



Mantas Nainys, Ju Jing, Jim Ye Future vision for healthcare architecture autumn 2014 Chalmers University of Technology

## Background

Östersund Hospital is located in center of Östersund in northern Sweden. It's the sole hospital serving Jämtland county with an area of 49,443 square kilometres and a population of 127,000 inhabitants. The building has undergone several changes since first constructed in 1827. Today however, the hospital is in need of an upgrade to meet the new technology advancements and demands within healthcare.



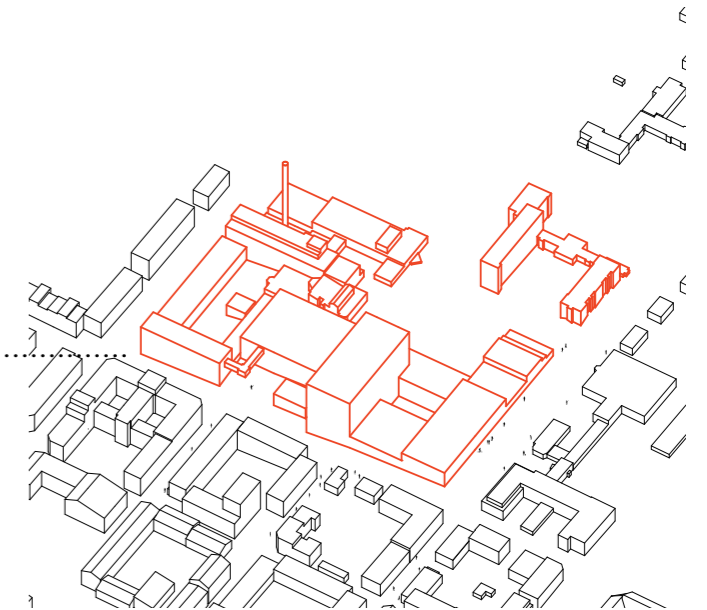
Sweden



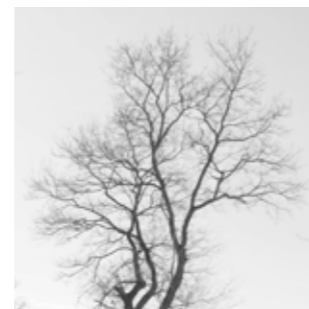
Jämtland



Östersund



Östersund hospital



## Concept

### CONNECTION TO THE CITY

- strengthen ward building's position as a landmark
- strengthen relation between hospital and the streets  
Prästgatan/Storgatan/Kyrkgatan
- emphasize main entrance

### EASY NAVIGATION

- connect buildings in a certain level
- make wayfinding simple and clear

### PRESENCE OF NATURE

- bring in nature to hospital
- create simple access to green space

## Research input



Lariboisière Hospital, Paris. Hospital buildings creates appealing inner courtyard space

Image source: [http://www.panoramio.com/photo\\_explorer#view=photo&position=2917&with\\_photo\\_id=96328398&order=date\\_desc&user=4081389](http://www.panoramio.com/photo_explorer#view=photo&position=2917&with_photo_id=96328398&order=date_desc&user=4081389)

### Input from theme 1:

A run through history was very handy to understand the structure and evolution of hospitals. The ones with linear spine and buildings arranged on it seemed to function well in terms of slower spread of infections and future development as buildings were able to be easily added/removed/replaced without interrupting the whole structure. ( e.g. Sahlgrenska hospital).

Florence Nightingale story showed how important general conditions are for patients - appealing environment, clean, airy, day lit spaces (things that architect is highly responsible for). It seems to be self understood, but the qualities we provide for patients in 21 century sometimes looks less appealing than it was a century ago. Image on the right Shows differences between iconic hospital built between 1901 and 1930 by Luis Domenech y Montaner, and new hospital structure completed in 2003. Ratio between green spaces around buildings and decrease in spacial qualities is extreme.

### Input from theme 2:

Increasing amount of respiratory illnesses are being caused by chemicals found in the indoor finishes, therefore new designs should aim for usage of natural materials.

Right placement of main entrance to the building and providing needed infrastructure (public showers; bicycle parking) can significantly increase usage of environment friendly public and bicycle transportation.

Landscaping solutions can help to stop and store rainwater.



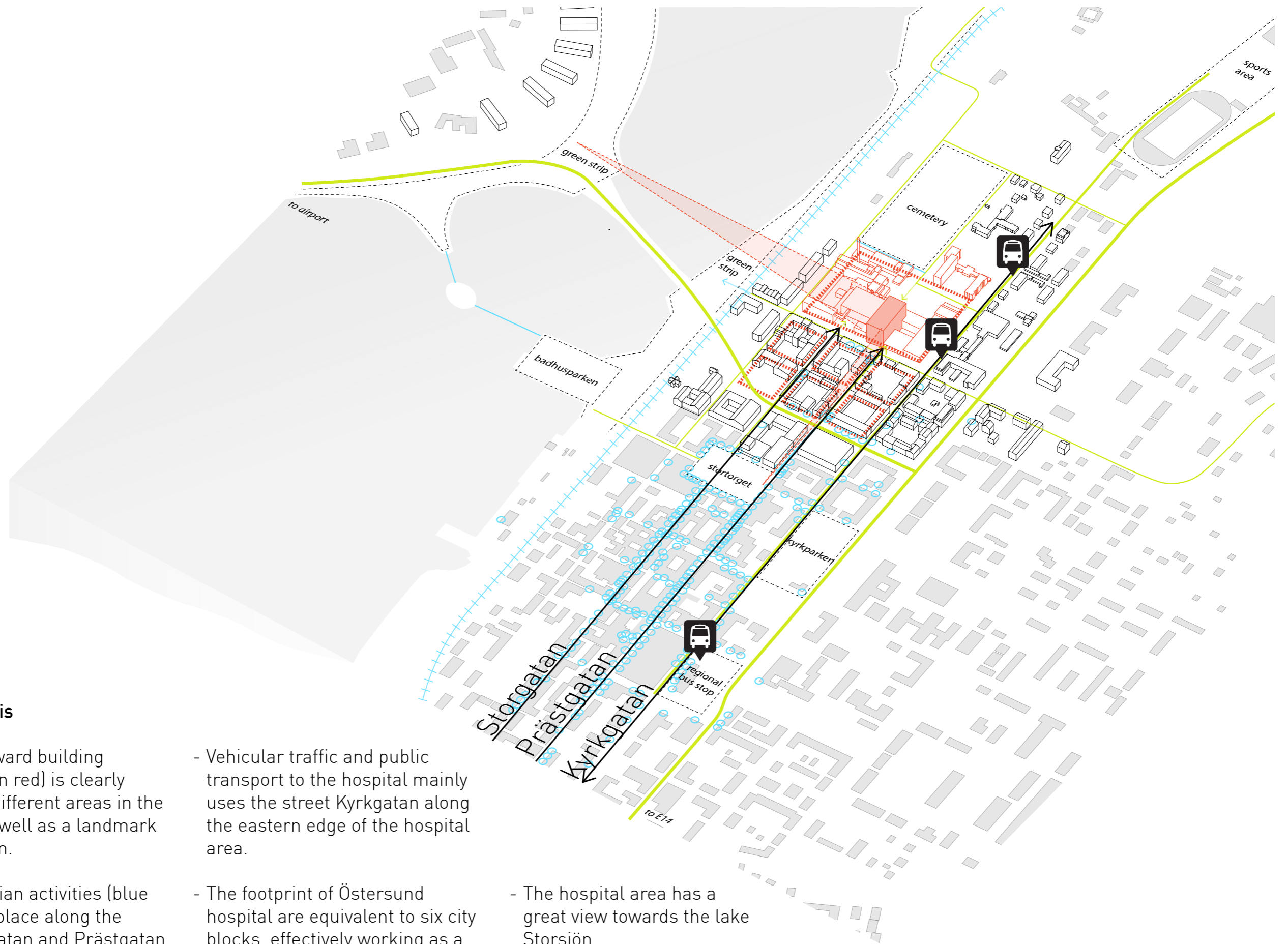
Lariboisière Hospital, Paris. Pavilion scheme implemented in a loop creates clear, highly connected structure and maximizes the usage of available space.

Image source: google maps



Hospital De la Santa Creu i Sant Paul, Barcelona. New(top) and old hospital parts and spaces between them, can be easily compared.

Image source: google maps

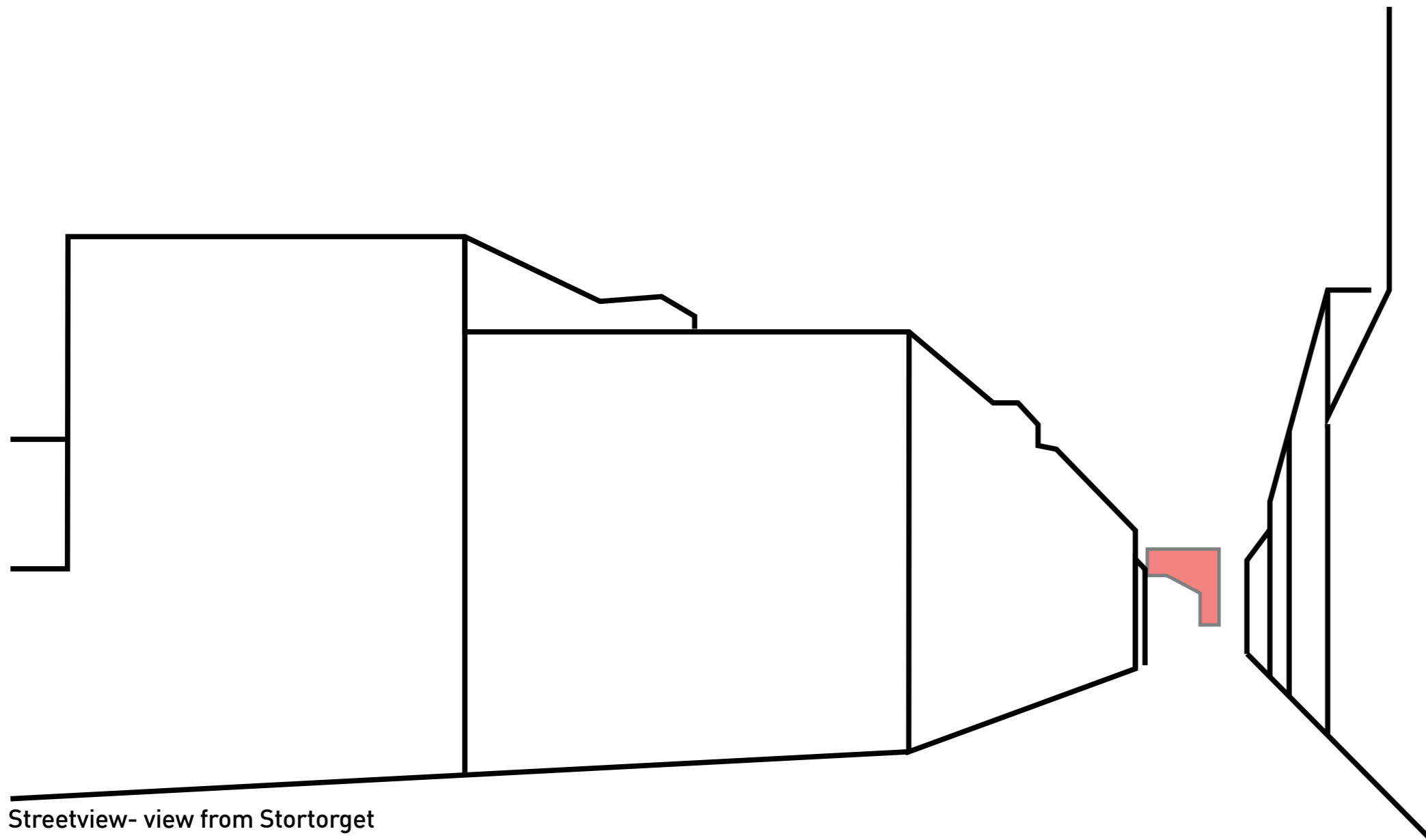


### Urban analysis

- The current ward building (highlighted in red) is clearly visible from different areas in the city. It works well as a landmark for orientation.
- Main pedestrian activities (blue circles) take place along the streets Storgatan and Prästgatan which ends at the boundary of Östersund hospital.
- Vehicular traffic and public transport to the hospital mainly uses the street Kyrkgatan along the eastern edge of the hospital area.
- The footprint of Östersund hospital are equivalent to six city blocks, effectively working as a boundary to the city's structure.
- The hospital area has a great view towards the lake Storsjön



Panorama - view from Frösön

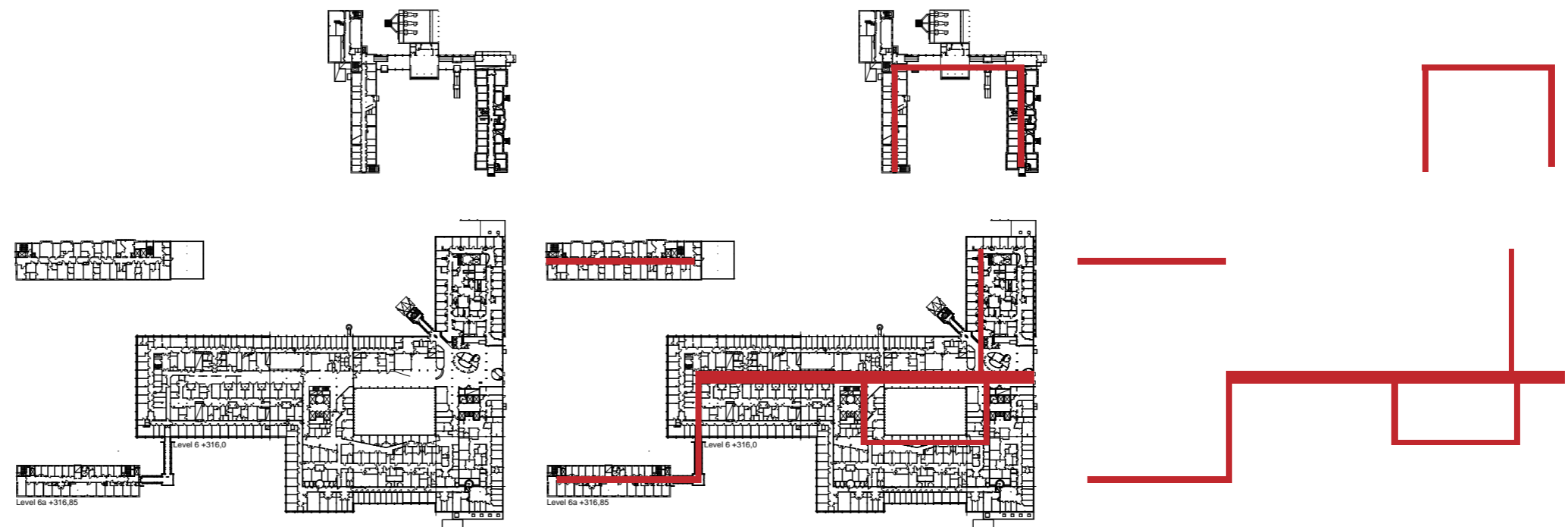


Streetview- view from Stortorget

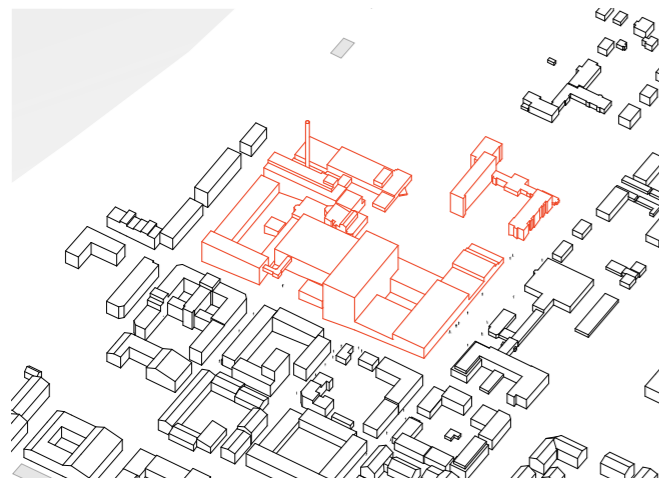


### Site analysis

- Complicated wayfinding, buildings from different centuries have been connected in an unlogical way. There isn't any floor that connect all building forcing staff rely on the culvert system and patient to go outside to move between buildings.
- None apparent main entrance combined with many regular entrances also makes wayfinding confusing. Patient are often reported to enter the wrong door.
- Lack of green. The hospital is mainly surrounded by streets and parking.



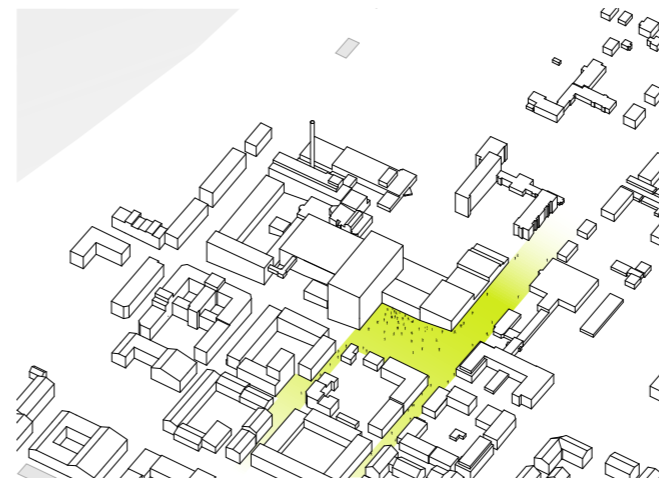
## Design process



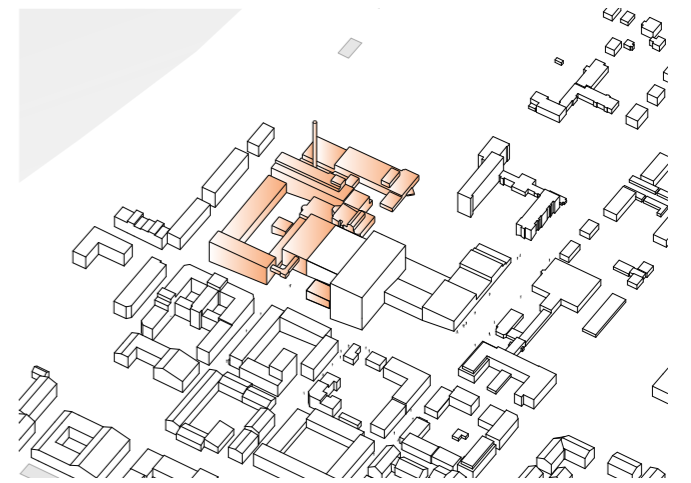
1. The hospital today



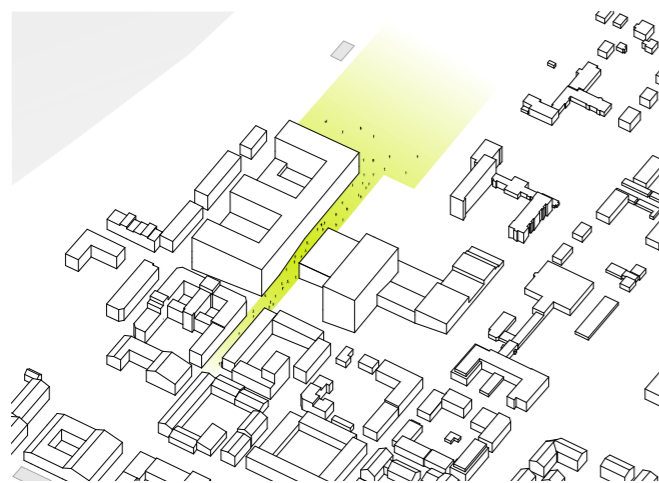
2. Corner meeting Prästgatan and Kyrkgatan deconstructed...



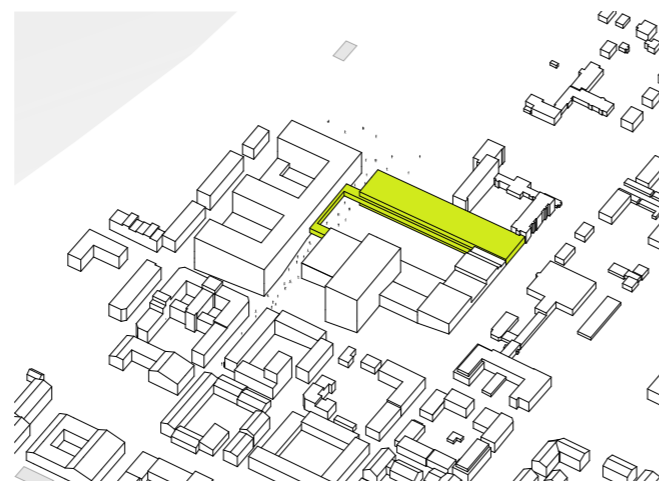
3. To create a new main entrance with a square



4. Older irrational located buildings deconstructed...



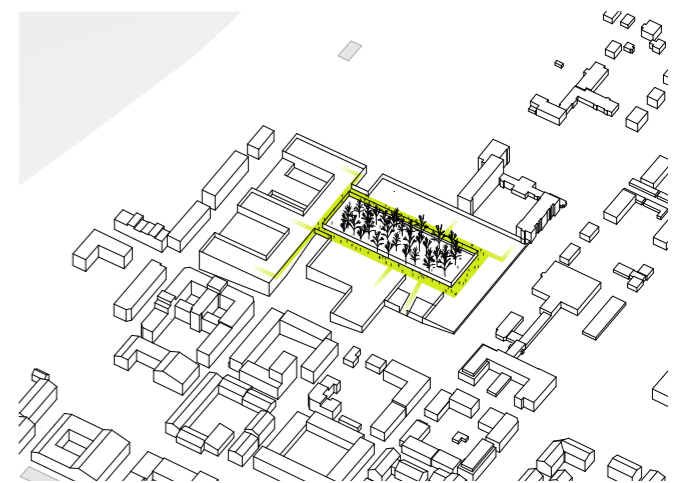
5. to leave space for new building for emergency and wards and to open up Storgatan towards cemetery



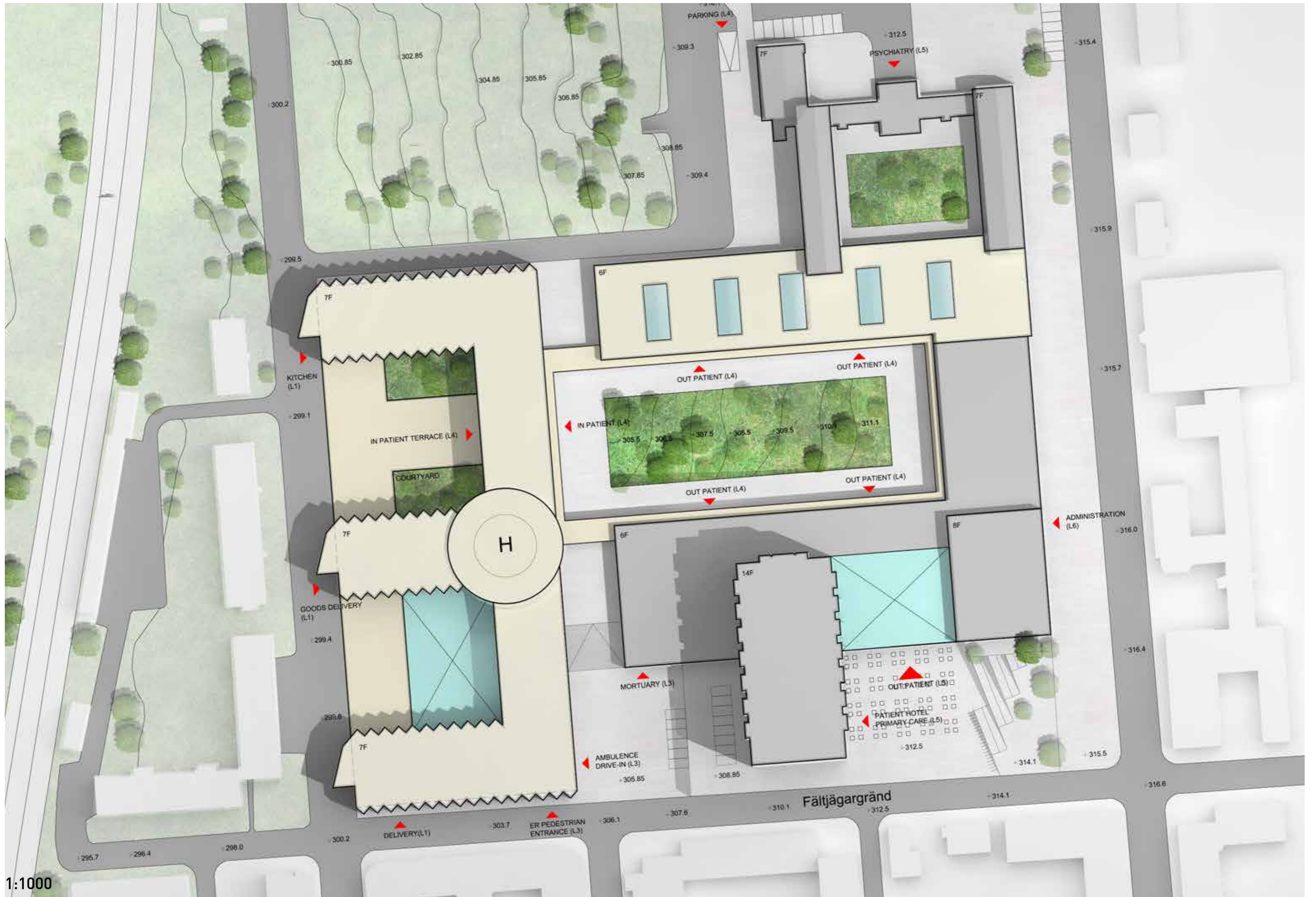
6. New building for expanded outpatient department connects all buildings



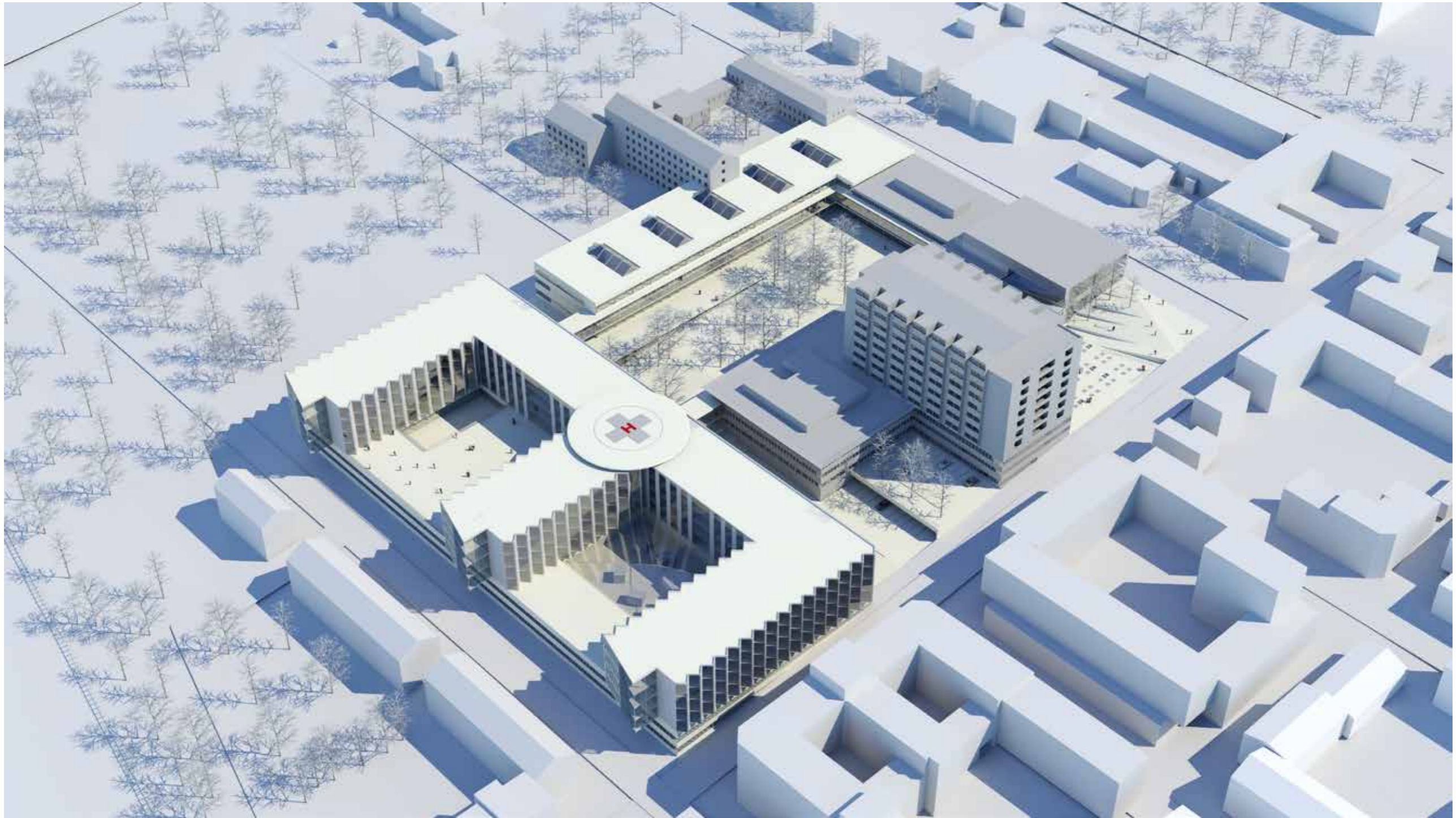
7. Framing an forest courtyard



8. Creating a main corridor along the facade around the forest courtyard







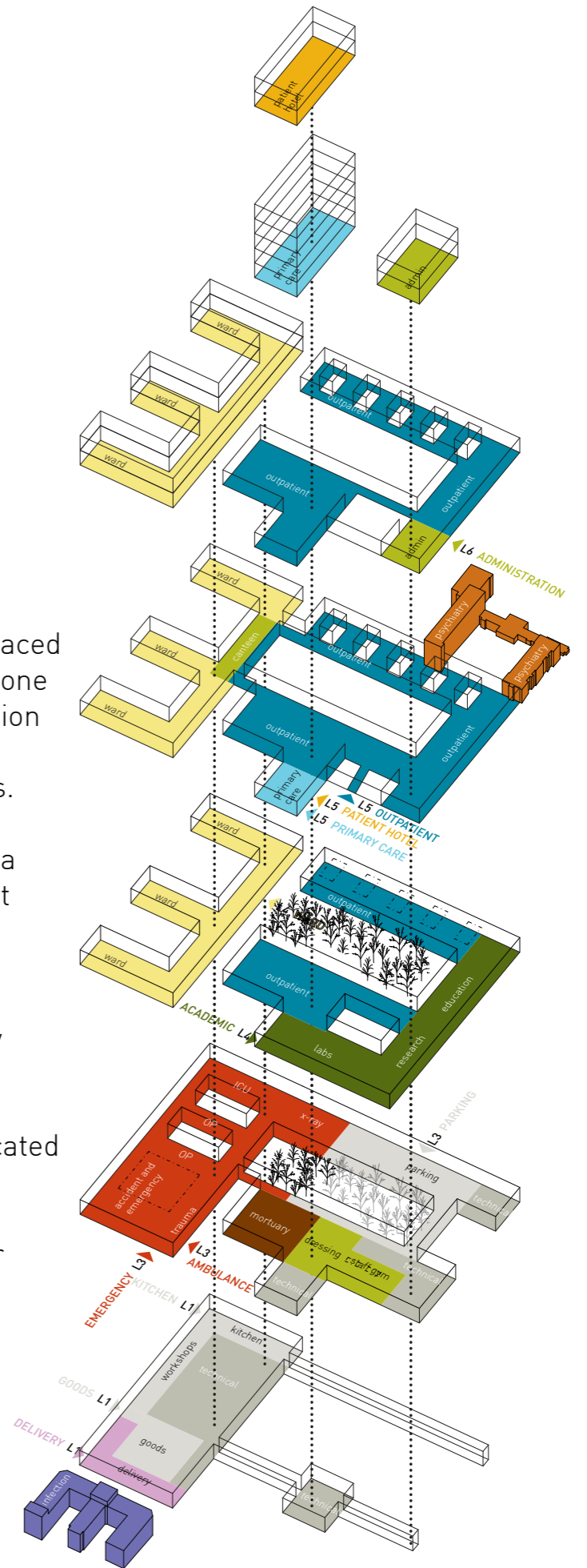
Overview



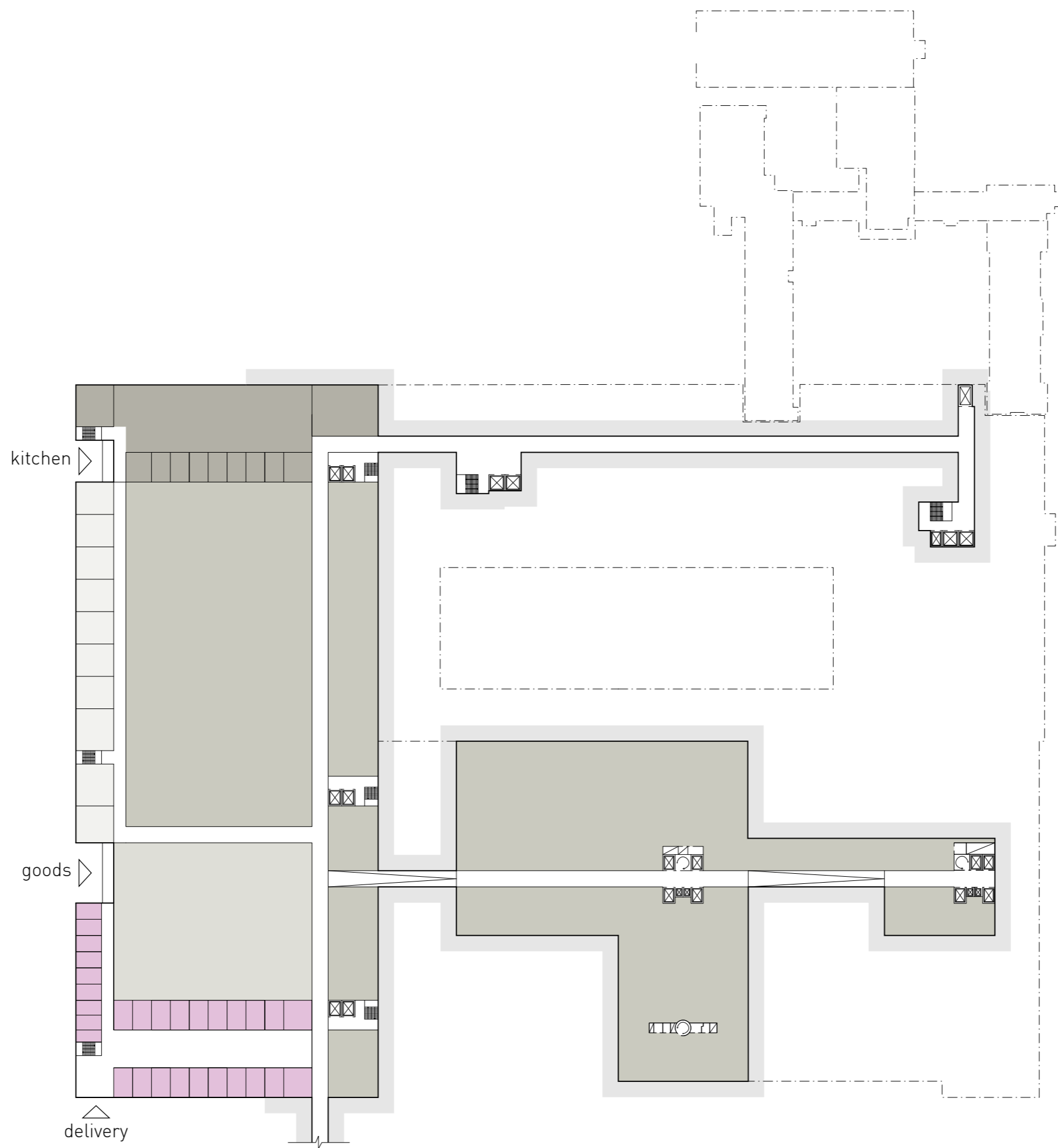
Forest courtyard

### Exploded axo

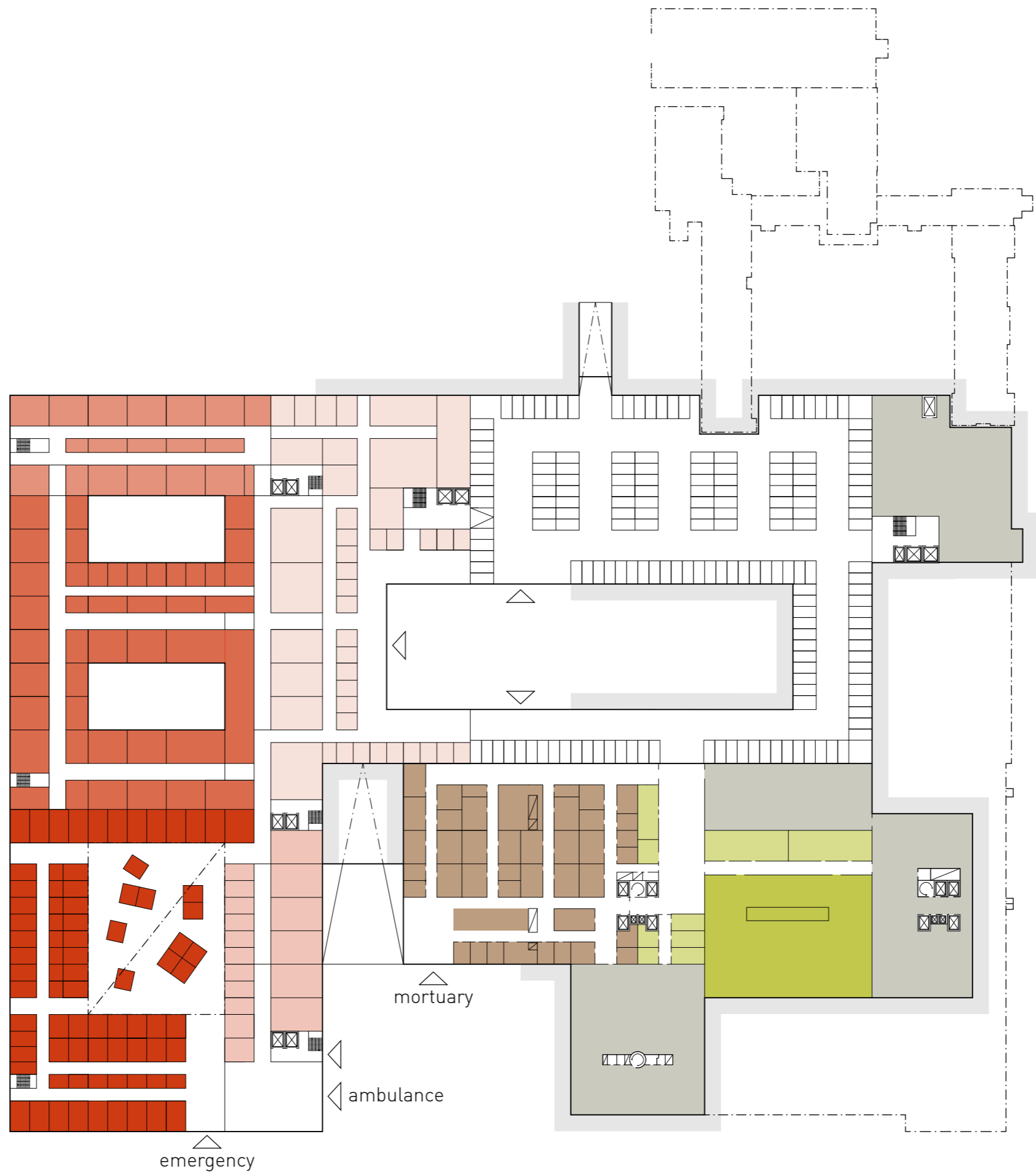
- Emergency and wards are placed towards the lake Storsjön in one block for simple communication between the two and to give great views for the inpatients.
- Canteen is located in the area where outpatient department meets wards with great view towards the lake as well.
- The forest courtyard is easily accessed from all buildings.
- More active functions are located around the main square.
- Psychiatry has its own minor courtyard.
- Goods are transported in an underground culvert system.
- Parking lots are located underground.



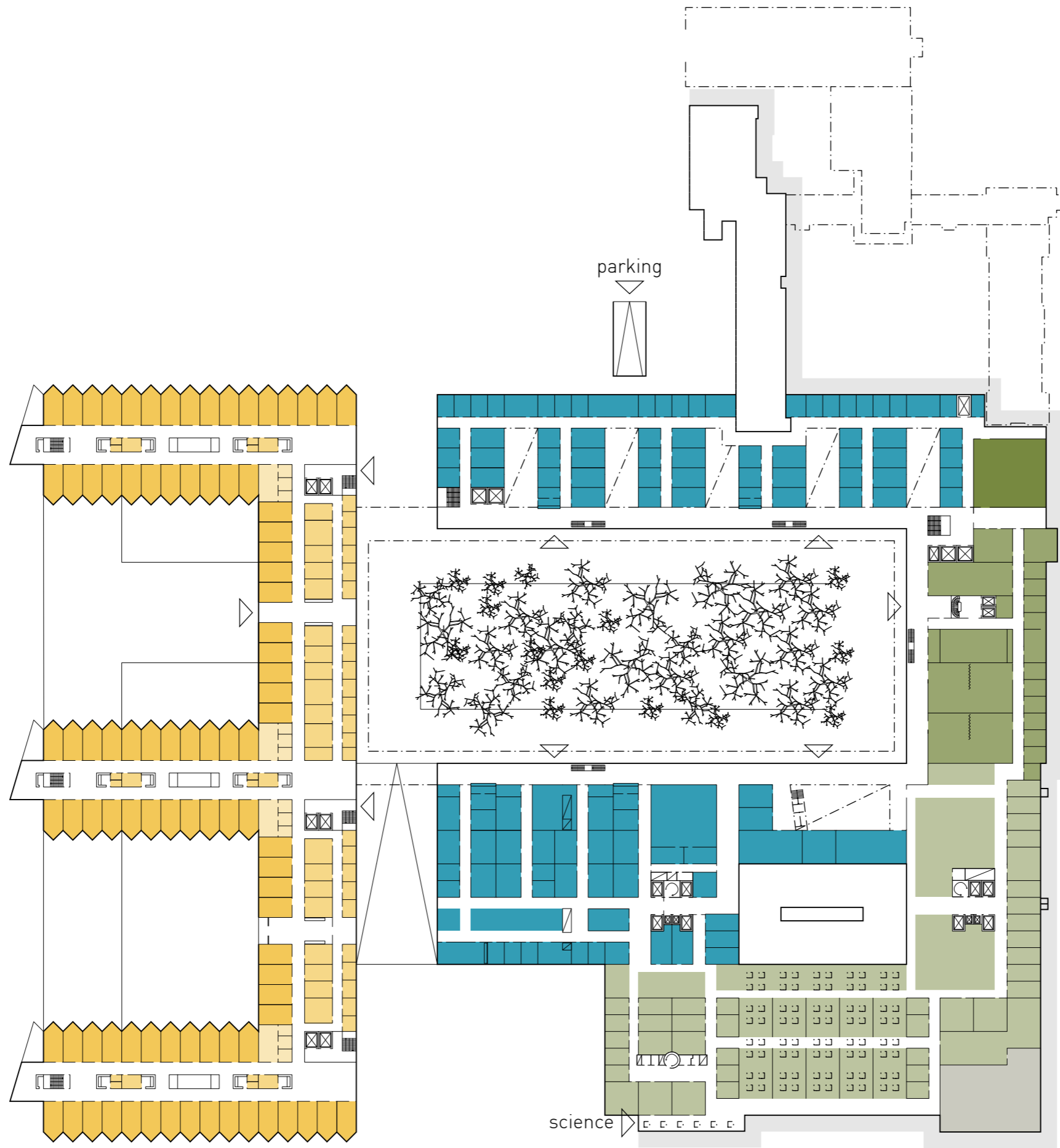
- Level 1-2**
- maternity
  - delivery
  - hospital support
  - kitchen
  - technical
  - goods
  - workshops

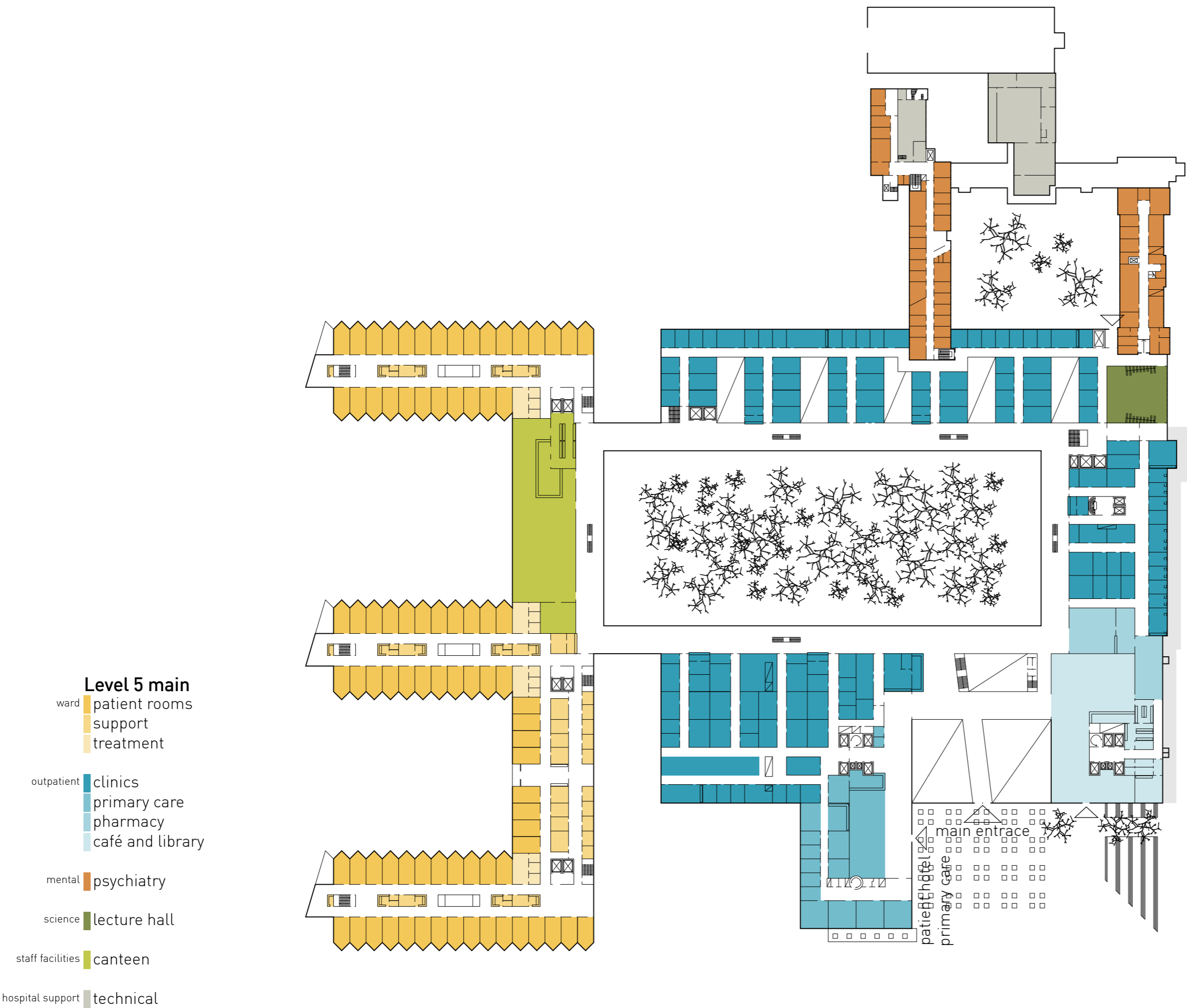


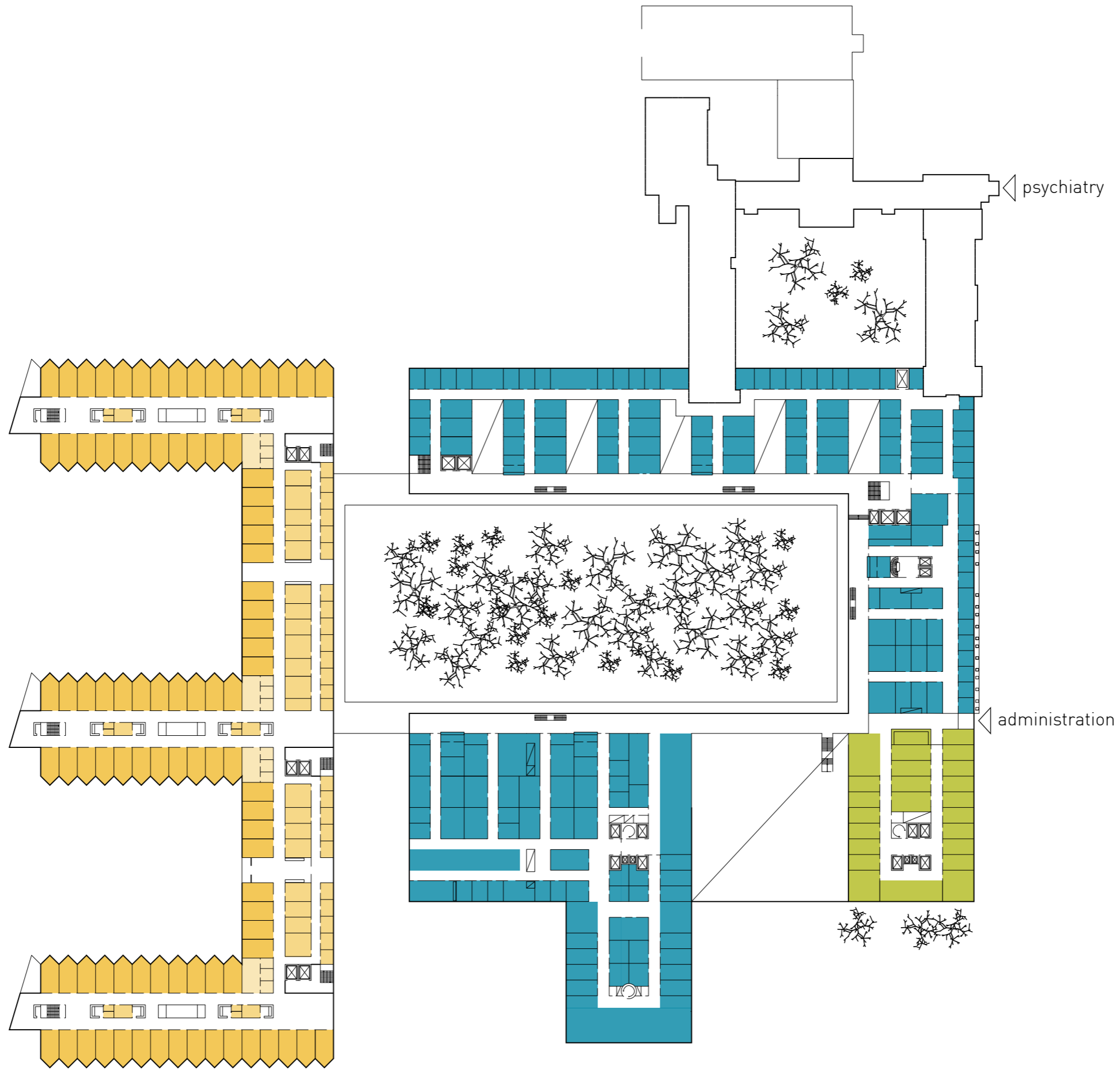
- Level 3**
- hot floor
    - emergency
    - OP
    - ICU
    - trauma
    - x-ray
  - mortuary
  - staff facilities
    - staff gym
    - changing
  - hospital support
    - technical



- Level 4**
- ward
    - patient rooms
    - support
    - treatment
  - outpatient
    - clinics
  - science
    - lecture hall
    - education
    - labs / research
  - hospital support
    - technical





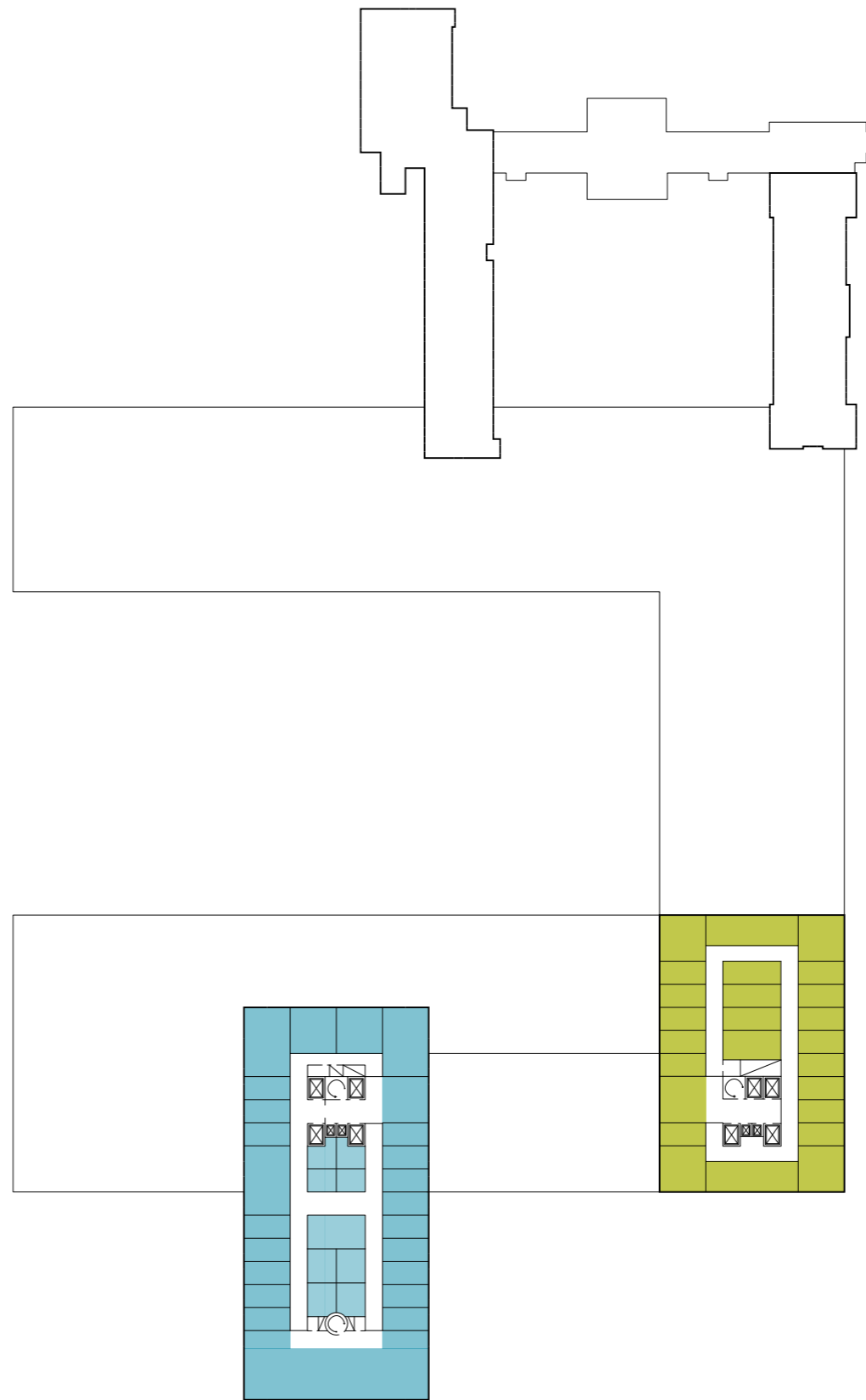
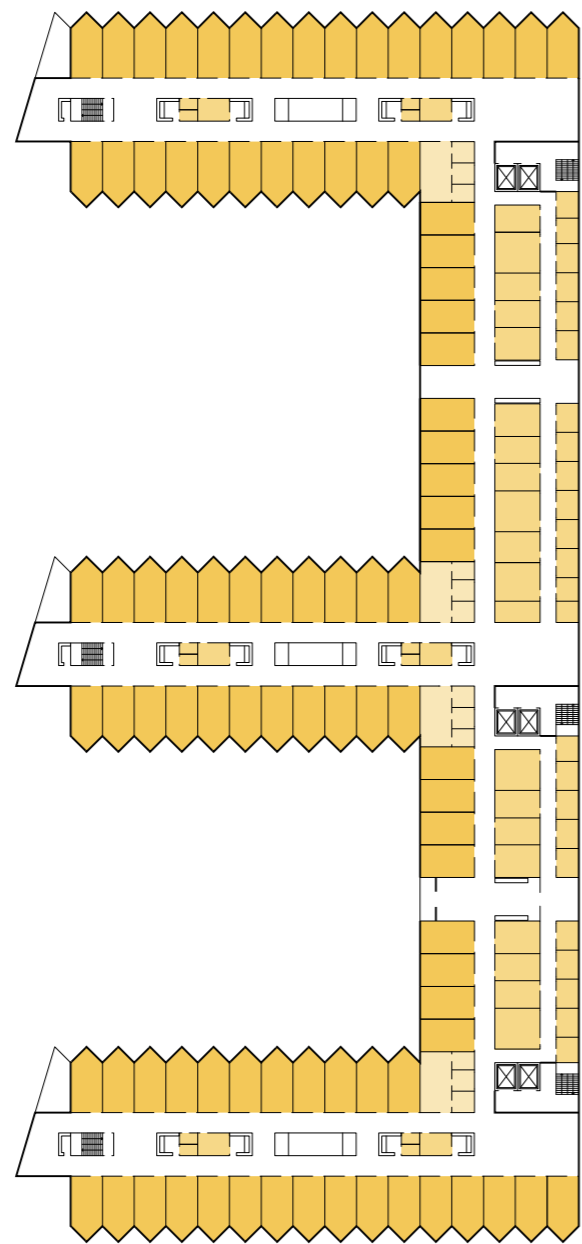


psychiatry

administration

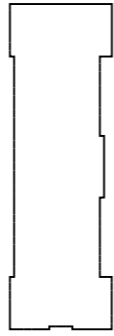
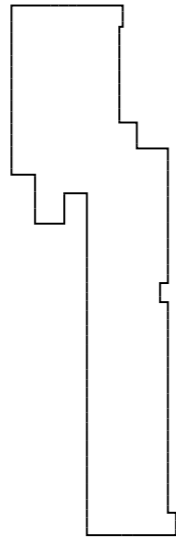
**Level 6**

- ward
  - patient rooms
  - support
  - treatment
- outpatient
  - clinics
- staff facilities
  - administration

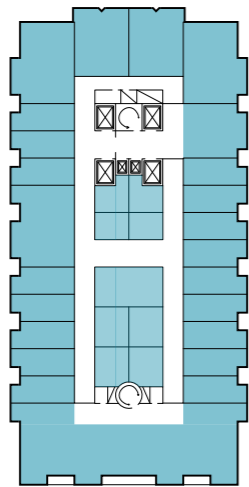


- Level 7**
- ward
    - patient rooms
    - support
    - treatment
  - outpatient
    - primary care
  - staff facilities
    - administration

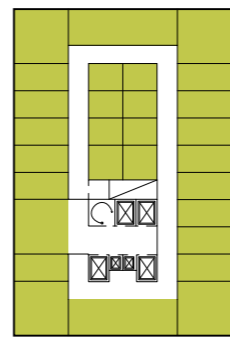




**Level 8-12**  
outpatient primary care  
staff facilities administration

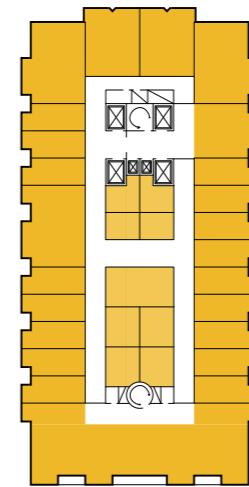


[Level 8-12]



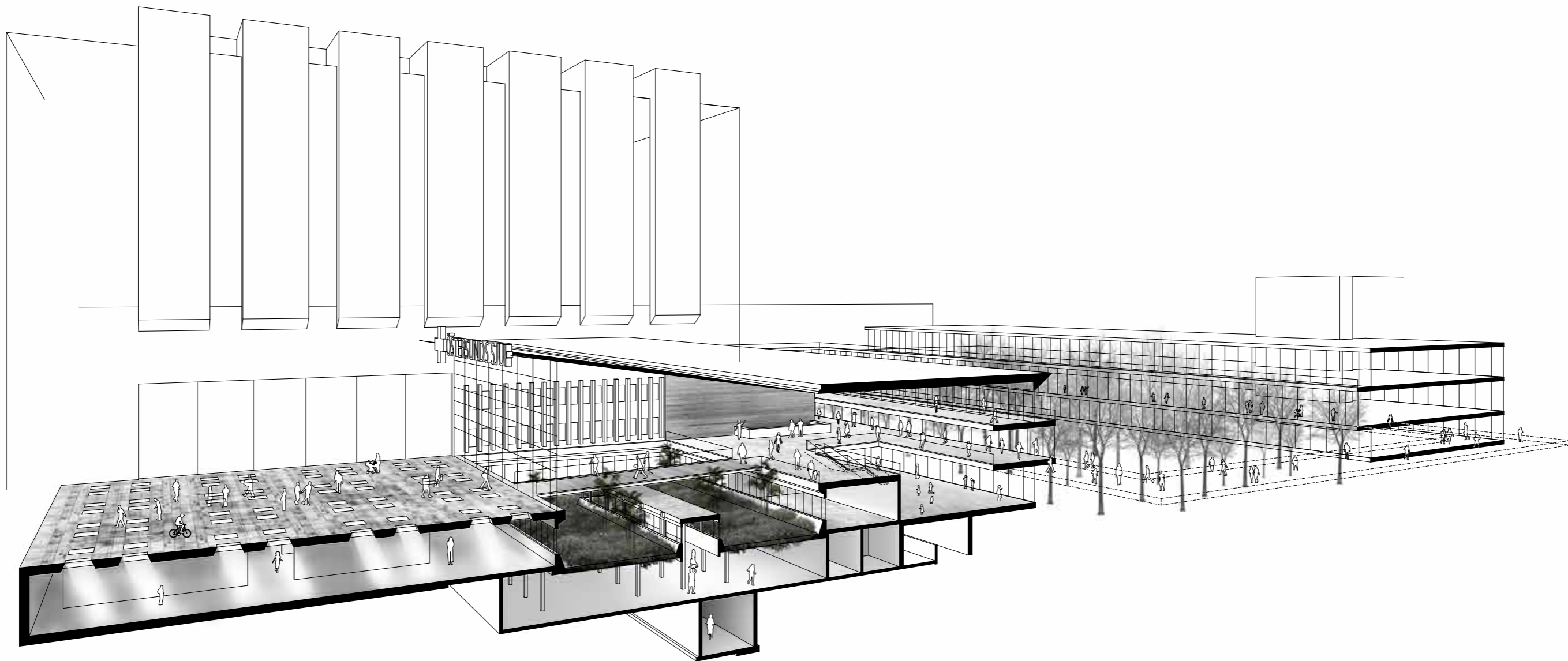
[Level 8]

**Level 13-14**  
outpatient patient hotel





Main entrance square



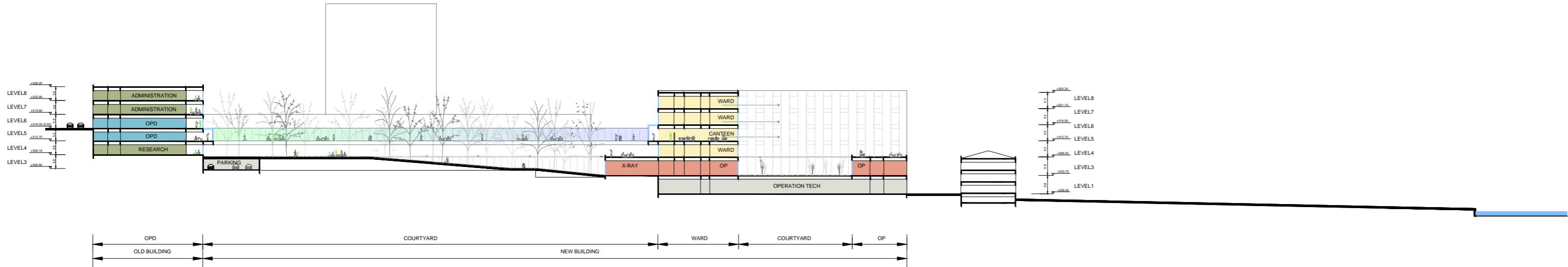
Entrance sequence



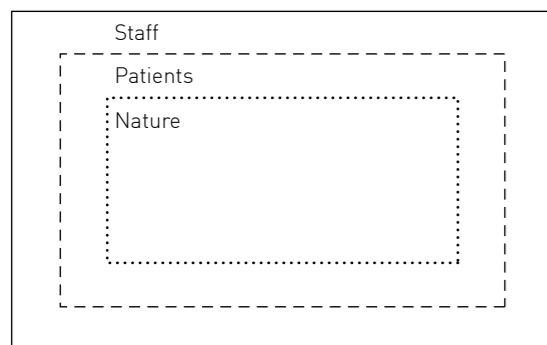
Forest courtyard



Loop - main corridor



Forest courtyard section



### Flow concept

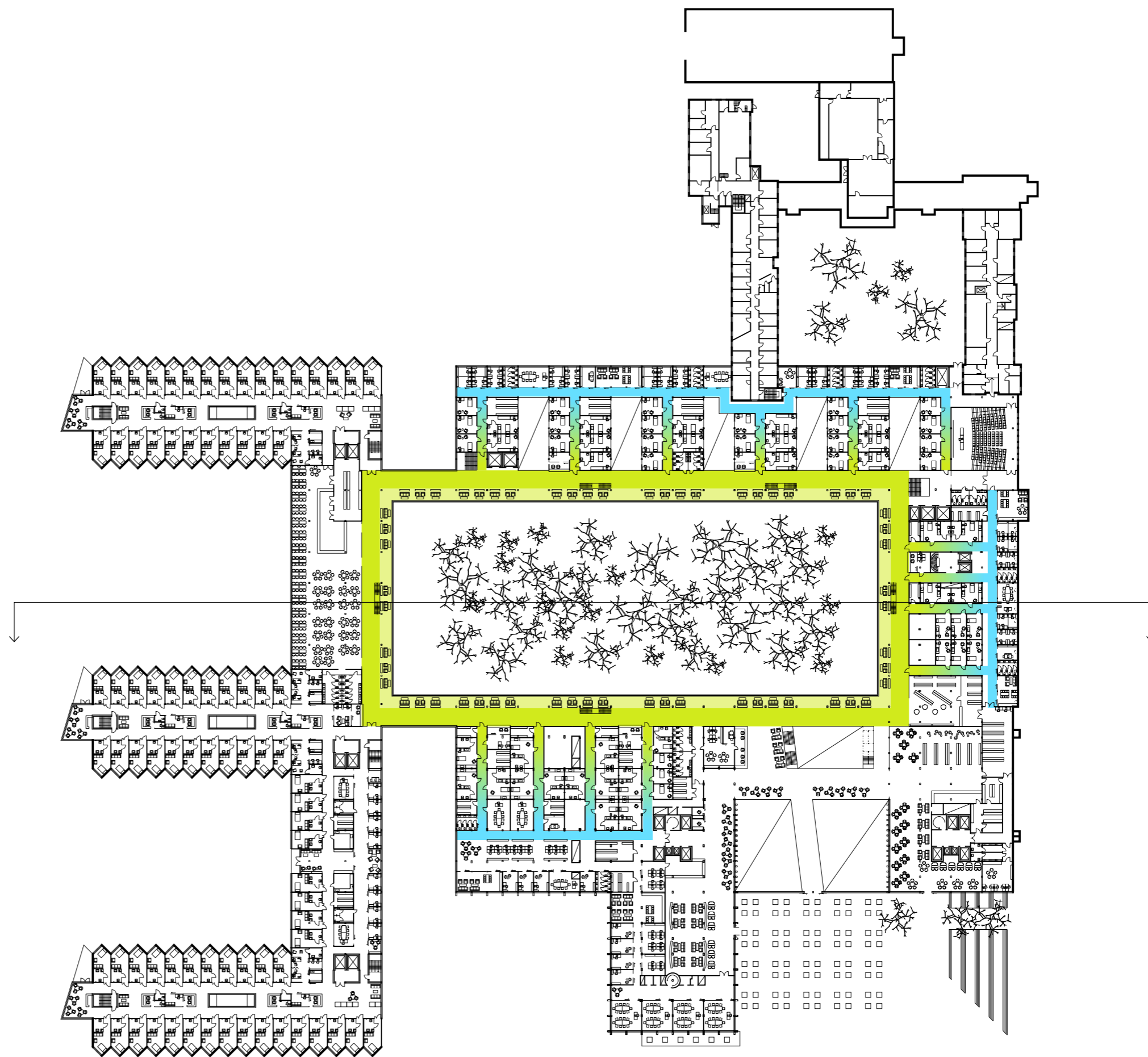
Patient communications between clinics and different buildings take place in the loop on the main level 5 (green).

Doctors have a separate corridor for communication (blue).

Treatment and exam rooms are located between these pathways (green-blue).

Constant view towards the forest courtyard eases navigation and brings the sense of calmness.

Patient sit and wait in the area closest to the facade.



Level 5 main

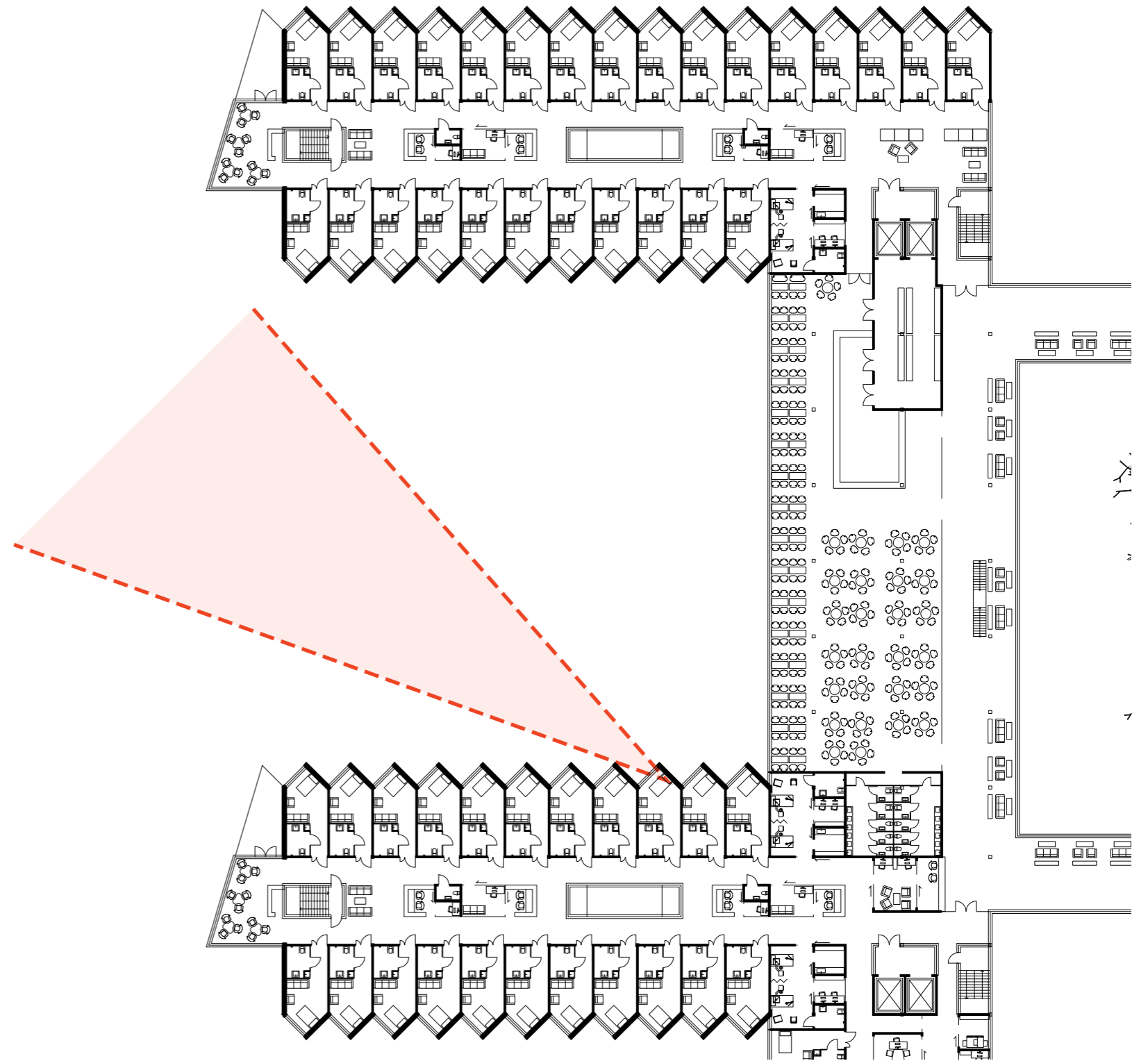
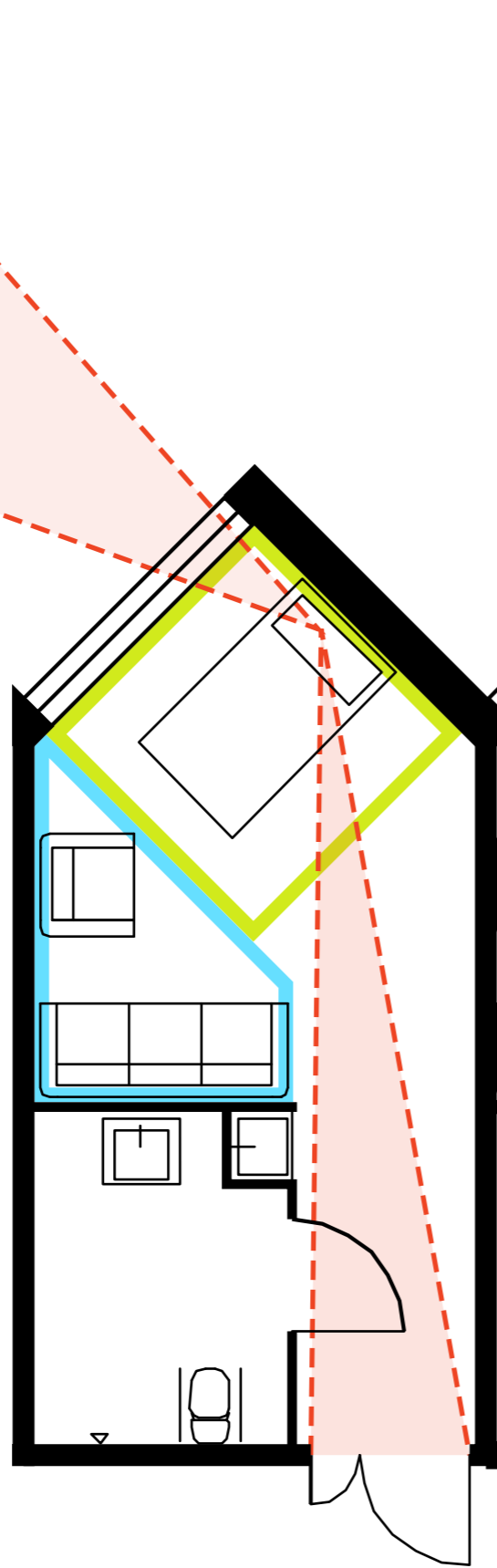


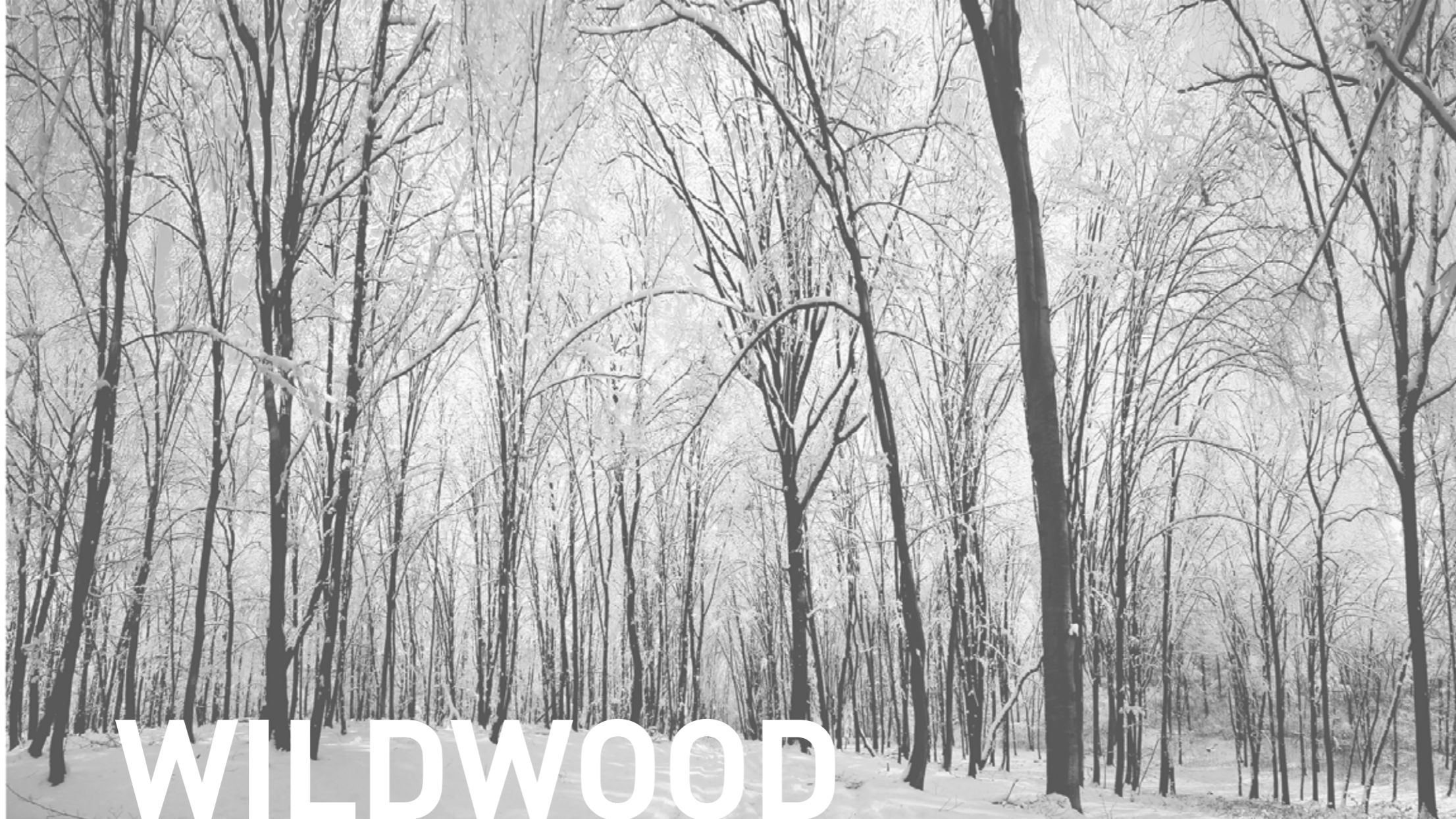
Exterior ward building - north facade

### Patient room

The facade is jagged with placement of the bed next to it. In this way patients will have a great view both towards the lake and the corridor.

Each room is a single patient room with private hygien room and space for visitors.





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