

FRIHAMNEN SJUKHUSET
- THE HARBOUR HOSPITAL

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CHALMERS SCHOOL OF ARCHITECTURE • GOTHENBURG, SWEDEN

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BACKGROUND

FRIHAMNEN

The new Frihamnen District was developed in order to link the center of Gothenburg across the river, into the Kvillebäcken, Lindholmen and Backaplan areas. The vision was to turn this habour area into a green and dense part of the Gothenburg city center.

By 2021, it is projected that the Frihamnen District will have 3,000 new homes, 2,000 new workplaces and a sizable public park. It is projected to be a walking district where visitors will park their cars in a public garage before entering the residential area situated right next to the park.

The design of this area also revolves around the idea of social integration. The pavements are immersed in green qualities that enable the user the possibility to stop, sit down and have a conversation with other pedestrians passing by. It is a strong pledge to embrace the cultural diversity currently being brewed in the city and give way to a stronger and unified society.

VISION

After going through the course literature and having made a thorough analysis on the existing conditions and projections for the site, we produced our interpretation and intentions for this design commission. We believe that it is time to have a comprehensive approach and be aware that the user experience proves to be as important as the end purpose of going to a healthcare facility: treating our ailments and getting better.



GREEN

We want to give the hospital a qualitative courtyard with trees and seating areas. We believe it will provide a healing environment for both patients and staffs. The atmosphere is calm and quiet as opposed to the busy square in front of the hospital.



INTEGRATION

The building provides health promoting functions in two of its levels. As designers, our intention is to bring the public into the hospital's courtyard as a way to take away that feeling of estrangement from ill people.



SELF-EMPOWERMENT

We aim for a clear and rational floor structure inside the hospital that allows patients to be as much independent as possible.



MEMORY

We want to use the origin of the place, which is a ship harbour, as an inspiration to design the envelope of the building. By doing this, we hope people will be reminded of Frihamnen's history when they arrive to the public transportation hub and meet our hospital.

BACKGROUND

PLOT ANALYSIS

The site is located along the main street that opens up from the Gothenburg City Center into Frihamnen, and provides a link with Backaplan.

Facing the largest square of the district with several bus and tram stops on its northern side, the hospital stands as a gateway leading people into Frihamnen's attractions such as the Jubileum's Park and Frihamnen's Waterfront which stay further down the southern part.

The building will also probably leave people with their first impression on Frihamnen when they visually experience it right after getting off the public transports.

The busy atmosphere as part of the northern facade will be attenuated when people either walk down the western or eastern smaller streets to access the area. Although the two bear resemblances in terms of size, the western one possibly carries heavier traffic flows as it connects with another big traffic node two blocks away from the hospital and then finally ending at the park and waterfront area.



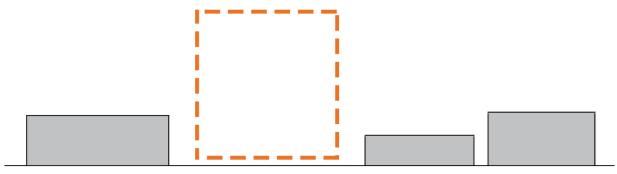
PRELIMINARIES

DESIGN GUIDELINES

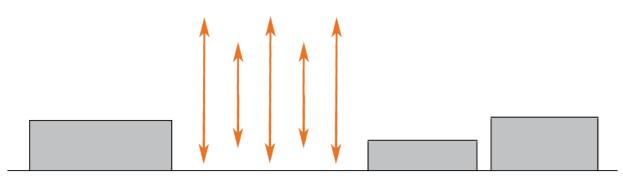
Before actually coming up with the building's shape, we envisioned its character through some basic guidelines:



1. The plot sits in an area surrounded by bulky buildings that form a solid belt in front of the square.



2. If the building's shape follows the surrounding typology, the belt will be even more obvious.



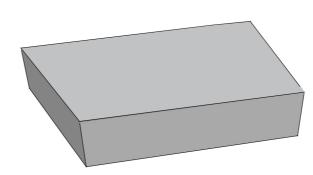
3. We played with verticality to create a rhythm that breaks this belt.



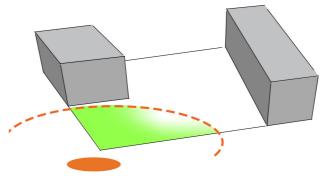
4. It's important to give the building a human-scale character to relax the pedestrians coming to the hospital or just walk pass it to access the area.

SCULPTING PROCESS

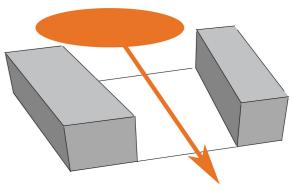
The volume was sculpted based on the design guidelines:



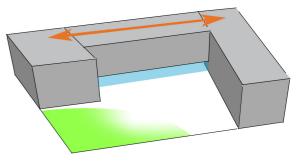
1. We simply took the plot's footprint and extruded it.



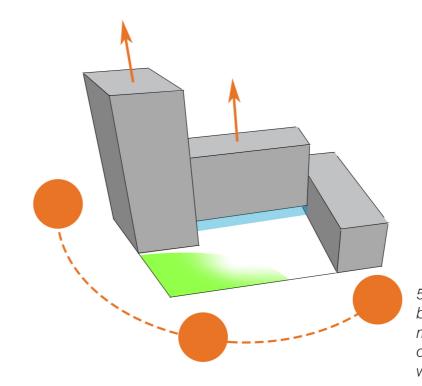
3. We identified the main traffic node. We then shortened the west volume to direct people to the node, and we started the courtyard from there.



2. The volume was then split in half to create a walkway into the plot.



4. In order to provide a more efficient workflow and an indoor connection between these two volumes, we decided to link them through a third middle block. The lower part is glazed to allow a visual connection to the courtyard.



5. We emphasized the verticality aspect of the volumes by adjusting the three heights according to sun study to make sure the courtyard receive the best and longest daylight all year round. We finally came to a conclusion with a basic three-volume composition.

SITE PLAN

OVERVIEW

The entrances to the building were determined based on the traffic analysis:

• Main Entrance for patients and visitors

• Placed along the middle volume on the northern façade of the hospital, it faces the square and can be easily to be seen from the distance. Visitors can access the building from the courtyard as well.

Staff Entrances

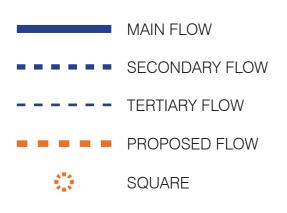
• Two Staff Entrances were deemed necessary in order to provide an efficient workflow for the staff. One is located on the northeast corner of the building, and the second along the west side of it. With this arrangement, staff will access the building depending on the entrance's proximity to their department.

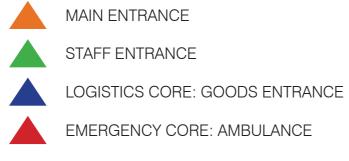
Goods Entrance

• Trucks will arrive to the hospital's east side into the garage and proceed to unload the goods. Since this side of the building has low traffic flow and still stays close to the main street, it's suitable for goods delivery

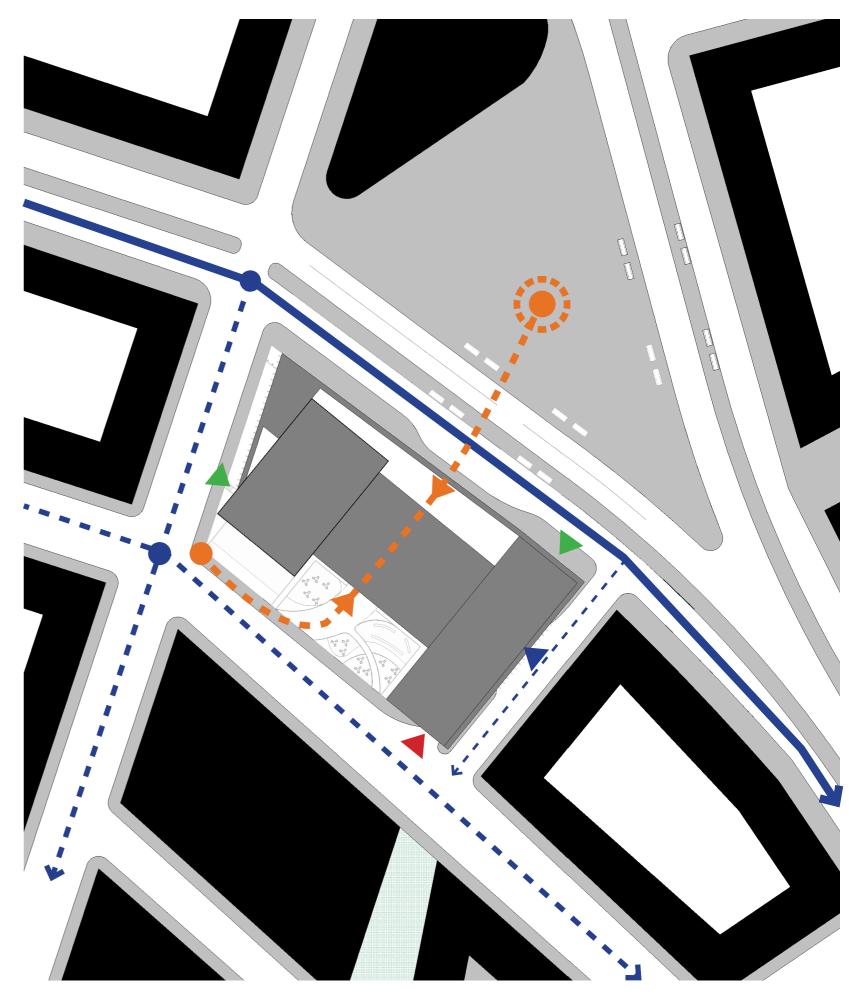
Ambulance Entrance

• The ambulance garage is located on the eastern volume with direct access to the emergency elevator and facing a low traffic street for a quick exit.



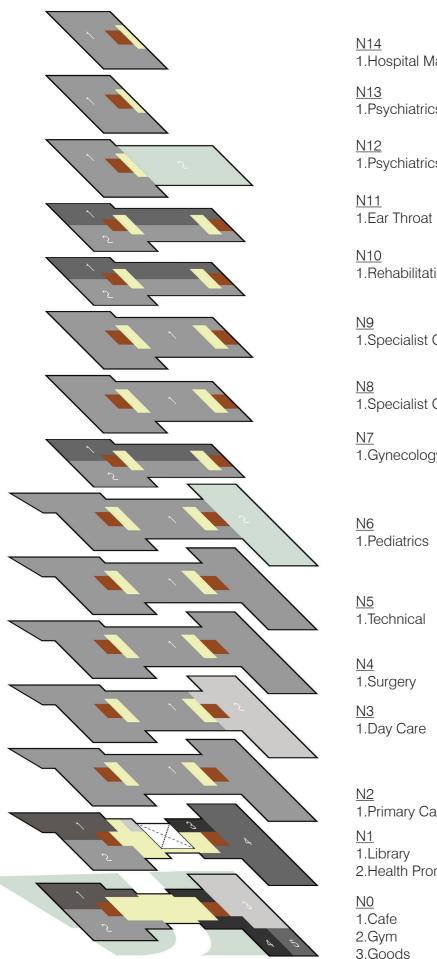






DESIGN PROGRAM

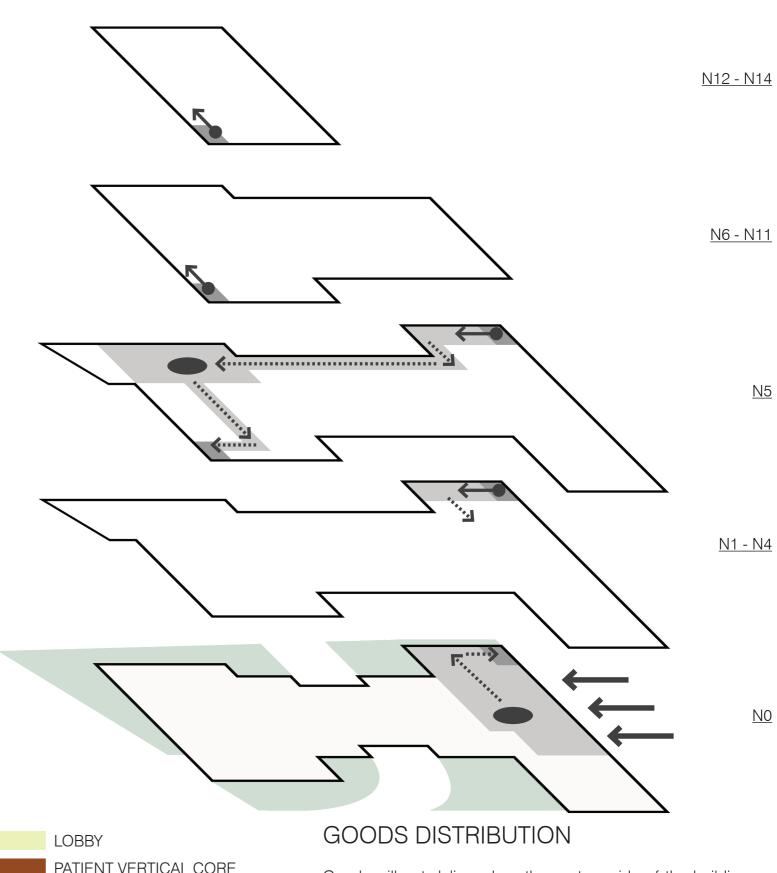
GOODS FLOW



1.Hospital Management N13 1.Psychiatrics Doctor Office 1.Psychiatrics 2.Rooftop Garden 1.Ear Throat Nose 2.Dialysis 1.Rehabilitation 2.Orthopedics 1.Specialist Care Center 1.Specialist Care Center 1.Gynecology 2.Pain Center 2.Rooftop Garden 2.Imaging N2 1.Primary Care 3. Retails 2.Health Promotion 4. Sampling

4.Retails

5. Ambulance Garage



Goods will get delivered on the eastern side of the building on Level No. After unpacking and sorting, they will be transferred to upper floors through the northeastern core upon Level N5. Here, they will be moved from east to west via a goods corridor, and then continue upwards through the southwestern core for goods.

FLOOR STRUCTURE

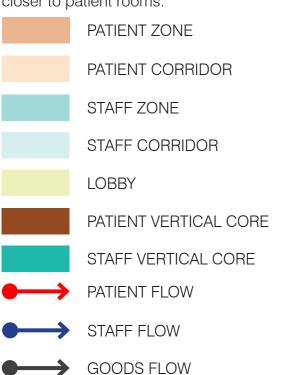
BASIC STRUCTURE

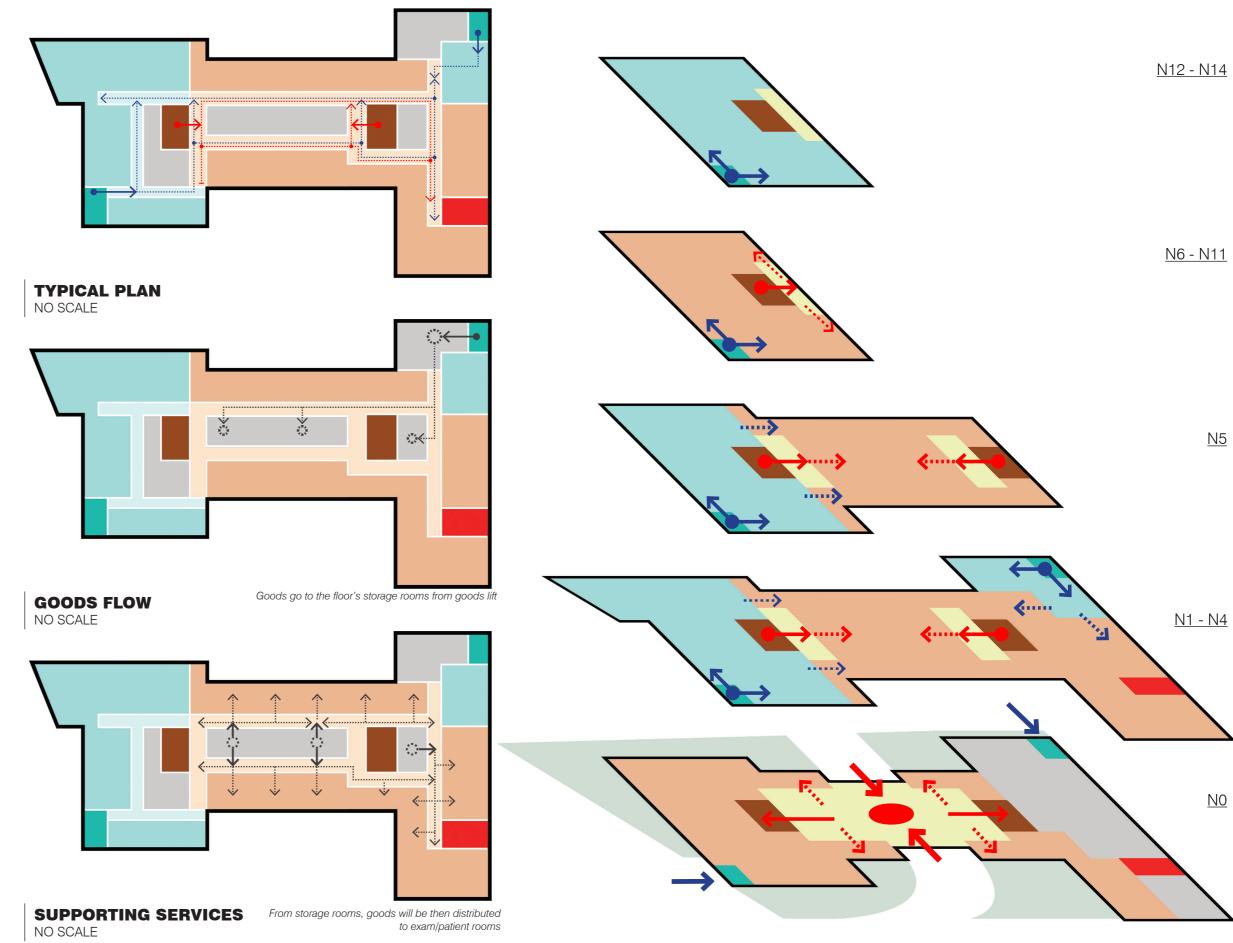
Coming up to any floor by taking one of the two main circulation cores, patients or visitors will see the reception desk right away. Then, they can access the department either through the middle volume or the eastern volume.

The location of the two cores and the departments keep the travel distances as short as possible, while the corridor structure provides a clear way finding inside the hospital, allowing patients to see the other end or locate the other circulation core regardless of where they are standing in the corridor.

The staffs areas sit in the eastern and western wings of the hospital, built around two staff cores. This arrangement gives way to easy access to patient areas and also keeps the travel distance to a minimum.

From the Goods elevator, goods packages are first delivered to the floor's main storage right next to it, then get distributed to smaller storage rooms the dark core which are closer to patient rooms.





SCHEMATIC FLOORPLANS



LEVEL NO - GROUND FLOOR SCALE 1:800

GROSS SURFACE: 2,911.755 SQM

RENTABLE SURFACE: 1,582.250 SQM - RETAIL + LOBBY

463.150 SQM - GOODS 173.900 SQM - OTHERS

RENTABLE SURFACE:



LEVEL N1 - HEALTH PROMOTION + SAMPLING SCALE 1:800

GROSS SURFACE: 2,907.850 SQM

RENTABLE SURFACE: 158.200 SQM - RETAIL

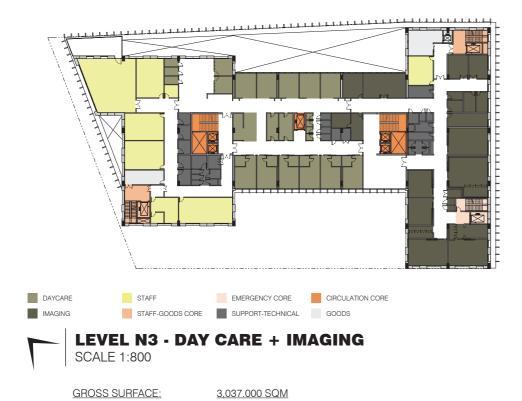
1,017.250 SQM - SAMPLING 1,218.500 SQM - HEALTH PROMOTION



LEVEL N2 - PRIMARY CARE SCALE 1:800

> **GROSS SURFACE:** 3,037.000 SQM

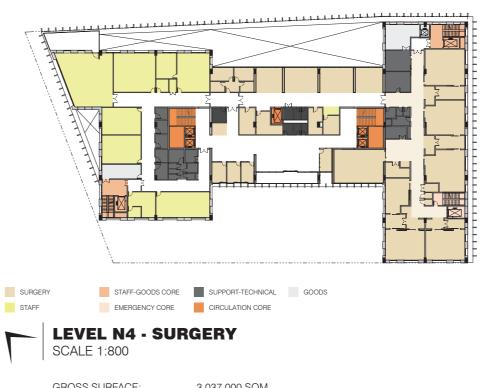
RENTABLE SURFACE: 2,452.800 SQM - PRIMARY CARE



782.850 SQM - SHARED STAFF

811.800 SQM - IMAGING

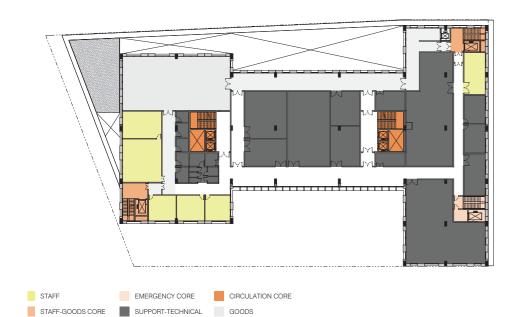
858.150 SQM - DAY CARE



GROSS SURFACE: 3,037.000 SQM

RENTABLE SURFACE: 898.850 SQM - STAFF 1,553.950 SQM - SURGERY

SCHEMATIC FLOORPLANS



SCALE 1:800

LEVEL N5 - TECHNICAL FLOOR

FRIHAMNEN SJUKHUSET GÖTEBORG, SE - DECEMBER 22, 2016

RENTABLE SURFACE:

GROSS SURFACE:

564.150 SQM - GOODS DISTRIBUTION HUB

1.888.650 SQM - TECHNICAL

2,700.000 SQM



LEVEL N6 - PEDIATRICS SCALE 1:800

GROSS SURFACE:

RENTABLE SURFACE: 452.050 SQM - SHARED STAFF 1,106.750 SQM - PEDIATRICS 767.800 SQM - ROOF GARDEN

2,667.600 SQM

PAIN CENTER STAFF SUPPORT-TECHNICAL GOODS GYNECOLOGY STAFF-GOODS CORE CIRCULATION CORE **LEVEL N7 - GYNECOLOGY + PAIN CENTER** SCALE 1:800

2,667.600 SQM

464.450 SQM - SHARED STAFF

576.760 SQM - GYNECOLOGY

545.600 SQM - PAIN CENTER



GROSS SURFACE: 1,766.800 SQM

RENTABLE SURFACE: 452.050 SQM - SHARED STAFF

1,106.750 SQM - SPECIALIST ADULT CARE CENTER



GROSS SURFACE:

RENTABLE SURFACE:

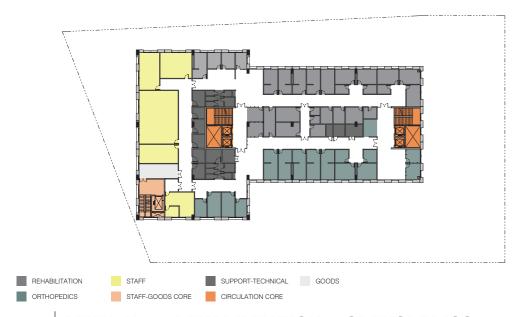
SCALE 1:800

GROSS SURFACE: 1,766.800 SQM

RENTABLE SURFACE: 452.050 SQM - SHARED STAFF

1,106.750 SQM - SPECIALIST ADULT CARE CENTER

SCHEMATIC FLOORPLANS



LEVEL N10 - REHABILITATION + ORTHOPEDICS SCALE 1:800

GROSS SURFACE: 1,766.800 SQM

RENTABLE SURFACE: 454.050 SQM - SHARED STAFF

576.750 SQM - REHABILITATION 530.000 SQM - ORTHOPEDICS

STAFF SUPPORT-TECHNICAL GOODS EAR, NOSE & THROAT STAFF-GOODS CORE CIRCULATION CORE

LEVEL N11 - EAR NOSE THROAT + DIALYSIS SCALE 1:800

1,766.800 SQM

GROSS SURFACE:

RENTABLE SURFACE: 436.450 SQM - SHARED STAFF

530.000 SQM - EAR. NOSE AND THROAT

592.350 SQM - DIALYSIS



GROSS SURFACE:

1,408.500 SQM

RENTABLE SURFACE:

734.550 SQM - PSYCHIATRY (EXAMINATION)

535.650 SQM - ROOF GARDEN



LEVEL N13 - PSYCHIATRY (ADMIN) SCALE 1:800

GROSS SURFACE: 864.000 SQM

RENTABLE SURFACE: 734.550 SQM - PSYCHIATRY (ADMINISTRATION)



LEVEL N14 - MANAGEMENT + ADMINISTRATION SCALE 1:800

GROSS SURFACE: 864.000 SQM

RENTABLE SURFACE: 734.550 SQM - MANAGEMENT (ADMINISTRATION)

PROJECT OVERVIEW

GROSS SURFACE: 32,268,705 SQM RENTABLE SURFACE **CIRCULATION CORES** GROSS / BUILT RATIO 27,284.350 SQM 1,678.800 SQM 90%

GROSS SURFACE:

• INCLUDES EXTERIOR AREAS, BRACE, LANDSCAPE AND GREEN ROOFS

RENTABLE SURFACE:

• INCLUDES INTERIOR CORRIDORS BY DEPARTMENT AND TECHNICAL ROOMS ON EACH FLOOR.

GROUND FLOOR

The main lobby stands right in the middle of the three volumes, and serves as a transition area leading people from the outside into the courtyard. In terms of way finding, it is easy to get to the two main circulation cores which are visible even from the landscape in front of the main entrance. People can check at the reception booth to be sure which elevator they should use to get to a specific department upstairs.

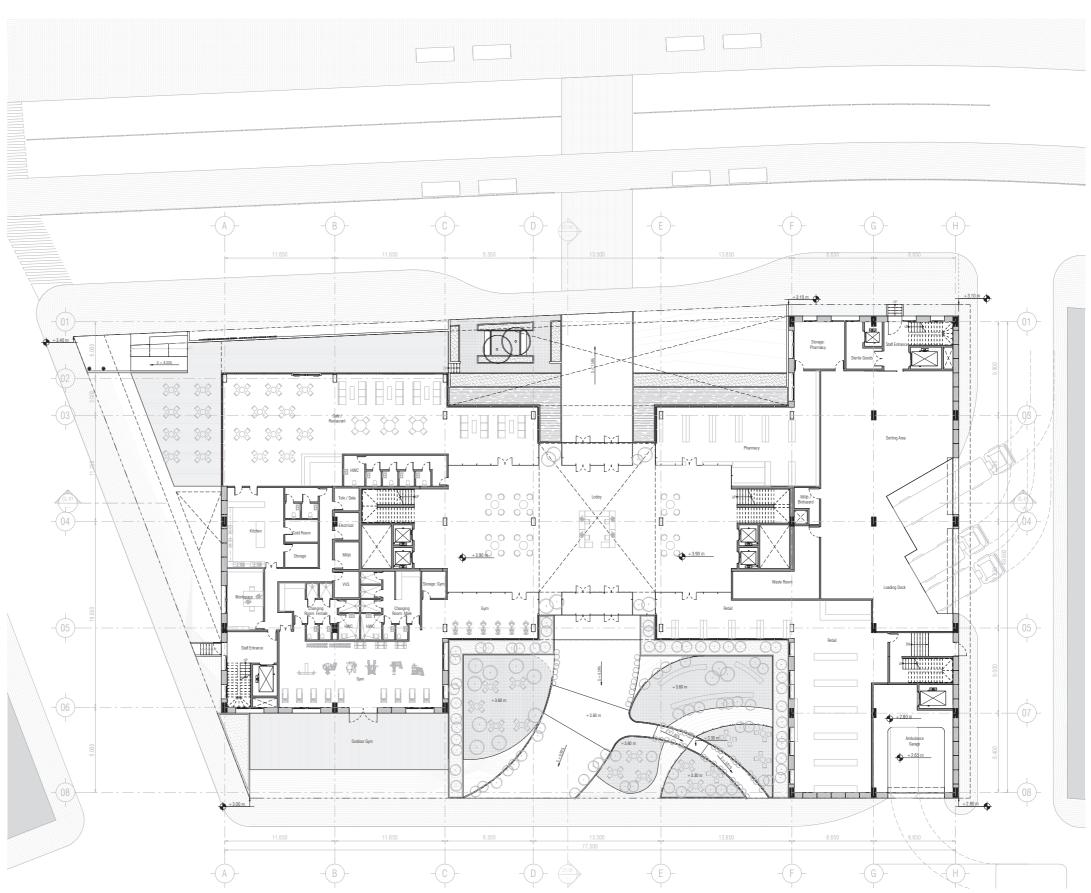
The Café Shop, Gym and and other retail spaces contribute to turn this floor into a populated public area with visual access to the busy square or the calm green courtyard.



SCHEMATIC FLOORPLAN NO SCALE

THE RINGE OF THE PARTY OF THE P

GROUND FLOOR LOBBY





HEALTH PROMOTION + SAMPLING

Self check-up, Library and Health promotion department are in the west wing, whereas the east one houses Retail and Sampling Department. The atrium allows a visual connection with the lobby on Ground Floor, and doubles the normal ceiling height giving the lobby a grandeur character. A bridge was added across the void to unify the whole floor plan.

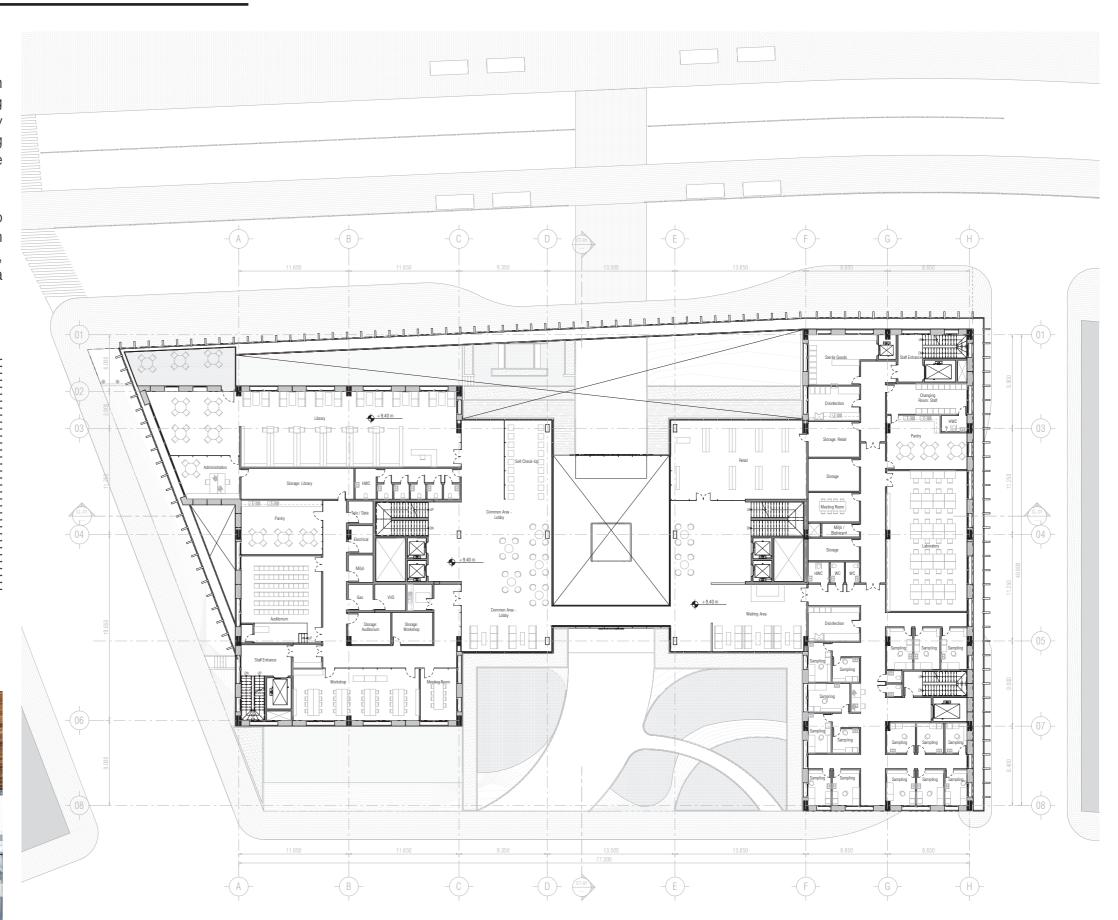
The Health Promotion department is a new function into the design program. The purpose of having it is to create an educational place for people to come and attend seminars, lectures or workshops to gain knowledge about how to lead a healthier life.



SCHEMATIC FLOORPLAN NO SCALE

HAMINEN SJUKHUS
HUVUDU

GROUND FLOOR LOBBY FROM N1

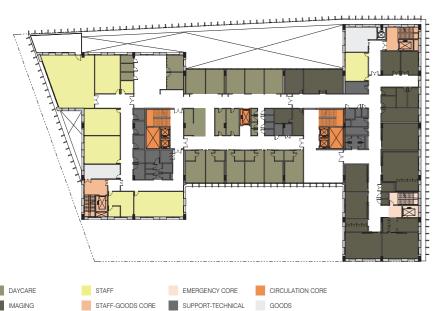




DAY CARE + IMAGING

Regarding Day Care, we provide single-bed and double-bed patient rooms to give them the opportunity to choose what suits them better. There is one elevator placed in the middle dark core for dedicated use between N3 and N4 (Surgery Floor) in order to ease the patient transfer process from post-surgery to their own rooms.

Imaging is in the east volume and like Daycare, it has its own lobby, reception area, waiting area but the two departments are connected to support each other function-wise.

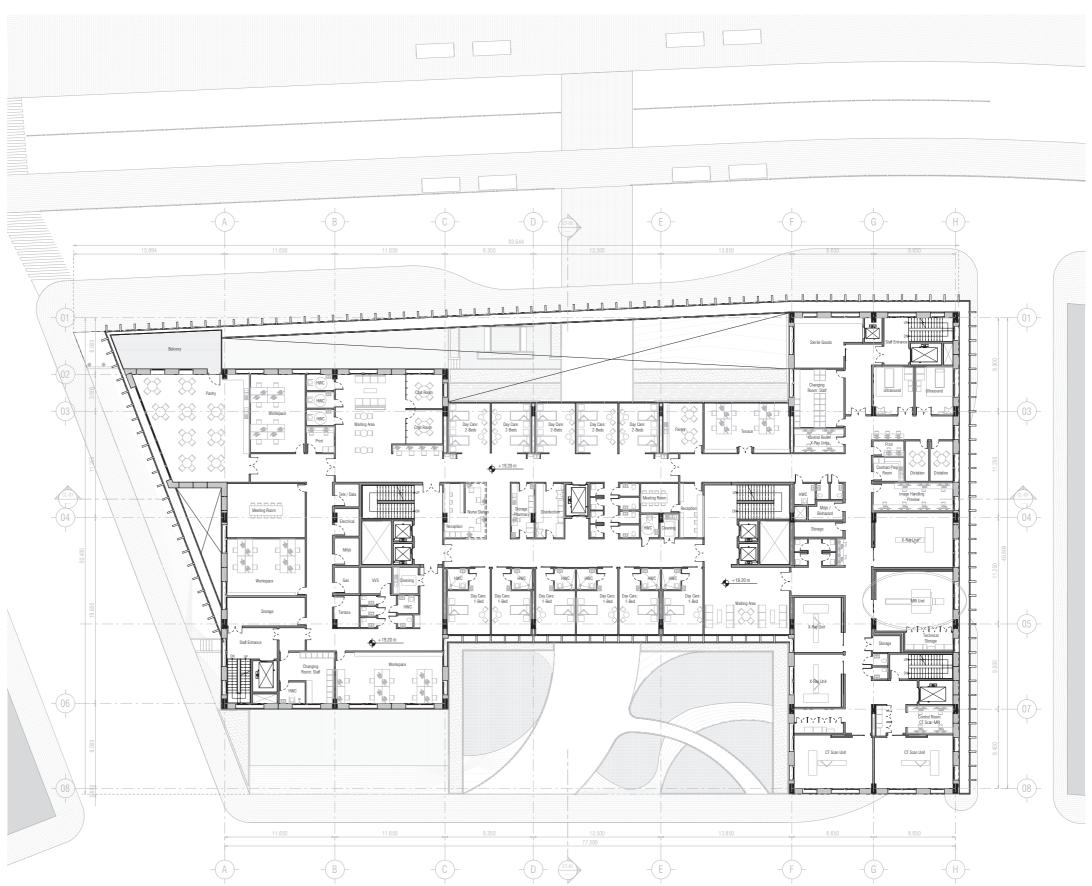


SCHEMATIC FLOORPLAN

NO SCALE



DAY CARE ROOM - SINGLE BED





SURGERY FLOOR

Doctors, coming from their office located on the west volume, access the *Clean Zone* through a set of locks in the middle part of the building. Then, they proceed to the disinfection room and then change into their surgery gowns. After that, they go through another set of locks to enter the *Sterile Zone* with six Operation Rooms and one Endo-Gyno Operation Room.

Pre-Post Op Rooms are located within the middle volume as open plan rooms and connected with the level below through a dedicated lift. N4 is supplied by an inclusive sterile goods cycle.

The emergency elevator sits in between the operation rooms and goes right down to ambulance garage on ground floor.

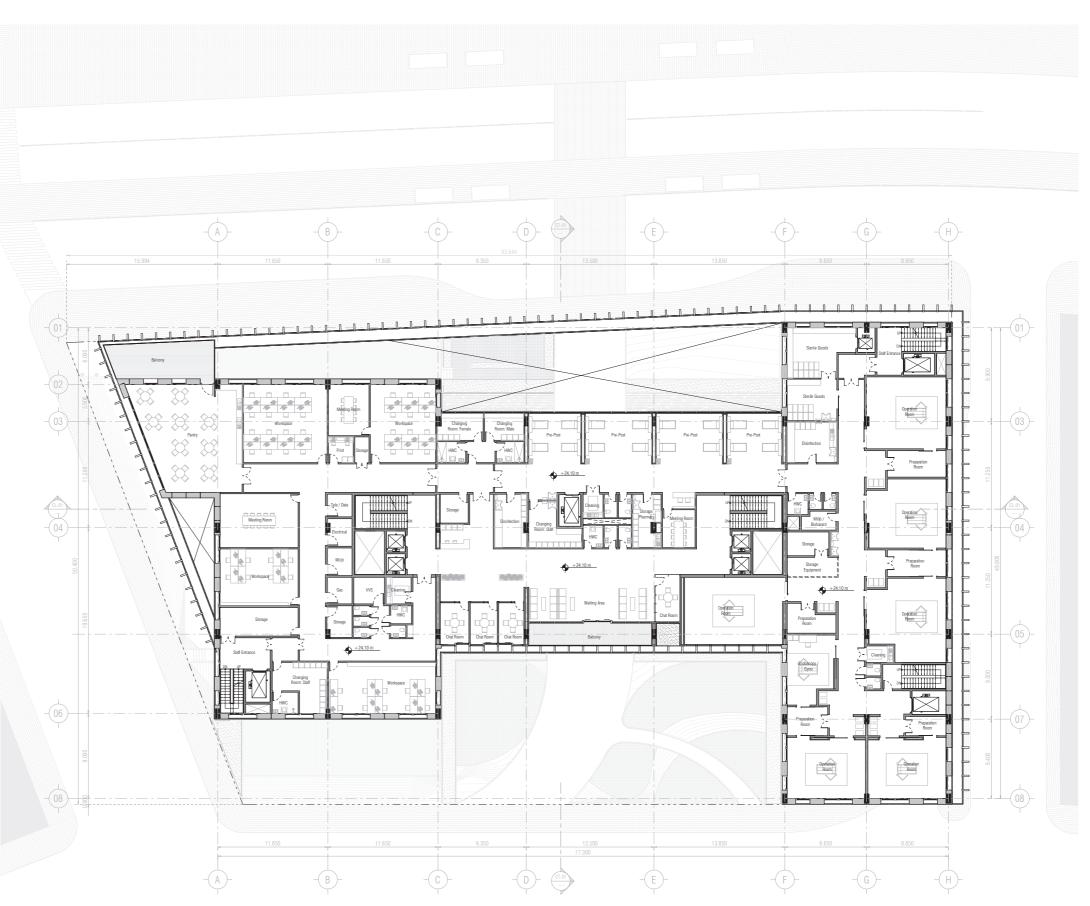


SCHEMATIC FLOORPLAN

NO SCALE



WAITING ROOM - SURGERY FLOOR





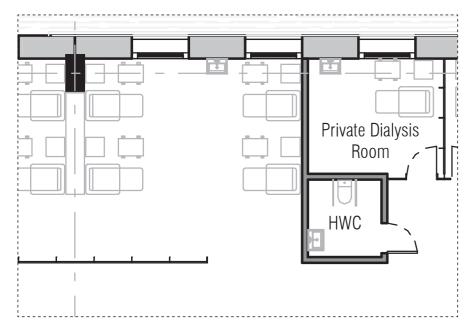
EAR NOSE THROAT + DIALYSIS

In order to provide the patient the opportunity to integrate, communicate and to avoid the sense of captivity commonly associated with this type of facilities, we decided to introduce two types of dialysis rooms: private and lounge. Both options were designed taking as point of departure glass partitions to have a clear connection with the surroundings but yet adding some privacy to the single rooms. As for the *Dialysis Lounge*, no interior partitions were considered as we envision this room as a space for communication and dynamism.

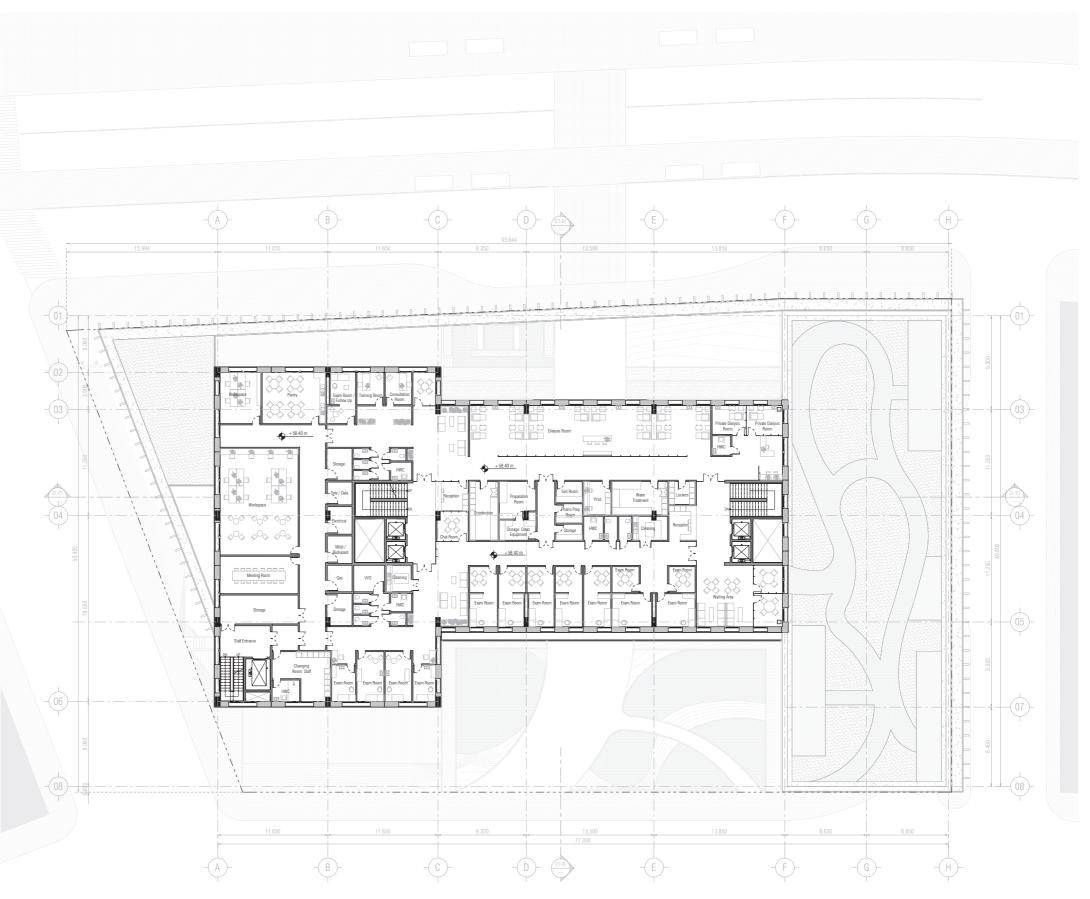


SCHEMATIC FLOORPLAN

NO SCALE







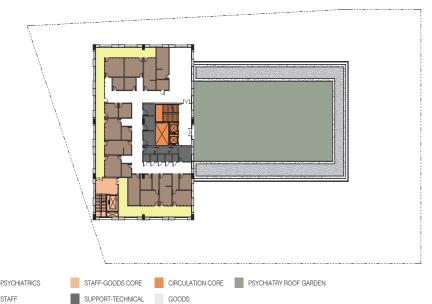
LEVEL N12 - N13

PSYCHIATRY FLOOR

The Psychiatry Department is divided into two levels. Level N12 houses the basic Patient - Doctor encounters through several types of Examination Rooms supported by an escape corridor on the back leading to staff's communication core; and Chatting Spaces.

Level 13 provides each doctor with a private office to work on their daily journals or other errands related with the department. This department features a dedicated outdoor garden with access on the patient's level.

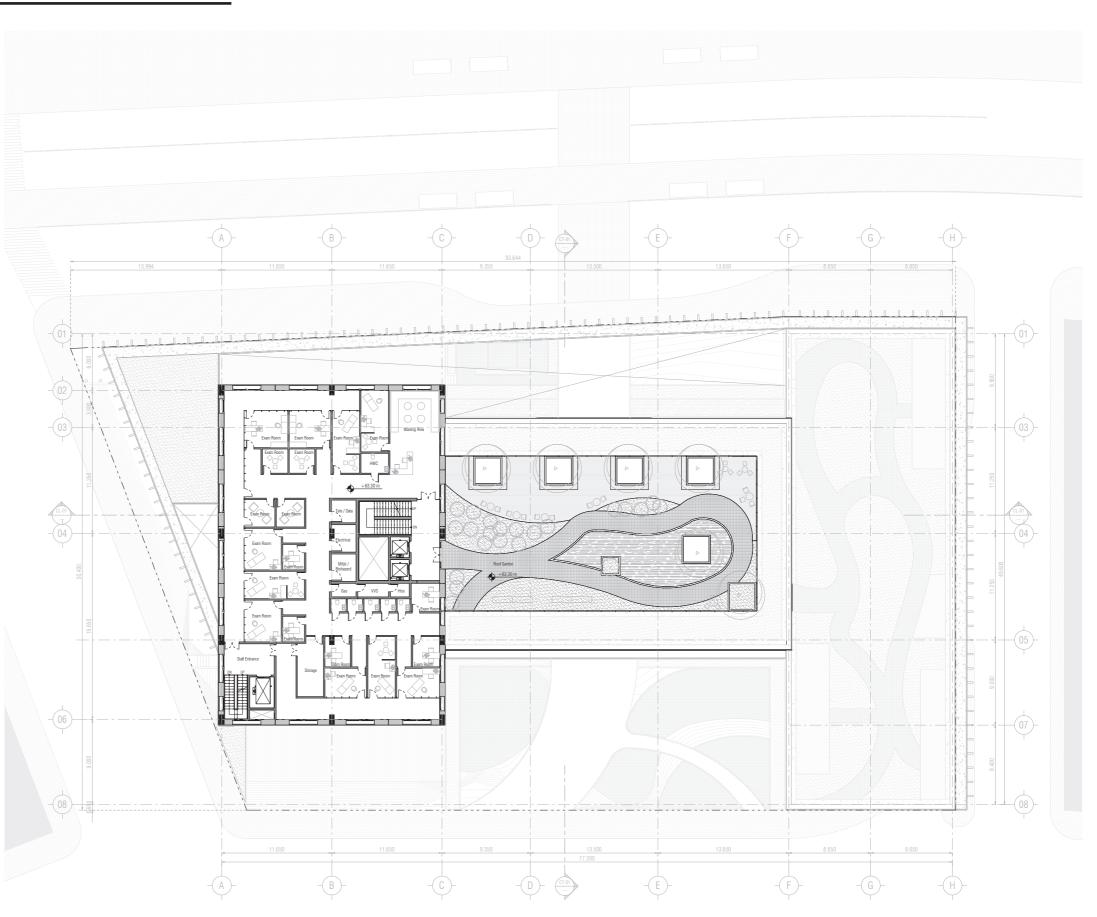
The garden is fenced by 4.50 m height mesh panel system which allows visual connection to the surroundings but also complies with the safety regulations regarding this department.



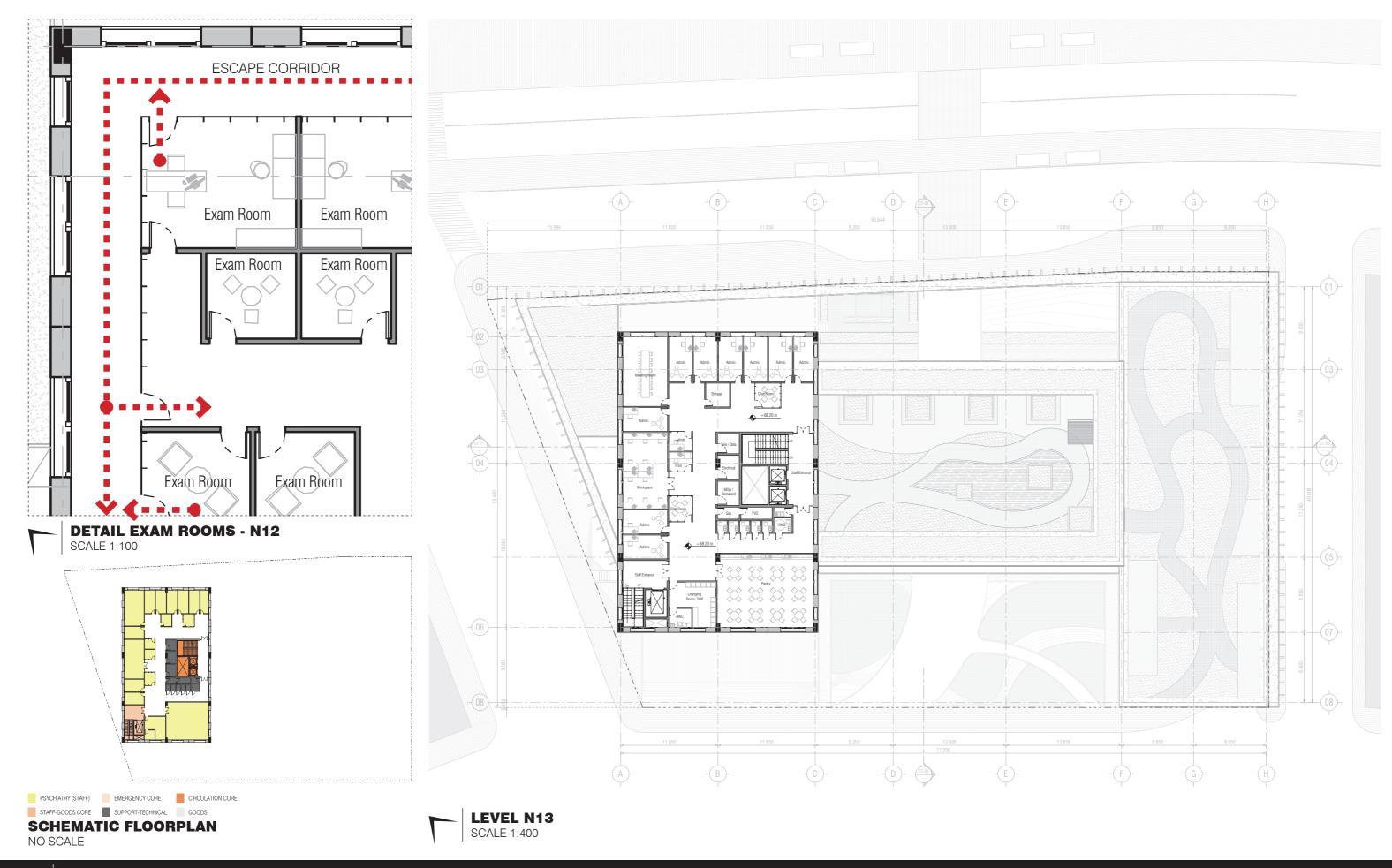
SCHEMATIC FLOORPLAN N12 NO SCALE



PSYCHIATRY ROOF GARDEN







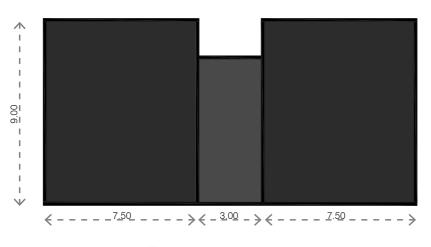
STRUCTURE

GENERALITY

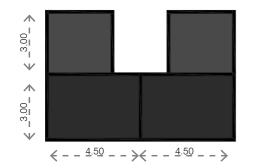
We started with a basic 1.50~X~1.50~M square to set the main drafting lines. This measurement enables various possibilities of room combinations, which fulfils the needs of the hospital in terms of functionality and generality. The grid system of the hospital was then developed based on this.

Below are examples of how we can achieve an assortment of room compositions serving different departments thanks to the 1.50 meter measurement.

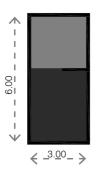
The floor plan is also capable of handling extreme future changes to its room layout. The middle volume has less general quality due to constraints from the dark core in the middle, whereas the other two volumes can be re-configured up to 100%



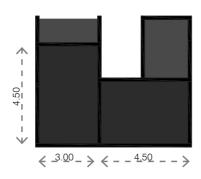
Two operation theaters and preparation room



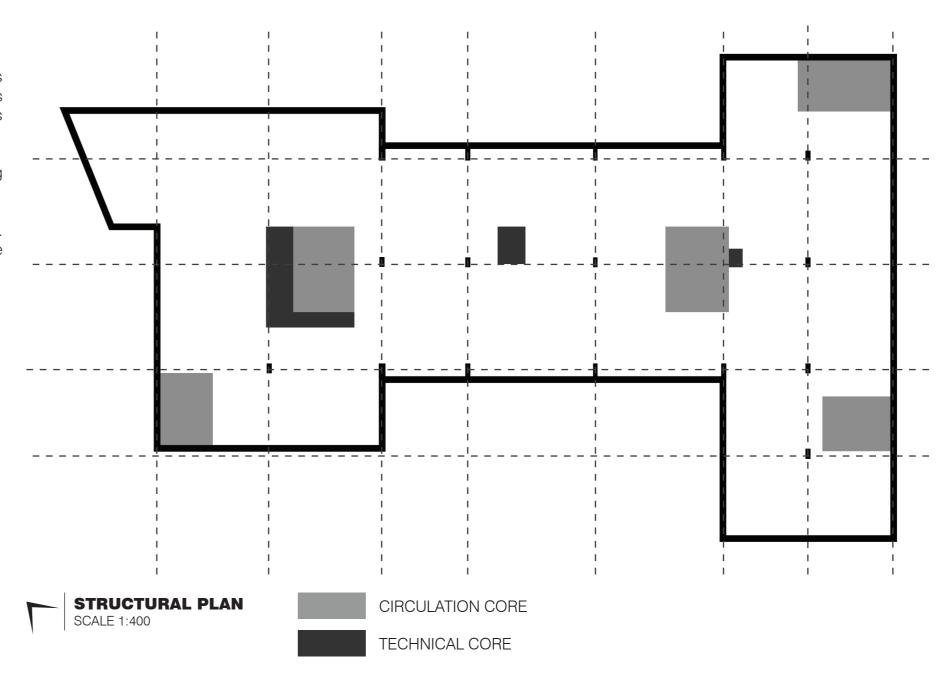
Sampling / Exam rooms with smaller units



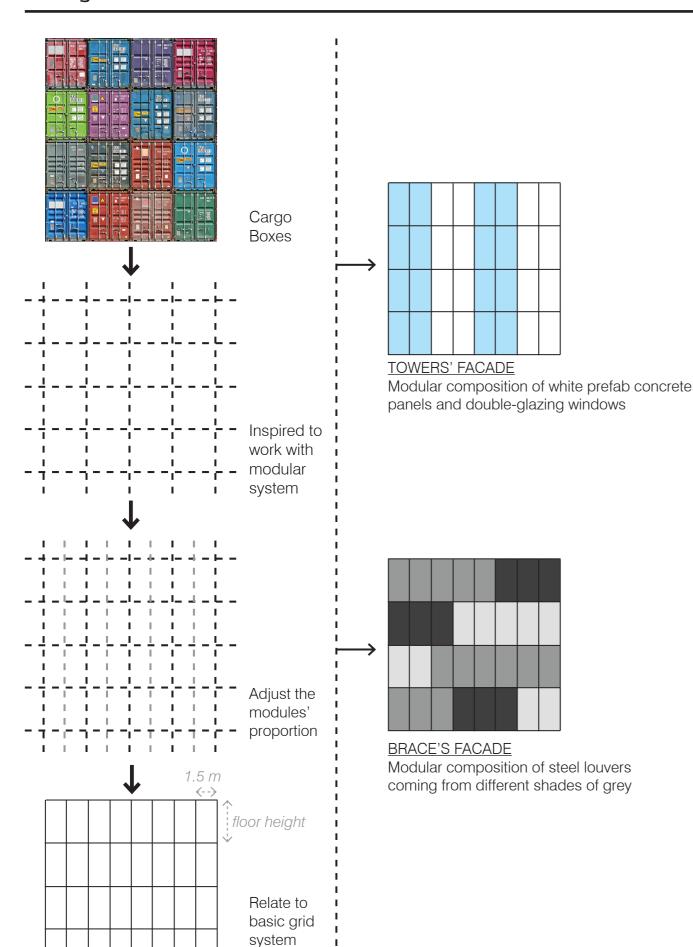
Exam room with meeting area



Two examination rooms, chat room and workstation



FAÇADES: DESIGN GUIDELINES





VIEW COMING FROM NORDSTAN TO THE FRIHAMNEN DISTRICT

INSPIRATION

The façade idea was inspired by the image of ship cargo boxes stacked on top of the others, from which we translated to a modular system of 1.50 meters wide panels sitting side by side horizontally and vertically. The 1.50 m measurement came from the attempt to strengthen the generality quality as explained on previous pages. There is a variety of panel types including solid for wall, transparent for windows.

The brace was added to the 3-volume composition as a 4th element to bring down the size to a more human scale. It features a louvered skin with 1.50 meters between each vertical element, in consonance with the existing modules for the main façade. We emphasized the cargo box inspiration on this element the most as it reflects in the way multiple shades of grey were introduced on the louvers to create different rhythms.

The material selected for the solid panel is white pre-fabricated concrete panels and powder-coated steel plates louvers.

1.5m wide

FAÇADES



NORTH FAÇADE SCALE 1:800



WEST FAÇADE SCALE 1:800



SOUTH FAÇADE SCALE 1:800



EAST FAÇADE SCALE 1:800



VIEW FROM THE COURTYARD

MODULARITY

The placement of the modular windows follows one of the design guidelines which is stressing the verticality of the architecture.

The façade of the three towers is also kept to the most minimalistic level in order to emphasize the height transition of the towers.

SECTIONS



SECTION CL-01

SCALE 1:800



SECTION CT-01

SCALE 1:800

CONNECTIVITY

The long section indicates that two main vertical communication cores connect the three volumes effectively. They fulfill their purpose of reducing the travel distance and establishing a clear way-finding structure in the building. The short section illustrates how the building works with landscapes and the square. The green area in front of the building acts as a buffer zone between the square and Ground Floor, underneath an outdoor atrium created by the brace. The courtyard behind the tower is more hidden, but since the lobby is all glazed, it is possible to get a glimpse of this calm green area from the main entrance

SCALE

In order to enable a wide range of possibilites in terms of future technology and expansion, we decided that the distance from slab to slab on each level should be 4.90 meters, except for ground floor, where the measurement is 5.50 meters. On the main lobby, the total height is 10.40 meters.



VIEW FROM THE ATRIUM



URBAN SECTION



FRIHAMNEN SJUKHUSET
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