



A **CORE**-RELATING HOSPITAL

Providing a mutual relationship between patient, staff & community.

GROUP 9
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ARK263 - Fall 2021
Chalmers university of technology

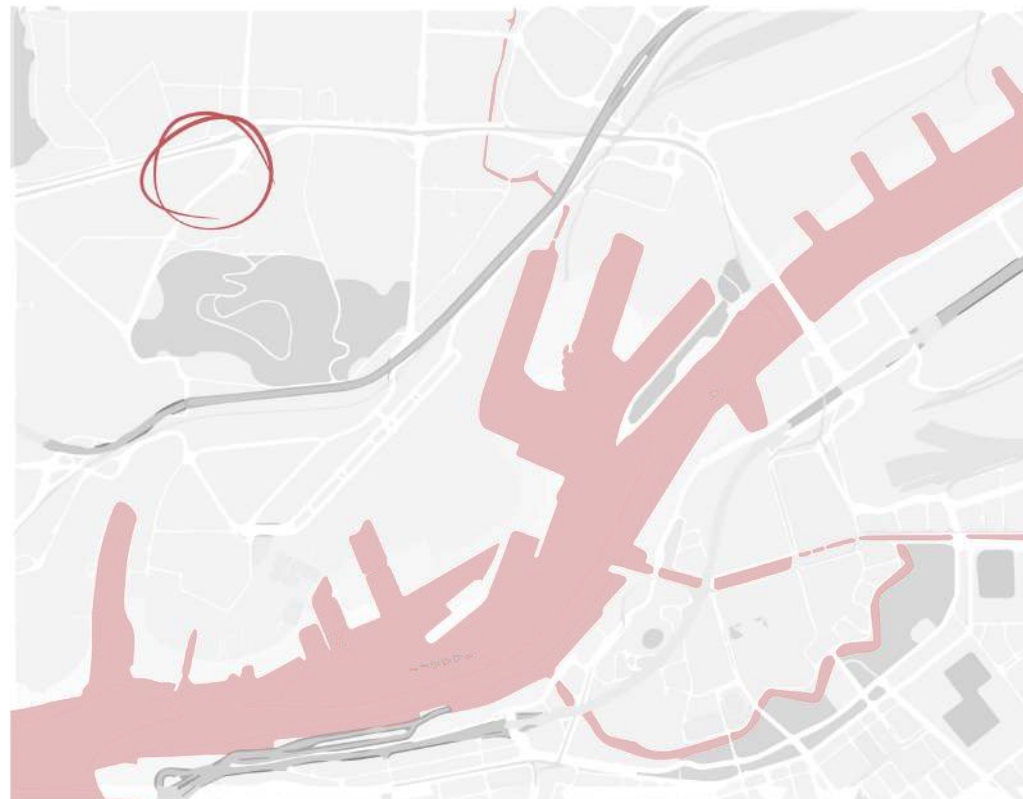
THE TASK

An ongoing community hospital project in Västra Götalands Region. Through the client Västfastigheter (VF), students are given the possibility to design for a real task with support from context-rich commissions that are a part of the planning processes of a new community hospital on Wieselgrensplatsen in Hisingen, Gothenburg.

The project development will consider the existing and future development plan of the area, that includes a new swimming pool, ice rink and mobility hub. In a later future, Hjalmar Brantings gatan is planned to become a boulevard in the urban fabric.

The program for the site includes a variety of health care departments - from self authorised dialysis to the outpatient surgery as well as the public mobility hub. The size of the hospital is estimated to be between 15,000 and 20,000 square meters.

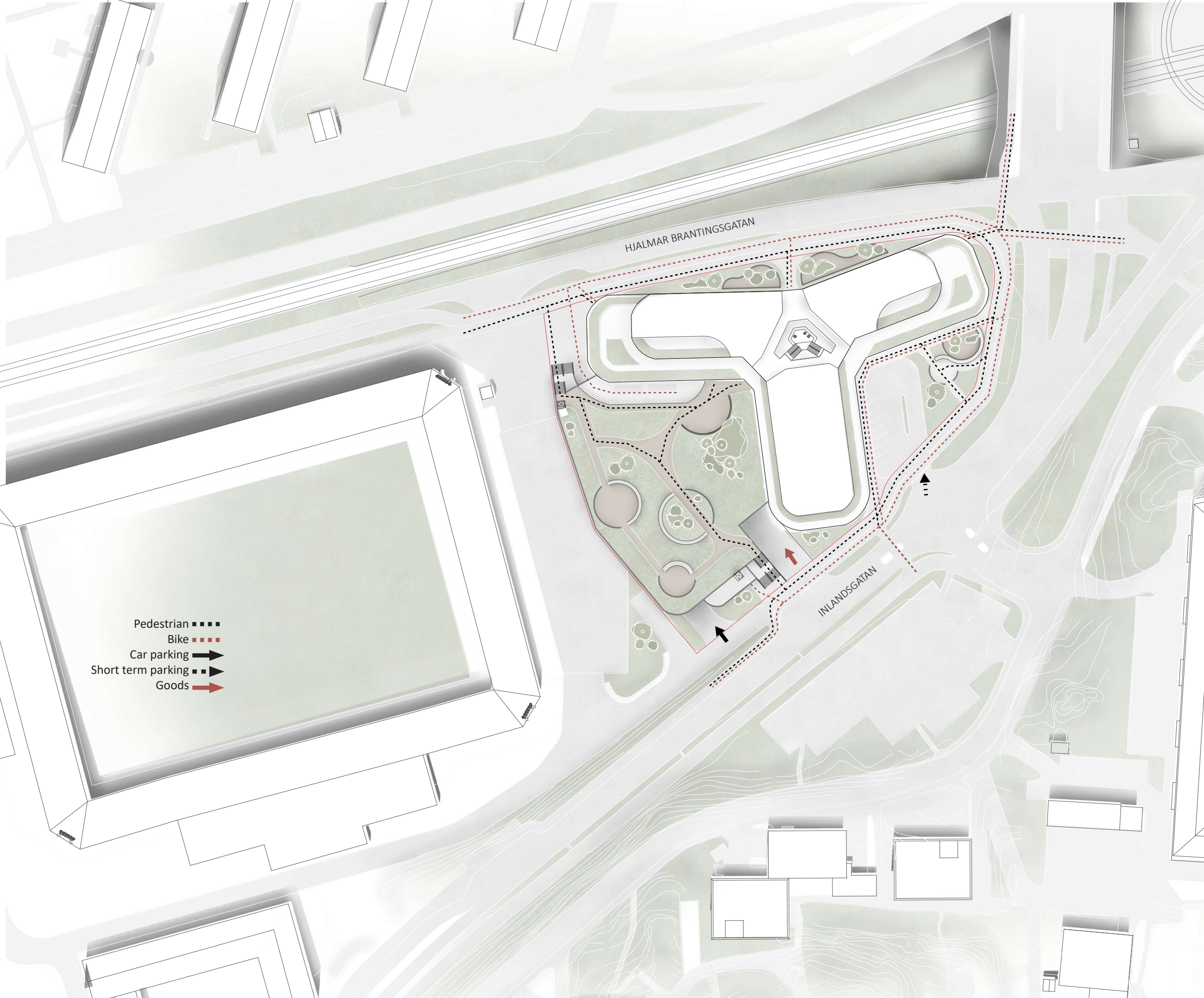
The challenge of the task is to analyse both the site and the hospital brief to find ways for the care logistic arrangement and sustainable integration to the community, as well as creating future proofing and health promoting strategies for building design and environment for patient and staff.



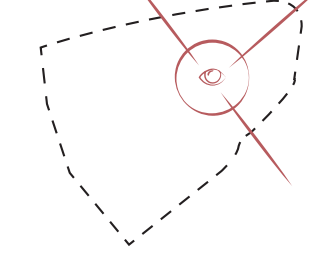
57°43'11.4"N 11°56'00.1"E

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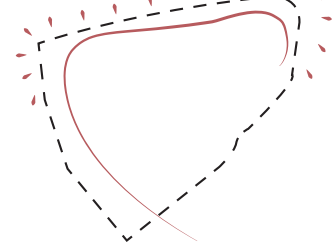
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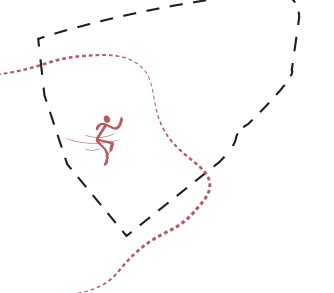
VISUAL CONNECTION



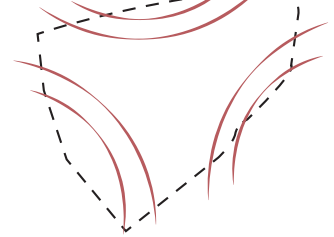
PUBLIC ACTIVATION



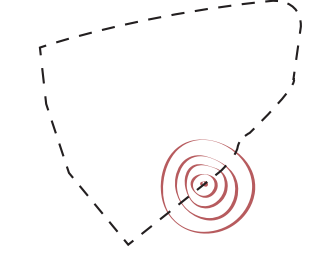
ACTIVITY CONTINUATION



SITE INVITATION



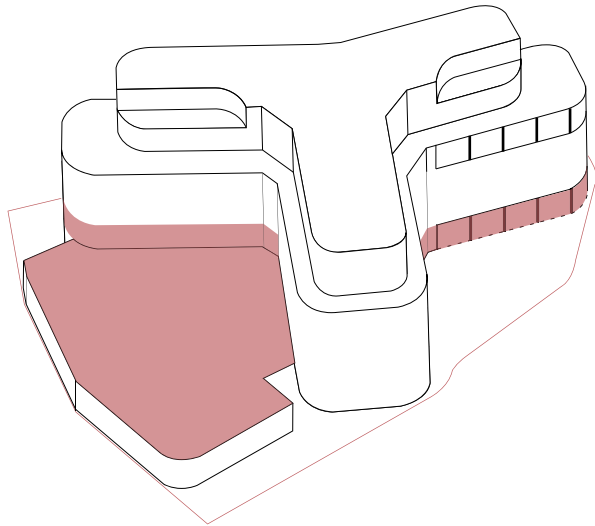
CONCENTRATING CAR TRAFFIC



The aspects above are observed needs to become an integrated part of the community and to physically with insecurity and crime. We are looking at a site a north connection to a highly trafficated road, with future plans of a boulevard, a variety of sports facilities on the west and a population mainly younger than the average of Gothenburg that currently use the site (Mc Donald's) as a social node.

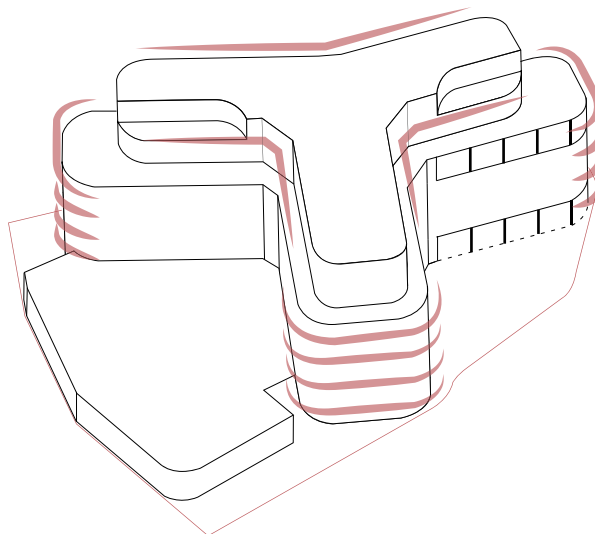
SITE ANALYSIS

Site & Context



COMMUNITY ACCESS

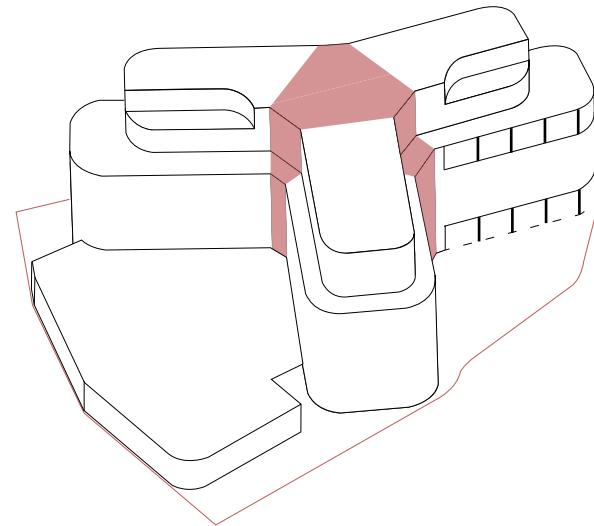
By inviting the public to a shared ground floor - *spaces can be used more hours of the day and will increase the activity on site and brighten it up during night.*



INVITING BUILDING SHAPE

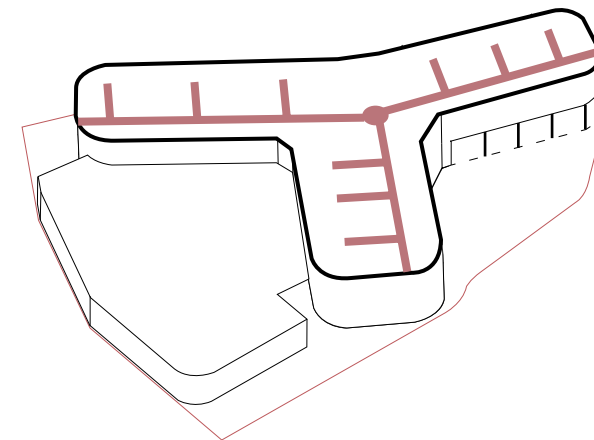
By reducing sharp corners and designing the orientation of the wings according to existing flows - *blind spots regarding safety and orientation can decrease.*

Brief & Logistics



CENTRAL ENTRANCE SQUARE

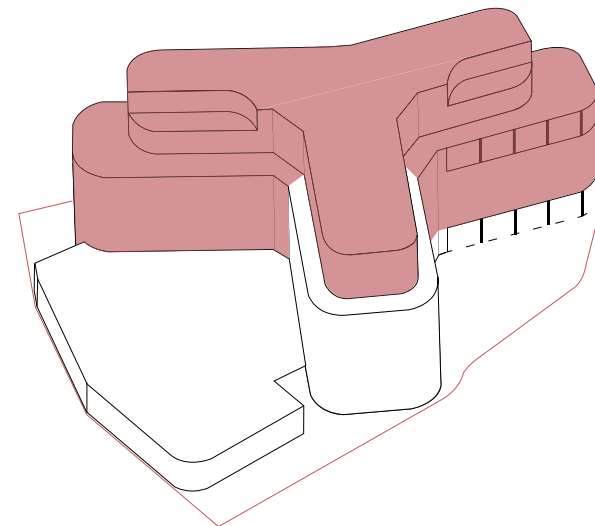
By working with a central entrance square that keep visual access across the site - *patients' orientation is strengthened and all functions are accessed from a central node to create a usage-efficient network.*



EFFICIENT WORKSPACES

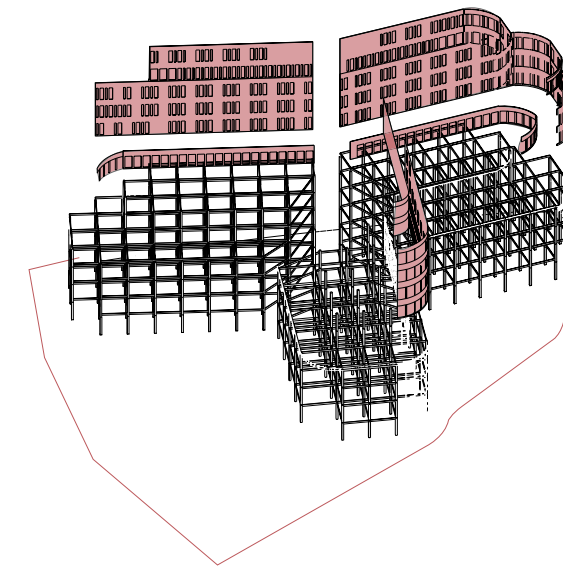
By separating patient and non-patient related work, in addition to quick access between administration and treatment - *efficient work spaces are created for the staff.*

Sustainability



MAXIMISING USAGE OF WOOD

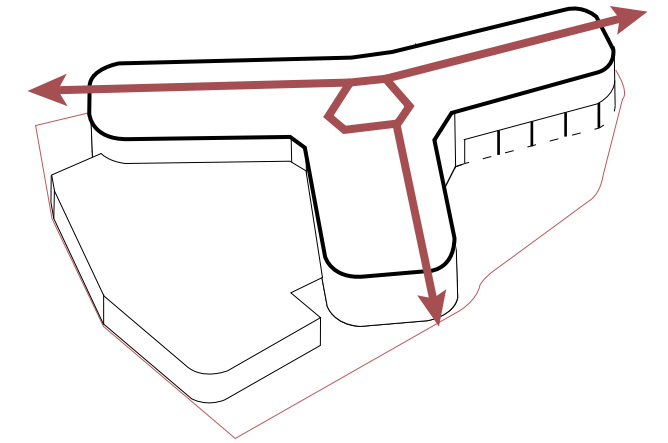
By maximising usage of wood in the building structure - *a lighter carbon footprint is created and visibility to wood can increase wellbeing for visitors.*



LAYERS OF LIFESPAN

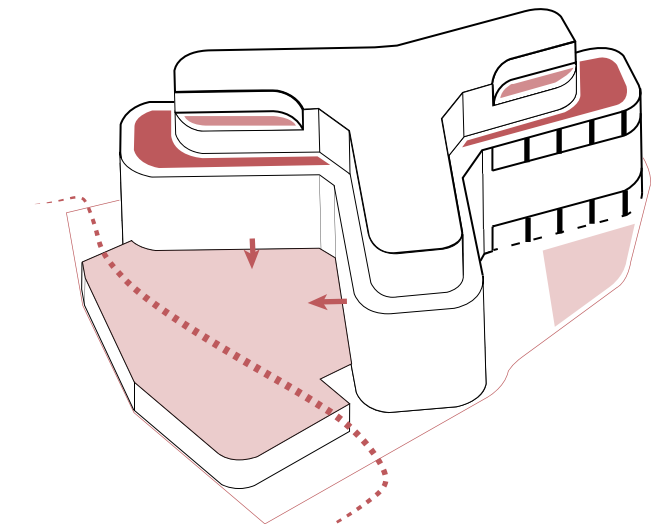
By considering different lifespans and layers of materials in the structural hierarchy through pillar system and facade modules - *a system to extend the overall life of the building is implemented.*

Health promotion



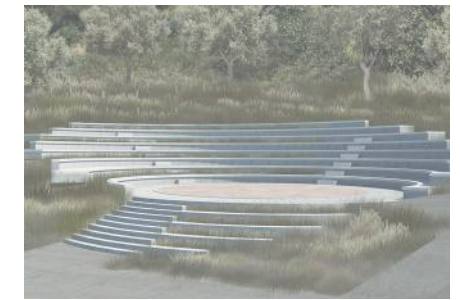
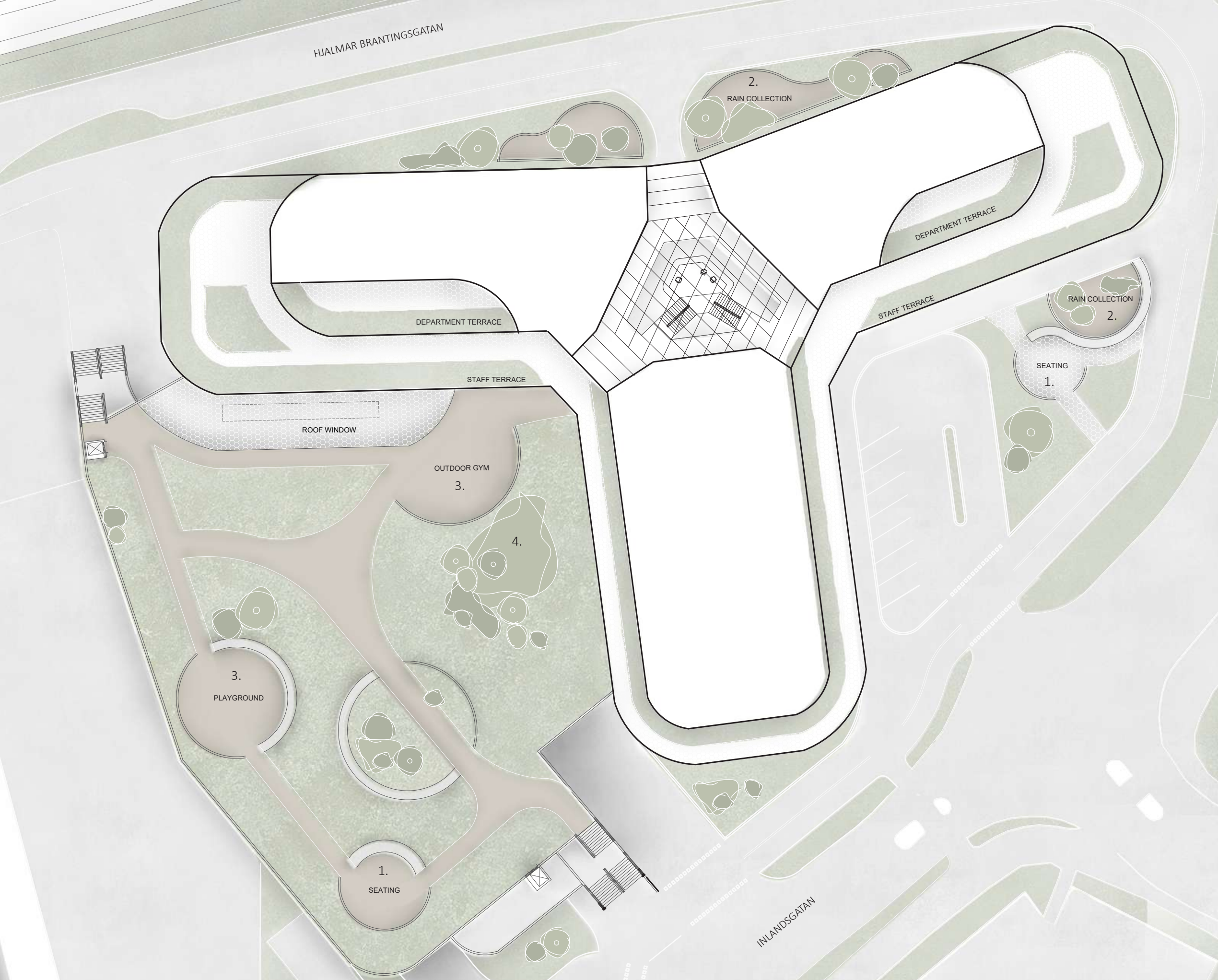
PATIENT WAYFINDING

By extending the treatment corridors towards the facade and tip of the wings as well as a general department layout on each floor connected to the central core of vertical transport - *patient wayfinding is simplified.*



CONNECTING ACTIVITIES & GREENERY

By implementing green roofs and pockets - *greenery is connected the hospital treatment and staff as well as creating a node that connects the surrounding activities.*



1 PUBLIC SEATING & PAUSE
Panos Dragonas, Barbara Christopoulou



2 RAIN WATER COLLECTION
3deluxe architecture



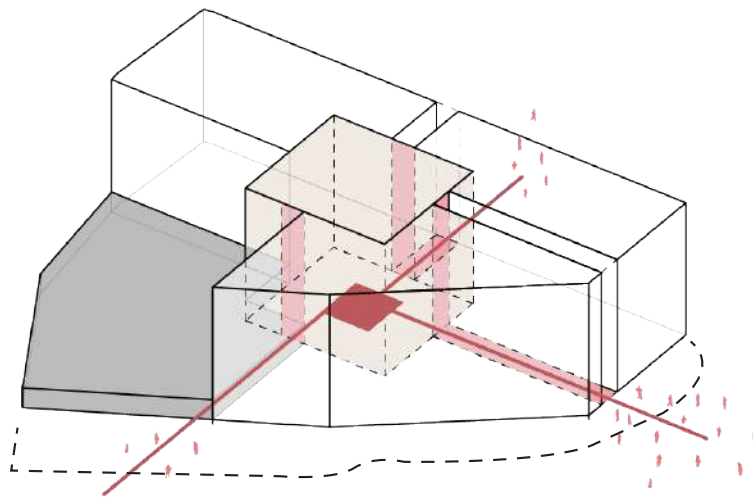
3 OUTDOOR GYM & ACTIVITIES
JAJA Architects



4 VIEW OF GREENERY
3deluxe architecture

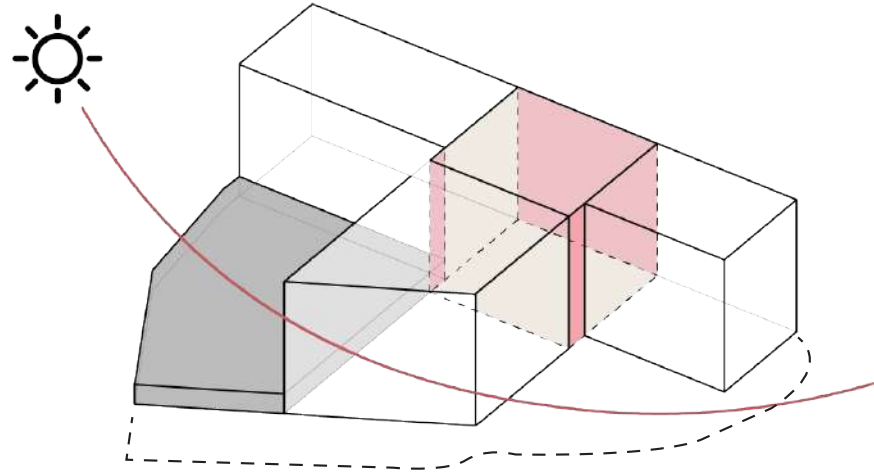
The City of Gothenburg have an aim to increase the proportion of greenery and biological diversity. The strategy of creating pockets on each side of the building will avoid unused surface and has been developed to deal with risk of flooding at the tip of the right wing, to create a welcoming path and surrounding from all angles and extend the activities from the west. As well as accessible views from the departments. Access level varies between public, department and staff.

SURROUNDINGS



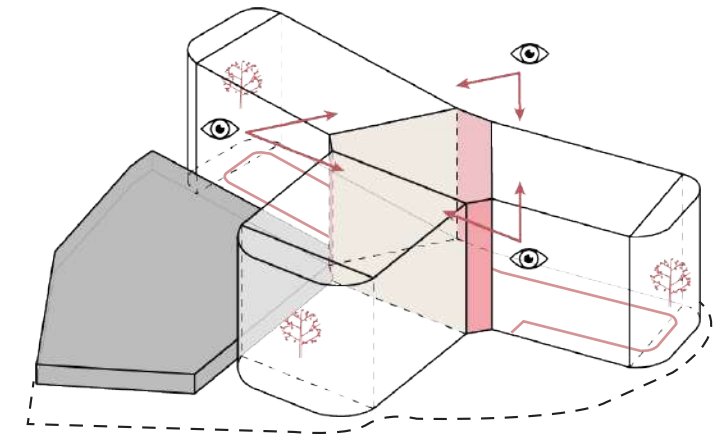
CORE OF FUNCTIONS

Creating a central core and entrance for all hospital functions is the “core” concept of our project. A design strategy that seems suitable for relating to the surroundings in addition to access efficiency and integration within the hospital. This concept can also reduce the amount of corridor space.



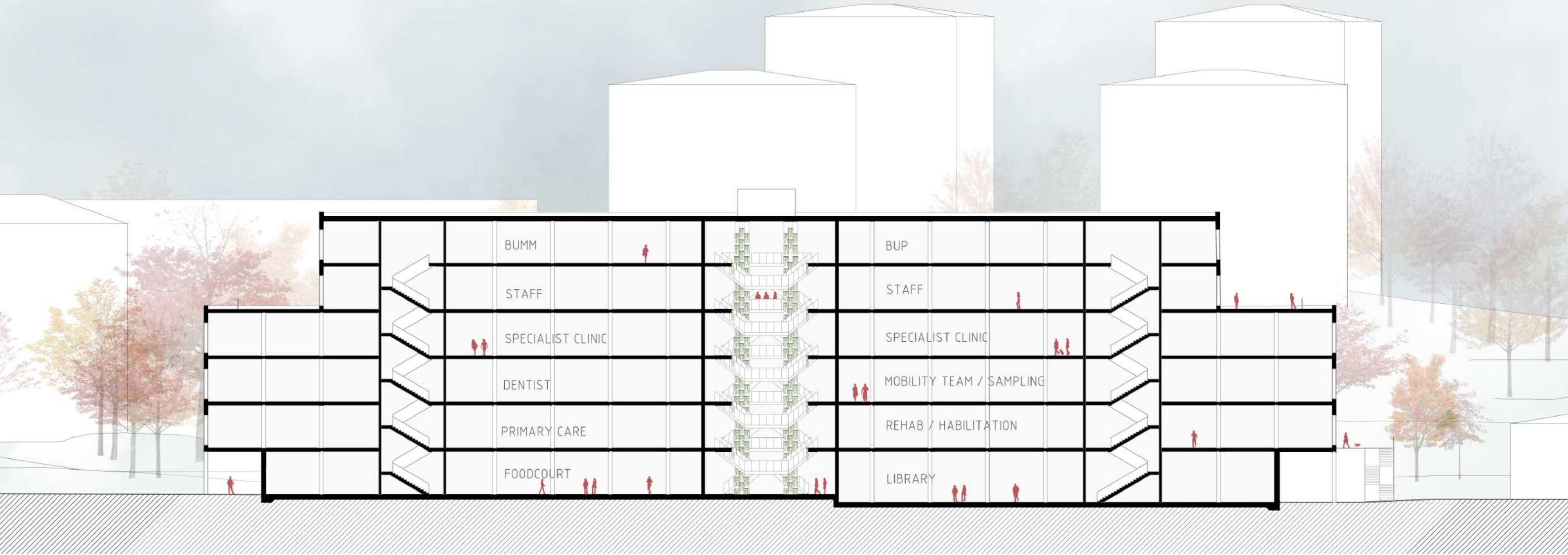
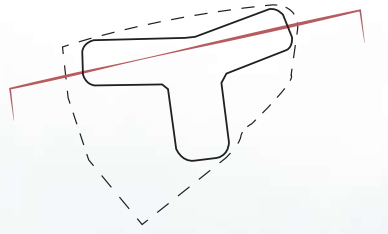
BUILDING DAYLIGHT & VIEWS

The core risk ending up as a dark space with high intimidating walls, while departments block each others view. Creating wings extending from the core and gaps for views increase both atmosphere and wayfinding within the atrium as well as sunny facades for each department.



SHAPE THAT INVITES

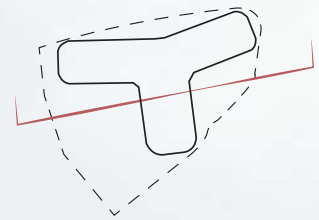
Site and context adaptation is created by inviting angles and rounded corners connecting more naturally to the existing flows. The rounded tip of the wings are lastly creating a more playful expression to the community as well as soft interior atmosphere.



SECTION A

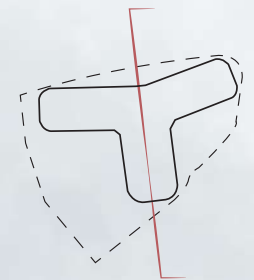
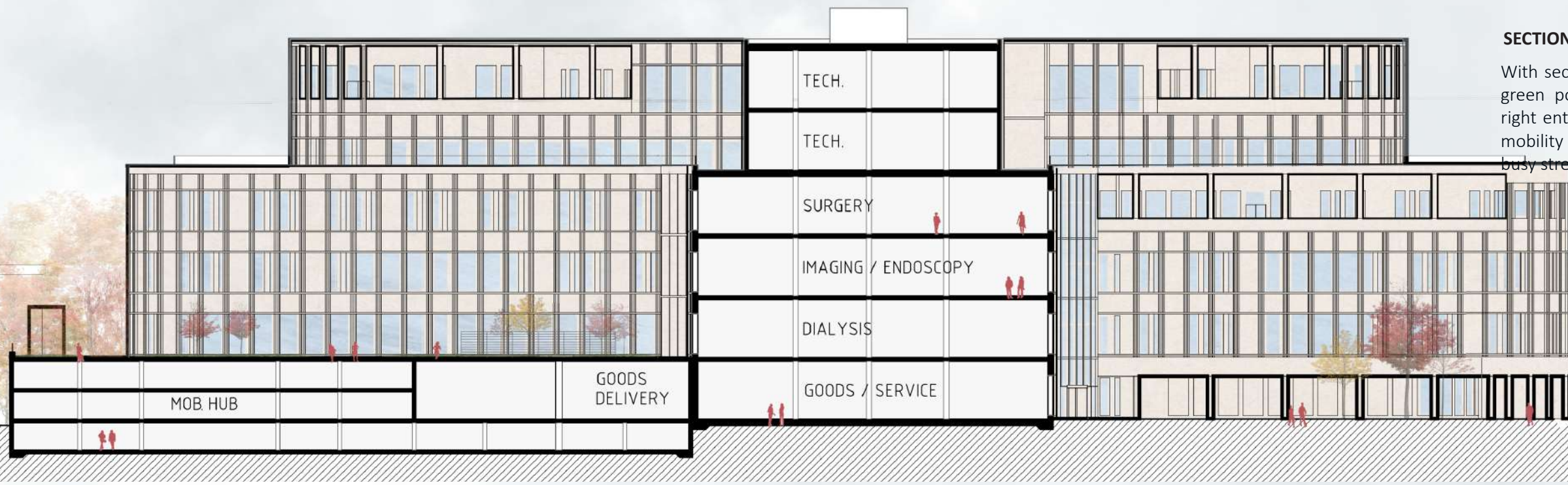
As we can see, the ground floor does not hold any hospital departments, to keep integrity of patient and integration with community. Looking from Hjalmar Brantings gatan, section A, the pedestrian or cyclist have access across or through the mobility hub to the right. The general floor height is 4.8m.

50 m 1:400



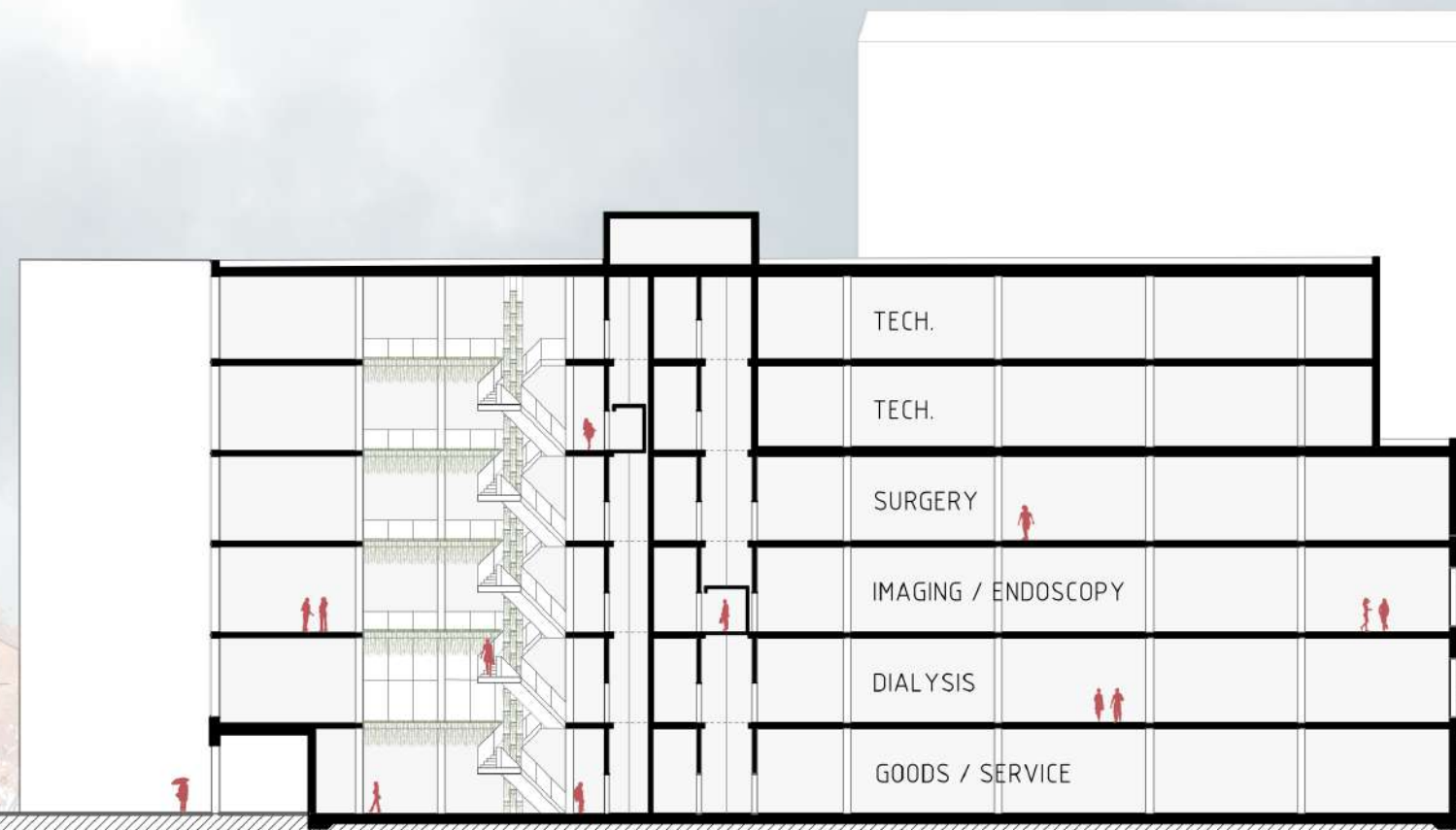
SECTION B

With section B we want to illustrate the green pockets that are created at the right entrance square and on top of the mobility hub, both protected from the busy street.



SECTION C

Visualising the relationship between inlandsgatan and Hjalmar Brantingsgatan, the south wing has been put slightly beneath streetlevel to be able to keep the entrances accessible.



HJALMAR BRANTINGSGATAN

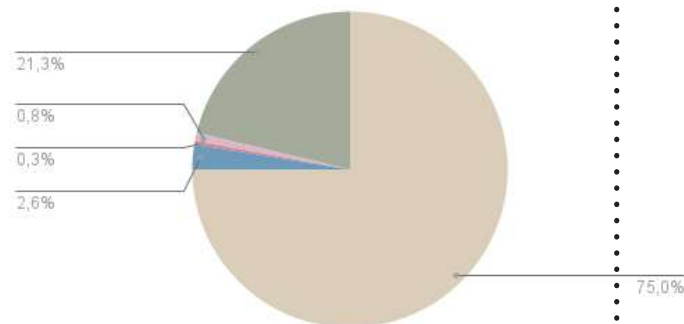
INLANDSGATAN

50 m 1:400

THE CLIENT

Nr. of rooms Functions within: (sqm)

DEPARTMENTS		
150	Administration	
51	Quiet rooms	
6	Team stations	
22	Group rooms	
16	Conference rooms	
14	Relax rooms	
14	Staff/lunch rooms	
16	Copy rooms	
15	Archive rooms	
92	Treatment rooms	
15	Reception	
15	Waiting area	
Total area all departments		total 9008
COMMON STAFF AREAS		
1	Changing rooms	300
1	Post boxes	10
total		310
ENTRANCE		
1	Entrance & Info	42
total		42
PUBLIC		
1	Cafe	50
1	Pharmacy	50
total		100
SERVICE & TECH		
	Service & Goods	452
	Ambulance	15
	Tech	2090
total		2557



THE PROJECT

Nr. of rooms Functions within: (sqm)

DEPARTMENTS		
77	Administration	
61	Quiet rooms	
5	Team stations	
19	Group rooms	
10	Break rooms	
91	Treatment rooms	
Total area all departments		total 6465
COMMON STAFF AREAS		
1	Changing room	219
1	Post & back office	60
12	Conference rooms	330
1	Relax room	152
1	Lunch area	190
total		951
ENTRANCE & ATRIUM		
1	Entrance & Reception	271
1	Waiting area	696
total		967
PUBLIC		
1	Food court	260
1	Pharmacy	50
1	Libarary	139
1	Gym (incl. in department)	233
total		682
SERVICE & TECH		
	Service & Goods	353
	Ambulance	15
	Tech	1892
total		2260

This chart shows an overview of the hospital, where we can see a more even distribution of departments, entrance, staff and public functions.

Departments are reduced extensively to effectivise the patient related work. Number of administrave rooms have been reduced, since the general room fit four people instead of two. We are aiming for a more activity based workspace, but due to a future increase of digital health care we have chosen not reduce the number of admin seats, and instead increase the amout of single person admin. The office mainly consists of two sizes of admin, support functions and group rooms and a break room with tools for copy or coffee and spontanious meetings during the day.

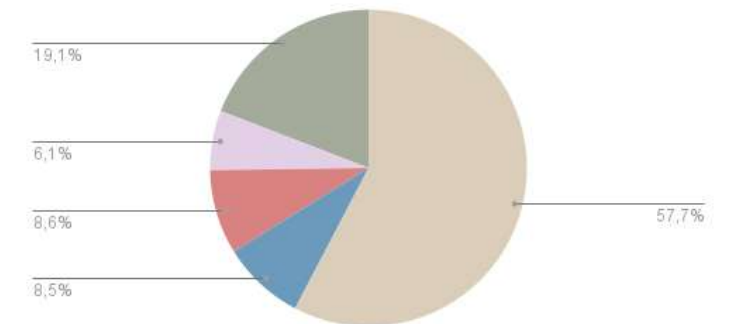
The lunch and resting area has been extracted from the departments into a general staff floor too increase the well-being off the staff and to promote breaks that are disconnected from work. The rooms for confarence and scheduled meetings has also been extracted to this floor to also allow for more external exchange and education and without disturbing the work at the departments. It is also a way for exchange between the hospital departments. An added function is the non-patient related admin space for reception staff.

The idea of reception staff is concentrating all receptions to the entrance level to support future self-check in with human conntact and patient orientation as well as concentrating the departments for the sake of the patient. The waiting areas are still connected to each department for integrity, but kept in the central atrium.

Extrended public spaces are the last concept of arranging and adding to the spaces of the brief. We believe that the building has to create an exchange with the community to become a place for health and not only sickness. The gym has been opened up to the public at night time and therefore increased. Food court has been extended both in space and time and in addition to a library and study space the social node can be kept and varied among different activities around the site.

Nr. of rooms per department

FLOOR 1	A	Q	T	G	B	T
Rehab						
Habilitation	5	2		2	1	8
Primary care	8	10	1	2	1	14
Dialysis	3	2		1	1	16
FLOOR 2						
Spec. clinic	21	18	2	4	1	30
Endoscopy						
Imaging	8	5		3	1	2
FLOOR 3						
Sampling						
Mob team	16	13		3	1	
Dentist	6	3	1	1	1	11
Surgery	7	2	1	1	1	2
FLOOR 5						
BUP	2	3		1	1	5
MVC/BUMM	1	3		1	1	3
total	77	61	5	19	10	91



THE CLIENT

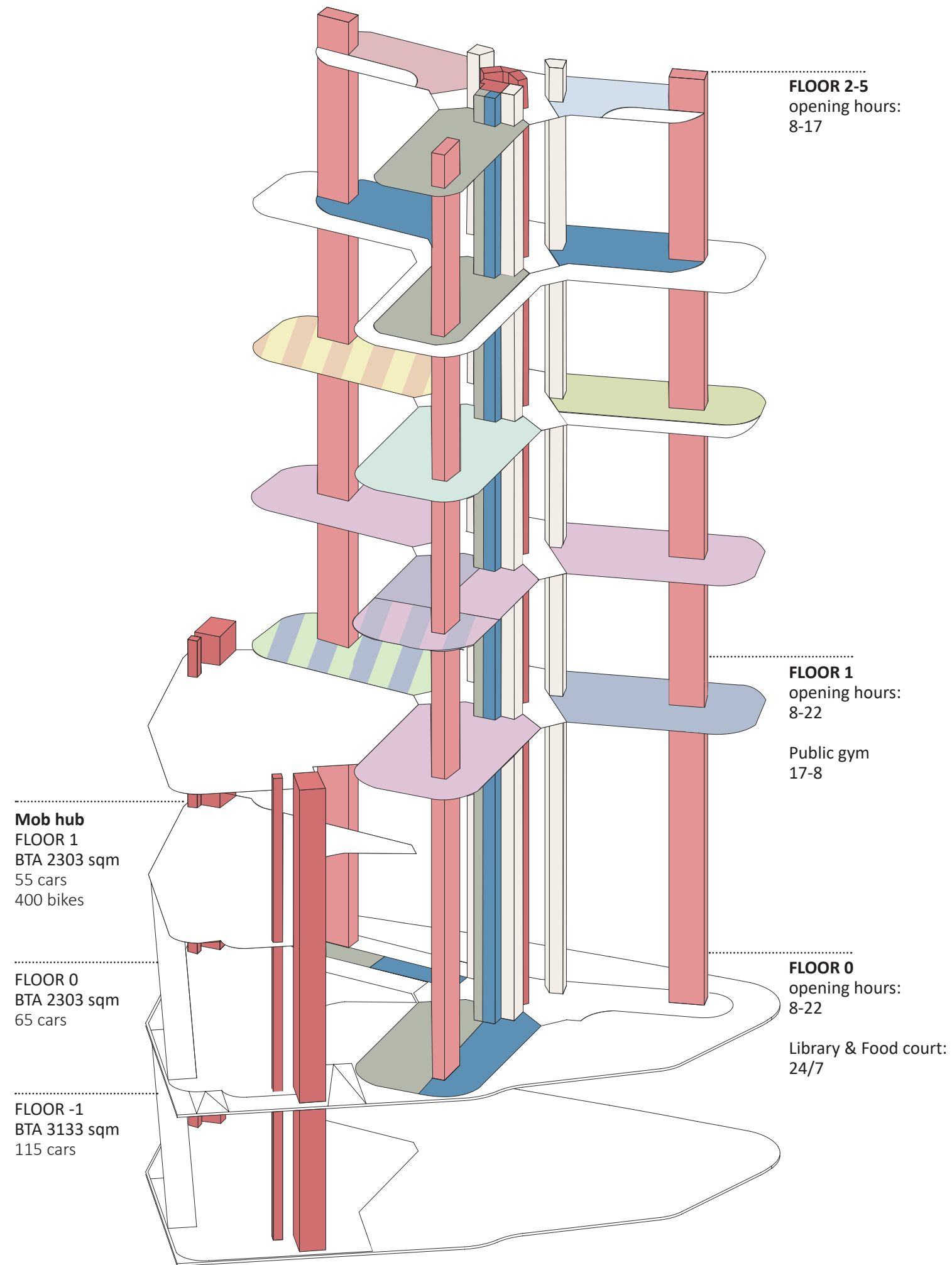
THE PROJECT

department	PY (sqm)	BTA (sqm)	department	PY (BTA / 1.8) approx. (sqm)	BTA (sqm)
GROUND FLOOR			GROUND FLOOR		
Entrance	57	103	Entrance	271	488
Public	100	180	Public	448	806 89 Pharmacy, 467 Food, 250 Library
Staff	310	558	Staff	279	502 395 Changing rooms, 107 Back office
Service	467	841	Service	368	662
			Tech		(100 Technical rooms, 44 Shafts (x5 Floors=220)) = 323
FLOOR 1			FLOOR 1		
Rehab	415	747	Rehab	323	582 271 Atrium floor 1
Habilitation	475	855	Habilitation	324	583
Primary care	1006	1811	Primary care	647	1165
Dialysis	599	1078	Dialysis	639	1151
FLOOR 2			FLOOR 2		
Spec. clinic	1699	3058	Spec. clinic	1268	2282 271 Atrium floor 2
Endoscopy	270	486	Endoscopy	202	363 1165 Wing A + 1117 Wing B
Imaging	625	1125	Imaging		788
FLOOR 3			FLOOR 3		
Sampling	469	844	Sampling	299	538 271 Atrium floor 3
Mob team	398	716	Mob team	348	627
Dentist	510	918	Dentist	437	788
Surgery	974	1753	Surgery	639	1151
FLOOR 4			FLOOR 4		
			Staff	672	1209 220 Atrium floor 4
			Tech (ventilation)		594 Conference, 274 Relax, 341 Lunch area 781
FLOOR 5			FLOOR 5		
BUP	362	652	BUP	306	551 220 Atrium floor 5
MVC/BUMM	272	490	MVC/BUMM	262	472
			Tech (ventilation)		781
ATRIUM (total)			ATRIUM (total)		
				696	1253
PY (excl. Tech)		9008	PY (BTA excl.Tech/1.8)		8756
Recommendations for tech					
Tech (ground floor)	90		Tech (ground floor)	100	
Tech (ventilation OP)	200		Tech (ventilation OP)	200	
Tech (ventilation PYx0.2)	1800		Tech (ventilation PYx0.2)	1582	
Tech (total)	2090		Tech (total)	1882	
BTA (excl.Tech)		16215	BTA (excl. Tech)		15747
BTA (incl.Tech)		18016	BTA (incl. Tech)		17409

The overall BTA of the hospital is reduced by 500sqm. By concentrating function and focusing on one specific task for department treatment, the space can be made much more efficient. Departments with similar functions are sharing spaces like gym and administration, while some have been extended to include the aspect of wellbeing and health promoting surroundings. For example dialysis, MVC and BUP - with green and social spaces that can become part of the treatment.

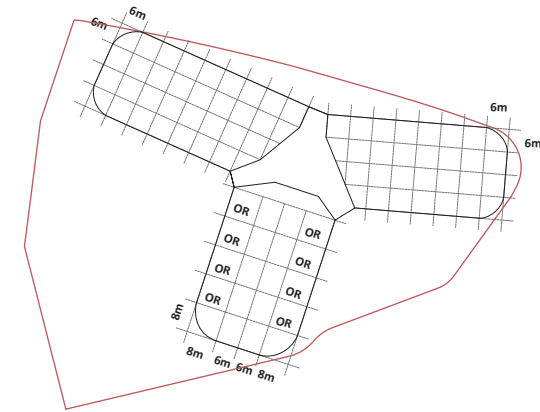
Regarding treatment and administration, we have tried to keep the overall sizes of each department when it comes to the amount of seats as well as balance the general shape of a floor and the floors above each other.

CHALLENGED BRIEF



The centralisation is a way of concentrating the vertical connection and create efficiency in transportation. The hospital entrance is matched with the ground and the entrance level of the mobility hub for direct connection from vehical parking. The activity roof of the mobility hub is then matched with level one, the upper floor of public and late night opening hours.

VERTICAL CONNECTIONS



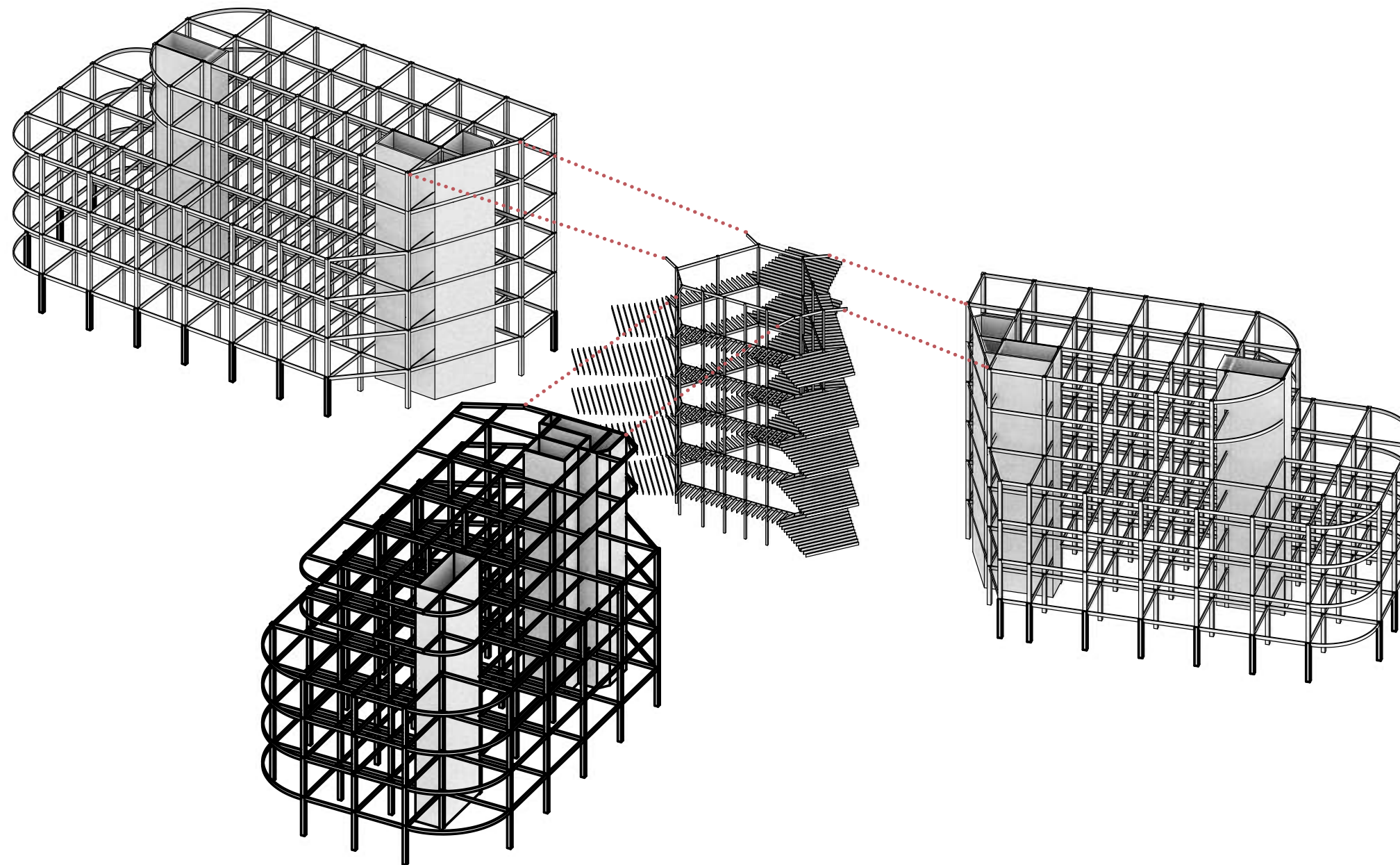
The building consists of a load bearing pillar system. Using one grid, 8x8m, for the lower wing in concrete, that are adapted for the operating theaters and with possibilities for extending the amount of rooms or rearranging it to the opposite side.

The second grid is 6x6m for the upper wings. These wings will be mainly in wood but keep a ground floor foundation and outer pillars in concrete to protect from moist and flooding.

The core of the building will use its own system in wood, but hold the vertical shafts in concrete as well as being a docking station for the wings. We also think that this type of regular grid within each department can increase flexibility in the layouts and help us keep a logic throughout the floors. Theoretically the principle could be used to also extend the number of wings, but in our case the site borders and surroundings are limiting this idea in practice.

Vertically, the floor height is kept consistent 4.8m to prioritise the atrium to be accessible throughout each level and to strengthen the accessibility. An exception is made at the two higher levels of departments. Generally this will mean that the ceiling is thicker in some departments to have a good atmosphere. But can be changed in the future and we believe that using the larger dimensions could contribute to future flexibility regarding exchanging some of the functions.

GRID & STRUCTURE





When entering the hospital patients are welcomed with a central reception where supported or self authorised check-in is offered. Here, you are given directional information of your treatment. The atrium is aimed to be an activated but calm space where you are embraced by green walls and a crown of daylight.

The process of design has been focusing on keeping visual access to other entrances and a clear wayfinding system towards the next step of the patient journey. Enter by the reception, locate the stair and elevator for departments and easily access to functions such as pharmacy and café on your way out.

THE CENTRAL ENTRANCE SQUARE



The entrance reception is reached from three different sides. Considering the surrounding flows we see that: pedestrians arrive from north or east; cyclists from all three, depending on the length of their stay; drop of at the east open square and long term parking from within the mobility hub in the west. Public functions are all reached from the center, while service and staff are closed off.

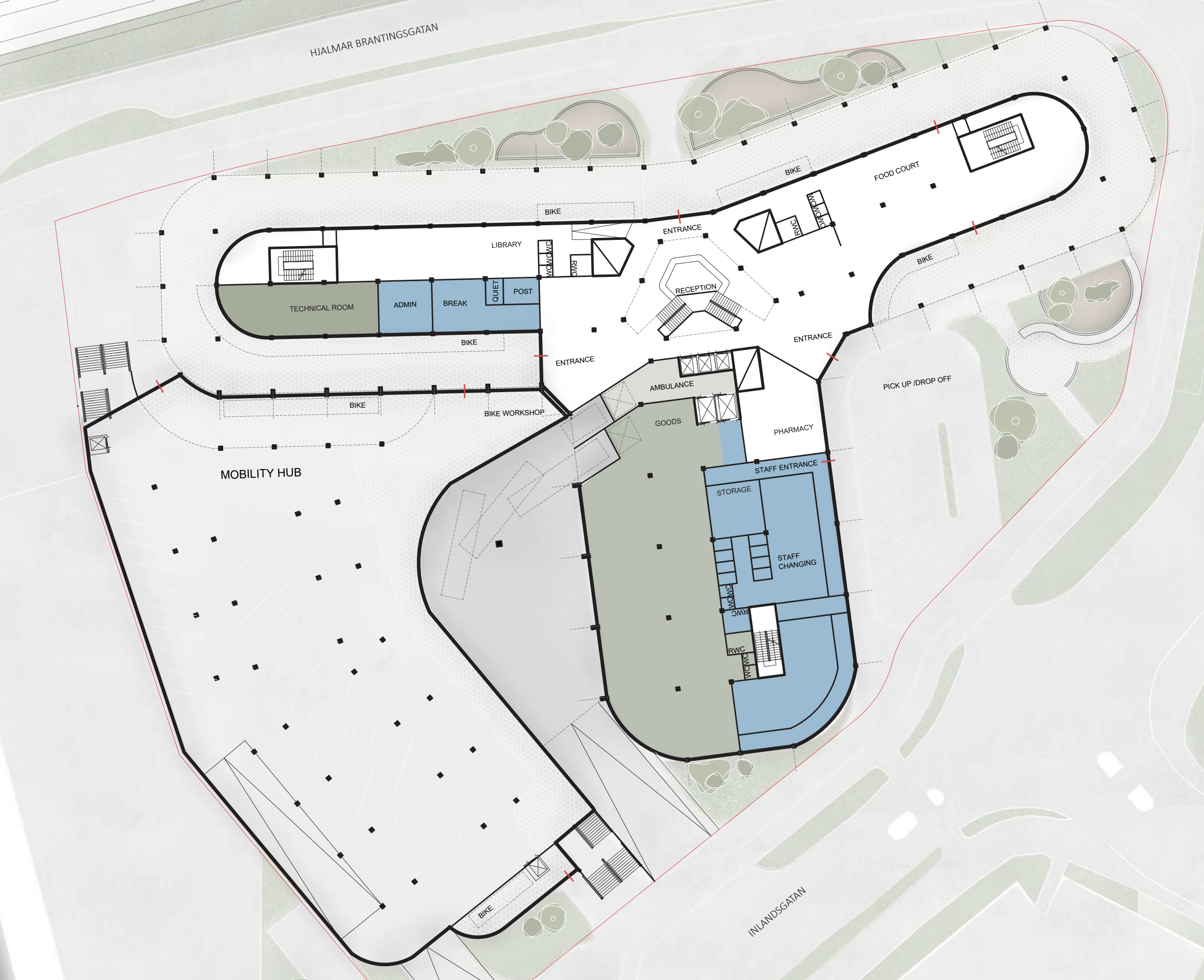
25 m ⌚ 1:200

GROUND FLOOR



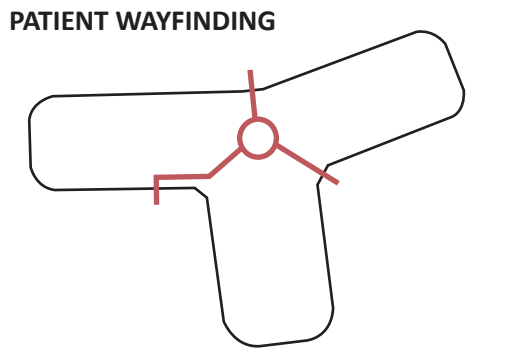
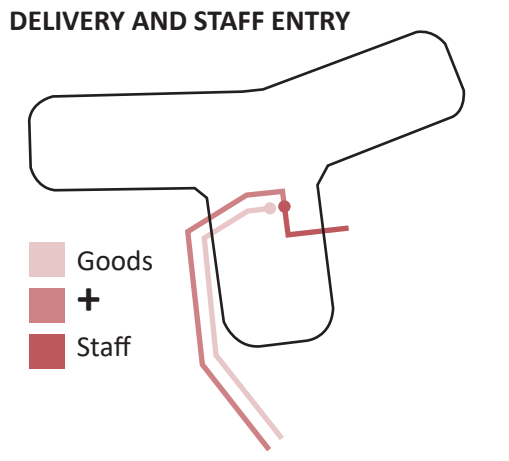
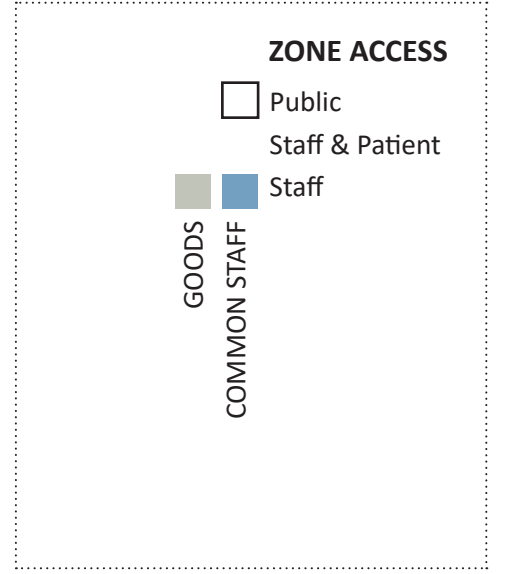
Level one holds the late night functions and departments with more self authorisation. Opening up to the mobility hub roof gives access to both views entrance and activities. We can also see primary care in action with the typical layout for departments where patients view the outdoors at the end of the treatment corridor and staff spaces that access from the middle to shorten the distance to each meeting.

25 m ⌚ 1:200



HJALMAR BRANTINGSGATAN

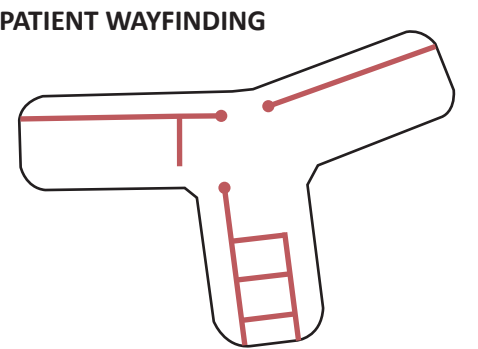
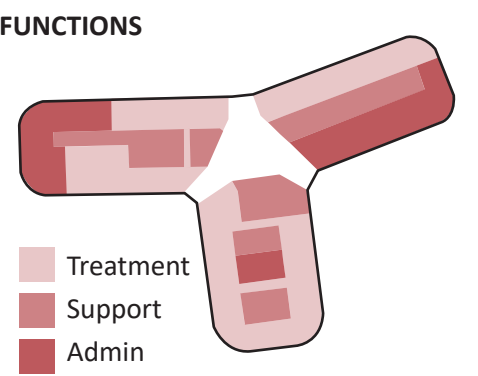
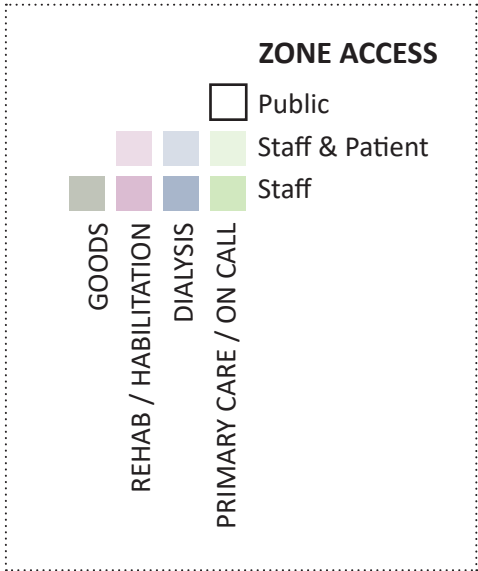
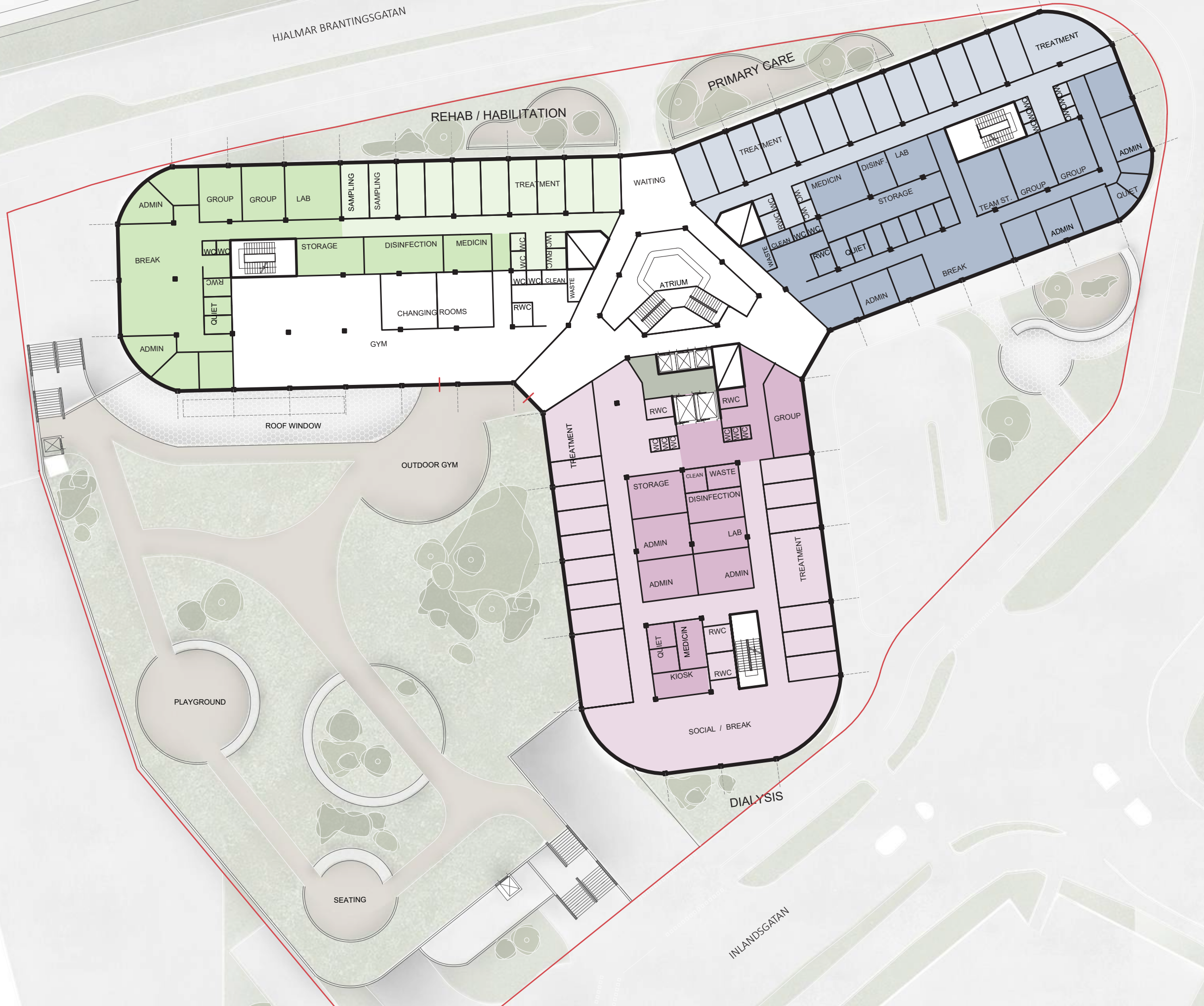
INLANDSGATAN



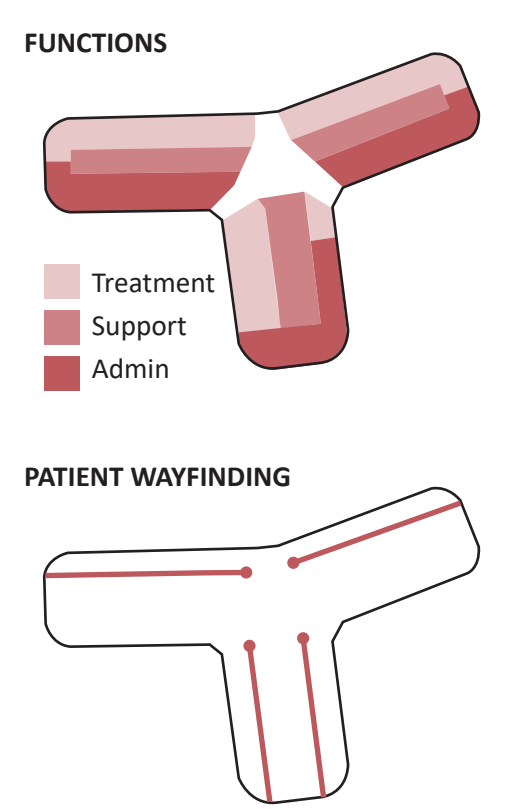
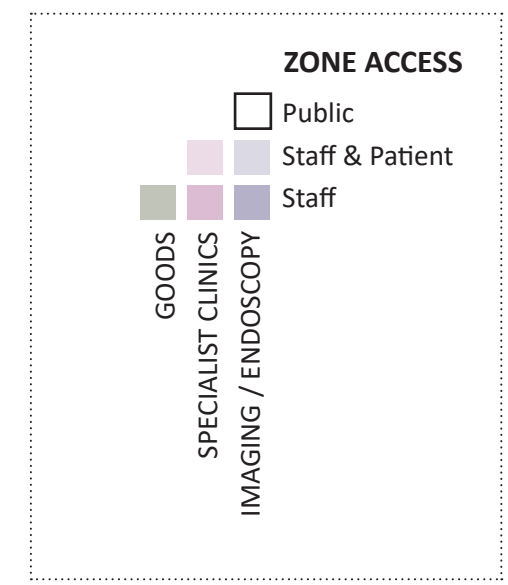
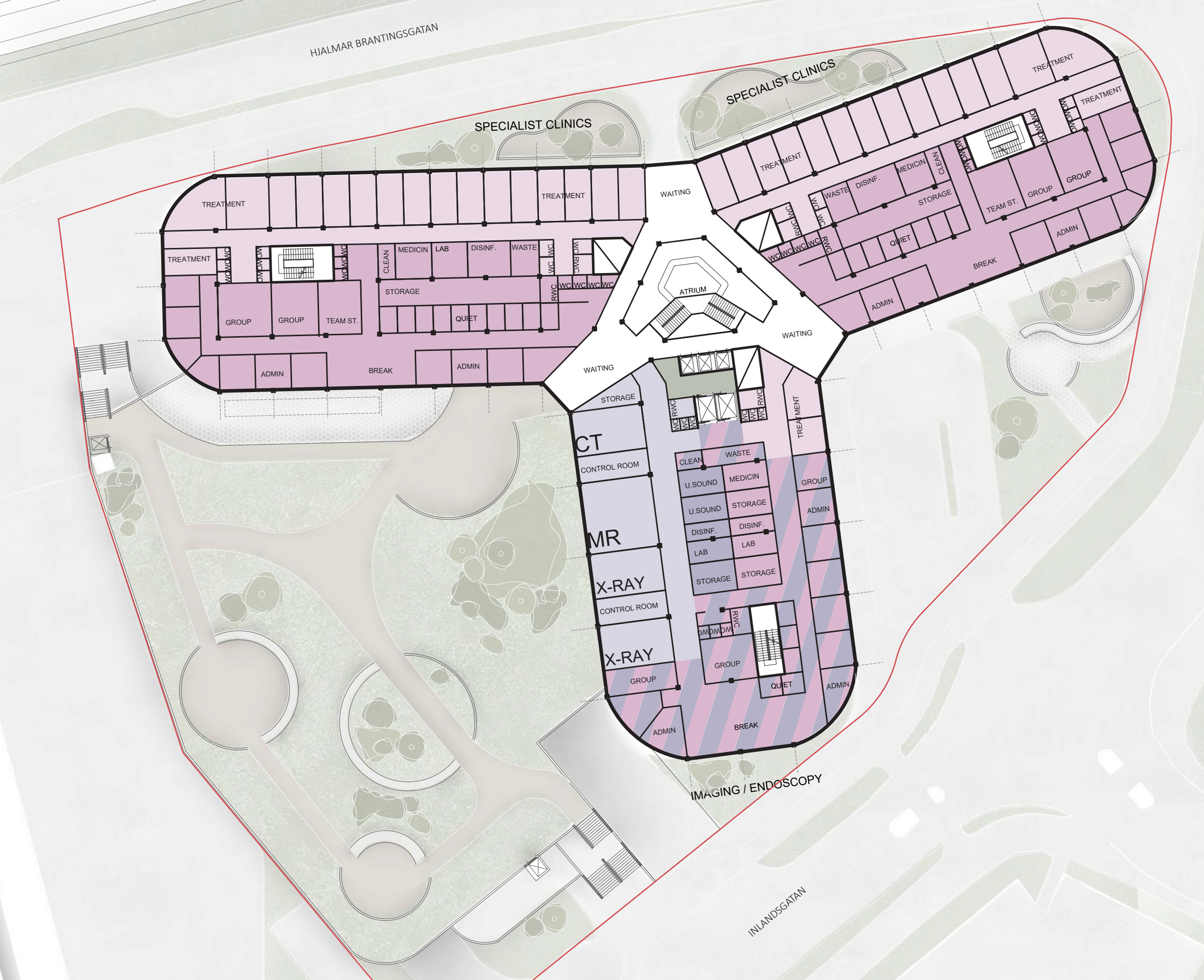
50 m 1:400

Zooming out the ground floor we can also see the access for deliveries that reach the same concentrated cluster of elevators. Staff has the possibility of entering from a separate entrance in need of a dressing room, they can from within reach the elevators up to the departments.

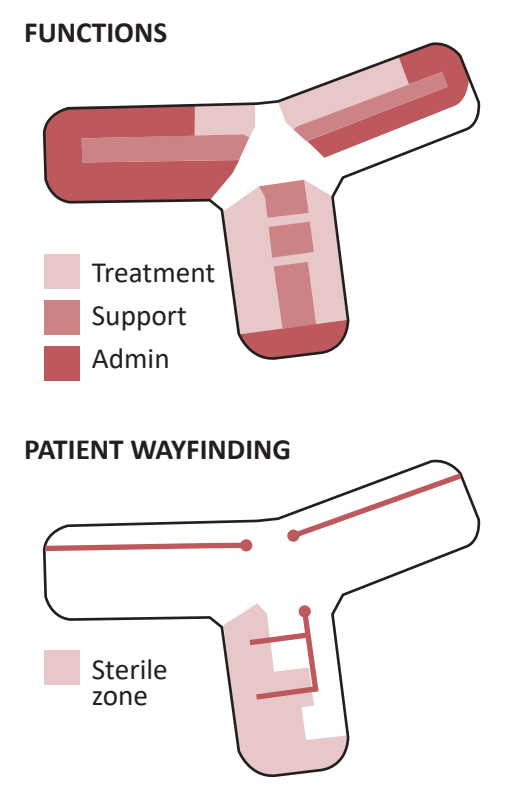
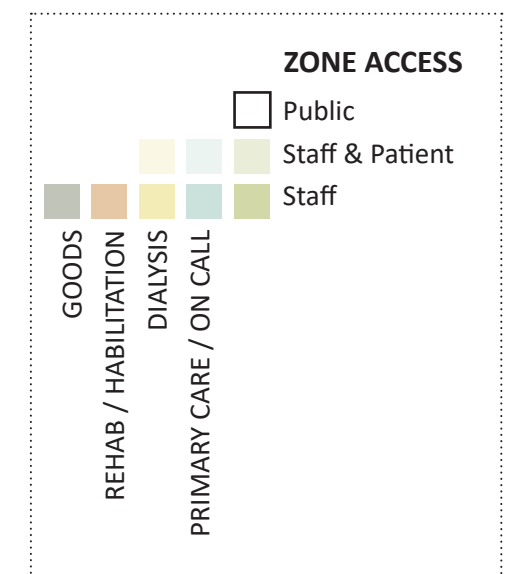
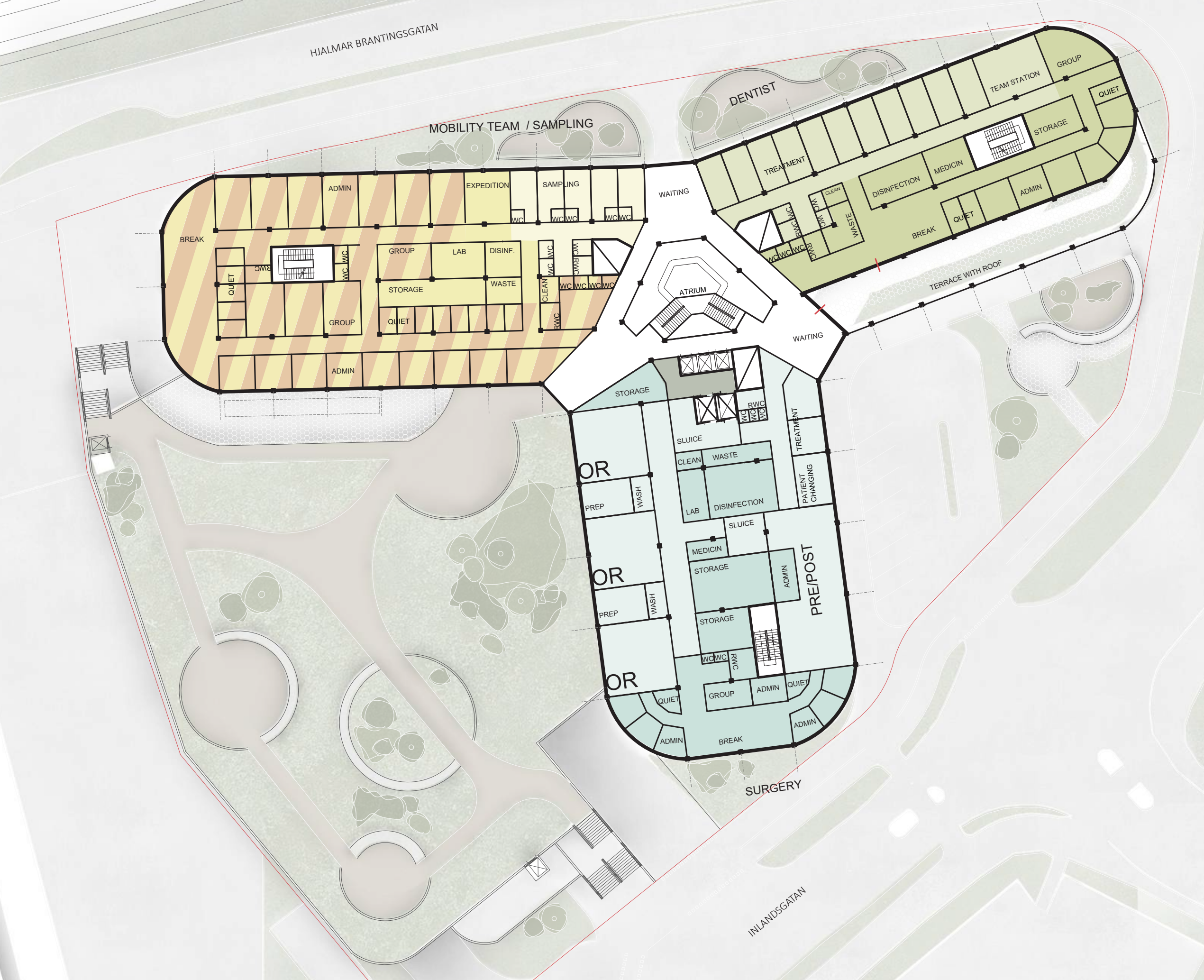
GROUND FLOOR



For departments, general functions are mainly concentrated to the darker middle areas, administration and office to the south and treatment towards north (east or west in the lower wing). However, dialysis is more integrated and share space in the south for patients spending alot of time and treatment rooms varies in size. Rehab and habilitation share spaces and open up the gym in the south to connect to the outdoor gym and public entrance.

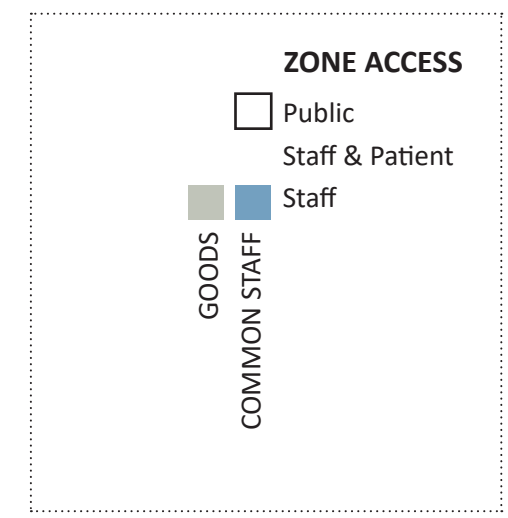
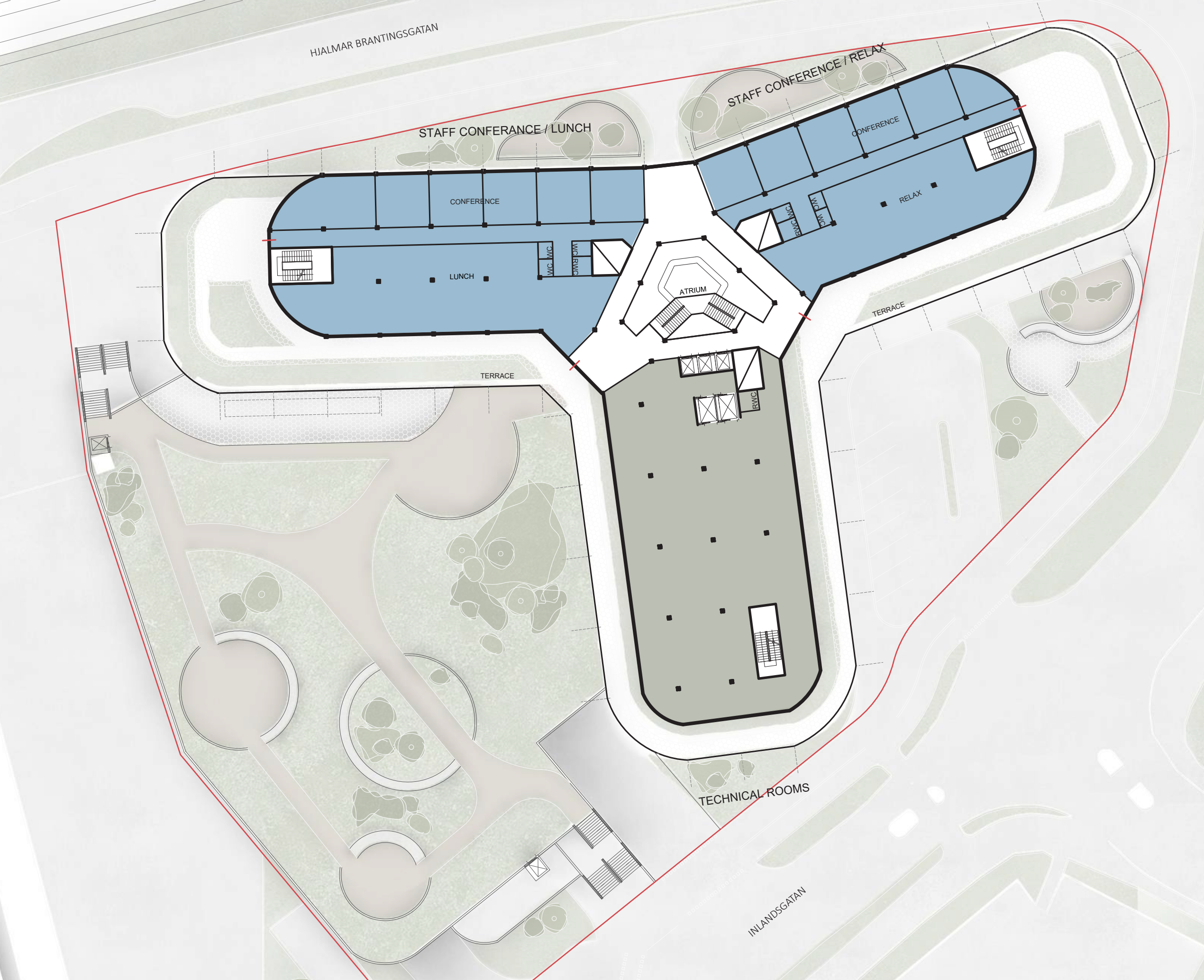


Specialist clinics follows the general idea of the department and continues the treatment corridor across the two upper wings. When using self-check in the name of the corridor is clearly stated in connection to the waiting area in the middle. Similarities in equipment makes it suitable to put imaging and endoscopy are in the same wing. Integrity of the patient are kept by using separate treatment corridors while staff can still share the majority of the functions. Endoscopy patients need close access to surgery and are therefore put near the big elevators, with surgery just above.



The grid is developed to fit the operating theaters for future flexibility and the treatment can be reached both through pre op or passing the elevators. Dentist is a smaller department and has therefore given room for a terrace that can be accessed from the atrium as well. Sampling and the mobility team has a high amount of admin, which makes it necessary to share for being able to shift between north and south located rooms. Staff entrance to the department is however mainly from the south for quick access to elevators and the reserved parking spaces within the mobility hub.

50 m 1:400

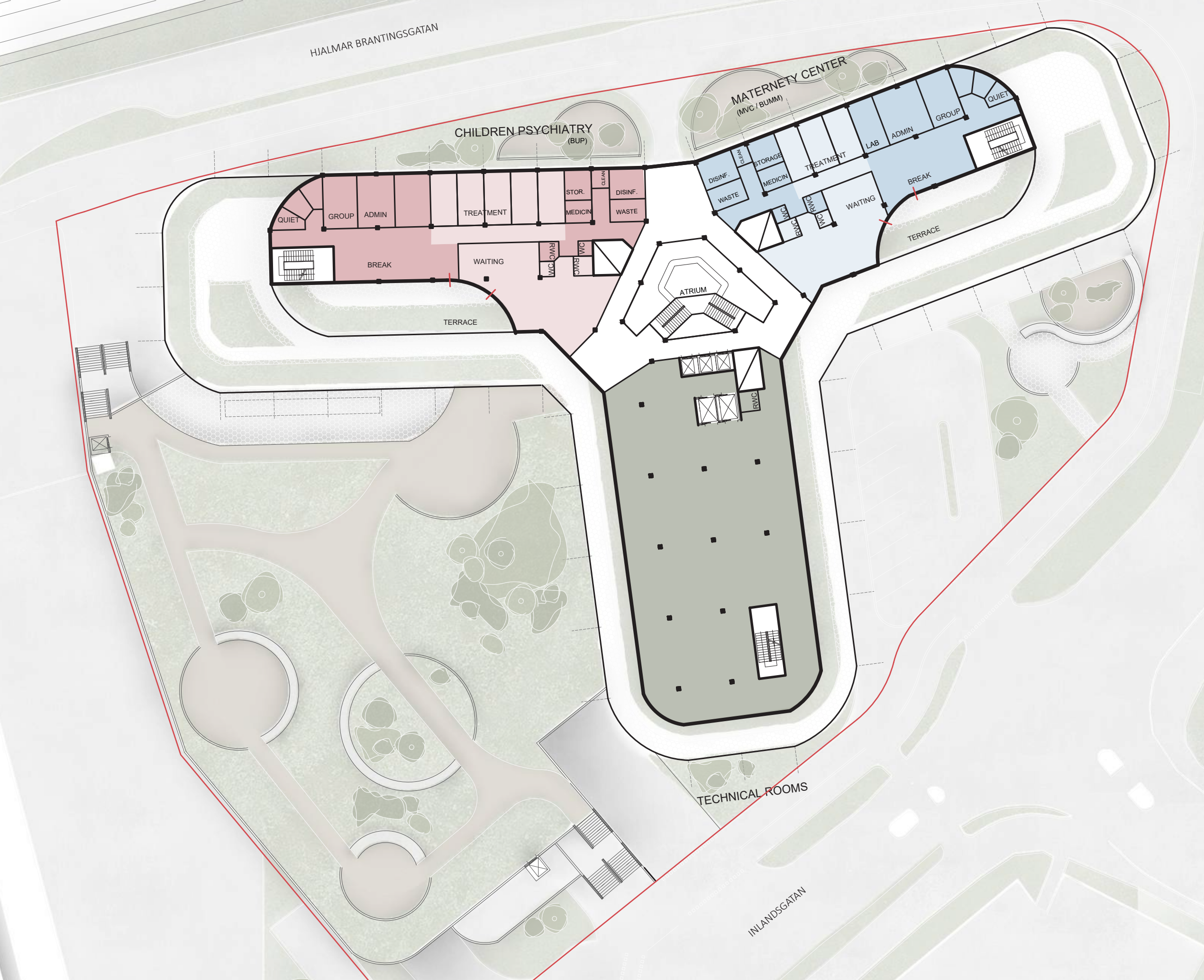


INTERVIEW WITH HELENA
consultant at Queen Silvia children's hospital



Retold:
 "Hospital staff are in need of flexibility related to specific needs and privacy (for example regarding work related discussions). Spaces should not be generalised into open landscapes between patient and staff due to the confidentiality of patients... We are efficient in our work tasks and often want to continue conversations during lunch..."

As explained, the importance of disconnected breaks during work hours are known as a health promoting aspect. In respect to wishes from staff, the break space is created for the necessary conversations. But in times of a heavy loaded health care system we want our hospital work environment to be future proof an believe that more people would like to work in healthcare and have the possibility to stay healthy in the environment if prioritising the work environment and staff health needs as much as an efficient work flow.



HJALMAR BRANTINGSGATAN

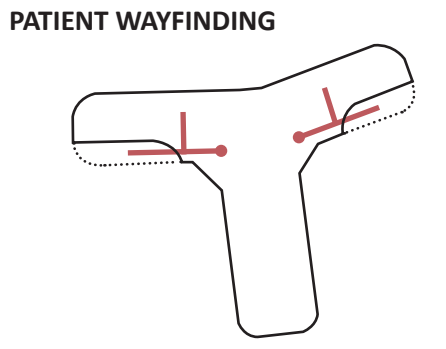
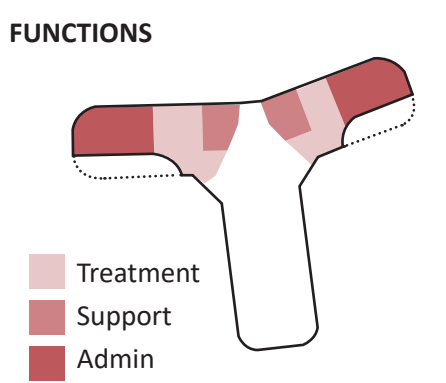
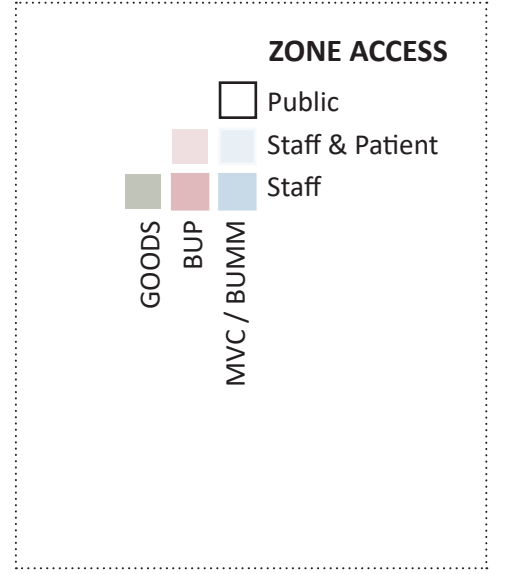
MATERNITY CENTER
(MVC / BUMM)

CHILDREN PSYCHIATRY
(BUP)

ATRIUM

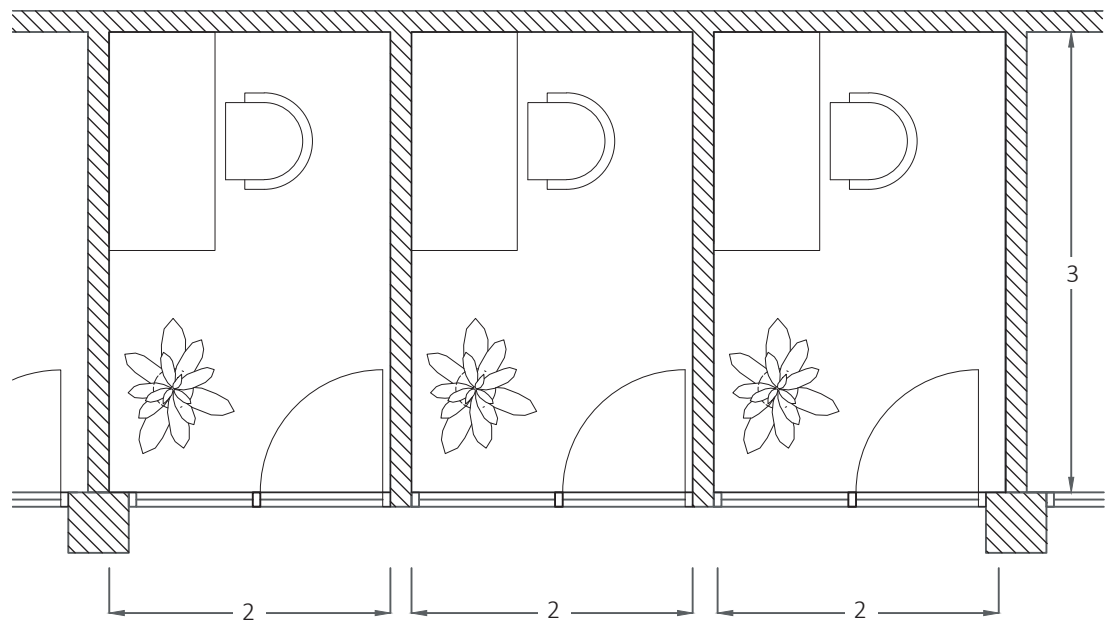
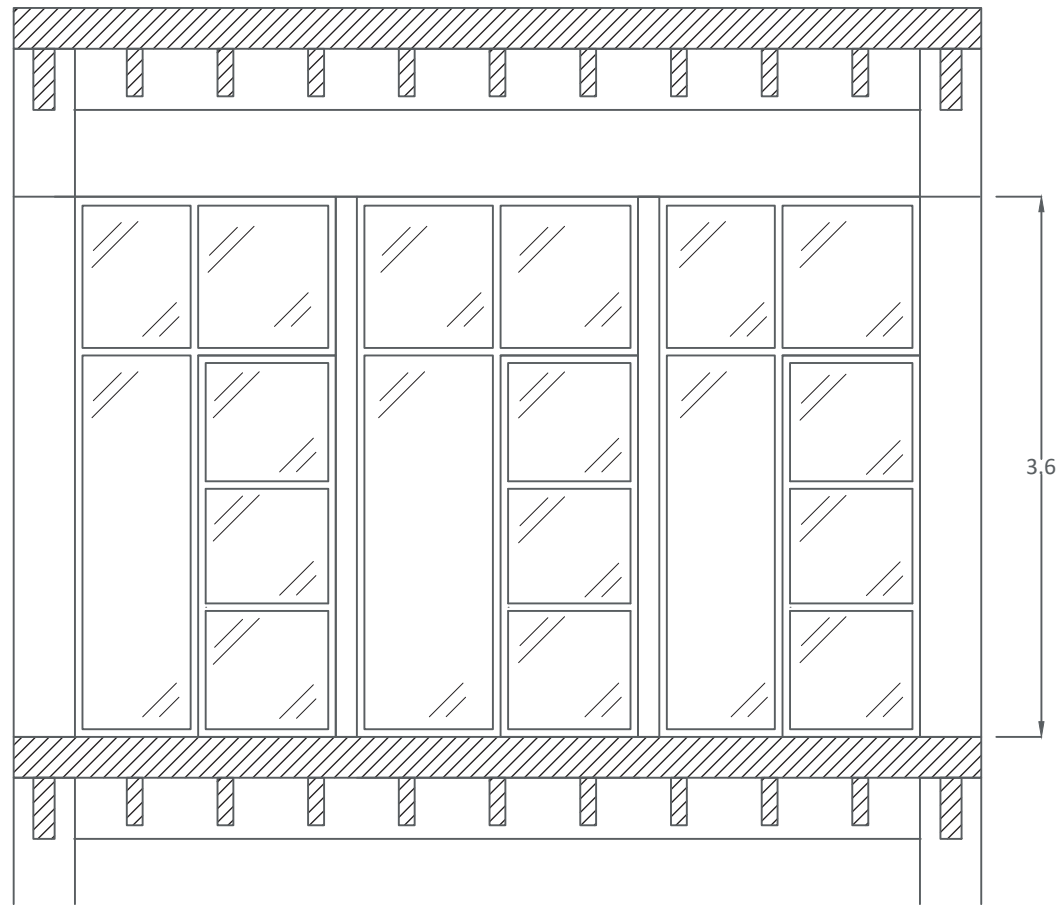
TECHNICAL ROOMS

INLANDSGATAN

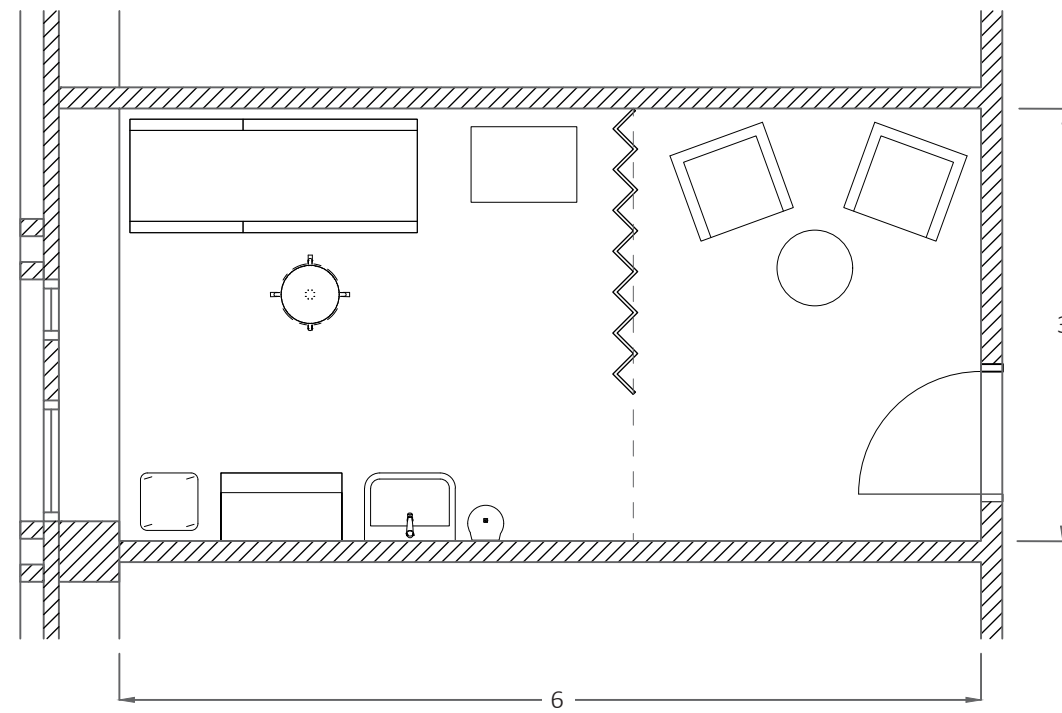
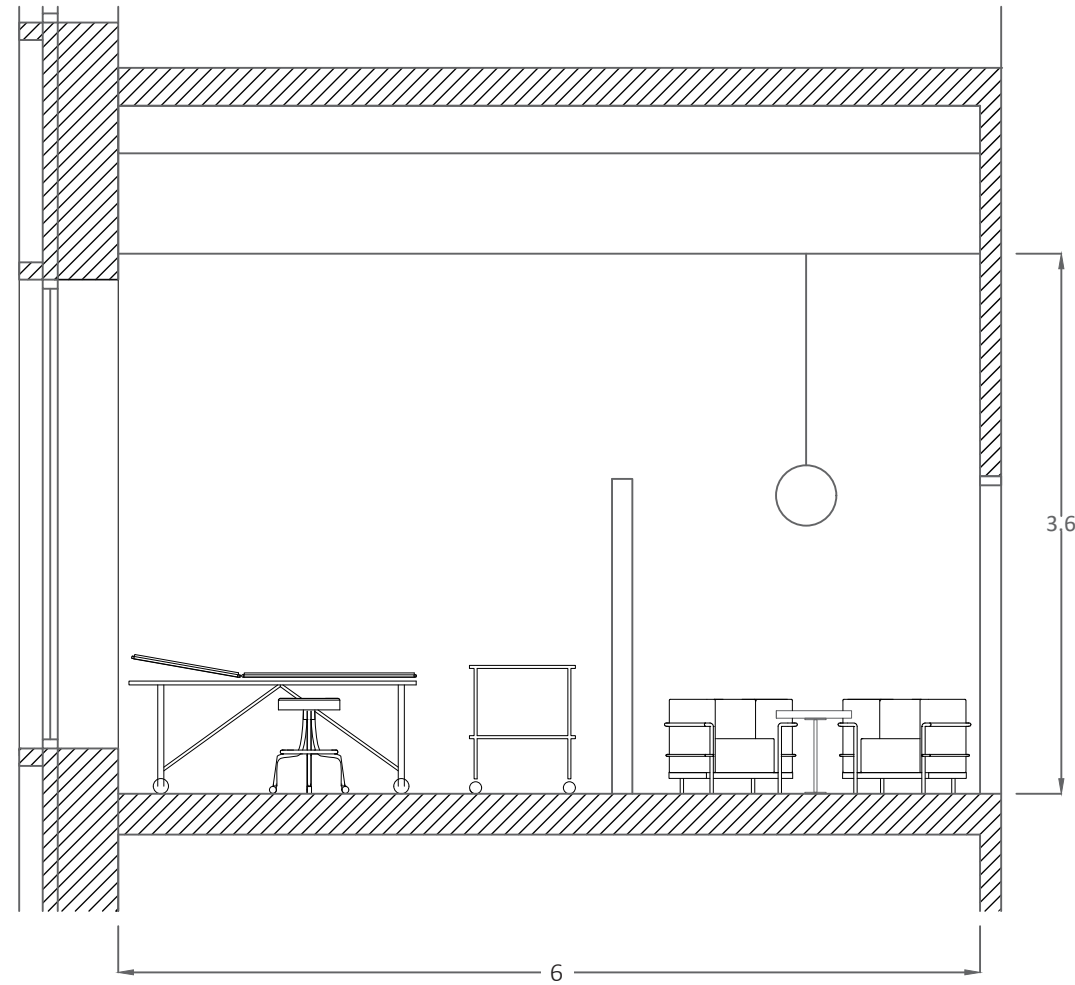


BUP and MVC/BUMM are placed at the highest level. This opens up for the possibility of separated greenery and integrity. Waiting areas are extending into the departments to connect to this space and again become part of the treatment and encouraging environment for the young and vulnerable patients. This layout creates a different office layout, but due to the small department sizes the efficiency of the corridors are kept.

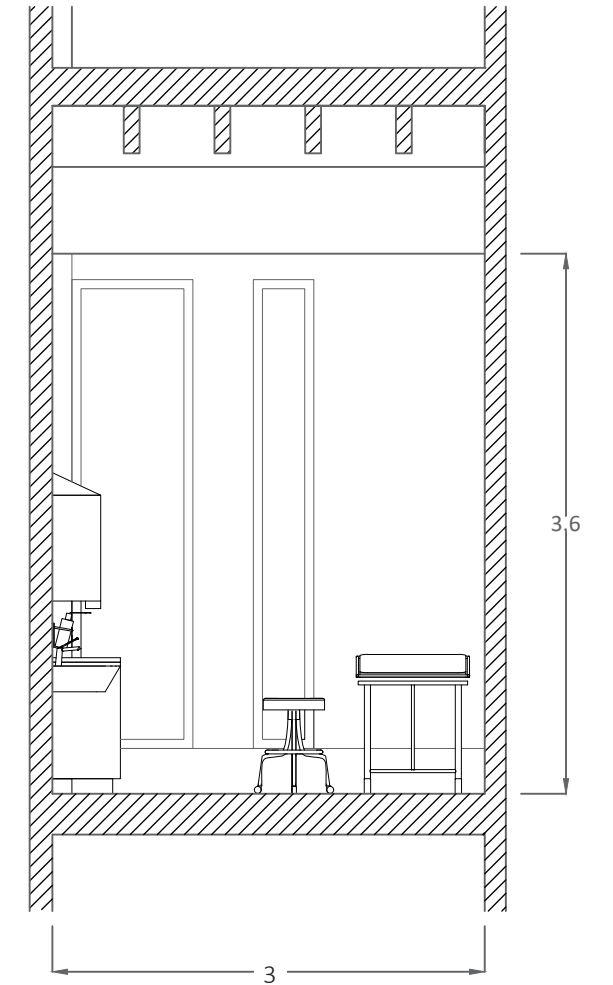
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DIGITAL TREATMENT & QUIET ADMINISTRATION

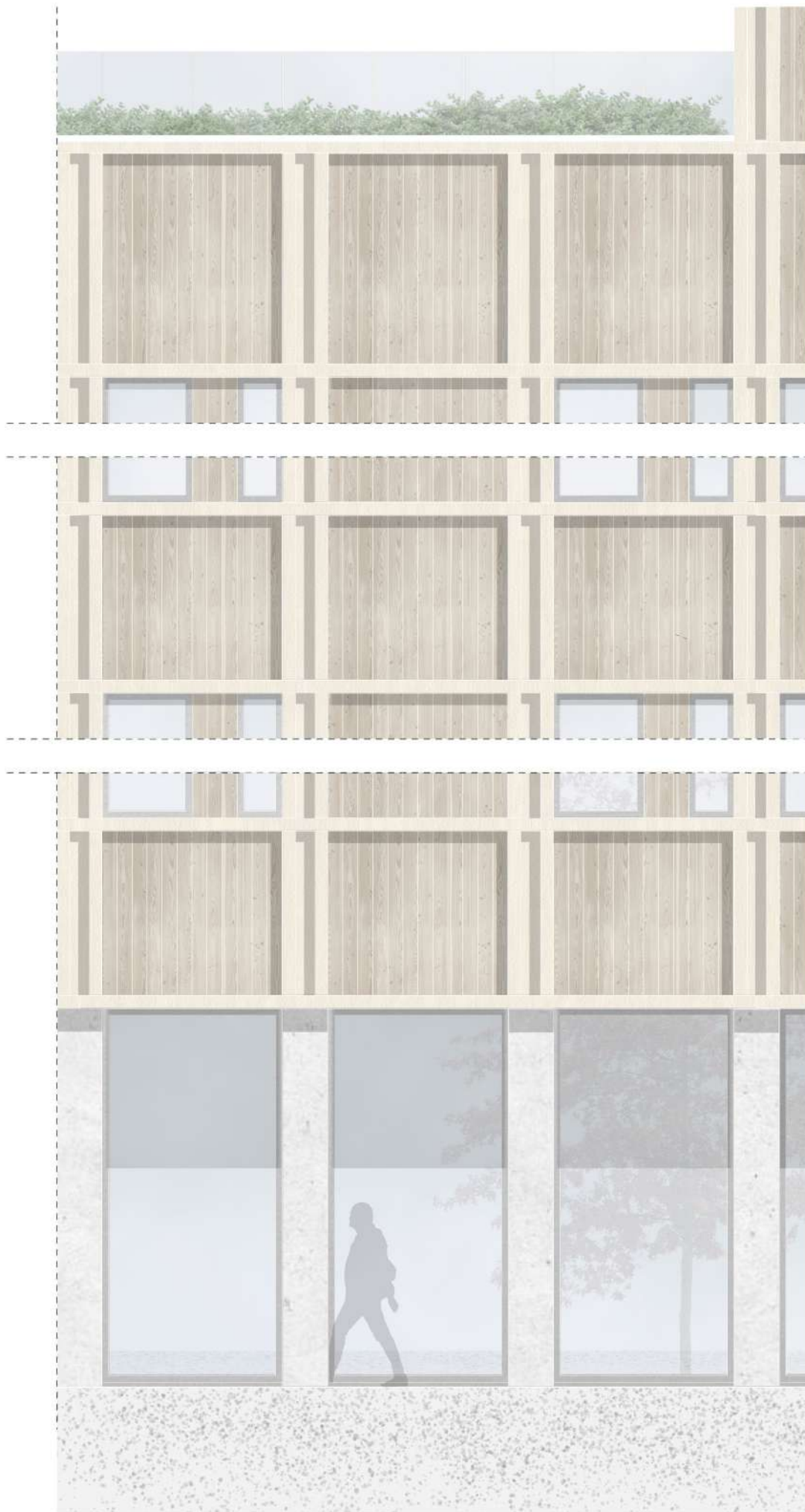


GENERAL TREATMENT ROOM

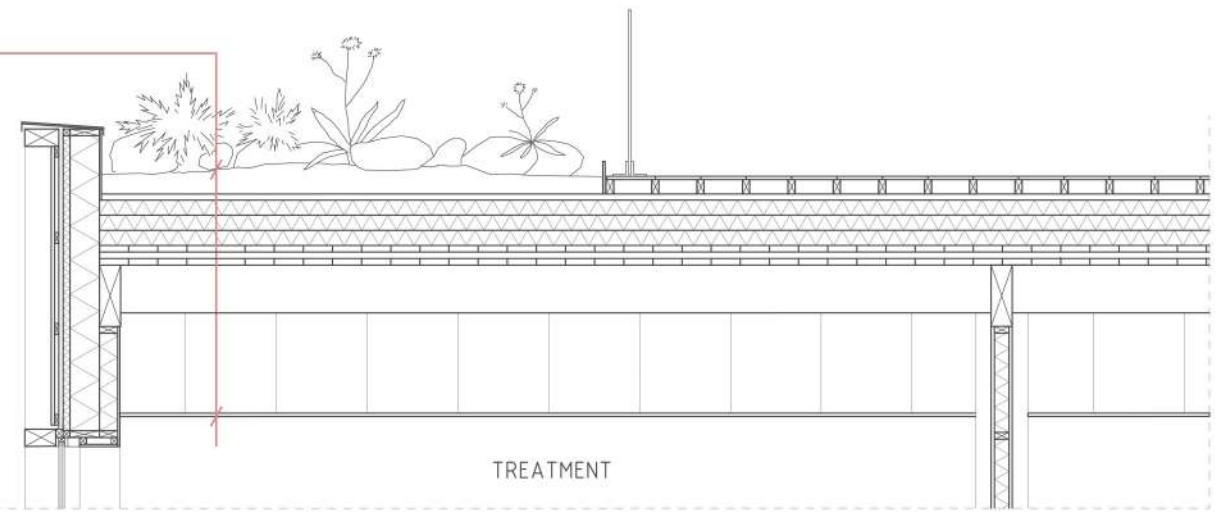


The general treatment room is based on the concept program for local healthcare, with the difference of similar corridor for entrance of patient and staff. Both consultation and treatment planning can take place within this type of room, where one zone is created for conversation or education and the other for treatment. Creating different zones for different parts of the meeting allows the patient to be more in control and respected throughout the session. The zone for conversation can be used as additional waiting area for patients arriving through self check-in, as well as digital patient meetings that require more space. However, the number of rooms quiet rooms from the brief, are increased and planned to be used as the main room for digital meetings as well as quiet administration.

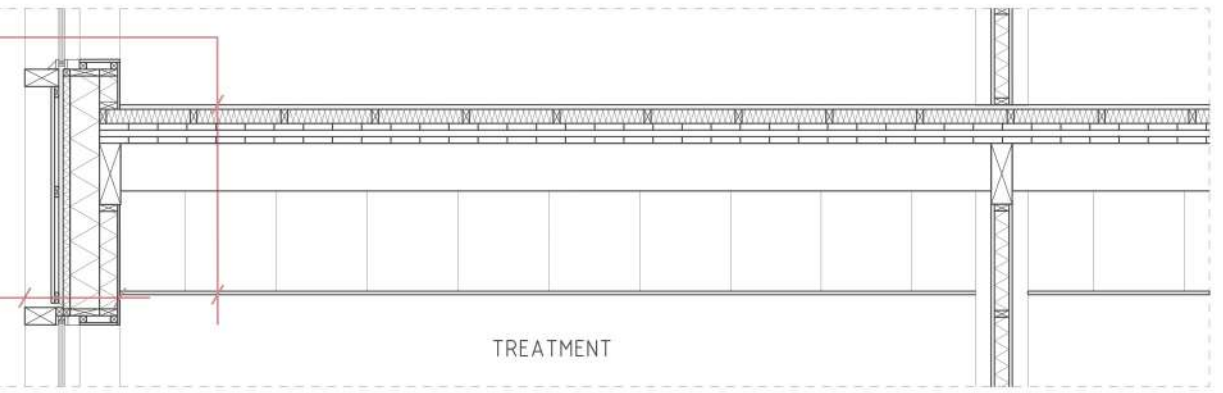
TREATMENT ROOMS



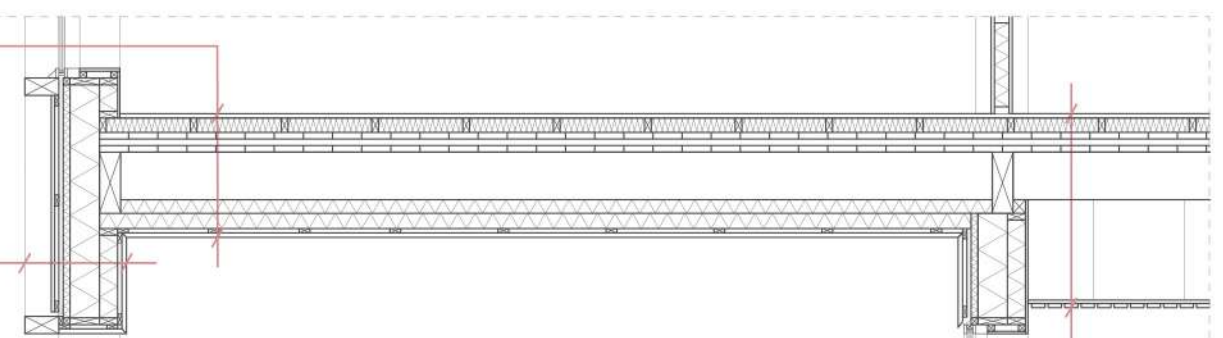
- >130 PLANTS
- 4.0 GROWING MEDIA
- 2 DRAINAGE MEMBRANE
- 300 PVC PROTECTIVE PLASTIC
- 130 ROOT PERSISTENT PVC-CEILING MEMBRANE
- 105x305 INSULATION CELLULAR PLASTIC
- 14.0x4.05 VAPOUR BARRIER
- CIT SLAB
- GLUE LAM BEAM
- GLUE LAM BEAM
- ROOM FOR INSTALLATION
- SUSPENDED CEILING



- 4 MARMOLEUM ACOUSTIC
- 3 CORKMENT UNDERLAY
- 22 FLOOR CHIPBOARD
- 45x95 SUPPORT STUD
- 105x305 GLUE LAM BEAM
- 14.0x4.05 GLUE LAM BEAM
- ROOM FOR INSTALLATION
- SUSPENDED CEILING

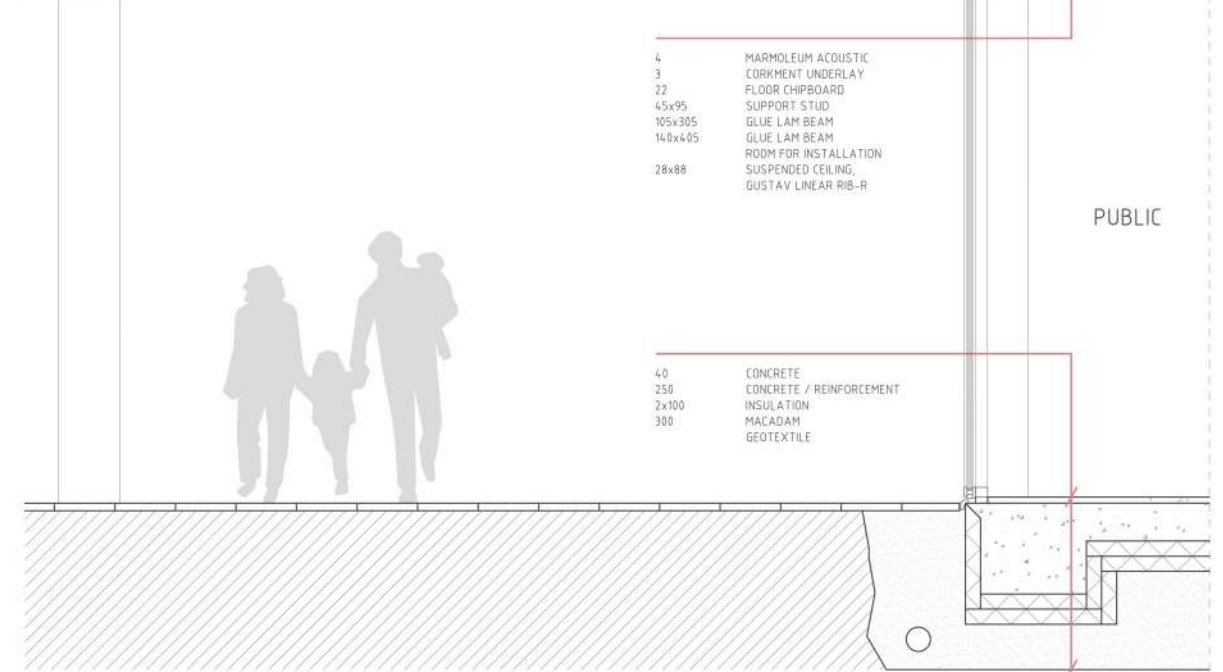


- 4 MARMOLEUM ACOUSTIC
- 3 CORKMENT UNDERLAY
- 22 FLOOR CHIPBOARD
- 45x95 SUPPORT STUD cc 300
- 105x305 GLUE LAM BEAM cc 600
- 14.0x4.05 GLUE LAM BEAM
- 2x100 INSULATION
- 2x13 PLASTERBOARD



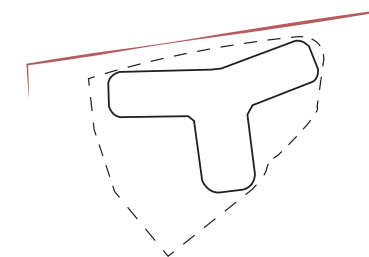
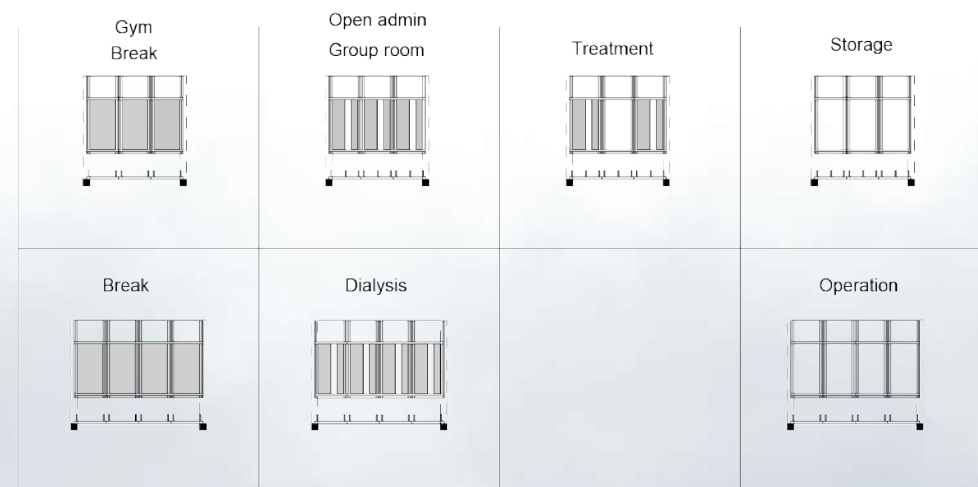
- 200 WOOD STUD
- 22x112 WOOD PANEL
- 28x70 LATH
- 28 AIR GAP
- WIND PROTECTOR
- 45x45 WOOD STUD / INSULATION
- 45x195 WOOD STUD / INSULATION
- VAPOR BARRIER
- 45x120 WOOD STUD / INSULATION
- 28x70 LATH
- 22x112 WOOD PANEL

- 4 MARMOLEUM ACOUSTIC
- 3 CORKMENT UNDERLAY
- 22 FLOOR CHIPBOARD
- 45x95 SUPPORT STUD
- 105x305 GLUE LAM BEAM
- 14.0x4.05 GLUE LAM BEAM
- ROOM FOR INSTALLATION
- SUSPENDED CEILING,
- GUSTAV LINEAR RIB-R
- 28x88



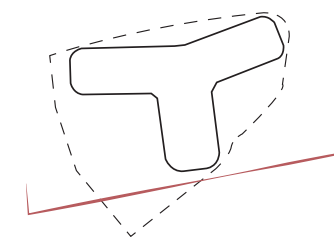
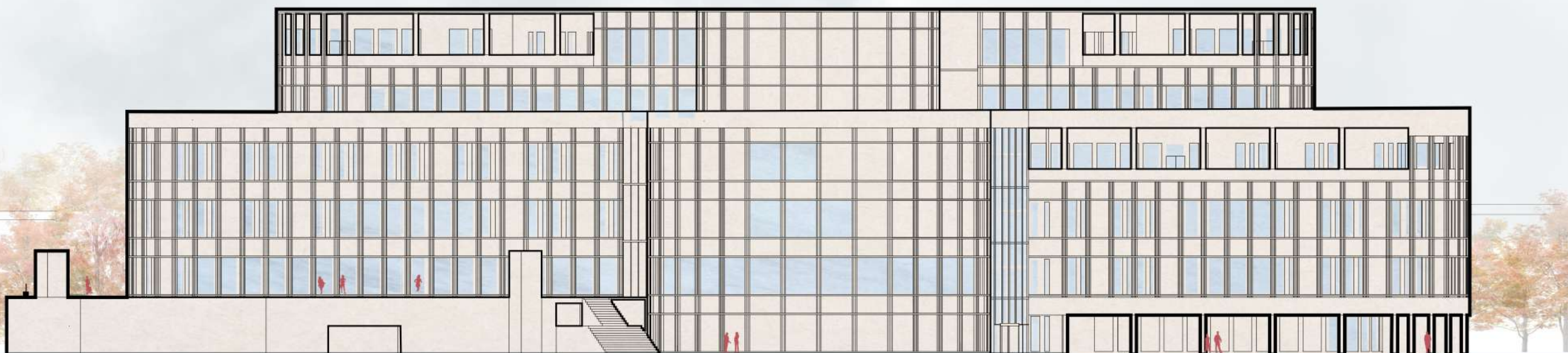
- 40 CONCRETE
- 250 CONCRETE / REINFORCEMENT
- 2x100 INSULATION
- 300 MACADAM
- GEOTEXTILE

FACADE DETAIL



NORTH ELEVATION

The facade facing Hjalmarbrantings gatan mainly relate to treatment rooms and in a few cases administration. By the narrower window that is elevated from the floor, a balanced relation with the busy street is reached. The ground floor has an offset that invites the flow towards and beneath the building, the ground floor uses large window modules for light both inwards and outwards.



SOUTH ELEVATION

In the south facade you can see the continuation of the public ground floor in the right wing, that leads to one of the entrances. This drawing also illustrates the bigger windows for the staff floor, break rooms, dialysis and the gym.

50 m 1:400



A **CORE**-RELATING HOSPITAL

Providing a mutual relationship between patient, staff & community.

GROUP 9
Martina Verme,
Sara Winberg & Zhe Li

ARK263 - Fall 2021
Chalmers university of technology