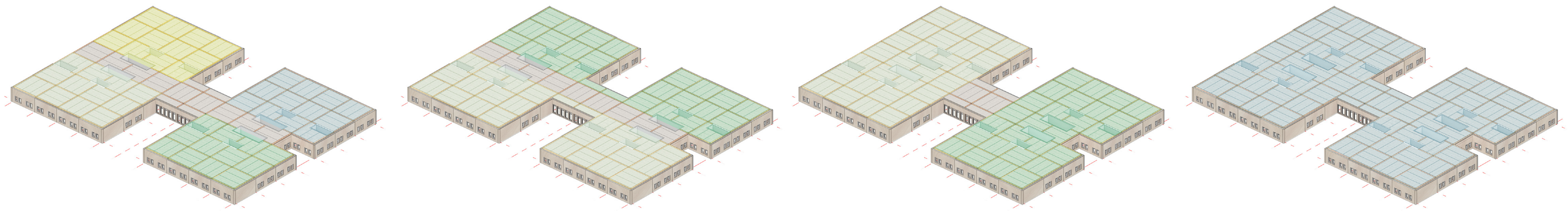
FLEXCARE A flexible future for Lund University Hospital



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ARK 263 Future visions for Healthcare, housing and work: Healthcare Architecture

CONTENT

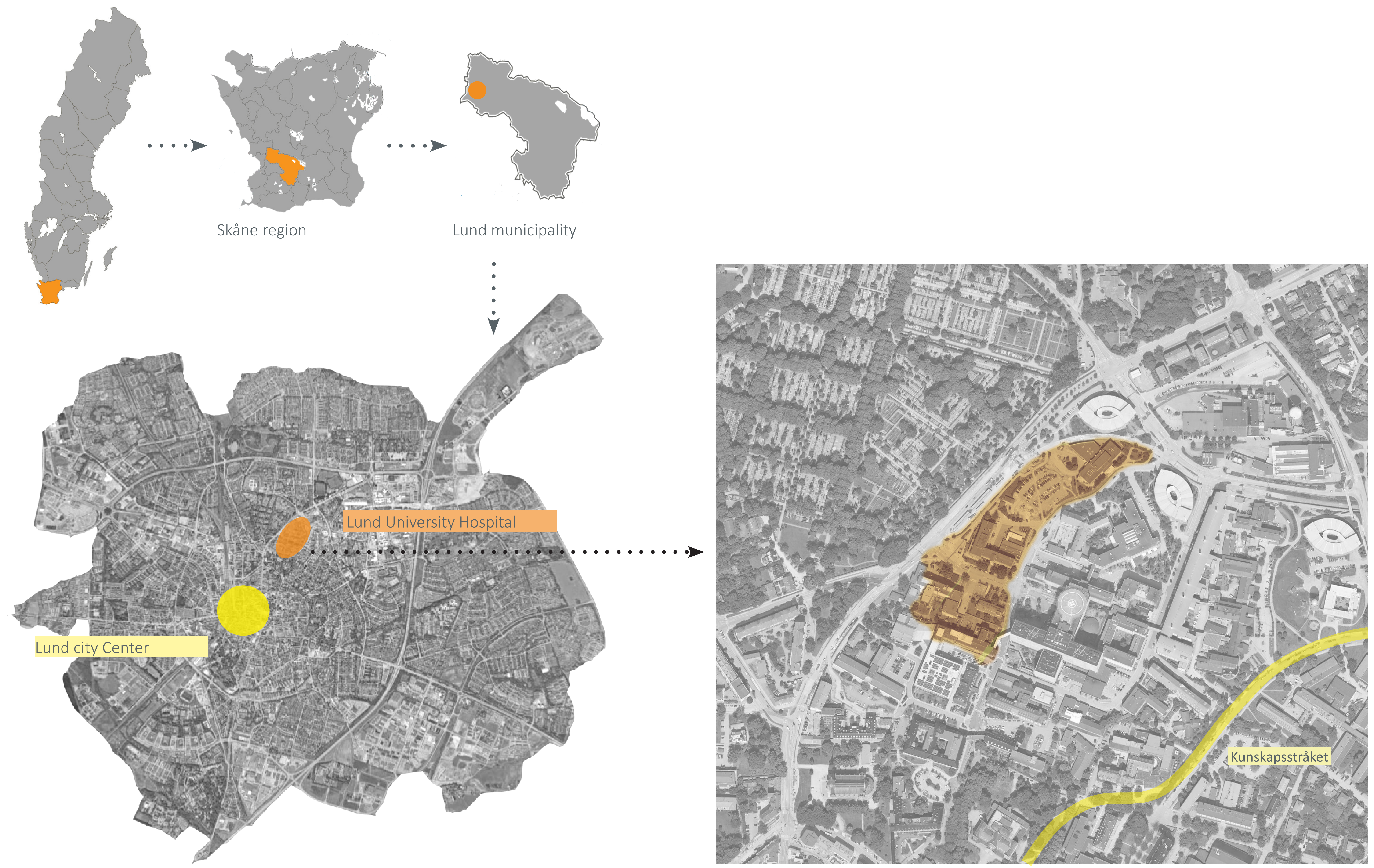
PROJECT INTRODUCTION

The task of this year studio is to design a high-tech hospital, for a future extension of Lund University Hospital. A complex program with hospital functions of around 110000m2 and high demands of connections in between departments to ensure an efficient and patient oriented workflow has been one of the great challenges in this project.

The plot area is around 22600 m2. It currently contains a few buildings, and an open parking. The buildings, for example the existing Primary Health care building will need to be demolished for creating room for the new hospital.
Next to the plot, a new tram station on Lunds new tram line is located, which means that the hospital extension will be the gate to the (hospital - university) area. The municipality has a future plan for the whole area, and one of the visions is to create a link between the tram line and Kunskapsstråket (The link of knowledge) through the plot.
Beside this we have to take in consideration the cultural and historical value of the university hospital, municipality visions and plans, and the science within the field health promoting architecture.

In order to do this, we have designed design strategies, to guide us along our project design journey. Some strategies is clearly expressed in the final result, and some have guided us in our discussions, and given us inspiration.
This is an early study on how a new hospital could look like and work.

THE CONTEXT



DESIGN STRATEGIES

SITE & CONTEXT

CONNECTING INFRASTRUCTURE TO PUBLIC AREAS

SIGHTLINES FROM ENTRY POINTS

ANCHOR SPACES & ANCHOR POINTS

BRIEF & LOGISTICS

BREAK THE BARRIER

ADDING TO THE DIVERSITY

CREATE EMBRACING SPACES

SUSTAINABLITIY & FUTURE PROOFING

USING WOOD AS CONSCTRUCTION MATERIAL

SPACE & STRUCTURE DESIGN FLEXIBILITY

CREATING SOCIAL SUSTAINABILITY

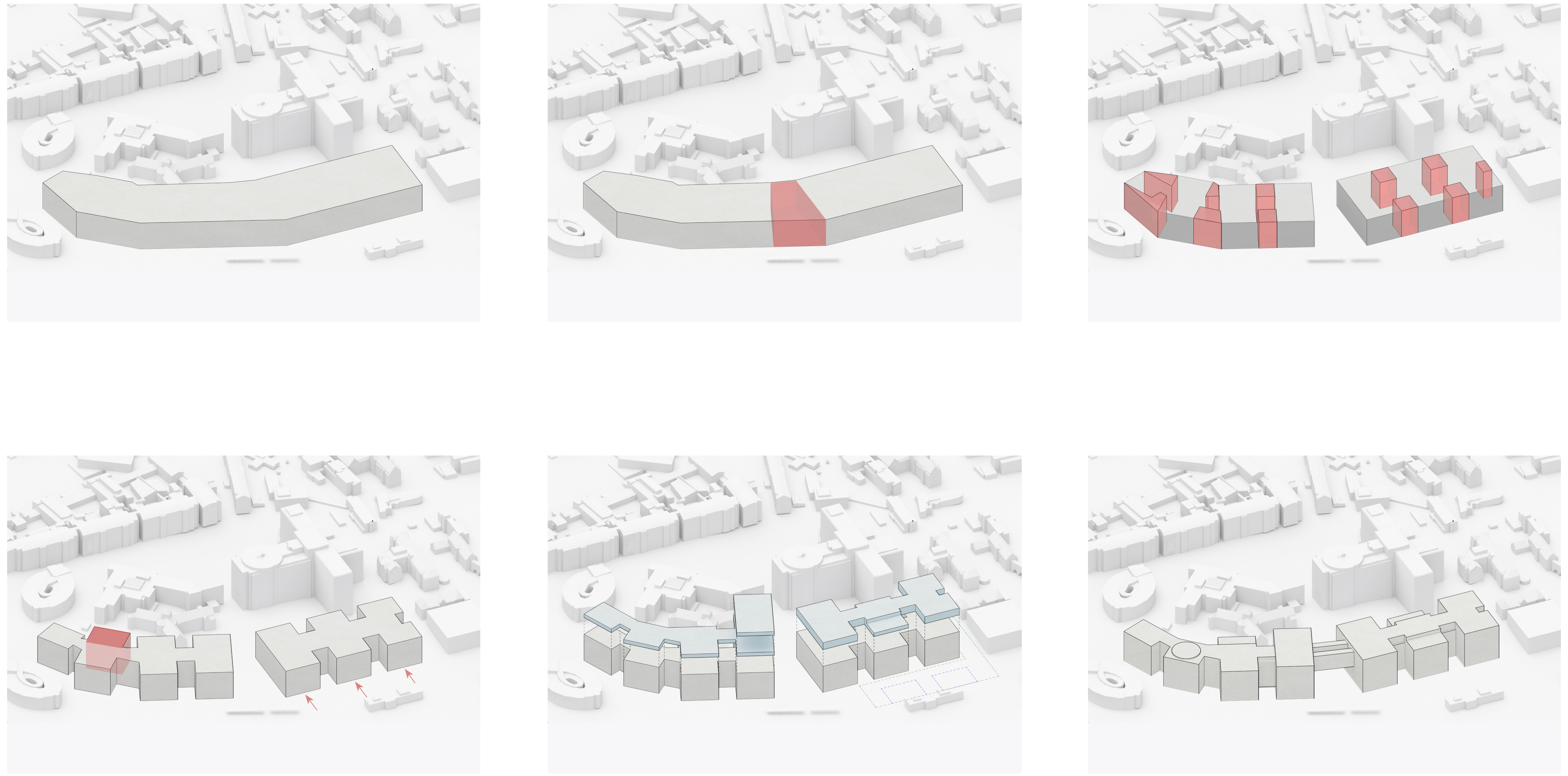
HEALTH PROMOTIVE ARCHITECTURE

IMPROVING & CREATING GREEN INFRASTRUCTURE

GRADIENT TRANSITION FROM PUBLIC TO PRIVATE

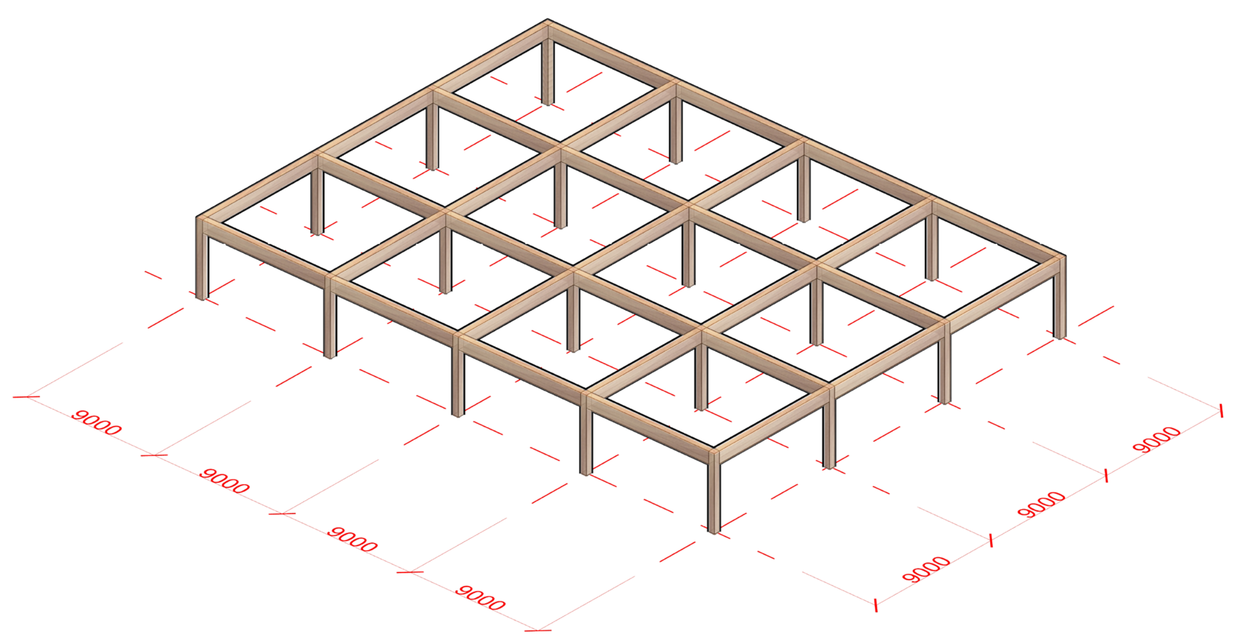
ADDING PUBLIC HEALTH FACILITIES

EVOLUTION OF THE VOLUME

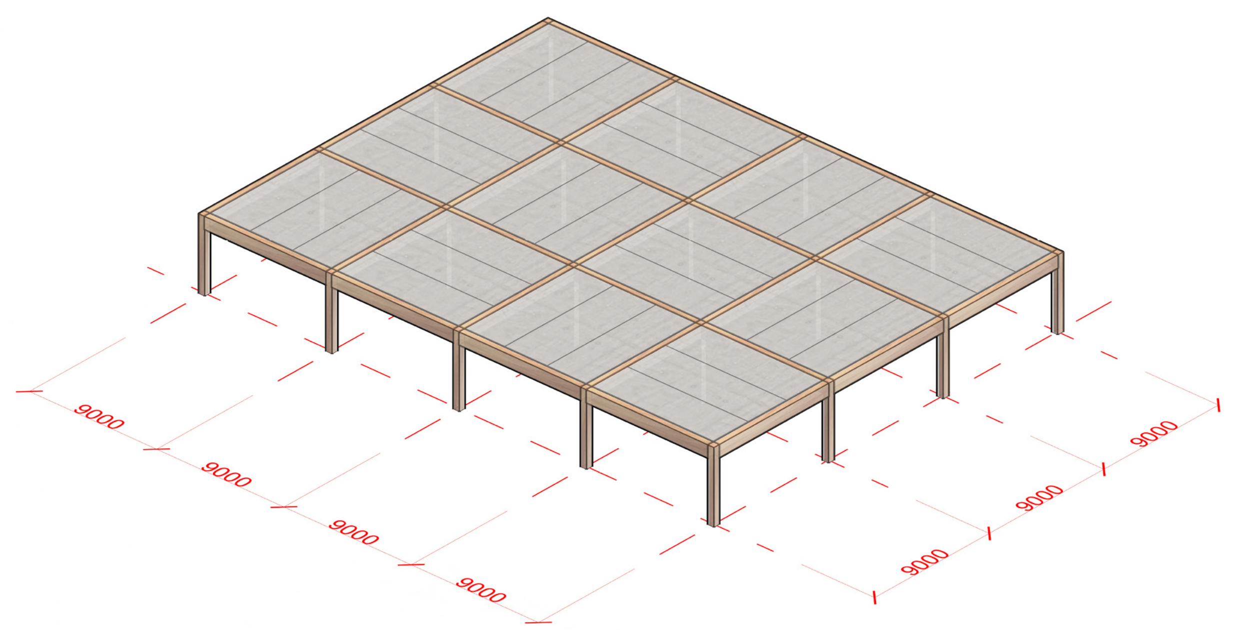


STRUCTURAL PRINCIPLE

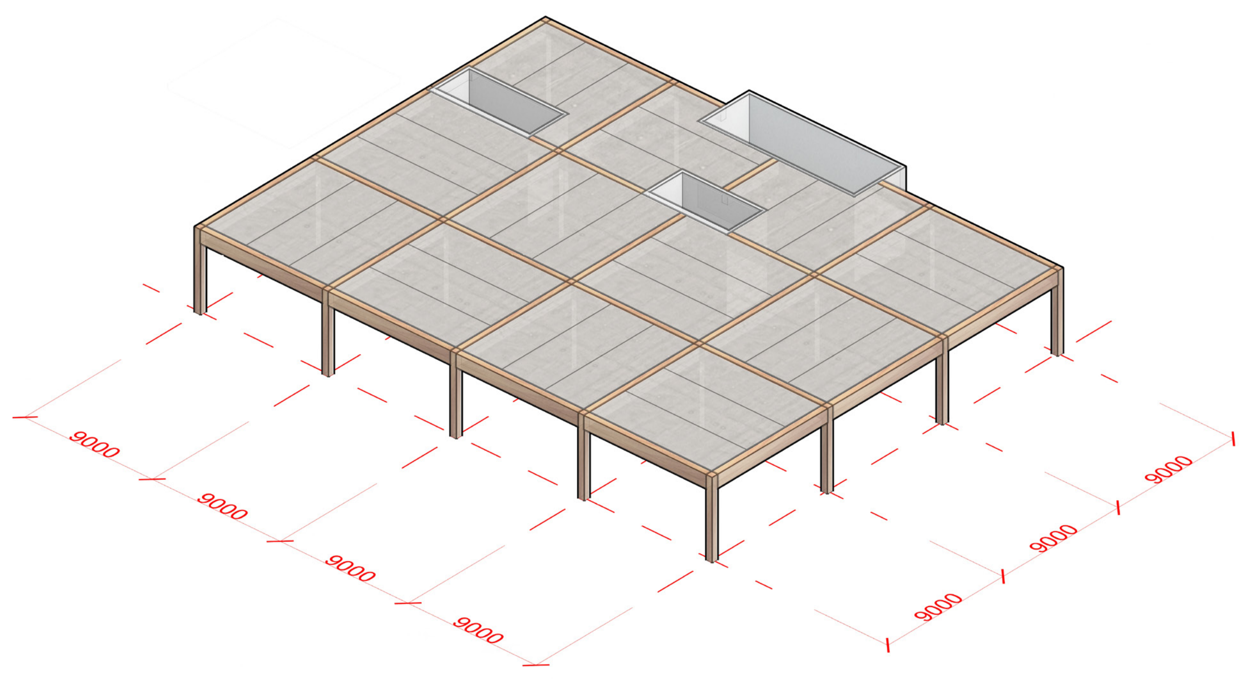
1. A 9x9m grid is used to generate the 36 x 27m module. A beam-grid of gluelam timber beams rests on gluelam timber pillars.



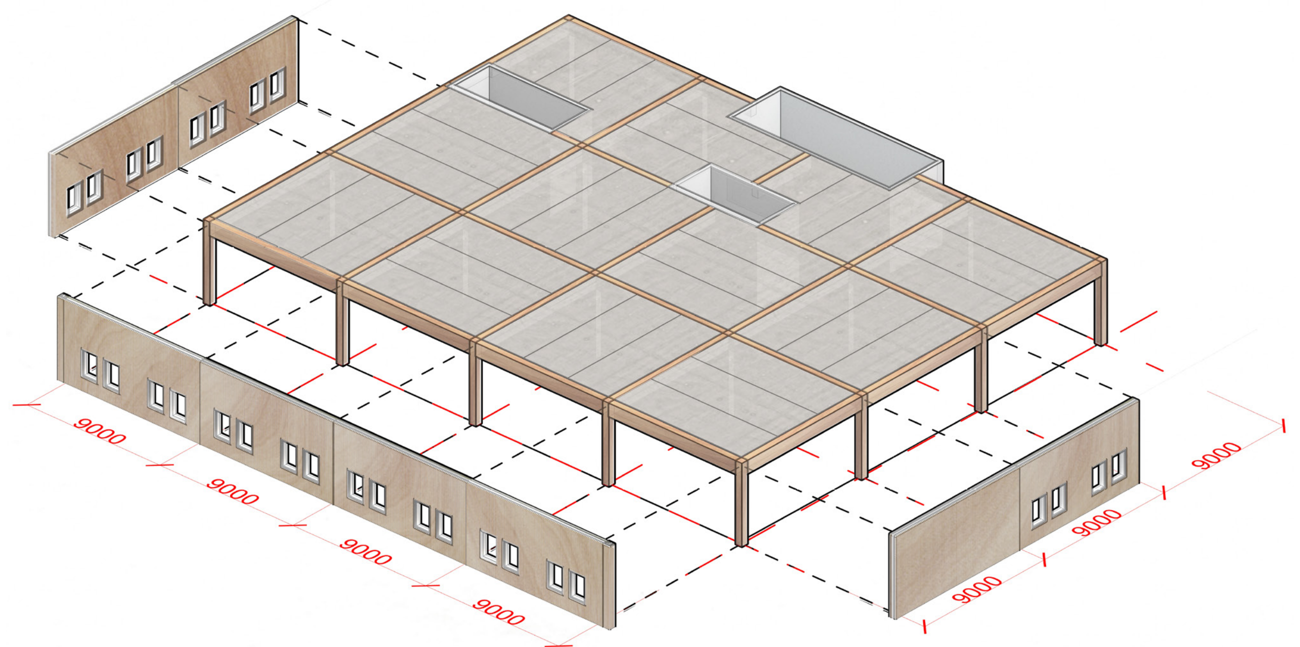
2. Composite slabs consisting of CLT with a upper layer of concrete gives a heavier slab than a slab only made of wood and gives better acoustical coniditons.



3. Cores casted from concrete gives the structure horizontal stability.

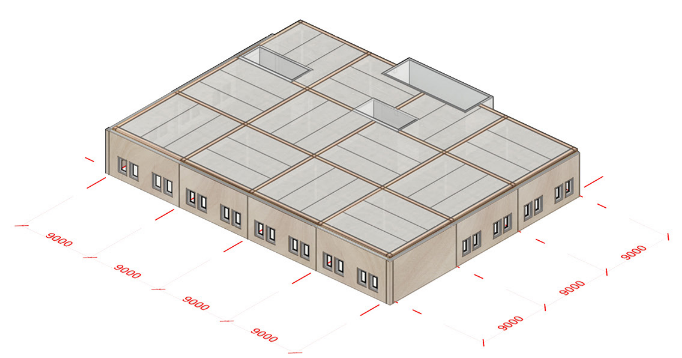


4. Prefabricated wall elements are hanged onto the structure.

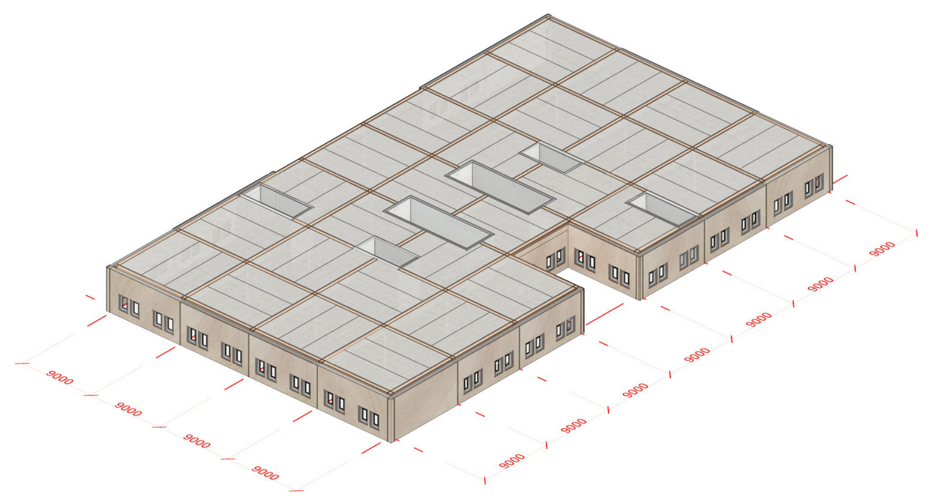


GENERALITY OF THE MODULE

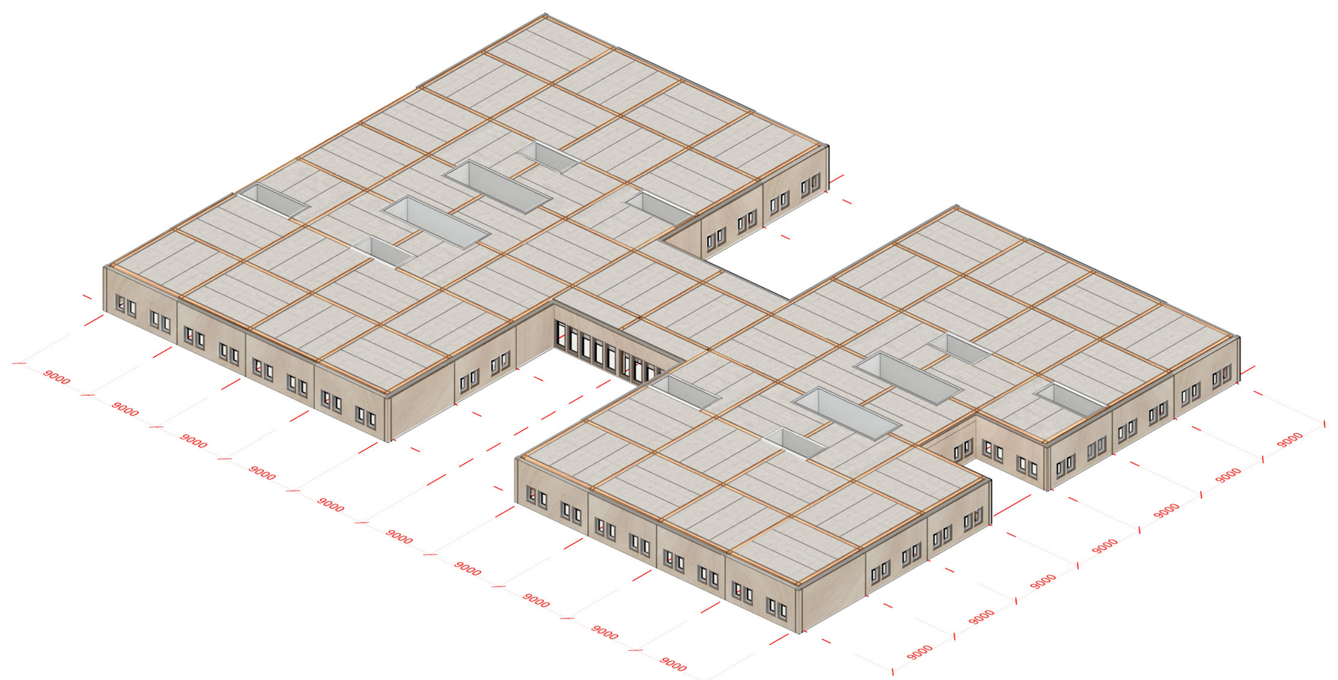
1. By using a standard module, the planning and construction of the hospital is simplified.



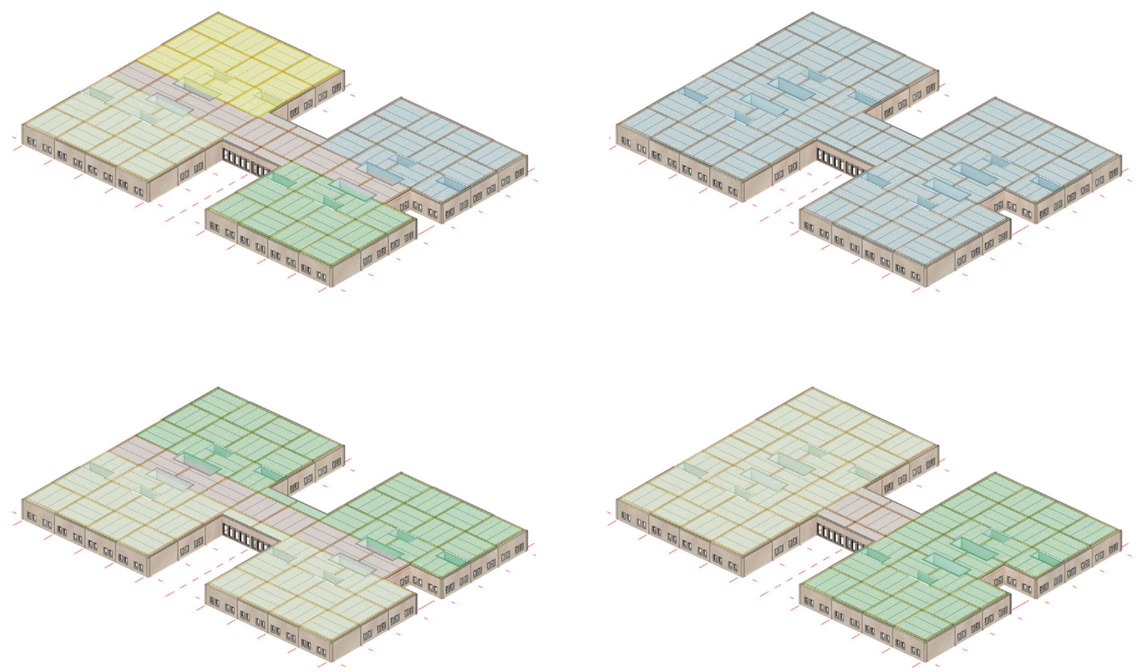
2. The module is rotated to create a pair of modules and an elevator core.



3. The module repeats throughout the hospital creating a flexibility in the future use of the hospital.

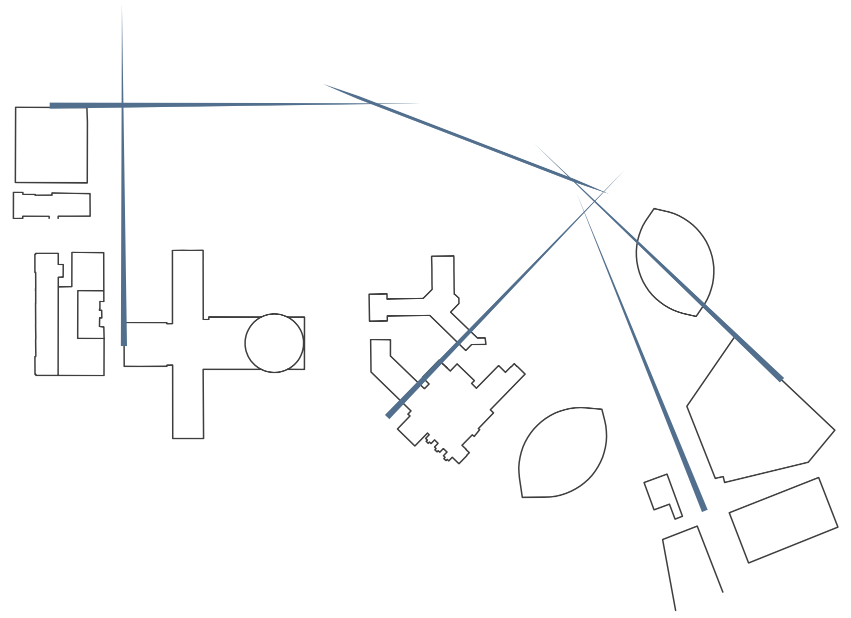


Examples on how departments can be distributed.

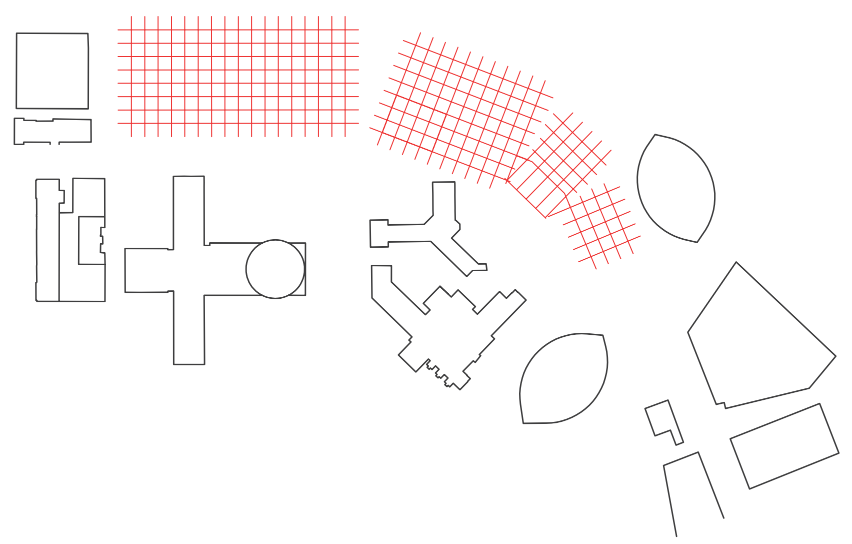


GRID AND BUILDING ORIENTATION ANALYSIS

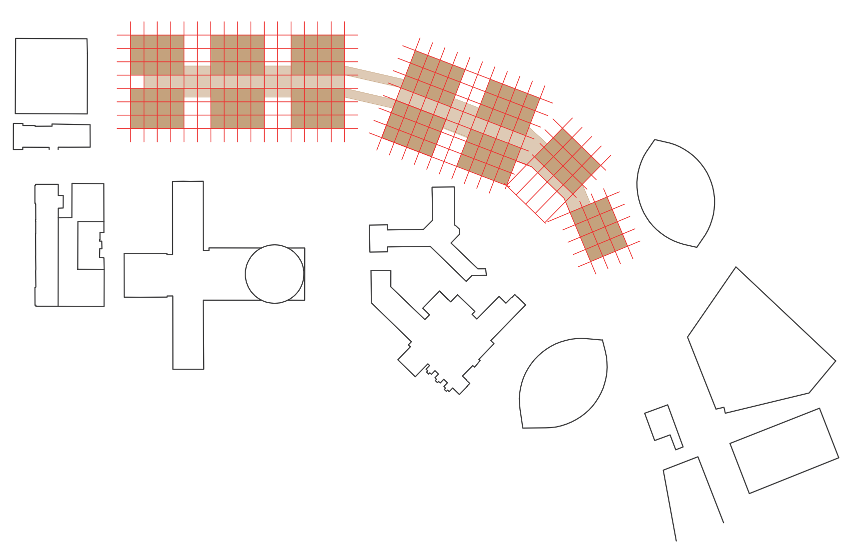
1. By using the orientation of the existing buildings, the new building gets a relation to the old buildings.



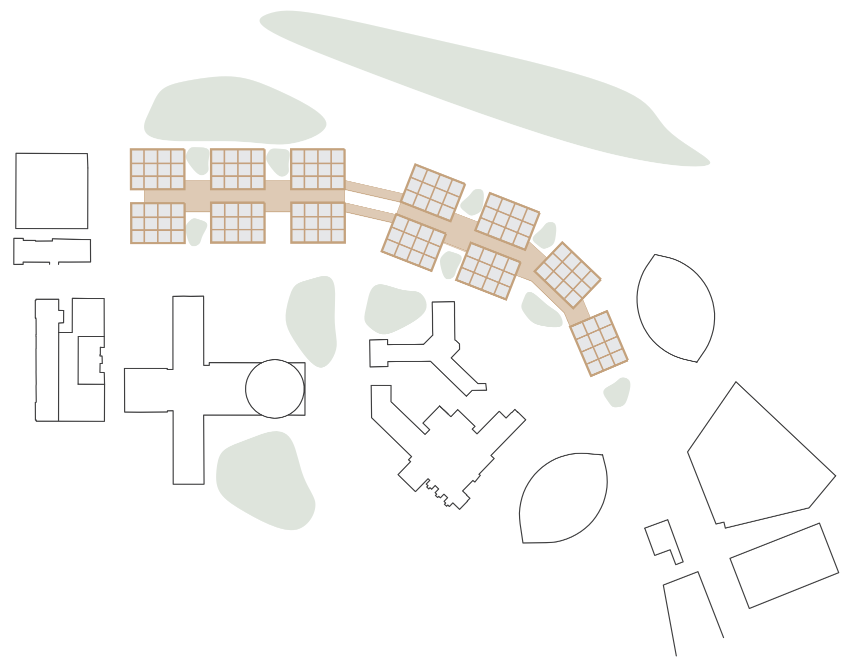
2. A 9x9m structural grid is used throughout the planning.



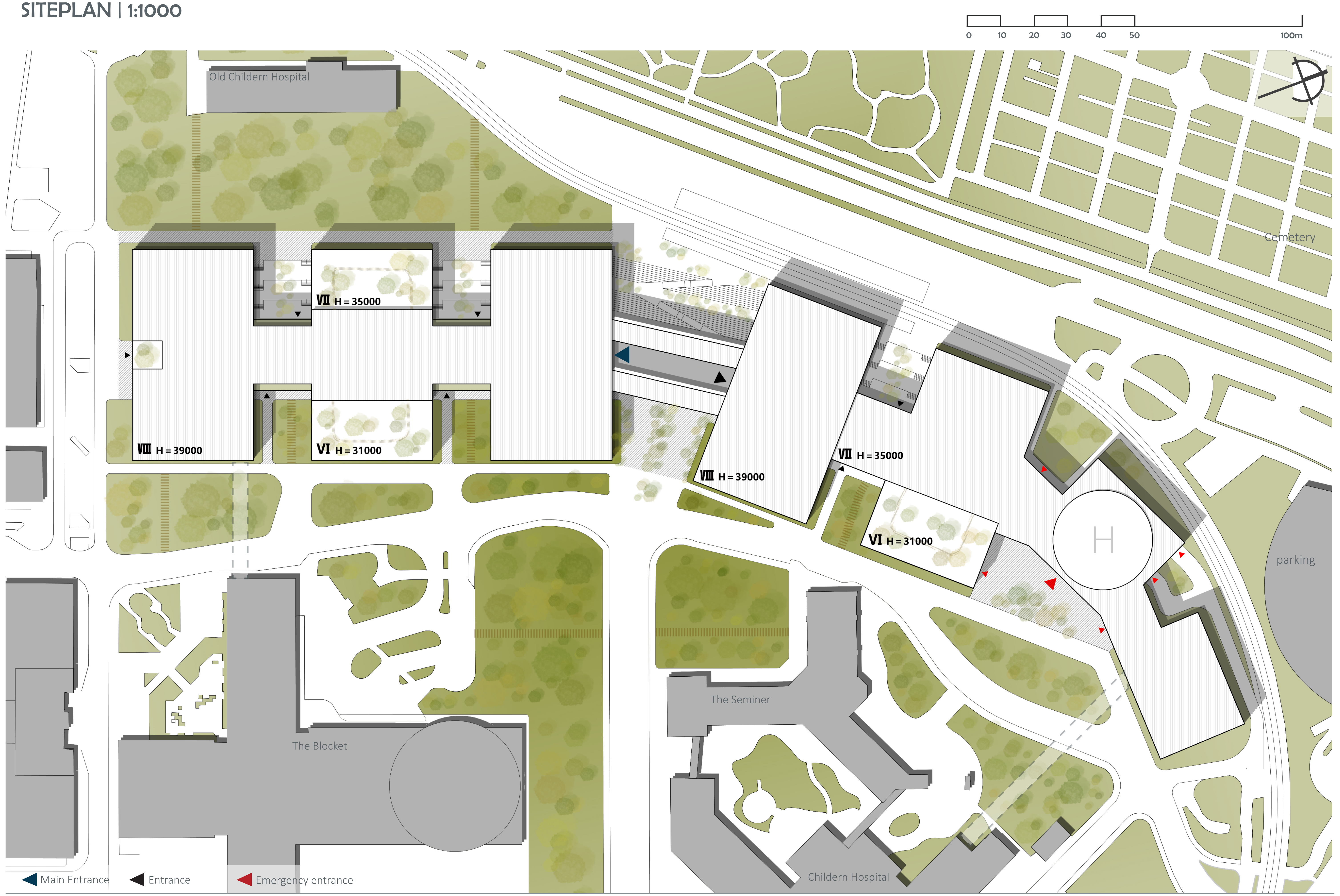
3. The grid is divided so that a module of 36x27m is used for the functions and 18m/9m for spacing in between the modules. Exception is the very north part were the spacing is different due to the geometry of the site.



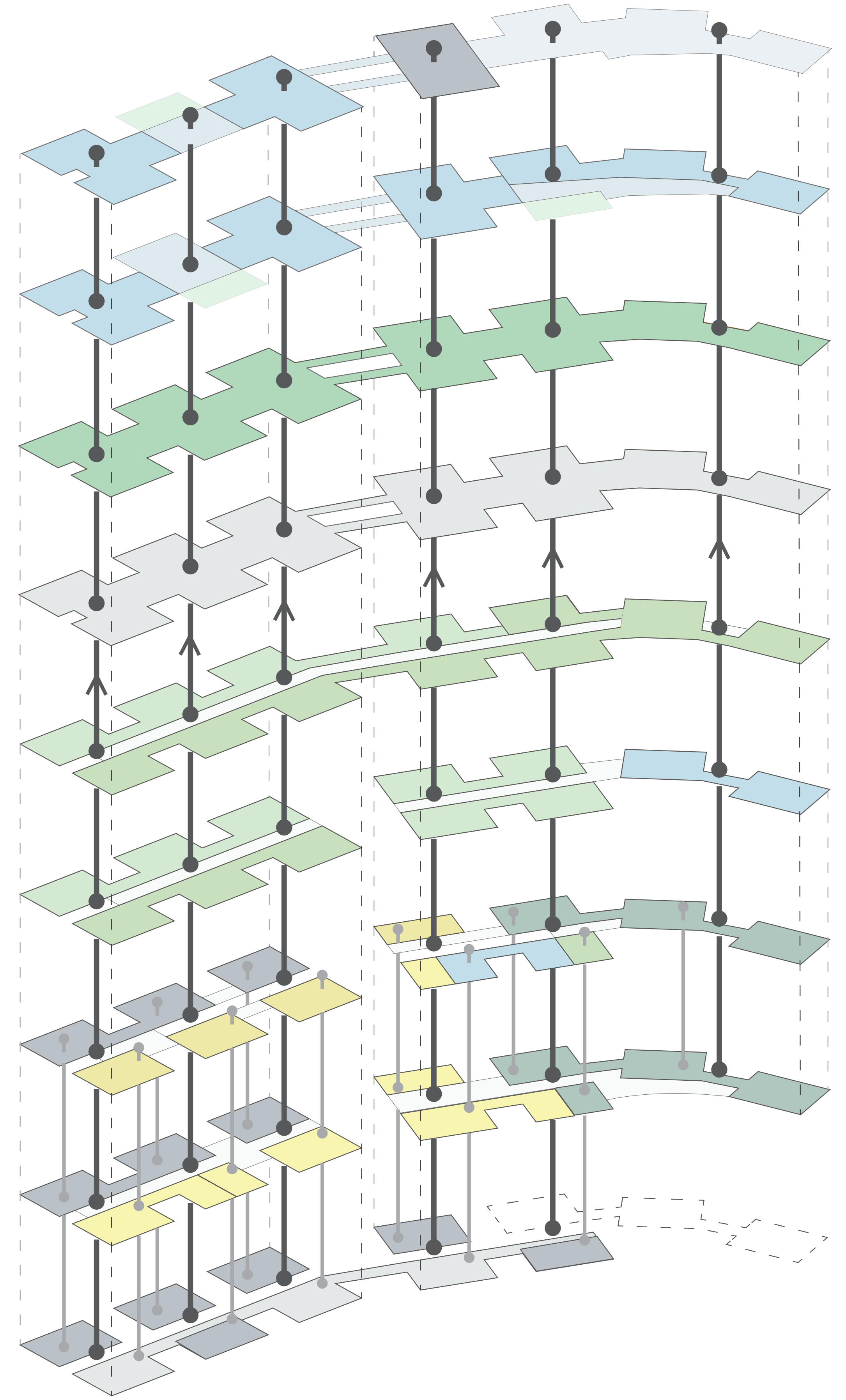
4. The repeating nature of the building using modules, makes a rather simple structural concept possible, and also help in the planning of departments, and in the orientation for the user of the hospital.



SITEPLAN | 1:1000



SCHEMATIC LAYOUT



Emergency
Imaging & Diagnostics
ICU _Intensive care unit
Operation
Inpatient ward
Outpatient
Public & Commercial
Technical
Vertical connection (Elevator& stairs)
Stiars (level: -1, 0, 1)

Total BTA area 128716 m²

Women & Neonatal

Mother care center	1615 m²
Specialized emergency	568 m²
Delivery ward	2559 m²
Prenatal ward	1115 m²
Perinatal / maternity ward	4110 m²
Delivery operation	568 m²
Neonatal ICU / co-care ward	5011 m²
Neonatal for outpatients	501 m²

Hot Floor functions

ICU (Intensive care unit)	9281 m²
Operation	14011 m²
Imaging & Diagnostics	15700 m²
Emergency	7743 m² + Helipad

Outpatient functions

Gynecology	2120 m²
Kidney med / dialysis	2676 m²
Day surgery center	1673 m²
Primary health care	2006 m²

Inpatient wards 16709 m²

5 words, Each word is 2694 m²
+ common & staff area 2773 m²

Staff & Public functions

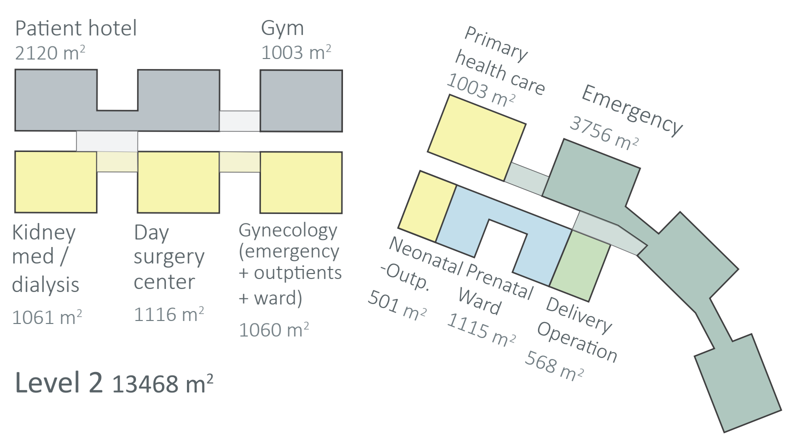
Adminstration	2317 m²
Dressing rooms	2270 m²
Public &Commercial	5014 m²
Gym	1504 m²
Patient hotel	3740 m²

Medical Supply & Technical functions

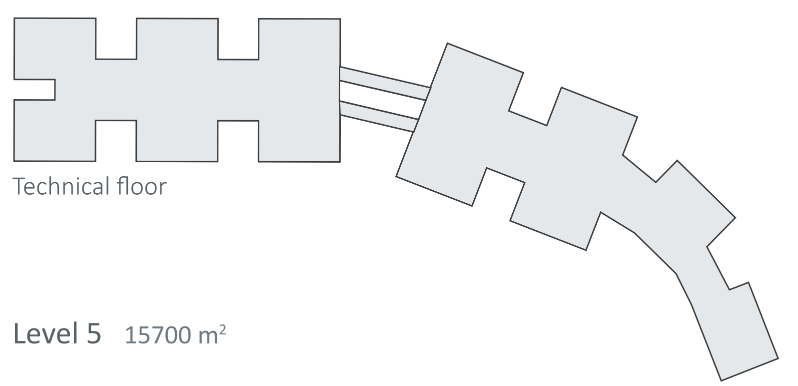
Cyclotron + STE	4260 m2
Technical floor	15700 m2

+ Storage areas, AGV (Automatic Guided Vehicle) in the hot floor + Inpatient wards

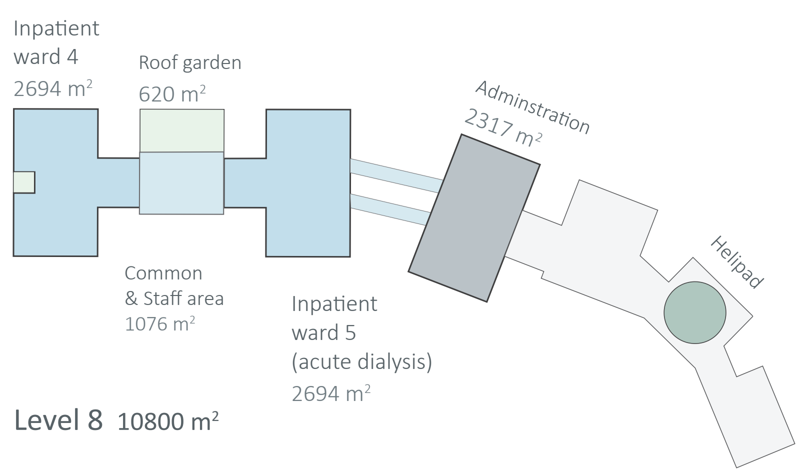
SCHEMATIC LAYOUT



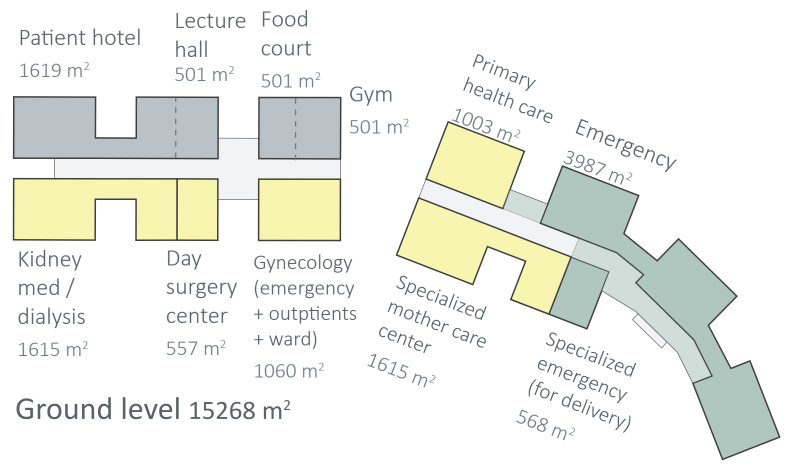
Level 2 13468 m²



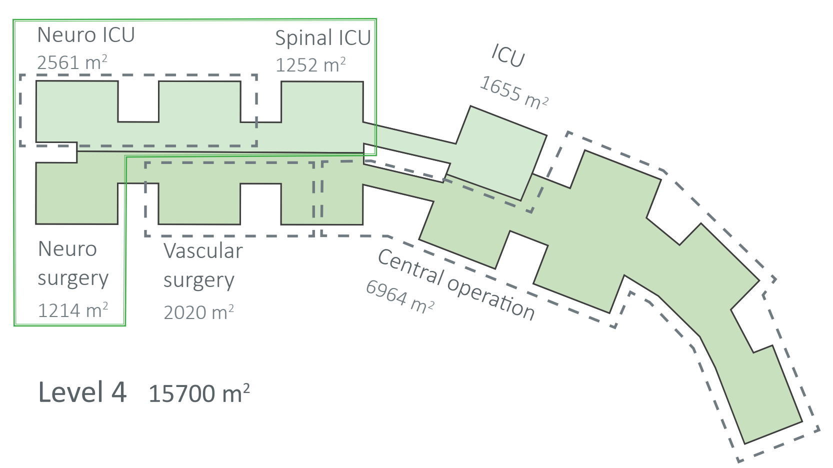
Level 5 15700 m²



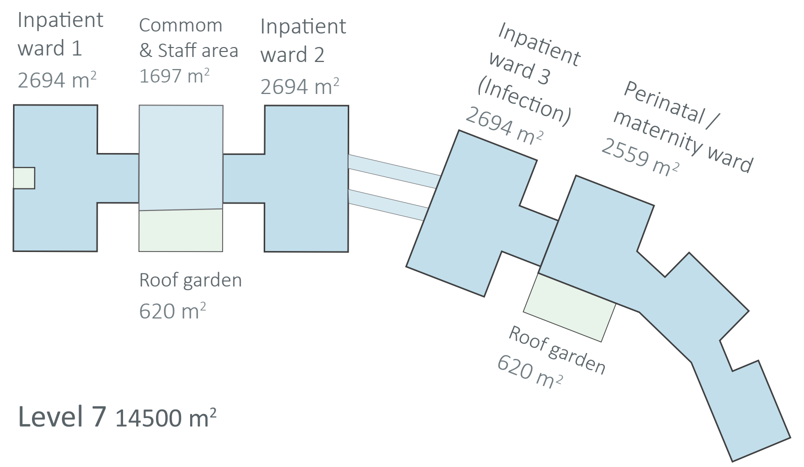
Level 8 10800 m²



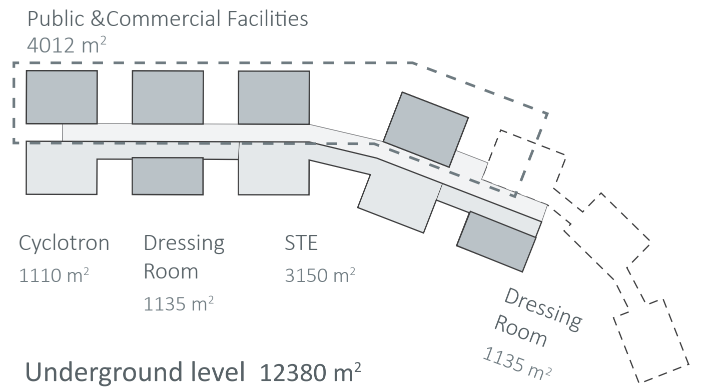
Ground level 15268 m²



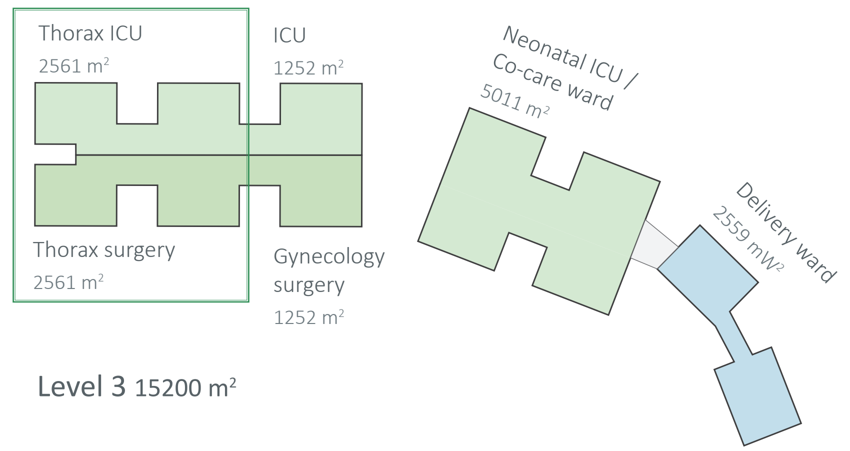
Level 4 15700 m²



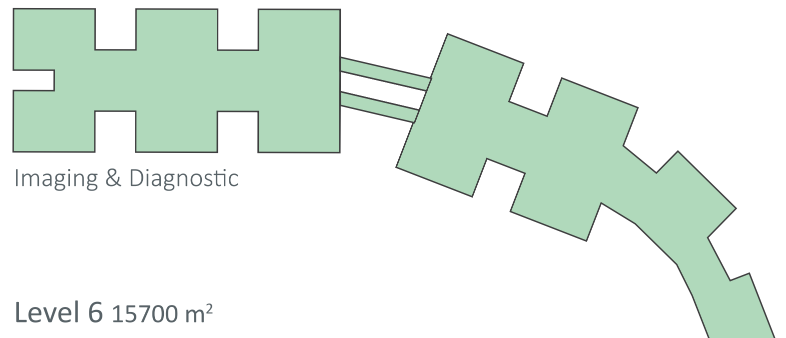
Level 7 14500 m²



Underground level 12380 m²



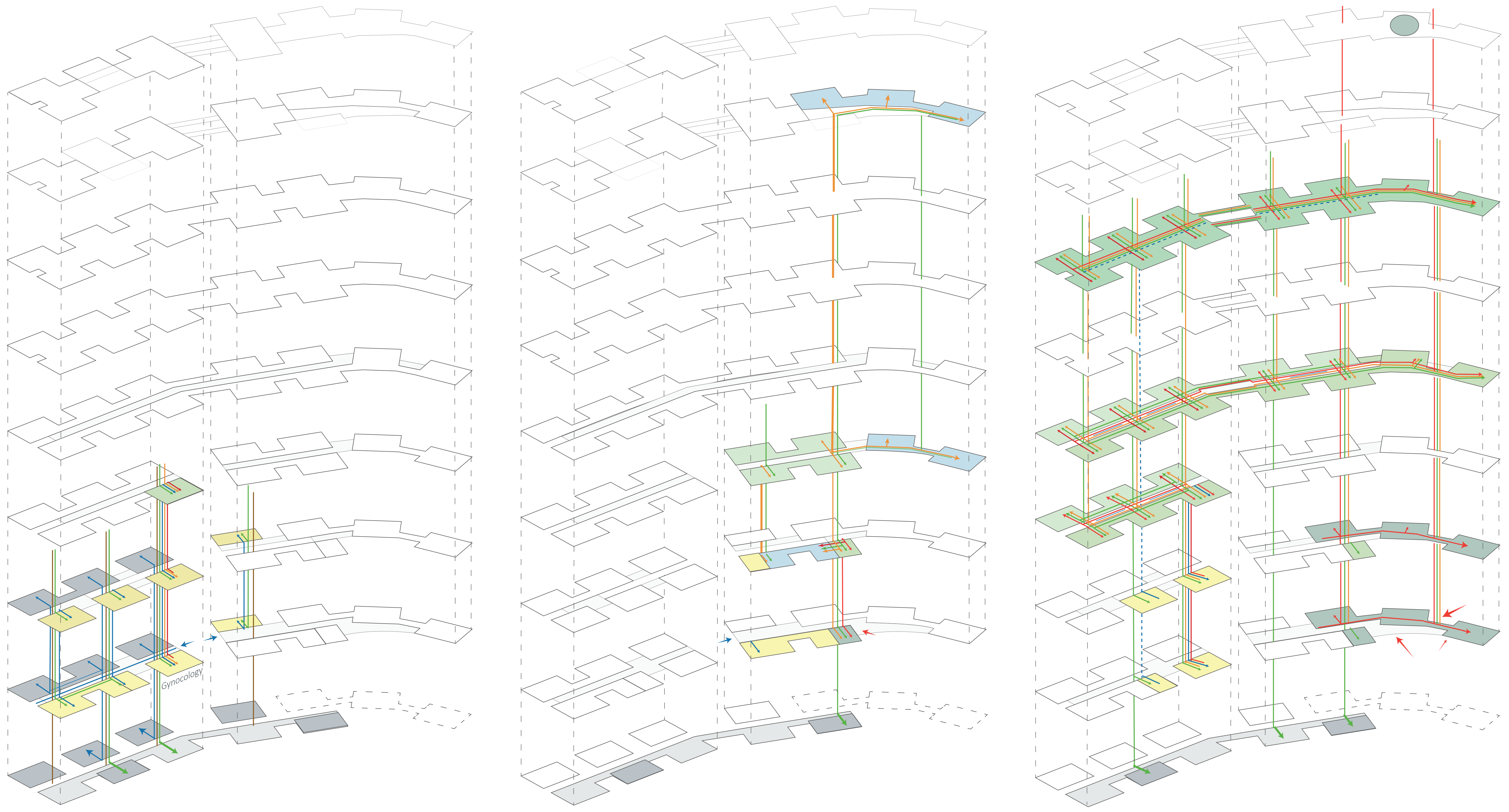
Level 3 15200 m²



Level 6 15700 m²

Emergency
Imaging & Diagnostics
ICU _Intensive care unit
Operation
Inpatient ward
Outpatient
Public & Commercial
Technical
Function boundries
Required close connection within the department

MAIN CLUSTERS ANALYSIS



OUTPATIENT FUNCTIONS   WOMEN & NEONATAL   HOT FLOOR

Emeregncy   Staff   Inpatient   Outpatient/ Visitor   Goods

CORRIDOR FLEXIBILITY

Central corridor

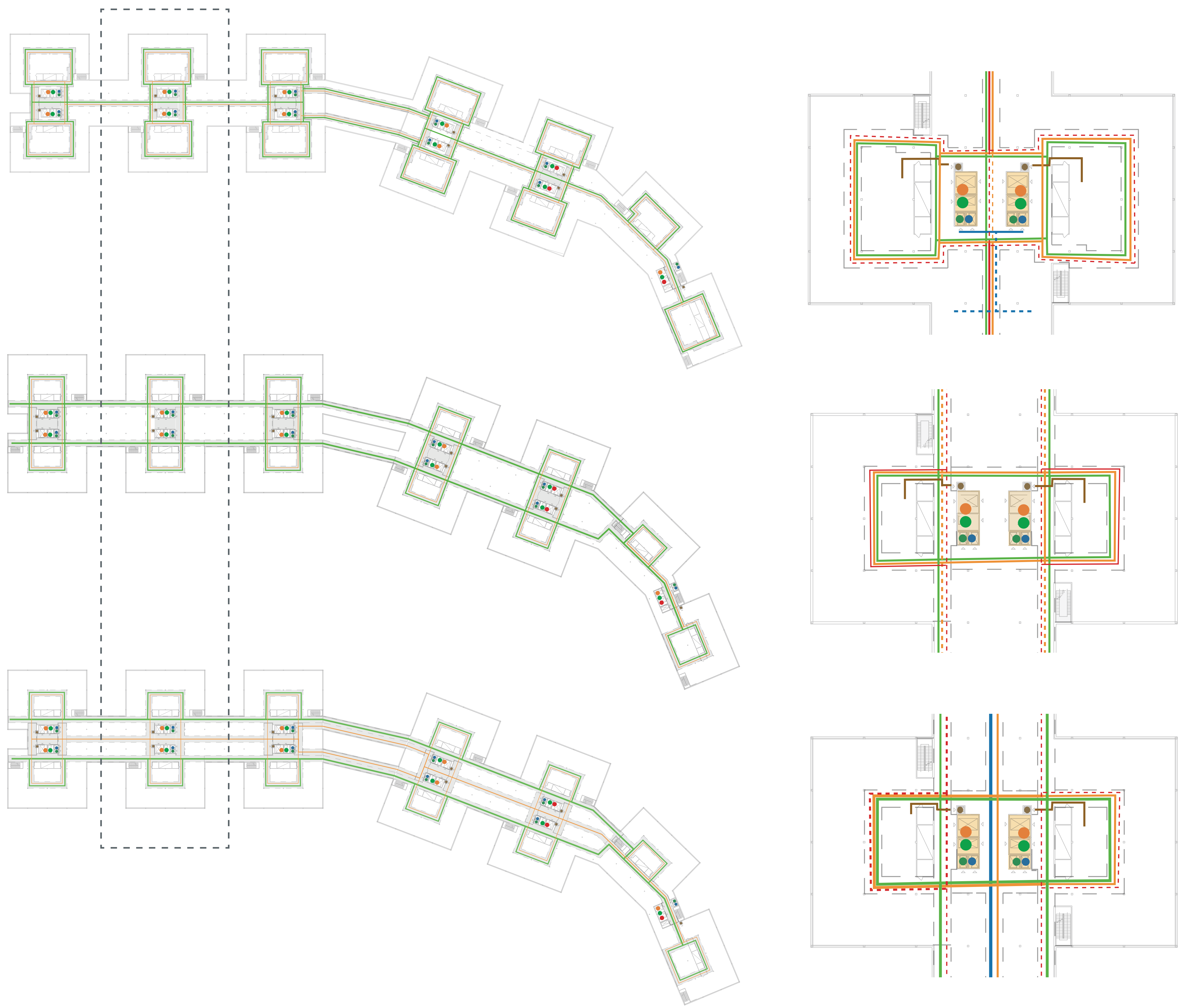
The single corridor scheme is favourable were the public/patients and the staff could share communication space, for example on Ward levels. The central corridor makes it easy to walk between the elevator cores and makes possibility to create public spaces in between the function modules, as on the ground floor.

Double corridor

The double corridor scheme is mainly for levels/parts of the building that is not accessible for the public, but is for staff and inpatient only, such as surgery and ICU. The corridors provide a fast connection in between function modules and since the corridor goes along the facade in between the function modules the staff will experience the outside while walking in the corridor.
The space in the core of the building can be used for supporting the functions within the modules.

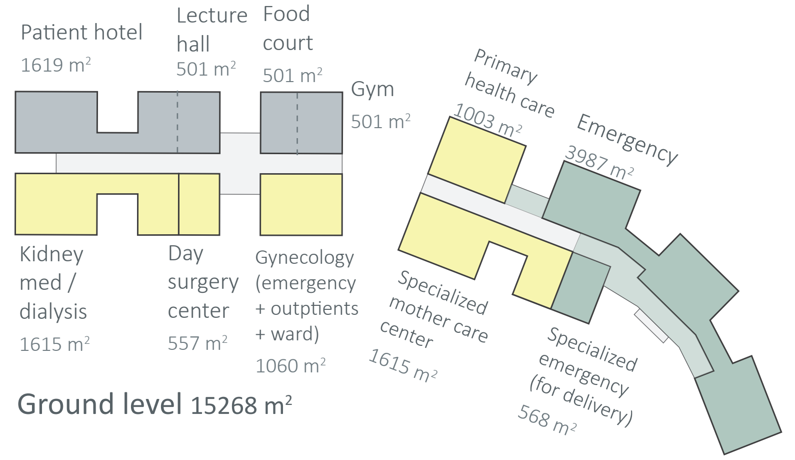
Triple corridor

The triple corridor scheme is for parts of the hospital were the public and the staff flows are separated. This scheme could for example be used this scheme in the mothercare cluster, were one can expect a lot of outpatients and also visitors. These groups can use the central corridor while the staff and inpatients could use the more private outer corridors.

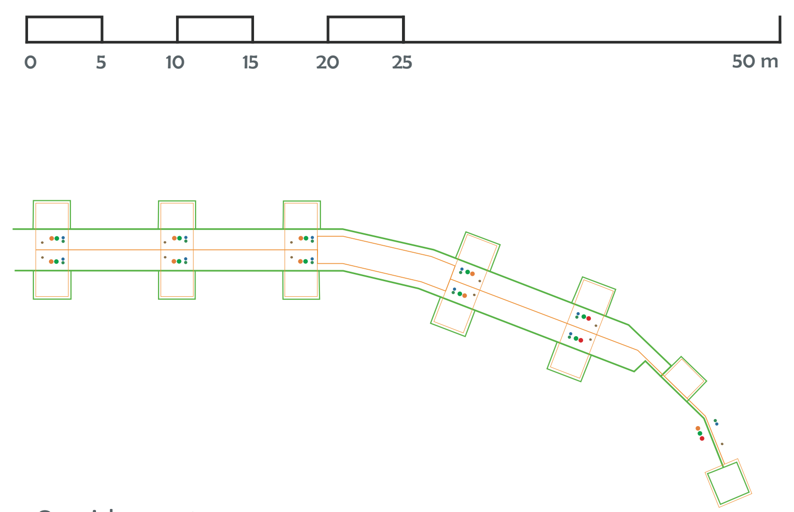


Emeregncy   Staff   Inpatient   Outpatient/ Visitor   Goods

GROUND Level | 1:500

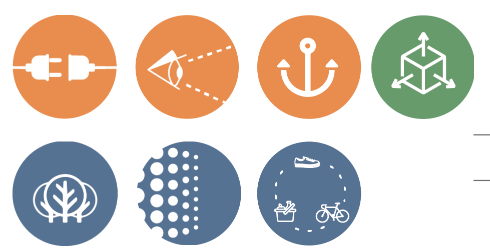


Ground level 15268 m²



Corridor system

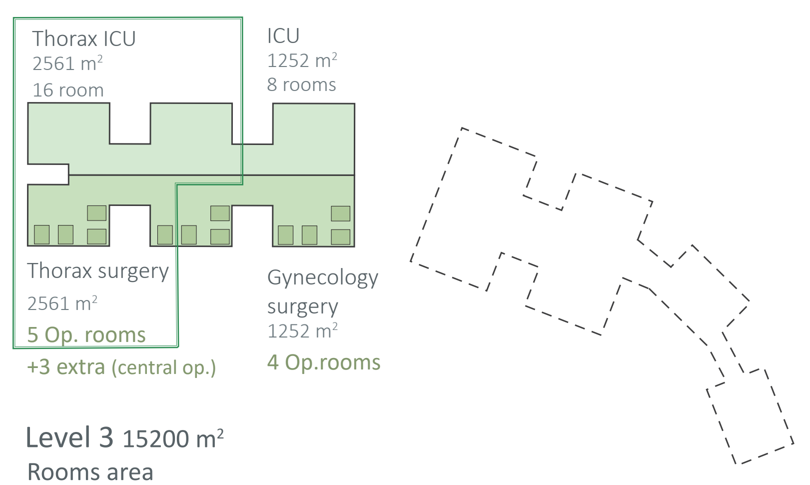
Guideline Strtegies for designing level 0



Module corridor system

Emergency	Outpatient	Primary care	Reception are	Stairs & Elevators	Emergency flow	Inpetient flow	Staff flow
Patient hotel	Public & Commercial	Common & Waiting area	WC	Technical shafts		Outpetient/ Visitor flow	Goods flow

OPERATION & ICU_ LEVEL 3 | 1:500



Level 3 15200 m²

Rooms area

. ICU room 43 m² (37 m² + Bathroom 5.6 m²)

. Normal Op. room 60.6 m²

. Hybrid Op. room 132 m²

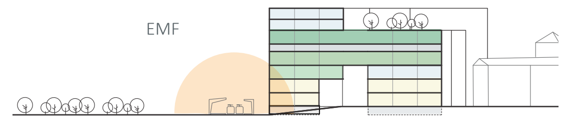
In this level, extra rooms were provided in both the ICU and Operation departments, as a result of applying (space and structure flexibility) strategy within the modules.

. 1 extra room for each ICU departments.

. 3 extra central operation rooms

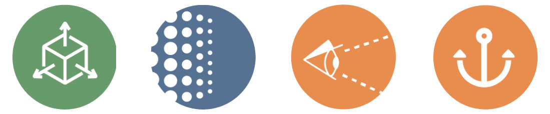
. 1 Module (1000 m²) that can be used for fitting more operation rooms, or for other functions.

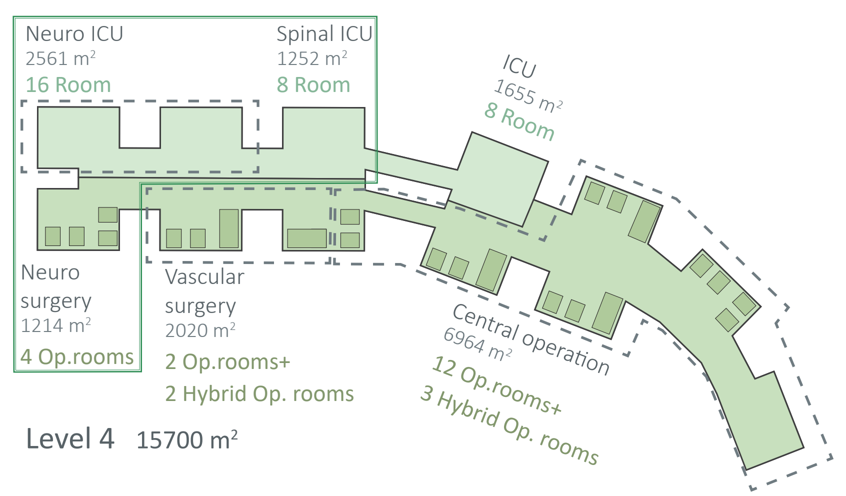
There has been raised concerns about the impact of the electromagnetic (EMF) field from the tramline on the plot of the new hospital. As a response to this we have tried to place high-tech functions, that have a risk of being affected by the EMF on level 3 and above.



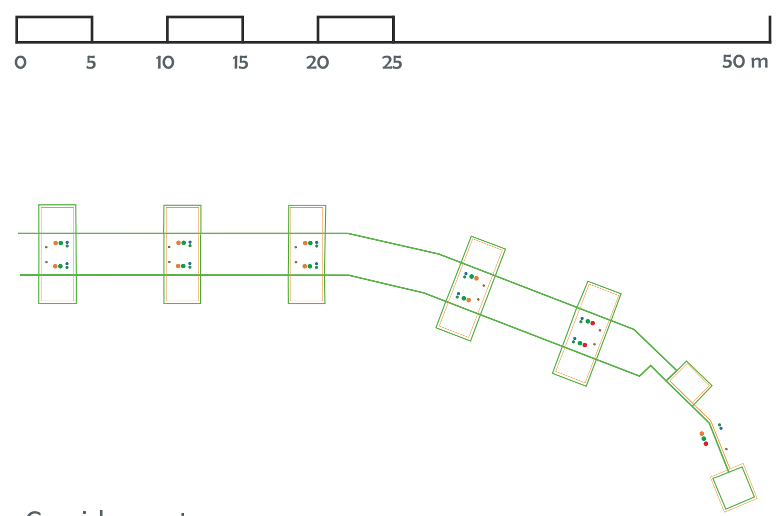
Additionally, for the future proofing, all the close normal operation rooms can be combined and transformed into Hybrid rooms if needed.

Guideline Strtegies for designing level 3- 4





Level 4 15700 m²



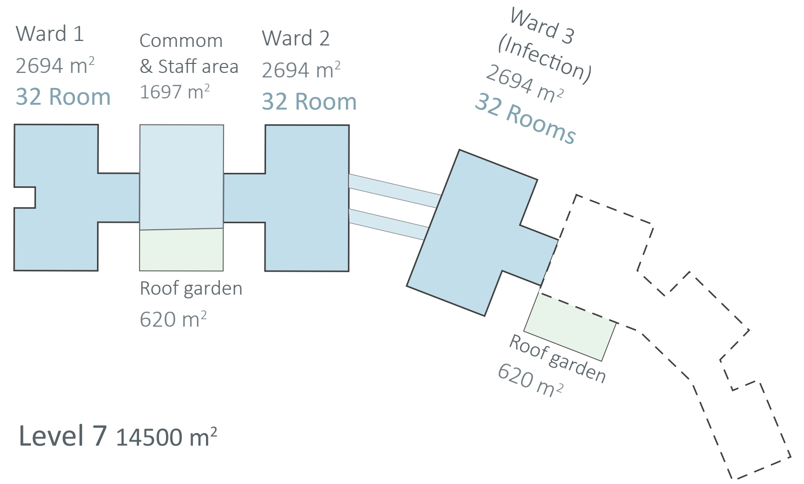
Corridor system

OPERATION & ICU MODULE | 1:200

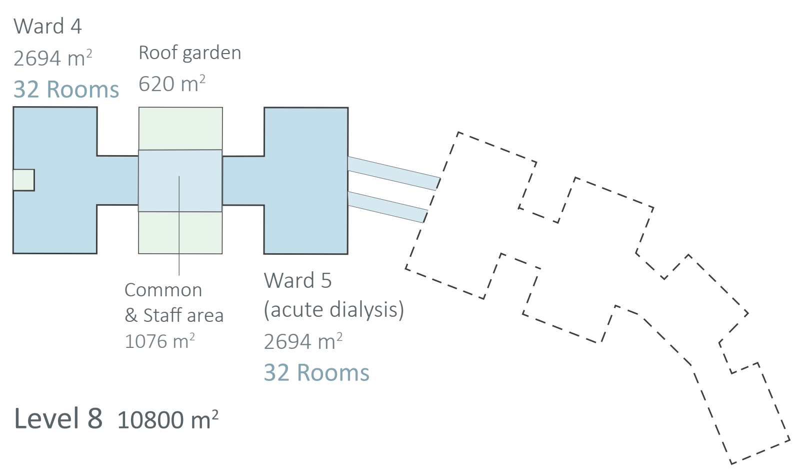
Module corridor system

8 ICU rooms / 4 Op. rooms

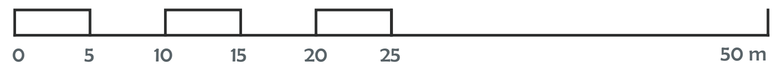
IN-PATIENT WARD _ LEVEL 7 | 1:500

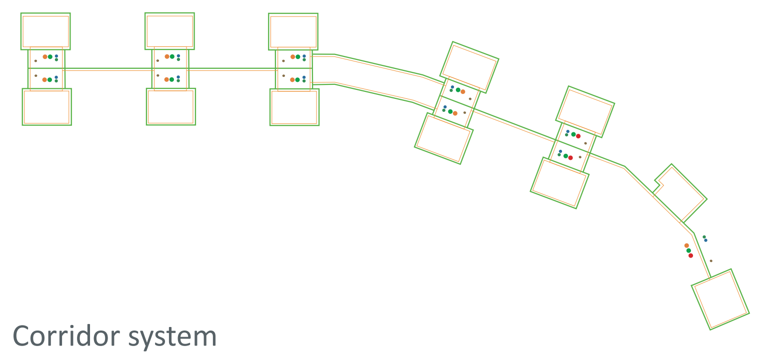


Level 7 14500 m²



Level 8 10800 m²





Corridor system

Rooms area

. In-patient room , IMCU : 28.5 m²

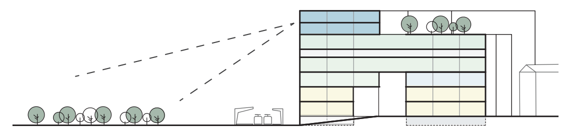
(22.7 m² + Bathroom 5.6 m²)

Level 7 & 8 were chosen for the wards, to provide the following:

. View on the cementary.

. Roof gardens

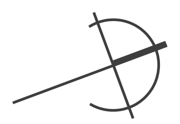
. Privacy



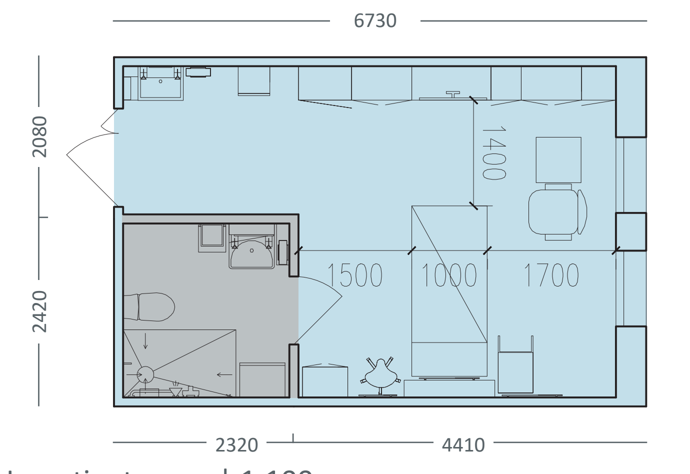
The distribution of function is focusing on the patients and the staff at the same time, giving the staff a separated area beside the common area, in order to apply our (promotin the social sustainabilty) strategy.

Guideline Strtegies for designing level 7-8

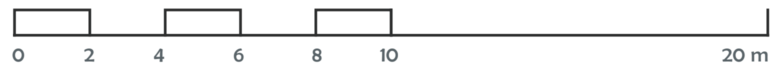
Inpatient ward
IMCU
Staff area
Stairs & Elevators
Common & Waiting area
Storage area
Technical shafts
WC
Reception are
Roof garden
Emergency flow
Inpetient flow
Outpetient/ Visitor flow
Staff flow
Goods flow

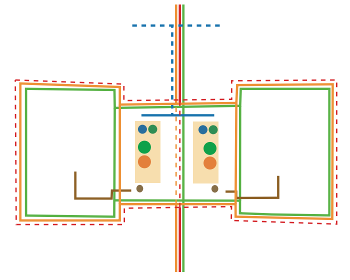


IN-PATIENT WARD | 1:200

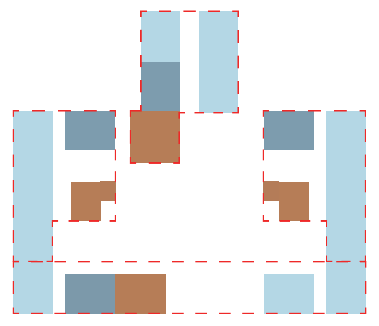


In-patient room | 1:100

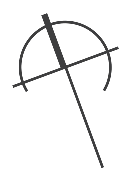




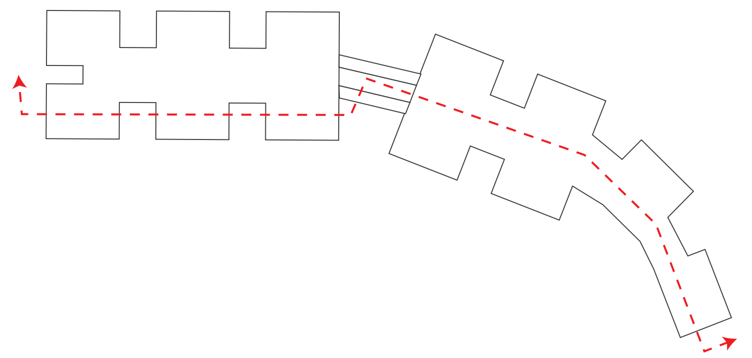
Module corridor system



32 room divided into 4 groups
Group: 6 rooms + 2 IMCU + Staff



NORTH SECTION | 1:500



WEST ELEVATION | 1:500

VISUALIZATION OF THE NEW HOSPITAL