



KÄRRA VILLAGE

DESIGNING FOR DEMENTIA

150 000

People in Sweden who suffer from dementia

25 000

New cases of dementia that arise every year

300 000

By 2050, twice as many people will suffer from dementia

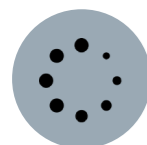
According to Socialstyrelsen (2018) our total life expectancy is increasing, which means that more people will suffer from dementia in the future. Today, there are approximately 130 000-150 000 people in Sweden who suffer from dementia, where 20 000 - 25 000 new cases arise every year and the number of people suffering from dementia will double by 2050. This place demands on improved forms of housing for our aging population. By creating a good living environment for our elderly, the quality of life for all inhabitants of our society can increase, as well as contribute to equal conditions for a dignified life.

WHAT IS DEMENTIA?



Dementia is a general term used for diseases related to cognitive impairments and can be defined as a disorder in which the progressive deterioration of cognitive capacity eventually leads to a loss of the competencies one needs in everyday life. Various difficulties and obstacles can arise and vary depending on which form of dementia the person suffers from. (Freddersen & Lüdtké, 2014).

THE PROGRESS OF DEMENTIA



Usually, the short-term memory is affected first, while the long-term memory persists longer. When the long-term memory starts to fade what remains is the embedded primeval behaviors, such as the feeling of security and safety (Freddersen et al., 2014). Dementia generally progresses through several stages and ultimately leads to hospitalization and helplessness (Freddersen & Lüdtké, 2018). Initially it starts with memory loss (Freddersen et al., 2014). In the next step the disorder can make people unable to recognize familiar things and become more disoriented. In the later stages the illness can lead to social isolation and loss of identity (Freddersen et al., 2018).



OBSTACLES AND FEARS

For someone suffering from dementia various obstacles in their everyday life can occur, where one of the deepest fears is the loss of orientation in space. When someone's memory is weakened the feeling of spatial orientation also decreases, what remains are the direct sensations. This experience of confusion can be an almost daily occurrence. Our senses develop during our early childhood, from the sense of touch as well as sight and hearing. The sense of space develops similarly, where the most important sense for perceiving spatial characteristics is that of sight (Freddersen et al., 2014). Our visual perception is a combination of images that arise through signals received from the eyes to the brain. Most people with dementia are older and for the elderly in general, the visual systems are less effective. For someone suffering from dementia, this complex communication works under high stress, which can cause visual disturbances, for instance a black flat-screen TV can be perceived as a hole in the wall. At age of 75 years, a person needs twice as much light as a middle-aged person does to get the same visual response (Freddersen et al., 2014).



LIGHT AND COLOR

Our well-being is affected by our physical and psychological senses, where light and color play an important role. It is common to lose some of our sensory abilities at an older age, where sight and hearing is usually affected first. Likewise, the spectrum of our perception can change, colors such as red and yellow usually remain strong, where other colors can weaken. (Freddersen et al., 2018).



Colors affects how we take in our surroundings and process what we see, people suffering from Alzheimer's disease experience a greater loss, with difficulty distinguishing within the blue-violet spectrum. (Freddersen et al., 2014).

Additionally, exposure to daylight, especially in the blue light obtained in the morning, promotes the hormone melatonin, which has a great effect on the body's main clock. Melatonin is responsible for the biochemical processes that are important for our performance, such as sleep, heart, wakefulness, thermoregulation, and cognition.



OUR FOCUS

In this project, we have had a strong focus on the difficulties that can arise in everyday life for someone suffering from dementia. By working with different colors both externally and internally, our goal is to create a form of security and facilitate orientation. The kitchens in the units have been adapted to the two colors, red and yellow, which we humans perceive the longest, as other colors have begun to weaken. This creates a clear orientation and increased security for the residents. Externally, the units also receive their own character color, to facilitate orientation and reduce confusion. The two units, which are made of brick, also have bricks that differ in color, which contributes to increased orientation. The public buildings receive colors and materials that are more natural and similar to each other to make its content easier to clarify.



Another focus has been on light, where the design of the apartments has been based on being able to experience daylight and the seasons outside the window even in bed. In addition, all units receive a winter garden, which provides residents with good daylight. Additionally, different types of luminaires and at different heights has been of great importance, to create security.



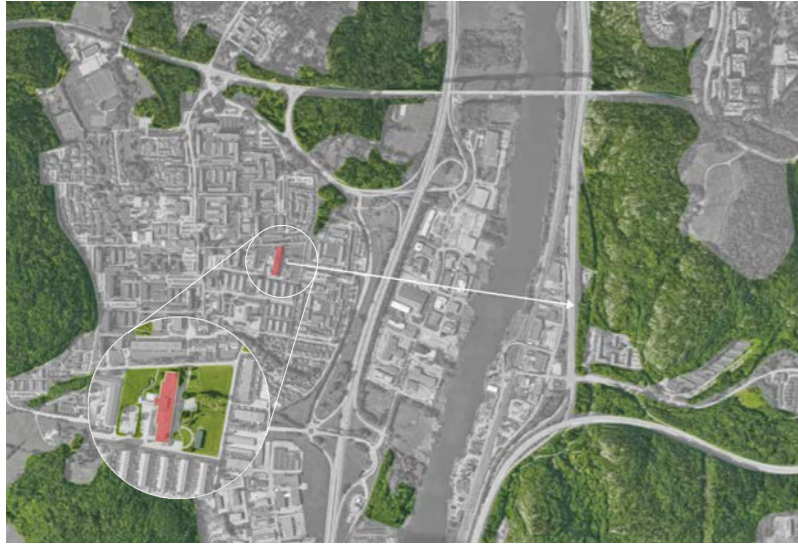
Furthermore, our last main focus has been on movement. We have worked with a circular movement, which is found both indoors and outdoors. In the units, the residents can move freely, where different themes are found along the walls that create varying experiences around the unit. The inner courtyard is designed in different themes to create clarity and encourage physical activity. This can take place under a roof, which provides protection against weather but also via several paths, with various ground cover to give different character and sound. Outside the building this movement also takes place, where the residents can move through the connection buildings and around to various themes and social gatherings.

References:
Freddersen, E., & Lüdtké, I. (2014). *Lost in Space: Architecture and Dementia*. Basel: Birkhäuser.
Freddersen, E., & Lüdtké, I. (2018). *Living for the Elderly. A Design Manual, Second and Revised Edition*. Basel: Birkhäuser.

Socialstyrelsen (2018-3-1). *Vård och omsorg vid demenssjukdom - Sammanfattning med förbättringsområden*. Åtta.45 Tryckeri AB.

ANALYSIS AND CONCEPT

Analysis highlights



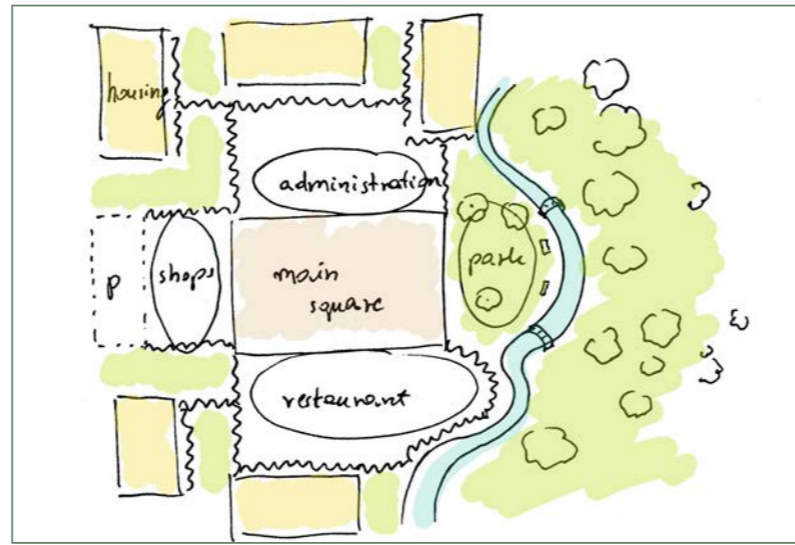
Eastern view and existing greenery



Slope and school proximity

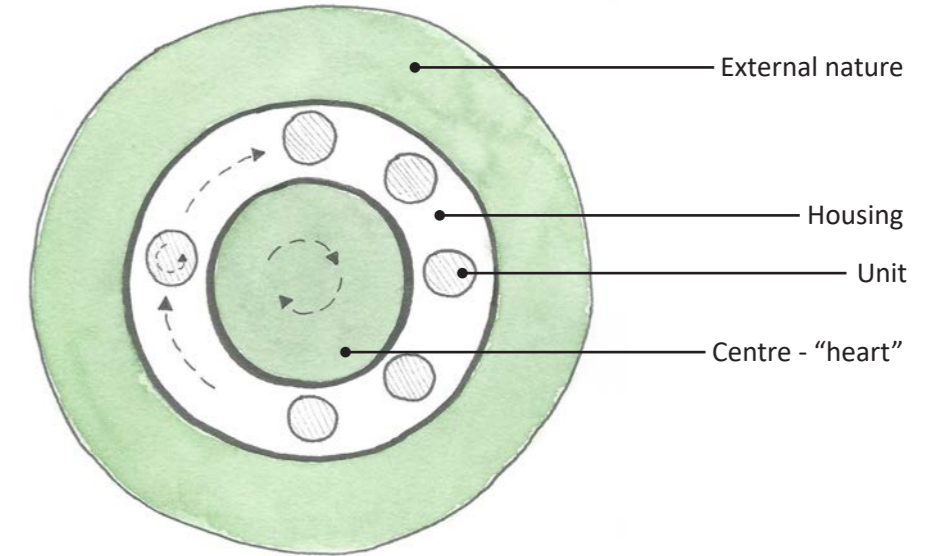


South access and existing facilities



Village as a place with a centre and variation in buildings and nature

Concept



The circular concept is based on our research about dementia and about the structure of a village. We put emphasis on movement of the users: for the residents by allowing them to explore and meet their need of walking around undisturbed; for the staff by connecting all functions and facilitating good overview of events.

The outer green ring represents open nature, while the inner one is a more structured heart of the village.



Home-like atmosphere & human scale



Wide variety of walking routes

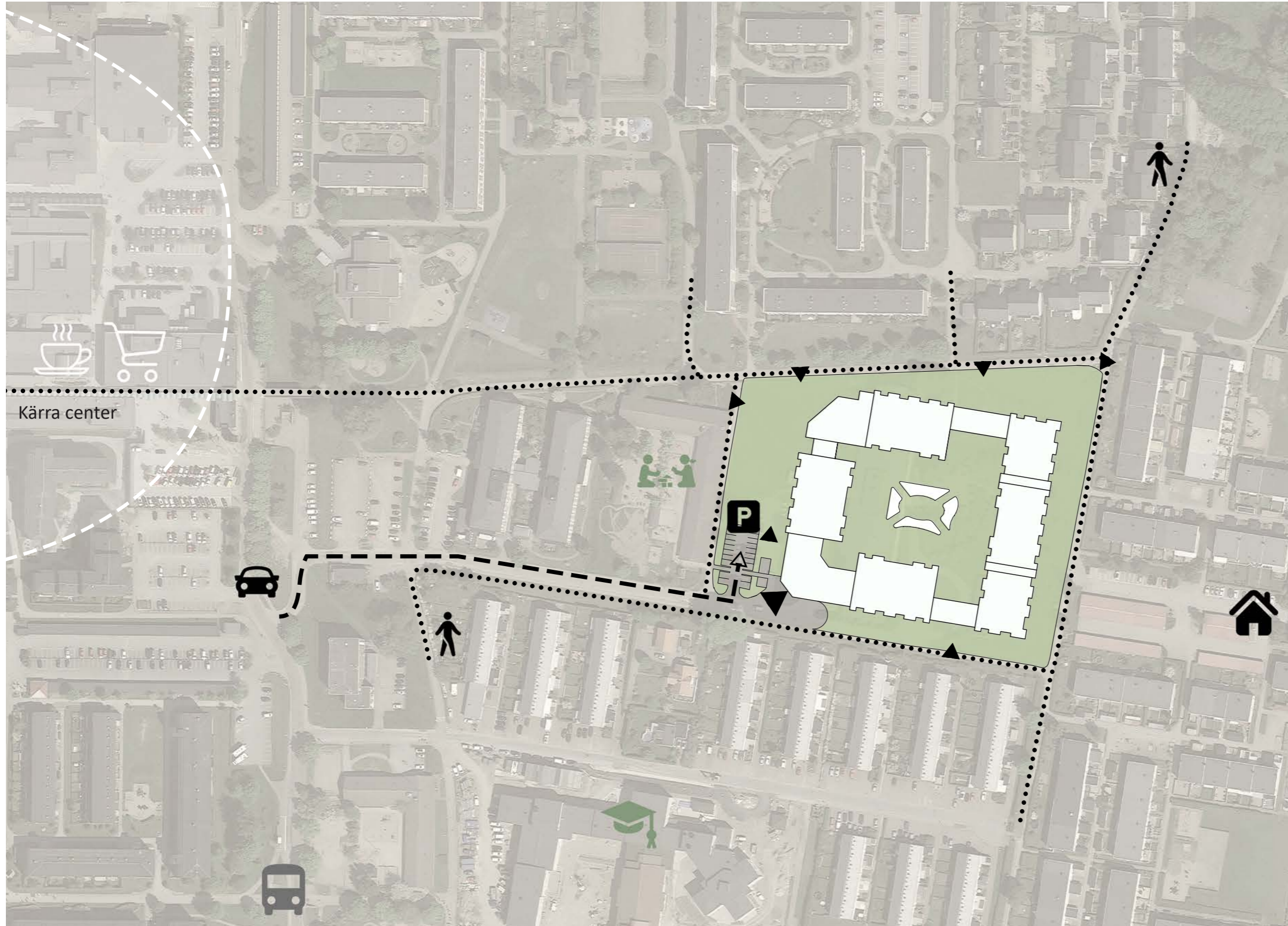


Attractive outdoor space



Activities for everyone

SITUATION

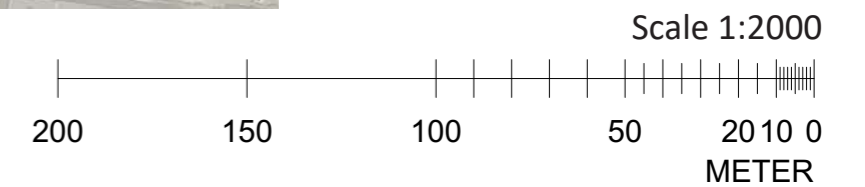


In the west, south and east, the facades align directly with the surrounding built environment forming a more distinct spatiality of the streetscape along the pedestrian walkways.

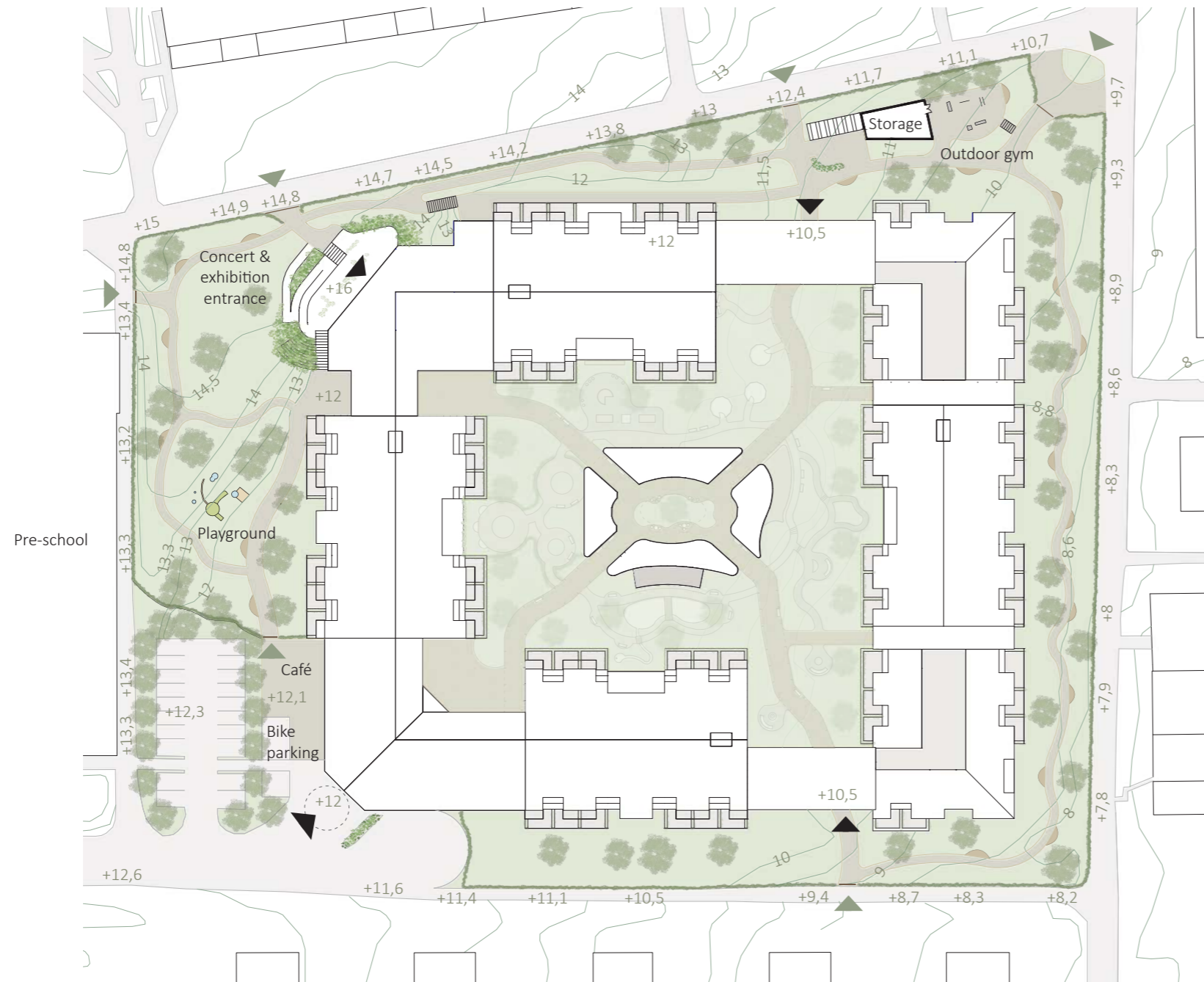
To clearly present itself to the walkway and bring in the movement coming from Kärä Center in the west, the northwest corner is cutout, forming a welcoming facade facing straight onto incoming pedestrians.

The same cutout method is used in the southwest corner, with the main entrance presenting itself for incoming visitors.

Instead of following the site plan in the northeast corner, creating a pointy edge onto the three-way intersection, the alignment of the north facade creates a triangular spatiality with the surrounding environment. Leading to a more diverse streetscape around the site. This way the northern facade also avoid facing straight north, but at a slight angle, for sunlight purposes.



SITE PLAN



The main entrance is located next to the car park and bike stalls, where the existing access for vehicles is situated. There are secondary entrances (small black arrows) which provide access to the building through the surrounding green area.

The park entrances (green arrows) are situated in relation to the neighbourhood, to facilitate easy routing. The green area around the building is accessible for everyone - the gates can only be opened with a handle placed in an unusual spot (higher than normal) to decrease the risk of residents leaving the facility (in addition to an alarm system).

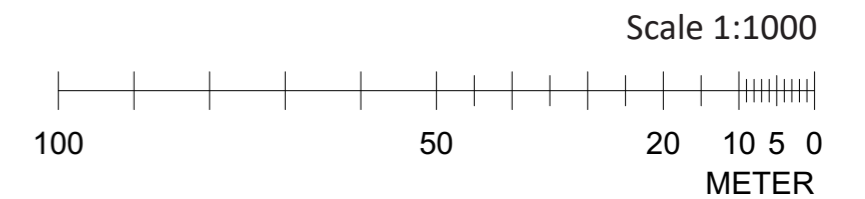
The North West access point is aimed at visitors of the concert and exhibition area. The big stairs covered with plants draw attention to the facility.

The pre-school is able to make use of a playground on a slope, which also provides a playful space for children visiting the café with their families.

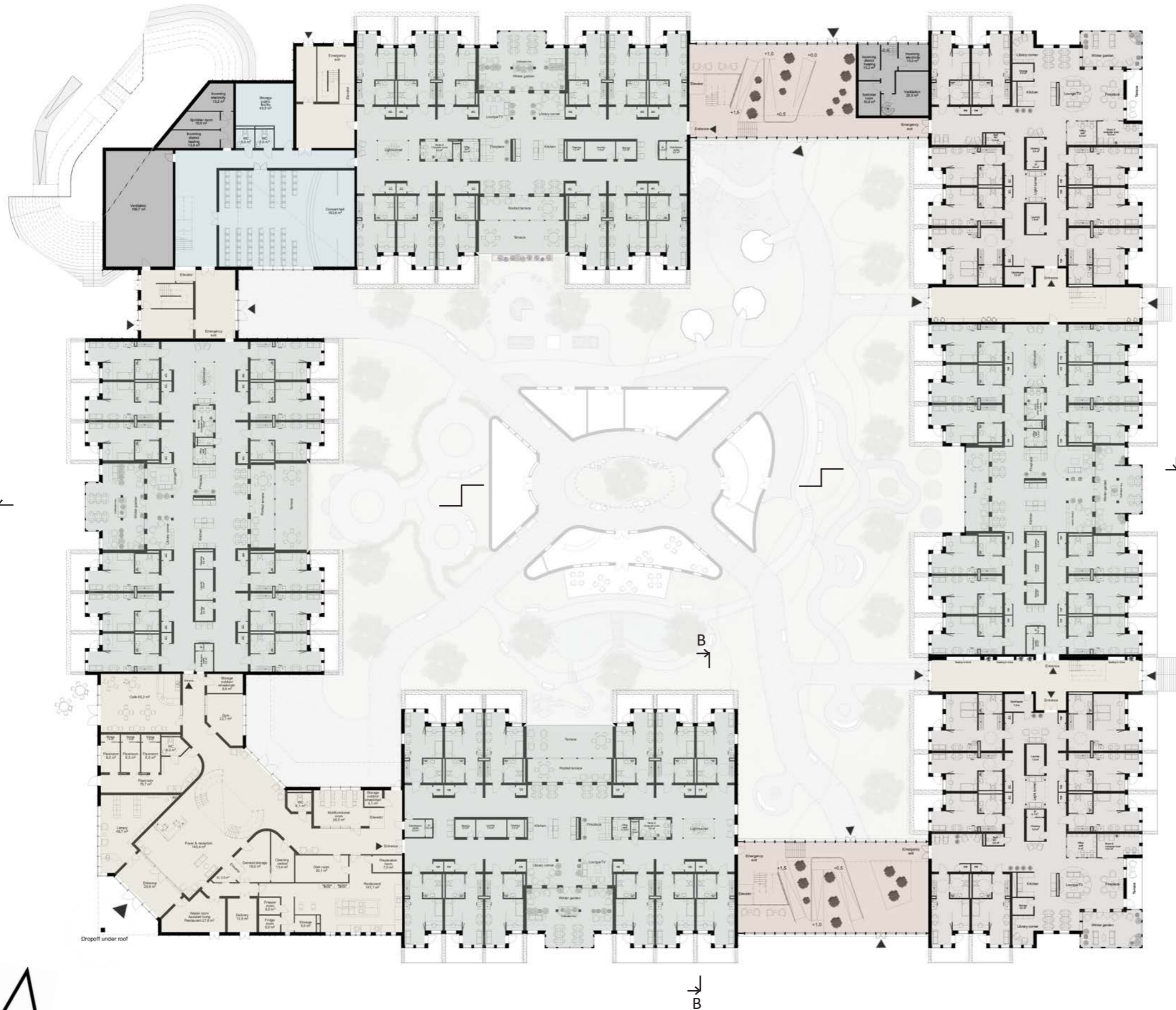
In the North East corner, where many people walk or cycle on the bike path, there is an outdoor gym with an inviting entrance.

The park is a place with a natural atmosphere and plenty of sitting options situated along the paths.

By including extra facilities, we invite the inhabitants of Kärä to visit the site and interact with the elderly.



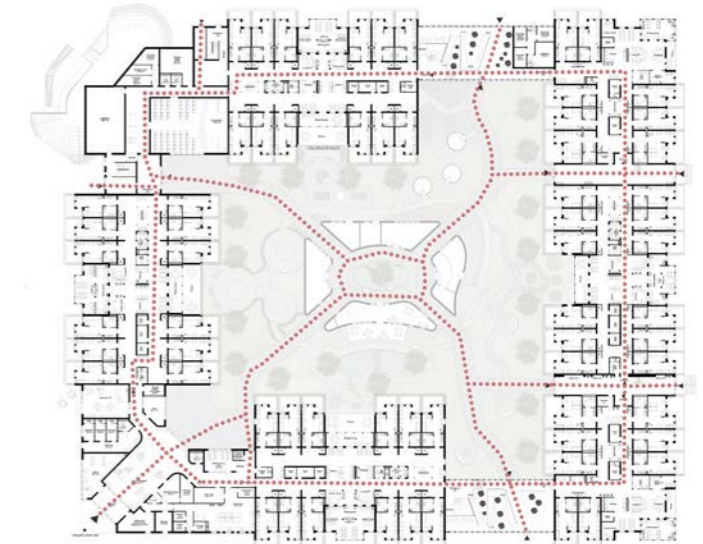
FLOOR PLAN - GROUND FLOOR



Color definition

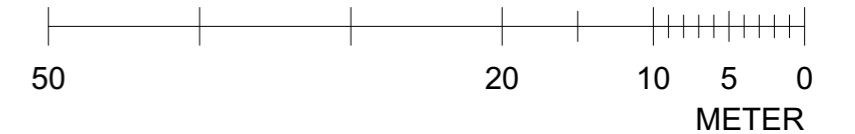
- Entrance building and secondary entrances, containing, café, kitchen, staff area, library, flexiroom, gym and reception.
- Middle unit, with 12 apartments.
- Corner unit, with 8 apartments, of which 2 are couple apartments.
- Public facility, containing a concert hall.
- Technical room, where the technical room in the connector is on two levels.
- Connector, works as a bridge between the units, emergency exits, secondary entrance and connection to the roof terrace.

Movement



Movement in and around the building. The movement outside and through the courtyard is also used as a way to minimize risks in the event of a future pandemic.

Scale 1:500



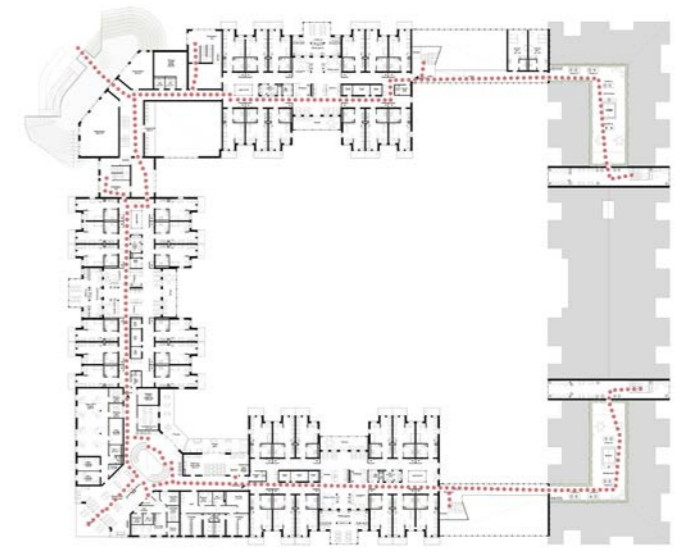
FLOOR PLAN - FIRST FLOOR



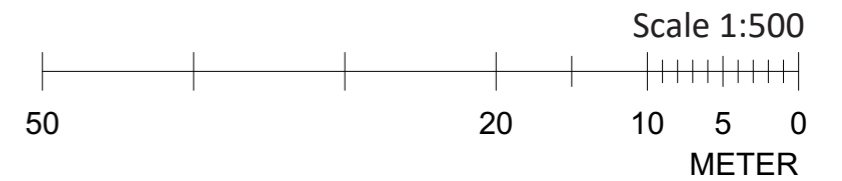
Color definition

- Entrance building and secondary entrances, containing admin, staff area department, spa and shared lunch / rest room.
- Middle unit, with 12 apartments.
- Guest apartments.
- Public facility, containing, concert hall, makerspace and art/exhibition room.
- Shared roof terrace for the residents.
- Connector, works as a bridge between the units, emergency exits, secondary entrance and connection to the roof terrace.

Movement



Movement in the building. The units on the 1st floor can be easily reached from various entrances, which promotes free movement to and from the unit in the event of a future pandemic. The roof terraces can be reached from two different entrances.



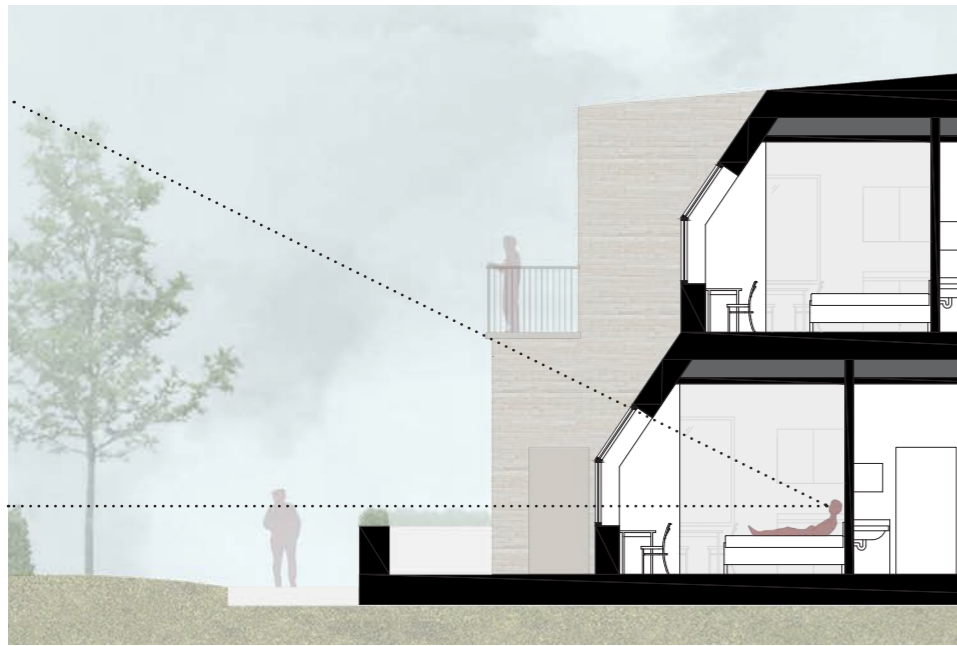
APARTMENTS

In many elderly care homes and assisted living facilities of today you see great emphasis and focus on the shared, common spaces. The notion of meeting other people as part of the healing process has heavily influenced the design approach, in many cases partially neglecting the individual apartments.

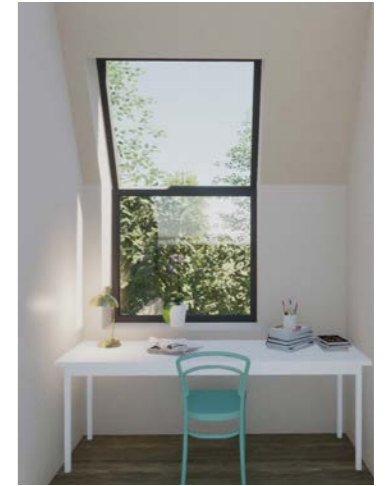
But the group of people suffering from dementia is as diverse as the rest of the population. Not everyone enjoys big crowds. Many personalities rather find their path to well-being in spending most of their time alone in a calm, private environment.

Another group of people are those who are in a bad enough condition to not even being able to move out of their beds for more than an hour or two per day. Those who might need the most help actually being closed off from many of the healing qualities of a dementia village is not optimal.

Therefore, particularly with these groups of people in mind, we have developed a **sloped window concept** as an added quality to the apartments. Generously sized and angled for optimal sight lines from the bed onto the nature outside, taking advantage of its documented effect on well-being without having to move out of your safe, private sphere.

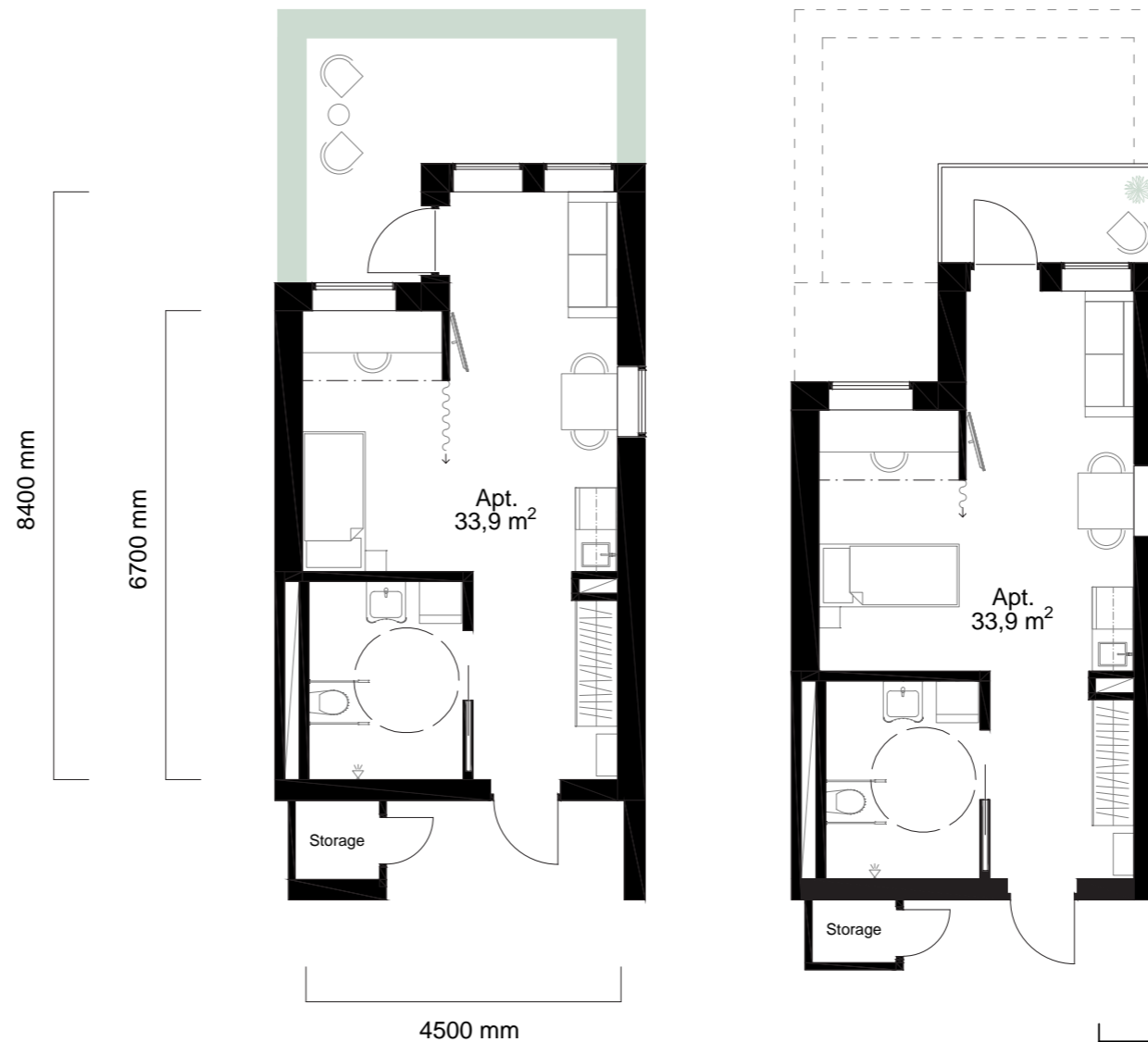


To allow the sloped window concept on both floors, the ground floor is pushed out in relation to the first floor. This also creates space for a private balcony for the first floor apartments, on top of the outer part of the apartment below.



Ground floor plan

First floor plan



The apartments are identical on both floors, apart from either a private garden or a private balcony.

The bed area can be closed off from the rest of the apartment by retractable curtains.

For residents in need of a higher level of staff support, the bed can be rotated 90 degrees for sufficient space around both sides of the bed.

For apartments placed at the end of a unit, a window is added by the kitchen table. These apartments are optimal for the rotated bed solution, maintaining the concept of nature being visible at the foot of the bed.

To allow a load-bearing construction entirely made out of wood, the span width of the apartment is limited to 4.5 meters. A general drawback of narrow apartments is the limitation of light coming in, but the push-out of the living room area helps offsetting this.

Scale 1:100



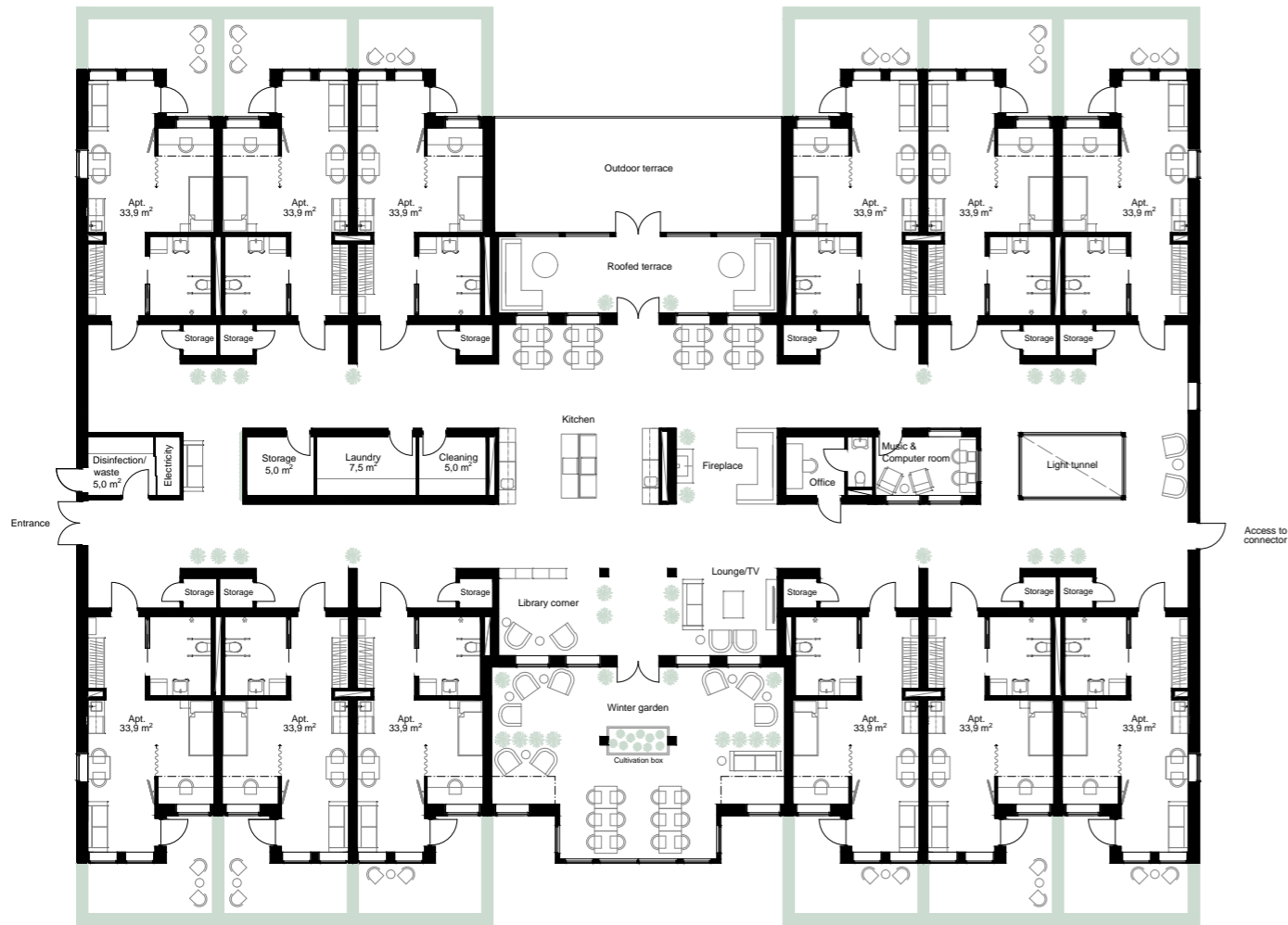
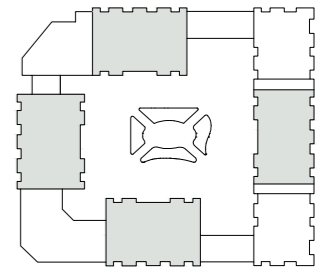
MIDDLE UNIT

The first floor is pushed inwards 1.5 m to allow the sloping windows of the apartment on both floors. This difference between the floors is being taken up by the corridors. Allowing the central axis rooms (laundry, cleaning etc) and the rest of the common space functions to have the exact same positioning and structure across both floors.

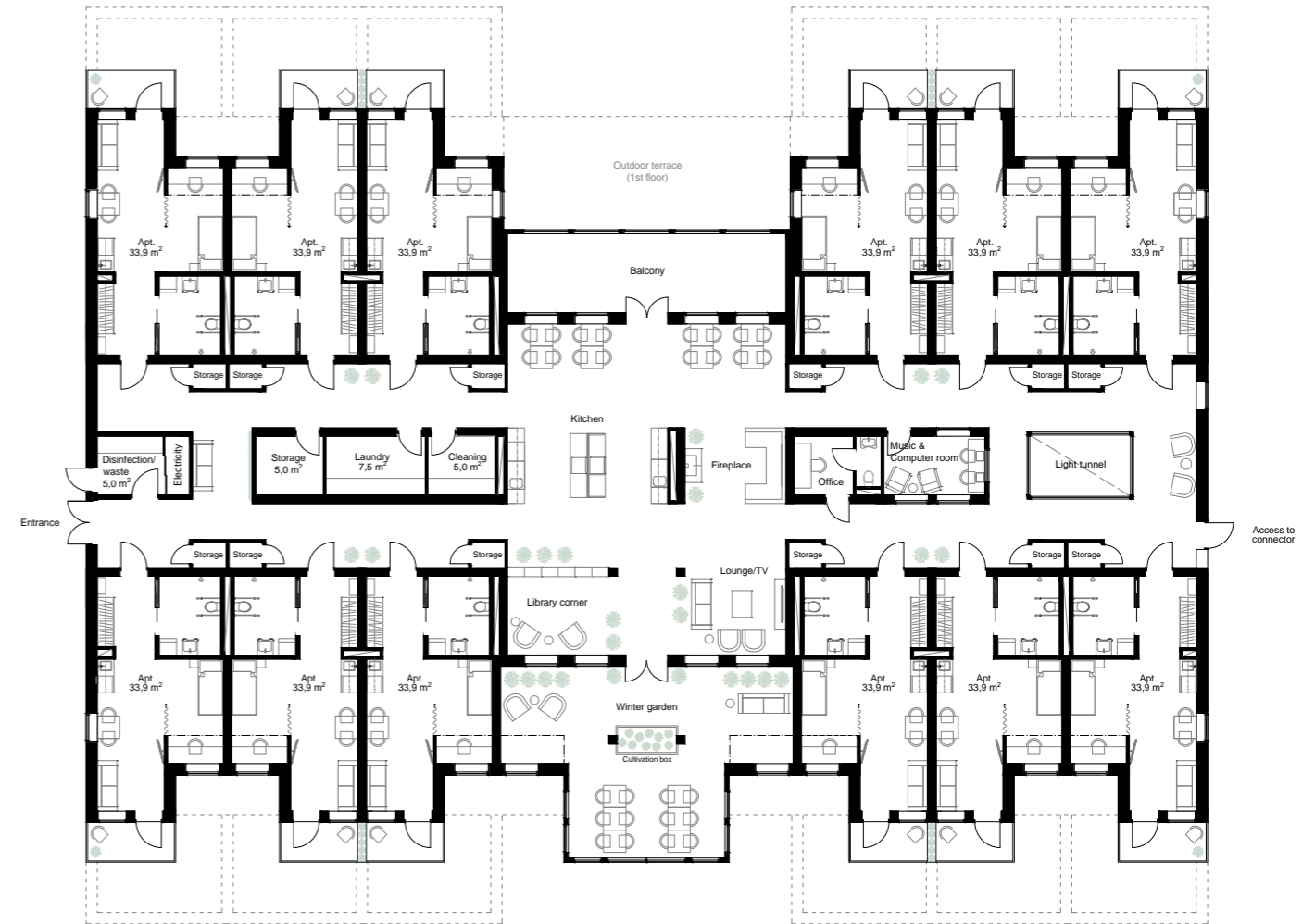
The unit is designed in line with the circular movement concept, with corridors forming a path leading around the central axis rooms, where the organisation of the personal storages help creating different spatial sequences along the way. In the middle of the unit, the path opens up in a bigger space forming the common area.

Positioning of pillars, walls and plants create different levels of privacy along the path but also within this bigger common space to accommodate a wide range of personalities and preferences. Presenting the possibility of choosing between active participation in group activities, observing at a distance or resorting to a more quiet, private corner.

Orientation figure



Ground floor



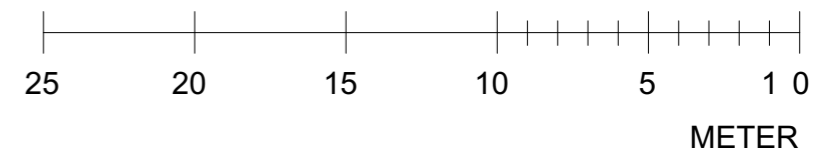
First floor

To bring more light and nature into the experience, the common area faces the outside environment in two directions, with sight lines running across from side to side.

In one direction there is a winter garden filled with plants and seating arrangements, either for active

participation in cultivation or just a place to relax with an outside view through the big windows. Facing the other way is either a terrace, with further access to open air, or a balcony depending on floor.

Scale 1:250



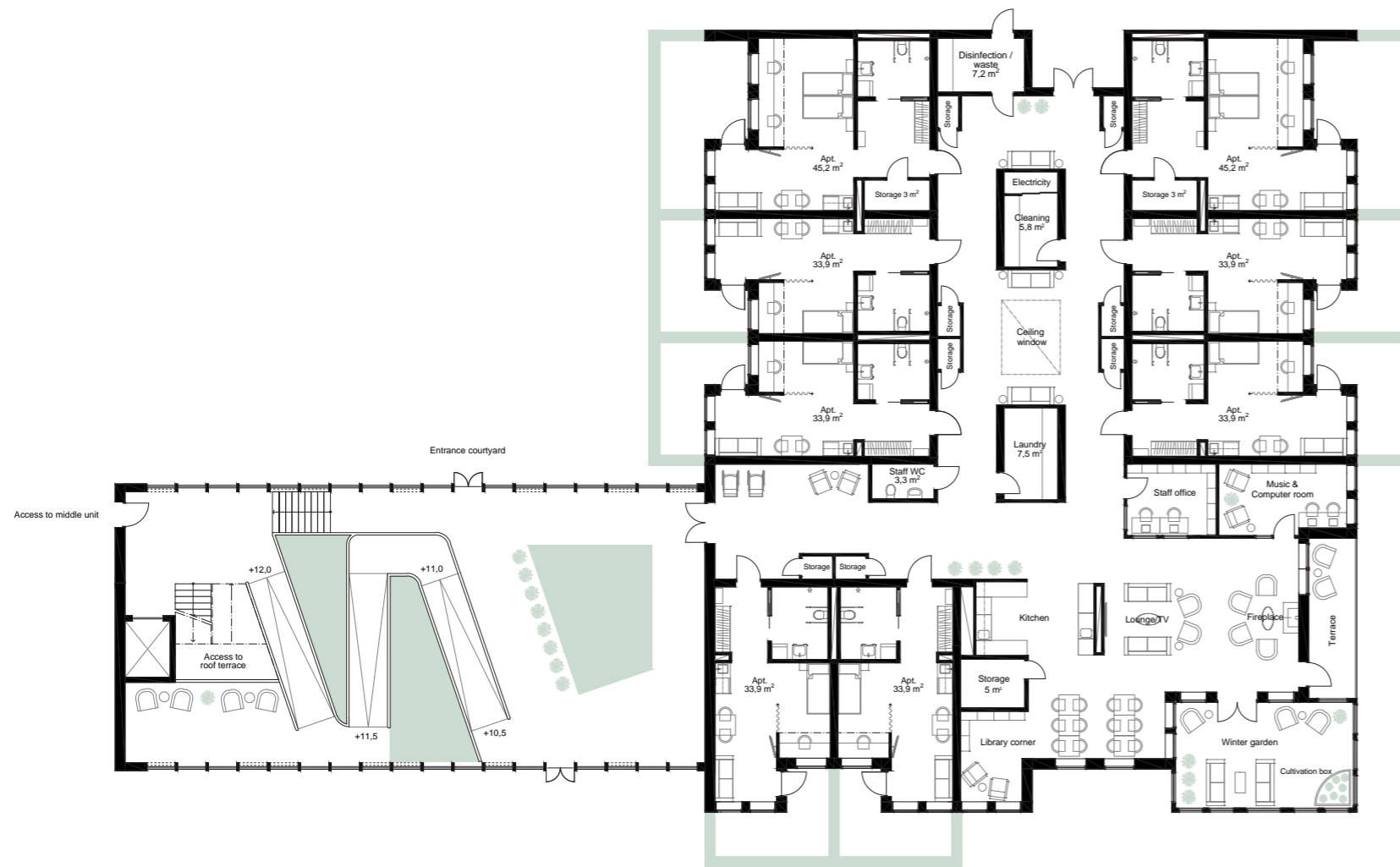
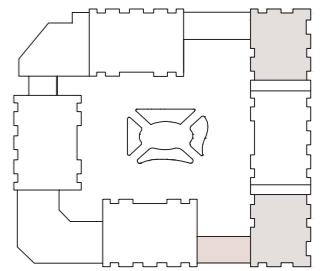
CORNER UNIT & CONNECTOR BUILDING

The connector buildings, next to the corner units in the southeast and the northeast, serve several purposes. They are the two main access points to the outside park, with the glass facades presenting the only view from courtyard ground level to the outside for easier understanding this is the way out to the surrounding park.

The site comes with significant height differences, mainly from northwest to southeast. The connector buildings are also the main part of coping with these differences between the western and the eastern set of apartment units. They lead the residents through a 1.5 meter height difference, and also aesthetically respond to the site by being

the first step in a two-step height drop of the facade, following the slope of the ground (see north and south facades on page 15). Furthermore, the connectors provide access to the roof terraces above the corner units, with a nice view of the eastern hill landscape made available to all residents.

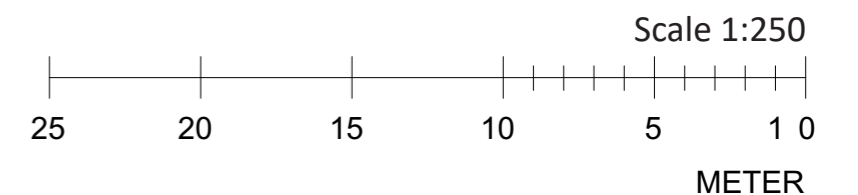
Orientation figure



The corner units are of similar design as the middle units in terms of circular movement through the corridors, spatial organisations along the way and passing by the common area. The main difference being 8 apartments instead of 12 and ways of interacting with light and nature through a corner position rather than in two opposite directions.

These units also hold an alternative version of the apartments, targeting couples with desire of living together, adding diversity to the apartment pool. Same design language as the normal apartment, but with two sloped window bed areas turned into one and rearrangement of the hallway and toilet creating more space for storage.

Renderings of the south connector building



VISUALIZATIONS



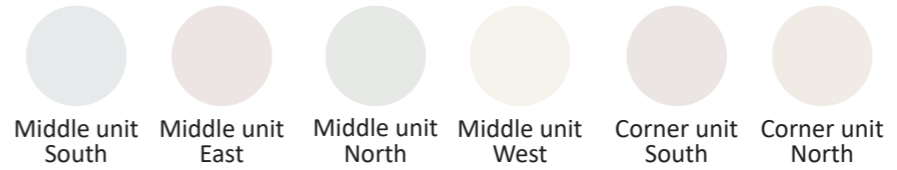
View of the anterooms to the individual apartments, each with different colors aiding navigation.



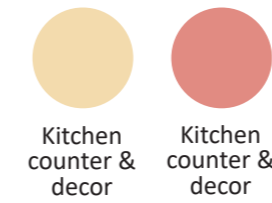
View of the common spaces in the middle unit

COLOR CONCEPT

Walls indoor - main color



Kitchen colors



Variation between entrance level and first floor, as between units. The color choices are made according to the research that exists around our perception of color.

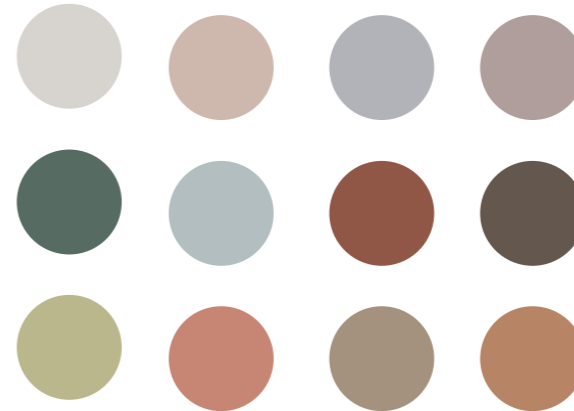
Common rooms



Calm colors that give a feeling of warmth and cosiness.

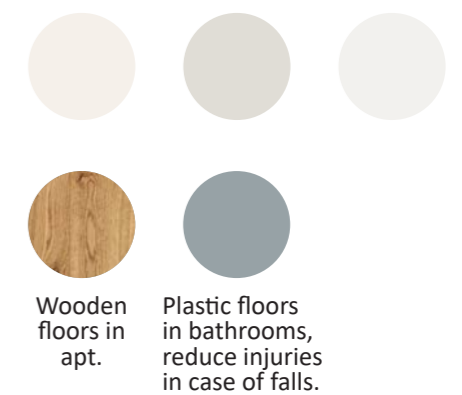
Walls in front of entrance to apt.

By using different colors in front of each individual apartment entrance, orientation and clarity are increased, as well as contributing to increased security for the residents.



Walls in apt.

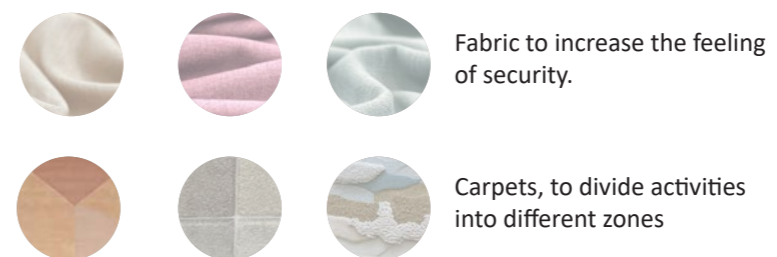
Calm colors that give a feeling of warmth and security, and increase a varied personal furnishability.



Wooden floors in apt.

Plastic floors in bathrooms, reduce injuries in case of falls.

Other materials

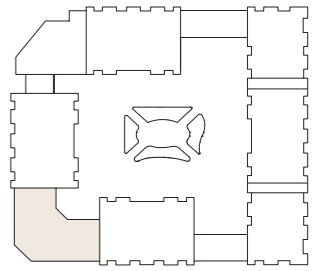


Fabric to increase the feeling of security.

Carpets, to divide activities into different zones

ENTRANCE BUILDING

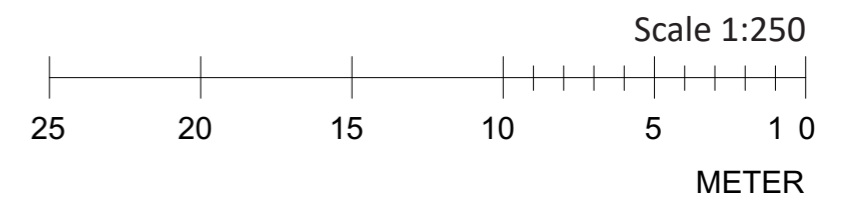
Orientation figure



Ground floor



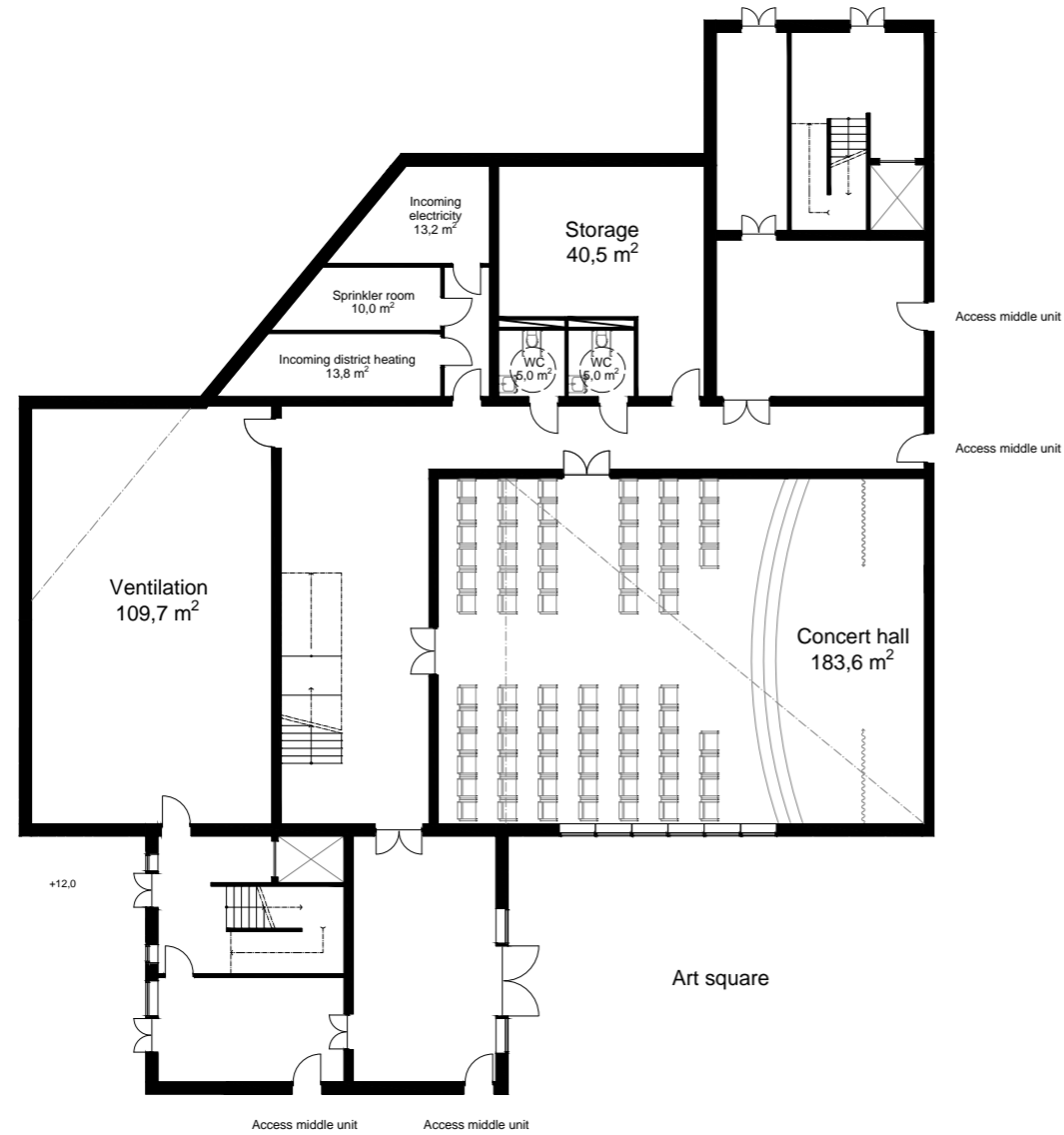
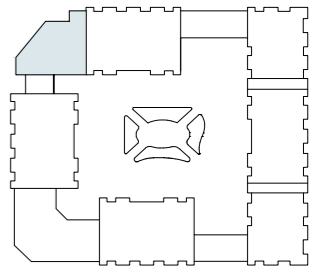
First floor



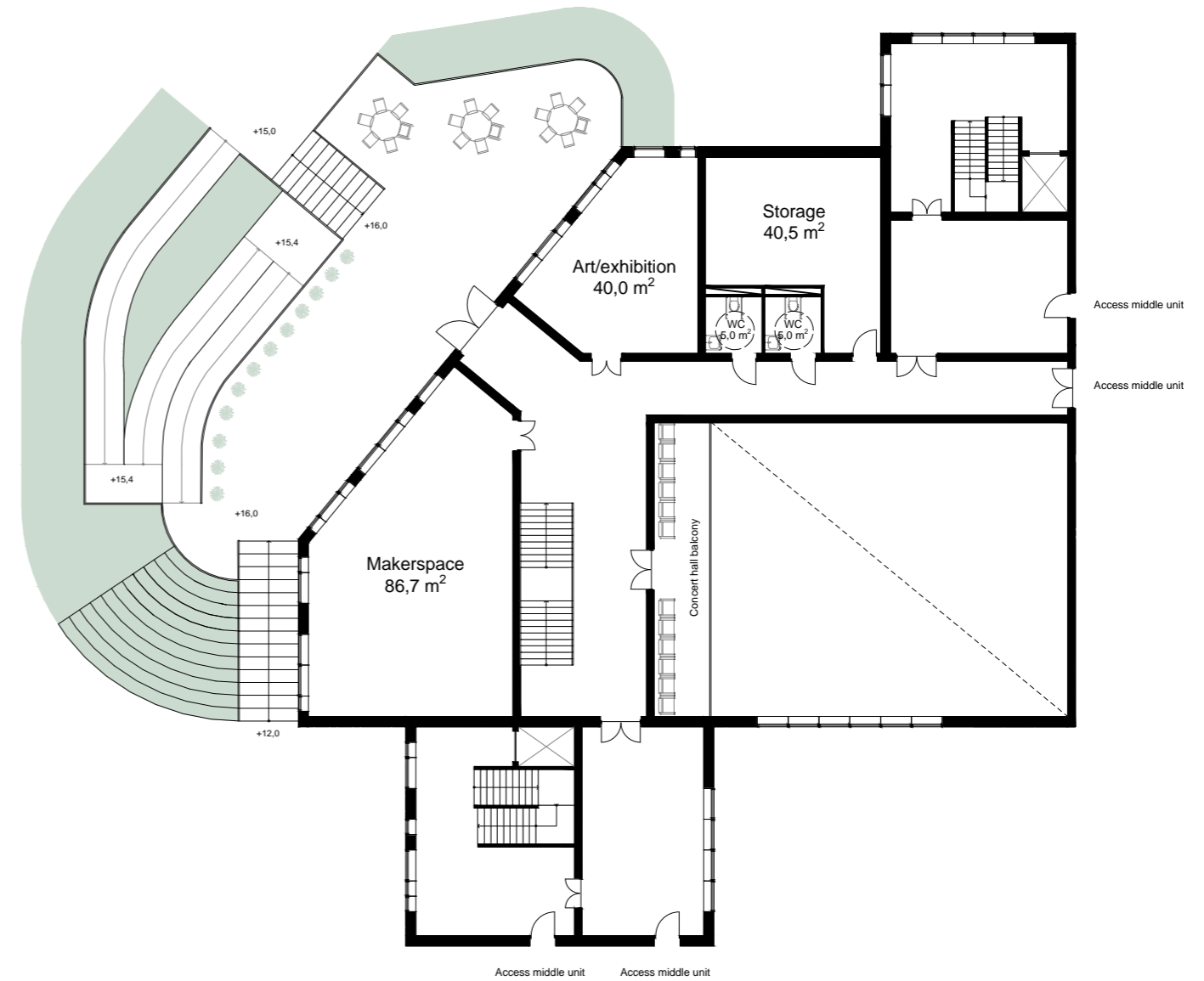
PUBLIC FACILITY

To accommodate and integrate the steep slope of the northwest corner of the site, the public facility is of a souterrain design. It connects the height level of the northern pedestrian walkway (+15 m) up to the first floor (+16 m) and down to the ground floor (+12 m) of the units.

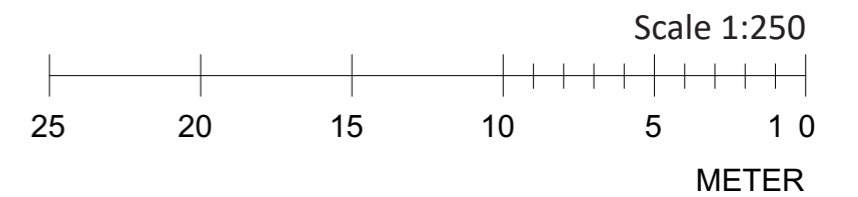
Orientation figure



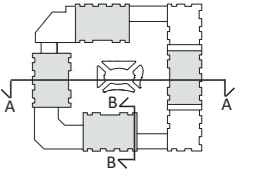
Ground floor



First floor



SECTIONS



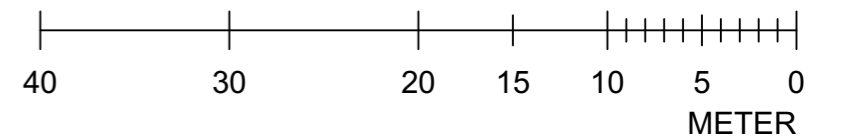
Section B-B

Scale 1:100



Section A-A

Scale 1:400



FACADES



South facade



North facade



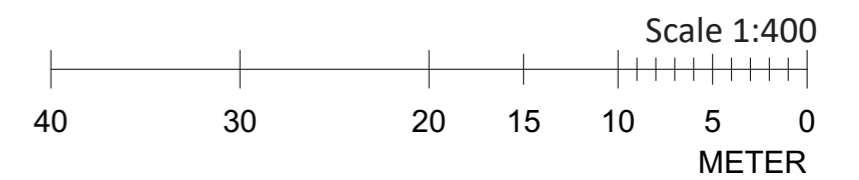
FACADES



East facade

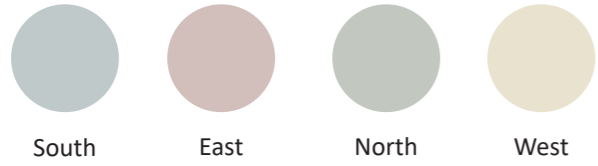


West facade

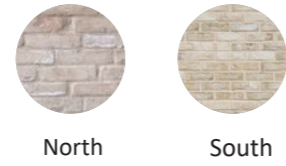


FACADES

Wooden walls outdoors on Middle unit



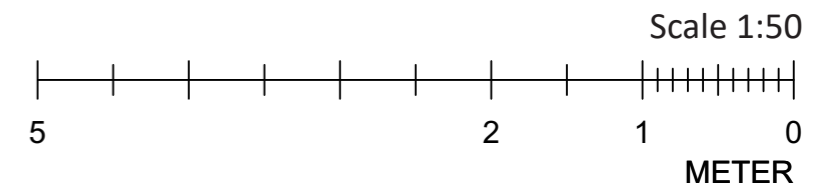
Brick walls outdoors on Corner unit



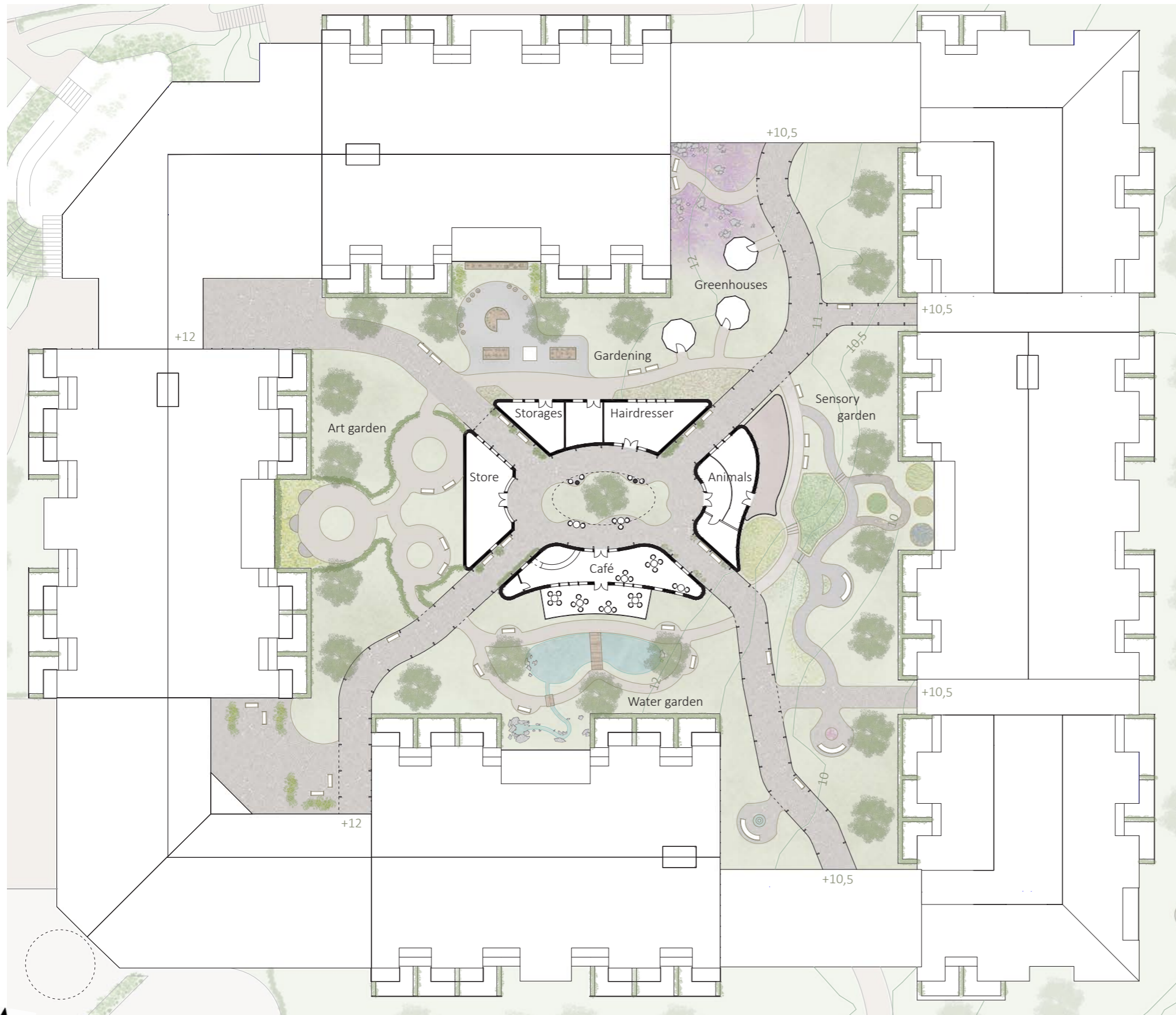
Eastern facade



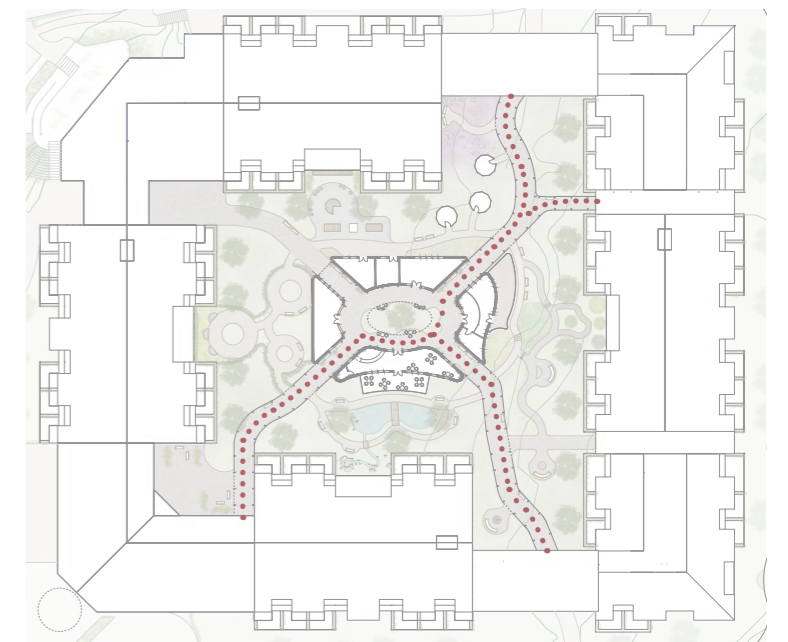
North facade



INNER COURTYARD



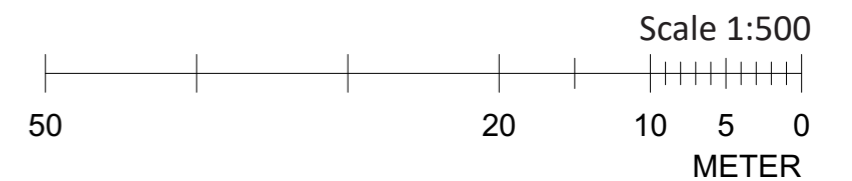
Movement under the roof



The courtyard can be accessed by the residents and their visitors. The staff can also use it to reach every unit without passing through the others. This quality can prove valuable especially during a pandemic. Each passage (see above) is protected from the weather with a roof and partly open walls.

The area is divided in four themes: art, gardening, sensory and water, which guided the design of each quarter as well as the neighbouring units. The roofed passages define them further, making the spaces more cosy. The walls of each of them exhibit elements related to the themes to facilitate easy orientation.

The buildings in the middle form a central point of the village with extra facilities for the residents. The space is under a glass roof with a cut-out in the middle for greenery. The shapes respond to the terrain around it. The North and West buildings have brick facades with patterns on the windowless walls. The South and East ones are wooden. All the facades facing the very middle are wooden to achieve a warm and unique atmosphere.



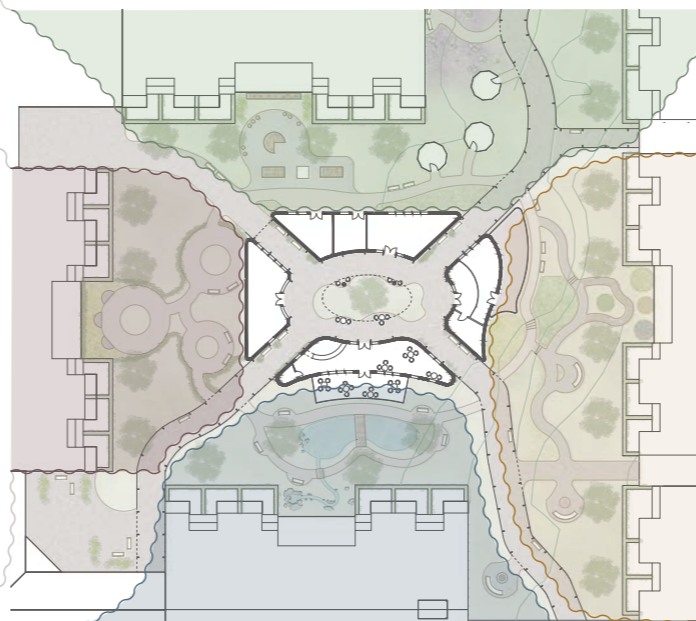
INNER COURTYARD - THEMES



Gardening theme



Art theme



Sensory theme



Water theme



Art theme



VISUALIZATIONS

View from one of the connectors towards the inner courtyard buildings.



The small square in the middle of the courtyard building.

