



Östersund's Future Hospital

SYNAPSE

Anni Stockeld, Lin Tan and Jessica Kos´ 2014

Future visions for healthcare, housing and work 3:
ARK262 Healthcare Architecture

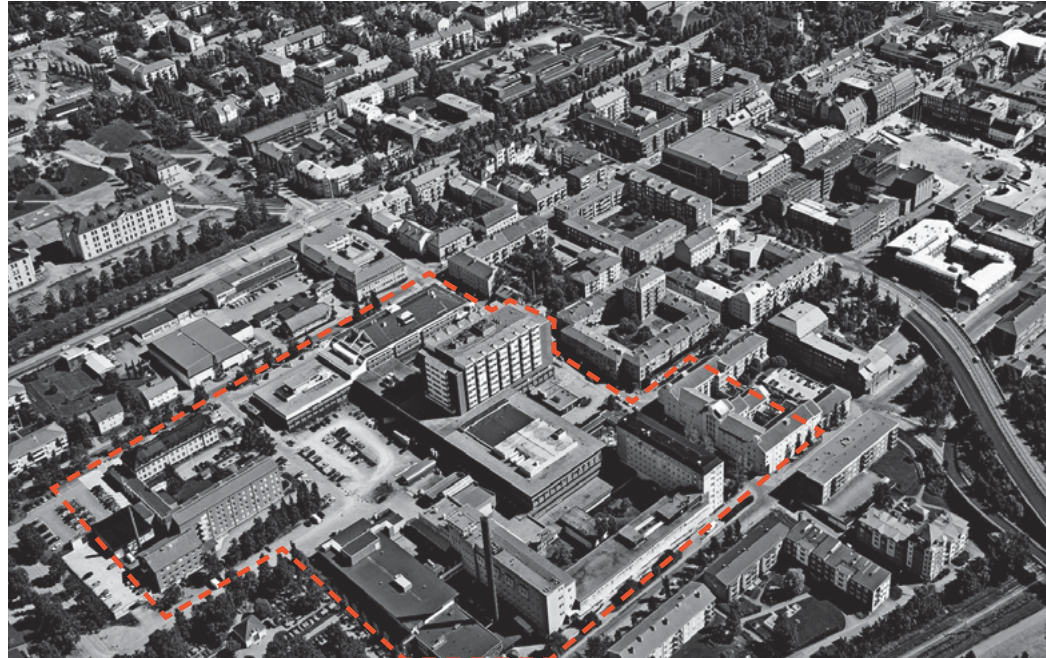
Department of Architecture at Chalmers University of Technology, Gothenburg, Sweden.

Peter Fröst, Examiner
Cristiana Caira, Tutor

Östersund's hospital



hospital site



hospital site



surrounding views

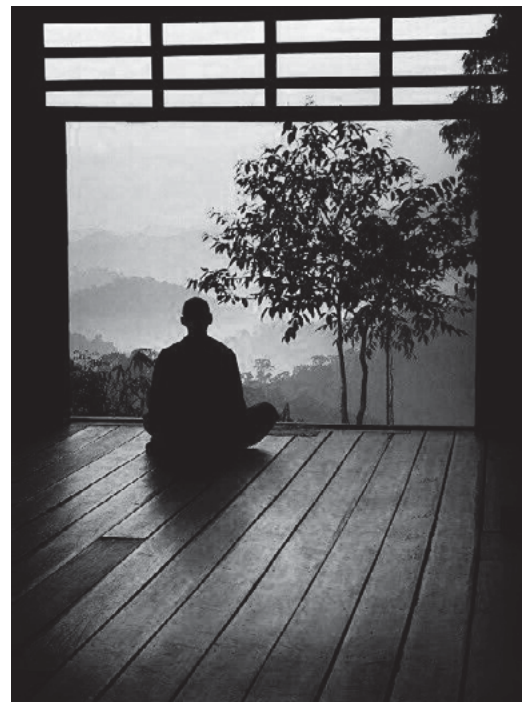
Healthcare architecture



social support



safety



presence of nature



exercise

ÖSTERSUND'S HOSPITAL

INTRODUCTION

Östersund's hospital is the center for healthcare in the county of Jämtland. It was first established in the early 1900's and has grown over time, with buildings ranging from 1900-1970's. It is an urban hospital with close connections to the city, however still with presence of nature through the magnificent settings surrounding Östersund, with mountains and lakeviews.

The hospital is now at a point where the facilities are getting too small and partly outdated, and the hospital is in need of a change. Future healthcare has new demands with single patient rooms and high technological spaces, which is hard to accommodate within the existing structure.

This is a report showing a future hospital in Östersund where the vision is an urban hospital that invites the community and promotes health and research through a cooperation between healthcare and society. Research and education is the future and involving the public creates an opportunity to proactively work for public health and self-care.

THE PROGRAM

Through creating a new masterplan over the hospital area, the project should increase the size of existing functions by 10-20 percent as well as accommodate:

- 420 single patient rooms
- 12 operating theatres
- 10 ICU rooms
- a developed emergency department
- a patient hotel with 20 rooms
- a new effectively located helipad

A new centre for primary care has also been located in the hospital, with an area of 7000 sqm.

HEALTHCARE ARCHITECTURE

The goal for Jämtland's county council is good health and positive living environment for all people in Jämtland. These are also important values within healthcare architecture where the goal for healthcare should be not only to cure but also to care. Evidence based design shows that the health of patients and staff can be influenced by the environment they are in. Therefore healthcare architecture becomes an important part of the healing process. Already in ancient Greece, the belief was that a holistic view of a man is the context of his total environment.

Evidence based design focuses on areas such as well-being, healing, stress reduction and safety through for example social support, exercise, control, and presence of nature. These are important focus points and issues that are highlighted on different scales within this project. To benefit from the context the project integrates both nature and city, creating social spaces for people to gather as well as bringing in nature. In contrast to the larger public spaces are the inpatient wards and single patient rooms, each with its own French balcony overlooking Storsjön. The range of places provide the user with the possibility to choose the level of privacy.

HEALTHCURE

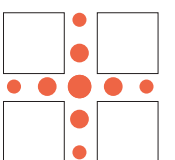
Self-treatment is growing and an increasing number of illnesses can be treated by medication instead of operation. The trend is predicted to continue which would affect the hospital as a whole. Less pressure would be put on the hospital's resources. However, increasing self-treatment requires that curing methods are highly accessible. To encourage future self-care, a telemedicine network will be introduced. Furthermore, the new hospital has put labs connected

to the commercial street where visitors easily can drop by and take samples for lab analyses. Additionally, health pavilions are planned in the public health park for visitors to keep informed about ongoing research and innovation.

EXPANSION

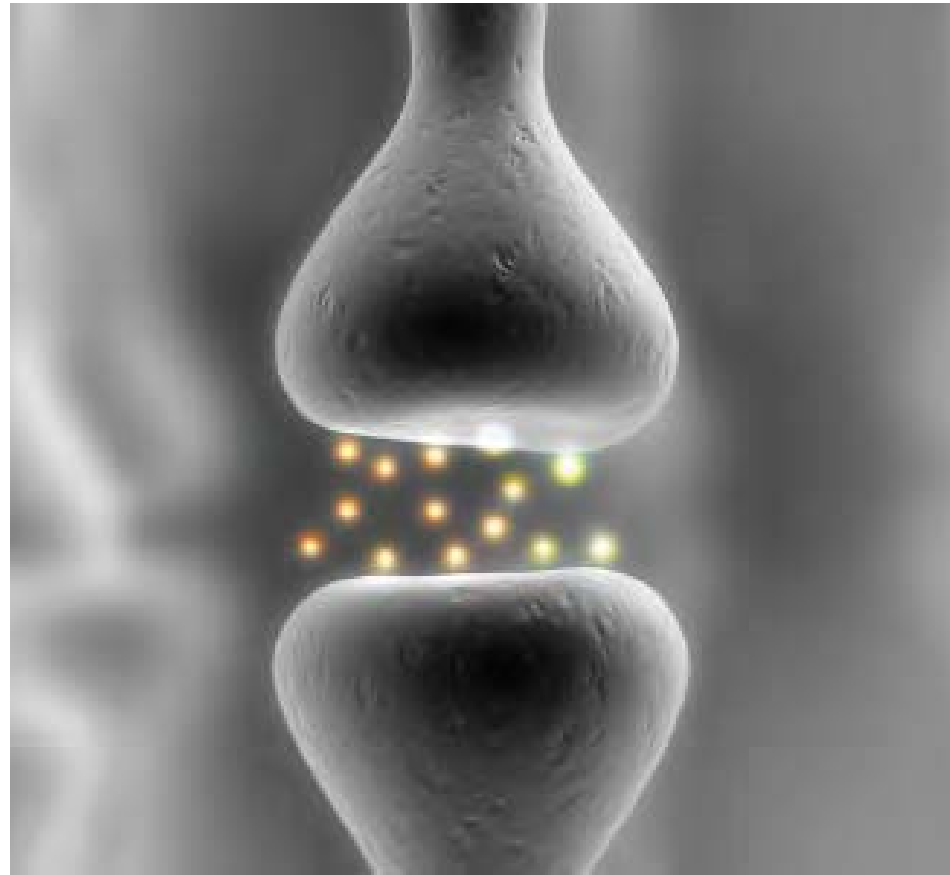
The design has incorporated flexibility to accommodate changes that likely will occur in the near future. The building will reduce the need for additional exterior reconstruction. No internal partitions are structural and the pillar grid is set out in an order suitable for shifting internal functions.

The building is planned on the site to give room for further hospital expansion. The north east side of the site has been planned for parking, a temporary situated function that could be moved if the hospital needs to grow further.



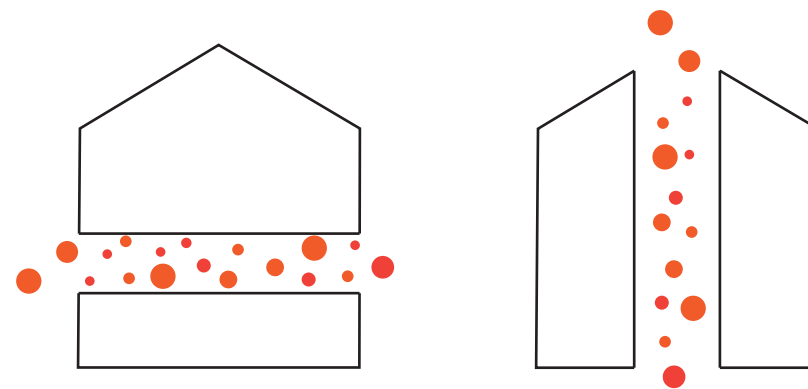
CONCEPT

SYNAPSE - DIVIDE TO CONNECT

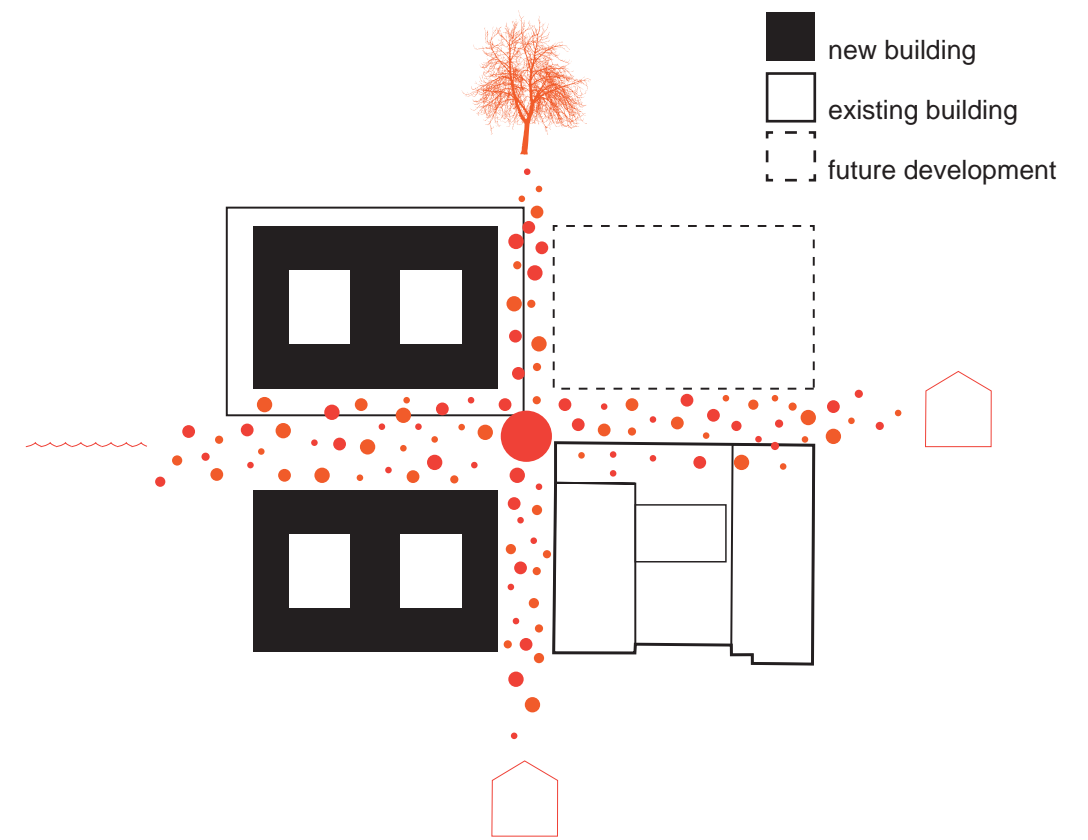


“ *Synapse is the site of transmission of electric nerve impulses between two nerve cells.* ”

The concept of the project is the synapse; the site of transmission of electric nerve impulses between two nerve cells. Dividing the structure of the hospital into several parts and buildings creates spaces in between which becomes the synapse; public and social places connecting people and activities. Through the division the hospital becomes more integrated in society, connecting to the surrounding city and nature. The vision of the future hospital is an urban hospital that invites the community and promotes health and research through a cooperation between healthcare and society.

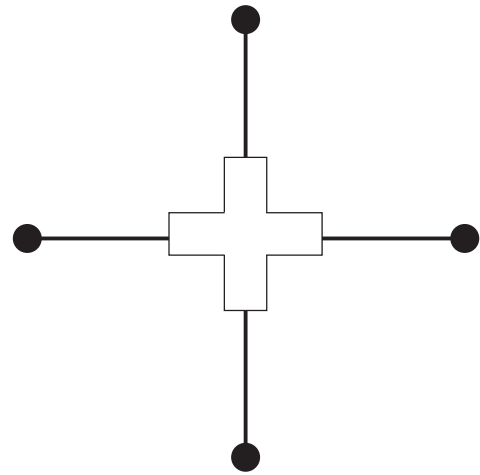


breaking up the building mass both horizontally and vertically

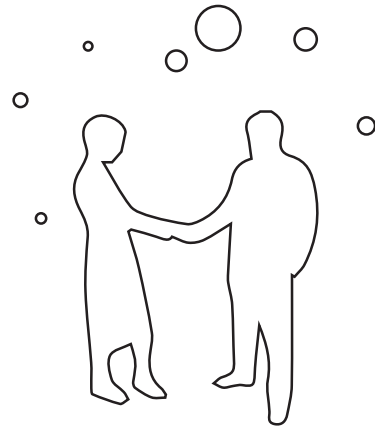


creating a new main entrance in the center of the hospital with streets connecting to the surroundings, in the shape of a cross

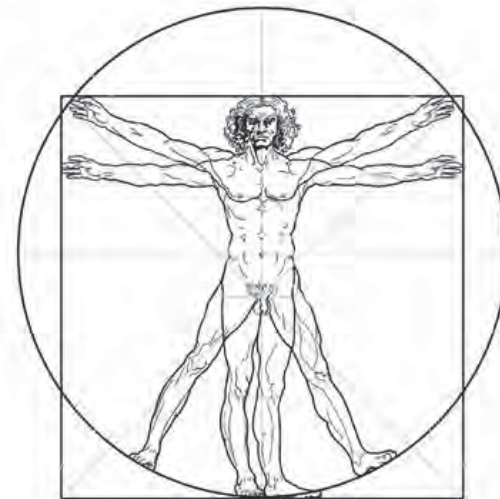
SYNAPSE - QUALITIES



connecting the surroundings



public space and social meetings



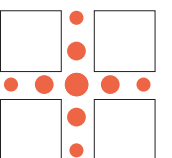
a smaller scale adapted to the city and the human



views and easier wayfinding.



presence of nature



SUSTAINABILITY

SUSTAINABLE ENERGY

Östersund's hospital has to operate 24 hours of the day which consumes a high amount of energy. Therefore it is significant to introduce green alternatives for energy production. Synapse has made use of the hospital's large roof areas by installing solar panels that makes the hospital partly self-sufficient.

Furthermore, Synapse has sedum floors in the court yards and on selected roof areas. The sedum surfaces have several benefits. They reduce surface run off of rain falls and can be used for internal water usage. The sedum courtyards also provide a degree of insulation and reduce the need for air conditioning.

FOSTERING HEALTH

Today, Östersund hospital is the work environment for 2500 employees and a destination for 700 patients each day. Synapse will take advantages of the high amount of visitors in order to influence Östersund as a whole. The new hospital will implement solutions to foster public health as well as social and economic sustainability.

By making healthcare research available to the public, the hospital will practice and promote healthy living in a setting that offers physical activity. A health park with pavilions informing about ongoing research will be open to the public at all times.

GREEN COMMUNICATION

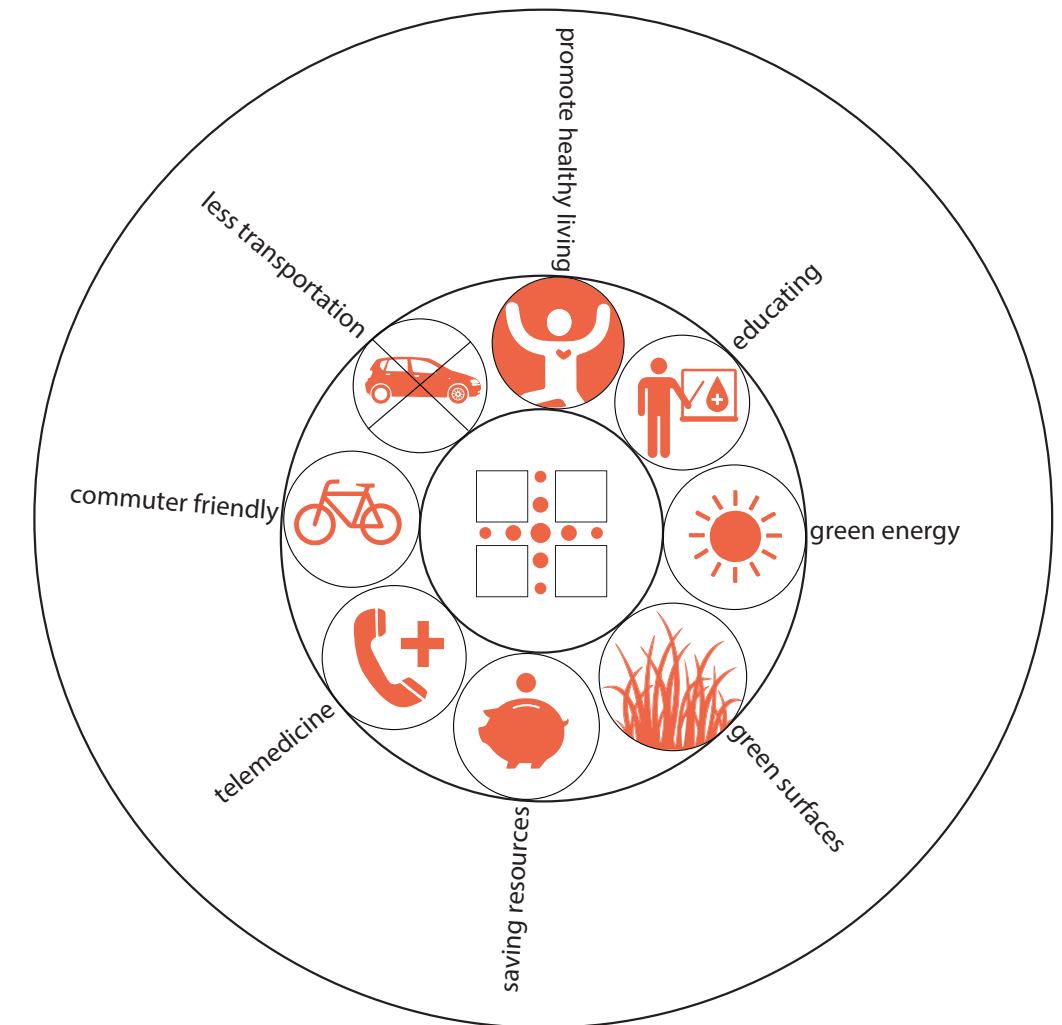
Synapse embraces the qualities of being a city based hospital. The central location gives opportunities to minimize motorized transportation methods. Synapse turns its face towards the city and the green path along Storsjön which makes it easy accessible for pedestrians, bikers and commuters.

Furthermore, the proposal promotes less transportation to the hospital by introducing a new telemedicine department. Telemedicine is an important addition to Östersund's hospital since many patients travel from wide distances. Telemedicine does not put considerable pressure on the hospital's resources and contributes to environmental and economic sustainability.

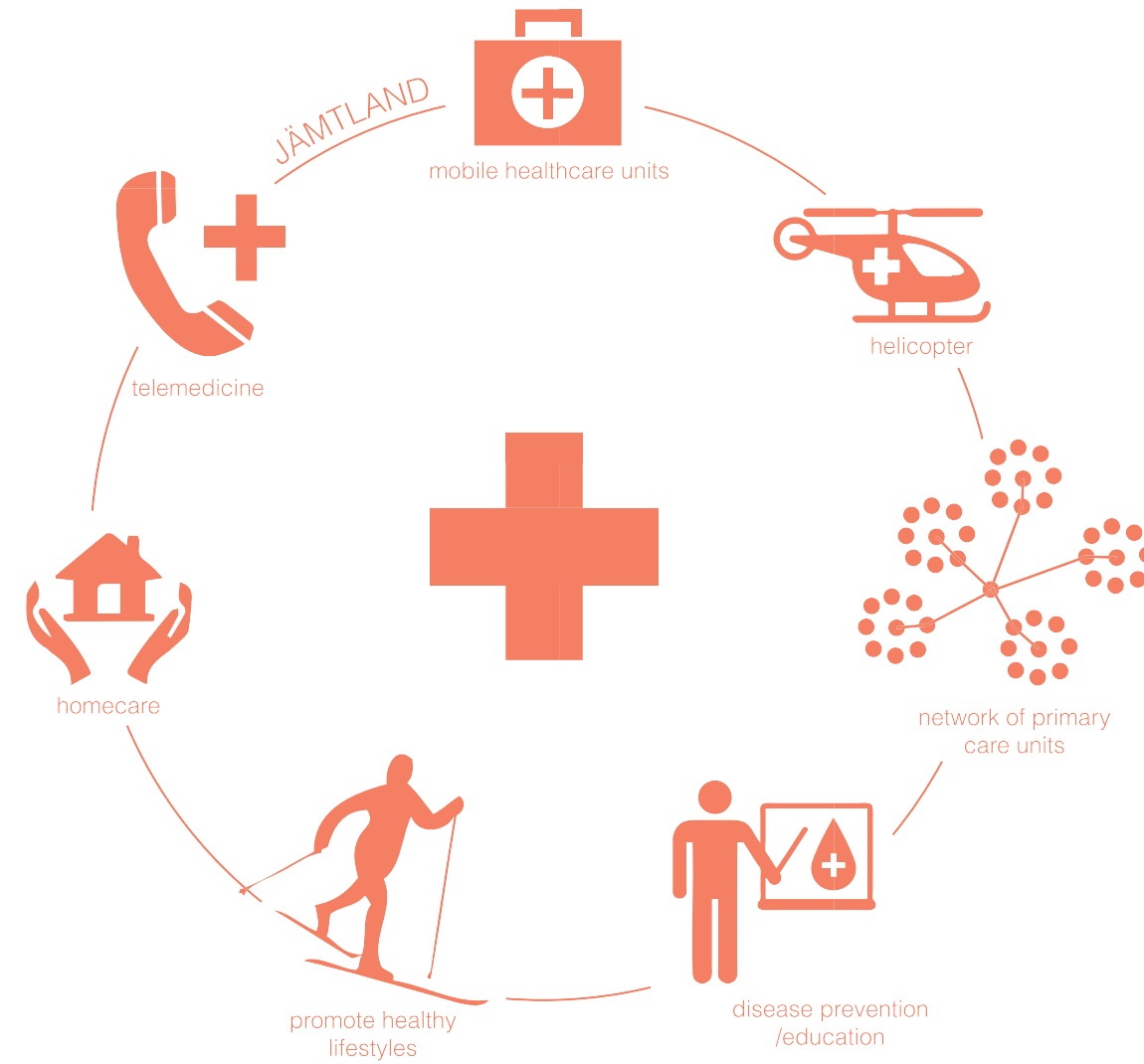
FLEXIBLE FUTURE

Generality is highly important when designing for unknown future needs. The applied grid system in the new hospital has been designed with possible future development in mind. The slimmer building does not only apply to ward unit functions. It is designed to shift to administrative departments, elderly care or out patient facilities.

The hotfloor has also been designed for future adaptation. It would be constructed for internal flexibility where the operating theatres can grow over time.

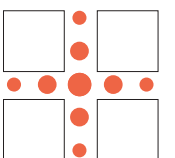


----- size comparison with Denmark



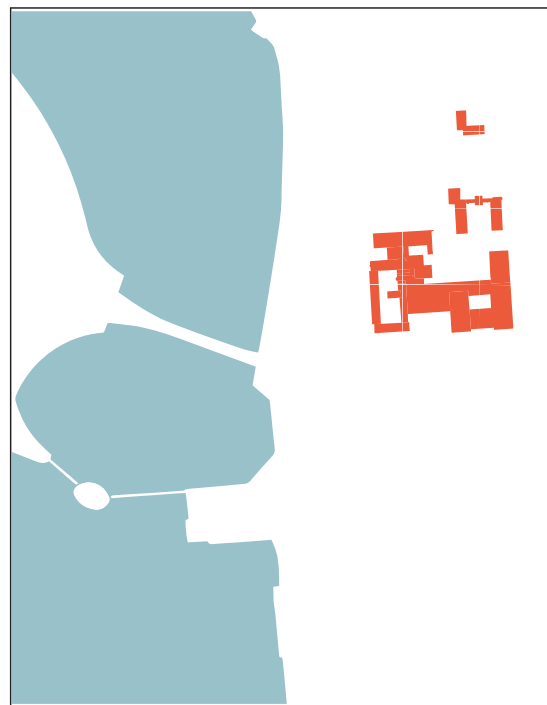
JÄMTLAND

In such a wide spread area as Jämtland, it is important to divide healthcare into several units to be closer to the patients. The units should, however, be well connected through a healthcare network with the hospital of Östersund functioning as the node. Future healthcare with increased home care, tele medicine and more available primary care through for example mobile units will be especially important.





the city



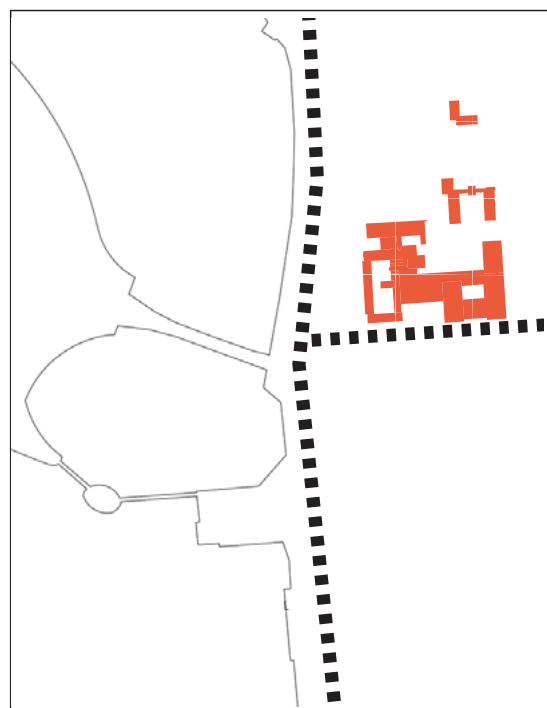
the lake



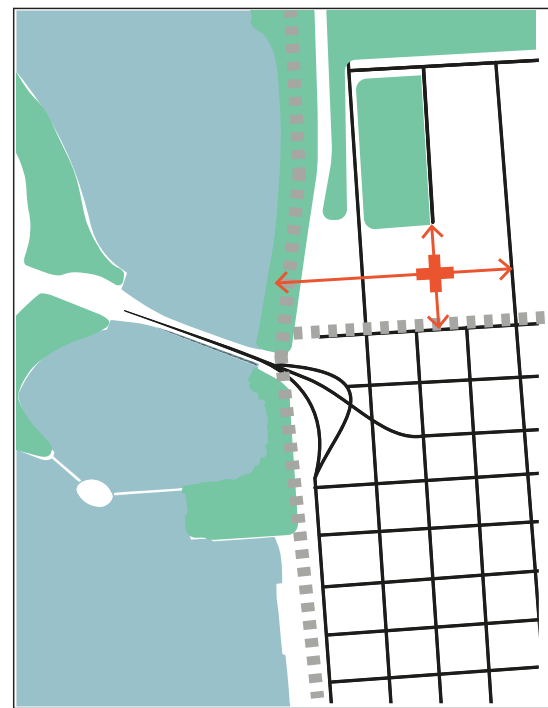
the nature



street grid

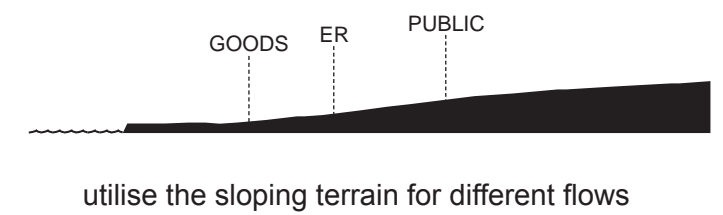
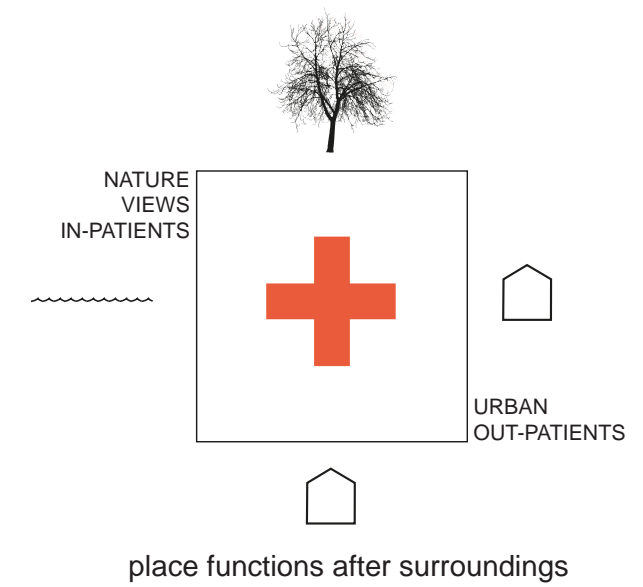


barriers



synapse

urban elements
scale 1:12 000
500 M



ÖSTERSUND

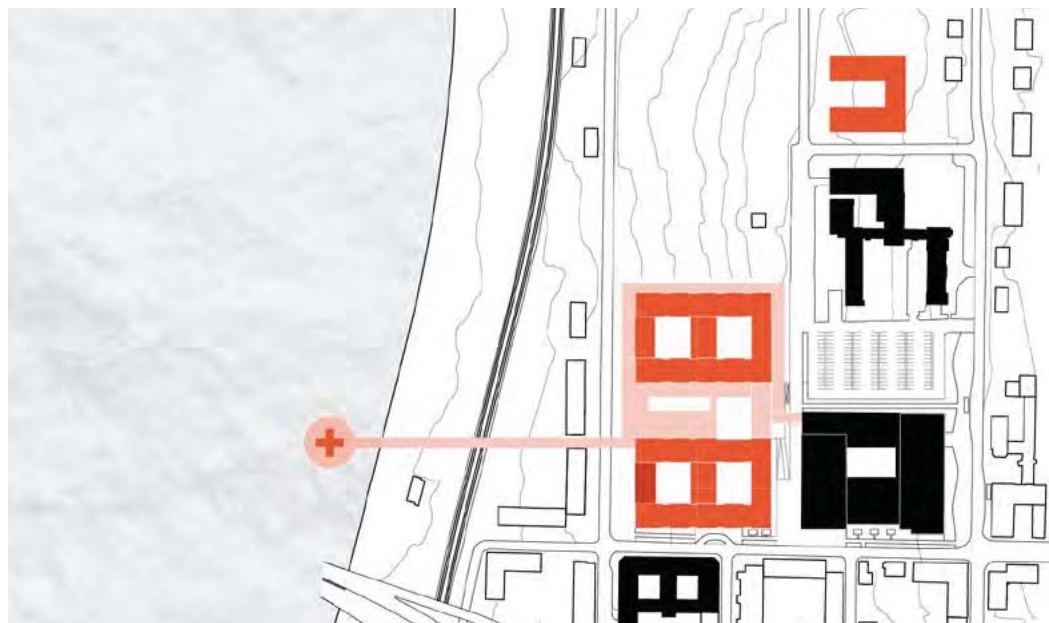
The city of Östersund is surrounded by water and nature. However, the hospital together with the railroad are creating barriers disconnecting the city from its surroundings. A transformation of the hospital creates an opportunity to break the barrier and let the hospital be the connector, connecting the city to the nature and the lake front.



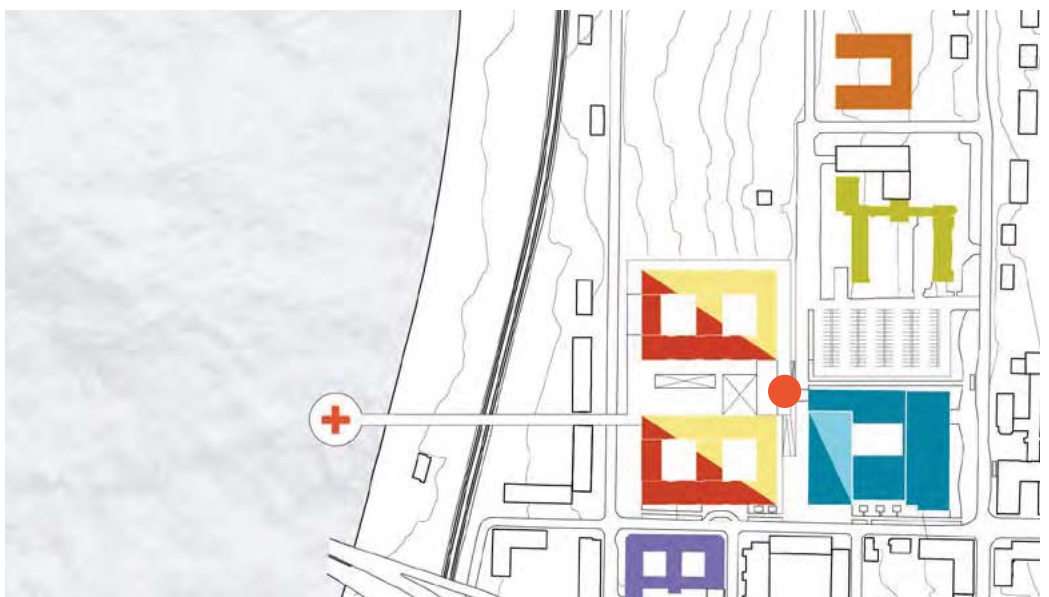
scale 1:5000

250 M

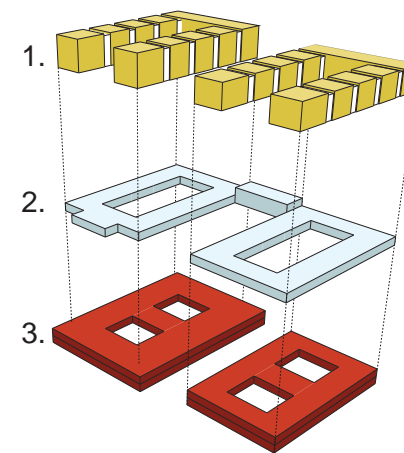
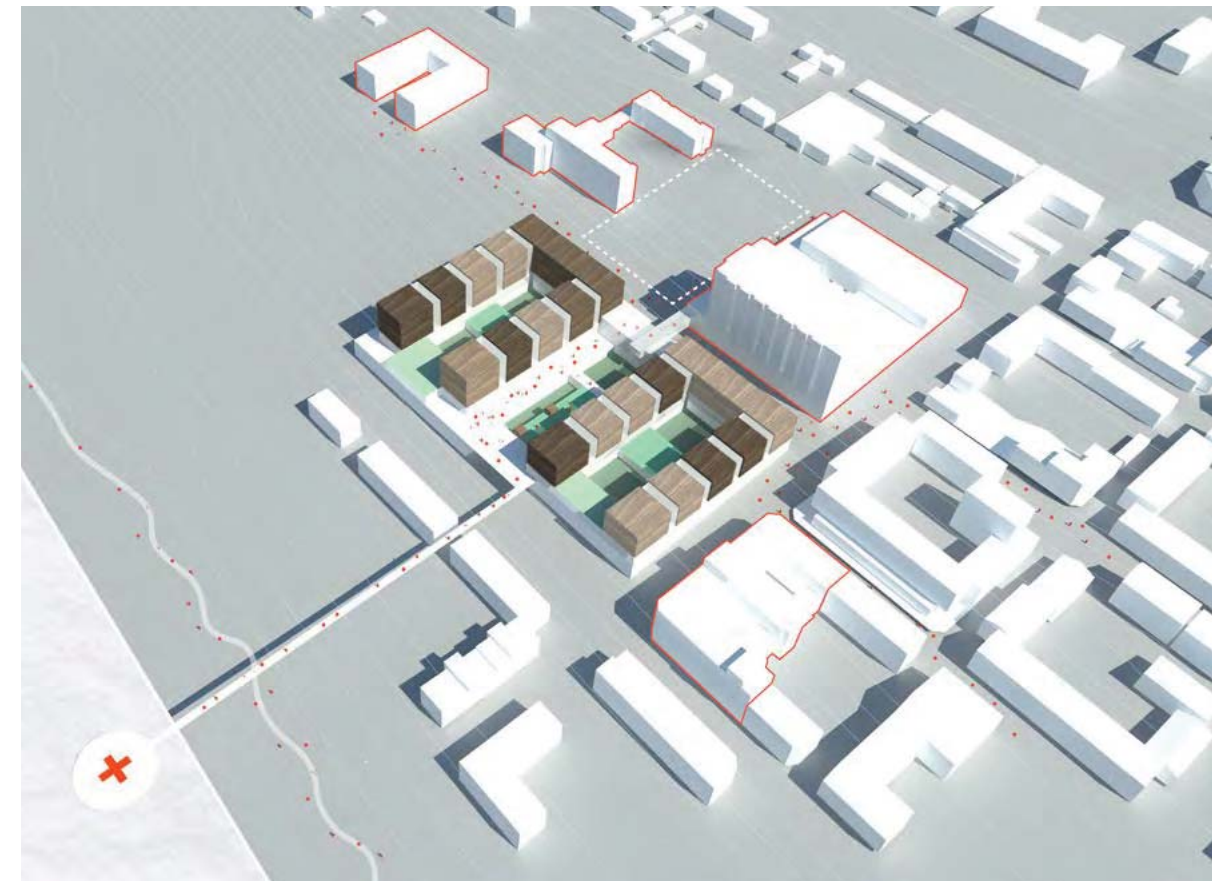
- retained buildings
 - demolished buildings
- demolition plan



- retained buildings
 - new buildings
- new buildings



- psychiatri
 - administration
 - out-patients
 - outpatients / primary care
 - patient wards / hot floor
 - infection
 - main entrance
- new functions

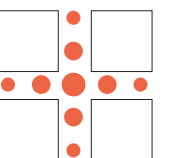


1. HOUSES WITH INPATIENT WARDS
2. TRANSPARENT PUBLIC FLOOR
3. PLINTH WITH HOTFLOOR AND SUPPORT FUNCTIONS

THE BUILDINGS

The buildings in the west are replaced with two new buildings foremost for hotfloor facilities, research, diagnostics and inpatient wards, with a total area of 62 000 sqm. The buildings in the southeast is retained and transformed into a center for out patients and 24 hour primary care. Infection takes over the psychiatry building which then moves to new facilities in the north of the hospital lot, with closer connection to nature.

The new buildings consist of three articulated parts; an effective plinth with hotfloor and support functions, a transparent public floor and inpatient wards on top.





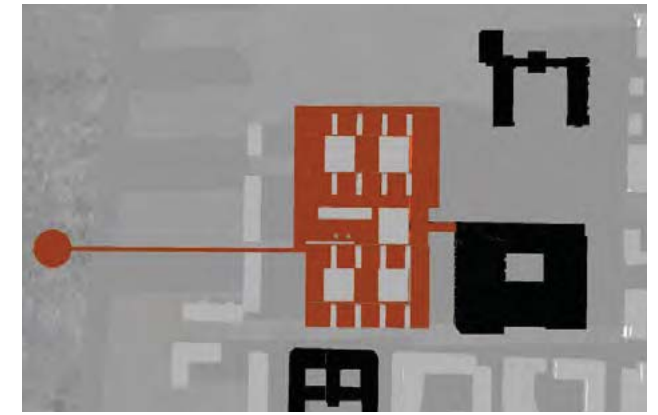
9 a.m./spring/fall



noon/spring/fall



3 p.m./spring/fall



6 p.m./spring/fall



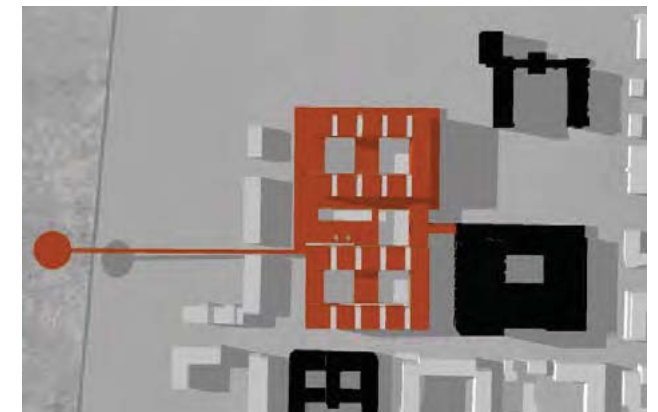
9 a.m./summer



noon/summer



3 p.m./summer



6 p.m./summer

ENTRANCES

The sloping terrain allows entrances on different levels, which helps to separate flows. The new main entrance is placed in the central part of the hospital, connecting to the streets coming from the city. Here pedestrians are in focus while cars and buses enter from the sides. Fältjägargränd has been made more public and is turned into a 24-hour street with entrances to emergency, primary care and pharmacy.



SECTION

SECTION

AMBULANCE L'2 >
GOODS DELIVERY L'1 >
HELIPAD L'2 >

L'3 < MAIN ENTRY > L'4

< ENTRY L'6

KÖPMANSGATAN

TYSYTA VÄGEN

KYRKGATAN

GARAGE L'0 >

EMERGENCY & DELIVERY L'2

PRIMARY CARE L'4

FÄLTJÄGARGRÄND

ENTRANCES >

VIEWS >

10 M

50 M



site plan
scale 1:1000



THE CONNECTION

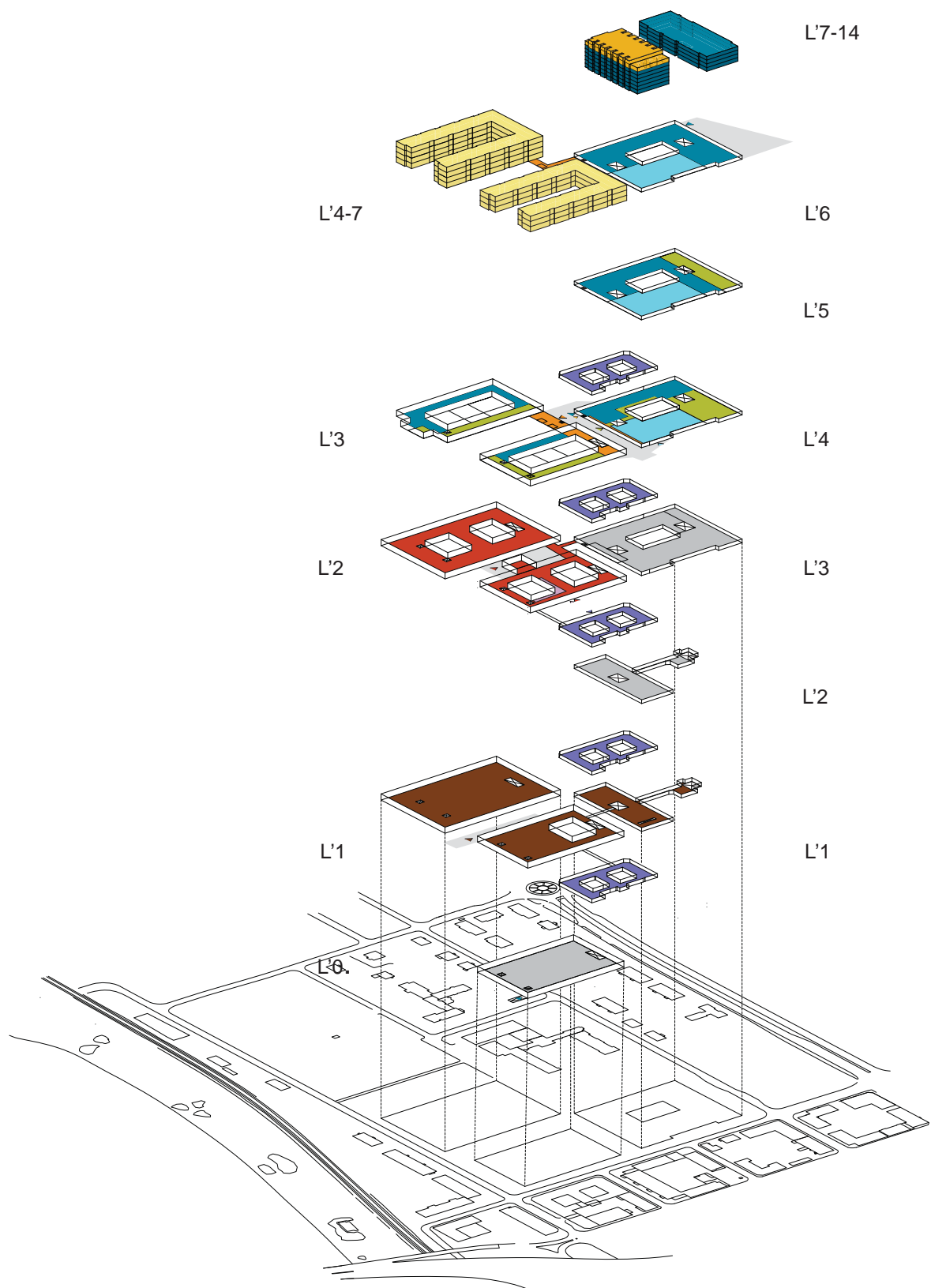
A new helipad down by Storsjön connects straight to the emergency department through a skybridge. The roof of the skybridge creates a pathway from the hospital all the way down to the lake, bridging over the railroad. It is then possible to go through the entrance on level 6, that connects to the new main entrance and the pathway between the buildings all the way down to the water. The pathway is a healthwalk with information pavilions open to visitors.



SYNAPS

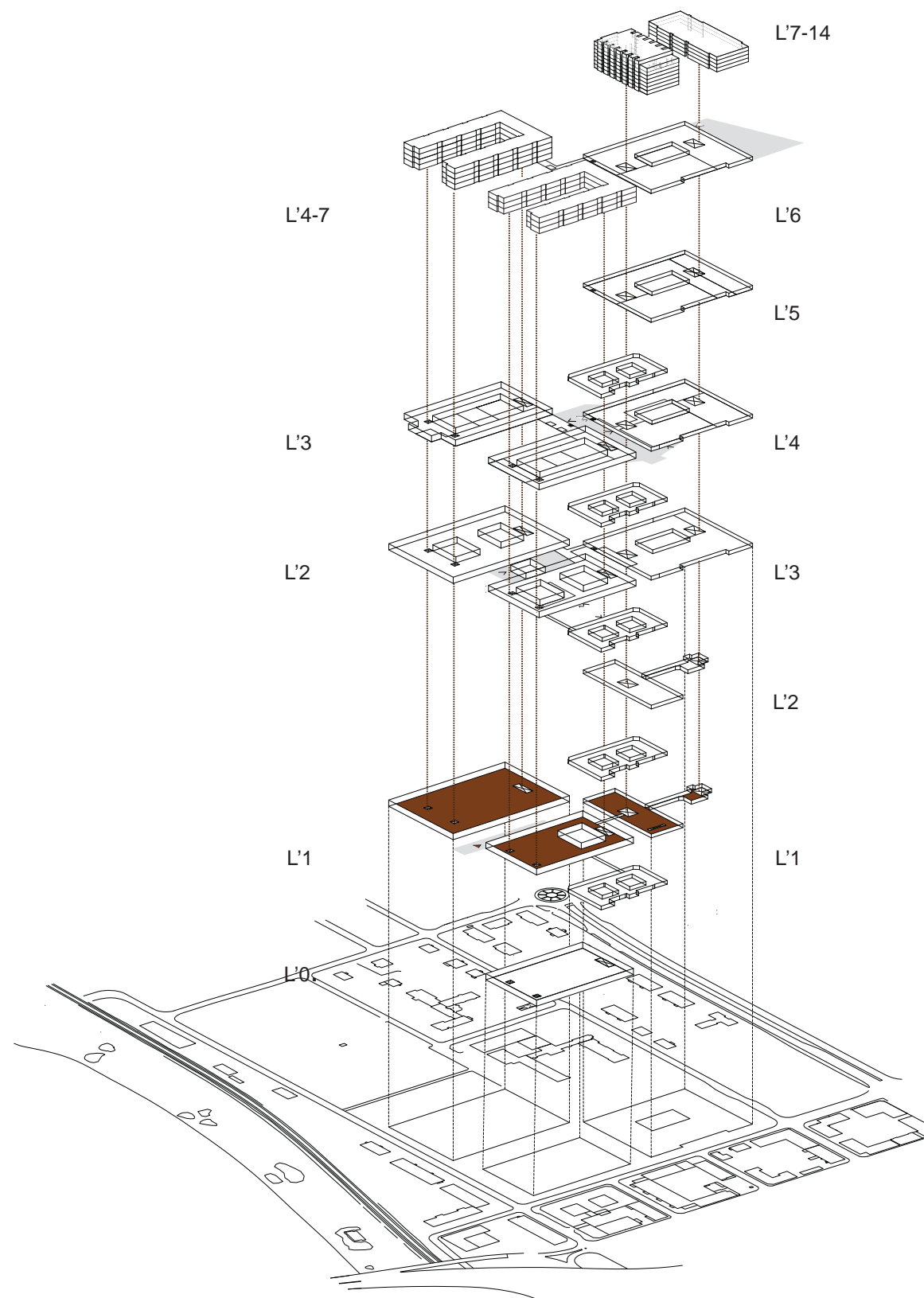
HEALTH

INFO



FUNCTIONS

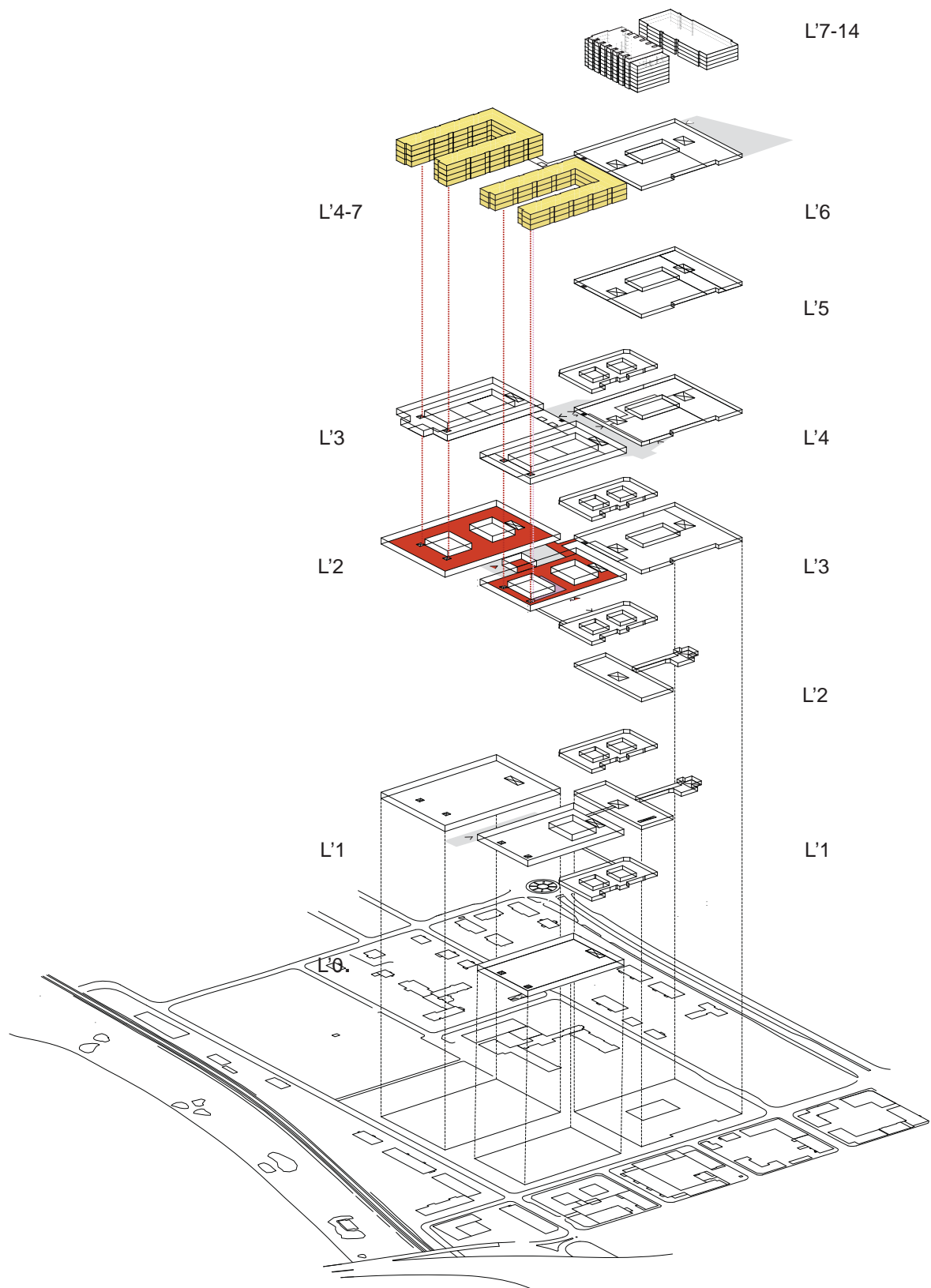
Since the main entrance is located on the third level, the levels below can be focused on hotfloor facilities and support functions. The third level is the open synapse floor with out patient- and public facilities. Here are also staff areas situated, placing them central in the hospital. Inpatient wards are placed above the third level. Out patient facilities, primary care and patient hotel are placed in the existing building. The infection clinic is placed in a separate building, closely connected through both a skybridge and a culvert.



FLows: GOODS

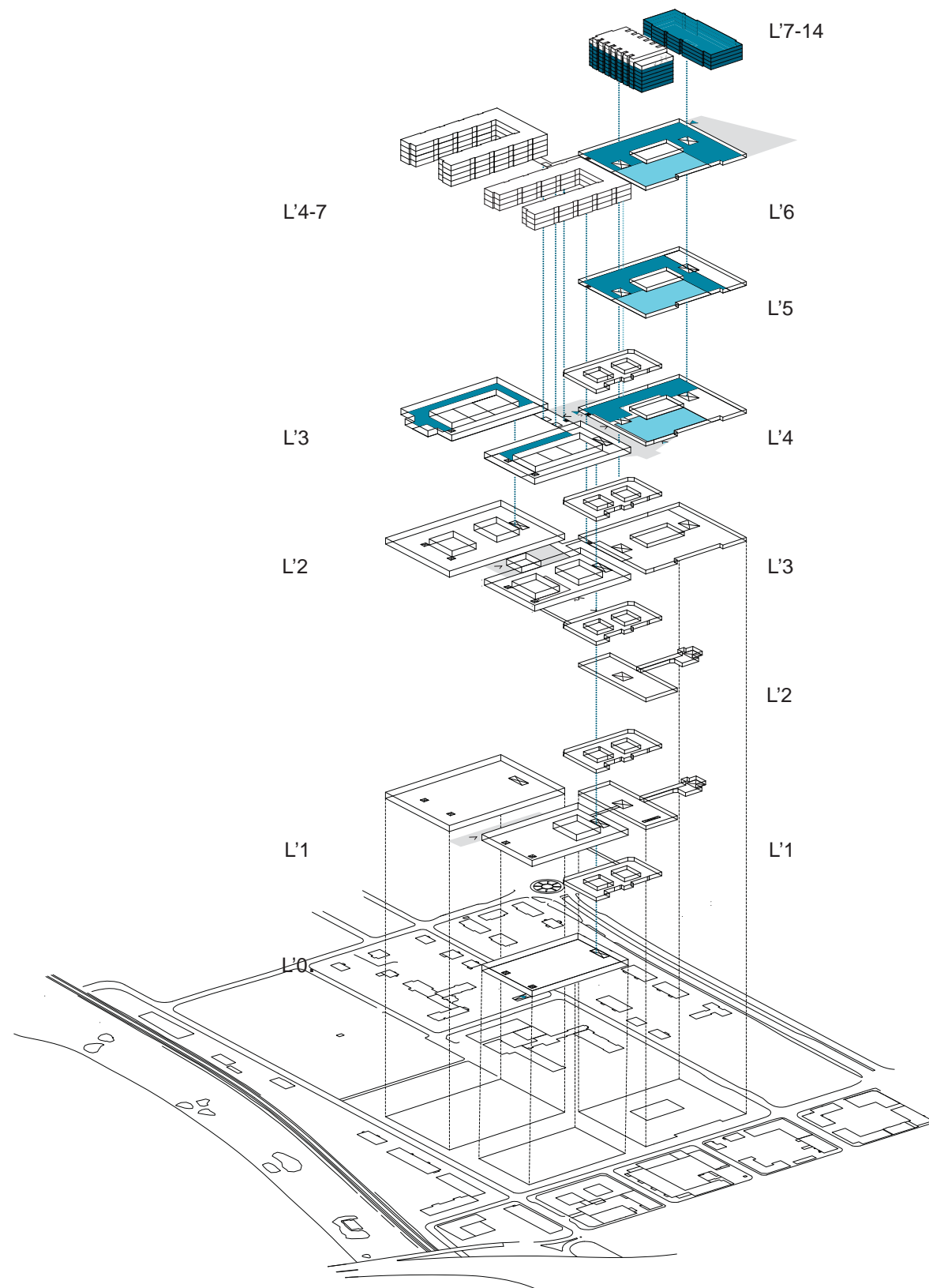
Goods are delivered and stored on the first floor from where they are transported horizontally in culverts, connecting to existing culverts in the old building and the infection building. The goods are then transported vertically to all the clinics and wards. The kitchen is located close to the goods delivery and is transported through the building in the same way.

- inpatient ward
- hotfloor
- outpatients
- technic
- support functions
- patient hotel
- staff functions
- primary care
- infection
- delivery
- labs



FLows: EMERGENCY AND INPATIENTS

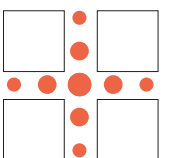
All emergency patients enter on the second floor, either by foot, car, ambulance or helipad. The two buildings are connected in two places creating close connections and helps to separate flows. Level two is directly connected to the wards through a designated bed lift.

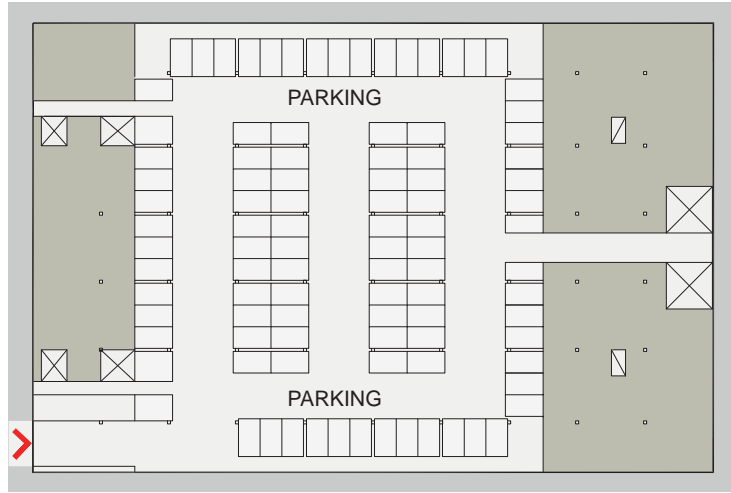


FLows: OUTPATIENTS

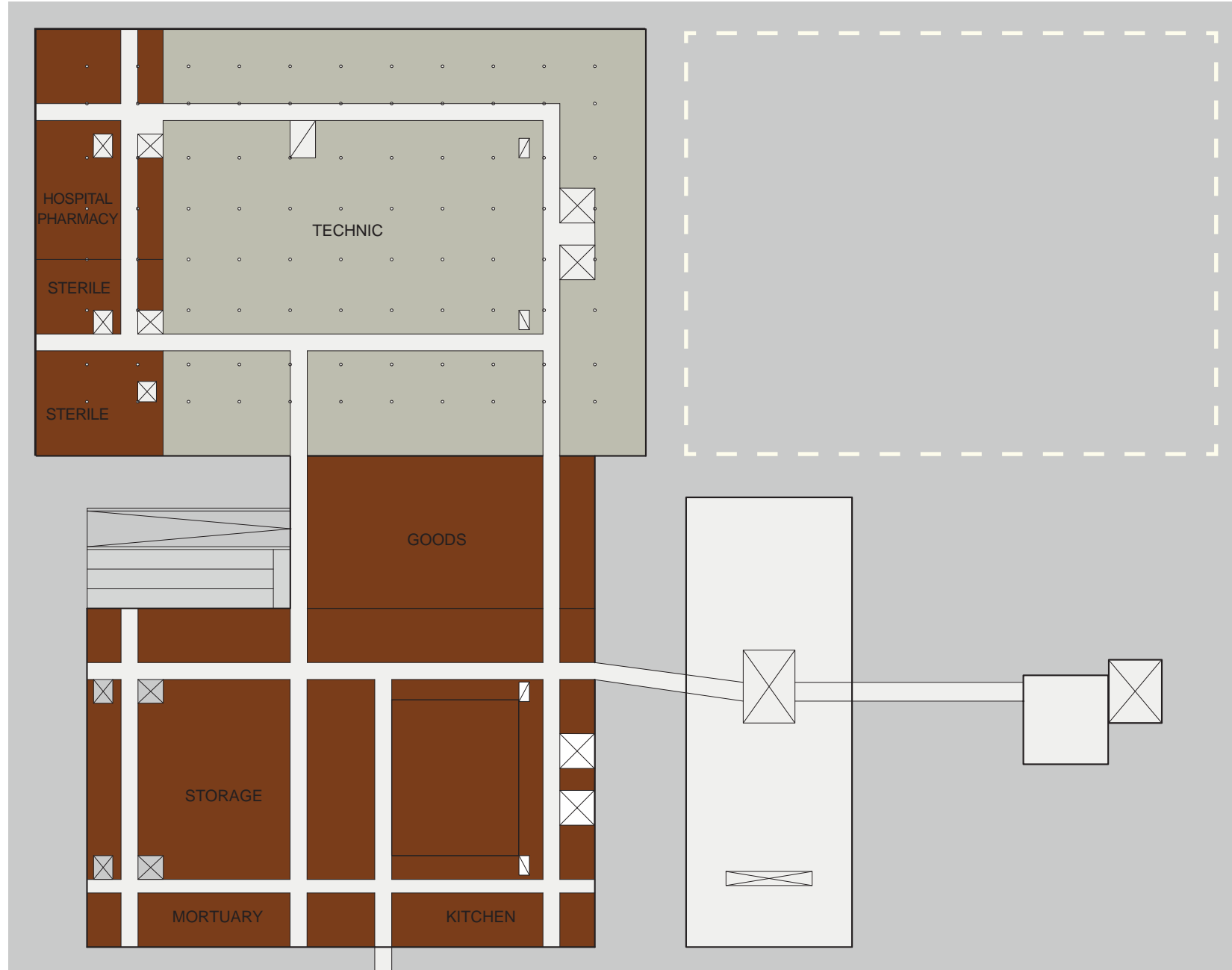
The outpatients coming from the city or by car enter through the central main entrance. However there is still a possibility to enter the hospital through the old entrance on the sixth floor where the bus stop is. The outpatient clinics are concentrated to the old building and on street level in the new buildings, making them more public.

- inpatient ward
- hotfloor
- outpatients
- technic
- support functions
- patient hotel
- staff functions
- primary care
- infection
- delivery
- labs





new building L'0



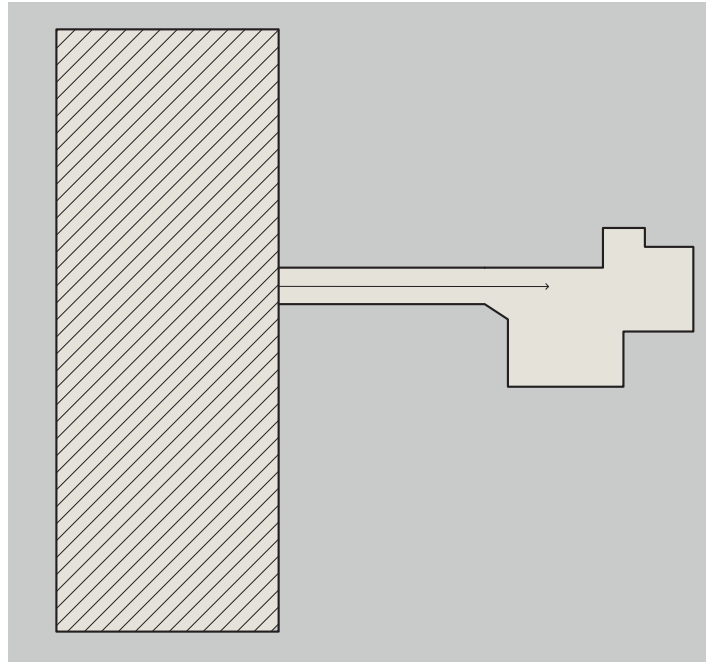
areas in total

- 62 000 sqm new buildings
- 22 600 sqm inpatient ward
- 26 600 outpatients
- 3500 sqm patient hotel
- 7100 sqm primary care
- 2000 sqm labs
- 2000 sqm research and education
- 4000 sqm emergency
- 540 sqm delivery
- 1200 sqm ICU
- 2700 sqm operation
- 3300 sqm x-ray

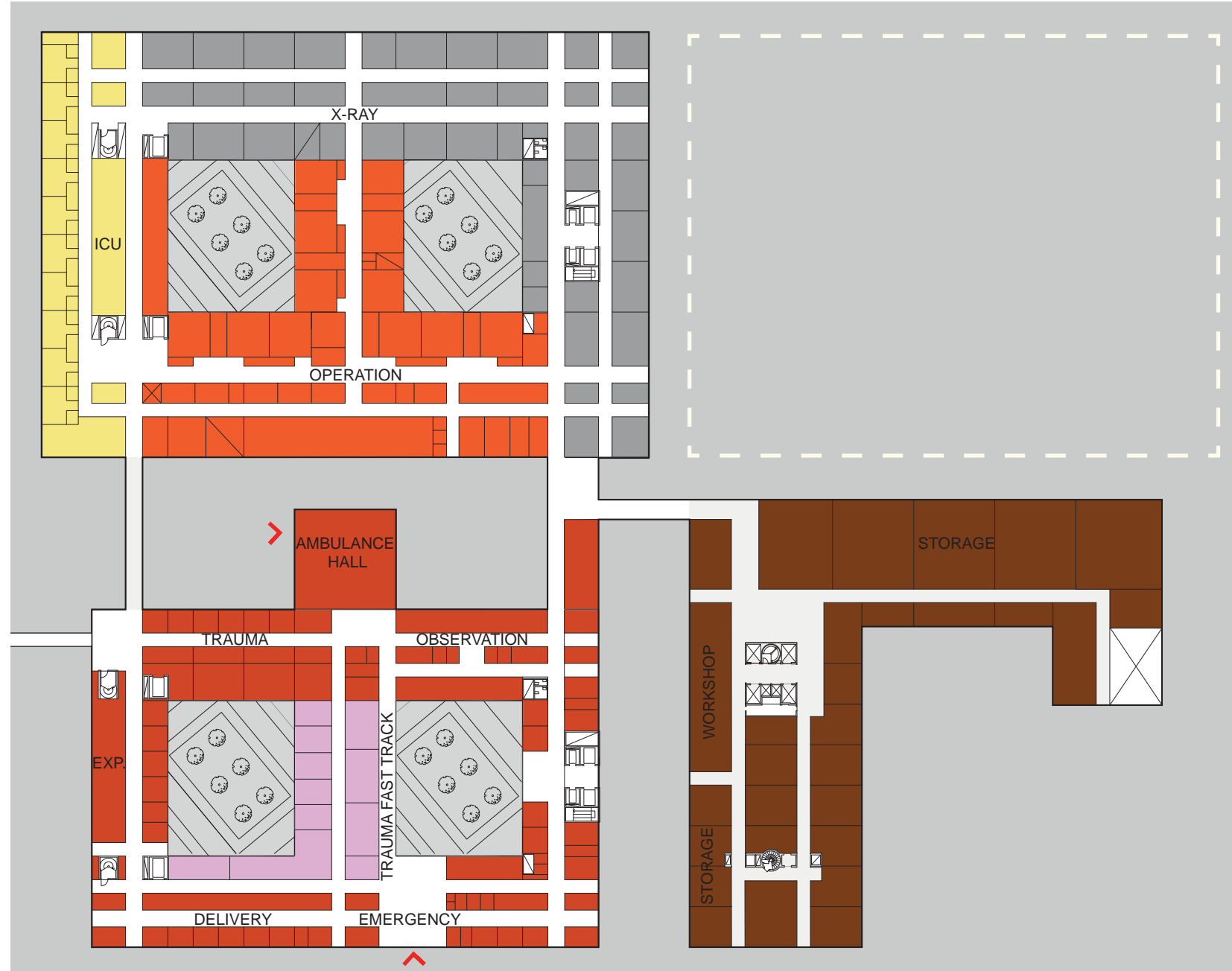
new building L'1
scale 1:1000

- technic
- support functions





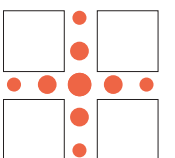
old building L'2

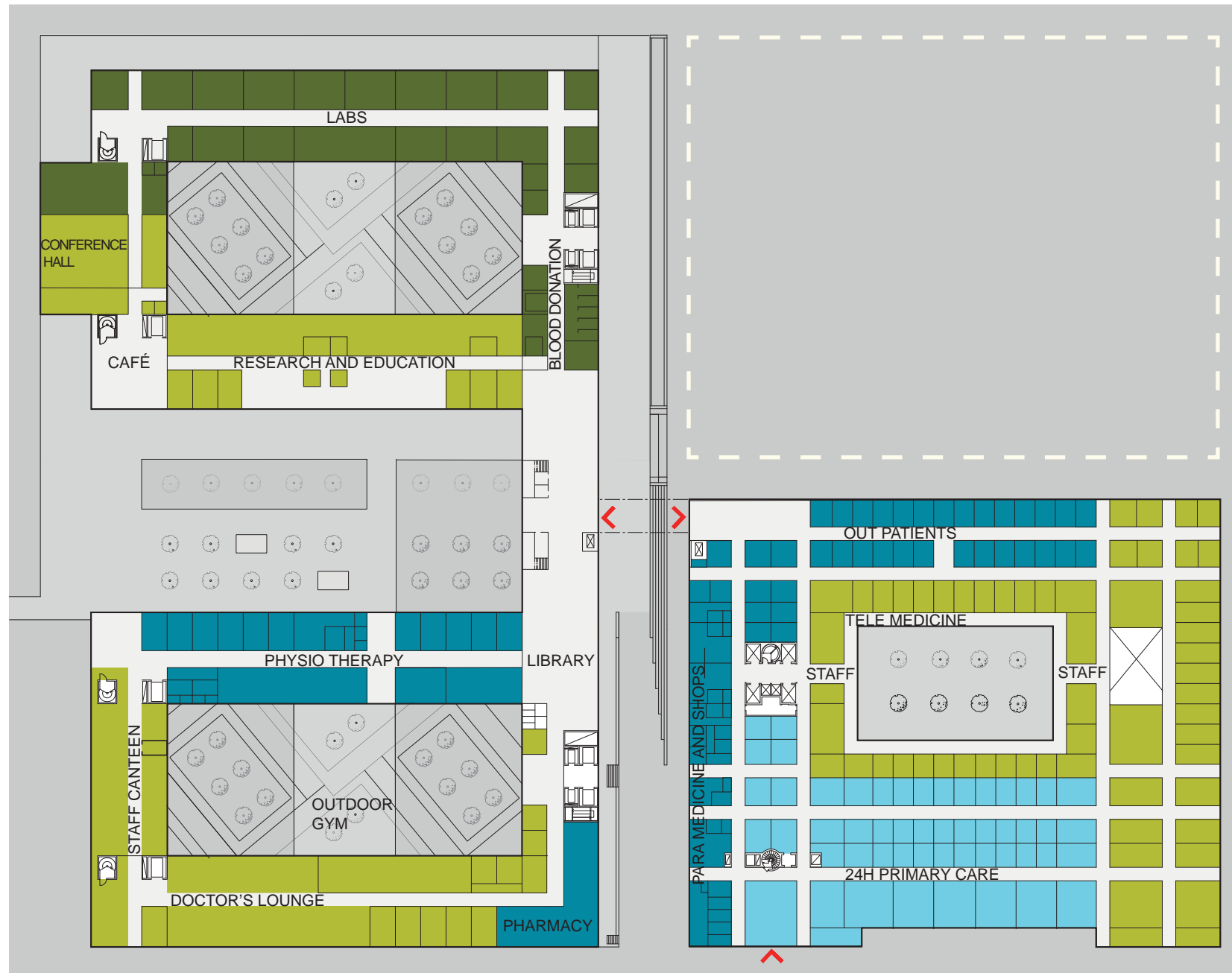


new building L'2
old building L'3

scale 1:1000

- emergency
- delivery
- ICU
- operation
- x-ray
- support functions
- technic

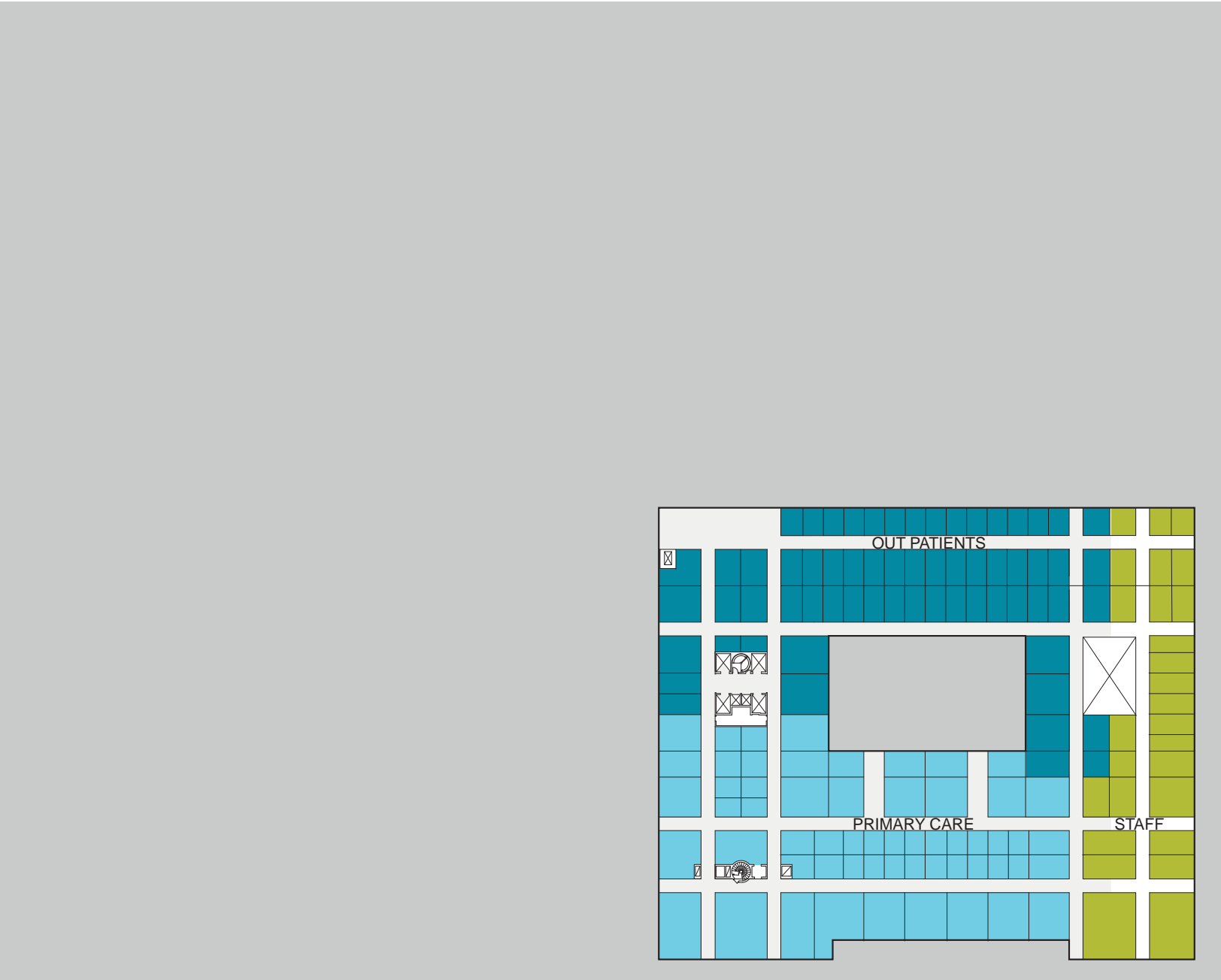




new building L'3
old building L'4
scale 1:1000

- outpatients
- staff functions
- primary care
- labs





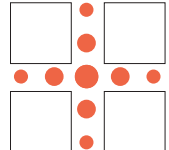
old building L'5

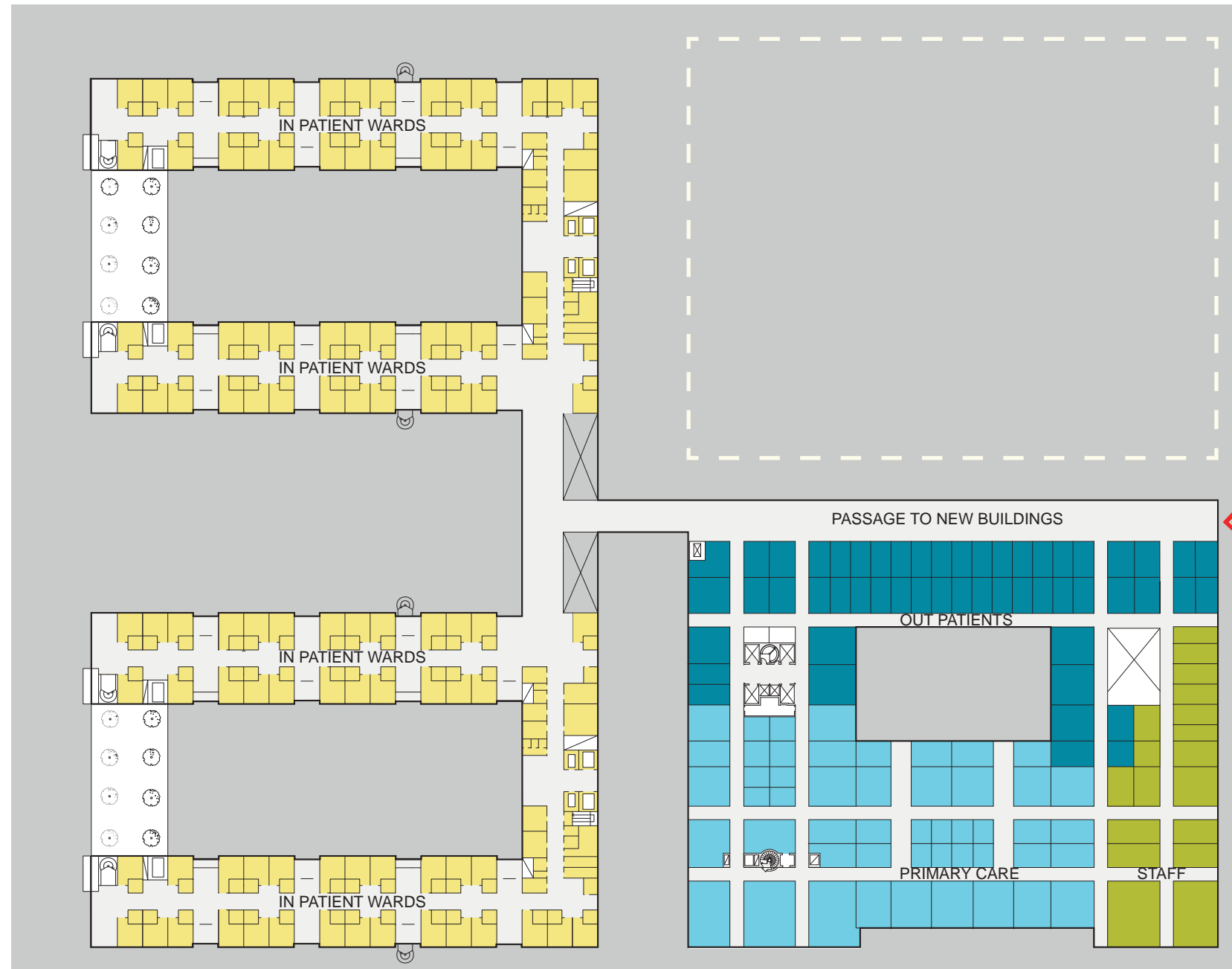
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outpatients

primary care

staff functions

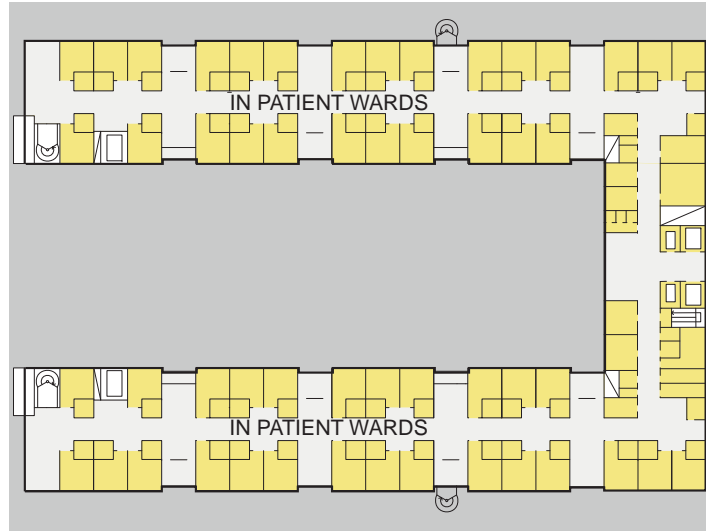




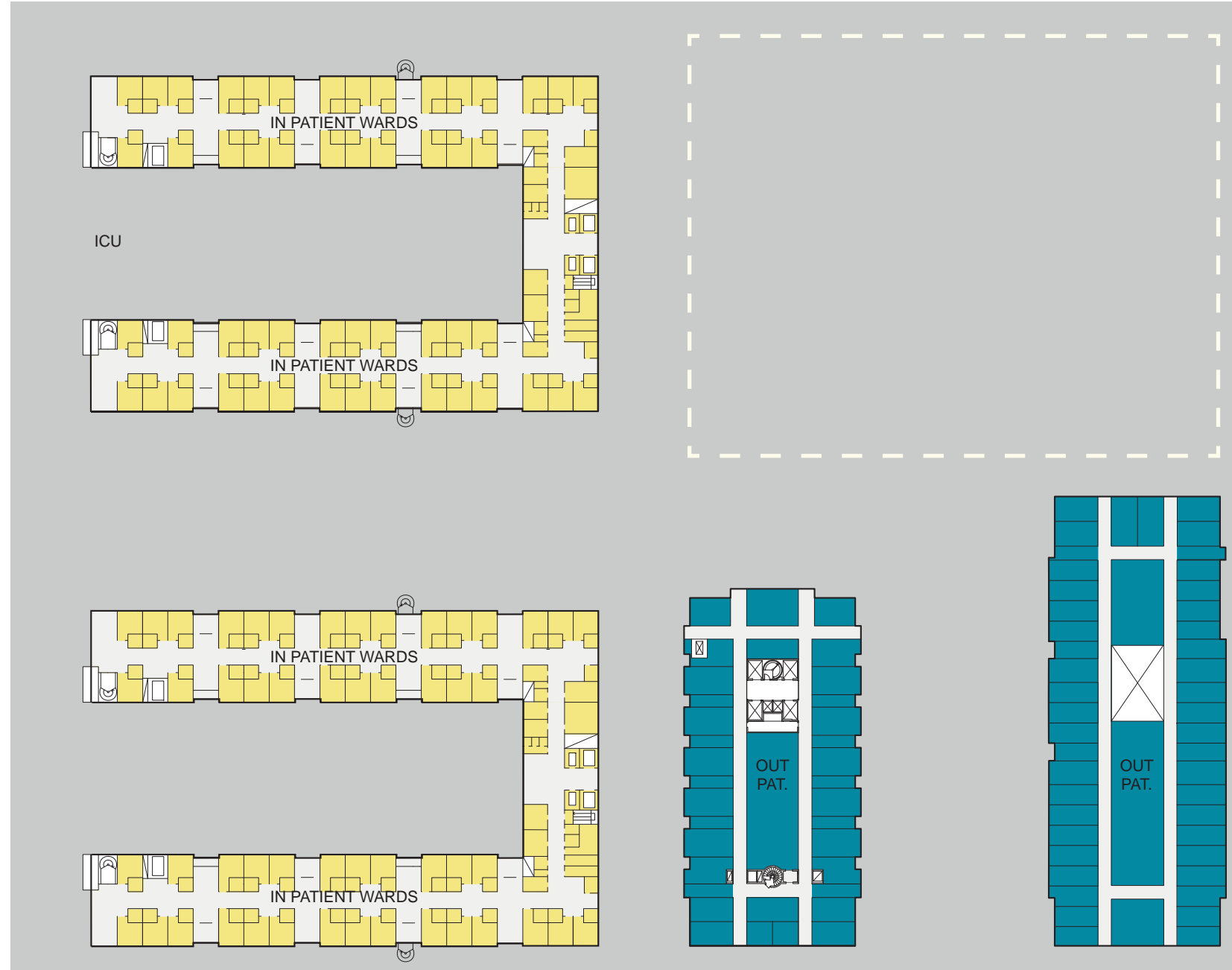
new building L'4
 old building L'6
 scale 1:1000

- inpatient ward
- outpatients
- primary care
- staff functions



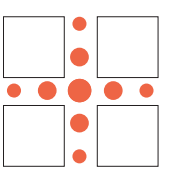


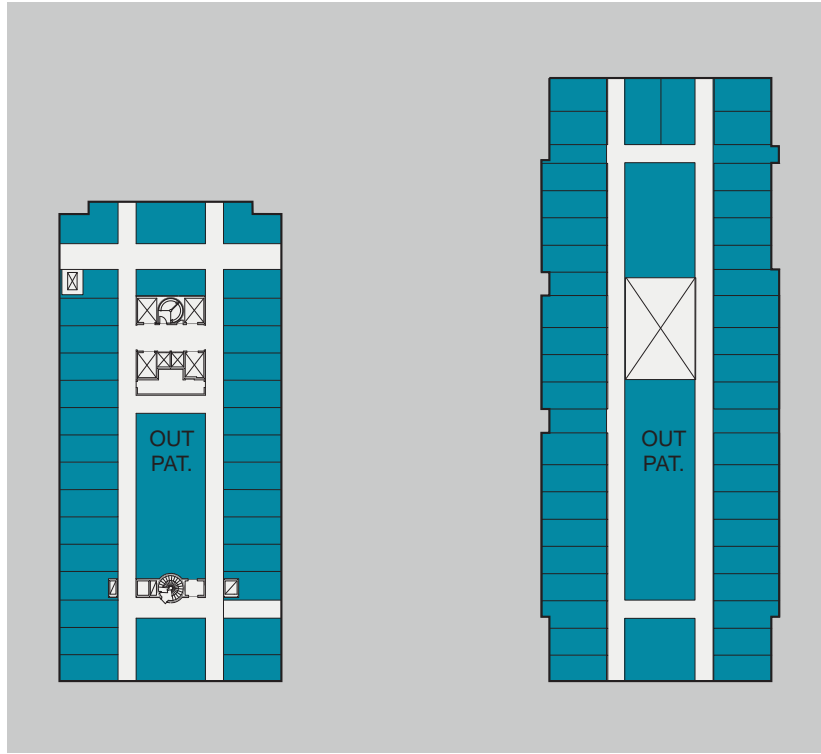
new building L'7



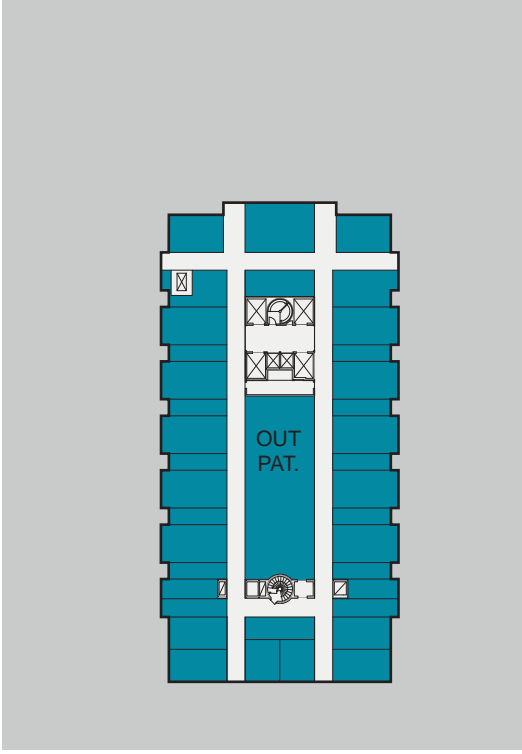
new building L'5 & 6
old building L'7 & 8
scale 1:1000

inpatient ward
 outpatients

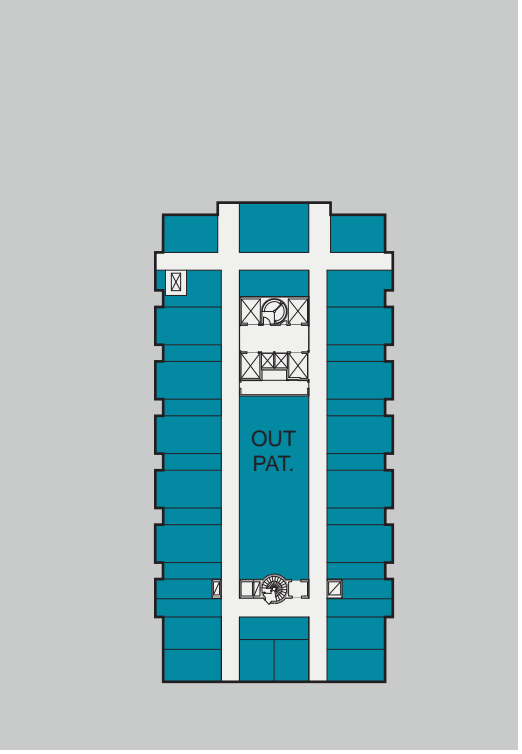




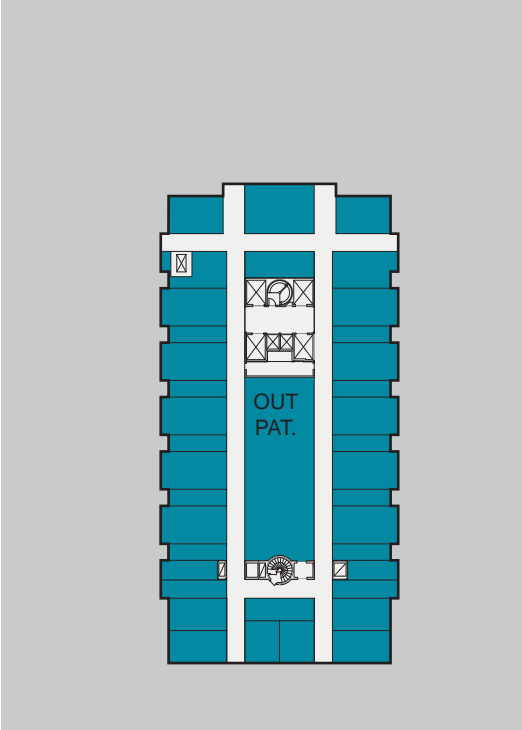
old building L'9



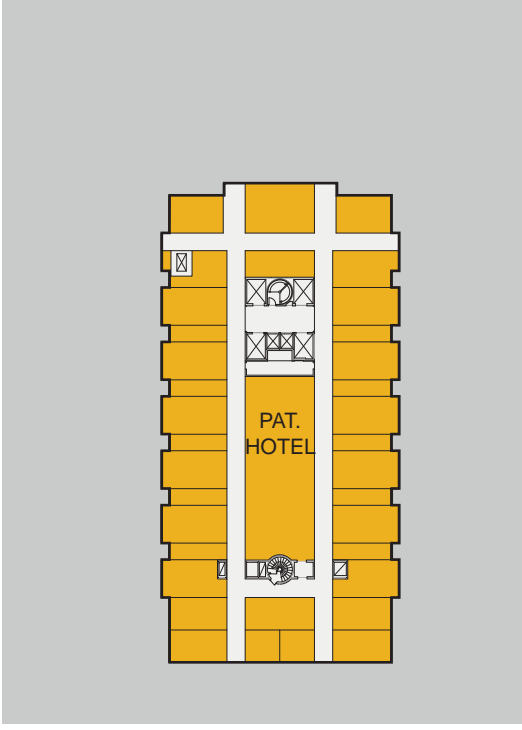
old building L'10



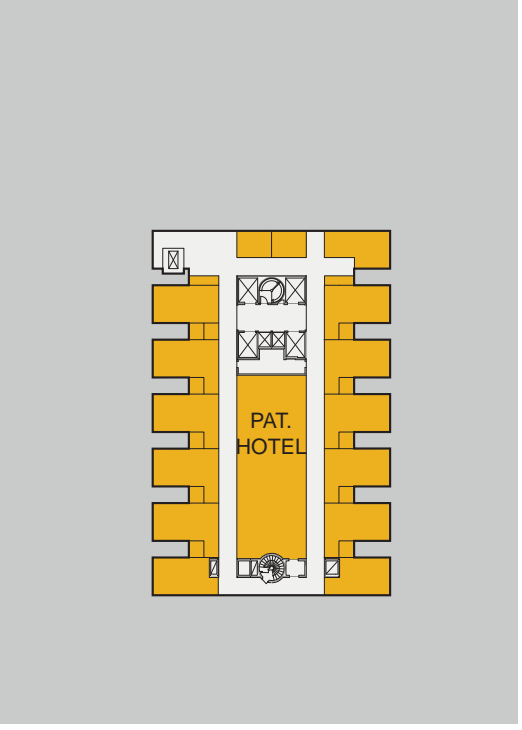
old building L'11



old building L'12



old building L'13



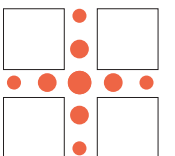
old building L'14

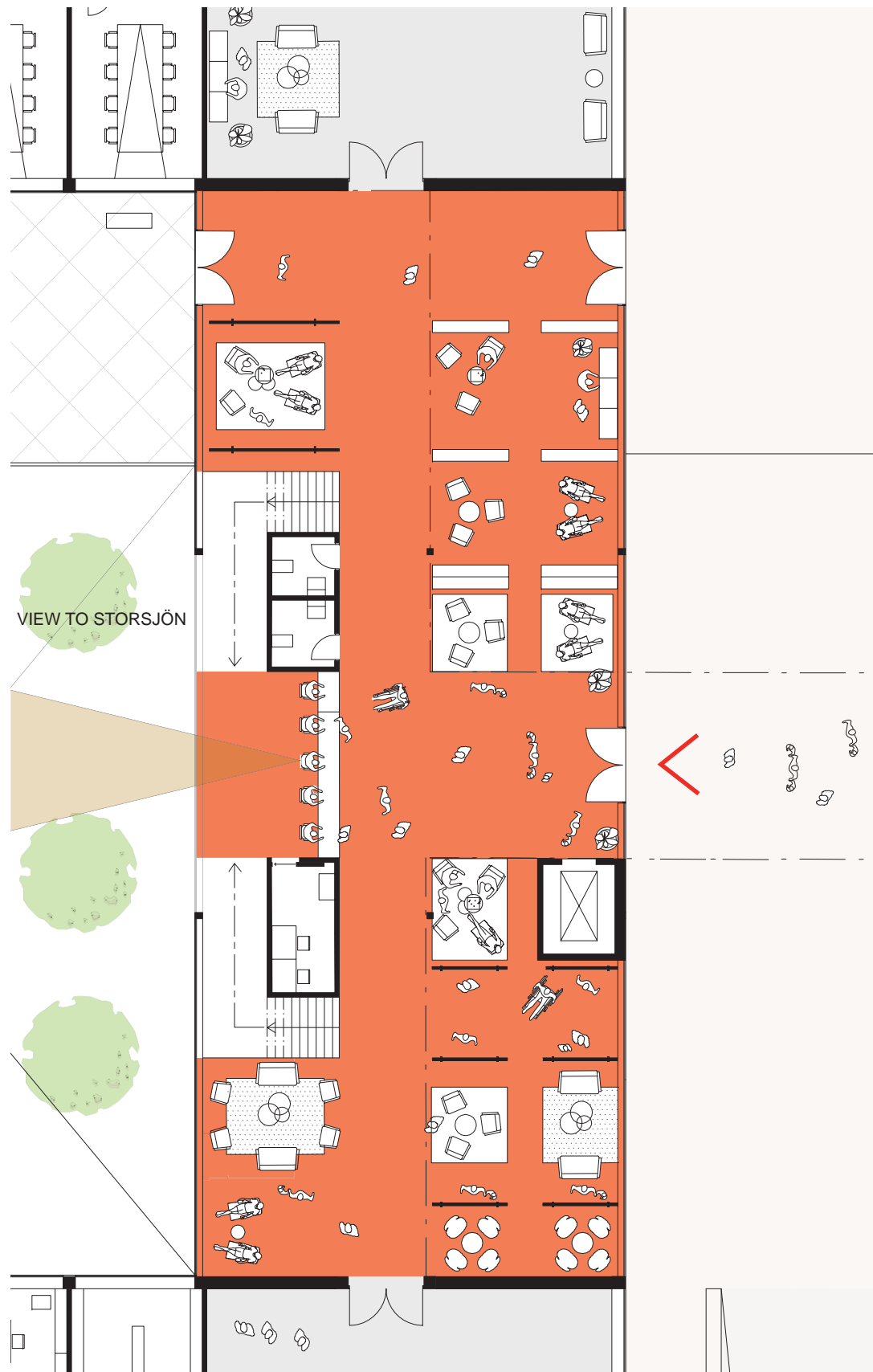
scale 1:1000

outpatients

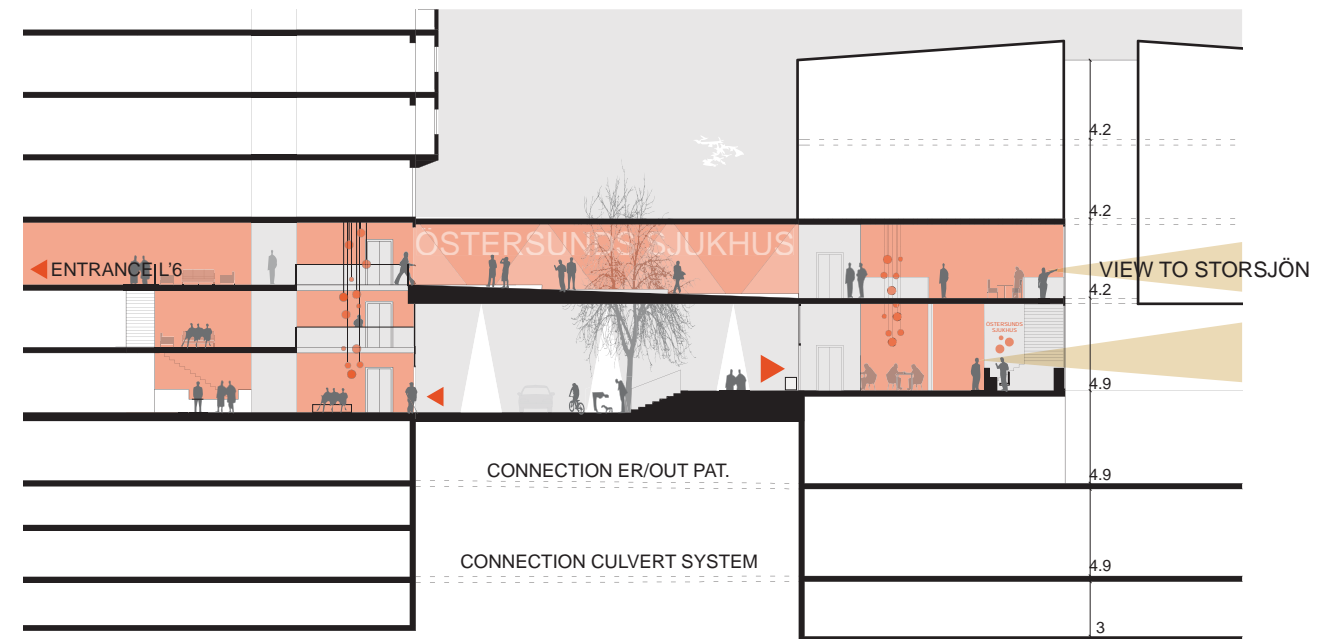
patient hotel







entrance hall
scale 1:200



entrance hall
scale 1:400

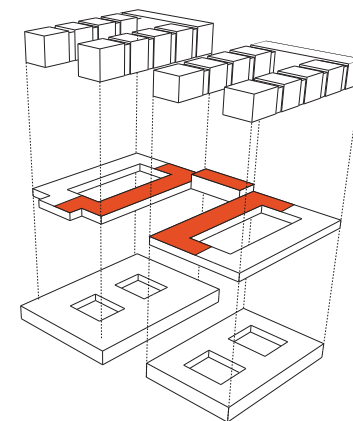


THE ENTRANCE

The commercial streets are prolonged throughout the hospital where the public can pass through. A skybridge connects level 6 in the old building to the new structure and creates a roof over the entrance area, framing the entrance while announcing the hospital.

When entering the entrance hall you are welcomed by the reception and the magnificent view of Storsjön. The open entrance hall is the synapse and the node in the hospital connecting all buildings.

The entrance connects to the open floor where healthcare meets the public, promoting and involving visitors about health and ongoing research. Activities involve for example a library, research and education facilities, café, conference centre, gym, canteen, doctor's lounge, blood-donation and labs.





← PATHWAY TO STORSJÖN

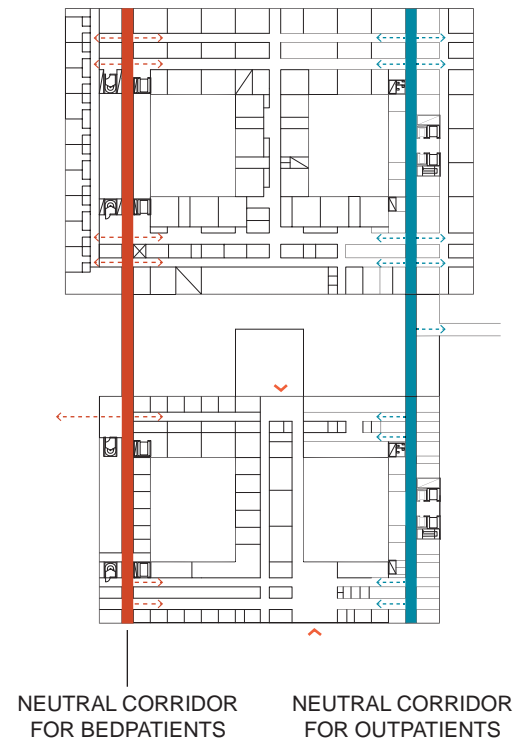
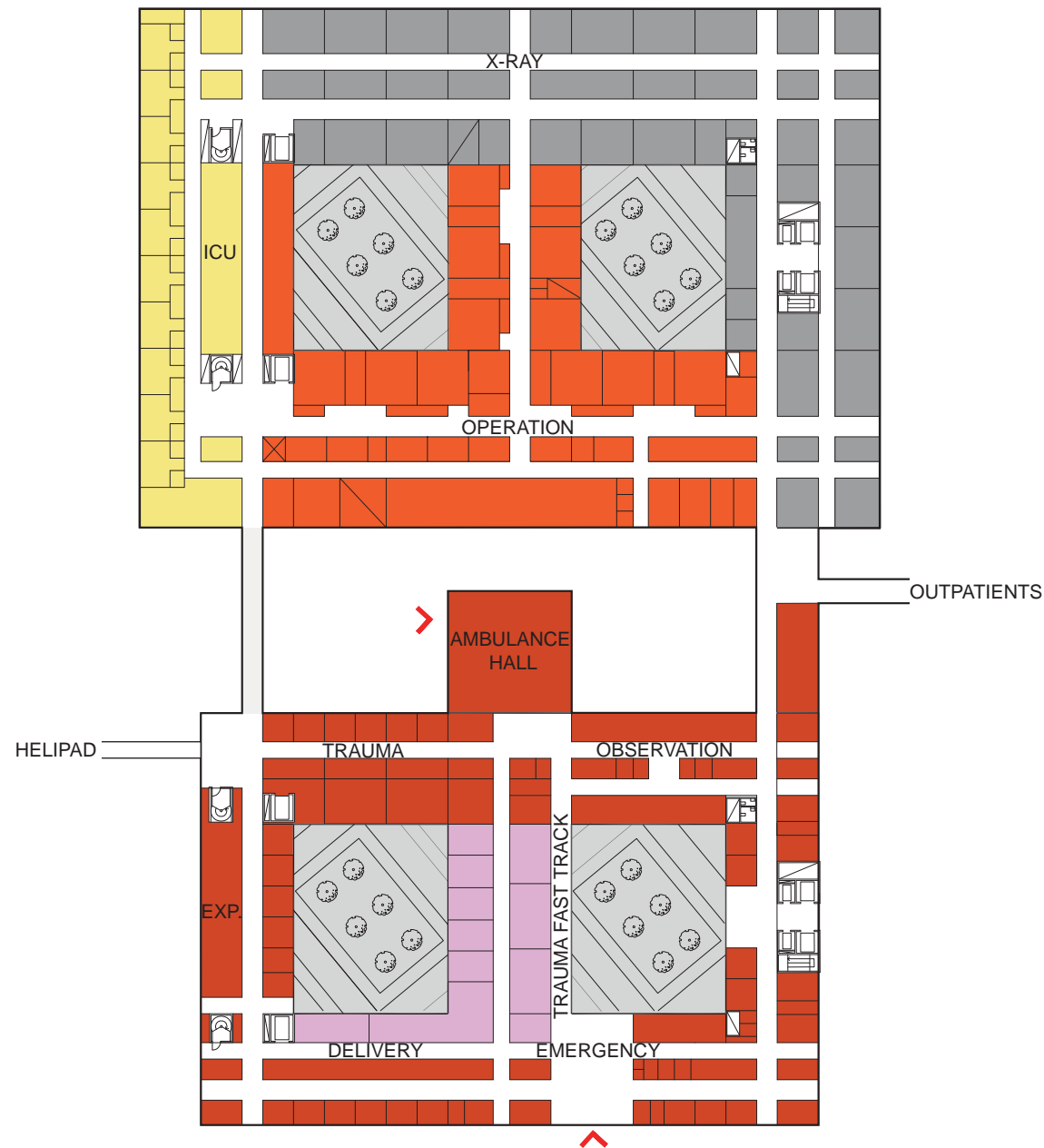
SECTION

SECTION

scale 1:400

4 M

20 M

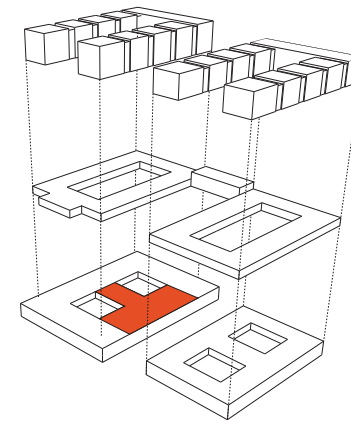


HOT FLOOR AND OP

- The hot floor includes
- Emergency department
 - Delivery
 - Intensive care unit
 - X-ray department
 - OP department

These functions are all connected to emergency and high technological care and benefit from being closely connected. X-ray, OP and ICU demand large technical areas and are therefore gathered within the same building with a connecting technical floor below.

The flows between outpatients and bed patients are separated between two neutral corridors. The bed patients are close to the elevators directly connecting up to the wards, while the outpatients move on the side connected to the main entrance.





- operating theatre
- pre-op/post-op
- support functions

scale 1:400
20 M

4 M

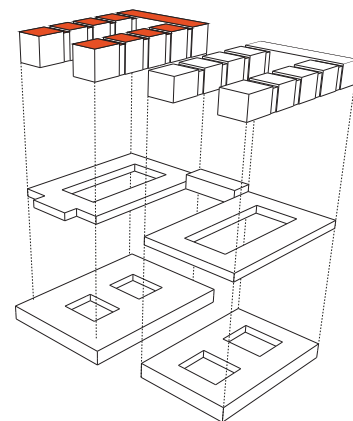


IN PATIENT WARD

Each level of wards are divided into two ward units with 26 patients each. In the two new buildings there are 360 single patient rooms, and the remaining 60 are located in the infection unit in a separate building.

To be close to the patients, the ward unit is divided into smaller teams with own teamstations and dayrooms. They are however visually connected throughout the corridor so that the teams can cooperate and help each other. These spaces create the synapse, the social spaces in between that are breaking up the building mass into smaller house units. They also break up the corridor both in material, activities and views.

In the end of the corridor there is an open view to Storsjön with a big diningroom and terrace. All dayrooms facing south have a balcony and all patient rooms have their own French balcony.

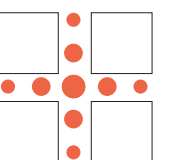
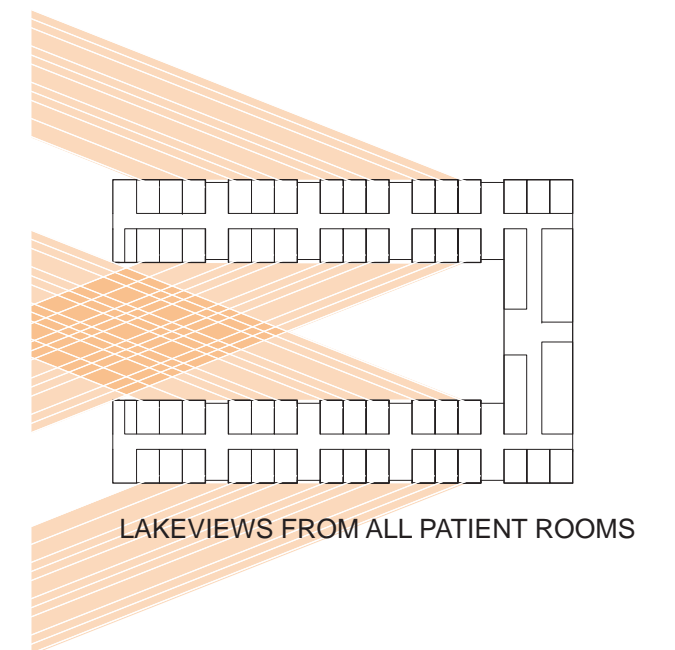
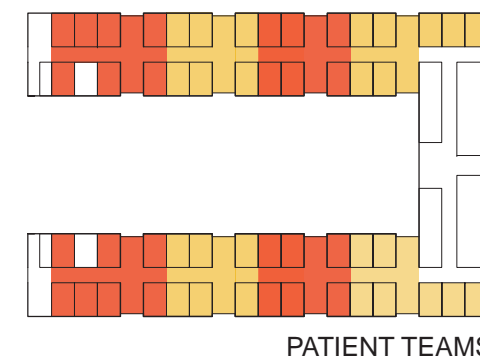
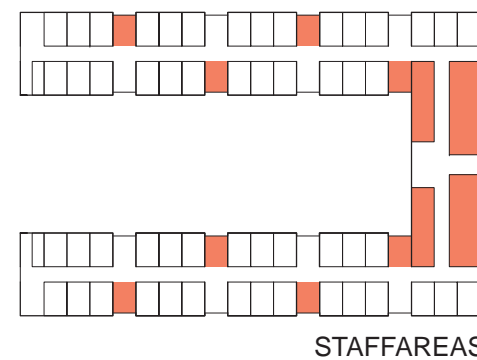
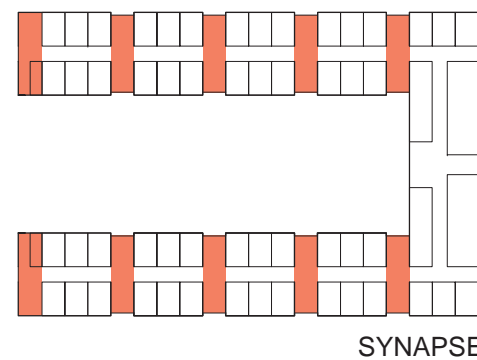


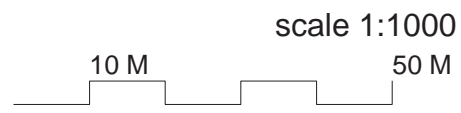
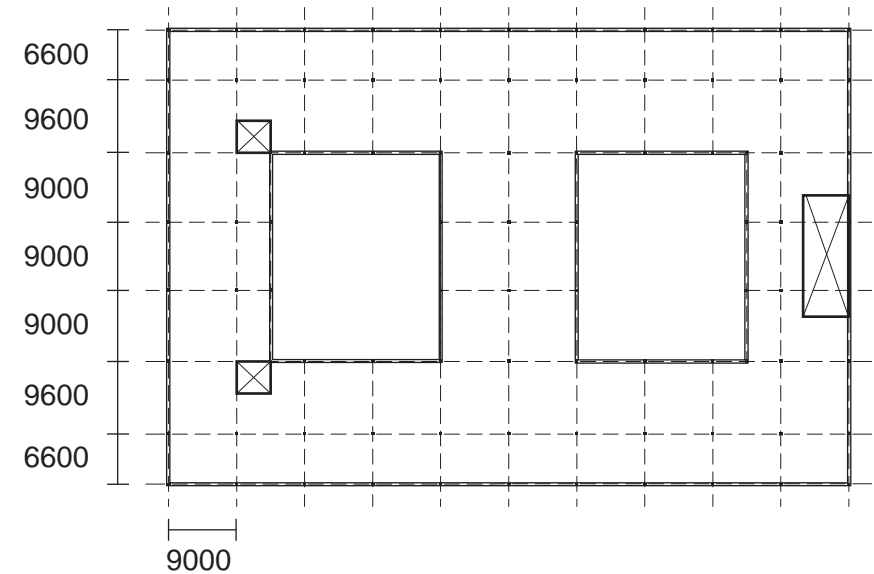
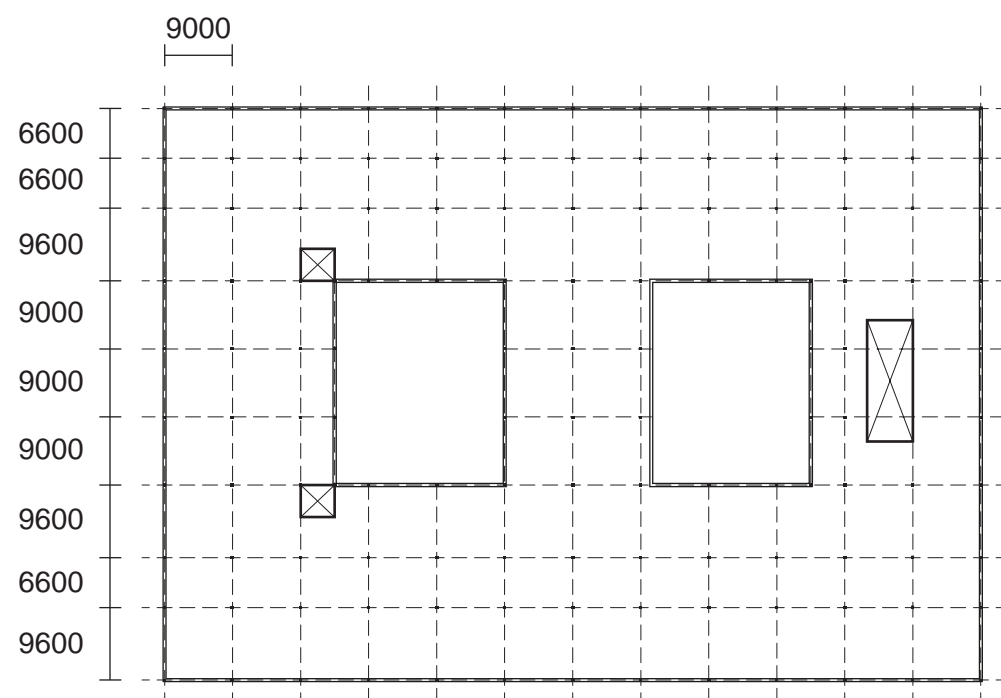
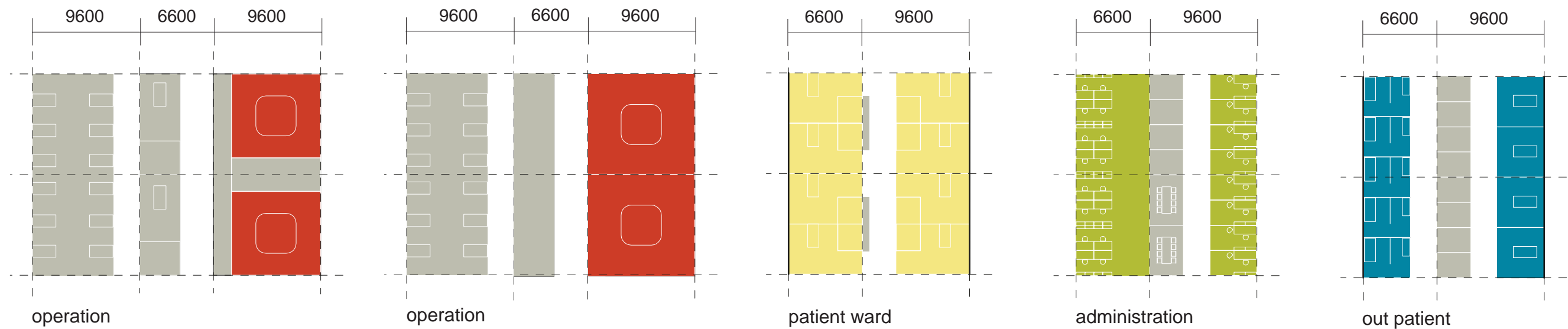


TEAMS AND PATIENT ROOMS

Within each team, the nurse station is centered in the middle to be as close to the patients as possible. The staff has a support room behind for small meetings and desk work. In the corridors, there are smaller units for storage and each patient room has a small disinfectant in the bathroom. Other support functions are shared between the two units.

The buildings are shaped and positioned so that all patient rooms have a lake view from the bed. The rooms are furnished with moveable furnitures that provide freedom and flexibility. The patient can move a chair to the window or sit by the table and enjoy a meal.





STRUCTURE

The grid system has been designed for flexibility with possible future development in mind. The slimmer building can host several different functions, answering to future changes. The hotfloor is designed with internal flexibility where for example operating theatres can grow over time.

FACADE

The three parts of the buildings are articulated in the facade. The compact plinth is made of brick with ribbon windows. The window system is adapted to the grid so that it can be divided into one, two, three or four parts.

The public floor is transparent with a glass facade which breaks up the building visually and blurs out the boundary between inside and outside.

The wards are divided into separate house units with a wooden facade. Each ward room has one window from floor to ceiling with a french balcony, that allows views over the lake. Every room also has a smaller window which creates privacy from the bed, but allows outlooks.

The facade to the west is facing the lake and becomes a part of the city skyline. The scale of the buildings are adapted to the existing city scale, both in width of the buildings and the blocks.



south facade



west facade
scale 1:400

