GROWING UP IN THE CITY

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HIGH-RISE AS AN ALTERNATIVE FOR HOUSING FAMILIES IN AMSTERDAM

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DATE JANUARY, 2021

THE **LIVEABLE** CITY

THE **OPEN-ENDED** CITY

THE **INCLUSIVE** CITY

THE **GLOBAL** CITY

THE **SHARED** CITY

THE **CONTRASTING** CITY

THE **SUSTAINABLE** CITY

THE **ANONYMOUS** CITY

THE **AFFORDABLE** CITY

THE **WALKABLE** CITY

THE **CONNECTED** CITY

THE **ACCESSIBLE** CITY

THE **HEALTHY** CITY

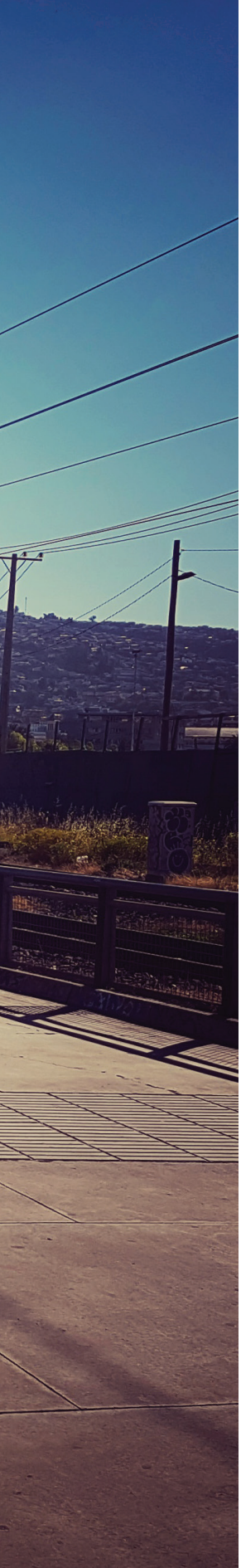
THE **BOOMING** CITY

THE **PROMISING** CITY

THE **CULTURAL** CITY

THE **CHILD-FRIENDLY** CITY


CULPABLE



PREFACE

Cities fascinate me. My favourite thing to do is wandering around a city, especially ones I have never been to before. I take random turns, which leads me into the everyday life of strangers. I become the spectator in a theatre, where the city is the stage and its dwellers the players. The serendipities I encounter is one major pleasure of me being in a city. Even cities most tourists avoid have a countless amount of these special moments, because there is one thing every city has: people. These people live their lives in the city, day in day out. Some of them move to the city because they want to, some of them because they have to. And some of them because they were born in the city.

Children did not choose to live in the city, and therefore deserve a liveable environment to grow up. With this topic, “families in high-rise”, my main goal is to find a satisfying solution to house this specific target group in a high density environment. This corresponds with another fascination of mine: how to create innovative and alternative floor plans of dwellings which perfectly suit the needs of its users.

CONTENTS

TOPIC RESEARCH

“We left Amsterdam because we needed space and could not afford a larger house. With our average incomes, it was even absolutely priceless. And there was actually no place in town for children. If we wanted to meet up with friends, the question was always where. Every bar is small, so there they are not waiting for children; every terrace is on a street, children get under cars and bicycles. A befriended couple had a somewhat larger house, so we usually agreed to have a drink there.”

Roos Monnik (32), Tharko Emmen (33), Lot (5), Joep (1) and Suus (0)
Moved from Amsterdam to Maurik

“Before my pregnancy I never thought about leaving the city. We lived in a very nice apartment at the end of the Overtoom for fifteen years. But when I became pregnant, we thought: how are we going to do that while living at the third storey? We first searched for a house in Amsterdam, but with our budget we could not get what we wanted: a garden, at least three bedrooms, and I did not want to go to Haarlem for example. I have never felt the need to start a new life in another city.“

Chanine Kerseboom (36), Jarno Potijk (41) and their son Jukka (2)
Moved from Amsterdam West to Badhoevedorp

“We had a nice house in the Spaarndammerbuurt. Not the space, but the crowds were problematic for us. When I stepped outside, I had to be so careful that Julian, at that time 3 years old, did not walk into the street. I was always on my guard, which was stressful. We did not necessarily want to leave the city, but we wanted to go to a quieter street with fewer cars and buses and more greenery in the neighbourhood and more parking space.”

Sara Oomen (36), Jeroen (38), Julian (8) and Ines (5)
Moved from the Spaarndammerbuurt to Weesp

INTRODUCTION

MORE SPACE TO LIVE IN THE CITY

Families are leaving Amsterdam, whether they like it or not. The anecdotes on the right (NRC, 2017) illustrate the problem young couples face when having children. A lot of families would like to stay in the city but they are not able to afford suitable housing and are drawn to more spacious, quieter and greener neighbourhoods in surrounding villages. This is not only a problem for the families themselves, but also for the city, as the disappearance of families correlates with the economy, liveability and safety of the city.

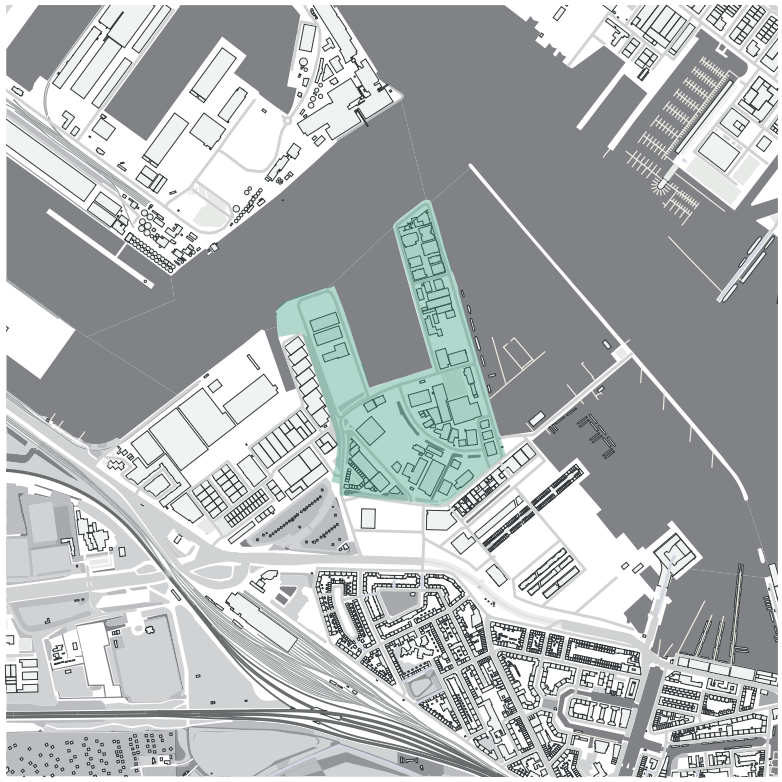
The current supply of new housing is insufficient to keep up with the demand. To alleviate this problem, Amsterdam will use former industrial areas in the western part of the city to build new housing and offices. This project, named 'Haven-Stad', will provide forty to seventy thousand dwellings in the coming decades (Municipality of Amsterdam, 2019).

Minervahaven, the location of the graduation project, is a sub-area of Haven-Stad. The area is situated inside the ring road (A10) of Amsterdam, and therefore a central and desired location. Due to its absence of historical buildings, Minervahaven is a convenient location for less conservative building forms. Because of the high land value, high density high-rise will be suitable for this specific location and has multiple benefits for families as well as for the city. Currently, there is a debate in the Netherlands whether more high-rise should be built to meet the high demand in housing. At the moment,

3 Minervahaven, Haven-Stad and ring road (own illustration)

several high-rise buildings are being planned and built. Nonetheless, most of them are aimed at target groups other than families. For families, the common choice continues to be row housing in quiet neighbourhoods outside the city centre. To reverse the outflow of families in Amsterdam, it is therefore proposed to give an alternative, by housing families in high-rise.

In the following chapters research is conducted on the topic ‘families in high-rise’. An answer is given to the question why families are staying in the city and why they (have to) leave. Furthermore, the target group is investigated



4 Minervahaven, bordering the water of 't IJ (own illustration)

with their needs in the city, building block and dwelling. From this research, a design will be made, by which a solution will be given for the question on how families can be housed in a high-rise building in Amsterdam.

After the research, the report will focus on the chosen master plan, Manhattan aan 't IJ, with a justification of the chosen plot. The subsequent two chapters will show the products of the quickstart week and the VR tutorial. After this part, four case studies are presented, which exemplify the housing of families in high-rise. For each case study, the outdoor spaces and the connection from the dwelling to the building block are analysed.

6 Father on cargo bike in Amsterdam (NRC, Maurice Boyer)

In the last section, a brief for the final design project is composed, based on the research in the first part of this report. Finally, a conceptual design is suggested, which will be further developed in the second part of the graduation studio.

5 Minervahaven, Amsterdam. View from pier towards north (own image)

7 Housing situation of families in Amsterdam around 1900 (Beeldbank Amsterdam)

FAMILIES LIVING IN THE CITY

A NECESSARY EVIL?

1876. The first port of Amsterdam is excavated west of the city, alongside ‘t IJ. In the Houthaven, wood is stored and transferred from Scandinavia to Africa, Asia and Russia. (Damen, 2015) A few years later, more space is needed for this important trading port. Further west, the Minervahaven gets dugged out. (ARCAM, 2019). These developments are part of the industrial revolution, which occurred in the second part of the 19th century in the Netherlands. Families are moving from the countryside to the city hoping to find work. They have to do heavy work, in places such as the Minervahaven, and get paid depending if there is work available. (Damen, 2015)

Van der Woud (2018) writes in his book ‘Koninkrijk vol sloppen’, that the people did not only go to the city because of more employment opportunities. The city even attracted because of the “darkness”, by feeling the modern city with all their senses. Citizens enjoyed the modern life by absorbing the crowds and strolling the streets.

The modern image of the city was formed by palatial buildings, such as the station, museum and concert hall. On the outskirts of the city the image also changed. In this part, new neighbourhoods were built in former meadows. These had a different appearance however, homogeneous and boring. The city “was not a theater, there was no feeling” (Van der Woud, 2019, p.48)

During this period, neighbourhoods like these were built to offer a solution

8 Girl looking through window (Beeldbank Amsterdam)

for the high demand in housing. The shortage was possibly the largest in Amsterdam. Between 1880 and 1902, 16.667 new dwellings were built, only one tenth of the population growth during these years. Housing was built as mass production, often in low quality. A large part of the centre of Amsterdam was built during this period, most of these neighbourhoods being amongst the most popular, such as ‘De Pijp’, in the southern part of the centre of Amsterdam. Expensive dwellings had separate rooms for parents, sons and daughters. Cheaper ones however, consisted often of only one room. Cooking, eating, working, sleeping, laundry and toilet use was all done in a space of 15 to 25 square meters, shared with 4 or 5, sometimes even 7 or 8 family members. (Van der Woud, 2018)

In 1901, a law is introduced to tackle the poor housing conditions. The 'Woningwet' (Housing Law), sets minimum requirements for newly built dwellings and allows municipalities to expropriate and demolish poor housing. Subsidies made it possible to build higher quality social housing, and new neighbourhoods were built according to the garden city principle. (Municipality of Amsterdam, 2019)

In the subsequent years, many people moved to Amsterdam hoping to find a job and a better life. Medical improvements made the death rate decline, especially among infants. In 1959 the amount of people living in Amsterdam hit a record high of 872.000 inhabitants. (OIS, 2019)

FAMILIES MOVING FURTHER AWAY

After 1960, families started to leave the city. Between 1960 and 1985 the population of Amsterdam declined every year. The housing stock was deprecated and modern and more spacious homes became available in the so-called “groeikernen” (growth centres), such as Purmerend, Lelystad, Hoorn, Alkmaar and Almere. Due to families leaving the city, and the arrival of the contraceptive pill, the amount of newborns in the city decreased. Amsterdam reached a low point of 676.000 in 1985.

In the 80’s, Amsterdam started to grow again. This time mostly because of immigrants who came the Netherlands as guest workers since the seventies, who brought their families here after some years. Families were still moving to neighbouring municipalities, but the city became more attractive because of city renewal. Locations such as IJburg and the Eastern Docklands were

9 Pre-war “strokenbouw” in Amsterdam West (Beelbank Amsterdam)

10 Children jumping from bridge in Borneo Sporenburg neighbourhood, part of the Eastern Docklands (Beeldbank Amsterdam)

AMSTERDAM AS THE PLACE TO BE - DEMAND EXCEEDS SUPPLY

Since 2008, the city sees a large growth of its inhabitants, mostly because of the high birth rate. Besides this, there is a large influx of expats, mostly from Europe, the US and BRIC countries. For families however, it has become more difficult to find a place in the city, especially among families with young children. (OIS Amsterdam, 2019)

11 Child drinks a “babyccino” (Babyccinokids.com)

FAMILIES WANT TO STAY IN THE CITY

Currently, a large amount of families want to live in Amsterdam. They either were born in the city, or came here for example to study. Over time, they formed a bond with the city and would like to stay, even after having children. There are several reasons why families want to live in the city. Karsten (2007) divides these reasons in three subcategories: functional, social and symbolic bonding.

Functional

The most important reason to live in the city is are time-geographical considerations. In particular the distance from home to work is an important factor, as living and working in the same city will decrease commuting time substantially. Besides work, the close proximity to other functions such as

schools, playgrounds, and culture is seen as an advantage. In contrast to the past, nowadays often both parents work, which results in restrictions of place and time. Amenities and work should be in cycling distance, as this is a frequently-used measure fol local daily activity patterns.

Social

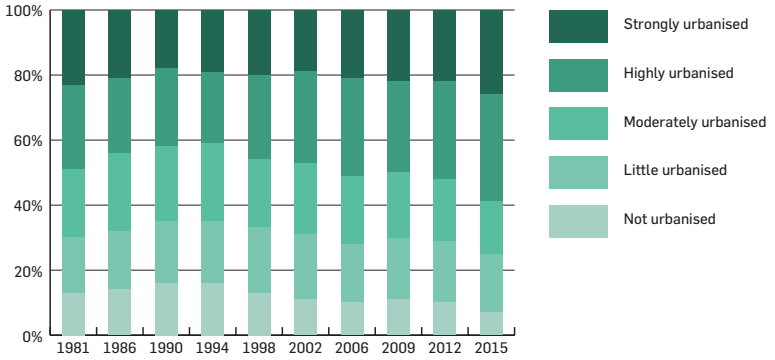
Established social networks form a strong basis to continue the urban lifestyle. Families do not isolate themselves, but are part of a large network of friends and neighbours. For migrant families relatives are important as well. The networks are relatively homogeneous, families bond with other like-minded families from similar demographics and classes. However, the diversity present in cities, is highly valued, as they are in close proximities. People do not dissociate themselves from their environment, partly due to the absence of private schools, the extensive use of bicycles and emphasis on playing outside.

Symbolic

Families which live in the city know they are unconventional in their lifestyle, and they are proud of it. They are attracted to the big city and perceive living in the suburbs as negative, however often they need to defend their choice to live in the city. Being urbanites is part of their identities, also after having children. They feel that they did not lose this right when becoming families.

The desire by families to live in urban environments is also visible in the graph above. Where the desire to live in such environments was decreasing in the nineties, the past decade shows in increase in highly and strongly urban environments.

13 Families commuting through Amsterdam (Groene Amsterdammer)



13 Desired urbanity of families (30-54) (PBL)

When young couples want to move, they mostly want to stay in the same municipality. However, when they want to move to a different municipality, they often want to go to a more urban environment. This applied to 71 percent of this group, against 5 percent wanting to move to a more rural environment. (Van Dam & De Groot, 2017)

As we have seen, a significant amount of families want to stay in the city, also after having children. Unfortunately, numerous of them do not have the option to do so. The next section will discuss the ongoing trend of families leaving the city and why this is a problem.

REASONS TO STAY

FUNCTIONAL

SOCIAL

SYMBOLIC

Geef mij maar Amsterdam - totdat je kinderen krijgt

Gezinswoning Steeds meer jonge gezinnen verlaten Amsterdam: inmiddels trekt 40 procent naar randgemeenten. Goedkopere huizen, meer ruimte, meer rust en meer groen.

Gezinnen met jonge kinderen verlaten Amsterdam

Gezinnen verlaten Amsterdam, omdat ze geen huis meer kunnen vinden. Dat is slecht nieuws voor de stad, want families zijn belangrijk voor de samenhang, betrokkenheid en welvaart.

Jong gezin verruilt stad vaker voor goedkopere randgemeente - vooral Amsterdammers trekken weg

Het aantal jonge gezinnen dat hun krappe woning in de grote stad inruilt voor een gezinswoning in randgemeenten neemt nog elk jaar toe, bleek maandag uit nieuwe CBS-cijfers.

Grote steden zien jonge gezinnen vertrekken

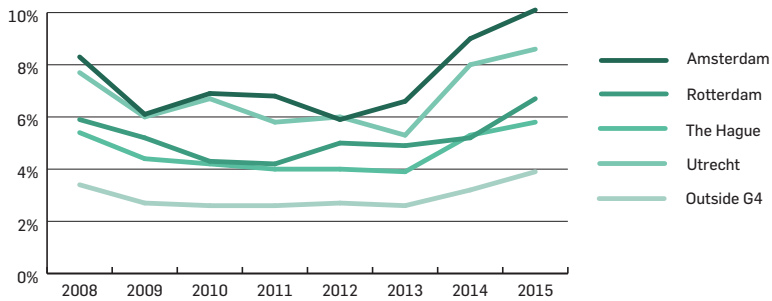
Woningmarkt De vier grote steden zien hun inwoners vertrekken naar elders in Nederland. Amsterdam groeit, maar dat komt door de expats.

14 Newspaper articles addressing leaving of young famies from Amsterdam (NRC, Parool, Volkskrant, NRC)

FAMILIES ARE LEAVING THE CITY

Even though a lot of families would like to stay in Amsterdam, a lot of them are leaving the city. “Young couples leaving Amstedam” were headlines in several newspapers in recent years, as seen on the right. The figure below shows the relocation of young families from the four biggest cities in the Netherlands (G4) to other municipalities. For Amsterdam, this percentage went up after 2013, and is even the highest among the G4.

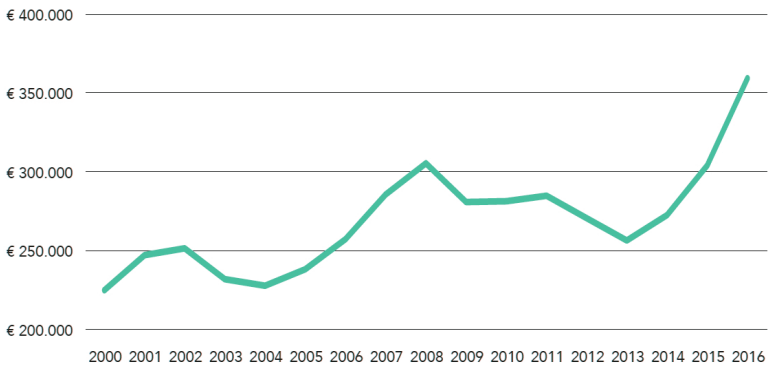
According to the newspaper articles, an important factor why families leave Amsterdam is the inability to find suitable housing for an affordable price. Although they want to stay, the advantages of moving to a suburban area outweigh the wish to stay in the city. This section discusses the reasons why families leave Amsterdam, what kind of families they are and why it is a problem for the city.



15 Relocation of young families to another municipality (30-54) (CBS)

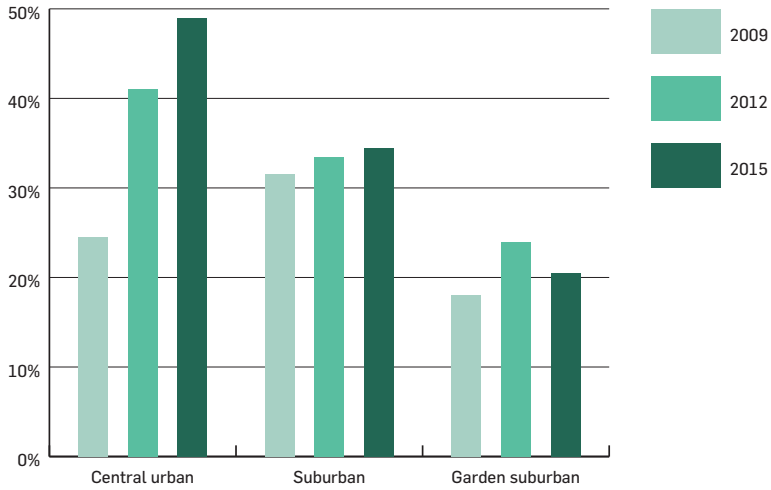
REASONS TO LEAVE THE CITY

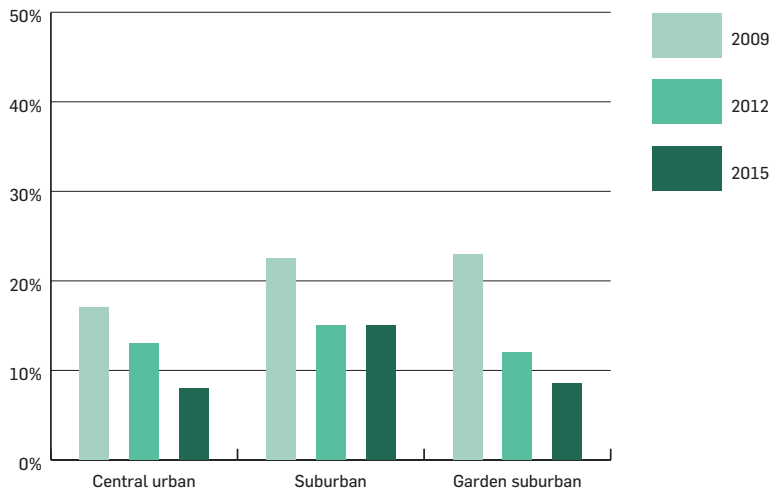
The housing market in the Amsterdam is overheated. After the financial crisis in 2007 the housing prices went down for a couple of years. In recent years however, they have risen substantially (figure 16). Small apartments of 60m^2 are currently sold for over 400.000 Euros. Even for middle-class families it is impossible to find a house with sufficient space or get the mortgage for the scarce amount of houses which do meet the requirements.



16 Average selling price of houses in Amsterdam (CBS)

The graphs on top of this page confirms the previous statements about families leaving the city. Both graphs show if families with the desire to move want this because of their home or their living environment. For central urban environments, the desire to move because of their home is in 2015 way higher (49%) than because of their environment (8%). Interestingly, over time the desire to move because of the home increases and because of the living environment decreases. Families apparently want to stay in Amsterdam, but want to move because their current home does not comply with their wishes.





17 Percentage of families in G4 with a desire to move because their home (left) or their living environment (right) (PBL)

The most important aspects about the dwelling which play a role in considering to move to suburban neighbourhoods are the location, the amount of bedrooms and the presence of a private outdoor space. Higher incomes weigh these factors against the asking price for such homes. For lower incomes the shorter waiting list for social housing in other municipalities is a significant factor, location and renting price play a minor role. (Karsten, 2016)

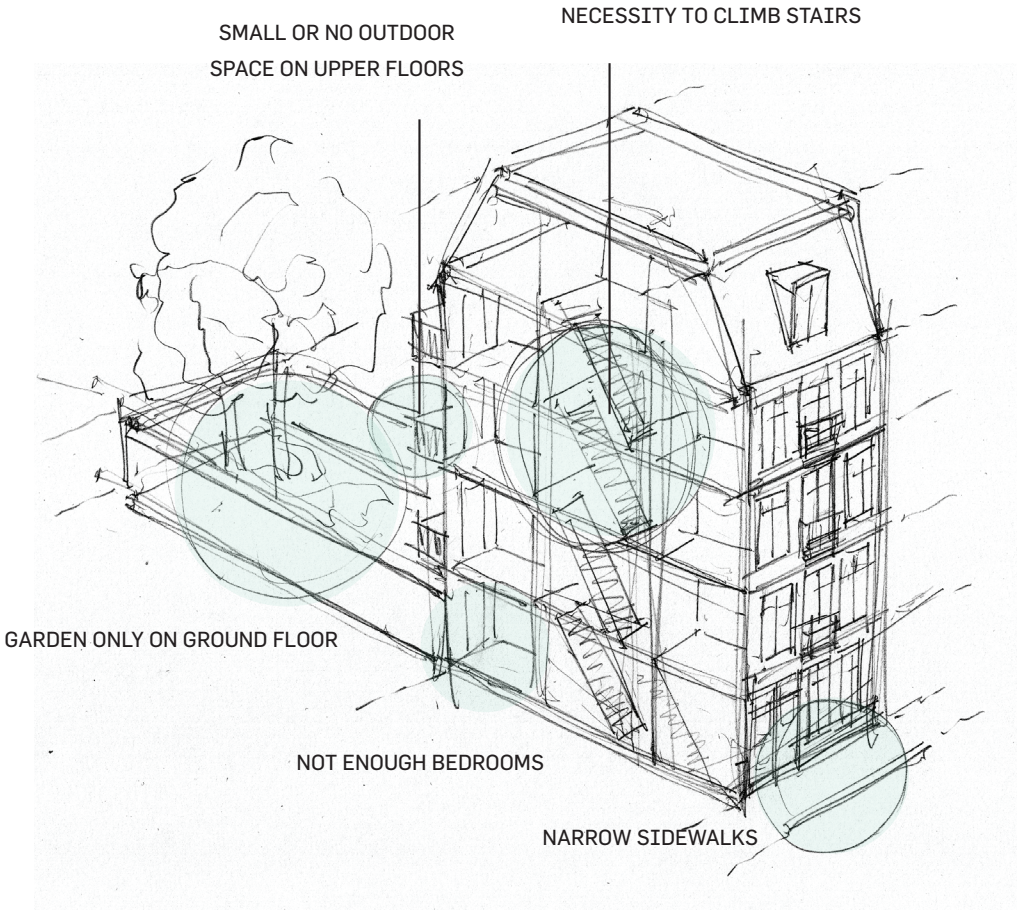
On the right, the choice families have to make is illustrated with a typical small apartment in desired neighbourhoods in Amsterdam (figure 18) and a typical row house in suburban neighbourhoods in the Netherlands (figure 19). Nearly forty percent of the housing stock in the Netherlands consists of row housing and this is the most common housing type families move to (RVO, 2011). It becomes clear that due to several elements in and around the house, the suburban row housing is more suitable for housing families.

REASONS TO LEAVE

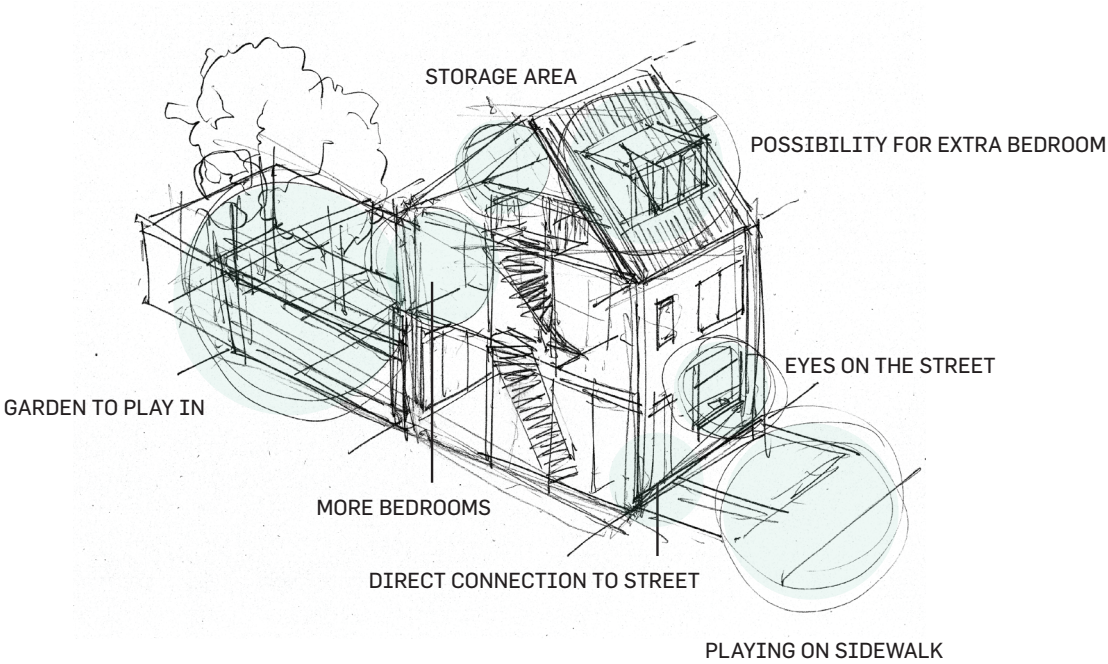
SUITABLE HOUSING UNAFFORDABLE

NOT ENOUGH BEDROOMS

DESIRE FOR OUTDOOR SPACE



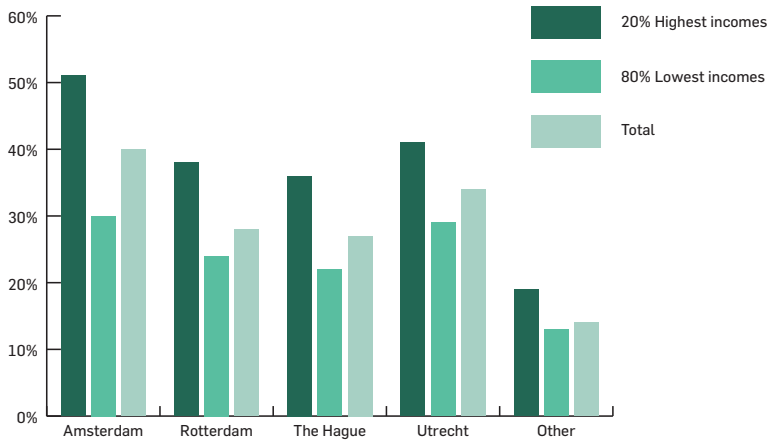
18 Disadvantages for families for typical housing in desired neighbourhoods in Amsterdam (own illustration)



19 Advantages for families for typical row housing in suburban neighbourhoods in the Netherlands (own illustration)

ACCOMMODATING VARIOUS FAMILIES

Forty percent of the young families in Amsterdam moved to another municipality within four years of the birth of their first child, often close to the city. Especially families with a high household income moved more often than average, as seen in the graph below. Around half of them exchanged the Amsterdam for another municipality. For the rest of the families this percentage is around 30 percent, a lot less but still significant. Families with a migration background leave the city less often after having a first child. Families without a migrant background who had a first child in Amsterdam in 2012, almost half had left for another municipality at the end of 2016. For families with Turkish and Moroccan ancestry, this percentage is much lower, respectively 15% and 12%.(CBS, 2017)



20 Couples who had their first child in 2012 and moved to another municpality before 2016, by household income (CBS)

In Amsterdam, there are currently 40.000 single parent families, around 17 percent of the total amount of families in Amsterdam (OIS Amsterdam, 2019). More and more children are born into single-parent families. In 2017, 9% of babies were born in such families. (Parool, 2018) In addition, both fathers and mothers often have to move after they get divorced. For them, it is then difficult to find suitable and affordable housing. (NRC, 2018)

As we have seen, the largest group of families that leaves the city have relatively high incomes and are non-migrant. However other groups, such as single-parent families, also have a significant size, and should therefore not be forgotten when designing housing for families.

VALUE OF FAMILIES

Why is it a problem that families are leaving the city? Because families are important for the city, their value benefits the rest of the citizens. There are multiple reasons for Amsterdam to actively try to preserve families in their city. This group has a large impact on the economy and liveability of the city, and hence affects many other inhabitants.

Families have the financial means to spend money in the city, and usually do so. Their economical power makes it easier for retail to be profitable. Therefore, the amount and variety of stores in the city increases. Furthermore, the future of other amenities becomes more assured when there are more families. Schools, theatres, cinemas, libraries and sports clubs are dependent on this group. Likewise, other users of the city can make use of these amenities. (Keesom, 2011)

21 Store with clothing for children in Amsterdam (Pinterest)

WHY FAMILIES?

ECONOMICAL POWER

SOCIAL STRUCTURE

LIVEABLE ENVIRONMENT

A CITY FOR FAMILIES

As families are of high value for Amsterdam and families want to stay in the city, the city and its dwellings should be better aligned with this target group. This section defines the needs of families on different scales and what Amsterdam can do to make the city more attractive and affordable for families.

WHAT DO FAMILIES NEED?

Living in an apartment is not considered unsuitable anymore, shows research from Karsten, Bekius and Dijkers (2011). Dwellings connected to the ground floor with a garden are not a strict requirement anymore This can be seen as a shift in the Dutch living ideal of the single-family home. Nevertheless, families still have certain wishes for their dwelling, building and the city.

DWELLING

For the dwelling, most important is the surface area of the dwelling, in particular the amount of rooms. Often the amount of bedrooms is not sufficient to give each child its own bedroom. The presence of garden is less important, however there is still a large desire for a usable outdoor space. (Karsten et al., 2011)

Another aspect is the flexibility of the dwelling, in order to optimally use the scarce space. With sliding doors contiguous areas could become one larger area. Furthermore, multiple activities could take place in one room. (Keesom, 2013)

BUILDING

Besides private outdoor space, families also desire common spaces for children to play and meet. For social cohesion, it helps when routines intersect and when children live in the same building. Using the same amenities allows for social contact. (Karsten, 2011)

In addition, more attention should be given in the building to the relation between dwelling and city, in other words the route between the front door of the building and the front door of the dwelling. For example, areas could be created along this route for children to play. (Keesom, 2013)

CITY/NEIGHBOURHOOD

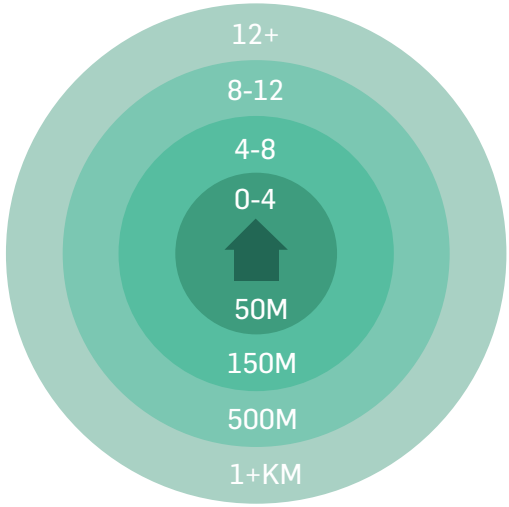
The neighbourhood is important for families, as their mobility lowers when having children. (Karsten, 2003)

They want their social contacts in close proximity. This also applies to functions, such as stores, the school and a park. Moreover, they aspire a safer environment with less traffic, better outdoor space and wider pavements to play on.

Another desire are family-directed and children-directed consumption spaces. Often residents (parents themselves) open new businesses related to family, because they see what is missing in the neighbourhood and use their social circle as customers. (Karsten, 2014)

RANGE OF ACTION

Children need to explore the world to become strong and independent adults. The environment has to give the possibility to do so. However, the distance in which it is safe for children to discover their surroundings, grows gradually according to their age. Babies and toddlers (0-4 yrs) need around 50 meters in and around the dwelling. For the younger children in primary school (4-8 yrs) this action radius rises to 150 meters. Older children in primary school (8-12 yrs) need to cover distances independently of up to 500 meters, for example to go to school or their sports club. Once children go to high school (12+ yrs), the range grows to multiple kilometres. (Keesom, 2013)



21 Radius of action in different life stages (own illustration)

A CITY FOR CHILDREN

Amsterdam does want to better cater families in the future. In their vision for the future, the ‘Structuurvisie 2040’, they advocate to better satisfy families in the city. They plead for a higher amount of dwellings with enough bedrooms and outdoor space. In addition, the city should be child-friendlier green spaces the possibility to play on the sidewalk, and separated bicycle lanes for more safety.

When planning amenities, the desires of families should be taken into consideration, such as schools, daycare and sports facilities. (Gemeente Amsterdam, 2011)

DESIRES OF FAMILIES

ENOUGH BEDROOMS

SPACE TO PLAY

AMENITIES NEARBY

SAFE ENVIRONMENT

SOCIAL COHESION

LOW TRAFFIC

AFFORDABLE FOR ALL

Dwellings should also be available and affordable for all income groups. The group with highest incomes are able to get a mortgage for a home that meets their desires. This also applies to the lowest incomes, as they are applicable for social housing with sufficient bedrooms. The possibilities to find sufficient housing for the group in between, mostly middle-class incomes, is a lot more problematic. Fortunately, Amsterdam can oblige developers to build enough affordable housing, by offering their ground for lower leasehold prices. Amsterdam aims to build new housing according to the 40-40-20 rule, which means 40% social housing, 40% medium prices and 20% high prices (Municipality of Amsterdam, 2019)

Besides this, the city of Amsterdam has the power to make obligations about the maximum income of households who rent the dwellings. With housing permits it is ensured that for example large dwellings will only be rented out to families for a period of 25 years. This gives the possibility to build suitable dwellings for families for multiple income groups, not only high income families who can afford the high square metre prices in Amsterdam. (Municipality of Amsterdam, 2017)

AN ALTERNATIVE BUILDING TYPE

Families want to stay in Amsterdam, but are not able to find suitable housing, and therefore move to row housing in surrounding neighbourhoods. In order to give families the opportunity to stay in the city, which benefits families as well as the city, an alternative solution is proposed: housing families in high-rise.

In this last section of the research it is argued why high-rise is a favourable option compared to the existing practice of housing families. After a brief history of the relationship of Amsterdam with high-rise, several arguments are given to justify this hypothesis. It is concluded that high-rise is beneficial for housing families, as well as for the city.

23 12-verdiepingenhuis in Plan Zuid (Beeldbank Amsterdam)

24 Children playing in front of Bijlmer flats (Beeldbank Amsterdam)

AMSTERDAM AND HIGH RISE

The invention of the elevator in the 19th century played an enormous role in the development in high-rise buildings around the world, as the necessity to climb many stairs disappeared. However, this did not mean that high buildings became the new standard in Amsterdam. The ‘Wolkenkrabber’ (skyscraper), was the first non-public high-rise building in Amsterdam (image 23). This 40-meter tall building was designed by J.F. Staal and was completed in 1932. Although 40 meters seems low, at the time a strong discussion was held about the question if people could be housed in such a high building.

25 Children playing in front of Zuid-As (Beeldbank Amsterdam)

Proponents of high-rise before the war supported the ideas of ‘het Nieuwe Bouwen’ and CIAM: modern buildings with of more light, air and space. In practice, however, high-rise buildings proved to be too expensive and tall buildings were only erected in prominent urban areas for rich citizens. Cheaper high-rise buildings became possible in the sixties due to serial construction and a light system for stairwell and galleries. The high-rise buildings in the post-war neighborhoods such as the ‘Westelijke Tuinsteden’ and ‘Buitenveldert’ are part of the spatial, urban composition, with building heights up to approximately 70 meters. However, due to the negative

association with the Bijlmer (image 23), high-rise buildings becomes a taboo in the seventies and eighties, the preference goes to smaller-scale development. Nevertheless, in the early nineties, high-rise buildings are being re-introduced. By densifying the city, the aim is to ensure that people stay in the city for as long as possible. This is in contrast to the policy that has been pursued for decades, whereby the establishment in growth centres outside the municipality was encouraged. High-rise buildings were also regarded as a symbol of a new kind of urbanity. Many companies that settled in Zuidoost or at Sloterdijk station and along the A10 use high-rise buildings as a "corporate image" for the manifestation of their presence. The building heights increase at the end of the nineties, mainly of offices around the public transport hubs such as the Zuid-As (image 24). (Gemeente Amsterdam, 2011)

BREAKING THE TABOO

In recent years, there is a fierce debate on building more residential high-rise towers as a solution for the current housing shortage in the Netherlands. Although this way of housing is relatively uncommon, several cities in the Netherlands are building or planning to build these. Opponents of high-rise still have the 'failed' examples in their mind and criticise this building for example because of the high costs per square meter and its blockage of sunlight and views (Volkskrant, 2018). On the other hand, high-rise has numerous benefits that outweigh the disadvantages. When done in the right way, high-rise will give multiple advantages and does not have to mean that existing qualities are lost.

ADVANTAGES FOR FAMILIES

In western countries, residential high-rise is often associated with the urban poor, as middle-class families preferred to live in the more spacious suburbs. In Eastern cities however, such as Hong Kong and Singapore, high-rise is the most common form of dwelling for all families, also for households with a higher income. Therefore buildings in these context give a better image of what the benefits of high-rise are, as higher quality buildings are also taken into account. Inhabitants of Hong Kong view this housing type as the most

26 High-rise in Hong Kong, most common housing type (own image)

ideal for young families. They acknowledge the convenience of living in high-rise and appreciate the views and the better air quality. Furthermore, the urban safety and the high standards of public transport are highly valued. (Karsten, 2015)

In addition to these benefits, which will also apply to high-rise in the western context, there are more reasons to build high-rise. Meyer & Zandvelt (2013) argue in their book 'High-rise and the sustainable city' why high-rise could be a sustainable solution for cities. It can increase the density, but only when built close to each other in clusters. Moreover, several high-rise buildings as an ensemble form the critical mass for a more intense urban life, the kind of lifestyle families in the city aspire.

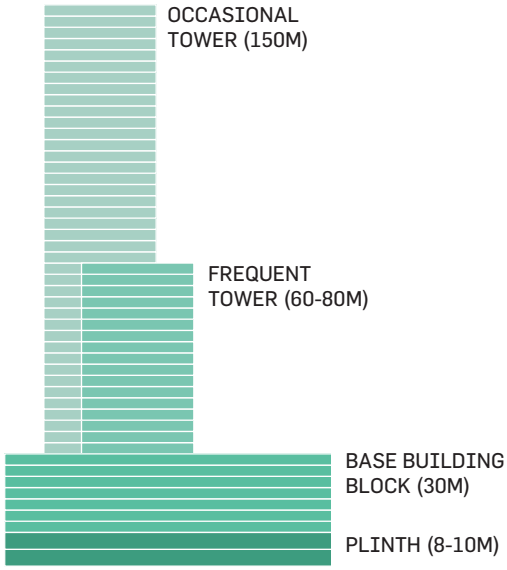
A final main reason why high-rise is favourable choice is the close proximities it gives to amenities, as well a desire for families. Subsequently this also makes the city more sustainable, as it becomes more convenient to use public transport for commuting.

ADVANTAGES FOR THE CITY

Amsterdam is not against high-rise. In their vision about the future of the city, the 'Structuurvisie 2040', they state that intensification of ground use is necessary. High-rise is seen as a suitable way to accomplish this. Depending on its position, it can contribute to the quality of the city as a metropolis. (Gemeente Amsterdam, 2011)

High-rise gives the opportunity to house a lot of residents on a relatively small piece of land. Minervahaven is located inside the ring road A10, the most wanted location in the city. These square kilometres are among the

most valuable in the whole country. With high-rise the costs of the land can be divided between more dwellings. Free market houses can be sold for relatively high selling prices, which makes high-rise on this location profitable, even when taking into account the expensive safety measures needed for this typology. In addition, the locations where high-rise is possible in Amsterdam are scarce. A large part of this area is built with historically valuable buildings which will not be demolished. Therefore, there is a strong distinction between areas where high-rise is stimulated and areas where high-rise is used with great caution. High-rise is stimulated alongside the river flanks of 't IJ, the Minervahaven is part of this area. In this area almost no historical buildings are present, hence no disturbance to the historical image of the city will occur. (Gemeente Amsterdam, 2011)



27 Building height Havenstad (own illustration)

28 Impression Haven-Stad (Gemeente Amsterdam)

The high-rise typology is consistent with the vision of the municipality for Haven-Stad and Minervahaven, as seen on the image above. The building typology the municipality requests is illustrated in figure 27. The base building block is 30 meters high, with a plinth on the bottom two layers. On top of this building blocks, frequent towers between 60 and 80 meters are planned and occasionally a tower of approximately will rise.

Finally, the municipality is willing to build a metro line across Minervahaven, provided that enough residents work and live in this area. Therefore, the high density makes a metro station possible, hence a better connectivity for its inhabitants.

WHY HIGH-RISE?

LOW HISTORICAL VALUE

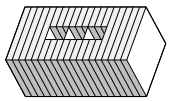
VISION MUNICIPALITY

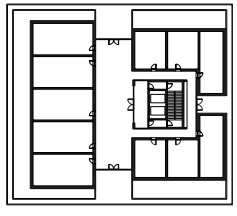
VALUABLE LAND

WALKABILITY

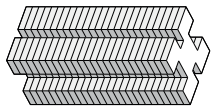
PLAN ANALYSIS

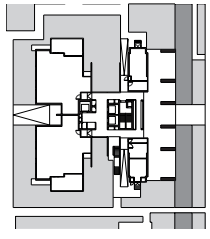
MAASBODE ROTTERDAM

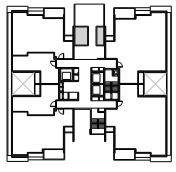




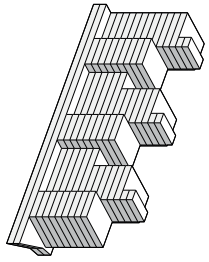
KENT VALE SINGAPORE

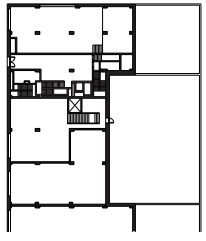


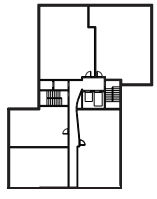




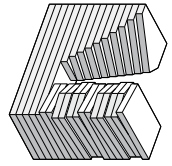
NOU BARRIS BARCELONA

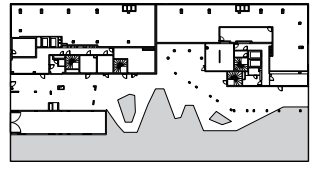


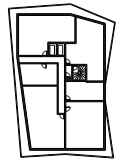


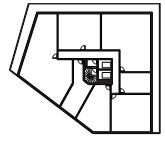


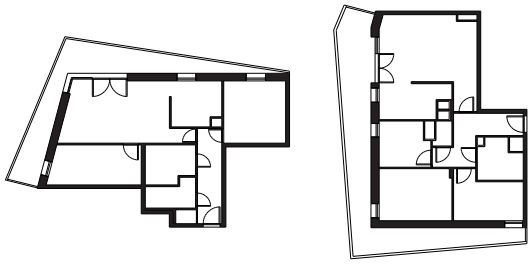
BATIMENT HOME PARIS

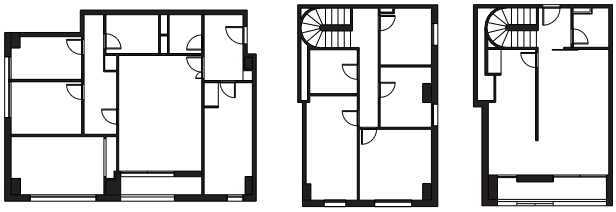


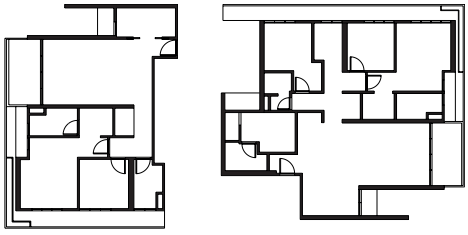


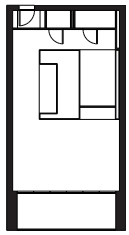


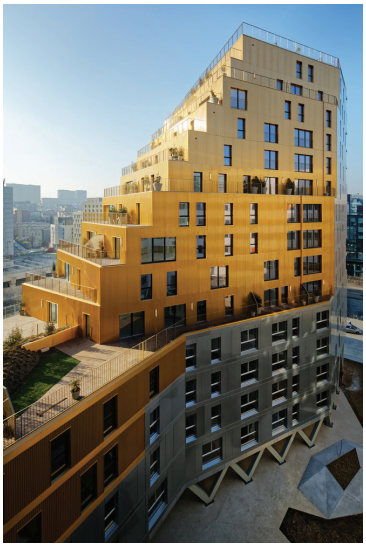








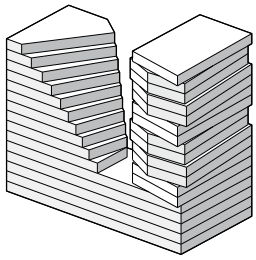




BATIMENT HOME

LOCATION PARIS, FRANCE
ARCHITECT COMTE & VOLLENWEIDER, HAMONIC + MASSON & ASSOCIÉS
YEAR 2015

14-17 STORIES
188 UNITS

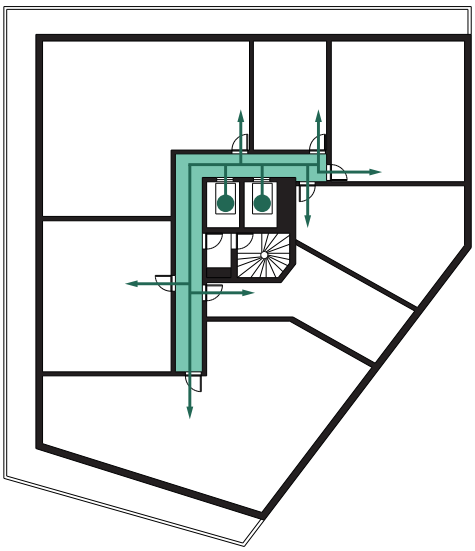


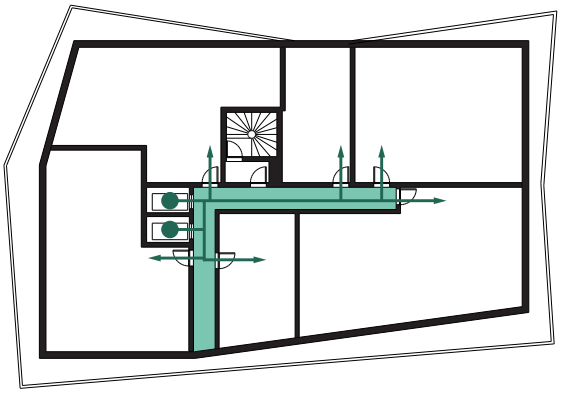
Bâtiment Home is the first tall residential building in Paris since the 1970s, as the city was asking for more vertical housing. Out of the 188 units, 96 are privately owned and 92 are intended for social housing. Children can play on the private terraces that can be supervised from inside the dwelling. Other outdoor spaces include a shared space on top of the 4-storey base and a landscaped open space on the ground floor. Nearly 3 out of 4 apartments contain at least two bedrooms, large enough to house families. (City of Toronto, 2019)

SITUATION

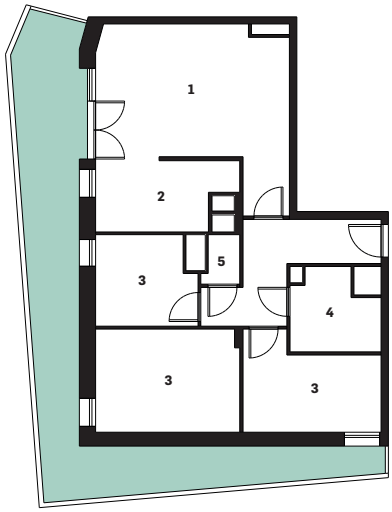
GROUND FLOOR

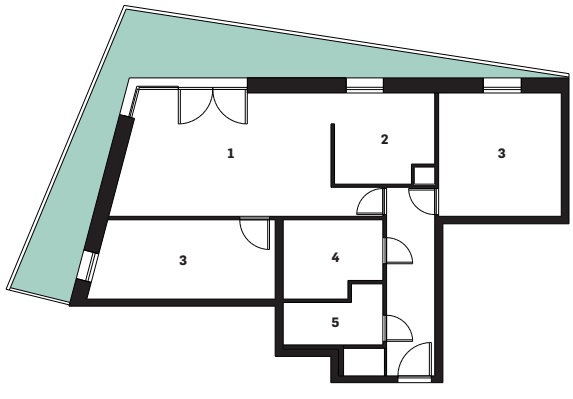
FLOOR PLAN





UNIT PLAN 1:200



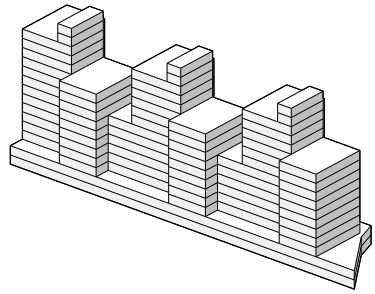


1 LIVING ROOM
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 TOILET

NOU BARRIS

LOCATION BARCELONA, SPAIN
ARCHITECT JOAN PASCUAL,
RAMON AUSIÓ ARQUITECTES
YEAR:1998-2002

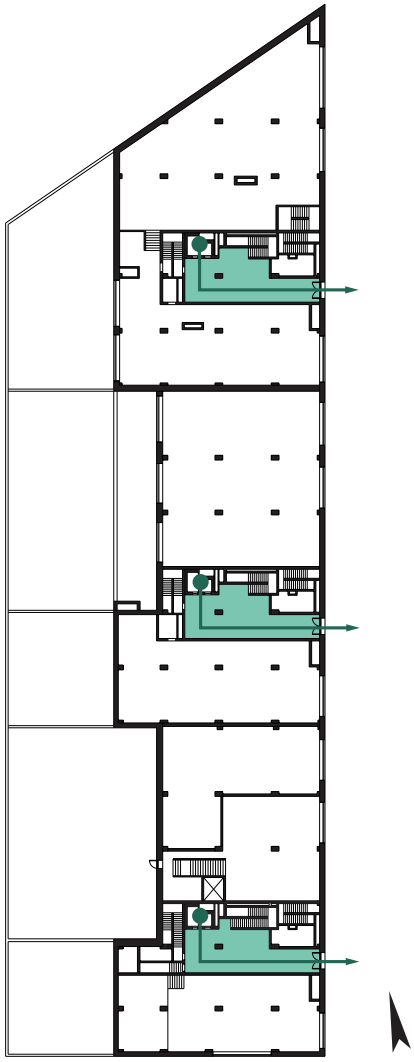
8-15 STORIES
160 UNITS

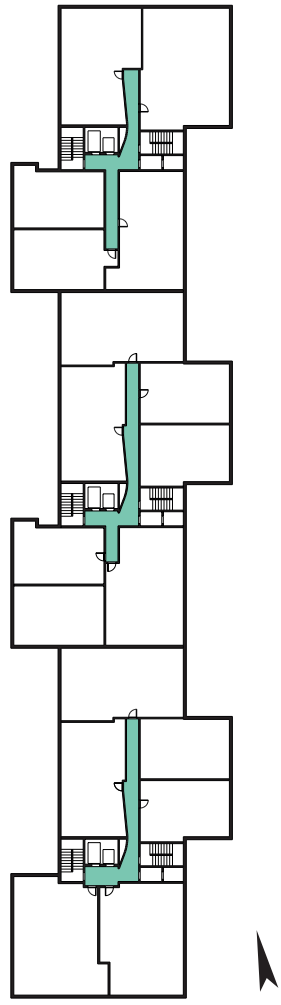


This housing complex is located in the northern part of Barcelona and was completed in 2002. Direct interpretation of the planning regulations would have resulted in a massive building mass with narrow ventilation shafts. Instead, the building consists of several volumes with different heights, allowing for more facade area for the apartments. Up to six units per floor are served by each elevator. (Pasqual & Ausio, 2019)

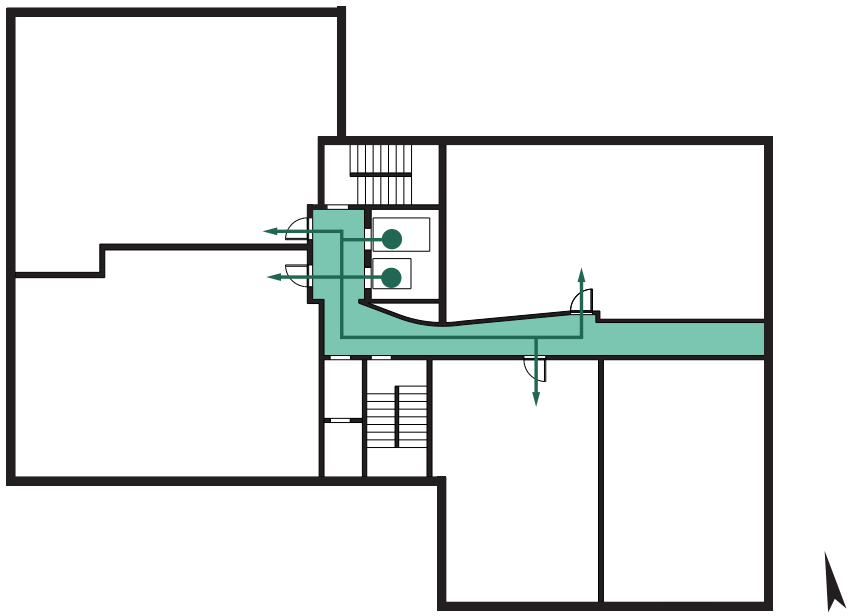
SITUATION

GROUND FLOOR

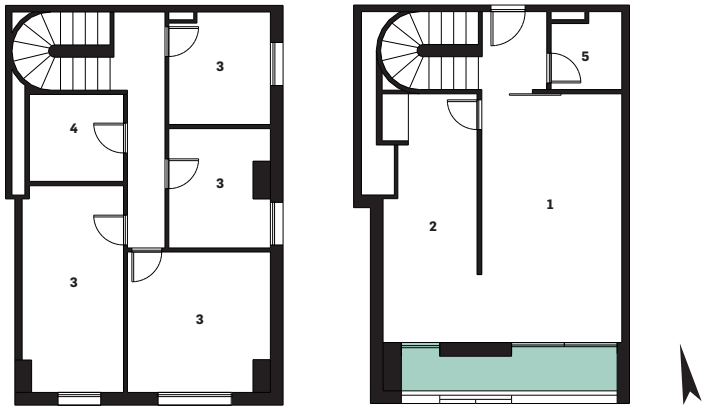




FLOOR PLAN



UNIT PLAN 1:200

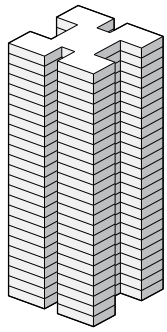


1 LIVING ROOM
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 TOILET

KENT VALE

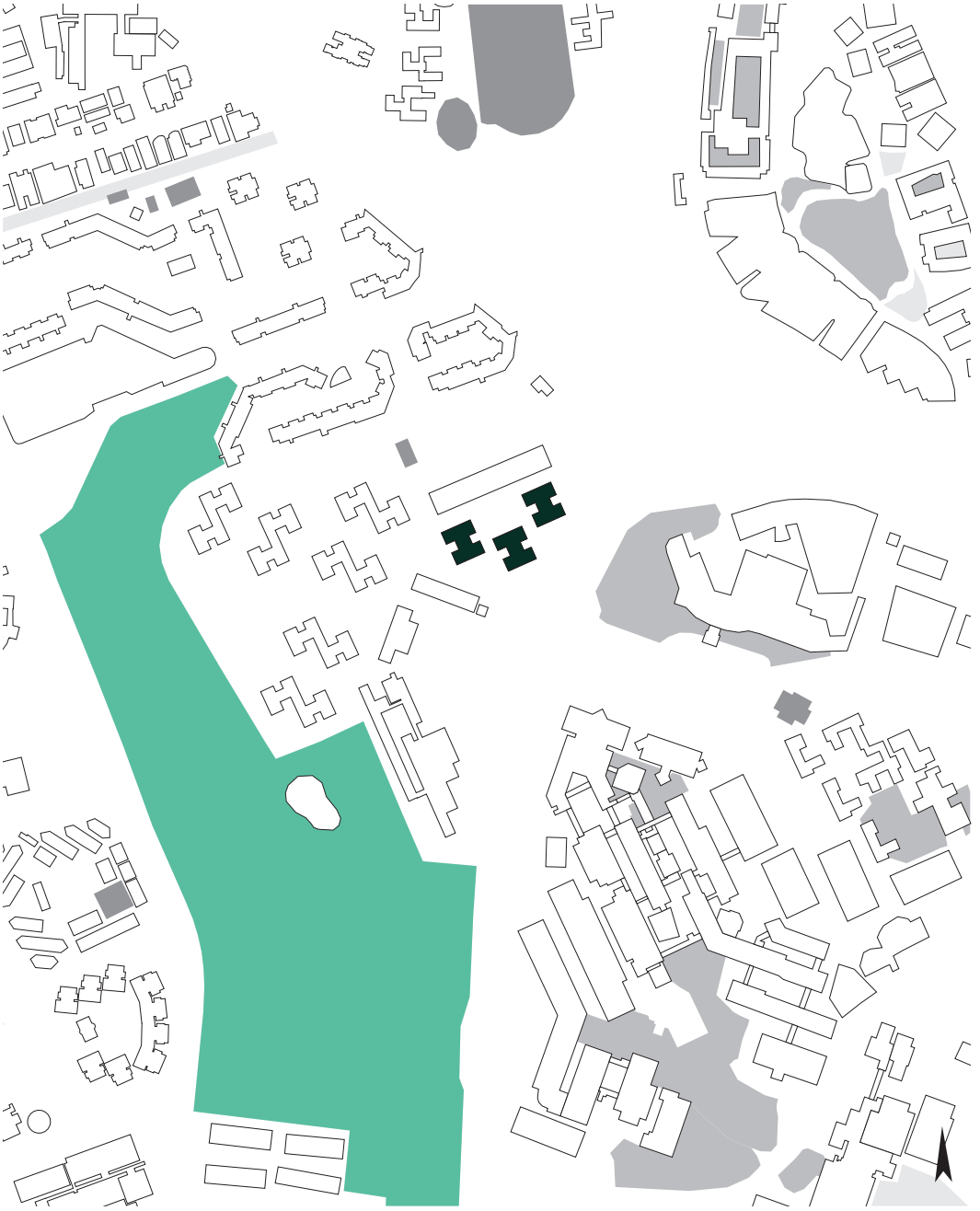
LOCATION SINGAPORE
ARCHITECT MKPL ARCHITECTS
YEAR 2012

25 STORIES
150 UNITS

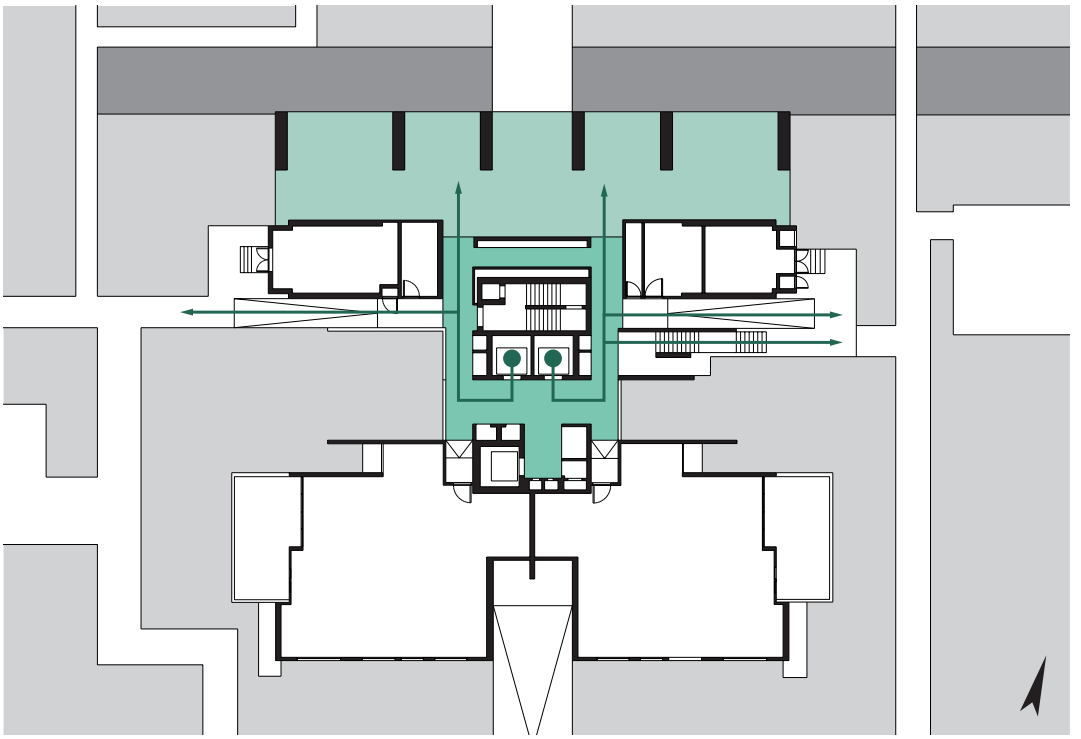


Kent Vale in Singapore was built in 2015 and houses faculty members of the university and their families. The 1-, 2- and 3-bedroom apartments allow housing of different household sizes. Private and public outdoor spaces can be used by children to play. The apartments contains a storage room, which is useful for families with children. In the 3 bedroom unit a flexible space is available which can be used for multiple purposes. (City of Toronto, 2019)

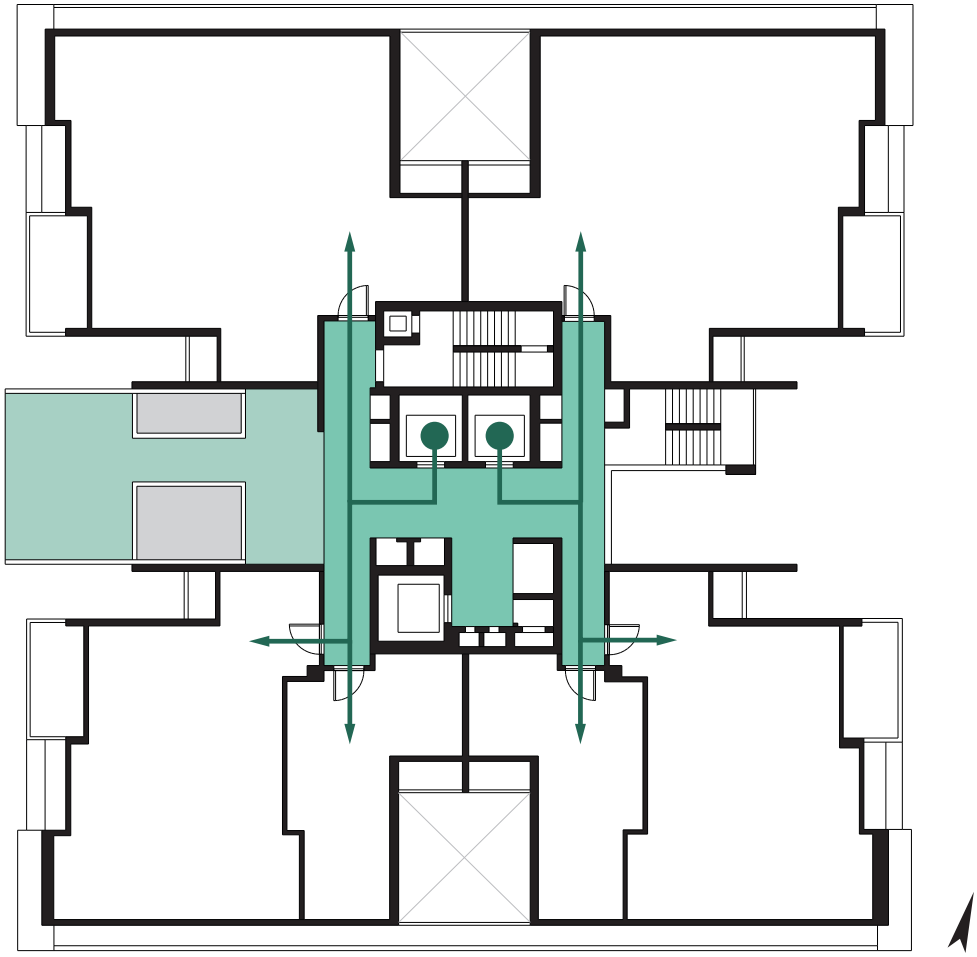
SITUATION



GROUND FLOOR



FLOOR PLAN



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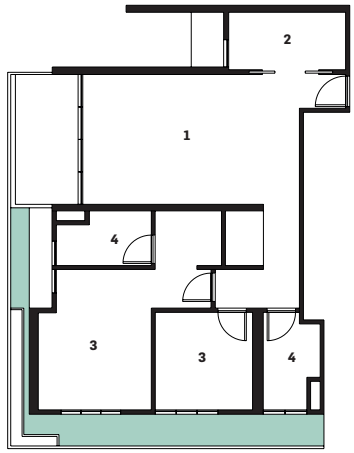
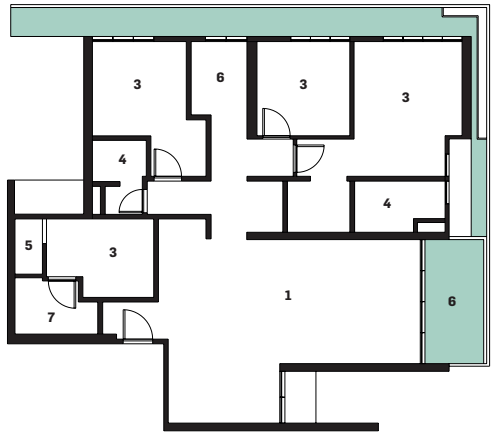


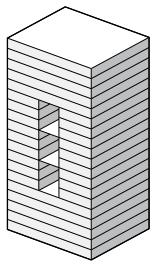


1 LIVING ROOM
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 TOILET
6 STUDY ROOM
7 UTILITY ROOM

MAASBODE

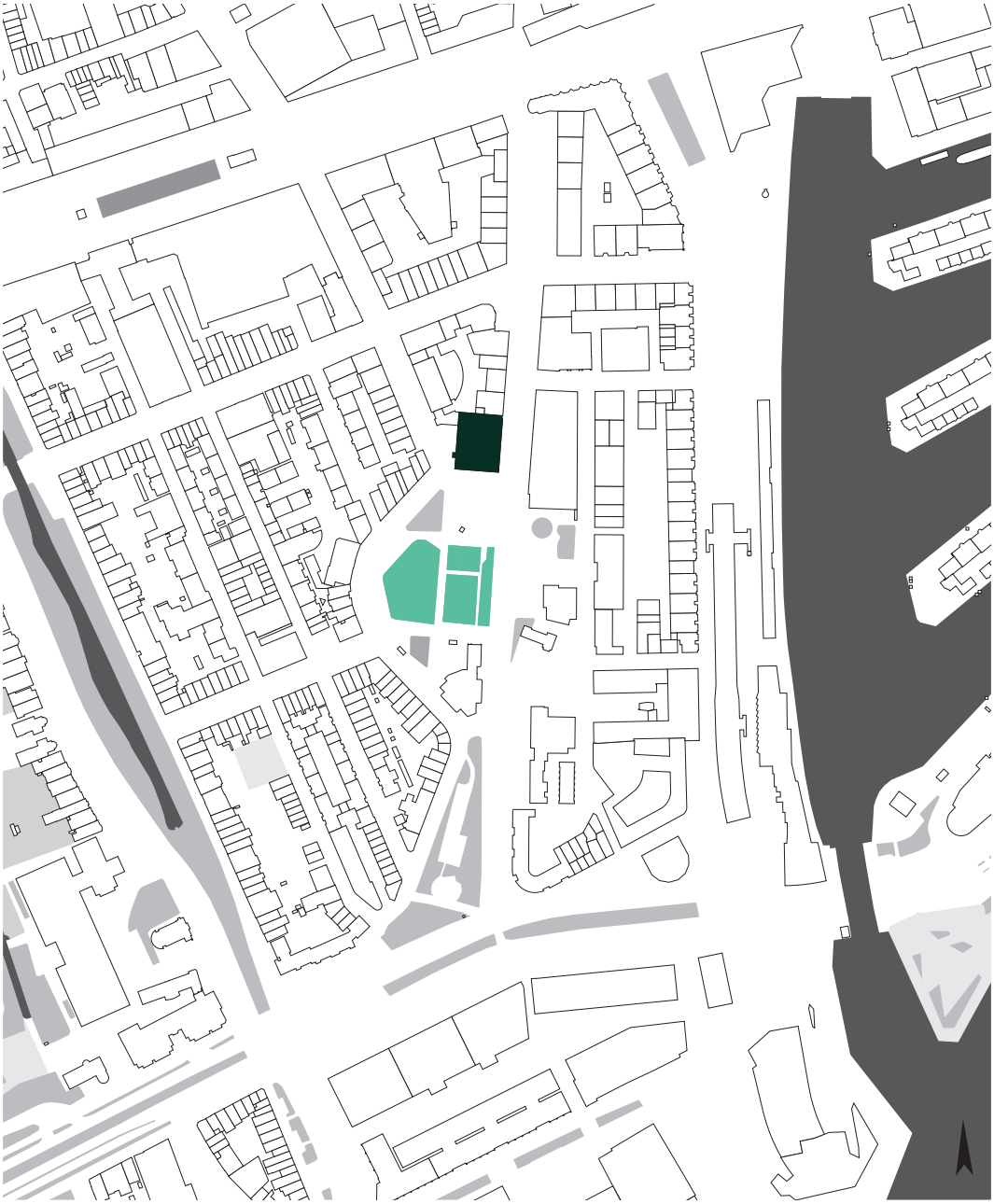
LOCATION ROTTERDAM, NETHERLANDS
ARCHITECT VAN BERGEN KOLPA
YEAR 2019 (UNDER CONSTRUCTION)

19 STORIES
85 UNITS

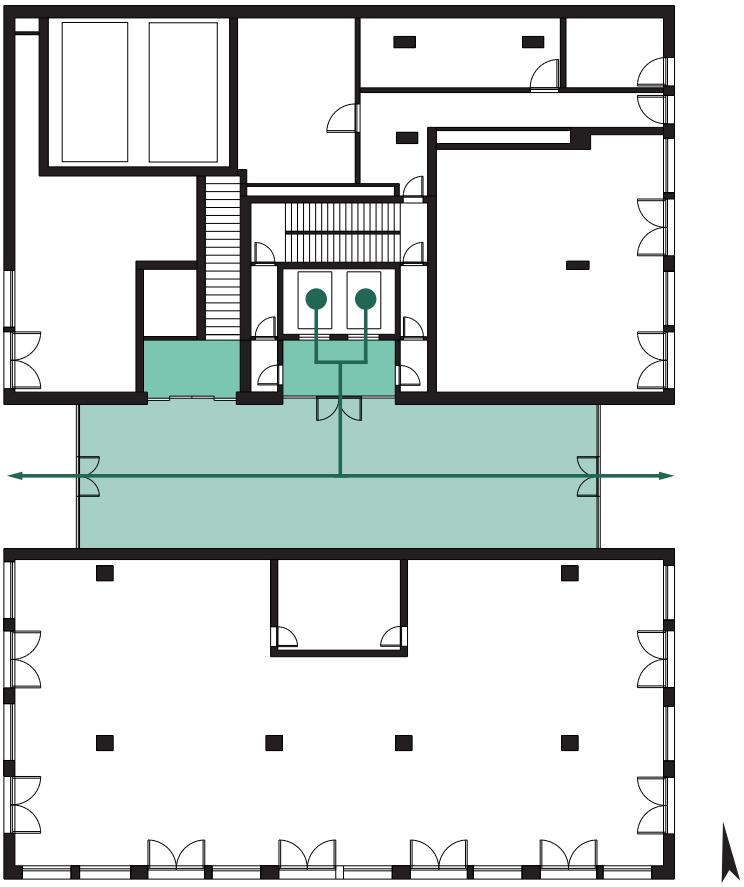


De Maasbode in the centre of Rotterdam is currently under construction and consists of stacked inner “streets” in combination with apartment floors. Three-storey family homes will be built in the middle of the tower, similar to single-family homes in regular neighbourhoods in the Netherlands. Each street consists of 13 homes in total and is approximately 9 meters high and 25 meters long. On these streets neighbours can meet each other and children can play safely.

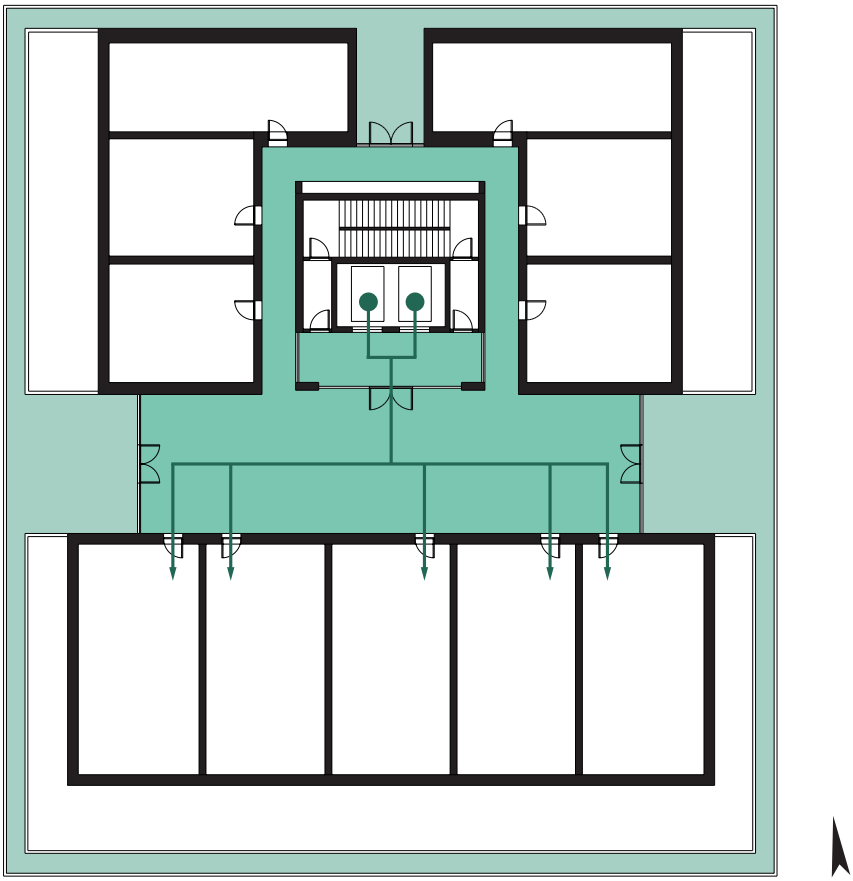
SITUATION



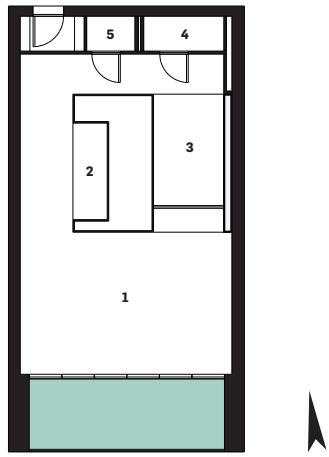
GROUND FLOOR



FLOOR PLAN



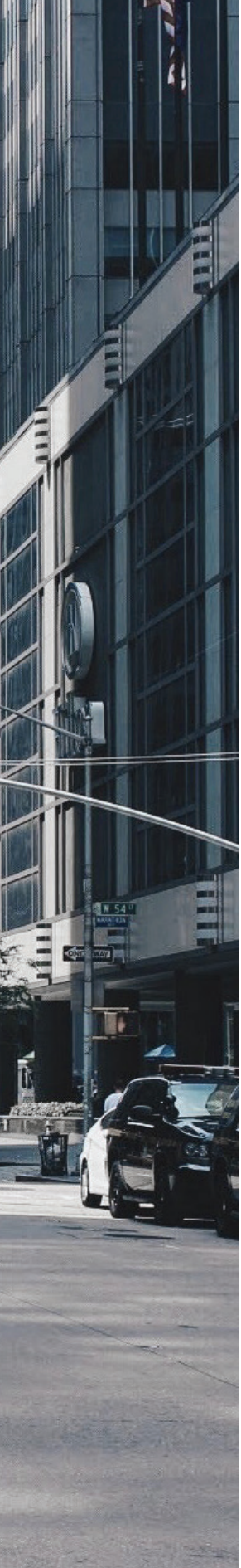
UNIT PLAN 1:200



1 LIVING ROOM
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 TOILET

DESIGN PRINCIPLES


RADIO CIT



DESIGN QUESTIONS

HOW CAN FAMILIES BE HOUSED IN A HIGH-RISE BUILDING IN AMSTERDAM?

HOW TO CREATE A SUITABLE ENVIRONMENT FOR CHILDREN IN A DENSE AND ACTIVE CITY?

HOW CAN **MULTIPLE TYPOLOGIES** FOR FAMILIES BE INCORPORATED IN THE BUILDING?

HOW TO DESIGN **OUTDOOR SPACE** SUITABLE FOR CHILDREN?

HOW TO CAN SPACES BE **SHARED/FLEXIBLE/MULTIFUNCTIONAL**?

HOW CAN THE BUILDING **ADJUST** TO AN UNKNOWN FUTURE?

HOW CAN THE DWELLING BE **CONNECTED** TO THE CITY?

HOW CAN THE BUILDING AND DWELLING ACCOMMODATE DIFFERENT **LIFE STAGES** (0-4, 4-8, 8-12, 12-18)

HOW CAN THE BUILDING ACCOMMODATE A **VARIETY IN DWELLINGS** FOR DIFFERENT INCOME GROUPS AND HOUSEHOLD SIZES?

HOW CAN THE BUILDING BE **SUSTAINABLE** (SOCIAL/ECONOMIC/ENVIRONMENTAL)?

MAIN PRINCIPLES

HIGH DENSITY

In the design a balance should be found between quantity (the amount of dwellings) and quality (views, sunlight, privacy etc.). The aim is to accommodate at least 150 dwellings. These will have a large variety in size (60-200 m^2), with most of them having at least 3 bedrooms.

TYPOLOGY FOR FAMILIES

The building has to consist of typologies suitable for families. Optimal floor plans should be designed to find a balance between affordability and desired sizes of spaces. The dwellings should contain enough bedrooms to accommodate parents and their children.

ADAPTABLE & FLEXIBLE

The future of the city is unknown, therefore the building should be able to adapt to an unknown future. Especially commercial spaces should be able to accommodate diverse functions.

MULTIFUNCTIONALITY

The space is scarce and valuable in this part of the city. If possible, spaces should be transformable or multifunctional. Different functions could share a space according to the time of the day or week. This applies to the dwelling, as well as for public space in the building block.

VARIETY IN FLOOR PLANS

To cater for different household sizes and income groups, a range of floor plans should be offered, varying in size. These should be mixed to subsequently create mixed smaller “neighbourhoods” inside the building block. A portion will be dedicated to single parents.

CONNECTION TO CITY

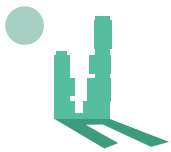
In most high rise buildings the transition between the private dwelling and the public city is relatively abrupt. To create a building suitable for children, the connection from the dwelling and the city should be more gradual, with child-friendly spaces

VIEWS

The situation of the plot and the high-rise typology allow for desirable views. The water on two sides allow for wide views, even on the lower floors. As much dwellings as possible should get a view towards the water and the city, preferably from the living room.

PRIVACY

With the high density typology, a high amount of dwellings are situated in close proximity to each other. Therefore attention need to be paid the placement and orientation of the dwellings to ensure enough privacy for the residents.



NATURAL (SUN)LIGHT

The high density high-rise environment will cause high amounts of shadows. The dwellings should be designed to allow for enough natural (sun)light. Communal outdoor spaces should receive direct sunlight at certain moments of the day, preferably in the afternoon and evening.

OUTDOOR SPACE

Children should be able to gradually explore the environment, according to the action radius in different life stages. Therefore outdoor spaces in different distances from the dwelling have to be present. Space should be allocated to wide pavements for children to play on.

(SEMI)PUBLIC FUNCTIONS

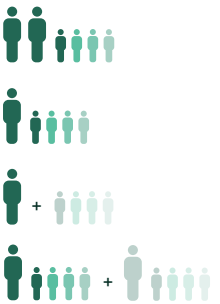
The building should allow for a diversity in functions other than housing, which fits the desired lively urban environment. Proposed functions inside the building are a primary school to bring more social cohesion and commercial spaces to allow for small family-oriented businesses.

SAFETY

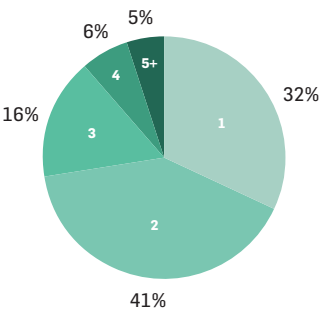
All spaces should be safe for children. Children need to play in a safe environment without busy traffic. The fire safety, an important factor influencing the design of high-rise, should comply with regulations.


Schoenreparatie
Sleutelservi
de Kombuis

TARGET GROUP



The target group consists of **different types of families**, with 1 to 4+ children. Both nuclear families and modern families (single-parent and blended families) are included

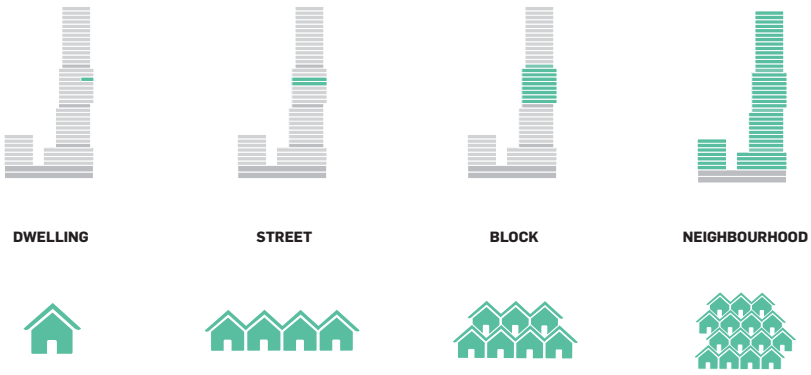


Source: CBS

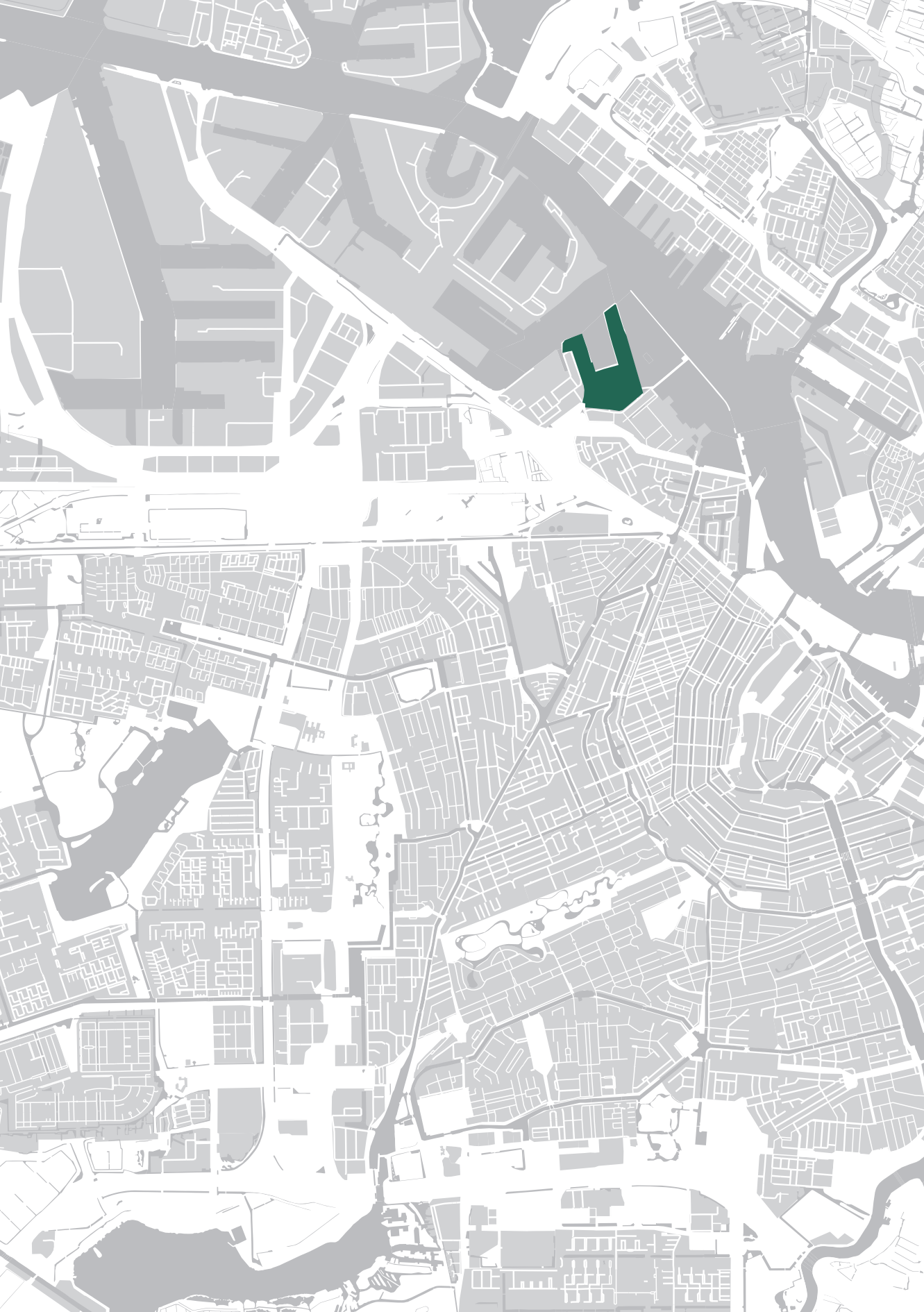
Circa 90% of the mothers in Amsterdam have **one, two or three children**. Most mothers have 2 children (41%), followed by 1 child (32%) and 3 children (16%). 11% has 4 children or more

CONCEPT

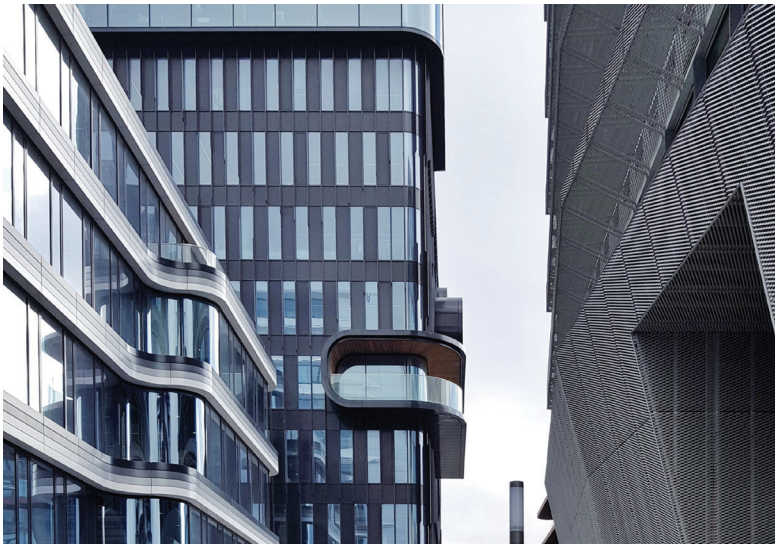
‘VERTICAL NEIGHBOURHOOD’



SITE



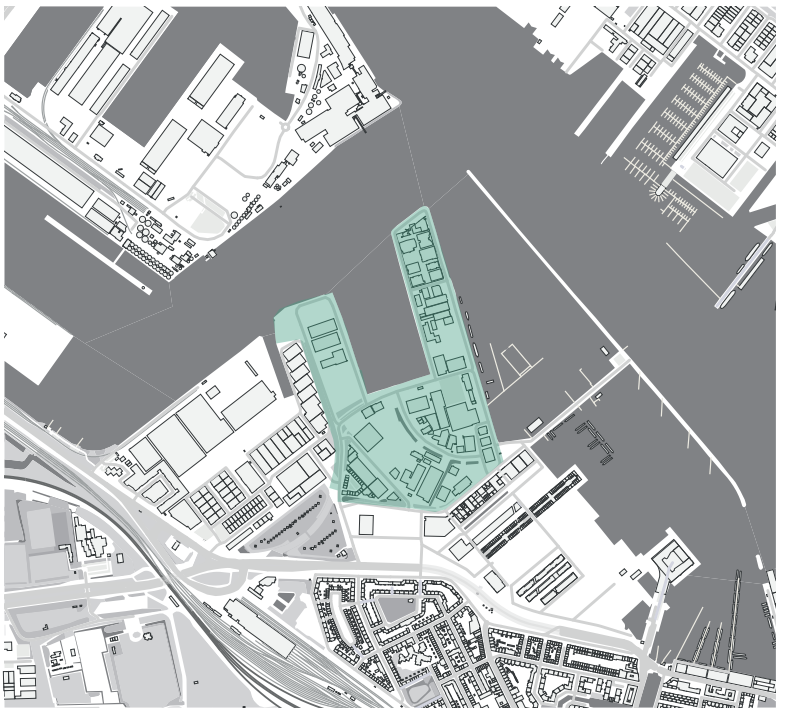
The location of the project is the Minervahaven area in Amsterdam, in the northeast side of the city. This site is a former industrial area which served mainly for storage of wood. The port gradually has moved further west, and most of the industrial functions have disappeared. Nowadays the site is being redeveloped into other functions, such as offices for clothing companies. Besides this, a theatre and a hotel are situated on the plot. The buildings have a relatively modern appearance, a large contrast with buildings in the historical part of the city.




RENTAL
& SALES


1XR 46950
van HAPPEN Containers .nl

Due to its location near the centre, inside the ring road of Amsterdam, it is potentially a highly desired area for people to live. The plot on the east of Minervahaven, Houthavens, has recently been redeveloped into a neighbourhood with mostly housing. The demand of housing in this area seems high, as asking prices are substantially above the average in the Netherlands. Below the area is indicated for which a master plan is developed.



BUILDINGS

The site used to house mostly industrial buildings, but is now redeveloped with high-end office buildings. Adjacent to Minervahaven is the Spaarndammerbuurt

ROADS

Minervahaven is located nearby the ring road A10. However, the plot is only connected to the south, and therefore the traffic is currently relatively low.

WATER

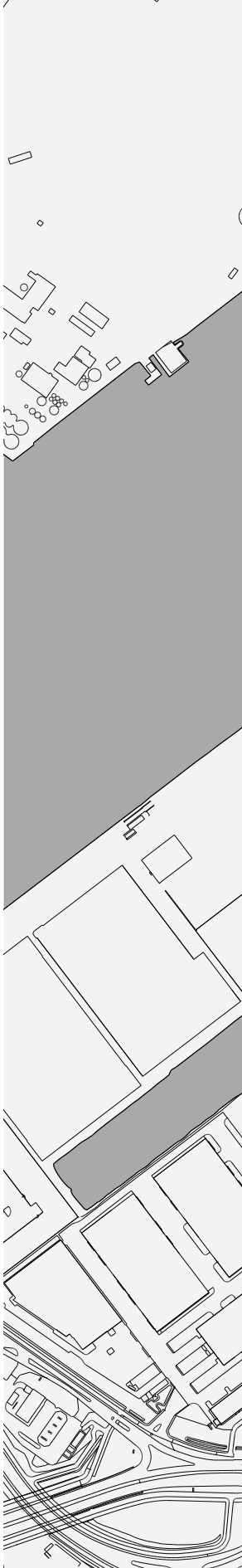
One of the major aspects of this site is the presence of the water (‘t IJ), connecting the site to the canals of Amsterdam. The tides do not influence the water levels.

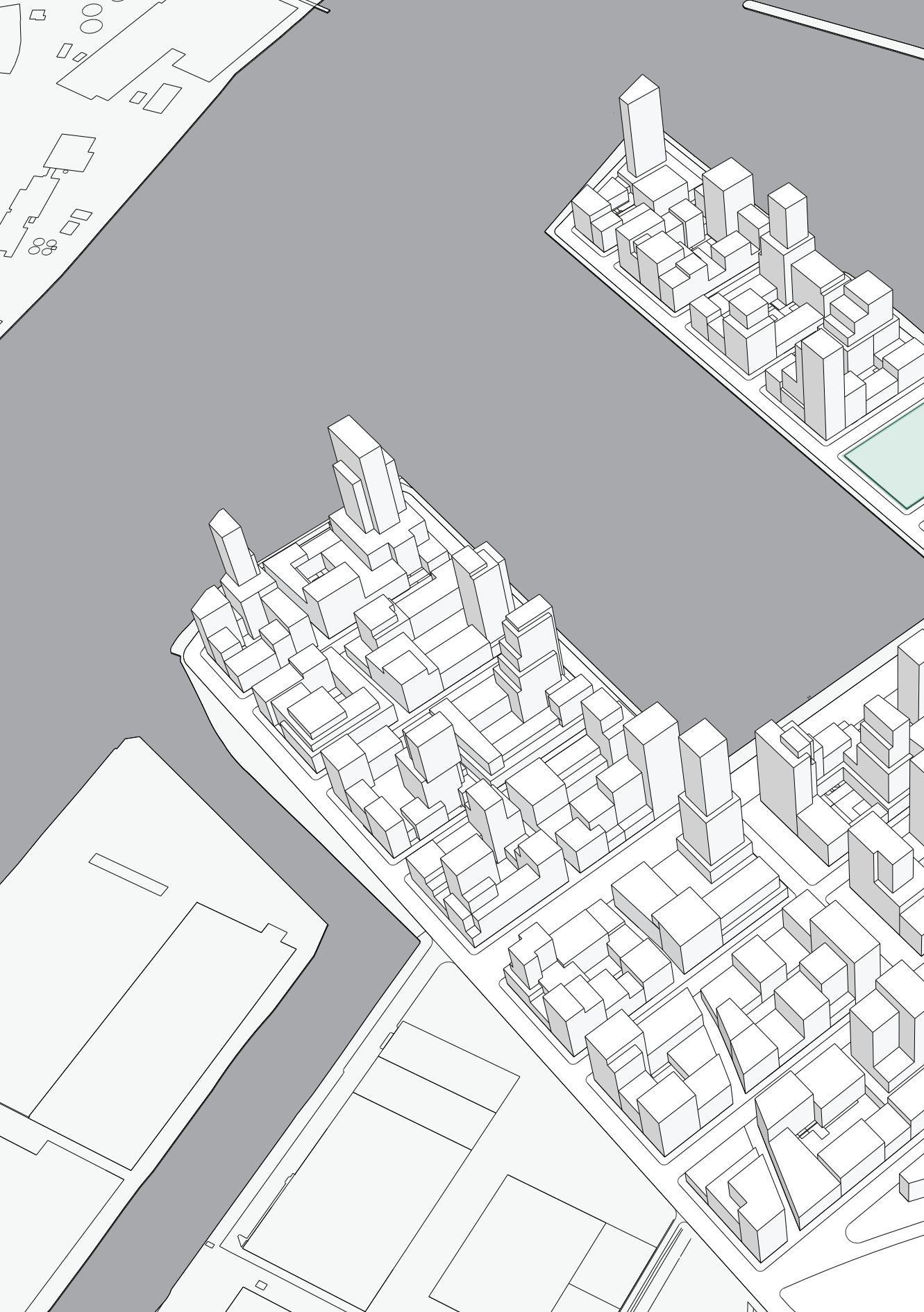
GREEN

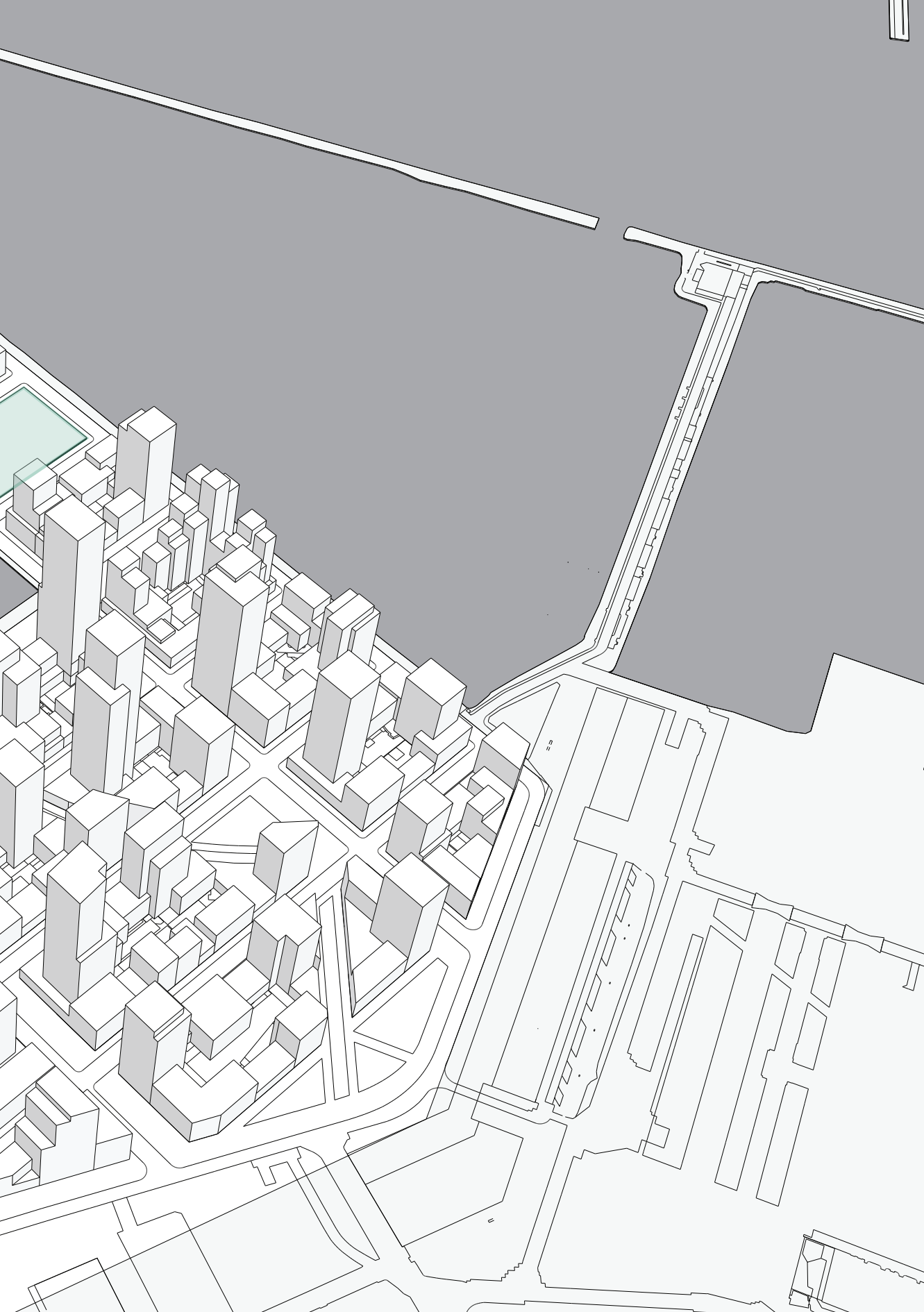
The site is in close proximity to the Westerpark. In the future, a park is planned on the east side of the plot alongside the pier.

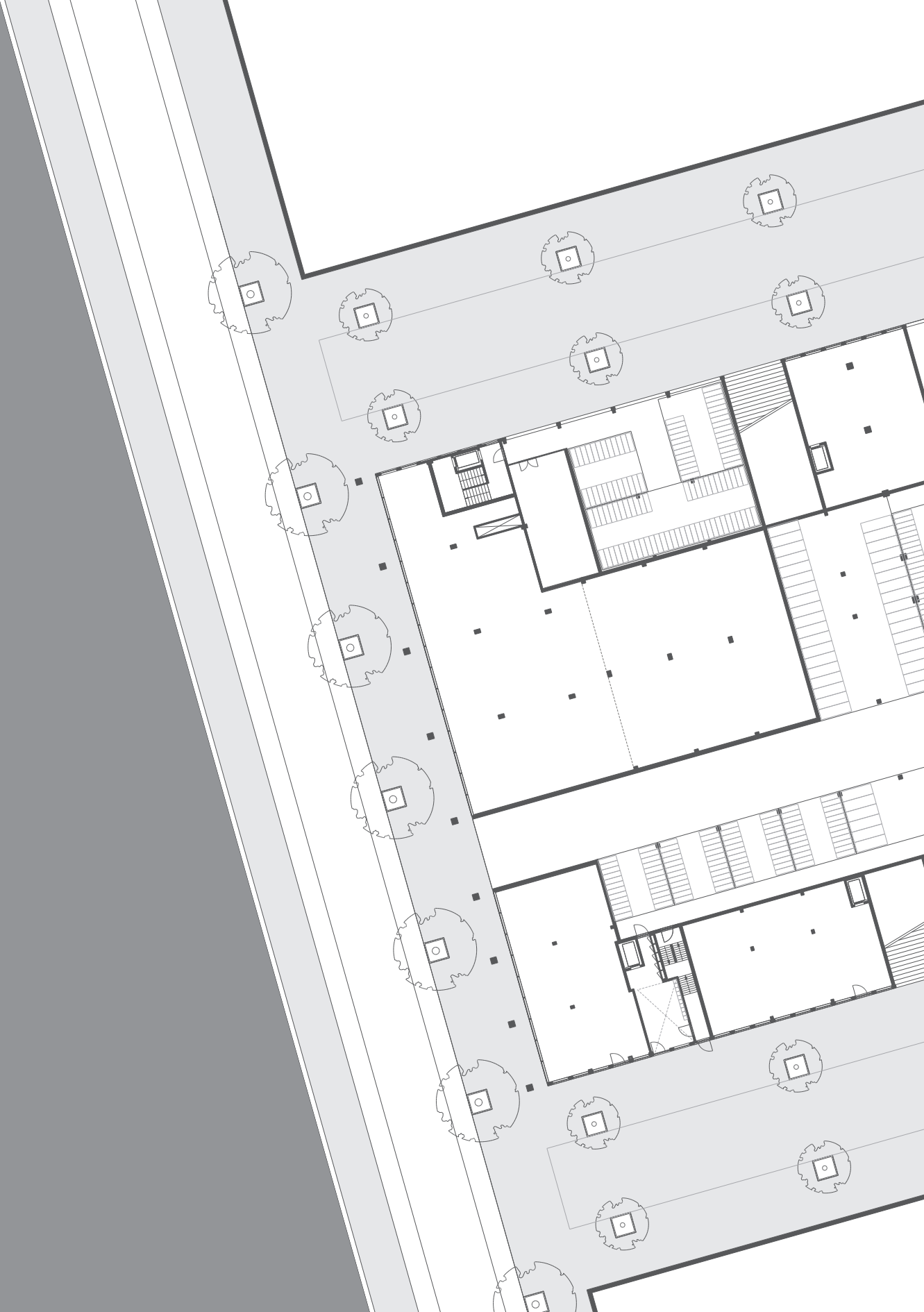
During the first four weeks four different master plans were developed for the Minervahaven. I was part of the group which designed a high density low rise typology for the site. However, this typology was not suitable for my topic, families in high-rise. Therefore, the plan with a high density high-rise typology, “Manhattan aan ‘t IJ”, was chosen. This plan is a superimpose of Manhattan. An equal grid system is adopted with comparable building blocks. This will create an active urban environment.

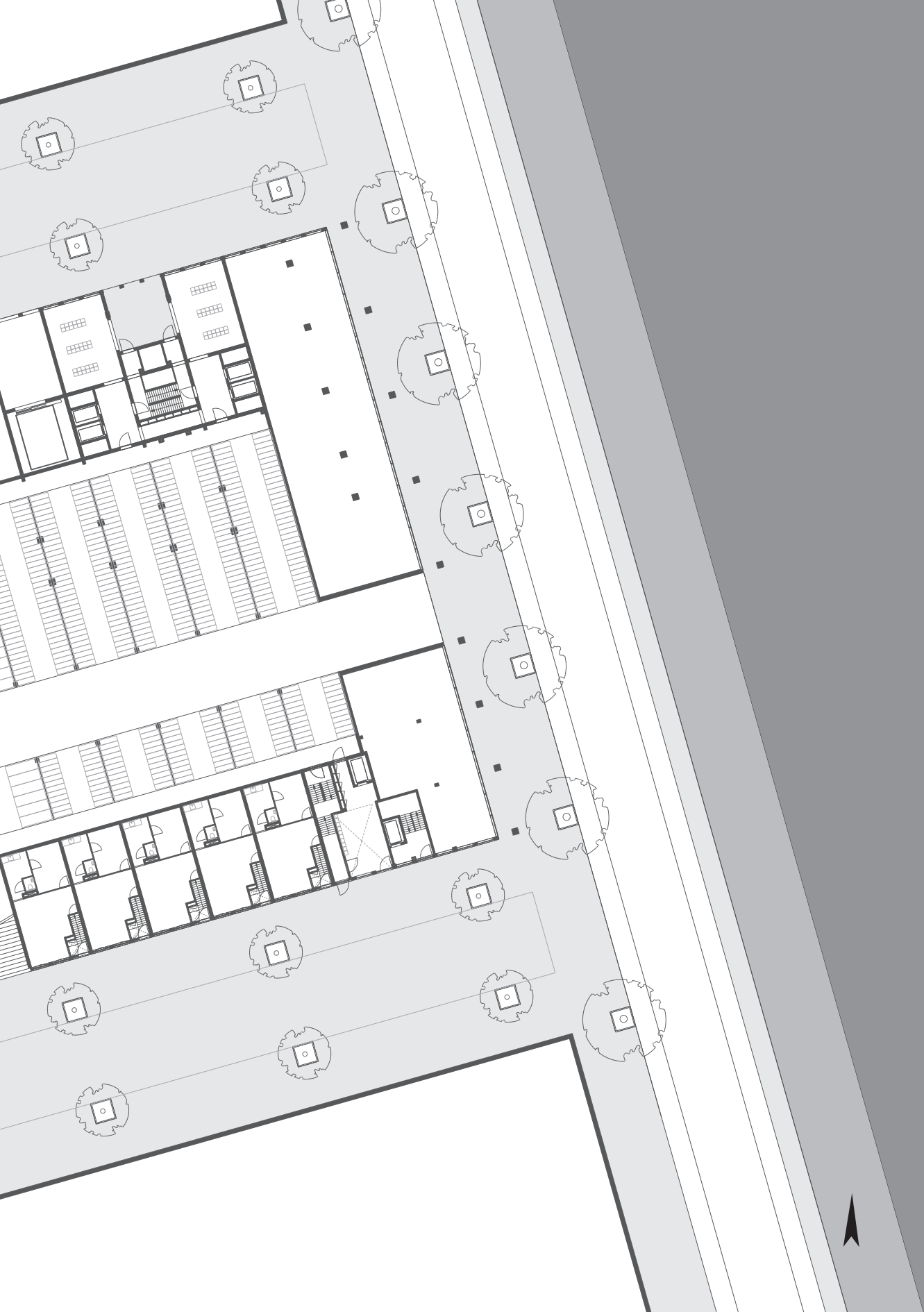
The selected plot is situated on the right pier of the site. The dimensions are 60 by 90 metres. The plot is suitable for housing, as it has views towards the water on two sides. In addition, this also means there is less shadow from adjacent buildings. Along the longer side of the plot, the streets have a low amount of traffic, as they do not connect to other streets. Nearby this plot a new park is planned, the so-called “Haparandapark”, which is of great value for the target group.



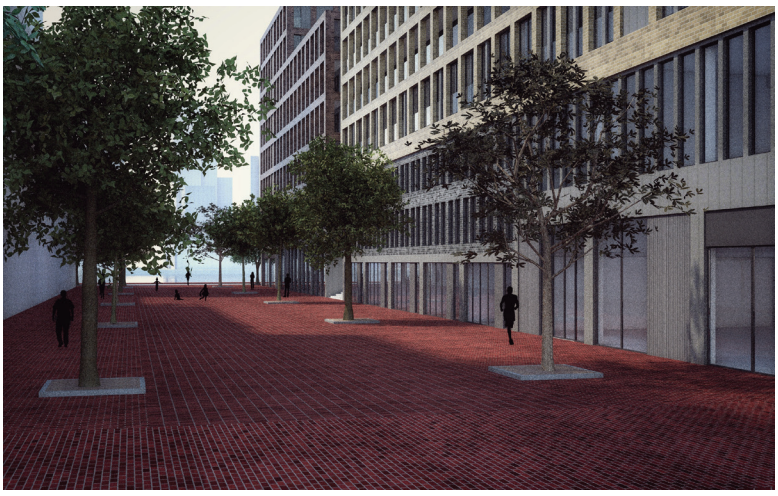






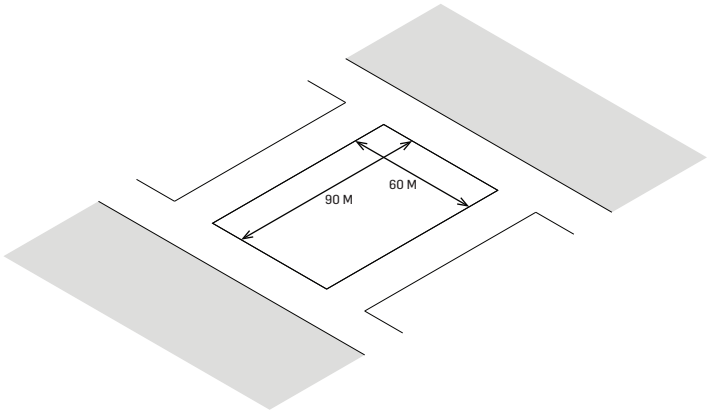


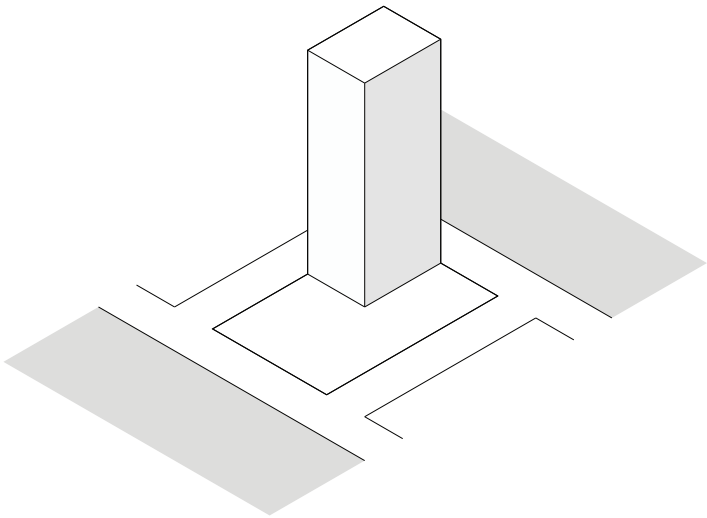

7
6
7



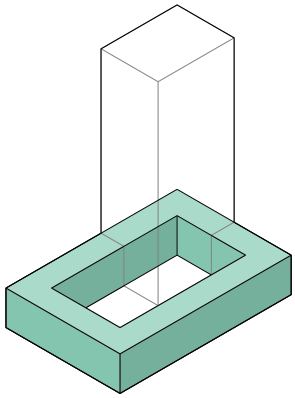
MASS

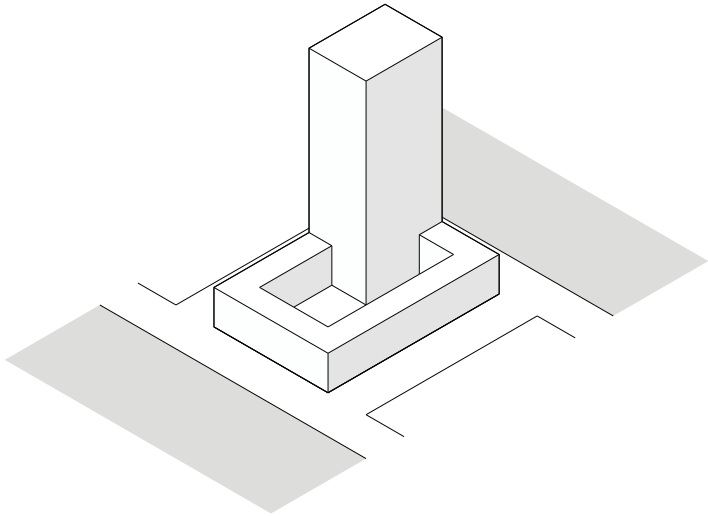
The chosen plot has a size of 60 metres wide and 90 metres long. The starting point of the building mass is a tower, situated on the north side, to maintain sunlight in the other part of the plot.



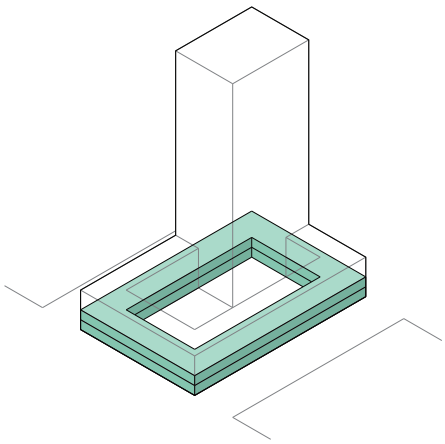


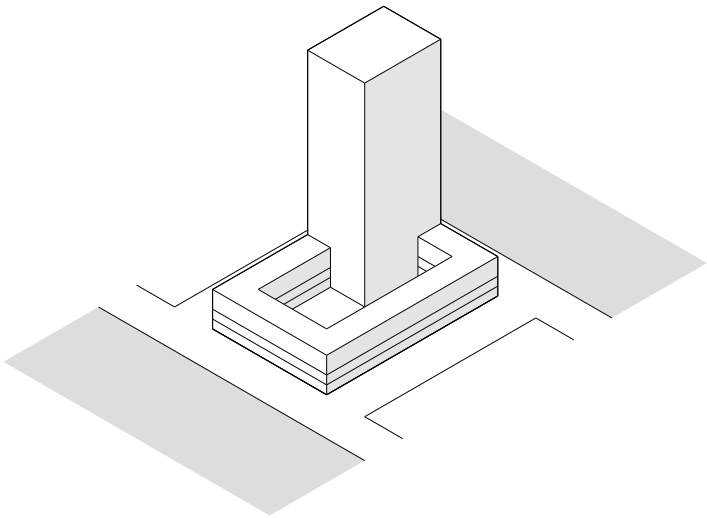
The lower part of the block uses the principle of an enclosed building block, a common typology in the central part of Amsterdam, such as the neighbouring Haarlemmerbuurt.



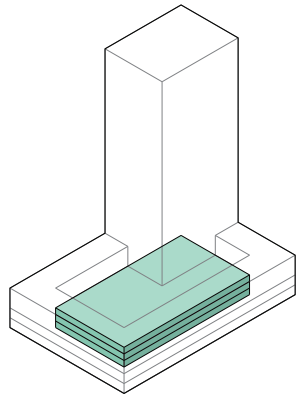


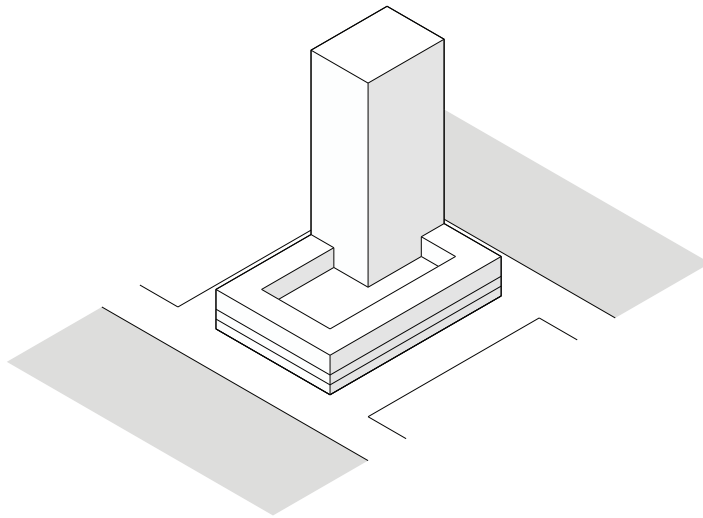
The first two layers are reserved for mixed functions, to generate activity during different parts of the day and week. Blind facades are avoided as much as possible



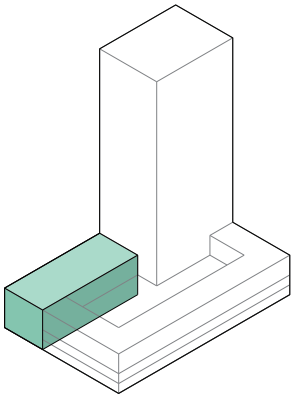


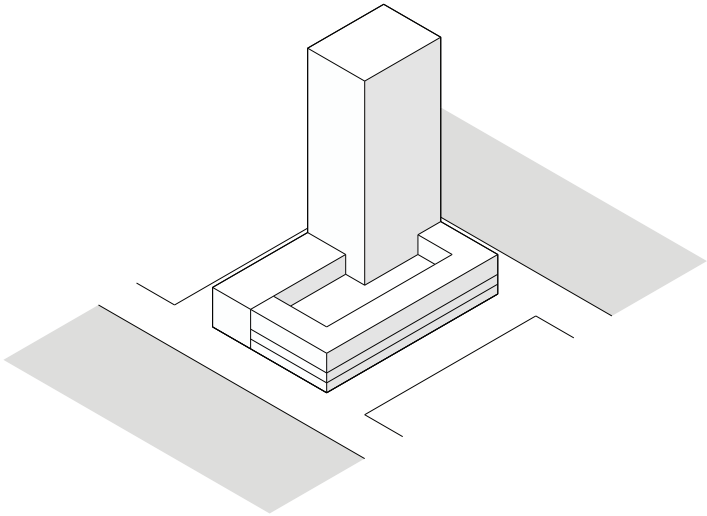
Inside the building block, space is available for necessary amenities with low daylight needs, such as parking.



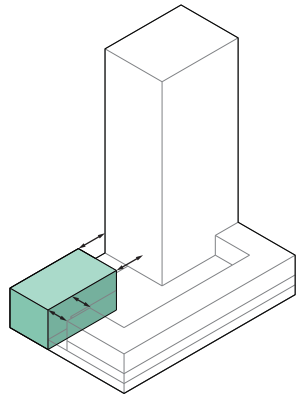


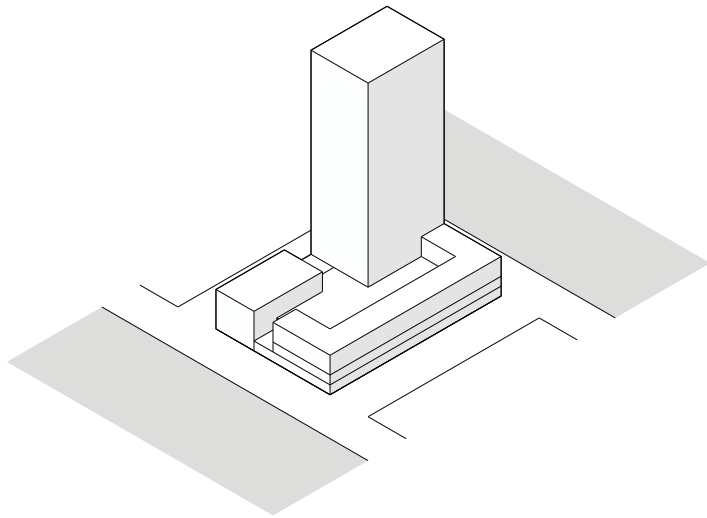
A part of the building is reserved for a primary school, which creates cohesion between families. This saves space as another plot, otherwise used for a school, will be available for other functions.



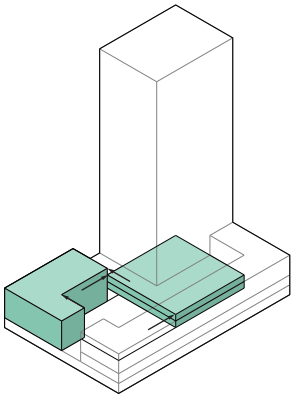


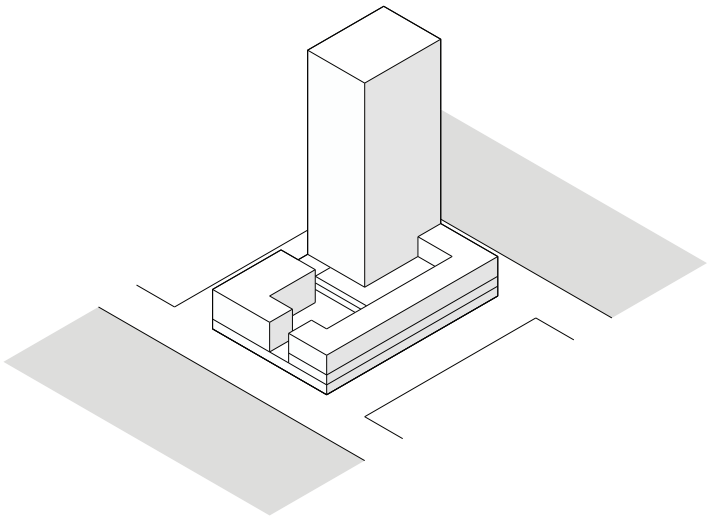
The school is disconnected from the rest of the building. Outdoor spaces however, are shared between the school and the dwellings.



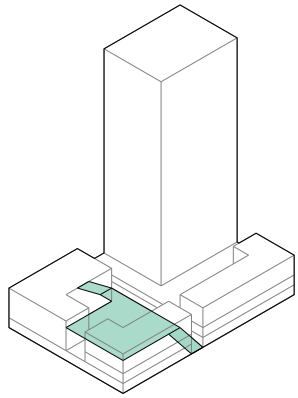


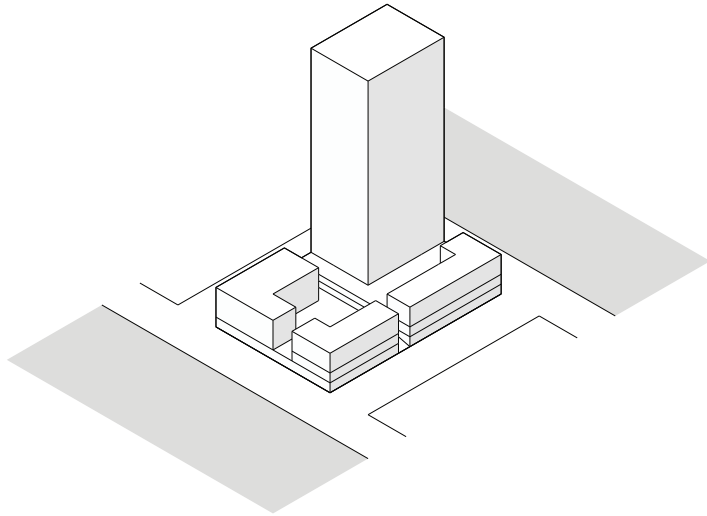
The mass inside the block is moved outwards to create a square inside the block, three metres above ground level. This square can be used as a school yard and as an area to play after school hours.



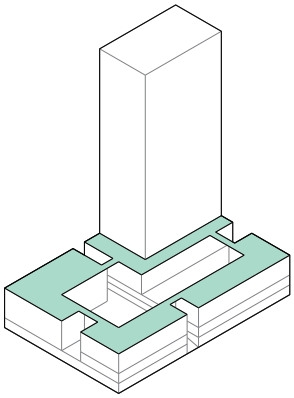


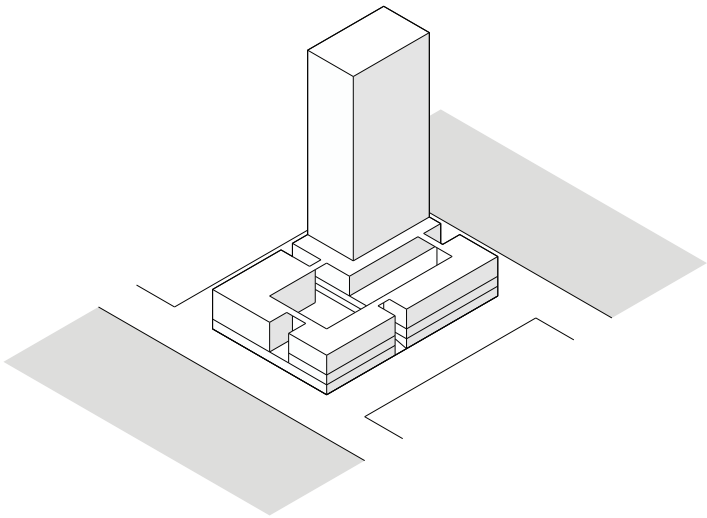
The position of the square gives an enclosed space, more separated from the city. The square is still connected however with the ground level by stairs on two sides.



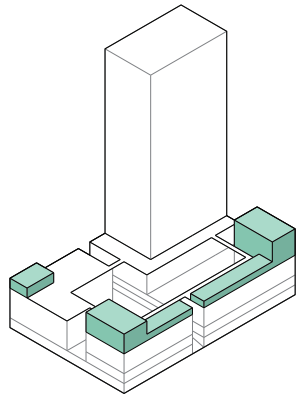


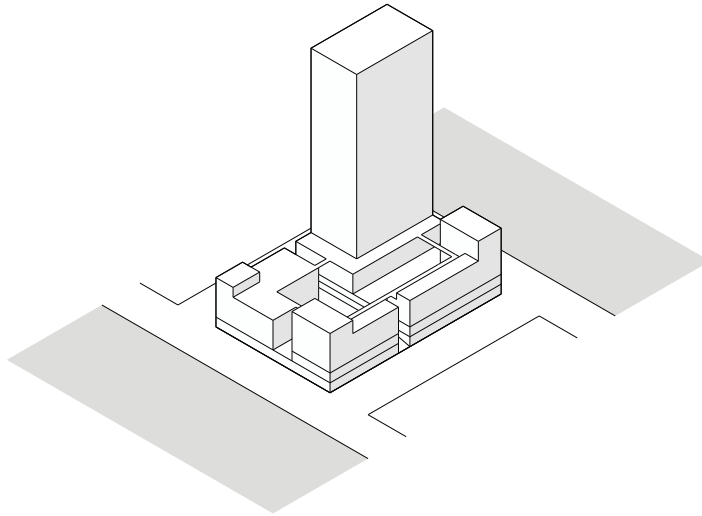
On top of the lower block, the roof area is used as a collective layer for the building block. This space receives a lot of sunlight and allows for views towards the water. High railings and accessibility solely for residents allow for a safe space to play.



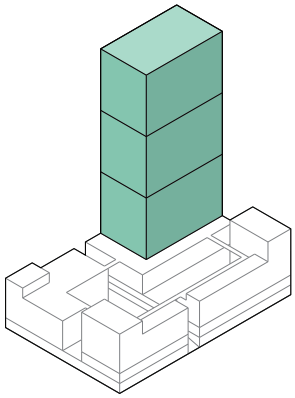


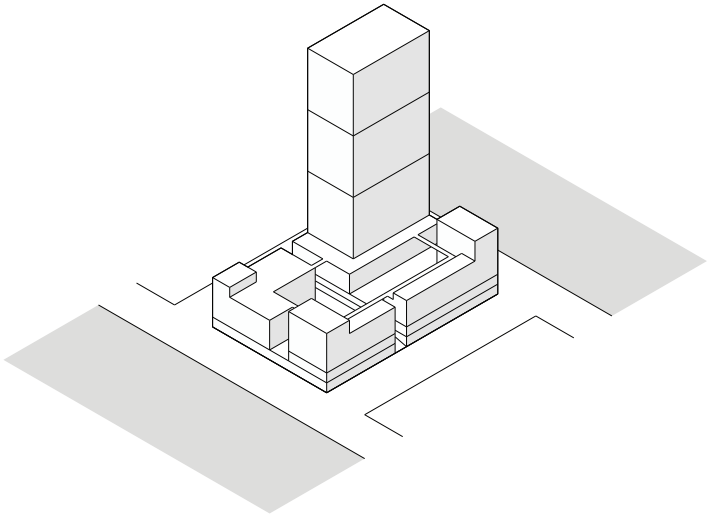
Extra mass is added to the collective layer, allowing for extra dwellings for more social safety and a connection with the school.



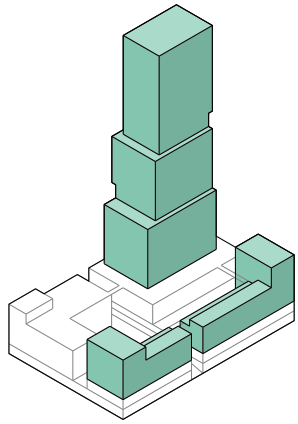


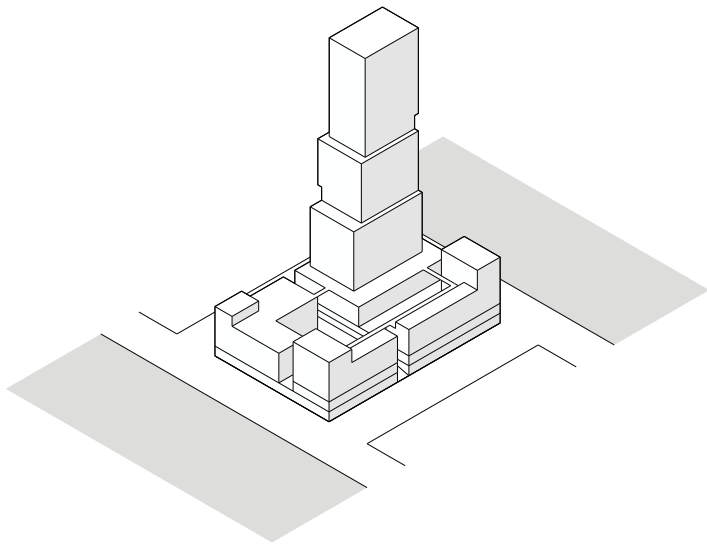
The tower is divided into three smaller blocks, to create different ‘neighbourhoods’ inside the building.

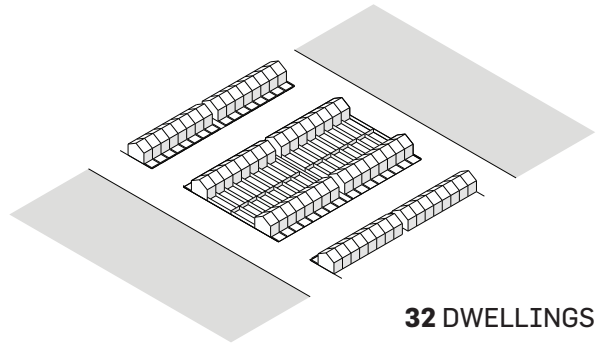




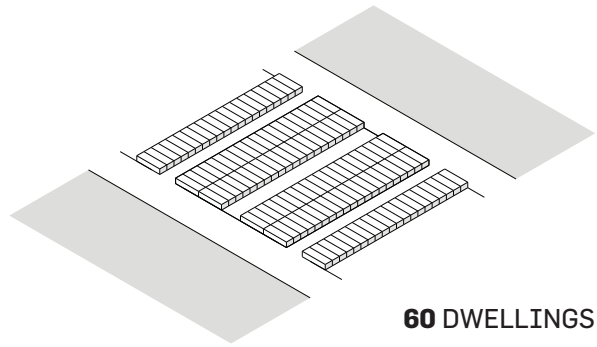
The mass of the blocks is slightly adjusted to create a more interesting composition and to emphasize the different blocks.



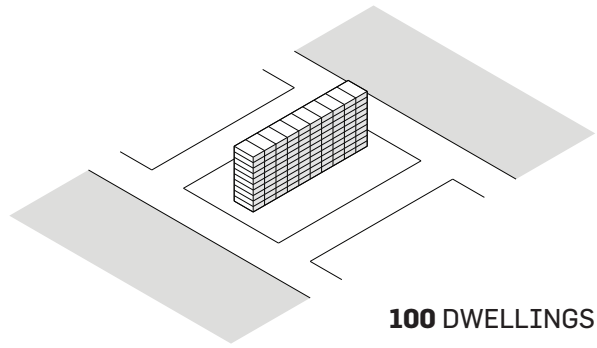




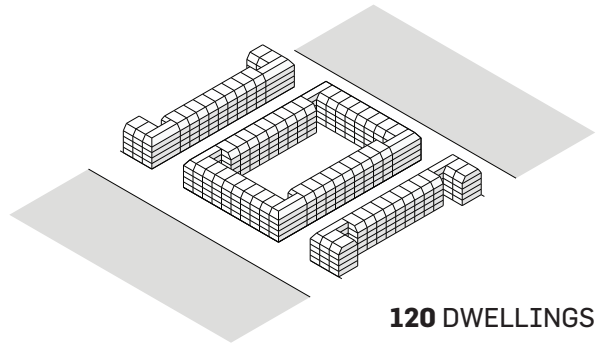
32 DWELLINGS



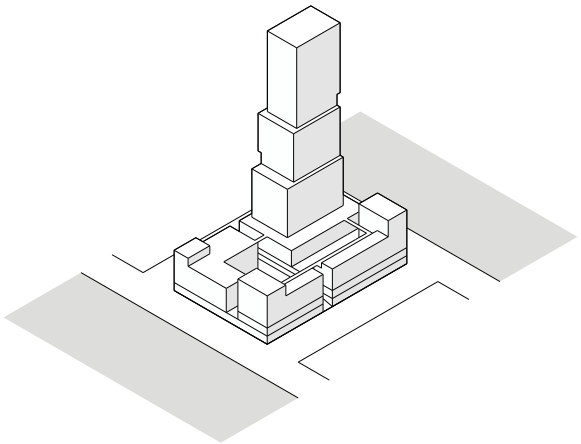
60 DWELLINGS



100 DWELLINGS

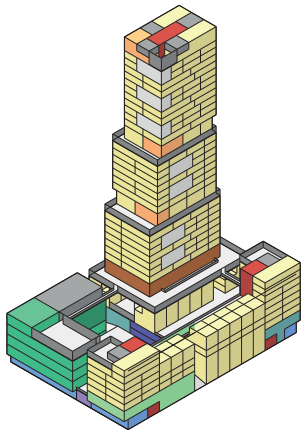


120 DWELLINGS



255 DWELLINGS

PROGRAM



COMMERCIAL

RETAIL

RESTAURANTS

DWELLING BLOCKS

SEMIPUBLIC SPACES

FLEXIBLE SPACES

SCHOOL

COLLECTIVE LAYERS

SQUARES + STREETS

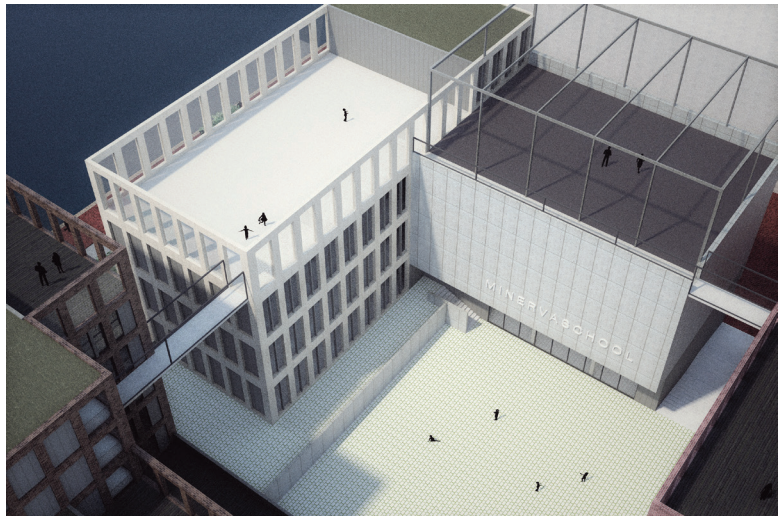
PARKING

CARS

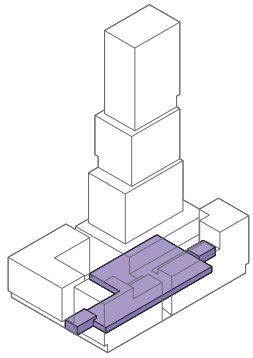
BICYCLES

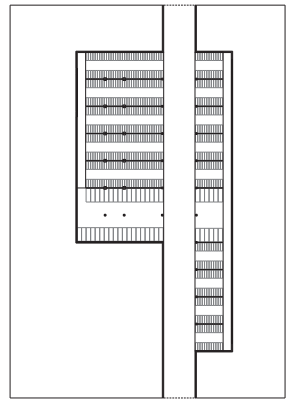
SQUARE

STREET

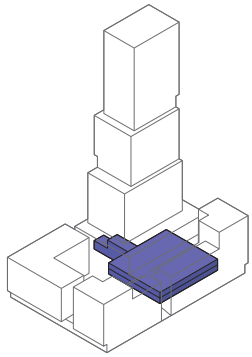


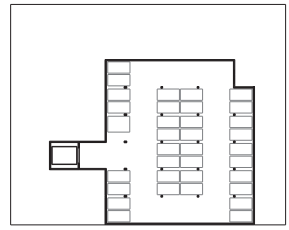
The building accommodates a variety of functions, to create a vibrant and socially sustainable environment. Commercial spaces are situated on the ground floor, alongside the two busier streets. Flexible spaces for (semi) public functions and a primary school are located on the first floor, with a connection to the square and the ground floor. On top of the lower layers, the building has six different blocks with dwellings, varying in size. Besides public functions, the ground floor also contains dwellings with a working space and entrances to the dwelling blocks, parking garage and bicycle storage.

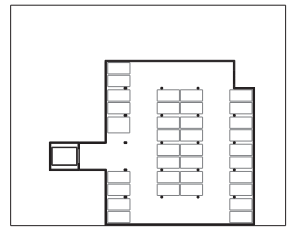




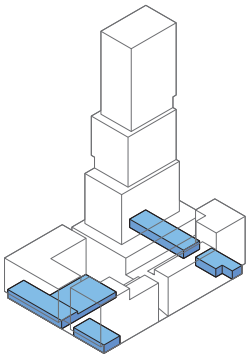
BICYCLE STORAGE
500-1000 BICYCLES
1 LAYER (GROUND FLOOR LEVEL)
DIRECT CONNECTION TO STREET



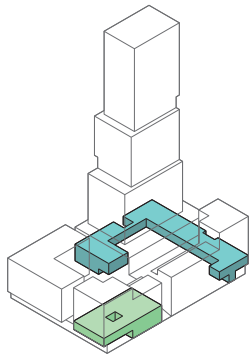




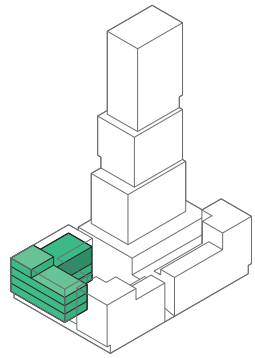
PARKING GARAGE
70 (SHARED) CARS
2 LAYERS (1st +2nd FLOOR)
ACCESSIBLE WITH CAR LIFT



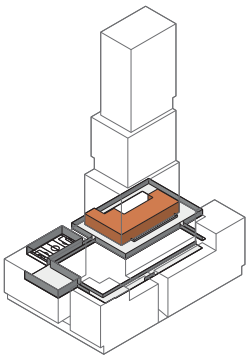
COMMERCIAL SPACES
GROUND FLOOR
RETAIL OR RESTAURANTS
4.5 M CEILING HEIGHT



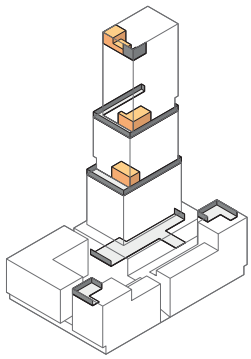
MULTIFUNCTIONAL SPACES
FIRST + SECOND FLOOR
4.5 M CEILING HEIGHT
ENTRANCE STREET + SQUARE



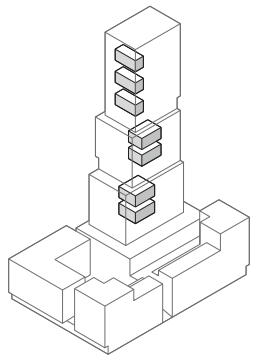
SCHOOL
12 CLASSROOMS
SPORTS HALL (RENTABLE)
ENTRANCE STREET + SQUARE
CLASS ROOMS VIEWS + SUNLIGHT
OUTDOOR SPACE ON ROOF



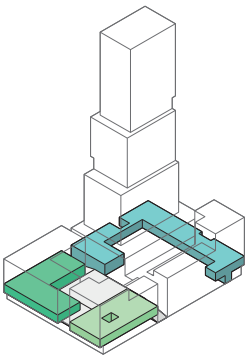
'NEIGHBOURHOOD'
FOR ALL RESIDENTS OF BUILDING
(CA. 250 DWELLINGS)
INDOOR + OUTDOOR
DWELLING ENTRANCES
SHARED OUTDOOR SPACE SCHOOL
SUNLIGHT + VIEWS



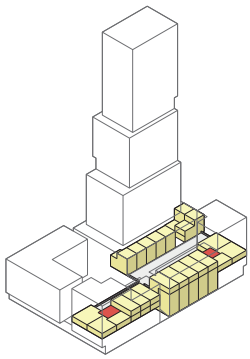
'BLOCK'
FOR RESIDENTS BLOCK
(CA. 50 DWELLINGS)
INDOOR + OUTDOOR
DOUBLE HEIGHT
ON TOP OF EACH BLOCK
SUNLIGHT + VIEWS



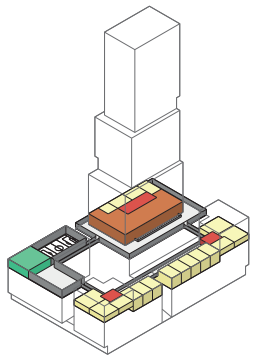
'STREET'
FOR RESIDENTS ADJACENT LEVELS
(CA. 15 DWELLINGS)
OUTDOOR
DOUBLE HEIGHT
NEARBY DWELLINGS WITHOUT BALCONY
SUNLIGHT + VIEWS



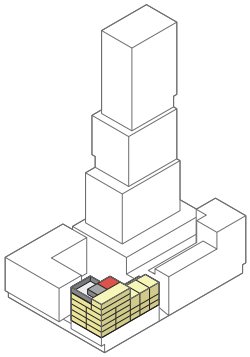
1TH FLOOR +3M
ELEVATED SCHOOLYARD
ENTRANCE SCHOOL
ENTRANCE MULTIFUNCTIONAL SPACES
ENCLOSEMENT + PROTECTION



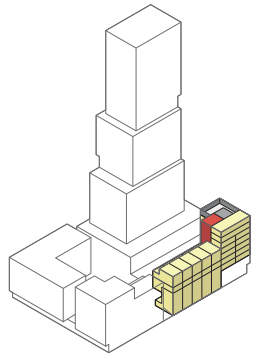
4TH FLOOR +9M
ELEVATED STREET
ENTRANCE 21 DWELLINGS
VIEWS TOWARDS WATER



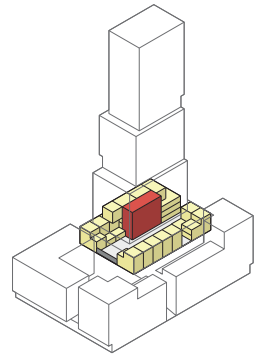
7TH FLOOR +18M
AROUND INDOOR SHARED SPACE
SCHOOLYARD + SPORTS CAGE (SHARED)
ENTRANCE 12 DUPLEX DWELLINGS
VIEWS TOWARDS WATER + SUNLIGHT



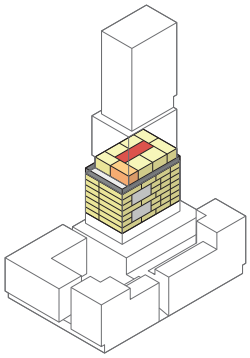
BLOCK
24 DWELLINGS
TWO-SIDED ORIENTATION
COLLECTEVE SPACE ON TOP OF BLOCK



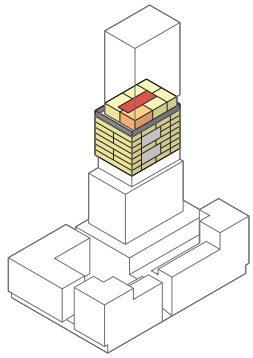
BLOCK
33 DWELLINGS
TWO-SIDED ORIENTATION
COLLECTEVE SPACE ON TOP OF BLOCK



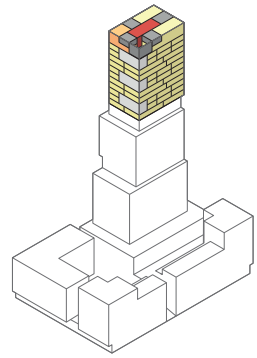
BLOCK
23 DWELLINGS
COLLECTIVE INNER STREET
COLLECTEVE SPACE ON TOP OF BLOCK



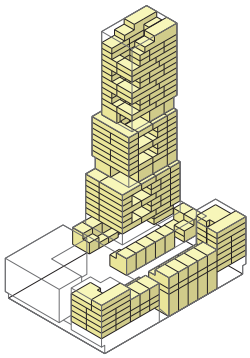
BLOCK
63 DWELLINGS
COLLECTEVE OUTDOOR SPACE 3 LAYERS
COLLECTEVE SPACE ON TOP OF BLOCK



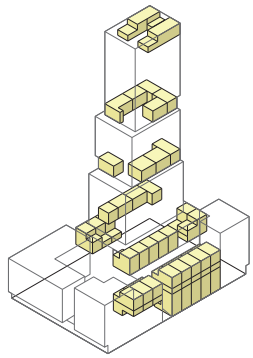
BLOCK
54 DWELLINGS
COLLECTEVE OUTDOOR SPACE 3 LAYERS
COLLECTEVE SPACE ON TOP OF BLOCK



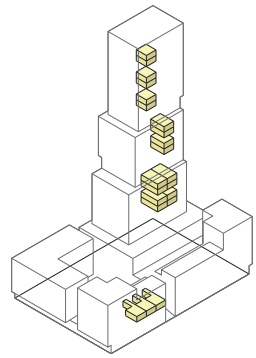
BLOCK
58 DWELLINGS
COLLECTEVE OUTDOOR SPACE 4 LAYERS
COLLECTEVE SPACE ON TOP OF BLOCK



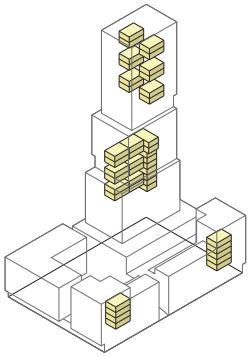
ALL DWELLINGS
255 DWELLINGS



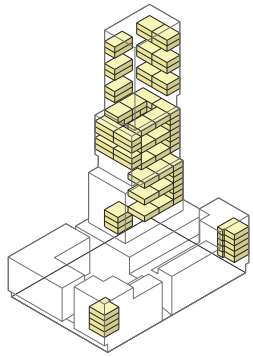
MULTILAYER
90-180 M²
46 DWELLINGS
SHARED OUTDOOR SPACE



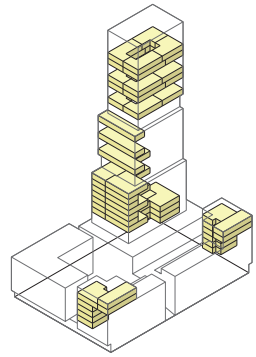
STUDIOS
35-50 M²
21 DWELLINGS
SHARED OUTDOOR SPACE ON LEVEL



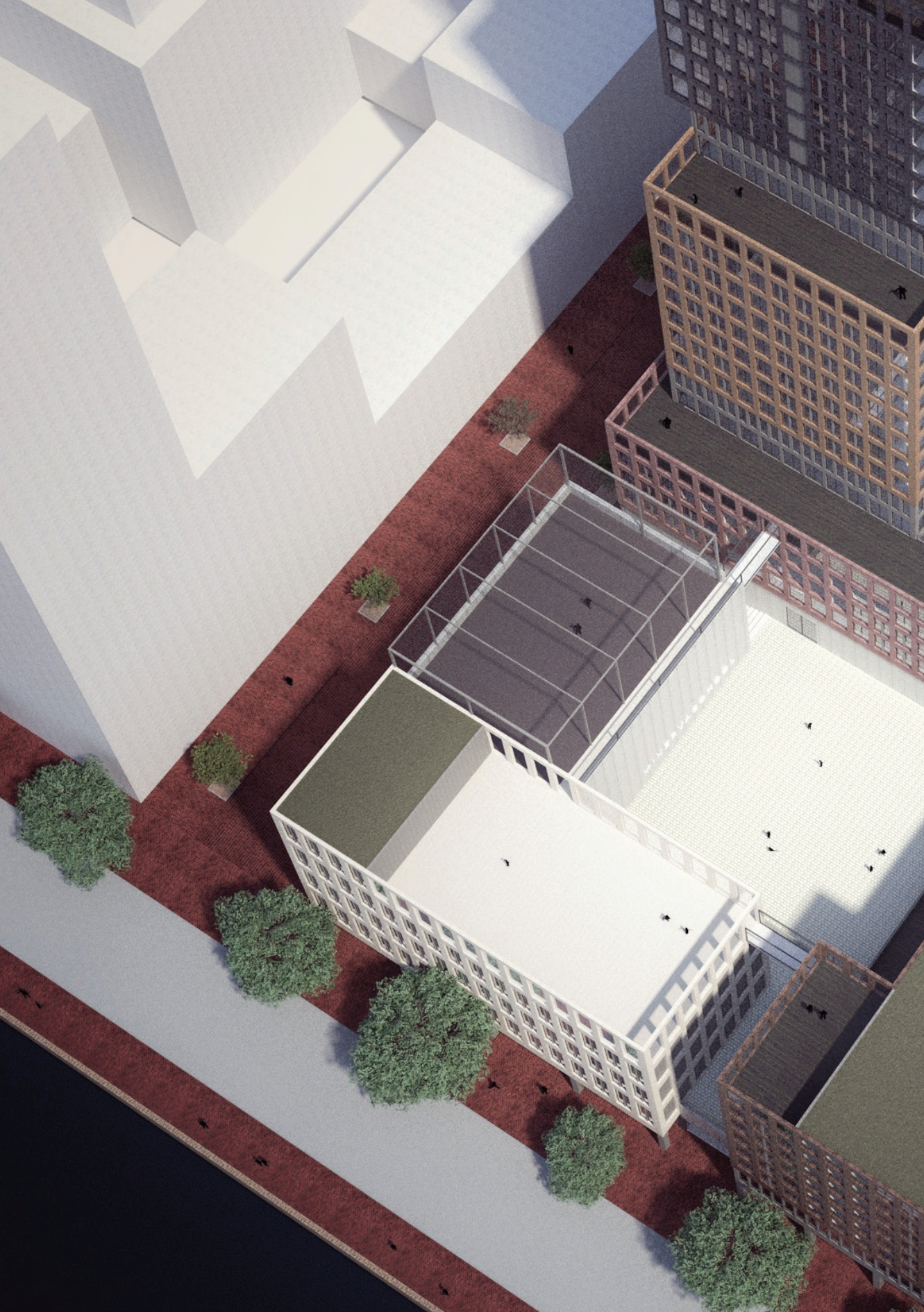
SMALL APARTMENTS
CA. 50 M²
42 DWELLINGS
SHARED OUTDOOR SPACE ON LEVEL



MEDIUM APARTMENTS
50-80 M²
85 DWELLINGS
PRIVATE OUTDOOR SPACE

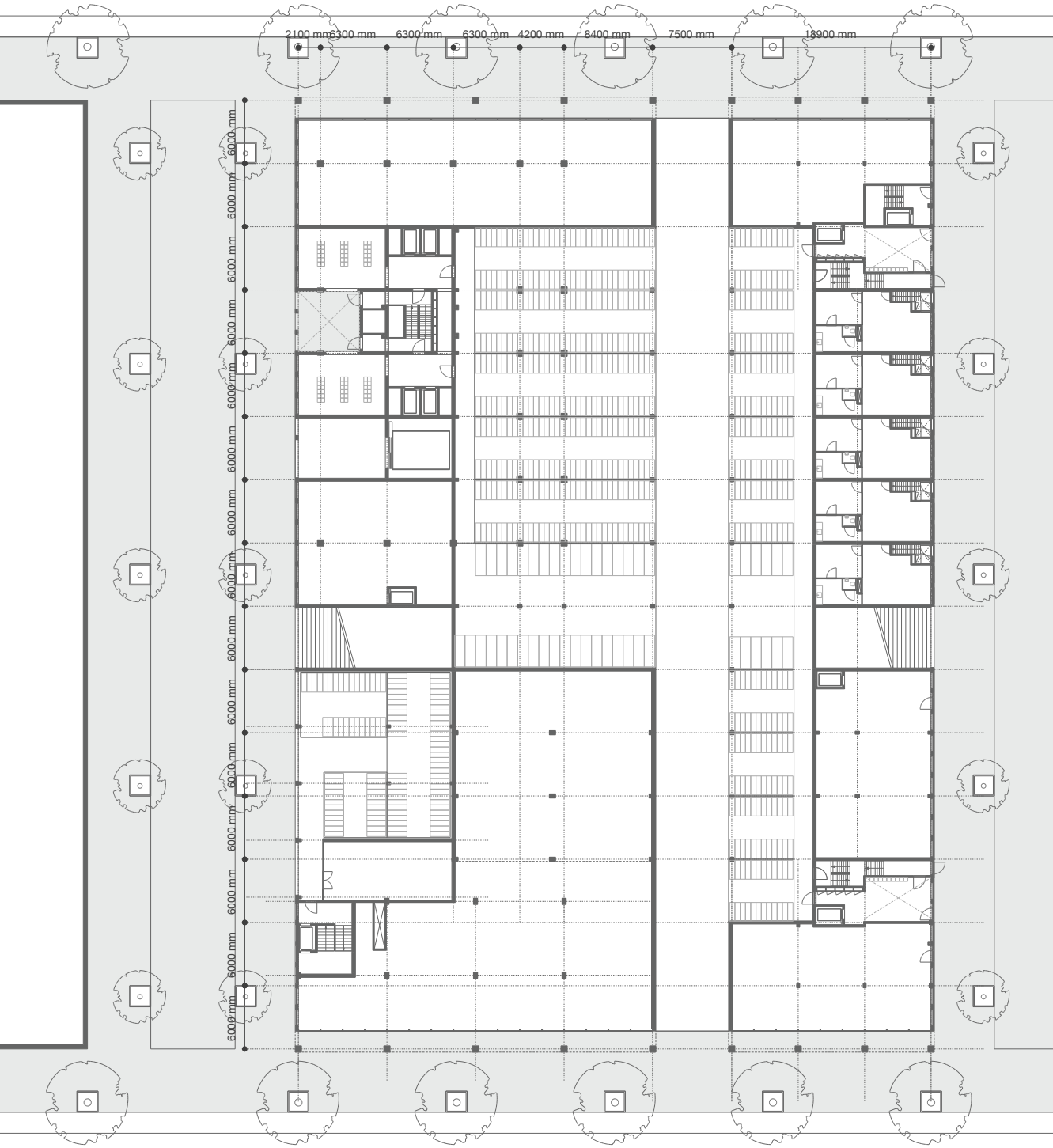


LARGE APARTMENTS
80+ M²
61 DWELLINGS
PRIVATE OUTDOOR SPACE



BUILDING

The distinction in the different blocks is made with both form and materialisation. The different colours of brick resemble the materials of the typical canal houses in Amsterdam. This way, the building gets a friendlier appearance. The facade has a rational grid, to emphasize the different blocks and to acquire a coherent overall image.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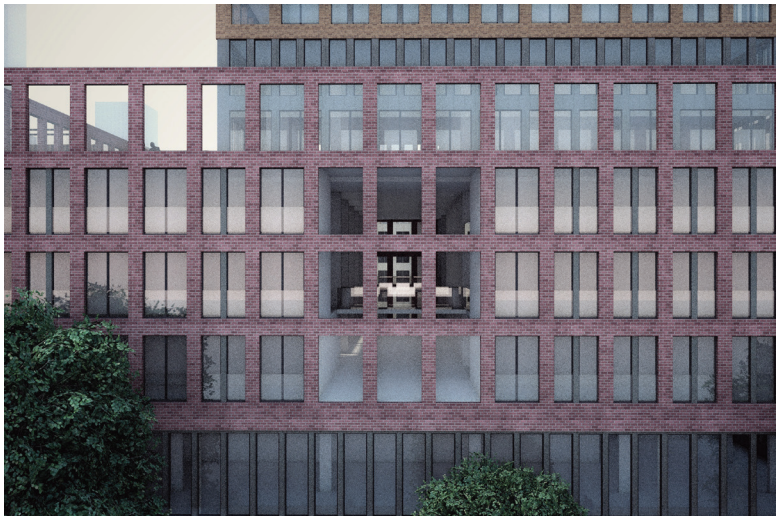
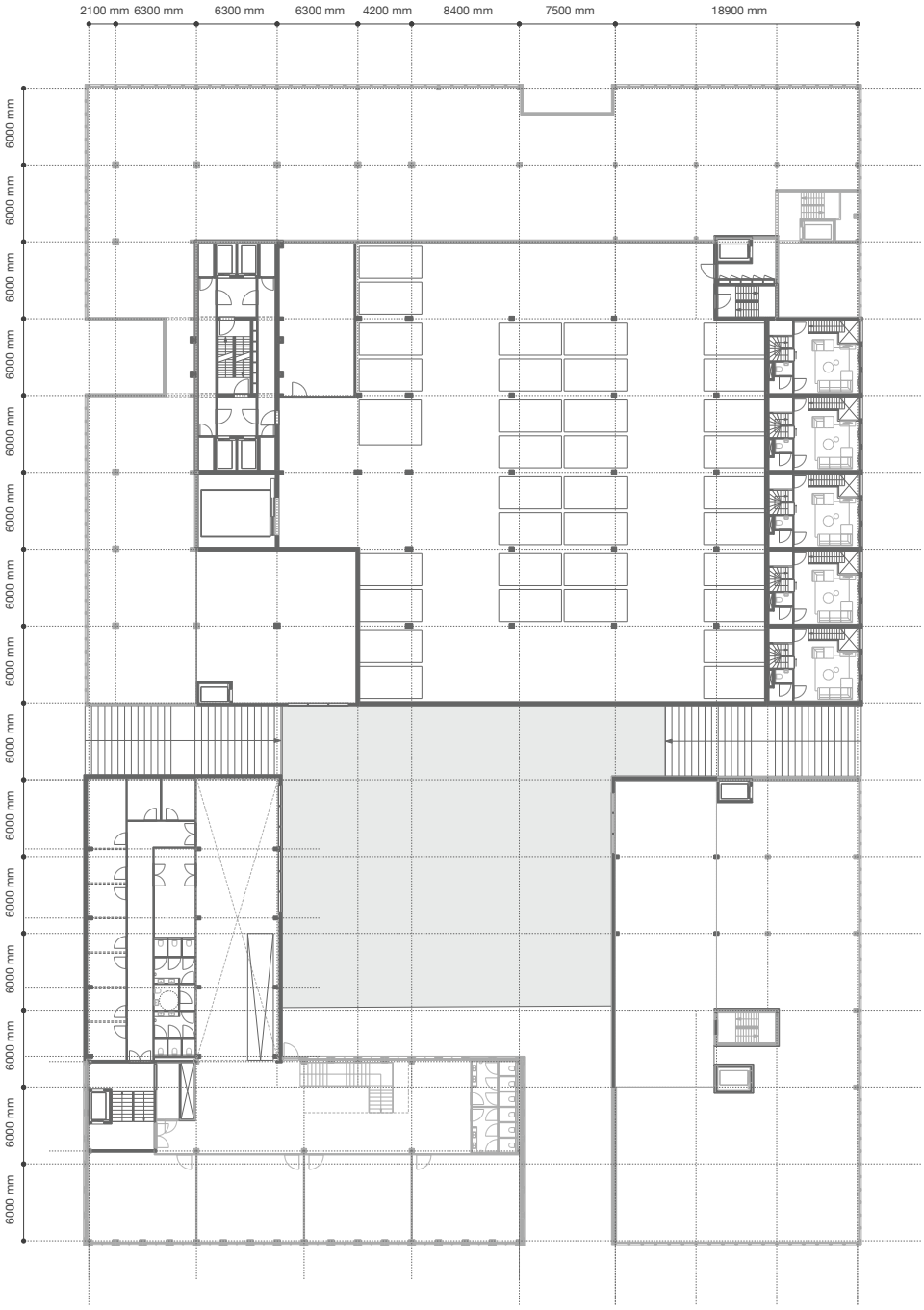


The ground floor consists of a mix of functions alongside the four different streets, with the entrances of the dwellings at the quieter streets. The tower has two entrance halls, each serving two blocks. The low-rise part has two different entrances on the same street. A collective layer for all its residents is situated on the 6th floor, 18 metres above ground level. This layer contains a large outdoor space and a flexible indoor space. Besides this, each block has its own collective space. The lowest block in the tower resembles a street with triplex dwellings. The other three blocks have an in- and outdoor space on top of them, with duplex dwellings adjacent to the outdoor space. These blocks also incorporate outdoor spaces on each three or four layers, serving a smaller group of residents. The collective spaces allow for a gradual exploration of the environment for children, following the widening range of action according to their age.

0 +0000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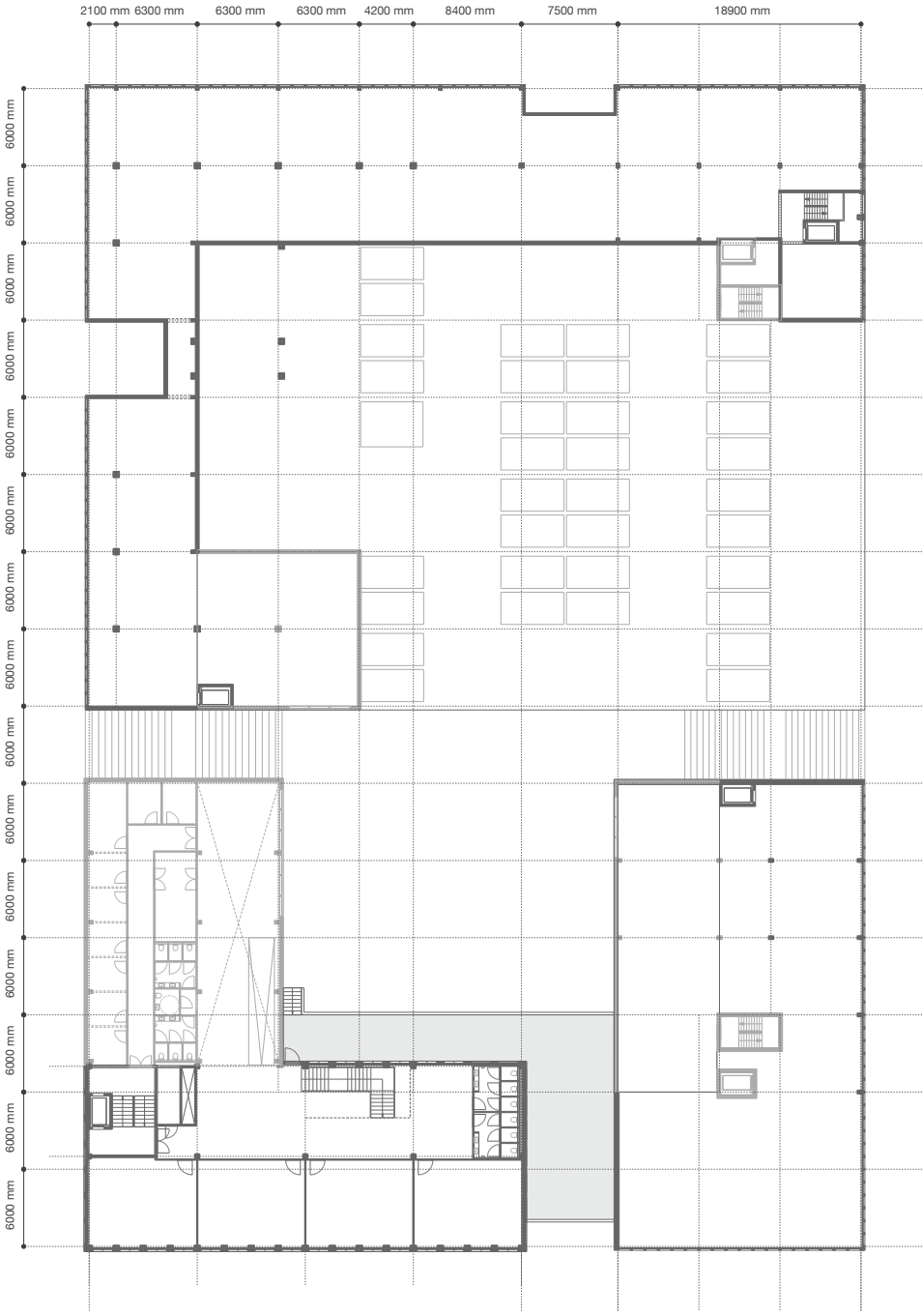
1 +3000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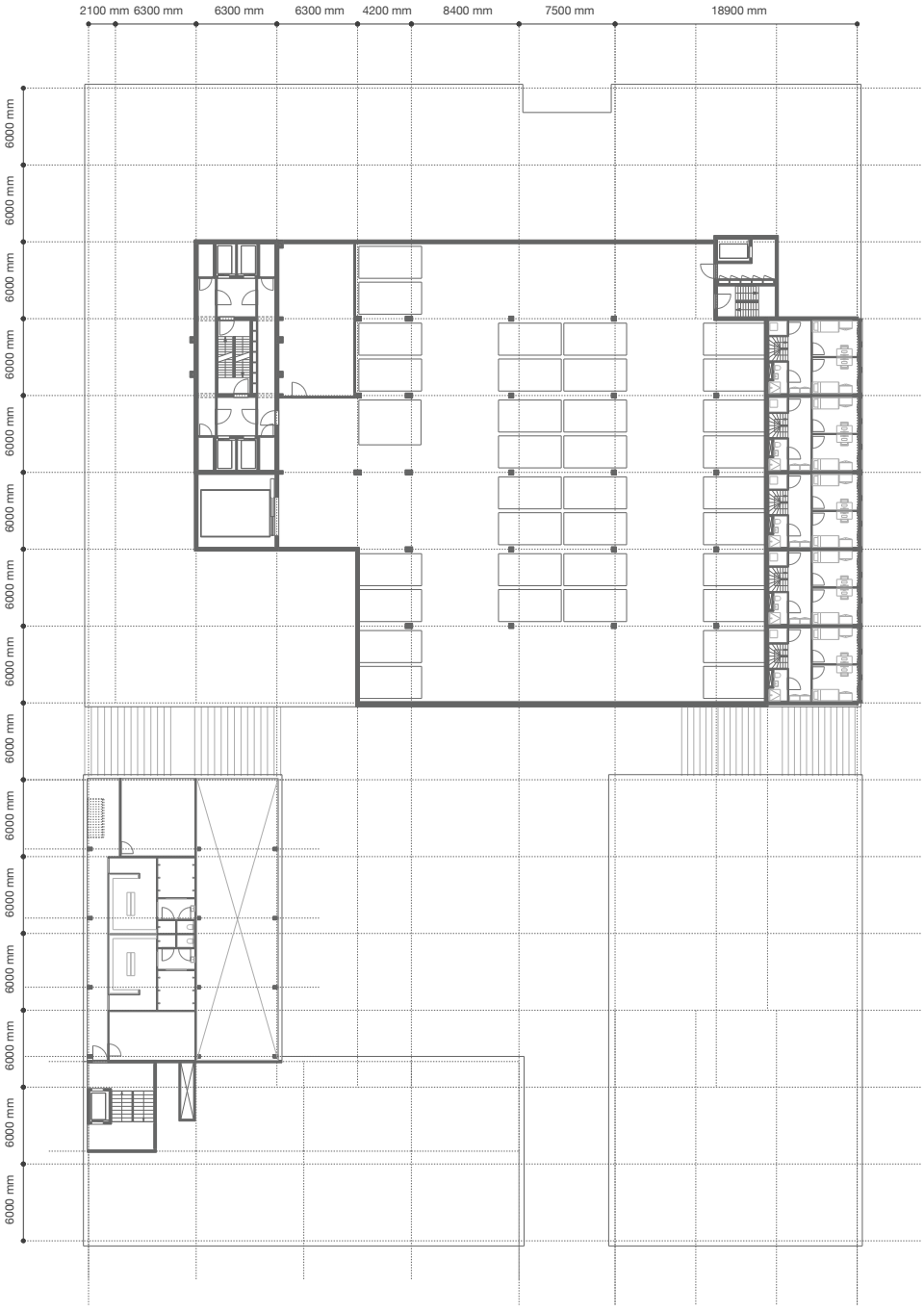
1,5 +4500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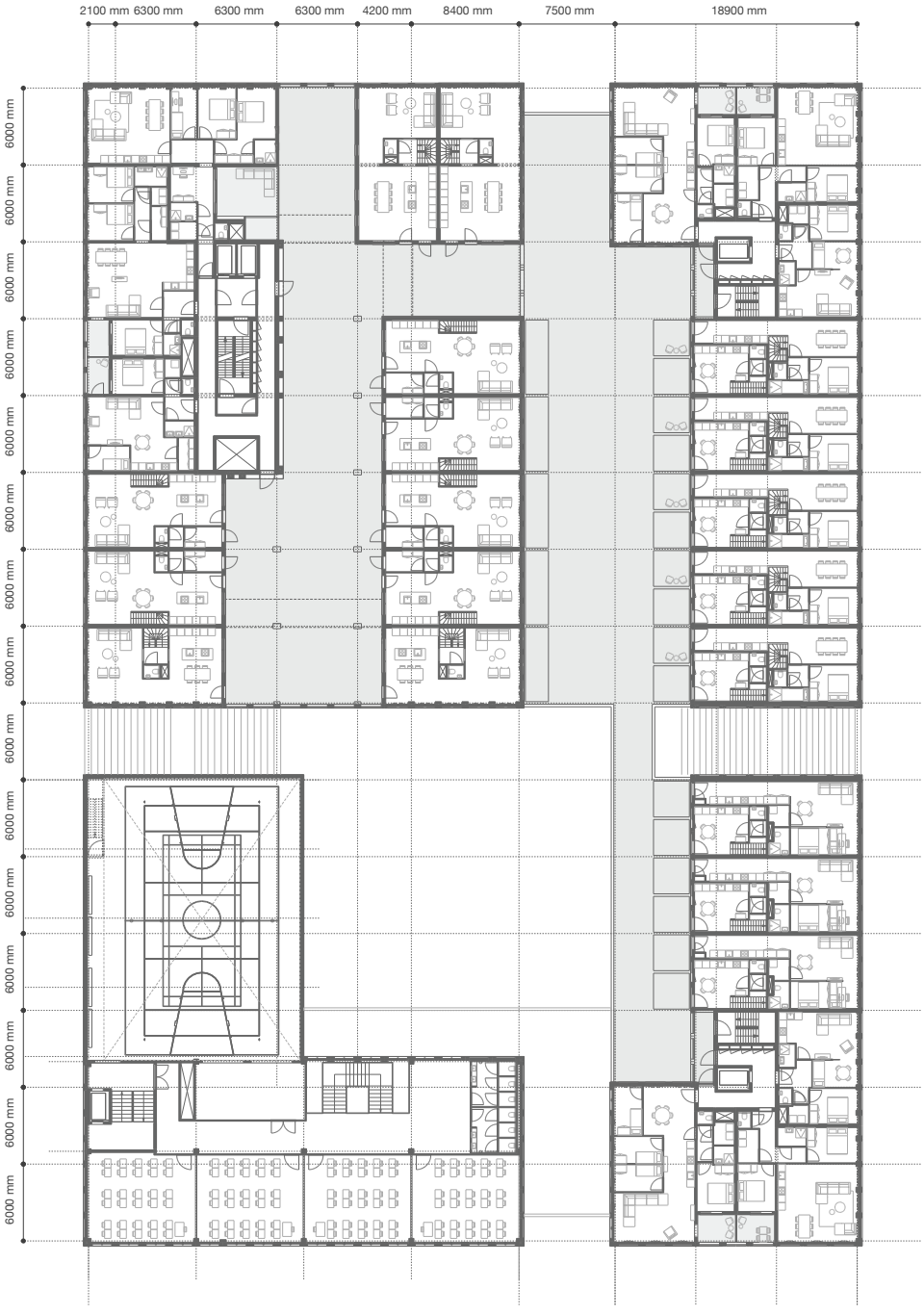
2 +6000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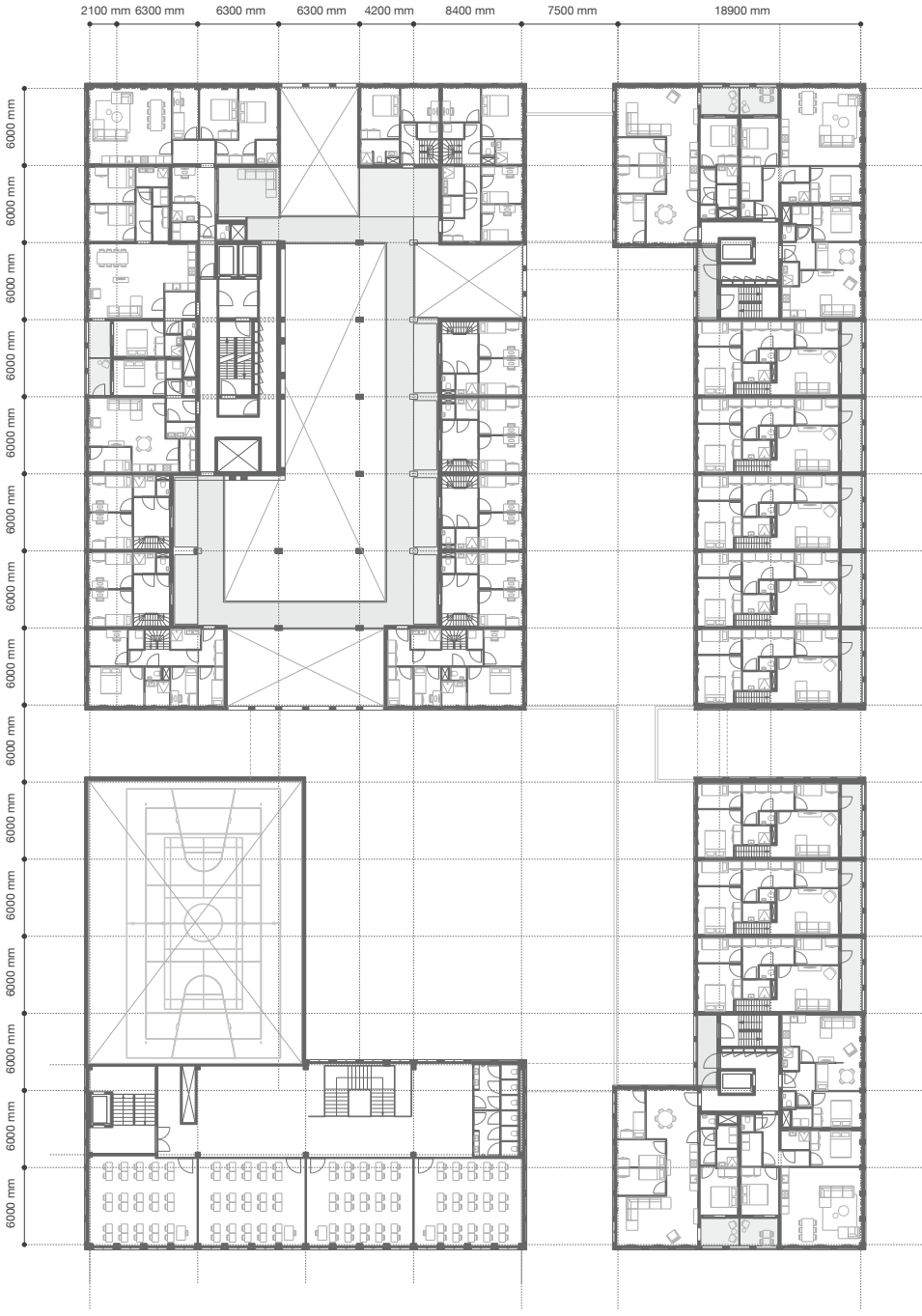
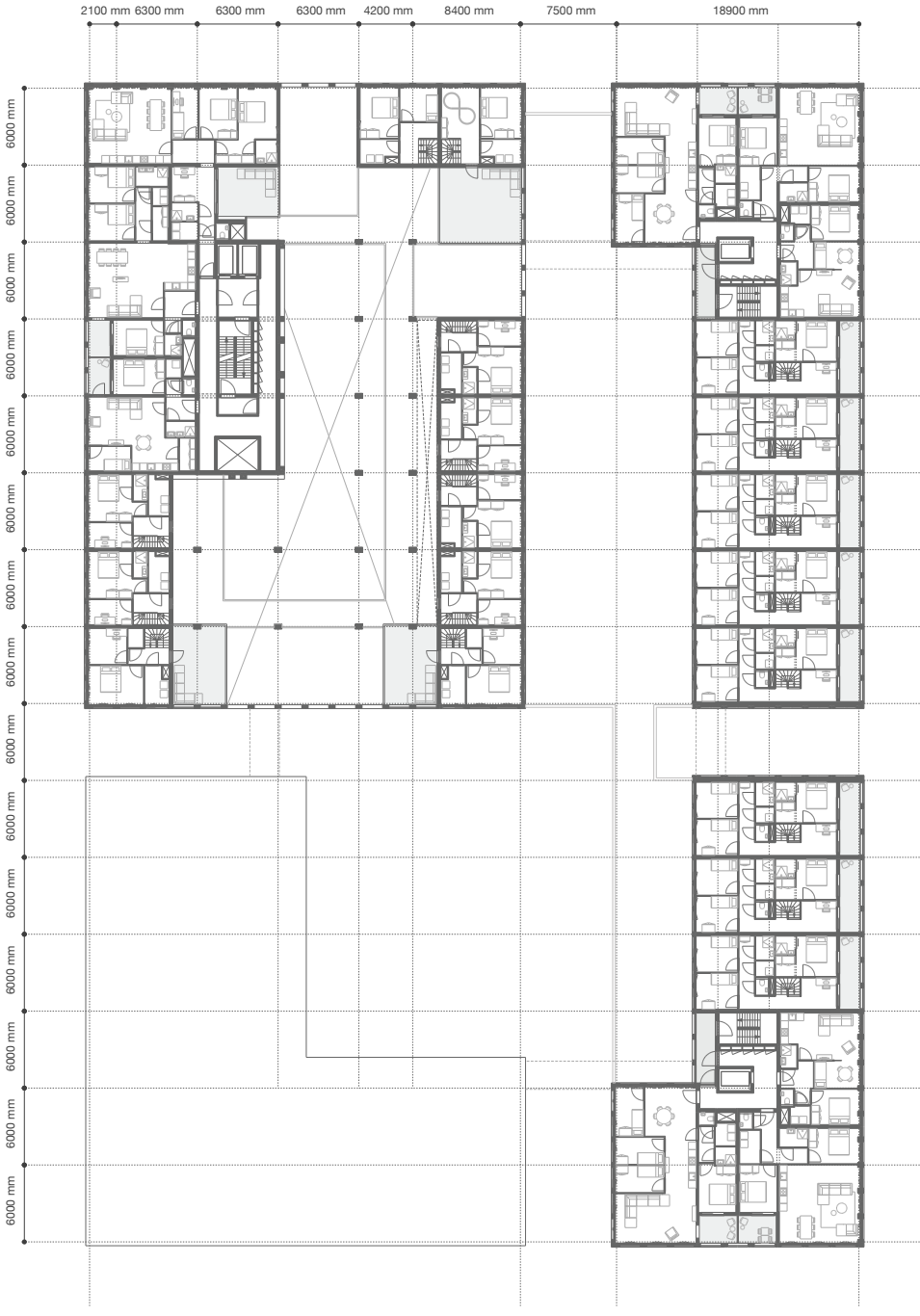
3 +9000



4/4.5 +12000/13500 (SCHOOL 0.5M HIGHER)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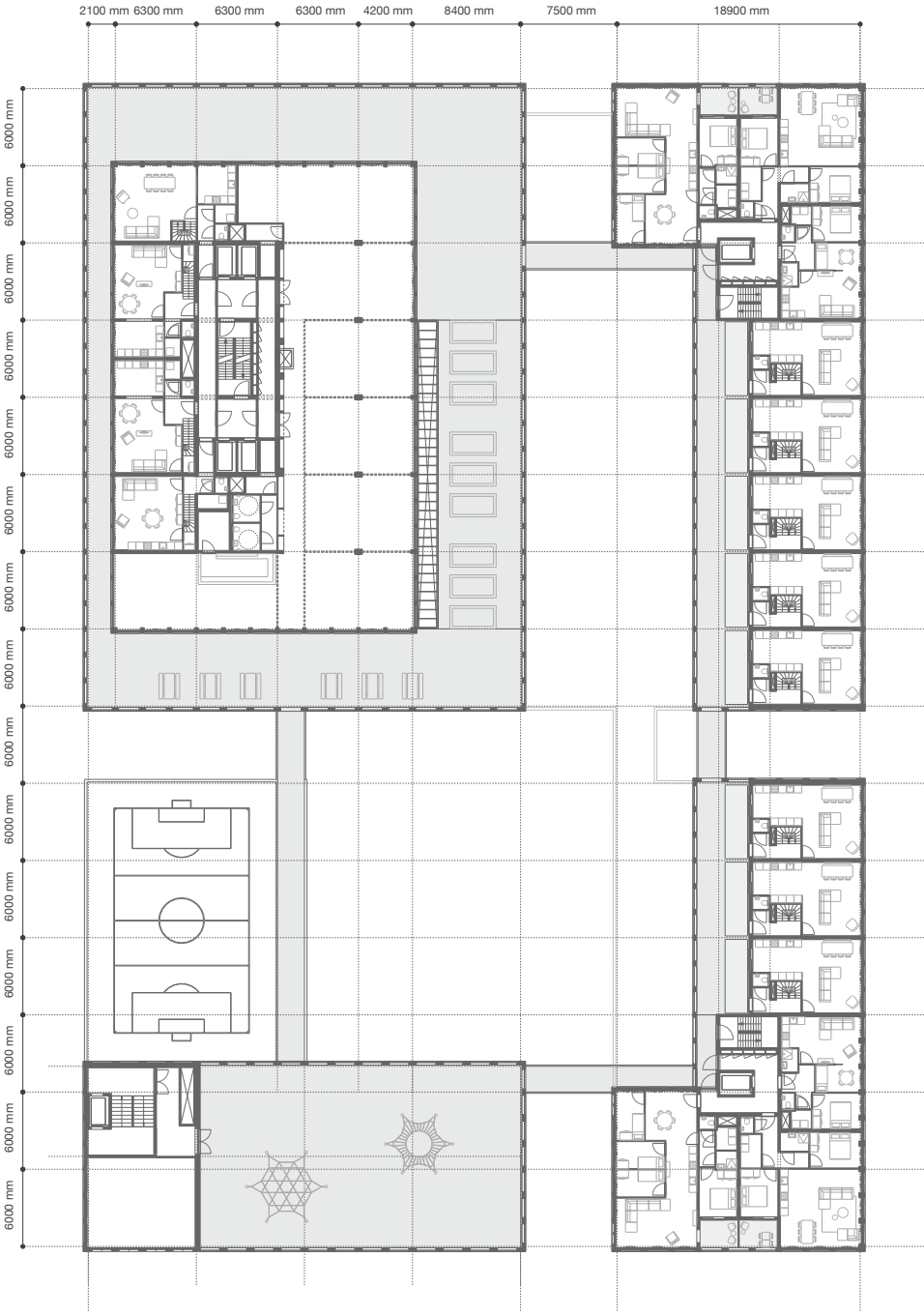
5 +15000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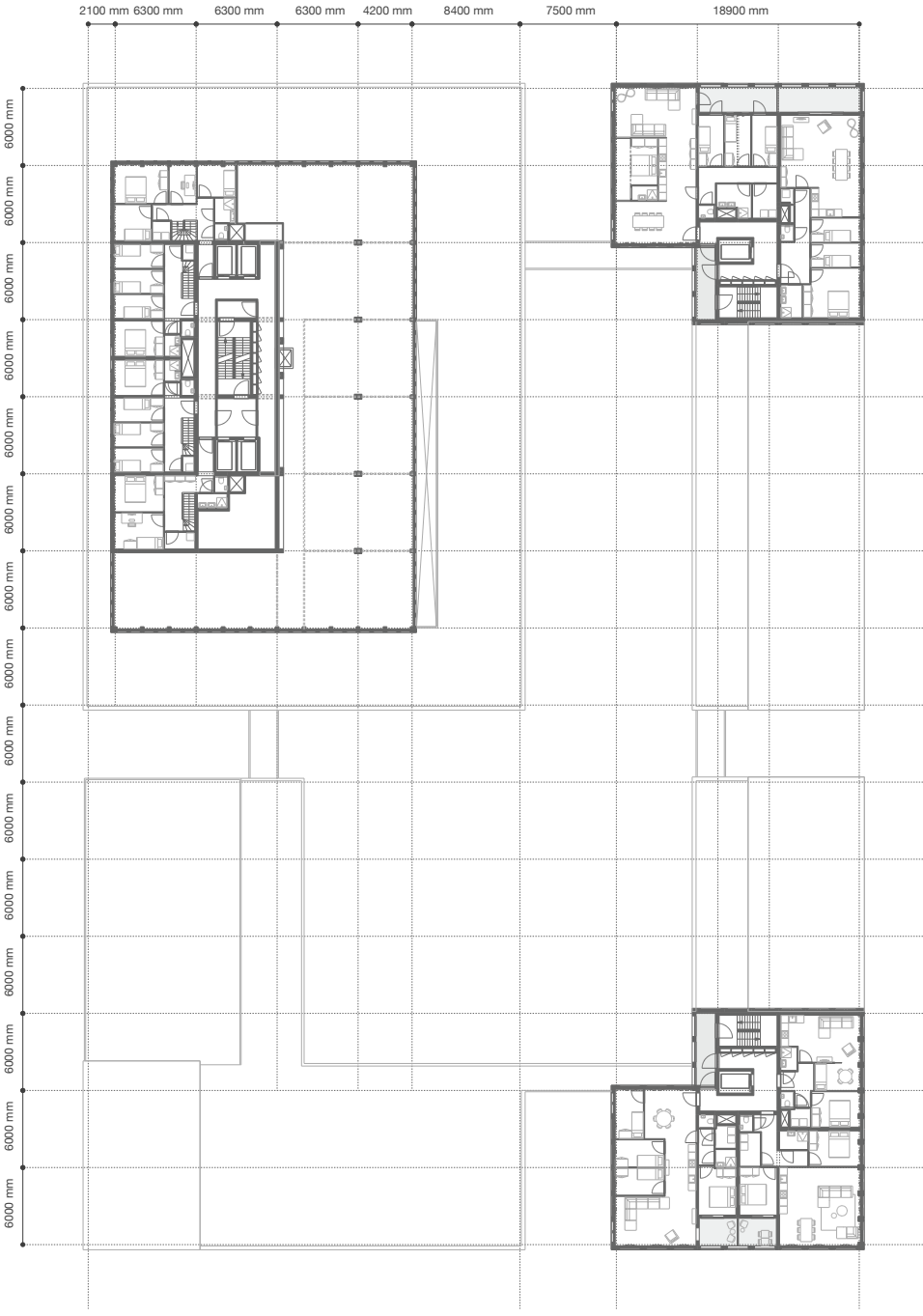
6 +18000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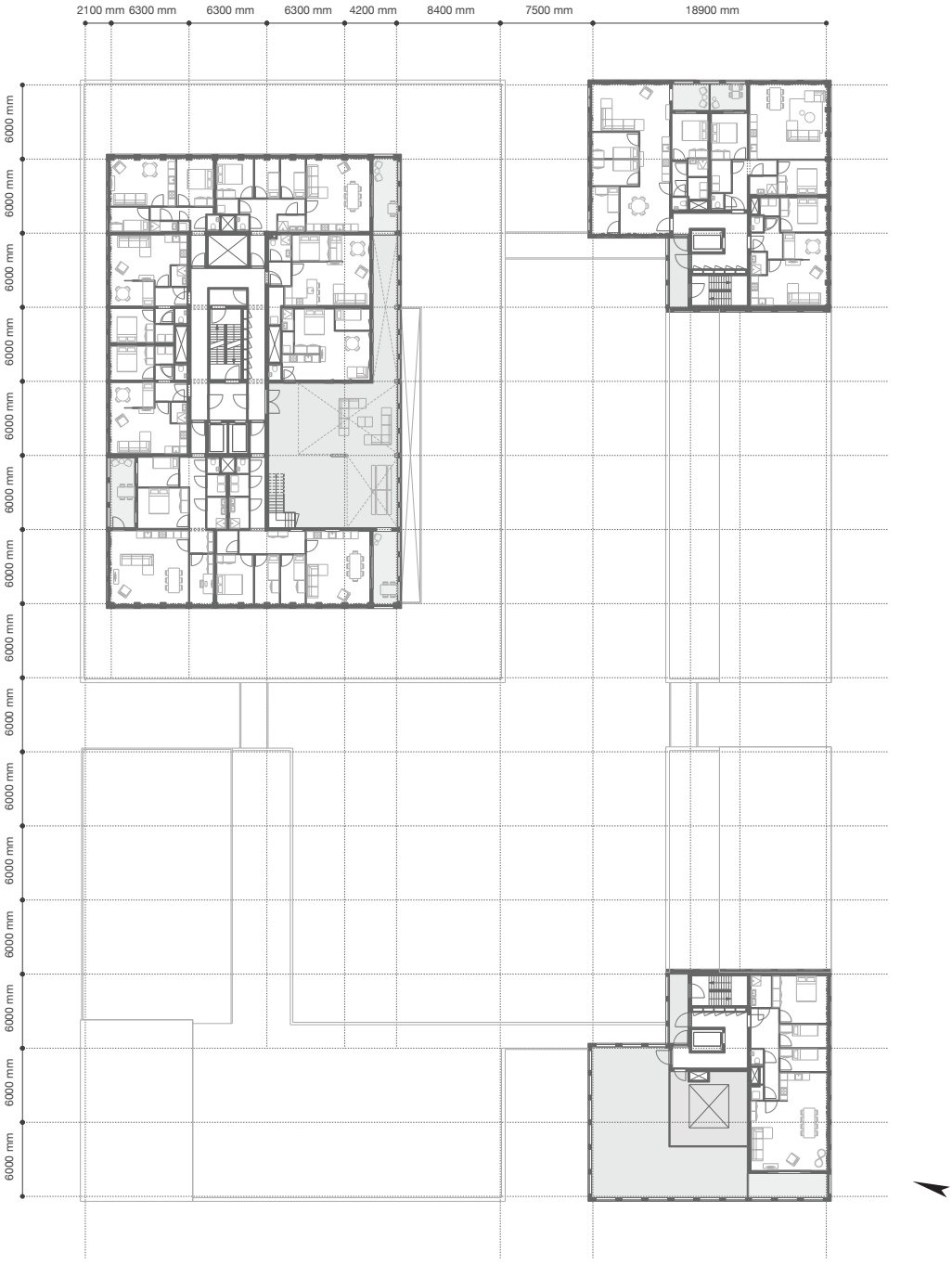
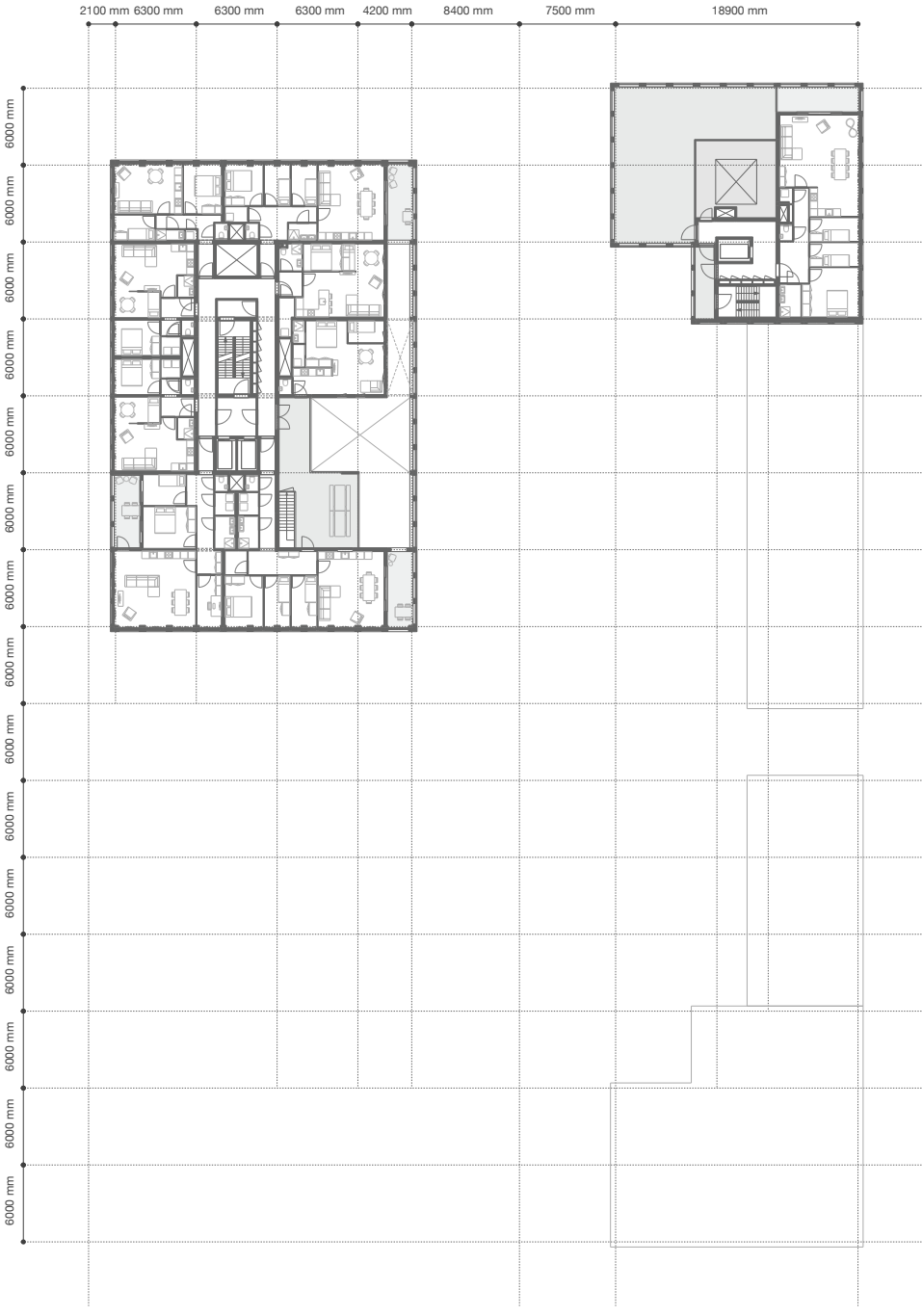
7 +21000



9 +27000
12 +36000



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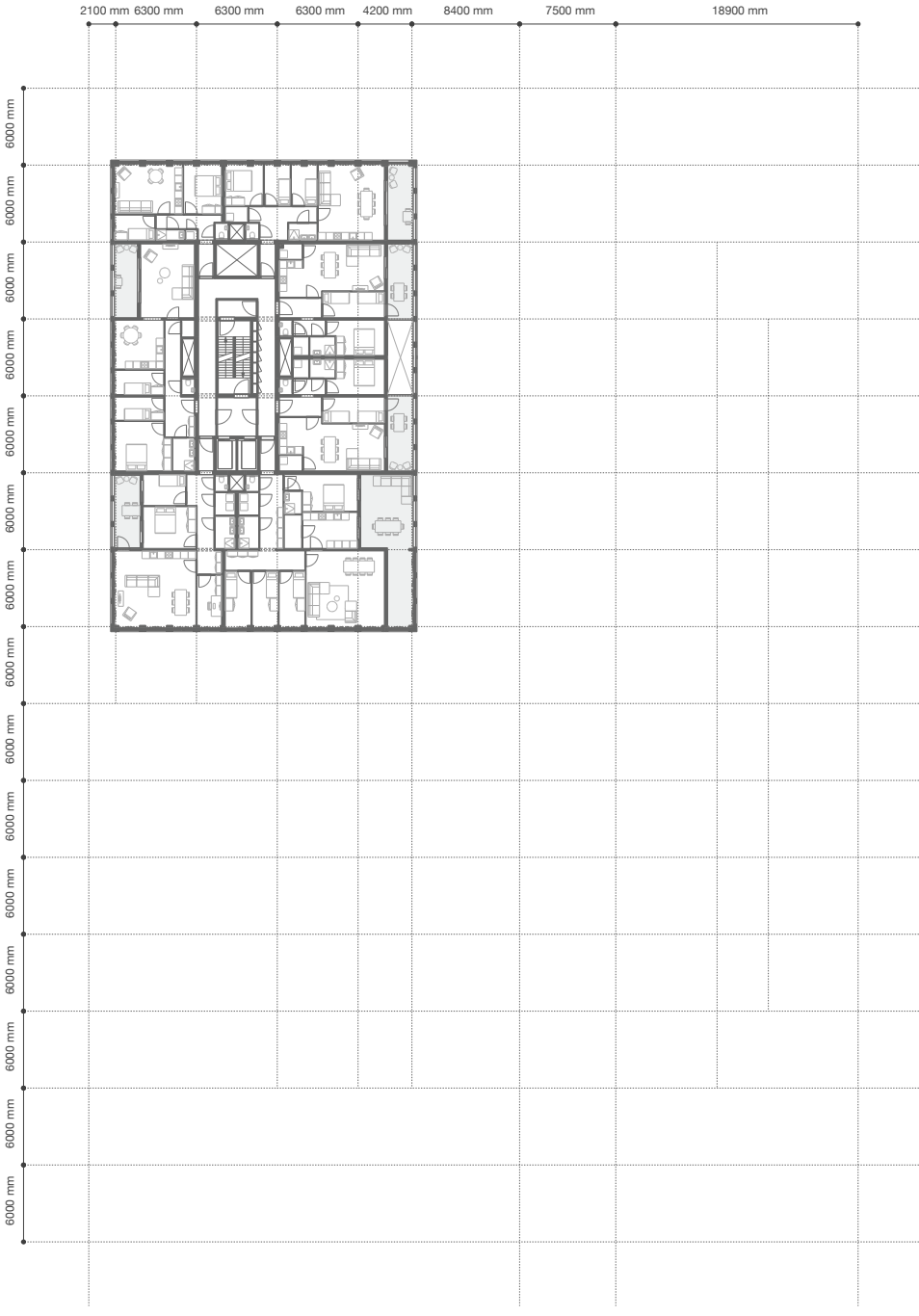
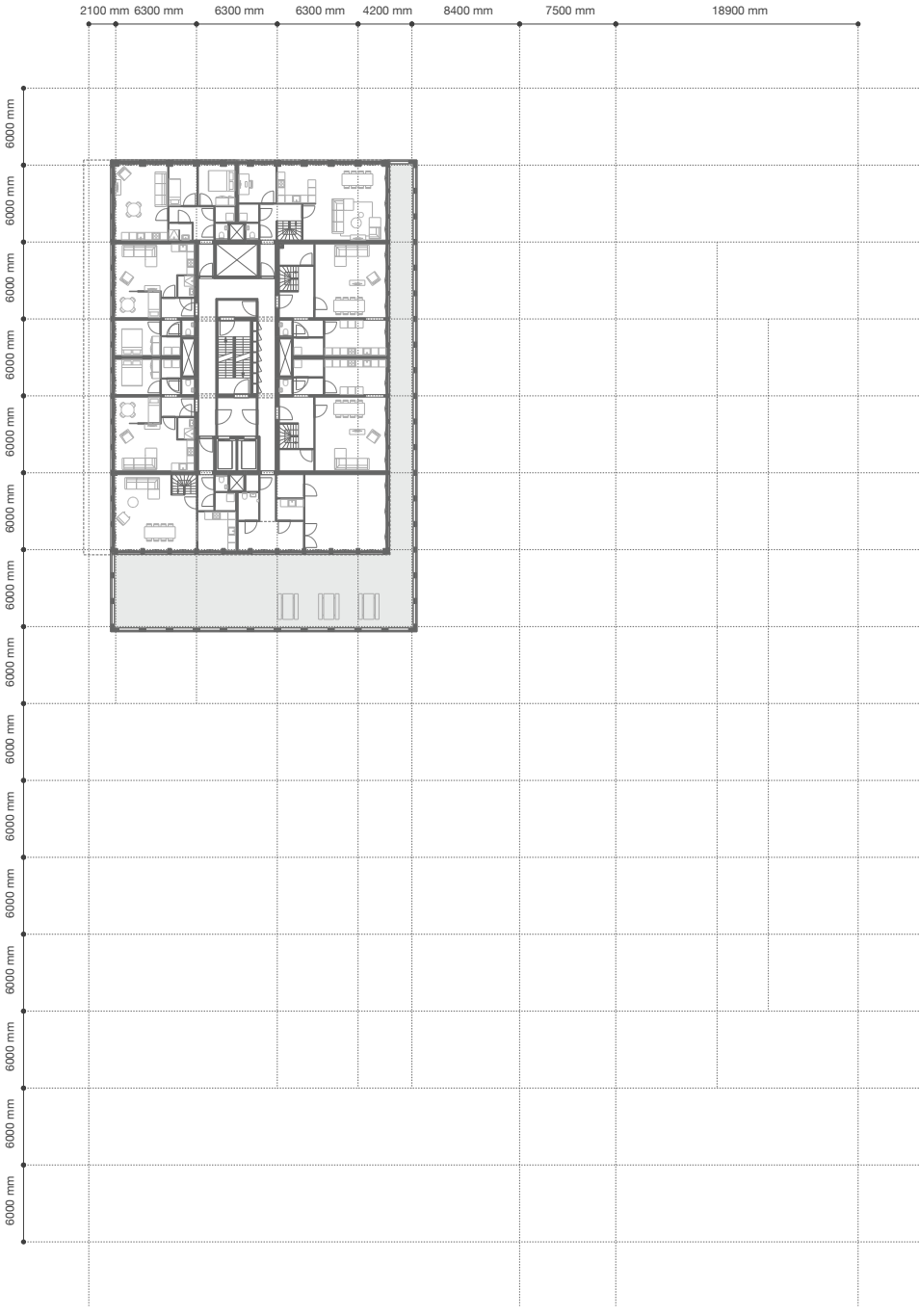
13 +39000



8 +24000
11 +33000
14 +42000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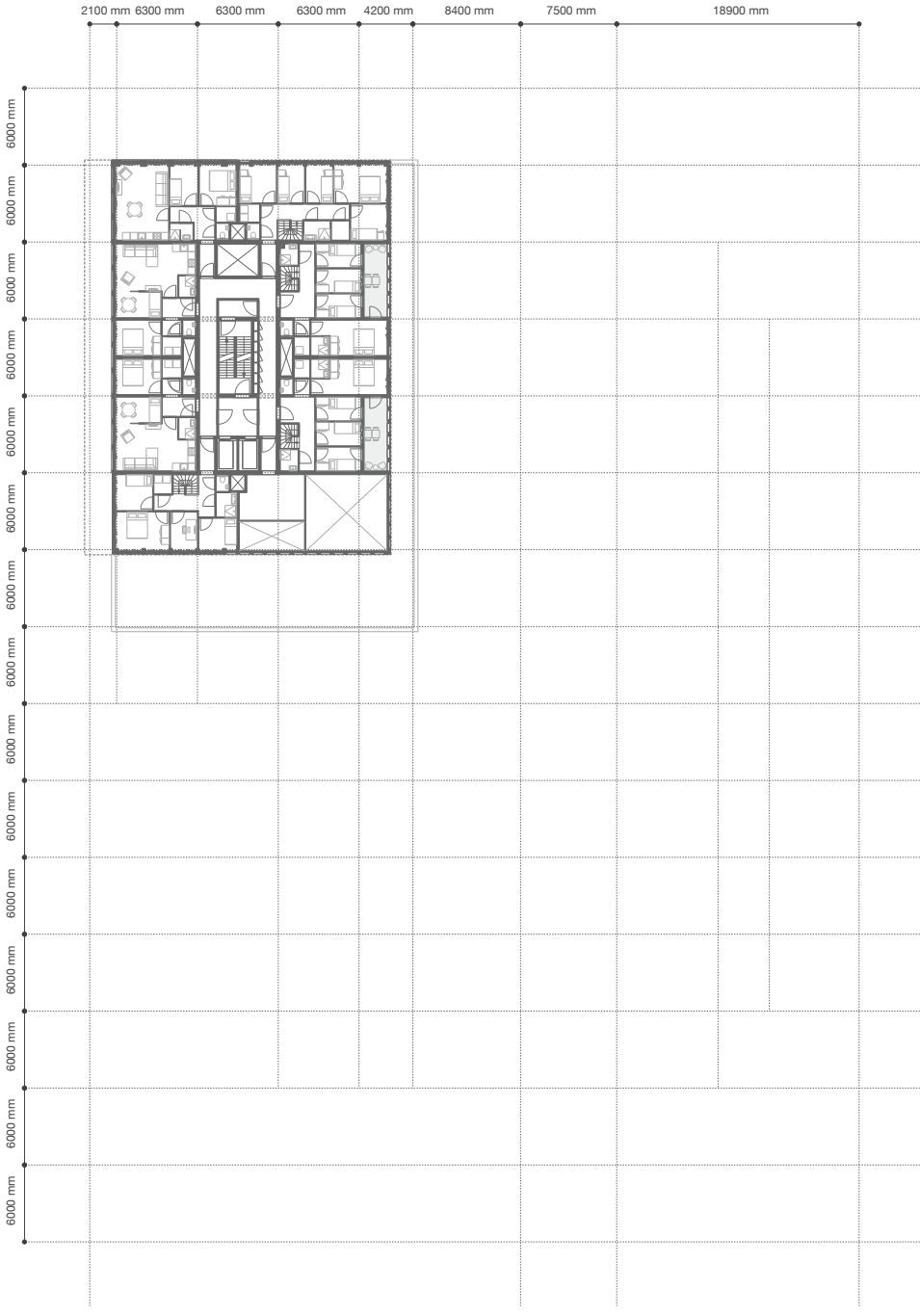
15 +45000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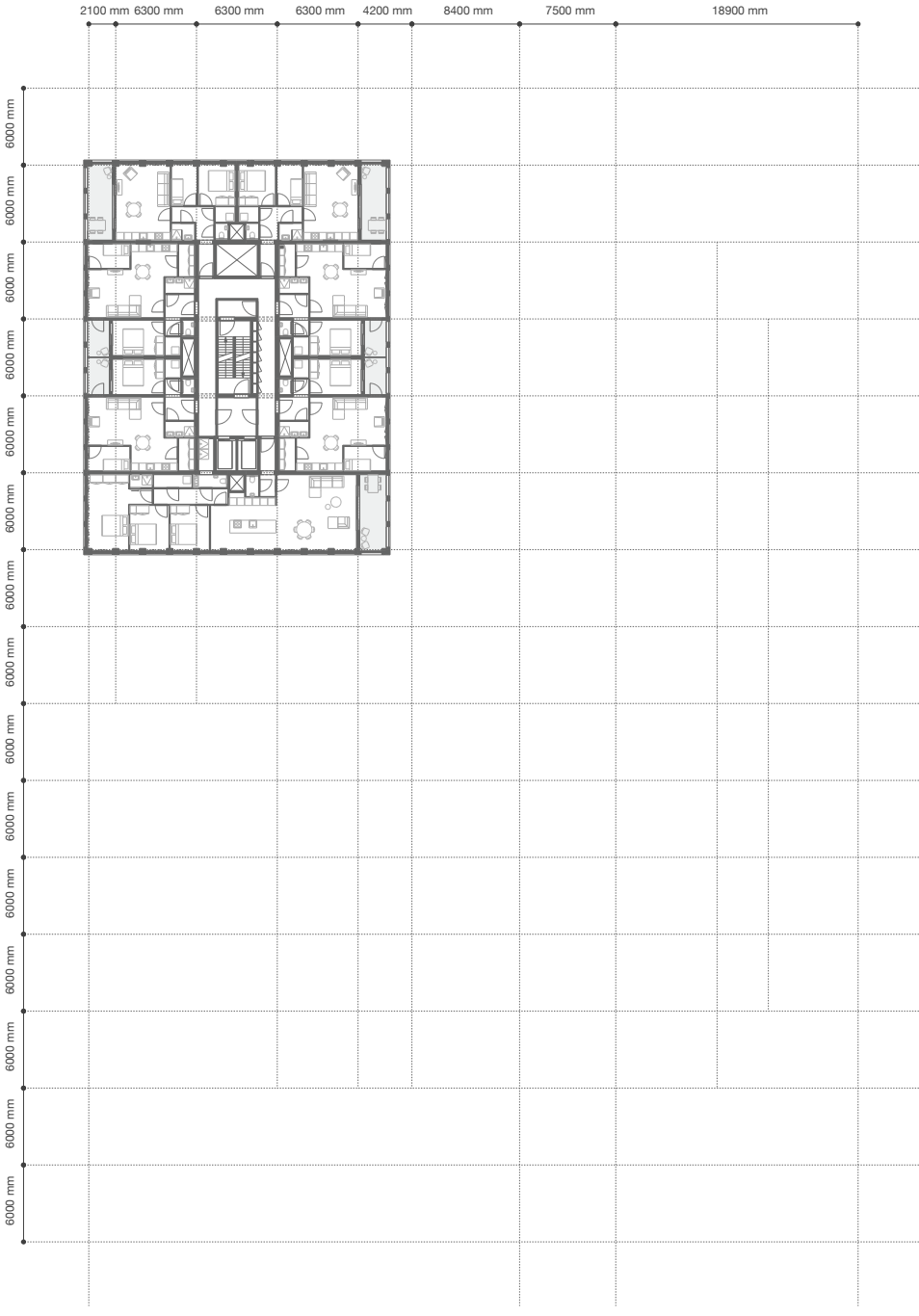
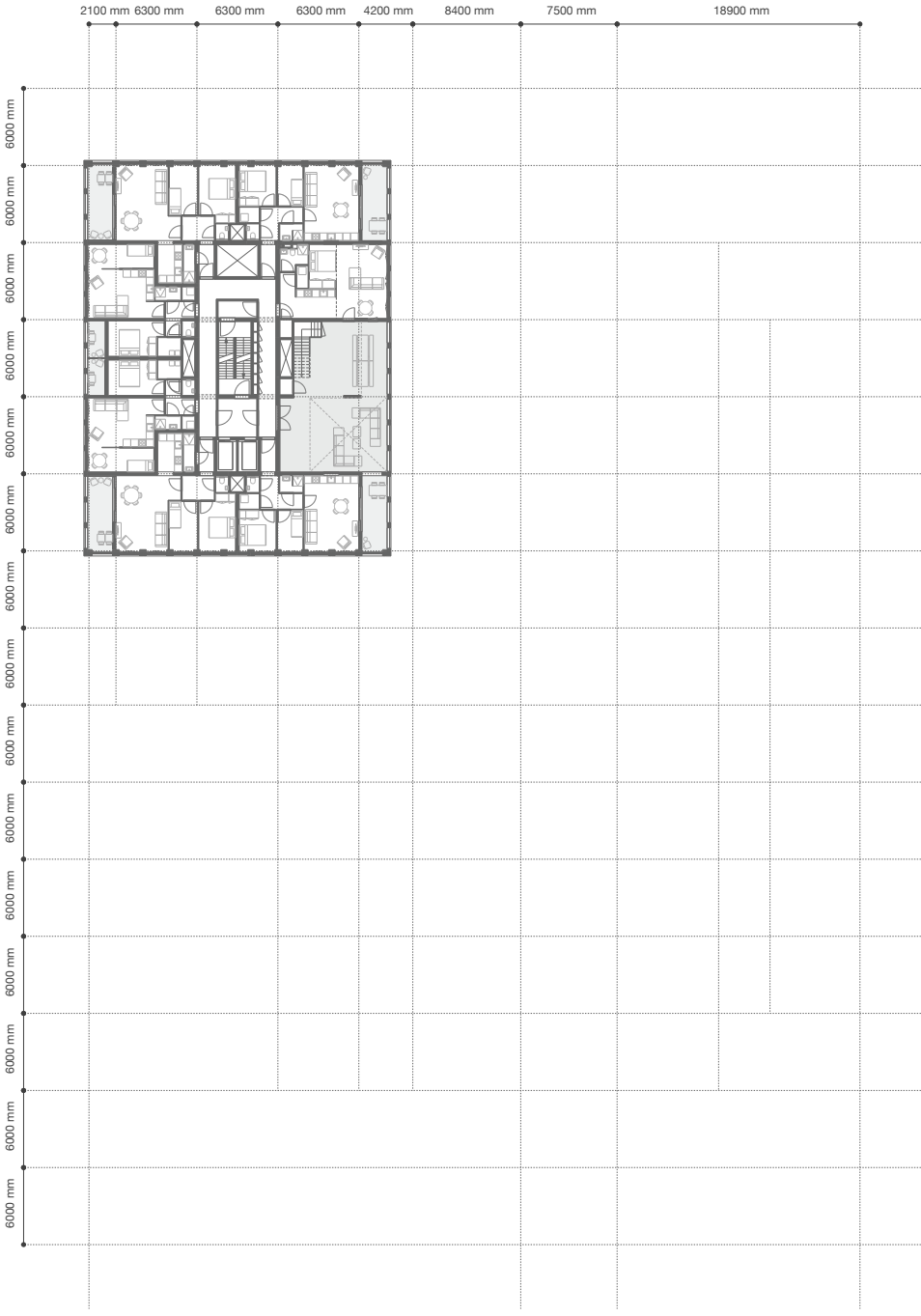
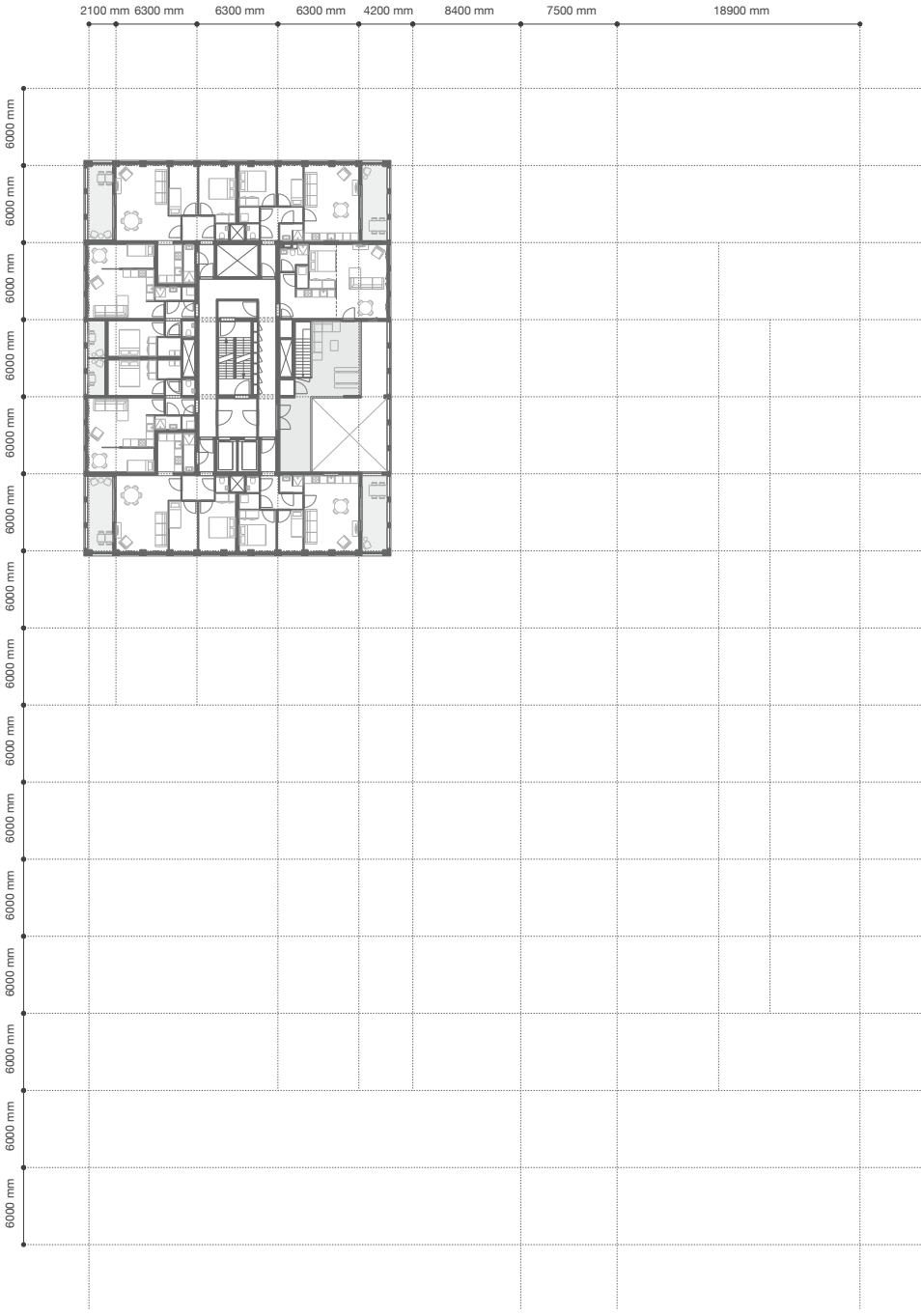
16 +48000



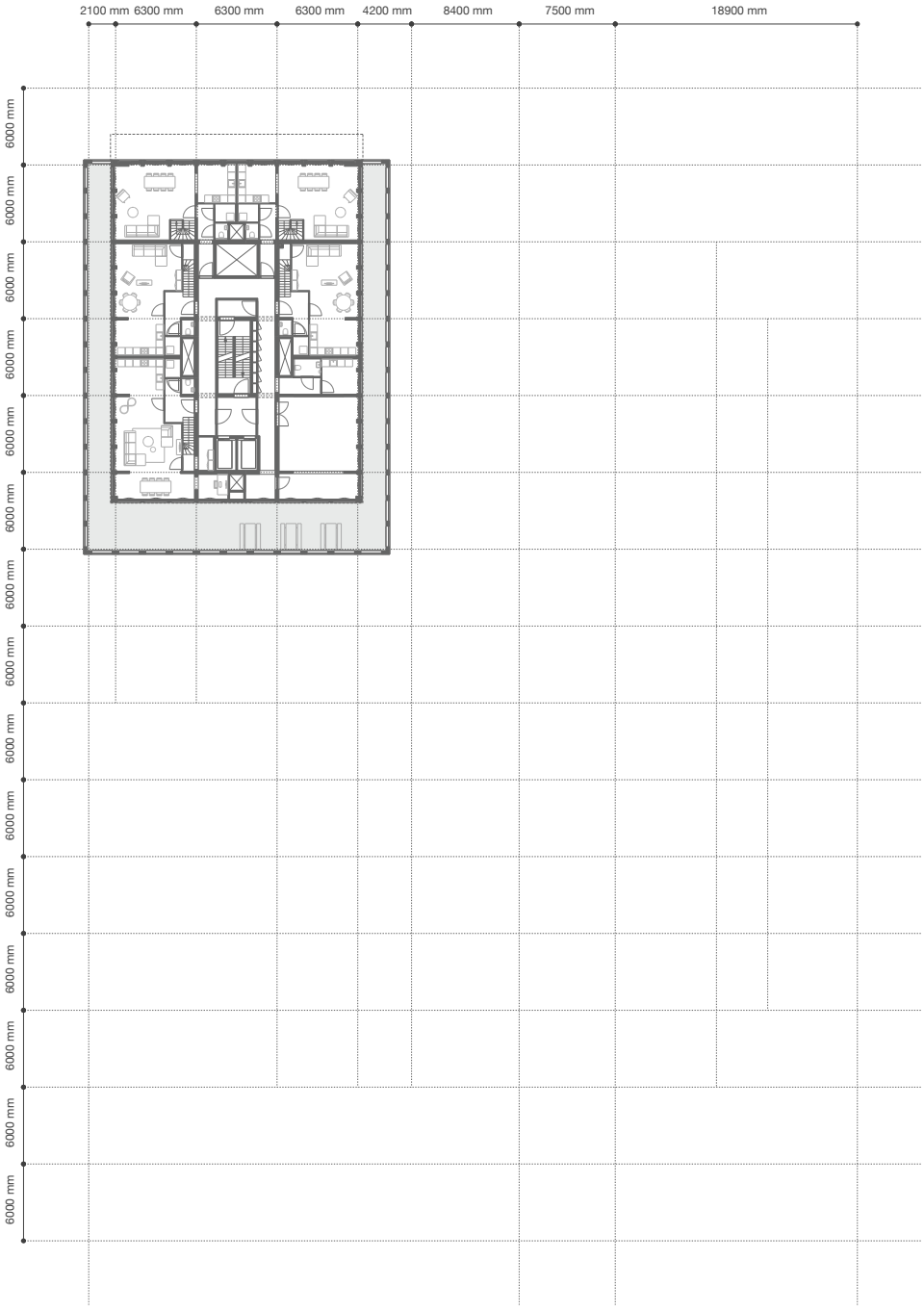
17 +51000
20 +60000
23 +69000



18 +54000
21 +63000



19 +57000
22 +66000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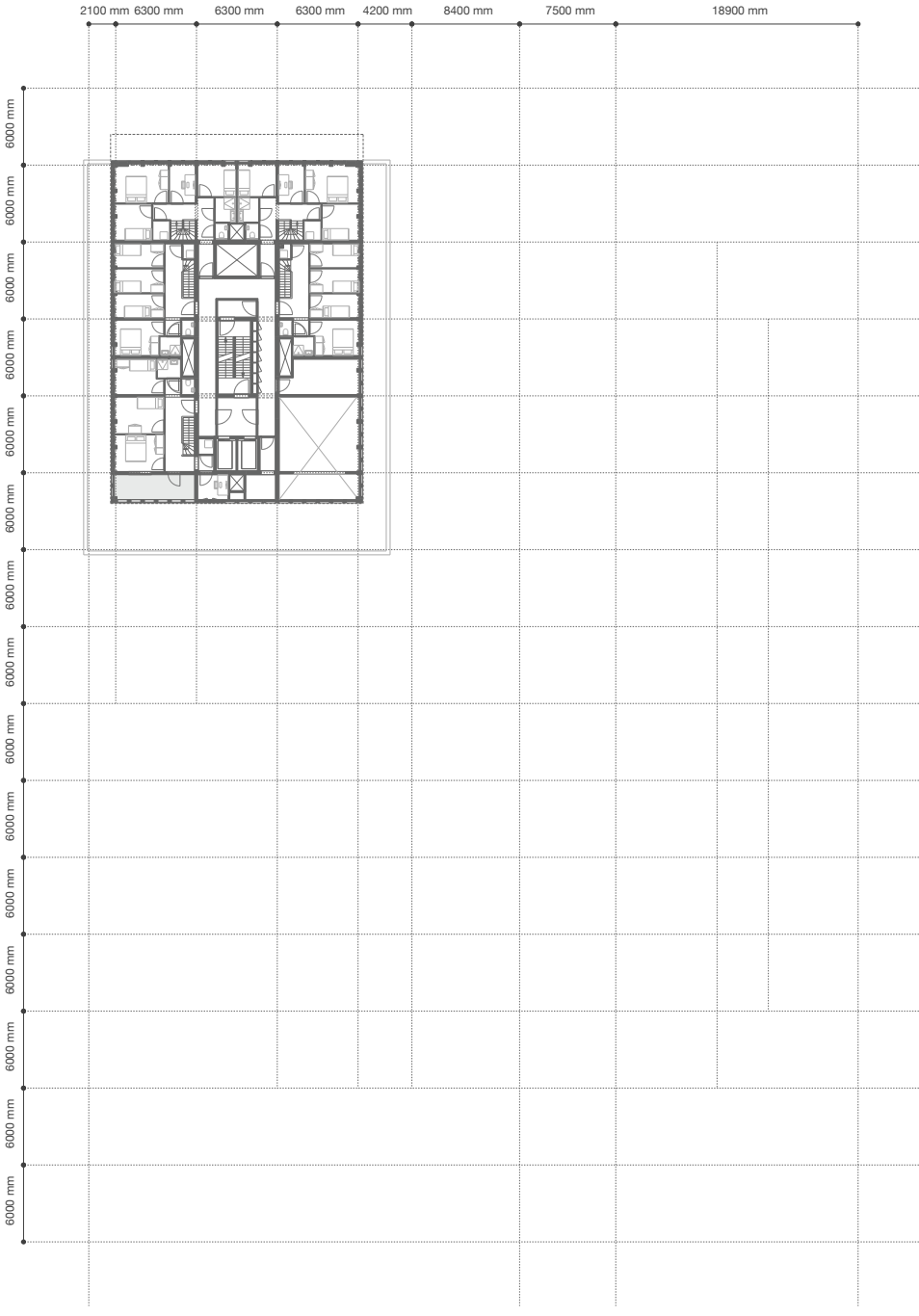
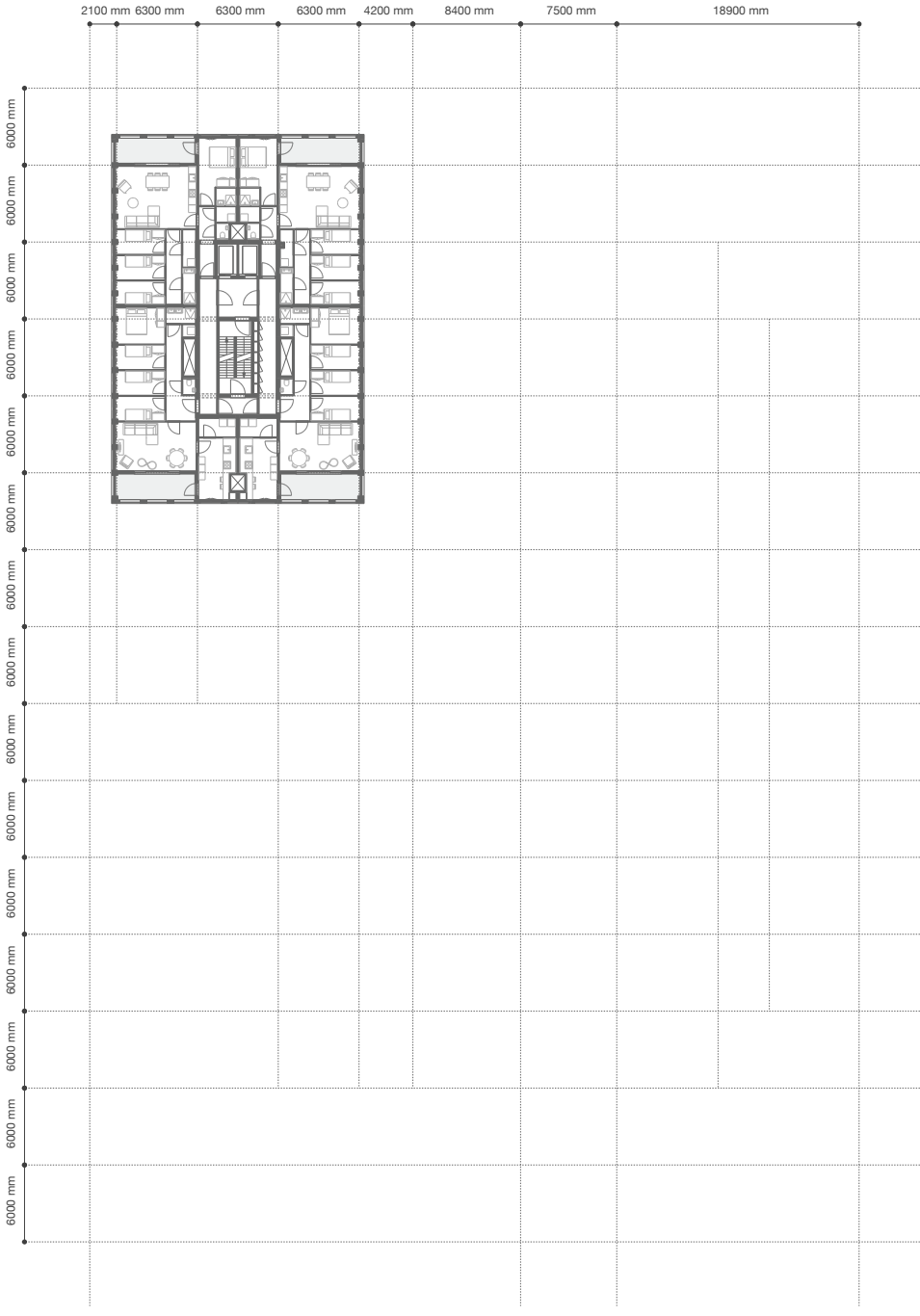
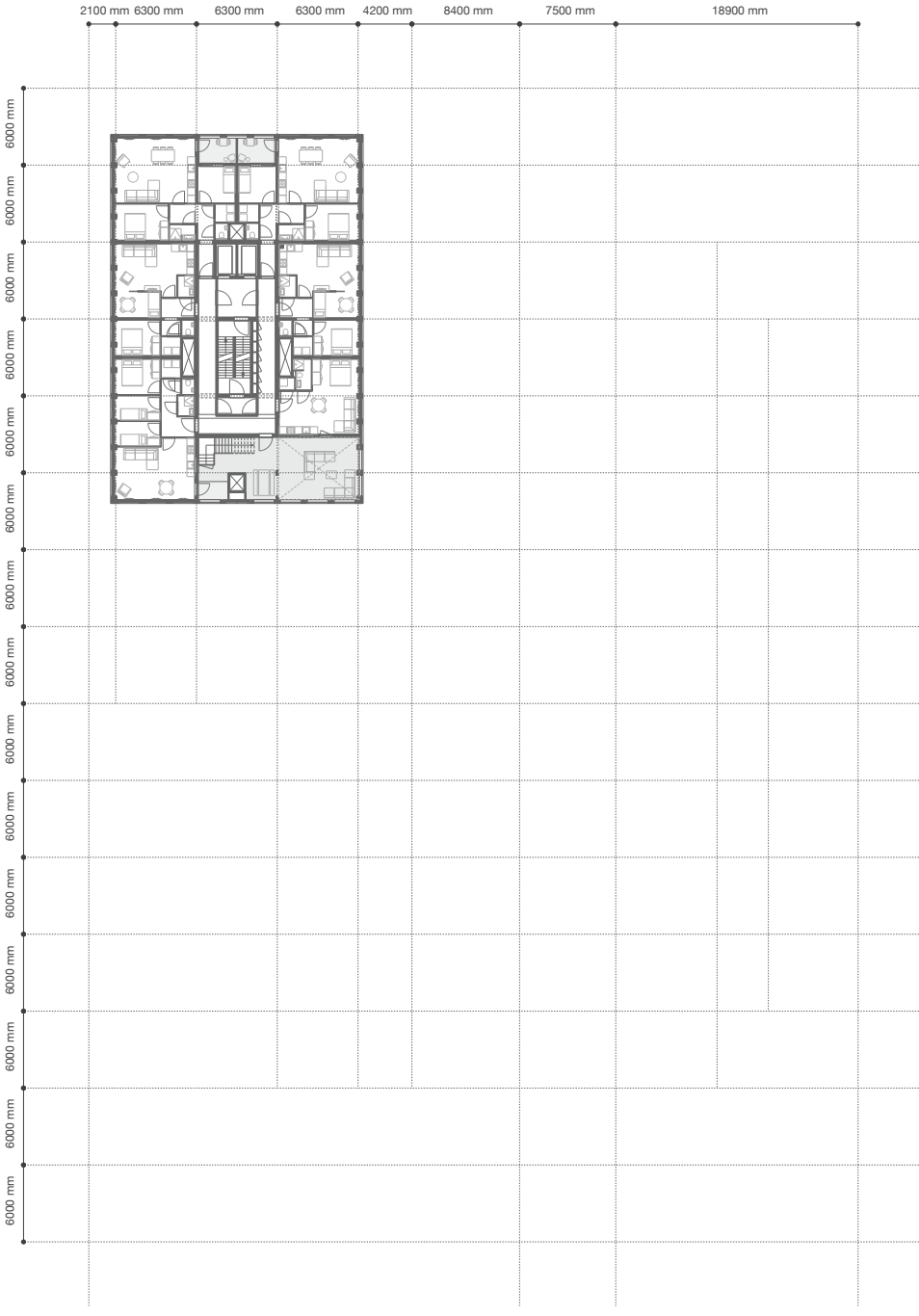
24 +72000


2100 mm
6300 mm
6300 mm
6300 mm
4200 mm
8400 mm
7500 mm
18900 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm
6000 mm

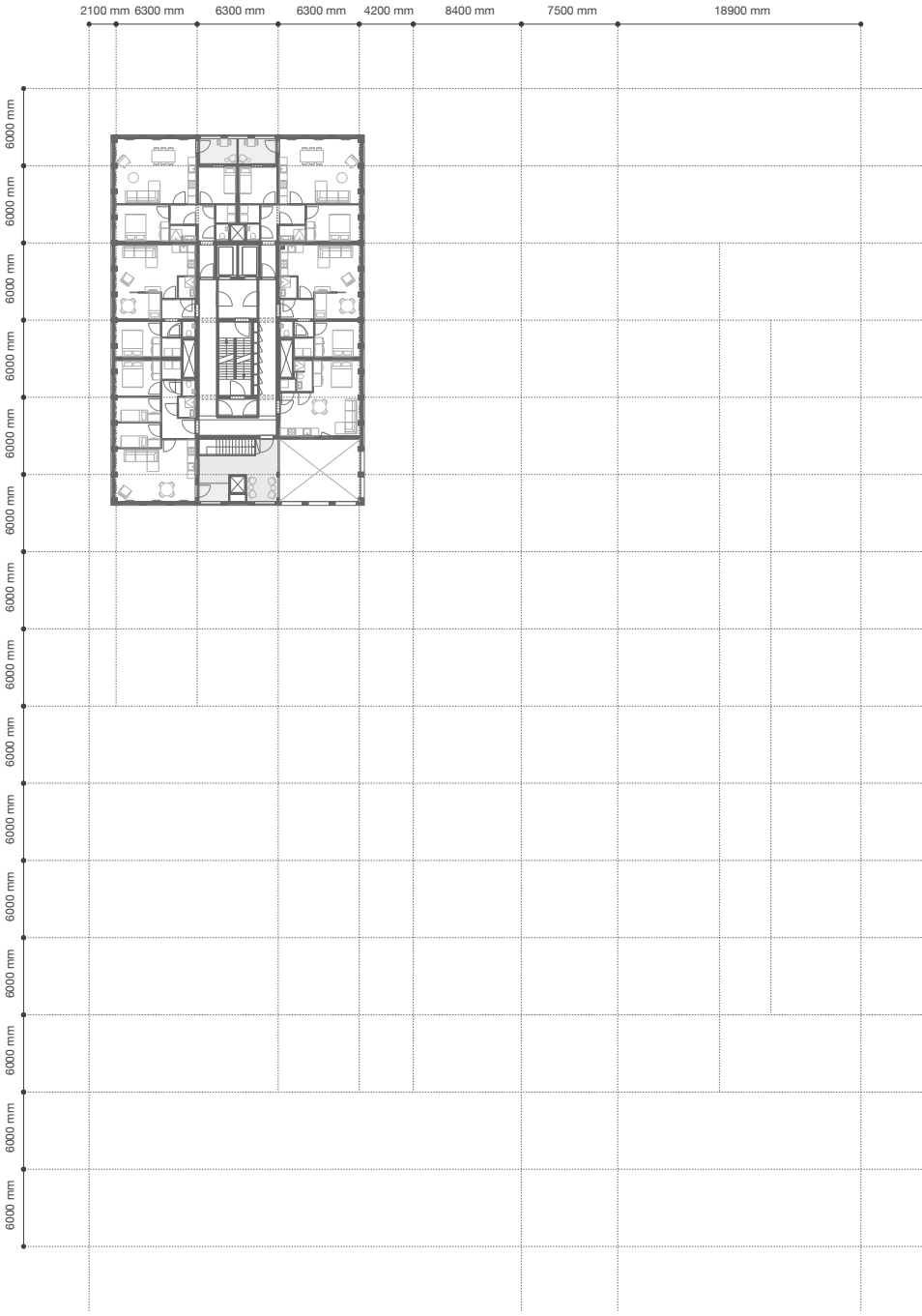
25 +75000



26 +78000
30 +90000
34 +102000



27 +81000
31 +93000
35 +15000



28 +84000
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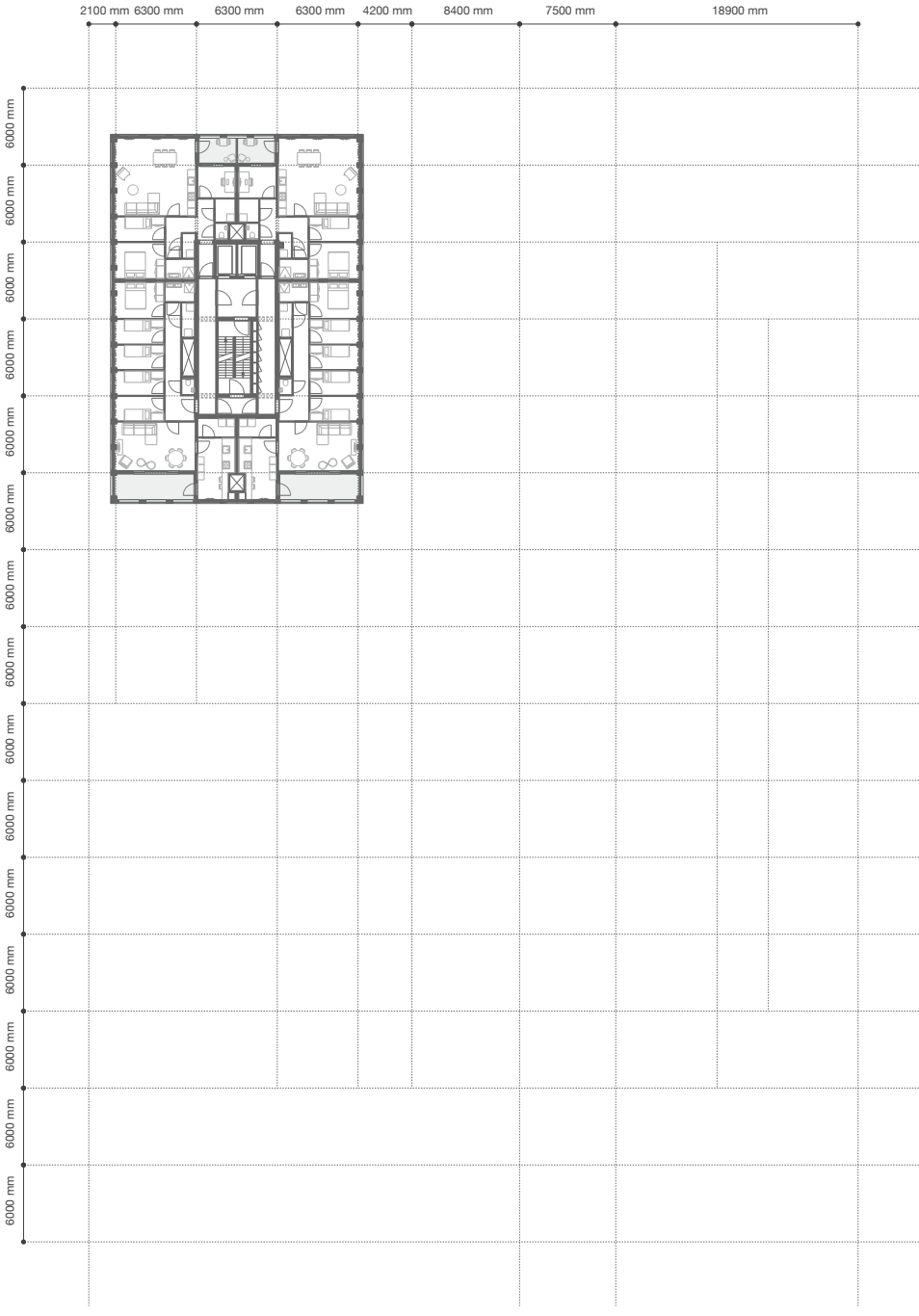
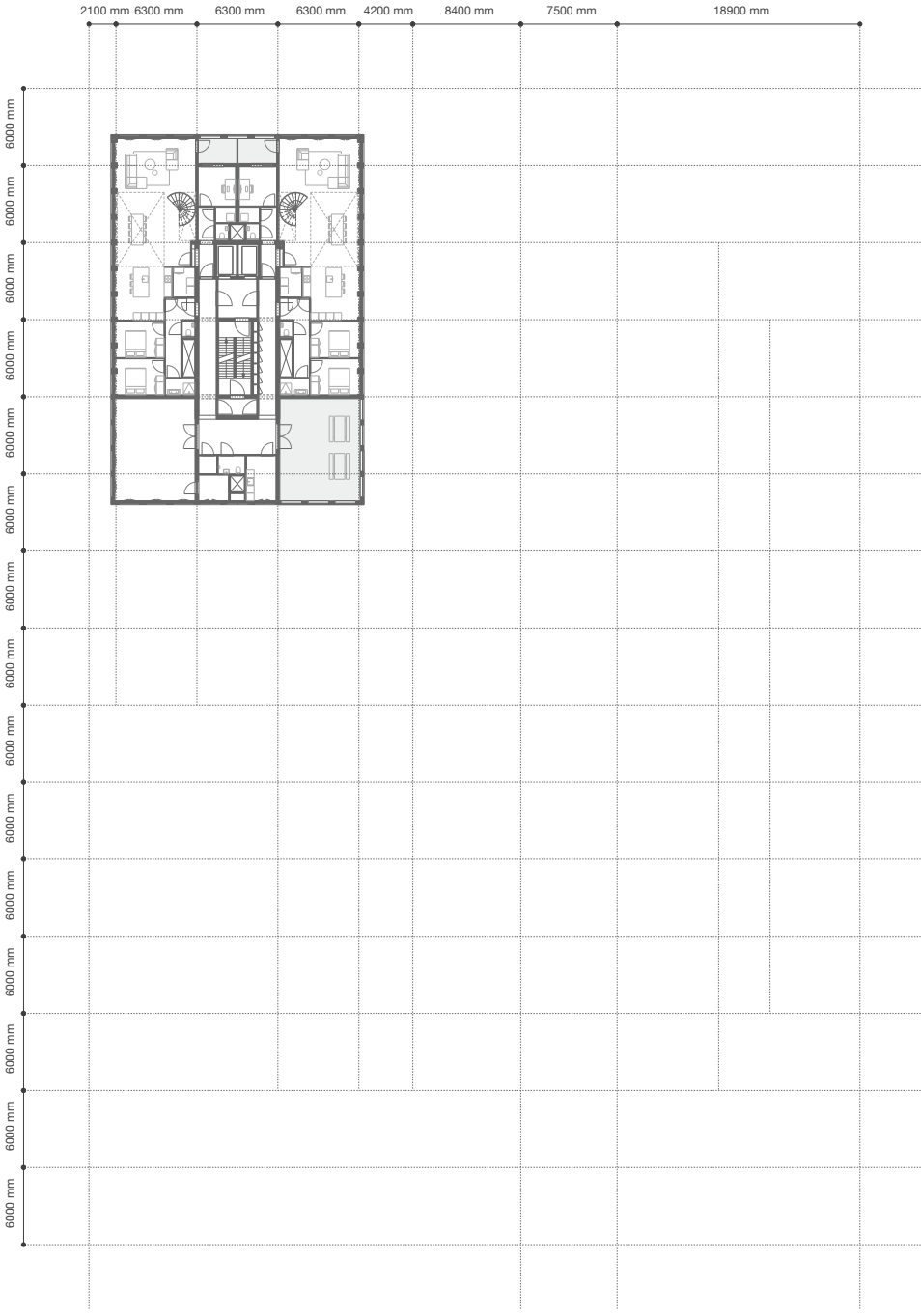


29 +87000
33 +99000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6300 mm
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18900 mm
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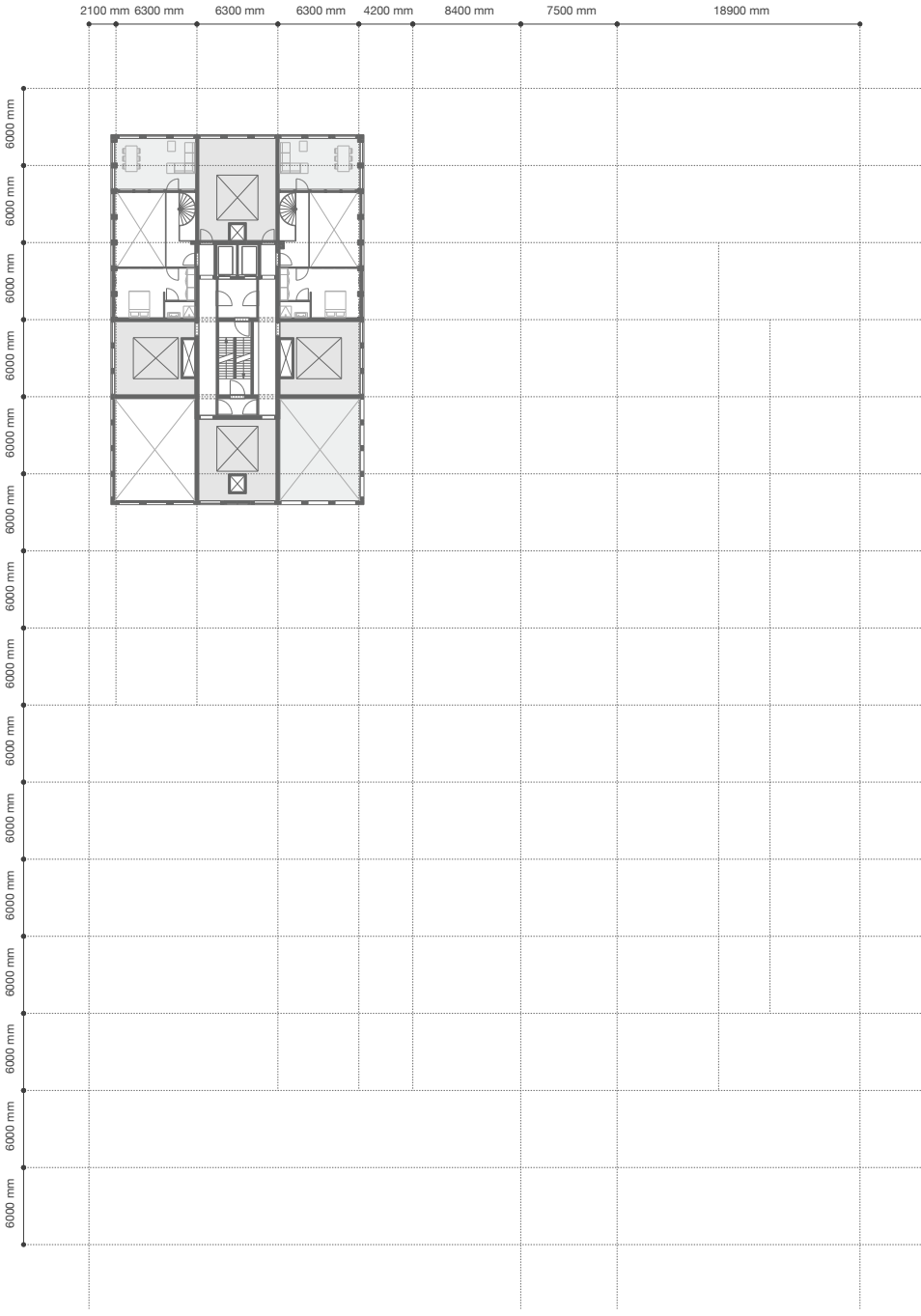
2100 mm
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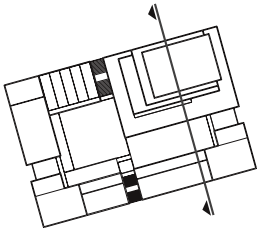
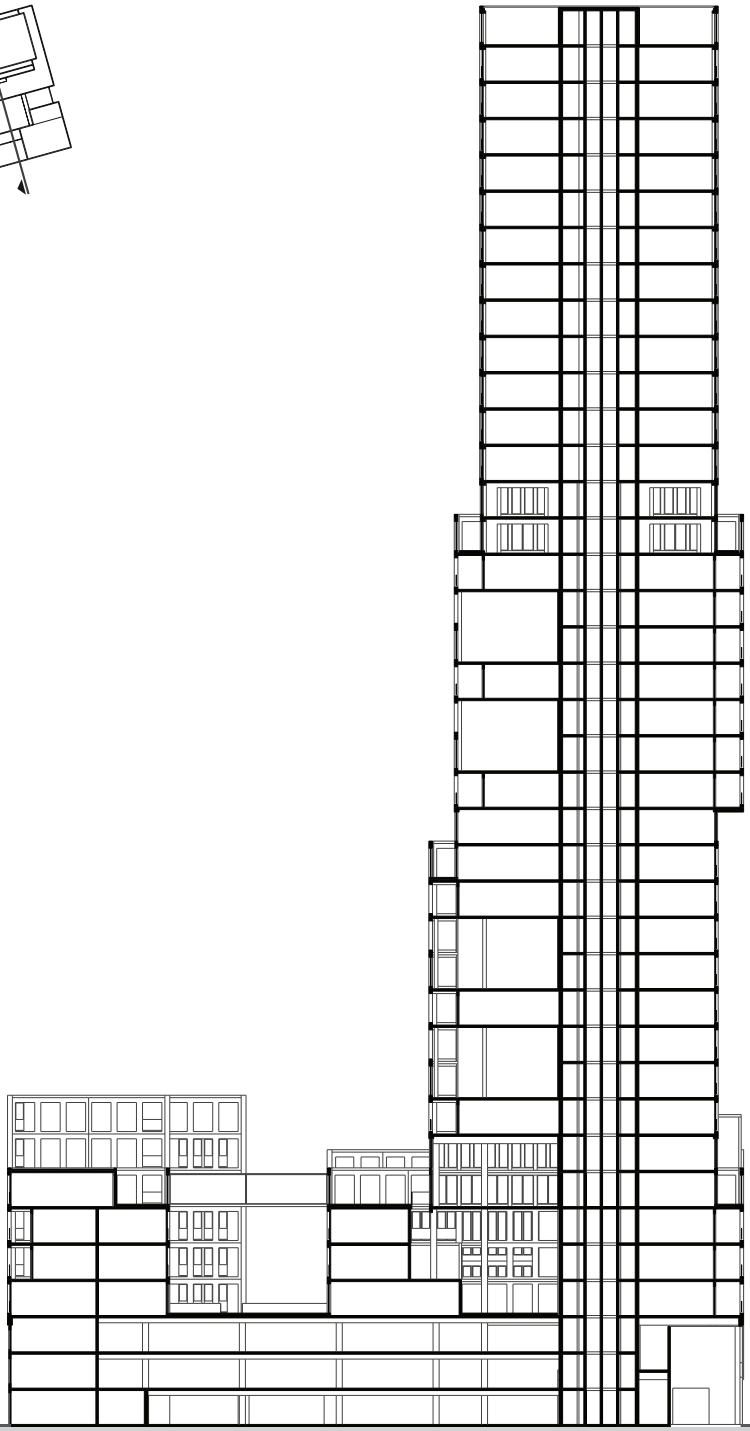
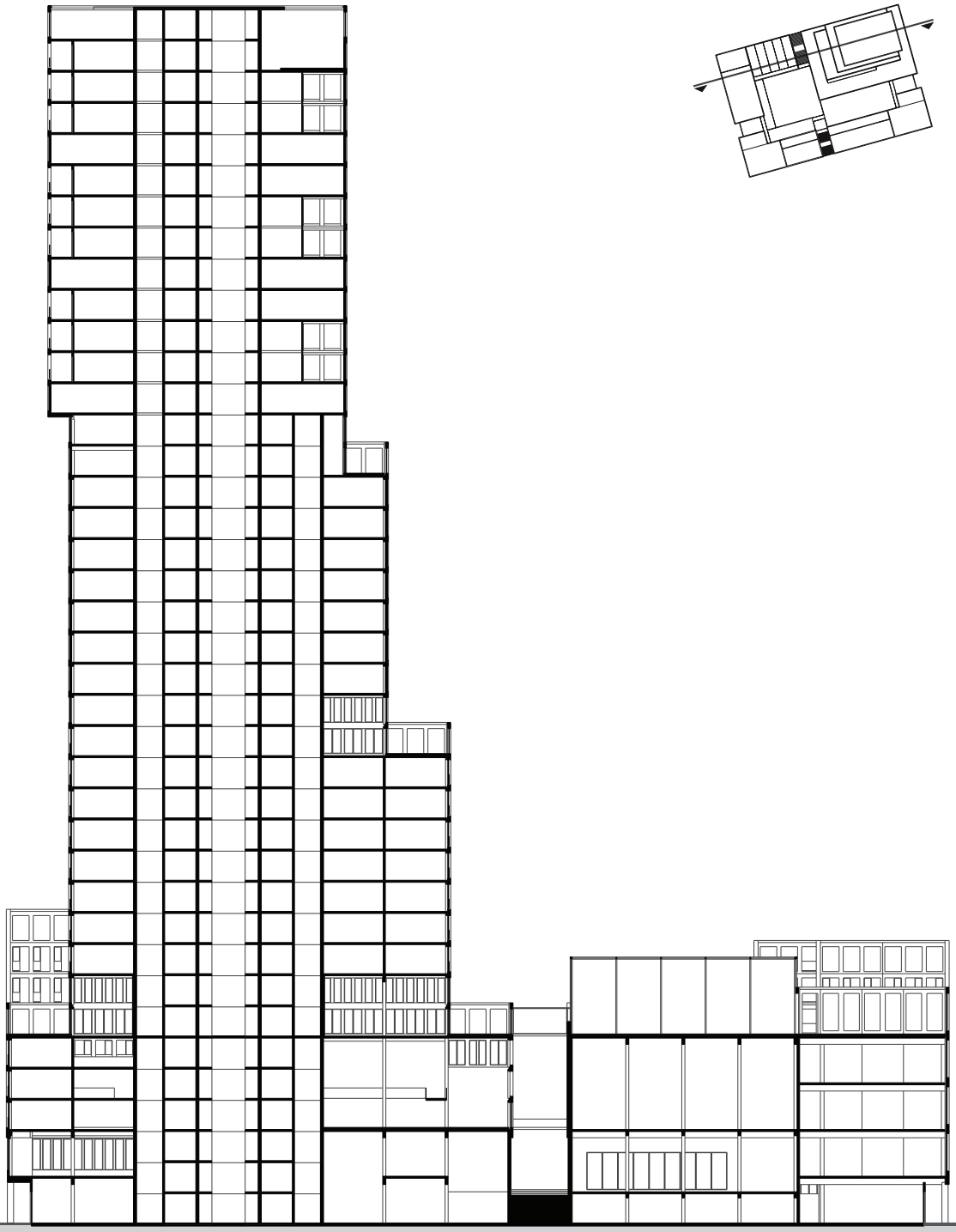
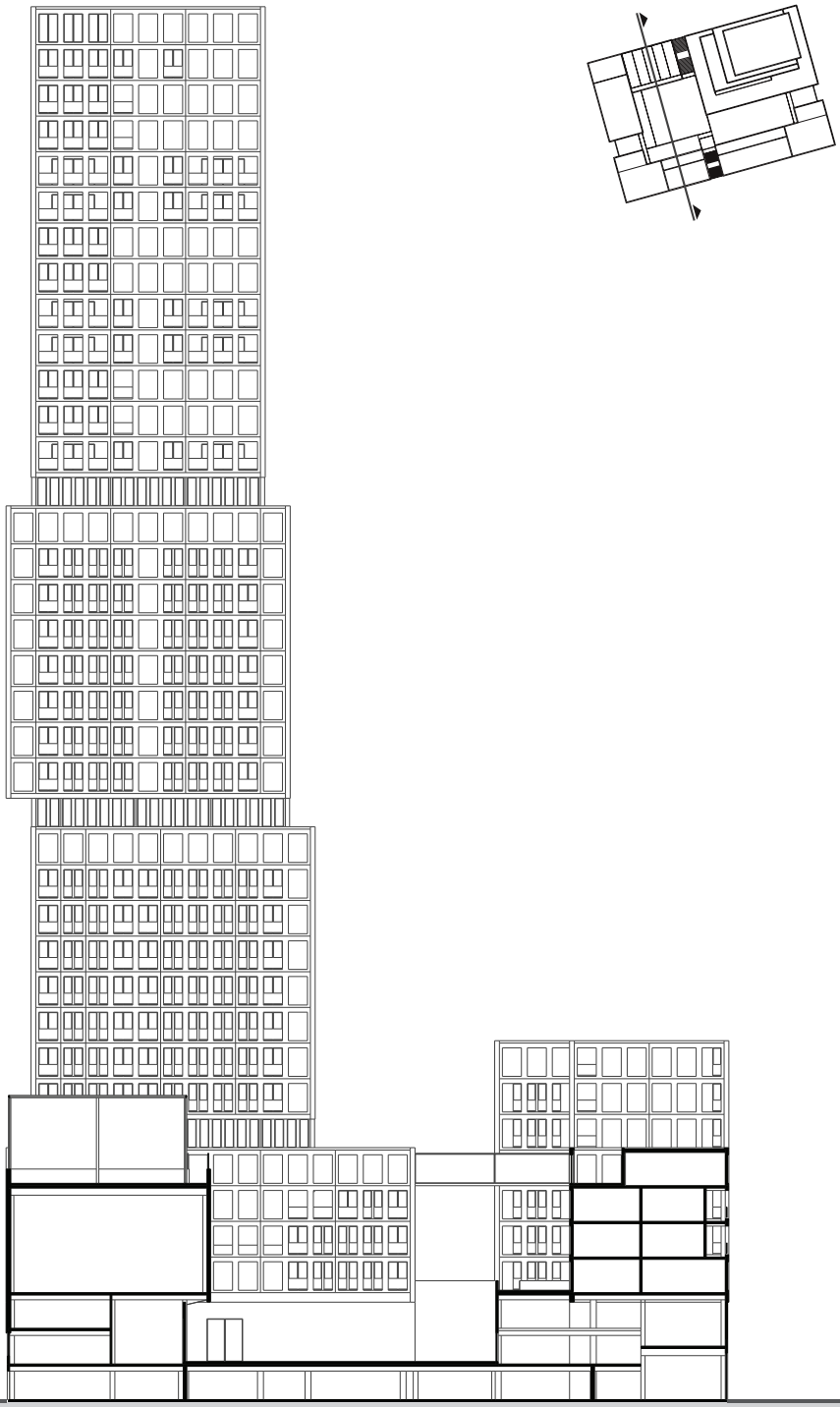
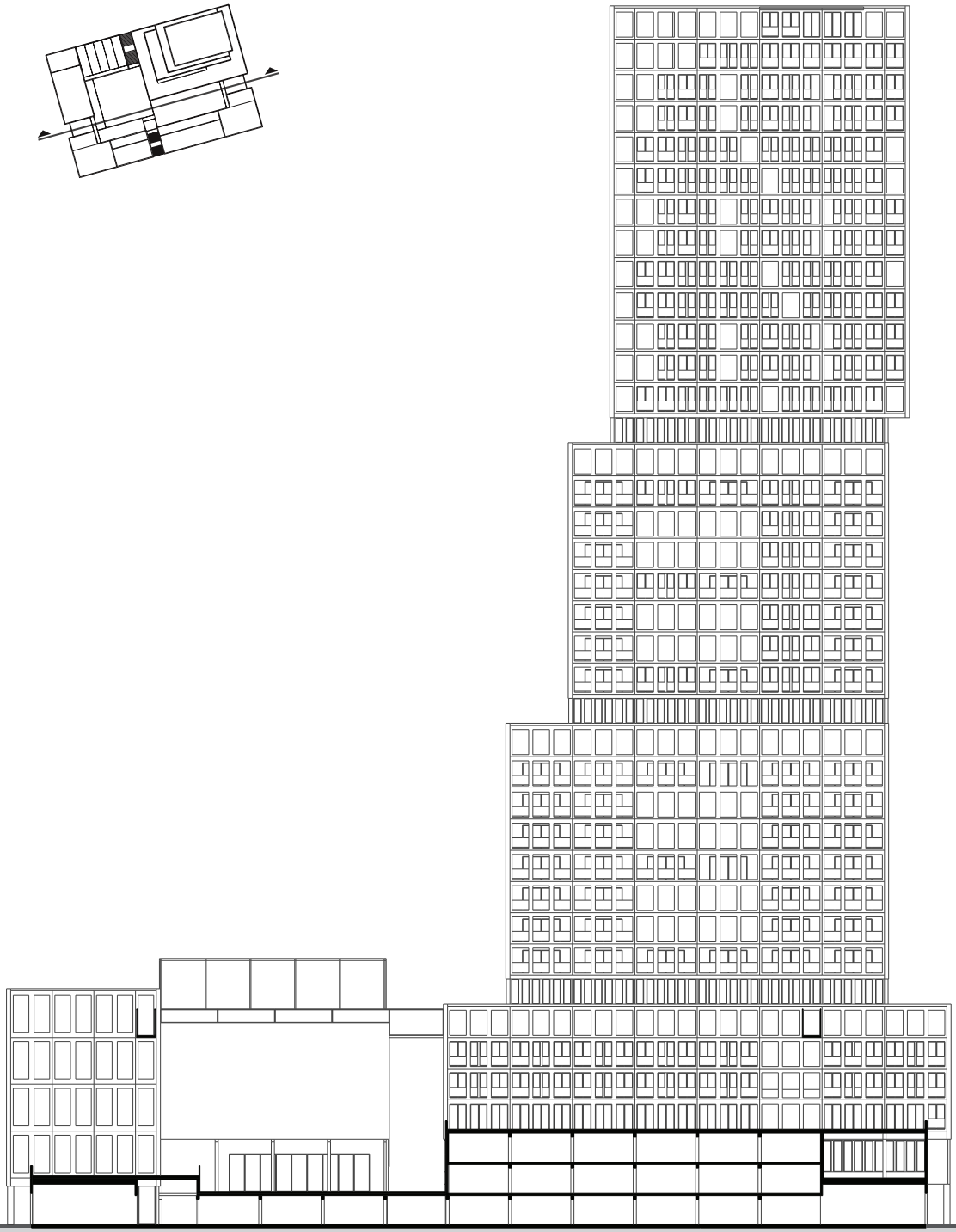
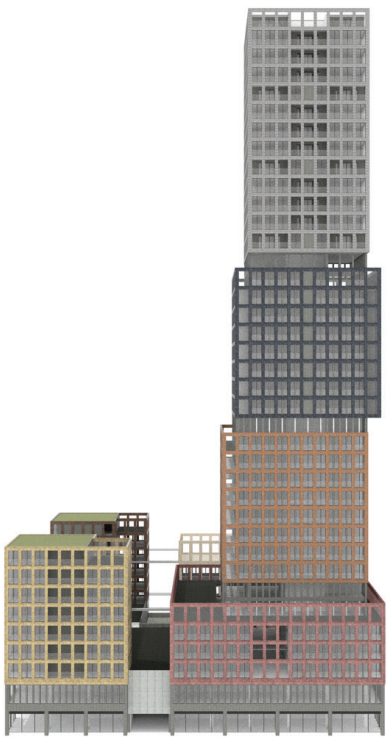




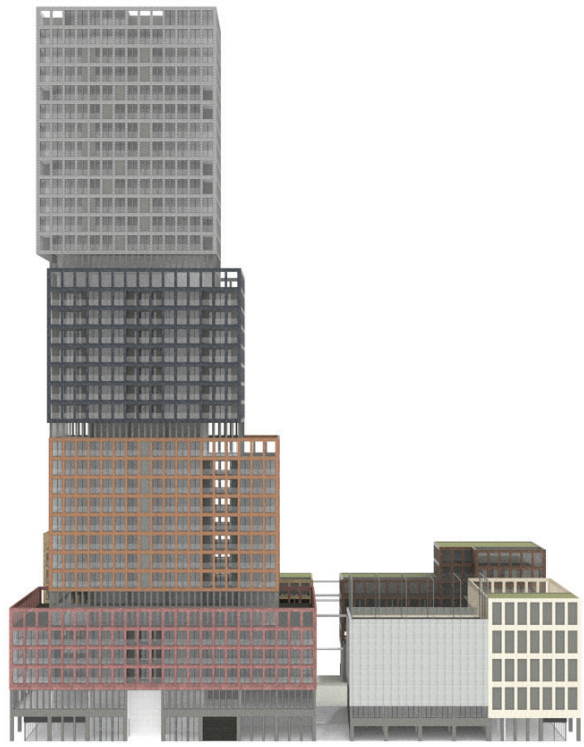






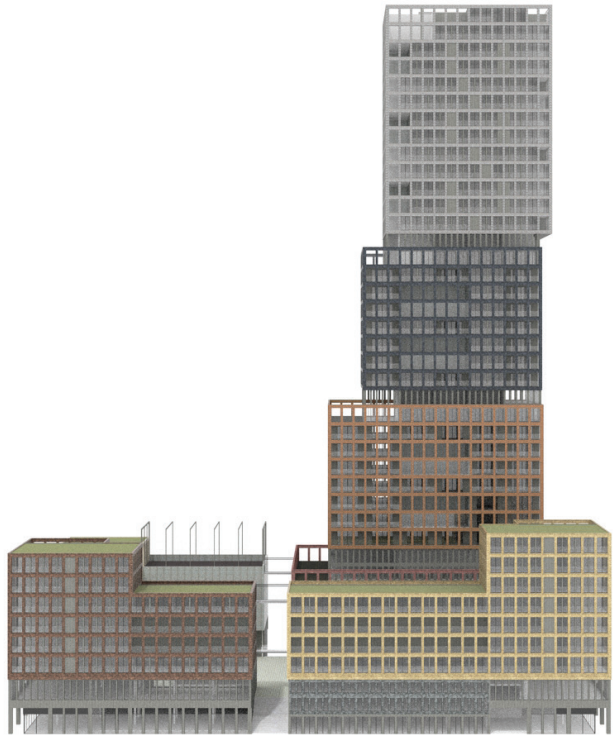


NORTH **EAST**



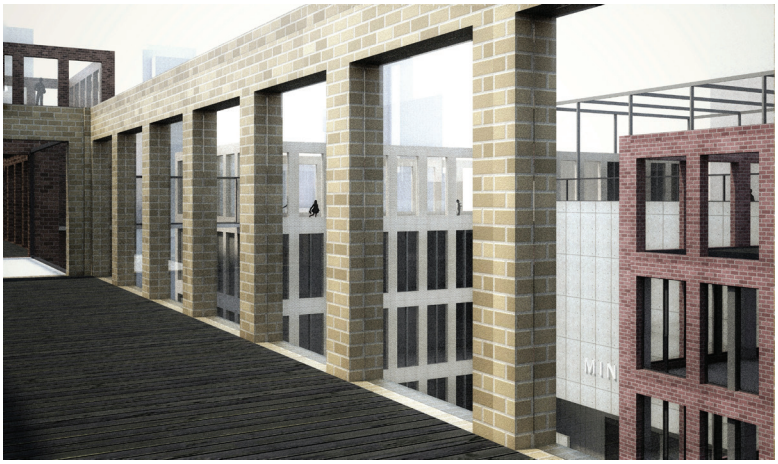
NORTH WEST

SOUTH **WEST**

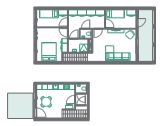


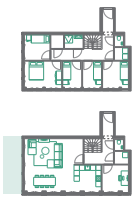
SOUTH EAST

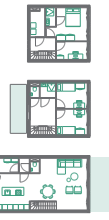
DWELLINGS

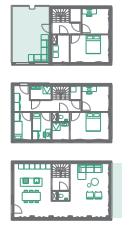


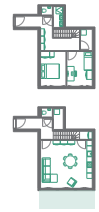
The building contains a total of 255 dwellings, varying in size and consequently in affordability. Each dwelling is designed with the target group in mind, hence for example smaller but more bedrooms, a relatively small bathroom and a slightly larger hallway to store a stroller. To maintain a degree of flexibility, the smaller bedrooms are mostly situated next to the living room. This allows for a change in floor plan, to create for example a larger living room, more bedrooms or larger bedrooms.

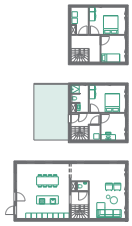


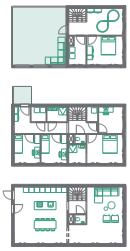


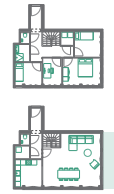


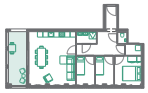


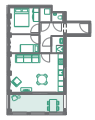


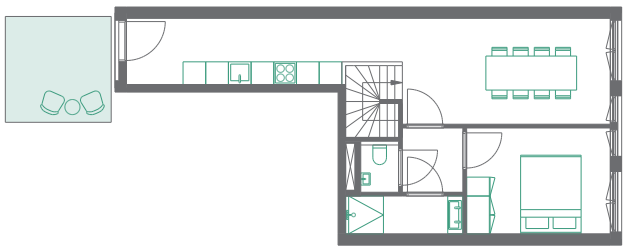


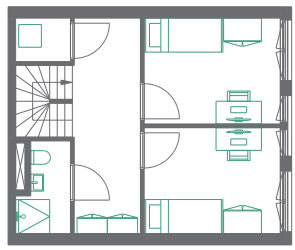


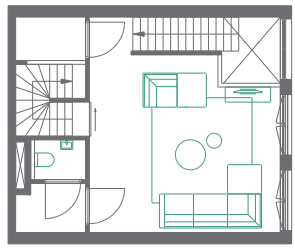


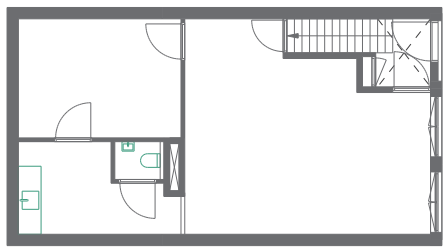


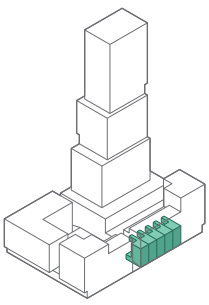












MIXED-USE

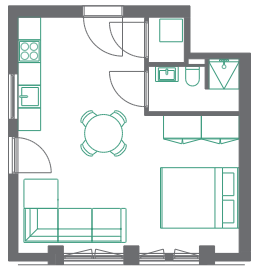
5 DWELLINGS

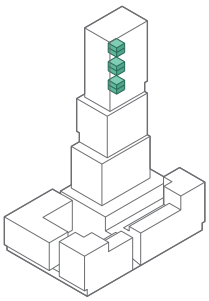
131,4 M² INDOOR SPACE

57,8 M² COMMERCIAL SPACE

7,9 M² OUTDOOR SPACE

3-4 BEDROOMS



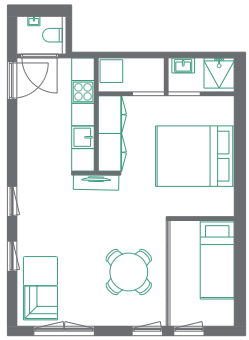


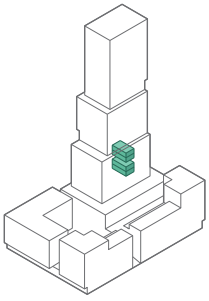
STUDIO

6 DWELLINGS

34,8 M² INDOOR SPACE

1 BEDROOM



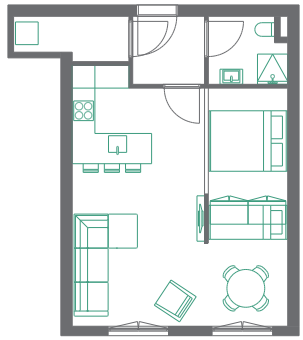


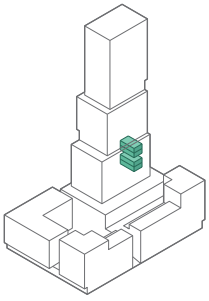
STUDIO

4 DWELLINGS

42,2 M^2 INDOOR SPACE

1-2 BEDROOMS



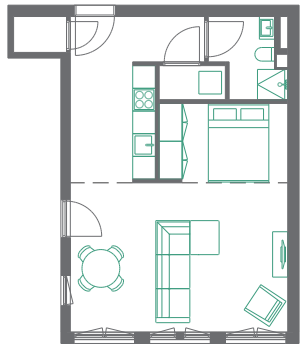


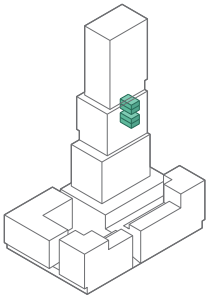
STUDIO

4 DWELLINGS

48,0 M² INDOOR SPACE

1-2 BEDROOMS



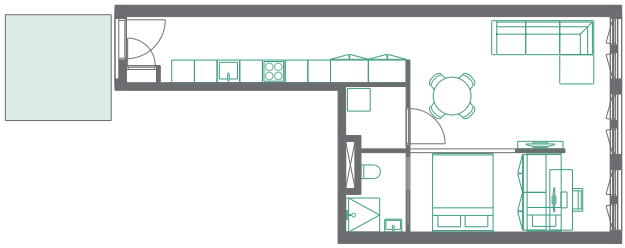


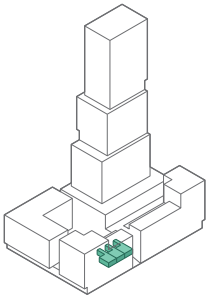
STUDIO

4 DWELLINGS

49,0 M² INDOOR SPACE

1 BEDROOM





STUDIO

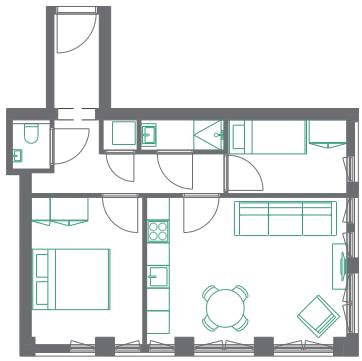
3 DWELLINGS

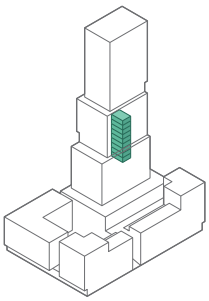
49,4 M² INDOOR SPACE

7,9 M² OUTDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





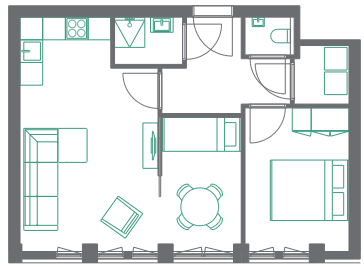
APARTMENT

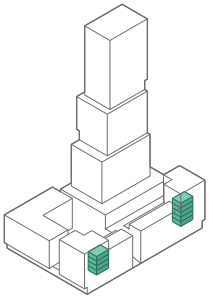
4 DWELLINGS

49,6 M² INDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





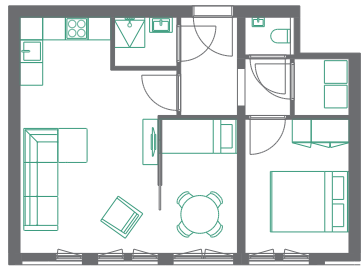
APARTMENT

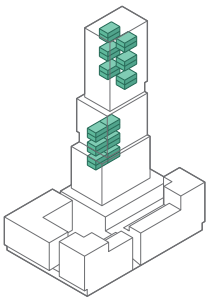
9 DWELLINGS

49,7 M² INDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





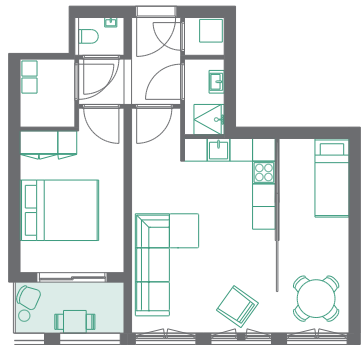
APARTMENT

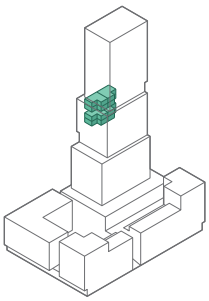
24 DWELLINGS

50,0 M^2 INDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





APARTMENT

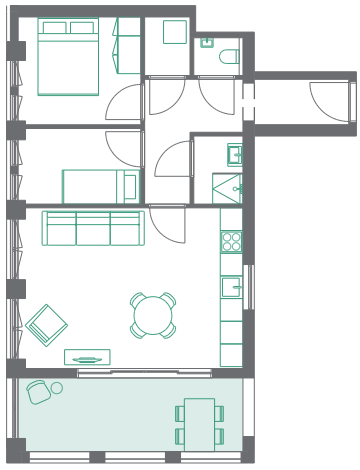
8 DWELLINGS

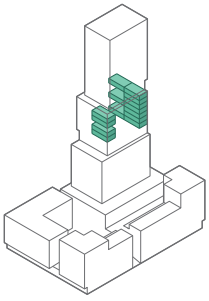
54,7 M² INDOOR SPACE

4,0 M² OUTDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





APARTMENT

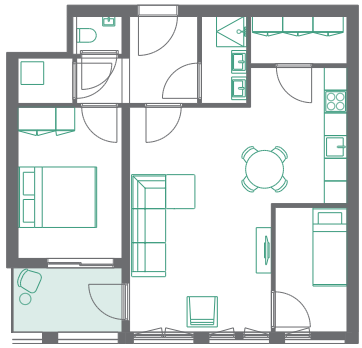
14 DWELLINGS

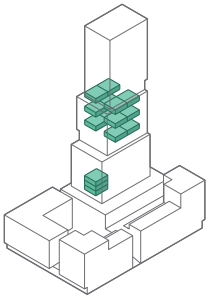
57,9 M² INDOOR SPACE

11,5 M² OUTDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





APARTMENT

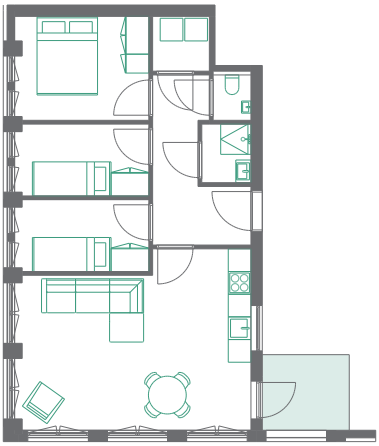
15 DWELLINGS

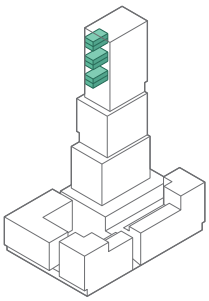
64,3 M² INDOOR SPACE

4,9 M² OUTDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





APARTMENT

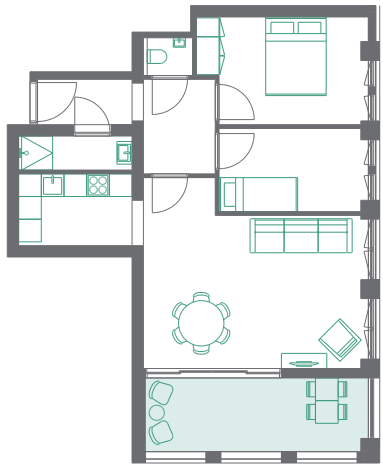
6 DWELLINGS

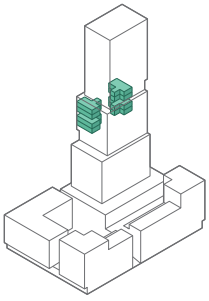
66,8 M² INDOOR SPACE

4,0 M² OUTDOOR SPACE

1-3 BEDROOMS

0 1 2 5 10





APARTMENT

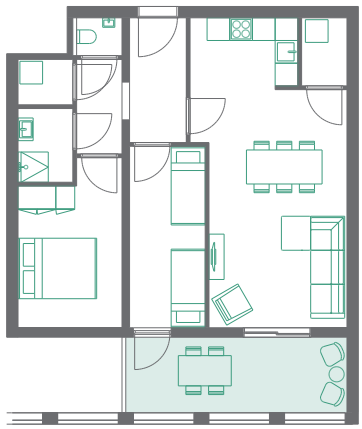
8 DWELLINGS

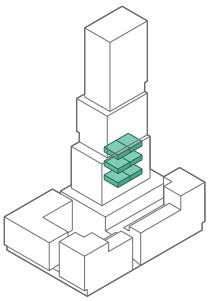
66,9 M^2 INDOOR SPACE

11,4 M^2 OUTDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





APARTMENT

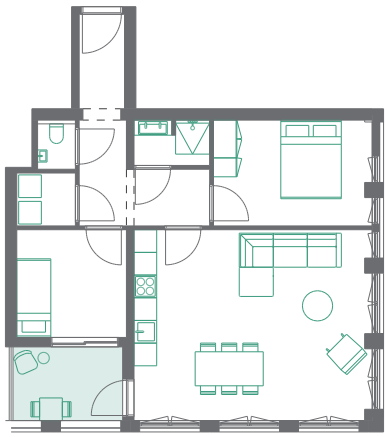
6 DWELLINGS

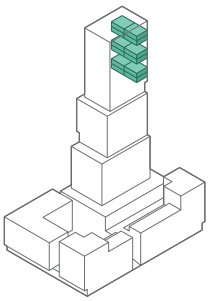
68,3 M² INDOOR SPACE

11,7 M² OUTDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





APARTMENT

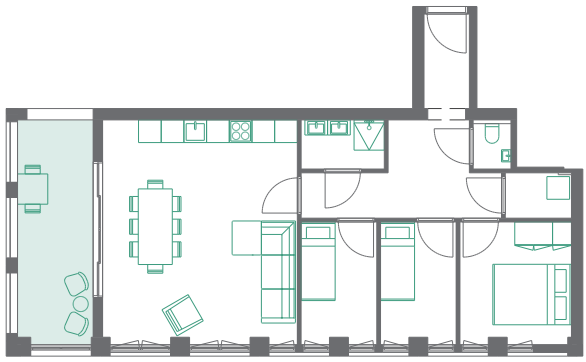
12 DWELLINGS

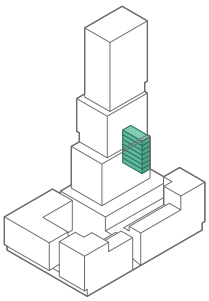
69,6 M² INDOOR SPACE

5,7 M² OUTDOOR SPACE

1-2 BEDROOMS

0 1 2 5 10





APARTMENT

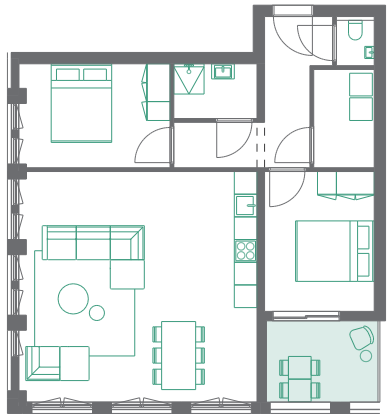
7 DWELLINGS

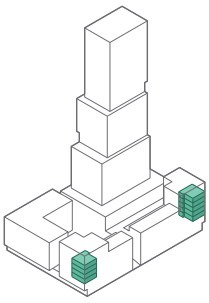
74,8 M² INDOOR SPACE

11,8 M² OUTDOOR SPACE

1-3 BEDROOMS

0 1 2 5 10





APARTMENT

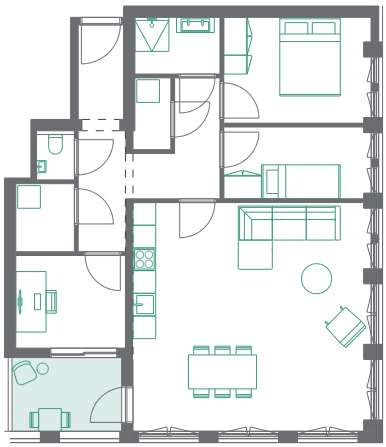
9 DWELLINGS

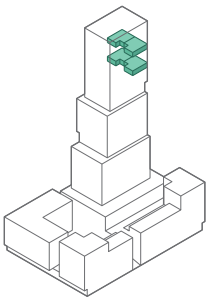
79,2 M² INDOOR SPACE

6,3 M² OUTDOOR SPACE

1-3 BEDROOMS

0 1 2 5 10





APARTMENT

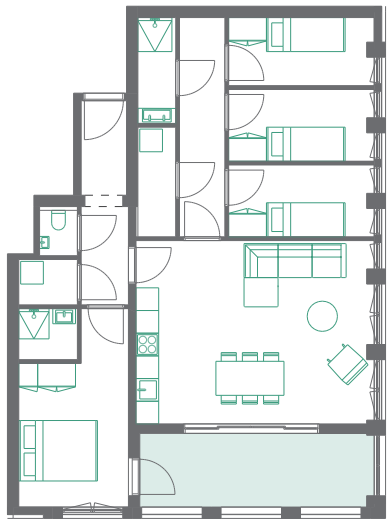
4 DWELLINGS

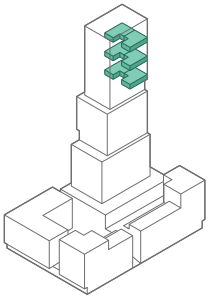
88,3 M² INDOOR SPACE

5,7 M² OUTDOOR SPACE

1-3 BEDROOMS

0 1 2 5 10





APARTMENT

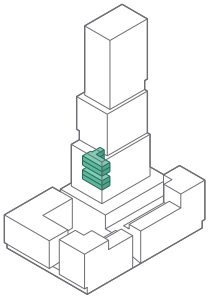
6 DWELLINGS

93,2 M² INDOOR SPACE

12,0 M² OUTDOOR SPACE

2-4 BEDROOMS

0 1 2 5 10



APARTMENT

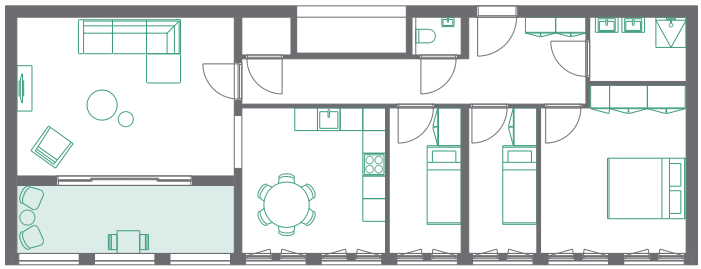
4 DWELLINGS

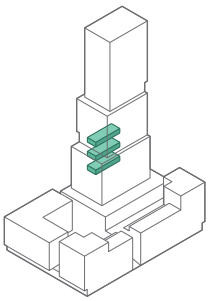
93,5 M² INDOOR SPACE

11,8 M² OUTDOOR SPACE

1-3 BEDROOMS

0 1 2 5 10





APARTMENT

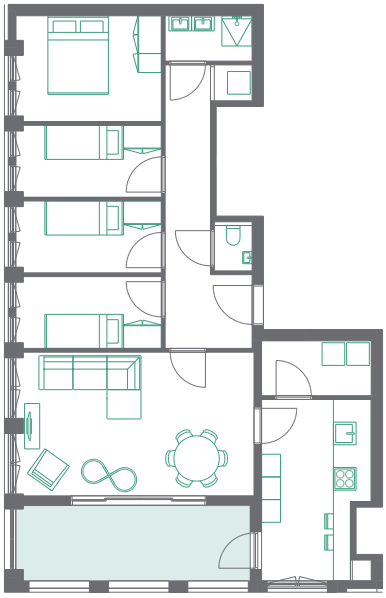
3 DWELLINGS

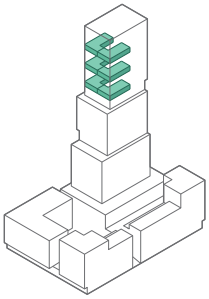
93,5 M² INDOOR SPACE

10,3 M² OUTDOOR SPACE

1-3 BEDROOMS

0 1 2 5 10





APARTMENT

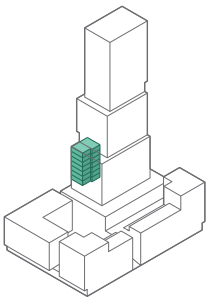
6 DWELLINGS

93,8 M² INDOOR SPACE

12,3 M² OUTDOOR SPACE

1-4 BEDROOMS

0 1 2 5 10



APARTMENT

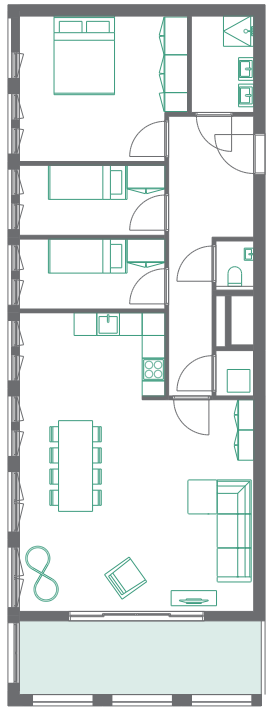
7 DWELLINGS

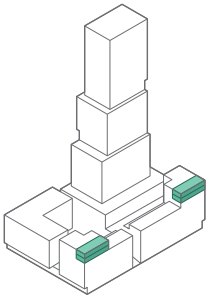
94,0 M² INDOOR SPACE

11,3 M² OUTDOOR SPACE

2-3 BEDROOMS

0 1 2 5 10





APARTMENT

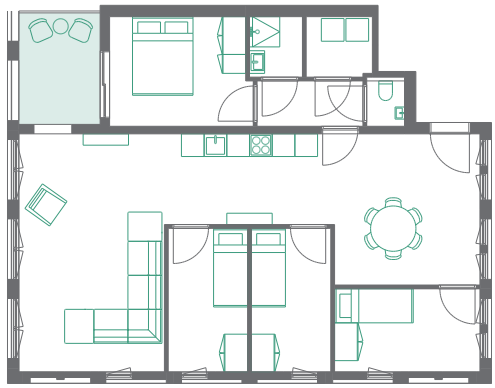
9 DWELLINGS

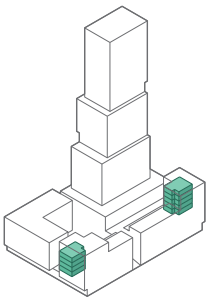
96,5 M² INDOOR SPACE

12,5 M² OUTDOOR SPACE

1-4 BEDROOMS

0 1 2 5 10





APARTMENT

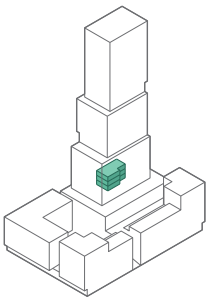
9 DWELLINGS

98,6 M² INDOOR SPACE

6,3 M² OUTDOOR SPACE

1-5 BEDROOMS

0 1 2 5 10



APARTMENT

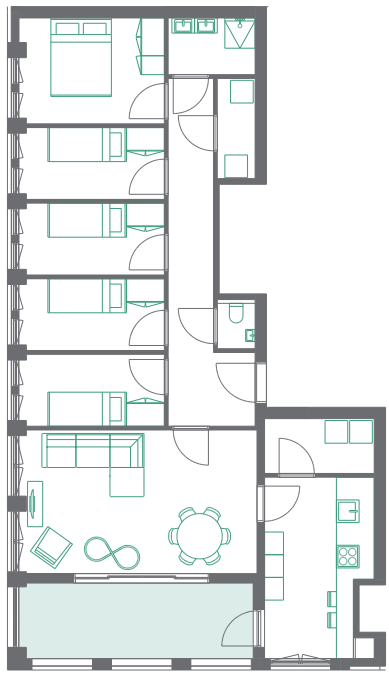
3 DWELLINGS

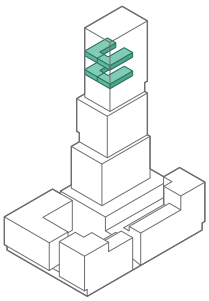
100,4 M² INDOOR SPACE

4,9 M² OUTDOOR SPACE

3 BEDROOMS

0 1 2 5 10





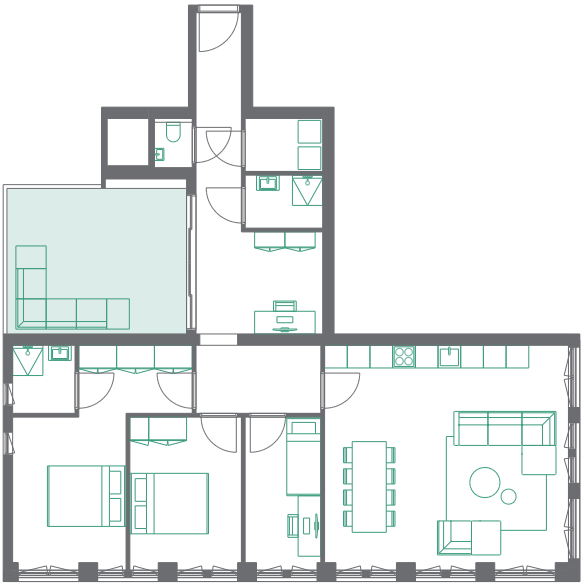
APARTMENT

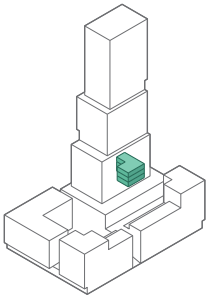
4 DWELLINGS

107,2 M² INDOOR SPACE

12,3 M² OUTDOOR SPACE

1-5 BEDROOMS





APARTMENT

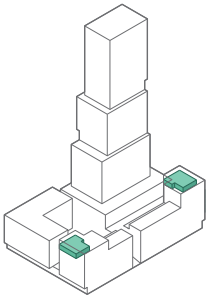
3 DWELLINGS

111,7 M² INDOOR SPACE

18,3 M² OUTDOOR SPACE

1-4 BEDROOMS

0 1 2 5 10



APARTMENT

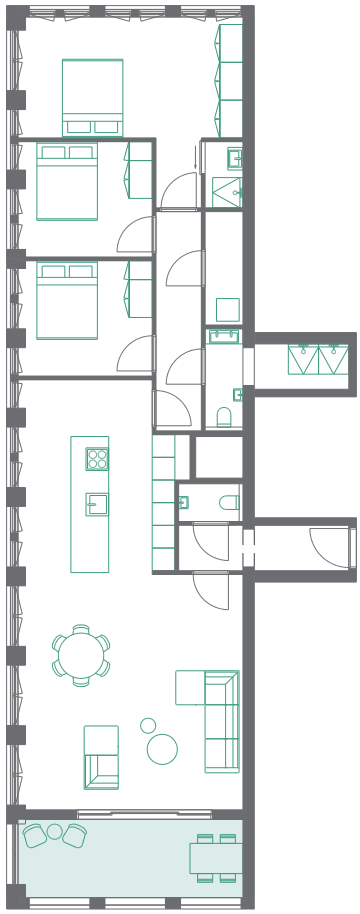
2 DWELLINGS

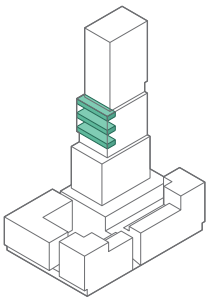
124,4 M² INDOOR SPACE

11,8 M² OUTDOOR SPACE

2-4 BEDROOMS

0 1 2 5 10





APARTMENT

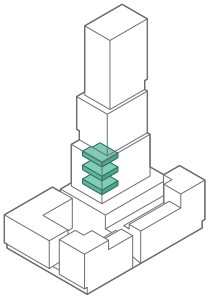
3 DWELLINGS

129,4 M² INDOOR SPACE

12,3 M² OUTDOOR SPACE

1-4 BEDROOMS

0 1 2 5 10



APARTMENT

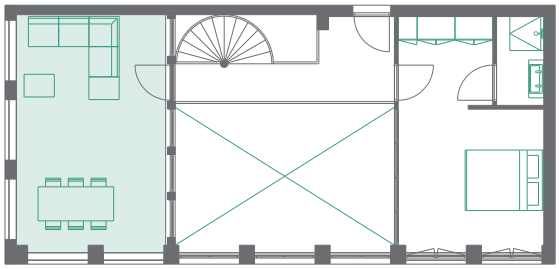
3 DWELLINGS

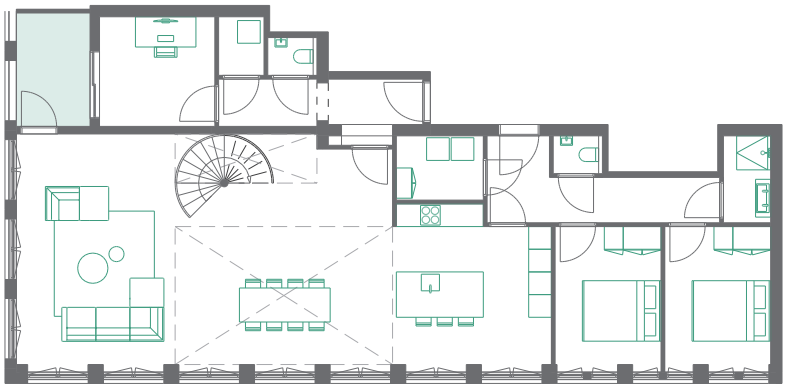
130,4 M² INDOOR SPACE

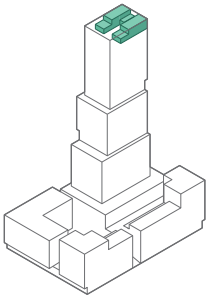
35,7 M² OUTDOOR SPACE

1-4 BEDROOMS

0 1 2 5 10







PENTHOUSE

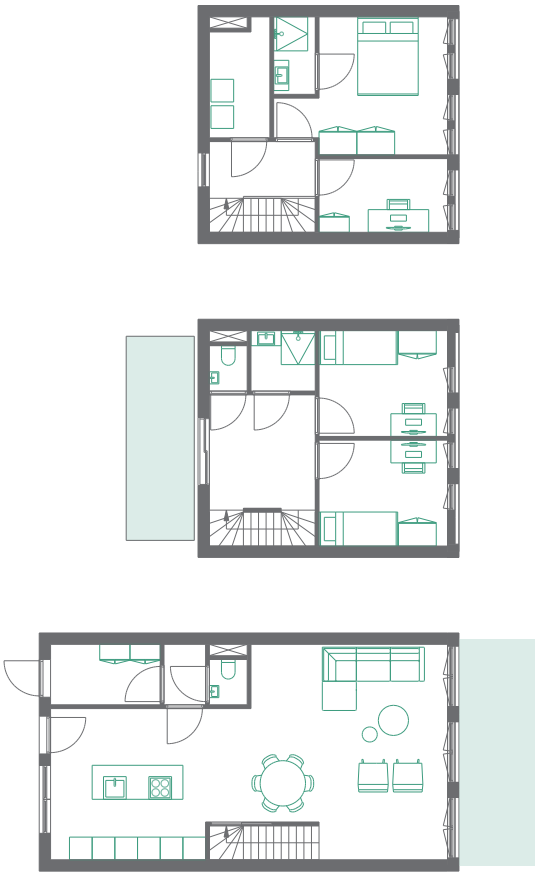
2 DWELLINGS

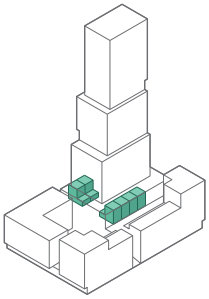
179,1 M² INDOOR SPACE

30,6 M² OUTDOOR SPACE

1-4 BEDROOMS

0 1 2 5 10





TRIPLEX

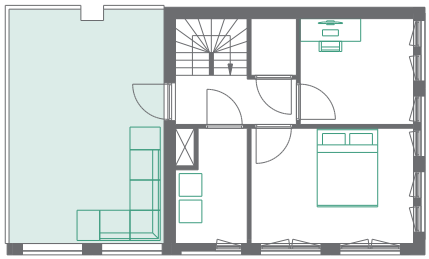
6 DWELLINGS

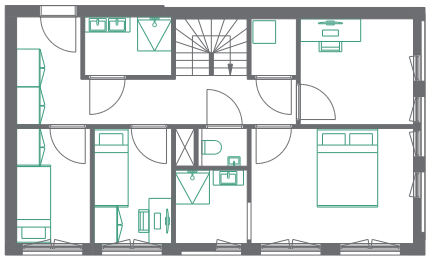
130,3 M² INDOOR SPACE

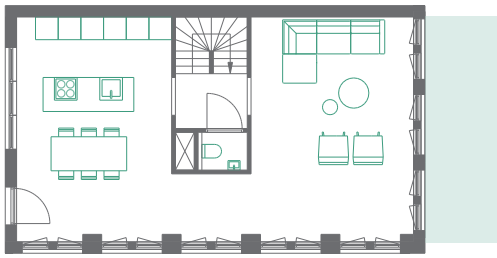
10-20 M² OUTDOOR SPACE

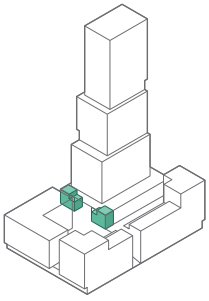
4-5 BEDROOMS

0 1 2 5 10









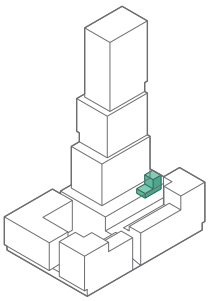
TRIPLEX

2 DWELLINGS

158,8 M² INDOOR SPACE

25-35 M² OUTDOOR SPACE

5-7 BEDROOMS



TRIPLEX

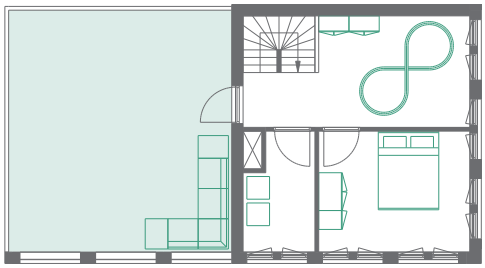
1 DWELLING

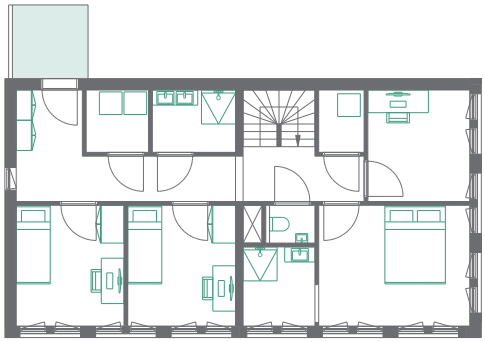
142,4 M² INDOOR SPACE

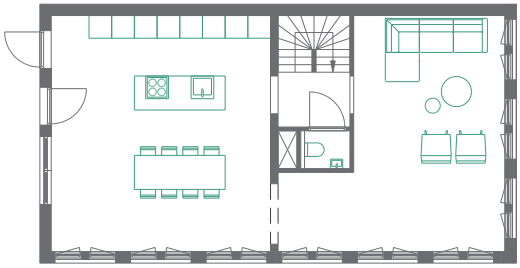
23,4 M² OUTDOOR SPACE

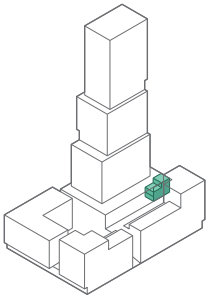
4-6 BEDROOMS

0 1 2 5 10









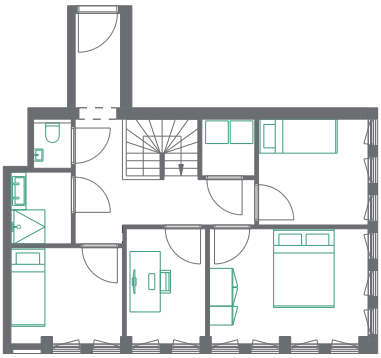
TRIPLEX

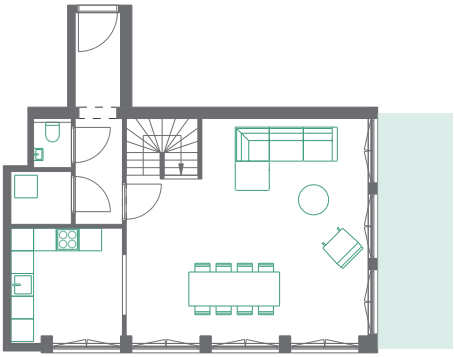
1 DWELLING

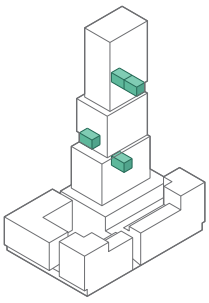
183,6 M² INDOOR SPACE

37,8 M² OUTDOOR SPACE

5-8 BEDROOMS







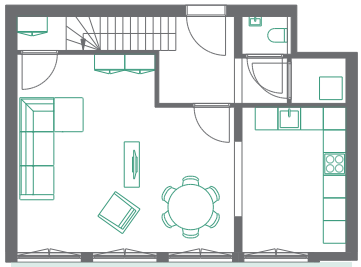
DUPLEX

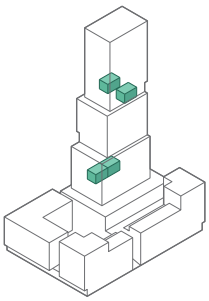
4 DWELLINGS

117,4 M² INDOOR SPACE

12 M² SEMI PRIVATE OUTDOOR SPACE

3-4 BEDROOMS





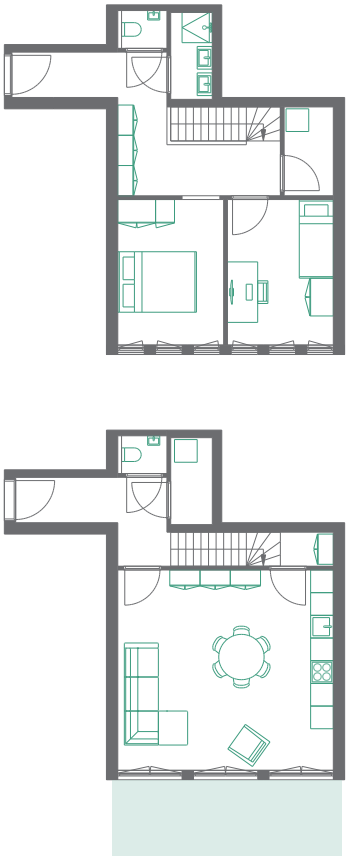
DUPLEX

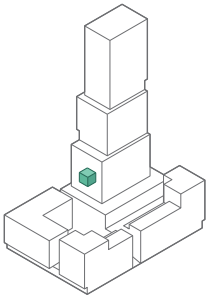
4 DWELLINGS

104,3 M² INDOOR SPACE

20 M² SEMI PRIVATE OUTDOOR SPACE

3-4 BEDROOMS





DUPLEX

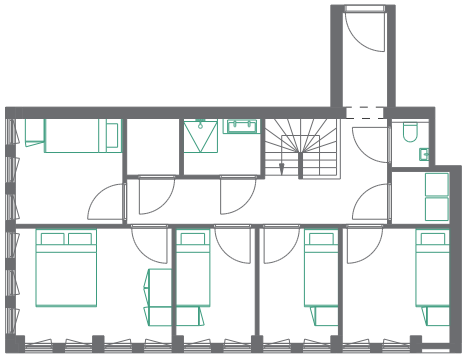
1 DWELLING

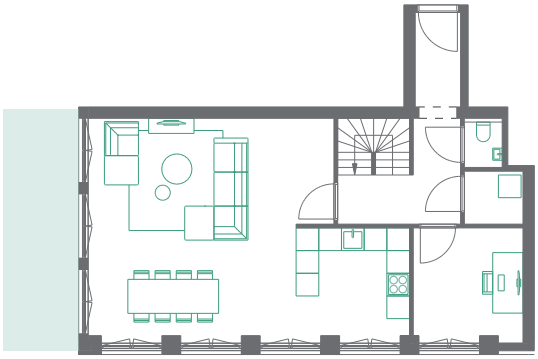
90,4 M² INDOOR SPACE

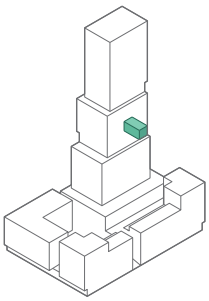
12 M² SEMI PRIVATE OUTDOOR SPACE

2 BEDROOMS

0 1 2 5 10







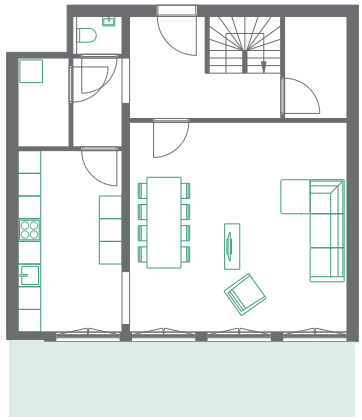
DUPLEX

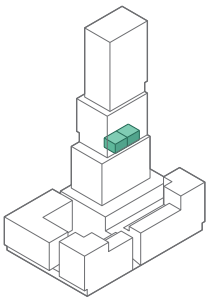
1 DWELLING

141,9 M² INDOOR SPACE

12 M² SEMI PRIVATE OUTDOOR SPACE

3-6 BEDROOMS





DUPLEX

2 DWELLINGS

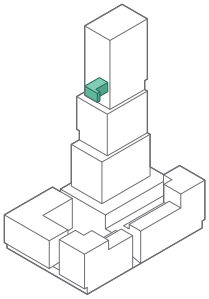
127,7 M² INDOOR SPACE

10,3 M² OUTDOOR SPACE

20 M² SEMI PRIVATE OUTDOOR SPACE

3-4 BEDROOMS

0 1 2 5 10



DUPLEX

1 DWELLING

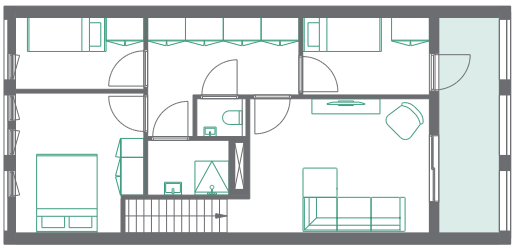
130,5 M² INDOOR SPACE

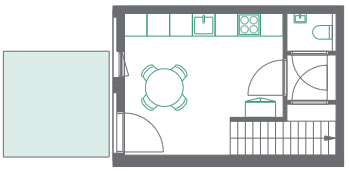
12,2 M² OUTDOOR SPACE

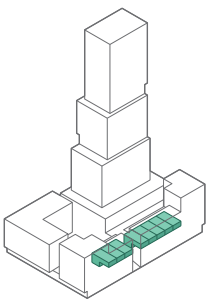
24 M² SEMI PRIVATE OUTDOOR SPACE

3-5 BEDROOMS

0 1 2 5 10







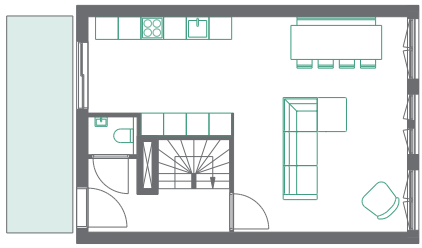
DUPLEX

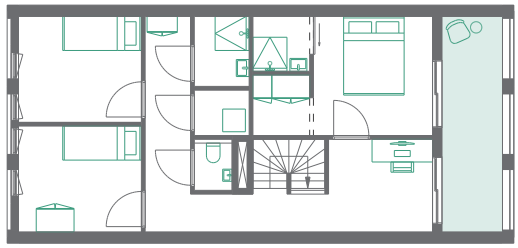
8 DWELLINGS

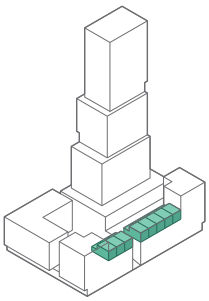
82,6 M² INDOOR SPACE

9,1 M² OUTDOOR SPACE

3 BEDROOMS







DUPLEX

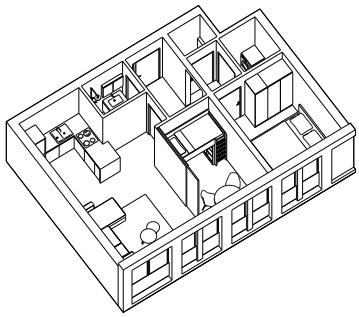
8 DWELLINGS

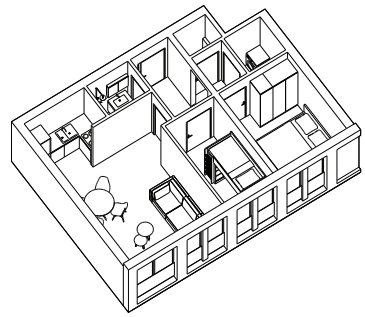
108,9 M² INDOOR SPACE

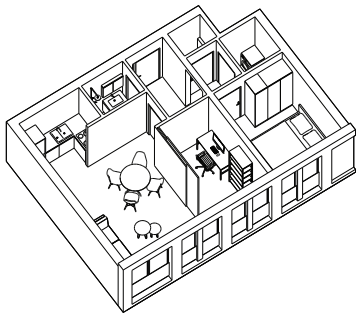
9,1 M² OUTDOOR SPACE

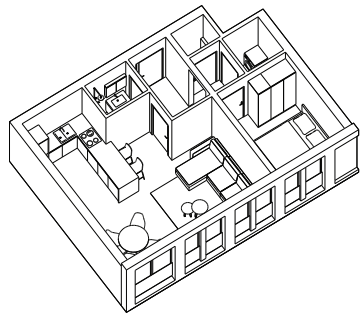
3-4 BEDROOMS

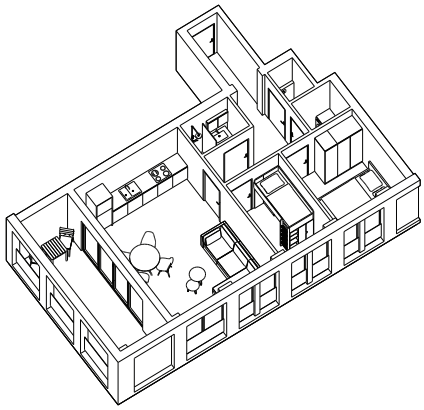
0 1 2 5 10

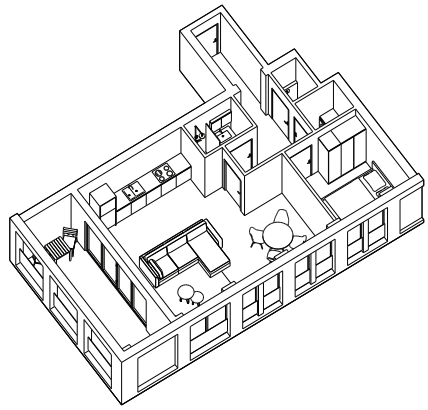


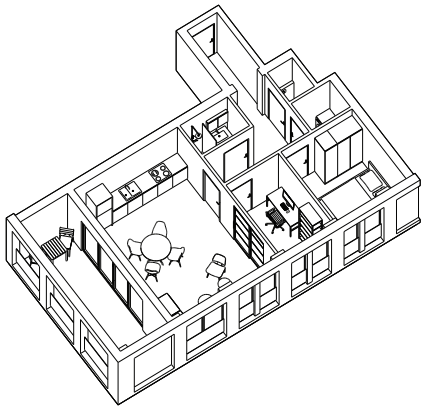


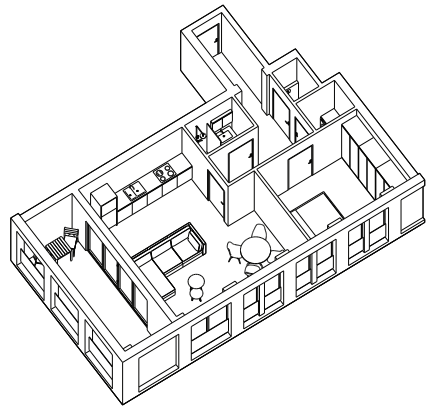


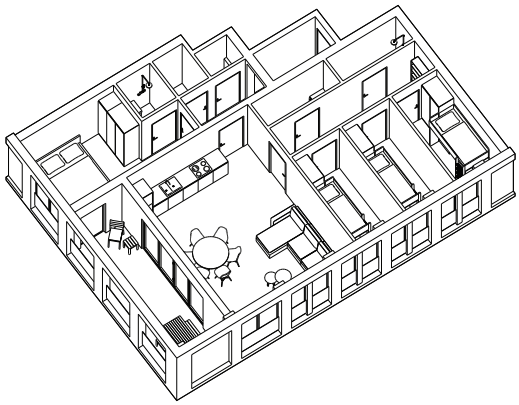


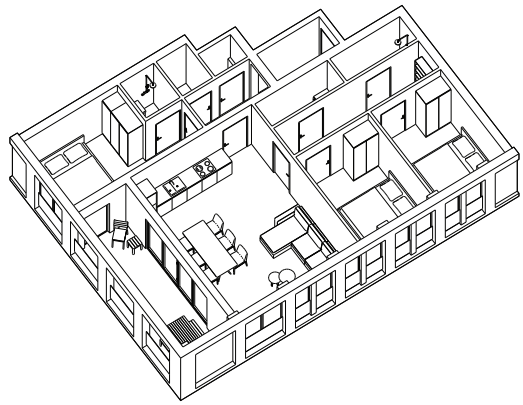


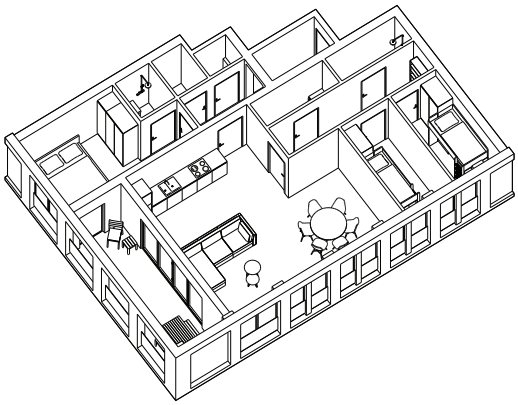


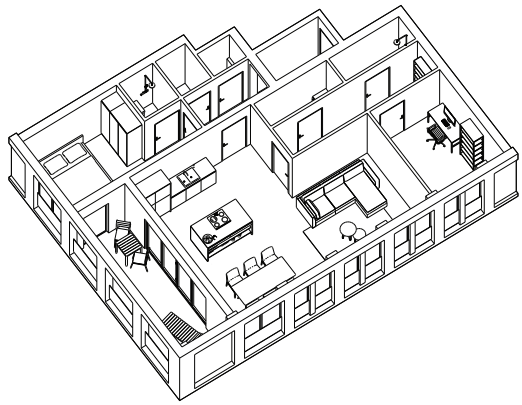




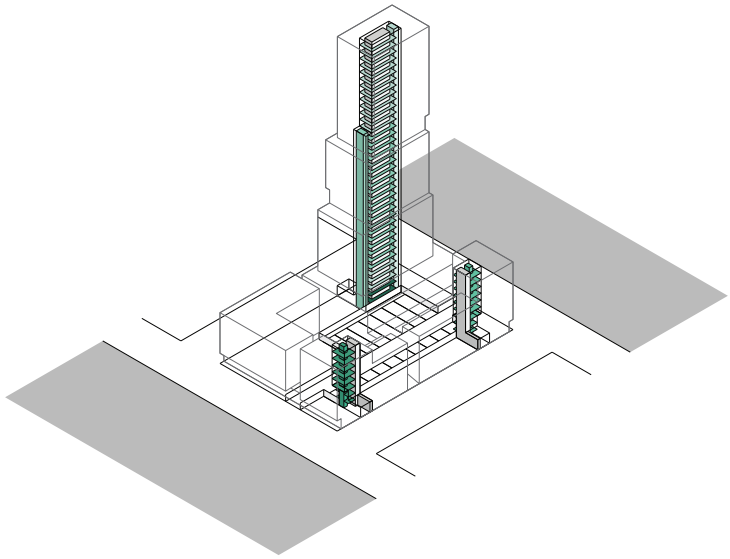


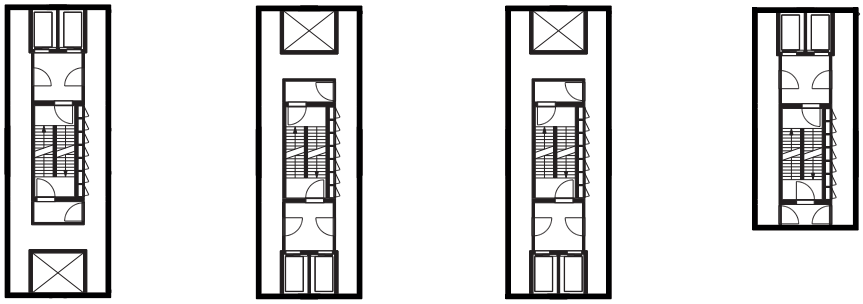


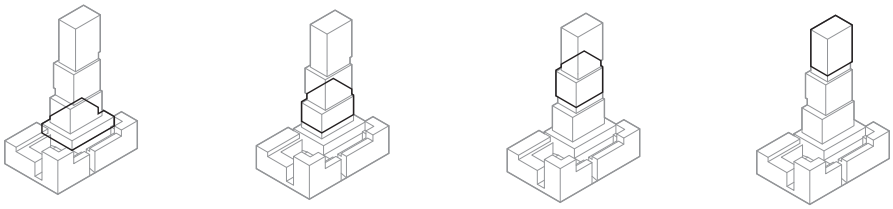




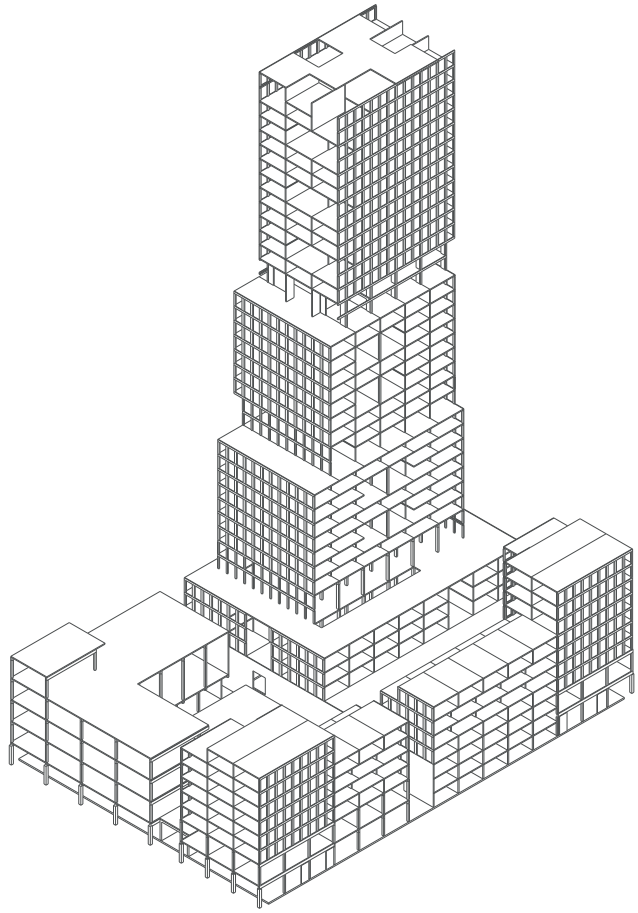
TECHNOLOGY

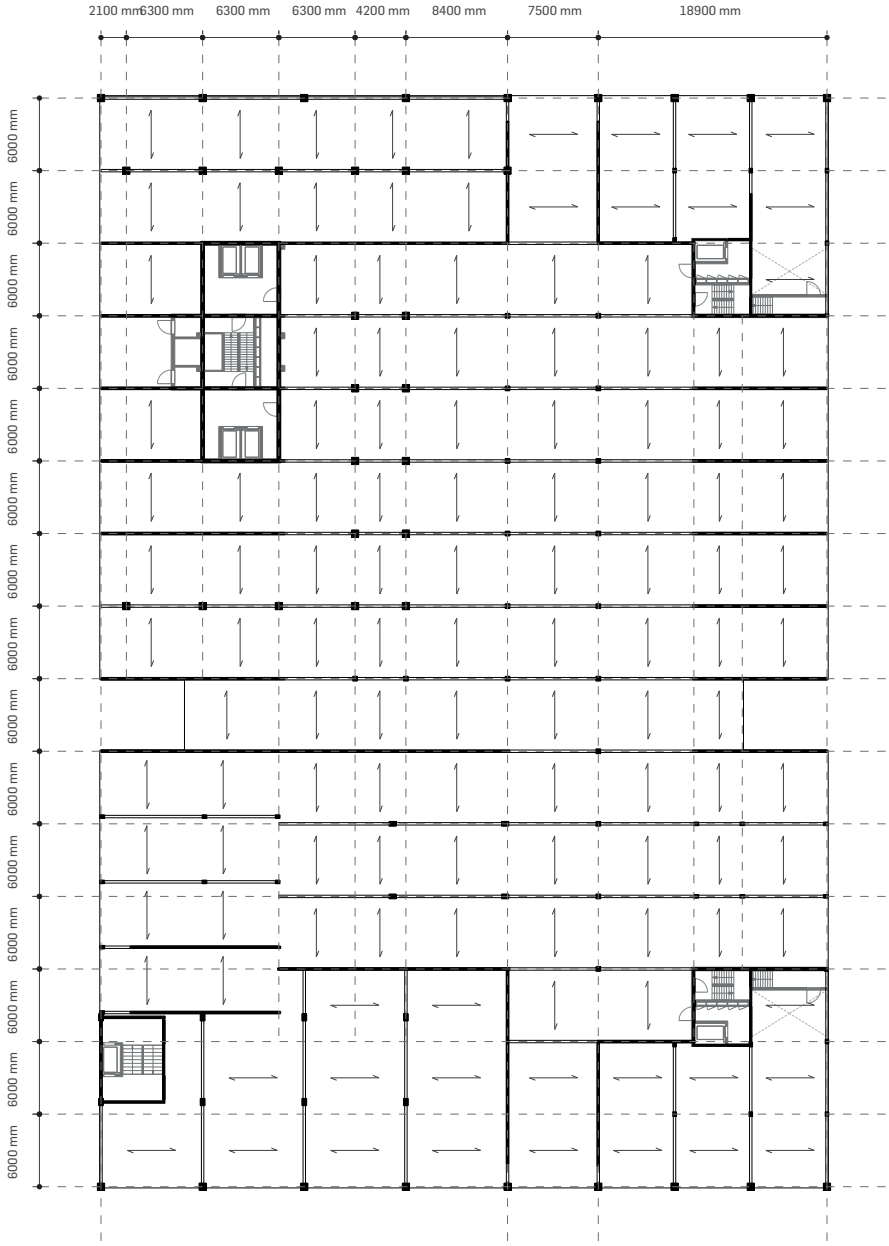






The construction of the building consists mostly of cross laminated timber panels, a sustainable alternative for concrete. The CLT wall and floor panels are placed on a grid of 6 meters and are prefabricated, resulting in a more efficient building process. The tower has a core with two elevator blocks, each serving two blocks, to reduce waiting times. Around the core are shafts for sewage and ventilation. The climate system in the tower is balanced ventilation with heath recovery.

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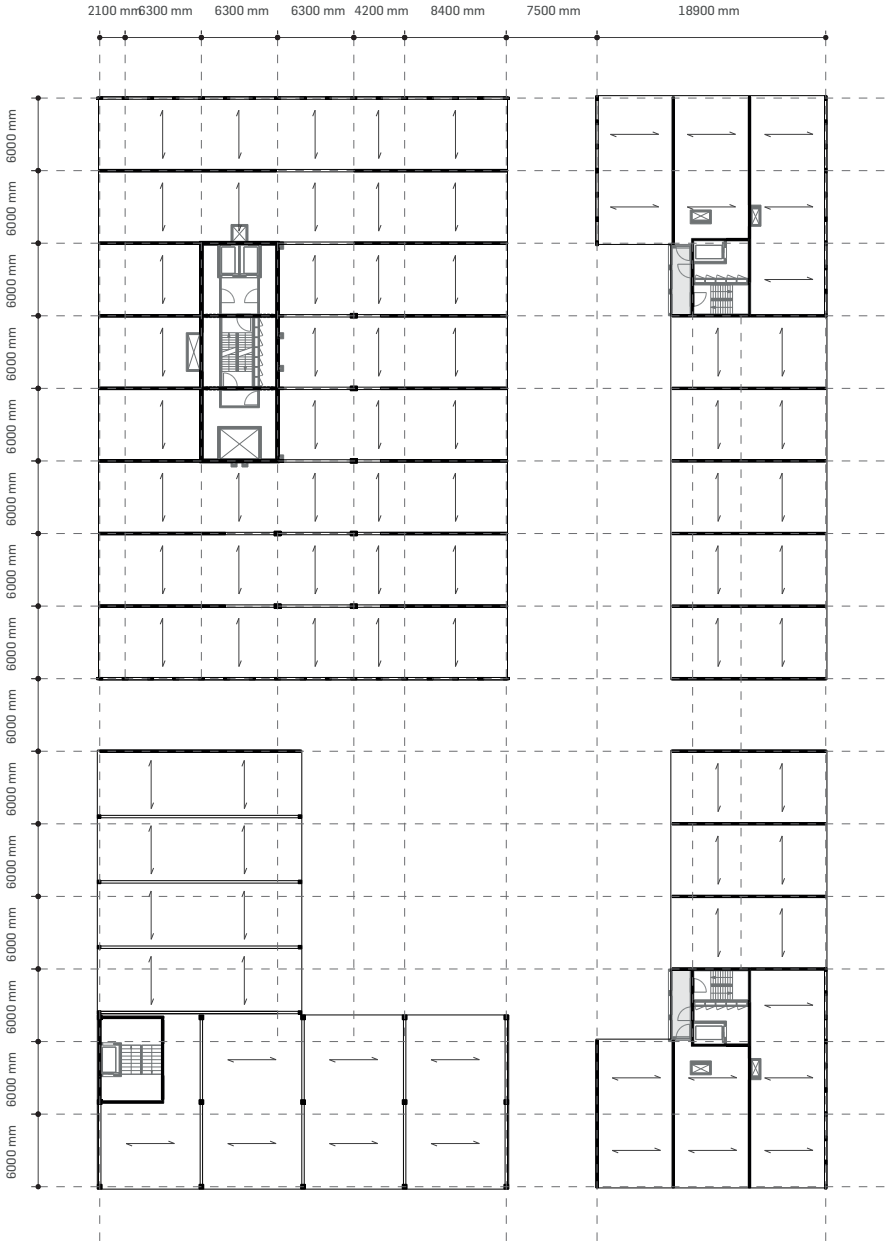
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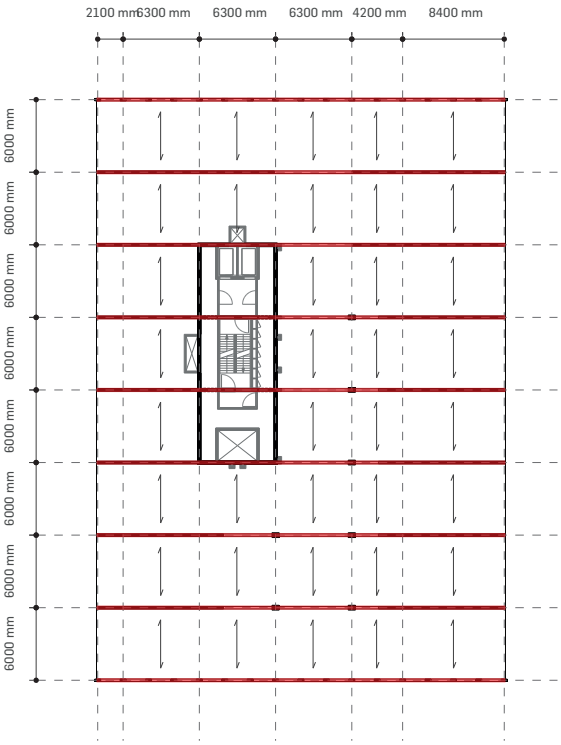
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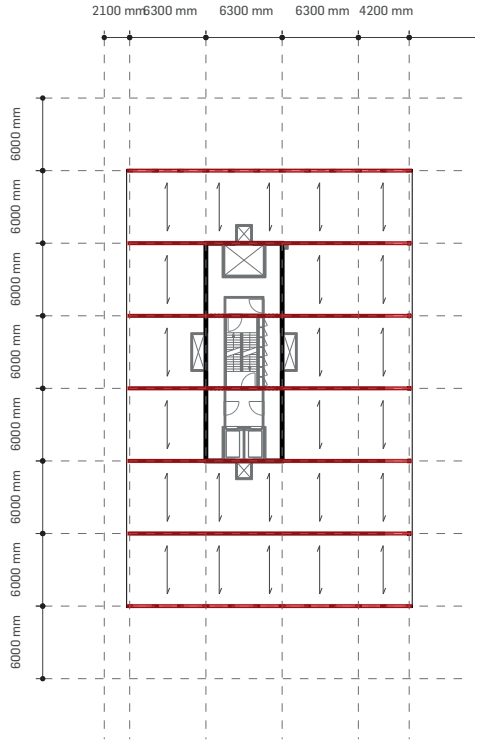
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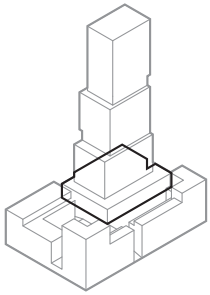

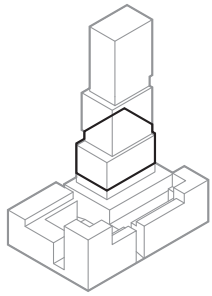

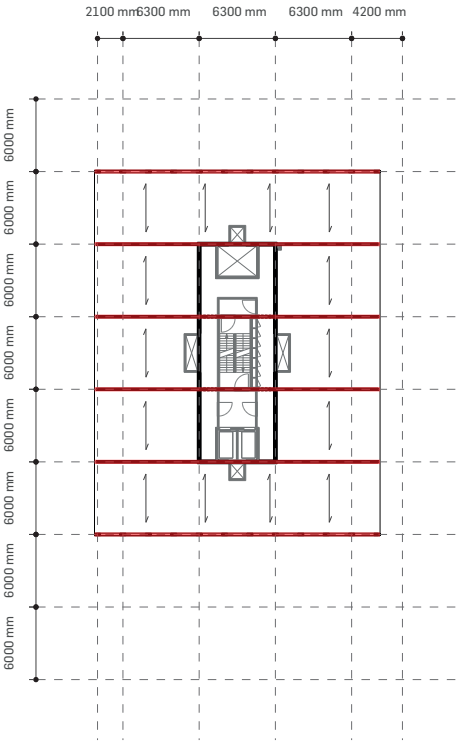
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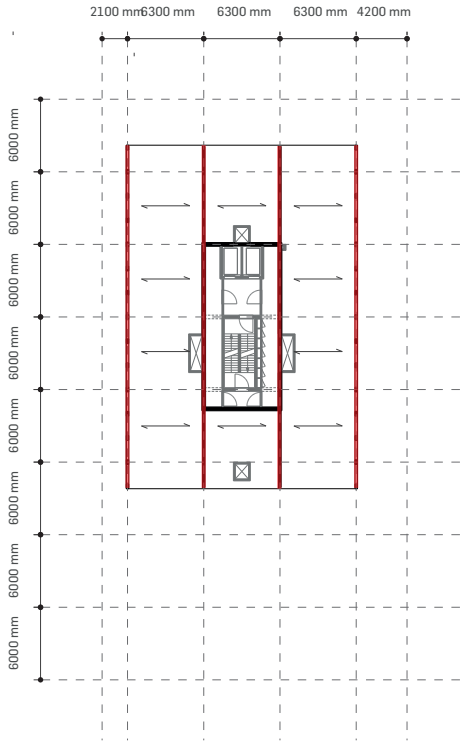
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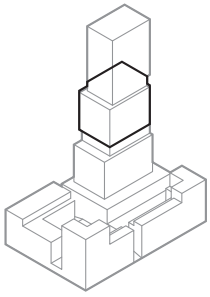

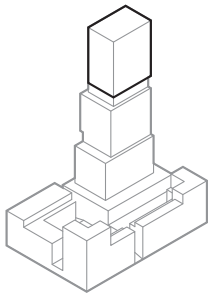

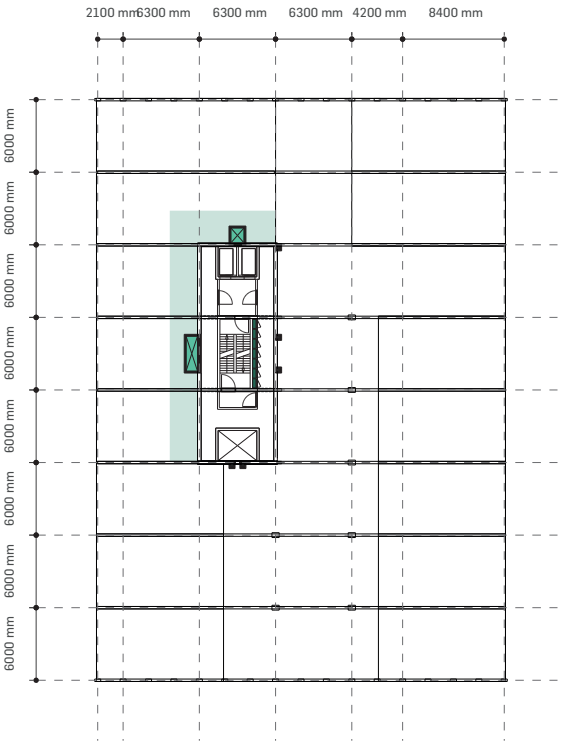
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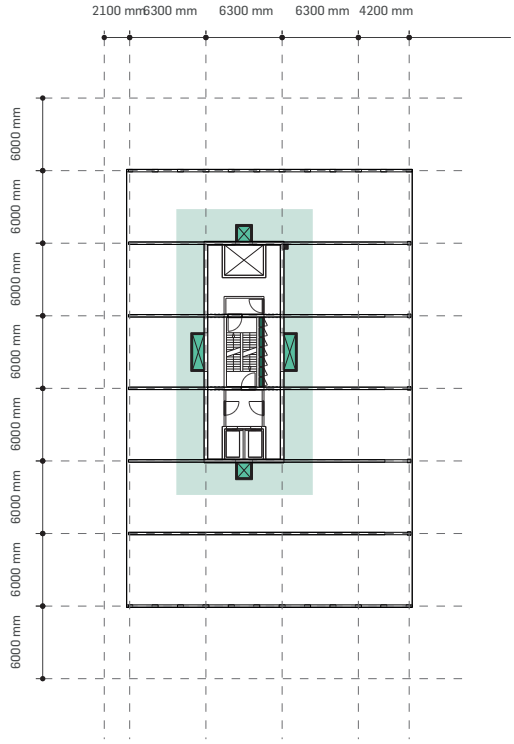
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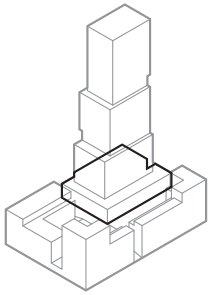

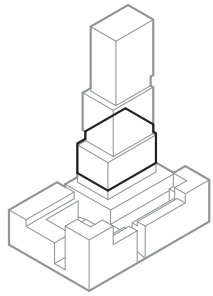

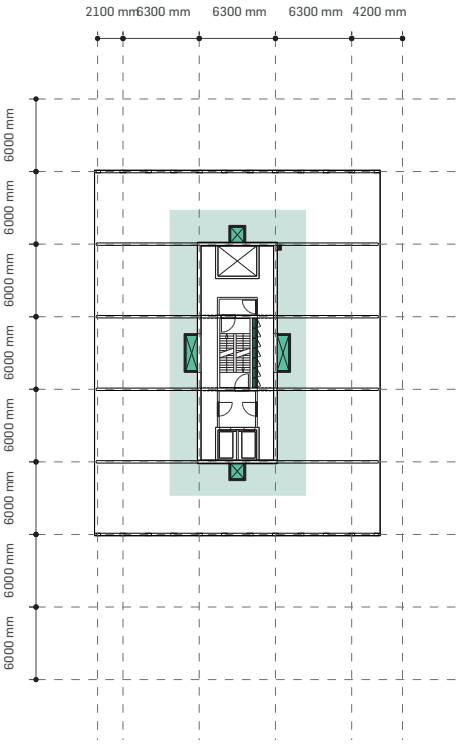
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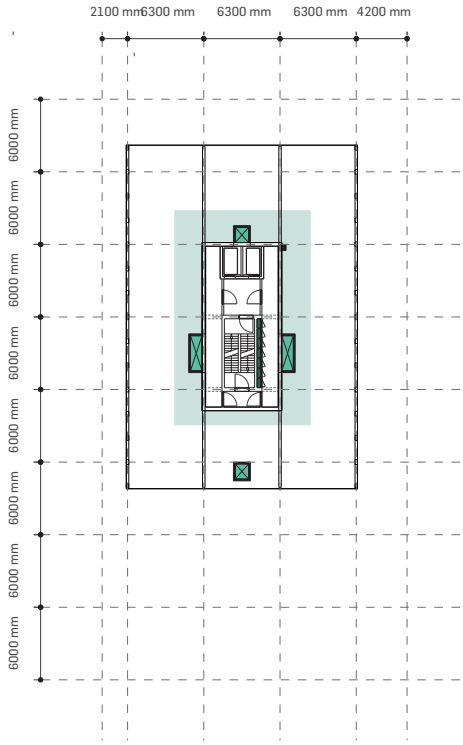
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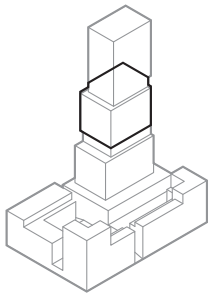

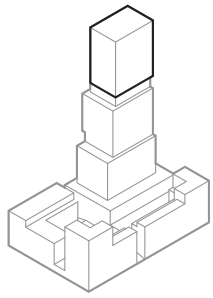

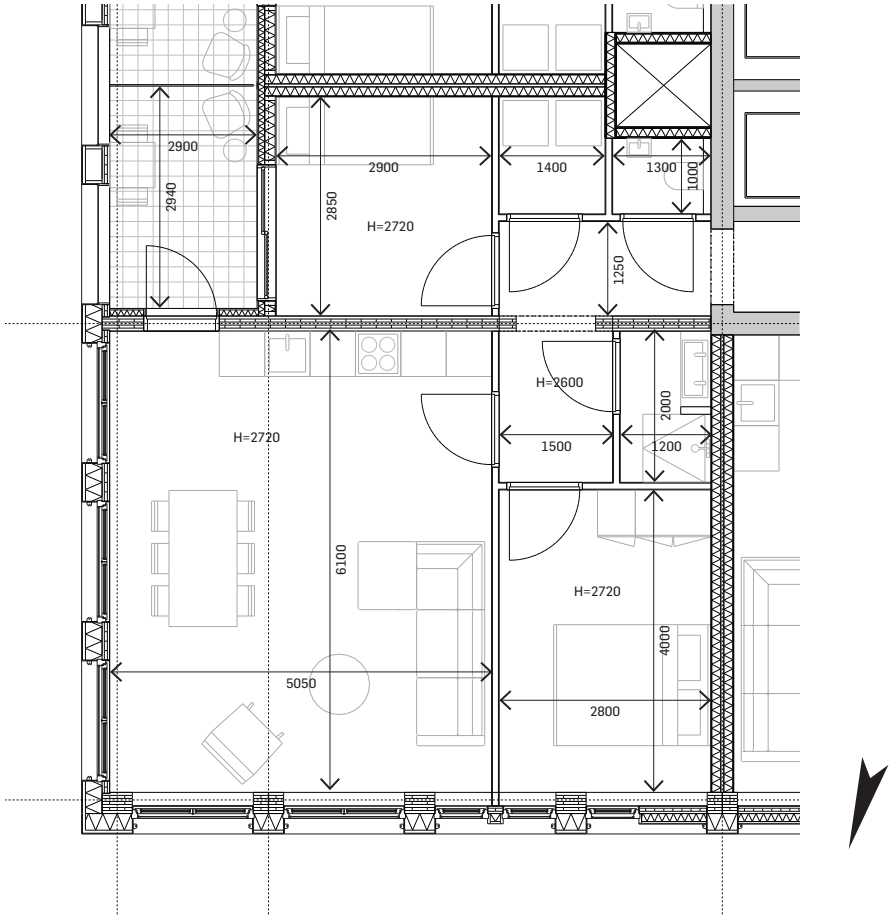
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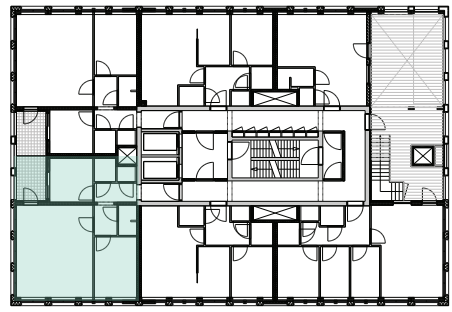

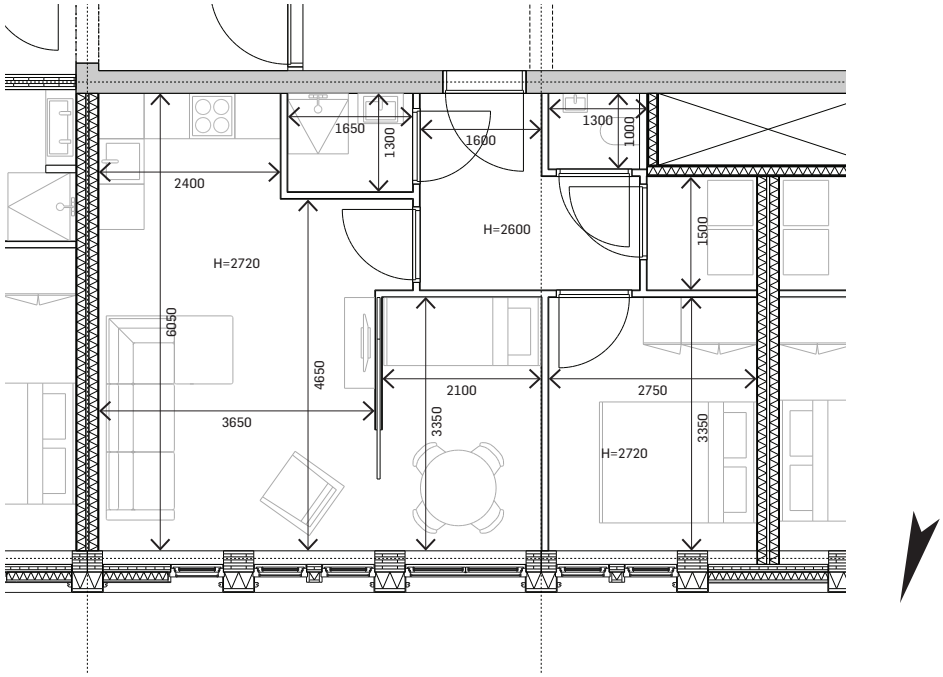
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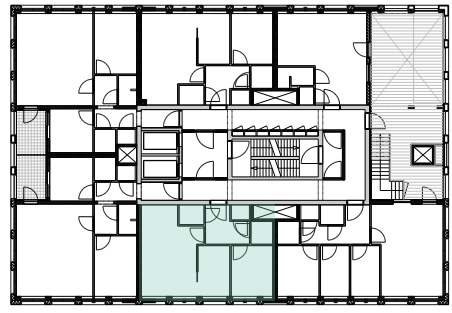

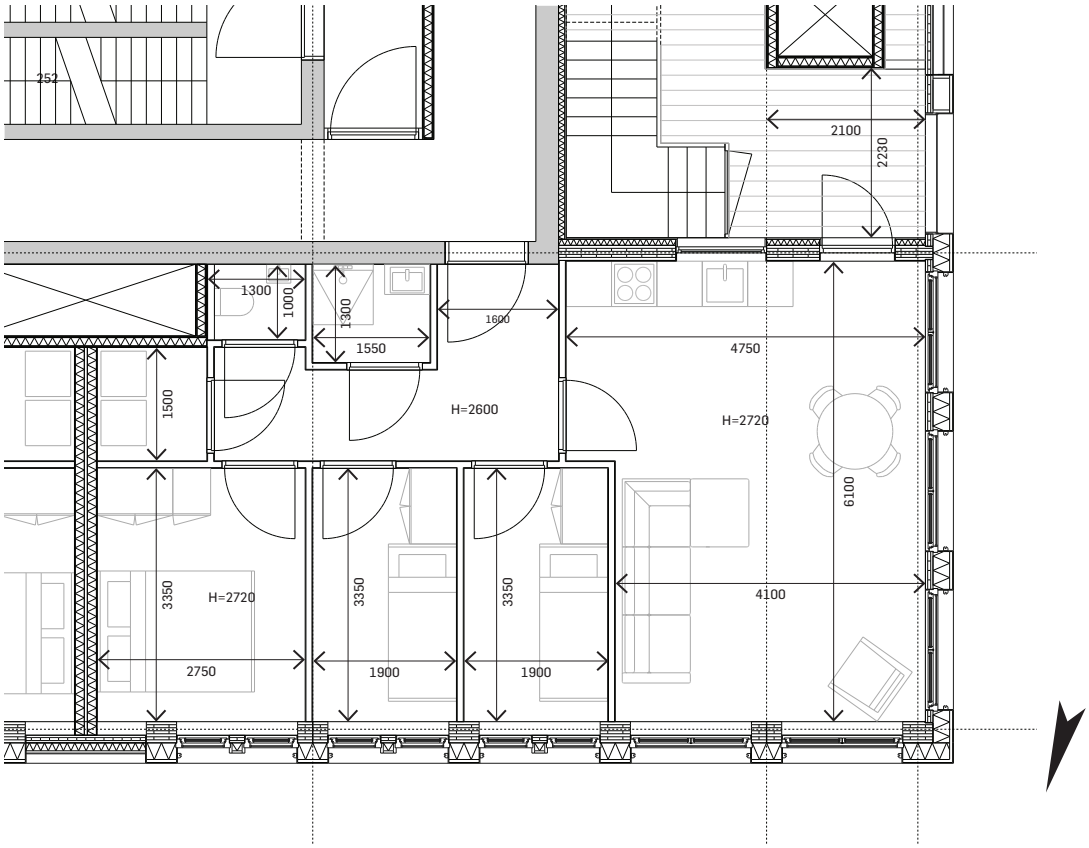
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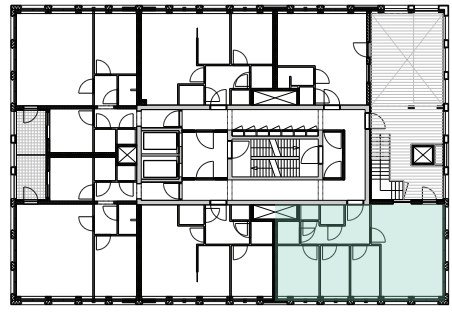
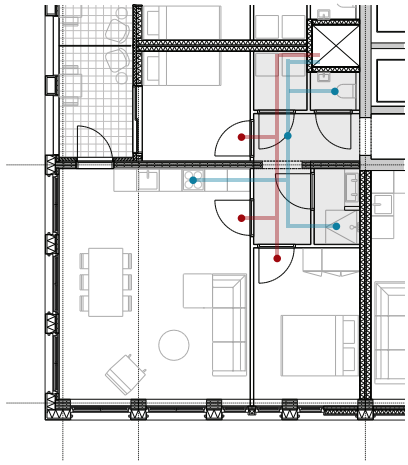
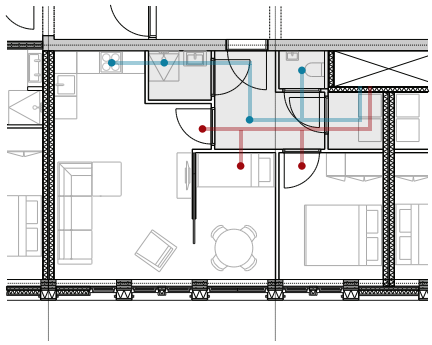
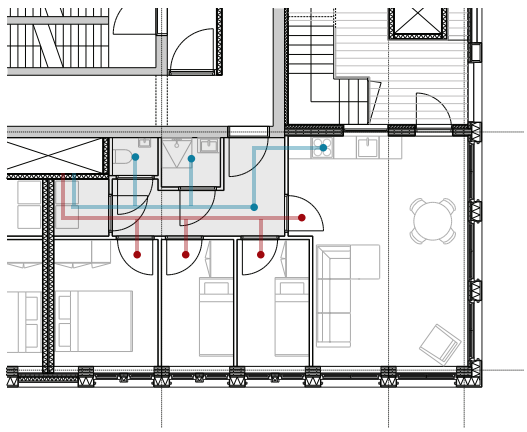
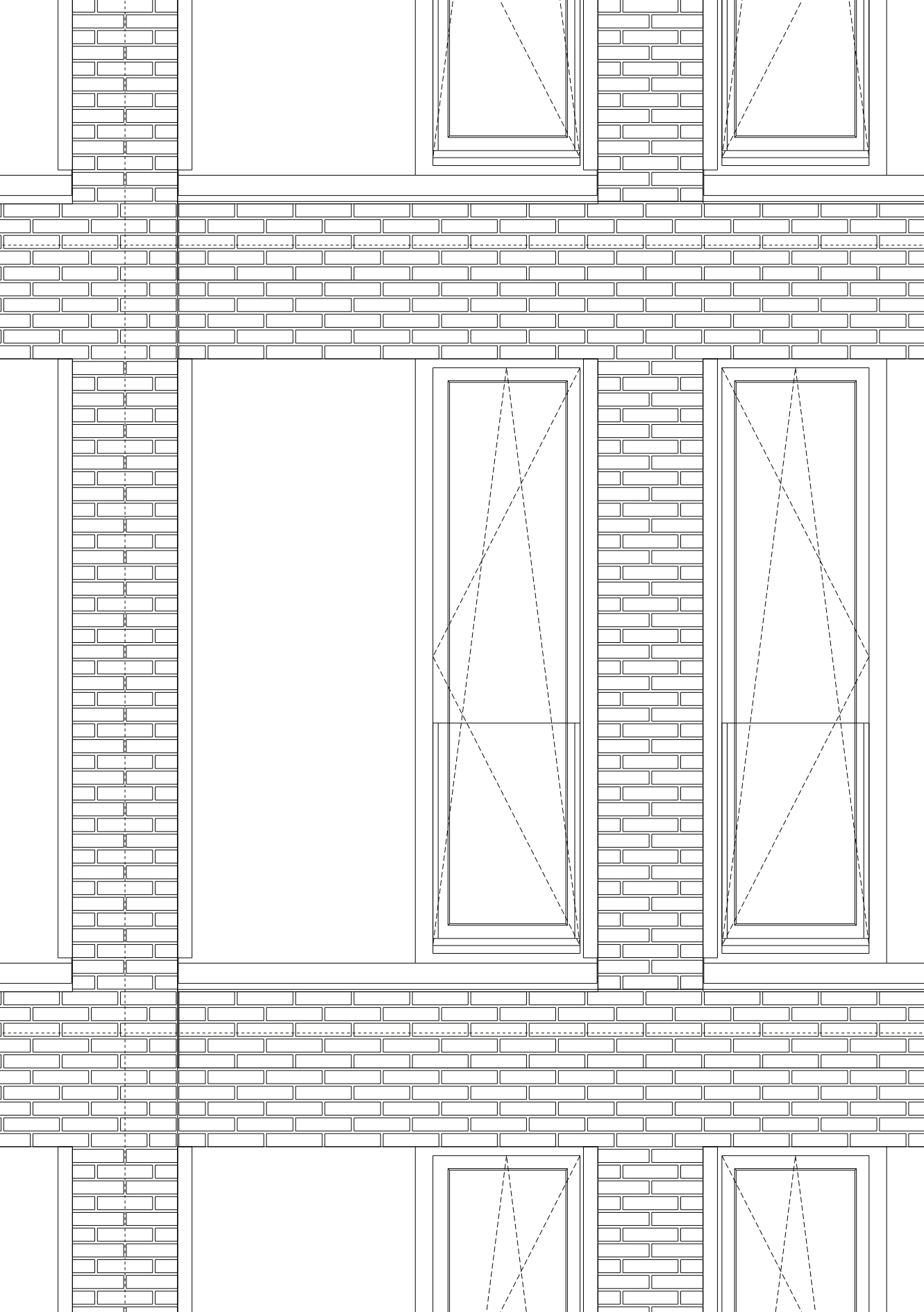
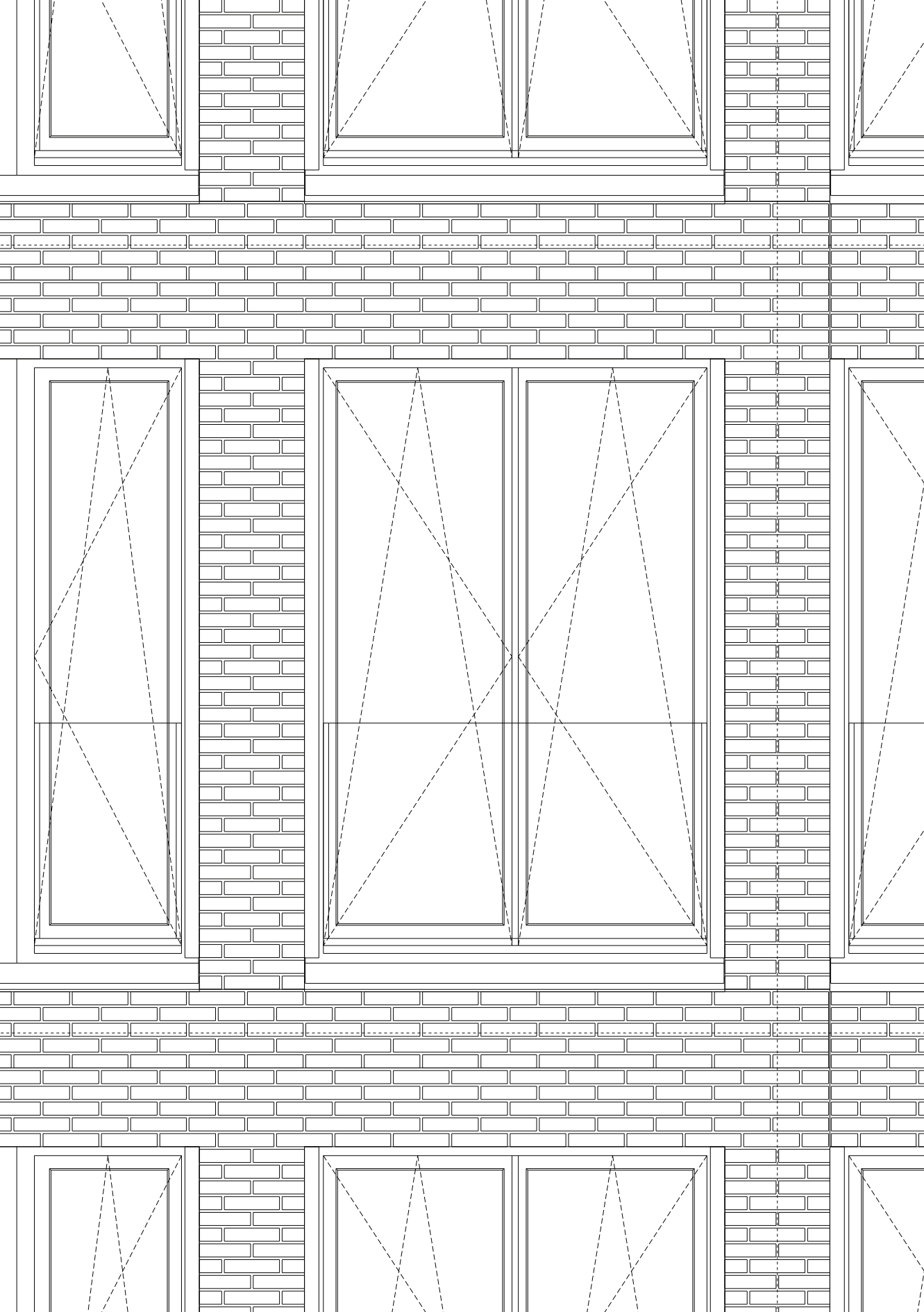


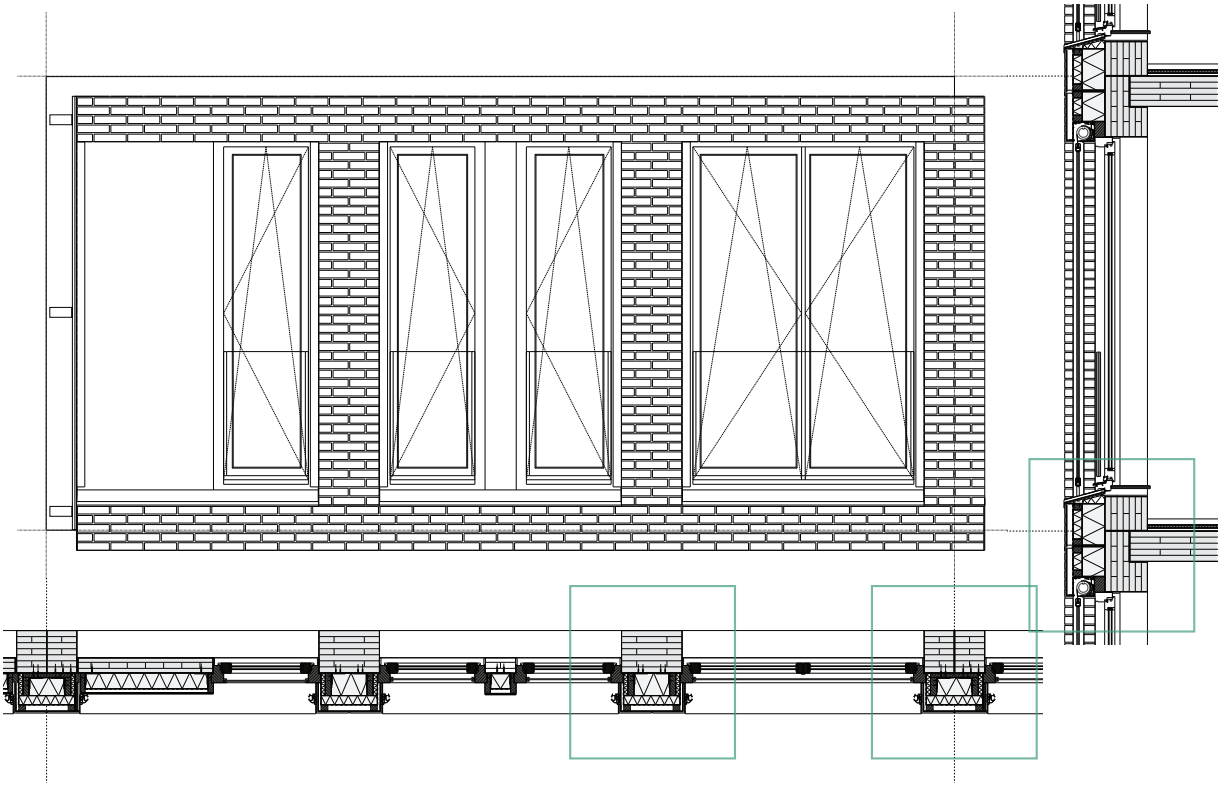


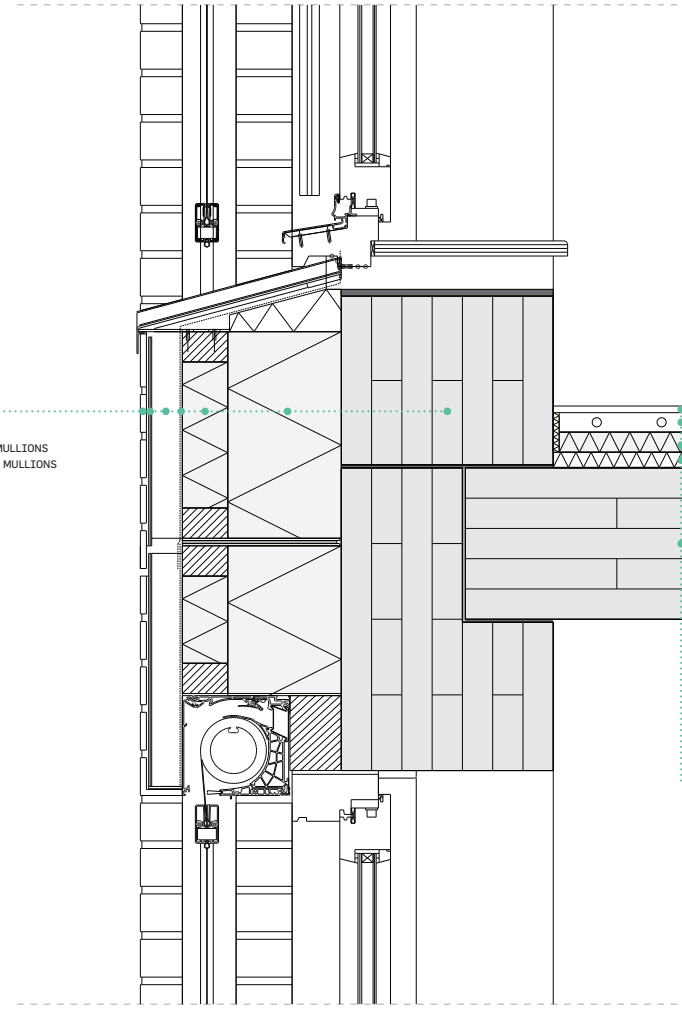






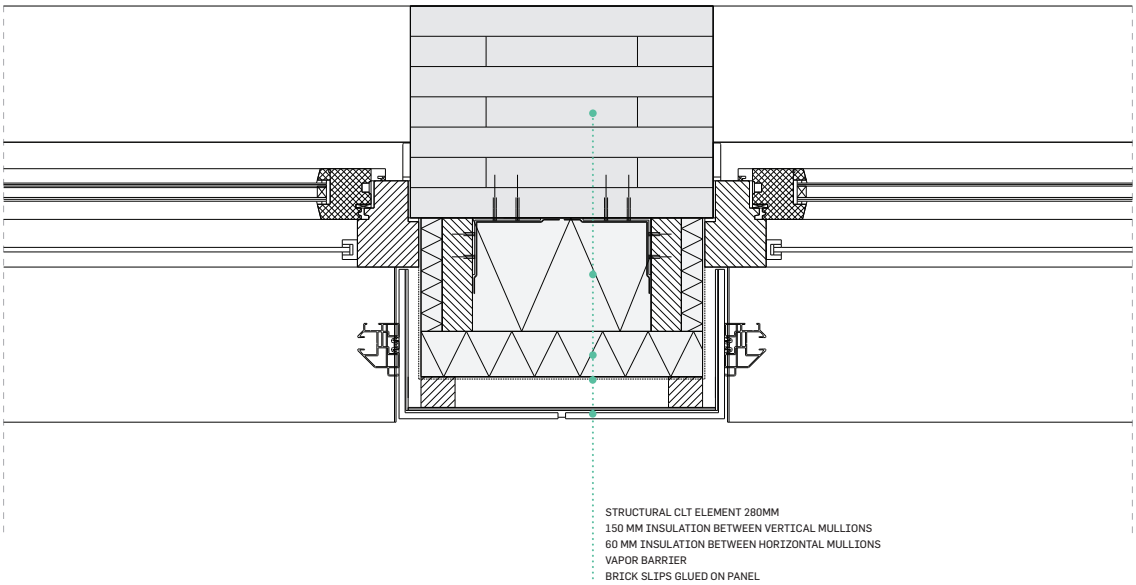






STRUCTURAL CLT ELEMENT 280 MM
150 MM INSULATION BETWEEN VERTICAL MULLIONS
60 MM INSULATION BETWEEN HORIZONTAL MULLIONS
VAPOR BARRIER
VERTICAL SLATS
BRICK SLIPS GLUED ON PANEL

FLOOR FINISHING LAYER
HEATING SCREED
THERMAL INSULATION
ACOUSTIC INSULATION
CLT FLOOR SLAB 200 MM



STRUCTURAL CLT ELEMENT 280MM
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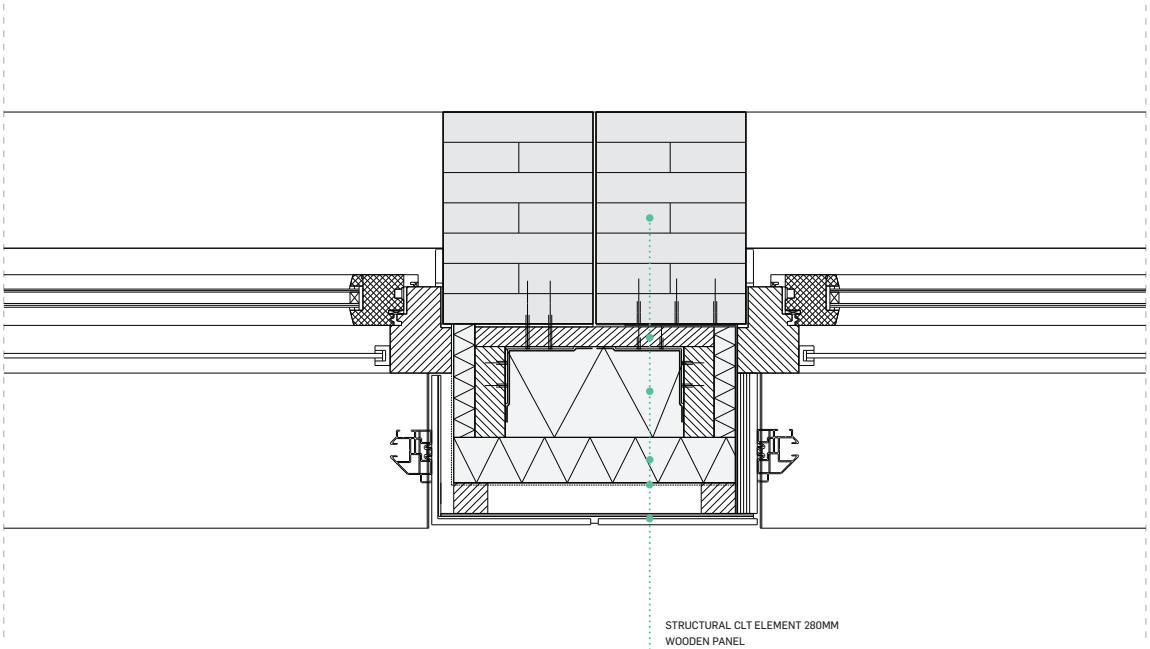
60 MM INSULATION BETWEEN HORIZONTAL MULLIONS
VAPOR BARRIER
BRICK SLIPS GLUED ON PANEL



STRUCTURAL CLT ELEMENT 280MM
WOODEN PANEL
150 MM INSULATION BETWEEN VERTICAL MULLIONS
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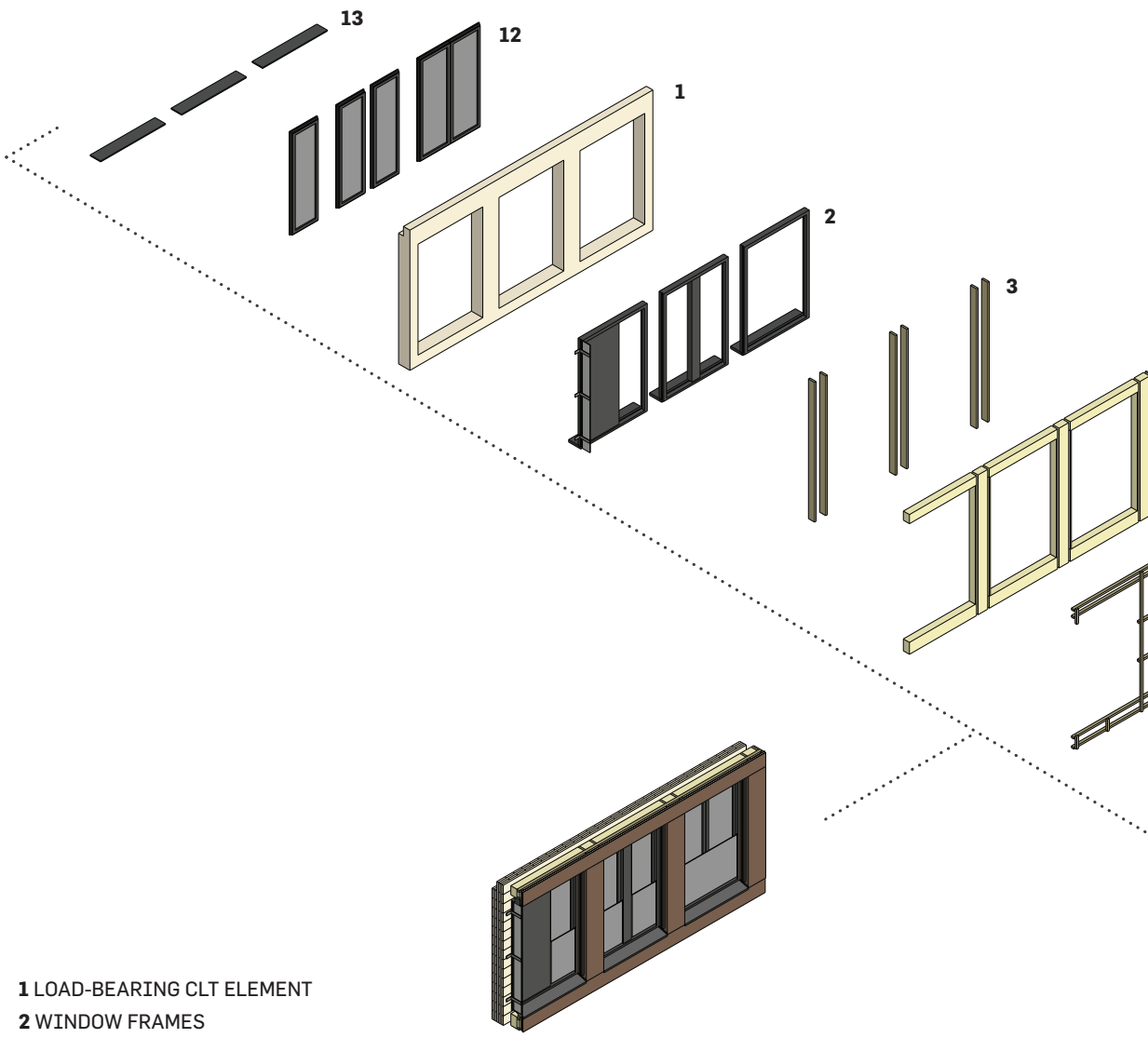
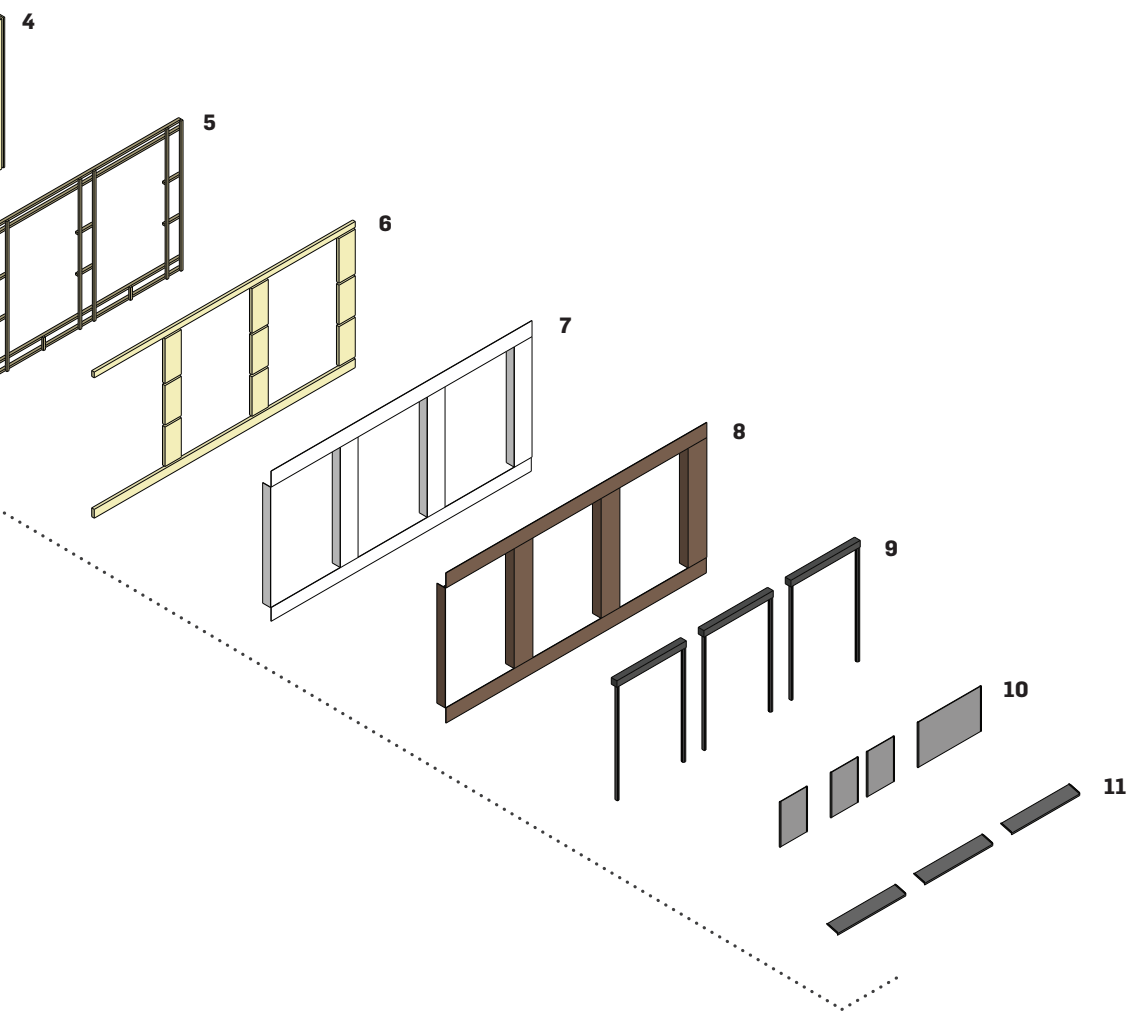
VAPOR BARRIER
BRICK SLIPS GLUED ON PANEL



1 LOAD-BEARING CLT ELEMENT
2 WINDOW FRAMES
3 WOODEN FRAMEWORK
4 FIRST INSULATION LAYER
5 WOODEN FRAMEWORK
6 SECOND INSULATION LAYER
7 PANEL
8 BRICK SLIPS
9 BLINDS
10 FENCING
11 OUTDOOR SILL
12 WINDOWS
13 INDOOR SILL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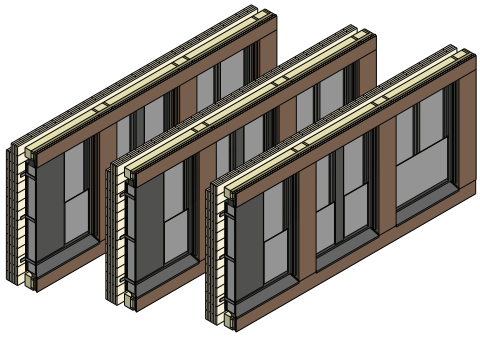
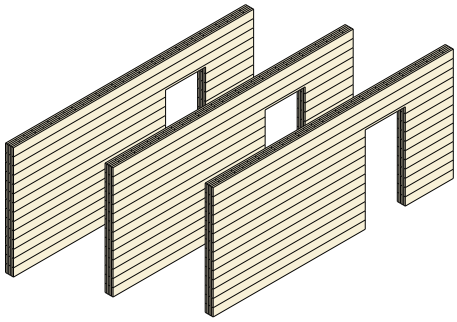
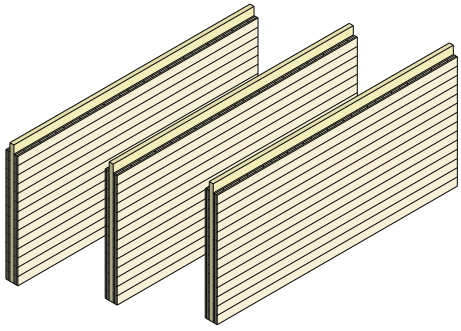


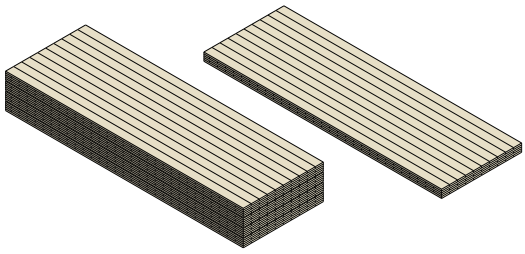
PREFABRICATED LOAD-BEARING
FACADE ELEMENTS



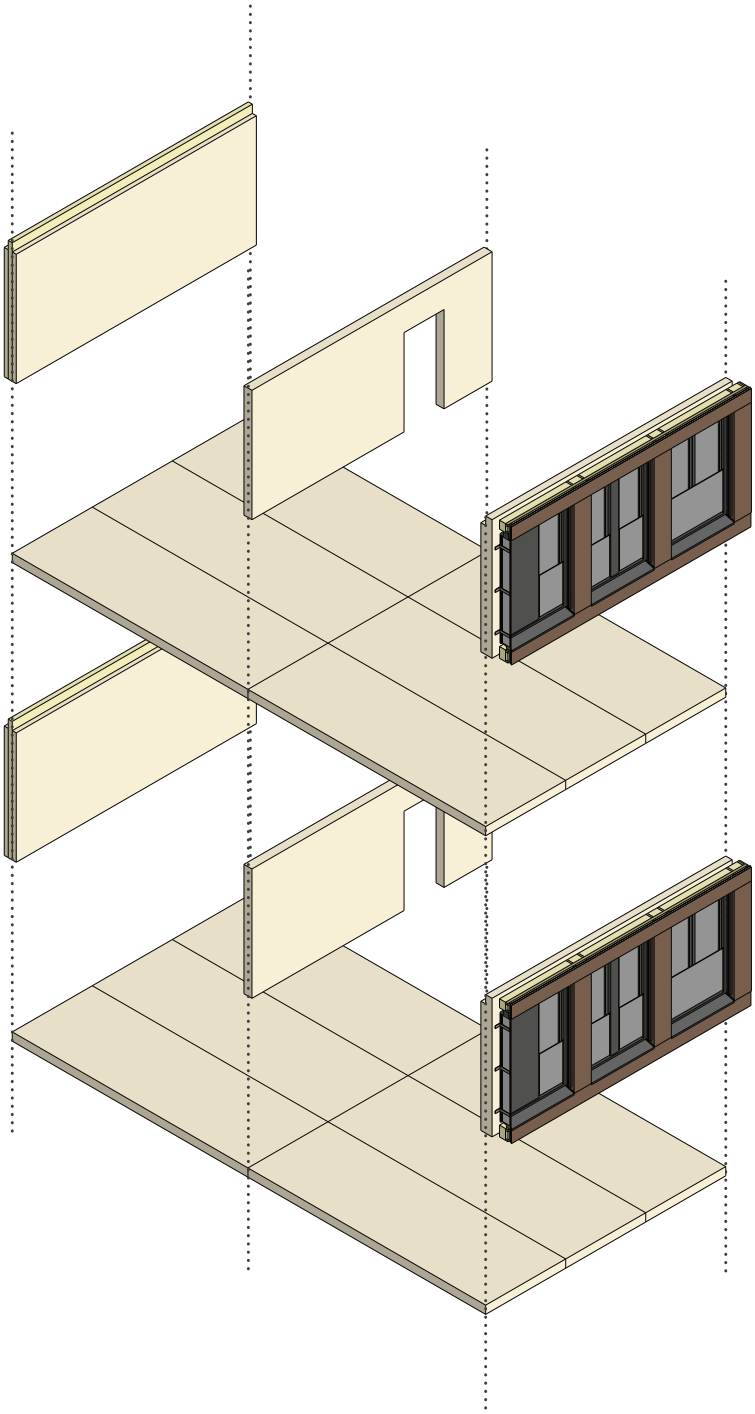
CLT WALL ELEMENTS
WITH OPENINGS



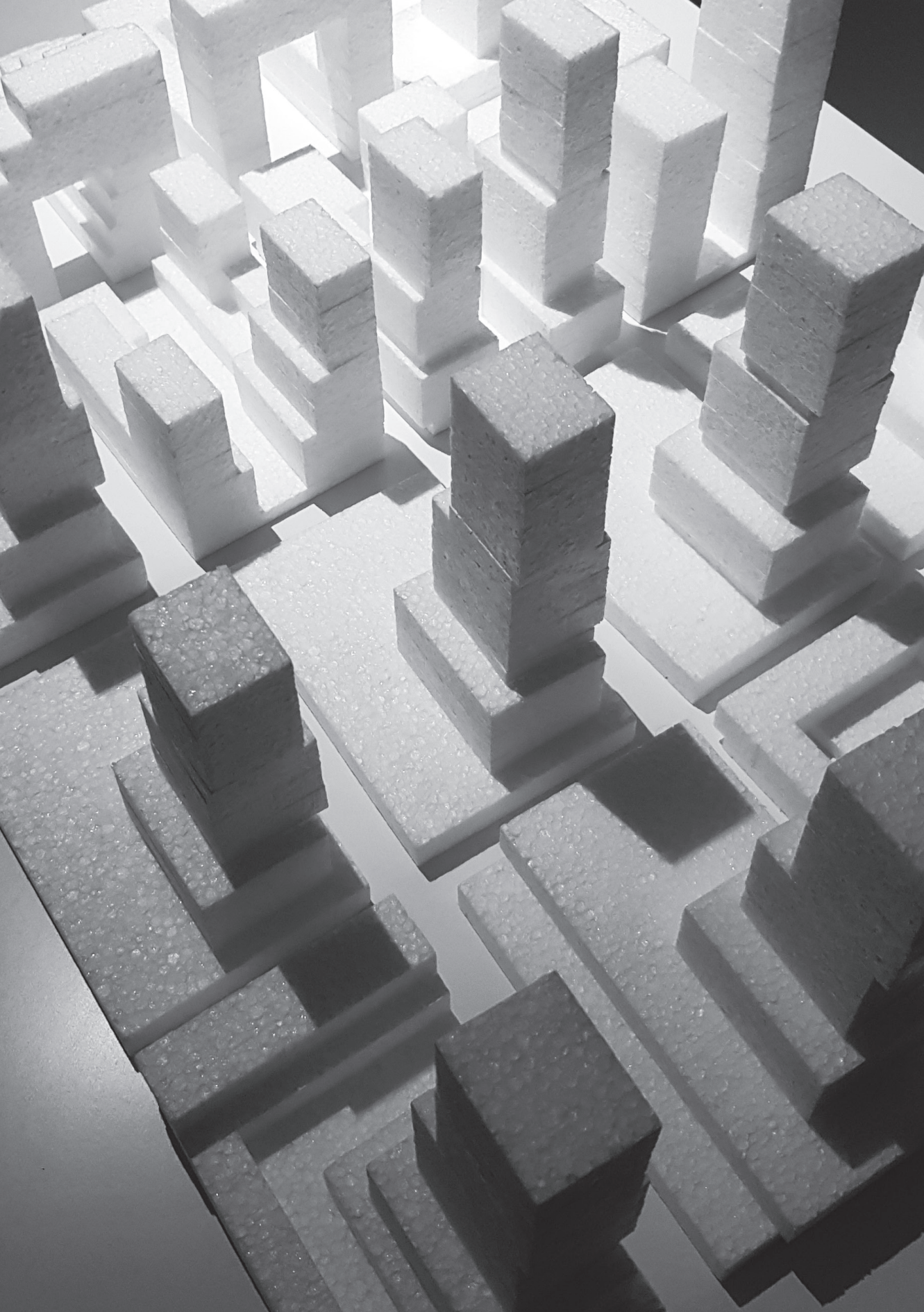
CLT WALL ELEMENTS
WITH INSULATION

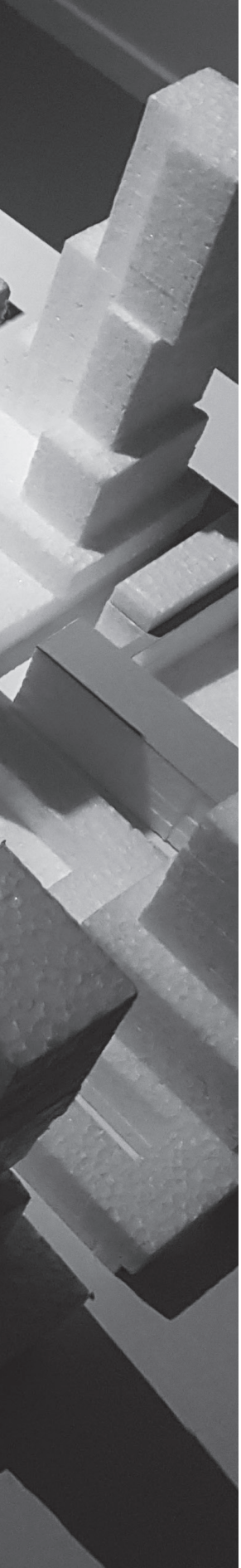


CLT FLOOR ELEMENTS



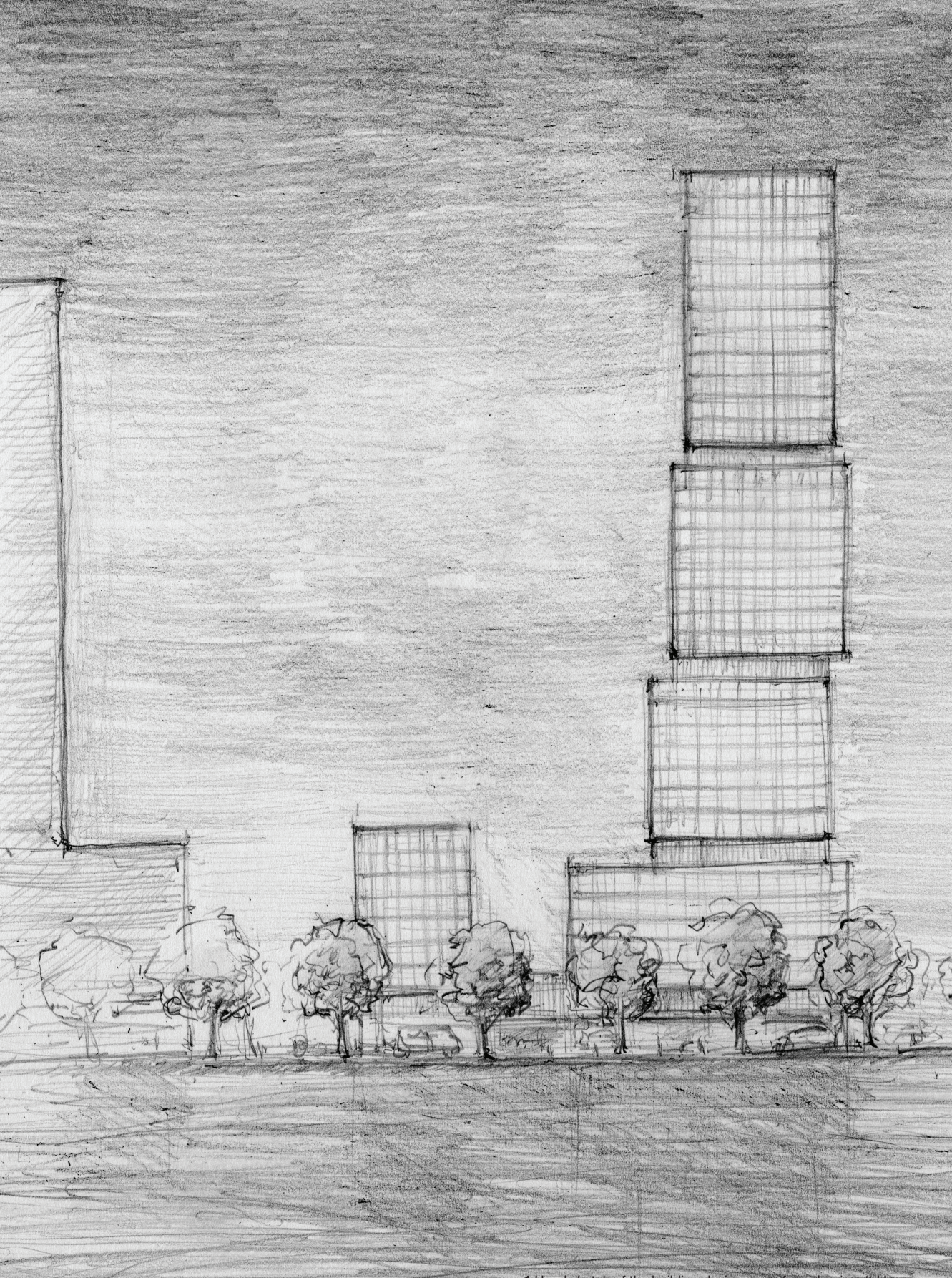
REFLECTION



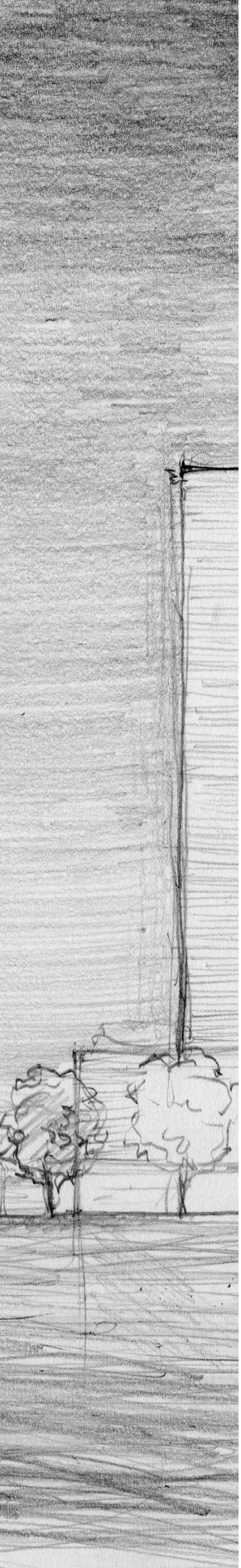


PREFACE

This reflection report is part of the Dwelling graduation studio at the TU Delft Faculty of Architecture. This one-year project focuses on the design of housing in the Dutch context, in this case the Minervahaven in Amsterdam. My self-chosen topic comprises families in high-rise. Families are an important factor in the liveability of neighbourhoods. As more and more families are leaving Amsterdam, innovative ideas are needed to reverse this trend. In my project a residential tower is proposed, a relatively uncommon building form in the Netherlands, especially for this specific target group. The process of getting to a final design consisted of various research and design steps. This report reflects on these steps towards the design of a high-rise building for families.



1 Hand sketch of the building design, seen from the river 'IJ'



INTRODUCTION

For every design project in university, I basically used the same method to get to my design, mainly based on intuition. By knowing the preconditions, such as the requirements and the location, I try to come up with the most optimal plan. I do this by sketching many versions of plans with my black ballpoint pen on checkered paper. I start with one line, than another one and another one. I try to create interesting and convenient spaces that make you feel either connected to or protected from the environment. The remarkable thing is that even when I start over with a new blank page, a similar plan emerges.

This practice probably originated during high school, when one of my free time activities was drawing plans. Although I learned to use other methods, such as the plan analysis, I notice I always fall back into this sketching habit, probably because this takes me - in my eyes - to the best result. However, there are major downsides to this method. It is not based on experiments, variants or objectively measurable parameters. This made it difficult to explain at presentations why I came up with a certain design. In this project I still used sketching plans as a method. However, in contrast to other projects during the bachelor and master, which usually take around ten weeks, the allocated time for the final project is a full year. This gave me the opportunity to conduct a larger amount of research, not mainly intuitively sketching plans.

I used more and different methods, implementing a larger amount of objective and scientific research. I considered this important, as the outcome of the design project is not a building that is going to be built. Instead, the graduation studio has an educational purpose and is the final step to obtaining a Master of Science degree at the Delft University of Technology. Hence, “science” and “technology” have a certain role in the project. However, the seemingly objective character of an institute of technology often contradicts with the subjective nature of architecture and design. Scientific research is important at the university, but can be challenging in regard to architecture. According to Van der Voordt (Ways to Study, p.3), scientific research is “the methodical, verifiable, objective, valid and reliable collection, processing and analysis of data in order to better understand and explain reality and thereby make it more manageable”. I acknowledge the value of scientific research in general, as well as in the field of architecture. However, when designing a building, the question is whether the implementation of scientific research will help in order to achieve a ‘better’ design result. To what extent should the project also encompass research that is scientific?

In the end, I used a wide range of research methods of which some followed the aspects of scientific research more than others did. This reflection report will review the used methods to examine the relationship between the conducted research and the design. Therefore my main question with this reflection is to what extent the research and its scientificity helped to make a better design. In other words, what was the value of the research and how did it improve the design?

In the next chapters, the different methods I used are explained by dividing the research into six categories. They all had a large influence on the design, but vary in objectiveness. For each method, I will first mention what I actually did and how this influenced the design. Then I will reflect on the usefulness of the method and its limitations, as well as its scientificity. This gives me a notion of the value of that specific research method for a better design. In the subsequent part I will elaborate on four additional aspects to relate the project to the larger framework. Finally, I will conclude on the value of research for a better design.

METHODS OF RESEARCH

During the design process I used different methods to do research, in the subsequent paragraph I will reflect on these. I divided the research into the following subdivision:

1. The preconditions: fixed parameters with a large influence on the design, for example regulations and site conditions.
2. Applying existing knowledge: literature research, mainly to obtain knowledge about the target group.
3. Intuitive sketching: two-dimensional drawings of the building, mostly in the form of floor plans.
4. Probing into precedents: learning from existing examples, such as a plan analysis.
5. The third dimension: understanding spaces, using virtual reality and both digital and physical models.
6. Aesthetic choices: creating variants to make subjective choices more objective.

The division is not based on chronology or a scale from objective to subjective, as there is no clear distinction due to overlapping of the methods. Nevertheless, there are several differences regarding chronology and objectiveness. The preconditions (1) and literature research (2) were mostly done in the primary stage before the P2, although they reappeared in later stages. The sketching in 2D (3) and modelling in 3D (5) were done almost continuously, spread over the entire project. Precedents (4) and variants (6) were also used during the whole span of the project, but were more like recurring sub-investigations. I would argue that the preconditions are the most objective and rational. The project for example either meets the legal requirements or it does not. The aesthetic choices and use of models are in my opinion the most subjective, although the use of variants make it more objective. Intuition is probably most used in the third category, intuitive sketching.

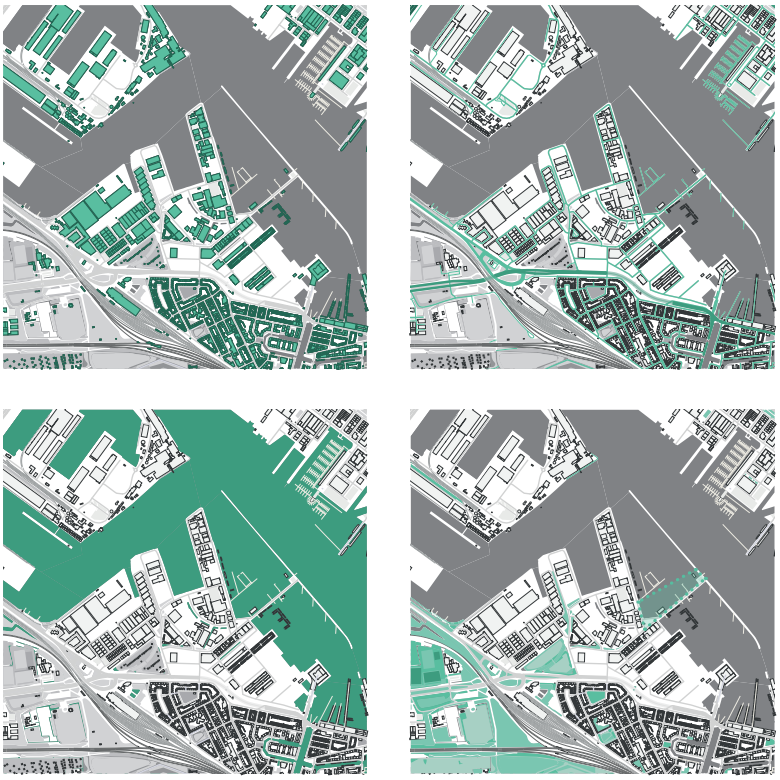
In the following chapters, I will elaborate on the relationship of the research and the design in the above-mentioned six categories of research methods.

2 Satellite image of Minervahaven

THE PRECONDITIONS

Each design of a building starts with a certain set of preconditions, as each assignment has its own unique context. This makes it both interesting and complex. A design that works for one location could easily be worthless for another one, especially in distinct countries. I regard these factors as the input of the design. They are present from the start and do usually not change during the further scope of the project. Nonetheless, they have a substantial influence on the design. I will elaborate on three of them, which in my opinion have the most influence on the design: the site, the regulations and the budget.

The site has certain characteristics, such as the morphology and the size of the plot. At TU Delft, each project started with an analysis of surrounding buildings, infrastructure, water and green. Hence, I did this also for this project (image 3). The tracing of the context helps to get a solid grasp on what is there, which in turn provides tools to design with. Therefore, only observing what is there is insufficient. It needs another step, a translation into what it means for the design. For example the presence or absence of buildings affects the sunlight and views. I do not really see this as research, more like 'finding out', although it sometimes needs some digging to discover important elements. For example a large park and metro station are planned in close proximity, which made it more legitimate to exclude green or a large parking garage inside the boundaries of plot.
Another precondition is the set of regulations and requirements the

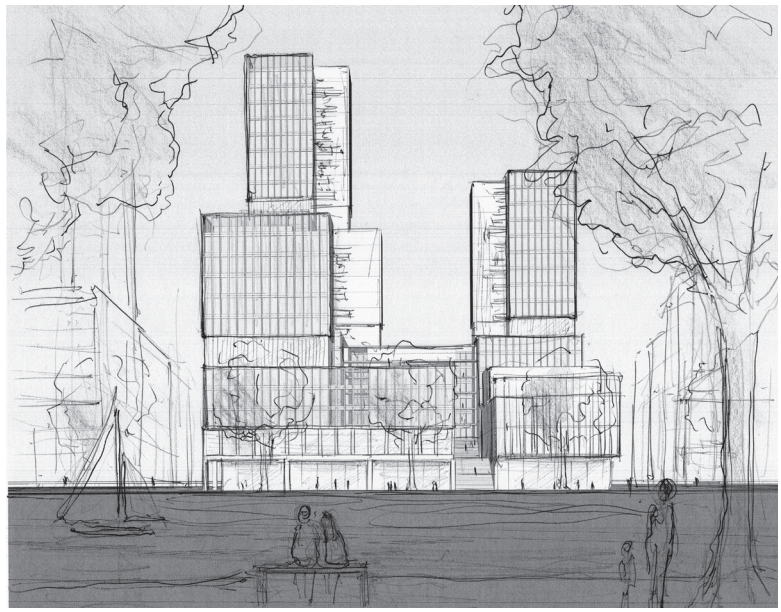


3 Analysis of buildings, infrastructure, water and green

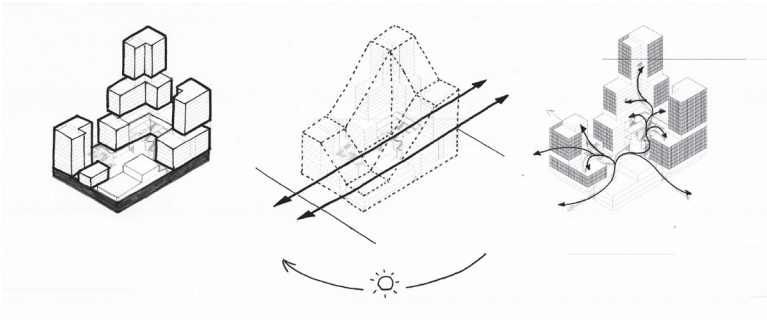
government demands on for example (outdoor) spaces, sustainability and fire safety. The building code for the Netherlands contains a lot of obligations, such as the amount of storage rooms and spaces for parking cars and bicycles. These take up a lot of space in the design, mostly on the lower floors. Likewise the fire safety extensively determines the layout of the building core. I was unaware of these specific rules at the start of the project. It was difficult to add these later on without altering the design too much. Knowledge of these aspects would have helped to integrate it in the design immediately. A third precondition, the budget, is not explicitly mentioned in the

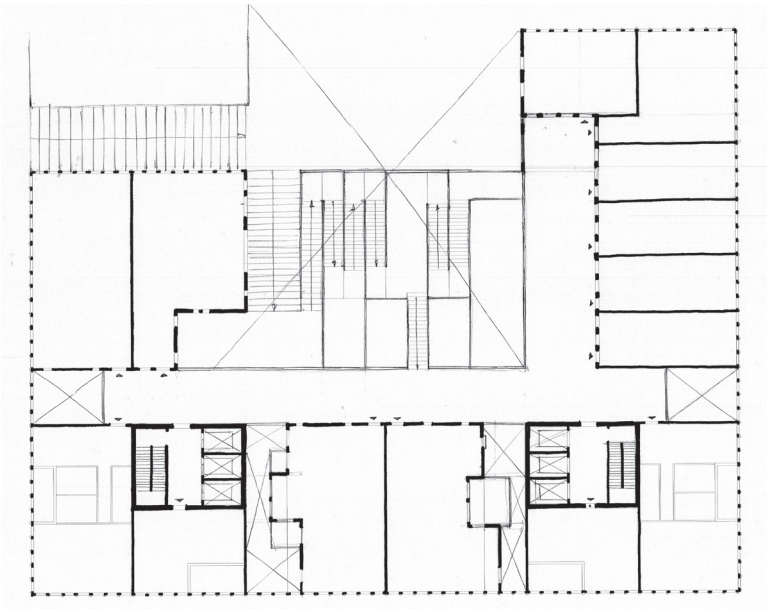
assignment. Still, in reality it certainly is an important factor in design projects, and therefore I took this into account. If the building cost would not have been an issue, I would definitely have designed a completely different building. Nonetheless, I think that the design has more value when the affordability and feasibility is also considered. What made it difficult was that I did not have enough knowledge about the specific building costs to smartly integrate this into the design.

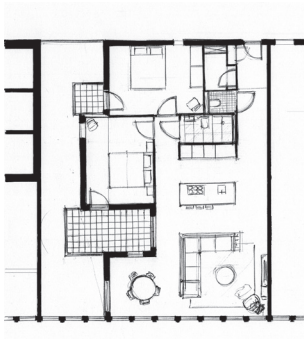
The lack of knowledge is for example visible in the very first version of the design. This building was designed within a week during the quick start of the project (image 4a & 4b). The building for example does not comply with fire safety regulations. Besides that, dwellings do not get enough sunlight and are too large, which make them unaffordable.

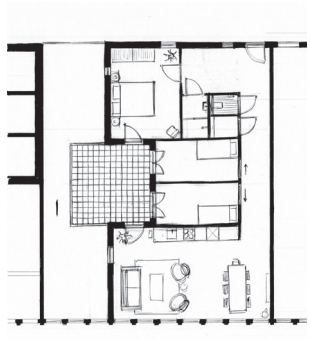


4a Quick start design







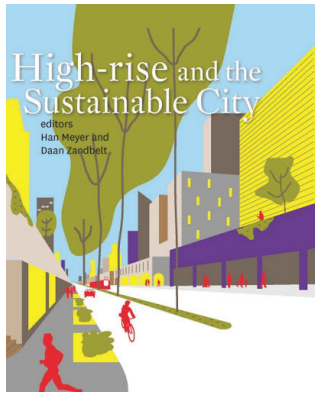


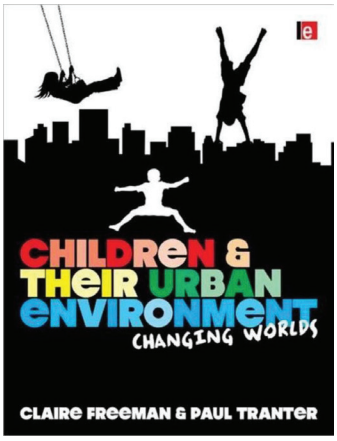
4b Quick start design

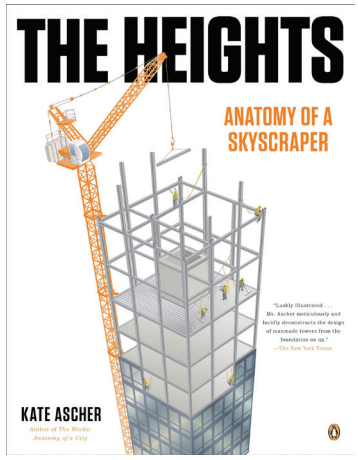
Knowing the preconditions is valuable. First, the context of the building, such as the morphology, can provide opportunities for an interesting design, coherent with its environment. Seeing these as limitations or restrictions is in my opinion not necessary.

Second, having knowledge from the regulations in the early stages of the project, absolutely helps for the later stage of the project. One overlooked minor aspect can have a butterfly effect on the rest of the design, making it necessary to change everything. Although I think these preconditions are not infinite, I did not succeed in knowing all of them early on, partly due to the lack of experience in dwelling. Only reading the legal texts without seeing what is means in practice did not work, as these are too extensive. In future projects I would be able to integrate more of the preconditions from the start, as I obtained more knowledge during this project.

Third, the preconditions can give valid reasons for design choices. This can be valuable when explaining the project.







5 Books used for research on topic

APPLYING EXISTING KNOWLEDGE

A lot of knowledge is already available to use for a design project. It is not always necessary to conduct research when it already has been done before, often in a more reliable way. Especially in recent years the access to relevant sources has become easier. On the one hand, this gives the opportunity to make deliberate design choices and the ability to justify these with (scientific) research. On the other hand, the infiniteness causes a certain anxiety that I possibly miss something important, that one relevant article or book about my specific topic that I might overlook. This also happened during this project. I kept on looking for more relevant books and news articles, even in the later stages when I was not even able to use it anymore. I have the tendency to try to find everything there is about a specific topic, while a handful of reliable sources could be sufficient.

The information I retrieved from literature was mostly about my target group, families. More specifically, families living in the city, in this case Amsterdam. As I do not have children myself, I am not completely familiar with this group of people. I do get the wish to live in an urban environment, as I have this urge myself, but I did not know enough about what having a family meant concerning the needs for housing. My main research question was therefore about the needs of families, to find out when they would be more inclined to stay in the city. Consequently, I wanted to translate the findings into the design of another building form, a residential tower.
The literature about families in residential towers in the Netherlands

was limited, probably because this is still not common. Literature about families in high-rise in other countries such as Hong-Kong was available however. Yet I found this not applicable enough, as the cultural and physical context is too different from the Dutch. Luckily there was literature available on the specific subject of families in Amsterdam. Lia Karsten, a researcher at the University of Amsterdam, specialises on this topic and published several articles and books. Besides this, I used other books as well, as I did not want to be reliant on just one source. Other books were used to gather information and justify design choices (image 5).

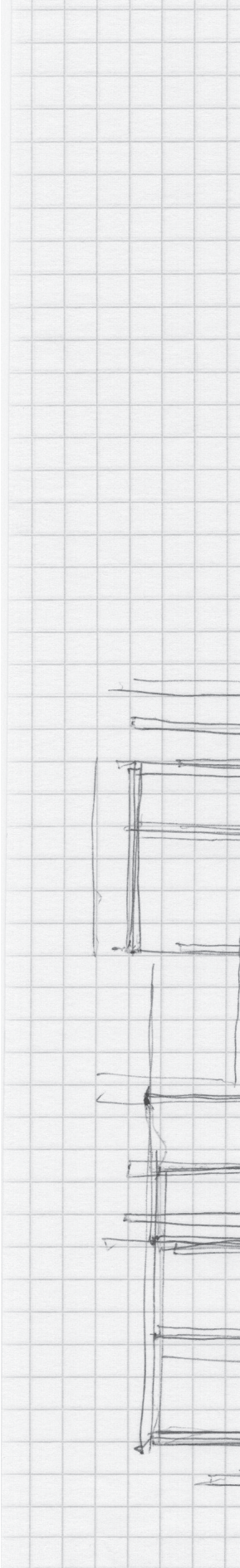
The literature helped me to get more grip on the target group and their desires, although it did not give me a convincing answer on what families, more specific in Amsterdam, really want and need. This might be because there is not one answer, as all families have different sizes, incomes and cultural backgrounds. Therefore it is impossible to reduce them into one stereotype. Certain needs apply to the majority of families, but probably not to all of them. Furthermore, families may not be familiar with other possible housing forms, only with known examples. They might have an image of what their house should look like: the typical Dutch family home with a garden, three or four bedrooms and storage space in the attic. This is what most people are used to, but other forms, such as high-rise might be just as desirable. For example the need for a garden could disappear when there is an alternative for this. Also, not every family is the same, especially families who make the choice to live in a city. My target group are not families that want to live in a quiet

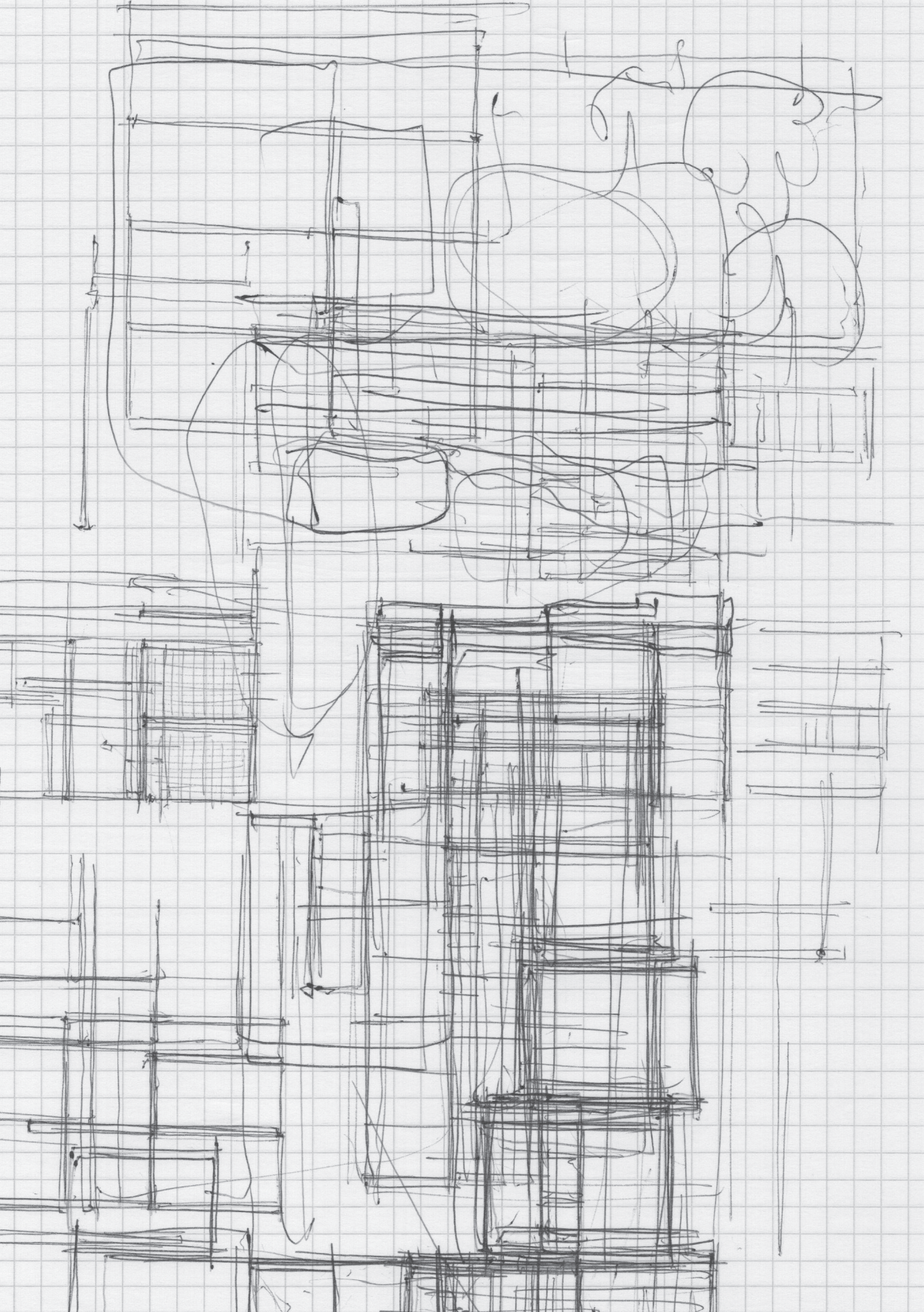
child-friendly neighbourhood. Perhaps there are still enough families that do not have this urge for a private garden and lots of storage space. Although this is an assumption which I cannot base on solid reliable evidence, it does not make it necessarily untrue.

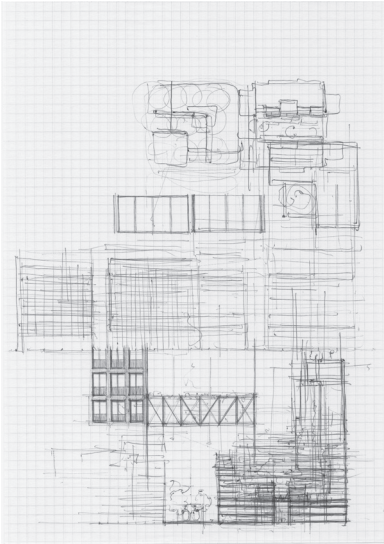
These doubts about the desires of families do not mean I neglected findings from the literature about families in the city. The literature presented two main reasons for families to leave Amsterdam, which are the lack of space (for enough bedrooms) and a garden in the current home. In surrounding municipalities it is possible to buy a house with garden and more space for a similar asking price. However, bluntly implementing these two aspects into the design, a larger floor area and more private outdoor space, would mean less affordability. Therefore, I implemented this in another way, with more collective outdoor spaces and flexibility in rooms and floor plan. I made smaller dwellings, still with enough bedrooms and I tried to make more optimal use of the available space. Other aspects I used in my design are the expanding range of discovery of the environment and the value of a school in close proximity, by including a school within the plot.

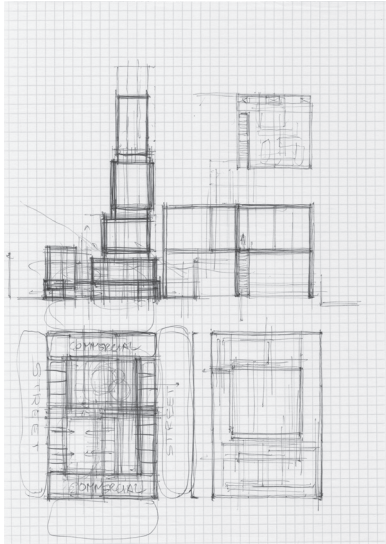
In my opinion literature research is useful, because it can justify certain design choices. It gives more weight to a decision when it is based on scientific sources which are objective and verifiable. In addition, to me it is pointless to get answers by doing my own research among the target group, when this is already done in a more extensive and

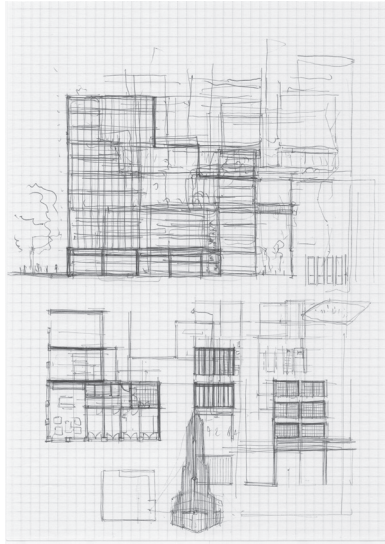
reliable way. A potential risk of literature research is a conformation bias, by only looking for literature that gives justification to already made decisions. It is tempting to steer into a certain direction by only presenting that specific research and neglecting other viewpoints. Besides this, I often found it difficult to translate certain findings into the design, as there are too many other factors to take into account. Finally, there is a possible issue of stereotyping the target group.

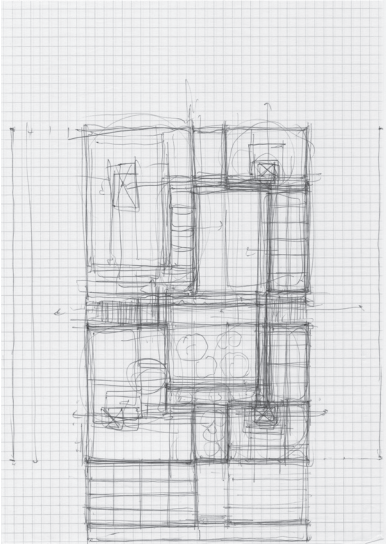


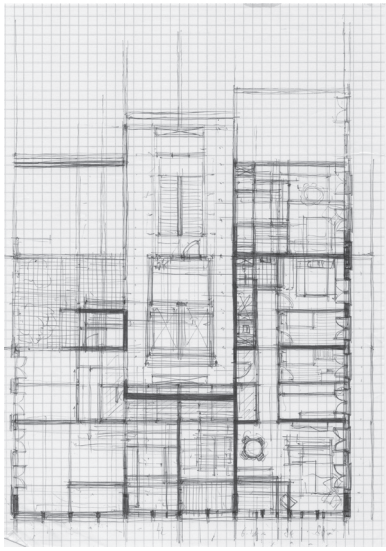


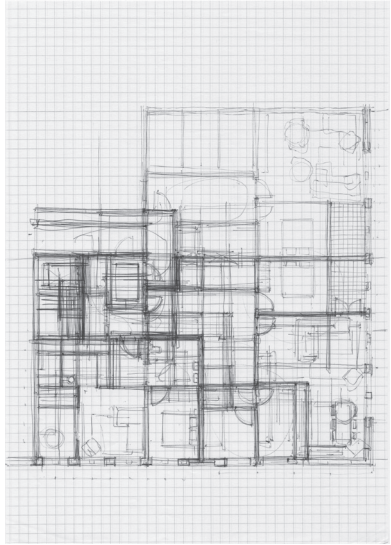


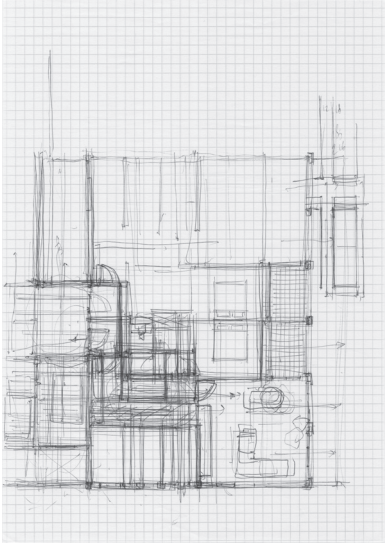


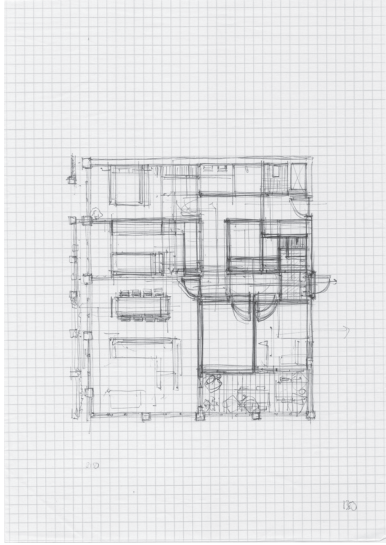


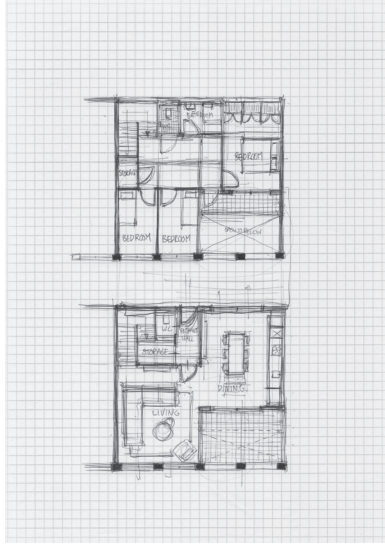












6 Sketches of plans

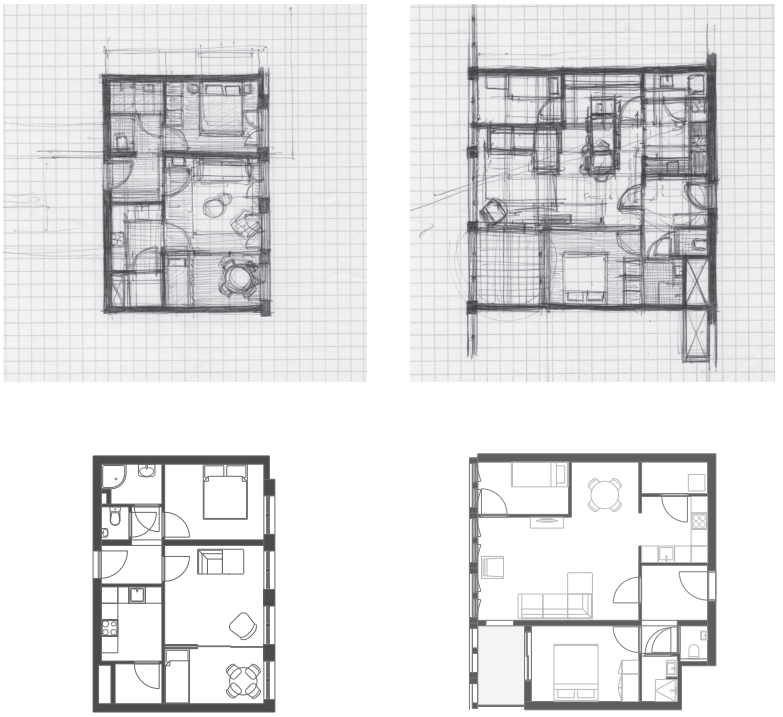
INTUITIVE SKETCHING

Sketching with a black ballpoint pen, mostly in the form of floor plans, is my favoured way of designing. When I have read the assignment, I just start drawing the first line, which evolves into a two-dimensional wall or space on paper. I do not know how the sketch will develop, but in my imagination the building starts to take form into a three-dimensional building. This process is mostly intuitive. I take decisions on what the building will look like at the moment I draw the lines. I try to draw the best option for a specific space, incorporating sight lines and aligned spaces to construct an optimal configuration.

I always use graph paper with a grid of five millimetres, which allows me to draw the plans to scale. Most of the drawings, are 1 to 100, which gives enough detail and the best sense of how large the spaces will be in reality. Sometimes I use a bigger scale of 1 to 200 for story plans or 1 to 500 for the whole building block. A small selection of sketches I made during the project is shown on the left page. I started on the scale of the building block with a plot size of 60 by 90 metres. This was mostly for the configuration of dwellings, outdoor spaces and staircases. The story plans of the tower started with a core and the possible position of load-bearing walls and shafts. In the facade, at least the width of a living room, one master bed and an x amount of bedrooms should fit. Sketching this onto paper allowed for seeing what was possible and what would work best. Likewise, the dwelling plans were easier to sketch first, instead of designing them on the computer. Because I start drawing with low pressure, the strokes are relatively thin at first. This way, potential

other configurations are still visible, unlike computer drawings. When I knew the constraints and dimensions of a certain dwelling, I tried to fit in all functions in proportion to each other. Consequently, for larger dwellings I made all spaces larger accordingly.

In the end, most of the dwelling plans were first sketched on paper, before drawing them in the computer (image 7). Hence, this intuitive method of designing had a large influence on the design, mostly for the (programmatic) configuration of the plans on different scales.



7 Digitalisation of drawn floor plans (scale 1:200)

The positive aspect of this method is that I think the floor plans become better than when I would have designed them digitally. It is easier to see possible options when not drawing lines with the same thickness. This gives room for more optimal floor plans. However, there are major downsides to this approach. First, it is difficult to communicate the idea during the process by only showing plans. Not all the ideas are visible or easily recognisable from the plan, especially when one is not familiar with the building. Second, the design choices are not clearly visible and other possibilities are not always considered. Third, when the building gets too complex, it becomes harder for myself to visualise the building by only drawing plans. Finally, the method is hardly scientific. I do not use a fixed method and it is neither verifiable nor objective.

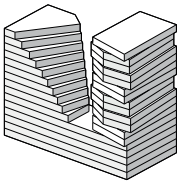
Nevertheless, I am convinced that sketching from intuition works better then designing rationally on computers. Therefore implementing this method in the process is, for me at least, vital for a better design.

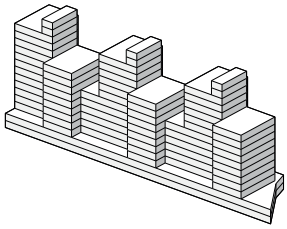
BATIMENT HOME PARIS

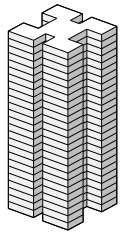
NOU BARRIS BARCELONA

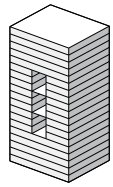
KENT VALE SINGAPORE

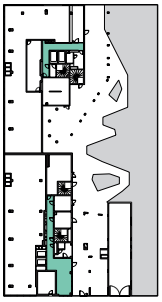
MAASBODE ROTTERDAM

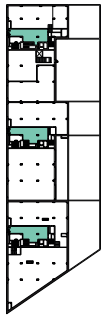


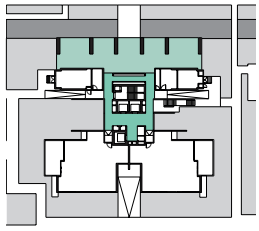


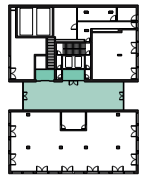


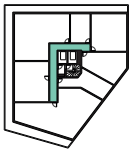


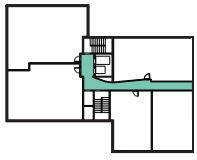


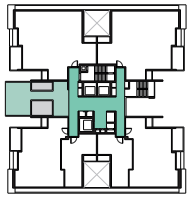


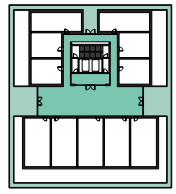


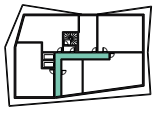


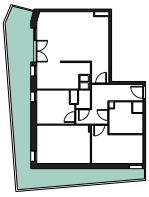


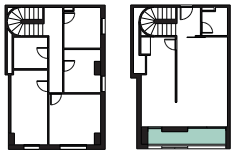


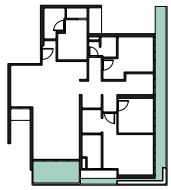


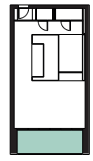








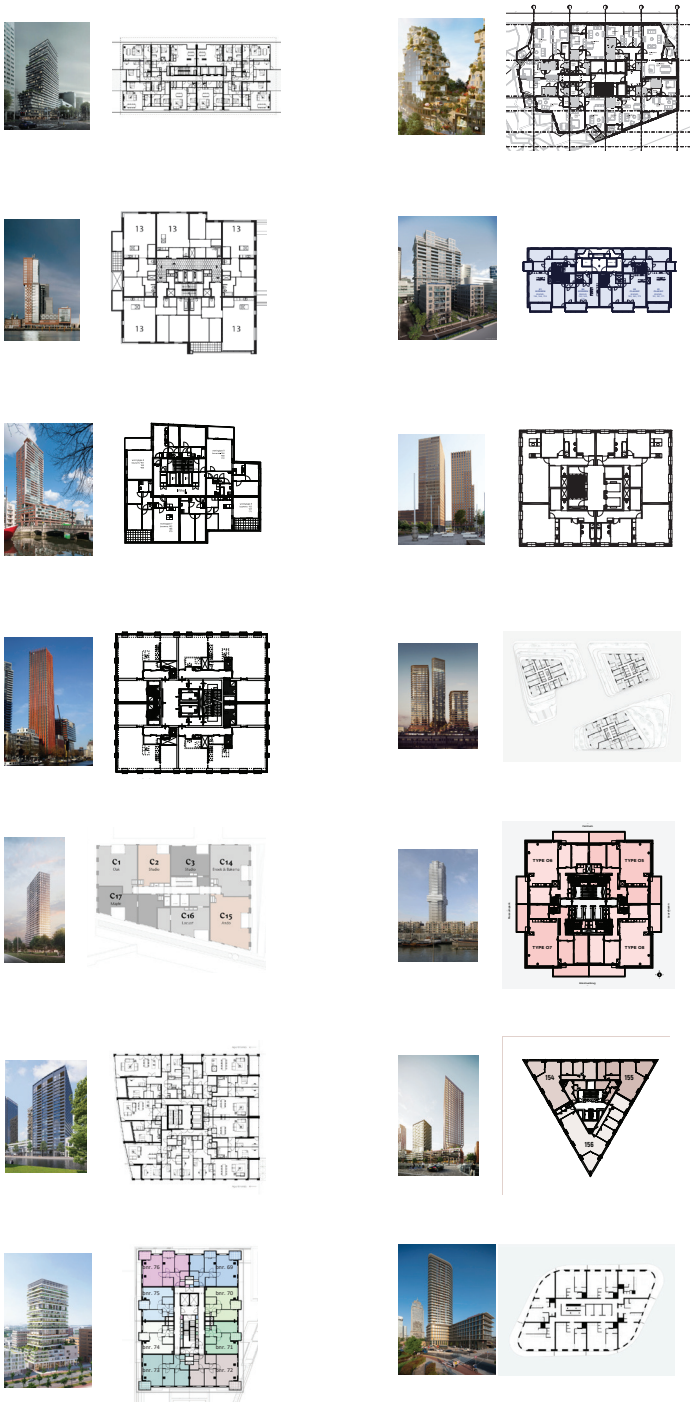




PROBING INTO PRECEDENTS

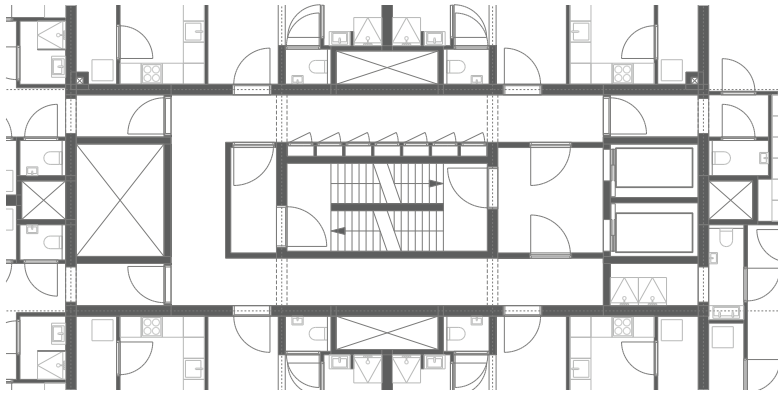
Although every building is unique, a lot can be learned from existing examples. In my projects I used precedents in several ways, ranging from systematically investigating them to merely as inspiration. Below I will elaborate on these methods of analysing and exploring precedents.

An obligatory part of the design studio is a plan analysis of four case studies. My criteria for choosing the precedents were high-rise buildings with dwellings targeted to families. As I could not find representative examples in the Netherlands, I chose foreign buildings as well. I analysed the plans of the four precedents on their outdoor spaces and the connection from the dwelling to the city (image 8). It was interesting too look into the plans more thoroughly than I usually do. Nevertheless, I found them to be too different from my own assignment, mainly because of the contrasting location. Presumably, they are designed with the incorporation of their local climate and culture. I deemed the chance too high that the design would not correspond with Dutch needs. Therefore, I did not incorporate much of the findings directly into my design, except for one idea from the precedent in the Dutch context. This building, Maasbode in Rotterdam, has ‘streets’ stacked on top of each other. As it is currently being built, I was certain this idea is possible despite Dutch regulations. In contrast to Maasbode, I only did this at one level in the building, as these dwelling types become relatively expensive. This way, they remain more unique and saleable.



9 Floor plans of residential towers in the Netherlands

Another analysis I did, albeit less systematic, was looking into cores of residential towers in the Netherlands (image 9). At the P2, there were comments on the core of the building design, so I had to improve this part. Fire safety regulations and economical aspects limit the possibilities for the design of the core. Looking into the cores helped me to see similarities, such as the spiralling staircase. However, some examples did not seem to correspond with current regulations. This may be because equivalent measures were implemented to meet the criteria, which are not visible in the plan. In the end I designed a core similar to 'Vertical' in Amsterdam (bottom left), in the same municipality as my assignment. The corridor allows for exiting the building in two directions and gives more possibilities for entrances of the dwellings (image 10). In the end I am satisfied with the core, but it would have helped if I was more familiar with regulations from the start of the project. It would have given much more opportunities for more creative solutions regarding for example collective spaces, without making it illogical or uneconomical.



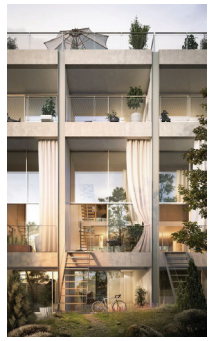
10 Core level 15











11 Precedents of facade

Precedents can also serve as inspiration. The internet is an almost infinite source for this and is easily searchable. I did for example many searches for high rise buildings, both in the Netherlands and abroad. I also explored precedents of specific aspects of the building, such as the facade (image 11). In addition, field trips can be useful for understanding how a building works and how it is used, which is sometimes not properly perceivable from images. An example of this was the field trip to Brussels. I also had accidental encounters in Amsterdam of buildings I was unaware they existed, such as a building in which apartments are on top of a school (image 12). It is fascinating to see ideas in practice, in this case for example the collective spaces and entrances. Besides this, I paid more attention to the behaviour of children and its parents. Before, I was not even aware there were children in Amsterdam. After starting this project, I suddenly saw them everywhere in the city. These precedents, both digitally and in real life, did not directly influence the design. I did not use concrete findings and copied them into the building. As you can see, the final facade design does not really correspond with the images above. Nevertheless, it gave me a better feeling for subjects I was unfamiliar with, such as living in the city as a family. Moreover, it especially helped to get inspiration and to get enthusiastic again.

In my opinion, precedents are very helpful for a design project. A lot can be learned from existing examples. They can be useful for seeing what is possible, for example regarding fire safety. Existing details can be used and adjusted for the own building. Moreover, precedents can serve as inspiration, to keep the project going. It








12 Bouwblok Nieuw-West, Paul de Ruiter Architects

is difficult however to directly incorporate the ideas into the design, especially for dwelling. If the project comprised another building type, perhaps a certain standard system could be distilled. Housing seems too much determined by its local customs and climate. Besides this, the building industry is relatively conservative, which makes it more difficult to find innovative examples. Another problem was that I kept looking for more precedents, because I might have missed a better one.

Simply looking for similar buildings is not really a scientific method of research. The plan analysis however, has a more scientific approach. A fixed method is used which makes it better verifiable and repeatable.

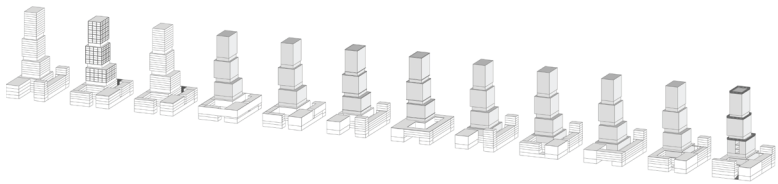
To conclude, this method is valuable for the design process, but it is important to be critical whether it can be used in the own design. Instead of directly copying, precedents are mostly useful to learn and get inspiration from.

13 Sketchup model of building design

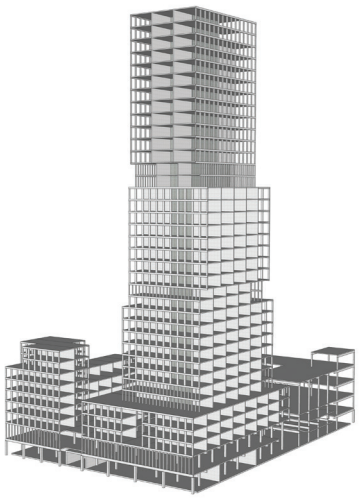
THE THIRD DIMENSION

In this project I tried to incorporate the third dimension more than I did in former projects. As stated before, I am used to designing by drawing two-dimensional plans. I imagine what the space will look like in my mind and this usually corresponds with what it will look like when I would actually draw the space in 3D. However, I also acknowledge the downsides of this approach. The transferability of ideas and understanding of the building is sometimes too complicated. Therefore, only drawing floor plans is inconvenient. Besides, as the real world has three dimensions, it seems sensible to explore the design in the third dimension as well. I will discuss the way I did this below.

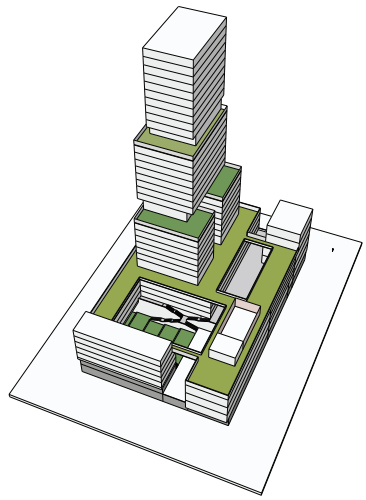
I repeatedly used 3D modelling software (Sketchup) during the process. With this program it is possible to make three-dimensional objects relatively quickly. This helped with testing ideas for the building mass in a short amount of time. Numerous variants can easily be made, copied and modified (image 14). This way, adjustments to the building mass can be seen next to each other



14 Sketchup model of building masses



15 Sketchup model of construction



16 Early Sketchup model of building mass

from different angles. In a later stage, I decided to model my design with more detail (image 13). This gave me the opportunity to better understand aspects of the building, such as the complex parts and the construction (image 15).

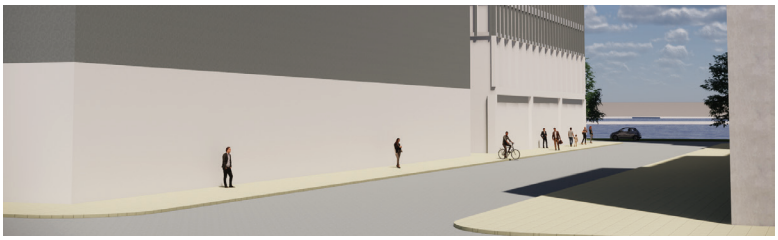
Image 16 shows one of the earlier variants of the building mass and its collective outdoor spaces. This model was based on plans drawn by hand and gave me a quick review if my imagination was correct. The visualisation made it also easier to communicate the ideas and discuss these with the teacher. Consequently, changes were made to the design, especially in the lower part. The Sketchup model also made it possible to see what small interventions in the plan meant in 3D and vice versa. This made the design process more efficient.

Next to the graduation studio, a mandatory course was given, in which virtual reality was used to explore the design. This way, a simulation of the building could be examined from eye-level to better approach what it will look like in reality. Watching everything in a panoramic view by using the headset, made a noticeable difference from just using the Sketchup model. Seemingly small changes in the design look suddenly pretty large when seen in virtual reality, instead of a birds-eye view on a small screen. Examples of this are shown in image 18. Especially the blockage of sight lines where eye-opening to me, which I kept in mind during the rest of the design process. Virtual reality is also an effective tool to use at presentations to transfer ideas (image 17). I did not do this however, because modelling the project to the level that it shows correctly in virtual reality was too time-consuming.

17 Presenting design with virtual reality



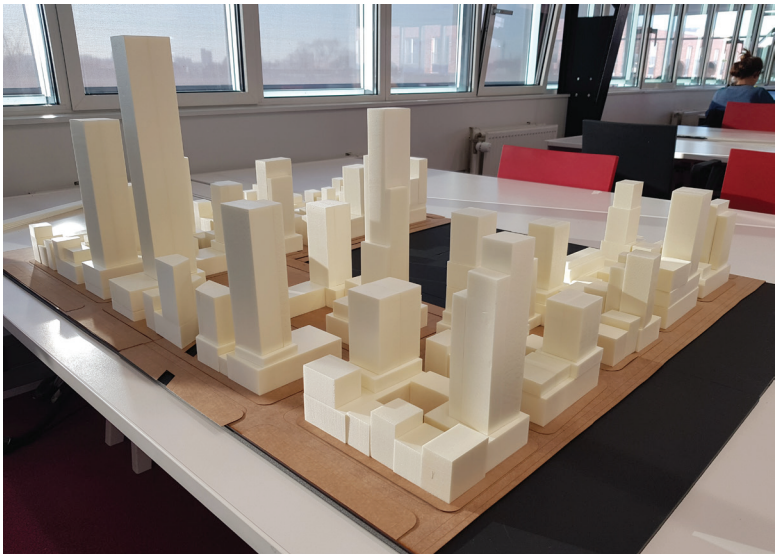





18 Exploring design in virtual reality

Besides digital models, I also used physical models to explore my design. In former projects, I hardly did this during the process itself. In this project I used foam models in different scales to explore other possibilities and to show choices (image 19 & 20). I made a lot of 1:500 models, on which I will elaborate in the next chapter. The models shown on the right, to explore the third dimension, did not really change my design. Nevertheless, I considered them helpful for myself and during teaching sessions. It is more pleasant to talk about a physical model instead of one on the computer.

20 Foam model (scale 1:200)

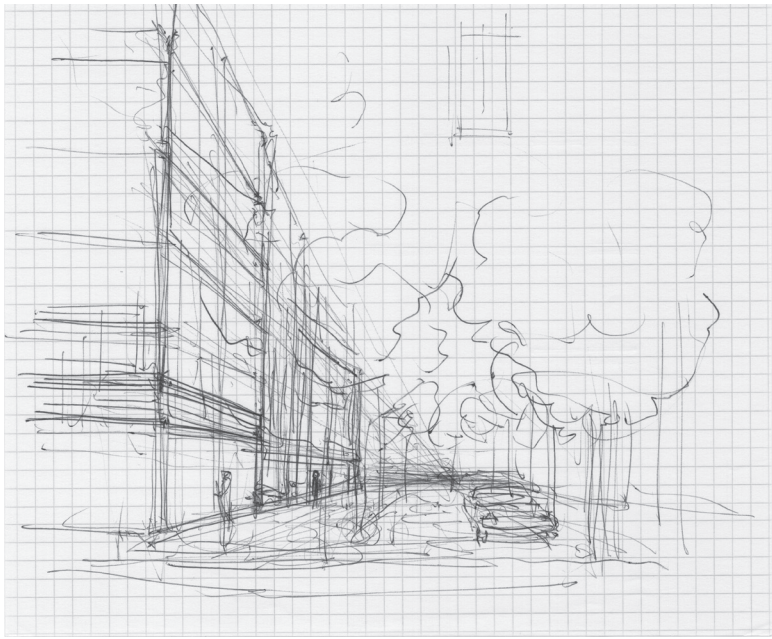


19 Urban model (scale 1:500)

A less used method regarding three-dimensionality were hand drawings (image 21). I include this because I found it remarkable that I made a relatively low amount of these. At the same time I also noticed that they do not help me, as they are just a representation of a mental image. In hindsight, I could have used to them to show ideas, but they would not have influenced the design.

In my opinion, the research of the design in the third dimension is essential. Buildings are designed for the three-dimensional world, so sticking to plans is not sufficient. Moreover, exploring the building on eye-level is important, as this is the perspective how people will see the building eventually. Three-dimensional images show the impact of design choices and are useful to comprehend the complicated elements of the design.

A downside of this approach is that making models can be time-consuming. This is also true for getting an adequate representation to test certain ideas (in this case in VR). Besides this, choices made in the third dimension can be too subjective and unscientific. I tried to overcome thus by making multiple variants, as seen in the next chapter. Nevertheless, three-dimensional models are useful, to understand the design and for representational purposes.



21 Hand drawing













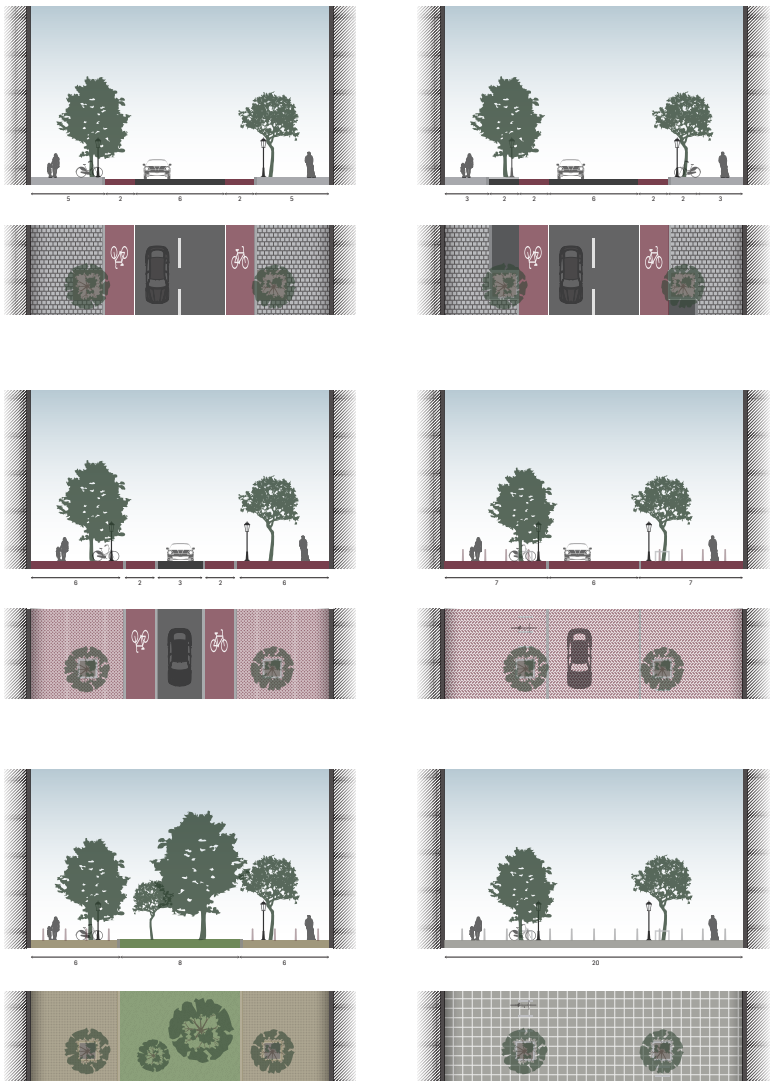


AESTHETIC CHOICES

Aesthetic aspects of the design, such as the composition and materialisation, are mostly subjective. Usually I just go for what I think is the best option. This time, I wanted to have a more objective basis for my aesthetic choices. Therefore, I did several variant studies.

In the early stages of the project, I made foam models for the composition of the building (image 22). My only constraints where the plot size (60 by 90 metres) and a desire for high-density. Although I kept in mind that dwellings should be able to fit inside the mass, I wanted to stay open for all possibilities. I started with a closed building block, a type which is common in Amsterdam. Then I made completely different forms, some of them slightly based on existing buildings (Pontsteiger, Sluishuis, Markthal). After the decision to design a high-rise building, I explored the composition of the tower and the lower levels. First, I built models with two towers, based on the quick start design. In addition, I tried a variant with only one tower, which I continued with for my further design. Hence, this method did have a significant influence because I chose the variant with only one tower. Otherwise I probably would have stuck to the variant with two towers next to each other.

Another study I did, was making multiple alternatives for street profiles on the long sides of the building, where the entrances are located (image 23). Although this was not really part of the assignment, I think the surrounding streets do have a substantial influence on the building design itself. Especially in my case, as I



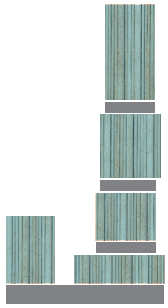
23 Variants of street profiles

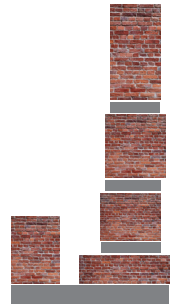
want to avoid a harsh border between the building and the city, the adjacent environment is also part of that. As these two streets only generate local traffic, there could be more space for playing instead of cars. The option on the middle right was the most logical for me,

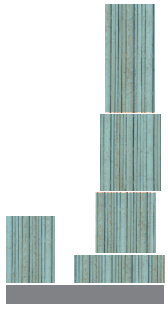
as it reserves space for cars, but in a subtle way. It also resembles the typical pavement in Amsterdam.

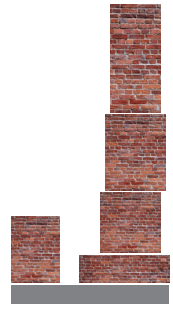
A third study included the appearance of the facade and the emphasis on the blocks (image 25). I proposed several ideas for the materialisation of the dwelling blocks, and to what extent these differ from the collective layers and the plinth. I experimented with various colours and materials, resulting in 32 different options. I could have made an infinite amount of options, but this amount seemed sufficient. If I had followed my personal taste, I would have chosen for the one which is completely black, with another material than brick. Despite that, I chose for the option with brick in different colours, keeping my target group in mind. In my opinion, brick is more suitable for family housing in this city, as it resembles the materialisation of most housing in Amsterdam. The different colours give a subtle difference between blocks, but they are still recognisable as one building (image 24).

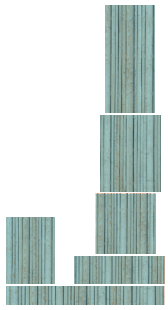
I think these studies are good for making subjective choices a bit more objective. The final choice is still personal, but at least other options were considered. It can also justify certain aesthetic aspects, as it shows the 'best' one between a set of possibilities. These studies can be time consuming though, sometimes for just a minor segment of the design. However, it also shows that it did have an influence on the design because I was more open for other possibilities. I doubt if it made the design really better, as other options may have been good enough. Nonetheless, now I am more able to justify the most subjective elements of the design.

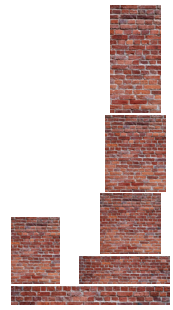



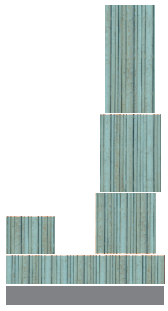


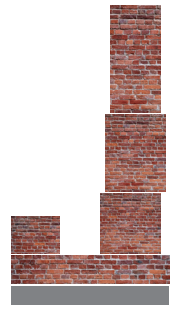


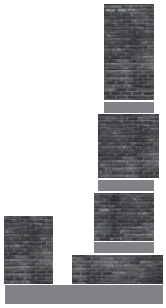
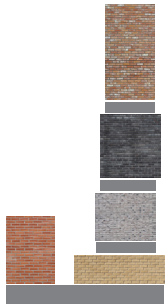


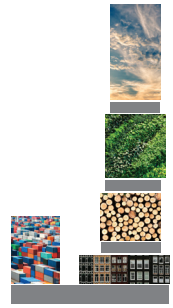
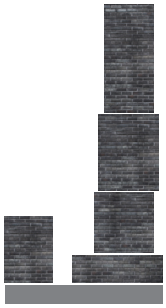
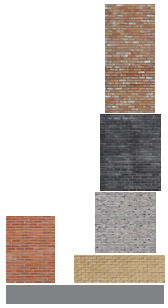


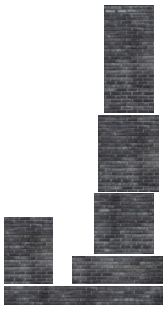
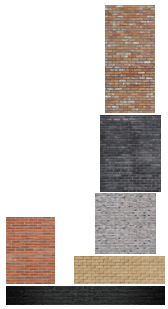


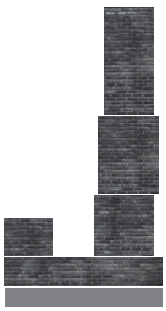
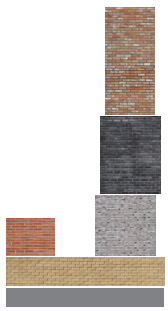




ADDITIONAL ASPECTS

THE RELATIONSHIP BETWEEN YOUR GRADUATION (PROJECT) TOPIC, THE STUDIO TOPIC, YOUR MASTER TRACK (A,U,BT,LA,MBE), AND YOUR MASTER PROGRAM (MSC AUBS).

The graduation studio 'Dutch Housing', part of the Dwelling chair, focuses on the future of housing in the Netherlands. The topic of my project, families in high-rise, is an example of a possible innovative solution for new forms of housing. This is also in line with what the Architecture track tries to achieve: "Teaching encourages students to develop creative and innovative building projects that use design as a means to deal with the technical, social and spatial challenges encountered in the built environment" (TU Delft website). This is what I tried to do in my project, creating a new form of housing which fits the target group, the location and is technically possible. As the project also incorporates for example the urban design and feasibility, it does not neglect important other aspects of designing buildings which are included in the Master program (Msc UABS) besides the Architecture track.

ELABORATION ON RESEARCH METHOD AND APPROACH CHOSEN BY THE STUDENT IN RELATION TO THE GRADUATION STUDIO METHODICAL LINE OF INQUIRY, REFLECTING THEREBY UPON THE SCIENTIFIC RELEVANCE OF THE WORK.

The first semester of the project follows a fixed structure, including methods such as a plan analysis, literature research and virtual reality. This allows for a solid basis with scientific value. The second semester has more freedom in terms of research, other methods are

accepted as well. This makes it possible to use preferred methods and explore personal interests. In my work I tried to find a balance between objective and subjective research, and between rational and intuitive steps, without losing its scientific relevance.

ELABORATION ON THE RELATIONSHIP BETWEEN THE GRADUATION PROJECT AND THE WIDER SOCIAL, PROFESSIONAL AND SCIENTIFIC FRAMEWORK, TOUCHING UPON THE TRANSFERABILITY OF THE PROJECT RESULTS.

Currently there is an urgent need for housing in the Netherlands. Especially in Amsterdam, the location of the project, affordable housing has become scarce. This makes it difficult for many groups of people, also families, to find suitable housing. Some families are forced to leave the city, as seen in statistics. This is a problem for the liveability of neighbourhoods. My design is a possible solution to keep more families in the city. By combining functions and sharing space, the scarcely available land in Amsterdam is used more efficiently. The project still has a sufficient amount of outdoor space and even added qualities such as views and more daylight. Usually family housing takes up much more space. The principles in the design could be transferred to other cities in the Netherlands suffering from the housing shortage. The design is intended to be integrated into a high-density environment, often locations where more housing is desired. The gradual transition from the private dwelling to the busy city make it suitable for existing high-density environments.

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.

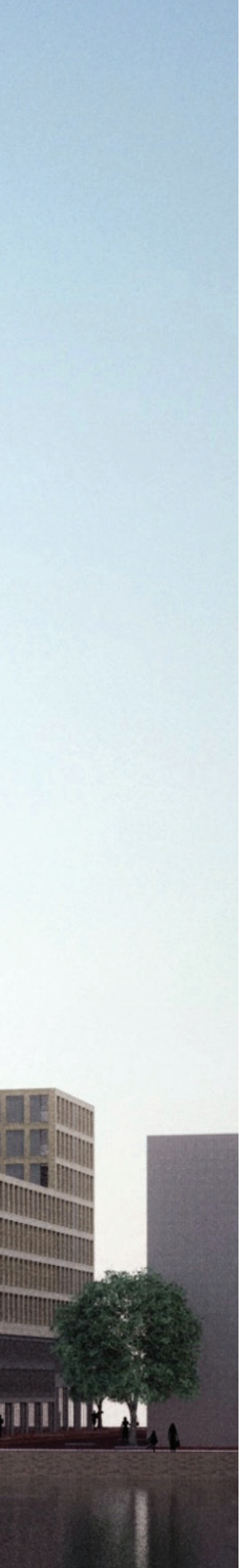
One of the ethical issues I encountered was the danger of stereotyping. Designing for a specific target group makes it tempting to reduce the whole group to one person with specific characteristics. This is in particular a problem because of the large gap between income groups that are most able to live in the city: families who qualify for social housing and families who are able to afford the high rents or asking prices. On the one hand, I think it is too naive too think there is no difference, but on the other hand it feels wrong to actually divide them into two groups.

Besides this, I had the dilemma of affordability. A lower floor area equals a lower asking price, hence more affordability.

The question is how far to go in limiting space and comfort to keep dwellings affordable. Personally, I think this is a political issue, due to the current policy there are barely any alternatives available between social housing and the free market. Luckily there is more attention for middle incomes in recent years, but this is still a problem. In my opinion, the housing market is not a free market. Resources, such as free plots, are not infinitely available. Comparable to healthcare, education and public transport, quality is more important than high returns. The value of land in Amsterdam does not only consist of material costs. The people who actually live there, such as the families, contribute to this value. Of course without initial investments there may be nothing built at all, but it seems to me there is a large discrepancy between housing costs and corresponding living

spaces for different people. One could argue that people have a free choice to live in larger affordable dwelling outside the city, but the consequence could be the loss of families in the city, hence the loss of liveability. I want to note that the purpose of this graduation project is not designing a building that really gets built, so this was not necessarily a limiting factor in my own project.

Finally, the sustainable aspect of construction keeps getting more important in recent years, a trend which will inevitably continue in the future. The issue with this is that aesthetic or financial choices which are considered as not sustainable become impossible. This sometimes limits potential innovative solutions.



CONCLUSION

As stated in the introduction, this reflection tries to answer the question to what extent the conducted research and its scientificity helped to make a better design. In the previous sections I reflected on the specific methods I used by mentioning their impact on the design and their values and limitations. As my usual method in design projects is intuitive sketching, I wanted to discover if using more objective methods improved the design.

I think each method benefits a design project in its own way. Knowing the preconditions and conducting literature research result in a solid basis to start the design phase. Research by design in both two and three dimensions helps to create more unique and optimal solutions, arising from the subconscious. Precedents can be very helpful to understand specific aspects or as inspiration. Finally, aesthetic aspects are better explainable when using variants.

Each method also has its downsides. Some methods can be too time-consuming for the acquired results. I also noticed I sometimes went on for too long with a certain method, trying to get better results. For example endlessly sketching or looking for more reliable sources had a relatively minor impact on the design. I could have done this more efficient by setting a deadline ore spending a certain amount of time. Continuing until I am satisfied myself is ineffective, as I often never reach that point.

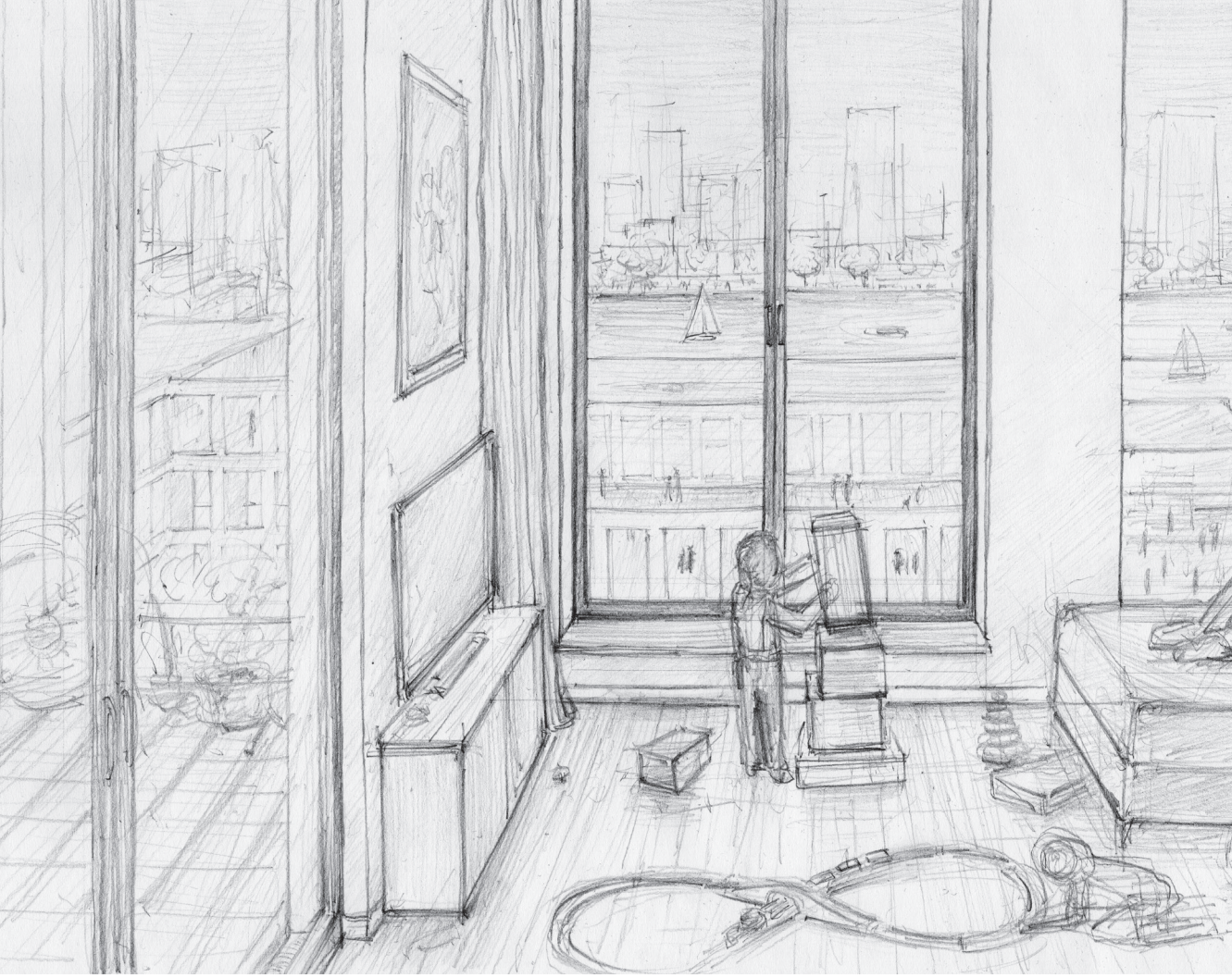
In my project I tried to implemented principles of scientific research. I used for example verifiable sources for my research on the target group. The plan analysis used a methodological approach and the use of variants made aesthetic choices more objective. I think this is important as the project is part of the graduation studio at a university. This way, it better fits the academic values of a university. Besides this, I think the scientific approach makes the project more solid and credible.

As more design choices in this project were based on objective research, has it become a better building? This is a tough question because what even is a 'better building'? One that is more cost efficient, technologically correct, sustainable, or one in which people like to dwell in? A lower building cost, higher isolation value, less energy consumption are objectively measurable and therefore more convenient for justifying or explaining design choices. However, the experience of being and living in buildings may be equally as important, especially for dwelling.

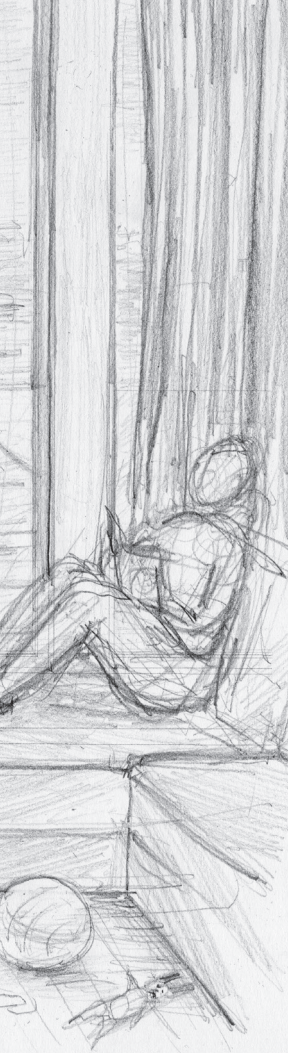
In my opinion a good design cannot be solely based on objective choices. The subjective elements of a building are equally as important. As buildings are part of the built environment, people are forced to dwell in the creations made by architects. Therefore I feel a certain responsibility to shape a desirable habitat. This aspect of architecture is difficult to measure however, although it should therefore not be ignored.

I think creating desirable spaces is for a large part based on intuition. Presumably there is not one answer or solution, neither is it black or white. However, in this grey area there are certainly 'rules' about what does and does not work. The location of the project is inside the ring road of Amsterdam, a location many people want to live. People are willing to pay a lot more compared to just a few kilometres further away. This is not a coincidence and has certain reasons. The difficulty with this, is that these reasons are not easily explainable and rather ambiguous.
With this project I tried to keep that in mind, by creating spaces which feel good and people want to be in. I think this cannot be reached by only doing objective research or objective design steps. Intuition is needed to make a building which can develop into an inspiring environment.

To conclude, I think both subjective and objective research is needed when designing a building. This was the case in my project, but I think this is also true in general. On the one hand, objective and scientific research is important and improves the design. Not only because this specific project is part of the graduation program at a university, but also for design projects in general, as it makes the design justifiable and more explainable. On the other hand, intuitive and subjective research is essential as well. Architecture is more than science, subjective research provides a building which is appreciated by its users with more resilience for the future.
If I could start over I would not exactly make the same design steps. I would be more deliberate in my research to be more productive and



efficient. However, I would definitely implement both objective and subjective methods, instead of mostly using intuitive sketching as a method like I did in former projects. In the end, I think it is necessary to have a balance between objective and subjective research to create the best design possible.



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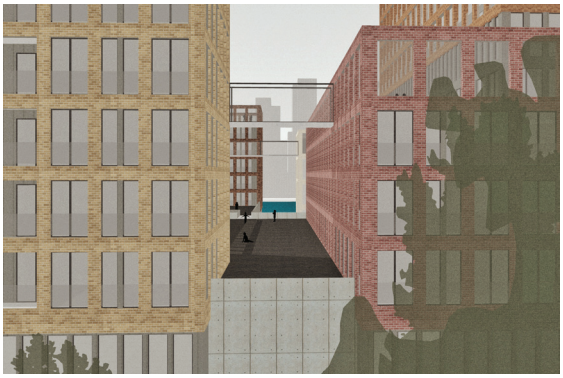

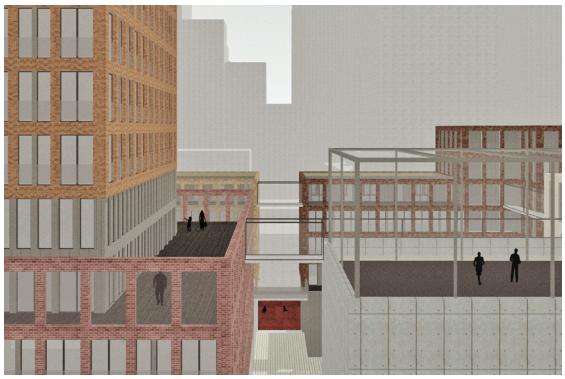

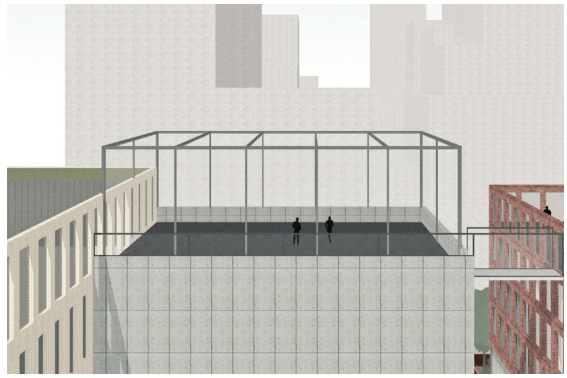

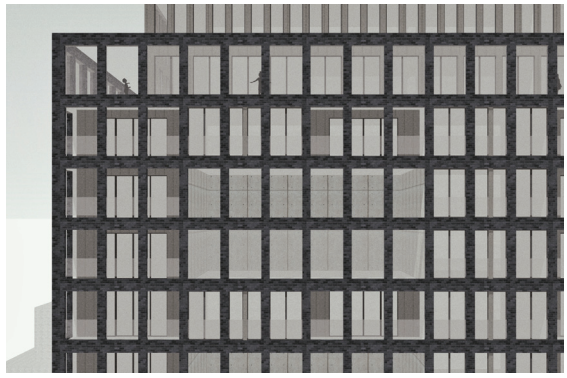

HIGH-RISE AS AN ALTERNATIVE FOR HOUSING FAMILIES IN AMSTERDAM