

ARK263 : Future visions for Healthcare, housing and work Chalmers School of Architecture : Master's programme course (Autumn 2021)



A PROJECT BY GROUP 8

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Introduction

Task

The brief for the studio this year (2021) is to design a new Community Hospital (Närsjukhus) near Wieselgrensplatsen in Gothenburg, Sweden. Current hospitals in the area are deemed to not be able to meet the demands of the future. Therefore, the client Västfastigheter (the property department of the Västra Götaland Region) plan to build a new hospital. Their vision is to create an attractive, sustainable and health-promoting health care center with a human-centric approach.

The city of Gothenburg is also interested in the project and wishes to see a landmark building which contributes to an urban city life. The new building will contain both primary care as well as dental care, day surgery and certain specialist functions. The hospital is estimated to have 444,700 yearly visitors. The hospital shares the site with a mobility hub which is planned to contain car parking, bike parking and a bike repair shop.

Site & context

City

Gothenburg is characterized by its variation in topography with high hills and low bay areas near the river Göta älv. The skyline is filled with iconic silhouettes. From the ferries wheel at the amusement park Liseberg to the old cranes from the old ship industry. During the last decades more and more high-rise buildings have appeared on the skyline.

Wieselgrensplatsen is located on Hisingen, a city district on the north side of the river. Nearby is both a high hill filled with nature and a small local center with both small businesses and larger grocery stores. Göta älv is a divider of Gothenburg which the municipality is working on erasing. The River City project is part of this work which aims to connect Wieselgrensplatsen and Vågmästareplatsen with the extended inner city and the city center.

Analysis and Interpretation

The site is located at the corner of an area with lots of activity, for example football, ice skating and swimming. It is also near to public transport. The surrounding buildings consist mostly of high-density residential buildings as well as a local commercial center. This means that there is a potential for a high amount of people passing through the area. The challenge is to create a space which intrigues people to stay and spend some time on the site. There are two large parks on opposite sides of the site which we strive to connect with our green path concept. This helps people in the parks find our building as well as help people from our building find the nearby parks.

Our vision

We aim to create a green connection between the parks with a center point in the core of the site. We strive to create a landmark building that respects the surrounding area and buildings. The building should be a space for people to spend healthy quality time to create a lively urban city life. The hospital should have a flexible and health promoting design.



The height of the building is lowered towards the stadium, this is to create a connection between the buildings.



Towards Hjalmar Brantingsgatan there are no entrance. Therefore, the sole purpose of the facade is to be a landmark for the city.



Design Strategies



Green Heart Concept

We believe that hospital design and human-centricdesign cannot be separated from each other. We strive to bring nature from the surroundings into the building with a green spine. A hospital is like the heart of an organism. It must constantly work to keep the flow running. Therefore, we aim to create a hospital which brings fresh air and energy to the urban life.

The public center core space be shaped by departments and staff functions in outer space which is a translucent wall welcoming public able to look a green area inside.

Lack of connection between surrounding green areas. **Green Spine** Linking a main entrance, courtyard with the local context via green axis. A risk of the traditional internal flows which is based on work structures rather than visitor's needs **Easy Wayfinding** Helping visitors find their way and seperated flows between patients and staffs.

arena

SITE & CONTEXT

Surrounded by a diversity of architecture visualization.

Related Surrounding

Be a neighborhood landmark while architecture respects the surrounding building.

BRIEF & LOGISTIC



A risk of the traditional internal flows which is based on work structures rather than visitor's needs.

Central Core

Offering the center green space which contains an inviting staircase to encourage physical activity.

FUTURE PROOFING & SUSTAINABILITY







Challenge the brief by reaching the highest area usage.

Adding Shared Spaces

By co-using facilities and encourage interactions between different departments.



Challenge the brief by reaching the highest area usage.

Maximize Building Usage

Building a sense of ownership and community with new public spaces.

Building Concept Design



01 Respect site and context

The shape of the building has evolved from the shape of the site. The design also has to manage the difference in elevation between the south and north part of the location.



02 Strengthen accessibility

Find possible entrance points by analysing the surrounding flows and create the connection between the two large nearby parks.

The public functions are placed in the central core while areas for staff is placed in the part of the building facing out. There is also a green balcony in the front of the building welcoming the visitors.



04 Work with program and grid

Create a well-functioning relationship between the program of the healthcare departments and the structure, grid of the building.



05 Breathe the space and volume

Lower the volume towards the south and west to receive more sunlight to the central core of the building.



Create a landscape design with a seamless transition between indoor and outdoor spaces, bringing the outdoors in with wood materials and vegetation.

" Green Heart Hospital project "



03 Surround public by staff's workspaces

06 Natural appeal



Site Plan

The public can access the building from different points depending on their mode of transportation. If they arrive with their own car or bike they enter from the west side of the building. If they use public transport they are most likely to arrive from the east side of the building.

The street north of the building, Hjalmar Brantingsgatan, has lots of traffic and is the adjacent bike path is an important commute route. However, the municipality has visions to transform this street to a more urban and welcoming boulevard in the future.

Therefore, we have made it possible to access the site from north as well. The eastern part of the site is adjacent to the football stadium Bravida Arena which does not allow easy access.

Finally, the south-east part of the site is used for receiving and sending goods. The loading bay and ambulance parking are near to the street Inlandsgatan which allows for quick and efficient access to the site.

Programme & Area

Effective Spaces



Our concept is to have а highly effective layout and to relocate the space to be used were it is needed the most.

Shared Office Support

To reach a higher usage of conference rooms and copiers these functions are shared between departments on the same floor.

Shared Workspace in Admin

Usually activity based offices has capacity for 70% of the employees according to Chalmers researcher Maral Babapour Chafi.

Increased Space for Staff 🖂

All employees share lunch room on the 6th floor. However, each department still have a break room and resting room.

Increased Space for Patient

On ground level patients find the central reception as well as the all-year-round indoor garden. Plenty with space is allocated for waiting areas to ensure social distancing in case of future pandemics.





Total PY Area

- Client
- Proposal
- Added Public Functions

More Space, More Functions

The BTA and PY are both larger than the initial client proposal. However, our project includes 1 066 sqm of added functions. Without these functions the PY is lower than the client. Moreover, when comparing the ratio between PY and BTA our building has a 5.3% higher area efficiency.

Client

PY per department (sqm) 918 are 491 sion 688 sion 575 m 2163 t 624 re 1M 313 345 304 n 1093 1740 ctions 1864 ces

1481 •	Primary Ca
499	Sample Divis
655 •	Image Divis
428	Mobile Tea
688	Specialis ⁻
540	Dental Car
302	MVC, BUM
392	BUP
505	Habilitatio
004	Surgery
534	Support Func
	Shared Spa
	Added Public Fu

Totals (sqm)	
PY	11 863
BTA	19 984
Ratio PY:BTA	59%

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The Project in Numbers

Proposal

nctions	6 9	1066



Floor Plan Concept

" 3 storey of mobility hub + 7 storey of hospital our mobility hub is connected to the hospital with seperated structure."

Vertical Flows

The main flows for both visitors and employees are located near the center of the building. This is the most efficient placement to create even travel distances. The public communications consist of one staircase with a dynamic flow and two elevators in a glass shaft for a more interesting elevator trip. The employees have access to a staircase and two large elevators which can be used for both beds and goods. There are two more stairs which are foremost for fire escape but can also be used by staff on normal workdays.



Horizontal Flows

The concept for the horizontal flows is to keep patients and staff separated when beneficial. When possible, the patients' walkway is closely connected to the green core which creates a nice environment and good overview of the hospital for the patients. The staff corridors are situated further out in the building. This allows for efficient use of space as rooms can be reached from both sides of the corridor.







The grid has an 8-meter span along the facades. This length fits well with many functions in the hospital (e.g. operating theatre, examination room, meeting room, dialysis and administration).

The concrete floors (basement up through second floor) has a grid designed for high tech rooms with high flexibility. A high rate of flexibility is created using long spans between pillars. Because the pillars are only placed in the middle of the building as well as the façade, the space with daylight if free from pillars. The wood grid is designed to fit medium tech rooms with medium flexibility.

The size of the grid is a compromise between the possibilities of the wood material and flexibility. The wood grid is based on the concrete grid which makes it easier to place vertical communications such as stairs and ventilation.

HIGH TECH - CONCRETE

MEDIUM TECH - WOOD

Structure



BASEMENT 1,2 FLOOR PLAN scale 1:400

0 MOBILITY HUB SAMPLE DIVISION **NEW FUNCTIONS** ۲ . **REGIONAL SERVICE** . **TECHNICAL ROOM**

	PUBLIC
	PATIENT
	STAFF
	GOODS
	RETURNS & WASTE
01 02 03 04 05 06 07 08	VENTILATION CLEANING ROOM STORAGE RECYCLE TRASH QUIET ROOM COPIER ROOM ARCHIVE ROOM MEETING ROOM
09 10 11 12 13 14 15 16	CONFERENCE ROOM BUSINESS, OFFICE AND ADMINISTRATION STAFF RESTING ROOM STAFF BREAK ROOM TEAM STATION DISINFECTION LAB DRUGS

The basement consists of two floors. These contain parking for 242 cars as well as parts of the regional service on the uppermost floor. There is a direct access to the hospital which is closely connected to the accessible parking. On this floor staff can change clothes and collect their staff mail.



	FLOOK PLAN
	scale 1:400
, ,	
	NEW ELINCTIONS
	REGIONAL SERVICE
	TECHNICAL ROOM
Ŋ	PUBLIC
1	PATIENT
	STAFF
	GOODS
Χ.	RETURNS & WASTE
01 02 03 04 05 06 07 08 09 00 1 2 3 4 5 6	VENTILATION CLEANING ROOM STORAGE RECYCLE TRASH QUIET ROOM COPIER ROOM ARCHIVE ROOM MEETING ROOM CONFERENCE ROOM BUSINESS, OFFICE AND ADMINISTRATION STAFF RESTING ROOM STAFF BREAK ROOM TEAM STATION DISINFECTION LAB DRUGS





To connect the mobility hub with the hospital a covered walkway goes across the park. From this side can people arriving with taxi, car or bike easily access the hospital. On the opposite side (north-east) is the entrance for people arriving with public transport. The central reception is visible from both entrances.

The mobility hub has short-termparking, bike parking and a bike shop on the ground floor. In the hospital there is areas for the green central core, public functions, sample division and regional service.

The central reception together with self-check-in desks is situated in the middle of the building. This makes it visible from both the entrance as well as the entrance towards the mobility hub. This floor also has a pharmacy, a café and a shop which strengthens the building's connection with the urban life in the area.

10 m



MEZZANINE 0.5 FLOOR PLAN scale 1:400





For most of the ground floor an extra high floor height is desirable. However, some rooms work better with a more normal floor height which is why there is a mezzanine floor. This floor contains space for the café and the sample division.





PRIMARY CARE
 DIALYSIS
 TECHNICAL ROOM

A	PUBLIC
	PATIENT
	STAFF
	GOODS
	RETURNS & WASTE
01	VENTILATION
02	STORAGE
04	RECYCLE TRASH
05	QUIET ROOM
06	COPIER ROOM
07	ARCHIVE ROOM
08	MEETING ROOM
09	CONFERENCE ROOM
10	BUSINESS, OFFICE AND ADMINISTRATION
11	STAFF RESTING ROOM
12	STAFF BREAK ROOM
13	TEAM STATION
14	DISINFECTION
15	LAB
16	DRUGS

The first floor is shared between the primary care and the dialysis. Primary care has lots of visitors which is why it is placed near the ground floor.

The patients of the dialysis are visiting the hospital regularly and therefore is this division also easy to access.

The rooms in the dialysis division is consist of one large room with the possibility to socialize during the treatment and a few small private rooms from which one can enjoy views of the central core.



50m





IMAGE SURGERY **NEW FUNCTIONS TECHNICAL ROOM** .

۲

A -	PUBLIC
	PATIENT
	STAFF
	GOODS
	RETURNS & WASTE
01 02	VENTILATION CLEANING ROOM
03	STORAGE RECYCLE TRASH
05	QUIET ROOM
06	COPIER ROOM
07	MEETING ROOM
09 10	CONFERENCE ROOM BUSINESS, OFFICE AND ADMINISTRATION
11	STAFF RESTING ROOM
12	STAFF BREAK ROOM
13	TEAM STATION
15	LAR
16	DRUGS



The second floor consists of the image division and the surgery division. These are both high tech functions that need the large spans that concrete is capable of.

50m



2 ND FLOOR PLAN scale 1: 200

SURGERY DEPARTMENT



The surgery is placed with near access to the two large staff elevators which can be used to transport bedridden patients to and from an ambulance if needed.

Because x-ray, CT- and MR-machines work well in windowless rooms the patient corridor is placed alongside the central core.

10 m

13









50m

The third floor is divided between the mobile team, dental care and endoscopy division. There is also a significant area for the tech of the operation theatres on the floor below.

On this floor the building transition from a concrete structure to a wooden structure. The walkway of the patients is closest to the central core. The exam rooms are placed in the middle which allows for separate access for patients and staff. In the outer part of the building are rooms for staff.









The largest division is the general specialist which occupies the fourth floor. Due to the large amount of exam rooms the space for patients have expanded and the staff area has been concentrated at the north-east part of the building. There is an extra staircase connecting the administrative spaces on the fourth and fifth floor.









The fifth floor is shared between the rehabilitation part of the primary care and the habilitation and health division. Both need access to gym facilities which they can easily share. There is also possible to access the roof top gym to have the consultation outside.

50m







- STAFF RESTING ROOM
 STAFF BREAK ROOM
- 13 TEAM STATION
- 14 DISINFECTION
- 15 LAB 16 DRUGS



The sixth floor consists of BUP and region health. There is also the staff lunchroom for all divisions. The lunch room is placed in the south with nice views over the surrounding buildings and landscape.

The seventh floor is filled with technical equipment which includes for example ventilation.

Examination Room

2700

staff



Plan Examination Room 1:50

The examination room uses influences from nature with green as well as wood walls to create a calm atmosphere for the patient and doctor.



Axonometric View Examination Room (scale 1:50)

400C

The room has one area for physical examinations with a bed and health care appliances. There is also space for consultation where the patient and doctor can sit together and talk. There is also a screen available for the doctor to show information to the client from the computer. The room has a window towards the green core of the building which is brings views and light to the workday for the staff. The window can be covered with a curtain for the patient's privacy and there is also a screen available in the middle of the room if needed. For example, if the patient has company to the meeting.



Healthcare and Promotion

0

+0.00

-0.80

+0.00

-0.60

-0.70

Landscape Layout

Integrating landscape from outside into the building and connected to the context routes. Also, design a freeform of naturally curved lines to reduce the sense of formality and offer a more aesthetic atmosphere.

-1.60

-0.80

-0.80

-0.80



Park - Healthcare promotion

The park, is mainly developed at an altitude of -0.80 cm above south street level. The park has been designed on several levels, which, in addition to defining different degrees of privacy, takes up the shapes of the neighbouring context.

Design of a hole for the light and ventilation of the parking that become also a sitting space
 Design of a little green plaza at different levels. Space for meeting and playing



The Green Spine Park (Exterior perspective - connected mobility hub) The park is characterized by circles and differences in height. The design creates many spaces to sit, talk or play. It can also help lowering the impact of heavy rainfall.



Iconic Section



FLOODING PROBLEM

The nearby hill in conjunction with climate change creates a risk for flooding in the future. Therefore, the park has been designed with areas for water storage during high water levels.Duringnormalweatherconditionsthesedesignelements create a more varied and dynamic park with different levels.



SURROUNDING

The building volume is lowered towards the stadium creating a visual connection between the buildings.



ORIENTATION

The health center is oriented towards the south and west for quality outdoor areas. This also allows for solar cells on the greenhouse facade.



HEALING GARDEN

The healing garden becomes a green central point for all visitors and employees. A mixture of plants keeps the garden attractive all-year-round.

FUTURE

The high building volume towards the north-east meets the scale of the city and future masterplan.



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TERRACE

Green balconies creates an urban connectiontothecitiesaswellasaspace for staff to rest during their workday.





Green Central Core (interior perspective)

The green core gives a natural relaxed start to the hospital visit. As the space reaches up to the fourth floor it helps giving the patients an overview of the building. The difference in wall color between the ground floor and the upper floor represents the difference in privacy. The ground floor is more public compared to the upper floors with only hospital functions.



Inlandsgatan Facade - South elevation



Hjalmargatan Facade - North elevation



Site & context

With our facade, we strive to create a dynamic facade where the floors are combined into one large surface. The facade has a very light brown colour with a few panels in another shade to create some variation to the large surface.

There is also a grid to create more depth to the facade as well as large white frosted glass panels to add some larger elements to accent the normal smaller panels. For the front of the building the facade opens for the staff balconies and creates an iconic expression for the building.

The horizontal grid is fitted to the height of the floors to create an even grid from floor one to seven. The grid leads to rather high windows which means that it is not possible to have windows along the whole facade and still meet the client's requirement to have a maximum 30% of the facade being windows. Therefore, there is a mixture of solid and transparent panels.



DIAGRAM OF FLEXIBLE



Material

Our concept it to use wood as the primary finishing. On the outside the wood has a bright grey color and on the inside a warmer and more vibrant natural wood color.



Detail Section

scale 1:50

The vertical grid is based on the structural grid of eight meters. This length has been divided into ten to create 800 mm wide panels which allows for large flexibility to connect interior walls with the outer wall. The façade consists of a flexible wooden curtain wall which allows for panels to be changed. It is therefore possible to exchange a solid panel for window panel if needed in the future.



The Entrance (Exterior perspective - Hospital Community Landmark)

The main entrance gives a warm welcome as the facade opens up to reveal the interior gardens. This design also has potential to be a landmark for the local community as well as Gothenburg as a whole.

