Growing Up & Growing Old in the City

Intergenerational living in a residential urban complex.

Graduation Booklet

Jordy de Rouw

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Advanced Housing Design Graduation Studio
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Preface

This document is a graduation booklet made for the Advanced Housing Design Graduation Studio. It is a part of the graduation trajectory of the MSc in Architecture at the TU Delft.

The goal of this booklet is to present the research that is conducted during the graduation studio and to showcase the architectural design that comes forth from this research followed up by a reflection on the process.

The starting point of the research is the studio theme "Designing for modern households, building a city for everyone". The main question the studio therefore wants to answer is: "How do we provide suitable, affordable housing for a diverse population?"

My personal fascination with the topic starts from the realization that while buildings are often designed as static objects, their inhabitants are very much evolving. As we move through the different stages in life, we require different things form our dwelling, our building, the neighbourhood, and the city.

For this project, the design part will take place in the Merwehaven a former harbour area in the city of Rotterdam. The municipality of Rotterdam has set the goal to transform this harbour area into a residential neighbourhood. For this area I together with the other participants of the studio have designed an urban master plan. From this urban plan each one of us has chosen one plot with an urban block that will be further developed into an architectural building design.

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Research

Introduction

The Netherlands is currently facing an overloaded housing market. This has the consequence that many people can not find a suitable dwelling. To solve this issue the government made the plan to build one million houses between 2020 and 2030.

Apart from the quantitative problem of too little houses what is even more important is to figure out what type of houses to build. Where should the houses be build? For whom should they be build? How do these people want to live? These questions need to be answered to make certain the houses that will be build have the potential to solve the housing shortage.

To figure out for who to build I examined demographic data of The Netherlands and the design location the city of Rotterdam. The data showed that most household growth in the coming years will occur among families with children and singles of all age categories with the largest increase in the 65+ age category.

Looking at the current housing situation of families and elderly people living in the city it seems like there is already a shortage of suitable housing. With the prognosis pointing out that there will be a growth in these households the shortage will only get worse unless action is taken.

Living environment plays a crucial role in peoples lives especially in the most vulnerable parts when growing up as kids or when nearing the last stage of life. This is because when we are young but also when we grow old we are dependant on caregivers and on what our direct environment can offer to meet our needs.

In this research I will therefore pay special attention to these two phases in life to explore how architectural design can assist during these phases. To find out what type of houses need to be build for these specific user groups.

To do this I will look into an intergenerational housing approach based on the thought that bringing together people in different life phases will help to create an inclusive community. This community can benefit all the participants and have a positive impact on the whole of society.

Keywords

Intergenerational living, Inclusive city, Aging in place, Child friendly city, Community forming, Autonomous living, Transformations through life phases

News articles 1 million homes

bpd
bouwfonds gebiedsontwikkeling

Publicatiedatum: 18 september 2017
Thema: Integrale aanpak

Home > Actueel > Onderzoeken > 1 miljoen woningen nodig tot 2030...

1 miljoen woningen nodig tot 2030

Volgens prognoses van ABF Research worden er in Nederland tot 2030 een miljoen woningen gevraagd. Hoeveel van deze nieuwbouwwoningen kunnen we redelijkerwijs in bestaand gebied bouwen? Hoeveel transformatieruimte is er in de bestaande stad?

Source: (bpd, 2017) https://www.bpd.nl/actueel/onderzoeken/1-miljoen-woningen-nodig-tot-2030/

25 augustus 2018 09:48
Laatste update: 28 augustus 2018 09:20

In elf jaar tijd moeten er een miljoen extra woningen komen, stelde minister van Binnenlandse Zaken Kajsa Ollongren in mei dit jaar. Of dat gaat lukken is de vraag, want de grond raakt op, de overheid laat de bouw grotendeels aan gemeenten over en onze woonbehoefte is veranderd.

Source: (NU.nl, 2018) https://www.nu.nl/wonen/5427335/miljoen-woningen-erbij-2030-gaat-wel-goed.html

NOS

NOS NIEUWS • BINNENLAND • ECONOMIE • WO 17 FEBRUARI, 07:50
• AANGEPAST WO 17 FEBRUARI, 08:10

Grote bouwcoalitie presenteert actieplan voor 1 miljoen woningen in tien jaar

Source: (NOS Nieuws, 2021) https://nos.nl/artikel/2369043-grote-bouwcoalitie-presenteert-actieplan-voor-1-miljoen-woningen-in-tien-jaar

DELFT INTEGRAAL

Door Christian Jongeneel.
Oktober 2018

Gevraagd: een miljoen woningen Maar welke?

In 2030 moet Nederland een miljoen woningen meer tellen dan nu, stelde minister van Binnenlandse Zaken Kajsa Ollongren afgelopen voorjaar. Dat klinkt als heel veel, maar uitzonderlijk is het niet. De grote vraag is eerder: wat voor woningen? "We moeten niet dezelfde fout maken als vroeger, om een heleboel dezelfde woningen neer te zetten", zegt prof.ir Dick van Gameren, hoogleraar woningbouw aan de TU Delft.

Source: (Delft Integraal, 2018) https://www.tudelft.nl/delft-integraal/articles/gevraagd-een-miljoen-woningen-maar-welke

Demographics Netherlands

The Netherlands is expected to continue to grow in population in the coming years. The main reasons for the continued growth are natural birthrates, longer lifespans and foreign migration.

Apart from population growth also the amount of households is expected to grow. Especially because there will be an increase in single person households. This will lead to a higher demand for housing. On a national scale it is also clear that the highest growth will be in the 65+ age groups.

The consequence is that the housing shortage will most likely still increase over the next five years and then hopefully hit a peak and after that slowly diminish as population growth and household growth stabilize.

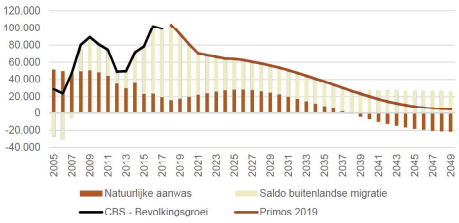
The highest housing shortages will be around already dense urban areas like the Randstad as this is were the demand is also the highest.

Sources:

ABF research. (2019). Primos 2019, Prognose van bevolking, huishoudens en woningbehoefte 2018-2050. Delft: ABF research.

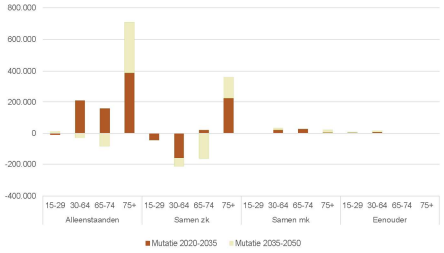
ABF research. (2020). Primos 2020, Prognose van bevolking, huishoudens en woningbehoefte tot 2050. Delft: ABF research.

Expected population growth The Netherlands 2005 - 2049



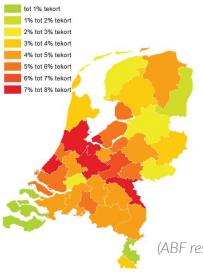
(ABF research, 2019)

Household growth and shrinkage per type and age 2020 - 2035 & 2035 - 2050



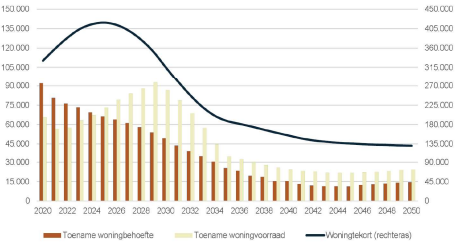
(ABF research, 2020)

Expected housing shortage per region by 2025



(ABF research, 2020)

Expected housing shortage by 2020 - 2050



(ABF research, 2020)

Demographics Rotterdam

Looking at the data collected about Rotterdam it is also clear that the groups that will be growing the most are families and elderly people.

Again it can be seen that the single households will grow the most but for the city of Rotterdam all household compositions show a growth.

Again most of these single households will be people in the age category of 65+. The growth is even bigger in the highest categories of 75+ and 85+ years of age.

The city of Rotterdam is expecting to have a peak housing shortage around 2024 of almost - 40.000 houses. But by building extra and redeveloping certain area's they hope to have reduced this to around -12.500 houses in 2050.

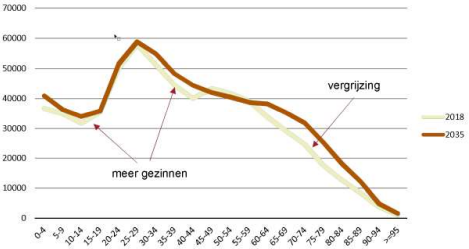
Sources:

Hoppesteyn, M., Permentier, M., & Van der Zanden, W. (2018). Bevolkingsprognose Rotterdam 2018-2035. Rotterdam: Municipality of Rotterdam, Onderzoek en Business Intelligence (OBI).

Municipality of Rotterdam. (2019). Uitvoeringsprogramma Rotterdam, Ouder en Wijzer. Rotterdam: Municipality of Rotterdam.

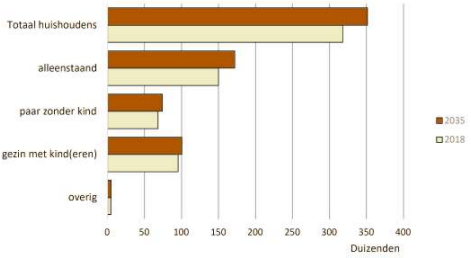
ABF research. (2020). Primos-prognose, woningtekort / overschot. Retrieved March 10, 2021, from https://primos.abfresearch.nl/dashboard/dashboard/woningtekort----overschot

Expected population growth Rotterdam 2018 - 2035



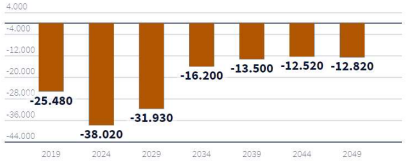
Hoppesteyn, M., Permentier, M., & Van der Zanden, W. (2018)

Household growth per type Rotterdam 2018 - 2035



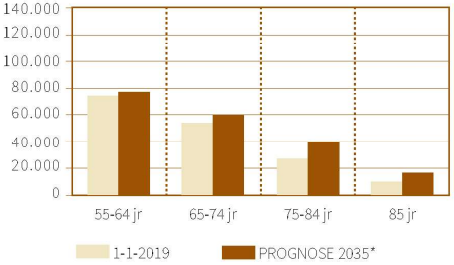
Hoppesteyn, M., Permentier, M., & Van der Zanden, W. (2018)

Housing shortage Rotterdam 2019 - 2049



(ABF research, 2020)

Expected population growth Rotterdam 65+ age group 2019-2035



(Municipality of Rotterdam, 2019)

Shortage of suitable elderly housing in Dutch cities including Rotterdam

Rotterdam gaat ouderenwoningen bijbouwen

DONDERDAG 3 OKTOBER 2019, 19:39

De Rotterdamse gemeenteraad gaat het tekort aan ouderenwoningen aanpakken. Zonder extra maatregelen heeft de stad in 2035 een tekort van ruim 9 duizend woningen.

(Rijnmond, 2019)

Groot tekort aan geschikte woningen voor ouderen

1 feb 2020 · leestijd 4 minuten · 444 keer bekeken

Er is sprake van een landelijk tekort aan geschikte woningen voor (alleenstaande) ouderen. Dit tekort zal verder toenemen door de vergrijzing die in Nederland plaatsvindt, stelt onder andere de Algemene Nederlandse Bond voor Ouderen (ANBO). Veel ouderen zitten daardoor nu klem in grote woningen die niet toekomstbestendig zijn. Maar wie is er verantwoordelijk voor het oplossen voor dit probleem? En wanneer gaat hier concreet iets aan worden gedaan?

(Kassa, 2020)

Sources: Kassa, 2020. Groot tekort aan geschikte woningen voor ouderen. [Online] Available at: https://www.bnnvara.nl/kassa/artikelen/groot-tekort-aan-geschikte-woningen-voor-ouderen [Accessed 3 June 2021].

Rijnmond. 2019. Rotterdam gaat ouderenwoningen bijbouwen. Accessed July 5, 2021. https://www.rijnmond.nl/nieuws/186864/Rotterdam-gaat-ouderenwoningen-bijbouwen.

Cities have difficulty keeping families due to a lack of suitable housing

Veel jonge gezinnen verlaten de grote stad

7-11-2017 02:00

© Hollandse Hoogte / David Rozing

Gezinnen verhuizen vaak als de kinderen nog niet naar school gaan, vooral als ze in een van de vier grote steden wonen. Van de stellen die in 2012 een eerste kind kregen buiten de vier grote steden, verhuisde 14 procent binnen vier jaar naar een andere gemeente. Het vertrek uit de grote steden was twee tot drie keer zo hoog. Dat meldt het CBS op basis van nieuw onderzoek.

(CBS 2017)

26 juni 2019 10:41
Laatste update: 26 juni 2019 11:49

7,7 procent van de jonge gezinnen uit Rotterdam verhuisde vorig jaar naar een andere gemeente. Dit blijkt uit een analyse van *LocalFocus* op basis van cijfers die het Centraal Bureau voor de Statistiek (CBS) woensdag publiceerde.

(NU.nl 2019)

Sources: CBS, 2017. Veel jonge gezinnen verlaten de grote stad. [Online] Available at: https://www.cbs.nl/nl-nl/nieuws/2017/45/veel-jonge-gezinnen-verlaten-de-grote-stad [Accessed 2 06 2021]
NU.nl. 2019. Bijna 8 procent van jonge gezinnen vertrok vorig jaar uit Rotterdam. Accessed July 6, 2021. https://www.nu.nl/rotterdam/5953989/bijna-8-procent-van-jonge-gezinnen-vertrok-vorig-jaar-uit-rotterdam.html.

Problem statement

The current housing stock in the cities no longer fits well with the demands of families nor the elderly citizens. Therefore, apart from building more houses we need to figure out what type of houses are needed. To do this it is important to take a closer look at the changing life trajectories, identities, and societal need of these groups to understand what has changed and to come up with new schemes, types and methods of dwelling design that fit better with their current lives.

Research questions

Main questions

How can housing design answer the needs of elderly citizens and families with children and incite a positive rewarding encounter for both groups?

Sub questions

- What has changed in the life trajectories, identities and societal needs of elderly citizens and families with children?
- What are the needs of elderly people living in a dense urban setting and what formal and functional features of the building, dwelling and the urban surrounding can support them?
- What are the needs of families with children living in a dense urban setting and what functions in the building, dwelling and in the urban surrounding can support them?
- How can housing design support community forming and incite a positive encounter between the different age groups?

Relevance

Intergenerational living is an up-and-coming topic. Within the field of architecture there is a lot of research to be found on how to design for elderly people and also how to design for families but the mixing of these two specific target groups is something that is not yet seen often in the Netherlands as the need for this type of housing might not have been that apparent until recently.

With the legislative changes that have taken place in the Netherlands over the last five years with regard to elderly care switching from a system with institutionalized care to a system of care at home has made the elderly much more reliant on their relatives, social circle and direct community.
It can be debated if the changes in the way elderly are taken care of are desirable but it is a reality and I think architecture can assist in making things easier.

At the same time living in the city has allowed for families were both parents can chase a career while at the same time raising children. Is this best for the children? Depending on how they arrange things it might or might not be. Then again if architecture can help by providing these families with a community it can relieve some of the pressure by being able to share some of the child rearing tasks.

Another important aspect is that an inclusive building design can also be important to serve as a bridge between different generations, to avoid alienation between different groups and to allow exchange of information and values in order to create mutual understanding.

So, this research aims at filling a gap in architectural knowledge on how to integrate the families with children and elderly in one building and also figuring out what functions they can share and how to stimulate community forming.

Research methods

For the research I will use two methods: literature research and case study analysis. For the literature research I will make use of news articles, journal articles, reports and books. For the case studies plan drawings and images that are made available by the different firms that designed the projects that will be used. Also, I will look at written explanation of the building either from the architects themselves or from different project reviews.

The first part of the literature research will be the introduction in which news articles and reports are used to show the current relevance and urgency the topic. Also included will be research conducted by architects from different firms in which they looked at how different families and elderly citizens live in the city and used this information to come up with different design concepts that can be implemented during a design project. In this part it is crucial for the reader to understand why there is a real necessity to improve upon the way we build for elderly citizens and families in the city and what the benefits of doing this in an intergenerational building block can be.

For the second part of the literature research the goal is to further define the user groups in this case the elderly and the families, defining their challenges and defining their needs on the scale of the neighborhood, the building block, and the dwelling.

The third part will consist of case study analysis. This part will focus on plan analysis of four selected case study projects. This analysis will result in conclusion drawings that show the main principles of the projects in order to compare them to each other to find out what are the differences and similarities and to be able to notice trends between the buildings.

What changed for Elderly Citizens?

In the coming years, the amount of elderly people in the city of Rotterdam will increase. Like in many other European cities this is due to increasing life spans and the post war increase in birth rates. Between 2019 and 2035 the amount of people 65+ years of age is expected to grow from 97.000 to 129.000 (Municipality of Rotterdam 2019).

Due to improvements in healthcare and living circumstances, the elderly of today live longer and stay active longer. With the growing elderly population, the healthcare costs will be increasing and to reduce costs the government has been scaling down on institutional healthcare. With legislative changes in 2015 (Wmo2015) the government separated living and care. Where in the past people with minor issues would be eligible for institutional care, they would now receive the required care at home and (Aanjaagteam Langer zelfstandig wonen 2016).

(Ministry of Health, wellbeing and sports, 2018)

(Aanjaagteam Langer zelfstandig wonen, 2016)

Based on the idea that many elderly citizens want to remain autonomous, independent, and self sufficient the government made de following assumptions: people want to live at home independent as long as possible. They can and want to pay more for professional aid and support. They can receive much more help form informal caretakers in their own social circle. The use of technology will support elderly citizens at home and compensate for increasing physical and mental limitations (Doekhie 2014).

This means that the government expects a new level of self-reliance from the elderly citizens. In one way being able to organise your own care at home can be an advantage because it can be completely tailored to your personal needs.

But what the assumptions fail to acknowledge is that the elderly citizens are not a homogeneous group and not all of them have the capacity to organise their own care and be completely self-reliant (Doekhie 2014). For these people also alternatives need to be found.

For the elderly to live independent longer they need to be able to adapt their home or be able to move to more suitable dwellings that they can continue to use also with diminishing health and mobility (Ministry of Health, well-being and sports 2018). In the current housing market finding these dwellings to move to can be difficult as smaller affordable housing is also popular with other groups like students, starters, singles, ex-pats, and refugees. A second issue is that adapting all the dwellings to fit all the different types of limitations can be difficult and expensive. Someone in a wheelchair will need different adaptations than someone with poor vision or someone that has dementia and that is why a personal approach is advised (Aanjaagteam Langer zelfstandig wonen 2016).

Apart from the care and housing problem what is also important is that with the disappearance of institutional care also some of the daily activities for the elderly have disappeared. The elderly citizens of today will have to take much more initiative

to maintain a social circle and as they get older and spouses, relatives and friends pass away this might be increasingly difficult. The danger of isolation and loneliness start to play a role here and society should not look away (Aanjaagteam Langer zelfstandig wonen 2016)

Here we can ask ourselves if the political changes are actually desirable. But as they are currently a reality we better find the best way to deal with them. This is also the point were there is the opportunity to come up with different ways of housing the elderly. Ideas like clustered living with nearby care can be an option but also the traditional courtyard housing type with private dwellings and collective shared spaces can offer a solution. Being part of a community can provide a safety net and ensure that elderly citizens receive help on time when they need it (Ministry of Health, wellbeing and sports 2018).

Changes:

1) Growth elderly population in Rotterdam
- Post-war baby boom
- Longer lifespans due to better healthcare & living conditions

2) New Governmental Law
(Wet maatschappelijke ondersteuning 2015)
- The elderly have to stay home as long as possible and can receive care there if necessary.

Consequences

1) There is a large deficit of suitable elderly dwellings.
- The current houses were not made with growing old at home in mind.

2) Social challenges
- Dependency on informal caregivers
- Difficulty to maintain a social network increases the risk of loneliness.

(Eenvandaag, 2020)

Sources:

Municipality of Rotterdam. 2019. Uitvoeringsprogramma Rotterdam, Ouder en Wijzer. Policy note, Rotterdam: Municipality of Rotterdam
Ministry of Health, wellbeing and sports. 2018. Programma, Langer Thuis. Policy note, The Hague: Central government
Aanjaagteam Langer zelfstandig wonen. 2016. "Van tehuis naar thuis, Hoe is te bevorderen dan mensen zelfstandig kunnen (blijven) wonen?"
Eenvandaag, 2020, https://eenvandaag.avrotros.nl/item/door-verdwijnen-verzorgingshuis-moeten-ouderen-langer-thuis-blijven-wonen-er-is-geen-alternatief-m/

What changed for Families?

At the same time there is a parallel trend of families with children having difficulty with finding a suitable house in the city. A quarter of all households in the four big cities in the Netherlands consist of parents with children. From this group at least two thirds are unhappy with their current homes and are struggling to find a more suitable one (Keesom 2013).

Karsten states that a big driver for families moving and staying in the city is female emancipation (Karsten 2016). During the first half of the twentieth century up to the 1950's females that got married and started a family were supposed to quit their job and become the caretaker of the children and housekeeper. This also meant that if they had a different career, it would be over (Verwaaij 2018).

With the large economic growth in the 1960's and 1970's and the steps made in female emancipation and education, being a working mother became more popular. Increased child support, easily available child daycare and the rise in part-time jobs also helped (Verwaaij 2018).

Between 1965 and 1985 the suburbs were the most popular place for families to live. Living in the suburbs has the advantage that there is more living space and more green space for kids to grow up, but it makes it difficult for both parents to pursue a career. Moving to the suburbs therefore often meant that the man would continue to pursue his career while the female took a step back to take care of the children (Karsten 2016).

By living in the city distances between work, school and different amenities are short making it possible for both parents to have a career while still taking care of the children. This has therefore led to a more equal labour division for households living in the city allowing both parents play a significant role in raising the children. This also led to the birth of the 4x4 family were both parents work four days a week to have one weekday free to spend with the children. This means that the kids only need daycare or after school care three times a week instead of five (Karsten 2016).

So roughly from the 1990's onward there is new generation of city dwellers that like to stay in the city to be able to pursue a career and a family at the same time. Currently thirty years later the children of this initial group might also want to live the same way as they did growing up. Apart from that there are many young people that come to the city for their studies and find a job in the city. Many of them also go on to form this relatively new type of family were both parents work and share the care for their children while having a busy social life (Keesom 2013).

Then there is also a large increase in single parent households as they make up about one third of the family households in the city. These single parents also have to work to sustain themselves while at the same time raising their kids. It is therefor clear that many of these urban families can benefit greatly from a strong social network where they live to help raising their kids (Keesom 2013).

These new urban families enjoy the many urban amenities and having short distances between their job, schools, childcare, and their homes, but many find the urban dwellings too small and worry about the lack of safe and green areas in their neighborhood for their kids to play (Laarman and van Dam 2018).

Families bring live to the city, they play, work, move, relax and consume in the city providing income for retailers, libraries, swimming pools, sport societies, theaters, cinema's and many more. Having them leave the city because

of lack of suitable housing is therefore not desirable. To give families more perspective for living in the city more attention must be paid to figure out how to accommodate their dwellings needs.

The houses being build should suit them better in size, organization, number of rooms, living environment and costs. The lives of current families living in the city is completely different from those living there 50 years ago, kids have less brothers and sisters but more toys to play with. At the same time kids play more often inside due to television and computers but also because a lot of play space has been taken over by cars. For families, safety is especially important, not only from traffic but also from criminality and vandalism in the neighborhood as children growing up are more vulnerable.

For the development of children, it is especially important that they can safely extend their range of play over time to develop their motor, social skills and independence. This requires having safe play spaces for children of different ages within 500 meters of the dwelling (Keesom 2013).

The solution seems simple provide large houses with a garden for each family. The only problem is that this is not possible in the city as space is limited and the square meter price is very high. With the current housing market also leaving the city is not an option for many families so a new solution needs to be found in the city.

Family apartments can be a part of this solution. By stacking dwellings inside a building block more dwellings can be provided. Apart from the dwellings also collective spaces are deemed important to provide extra functionality that does not fit anymore into the dwelling (Municipality of Rotterdam, City development 2017).

To find out what is needed to make good family apartments the municipality of Rotterdam organized a contest to come up with design ideas for new urban dwellings for families in the city (Municipality of Rotterdam 2015). From this contest a few themes were distilled that kept coming back in many of the 150 submissions. Themes in order of popularity were flexible floor plans, collective outdoor spaces, private play space for each child, bike storage, roof gardens, vertical streets, privacy, extra storage space and a spacious entry hall. These are therefore important aspects to take in consideration when designing new dwellings for families.

As the municipality of Rotterdam has the inclusive city as one of their key values for a sustainable city (Municipality of Rotterdam 2020), it is important to have a city suitable for people of all age groups. It is here that the opportunity arises to come up with new dwelling types and new ways of living that can support and adapt to the changing lifestyles of elderly citizens and families in the city.

Changes:
A new generation of families wants to stay in the city and raise their children there instead of moving to the suburbs.

- They have a job in the city and want to live nearby
- They grew up in the city
- They studied there and have their social circle there
- They like to use the many amenities the city has to offer

Consequences
Two thirds of the families in the city is looking for a house that better suits their needs.

- Not enough space in the dwelling
- Lack of safe playing area for the kids
- Lack of green space
- Difficulty with parking
- Difficulty affording a house in the city

Daily routines and possible needs of families and elderly.

To get a better understanding of where families with kids can use some help and where elderly can use a hand I looked at my own experience and what I know from the people around me to get an idea of the routine of my user group.

Parents
For parents the main struggle will be between work and raising the children. The standard workday in the Netherlands is from 9:00 to 17:00. Of course there are many jobs that have different work times, think of restaurants, security, healthcare or people with their own business. But to get an idea of where a job might collide with child rearing it is a good estimate.

Child rearing & the Dutch school system
School plays a large role in the life of a child so I will try to explain a bit how school is scheduled in the Netherlands.

When a baby is born the mother has about 10 weeks maternity leave so a little over three months. After this period if both parents are working the baby can go to a crèche or to a guest parent this can be full daycare from 7:00- 18:00. The care has to be paid for by the parents but it is possible to get government subsidies if the income is low. Between the ages of 2,5 - 4 the kid can start acclimatizing in kindergarten. This is usually for two or three days a week and a maximum of 4 hours per day. Again this has to be paid for but the government supplies a subsidy to parents if they both work.

From the age of 4 kids can start with elementary school this lasts until about the age of 12. Elementary school is five days a week (Monday-Friday) it starts lasts from about 8:30 to 12:00 and from 13:00-15:00. So there is a break in the middle. During this break kids can go home to eat or they can stay at school as most schools offer lunchtime care for a small fee. Usually there is also one day when the school lasts from 8:30-13:00 this is usually Wednesday and this allows kids to have more playtime. There are also certain schools that make use of a continuous schedule. They usually last from 8:30- 14:30 some parents find this more desirable. There is also the possibility of pre /after school care for kids from elementary school from 7:00-8:30 (pre) to 14:30 /15:00 - 18:30 (after).

From the ages of 12 to 18 kids go to high-school at this point in most cases they are deemed responsible enough to go to school and come home by themselves.

Apart from school the child will also needs time with their parent. The idea is that parents are able to spend time with their kids after school and also in the weekends. For the parents the time at home is also needed for household chores. Bringing and picking kids up from their many hobby's can also be time consuming.

By being part of a community parents and other adults like an elderly neighbor might help out by bringing and picking the kids up from school also watching over them during the hours were work and school overlap. By sharing the care hopefully each parent can spend more quality time with their children and there will be a smaller dependency on child day care and after school care. Also, being around different adults can teach kids different skills that they can use in life.

Elderly
For elderly it is hard to come with a certain routine as their daily schedule can vary wildly, especially if they are retired. What is however certain is that as people get older most will experience some physical issues like reduced, vision, hearing, mobility or mental issues like

poor memory up to dementia. These are common issues but there can be many more that can lead to an elderly person requiring help.

From my own experience with grandparents and other older people in my environment I see that area's were elderly people eventually need help with are bodily care, housekeeping, cooking and grocery shopping. The bodily care is often assisted by professional caretakers or close family members. But for the other tasks a community inside the building can easily assist.
Apart from that companionship, visits from friends and family are very important to meet the needs of social interaction and to stay connected to society.

Needs and wishes of elderly and families living in the city translated to Architectural solutions.

As stated before changes is society have led to specific requirements for elderly citizens and families that want to live in the city.

How these households live is not only determined by architectural means but also by political, social and cultural influences and this is the same for the challenges they face. Therefore to say that all their problems will be solved by good architectural design is a bit short sighted.

Ana architects and Heren 5 architects have done extensive research into both user groups. By talking to multiple households they managed to translate the needs and wishes of the these user groups into architectural requirements.

By no means are these architectural tools a complete solution to all the challenges that these groups are facing but they can be an initial approach to solve part of the issues these groups are facing.

In the research four main categories used are: the scale of the city, neighborhood, the building and the dwelling. Some of the options are viable on multiple scales while some of them are specific. Of course the more influence the architect has over all the scales the more impact the design can have and the more fine tuned it can be to the users.

What user group to design for?

Elderly citizens

- 65+ years of age
- Want to live in the city
- Want to be independent as long as possible
- Want to grow old in place with possibility to receive care
- Want to participate in an intergenerational community

Families

- Parents with school aged kids
- Want to live in the city
- Want a safe space for kids to grow up
- Want to have some support raising the children
- Want to participate in an intergenerational community

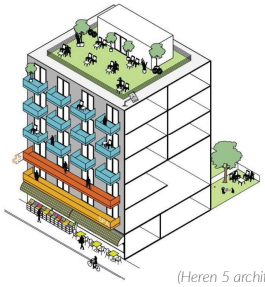
What are the needs of Elderly citizens?

The most important aspect for elderly citizens is to maintain an active social network. Having a good social circle is the best way to stay connected and involved in society and to avoid loneliness. A good social network will also help in times of need. As people get older and become less mobile they might need help with things like doing groceries but also personal care in addition to the formal care they receive. To encourage a social network in the building it is important that there is a good mix between dwelling types to also increase the mix in household types so that people in different life phases can meet. Also having the option for collective living can increase social contact and avoid loneliness. When people live together and share spaces they will be more inclined to take care for each other (Heren 5 architects, 2020).

The second very important aspect for elderly people is having daily amenities as a supermarket and other small shops nearby. Being close to public transport and also being close to a doctor and a pharmacy might be desired (Mol, 2020). This will allow them to stay independent longer because as people get older they might become less mobile and have a smaller movement range. So by having these functions nearby they are still able to visit them on their own (ANA architects, 2017).

The third important aspect is a walk-able environment. For the neighbourhood it is important that sidewalks are good accessible and threshold free. Benches in the shade at tactical intervals can provide some rest on longer routes. For the building it is important that everything is accessible by elevator (ANA architects, 2017).

Mixed living, Roof terrace

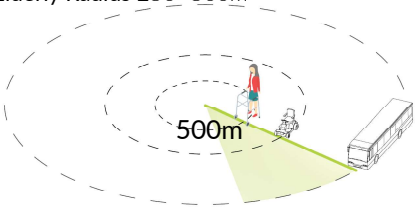


(Heren 5 architects, 2017)

Collective living apartment

(Heren 5 architects, 2020)

Elderly Radius 250- 500m



(ANA architects, 2017)

Walk-able environment + places to sit

(ANA architects, 2017)

To further improve the community forming and to make it easy for elderly to keep participating in society it is recommendable to have many meeting spaces throughout the building. A very suitable space to meet neighbors can be a living space in front of the dwelling either at the street or along the gallery. Because this is a place that people will pass by it will make it easy to strike a conversation and interact in a casual way.

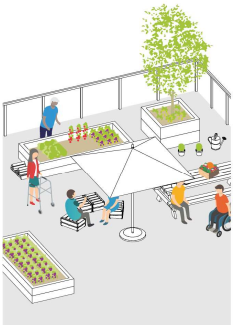
Another way to promote interaction could be trough different public and collective functions in the building. This can be in the form of a community centre for the residents, a cafe, or something like a library. Because the elderly dwellings are not always very spacious things like a collective roof garden can be an option. Elderly can share this garden and grow flowers and vegetables but the ones that just want to sit and talk can also enjoy the space. Other options can be art spaces or workshops where the people can meet others while engaging in their hobby.

For the dwelling there are also a few requirements, the most important is to have the full apartment on one level with no steps thresholds and hight differences (Mol, 2020). Low window sills are also advisable as this makes it possible to sit in a chair and still look outside. A guest room to be able to have a grandchild over or a family member or other informal caretaker. This room can also be used for storage or as a hobby room. Other than that place for technical aids like a walker, place for bars in the corridors and next to the toilet but also digital aids like a front door camera to improve the safety and open the door at a distance for caretakers (Aanjaagteam Langer zelfstandig wonen, 2016). Last it would also be nice if the dwelling is made in a wheelchair friendly way .

Wide gallery with living space

(ANA architects, 2017)

Roof garden



(ANA architects, 2017)

Workshop / art space

(ANA architects, 2017)

What are the needs of Families?

One of the most important aspect for families in the city is also the social network. Many of the families living in the city have family and friends living nearby. Staying in close proximity means they can meet them often and also they can receive help from them in taking care for the children.

The second very important aspect for families living in the city is having enough outdoor play space for the children. Children of different age groups have different requirements and need different spaces to play. For the smaller kids age 0-4 this need to be closer to the dwelling at approximately 30 meters at a place where the parent can constantly keep an eye on the child these children primarily use play to practice their motor skills. For kids that are between ages 4-8 the range extends to 150 meters and these kids also start to practice their social skills in the form of playing games together. The play range for kids aged 8-12 extends to about 500 meter these kids start to practice their independence (Heren 5 architects, 2010).

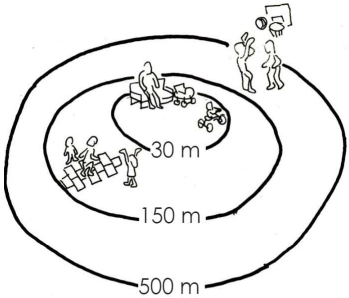
Research done by (CMO Groningen 2006) gives insight in what kind of games kids play and what is needed on a playground

age 0-5,
water, sand, clay, branches, stones
hide and seek, swinging, sliding, climbing, stepping, cycling, jumping

age 5-11,
playing together, risk taking, speed, sport, games (cycling, skating, ball games)

age 12-16,
sport, meeting place, basket ball, football cage, skate park, hangout place

Children Play Radius



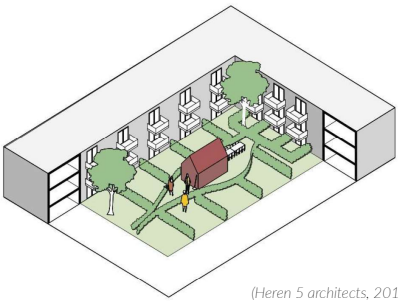
(Heren 5 architects, 2010)

30 m,	age 0-4,	motor skills
150 m,	age 4-8,	social skills
500 m,	age 8-12,	independence

Playground equipment different age groups

(Heren 5 architects, 2010)

Courtyard garden



(Heren 5 architects, 2017)

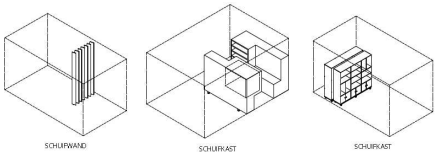
What is also very important for families are the available nearby amenities. Number one for families is the availability of a good school for the children. After that what is handy is a child daycare and a supermarket for daily shoppings. Other things that families like to have are sports clubs, community center, library but also entertainment like theatre and cinema (Keesom 2013).

What also needs to be taken into account for families is the amount of space that they require. Apart from having a room the kids also need space to play, but at the same time the house should also allow the parents some privacy for when they need to work. Families also usually have a lot of possessions so having enough place to store them is important. Research done by (ANA architects, 2017) shows smart ways to organize space to allow for extra storage but also to be able to use the same room in multiple ways. Important for this to work is that it has to be easy.

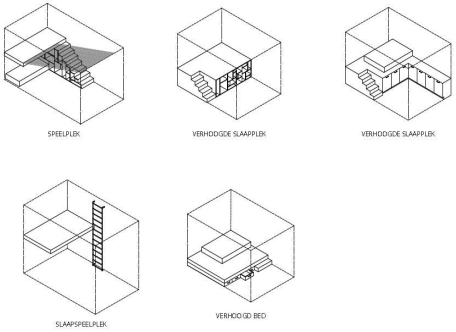
Having a partition walls or moving shelves are desired to quickly create separate spaces in one room. An elevated bed with storage or play space underneath can also be a good solution to optimize the available space by using the height of the room. Being able to divide a room into two parts by adding a separation wall is also a great benefit. This is handy so that for instance the toilet and bathroom can be used at the same time by multiple people or to make two bedrooms from one. The way in wich they designed the partitionwall in the dubbelbed example with two separate rooms but with the beds still stacked is also pretty smart to optimize the use of space. A shelfwall can be a good option if it is custom made to fit a room. It is however not very flexible. Rretractable furniture can be a good option but if it has to be manually stored is not very popular as it takes a lot of effort to transform the room.

Smart design maximizing space & storage

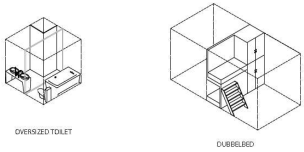
Moveble partition wall / shelves



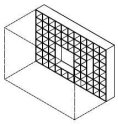
Elevated bed with storage / play / work space underneath



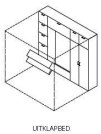
Option to divide room into two separate spaces



Permanent shelf-wall



Retractable furniture



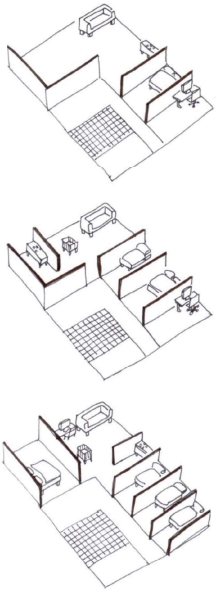
(ANA architects, 2017)

Transitionality of households

Households are not static but evolve over time and it is important that the dwelling can adapt to different household compositions. If the family expands for example with the arrival of a new partner or child their should be the possibility to reorganize the space to create an extra room. By keeping the dwelling adaptable it can serve the family through different life stages (Heren 5 architects, 2010).

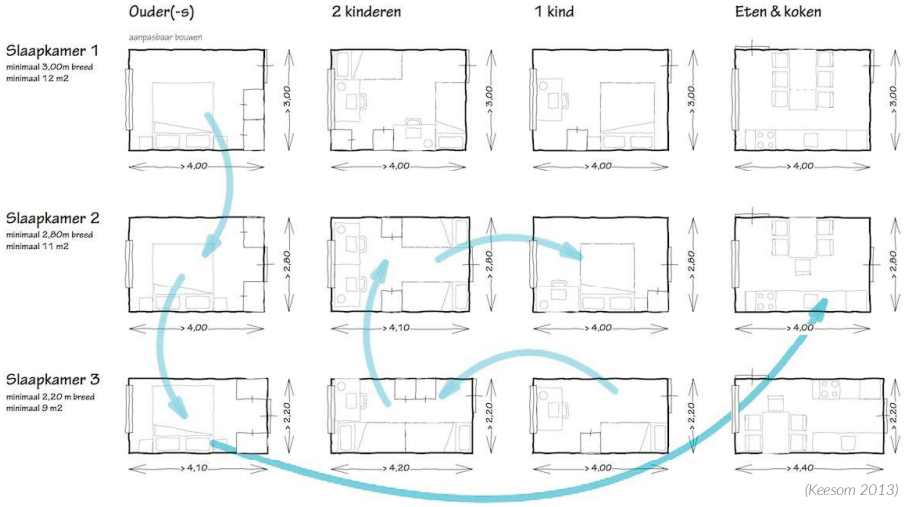
It would be nice if a single person could buy a dwelling that can than also be used as a couple and later as a family home and that the space can be adapted based on the needs. If the initial dwelling is to small another option could be to be able to make a housing career within the same building as the big advantage is that you can maintain your social network and you are already familiar with the neighborhood. Apart from adding rooms it is also a benefit if the rooms are dimensioned in a way that they can have different functions from sleeping to living to cooking. This is also shown in (Keesom 2013).

Dwelling adaptation to evolving family composition



(Heren 5 architects, 2010)

Transitionality of spaces



(Keesom 2013)

Elderly

Active Social network
- Stay active in society
- Provide informal care
- Mixed / Collective living

Nearby amenities
- Daily amenities like supermarket
- Care amenities like doctor, pharmacy and elderly home care centre
- Walker radius of 250-500m

Walk-able environment
- Good walk-able paths
- Benches along the route to sit in the shade
- Elevator access

Spaces with different activities
- Community centre
- Sports club
- Vegetable / Flower garden
- Grand cafe
- Library
- Workshop
- (Collective) outdoor space

Dwelling requirements
- Single level floor plans
- Low window sills for view
- Extra room
- Technical / digital aids
- Wheelchair friendly

Family

Active Social network
- Stay active in society
- Support with child rearing
- Mixed living

Safe playing space for the children
- Multiple options within 500m
- Play options for different age groups
- Free of traffic

Nearby amenities
- Good school
- Child day care
- Daily amenities like supermarket
- Community centre, playground, sports club, library, parks
- Theatre, cinema, swimming pool

Enough space
- Entry hall
- Storage space
- Living space
- Outdoor space
- Play space

Flexibility of Dwelling
- Floor plan organization (extra rooms)
- Dwelling should adapt to life phase (transitionality)

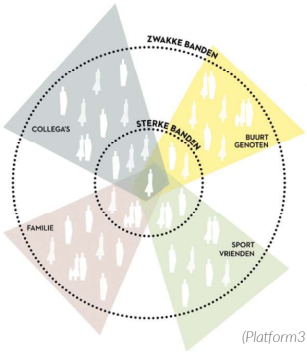
How can housing design incite a positive encounter between the different age groups?

To reach inclusivity and to ensure people from different age groups and walks of life can live together it is important that a building design stimulates community forming.

Two important ways to achieve community forming are planned encounters and spontaneous encounters. Planned encounters often happen between families, friends and like-minded people who have similar hobbies and interests. Spontaneous encounters can happen with anyone and therefore serves as the glue that binds people, brings understanding and supports inclusivity.

When looking at social networks most people have a few strong bonds and many weaker bonds with people around them. When looking at the scale of a building in the city most of the neighbours will fall within the weaker bonds. For networking and forming communities it is these weak bonds that need to be nourished. To do this it is essential that people can meet each other in a casual way and the building should provide this (Mantingh and Duivenvoorden 2021).

Social network



(Platform31, 2021)

To stimulate spontaneous meeting in a residential building design five different zones need to be taken into account. The neighbourhood, the route from street to home, the building block, the entrance zone of the dwelling and the dwelling itself.

Meeting zones

(Platform31, 2021)

On the scale of the neighbourhood the most important aspects to take into account are having a large variation of programmatic functions to suit the needs of many different households. Especially daily amenities like a supermarket or functions like a community centre and library can be places where people casually meet. But even more important are the outdoor spaces. A neighbourhood should have spaces for all the different inhabitants. Playgrounds for kids of all different age groups, places to sit, small squares and maybe a vegetable garden. These places should not be to big as this can make encounters more difficult. Also benches should be placed

close enough to be able to spark a conversation. Having a conversation starter is also important, Having it look towards a playground, an art piece or a nice view can help.

For the route from street to the dwelling important aspects are that there are multiple routes leading to the dwelling so that residents have multiple options and can choose to pass different places. Important for meetings is to have all types of residents using the same entrances. Also some space to linger is advisable, a place to collect mail can for instance spark a conversation. Also having the different public and collective functions as a natural part of this route can help making these places more active and allow for engagement between residents. Having the outdoor spaces also as part of this route will make them more lively and people will also be more inclined to care for them as they see them as part of their living space. It is also advisable to have to route towards the dwelling pass different other dwellings to increase the likelihood of interactions between residents.

For the building block it is important that there is a good balance between mixing different types of dwellings and clustering similar dwellings. Having a mix will allow people to come in contact with different people and create more understanding at the same time having similar households together can increase the likelihood that bonds will be formed.

At the entrance zone of a dwelling it is important to have a transition space. This transition space will function as a buffer between the dwelling and the outside inviting residents to sit outside and enhancing the contacts with the neighbors passing by. It is the best if the space is directly accessible from the dwelling and if it is connected to a more public functions within the house like the kitchen or living room. The size of the space should be between 1-2 meters too big and there is a chance that the residents close it off, too small and it is not going to be used.

For the dwelling it is important that it is life cycle resilient. Important for a thriving community is stability and if people have to move out of their dwellings because it does not suit their needs anymore and they can not find a new dwelling nearby they will be lost to the community and at the same time loose their network. To counteract this ether the dwelling will need to be easily adapted, allowing for extra rooms or the possibility to share the house while the other option is to be able to make a housing career in the same building by having a variety of dwellings to move to nearby when one dwelling does not suit the need of the inhabitant anymore. In that way they can stay within the same community if wanted and have the support throughout their lives.

Neighborhood:
- Different programmatic functions
- Outdoor spaces for different inhabitants

Route from street to dwelling:
- Different routes
- Same entrances
- Route passes public & collective functions

Building block:
- Balance between mixing and clustering dwellings

Transition zone dwelling:
- Buffer zone of 1-2 meters
- Connection with kitchen / living room

Dwelling:
- Life cycle resilient

Summary Conclusions

Main question
How can housing design answer the needs of elderly citizens and families with children and incite a positive rewarding encounter for both groups?

A good housing design can assist elderly citizens and families with the challenges they are facing in current life by keeping into account their demands and by being flexible enough to adapt to their changing wishes. It can especially help to enhance the bonds between neighbors and help to form a community of which all the households can benefit. Can housing design deal with all the problems the inhabitants are facing? That is most definitely not the case, as political, social and cultural aspects also play a role there is a limit to what an architect can accomplish so it stays important to question these other area's as a society but also as an individual in order to provide both target groups with the best possible living situation. For architects it is important to keep an eye on the developments in living so that they can keep evolving and so that the dwellings build keep matching the desires of the users.

Sub questions

- What has changed in the life trajectories, identities and societal needs of elderly citizens and families with children?

If we look at the elderly what has changed is that they have to stay at home as long as possible while growing old. Institutional healthcare is only a viable option when their condition becomes so bad that they need continuous care. This leads to high demands on the dwelling of the elderly to be able to adapt to their situation and also requires the elderly person to need help from informal caregivers, family and friends to support them when they are unable to manage things by themselves. If they are living by themselves they also need to maintain a social circle to avoid loneliness.

For families what has changed is that both parents want to be able to pursue a career while at the same time raising children. This puts a lot of pressure on the available time. To make optimal use of time living in the city close to work, school and other amenities these parents do this. Downside is that living in the city means that living space is expensive and you can only get limited amount of square meters. Apart from that the city is a busy place so having a safe play space sthat the kids can use without the need for parental supervision is also very important.

- What are the needs of elderly people living in a dense urban setting and what formal and functional features of the building, dwelling and the urban surrounding can support them?

For elderly citizens what is important is to have a good walkable environment with many amenities at short distances including public transport, a supermarket and a doctor and pharmacy. The dwelling should be on one level without thresholds and have elevator access. Also important is that the dwelling is able to adapt to possible impairments that come with age. Also places in the neighborhood to go to meet people or to do hobbies are highly desirable to keep active in society. Other than that having space to be able to have a care taker, family, friend or grandchild stay over is very desirable again to avoid loneliness and to get help when it is required.

- What are the needs of families with children living in a dense urban setting and what functions in the building, dwelling and in the urban surrounding can support them?

The most important things for families living in the city are having enough living space, having enough play space for their children, having a good school nearby and have different amenities for daily shopping and entertainment. Apart for that having a community that can help with child rearing especially during work hours can be a great benefit. Apart from that being able to grow within their own dwelling as the family composition changes or being able to make a housing career within the building can help to improve living satisfaction and keep families as part of the community longer.

- How can housing design support community forming and incite a positive encounter between the different age groups?

For community forming people should be able to meet, get to know each other and interact with each other. This can be done through planned encounters and spontaneous encounters. For a community of neighbours inside a building especially spontaneous encounters are important. The most important thing when it comes to spontaneous encounter is to provide shared spaces, shared amenities and have the routing of the building pass these places to allow for spontaneous interaction. By making the different collective spaces in the building attractive to multiple user groups they have the opportunity to casually interact and form bonds.

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Case Study Analysis

01

Multi-generational Housing

Architect: Franziska Ullmann and Peter Ebner
Realization phase: 1998 – 2001
Location: Austria, Vienna, In der Wiesen Nord

02

Gelaagd Hof

Architect: ANA architects
Realization phase: 2000 – 2004
Location: Amsterdam, IJburg, Haveneiland West

03

The Family

Architect: ANA architects
Realization phase: 2018 – under development
Location: Delft, Spoorzone

04

Eenhoornblokken

Architect: Korth + Tielens
Realization phase: 2018 – 2021
Location: Amsterdam, Watergraafsmeer

Selection criteria

I have selected four projects to analyse. Two of the projects are intergenerational buildings. One project is for elderly only and one for families only. Three of the projects are located in the Netherlands, one in Austria. The buildings were realized between 1998 and today. One is still under development namely “The Family”.

These were the selection criteria:

- The projects need to be a mid size residential block made for an urban environment corresponding to the design assignment to extract as much relevant information as possible.
- The projects need to be designed for intergenerational living or for one of the target groups elderly citizens or families with children.
- The projects should preferably have a courtyard typology.
- The projects should be mainly located in The Netherlands in order not to overlook country specific design requirements.

Analytic criteria

The plan analysis will focus on the following elements:

- Types of collective and public functions in the building
- Different dwelling typologies in the building (clustering, bay with and depth)
- Configuration of functions and dwellings in the building
- Division of private, collective, and public space in the building
- Routing in the building and placement of dwelling entrances
- Floor plan layout of the dwellings with notable features

Multi-generational Housing
Anton-Baumgartner-Straße, Vienna

Images: Schittich, 2007 - photographer: Margherita Spiluttini

Architect: Franziska Ullmann and Peter Ebner
Realization phase: 1998 – 2001
Location: Austria, Vienna, In der Wiesen Nord
Address: Anton-Baumgartner-Straße 125
Client: Kallco

Motto: "We are taking our parents with us."

Site area:	6000 m²
Footprint:	2040 m²
Residential area:	4905 m²
Internal volume:	34.312 m³

Functions: shops, café, offices, medical practices, apartments

Dwellings: Total: 87 living units
30 assisted living units (51.46 m²)
12 mini lofts (31.39 m²)
6 maisonettes (98.65 m²)
26 2-room apartments (54.72 m²)
13 3-room apartments (78.81 m²)

Floor height: 3.56m ground floor
3.15m first floor
2.76m second-fifth floor

Construction: Reinforced concrete

General information
The motto of the building is: "We are taking our parents with us" (Schittich 2007). The building therefore has a variety of dwellings for different generations. Inhabitants can bring their parents with them but house them separately, while still providing support. Also, professional assistance is available in the building that can be called upon as needed (Ulmann 2016).

The main idea of the building is to create a community. To help with this shopping, housing and work are integrated into one building. The building is a large block of five stories high with a semiprivate courtyard in the middle. On the ground level there are shops for the daily needs of the residents and a café that animates the square (Schittich 2007).

The building has several housing types, thirty assisted living units for handicapped and elderly residents, six marionettes for families, twelve mini-lofts for students, twenty-six two-bedroom apartments and thirteen three-bedroom apartment. On the two lower levels there are also an assisted living center and a medical office that residents can contract for services and help (Fromm 2011).

Keywords
Assisted living, Courtyard housing, Public facilities

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Multi-generational Housing
Site

Image: Ulmann, 2016

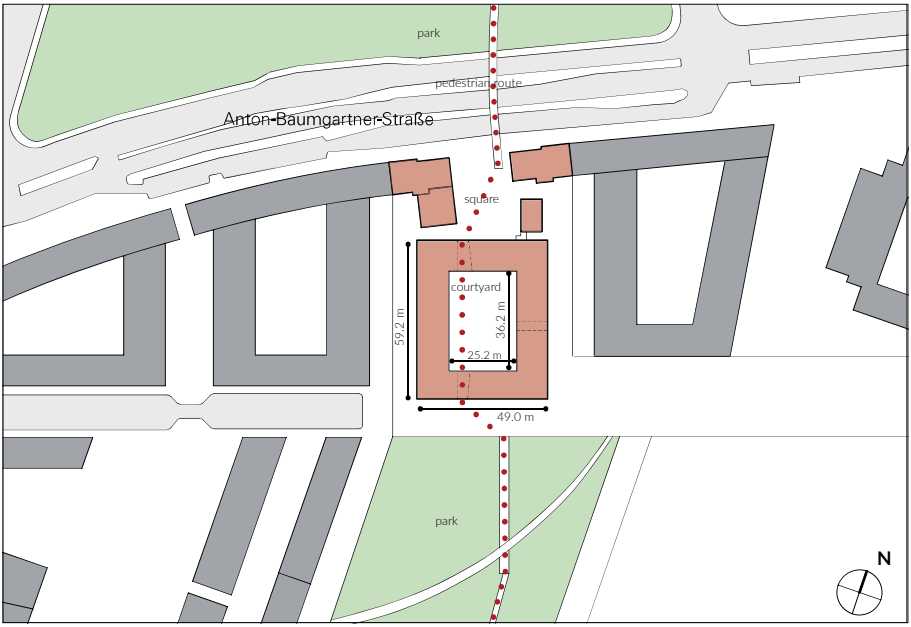
Image: Google maps, 2021

Site information

The site is located south from a large road the Anton-Baumgartner-Straße. The block is surrounded by other urban blocks and a school to the south. What is interesting is that there is a pedestrian route with a bridge crossing the road connecting the neighborhoods above and below the street.

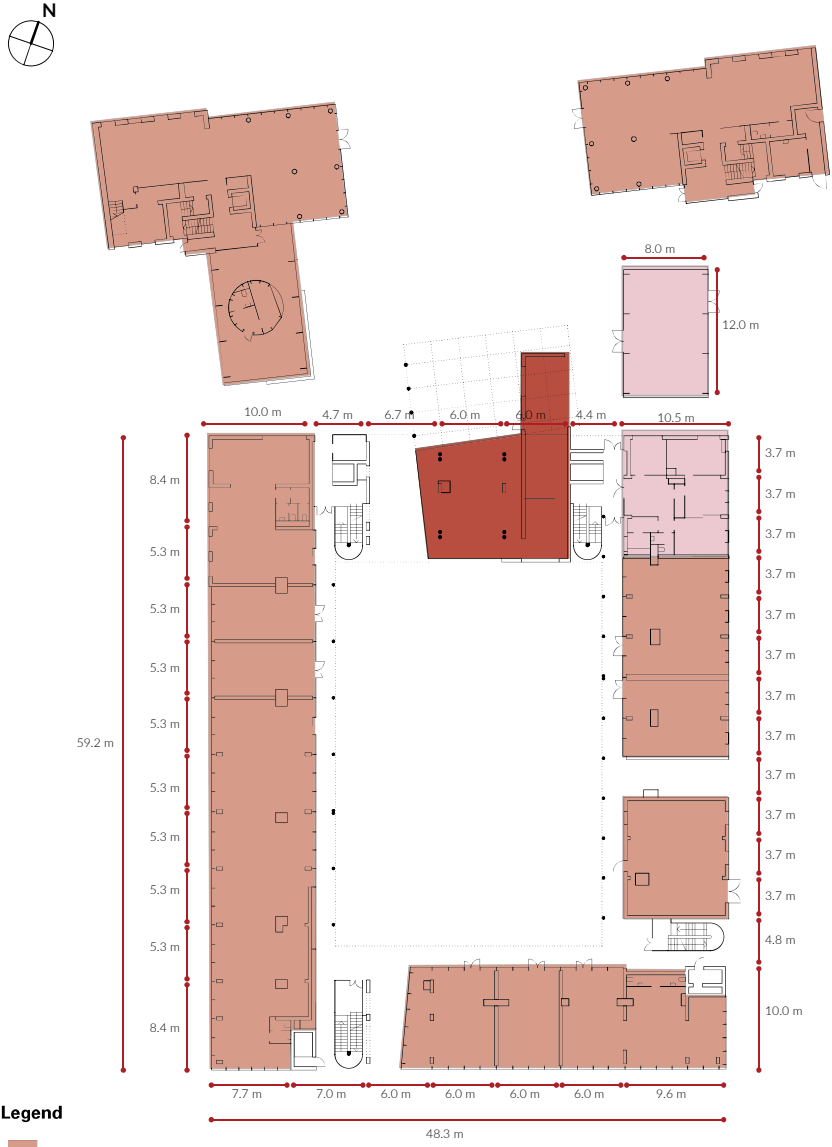
This pedestrian route is at the exact place of the building and this route is lead through the building forming a string of spaces. These spaces are from north to south a park, a square, a courtyard and another park.

Urban context 1:2000



Multi-generational Housing
Ground floor urban connection

Representaive floor plan Ground floor) 1:500



Legend

1. Businesses / Office
2. Red Cross care station
3. Café

Multi-generational Housing
Public / Commercial functions

Legend

- 1. Businesses / Office
- 2. Medical practice
- 3. Red Cross care station
- 4. Café

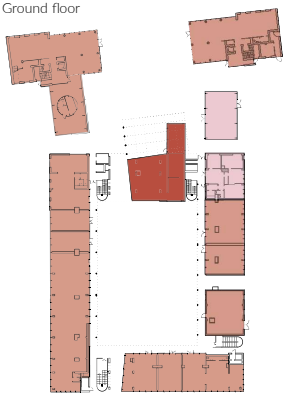
N

Functions

The plinth contains only public and commercial functions. Because of this the courtyard receives many different visitors and is very active during the day.

Floor plans 1:1500

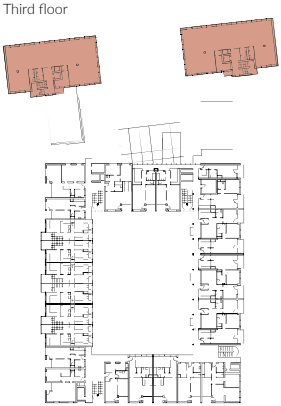
Ground floor



First floor

Second floor

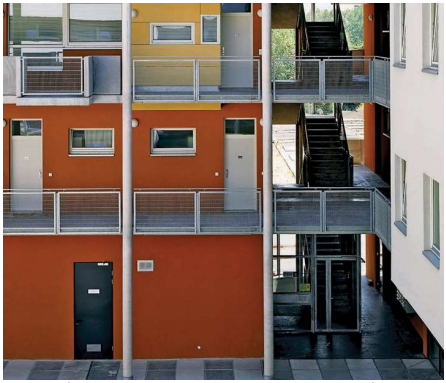
Third floor



Fourth floor

Section a-a 1:500

Multi-generational Housing
Circulation & Routing



Images: Schittich, 2007 - photographer: Margherita Spiluttini

Legend

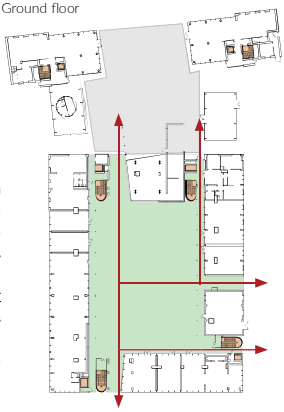
1. Courtyard (semi public)
2. Stairs & Elevators (collective)
3. Corridor (collective)
4. Square (public)

Circulation & Routing

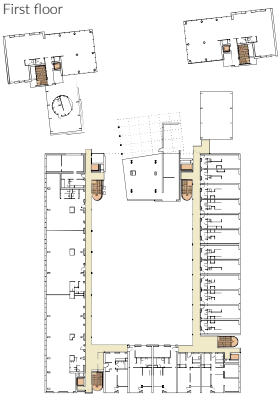
The dwellings are accessible from the open corridors that run along the courtyard and in most cases have the kitchen with a large window along this corridor creating a connection between inside and outside. The vertical transport is done by open staircases and elevators in the four corners of the building. Both the open staircases and corridors are supposed to enhance visibility between the residents and to encourage contact.

Floor plans 1:1500

Ground floor



First floor



Second floor

Third floor

Fourth floor

Multi-generational Housing
Dwelling typologies

Legend

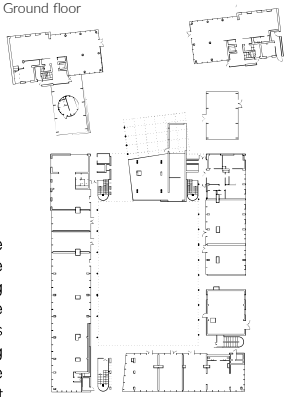
- 1. 2 & 3 -Room apartment
- 2. Assisted living apartment
- 3. Family maisonette
- 4. Mini-lofts
- 5. Storage

Dwelling typologies

All the dwellings are positioned in the higher levels of the building above the plinth. Also the different dwelling typologies are clustered together in the building. This leads to the target groups having their own space in the building but at the same time lowers the chance for encounters between the different groups.

Floor plans 1:1500

Ground floor



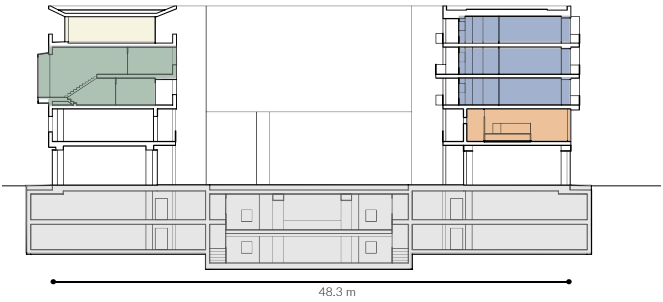
First floor

Second floor

Third floor

Fourth floor

Section a-a 1:500



Multi-generational Housing
Bay depth and with

Representaive floor plan (Second floor) 1:500

Multi-generational Housing
Family maisonette

Images: Ullmann, 2016

Legend

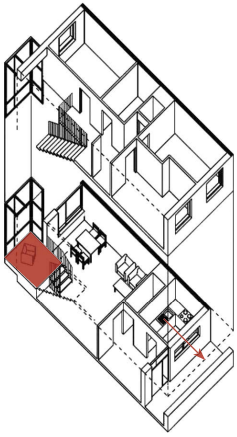
1. Hallway
2. Bathroom
3. Bedroom
4. Livingroom
5. Kitchen

Family maisonette

The family maisonettes are situated over two floors and have an internal staircase. They are accessible from the corridor on the lower floor. Because of these the other three facades are free and allow for more light, view and privacy. Again, the kitchen is located along the gallery to enable some connection between the inside of the dwelling and the rest of the building. The hallway and also the staircase are very spaciously set up. Because the way the staircase is designed there is an elevated platform in the living room with a large bay window serving as a smaller room withing the bigger living room.

Floor plans 1:200 Family maisonette - 98.65 m²

Axonometry



Multi-generational Housing
Assisted living

Images: Ullmann, 2016

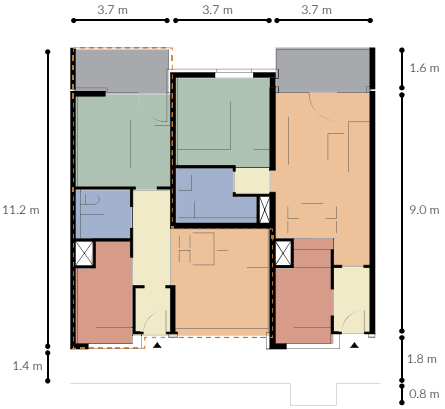
Legend

1. Hallway
2. Bathroom
3. Bedroom
4. Livingroom
5. Kitchen
6. Balcony

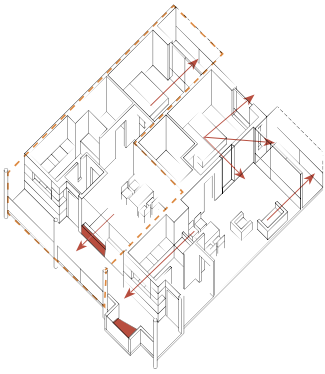
Assisted living

The apartments are accessed by a wide corridor, along the corridor there are niches where residents can place some furniture to sit. The kitchens are placed along the corridor allowing for visual contact with what is happening on the corridor. In the assisted living units also, special attention has been paid to ensure there is visual contact from the bed towards the living room, the outside and the balcony (Schittich 2007). The windowsill is therefore also extra low. In this way resident that are mostly bed ridden or in a wheelchair can still feel connected to what is happing around them. (Ullmann 2016) (Fromm 2011).

Floorplans 1:200 Assisted living - 51.46 m²



Axonometry



Multi-generational Housing
Mini-lofts

Images: Schittich, 2007 - photographer: Margherita Spiluttini

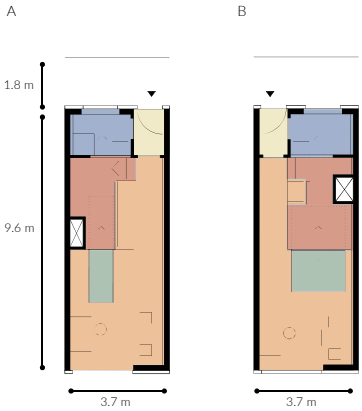
Legend

1. Hallway
2. Bathroom
3. Bedroom
4. Livingroom
5. Kitchen

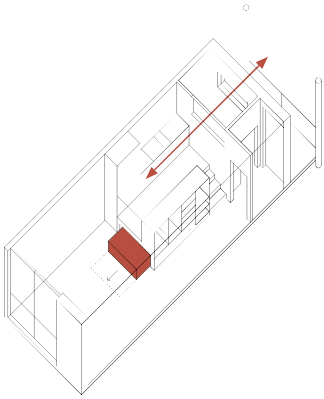
Mini- lofts

The small lofts are for short term stay for example for students. To maximize the use of the space the ceiling height is a bit higher allowing the kitchen to be on a raised platform. Below this platform the bed can be stored during the day to maximize the living area (Fromm 2011). Another remarkable feature is the window that allows you to look from the kitchen through the bathroom onto the corridor (Schittich 2007). Because of the very low running costs the mini lofts have also been very popular amongst the elderly (Ulmann 2016).

Floorplans 1:200 Mini-lofts - 31.39 m²



Axonometry

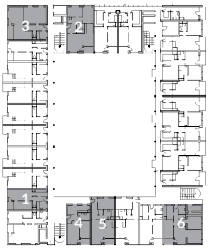


Multi-generational Housing
2 & 3 Room apartments

Legend

- 1. Hallway
- 2. Bathroom
- 3. Bedroom
- 4. Livingroom
- 5. Kitchen
- 6. Balcony
- 7. Storage

Place

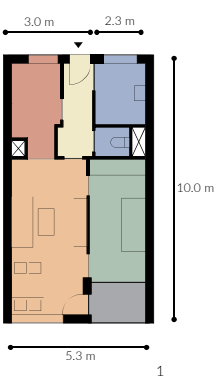


2 & 3 Room apartments

There is a wide variety of 2 and 3 room apartments in the building and the configuration is different depending on the place and the connection with the corridor. Interesting things to note are that plan 1,4,6 have a separate kitchen while the others have a combined kitchen living and dining room. Another noteworthy thing is that plan 1,3,6 have their bathrooms along the corridor, this is good for ventilation but less ideal for privacy. Also, a very interesting choice is to have a bay with of 2.3 m inside dwelling plan 1. This means that the bedroom is not well suitable for a double bed. The same is the case for plan 6 but here there is an extra bedroom so it is not an issue.

Floorplans 1:200

Gallery apartment 53 m²



1

Gallery end apartment 79 m²

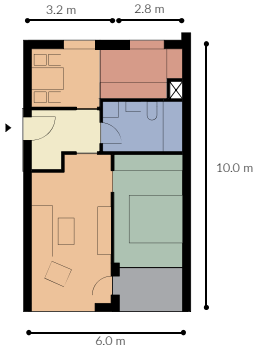
2

Corner apartment 84 m²

3

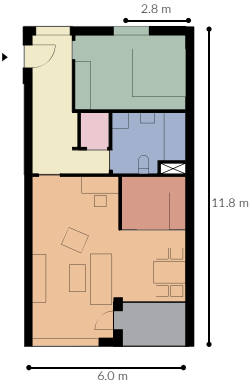
Floorplans 1:200

Gallery apartment 60 m²



4

Gallery end apartment 70 m²



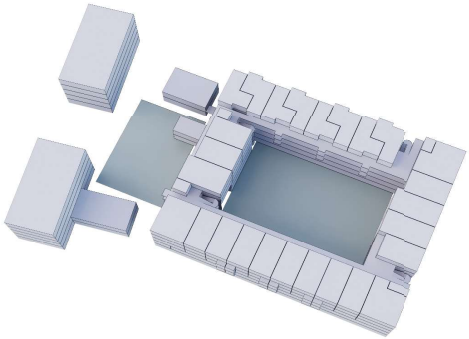
5

Corner apartment 86 m²

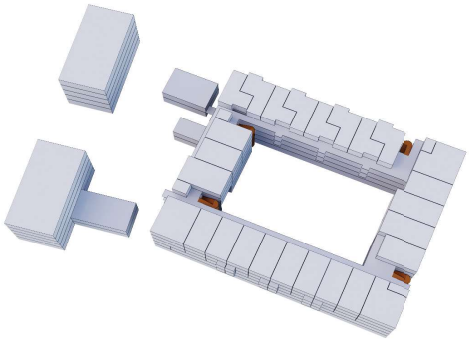
6

Multi-generational Housing
Conclusions

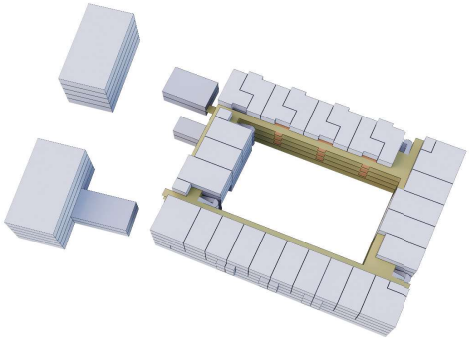
Public square and courtyard



Open staircase connecting galleries with view towards the courtyard

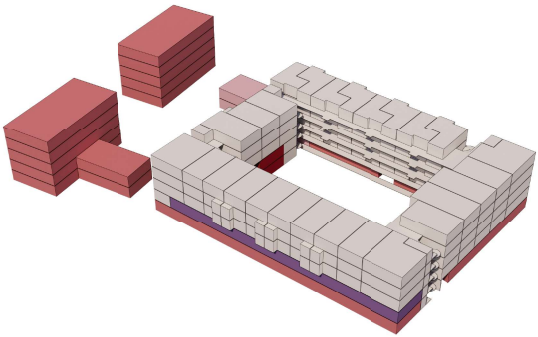


Open galleries on the courtyard side of the building that includes living area

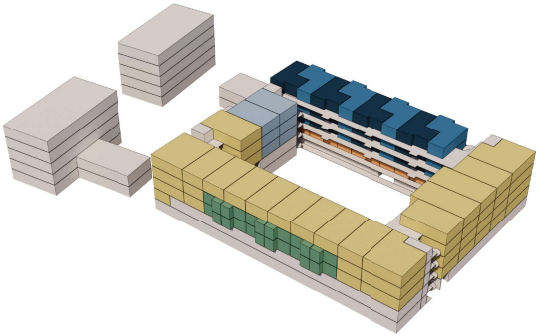


Multi-generational Housing
Conclusions

Commercial functions in the plinth



Clustered dwelling typologies



Gelaagd hof
Erich Salomonstraat , Amsterdam

Image: ANA architects, 2019 - by Luuk Kramer

Image: ANA architects, 2013

Architect: ANA architects
Realization phase: 2000 – 2004
Location: Amsterdam, IJburg, Haveneiland West
Address: Erich Salomonstraat 1087 GZ
Client: Stichting PWV wonen
Developer: Slokker Bouwgroep BV

Functions: medical practice, apartments and parking

Dwellings: 34 dwellings for elderly citizens:
4 ground bound apartment (m²)
5 maisonettes (m²)
15 middle apartments (m²)
10 corner apartments (m²)

Average dwelling size: 82m²
Average dwelling rooms: 3

Financial category: social rental housing

Site area:	1200 m²
Footprint:	900 m²
Residential area:	3400 m²

General information
The project is located on Haveneiland IJburg and is based on a courtyard typology. This block has 34 dwellings for elderly residents arranged around a courtyard and also a medical practice.

The collective courtyard square of the block together with a collective roof terrace and a collective roof garden produce a three-dimensional green space (ANA architects 2018). The roof terrace gives view over the internal courtyard but also over a green square outside of the building block. The roof garden is used for a wild flower garden. Underneath the building there is a parking garage that is also used by residents of the adjacent building (ANA architects 2013).

The dwellings are oriented towards one of the collective outdoor spaces. For the dwelling design special attention has been paid between the more private courtyard side and the more public street side giving the dweller the choice to what extend they want to engage with their surroundings. For the street side a more formal brick façade is used while on the courtyard side a more open and colourful façade is used enhancing the informal character (Municipality of Amsterdam 2004).

Keywords
Elderly housing, Courtyard housing, Collective green spaces

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Gelaagd hof
Site

Image: ANA architects, 2013

Image: Google maps, 2021

Site information

The site is located on the corner of the Erich Salomonstraat and the Diemerparklaan in IJburg. The block is part of a larger urban ensemble surrounded by other urban blocks. Together with the two other urban blocks that are in between the roads and the canal it forms plot 24a.

As can be seen the courtyard inside the building is a natural continuation of the green space inside the larger urban plot (ANA architects 2013).

Site 1:1000

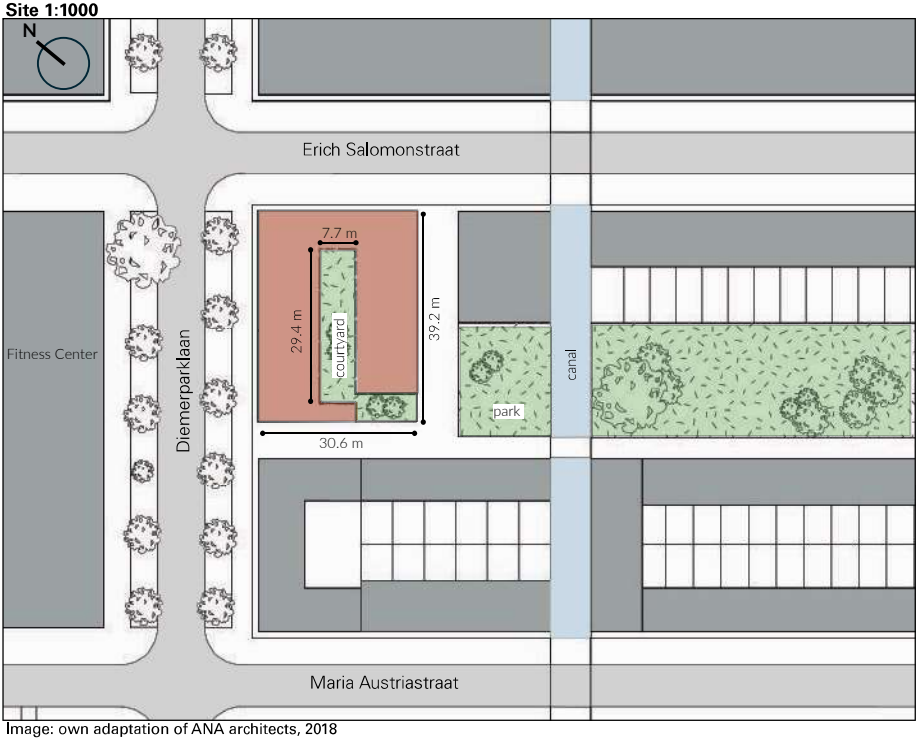
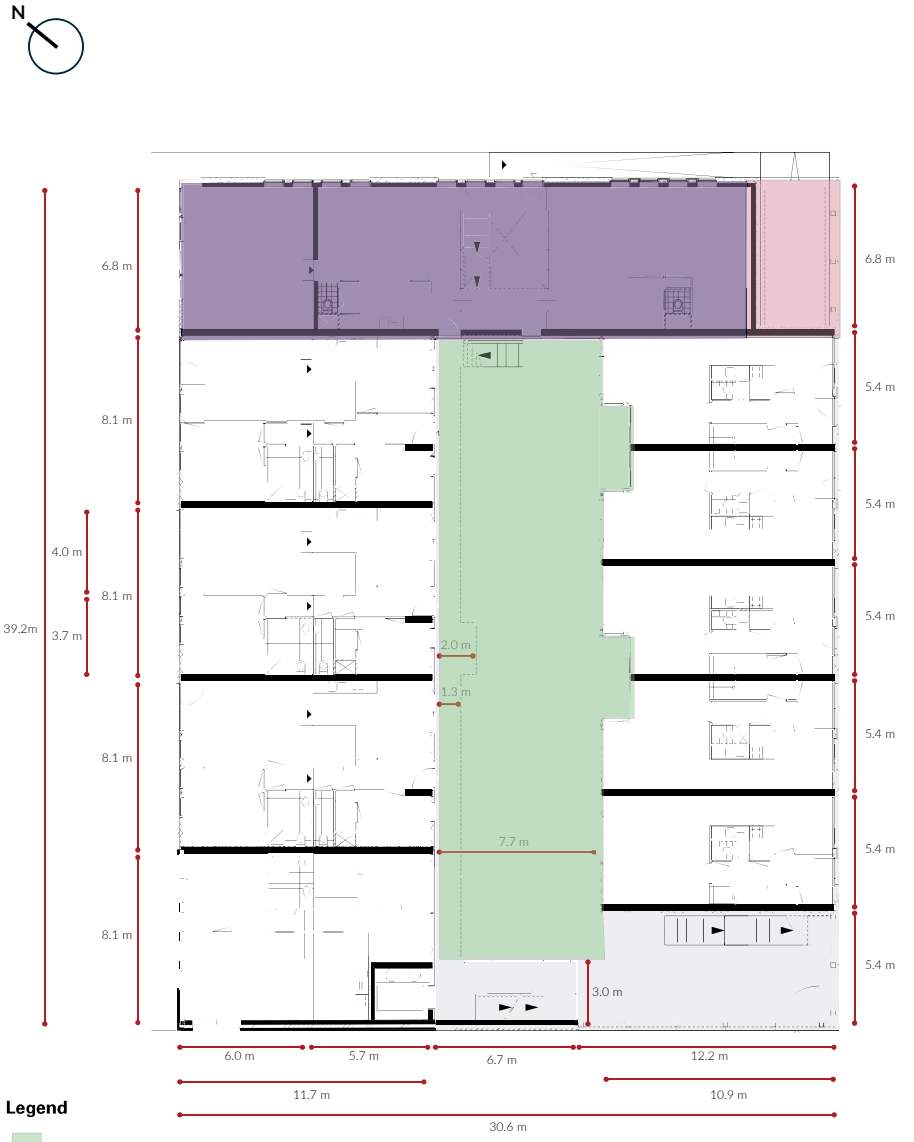


Image: own adaptation of ANA architects, 2018

Gelaagd Hof
Bay depth and with

Representaive floor plan (Ground floor) 1:250



Legend

1. Courtyard
2. Medical practice
3. Parking

Gelaagd Hof
Public / Collective functions

Legend

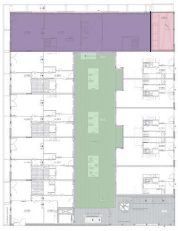
- 1. Courtyard / Terraces
- 2. Medical practice
- 3. Parking

Functions

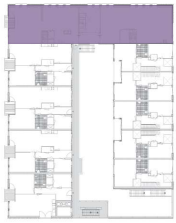
The plinth contains a medical practice that also extends to the first floor. Other than that there is the entrance to an underground parking garage. There are three distinct outdoor collectives spaces in the building. The courtyard on the ground floor, the roof terrace on the second floor and a wildflower roof garden on the third floor. Each of these spaces can be used by residents to meet up with each other.

Floor plans 1:1000

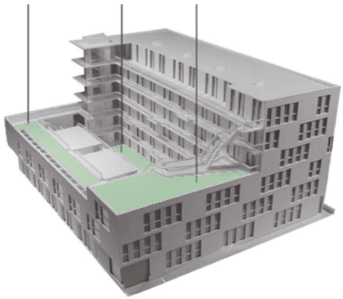
Ground floor



First floor

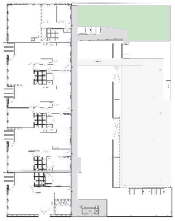


Roof Terrace Courtyard Roof Garden

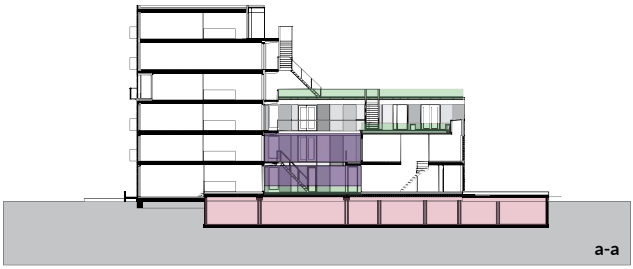


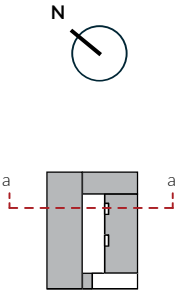
Second floor

Third floor



Section 1:500





Gelaagd hof
Circulation & Routing

Legend

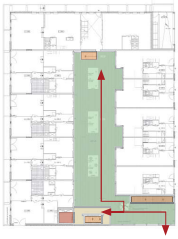
1. Courtyard (collective)
2. Elevator (collective)
3. Corridor (collective)
4. Stairs (collective)

Circulation & Routing

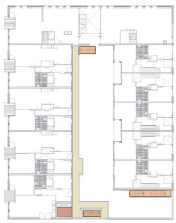
The dwellings on the lower levels are directly accessible from the courtyard, while the dwellings on the upper levels are accessible by an open corridor system that faces the courtyard. The corridors are connected with an internal staircase and elevator and also by an open outdoor staircase. Through this staircase the courtyard also gives access to the roof terrace and the roof garden (ANA architects 2018).

Floor plans 1:1000

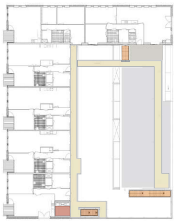
Ground floor



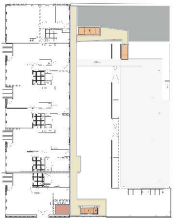
First floor



Second floor



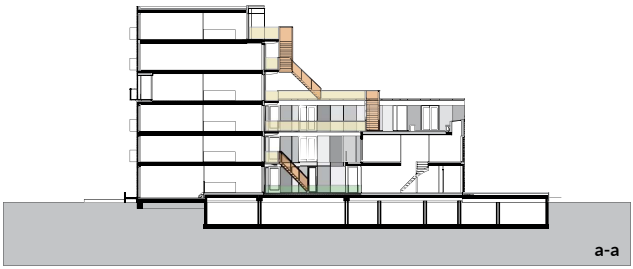
Third floor

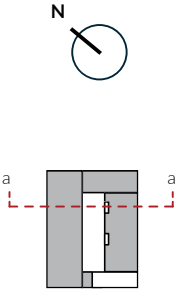


Fourth floor

Fifth floor

Section 1:500





Gelaagd hof
Dwelling typologies

Legend

1. Elderly ground bound apartment
2. Elderly middle apartment
3. Elderly maisonette
4. Elderly corner apartment

Dwelling typologies

The building has three types of apartments and maisonettes. The maisonettes are ground bound and have their entrance at the street side. The apartments a ground level are slightly different form the ones on the other floors as they can be entered from two sides and there is a slight hight difference because of the roof of the parking garage underneath that is covered by two steps. The apartments on the higher floors are pretty similar except for the corners dwellings that have their own layout to keep into account the extra outside facade.

Floor plans 1:1000

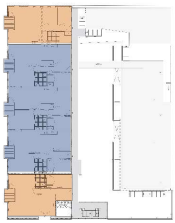
Ground floor

First floor

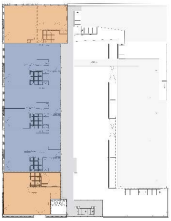
Second floor

Third floor

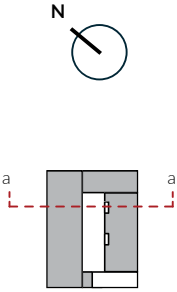
Fourth floor



Fifth floor



Section 1:500



Gelaagd hof
Elderly maisonette (m²)

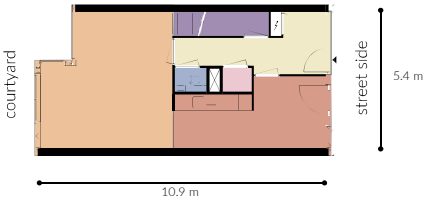
Legend

- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom
- 5. Kitchen + Dining
- 6. Balcony
- 7. Stairs
- 8. Storage

Image: ANA architects, 2013

Floor plans 1:200

Maisonette - Ground floor 55m²



Maisonette - first floor 50m²

Elderly maisonette ground floor

The entrance of the elderly maisonette is oriented at the outside of the block on the street side as is the kitchen. The living room is oriented along the courtyard. There is a large staircase going from the living room to the second floor. Above the entrance hall and at the start of the staircase there are two small atrium's making a connection between the two floors

Elderly maisonette first floor

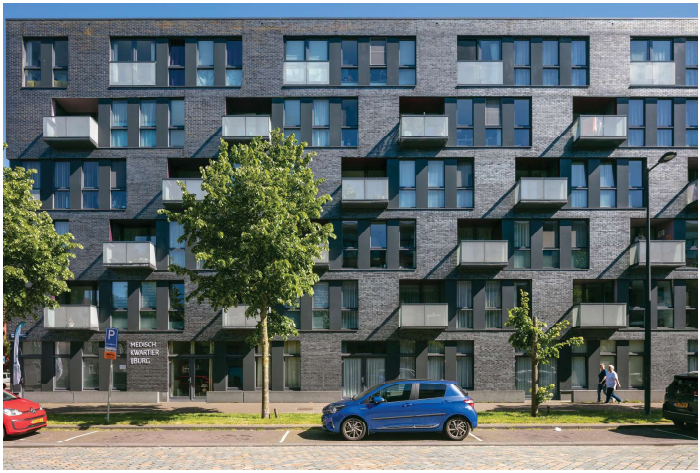
The upper floor has a spacious hallway. It has two bedrooms a storage room and a bathroom that can be entered from the bedroom and the hallway. The balcony can be entered through the bedroom and is shared with the adjacent dwelling.

Gelaagd hof

Elderly ground bound & middle apartment (m²)

Legend

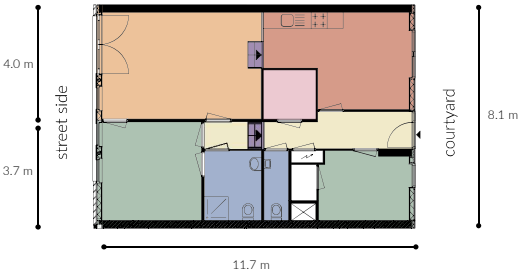
- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom
- 5. Kitchen + Dining
- 6. Balcony
- 7. Steps
- 8. Storage



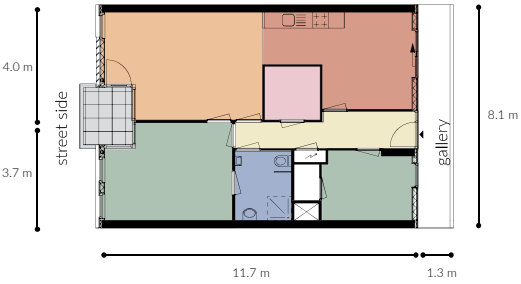
Images: ANA architects, 2018

Floor plans 1:200

Courtyard apartment - Ground floor 90m²



Gallery apartment - First floor 90m²



Ground bound elderly apartment

The ground bound elderly apartments have a double orientation and have their main entrance on the courtyard side and a second entrance on the street side. What is very remarkable is that there are some steps in the middle of the apartment. They are there to compensate between the street level and the elevated roof of the parking garage below the building. For elderly people that like to grow old in their dwelling and that can become mobility impaired this is a curious choice.

Elderly middle apartment

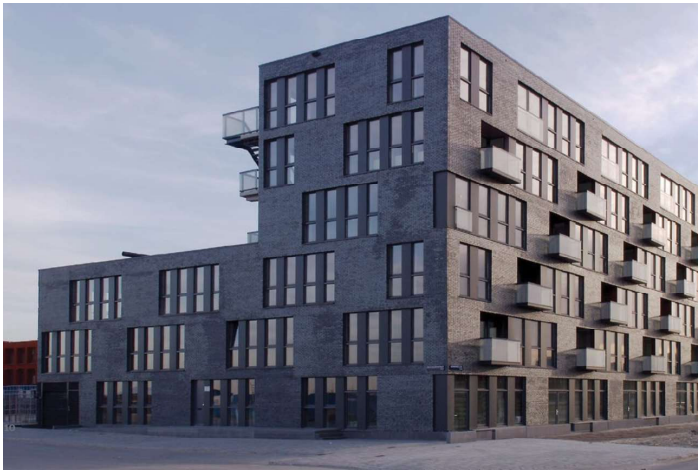
The elderly middle apartment are the most common dwelling type in the building. They are accessible through a corridor at the courtyard side and have a balcony on the street side. The kitchen and dining room are located on the corridor side allowing for more engagement with what is happping on the gallery and the courtyard. The living room is on the street side making it a bit more private.

Gelaagd hof

Elderly corner apartments (m²)

Legend

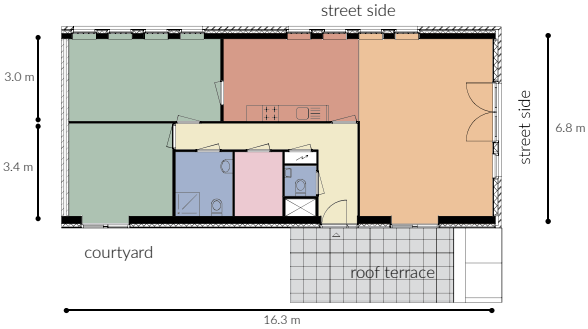
- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom
- 5. Kitchen + Dining
- 6. Terrace
- 7. Storage



Images: ANA architects, 2013

Floor plans 1:200

Corner apartment - Second floor 115 m²



Corner apartment - fifth floor 80 m²

Elderly corner apartment 1

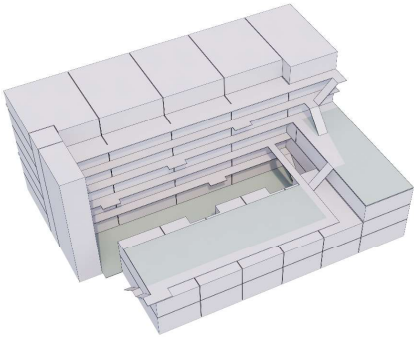
This is one of the corner apartments of the second floor and it is directly connected to the roof terrace. It is one of the biggest apartments having two spacious bedrooms a large storage room a and a even a guest toilet, on top of a big living room kitchen and bathroom. What is nice of this dwelling is that it has many windows for daylight to enter. Most of the windows are oriented towards the street making the apartment one of the ones that is less courtyard oriented.

Elderly corner apartment 2

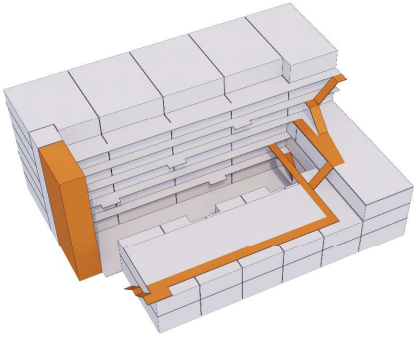
This is a corner apartment on the fifth floor. Compared to the other apartments it has an extra room. Also where in many of the other gallery apartments the kitchen is along the corridor, in this one the kitchen is combined with the living room and is situated on the street side.

Gelaagd hof
Conclusions

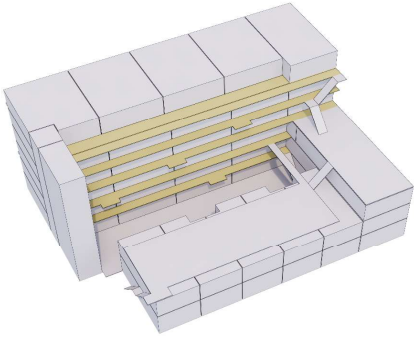
Green spaces on different levels of the building



Open staircase connecting galleries with view towards the courtyard

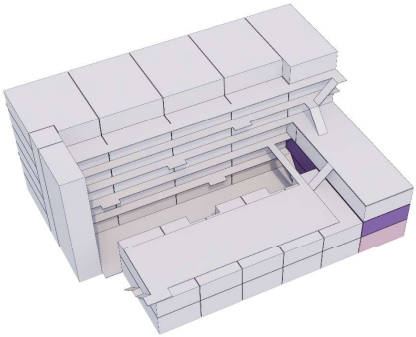


Open galleries on the courtyard side of the building that includes living area

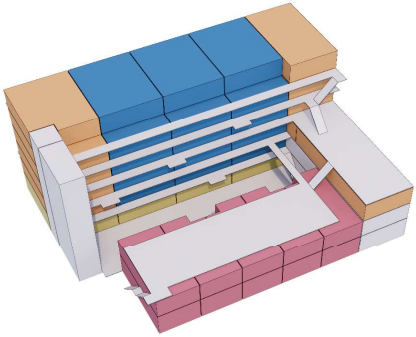


Gelaagd hof
Conclusions

Public and collective functions in the plinth



Clustered dwelling typologies



The Family
Röntgenweg , Delft

Images: ANA architects 2018

Architect: ANA architects
Realization phase: 2018 – under development
Location: Delft, Spoorzone
Address: Röntgenweg 2624 WW
Client: BPD
Developer: not yet known

Functions: collective room 43 m² shared workshop space 33 m², collective elevated street, collective roof terrace.

Dwellings: 94 dwellings for families:
38 tower apartment (50-90 m²)
4 rooftop maisonettes (120 m²)
52 gallery apartments (75 m²)

Site area:	3050 m²
Footprint:	2234 m²
Residential area:	8600 m²

General information
As more families are choosing to live in the city instead of the suburbs it is important that there are suitable dwellings for them. At the newly developed Spoorzone in Delft, ANA architects designed a new building (ANA architects 2019).

Because of it's location the building is close to the inner city of Delft, there is a school nearby, public transport and a variety of shops at walking distance. There is also a lot of green in the vicinity (Nieuw Delft 2021).

The building will have a diverse range of dwellings for diverse family types living in the city. The dwellings will be adaptable to every life phase of a family (Nieuw Delft 2021).

Because square meters are expensive in the city the building also offers different collective spaces like a workspace, storage space and living room, all of this to minimize the expenses and to maximize the limited living space in the city (ANA architects 2019).

Apart from the collective rooms there are also collective places for kids of different age groups to play. The elevated living deck, the play stairs with slide and the extra wide galleries (Muis, 2021).

ANA together with the developer BPD did a lot of research into the modern family household. Having a large living room when the kids are smaller is advantageous as they want to play close to their parents. As they get bigger they need more privacy and the dwellings are meant to adapt to these changes (Muis, 2021).

Keywords
Family housing, Collective spaces, Play spaces

References

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Nieuw Delft. 2021. The Family Delft: Appartementen voor stadsgezinnen. Accessed April 3, 2021. https://nieuwdelft.nl/portfolio/the-family-delft/.

The Family
Site

Image: ANA architects, 2018

Site information

The site is located along the Spoorzone in Delft. It Together with the adjacent block that is a student complex it forms an urban block with a courtyard in the middle. The block is surrounded on four sides by canals making the site feel a bit like an island.

The main entrance of the building is at the courtyard, but the plinth of the building contains mostly parking for bikes and car's, so the connection with the residents and the courtyard is made by the elevated street on the first floor.

Site 1:2000

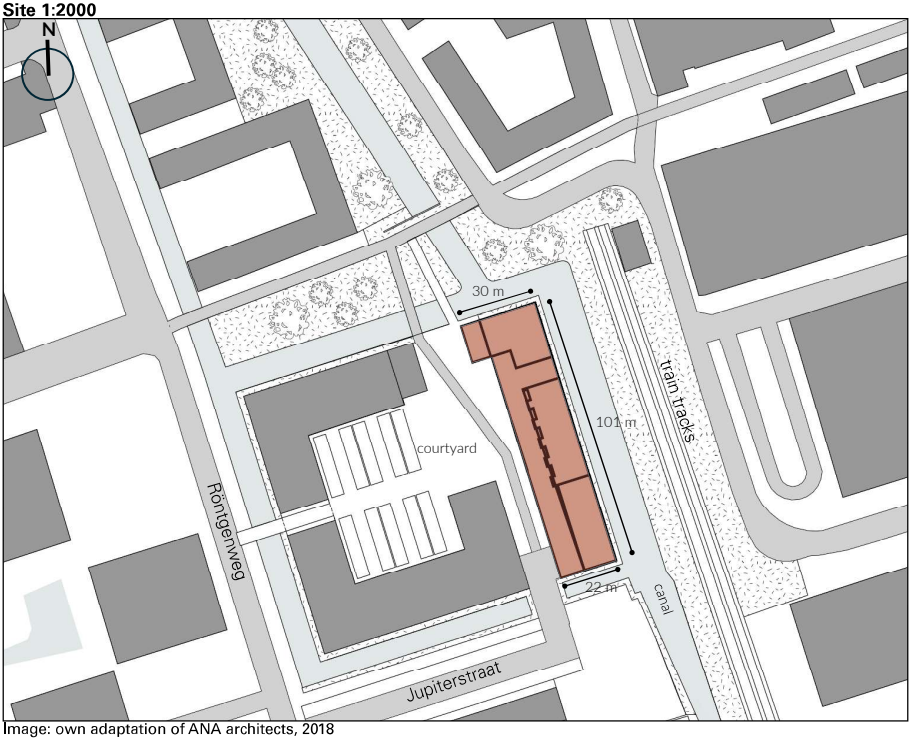


Image: own adaptation of ANA architects, 2018

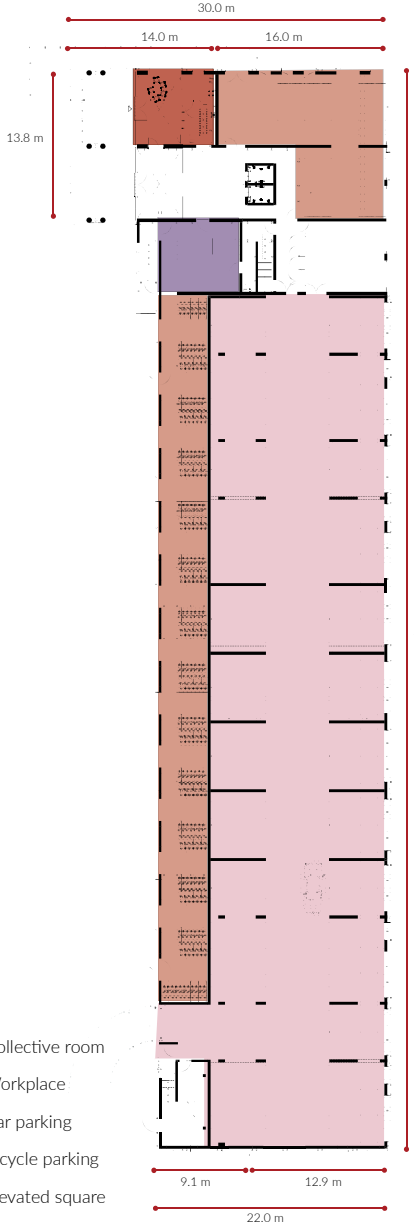
The Family

Collective functions & Bay depth and width

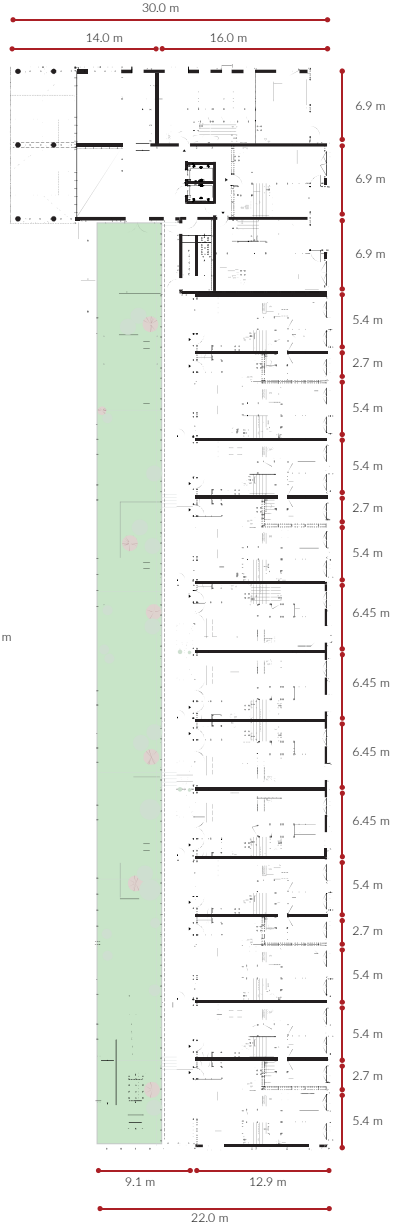
Case study
Family housing

N

Floor plan 1:500 Ground floor



Floor plan 1:500 First floor



Legend

- 1. Collective room
- 2. Workplace
- 3. Car parking
- 4. Bicycle parking
- 5. Elevated square

The Family
Collective spaces

Collective room

Image: ANA architects, 2018

Workplace

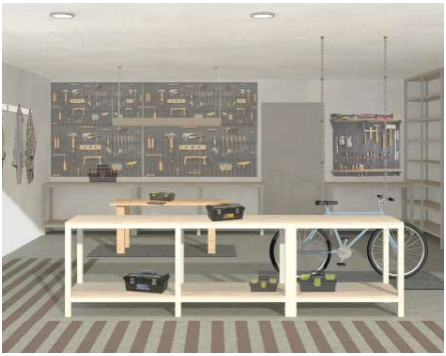


Image: ANA architects, 2018

Entrance with swing

Image: ANA architects, 2018

Elevated play square

Image: ANA architects, 2018

Play stairs with slide

Image: ANA architects, 2018

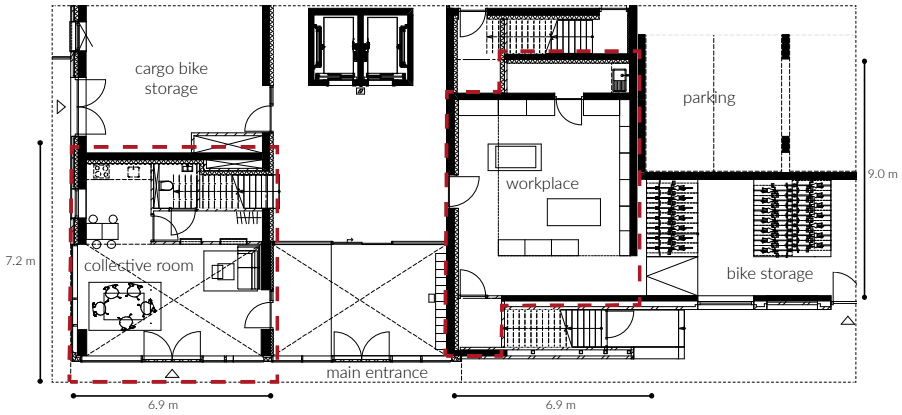
Roof terrace + garden

Image: ANA architects, 2018

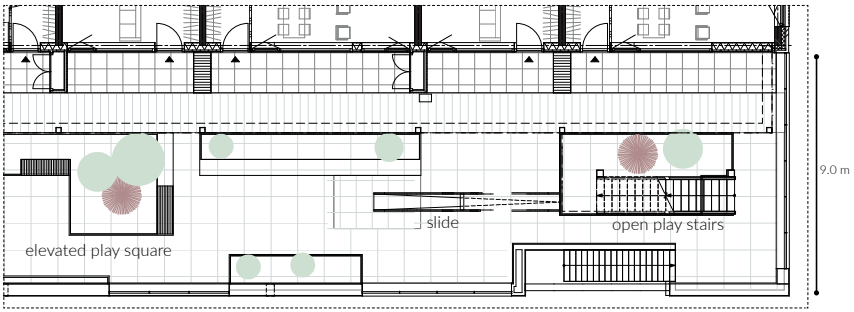
The Family
Collective spaces - Floorplans

N

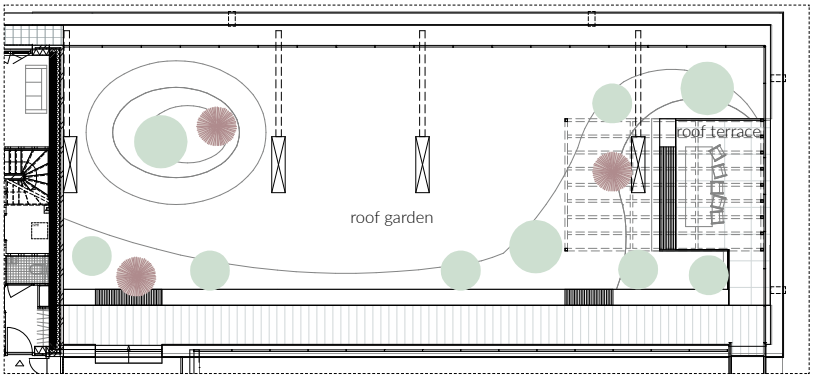
Floor plan 1:200 - Collective room & workplace - Ground floor



Floor plan 1:200 - Elevated play street with slide - First floor



Floor plan 1:200 - Roof garden - Fifth floor



The Family
Circulation & Routing

Legend

1. Elevated street / Roof garden
2. Elevator
3. Corridor / Hallway
4. Stairs

Circulation & Routing

The routing is done in the tower part of the building through a central core with an elevator shaft and a staircase. While in the elongated part there are galleries functioning as elevated streets that connect to the core on one side and an open staircase on the other side. The galleries are all at the courtyard side and look out over the elevated square increasing the social contact between inhabitants.

Gallery niches

Image: ANA architects, 2018

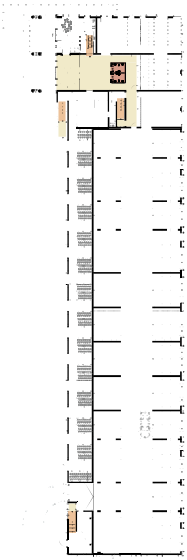
Gallery atrium

Image: ANA architects, 2018

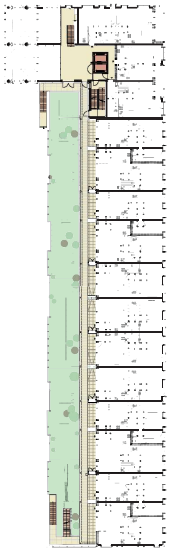
Floor plans 1:1000

N

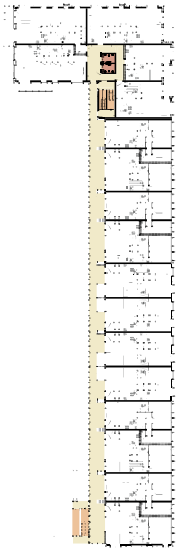
Ground floor



First floor



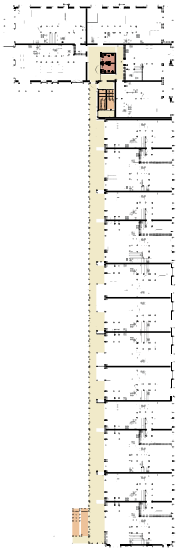
Second floor



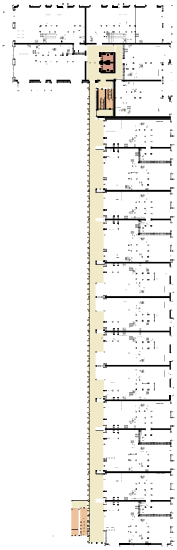
The Family
Circulation & Routing

Floor plans 1:1000

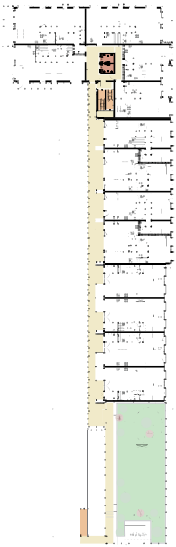
Third floor



Fourth floor

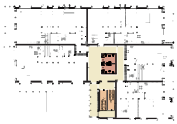


Fifth floor

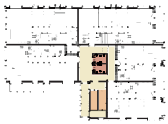


Sixth floor

Seventh floor



Eight floor



The Family
Dwelling typologies

Legend

1. Central core apartment 1	x38	82-90 m²
2. Central core apartment 2	x	50-60 m²
3. Maisonette	x4	118 m²
4. Gallery apartment 1	x16	73 m²
5. Gallery apartment 2	x18	77 m²
6. Gallery apartment 3	x18	75 m²

Dwelling typologies

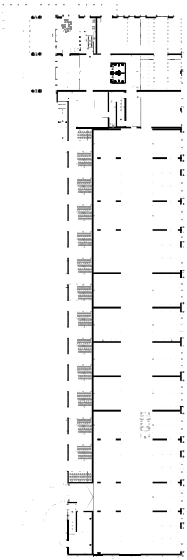
There are nine different dwelling types in the building. Five of the types are in the tower part of the building and are accessible from the central core. The other four types are along the galleries. All of the units are on one floor except for the maisonettes that have an internal staircase. What can be seen is that the similar type dwellings are grouped together, this of course has benefits when stacking them as the shafts and load bearing walls are in the same place.

Courtyard facade

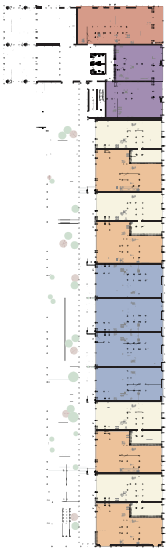
Image: ANA architects, 2020

Floor plans 1:1000

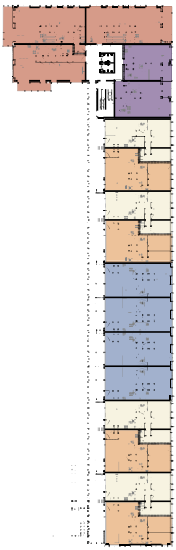
Ground floor



First floor



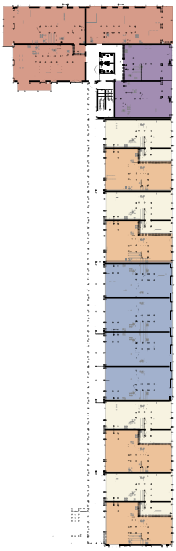
Second floor



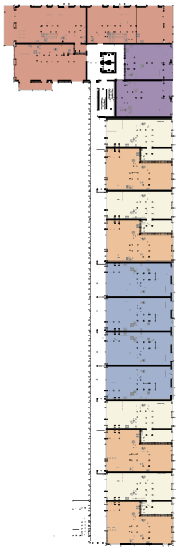
The Family
Dwelling typologies

Floor plans 1:1000

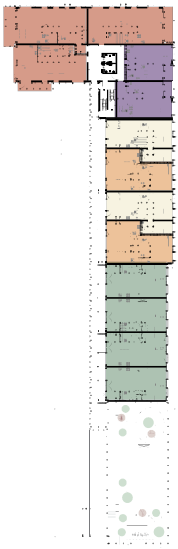
Third floor



Fourth floor

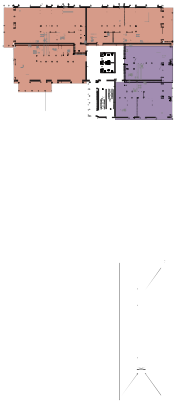


Fifth floor

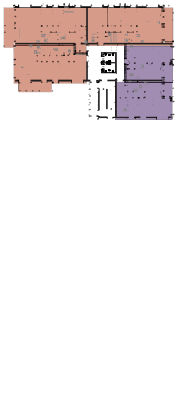


Sixth floor

Seventh floor



Eight floor



The Family
Family maisonette

Legend

- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom + Dining
- 5. Kitchen
- 6. Balcony
- 7. Stairs
- 8. Storage + Installations

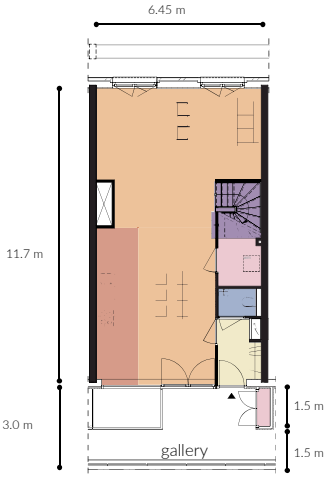
Image: ANA architects, 2018

Maisonette

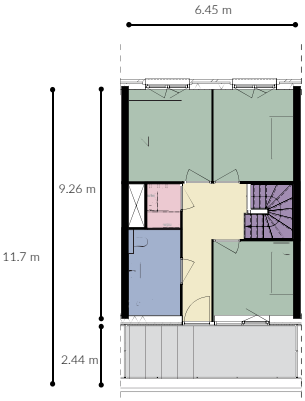
The lower floor is connected to the gallery. There is a small niche at the front door that can be used by the residents to sit on the gallery and have interaction with their neighbors. The kitchen and the dining room are placed along the gallery and form the more public parts in the dwelling, while the living room at the back is more private. Because the kitchen, dining room and living room form one space and the shaft is placed in the middle of the dwelling it would be possible to rearrange the room and have the living room alongside the gallery. Because the dwelling is over two floors there is a staircase. It is placed in the middle and is accessible through the living room. At the upper floor it is interesting to note that the bedrooms are about the same size making them have less of a hierarchy, making the dwelling suitable for a variety of family types.

Floor plan 1:200

1. Maisonette floor 1: 66.5 m²



1. Maisonette floor 2: 51.4 m²



The Family
Family Corridor apartment

Legend

- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom + Dining
- 5. Kitchen
- 6. Balcony
- 7. Storage + Installations

Image: ANA architects, 2020

N

Gallery apartment 1

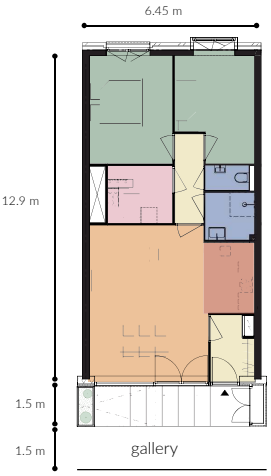
The apartment is accessible through the gallery, again there is a niche in front of the house that is part of the gallery but that can be used by the residents. Part of the niche is an atrium to allow for some extra daylight as the gallery is 3 meters deep. In this dwelling the dining room and the living room form the more public parts of the dwelling. The kitchen is tucked away at the side but is still part of the living room. The bedrooms again have a similar size.

Gallery apartment 2 & 3

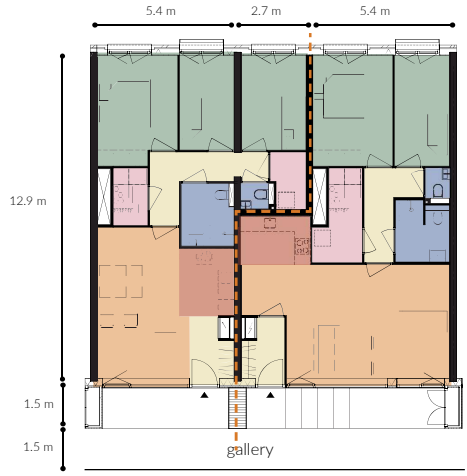
The other two gallery apartments have an L shape. One has a larger facade on the gallery side while the other has a bigger facade on thee back side of the building. Again the living, dining room and kitchen form the more public parts alongside the gallery. The apartment on the left side does not even have an hallway, this probably has to do with space and daylight entry but is not really desirable during the cold periods. In these dwellings there is a clear hierarchy in bedroom size.

Floor plan 1:200

2. Gallery apartment 1 - 73.0 m²



3. Gallery apartment 2 - 75.5 m² **4.** Gallery apartment 3- 77.5 m²



The Family
Family Tower apartment

Legend

1. Hallway
2. Bathroom / wc
3. Bedroom
4. Livingroom + Dining
5. Kitchen
6. Balcony
7. Storage + Installations

N

Image: ANA architects, 2020

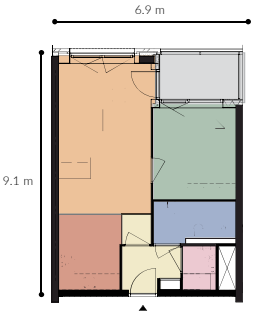
Central core apartment 1
The dwelling is accessible through the core. Therefore there is no real public part in the dwelling. Because it is situated at the corner it still has two large facades with daylight. It has a large room for the living, dining and kitchen with a large spacious balcony. At the same time it has space for three bedrooms. There is a clear hierarchy in the rooms with one being the master bedroom. The bathroom and storage are again in the parts of the dwelling with less daylight.

Central core apartment 2 & 3
These two apartments are also accessible from the core and have no public part inside the dwelling. They have a single side orientation with only one facade that gets daylight. The living room and the bedroom are oriented along this facade, while the kitchen, the bathroom and the storage are in the part of the dwelling that gets less daylight.

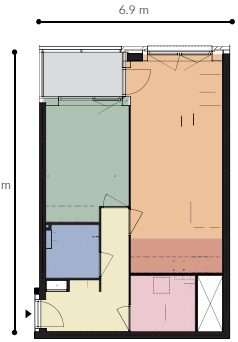
Floor plan 1:200

5. Central core apartment 89.9 m²

6. Central core apartment 49.9 m²



7. Central core apartment 59.9 m²



The Family
Family Tower apartment

Legend

- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom + Dining
- 5. Kitchen
- 6. Balcony
- 7. Storage + Installations

N

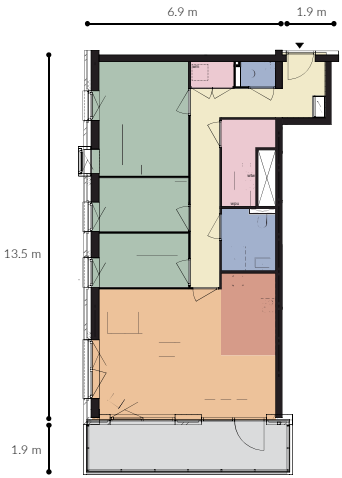
Image: ANA architects, 2018

Central core apartment 4
This apartment is similar to the first central core apartment but mirrored. Where the other apartment was orientated north-east this one is orientated north-west having more evening sun. Again there is the large living, dining room and kitchen combination along a large balcony. The bedrooms are again divided in one master bedroom and two smaller ones. So this apartment caters to the classic family of two parents with two kids.

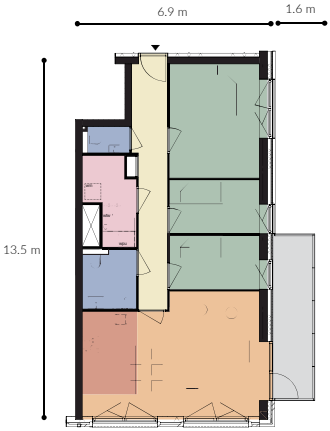
Central core apartment 5
This apartment is similar to core apartment one and four. It has a south-west orientation. Again it has a large room that serves for living, dining and kitchen and also the one master bedroom and two smaller ones is the same. Where there is a difference is that this dwelling has limited entrance space as the hallway is just a corridor. Also the balcony is flipped around to the south side of the dwelling making it have less connection to the kitchen and the dining room.

Floor plan 1:200

8. Central core apartment 89.9 m²

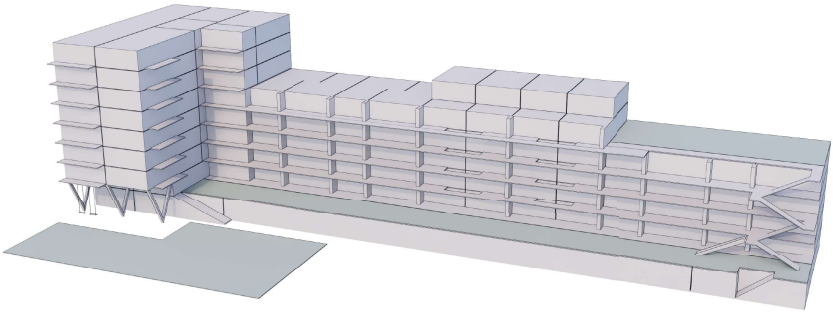


9. Central core apartment 82.4 m²

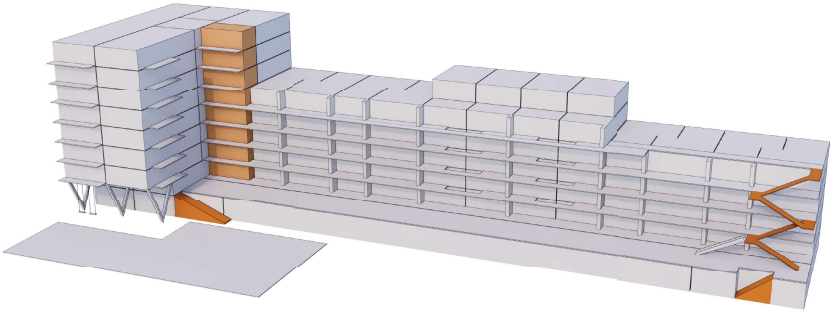


The Family
Conclusions

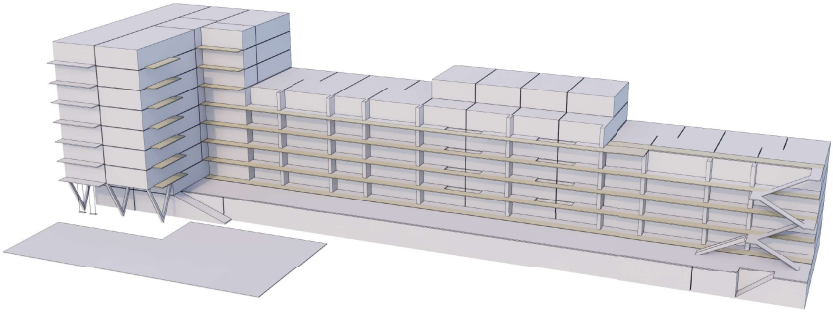
Green spaces on different levels of the building



Open staircase connecting galleries with view towards the courtyard

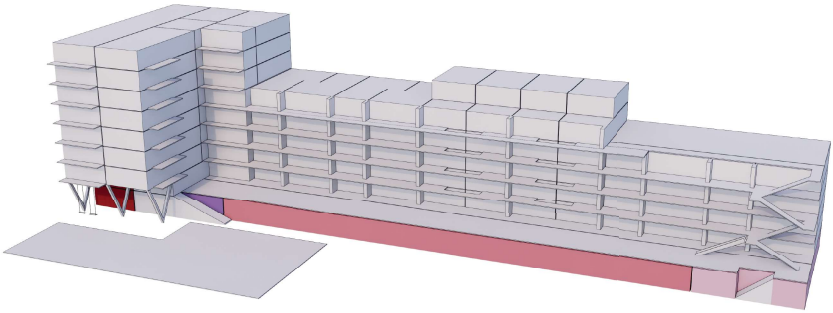


Open galleries on the courtyard side of the building that includes living area

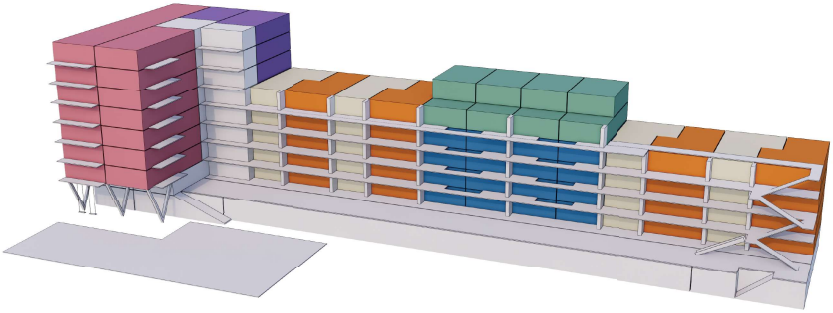


The Family
Conclusions

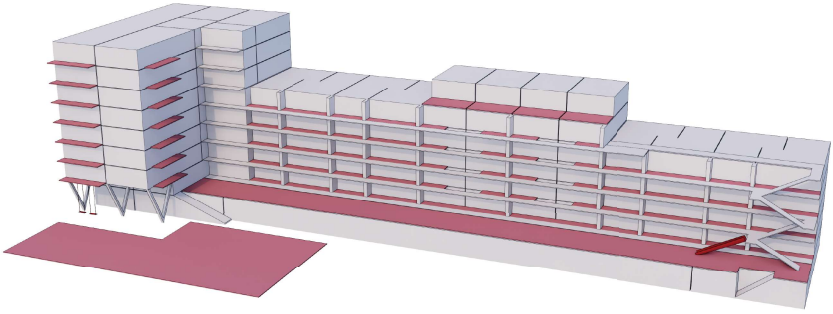
Collective functions in the plinth



Clustered dwelling typologies



Spaces for children to play with different levels of control throughout the building



Eenhoornblokken - Korthtielens
Stephensonstraat, Amsterdam

Images: Korth+Tielens architects, 2019

Architect: Korth + Tielens
Realization phase: 2018 – 2021
Location: Amsterdam, Watergraafsmeer
Address: Stephensonstraat 1097 BB
Client: Ymere housing corporation
Developer: Era Contour

Functions: collective living room, laundry room

Dwellings: 149 social rented dwellings

48 Corridor apartment (40 m²)
53 Corner apartment (33-88 m²)
22 Maisonettes (80-87m²)
26 Gallery apartments (37-49m²)

Site area:	5800 m²
Footprint:	3950 m²
Residential area:	7427 m²

Bicycle parking: 358
Car parking: 12

General information
The municipality of Amsterdam is working on making more compact neighbourhoods to be able to provide more people with dwellings. That is why Korthtielens was asked to design two residential urban blocks. The buildings are both courtyard buildings meaning that they are designed around an inner garden (Architectenweb 2019).

The buildings consists of social housing with a mix of different dwellings for starters, families and elderly citizens. They provide high density living in the city while the compact dwellings are being complemented by shared collective facilities. A survey among potential residents has shown that there is not interest in a shared a kitchen, bathroom or guest bedroom but the shared living room was however desired (Damen 2019).

Right next to the entrance lobby of both buildings there is a collective living room and a laundry room. The collective living room can be used by the residents that do not have much money for restaurants or cafe's but still want to socialize with their neighbors. It can also be used for parties for residents with smaller dwellings. The laundry room saves space in the dwelling because not everyone needs to have their own washing machine. Because of the compact living and the shared facilities, it is expected that people will meet each other in the building more often, stimulating social cohesion.

The different dwellings differ in sizes and arrangement. The smaller dwellings are relativity wide and not to deep with floor high windows to allow a lot of daylight to enter (Korthtielens 2019).

For sustainability there are solar panels on the roof of the building and there is no connection to the gas network, so no direct consumption of fossil fuels (Damen 2019).

Keywords
Intergenerational, Social housing, Courtyard housing, Collective facilities

References
Architectenweb. 2019. "Korth Tielens ontwerpt twee blokken met sociale huurwoningen in Amsterdam-Oost." Accessed May 15, 2021. https://architectenweb.nl/nieuws/artikel.aspx?ID=45722.

Damen, Tom. 2019. "Ymere bouwt luxe sociale huurhuisjes in Oost." Het Parool (newspaper). Accessed May 15, 2021. https://www.parool.nl/nieuws/ymere-bouwt-luxe-sociale-huurhuisjes-in-oost~b851ac8d/.

Korthtielens architects. 2019. "Eenhoornblokken, Amsterdam." Accessed May 15, 2021. https://korthtielens.nl/architecture/eenhoornterrein/.

Eenhoorn Block 1
Site

Images: Korthtielens architects, 2019

Site information

The site is called the Eenhoorn terrain. The building is part of an urban ensemble that consists of six residential courtyard blocks and a police office surrounded by car roads. The two most northern blocks are designed by Korthtielens architects and will be shown. In between the blocks there is a car free zone. This is made specifically for pedestrians and for children to play. There is also a lot of green in this area making it a comfortable place to be. Because it is a social building project, the dwellings are not very big, therefore the collective courtyard and the green public space surrounding the building is very important.

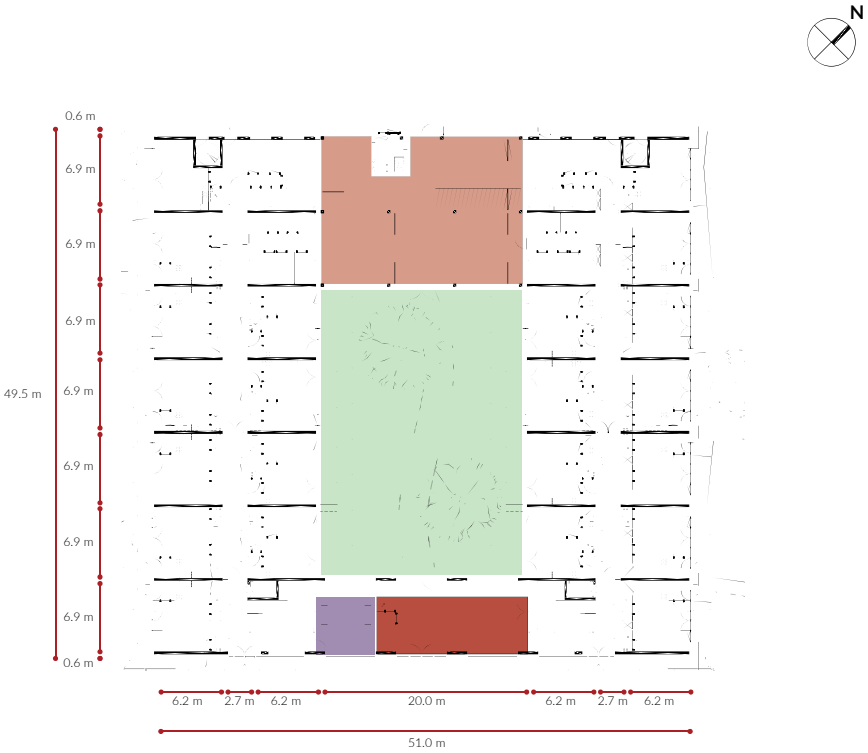
Site 1:2000

Image: own image

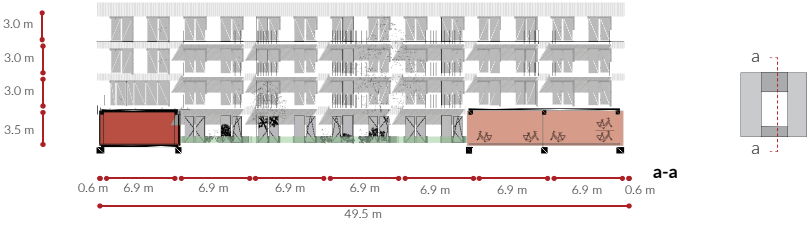
Eenhoorn Block 1

Bay depth and with & Collective Functions

Representaive floor plan (ground floor) 1:500



Section 1:500



Legend

- 1. Collective room
- 2. Laundry room
- 3. Bicycle parking
- 4. Collective courtyard

Eenhoorn Block 1
Circulation & Routing

Legend

1. Courtyard / Terrace (collective)
2. Elevator (collective)
3. Corridor (collective)
4. Stairs (collective)

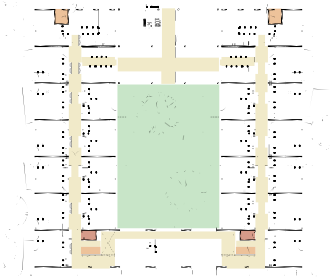
Circulation & Routing

The circulation in the building is provided by corridors. Because of this choice the dwellings have a one sided orientation. On the ground floor, the dwellings on the out side have their entrance at the outside of the building instead of at the corridor to enhance the urban connection. The vertical transport is done by four staircases one in each corner, and two elevators in the lower corners.

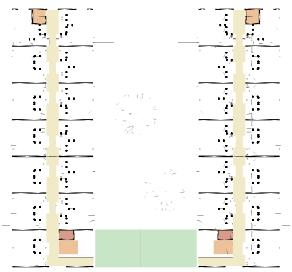
Images: Korthtielens architects, 2019

Floor plans 1:1000

Ground floor



First floor



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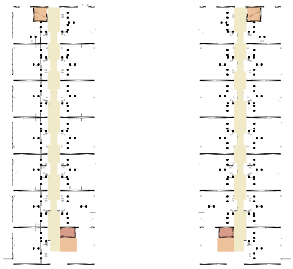
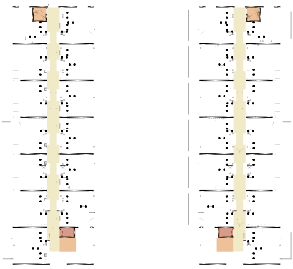
Second floor



Third floor



Eenhoorn Block 1
Dwelling typologies

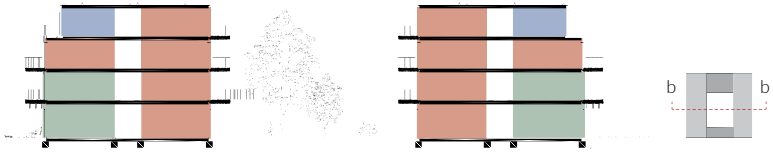
Legend

1. Corridor apartment	x48	39.8 m²
2. Maisonette	x12	79.9 m²
3. Corridor apartment	x10	30.1 m²
4. Corner apartment ground floor	x2	84.6 m²
5. Corner apartment	x6	33.0 m²
6. Corner apartment	x4	60.5 m²

Dwelling typologies

There are six different apartments in the building. On the outer side on the ground floor there are the maisonettes. Even though they have a one sided orientation they are a bit bigger because they are over two floors. The corridor apartment is the most common one and is positioned along the courtyard and accessible through the corridor. On the top floor there is a variation of this apartment with a setback to make the building feel less tall. The other dwellings are the corner variations that are needed mostly to allow for the staircases and elevators.

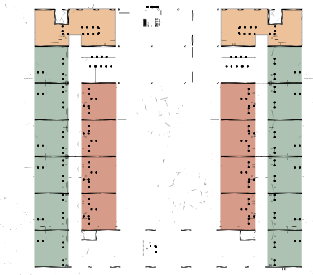
Section 1:500



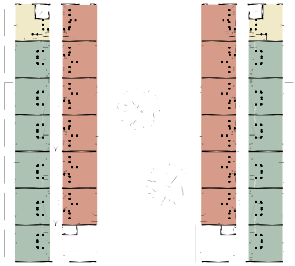
b-b

Floor plans 1:1000

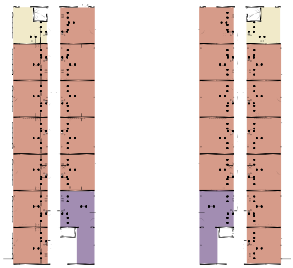
Ground floor



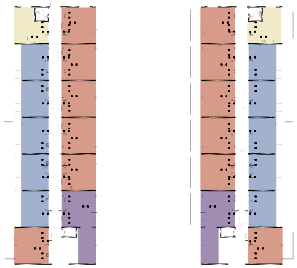
First floor



Second floor



Third floor

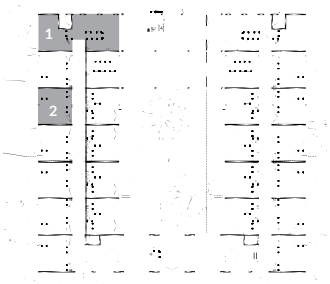


Eenhoorn Block 1
Dwelling Floorplans

Legend

- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom + Dining
- 5. Kitchen
- 6. Balcony
- 7. Storage + Installations
- 8. Stairs

Place - ground floor

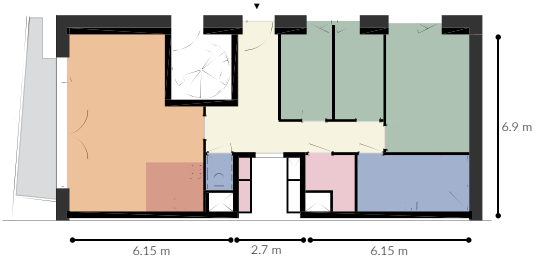


Dwelling floor plans

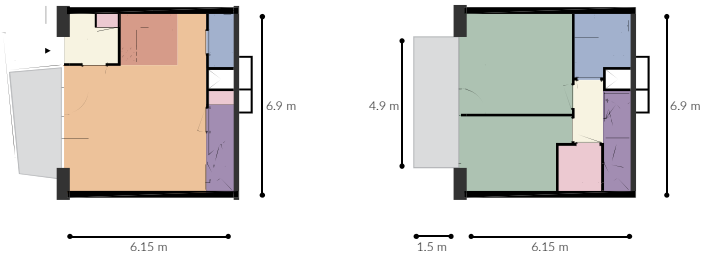
The dwellings are designed pretty compact to keep them affordable. In all of the different floor plans the living room dining room and kitchen are combined into one room. In the smallest dwellings number 3 and 5 also the bedrooms are added to this. In this way the use of the space is optimized but at the same time it offers very little private space if you live in the dwelling with more than one person. As the dwellings except for the corner ones only get daylight from one direction they can not be to deep. The maximum depth is 6.15m with the bathroom and storage placed in the parts of the dwelling that receive the least light. In the maisonettes also the stairs is placed all the way to the back allowing the living spaces to get the maximum daylight.

Floor plans 1:200

1. Corner apartment - 84.6 m²



2.Maisonette - 79.9 m²

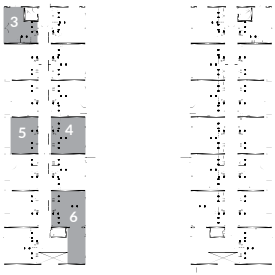


Eenhoorn Block 1
Dwelling Floorplans

Legend

- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom + Dining
- 5. Kitchen
- 6. Balcony
- 7. Storage + Installations
- 8. Stairs

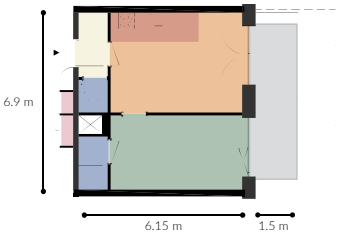
Place - third floor



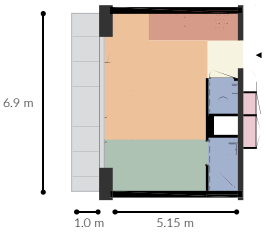
Floor plans 1:200

3. Corner apartment - 33.0 m²

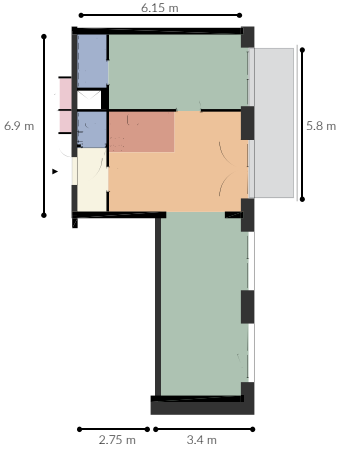
4. Corridor apartment- 39.8 m²



5. Corridor apartment - 30.1 m²

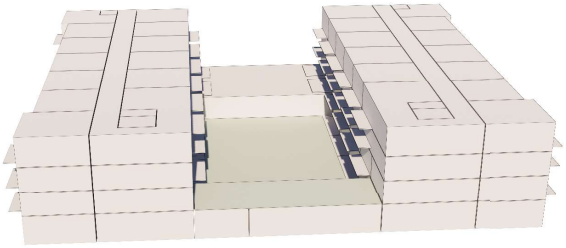


6. Corner apartment - 60.5 m²

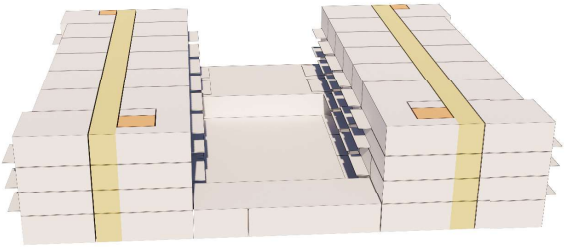


Eenhoorn Block 1
Conclusions

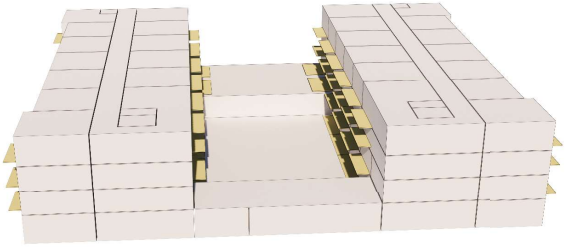
Green spaces on different levels of the building



Internal corridor circulation

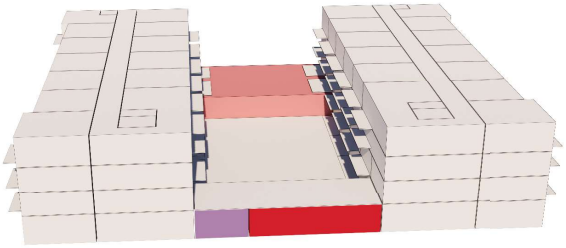


Balconies on the courtyard side of the building with view on the courtyard

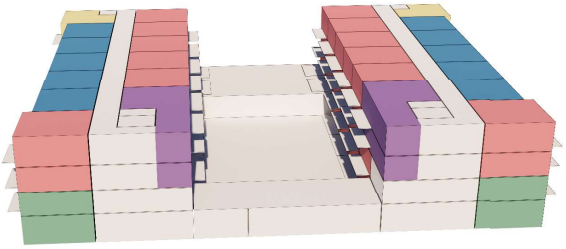


Eenhoorn Block 1
Conclusions

Collective functions in the plinth



Clustered dwelling typologies



Eenhoorn Block 2
Site

Images: Korthtielens architects, 2019

Site information

The second Eenhoorn block from Korthtielens is the one located most in the north of the urban ensemble. It is a little bit slimmer than the first block and therefore has a smaller courtyard. For this block two of the facades are at the street side while the other two are connected to the pedestrian green space in the middle of the blocks.

Notable for this block is that the courtyard is not situated on the ground floor but instead is located on the first floor. The ground floor is used for bicycle and car parking plus some storage. Because the courtyard is elevated it is a bit more detached from the urban surrounding which gives it a more private feel.

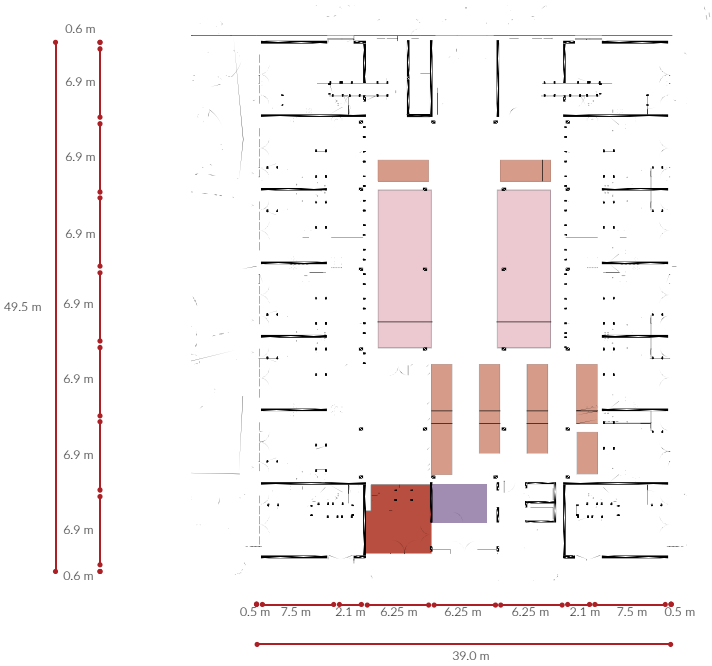
Site 1:2000

Image: own image

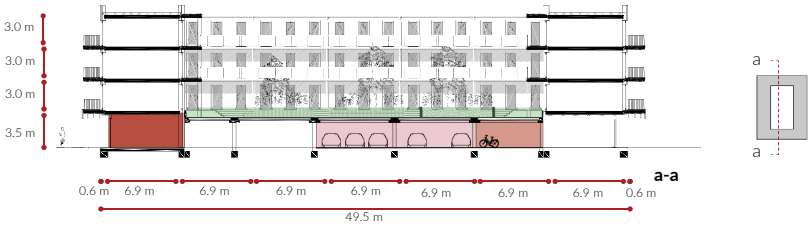
Eenhoorn Block 2

Bay depth and with & Collective Functions

Floor plan (ground floor) 1:500



Section 1:500



Legend

- 1. Collective room
- 2. Laundry room
- 3. Bicycle parking
- 4. Parking
- 5. Courtyard

Eenhoorn Block 2
Circulation & Routing

Legend

1. Courtyard / Terrace (collective)
2. Elevator (collective)
3. Corridor (collective)
4. Stairs (collective)

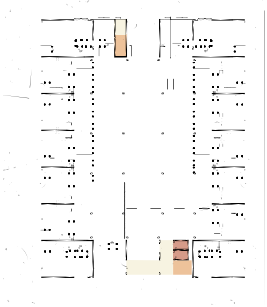
Circulation & Routing

The routing in the building is done with an open gallery located at the courtyard side. Except for the dwellings at the ground floor that are accessed from the street and the public green spaces all of the dwellings from the higher levels have their entrance along these galleries. There is a staircase at the top for vertical transport and a staircase and elevators at the bottom. They both also connect to the gallery.

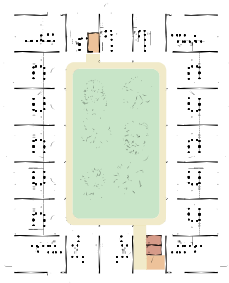
Images: Korthtielens architects, 2019

Floor plans 1:1000

Ground floor

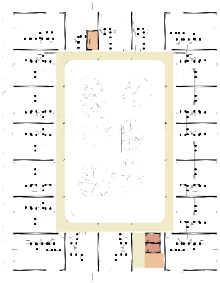


First floor

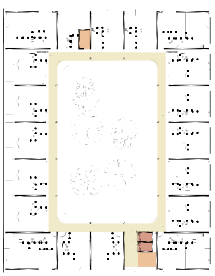


N

Second floor



Third floor



Eenhoorn Block 2
Dwelling typologies

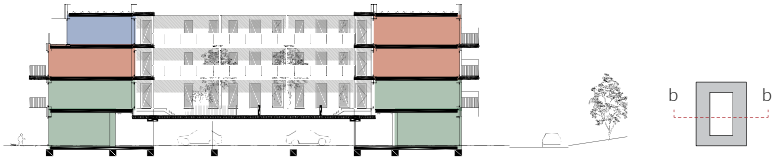
Legend

1. Gallery apartment	x15	49.0 m²
2. Family Maisonette	x10	86.7 m²
3. Gallery apartment	x5	37.3 m²
4. Corner apartment	x2	86.0 m²
5. Corner apartment	x11	61.4 m²
6. Corner apartment	x3	62.0 m²
7. Gallery apartment	x6	40.3 m²
8 Gallery apartment	x6	40.4 m²
9. Gallery apartment	x3	31.8 m²

Dwelling typologies

There are nine type of dwellings and all the dwellings have a two sided orientation. This means that they are connected to the outside and to the courtyard so the resident can choose for more privacy or more engagement. Same type dwellings are again clustered together and stacked on top of each other. Exceptions are in the corners.

Section 1:500

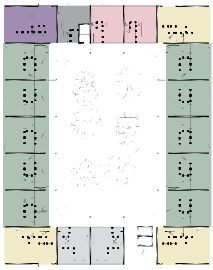


b-b

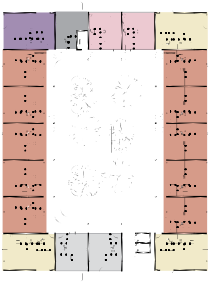
Floor plans 1:1000

Ground floor

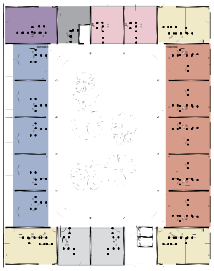
First floor



Second floor



Third floor

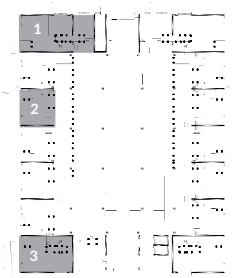


Eenhoorn Block 2
Dwelling Floorplans

Legend

- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom + Dining
- 5. Kitchen
- 6. Balcony
- 7. Storage + Installations
- 8. Stairs

Place - ground floor

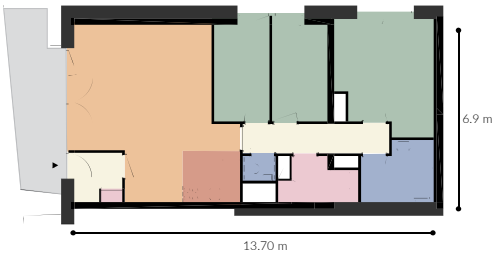


Dwelling floor plans

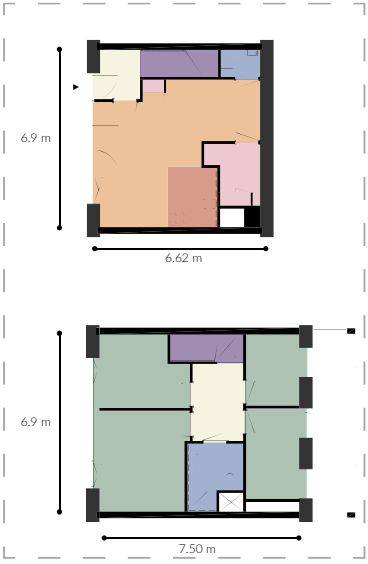
Also in this block the dwellings are designed compact. Because the two sided orientation for daylight the dwelling can have more depth and range between 6.9 and 7.5 meters deep. In all the dwellings the living room, dining room and kitchen are fused together into one room. What is interesting to see for the gallery apartments is that in some cases the living, dining and kitchen are placed along the gallery while in other cases the bedroom is placed there. This of course can have consequences for the engagement with the gallery but also with the privacy of the dwelling. By mixing it up people with different preferences can have options to choose from. Other notable things are that dwelling type 4 and 8 do not have a separate bedroom it is again included to the main room to maximize the usage of the space. Another interesting choice is made with the design of the 9th dwelling type where you have to go through the kitchen to reach the living room. For the maisonette the internal stairs is place at the side in order to not take up facade space on the second floor.

Floor plans 1:200

1. Corner apartment - 86.0 m²



2.Maisonette - 86.7 m²



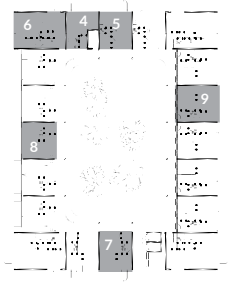
3. Corner apartment - 61.4 m²

Eenhoorn Block 2
Dwelling Floorplans

Legend

- 1. Hallway
- 2. Bathroom / wc
- 3. Bedroom
- 4. Livingroom + Dining
- 5. Kitchen
- 6. Balcony
- 7. Storage + Installations

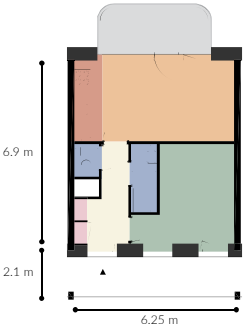
Place - third floor



Floor plans 1:200

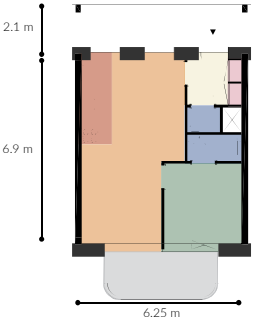
4. Gallery apartment - 31.8 m²

5. Gallery apartment - 40.4 m²



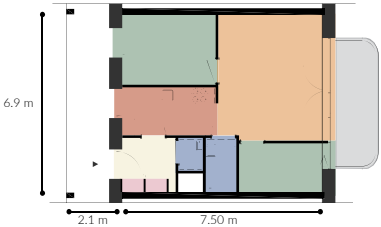
6. Corner apartment - 62.0 m²

7. Gallery apartment - 40.3 m²



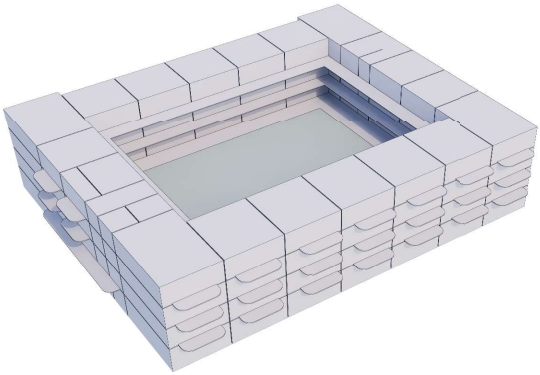
8. Gallery apartment - 37.3 m²

9. Gallery apartment - 49.0 m²

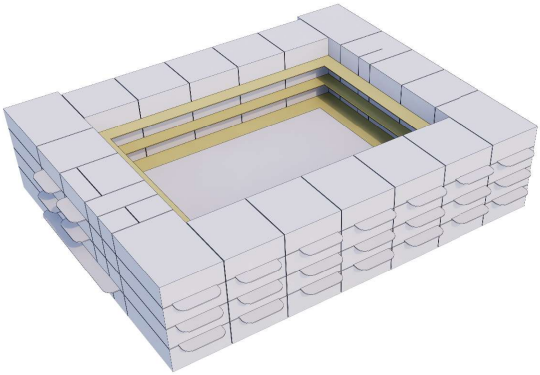


Eenhoorn Block 2
Conclusions

Green courtyard on an elevated plinth

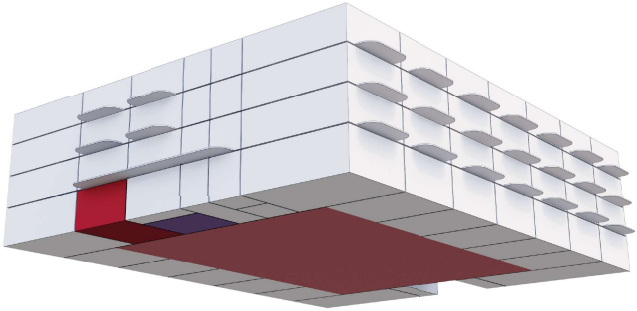


Open galleries on the courtyard side of the building

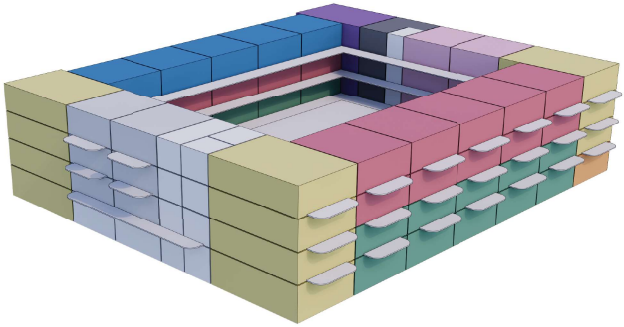


Eenhoorn Block 2
Conclusions

Collective functions in the plinth



Clustered dwelling typologies



Urban Master Plan

Site history

The Merwehaen is a harbor area in the city of Rotterdam that got developed between 1932 and 1933 due to large commercial and industrial growth. As the city expanded the harbor area move more towards its outskirts. The Merwehaven was made as a transshipment port and fruit was the main transit product. When during the 1960's harbor activity shifted towards containerization the Merwehaven lost part of its function to other bigger harbors. As companies were leaving decay set in the area. To turn the tide the municipality started to make plans to redevelop the area. To transform it into a work live area. From 2005 new industries got attracted while from 2017 the plans started to also transform parts of the harbor into a residential neighborhood. This is also the starting point of this urban plan.

Plan description

Currently there is still some harbor activity on the peer. There are some warehouses that determine the atmosphere. We started the urban plan choosing which one to keep and selected three of them to include in the plan. Because it was important to keep the feel of the place and have a link with the history the long lines of the warehouses along the peer would be maintained. The warehouses that were kept got special attention by having them put in a break were the long lines would be interrupted. For the circulation the middle axis and one side of the peer is used leaving the other side of the peer car free. The roads are placed in such a way that there are multiple building depths possible leading to a variety of building typologies in the plan. The last important aspect is the green route that was designed to connect the different parts of the plan and provide ample green space.

Current situation Merwehavens

Image: (Google maps, 2021)

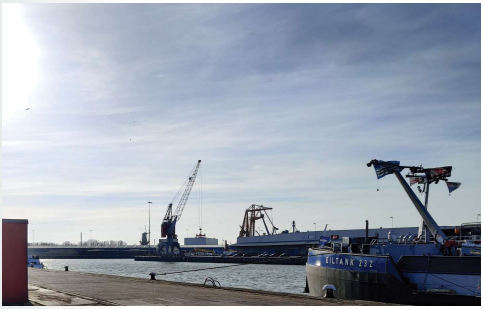
Historic images Merwehavens design site

Images: (portofrotterdam, 2021), (kustvaartforum, 2021)

Timeline

1932-1933	1960	2005	2017
Merwehaven Constructed as a fruit transshipment port	Due to containerisation port activities move away setting in a period of decay.	Revitalization of the area by attracting new innovative industries and artists	Start planning for the transformation of the area into a work and live neighbourhood.

Photographs site visit current situation



Images: site visit 2021 (Photographer: Ricardo Kemp)

Current plan view Merwehavens design site

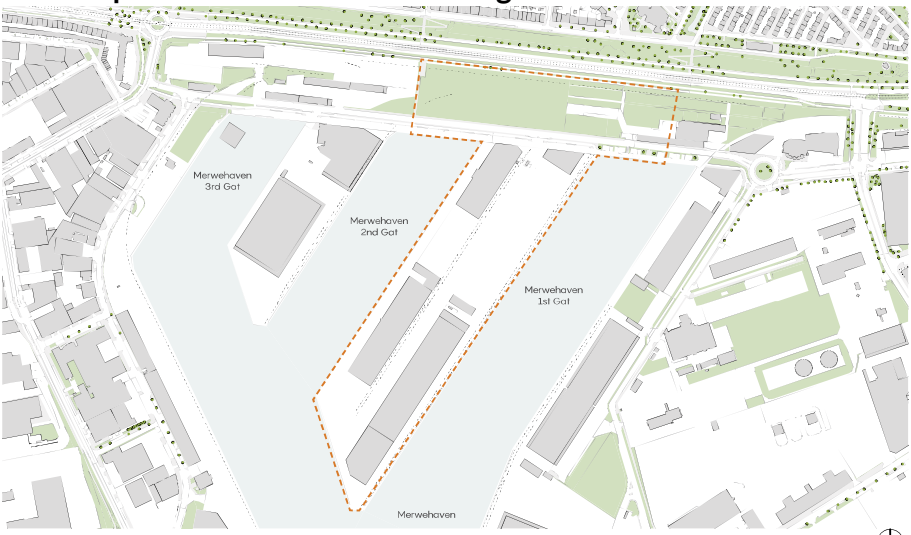


Image: (Urban Masterplan, 2021)

Preservation of characteristic harbor elements

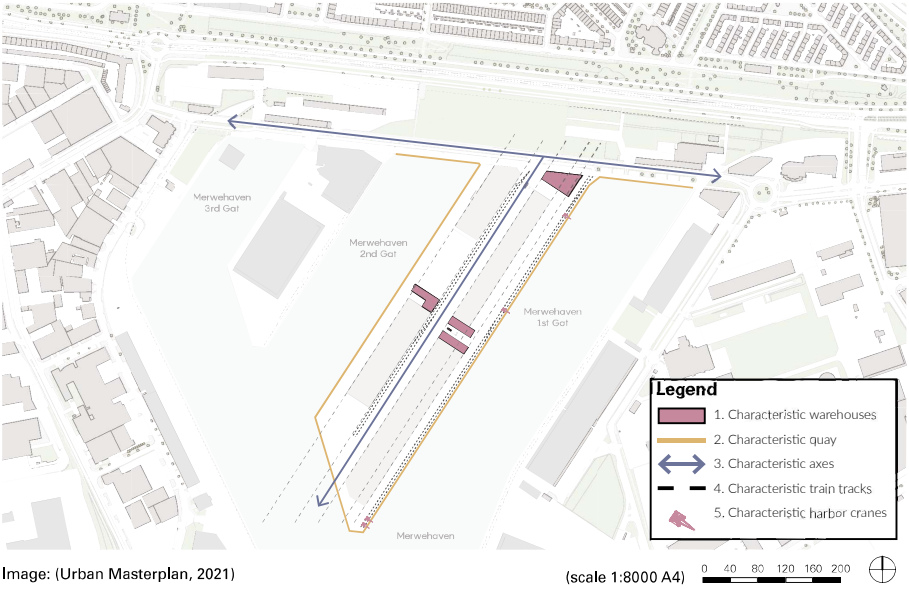


Image: (Urban Masterplan, 2021)

Keep historic view lines - add to break showcase historic elements

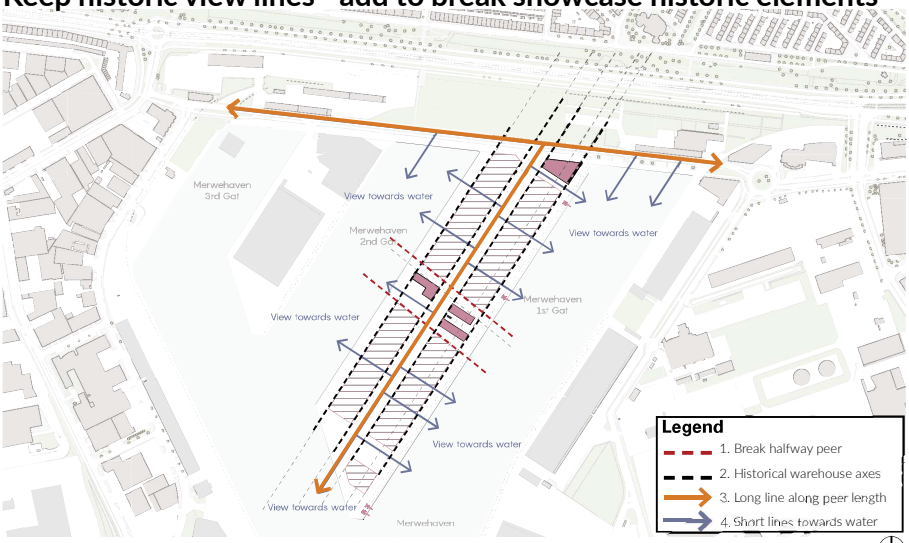


Image: (Urban Masterplan, 2021)

Circulation

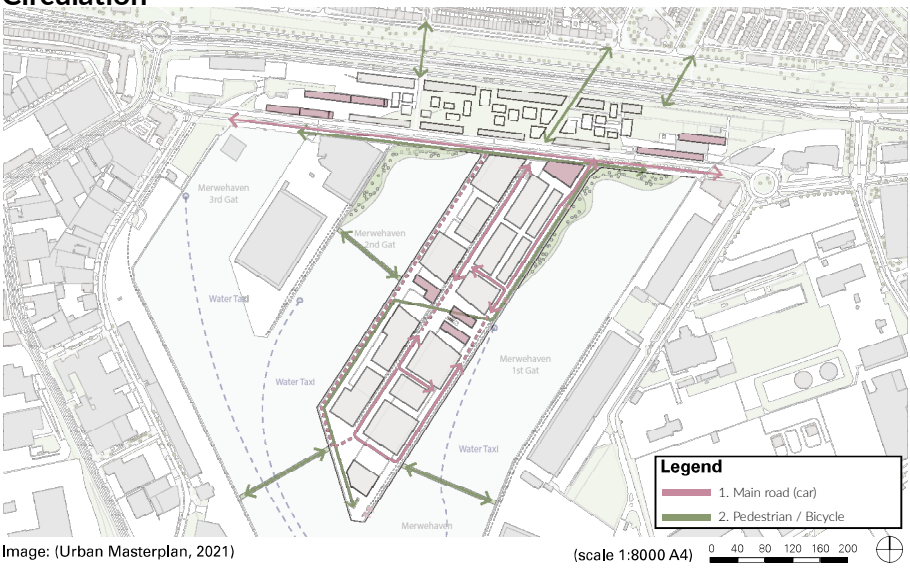


Image: (Urban Masterplan, 2021)

Diverse building typologies

Image: (Urban Masterplan, 2021)

(scale 1:8000 A4) 0 40 80 120 160 200

Green Route

Image: (Urban Masterplan, 2021)

(scale 1:8000 A4) 0 40 80 120 160 200

Final Urban Design

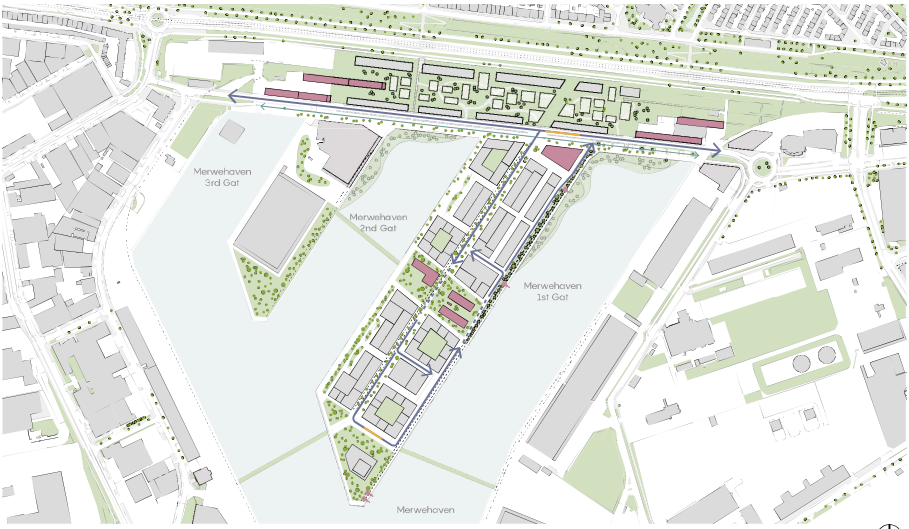
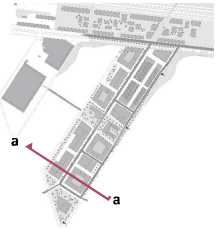


Image: (Urban Masterplan, 2021)

(scale 1:8000 A4)

Urban Section a-a

The height of the different buildings on the peer was kept at a minimum of 3 layers and a maximum of about 8 layers. This was done to maintain the feeling of the harbor area with the relative low long stretched warehouses. The only exception to this is the high rise that serves as an icon at the head of the peer.



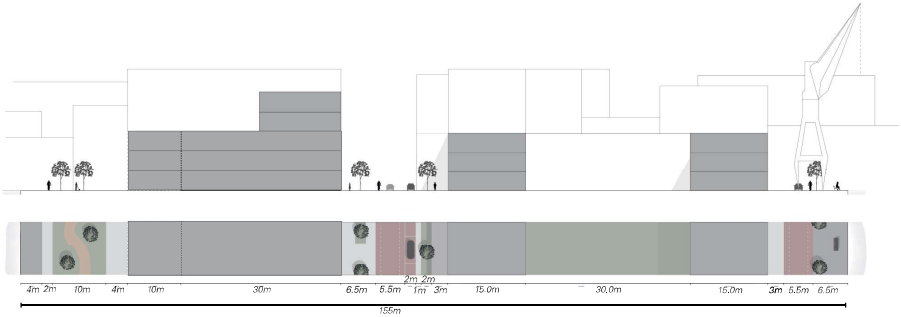


Image: (Urban Masterplan, 2021)

(scale 1:1000 A4)

Plot Choice

Final Urban Design with chosen block

Image: (own image, 2021)

Plot 13: Courtyard Block

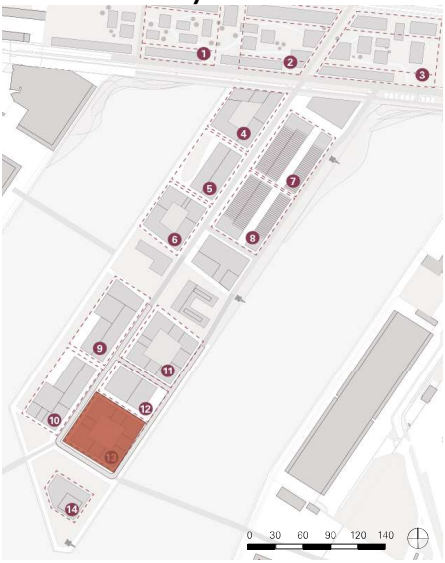


Image: (own image, 2021)

Reason for choice

I liked the location at the head of the peer and was inspired by two quotes by Floris Alkemade and Richard Sennett to look into the courtyard typology.

Floris Alkemade - Chief government architect (2015-present day)- NRC, 2020

"Het huis van de toekomst is misschien wel een middeleeuws hofje."
(Translation: The house of the future may well be a medieval courtyard)

Richard Sennett - Sociologist and Writer- Lecture Architecture foundation, 2020

"The typology we are exploring is one that is a modern version of the Shikumen"

(The Sikumen is a traditional Chinese courtyard)

Starting plot

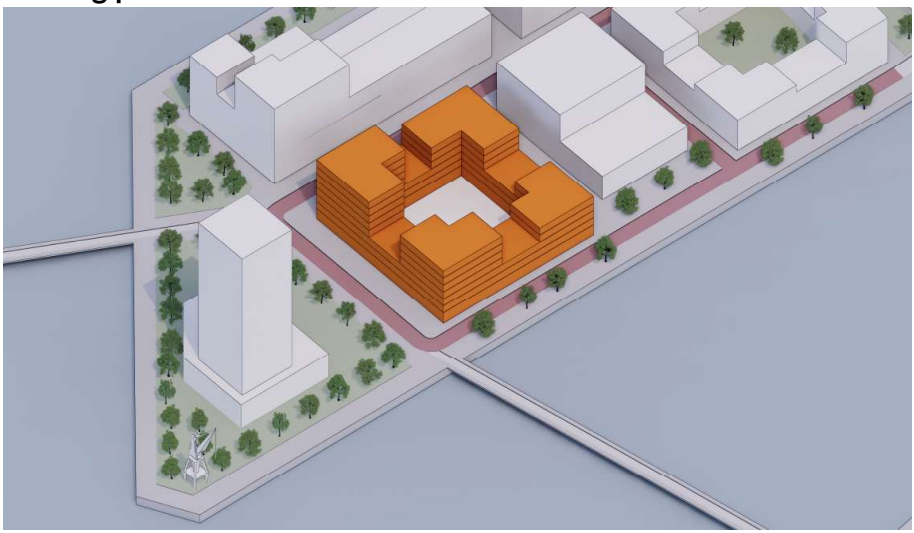


Image: (own image, 2021)

Sun path & Scale building plot

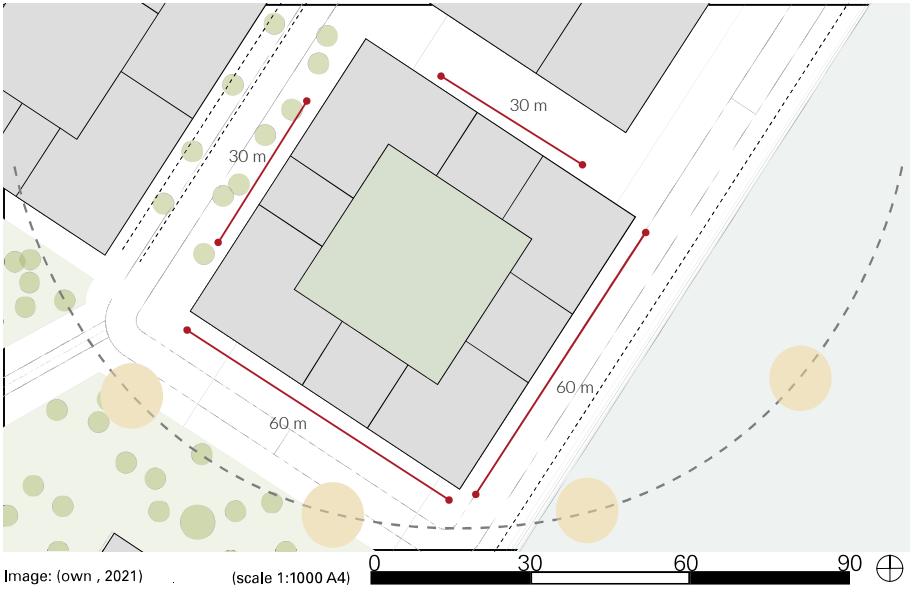
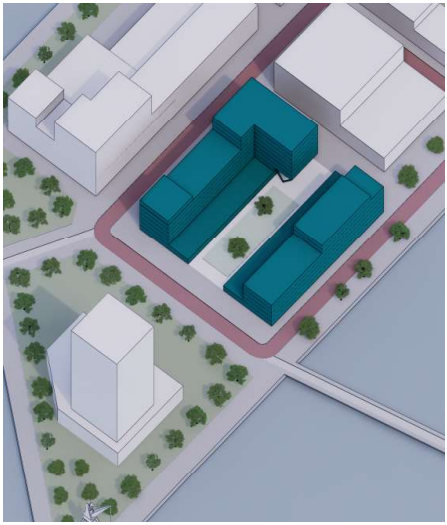


Image: (own , 2021)

(scale 1:1000 A4)

Quick Start

Quick start assignment



Design inspiration

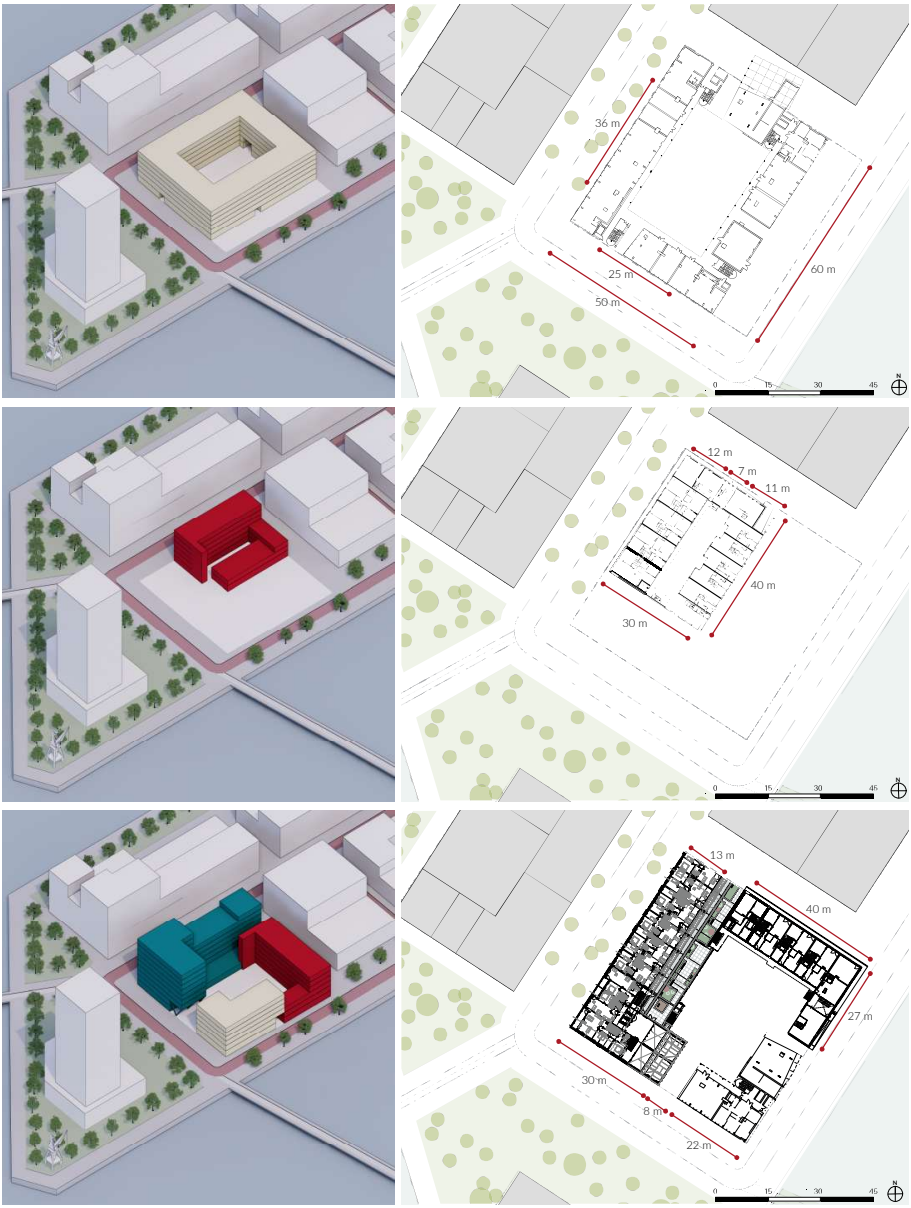
To start the design phase there was a quick start assignment. For this assignment the goal was to paste multiple of the case study reference projects on the site to get a feeling for scale and to explore possibilities. In total I pasted three different buildings on the site and adapted them where necessary for them to fit. Afterwards I also tried to combine multiple buildings to see what interesting ideas this would give. At the end of the assignment the composition that I was most happy with was one that used the case study project "The Family". After having to split it in two parts and mirroring the top part it formed a pretty good urban block. The highest part was situated in the north and also the highest half was on the inner part allowing view towards the water. What was also nice was the elevated square and the courtyard forming a layered green collective space. Therefore I took this ensemble as the starting point of my design.

Quick start assignment

Image: (own , 2021)

(scale 1:1000 A4)

Testing case studies on the design plot



Design

Design questions

Main question

How to design a residential urban courtyard block in the Merwehavens in Rotterdam for families with kids and elderly citizens in such a way that they can benefit from each other?

Sub questions

- What are the different types of dwellings needed for elderly citizens and families with children regarding size, organization, autonomous living, and flexibility?

- How to organize these dwellings in a courtyard block while keeping into account solar orientation & daylight entry, view and stacking of structure and installation shafts.

- What type of circulation systems would be good for accessing dwellings in a courtyard block while at the same time allowing for encounters between neighbors and a good connection to the collective and public spaces?

- What public and collective functions would suit the need of families and elderly citizens in an urban block? What size should they have and where should they be placed in the building?

- What is a good way to integrate green outdoor spaces into a courtyard block?

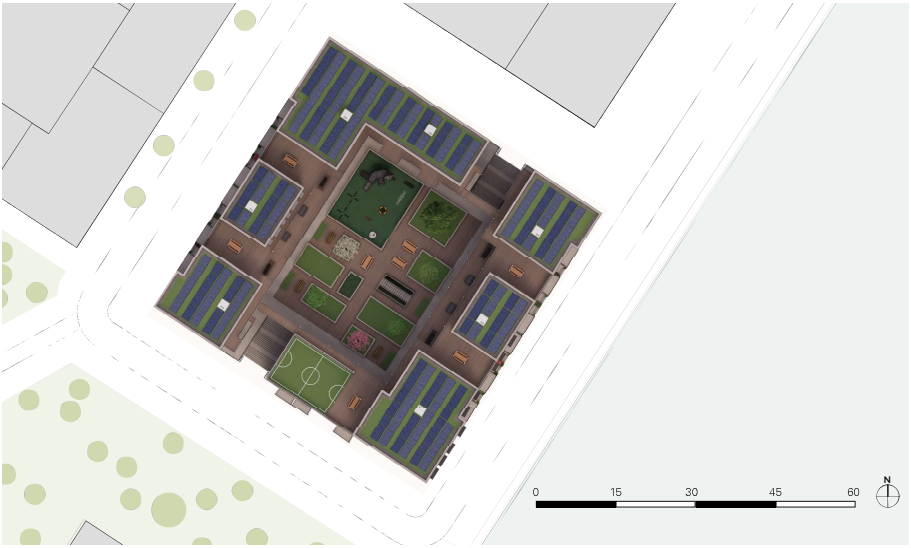
Building design guidelines

- The highest part of the building should be in the northern corner in order not to block sunlight.
- The part of the building towards the middle of the peer should be higher to provide more dwellings with view towards the water.
- The building should have an active plinth to connect to the surrounding, with dwellings, collective and commercial functions.
- The building will have a harder outside that reminds of the harbor while having a softer more human scale on the inside.
- The building should provide private and collective outdoor spaces to all the inhabitants. The green spaces should be located on different layers of the building.
- Similar dwelling types should be clustered together to make them easy to stack and to repeat but the clusters of dwellings throughout the building should be mixed to increase interaction.
- The entrances should be placed on the courtyard side of the building as should the galleries. This will make it more natural to encounter people and interact.
- The kitchen and or the living room should be located along the gallery to ensure social control and to make the courtyard as active as possible.
- All places must be accessible by elevator to ensure that physically impaired people can also get there and are able to participate.
- Family dwellings should have enough storage space inside the dwelling or there should be a storage space somewhere else in the building.
- By making the galleries extra wide or adding balconies parts can be given to residents as outdoor space making them feel more responsible for this spaces and allowing for spontaneous meetings.
- The building should include spaces that house activities attractive to many age groups like, sports, music, gardening.
- The dwelling plan should be flexible in organization, by not having everything set in stone the families can personalize the dwelling to their own need.
- The balconies, galleries and the courtyard should provide safe play space for children so that as they grow older they can relatively safely expand their range and discover more of the building.

Urban design Merwe 4 Havens Rotterdam

Urban design - building in context

Urban design - building in context

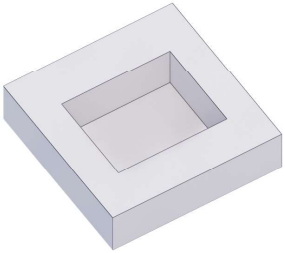


Urban Circulation

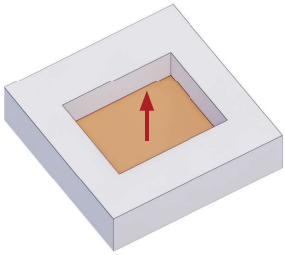
Design strategy

Courtyard block mass model

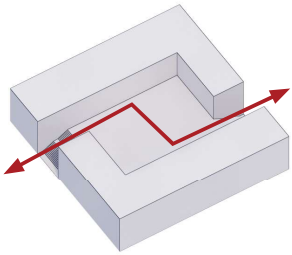
1. Courtyard block



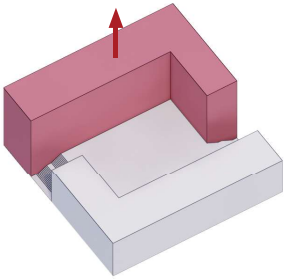
2. Elevated courtyard for parking & storage



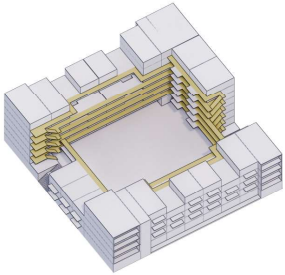
3. Connect courtyard to urban network



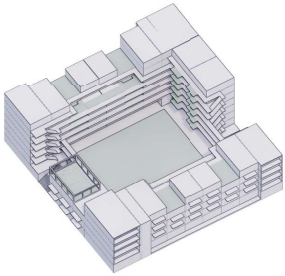
4. Higher north side For daylight & view



5. Gallery circulation on the inside

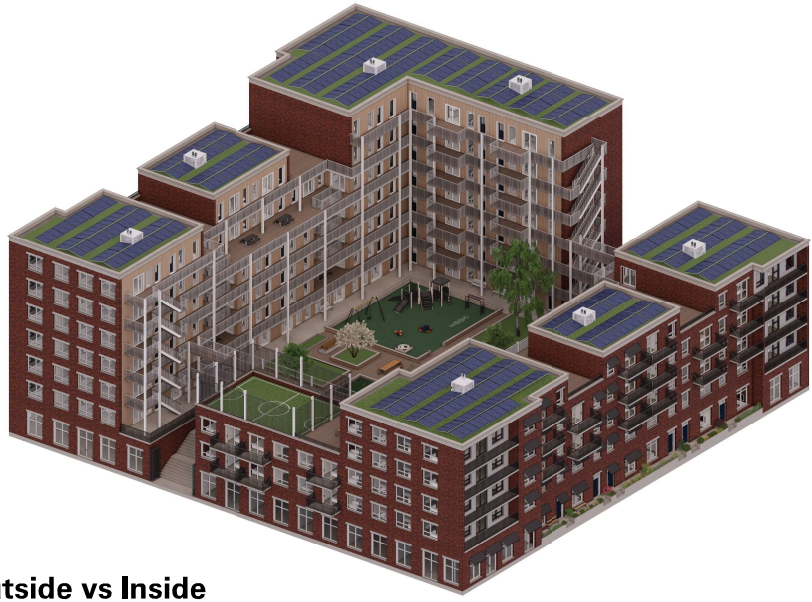


6. Public & collective meeting spaces



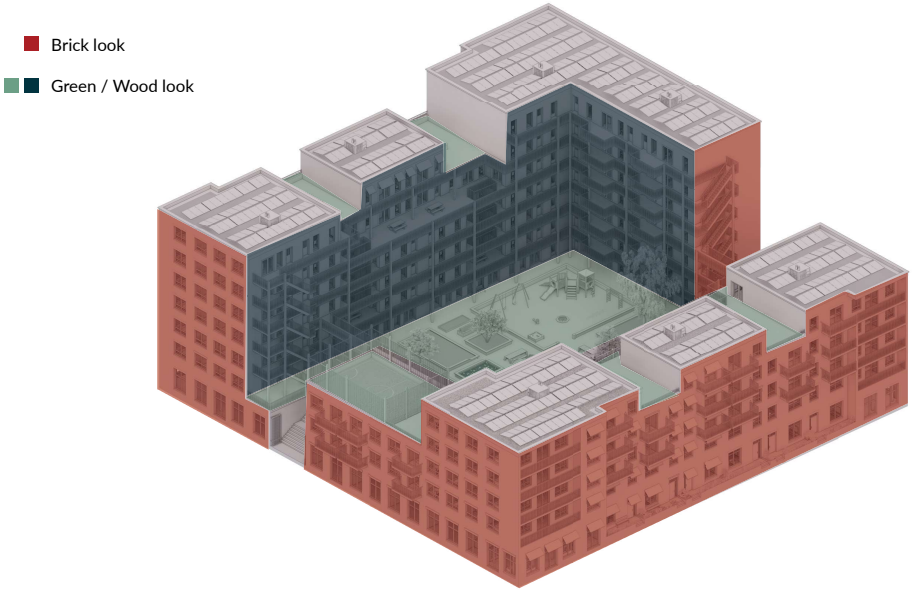
Building Isometric

Bird eye view



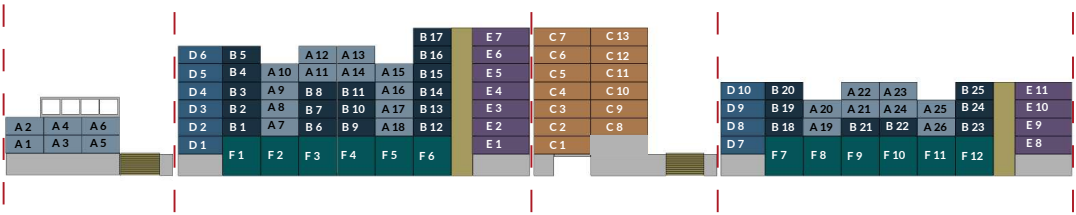
Outside vs Inside

Harbor look vs Green/Wood look

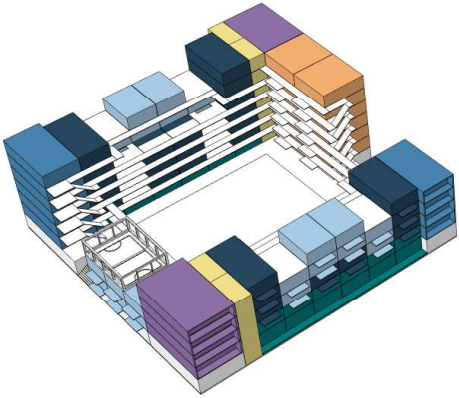


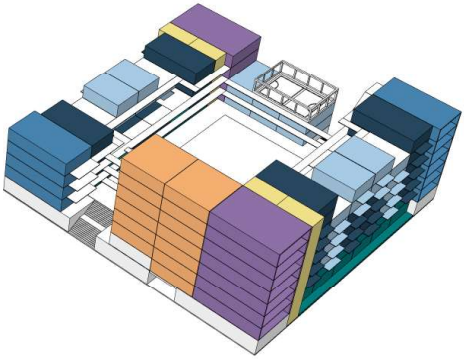
Dwelling typology
Dwelling organization

A	26x	Area:	61m2	**C**	13x	Area:	92m2	**E**	11x	Area:	153m2
		Floor:	6.4m x 9.6			Floor:	9.6m x 9.6m			Floor:	9.6m x 16
B	25x	Area:	82m2	**D**	10x	Area:	108m2	**F**	12x	Area:	125m2
		Floor:	6.4m x 12.9			Floor:	7.5m x 14.4			Upper floor:	6.4m x 12.9
	Stairs									Lower floor:	6.4m x 6.7



North **South**





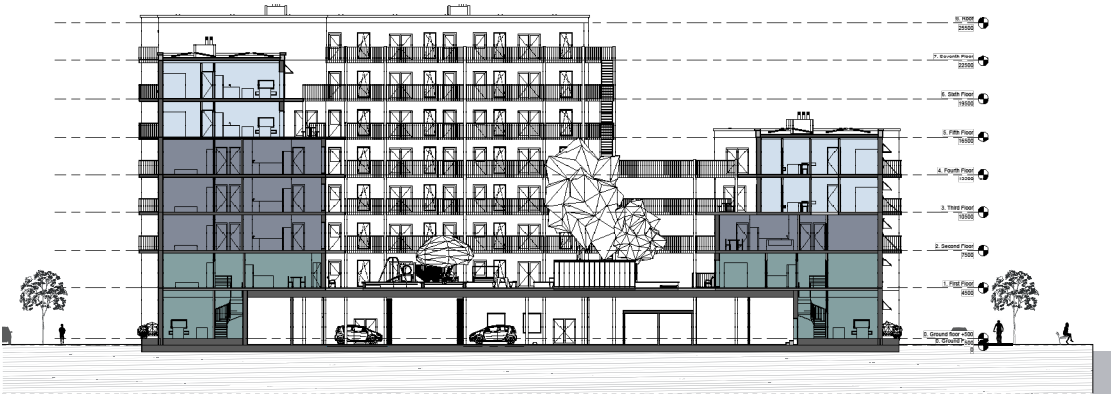
South **North**

Dwelling orientation

Top view second floor- Scale 1:500

Section

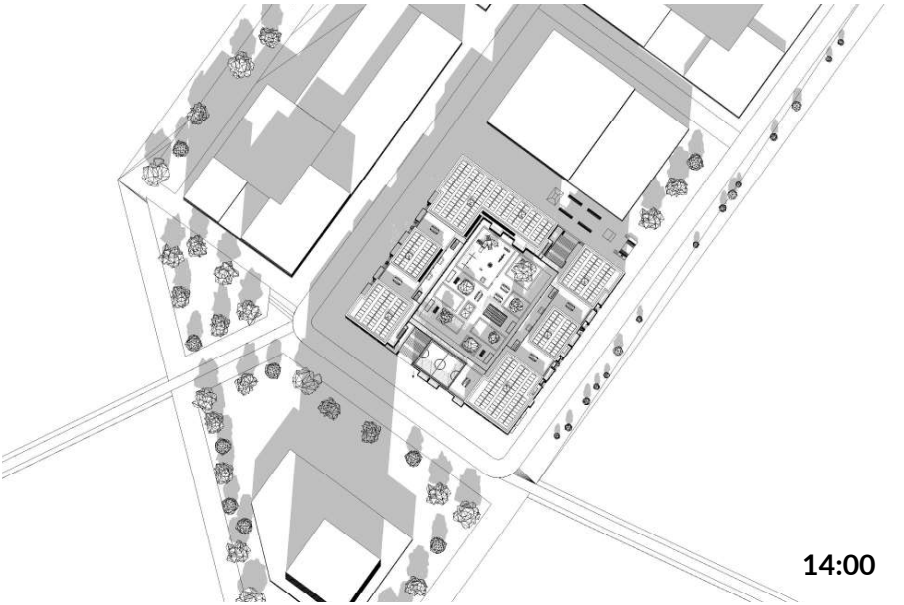
East- West dwelling types



Sun study

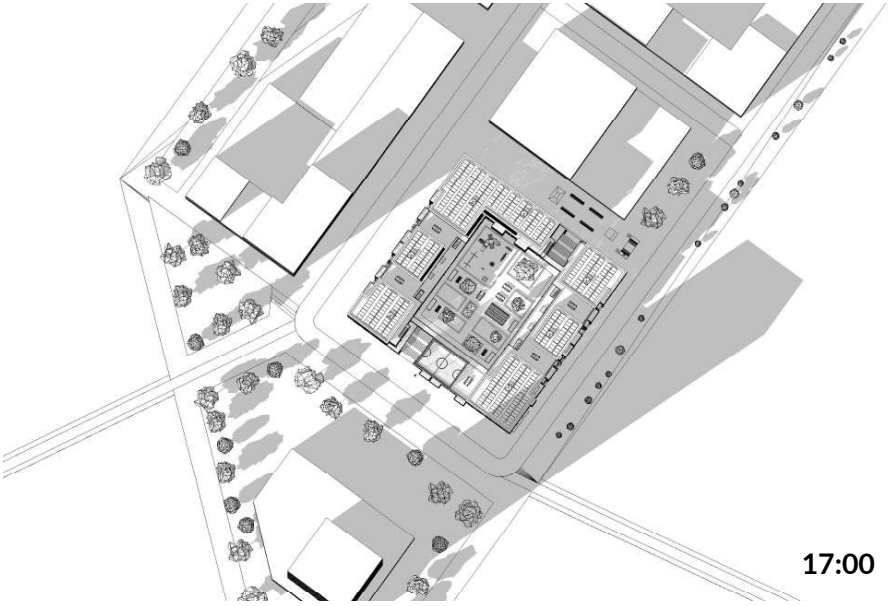
Direct sun March 21st : 9:00 - 11:00 - 14:00 - 17:00

9:00



14:00

11:00



17:00

Public & Collective Spaces

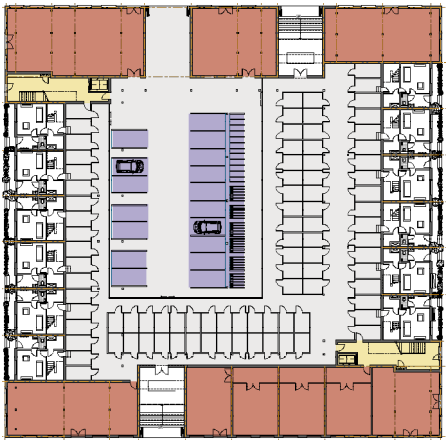
Indoor spaces situated in plinth

- Public Functions
- Public outdoor space
- Collective Functions
- Collective outdoor space
- Entrance / Stairs

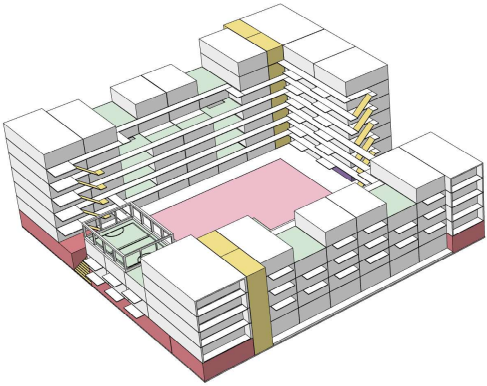
Desirable functions in empty spaces plinth

- **Small supermarket**
- **Cafe / restaurant**
- **Medical center**
- **Child daycare**
- **Pharmacy**
- **Gym**
- **Workshop**

Ground level floorplan

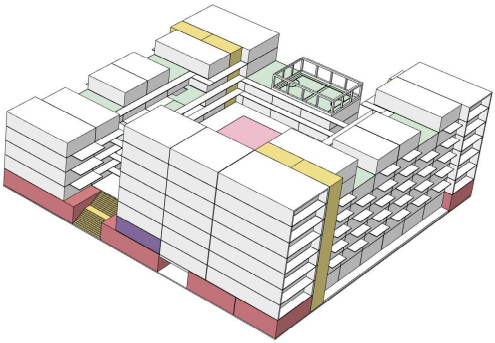


North



South

South

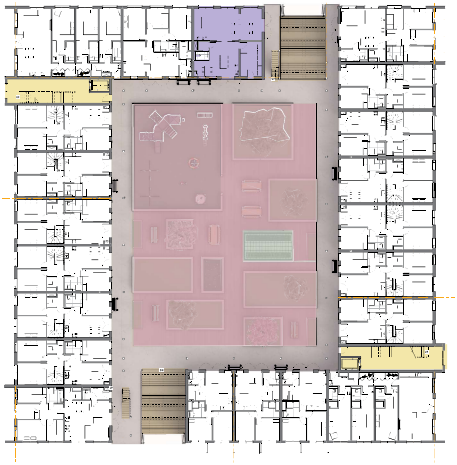


North

Public & Collective Spaces

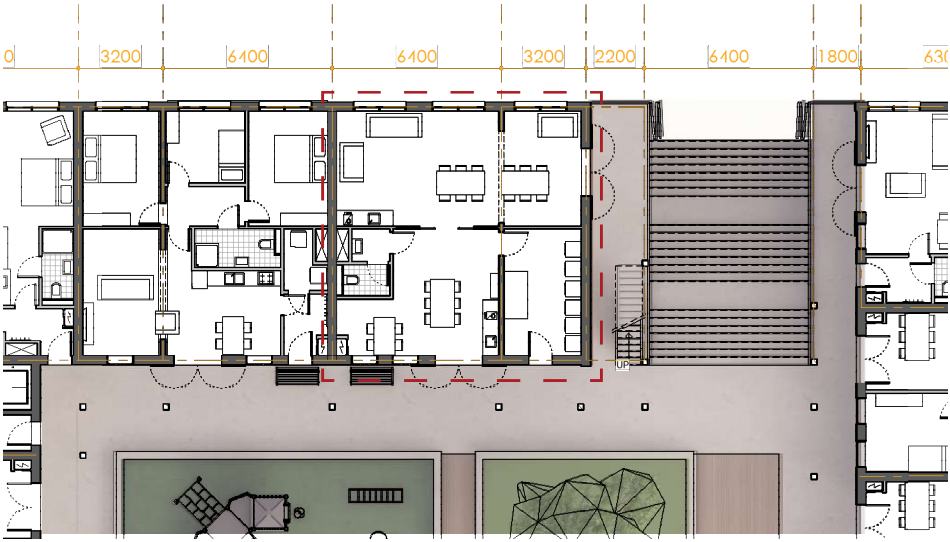
Indoor spaces situated in plinth

First level floorplan



Third level floorplan

Collective room



Circulation & Dwelling access

Ground floor, First floor, Second floor

Dwelling access

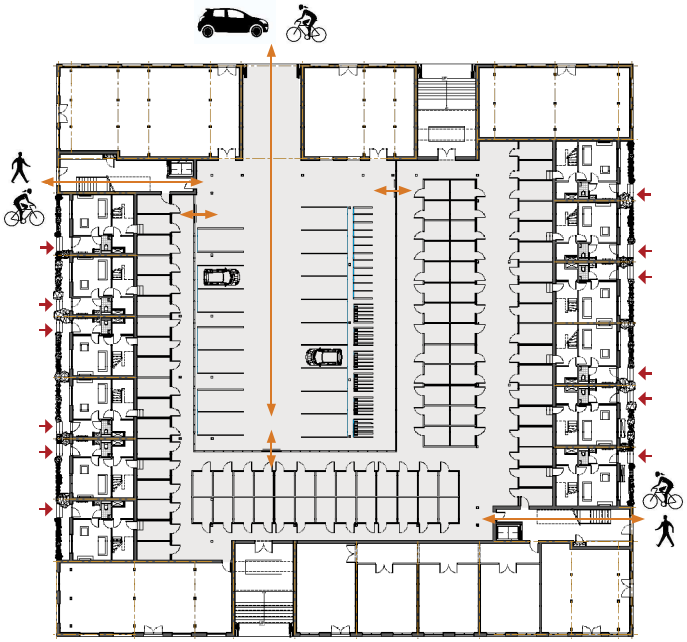
Circulation

Car entrance

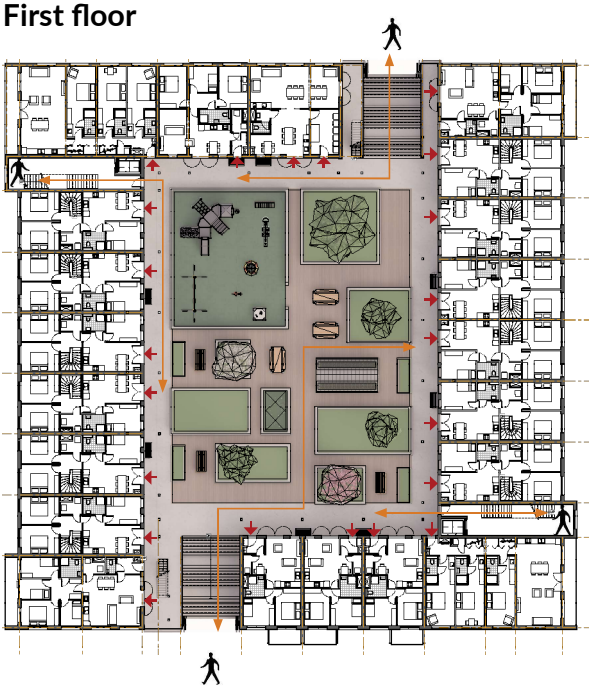
Cyclist entrance

Pedestrian entrance

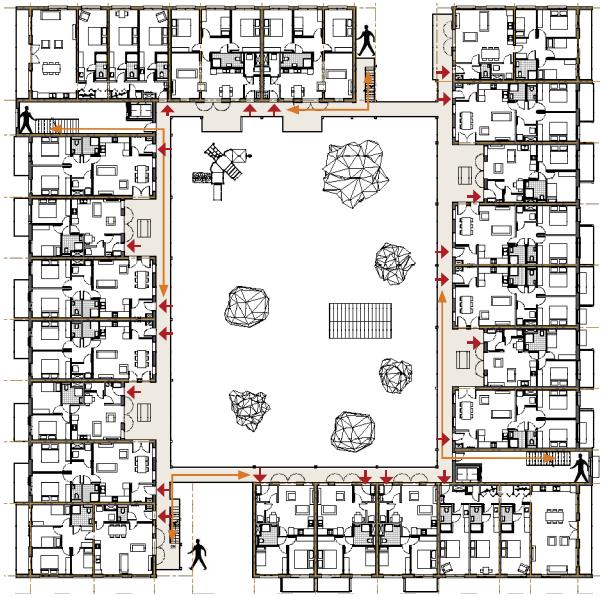
Ground floor



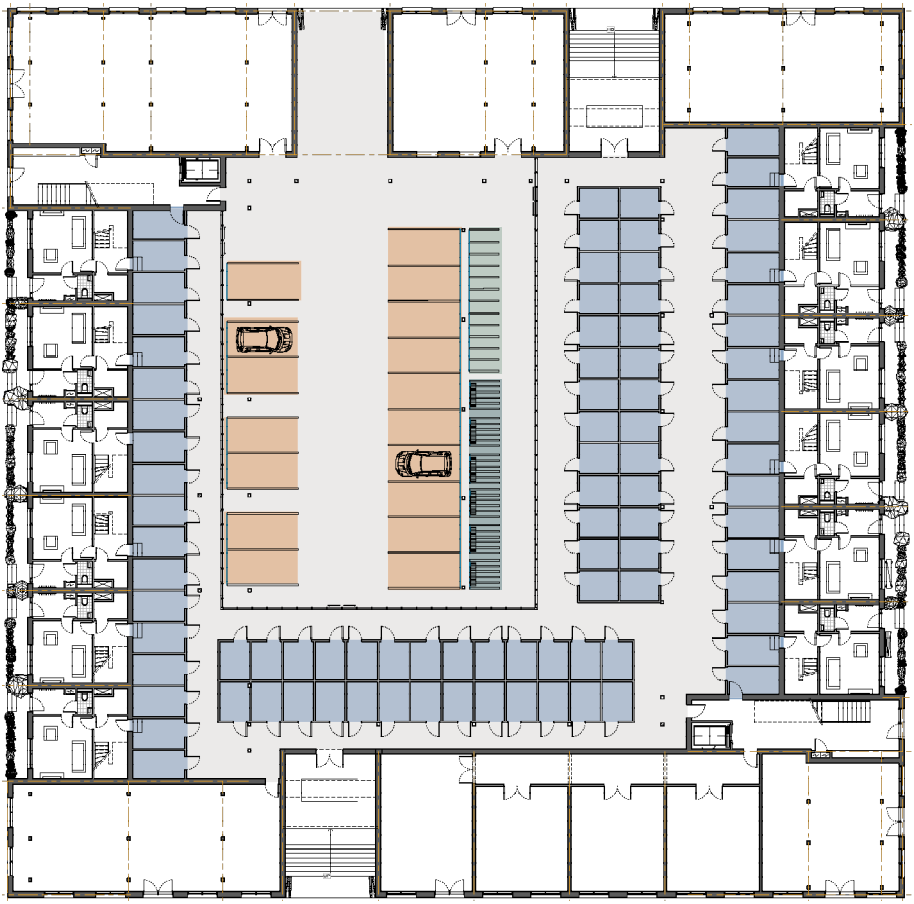
First floor



Second floor



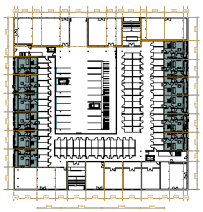
Ground Floor
Parking & Storage



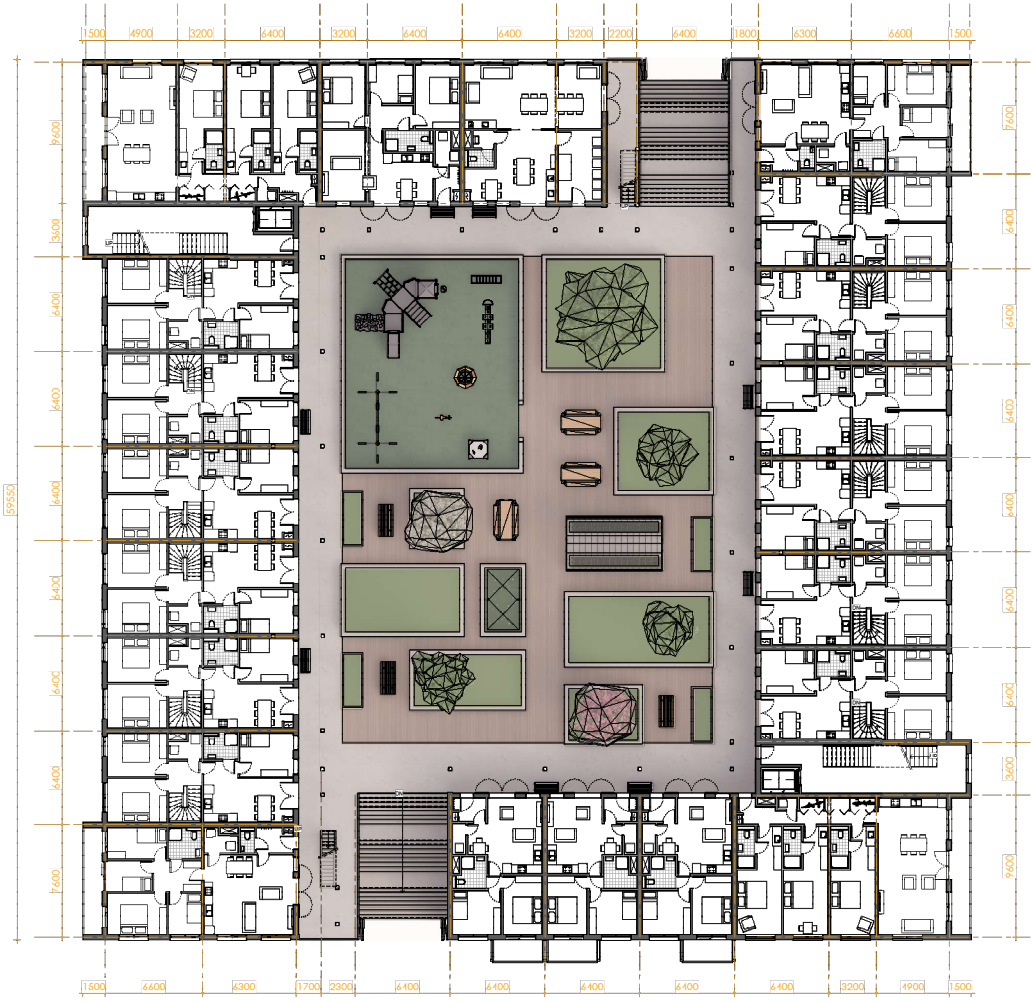
Parking & Storage

- 17x Car parking
- 12x Cargo bike
- 30x Bicycle parking
- 88x Storage spaces

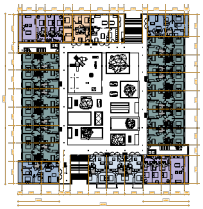
Color guide dwelling typologies



First Floor
Courtyard plan

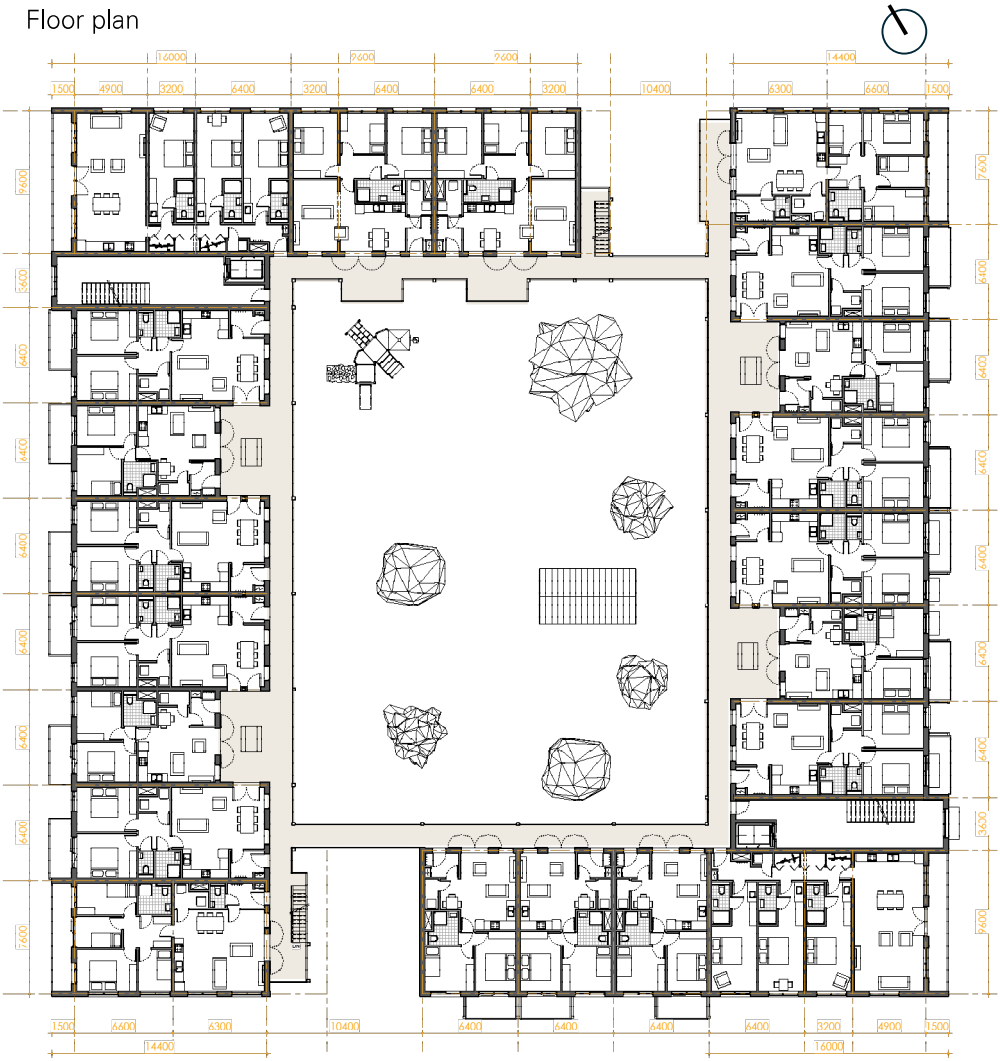


Color guide dwelling typologies



Second Floor

Floor plan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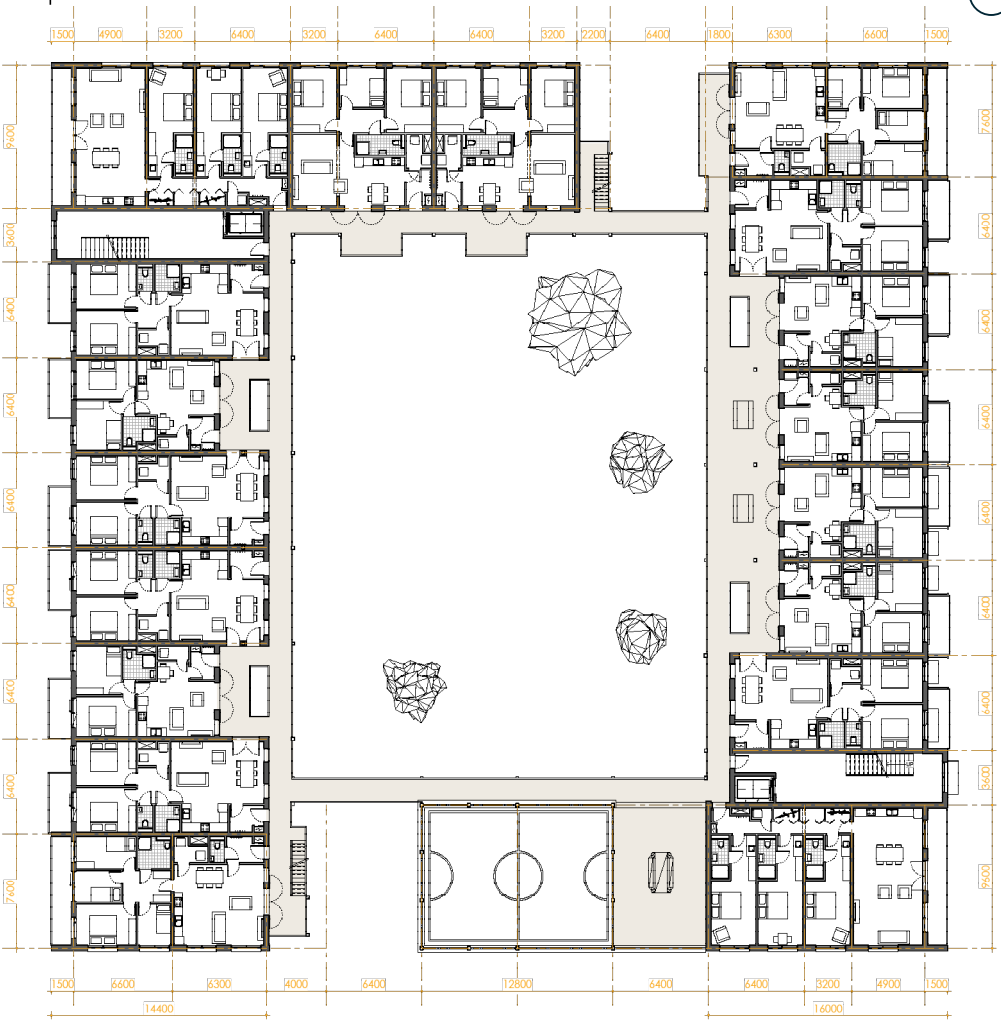
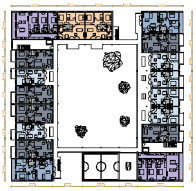
6400

Third Floor

Floor plan



Color guide dwelling typologies

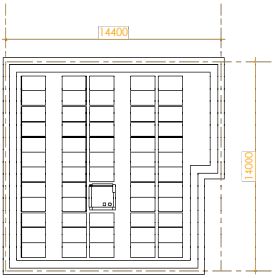


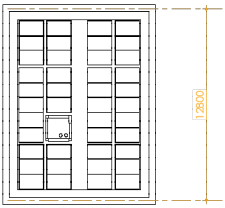
Fourth Floor

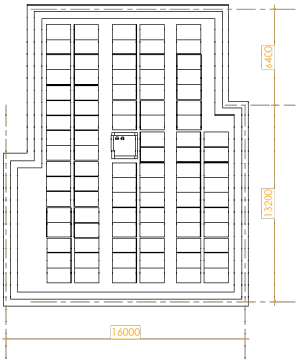
Floor plan

Color guide dwelling typologies

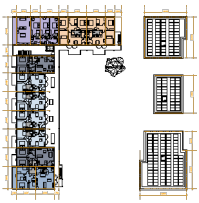
Fifth Floor
Floor plan



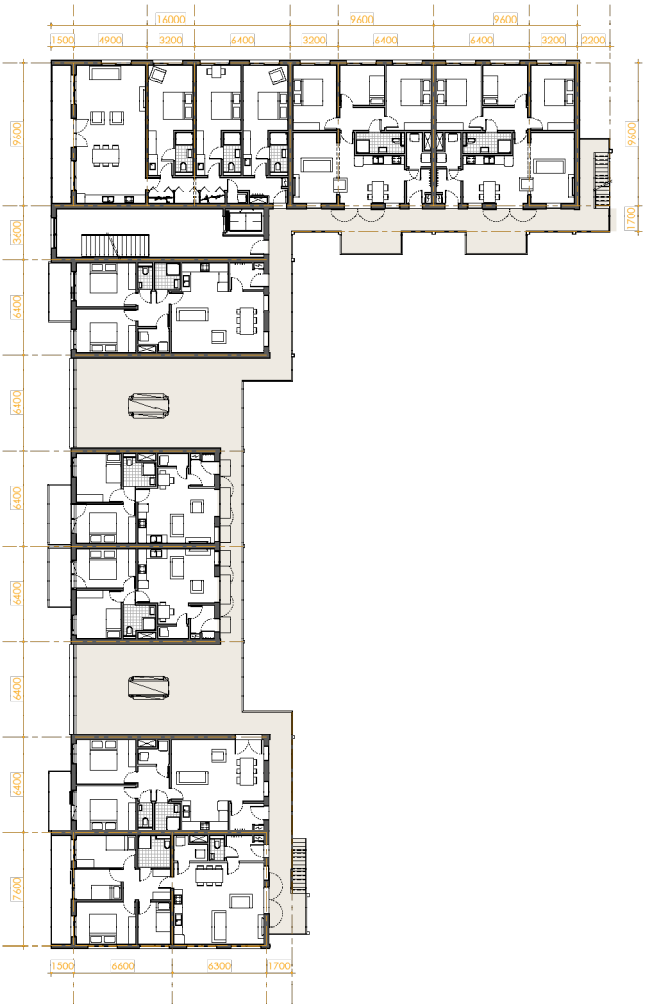




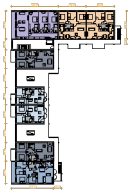
Color guide dwelling typologies



Sixth Floor
Floor plan

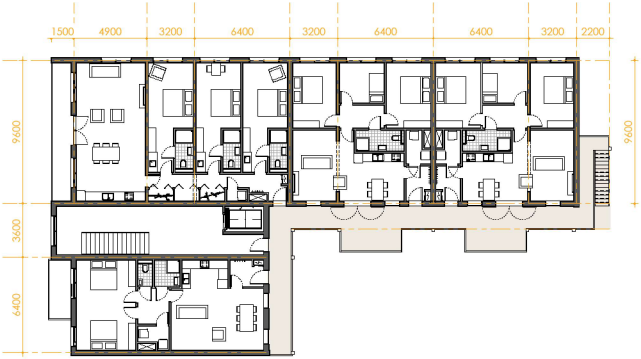


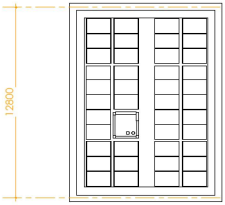
Color guide dwelling typologies

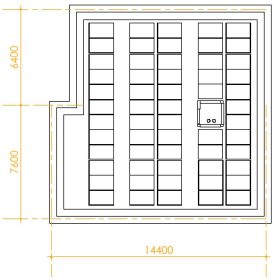


Seventh Floor

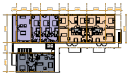
Floor plan





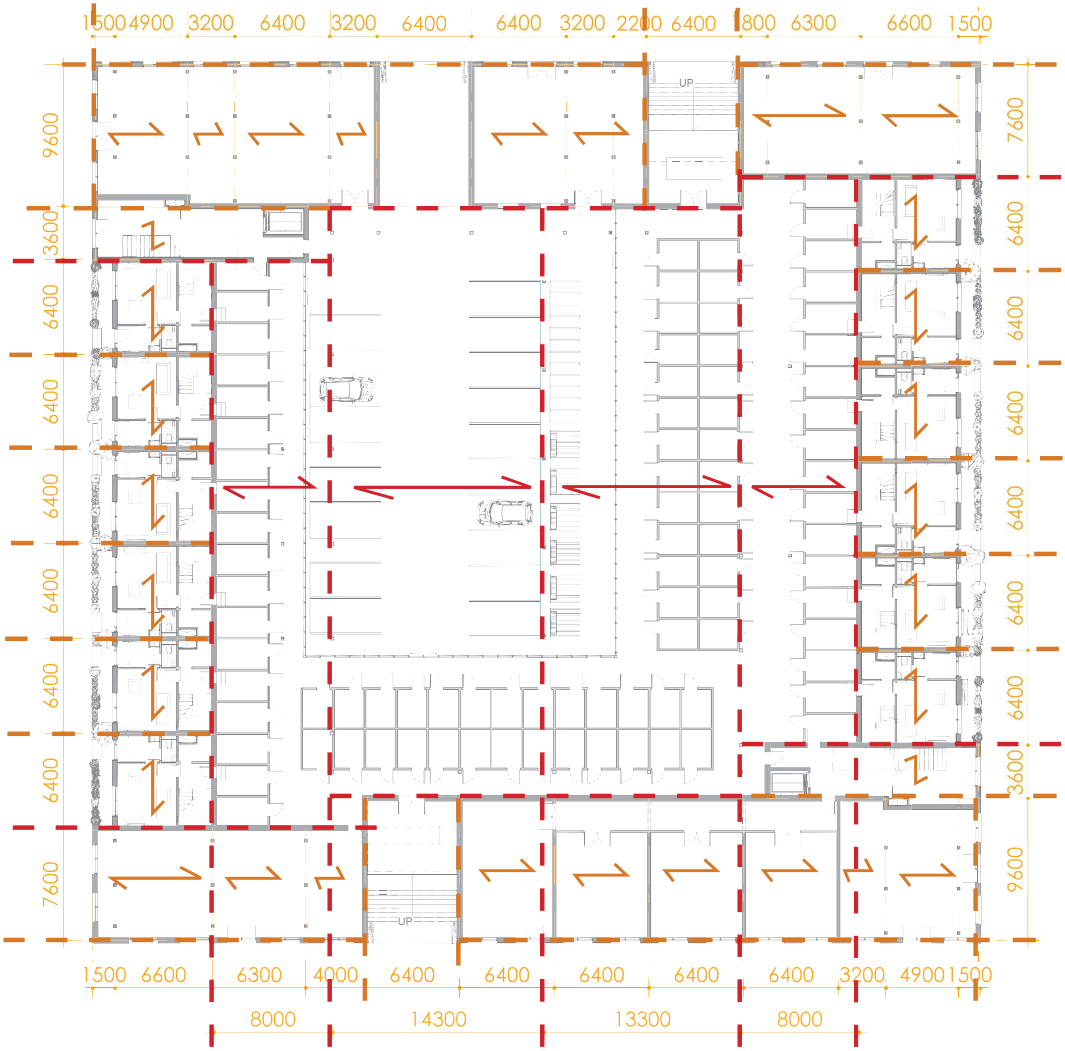


Color guide dwelling typologies



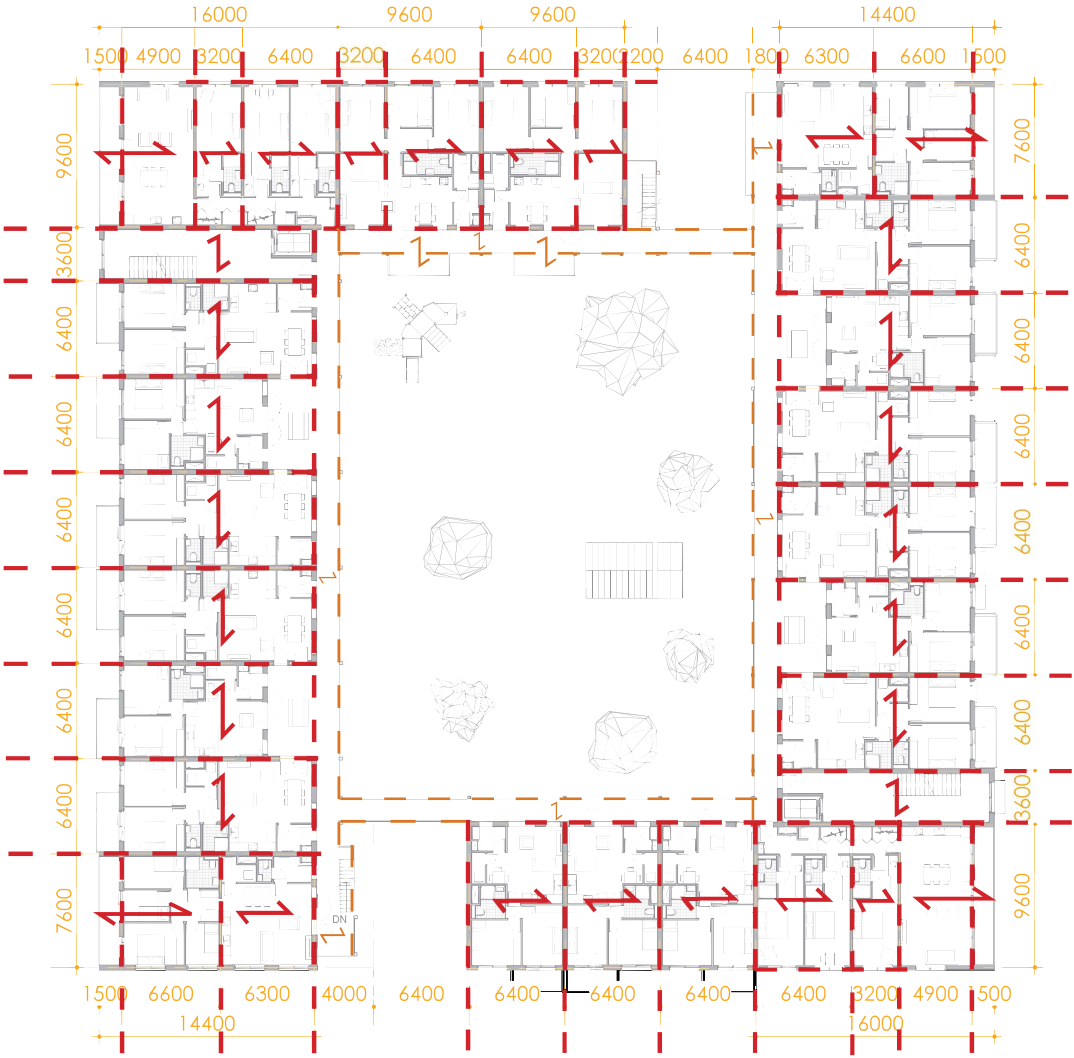
Ground Floor Spans

Concrete Floorspans



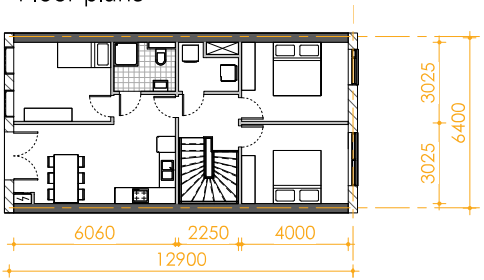
Second Floor Spans

CLT Floorspans

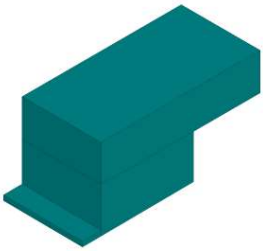


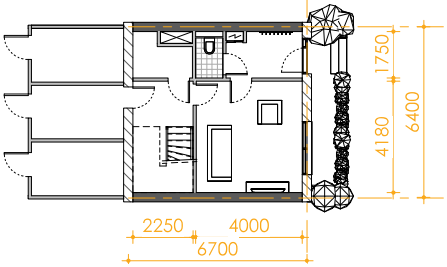
Dwelling typologies

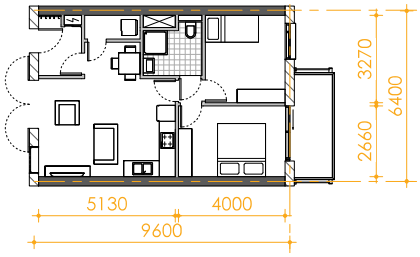
Floor plans



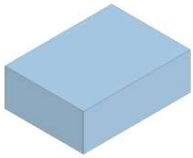
12x Area: 125m2
Upper floor: 6.4m x 12.9
Lower floor: 6.4m x 6.7

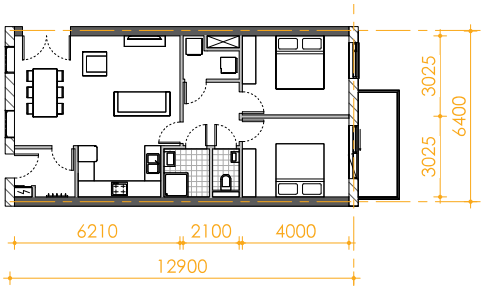




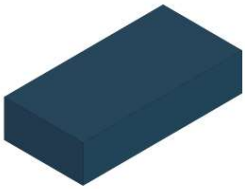


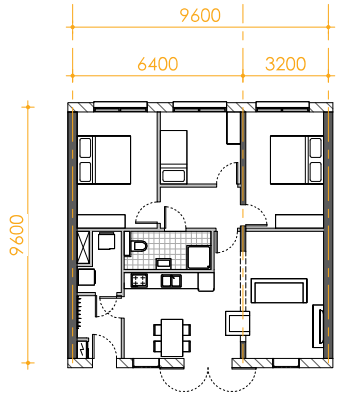
26x Area: 59m2
Floor: 6.4m x 9.2



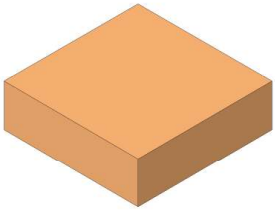


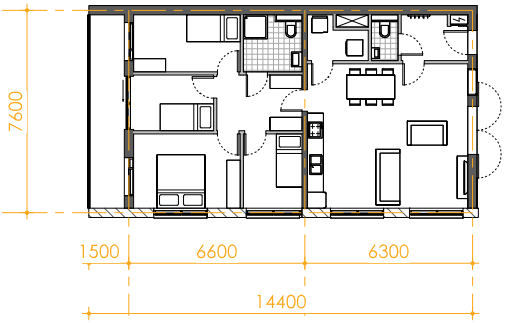
24x Area: 82m2
Floor: 6.4m x 12.9



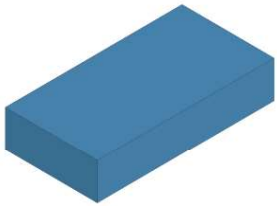


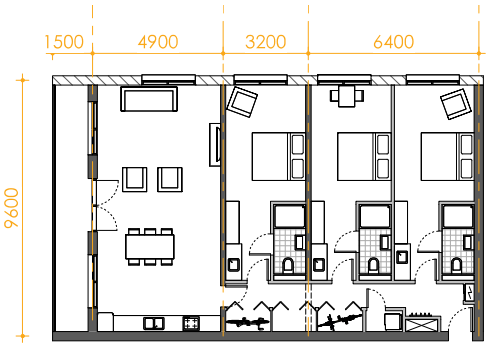
14x Area: 92m2
Floor: 9.6m x 9.6m



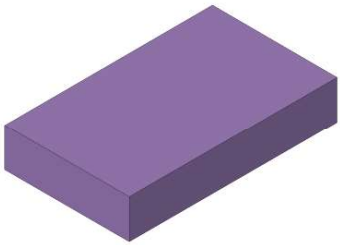


10x Area: 108m2
Floor: 7.5m x 14.4

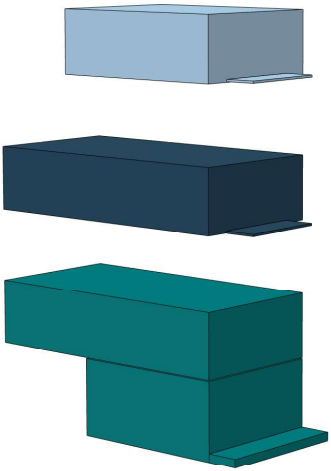


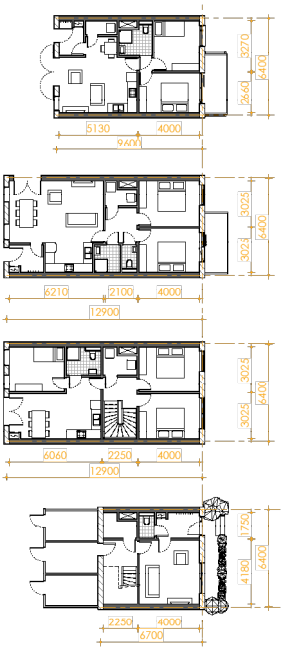


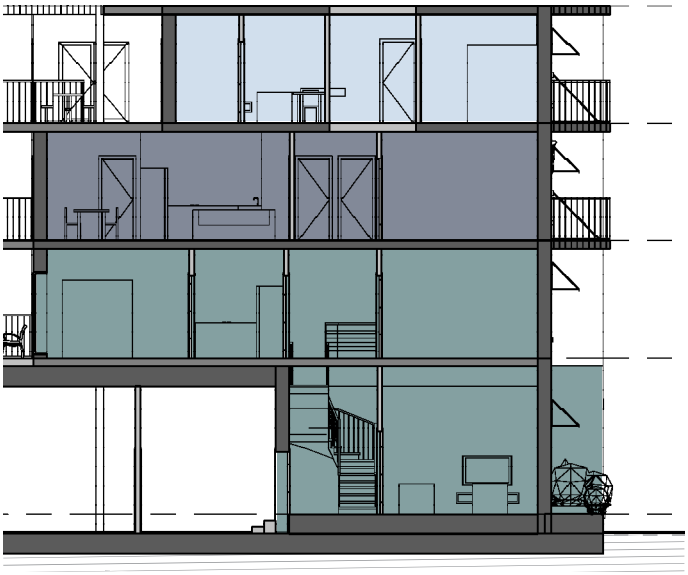
11x Area: 153m2
Floor: 9.6m x 16



Dwelling types stacked

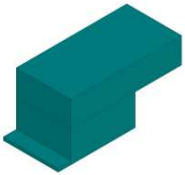






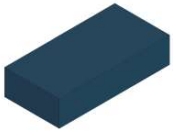
Transitionality Dwellings

Growing up
Family Home

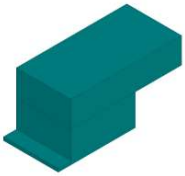


Moving out
Starter Home
Single

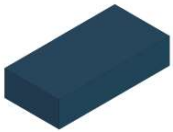
Economic Growth
Family expansion
Couple



Family Life
Multiple Children

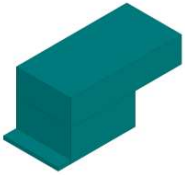


Kids moved out
Parents splitting up
Couple (Elderly)
Single parent



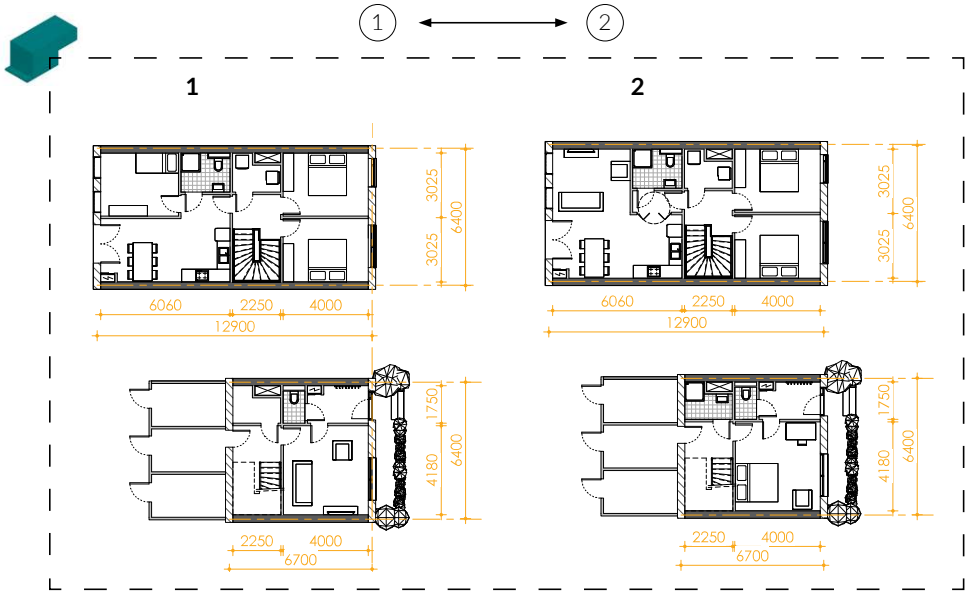
Elderly single / couple
Smaller budget

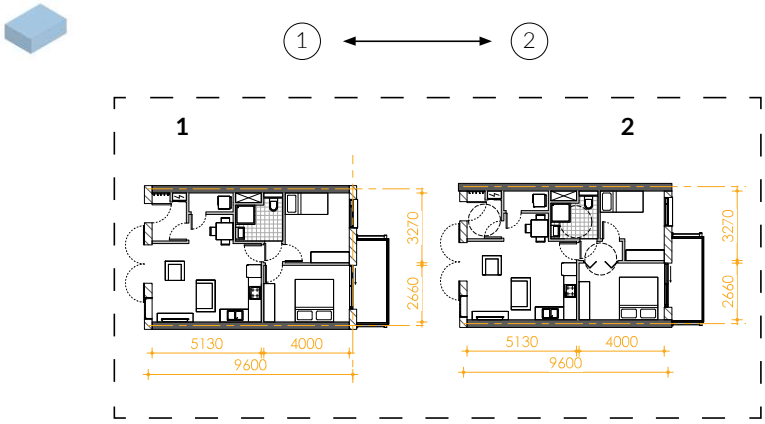
Elderly moves in with
family, child



co-living

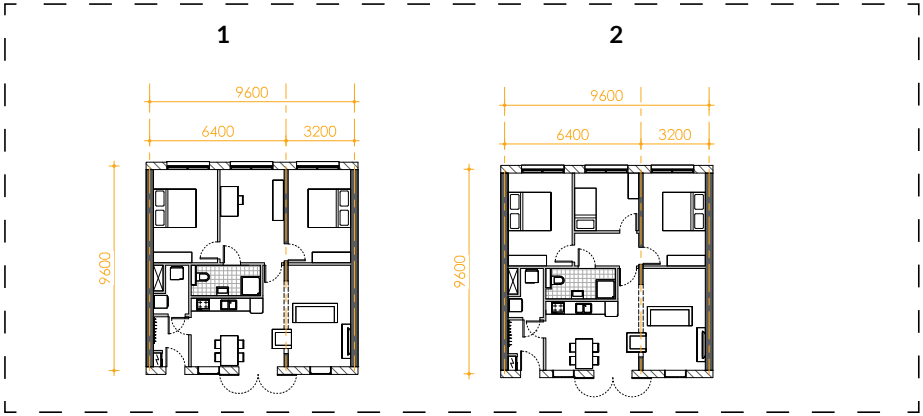
Transitionality Dwelling Floorplans





Transitionality Dwelling Floorplans

1 ⟷ 2



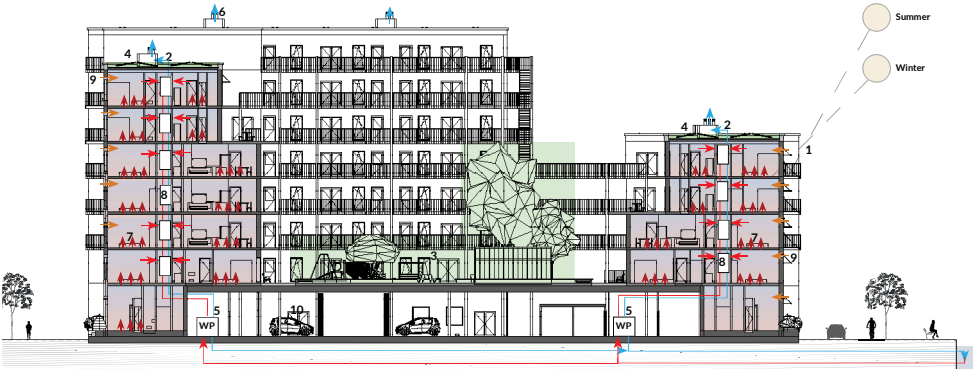
Elevation South-East Facade

Elevation North-West Facade

Elevation North-East Facade

Elevation South-West Facade

Climate schemes



Passive systems

1 • Sun shading for cooling (gallery , screens, trees)

2 • Green roofs with water retention, water drainage through shaft

3 • Green courtyard versus urban heat island effect and for biodiversity.

Materials

- CLT (CO2 retention + Recyclable)
- Durable wasserstrich brick on the outside
- Wooden cladding on inside with acoustic panels for noise reduction

Active systems Building

4 • PVT panels on roof for heat and electricity

5 • Heat pump with heat from harbor water

6 • Mechanical air extraction units with heat recovery for public & collective spaces

Active systems Dwelling

7 • Floor heating (low temperature <45°C)

8 • Heat pump recovers heat from air in dwelling

- Air extraction with heat recovery

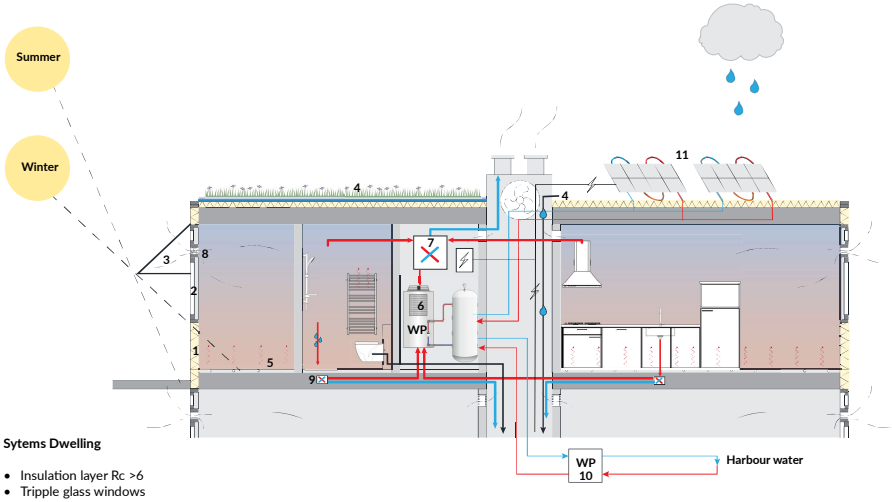
9 • Natural air supply inlets with preheated air in winter CO2 and temperature driven (Climatop AK60+)

- Heat recovery waste water

Transport

10 • Car sharing (electric)

- Bicycle sharing



Sytems Dwelling

1 • Insulation layer Rc >6

2 • Tripple glass windows

3 • Sun shading for cooling (gallery , screens, trees)

4 • Green roofs with water retention, water drainage through shaft

5 • Floor heating (low temperature <45°C)

6 • Heat pump recovers heat from air in dwelling

7 • Air extraction with heat recovery

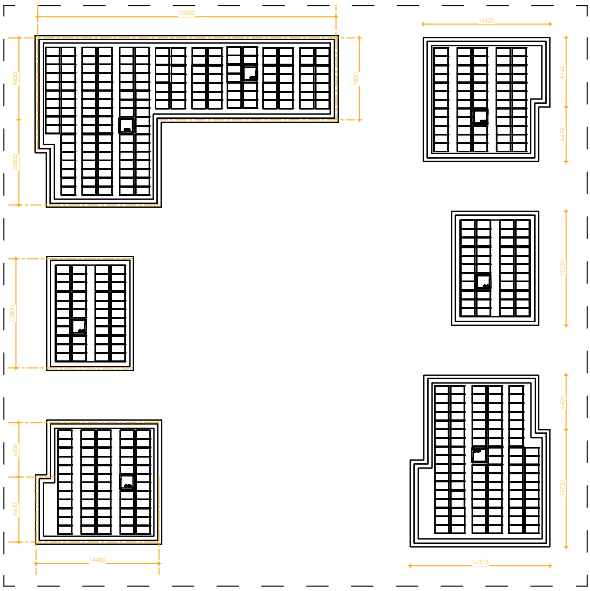
8 • Natural air supply inlets with preheated air in winter CO2 and temperature driven (Climatop AK60+)

9 • Heat recovery waste water

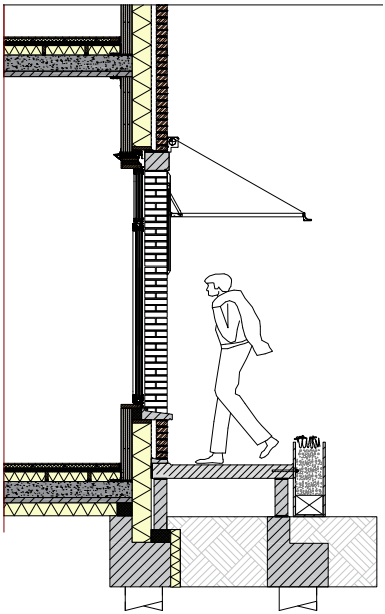
10 • Heat pump based on temperature difference harbour water

11 • PVT panels on roof for heat and electricity

Roof plan

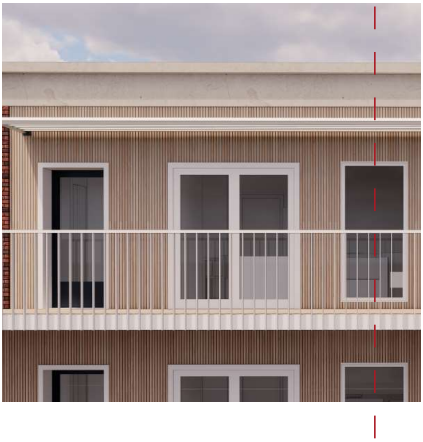


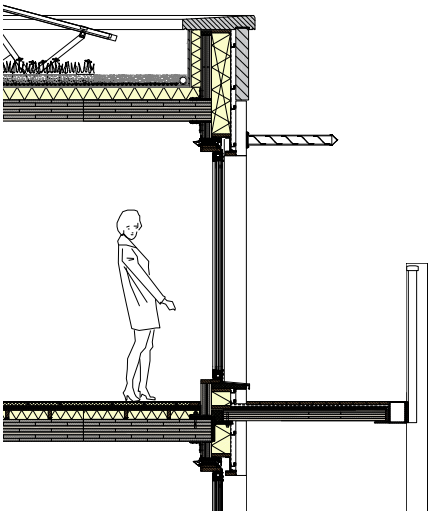
Vertical section outer facade



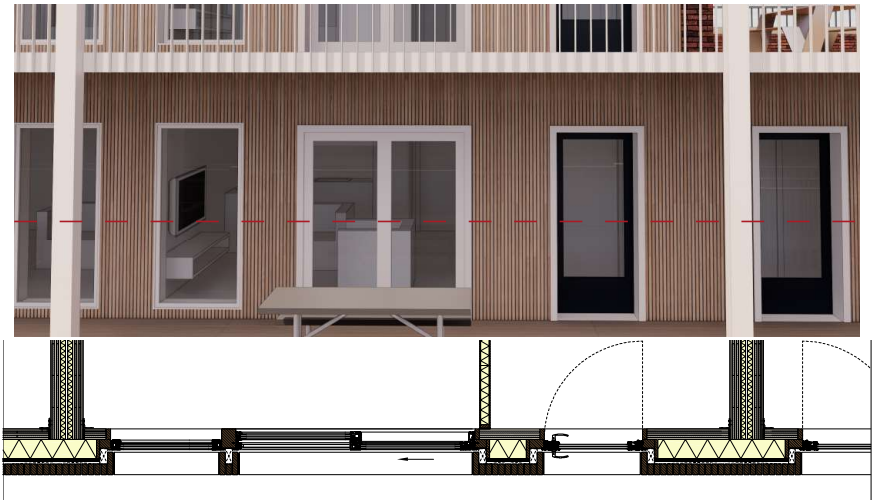
Horizontal section outer facade

Vertical section inner facade

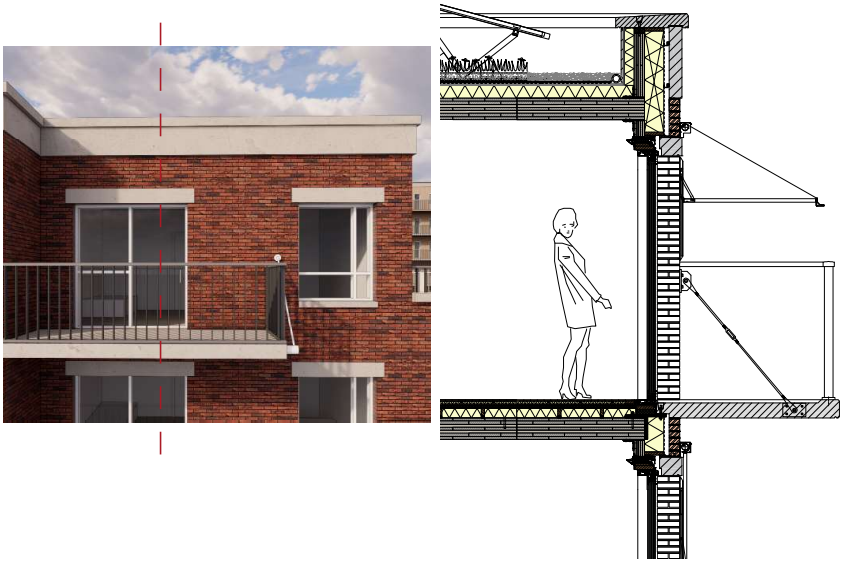




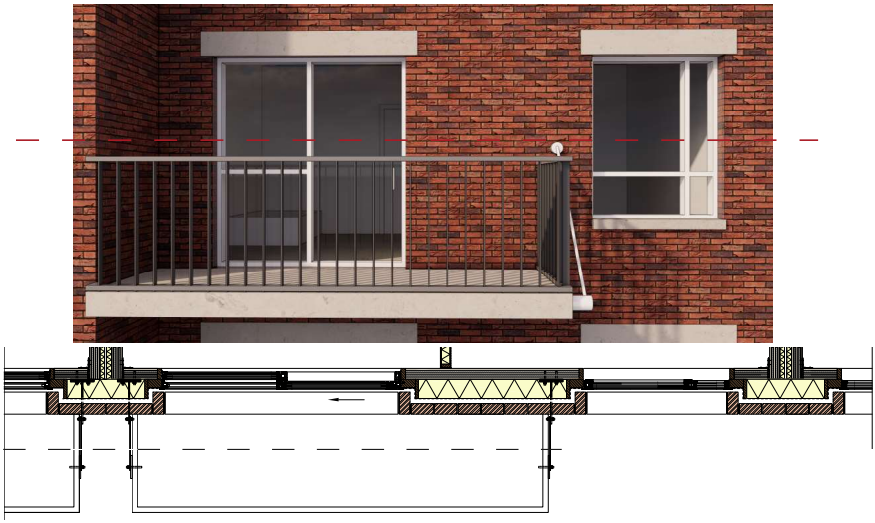
Horizontal section inner facade



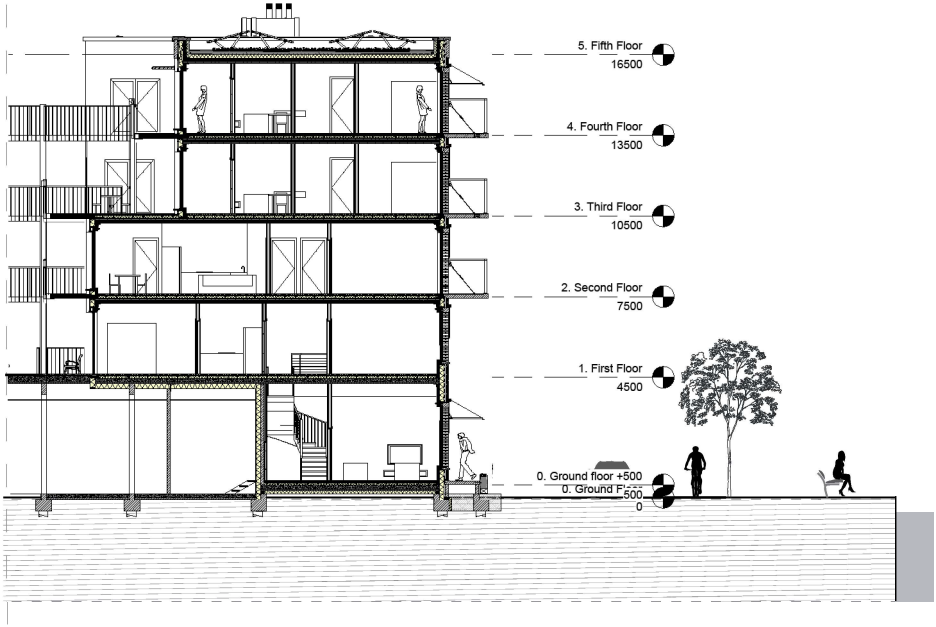
Vertical section outer facade



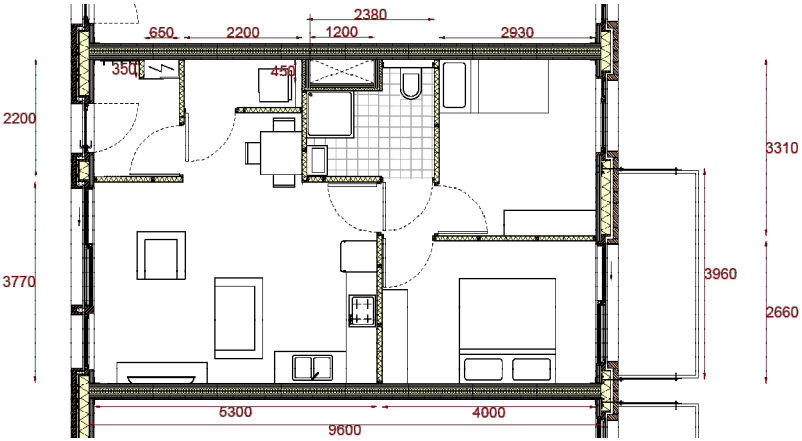
Horizontal section outer facade



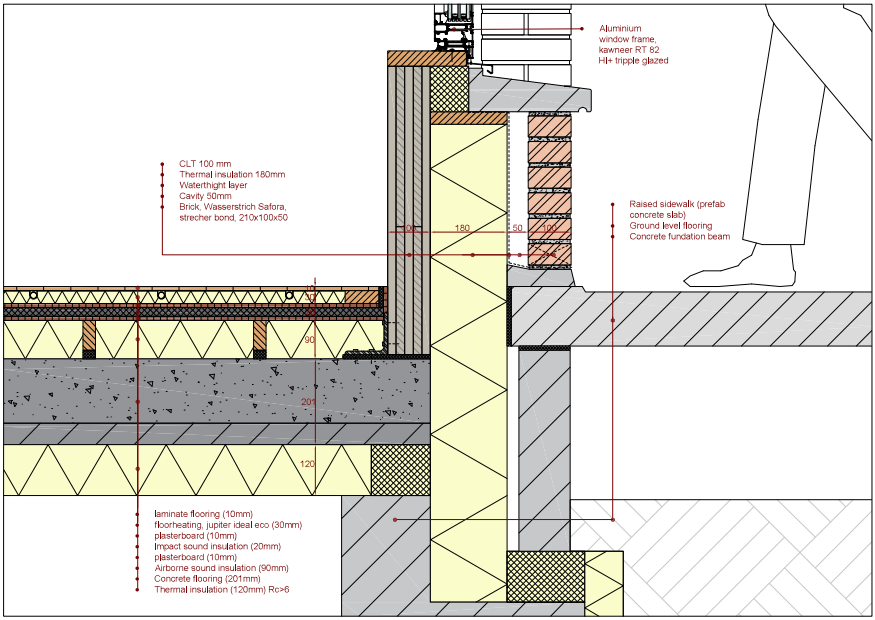
Building section South-East Facade



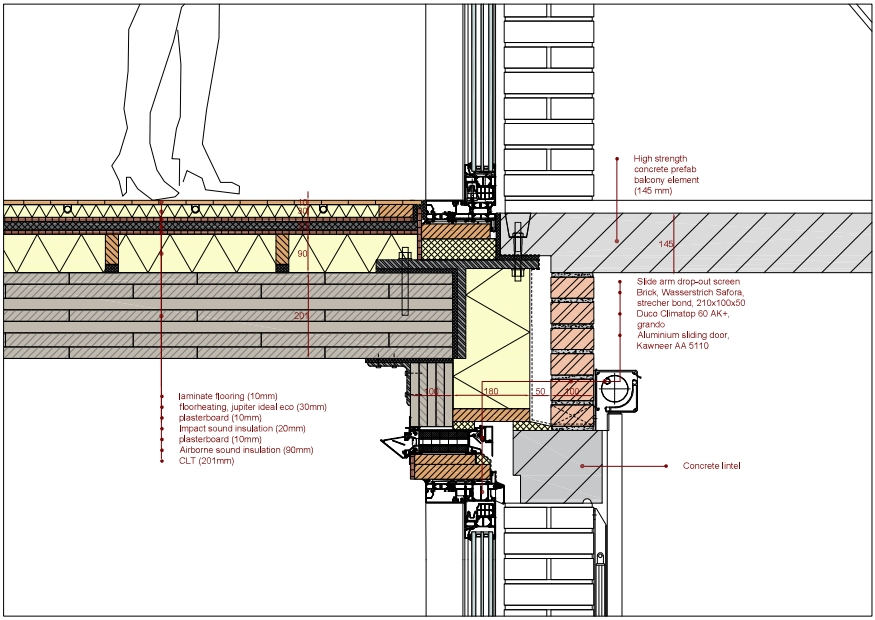
Detailed floor plan



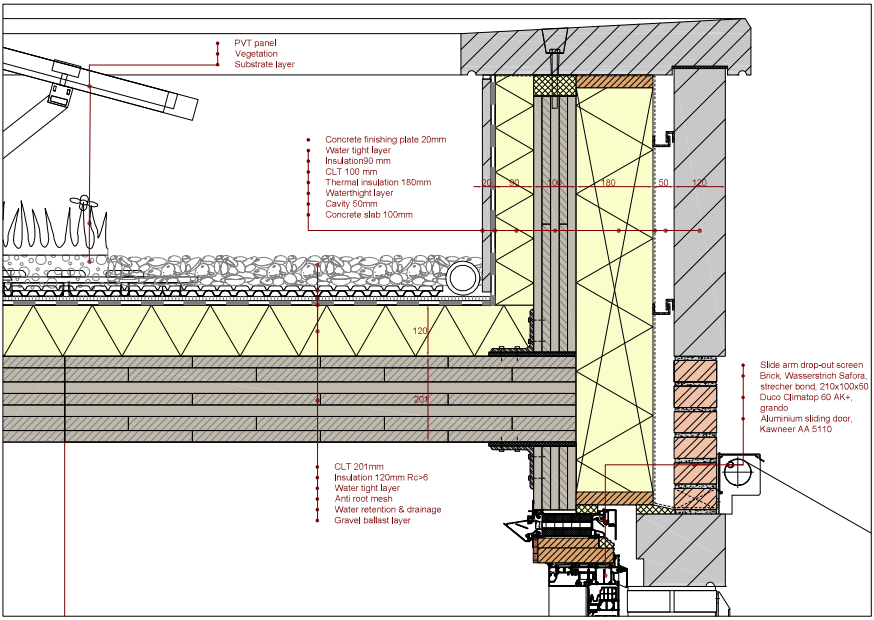
Vertical detail - Foundation



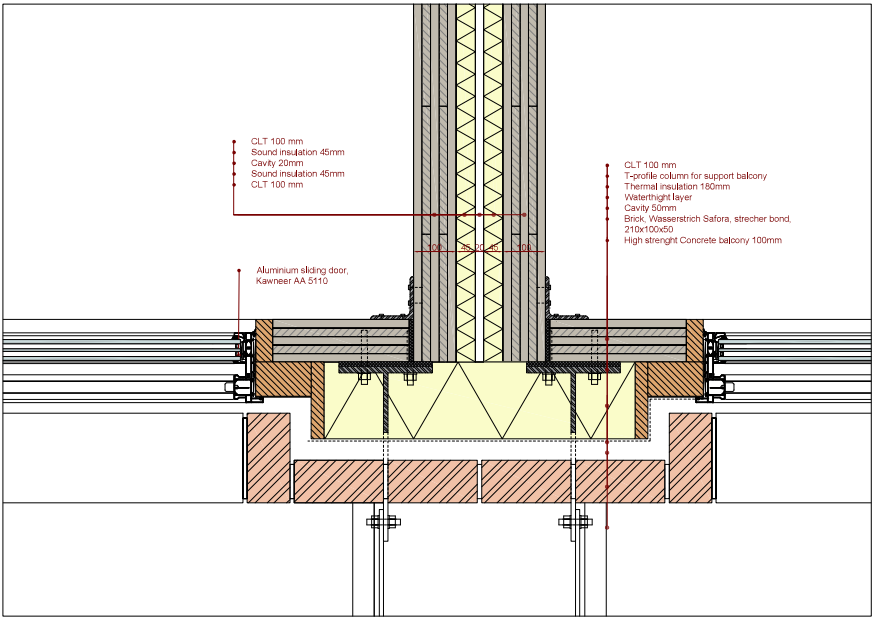
Vertical detail - Balcony



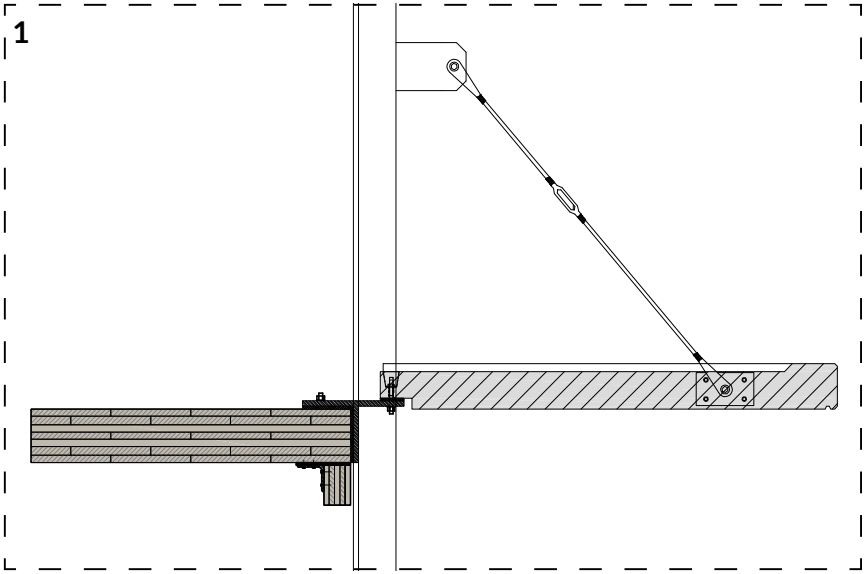
Vertical detail - Roof

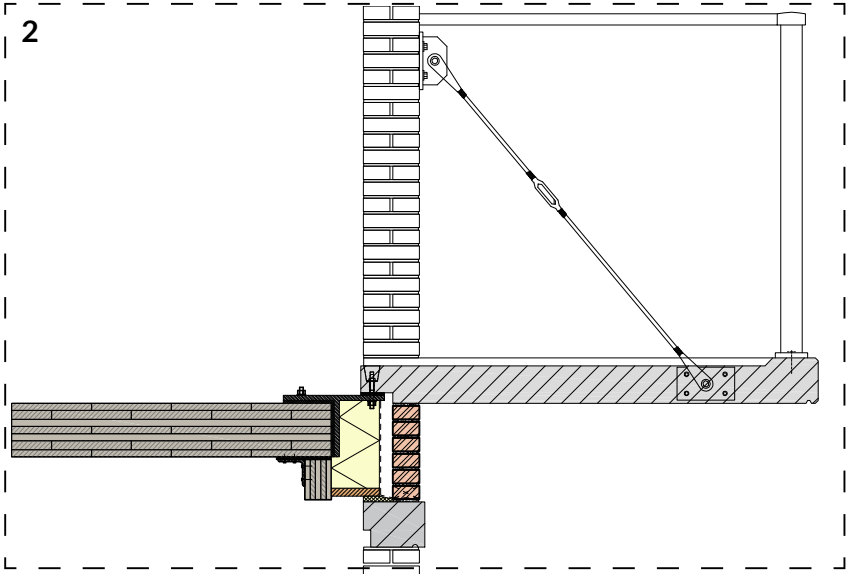


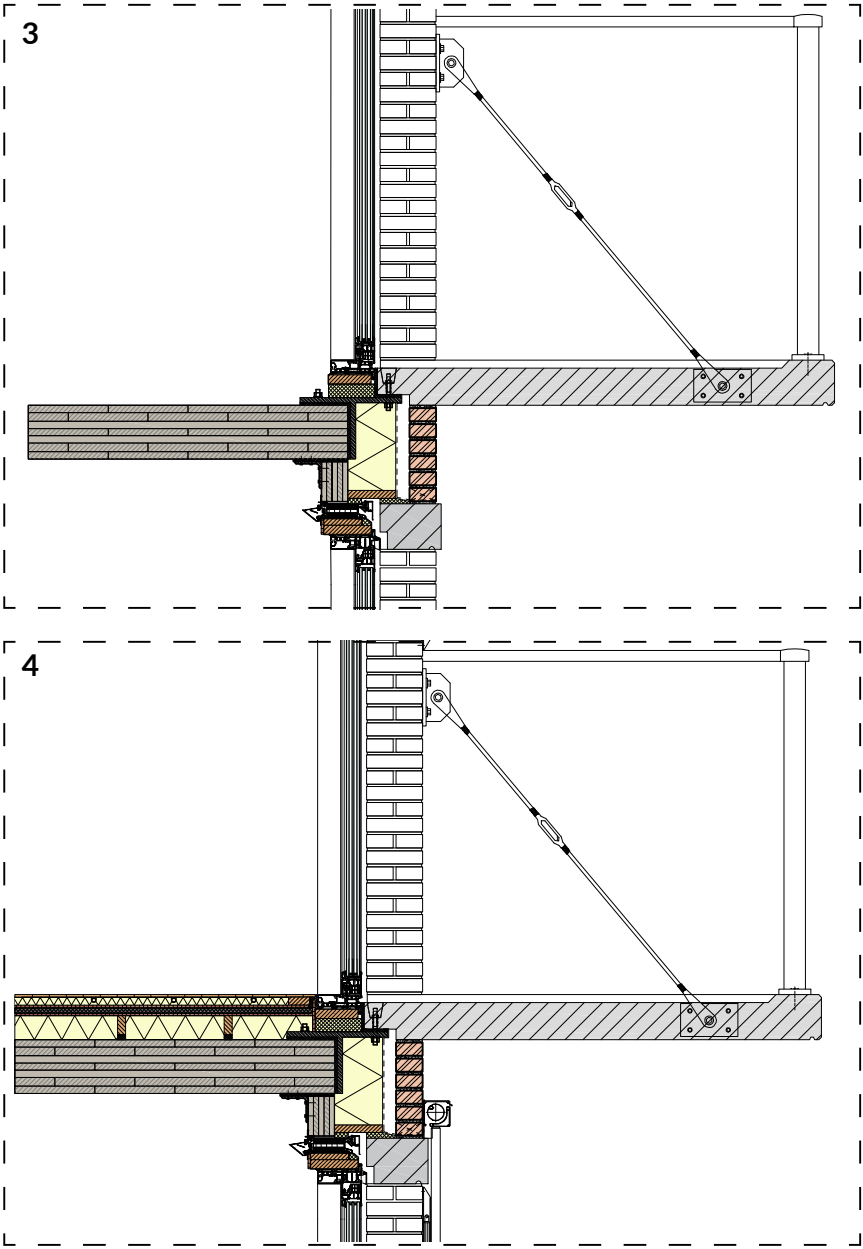
Horizontal detail - Separation wall & balcony connection



Facade detail built-up



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4

Street level perspective - South East view

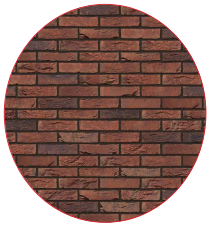
Street level perspective - North East view

Street level perspective - North West view

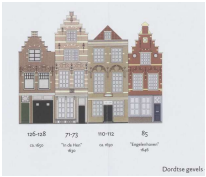
Bird eye view courtyard

Facade Materialization

raised sidewalk along street with flowers & bench



Wasserstrich Safora
Stretcher bond



Doors in night blue color

Entrance Hall

Sun shading solution outer facade

Sun shading solution inner facade

Spaces for play - playground

Spaces for play - soccer field

Courtyard views

Courtyard greenhouse

Reflection

Preface

This part of the booklet is a reflection report made for the Advanced Housing Design Graduation Studio running from February 2021 - January 2022. It is a part of the graduation trajectory of the MSc in Architecture at the TU Delft.

The goal of this reflection report is to look back at the graduation trajectory and to reflect on the relationship between research and design.

Interesting to know is that the graduation took place during the covid-19 pandemic in 2021. This means that the first half of the graduation took place from home and mostly through zoom meetings. On the one hand it was very promising to see how quickly we adjusted to these circumstances and how we managed to keep the project going from home. On the other hand things like group work and communication were a bigger challenge as we were not use to working this way. It is nice to see that despite everything the process could still continue and that is possible to do a graduation under these circumstances.

Reflection Aspect 1

Introduction

This part of the reflection is aimed at answering the question "**What is the relationship between research and design?" .** In order to answer this question I will go trough the different phases and research conducted during the project and reflect on the benefits and shortcomings of each step. If they worked or not and why they worked or not and also explain how I translated the feedback given by my mentors into my work and how I learned from my work.

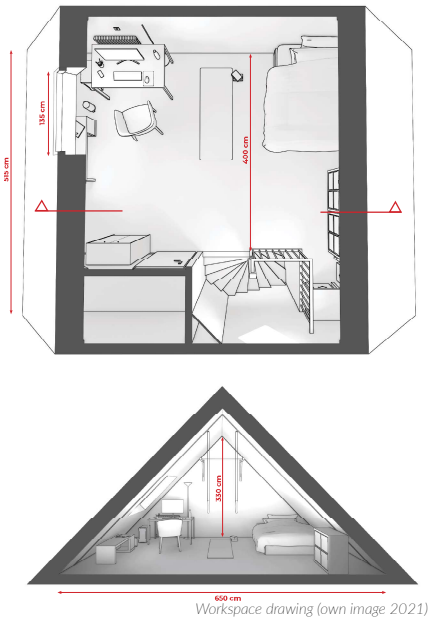
Start up assignment: Auto-ethnographic research

The first type of research that was conducted is auto-ethnographic research. Due to the covid-19 pandemic everyone was studying from home and meetings were held through zoom. As we could not meet the other students or teachers t assignment consisted of drawing a representative image of our workspace to get a better idea of the conditions in which everyone was studying apart from the small glimpse shown through the web-cam.

This assignment had some good and some bad parts as for many students their workspace is also their living space and sometime their bedroom so in essence you are inviting 10 strangers to the privacy of your own home. On the other hand it helped to understand the situation of each of the persons in the group and get to know each-other a little better. In this way created more understanding for each-other.

Another benefit from this exercise is that it was a good first step to start thinking about dwelling. As everybody lives somewhere, grew up somewhere, maybe lived in different places a lot of the ideas of what a good dwelling is comes from personal experience. By critically looking at your own living space you can get ideas about what a good or bad dwelling is but also realize that we are all biased based on our past. By mixing our own preferences and ideas on living with the preferences of other people and experiences from research we might be able to come to better dwellings. So in that way this exercise was a good start.

Advanced Housing Graduation Studio: **Workspace**



Workspace drawing (own image 2021)

Phase 1 up to P1

Phase 1 spanned the first 10 weeks of the project and consisted mainly on group work. The goal was to find out information about the one million houses question, the current demographics of Rotterdam and Research into the design location. The phase of the research ended with the presentation of our group urban plan and a research plan specifying what type of further research we would do for our projects.

The research in the first few weeks was divided over the group and consisted of 3 parts. Research into the housing shortage, research into the demographics and current households in Rotterdam and research on the site. As we were with 10 students we got split up into two groups of five and each of the groups had to come up with a presentation on each of these subjects.

A big advantage of splitting up the group is that it was a lot more easy to work together. Also by working in groups it was possible to do a lot more research and to look into many different sources. A disadvantage was because both of the groups looked into the same topics that there was a lot of overlap and we had to sit through similar presentations twice. There were however a few different findings so maybe it was still worth it.

Another thing that was that within the groups the work was also divided. Because of this we could get more findings in a shorter time. The disadvantage was that because other student s looked at some of the topics I still had to go through their sources at a later stage and read up to be able to include it in my own research so it was less efficient than it seemed.

News/ Media research

The goal of this research was to look into the one million houses question. By looking at different news and media sources we tried to establish the urgency of the challenge. It was also handy to find out what other issues play in society especially when it comes to housing in The Netherlands. So this part was useful as background to be able to later frame our design proposal and have a relevant project.

News article

bpd
bouwfonds gebiedsontwikkeling

Publicatiedatum: 18 september 2017
Thema: Integrale aanpak

Home > Actueel > Onderzoeken > 1 miljoen woningen nodig tot 2030...

1 miljoen woningen nodig tot 2030

Volgens prognoses van ABF Research worden er in Nederland tot 2030 een miljoen woningen gevraagd. Hoeveel van deze nieuwbouwwoningen kunnen we redelijkerwijs in bestaand gebied bouwen? Hoeveel transformatieruimte is er in de bestaande stad?

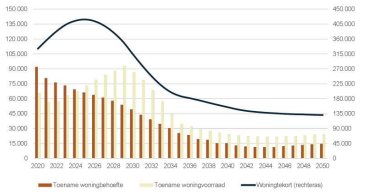
Source: (bpd, 2017) https://www.bpd.nl/actueel/onderzoeken/1-miljoen-woningen-nodig-tot-2030/

Demographics & Household research

The demographics research focussed on the Netherlands and the city of Rotterdam, the goal was to find out the current trends in living but also to look at the past and into the future to figure out what type of houses are needed for what type of people. The most useful information where the many government documents and statistics found online. In many of these documents we found graphs and prognosis of things like population growth, household types and housing shortages. This information we gathered to be able to pin point a user group to build for and also have an idea of the type of housing that are needed.

I think we were pretty successful in gathering this information and there was enough information available to substantiate our user group choices in a later stage of the design.

Example graph: Expected housing shortage by 2050



(ABF research, 2020)

Historical Research

For the historical research we looked at the history of Rotterdam and of our site. By looking into the past we got an idea of how the area developed and how it has become what it is today. Also this research made it possible to identify certain aspects that are that are valuable to the place and that determine the character. These aspects could then be included into our urban plan and the vision for the area.

Location Research & Plan analysis

To get to know more about the location we had a few methods. In one of the first weeks a lecture was organized for us were the alderman of the municipality of Rotterdam that is responsible for the development of the site briefed us with information. There was a part of the history and a part on the current desirable development direction. This lecture served us very well as it gave us a lot of information on the area and also the guidelines from the municipality could be used very well to test our urban proposals and get an idea what would work.

The second way to get to know more about the location was through a location visit. With a group of fellow student I went to the location in the third week. This was a very good experience. By walking around it was much easier to get a sense of scale and the atmosphere of the place and also as we were with a group we could share our observations with each other and notice all the details of the site. I would say a location visit is a very beneficial way of gathering knowledge of a design site and should always be included.

For the third part to get to know the location we made a plan analysis of the site and its surrounding. This was mostly done using maps. This type of research is handy as separating the area into different layers can show the exiting structures more clearly.

Historic image

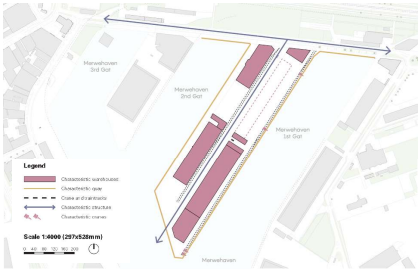
(werf-gusto, 2021)

Pictures location

(Own picture, 2021)

(Own picture, 2021)

Image plan analysis



(Urban Masterplan, 2021)

Typology transfer urban plan

To get started with developing the idea for our own urban plan we used a typology transfer strategy. I had not used this method before. In essence what you do is you take an area of city with a certain typology and a comparable scale to your design site and you paste past of this existing city onto the design site.

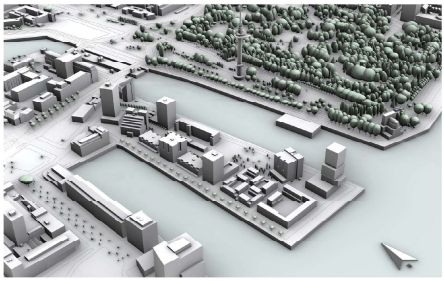
By using multiple area's with multiple different typologies. We could quickly get an idea how our area reacted to different routing possibilities, building densities, building heights. Except from literally pasting one site onto another the follow up strategy is to analyse the given urban area, extract the main principles and try to use this on our design site.

Here again we made use of a site visit and we used a plan analysis to get more information on the site that we were pasting. I together with my team mate had to analyse the Mullerpier which is a similar pier to the Merwehaven and I was surprised how well the transfer worked. As we worked it in smaller groups after finishing this part we already had 4 very distinct urban plans that could potentially be made on our location.

The difficult part after this phase was to combine all these plans into one final urban plan. This took a lot of afford and communication up and down as everybody was trying to get the best aspects of the plan they had made into the final design.

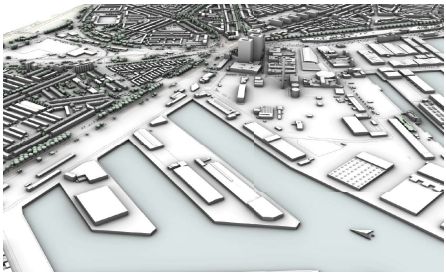
I think this method of typology transfer is a very good way to design an urban plan as it can give you ideas that you would not have thought of initially If you tried to immediately design the plan.

Mullerpier



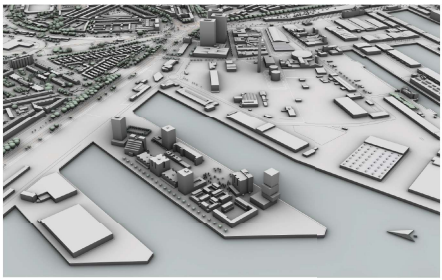
(Own image, 2021)

Merwepier



(Own image, 2021)

Typology transfer



(Own image, 2021)

Rotterdam neighbourhood research

To gather more data on the city of Rotterdam we also conducted a neighbourhood research. We divided the different districts in the city of Rotterdam between the different members of the graduation studio and the goal was to find out as much information about your area especially when it comes to housing and inhabitants.

I got the area Pernis I looked at the history, the amount of inhabitants, the type of households, age distribution, income, migration background, the housing typologies, rent versus ownership, accessibility, facilities.

Each of the students did the same type of research for their area and in the end it got combined into one big research report on the area's in Rotterdam.

This research was pretty interesting but also quite time consuming as not all the information is easily available and we had to search well to find reliable sources. I think there was initially also a part of interviews planned for this research to talk with inhabitants and get some information in the field. Due to the covid-19 lock down this did not come to fruition. Also during this project the main mentor in charge of this research fell ill so there was a bit of confusion where this research should lead to.

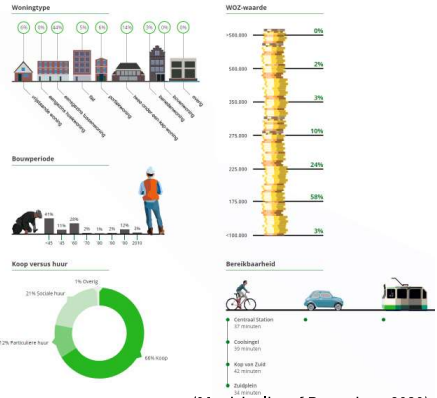
In the end it was interesting to learn about a district in the city but as Pernis is more a village and does not have a direct connection to my design site, the typologies used and the way it is organised could not be very well translated to the design site. I think the idea behind this research was good but maybe we should have stuck with the adjacent neighbourhoods or only have chosen area's that are more similar to the area we wanted to develop our plan into, that would have made the information much more usable.

Area's Rotterdam

Pernis

(google maps, 2021)

Niehgborhood information



(Municipality of Rotterdam, 2020)

Urban plan / P1

At the P1 we had to present our final urban design and also show what our plans where for the further development of our graduation project. We needed to have a design plot and a user group.

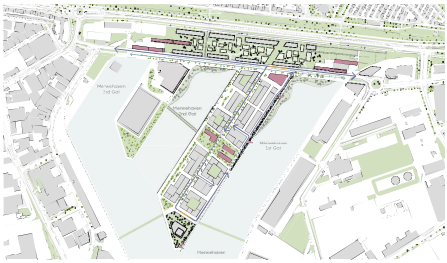
I think for the urban plan we managed to make a good plan with enough versatility and varietion so that every student could choose and plot that is interesting enough to further develop.

I myself choose a plot at the bottom of the peer as I wanted a coutyardblock and I iked the location almost at the head of the peer.

For the user group I choose elderly and families as I was interested in the challenges of both groups. Later in the process this turned out to be quite a challenge as I had to do research into both groups to find out what they needed and I also needed to find a way to cater to both their needs witin the design.

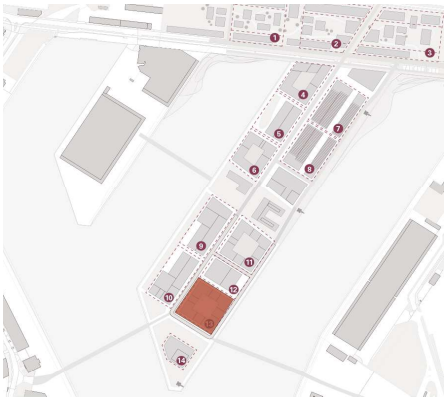
The good thing is that I it leads to a much more versatile building as the user group is wider and less focussed.

Final urban plan



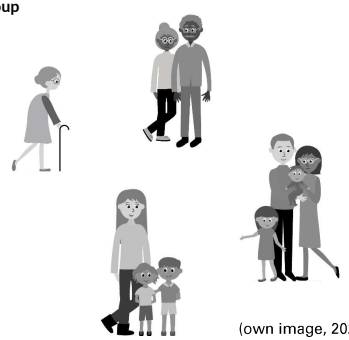
(Urban Masterplan, 2021)

Chosen Plot



(own image, 2021)

User group



(own image, 2021)

Phase 2 up to P2

After the P1 the next steps needed to be taken were the case study analysis, quick start to the concept design an literature research in order to make a research report and have a strong base of knowledge to base my design decisions on.

Case study Research

In order to design a building for my user group I looked at existing buildings made by different architectural firms to gather information and inspiration for my own building. I looked specifically for buildings that were urban blocks of similar size to my plot, they needed to be or for elderly or for families and preferably for both. They also preferably needed to have a courtyard. I managed to find a few buildings that fit my requirements.

It was difficult to find buildings that had a mixed user group of elderly and families so most of them turned out to be either for one group or for the other. This was not a big problem as findings could later be combined. I also tried to contact architects for an interview on the buildings but most of them did not even want to share the plans so I had to work with what was available online in most cases.

The analysis of the buildings gave me a lot of valuable information especially when it comes to dwelling organization, routing in the building and dwelling typologies. I spend a lot of time on the case study research and it was for sure worth it as many of the findings could be implemented into my design. I would therefore say that this form of research is advisable as long as the case study projects are close to the design project.

Case study buildings

Multi-generational Housing

(Schittich, 2007)

Gelaagd Hof

(ANA architects, 2019)

The Family

(ANA architects, 2018)

Eenhoornblokken

(Korth+Tielens, 2019)

Quick start (typology transfer)

The quick start assignment was in essence a typology transfer assignment. During the first week of the second quarter we all had to come up with a potential design for our plot by pasting our different case study buildings onto our chosen plot.

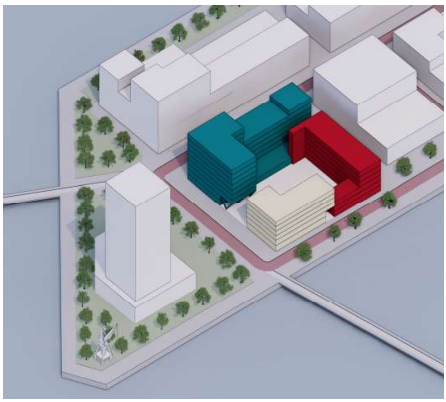
After pasting the different buildings it was the intention to see what works and to gather the strong points of each of the different options.

As a second step it was possible to mix different buildings on the plot in order to get different ensembles in which strong points of different buildings would be combined. On the images an example of this transfer can be seen.

I did not have very high expectations from this approach as we only had a few days to work on it and it was more of a fun game to see what would fit. But at the end of the assignment i actually ended up with a few viable options that could serve as the starting point of my design.

As buildings are usually mate specific to their context it is hard to transfer the findings to your own design but this research approach can help with coming op with a potential building mass and circulations system that can be used in a design. The big advantage of using this method is that you know that the different masses you extract from it are suitable for dwellings as they come from existing buildings.

Quick start 3d view



(Own image, 2021)

Quick start floor plans

(Own image, 2021)

Quick start visual

(Own image, 2021)

Literature Research

To get to a good design having good background research is very important. Therefore part of our assignment was to write a research report in which we would ask the most important questions that we needed to answer in order to make our design.

As I had a clear idea of my user group and of the direction I wanted to go with the building it was relatively easy to find literature. I found myself buried in sources in no time and it was a struggle to find enough time to read trough all of it while at the same time working on my design. The goal of the literature research for me was to find out the challenges of my user group and their needs and to translate these to design guidelines to be used in my building.

The most important sources I had when it comes to literature were the research reports made by different architecture firms in which they described the research they had done to accommodate elderly and families in the city. Not only did they describe the challenges but they also had many recommendations how to design for my user groups. Many of my research findings therefore became guidelines for my design. Because the research was done by architecture firms in order to make a building design it was very practical and easy to implement.

Another important part of my research was based around creating encounter and communities. Also here I managed to find sources that linked the creation of encounter to design principles. I think that these type of sources that link research to design are very valuable and also practical to use. They make the literature research a very valuable input in my process as the design will be directly linked to my research.

Reports on elderly family, encounter

(Heren 5, 2016)

(Keesom, 2013)

(Platform 31, 2021)

Concept design / P2

During the P2 we had to present our research and show how that research had led us to the concept design. As there was only a little time for the design it had to show the the most important principles. I managed to fail my first P2. I was told that the design I had made did not coincide with the goals I had set myself namly to create a block were elderly and families could live together and interact. While at the same time the closed courtyard made the building really closed and shut down interaction with the surrounding urban context. So my assignment was to look better at how I devided my puclic and collective spaces in the building, how I organize the dwellings for more encounter and how to connect to the urban network.

After the presentation I had to admit that I was dissapointed but I had to agree on the feedback from my mentors and the fact that it did not reflect my design principles very well.

I than had a few weeks to revise the design and in this time I redesignd the urban block opening it up to the city and having the collective spaces much more despersed through the building. This concept design allowed me to pass the P2.

I think that having to come up with the concept in very little time and not having that much feedback made me have a bit of a blind eye towards the shortcommings of my inotial desing. But by listening to the feedback of my tutors I managed to redevise the building and come up with a design that better propagated the values from my research.

Initial design P2

(Own image, 2021)

Design retake P2

(Own image, 2021)

Phase 3 up to P4

During the third phase of the project te focus would shift from research more towards the design. During this phase I also use more research by design as opposed to design by research that was used in the first half of the graduation. As there is also the P3 this could also have been a phase but due to planning the P3 was very close to the P4 so not much changed about the research that is why I see this as one phase.

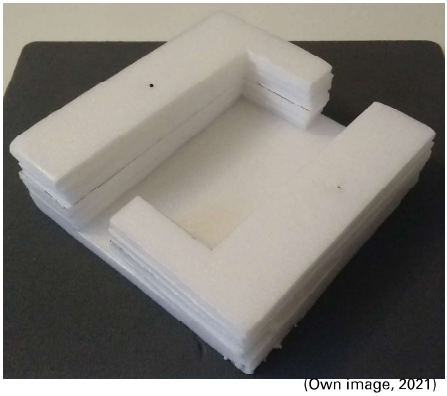
Design Research >P4

Model making

The third phase started with a revision of the P2 concept design. As we were allowed on campus again it was also time to make some models to quickly go through some design options to fine-tune the mass of the building. I started with a model on the scale of 1:500 but it quickly became apparent that the level of detail on this scale was to low. So I decided to make a 1:200 model and with the help of the model I achieved a good building mass. To see how the mass reacts to the context also a digital model was made. I think it is nice to make use of a tangible model during this design phase as you see things differently than on the computer screen. So for this phase of the design the model worked well. I have not made any physical models anymore after this as it was easier for me to test out facade and floor plan variations on the computer in a 3d model as it is quicker to make design iterations one the level of detail goes up.

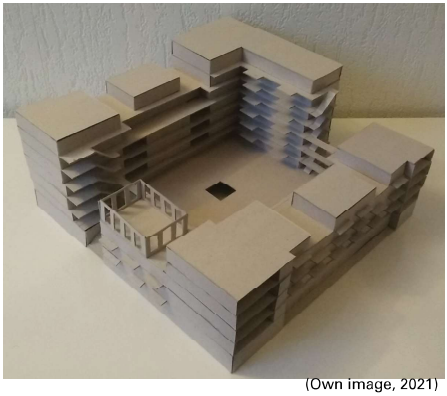
Mass studies

Foam model 1:500



(Own image, 2021)

Cardboard model 1:200



(Own image, 2021)

Digital model in urban context

(Own image, 2021)

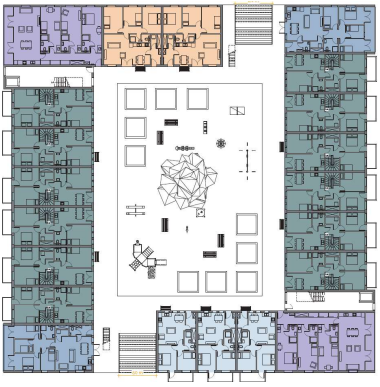
Drawing / 3d modelling
Also for the building floor plans but also the dwelling floor plans I used research by design in this phase to continue to evolve them. Even though the floor plans were initially based on floor plans from my case study as the project moved forward they changed and become more and more specific to my own building.

By making floor plan variations and discussing them with my mentors during the meetings I was able to fine-tune the plans a little bit more with every meeting.

Reference analysis into Research by design
During this face of the project the research for architecture mainly consisted at looking at reference projects and see what elements can be extracted from them and adapted to my own design. This is for instance also the case for my courtyard design.

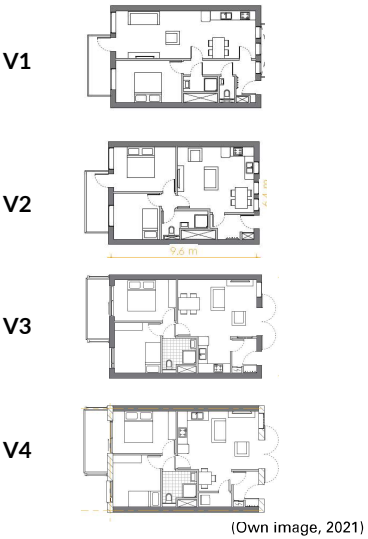
Feedback from mentors
I think a crucial aspect during this phase was the feedback from my mentors. With their many years of experience they were able to pinpoint the weak and the strong points in the design to help develop it further. I think it is important to have this feedback during this design phase to stay critical at the design.

Courtyard and dwelling typology



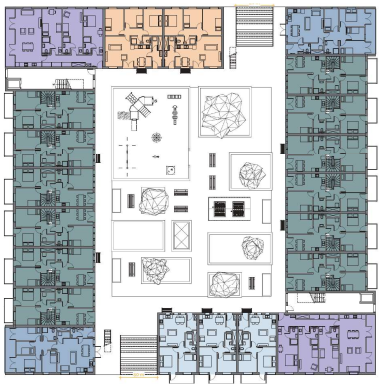
(Own image, 2021)

Evolution floorplans



(Own image, 2021)

Courtyard design reference



(Own image, 2021)

For the facade also a similar approach was taken , by first looking at reference projects I was able to pin point important qualities that I wanted to use in my of building. Then different variants were made that would be discussed with my mentors eventually leading to a better design.

During the last part of the design the focus switched more toward building technology. This is because as the design moves along more details can be added. The information used during this phase consisted for a large part of knowledge provided by our technology mentor. But also the Dutch building regulation and other technical manuals were used to define the climate system and to draw the construction details. During the putting together of the details I also looked at many different details from existing buildings and manufacturers to figure out would could work and what would not. This combined with a few round of feedback from our mentor helped with the development of these products.

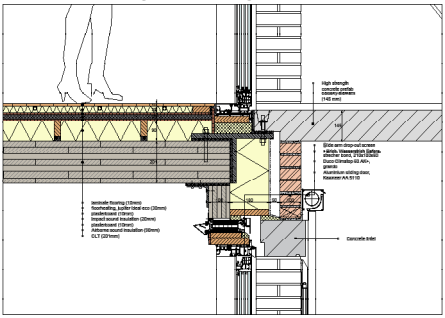
I myself enjoy this part of the process most as when you are using reference studies combined with research by design combined with feedback you can quickly develop the building and also in this phase everything starts to come together.

Facade studies

(Own image, 2021)

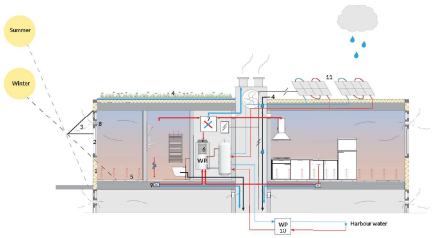
(Own image, 2021)

Detail building technology



(Own image, 2021)

Climate scheme



(Own image, 2021)

Conclusion

When looking back at the graduation trajectory I can say that many different forms of research were used in order to fuel the design. Each piece of research and each research method comes with its own benefits and can give new information for the design.

Looking at the whole trajectory it is clear the in the first part the focus is more on design by research while during the second part of the graduation trajectory the focus switches to research by design.

Because the research is so intertwined with the design process the final design is not only an object of art but can be backed up scientifically by the results of the research. This makes it possible for other people that embark on a similar project to use the research results to make a building with similar qualities as the one that I developed. It also makes it possible to systematically look at the strong and the weak point of the design and to improve upon them over time.

Looking ahead

For now the next goal is to pass the P4, after that there is a little bit of time to incorporate the last feedback I get from my mentors into the design and to finalize the presentation and products that are required for the P5

Reflection Aspect 2-4

Aspect 2: The relationship between your graduation topic, the studio topic, your master track and your master program.

The project is part of the master track architecture and the studio is the Advanced Housing Design Graduation Studio. The topic of the studio is M4H "Designing for modern households, building a city for everyone". The studio aims at answering the question how to provide suitable and affordable housing for a diverse population.

The project location is an old harbor area located in Rotterdam the Merwehavens (M4H). After looking at the current information on acute issues society is facing and the demographic information of Rotterdam I decided to choose elderly citizens and families as my user group. I asked myself the question: How can housing design answer the needs of elderly citizens and families with children and incite a positive rewarding encounter for both groups?

I think this question is an important question at the moment as both these user groups are facing many issues and changes and architecture can help solving some of these issues. The research question eventually resulted in the design of a residential building in which i have tried to cater to the housing needs of the elderly and families as much as possible. So the design solution tries to answer the main question of the studio by being an example of suitable housing for a diverse (different age groups and family compositions) population.

Aspect 3: 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 advanced housing graduation studio has a predetermined program and trajectory in which several research methods need to be used in order to advance the project.

Research methods that have been applied are: auto-ethnograpic research looking into my own workspace, Historical research into the history of the location Demographics research into the current situation of Rotterdam using online data. Location research by visiting the site and making a plan analysis. Literature research on how to design for the different user groups and how to stimulate community forming. Case study research by analyzing four existing buildings that are similar to my design assignment and for a similar user group ideas of best practices were gathered. Design research consisting of model making and drawing an making schemes (by hand or on the computer) while getting feedback from the teachers to improve the design.

I think that the combination of all these different research methods combined leads to a very solid base of the project as it is informed by multiple sources of information. By using these different research methods it also gives a good starting point to base all the different design decisions on as they can be traced back to research increasing the relevance of the final result.

Aspect 4: Elaboration on the relationship between the graduation project and the wider social, professional and scientific framework, touching upon the transferability of the project results.

As stated before the project is based on different forms of research that combined lead to the project results. Part of the research done is specific meaning that the results are specifically aimed at the current project and its context. In this case it would be the historic research and the location research done for the city of Rotterdam.

This research will be harder to reuse as it is only relevant for that location. The research can however serve as an example to research a different location so in this way it can still be usable for other projects.

Then there is a large part of the research that is more general. This includes the case study research and the literature research. The case study research in this case can be interesting to everyone that wants to build urban dwelling blocks. The literature research is even more useful as everyone that is interested to develop a housing project for a similar user group can use it to figure out their current needs and possible solutions to their challenges. Over time though this research might lose some of its relevance as changes in society and politics might lead to different needs and issues arising requiring different solutions.

The final design itself could be used as an example of the applied research and can serve as a case study for a future design. However because it is not build it is not possible to see how well the different design solutions worked and if the goal of community forming is reached.

Aspect 5: 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.

During the research it was important to gather as much information as possible about different households, their composition, where they lived, how they lived, how they use their dwelling and the height of their income. This information is very valuable for architects that want to develop new housing projects but at the same time this information is very personal and not everyone is willing to share this. This same information can also be sensitive as it can be used to try to exclude certain groups from specific parts of the city or certain projects.

The same ethical issue applies during the choosing of a user group. By choosing a certain group to build for other groups are excluded. This can happen consciously but also on a more unconscious level as the dwelling design might be to expensive for certain groups to afford.

Another thing to consider during the design is in what way are we supporting certain political, cultural or social ideas with our design. In case of this design for example dwellings are designed to help elderly citizens to stay at home as long as possible. This growing old at home is something that has been decided partly by politics. Do we as architects support these ideas by building buildings in accordance to them? The same can be said for family dwellings in the city. By building for families were both parents work do we give our approval that two people who are chasing a career in the city have enough time to raise children?

Of course the truth lies somewhere in the middle but it is important to realize that architecture can support or discourage certain lifestyles and it also has the power to include or exclude certain groups, so staying critical also towards political and societal ideas is important.

As for the results of the project, a big goal of the design is to promote community forming. Many architectural tools have been used to try to stimulate community forming but in the end architecture can only do so much. The willingness of people to live together and to engage in the community is ultimately what it comes down to. So the success of a project like this is never certain and it would be nice to follow more similar projects to see what other factors influence community forming and to try to figure out how to improve the success rate.