THE BREATHING BUILDING

The brand new residential area of Frihamnen is developed as an expansion of the city across the river. It links with Kvillebäcken, Lindholmen and Backaplan creating a united seafront with stronger connection to the city. Frihamnen has been developed to become "*open to the world with a strong focus on the public rooms in the water, on the water and between the houses*". The innovative Frihamnen is the area where the hospital of the future will be built. A hospital being a vital part of the city**.**

FRANSSON - HAKKY - KULLBERG

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VISIONS

FRIHAMNEN- AN AREA FOR INNOVATION

With a strong focus on the visionary statements for developing Frihamnen, the project has taken into account several of the themes stated. The hospital has been developed in order to create meeting places, providing them inside as well as in the surroundings of the building. The hospital itself, as its location, is a place for innovation and growth. In order to assure the future of the hospital and its place in the city, the organic shape does not only provide a fascinating design feature, but it also allows and symbolizes for flexibility and adaptation in the future area of Frihamnen.

THE HOSPITAL – A VITAL PART OF THE CITY LIFE

Historically, the hospital has always been an important institution for a city. The placement of the hospital in relation to the city has however changed over the years and is now moving in to the dense urban fabric of cities. The site at Frihamnen is a dense urban setting, which opens up the possibility of reaching a large and various community, further allowing healthcare to become more integrated into the society. The project aims create an innovative hospital of the future while also expanding its services and interrelations with its immediate surroundings and the fabric of the city. The project has explored the great potential of integrating social services and sustainability strategies with the hospital for a healthier and happier community.

THE DESIGN- WITHIN THE FABRIC

The design of the building has aimed for including mixed uses, both public functions in combination with strict clinical purposes. This is in order to create a building where the hospital becomes a place for anyone anytime. This allows the hospital to efficiently integrate into the lives of unhealthy as well as healthy people. Hospitals are furthermore moving into dense urban fabrics, finding the balance between blending with their surrounding yet being easily located and distinguished is a fun design challenge this project explored.

HIGH RISE TYPOLOGY- VERTICAL THINKING EXPLORED

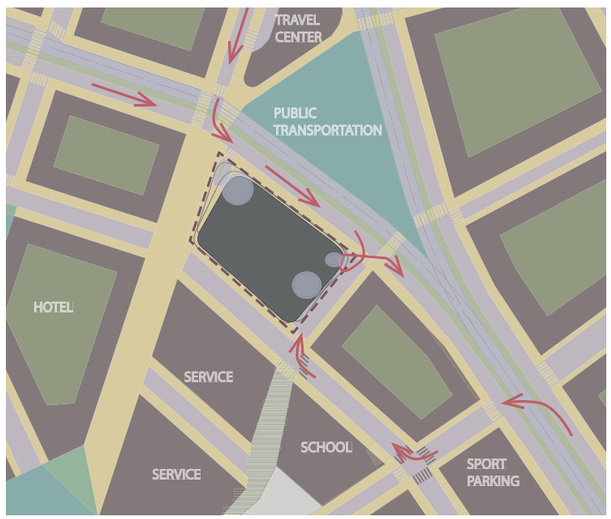
A vertically distributed hospital provides many advantages that have been explored in this project. The high rise hospital offers an opportunity for more well-organized, space efficient and symbiotic placement of clinical, educational and research elements of healthcare function. It allows for more efficient work flows, shorter distances and easier way finding. Designing in a sustainable way with the surrounding in mind provides a distance from noise and vibration and efficient and innovative solutions for balancing aesthetics with good insulation. By occasionally connecting the two towers to departments that need large floor space or strong connections, a horizontal flow is also created within this vertical growing hospital.

SUSTAINABILITY- SOCIALLY AND ENVIRONMENTALLY

Together with different green and sustainable strategies, the aim has been to allow the hospital to become a pioneer within the field of sustainability. This does not only include the actual energy and waste consumption, but also discovering what a social and healthy environment is for human beings in the hospital's exterior and interior. By working with different natural resources such as wind, sun and vegetation the building embraces the natural elements creating a sustainable hospital for the future.

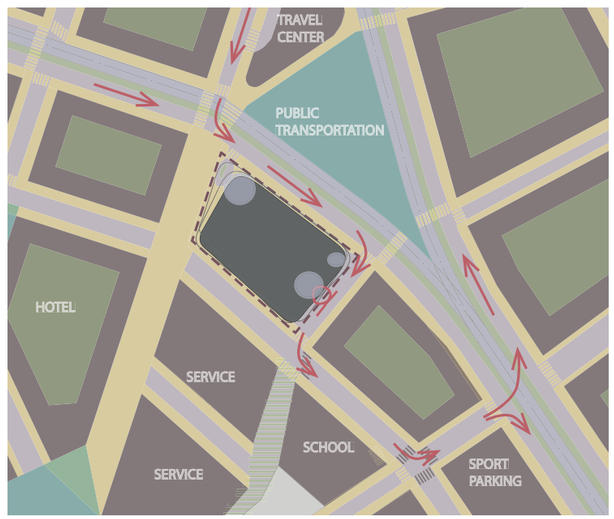
BACKGROUND & SITE ANALYSIS

Ambulance



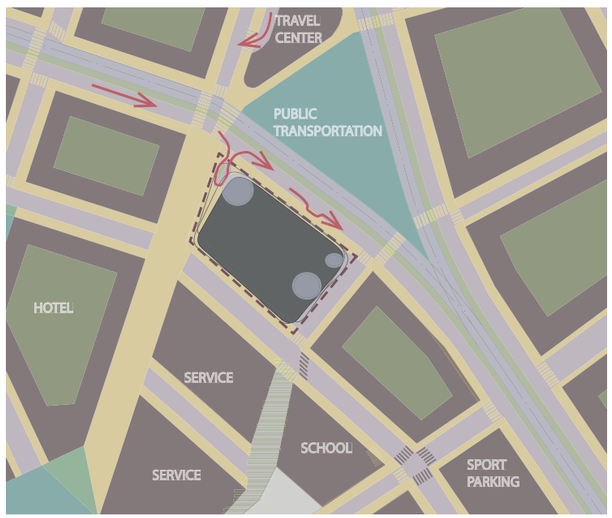
The ambulance entrance is located on the building's south facade, close to the main road, with the fastest and most efficient entrance.

Goods



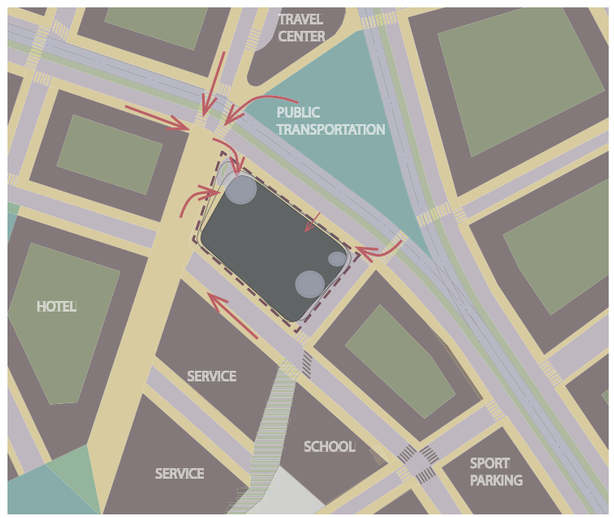
Goods will be loaded next to the ambulance entrance at the building's southern facade in order to disturb the public as little as possible.

Taxi and drop-off



Taxi parking is located at the travelers center across the street with close access to the drop-off zone in front of the main entrance.

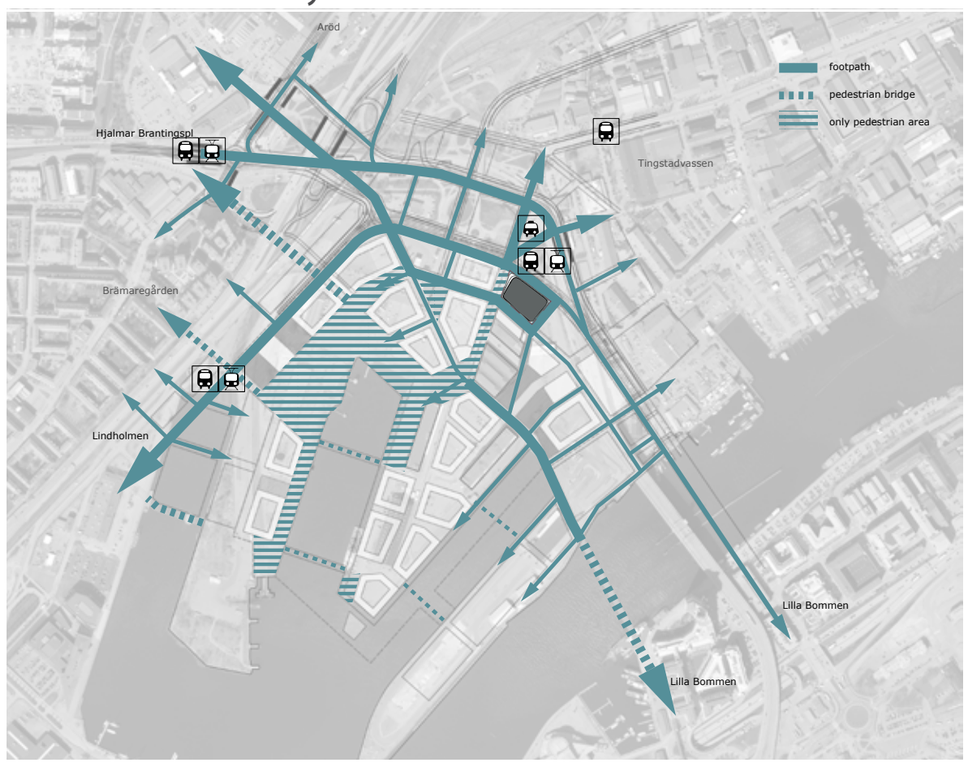
Pedestrian and bicycle



The main flow of pedestrians and cyclists will arrive via bicycle lanes, public transportation or the pedestrian street from the south.

N

Pedestrian and bicycle



Motor vehicle

ARCHITECTURAL CONCEPTS

DESIGN GOALS

Relate to surrounding

Flexible

Open to surrounding

Contemporary & Innovative

Organic

Renewable

Landmark

Defined

Enclosed within itself

Familiar & Homelike

Structured

Durable

PROCESS

Organic

Structured

Balancing | Combining

Constant

Morphing

why two buildings?

why organic shapes?

less massive for its surroundings

softer impact on its surroundings

curves represent the meeting of institution and patient-centered care

more light to areas behind the building

more light into the building

curved interiors are more exciting and inviting

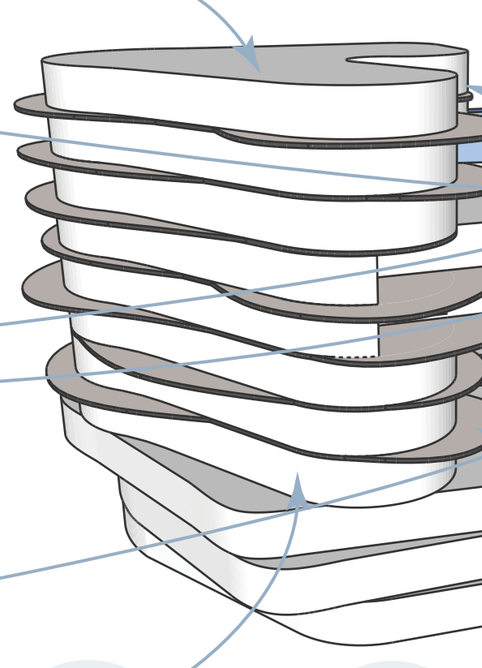
wind tunnel

represent human aspects in healthcare rather than a standard system

more facade space

more terras space

inviting not intimidating



SUSTAINABILITY ASPECTS

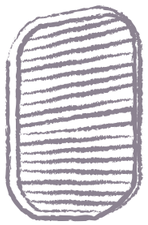
WIND

Utilize the windy location to generate electricity for the hospital as well as surrounding buildings

BENEFITS

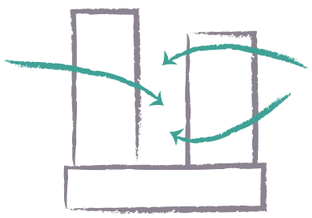
Generate green energy for the building and surroundings

EXAMPLE

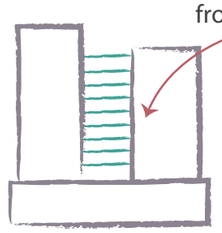


DELFT prototype on wind energy

DESIGN IDEA



building creates a wind tunnel



use DELFT technology

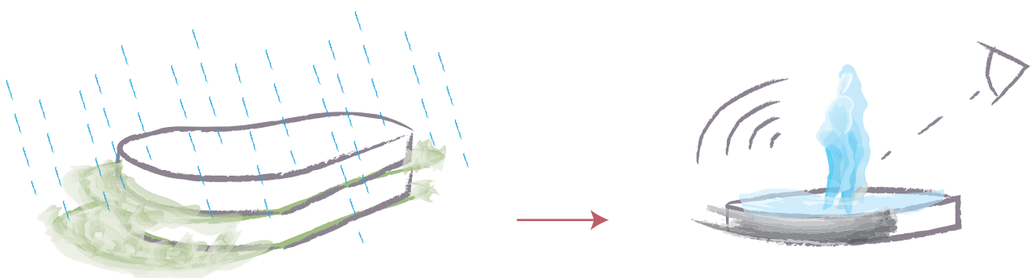
WATER

Rainwater will be collected from the terrases and used for different decorative fountains in the building and for gray water

BENEFITS

SOUND: the sound of water is soothing and comforting, it also helps with the building's aucustics by reducing unwanted noise

VISUAL: running water provides a naturally beautiful element to watch



collect rainwater from terrases

Fountains: visual & aucustic pleasure

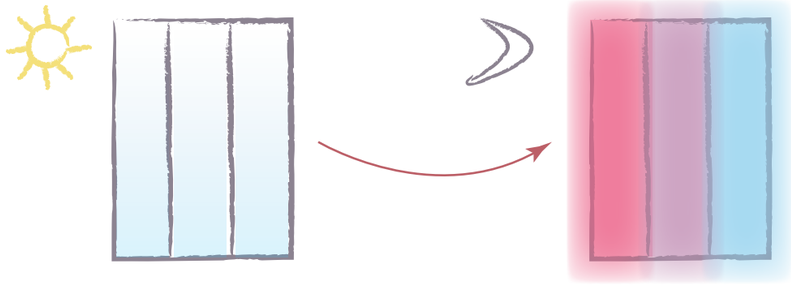
SUN

Solar power will be used for the LED lights in the facade to light up the building at night and on cloudy days

BENEFITS

VISUAL: since Gothenburg is a cloudy city, a light and color are always welcomed

LANDMARK: it will give the building a stronger sense of individuality



GREENERY

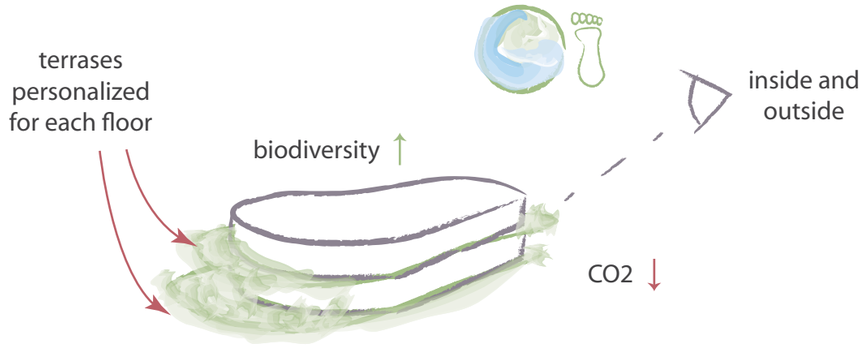
Grow vegetation on the building's terrases to create an urban garden

BENEFITS

ENVIRONMENTAL: Lessen footprint, support biodiversity, reduce CO2

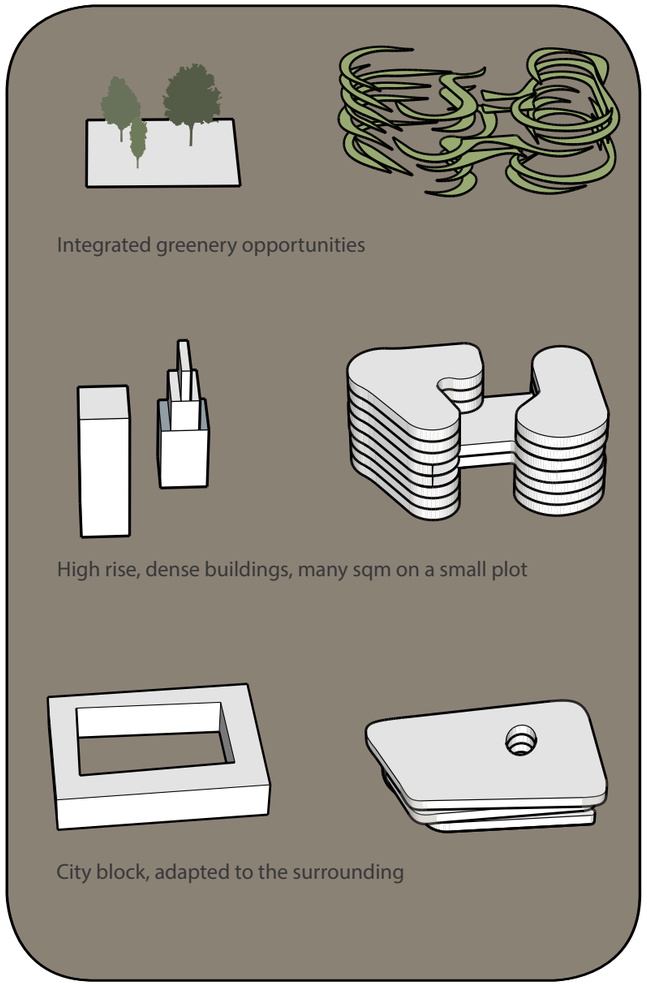
VISUAL: a naturally beautiful atmosphere to look at and be within

THERAPEUTIC: horticulture and urban farming are great methods for therapy

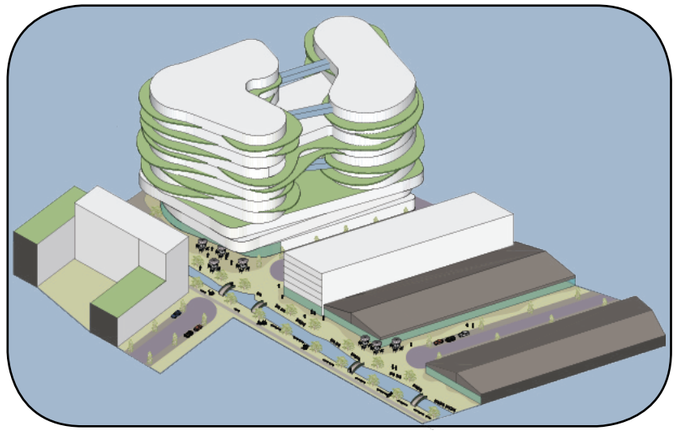


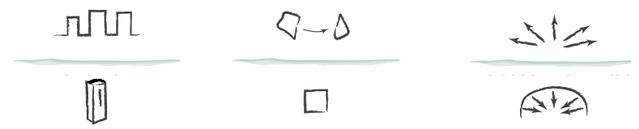
CONTEXT

The height is proportionate in relation to surrounding buildings, but distinct enough to make the building a landmark. On bottom floors, the building aspires through careful design to enhance the liveliness of surrounding streets.



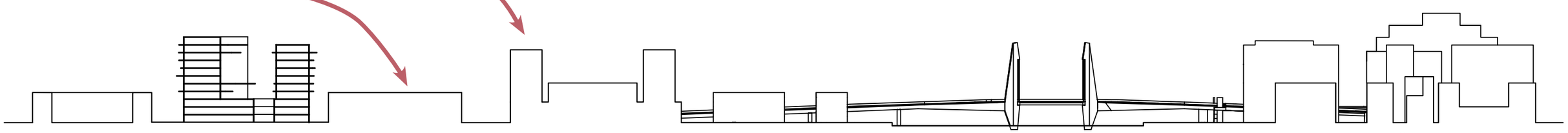
Open stormwater management. Green corridor connecting public transportation hub and the hospital with the central park.





A extended second floor creates an outdoor weather protection that attracts people and is a welcoming architectural gesture.

The two towers will always allow the sun to pass through the building and reach the northern square.



"FRIHAMNEN SHALL BE OPEN TO THE WORLD WITH A STRONG FOCUS ON THE PUBLIC ROOMS IN THE WATER, ON THE WATER AND BETWEEN THE HOUSES."

Scale 1:2500

PROGRAM

Hospitals are moving further and further into the city and its urban fabric thus creating benefits and challenges for the future. By aiming for the hospital to blend well with its surrounding and to provide both medical and social services, a vertical approach seemed like the best approach. By devoting the bottom two floors for social services to strengthen the community and bring people into the medical building, healthy lifestyles can be promoted and the property's usage can be expanded to many benefits.

The hospital was split into two buildings allowing maximum facade space therefore maximum daylight into the building. By splitting the building, different departments were placed and grouped based on the relations between them and each department's needs. This allowed the spatial division to be suited perfectly to departments, rather than the other way around. Furthermore, splitting the plot into two buildings and raising the volume vertically creates more efficient work flows for and between staff, more efficient patient flows and easy way-finding, shorter distances and easiness in moving goods and equipment throughout the hospital.

11th Floor
- Conference | Events Hall | Cafe
- Urban Farming | Network groups

10th Floor
- BUP
- Phsychiatric Care

9th Floor
- BUM
- Dermatology
- Spirit Room | Recreational Space

8th Floor
- Technical Floor

7th Floor
- Surgery

6th Floor
- Internal Medicine
- Pain Center

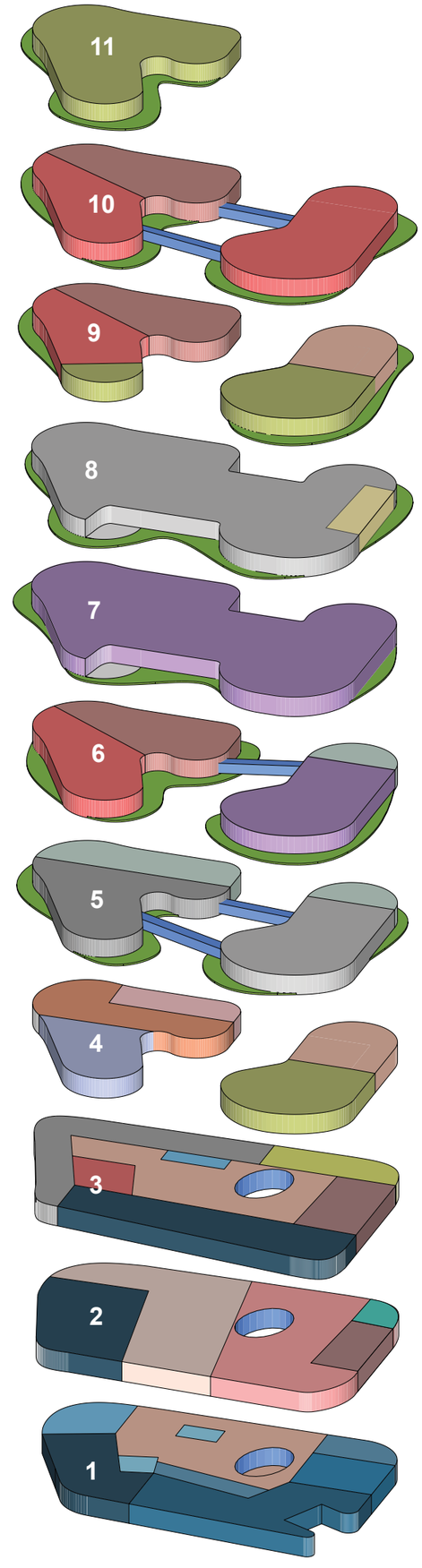
5th Floor
- Admin
- Orthopedia

4th Floor
- Gynecology & Urology
- ENT
- Children's Medicine

3rd Floor
- Primary Care
- Sampling
- Children Habilitation
- Habilitation
- Reception
- Waiting
- Rehab Changing
- Staff Changing

2nd Floor
- Gym
- Facility service
- Staff changing
- Spa
- Cinema

1st Floor
- Entrance
- Waiting area
- Ambulance
- Goods
- Gym
- Cafes
- Retail



10th Floor
- Dialysis

9th Floor
- Research
- Staff lunch

8th Floor
- Technical Floor
- Bed Cleaning

7th Floor
- Surgery

6th Floor
- Admin
- Pre & Post Operation

5th Floor
- Admin
- Imaging

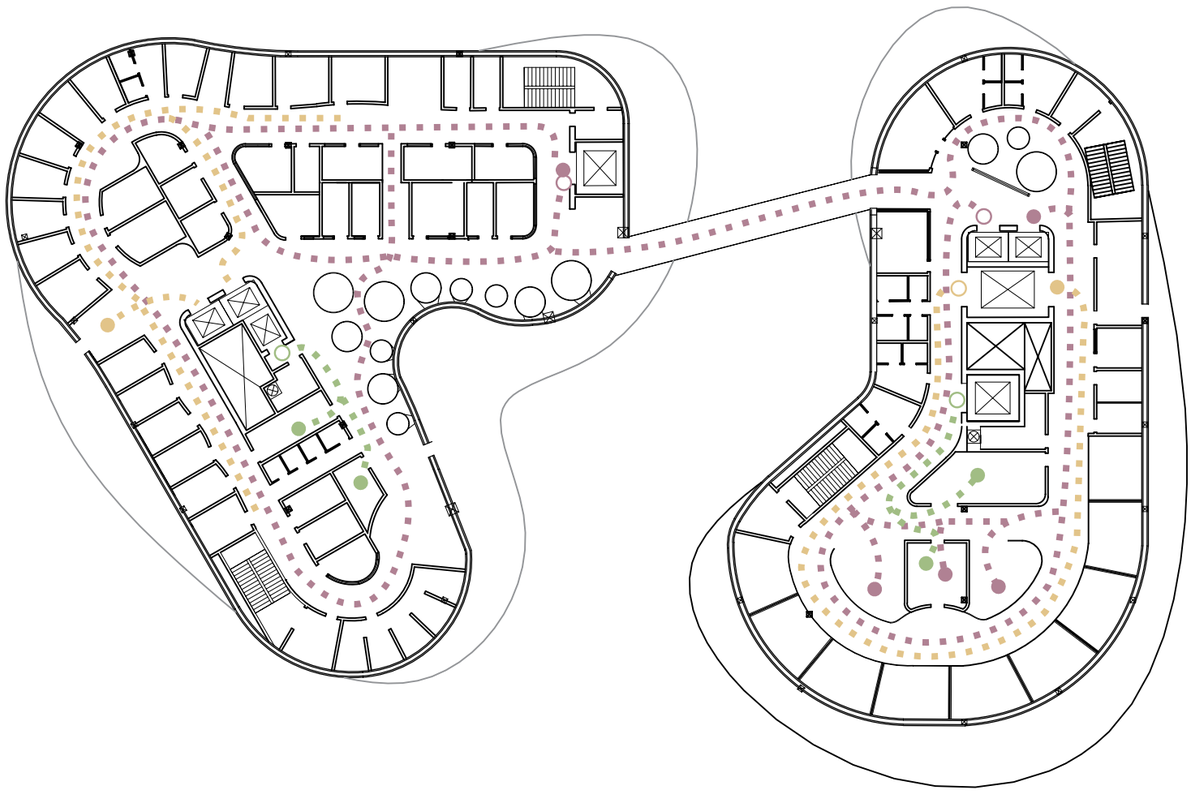
4th Floor
- Waiting
- Terras | Restaurant

FLOWS AND MOVEMENT

The elevators are separated between the staff and the patient. The patient elevators are placed in an easy accessible and visible location while the staff elevators are more hidden. The division is made to separate the people that are new and unfamiliar with the building from the regular users. This means that patients that visit the hospital at a daily basis are able to get access to the more hidden elevator to ease their process.

Goods will be distributed on the entrance floor, then transported in the applicable elevator to the relevant floor. The building has a vacuum system for the waste with one central refuse chute in each tower of the building. The litter will then be transferred and divided at the collection station on entrance floor.

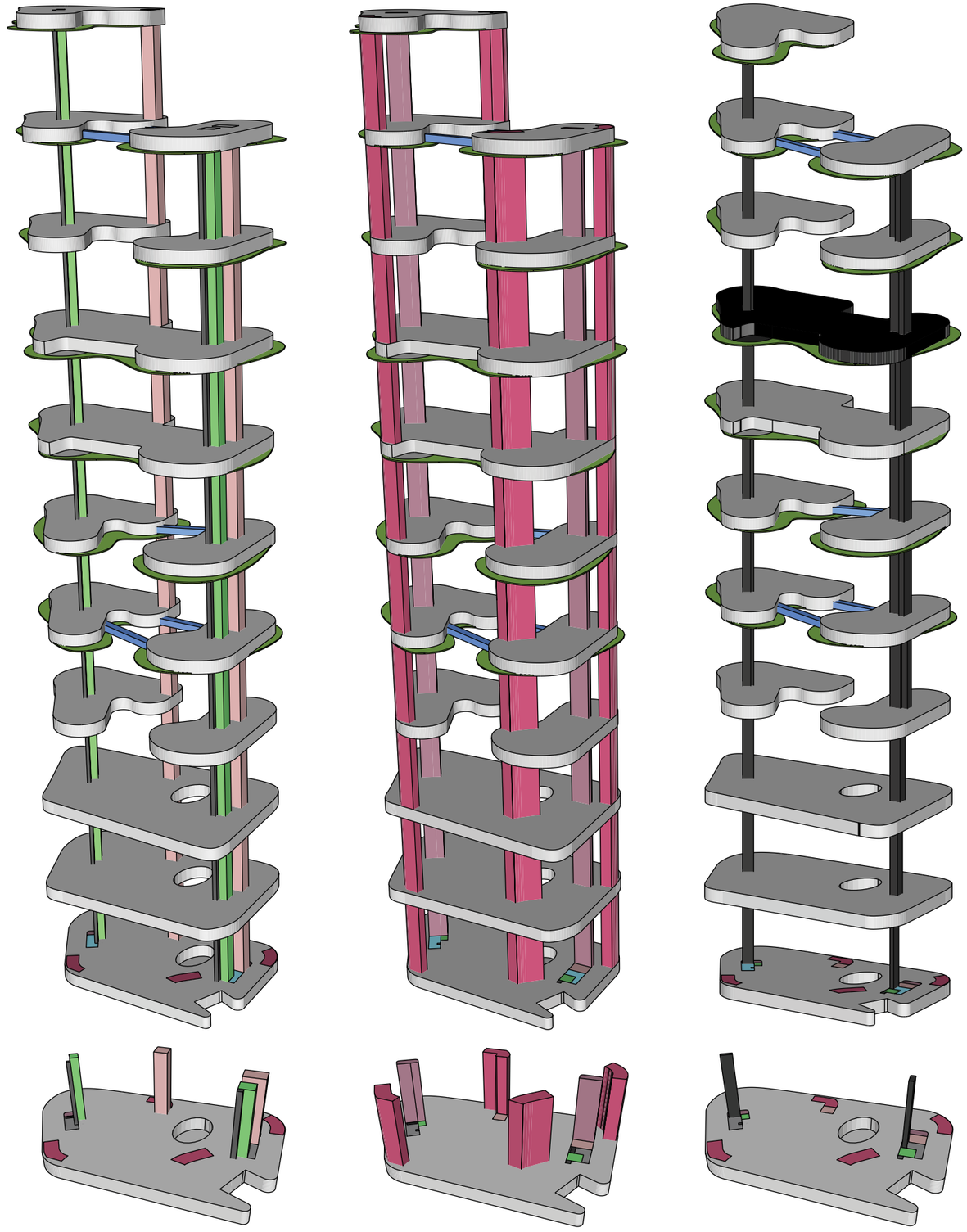
Horizontal Flows and Vertical Flows



Patients

Staff

Goods



STAFF (EAST TOWER STAFF & AMBULANCE)

GOODS

RECYCLING

PATIENTS

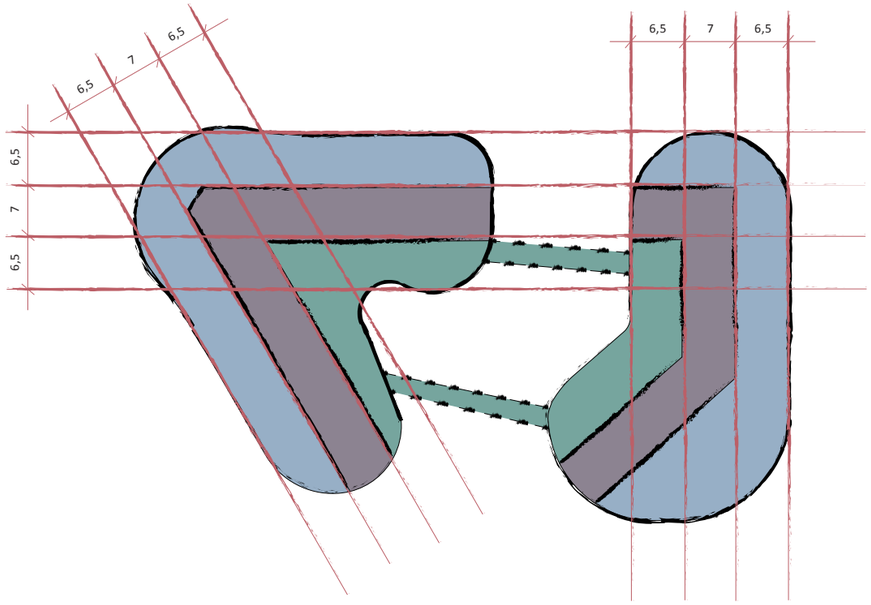
ESCAPE STAIRCASE

SHAFTS

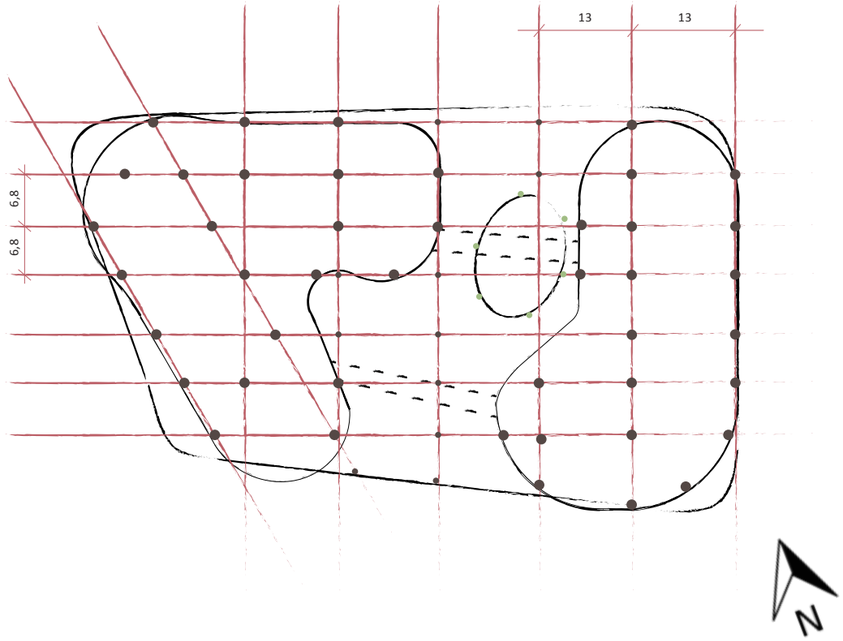
TECHNICAL FLOOR

STRUCTURE

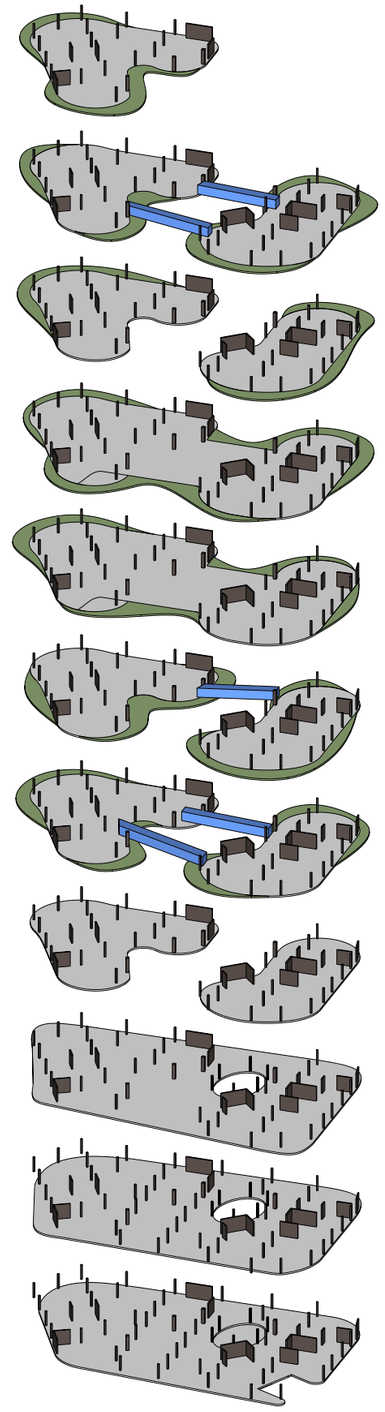
Programmatic structure



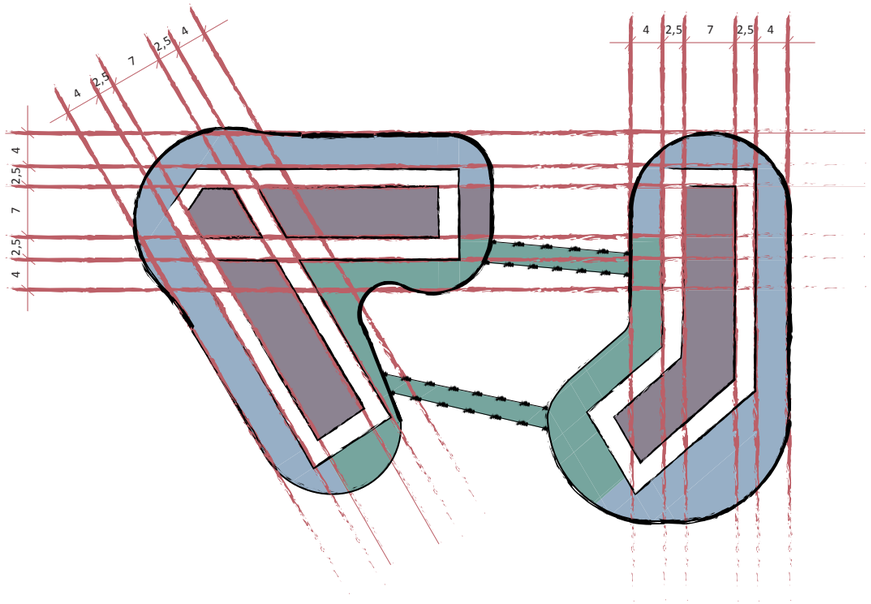
Pillar system



Construction



Programmatic structure with corridors



Staff

The core between the towers are being used for staff oriented functions. In order to facilitate the horizontal movement between the departments, sky walks have been added where necessary. The visual connection between members of staff is a vital tool in order to raise working morale, enhance group work, and create a sense of belonging and wellbeing.

Supporting spaces

Supporting spaces such as storage and toilettes have been placed in the dark core of the two towers. Some of them also contain administration workplaces, these are however are completely glazed towards the facade and staff areas, still allowing daylight to enter.

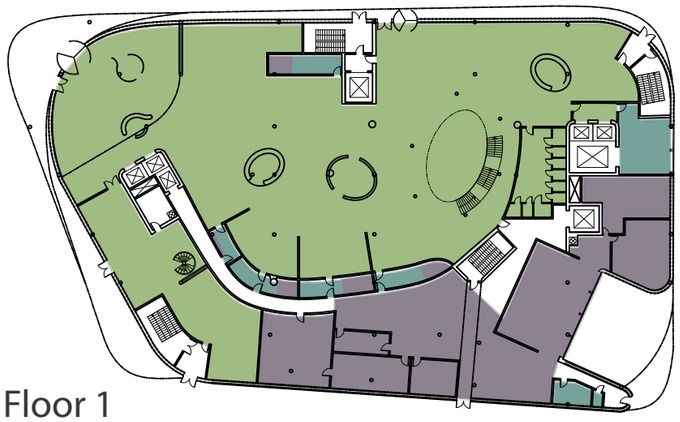
Patient

Patients have been placed along the facade, taking into consideration their privacy so as there will not be people from nearby buildings observing them. The examination rooms and waiting areas have been placed in connection to the terraces, allowing for further intimacy and strong visual and sometimes spatial connections to greenery.

OVERVIEW

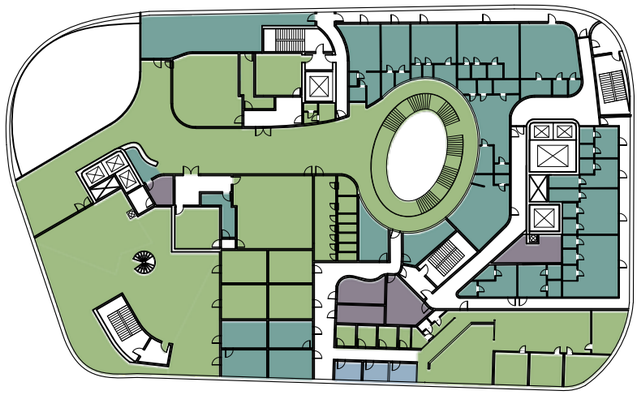
The first three floors create the foundation on which the two hospital towers land. The floors relate to each other in shape and focus on contributing to the neighborhood. The open space is optimized by placing various functions that attract people into the building such as cafes, shops, news stands, and E-information promoting healthy lifestyles and sustainable living to contribute to the activity in the area. The second floor focuses on contributing to knowledge and culture via film or presentations in the cinema theaters.

The grand stairs in the core of the building connect the different floors with each other both physically and visually. The stairs connect to the roof of this public foundation and provides a roof terrace that can be visited while waiting for the hospital visit or just for itself. The three first floors also act as an activity based waiting room for the hospital. Through screens or smart phones, patients will know exactly when to ascend to the hospital floors and waiting will no longer be a waste of time.



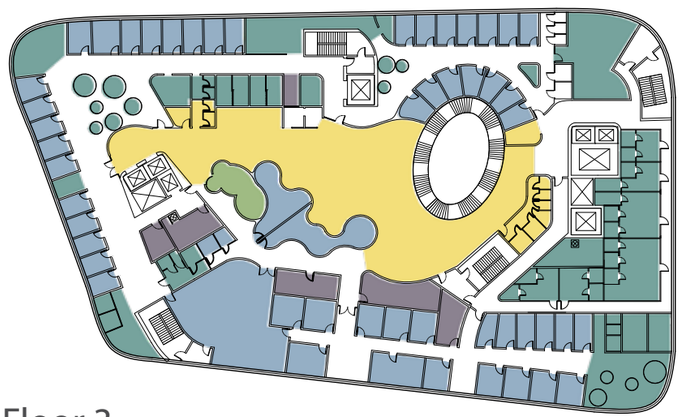
Floor 1

Main Entrance - Café - Retail - Gym - Goods - Ambulance - Waiting Area



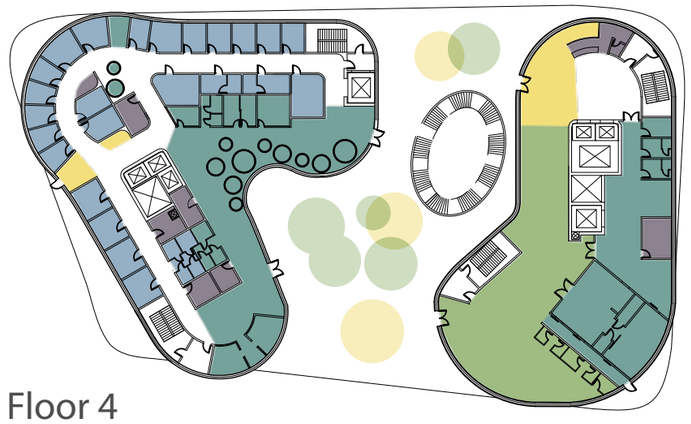
Floor 2

Cinema - Spa - Gym - Facility Service - Staff Changing



Floor 3

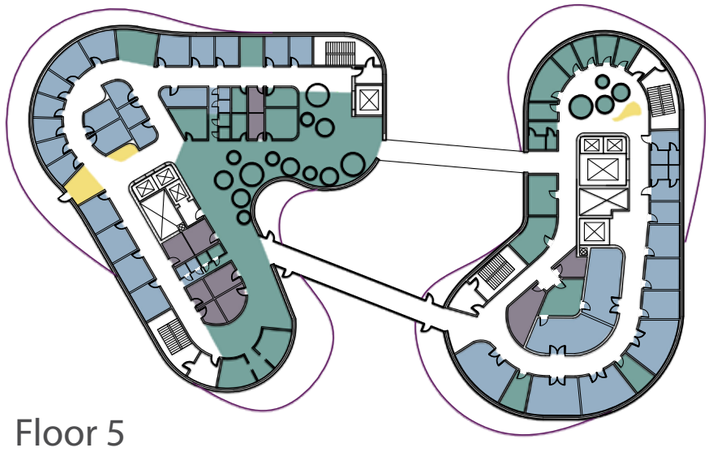
Primary Care - Waiting Area - Sampling - Habilitation - Rehabilitation - Staff Changing



Floor 4

Gynecology & Urology - ENT - Childrens Medicine

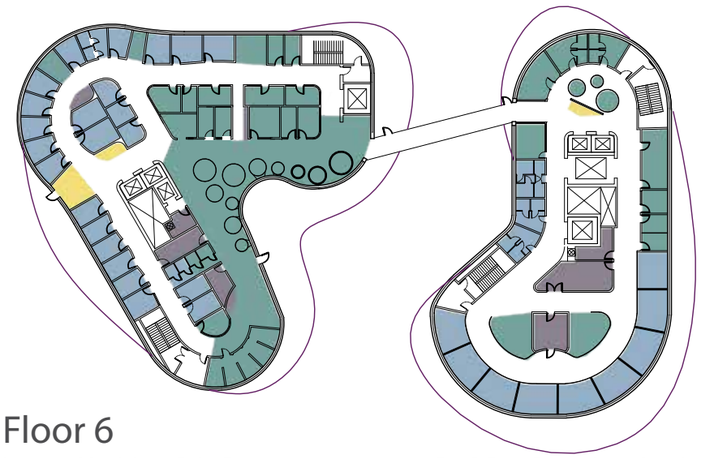
Terras - Restaurant



Floor 5

Orthopedia - Admin

Imaging - Admin



Floor 6

Internal Medicine - Pain Center

Pre & Post Operation - Admin

Patient

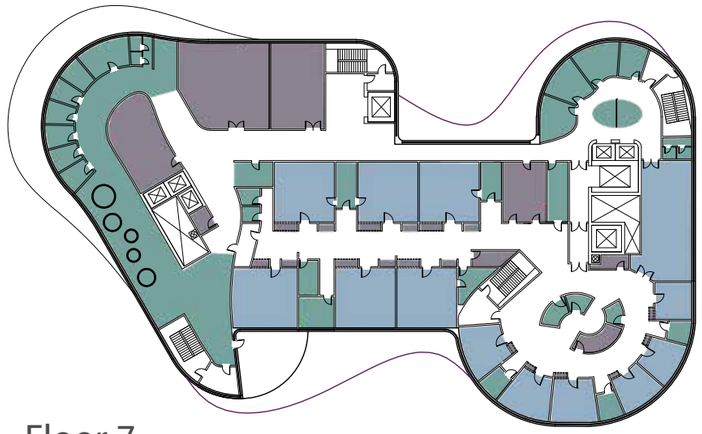
Staff

Waiting

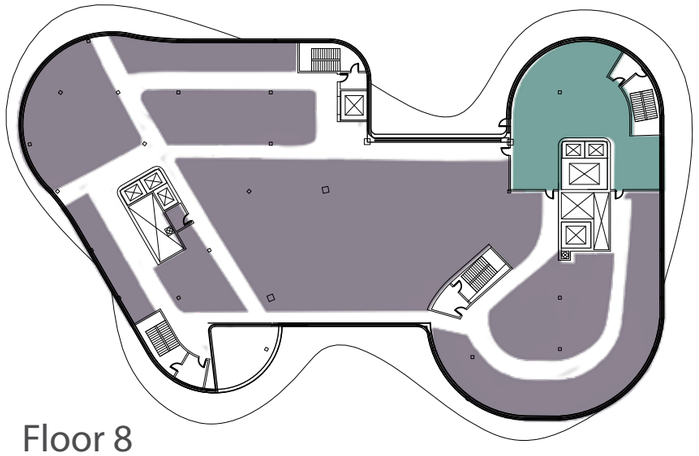
Supportfunctions

Public

OVERVIEW

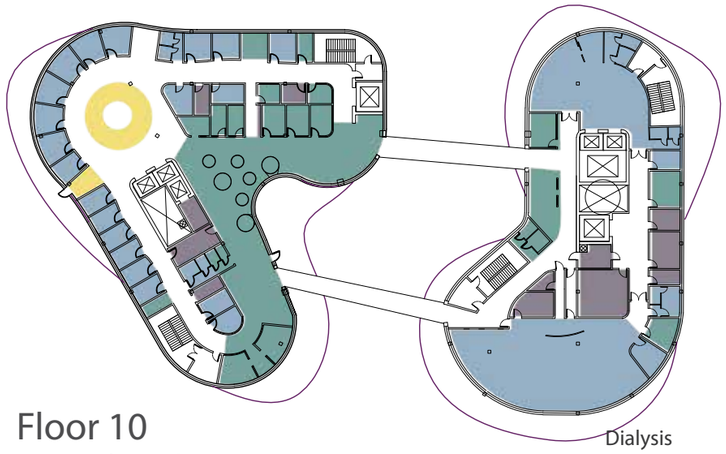


Floor 7
Surgery



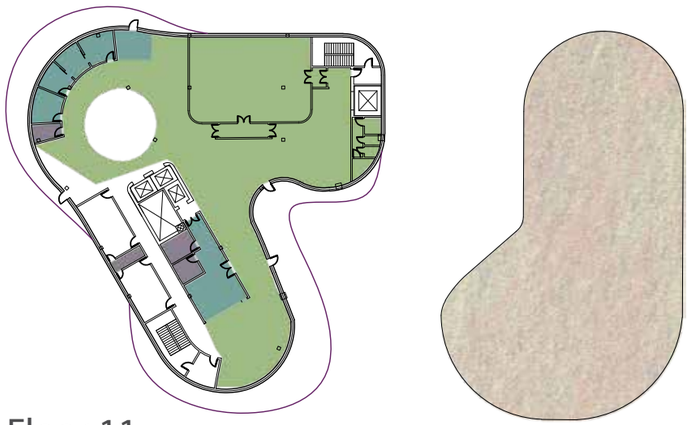
Floor 8
Technical

Bed Cleaning

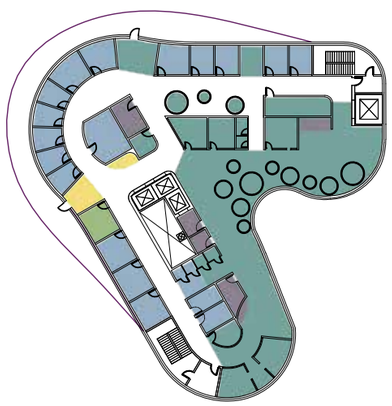


Floor 10
BUP - Psychiatric Care

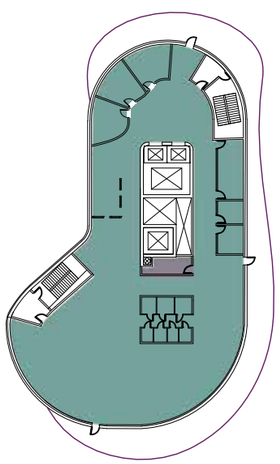
Dialysis



Floor 11
Conference - Event Hall- Network Groups - Urban farming

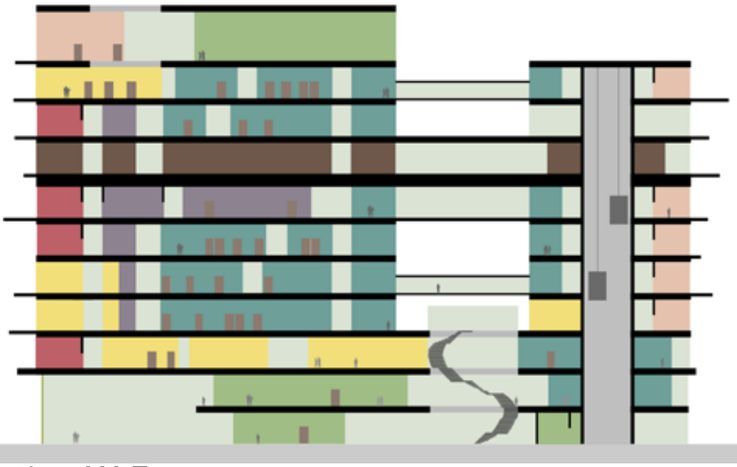


Floor 9
BUM - Dermatology



Research - Staff Break

Examination
Patient
Staff
Waiting
Offices
Supportfunctions
Public



Section W-E

Scale 1:400

All hospital floors follow the same structure with an aim to separate the plans into three different zones, patient, staff and support functions. Each floor is then adapted to fit the needs of the relevant department. The surgery floor is a great example of how flexible it is to work with the general structure of the building, making it possible to truly optimize floor plans for each department.

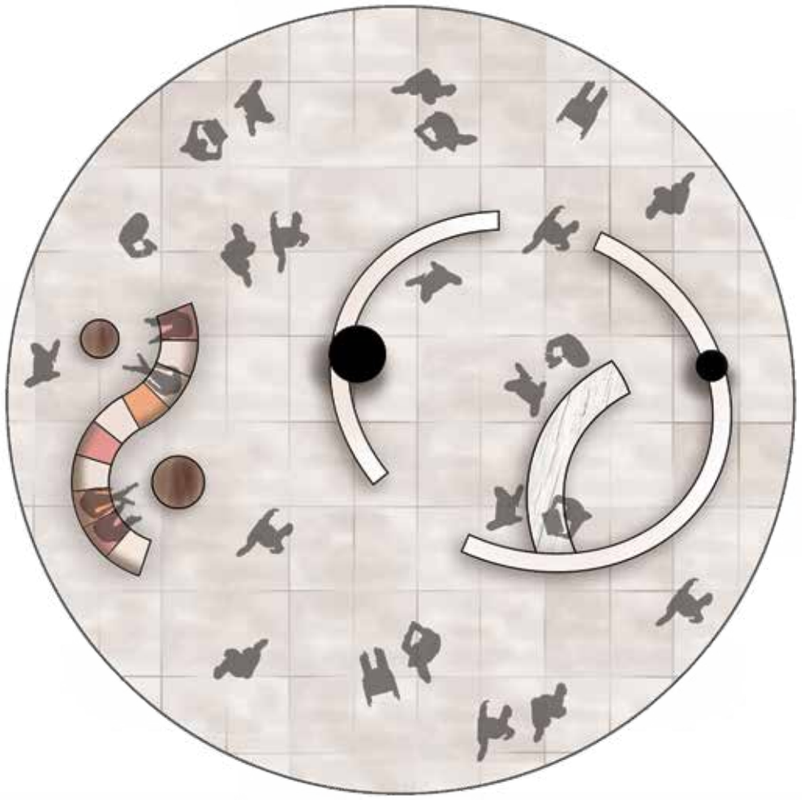
Technical equipment is placed on the 8th floor. All shafts start from that point. The shaft's area gradually decrease the further away from the shaft. The technical floor has been place above the center of the building, giving way for easy future expansion.

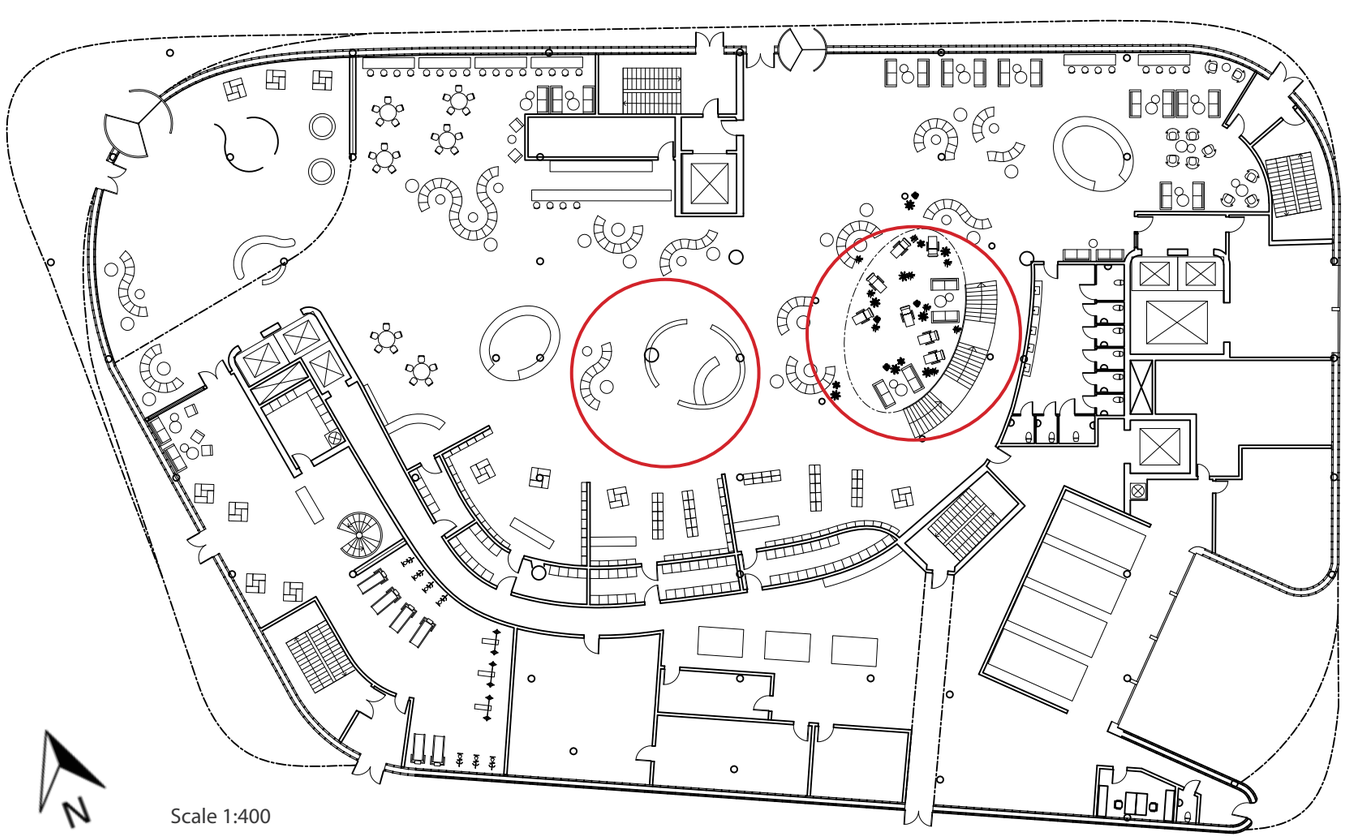
ENTRANCE PLAN

As the first floor and the first interaction with the building, the entrance floor plays a crucial role in welcoming people into the building and making use of its vibrant location. The general division is to have the goods and ambulance on the east and southern sides, to have the gym on the west and southern sides, and to have cafes, boutiques, and seating areas in the middle and northern side of the entrance floor.

For the interiors, the floor in the public area is a glossy peach color which is light but has a subtle color making the large space feel homelike. The functions within the waiting area such as boutiques and seating will be a subtle cream color that matches the floor and walls, but has orange and peach accents. Orange is a color that entices social activity and therefore is welcomed in crowded areas where interactions are encouraged. Peach is a soft mix of orange and pink, an energetic color. In the goods area, a polished concrete material is used for extra durability.

A light shaft takes place in the heart of the building. It contains relaxed seating and greenery which ultimately gives the entrance floor a core that highly resembles that of an interior garden, symbolizing health and wellbeing.





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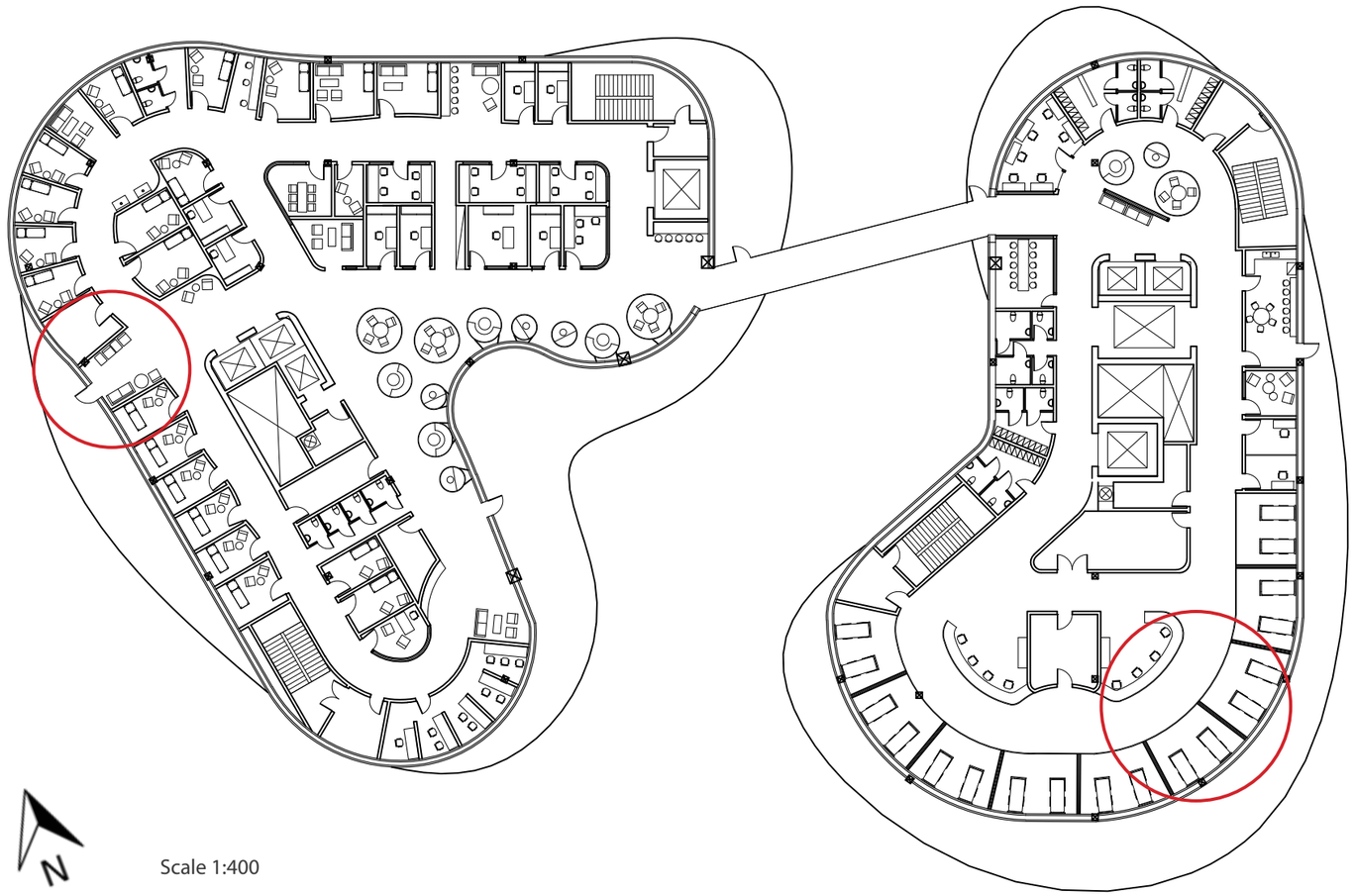
GENERAL PLAN

The floors fit into a module making it easy to divide the hospital's rooms and optimizing the usage of space. By placing examination rooms along the facade, patients enjoy beautiful views from the building. Staff rooms are placed along the inside facades which allows them an interior view to the core building and a visual connection and often a spatial connection through sky walks to the opposite tower. The core of the building contains storage rooms, toilets, and circulation, with a few exceptions, therefore illuminating the chances of staff working in dark areas for a long time. The floors follow organic yet tamed lines and the terraces are more free organic lines enveloping the building and further enhancing its softness. The walls in some interiors are curved and others straight for way finding purposes.

Waiting rooms are ideally placed and often with access to the terraces. The colors in the waiting rooms balance both social and calming colors for the patient to relax before meeting the doctor. Patient rooms are designed with warm floors which contrast calming light furniture, inducing a cozy feeling and homelike atmosphere.

The Pre and Post Surgery floor has a lighter floor, the material balances durability and aesthetics. The beds are of different soothing colors which breaks free from its common tradition of being only white and cold. The chairs of the nurses are a light maroon which is an energetic color suitable for the need for high levels of alertness.



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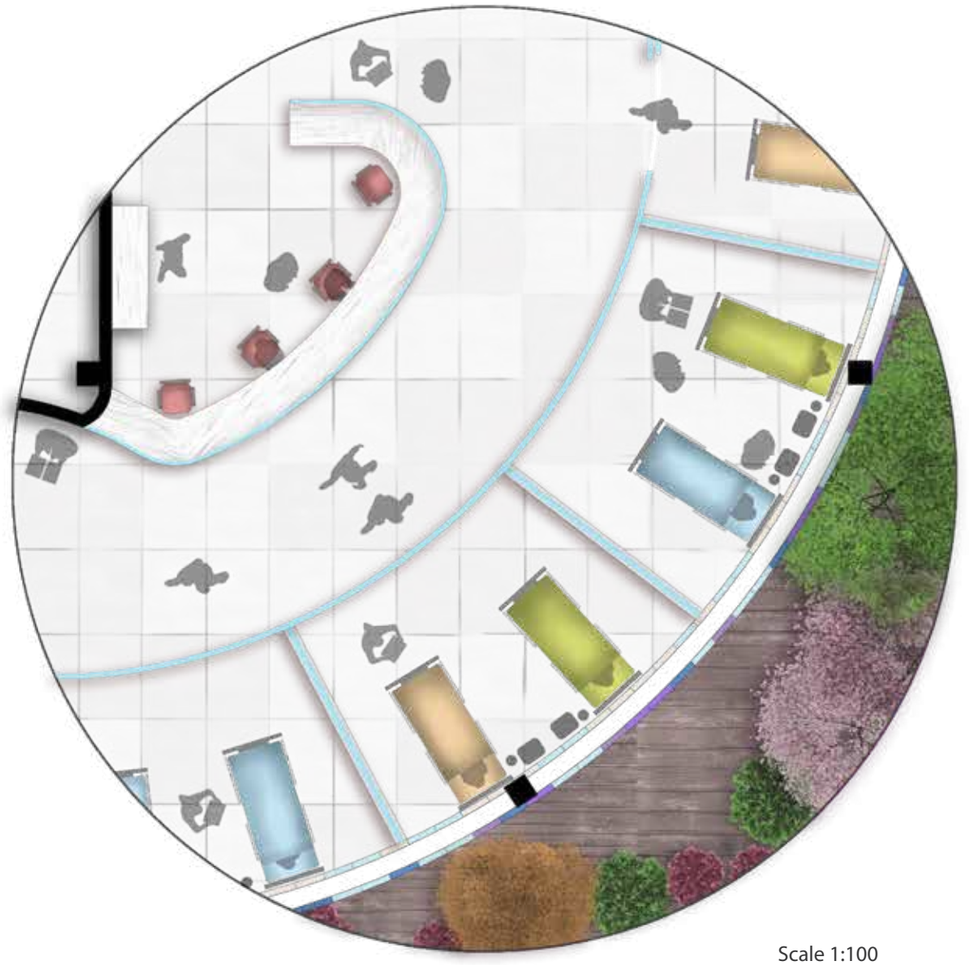

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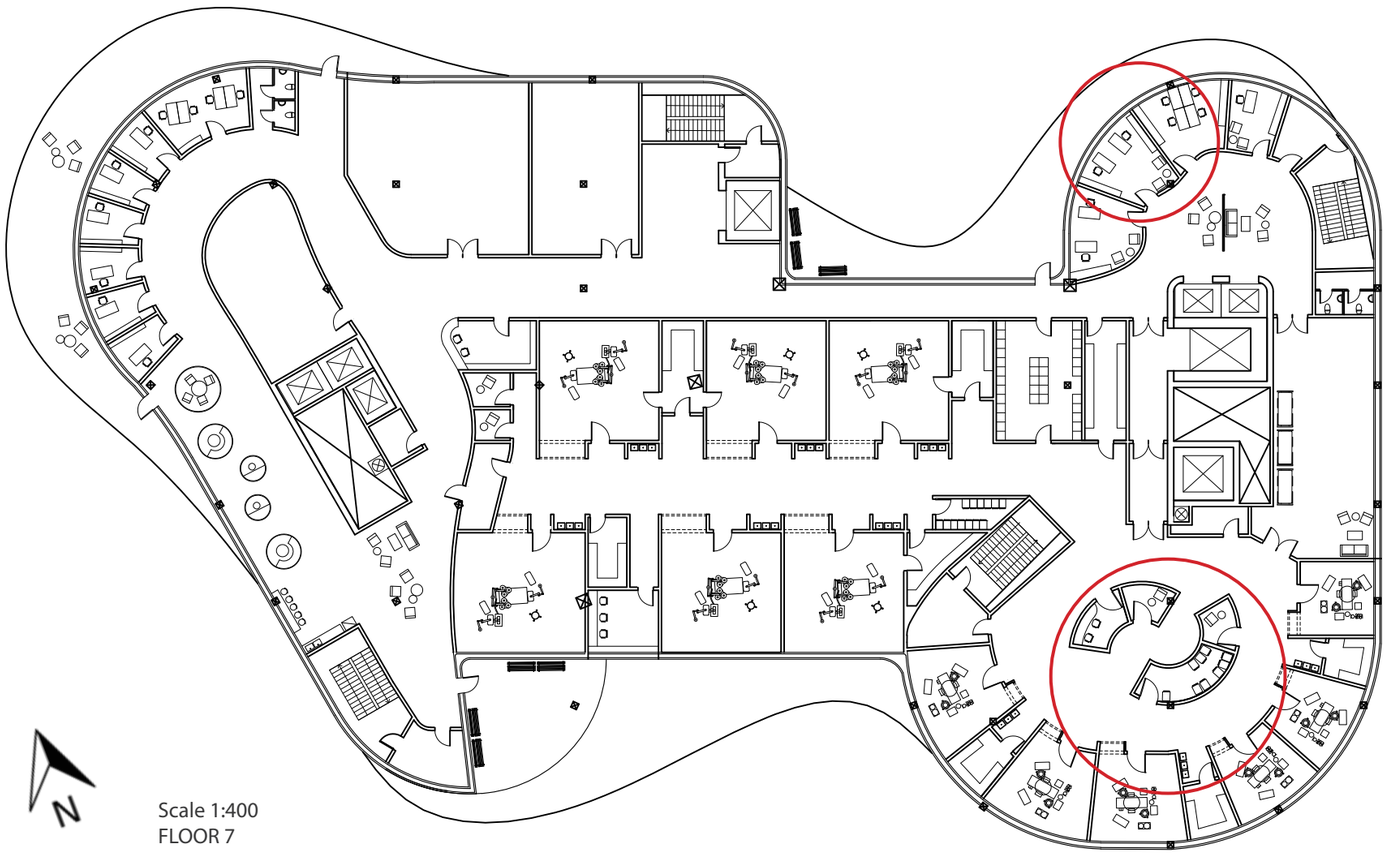
SURGERY FLOOR

The surgery takes a different shape as it extends from one tower to the second, although it still speaks the same language of all the other floors throughout the building. With a highly studied connection to the Pre and Post operation floors, the movement throughout the floor is optimized for easy access, short distances and background aesthetics. The surgery floor contains 60sqm operation rooms for general surgeries, 32sqm operation rooms for endoscopy and 23sqm gynecology surgeries. The staff are at the core of the clean surgery zones maximizing their easy access and quick movement from one operation room to the next. Outside of the clean surgery zone, a variety of offices and meeting rooms are placed for doctors to proceed with their research and work before and after their operations. The interior design idea was to have the offices as relaxing as possible, playful and warm, to reduce and dissolve the stress of performing surgery.

Doctors enjoy the view to a large encircling terrace filled with soothing greenery and access to an incredible view and relaxing environments. The colors of the offices are calming and home-like. The surgery clean zone has white floors and very light interiors allowing the staff to focus on the tasks at hand and keeping them alert and on edge. The dictation rooms have subtle relaxing colors for their short breaks for dictation.



Scale 1:400
FLOOR 7

Scale 1:100

MOOD BOARD

Soft Aspects



1| Integrating architecture with nature
2| Light, Airy
3| Festive, Cheerful

Spatial Criteria


1

2

3

4

1| Large windows | Connection to surrounding | Airy
2| Light breaks | Visual connections
3| Multifunctional | Flexible | Visual connections | Private
4| Integrating greenery

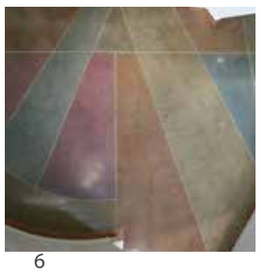
Interpretations


1

2

3

4

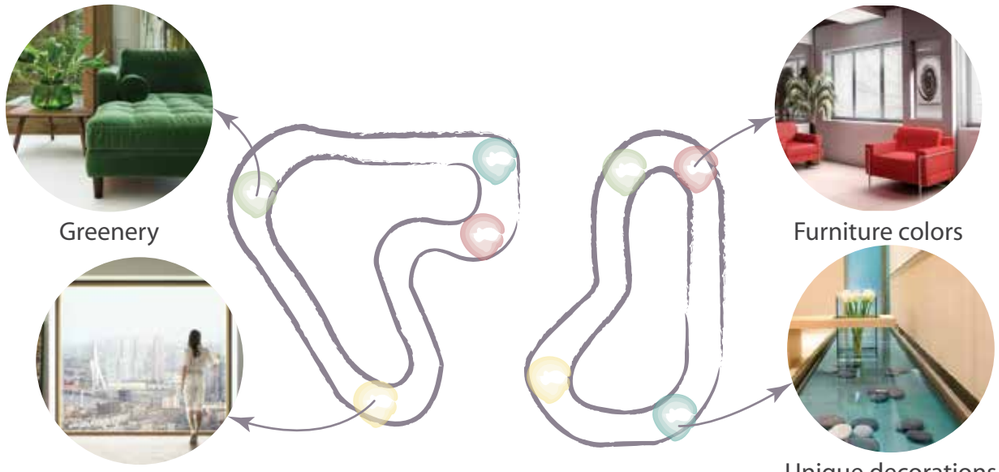
5

6

1| Printed glass panels
2| Soft fabrics when applicable
3| Curved walls = exciting interiors
4| Soft materials in detailed areas
5| Screenwood soundprood timber ceiling and wall panels
6| Polished concrete = durable and easily maintained

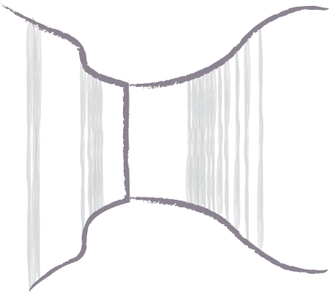
INTERIOR VISION

The interiors of hospitals for a long time were the symbol for cold, empty and linear spaces with lack of personalization and warmth, often inducing the sense of insignificance and nervousness to its patients. The Breathing Building aims to defy that by creating warm and exciting spaces for patients to enjoy. Through curved walls and detailed design, interiors become exciting to walk through and gracefully guide patients and staff through various spaces and different zones or departments. Interiors balance variety with familiarity and wayfinding. By creating unique endings to corridoors, it becomes easier for people to locate themselves within the building.

Ideas to make the endings of corridoors unique for more exciting interiors and better wayfinding



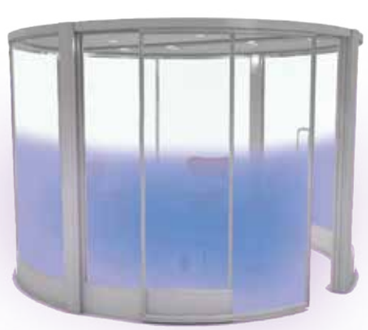
Curved walls for exciting interiors and better wayfinding



Pods design

Pods are designed for privacy amidts public areas for easy access without complete isolation. When a pod is not in use, it is completely transparent allowing light to pass through and by that expanding visual connections and opennes throughout the building. However, when in use, the glass is covered with colorful LED that works as a timer, indicating how long it will take for it to be unoccupied.


Unoccupied

Recently occupied

Nearly unoccupied

COLOR SCHEME

Dark Brown: Warm, cozy
waiting areas rooms &
adminstration rooms

Gray Brown: neutral, warm
waiting areas & examintation
rooms, carefully in all areas

Light Brown: neutral, calming
waiting areas & corridoors,
examintation rooms

Dark Peach: calming, exciting
Accent: Corridoors, reception

Light Peach: relaxing
All areas

Light Green: calming, natural
All areas

Orange: social
Accent: Waiting, reception

Pink: happy, exciting
Accent: Waiting, reception,
administration rooms

Blue: serene
All areas

Green: healing
All areas in different methods

FLEXIBILITY

The illustration shows a variety of different room types that can be located within the hospital. The floor plans are based on a two corridor system with a room depth of 3800mm along the facade. The width of the rooms are flexible and the illustration shows different room sizes, with the smallest patient room at 2500mm. For administration areas it's also possible to create an open landscape which would let the daylight further into the building. This will allow closed office spaces to be placed deeper in the building and give the best facade spaces to common used areas.

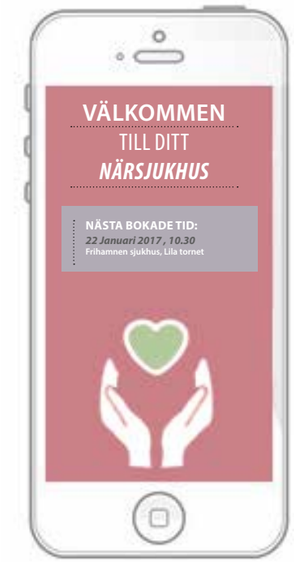
The floor plans have a 2500mm wide corridor. For departments that need deeper than 3800mm rooms it is possible to make the corridor a bit narrower and extend the room's depth with 500mm. The dotted line in the illustration shows the location of this optional wall placement. It is also possible to use the 500mm span to play with the expression of the room and the corridor by creating a less regular wall shape.

The core in the center of the building is 6500mm wide. This could be used for storage that connects the staff side with the patient side. Both staff and patient toilets can be placed together for easier shaft structure and if divided with a non-translucent glass wall it creates a diffused connection between the different zones. It is also possible to divide the space into two different rooms with 3800mm and 2500mm width. Small examination rooms that benefit from a more enclosed environment could also be placed in the center e.g. visits that require a lot of skin showing.

Scale 1:100

WAYFINDING

Before, during & after each visit



A NEW APPROACH

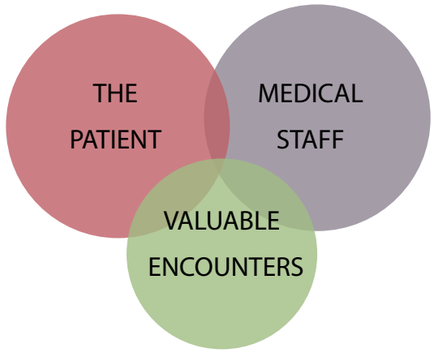
E-health service is the future of the hospital. The hospital app will allow users to personalize their experience and visit, making them feel more in control.

Through the hospital app, patients can, among other things:

- BOOK APPOINTMENTS
- ACCESS MEDICAL PRESCRIPTIONS
- ACCESS HOSPITAL MAPS
- ACCESS FILES
- SEE CURRENT WAITING TIMES
- ACCESS THE SCHEDULE OF VISIT

"An app that allows for a smoother communication between you and your hospital"

In turn, medical staff can have a patient overview and access to patient details. Here, daily data such as blood pressure, diet and exercise can be monitored, allowing precise diagnosis and treatment.

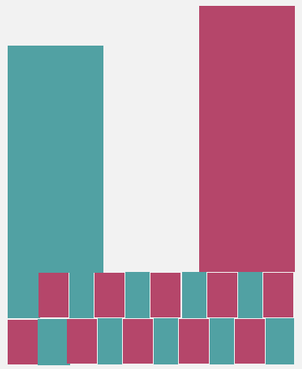


Arrival at your Närsjukhus

EASY ARRIVAL, EASY EXIT

The way finding system already begins at an urban level. When arriving at the site through public transport the way towards the hospital has been clearly marked out in the street leading you straight towards the building. The building itself has two colors for each tower allowing the patient to already identify which tower they have been summoned to. The main entrance of both the hospital and the public floor has been placed where the main flow of people are calculated to be, allowing for a natural approach to the hospital and its facilities. Furthermore, a drop of zone has been placed as close as possible to the main entrance for easy mobility.

Urban way finding



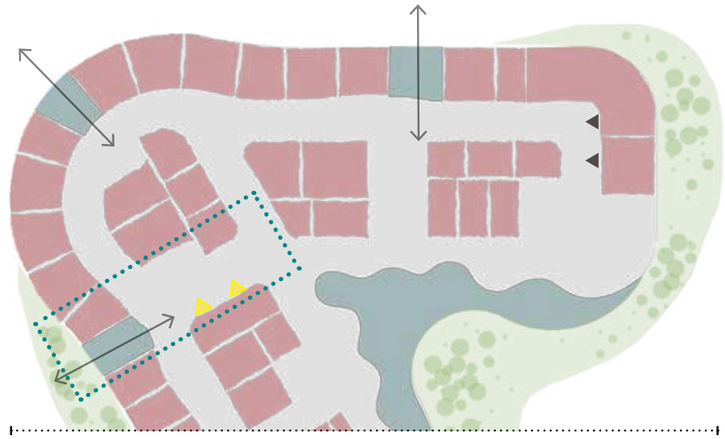
Coloring of facade

Main entrance

Interior strategy

CREATING CONTEXT

In the interior wayfinding system the corridors have been designed with one wall straight and the other slightly curved in order to give a feeling of recognition. In the end of every corridor an opening to the façade gives orientation and creates a relationship to the greenery and the city outside. These places have been designed for waiting and administration work, referred to as low intensity spaces. By using a different material, in this case wood, it signalises the time for recovery and relaxation.



Rooms
Low intensity spaces
Green spaces
Arrival patients
Arrival staff

Admin and meeting area
Western tower

SECTION

Scale 1:400

FACADE

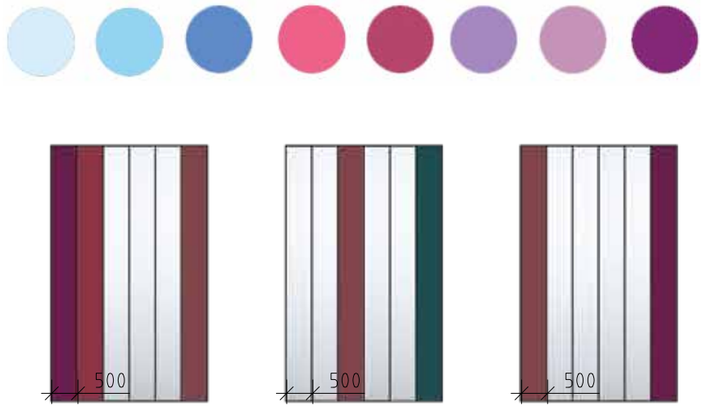
The terraces are a significant strategy for privacy and intimacy creating smaller gardens for different departments and people. Furthermore, vegetation has potential to reduce noise, air pollution, flooding and improve the local climate.

The mostly transparent facade allows for sun to enter where it is most beneficial, both from an environmental and health beneficial perspective. The colors for the exterior have been picked in order to make the building stand out in its surroundings, illuminating a calming blue and attractive purple. It is a landmark within a raising context.

The facade consists of a 500mm grid system with either glass or solid panels. The panels can easily be exchanged and a solid panel can with fairly small resources become a window. This will create a good flexibility for the interior since the facade can be adapted to the interior needs and its different room divisions.

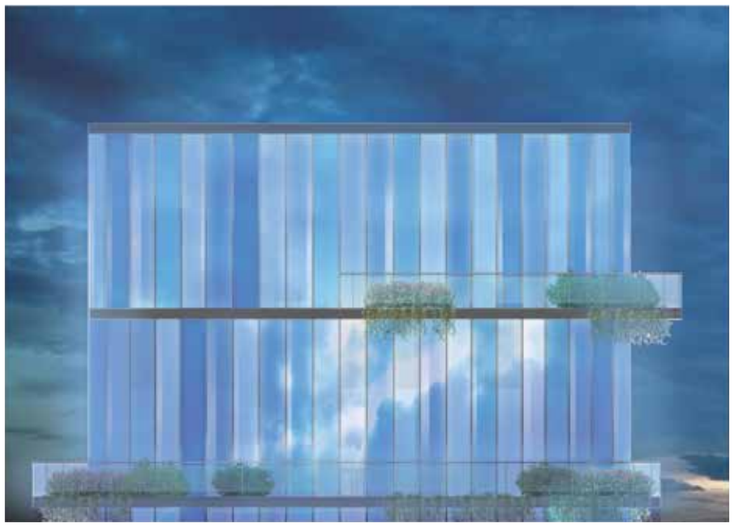
During the night and cloudy days, LED lights light up the entire facade illuminating blue and purple colors that provide visual beauty for the building's surrounding and Gothenburg's skyline. Therefore, emphasizing it being a landmark for the city.

Similar to the architecture of London's Southbank building, there are two layers of glass in the facade with air in between, helping maintain the building's heat and insulating it from the outside climate.



Panel divisions

Day



Night

Night

MAIN ENTRANCE

REFERENCES

THE BUERGER CENTER
The organic building

GLASVASEN IN MALMÖ
Green panels with green spaces

THE DUTCH EWICON
Renewable wind energy

BY SHEPPARD ROBSON
Sustainable facade

SAHLGRENSKA
Walking on the sky