

DIPL
OMA

Long-term Temporary

HOUSING THE LONG-TERM SICK

20
22

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Intro

Abstract

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There is an interaction between human health and the built environment. How we design our buildings affect us. A good physical environment can stimulate, engage and improve a person's sense of coherence and thereby promote health. Architecture can be healing.¹

In my diploma I look into the significance of architecture in patient accommodation. For the long term sick especially, the physical environment of a health institution plays a major part in promoting security, meaning and life quality.

In 2020 the foundation Sonja Victoria was established to raise the discussion of the physical environment of the pediatric cancer ward in Norway. After several years spent in hospitals, the parents of Sonja wish to change the physical environment of children's wards. In their magazine, the topic of children, hospitals and architecture are discussed by the parents, architects, scientists and colour experts.

Using this discussion as a base, long term sick children will be the target group for my project. Long-term sick children are perhaps the most vulnerable group of patients, and even though they have the unique ability to continue to live and play even when they are ill, today's small, white and grown up hospital rooms are not arranged for children. It is proven that children that are allowed to be children use less painkillers and feel better during hospital stays.²

People in demanding life situations have an extra need for accommodating and safe environments, and the benefits can be significant - both financial and health-wise.³ It has been proven that physical environment affects how long a patient will stay in hospital. Investing in better physical environments it therefore a more sustainable approach to healthcare architecture.



Image: sonjavictoriastiftelsen.no

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“For two and a half years, we lived in an environment that is more reminiscent of an environment that punishes than an environment that heals. White walls, small and often north-facing rooms, windows so high up on the wall that children have to be lifted up to be able to look out, no place to eat together, no place to sleep together and no room for play.”⁴

1. <https://healthmanagement.org/c/imaging/issuearticle/the-influence-of-design-and-architecture-on-health>

2. Dagny Thurmann-Moe, “De sterile sykehusene gjør pasientene sykere!”, *Sonja Vol.1, 2021, p. 23*

3. Christina Skreiberg, “Vi ble eksperter på å trives på gråstein”, *Sonja Vol.1, 2021, p.10*

4. Inger Therese og Jon Harald Hoff, *Sonja Vol.1, 2021, s. 5*

Today, the pediatric cancer ward is a place of hope, where most patients survive. As a result more children receive more and longer treatment.

The treatment is organised between the four regional hospitals, with the most advanced treatments centralised in Oslo and Bergen. This means that a lot of patients have to travel to get the treatment they need. This can vary from monthlong stays to frequent intervals of treatment.⁵ When a child becomes ill, the whole family is affected, and it is normal for both parents and siblings to come stay with the patient at the hospital.

The pediatric cancer ward in Oslo is located at Rikshospitalet. Patients get treated here or at one of OUS' other campuses. The ward contains 9 single rooms and 4 double rooms. A double room is as small as 15m², and four patients with relatives share one bathroom on the hallway. The room can be separated with a plastic curtain, blocking light and window view for one of the patients. There is little or no space to stay with the patient over night, and family mainly have to stay at the parent accommodation on the other end of the hospital.



5. <https://www.barnekreftportalen.no/info/om-barnekreft-i-norge/organisering/>

Program

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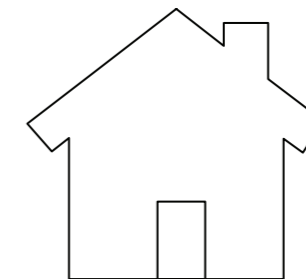
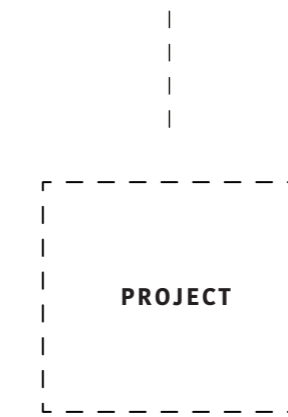
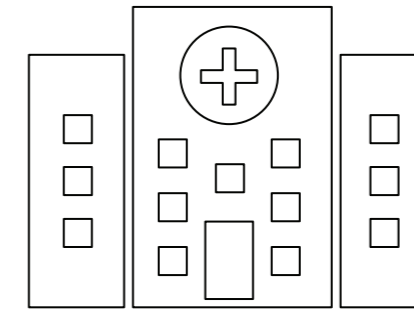
Thanks to new technology, patients living close to a regional ward are offered “advanced home hospital”. This means that the hospital comes to them, making it possible to receive a lot of treatment and support care at home. This can go as far as getting chemotherapy at home before going to kindergarten. Patients from other parts of the country do not have the same offer, and regardless of their condition, they have to stay at the ward at Rikshospitalet when they come to Oslo for treatment. This made me wonder why the current hospital standard aims to house all its patients within the same framework, regardless of frequency or length of stay.

Poorly utilised hospital wards are often justified by lack of space and financial constraints, but why does everything really have to fit into this one big machine in the first place? Advanced home hospital prove that many cancer patients and other long-term patients can live at home while getting treatment at the hospital or even be treated at home. Can't also the travelling patients get their “home” close to the hospital?

My diploma project is an alternative accommodation facility that operates as an external extension of the existing children's ward at Rikshospitalet.

The project serves as an intermediate stage between hospital and home and can house patients who are under moderate treatment. By still being in close proximity to the hospital and being manned 24 hours a day, the project will be able to provide the same treatment as advanced home hospital and more. In addition to patient units the project will offer shared space, supportive care, and be able to function as a pediatric cancer centre during the daytime, which will be a public offer for the entire children's ward.

By introducing an external building, the project is able to keep a domestic scale, and is free to better respond to the patient group's specific needs. In addition, moving parts of the ward will free up space in the hospital, enabling transformation and better use of existing space for those in need of more advanced care.



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Functional program

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SHARED SPACE

Area:

Entrance
Reception and wardrobe. 50 m²

Kitchen and eating area
Common kitchen where residents can cook together or for themselves. Space to eat together or separate. 100 m²

Living and play area
A variety of shared living room- and play areas. Different zones of different program and activity level. Tv-area, a library, seating areas. Small niches and bigger spaces. 200 m²

Rest/quiet area
Space for rest and conversation. 20m²

PATIENT

Patient unit x 12
The patient unit is the patient and family's private unit within the project. The room will include a bed for the patient and bed(s) for parents/siblings, a small tea-kitchen, seating niche and a private bathroom. 27 - 35m²

SUPPORT TREATMENT

Physiotherapy
Space for mild exercise. Can also be used for play or events. 40m²

Area:

Swimming pool
For mild exercise and activity. 46 m²

Wardrobes
In connection to Physiotherapy and swimming pool. 30 m²

Classroom
Space for school work, patients and siblings. 25 m²

STAFF

Office
Offices for daytime staff. 15 m²

Kitchen / break room
Separate kitchen and break room for staff. 17 m²

Overnight room
Overnight room for night shift staff,. 6 m²

Wardrobes
Changing room and storage. 10 m²

Prep Kitchen
Kitchen operated by staff serving food to all residents. 12 m²

MAINTENANCE

Lab
Medical equipment and preparation. 10 m²

Storage
Medical equipment, user equipment, food etc. 100 m²

Washing / drying
User equipment 25 m²

EXTERIOR

Outdoor space
Private nished and shared gardens.

Outdoor play area
Playground for both patient and siblings.

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Architectural approach

There is a lot of research done in different disciplines that points to what creates optimal spaces for humans and which qualities that promote health. During my process I have worked with four main topics that has been important throughout the project.

6. <https://www.healthcare-facilitiestoday.com/posts/Six-trends-in-healthcare-architecture--16520>

7. <https://journals.sagepub.com/doi/10.1177/1937586716672041?icid=int.sj-full-text-similar-articl>

8. <https://healthcaredesign-magazine.com/architecture/designing-access-nature-healthcare/>

9. Gaute Brochmann "Vår bransje har mye å gå på nå"

10. Dagny Thurmann-Moe "Det sterile sykehuset gjør pasientene sykere!", *Sonja Vol.1, 2021, p. 23*

11. Dagny Thurmann-Moe "Det sterile sykehuset gjør pasientene sykere!", *Sonja Vol.1, 2021, p. 25*



Familiarity

A common wish for patients and relatives is to live as normal as possible while facing a demanding situation. It is therefore important to feel at home in a healthcare facility. Traditional hospitals are often characterised by white walls, pale colours, fluorescent lights and sterile surfaces. My project aims to provide a domestic character through materials, scale and interior.

Having family close can make a big difference, and patient units should have the space and flexibility to accommodate different family situations to stay together. Room for personalisation can also be very important for the comfort of patients when placed in an unfamiliar environment, and is proven to reduce anxiety.⁶



Thresholds and connections

How rooms and functions are scaled and organised has a great impact on both the functional operation of the facility, as well as the spacial perception of the place. Graduated spaces that helps an individual move from privacy to to a larger social groupings in a dignified manner fosters autonomy and well-being.⁷ How can generosity be perceived as intimate? How can one be private in a room shared with others?

Maybe especially in children's wards, patients are not always in bed but moving from place to place interacting with staff, other patients and visitors, making those in-between spaces all the more important. In my project I work with how the circulation space can also be a place to be, counteracting the perception of corridor with spaces transitioning from private to social.



Connection to nature

Access to nature has become one of the most documented areas of research in healthcares' evidence-based design, and one of the most meaningful to patients, staff and visitors. People with access to wild green areas that change with the seasons feel calmer, have better concentration, improved creativity, and a heightened sense of hope. The human connection with other living systems meditates our sense of understanding in times of stress.⁸

Having a view, both near and far lets us follow the day and provide an overview of the external surroundings. Being able to look out reduces the feeling of isolation and is proven to reduce hospital stays by up to 30%. It is significantly better to look out at nature or the sky versus a concrete wall.⁹



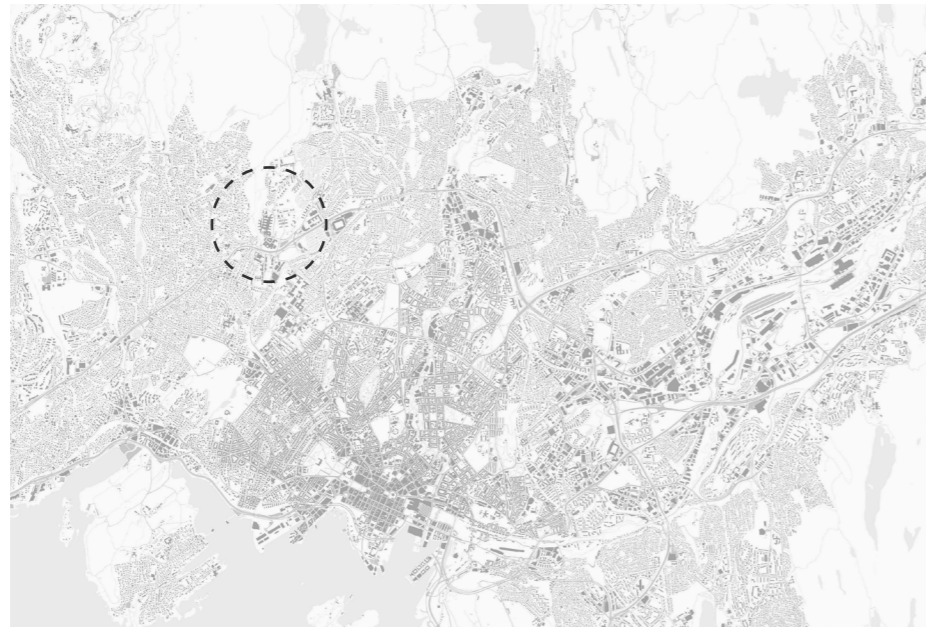
Materials and colors

As well as visual exposure to the natural world, research is showing that incorporating nature into the build environment using organic material such as wood and stone also has its health benefits. For instance, exposed wood creates a natural aesthetic and its hydrothermal benefits provides a better indoor climate. Glass, steel and concrete has the opposite effect and can increase heart rate rather than lowering it.¹⁰

Different colors affect us differently, and can therefore be thoughtfully used to influence us in a given direction. For instance colours of nature, green and blue, make us feel calm and secure, while tones of yellow and red can enhance optimism and creativity. The use of colors is also a way to avoid monotonous environments, as this can be experienced as uncomfortable regardless of color and material. One should also avoid large empty surfaces without anything to rest the eyes on. This can promote stress.¹¹

Project

Site

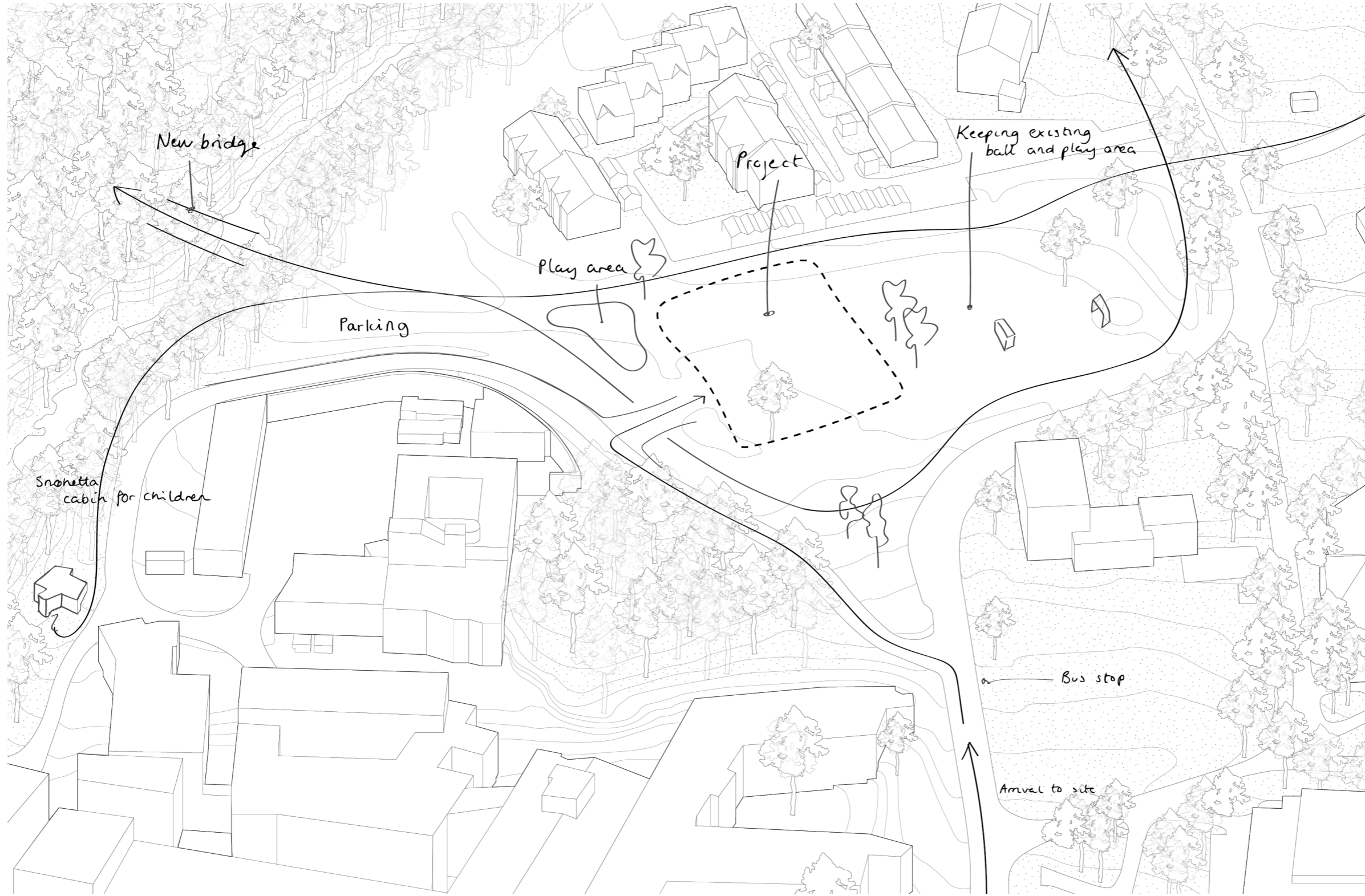


The project site is close connected to Rikshospitalet, located north-west in Oslo. It is well connected to the city's main roads and public transportation, and lies along side the a river and the outskirts of Osломarka.

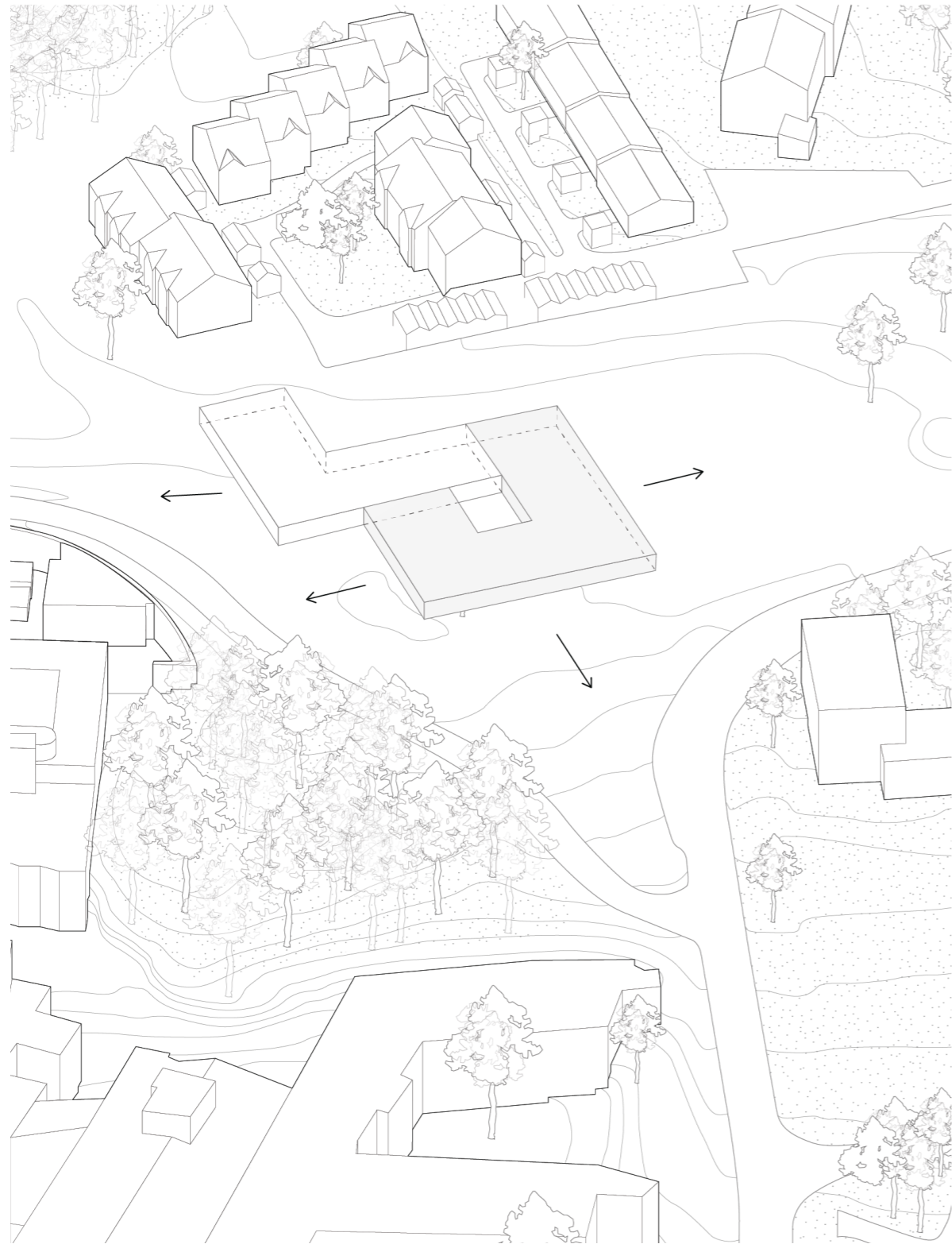




The site is an open field on a hill just above the hospital. It is surrounded by a housing area, a kindergarten and the forest to the west. Along the river, Snøhetta has designed a small cabin for children staying at the hospital, to encourage outdoor activity.



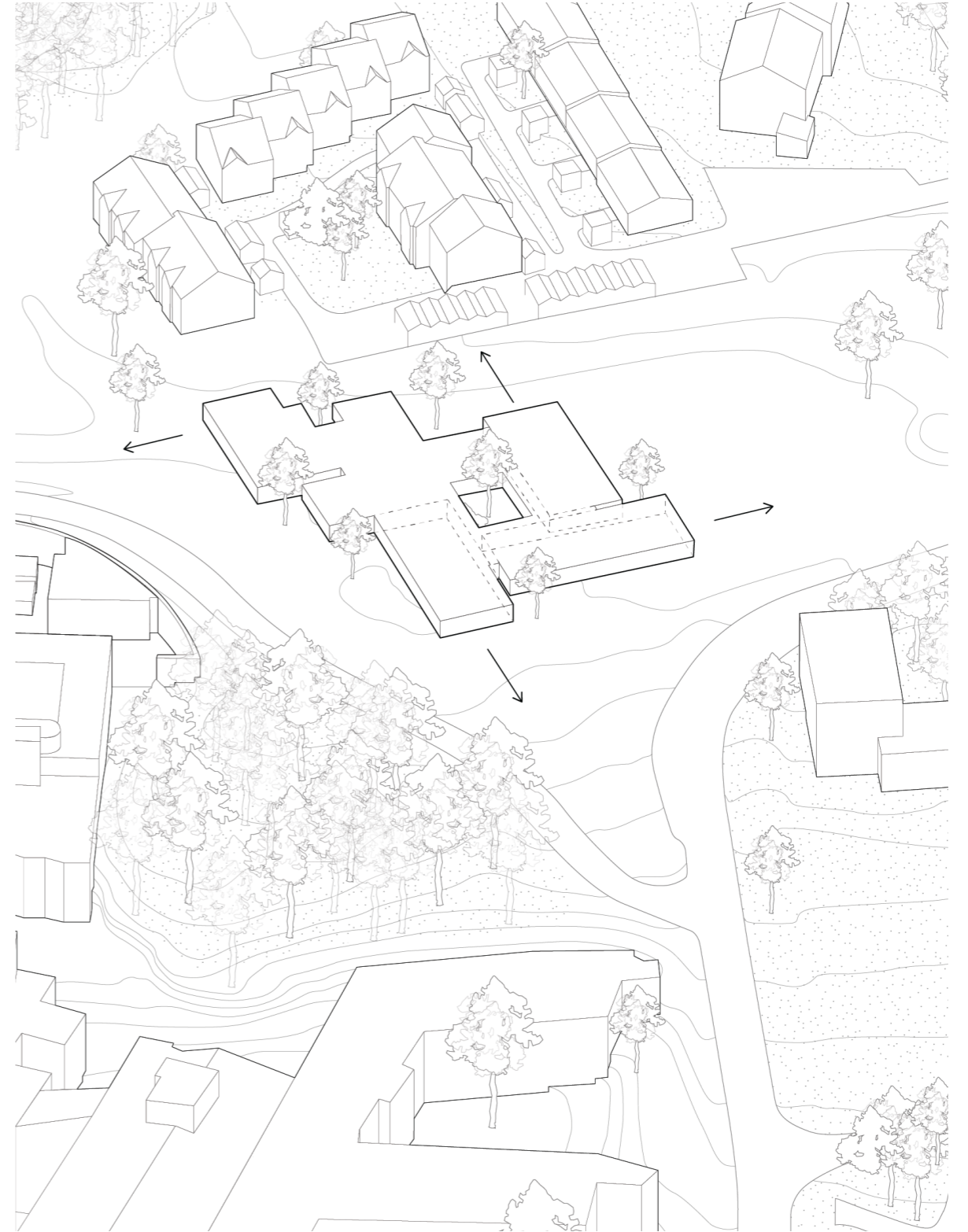
The area brings great potential in working on a project that is not only a protected inner world, but also extends beyond the site and connects to the area.



Organization

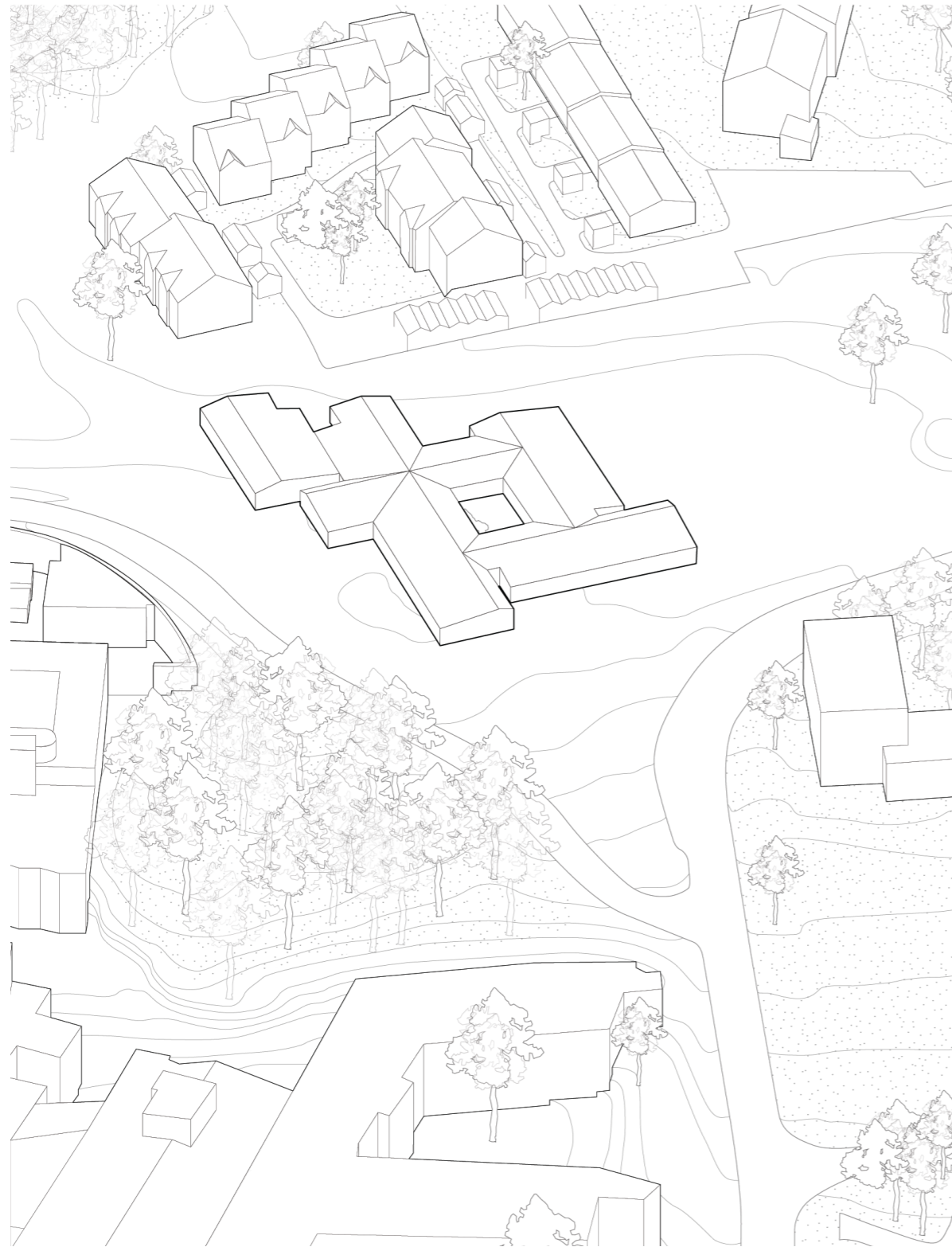
The project is organised over one story, to give all units and shared functions direct access to the outdoor. The program is divided into the residential and the public functions arranged around an atrium. The patient units are oriented towards the sun and view, while the public functions stretch towards the forest and playground.

- Patient units
- Daytime centre



Adjustments

To make the plan more porous, the volume is splitted and shifted. This minimises the distance around the atrium and lets the surrounding nature grow into the project.



Domestic character

A pitched roof gives the project a familiar and domestic character, which connects to the surrounding housing typology. In the interior the ceiling brings spacial height and variety.



Construction and interior surface

The project has a CLT construction-system which is both a sustainable and efficient way of building. The construction also has a direct influence on the interior with exposed wooden surfaces, creating a warm and domestic feel as well as a good indoor climate.



Model
1:500



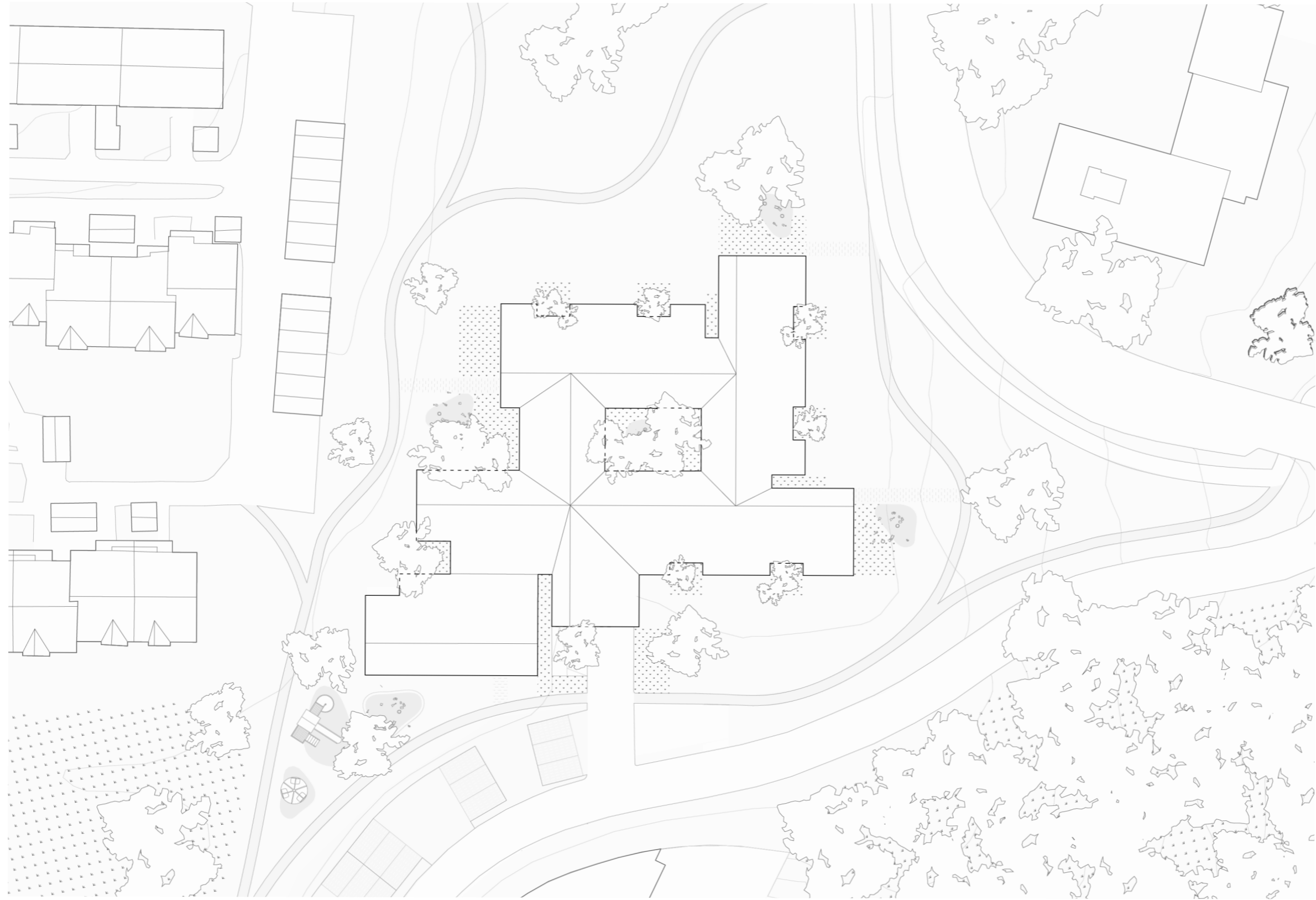
Model
1:150

Model
1:150





Siteplan
1:1000



Exterior plan
1:500



South facade
Model 1:150

Exterior

Approaching the site from south. The project has a domestic appliance with wooden cladding and pitched roof.



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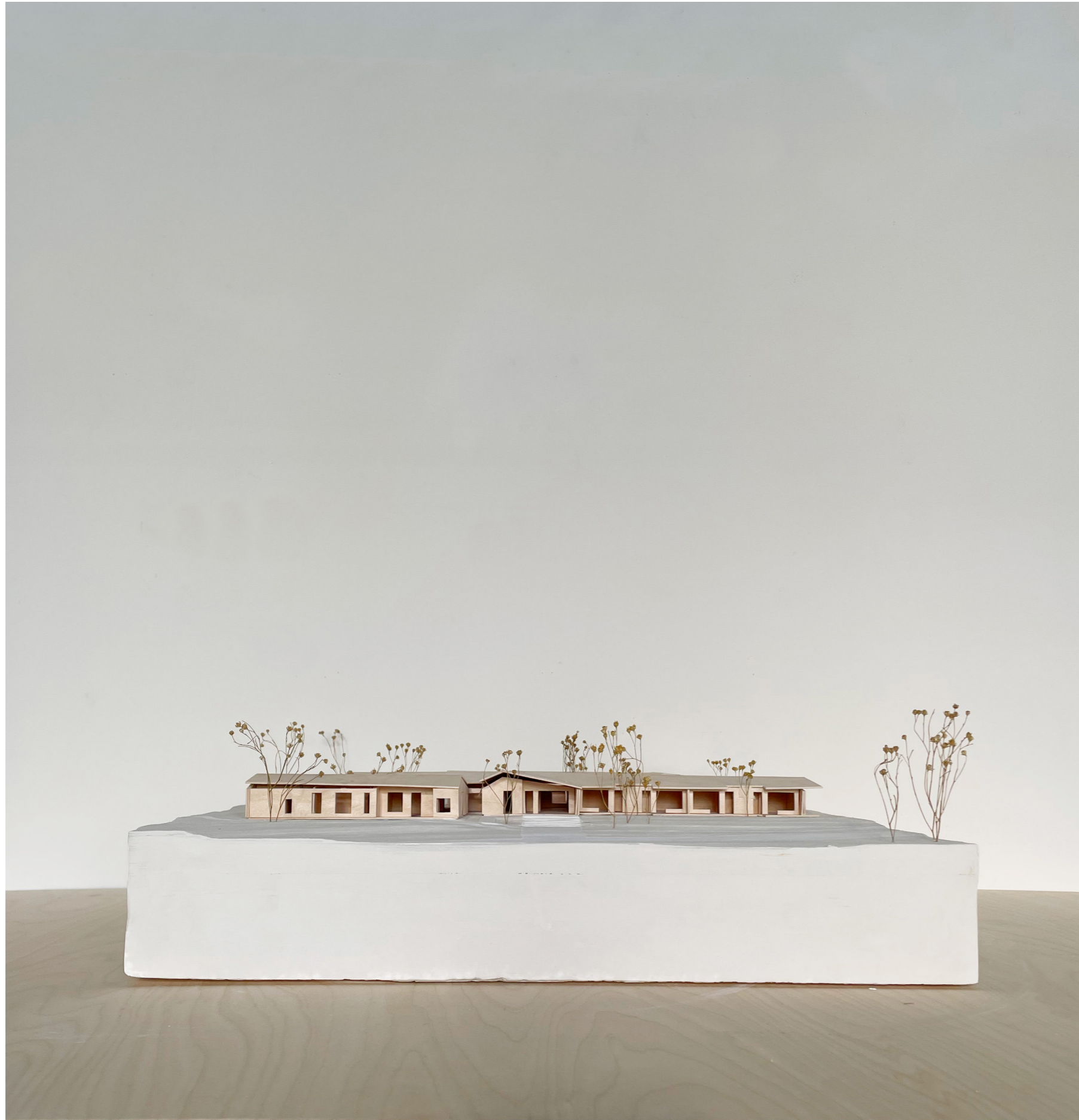


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LONG-TERM TEMPORARY

West facade
1:200



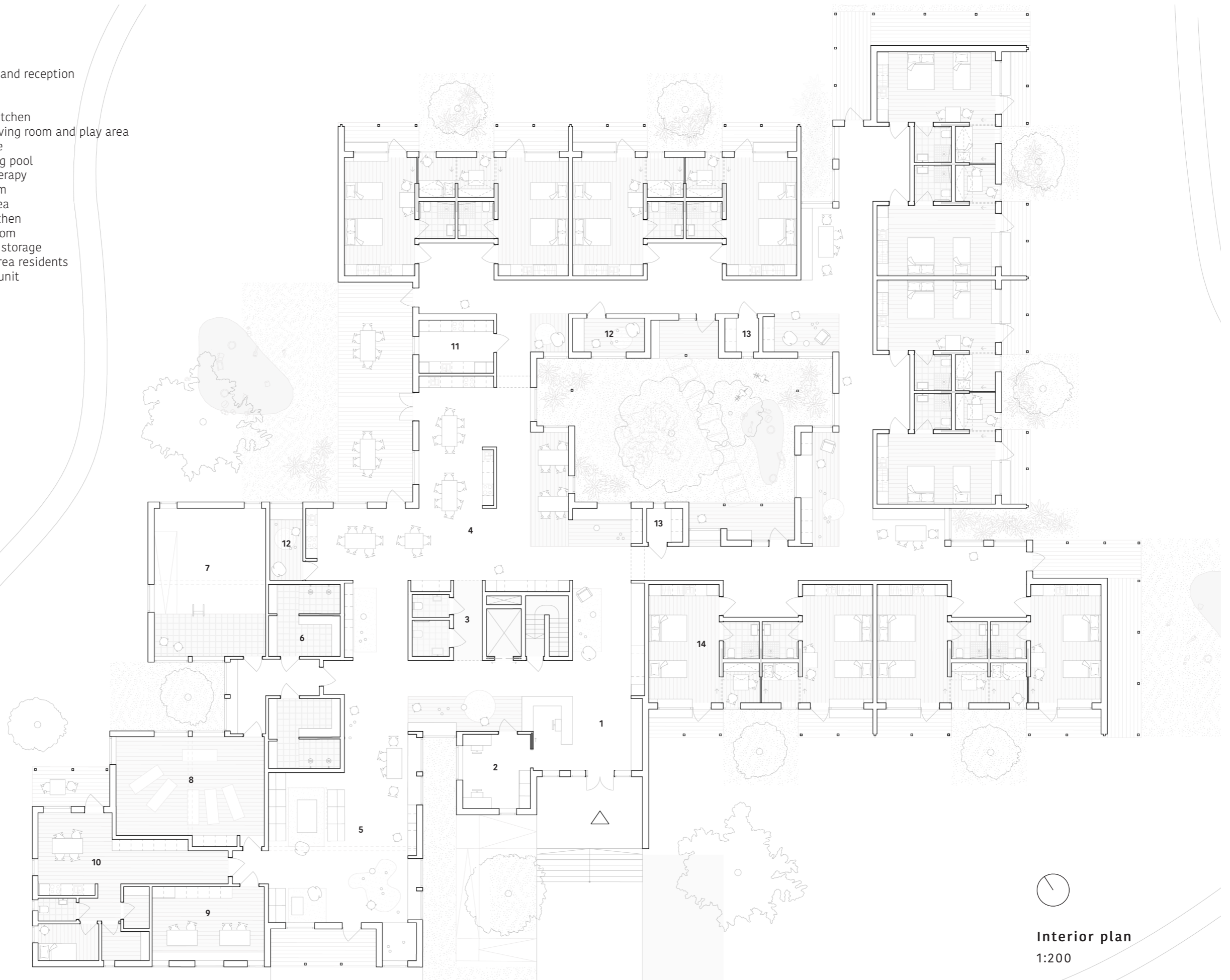
North facade



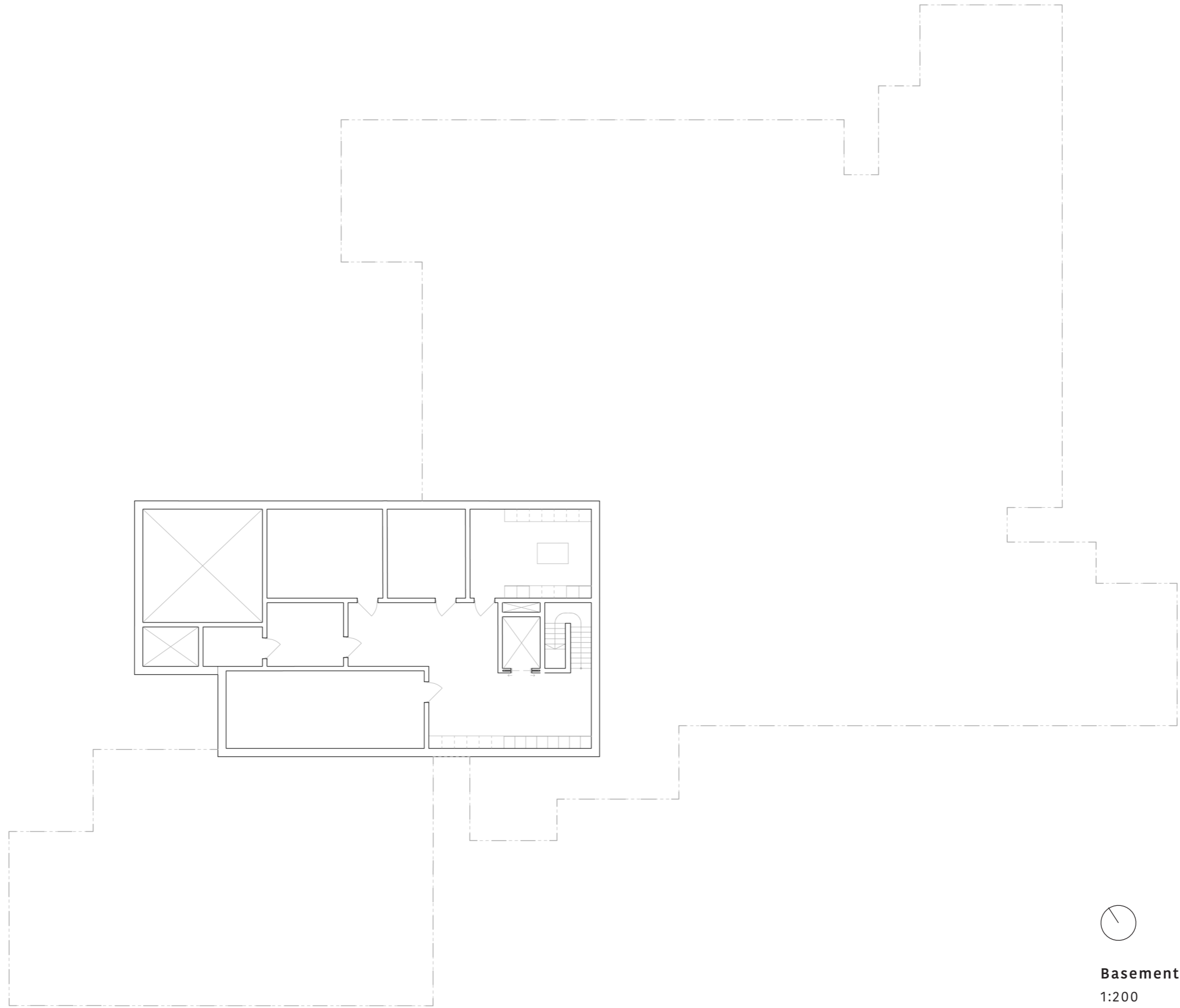
East facade

West facade
Model 1:150

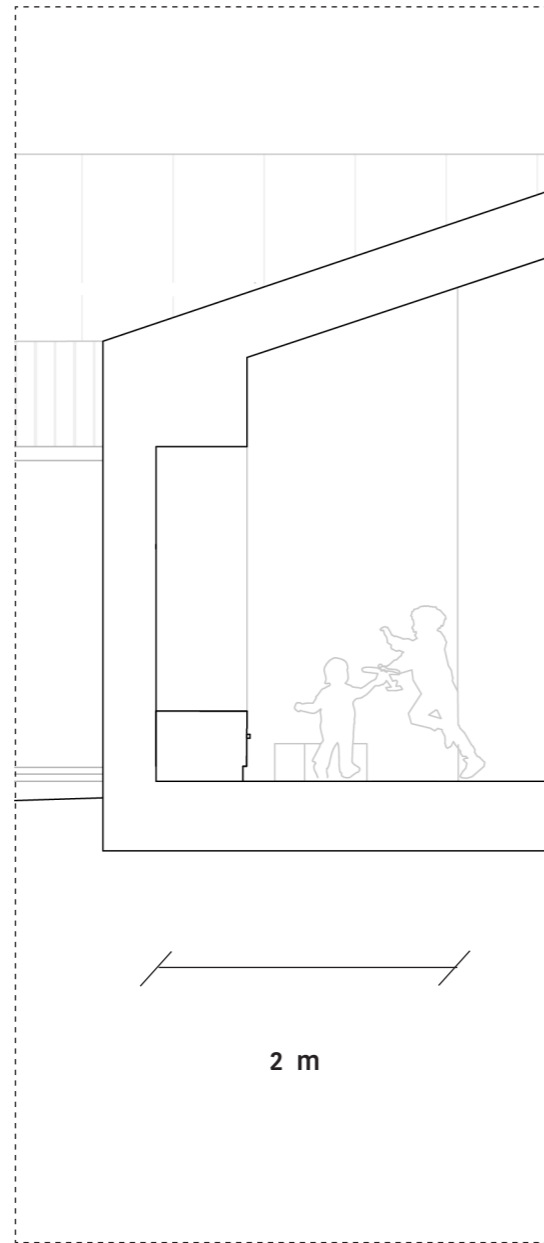
- 1. Entrance and reception
- 2. Office
- 3. Toilets
- 4. Shared kitchen
- 5. Shared living room and play area
- 6. Wardrobe
- 7. Swimming pool
- 8. Physiotherapy
- 9. Classroom
- 10. Staff area
- 11. Prep kitchen
- 12. Quiet room
- 13. Medical storage
- 14. Living area residents
- 15. Patient unit



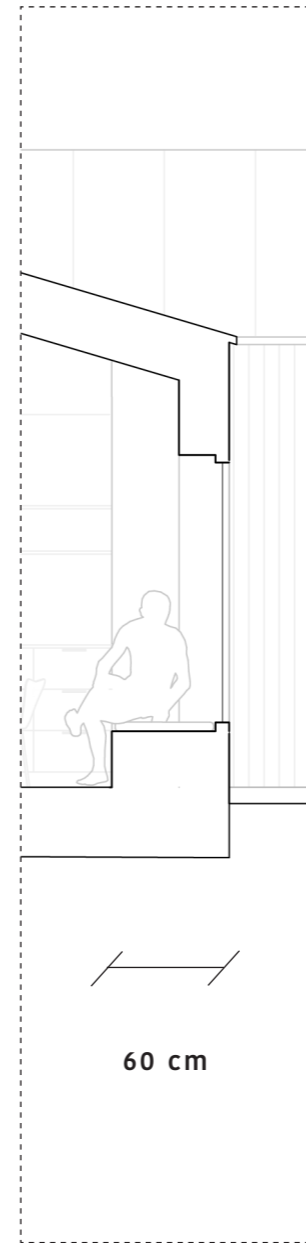
Interior plan
1:200



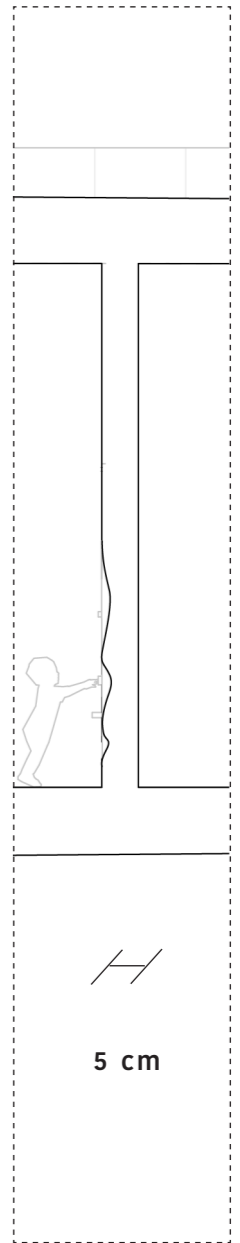
Basement plan
1:200



2 m



60 cm



5 cm

Programming the in-between

Characteristic for healthcare institutions are the long straight corridors. This project explores how working with the depth of the wall can programme and activate the in-between spaces. The concept varies from shifting the wall to make niches, using integrated furniture, and directly programming the wall with milling of the CLT.



Model
1:30

The in-between

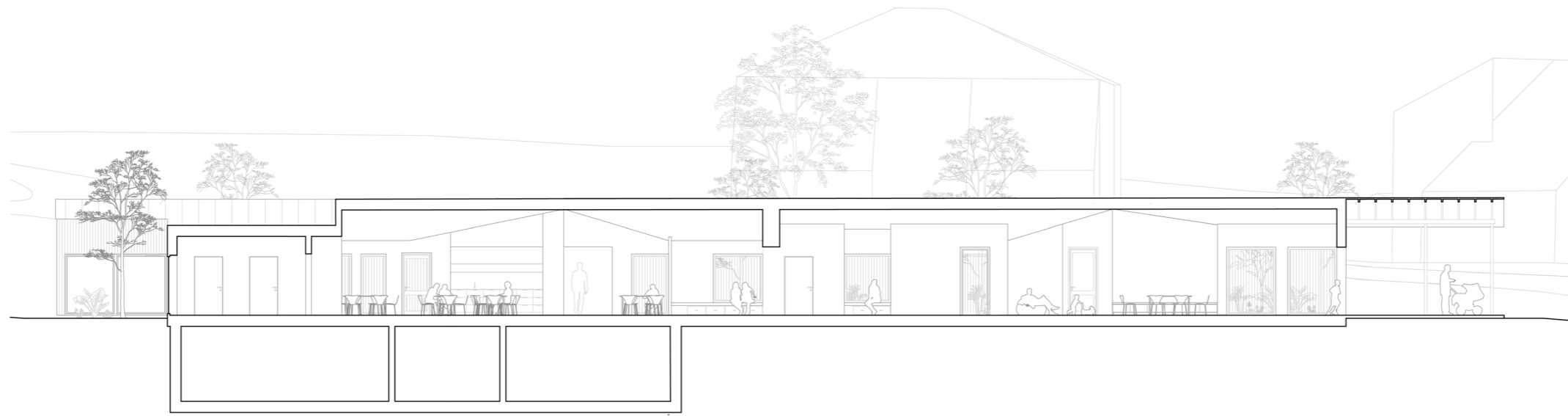
Exposed wooden surfaces and integrated furniture in coloured valchromat.

Kitchen

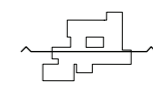
The shared kitchen has space for many while keeping the spacial appearance of a domestic dining room.



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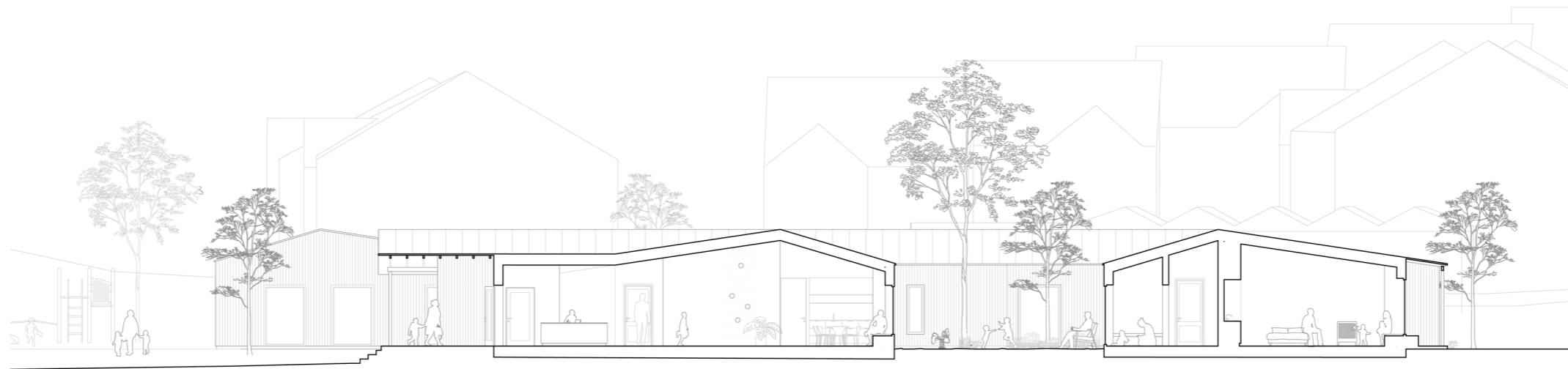
East section
1:200



Entrance

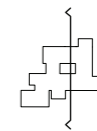
A direct view to the atrium gives an imitate understanding of the building.

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LONG-TERM TEMPORARY



North section
1:200



60

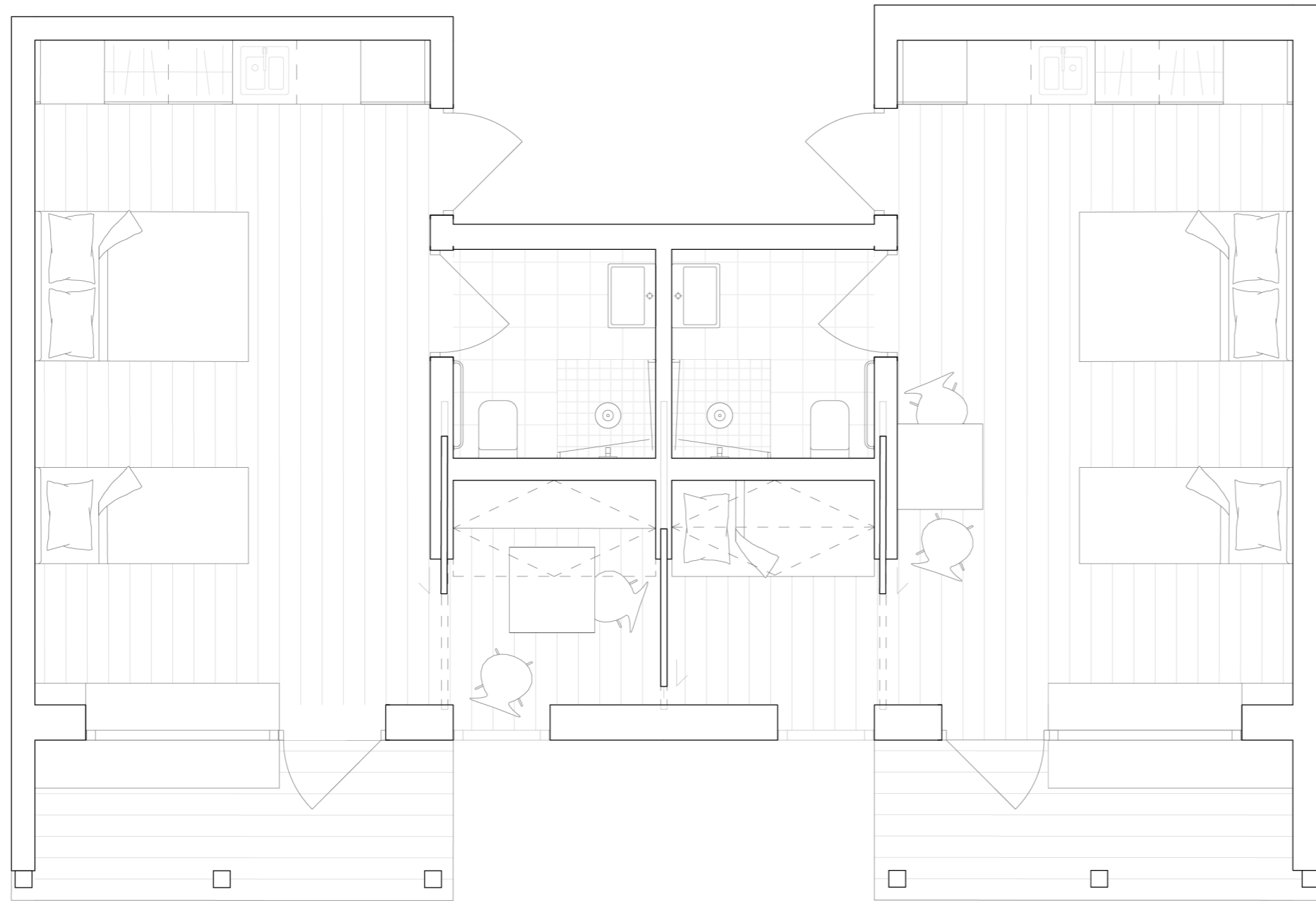
Model
1:30

Atrium

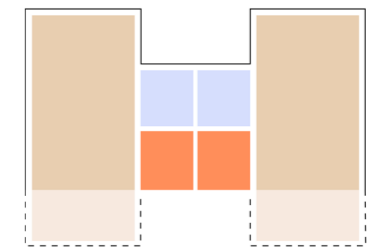
An enclosed garden for the project residents stands in contrast to the outer exterior spaces.



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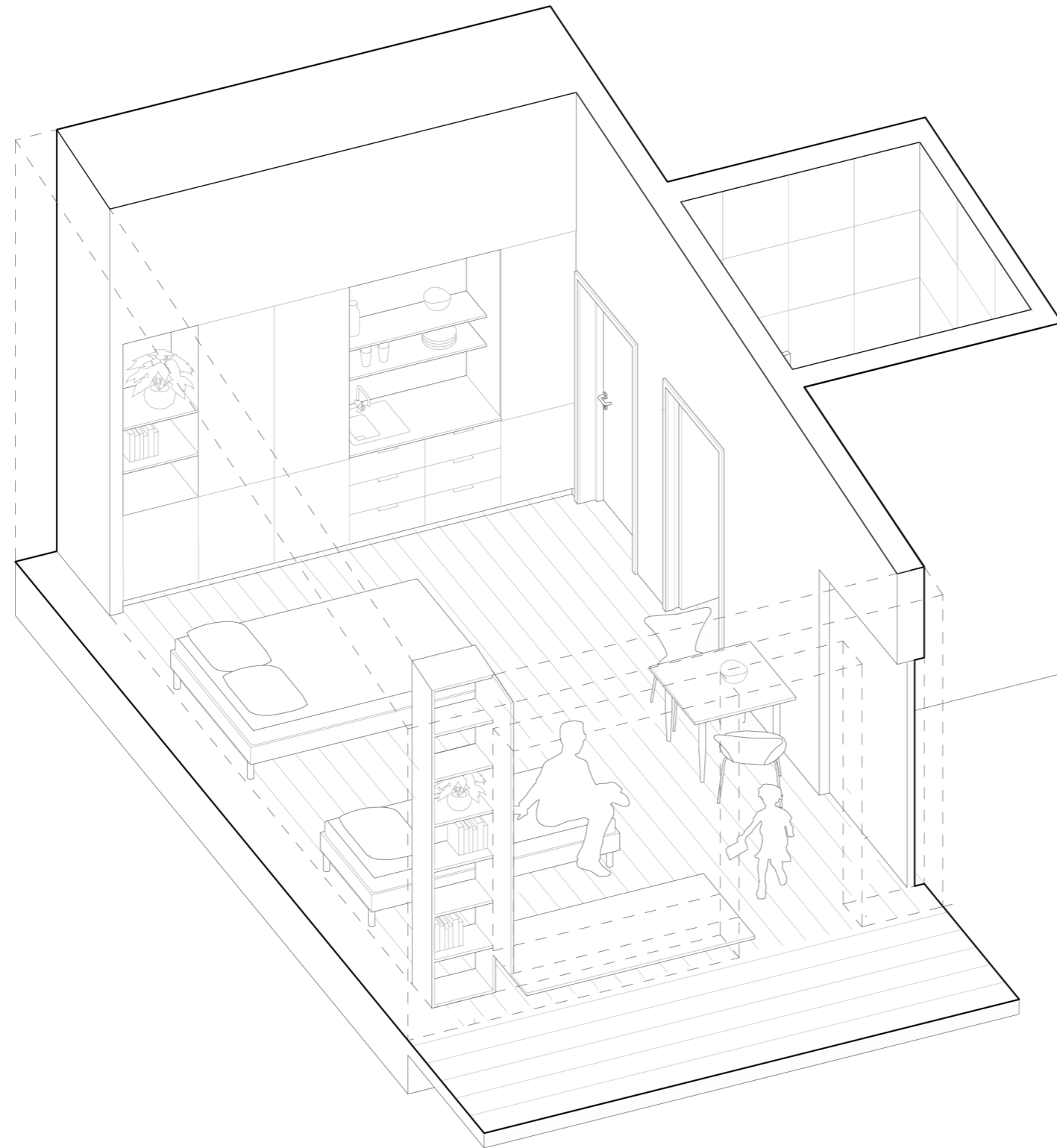


Patient unit
1:50



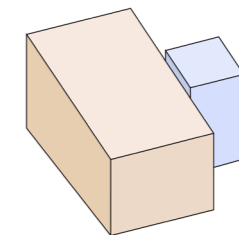
The patient units are organised in pairs. Basic, necessary functions are located in the main room with sufficient space for visitors and medical care. The bathrooms are paired in the centre and along the facade are two flexible niches that can be dedicated to each of the rooms according to needs. This gives the rooms the flexibility to accommodate different types of families and lengths of stay. Both rooms have a small outdoor space and an entrance retracted from the corridor creating a small threshold between private and social.

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Axo
Type 1 - 27 m²

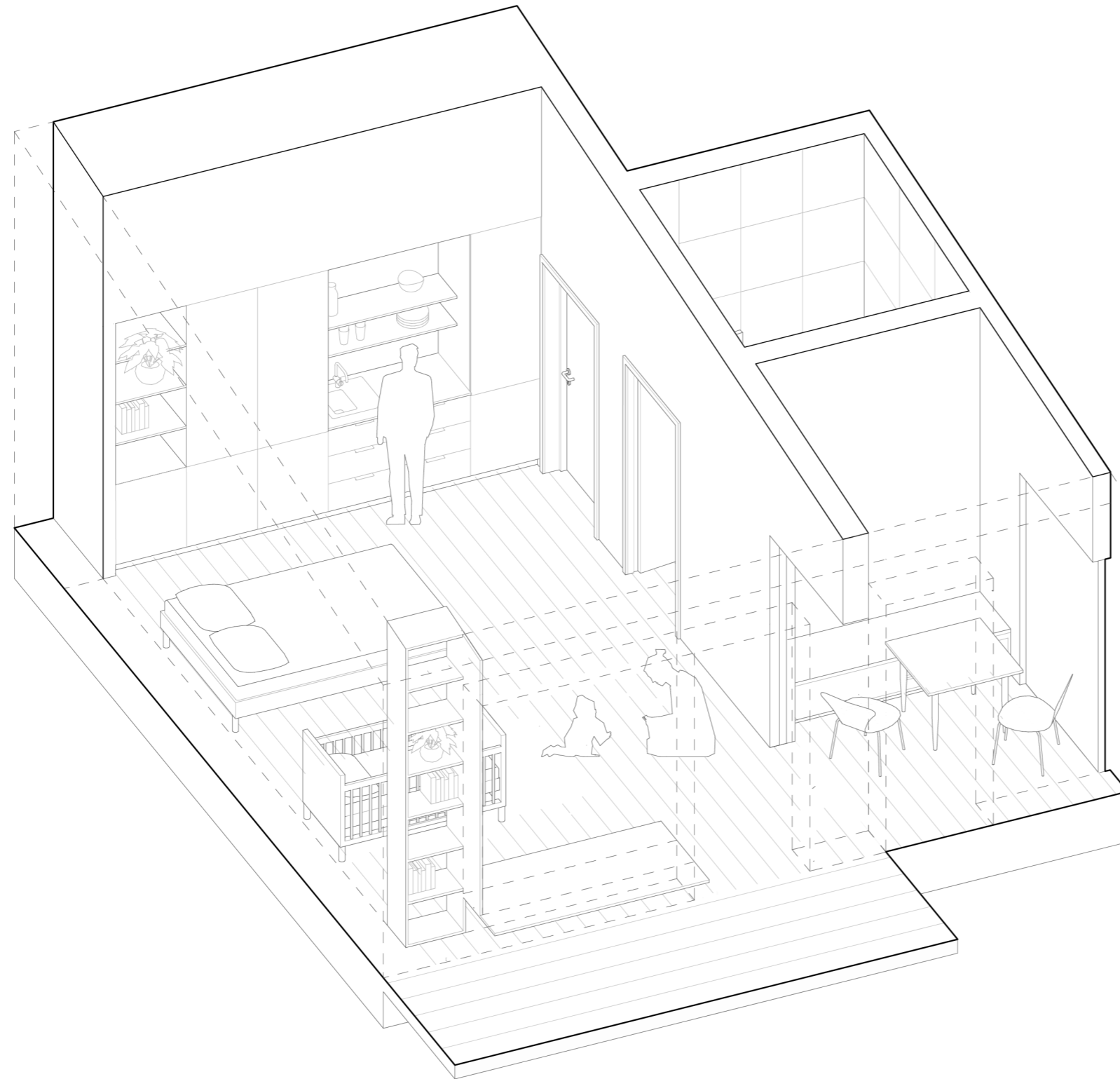
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Type 1
Patient and one or two
parents. Shorter stay.

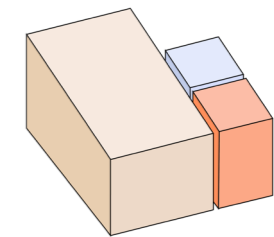
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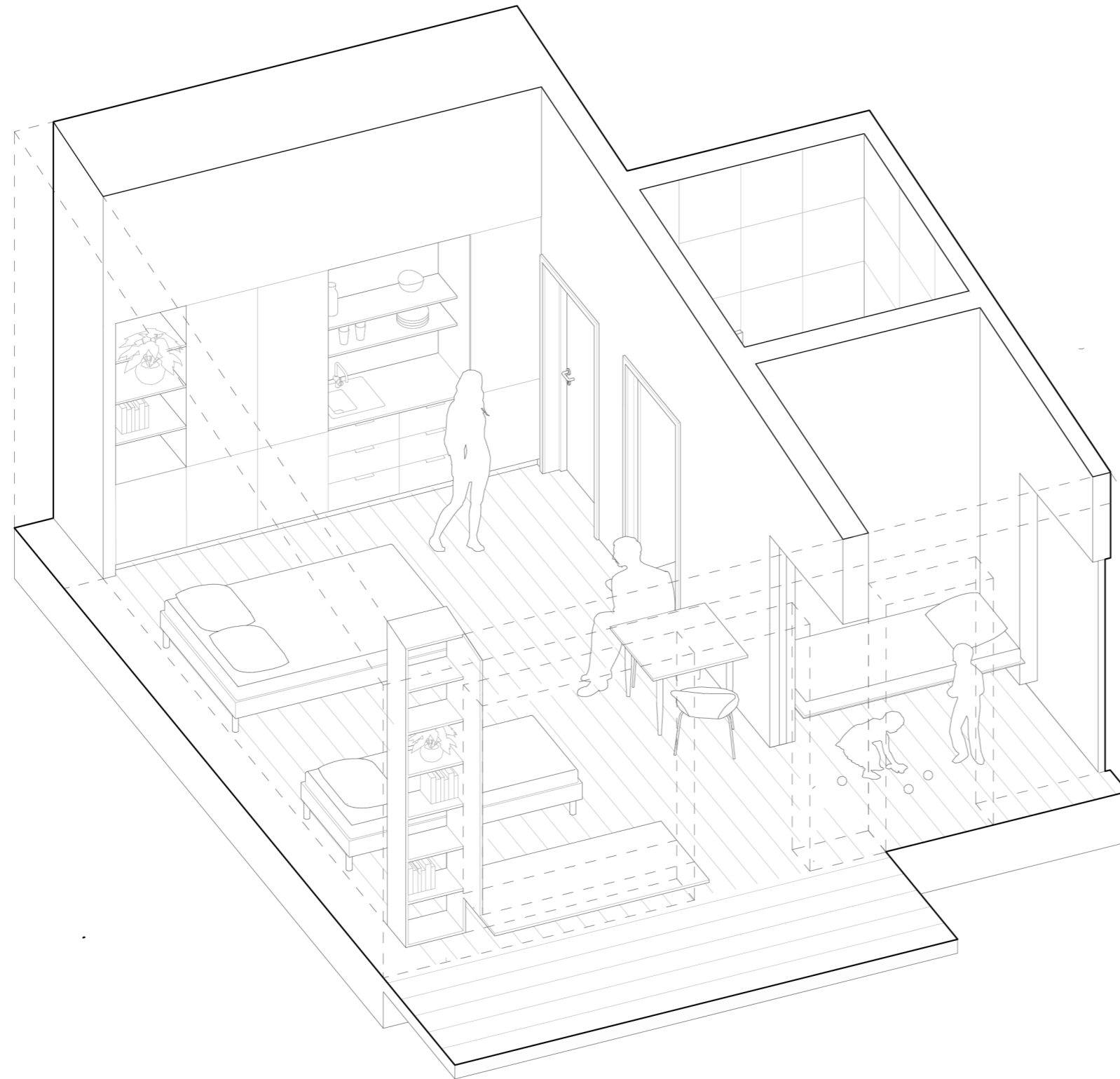
LONG-TERM TEMPORARY

Axo
Type 2 - 31 m²



Type 2
Patient and one or two par-
ents. Extra living space for a
longer stay.

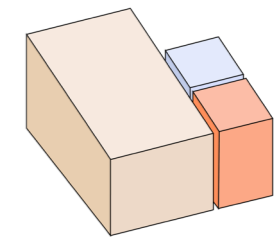
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LONG-TERM TEMPORARY

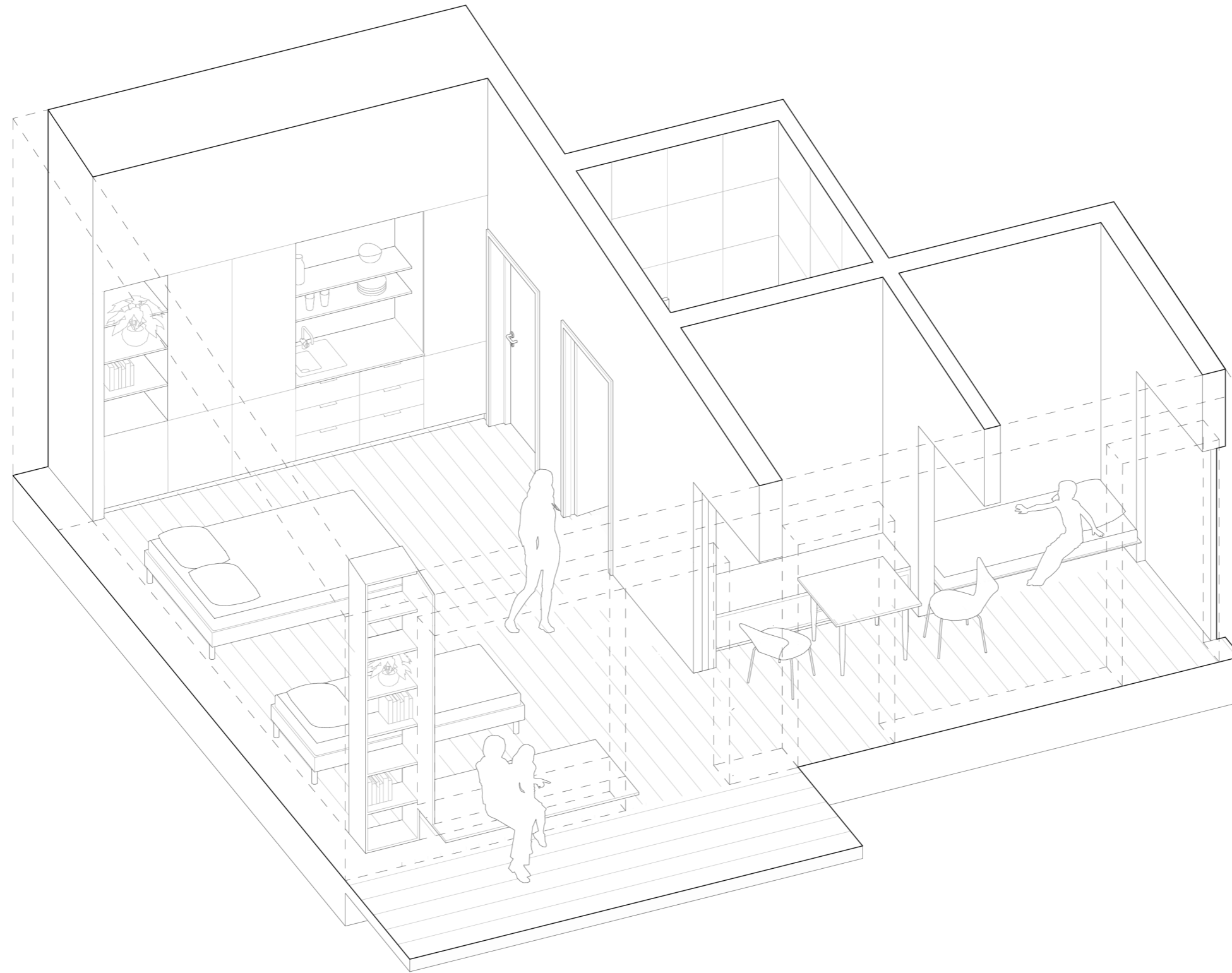
Axo
Type 3 - 31 m²



Type 3
Patient, two parents and a sibling. Seating niche transforms into extra bed.

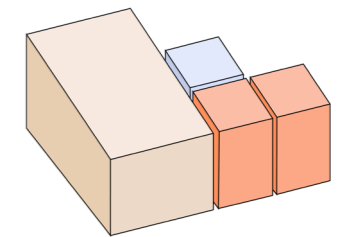
70

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LONG-TERM TEMPORARY

Axo
Type 4 - 35 m²



Type 4
Bigger family with space for a longer stay.



Model
1:30

Patient unit type 2

Exposed wooden surfaces and integrated furniture in coloured valchromat or plywood.

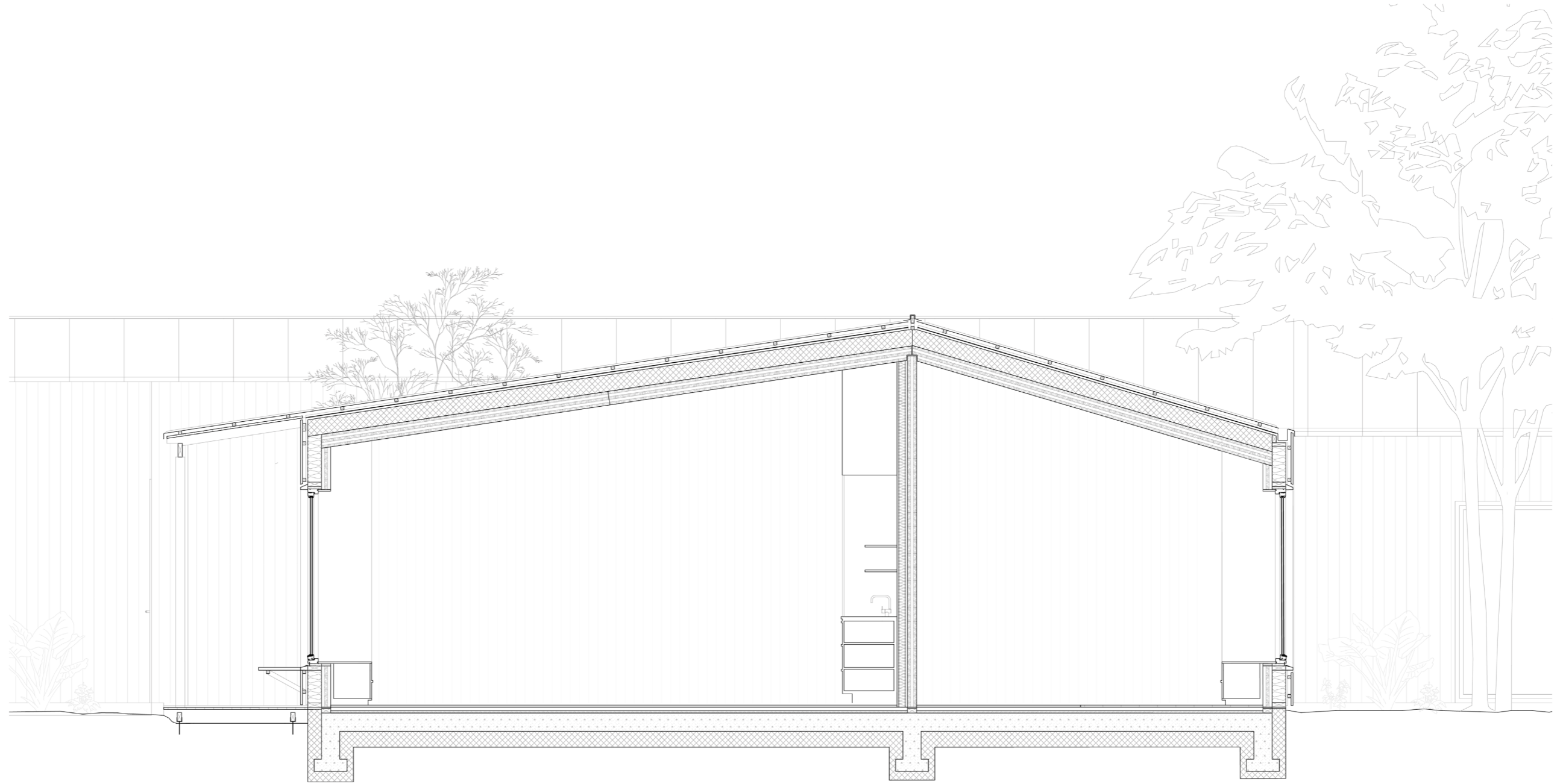
Connected and protected

Direct access to the outside connects each unit to the site and area. Extended roof framed with columns becomes a buffer between the private room and shared outdoor.



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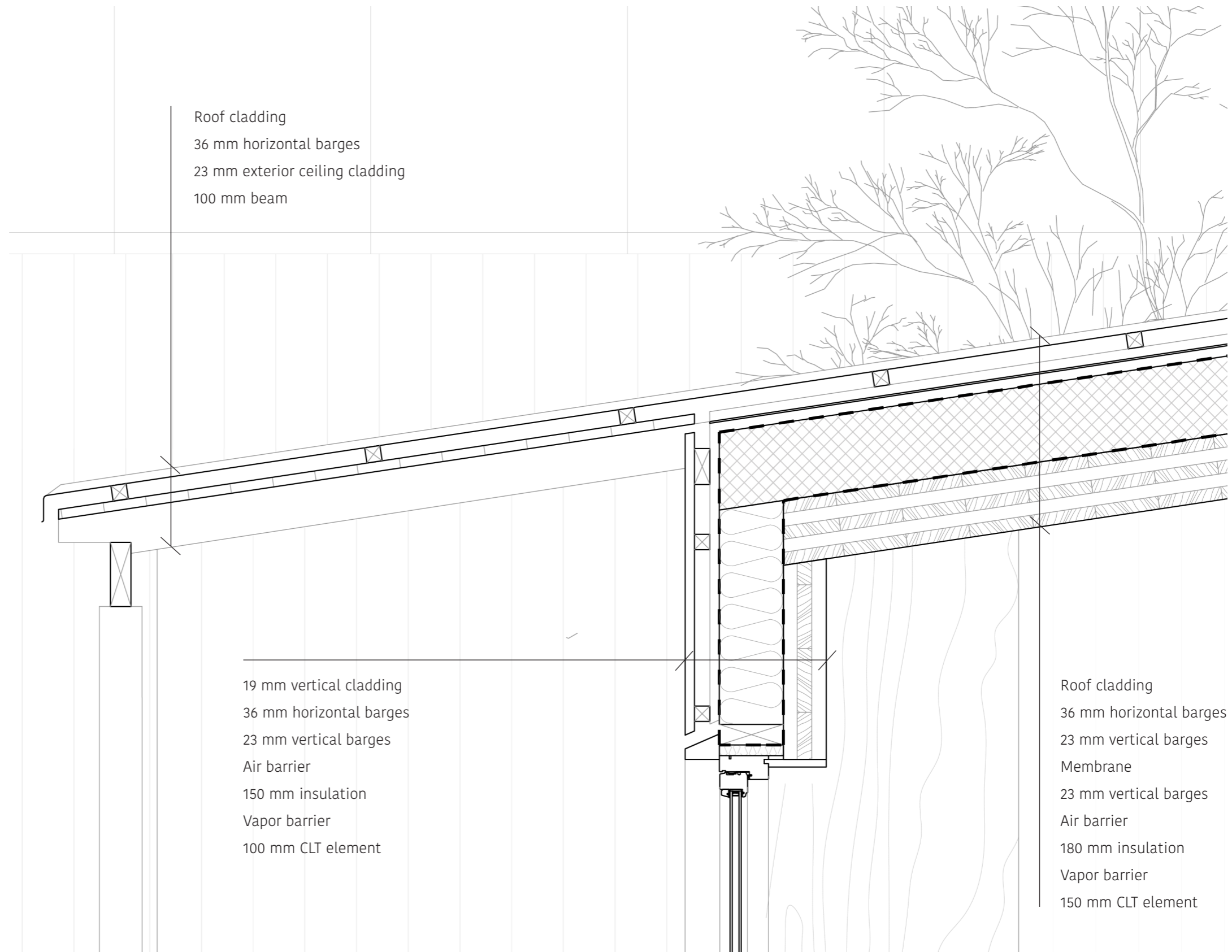


LONG-TERM TEMPORARY

Detail section
1:30

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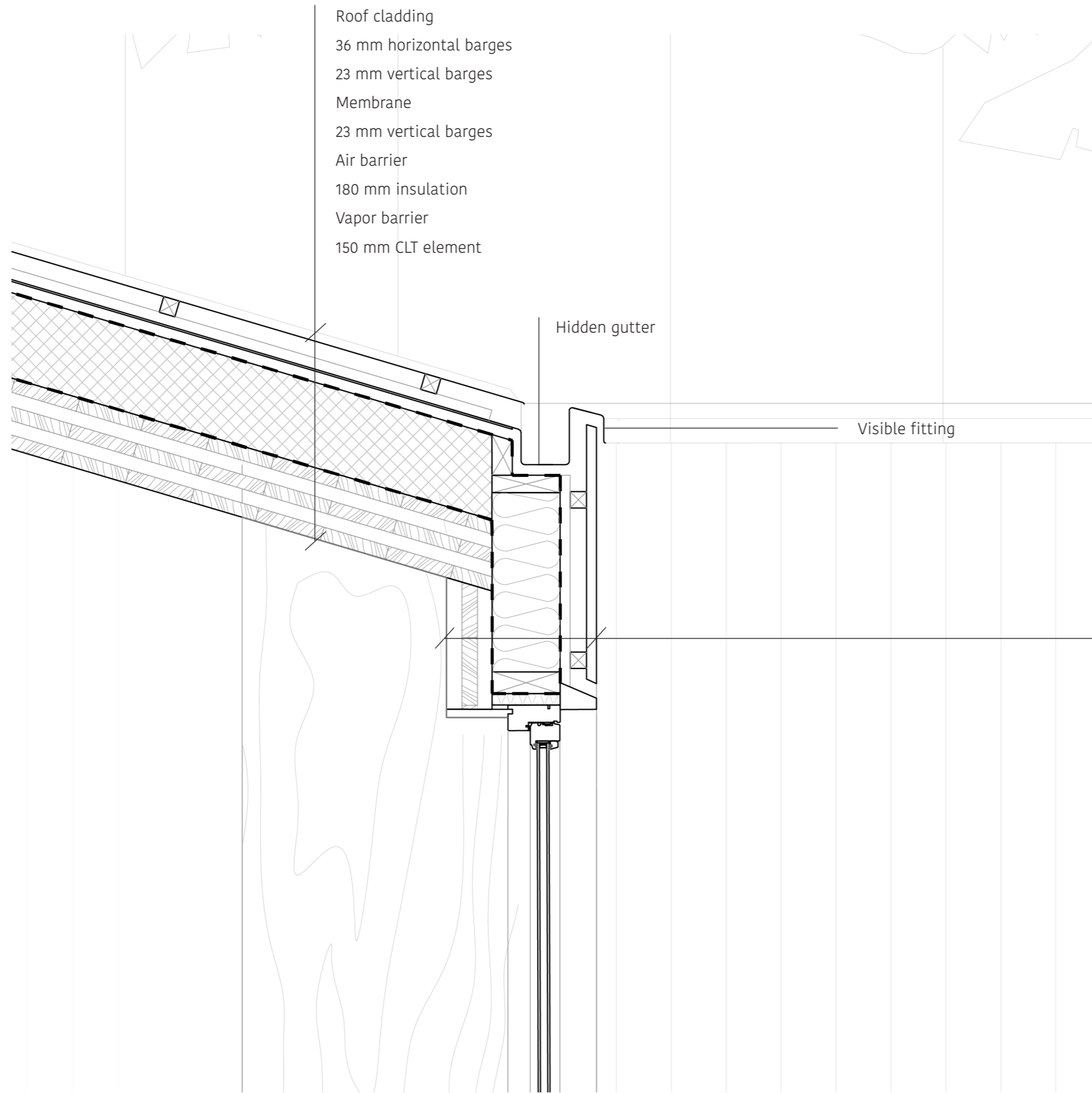


Roof cladding
 36 mm horizontal barges
 23 mm exterior ceiling cladding
 100 mm beam

19 mm vertical cladding
 36 mm horizontal barges
 23 mm vertical barges
 Air barrier
 150 mm insulation
 Vapor barrier
 100 mm CLT element

Roof cladding
 36 mm horizontal barges
 23 mm vertical barges
 Membrane
 23 mm vertical barges
 Air barrier
 180 mm insulation
 Vapor barrier
 150 mm CLT element

Roof detail
 1:10



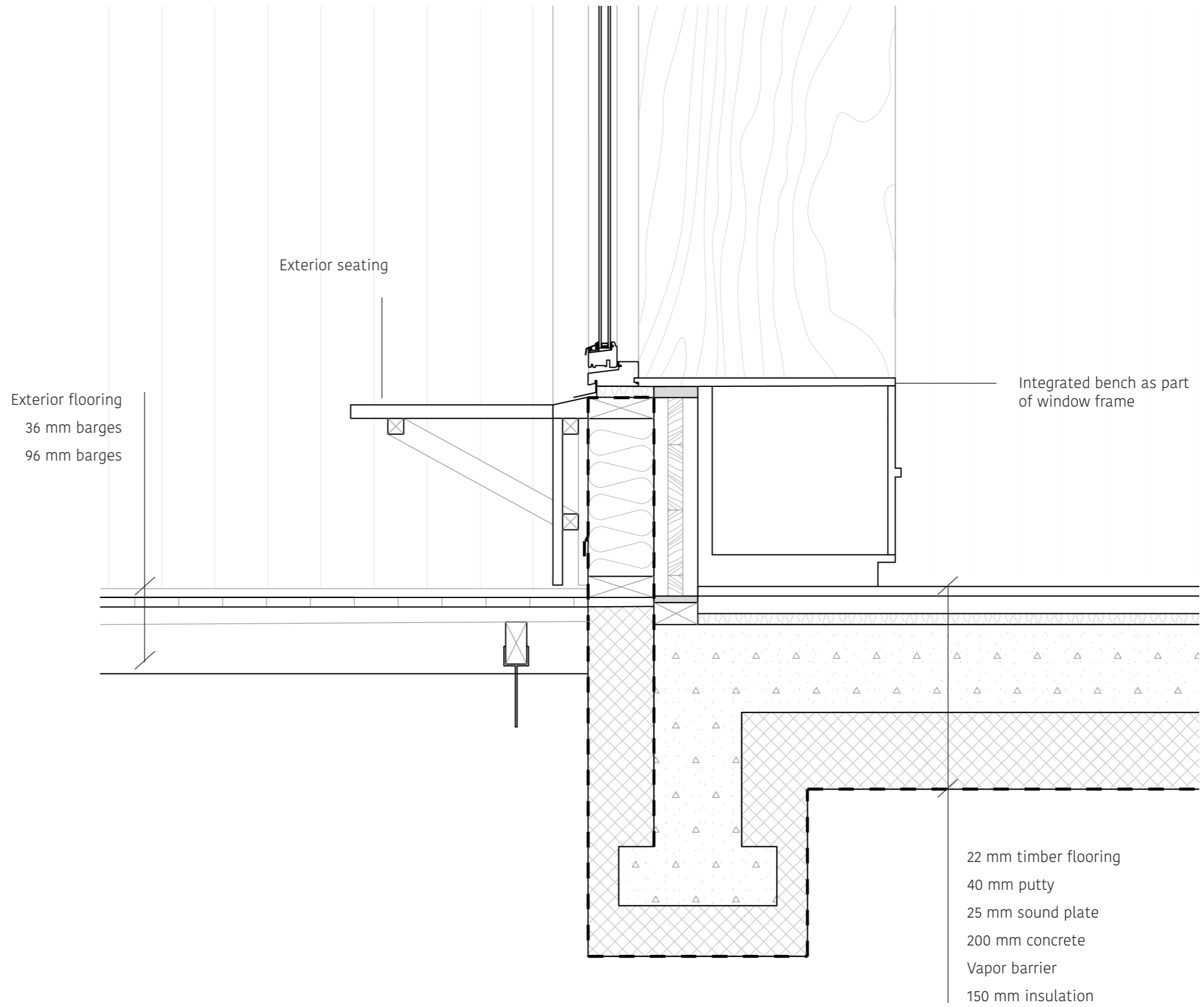
Roof cladding
 36 mm horizontal barges
 23 mm vertical barges
 Membrane
 23 mm vertical barges
 Air barrier
 180 mm insulation
 Vapor barrier
 150 mm CLT element

Hidden gutter

Visible fitting

19 mm vertical cladding
 36 mm horizontal barges
 23 mm vertical barges
 Air barrier
 150 mm insulation
 Vapor barrier
 100 mm CLT element

Gutter detail
 1:10

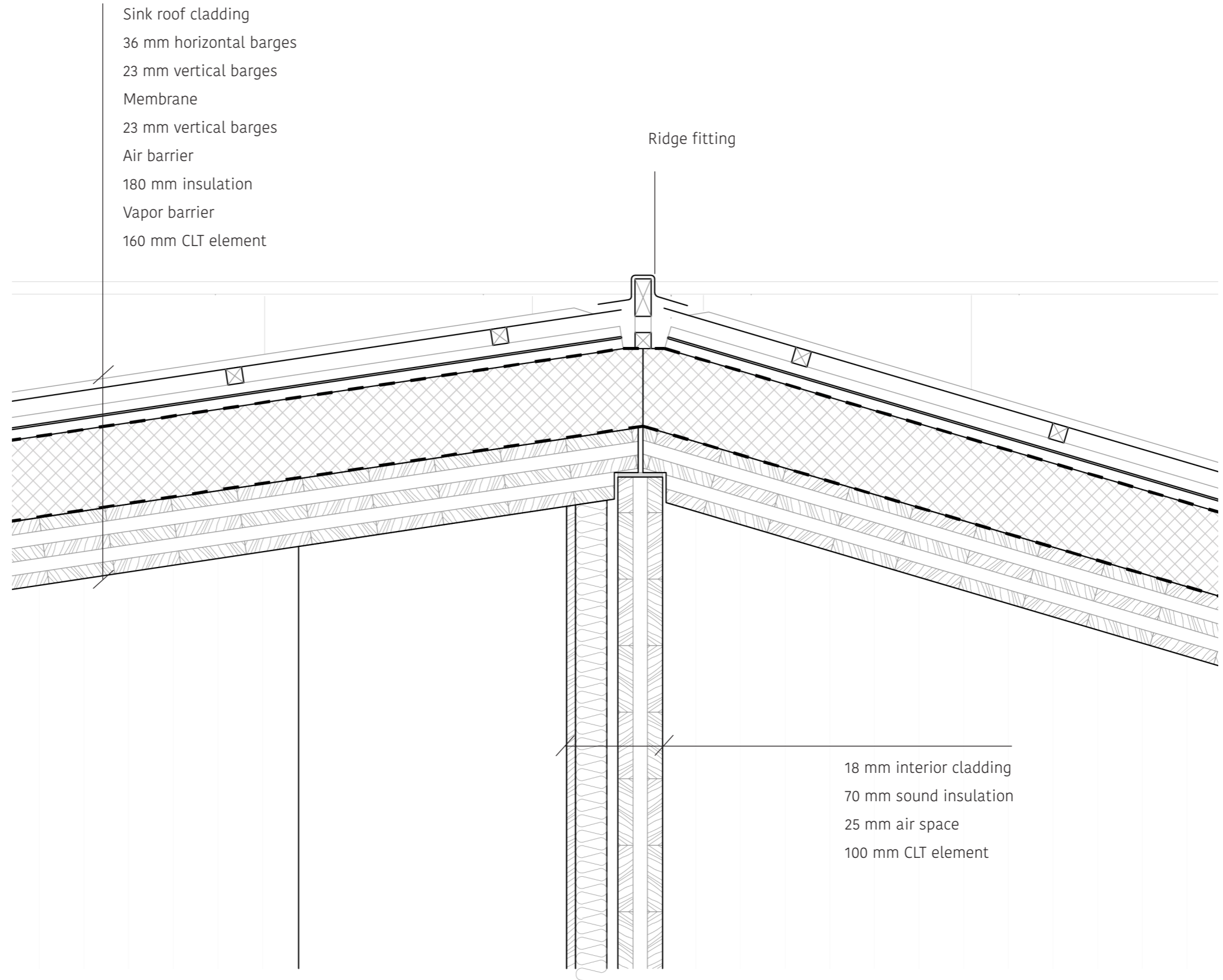


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LONG-TERM TEMPORARY

Foundation detail
1:10



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LONG-TERM TEMPORARY

Ridge detail
1:10

18 mm interior cladding
70 mm sound insulation
25 mm air space
100 mm CLT element

Sink roof cladding
36 mm horizontal bargeboards
23 mm vertical bargeboards
Membrane
23 mm vertical bargeboards
Air barrier
180 mm insulation
Vapor barrier
160 mm CLT element

Ridge fitting



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