Growing old independently in a cohesive environment

Research Report

Student

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Version

June 29th 2020

Preface

This research report is part of the graduation project of the master Architecture, Urbanism and Building Sciences at the TU Delft. To graduate, I decided to choose the studio of Dutch Housing that focusses on care: Designing for Care. The decision for this studio came on one hand from my interest in housing in general. What I especially like about architecture is the fact that our profession deals with the design of the environment everyone lives in and can make use of. Especially the private living environment is what interests me as it stands closest to a person. Therefore the choice for graduating in the course of dwelling was an easy one to make.

What interested me in the studio *Designing for Care*, was the fact that a really relevant societal problem lies underneath. When following the news and actualities over the last years, the changing elderly care system and the side effects this caused, was one of the topics that often came by. Alarming stories about the difficulties elderly people have in coping with their health issues in daily life and the rising stress that has been put on the shoulders of the ones who provide them with care are well known. Also in my private life, I could see how difficult it sometimes could be for both the care receiver as the care giver to cope with the challenges they faced.

This made my choice for this design studio clear, as it appealed to me to not only design a general, nice looking housing project, but really think about how this current societal challenge could be helped by the design of a different, innovative living environment.

I would like to thank all the people that have been involved during this year of graduation. I want to thank my mentors, Birgit Jürgenhake, Mo Sedighi and Paddy Tomesen for the tutoring and guiding they gave me over the course of this year and helping me to round off my master at the TU Delft successfully.

Contents

Introduction

The Dutch elderly care system has seen a lot of changes over the past years. During the 60's, it was common for elderly people to move to an elderly home where they received government subsidized care and housing. As this became too expensive, and also with the prospect of an aging Dutch society in mind, the government revised the system over the last decades to the point that such institutions are only available for the elderly with the highest demand for care. A policy of providing care directly at home by health care professionals or informal care by the social network is promoted by the government.

With the disappearing care homes, a gap has emerged in the Dutch elderly care system. One side of the spectrum contains elderly people that are able to live independently in their own homes, with elderly with a high care demand that live in nursery homes on the other side. In between there is a large group of elderly that have a care demand that is too high to be able to live independently at home, and too low to qualify for a nursery home. These people are now forced to stay at home and are relying on support from their own family, friends and professional home care.

The changed system of providing care for the elderly in Holland puts a lot of pressure on the group of care demanding, at home-living elderly and their supportive network. Research also shows that thegroup of elderly that will become care demanding will rise with 70% until 2040. Adding to that, the amount of possible care providing people will only increase with 7% in the same period. (SCP, 2019). These numbers predict that the pressure, that is already a problem right now, will likely increase in the coming years.

Where on one hand staying longer at home is desired by a lot of elderly people (Doekhie, 2014), the problems are also serious when their health gets in the way. Everyday activities like grocery shopping or cleaning the house for example, can become a big struggle without help when someone's mobility is decreasing, up to the moment even personal care becomes difficult. When health problems occur that impact an elder's life, they have to rely on support and care that is provided by professionals or their social network. This does mean that such a network must be available to an elderly. The problem is that this network isn't always a given fact for every elderly. A lack of such a network can have major consequences.

A big demand on the social involvement of the society with taking care of the elderly is being made in the current elderly care system. Especially the intimate network of an elderly gets addressed with the responsibility to provide informal care when needed. Often a partner or an adult child are informal care providers when it comes down to taking care of an elder person. For them, this means that providing care has to go along with work, social life and other activities. The fact that children often live at quite a distance from their parents, makes a quick visit even more difficult and time consuming. This can mean that sometimes elderly don't have a supportive social network to fall back to or an increased level of stress for a caregiver.

With the situation as mentioned above, the need for a different way of thinking about a living environment in which elderly people with a care demand can still stay at home emerges. With this, at first it's necessary that the living environment of these elderly people fit the current government's policy by providing them with a supportive and safe environment in which they can grow old and receive the care they need while living independently. This should be possible even when they don't have a supportive network of family and friends of their own.

Therefore, the aim of this research report is to discover how this could be done by researching the key aspects that are of influence in this problem and see how these could lead to architectural and urban solutions. The targeted outcome of this research is a concept that contributes to tightening the gap that is currently existing in the Dutch elderly care system.

Research structure

This research has been conducted according to the structure as mentioned in this paragraph. This paragraph will contain a brief explanation of the structure.

Observation week
Prior to the definition of the research question, an observation week in an elderly housing complex has been carried out. During this week, the daily life in this complex has been researched by the use of observations, interviews and participation in activities. The outcomes of this week have eventually lead to the exact focus of this research: letting elderly stay longer at home.

Staying longer at home
This part of the research contains a deeper look into the problems and wishes among elderly concerning staying longer at home. The following sub-question has been used here: *What are the problems & wishes with keeping elderly people longer at home?* Information will be gathered from literature.

Concept
From the findings fromt the previous part, a concept was formed that will be the focus for the remainder of the research.The following main research question will be used: *How could a housing scheme provide a living environment in which social cohesion is being stimulated in a way that care demanding elderly can stay longer at home?*

Sub-questions
To be able to answer the main research question, the main topic has been divided into two subcategories : *Social cohesion* & *Architectural precedents*. These categories will be researched by using several subquestions. Information will be gathered from literature, observations deriving from fieldwork and case studies.

Social cohesion
- How can a neighborhood stimulate social cohesion among its residents?
  - How could the built environment provide in the social demands elderly have regarding neighborhood contacts?
  - How could the built environment create a sense of attachment to the neighborhood?
  - How could elderly and surrounding residents benefit from each other?

Recent developments
- What could be learned from new relevant developments that stimulate elderly in staying longer at home?

Design tools & guidelines
From the provided answers to the subquestions, design tools are conducted that can be implemented into the design. These tools are the translations from the conclusions of the theoretical part of the research into measures that can be used during the design process to achieve the desired result. Together, the obtained tools will form a starting point for the design of a living environment that stimulates social cohesion in a way that elderly can stay longer at home.
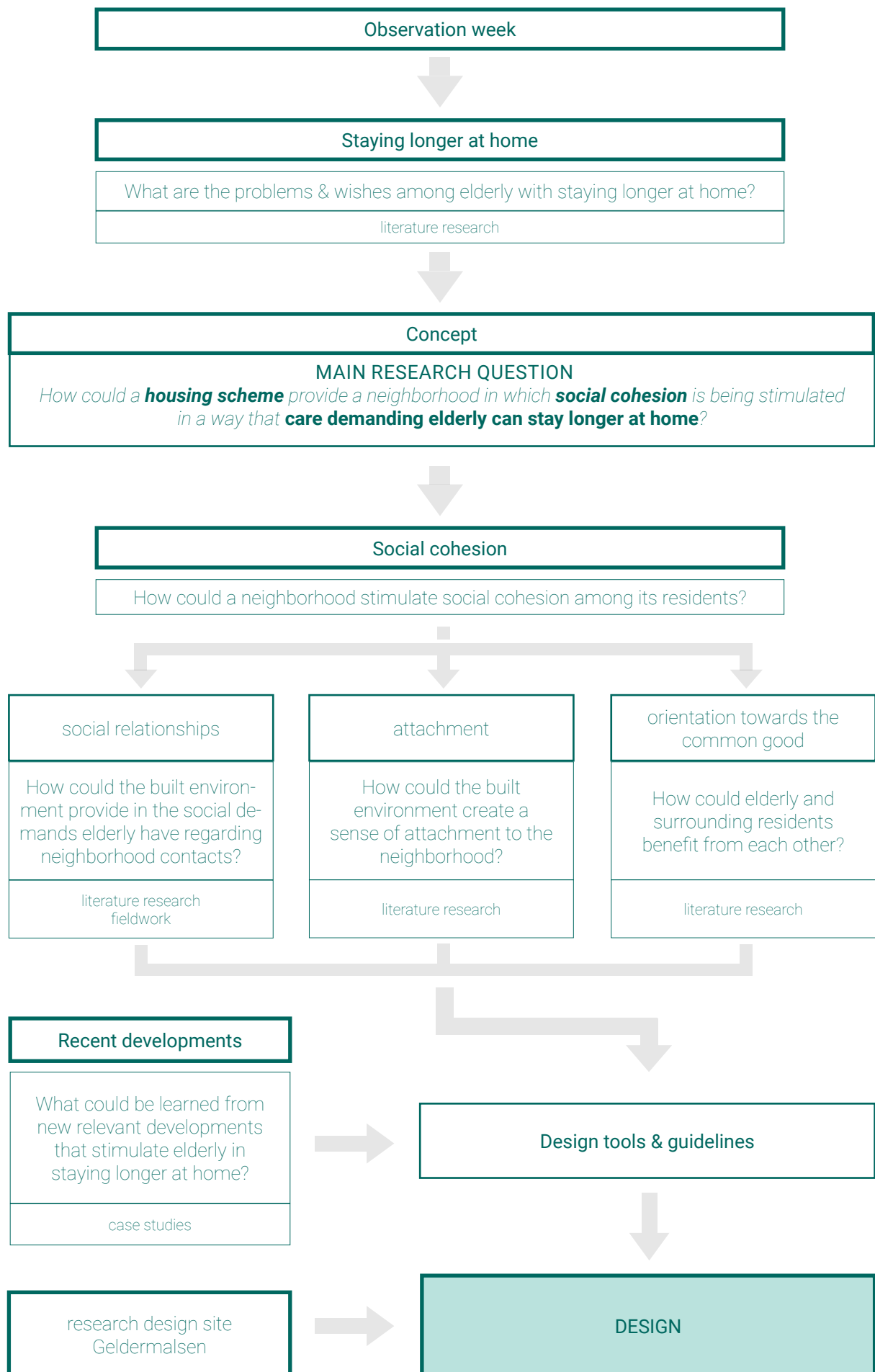
Research design site Geldermalsen
This graduation research partly consists out of translating the theoretical findings from the research into a design that reflects them. This design will be made for a design site that is located in the Dutch town of Geldermalsen. Research into this location will be conducted to be able to make a site specific design. The aim of this part of the research is to explore the strengths of the location to be able to benefit from by implementing them into the design.

Design
By implementing the design tools from the theoretical research and the conclusions from the site analyses, a final design will be made for the location in Geldermalsen that reflects the proposed concept.

Observation week

Staying longer at home

What are the problems & wishes among elderly with staying longer at home?

literature research

Concept

MAIN RESEARCH QUESTION
How could a **housing scheme** *provide a neighborhood in which* **social cohesion** *is being stimulated in a way that* **care demanding elderly can stay longer at home***?*

Social cohesion

How could a neighborhood stimulate social cohesion among its residents?

social relationships	attachment	orientation towards the common good
How could the built environment provide in the social demands elderly have regarding neighborhood contacts?	How could the built environment create a sense of attachment to the neighborhood?	How could elderly and surrounding residents benefit from each other?
literature research fieldwork	literature research	literature research

Recent developments

What could be learned from new relevant developments that stimulate elderly in staying longer at home?

case studies

Design tools & guidelines

research design site Geldermalsen

DESIGN

1. Observation week

In order to get more familiar with the topic and target group of this graduation research, an observation week was conducted in the first weeks of this project. This observation week consisted out of a one week stay in an elderly housing complex in the Dutch town of Zuid-Scharwoude, a small village located five kilometers north from Alkmaar.

After this complex used to function as a former care home, it was renovated into a mix of care apartments and independent living apartments for seniors and elders. The care apartments are used by elderly people with a high demand for care, especially dementia. They can make use of the professional care and daycare activities that are present at the complex. In the independent apartments, seniors and elderly with a lower demand for care are living on their own. When they become care demanding, they are able to stay in their apartment and buy the needed care from any desired organisation. Spread around the building are several facilities that accommodate for social activities. For a small contribution, people are able to participate in these activities.

During this observation week the aim was to get familiar with the target group and learn more about their daily lives. This week eventually resulted in the general focus point of this gradution research: making it able for care demanding elderly to stay longer at home.

This chapter will contain general information about the complex in Zuid-Scharwoude, and will describe the different findings and experiences that lead to the research topic.
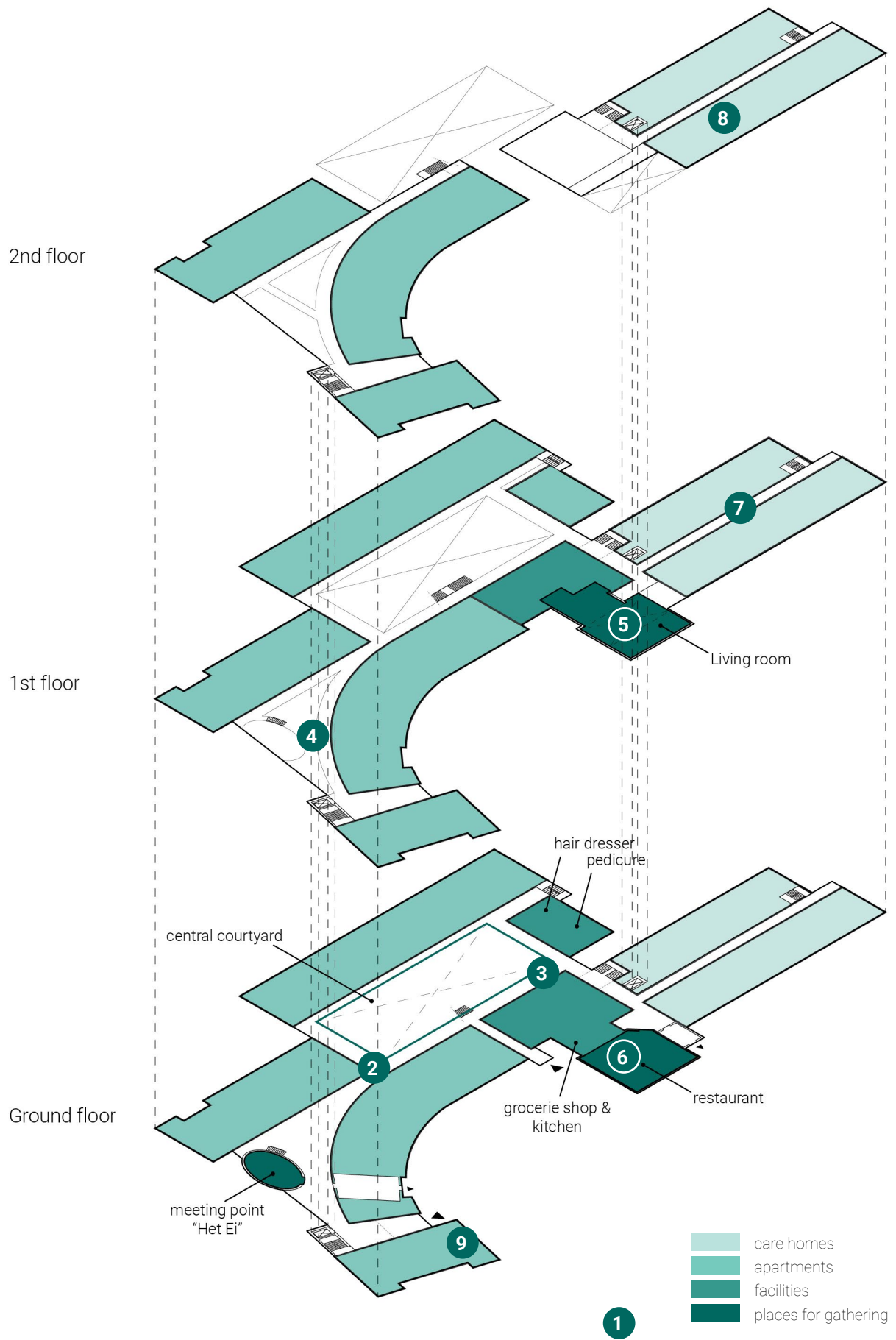
1.1 The complex

1 fig. 1.1.1: Exterior view at the complex at Zuid-Scharwoude (own image)

2 fig. 1.1.2: Central courtyard (own image)

2nd floor

1st floor

Living room

Ground floor

hair dresser
pedicure

central courtyard

groceries shop &
kitchen

restaurant

meeting point
"Het Ei"

care homes

apartments

facilities

places for gathering

3 fig. 1.1.3: library at the central courtyard (own image)

4 fig. 1.1.4: Look onto several entrances of independent apartments (own image)

5 fig. 1.1.5: Activity at the living room (own image)

6 fig. 1.1.6: Group activity at the restaurant (own image)

7 fig. 1.1.7: hallway with entrance doors to the care homes (own image)

8 fig. 1.1.8: Interior view of care apartment (own image)

9 fig. 1.1.9: Interior view of independent apartment (own image)

1.2 Independently living elderly

The thing that caught my main interest during the observation week in Zuid-Scharwoude was the general satisfaction among the independently living elderly in the complex about their living situation. Despite the (minor) health issues a lot of the inhabitants of the complex have because of their age, I found it really interesting to see how people still enjoyed their everyday life and coped with their limitations. In general, people were satisfied with their apartment, the complex and the neighborhood. These three aspects will be discussed separately in this paragraph.

1.2.1 Apartments

A lot of the elderly people we spoke that lived in the independent apartments spent a lot of their time inside their own home. Asked if they liked their dwellings and if they would change something, almost everyone was satisfied and positive. The apartments, which varied from 50 to 60 m2, were found large enough with sufficient amount of space to move around. One complaint that we heard was the lack of storage space in one of the apartments. The couple that complained about this just only recently moved out of a much larger house into a smaller apartment which meant that they had a lot of stuff they took with them.

What was interesting to see that people could move around their apartment well despite their walking difficulties. What could be seen is that people with walking disabilities and walkers had less furniture in their apartments to be able to move around better. This could be seen in the floor plans that are showed in figure 1.2.1. These are all from apartments of people with walking difficulties. Even in apartment 54, that was actually quite packed with furniture, the owner showed us she could move around every part of the house. Also when asked if their bathrooms were sufficient for their physical difficulties, people were satisfied.

1.2.2 The Building

The building it self offers the inhabitants several opportunities to engage in social interactions and participate in activities. At first, as figure 1.1.2 shows, a large part of the dwellings are located in several stories around a central courtyard. This courtyard is covered with a roof which protects the space from unpleasant weather. The roof also allows for natural ventilation which does give the space an exterior climate as temperature and wind are able to be experienced. The wind however also causes some people to not use this courtyard for activities, as they find it too cold. Inside the courtyard, a pitch for a local ball-game (called Kolven) could be found on which the local club plays twice a week. This brings in people from outside the complex and also gives liveliness to the space.

As could be seen in figure 1.1.4, other parts of the building's circulation are also covered with a semi-open roof structure. This makes the circulation almost feel like an exterior street that protects people from the exterior elements.

The building offers several facilities that cater weekly activities. At first there is a restaurant at the ground floor level (figure 1.1.6), in which every night people can have dinner. Every Monday there is an organized dinner, called *Schuif maar aan* (also see chapter 4.2.2), in which people inside the complex, but also people from the neighborhood can eat together and meet each other. Again as with the game pitch in the courtyard, this brings people from outside, inside the complex which stimulates social interaction. Also other activities are being organized here, such as gym or workshops.

At the first floor a living room has been located that is accessible to all the inhabitants of the building (figure 1.1.5). However, this space is most of the time in use as daycare for the inhabitants of the care apartments. This makes that the people who live inside the independent apartments do not often use this room, as they feel they don't belong there and don't want to sit in between the elderly
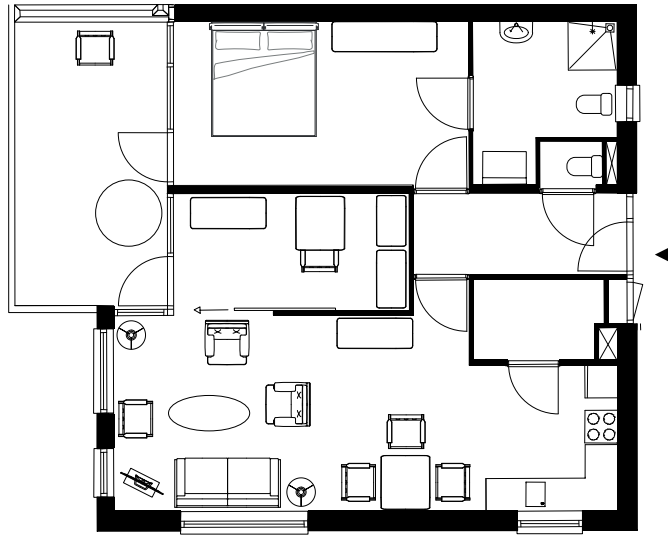
apartment no. 54
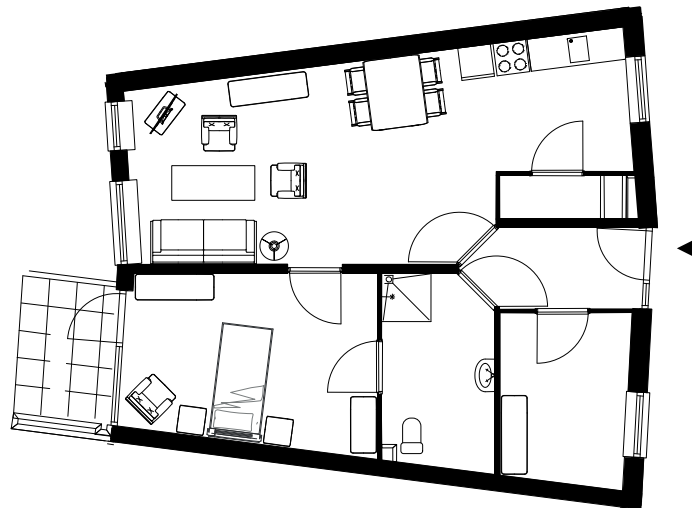
apartment no. 89
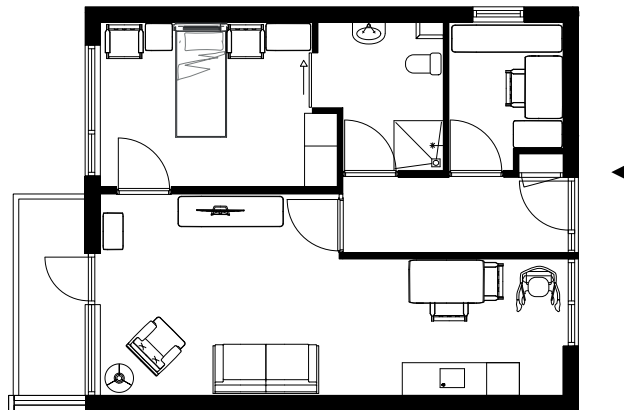
apartment no. 117

fig. 1.2.1: Floor plan examples of independent apartments

with dementia and other issues.

At last, *Het Ei* is a small space located at the ground floor, that has a multi-functional use. It is being used for meetings between inhabitants and several involved organizations such as the building operator or as a work space for the complex manager. Besides that, every week games are being played there and also workshops are being held. The space also offers room for celebrations, as birthdays or other events. During our stay we didn't saw much activity going on inside in which inhabitants of the complex were involved. This could be a coincidence as some of the inhabitants told us that every week, apart from that week, they participated in activities that were held there.

This all makes that the building offers people things to do and places to meet outside of their home. During conversations we had with people, there was a mix of positive and negative reactions. The positive sides were the activities people could participate in and the facilities they could use. It was also noticeable that most people knew who lives inside the complex and that this was also beneficial to them.

One lady for example had a surgery which caused her to revalidate inside her home as she had difficulties with walking. Therefore it was difficult for her to go to the supermarket. As a solution, her neighbor went twice a week with her to the supermarket by car so she was able to get her groceries and being in the fresh air at the same time. Another example was an older man who often went on a visit at one of the inhabitants in the care apartments who felt depressed and lonely. He found it very important to support this man and help him if he could. These are two examples which show the importance of having opportunities to meet other people and what that could lead to.

The negatives were also interesting. One big complaint was that the people who lived in the independent apartments felt that the living room, that was supposed to be for everyone, was "taken" in by the care residents as they had their daycare there. As a result, these people didn't feel like going to the living room as, besides daycare activities for the care demanding elderly, nothing was being organized there for them. Some people found this a shame and, however, had the willingness to help and change this to make it suitable for everyone.

A second complaint, was that people didn't make use of the central courtyard that much as the wind caused a breeze inside. For most of the time, this was found unpleasant by the elderly inhabitants. Although they really referred to the courtyard as beautiful and an added value to the complex, this shows that such a small detail can have a big effect on the use of a space.

1.1.3 The neighborhood

When looking to the neighborhood, facilities as shops, a park and sporting facilities could be found within 500 meters from the building. When asked, almost all of the elderly that lived in an independent apartment went outside. The people in the care apartments hardly made use of the neighborhood.

As most shops are located between 400-500m from the building, for some people this distance was quite a challenge. Especially for those who walked with a walker, a visit to the supermarket was a trip that covered a reasonable part of their morning or afternoon. Resting stops during this trip on the roller had to be taken in order to manage the distance. As already mentioned before, sometimes the distance was too far and help from other neighbors had to be called in. In terms of the self sufficiency of the elderly, it would have been better if the distance towards the facilities such as the supermarket was smaller.

Facilities that were in a closer range, such as the park and the billiard club, were popular places to go. Some of the residents were a member of the billiard club and participated there several times a week, which they very liked as this gave structure to their lives. Also the park that was bordering the complex was used by the people.

In terms of accessibility of the environment around the complex, there were several problematic places where disabled people could experience troubles when passing by. Figure 1.2.5 for example
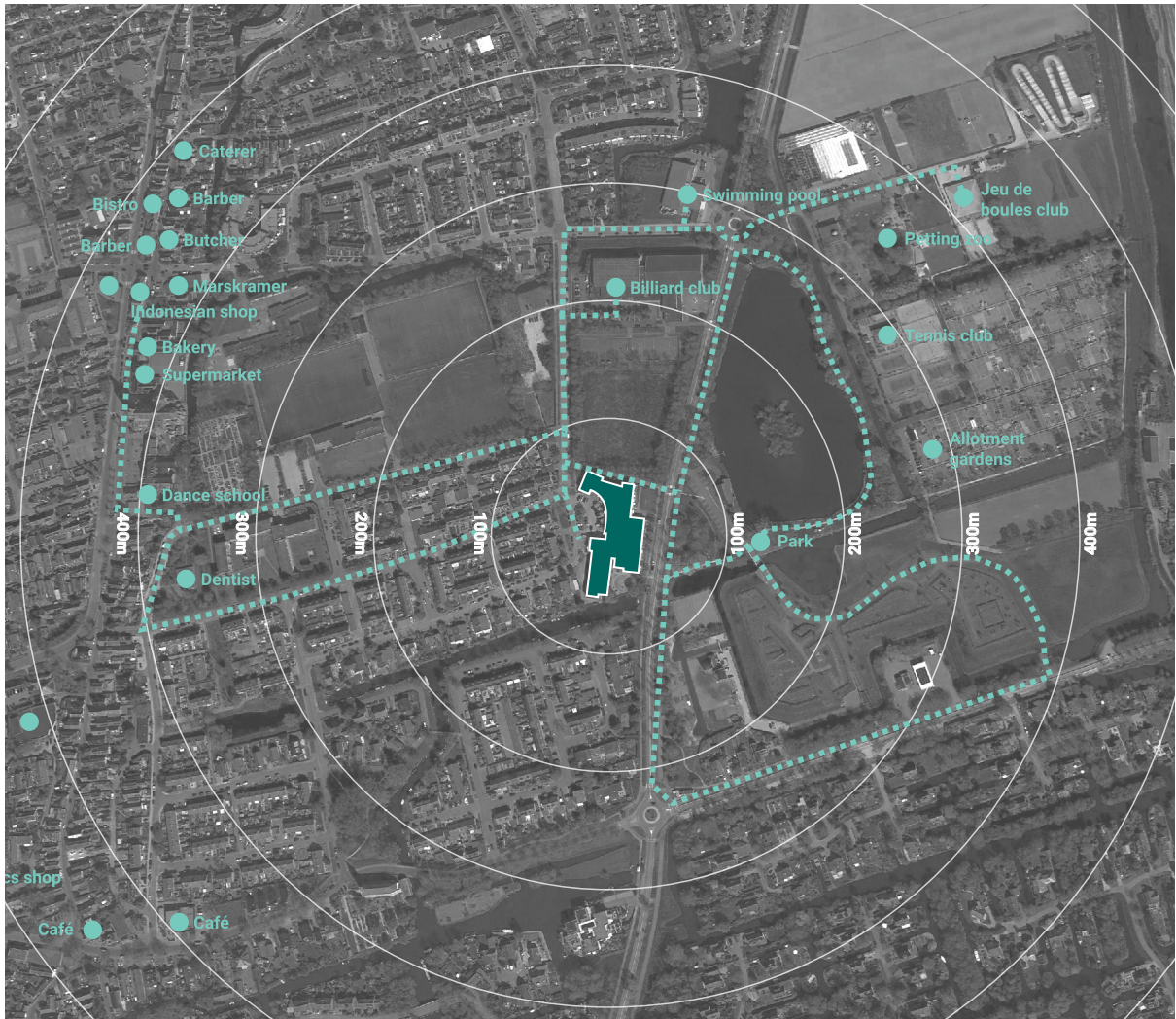
fig. 1.2.2: Location and use of facilities and public space in the neighborhood (from: Google Maps, own edit)

shows the crossing people have to take when they want to go from the complex to the park. It crosses a busy road without clear markings on the road surface. It was mentioned by some of the disabled elderly people that they found it sometimes scary to take this crossing. Figure 1.2.3 is also another example of a dangerous crossing. To get to the other side of the road, it has to be crossed diagonally. For elderly people this could take some time as walking isn't always going that quickly. In combination with the blind corner at the end, this could result in dangerous situations.

Other difficult situations that could be seen are for example showed in figure 1.2.4, where passing could become problematic when driving a mobility scooter or riding in a wheelchair. Also the bridge in figure 1.2.6 was quite steep which could make the access for people with a walker or wheelchair difficult.

Although these and many other difficult situations that could be seen all over the neighborhood, it was interesting to see that many elderly found a way to cope with it. When asked, one elderly woman for example told us she went for a walk every day around the park and managed to cross the bridge in figure 1.2.6 every time, although in advance we thought that would not be impossible.

1.3 Moving on after the observation week

After the observation week, my initial interest in the topic of keeping elderly longer at home was strengthened which made me want to dive deeper into it for the remainder of this graduation research. I found it interesting to see how the independently living elderly in the complex lived and how some of them coped with the disabilities they had.

The overall image I got from the elderly was a very positive one. People were happy and felt comfortable in their homes, the building and were happy to live in the neighborhood they knew already for a long time. What I was almost wondered about after this week, was that I didn't recognize the well known image that exists of independently living elderly people that struggle in every day life because of their disabilities.

This could be due to the fact that the elderly we spoke with during the week did have difficulties with mobility for example, and some of them did receive professional medical or household help, but the severity of their problems wasn't that big. Therefore it was quite "easy" for them to continue with their everyday lives without relying too much on support from their social network. From the news and other sources I knew however that this image isn't always that bright and that many elderly do struggle with everyday life because of their limitations and that a supportive network isn't always available to them.

That is why in the next chapter the focus will lie on these elderly with the aim to discover the reasons why they struggle and why they do not always have a supportive network to fall back on to. Besides that I can learn from the positives I discovered during the week and take them into account when developing a concept.

fig. 1.2.3: Dangerous, diagonal crossing of the road. (own image)

fig. 1.2.4: difficult access with mobility scooter and wheelchair (own image)

fig. 1.2.5: Dangerous crossing of road (own images)

fig. 1.2.6: Abrupt ending of pavement (own image)

GROWING OLD INDEPENDENTLY IN A COHESIVE ENVIRONMENT | **25**

2. Staying longer at home

This chapter will dive deeper into the topic of letting care demanding elderly stay longer at home. In addition to the introduction, a deeper insight will be given in the problems and wishes that elderly people and their supportive network have regarding to this topic. The sub-question that will be discussed in this chapter will be:

What are the problems & wishes with keeping elderly people longer at home?

Therefore, at first a look into the historical development of elderly care will be given to understand why the current situation is as it is right now. After that, the reasons for, and consequences of the lack of a sufficient supportive network of an elder person will discussed. Finally, the wishes among elderly people themselves on how they want to grow old are being discussed to have a clear image on what they want themselves.

2.1 Historical development of elderly support

Before taking a look to the current problems and wishes among elderly when it comes down to staying longer at home, it is interesting to take a closer look on how elderly support has developed over the past centuries. By looking back, an understanding on why the current society has difficulties with taking care of old relatives could be obtained. Different periods in history are being described. A line has been drawn to illustrate the dependence of elderly on their social network over time.

<1400
Mostly dependent on family & relatives

Elderly at the first half of the Middle Ages were mostly dependent on family and relatives when they reached an older age and were in need of care. Financial structures as we know to support an elder when they were care needing weren't common and therefore, especially poor people, were forced to work until the final end. The support received by family and relatives consisted of care and housing in return of the family inheritance after passing away. (Zuiderduin, 2015)

dependence on social network (illustrative)

1200   1300   1400   1500   1600

1400 - 1945
From family & relatives towards institutions

During the Late Middle Age the *elementary family*, a family system that consists of a family group of two parents and their children, became more and more common. This system goes along with neolocality: children no longer remained living at home, but leave their parent's house after marriage. This caused parents to live without their children during their older days and made that they had to be more self-reliant. (Zuiderduin, 2015)

Where familial care was still one of the sources of help for elderly, living together with family was getting out of fashion. Recent research that has been carried out shows that only 2,1% of the elderly people in Leiden lived together with family during the 17th century. (Boele, et al., 2014). People that didn't have family or people from which the family financially couldn't afford to support them could fall back on several public instances. Most of these where founded by the church, the government, wealthy citizens or people from the aristocracy. Until the 20th century, these forms of elderly care were common. (Van Campen, et al., 2017)

The most famous example of these instances were the so called *hofjes*, where elderly could live in their own home, centered around a courtyard. In here they received the care they needed. Differing on the kind of hofje, a different amount of fee had to be paid. Sometimes houses were for free. (Boele, et al., 2014) (Van Campen, et al., 2017). Out of charity, the government founded Oude Mannenhuizen and Oude Vrouwenhuizen for the poorest of people that couldn't afford care. Other forms of elderly care could also be found back then. Guilds and neighborhood communities also provided a source of support to elderly that participated in these collectives. Also contracts with families and strangers where common where they received care in return of payment. (Boele, et al., 2014)

1945 - 1975
Governmental institutional elderly care for everyone

Towards the end of the nineteenth century, it became clear that the living situations among elderly in the different institutions were very bad. Abuse, diseases and small living spaces were everyday's business. This caused the implementation of a law that made families responsible for looking after older people. This law, however, didn't work out, as elderly still were living in appalling situations during the 1950's.

After the Second World War, individualism grew in the Netherlands. Therefore it became even less obvious for children to look after their parents. This caused the development of a welfare state that involved the introduction of pensions and other social support structures. Together with the big demand of new housing for young people, this led to the development of government funded retirement homes where elderly could spend their final years with other elders. Every older person could move into a retirement home, regardless their health situation. (Van Campen, et al., 2017)

2015 - present
Further decrease of governmental institutional care, shift towards informal care

After the introduction of the WlZ (Wet Langdurige Zorg), it became even harder for elderly to move to a care institution as care residences were closed. Nursing homes, (institutions that only offer high levels of elderly healthcare) are the only governmental institutions left in which only elderly with the highest demand for care can live. Other elderly have to stay at home, even if they have a certain demand for care. They are dependent of direct nursing and family or friends that can provide in informal care. (Van Campen, et al., 2017)

1700   1800   1900   2000   2100
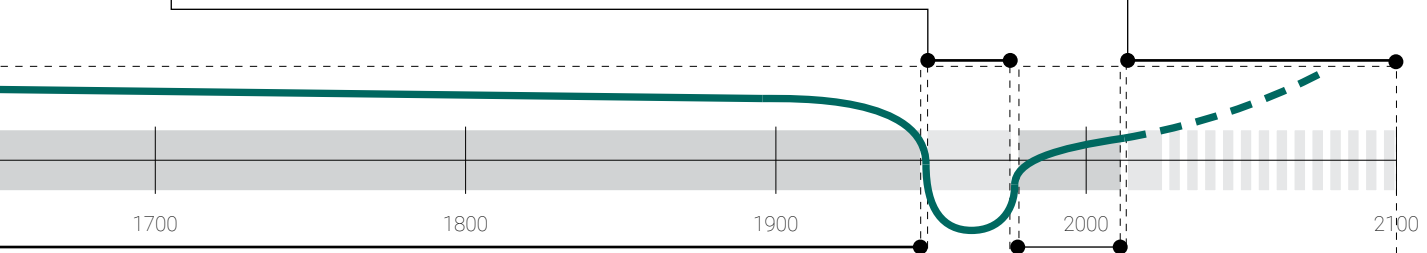
1975 - 2015
Governmental institutional care only for care demanding elderly

Soon it became clear that this system wasn't viable as it was much too expensive. Therefore, in 1975 the government restricted healthy people to move into retirement homes. The policy was changed: only elderly that where in need of care could move into a care residence or nursery home. Healthy people had to stay at home as long as possible with the support of family and relatives. (Van Campen, et al., 2017)

2.2 Returning to collectivist traditions in a individualistic society

The previous paragraph clearly shows that elderly people had a declining dependency on support by family & friends over the course of time. The emergence of neolocality and the founding of institutions that took care of elderly as a reaction, took away a part of the care responsibility that the social network had elderly people from the Late Middle Ages onwards. As it became more common for children to move out of the parent's house when they were grown, living together with them on an older age became less likely for older people. Emerging institutions provided elderly more options when it came to receiving care in their old days. No longer did they only have to rely on support from their own network, but were also able to receive care from other sources, with or without having to contribute financially.

As more and more institutions emerged over time, the dependence on family & friends got less. This continued for centuries until the end of the Second World War. Around that time, conditions in elderly care institutions were appalling. People realised that these conditions had to improve, which happened with the rise of the welfare state. Pensions provided elderly with an income to be financially independent. Growing individualism caused children to feel even less responsible for the care and housing their parents demanded.

In the context of society that became more and more individualistic, the government founded care residences and nursing homes to which elderly could move to spend their old days. In these institutions, that were paid by the welfare state, elderly were able to make use of care arrangements according to their needs. Both healthy and care demanding elderly could make use of these new living arrangements, while the children in the mean time had time to do other things than having to think about taking care of their parents.

As this type of elderly housing already quite quickly became too expensive, from 1975 only elderly with a certain care demand were able to move in such institutions. Most elderly had to stay longer at home in which they had to receive care from professionals, friends or family. For the first time in years, the demand for network support rises instead of lowers, as elderly become more dependent for help. This dependence even got bigger after 2015 when the government closed the care residences which caused that institutions were only available for those with the highest demand for care. The people that can't have a place inside such residences, will have to remain at home and receive informal care from their network or from care professionals.

With the current government policy, a shift towards a more collectivist approach to elderly care has been made, as elderly are partly supposed to be cared by their network of family and friends. When looking back in the history, this isn't new to Dutch society, as during the Middle Ages taking care of elderly was normal. As this was actually 600 years ago, the society has changed a lot ever since. In an era where individualism is the standard, where people are busy with work, their social lives and taking care of their own household and where distances between relatives are increasing, taking care of an elder relative on a regular basis could be very difficult to combine for a lot of people. Sometimes this could lead to the lack of a supportive network for elderly people.

This doesn't mean however that there isn't any willingness to help elderly people. Research shows that the willingness to provide informal care raised from 50% in 2013, to 72% in 2019 (Van Vliet, 2019). This shows that people are willing to take care of a care needing person. What is important however with the individualistic society in mind, is that the care task shouldn't overrule the care giver's life. Space should be left for everyone to live their own lives. Examples could be found of small neighborhood communities in which people look after each other and provide help to make sure people are able to live longer independently, as long as this help is for short term and not too demanding. The help provided consists out of practical tasks as grocery shopping, collecting medicines and other gestures. More care related support is provided by more intimate relatives or professionals (Machielse, 2016).

Availability of a supportive network **2.3**

The previous paragraph showed that the individualistic mindset of today's society makes that a supporting network to rely on isn't always a given fact for elderly. This paragraph takes a closer look on the reasons why this network sometimes lacks.

On one hand this depends on the social capability of a person. Where some people have developed a meaningful network of friends, relatives and family members over their lifetime, other's may not have such a broad social circle of relationships. People with a meaningful social network are more resistant when they become care dependent. Elderly that do not have such networks are more vulnerable. (Machielse, 2016)

Having a broad network of social contacts doesn't always mean that the entire network is available for providing help. Busy lives of relatives and an increasing distance between friends and family makes that providing support to a care demanding elderly could sometimes be difficult.

Besides that, social networks aren't stable structures which can change according to events during someone's life. During a young age, social networks often expand with colleagues, fellow students or a partner. When people grow older, this network shrinks down as a result of different reasons, for example ending a friendship because of a fight. The passing away or moving from relatives is also an important shrinking factor for the social network of an elderly. As elderly people often get less mobile because of physical disabilities, it also could become difficult for them to maintain certain relationships. (Machielse, 2016)

Aside from the size of the network that can change over time, the nature of the relationships in the network could also change when care gets involved. As an elderly gets dependent from relatives when they become in need for care, their relationship could change as a result of a lack of reciprocity. (Machielse, 2016)

At last the social network could change as a result of changing needs when age increases. When people grow older, elderly often become more selective in the social contacts they enter into. Often they are more in need of meaningful contacts than shallow, meaningless ones. Quantity is less important than quality. (Machielse, 2016)

Consequences of a lack of support **2.4**

The lack of a supportive network can have several negative consequences for independently living elderly people with a care demand. The prominent consequence of lacking support is the difficulty with everyday tasks and the effect this has on a person's autonomy. Not being able to shop for groceries for example, or having to climb the stairs at home could be severe troubles when additional support is not available. Especially when professional support also lacks, harrowing, exceptional situations could occur. An event that illustrates this problem and received a lot of attention in the Netherlands was the case of an elderly person in Rotterdam, who was found dead at home in 2013, ten years after she passed away. For all these years, no one looked after her. (Schoorl, 2013).

On the social level, elderly could also experience drawbacks when a social supporting network isn't available. Loneliness, depression and physical problems could occur when an elderly's personal network doesn't meet their social needs. Also the feeling of being dependent on support from close relatives can cause a change in relationships with feelings of loneliness as a result. (Machielse, 2016)

Loneliness can occur in several forms. Emotional loneliness occurs when there is a lack of intimate, meaningful relationships with for example a partner, child or close friend. Social loneliness contains the lack of a wider network of friends and relatives, that are defied by a less profound relationship. These two forms of loneliness can occur at an older age as a result of the loss of friends, family or a partner. At last, existential loneliness could occur. This type of loneliness has more to do with certain (social) problems a person has experienced during his life that has led to a reduced social network. Also the feeling of being redundant as a result of a lack of contribution to the society can cause be a cause of existential loneliness. (Machielse, 2016)

The case of Bep de Bruin (Rotterdam 2013, The Netherlands)

"Het is stil in de Jan Porcellistraat, na een week lang heftige hectiek, waarbij buurtbewoners en hulpverleners, en eigenlijk ook de burgemeester, en zelfs het hele land, zich afvroegen hoe dit toch heeft kunnen gebeuren. Hoe is het mogelijk dat in een stad als Rotterdam, een mens tien jaar dood op een matras in de kamer ligt, onopgemerkt, totaal genegeerd.

Drie weken lang werden hier de gasleidingen verlegd, en bewoners werd verteld dat de bouwvakkers ook binnen moesten zijn. Toen er op het adres van 'BD de Bruin' geen reactie kwam, na herhaalde waarschuwingen, werd de politie erbij gehaald, vorige week donderdag. De voordeur gaf niet mee, door de achter de deur opgehoopte berg ongeopende post.

Op een matrasje vonden agenten het gemummificeerde lichaam van Bep de Bruin, op 74-jarige leeftijd gestorven aan een natuurlijke dood, tien jaar geleden. Bedekt met een groen zeil werd ze nog dezelfde dag met een brancard uit haar woning getild."

'Leven zonder liefde, dat kan hier'. Taken from: *de Volkskrant*, 30 november 2013

2.5 How do future elderly want to grow old themselves?

As the government policy is directing towards a society in which elderly stay at home as long as possible, older people in the Netherlands are more or less forced to do so in the coming decades. But what do they actually want themselves? Do they also prefer staying at home or would they actually rather live somewhere else?

Nivel, a Dutch research institute on healthcare, has carried out a research in 2014 (Doekhie, 2014) on the wishes and demands of the "future elderly" in the Netherlands. By interviewing people from the age group of 57+ years old, the researchers were able to analyze if the current government policy is aligning with the demands of the elderly in the coming decades.

When looking to where and how the future elderly want to live, 79% of them would like to stay at home as long as possible when they become in need of care. Staying in the same home can mean that at it has to be adapted at some moment to suit the care demand an elderly has. These adaptations could be a stairlift for example, or removing doorsteps. (Doekhie, 2014)

20% of the elderly want to move elsewhere when their care demand increases. Reasons to move are for example a home that is too large or that has multiple stories, which makes living in it while having physical disabilities more difficult. Eighty percent of the young elderly (55-64 years old) tend to move out of precaution, to anticipate on a possible decrease in mobility. (Doekhie, 2014)

When elderly want to move, most of them would like to stay independent, but close to a care facility. The following table shows the results that came out of the Nivel research (2014).

housing type	%
an apartment	43
a senior / elderly dwelling	38
a sheltered home near a care facility	26
a service flat	24
a single family home	8
a specific living arrangement for care dependent people	3

fig. 2.5.1: preferences on living arrangement when getting older. Taken from: Nivel, 2014

Besides the type of housing future elderly would like to live in, the research also describes their preferred living environment. People that are satisfied with their current neighborhood, rather would like to stay in the same area, as they have build up a collection of memories and relationships over the past years. Almost 75% of the elderly would like to stay in the same area when moving. People in rural parts of the country, are more likely to move outside of their neighborhood towards a bigger town or city to have a better access to facilities and shops. Besides that, elderly would like to live among other generations, close to shops and other facilities. (Doekhie, 2014) Table 5.2.2 shows several preferences that came out of the research.

demands on living environment	%
near shops, healthcare facilities and other facilities	55
in a neighborhood with multiple generations	47
near own children	26
in a neighborhood where people live that would like to provide help when needed	22
in a neigborhood with equal minded people (same hobbies, preferences etc.)	12
near friends	9
near family members (other than own children)	7
In a neighborhood with a lot of elderly people	4
No specific preferences	10

fig. 2.5.2: preferences on living environment when getting older. Taken from: Nivel, 2014

2.6 Conclusions

From this chapter the following conclusions could be drawn:

- With the current government policy, a shift towards a more collectivist approach to elderly care has been made, which is in contrast with the nowadays individualist society;
- Elderly people do not always have access to a supportive social network when they become in need for care;
- Also having a broad social network doesn't always mean that this network is available to an elderly when they become care needing. Several aspects could be the reason for this;
- The prominent consequence of lacking support is the difficulty with everyday tasks and the effect this has on a person's autonomy.
- Loneliness, depression and physical problems could occur when an elderly's personal network doesn't meet their social needs;
- When looking to where and how the future elderly want to live, 79% of them would like to stay at home as long as possible when they become in need of care;
- 20% of the elderly want to move elsewhere when their care demand increases;
- When elderly want to move, most of them would like to stay independent, but close to a care facility;
- Almost 75% of the elderly would like to stay in the same area when moving;
- Elderly would like to live among other generations, close to shops and other facilities;

As an answer to the sub-question that has been discussed in this chapter, could be said that one of the big problems that goes alongside keeping elderly longer at home, is that a sufficient supportive network of family and friends, that is assumed to be there when care is demanded, isn't always available. Due to a result of several factors, this lack can cause practical, physical and social problems in an elder's every day life. The concept of staying at home for as long as possible however is wished for by most of the future elderly. With this, living together with other generations and near shops and facilities is preferred.

This means that the concept of keeping care demanding elderly at home is wished by both the government as the future elderly themselves. The problem that has to be solved lies in how an elderly person with a care demand can always have access to a sufficient supportive network in their home environment

3. Concept

When looking back to the previous paragraphs, it could be concluded that the supporting social network that is assumed to be existing for every care demanding elderly, isn't a given fact for a lot of old people in the Netherlands, with practical and social problems as a result. Several personal and societal factors can make that an elderly only has limited access to a supportive network of family and friends that can help them when they become care demanding.

As the current elderly care policy directs towards informal support and a strong social network isn't available for every elderly, embedding them in a neighborhood community in which they can rely on support from neighboring inhabitants and (care) facilities could be necessary to fulfill in this demand. An environment in which people provide support and look after each other in return of favors could be an interesting concept in which care demanding elderly could remain living at home independently while still being part of a bigger whole.

In this proposed living environment, it's inhabitants form (next to family and friends) an additional source of informal care for their elderly neighbors. Doing small favors, as grocery shopping, walking the dog, changing a lightbulb or just simply having a nice conversation with each other can be of a great importance in making the lives of an elder person easier. Small tasks that are easily doable for someone that lives nearby. Also by providing the possibility to give something back in return and participate in the community keeps elderly part of the society and builds upon a sense of reciprocity.

When talking about such a concept, a living environment is demanded in which a strong sense of community is present. A community in which people are aware of, and look after each other. In literature and studies, a general notion consists that the term *social cohesion* is of great importance when talking about a community (Schiefer, et al., 2016). According to Schieffer and Van der Noll, social cohesion could be defined as follows: "... *a cohesive society is characterized by close social relations, pronounced emotional connectedness to the social entity, and a strong orientation towards the common good*" (Schiefer, et al., 2016).

This definition aligns with the idea that is being stated above and could contribute to a living environment in which people look after each other in such a way that elderly people could stay at home as long as possible. This leads to the following main research question:

How could a **housing scheme** *provide a neighborhood in which* **social cohesion** *is being stimulated in a way that* **care demanding elderly can stay longer at home**?

To be able to design a living environment that stimulates social cohesion, it is necessary that further research has been done in what social cohesion contains and how the built environment can have an influence on it. Schiefer and Van der Noll (2016) defined three main topics that are of a main importance to social cohesion, which derived from a widespread literature review into the definition of social cohesion. These topics are *Social relations, Attachment* and *Orientation towards the common good.* (Schiefer, et al., 2016).The following chapter will dive deeper into these topics with the aim to gain knowledge on how to translate them into the built environment.
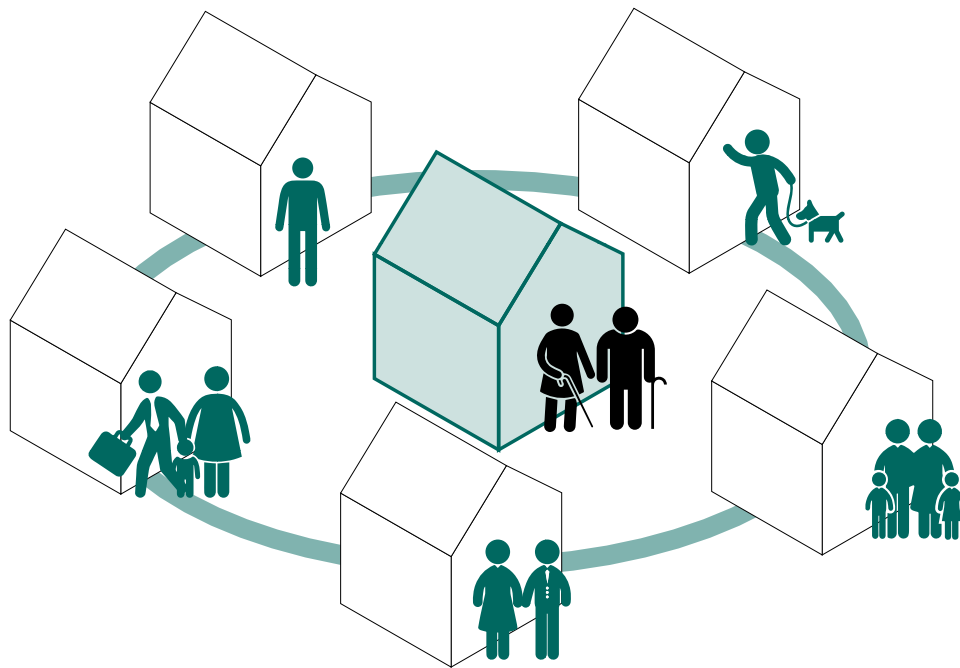
Embed elderly in a neighborhood, in which they can rely on informal support from their neighbors by stimulating social cohesion

4. Social cohesion

Chapter four will contain an in depth research into the topic of social cohesion. This will be done in order to gain insight in how the built environment could affect the experienced sense of community in a living environment. The outcomes of this chapter should provide a basis for the eventual translation from the concept into a design. The following sub-question will be answered during this chapter:

How can a neighborhood stimulate social cohesion among its residents?

By using the following sub-sub-questions:
- How could the built environment provide in the social demands elderly have regarding neighborhood contacts?
- How could the built environment create a sense of attachment to the neighborhood?
- How could elderly and surrounding residents benefit from each other?

Therefore, at first social cohesion will be defined. After this, the three main important aspects that define social cohesion will be discussed: *social relations, attachment* and *orientation towards the common good*. From all of these three topics design tools will be distinguished that will be presented in an overview scheme. These tools will provide the architectural base for the translation of the concept into the design.

4.1 Definition

In the previous chapter, the term *social cohesion* was already introduced. In this paragraph, the term will be more elaborated to be able to have a clear understanding of it's meaning so it can be implemented into the design in a well-thought way.

Schieffer and Van der Noll defined a global definition of social cohesion that will be used for the remainder of this research. They define a society in which social cohesion is present as follows:

... a cohesive society is characterized by close social relations, pronounced emotional connectedness to the social entity, and a strong orientation towards the common good"
(Schiefer, et al., 2016)

In this definition, they distinguish three important aspects that contribute to social cohesion: *social relations, attachment* and *orientation towards the common good.*

Social relations
This term relates to the attraction between members of society. According to Schiefer and Van der Noll, "social relations make people continue to stay in the group". Social relations are about "the quality and strength of people's relationships and bonds with others..." (Schiefer, et al., 2016).

The subject of social relations consists out of a couple of important factors.
- social networks: the quality and quantity of social interaction with family, friends and acquaintances, also better known as the social capital;
- trust: between people in society in both the horizontal direction (towards neighbors) as well as in the vertical direction (towards institutions)
- mutual tolerance: the mutual acceptance between different societal groups;
- participation: the participation in societal activities / groups to strengthen shared values, sense of belonging and trust.
(Schieffer, et al. 2016)

Attachment
Attachment is about the importance of "feeling attached to or identify with the social entity" (Schieffer, et al., 2016). This subject will be reviewed from both the social as from the physical side. Schieffer and Van der Noll link this feeling of being attached with social factors as shared values and lifestyle that take place in a certain geographical location. Dempsey (2008) on the other hand, linked the contribution of attachment to social cohesion with physical elements in the built environment. He showed that certain aspects in a neighborhood can lead to people feeling more attached to a physical place: *place attachment.* (Dempsey, 2008).

Orientation towards the common good
This last term contains "feelings of responsibility for the common good..." in which a "commitment to the community and the willingness to subordinate personal needs under the welfare of the social environment" is present. (Schiefer, et al., 2016). It is about contributing to the community and reciprocity among it's members.

The three terms that are mentioned above will all be elaborated on in this chapter in the following paragraphs.
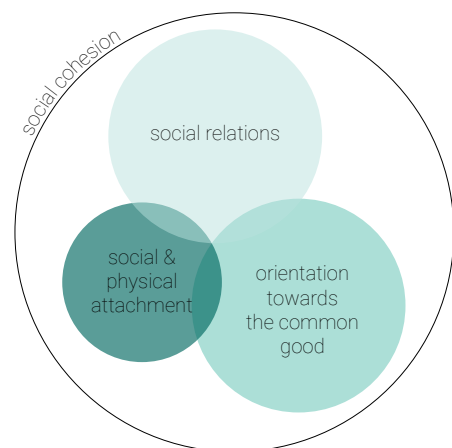
fig. 4.1.1: elements of social cohesion, based on Schieffer and Van der Noll (2016) and Dempsey (2008)

According to the definition by Schieffer and Van der Noll, social relations are all about the quality of contact between the people in a certain group. When talking about the composition of a persons social network, different types of relationships could be distinguished. In his well known theory, Mark Granovetter (1973), an American sociologist, talks in this case about *strong ties* and *weak ties*. The first refers to close, meaningful relationships. The latter is about less meaningful, more shallow relationships. As strong ties mostly are regarded as being highly important, according to Granovetter the importance of weak ties should not be underestimated. These relationships contribute to the integration of an individual into a community, whereas strong ties tend to create more segregation. (Granovetter, 1973).

The network of near friends and family of an elder person could be regarded as their network of strong ties. These people are standing the nearest to them. Also when it comes down to informal care, this part of an elderly's network often provides them with the demanded care. As the previous chapter showed however, not every elderly has access to this network.

The contacts with neighbors, on which this research focuses as an additional source of care, could be regarded as weak ties. Making sure elderly people have the opportunities and are given the right environmental conditions in which the development of these weak ties with neighboring inhabitants could take place, could contribute to an environment in which support for them is more likely.

Therefore, it is very interesting to know what elderly people find important about contacts with neighbors. This paragraph will answer the question: *How could the built environment provide in the social demands elderly have regarding neighborhood contacts?*

4.2.1 Demands

Belgian research shows that *neighborhood contacts* are in general of great importance to the daily lives of elderly people. (Buffel, et al., 2011). Often this contact consist out of small talk, which is highly valued by elderly, especially among those who don't have a partner (anymore). These contacts, which are an example of weak ties, can create a feeling of being at home in the neighborhood. This is created by being familiar with who is living around them which creates a feeling of mutual trust (Buffel, et al., 2011).

The *composition of the inhabitants* of a neighborhood also has an influence on how an elder person could connect with the surroundings. Research shows that a big group of elderly would like to live between other generations. (Doekhie, 2014). However living together with too many young families for exmple, can have a negative effect on the amount of social interaction with neighbors. (Buffel, et al. 2011). This shows that an adequate mix of target groups is demanded to make sure an elderly still feels connected.

Activities and meeting places are also important sources of social contact for elderly. Joining a club or participating in voluntary work provides in needs for social contact, meeting new people and being able to help someone. Still being able to participate in society could mean a lot to older people. Also less formal sources, as a neighborhood barbecue, a visit to the local library, a neighborhood center or the supermarket contribute to social engagement. (Buffel, et al., 2011).

Where having contact with others is very important, *maintaining privacy and autonomy* from each other also has to be taken into account. As neighborhood contacts are often weak ties, people are in need of a distinction between public and private space. Providing people with the choice between engaging in or avoiding contact with others allows them to control the amount of social interaction they have. As the demand for social contact differs between each individual, this is a very important aspect to take into account. (Buffel, et al., 2011)

4.2.2 Learning from the observation week

During the observation week in an elderly housing complex called BuitenZorg in the Dutch town of Zuid-Scharwoude, examples could be found of the importance of social relations to the life of

Resident apartment no. 3

The story of the resident living at apartment number 3 was really striking. After his wife passed away and having a stroke shortly after, he wasn't able to live on his own anymore as he became care demanding. As he hardly could be described as an elderly (he only was in his fifties and recently owned his own company), he ended up living between people no younger than 70 years old in the care department of the complex. This made him not feeling at home at all with depressed feelings as a result, as he couldn't fulfill his social demand. He also didn't have a broad familial social network to fall back onto, as his son wouldn't visit him anymore and his daughter only came by once in a while. One of the inhabitants of the sheltered homes did visit him a couple of times a week. They always had some drinks together, which provided some sort of support to him.
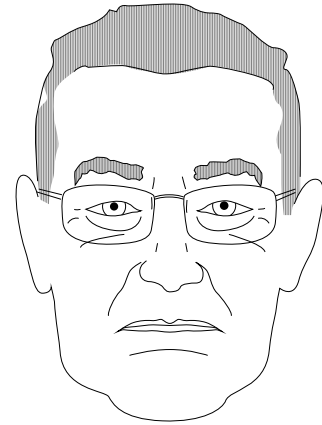
This example clearly shows what the effect could be when someone is living in an unhealthy mix of people while not having a social network to fall back onto. This person lived together with people that were all at least twenty years older and had dementia. As a result of his (psychological) health, he wasn't able to change this himself and therefore experienced serious levels of loneliness and depression.

Resident apartment no. 117

This resident was living independently in one of the sheltered apartments. Besides the fact that he had mobility problems and therefore had to walk short distances with a walking stick and was dependent on his mobility scooter for longer distances, he had a busy social life. He participated in several clubs in the town, as the billiard club and the jeu des boules club. Besides that, every week he went to karaoke nights in another building complex and even had a job on Friday morning. Inside the complex, he actively participated in organizing together with other residents. Although he lived alone after his wife passed away, he didn't mention feeling lonely or not feeling supported.

Although this person lived alone, he never felt lonely as he was participating in a lot of social activities that provided in his social demand. As a result, he didn't limit his contacts to the elderly housing complex he lived in, but expanded his social network throughout the entire village. This clearly shows the importance of participation at an older age and having the possibility to do so.

Schuif maar aan...

'Schuif maar aan' is an initiative that is being organized every monday in BuitenZorg, in which people from aswell inside and outside the complex could come over and dine in the complex' restaurant. This evening, that is organised by an entrepeneur who owns the kitchen and a small shop inside the complex. For a small contribution, elderly could enjoy a three-course diner. Every week, around twenty to twenty five people attend this evening.

fig. 4.2.1: Elderly people participating in *Schuif maar aan...* (picture from: www.chantelsmengelmoes.nl)

What is interesting about this concept, it that it brings in people from outside the complex. Often these are also elderly people that live in the surrounding neighborhood. After talking with the elderly that attended this diner, it appeared that most of the time around half of the group of elderly comes from outside the complex. Some of them are friends of one of the residents from which the friendship goes back for years. They use this event to meet each other and dine together. Others are participating in order to meet new people.

Klaverjas club

Every Wednesday the klaverjas (card game) club, that only consists out of three elderly inhabitants, come together in the afternoon to play together. A volunteer that lives in the village joins this game every week. The elderly are fond of him and are happy that he participates with them in playing the game. The volunteer himself also really values this weekly event as he finds having contact with the elderly very important.

fig. 4.2.2: The klaverjas club (own image)

As with the previous example, the klaverjas club brings people from outside the complex in and provides interaction with the residents. For both the elderly as the volunteer, this weekly gathering is a very positive experience.

From the previous examples two important lessons could be learned. At first, making sure that there is a healthy mix of age groups is very important. This point was also already stressed by Buffel et al. (2011) in paragraph 4.2.1. With a wrong mix, neighborhood contacts can decrease and lead to fewer social interaction, which could result in some cases to severe mental problems.

Besides that, the availability of social activities in the direct surroundings provides elderly with an important source for social interaction. These activities give elderly the opportunity to expand their social network and fulfill their social needs. By organizing activities that are accessible for everyone in the neighborhood, a broad range of social contacts could be made.

4.2.3 Translation to the built environment

From the previous paragraphs, four main important demands of elderly people concerning neighborhood relations could be distinguished: *opportunity for social interaction, a right mix of generations, social activities* and *being in control of privacy*. This paragraph will explore the way how the built environment can contribute to meeting these demands.

Opportunity for social interaction
Just as Granovetter (1973) already mentioned, Jan Gehl stresses the importance of weak ties for a person's social life in his book *Life Between Buildings* (2011). Contacts of *Low intensity,* or *passive contacts* as he calls them, could eventually lead to more complex contacts, as a conversation, and eventually even to being acquainted, a friendship or more. (Gehl, 2011). For elderly this could mean getting in contact with their neighbors and getting to know them for example. This can create a mutual sense of trust that leads to a feeling of being at home in the neighborhood (Buffel, et al., 2011) and a possible expansion of their social and supportive network.

For social interaction to take place, at fist two people have to be in the same space. Passive contacts often happen spontaneously. When these spontaneous encounters between the same people happen more often, relationships could be established and grow. (Gehl, 2011). For this research a division into two places where social encounter could take place in a residential environment will be made: *at the front door* and *in the public domain.*

Gehl stresses the importance of *soft edges* around a dwelling to create a gradual gradient from the private dwelling towards the public domain. (Gehl, 2011). Soft edges are transitional zones at the entrance of a house that forms a border with the public realm, as a front yard or a porch. These semi-private outdoor spaces make it possible for someone to be outside the house on own property and provide them with an opportunity to engage in an activity or social interaction with neighbors. (Gehl, 2011). Applying these zones to the home of an elderly and make them easily accessible from inside the house, increases the possibilities for them to be outside in an accessible way, which puts them in a position in which the chance on social interaction with neighbors is increased.

When it comes down to stimulating social interaction in the public realm, several factors are important. At first, streets, other urban spaces and facilities should be easily accessible. This contributes to the amount of social interaction (Dempsey, 2008), and is desired from the stance of a decreased mobility of the elderly. Attractivity and the quality of these spaces are also very important when it comes down to the actual use of them. Gehl (2011) mentions that the amount of activities that take place in an urban space increase when the perceived quality is higher. Examples of quality related aspects are the amount of high-speed traffic, having the opportunity walk, stand, sit, see, hear and talk (Gehl, 2011) and maintenance. (Dempsey, 2008). These aspects all contribute to lively streets that are attractive to use.

To summarize: implementing *accessible and lively urban spaces* into the project therefore will make it easier for elderly to become engaged in social contact in the public realm. Pages 50-53 show with which measures, according to Jan Gehl, such an urban environment could be achieved.

fig. 4.2.3: Soft edges allow for activity in front of the house and provide opportunities for social interaction (Pilgrim Gardens, PRP)

fig. 4.2.4: Interior view of Ramses Shaffy Huis (Studioninedots, 2017)

fig. 4.2.5: Alternating family and elderly homes in Sint Annaparochie, Friesland (VNL Architecten, 2018)

Mix of generations

From the previous paragraphs, the importance of the right mix between the different generations became clear. The question what the ideal social mix in a neighborhood would be, is an unanswered question that is already around for many years. Many researches concluded that it is difficult to what preconditions such a mix should comply. Often, each individual case needs an individual approach as many parameters are from an influence. (van der Velden, 2016)

An interesting conclusion in the light of this research, is that people often like to live together with people that share more or less the same lifestyle. (Buys, 1997) As most of the elderly people are retired, they spend a lot of time at home or in the neighborhood. Living together with people with the same daily rhythm therefore could be helpful. Young seniors (55+) for example, as often their adult children already moved out and are often also pensioned or are working less could be interesting. Also students could be interesting as they aren't restricted to a strict daily working routine. Mixing elderly in a neighborhood with only two income households for example, would be less cohesive as they spend a lot of time each week outside the neighborhood.

To have an idea about the ratio between the amount of elderly people and other generations when living together could be obtained when looking to recent precedents. The Ramses Shaffy Huis in Amsterdam (fig. 4.2.4) for example, which partly provides housing for young and old artists, consist out of 12 apartments for people younger than 27 years old, and 24 dwellings for elderly artists. (Stichting Kunstenaarshuizen Amsterdam, 2020). An other example in Rotterdam, the transformed retirement home Samen & Anders houses in total 268 apartments, from which 50 are inhabited by younger generations. (Aedes, 2016). Results are positive for both of these projects in terms of social interaction and engagement. (Witter, 2018).

Another example could be found in Friesland that shows a different division. VNL Architecten designed a small neighborhood that consists of twelve dwellings in the town of Sint Annaparochie. (fig. 4.2.5) Five out of twelve dwellings are for elderly people and are placed alternately between family homes. The aim of the architect was to reduce the feeling of loneliness among the elderly by placing them between family homes. (VNL Architecten, 2016).

These examples show that the percentage of elderly people in living arrangements can vary form 40% to 80%. In the first two examples the amount of elderly was significantly higher than the amount of younger inhabitants (70 - 80%). The amount of elderly in the last example is more balanced with the younger generation. This could be explained by the fact that in the first two examples younger generations were put in an existing elderly complex. The main inhabitants remained elderly people with a minority of younger people that filled the gaps. The example in Friesland however, was a new neighborhood in which the architect deliberately wanted to embed the elderly in between young families. Therefore he mixed them in an equal way. Looking to the nature of this research, a more equal division as in Friesland has been applied seems obvious, as the aim is to let elderly live in a normal neighborhood in between all the other residents.

Social activities

As already mentioned in paragraph 4.2.1, participating in social activities could be an important source of social interaction for elderly and could make them still feel part of the society. Providing them with places where these activities could take place should be facilitated by the built environment. A neighborhood should have facilities that provide in facilitating activities indoors, as a community center, library or a daycare facility. Activities as described in paragraph 4.2.2 as club gatherings, diners or meetings could be organized in such facilities which make it possible for elderly to meet people from the neighborhood. Providing the neighborhood with such buildings can foresee in these needs.

Besides buildings, public outdoor space could also facilitate in these needs. Jan Gehl states that, as with stimulating opportunities for social interaction, an environment that has been made attractive to walk, stand, sit, see, hear and talk, is also attractive for social and communal activities to take place. (Gehl, 2011). Providing in such public spaces, as a courtyard, public square of pedestrian street, can facilitate activities as neighborhood barbecues or outdoor games as jeu de boules.

Being in control of privacy
As social interaction is important to expand an elderly's supportive network, being in control of privacy is of equal importance. The demanded level of privacy is different to everyone, and could even change per individual over the course of the day. The built environment should facilitate the possibility to move between different levels of privacy, according to someones demands.

For everyone, the home is the place with the highest degree of privacy. The home is being surrounded by public space. Again, as with stimulating social interaction, *soft edges* (Gehl, 2011) come into play, as they function as the threshold between the private house and the public street. Where on one hand soft edges are important in increasing the opportunity for social interaction, they are also important in providing privacy between the house and the public realm, as the front yard creates a distance between the house and the street. According to the layout of the border with the street, a certain degree of privacy or publicity could be created. The depth of the frontyard is also determining the amount of privacy. (Gehl, 2011).

By the arrangement and layout of buildings and public space, certain degrees of privacy could be created. Introducing an outdoor communal space for example that is surrounded and shared by a couple of dwellings provides an exterior semi-public space that has a more private feeling than a main public square. Such semi-public spaces can enhance social security and familiarity between neighbors. Sequences of certain spaces can create a structured transition from completely private to completely public. (Gehl, 2011). The influence of the adopted sequence should be taken into account to create the desired transition and amount of social interaction and privacy.

fig. 4.2.6: Example of different degrees of privacy zones in one enclosed space: backyard > in-between yard > public footpath (Wonen rond een binnentuin, B5 Architecten)

The second important aspect of social cohesion, is the sense of attachment to the community. Considering yourself as part of the group stimulates cohesiveness for the collective. According to Schieffer and Van der Noll, attachment is about the importance of "feeling attached to or identify with the social entity" (Schieffer, et al., 2016) This paragraph will outline the influence of the built environment on stimulating attachment to give an answer to the question: *How could the built environment create a sense of attachment to the neighborhood?* To do this, a division will be made between social attachment and physical attachment.

Social attachment
When it comes down to the stimulation of social cohesion, it is very important that people feel attached or being able to identify themselves with a social group. They have to feel part of the wider community. (Schiefer, et al., 2016).

As there are many different explanations on social attachment, Kearns and Forrest describe it in a way that is applicable to this research. They state that feeling emotionally connected to a geographical location or group, is being expressed by, among other things, shared values and lifestyles. (Kearns & Forrest, 2000). This interconnectedness stimulates the willingness for participation and social networking. (Schiefer, et al., 2016).

When discussing mixing generations in paragraph 4.2.3, the notion by Buys (1997) has already been mentioned that people like to live together with the ones who share similarities in lifestyle. This could also be a starting point for stimulating social attachment. By combining homes for elderly people with dwellings for target groups with similarities in their daily rhythm, social attachment, and thus social cohesion, could be stimulated.

Physical attachment
A lot of people have memories and feelings when talking about a certain place. Feelings of joy or nostalgia could for example arise when talking about the neighborhood in which a person grew up as a child. These feelings can make that someone feels attached to a certain place. According to Dempsey (2008), this attachment is of an influence on social cohesion in a neighborhood, as it contributes to the enjoyment of someone's living environment. (Dempsey, 2008)

But which physical aspects exactly contribute to this feeling of being attached is somewhat vague. Research results show three aspects that are from influence on achieving a sense of place attachment: *attractiveness, character* and *perceived quality.* (Dempsey, 2008) These results however, are all aspects that are depending on the subjective opinion of each individual which make them hard to assess.

For Dempsey (2008), attractiveness has to do with how people like aspects as greenery, trees and the design of buildings and public spaces in their neighborhood. Besides that, he describes character as a" *'sense of place' claimed to be achieved through good urban design."... "Character is consistently described in abstract terms as it is inherently dependent on the nature and context of individual places and, like attractiveness, depends on how a place is interpreted by residents and users"* (Dempsey, 2008 p-107).

These definitions are all directing towards a certain place identity that people address to the built environment, based on it's physical presence, from which it is possible to identify themselves with. How people define or like this identity, is dependent of the subjective interpretation of each individual. If the characteristics of this identity are shared by the residents of a neighborhood, social cohesion could be stimulated as they can distinguish their place from a neighboring neighborhood. (Dempsey, 2008)

Qazimi (2014) depicts a couple of factors that are important to place identity, from which *recognition* and *expressiveness* are the most addressing. (Qazimi, 2014). From this could be argued that by creating an recognizable neighborhood with a clear expression, people should be able more easily to create a sense of attachment to their physical neighborhood, and thus stimulate social cohesion.

Jan Gehl - Life Between Buildings (2011)

The following principles describe how certain aspects can contribute to achieving a lively urban environment, which is being strived for in this research. Taking these into account during the design can stimulate social interaction to take place in the public realm. The described principles and topics derive from Jan Gehl's book 'A Life Between Buildings' (2011), in which he discusses the matter of creating livable and lively urban environments.

Senses, distance & communication
Jan Gehl, Life between buildings, p 63-79
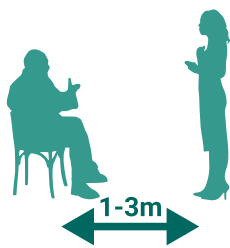
distance for meaningful
contact

distance for identifying individuals
*could be less for elderly people
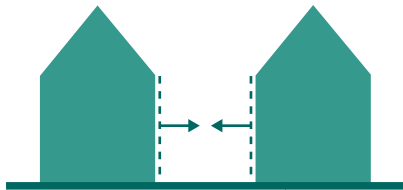
close distances and narrow streets create
intimate, warm and personal cities
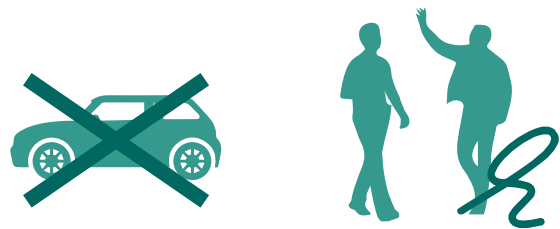
low speed increases interaction

Invite or repel

Jan Gehl, Life between buildings, p 113-120
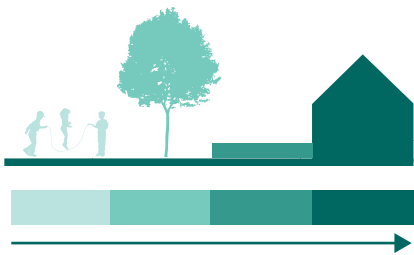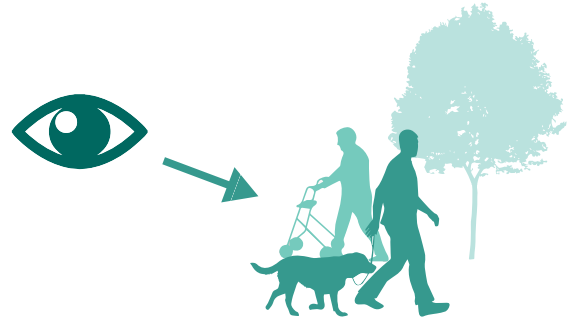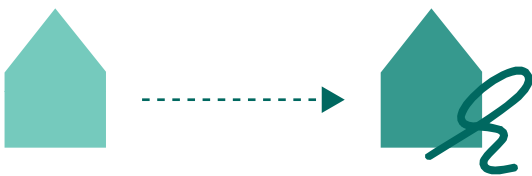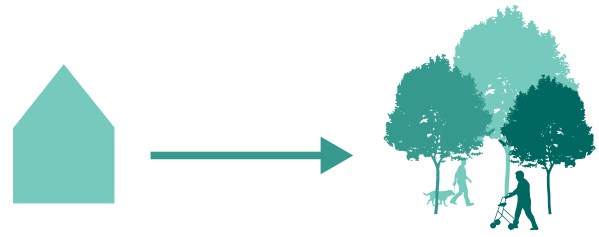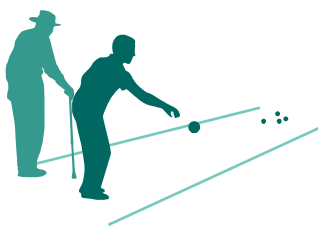
Walking

Jan Gehl, Life between buildings, p 133-145
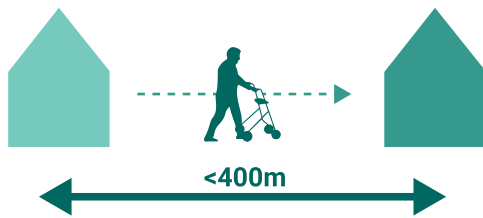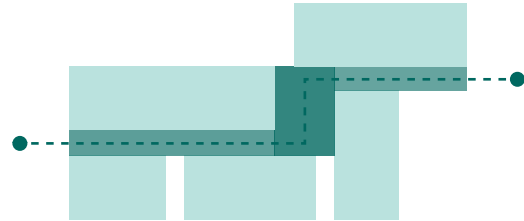
A pleasant place in every respect

Jan Gehl, Life between buildings, p 171-182

being able to experience the weather

good protection against bad weather elements, access to good weather elements

Staying: standing

Jan Gehl, Life between buildings, p 147-153

Staying: sitting

Jan Gehl, Life between buildings, p 155-162
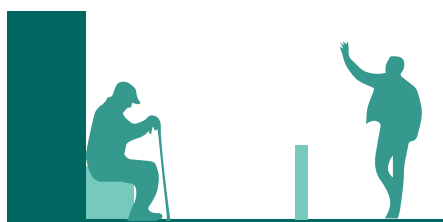
4.4 Orientation towards the common good

The last of three aspects that contribute to social cohesion, is the orientation towards the common good. This paragraph will probvide an answer to the question: *How could elderly and surrounding residents benefit from each other?*

This aspect is about feeling responsible for this common good (Schieffer, et al., 2016), which in the case of this research entails supporting elderly people in the neighborhood. Solidarity is a term that is closely related to the orientation towards the common good and the concept of supporting, as it stands for "caring for the other, regardless whether one knows the person or not." and "the willingness to give to others". (Schiefer, et al., 2016 p-10).

In a neighborhood where elderly could receive support from their neighbors, the willingness to give to each other is a necessary condition where people have to be willing to comply to. Where on one hand not everyone will be willing to participate in such settings, reciprocity on a large scale could stimulate people in contributing to the common good as a result of *social proof*. (Molina, et al. 2014). This term relates to people's adaptability to the behavior of a bigger group. When a large group is performing certain behavior, as supporting elderly people in the neighborhood for example, individuals tend to adopt this behavior or are more willing to contribute. The bigger the group, the stronger the effect of social proof will be. (Molina, et al. 2014).

This could mean that during the process of selling / renting the houses to new inhabitants, a selective approach should be adopted in who will live in the neighborhood to make sure the largest part of the inhabitants are willing to contribute to the common good. This will be essential for this concept to work. Social proof can increase the willingness among others to make a contribution to, and create awareness of the common good.

To know how the orientation towards the common good looks like in the light of this research, a deeper look will be taken into the possible support exchanges between elderly and their neighbors to find out how they both can benefit from each other.

4.4.1 Informal care

The posed concept in this research focuses on the mutual exchange of support between care demanding elderly and their neighbors. When this support is health related, the direction of this support will probably be single-sided: in the direction of the elderly. When care is provided by someone from the personal network, by for example a neighbor, a friend or family member, this type of care is called informal care (mantelzorg in Dutch).

Informal care can be defined as "*all help that is provided to a care demanding person, deriving from his social network.*" (De Klerk, et al. 2019). This help is often unpaid and on a voluntary basis. The help that is provided by an informal caregiver supports care receivers in their self-sufficiency and participation. The care demand can contain light, household related support, as grocery shopping and vacuum cleaning. Heavier care tasks can also occur like personal care and nursing. Only one out of fifteen informal care givers provide heavy care to a person that has actually been indicated to receive institutional care. (De Klerk, et al. 2015).

Often, when thinking about informal care, care provided by the family is considered to be the main source. Friends and neighbors however, could also be a valuable source of support. Egging, De Boer and Stevens (2011) carried out a research in which they compared the nature of the informal care that is provided by friends or neighbors to the support by the child(ren) of an elderly. Interesting information about the nature of neighbor support could be obtained from this research.

At first it is interesting to have a broad picture of who care providing neighbors are. With an average age of 52,7 years old, 42% of them are from the age group of 50-64 years. 38% are between 18 and 49 years. Only 20% is older than 65 years. Only 17% of them has live-in children younger than an age of 13 years old. Slightly less than half of them participate in paid work (46%). (Egging, et al., 2011)

More than half of the neighbors (56%) mentioned a longterm, good relationship with their neighbor as one of the reasons to support them. Providing support out of love and affection (55%) and out of a sense of duty (44%) were also important reasons to them. (Egging, et al., 2011)

The type of care that is provided the most by neighbors, are household related (69%) and emotional support (70%). Neighbors also tend to provide accompanying support, as taking care of a pet or going on a small trip together (43%). Almost two-third of the neighbors provided this help to someone with severely limiting physical disabilities. In comparison to friends, neighbors were also providing more nursery help (16% compared to 8%). This could be due to the fact that neighbors live much closer and therefore preparing medicaments is much easier for them. Friends often have to travel longer distances. (Egging, et al. 2011).

Experiencing stress and feeling burnt out as a result of an overload of pressure deriving from the informal care task, is a common problem among informal care givers. Children do often experience more stress as a result from providing informal care than friends and neighbors do. Neighbors can experience stress, but often only on low levels. For neighbors, the amount of care tasks doesn't seem to have an affect on the amount of experienced stress, but severe behavioral problems do. Neighbors are also sharing the task of providing informal care much more with friends of the care receiver than children do (44% vs. 8%). This could be a reason why they experience less stress. (Egging, et al., 2011)

Another interesting factor that is of influence on the amount of experienced stress, is the fact that friends, and to a lesser extend neighbors, less often had live-in children and work. This means that they have more time to provide the demanded support. This is probably explainable by the higher average age of friends (58,7 years old) and neighbors (52,7 years old) in comparison to children (49,3 years old).

In contrast to children, the influence of the sense of duty on the stress-levels of neighbors and friends isn't that high. Probably this could be explained by the fact that friends and neighbors are better able to distantiate themselves from the situation, as the relation is less close to them than it is to the elderly's children. (Egging, et al. 2011).

From all this, several conclusions could be drawn. At first, it could be seen that neighbors merely provide practical support to a care demanding elderly neighbor. Supporting them in doing groceries, taking the dog out for a walk or supporting them emotionally are tasks that neighbors are willing to provide. When it comes down to healthcare related support, neighbors are, just as friends and to a lesser extend children, less willing to provide help.

This means that home care, that is provided by a professional healthcare supplier, should be available in the neighborhood when an elder person becomes in need of healthcare. By centralizing such care facilities in the neighborhood, the distances between the care provider and receiver could be reduced and lead to a better accessibility.

An example in which centralized healthcare is an important aspect, are so called *woonservicegebieden*. These are urban areas in The Netherlands that pay extra attention to (elderly) care, in which the idea is that care demanding people can stay longer at home by improving these areas in terms of for example accessibility and facilities. In these areas, the norm is that the distance between the home of an elderly and a certain facility should be 400 meters at maximum. Facilities that should be inside this range is a doctor, a supermarket and a place to meet. (De Kam, 2012). This could be an interesting norm to apply in the final design of this research.

Secondly, the research shows that neighbors are more stress resistant to the influence of informal care than children are. This is because they are sharing the task of providing the care with others (often friends of the care receiver) and are able do keep distance to the situation. This makes neighbors in terms of stress resistance an interesting source for support.

At last, the notion that because of the average higher age care providing friends and neighbors have more spare time as they less often have live-in children or work, could be an interesting direction towards a target group that could fit in this concept. Combining elderly housing with dwellings for people of 55 years and older that want to move to a smaller house, therefore could be contributing to a societal mix in which people are more willing to help each other.

4.4.2 Intergenerational activities

When it comes down to healthcare, the direction of support will be towards the elderly. That doesn't mean however that elderly people cannot contribute to the larger community. This paragraph will provide some interesting examples of intergenerational exchanges that show how a mutual support from both sides could look like.

Activities with children
Activities for both elderly and children are already a well known example in which both generations could learn and benefit from each other. These activities take place in different forms, in for example collaborations with primary schools. *Gluren bij de buren* is an example in which up to three times a week children from primary school *Tussen de Singels* visit elderly residents of nursery home *Stellinghaven*, or vice versa, in the Dutch town of Oosterwolde. During these visits all kinds of activities are being undertaken, as hand crafting or making trips in the neighborhood. Where most of the activities are being undertaken in groups, also individual contacts are established. An elderly women for example helps children that have difficulties with reading by reading together with them. (De Jong, 2013).

These examples are all very important for both generations. Children are getting into contact with the older generation and are developing their social skills. Elderly are able to transfer their knowledge to the children which gives them the feeling of being able to contribute to their lives. Both generations often also generate a lot of enjoyment out of these interactions. (De Jong, 2013)

Another successful example are *generatietuinen* (generational gardens), in which children maintain a public garden together with elderly people. Generatietuin Den Haag is an example of such a garden that opened in 2010. Together, they cultivate flowers and crops, which they harvest in summer. Afterwards the children and elderly have a drink together. (De Jong, 2013). Again, both generations can benefit from each other in terms of mutual enjoyment and fulfillment.

Cooking for neighborhood
In Rotterdam, a nice initiative was founded in 2015, in which elderly people are preparing meals for students and other people, called *Oma's Pop-up*. Elderly people could participate in cooking or workshops, in which they prepare meals from the traditional Dutch cuisine. Afterwards they will take part in the dinner together with guests, where they can enjoy the food they have prepared. Among the guests are all kinds of people, for example students, who can enjoy a meal for a decent price. (Oma's-Pup-up, 2020).
This initiative was founded with the aim to draw attention on loneliness among elderly people. By bringing them in contact with guests and other elderly, loneliness could be tackled. These events could also enlarge the social network of an elderly, which makes them socially more resistant. (Oma's Pop-up, 2020). Also from the perspective of the guests, getting into contact with the elderly widens their perspective, which could be beneficial for their social development.

Walking the dog
Stichting OOPOEH is a foundation that focuses on an active participation of elderly people. By making it possible for elderly to babysit a dog, they can really pay a positive contribution to society. A prerequisite for this is of course that elderly have to be physically able to execute this task. (OOPOEH, 2020). For elderly with a limited mobility as a result of physical disabilities, participating in this initiative will be harder.

fig. 4.4.1: child and elderly participating in shared activity (from: KCWZ, 2013) & OmroepWest.nl, 2013)

fig. 4.4.2: children and elderly working in Generatietuin Den Haag (from: OmroepWest.nl, 2013)

This initiative could be beneficial to the elderly as it gives them company. Feelings of purpose also arise as the elderly are presented with a caring task which also structures their day. In terms of health, babysitting a dog keeps elderly people also active. Besides that, babysitting a dog could also facilitate social interaction, as walking them brings people in contact with others. (Scheibeck, et al., 2011).

This is illustrated with an example of Peter (73), who is a babysitter at OOPOEH. Because he is babysitting the same dog already for several years, the amount of social interaction he has with the neighborhood increased. This increase in social contact also helped reducing problems with stuttering. (OOPOEH, 2020).

On the other hand, the owner and his dog also benefit from this initiative as they have a reliable babysitter that can give attention and care to the dog. For people with busy lives, work and other weekly commitments, having a reliable babysitter to the dog coud be of great value.

Conclusions
The examples in this paragraph show the importance of activities or initiatives that stimulate a mutual benefit between the different generations. The implementation of such facilities into the posed concept in this research therefore could be of a great importance.

fig. 4.4.3: dining together with students at Oma's Pop-up (from: Omas Pop-Up)

fig. 4.4.4: babysitter Peter (73) with dog Bauke (from: OOPOEH, 2020)

4.5 Conclusions

After researching all the different topics that are concerning social cohesion in this chapter, a summary overview will be given of the conclusions that were drawn, which will be listed down below. Together, the conclusions provide an answer to the sub-question in this chapter: *How can a neighborhood stimulate social cohesion among its residents?*

These conclusions will be translated into design tools for achieving a final design that reflects the posed concept. An overview of these tools will be given in the scheme of paragraph 4.5.2. In this scheme, some tools will be a combination of different overlapping conclusions.

4.5.1 conclusion overview

- Four important aspects came out of a review of the demands of elderly people when it comes town to contacts with their neighbors: opportunity for social interaction, a right mix of generations, social activities and being in control of privacy;
- Findings from the observation week emphasized the importance of social interaction and a right mix of age groups;
- Paying attention to soft edges (Gehl, 2011) between the house and public realm is essential for stimulating the chance on social interaction;
- Creating accessible and lively public spaces according to the descriptions (see pages 50-53) of Jan Gehl (2011), are very important in stimulating the chance on spontaneous social interaction;
- Combining elderly housing with housing for other target groups that share similarities in lifestyle and daily rhythm can contribute to a healthy social mix;
- From reviewing several examples, an equal division in generations seems more applicable to the posed concept in this research;
- The implementation of physical facilities, as a neighborhood center, is important for organizing social activities in the neighborhood;
- By providing public spaces that have been made attractive to walk, stand, sit, see, hear and talk, according to the desciptions (see pages 50-53) of Jan Gehl (2011), are attractive for social activities to take place;
- Soft edges as mentioned by Jan Gehl (2011) are also important in providing control in the amount of privacy between the private house and the public realm;
- Attention should be paid to the sequence of spaces from public to private (Gehl, 2011), to facilitate in the demand for privacy;
- Combining elderly housing with housing for other target groups that share similarities in lifestyle and daily rhythm can contribute to a greater sense of social attachment to the neighborhood;
- By creating a recognizable neighborhood with a clear expression, people should be able more easily to create a sense of attachment to their physical neighborhood;
- It could be possible that a selective approach should be adopted in who will live in the neighborhood to make sure the largest part of the inhabitants are willing to contribute to the common good;
- When neighbors provide informal care, research showed that they merely provide practical support to a care demanding elderly neighbor;
- Professional healthcare facilities should be implemented into the neighborhood to fulfill the elderly's care demand. By centralizing such care facilities in the neighborhood, the distances between the care provider and receiver could be reduced and lead to a better accessibility.
- Neighbors are more stress resistant to the influence of informal care than children are, as they are sharing the task of providing the care with others (often friends of the care receiver) and are able do keep distance to the situation;
- Combining elderly housing with dwellings for people of 55 years and older could be interesting as they have more time to provide care, as they less often have live-in children and work;
- Implementing activities in which different generations can benefit and learn from each other can be of great importance to the posed concept.

4.5.2 design tools

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                    ┌──────────────────────────────┐          ┌──────────────────────────────┐
                    │        SOCIAL COHESION        │          │     RELEVANT DEVELOPMENTS     │
                    └──────────────────────────────┘          └──────────────────────────────┘
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social relationships	attachment	orientation towards the common good **7**

| social interaction **1** | right mix of generations **2** | social activities **3** | controling privacy **4** | social attachment **5** | physical attachment **6** | informal care **8** | intergeneration-al exchanges **9** |

RELEVANT DEVELOPMENTS

mixed generation nursery homes	Citizen's initiative: Knarrenhof	Buurtcirkel

ARCHITECTURAL TOOLS

4 sequence of transitions from public to private spaces to control privacy

1 4 implement soft edges for stimulating social interaction and controlling privacy

1 3 accessible, attractive & lively public spaces to stimulate social interaction and activities

6 recognizable neighborhood with a clear expression to enhance physical attachment

3 neighborhood facilities to accommodate social activities

8 centralized healthcare to fulfill elderly's healthcare demand

PROGRAMMATIC TOOLS

2 5 8 mix elderly housing wiht dwellings for target groups that have similarities in lifestyle

2 strive for a balanced ratio between the age groups to enhance social relationships

9 provide possibilities for intergenerational activities for mutual benefit

7 assign users to the project that are willing to support elderly when needed

5. Recent developments

With the changing care system, a strong demand for new ways of housing and providing care emerges in the Dutch society. Because of this, new small scale initiatives can be found all over the country that explore new concepts concerning the topic of caring for each other. Where in 2013 only thirty of these initiatives were present, it is estimated that in 2018 this number was already over 500. (Witter, et al., 2018).

This chapter will discuss a couple of these initiatives to be able to learn from them and implement the positives into the design. The following sub-question will be answered in this chapter:

What could be learned from new relevant developments that stimulate elderly in staying longer at home?

To answer this question, three example projects will be highlighted in this chapter: mixing generations in former care homes, Knarrenhof and the Buurtcirkel.

5.1 Mixing generations in former care homes

As a result of the changed government policy, many care homes disappeared. Some of these buildings could be transformed towards nursery homes. For others, it was more difficult to perform this transformation as they were too small to house the extra space a nursery home requires. Corporations that own these buildings therefore had to think about new ways to exploit their estate. A trend of introducing other generations into such buildings could be seen over the last years in order to keep them exploitable.

An example that has already been mentioned earlier in this report, is the project *Samen & Anders* in Rotterdam. As this building couldn't facilitate enough space to provide high levels of healthcare, Laurens Wonen decided to transform the building to a mixed generation complex, in which vulnerable people live together with less vulnerable inhabitants. Partly, the complex is transformed into a nursery home that houses place for care demanding eldery people. Besides that, studios are available for both vulnerable and less vulnerable people. (Aedes, 2016)

Reciprocity is highly valued in this concept, as the rents are low in exchange for a participatory mindset. Each inhabitant has to contribute at least ten hours a week to the community, which is captured in the rental contract. Examples of the contribution people are paying to the community, are teaching music or chess, helping with grocery shopping when someone can't do that for himself anymore, or maintaining the complex' paintwork or garden.(Aedes, 2016).

Another important aspect of this concept is the collaboration with several parties in Rotterdam, as the Hogeschool Rotterdam, the municipality, Pameijer and the Afrikaanderwijk Coörperatie. Together with these parties, effort has been done to provide work for example, to people with mental disabilities. They now work in the restaurant or as part of the facility management. Also entrepreneurs are being attracted to the complex to locate their business in the building. Also inhabitants of the complex open up pop-up stores. (Witter, 2018).

This concept has a positive effect on the inhabitants of the complex: "A lot of new energy is emerging and the intended communal effects are being achieved" (Witter, 2018).

Another example that could be found is the project *Genderhof,* in Eindhoven, where a caring home also provides space for younger generations. After the complex mostly stood vacant in 2014 Wooninc decided to grant access to new target groups into the building. The new inhabitants largely consist out of students and migrants, but also divorced people, startes, expats, people with psychological problems and people that used to be homeless have moved in. (Van der Velden, 2016).

The rent is based on short stay as the building is being listed to be demolished. As a prerequisite to be able to live in the complex, people need to have an affinity with elderly people, shouldn't have children and need to be willing to help others. New inhabitants are often suggested by inhabitants that already live in the complex and are being placed scattered over the complex, in between all the elderly people. All the inhabitants have the availability to a couple of shared facilities, as a restaurant, laundry and a hairdresser. (Van der Velden, 2016).

Also this concept proved to be successful. Inhabitants have a lot of social contact with each other and undertake shared activities as drinking coffee, playing a game of billiards or watching football together. The number of volunteers also increased which caused a shared management of the complex between the owning corporation and the inhabitants. (Van der Velden, 2016).

For both of the projects, a selective approach that only allows people who are willing to contribute to the community seemed to be one of the big success factors in these concepts. Besides that, an important factor is that both concepts consist out of a combination of both vulnerable and less vulnerable people.

fig. 5.1.1: Generations living together in the complex Samen & Anders, Rotterdam (from: www.aedesmagazine.nl)

fig. 5.1.2: Social activity in Genderhof, Eindhoven (from: Van der Velden, 2016)

fig. 5.2.1: Knarrenhof Zwolle, Het Aanhof (from: RTV Oost)

fig. 5.2.2: Scheme Knarrenhof Zwolle (from: www.knarrenhof.nl)

Citizen's initiatives: Knarrenhof **5.2**

Another popular trend could be spotted in the revitalization of the so-called *hofjes*. In former days (see chapter 2.1) hofjes provided a protected environment for elderly people where they could live independently. (Van Campen, 2017). Elderly people nowadays are funding small initiatives in which they live in communes in which they can receive mutual support. Small scale, individual examples of these communes were described in the previous paragraph. The example in this paragraph is also based on this idea, but differs from the fact that a national foundation, Knarrenhof, helps seniors realizing their initiatives for communal living. In this way, all around the country Knarrenhofjes are being built. In this sense these projects could be considered as a modern version of the former hofjes.

Knarrenhof is the foundation that on a national scale helps senior initiatives realize their ambition to live together with other seniors in a communal setting. Besides only focusing on hofjes for seniors, other forms of this concept are also being realized. Multigenerational hofjes for example are projects in which people from "19 - 109 years old" (Witter, 2018) can live. According to the website of Knarrenhof, the strength of this concept lies in the custom approach to each project, as each project is being developed according to the needs and wishes of each individual initiator. There are also no obligations towards each resident, but space is provided for social activities and undertaking things together in the form of a shared garden. (Knarrenhof, z.d.).

The first Knarrenhof that has been realized is Het Aanhof in Zwolle in 2018. An interview with two of the inhabitants of Het Aanhof shows some of the positive sides of this concept. The interviewed couple (60+ years old) like the communal approach and the social involvement with their neighbors. A lot of social activities are being undertaken such as the maintenance of the shared garden. A central meeting point facilitates several activities as having a drink together and participating in the dining club. Also individual parties are being organized in this meeting point by the inhabitants. The management of several aspects as the organization of activities or the maintenance of the garden are organized in small teams. Participation in these teams isn't obligatory. (Vos, 2019).

Besides that, the dwellings are also future proof, in a sense that it is possible to completely live at ground floor level. To achieve this, one bedroom and the bathroom are located at the ground floor which doesn't make it necessary to use the stairs. The first floors of each house are flexible in its layout. (Vos, 2019). Also in terms of maintenance, maintenance-free products have been used as leaf catchers that prevent leaves from falling into the gutter. (Van den Dool, 2019). At the front of each house, inhabitants have access to a private terrace that overlooks the communal garden. (Vos, 2019)

All the inhabitants that live in Het Aanhof, signed a social contract, in which they trust to look after each other and ask their neighbors for help if they need it. Motivational letters were also obligatory in which for their motivation to live in Het Aanhof, their talents and hobbies was asked. Based on this information, a careful selection of interested people has been made in order to achieve a good mix of the users. (Van den Dool, 2019)

Interesting about these new hofjes, is the fact that the wish for a communal living environment by groups of people is being supported by a national foundation that helps the initiators in the realization process. Besides that, this example also shows that people are seeing their neighbors as a possible source of support. Also, as already stated in the previous paragraph, a selective approach to who lives together is adopted to achieve a cohesive composition of users which all have to sign a social contract for promising mutual support. A final interesting aspect is the adaptability of the dwellings to the health status of the inhabitants, as all the necessary functions are located at ground floor level. This makes it possible for elderly that become care demanding to remain in the same house.

5.3 Buurtcirkel

A concept that has its origins in England, is the so-called *Buurtcirkel.* Based on the English *supported living networks,* a Buurtcirkel consists of nine to twelve people that live at a close distance from each other. The idea behind this concept is that each member of the group can support each other by using their own personal strengths and competences. The group is being supported by a volunteer from the same neighborhood and a professional coach. (KCWZ, 2017)

In 2017, Holland counted 25 Buurtcirkels. Now already 84 of these groups can be found over the whole country. (Buurtcirkel, 2020). An evaluation of four Buurtcirkels in 2017, showed very positive results. The researchers concluded that the social network of participants grew after joining the group which positively affected their well-being. A lot of participants were able to get out of being socially isolated after participating in the group. The group increased their social network, which made them visit each other and undertake activities together. Also their self-sufficiency improved as they learned how to handle a mobile phone for example, or how to use the public transport. (Weltevrede, et al., 2017)

As a lot of the Buurtcirkels were accessible for everyone, a special Buurtcirkel for elderly people has been founded in 2017. The Dutch town of Ridderkerk noticed that a lot of elderly in the municipality had problems with loneliness. For healthcare organisation Aafje this was a reason to start a Buurtcirkel in which these elderly people could participate and support each other. (KCWZ, 2017)

The aim of this Buurtcirkel was to decrease the loneliness of these elderly and to broaden their social network. Therefore, activities in this group are socially oriented. Activities differ from small-scale gatherings, as drinking a coffee together in the evening, to going on a trip. (Aafje, 2017)

Just after the group was formed, results were already noticeable. Next to the group meetings, the elderly were also starting to meet each other to go on a trip for example, or to have dinner together. Also they could rely on each other for support. A women who lives the same neighborhood as the participants functions as a volunteer in this group. For six hours a week, she contributes to this group. The elderly group members like that she lives near them as she is an extra source of support to them. (KCWZ, 2017)

What is interesting about this concept is that the Buurtcirkel is a source of support that doesn't limit itself to the direct surroundings of an elderly, like the street an older person lives in, but stretches over the entire neighborhood. By providing such useful groups, an elderly can have the access to a wider social network. The implementation of such a network in the final design therefore could really contribute to the independency of older people.

fig. 5.3.1: Members of the Buurtcirkel in Ridderkerk (from: KCWZ)

fig. 5.3.2: Buurtcirkel (from: Platform31)

5.4 Conclusions

Some interesting lessons could be taken from the precedents that are discussed in this chapter. The conclusions that are listed down below provide an answer to the sub-question discussed in this chapter: *What could be learned from new relevant developments that stimulate elderly in staying longer at home?*

In paragraph 5.4.2 the findings of this chapter will be added as new tools or additions to the existing ones that came out of the previous chapter.

5.4.1 conclusions

- A selective approach to the selection procedure of the inhabitants for both the mixed generation care homes and the Knarrenhof was adopted to contribute to a good mix of users. The willingness of future users to contribute to the community is an important factor in the success of these projects;
- A good mix of vulnerable and less vulnerable people was an important aspect in the success of the mixed generation care homes;
- The example of Knarrenhof showed that seniors consider neighbors as a good source for support;
- The adaptability of the dwellings in Knarrenhof makes them resistant to changing health conditions, that make it possible for care demanding elderly to remain in the same house;
- The Buurtcirkel is a valuable initiative which could broaden the social network of an elderly on the scale of the entire neighborhood.

5.4.2 design tools

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┌─────────────────────────────────────┐          ┌─────────────────────────────────────┐
│           SOCIAL COHESION           │          │        RELEVANT DEVELOPMENTS        │
└─────────────────────────────────────┘          └─────────────────────────────────────┘
```

| social relationships | attachment | orientation towards the common good **(7)** |

| **(1)** social interaction | **(2)** right mix of generations | **(3)** social activities | **(4)** controling privacy | **(5)** social attachment | **(6)** physical attachment | **(8)** informal care | **(9)** intergeneration-al exchanges |

| **(10)** mixed generation nursery homes | **(11)** Citizen's initiative: Knarrenhof | **(12)** Buurtcirkel |

ARCHITECTURAL TOOLS

(4) sequence of transitions from public to private spaces to control privacy

(1)(4) implement soft edges for stimulating social interaction and controlling privacy

(1)(3) accessible, attractive & lively public spaces to stimulate social interaction and activities

(11) adaptability of houses to changing health situation keeps elderly at home

(6) recognizable neighborhood with a clear expression to enhance physical attachment

(3)(12) neighborhood facilities to accommodate social activities

(8) centralized healthcare to fulfill elderly's healthcare demand

PROGRAMMATIC TOOLS

(2)(5)(8) mix elderly housing with dwellings for target groups that have similarities in lifestyle

(2) strive for a balanced ratio between the age groups to enhance social relationships

(12) connect elderly on a neighborhood scale to increase their social (supportive) network

(9) provide possibilities for intergenerational activities for mutual benefit

(7)(10)(11) assign users to the project that are willing to support elderly when needed

6. Design site

As a translation of the concept that is proposed in this research booklet, a design will be made on a specific design location. For this location, a site in the Dutch town of Geldermalsen has been chosen. This site, which is part of a new development by Dura Vermeer, is located at the train station of Geldermalsen. Where the design of the actual development of the plot is already in an advanced stadium, the design that will be made for this graduation research will be a fictional plan with only study purposes.

This chapter will contain the site analyses of the design location. The aim is to gather the demanded information related to the topic of elderly care to take into account during the design process. Therefore, a look into the demographics of the town will be taken to be able to make a consideration in which target groups to implement into the plan. The urban framework will also be analyzed to determine which functions or facilities miss in the surroundings and to explore possible opportunities.

6.1 General information Geldermalsen

To get a better understanding of Geldermalsen, it is necessary to have a general impression of the background of the town. This paragraph will look into the demographical data of the town to gain knowledge about it's inhabitants. Also, research-related information will be gathered by looking into numbers about informal care provision in Geldermalsen.

6.1.1 General information
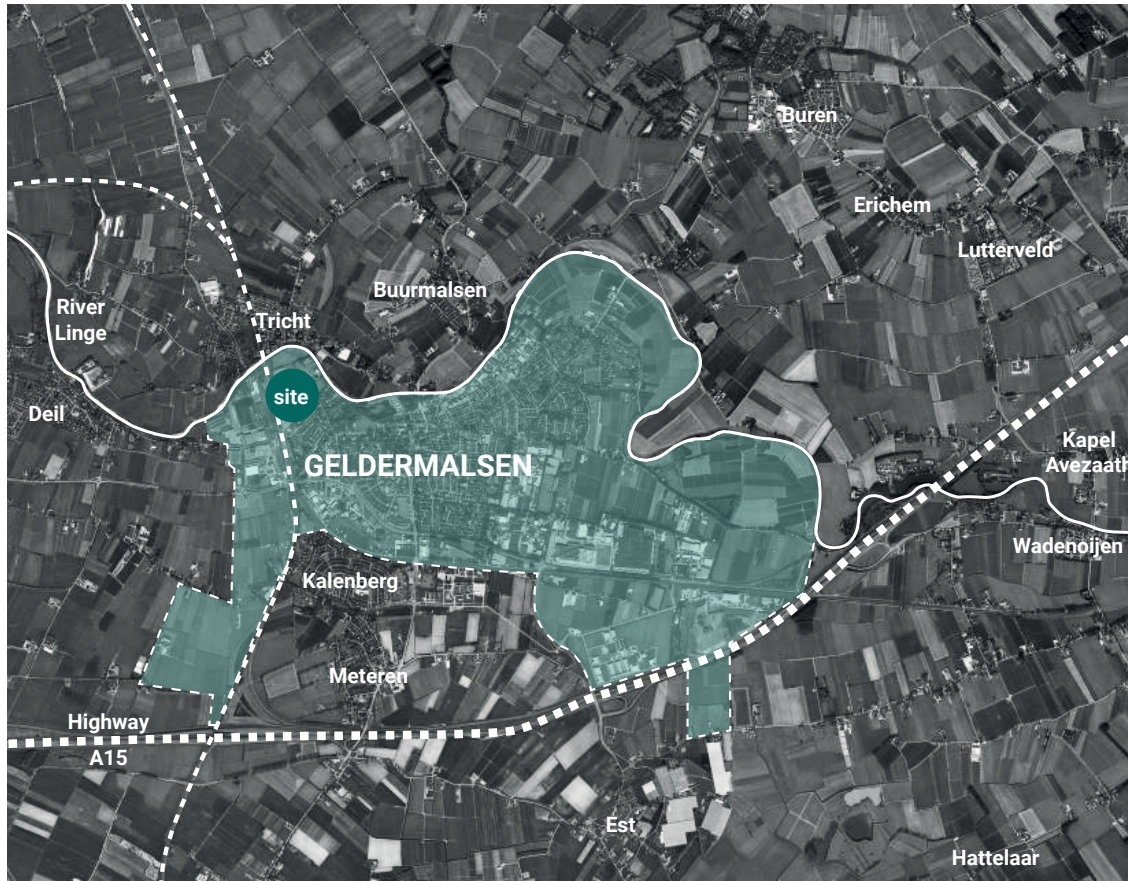
fig. 6.1.1: Map Geldermalsen and surroundings. (from: Google Maps, own edit)

inhabitants (2018)
22.965
rising number of inhabitants

Income
€ 26.800
slightly higher than Dutch average

Religion
Religious community
61,5% Christian oriented

Age division
Large group of older inhabitants (55+ years old)
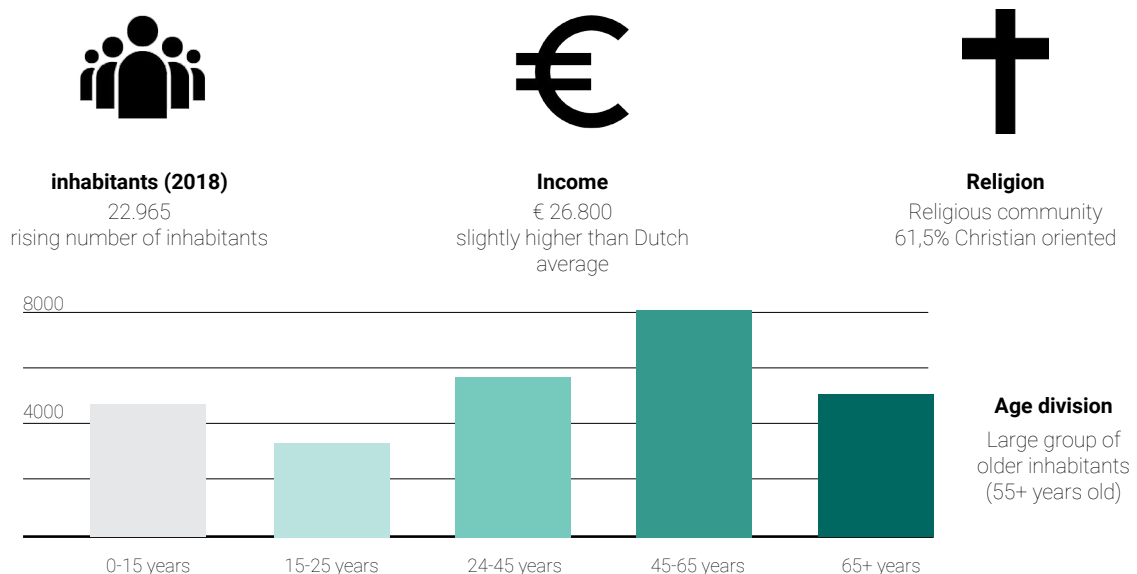
fig. 6.1.2: demographical overview (from: www.allecijfers.nl/gemeente/Geldermalsen)

6.1.2 Informal care

When looking to the amount of informal caregivers, 15% of the inhabitants of Geldermalsen provide in this type of care. This number is slightly higher than the Dutch average of 14%. The amount of people that are receiving informal care is also 15%, which is the same as in the rest of the country. From this can be learned that the participation from the inhabitants in Geldermalsen is average, and therefore proves to be a good location to the topic of this research. (RIVM, 2016)

What further strikes out, is that the numbers of lonely people in Geldermalsen are significantly lower than the country's average. 41% of the people are lonely (44% in the rest of the Netherlands) and 7% is very lonely (10 in the rest of the Netherlands). (RIVM, 2016) When looking to other demographic information, possible explanations could be found.

At first, there are more people volunteering in Geldermalsen than the average Dutch population does. (34% vs 29%) Also the amount of experienced autonomy people have is slightly higher. (RIVM, 2016) When taking these two facts into account and with the slightly higher amount of informal care providers in mind, the image of Geldermalsen as a close community where people look after each other arises. Besides that, Geldermalsen is a religious town with several Christian communities, which can also indicate the presence of a close community.
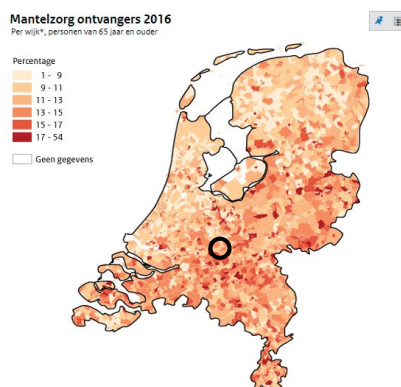
fig. 6.1.3: informal care receivers 2016 (source: VGZ, 2016)
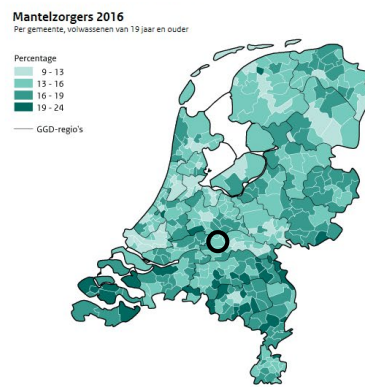
fig. 6.1.4: informal caregivers 2016 (source: VGZ, 2016)
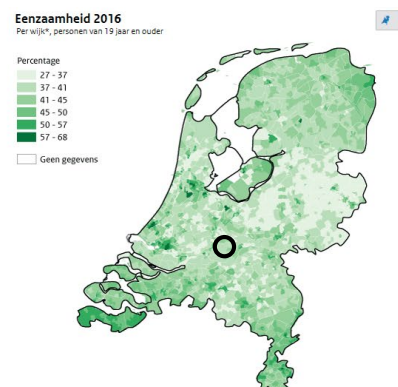
fig. 6.1.5: loneliness 2016 (source: VGZ, 2016)

	Gemeente	Nederland
Bevolking	26346	16979120
Cijfers over participatie (%)		
Mantelzorger	15	14
Mantelzorg ontvangen afg 12 mnd (65+)	15	15
Eenzaam	41	44
Ernstig/zeer ernstig eenzaam	7	10
Matig/veel regie over eigen leven	91	89
Vrijwilligerswerk	34	29

fig. 6.1.6: numbers Geldermalsen (source: RIVM, 2016)

6.2 Target groups

This paragraph explores the potential target groups in Geldermalsen besides eldery, for which housing could be implemented into the project. The choise fo these groups have been made based on recent developments and demographical information.

6.2.1 Seniors (55+)

What already could be seen in the previous paragraph, is that the amount of older generations in Geldermalsen is substantial. Especially the group of people between 45 and 65 years old is quite large. This means that in ten to twenty years time, this group will contain a considerable amount of people that will become care demanding. Given the fact that most informal care providers are between the age of 50 and 75 year old (Te Riele, 2019) this also means that this group of inhabitants already contains a lot of potential informal care providers, and that this group can grow over the years. By implementing housing for this group, a possibility for them is being created to already move to a place where they know they have access to a resource of support when they become in need of (informal) care.

From chapter 3, it also appeared that seniors (55+) could be a good fit in terms of lifestyle with the (care demanding) elderly, as this group contains a lot of pensioned people with kids that already have moved out.
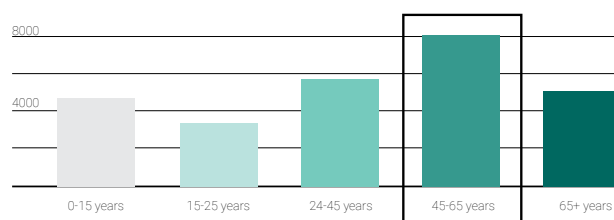
fig. 6.2.1: large age group of 45-65 years old (from: www.allecijfers.nl/gemeente/Geldermalsen)

6.2.2 (Single) starters

The second interesting group that could be adopted into the project, is the group of starters. These contain young people, that just made the transition to a working life and who want to buy their first house. Especially for young people that are single (around 50% in 2014), their income is too low to receive a decent mortgage. (Van Marwijk, 2014)

As Geldermalsen is aging, the municipality is making efforts to prevent youth from moving out. By complementing the remaining part of a mortgage that a starter falls short of (up to 30.000 euros) in the form of a special loan, the municipality hopes to attract this group of young people to buy their first house in Geldermalsen. (Wijnacker, 2019)

Looking to the division in age groups, the amount of possible starters in Geldermalsen is also of a considerable size, assuming that this group would have an age of between 20 and 30 years old. Providing small, affordable housing for them therefore could be a viable option.

In terms of lifestyle, starters often have a working life, which could mean that they will be out of the neighborhood for a large part of the day. This could mean that the amount of contribution to supporting their neighbors could be lower as it has to be combined with their work. As long as they are willing to pay a contribution to the neighborhood, although it may be little, this doesn't have to be a problem. A selective approach in the assigning procedure on this topic therefore might be necessary.
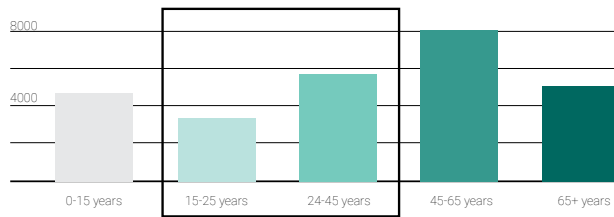
fig. 6.2.1: large age group of 45-65 years old (from: www.allecijfers.nl/gemeente/Geldermalsen)

6.2.3 Families

As a result of higher birth- than mortality rates, predictions for the coming years show a slight grow of 2% of the population fo Geldermalsen in 2035. Neighboring municipalities show higher rates up to 7,8%. (Te Riele, et al., 2019).

Therefore, it could be interesting to implement houses for families with young children into the plan. In combination with houses for starters, this target group can contribute to an equal mix of generations throughout the plan. Also on a larger scale, implementing homes for families into the plan can provide a connection and gradual transition with the newly built surrounding family homes that are bordering the design site (paragraph 5.3).

Corresponding with the target group of starters, the possible available time to support the neighborhood could be less than with for example the group of 55+ people, as work and taking care of the own children costs time. Again, although the amount of contribution might be lower, the willingness to contribute to the common good is the most important.
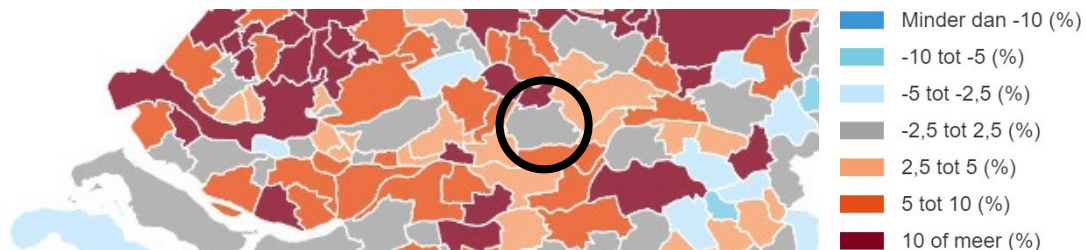
fig. 6.2.3: prediction of population growth 2018 - 2035 (from: Te Riele, et al. 2019)

6.3 Design site

development
public park

building area
10.300 m²

3

2

building area
2.000 m²

development
station square

train station Geldermalsen

1

N
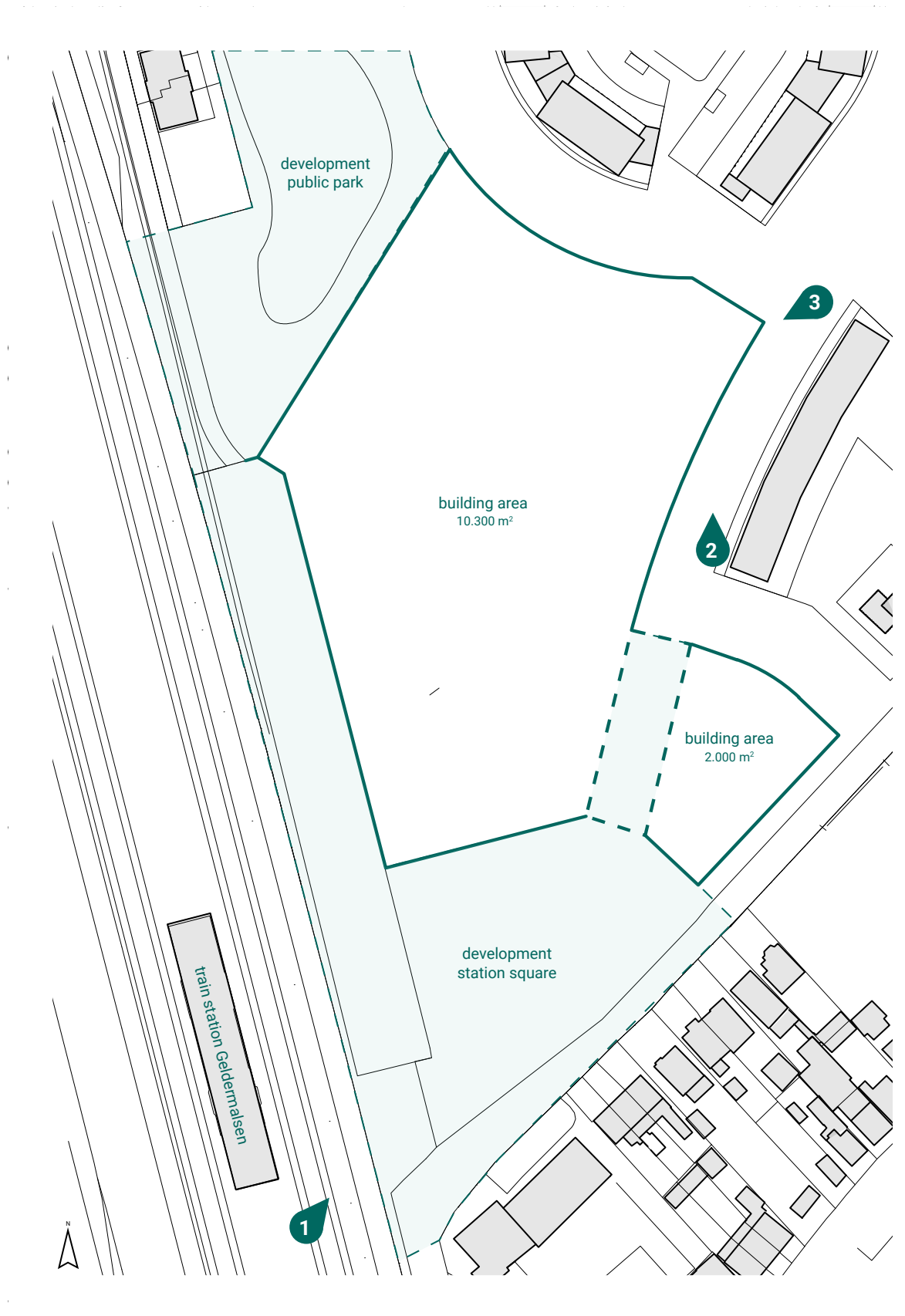
1 fig. 6.3.1: project location seen from bridge towards trainstation, with newly built family homes in the background

2 fig. 6.3.2: project location seen from east side, with access street towards surrounding neighborhood

3 fig. 6.3.3: project location seen looking to the south, with train station at the back

6.4 Urban framework

6.4.1 Facilities

Transportation facilities

As the site is being located along the train station of Geldermalsen, you would expect that public transportation is at the doorstep of the homes of the future residents. When taking a closer look however, shows that there is a big border between the design site and the station. For reaching both the bus stop and the train platform, the rails have to be crossed, which currently happens with a bridge. In the future situation, plans are already been made to make this easier with implementing a tunnel underneath the train tracks which should make this easier. In the present situation, no bus stop is available at the east side of the station. The presence of such a stop would be very useful in the future, as people then wouldn't have to reach the other side of the railway. The current bus lines that are available do offer a decent connection to the city center.

Commercial facilities

In the direct surroundings of the location, no important facilities could be found. Only one restaurant and a shop at the train station's platform are within 100 meters from the site. These two facilities aren't enough to provide the future residents in their daily needs. The bus connection that starts at the train station offers a good connection to these facilities. However, for elderly with a limited range because of walking disabilities this isn't always a viable solution, as they are relying on facilities within a very small range. To be able to support in the daily demands as groceries or leisure, supporting facilities as a small supermarket or cafe should be implemented in the new plan. These facilities should make sure that this new addition to Geldermalsen can be self-supportive.

The map shows concentric circles at 250m, 500m, 750m, and 1000m radii, with labeled healthcare facilities: dentist, psychologist, physiotherapist, doctor, psycho-logist, physiotherapist, dentist, policlinic, physio-therapist, doctor.

Healthcare facilities

In terms of care, most facilities in Geldermalsen are located around the center and the Rijksstraatweg, the road that forms central spine towards the center. Different types of healthcare facilities can be found, as doctors, physiotherapists and dentists. As with the commercial facilities however, these are more than a kilometer away from the project site. Especially when concerning elderly people, it is important to have these facilities in a close proximity from their home. Implementation of these should be part of the design program. In this way not only the future elderly people can benefit from these facilities being nearby, but everyone that lives in the station area.

Maranatha Tricht
Gereformeerde gemeente in Nederland
RK Sint Hubertuskerk
Suitbertuskerk
Gereformeerde kerk Geldermalsen
250m
500m
750m
1000m
Bethelkerk

Religious facilities

As Geldermalsen has a big religious community, the presence of churches is also an important aspect to take into account. Within the range of 500 meters, two churches could be found. Three others are located more than a kilometer away in the city center. Only these three churches are accessible by public transport. As religion could be very important to the future inhabitants, implementing a small religious space for elderly with a limited range could be very helpful to them.

6.4.2 Possibilities

Public squares

As the station area in in the west part of Geldermalsen is a new development, the urban environment is still under construction. In the masterplan, a future station square has been implemented on the east side of the railway. This square directly borders the site, which makes it possible to interact with the buildings that will be on the site. For the future inhabitants of the site, but also for the new developed family houses to the north, this square potentially could have an important role in their environment, as it is the only close meeting space in this part of Geldermalsen. Special attention should be paid on how the traffic from the station will be managed throughout the design site.

Recreation

For recreation purposes, the now desolated grass land at the north, between the town of Tricht and the design site, will become a green park in the future. In the masterplan, this area will function as a place for recreation with walking paths that run through green and along water. The park will flow into the neighborhood. The park will become an important place for future inhabitants of this part of Geldermalsen to recreate and meet people. It borders the design site at the northwestern side, which could allow for an interesting integration of the two.

Family homes

A newly developed neighborhood has been located just along the borders of the design site. This neighborhood consists out of family homes of different typologies. By seeking connection in the design with these family homes, big opportunities could arise in terms of intergenerational exchange (paragraph 3.4.2). With paying attention to a connection with the neighboring environment, the design site has the potential to function as a transitional zone in which people from the family homes can meet other generations. Connecting both parts also prevents the separation of the area.

6.4.3 Borders

Image labels: railway, indistrual area, site

Railway and industrial area

The design site directly borders the railway and the station. These form a direct border to the location as it makes a clear division between the west and east side. At this moment, a bridge makes it possible to cross the railway. In future plans a tunnel underneath the railway will make it easier to cross to the other side. The industrial area at the opposite side of the railway however, isn't an inviting environment to go to. Both these factors make that the focus of the design will most likely lay on the east side of the railway.

Noise pollution

Where the railway forms a physical border between the east and west side of the tracks, it's also a source for noise pollution. As the design location directly borders the railway tracks, measures should be taken into account to prevent nuisance among future residents from trains passing by.

6.5 Conclusions

From the site analyses, it is able to draw conclusions that could be implemented into the project. These conclusions will be used to form several site specific design tools, that are shown in paragraph 6.5.2.

6.5.1 conclusions

- The amount of inhabitants in Geldermalsen has risen over the last years;
- Geldermalsen is a religious community;
- There is a big group of older people in Geldermalsen (45 - 65 years old and 65+);
- The amount of informal care providers in Geldermalsen slighlty higher than in the rest of the country;
- The number of volunteers in Geldermalsen is 5% higher in comparison with the rest of the country;
- Loneliness rates are lower in Geldermalsen;
- The combination of higher rates of volunteers, informal care providers and the religious nature of the town might suggest the presence of a close community;
- Three target groups are interesting to implement into the project: seniors (55+), (single) starters and families;
- The site lacks transportational, commercial, healthcare and religious facilities in a reachable distance for elderly with a reduces mobility;
- The development of a public square between the project location and the station, and of a park at the north form interesting possibilities to respond to in the design;
- Seeking connection with the neighboring family homes forms an interesting opportunity for intergenerational exchange and prevents seperating the development from its surroundings;
- The railway and industrial area form a border at the west side of the plot that should be taken into account during the design. Extra attention should be paid to the noise pollution that derives from the railroad.

6.5.2 site specific design tools

TARGET GROUPS

Families

Seniors

(Single) starters

POSSIBILITIES & AMBITIONS

Implement commercial, transportation, healthcare and religious facilities into the project to provide in ever day needs

Seek connection with station square and park to improve integration of the project with the surroundings

station square

Seek connection with newly built family homes to integrate project with the surroundings

Pay attention to sound pollution by railroad to minimize disturbance

7. Moving on towards the design

In this research the focus lay on the search for a living environment in which care demanding elderly people could remain living at home. The main reason for this focus was the fact that, in the current government's elderly care policy, elderly people are expected to have access to a supportive social network of family and friends that can provide them with support when they become in need for care. Unfortunately, reality is that this isn't always the case. Family for example are too busy with their working and social lives to be able to offer frequent support, or children and friends live at a too large distance to provide them with help. As most of the nursing homes are only for the ones with the highest demand for care, these elderly people are forced to remain living at home. For them, a lacking supportive network of family and friends can have severe consequences.
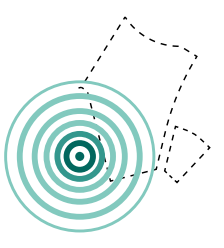
This resulted into the idea to embed elderly people into a neighborhood community. In here, they can rely on support from their neighbors as an addition to their (lacking) supportive network of family and friends. By implementing a centralized healthcare facility, professional healthcare is always close in order to complement the care demand an elderly person has. The term *social cohesion* is very important in this concept, as it is key in establishing a community. From this idea, the following research question was being formulated: *How could a housing scheme provide a living environment in which social cohesion is being stimulated in a way that care demanding elderly can stay longer at home?*

The answer to this question translates into a neighborhood in which *social cohesion* is being stimulated by taking the three important aspects into account that contribute to this term: *social relations*, *attachment* and *orientation towards the common good*.

For the built environment this means that dwellings for elderly people will be mixed with houses for other generations to be able to provide them with neighbors that are capable of supporting them. The public spaces will be inviting for social interaction to take place in order to increase a communal feeling. This makes people know who lives around them and will provide a sense of familiarity and security. Therefore, the public domain should be accessible, attractive and inviting. Public amenities besides that, should be present to house activities and meetings, which also allow for people to meet each other and to participate in the community.

By stimulating the social component in the neighborhood, the aim is to raise willingness to help each other and to generate a sense of reciprocity in which care demanding elderly people can be supported. Helping with small tasks as doing the groceries for example or walking the dog could be of great importance to an older person who has troubles in living alone. Also it can reduce stress on care giving family members or friends, as these small tasks are shared with neighbors.

However, as could be seen in the small scale initiatives that were mentioned in this research report that are equally based on reciprocity, the willingness of people to participate in such a concept is crucial for it's success. This does mean that the proposed concept will not be suitable for everyone to live in, and that people who do so have to be open to help other people around them. The concept therefore, could work in small areas in a town or city. In such an area, it should become clear to people who want to live there that the willingness to help each other is a prerequisite for living there. This selective approach is already used on a small scale, as could be seen in chapter 5 with the Knarrenhof and the transformed elderly homes, and proved to be successful.

The design tools from chapter 5.4.2 and the site specific conclusions from chapter 6.5.2 will form the base for the translation of the concept into a design for the design site in Geldermalsen. In this design, the aim is to translate the principles that came out of this research into an architectural representation a living environment that reflects the proposed concept.

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Appendix

Reflection

The MSc3 and MSc4 semesters together have formed an interesting last year of my study career. For the first time, I had the opportunity to research a topic for the duration of an entire study year. As previous design studios only lasted one semester, I now had time to carry out a thorough research on the graduation topic: designing for elderly care. As the topic of this graduation studio is a very relevant in the Dutch society (and maybe even became more relevant over the course of this academic year) I was really motivated to dive deeper into this topic and understand the underlying problems.

To carry out this research, several different methods were used. The beginning weeks of the graduation studio consisted out of anthropological research by means of observation. This ultimately led to an observation week in an elderly home in the Dutch town of Zuid-Scharwoude. During this week that was mandatory for this studio, I got in touch with the elderly people that lived there and learned how their daily lives looked like, learned about the problems they faced and which demands they had.

The idea with this observation week was to start it with an open mind, without having any clear research direction. This direction should follow from the findings that came out of the observation week. As I normally like to have a clear focus on what to research, I found it to be quite difficult at the beginning to observe without. Also when looking to the analyses of the observations in the weeks after, I found in difficult to draw conclusions from all the data I had gathered. Therefore it also took me quite some time and effort to gain a relevant research question that I could use for the remainder of this research from all of this. This caused me to switch from topic just before the P2. I eventually did find a relevant topic that I liked, which showed me that using a different approach to what I am normally used to do could also result in a positive outcome.

The eventual research direction was about embedding elderly people in a neighborhood in which they can rely on informal support from their neighbors. This was partly based on experiences from the observation week, and partly from looking to recent developments of small scale citizen's initiatives. I saw examples of neighbors that were an important source of support to elderly people in different settings: from normal housing environments to small scale communes. As they sometimes struggle because of a lacking supportive network of family and friends, I thought that creating a normal neighborhood in which the emphasis lies on helping each other could be an interesting solution.

With this I know that such a concept is representing an ideal world in which we all help each other, and that this probably will be different in the real world. Nevertheless I found it interesting to research deeper upon this topic as I saw prerequisites that show that this concept is successful on a small scale.

From the observation week I mostly gained experience and knowledge about the everyday life of elderly people which partly also lead to the main research topic. The real in depth information I needed on this topic, was gathered from literature and scientific research. As the focus lie on creating an environment in which social cohesion is stimulated, I looked for a solid base in social literature and research. From this, I could determine a clear definition of social cohesion, which thereafter, I translated into architectural conclusions by using more architectural related research, literature and references.

I found this approach to be suitable for me, as it eventually gained me a set of design tools on which to base the design. In hindsight I could have strengthened and checked these conclusions by verifying them with a survey or extra interviews, which I eventually didn't do. This does mean that the conclusions from this research are all theoretically based and that they maybe miss a practical verification. However, most of the conclusions derive from researches that are based on surveys or anthropological research among large groups of people and therefore do contain a practical foundation.

After I had the conclusions from the theretical research I advanced towards the design. The design process developed quite natural in my experience. I started at the bigger scale, and continued gradually towards the smaller scales by using several techniques. At first I merely sketched and used mass studies (virtual and physical) to gain insight in the urban part of the design. The more intro detail I went, the more I switched towards digital design tools such as SketchUp, Revit and AutoCad. During this process, I did not discover big hiccups or setbacks.

During the meetings with my design tutors (Birgit Jurgenhake, Mo Sedighi and Paddy Tomesen) I received good feedback and was able to ask the questions I had. This feedback helped me to sometimes see things from another perspective and provided me with design solutions I wouldn't otherwise be aware of. This definitely broadened my perspective.

Eventually this all resulted in a design and research I'm satisfied with. I'm happy with how the conclusions from the theoretical research are begin reflected into the design. I think this is partly due to the fact that I formulated the conclusions as clear design tools, that were directly applicable into the design. There are of course things that I would have done differently in hindsight, as for example the floor plans of the dwellings which they aren't always that practical in use. I also have my doubts on the practicality of the sliding walls in the apartments to cater for an adaptable layout. But overall I am really pleased with how everything turned out.

I also think that this project in it's core could be relevant for practice. I genuinely believe that the idea of having certain small neighborhoods in a town or city where people are expected to help each other could be a viable solution that helps elderly and other care demanding people in staying longer at home. I think that creating an environment that stimulates social cohesion and interaction in an advanced way, can help the presence of a sense of community and familiarity among it's residents, which can lead to reciprocity.

If my translation of this concept to an actual design in Geldermalsen is viable could be questioned. In it's core I think the building layout and the concept of adaptation could work in reality. The elaboration in terms of materialization, used construction systems et cetra is less viable due to the high construction and maintenance costs. This however could also be done in a less expensive way without destroying the concept.
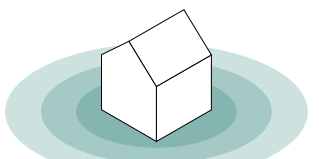
Graduation Report
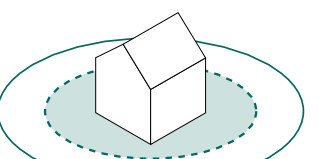
Conclusions & design tools from research

ARCHITECTURAL TOOLS

THEORETICAL RESEARCH

4 — sequence of transitions from public to private spaces to control privacy

1 4 — implement soft edges for stimulating social interaction and controlling privacy

1 3 — accessible, attractive & lively public spaces to stimulate social interaction and activities

11 — adaptability of houses to changing health situation keeps elderly at home

6 — recognizable neighborhood with a clear expression to enhance physical attachment

3 12 — neighborhood facilities to accommodate social activities

8 — centralized healthcare to fulfill elderly's healthcare demand

PROGRAMMATIC TOOLS

2 5 8 — mix elderly housing with dwellings for target groups that have similarities in lifestyle

2 — strive for a balanced ratio between the age groups to enhance social relationships

12 — connect elderly on a neighborhood scale to increase their social (supportive) network

9 — provide possibilities for intergenerational activities for mutual benefit

7 10 11 — assign users to the project that are willing to support elderly when needed

SITE RESEARCH

TARGET GROUPS

Families

Seniors

(Single) starters

Implement commercial, transportation, healthcare and religious facilities into the project to provide in ever day needs

station square

Seek connection with station square and park to improve integration of the project with the surroundings

Seek connection with newly built family homes to integrate project with the surroundings

Pay attention to sound pollution by railroad to minimize disturbance

P2

january 16th, 2020

Mass studies urban layout
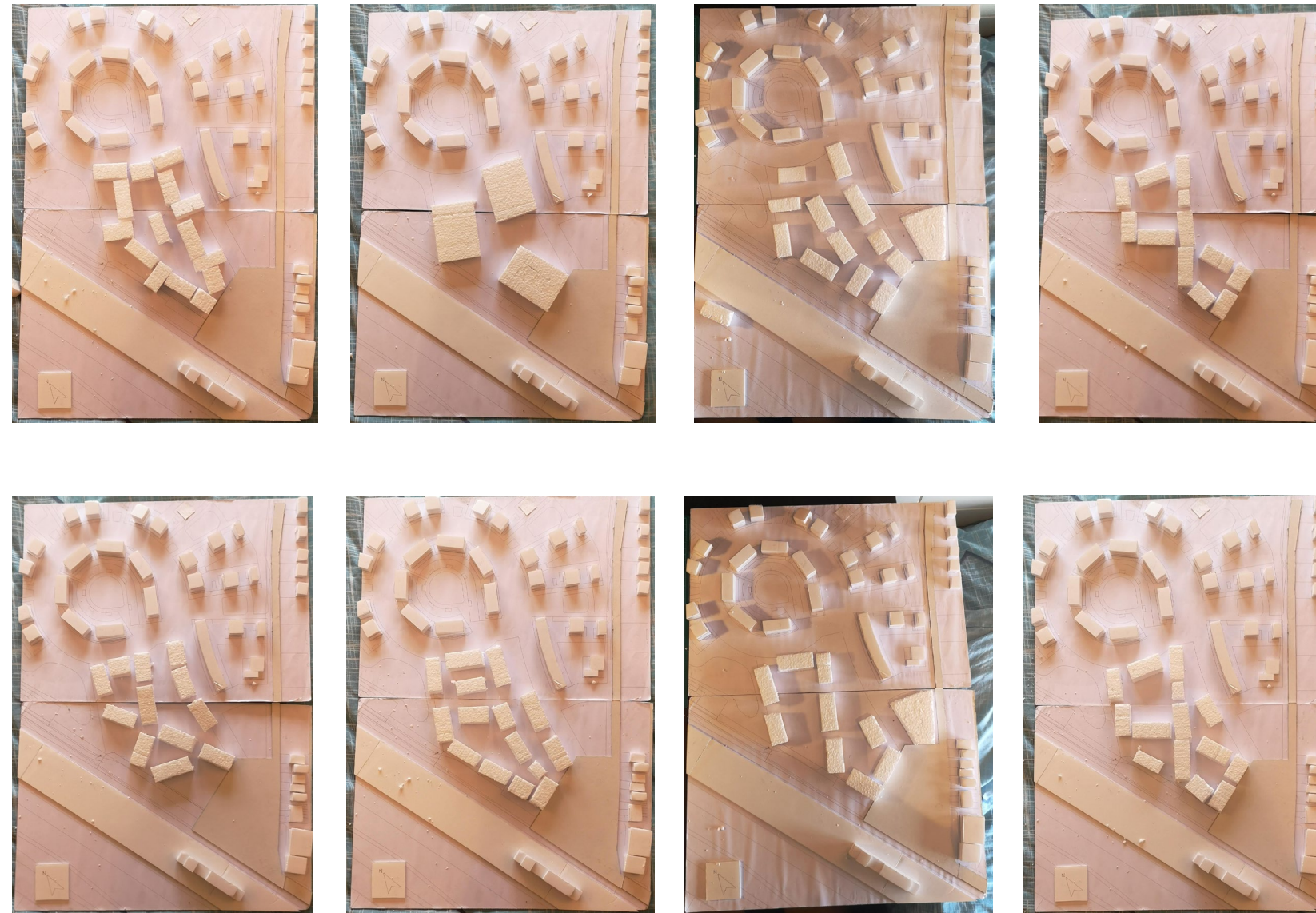
Mass studies
Concept

Chosen urban concept at P2

Plan view, scale 1-500

Children daycare & neighborhood centre

Healthcare & commercial facilities
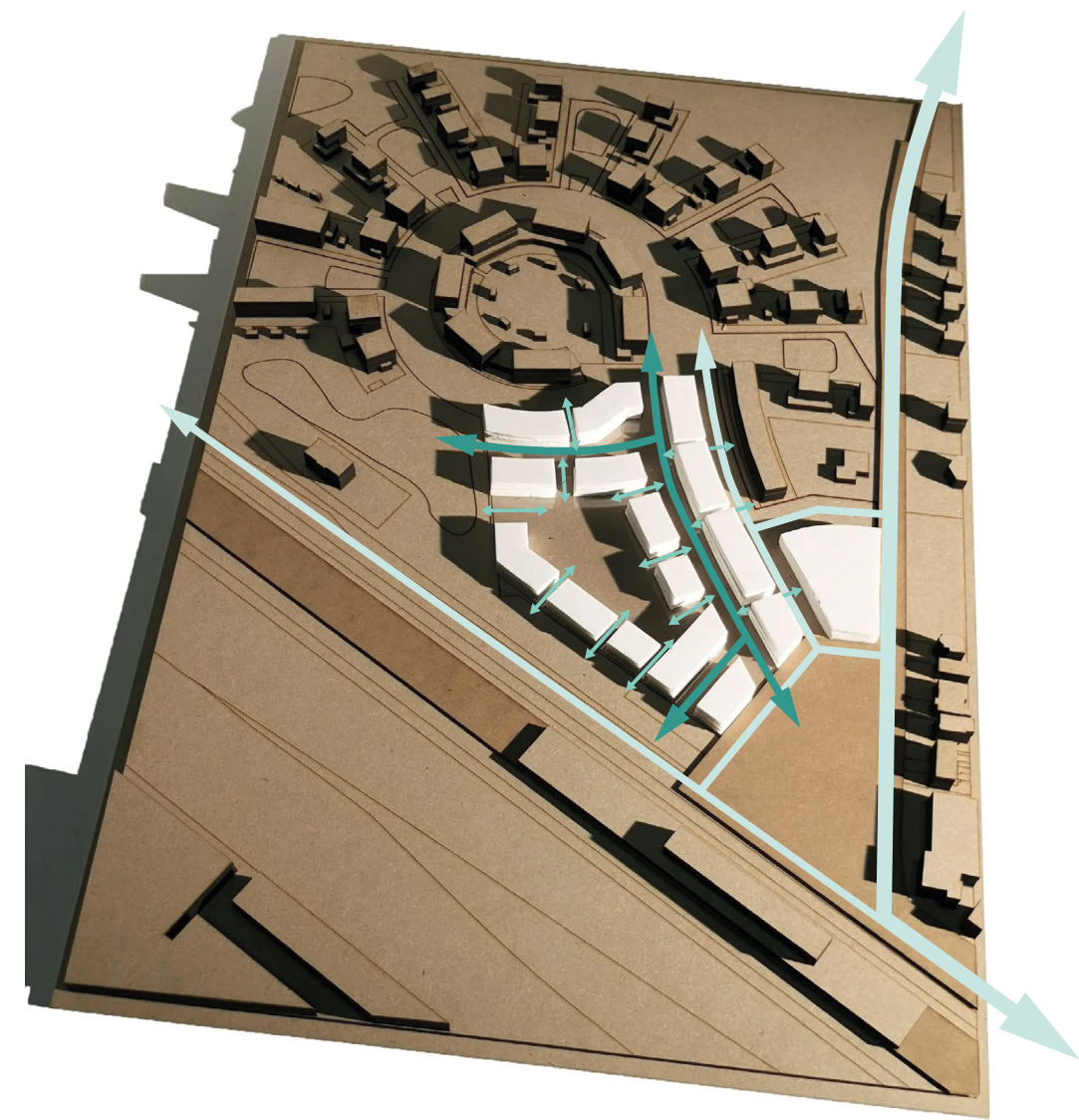
Circulation scheme

Mass study
Concept

This concept was chosen as it provided opportunity for spontaneous interaction in different ways: at the front door (pedestrian streets, front doors facing each other), at the backdoor (shared courtyard). In the light of the concept, where meeting your neighbors and being familiar with who lives around you is very important, this layout seemed to fit that the best.
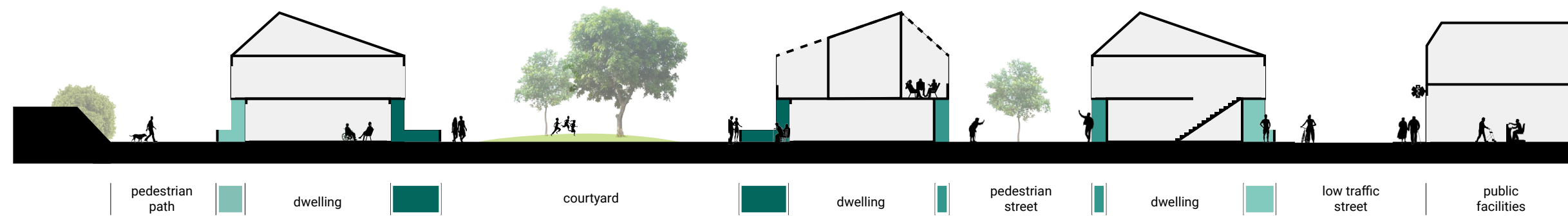
| pedestrian path | dwelling | courtyard | dwelling | pedestrian street | dwelling | low traffic street | public facilities |

Section, scale 1-500
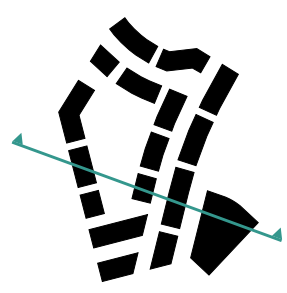
Mass study
Concept

References urban environment

Blomstraat Weesp, Braaksma-Roos

Block 62 IJburg, Aarons en Gelauff Architecten

Dirk Janzstraat, VNL Architecten

Adobe, Great Kneighton (UK), Prochtor and Matthews Architects

Noisy Ecoquartier (FRA), SOA-Architectes

Woodside Square, Muswell Hill, Pollard Thomas Edwards

Pedestrian street
Concept

Skärvet Växjo (SWE), Kjellander Sjöberg

Funenpark, Amsterdam

BIGYARD, Berlin (DE), Herrburg Landschaftsarchitekten

Woodside Square, Muswell Hill, Pollard Thomas Edwards

Knarrenhof, Zwolle, Inbo

Courtyard
Concept

From P2 towards P3

january 16th, 2020 - april 15th 2020

Urban layout

Drawing plan in more detail and dividing courtyard into smaller parts
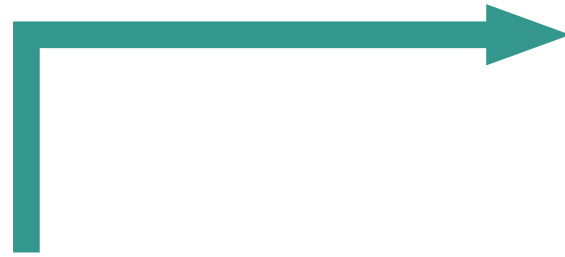
Contextualizing into surroundings by introducing curved lines
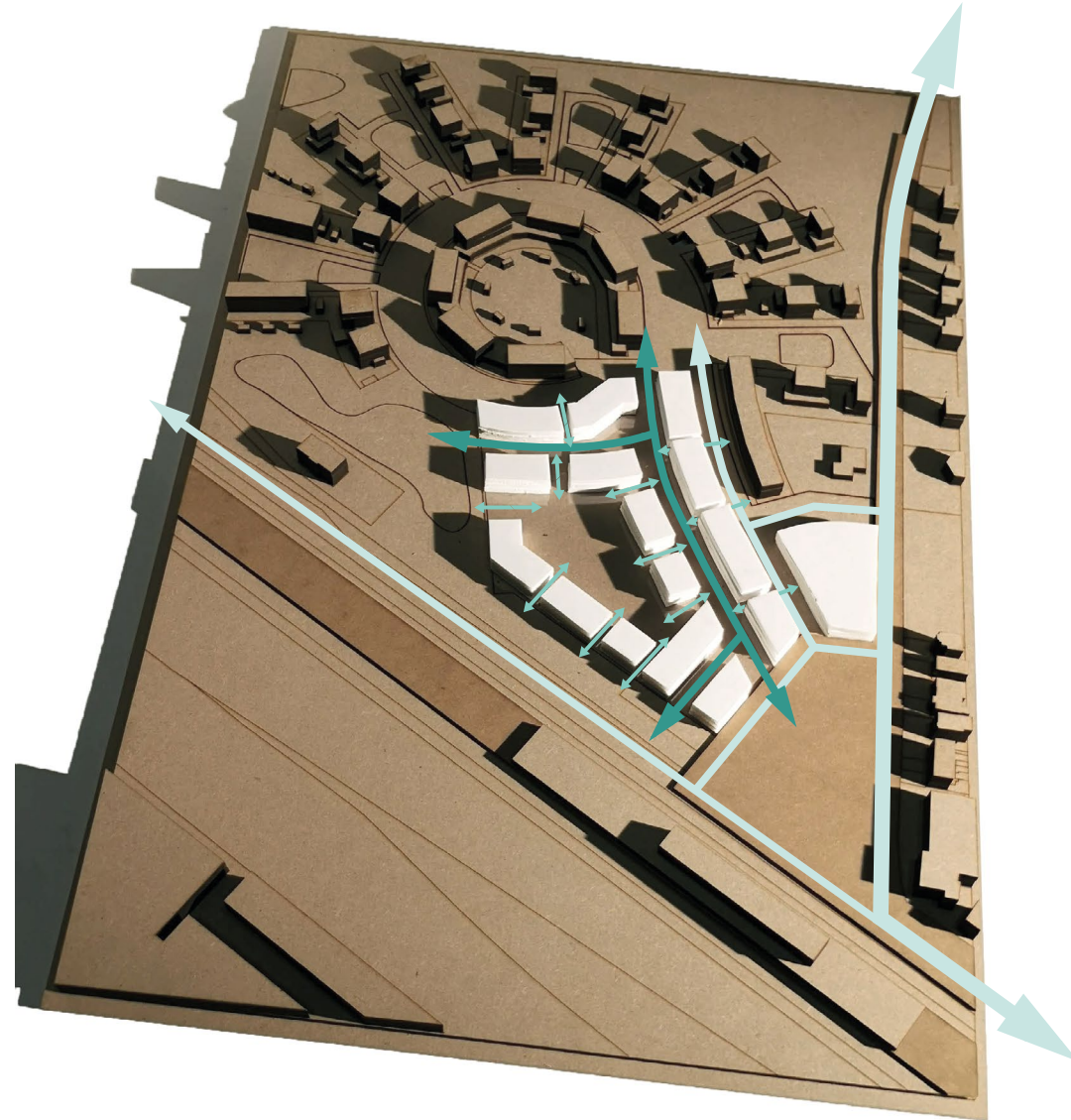
changing direction of
main pedestrian street
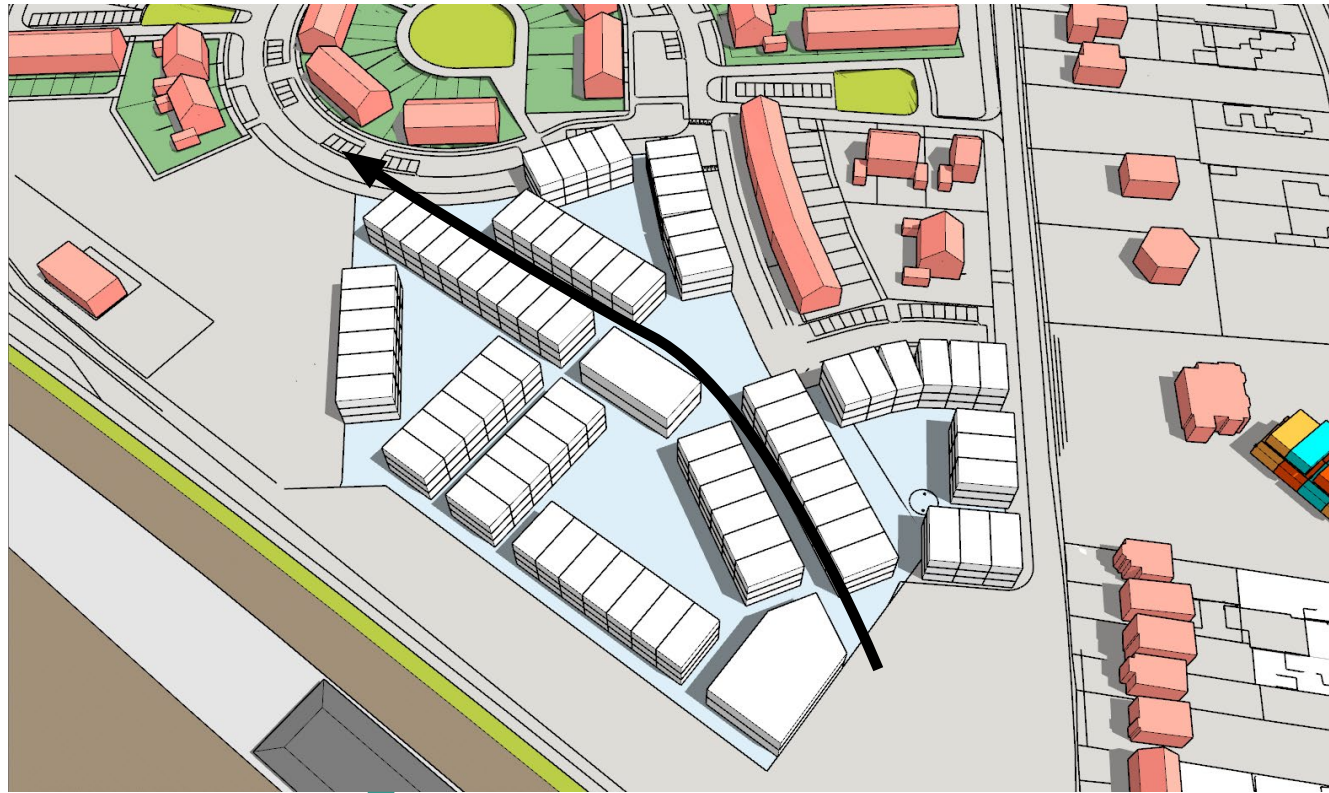
Contextualizing into surroundings by
introducing curved lines. Also created a
central square where the main healthcare
facility is located. This will become the
"Healthcare Hub" that will provide the
demanded care to people in the surrounding
neighborhoods, from elderly people to children
and young adults. A general practitioner,
physiologist, dentist and home care facility
are located there. At ground floor level it will
also function as a neighborhood center, where
people can meet each other and participate in
activities.
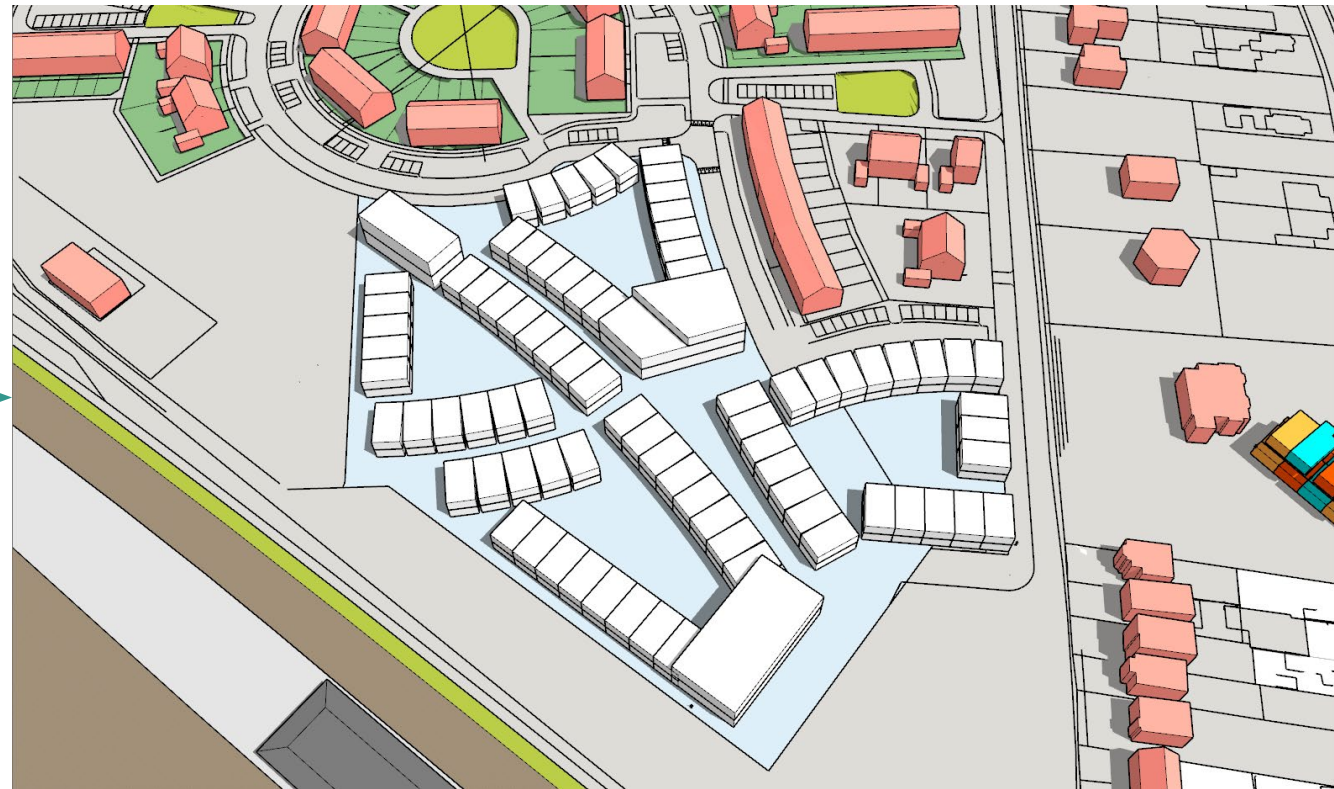
Visiting the design site for the second time

Realisation: building directly alongside the railroads is not an option, trains and noise too close

creating green zone between railway and neighborhood with green hill to function as sound barrier

Cluster studies
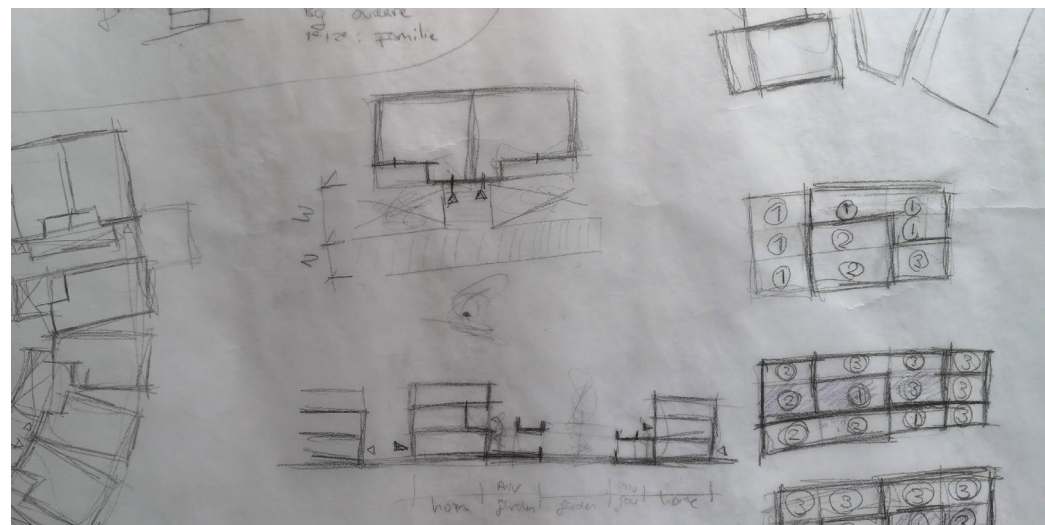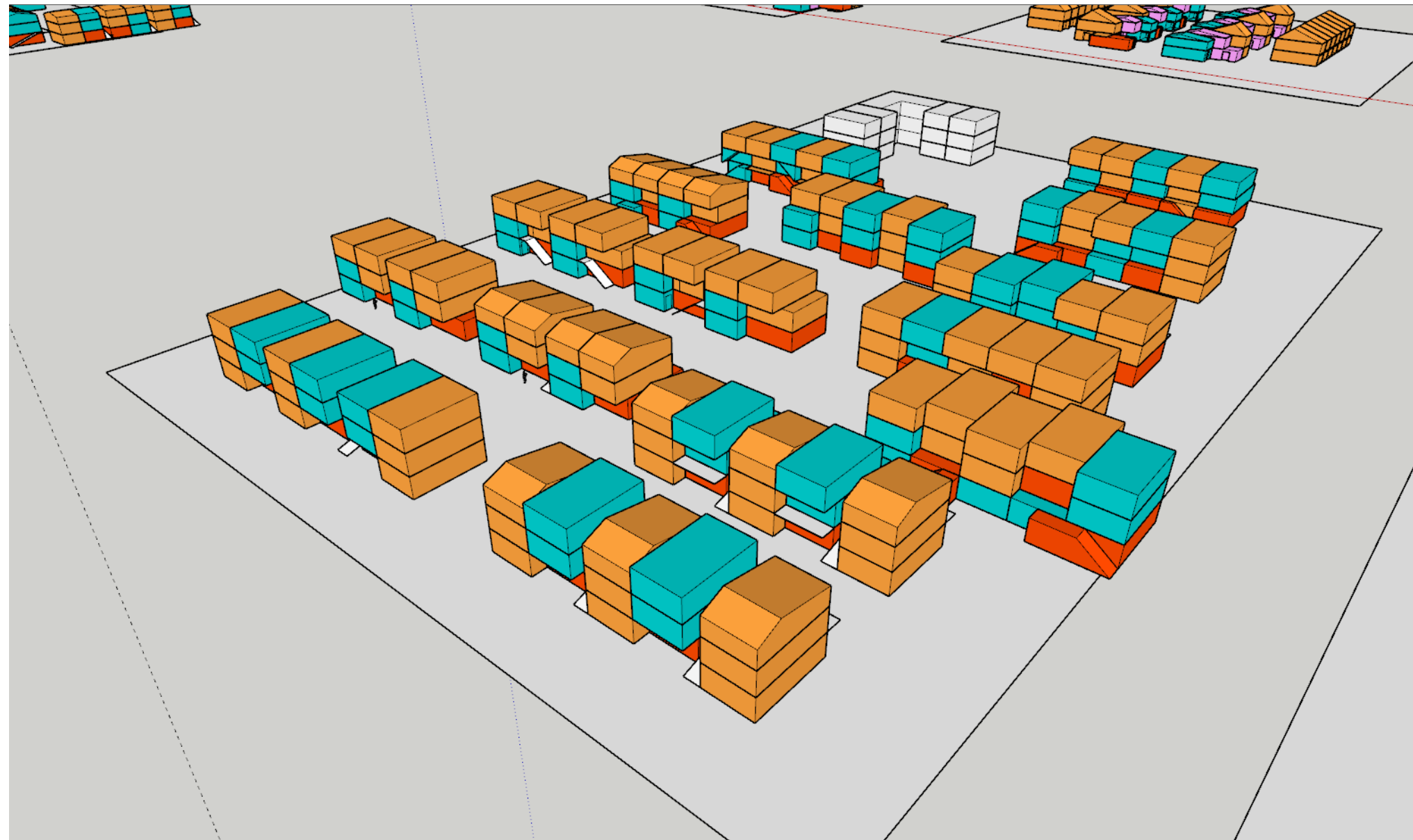
First studies about how to combine dwellings for different target groups into one cluster. Yellow: family dwellings. Blue: starter / family / senior. Red: Elderly, senior

implementation of clusters into urban plan
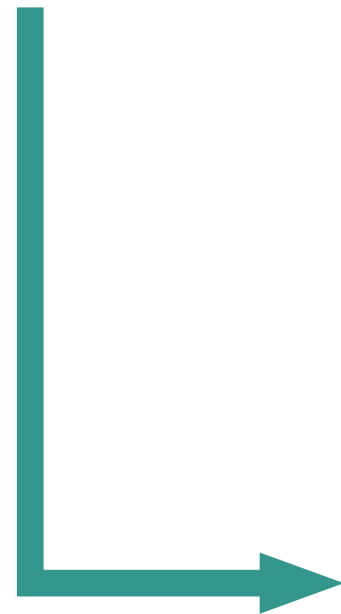
Re-design of building block corners into closed building blocks to get rid of unconfortable intermediate spaces at the corners

Adaptability of the clusters

I realized that the current demand for dwellings could change over the years. Where we now need a lot of elderly dwellings or dwellings for starters, this could be different in maybe 20 years time. To be able to cope with such a change, I searched for a way to adapt the dwellings to this changing need. Therefore I wanted to look deeper into combining or dividing dwellings vertically, so that the different levels could be combined into dwellings of one, two or three layers, depending on the current demand. In this way, it is easy to adapt dwellings to for example elderly apartments of one level or to a family home of three levels.
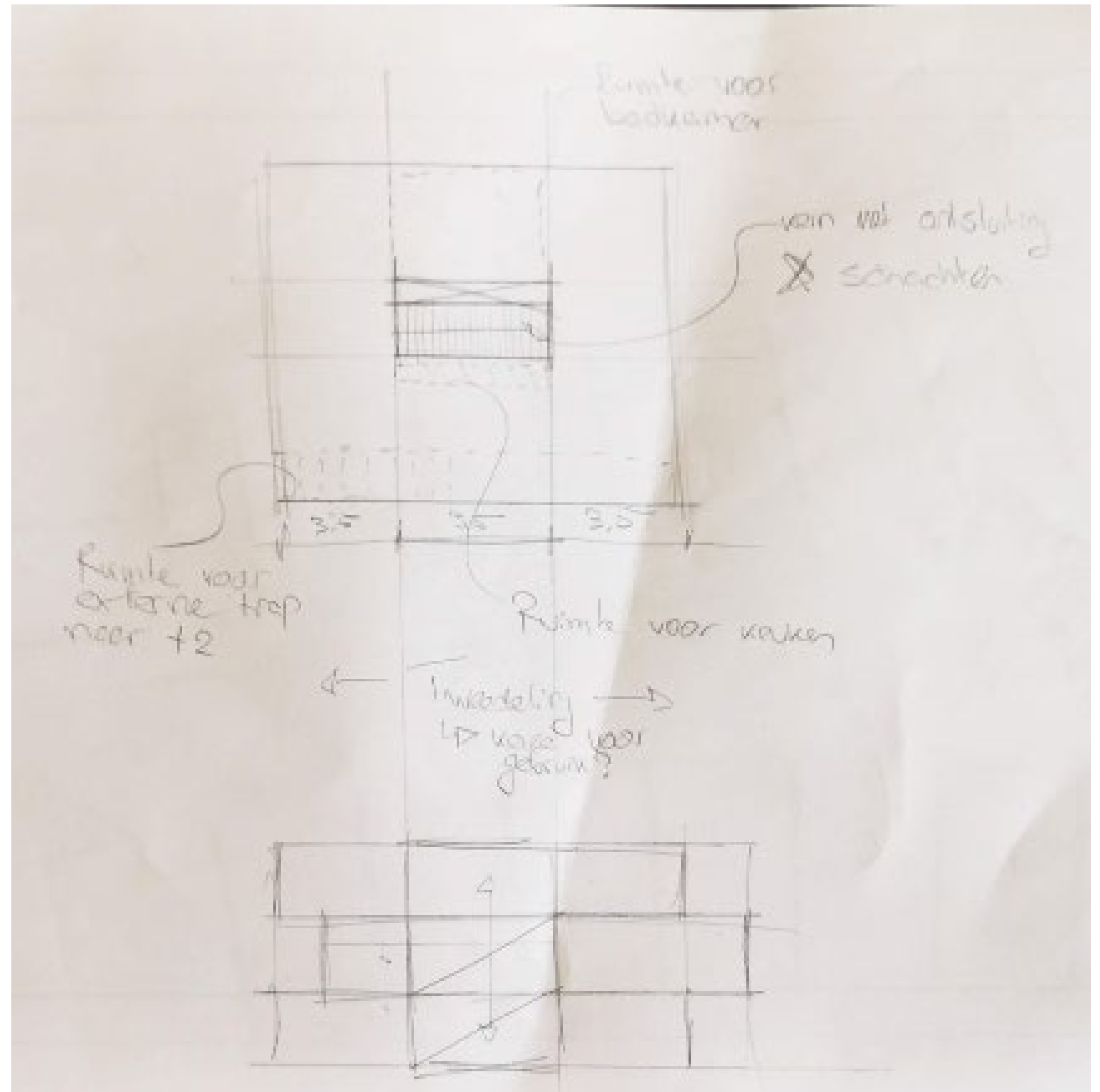
Idea for implementing adaptable dwellings that can be combined vertically by implementing a central core with zoning for installation pipes, bathroom and kitchen. The stairs in this central core should be the elements that allows for combining or dividing dwellings
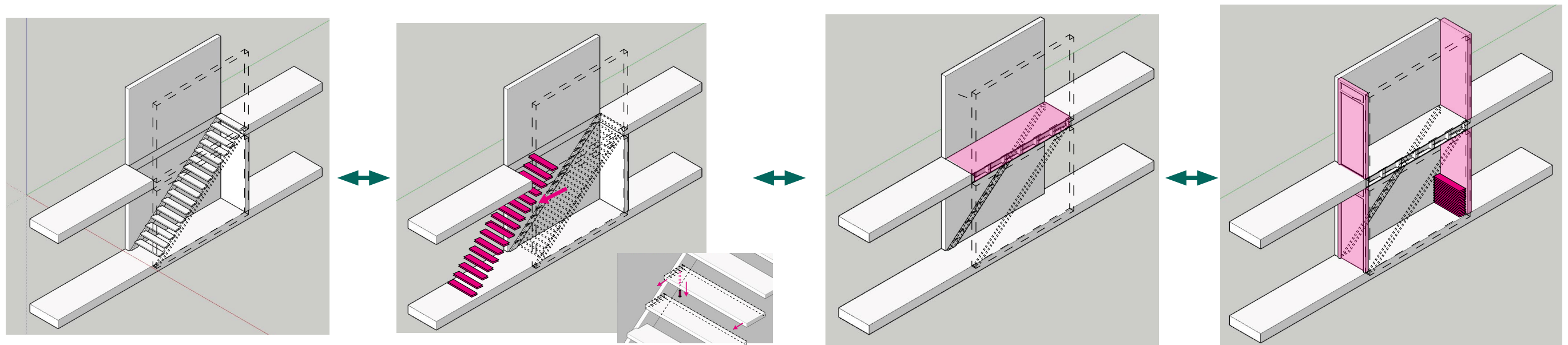
Idea about how to combine or divide dwellings by applying a removable staircase

Adaptability of clusters and floor plans

First floor plans that show adaptability

Centrale kern
woning 3 lagen

2e

1e

BG
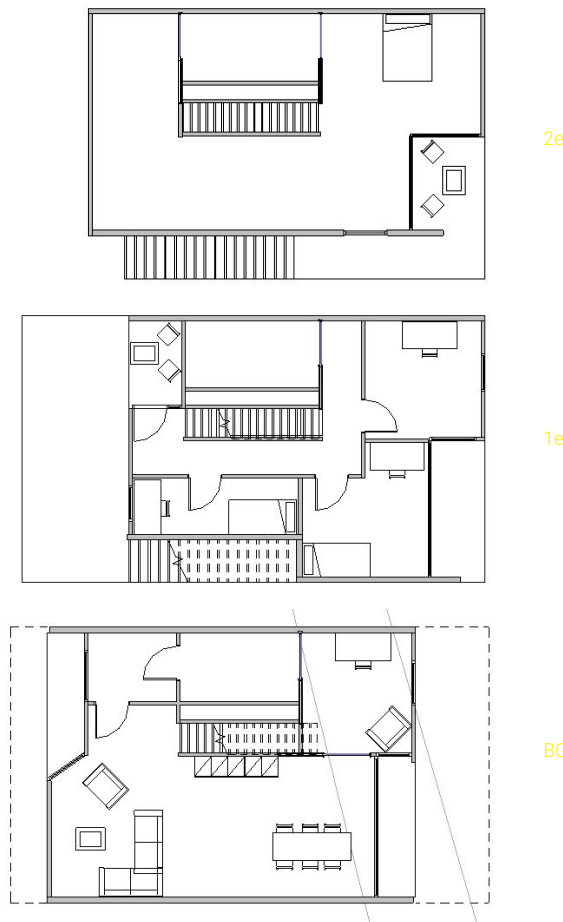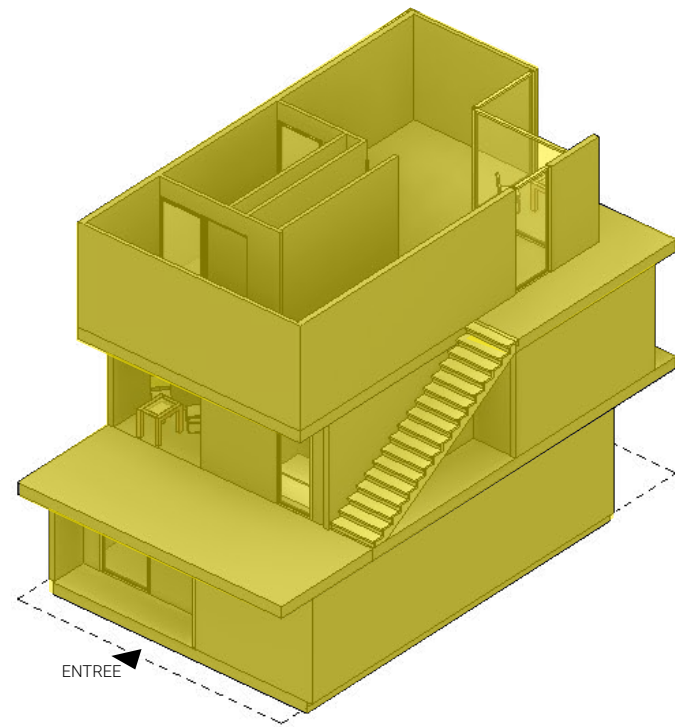
	woning 1 laag: +- 60 m2
	woning 2 lagen: +- 120 m2
	woning 3 lagen: +- 180 m2 << te groot? misschien houden bij 2 lagen

Centrale kern

ENTREE

2e

1e

BG
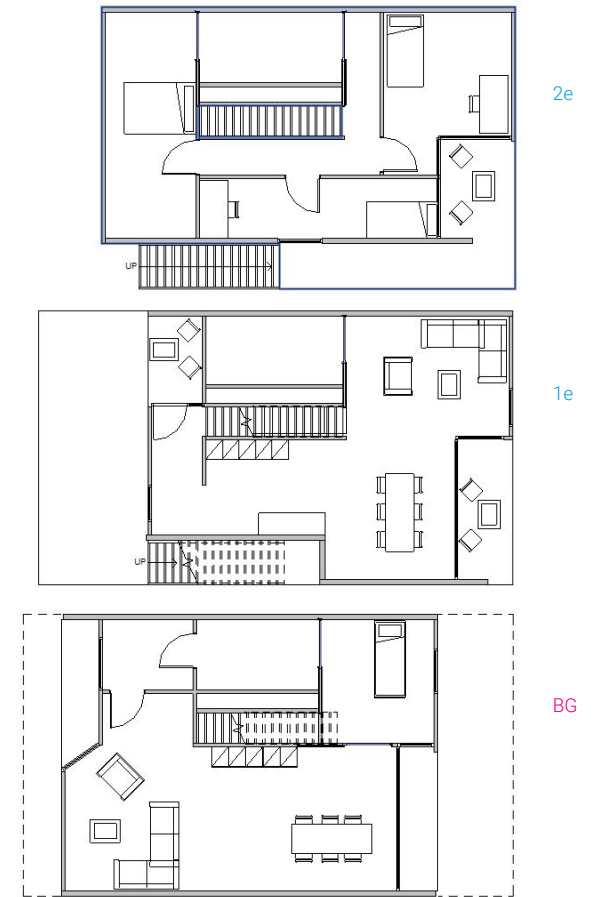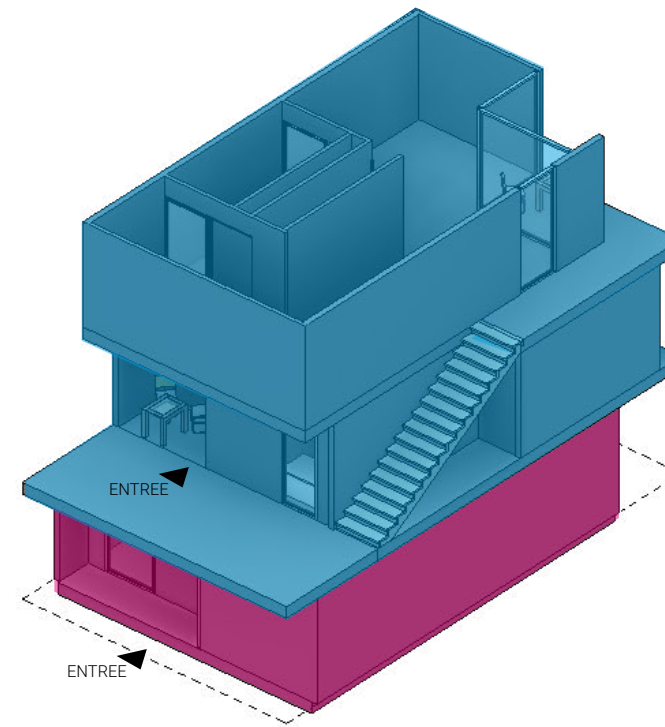
	woning 1 laag: +- 60 m2
	woning 2 lagen: +- 120 m2
	woning 3 lagen: +- 180 m2

Circulation

In terms of circulation it was important to have a possible entrance on every floor to allow for the vertical adaptation. As could be seen in the diagrams on the left, this has been made possible by creating outdoor spaces at each floor, that could function only as balcony, garden or terrace, but also could be used to enter a dwelling. In the image below, you could see that by implementing a wide gallery at the first floor, contact with the street could be created at different levels. Something that is important in this project as it stimulates spontaneous social interaction. By implementing elevators and stairs from the ground floor, the different levels are accessible.
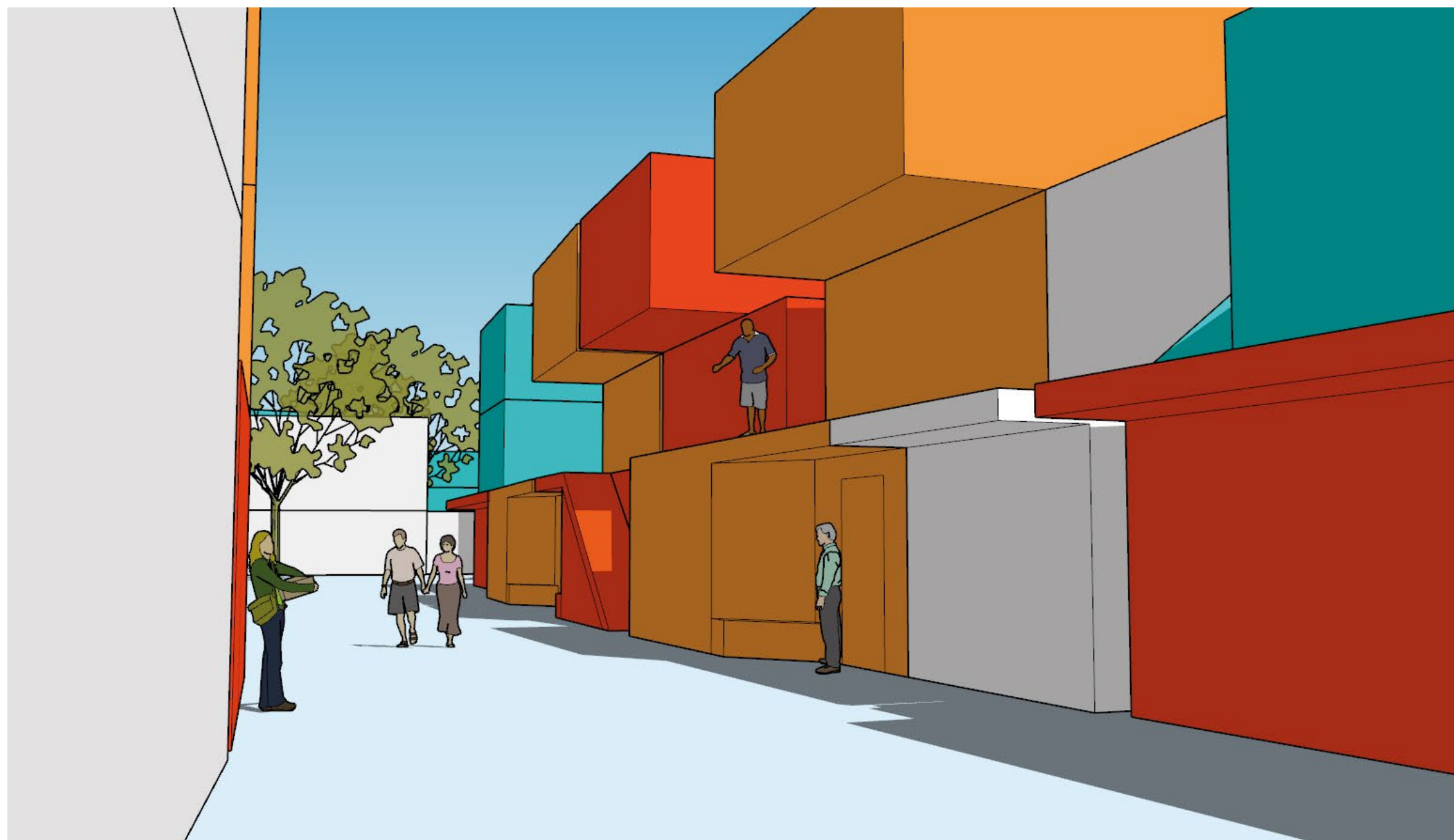
Redeveloping floorplans
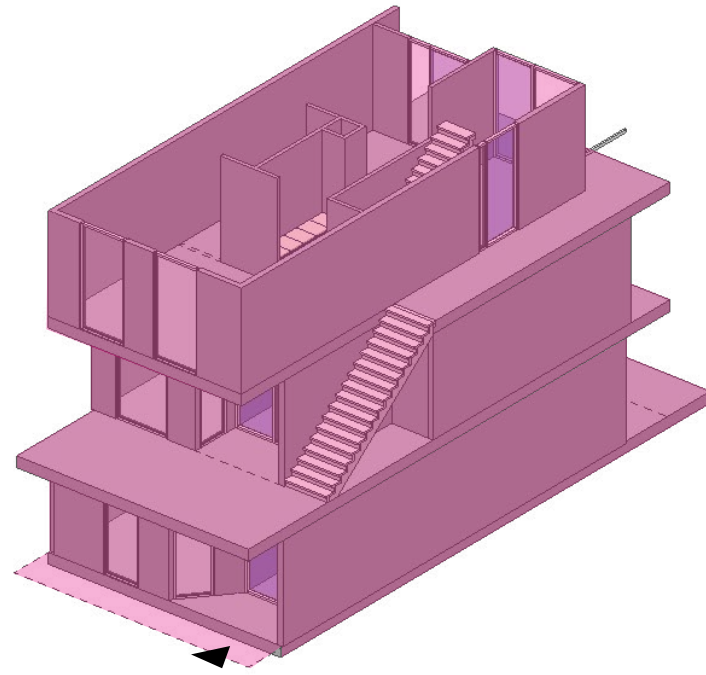
Dwelling 3 layers +- 180m2
- Families
- Generational living
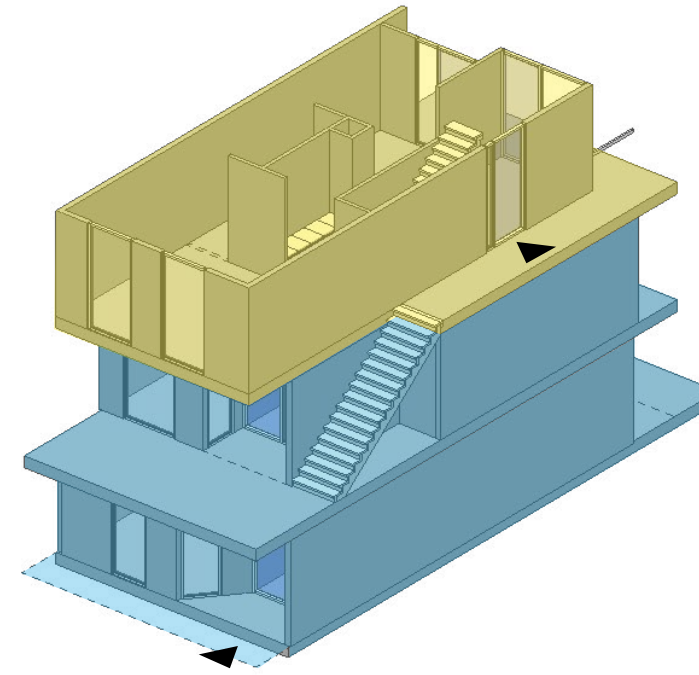
Dwelling 1 layer +- 60m2
- Starters

Dwelling 2 layers +- 120m2
- Starters
- Seniors
- Families
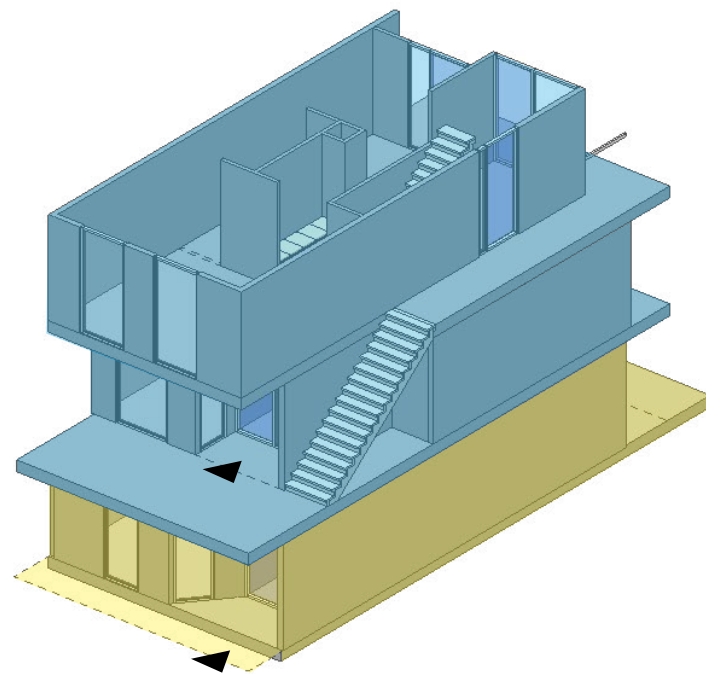
Dwelling 2 layers +- 120m2
- Starters
- Seniors
- Families

Dwelling 1 layer +- 60m2
- Care demanding elderly
- Seniors
- Starters
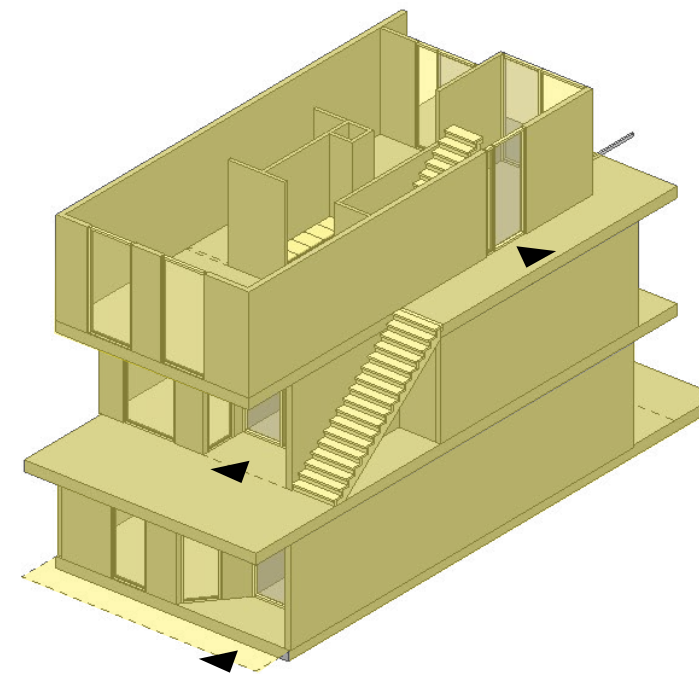
Dwelling 1 layer +- 60m2
- Seniors
- Starters

Dwelling 1 layer +- 60m2
- Care demanding elderly
- Seniors
- Starters

Dwelling 1 layer +- 60m2
- Care demanding elderly
- Seniors
- Starters

All different possibilities in dwelling layouts. Each level contains a possible entrance, which could also be used as an exterior space when not used as an entrance. The ground floor and first floor (2/3 of the plan) are accesible for disabled people via elevators from the ground floor (not shown in this scheme) , the second floor is only reachable by stairs that run from the first floor

Redeveloping floor plans with a more centralized layout with possible living spaces at the front and backside of the dwelling. In the center, zones for the kitchen, stairs and bathroom are located. The kitchen is equipped as a cupboard wall that normally functions as storage, but can be equipped with a cooking plate and fridge easily to upgrade it to a kitchen and visa versa. The area for the bathroom contains the demanded water connections and can be used standard as a storage or left open. When needed, it can be upgraded to a bathroom and visa versa. With sliding walls, different layouts could be attained. The adaptability of the kitchen and bathroom space is necessary because i this way, each floor can function as a "ground floor" and as a storey of a dwelling.

Different types of spaces that could be created with the sliding walls. In this way, several layouts could be achieved, from a more open structure for for example a ground floor of a multi-storey dwelling, to a more fragmentated layout for an apartment.
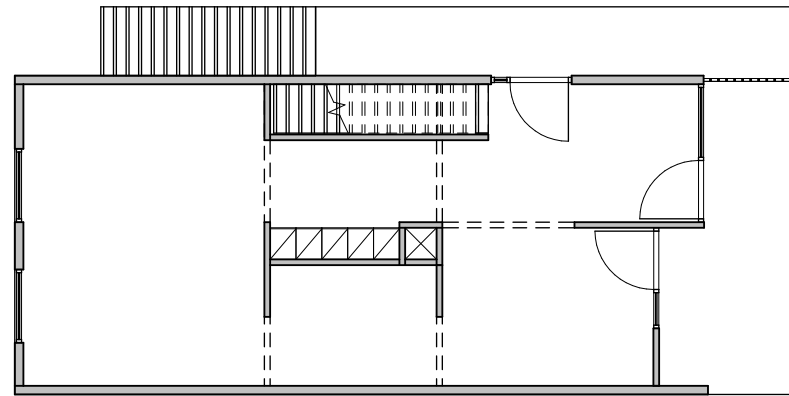
Standard dwelling, second floor
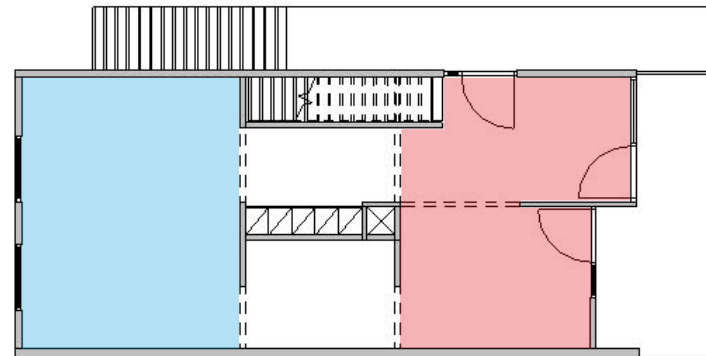
2e verdieping
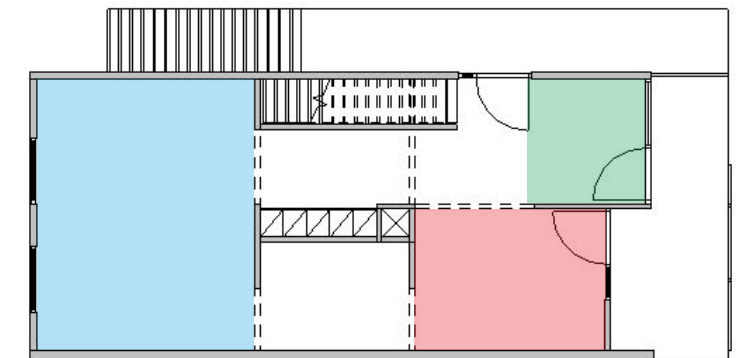
2e verdieping
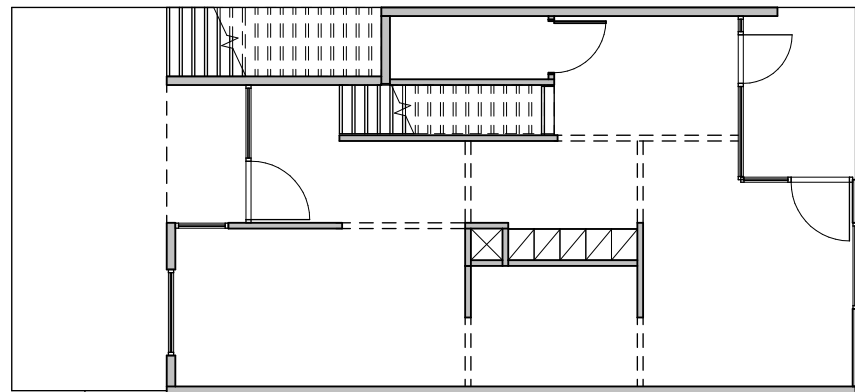
Standard dwelling, first floor
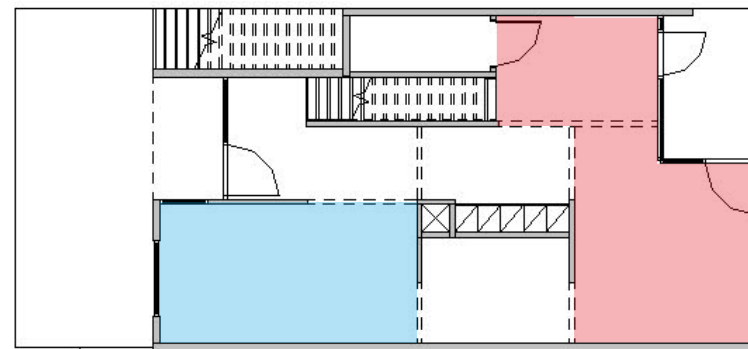
1e verdieping
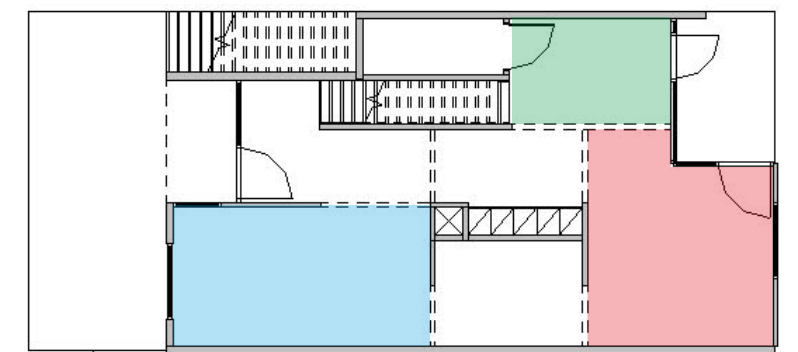
1e verdieping
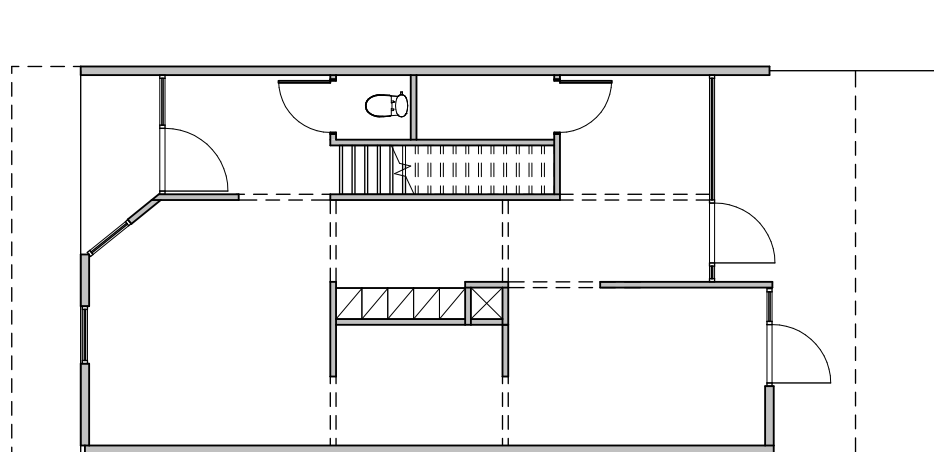
Standard dwelling, ground floor
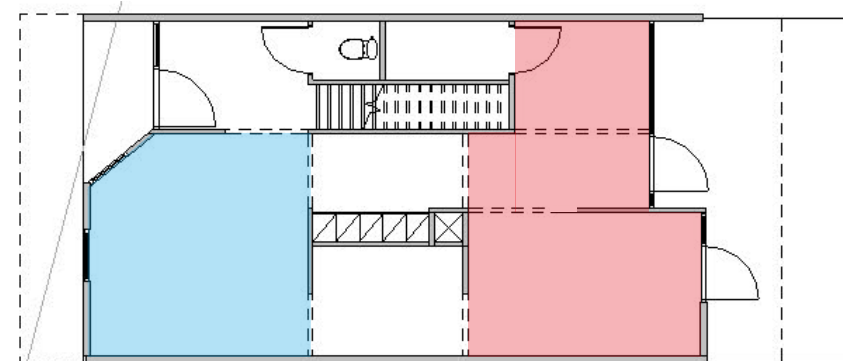
Begane grond

Begane grond

Developing the Healthcare Hub

First plans of the healthcare hub with functional partition. Ground floor contains space for the general practitioner and pharmacy. The other space functions as neighborhood center and meeting point for elderly people and other neighborhood inhabitants. In here they can meet each other and participate in activities.

the first floor contains spaces for the physiotherapist and the dentist. The second floor contains room for the staff and for the home care.
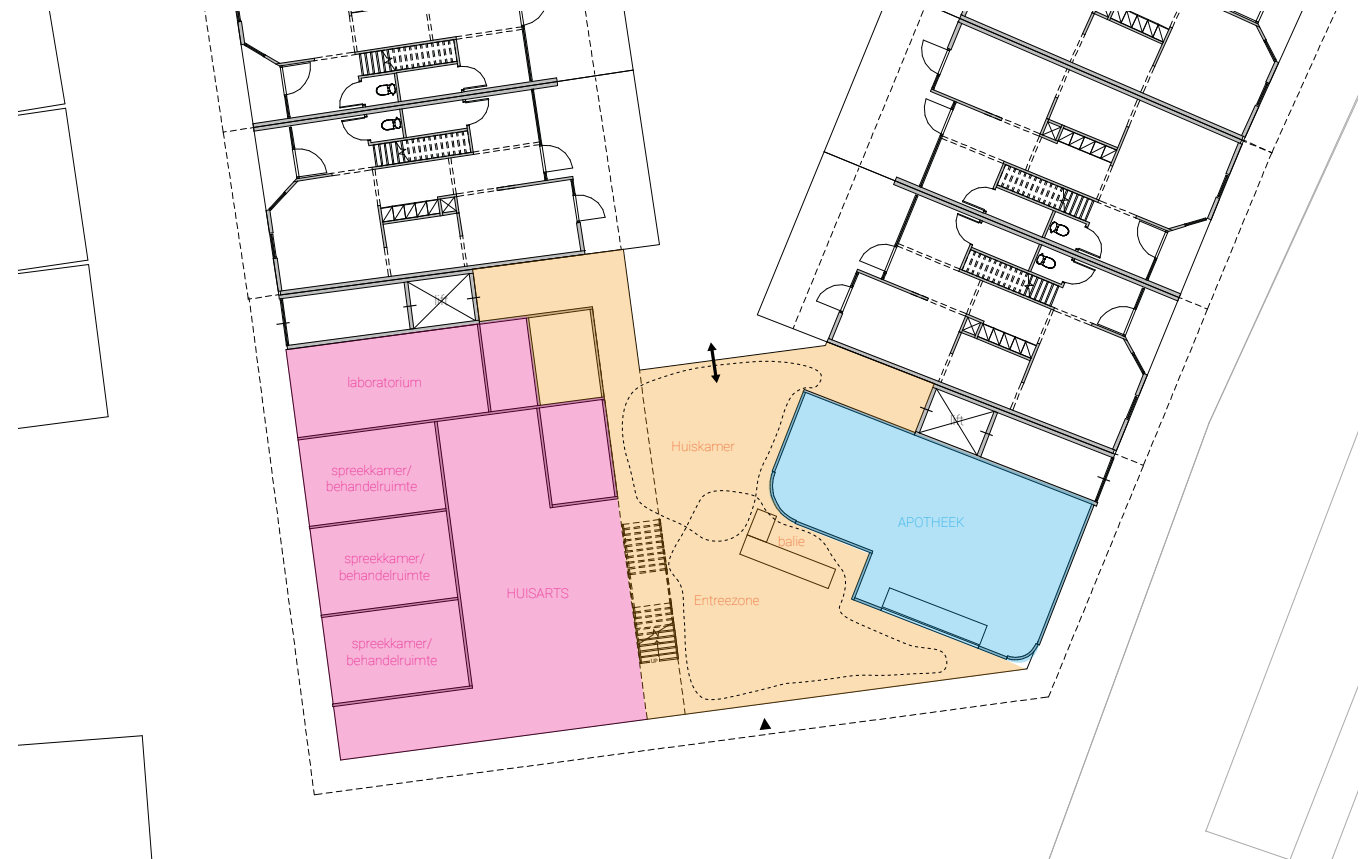
In this axonometry I looked to the logistics of the healthcare hub in relation to the dwellings. As it should be possible for the home care to easily reach, but also retrieve care needing people towards the healthcare hub, easy access should be possible.

2e verdieping uitvalsbasis thuiszorg

2e verdieping

De galerij op de 1e verdieping is via een interne verbinding met een lift bereikbaar voor de thuiszorg. Minder-validen kunnen ook via deze route in een rolstoel of een bed vervoerd worden naar de huiskamer.

1e verdieping

Huiskamer bereikbaar voor alle mindervalide inwoners van het gebouw door interne verbinding met lift

Begane grond

Zorghub
Logistiek thuiszorg

Developing the facades

Inventarising the demands for soft edges around the facade of the dwellings

zien & verblijven

beschutting tegen onprettig weer
toegang tot prettig weer
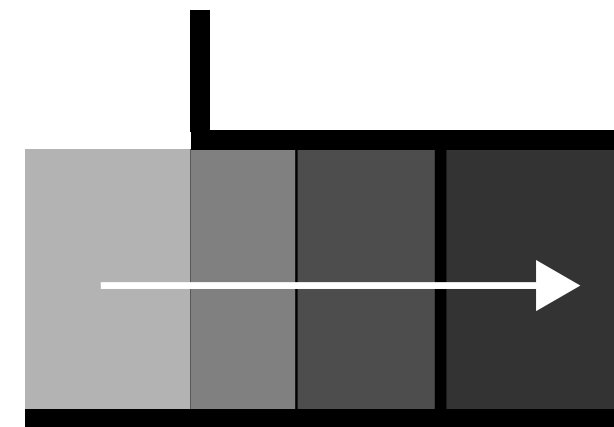
overgang van publiek naar privé
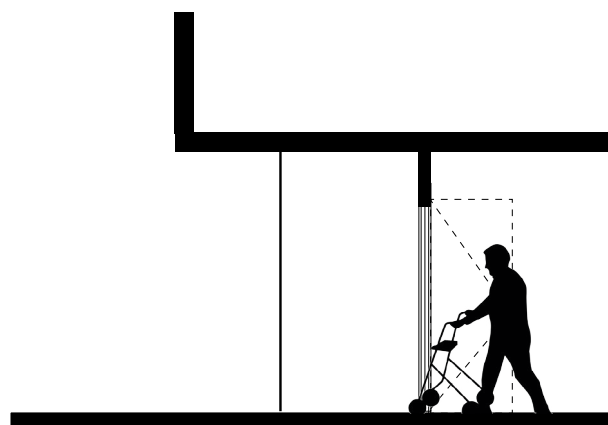
makkelijk in- en uitgaan
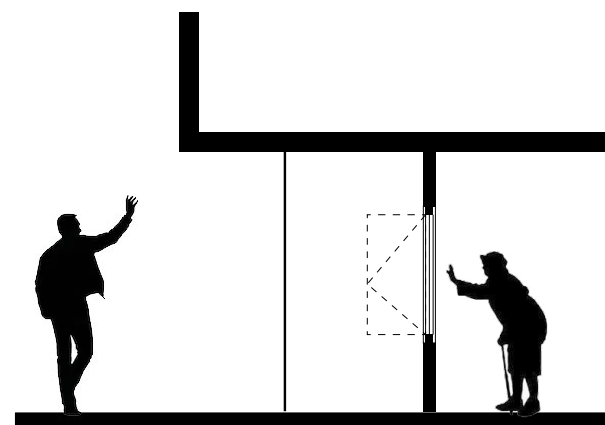
interactie en frisse lucht
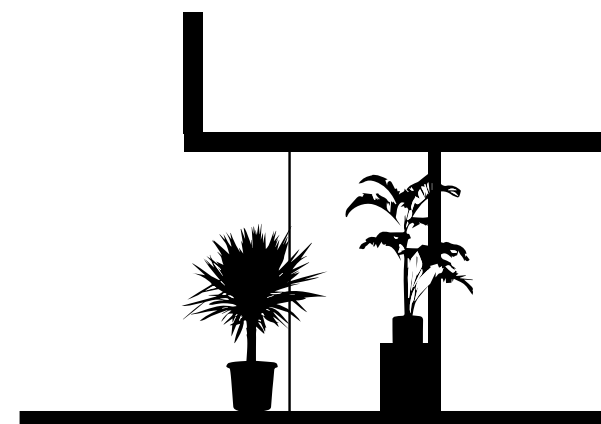
personaliseren
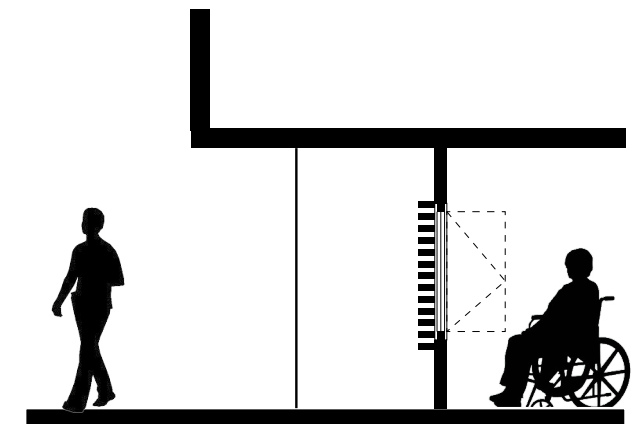
privacy controleren
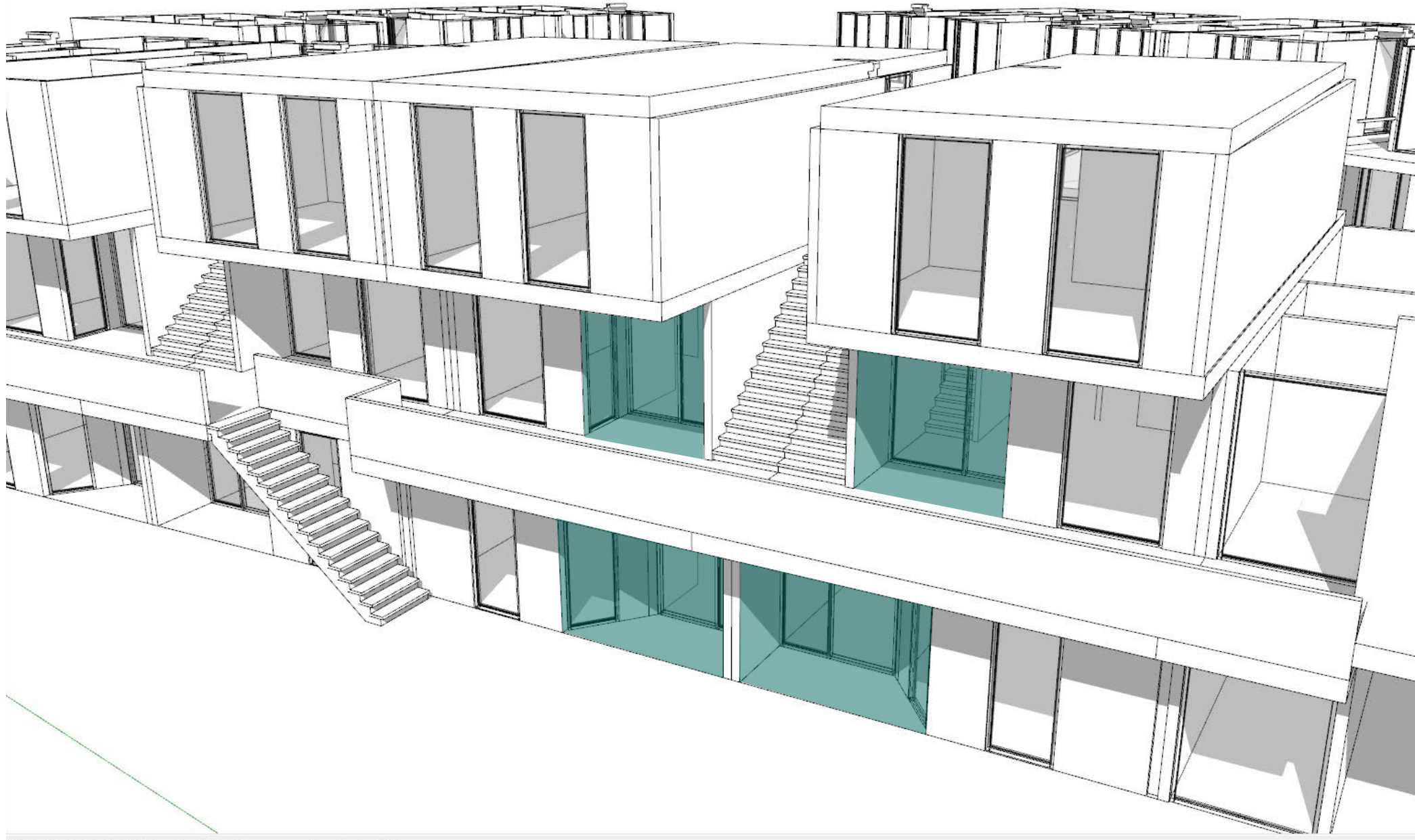
Introducing niches in the facade at the front doors that could be used as places to stay or to decorate. These spaces are providing a smoother transition from public to private and also provide protection from rain and sun.

Developing the facades
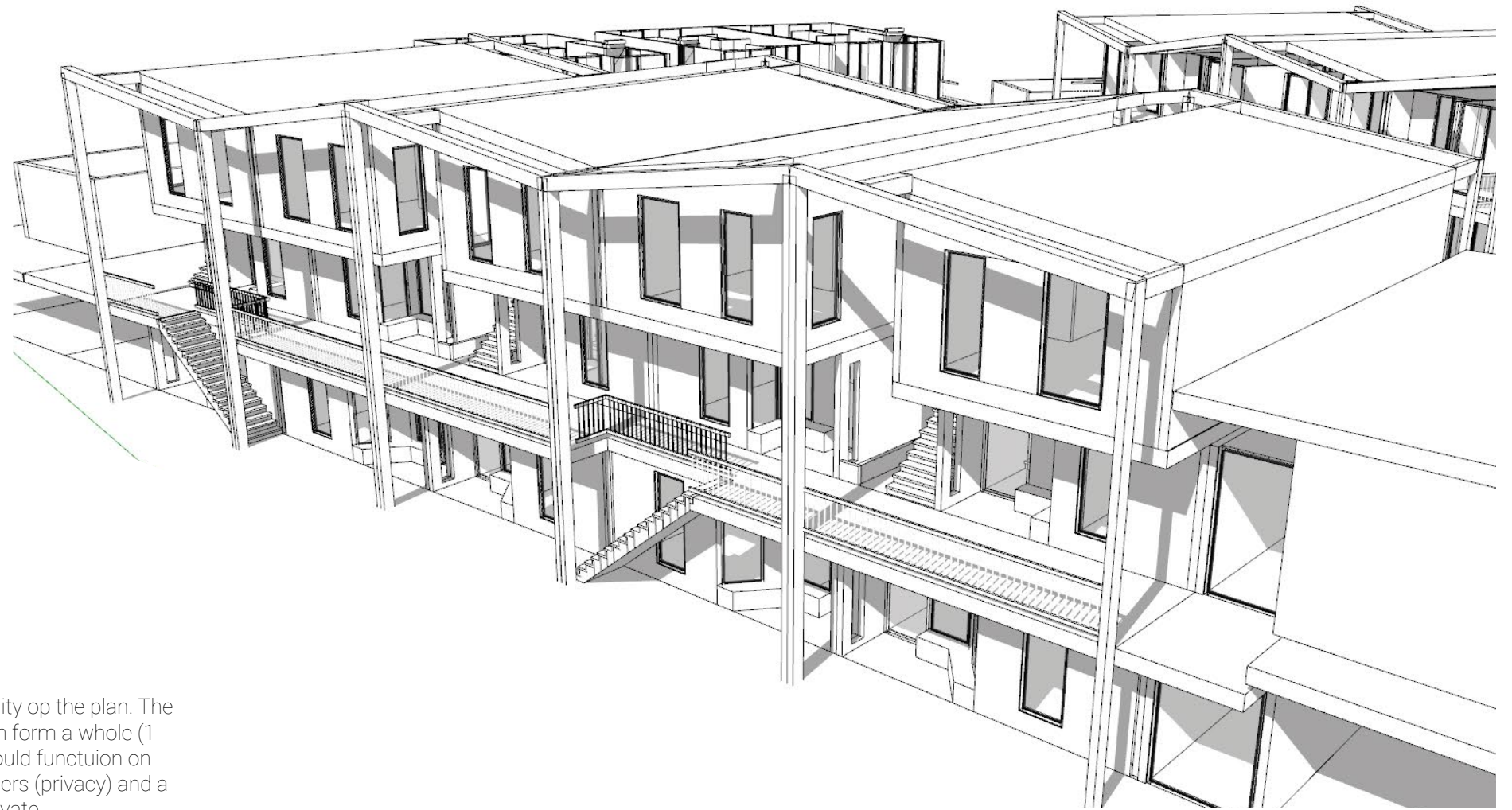
introducing exterior frame that expresses the adaptability op the plan. The frame shows that the three levels above each other can form a whole (1 entire dwelling), but also that each individual volume could functuion on its own. The frame also allows for adaptation by the users (privacy) and a further smoothening of the transition from public to private.

3 blokken in één frame

Developing the facades
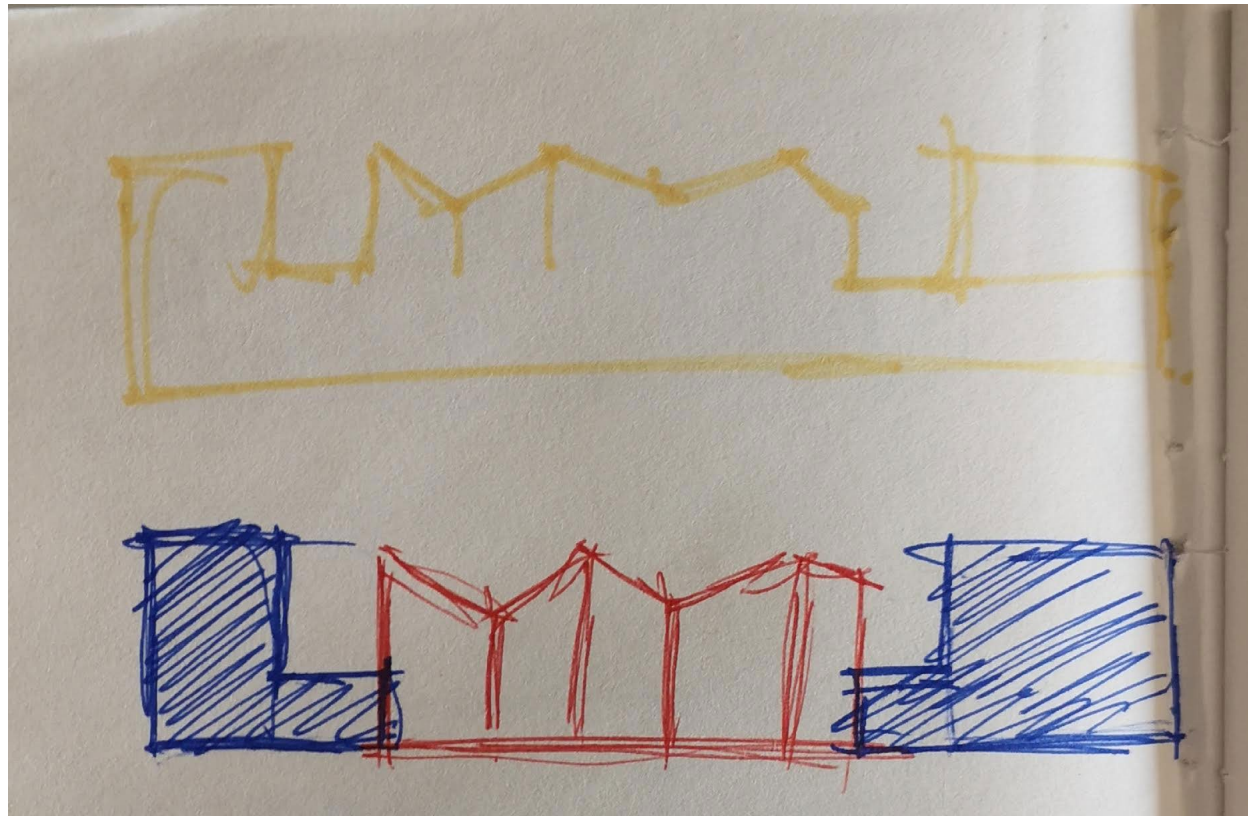
Simple sketch that shows the principle of the facade. I wanted the building block to look as a whole. As the dwellings had a lighter appearance because of the applied frame, I wanted the corners to appear more solid, to be able to end the frame in a rigid way. (see left image, solid corners in blue, lighter dwellings with frame in red). To make the composition as one, i wanted the frame and the corners to lie in the same plane and with the same materialisation. In this way, the corners and frame form a sort of outer layer, with the dwellings in the middle forming a layer behind that.
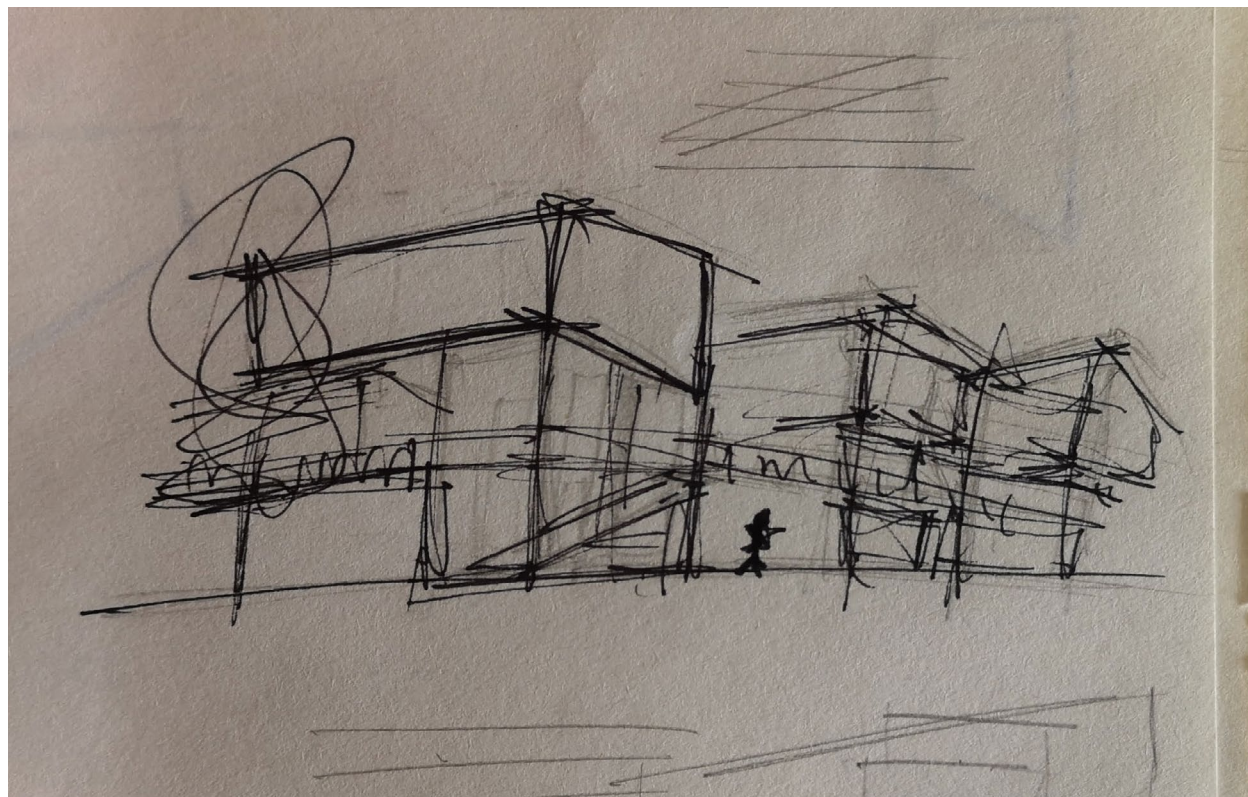
Development of the ends of the building bloc with the solid appearing
corners and health care hub
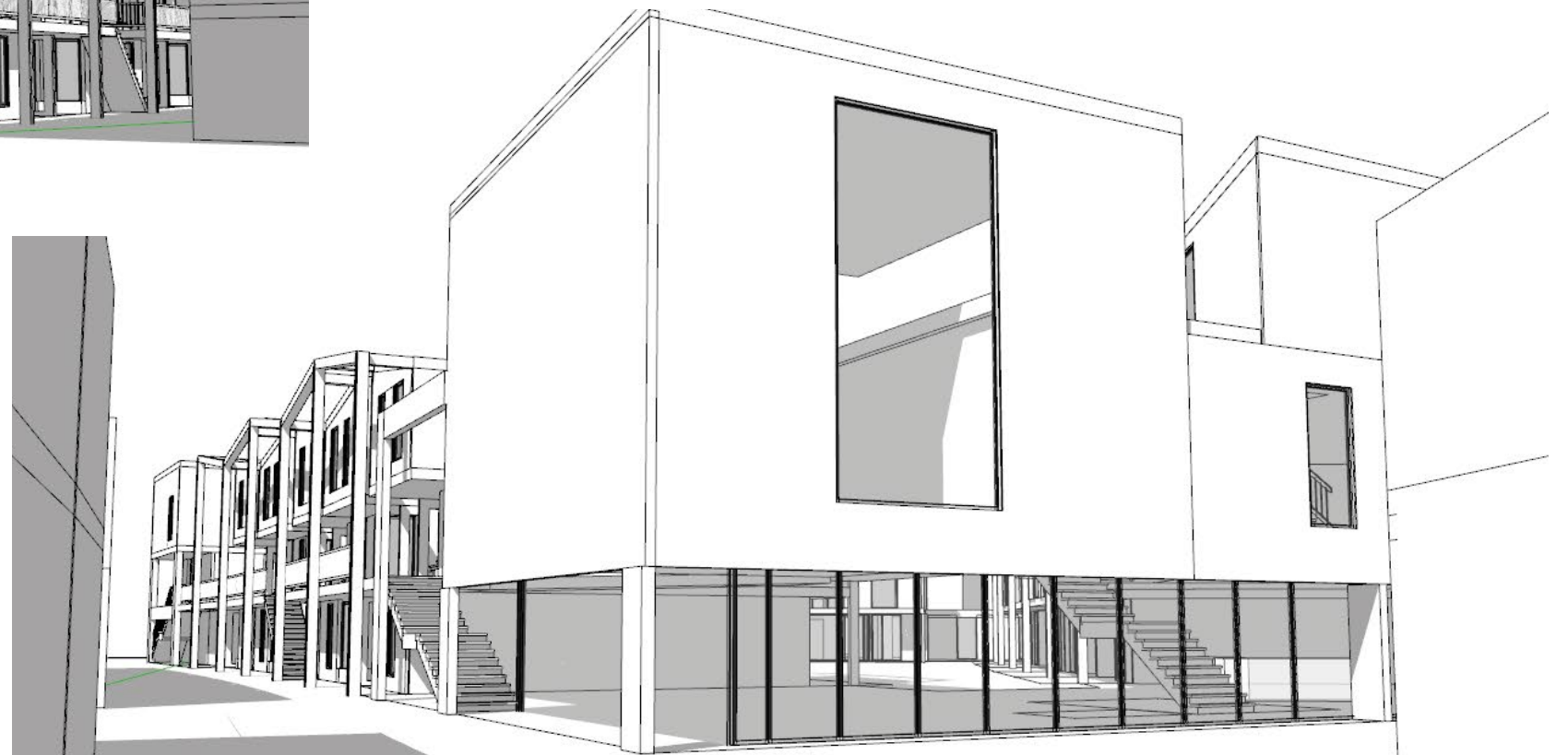
P3

april 15th 2020

Design

The situation drawing at this point shows the general layout of the plot, with the building blocks, public spaces and parking. What lacks is a more detailed elaboration on the public space: furnishing, spaces to stay, borders et cetra.

Overview
Location

children
daycare

healthcare
Hub

commercial
facilities

Facilities
Location
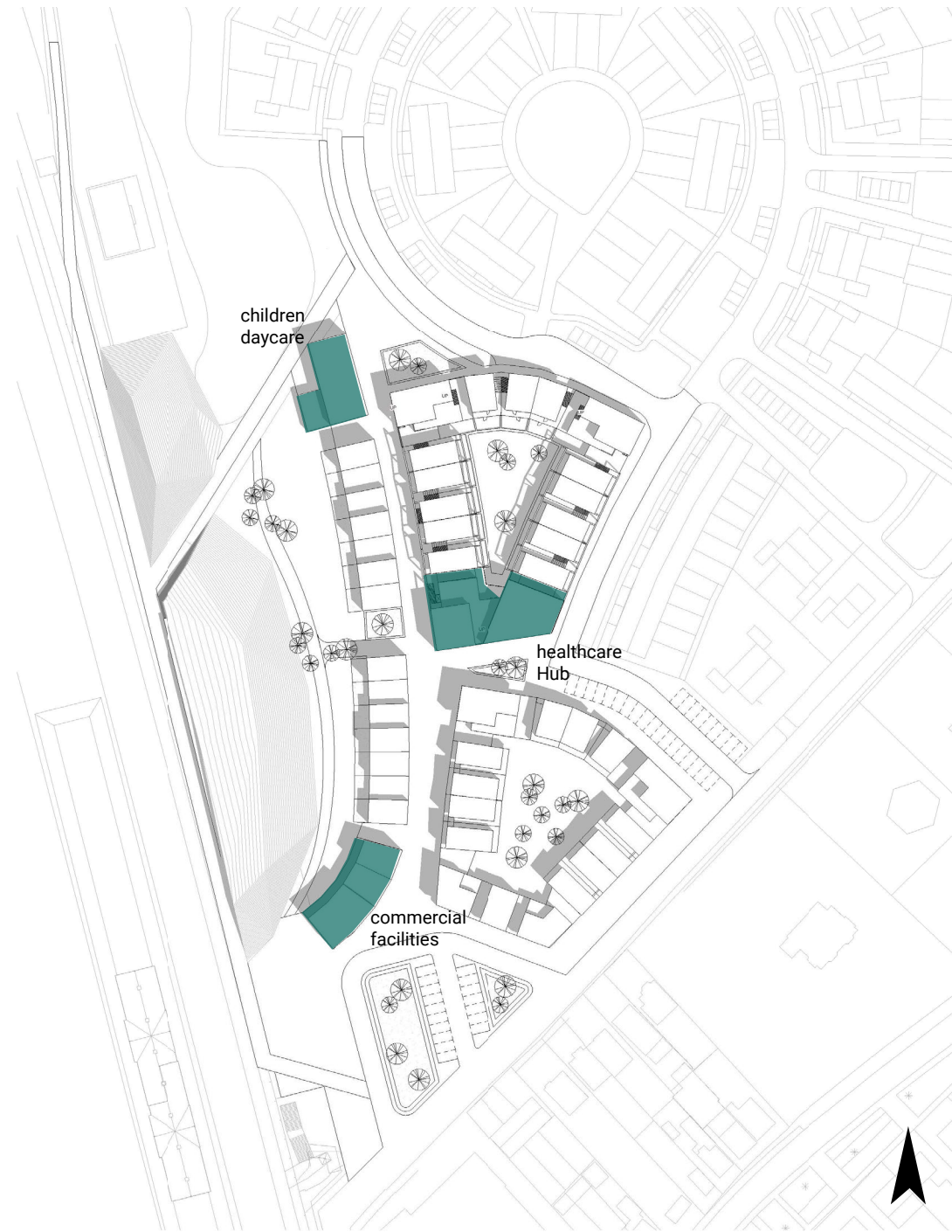
The routing as showed could be more elaborated in the design. Especially the connection between the routes that are displayed and the surrounding environment could be more clear.

neighborhood

park

central square

station square

train station
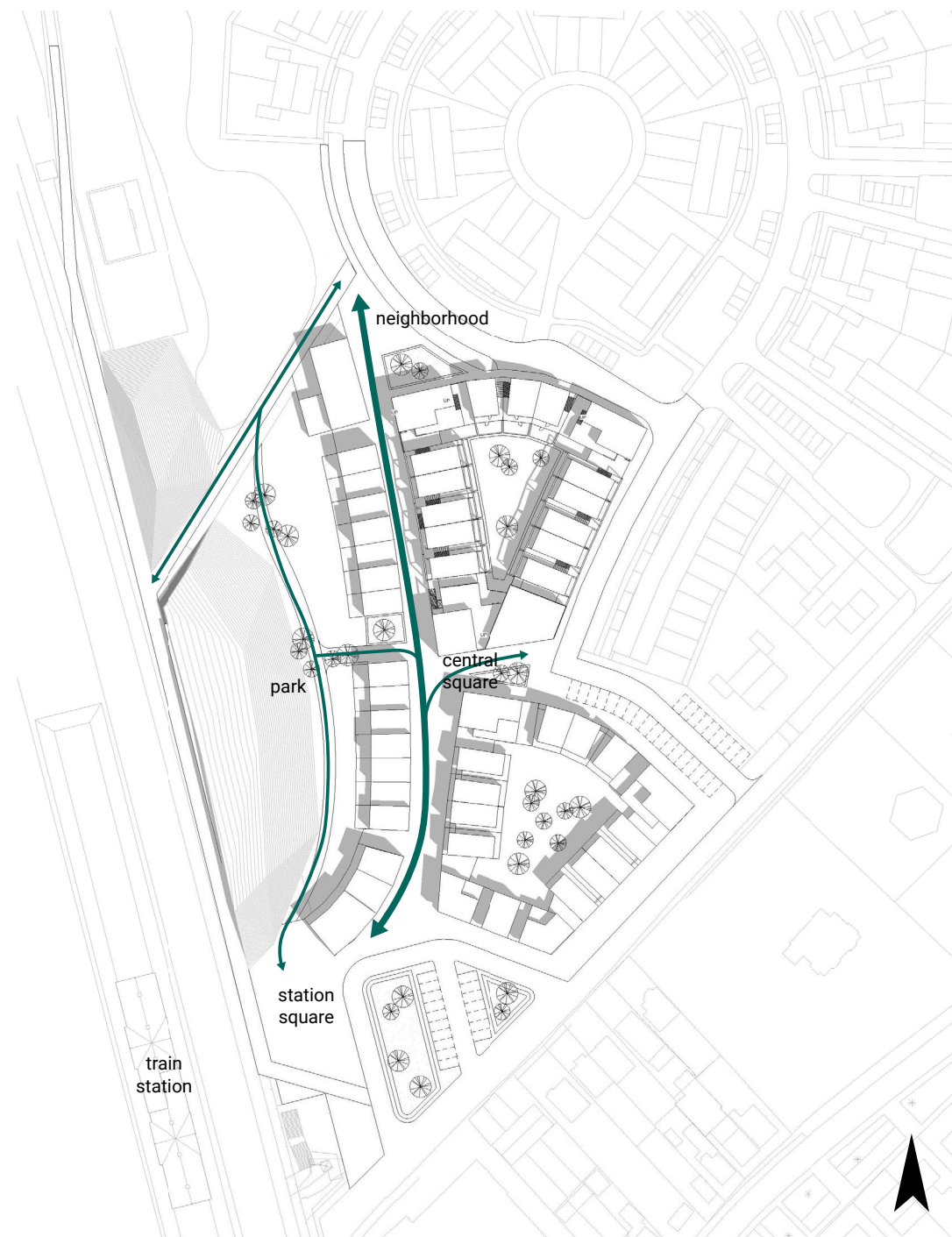
Pedestrian space & routing
Location

parking & K+R children
daycare

underground parking
inhabitants

parking visitors,
healtcare hub

parking supermarket,
visitors, K+R station

Car routing & parking
Location
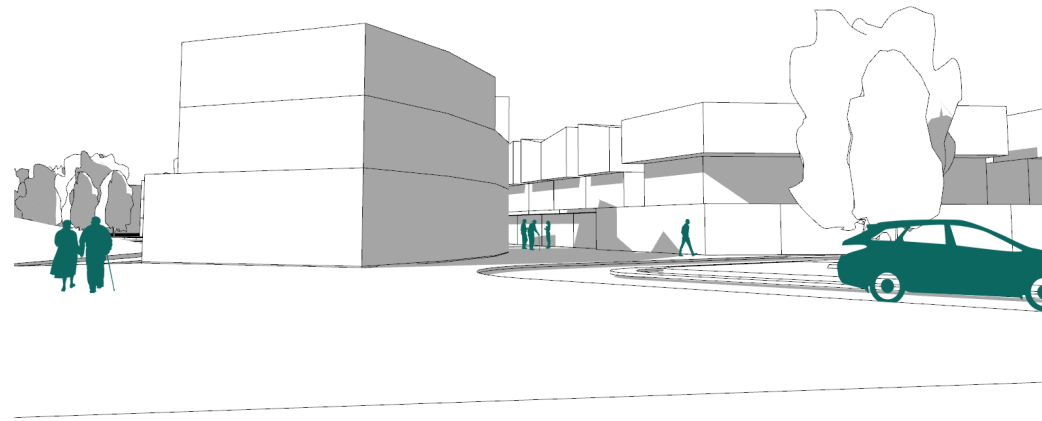
Starting at Station square
Walkthrough
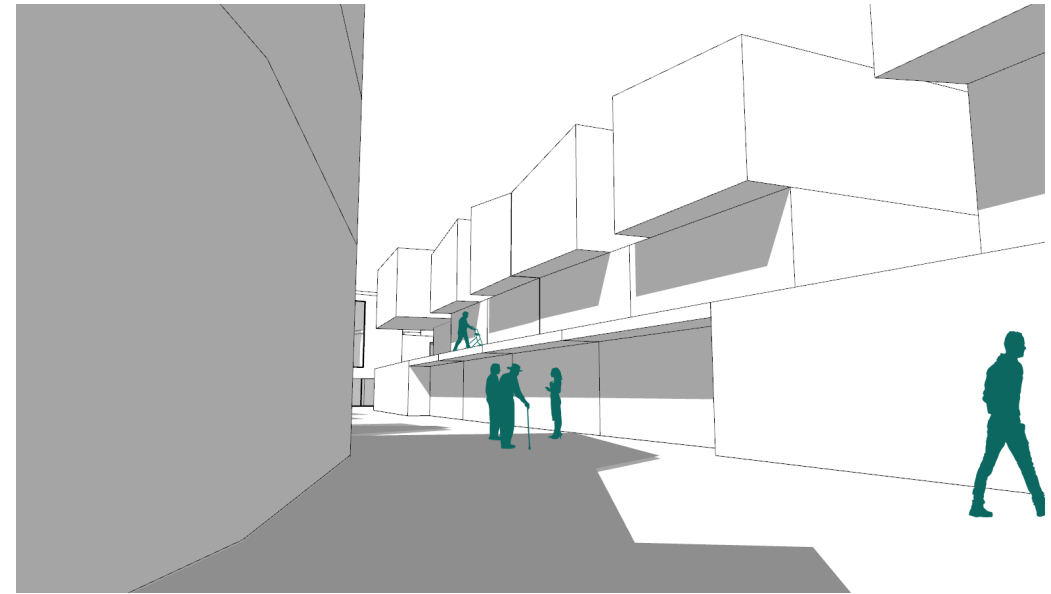
Entering neighborhood
Walkthrough
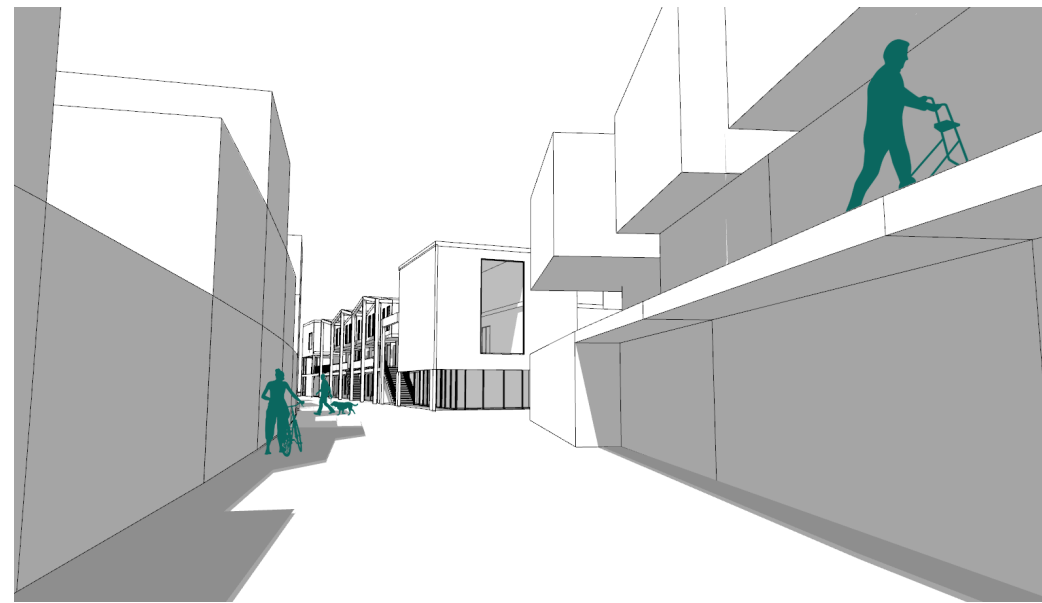
Walking through pedestrian street
Walkthrough

Entering central square with Care Hub
Walkthrough
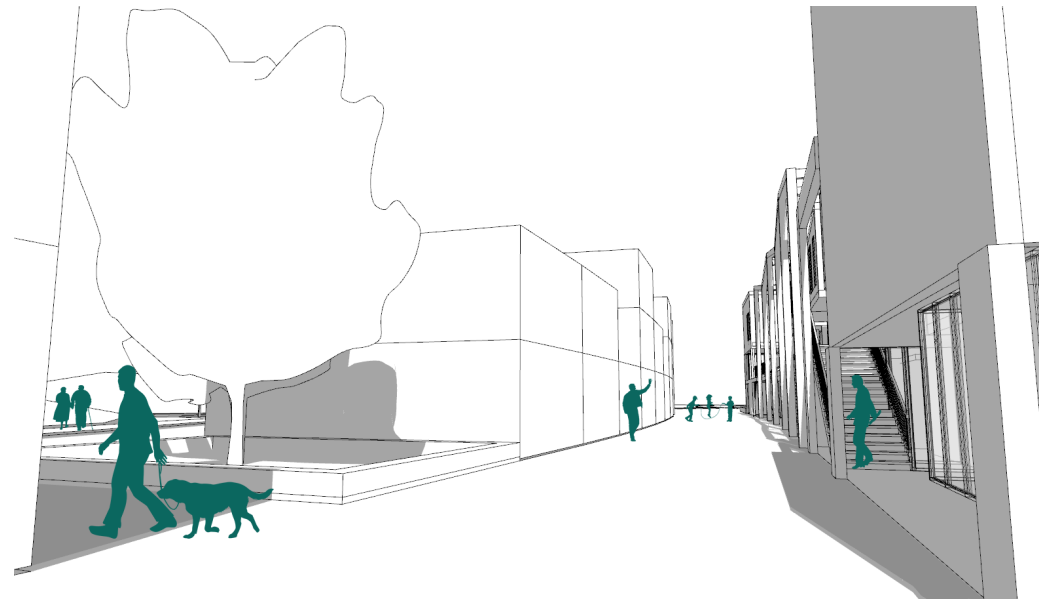
Continuing through pedestrian streets
Walkthrough

Pedestrian street
Walkthrough

the facades of the block coul dbe more elaborated at this stage in terms of materialisation

Taking a look back
Walkthrough

Courtyard
Walkthrough
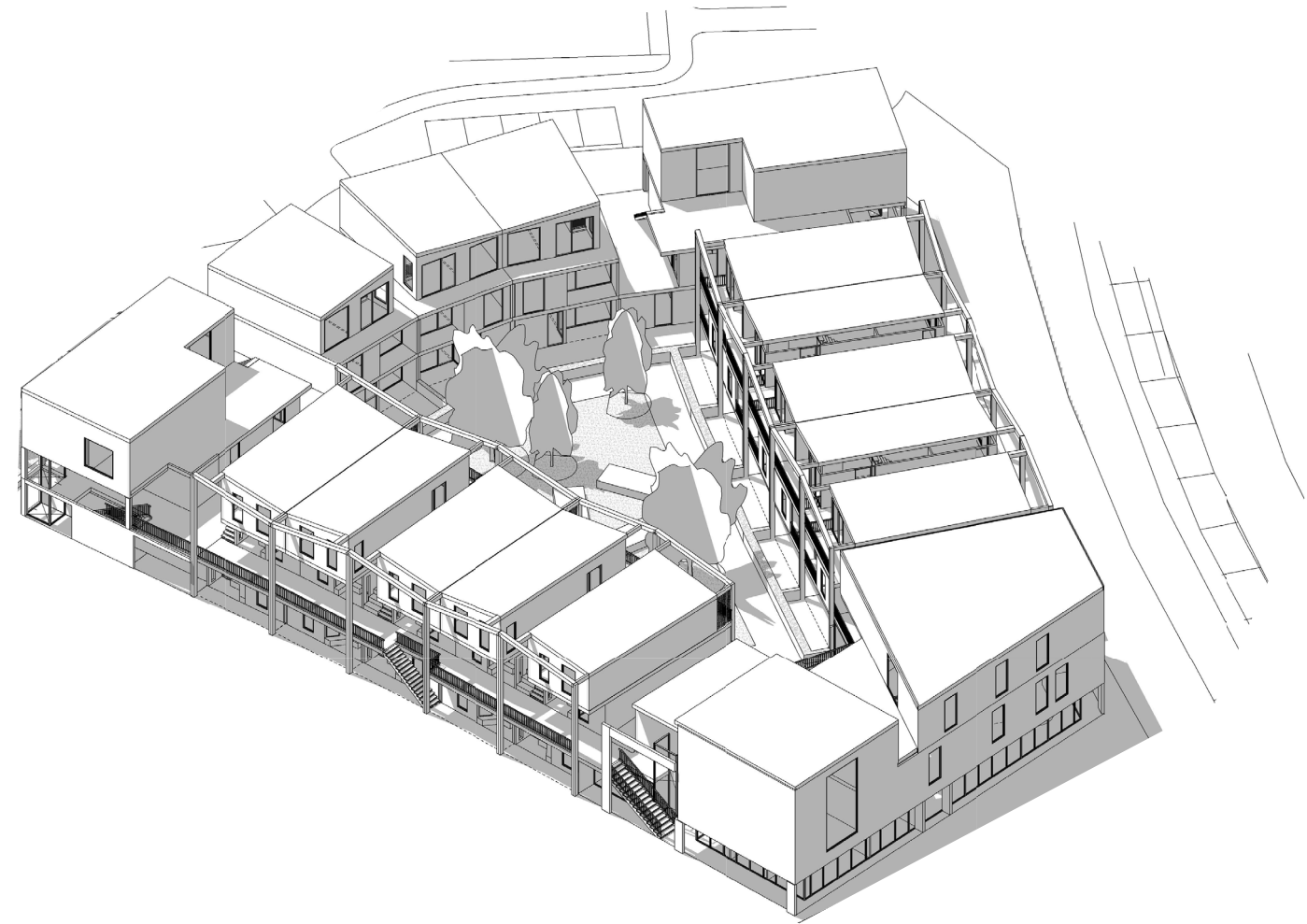
Building

The general layout of the building is clear. What misses is the further development of the healthcare hub, the storages and technical representation o the walls.

Ground Floor
Building

First Floor
Building

Second Floor
Building
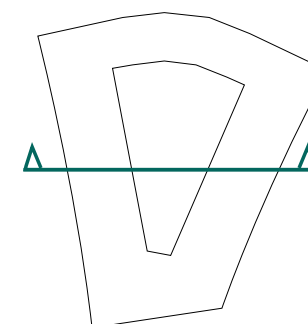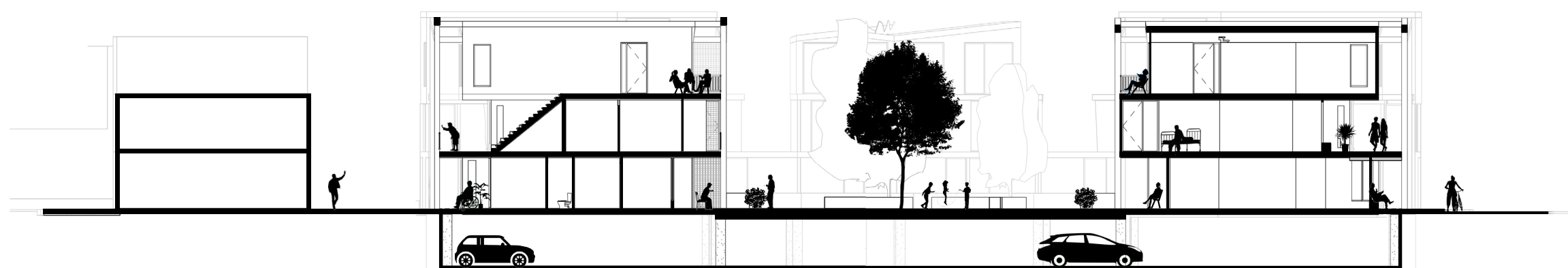
Cross section
Sections
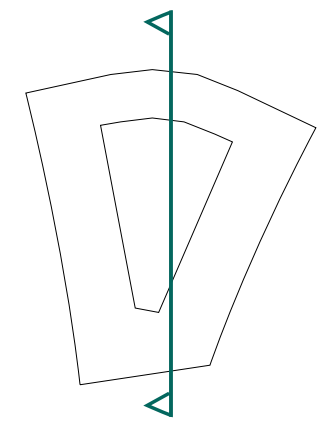
Longitudinal section
Sections

The concept of materialization is known, but not yet showed upon these drawings. The translation from reference towards design still has to take place.

Elevation west facade
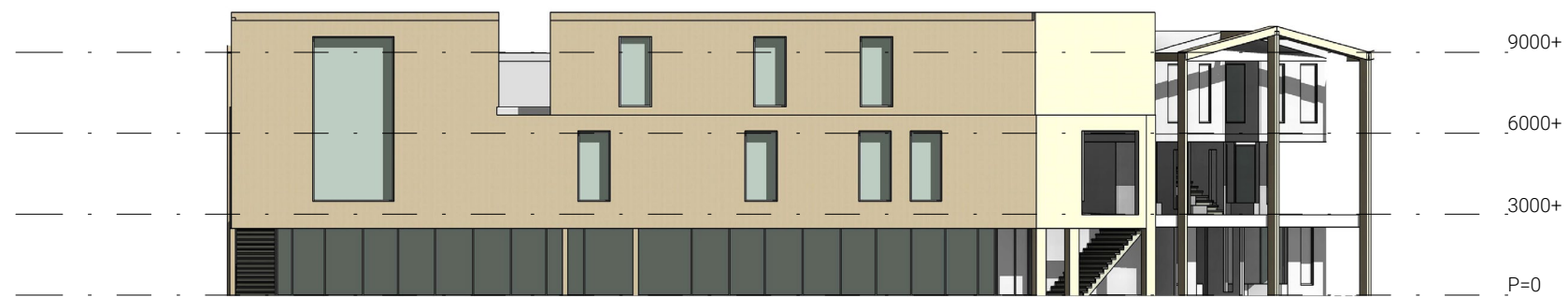
Elevation south facade

Facades

Saunahaus, Koblach

Housing complex Borchrijk, Harkstede

Materialisation

Just before P3, the final choise on the building structure has been made. To be able to buld in a circular way, I strived for a demountable structure with parts that could be re-used. In this, the curved shape of the floorplans caused difficulties in this idea as the floor aren't perpendicular. Therefore concrete floors for example wouldn't work, as they wouldn't be usable after demounting them. Reshaping them back into a perpendicular shape is not possible. Wooden CLT floors however could be easily trimmed back into a perpendicular, modular size by sawing a piece off to make them usable again in another building. Therefore, CLT will be used as main structure.

Figure 4.20 Joint between wall panel and floor slab using angle bracket.

Figure 4.21 Joint between wall panels and floor slab using fully threaded screws and dowels.

De-mountable joints between CLT walls and floors (from: The CLT Handbook, 2019)

Interior with the use of CLT (from: The CLT Handbook, 2019)
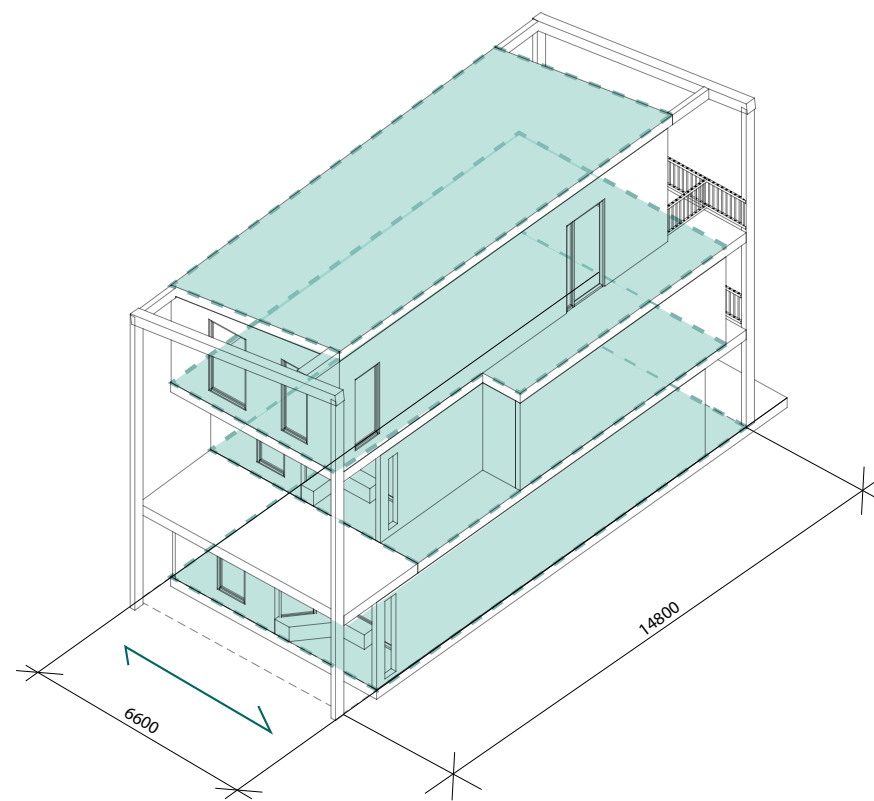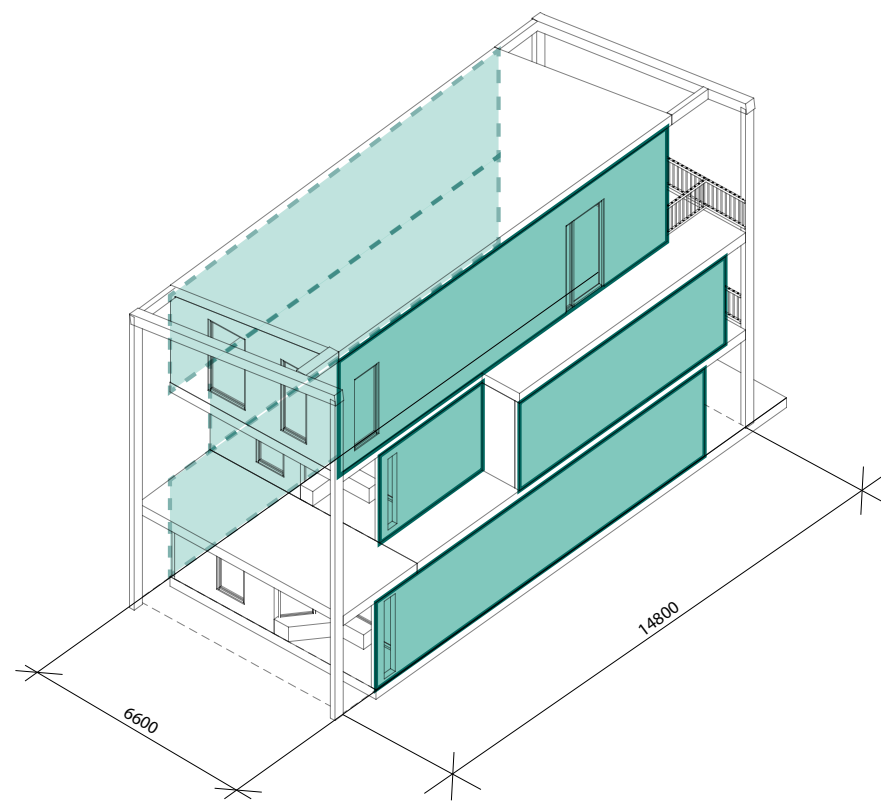
Load bearing walls & floors: CLT
Structure

Wooden balconies and framing, Housing complex Borchrijk, Harkstede
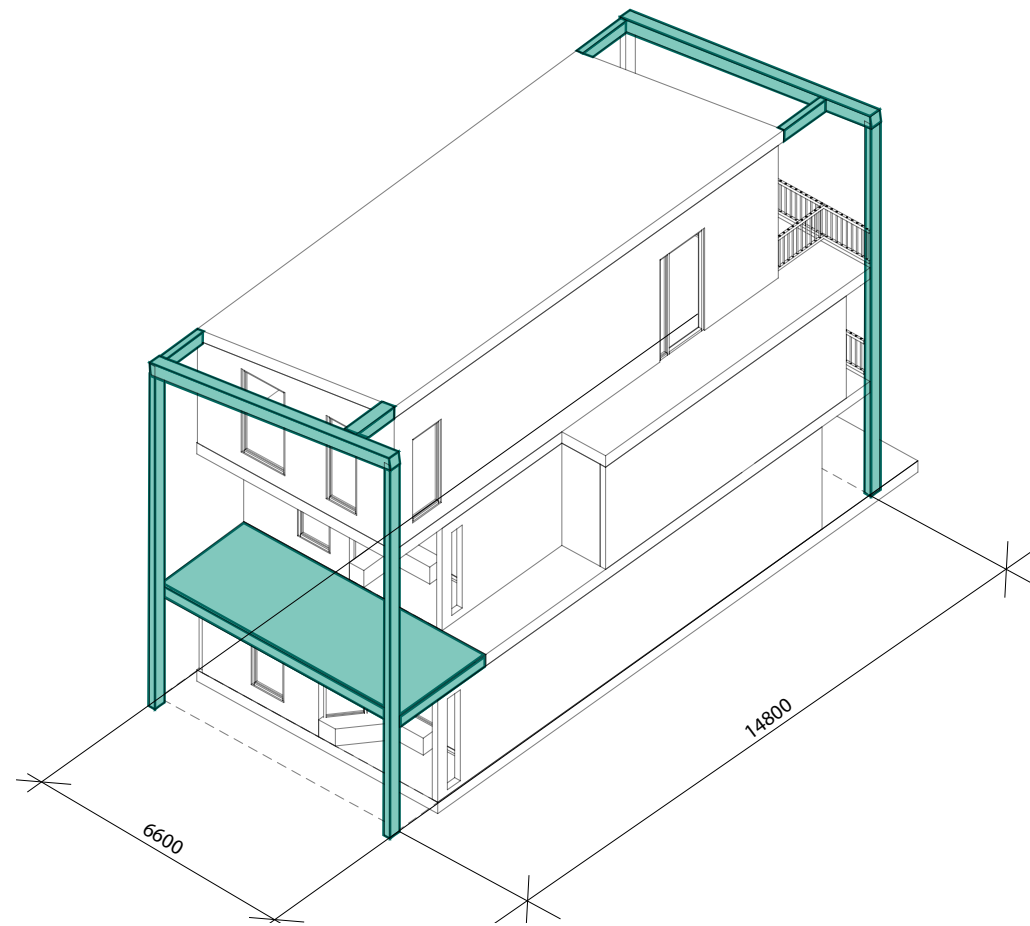
Gallery & exterior frame
Structure

As the building is adaptable in it's dwelling configuration, applying a centralized cooling and heating system is a logical choice. Therefore, a geothermal heat pump will be installed. Low temperature radiators will be used to deliver the heat and cold to the room.

Rain water
collect rain water to use as grey water in apartments

Energy
Implement solar panels in roof to generate electrical energy and use for additional heating

Ventialtion
Natural ventilation intake for healthy and natural indoor climate. Mechanical outtake with heat recovery.

Heating & cooling
Collective closed-loop geothermal heatpump to suit adaptive dwelling layouts.

Climate

From P3 towards P4

april 15th 2020 - may 15th 2020

Materialization
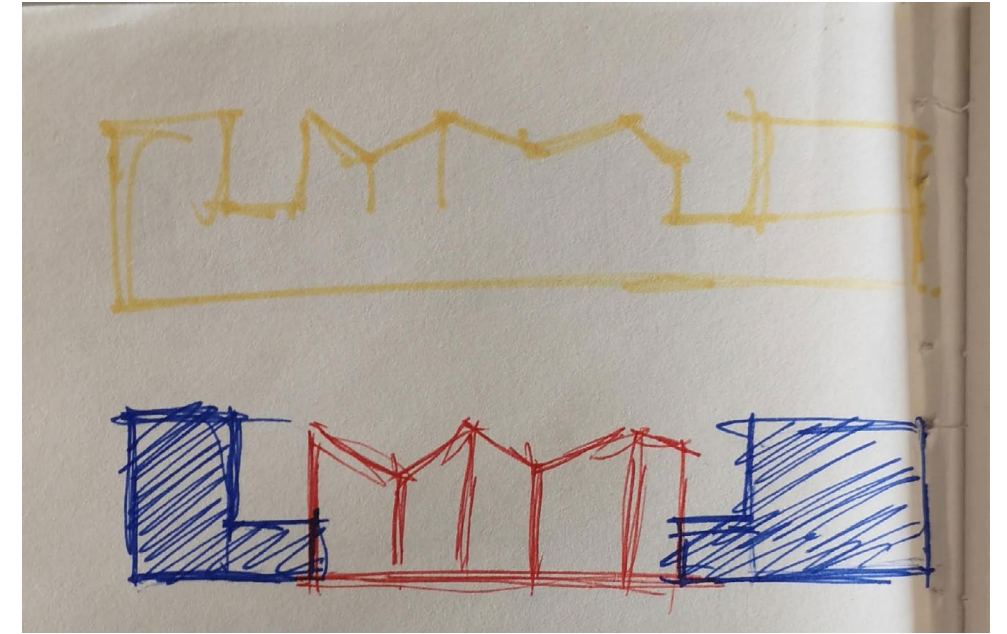
In the materialization of the facades, I used the simple sketch we saw earlier as the main principle. Each layer in depth in the facade should have an own appearance in order to express the layering in the composition.
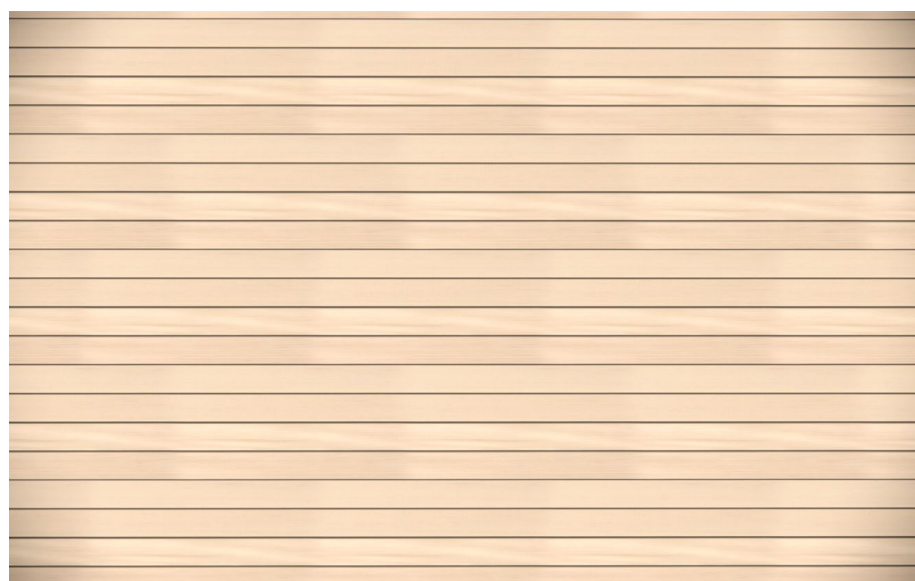
Corners
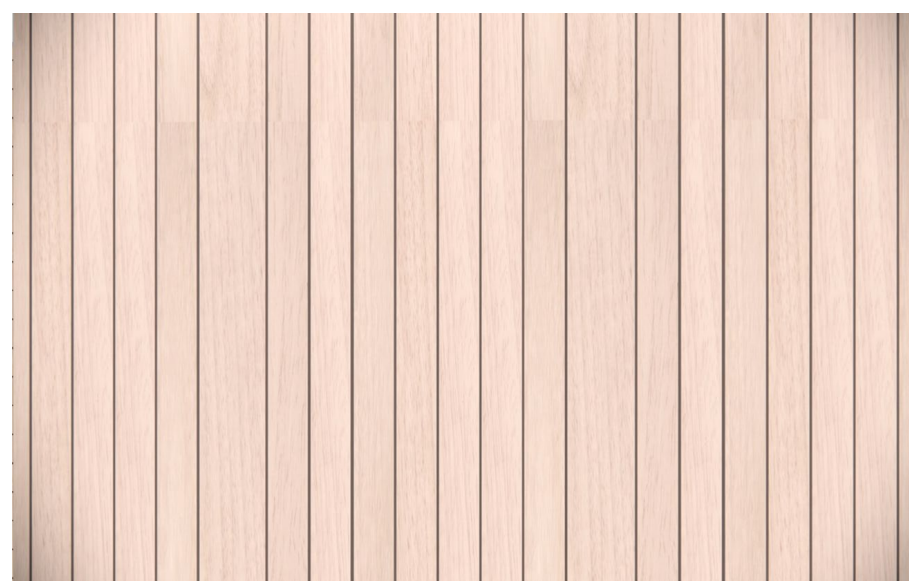
Ground floor and second floor
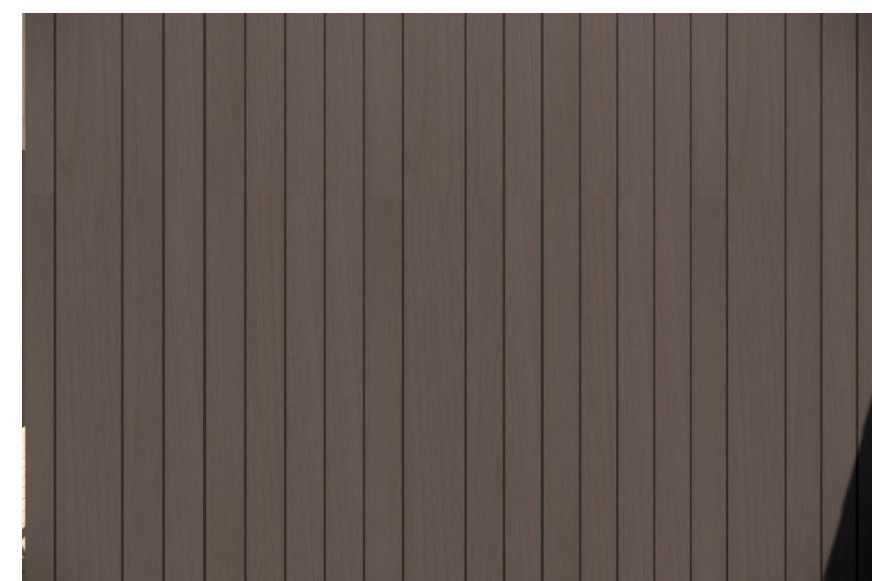
First floor

The applied material is wood. As most of the surrounding buildings around the plot are made of brick, the choice for wood drives from one of the design tools. To be able to identify yourself with a neighborhood, it helps if it is easily recognizable. Therefore, wood contrasts nicely with the surrounding brick houses. It also provides a warm, inviting atmosphere.

Materializing the corners

Wooden louvers are being used around the building to enhance the solid appearance of the corners, without losing the desired connection with the street. They are used around the stairs and elevators towards the galery on the first floor. Their semi open appearance highlight these positions. During the day, they will form a nice solid finish of the corners. At night, light can cast through to brighten up the corners and make them more inviting and safer.
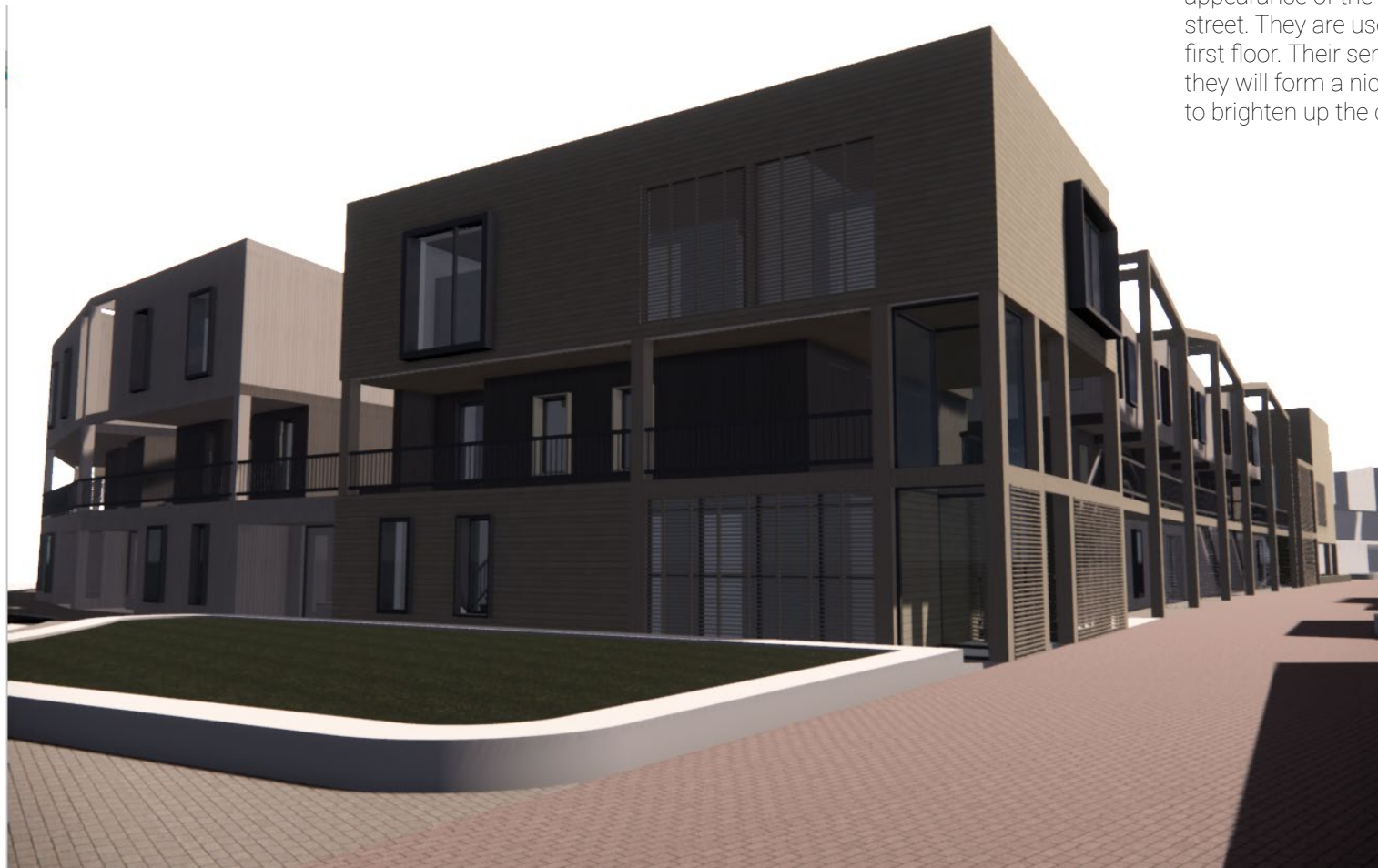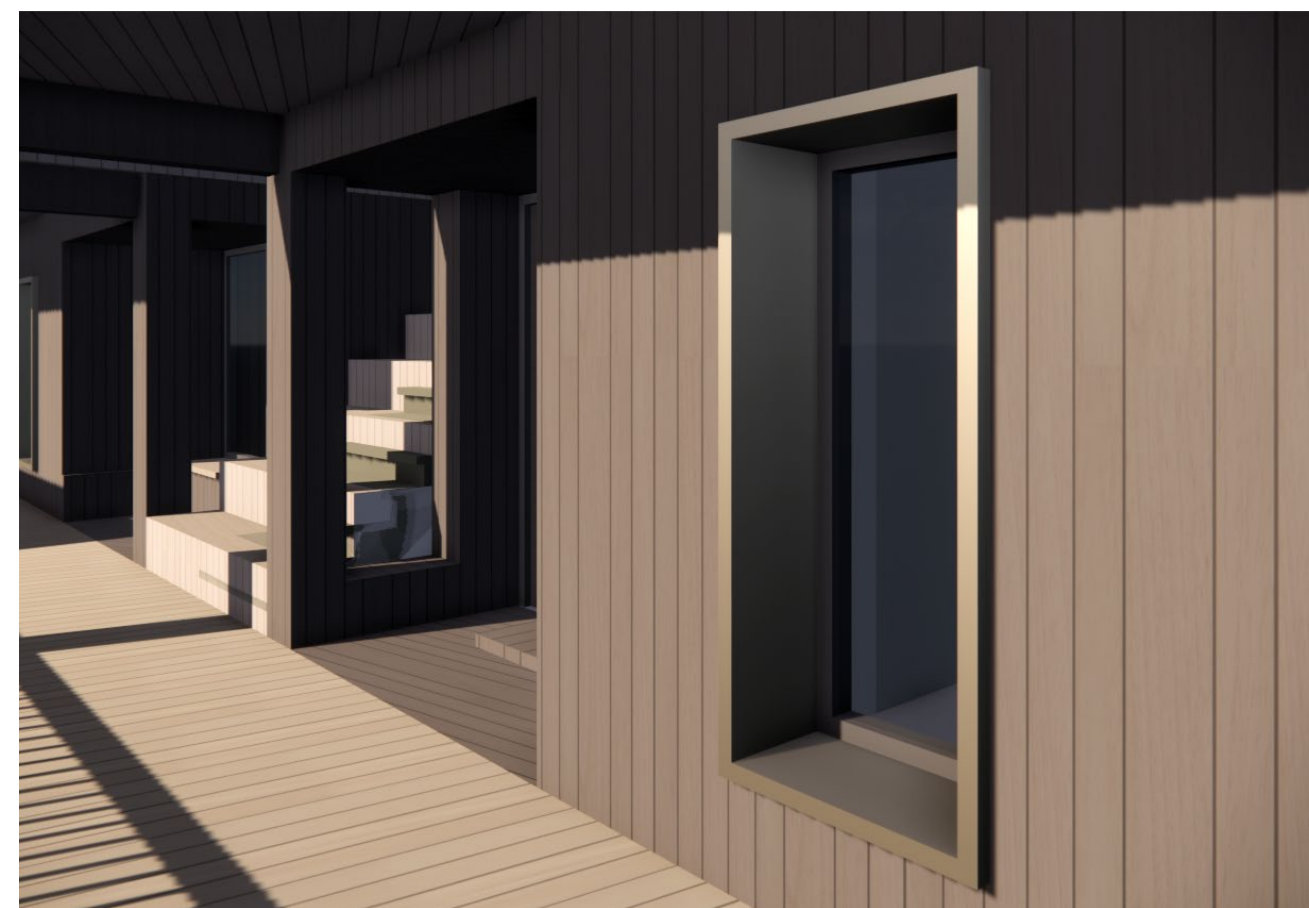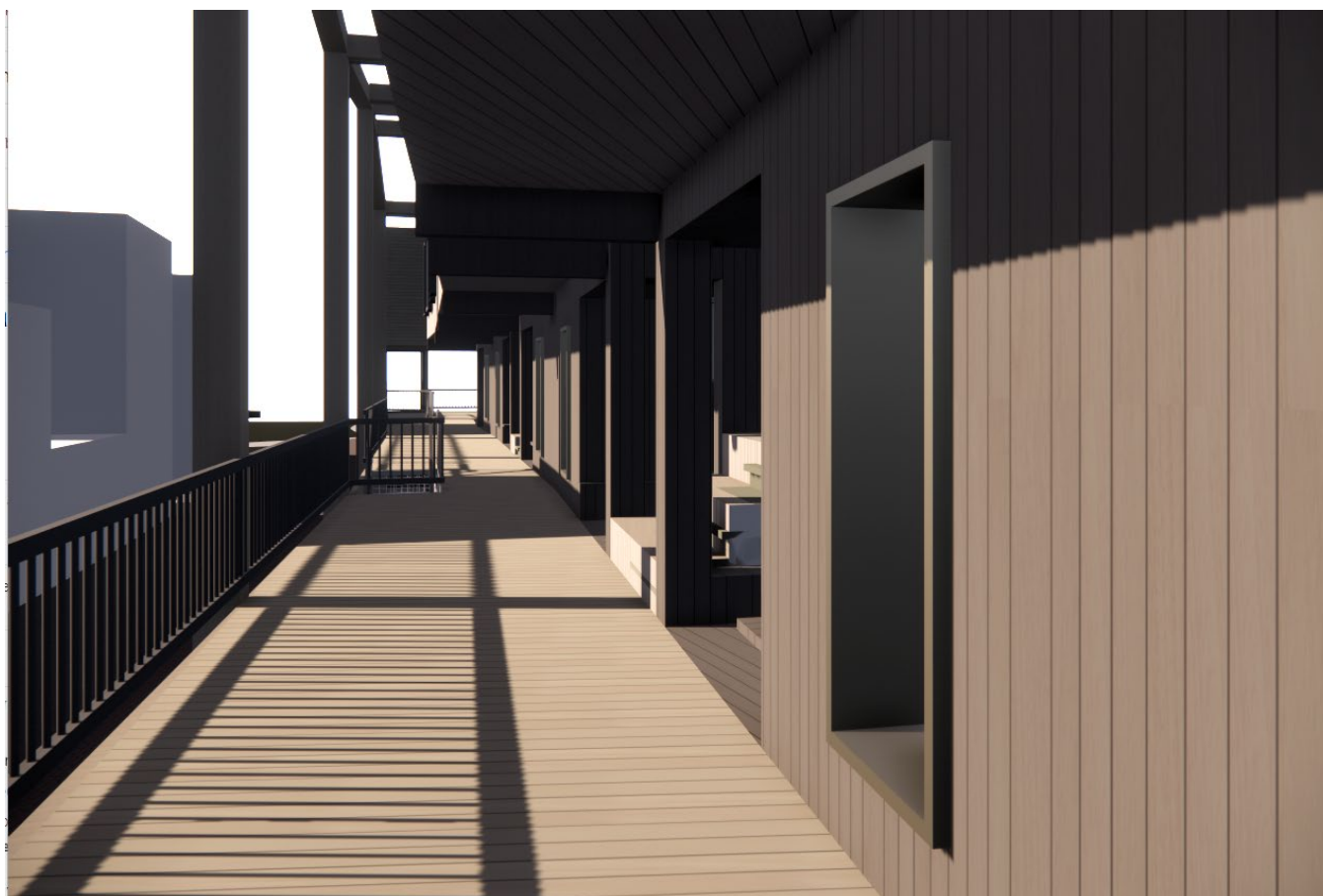
Aluminum frames around the windows provide more privacy inside the dwelling from passers-by. From the inside, still a good look towards the outside could be obtained. The recessed frame also provides opportunity for personalization as placing plants. Also it could be used as a place to sit.

Redeveloping the healthcare hub facade

In redesigning the healthcare hub facade, a much greater emphasis on the entrance has been made by making a clear division between the two joining volumes and adding a canopy above the entrance. Also by applying a different sized windows, that are placed in aluminum frames, a more playful appearance of the facade has been realized. Wooden louvers are also used to enrich the facade. Alongside the facade, large planters to are created that on one hand provide privacy towards the doctor's offices inside, and also provide places to sit and meet other people.

North facade
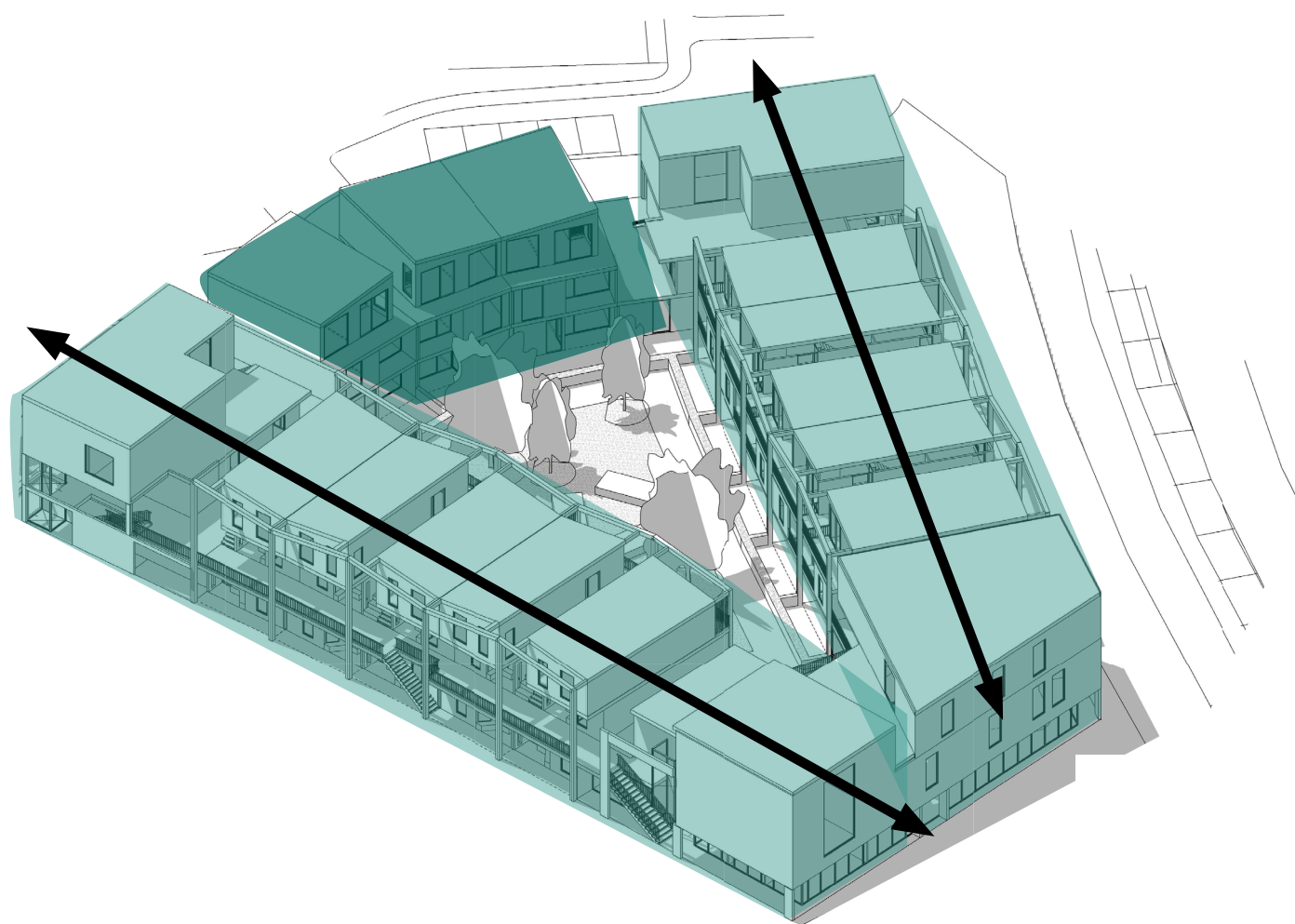
The north facade has been designed in a slight different way than the other facades. As could be seen, the building could be seen as in the diagram at the left: two main directions that end in the healthcare hub. Both of these directions are connected at the north side with the dark blue part. To enhance this in the exterior, the frame that is clearly present in the other parts, is more integrated in the building mass. To make the clear distinction between the corners, the materialisation is kept the same over all the levels.
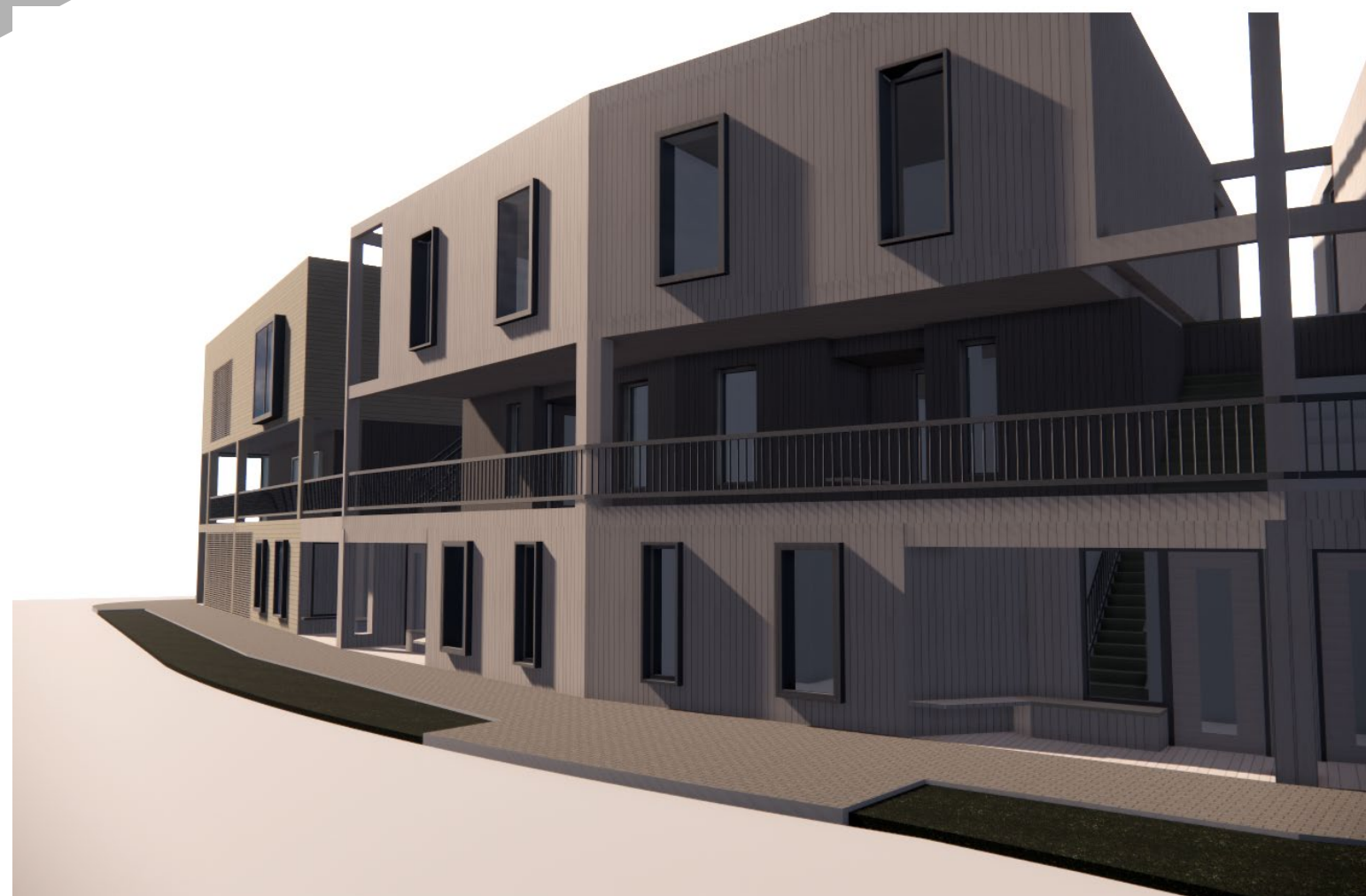
Facade fragment and details

D.01

+9450
03. Roof
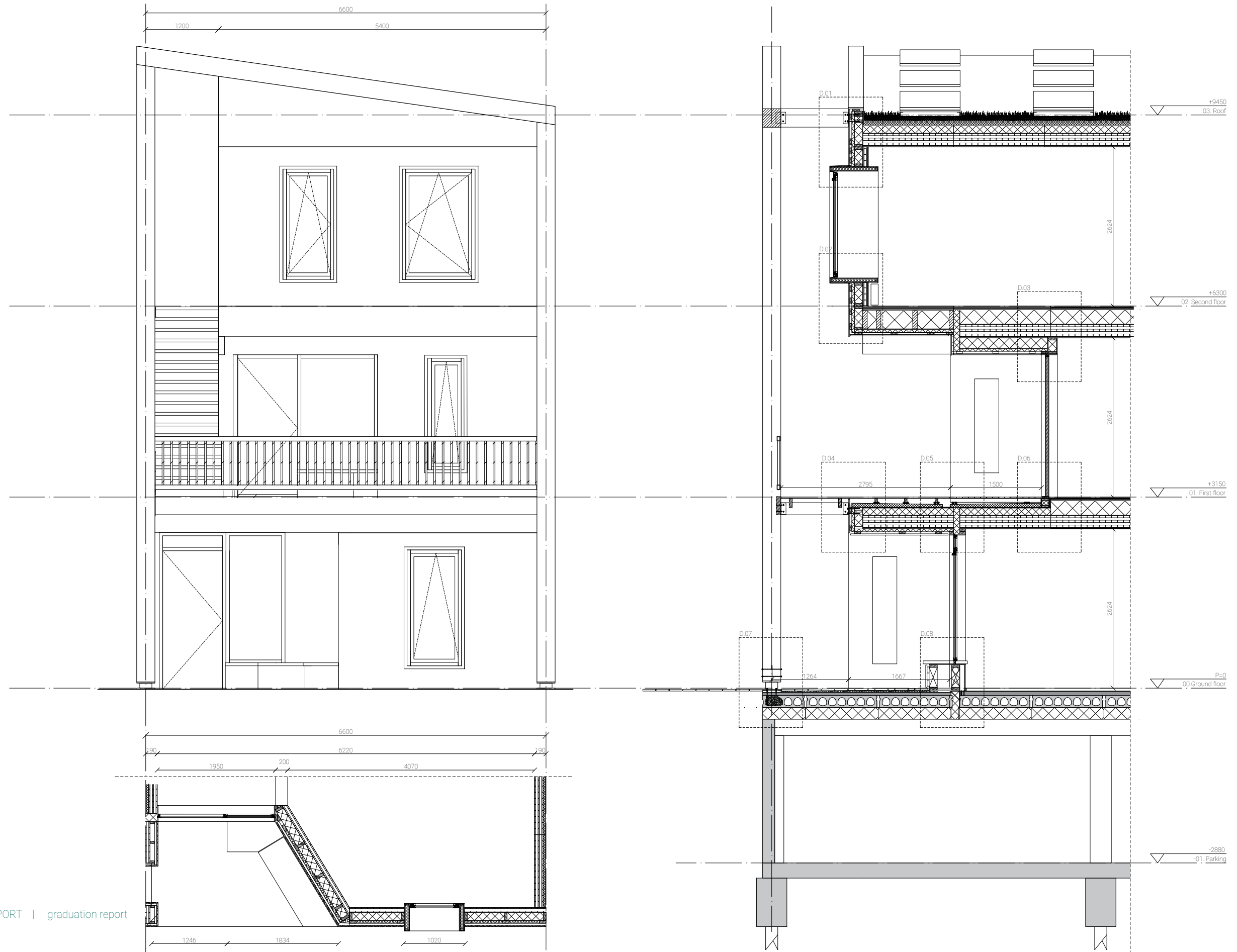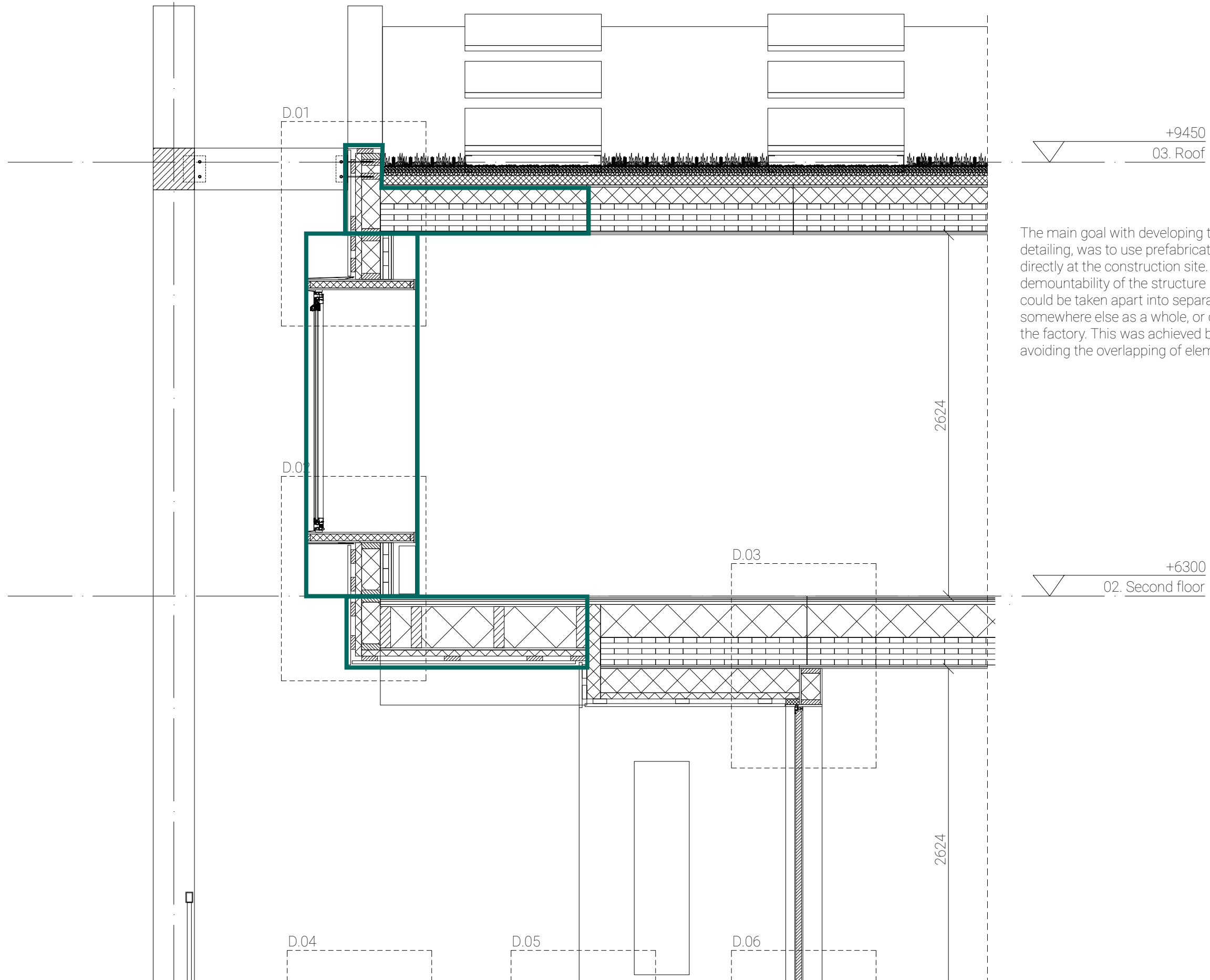
The main goal with developing this facade section and the detailing, was to use prefabricated elements that could be installed directly at the construction site. This was done with the easy demountability of the structure in mind. In this way the building could be taken apart into separate parts, which could be used somewhere else as a whole, or could be further taken apart in the factory. This was achieved by only using dry connections and avoiding the overlapping of elements at the joists.

2624

D.02

D.03

+6300
02. Second floor

2624

D.04

D.05

D.06

Use of the exterior frame

As the exterior frame has a big aesthetocical purpose and also helps marking the borders between public and private, it also has potential to serve wider purposes. Therefore I explored different ways to increase the use of it in order to integrate it better into the project.

the frame could house green screens that could bring in more green into the project. In the same time, the screens could provide more privacy if demanded. People could also use the screen to personalize their property by for example hanging or mounting things to it.
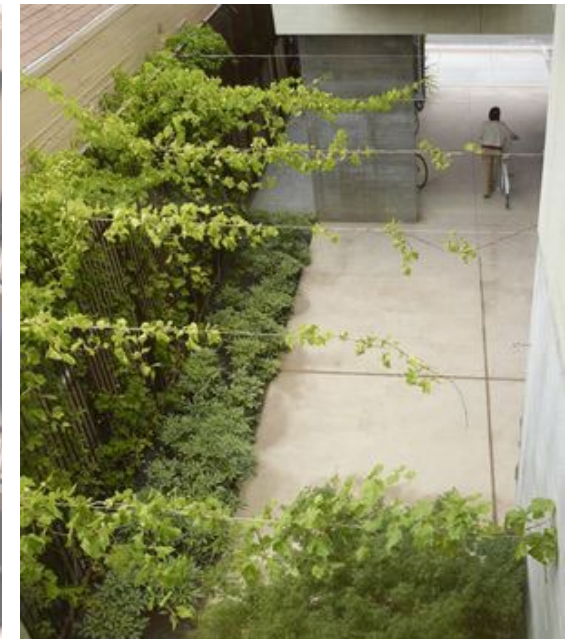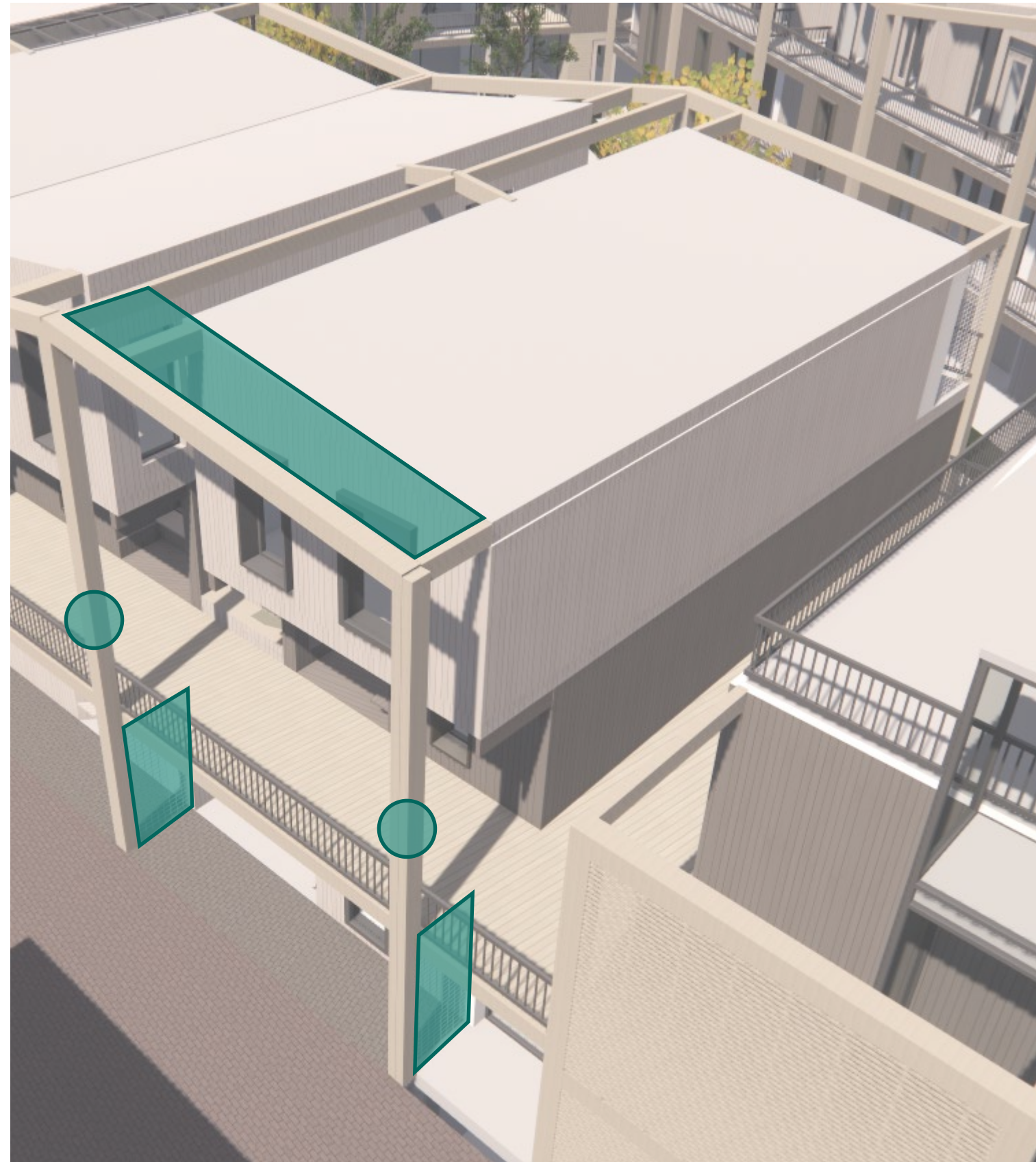
Along the roof, cables could be mounted on which vines could grow. Again this brings more green into the project. It also could develop some more shade which could be nice during hot days.

Apply small hooks or mountings to the wooden columns to allow people to personalize the gallery

At the courtyard side, people could have the choise to also let vines grow along cables, or to choose for example for a sunscreen to be able to regulate the amount of shadow.
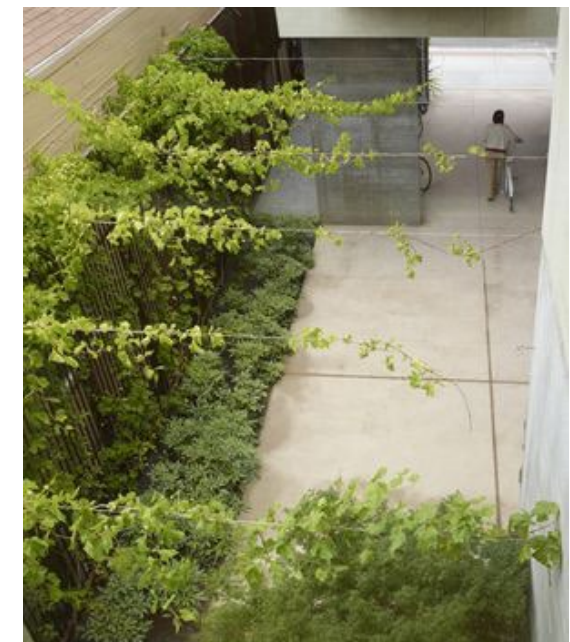
the frame could house green screens that could bring in more green into the project. In the same time, the screens could provide more privacy if demanded. People could also use the screen to personalize their property by for example hanging or mounting things to it.

Use of the exterior frame

The frame in the middle could also be used to grow vines along cables, which gives the outside space underneath a sheltered feeling. In this way the space becomes an outdoor space which could feel like a garden that is shared by the two neighboring dwellings.
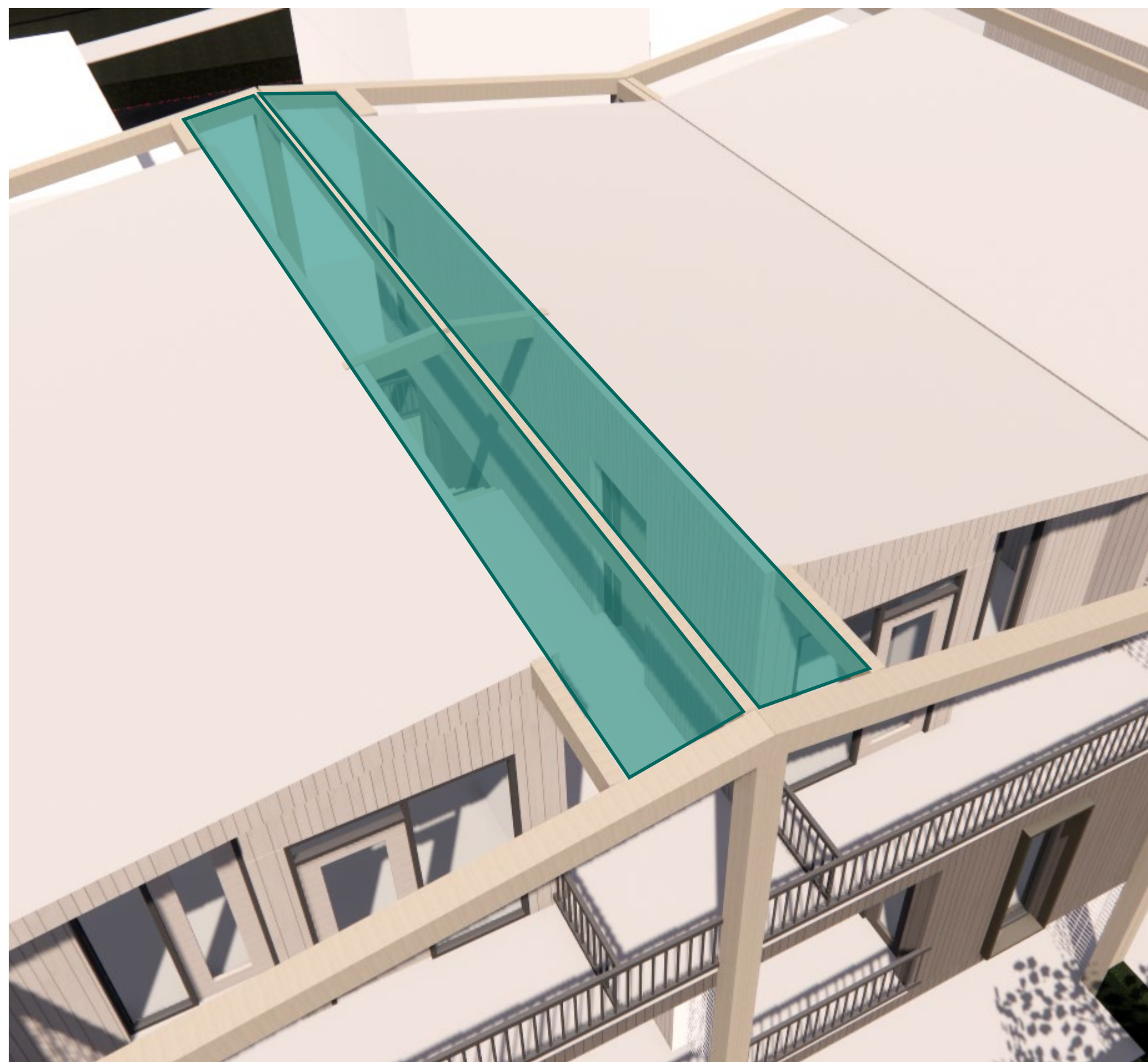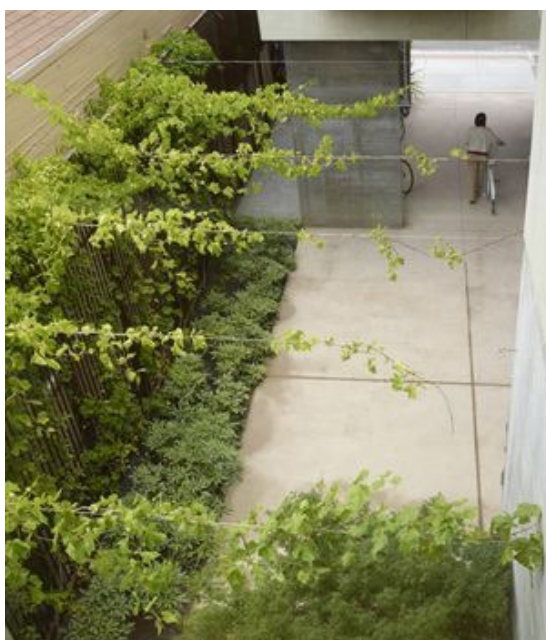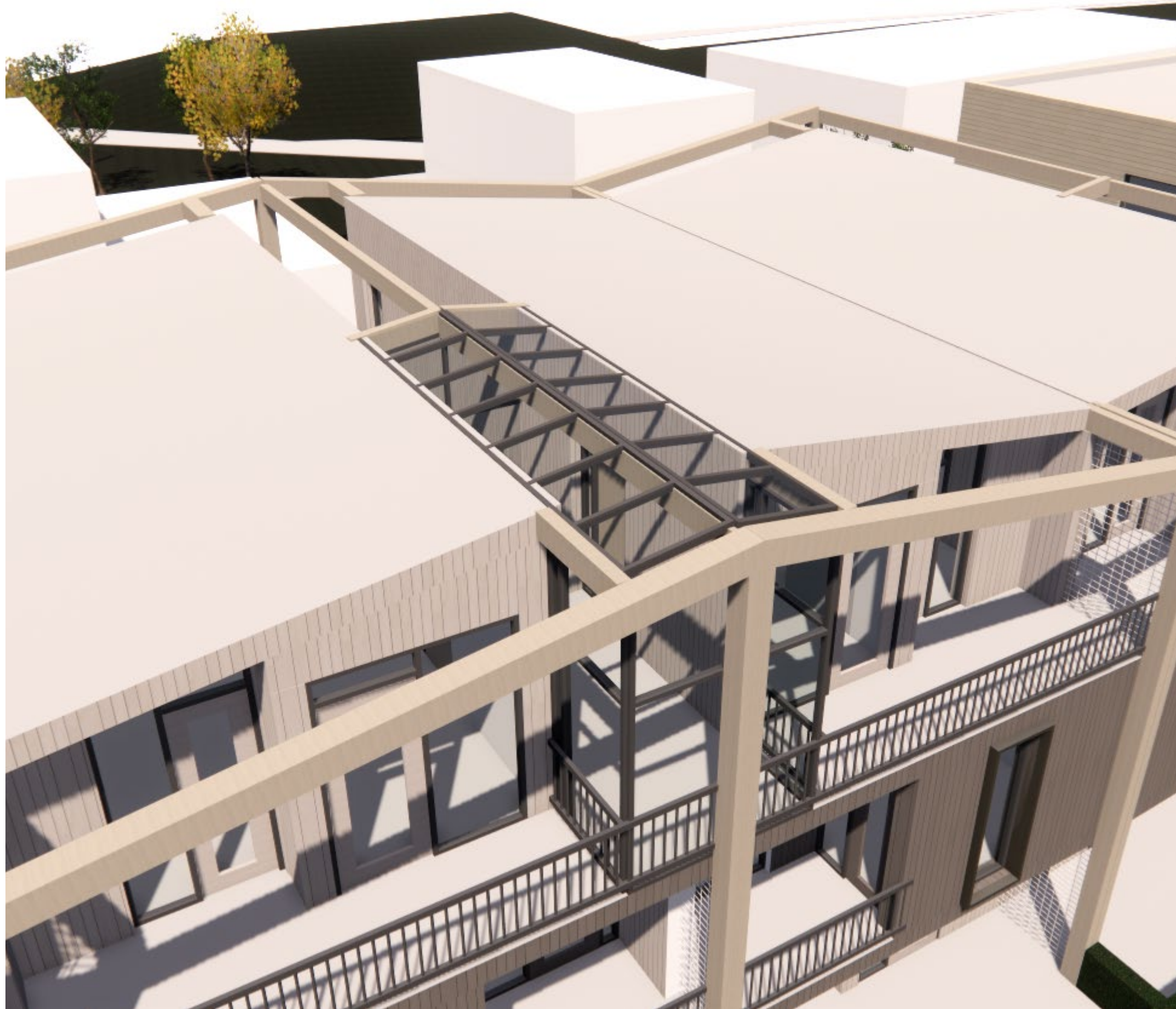
The frame could also be used for creating a semi indoor space with applying curtain wall roof- and wall panels to it. In this way it becomes a small green house which forms a thermal buffer between inside and outside. In this way, plants and crops could be grown there or the space could be used to stay in as it gets warmed up by the sun in the colder periods of the year. The space could be a shared semi indoor space between the two neighboring dwellings

P4

may 15th 2020
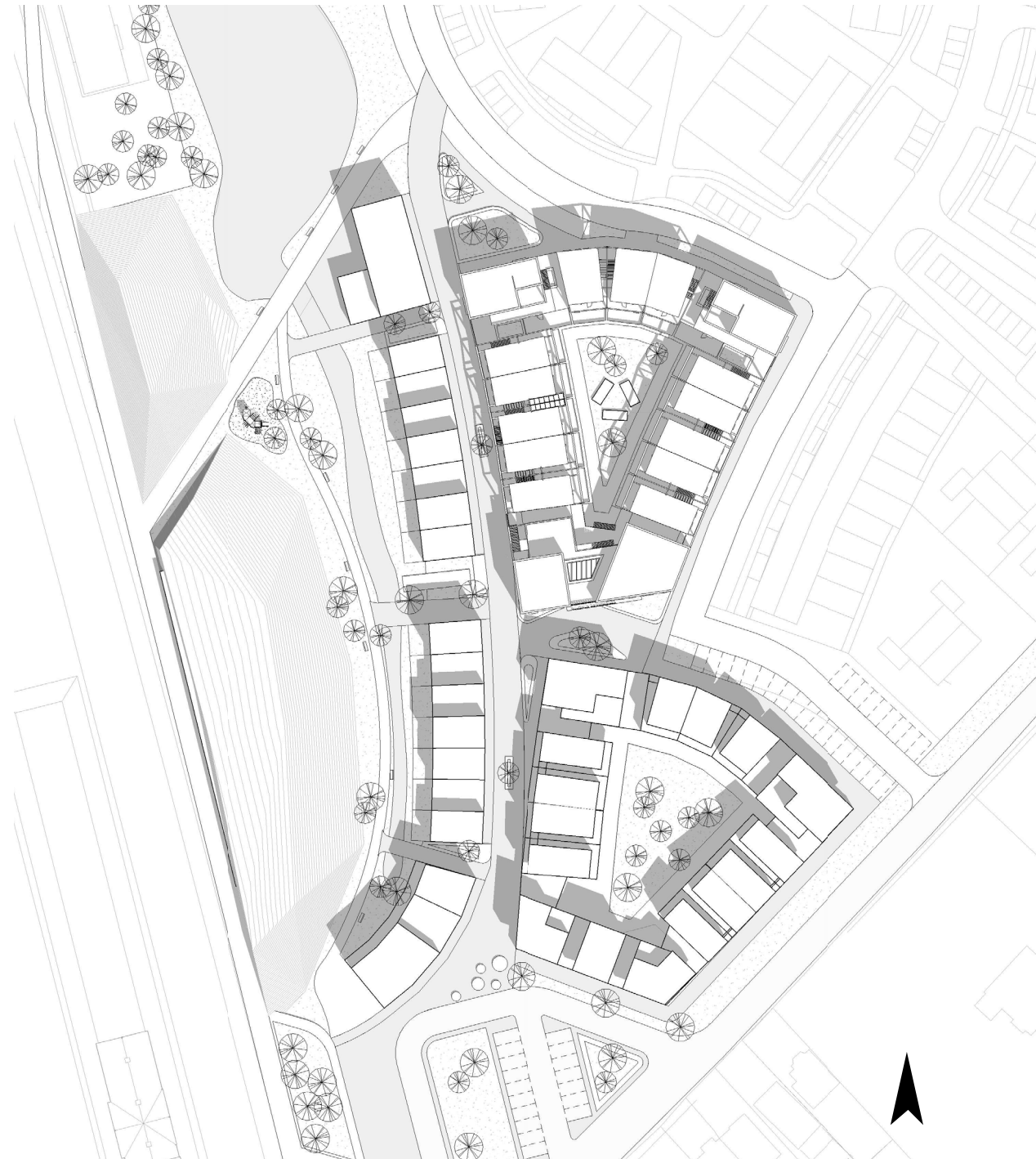
Urban scale
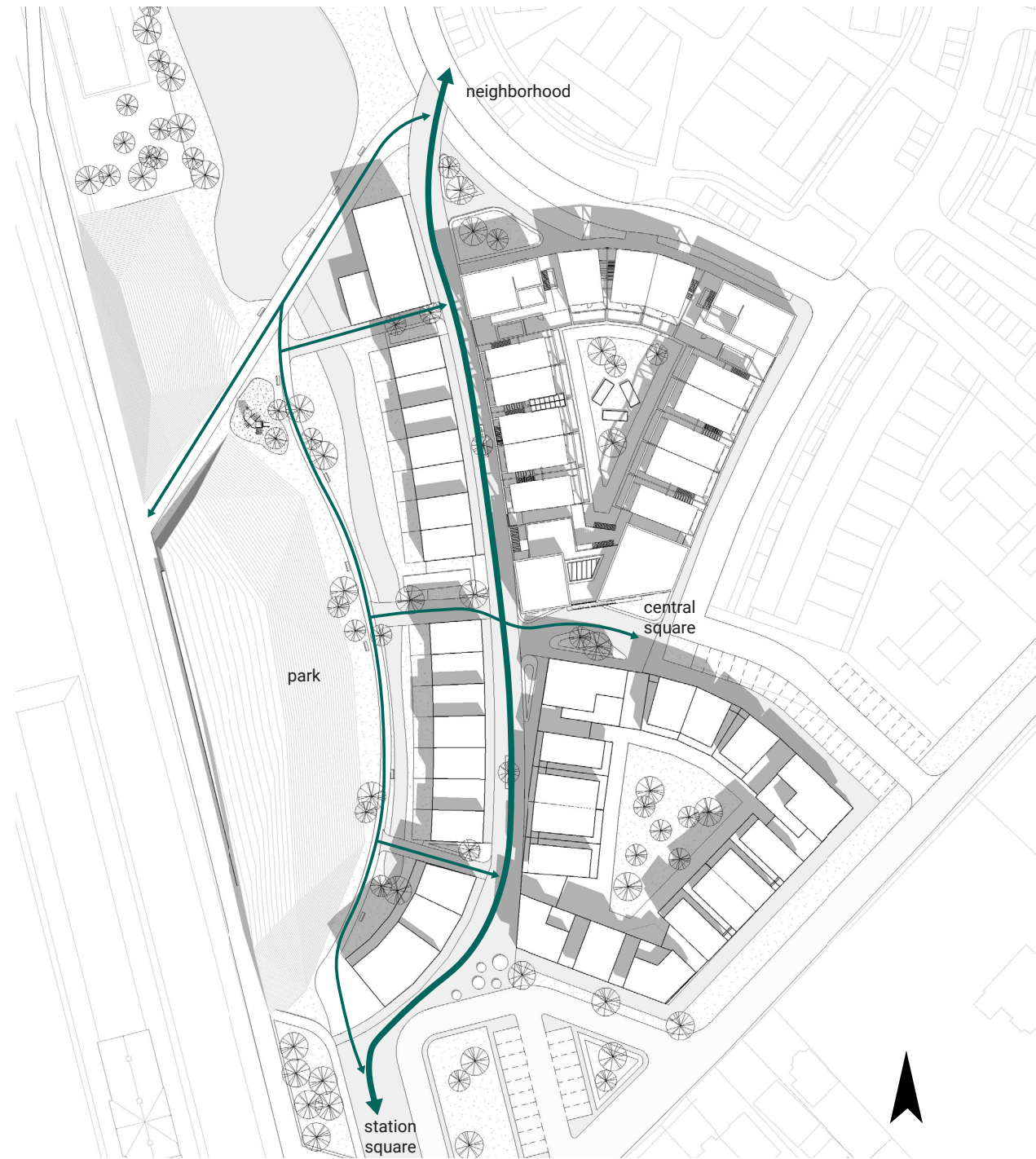
Routing
Urban scale

neighborhood
square

central
square

public park
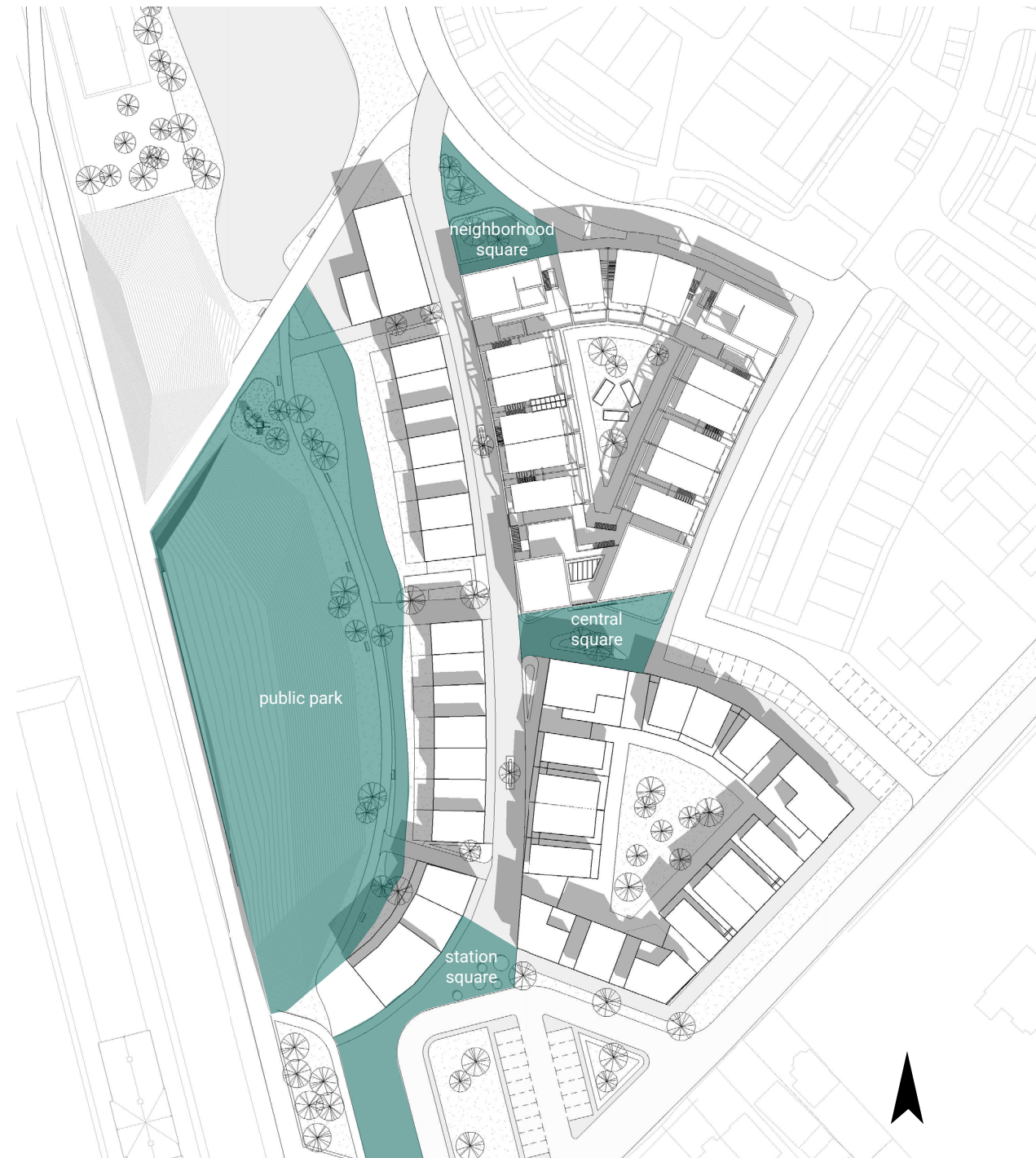
station
square

Public spaces
Urban scale

Public spaces
Urban scale

Children daycare

Neighborhood Hub

Commercial facilities
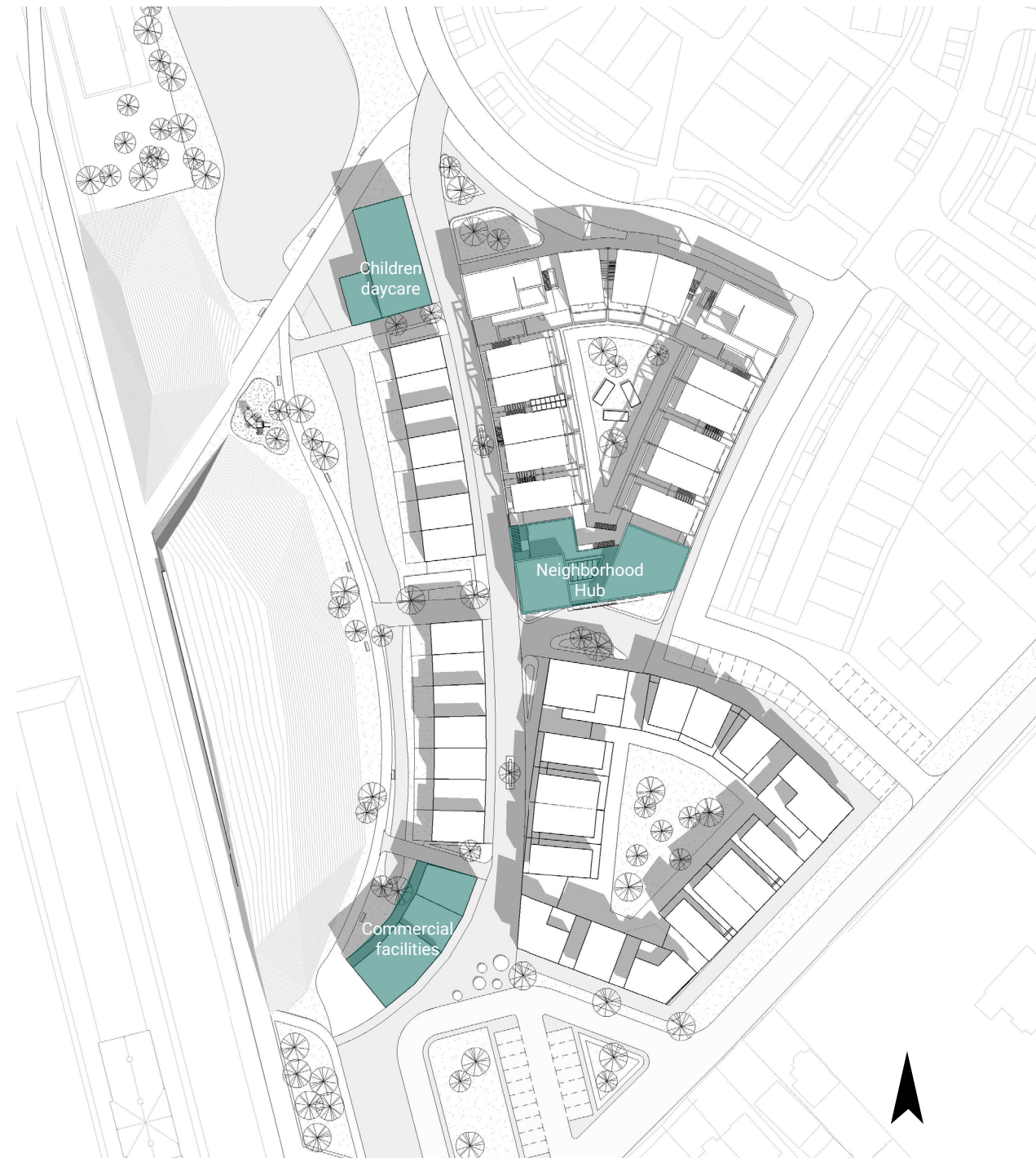
Facilities
Urban scale

Overview
Urban scale

Overview
Building

Plan Ground floor
Building

Plan First floor
Building

Plan Second floor
Building
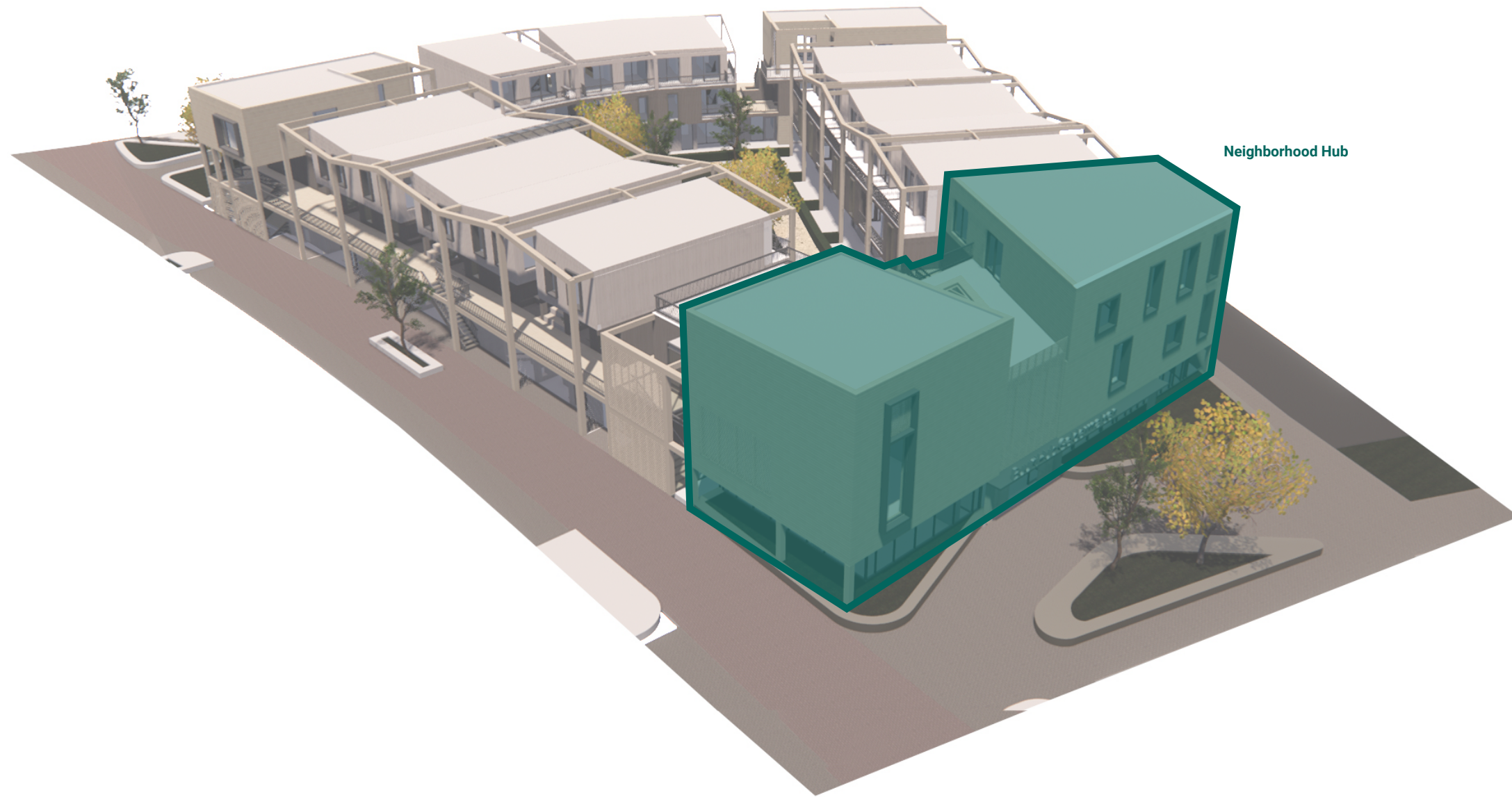
Neighborhood Hub

Overview
Building
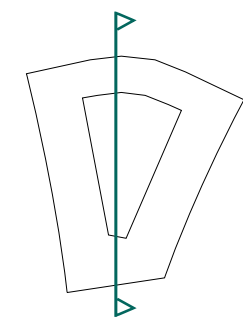
Longitudinal section
Building

Courtyard
Urban scale

Dwellings & circulation

Overview
Building

street

courtyard
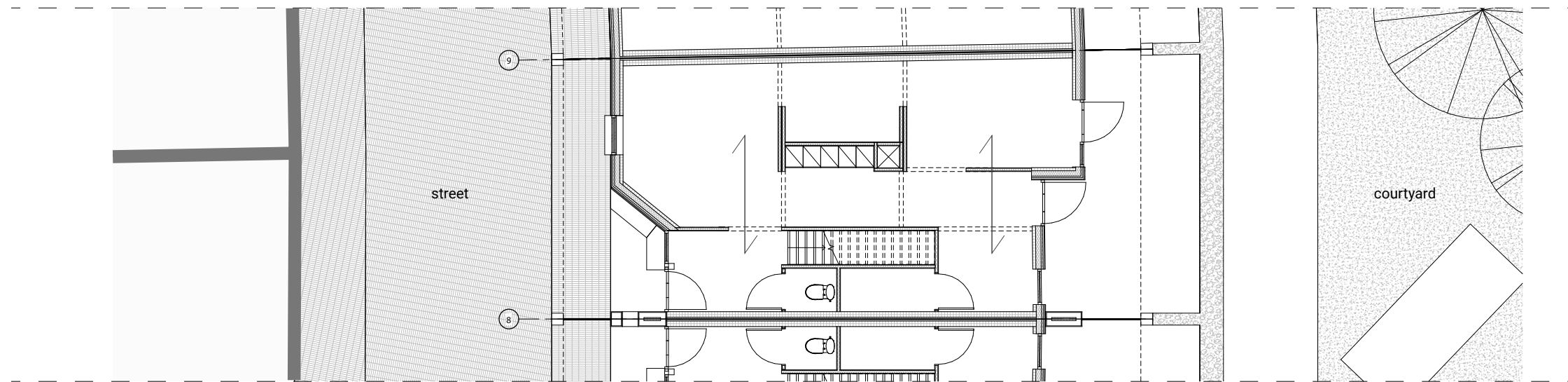
Fragment ground floor, 1:50

Soft edges: ground floor
Building

street

courtyard

9

8

Fragment ground floor, 1:50

public ⟶ private ⟵ public

Soft edges: ground floor
Building

gallery

courtyard
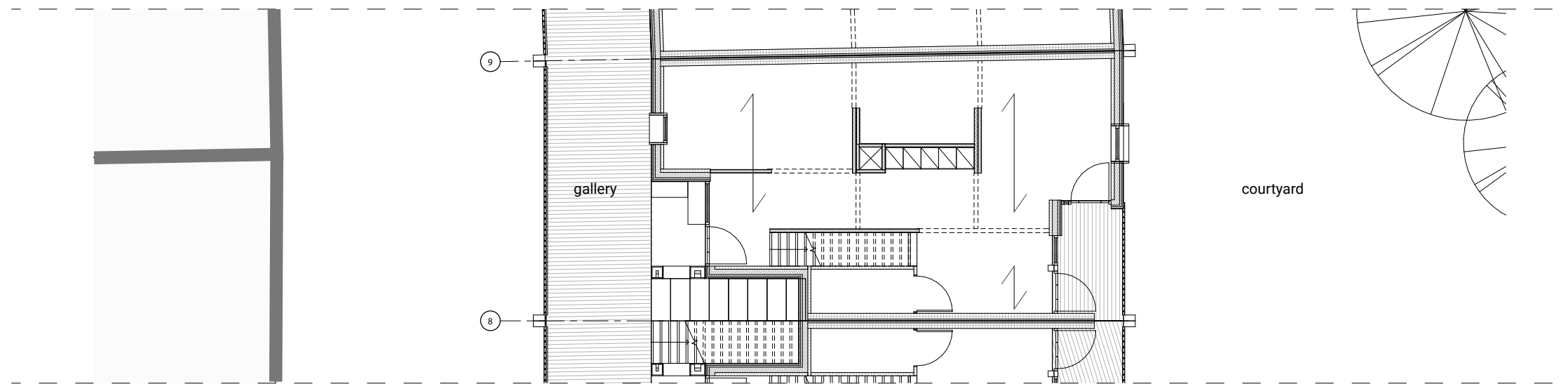
Fragment first floor, 1:50

Soft edges: first floor
Building

Fragment first floor, 1:50

gallery

courtyard

9

8

public   private   public

Soft edges: first floor
Building

staying in front of the house

personalisation

see and be seen

space for mobility scooter
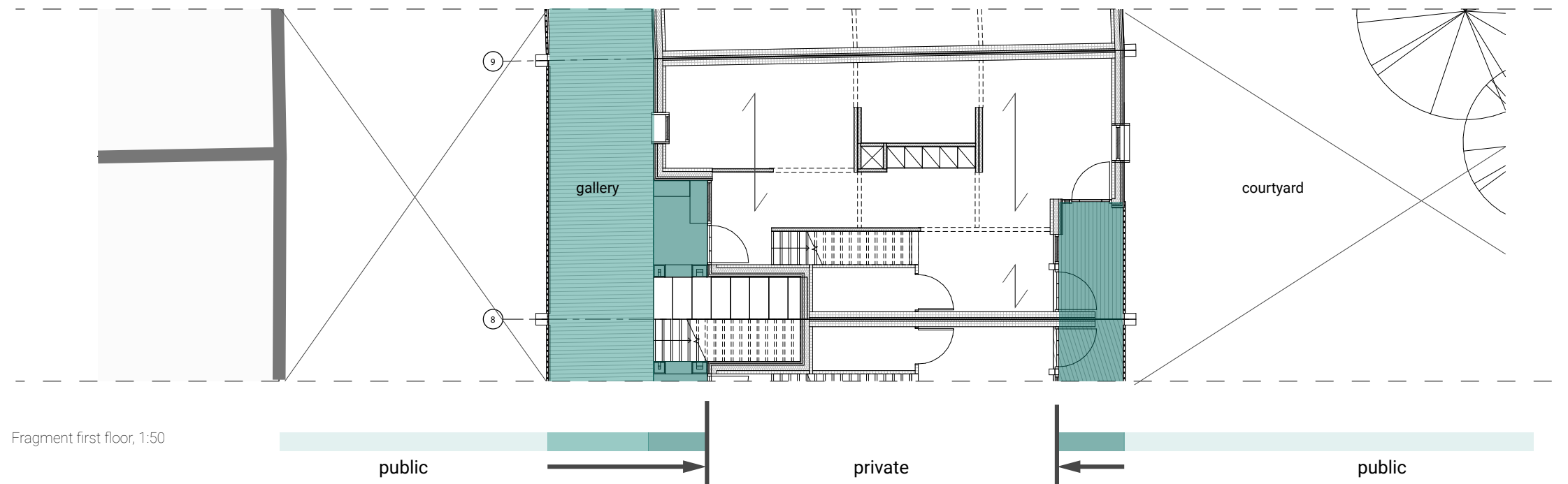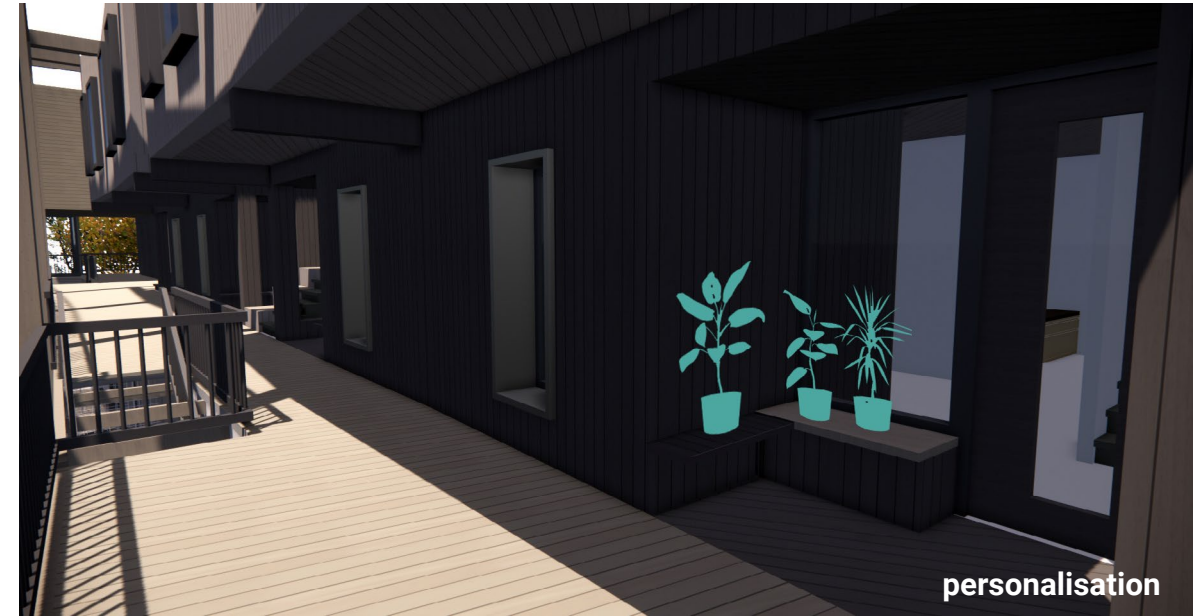
Soft edge: first floor
Building
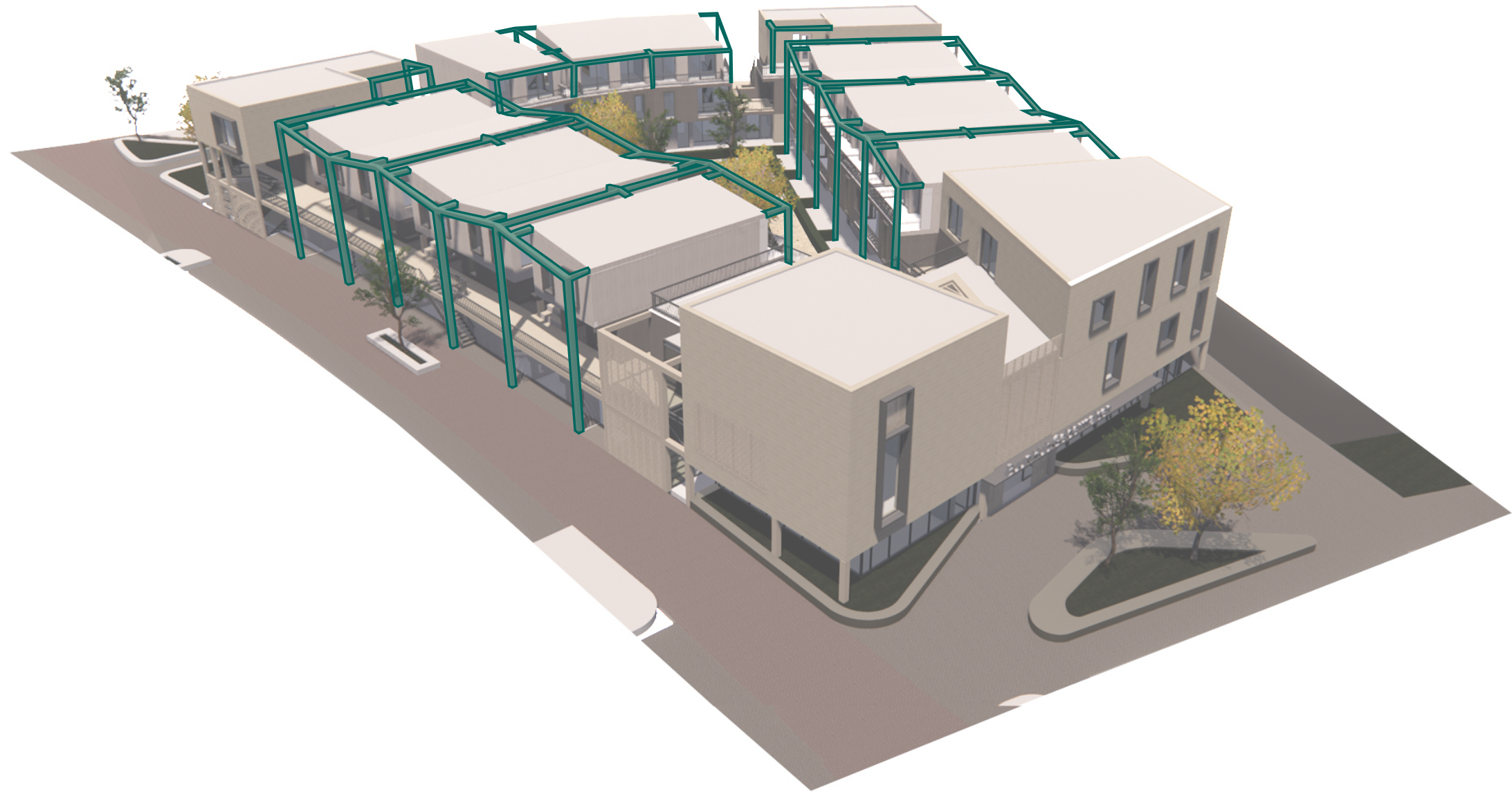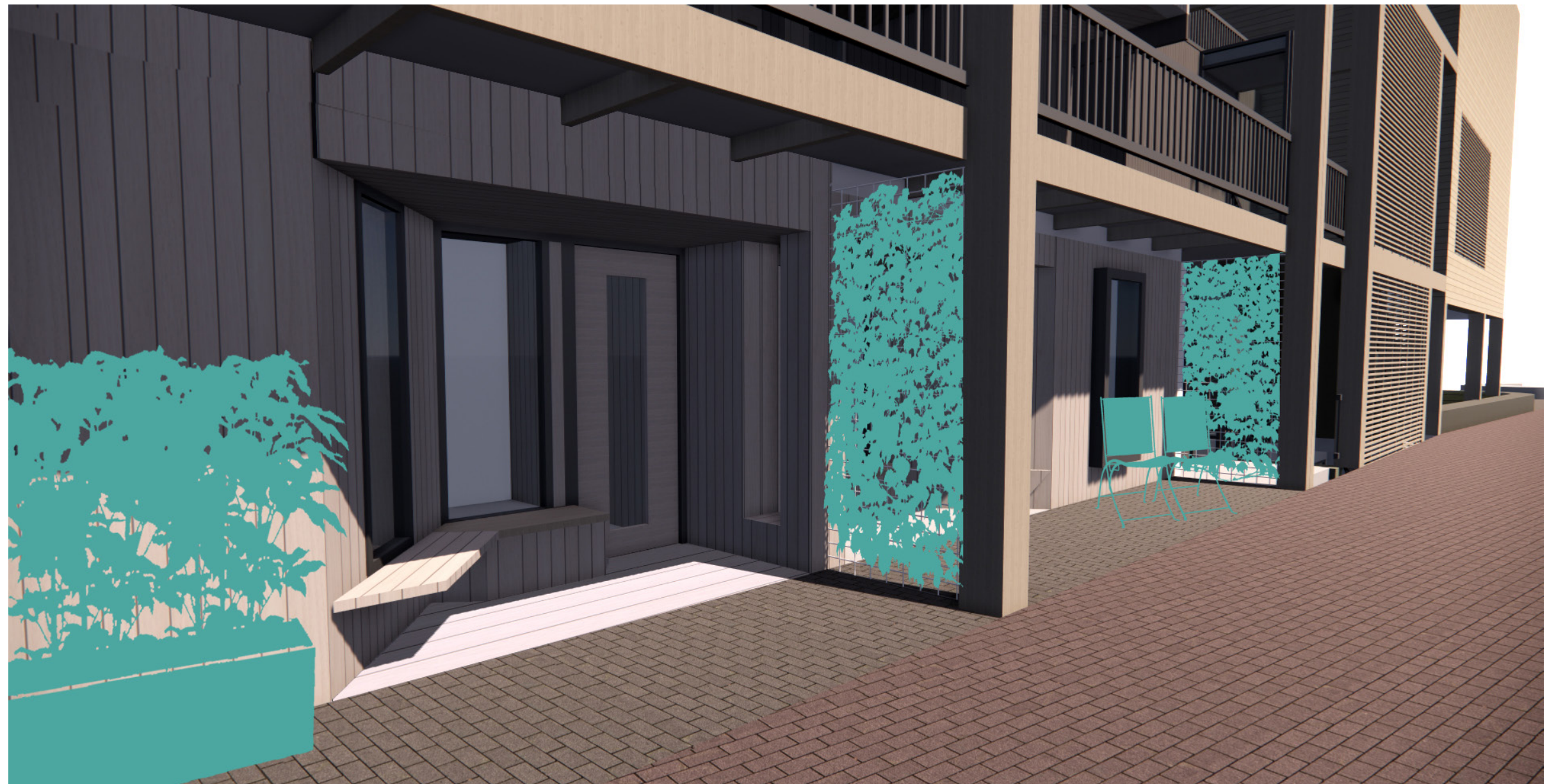
Soft edge: ground floor
Building
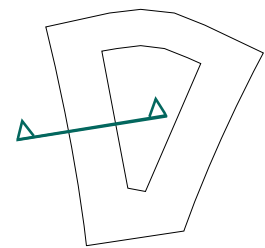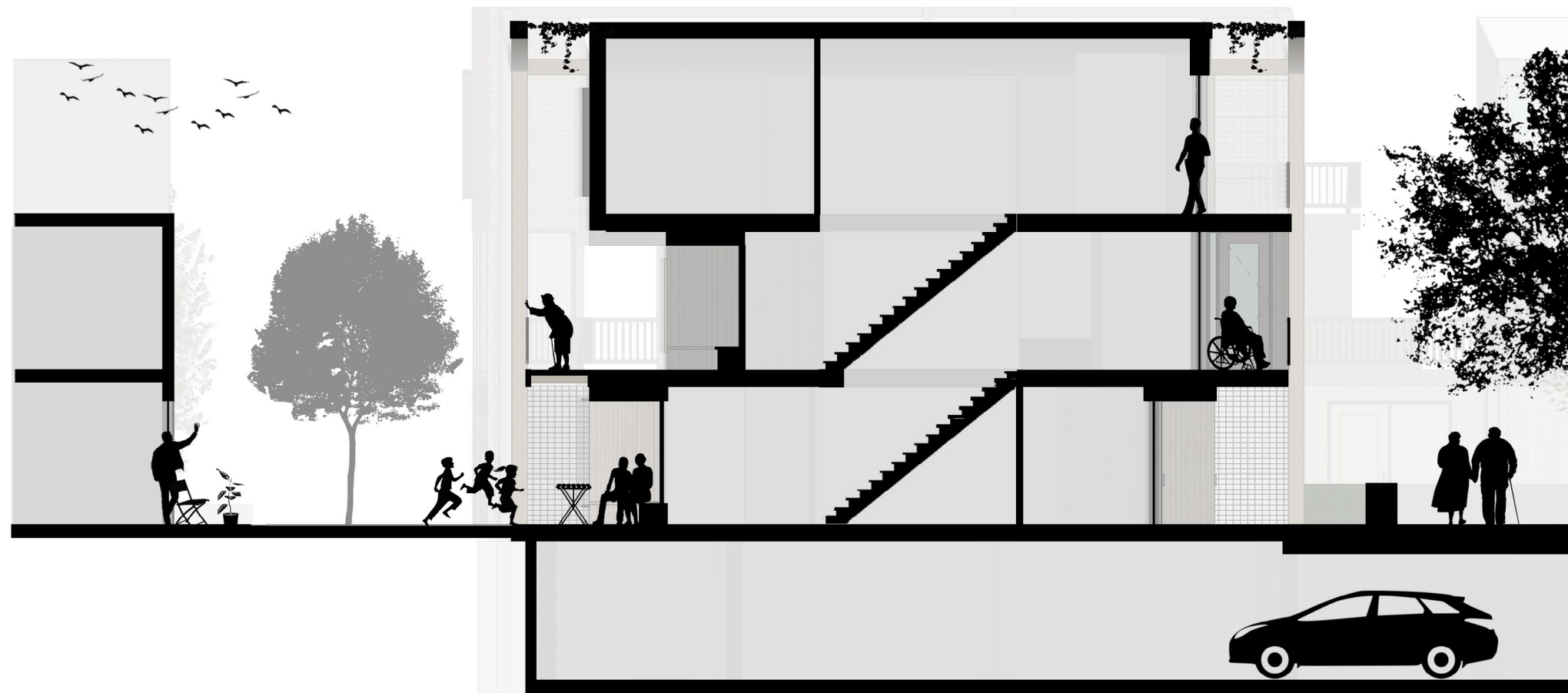
Soft edge: cross section
Building

West facade 1:200

Corners
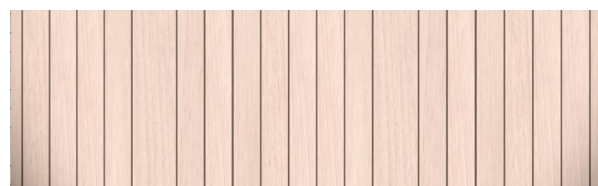
Ground floor and second floor

First floor

Materialization: West facade
Building

Facade fragment 1:20
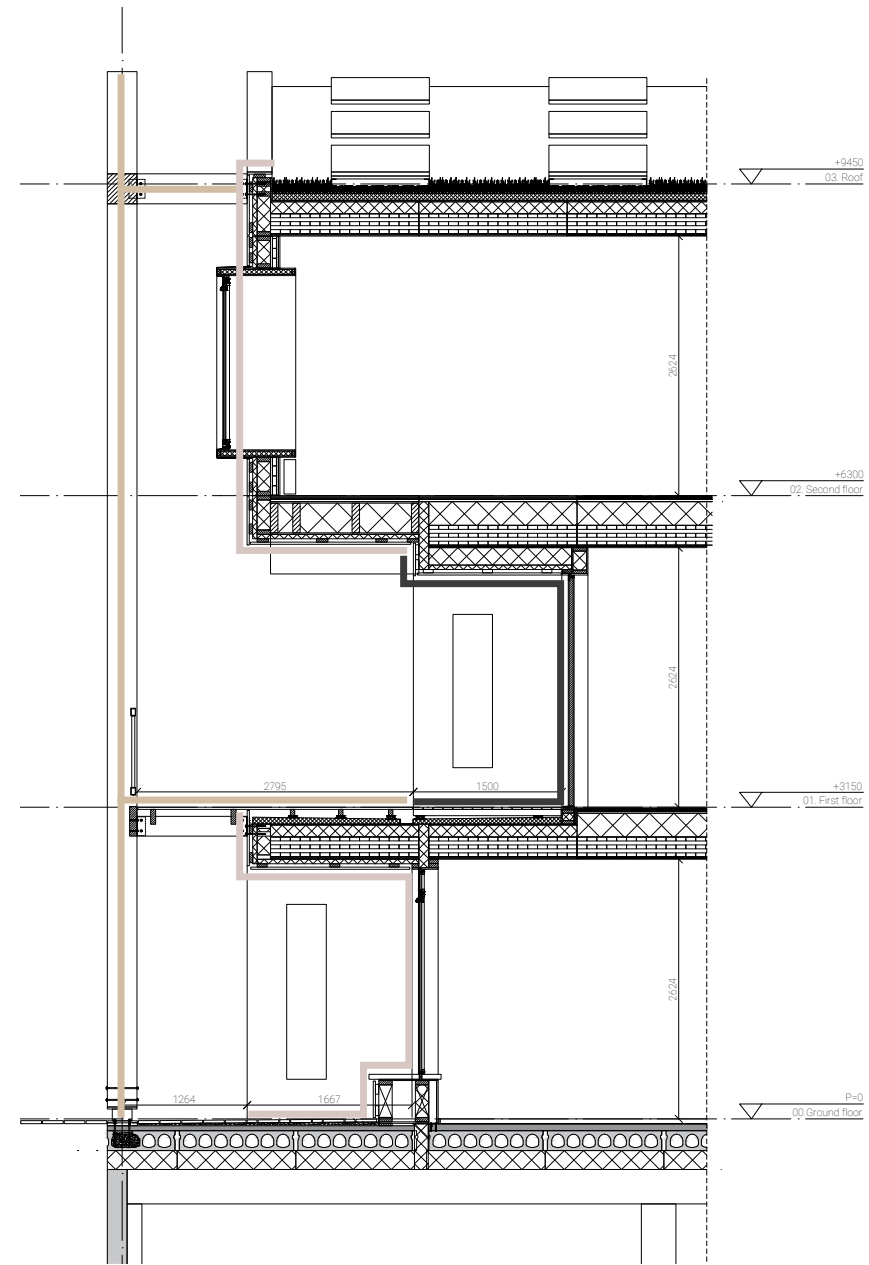
Materialization: Layering
Building

South facade 1:200

Materialization: South facade
Building

North facade 1:200
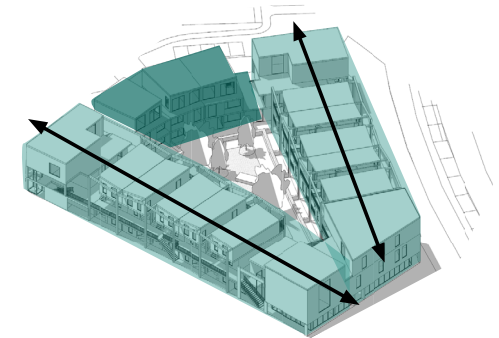
Materialization: North facade
Building

Materialization: Corners
Building
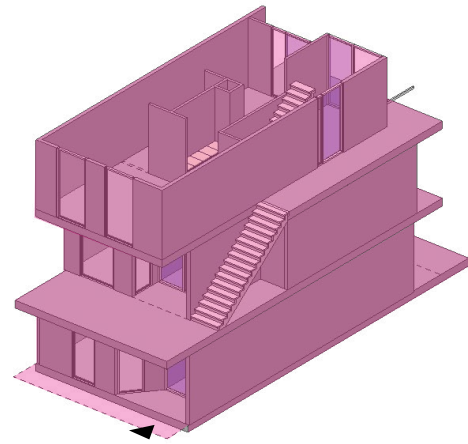
Dwelling 3 layers
+- 180m2
- Families
- Generational living
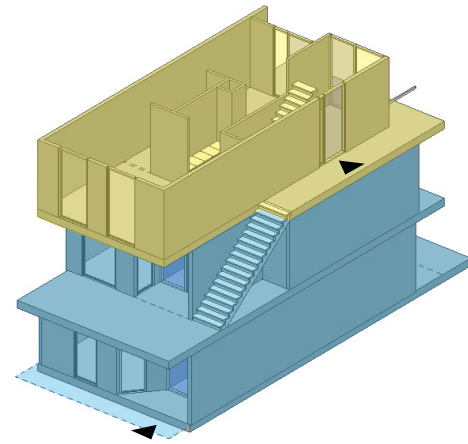
Dwelling 1 layer
+- 60m2
- Starters

Dwelling 2 layers
+- 120m2
- Starters
- Seniors
- Families
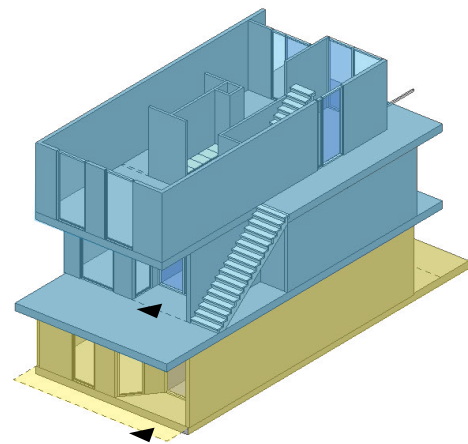
Dwelling 2 layers
+- 120m2
- Starters
- Seniors
- Families

Dwelling 1 layer
+- 60m2
- Care demanding elderly
- Seniors
- Starters
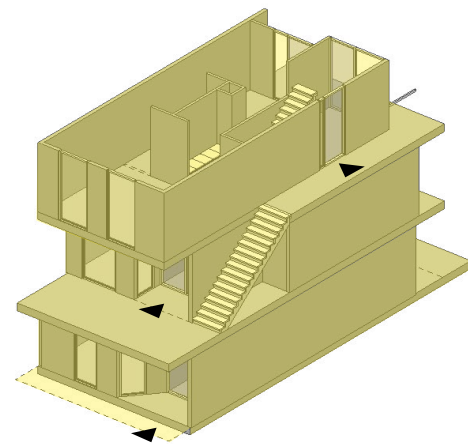
Dwelling 1 layer
+- 60m2
- Seniors
- Starters

Dwelling 1 layer
+- 60m2
- Care demanding elderly
- Seniors
- Starters

Dwelling 1 layer
+- 60m2
- Care demanding elderly
- Seniors
- Starters

Adaptability
Dwelling
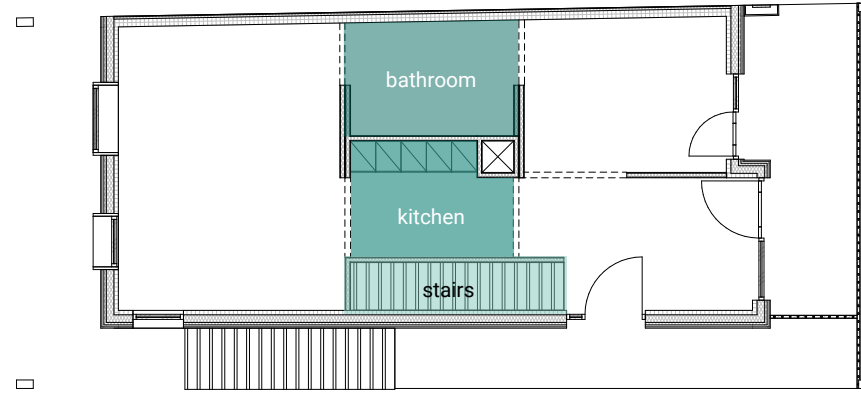
*standard plan second floor*
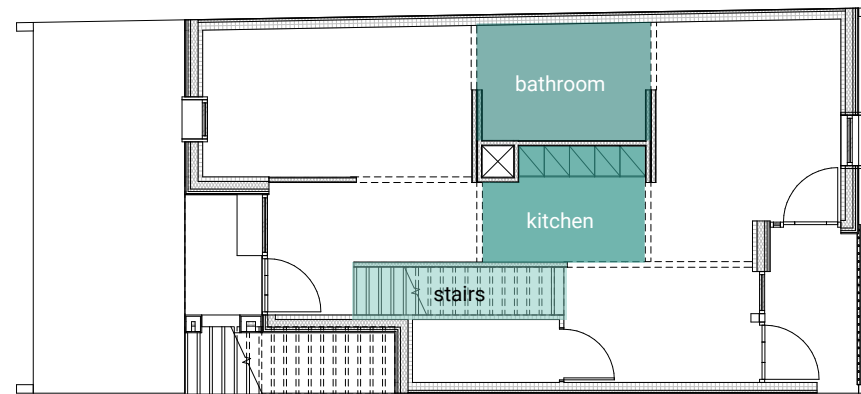
standard plan first floor
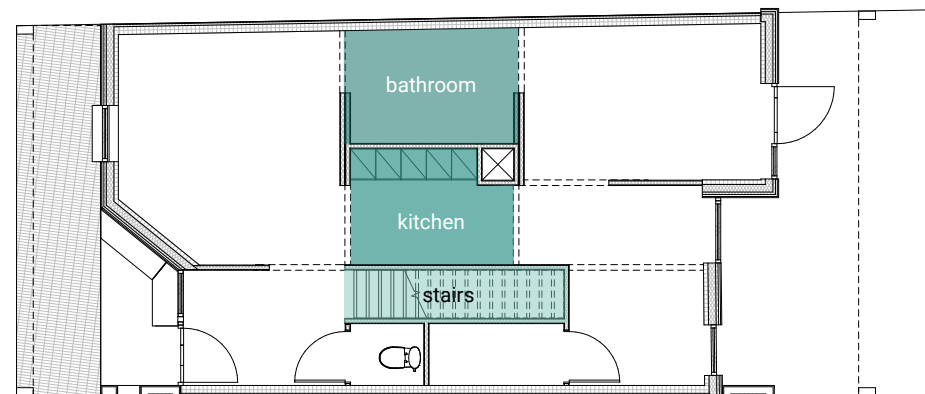
standard plan ground floor

Adaptability
Dwelling
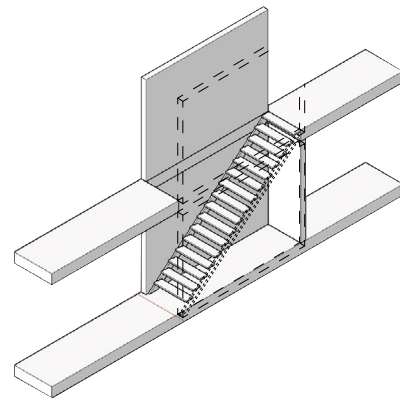
Adaptability: from stairs to storage
Dwelling
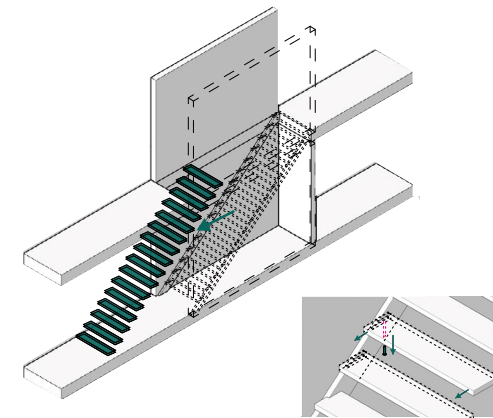
Detatch and remove the steps

Adaptability: from stairs to storage
Dwelling
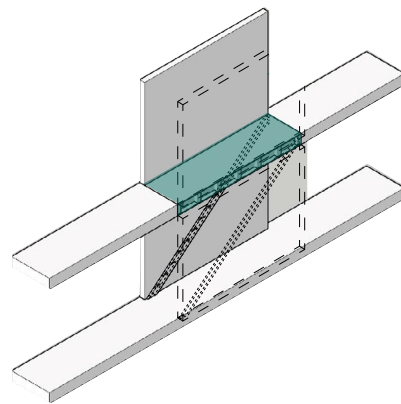
Close off floor with timber framing

Adaptability: from stairs to storage
Dwelling
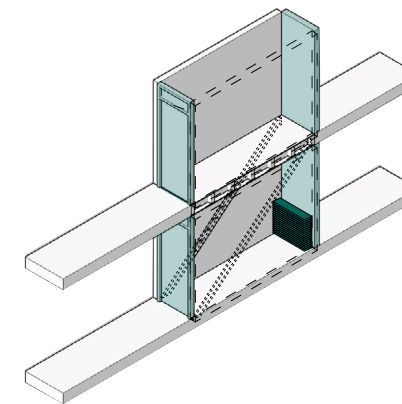
Close off space to create storage.

Adaptability: from stairs to storage
Dwelling
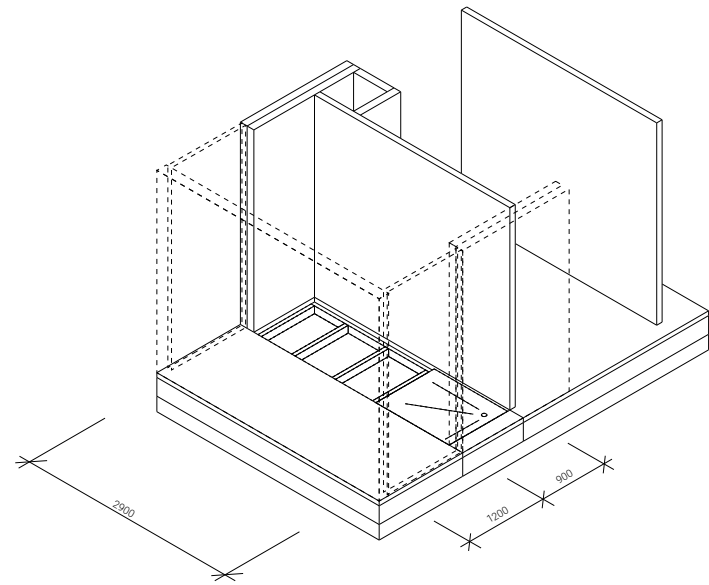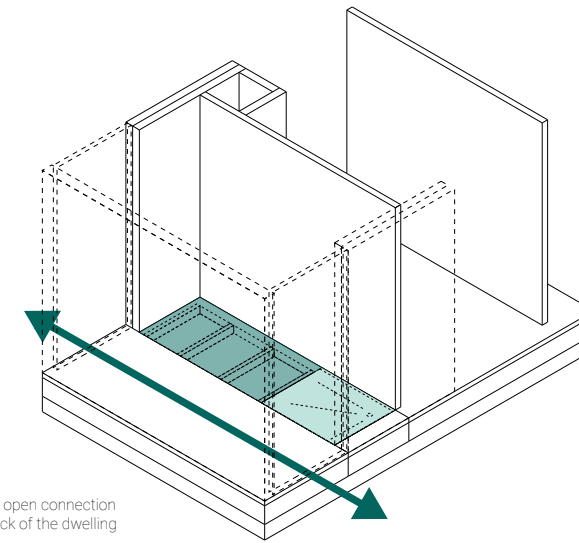
Closing floor to create an open connection between the front and back of the dwelling
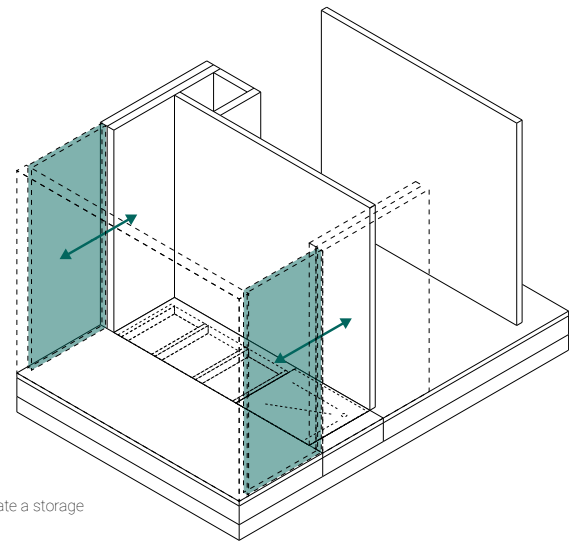
Close the sliding walls to create a storage
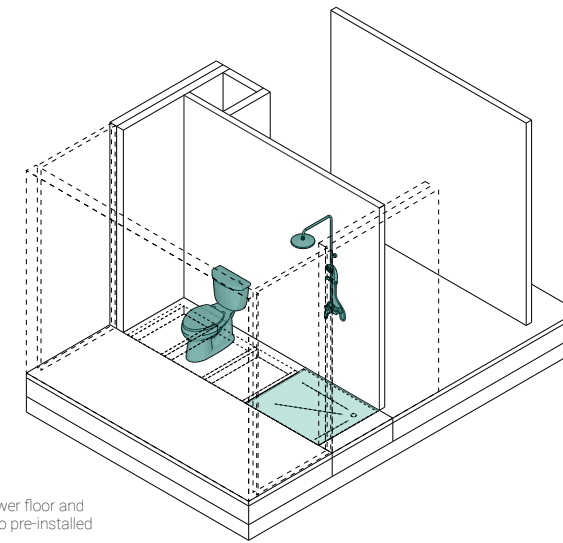
Open up floor to reveal shower floor and connect shower and toilet to pre-installed fixtures

Adaptability: Kitchen
Dwelling

Adaptability: Kitchen
Dwelling

Adaptability: Kitchen
Dwelling
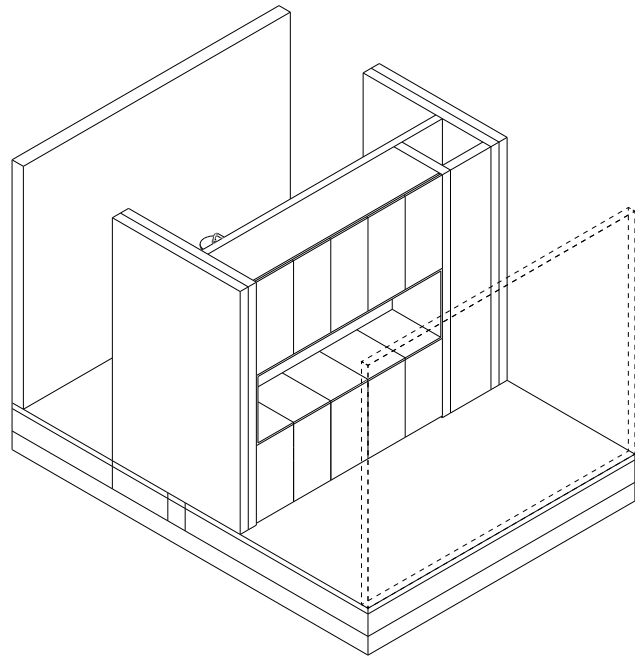
Adaptability: Kitchen
Dwelling

Dwelling 3 layers
180m2
- Families
- Generational living
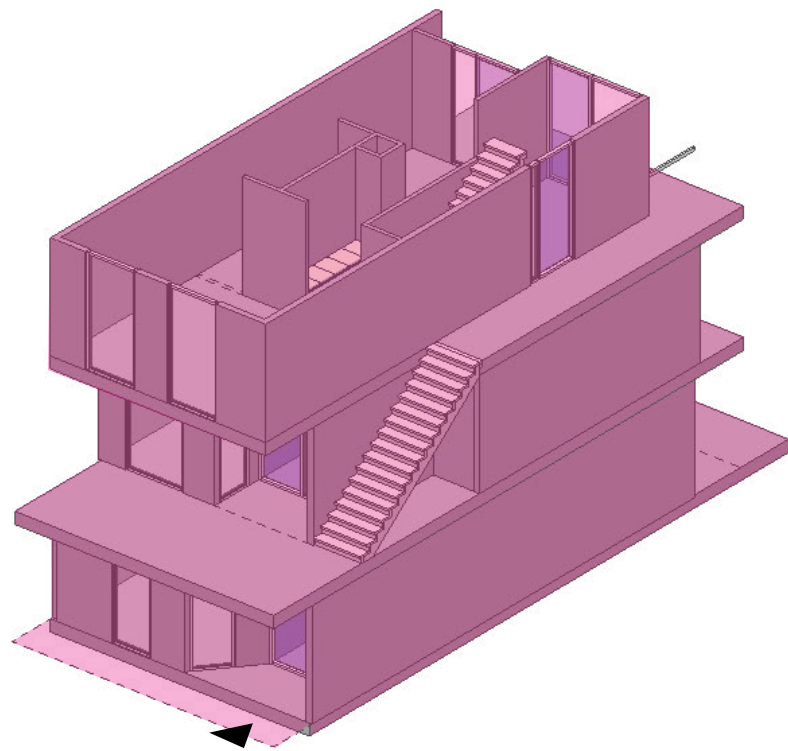
2nd floor

1st floor
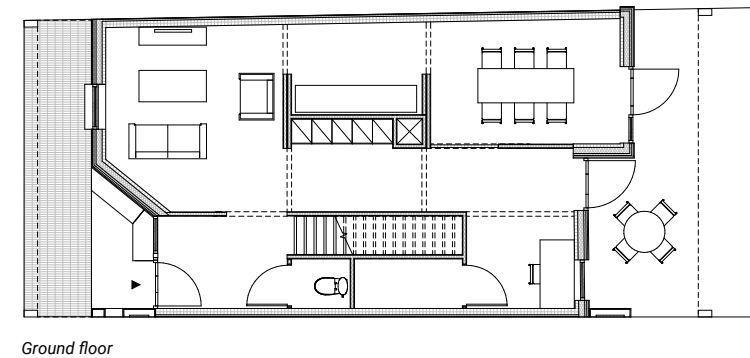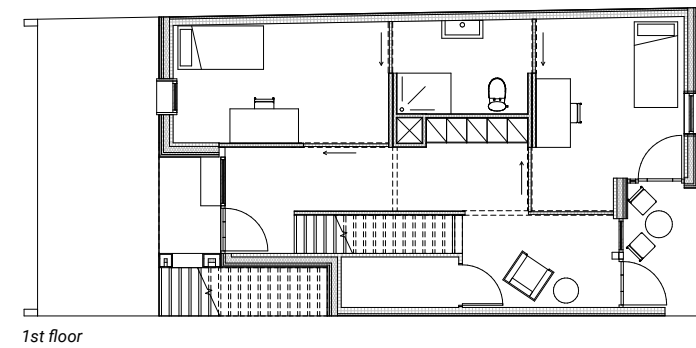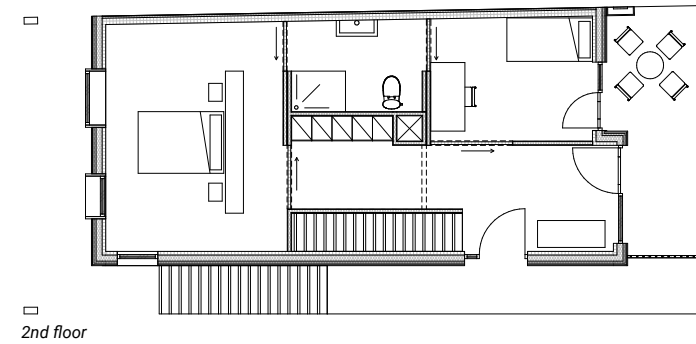
Ground floor

Adaptability: Dwelling layouts
Dwelling
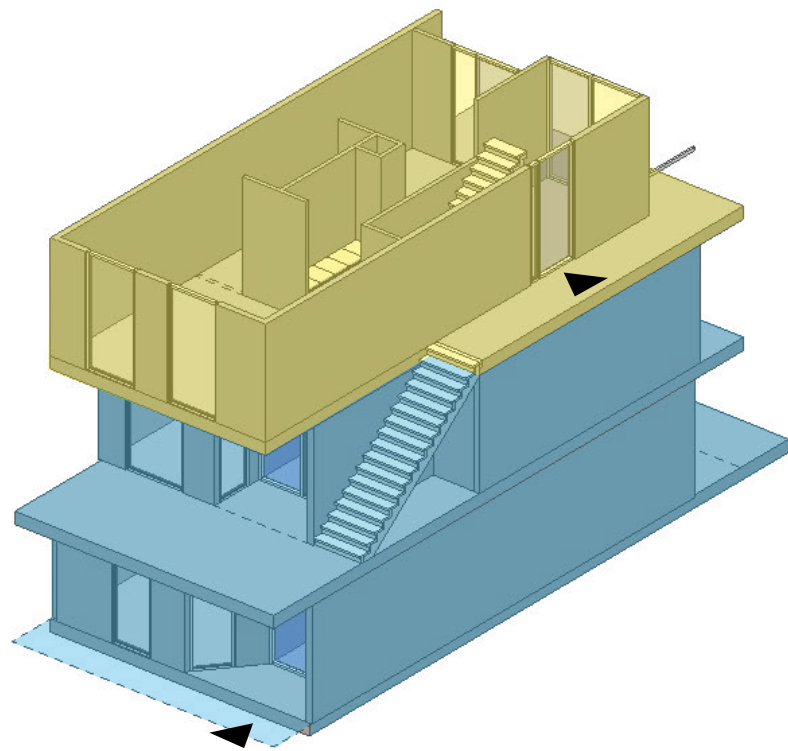
Dwelling 1 layer
60m2
- Starters

Dwelling 2 layers
120m2
- Starters
- Seniors
- Families
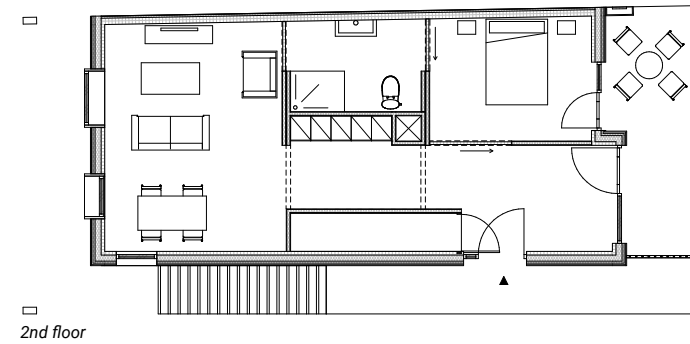
2nd floor
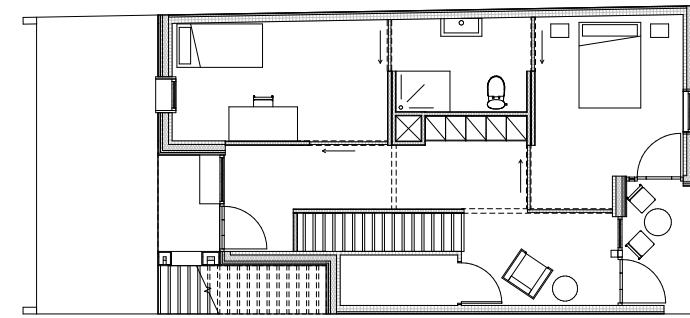
1st floor
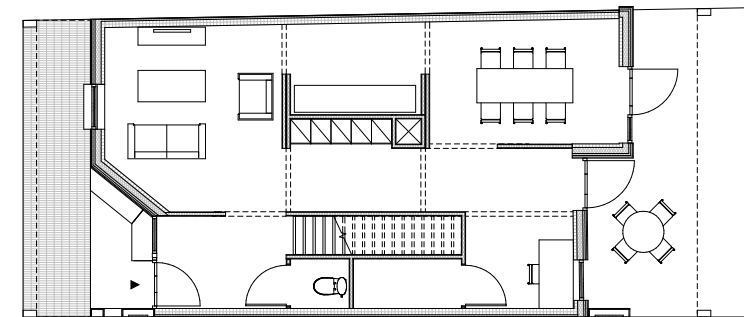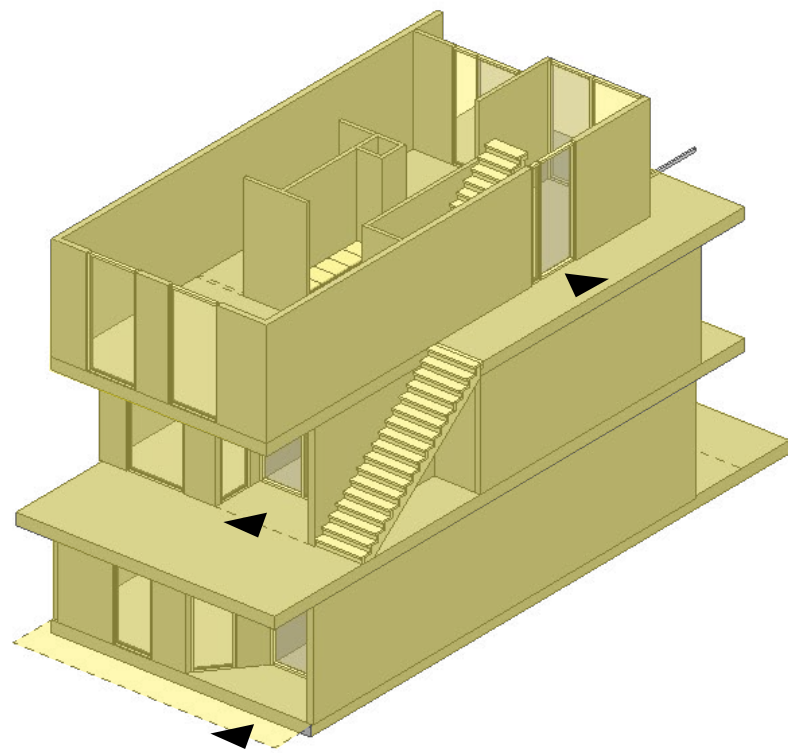
Ground floor

Adaptability: Dwelling layouts
Dwelling

Dwelling 1 layer
60m2
- Seniors
- Starters

Dwelling 1 layer
60m2
- Care demanding elderly
- Seniors
- Starters

Dwelling 1 layer
60m2
- Care demanding elderly
- Seniors
- Starters
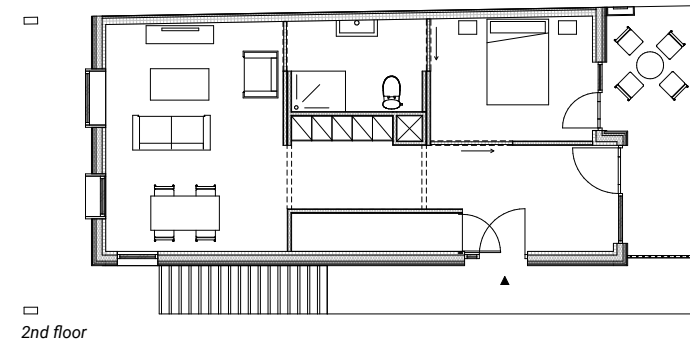
2nd floor
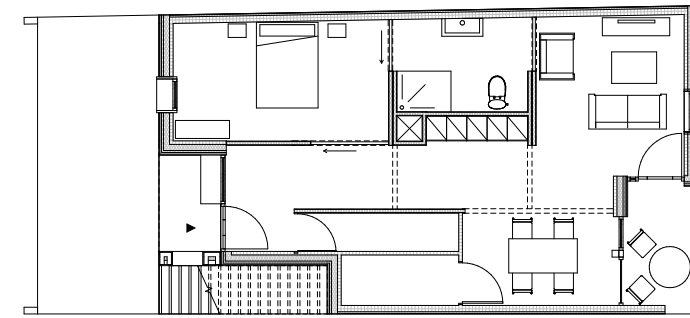
1st floor
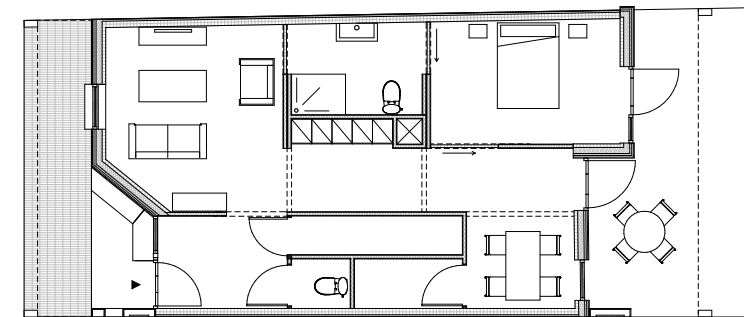
Ground floor

Adaptability: Dwelling layouts
Dwelling
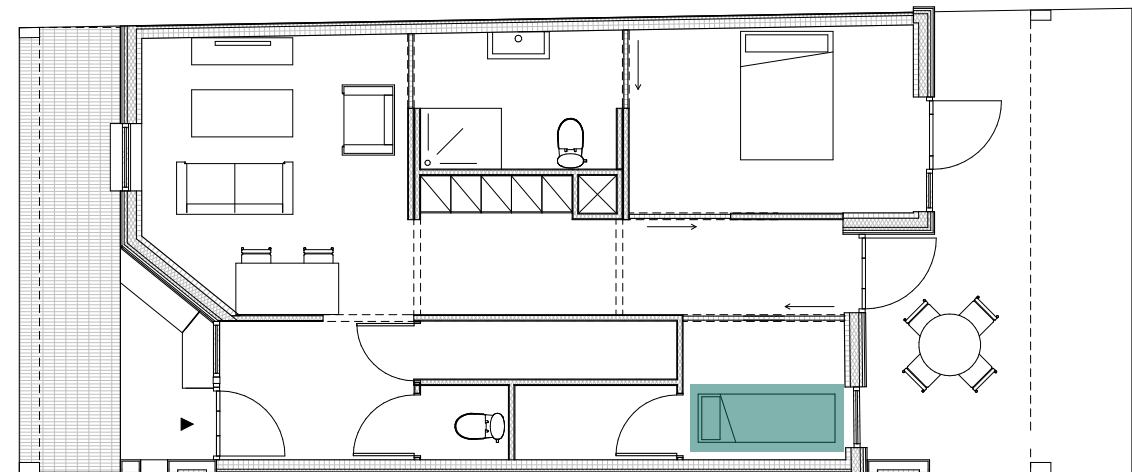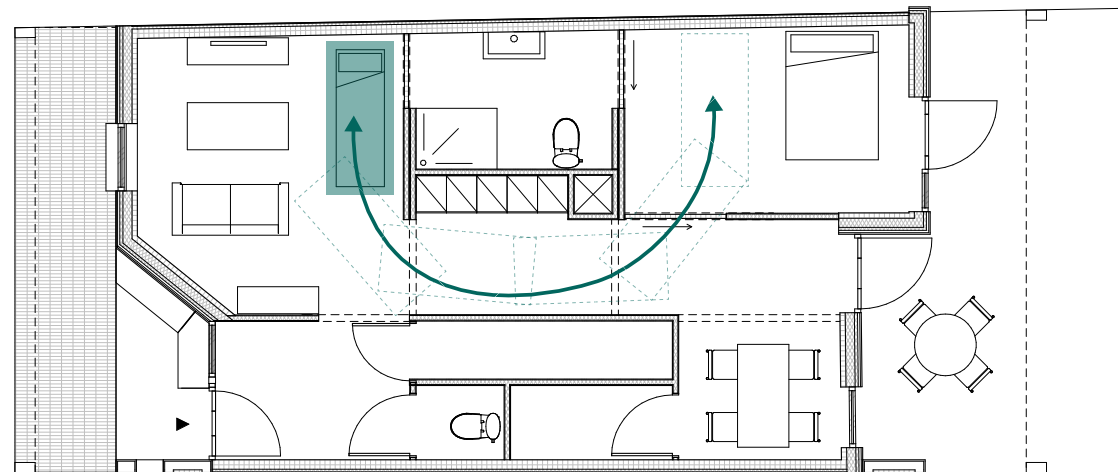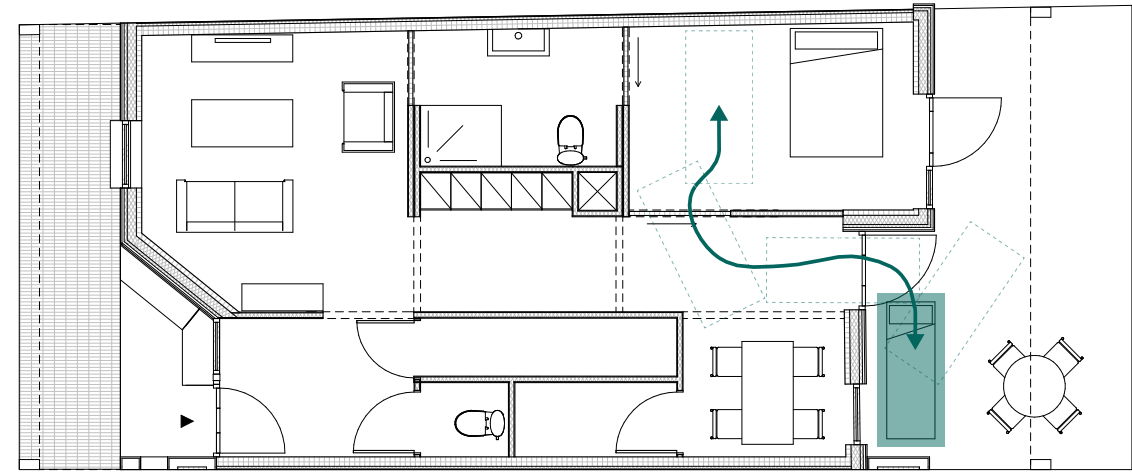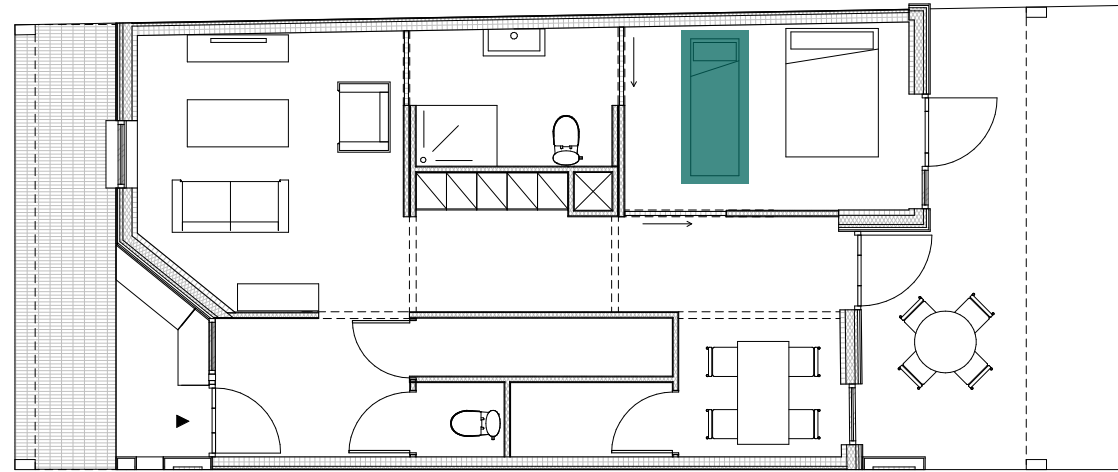
Adaptability: Care situation
Dwelling
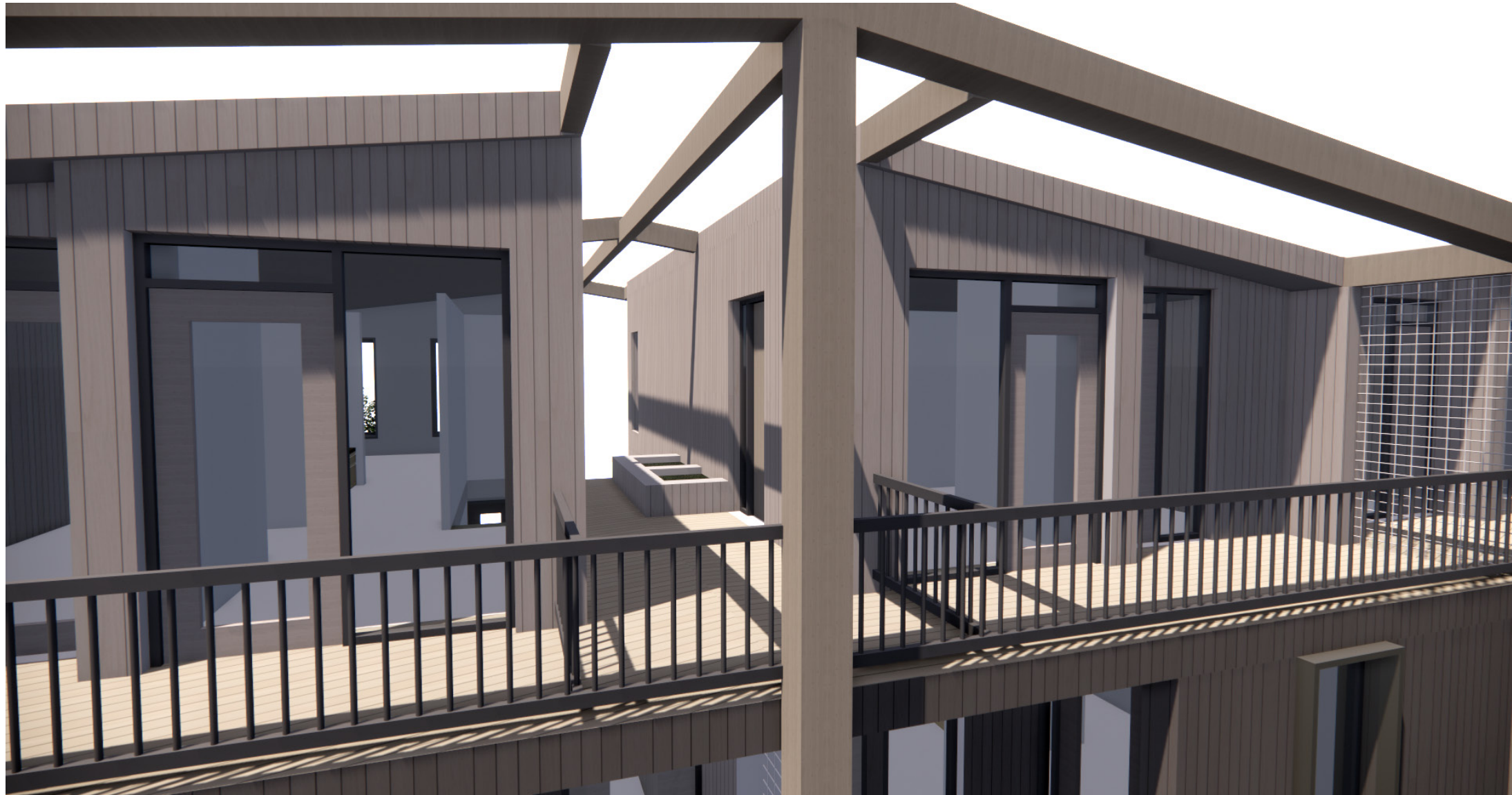
Adaptability: frame
Dwelling

Adaptability: frame
Dwelling
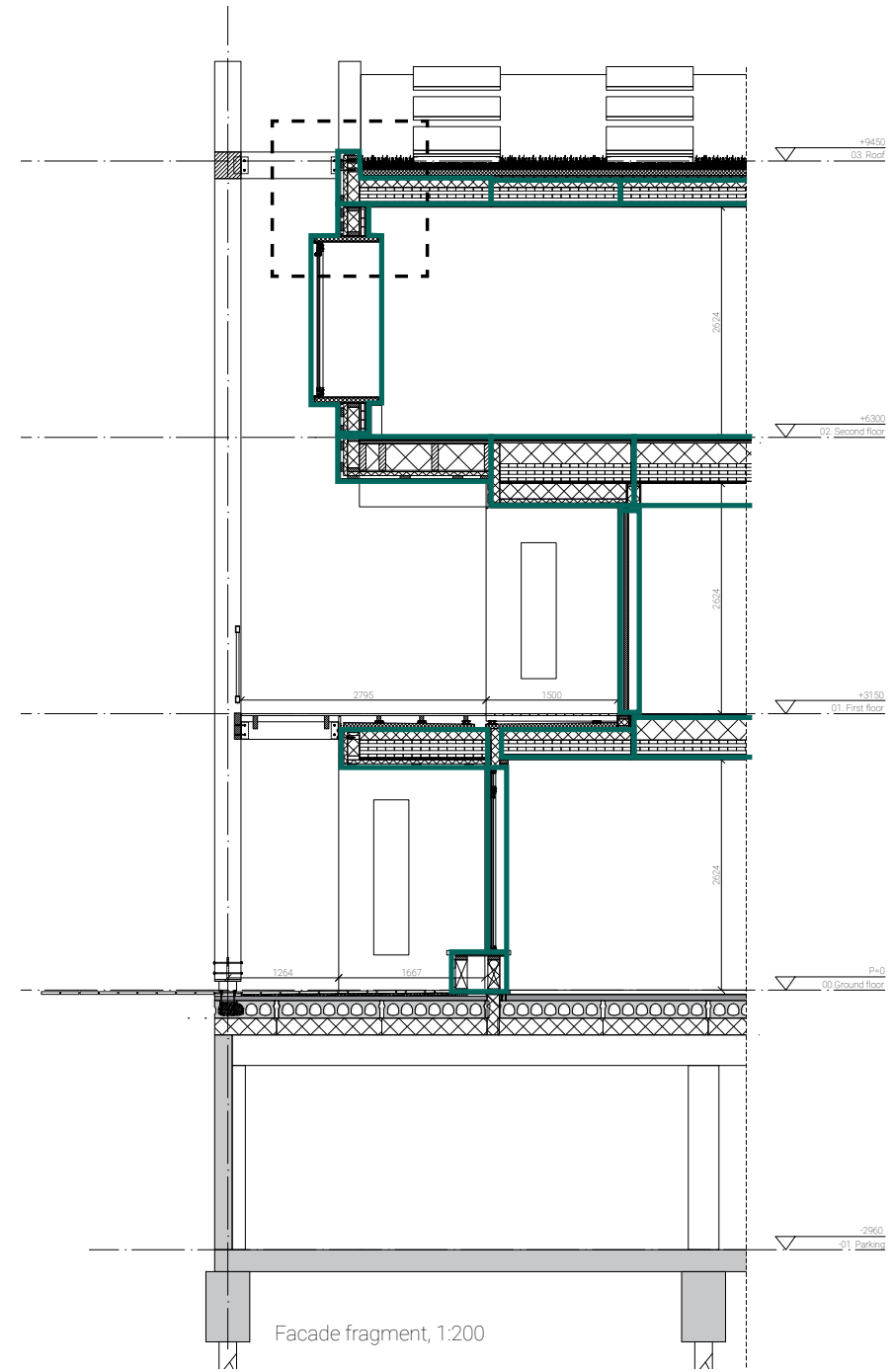
Adaptability: frame
Dwelling
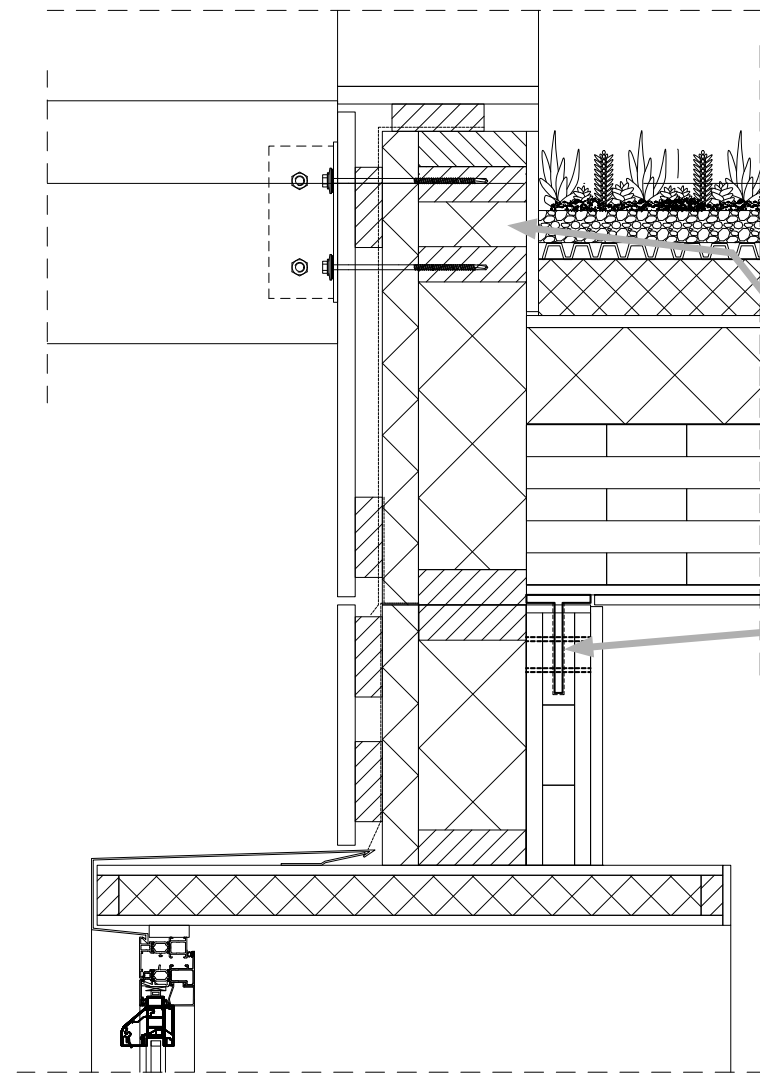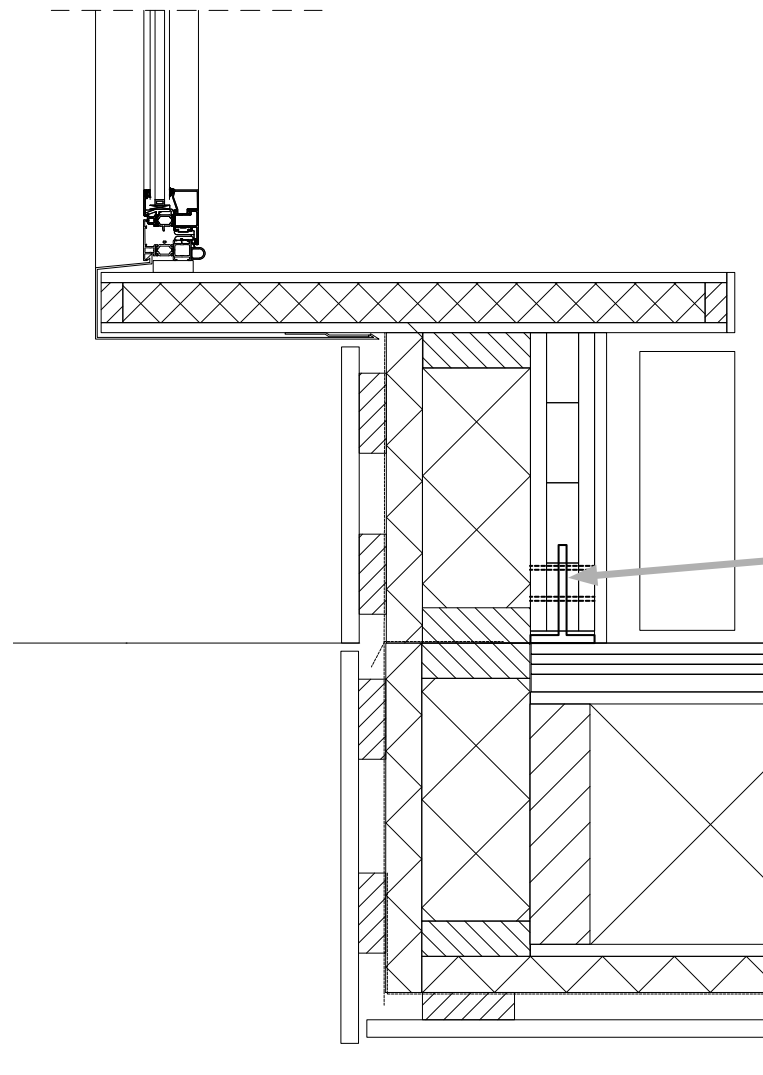
demountable
connections

Detail roof top, 1:5

Facade fragment, 1:200

Adaptability: Structure
Dwelling

demountable
connections

Detail floor edge, 1:5

Facade fragment, 1:200

Adaptability: Structure
Dwelling