEMENT ON SITE

On the site the new health care center is placed in the north west corner, carefully surrounding the existing house on site, to allow as much public area as possible south of it, marking the main entrance of the health care center.

## FLOWS

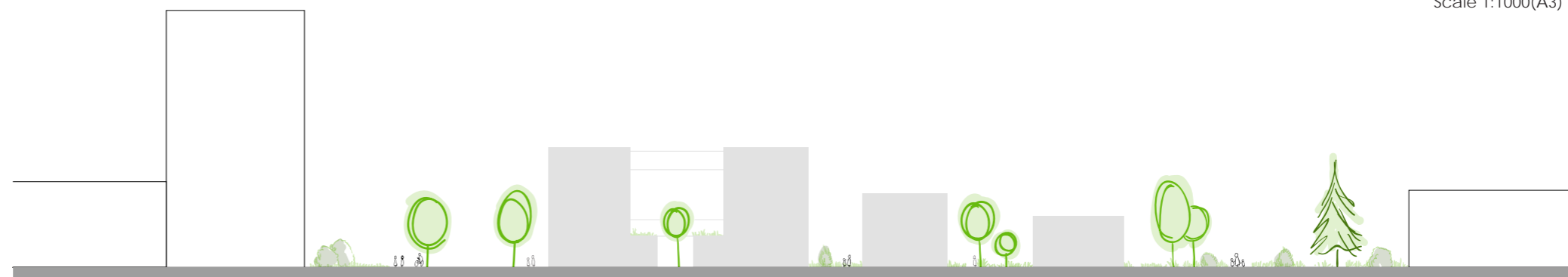
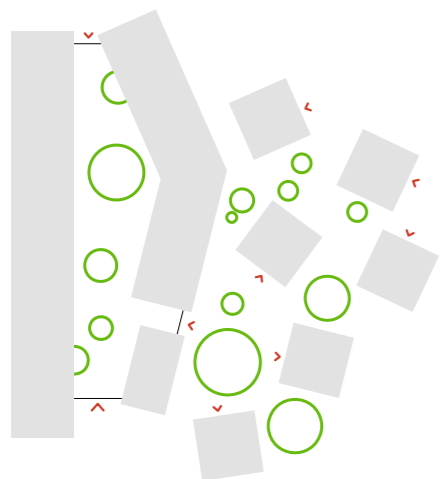
The main entrance is to the south, in between our new building for primary care and the existing house on site. The small road leading up to it from Köping-hultgatan is shared space, meaning cars, bikes and pedestrians share the space and the speed limit is walking speed 7 km/h. To the north there is also an entrance from the intersection of Ribbingsgatan and Östra bangatan. Both are supplied with bike parking, accessible car parking and drop off zones for cars.

In the south end of the site there is a underground parking garage for cars and a logistics hub where all goods are delivered and later distributed from via the cellar floor. From Köping-hultgatan there is a facade showing the entrances to these, but from the other sides all you see is a hill in the park.

The ambulance entrance/pick up point is in the north from Ribbingsgatan, ensuring a less crowded street for the ambulance.

## THE IN-BETWEEN SPACES

Both the spaces in between the buildings of the main health care facilities = the inside street, and the smaller houses in the park are treated in the same way, providing circular parks. Either atrium gardens when inside or circular plantings, gardens or playground when outside (see diagram below).





The health care center seen from the south, approaching the main entrance.



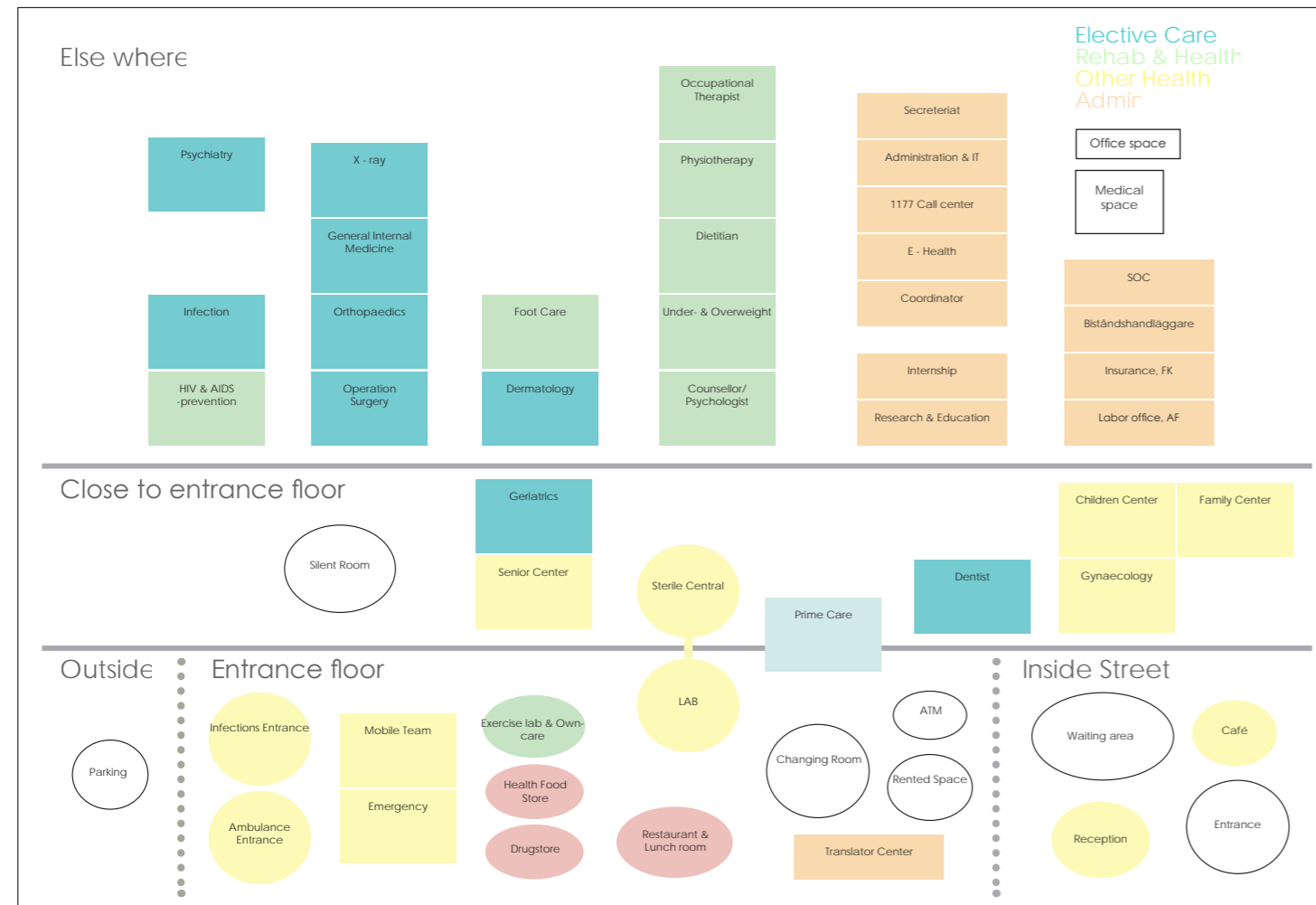
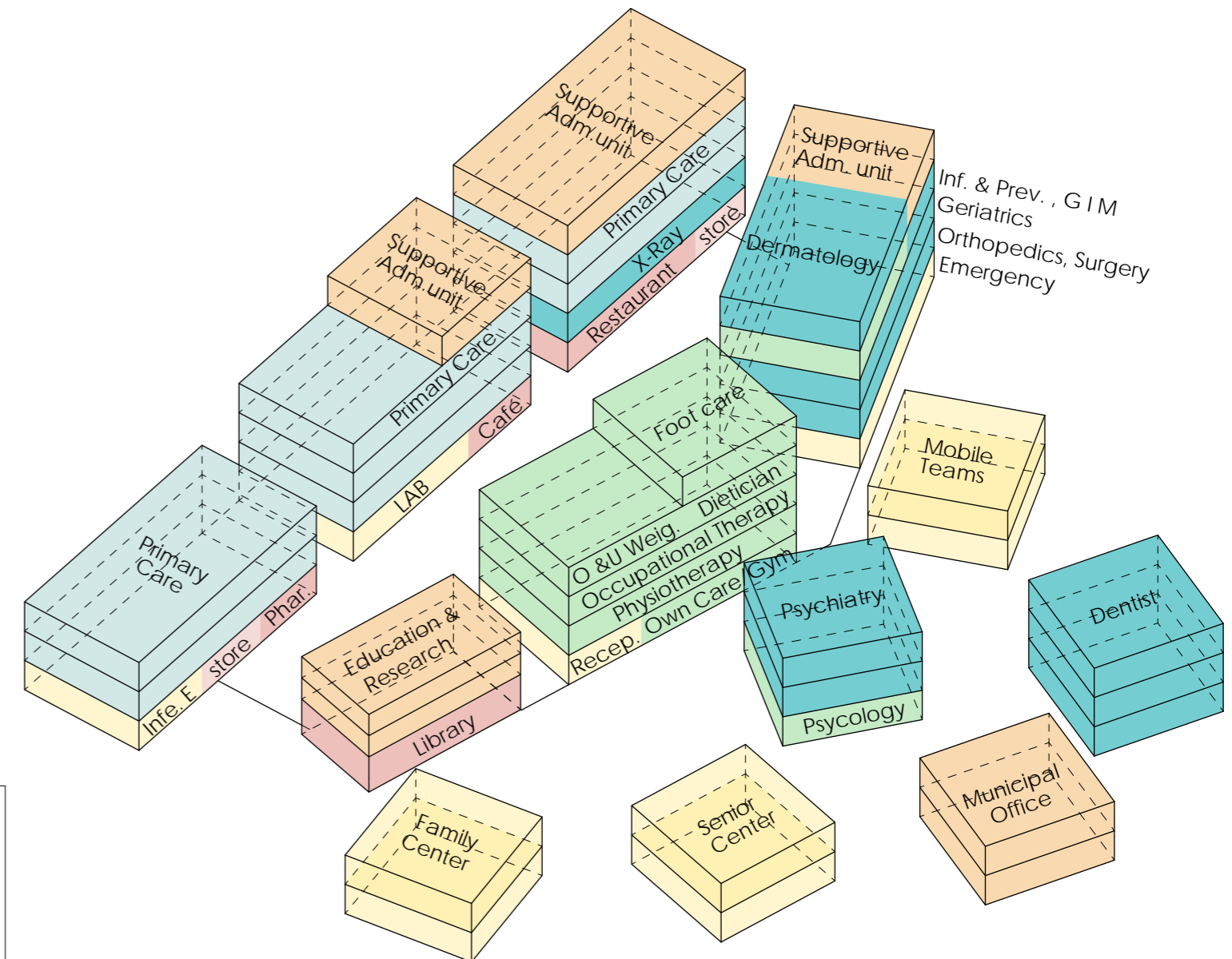
The parks in between the buildings

# PROGRAM / FUNCTIONS

From the client we got a list of functions wanted in the new health care center. We translated this into the diagram above that shows roughly what type of space the function needs and what type of care it is.

From this diagram and the 50 000 listed patients we calculated how many specialist doctors, nurses, and other staff would be needed and estimated that a team of 14 would be enough for one medical unit and that the program (see axonometry to the left) would cover the entire need for the listed patients.

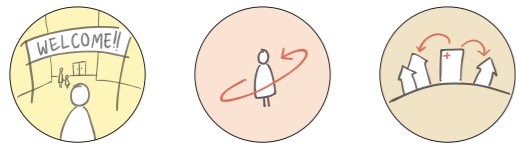
Total number of square meters is 14 009 m<sup>2</sup> (not including the basement containing changing rooms for staff, space for technical installations and distribution of goods).



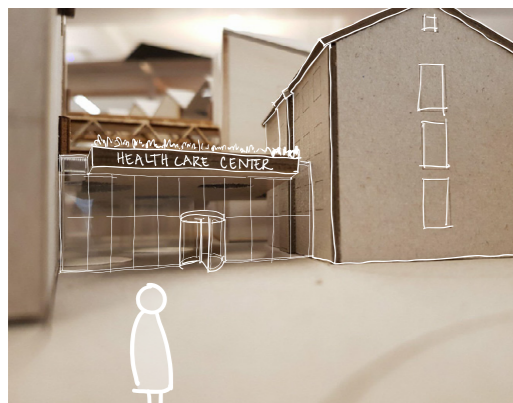
- primary care
- specialist care
- rehab & health
- other health
- administration
- other functions



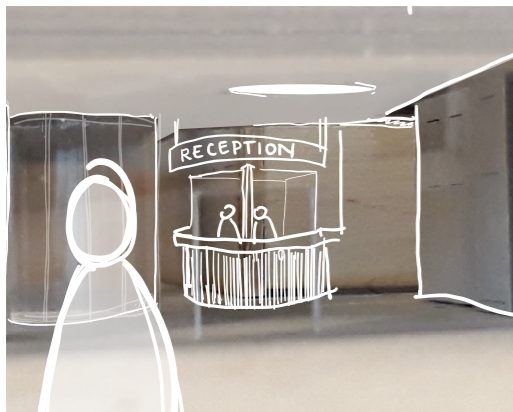
# ENTRANCE FLOOR



## WAY-FINDING PERSPECTIVES



Approaching the building from the south, towards the main entrance.



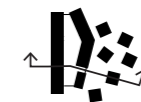
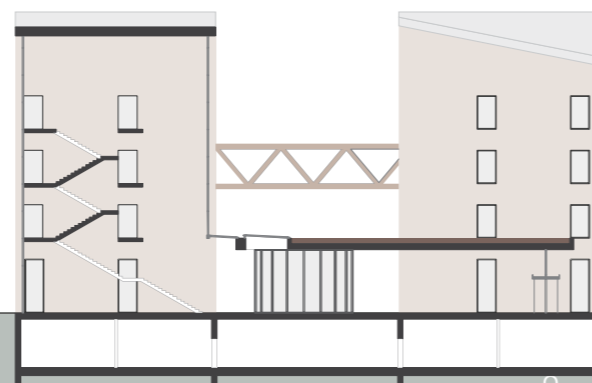
When entering the main entrance, the reception is straight ahead.



After checking in at the reception or at the check in counters you easily find the stairs that will take you to the right floor.



Floor -1  
distribution floor



# THE FUNCTIONAL UNIT

## GRID & STRUCTURE

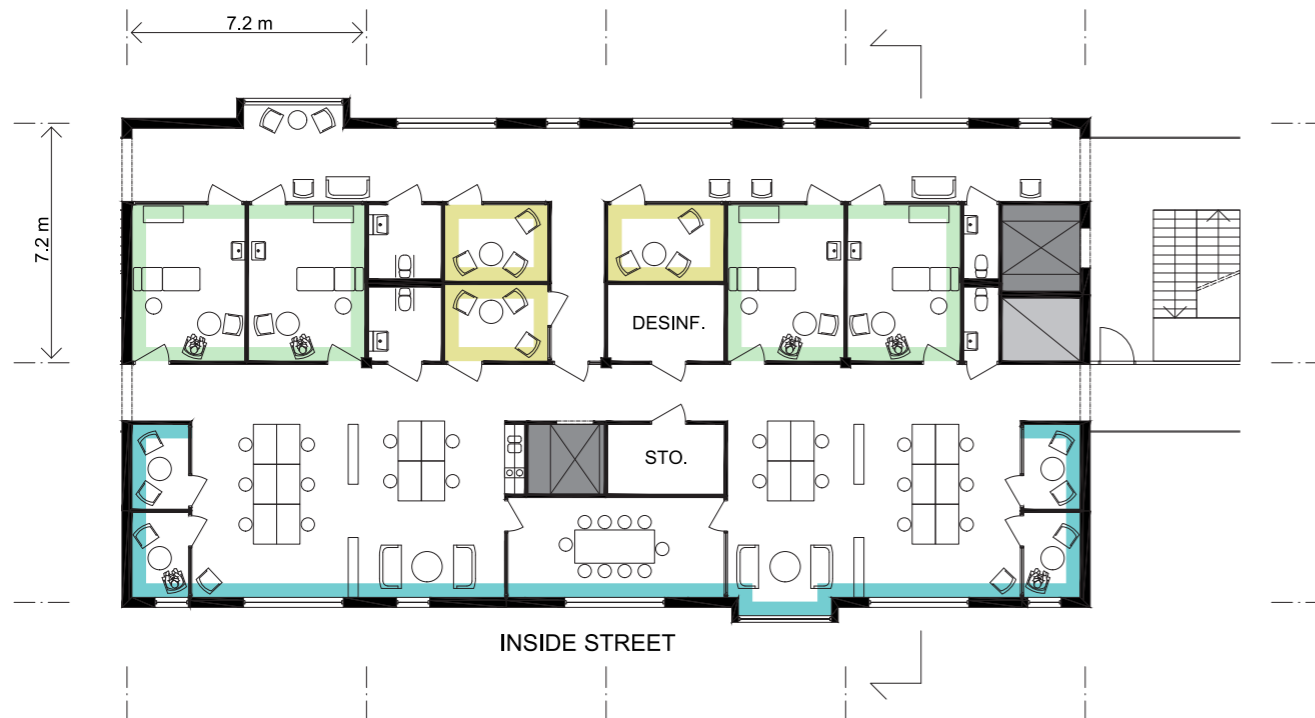
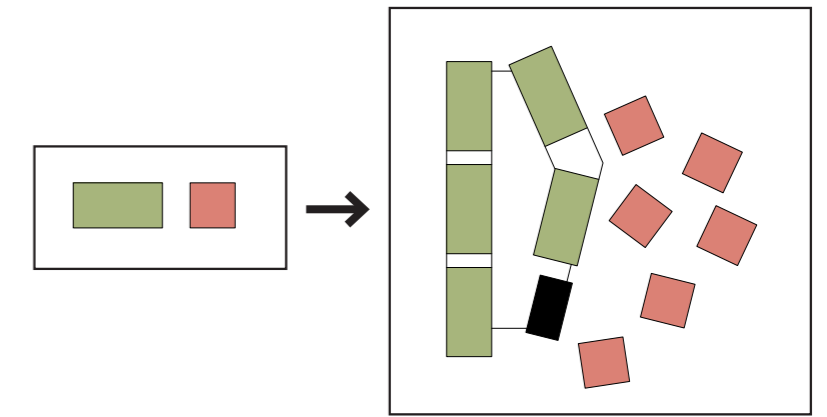
To ensure a flexible structure for the future use of this building we have a grid of 7,2 m x 7,2 m, using a pillars and slabs construction of glue laminated wood. Two volumes are created, one 14,4 x 28,8 m and one 14,4 x 14,4 m.

## TYPE ROOM

Within this grid we have the possibility to put many different shaped rooms, for example examination rooms, office spaces & service functions.

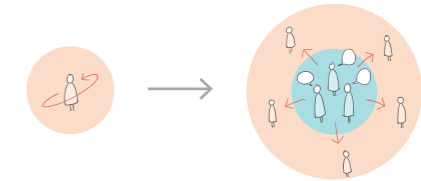
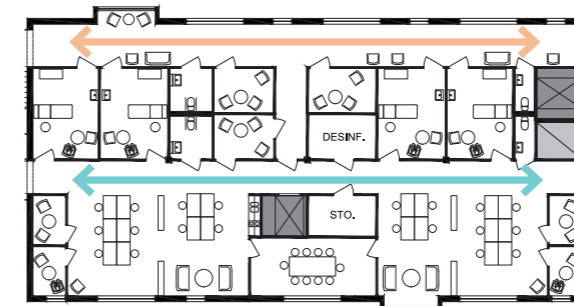
## FUNCTIONAL UNIT

When working as a medical floor plan, the larger functional unit contains two teams of 14 persons. On the top floors they instead work as supportive administrative units. The smaller functional unit can work either as a medical unit (for example the dentist), activity space for the family and senior center, or office space (for the municipality). See plan-diagram for how these units are put together.



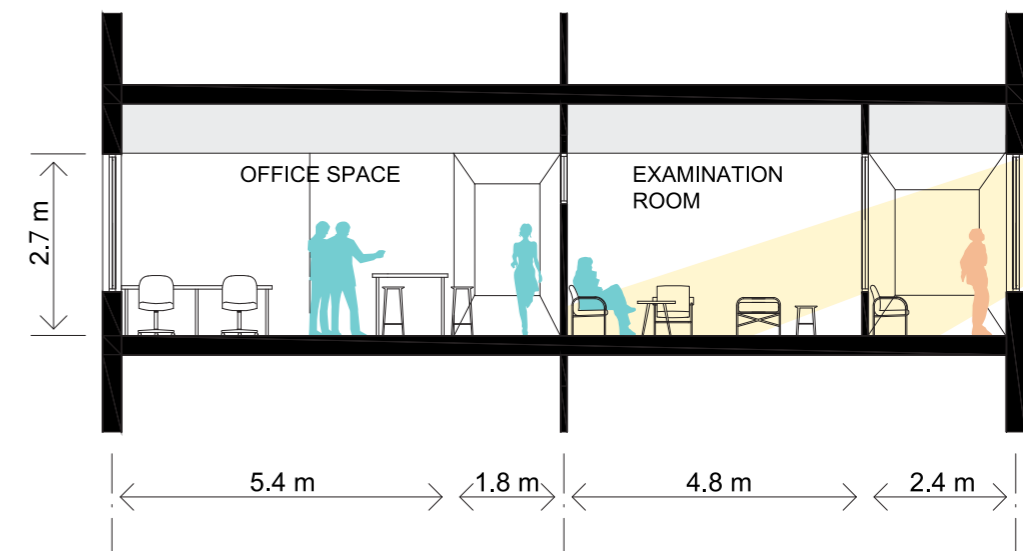
## SEPARATED FLOWS

In the larger functional unit we have separated the flows for staff (blue) from the flow of patients (red). To make sure that the care is patient centered the spaces are designed to maximize staff collaboration.



This means that we will have one corridor that is only for staff enabling the office spaces to become more free and flexible, adaptable to more team orientated work ways.

In between these corridors the examination/treatment rooms are situated. In order to get a good working environment the wall in between the patient corridor and the room allows a lot of daylight to pass through (see section below). There is also a curtain in every room to provide privacy, if needed.

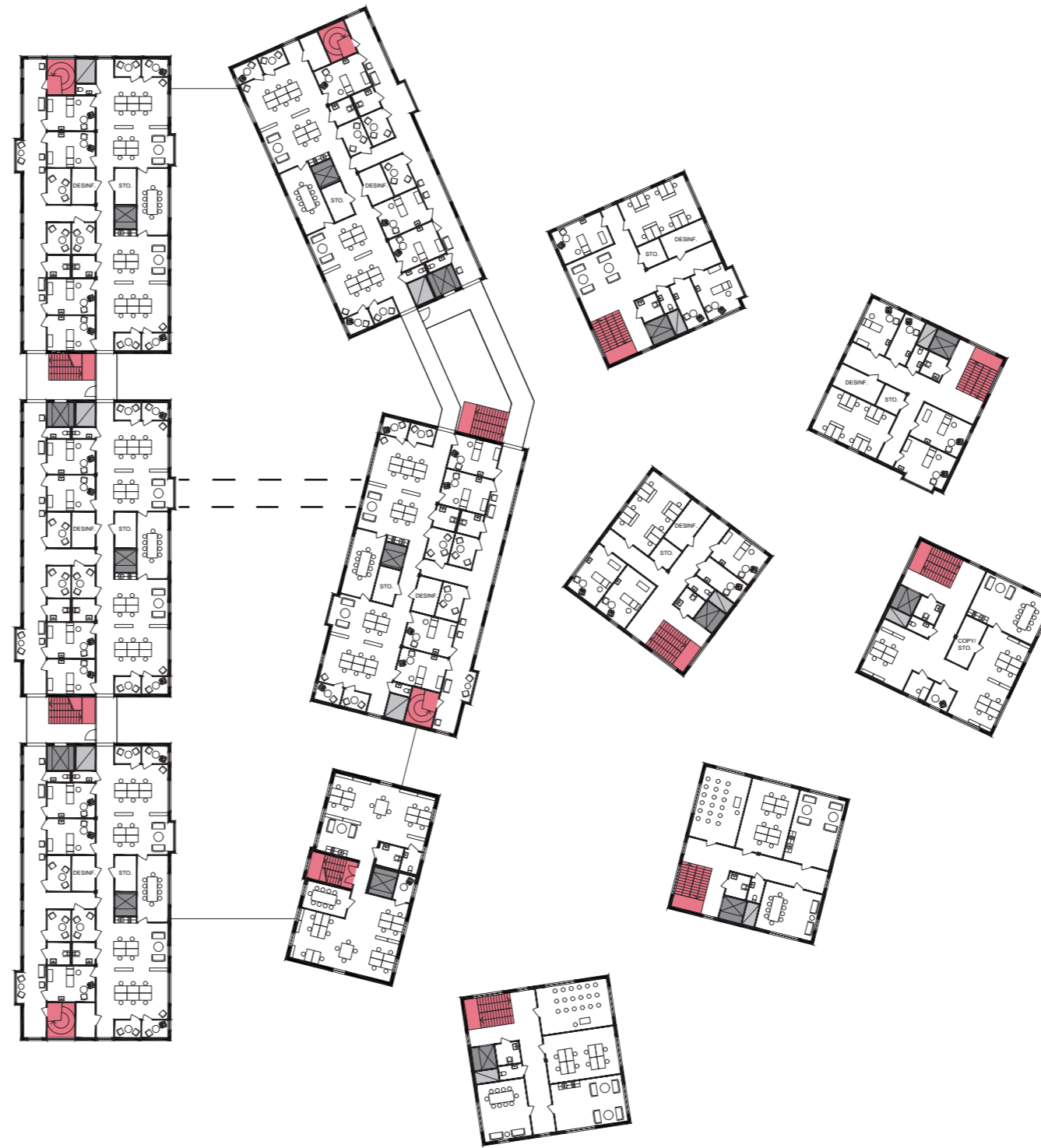
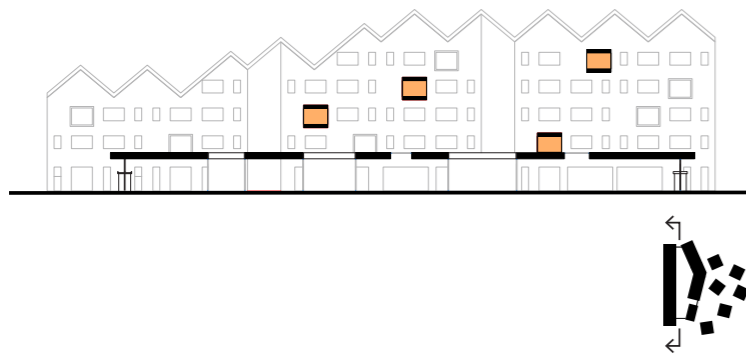


# TYPICAL FLOOR PLAN

When all the functional units are put together, as we explained on the previous page, we end up with the typical floor plan, that is true for all floor above the entrance floor.

In this plan the vertical circulation is highlighted with red for the stairs, dark grey for elevators and light gray for shafts for technical installations.

In between the main health care buildings we have bridges for the staff to more easily cooperate with other teams in another part of the building. In the diagram section below the placement of these is shown.



0 5 20m



# BRIDGES IN BETWEEN



section / elevation inside street



# FACADES

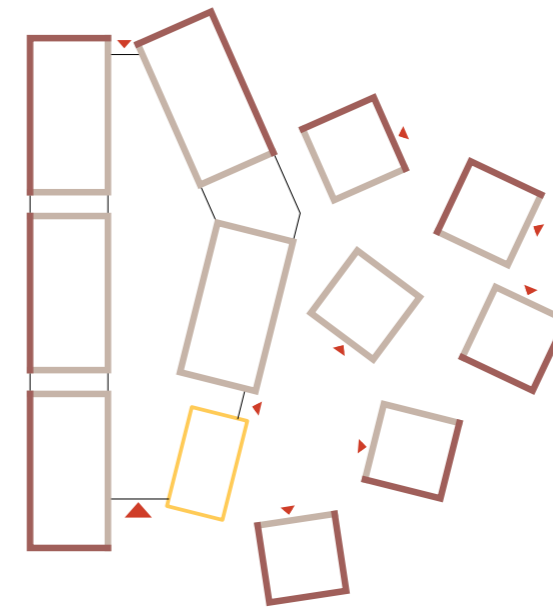


EXISTING BUILDING

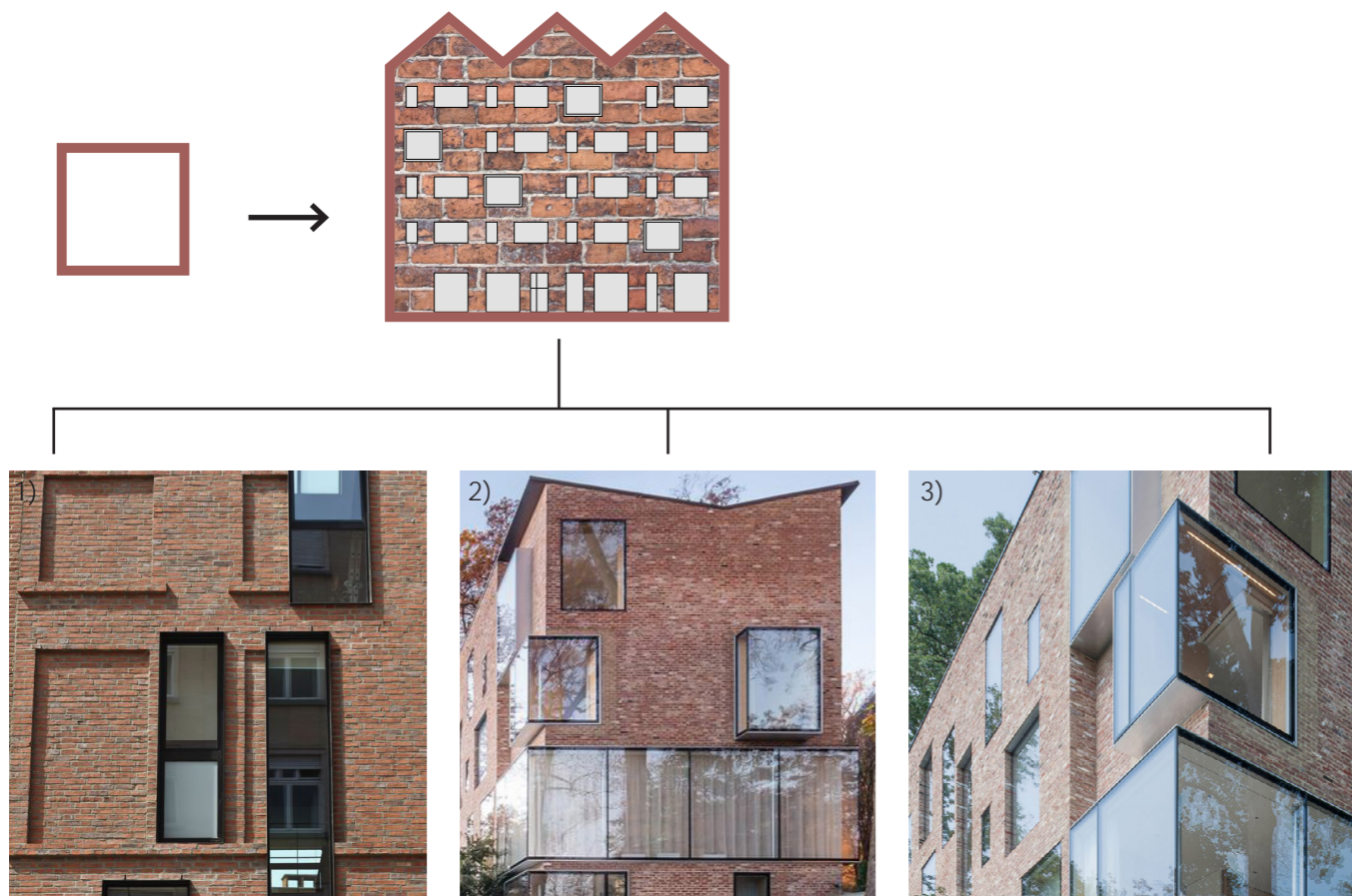
The new health care center is placed around an existing building on site (see image to the left). This building is the inspiration for the facades, with which we want to connect the new with the old.

The facades of the new buildings are matching either with the material or the color. The buildings have both inside and outside facades, depending on where they are placed on site (see diagram to the right).

The outside facade matches the bricks of the existing house, but is contrasting the existing house by having red bricks instead. The inside facade matches the color of the bricks with a wooden facade, but will over time develop into a more contrasting color of the pale grey wood. Below you can see how these facades will look like.



INSIDE & OUTSIDE FACADE PLACEMENT



Reference pictures showing our ambition with the outside facade materials & detailing. 1) Woning Gillaerts – De Coninck by VBM Architects, Leuven. 2 & 3) Rock Creek House adaptation by NADAAA, Washington DC.



Reference pictures showing our ambition with the inside facade materials & detailing.

# FACADES



OUTSIDE FACADE - FACADE TOWARDS THE STREET



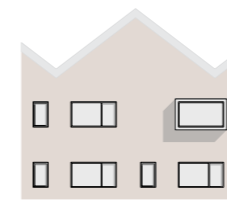
OUTSIDE FACADE - SMALL HOUSE



DAY



INSIDE FACADE - FACADE TOWARDS THE PARK



INSIDE FACADE - SMALL HOUSE

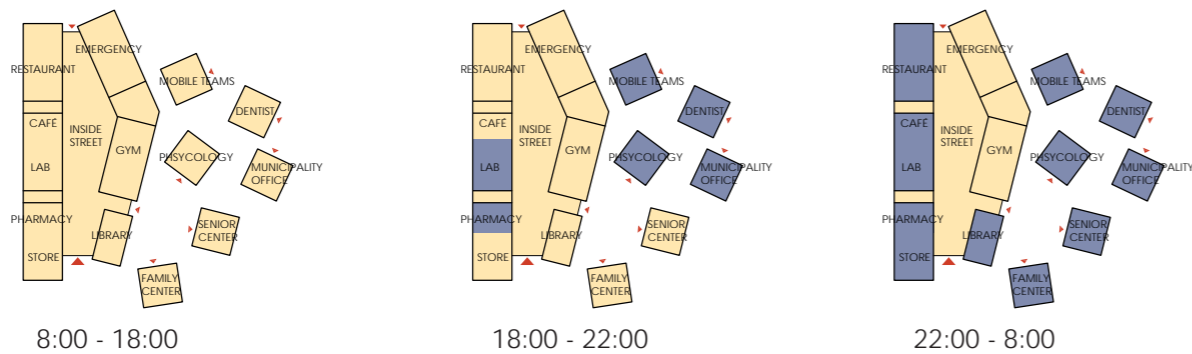


NIGHT

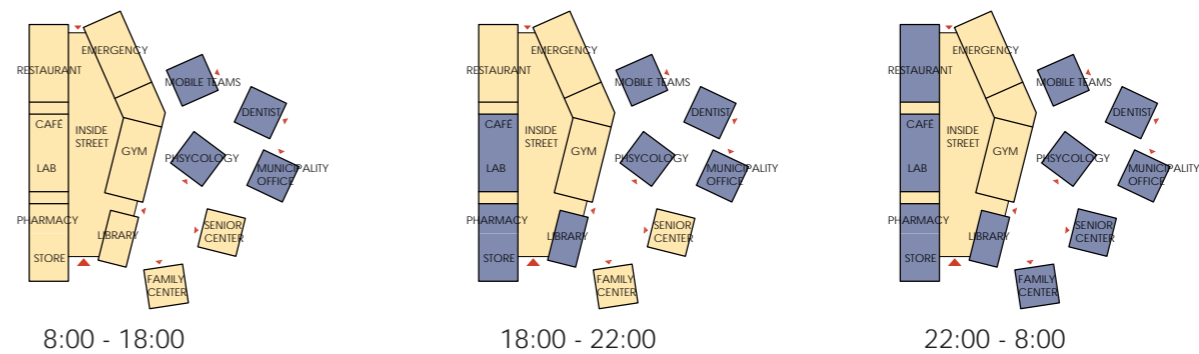
## OCCUPANCY OVER THE HOURS OF THE WEEK

open
  closed

MONDAY - FRIDAY

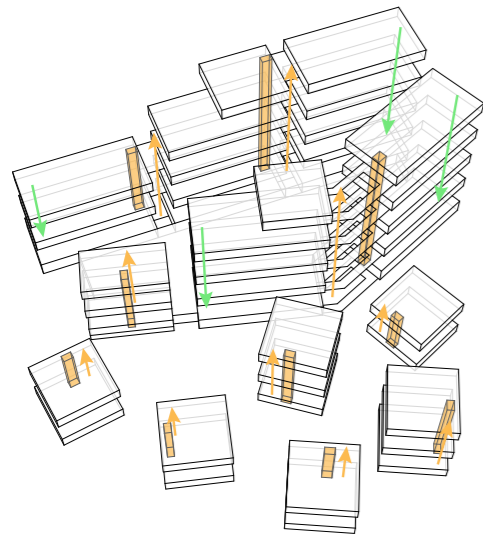


SATURDAY - SUNDAY

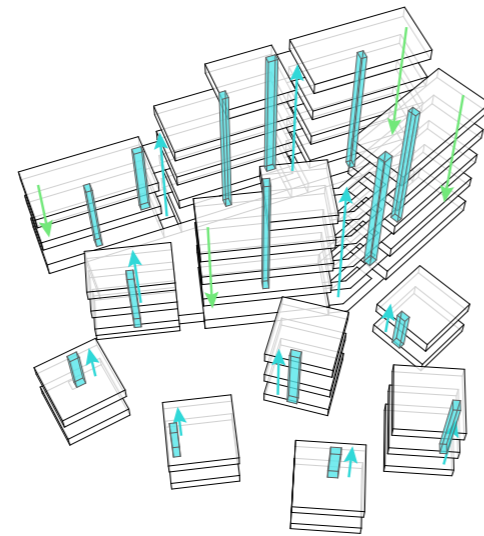


# FLOWS

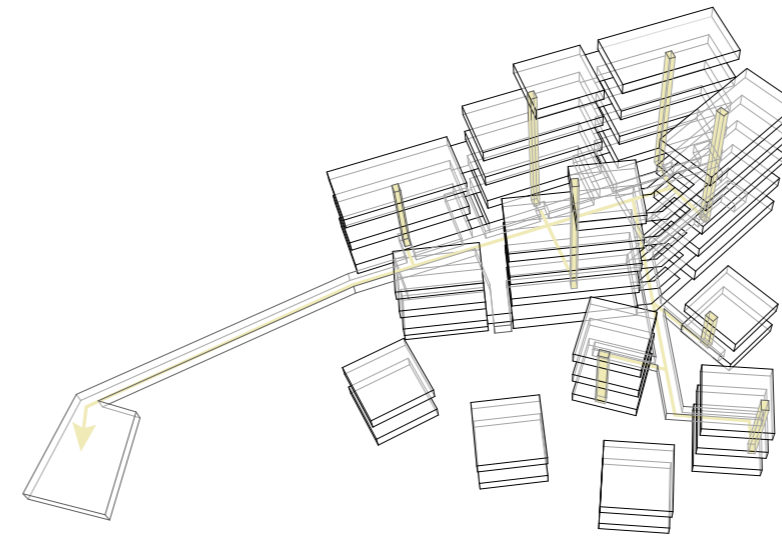
## VERTICAL FLOWS



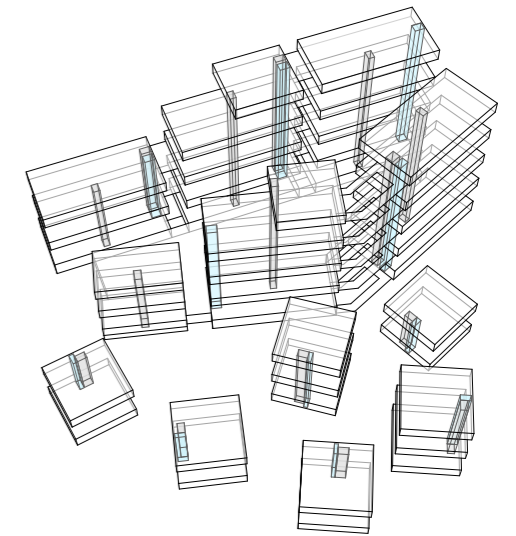
Patients



Staff - Using both patients stairs and their own.



Goods - Using staff elevators connected to basement and logistics hub below parking.

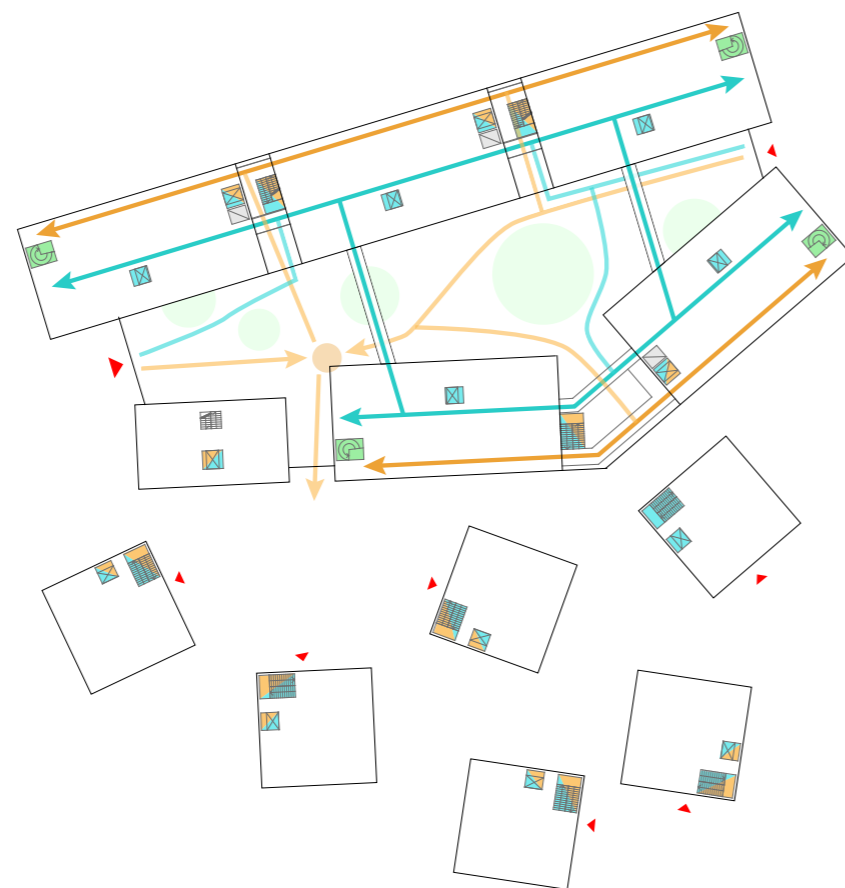


Shafts

## HORIZONTAL FLOWS

Entering the main building you immediately see the reception. From here you go to the main staircases and up to the corridors within the buildings, where the flow of patient and staff is separated.

In the smaller houses the flows are mixed as the floor plans are much smaller.



On the underground floor the goods are delivered from the logistics hub to underneath the healthcare center in culverts.

# SUSTAINABILITY

The new health care center will be a way to promote sustainability in Örebro, by being a pedagogical example for the people visiting it. Here we will explain some of the ways we integrate sustainable solutions into this project:

## WATER HANDLING

Taking care of the storm water is increasingly important in a building project of this scale. We use the park and the green roof of the inside street to slow down the water in case of heavy rains.

In the artificial slope on top of the parking garage/logistics hub we place a water filtering system consisting of multiple ponds, planted with species of plants that help clean and filter the water to a drinkable quality.

After the water passes through this system it will be stored in an underground cistern and can be used for multiple things, for example watering the gardens nearby, the vegetable garden and the park, flushing toilets, cleaning the facades or in case of drought. This system will reduce the strain put on the existing sewage system.



## PROVIDING FOR SOCIAL SUSTAINABILITY

The health care center of the future will not just treat diseases, it will be focusing a lot on promoting health.

To provide a ground for social activities to take place in the community, we have included spaces for the family center and the senior center to have activities not at all linked to the health care organization. For example clubs and organizations that could rent these spaces and have cooking classes, dance lessons, game nights, knitting classes, gardening etc.

By providing spaces for activities like these in a neutral space linked with a public function like the health care center, a growing ground for social sustainability is enabled. These buildings are placed closest to the passing flow in the park, thereby exposing these functions to the public.

## SOLAR CELLS

Solar cells are placed on the roof angled towards the south. The power generated by these will be visible for the visitors of the health care center in the main space on the first floor together with the energy usage of different things in the building.

This is a pedagogical way of informing citizens of energy usage and also get people thinking of where electricity comes from. By doing this the health care center shows that solar cells can work in a setting like central city Örebro.



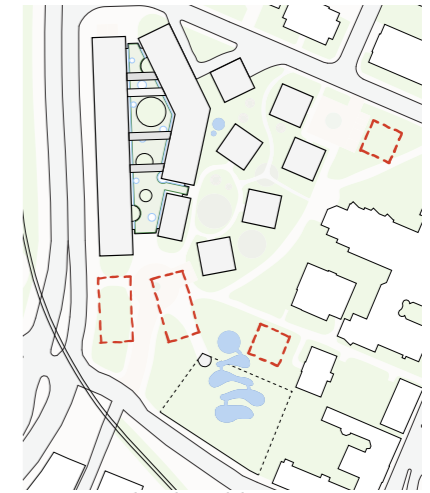
## FLEXIBILITY & FUTURE PROOFING:

In this project we have focused a lot on future proofing the architecture. The most sustainable thing you can build is a house that does not have to be torn down just because the program changes functions for the built environment.

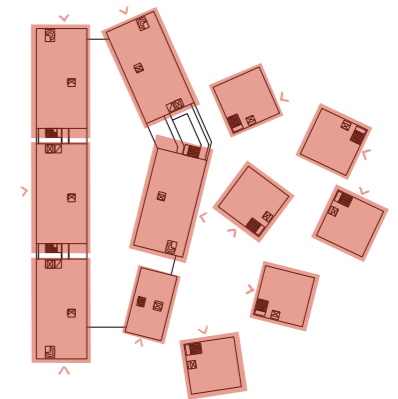
Therefore the structure is very allowing for program changes by having high ceiling heights, space for heavy installations anywhere in the buildings and a generous grid system for the load bearing structure to allow for an ever changing floor plan.

The main buildings are placed on site to allow for future expansion of the health care center (or other functions), where as the smaller houses in the park do not allow future densification as easily. By placing these buildings like this we ensure that the park in between the buildings will be preserved for the future.

The health care center is designed in such a way that it is easy to seal off and isolate one unit if there is a risk of infection. Therefore each building have separate vertical circulation and a possibility for a separate entrance. This design also allows for future changes in the program. In case the health care center needs to downsize some of the buildings could easily be transformed into housing apartments or office buildings.



In case the health care center needs to grow.



If there is a need to isolate the units.



If the health care center downsizes.

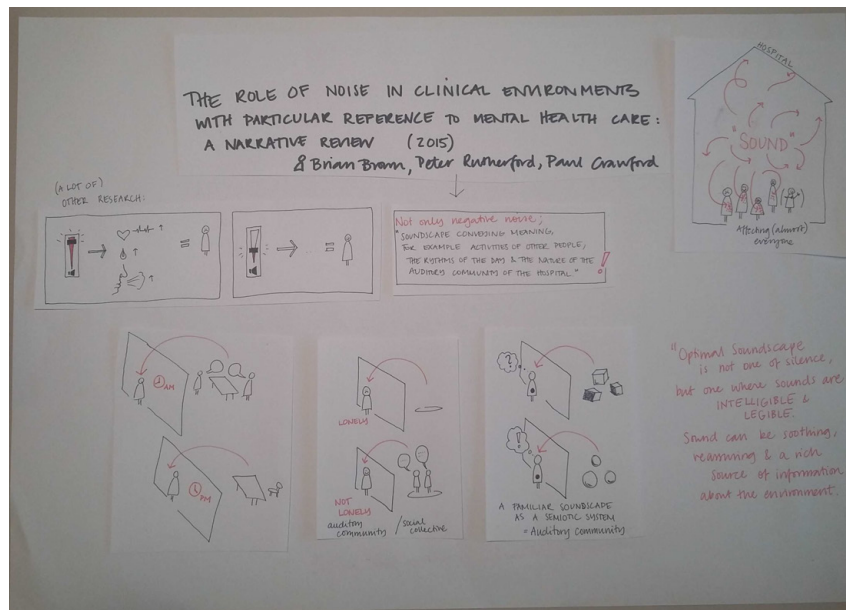
Health care  
Housing  
Office



# Theme 1: Healing Architecture, Evidence-Informed Design and Evidence-Based design

The Healthcare world is one where there are very strict rules and where a lot of different input needs to be taken into account in order to have a healthy and healing environment. Designing these spaces requires more than just the intuition of an architect. The design of these spaces needs to be based on evidence that can prove that one concept or idea is better than another one. These choices need to be beneficial in different aspects. That it be for the building itself, the patients, the staff or the exterior users.

During the workshop we each had a different topic on which we worked trying to see if it could be of interest in our future project designs and how it affected the different users of the building



After the workshop we started by reflecting on what healthcare was for us and how the Healthcare center should reflect those choices. We went through the different lectures and texts to see which concepts and ideas discussed of were the closest to our first thoughts so we could correlate it with design and concepts based on evidence showing they went our way in trying to create a health promoting facility.

The following points are the ones we chose to integrate and develop more specifically in our project:

- Separating flows
- Views to nature
- Dividing up the waiting space into different views and spaces to wait
- Office space and examination rooms separated
- Human scale
- Facilitating interaction and communication amongst staff for better treatment of the patients



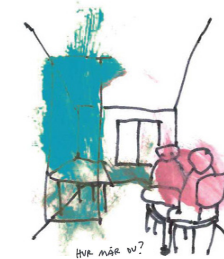
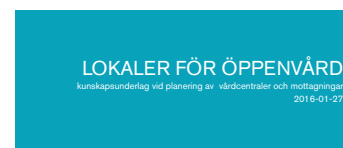
Informal meeting places both for patients and for staff, to encourage communication.

The atrium gardens in the inside street, to provide life-giving elements both visually and sensually and reduce the stress for the people within.



Human scale to make the patient feel more integrated to the whole of the facility and not being in a big machinery

Materiality that helps the patients feel less stressed and and yet not to neutral



PROGRAM FÖR TEKNISK STÅNGÅNG CHALMERS GÖTEBORGS UNIVERSITET

## LITERATURE:

Sadler, B. L., Berry, L. L., Guenther, R., Hamilton, D. K., Hessler, F. A., Merritt, C., & Parker, D. (2011). Fable hospital 2.0: The business case for building better health care facilities. *The Hastings Center Report*, 41(1), 13-23. Retrieved from <http://proxy.lib.chalmers.se/login?url=https://search.proquest.com/docview/847386904?accountid=10041>

Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H., Choi, Y., . . . Department of Architecture. (2008). A review of the research literature on evidence-based healthcare design. *HERD: Health Environments Research & Design Journal*, 1(3), 61-125. doi:10.1177/193758670800100306

Helsebygg Midt-Norge, (2001). Space for health. Excerpt of Chapter 4 - INTERIOR FORMVEILEDER St.Olavs Hospital 10.10.01 Translation / modification 03.03.03

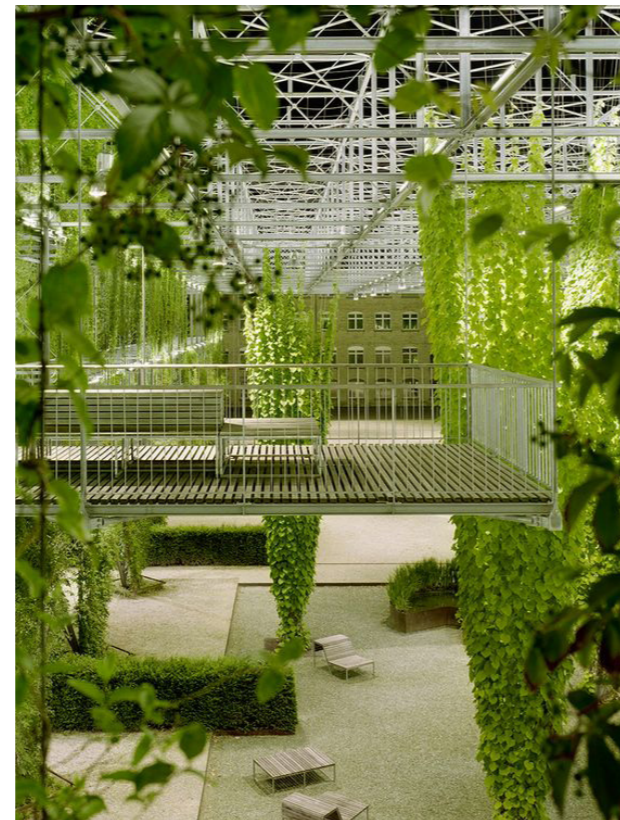
## Theme 2: Healthcare Architecture

During the Pinterest workshop we started use common reference projects and pictures. We tried to find common visions and goals for the health care center and also graphical concepts, how to present it. A lot of the pictures we printed and used as references in discussions during the hole design process. We also started to make a dummy for the final poster.

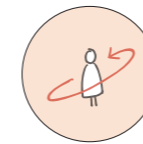
A concept that followed us during the hole process and appeared during the workshop we call The inside street and this is some pictures we pinned on this subject:



Reestruturção Urbana Les Bassins



MFO Park in Zurich



We also talked about patient centred care. That any patients going to the health center should not feel confused where to go and should also not have to change room during the visit. If it's a first time standard visit the room is close and easy to find from the waiting room. But if its a department where patients come maybe once a week, it can be further away. An other way to try to make more patients centred care is to come down in scale with the hole building



Healthcare center for cancer patients, Copenhagen



New healthcare center in Randaberg, Norway

These two pictures we've used the most during the project.

By having these shared Pinterest maps, we work with the references a lot and we also found new references during the hole process. It also made us put up detailed dummies early before the presentations and more consciously work with graphics according to reference pictures.

Another early concept that we had was to have different kinds of atriums, to get both light and green views from the waiting room.



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# Theme 3: Health promoting building design

In the workshop on health promotion we created personas to help us design for specific needs. Below are the most important design aspects for each persona:



**Sophia - NEIGHBOUR**  
- Providing many different facilities "under the same roof"  
- café, library etc.



**Helen the Hare - NEIGHBOUR**  
Facilitate link between different green spaces on the site but also with other green areas in the neighbourhood.



**Felix - PATIENT**  
Make it enjoyable for people that come often: have things that are familiar and but also having some details that change.

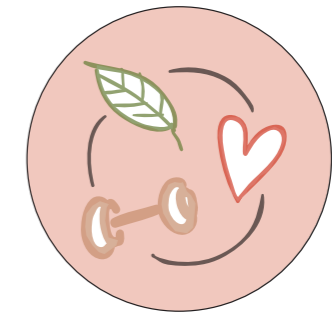


**Johan - PATIENT**  
Easy way-finding and an app that tells him where to go for his appointment.

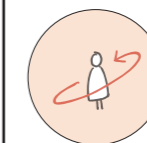


**Ann-Charlotte - NURSE**  
- Common spaces for eating or fika to facilitate exchange between different "units" and also between medical staff and administration.

To create a truly health promoting health care center we took all that we learned from this theme and made it into one of our 2 cores in our vision:



**HEALTH PROMOTION:**  
Not only focusing on treating disease



Patient centered care

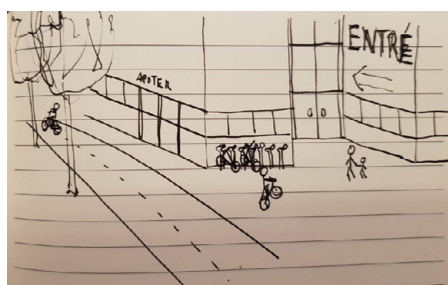


People are in control of their own health and care



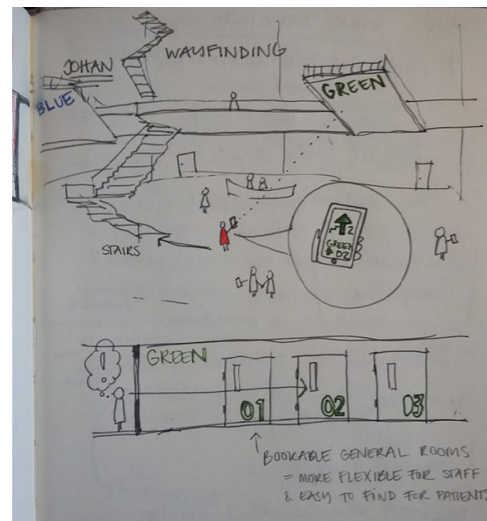
People feel comfortable and welcome when visiting the building

Some sketches about these design aspects:

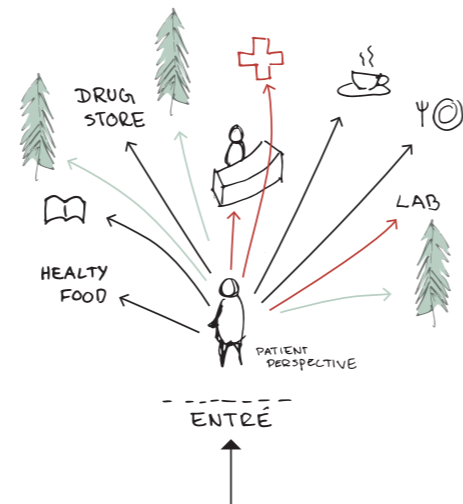


In the health care center there are many different areas to wait in, suited to fit many different types of people.

Bike parking is easy to find, and by being visible it encourages other visitors to take the bike next time.



To find the examination room as a patient, the health care center is designed to make it easy for you, making sure that the patient is in power over her/his care.



From the entrance you can see straight to all the different functions you might need to find, to empower the visitor and make the health care center accessible to as many as possible.

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Bloomberg, M., Burney, D., Farley, T., Sadik-Kahn, J., & Burden, A. (2010). *Active design guidelines, Promoting physical activity and health in design*. New York City, USA.

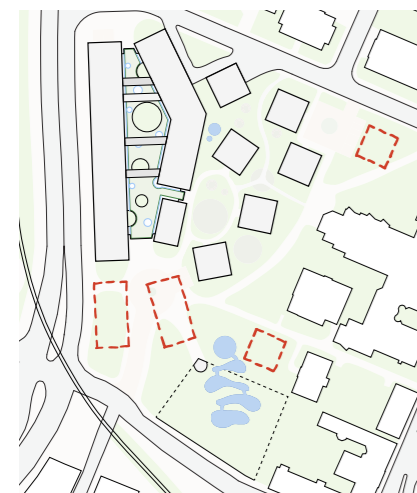
# Theme 4: Future Proofing

In this project we have focused a lot on future proofing the architecture. The most sustainable thing you can build is a house that does not have to be torn down just because the program changes functions for the built environment.

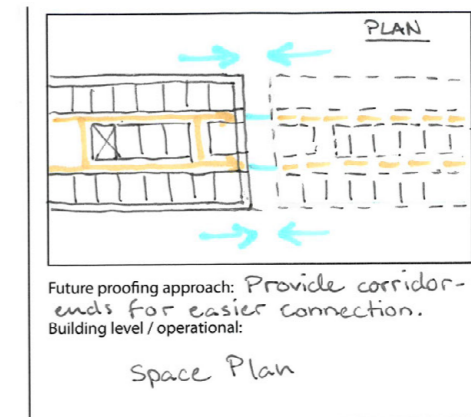
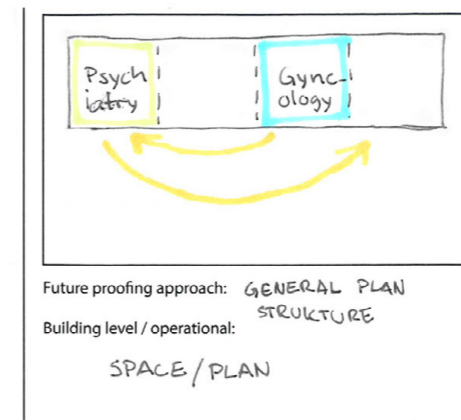
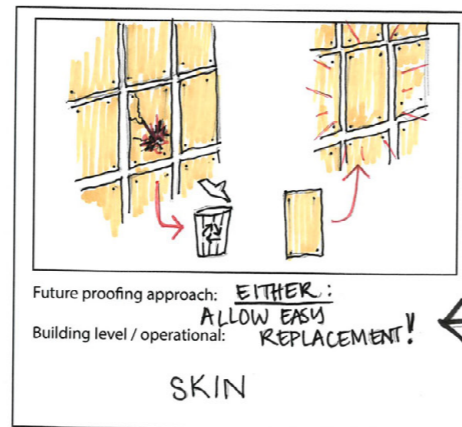
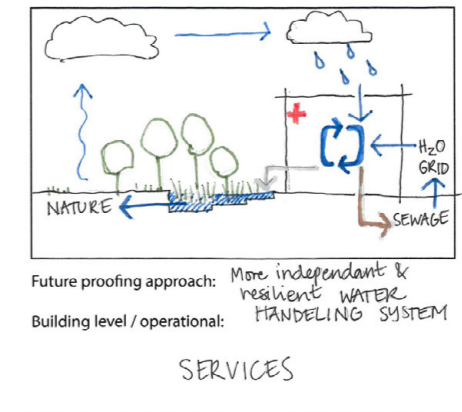
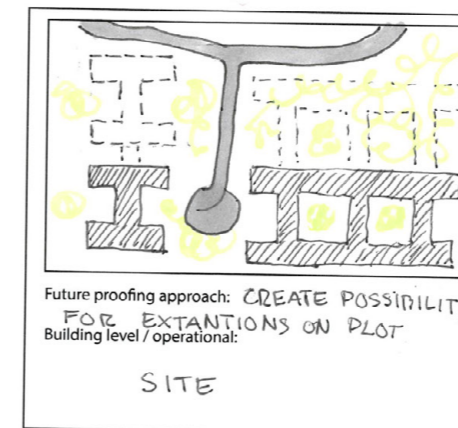
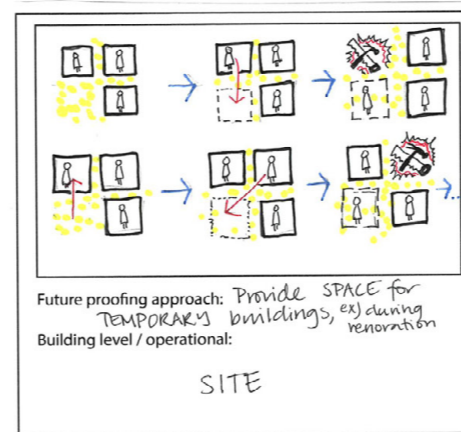
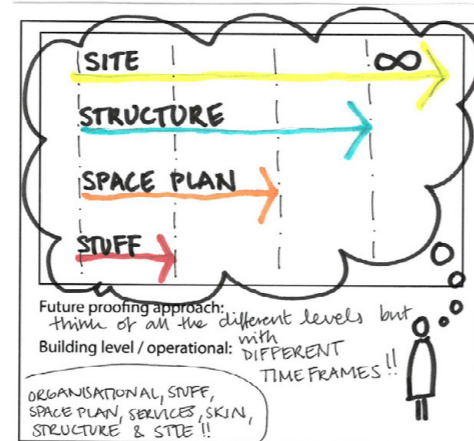
During the workshop we decided on many different strategies for future proofing the building, shown on the right. These were categorized according to Steward Brand's system of what level the element has = what time frame applies to that element (Site, Structure, Skin, Services, Space plan, Stuff).

Not shown among these sketches are our plans for the structure: It is very allowing for program changes by having high ceiling heights, space for heavy installations anywhere in the buildings and a generous grid system for the load bearing structure to allow for an ever changing floor plan.

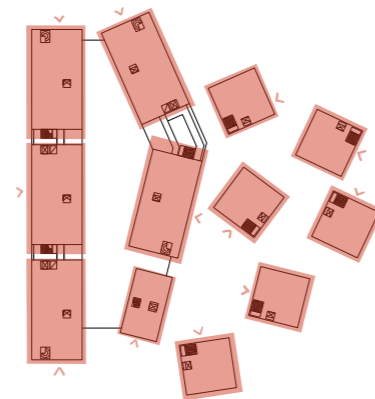
In our project, the main buildings are placed on site to allow for future expansion of the health care center (or other functions), where as the smaller houses in the park do not allow future densification as easily. By placing these buildings like this we ensure that the park in between the buildings will be preserved for the future.



In case the health care center needs to grow.

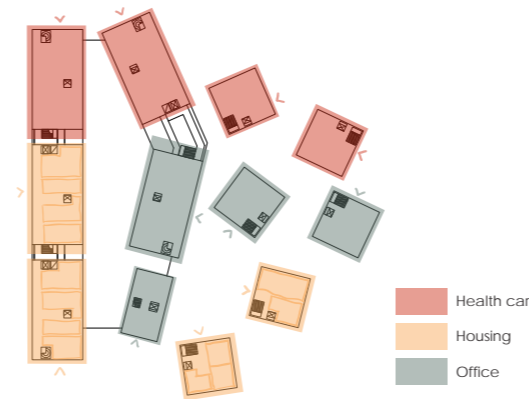


The health care center is designed in such a way that it is easy to seal off and isolate one unit if there is a risk of infection. Therefore each building have separate vertical circulation and a possibility for a separate entrance.



If there is a need to isolate the units.

This design also allows for future changes in the program. In case the health care center needs to downsize some of the buildings could easily be transformed into housing apartments or office buildings.



If the health care center downsizes.

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Karliner, J., & Guenther, R. (2011). *A Comprehensive Environmental Health Agenda for Hospitals and Health Systems Around the World. Health Care Without Harm.*

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