The Future Playground
Creating a high-rise community for families

MSc 3/4 Advanced Housing Design
Master Thesis

Preface

This booklet shows the result of the graduation studio Advanced Housing Design. It presents both the research and design of my graduation project of the Master Architecture at the TU Delft. With this project I am focussing on the optimization of Dutch family housing to fit a new way of living in high-rise residential buildings. Within my research I try to find an answer to the following question:

How can a high-rise residential building contribute to improving the living environment of children in cities while stimulating a sense of belonging to a high-rise community in Rotterdam?

The studio is set in the ever densifying centre of Rotterdam. The need for densification in Dutch cities is becoming an important aspect when it comes to the design of buildings in cities. A logical respond to the decrease of available land for new buildings is to build more high-rise buildings. Rotterdam is the forerunner of Dutch cities when it comes to building high-rises. These are often office buildings but more and more high-rise residential buildings are being built. High-rise residential buildings come with advantages and disadvantages. Within my research and design I try to optimize the conventional high-rise residential building to make it more suitable for living as a

family, while stimulating a sense of belonging.

To follow my personal fascination I took a social approach on my graduation project. I focus on the way people interact and experience their surroundings. This resulted into a part of my research being dedicated to the study of Environmental Psychology, a field of study I had not yet encountered during my education. In my opinion architectural design can benefit enormously from taking into account the study of Environmental Psychology. With my graduation project I try to design a building that is truly appreciated and valued by is users.

I proudly present to you my final graduation project *The future playground, creating a high-rise community for families.*

Lastly, I want to thank my tutors who have guided and motivated me during this graduation project. It has been a very informative, complete and above all a fun process to end my studies in Delft.

Enjoy reading this booklet and learning more about my final design.

- Mirthe Ebels

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Figure 1 - Photograph of the VM House in Copenhagen (Cover)

Photograph by Author (2018). VM House

Introduction

Introduction

Introduction
The dynamics of living in the Netherlands

The graduation studio AR3AD100 Advanced Housing Design focuses on the great challenges today's society is facing when it comes to housing design in the Netherlands. There is a need to explore design solutions for affordable housing that can deal with diversity, live-work interactions, environmental challenges, and sustainable design solutions. The challenge for Rotterdam is to expand its affordable housing stock and create a sustainable living environment for its inhabitants.

Personal motivation
The social character of this studio was, for me, one of the main reasons to choose the Advanced Housing Design studio. Not only does Rotterdam have a shortage of affordable housing for people who want to buy their first home, but almost all of the Netherlands also has the same problem and challenges. There is a need for 1 million new homes before the year 2030 (NOS, 2021). Next to that, with the current housing market in the Netherlands, it is very difficult to rent or buy a house, especially for starters on the housing market, who have just started working or are still looking for a job. Within a year, this will be my situation as a recently graduated student and this is already something I am worried about. The role of the architect in the complex world of housing in the Netherlands is a role I find very interesting to investigate. The studio Advanced Housing Design allows experiencing and examining the way architecture can influence the way people live in cities and how architecture can create an inclusive living environment.

Relevance of high-rise residential buildings
New concepts of affordable and sustainable housing could influence the way people live in cities. Cities in the Netherlands will get denser due to a growing population and the increasing amount of people who move to the so-called Randstad (PBL/CBS, 2019). Because of the rising amount of people that want to live in the cities, densification of the urban fabric is needed. This is a challenge for urban planners and architects. Densification is therefore one of the main focus points for the redevelopment of the Walenburghof in Rotterdam. One of the solutions for creating more dwellings in a city with a growing population is the realisation of high-rise residential buildings (figure 2). More high-rise residential buildings will be built in the Netherlands in the coming years. These buildings provide an efficient but anonymous way of living.

Problem statement
When it comes to high-rise residential buildings there are many different opinions. It may seem that high rise living is one of the best solutions to the growing demand for housing in the Netherlands. However, there are some downsides such as the high cost of building a high-rise. Next to that, high-rise buildings are experienced differently from conventional low-rise dwellings and other buildings. David Halpern (1995) even states that there is a relationship between living in a high-rise building and poor mental health. This has been proven for children who are more likely to develop behaviour problems when they live on the higher floors of a high-rise. In the Netherlands however, there is still only a small group of families living in high-rise residential buildings (Raemaekers, 2011). One other disadvantage of high-rise residential living is that for most people in the Netherlands, these houses are seen as a home to eventually move on from to an owner-occupied home, it is rarely the ultimate goal for a tenant (Raemaekers, 2011). Because of this, tenants will not develop a connection with high-rise buildings as strong as with owner-occupied row houses. This results in a lack of a sense of belonging between the residents and the high-rise residential building they are living in. Because of these problems concerning high-rise living, in my design and research, I will focus on children and one- or two-person households. For me it is important to design for these target groups, by doing this, I can try to find ways to create affordable housing in the city centre and design a living environment that can result in a positive future for children living in high-rise buildings.

Relation to the site
Within the Walenburghof in Rotterdam there are a few buildings that are quite high, they can however not be classified as high-rise buildings. In the Netherlands, a building can be classified as a high-rise when it is higher than 70 meters. Because of their height, the buildings at Walenburghof do have some characteristics a high rise building can have. There is not a strong visual connection between the higher floors and the public space on street level. The connection between the building and the public space has also not been designed in a way that social interaction is encouraged (figure 3).
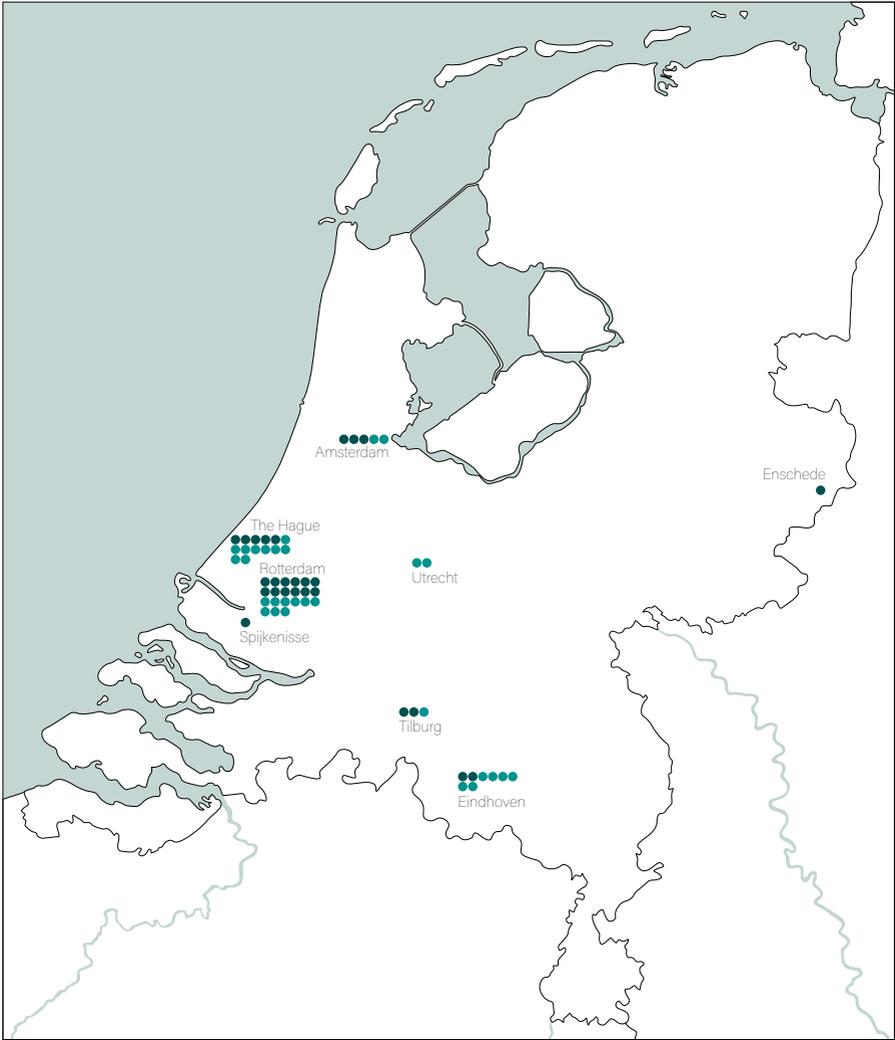
Figure 2 - Amount of high-rise residential towers (that are higher than 100 meters) in the Netherlands

Drawing by Author (source: https://www.ed.nl/wonen/wonen-op-grote-hoogte-groeispurt-wolkenkrabbers-in-nederland~a5e41543/

Figure 3 - Front doors at Walenburghof
Photograph by Author (2021). Entrances Walenburghof

In and around these large and repetitive buildings it may feel like the human scale has not been taken into account. To help create a high-rise residential community where people feel connected to their surroundings it is important to study the transactions between the residents and their physical setting. This can be done by studying environmental psychology.

Frame of reference
The frame of reference for my research will be the study of **environmental psychology** which is a study of transactions between individuals and their physical settings. The book by Robert Gifford, who is a psychology professor, on the Principles and Practice of Environmental Psychology (2014) will form the basis of this part of the research. The study of environmental psychology will be used to learn more about the way people experience their physical environment. As an architect, but also on an institutional level, it is difficult to design a building that is used exactly the way it was meant to be used. By learning more about the different transactions between people and their physical setting, I hope to gain more insight into how to design truly good buildings for everyone.

The main theme of the graduation studio is

ecology of inclusion. **Ecology** is the relationship between living organisms, including humans, and their physical environment (What Is Ecology? – The Ecological Society of America, n.d.). This refers to the way people interact with each other and how they experience their surroundings. **Inclusion** is interpreted in a way that the final project should be accessible and liveable for all kinds of people that may have difficulties finding a house in the city centre of Rotterdam at the moment.

Hypothesis
Within a city, there is always something to find that suits a certain person, this should also be the case in the redeveloped Walenburghof. With this redevelopment, there is a chance to create a high rise community for different types of households with varying incomes and different needs. Within this dense urban fabric, the building should be a place where people feel at ease and at home. I hypothesise that human scale, social interaction, privacy, ownership and feeling at home are important aspects of improving the way people live in high-rise residential buildings.

Research question

How can a high-rise residential building contribute to improving the living environment of children in cities while stimulating a sense of belonging to a high-rise community in Rotterdam?

This subject is addressed at the level of architectural design, specifically how architecture might create social relations within a certain institutional setting. To find an answer to the research question, the research will be divided into several sub-questions:

- *How can the quality of the living environment of children in cities be improved within a high-rise residential building?*

- *How can a sense of belonging to a high-rise community be stimulated in a residential high-rise building?*

To answer these questions I will be studying the concept of environmental psychology in combination with literature research and the examination of several case studies.

The aim of this research is to explore the ways of creating a high-rise residential building where the

needs of children have been taken into account on different scales from the public space to the dwelling. The building should also be a place where a diverse group of people, with different household configurations, different income levels and even different ages will feel at home and have a sense of belonging.

By doing this research, I will develop design tools and guidelines that can help with designing a new high-rise residential building in Rotterdam. Within this building, the residents can enjoy life in their private individual houses, but can also enjoy the social interaction with their neighbours because they feel like a small community.

Research methods
For this research, I want to introduce three research methods that I will be using as a guiding tool (figure 4) . The research will be based on: research methods from the field of environmental psychology, literature on children and community building, and the examination of case studies. For each method I will explain its relevance to the proposed research and how it will be used to answer the main research question and sub-questions.
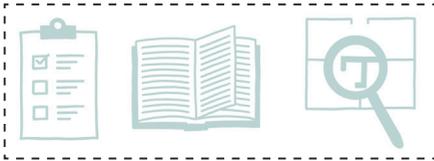

Figure 4 - Research methods
Drawing by Author

Research methods in Environmental Psychology
I will use the study of environmental psychology as a theoretical framework. Within the field of environmental psychology, there are many different methods of study. These methods are described in the book Environmental Psychology: Principles and Practice by Robert Gifford (2014). Depending on the research question different methods are suitable. In the chapter about environmental psychology I will explain more about the different methods that I will be using.

Children
For the first sub-question on children, it is important to focus on the way children experience their living environment and what elements are important for a child to thrive. To find an answer to the sub-question

"*How can the quality of the living environment of children in cities be improved within a high-rise residential building?*" I study children's needs and behaviour through literature about the relation between children and their living environment. Next to that, I study case studies that are designed specifically for children. However, I also want to look at buildings not designed for children, but study them from the perspective of children. In both cases I will do a morphological analysis combined with an interpretation based on my own experiences, information from other sources and ethnographic research.

Belonging
For sub-question 2 on the sense of belonging, the theoretical framework of environmental psychology is again very important. The second sub-question is: How can a sense of belonging be stimulated in a residential high-rise building. To stimulate this sense of belonging a few topics will be investigated such as: creating a community, stimulating social interaction and identity. "For almost anyone, a sense of collective and cultural identity is a powerful source of motivation for active involvement and leadership. If residents feel like they don't belong to a place or a region, it is difficult for them to invest time and energy to work on improving things around them. (And it doesn't hurt that sense of belonging contributes directly to health outcomes–since that's the ultimate goal. Research has shown that people who feel attached to, and interact more with, others enjoy better health than those who are more isolated.)" (Stojicic, 2018)

Case studies
By studying both questions with the literature, the newly acquired knowledge can be used to study several case studies (figure 5). For each case study, I will describe why it is relevant for my research to look at that specific building. I will use these case studies to answer the sub-questions about the children and creating a sense of belonging to a high-rise community.

The case studies that I want to use for this research all have different qualities. There are four existing case studies and one not yet existing case study. The first four are existing.

- The 8 House - BIG - Copenhagen, Denmark - 2006-2010
  The 8 House in Copenhagen is a very large

complex with dwellings on high floors that are connected to a very interesting outdoor circulation space. Some houses on the upper floors even have front gardens that are connected to this elevated street.

- **The Wolkenkrabber - J.F. Staal - Amsterdam, Netherlands - 1932**
  The Wolkenkrabber in Amsterdam was the first "high-rise" residential tower in the Netherlands. People where sceptical about the success of such a relatively high building. Living at such a high was not expected to be pleasant. The dwellings in the Wolkenkrabber are nowadays very expensive and the project can be seen as a success.
- **Amager Children's Culture House - Dorte Mandrup - Copenhagen, Denmark - 2013**
  The Amager Children's Culture House in Copenhagen is a building designed especially for children. The needs of children have been taken into account during the design process. This can be seen in the low hight of certain windows for example.
- **Unité d'habitation - Le Corbusier - Marseille, France - 1947 -1952**
  The Unité d'habitation in Marseille is a very interesting case study because of it communal character and the housing typology that is suitable for families. The building houses a lot of facilities that encourage community building.

The last and fifth case study is not yet an existing building. It will be built in the near future in the centre of Rotterdam.

- **Family Scraper - Van Bergen Kolpa Architecten - Rotterdam, Netherlands - 2004 - present**
  The Family Scraper is a high-rise residential building that has been designed for families in particular. It is interesting to study the principles that have been used to design this tower in a way that it is suitable for families with young children. This building uses the typical Dutch row house typology in a high-rise residential building.

Amager Children's Culture House
Dorte Mandrup
Copenhagen - Denmark
2013
Source: https://www.archdailycom/388629/ama-r-children-s-culture-house-dorte-mandrup

Unité d'habitation
Le Corbusier
Marseille - France
1947 - 1952
Source: https://archixplore.com/nl/unite-dhabitation/

De Wolkenkrabber
J.F. Staal
Amsterdam - The Netherlands
1932
Source: https://archief.amsterdam/beeldbank/detail/4ba47849-a173-c4dc-baf2-1c7a2878d00e

8 House
BIG
Copenhagen - Denmark
2006 - 2010
Source: https://big.dk/#projects-8

Family Scraper
Van Bergen Kolpa Architecten
Rotterdam - Netherlands
2004 - present
Source: https://www.vanbergenkolpa.nl/nl/16_family_scraper_de_maasbode.html

Figure 5 - Case studies

Environmental psychology

Environmental psychology

Environmental Psychology

What can architects learn from the study of environmental psychology?

For this research, I use the study of Environmental Psychology as a theoretical framework. To understand the importance of environmental psychology within the field of architecture I will use the knowledge of Robert Gifford, who is a professor of Psychology and Environmental Studies ate the University of Victoria in Canada. Environmental Psychology is one of his main research interests, because of which he wrote the book Environmental Psychology: Principles and Practice (2014). This book explains how environmental psychology can be used to improve the way architects design the built environment.

According to Gifford (2014, p. 2) "Environmental Psychology is the study of transactions between individuals and their physical settings." Environmental Psychology focusses on the human side of design.

How can environmental psychology be used to improve the design of residential buildings?
Theories in Environmental Psychology provide directions towards solutions instead of providing and answer to specific problems. By using this field of study in my research, I therefore do not hope to find direct answers on how to design for children and community building. I hope to find guidelines and tools on how to design for children and community building. These guidelines won't be applicable to every situation in the exact same way and should therefore be evaluated for each specific situation. Within this research I then undertake the next step, and translate these guidelines to more usable directions for designing a high-rise building in Rotterdam.

Methods in environmental psychology
Within the field of environmental psychology, there are many different methods of study. These methods are described in the book 'Research Methods for Environmental Psychology' by Robert Gifford (2016). Depending on the research question different methods are suitable. The different kinds of research methods that can be divided into three broad paradigms.

- **The adaptation paradigm:** which focuses on biological and psychological survival as a key process. The way people behave in their physical setting is determined by the need to survive as a species.
- **The opportunity paradigm:** in which the drive to actively fulfill goals determines the way people interact with their environment, instead of reacting to the threats and demands of their environment.
- **Sociocultural environment:** here researchers believe that the way humans behave in their physical environment is nested within other contexts and disciplines such as history and culture.

The different research methods of environmental psychology have often limitations because it is difficult to use them all at the same time within the same research. One solution can be to look for patterns in multiple studies. Because I will be doing only one research, one way to validate the outcome is to compare it to other research that has already been done within the field of environmental psychology. Therefore I will be looking for existing research on living in high-rise buildings to compare my own findings with.

For my research, I will focus on different themes within the field of environmental psychology. One of these themes is the way people experience their dwelling and the public space around it. To study this theme there are different approaches. One of these approaches is measuring home.

- **Measuring Home** (Gifford, 2014, p. 217)
  The sense of home can be measured in six different ways:
  1. Classifying based on the five structure-and-use dimensions:
     · Permanent to temporary
     · Differentiated to homogeneous
     · Communality to noncommunality
     · Identity to communality
     · Openness versus closedness
  2. Measuring the financial value of the dwelling
  3. Objective listing of the attributes of the residence
  4. Measuring the quality of the resident for a particular purpose
  5. Measuring what a residence can do for a person
  6. Measuring the meaning of a residence as a home

Further on in the research I discuss the role of measuring home in developing a sense of belonging to a dwelling complex.

Another theme that can be studied is place attachment. Studying place attachment can be done with two different approaches:

- **The quantitative approach:** where the strength and the type of attachment are translated into numeric terms.
- **The qualitative approach:** where meanings and personal experiences of the attachment are articulated by individuals and summarized into prominent themes. The approach can be used with case studies, where the summarized themes can be translated to new projects.

Human-centred epistemology
In my research, the transactions between humans and their physical environment will be the focal point. The research will therefore be human-centred. The field of praxeology has become of greater value for architecture and it can be interesting to study the social-spatial practices and the user perspective. Praxeology is based on practice and everyday life and focuses on how people use their environment. By doing this the human individual can become more involved in architecture, the use of a building becomes more important than the aesthetic character. Doing survey research can be a part of this praxeological approach. For this research I will however focus on a less subjective approach by looking directly at people behaviour instead of asking people to describe their own behaviour.

Children in high-rise residential buildings
What do we need to know about children living in high-rise buildings?

For me, it is difficult to imagine the future of living in the Netherlands without high-rise residential buildings. The Netherlands is a small country with an increasing amount of residents. The population in the Netherlands is expected to increase with 4 million to 21,5 million people in 2050 (Nidi, 2021). Without the possibility to keep expanding Dutch cities, it is necessary to densify cities within their existing boundaries. High-rise living can be one of the solutions to react to the growing demand for housing in the Netherlands. High-rise residential buildings have a lot of potential, because of the large amount of people that can live on a small plot of land in the centre of the city, a high density can be achieved. High-rise buildings also provide their residents with a view that cannot compete with conventional low-rise dwellings. However, there are some downsides such as the high cost of building a high-rise. Next to that high-rise buildings are experienced differently from conventional low-rise dwellings and other apartment buildings. David Halpern (1995), head of the British Behavioural Insights Team, even states that there is a relationship between living in a high-rise building and poor mental health. This has been proven for children who are more likely to develop behaviour problems when they live on the higher floors of a high-rise building.

Children's needs

Children have different needs than adults when it comes to their living environment. Social researcher Pearl Jephcott states that for children it is the most important to provide adequately for their recreational needs (1971). Within many existing high-rise buildings this is not yet provided well enough. Jephcotts research took place more than fifty years ago in Glasgow. However, for children it is and always has been important to be able to play and explore close to their home in a safe environment. The natural instinct of children to play and explore has not necessarily changed over the last fifty years. The way children play en explore has however been influenced by technology. To play freely, a certain degree of privacy is needed (Jephcott, 1971). Children benefit from having places that they can make their own and having their own things that they can use while playing. In a conventional neighbourhood, this can be provided by back alleys, stairways, old brick walls or unexpected corners. Within a multi-story estate, the hallways are often well-maintained and very

straightforward without any possibilities to explore. Next to that, the relation between the dwelling and the street, or the place where children play, is very important. For parents it is pleasant to be able to keep an eye on your child while he or she is playing outside without disrespecting its privacy. For a child it is good be closely connected to the home while playing. When something goes wrong, it is important for the child to be able to go home quickly and retreat to the safe environment of their own home. When it is more difficult to return back home for safety, children tend to be more aggressive (Jephcott, 1971, p. 87-88).

In most high-rise residential buildings the close connection between the dwelling and the place where children play is missing because the children can only play outside of the building, next to the ground floor, while their parents are in the dwelling much higher up in the building. There is no visual connection between the child and its parents while playing. This is problematic for both the children and their parents.

One of my goals for this research is to understand what aspects make places suitable for children to play. Based on the book Homes in High Flats by Pearl Jephcott (1971), the aspects in figure 6 show the most important characteristics of suitable and safe places for children to play.

Possibility to explore

Visual connection with the dwelling

Privacy

Things to play with

Space to play

Figure 6 - Aspects of play
Drawing by Author

Firstly, children need space to play. This is preferably a place where children can also play when the weather is bad. It is important to keep in mind that children produce a lot of noise while playing.

The place where children play has therefore to be placed strategically in relation to the dwellings. Important aspects for the place where children play are that children need to have a certain degree of privacy to play freely. Next to that, children need to be able to make the place where they play their own and they need things they can use to play with. Playgrounds with dynamic objects are used better than static playground. Slides are an exception to this rule. Another important aspect is the connection to the home. This close connection between the house and the street is often missing in high-rise buildings. Parents want to be able to keep an eye on their child while being able to give them enough privacy to play freely.

The last, but maybe the most important aspect of the places where children play is that children need to have the possibility to explore. "If children are not able to explore the whole of the adult world round about them, they cannot become adults. But modern cities are so dangerous that children cannot be allowed to explore them freely" (Alexander, Ishikawa & Silderstein, 1977, p. 294). It is therefore important to create a safe environment where children have the possibility to play freely and explore.

These aspects of play are mostly focussed on the scale of the building. On neighbourhood level there are also different aspects that contribute to the liveability for children in the city. Lia Karsten, Associate Professor Family and Child Geographies and architect Naomi Felder, did a research on the next generation of children living in cities. In their book, De Nieuwe Generatie Stadskinderen (2016) (The New Generation of City Children, 2016), they show the ways children and their parents use their living environment, the places they like to be and the places they rather avoid. They also show how a city should be designed to invite children to play, move and meet.

Families often move to the city because of the short travel distance to all daily facilities. For a child it is important to be able to travel to these daily facilities without needing their parents help. By being able to travel somewhere on you own, a child develops a sense of physical and social mobility (Karsten & Felder, 2016). Next to that they show other aspects that could make the city more suitable for growing up as a child (figure 7).

Densifying the city
More users of less public space stimulate encounters, because there are more people, the chance to meet somebody is higher. This can be used both inside or outside the building.
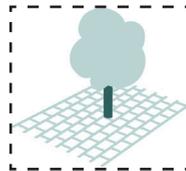

Create wide sidewalks
Place trees in the middle of the sidewalk, this creates a place to play. Wide sidewalks need to be combined with parking spaces for bicycles, to keep people from placing their bicycle on the sidewalk.
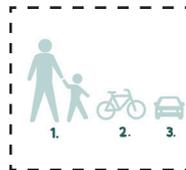

Prioritize pedestrians over cyclists, but cyclists over drivers. Create safe mobility by differentiation in the street typologies on neighbourhood level. This will stimulate the participation of young children.
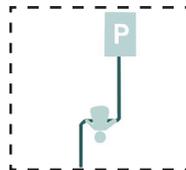

Design double use
Children play always and everywhere. Think imaginatively about playing. Think about the distance between trees or lampposts. This will help children to play within the city.
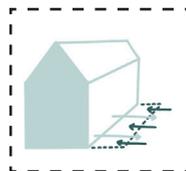
Connect dwellings to the ground floor
(high-rise also) Create dwellings with a view to the street and a semi-public threshold zone. Residents can appropriate this area. It stimulates staying and meeting at the street.
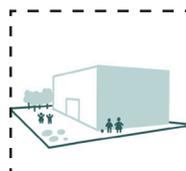
The school yard and the neighbourhood square
Easy to get to, accessible after school hours, supplemented with other social functions such as clubs or greenery. The neighbourhood can meet here.

Figure 7 - Aspects of play
Drawing by Author

Children in high-rise residential buildings

Children in high-rise residential buildings

Next to these aspects on neighbourhood level, there are aspects that make the inside of a dwelling more suitable for living with children. The bond between children and adults is extremely important in a family home. To provide enough privacy but also to encourage this bond between the parents and children it is important to create three distinct areas in the house: a realm for parents, a realm for children, and a common place. These areas should be approximately the same size, with the shared space being the largest (Alexander, Ishikawa & Silderstein, 1977).

Children require room to discharge energy when it is required. It is critical to have a small area dedicated solely to the children. Children also benefit from having their own door to the street or an outdoor area where they may play whenever they wish, sheltered from the weather. As a result, it is critical to designate a room in the home solely to the children. This could be, for example, their bedroom. It's critical that this bedroom has access to a secure outdoor play area where kids can play safely.

To create a healthy living environment for children, it is thus important to create a safe space where children have the freedom to play en explore. While playing, children need to have a feeling of privacy, but need to be closely connected to the safety of their own home. To create a safe living environment, it is important to stimulate a feeling of social safety. When there is a great feeling of social safety in and around the dwelling complex, parents are more likely to let their children play outside unsupervised. The next chapter about community building will focus more on this theme of social safety.

The ideal place to play outside for children consists of a few characteristics. To create a pleasant space it is important that is it protected when it rains. Children also benefit from having plants and greenery where they play. For children between the age of two to five it is for example important to play with natural materials and being able to explore bushes and trees. For the rest of the building it is also important that the children play at a place where the noise doesn't bother the other residents. Some residents without children may find it disruptive to hear children play every day.

Age determines a lot about the way a child plays. The scheme below (figure 8), shows the most important aspects of playing for children of different ages (How Children Play at Different Ages, 2018).

0-6 months
- Inside
- Direct supervision needed
- Stimulating senses

6-12 months
- Inside
- Direct supervision needed
- Games
- Use of the whole body

1-2 years
- Outside is important
- Direct supervision needed
- Not interfering unless in danger
- Getting dirty
- Improving movement

3-5 years
- Like to be outside
- Direct supervision needed
- Exploring
- Making things

5-8 years
- Structured activities
- Freedom to choose what he or she wants
- Imaginative playing
- More independence

8-12 years
- Creative
- More challenging activities
- Playing with friends
- Further from the home

12-18 years
- Friends and friendship groups are important
- Being in public places
- Identity
- Online relationships

Figure 8 - Aspects of play

These different ways of playing can have a big influence on the way spaces are designed. Depending on the user of a certain space, other playing elements can be introduced.

Morphological analysis
How can children use the buildings they live in?

By looking into several case studies I want to explore the ways children use and experience their physical settings. After doing this I hope to be able to use the findings to determine child friendly design guidelines for high-rise residential buildings. The exploration of the case studies will help to make the translation from literature research to a final design concept.

Analytic criteria

- **Places to play**
  - Where are possible places to play in and around the building?
  - What aspects make a place suitable to play?
- **Possibilities to explore**
  - Are there possibilities for multiple routes through the building that allow people to explore?
  - Why are some circulation spaces more suitable for exploration than others?
- **Scale**
  - What is the scale of the building and the different parts of the building?
  - How does the scale of the building relate to a child's perception of scale?

Places to play

For the first part of the morphological analysis about places to play I looked at the Amager Children's Culture House in Copenhagen, which has been designed for children in particular. The Amager Children's Culture House in Copenhagen was designed by architectural firm Dorte Mandrup. During the design process the architects consulted children to optimize the design for this target group.

According to the architect, "the house offers flexible spaces and customized furniture, which have been proven to enhance children's creativity and active participation. The expression of the Children's Culture House is surprising and imaginative - the roof and facades are treated as the same, and the house does not have a "beginning" and "end" as ordinary houses do. All interior spaces are visually connected and are bound together by dynamic circulation" (Dorte Mandrup, 2013). During my visit to this project in 2018, it immediately became clear that everyone who entered the building, including adults, immediately tended to start playing. This behavior was clearly encouraged and provoked. I can therefore say that the building is indeed surprising and imaginative. I do however think, that

the building has a clear beginning and end, maybe it is not the same for everyone, but I would nog say that there is none.

By letting children be a part of the design process, certain elements have been integrated into the design, such as "many intriguing angles, caves and stairs that provide a wealth of opportunities for creative expression and exploration. Just like the kids wised for! A dream come true!" said Nild Regout, Head of Amager Children's Culture House (n.d.).

The following drawings show the elements that are used in the design of the Amager Children's Culture House, which has been designed to create a building that is specifically made for children. These different elements create a safe environment where children have the possibility to play freely and explore. Some elements come with their own difficulties such as the contradiction between wanting to have great visibility for the teachers, but also wanting to have nooks and cave like spaces for the children to retreat. These contradictions are mentioned also in the discussion of this chapter.

Figure 9 - Interesting staircase
Drawing by Author

The different interesting staircases give the children a possibility to use them as a place to play and explore. There is a staircase which is combined with a climbing wall and a staircase combined with seating.

Figure 10 - Lower windows
Drawing by Author

The windows in the building are made to fit both the height of the children and the adults that use the building. The windows are all on different heights, very low to very high, so that even small children can easily look through them.

Figure 12 - Caves
Drawing by Author

Children benefit from having small, cave like places to play in. Therefore within the building, many places have been created where only children can come. They can be tucked away in natural nooks and crannies, such as under the staircase
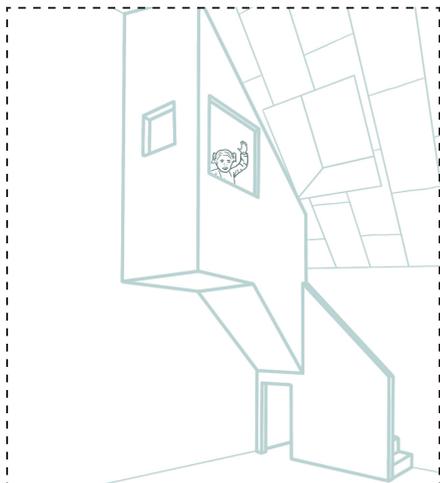
Figure 11 - Interesting angles
Drawing by Author

Having the possibility to explore is a very important aspect of a child's development. The building therefore provides children with interesting and unpredictable angles to promote creative use of the space.
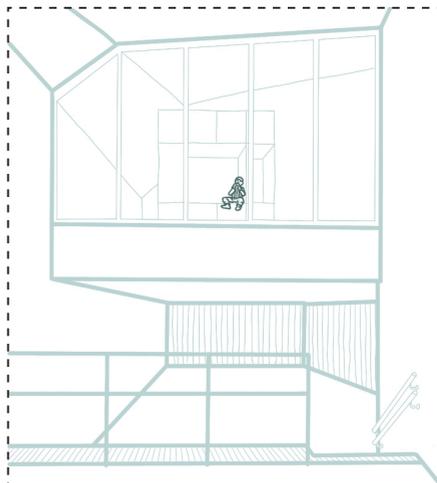
Figure 13 - Visibility
Drawing by Author

Another important aspect that has been taken into account is visibility between the teachers and the places where children can play. Many spaces are connected by glass walls to improve the visual connection between these spaces.

Figure 14 - Double use of the staircase

Photographs by Author (2018).

Figure 16 - Possibility to explore

Photographs by Source: https://www.archdaily.com/388629/ama-r-children-s-culture-house-dorte-mandrup

Figure 15 - Things to play with

Photographs by Author (2018).
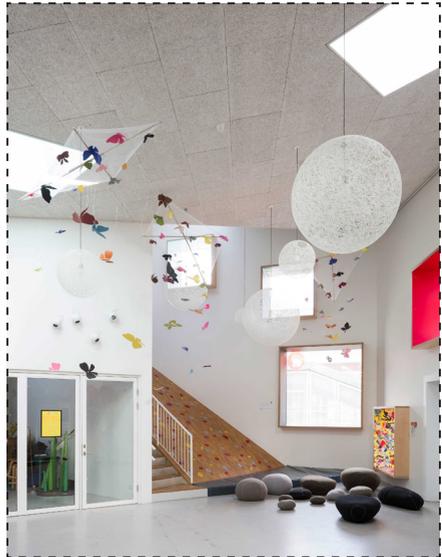
Figure 17 - Child eye-level windows

Photographs by Source: https://www.archdaily.com/388629/ama-r-children-s-culture-house-dorte-mandrup

For this part of the morphological analysis I have also looked at the Family Scraper in Rotterdam. The Family Scraper has been designed specifically for families with young children. The design of the building uses the traditional Dutch row house typology in a high-rise residential building.
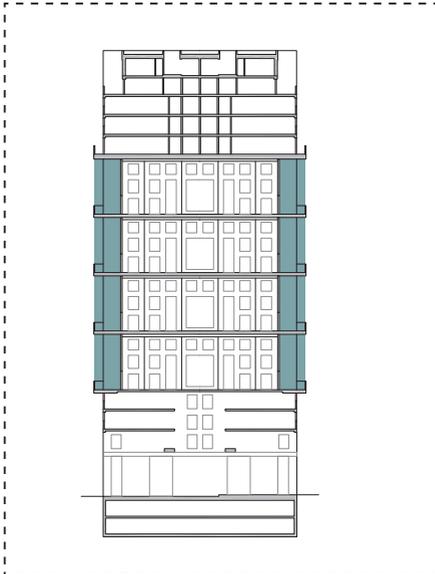
Figure 18 - Places to play
Drawing by Author

The Family Scraper consists of four main parts. The bottom layer is dedicated to a commercial plinth with street studio's on top. The next block is dedicated to terraced family houses. These houses are on the lower entry level all connected to a collective exterior circulation space that goes around the whole building (figure 18). Every three floors, there is such a deck where children can play close to the front doors of their house. Most dwellings also have a small garden that is connected to this deck (figure 19). The top block consists of panorama lofts that have small patio's as a private exterior space. Especially the block with family houses seems suitable for children to play outside without being too far from the home. One of the downsides of having these large collective terraces is that they are quite high and can therefore feel unsafe. The barrier in figure 19 does not look sufficient to me. When children want to play with a ball for example it is very likely that the ball will end up going over the fence and drop

Figure 19 - Interesting angles
Drawing by Author

down to the street below. This can be dangerous for not only the children in the building, but also for the people on the street. Therefore, it would be more useful to have more space to play, or a higher fence around the deck. Another solution can also be to place the collective exterior space on one of the lower levels. The idea of creating this area where children can play, while their parents are in the garden so the can watch, is very important. It will however be difficult to create a place that is closely connected to the dwellings of the whole tower, and a safe place for children to play freely.

Possibilities to explore

Children benefit from the possibility to explore within the areas surrounding their dwelling. In a conventional neighbourhood this will concern the roads, alleys, corners and squares connected to the dwelling. High-rise buildings are lacking these direct connections to the streets. Within the case studies, I explored the possibilities for exploration. I have looked into the circulation space and the possibilities to choose different routes to get to your dwelling and the aspects that make a space interesting for children to explore.

In the Wolkenkrabber in Amsterdam there is one hallway on each floor connecting two dwellings to the elevators and staircase. The hallway is situated around a core with a chimney. Because of its circular shape I can image children running around the core and trying to catch each other (figure 20). This is something I personally associate with my parents house, we had the same opportunity to run in circles, and as a child I did that very often. Next to that possibility of running in circles, it would be possible to go to the floor below by using the stairs and using the elevator to go back up. Even though it is only a small hallway, there a possibilities to play and explore. The size of this circulation space is however not comparable with my parents house. In a building like this, it is much more difficult as a parent to supervise when your children are playing. Figure 21 shows a way to explore the different levels of the Wolkenkrabber. It is most definitely not the most efficient way of moving through the building, but it is a possibility, which is very important to create an environment

Upper floors

Ground floor

1:500
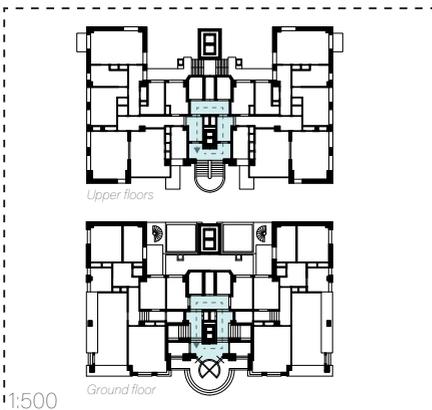
Figure 20 - Possibility to explore in the Wolkenkrabber
Drawing by Author
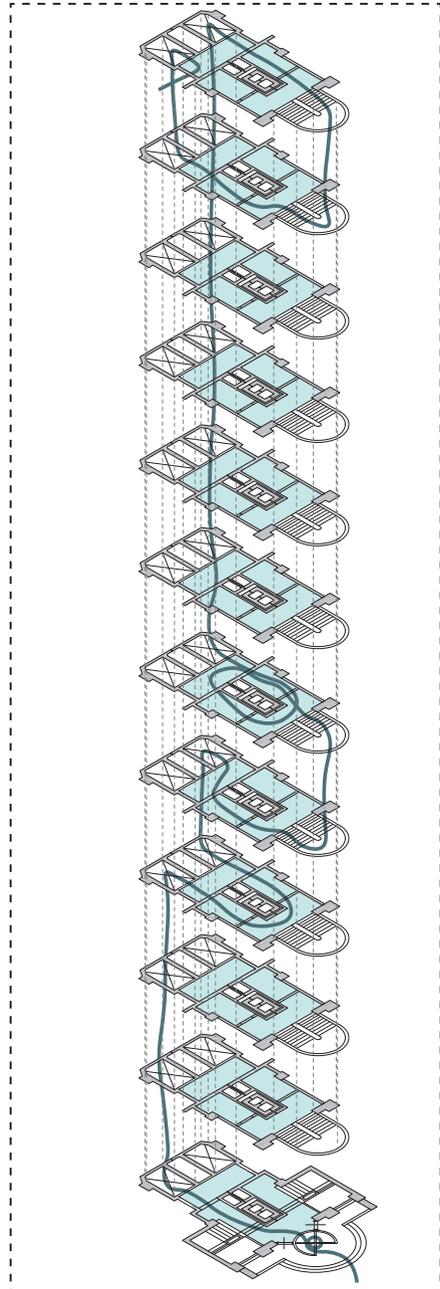
Figure 21 - Possibility to explore in the Wolkenkrabber
Drawing by Author

to explore for children.

In the Unité d'habitation the hallway much more straightforward than in the Wolkenkrabber (figure 22). It is one long and straight hallway with a few inlets where children can maybe hide. However, there is a high degree of control possible because
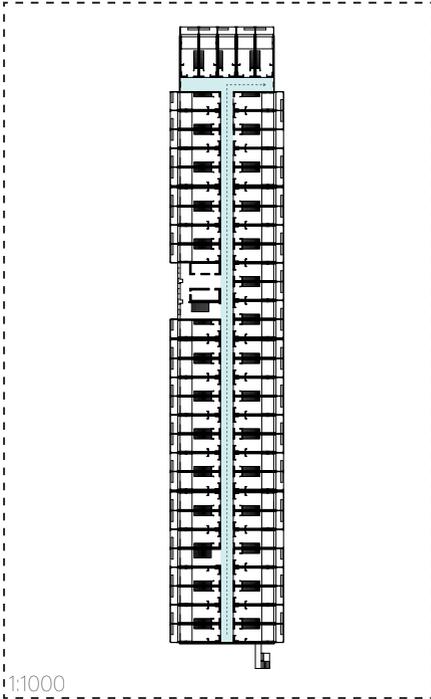
1:1000

Figure 22 - Possibility to explore in the Unité d'habitation
Drawing by Author

of the overseeable layout of the hallways.

The Unité d'Habitation is designed with a collective roof where the residents can meet. This is also the place where children can play outside, in a relatively safe and protected environment. Because there is this possibility, it is less important to have circulation space that is suitable for playing. One big disadvantage, is however, that the rooftop is not visible from the dwelling.

The 8-House has a very interesting outdoor circulation space, that is wide enough for children to play and ride their bikes. The houses that are directly connected to this circulation space, have large windows and small front gardens. Parents can therefore have a visual connection with their
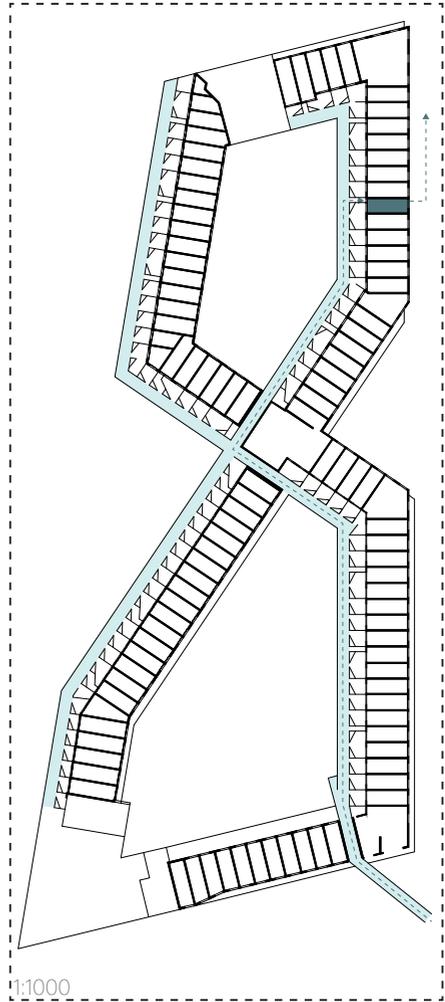
1:1000

Figure 23 - Possibility to explore in the 8 House, Copenhagen
Drawing by Author

child playing outside, from their own living room. Because of its shape, the 8-house is also very suitable for exploring. It is possible to walk along all the outdoor corridors and use many of the vertical circulation spaces to create an infinite amount of possible routes through the building (figure 23).

The circulation space plays thus an important role in increasing the possibilities for exploration within a building. The most important aspect is that there is a possibility to move in circles instead of one straight and predictable line.

Scale
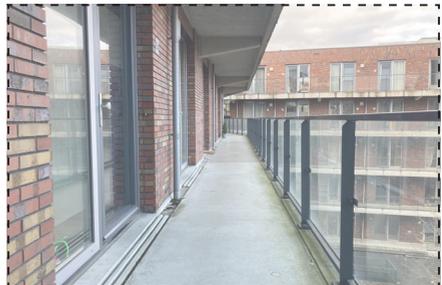
Figure 24 - Adult eye-level
Photographs by Author (2021). Michiel de Ruyterweg Student Housing Complex

Figure 25 - Child eye-level
Photographs by Author (2021). Michiel de Ruyterweg Student Housing Complex

The scale of a building is perceived differently by children and adults, because of the difference in height. The pictures in figure 24 show the perspective of an adult while walking through the building that I live in myself. The pictures in figure 25 have been taken at the same location as the pictures in figure 24. Here the perspective has changed to the eye-level of a child. The main difference between these two sequences are the elements that block the view of the horizon. As a child the view of the horizon is blocked quite often. This prevents the child from having a complete overview of the space. As an adult it can also be very frustrating when you are not able to see the horizon. It is important to keep this in mind when designing a building that houses a lot of children.

An example of keeping in mind a child's perspective can be seen in the design of Amager Children's Culture House where some windows are lower to the ground to make it easier for children to look through. Another example is that some paintings have been placed very low on the walls for to make them easier to look at from the eye-level of a child. These are all ways of dealing with another eye-level and another perspective.

Translation to high-rise

When designing for children, I imagine that the role of the architect is to design buildings and neighbourhoods in a way that children's needs are taken into account. Within this research I try to find design tools and guidelines, that can help to design specifically for children. To get to these tools and guidelines, I looked into different case-studies and consulted different literary sources on children's living environment, behaviour and development.

When studying children, there is a wide range of researches that have been done to learn from. It is however, more difficult to find information about children in the Netherlands specifically. I think, however, that children from all over the world have something in common, and that is the element of playing. Every child, whether it was living forty years ago in Glasgow or in the near future in Rotterdam, has the urge to play. This urge lasts until adulthood. It is however the question whether the building typology, that does differ between countries and decades, influences these researches.

After consulting the different literary sources, I looked into different case studies to both understand more about the way children experience their surroundings and how spaces can be designed for children in particular.

Eventually I combined the findings from both the literature studies and the analysis of the case-studies to come to a defined set of tools and guidelines. Many of these guidelines come with difficulties or contradictions. One example is that children benefit from having privacy while playing, while it is also beneficial to have a visual connection with their dwelling and parents. This is for example also the case in The Amager Children's Culture House in Copenhagen. Here the children have special nooks where they can retreat and play in privacy. For the teachers it is however important to be able to keep an eye on the children.

Another example of the difficulties that come with designing for children is the ability to explore. A child has the need to be able to explore to be able to truly develop. In a conventional neighbourhood the possibility to take multiple routes provides this possibility to explore close to the home. In a dwelling complex this possibility to explore can be provided by a complex circulation system. This can

however come with some downsides. A complex circulation system can become very daunting for small children. There is also the possibility for children to get lost. These downsides do however come across with the downsides of a conventional neighbourhood where children also can get lost.

For this research I have mainly looked into the spatial aspects of playing and growing up as a child. For these aspects it is quite clear how to implement them into a new design project. To understand even more about children, I tried to make a connection with the field of environmental psychology. When truly designing for children, I would recommend to study more about children and their development. Children of different ages have for example different ways of playing and therefore different needs. I only touched upon that very briefly in my research. But it could be very interesting to learn more about it.

Design tools and guidelines

As discussed, there are certain spatial aspects that can help to create an environment where children have the freedom to play and explore and where parents have the feeling that it is safe to let their children play outside of the dwelling. Figure 26 shows the most important aspects that I would want to integrate in my own design.

These different aspects can be achieved in different ways when designing a building. It is the task for the architect to find the most suitable way, in each specific project, to realise these guidelines. Some can be translated more easily and directly than others.

Possibility to explore

Close connection between the dwelling and circulation space

Private places for both parents and children

Protected places to play

Things to play with

Design for double use

Private places to play in the building

Separate floor for living and sleeping in the dwelling

Private and safe outdoor area for each dwelling

Noise reduction

Things on the eye-level of a child

Greenery
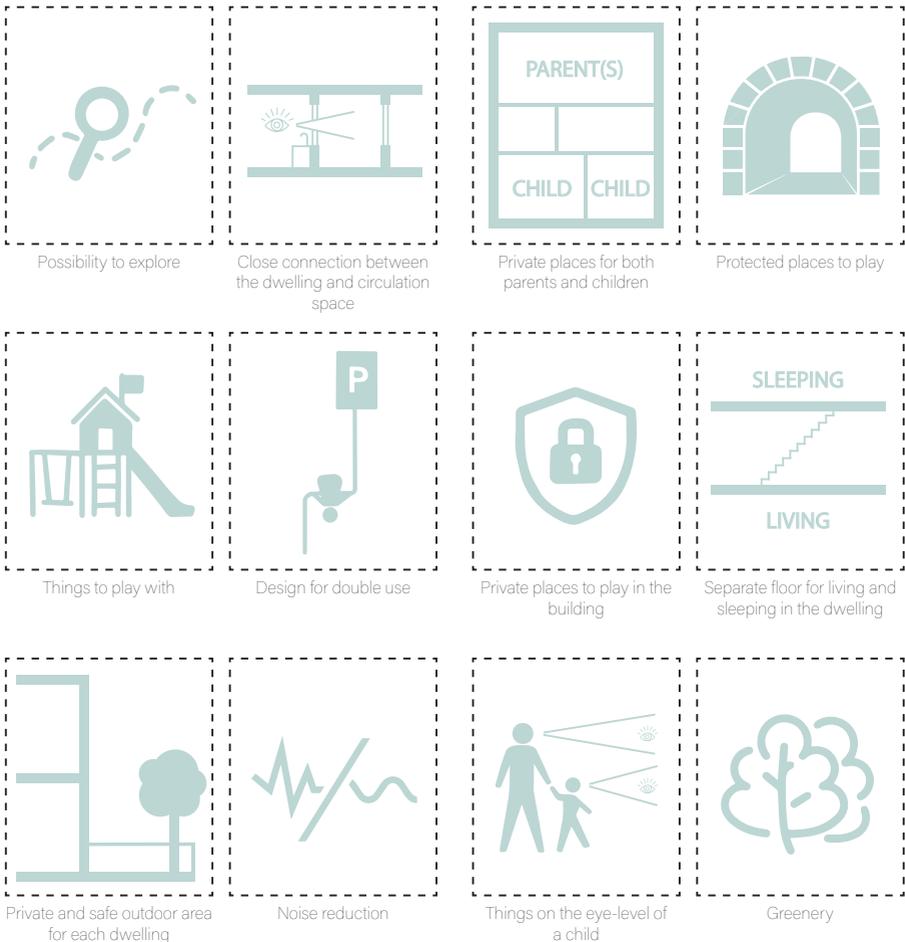
Figure 26 - Design tools and guidelines to create a pleasant living environment for children in a high-rise residential building
Drawing by Author

Community building in high-rise residential buildings

Community building in high-rise residential buildings

Stimulating a sense of belonging to a high-rise community

How can architects stimulate a sense of belonging to a high-rise community?

High-rise residential buildings in the Netherlands come with advantages and disadvantages. At this moment, for most people, high-rise dwellings are seen as a home to eventually move on from to an owner-occupied home, it is rarely the ultimate goal for a tenant (Raemaekers, 2011). Because of this, tenants do not have a good connection with high-rise buildings. The residents do not have a sense of belonging when it comes to the high-rise residential building they are living in. Within this research I want to find ways to increase this sense of belonging. By doing this, I want to make high-rise living a more viable solution for the increasing demand for housing in the Netherlands.

Measuring home

One way of increasing the sense of belonging to a building could be increasing the sense of belonging to a community. Studies have shown that being in a community cultivates a sense of belonging (Capece & Costa, 2013). It is however not a requirement to be part of a community before one will be able to feel at home (Blokland, 2008). There are many aspects that contribute to the feeling of home. Within the field of environmental psychology there is the idea of measuring home, which helps to understand more about the things that make a house into a home. A house in this case is the physical structure and a home is a set of meanings that people bestow on a residence. By doing this the home becomes part of the identity of the resident.

Different people are satisfied with different housing. Some housing will be liked by almost no one or almost everyone, such as a very expensive villa. There is however a large group of people that will have the same physical characteristics of a building that appeal to them. Most people will for example prefer a single family home over an apartment. Also most people prefer an open plan living room with an open kitchen. There is however an difference between women who work outside the home, who prefer an open kitchen more than women who do not work outside the home. (Gifford, 2014) A solution for these different preferences can be to create a flexible interior space where residents can change the space according to their needs and wishes. By providing flexibility in the home,

the resident has a feeling of having more control. This increases the sense of feeling at home and stimulates a sense of belonging.

For this research I focus on the role of the community feeling on the sense of belonging. Within a high-rise residential building for families it is important to create a community feeling for both the parents and the children. By increasing the high-rise community feeling, I hope to increase the sense of belonging for future residents of high-rise residential buildings in Rotterdam.

Creating community

There are different aspects that can contribute to creating a community. One of these is social interaction. Within the concept of social interaction there is a main theme that has an effect on the sense of community between residents. This theme is small talk, which develops trust between neighbours. Having small talk can be encouraged by providing possibilities for spontaneous encounters, that contribute to feeling at home by creating public familiarity.

There are four spatial zones used in social interaction (Hall, 1966):

- The intimate distance: 0-45 cm
  The intimate distance is rich in terms of its potential for communication and is usually reserved only for intimates, lovers, and spouses.
- The personal distance: 45-120 cm
  The personal distance is transitional between intimate contact and rather formal contact and is often used for public behaviour.
- The social distance: 120-350 cm
  The social distance can be used for business and general social contact.
- The public distance: 350-700 cm
  The public distance is for formal occasions or public speakers or high-status persons.

When taking into account these different spatial zones, it is important to focus on the threshold zone between the dwelling and the public space. The intimate distance will mostly be used within the safe boundaries of the house, which makes privacy a very important factor. Privacy and social interaction are connected through the threshold
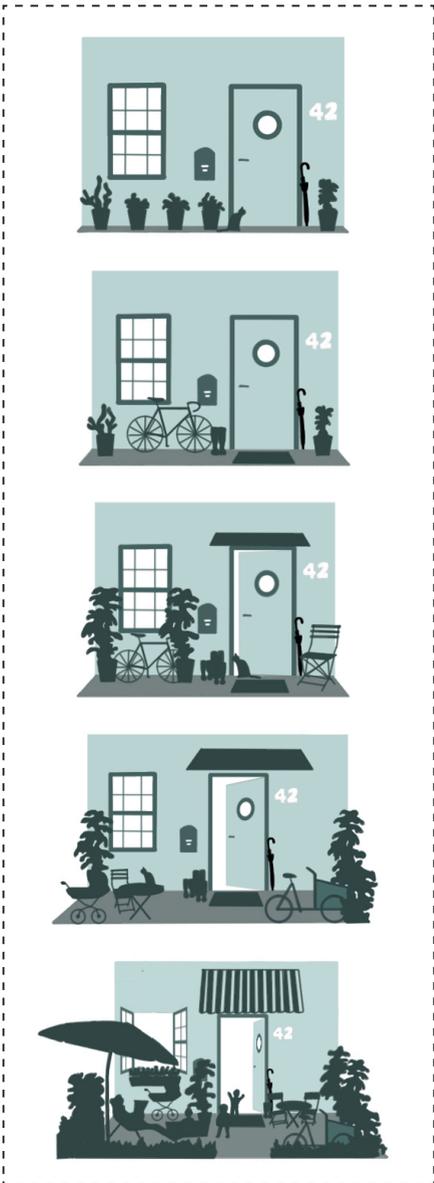
10-15 cm

There is space for a row of plant pots, an ashtray to be left out, or a place for a cat to perch undisturbed.

15-50 cm

There is room for bigger potted plants, a parked bike, and perhaps a narrow bench.

50-90 cm

There is space for a small overhang. This offers protection form the elements. This edge zone might be enough to leave the door ajar, and leave a little chair outside.

90-150 cm

There is space for a planting zone, a small table and a couple of chairs, space to park the pram or stroller sideways, or a couple of bikes.

150-180 cm

There is room for a table or a chaise lounge. The more supports to comfort you can fit in, the likely you are to spend time outdoors and socialize with yout neighbours.

Figure 27 - Threshold zone measurements
Drawing by Author

zone. Figure 28 shows the threshold zone as described by Platform31 (2021) in their document about design for interaction.
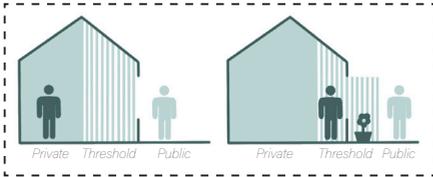
Figure 28 - Threshold zone
Drawing by Author

The threshold zone should be connected to the more public areas of the dwelling, to extend the threshold zone even more. The kitchen is one of the most public rooms in the dwelling. In Dutch households the kitchen is often used to welcome guest or even as the entrance of the home. This could therefore be one of the rooms that is closely connected to the threshold zone that connects the dwelling to the circulation space. Having this threshold zone, gives the residents the opportunity to appropriate the little space in front of their house and use it as they would like. The possible use of the threshold zone is enhanced by its measurements. The larger the threshold zone, the higher the chance that residents will be outside of their dwelling and have the possibility to see and talk to their neighbours (Platform31, 2021). When people tend to be outside more often, it is easier for parents to watch their children play outside of the dwelling. The threshold zone can therefore also be used to create a more child friendly environment. Figure 27 shows the different measurements of the threshold zone and its influence on the use of this zone.

Another way to increase social familiarity among the residents the following principle described by Jan Gehl, in his book Life between buildings (2011), can be applied. Gehl states that there is a visual connecting between the ground floor and the higher floors, where up until the fourth floor, it is still possible to recognize people at the ground. When you go higher, there is no recognition and no feeling of social familiarity. The first four floors of a building therefore have a connection with each other and the ground floor (figure 29).
This principle can be very useful when designing a high-rise building. To improve the connection between the building and the public space at the street the first four floors play an important role. This principle can also be used to improve the visual

contact between the residents. Visual contact that increases social familiarity also increases the feeling of social safety.
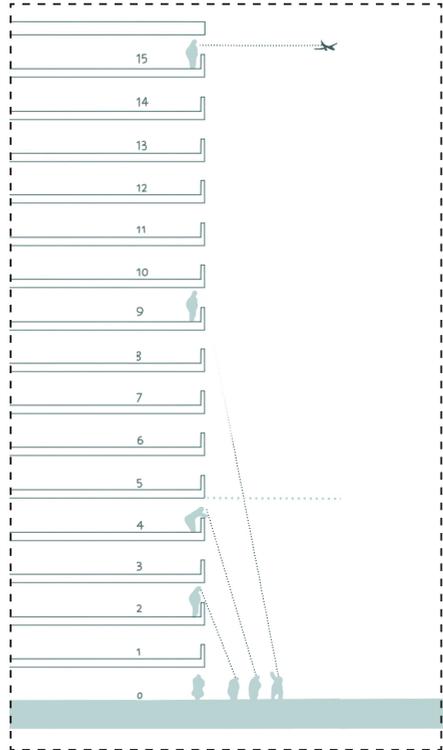
Figure 29 - Visual connectivity
Drawing by Author

Social safety is again a very important aspect for the living environment of families. For children to be able to play outside without direct supervision, it is important that both the parents and children have the feeling that they are in a safe environment.

Creating sense of belonging
For the most part, homes in high-rise buildings are viewed as stepping stones to a home-ownership; it is rarely the end goal for a tenant in the Netherlands (Raemaekers, 2011). Dwellings in high-rise buildings are often easier and faster to get, than owner-occupied homes in the outskirts of Dutch cities. Because of this, residents lack in developing a social connection with the building they live in. Within this part of the research I try to find ways

to increase this emotional connection. Rentals of any kind operate against mechanisms that allow people to live in stable, self-healing communities. It is critical to provide people with their own home, complete with a garden; even in high-rise buildings. To improve the emotional connection to the home people also require the legal authority and physical ability to modify and repair their own spaces (Alexander, Ishikawa & Silderstein, 1977).

When it comes to how they want their house to be placed in the neighbourhood, people have varying desires. It is critical that occupants feel at peace with their home's location in order to strengthen the emotional bond between them and their home. According to Alexander, Ishikawa & Silderstein, (1977), there are three sorts of houses:
·   Houses that are connected to quite back alleys
·   Houses that are connected to busy streets
·   Houses that are located more or less in between
It is important to provide these three different housing typologies to ensure that every resident can find a house that meets their needs and desires.

The same goes for high-rise residential towers. Preferably the dwellings are all owner-occupied homes, and future residents have enough choice between different types of dwellings to find one that fits their needs and wishes the best.

This al contributes to the feeling of home, which has e great impact on the sense of belonging to a certain living environment or dwelling complex.

Morphological analysis

How do buildings contribute to creating a community feeling?

By looking into several case studies I want to explore the ways buildings can be designed to encourage social interaction and community building. After doing this I hope to be able to use the findings to determine design tools and guidelines for high-rise residential buildings. The exploration of the case studies will help to make the translation from literature research to a final design concept.

Analytic criteria
- Circulation space
  - How is the circulation space organized within the building?
  - What are the qualities of the circulation space?
  - How does the circulation space create possibilities for spontaneous encounters?
- Private, collective and public spaces
  - Where are they within the building?
  - For whom are these spaces?
  - What are their functions?

Circulation Space

Upper floors

Ground floor

● Horizontal circulation
● Vertical circulation

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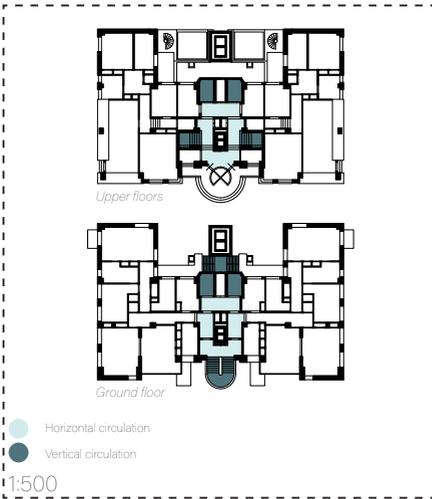
Figure 30 - Circulation space
Drawing by Author

The circulation space in the Wolkenkrabber in Amsterdam is quite standard. It is a portico like circulation typology (figure 30). There is a main entrance on the ground floor that gives access to a hallway with a core in the middle that is connected to one staircase at the front of the building with a

beautiful glass facade and two elevators in the back of the building. Because of the large amount of glass connected to the staircase, the small hallway on each floor, has a lot of natural light. This improves the quality of the hallway a lot, compared to a hallway from the same size that would be fully surrounded with closed walls. The circulation space in this building is decorated with beautiful materials that create a luxurious feeling.

● Horizontal circulation
● Vertical circulation

1:1000
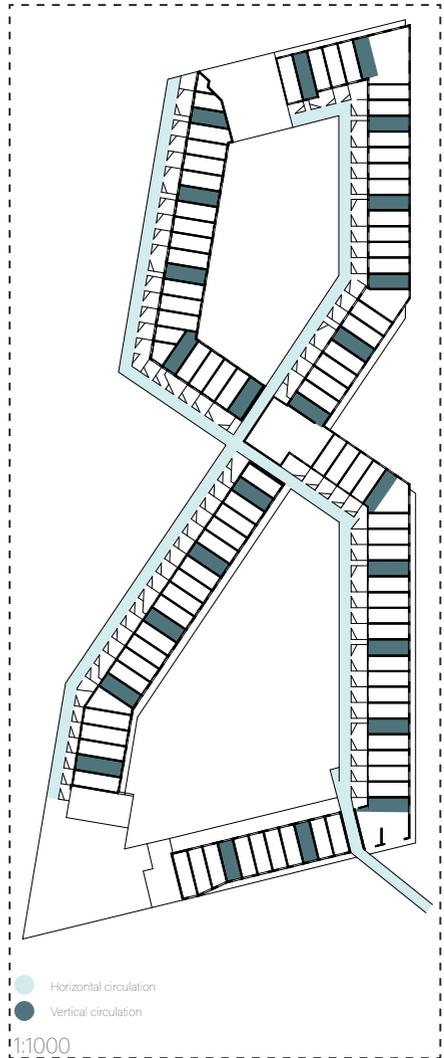
Figure 31 - Circulation space
Drawing by Author

In the 8-House a innovative circulation type has been applied. There is a large outdoor circulation system that connects in both the horizontal and vertical direction (figure 31). This outdoor walkway is publicly accessible and leads to maisonette type dwellings with small front gardens that are connected to the path. Because of the possibility to have a private garden that is connected to one of the main routes for circulation within the building, there is a higher chance that residents will meet each other and develop a form of social familiarity. By having a garden, the residents have also gained an opportunity to make their home more personal, which will also increase the sense of belonging. Next to that, the width of this walkway is suitable for all different kinds of interaction. It is important to give people the possibility to keep a certain distance from their neighbours that feels comfortable for them. In the Wolkenkrabber the circulation space is a lot more cramped which may influence the feeling of control over your personal space.

In the Unité d'habitation the horizontal circulation space is very interesting. Le Corbusier has applied a system where three floors can be accessed by one corridor on the middle floor (figure 32). By doing this, Le Corbusier, uses the available space very efficiently. This is something that can be very helpful when designing high-rise buildings. On the higher levels, there is often, relatively, a lot of space dedicated to circulation space. By accessing three floors with one corridor, a lot of space can be saved and instead be used for extra dwellings.

One other result of using this circulation typology is that because there is a lot less circulation space, residents have a higher change of meeting their neighbour when walking from the front door of the building to their own dwelling.

A disadvantage of this circulation type is that there is only a very small amount of daylight entering the corridors. It is only possible to create windows at the ends of the hallways or next to the staircases. Having a large window at the end of a hallway can become a great asset of having circulation space in a high building. The rest of the hallway can however become quite dark. It would be better to implement this same system on a shorter hallway where to windows at both ends can provide enough natural light for the whole hallway to be perceived as a pleasant space to be.

The way a hallway or staircase is designed has thus a great influence on how people experience being there and how long they will be there. The better the circulation space, the higher the change that residents can meet each other there.

Horizontal circulation

Vertical circulation

1:1000
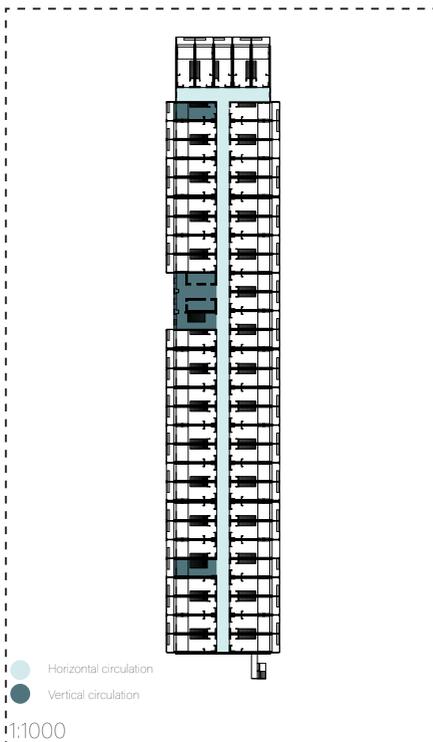
Figure 32 - Circulation space
Drawing by Author

Upper floors

Ground floor

○ Private space

● Collective space

1:500
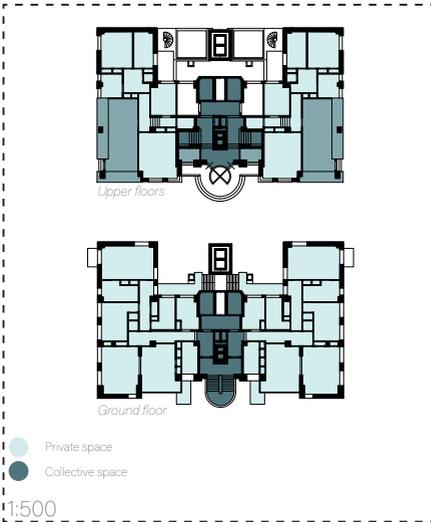
Figure 33 - Private, Collective and Public spaces
Drawing by Author

The design of a building can contribute to the feeling of belonging to a community. Having communal areas within a building provides places where residents can meet and develop social familiarity. Such places can be the central entrance with the postboxes, the elevator where you stand next to your fellow residents or a collective laundry room.

The Wolkenkrabber in Amsterdam was not designed with dedicated collective areas where the residents can meet. The circulation space is the only space where it is possible to meet your neighbours (figure 33). Having the circulation space only accessible for the residents, makes it a safe place to be. At the ground floor there are two spaces that are meant to be small shops or businesses to serve the residents of both the Wolkenkrabber itself and of the surrounding buildings. At this moment in time, one of these spaces is used as a private office. The other space is used as a physiotherapy office. This is still a place where residents from both the flat and the rest of the neighbourhood can come and potentially meet each other or develop social familiarity.

The 8 House in Copenhagen is designed completely different. The main circulation space is exterior and directly connected to the public space on ground level. This makes the circulation space

publicly accessible (figure 34). It does however not feel less safe than a circulation space that is only accessible for residents. Almost all of the dwellings in the building are visually connected to this exterior circulation space. There is a large amount of social control which increases the feeling of social safety. It is therefore a suitable space for children to play en residents to meet. A part of the houses in the building are directly connected to the circulation space with a small front garden. This garden forms a threshold zone between the dwelling and the circulation space. It is an area residents can personalize, which makes it more likely for the residents to use this space and be outside.

○ Private space

● Public space

1:500
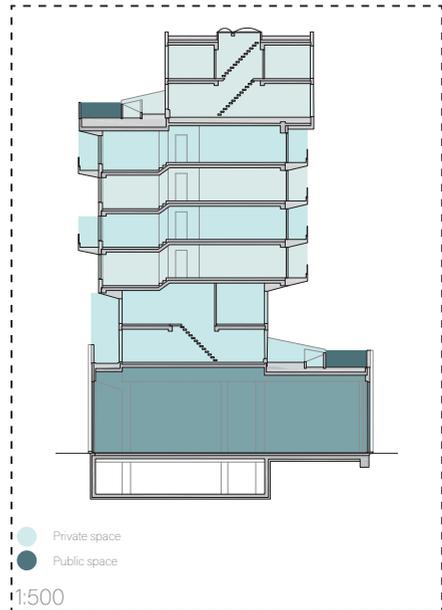
Figure 34 - Private, Collective and Public spaces
Drawing by Author

When trying to design a building that encourages community building, the connection between the residence and the circulation space is critical. The circulation space is together with dedicated communal spaces, the place where neighbours can meet and develop social familiarity.

Next to the circulation space dedicated communal areas can contribute to creating a community. The Unité d'Habitation in Marseile has become famous partly because of these communal facilities. The building has two main layers with

Private space

Public space

1:500
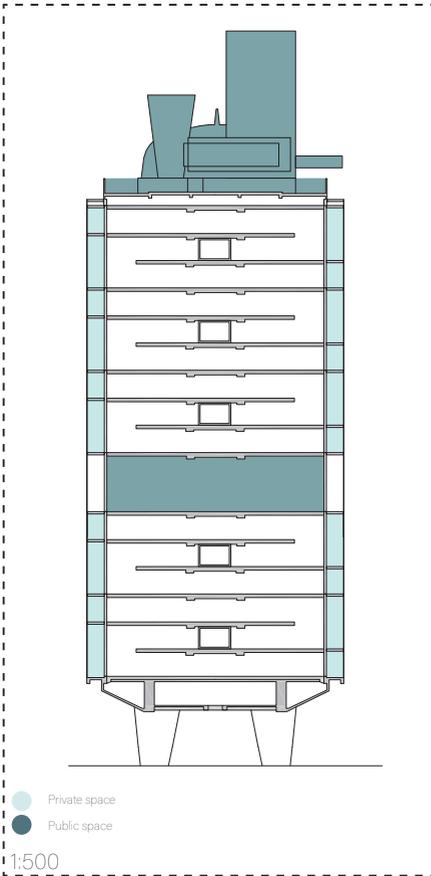
Figure 35 - Private, Collective and Public spaces
Drawing by Author

communal facilities (figure 35). The first layer halfway up is designed to be fully dedicated to shops. The top layer of communal facilities consists of a primary school and a roof terrace with many different functions such as a gym, swimming pool and a theatre. By provide a large amount of communal facilities, Le Corbusier wanted to develop a separate, ideal society in which a sense of community prevails. The building can almost function as a small city within the city.

Building community and creating a sense of belonging in a high-rise community is a difficult task. Even with all the theoretical aspects covered, the residents have to do the biggest part themselves. Residents have to put in the effort themselves to make the project a success. The architectural design can however help the residents with the first step. Without dedicated communal areas, there is no space for communal activities. Without a threshold zone, there is a higher chance of having mainly closed curtains instead of sporadic eye contact with a neighbour.

An important aspect of both building community and feeling at home is contact with neighbours. The similarity of neighbours is an important social factor that influence residential satisfaction. When residents believe that neighbours are similar to them, residential satisfaction is greater. Related to this is the threshold zone, which provides a balance between separation from everyone and togetherness with neighbours. It is important to give the residents the possibility to change their threshold zone from completely open to completely closed, based on what they want in a specific moment. This touches again upon the theme of flexibility. By giving the residents more possibilities to change the space to their own needs and wishes, the resident is more likely to feel satisfied and at home.

When translating the aspects that can help to stimulate a sense of belonging to a high-rise design, certain aspects are more suitable then others. In a high-rise building the amount of space is limited which makes the implementation of communal facilities very logical. A shared room with washing machines is more efficient that having space for a separate washing machine in each dwelling. Having one central room with all the washing machines, at the same time, creates a space where residents can meet and spontaneous encounters can take place. Maybe you meet your neighbour from three floors below you every week, during your concurrent Saturday morning washing moment.

The circulation space is also very important in high-rise buildings. It takes a relatively long time to get from the public space to the front door of your dwelling. The route in between provides possibilities for meeting and seeing your neighbours. The design of the circulation space determines how long people will stay in this space. The longer people spend in the circulation space, the higher the change is, that they see other people who are moving through the building.

It is possible to keep in mind certain guidelines when designing a building that should stimulate community building. But the residents will always have the most influence on the success or failure of a project.

Design tools and guidelines

As discussed, there are certain spatial aspects that can help to create an environment where community building between residents will be encouraged. Figure 36 shows the most important aspects that I would want to integrate in my own design to increase the communal character of the project. Integrating these aspects will also help to create a dwelling complex where social familiarity is stimulated which will help to increase the feeling of social safety.

These different aspects can be achieved in different ways when designing a building. It is the task of the architect to find the most suitable way for each specific project to realise these guidelines. Some can be translated more easily and directly than others.

Threshold zone between 90 and 180 cm.

Visual connection with the circulation space

Four visually connected floors

Enough room for social distance

Wide circulation space

Dedicated collective spaces

Large amount of residents connected to the same circulation system

Increase possibilites for encounters

Pleasant circulation space

Visually connected floors
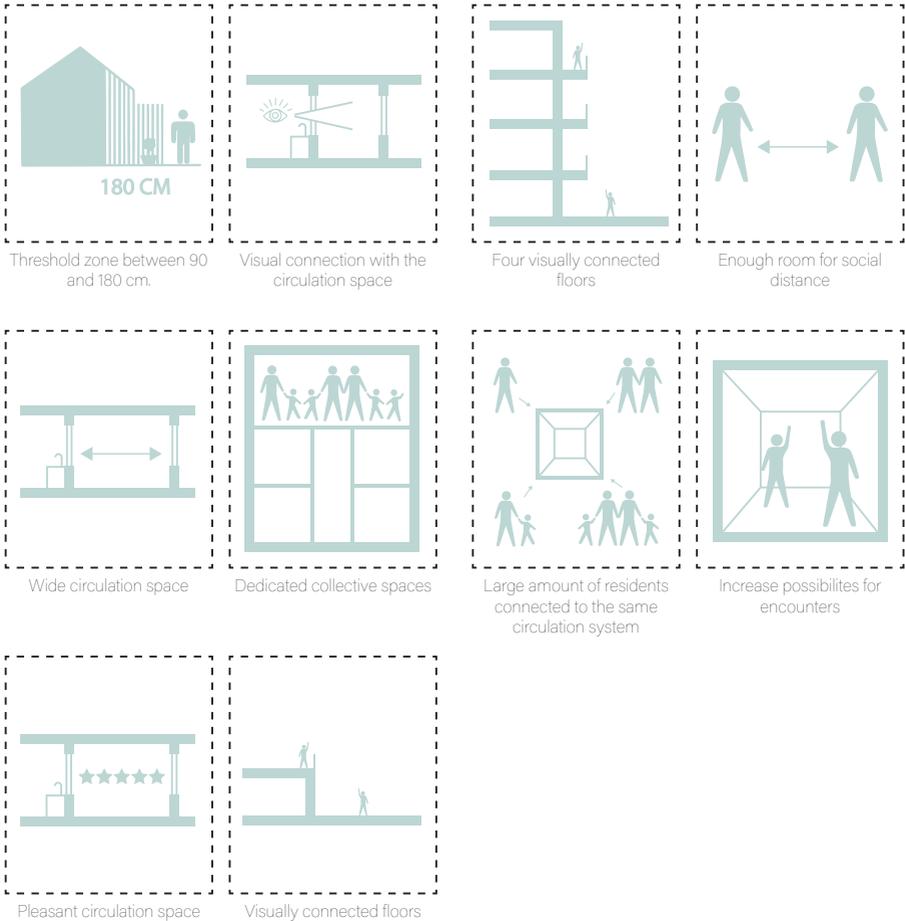
Figure 36 - Design tools and guidelines to create a sense of belonging to a high-rise community
Drawing by Author

Ethnographic research

Ethnographic research

Ethnographic research
Use of the public space

In my research, the transactions between humans and their physical environment is the focal point. The research is therefore human-centred. The field of praxeology has become of greater value for architecture and it is interesting to study the social-spatial practices and the user perspective. Praxeology is based on practice and everyday life and focuses on how people use their environment. By doing this, the human individual can become more involved in architecture, the use of a building becomes more important than the aesthetic character.

Observing residents
To understand more about the way people experience living in high-rise buildings I did ethnographic research in the form of observing residents around their dwelling or the building they live in. There are many different approaches on how to study the behaviour of people. In this research i use the qualitative approach.

- **The qualitative approach:** where meanings and personal experiences of place attachment are articulated by individuals and summarized into prominent themes. The approach can be used with case studies, where the summarized

themes can be translated to new projects. (Gifford, 2014)

To execute this type of ethnographic research I observed the residents and other users of the Wolkenkrabber in Amsterdam. The research is focussed on mapping the behaviour and experiences of different individuals in and around the building. After mapping these behavioural aspects, the different experiences are summarized into different themes. The goal is to translate these themes to future projects.

This part of the ethnographic research will be based on the drawing that are made by Jan Rothuizen (figure 37). In these drawings Jan Rothuizen maps the way he and other people perceive the things around them.

Themes I looked at during the observation:
- How do people use the public space around the building? Where do children play?
- How do people use the circulation space in and around the building?
- What kind of people use the facilities on the ground floor?
- What kind of people enter the building?
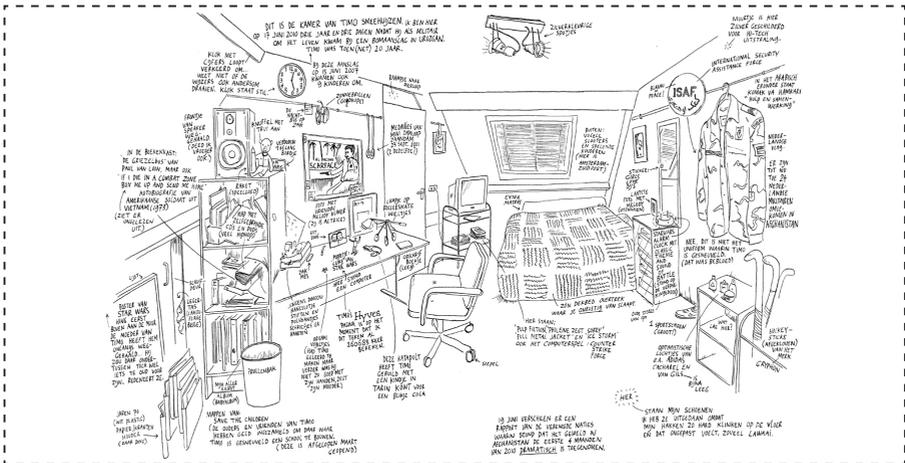
Figure 37 - Ethnographic research by Jan Rothuizen
Drawing by Jan Rothuizen

In his drawings, Jan Rothuizen shows the physical aspects of a room, in combination with text that shows the way certain elements are experienced by their user.

The drawing gives an extra dimension to the space.

Figure 38 - Ethnographic analysis on the Wolkenkrabber in Amsterdam
Drawing by Author

The drawing shown in figure 38, is the result of my visit to the Wolkenkrabber in Amsterdam. During a period of two hours, I studied the public space and the way people behave in an around the building. Based on the observational themes, the following aspects stood out to me:

How do people use the public space around the building?

The front door of the building is used by residents and visitors. Because there is a very wide sidewalk in front of the building, people can park their bikes directly in front of the building. The wide sidewalk makes this part of the neighbourhood relatively pleasant for a walk.

Where do children play?

One thing that stood out to me, was that the small protected green areas next to the building where used by children to play. Because these green areas are protected, children can leave their toys there and play without direct supervision of their parents. People also used the fence around these green areas to lock their bikes to.

How do people use the circulation space in and around the building?

People tend to use the elevator more often that the staircase. During the two hours that I observed the building I have seen many people entering and leaving the building, but I have seen nobody using the staircase.

The circulation space around the building is very windy because of the high of the building and the composition with the neighbouring buildings.

The results from this part of the research will be taken into account when formulating the design tools and guidelines.

Research
conclusion

Research conclusion

Research design

Conclusion

In the last part of my research I reflect back on the main research question: *How can a high-rise residential building contribute to improving the living environment of children in cities while stimulating a sense of belonging to a high-rise community in Rotterdam?*

I divided my research into two smaller parts with two separate sub-questions: *How can the quality of the living environment of children in cities be improved within a high-rise residential building?* and *How can a sense of belonging to a high-rise community be stimulated in a residential high-rise building?* For each sub-question I tried to find the answer in the form of design tools and guidelines that I can use in my own design. To answer the main research question I look at these tools and guidelines. To provide for children, and at the same time stimulate building a community, the determined design tools and guidelines can be combined to design the 'ideal' building.

Possibility to explore | Close connection between the dwelling and circulation space | Private places for both parents and children | Protected places to play

Things to play with | Design for double use | Private places to play in the building | Separate floor for living and sleeping in the dwelling

Private and safe outdoor area for each dwelling | Noise reduction | Things on the eye-level of a child | Greenery

Figure 39 - Design tools and guidelines to create a pleasant living environment for children in a high-rise residential building
Drawing by Author

As an architect it is the goal to translate these finding to the design of a high rise building. The most important aspects to take into account are the relationships between the residents. The most critical relations are between:
· The parents and the children
· Residents and their direct neighbours
· Children and other children in the building
These different relations need a different approach and are stimulated in different areas in the building. The relation between the parents and the child is mainly relevant in or very close to the dwelling. This does however not mean that the lay-out of the dwelling floor plan has no influence on the other types of relationships. The relations between residents and their neighbours and between the children in the building are stimulated in the circulation space. The design of the circulation space can influence the way people interact inside the building, which is a critical element for creating a community but also for creating a safe environment for children to play outside.

Threshold zone between 90 and 180 cm.

Visual connection with the circulation space

Four visually connected floors

Enough room for social disctance

Wide circulation space

Dedicated collective spaces

Large amount of residents connected to the same circulation system

Increase possibilites for encounters

Pleasant circulation space

Visually connected floors
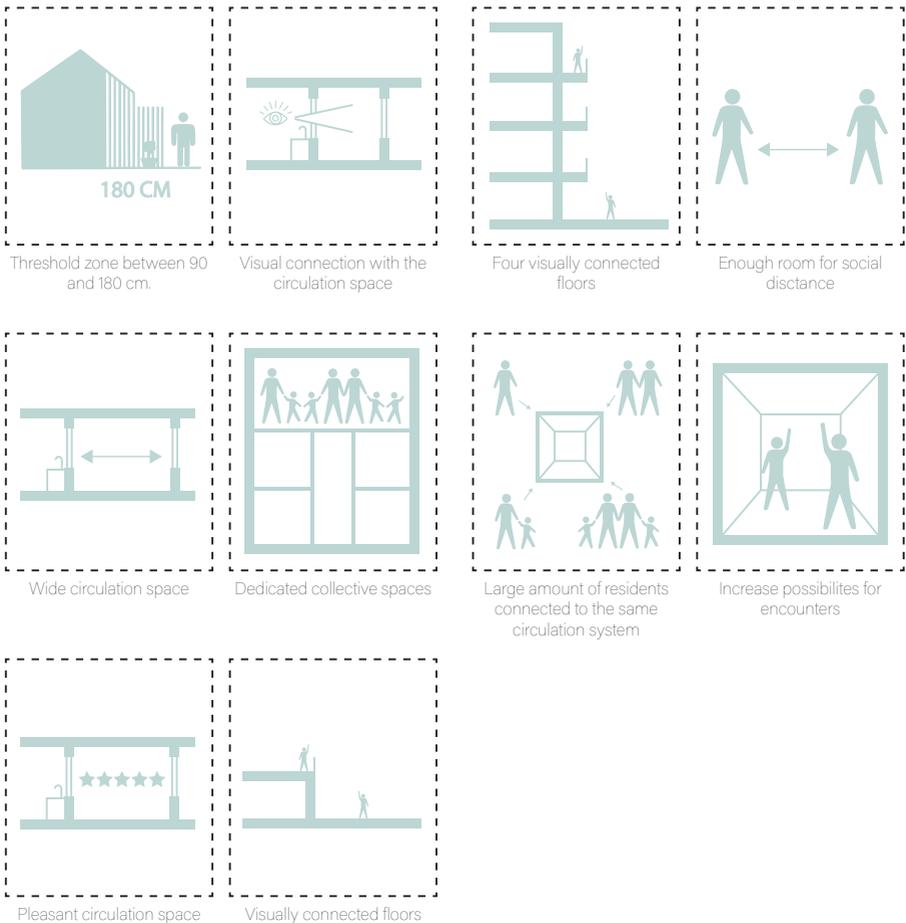
Figure 40 - Design tools and guidelines to create a sense of belonging to a high-rise community
Drawing by Author

Research design

Designing a high-rise residential building for families sounded like a dream to me. Most families have a clear view of what their ideal home should look like. It has a front and back garden, at least two floors and an open plan living room and kitchen. With a relatively low density, this is quite easy to make and the architect has a lot of freedom and possibilities. To create this type of dwellings in a very high density it is however much more difficult to meet these criteria. To be able to create dwellings in a high-rise building that are still suitable for families the design tools and guidelines from this research can be used. The same goes for creating a community. This is something that is always difficult to create with a design. But the tools and guidelines can help to create an environment that stimulates building a community. The goals for this research was to find ways to stimulate a sense of belonging to a high rise community and to improve the living environment of children in cities. The outcome of this research is that I have gained knowledge on what is important for a child regarding playing en developing and I have learned more about the ways people develop a feeling of social familiarity. There are however, many more aspects that influence these two themes.

When it comes to children, in my research I have mainly focussed on the more general term. Every child is however different. Not every solution will work for every child. It is therefore important to provide these children with many different possibilities so that children are not disadvantaged because of a character trait for example. The same goes for the theme of belonging. In one part of the research I focussed on measuring home. This again was a very general research. There is for example a difference between cultures how people experience the home and what the meaning of home is. To be able to find more specific guidelines it can therefore be useful to use the study of environmental psychology even more to understand more about the differences between cultures, genders or age groups when it comes to dwelling requirements. It is than also important to have a very specific target group.

The results from this research are therefore mainly useful for a more general design assignment. With more time and words, this research can be expanded to be a lot more critical and detailed. There are many more aspects that are important

for a child than just playing and exploring. Learning can also be a very interesting theme to look at for example. How can learning for children be stimulated through the architectural design of a high-rise residential tower? This can be a whole new research in itself. By thinking about is like this, there are many more interesting aspects to look at when it comes to children and community building.

For now the findings give however a lot of information that is critical for a childhood in a high-rise residential tower, and can definitely help to design better buildings for families.

The critical spatial element for my design will be the circulation space. This is where residents meet and children can play. It will however be difficult to convince a developer that the extra space for circulation is really necessary. In the current housing market, every dwelling is imitatively sold, Why should it be necessary to create more circulation space if it will not even be earned back? This is a question the architect will need to answer.
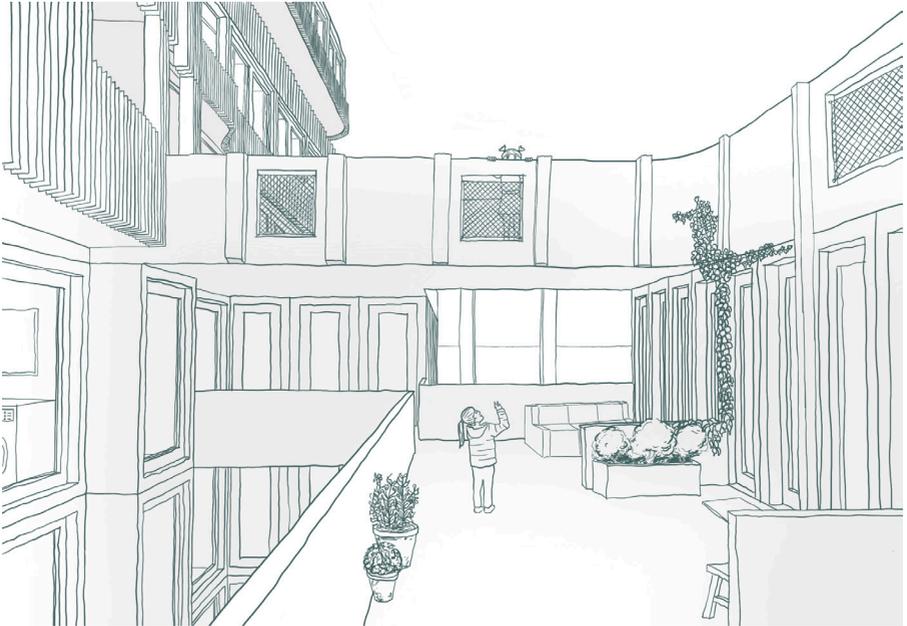
Figure 41 - Visual connection between levels
Drawing by Jan Rothuizen

Figure 42 - High quality interior circulation space
Drawing by Jan Rothuizen

Design

Design

Research design

<u>Design brief</u>
New concepts of affordable and sustainable housing could influence the way people live in cities. Because of the rising amount of people that want to live in the cities, densification of the urban fabric is needed. This is a challenge for urban planners and architects. One of the solutions for creating more dwellings in a city with a growing population is the realisation of high-rise residential buildings. Creating a high-rise residential building in Blijdorp comes with its own challenges and possibilities. Based on the urban analysis that has been done in the beginning of the studio I want to create a building that can help with providing high quality public space which can help to improve social cohesion in the neighbourhood Blijdorp. To realise both improvement of the public space in the neighbourhood and a new high-rise residential tower, funding from the municipality of Rotterdam is needed. The new high-rise will provide parking places for both the residents and other people that live around this building and houses a primary school in the plinth. These are also elements the municipality can benefit from.

Next to that it is important to invest in creating affordable and good quality housing for young families and small households. Currently, these groups have difficulty finding a place to live close to the centre of Rotterdam. By providing a high-rise residential building with dwellings for families I hope to be able to cover the high cost of building a high-rise and provide housing for one or two-person households. Family dwellings will always be more expensive than smaller apartments. By providing both larger and smaller family dwellings in the building I hope to provide dwellings for smaller and larger families with a lower-middel to high income. By combining some more expensive dwellings, I hope there is room for some smaller and less expensive apartments for one or two-person households.

With designing this new high-rise building I also want to improve the mental health of the residents and increase biodiversity in the area. This encourages an innovative and creative design solution which will provide a new way of living in cities and shows the potential of living in high-rise buildings in the Netherlands.

My design focusses on creating a pleasant living environment for children and their parents in Rotterdam. The children of today are our future, and their development starts at the home they grow up in.

Within our urban masterplan (figure 63), this high-rise will be the highest building on the direct area and because of this, it will act as a landmark for the site. It is located near the central train station next to the train tracks. Because of this a lot of people entering Rotterdam by train will see this building and its surroundings. Is will therefore become an entrance to the city of Rotterdam. Next to that, the building houses a primary school, which brings in a lot of visitors to that part of the site. The building connects the residents with these visitors.

The intended residents for this building are:
- **Families:**
- · One or two parents with one or more children.
- · Lower-middel, upper-middel or high income
- · Maisonette-type dwellings with a clear separation between living and sleeping with a good connection to the outdoor areas.
- · Mainly owner-occupied dwellings

- **One/two-person households:**
- · Lower-middel or upper-middel income
- · One-bedroom apartments on the higher levels of the building.
- · Both owner-occupied dwellings and rental apartments.

The residents will benefit from sharing certain facilities within the building. The following collective spaces will therefore be created within the building:
- · Car-sharing facility/mobility hub
- · Laundry room (not mandatory)
- · Playroom
- · Outdoor deck
- · Study room
- · Theater (combination with the primary school)
- ·
- · The spatial layout of the building will further stimulate social interaction and provide places to play for the children. The final design will be shown in a separate design booklet.
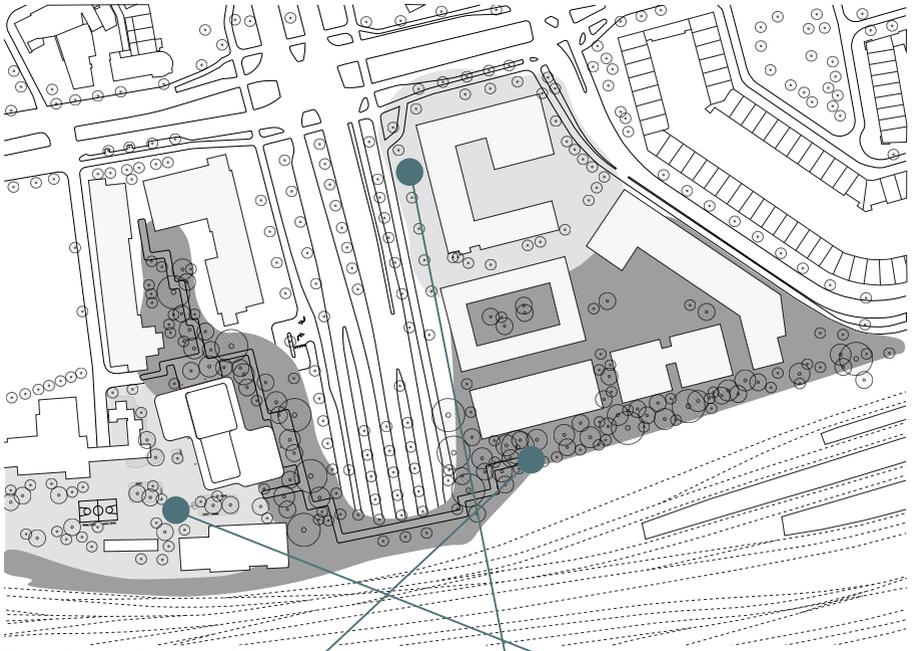
Figure 43 - Urban Masterplan 1:500
Drawing by Source: Urban strategy group - Species
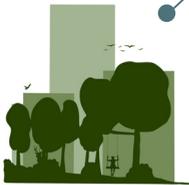
Species & Humans

Centre for Blijdorp

Campus area

Figure 44 - Urban Masterplan - core values
Drawing by Source: Urban strategy group - Species

Children
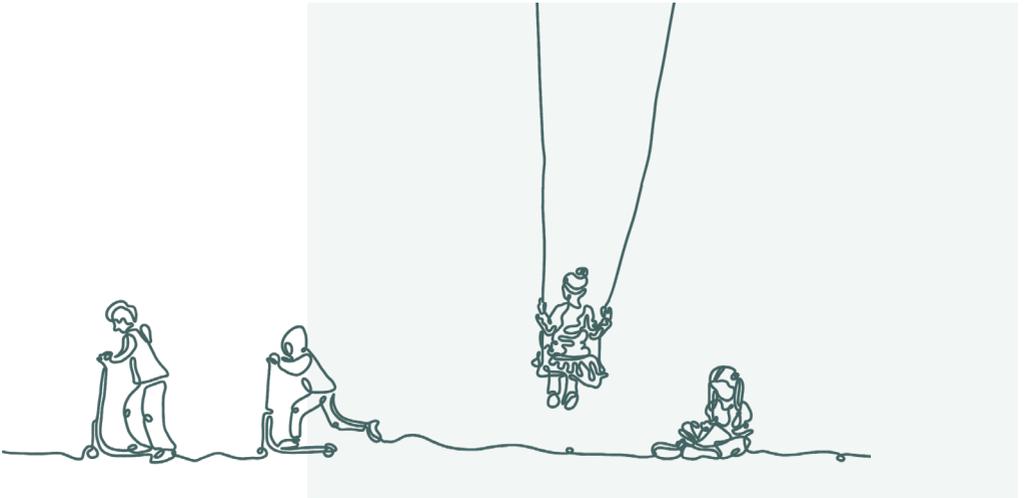
Community
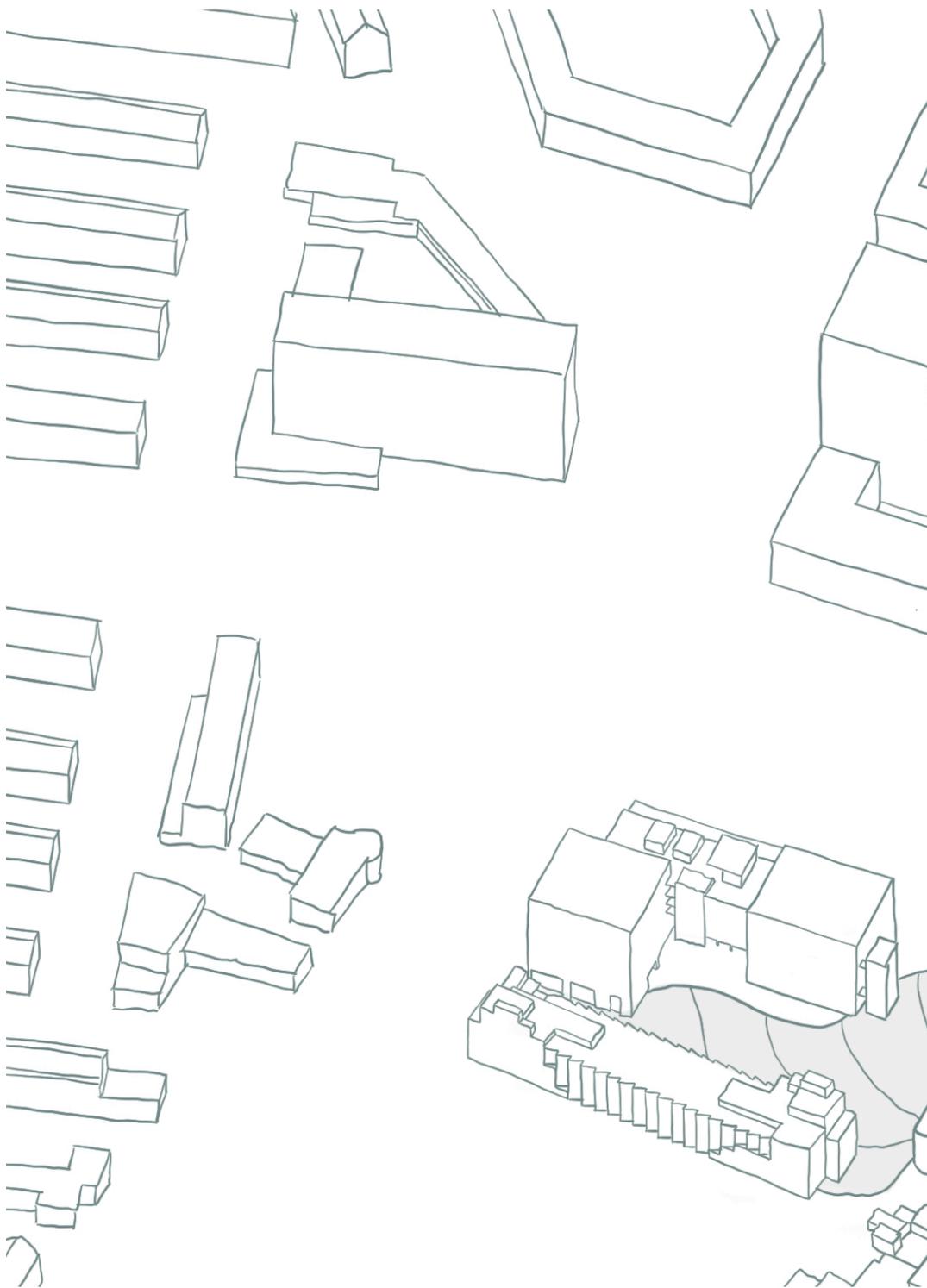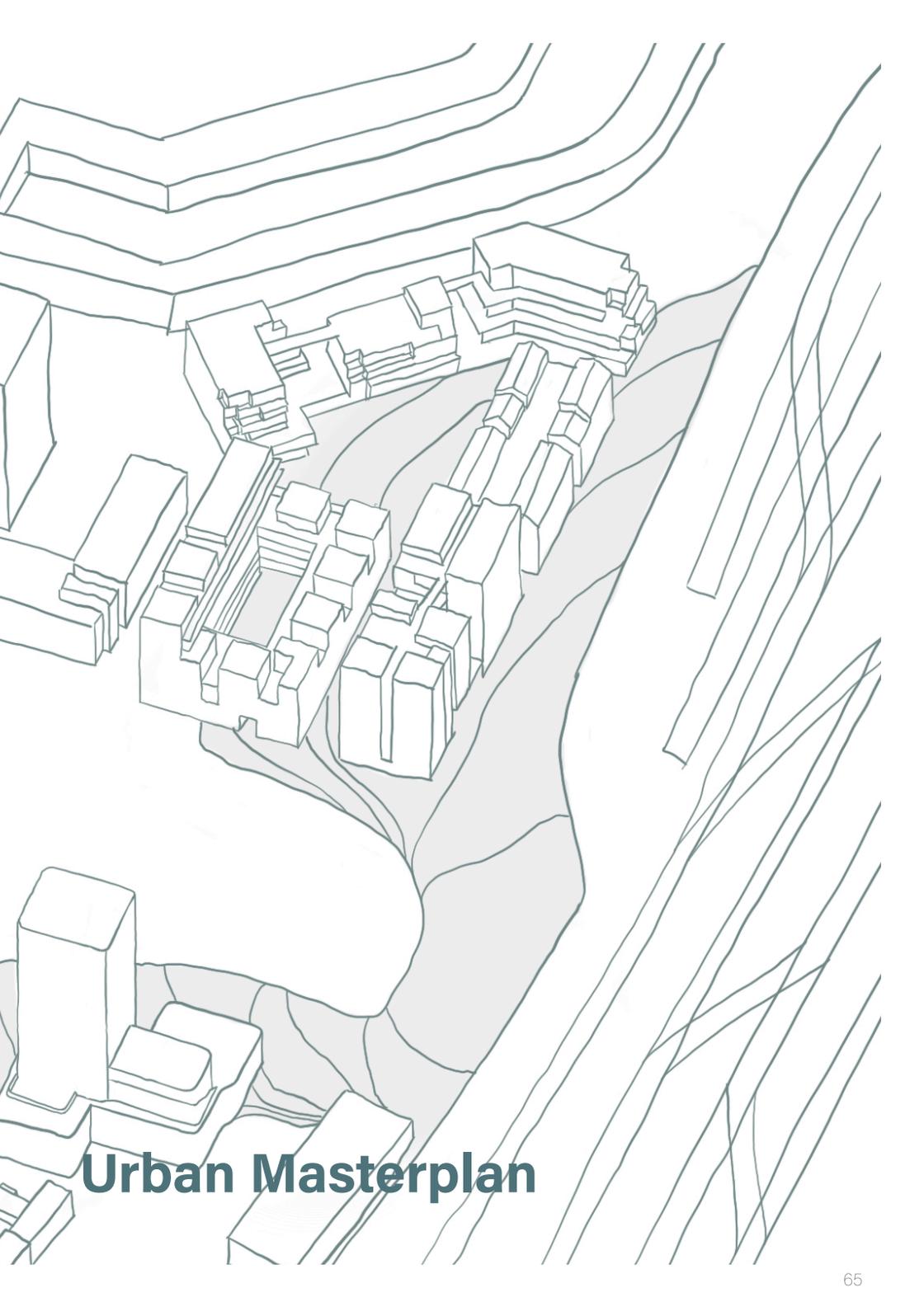
Urban Masterplan

Masterplan
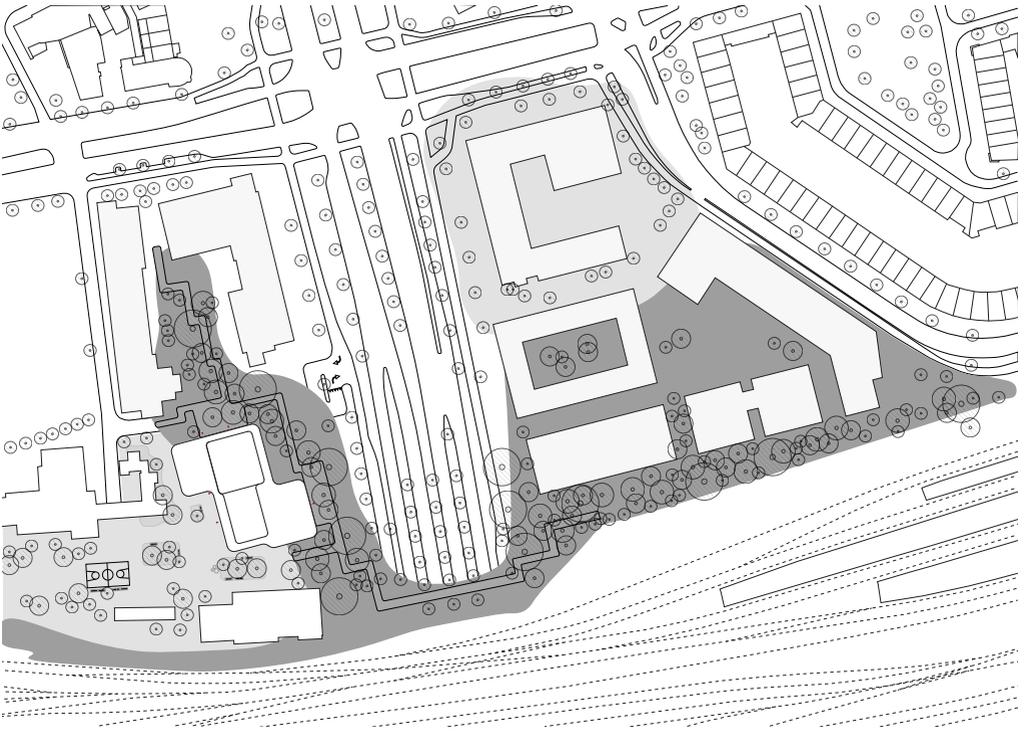
0 10 20   40m

Site location
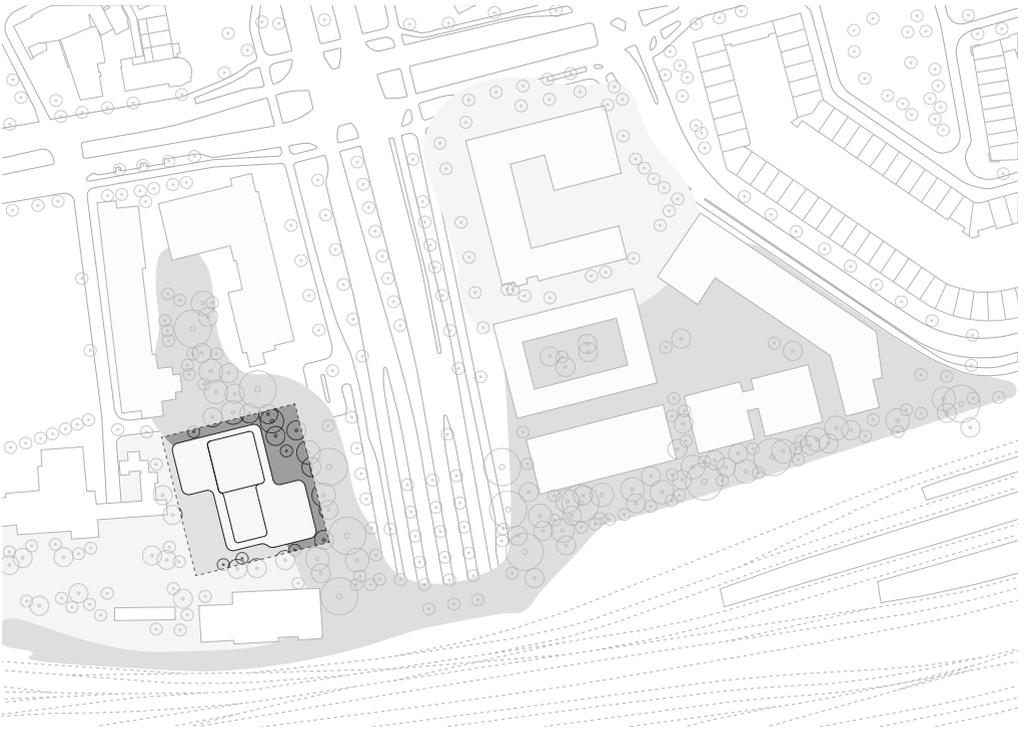
0 10 20 40m

Masterplan diagrams

Water infrastructure
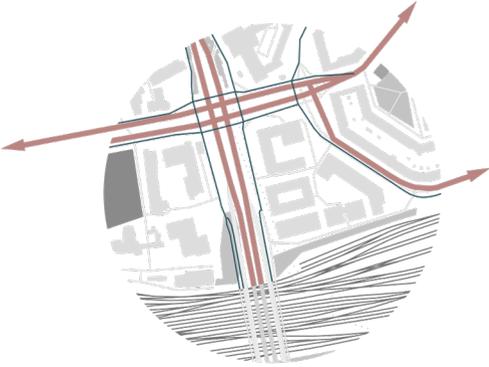
Car/Bike infrastructure

Pedestrian circulation

Green spaces

Connecting square

Access

Take-aways urban analysis

Material Re-use

Energy

Climate

Healthy living

Political economy

Urban typology

Historical context

Social context

Re-use materials when the quality of the new project can be guaranteed.
Look at the future use of the materials that will be used for the new projects.

Cogeneration unit and solar panels as possible energy suppliers.

Adding more greenery.
Using sustainable materials that can contribute to the living environment of other species.

Provide high quality outdoor (public) space.
Support mental health.
Increase biodiversity.

Provide affordable housing.
Provide good quality housing.

Dealing with the large parcel size.
Dealing with noise pollution.

Being a part of the NeNijTo area.

Creating a place where residents feel at home and welcome.
Creating housing for smaller households and young families.
Improving social cohesion.
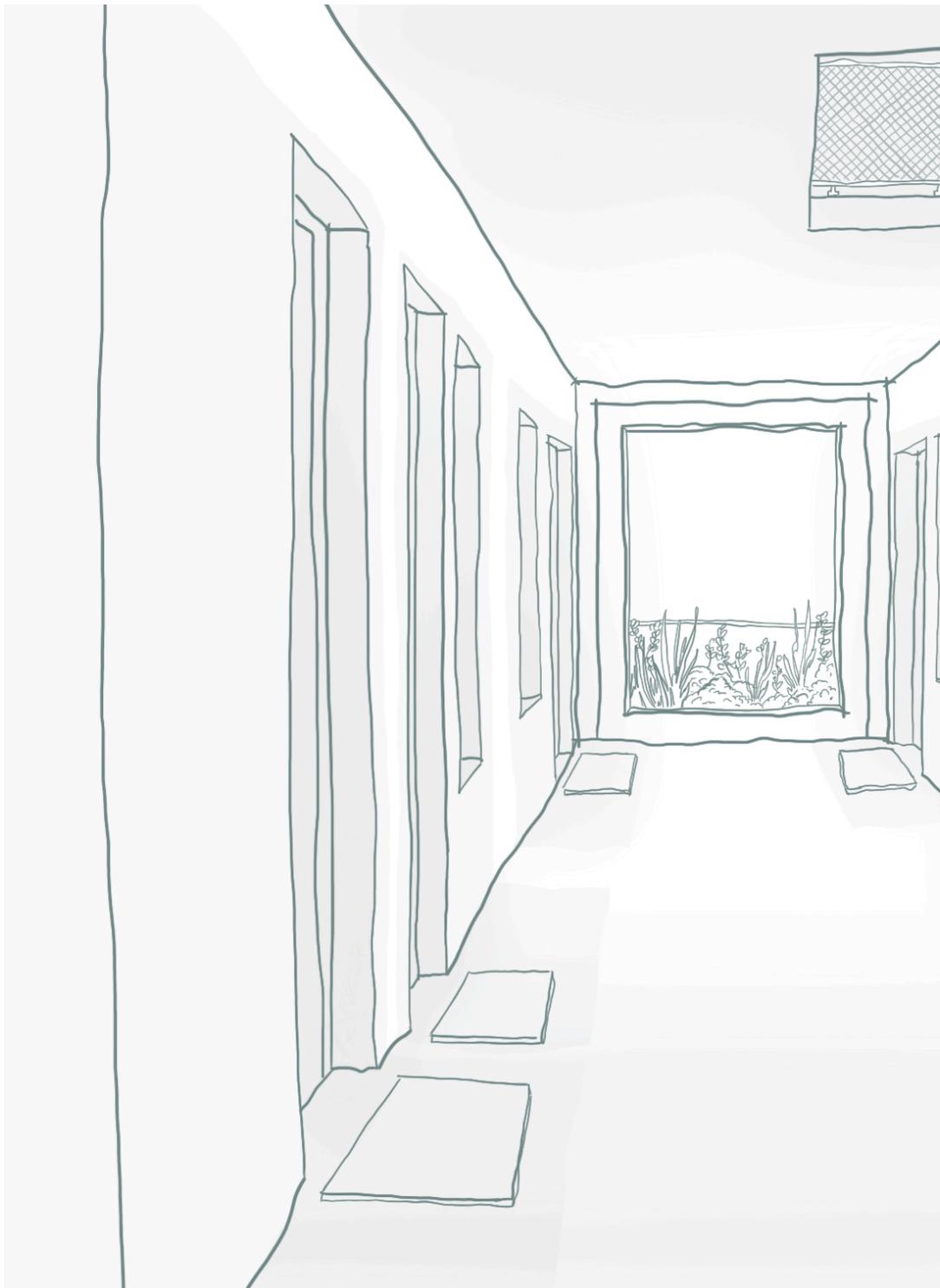
Concept

Concept development
Diagrams
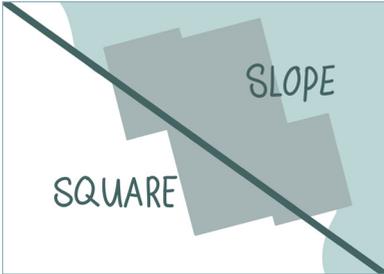
Dual character due to the slope on one side and a public square on the other side.
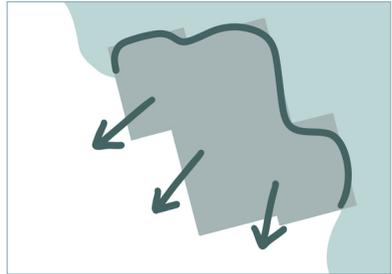
The building has one more open side and one more closed side.
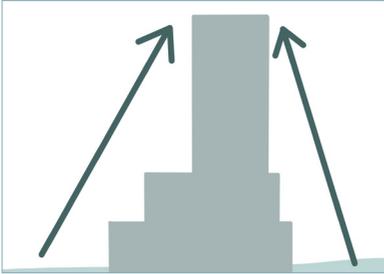
The volume of the tower is larger at the base and smaller at the top.
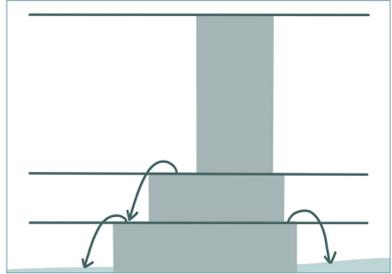
The lowest part of the builiding has a connection with the ground floor .

The lower levels house a school on one side and dwellings on the other side.

CROWN

SHAFT

BASE 2

BASE 1
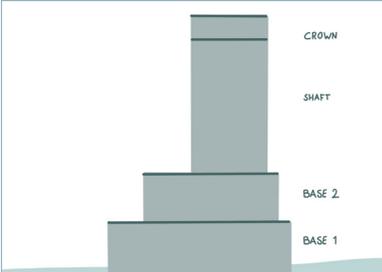
The building is divided into the 3 typical elements of a skyscraper.

DETAILS IN THE FACADE
CONTRIBUTE TO THE HUMAN SCALE

CROWN

SHAFT

BASE

SCALE IS SUITABLE FOR
CONNECTION WITH PUBLIC SPACE

HUMAN SCALE
RECOGNISABLE ELEMENTS

FLAT SURFACE
LARGE SCALE

HIGH-RISE

CROWN
SHAFT

BASE

MID-RISE   LOW-RISE

RECOGNISABLE ELEMENTS IN THE FACADE

CROWN

SHAFT

BASE

SMALL SCALE IN THE FACADE

HIGH-RISE
└ LARGE SCALE

LOW-RISE
└ SMALL SCALE

DIFFERENCE IN HEIGHT
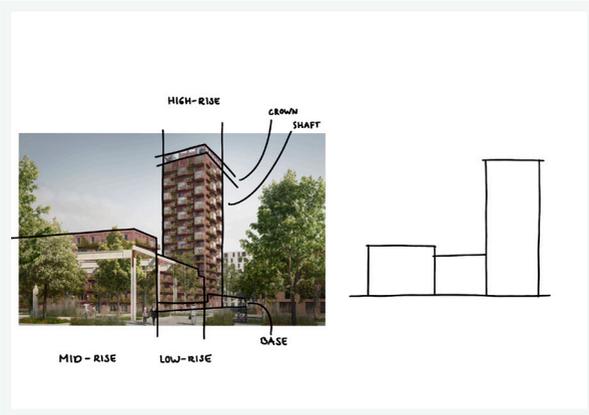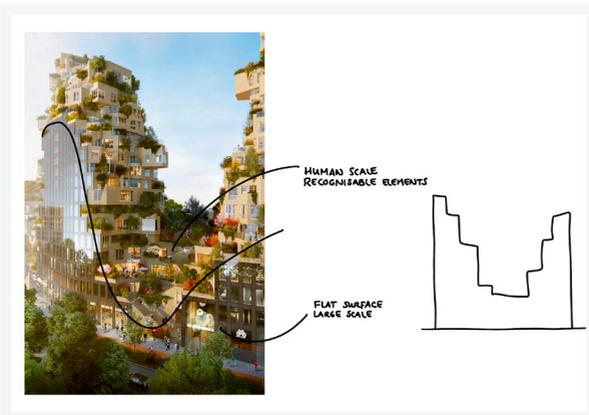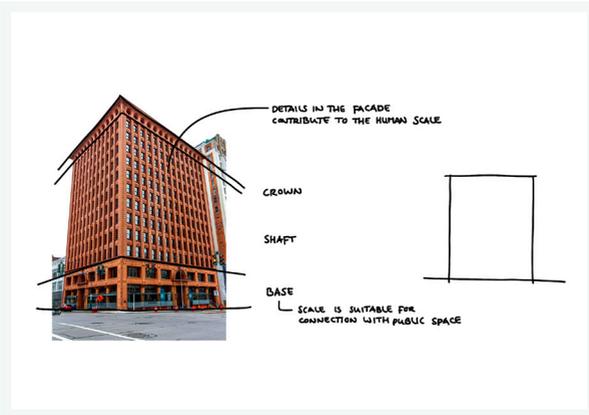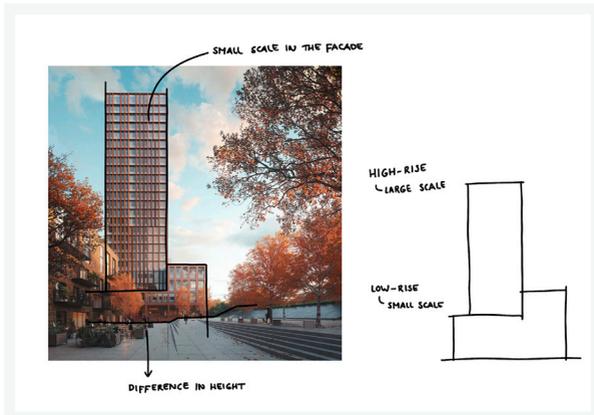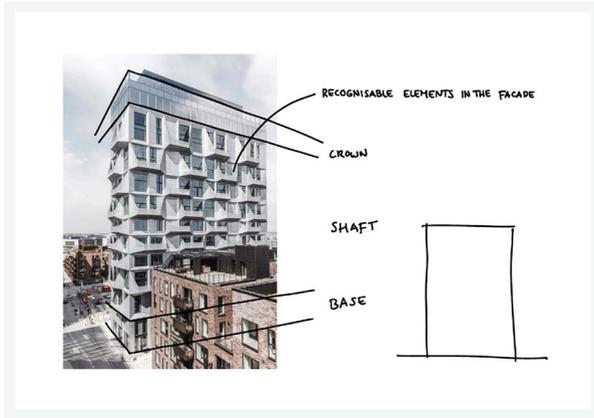
Existing high-rise buildings are studied to determine the preferred shape and hight of the building. The conclusion is that a high-rise building benefits from having a lower plinth that connects to the street with a tower on top with a slight setback.

Concept development
Model making
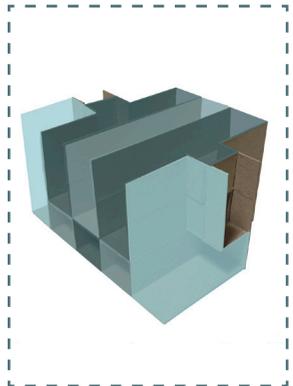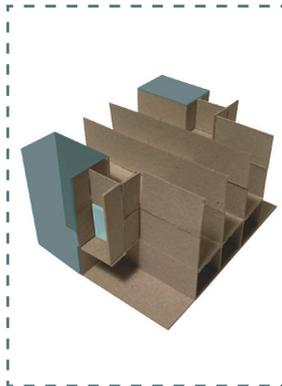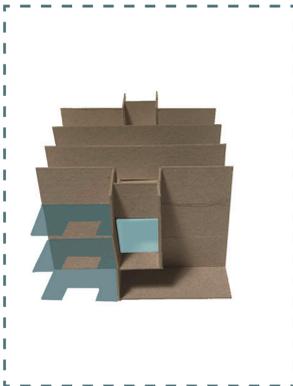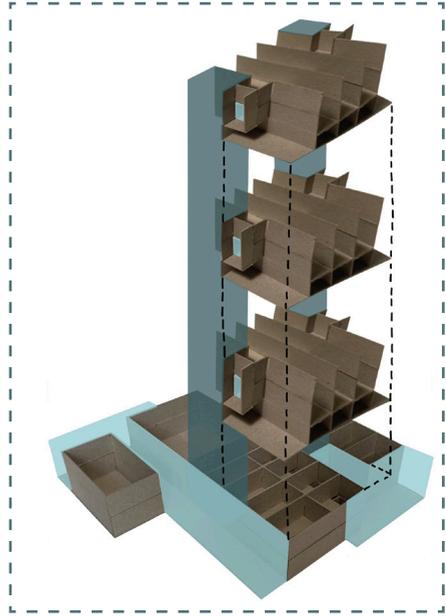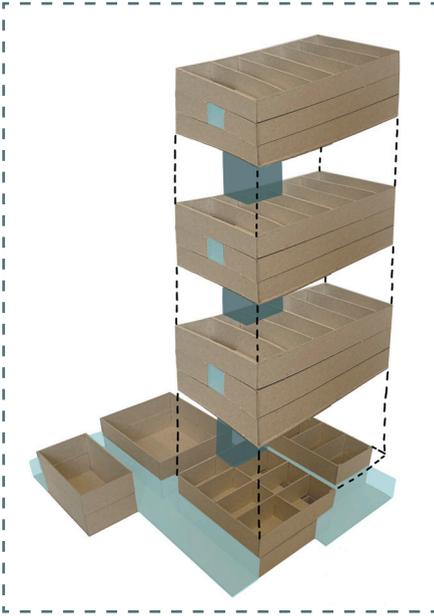
Model making is introduced in the concept development phase. Making models helps to determine the way different floors and circulation typologies connect. Using models also helped me to find the best configuration of the dwellings in the tower block, where the circulation space is brought to a minimum.
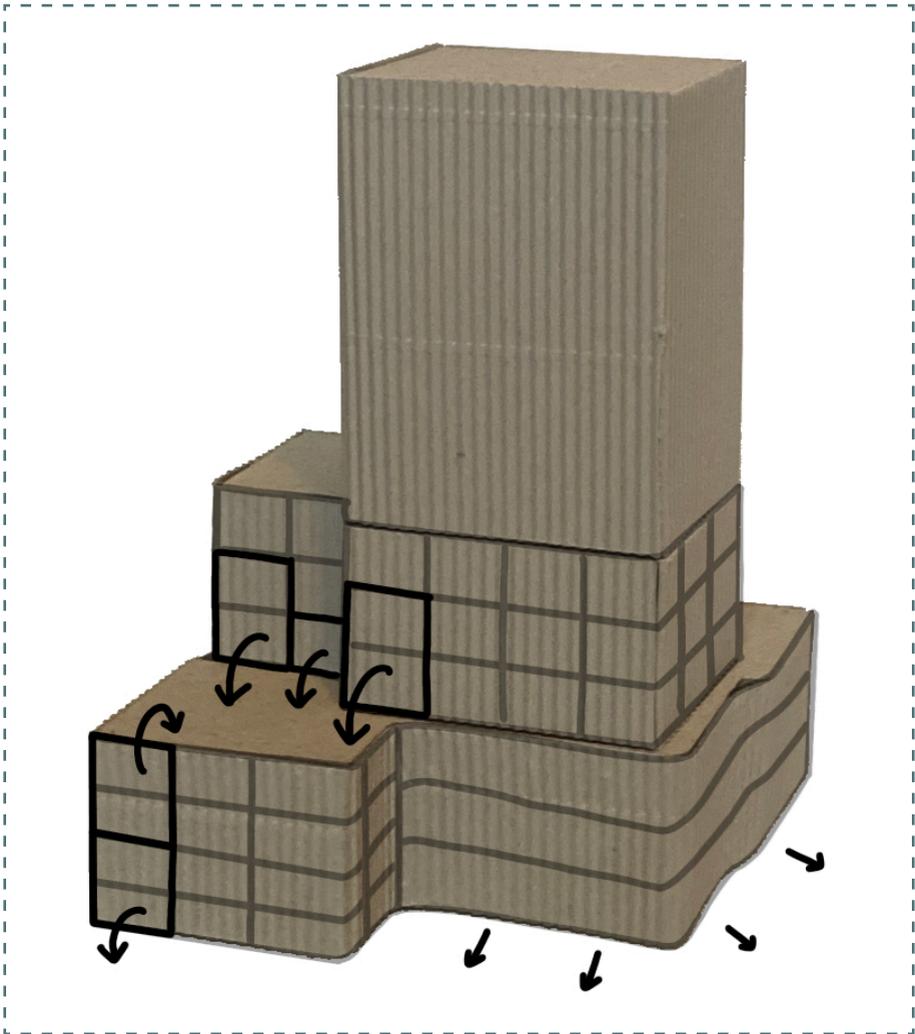
Model making is also used to determine the shape of the building block. In high-rise the connection with the street is critical. Therefore, the shape of the building should be determined carefully. Making models helps to see the impact of certain design decisions directly translated to the shape of the building.

Concept development
Typological transfer exercise
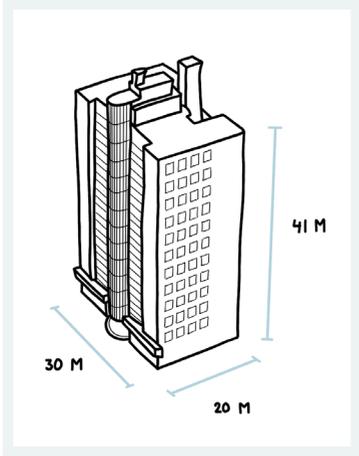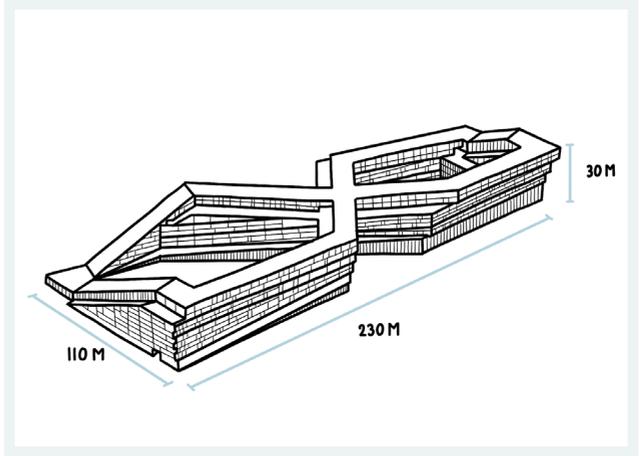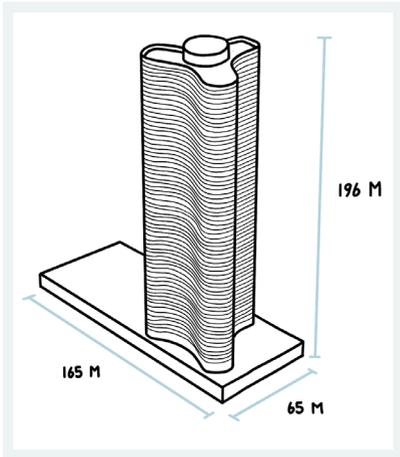
De Wolkenkrabber

41 M
30 M
20 M

8-House

30 M
110 M
230 M

Lake Point Tower

196 M
165 M
65 M

Unité d'habitation

56 M
25 M
138 M
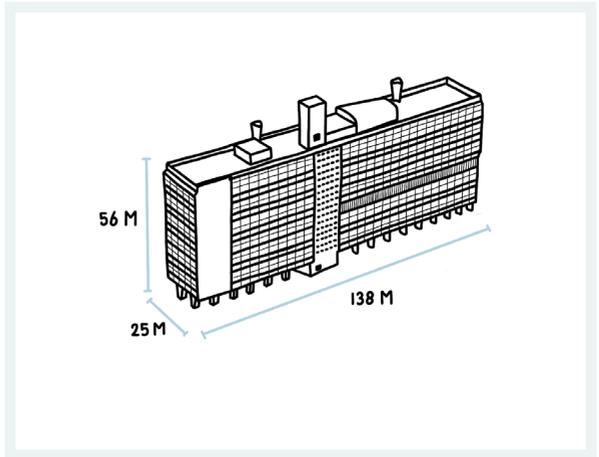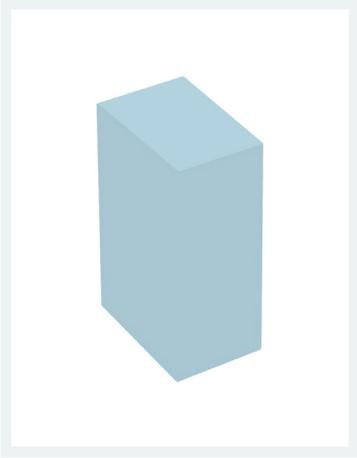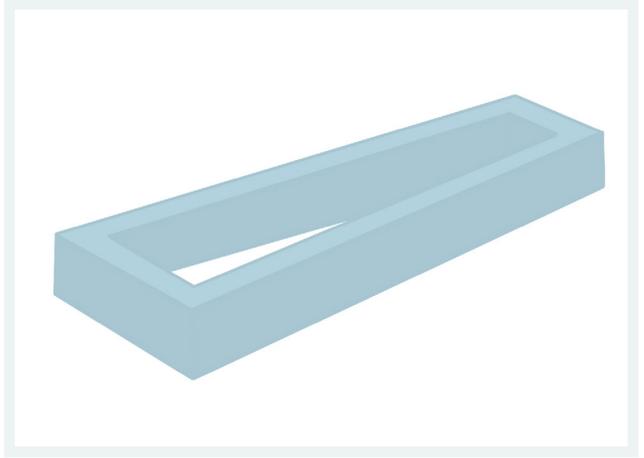
De Wolkenkrabber
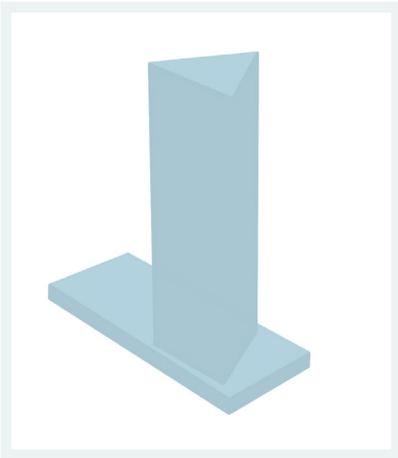
8-House
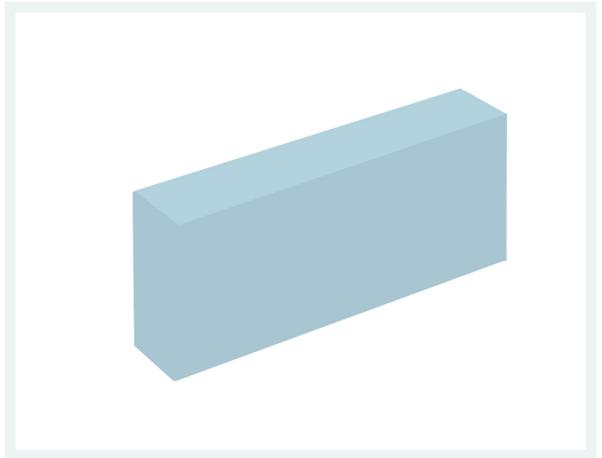
Lake Point Tower

Unité d'habitation

Concept development
Typological transfer exercise
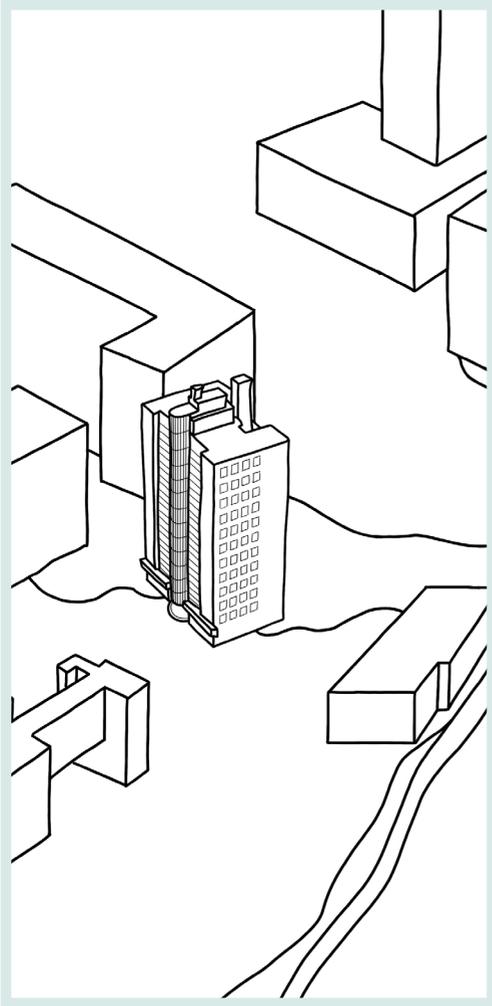
De Wolkenkrabber
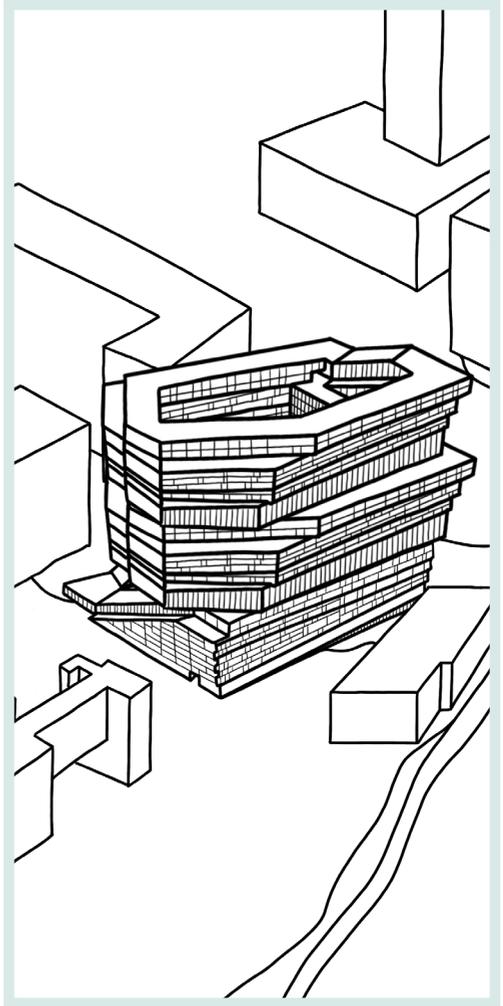
8-House
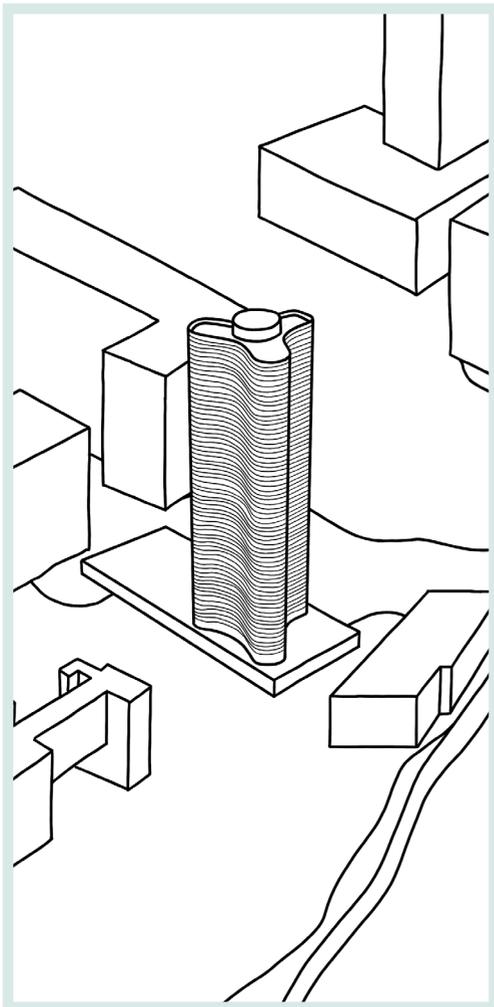
Lake Point Tower
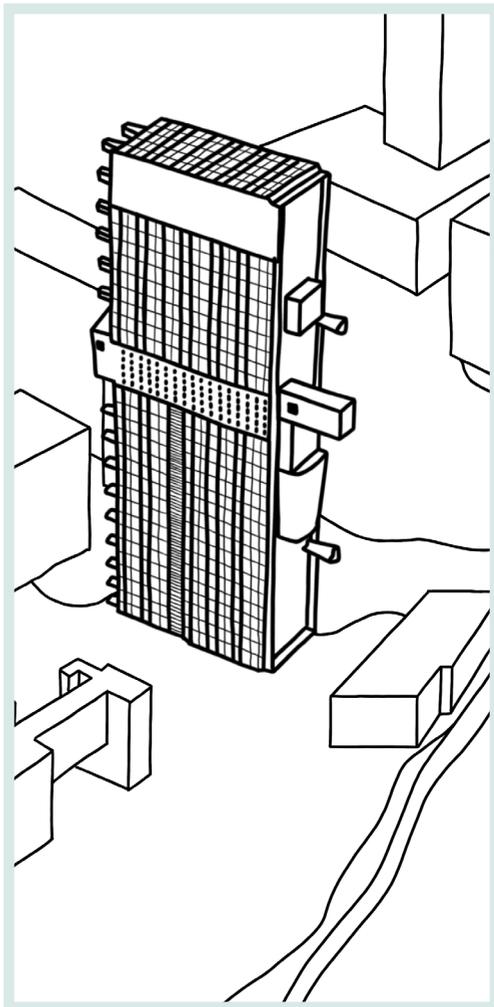
Unité d'habitation

Building concept
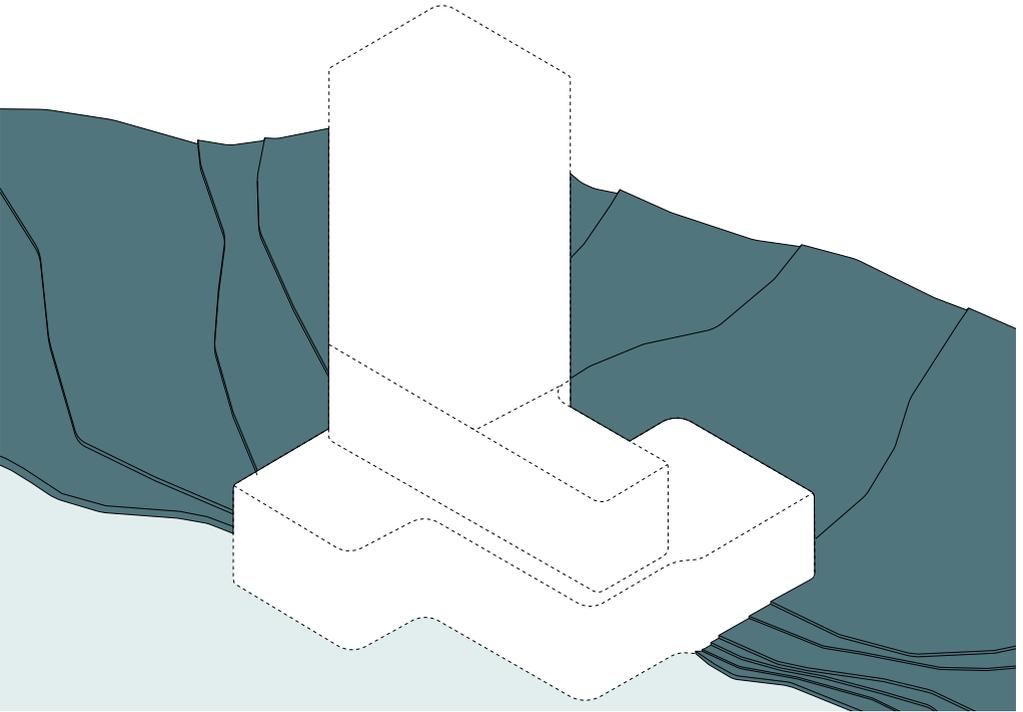
Because of its location the building will have dual character with the green slope on one side of the building and the public school square on the other side. Because of this slope, the building will also have a more open and a more closed side on street level.

Dual character
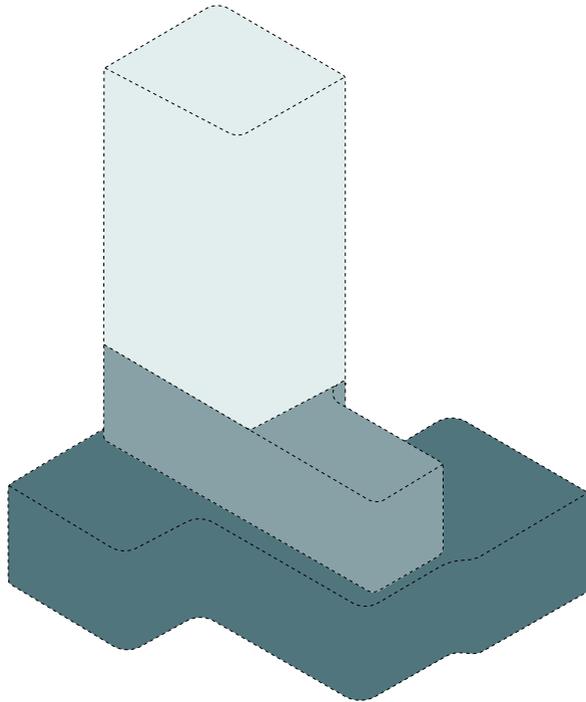
Based on the concept of Jan Gehl (page 36), the bottom part of the building will be divided into blocks of four floors to facilitate the visual connection between the building and the public space at the street.

Each block has a different circulation typology based on one of the case studies. The circulation space can be seen as the core of the building. Each typology has a different quality for both children and community building.

Three blocks

Circulation typology

Block 1:

In the bottom block the circulation system is based on that of the Family Scraper in Rotterdam, and consists of interior and exterior spaces that are visually connected and provide spaces for interaction.

Block 2:

In the second block, the circulation space is based on that of the 8-House in Copenhagen, and is mainly exterior which creates a direct connection between the dwellings and the collective roof terrace.

Block 3:

In the tower block the circulation space is based on that of the Unité d'Habitation in Marseille, and is much more efficient which encourages the residents to see and meet their neighbours and encourages children to explore.
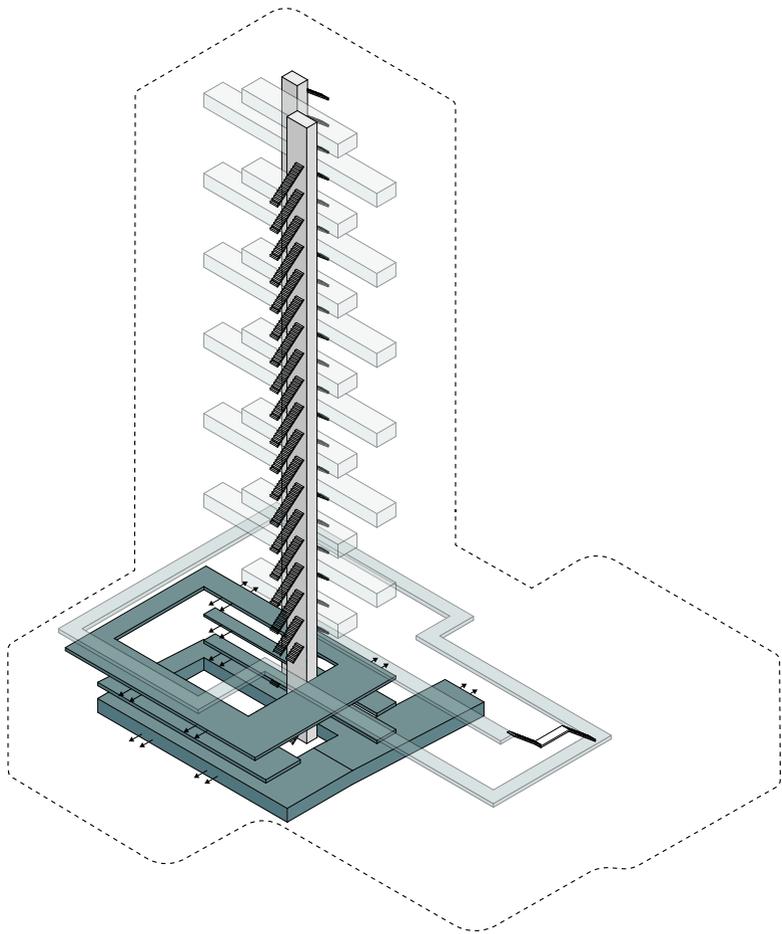
Block 1
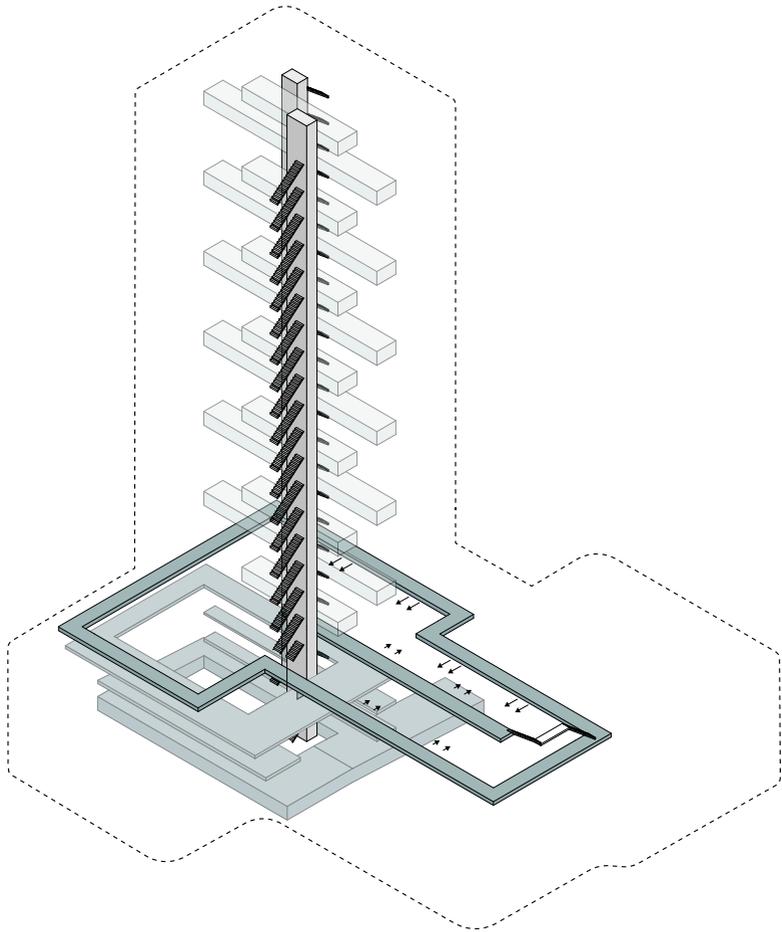
Block 2
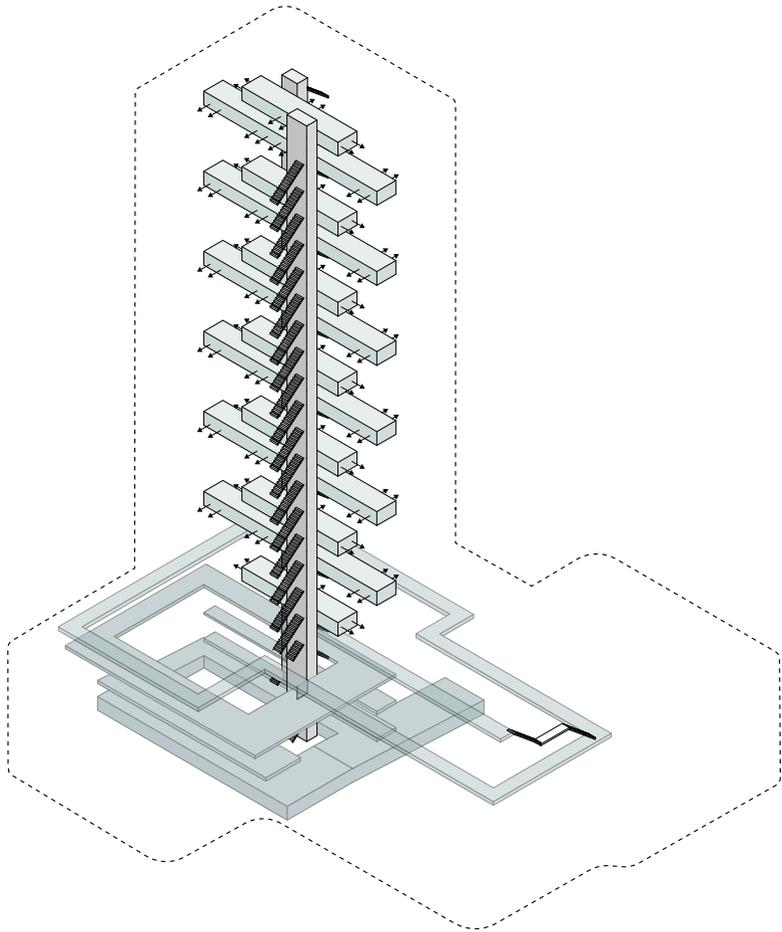
Block 3
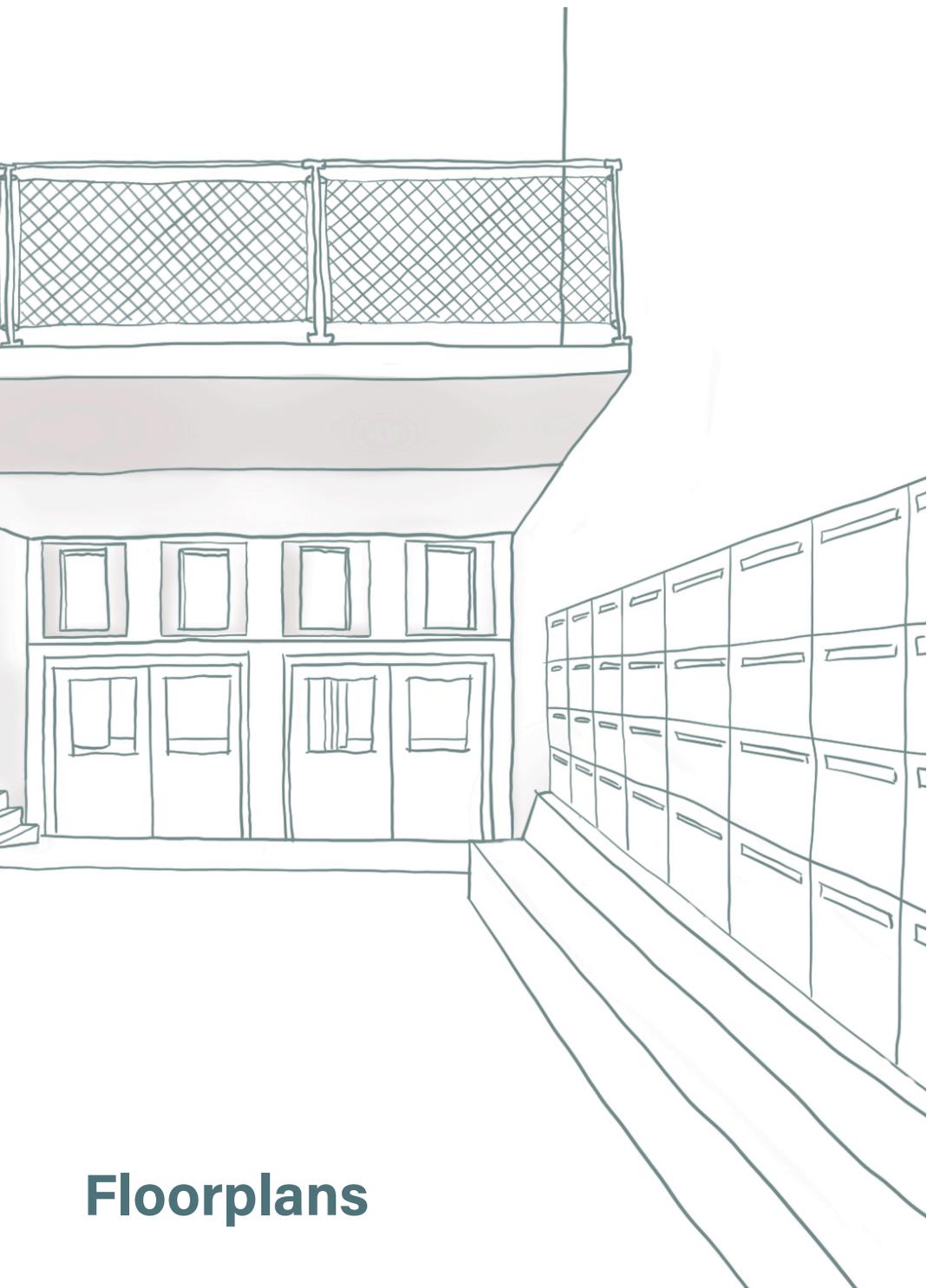
Floorplans

Site plan

0 2 4   8m

Floorplans
Level 0/1

0 2 4 8m

Floorplans
Level 0
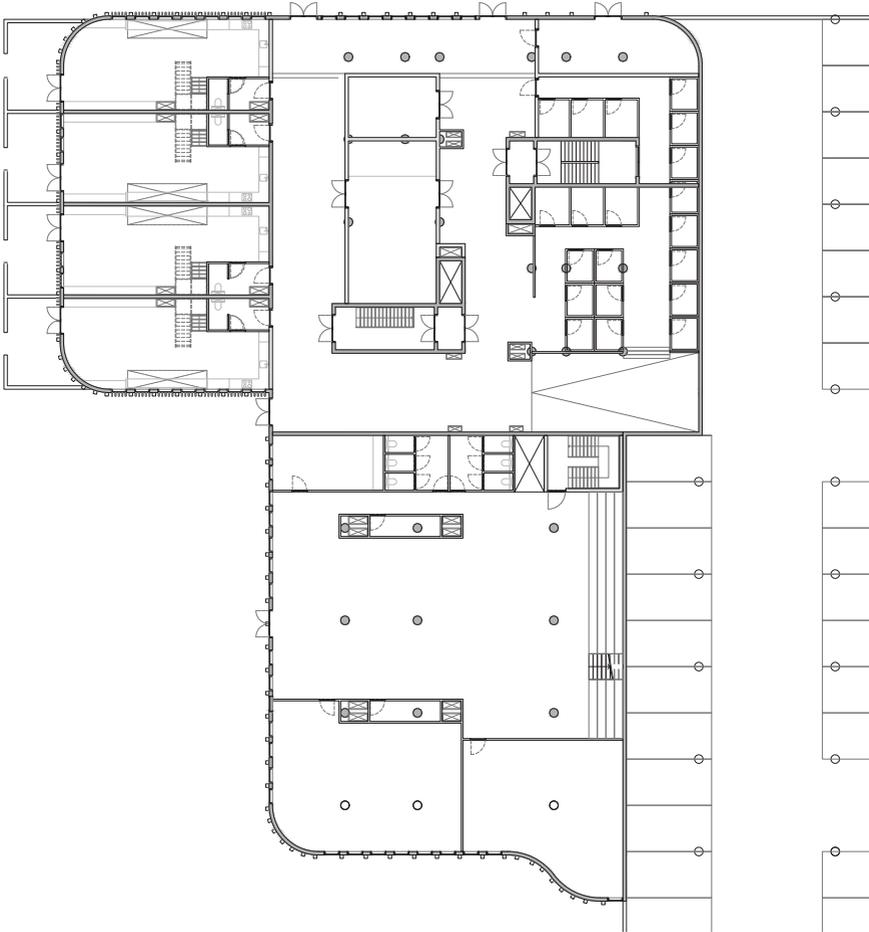
0 2 4   8m

Floorplans
Level 1
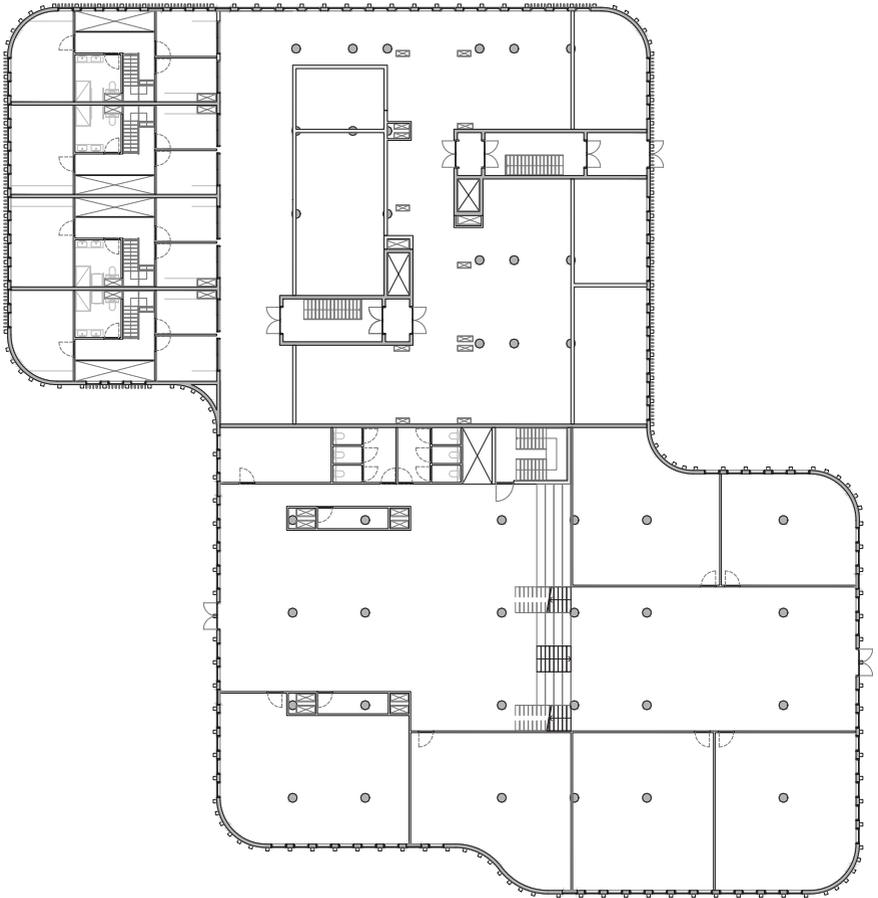
0 2 4   8m
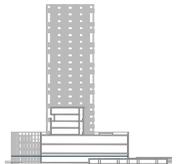
Floorplans
Level 2
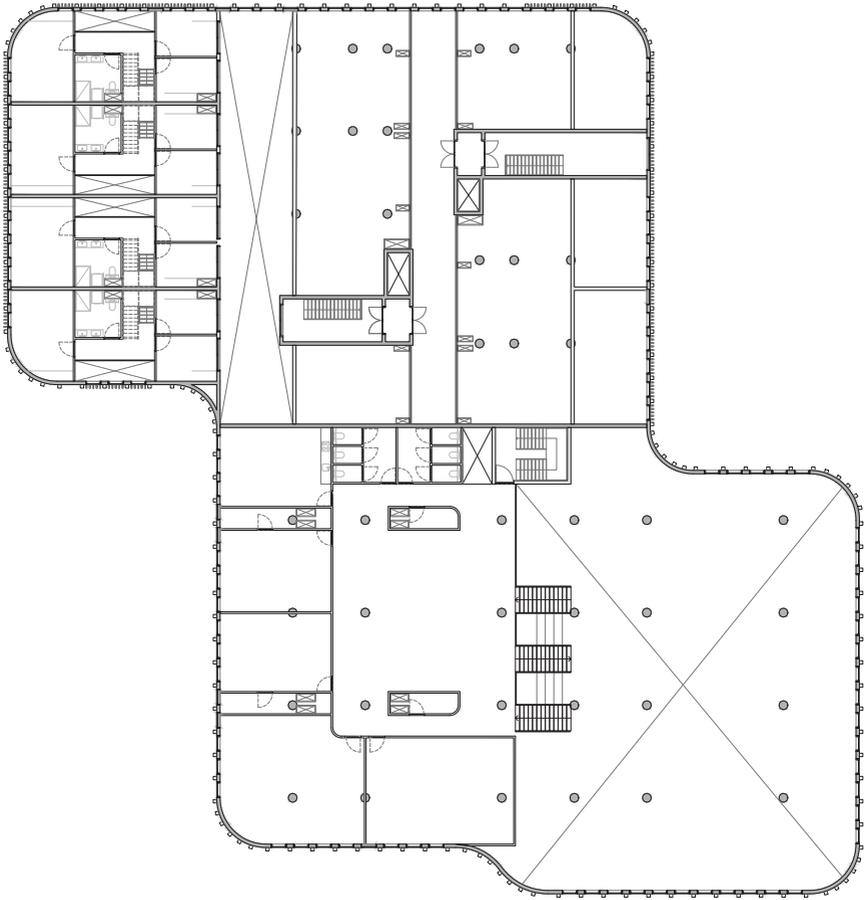
0　2　4　　　8m
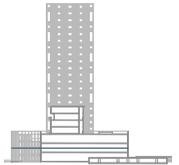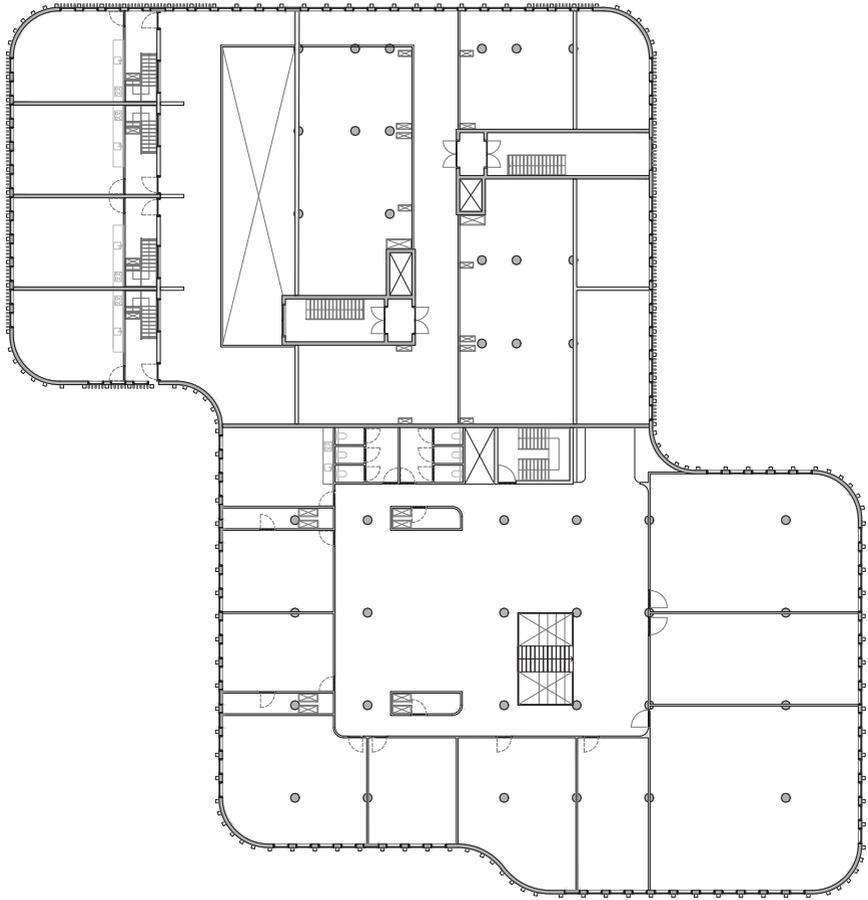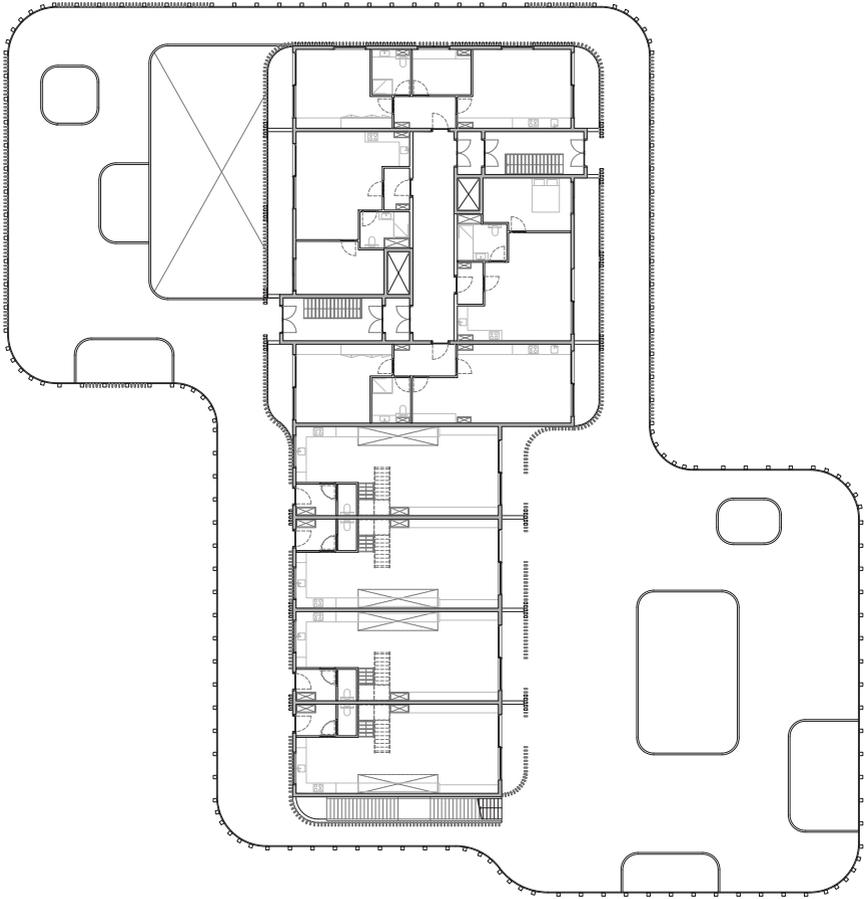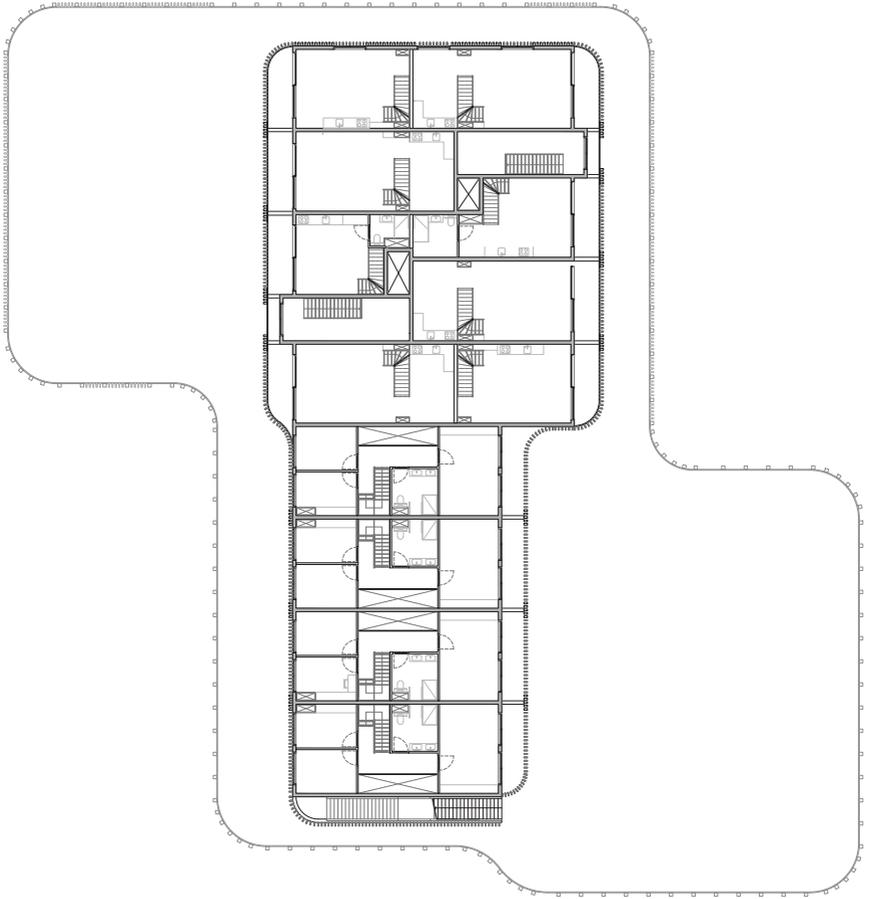
0 2 4   8m

0 2 4   8m

Floorplans
Level 5

0 2 4   8m
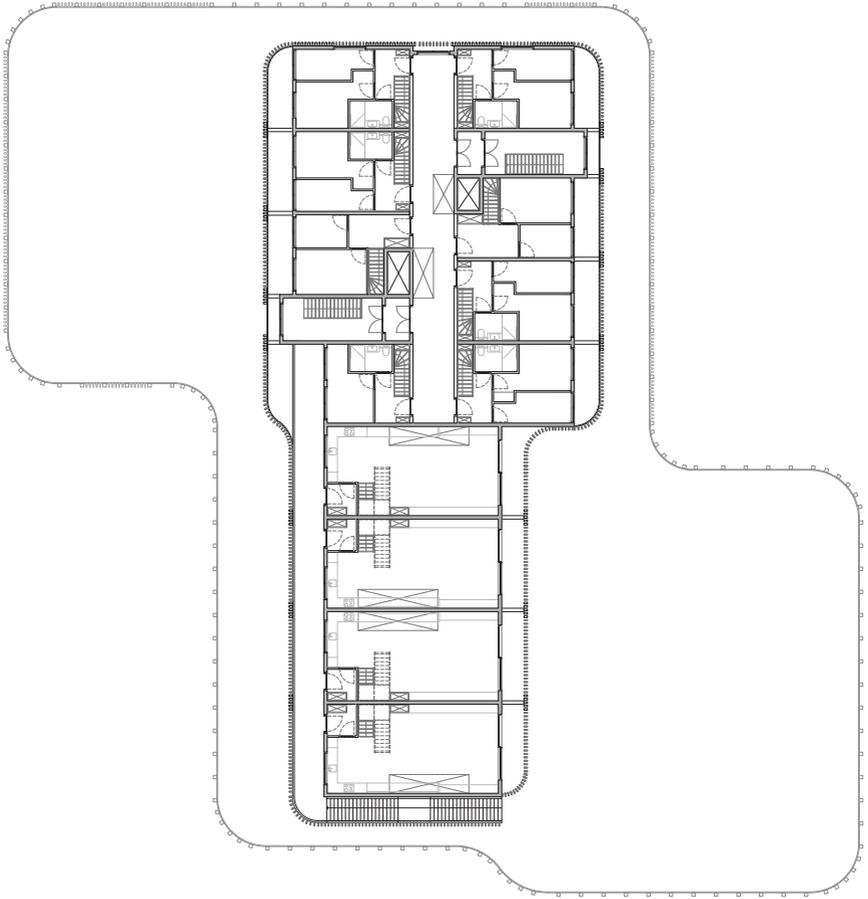
Floorplans
Level 7
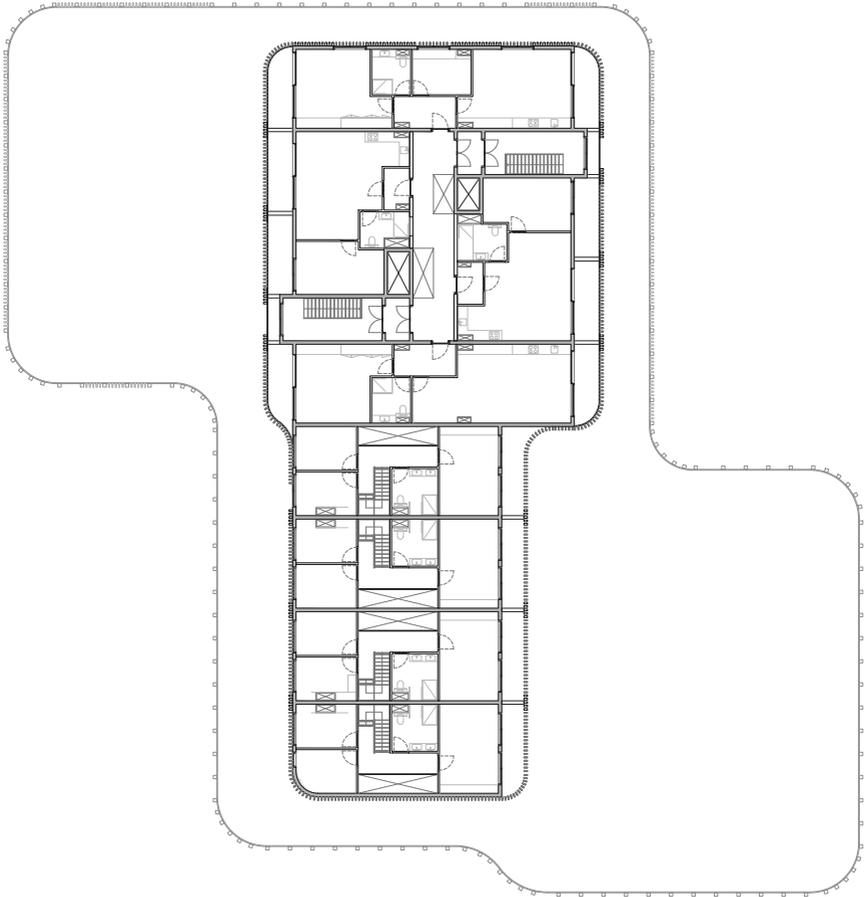
0 2 4   8m

Floorplans
Level 8, 11, 14, 17
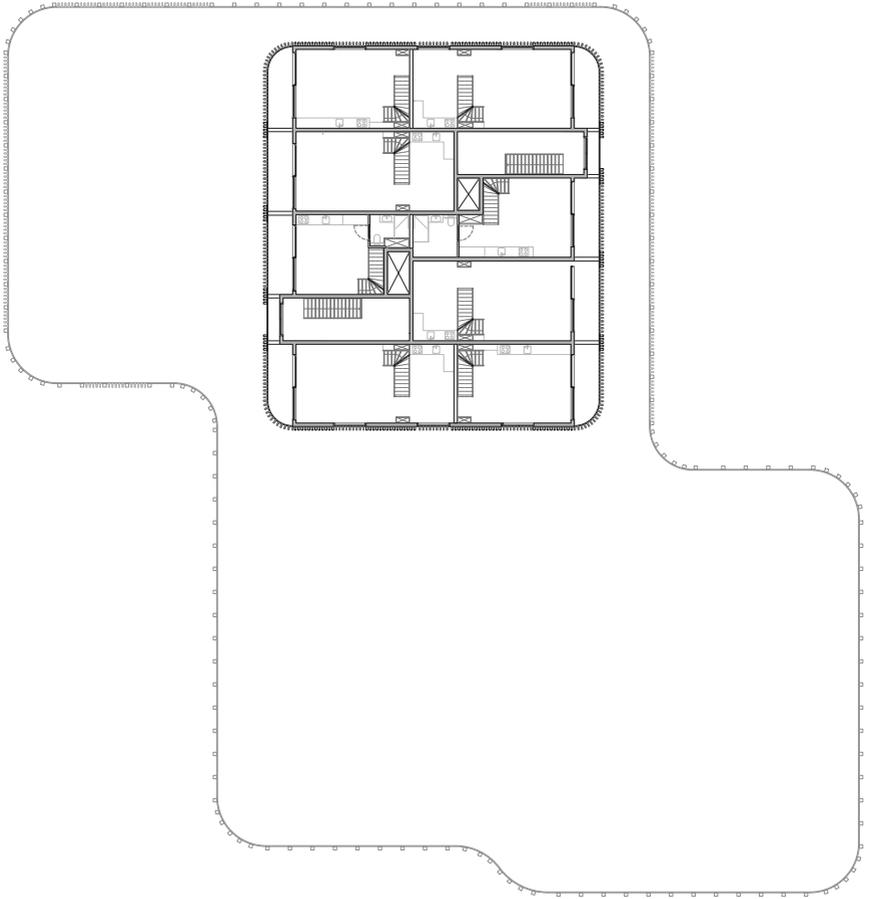
0 2 4   8m

Floorplans
Level 9, 12, 15, 18
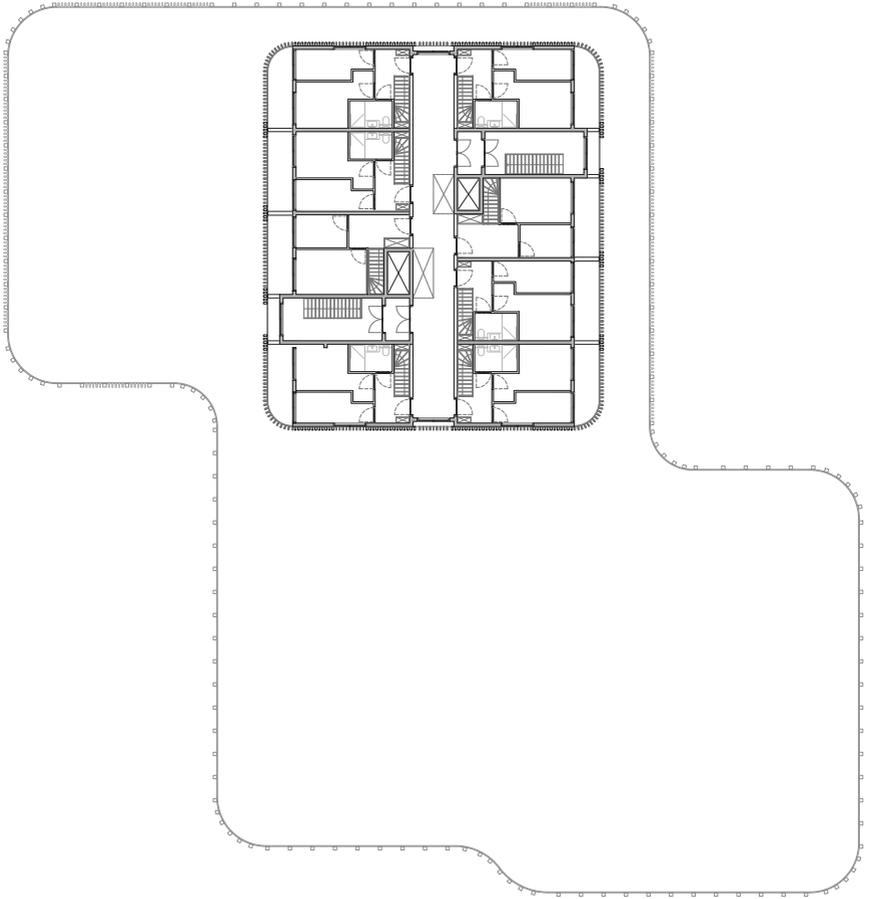
0 2 4   8m

Floorplans

Level 10, 13, 16, 19
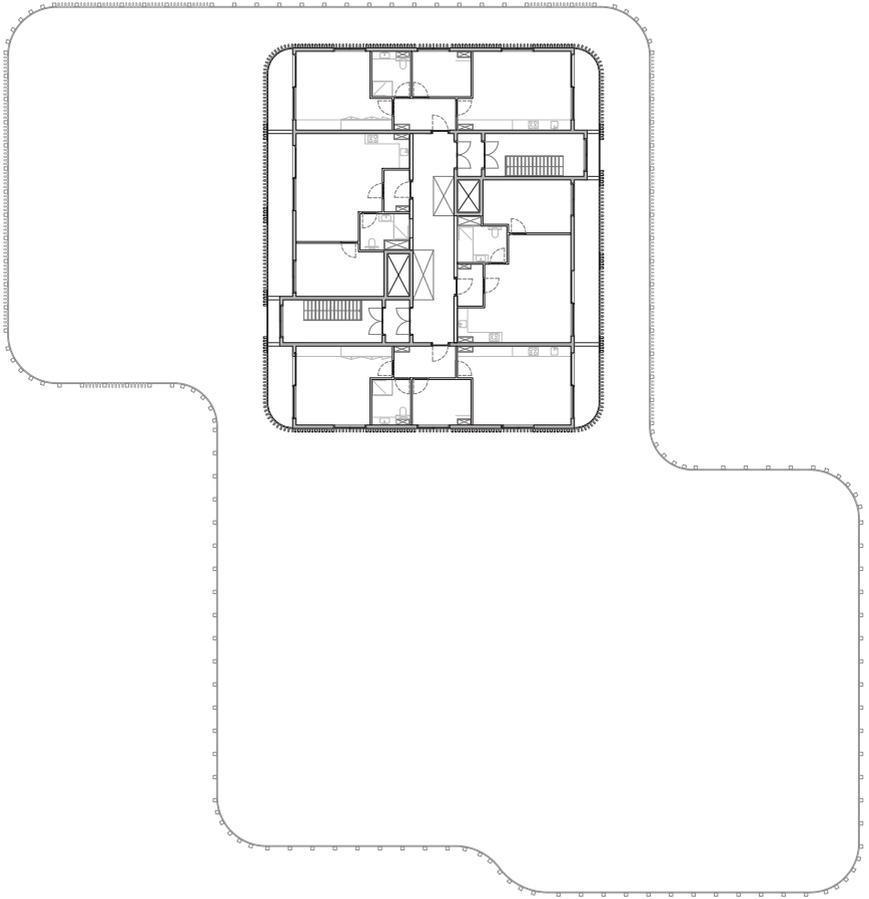
0 2 4   8m
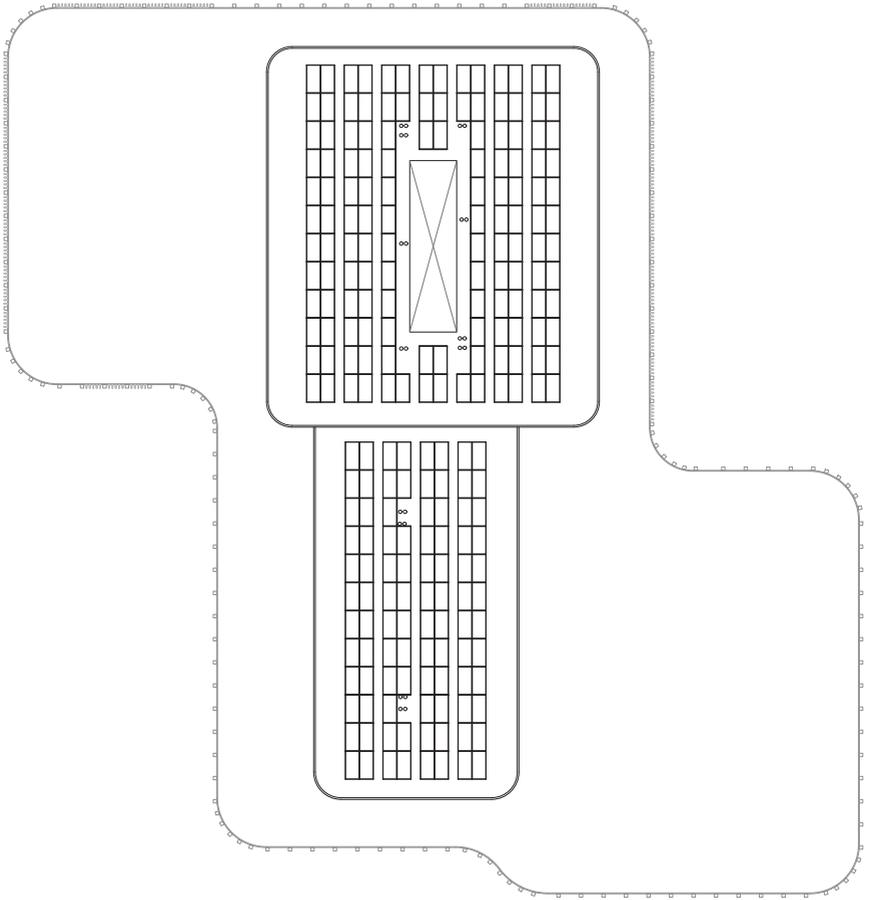
0 2 4   8m
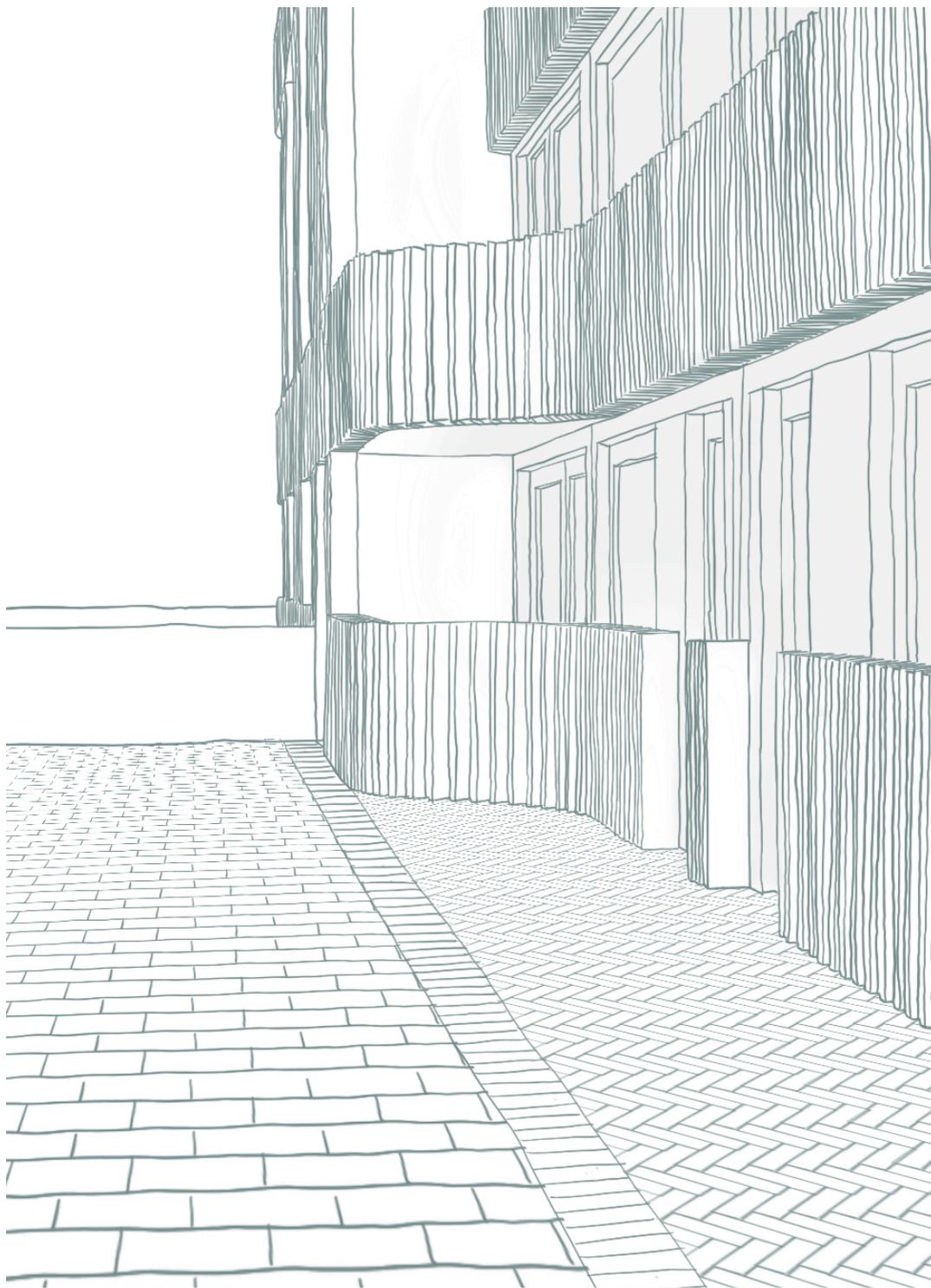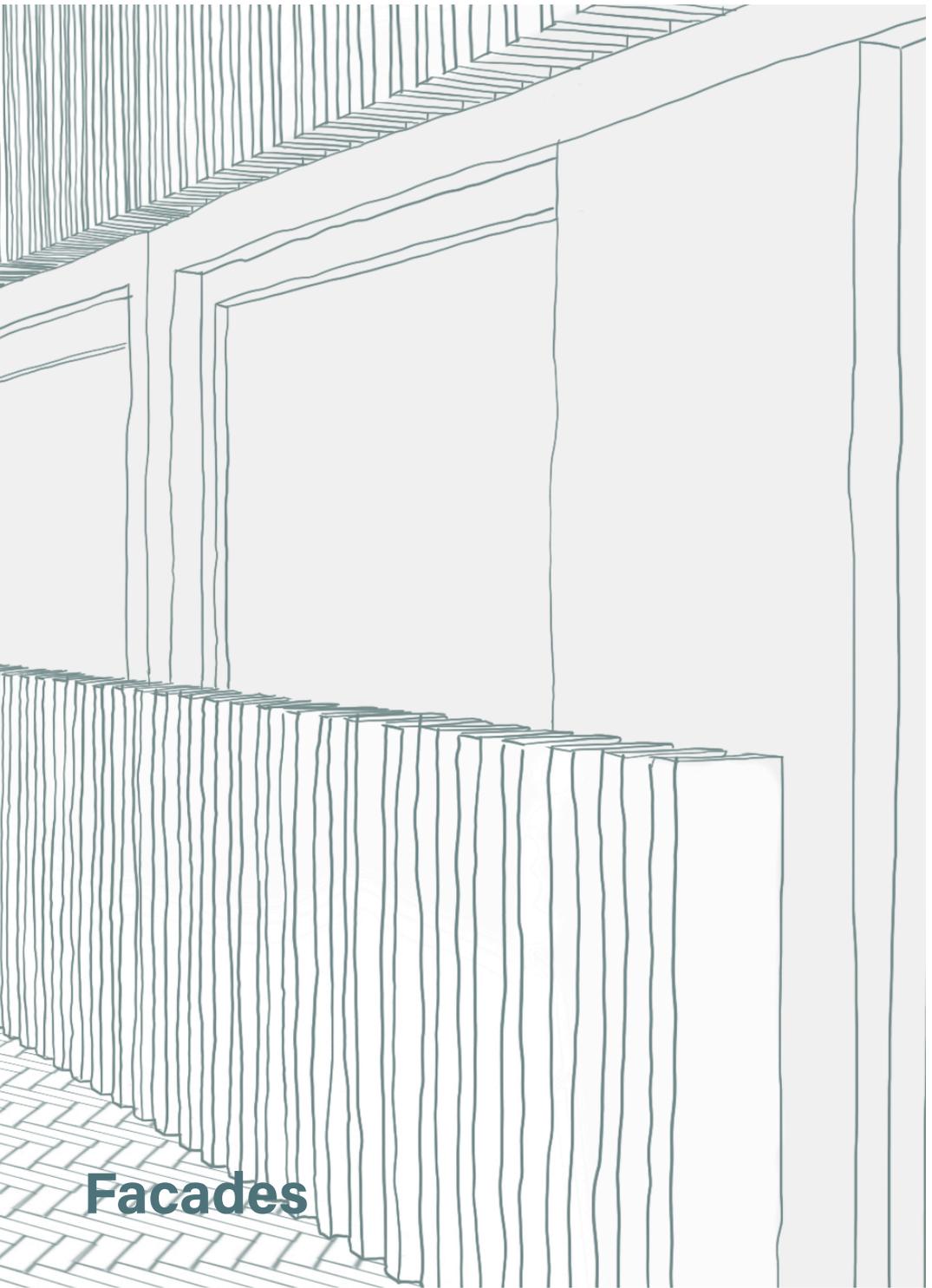
Facades

Elevations

North
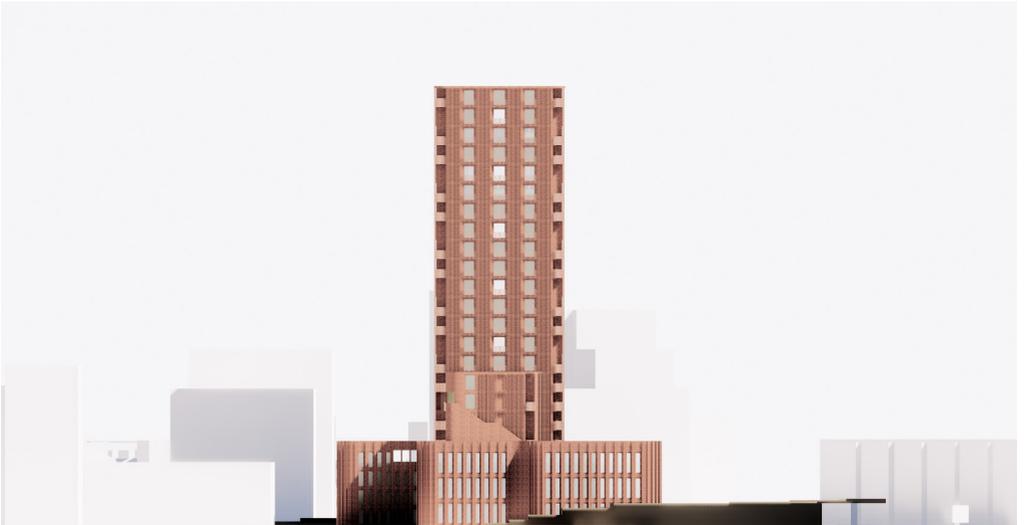
South

East

West
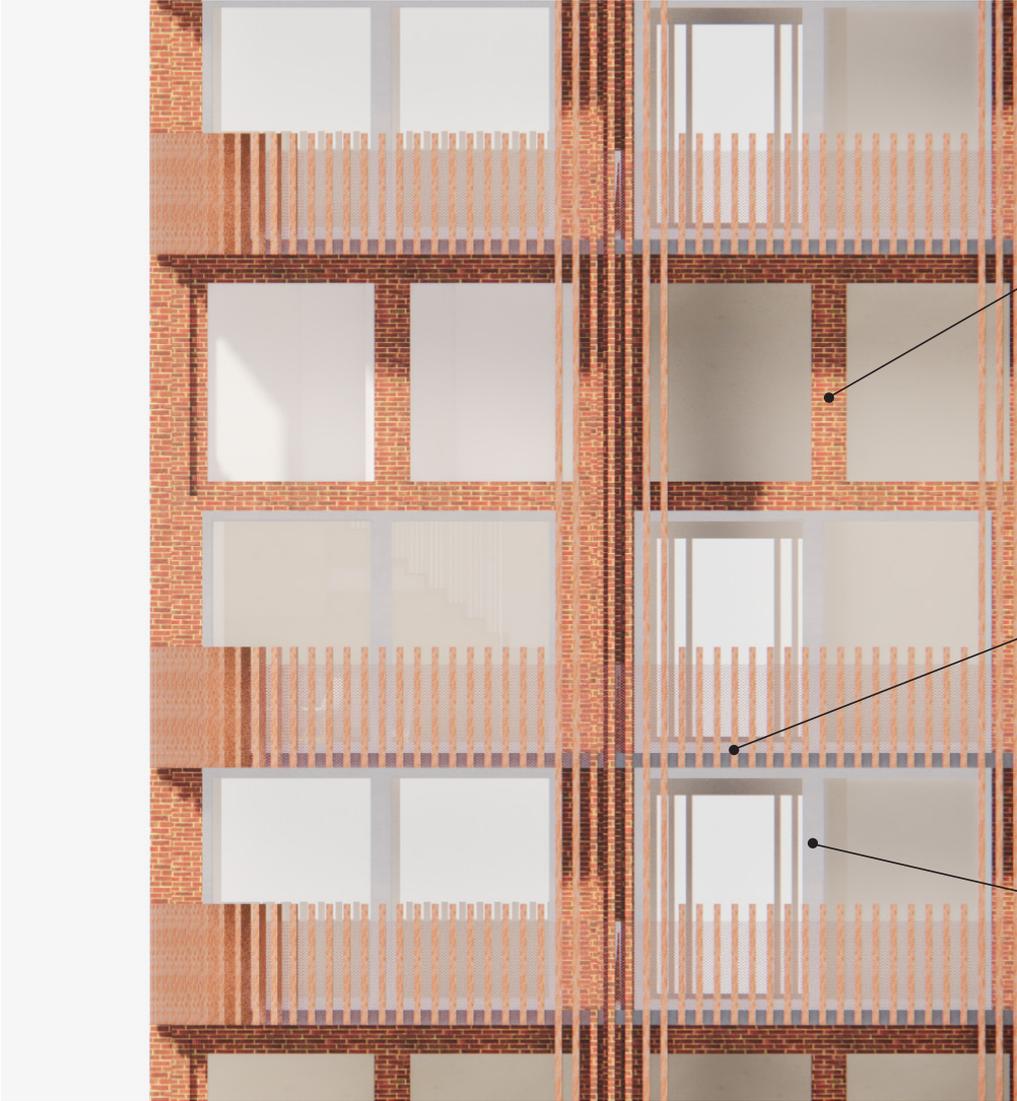
Brick
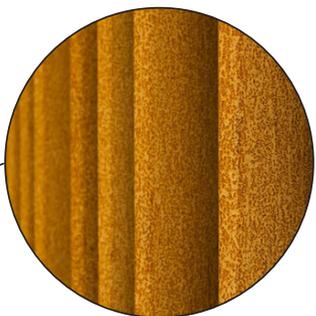
Corten steel
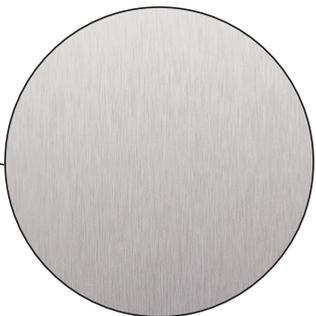
Aluminium
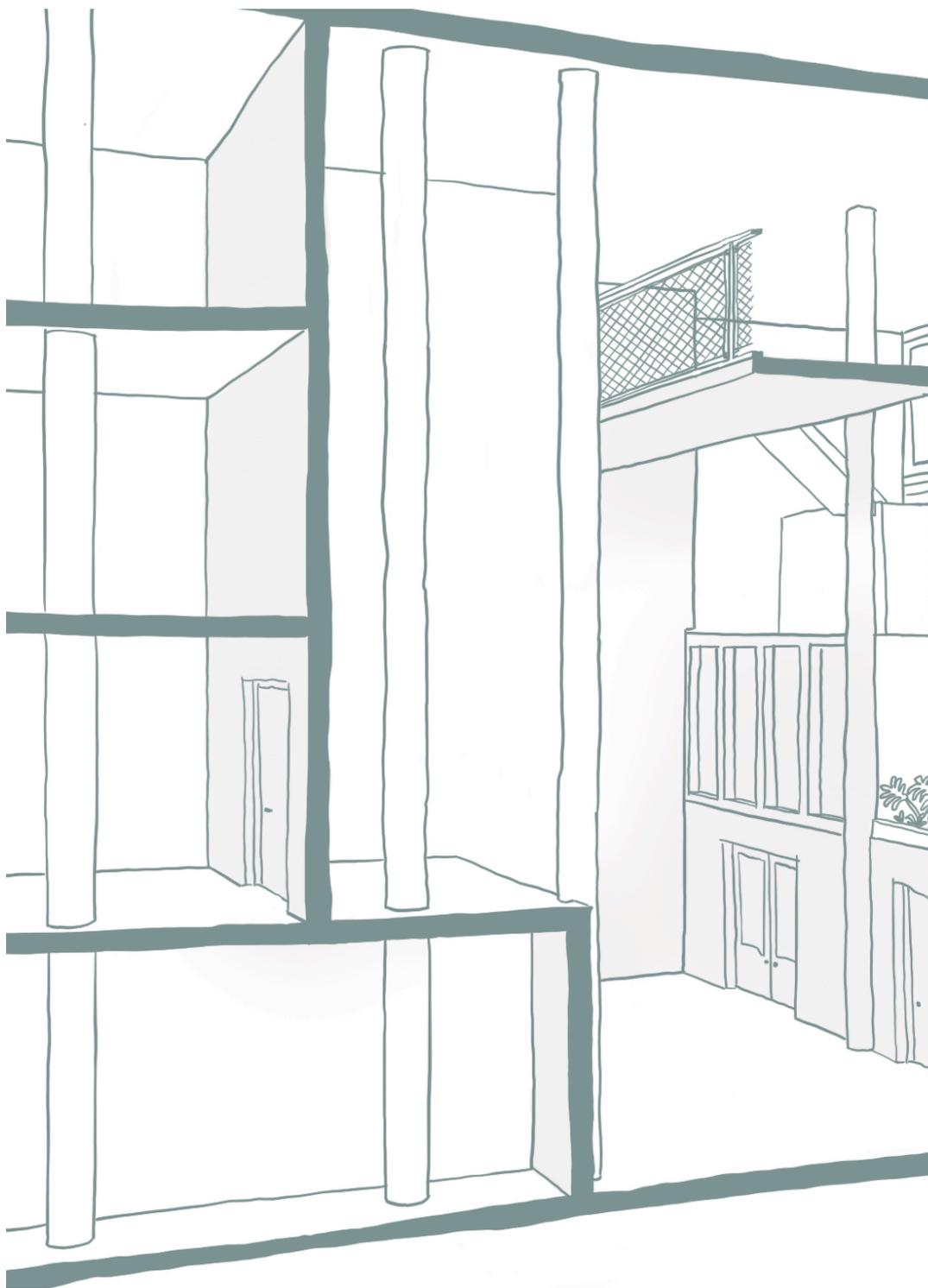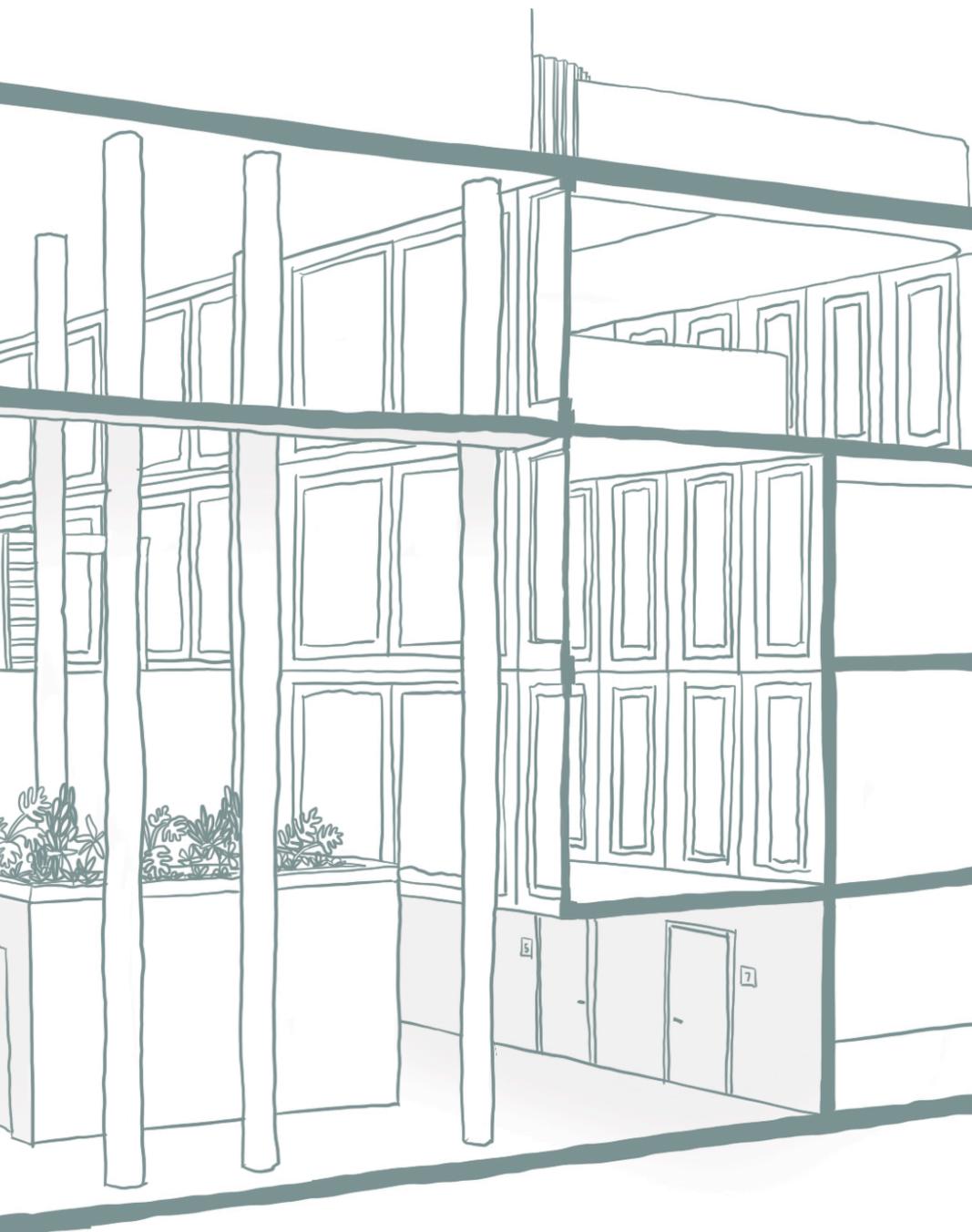
Dwelling fragment

Dwelling fragment
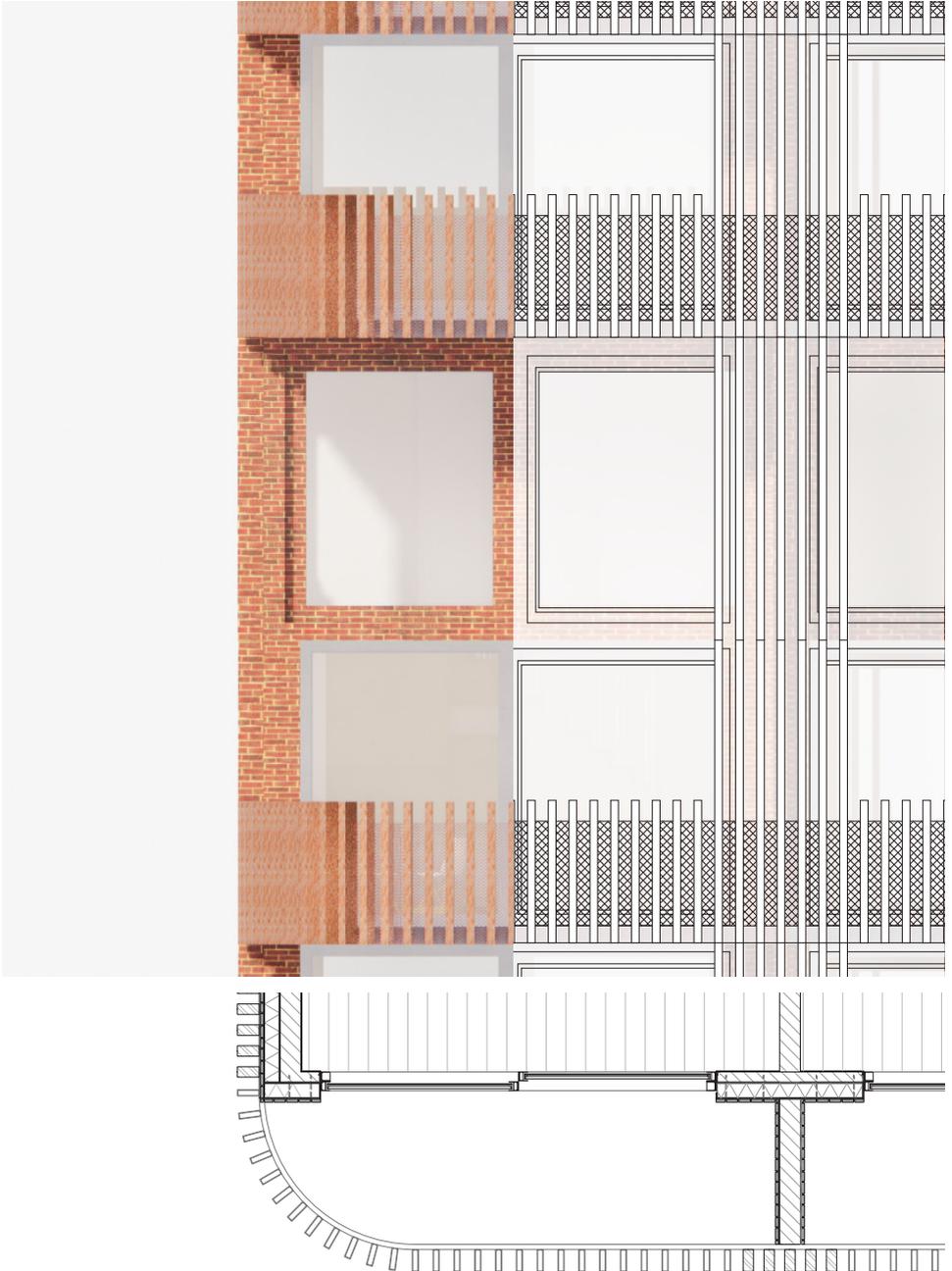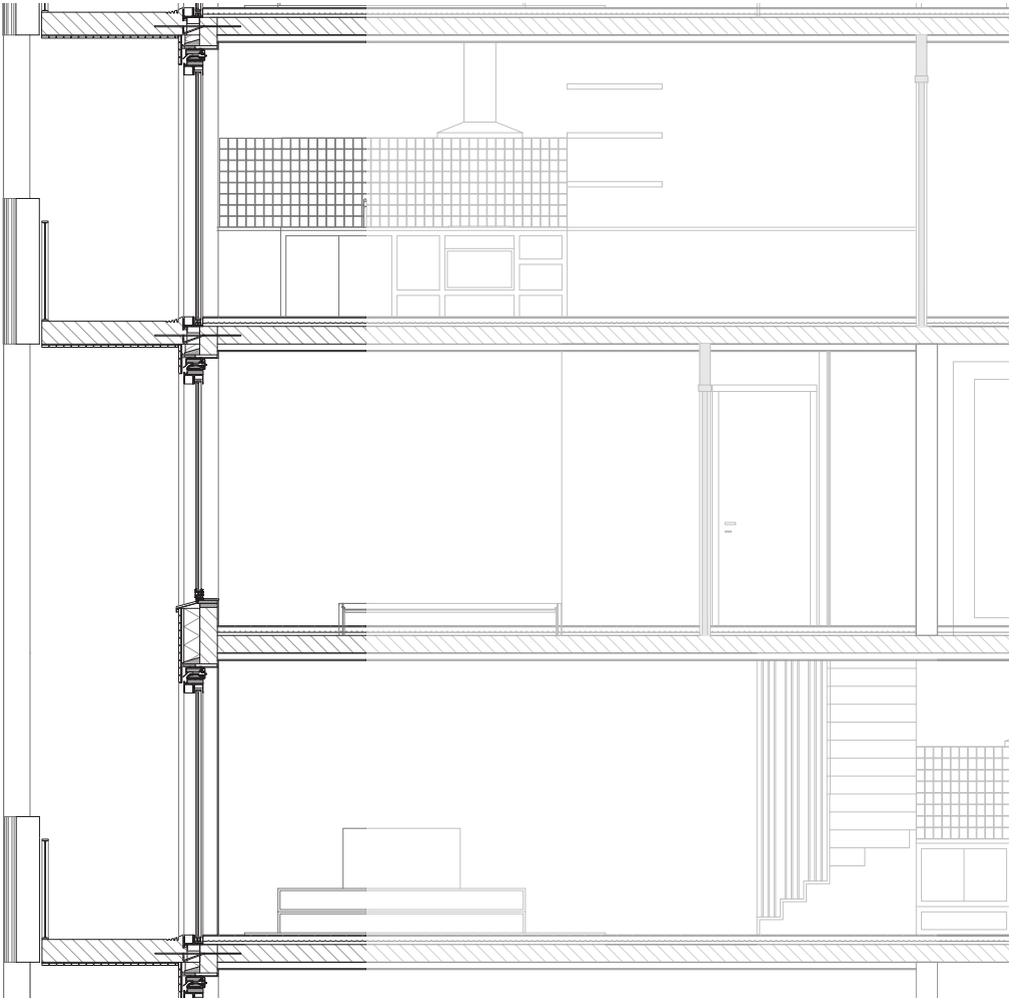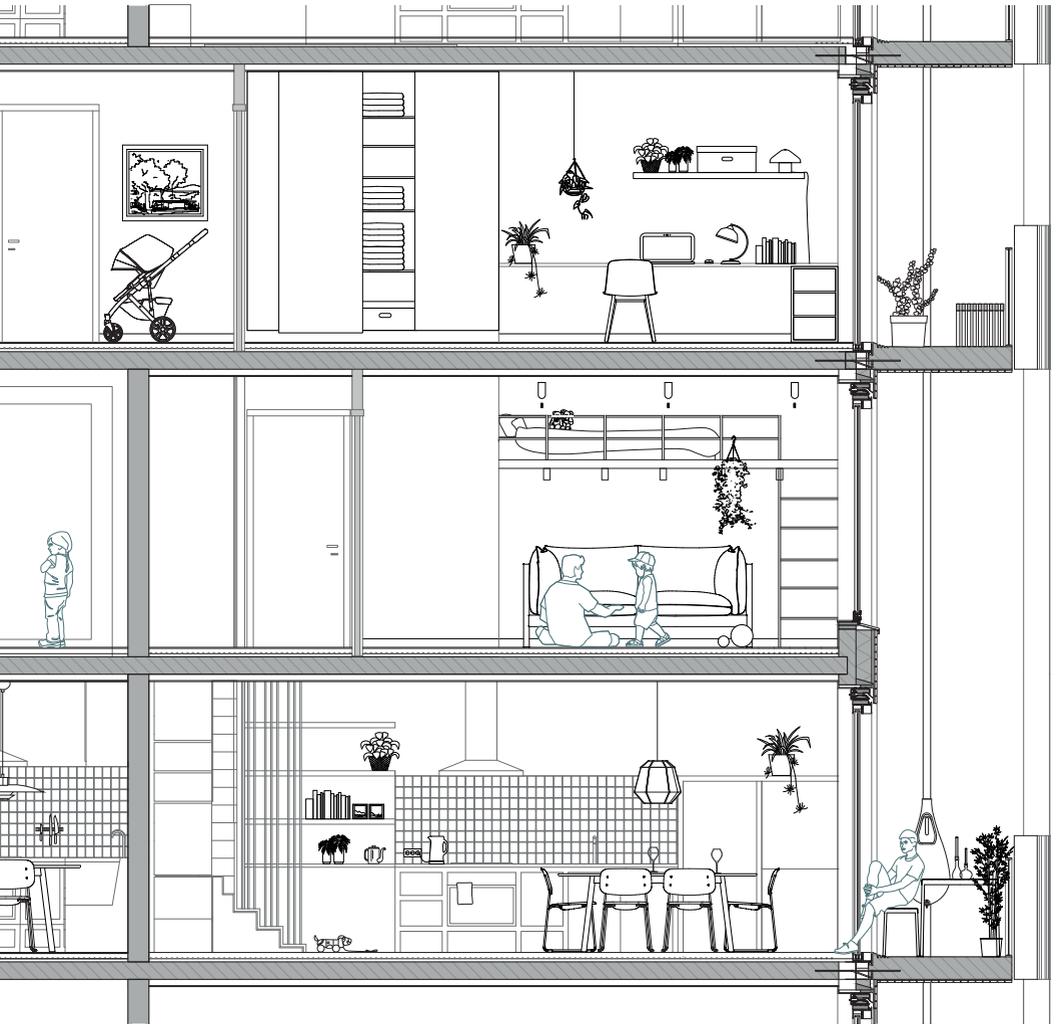
I   I   I   I
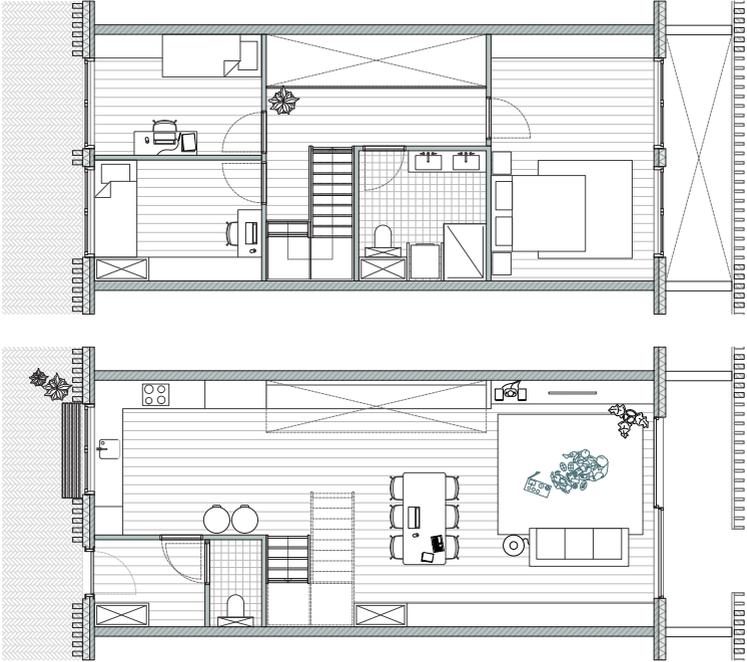0 0.5 1   2m
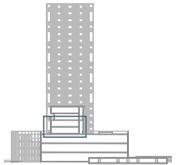
Dwelling fragment
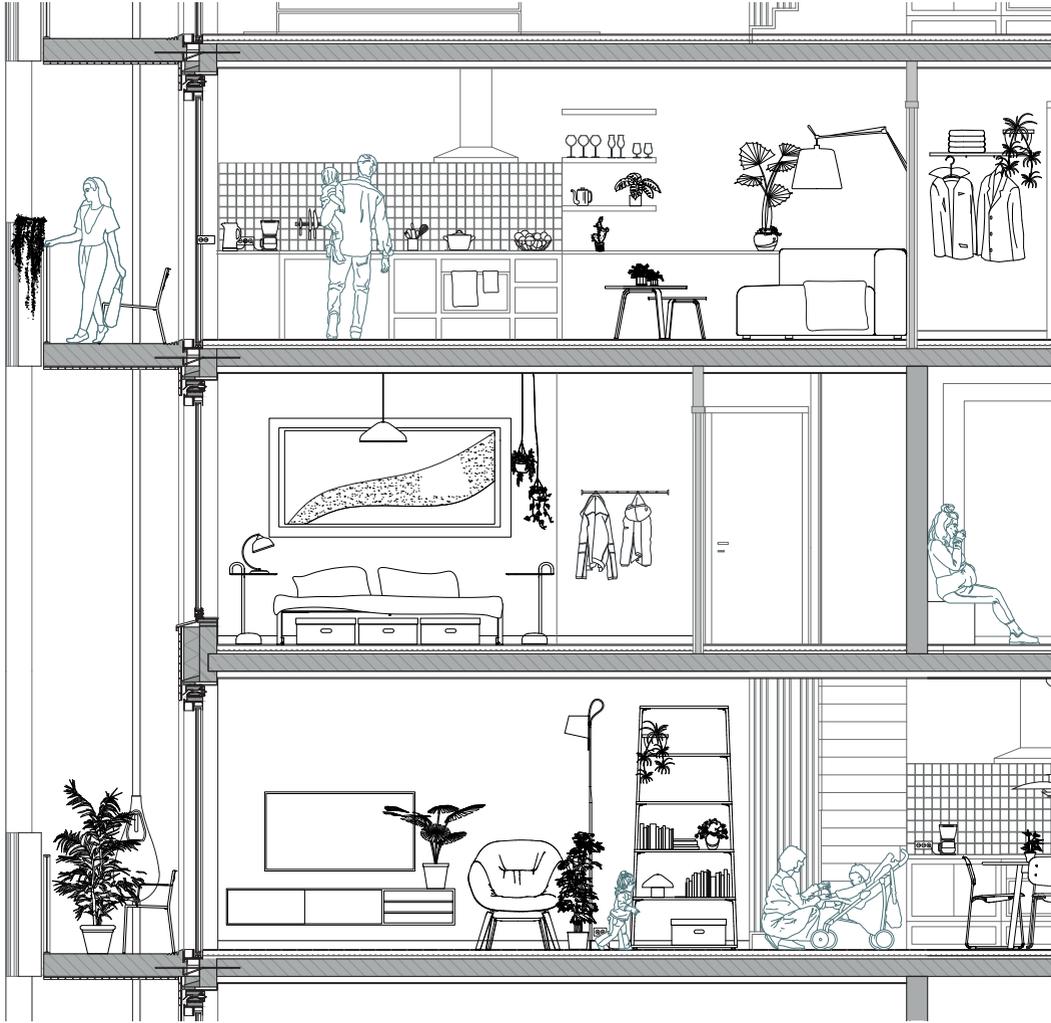

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I    I    I         I
0    0.5  1         2m
```

Dwelling floorplans

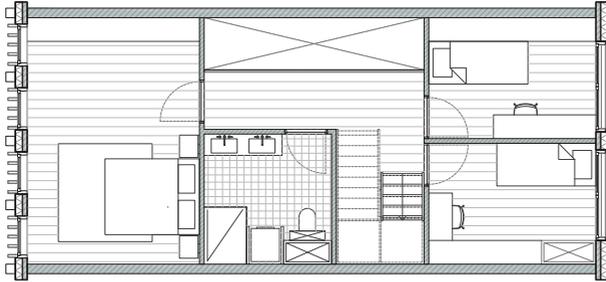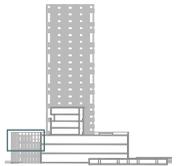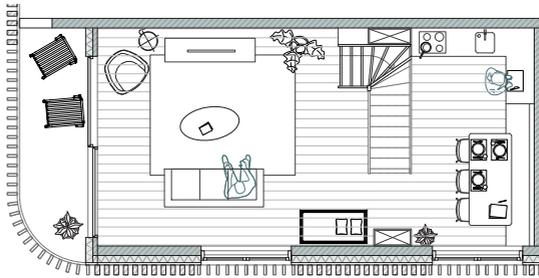# Dwelling type A1

0 0.5 1   2m

Dwelling type A2

0 0.5 1 2m

Dwelling type B1
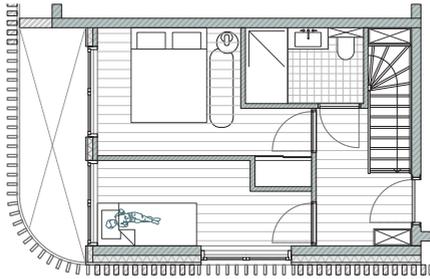
0 0.5 1   2m

Dwelling type B2
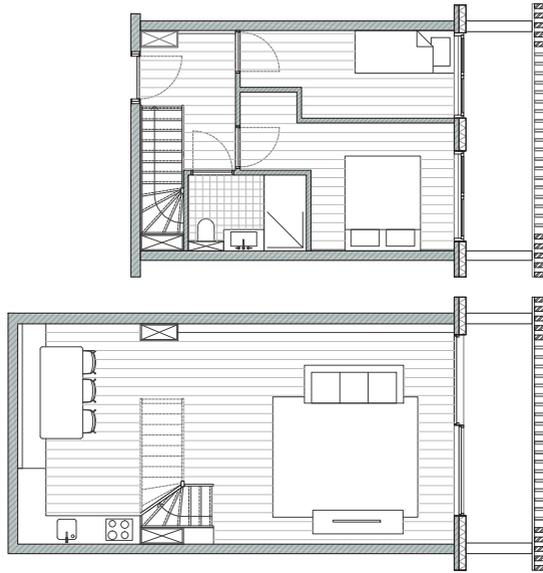
0 0.5 1   2m

Dwelling type B3
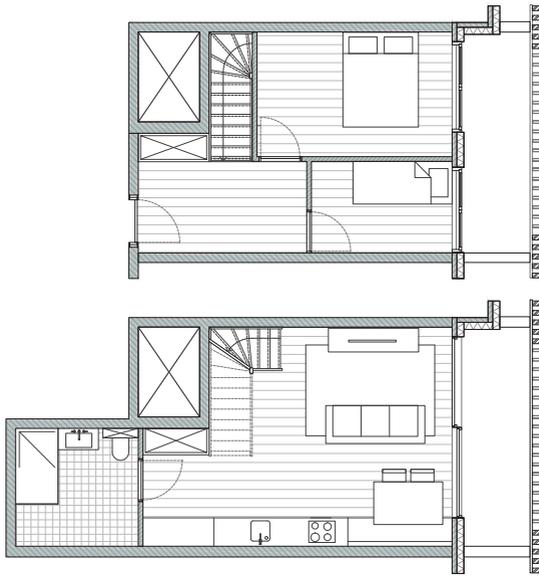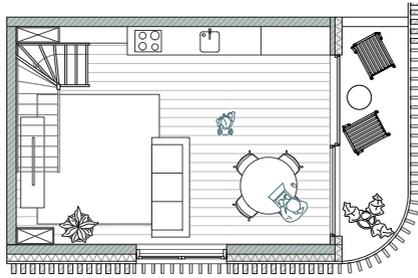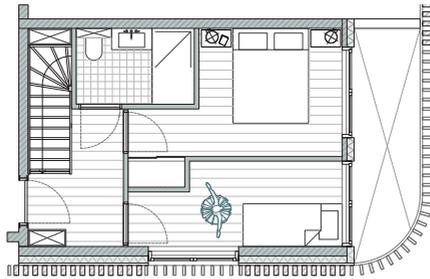
Dwelling type C1
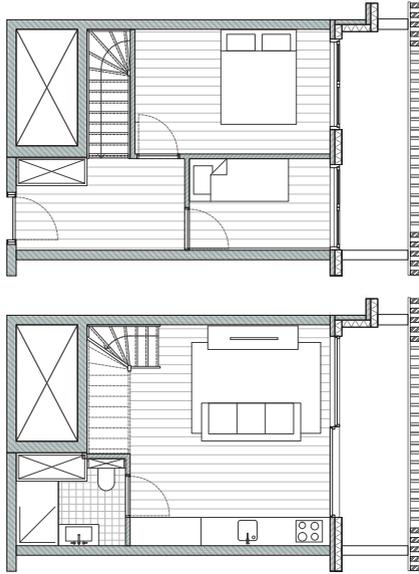
Dwelling type C2
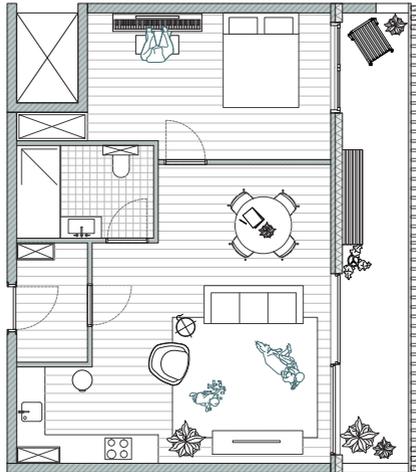
Dwelling type D

0 0.5 1   2m

Dwelling type E
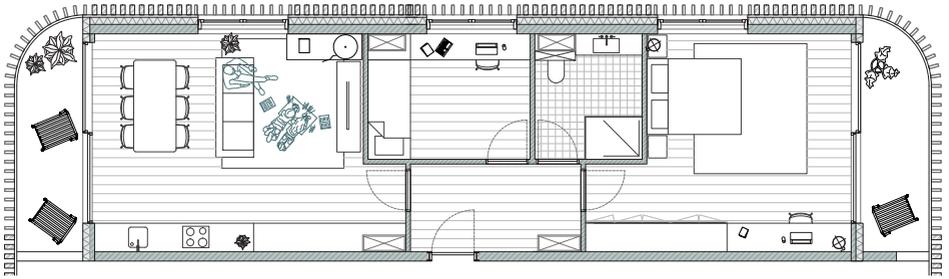
0 0.5 1   2m

Impressions
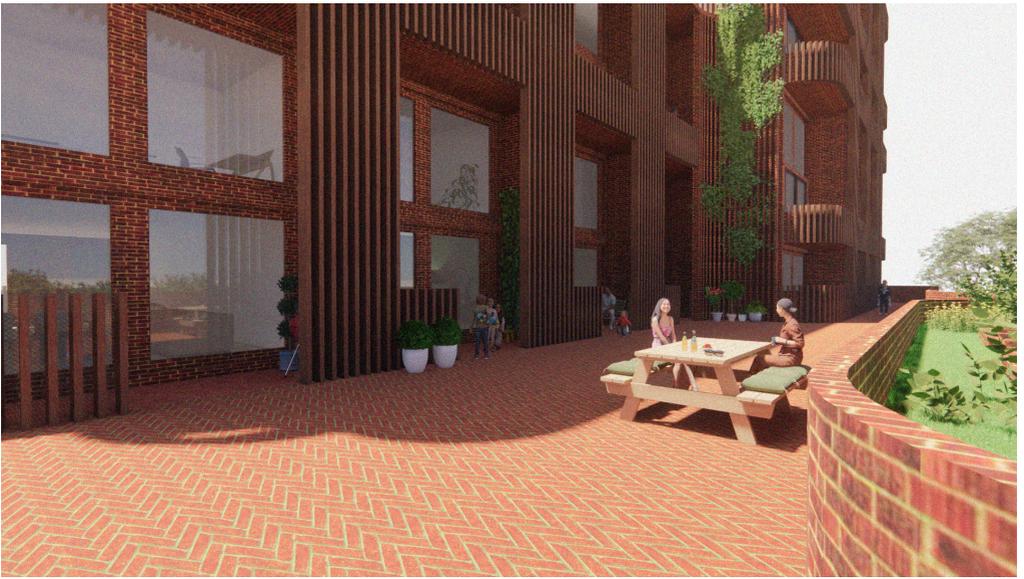
Collective deck with maisonette dwellings directly connected to it.

Multifunctional planters to provide greenery and the possibility to have a vegetable garden.

Gallery on the collective deck with a large threshold zone to the dwelling.

Hallway with places to sit, store toys and a private closet for each dwelling to store shoes and collect packages.

Interior places dedicated for children to play.

Woman reading in her living room (dwelling type C1)

Woman reading in her living room (dwelling type C1)

Woman watching the sunset from her balcony (dwelling type B1)

Two women talking in the kitchen (dwelling type B1)

Bedroom for a teenager (dwelling type A1)

Bedroom for a child (dwelling type A1)

Living and dining room (dwelling type A1)

Dining room, kitchen and staircase with a place for children to play (dwelling type A1)
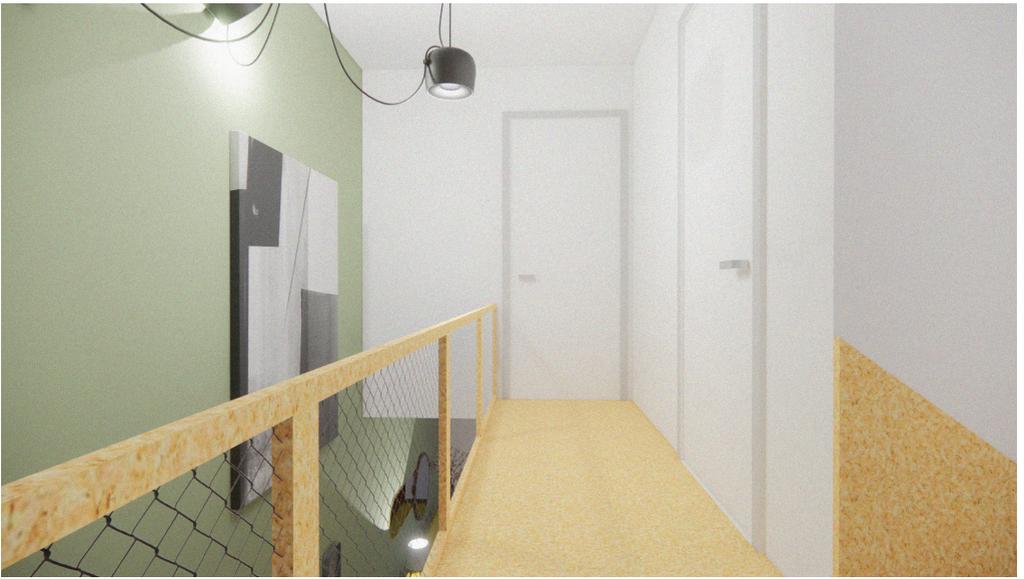
Corridor with a sight-line to the living room downstairs (dwelling type A1)
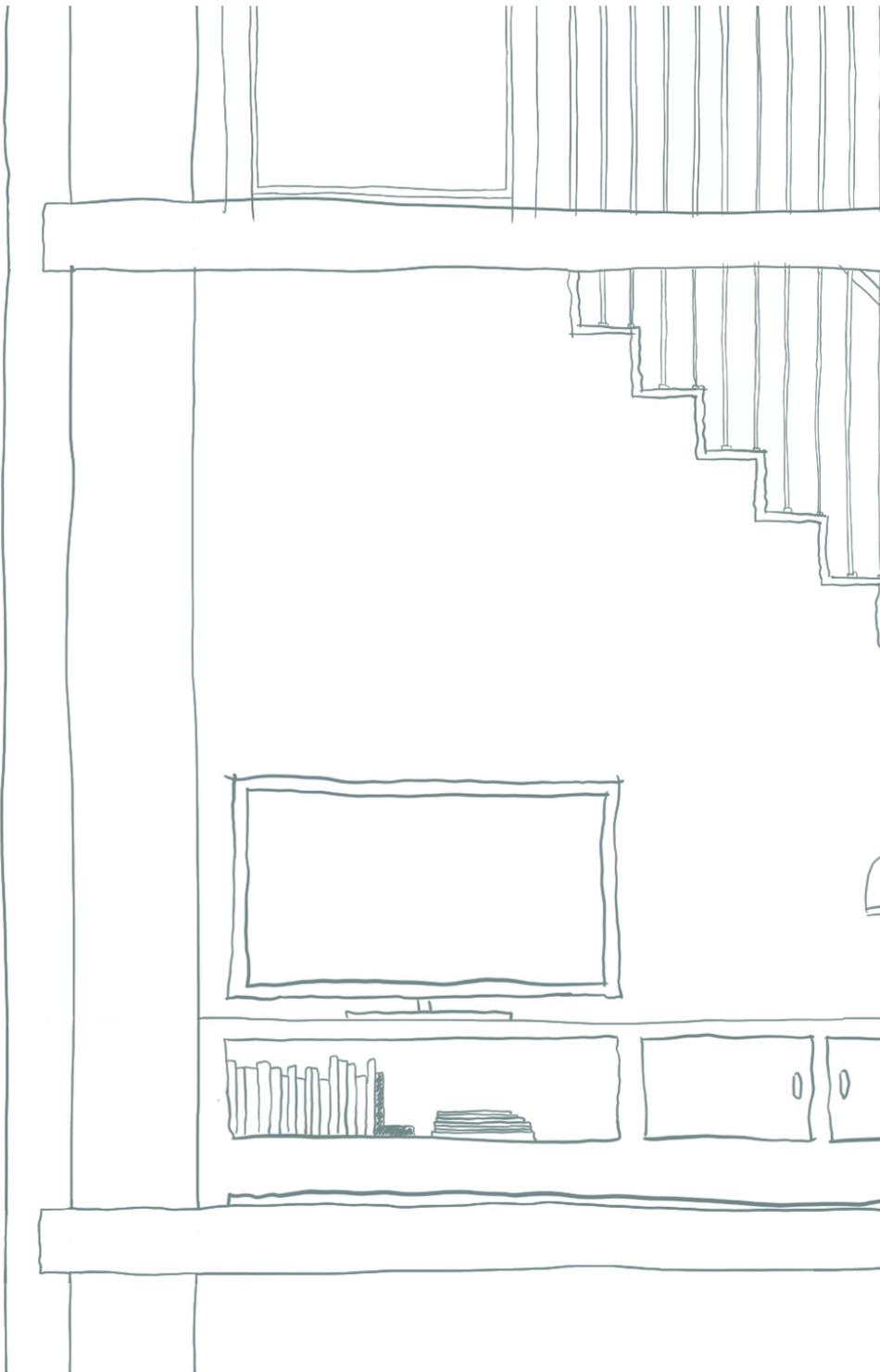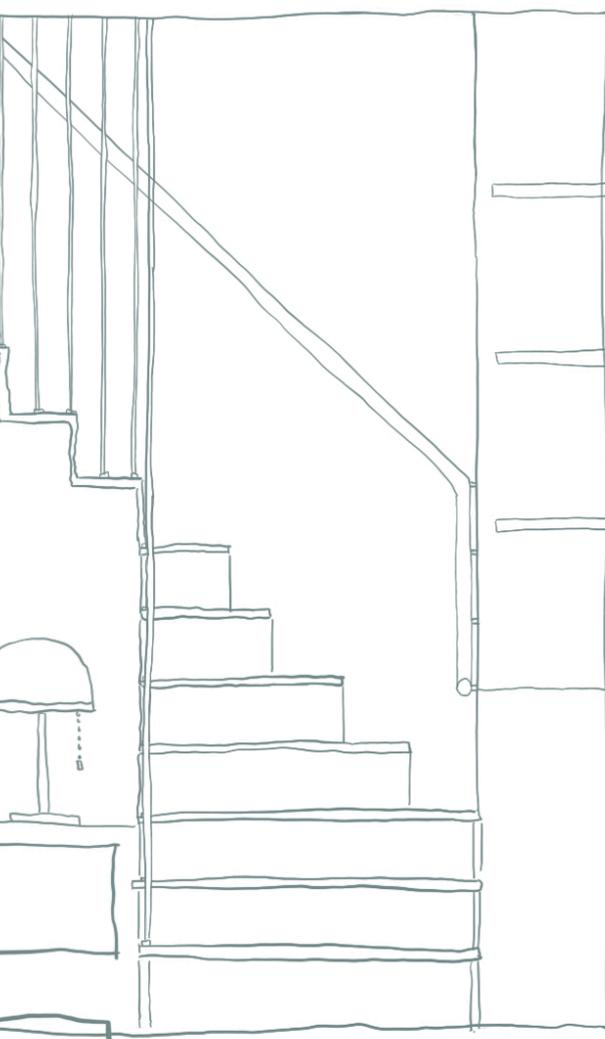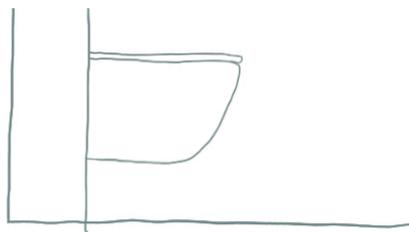
Technical aspects

Detailing
Prefab facade

Prefab floor structure

- Engineered parquet
- Screed with floor heating (70mm)
- Insulation (30mm)
- Concrete prefab elements (160mm)
- Stucco

- Filler brick

- Attachment wall to floor

- Accoustic barrier

- Insulation

- Decorative brick element

- Schöck Thermal anchor

**Prefab wall structure Rc>4,7
(from outside to inside)**

- Brick slips (20mm)
- Glue
- PIR-foam panels (120mm)
- Glue
- Concrete prefab elements (160mm)
- Stucco

Prefab load-bearing facade

```
|    |    |         |
0    5   10        20cm
```

Detailing
Window frame + Sliding door frame

- Uc < 1,65 W/m^{2}K

- Aluminium window frame

Prefab floor structure
- Engineered parquet
- Screed with floor heating (70mm)
- Insulation (30mm)
- Concrete prefab elements (160mm)
- Stucco

Prefab wall structure Rc>4,7
(from outside to inside)
- Brick slips (20mm)
- Glue
- PIR-foam panels (150mm)
- Glue
- Concrete prefab elements (75mm)
- Stucco

- Duco SkyMax ZR

- Aluminium sliding doorframe

- Uc < 1,65 W/m^{2}K

Window frame/sliding door frame

```
I    I    I         I
0    5    10        20cm
```

- Corten steel ballustrade
- Wire gauze fence
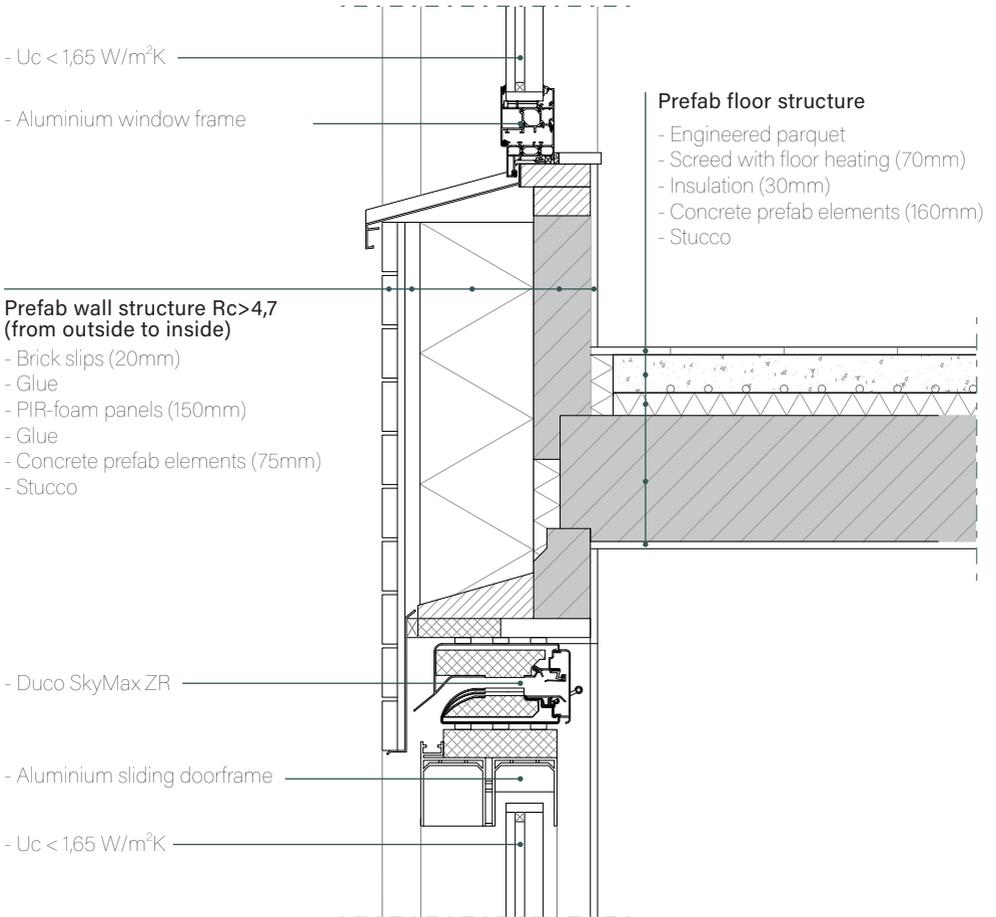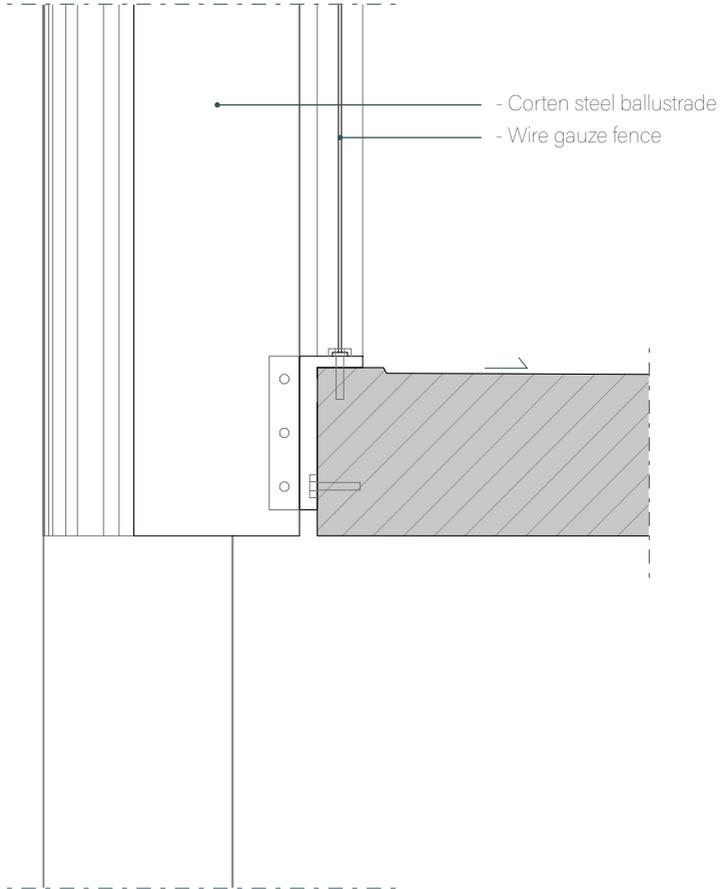
Balcony railing

0   5   10   20cm

Prefab floor structure

- Engineered parquet
- Screed with floor heating (70mm)
- Insulation (30mm)
- Concrete prefab elements (160mm)
- Stucco
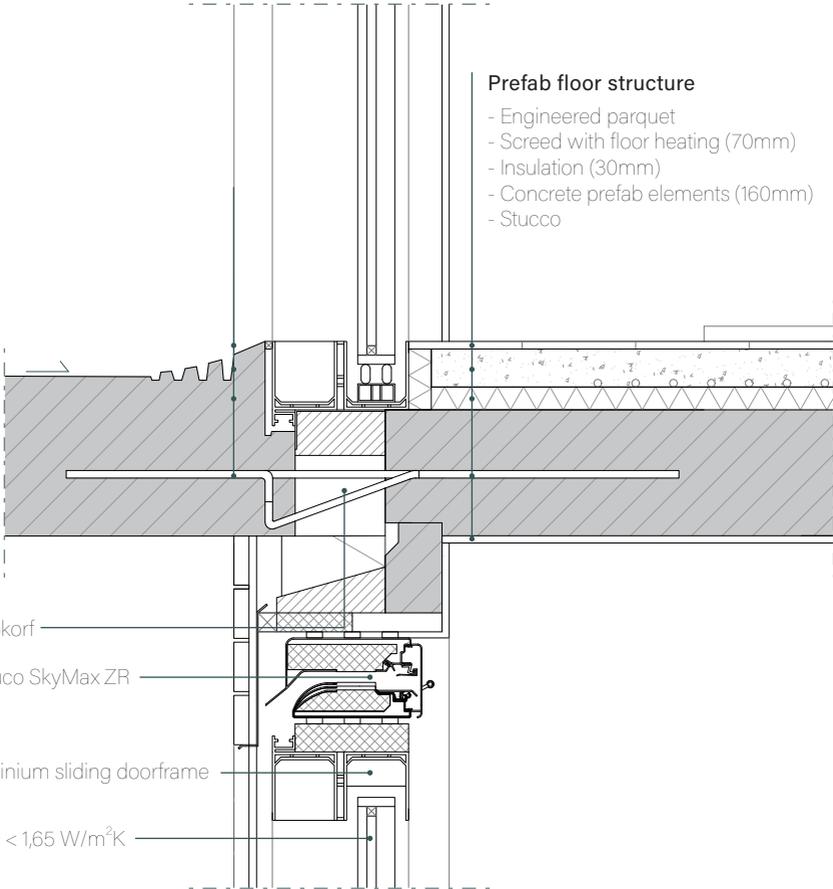
- Isokorf

- Duco SkyMax ZR

- Aluminium sliding doorframe

- Uc < 1,65 W/m^{2}K

Balcony connection

0   5   10   20cm

Detailing
Prefab facade assembly
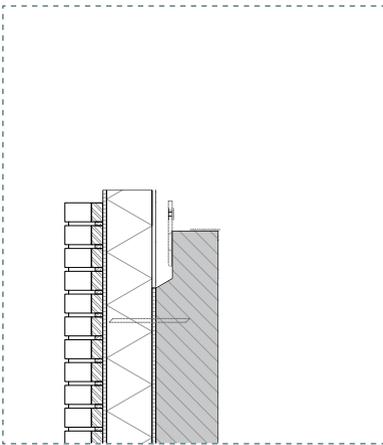
1. The prefab elements from the load bearing façade consist of a concrete structural element, insulation and brick cladding. First the prefab load bearing wall element is placed.
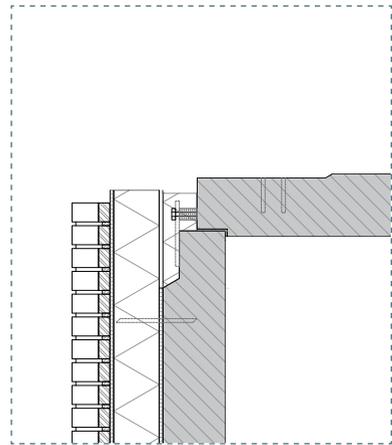
2. Then the next wall element can be placed and connected to the floor.

Detailing
Prefab facade assembly

3. Then the floor is placed on top and secured to the wall below.

4. Lastly, the floor heating and floor finish can be placed. One brick is placed between the two prefab elements on the outside of the building to conceal the gap.

Energy

264 solarpanels on the roof of both the high and the low part of the tower provide the energy needed for one third of the households.

Water

Rainwater is collected and repurposed to water plants in communal gardens and private balconies.

Energy-generating play

The collective deck has places to play where children are encouraged to generate energy by playing on the energy floor which stimulates awareness on the topic of sustainablity.

Greenery

The green roof provides a way to reduce the urban heat island effect. It also increases the amount of rainwater that can be collected.

Heating

Floorheating and cooling, which is connected to a heatpump with thermal storage, regulates the temperature in the building.

Climate
Floor level

Water

Rainwater is collected and repurposed to water plants in communal gardens and private balconies.

Shading

The balconies provide shade during the summer. When the sun is positioned lower, during the winter, this shading effect is reduced.

Heating

Floorheating and cooling, which is connected to a heatpump with thermal storage, regulates the temperature in the buildings.

Ventilation

Type C ventilation is applied in the buildings, which means natural input and mechanical outtake. Ventilation grilles above the windows bring in natural fresh air, which are developed specifically for high-rise buildings up to 70 meters. Mechanical outlets can be found in the kitchens, toilets, and bathrooms.

Shading

The balconies provide shade during the summer. When the sun is positioned lower in the winter this shading effect is reduced.

Water

Water is distributed through shafts that are closely connected to the areas of the home that need running water, such as the bathrooms, toilets and kitchens. Warm grey water from the shower is used to preheat its fresh water supply.

Shafts

Every dwelling has at least two shafts, one for the meter cupboard and one for ventilation and other pipes

Heating

Floorheating and cooling, which is connected to a heatpump with thermal storage, regulates the temperature in the buildings.

Water

Every dwelling has its own boiler to provide warm water for the kitchen and bathroom.

Ventilation

Type C ventilation is applied in the buildings, which means natural input and mechanical outtake. Ventilation grilles above the windows bring in natural fresh air, which are developed specifically for high-rise buildings up to 70 meters. Mechanical outlets can be found in the kitchens, toilets, and bathrooms.

Climate
Public space

Unpaved / semi-paved / paved

Minimize paved area to reduce
urban heat island effect. Use
greenery and difference in pave-
ment to create threshold zone
between public space and the
building

Unpaved / semi-paved / paved

Provide possibilties for rainwater to
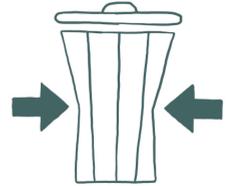infiltrate and relieve the sewer
system.

Durable materials to
limit maintenance
and the amount of
materials.

Increase awareness
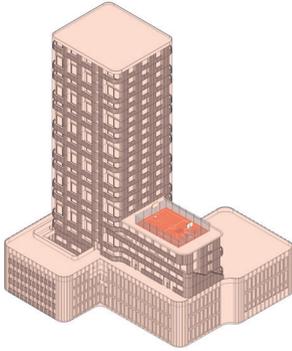about sustainability

Prefab elements to
reduce waste and time
at the building site.

Sustainability
Roof use
Rotterdamse Dakendagen MVRDV

Red rooftop: Social functions

Green rooftop: Providing greenery
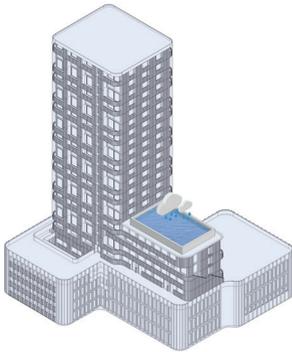
Blue rooftop: Collecting rainwater
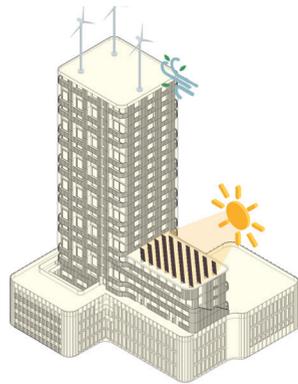
Yellow rooftop: Providing renewable energy
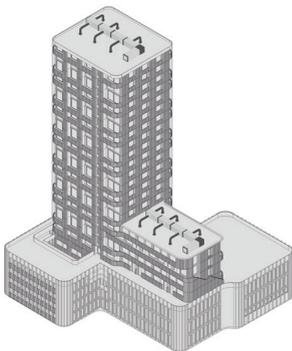
Grey rooftop: Installations and utility services

Orange rooftop: Providing space for mobility
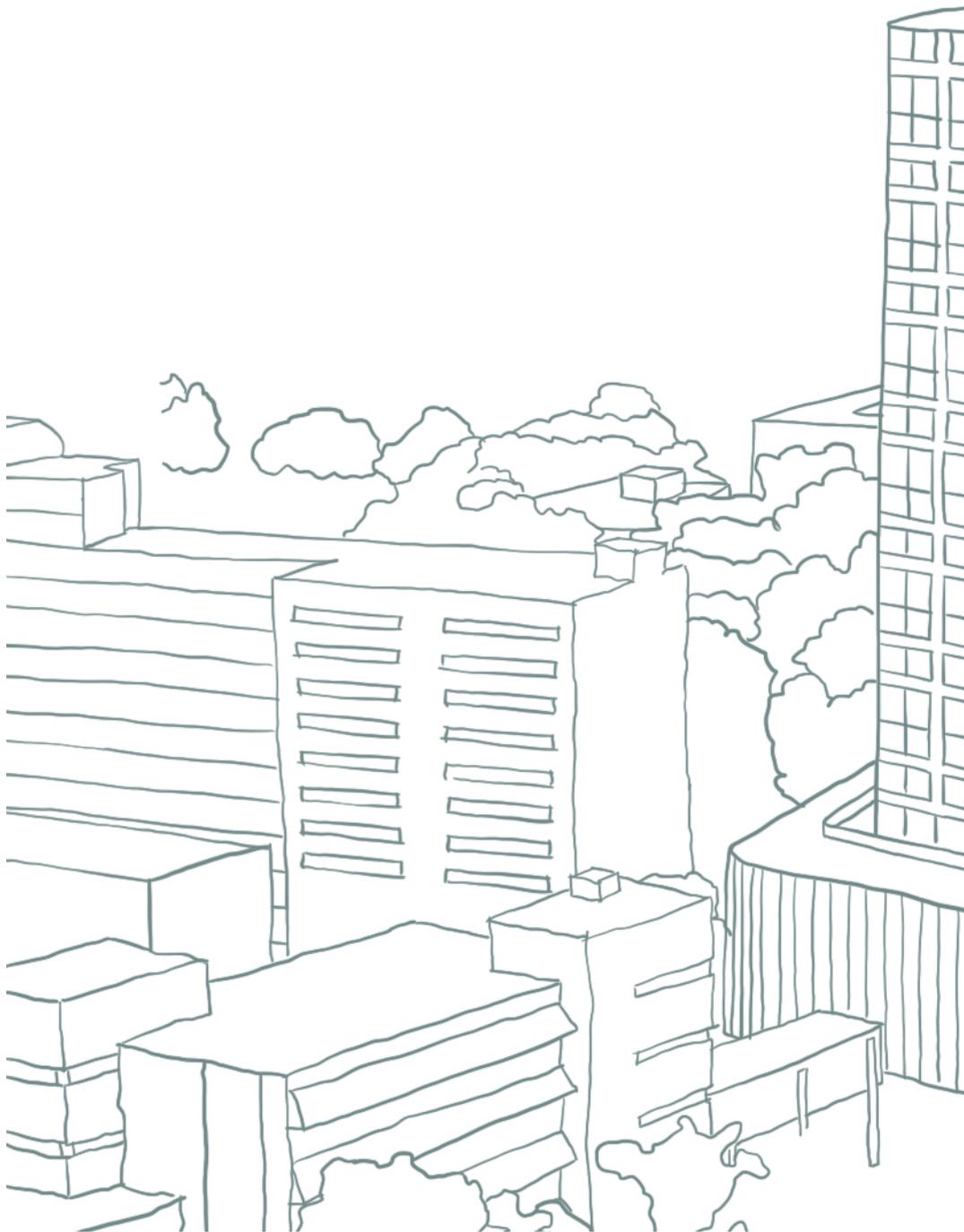
Design Interventions

Design interventions

Transparent barriers

Low windows

Step to reach mailboxes

Visual connection between floors

Low buttons in the elevator
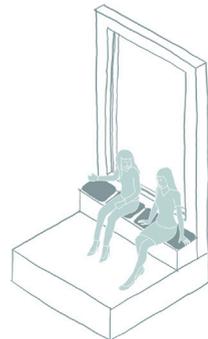
Places to sit
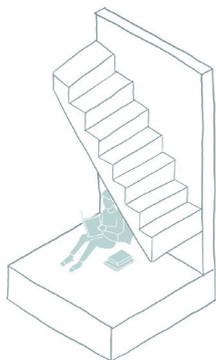
Spaces to withdraw
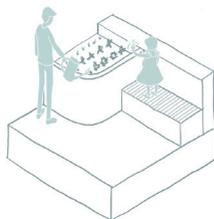
Possibilities for gardening
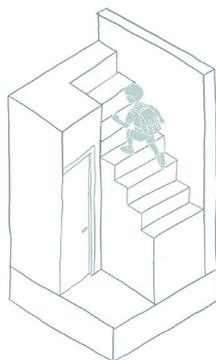
Possibility to explore

Graphic Novel

Graphic Novel

Graphic novel

The target group for my design will be mainly families with children, because of the proven negative effects of living in high-rise buildings on the mental health of children. These families are combined with one- or two-person households because of the sho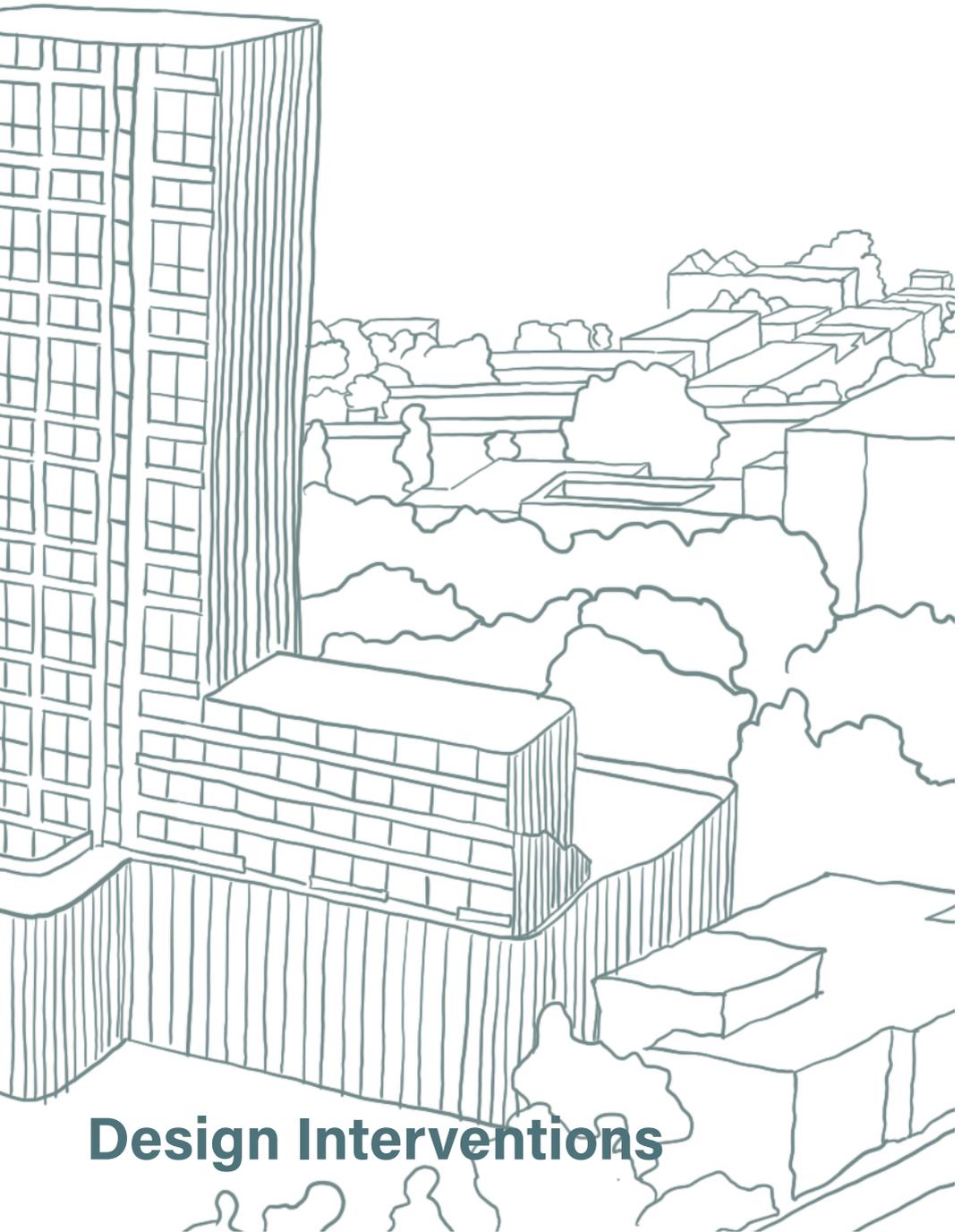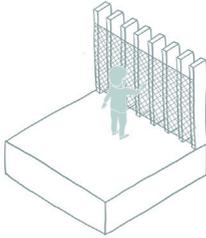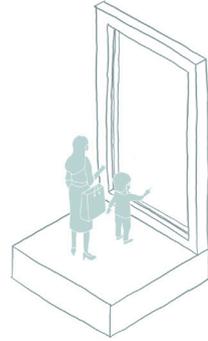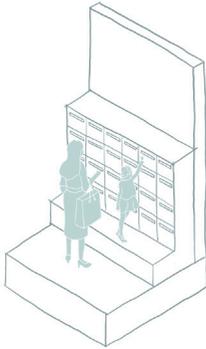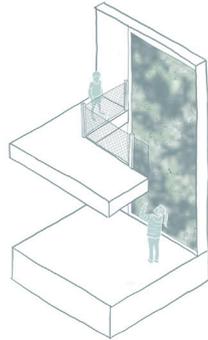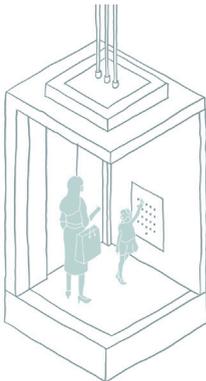rtage in housing for this group. To get a better understanding of the way children live in high-rise buildings, I use the development of a graphic novel with two children as the main

characters (figure 39). I try to develop a storyline that highlights the way children experience living in a high-rise building. The story is about two children playing in and around their houses inside a high rise building in Rotterdam. With this graphic novel, I try to understand what is important for children in their living environment.

The graphic novel consists of three parts that take place in three different time frames:

· The first part is about two children that move into a building that is design by an architect who wanted to improve the liveability for children in cities. These two children are used to living in ground-bound dwellings and need to adjust to their new surroundings.
· The second part is about the two children that have spent their youth in the high-rise building and are fully ground up. They have both moved into their own space in the building.
· The third and last part shows the two main characters that have now children of their own who have been born in the high-rise and do not know any better. They play on the high floors like it is nothing special at all.
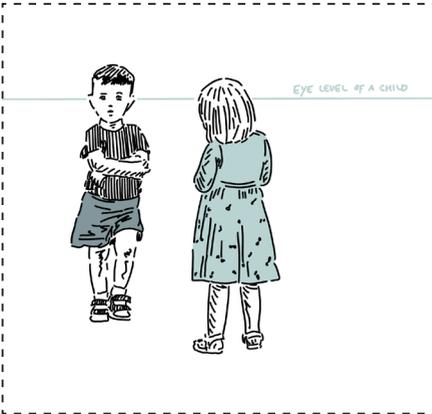
Figure 45 - Perspective of a child

Figure 46 - A child alone in the city

Figure 47 - The architect designing with a dream

There once was an architect with a dream. Her dream was to design a high-rise residential building in Rotterdam specifically for children.

Figure 48 - The architect designing

She quickly started designing and learned a lot about the way children play and live. She also discovered other elements that are very important for a child while growing up.

Figure 49 - The architect and children talking

To make an even better design, she decided to talk with a group of children and ask them about the things they would want to have close to their home when they would live in the centre of the city.

Figure 50 - The architect watching her building being built

After collecting a much information as she could, and finishing the design, it was time to finally start building this child friendly high-rise building next to the central train station in Rotterdam.

Figure 51 - Moving to a new home

Together with her parents and sister Rachel, Mia moved in as one of the first new residents of the skyscraper. They quickly started to unpack boxes, but Mia was exited to explore the building.

Figure 52 - A child wandering around alone

At first it al seemed a little scary. Mia just turned ten years old and this was quite a big building compared to the house the used to live in. Instead of twenty floors, her old house had only three…

Figure 53 - Mia and Lucy on the collective deck

Mia met Lucy who lived at the same floor. She had lived there for five days now and could show where the best playing spots where.

Figure 54 - Children playing hide and seek

She also showed Mia the best hiding spots while they where playing hide and seek with the other children.

Figure 55 - Children playing on the outdoor staircase

Mia met Robert on the staircase from the lower part of the deck they where playing in. He showed her how his house was one floor below hers!
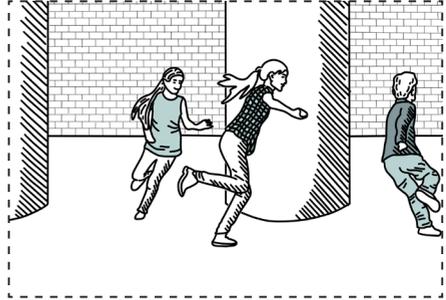
Figure 56 - Children running around a column

Mia and her sister Rachel became good friends with their downstairs neighbour Robert.

Figure 57 - Children playing on the square

Sometimes their parents would allow them to play with some other children outside in the square next to the building. They could wave to their parents on the forth floor of the building.

Figure 58 - Parents watching their children play outside

Inside the building there was however enough space for Mia and Rachel to practice their personal handshakes. Their parents would watch and try to remember how to do it themselves.

Figure 59 - Saying goodbye

After a few years Mia's father moved out. Mia was scared that he would move very far away and that she would never see him again.

Figure 60 - Children enjoying the view

Luckily, Mia's father was able to buy one of the smaller apartments in the highest part of the same building. From his new house you could see the whole city!

Figure 61 - Teens enjoying the view

Mia spend a lot of time at both her father and mother. However, she also spend a lot of time at Robert his house. The became best friends.

Figure 62 - Unpacking boxes

After graduating Mia and Robert decided that they wanted to get their own home, but preferably close to their parents and friends. They decided to buy a home in the higher part of the building.

Figure 63 - New parents enjoying their child

Their new home was large enough for one extra person… Their daughter Paula was born!
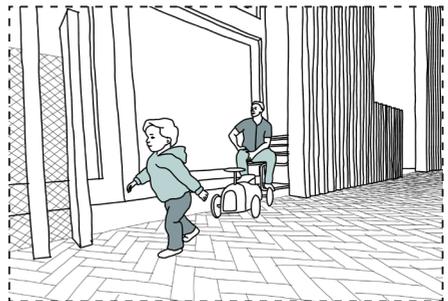
Figure 64 - A father watching his child play

Maybe Mia and Robert will one day move to one of the bigger homes, closer to the deck to have more space for a baby brother or sister for Paula!

Reflection

Reflection

Reflection

In general, I have truly enjoyed the graduation studio 'Advanced Housing Design – Ecology of Inclusion.' My goal at the beginning of this studio was to create a new building in a high-density environment with a very social character. The Walenburghof in Rotterdam was the perfect site to create such a building.

Where do you situate your project within TU Delft?

The graduation studio 'Advanced Housing Design – Ecology of Inclusion' tackles large social problems in the Netherlands through architecture. With my research on children and community building in high-rise residential buildings, I focus on many different scales from the user to its context. Architecture is about the relation between these different scales. By using Environmental Psychology as a theoretical framework, this relation is studied on a deeper level. This can help with tackling these kinds of social problems and help designing for people. With my research 'The future playground' I hope to positively influence the way people will live in cities. The research deals with many different aspects of living in cities with a focus on architectural and psychological elements. This multi-disciplinary approach is a critical aspect of the master programme in Delft. By constantly switching between different domains and supporting the design with research, the academic standards from both the Bachelor and Master are met.

How are research and design interrelated within your entire graduation project?

My research aims to explore the ways of creating a high-rise residential building for families, where children can play outdoors and parents can meet their neighbours. My goal was to develop design tools and guidelines that can help with designing a new high-rise residential building in Rotterdam. Within this building, the residents can enjoy life in their private houses, but can also enjoy the social interaction with their neighbours because they are part of a community. As a result, the residents feel connected to their building and a sense of belonging is created. The research provides tools and guidelines that can be used to answer questions and help to make certain decisions during the design process. They layout of the graduation studio 'Advanced Housing Design – Ecology of Inclusion' helps to be able to use

the research as a base for making most design decisions. During the first semester, we have mainly focussed on researching the site, Walenburghof in Rotterdam, together with doing the individual research. By observing, analysing, interviewing and doing literature research, a foundation was build to create a suitable urban masterplan for the site. By analysing the site, the spatial and social problems of the neighbourhood Blijdorp in Rotterdam became clear. These problems became the base for design guidelines, such as the preferred target groups and dwelling typologies for the new urban masterplan. These guidelines help the design process during the second semester where every choice or step can be reflected on by looking at both the individual research and the urban analysis. This helps to guide the design process which is not a linear process. I have reflected on many design choices multiple times before making a final decision. The research can be used both consciously an unconsciously to make certain decisions. By doing the research before starting with the design the knowledge about children and belonging was already there, which made it a lot easier to find my own path in the design process.

The research provides guidelines for different parts of the design. These aspects have various scales and therefore different parts of the research can be useful at different moments during the design process. The urban analysis together with the individual research shapes the building during the first phase of the design. The concept is largely influenced by the urban analysis for example. Further into the design process, the individual research becomes more and more important. Especially on the aspect of children, the smaller scale in a building is very important to design with the research in mind. Small elements such as the height of windows or the design of a fence are of great importance for the experience of a child. While the design of the building shape can have a great influence on the aspect of community building. For each scale it is therefore important and useful to reflect on the right elements from the research.

Many elements from my design can be directly related to my research. The shape of the building in elevation is based on the principle by Jan Gehl, where four floors of a building can be visually connected (figure 65).

> The lower block of the building has a visual connection with the ground floor. The two lowest blocks are also visually connected to eachother.

Figure 65 - Research in design
Drawing by Author

Another element that is directly taken from the research is the design of the circulation spaces. They are different throughout the building and based on three of my case studies (figure 66):
·   Block 1: 8 House - BIG
·   Block 2: Family Scraper - Van Bergen Kolpa Architecten
·   Block 3: Unité d'habitation - Le Corbusier
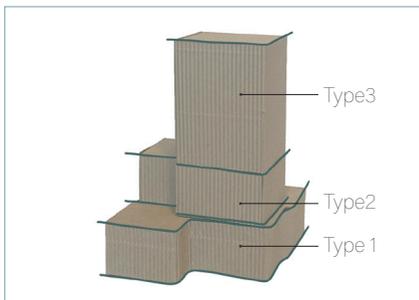
> Each block in the tower has a different character and the circulation typology for each block is based on a different case study.

Figure 66 - Research in design
Drawing by Author

These two examples show how I have used my research in the beginning of the design process to determine the concept.

In the next phase of the design process I have again used the research to directly take information from and translate this into a high-rise design for families. One example is the use of maisonette dwellings in a high-rise building so that sleeping and living can be separated in the same way as in conventional Dutch row houses (figure 67).
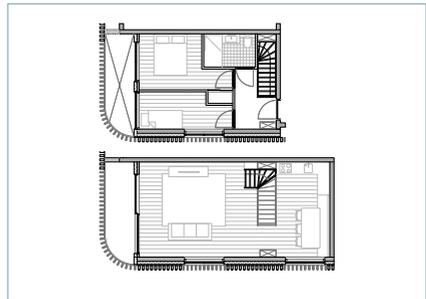
> Maisonette type dwellings are more suitable for families than one-floor appartments.

Figure 67 - Research in design
Drawing by Author

The last example is about the smallest scale. Which is for children the most relatable scale and therefore the scale that has the most impact on their experience of their surroundings. This last example is about the materialisation of the building. The choice of a certain material has a great impact on how the space is experienced. The materialisation and design of fences in a high-rise building is for example very important. In a high-rise building the fences should provide safety, but for a child it is also important that it does not block the view. On the balconies of the higher homes a steel netting is used to provide both safety and transparency (figure 68). The same principle can be applied when designing windows. If children of all ages should be able to look through a window, the window should be close to the floor with the sufficient safety measures.

Using transparent fencing allows
children of all ages to look through or
over a fence. The physical barrier does
not become a visual barrier.

Figure 68 - Research in design
Drawing by Author

What is the relation between your research method and your gained research insights?

Within my research I have used three main research methods. The research is be based on: research methods from the field of environmental psychology, literature on children and community building, and the examination of case studies.

From the field of environmental psychology I have gained insights in how people experience and use their physical surroundings. At has helped me to find another perspective to look at my design and my other research insights. The extra dimension that is added to making design choices, is asking the following question: how do people experience this space, and are they going to use it how I, as an architect, want them to use it?

The literature research, together with the case study analysis, has resulted into the largest part of my research insights. I have used the literature reviews to learn more about the way children live, learn, develop and play. The relation between reviewing literature and analysing case studies is very important within my research. By doing the research on children, for example, I was able to determine the most important physical aspects of the living environment of a child. The aspects then became the base for my case study analysis. During the case study analysis I could then focus

solely on these aspects and see how and if they could be translated to the design of high-rise building in Rotterdam.

Next to looking at the way buildings have been designed for children, I have also looked at building that where not specifically designed for children. By doing this, I wanted to encourage myself to think more outside the box. When doing the research first and looking at buildings where the most important elements from the research have been implemented, it is easy to not look further than only these elements. It is useful to have the confirmation that they can be implemented and do or do not work. But by looking at buildings without these "easy to recognise" elements, I wanted to give myself more freedom in designing from the perspective of a child. Based on my own experiences as a child and talking to young nieces, I was able to see possibilities in for children, in spaces that do not look like they are designed for children.

Looking at case studies that are not designed with children or community building in mind also helps to understand what would not work. Some spaces are not suitable for children, because of the lack of possibilities to explore for example. Looking for both things that do an do not work truly helps to find design tools and guidelines that can be used during the design process.

How does your project relate to contemporary societal issues and challenges including the changing role of the architect?

New concepts of affordable and sustainable housing could influence the way people live in cities. Because of the rising amount of people that want to live in the cities, densification of the urban fabric is needed. This is a challenge for urban planners and architects. One of the solutions for creating more dwellings in a city with a growing population is the realisation of high-rise residential buildings. More and more high-rise residential buildings will be built in the Netherlands in the coming years. These buildings provide an efficient way of living with unique views but often have many shortcomings. Living in high-rise buildings will be a part of the future in the Netherlands, and with this research, I hope to gain insight into how to solve some of these shortcomings. The research 'The future playground' focusses on creating a

pleasant living environment for children and their parents in Rotterdam. The children of today are our future, and their development starts at the home. An architect has a large responsibility when designing the living environment of people in cities. They get denser and it becomes more difficult to find a balance between, living, working and leisure. Next to that, the role of the architect becomes more and more important, because of the changing housing market. This role therefore changes to designing more and more affordable housing in cities. More people are depending on the work of the architect.

Discuss the ethical issues and dilemmas you may have encountered in (i) doing the research, (ii, if applicable) elaborating the design and (iii) potential applications of the results in practice. 150-200 words.

There are two main ethical issues that I encountered during the research and design process. The first dilemma is the balance between social issues and environmental issues. My research mainly focusses on social issues, while environmental issues are just as important to discuss and take into account. However, for this graduation studio I personally wanted to focus more on the social issues and have therefore decided to do less research on environmental issues. This does however not mean, that the environmental issues have not been taken into account when designing my building. In essence, the building must be sustainable, but it could have been even more sustainable when this would have been a larger part of my research.

The second dilemma is that the studio focusses on inclusion, while I am designing a building for a specific target group. To create the best building for children, it should maybe be built solely for children. This is however not possible, when designing a building where their parents should also be able to live, together with other adult residents. A building with only ceilings, windows and doors that are adjusted to the height of children is not suitable for others. To be able to include different target groups in a building, the building gets less and less suitable for each target group.

Reflection on design choices
During the design process many choices have to

be made in a certain time frame. When reflecting on my own design, there will always be design choices that I look back on and come to the conclusion that another choice would maybe have been more fitting or suitable for my design. One of the aspects for which I see improvement is the facade of my building. The composition, I am very happy about. These choices where made from both the architectural perspective, but also to support the design goals that where formulated in the beginning of this studio. The choice for the materialisation of the vertical slats was however based on mainly aesthetic arguments. The corten steel slats match the brick very well. Steel is also a very durable material, which makes it very suitable for high-rise as there is not much maintenance needed over the years. Steel is however not a very sustainable material to produce and work with. A more sustainable option could be to make the vertical slats of wood. This material does however require quite a bit of maintenance, which is less practical for a high-rise building. Another option is to use recycled plastic to produce the vertical slats. These could be made in the same colour as the corten steel and this also does not require a lot of maintenance. To discover what the best material choice is, a follow-up research could be done on the materialisation of the facade and the relevant sustainability aspects.

Bibliography

Biblography

Bibliography

Community building:
·   Aalbers, M. B. (2007). A Century of Social Housing in the Netherlands: From Mass
    Model to Gentrification? OASE, 73. https://www.oasejournal.nl/en/Issues/73/
    ACenturyOfSocialHousingInTheNetherlandsFromMassModelToGentrification#029
·   Altman, I. (1975). The Environment and Social Behavior. Monterey: Brooks/Cole Publishing Company
·   Blokland-Potters, T. V. (1998). Wat stadsbewoners bindt: sociale relaties in een achterstandswijk.
    Kampen: Kok Agora.
·   Blokland, T. (2009). Oog voor elkaar: veiligheidsbeleving en sociale controle in de grote stad.
    Amsterdam: Amsterdam University Press.
·   Blokland, T. (2008). Ontmoeten doet er toe (Essay). Consulted on 26-10-20, from https://docplayer.
    nl/77751-Ontmoeten-doet-er-toe.html
·   Gehl, J. & Svarre, B. (2013). How to study Public Life. Washington DC: ISLAND PRESS
·   Gehl, J. (2011). Life between buildings: Using Public Space. Washington DC: ISLAND PRESS
·   Huron, A. (2018). Carving Out the Commons: Tenant Organizing and Housing Cooperatives in
    Washington, D.C. (Volume 2) (Diverse Economies and Livable Worlds) (1st ed.). Univ Of Minnesota
    Press.
·   Jacobs, J. (1961). The Death and Life of Great American Cities. New York City: Penguin Random House
·   Lofland, L.H. (1998). The public realm, exploring the city's quintessential social territory. New Jersey:
    Transaction Publishers.
·   Platform31 (2021). Ontwerp voor ontmoeten. Den Haag: Platform31
·   Schoonen, W. (2020). Een gebrek aan sociale contacten? Dat is net zo schadelijk als roken. Retrieved
    on 22-10-2020, from https://www.trouw.nl/nieuws/een-gebrek-aansociale- contacten-dat-is-net-zo-
    schadelijk-als-roken~b0a82139/
·   Stojicic, P. (2019, September 25). The Importance of Residents' Sense of Belonging, Trust, and Power.
    Rethink Health. https://rethinkhealth.org/Resource/the-importance-of-residents-sense-of-belonging-
    trust-and-power/
·   Van de Wal, H. & Van Dorst, M.J. (2015). Privacyscript – De invloed van architectuur op sociale
    interactie in woongebouwen. Bussum: Uitgeverij Thoth
·   Webb, M. (2017). Building Community. London: Thames & Hudson.

Children:
·   Alexander, C, Ishikawa, S. & Silderstein, M. (1977) A Pattern Language. New York: Oxford university
    press.
·   Amager Children's Culture House, Denmark | Dorte Mandrup. (n.d.). Dorte Mandrup. Retrieved 13
    January 2022, from https://www.dortemandrup.dk/work/amager-childrens-culture-house-denmark
·   Children's Culture House ama'r by Dorte Mandrup Arkitekter | The Strength of Architecture | From
    1998. (n.d.). Metalocus. Retrieved 13 January 2022, from https://www.metalocus.es/en/news/
    childrens-culture-house-amar-dorte-mandrup-arkitekter
·   Halpern, D. (1995). Mental Health and The Built Environment. Londen: Taylor & Francis.
·   How children play at different ages. (2018, July 24). Playful Childhoods. Retrieved 23 February 2022,
    from https://www.playfulchildhoods.wales/how-children-play-at-different-ages
·   Jephcott, A. P. (1971). Homes in High Flats: Some of the Human Problems Involved in Multi-storey
    Housing. Edinburgh: Oliver and Boyd.
·   Kartsen, L. & Felden, N. (2016). De nieuwe generatie stadskinderen. Rotterdam: nai010 uitgevers.
·   Nederlands Centrum Jeugdgezondheid (NCJ). (2015, February). Ontwikkelingsaspecten en
    Omgevingsinteractie (toelichting). https://assets.ncj.nl/docs/63a73514-4ead-49a2-8d54-
    95ce6f81ecf8.pdf
·   Rohmer, M., Keesom, J., & de Haan, H. (2016). What Happened to my Buildings. nai010 uitgevers.

Environmental psychology:
·   Gifford, R. (2014). Environmental Psychology: Principles and Practice (5th ed.). Optimal Books.
·   Gifford, Robert, ed. (2016). Research Methods for Environmental Psychology. New York: Wiley
·   Hamel, R. (2013). Omgevingspsychologie en ontwerpen, over de toepassing van psychologishce

kennis in het ontwerpen [E-book]. Amsterdam: Universiteit van Amsterdam, Faculteit der Maatschappij- en Gedragswetenschappen, Afdeling Psychologie, programmagroep Brein en Cognitie.
· Hall, Edward T. (1966). The Hidden Dimension. Anchor Books.
· Proshansky, H. M. (1970). Environmental psychology: man and his physical setting (First Edition). Holt, Rinehart and Winston.

Living in high-rise buildings:
· Gigon, A., Guyer, M., & Jerusalem, F. (2016). Residential Towers. Amsterdam University Press.
· Roggeveen, D. (Host). (2021, 13 oktober). Toren van Babel - Gesprek met Erik faber over stedelijke verdichting door hoogbouw [Podcastaflevering]. In Architectenweb Podcast. Lieven Heeremans. Geraadpleegd op 17 november 2021, van https://open.spotify.com/episode/3CO3HPgqfEDxdTyax9tgle
· Vesteda, & Raemaekers, M. M. W. (2011, December). Hoogbouw te hoog gegrepen? Ervaringen met wonen in hoogbouwcomplexen. https://docplayer.nl/10833289-Hoogbouw-te-hoog-gegrepen-ervaringen-met-wonen-in-hoogbouwcomplexen.html

Case studies:
· 8 House, Copenhagen - Denmark, 2010, BIG
· Torres del Parque, Bogotá - Colombia, 1970, Rogelio Salmona
· Residential Tower, Antwerp - Belgium, 2020, CF Moller Architects
· Unité d'habitation, Marseille - France, 1952, Le Corbusier

Other
· Klijn, O., Kockelkorn, A. (n.d.). Advanced Housing Design - Ecology of Inclusion (course guide).
· Nidi. (2021) Eindrapport Verkenning Bevolking 2050 Policy brief. Retrieved 13 December 2021, from https://nidi.nl/wp-content/uploads/2021/04/NIDI-Policy-brief-Eindrapport-Verkenning-Bevolking-2050.pdf
· NOS. (2021, February 17). Grote bouwcoalitie presenteert actieplan voor 1 miljoen woningen in tien jaar. https://nos.nl/artikel/2369043-grote-bouwcoalitie-presenteert-actieplan-voor-1-miljoen-woningen-in-tien-jaar
· PBL/CBS. (2019) "Regionale bevolkings- en huishoudensprognose". https://themasites.pbl.nl/o/regionale-bevolkingsprognose/
· What Is Ecology? – The Ecological Society of America. (n.d.). EsaMain. Retrieved 19 September 2021, from https://www.esa.org/about/what-does-ecology-have-to-do-with-me/