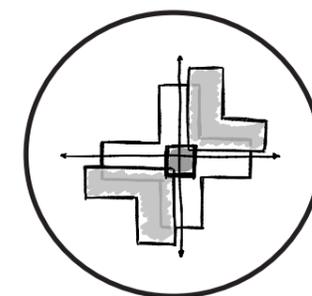




KARL-JOHAN GYDELL  
ALEKSANDRA KUKLINSKA  
FLORENCE VAN LAETHEM



# VADSTENA CARE CROSS

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## TASK

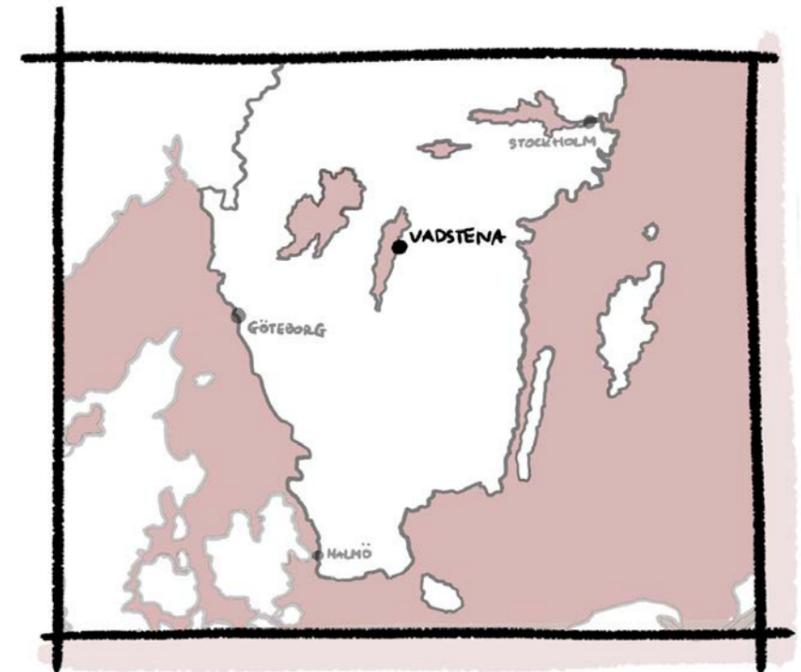
The focus of the autumn 2022 Chalmers Healthcare Studio was to design a primary care centre in Vadstena municipality. The task focused on the contemporary context of Nära vård in Sweden. With this new focus, primary care centers will play an important role in reducing the pressure on big hospitals but they will also act as preventive care facilities located closer to inhabitants. This means that the primary care centre should serve as a community health centre, where the patients have a proactive role. The studio was collaborating with a real client from Region Östergötland to create different proposals for a new building for the primary health facility in Vadstena.

## SITE

Vadstena is a municipality located in southeast Sweden in Östergötland County with 7.400 inhabitants. The requested project brief contains 3.000 square metres including the following departments: primary care unit, specialist outpatient unit, public dental care, child care and a family centre. In the current primary care centre in Vadstena 7.500 patients are listed and the building is not suited for the modern standards of healthcare. Vadstena has a long tradition connected to healthcare since the 15th century. The site of the project is located in the Brigitta's Hospital area which was built from 1947-1961. One of the existing building in the project site has an important heritage value and needs to be preserved (B), while the other one can be demolished (C). The design of the site also includes the Brigitta Square (A) which these days is not defined and works mostly as a parking lot.

## PROJECT

The design of the project focused on a high level of standardization of the floor plans and optimization of the patient & staff flows. Special attention was made on patient safety and easy wayfinding. In this project, creating a future proof primary care center was of utter importance.



# SITE ANALYSIS

The project has very high sustainability ambitions and the design will focus on circularity, reuse and resource efficiency.

## 1. GREENERY

The site has plenty of greenery and well-grown trees along its outlines. The area is interpreted as rather empty, mostly due to the low height-to-width ratio in the area. The hardened area to the west is the Birgitta Square, that will also be included in the design of this project. In the north there is an existing parking lot.

## 2. SURROUNDING

The current primary care center is located east of the site. To the north, an old healthcare building is used for residential purposes, and right behind it, lies a newly built forensic psychiatric center. A school is located to the west, and in the south there are dwellings and a building used by the municipality for administrative purposes.

## 3. ARRIVAL

The main flows of transportation are motor vehicles from south east and cyclists/pedestrians from the west and south.

## 4. AXES

There is a strong sense of orthogonality in the area, the important axes within the site (red) and the surrounding area (black) are identified as illustrated.

## STRENGTHS

- Cultural heritage
- Site context connected to the health care facilities
- Well grown trees and greenery
- Flat landscape - easy to shape and accessible



## WEAKNESSES

- Existing buildings on site are lacking future proof qualities
- No visual connection to the near water
- A strong orthogonality in the area to take into account
- Distances between buildings making the space undetermined



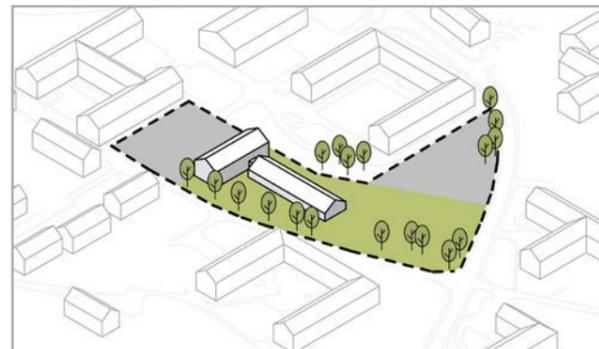
## OPPORTUNITIES

- Improvement of social life
- Area that promotes green 'between' spaces
- Birgitta square as recognizable place in Vadstena
- New direction for inhabitants' movement

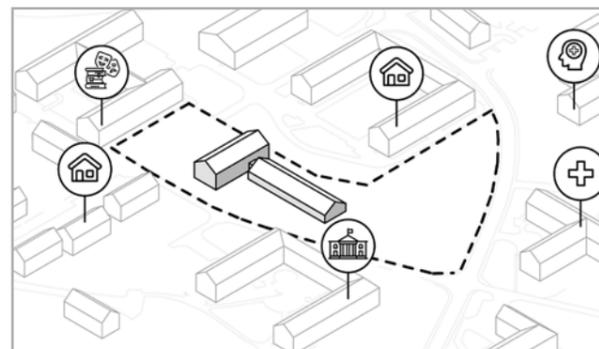
## THREATS

- New building that would not be coherent to the context
- Place to "come and go" only for appointments
- Breaking the rule of cultural preservation
- Competitive character of the new building

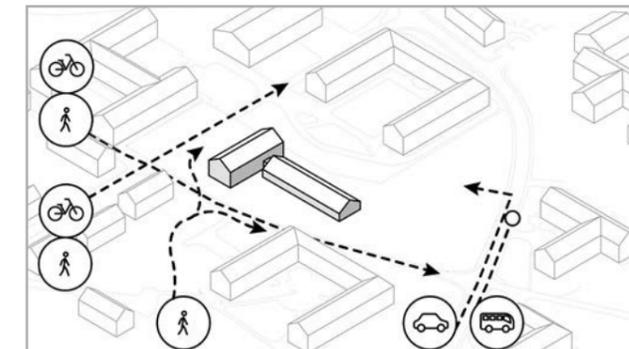
1  
GREENERY



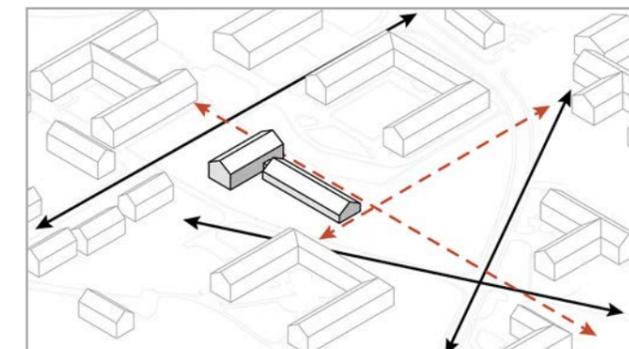
2  
SURROUNDING



3  
ARRIVAL



4  
AXES



# DESIGN STRATEGIES

## TASK

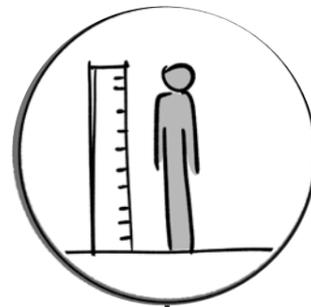
The following four themes are analyzed to form design strategies for this project: Evidenced-Based Design & health promotion, the brief & logistics, site & context, sustainability & future proofing. After a critical interpretation of these themes, specific strategies were chosen to implement in the further conceptual design. The strategies are then clarified into methods which are to be applied in the design. These strategies will also form the base to challenge the brief.

## THE HUMAN SCALE

The human scale is a very important aspect in a holistic point of view as requested by the client. In the current trend of Nära Vård, this is an aspect which cannot be forgotten about.

## THE GREEN IN BETWEEN

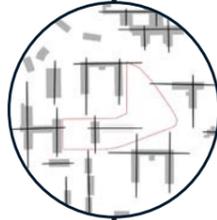
Eventually, the plot is not used to its full potential. The landscape today has no proper design, therefore focus will be laid on this. Greenery also has an important health promoting effect supporting the interior design.



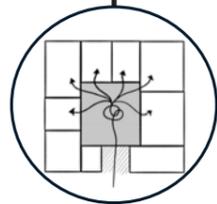
## HUMAN SCALE



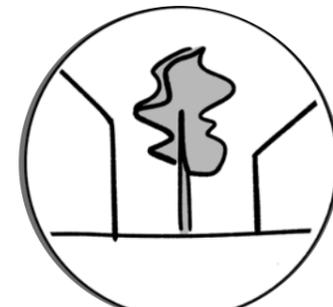
**Added public functions** like a café and pharmacy that support the healthcare function and the in between zone will become a green hub.



**Promote movement** by adding the pharmacy in the reused building. A playground for children in the green meeting hub. And an active organized area on the Birgitta square: ping pong, boules.



**Accessibility** by creating one main entrance from which all way finding and orientation starts to each department.



## GREEN IN BETWEEN



**Nature** present as a green hub between the two buildings. It works health promoting and is also a place for social interaction.



**Biodiversity** by integrating bio diverse elements in the green zones like insect hotels. A proper landscape design is integrated in this project. Some green will be integrated in the waiting area.



**Outdoors/Indoors** by creating a thin facade layer. The patient corridors go along a glazed facade and they also end with glazing, this gives an orthogonal look into the outdoor area.

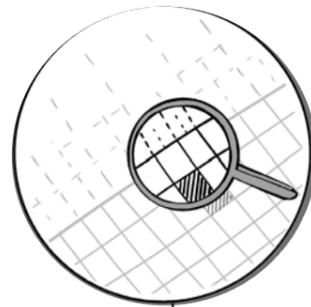
# DESIGN STRATEGIES

## PAST-PRESENT-FUTURE

The plot has an important healthcare history which cannot be forgotten about. Therefore the past will be recognized while making critical decisions. As the current building for the primary care center is not suited anymore for its health purposes, all contemporary trends in healthcare should be carefully implemented. But at the same time, possible future changes need to be taken into account. The building needs to be future proof to avoid the same situation in another 20 years. Furthermore, sustainable aspects play a major role in the design of every building these days.

## REUSE OR DEMOLISH

To support all these methods, the choice is made to demolish the second building. The chosen goals need to be reached and the current plot is too divided. The flexibility and future proofing goals cannot be reached as wished in the existing buildings. As the type of existing building is the same as the current primary care center, the energy performance and hygiene will not be sufficient. By still respecting the orientation of the buildings in the plot, respecting the original position of the demolished building. And by creating a proper landscape, most opportunities of the plot are used.



RECOGNIZE THE PAST  
FIT IN THE PRESENT  
PREPARE FOR THE FUTURE

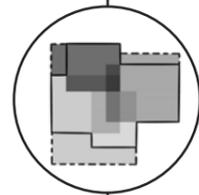


**Enhancing quality of existing spaces** by properly designing the connection between the new and reused building. The plot contour of the demolished building will be emphasized in this design.

PAST



**Orthogonality** is strongly present on the Birgitta Health plot. The orientation of the existing buildings will be studied and a grid will divide the plot in different zones.



**Space efficiency** is reached through sharing rooms between different departments: waiting rooms, conference rooms, etc. By excluding administration from examination, all these rooms will get a higher usage percentage.

PRESENT

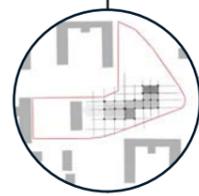


**Design a coherent plot** by demolishing one of the buildings and properly designing the zone in between.



**Reduced energy consumption** by using a timber column structure. Furthermore there will be thought about a logic building orientation and strategic room planning.

FUTURE



**Flexibility** by using grid systems in designing the volume and floor plans.

# CONCEPT BUILDING DESIGN

## 1. CORE

A central core is placed where the axes, identified from the site analysis, intersect. This core will be used as a main point of communication and orientation.

## 2. VOLUME

A volume is placed surrounding the central core.

## 3. SPLIT

As the core forms the main point of orientation, it needs to be accessible. Therefore the axes are used as guidelines to divide the volume into four building blocks.

## 4. ADAPT

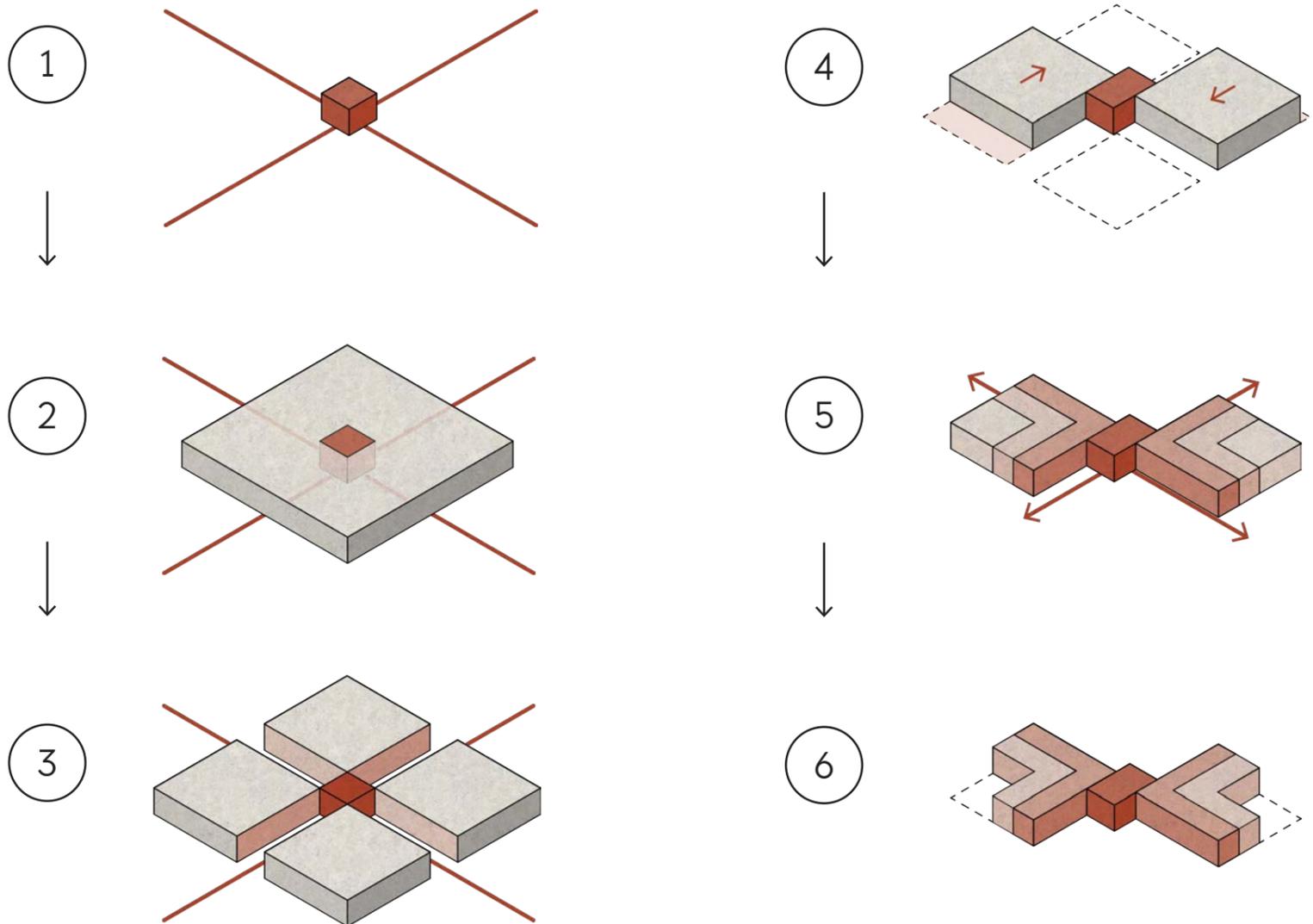
The site allows for two built stories, therefore two of the building blocks can be removed to allow for the remaining volume to fit properly in the site.

## 5. FLOWS

The main internal flows are spread out from the central core along the axes, allowing for a division of public and private flows within the volumes.

## 6. SHAPE

The shape of the volumes are adapted to allow for better light conditions. These new L-shaped building blocks make use of the separation of public and private flows by adding a double corridor system; one for patients and one for staff.

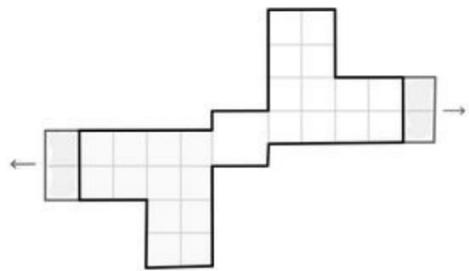


# CONCEPTUAL FOCUS

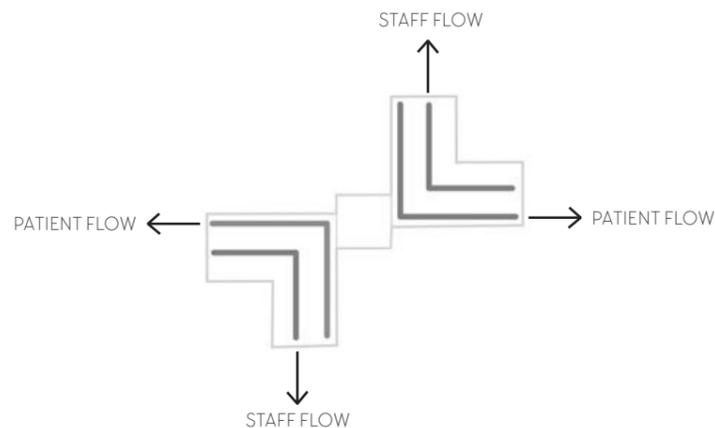
## FUTURE PROOFING

Vadstena's care cross is designed prioritizing future proofing of the site and the building. Therefore, this became the main focus of the conceptual design and the challenging of the brief.

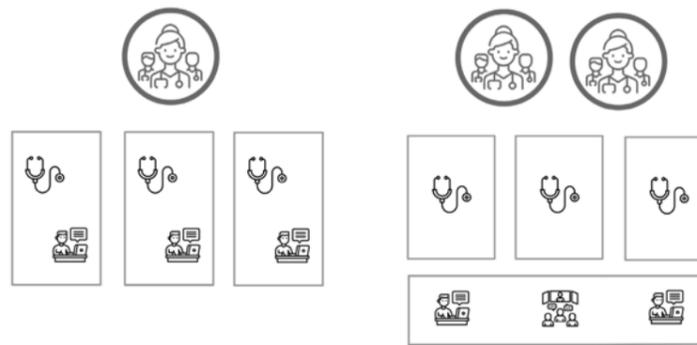
The plans are designed using a structural timber grid of 7.2m x 7.2m. In the future the volume can easily be horizontally extended by adding one grid at the horizontal ends of each L. Furthermore all the rooms are designed in a 1.2 m x 1.2 m grid to create a general, modular and cost-efficient interior. This flexibility creates the opportunity to easily adapt the departments inside the care center. The building is also suited for other functions and can even be divided for two different purposes, as it has two technical cores and two entrances in the central glazed core.



The floor plans are designed following a system. Each L has a technical core located centrally in the dark zone of the volume. The outer L-flow is equipped with rooms where both patients and staff need to have access to while the inner L-flow is only for staff.



Another aspect of future proofing is the division of administration from examination. The administration takes place in a co-work zone which is equipped with three small offices if there is need for silent work. In each L-volume and on each floor, this zone is present. The fact that these two functions are separated means that the examination rooms can reach a higher usage ratio. In the future this means that there is a possibility to work with more staff in the same building.

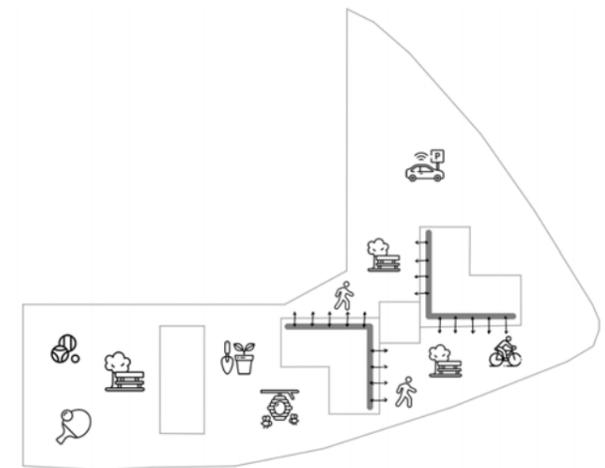


The choice to demolish one of the existing buildings and reuse the other one for functions with low hygiene requirements also results from a future proof vision. The existing building would create similar problems as there are in the existing primary care center in terms of ventilation, insulation, hygiene, security, etc.. By designing a new building, all these aspects are taken into account.

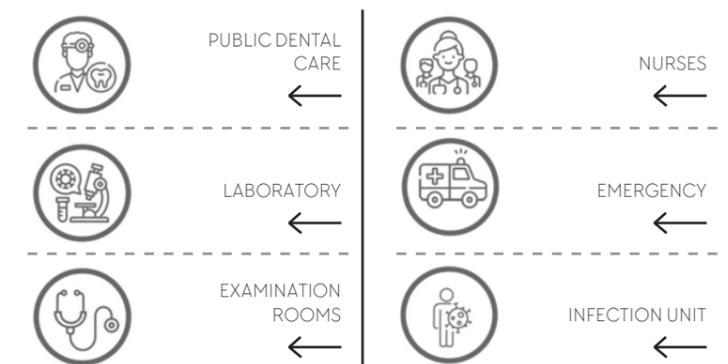


## HEALTH PROMOTION

Another aspect that goes along with future proofing is health promotion. At first the plot is designed in coherence with a proper landscape which has active zones like on the Birgitta square and more restful zones like in between the reused and new building. Furthermore, the patient corridors have a transparent connection with this outdoor environment through a glazed facade. This also means that natural light can enter easily.

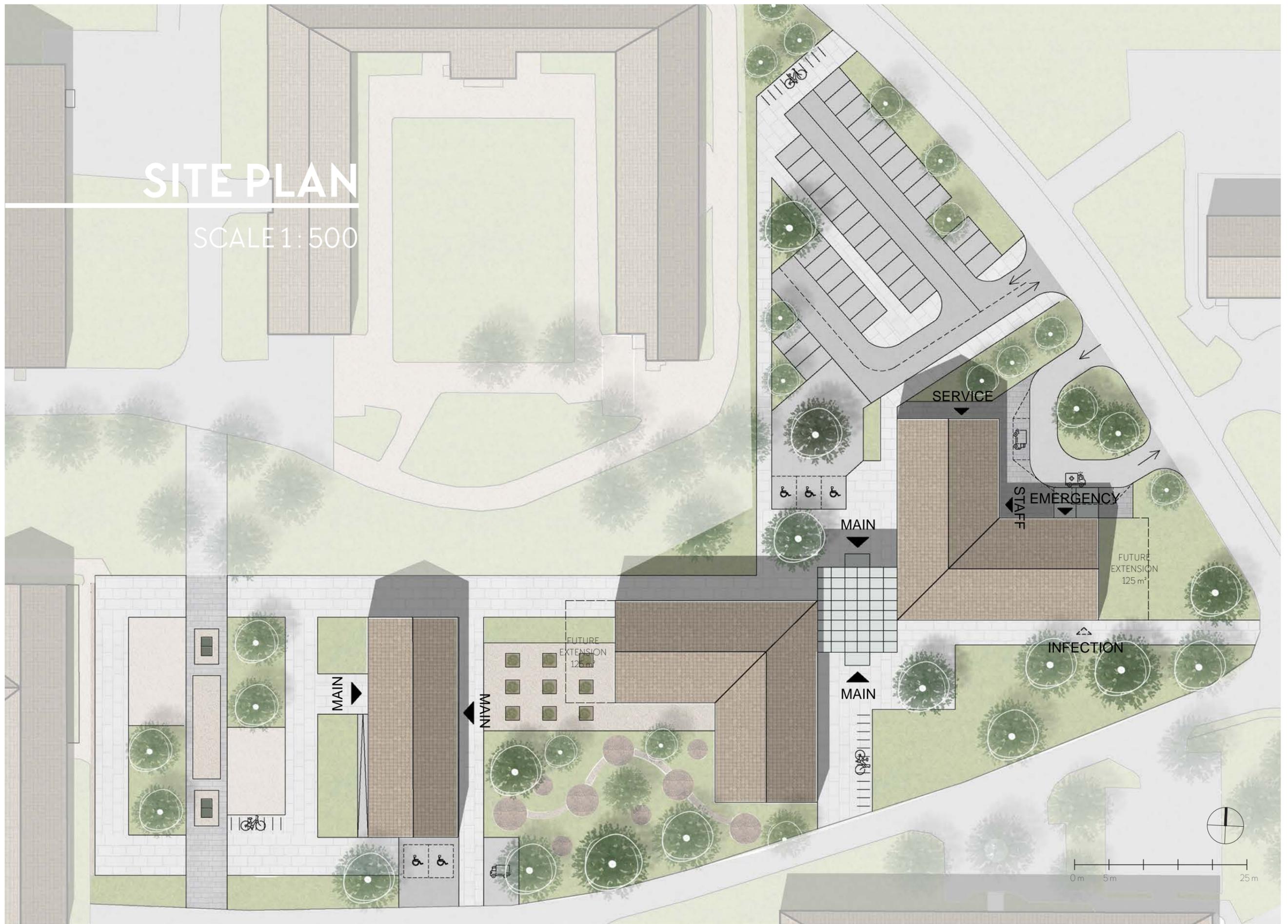


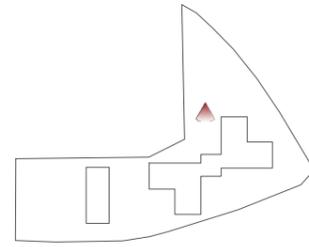
Finally, because of the easy way finding, the stress during a patient's visit is reduced. Also the staff's stress level is reduced by separating the flows with the patients.



# SITE PLAN

SCALE 1:500

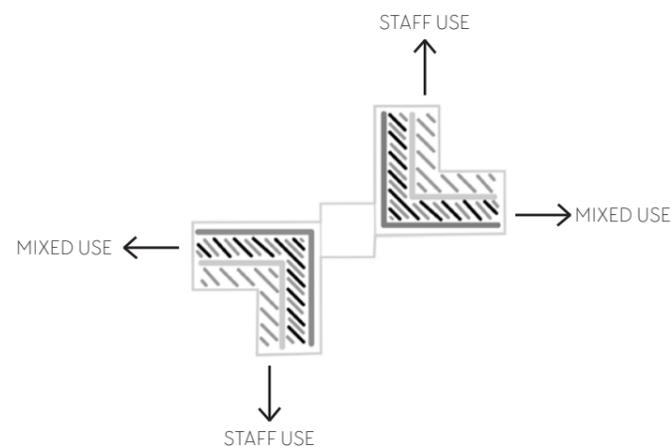
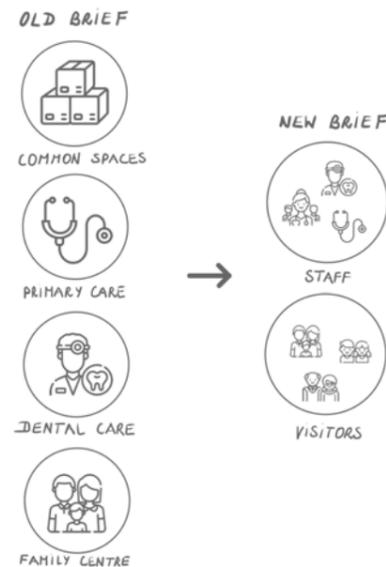




# CHALLENGE THE BRIEF

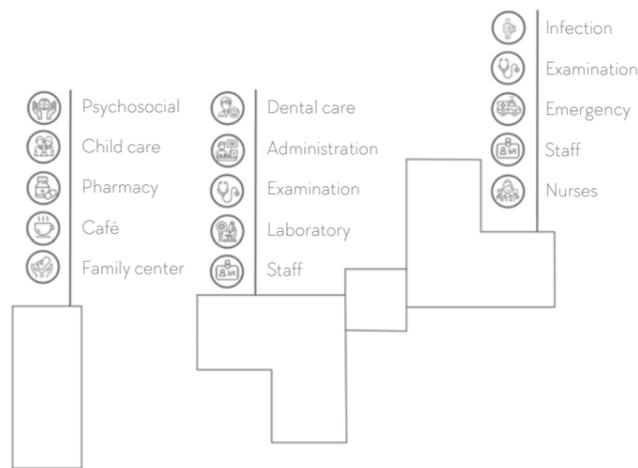
## SEPARATION OF FLOWS

To step away from a traditional design, several strategies will be applied to challenge the brief. The main idea is to not design the building based on the four departments as defined in the given brief by the client, but to divide the brief in staff areas, visitor areas and mixed use areas.



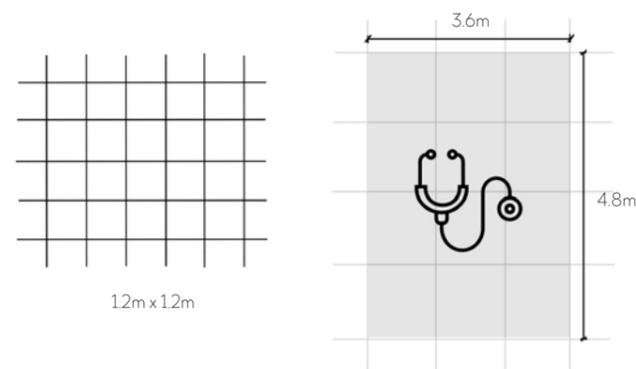
## ADDED PUBLIC FUNCTIONS

The primary care center will also support social aspects by adding public functions to the brief. This means that the site is not created for patients but for visitors. The ground floor of the existing building will be equipped with a pharmacy and a cafe. Furthermore the sick and the non-sick flow of the primary care center will be separated. Therefore the child care, family center and the psychosocial department will be located on the first floor of the reused building as well.



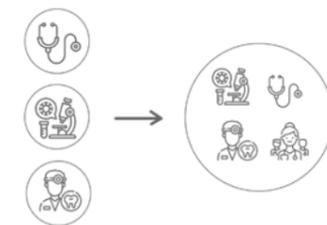
## FLEXIBILITY

Because of the use of a timber column grid of 7,2m x 7,2m and because all the rooms are fitted inside a grid of 1,2m x 1,2m. All the room sizes are defined by these dimensions.



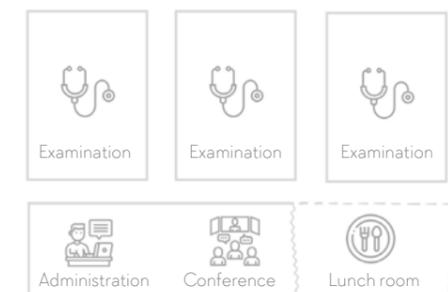
## ACCESSIBILITY

To keep in mind the patient centered concept of Nära Vard, the accessibility of the plot as well as the way finding in the building is very important. Therefore the central core between the two L-shaped volumes will be the main orientation point. Outside the building all the roads lead there. Inside this central core, the waiting rooms of all the departments are organized and all way finding departs.



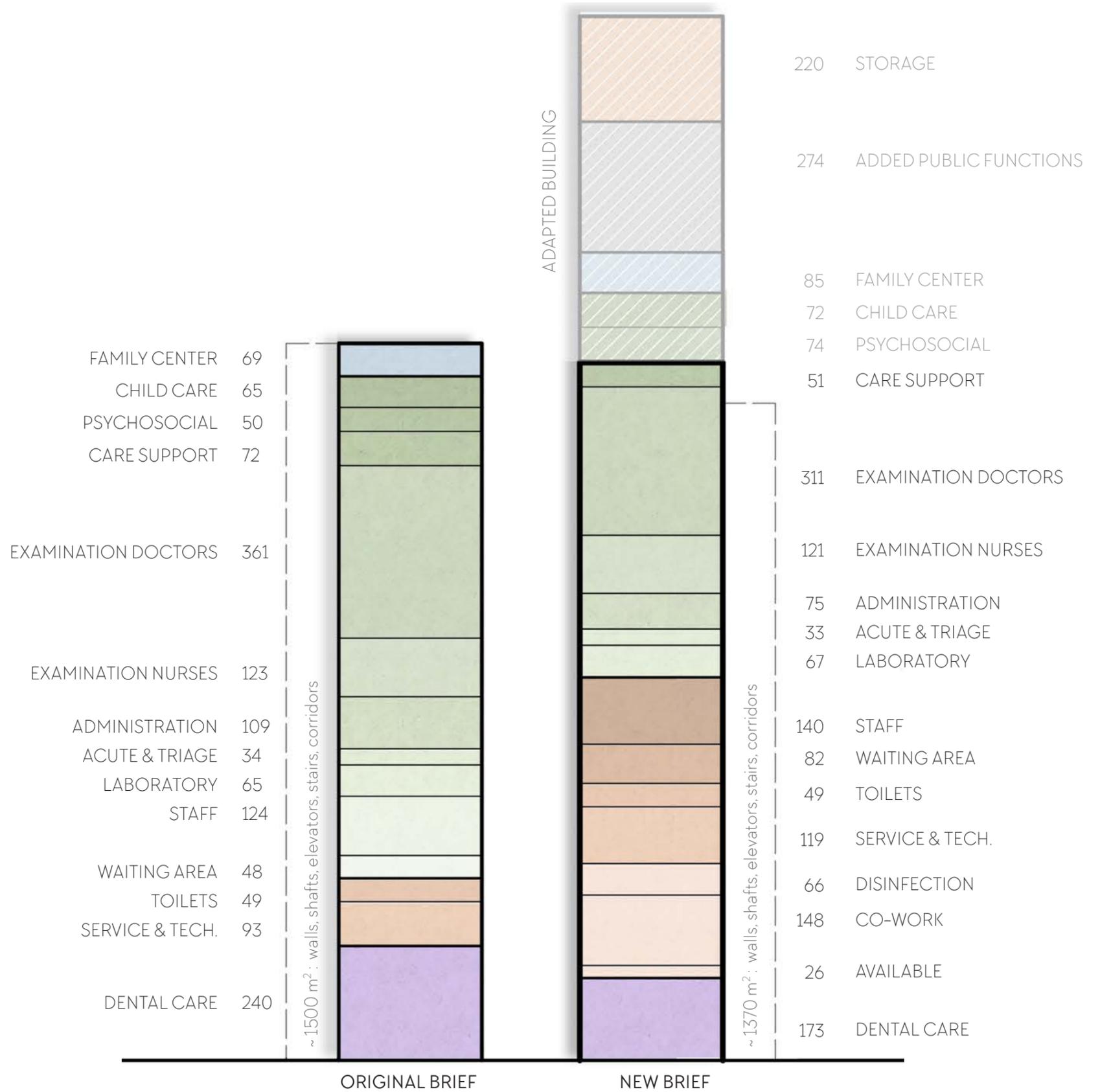
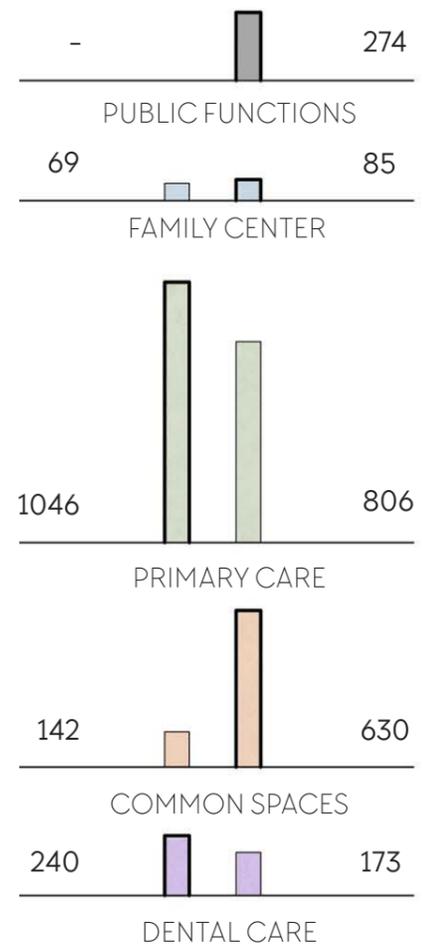
## SPACE EFFICIENCY

Initially space efficiency was tried to be reached by reducing the amount of square meters. During the process it became clear that this building should not be designed as small as possible but as systematic and future proof as possible. Therefore a strict system became clear in the floor plans. There is a strongly defined shell and core structure visible. The position of the mixed used areas follows from the separated flow system. Furthermore, administration is separated from examination which results in a more efficient use of the examination rooms. These co-work rooms also function as conference rooms. On the first floor there is a possibility to connect the co-work room with the lunch room to have a higher capacity for meetings.



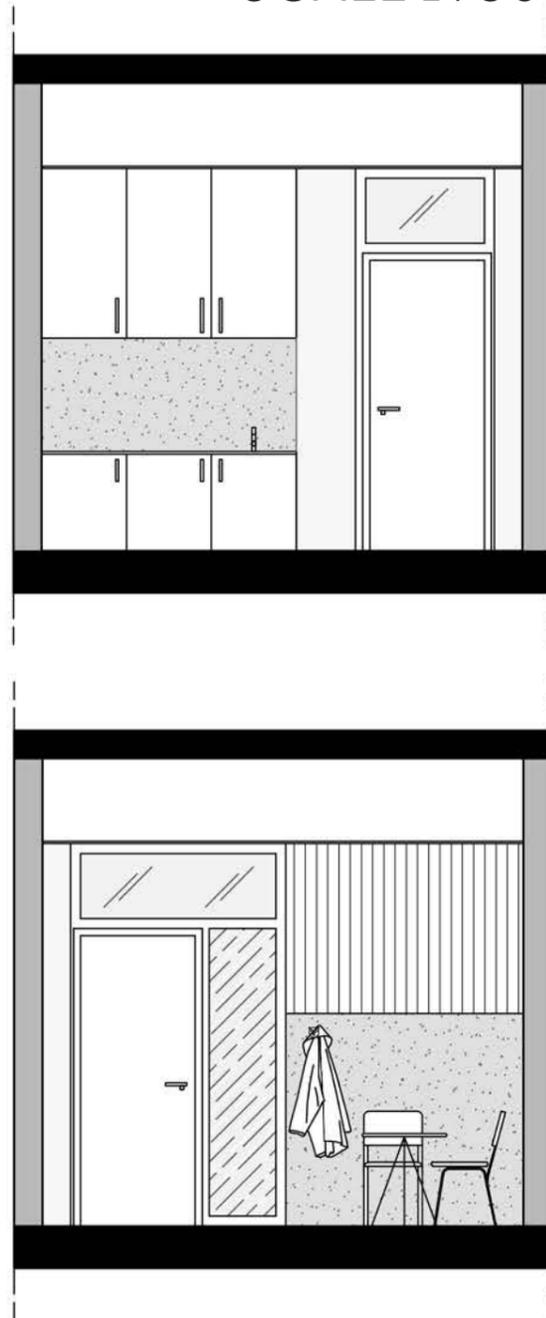
# CHALLENGE THE BRIEF

<b>ORIGINAL BRIEF</b>	<b>NEW BRIEF</b>
brief total : 1497.5 m <sup>2</sup>	brief total : 1463 m <sup>2</sup> + 725 m <sup>2</sup>
GFA : 3000 m <sup>2</sup>	GFA : 2840 m <sup>2</sup> + 1248 m <sup>2</sup>
GFA factor: 2.0	GFA factor: 1.9 (for new building)



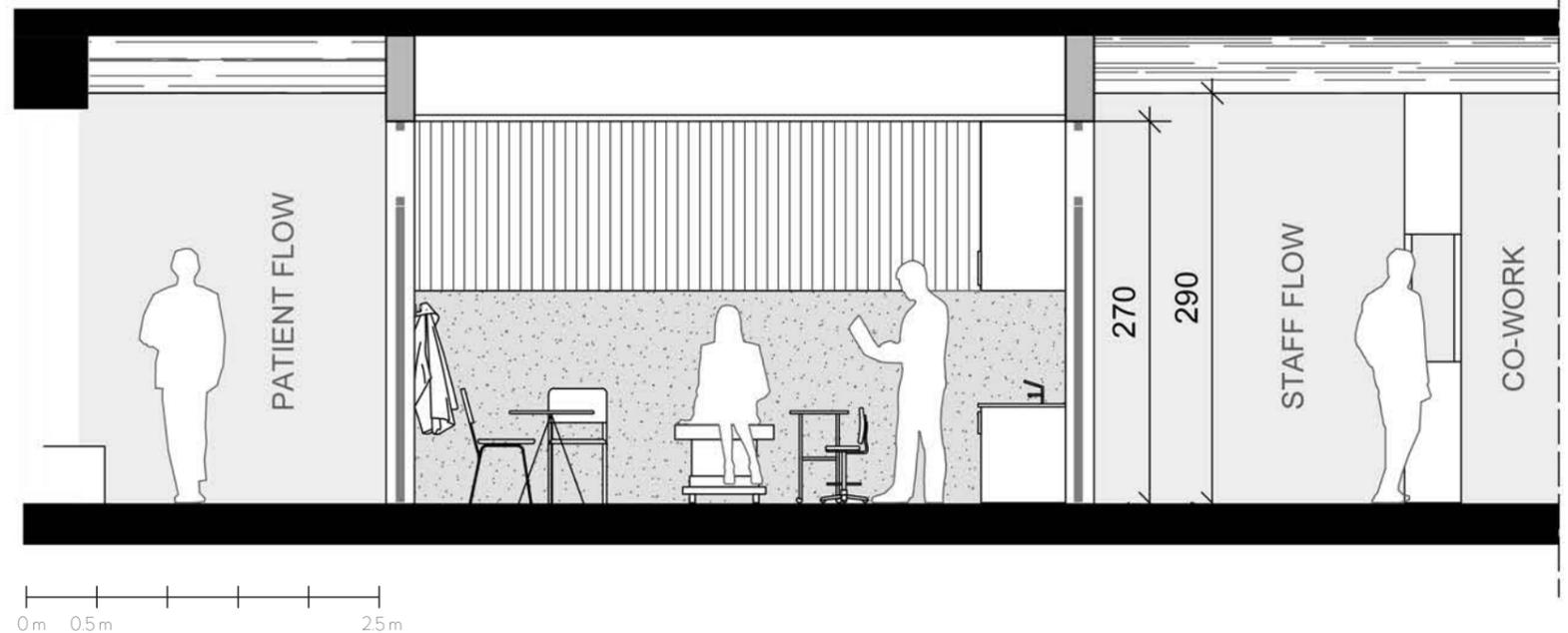
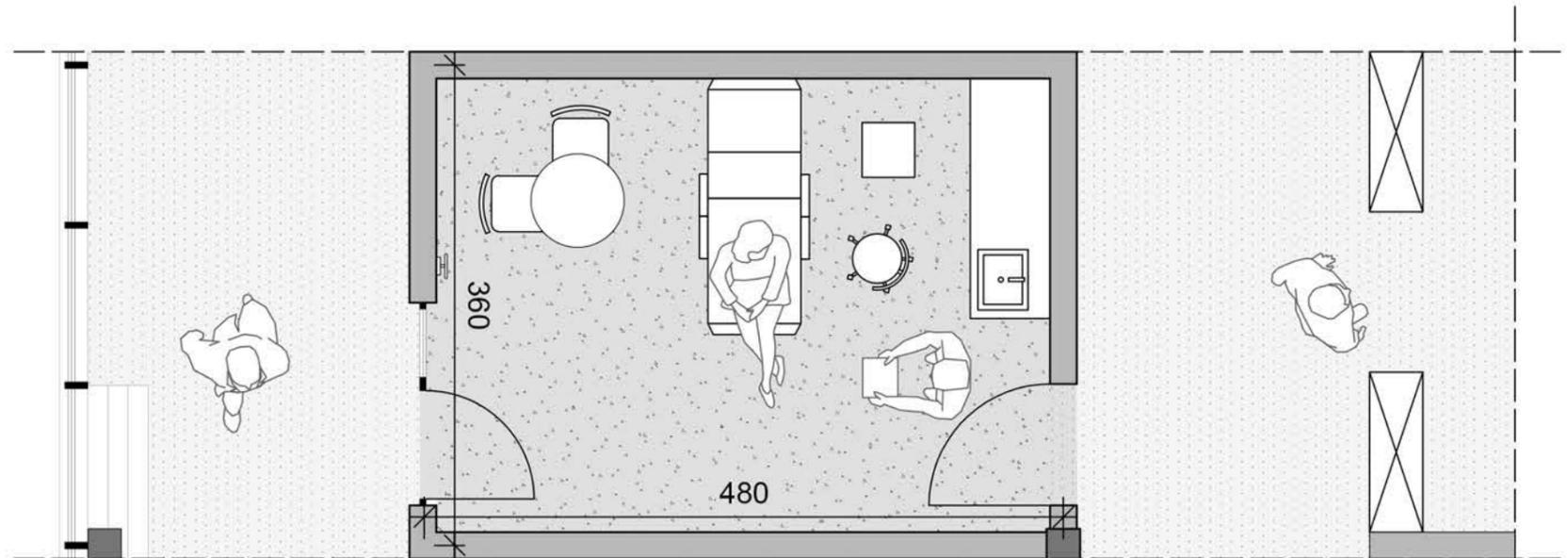
# EXAMINATION ROOM

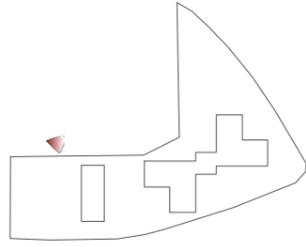
SCALE 1:50



Considering separated flows for staff and patients, placement of the examination rooms was fitted in between two corridors. In this concept the examination room doesn't have direct light. However, the problem was solved with glazing above both doors and an additional "milk-glass" panel next to the patient door. With that idea the room is having more private character but still has indirect access to daylight.

The office space for doctors was removed and provided in the co working zones available from the staff corridor. In that way the examination rooms are able to be used more efficiently and are not restricted to the amount of doctors working today.





# CONCEPT FLOOR PLAN

## SHELL & CORE

The concept for the volume is extended into the floor plans. The two L-shaped buildings will have a symmetrical and structural identical base. Although the volumes are designed to fit the program efficiently, the structure is not designed for any specific department. This creates a future proof building.

### 1. FLEXIBLE STRUCTURE

The two L-shaped buildings follow a structural 7.2m x 7.2m pillar grid. A future extension is possible by extending the grid to the east and west.

### 2. VERTICAL COMMUNICATION

The stairs and elevators are located centrally in each building, providing and strengthening the opportunity to use each wing for different functions. Structurally these are also important horizontal stabilizers.

### 3. WET AND TECHNICAL SPACES

Technical rooms, a disinfection room and toilets for both patients and staff are a part of the buildings' central, dark cores.

## FLOWS & FUNCTIONS

### 1. DOUBLE CORRIDOR

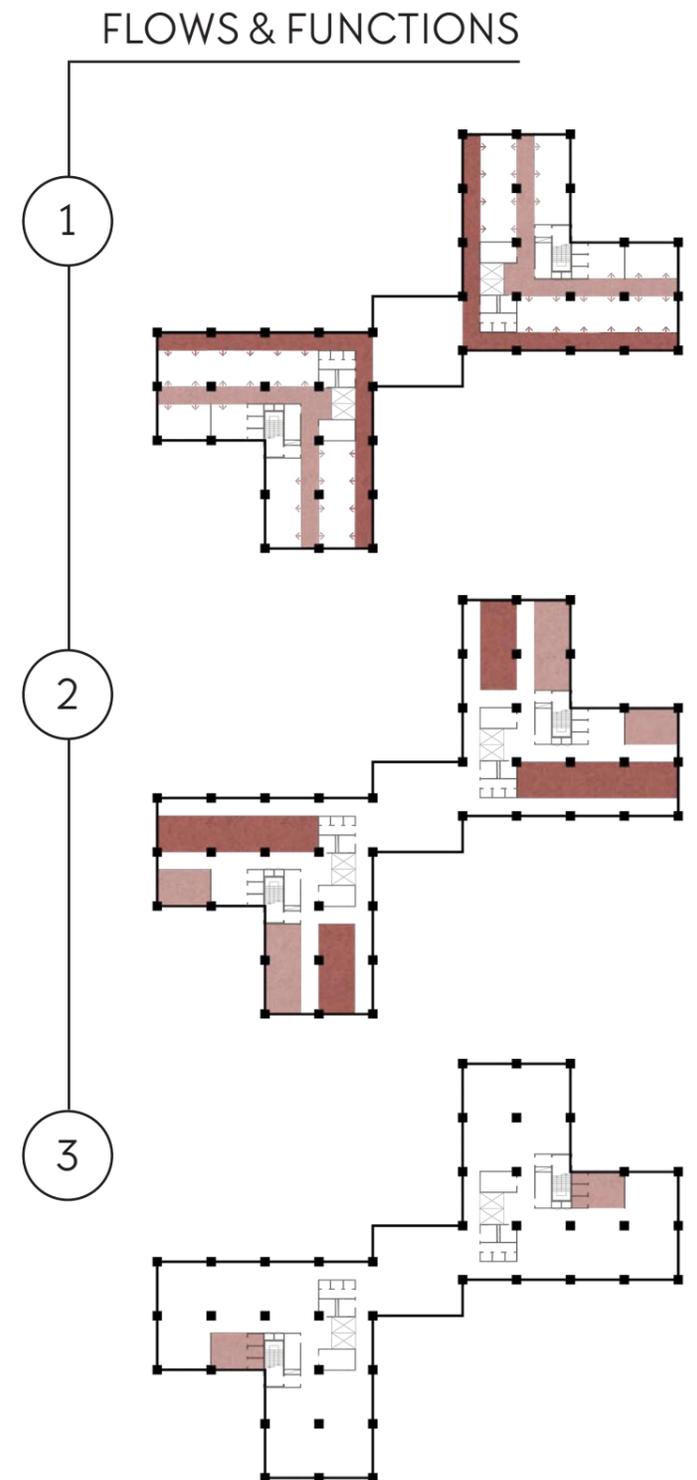
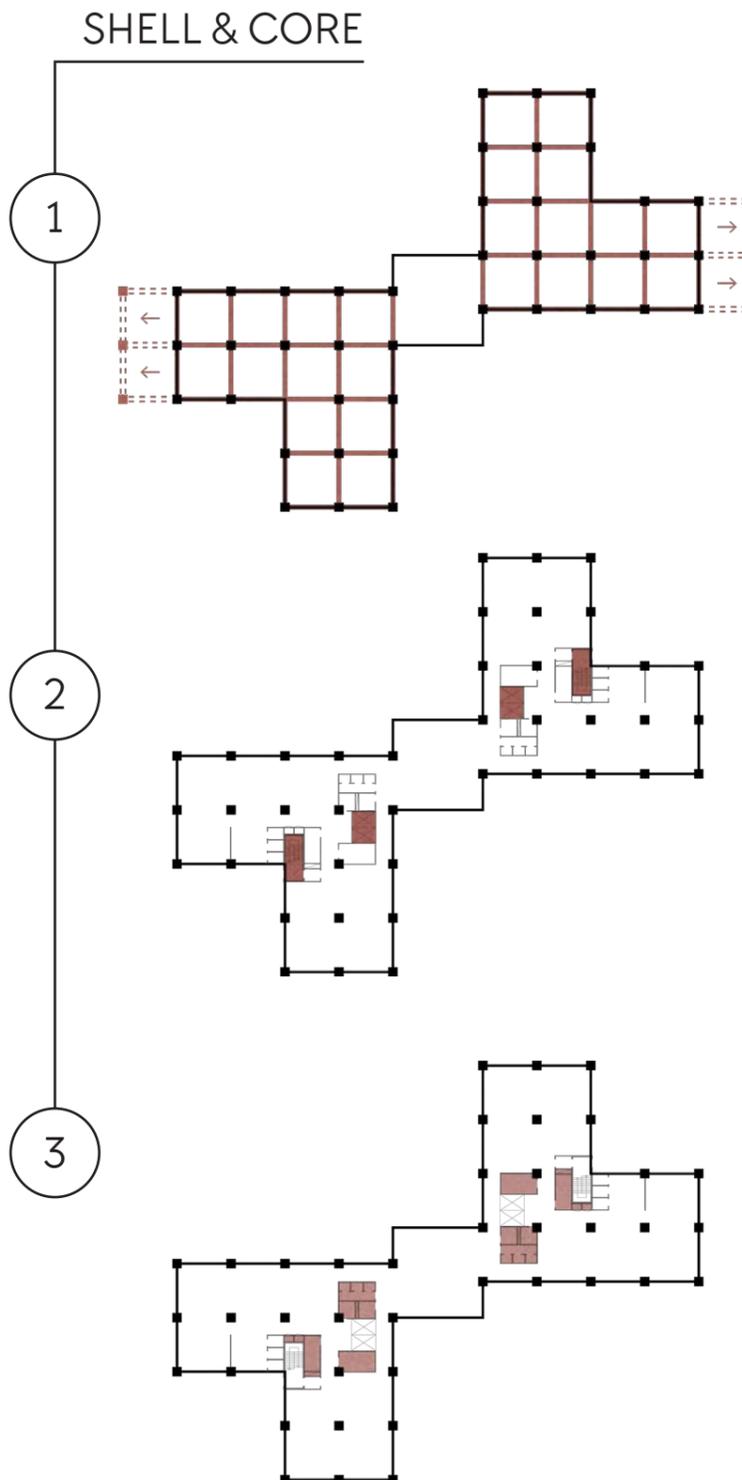
Each L-shaped floor plan has a double corridor system that separates the patient's flow from the staff's. Streaming out from the central core, the outer corridors provide communication for patients and visitors while the inner corridor is strictly for staff.

### 2. DEPARTMENTS

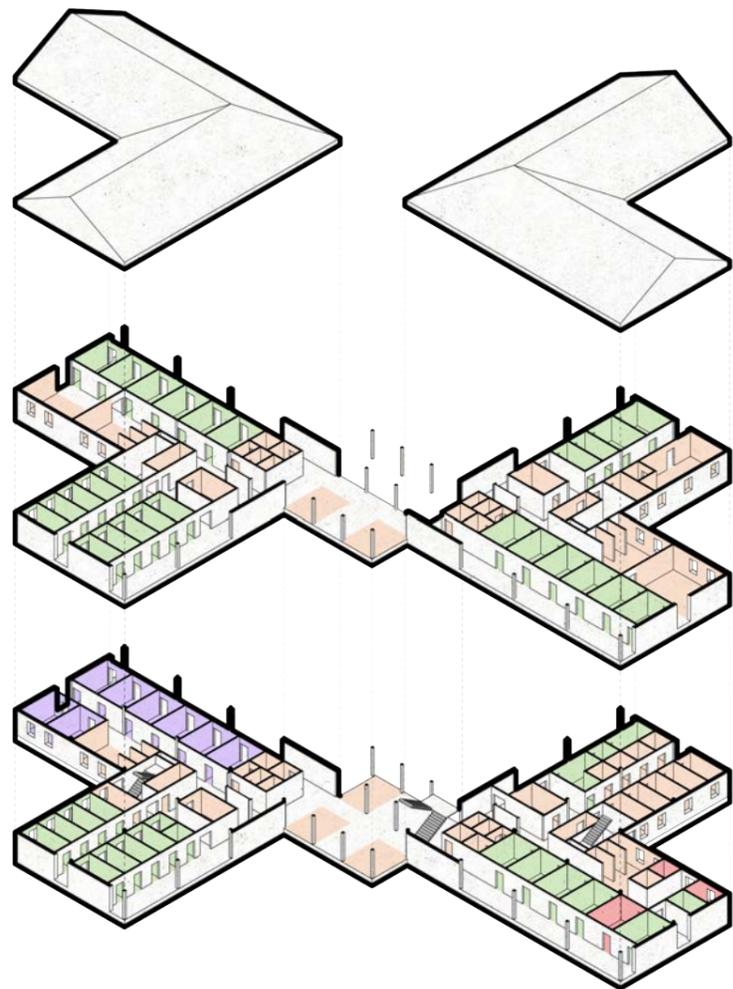
Strictly staff areas are placed along the facade of the inner part of the L-shaped building, while the shared areas are placed between the patient's and staff's flows.

### 3. CO-WORK SPACE

For a flexible and general system, each L-shaped floor plan has a zone designated for co-work space and offices. This zone is located in a close relation to the vertical communications.



# DEPARTMENT DIVISION



- FLOW PATIENTS
- PRIMARY CARE
- DENTAL CARE
- COMMON AREAS
- FLOW STAFF
- EMERGENCY



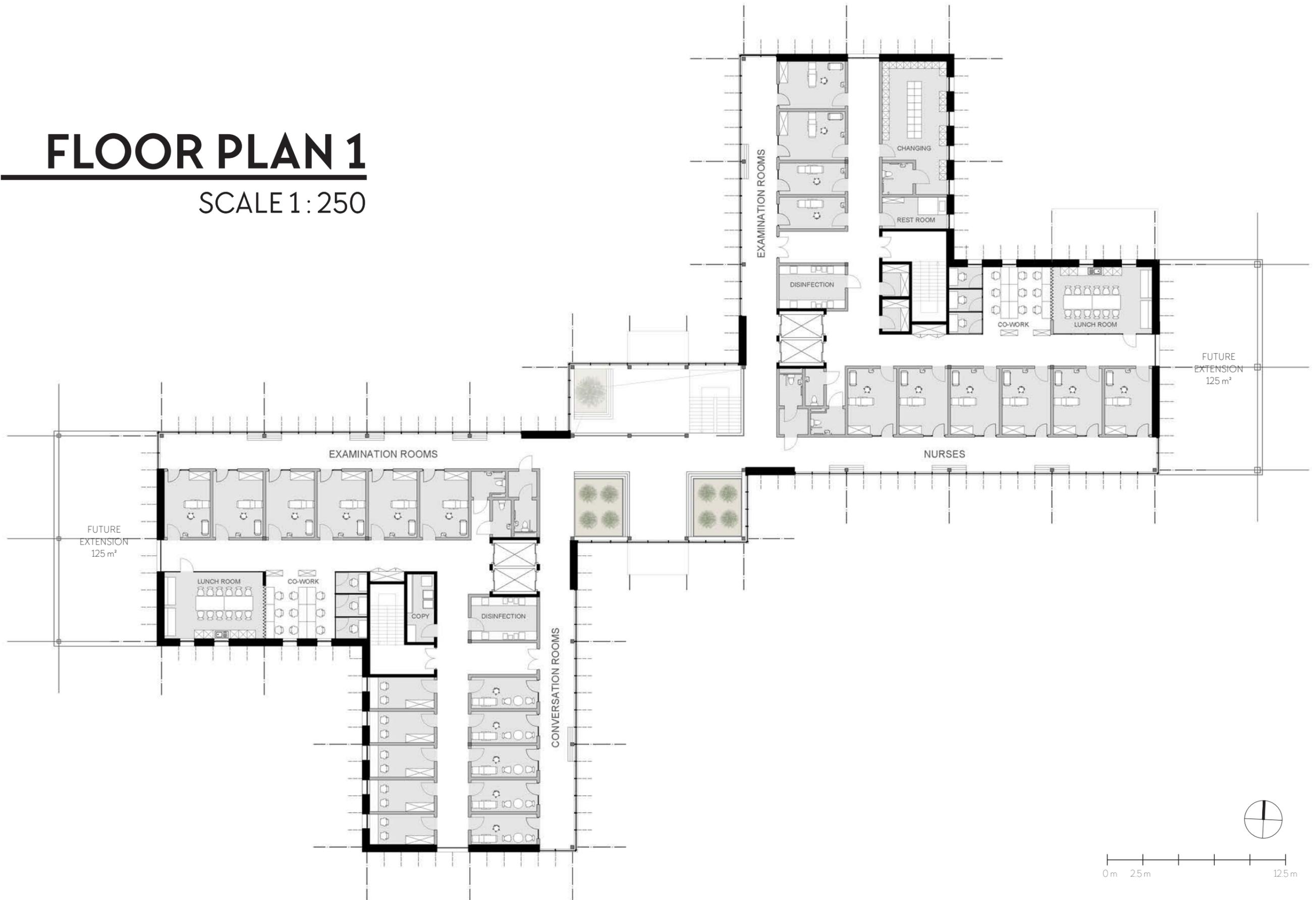
# FLOOR PLAN 0

SCALE 1:250



# FLOOR PLAN 1

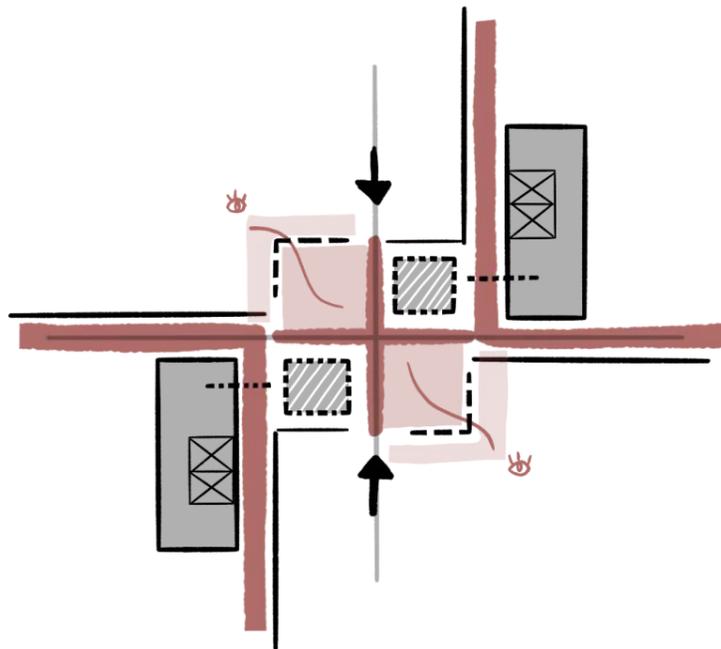
SCALE 1:250



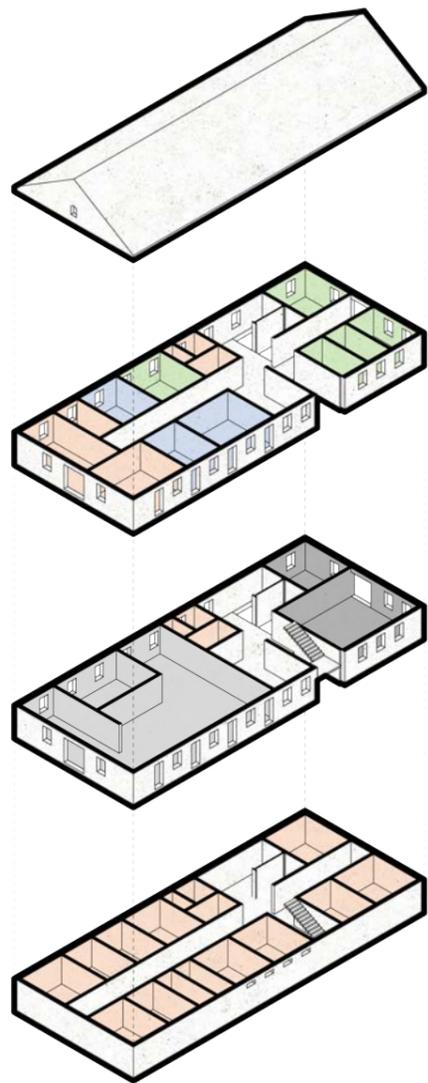
# ENTRANCE HALL

## CONCEPT

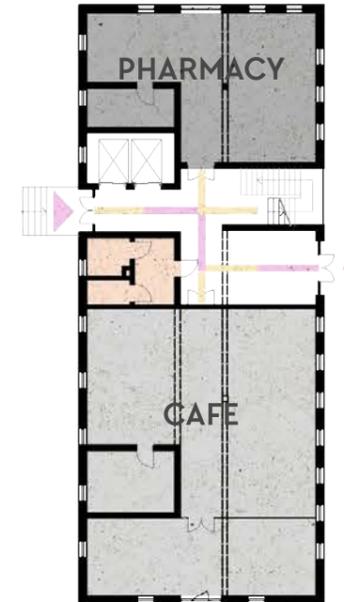
The core between the two L-shapes serves as the entrance hall of the primary care center. The volume concept is integrated by extending the axes into this core. The wind catchers are positioned on the vertical axis and are added outside the volume to attract people's attention and ease way finding. Furthermore, the horizontal corridors of the two volumes come together in the center of the core. These axes divide the entrance hall in four zones. The technical cores of the L-volumes will be extended with the two adjacent zones inside the entrance hall. In here are the reception and the staircase located. The other two zones are waiting areas. The waiting area is designed with benches which surround greenery. Through these waiting areas a diagonal visual axis from northwest to southeast of the plot is created, which connects the two entrance zones visually.



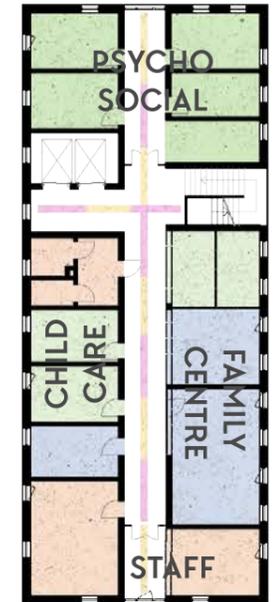
# DEPARTMENT DIVISION



-1



0

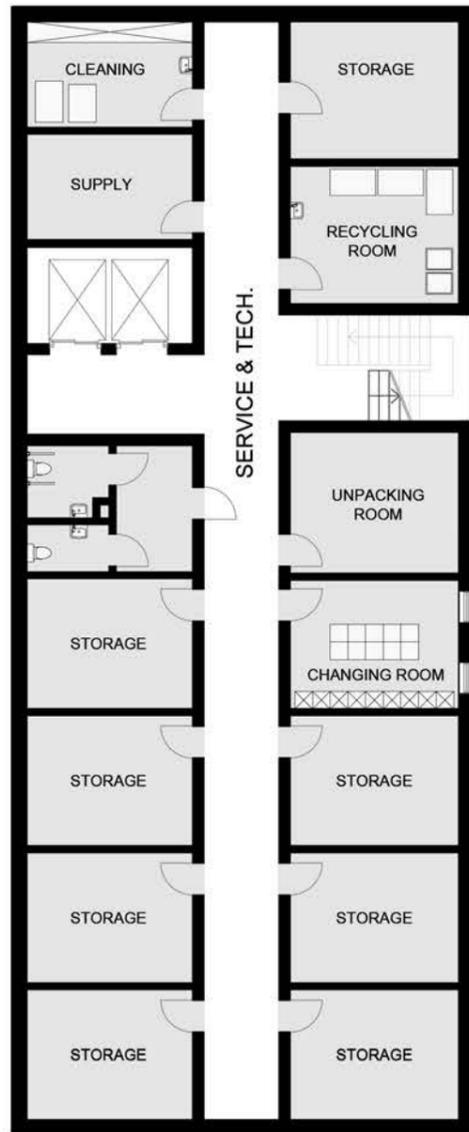


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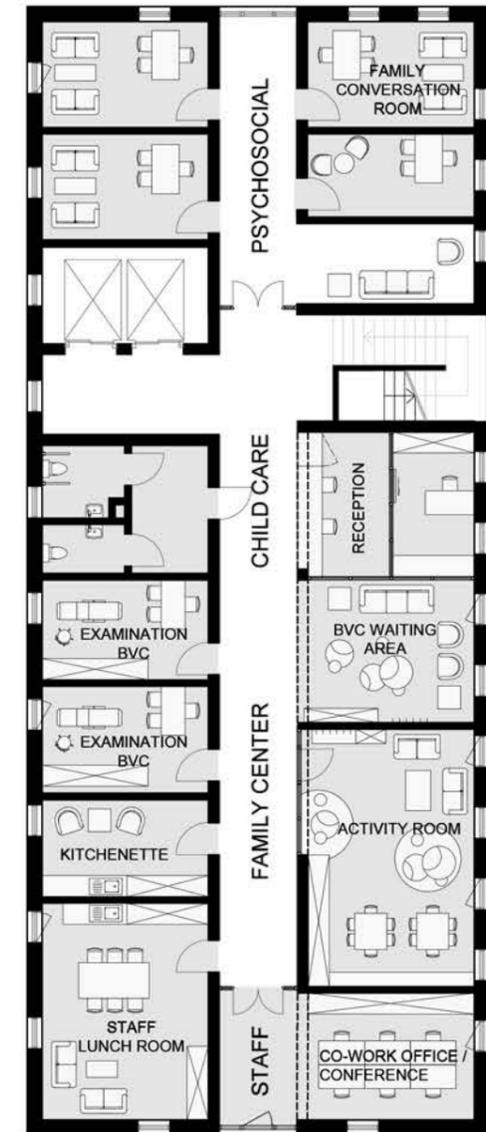
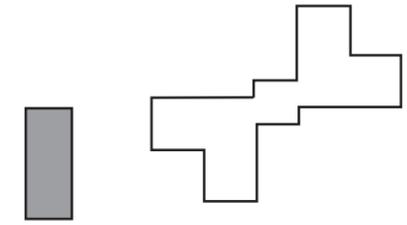
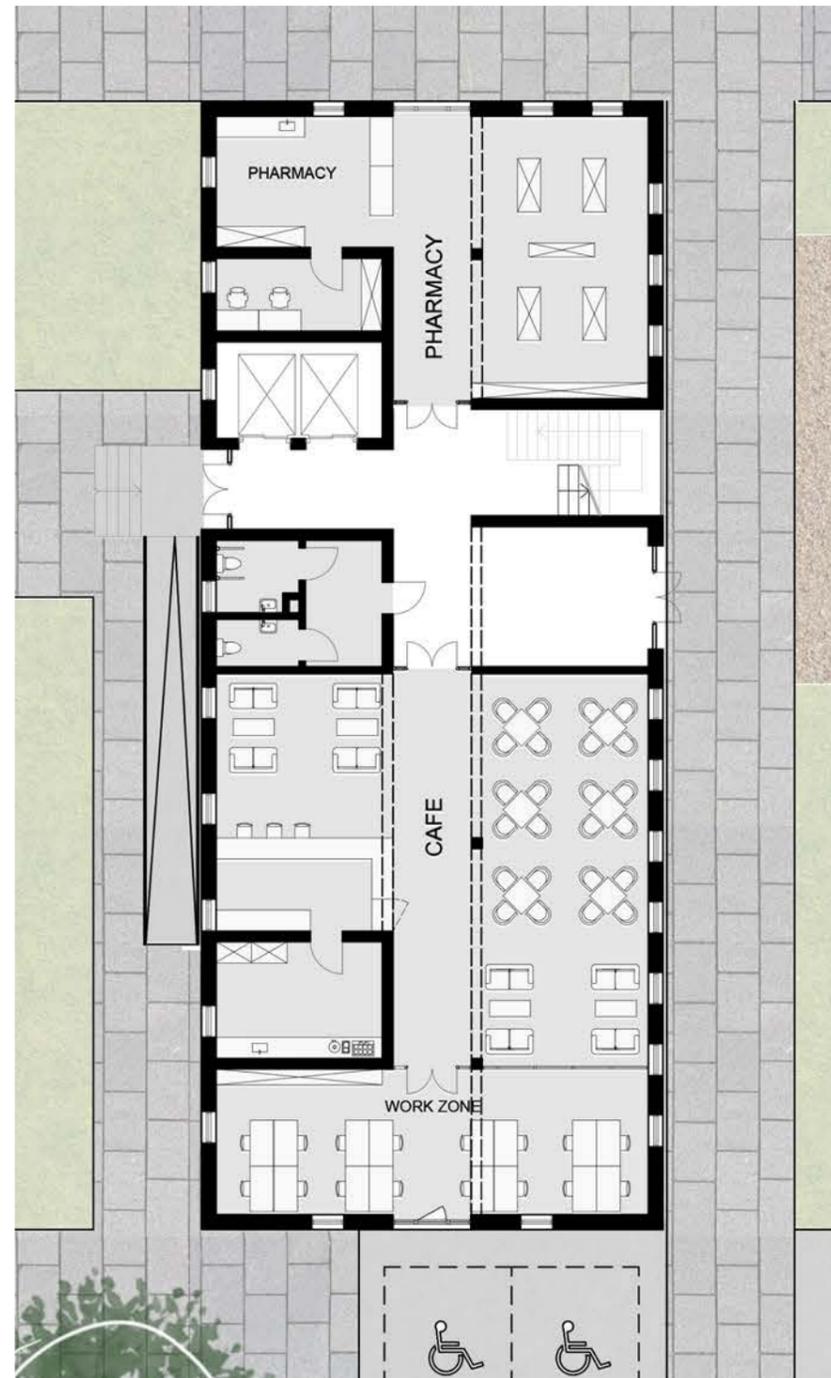


# FLOOR PLANS

SCALE 1:200



-1



1



# CONCEPT DESIGN FACADES

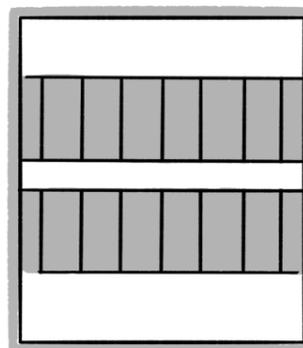
SCALE 1 : 200

## CONCEPT

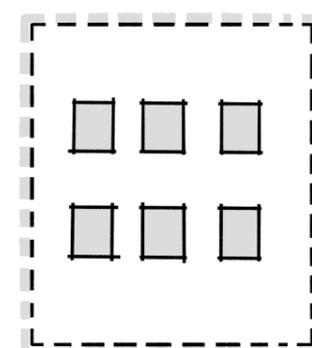
Concept design of the facades is directly related to public and private spaces. Both of the "L - shaped" parts of the building have the same structure of corridors.

The outer hallways are designed for patient flow, where the priority is focus on access to natural light, good patient orientation in the building and connection to the outer environment. To achieve those goals and to create open and bright corridors, outer walls were designed as glass facades.

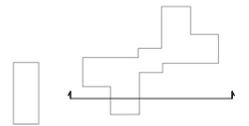
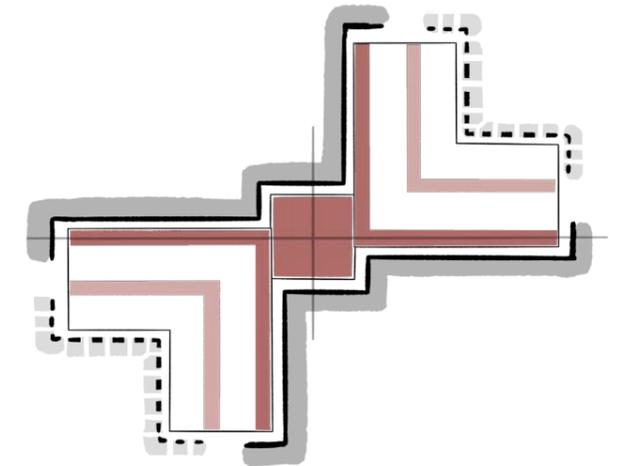
The inner corridors are serving only staff flow. In that part of the building are located facilities that often need more privacy, that is why the facades in those parts are designed with fewer openings.



PATIENT CORRIDOR

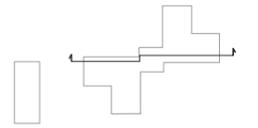


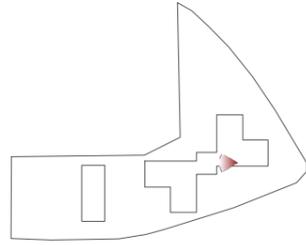
STAFF CORRIDOR

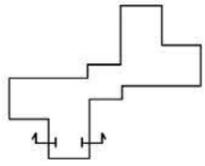


# SECTION

SCALE 1:200

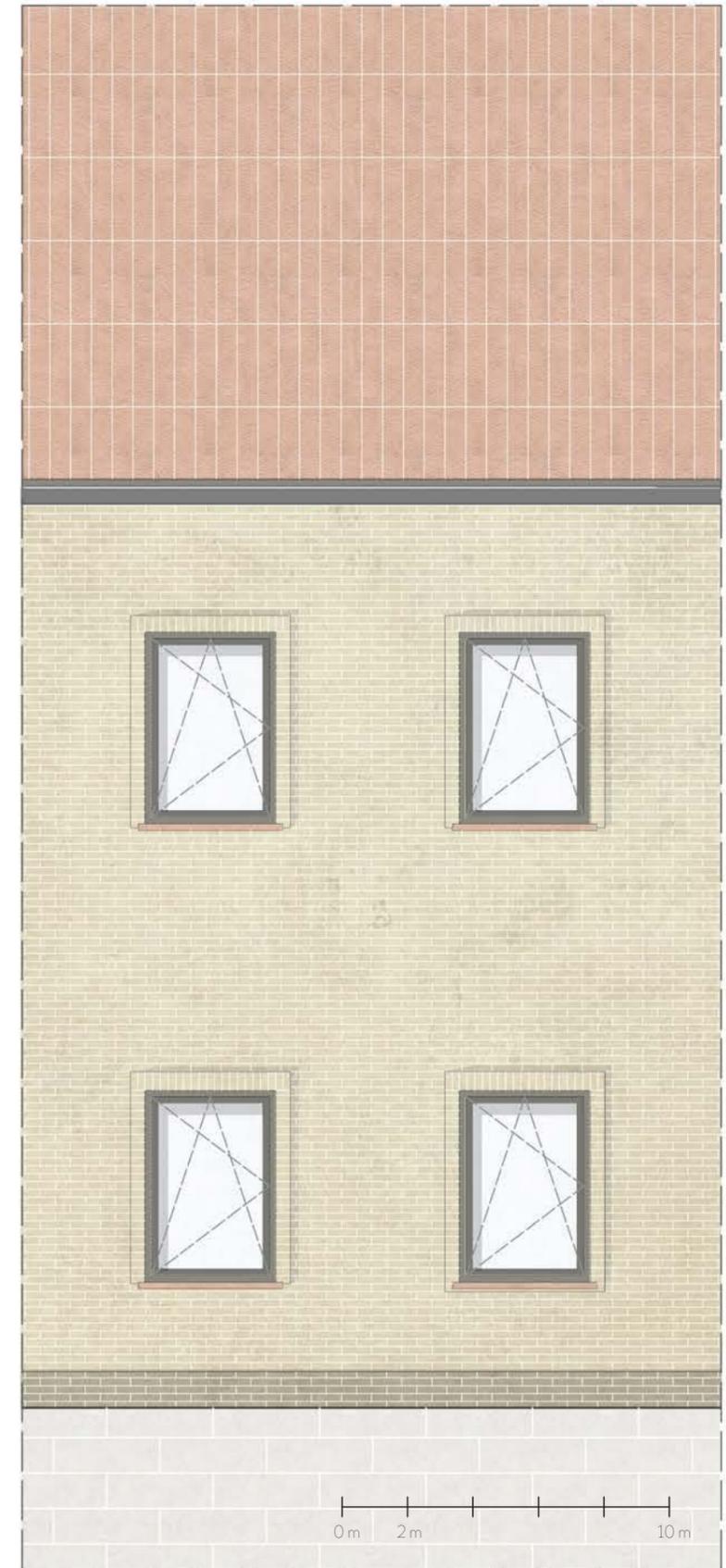
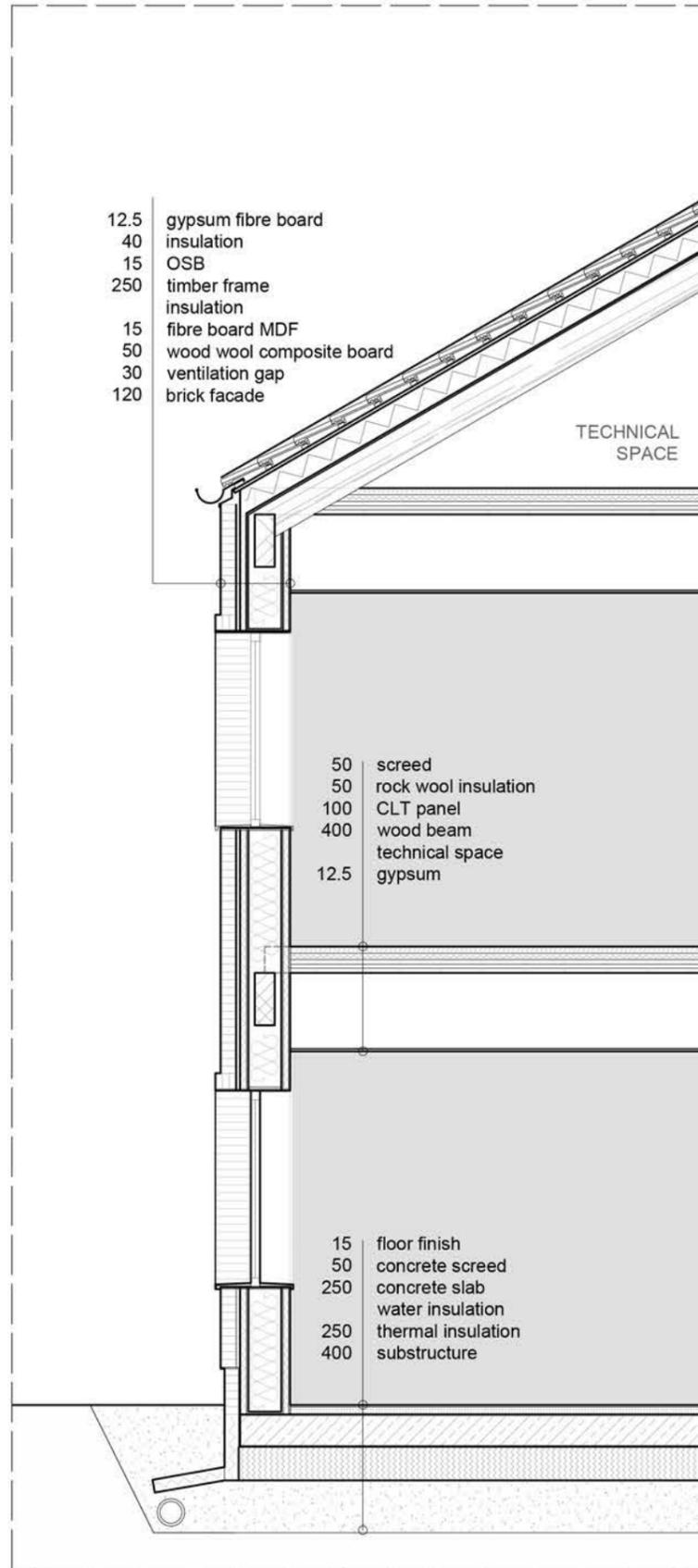
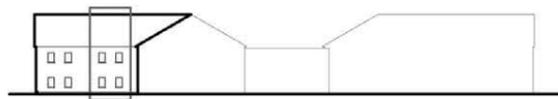


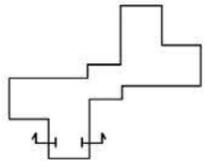




# FACADE DETAIL

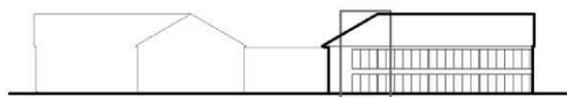
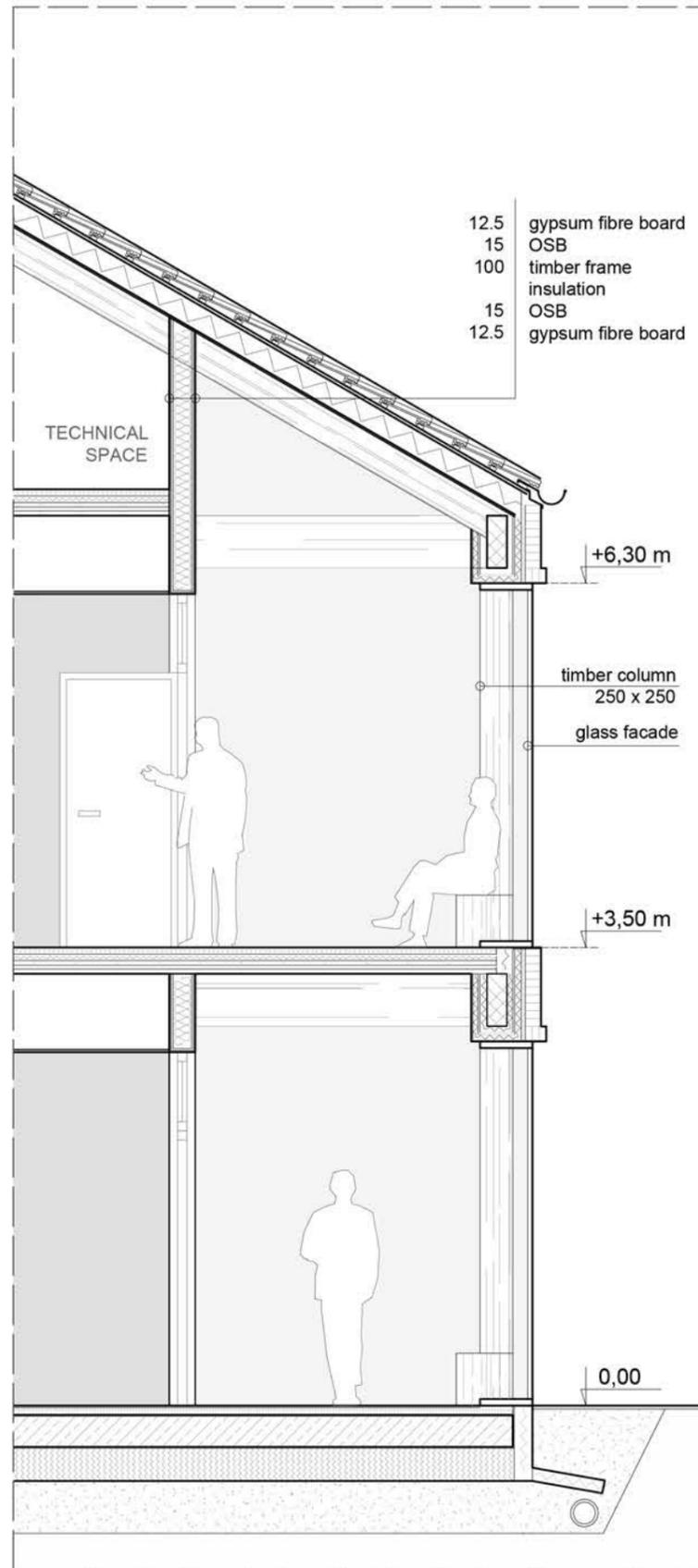
SCALE 1:50





# FACADE DETAIL

SCALE 1:50



# MODEL

