BENEFIT OF THE COMMON

housing for the urban families

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housing for the urban families

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A big challenge and responsibility lies in the urban planning that would prepare the area towards the new function in the city. Hence the proposition of the urban plan for Minervahaven\(^3\) was one of the first confrontations with the area. High density that characterised it raised the question: how to organise the life of inhabitants in a way that the density wouldn’t be experienced?

The research of Robin Dunbar, British anthropologist and evolutionary psychologist, about the diversified relationships in groups of different numbers became my main inspiration and focus of interests for the graduation project. It influenced the organisation of the building and the decision to cluster people in communities of certain sizes to stimulate certain relationships by encounters between tenants.

The final design is an attempt to find an answer for the lack of suitable family housing in the city and decreasing feeling of creating a community.

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1. Dwell (verb) - to live in a place or in a particular way. Cambridge Dictionary.
2. Amsterdam 2050
3. A part of Havenstad in Amsterdam

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INTRODUCTION

In September 2019 I joined Dutch Dwelling Graduation Studio. The main topic and the aim of the studio was to propose a residential building “between the standards and ideals”, that would answer for future needs of the inhabitants of Amsterdam. It was not my first housing project, but the location in the Dutch capital required a lot of knowledge about the society and people’s living patterns of the culture that I was roughly getting to know and after living in the Netherlands after only a year. At first I took it as a challenge, only to realise later that I already have my own experiences of working and dwelling\(^1\) myself. Those experiences I tried to translate into the architecture project.

The Netherlands is facing the problem of shortage of suitable housing. Predictions warn about the need of additional million houses for 2030. The rising number of immigrants arriving to the Dutch capital city forced the municipality of Amsterdam to prepare a vision for Havenstad 2050 - a development of industrial areas for the residential purposes.\(^2\)
Target group
In the beginning of my research I wanted to provide housing for as diversified target group as possible. The habits and needs of young couples, young families and elderly, finally the possibilities to create coherent community. My research showed that the differences between those groups are too big and it would be very difficult to fulfill everyone’s needs and at the same time keep high quality of relations in the community. My special concern was about elderly, that have very specific needs. The rising number of housings dedicated for seniors, that dutch government invests into, help a lot to fight loneliness among elderly. My doubt lied in the specific requirement to provide rather special care with stable and quiet environment. Therefore I decided to limit my target group to young couples and families.

Family life in the Netherlands
Researchers say that despite the times of individualism, increased mobility and supposed indifference, the foundation of the familiar bond is primarily economic. The radius of 50% of children that move out from parents when they grow up remains within 10 kilometres. Therefore the family life can be easily supported during many years.

Dutch households are often based on the scheme of single family house with various levels, which then in a clear way divides household into two zones - living space with collective functions and private bedrooms. Important aspect typical for dutch houses is direct connection to the outdoor space. Especially families search for the houses with gardens, to let their children play outs-
ide in safe environment that can be supervised.

**The context of Amsterdam**

The Statistics Netherlands (Centraal Bureau voor de Statistiek, CBS) shows that before 2012 the immigration number of people from abroad to Amsterdam equaled those emigrating out of Amsterdam. In the last few years, while the emigration number has remained the same, the number of immigration has risen dramatically. Resulting in the growth of Amsterdam by 11,000 people on average per year (last 5 years). In 2016: around 20,000 people left Amsterdam; while 30,000 people from abroad arrived in Amsterdam. In 2016 more people left than arrived (by 4,000). In 2015/2016: 9,000 27-40 years olds left the city with the same group of children (0-17 years olds; were replaced by the group of 22-27 (starters) along with 8,500 of 17-22 years olds (main purposes: work and study).

If we look closer to the migrating groups, it appears that immigrants are mostly young people: among them students and expats. The number of those who emigrate is stable, but every year more young families are leaving the city, last 2 years more leaving than arriving (CBS, 2017/18). The problems and effects following those migrations are various. House prices of properties in Amsterdam, that don’t fall within budget, therefore more affordable houses are to be found outside the city. Primary schools experience lower enrolment figures due to families moving to sub-urban areas. Thus there is a need to provide more affordable and attractive places for the families, to invite them back to the city.
The Dutch government has a vision of one million how homes in the Netherlands, of which the great part will be built in Amsterdam. The current situation of the market in Dutch biggest city is often organised that private owners rent rooms in family houses for students and expats, as then the rent for them is affordable for one room, but the collective rent for the whole house is impossible to be paid for the families with children. The demand of the single users created a market for single tenants (students and expats). This creates a problem, that is present in a lot of western societies: 60% of the population lives in one or two-person-households. This has increased feelings of loneliness and social isolation among many people.

The figures also show that it is mainly wealthy families that move; 38 percent of them disappeared from the city within four years of the birth of the first child (CBS, 2017). The last of the diagrams show that each year the number of families moving outside Amsterdam is increasing - particularly after the birth of the first child.

In the Netherlands the number of children in the family is nowadays 1.83 on average. Most of the parents decide on one child (48%), about one third has two children (35%), three or more are only in 17% of the families. Also not each family consists of both parents: one third of the households consist of single parents.

Families have a big influence on the quality of life in the city. They ensure more diversity and more capacity, are glue to the strong social networks, due to encounters between parents, at schools and additional activities of their children, like hobbies and sports. They made the society coherent and involved in the neighbourhood’s life. Economical aspect is important to mention, as families use shops, childcare, child’s activities. With that there are more options, the attractiveness of the city increases, and also employment. Cities must provide housing for
that the city struggles more with loneliness than other large cities like Amsterdam, is because the city is home to many immigrants, expats and students, and the population is aging. There are many ways to intervene and help fighting social isolation, among which one can be prevention by the design that promotes living in the community, creates strong social interactions and offers socialibility, support, sense of security.

A housing market bubble

According to the Swiss bank UBS Amsterdam is officially dealing with a bubble in the housing market (UBS Global Real Estate Bubble Index 2019, 2019). The city has recorded the strongest price increase of all cities in the study since 2015 (i.a. Munich, Toronto, Paris, Tokyo, Stockholm, Madrid, Milan, Dubai). On average, yearly real prices have increased by close to 10%, outpacing income growth by far. According to UBS a “strong regional economy” and “rapidly easing financing conditions amid a wave of speculative purchases” has contributed to the issue in Amsterdam, allowing investors to borrow more cash at a lower long-term cost. These investors increasingly buy homes in Amsterdam in order to rent them out at high monthly rates. (Pieters, 2019).

Social loneliness

Problem that is deepening, because of the overflow of solo dwellers in Amsterdam, is the loneliness. Various studies made by researchers working in the field of social behaviours confirm that around 30% of Dutch nationals are lonely and 10% suffer from severe loneliness, according to municipal health service GGD. That means 300,000 lonely people only in Amsterdam. This loneliness believed to be caused by a distinction between personal expectations and reality. The researchers distinguish between ‘emotional’ and ‘social’ loneliness, where emotional loneliness results from a lack of a ‘meaningful’ friendship, while social loneliness indicates a lack of a broader social network. Loneliness and social isolation can increase the emotions of sadness, worthlessness, depression, vulnerability, that are finally bad for our mental and physical health and wellbeing.

According to professor Theo van Tilburg, a specialist on loneliness who is helping the municipality address the issue, Amsterdam especially attracts vulnerable people who often come to the city alone. The reason
The size of the community has a significant influence on social interactions and their quality. There seem to be fewer in large communities, mostly because residents don’t know each other. Residents choose to interact in other environments, where others are known (workplace, school, etc). On the other hand, in very small communities people tend to lack their privacy, which may also lead to withdrawal from the social interactions. Clustering in larger communities can help to increase potential interactions.

The definition of cohousing, for the purpose of this research, will be the synonyme for the projects that help its inhabitants to cultivate closer social contacts, benefit from communal activities, mutual support and a stable neighbourhood in general. The cohousing is a certain form of a daily practice - the inhabitants are strongly involved during the conceptual and planning phase of the design. The project size can range from small buildings with a few flats to city quarters (see case studies), depending on the size of the community.

**The optimal size of the community**

The size of the community is the important factor in considering the cohousing project. On one hand the Netherlands will face the problem of providing one million new homes for 2050, with the requirement of the high density of the urban environment in large cities. On the other hand, studies show that
people only feel good in certain size of the community.

The community longevity as a function of group size was researched by Robin Dunbar and Richard Sosis in their article “Optimising human community sizes”, based on tree historical, small scale agricultural samples. The community sizes of 50, 150 and 500 are more common than other sizes and also have greater longevity.

To research the natural grouping patterns, Dunbar and Sosis (2018) tested possibilities using historical datasets from three types of collectivist societies: 19th century American utopian communes, Hutterite colonies of South Dakota (USA), and Israeli kibbutzim. All three situations are diversified economically and politically, yet they all face slow growth (births exceeding deaths) and sudden collapses (once the group reaches a limiting size set by their local economy). Researchers stated questions of what is the optimum size, how does the size affect community survival and longevity: “There is a significant negative relationship between the size of a community immediately after fission (size at foundation) and its duration (time to the next fission event). The regression equation suggests that communities of minimum viable size (~40 individuals) are unlikely to last 25 years without fissioning, and communities larger than ~180 would fission so frequently (at least once a year) that they would be socially unstable.”
**Dunbar’s number**

In 1993 Robin Dunbar suggested in his research “Coevolution of neocortical size, group size and language in humans” the presence of a cognitive limit number of people who can maintain stable social relationships, in which individual person knows other members and can relate to every other individual. The number lies between 100 and 250, but is valued commonly to be around 150 people.

**Group Thresholds**

There are the ideal numbers where a community seems to function best - called the threshold values; and the less than ideal numbers at which a community begins to grow unstable, remaining so until a new threshold number is reached. The relations between those numbers were studied by Christopher Allen (2008).

7 - “The Working Group”. A community this size has about 4 up to 9 members, however 7 is an average that also shows up in multiple studies. It is suggested that it is a number that the brain can easily and intuitively comprehend (Miller, G. 1956) and is referred to as the general “rule of seven”. A tightly-knit group of 7 is the first group size which is truly an optimal community size; moreover it is found to be a very comfortable group size and “feels” relatively natural (Allen, 2018). At this size members are able to easily get to know each other and behave together in an intuitive and organic manner.

13 - “The Judas Number” (Between 9-25; or 12-15). A community size of 13 doesn’t represent a threshold ideal value, but rather a low point. It is an unstable group size where group dynamics change due to a change of behavior (multiple leaders rise instead of one) or risk becoming dysfunctional. It is one of these valleys beyond every group threshold in which the previously harmonious group dynamics become more difficult. It is worth mentioning this specific group size as it’s a point that small communities often hit.

50 - “The Non-Exclusive Dunbar Number”. This community size sets in the range between 25 up to 75 members, but most the most natural is in the range of 50–60. This number was found by Allen (2008) in many online communities; Dunbar (1993) found it in clans of hunting groups in ancient times.

90 - “The Dunbar Valley”. As Non-exclusive Dunbar number communities grow, they reach a point where increased time obligations and the noise of socialization is required to keep the group stable. Similar as with “The Judas Number” this community size is a low point, where it requires more energy and commitment from group members in order to keep the group cohesive. A lack of commitment comes with the risk of a split in the group; while if the community agrees to a higher level of commitment it can grow to the next level.

150—“The Exclusive Dunbar Number”. Robin Dunbar (1993) got much of the discussion of group thresholds started. The number 150 applies more to groups that are highly incentivized and relatively exclusive and whose goal is survival. Yet, it is related and can be the highest limit of all for a tightly-knit community. Beyond this limit, communities are less cohesive, less trusted, and less participatory, people know each other less. The number of 150 is known as the number of relations that individuals are
able to maintain at once.

**Personal Circles**

Personal limit is the measure of the number of connections that an individual can hold. Following numbers, unlike the previous thresholds, are rather applicable in personal relations. These personal circles are discussed by Christopher Allen (2008).

The support circle (3-5): is the number of individuals that one seek advice, support or help from in times of severe emotional or financial stress. An average size of an individual’s Support Circle in most societies is 3-5.

The sympathy circle (10-15): is larger than the support circle. It is the amount of people when you seek for sympathy and those whose death would be devastating. The Sympathy Circle is in the range of 10-15 people, but can vary between 7 and 20. Not all people in the Sympathy Circle are connected - members of one’s Sympathy Circle can have additional people in their own, that are not part of the others.

The trust circle (40-200): people that one has some type of intimate connection to. Measured as the people that would send each other family Christmas card or simply test emotional closeness. The measure are the strong ties and trust. Some researchers compare it with the Exclusive Dunbar Number of 150, however Allen (2008) believes that they rarely come in the same mutual group.

The emotional circle (~290): the total number of people that one can have some type of non-mutual emotional connection with, which can be from diverse groups. The ties to those people do not necessarily have to be strong. This threshold is called “social channel capacity”. The group size can vary strongly between people and might have half of the size depending on the individual.

The familiar stranger (up to 1000): the faces individual is able to recognise, but people know nothing about themselves. In a place where there are a lot of unknown people, one will be unwilling to approach strangers, take risk such as asking questions or interact as eating lunch together.
Power laws let us measure the intensity of individual’s involvement in a group. The best-known power law is the Pareto principle, known also as the “80/20 law”, that says that 80% of the wealth would be held by 20% of the population. But it also tells that some people o a lot more work in any social situation than others - participation inequality. In tightly-knit communities it’s important to consider the degree of participation. There are various levels of participation.

**FOUNDATION OF THE COMMUNITY**

In order to understand what can support the social ties or bring members of the community together, I will investigate the historical approach and benefits, that were proved to be found in cohousing project.

**Building social interactions by design**

The case of cohousing provides a unique opportunity to study optimal conditions for social interactions and how to determine how social and personal factors may help to encourage the outcome of the design. In England, new neighbourhoods are designed to encourage social interactions. The need for more vibrant community helps to rebuild local social capital. Due to social interactions residents live in the community, knowing about other residents and social structure, which helps to build the trust between residents. This results in social capital, such as more efficiently functioning labour markets, higher educational attainment, lower levels of crime or better health.

Cohousing projects allow to study the interactions between residential design and resident behaviors and examine those communities are purposely designed for social connectivity and support. The design approach of those projects mostly represents design principles that literature identifies as crucial for the high level social interactions in neighbourhoods: higher densities, good visibility, clustering, inclusion, car parking on the periphery of communities. They also allow to determine wich of those factors are less or more important in terms of encouraging social interactions.

Increasing proximity through the design leads to forming closer social relations due to the often passive contacts between the tenants (Kuper, 1953). Residents who live on the edge of the community can feel more isolated. Those who live close to the stairwell are more likely to socialize with tenants from other floors, and those who live in the centre of the floor socialize more with immediate neighbours (Homans, 1968). In high densities residents feel less control over their social environment.

According to Altman’s optimization process (1975) the use of semi-private spaces as buffer zones can increase the threshold and they provide a gentle transition between public and private spaces. It protects tenants from overexposure to the community and can be great space for encouraging interactions, only by increasing the opportunity of accidental contacts (Abu-Gazzeh, 1999). Other elements that increase social interactions are shared pathways to private units, parking spaces and local amenities.

The size and the quality of the communal spaces (both indoor and out-
Historically cohousing was first created in Denmark and the Netherlands to increase sense of community; another factor was feminism and woman's empowerment - in order to reduce the burden of housework for woman and improve the live of working parents with children. Among others, cohousing was seen to positively influence the environment, especially as a solution for alienation on the suburbs. Finally, cohousing is proved to have economic benefits, making it a more sustainable housing type.

### Cohousing

The idea of cohousing is to combine the autonomy of private dwellings with the advantages of community life. This typology consists of private units, semi-private spaces and communal spaces. The design of the cohousing encourages a collaborative lifestyle and interdependence between tenants. There is a list of factors that influences particular behaviour, that is desirable to create a community: personal factors (personality, attitudes, communication, values), informal social factors (relationships between individuals and individuals in group), formal social factors (organisational policies, decision-making processes, social structure) and physical factors (layout, communal facilities, buildings).

Various studies have shown that the mutual support and social interactions are stronger and more developed in the cohousing communities. This is due to the sense of community and positive attitude towards social interactions. This kind of community can be very diversified in interests, age, religion, household types; yet is quite homogeneous in case of social class, race, education and attitudes.

Many researchers provided design principles that were adopted in cohousing projects, such as: (1) indoor and outdoor communal facilities with good visibility, (2) car parking outside or car-free community, (3) gradual transition from public to private - leading through collective spaces, (4) positioning activity sites and access points on shared pathways, (5) the tendency for smaller dwelling units than average size households, often due to limited private kitchen and laundry facilities, resulting in cheaper rental prices, (6) loss of the space in private units, that are supported instead by communal spaces (kitchen, dining, living area, laundry, gym, workspace, hobby rooms, workshop spaces, guest rooms, gardens and storages).

It proved to have positive influence for the social contacts between tenants, due to social interaction, participation, support, unity and safety. Torres-Antonini (2001) indentified six social contact design features that were supposed to be studied:

- shared open space,
- grouped structures,
- peripheral parking,
- pedestrian circulation,
- extensive common facilities,
- centrality of the common house.

What Torres-Antonini identified later is the impact of those features on the five social behaviours: social interaction, safety, participatory, support, unity. The first two were increased through the social contact design, and other three seemed to be independent. He suggested presence of other important factors, such as: common goals, the organization of communal activities, the joint ownership and management of the common space.

The foundation of nowadays community or cohousing is to go back to the idea of improving the quality of life of the families. The benefits of living in the community are, among others, social support, interactions, security in the closest neighbourhood.

Cohousing and community based projects lay in the circle of the phenomenon that could be called collective consciousness, where the members of the tribe care about each other.

**The neighbourhood unit movement**

Before the appearance of cohousing projects, in the early 20th century an American architect proposed principles for the measured urban unit. In 1923 Clarence Perry offered the neighbourhood unit as an answer to address social problems of alienation, youth delinquency and lack of civic participation through enhancing the physical design of the community. His inspiration came from his own previous involvement in the community-based social activities and concepts of ex. garden city.

The plan has set boundary and size for the neighbourhood, specified location of different land uses and facilities and suggestion to create safe internal streets by redirecting them. Perry’s neighbourhood unit was around 65ha and provided housing area for the population between 5,000 and 10,000 inhabitants, with the public facilities and elementary school at the center of the plan (Perry, 1929). The arterial roads would surround the neighbourhood and the internal roads would be designed to discourage traffic and provide a safe pedestrian environment. The basic principles of the proposal are presented on the figure to the right.

The neighbourhood unit received a lot of critique especially for defending social homogeneity, which could be used to discriminate against some social groups (Rohe, 2009; Silver, 1985) and for the deterministic approach considering that physical design is sufficient to bring social reform (Silver, 1985). Perry’s idea included separation of work and living areas.

The movement influenced others such as New Urbanism (Banai, 2013; Brody, 2009; Farr, 2008), and therefore contributed to evolution of the neighbourhood sustainability principles.

The idea was realized in Radburn, designed by Henry Wrighe and Clarence Stein (1928). It got characterised as “super blocks gree of traffic, where cars and pedestrians are separated from each other, and public facilities and shops are located on pedestrian networks and embedded in open space”.

The need for identity to a geographic neighborhood community has been
related by Perry to the human lifecycle. From young singles that often enjoy the relative anonymity of a city living toward a change when they get married and have children. Then they "long for a detached house and yard and the social benefit of a congenial neighborhood". The primary challenge for Perry was thus to create spaces that would best suit families with children. His solution: "the neighborhood unit".

Perry made the primary school the central institution in his plan. He noted that the quality of the school was the factor that affected home-buying choices. The social interactions were often formed around the school, so that many of the families' friends were parents of children in those children's classes. Parents were also involved in parent-teacher associations, and for those reasons Perry argued, that neighbourhood should be built around schools. He based the size of the neighbourhood around the number that can house families with the appropriate number of children for a primary school (800-1500 at that time). According to that, a circle of a half-mile radius would work well, to allow children to walk to school without crossing busy streets. The model would be influenced in density, the average number of primary-age school children per household and geographical particularities.

A graded street system would serve people passing by and the residents. After Perry's proposition of particular residential street widths and designs, that ensure the slow move of the traffic, Jan Gehl proposed traffic calming as improvement of life between buildings.

The plan was based mainly on single-family detached houses on separate yards with the business district on the edge of the neighbourhood unit, so that it can be reached easily by residents from internal streets and through traffic arterials by others.
Perry was focused on a limited segment of society, wanted to provide the sense of community for middle and upper-income nuclear families with children; he rejected the messy, mixed neighbourhoods that Jane Jacobs celebrated.

Perry specified particular principles of the Neighbourhood-unit, that applied in urban plans, could vary in results (Farr, 2007):

1. Size - accordingly to provide houses for families of 800-1500 elementary school children
2. Boundaries - by arterial streets
3. Open spaces - a system of small parks and recreation spaces
4. Institution sites - with service spheres in central point or common area
5. Local shops - adequate for the population to be served
6. Internal street system - proportioned to the probable traffic load

An example of the neighbourhood unit movement shows the relations between spaces, such as open spaces, boundaries, public and private spaces. It shows how architect wanted the neighbourhood to function. The pattern that he proposed, could be used in smaller scale - a single unit of perimeter block, that can function just like a small neighbourhood; it also has its own boundaries (facades or streets around), open spaces (courtyard), streets (circulation in the building).

TRANSITIONAL SPACES

One of the key aspects of the collective projects is the access to a sequence of the followign spaces. Oskar Hansen, polish architect, theorist and utopist, that developed his career during the communist times, and got famous by his visions and theory of the open form and linear continuous system. He believed that the society works on three levels - micro, mezo and macro, and those he studies in his architecture. His researches about the open form are strongly influenced by the presence of the mezo-zone. In his theories Open Form is the concept of creation, project of accomplishment, which by its nature is unfinished and open, allowing the recipient for the interpretation. Moreover, the interpretation take place on both mental plan and by the interaction with the project. Thus it is unsaid, ambiguous and ready to interpret (Springer, 2007). The open-form creation allows the user to make his
own interpretation by not imposing any fixed vision. The best example to show how this concept would work in architecture, is to take a look at the project that is the closest to architect - his own house in Szumin, Poland. Utopian project became open and changible through Hansen's life and was his constantly developing experiment. The concrete wall along the road leading towards the entrance had painted horizontal white line, that on the other side was reversed (white wall with concrete stripe) as a suggestion of being only below the roof, but in semi-interior. That was a representation of the mezo-zone, that despite being physically outside the house, belonged to the interior. Kitchen table (photo below) was built in such a way that was mirrored through the wall made of sliding glazed panels - allowing to remain closed during winter and open for the summer, ready for feasting with more people.

Those are only a few aspects of the house, but one of the most important to explain how Hansen perceived subtle and unsaid transitions of the following zones.

In order to investigate transition zones in collective residential architecture, further research will be led on case studies. I will focus on four chosen projects and examine routing from the public space to the private space of the individuals. My analysis will be based on the sequence of transitional zones, described by Christopher Alexander in “A Pattern Language”. The “entrance” on his diagram can be understood in various ways depending on the scale: entrance to the public space, to the building, to the common space, also to the apartment.

Theoretical research about the group numbers didn't result in a single number, but rather the relations that are created in those particular groups. Therefore I can possibly predict how strong will be the community feeling between the closest couple of families, that share together more private facilities, and what will be the relation with all neighbours from the block or even neighbourhood.
OPEN CITY

Following section consists of the abstracts, analysis and thoughts on the particular chapters from the book „Building and Dwelling. Ethics for the City“ by Richard Sennett. Each part is pursued by the conclusion and supported with illustrations that collect my thoughts on the chapter and put them into the perspective of Minervahaven and my design.

Building and Dwelling. Ethics for the City, Richard Sennett (2018)

Unstable foundations (Chapter 2.)

The chapter raises the question of how ville shaped cite and through the different themes refers to the relations between them, such as through social inclusion.

In this chapter Sennett provides the historical ideals of the development of the city and the ways of approaching it. He brings the examples of three urban planners (the 1850s great generation of urbanists) for the understanding of how the city was created. Their approaches are provided with different methods of urban analysis along with explanation from where they origin. Eventually Sennett concludes that all urbanists tried to shape the ville to mobilize the city, but their motivations were different and had limitations: Haussmann wanted to make the city accessible, but he privileged the space over place, Cerda - to make it equal, which led to monoculture, and Olmsted - to make it sociable, but his social integration wasn’t achieved.

The last part of the chapter provides the analysis of human behaviours in the crowd and it’s effect on urban planning - the dynamism of the streets, making streets feel crowded and the apparent impression of crowd control.

I believe that architects and urbanists should by their designs try to consciously influence the behaviours of users. It is important to keep in mind both, the elements of engineering and social psychology, and how they can be tools designing human reactions.

„Individuals have no effective voice in any community of more than 5000 persons“ Christopher Alexander, A Pattern Language (1977), p.71

Conclusion: Different approached towards making the city liveable have proven to be fruitful, but all had their weaknesses, which are uncovered over time. Sennett implies that social...
psychology, or a more thorough understanding of „the crowd”, can solve those weaknesses.

**Cite and ville divorce (Chapter 3.)**

In third chapter Sennett considers the disconnection between cite and ville.

The Chicago School - analysing and observing the community. Idea traced back to Thomas Hobes (XVII century) - based on that sociologist Ferdinand Tonnies (XIX century) made distinction between 'community' and 'society' (Gemeinschaft and Gezellschaft), he shrunk the cite: life is local.

The work of Chicagoans emphasized the cite, but neglected the ville. This manifests itself among a Park-Burgess' bull's eye target to represent the image of the city. The idea didn’t work because of too big simplification in comparison to the reality, as “big cities are made up of messy blobs and odd shapes”. On the other hand, CIAM focused on ville. Le Corbusier’s plan to transform Paris in 1925 with enormous X-shaped towers on a grid seemed to solve the problem of bringing light and air into mass housing (opposing to Cerda’s original plan). He tried to work out the most efficient plan for people to live in “a machine for living” in both: house and the city.

For CIAM three-dimensional modelling was important, so that you could immediately know why the structure is there, just by looking. They were searching for generic plans for the functional city.

In the last part of the chapter Sennett presents the opposed views of Jane Jacobs and Lewis Mumford for the opening of the city. Jacobs was mostly focused on social aspects of life, “eyes on the street” and opening from the bottom up. Mumford, with ideal of the “garden city”, was sure that challenges have to be met first at the level of the ville. He mostly criticized Jacobs idea that the integrated system can’t be created bottom-up and she couldn’t scale up from the local to the urban.

The discussion between two views of J. Jacobs and L. Mumford brought by Sennett brings questioning of how can we approach designing according to bigger scale. The approach of Jane Jacobs, that is strongly focused on social aspect, rises problem of scaling ville to bigger area. Example of Tietgen Dormitory in Copenhagen is modern design, that approaches the community and communal spaces. It can be considered as Jacob’s approach, with eyes on the street and surveillance. With the interviews of people living there, we could actually understand the problems on another level, than only from architects approach. For example, that students didn’t integrate with other flats and that feeling of community was not
strong enough with the whole building. Can it be improved or is the scale (360 flats) already too big?

The example of Brasilia - the city designed from scratch, was difficult to approach by people who couldn’t afford living there, so that they “designed” their own urban planning around, according to their culture, behaviours and habits. How much can we introduce new way of living to people?

How to can both views of designing bottom-up or top-down contribute to making cities more desirable to dwell?

**Klee’s Angel Leaves Europe**

*(Chapter 4)*

In chapter 4 Sennett brings divorce between cite and ville on another level. On one hand the introduction of global cities (Saskia Sassen), the network they create and how detached they are from actual local place or nation can show that ville started to evolve in a non-physical way. The physical ville can be shrinked to the very small size of the neighbourhood, while at the same time we can contact people around the world and order goods online, without moving from home. Also the process of globalisation itself can lead to blending cultures. We can observe the same typology of individuals units clustered around one common courtyard. That example we already saw in Shikumen, Iran’s Shushtar-Nou and in slightly different form of Tietgen Dormitory in Copenhagen (bringing more units around one communal space and distributing them also vertically). Up to which point is it copying, inspiration and when it becomes introducing new cultures? How do we know if we create different/the same typology? Can we copy it and adjust the same type to different cultures? Can it work in different climates?

The problem of the density and gro-
wing the cities raised my questions: what is the maximum capacity? How far can we let cities grow and make sure they still function? What is optimum size of cite and ville? And how to help people who occupy but not dwell?

I think transitional spaces such as communal gardens are key to help people dwell, feel like home and familiarize the space. The incorporation of those common spaces, that we also saw in shikumen, shrink the size of the whole city and help to create communities, which I believe is one of the most important factors to create healthy environment.

Is the globalisation beneficial for humankind in a way of blending cultures? Can we say that similarities in dwelling typologies come from sociological needs of people or are the cultures so different that some solutions can’t be introduced to different social groups?

**Tocqueville in Technopolis**

*(Chapter 6)*

In 6th chapter Sennett refers to the technology as the threat for the society. He states that “technology will solve what sociology cannot, sorting and smoothing the relations between people”. The idea of the smart city became actually two different kinds: prescribed - that dumbs people down, because of the lack of complexity, and coordinated - the one that interacts with people, self-criticizes, stimulates people and engages them in complex problems. The top-down technology of the prescriptive closed city provides user-friendly technology that lacks a struggle, which in consequence only works when people don’t think about it and don’t ask what-if? questions. As alternatives

Sennett gives example of the technology that is not only in service but also in charge (technology that controls activities or coordinates them).

Sennett questions that in the scale of urban planning, the city stupefies people, when they lack interactions with the surrounding. As an example he points that the highway which connects two places might be efficient, but it is not enriched with experiences - “(it favours) moving through space rather than experiencing place”.

Use of technology and its accessibility definitely influenced the development. But depending on the ways it is used, the result on people differs. Instead of prescribe it should provide. Easy access to technological solutions may lead to automatic work instead of questioning of what we do and why we do it. The close example (I believe) is the way that architecture students

the easiness of using solutions that people know and understand depends on the social group

the new ideas must be present in user-friendly way to encourage interaction instead of cutting users off
decide to sketch their ideas and draw first propositions for the projects.

During my bachelor in Warsaw, my supervisors used to tell students not to use overly-smart programs as ArchiCAD. They feared that the program doesn’t give full freedom, but rather the flexibility to work efficiently on further stages of the design. Weather it is “old-fashioned” paper and pen, physical model or simple SketchUp, those tools allow certain sketchiness of the idea without closing it in frames of wall with certain thickness. [The same tutors prefered when students used AutoCAD instead of ArchiCAD, because then “every line matters” – they are draw with intention.] Back then I thought it comes from their fear for the new technologies, that they didn’t knew yet. Now I understand the other point. Yet I believe that every method can be right, until it is used consciously.

The technology that makes people’s life easier doesn’t necessarily need to be stupefying. It is important for everyone to question their choices, leave space for doubts and not to take everything for granted.

“The stupefying smart city (is) a place that works well so long as you don’t think too much about it” (R. Sennett, p.158), but acc. to the paradox of choice, the elimination of choices reduces anxiety. How to find the balance?

The competent urbanite (Chapter 7)

In this chapter considers various ways of perceiving a city. He begins with the concept of “street-smarts” as people, who get knowledge from living in the city. He uses it as an introduction to the distinction between two terms: “erlebnis” and “erfahrung”, as the realm of wandering flaneur – a more open spirit (“erlebnis”) and the qualified flaneur (“erfahrung”). The conclusion he states is that “more erfahrung means less erlebnis”.

The other sense of the perception that Sennett presents in this chapter are shown in different scales, that philosophers and architects used in history. He reminds the observation of Haussmann about perceiving the street with different speeds. Then he lays various physical scales, from Leonardo da Vinci (Vitruvian man), Le Corbusier (Modulor), Allan Jacobs (60-degree cone of vision) and Jan Gehl (movement oriented measure). He concludes this part with his own deduction that “human scale is established not simply by moving, but by moving in a way which is puzzling”.

The last part of the chapter is a try to give tools for designers (especially urbanists) to talk to future users, to unable the dialog with future users of the space: hearing the unsaid, the declarative and the subjunctive voice, the “it voice” and informality.
The observation of different tries to catch the perception by different architects and urbanists made me realise, how many different attempts and angles we can try to consider as designers. I think it’s very important to be conscious of those ways, yet of course very difficult task. It’s not only how we design the architectural space to function, but how people (as users) approach it and how human perception changes while following the narrative of transition between the places.

**Five open forms (Chapter 8)**

In this chapter Sennett seem to provide solutions that would lead to open form in architecture and urban planning. He provides examples followed by concrete, though already known solutions.

The idea of “the membrane” is well explained in the third form. Sennett first uses the example of Nolli’s map of Rome, where buildings were black, but the interior of Pantheon was left white - because it was used as public place, where people could meet. The same graphic principle used on Plan Voisin by Le Corbusier shows the distinction between open public space between x-shaped towers with their public space around, and streets and squares in old urban tissue. This comparison prepares the reader to understand the distinction between borders and boundaries. In La Marqueta, New York, the street could have been transformed from the border to boundary by placing market between rich and poor. This way it became connection and place to serve both groups - that leads to open form.

The fifth form that he calls “seed planting” is the least obvious. It sums up previous forms, but refers to the context. Just as throwing seeds in the ground - using the same tools, may lead to quite different solutions. As the open form of “coordinated” plan, it does not tell the user exactly what he should do, but rather provides the tools where people can decide what they do and how they use the space.

After the lecture of this book I have quite mixed reflections. The complexity of previous chapters and provided analysis (historical and theoretical) built high expectations for the open-form solutions. Yet the examples seem logical, but very simple. Clearly explained difference between borders and boundaries didn’t bring the new understanding of the idea, but rather helped to look more consciously on how the space is created. Though while reading about the fifth open form, my mind was shifted towards other perspective: it’s about challenging and questioning, instead of providing/living a stable and balanced life (“cause it would lead to losing energy in the city”). Perhaps it is about making conscious choices, while using the same old tools that we already know, but need to rediscover. Especially nowadays, when people (so architects and architecture-users) are overstimulated, it is mindfulness and consciousness that should be promoted, rather than constant expectations for more.

Architects shouldn’t search for new urban/spatial solutions, but rather use and explore ones that are already known and familiar to people (users).

How to re-invent/re-discover old (design) tools that we already know?
Toolbox

Based on the analysis of the chapters from Richard Sennett’s book „Building and Dwelling“ I created a toolbox - a set of principles that will be useful for my own design process. Just as in abstracts of the chapters, I didn’t always agree with the author and his point of view, but rather discussed proposals based on his and my own observations.

The matrix of the toolbox is divided into four levels, suggested by the Habitat Bill of Rights - the document that tried to define the principles of designing houses grouped into communities. The document was

<table>
<thead>
<tr>
<th>Urban community</th>
<th>Pedestrian precinct</th>
</tr>
</thead>
<tbody>
<tr>
<td>different characters of dwelling for different target groups</td>
<td>different characters of dwelling for different target groups</td>
</tr>
<tr>
<td>City design should be approached top-down, with strong rules that enables clear, integrated structures in order to stimulate small, face-to-face encounters on cité level.</td>
<td>taking into account the group size, relations between people and the privacy levels</td>
</tr>
<tr>
<td>Progress is not a matter of ignoring the past. Instead, one that moves forward should simultaneously spin around his own axis in order to look at past and present. Only when he has searched, assessed and embodied its qualities (cité as well as ville) can he make sense of the direction he goes</td>
<td>approaching the design top-down</td>
</tr>
<tr>
<td>&quot;There are two kinds of smart city, closed and open. The closed smart city will dumb us down, the open smart city will make us smarter.&quot; User friendly technology: enables new development / or / stupefies its citizens?</td>
<td>We can look at different cultures to search for inspirations, but we should always make sure to look back at our own culture, to the past and not copy “blindly” from people of different life patterns.</td>
</tr>
<tr>
<td>It’s not only how we design the architectural space to function, but how people approach it and how human perception changes while following the narrative of transition between the places.</td>
<td>Easy access to technological solutions may lead to automatic work instead of questioning of what we do and why we do it - but the accessibility also encourages people to use it.</td>
</tr>
<tr>
<td>Amenities on the border of the building next to the street side, to intensify the interactions between the street space and the building</td>
<td>Providing careful connection with the context with dedicated speed of approaching different spaces / HBR: entrance</td>
</tr>
<tr>
<td>Designing building as an urban dominant (!)</td>
<td>Inner courtyard of the building open as public space for people</td>
</tr>
<tr>
<td>Amenities on the border of the building next to the street side, to intensify the interactions between the street space and the building</td>
<td>Space between the buildings used for interaction of tenants (dynamic tension)</td>
</tr>
</tbody>
</table>
presented by Government of Iran to the United Nations Conference of Human Settlements in Vancouver in 1976. It considers following six scales: individual, dwelling, cluster, pedestrian precinct, urban community and region. For the needs of this project I only focused on the middle four.

One of the last chapters in „Building and Dwelling“ clearly presents particular open forms:


Cluster

benefiting from different lifestyles

taking into account the group size, relations between people and the privacy levels

globalisation vs. authenticity

 propose new way of dwelling, but reflecting on the current life-styles and particular needs of target groups

the easiness of using solutions that people know and understand depends on the social group

the new ideas must be present in user-friendly way to encourage interaction instead of cutting users off

Adjusting common spaces to particular users

propose new way of dwelling, but reflecting on the current life-styles and particular needs of target

carefully designed spaces that provide specific proportions according to human perception (more thoughtful than only minimum)
carefully designed spaces that provide specific proportions according to human perception (more thoughtful than only minimum)

Providing flexible space for different activities:
- corridor --> place for meeting and interaction
  - living room
  - common kitchen

Providing spaces with different privacy levels

Providing common living spaces in the “heart” of house, but also using space privacy gradation (from the most public to the most private) to encourage interaction between tenants

Dwelling

Cluster Dwelling

various flat types families

young couples singles

Common spaces on the border of the communication spaces to encourage an interaction between other tenants

Flexible spaces and incomplete forms to let tenants decide how they want to use it and develop on their own

“Seed planting” activities for accidental interaction of tenants, with and between each other
Site analysis and urban plan

The collage of the first impression from Minervahaven in Amsterdam is based on the feeling of disconnection present on the site.

The buildings are standing out. Every one of the offices tries to be an icon. They lack of connection with the place and with the ground. But the relation between them exists mostly because they stand so close to each other.
sented by three metal tables with benches, that are placed in unmaintained area, surrounded wild high grass.

The water surrounding the site definitely represents the potential of the location, but is still used by boats, that are remains of industrial activity, which was placed and is still present to this days.

The dashed lines between buildings symbolise the illusory relation between the buildings. The connection seems to be only present due to close distance between the side facades.

**Historical background of Minervahaven**

Amsterdam as the capital of the Netherlands is the largest city with 800,000 inhabitants. In 17th century Amsterdam grew into one of the most important port cities in the world. The city is the cultural capital and financial centre of the country.

Havenstad is an area located in northwest of the city centre and the largest part of it is in between the city ring (A10) of Amsterdam. It is arranged as a harbour area and thus the location at the IJ is crucial. The municipality has the vision for the area to dwell and provide work space for 150,000 in the future.

Minervahaven is located between the Mercuriushaven and the Nieuwe Houthaven. The surrounding industry causes noise nuisance, but from 2030 the municipality wants the residential buildings to arise, and therefore slowly remove the port industry from the area. Minervahaven has two piers, of which the one in the east has turned into the Fashion pier with

The space between them is sometimes defined by common squares (especially on Fashionpier), but it remains empty and is lacking the interactions between users during the day.

One of the few places to sit is repre-
the offices of famous fashion brands. So far the location is mostly occupied by the companies, but the ambition is to provide the area with 80% of residential buildings and only 20% of the offices and other amenities.

Urban and master plan

As the part of the location research I made various analyses, followed by urban and master plan, together in the groups of four Msc3 students.
the density of the whole site even more. Those icons were supposed to work also as orientation points - often breaking very rigid structure of the linear streets and canals. Our urban plan was prepared basing on the same values and to explain different aspects of it, we prepared various diagrams, drawn by Sjoerd, of which a few I decided to include in this report.

**Public transport and car access**

Important part of the new urban plan is the aspect of transportation. We were told by the representative of the Municipality of Amsterdam, that their wish is to reduce the car access to minimum, as much as possible, and to promote better public transport. For this reason we included in the central part of our plan metro station - favourably connected to one of the dominant buildings, with direct connection to public facilities and to the waterfront. Secondary transport are two bus stops, strategically placed at the entrance to the plan and next to Fashion Pier -
district that we decided to be valuable, as an icon of the plan and important work place. Additionally also near to the Fashion Pier we placed possible connection with the ferry. Obviously car access is possible to all buildings, due to the safety reasons - ambulance or fire brigade. Though, we designed the streets between buildings thinking about pedestrians and cyclists, so that the plan is people-directed. Most of the streets are one-way streets designed in loops.

Public amenities

To direct the focus in particular places of the plan we tried to predict where the public amenities are most desirable. First is the main street, leading towards the pedestrian and cyclist bridge that in the future will connect two neighbourhoods. Secondly in each dominant it is planned to place commercial locals, with special accent for the place in the middle of the plan, where the attention will be also focused on the connection with the water activities, such as swimming place and cafe's.

Zoning for different target groups

To promote and bring diversity to this quite homogenoeus plan we proposed five various house typologies. Each of them: perimeter block (1), terraced houses back to back (2) or double sided on the water side (4), block of flats with staircase (3), could be placed in the configuration of the long line of building and is directed to different target group. We made calculations about the potential sizes of those and the density (units/ha) that they provide, so that the architect that is given the plot, can decide what typologies and how can he mix them to provide particular density (not smaller than 200 units/ha for low rise). The fifth type that we introduced are the roofscape (5a and 5b), that are another layer of living for solo dwellers and couples, with the qualities of living in high density and not experiencing it.
Public amenities

Zoning for different target groups

Roofscape possibilities
This way the rules for the master plan build up to the example of urban plan, executed in Minervahaven area. We presented the result in the urban model in scale 1:1000, with the distinction for the tenement houses with roofscape layer and volumes of the iconic buildings, as a representation of accent boosting the density of living units. Various zones are visible in the different typologies of low-rise row houses, as proposed in the typologies as the reflection of needs of different target groups.
CASE STUDY RESEARCH

Mehr Als Wohnen came about in response to Zurich’s inner-city housing crisis. The city has been experiencing, just as many of the urban centers, a sharp rise in its housing costs. In response, the City of Zurich organized an open design competition on a former industrial site.

A series of subsidies are offered to low-income earners, and 10% of the apartments are allocated to charities and not-for-profits, including an orphanage. The result is a development that includes a mix-

House A / Mehr als wohnen / Zurich, Switzerland

Amount of dwellings: 60
Dwelling types: 20 single-, 40 double-room apartments
Other functions: Common spaces and community facilities for tenants
Target groups: Small co-operatives
Size: 6880 m²
Architect: Duplex Architekten
Year: 2009-2015

Source: Duplex Architekten
ture of people, ranging from recently settled refugees to middle income professionals.

At Mehr Als Wohnen, the architects have been encouraged to explore new modes of planning and organization. The development thus proposes a variety of new ways for people to live together co-operatively.

A product of this experimentation is House A, a ‘cluster house’ designed by Duplex Architekten. This contemporary interpretation of a share house allows people to live with varying degrees of privacy and autonomy. Architecturally, this is achieved by arranging a series of small, apartment-like units around a generous common space. These joint living rooms provide a space to come together and socialize, with the option to retreat to a private apartment – equipped with a bed, bathroom and kitchenette.

Mehr Als Wohnen is a large-scale prototype for multi-residential housing. It transforms a once neglected neighborhood into a welcoming and diverse civic quarter filled with a genuine demographic mix. As a model, Mehr Als Wohnen is experimental and collaborative, encouraging new modes of living and working in close proximity. In such a way it is, as its name suggests, much more than housing (Duplex Architekten).

Location

The complex consists of 13 buildings designed separately as cooperatives. It is located on the outskirts of Zurich, between Hagenholzstrasse and the railway tracks, and is close to the Schule Leutschenbach – school’s building designed by architect Christian Kerez.
Each of the buildings has different level of collaboration and privacy for the tenants. The one that I chose to analyse, Haus A, has the biggest common-to-private ratio from all projects.

**Sun orientation**

The complex is designed in a way, that each building has between 6 to 8 floors and enough space inbetween to get enough sunlight. Haus A is located on the southern side of the site, therefore has the most of the sunlight. The external shape wasn’t especially influenced by the sunlight, but - as will be shown in following analyses - the interior and common spaces benefit from the light access.

**Acessibility**

The entrances to the building are located on both sides of it - from the public square of the complex. They lead to the main open core, located in the middle of the building. Due to it’s open structure through all floors, it gives feeling of open space and connection between all levels.

After finding themself on particular floor, tenants go towards their flat through the space inbetween, that is common for 4-5 flats. Common space of the cluster has functions such as kitchen and living space, that single flats are lacking. This way tenants are in some way forced to interact by passing the common space.

The routing towards the flat comes through spaces of different privacy levels: from outside (public), corridor common for the whole building, common space of the cluster (around 8 people) to the small private unit.

Transition from public to private: gradual.

**Social spaces**

Each of the floors consists of two separate cluster-like apartments. The size of each unit is around 8 people. In Dunbar numbers it lays between “the support circle” and “the sympathy circle”, therefore I can presume that the relations between tenants are still close and the comfortable atmosphere is still possible.

**Proportions: private / common**

Haus A is designed very specifically. The ratio between common and private is very high. Internal space dedicated to the communal activities takes almost half of the whole area. We can also distinguish different privacy zones, where different groups have access to them.

Common space: 3050 m² (46%)

Private: 3160 m² (46%)

Other internal space (staircase etc): 560 m² (9%)

**Outdoor space**

Each of the clusters have common balconies that can be accessed
from the collective spaces as well as from private units; they are located on every facade. Outdoor space on the groundfloor is dedicated for the community of the whole collective.

There is limited car access to the site, therefore it can be consider calm, safe and quiet.

**Amenities**

On the groundfloor there is commercial area with access from outside, used as occupational therapy workshop. Other special features of the building are workshops for disabled, gallery and raised groundfloor connecting to Andreas Park. Building doesn’t have internal parking space for cars.

Except of the common space in the large hallway of every cluster, there is also additional room located inbetween two clusters. There is also bike storage located on the groundfloor, next to the western entrance to the building.
Flat typology

Flats designed in the clusters are rather small - single and double rooms only, but according to the concept, they live in the bigger community with tenants in other flats located in the same cluster.

The location of each unit seem to be accidental. The space between them is used as the large hallway, kitchen, living space and community space for the cluster.

Flat 1

Example of flat for the couple: lettable floor area 42 m²

Located on the NW corner of the building. Windows looking outside at the square between other buildings from the collective. Consists of a living space with a kitchen, a bedroom and a bathroom.

Flat 2

Example of the flat for single: lettable floor area 28 m²

Located on the western facade, with single window in the bedroom. Consists of a hallway with a kitchen, a bedroom and a small bathroom.

Flat 3

Example of the double room flat for couple: lettable floor area 42 m²

Located on the western facade, with single windows in each of the rooms. Consists of a hallway with kitchen, a bathroom accessed from the hallway and two separate bedrooms.
**Flat 4**
Example of the flat for couple: lettable floor area 39 m²
Located on the eastern facade. The same typology as the first flat, with the difference that it’s located in the middle of the facade, not on the corner. Consists of a living space with a kitchen, a bedroom and a bathroom.

**Workshop space**
Single room: lettable floor area 26 m²
The only lightsource in the room comes from one window located on the eastern facade. A single room space that can be used for other activities, that tenants would like to execute in privacy. It has a single bathroom, without a shower.

**Flat 5**
Example of the double room flat: lettable floor area 32 m²
Located on the south-east facade. Consists of a hallway, bathroom and two bedrooms.
The street space continues upwards along the houses, with the stairs connecting the various plateaus. The stairs are a play area, seating area and viewpoint.

On the square there is a common area for children’s parties, (flex) workpla-
The load-bearing walls are used as home separating walls as much as possible, in order to meet the noise requirements with regard to contact noise. The core with the elevator and emergency stairs can be reached via the entrance hall on the Kratonkade (Laurens Boodt Architects).

**Location**

Babel project is located next to Schehaven, between Krantonkade and Loods Celebes. The building is visible already from the streets when approaching it, but also it is next to the water, therefore it can be seen with its outstanding shape from the other bank of the old harbour.

**Accessibility**

The building is located in the corner of the perimeter unit. The access to the site is directly from Krantonkade. On the groundfloor there are

...
entrances to apartments located in the groundfloor, to the main staircase, gate to the garage and to the outdoor terraces on every level.

**Sun orientation**

External facades from the street side are from the northern side. The building was shaped in a way that especially the southern side of the shape creates external space to meet with other tenants - there are not only private terraces accessed from each apartment, but also the same outdoor space on each level creates one long routing through every level towards the top of the building.

**Social spaces**

Common space inside the building is located on first level. On this floor there are no entrances to the flats - they are double floor apartments with entrance to them form the ground floor. This means that the access to the common room is equal for everyone, but on the other hand there is no opportunity to pass it accidentally.

According to Sennett, it is beneficial to place common spaces and amenities on the borders, because they encourage the interaction.

Transition from public to private: rapid.

**Proportions: private / common**

Design of the building is very efficient. The only internal space dedicated to the community is located on the first floor (see the diagram on previous page). On the other hand, the amount of the external space that is dedicated for all families as semi-private terraces seem to compensate for this single common space.

Common space: 60 m² (2%)

Private: 2430 m² (81%)

Other internal space (parking, staircase etc): 510 m² (17%)

**The size of the community**

The community number per staircase / the building is 25 flats (around 90 people). It lays within the optimum number of the flats per cohousing cooperative (between 12 and 30 flats).

The number of flats per floor is either 6 flats (0, +2, +4) and 4 flats (+6). This means around 18-20 people per cluster. In Dunbar numbers this fits into the concept of “super family” and lays still in the sympathy circle.

**Outdoor space**

The building has extensive outdoor space on every level, due to narrowing the flat size towards the core with the staircase. It is an extension of every flat - that it has outdoor space, just as typical single house. This design decision let to keep the quality of single family house, and at the same time provide truly urban density of the building (259 units/ha).
Another quality of this outdoor space is that it connects all flats together, just as the street. It helps to build the feeling of the community among other tenants, by sharing their semi private terraces as a path towards the top of the building.

**Amenities**

Babel doesn’t provide other amenities for tenants or local people. Ground-floor from the street side is occupied by the flats - with extended outdoor space on the street; from internal side (of the courtyard) it’s occupied by internal garage for tenants (30 parking places).

**Flat typology**

The main routing to the flat is relatively short and leads only through the internal staircase and very short corridor with entrances to 4-6 flats per floor. Therefore the transition between different privacy zones in quick: from the street level (most public) tenants go inside the building and with the lift or staircase (collective) they can go to their flats.

In this routing there is no common space on the way, when inhabitants can spend time together - as it is located on the first floor (there are no entrances to the apartments on this level).

If we want to consider outside routing to the flat, it is optional, but there is no entrance to the flat - only possible to enter it directly to the living space through the terrace door. Someone who decides to follow this path, will definitely experience more of the community life - the routing itself is semi-public area with the visual connection with every flat. It is physically longer and the wanderer has experience of walking the street.
and passing different houses with external spaces.

All flats in Babel project are double floor apartments. This design decision has following consequences on the quality of life:

The division in the flat for the living space and private bedrooms is very clear - as the entrances, living rooms and kitchens are kept on the lower level.

The level with living space has an access to the terrace (semi =public, collective space). The terrace itself is relatively narrow (around 2 metres) - for tenants it gives more of a feeling of the real street outside than the balcony. For every flat there is additional outdoor space taken from the volume of living space, that gives more privacy than the “street”. Other inhabitants that are passing the flats don’t have the experience of crossing by the very private space that belongs only to the flat.

The living space on the lower level is very open and spacious - with an open kitchen and dining space that transitions to the living room.

The upper level with bedrooms is designed very efficiently. Every tenant has their private space in bedroom, that has view on the street through the windows. The shape of the building didn’t allow architects to propose private balconies on those levels.
La Borda / Barcelona, Spain

Amount of dwellings: 28
Dwelling types: Double bedroom flats: 40m², 60m², 75m²
Other functions: kitchen-dining room, laundry, multipurpose space, space for guests, health&care space, storage, patio and roofs, central courtyard
Target groups: Young families
Size: 3000 m²
Architect: Lacol
Year: 2017-2018

There are three fundamental and cross-sectional principles of the project, (i) redefine the collective housing program. The building program proposes 28 units (40, 60 and 75m²) and community spaces that allow stretching the fact of living, from the private space to the public space to enhance the community life. All of the supporting functions are articulated around a central courtyard, a large relationship space reminiscent of the “corralas”, a typology of popular housing in parts of Spain.
(2) sustainability and environmental quality. The objective is to build with the lowest environmental impact possible, both in the construction work and during its life and, above all, achieve comfort in homes with minimum consumption, to reduce the overall costs of access to housing and eliminate the possibility of energy poverty among users. We started from the conviction that the best strategy is to reduce the initial demand of all the environmental vectors of the building (energy, water, materials and waste), especially at the energy level, where we prioritized passive strategies to achieve maximum use of existing resources.

(3) user participation. Self-promotion and subsequent collective management implies that the participation of future users in the process (design, construction and use) is the most important and differential variable of the project, generating an opportunity to meet and project with them and their specific needs. During the design, the participation was articulated through the architecture commission, which was the link between the technical team and the general assembly, and the one in charge of preparing the architectural workshops. We have conducted an imaginary workshop, program, project strategies, environmental strategies, typology, and sessions for the validation of the preliminary project (La-col).

Location
It is located in the very dense area of Barcelona. The building is facing the street on the northern side, a courtyard on the southern side and has a close relation with neighbouring buildings.
Accessibility

The access to the building is from the street side with the open passage leading to the backyard. The fact of the rather narrow street that is located on the northern facade influenced the internal shape of the flats: those on the southern facade (with a lot more of direct sun access and more free space) have the depth of even more than 10m; those on the northern facade are only 5-6m deep.

Sun orientation

The sun access is a crucial aspect of the project. The typology, that was used to designed this building, is based on the internal courtyard. Therefore the flats are shaped around internal galleries and have a sun access from the top glazing above the void.

Social spaces

There are various spaces ment for the residents of the building. On the groundfloor there is common kitchen and dining room. First floor offers a multipurpose space and storage. Second room has a guest room and health care room.

Common space inside the building is located on each level as an internal courtyard with gallery. Additionally there are flexible spaces around the courtyard, organised that they can be accessed from both flats, and the gallery. This way of organizing common spaces definitely encourages interactions the most, because of the close contact with other families.

On first floor the gallery was extended with the view to the street side. On fifth floor level it is extended outside for the common terrace. The use of this void not only brings more opportunities for interactions on various levels vertically, but also brings more daylight to the whole structure.

Transition from public to private: gradual.

Proportions: private / common

Design of the building is rather efficient. There are flats located around the inner void with sunlight access from various directions. There is no strict common space, but more of the collective open space on the edge of the flats and corridors. Every flat is designed with a decent amount of privacy.

Common space: 900 m² (30%)
Private: 1860 m² (72%)
Other internal space (commercial, staircase etc): 240 m² (8%)

The size of the community

The community number in the building is 28 flats (around 80 people). It lays within the optimum number of the flats per cohousing cooperative (between 12 and 30 flats).
The number of flats per floor is between 4 to 6 flats. This means around 18-20 people per cluster. In Dunbar numbers this fits into the concept of “super family” and lays still in the sympathy circle.

**Outdoor space**

The building has outdoor spaces on every level, accessible from the flats as a common terrace. On fifth level there is a terrace with access from the main courtyard, for every resident.

**Amenities**

There are amenities provided on the groundfloor: a public alley with an entrance to the public inner courtyard and commercial local.
**Flat typology**

Design of each flat is relatively flexible in a way that one of the rooms located close to the internal void can be accessed from inside the flat, as well as from the common space. Therefore it can be either isolated for other users and guests, or only used by the family that occupies the apartment.

The floorplan with the void made it possible make light access to the flats from both sides - internal courtyard and the outside of the building.

**Flat 1**

The flat has main living space stretching from the internal corridor to the outside facade. The space is divided by the bathroom in a cubical shaped with kitchen anex, therefore it remains open but clearly organised in different spaces with smooth transitions. Bedroom and the living space can be accessed not only from the main entrance to the flat, but also there is a possibility to open them directly to the common void. This way the privacy level is fading and makes the tenants integrate more with each other.

Windows of the living space are opening towards the southern facade, where tenants share terrace with other families.

**Flat 2**

General outline of the flat is very similar to the previous one: main living space is divided by the cubic of bathroom and kitchen anex around it. One of bedrooms is located on the side of the internal courtyard with common space; second one has access to the common terrace. Additional room is introduced in this flat: it is proposed as working space and can be accessed either from the com-
mon corridor, or from the living space of the flat. It remains flexible, as it can be easily joined to the flat by divisional wall with sliding doors.

**Flat 3**

Third of the flats has windows from the street side, thus it is not as deep as flats located on the southern side of the building - it is only 5m deep, while the other side has rooms with depth exceeding 10m.

The living space is smaller than in previous examples. Kitchen and dining space are located in the separated room. Additional feature of this flat is a small bedroom with the access from the flat and the common corridor.

The door leading to the corridor and efficient design suggest that it is meant as a guest room - for temporary use, with the possibility to include the room to the apartment.

**Flat 4**

Fourth flat has the main entrance opening directly to the living room and further to the dining space with the kitchen. Bedrooms are designed very efficiently - to provide sleeping and working space along with the wardrobe/storage. Second bedroom as in previous example has access to the corridor, therefore it can be excluded from the flat and used as a guest room on its own.

The design of all flats is very flexible - considering the multipurpose rooms, that can be either joined or detached from the circulation of the flat. Also the amount of the doors to almost every room shortens the physical distance to the common space, as well as the psychological barrier to experience the life of the community.
**Tower within a tower / Hong Kong**

Amount of dwellings: 8 apartments per module

Dwelling types: experimental 4 floor apartments: studio units, couple units and family units

Other functions: Common space between floors

Target groups: Young singles, couples and young families

Size: Varies

Architect: Kwong von Glinow

Year: Concept: 2017

Towers within a Tower brings Hong Kong’s urban verticality into the apartment units themselves. High-rise living, the twentieth century’s solution to urbanization on an unprecedented scale, has been a double-edged sword to cities: witness the wane of residential communities within the pancake stacks of apartments. Is the tower the antithesis of community? We think otherwise. Towers within a Tower is an alternate Tower typology that uses verticality to the benefit of community. Apartment spaces – the bedroom, kitchen, living room,
bathroom, study - inhabited as cells in a horizontal field, are instead stacked one atop the other.

Each apartment thus becomes its own Tower. Aggregated within a structural 5mx5m grid, these Towers curate a common space within their fold, a local neighborhood at every level. Each resident can rightfully lay the claim “That’s my tower” without sacrificing the feeling of the community.

Each unit type is composed of prefabricated elements. Once assembled into boxes, it can be easily mounted onto each other apartment with cast-in steel-plate embeds. The concrete frame is clad with colorful ceramic tiles highlighting the common construction material of residential towers in Hong Kong (Kwong von Glinow).

**Location**

The location of the building can’t be discussed, as it is only provided as a concept. Though the project provides variation of stacking a 4-floor high modules on top of each other, as an answer to new sky-rise-like typology, or next to each other in lower parts of the cities.

**Sun orientation**

The shape of the project doesn’t favour any of the facades to the sun exposition. The voids between flats are supposed to be used as vertical visual communication between tenants; and also bring a lot of light inside the core of the building.

**Social spaces**

The core of the project is ment to be the common space. The voids between different levels are supposed to enhance visual contact with other tenants. The routing towards the flat leads through the common spaces. This way it gives an opportunity for interaction between tenants. Additionally, the vertical openings in the floors make the space more open. Transition from public to private is gradual.

**Proportions: private / common**

The concept of the building is proposed as an experimental approach to living on various levels.

Common space: 75 m² (30%)

Private: 150 m² (60%)

Other internal space (staircase etc): 25 m² (10%)

**The size of the community**

The community number per module is 8 flats (around 18 people). It lays within the optimum number of the flats per cohousing cooperative (between 12 and 30 flats).

The number of 18 people per cluster, in Dunbar numbers, fits into the concept of “super family” and lays still in the sympathy circle.

**Outdoor space**

The particular outdoor space of the project isn’t proposed, therefore will not be discussed.

Internal common space on different levels can be considered as balconies, because it has connection with an external edge and it doesn’t have external envelope on the facade.
Amenities and social spaces

Other amenities are not discussed in the project.

Flat typology

The project is the combination of three different modules of flats, dedicated for different target groups: the single unit of 32 m², the couple unit of 37 m² and the family unit 42 m². Every unit is unique in the proportions and organization.

All of them are combined around one core to promote the community ties between different groups.

Access to the flats is differentiated per two lower levels, four flats per floor (as can be seen on the first diagram).

Flat

Flats are designed in three types: a single unit (lettable floor area 32 m²), couple unit (lettable floor area
The studio unit is 32 m² big and designed on 3 levels, with 3rd floor of the height of two floors. The entrance is located on the middle level in the sleeping area. Use of the multiple staircases on various levels seem to be very inefficient, if we consider the proportions to the total lettable floor area.

The location of levels in case of privacy is questionable. Entering the unit by the most private part (bedroom) to move downstairs to the dining/kitchen part seem not to be a rational choice in western culture. Therefore the division for different zones is very clear.

Two-floor-high last level adds to the spaciousness of the space.

The family unit, not significantly bigger than the single unit (42 m²) is located on all four levels of the tower.

The entrance to the unit is located on the second level, through the sleeping zone. It consists of rather different zones (levels) than separate rooms. There are two sleeping zones, dining and kitchen zone, and working zone on the third level.

Again as in the previous flat, the efficiency seem to be low, because of many staircases that take a lot of useable space.

Due to the openness of the whole structure, there is not much privacy left for particular members. The flat has very few wall-divisions of the plan. Placement of following functions on different levels brings the privacy division in vertical dimension.
REFLECTION ON QUICK START

Form studies in Minervahaven

In order to understand the scale of the plot and start working on the design, I compared the projects from case studies and placed them on the plot in Minervahaven.

At first I placed 5 buildings from the urban plan of Mehr als Wohnen from Zurich to see the real distances. Next I was able to multiply one of the buildings that I analysed and place it on my plot. I repeated this step with the concept project of the tower from Hong Kong and Babel from Rotterdam, in both plan and isometric view. This experiment suggested me what are the possibilities of the site, how many flats of what type I am able to propose and what are visual and organisational aspects of each proposition.

First two projects were rather separate buildings; the combination of Babel created semi-perimeter block and became an inspiration for the urban solution.

As seen above, the maximum possibility of the plot, presented as the single volume did not appear as attrac-
tive in either visual scale or form. The numbers of maximum height (44m to the roof, 13 floors) gave a lot of possibilities to shape the building. The density required on the plot is set on 300 units/ha, which multiplied by the size of the plot gives the requirement of at least 240 units. During my experiments with locating projects from case studies I was able to estimate the amount of flats, that each combination provided. First proposition resulted in 231 units, second with 400, third one only 200.

Though the combination of all three projects resulted in total number of 325 flats of very diversified relation between private and common space. The visual representation wasn’t coherent and clearly shown three separate and vary different buildings.

The result of the previous studies became an inspiration for the perimeter-like shape consisting of 8 towers connected with each other. This combination of Babel’s (project located in Rotterdam) was possible, because the building is the corner infill, connected to the other blocks.

**coliving: 141 flats**
13 floors (11 flats/floor): 250 people
5,700 m² (~40 m²/flat)

**3 towers: 81 flats**
12 floors (3 modules): 160 people
6,000 m² (~75 m²/flat)

**100 flats (4 blocks)**
10 floors: 400 people
10,000 m² (~100 m²/flat)

**in total:**
325 flats
810 inhabitants
21,700 m²
It gave urbanistically very interesting result of two perimeter blocks with open courtyards towards each other and quite public space in between them (plan below). Yet when rotated two of the middle towers and connecting them with each other, two courtyards were connected into one with more open and coherent space (plan on the next page). The transition of spaces in this configuration is more smooth and all towers, even divided, are perceived as one complex.

Following reconfiguration that I prepared consists of various flat types from the analysed projects. Depending on the size of the flat and mobility of the tenants, I proposed three types of the apartments: single floor for solo dwellers or people with reduced mobility, duplex for couples or families - because of the clear division between the common and private zones in flat arrangement, and apartment of four floors for families that need more space.

The idea behind dividing the perimeter block into eight tower-like shapes was to show the subdivision for separated communities. I tried to follow this path by proposing vertical segmentation of every tower for small-
ler tribes that could share similar lifestyles, hobbies, or just have similar family structure. For that reason second floor was only occupied by singles (floor plan based on Haus A from Zurich), next four floors were mix of families that could interact on different vertical levels. This experiment of the transition spaces I was able to research further and really perceive by the use of virtual reality.
My research in virtual reality was mostly based on the form studies that I prepared for the quick start of Msc3. As the result of the previously mentioned workshops was building with eight tower-like divisions representing clusters, rather than final shape. Thus what I decided to research through the virtual reality was the perception of the spaces, while moving from the street towards the building, through the courtyard and finally exploration of the common spaces. I was focused to find out the variety of experiencing different transitional zones - so for example how does it feel inside the open for public courtyard, if user would feel rather comfortable or intimidated by the scale of the building. Of course those experiences can be different between users, yet the reactions...
of other students and tutors exploring my model showed me the range of feeling and if I am heading in the right direction.

I have to admit that from the beginning of the course I was quite sceptical about the use of the method of virtual reality as a research method, especially in this very early stage of the design that we were dealing with. Yet it appeared to be quite enlightening in case of perceiving the size of the project, proportions between the shapes and the space in general. It’s worth mentioning, that I didn’t have any experience earlier with design using tools offered by the virtual reality.

Although the way of approaching the buildings as well as visibility from the distance is crucial for any building, it seems to me that it is often left out in the process of designing. Most of the times it is just very difficult to take into account all points in the neighbourhood (or the city), from which the building will be seen. There are many examples of “city views ruined by the new architecture” – one of them is the office/shopping mall building Plac Unii Lubelskiej in Warsaw, that seen from perspective of the street was closing the composition of the street, by extruding the triangular shape of the plot. Unfortunately, after finalizing the project it appeared, that the tower is so high, that it ruins very iconic view for the Belvedere Palace built in 1820s and designed as dominant on the hill of Royal Baths Park. I noticed on my own design, that moving around the model in virtual reality is just so easy, that it could help to eliminate those design mistakes of big scale buildings.

My presentation started from the far view from the main street and as the user moved forward, he or she was fed new information and details about the project. Stading in front of the building (figure 1) the user could see the structure and location of each flat types between the others, and also what kind of target group is expected to dwell in it. The size of the whole shape was scaled down due to use of openings, terraces and smaller blocks. Additionally the division for eight towers showed clear structure and gave each of the tribes identity.

Another great feature of the VR, that
I saw in my project, is dealing with the space from human scale and perspective. It helps, first of all, to experience the proposed building from the level of the eyes of its users and question the functionality of solutions proposed in 3d out-of-scale model. The advantage for my design process was that I was able to move around the inner yard of the building and test how the geometrical landscape proposal will be seen by tenants - is there enough space for interaction? Is it tempting to stop and enjoy it?

To conclude I would like to add that of course VR as a tool is useful in the smaller scale, such as designing interiors or even details of the building, but in my opinion it’s the big scale that is more difficult to imagine and understand.
CONCEPT DESIGN

Design brief

The term ‘benefit’ that I used in the title of my thesis refers to the profits, that individuals and families gain from living in the community. The most important factors that I identified are that children learn to live in the community and therefore learn to help each other. The society loneliness decreases and as people share more common spaces, housing becomes more affordable. The population statistics of the percentage of households with children in families show that Amsterdam has one of the lowest scores, only 29%, thus the quality of the spaces may attract those families back to the city.

The research about the optimum group numbers didn’t gave a single answer of what is a particular number, but rather suggested several numbers and the qualities of the regulations that are created in the groups. Examples of the different typologies analysed in case studies gave me insight for the various approaches. Designs of the complex in Zurich as well as La Borda in Barcelona have very open type that forces interactions and therefore can be catalyst towards stronger social ties. On the other hand, Babel in Rotterdam is an example of the project that gives its users (here: families) a lot of privacy and considers more of the accidental interactions and meetings rather than the direct contact. It is also reliable source of the standard of living in the Netherlands.

The topic and literature research led me to the following design question:

How to provide highly urban residential building with suitable housing for the diversified group of urban families, in which they could live independently and participate in the community life?
**Ambitions**

My vision for the design, build on the research that I conducted, will be based on the following principles and ambitions that I want to fulfill.

- Flats designed on the technological grid of 6x6m, with possible variations of sizes and forms (single or double floors), to answer to the needs of various families.

- Rather small flats, due to the financial aspect: affordability, that will be also achieved by creating common spaces as an expansion of private spaces.

- Master plan for the location requires the amount of minimum 300 dwellings per hectare. According to the size of the plot, it means the requirement of at least 240 units. In order to provide good functioning of the communities, dwellings will be grouped in smaller clusters - accordingly to the optimum size.

- Daylight access and broad views for all flats.

- Communal spaces of good quality: rooms for events (to invite friends, family etc), workshops and hobby rooms, laundry room, chill rooms with games, gym, guests rooms, living rooms, flexible spaces, gardens, common terraces and activities on the courtyard, storages. All spaces will be provided for the particular group, depending on the needs and the level of privacy (e.g. laundry rooms for couple of flats - one per floor, but gym can be open for everyone from the block).

- Sustainability of communal spaces: good acoustics in areas used for social events and meetings; optimum size of the spaces (spacious or cozy enough, according to the purpose).

- Local public amenities and commercial locals from the main street of the urban plan.

- Modular technology of the construction.

**Design concept**

The building is shaped in a way that clearly presents the division for the particular clusters - each of them is housed in the separate tower-like shape. Additionally the block is shaped in peaks and valleys that visually divide it, so that the whole structure doesn't look as massive, allows more light inside the block, allows for the views through and around...
the building, provides visual interactions between tenants of other clusters: views from the terraces on various levels. From primarily shaped volume of 6x6m blocks I removed one cube of 3x3m - it introduced additional outdoor space and visually scaled down the form closer to the human scale.

To provide similar quality of the communities - which optimum number is up to 40 dwellings per cohousing - I aim to locate rather smaller flats in the southern volumes, and bigger units in the northern towers. This way I want to propose various quality of the communities among the volumes of different sizes (diagram D0.)

**Dwelling types**

In order to provide affordable housing, the project will be based on the modules 6x6m for the construction grid. The arrangement of circulation will make it possible to fit varied range of the flats. To meet the standards of various families I proposed different types and sizes of apartments, with the depth of 6m. To know the demand for each type I made an estimation based on demographic statistics of the dutch families: therefore my aim is to provide around 40 single bedroom flats, 105 flats of 2-bedrooms, 70 flats of 3-bedrooms and 25 flats of four and more
D1. Shaping the form (lower on the southern edge; the northern higher)

D3a. Circulation and accessibility: entrances to the 6 staircases (smaller communities)

D3b. Circulation and accessibility: shaping internal circulation on module 6x6

D4a. Views for the water and surrounding

D4b. Visual connection between tenants
bedrooms (the numbers are a rough estimation and the amounts in final design may vary between 5-10%). Parents expecting a child were included within a group that already has an additional room.

**Design concept**

The shape of the building is based on the perimeter block with inner courtyard. The block was shaped according to the orientation (diagram D1.) - the part on the south is lower (up to 8 floors) to provide sun access to the courtyard, the part on the north is higher (up to 14 floors).

The organisation of the public facilities around the building is focused around the western facade that is facing the biggest street of the urban plan, leading to the pedestrian bridge (diagram D3a). Other three facades are mostly given to inhabitants (diagram D3b). Nevertheless, on the north and east side the building is facing the water, thus it seem to be naturally best to propose public activities on the waterfront, yet moved away from the direct contact with the building.

In order to make the building visually smaller and visually more attractive, it is shaped as 6 towers, which all are separate communities. The valleys between the towers are used for common and private terraces. Each community has the core with lift and two staircases (diagram D3a.); the organisation of residential floors is set at module of 6x6x6 (diagram D3b.), where the internal module is meant for the circulation and common activities, and external modules from the facades are meant for flats. This way the privacy was scaled: the groundfloor is occupied by the public (commercial locals) and common activities; flats are located
on the higher floors.

Important aspect of the design was to obtain optimal daylight conditions (diagram D2.) and views for the water and surrounding environment. The peaks and valleys create visual connections with the Haven even for inhabitants of the southern west and middle tower (diagram D4a.) and between tenants on various levels and different towers to enforce the feeling of living in the community (diagram D4b). Due to the valleys the daylight is present in every flat, even those inside the courtyard and on northern facades - also thanks to the orientation of the plot which has longer sides pointing towards NEE (diagram D2).

Parking places for tenants are provided in the level below the groundfloor (diagram D5.), so that the cars aren't visible from the street and eye-level can be left for catching and entertaining activities, interesting for inhabitants and people walking by. The access is led from the street on the southern side, thus the eastern and northern facades are car-free and waterfronts are left for pedestrians.

Courtyard inside the perimeter block remains open on two sides, on the longer facades: northern and southern. This internal space is dedicated mostly for the tenants and since the plot is located in highly urban environment, I proposed to plant extensive greenery to bring more nature and create a contrast with the surrounding (diagram D7). Particular species of trees and plants will be proposed on later stages of the design, based on the climate and soil possibilities and the maintenance map of City of Amsterdam. Due to the presence of trees and plants on the patio at least one metre of the soil is required. In order to do that the level of the courtyard was lifted about this one meter above the surrounding, therefore people approaching the inner space have stronger perception of transitioning between different zones, due to this height difference.
Benefit of the common

Common and public spaces located on the groundfloor:
- commercial locals
- waste
- entrances and circulation rooms
- kitchen for events, workshops, gym
- guest rooms
- bike storages
- entrance to the parking

Common spaces for inhabitants located on the floors 1-12:
- living rooms
- chill spaces
- laundry
- gardens
- terraces

Floorplan +2
Floor -1

Other spaces located on the floor -1:
- parking (>120 places)
- storage units
- technical rooms
Above: Impression on street level of spatial qualities of the concept design, view from the main street

Right: Impression of spatial qualities of the concept design, view from the common terrace towards the inner courtyard
REFLECTION REPORT
ON DESIGN RESEARCH

Preface

During the Dutch Housing Graduation Studio, I have been working on a cohousing project for the community, based on the theory of Robin Dunbar of relationships in group sizes. During the months of researching and designing, I have used various ways of doing research and each of them had influence on the design process and the design itself.

This report will reflect on research methods that I have used, the relation between research and design, and dilemmas that I encountered in my design process.
**Introduction to reflection**

The last project of my Master studies at TU Delft I decided to make in the Chair of Dwelling, Dutch Housing. The main question of the graduation studio is “how do we want to live in the future and what kind of buildings do we need to make that possible?” and the topic is “between standards and ideals”.

In order to identify the challenges that Amsterdam is facing I conducted research that became a basic for my graduation project. The final design is an attempt to find an answer for the lack of suitable family housing in the city and decreasing feeling of creating a community.

The first part of this report presents my reflections on the methodologies used in particular phases of the graduation: the research- and the design phase. This chapter elaborates on the variety and validity of approaches. It is a broad explanation of the following steps taken in the research process, from the problem analysis, through concept design and finally to development of the project.

Next chapter is the development and influence of the research on design. It is also a reflection of my graduation topic on the studio topic, master track and the master programme.

The following part reveals the transferability of the outcome in social, professional and scientific aspects. It reflects on the validity of cohousing in the current situation of Amsterdam and the possibility of the building’s existence in the proposed urban setting, based on Borneo-Sporenburg - urban plan from another part of Amsterdam’s harbours.

In the last part of this report I reflect on some of the ethical issues and dilemmas that I have encountered during the design phase of the project. The dilemmas of esthetic, social, economical and sustainable nature.
**Methods and approaches**

The setup of the graduation studio is divided in several designing stages of which the two main phases were the research phase and the design phase. Each stage came with different methods and approaches in order to determine information that contributed to the research.

In figure 1 an overview is provided with the two main phases and underlying methods. Following this setup led to the final design: a solution not only to the main question of this studio: “how do we want to live in the future and what kind of buildings do we need to make that possible?”, but a solution that addresses a problem of the municipality of Amsterdam, the location of my project.

**Research phase**

The start of the research phase was marked by a presentation given by Koos van Zanen, urban planner and a member of the municipality of Amsterdam, who addressed the vision of Amsterdam 2050. Our main focus was the development of the Mijnervahaven, an industrial site located in Haven-Stad, Amsterdam. This site, our location to develop our plans on, was visited to conduct field research.

**Field research**

The purpose of field research is to establish parameters of the site to introduce the best design, responding to the environmental features. By looking at the existing circumstances, such as size, topography, location, climate, plants, (also subjective: atmosphere of the place) architects are able to consider future changes of the site and how they influence the project; as every site is unique. In result, the project may consciously respond to the context and reflect it, or ignore unwanted conditions. Having those observations in our minds, it is possible to regulate buildings orientation, placement, form and materialisation; in later stages it determines the structure and sustainable solutions. The recordings of this field research were helpful for the urban design strategies, though the atmosphere was captured in the collage of our own subjective first impression of the place.

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5 Source: [https://www.archisoup.com/architecture-site-analysis-introduction](https://www.archisoup.com/architecture-site-analysis-introduction)
group came up with a master-plan, based on the principles of one of the following existing plans: Manhattan, Barcelona, Campus model and Borneo-Sporenburg. Those plans were first superimposed in the area, to understand the scale of the location, and adjusted to the harbour situation. The low-rise high density plan, based on Borneo-Sporenburg in Amsterdam, that I developed with my group, was expanded by us with typological research of new dwelling forms, suitable for this plan. Along this research, there was also conducted a research about the history of the harbor area and its connection with the city.

**Literature study and case study**

After the first stage of the research and identifying the problem (the P1 presentation) the phase was followed by a literature study. This concerned the topic of interest as well as context research about housing situation in the Netherlands, with emphasis on Amsterdam.

In my research I focused around the topic of community: What is the optimum group size of the community? And supported with sub research questions: What is the foundation of the community? How the spaces transition from public to private? In literature research I discovered, among others, a research led by Robin Dunbar, treating the diverse relations between people in groups of particular numbers. Knowledge about particular group sizes, combined with the research about the nature of cohousing and the conclusion of my studies, became the basis for the idea of clustering people and led to the shape of my building.

**Problem analysis**

The goal of this phase was to find a topic of interest. The more I read about the situation in Amsterdam, and from what I know from my own experience of growing up and living in Warsaw, people want to be independent, but due to that they became more disconnected and isolated from each other. Many people search for the particular standard of housing for themselves and their families, but those expectations rarely meet with the possibilities offered by the housing market (limited land, high prices for square metres, demand for small housing for solo dwellers i.e. expats and students). It has been found that Amsterdam is also facing the problem of leaving families and weak social ties. Therefore my focus was pointed towards cohousing projects, in which people share spaces. The value of the cohousing idea is the bonding factor, creating relations with neighbours and limiting private space by sharing facilities.

During this phase we were also assigned in the groups of four students in order to propose the masterplan for Minervahaven (base urban framework for our designs), as the area was only provided with the general development vision for 2050. Every
Next part of the research was about case studies, which is a commonly used methodology research to investigate dwelling typologies. The choice of the right projects for the case study is crucial. The aim was to find data of comparable aspects, but also to be able to take something from each one separately. The projects that I chose to analyse were based on the concept of cohousing, sharing facilities and highly urban environment, that supports increased density. To make the results of the analysis comparable, I focused on particular aspects of each project, i.a. accessibility and routing to the flat, proportions between private and common, public and local amenities, and flat typologies.

The variety of the methods, approaches and topics considered in the research phase, found a common language in the design process. The ambition of Amsterdam in the vision for 2050 served as a starting point for urban design proposal. Field research helped to establish the plot size. Due to problem analysis I learned about the housing situation and families moving outside Amsterdam, but also about connections between people in the city - weakening social ties. Thus urban families became my target group, and the aim of the project to strengthen ties. Literature and case study taught me about the desirable group sizes and cohousing. Elements that I chose to analyse in case studies gave measurable and comparable outcomes about various aspects, such as flat typologies or proportions between common and private. Thus I established the principles in design solutions, that I decided to apply to my design: group sizes and clustering people in smaller communities, green patio as a contrast to highly urban environment, ratio of private to shared spaces, views and visual connection, high density - the plot imposed the demand of minimum 300 units/ha) that wouldn’t be perceived by tenants.

**Concept design**

The second phase - design phase - consisted of the concept design (after P1) and development (P2-P4). The last element of finalizing the project will take place between P4 and P5. The concept design started from attempts to form the building, basing on the outcomes of the research. The quick-start helped to understand the size of the chosen plot, build mass and first floor plans, as a basis for the further design process. First shape was based on the previously analysed case study projects superimposed in Minervahaven’s location.

I wanted the shape of the building to be coherent with the idea of supporting the community life, together with the requirement of high density. The plot that I chose to work on was the size of 120 x 60m with the mini-
Within the inner courtyard. Moreover, the valleys allowed for the views and created terraces, allowing for the visual connection between inhabitants and the higher quality of dwelling in urban environment.

Because it was based on one of the shapes of analysed projects, the shape was not yet regulated. In

mum density of 300 units/ha and maximum height of 13 floors.

The early result was the shape of a perimeter block, consisting of eight towers with valleys in between, that have terraces on sides. The shape supported the idea of belonging to smaller clusters and keeping the community of the whole block connected within the inner courtyard. Moreover, the valleys allowed for the views and created terraces, allowing for the visual connection between inhabitants and the higher quality of dwelling in urban environment.

Because it was based on one of the shapes of analysed projects, the shape was not yet regulated. In
a further stage of design, and in order to simplify the concept, I decided on using a grid of 6x6m. The reasons to simplify the grid laid in technological benefits, prefabrication, lower costs and sustainability (repetitions). The organisation of the building on the grid helped to set up the depths of the flats and locate circulation and common spaces.

Before continuing on development of my project, I had to reflect on the concept phase. The proposed shape was sculpted freely basing on the modules that are flexible - then the question was when the building was determined by anything and when I know that the process is finalised. Therefore the first thing in the development of the design was the reconsideration of the adopted principles: construction grid 600x600cm, views, heights, and regulating them so that the fundamentals remained the same, but more crystallised in the shaping process.

**Development of the design**

The next step in the design process was to verify previously made assumptions about the concept of the building. Although I had established the locations and typologies of flats and thought about simplifying structure on the grid, further development was still a challenging phase with a lot of new ideas on how to improve and enrich the project, remaining in line with previous principles.

First step was the verification of the shape that I built during the previous phase. Despite the fact that I built it based on the module of 6 x 6 x 6 m box, the outcome could have been developed further. Therefore I remodeled the structure, using...
Marta Kaniuk / Delft University of Technology

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styrofoam blocks on the physical model 1:200. Final improved shape was still built on the principles of separate towers with valleys in between, two entrances in the perimeter block to the courtyard and height differences in towers - from lowest on the southern to the highest in opposite corner, but now the improvement was that sloped facades with terraces were only facing two directions, which simplified the geometry of the building.

In order to make sure that the solution is coherent, I checked the shape of facades: the pattern of the edge became finally clear with one edge going down every 3m (left to right) and then going up every 6m. This rhythm is repeated on all inner and outer facades of the building.

Together with the shape and facades, I was developing the spaces inside. Ground floor of my building I decided to use for public functions and local amenities, that on the higher floors would be connected through vertical communication with the common spaces for tenants on each floor. Therefore the entrances to each tower became an important design task to solve as a representative space. I tested spatial solutions with facade detailing on physical model 1:50. On this model I continued what I started in the computer model - testing proportions on the facades and the contrast between the high plinth of the groundfloor and the rest of the facade on higher floors, with flats.

Along with the physical modeling, I was testing the organisation and perception of the spaces using VR tools. By placing myself in the perspective of particular places I wanted to verify the perception of space.
Western facade
Southern facade

Northern facade

View from the south, through the valleys
Physical model 1:200; southern facade.

View through the valley towards northern part of the building.

Views through the building for terraces.

View between towers.
Benefit of the common
Second floor, staircase

First floor, staircase; light from the entrance

Ground floor, staircase
Physical model 1:200; southern facade.
Views through the building for terraces
Benefit of the common

- light, claustrophobic, spacious, and the clarity of organisation, where to go next (staircase, doors, other corridors, second entrance etc). VR as a research tool can be used in various ways; two of them that I used were: a head mounted display (that we used during Msc3 seminar) allowing for exploration of the model by walking, and low-tech Google Cardboard, which makes possible to render one particular scene in home conditions. During this phase I only used the latter myself, to verify if the spaces that I designed on paper have desirable qualities and navigate my own experiences on my design. I did not consider letting others experience the building with their feedback about my design decisions for two reasons. One of them was the sudden closing of the faculty for students and employees at the time due to COVID-19 outbreak and a command to keep the distance and limit meetings. The other was in order to receive measurable and comparable feedback from others, I would have to ask more than a couple of people. The more answers about various experiences, the more reliable would be the research; yet also finding a representable group for a proper scientific investigation could have been time consuming, and the results not fully satisfying compared to the effort put into. It is also hard for me to judge whether this kind of research should be carried out rather in the early stage of the design or later, when presented spaces would be more defined and answers more concrete.

Nonetheless this research appeared after all not to be fully subjective. It helped me to decide about aspects such as the amount of windows (light and views) and consideration of whether to place additional niches or cubics in the common zones dividing long space. Placing myself in the perspective of the terraces on higher floors gave me an insight of human scale in the whole complexity of the building. I could verify the visibility, views and possibility of visual interactions with (potential) co-inhabitants, that once worked on paper and on diagrams, but by “standing” on the terrace I could identify myself with future tenants.

While deciding on the materials and atmospheres in particular parts of the building, I did a lot of sketching on paper and Photoshop collages. It helped me to simplify the esthetic aspects. The concept for the cold blue facade came from the urban setting - the contrast with low-rise tenement houses, typically finished with a warm-colored brick. The inspiration for abstract representation came from the surrounding of the harbour water - so typical and substantial for this particular site.

Although I proposed the shape of the tiles used on the facade, further
research towards the color and level of reflectiveness would have to be continued on samples and mockups.

The color of the facade may vary per diagram, drawing or render. For the stage of this design I decided on green-blue. In the next (possible) phase of the design, the hue of the colours could be changed, depending on the samples tested in natural light and various conditions.

The combination of various methods can be the most fruitful, as each of them separately can’t give answers for all aspects of the design. 3d modeling allows us to build components very quickly and compare various versions. Physical models seem to represent the spaces more accurately and show how natural light performs in spaces; it also makes a “builder” more aware of the used materials, proportions, reflections, because it’s more tangible than digital representation.

**Conclusion**

The design process consisted of two main phases: research and design. In each of them I used a variety of research methods and approaches. The research phase consisted of explorative research (field research, literature research, typological research); further investigation into the project was conducted as research through design (experimental research, literature research, typological research). Approaches in those two phases were interdependent and complementary.

**Research and design**

The previous chapter presented the methods and approaches in the process of research and design. This part focuses on the direct influ-
Although the research towards the target group that I conducted was focused mostly on young families, who I found to be an important part of the city, the outcome of the design process changed my view towards the target group. The small flats and broad common facilities, that primarily were planned for urban families, appear to be much more versatile and flexible. The building could house a broader representation of social groups: also including singles or elderly, who lack the feeling of the community and social ties.

Relation topics

“The central question of the Dutch Housing Graduation Studio is: how do we want to live in the future and what kind of buildings do we need to make that possible? You will identify the challenges which the city of Amsterdam faces in the immediate and distant future and you will design a residential project which meets these challenges. By moving from ideal to concrete building design, you marry the world of ideas with that of material form. The result is an inspired, idealistic but also realistic design proposal.” (course guide)

The aim of the dwelling studio was to find a balance between the standards and ideals, with attention paid to the concerns like sustainability, climate, overpopulation, shifting demographics. The challenge of this task is the expectation of a new standard that is suitable and rationally affordable for the chosen target group. The awareness of the certain problems that our projects are causing is essential to make particular design decisions.

While choosing the graduation topic, I was searching for a problem, that is

The relation between research and design

Theory that has significant importance in my project is theory of relationships in groups of various numbers. What Robin Dunbar described are relations with people that we know, not necessarily the closest physically, but from personal relations in an individual’s life: family, school and work acquaintances. Christopher Allen, based on Dunbar’s numbers, created thresholds of Personal Circles, of which each has defined range and intimacy degree. Though I believe in transferability of those numbers to the living environment, so our physically closest surrounding. I decided to assign the numbers of particular groups to housing situations:

3-5 people: support circle → single flat / household

10-15 people: sympathy circle → common floor / couple of flats

100-300 people: emotional circle → one tower

Up to 1000 people: the familiar stranger → building / neighbourhood

This division of thresholds enables tenants to identify with a particular group of people, that is defined spatially. How is this project different from regular housing in the shape of perimeter block, that doesn’t divide people into smaller groups? I believe that conscious clustering into groups of particular sizes helps people to create certain relationships and influences their behaviours. The fact of dividing the building visually and spatially, improves the well-being and encourages a strong sense of community.
present in Amsterdam, yet also specific to many big cities. The dynamic changes that Amsterdam is facing are an increasing number of expats and students (solo dwellers) arriving to the city, and constantly rising housing prices followed by the families leaving to the suburban areas. Therefore my answer for the question “how do we want to live in the and what kind of buildings do we need to make that possible?”, is the building clustering young families in groups of different sizes, on various privacy levels (from the most private to the most common: flat, floor, building, neighbourhood). The idea of clustering was supported by various shared facilities, encouraging building the community and neighborly bonds.

The track architecture is focused on “developing creative and innovative building projects that use design as a means to deal with the technical, social and spatial challenges encountered in the built environment”. In my graduation project I confronted technical, social and spatial challenges and implemented solutions. The innovation of it depends on the clustering based on the research of Robin Dunbar’s theory of maintaining relationships according to numbers (group sizes). Technical aspect that is the most challenging is the CLT construction on the grid, that is non repeatable on following floors, and the consequences of this shape: relocation of shafts, drainage of extensive roof area, distribution of media through the building, vertical communication leading to top floors. Social aspect is connected to the idea of clustering people, how they use and encounter wide-ranging common spaces (those for inhabitants in circulation spaces were proposed, but would be most likely adjusted and designed according to particular tenants.

The master programme concentrates on “innovative ways to create more sustainable developments” can be perceived in the final result. The building uses already known technologies to support sustainable solutions, often in a passive way. Reduced size of the windows on the facade with external blinds (limiting heat loss and overheating), modular CLT construction on the grid (use of the material with lowered embodied CO2; elements easy to mount, demount and reuse), planting trees in greenery on the patio (absorption of the city noise, clearing air, breaking the wind flow, heat stress in the city).

**Social, professional and scientific framework**

The topic of my graduation is based on the various social issues that society is facing. The problem of families se-
Few of the dilemmas concerned building techniques and what should be the most important aspect: sustainability, affordability, quality of living? After my P3, where I proposed to use CLT not only for the construction, but also secondary/division walls, one of the remarks from tutors was that the consequence of using one material is pleasing, but also expensive. Therefore for the clarity I optimised the choice of materials: CLT for load bearing construction of the walls and slabs, secondary walls to be made of modular concrete blocks and division walls in flats with lightweight frame and gypsum cardboard finishing, due to inexpensive and easy installation.

Though the tougher decision concerned use of additional acoustic insulation in flats. Due to the direct connection between flats and common spaces, located in the circulation space, I decided to use an additional layer of acoustic insulation on walls, which would increase the standard of living. As feedback involved costs (very expensive to provide it in all flats) and appeared to be not necessary (the thickness of the construction already decreases noises), finally I compromised with coated interiors of common rooms for improved noise cancelation, as flats are located directly above those activity spaces.

For the flats the decision about using additional insulation or not, is in inhabitants hands, with the suggestion that acoustic performance can be improved.

What also concerned me was the consequence of development of the project. In the early conceptual phase of the design I already decided to use approximately 30% of the space in the building for common spaces. It...
Conclusion

During the research - as well as the design phase - I encountered multiple problems and dilemmas. The choice is hardly ever objective, and it strongly refers to architect’s morality. I believe that the choices that I made in this project would be justified and commonly sanctioned in real life. The process of designing revealed that the dilemmas architects are facing are rarely only of an aesthetic nature.

was one of the principles that helped me to build the idea. Meanwhile my research led me to the conclusion that land- and housing prices are expensive in Amsterdam, therefore its favourable to design rather smaller flats. In my setup the private zones (flat interiors) remained indeed relatively small (from flats of 50 sqm to few of 120 sqm), with an extensive circulation zone and ground floor of the building designated for common facilities. In the process of finalising the building, every square meter has its price; both private flats, but also corridors and staircases have to be paid for. Also the shape has extensive external surface, which makes the building more expensive (much more finishing facade materials, thermal insulation etc). Therefore the dilemma: is the idea and “iconic” look justified by the idea of clustering people for improved quality of life? Is it rational to propose this wide-ranging common space? There is a price for everything. I find that cohousing and building a community undeniably is the irreplaceable advantage and the quality of this set up.
The shape of the building was inspired by case study projects, but the process of finding the form can be described in following steps, presented on the previous page. The perimeter block on the grid $6 \times 6$m and depth of $18$m, was opened with two cuts. Diagonal cuts in the form created “valleys” between 6 towers. The intention was to divide massive buildings into smaller communities, while remaining the single structure. Respecting the surroundings of low-rise buildings and sun access, the heights were diversed from the lowest on the south, to the highest on the north corner. Finally from cubicles $6 \times 6 \times 6$m I removed smaller cubic forms $3 \times 3 \times 3$m to receive more terraces.
Benefit of the common

Dwelling

1 flat / 2-3 people

Floor / Cluster

8 flats / 25 people

Tower / Community

32 flats / 100 people

Building / Neighbourhood

210 flats / 700 people
One of the main principles that helped to determine the shape was translation of Dunbar's theory of relations between people. The various thresholds that build groups were transferred into the following orders:

a flat - the group of the closest (2-3) people, living together and sharing private unit;

a floor - the group of around 8 neighbouring flats (respectively 25 people) located on the same floor around the common circulation space. They share common laundry and have relationship of the closest neighbours;

a tower - the community of all people who's flats are located in the particular tower - around 32 flats (respectively 100 people). They know each other by the most common encounters that can happen daily at the entrance and in the common spaces;

the building - the community of all towers together. The relations between inhabitants are the weakest from all presented, but due to sharing common facilities on the groundfloor, the patio and carrying about the building, they have a common goal that keeps them together.

The consequence of the shape with valleys between towers are the visual connections between other outdoor spaces, the views to the surrounding and the daylight that is present in all flats and common spaces (shadow analysis presented on the plans above).
Benefit of the common

Left: Views for the surrounding
Right: Visual connections between inhabitants

Left: Division for smaller communities
Right: Green patio

Left: Public amenities and common spaces in groundfloor
Right: Flats lifted to the first floor for improved privacy

Left: Car parking below the building
Right: Common and private terraces
74% of the building is rentable (yellow)
The building is materialised as an impression of the moving water with warm wooden openings. Also interiors were designed to have particular atmospheres. Common facilities on the ground floor are finished with blue lastrico tiles on the floor, that is more suitable for increased use and creates a dialog with external facade. Their walls are coated with an additional layer of acoustic insulation to improve noise canceling performance. Circulation and common spaces on higher floors have exposed CLT structure that creates a natural, warm and welcoming atmosphere. Flats are finished with white paint on the walls and with open CLT structure on the ceiling, to create light and neutral environment of private units.
Diagram of the materialisation: principles
Benefit of the common

Impression from the low-rise street: contrast of materials with the surrounding

Impression from the patio: green interior in urban environment
Impressions of game room and bike storage

Impressions of music room and common kitchen
Benefit of the common space with activities

Impression of common space with laundry room
Impression of the flat interior

Impression of the flat interior
Site overview
Ground floor plan
Floor +1

Benefit of the common

Plans 1:100
Floor +6
Floor +7
Floor +8
Floor +9
Floor +10
Floor +11
Tree breeds favourable for the urban environment, with dense branches that accumulate acoustic waves (and mute the noise of the city).

1. Pinus mugo
2. Laurus nobilis
3. Chamaecyparis pisifera
4. Ilex aquifolium
5. Cryptomeria japonica
6. Buxus sempervirens
7. Cotoneaster horizontalis
8. Common juniper
9. Platanus acerifolia
Fragment of the floor plans: middle tower - ground floor

Floor +1
Facade N
Facade S

OUTER

INNER
Facade W

OUTER

INNER
Section AA
Section BB
Benefit of the common

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FLAT TYPOLOGIES

Plot area 60x120m=7200m²
demand: 300 units/ha
min: 300 u/ha * 0.72 ha = 216 units

IN TOTAL: 227 FLATS
All flats were designed based on the construction module of 6m. Although alternating between levels, they are distributed typologically above each other (when possible). In all cases, the structure of technological shafts was placed close to the load-bearing wall between flat and the circulation. This way they are kept on the same axis which helps to combine shafts between following storeys.

Diagrams on the previous page show the locations of typologies in the building with the distinctions of the modules: duplex 6x6m, 6x9m, 6x12m, 9x12m and duplex apartment on top.

Combination of the prefabricated technology of the construction and flats as modules allowed more creative freedom in the building. The shape and size dictates the possible amount of bedrooms, but the interiors remain flexible, due to division walls made of gypsum-board on light construction.

Due to relatively small sizes of flats the demand of the plot it was possible to provide certain density, while keeping extensive amount of common facilities and circulation spaces. Relations between those are presented in the diagrams below, on example of one of the towers.

Diagram of various flat typologies in the building

<table>
<thead>
<tr>
<th>Proportions of the spaces in one of the towers (%)</th>
<th>Total brutto area</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>4,040</td>
<td>100%</td>
</tr>
<tr>
<td>Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common for the building</td>
<td>Public amenities</td>
<td>0%</td>
</tr>
<tr>
<td>Common for the “tower”</td>
<td>Common space (ground floor)</td>
<td>3%</td>
</tr>
<tr>
<td>Private</td>
<td>Common space (floors +1/-11)</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Private (flats)</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>Parking and storage units</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Circulation</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Other (bike storages, laundry etc.)</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Technical spaces</td>
<td>5%</td>
</tr>
</tbody>
</table>
Proposed organisation of the flat combines technological shafts around the wall dividing flats from the circulation space. The amount of bedrooms and their locations in suggested and can be modified according to the wishes or needs of inhabitants. Each flat is organised to have a day-zone with living room and kitchen, and private-night-zone with bedrooms.
Depths of the flats allow for the maximum amount of natural daylight. In order to avoid overheating of the spaces in the summer, windows are equipped in external blinds in the form of horizontal slats, that give an additional qualities of reflecting indirect diffused light inside, and outside views, even when set down. Additionally each of the flats, regardless of the size has direct access to outdoor space: terrace or private balcony. Fully openable windows and balcony doors have installed markisolette blinds to provide shading also on the outdoor surfaces (extensive detailing presented in further parts).
Dwelling type 3, 70 m²

The part of the interior is warm and natural atmosphere, ensured by white wall finishing, open CLT structure on the ceiling and wooden floor finishing. The furnishing system of cabinets, based on modular prefabricates integrates visually with the open structure of the building and creates an opportunity for the cheaper production of the integrated finishing for residents.
Dwelling type 3, 70 m², axonometry

Impression of the flat interior
Climate is being controlled in the building on various levels (diagram and descriptions discussed below).

All spaces and rooms are required in mechanical ventilation (those that need it: bathrooms, kitchens, service rooms) in system centralised for one tower. The airflow is supported by the natural ventilation inlets above windows. This way the cross ventilation and constant airflow is possible within flats, circulation and common spaces. Valleys with terraces allow for the better sun access. At the same time the building is protected from overheating (summer) and heat loss (winter) by the use of triple glazed windows with integrated blinds. The top roofs of each tower make use of the sun power by processing it on solar panels and directing it to the drainage, where the water is transported to technical rooms and harvested to be reused in the toilets.

Heating of the flats was solved in the flooring system, supported with geothermal energy from the harbours water.

As already mentioned before, the species of trees and greenery on the patio were selected carefully to be able to absorb city noise, clear the air and break the wind flow of the particularly windy location.

**Futureproof solutions**

The sustainable solutions chosen for this project are applied due to the care of environment, future
Sustainability

- Cross laminated wood was chosen for the load-bearing structure of the building. This has to do with lower CO2 emission during production (in comparison to other building materials, i.e. concrete) and visual aspects - the open structure is visible in the circulation and flats, creating a warm and welcoming atmosphere.

- The decision to assemble the construction with prefabricated elements has a consequence in less time spent on the building site, easier mounting and demolishing of the building, but also in flexibility. Fixed elements and relatively small distances between axis allow to change the material to concrete, if needed. This way the construction process would become cheaper and easier alternative, as concrete is one of the most common used building materials in the Netherlands nowadays.

- Extensive amenities for tenants on the ground floor (common kitchens, workshops, music- and play rooms) support the integration between inhabitants.

- The flats were lifted to floors +1/+11 to improve the privacy of inhabitants and make a distinction from the common ground floor. Project has proposed variety of flats, therefore it can fulfill housing needs of the broad social group. The finishing of the flats is executed with light walls, therefore the arrangement remains flexible and durable for dynamically changing life conditions.

- The parking has reduced amount of car places to promote car sharing and electric cars.

inhabitants and to make the project „future proof“ - suitable in changing conditions, durable and universal.

- Multiple common spaces (social support, integration, fighting loneliness)

- Extensive amenities for tenants on groundfloor (common kitchens, workshop rooms, music- & playrooms, gym)

- Green patio, extensive terraces and views for environment

- Parked from the groundfloor to floors +1/+12 improve the privacy of tenants
Construction elements
affordability

Principle of construction scheme explained on the example of one tower. The construction of the full building to be executed accordingly.

The use of prefabricated elements influences affordability by reducing building costs and the assembly time on the site. The use of CLT as load-bearing material also reduces CO2 emission and exposing it in the interiors creates particular atmosphere and reduces the use of finishing materials (plaster, paint).

Types of windows used in the project.
A. Window, standard flats: 230 x 200 cm
B. Window, terraces and common facilities, flats and groundfloor: 230 x 200 cm
C. Window, standard flats: 230 x 130 cm
D. Window, frosted glass, bike storages: 230 x 130 cm
E. Window, standard flats: 150 x 130 cm

1. CLT external load bearing wall 296 x 300 x 23 cm, window frame 230 x 200 cm
2. CLT external load bearing wall 296 x 300 x 23 cm, window frame 230 x 130 cm
3. CLT external load bearing wall 296 x 300 x 23 cm, window frame 150 x 130 cm
4. Internal load bearing wall 296 x 300 x 23 cm
5. CLT floor slab, 600 x 600 cm
6. Reinforced concrete slabs and walls
The consequence of applying prefabricates and relatively short construction distances is the possibility of changing the load-bearing material for concrete in order to reduce building cost. Ground floor, condignation below the ground and foundations are designed from concrete, due to easier execution of the leveling and waterproof insulation of the building from the groundwater.
Construction scheme, floor +1

Principle of the construction of the floor +1

Floor +1 fragment
Many building parts are designed to be prefabricated in order to make the building more affordable and the process of constructing easier. Therefore as the CLT construction walls and slabs that are limited to modular elements, also the facade consists of prefabricated components, assembled to the structure on the building site. Due to the specific pattern of the tiles, that are spatially arranged one on top of the others, the facade is finished on the site by adding missing rows closing the gaps between panels.
Construction of balcony is separated from the main load-bearing structure and added along with the facade panels.
Assambled facade element is presented on the graphic on the next page.
Assembled facade

FACADE PREFABRICATES
1. CLT panel
2. Windows
3. Wooden mullions
4. Insulation (between the mullions)
5. Wind insulation / foil
6. Wooden framework for facade finish (vertical and horizontal)
7. Facade finish: shingle ceramic reflective tiles; below: vertical ceramic tiles matt
8. Window frames

BALCONY
A. Steel framework with tension rods
B. Floor finishing
C. Railing
D. Finishing panels, reflective
Fragment of the facade
Fragments of the facade

Facade view, typical fragment with proportions of elements. Windows and tiles finishing.

Facade view, first floor with balcony and ground floor edge with gutter system.
Section B-B, details overview

Section below shows a spatial organisation and material finishing in various spaces. It also gives an overview of the typical details presented in following part.

The top edge of the roof for this section is set on 27 m above the street level. The top edge of the whole building (the tallest northern tower) is on 39,4 m above the street level.
Details, overview
Fragments of the facade

Followins section of drawings show how the concept is materialised in details. The location of particular solutions is marked on the fragment of the facade for easier orientation. The height differences in various floor types are leveled in particular layers in order to achieve transition without thresholds between terraces, interior of flats and circulation space (detail 05). Window sizes and external elements, such as tension rods for balcony construction (detail 02), are chosen in accordance with the rhythm of the finishing tiles.

Vertical corners of the facade are finished with steel L-shaped profiles to ease the combination of two prefabricated panels (detail 03) and visually to highlight the conversion between two difference of facades - cold external tiles and warm wooden finishing of terraces.
Facade
- Ceramic tiles 250x250mm
- Wooden framework horizontal 30 mm
- Wooden framework vertical 30 mm
- Waterproof foil 2 mm
- Vertical wooden mullions 200 x 36
- Rockwool 200 mm
- CLT 230 mm

Floor
- Floor finish wooden panels 20 mm
- Wooden framework 30 mm
- Waterproof foil 2 mm
- Rockwool 70 mm
- CLT 230 mm

FLAT

Floor
- Floor finish wooden panels 20 mm
- Heating system / floor screed 70 mm
- PE foil 2 mm
- Rockwool 80 mm
- Waterproof foil 2 mm
- CLT 230 mm

FLAT

Facade
- Ceramic tiles 250x250mm
- Wooden framework horizontal 30 mm
- Wooden framework vertical 30 mm
- Waterproof foil 2 mm
- Vertical wooden mullions 200 x 36
- Rockwool 200 mm
- CLT 230 mm

FLAT

Facade
- Ceramic tiles 250x250mm
- Wooden framework horizontal 30 mm
- Wooden framework vertical 30 mm
- Waterproof foil 2 mm
- Vertical wooden mullions 200 x 36
- Rockwool 200 mm
- CLT 230 mm

FLAT

Facade
- Ceramic tiles 250x250mm
- Wooden framework horizontal 30 mm
- Wooden framework vertical 30 mm
- Waterproof foil 2 mm
- Vertical wooden mullions 200 x 36
- Rockwool 200 mm
- CLT 230 mm

FLAT
Fragments of the facade

Detail 03, terrace corner

Vertical

Horizontal

Drain pipe

Shaped profile

Facade details:
- CLT: 230 mm
- Rockwool: 200 mm
- Vertical wooden mullions: 200 x 36
- Waterproof foil: 2 mm
- Wooden framework vertical: 30 mm
- Wooden framework horizontal: 30 mm
- Wooden finishing: 300 x 30: 70 mm

Note: TERRACE and FLAT are labeled on the diagram.
detail 04, entrance recess

- Balcony
- Rainage system

Floor
- Floor finish wooden panels: 20 mm
- Floor screed: 90 mm
- Waterproof foil: 2 mm
- Rockwool: 60 mm
- CLT: >150 mm

Rockwool / mullions 260 x 36
- Waterproof foil: 2 mm
- Wooden framework: 3 mm
- Wooden finishing panels: 1 mm

detail 05, terrace drainage

Floor
- Floor finish wooden panels: 20 mm
- Wooden framework: 30 mm
- Waterproof foil: 2 mm
- Rockwool: >150 mm
- CLT: 230 mm

FLAT

- FLAT
- CIRCULATION

- TERRACE
- Drainage

- FLAT
- CIRCULATION
Urban model 1:500
Benefit of the common
GRADUATION PLAN

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Studio
Name / Theme Dwelling  
Main mentor Theo Kupers (Architecture)  
Pierijn van der Putt (Architecture)  
Second mentor Ferry Adema (Arch. Engineering + technology)  
Tuull Jylha (Management in the built environment)

Argumentation of choice of the studio
My interest in architecture lies mainly within residential architecture, due to close relation to the clients during the design process. For me it remains the closest way to influence and improve the quality of life of various social groups, by making people’s life better and more comfortable at the level of their basic needs and in their most important space. The problem of constantly growing population that many cities are facing - including Amsterdam, is the problem in the urban scale, but it also requires micro-scale solutions. My plan after the master graduation is to work in the Netherlands in architecture studio that is focused on the residential buildings.

Graduation project
Title of the graduation project: Benefit of the common housing for the urban families

Goal
Location: Amsterdam, the Netherlands

The posed problem
The world’s growing population brings new challenges, especially to the big cities. As more dwellings are needed, their prices are rising. An increasingly larger group of city emigrants are families with children, who’s parents search for affordable housing with particular standard on the suburbs. Amsterdam for many years is facing the deepening problem of migration - the number of citizens is growing mostly due to solo dwellers, students and
expats (CBS). The Municipality of Amsterdam addressed the issue of growing number of the immigrants and the requirement of providing high density in new built areas. As families search for the particular standard of house with gardens, it becomes a real challenge to provide those qualities in highly urban environment. Another problems following a lack of families and disproportionate amount of solo dwellers in the city are social loneliness, week social interactions and the lack of the community feeling.

**Research questions**

What is the optimum group size of the community?
What is the foundation of the community?
How the spaces transition from public to private?

**Design assignment in which these result**

There has to be explored a new approach for the families to dwell in particular environment. My goal is to provide attractive and affordable housing to invite families back to Amsterdam and propose the design that will have the qualities of single-family housing in highly urban dense environment. This said, the result will be an integrating inhabitants, safe and stimulating building block or neighbourhood, socially engaging and providing common indoor and outdoor spaces. I want to introduce modular solutions to the project in order to make it more affordable. Different dwelling sizes will ensure the diversity for the families of different sizes and needs.

**Process**

**Method description**

My research has been done using several various methods of research design. First, I made an extensive literature research to investigate the crucial subjects and prepared a design toolbox with principles for my own design. Afterwards, using the case study projects I analysed i.a. privacy levels, proportions between public, common and private, and flat typologies. My next step was research by design, in which I used my knowledge gained by analysing the case studies and eventually used virtual reality as a research tool. In addition to that I prepared an analysis of the location and proposed master plan, as a group work. On the basis of the results of this research, as following, I proposed conceptual design. In the next phase I will prepare a final graduation design.
Bibliography


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Tools and the Pursuit of Sustainability.

Appendices
The set of drawings (A3) is a complementary element showing results of the final design in proper scales. All drawings presented in this publication were scaled accordingly and used as an overview of the project.

Illustrations
Benefit of the common
housing for the urban families

Research report
Reflection report
Design

TU DELFT
Faculty of Architecture & Built Environment
Master Architecture
Dwelling Graduation Studio 2019/20
Dutch Housing Studio

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30th of June 2020

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