Capturing wishes

Translating personal housing requirements into affordable housing for young adolescents in Rotterdam Zuid

TU Delft Delft University of Technology Faculty of Architecture and the Built Environment

VELD ACADEMIE

Image on cover: Pexels.com (2021)

Capturing wishes

Translating personal housing requirements into affordable housing for young adolescents in Rotterdam Zuid

a graduation research for the Master of Science (MSc) degree in Architecture, Urbanism and Building Sciences, by

Anna Buiter

4538765

Ir. J. A. Vink	Prof. Dr. ir. M. van Dorst	Ir. J. D. Fokkinga
Main mentor	Research mentor	Building technology mentor

11 May 2022

Resilient Rotterdam Graduation Studio Veldacademie

Faculty of Architecture and the Built Environment

Delft University of Technology

TU Delft Delft University of Technology Faculty of Architecture and the Built Environment

VELD ACADEMIE

Image: Pexels.com (2021)

Abstract

CO-HOUSING, AFFORDABILITY, ARCHITECTURE, SOCIAL HOUSING, LOW INCOMES

In this paper, design principles for a co-housing project focused at young adults (18-27 years old) wishing to live in the Tarwewijk in Rotterdam Zuid are being proposed. These principles are based on literary research, reference projects, fieldwork and workshops held for students familiar with the design location. Topics that are touched upon are affordability, co-housing principles and the living wishes of young adults wishing to live in Rotterdam Zuid. While the target group did not perfectly fit the proposed target group, results were interpreted as if they were. The most important findings through different methods of research, among others, include that different types of housing should be realised, the building should contain several shared facilities in rooms which have a flexible floorplan, the neighbourhood should be involved in shared spaces, housing units should be designed as small and with as little walls as possible and that bathrooms and bedrooms should always be private. These results were combined into a design brief specifically created for the Tarwewijk in Rotterdam Zuid, yet the basic principles can be implemented in other affordable co-housing projects as well.

Image: Pexels.com (2022)

Preface

"STRIVE NOT TO BE A SUCCESS, BUT RATHER TO BE OF VALUE" - Albert Einstein (n.d.)

This research paper is part of my graduation project at the Veldacademie studio in order to gain the Master of Science degree in Architecture, Urbanism and Building Sciences at the Delft University of Technology.

During my studies at this faculty, I have come to learn that design briefs which hit close to home have my preference. Because the topic is relatable and it is easy to think like the target group, I feel like I can create a design to the best of my abilities. The Veldacademie Studio let me get close to this target group and really interact with them, to understand their wants and needs within a design project. Using different research methods than one usually would within the Faculty of Architecture, it felt more possible to get to the core of the needs of this target groups than ever. This fascinated and motivated me, mostly because I strive to create a design which is made for the people using it, rather than for my own success.

This research paper would not have been so thorough and in-depth without my research tutor, Machiel van Dorst, whom I would like to thank for his guidance and critical attitude towards my project. I would also like to thank my design tutor, Jacques Vink, who has been able to inspire me to step out of my comfort zone and make design related decisions I would not have without him. Furthermore, I would like to thank Otto Trienkens and Andrea Fitskie for endlessly inspiring me to pick up the phone and start calling whoever I needed for my project, and always keeping me alert and critical when working on my own ideas and conclusions.

Also, I would like to thank all the other ladies in my studio, Rosemiek, Quirine, Lisa and Annemijn, who have made this research so much more achievable by brainstorming with me about all different aspects. The shared lunches, the trip to Tallinn and Helsinki, the lunches and dinners after every presentation and all other moments we shared sure also helped me remain sane during this intense but exciting period.

Lastly, I would like to give a special thanks to Kelly and Tim, for helping me with the stressful models. Danny, thank you for proof-reading and giving helpful feedback on every presentation. All my BK friends for the most amazing student experience I could have ever wished for. Stijn, thank you for being there through every celebration and every grumpy stressed mood. My roommates for endlessly listening to my complaints and always supporting me through this period. And my mother for her support and critical notes from a field of knowldges. I am so grateful for all of you.

Hopefully you as the reader will enjoy reading this research paper into housing wishes and the possibilities within those for a co-housing project as much as I did writing it.

Yours sincerely,
Anna Buiter

Table of content

0 Introduction 13

0.1 Problem Indication and Scope 13

0.2 Relevance 13

0.3 Research Question 15

0.4 Research Method 15

0.5 Theoretical Framework 16

0.6 Thesis Outline 16

1 Literary Research 19

1.1 Affordability 19

1.2 Co-living 21

2 Reference projects 27

2.1 Startblok Riekerhaven Amsterdam by HVDN Architecten 28

2.2 Spreefeld Co-housing Berlin by Fatkoehl Architekten, Carpaneto Architekten and BARarchitekten 30

2.3 Mehr als Wohnen Zürich, House A and M by Duplex Architekten 32

3 The workshop 35

3.1 Questionnaire *35*

3.2 Current situation (drawing exercise) *35*

3.3 Comparing options *36*

3.4 Design Brief *36*

3.5 Reliability & Validity *36*

4 The results 39

4.1 Questionnaire *39*

4.2 Current situation (drawing exercise) *40*

4.3 Comparing options *40*

4.4 Design Brief *43*

4.5 Reliability & Validity *43*

5 **Conclusion** 45

6 **Discussion** 51

7 **Reflection** 55

8 **Bibliography** 61

9 **Appendix** 65

9.1 Appendix 1 66

Workshop material used

9.2 Appendix 2 70

Workshop results

9.3 Appendix 3 83

First design brief

9.4 Appendix 4 84

Final design brief


Deloitte
akd

0
Introduction

"PROBLEMS ARE NOT STOP SIGNS, THEY ARE GUIDELINES." - Robert Schuller (n.d.)

0.1 Problem indication and scope

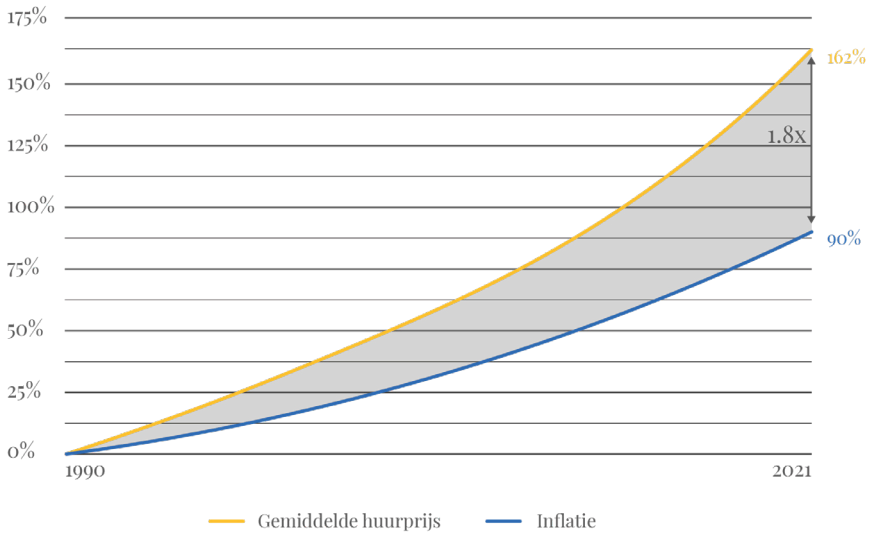
Things are not looking good on the Dutch housing market. In recent months, two well-attended housing protests have taken place in the Netherlands, with the most important demand being: guarantee good and affordable housing (NU.nl, 2021). Rents in the Netherlands rose by 162 percent between 1990 and 2020 (NU.nl, 2021). As a result, rents rose on average 1.8 times faster than inflation, which rose just under 90 percent over the same period. This increase makes it almost impossible, in particular for first-time buyers, to find an affordable home, because an increasing part of their income is spent on paying rent or a mortgage. The organization Woonprotest, which is supported by 203 organisations in the Netherlands, therefore writes in their letter of protest: "a protest for people who are still forced to live with their parents because they cannot afford a rental house, let alone ever buy a house somewhere" (Woonprotest, 2021).

0.2 Relevance

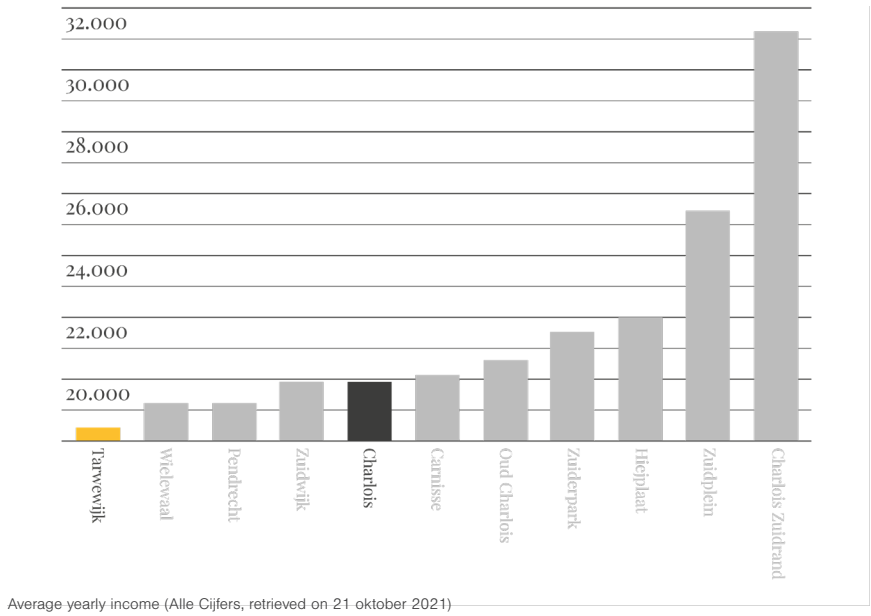
In 2018, het WoonOnderzoek Nederland was published. Although this study is somewhat outdated, it also provides a good overview of current trends in the demographics in the Netherlands. Between 2012 and 2018, the number of single households rose by 9 percent, most of which are located in the provinces of Groningen, Noord-Holland, Utrecht and Zuid-Holland (WoON, 2018). The disposable income of this group is - as expected - the lowest, namely about €22,000 per inhabitant in the Netherlands.

In South Rotterdam, however, this average is even lower than in the Netherlands. Where the average income of a resident of the Charlois district is €19,000, the income of a resident in the associated district of the Tarwewijk is the lowest of all the neighborhoods that fall under Charlois, namely €18,400 per inhabitant (Alle Cijfers, 2021). Age groups have not yet been included in this, although this also affects average income. 1,980 inhabitants between the ages of 15 and 25 live in the Tarwewijk (Alle Cijfers, 2021), making this group 7.5 percent of the entire population of the Tarwewijk. However, the vast majority of residents are in the age group between 25 and 45 years old, i.e. 4,755 inhabitants (18 percent of the total).

In areas with a 'high tension', such as Rotterdam, it takes an average of 30 months to find a suitable regulated house through a housing association. This is an extremely long period, especially at a young age, and even more so if the youngster feels the need to leave the parental nest. The maximum affordable rent for single households aged 23 up to state pension age with incomes at social assistance level is €506 (Het Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2021).



Average yearly income, (NU.nl, 2021)



Average yearly income (Alle Cijfers, retrieved on 21 oktober 2021)

It is therefore easy to imagine that this average price for young people between the ages of 18 and 27 is on average even lower due to a shorter time on the job market and the application of the minimum wage. And although the average rent for 2019 has increased by 2.4 percent in 2020, the maximum rent allowance to be received decreased by 4.1 percent in the same period (Het Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2021). In short, finding an affordable home is becoming increasingly difficult for Dutch people with a low income.

Not being able to find or afford housing can also affect the health of an individual. Although many studies have been done on the influence of housing on mental and physical health, this often focuses on the physical properties of the home. However, Baker, Bentley, Lester & Mason (2020) argue that the (un)affordability of a home also affects health. People who live in a home that is unaffordable to them on average experience more stress and have lower mental health. Although this is often thought, this influence is not merely caused by a worse financial situation. In this regard, prolonged exposure to unaffordable housing has a greater impact than sporadic or short-term exposure (Baker, Bentley, Blakely & Mason, 2013).

Thus, the mental health of a person who cannot afford their housing deteriorates. It also appears that the longer this situation continues, the worse it gets. To promote the health of residents in the Charlois area, it is therefore important to provide affordable and suitable housing. This study will specifically look at the age group of 18 to 27 years, because for this group the fewest suitable homes on the market are offered.

0.3 Research question

The purpose of this research is to gain a better understanding of the housing needs of young people between the ages of 18 and 27 who are currently living in the Zuidplein area. This will be done by talking to this target group in order to form an image of their housing needs. The results can then be used to offer a solution in the form of a design for a residential building containing affordable and suitable housing for this target group. Next to this, research into some of the most relevant aspects of affordable co-housing will be done in order to substantiate answers to these questions.

The main question of this research paper therefore is:

What are the housing needs of young people (age 18 to 27) with a low income, planning to live in the Tarwewijk in Rotterdam and how can affordable housing include these needs?

To answer this question, the following sub-questions will be investigated:

What is the current (housing) situation of the young people?
What are the living wishes of the young people planning to move out soon?
What facilities are young people prepared to share with other people, and with whom?

How can these wishes be made into affordable housing?

0.4 Research method

In order to answer the main question, interviews will be held with a number (10-20) of young people who are currently living with their parents in Rotterdam and neighbouring towns and are planning to move out within the timeframe of three years. The purpose of these interviews is to get answers to the sub questions, which focus on the current living situation and the desired future situation. These young adults will be asked about the most important requirements for a rental property to them. The questions are divided into three categories and include questions that focus on current situation, wanted accommodation and (desired) co-residency and participation (both in cohabitation form and in normal living form). Questions will be asked in the form of a workshop with different assignments. Some will use drawn out design principles, letting interviewees vote for their preferred option, others include creating their own design brief.

Besides this, literary research in to affordability and co-housing principles will substantiate conclusions drawn from the interviews. The analysis of reference projects will also be part of this research, mainly to create a frame of reference to build on while creating a design brief.

Using these different kinds of methods, design principles for affordable housing for young adults with a low income in Rotterdam can be created. These will form the conclusion of this research paper.

0.5 Theoretical Framework

In order to answer the main question, it is important to take into account the specific context of the target group. Therefore, the following topics will be taken into account while developing and conducting the study.

0.5.1 Ethnic background

Only 28.8 percent of the inhabitants of the Tarwewijk have a western migration background. Other migration backgrounds in the district are Turkey (14.3 percent), Suriname (15.0 percent), Antilles (11.0 percent), Morocco (10.3 percent) and other non-western backgrounds (20.7 percent). The housing needs of these groups could be very different from each other, which should be taken into account during a study of the housing needs of the target group. However, Bolt and Permentier (2006) state that although there are large differences between immigrants and natives in the current housing situation, the housing preferences differ relatively little. These housing preferences are mainly related to house type, house size and house price. These results also emerge from the 2002 WoningBehoefte Onderzoek (WBO).

0.5.2 Housing area size

The current average house in Rotterdam South is too expensive for low-income starters. Therefore, it is necessary to look at ways to lower these prices. The average living area for a single-person household in Rotterdam was 70.52 m² in 2017. In the Netherlands, that average was around 88 m² (CBS, 2018). The average surface price in Rotterdam is around €15.58 per square meter, where in the Charlois district it is around €13.63 per square meter (Pararius, 2021).

While average living-sizes are growing, it is relevant to question whether each individual needs this much space. Students living in a studio live on 30 square meters on average. This includes all the main facilities in the house itself: a kitchen, bathroom and living space. Thus, a home does not need to be much larger to be liveable. This could be a possible solution to make housing cheaper for starters. Therefore, it will be examined what the minimum required area for the housing unit should be, according to the needs of the individual. By doing so, housing prices could be further reduced.

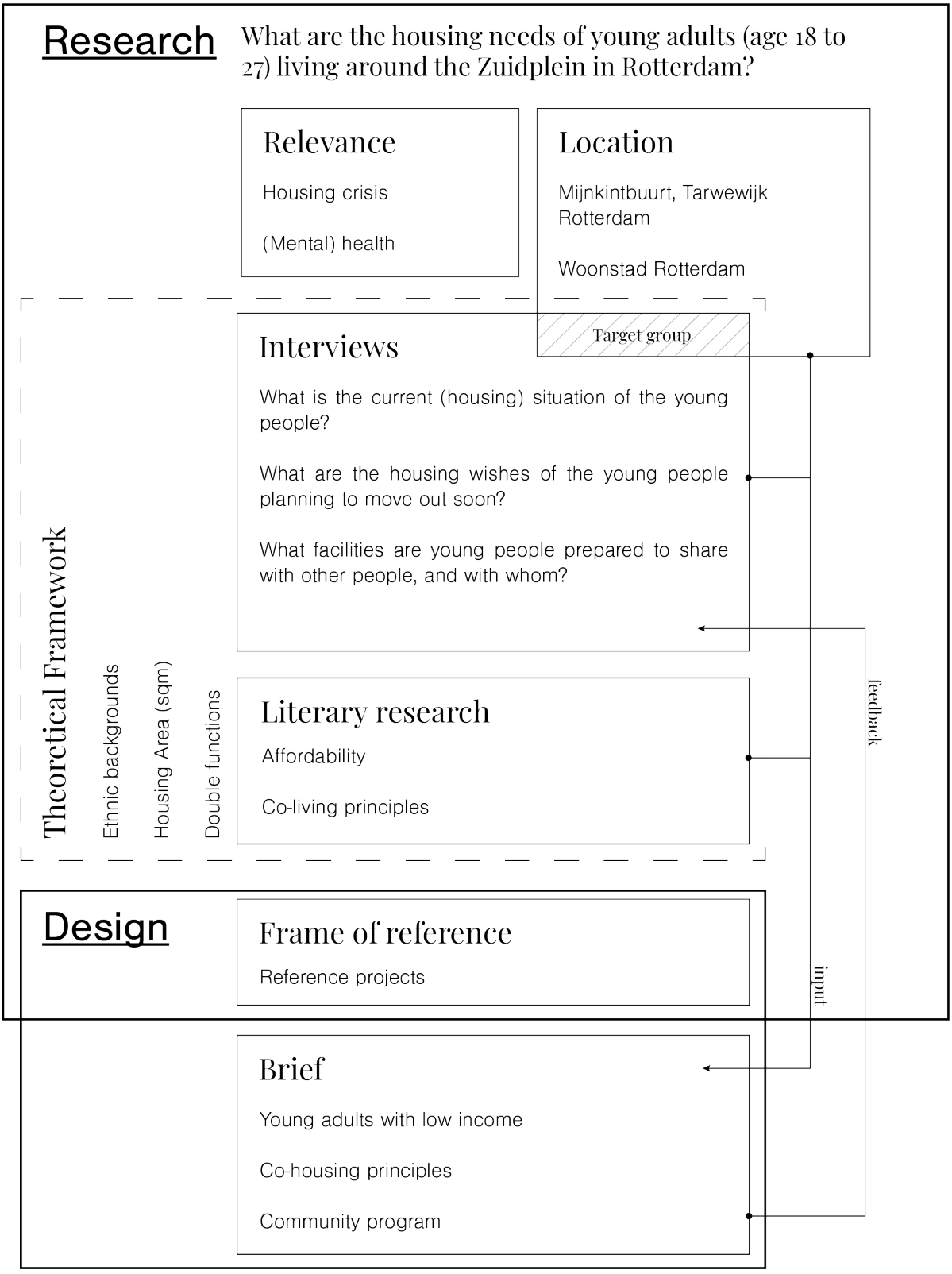
0.5.3 Double functions

If the study shows that small(er) housing is not a problem for the target group, a further elaboration of this reduction could lead to certain areas being shared by (some of) the residents. These spaces with a collective function will have to be arranged as efficiently as possible to save on costs. It is therefore interesting to look into double functions, such as a kitchen that can be used by residents, but can also be rented out to neighbours. In this way, optimal use is made of the available square meters. The research will examine whether this concept is desirable according to the target group.

0.6 Thesis Outline

In order to create a design brief, first a couple of important concepts need to be defined. In this paper the topics concerning housing affordability, co-living principles, and reference projects will be discussed using literary research. Some of the sources that will be used for this are Wonen in de 21ste eeuw. Naar een eedendaags Utopia. Gemeenschappelijke woonvormen in België en Nederland. Meer dan 100 inspirerende voorbeelden. (Camp, 2017), Design Strategies for Affordable and Sustainable Housing (Fay, 2005) and The Cohousing Handbook – Building a Place for Community (Nhatlinh, 2005). This research will also form the basis for the interviews.

Next, the interviews will be conducted with the target group. The results of these interviews will be processed to create a clear overview. With the previously collected knowledge on affordability and co-living principles, conclusions can be drawn and a design brief can be created. This will also form the conclusion of this paper.



Thesis and design outline (own illustration, 2021)

Image: Pexels.com (2021)

1
Literary research

"I DID THEN WHAT I KNEW HOW TO DO. NOW THAT I KNOW BETTER, I DO BETTER" - Maya Angelou (n.d.)

In order to answer the sub-question How can these wishes be made into affordable housing?, literary research into affordability and co-housing is necessary. More insight into these topics will help substantiate the final design principles from an academic point of view. Furthermore, the short analysis of a couple of reference projects can help to create a more realistic design brief.

1.1 Affordability

One of the most important factors in designing housing for a group with a low income, is the affordability of the rental homes. While one might think that the costs of building are mostly influenced by housing policy, financial models, regulations, land supply, infrastructure funding and taxation (Housing Industry Association, 2003), Fay (2005) believes that design is also a key factor in affordability and sustainability. Davis (1995) even states that 70 per cent of the cost of a new dwelling in the US is affected by design and planning.

When looking at actual quantities, the affordability of a building is influenced by several actors. As Belniak et al. (2013) sums it up, the most frequently named ones are location, building type, building height, building quality, number of floors and construction technology employed (Kouskoulas and Koehn, 1974; Brandon, 1978; Karshenas, 1984; Swaffield and Pasquire, 1996) (Belniak, Lesniak, et al, 2013). It is therefore interesting to see how some of these factors influence the costs and how to reduce these as much as possible.

It must be noted, however, that realising affordability is not just a matter of stripping down a building to its bare minimum. Instead, "it must be linked to sustainability, where issues such as equity, comfort, liveability and the environment are addressed, to ensure that housing is affordable in the short and the long term." (Fay, 2005).

1.1.1 Design strategies

As the design of a building is deemed one of the most influential factors on the affordability (Davis, 1995), it is very relevant to see what design choices can be made to reduce the building and maintenance costs of said building.

1.1.1.1 Flexibility

One of the most often mentioned strategies is flexibility, in different areas of the design (Fay, 2005). Flexibility can be achieved for example through: (Davis, 1995)

- Increased dwelling size
- Decreased housing specificity

- Allowance for changes (walls to be removed, added or moved)
- Provision of movable elements such as wardrobes, cupboards and walls
- Provision of developments containing a number of different types of units allowing residents to move as their needs change (i.e. children no longer live at home).

While increasing the dwelling size would be appealing, this might increase the rental price, as this is usually determined by the surface area of a dwelling. Decreased housing specificity could however be combined with the allowance for changes, for example by using moveable elements or even walls. On a larger scale, realising different types of housing units would increase the chances residents will stay longer and also would tailor to changing needs of residents over time, thus increasing the live-span of the building as a whole.

1.1.1.2 Size

Another factor in reducing the affordability is the sizing of both the building and the individual units. Previously, it was already mentioned that increased dwelling sizes could enlarge the flexibility of a building, yet rental prices would increase as a consequence. In a report published by the Dutch Ministerie van Binnenlandse Zaken en Koninkrijksrelaties in 2010, numbers show that the average surface area of a single-household home was 133 square meters between 1980 and 1989. After the year 2000, this average has increased to 162 square meters. The average family home has grown and is still growing larger, while average household sizes are decreasing and the amount of single-person households is growing (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2010).

In order to decrease rental prices, it is only logical to also decrease the size of the residence. Especially with the increase in single-person households, with lower budgets than larger households, smaller units could be one of the key factors in increasing the affordability.

Smaller sizes units could appear less attractive to a potential resident however, which is why strategies to make better use of smaller spaces would be desirable. Some of these strategies are (Davis, 1995; MacDonald, 1996; Susanka, 1998): (Fay, 2005)

- Reduce the area of circulation space but make the circulation space at the entry generous. Where hallways are required, increase their size so they have an additional functional purpose;
- Increase ceiling heights, including the use of pitched ceilings;
- Link interiors to exterior courtyards and gardens and to the landscape beyond the site boundaries;
- Utilise natural lighting;
- Use light colours for walls and floor and provide a horizontal emphasis;
- Reduce or eliminate the number of interior walls to create larger spaces;
- Porches, decks and roof overhangs, by layering space, can make small living spaces feel larger and at the same time create usable exterior spaces.

1.1.1.3 Building materials

A design strategy that is also often used to lower costs, is the use of cheaper materials. However, there are some dilemma's within material selection and construction. According to Fay (2005), the use of lightweight materials such as timber for external cladding will reduce construction costs relative to brickwork. Yet lightweight materials generally require more maintenance and sometimes lack thermal mass, which asks for more specialised thermal design solutions.

Fay (2005) also notes that external cladding of brick and terra cotta roof tiles can be expected to have a significantly longer life than timber wall cladding and profiled steel roofing. Belniak et al. (2013) notes that walls are one of the most expensive elements of a building, meaning that the choice of material will have a large influence on the costs of said building.

Another method to consider is the prefabrication of building elements. Using prefabricated elements reduces the risk of error and speeds up the building-process on site. Some experts note that the industrialised production of housing (elements) has not yet proven more affordable, and UK architect Brendan Phelan even states that modularised and prefabricated construction was 20-30 per cent more costly than traditional forms of construction and needed at least 100 units to be viable (Fay, 2005). Yet for elements such as wall frames, roof trusses, engineered beams and joists, wall and floor panels and aluminium windows, pre-fabrication does prove profitable, as the number of trades required on site and the construction period can be reduced.

1.1.2 Building shape

As was mentioned in the introduction of this chapter, the shape of a building also influences the costs of its construction, and thus the resulting rental prices (Belniak et al., 2013). While it is very difficult to establish and compare the exact costs of different building shapes, a comparison between different shapes can already create guidelines for cost-reduction related to the shape of a building.

A general rule says that the simpler the building shape is, the lower the unit costs are (Selley, 1983). Moreover, according to Belniak et al. (2013), many authors emphasize that the shape of the building has an effect not only on the construction costs but also the expenses generated throughout the whole cycle of the building life, including usage and energy costs (Swaffield and Pasquire, 1996; Bouchlaghem, 2000; Lewis, 2004; Al-Homoud, 2005; Bostancioglu, 2010).

One of the most expensive elements of a building is its walls, therefore any increase in the ratio between the surface of the walls and the surface of the floor leads to the growth of construction costs, according to Belniak et al. (2013). These authors used an index to compare different building

shapes, concluding that the most advantageous solution is the shape of a rectangle with the ratio between its sides not greater than 1:2.

1.1.3 Building costs

While designing an affordable building, the building costs play an major role in the total costs. According to Brook (2008) a typical breakdown of a contractor's costs on a construction project may be: labour (23 percent), plant (5 percent), materials (28 percent) and domestic subcontractors (44 percent). Some of these factors, for example the labour costs, are harder to reduce than others, because they usually are contracted for fixed prices. The plant and materials, however, can be easily influenced by a designer.

An important difference to note, is the difference between initial and future costs of a project. Brysch (2021) states that while using more durable materials initially might cost more, the future costs will be lower as the lifespan of the building grows and maintenance costs are reduced as well. Or, as Cunningham (2013) states it: "buildings incur costs over their life time; these include initial capital costs, operating costs, maintenance, disposal and finance costs. The key decision is whether to spend more money initially on better alternatives in order to save money in maintaining and operating the facility."

"Buildings incur costs over their life time; these include initial capital costs, operating costs, maintenance, disposal and finance costs. The key decision is whether to spend more money initially on better alternatives in order to save money in maintaining and operating the facility."

- Cunningham, 2013.

Another factor is the use of local labour and source materials, as it is an important factor in ensuring that unnecessary travelling and transport costs are not incurred in carrying out the work (Cunningham, 2013). The availability, location and capacity of existing utilities must be considered in the design.

1.1.4 Conclusion

While it is difficult to determine the exact costs and rental prices of a design without the exact numbers available, a lot of considerations can be made in order to reduce the expected costs. Different design strategies, such as reducing the size of units, creating open and flexible spaces and using local and durable materials as well as considering efficient building shapes and methods can large influence the total building costs and with that the rental prices.

In order to determine whether a building and its rental units are more affordable than average, constant comparison is necessary. Both comparison within the mentioned factors as well as between the final design and other existing buildings can help to determine whether the created design is in fact more affordable.

1.2 Co-living

While a large part of the affordability of a residential building can be determined by the above mentioned factors such as the building shape, costs and design strategies, these factors all focus on the initial design and building process. Yet through different configurations within the planned use of the building, costs can be further reduced. One increasingly popular technique to reduce rental prices, is through co-living principles.

1.2.1 Definitions

The concept of co-living has a long history. Its oldest forms might include monasteries and kibbutz (Camp, 2018). Sharing spaces and gardens were a central concept within these building forms. Newer, more modern forms were adopted only a few decades ago. The first modern co-living project was realised in Denmark in the late 1960s, when a group of dual income professional families were searching for better childcare and a way to share evening meal preparation (Scotthanson & Scotthanson, 2005). Later, this concept was adopted by Sweden as well, creating many co-living projects in the following years.

In Sweden, in the 1960s a need for socialisation and "neighbouring" due to organizational obstacles in everyday life and the anonymous and isolated life in residential environments occurred. (Friberg, 1993). Thus, the new concept of collective housing arose in the Sweden as well. In 1977 the first "Centraal Wonen-project" in the Netherlands was realised as well: De Wandelmeent in Hilversum (Span, 2017).

The term co-living, roughly translated from the Danish "Bofaellesskaber" (living communities), has been used globally since the late 1980s. Its most common definition is "a housing models where individuals have a private housing space, but also have access to a range of communal facilities such as shared living areas, dining spaces, gyms, gardens and cinema rooms" (Corfe, 2019). However, the actual realising of a co-living project knows many different forms.

1.2.2 Forms of co-living

No co-living project is the same and several different core types can be found around the globe.

Differences in group size, social organisation (in age, family configurations, occupation and even rent or buyers), management styles, building design and types of shared facilities all determine the type of project.

1.2.2.1 Group size

Co-living houses can vary greatly in size. The smallest houses, known as 'collective villas', might contain just five households, whereas large models containing up to 100-200 apartments also exist. The amount of households in a collective greatly influences the way in which the collective is organised. The larger the group, for example, the more difficult it will be to make decisions and reconcile divergent visions (ScottHanson & ScottHanson, 2005). Management styles within co-living projects will differ based on the group size as well.

"The optimum community size for a co-housing project is between 12 and 36 dwelling units."

- Scotthanson & Scotthanson, 2005.

While different group sizes have different benefits, ScottHanson and Scotthanson (2005) state that the optimum community size is between 12 and 36 dwelling units. They state that communities smaller than 12 unites may feel too intimate or have limited funds for creating and maintaining common facilities. They do note, however, smaller communities (between 6 and 12 units) do tend to work better in urban areas where there is less dependence on the personal relationship within the community. There is thus a greater likelihood of participation by non-residents in community meals and other activities.

Communities larger than 36 units make it difficult to get to know everybody. Another issue is that it may become too administratively complex to manage the community. When opting for a larger community, ScottHanson and ScottHanson recommend doing so in a suburban or rural area where the residents will be more insular.

1.2.2.2 Social organisation

The group so far most attracted to living in a co-living community is a group of young middle-aged households of which many have young children. They are often well educated and are employed in the public sector (Krantz & Palm Lindén, 1994). They also often belong to the 'post-materialist', defined as a person who is interested in cultural issues, human relations and environmental preservation, "less interested in fundamental material needs than in spiritual ones". It is also interesting to note that there are usually more women than men among the residents, and a rather high degree of single parents.

The collective houses have proved to be a positive environment for growing children. The children are viewed as the great winners of this living form, according to Krantz and Palm Lindén (1994). They point out that families talk about the advantages of having baby-sitters close at hand and their children benefitting from having their playmates in the same building.

In co-living projects, there are different social configurations possible. In one project, one could opt to only house a group of people based on age, for example. Another characteristic might be their occupation or household size. Krantz and Palm Lindén (1994) that people often prefer to live with people similar to them. Yet some co-living projects house both elderly and young families, which can have different results.

Often when different generations are put into the same co-living building, the optimal shared living situation is not realised. This is usually caused by the lack of integration between generations. Young families have a different life-rhythm to old people, meaning they will prefer dinner at a different time. Elderly also are often disturbed by children and teenagers in the common premises. In order to create a successful co-living situation, Krantz and Palm Lindén (1994) suggest involving all parties early in the planning process.

1.2.2.3 Management style

Management both from the owner of the building and within the community can differ greatly. The type of ownership influences the management style as well. Some forms of ownerships are an association, a partnership, a non-profit corporation and a (profit) corporation. In the Netherlands, the focus area of this thesis, the housing corporation would be the most common type of ownership for a co-living project, as collective collaborations are more feasible within housing corporations (Altés Arlandis, 2011).

Krantz and Palm Lindén (1994) mention two different types of co-living organization models. The first being one where tenants themselves share responsibility for the common meal and for the maintenance of the building, the tenant-management model. The second model, the service-management model, might include elements of tenant's self-management, but is primarily managed by the owner. The type of model used has a significant influence on the everyday life of the residents.

Within the tenant-management model, Krantz and Palm Lindén recommend creating projects with not more than 50 and not less than 20 units, in order to be able to manage the collective tasks and be able to make common decisions. When tenants are in charge of maintaining (most) parts of the building, it is important to have a responsible management team in place. In the cooperative communities it is quite common to agree on some dates in which most of the inhabitants/ neighbors will meet in gardens and common spaces in order to take care of the maintenance and reparations or improvements of those spaces (Altés Arlandis, 2001). Several studies have also shown that the common meal is the spine in the communal life, and thus essential for a sense of community

to grow. In larger groups, organising such meals will simply be too complicated (Krantz & Palm Lindén, 1994).

In the service-management model, the owner has a lot more influence on the management of the building. They will often manage the maintenance and reparations in common areas, like one would see in regular corporation housing. The consequence is the higher maintenance costs for the residents.

1.2.2.4 Building design

The organization of the common areas in relation to the private dwellings is essential for the social life among the inhabitants, according to Krantz and Palm Lindén (1994). How and where people meet and how 'deep' in the spatial system private dwellings are located also has important behavioural effects.

In 1982, a group of female architects and researchers presented an outline to a small collective house. Since then, the outline has been used as an inspiration in the design of new collective housing (Palm Lindén, 1992). In the outline, it was named that for common use, the building should contain a big common kitchen, a livingroom and other facilities. In addition, the families should have their own apartment, equal to ordinary apartment houses, thus fully equipped with kitchen, bathroom, living room and bedrooms.

According to Palm Lindén (1992), the area that is most crucial for social interaction is the transition zone. This is where the private and the common meet. In his study comparing several co-housing projects, Palm Lindén concluded that different spatial solutions give varying premises for privacy or community. For example, in order to create more privacy, one should avoid connecting rings with the placement of private apartments and locate common rooms in areas closer to visitors than to inhabitants (on lower floors). To provide premises for both community and privacy, it was concluded to use rings that both connect and separate different parts of the building to give possibilities of individual choice, as well as to place common living areas in a well integrated position, surrounded by dwellings. In order to emphasise the community within a group, is to place common facilities as centrally as possible, and to turn the building inward by being closed towards the outside and open to the inside.

It would be most ideal if a building design facilitates interactions in the most natural way possible. In order to do so, spaces that are easy and accessible for everyday life usage should be realised (Altés Arlandis, 2001). This usually means that individuals should be given the choice to engage or avoid.

1.2.2.5 Shared facilities

There are many different facilities that can be shared within a co-living community. This could range from shared storage spaces all the way to sharing kitchens and bathrooms. The degree to which people are willing to share spaces, differs greatly too. The most common co-living houses contain private housing units where all facilities are present, yet also share a communal kitchen and living or meeting room.

In a survey, conducted by Corfe (2019), people under 40 years old living in urban areas were asked which facilities they were most interested in sharing with other residents. The results showed that free private car parking, a gym for residents to use with no extra costs, a swimming pool for residents, a kitchen/dining area and communal gardens were most popular. The questioned were

Resident meeting at Coop Spreefeld. (Spreefeld Berlin / fatkoehl Architekten, n.d)

the least interested in to share were a car club, a concierge, dry cleaners, a café, a cinema room and green energy (e.g. solar panels/wind turbines).

Next to sharing facilities within a community, a designer could also include facilities that can be shared with visitors or people living in the neighbourhood. Possible benefits could be more community building and, if the spaces can be rented to others, generating more rent. These facilities could even permanently be rented out to other people or organisations. One good example of this are day-care centres, which is beneficial to both the children and parents, as was argued in 1.2.2.2 Social organisation.

1.2.3 Advantages and disadvantages

Co-living housing can have a lot of benefits if designed and managed well. Some of the advantages summed up by ScottHanson and ScottHanson are:

- **Safe and supportive environment**, as residents know each other and will spot strangers and potential danger more easily
- **Opportunities for social interaction**, as people become more isolated in modern society, the option for regular human interaction without rificing privacy becomes more attractive
- **Contribution**, as co-housers appreciate the opportunity to share their skills and talents with other members of the community
- **Sharing resources**, which gives people access to many more facilities than they would on their own, such as gardens, play areas, workshops, darkrooms, crafts rooms, lounges and kitchen and dining areas
- **Raising children**, as children have a safe place and appropriate facilities in which to play outside of their homes. Children have playmates within their community and parents have others to share child minding duties with
- **Environmentally friendly**, as sharing resources with others puts less strain on the environment
- **Preserve green space**, as by clustering homes, much of the green space is being preserved rather than being used for houses, streets and parking
- **Lower living costs**, as shared meals, bulk buying, sharing of resources, car pooling, sharing baby-sitting, trading goods and less travelling
- **Time saving**, as co-housers have more time because of shared meals, shared chores, less travel time due to more on-site activities and less time minding the kids

While these advantages sound promising, there also is a downside to co-living. As an owner, it can prove quite challenging to recruit new members of a community (Wang & Hadjri, 2017), as the concept is still relatively unknown and there exist a lot of biases about co-living still.

There is also always a chance that members of a community will not fit the group or are not willing to live according to the set rules. Real friction between individual can arise, creating an unpleasant living environment for the whole community. Due to different personalities and the nature of the community, co-living may have social limitations (Wang & Hadjri, 2017). Another risk can be found in the decision-making, as agreeing on something with a large group can sometimes appear quite challenging.

But probably the most challenging element for a designer, is the balance between privacy and publicity. As was suggested before, it is important to design spaces where social encounters can occur naturally, but also can be avoided when preferred.

In conclusion, while creating co-living projects can be quite challenging, the advantages are big and should, if designed well, undoubtedly outweigh the disadvantages. Especially for a target group of young adolescents with a low income and still in search for their future aspirations, co-living could offer a great first step into adulthood.

R50 – Cohousing / ifau und Jesko Fezer + Heide & von Beckerath (ArchDaily, retrieved on 20 January 2022)

Image: Coop Spreefeld, Berlin. (Spreefeld Berlin / fatkoehl Architekten, n.d.)

2
Reference projects

“GOOD ARTISTS COPY; GREAT ARTISTS STEAL.” - Pablo Picasso (n.d.)

In this chapter, a couple of co-housing projects will be analysed in order to gain a basic idea of the different forms of co-housing which are already existing. Inspiration can be gained from looking at other projects and several principles can be adopted in the own design brief. These specific projects have been selected based on different co-housing cultures in different European countries. While in the Netherlands the co-housing principle is still relatively uncommon, in Switserland and Germany are more experienced in creating and managing co-housing projects. These, therefore, will serve as interesting and very relevant analyses.

2.1 Startblok Riekerhaven Amsterdam by HVDN Architecten

Startblok Riekerhaven is a co-housing project where young refugees live together with students, which was developed by the municipality of Amsterdam in collaboration with housing corporation De Key and Socius Wonen. The project contains 463 individual studio's with collective living rooms and 102 non-individual rooms in 3- and 4-room apartments. The project is aims to connect young refugees and young adults with a Dutch background, between 18 and 27 years old, and offer the refugees a good start in the capital of the Netherlands (Krabbendam, 2020). While this project houses a very specific target group, the main design and management-principles could be quite similar to the design brief resulting from this research, as both projects are dealing with a wide variety of ethnic backgrounds and living requirements.

Private spaces and household areas

This projects contains two different kinds of 'collectives'. On the smallest scale, we have studio's for individuals who have their own kitchen and bathroom. These studio's are 23 square meters and cost €480 euros per month, including service costs. While residents of these apartments have all facilities to themselves, they also have the opportunity to make use of a collective living room with kitchen, which they share with 16 to 32 others.

Residents can, however, also choose a room in a cluster apartment. These rooms vary in size between 12 and 24 square meters. Living room, kitchen, bathroom and toilets are shared with one or two roommates with similar rooms. The rent varies between €407 and €480 a month, including service costs (Startblok Riekerhaven, 2021). In this type of apartments, residents are much more likely to come into contact with others.

Community spaces

Next to spaces shared by small groups of roommates, a bigger area is available for all residents of Startblok. In this area, called the 'clubhouse', residents get the opportunity to organise movie nights, jam sessions, parties, diners and language exchange meetings. Next to this building, a 'treehouse spot' is located, where residents can organise meetings as well. Since the project has been realised, however, these shared spaces have proven to be too little to organise collective activities, as the space only can be used by a maximum of 30 people.

Public spaces

This project contains no spaces which are shared or designated to be used by more than just its residents. This is probably due to the fact that the project itself is already quite large and could be viewed as a neighbourhood on its own.

Management style

Startblok has from the start been a self-management project which is heavily organised. Housing corporation is directing residents in different committees which are organised throughout the different building blocks. Every hallway contains a couple of 'hallway makers', who are responsible for making sure the coexisting in the hallway runs smoothly. Next to this, 'project makers' are responsible for umbrella matters like hygiene, safety and liveability. Tasks of this committee include directing cleaning teams, hosting consulting hours, but also solving issues between residents and being a first contact person in case of calamities (Lieven de Key, 2020).

Discussion

While this project is on a much larger scale than is intended for this research and design project, some interesting aspect can be implemented in the design brief. It is interesting to note that the project only contains one small space for collective activities, which can only host up to 30 people. For a project with more than 500 residents, this seems rather small. All residents do however have a separate common area as well. Apparently these rooms are not used for collective activities, presumably because they are more private and residents do not wish to share this space with a large group of strangers.

The mixture of studio's and cluster apartments is also an interesting principle, which could very well be adopted in the design brief, as the willingness to share facilities might very greatly among residents. By creating different options, more types of residents might be interested in living in a building which applies co-housing principles.

Exterior of Startblok with a couple of residents. (Krabbendam, 2020)

Interior of one of the shared apartments. (Krabbendam, 2020)

Urban plan with different modules. Secionts A are private apartments, B are shared and F is the clubhouse.. (Krabbendam, 2020)

2.2 Spreefeld Co-housing Berlin by Fatkoehl Architekten, Carpaneto Architekten and BARarchitekten

At the river Spree, in the middle of the city Berlin, Coop Spreefeld has ben realised as a collaborative project between three architectural firms. The building consists of an open-plan concrete structure with a timber façade and houses not only a daycare centre, working spaces, optional-areas, a couple of spaces for affordable public use, but also a wide range of a total of 65 housing models. These models range from small apartments of 25 square meters to cluster-apartments of 600 square meters which can house 20 inhabitants. Each house next to this also offers a semi-public roof-garden and large, private vertical gardens (fatkoehl Architekten, n.d.).

Private spaces and household areas

The community living in Coop Spreefeld consists of a mix of users, both wealthier and poorer, young and old and also with different wishes regarding the level of privacy. This project, just like Startblok, contains different kinds of housing units. Within each building, no two of the 64 apartment dwellings are alike, although they follow the same principle (Architectuul, 2022). In addition to conventional units, there are six cluster apartments that provide a communal living structure for groups of 4 to 21 people. Residents are diverse, multigenerational and multicultural, what made project possible was joint help of people with and without money.

The size of a standard flat can range from 54 up to 290 square meters. Cluster units are between 580 and 700 square meters, depending on the amount of residents in the community. While the communal living apartments have a shared space, all separate units are equipped with all the basic necessities such as a bathroom and 'mini-kitchen'.

Community spaces

Besides the basic necessities with which each apartment is equipped, Coop Housing offers a wide range of shared facilities for its residents. Some of these are a laundry room, fitness rooms, guest rooms, rooftop terraces and a music and a youth room. These facilities are often used by the residents.

Whenever a decision on these communal spaces needs to be made, all residents are involved in the decision making process. The residents of the building together decide what other functionalities should be installed or removed.

Public spaces

On the ground floor of the buildings, a couple of public functions for the neighbourhood to use are situated. These include communal gardens and cultural spaces, a daycare centre, a woodwork shop and a separate co-working space. While the ground floor and broad outdoor area bordering the river offer diverse places and services for the public, they collectively belong to the residents (N., 2017).

Also available to non-residents are Option Rooms, which are unassigned, unfinished spaces for community, social, or cultural projects. Option Rooms maintain the project's open character at the juncture of living and urban development (Sánchez, 2021).

Management style

Rents are staggered and start at a level on par with government subsidized housing, without havingreceived this subsidy. This has helped many of the Spreefeld residents, who could not otherwise aff ord tolive in the city center under today's conditions (Sánchez, 2021). Just as it was defined and administered from the start,participation has focused on collective concerns, uses, and spaces. The social skillsthat have developed throughout this process both enrich and facilitate a cooperative way of living (Architectuul, 2022).

During the design process, it was already decided that the residents would manage the building collectively. This means that every member can express an opinion about anything the community wants. It is proven difficult, however, to reach a decision sometimes. The rule is that only 50 percent needs to agree to a decision, but even this turns out as quite a challenge. The sense of community, according to the builder J. Finkbeier, is however very strong (N., 2017).

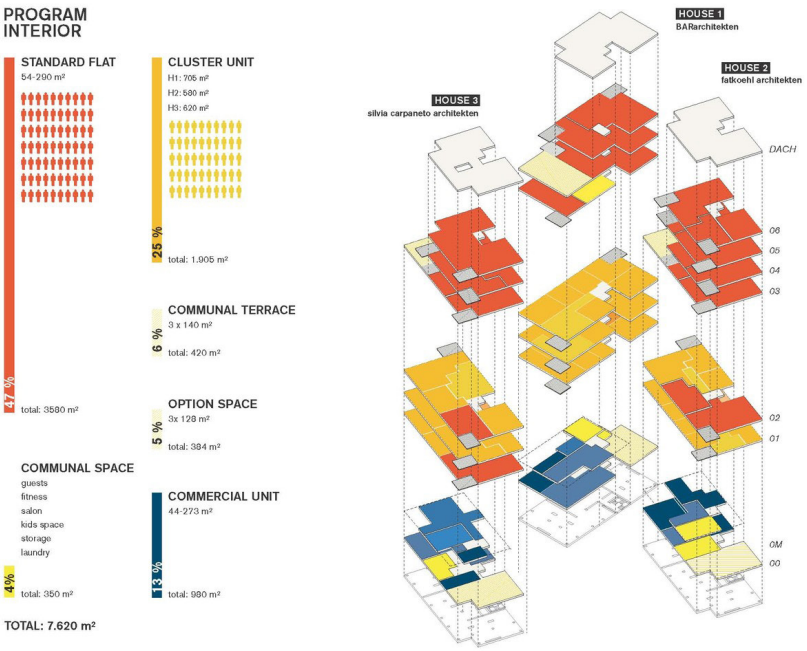
Discussion

This co-housing project too is on a larger scale than the design project related to this research. Yet a lot of similarities can be found in the goals and execution of a co-housing project. Once again there are a lot of different types of housing units, ranging from private dwellings to very large communal living units. This mixture seems to be rather popular in co-housing, probably because people with different privacy preferences can still participate in the community.

What is particularly interesting in this project, are the 'Option Rooms' which can be used by non-residents as well as residents. These spaces are extremely flexible and can be rented out for all different sorts of events. This could be an interesting addition to the Design Brief, as they serve both the community and the larger scale of the neighbourhood, if executed right.

Areal overview of the three apartment blocks. (Spreefeld Berlin / fatkoehl Architekten, n.d.)

A shared kitchen. (Spreefeld Berlin / fatkoehl Architekten, n.d.)



The division of program within one of the buildings. (Spreefeld Berlin / fatkoehl Architekten, n.d.)

2.3 Mehr als Wohnen Zürich, House A and M by Duplex Architekten

A total of 370 apartments, shops, restaurants, work and artist studios, crèches and a guest house were developed on the Zurich Hunziker site (Swiss-Architects, n.d.). The urban planning concept designed a cluster of adjacent, free-standing buildings that form a system of paths, squares and open spaces. Different architectural offices all designed buildings that fit into this urban plan, with different residential forms and floor plans that placed communal togetherness at its centre (Duplex Architekten, n.d.). Within this large project, House A and M were designed by Duplex Architekten

Private spaces and household areas

The satellite apartments in House A represent a new form of living together. The large communal apartments consist of a system of private units, including a small kitchenette and connected to a separate bedroom. Between the apartments, the communally used living spaces are situated, which are sequenced by squares and paths. These common areas are generous in space and are fully equipped as kitchens and living rooms.

In House M, otherwise known as the Housing Community, a total of 29 individual apartments are grouped around a large naturally lit staircase. All apartments have windows facing this indoor staircase as well. The apartments are intentionally small and compact in space, in order to leave more room for this staircase that also acts as a social space.

Community spaces

Where House A contains communal areas on every floor connecting the apartments with each other. No other community spaces are realised in this building.

In House M, the staircase that connects all apartments is not only an accessing space, but also serves as a common room for all residents in this building. There is a generous amount of space left between the corridors and each apartment's frontage, lending each unit a space to leave shoes, toys or bikes (DAC, 2022). Yet no additional functions can be found in this common space.

Public spaces

On House M's ground floor, a day care centre and a special education school are situated. These spaces open out onto public spaces and a common green. The day care and school will be used by neighbours from all around the neighbourhood, yet offer no real space for community building.

In the larger total area of the Hunziker site, however, many public functions are situated. In the other buildings one can for example find office spaces, a yoga studio, a restaurant and a second hand shop. Ateliers and a guest house are also included in the area.

Management style

The management of this project mostly relies on a hired group of staff members. This group of staff is responsible for facility management of the flats, outside areas and technical infrastructure as well as room management and administration. The operations also include bookkeeping and organising various events (information and participation events, general assembly, etc.) (More than Housing cooperative, 2018). The survey the More than Housing cooperative, however, showed that cleanliness in commons spaces appeared an issue. The administration was made aware of this and more resources were made available.

The communal spaces in this project take up about 1.5 percent of the total area. This area is filled in with a diverse range of different spaces, which they call commons. The areas are financed with parts of the housing rents, as most cooperatives do, according to the More than Housing cooperative (2018). While the ground floor spaces could have been leased to other parties, they say, they turned the areas into commons. These communally used commons complement private accommodation and 'ease some of the burden on low-income household budgets' (More than Housing cooperative, 2018).

Discussion

While this project also seems much larger than the design brief which will be created in this paper, smaller communities within the big urban plan can be recognised. In this project, too, different forms of co-housing are implemented. This further confirms the assumption that different types of co-housing principles are a profitable solution.

The management style of this project is rather different than of the previous two projects, as most of the management is carried out by a group of staff. Residents and members of a community are not responsible for keeping common spaces clean, but rather have an external party clean spaces. Whether this is also an option for the design brief resulting from this research, needs to be further investigated, as one can imagine it does have impact on the rental prices and thus the affordability.

Different buildings with similar principles are all situated at the Hunziker site. (Spreefeld Berlin / fatkoehl Architekten, n.d.)

The connecting and communal staircase. (Spreefeld Berlin / fatkoehl Architekten, n.d.)

House A. (Duplex Architekten, n.d.)

Image: Pexels.com (2022)

3
The workshop

“DOUBT CAN ONLY BE REMOVED BY ACTION.” - Johann Wolfgang von Goethe (n.d.)

In order to get insights into the living requirements of the target group, young adults (18-27 years old) planning to live in Rotterdam South, specifically the Tarwewijk, talking to this group should be the most fruitful. Thus, a workshop was created, containing different kinds of exercises to help the participants better understand their living requirements. The complete composition of the workout can be found in Appendix 1.

Below, the exercises used in the workshop will be explained further. This then results in a set of outcomes which can be used to create a design brief.

3.1 Questionnaire

The first exercise of the workshops is filling out a questionnaire with some questions aimed at gaining a better image of the current living situation of the target group. Some questions focus on the current house and household the participants live in, while others are focused on the preferred future living situation. The questionnaire including all questions can be found in Appendix 1. Participants do not receive any information prior to filling out this questionnaire and are asked to do so before the workshop starts.

The goal of this exercise is to gain a better understanding of (the situation of) the target group. It is important to take both current and wishes future living situations into account while creating a design brief. The information gathered from this questionnaire can directly be translated into the first basis of this brief.

3.2 Current situation (drawing exercise)

The second exercise can also be carried out before the workshop takes place. Participants are asked to make three drawings and rate how satisfied they are with the space they have drawn (not the drawing itself). In this rating, 1 means very unsatisfied and 10 meant complete satisfied. The drawings that have to be made are of their own current bedroom (1), their house (2) and the building they live in (3). There are no requirements to the type of drawing or to the use of correct sizing, but merely to let the participants think about the way they are currently living.

Once all drawings have been handed in, during the workshop some of the participants will be asked why they rated the space the way they did. Follow-up questions will help to understand what the participant values (or does not value) in their current living situation, which is the goal of this exercise. Some important conclusions can be drawn of the way participants rate and discuss their current living situation. Conclusions could include the level to which participant have knowledge about

architectural design principles as well as which elements are deemed very important in a bedroom, house or building.

3.3 Comparing options

During the workshop, the most important exercise is the comparison of different design principles which have previously to the workshop been drawn up and will now be discussed. The comparison takes place by posing a question and three or four possible answers. All participants get to vote for their preferred option using post-it notes with their name on it, which they stick to their answer.

After all post-its are placed, a discussion will be held about the different options. After this, participants get the chance to change their opinion if they have been convinced by a part of the discussion. The final voting will be written down and can be added to the basis of the design brief, as well as interesting remarks made in the discussion.

Options that are being compared focus on different aspects of a co-housing design. For example, participants are asked which configuration of rooms in relation to a common area they prefer. Another example is a question about which activities participants would be willing to do together with roommates.

The goal of this exercise is to get insight into which parts of co-housing resonate with the young adults. The participants get the room to elaborate on which kinds of facilities they are willing to share and with whom. These discussions will play a major role in creating the final design brief.

3.4 Design brief

The final exercise of the workshop is an individual exercise where participants fill out a previously prepared design brief focused on a residential building with public functions. This brief contains basic information like the available area and amount of residents the building should house at a minimum. Here they are asked to further complete the list of basic requirements of a residential building with public functions.

After this, the participants are provided with a set of possible functions that should be part of the building, as well as a basic idea of how expensive these options will be. Participants can now start puzzling, fitting in the desired functions, while still leaving enough room for the housing of future residents. Afterwards, students will hand in the filled out document and some will be discussed within the workshop group. After this, the workshop will be finished.

The goal of this final exercise is to let the participants think about which functions they would preferably see in a residential building. From this a number of things can be concluded, for example the plausibility they would actually use spaces mentioned in the list if it were to be built, or which functions really do not seem to match the housing and living requirements of the target group.

3.5 Reliability & Validity

This workshop is held in order to gain a better understanding of the wished living requirements of the target group for the design project. While it tries to stay as unbiased as possible, with some exercises the participants are stirred into the direction of co-housing. This is done because otherwise most of the participants might not be aware of the existence of co-housing and research into the willingness to share certain facilities would be nearly impossible. The results of this workshop, therefore, are not completely unbiased. As without mentioning co-housing, a big portion of these questions and exercises could not have been held in the same way.

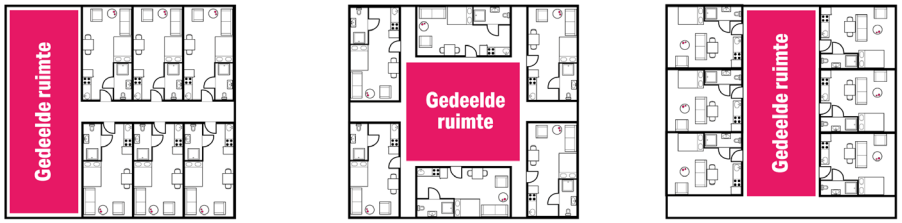
The workshop is supposed to be held under a group of 10 to 15 young adults living or planning to live around Zuidplein. Yet getting together a group of this exact demographic is proven to be rather difficult. Thus, young adults who are not necessarily planning to live in the designated area can also be part of the workshop, as their living requirements are supposedly rather similar. However, it is preferred the participants come from a lower income household, as the social background of an individual greatly influences their future ambitions and aspirations (Guyon & Huillery, 2014).

Wat we gaan doen vandaag

Hoe wil je gaan wonen?

Waar zou jij je gezamelijke ruimte willen zien ten opzichte van je woning?

A **B** **C**



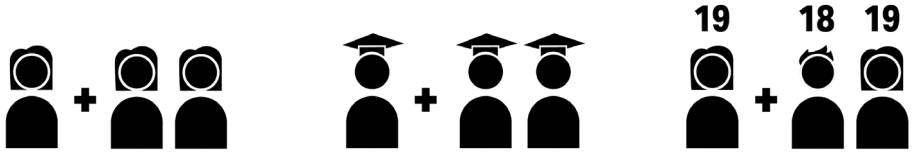
TU Delft

Met wie zou je het liefst willen wonen?

A
Hetzelfde geslacht

B
Hetzelfde opleidings-nivo

C
Dezelfde leeftijd



TU Delft

Three slides out of the workshop presentation. (own illustrations, 2022)

Image: Unplash.com (2022)

4
The results

"WHAT YOU CHOOSE ALSO CHOOSES YOU" - Kamand Kojouri (n.d.)

Due to COVID-restrictions, the execution of the workshops had been postponed a couple of times. Eventually a date was established on which the workshop could be held. The workshops took place over the course of two days, where both sessions were around one and a half hour long. They were also both completely held online, via Windows Teams. Participants were all Building Engineering students of the Techniek College Rotterdam and a responsible teacher was present most of the time.

Prior to the workshops, students were given two assignments which will be elaborated upon further on in this chapter. Unfortunately, one of these assignments was only completed by a small group (4 students).

While this workshop originally was designed for a group of around 10 to 15 students, it turned out that 40 students would be participating at the start of the workshop. This limited some of the results, as not everyone could participate in all the exercises. It also caused part of the students to not participate as actively as hoped. Therefore, for most of the exercises a group of 15 students will be taken as the active and effective group of participants, based on the number of participants per exercise. All results to the different exercises can be found in Appendix 2.

4.1 Questionnaire

In this first exercise, an average of 18 students actively participated. Some questions were answered by 22 students, where others were answered by just 15. All questions were purposely left facultative.

Using this questionnaire, it was found that over 60 percent of the participants is not living in Rotterdam and the same percentage was not planning to go live in the city in the future either. However, the remaining 35 percent was interested in living in Rotterdam, yet all but one of the participants preferred to live on the Northern side of the city. When asked why they were not willing to live in the South, all of them responded that Rotterdam South has a bad image, with a lot of criminality as well as low quality housing and living areas. Especially Bloemhof and de Tarwewijk (the design location) were known for their undesirable living conditions. Data collected by the municipality supports this claim by the youngsters, showing that safety index has lowered from 84 in 2016 to 73 in 2018, while in the entire city of Rotterdam, the index has risen from 102 to 108 in the same period (onderzoek010, 2022).

Only a little less than half of the participants were planning to move out in the coming five years. When looking for a new home, they deemed having their work or school nearby most important (4 points out of 5), closely followed by living nearby family and friends (3.9 points out of 5). The importance of close contact with neighbours was rated with 3.1 points out of 5.

Remarkable, only 40 percent of the participants wish to live with their partner in their next home. A quarter of the students wishes to live alone, while 6 percent wish to live with one friend. Around 20 percent are willing to share their house with more than one friend and of that 6 percent are even willing to share their house with strangers. When asked if one was willing to share their home

with strangers in order to reduce rental prices, 23.5 percent answered 'yes'. The average amount of unfamiliar people the students were willing to share a home is 2.5.

Participants were lastly asked which facilities they were willing to share with others. For some this meant with friends, for others it meant they were willing to also share with strangers. The facility students were most willing to share were a bicycle storage (65 percent) and a garden (50 percent). 40 percent of the students were willing to share a laundry room, outdoor area (balcony or gallery) and, surprisingly, a kitchen. Flexible workspaces, storage room, a dining room, living room and hobby room were popular to more than 20 percent of the students. The functions almost no one was willing to share were the bedroom, bathroom, a toilet and a shared car (all 5 percent). In this question, only 20 percent was not willing to share any of the mentioned facilities.

50 percent of the participants are willing to share a garden with others.

4.2 Current situation (drawing exercise)

This exercise was by far the least participated in exercise, probably due to it taking the most effort. Only four students participated. In this exercise, the students were asked to draw their current bedroom, their house and the building they lived in. Afterwards, they had to rate the three spaces from 1 to 10 according to their satisfaction, 1 being very unsatisfied and 10 being complete satisfied.

All the bedrooms drawn were approximately 10 square meters and all of them contained only basic furniture, including a bed, a wardrobe and a desk to study at. Surprisingly, almost all of the students rated their bedroom with a 9 out of 10. The only wish they articulated was that it could be a little more spacious. One of the students rated their bedroom with a 7 out of 10, but this was mostly because the room was not tidied up like the student wished. While these students spend a large portion of their day in these small rooms, they express being remarkably satisfied.

All three of the students that drew their house, live in a ground-bound home with three stories. They all appeared very satisfied with their current living situation and expressed planning to living in a similar house in the far future. The three houses all contain a big open living spaces and at least two toilets for a household of four people.

4.3 Comparing options

Doing this third exercise with a group of 40 students turned out rather challenging, which is why while initially the exercise was to be interactive using sticky notes, it was soon turned into a questionnaire where students could raise their hand for their preferred option. Some of the most interesting an relevant results and conclusions will now be discussed.

4.3.1 Configurations

The opinions on the configuration of rooms in relation to the common areas differ greatly and are mostly based on spatial preference. One student who voted for the common area in the middle between units (option B) commented that a more square space offers more possibilities in arranging the room. The configuration of groups of rooms on a plot also created different opinions, which mostly were based on noise disturbance: shattering units over the plot reduces nuisance from neighbours, or optimal use of space: when placing them close together, more units can be placed on one plot.

4.3.2 Sharing facilities

As was already concluded before, only 40 percent of the participants are willing to share facilities within their home, of which half are willing to share only the kitchen and not the bathroom. A lot of students, however, are willing to share one or two meals a week with others. 62 percent of the students even suggest finding cooking together with others enjoyable.

4.3.3 Unit size and pricing

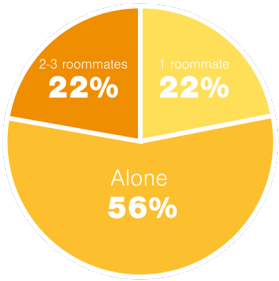
Concerning the pricing and size of one housing unit, all the students expressed wanting a unit as big as possible for a reasonable price. Their main motivation is that 'bigger is always better', even if they do not have the furniture to fill up these spaces. Through a short conversation it became clear that many of these student aspire making a lot of money in their future and buying big houses. Just a small portion of the participants noted that being happy with your living environment was more important than the size. The budget all the voting students chose was €550 per month.

4.3.4 Outdoor spaces

Another notable outcome, is that all of the voting participants preferred a small, private balcony over a big, shared balcony. While many claim to be open to sharing a garden, all participants desire at least a small private outdoor space. One student stated that 'he would like to host small barbecues with his own group of friends' on said balcony.

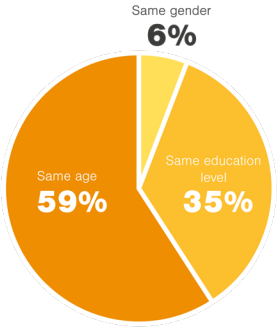
4.3.5 Demographic of housemates

Surprisingly, students do not care about the gender of their housemates. Where different ethnic backgrounds might suggest there could be differences in these preferences, this did not show in this



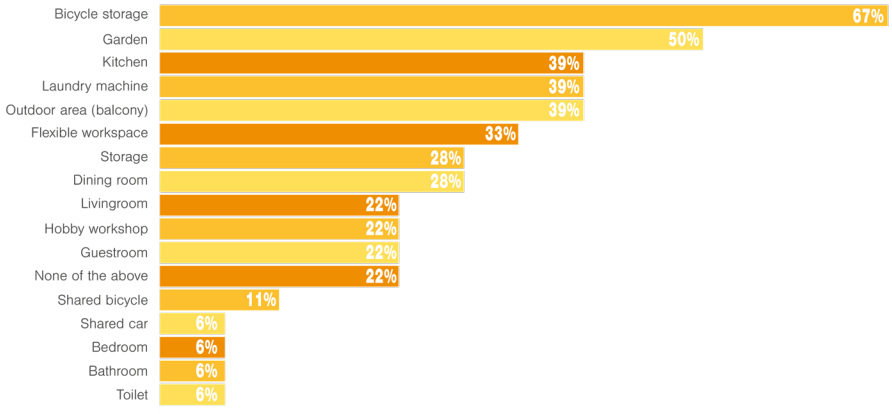
Amount of preferred roommates

Preferred price per month



Most important characteristic of neighbours

Some statistics derived from the workshop. (own results, 2022)



Percentage of participants willing to share facilities

Percentage of participants willing to share facilities (own results, 2022)

Private area

Floor 1, 2 & 3

Average size per person

10-30 m²

Average price per person

€550 per person per month

Private facilities

Bedroom(s)
Living space
Bathroom
Toilet
Balcony

Preferred configuration

Living space or dining room connected to shared area

Household area

Floor 1, 2 & 3

Amount of total households

10-20 households

Average size of household

3-4 people

Roommate preferences

Similare lifestyle (age, educational level and school/work)

Average size of shared space

20 m²

Private or shared facilities

Kitchen
Dining room
Storage space

Community area

Floor 0 & 1

Size of community

40-60 people

Shared facilities

Bicycle storage
Laundryroom
Workspaces
Workshop

Facilities possibly shared with neighbourhood

Garden
Community kitchen
Meeting/event spaces

(Semi-)public area

Floor 0

Facilities

Catering industry
Sport facility
Office/Start-up facilities
Shopping facilities

Activities

Within household

Cooking
Dining
Studying
Relaxing
Receiving guests

Within community

Partying
Beerpong
(Weekly) soccer matches
Carpenting/fixing furniture
Gaming event

Within neighbourhood

Organise workshops
Host movie nights
Host sports event

Design Brief. (own illustration, 2022)
See Appendix 3 for larger version

questionnaire. Instead, students prefer roommates with the same education level (35 percent) or a similar age (60 percent). After short discussion, it was concluded that the participants mostly preferred living with people with similar life styles and rhythms.

A similar lifestyle is the most important factor in picking a new roommate.

4.3.6 Shared activities

Finally, a discussion on whether students were willing to participate in activities with other residents or neighbours was held. It became clear that just little over half of the students were willing to take part in activities and on top of that, 20 percent even showed interest in organising events. While at first 25 percent showed no interest, after some questions it became clear that the events they had in mind were not something they were interested in. Activities they did fancy joining, however, were for example partying, entrepreneurship, movie nights, (weekly) soccer matches, beerpong or studying together.

4.4 Design brief

The final assignment involved letting the students create a design brief for an affordable housing project with shared and/or public facilities. For this, the students were provided with a document they had to fill in. Disappointingly, afterwards it became clear than almost none of the students understood the assignment correctly.

While the purpose of this assignment was for the students to make choices about which functions to include, showing the financial consequences within the design brief, most students interpreted the document as having to include all the proposed functions. Thus, in most design briefs a swimming pool, a fitness and a cinema were included. This makes it rather challenging to interpret the results in a reliable way. However, an attempt will be made.

Firstly, most groups suggest creating more units with smaller amounts of bedrooms, mostly 1 or 2 bedroom-apartments. Only two out of the four groups suggest also creating 4 bedroom-apartments. None of the groups concluded more than 4 bedroom-apartments in their brief. This resonates with the earlier drawn conclusions about students preferring to live with just a small group of friends or individuals.

Functionalities that, next to obvious elements like main entrances and mailboxes, should be included according to all groups are among others a laundry room, study or work spaces, a shared kitchen and shared dining room, storage spaces and a bicycle storage. From more unrealistic additions such as a swimming pool, fitness or cinema, the fitness and a workshop were used most in the design brief. One addition especially unpopular is a vegetable garden. While all other options were mentioned by at least 5 out of 6 groups, the vegetable garden was only mentioned twice.

The exercise where students were asked which public functions, which will be shared with the whole neighbourhood, to include in the building, the most popular function is the catering industry, which is mentioned by 4-5 out of the 5 groups. After this, sport or office facilities are most popular, closely followed by shopping facilities. A house of worship was mentioned twice and healthcare and industry were mentioned once. Childcare, a hotel function and education were not mentioned.

4.5 Discussion

One of the most important remarks that has to be made, is that 50 percent of the participants in this workshop are 16 years old, 30 percent are 17 years old. Not all of the youngsters planned to move out from their parents homes any time soon and some had not even thought about moving out yet. Thus, those participants were asked to imagine themselves in three years and what they would have answered to the questions in that case.

Besides this, 91 percent of participants are male. This is not a relevant display of the target group, especially when looking at other research, as in other questionnaires women tend to be more interested in co-housing principles (Paes, 2017). Consequently, the results of the workshop will be interpreted more loosely and taking into account the possibility that female participants might be more prone to feel positively towards co-housing principles (ScottHanson & ScottHanson, 2005).

Some parts of the workshop were better executed than others, the questionnaire being the most effective, as it is very straight to the point. These results can be interpreted without bias. The other exercises, however, appeared more difficult to interpret academically. Yet an attempt was made to interpret the results of the exercises in a way that they can be included in a design brief.

Lastly, the final exercise proved more difficult to understand for the students then anticipated. While the results of this exercise are difficult to interpret, when looking closely one can determine slight differences in the preferences expressed by the group of participants. When discussing the design briefs, it became clear that most of the unrealistic additions just seemed ‘fun’ to the students. Unfortunately, there was no time to correct the already finished design briefs. Still, the results were interpreted as thoroughly as possible.

Image: Pexels.com (2022)

5
Conclusion

“IT ALWAYS SEEMS IMPOSSIBLE UNTIL IT’S DONE.” - Nelson Mandela (n.d.)

The research question of this thesis was: What are the housing needs of young people (age 18 to 27) with a low income, planning to live around Zuidplein in Rotterdam and how can affordable housing include these needs? To answer this question, the following sub-questions were investigated: What is the current (housing) situation of the young people? What are the living wishes of the youngsters? What facilities are young people prepared to share with other people, and with whom? How can these wishes be made into affordable housing?

Using all the information gathered through literary research, the analysis of reference projects and the workshops, a design brief can be drawn up and thus the main research question can be answered. As the workshop formed the main source of information, all other research topics will be compared to these results. The conclusions drawn from this will form the complete design brief of an affordable co-housing project aimed at young adults with a low income in Rotterdam South.

4.1 Affordability and workshop results

The conclusions drawn from the literary research into affordability in (co-)housing showed a couple of basic design and organisation principles, which should be implied in the design brief. The most important ones were:

- Reduce the size, both of housing units and the building as a whole
- Create flexible spaces, meaning spaces which can be used for different purposes without having to change the layout of the building
- Keep the building design simple, the fewer unique and additional building elements, the lower the cost
- Use local materials, in order to reduce shipping and labour costs
- Use materials with a long durability, in order to reduce long-term management costs

All of these principles can realistically be implemented in the design brief, though they might not individually be mentioned within the description of each space. Flexible spaces and minimal unit sizing, however, will be mentioned in the brief.

One conflicting result between the workshop and the research into affordability, is with the sizing of housing units. Participants in the workshop specifically mention preferring a house as big as possible for a monthly rent of €550. In order to keep a unit affordable and within this maximum, however, the sizing of such a unit might turn out smaller than desired for the target group. This can be made more bearable by adding shared spaces which can thus be slightly bigger.

Flexible spaces will certainly be part of the design brief, as these will be the core of the project. Spaces which can be used by different people for different purposes will help reduce the rental prices and also attract more visitors from around the neighbourhood.

4.2 Co-housing and workshop results

Co-housing has proven to be very successful in reducing housing costs and can also serve as a very appropriate mechanism to stimulate personal growth and creating a sense of community. There are some limitations, however, as to until when co-housing actually stimulates these outcomes, instead of hinder them. Some of the most important notions are:

- Creating a total size of dwellings between 12 and 13 housing units, in order to keep communication between neighbours manageable but not getting too personal
- Housing people who are in similar life phases, in order to not disturb others on inappropriate hours
- Choose a management style which fits the demographic of the complex, as not every management style might fit the residents
- Facilitate natural encounters and interaction, while also offering the option to avoid, as each residents prefers their own level of privacy
- Add shared facilities, in order to reduce costs and stimulate natural encounters

All of these notions will be part of the design brief, meaning that only between 12 and 36 dwelling units will be realised. The target group consists of young adults who are about to move into their first private apartment, and should thus be in similar life phases. These phases could however divert after a couple of years, as couples might shift into a family-oriented life style, whereas other might remain in a more individual life-phase still. Different kinds of housing units for different life styles should thus become part of the design brief, while still making sure all units have access to shared facilities.

There are two management styles which could be implemented in this design project: either the tenant-management model or the service-management model. As only 20 percent of the participants in the workshop seemed interested in organising events, the willingness to self-manage seems quite low. Thus, a service-management model would be most suiting, if housing a big variety of tenants is the end goal. If, however, the goal is to create a self-sufficient and independent community, tenants should be selected on their willingness to participate, where tenant-management might be into place. The management style does have very little influence on the design brief and will thus be left out.

As not all participants showed the desire to share facilities or take part in group-activities, the option to avoid is a very important factor which should determine a good portion of the design. Each shared space should facilitate this option, as to not force any interaction on residents. Different methods to achieve this can still be researched.

4.3 Reference projects and workshop results

One of the most notable points which came up in the analysis of each of the three reference projects, is the possibility to choose different types of apartments. All three projects offered both private and semi-private apartments. Furthermore, all apartments had access to one or more common areas. In the workshops, participants also expressed preferring different levels of privacy and different amounts of facilities they were willing to share. So, different apartments, both in size and the amount of shared facilities should be added.

Another interesting aspect can be found in the project Startblok. In this project, every private studio has got access to a common area, which is shared with a couple of other studio's. In this way each resident has got their own fully equipped private space, but still is offered the opportunity to interact with neighbours in a natural way. These common areas will certainly become part of the design brief.

Lastly, 'option rooms', which were part of the Spreefeld design, will be added to the design brief as well. These spaces proof to be very popular by residents not only of the building, but of the entire neighbourhood. These spaces can stimulate creativity and the sense of community within the neighbourhood, as several different sorts of events can be organised here.

4.4 Set-up

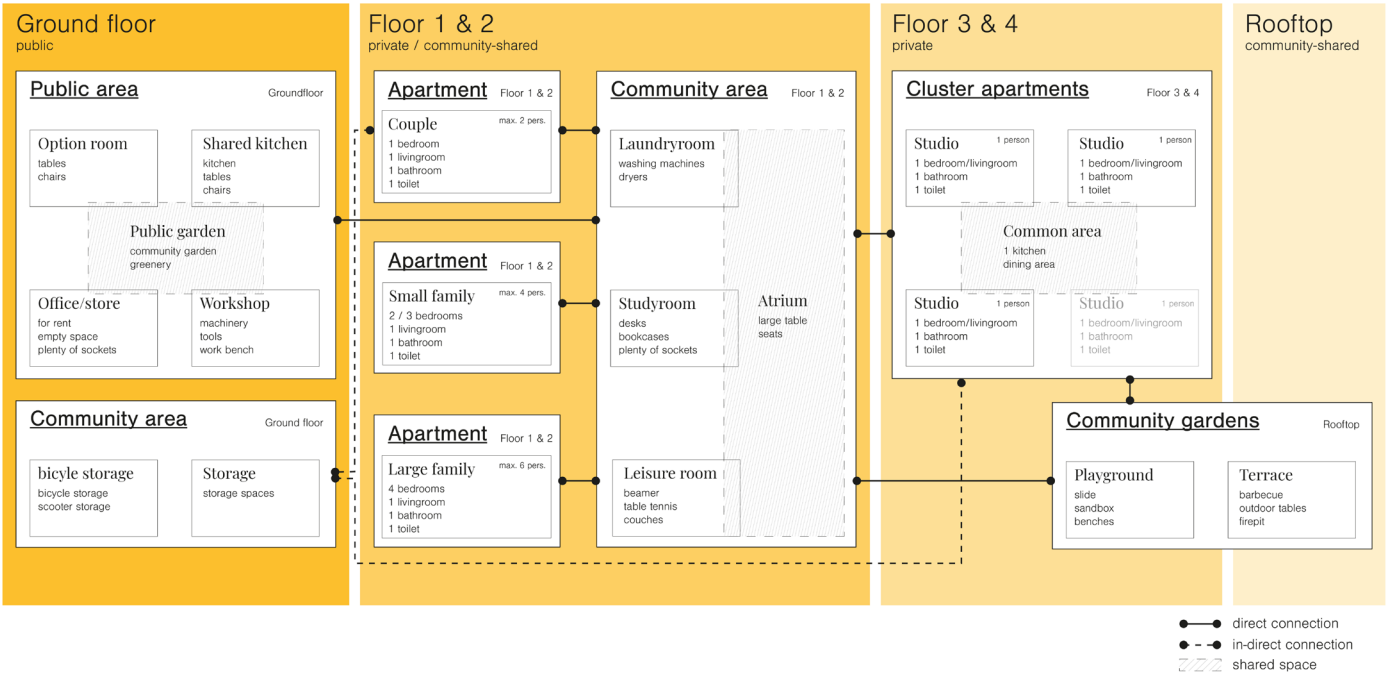
After analysing the results of the different research methods, a design brief can be drawn up, which is shown on the right.

The ground floor is made up of mostly public functions, as this is the most accessible space for residents living in the surrounding neighbourhood as well. All functions are to be used by the residents of the building, yet some will not be accessible to outsiders. All facilities are also connected to a community garden which is situated in the middle and will also be open to the public.

On the first and second floor, private apartments will be situated. The reason to put these apartments closer to the public functions, is to stimulate encounters with both other residents and visitors more, through visual and physical connections between private and shared spaces. This could be realised through for example balconies, windows, shared hallways and shared circulation spaces. All private apartments are also connected to a common area which is shared by all residents. By doing so, residents have the option to retreat into their private space, but also have the option to interact and make use of shared facilities.

On the third and fourth floor, cluster apartments are situated. These apartments have a private bed- and bathroom, as the workshops showed that close to no one was willing to share these facilities. The residents do, however, share a kitchen and dining area. This will reduce the living costs and improve the sense of community within this cluster. It must be taken into notion that not every individual will want to live in such an apartment, which is why private apartments are also added to the design brief.

Lastly, rooftops can be used exclusively by residents. The survey under participants in the workshop showed that many people were willing to share a garden, which is why the ground floor garden has been made public. In order to realise private outdoor spaces, these will be created on the rooftops and can have different, to be determined, functions.



Final design brief. (own illustrations, 2022)
See Appendix 4 for larger version

Image: Unplash.com (2022)

6
Discussion

"THE ONLY REAL GOAL OF EDUCATION IS TO LEAVE A PERSON ASKING QUESTIONS." - Max Beerbohm (n.d.)

The aim of this thesis was to find out: *What are the housing needs of young people (age 18 to 27) with a low income, planning to live around Zuidplein in Rotterdam and how can affordable housing include these needs?* To answer this question, the following sub-questions were investigated: What is the current (housing) situation of the young people? What are the living wishes of the youngsters? What facilities are young people prepared to share with other people, and with whom? How can these wishes be made into affordable housing?

In this thesis, both qualitative and quantitative research was conducted. Through this research a final design brief was drawn up, which can be found in chapter 4. The most important findings, among others, include that different types of housing should be realised, the building should contain several shared facilities in rooms which have a flexible floorplan, the neighbourhood should be involved in shared spaces, housing units should be designed as small and with as little walls as possible and that bathrooms and bedrooms should always be private.

While the most important aspects for creating a design brief for a co-housing model aimed at young adults with a lower income have been covered, many other aspects could be taken into account in order to create an even more coherent and realistic design brief. In this thesis the focus was mainly on affordability, co-housing principles and living wishes of the target group. Other aspects that could be taken into account are, for example, the building context of the design and the development plan of the municipality. Because this thesis did not have a specific location yet, these elements were left out.

Through literary research, more insight into affordability in housing and the design and organisation principles of co-housing were gathered. Several studies and papers on these matters have been written, resulting in a large amount of data to possibly analyse. In this thesis, two main sources were used to create the basic framework around which more research was conducted, being Design Strategies for Affordable and Sustainable Housing (Fay, 2005) and The Cohousing Handbook – Building a Place for Community (ScottHanson & ScottHanson, 2005). Besides these sources, several other sources were used in order to substantiate the findings.

A lot of research can be done into the different aspects of affordability and co-housing and the correlation between the two topics. While the individual topics have been researched thoroughly by a wide variety of researchers, the relationship to each other has not been investigated much. Further research in this topic, however, is very relevant in the current day and age, as housing prices around the country keep rising, while municipalities struggle creating communities within their cities. Affordable co-housing could possibly be a solution to both problems, and should thus be further researched.

The analysis of reference projects was done in order to better understand the elements of co-housing which are and are not successful. Three projects were analysed on their private spaces, community spaces, public spaces and the management style. Only one of the projects is situated in

the same country as the design location of this thesis. In the analysis, this was not taken into account, but in future research should play a role, as different countries have different housing organisations and cultural housing principles.

The depth of the analysis could also be more thorough, preferably through actual visits to the projects. Only through experiencing the projects oneself, can one truly understand the significance of its design on the impact it has on its users. The analysis in this thesis was based on online available material, such as drawings by the architect, video's and articles on several architectural websites. A conversation with a user or resident of the projects could also tremendously deepen the significance of this research.

In order to gain insight in the living wishes of the target group, two workshops were organised with a group of students. This group, however, turned out to not fit the actual target group of the design brief, as they were mostly 16 and 17 years old, and 91 percent of participants were male. Still, the discussions held with the students hold great value for this thesis, as they will become the target group in the future and have more knowledge on the living situation of the target group than average.

The results of the workshop are also very location-bound, and thus might be difficult to implement in other locations, where different socio-cultural issues are at play and have to be resolved than on this specific location. Therefore, the data conducted through the workshops can form the basis of further research, yet should not be taken as globally implementable truths. For this specific design brief, however, the results weigh heavily on the final brief.

Some parts of the design brief are still open for interpretation and could use further determination, such as the functions situated in the plinth. While some suggestions for the ground floor have been done, further research into the needs of the surrounding neighbourhood should be done, in order to match the functions to what is actually missing or needed in the area. This research will be conducted throughout the design process.

It must be noted that the final design brief will merely form the basis from which to start working on a design. During the design-process, changes to the brief can be made, as more research will also be conducted during this process. The aim of this design brief is to create a coherent starting point, including the most important elements which have been researched in this thesis.

Image: Pexels.com (2021)

7
Reflection

“CHANGE IS THE END RESULT OF ALL TRUE LEARNING.” - Leo Buscaglia (n.d.)

This reflection was written at the end of the research and design-process and thus contains a reflection on design aspects which have not been discussed within this thesis.

Relevance to the Faculty of Architecture and the Built Environment

Through the Veldacademie, it is recommended to create an architectural design which is as close and relevant to the target group as possible. In this studio, the development of an innovative building project that uses design as a means to deal with social and spatial challenges encountered in the built environment, is one of the main focuses. This closely relates to the educational goals of the master programme Architecture, Urbanism and Building Sciences.

The Veldacademie is known for their knowledge and experience in conducting fieldwork research. Through this studio, students were encouraged to get into the field and speak to stakeholders in order to gain a better understanding of the socio-spatial context and the issues at hand. Thus, two workshops were held with students who were familiar with the location and would (soon) be the target group of this project.

Research methods

The young adults were asked about the most important requirements for a rental property. The questions were divided into three categories and include questions that focus on current situation, wanted accommodation and (desired) co-residency and participation (both in cohabitation form and in normal living form). The workshop contained a drawing exercise, a questionnaire, a collective exercise in which questions were asked using drawn out design principles, after which the students voted for their preferred option and a discussion was held and finally an exercise in which students created their own design brief.

Not every exercise was carried out as successfully, mainly because the group size on the day of the workshop was four times the anticipated size. Yet the discussions held with the students lead to important insights, which were involved in the final design brief.

Besides this field work, literary research into housing affordability and co-housing principles was done, as well as the analysis of three reference projects. This desk research further scientifically substantiated the resulting design brief.

It must be noted, however, that the research done for this project is partly globally orientated

and partly oriented towards the design location, the Tarwewijk. The design brief that resulted from this, involves both perspectives and has dealt with any contradistinctions, even though there were few. By including different research methods in the thesis, all design decisions are argued through different perspectives and thus hold more scientific relevance.

Research and design

Research and design are very closely related to each other in this design project, as the results of the research are combined into a coherent design brief. This design brief contains all the knowledge gathered through both qualitative and quantitative research, in the form of literary research, the study of reference projects and the organisation of two workshops for young adults well acquainted with the area. The design brief then forms the starting point from which to design a co-housing project on a location in the Tarwewijk. While some aspect of the design brief are still relatively vague and undetermined, such as the functions in the plinth, a general proposal for the design and a lot of knowledge about the most important subjects, being housing affordability, co-housing principles and the housing wishes of the target group, has been generated through the research done.

Relevance to socio-spatial context

This design project focuses on a quite specific target group consisting of young adults with a lower income who are planning to live in the Tarwewijk. This group is quite ethnically diverse, yet research has shown that ethnic background does not have a big influence on the living wishes of an individual. Thus, the design brief could be relevant for different target groups in a similar age range as well.

The results specifically of the workshop are very location-bound, and thus might be difficult to implement in other locations, where different socio-cultural issues are at play and have to be resolved than on this specific location. Therefore, the data conducted through the workshops can form the basis of further research, yet should not be taken as globally implementable truths. For this specific design brief, however, the results weigh heavily on the final brief. In a wider social contacts, the results gained from the workshops should be removed from the design brief in order for the brief to be used.

The final design is based largely on the living wishes of citizens already familiar with or even living in the area, as well as on the socio-spatial problems the specific neighbourhood is facing. While the main structure of the building could be placed in other surroundings, the specific functions added to this design were focused on the context of the area. Thus, the general design could be used as a starting point for similar projects, yet the implementation of the design could and probably should be different.

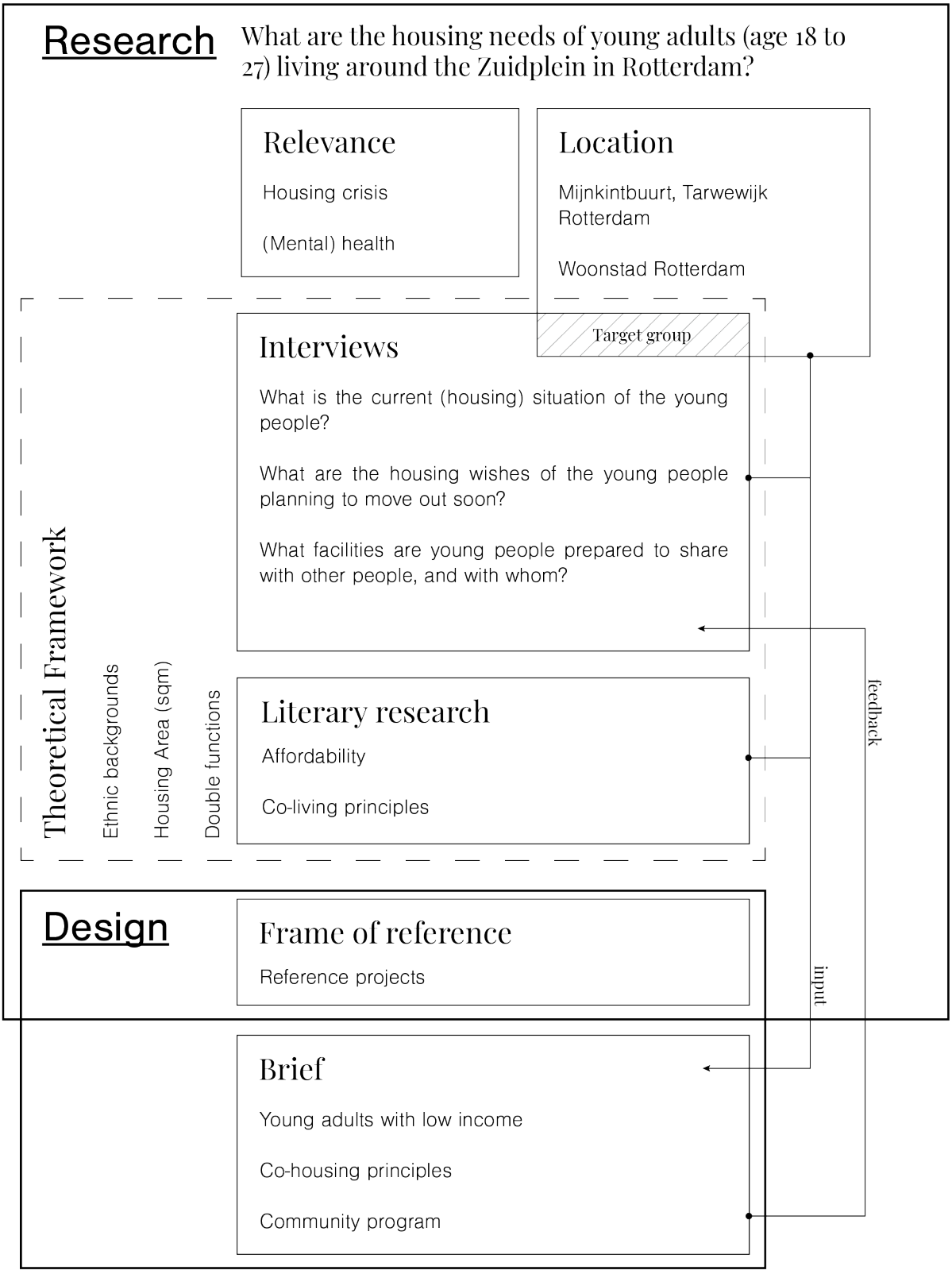
Ethical considerations and dilemma's

While the design brief that resulted from the research formed a useful starting point for the design, it did not cover all (ethical) considerations and decisions that still had to be made.

The most important and constantly re-occurring theme that influenced every design decision in this process, is the theme of affordability. This project is aimed at young adults with a low income, meaning that rental prices should be kept as low as possible. This has greatly impacted the design, in every possible way. Some important interventions are the design tiny housing units, of only 10 square metres, where each room has built-in furniture to maximise the usable space. These units are copied and pasted several times in a row, to minimise the variations and thus the building complexity, meaning that the entire building can be built much faster. For this exact reason, the design is also entire built out of CLT and timber, as these materials proof to be quite quick and easy to build and assemble on site. Furthermore, passive climate principles are integrated where possible and the building will produce its own energy and heating through PVT-panels.

Affordability is a very broad theme and has probably made this design project more complex than it would have been without this limitation. But besides limiting the design possibilities, it also offered a great direction to follow throughout the process. Each decision made in this design is based on its affordability, from the type of railing on the outdoor galleries to the overall construction, and from the configuration of cluster-apartments to the function and usage of the community-hub.

This community-hub, however, posed me with another ethical dilemma. The hub, located on the North-East side of the building, facing the current playground association, should function as a meeting space for both residents of the building and visitors living in the neighbourhood. This in the beginning was limited by the fenced of playground, which did not create a very welcoming environment for meeting new people. By removing the fence and opening up the park to the public, a first invitation to more interaction was made. Removing the playground-association building entirely was at one point also considered. However, after much consideration it was concluded that this would



Thesis and design outline (own illustration, 2021)

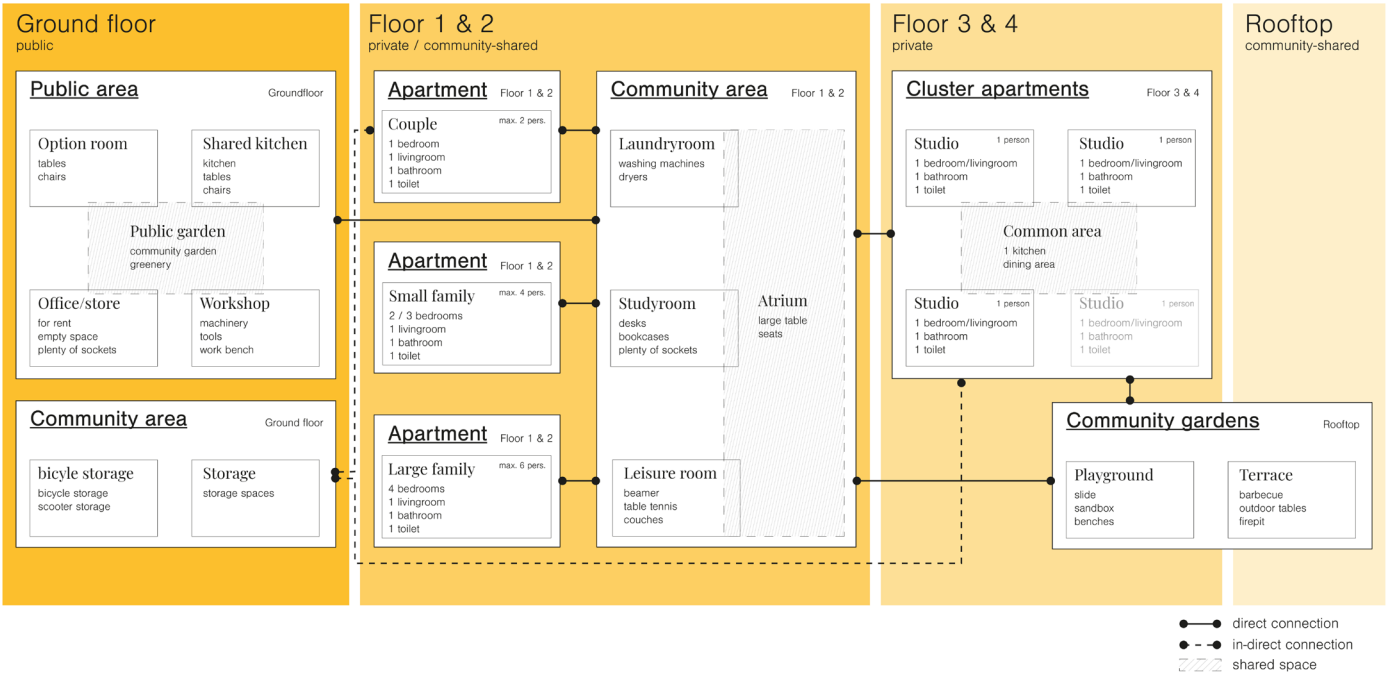
probably not be appreciated by the locals, as this is a building which represents pride and community to them. Instead, the new community-hub will interact with the playground-building, creating a bigger and even more inviting space, right in the middle of the neighbourhood.

Personal reflection

The approach in this project, being first interviewing the target group and then basing a design of this, has so far been quite fruitful. While not all results of the workshop were as useful as initially anticipated, the conversations with students definitely helped me gain a better understanding for which elements in housing the target group deems important. Furthermore, talking to different stakeholders and professionals, such as employees at housing corporations and PhD candidates specialised in relevant topics such as affordability, much helped me to form a basic understanding of the important elements involved in designing affordable co-housing.

During the design process, however, it became clear to me that a lot of further research still needed to be done. Mainly into the socio-spatial context and the problems in the Tarwewijk. Before starting on the research, I already realised that a design by research approach would be needed in this project, as many new problems would only occur once the design process was started. Thus, the research done is far from complete and will continue to be conducted throughout the further design process.

Especially my tutors have helped me realise that the research is never over and more information can almost always be gathered in order to further develop a coherent design. Their constant focus on unfinished elements and unanswered questions have helped me come further in this design process on several occasions and I look forward to even more critical and constructive feedback on the design, in order to learn even more about the wide variety of aspects of this design assignment.



Final design brief. (own illustrations, 2022)

Image: Unplash.com (2022)

8
Bibliography

Alle Cijfers (geraadpleegd 21 october 2021). Gemiddeld inkomen per inwoner (€18.400). Retrieved on 21 october 2021 from https://allecijfers.nl/buurt/tarwewijk-rotterdam/#inkomen

Alle Cijfers (geraadpleegd 21 october 2021). Inwoners naar leeftijd – buurt Tarwewijk. Retrieved on 21 october 2021 van https://allecijfers.nl/buurt/tarwewijk-rotterdam/#leeftijdsgroepen

Alle Cijfers (geraadpleegd 21 october 2021). Migratieachtergrond. Retrieved on 21 october 2021 from https://allecijfers.nl/buurt/tarwewijk-rotterdam/#migratie-achtergrond

Al-Homoud, M. (2005). Systematic approach for the thermal design optimization of building envelopes. Journal of Building Physics, Vol. 29 No. 2, pp. 95-119.

Altés Arlandis, A. (2011). Living Together: On the Role of Architecture in the Production of Habitable Collective Spaces. In: Oikodomos - Sint-Lucas School of Architecture (ed.), Innovating, Housing, Learning: Oikodomos International Conference 2011. Brussels: Sint-Lucas School of Architecture.

Architectuul. (2022). Spreefeld Co-housing. Retrieved on 18 January 2022, from http://architectuul.com/architecture/spreefeld-co-housing

Baker, E., Lester, L., Mason, K. et al. (2020, 5 March) Mental health and prolonged exposure to unaffordable housing: a longitudinal analysis. Soc Psychiatry Psychiatr Epidemiol 55, 715–721 (2020). https://doi.org/10.1007/s00127-020-01849-1

Belniak, S., Lesniak, A., Plebankiewicz, E. & Zima, K. (2013). The influence of the building shape on the costs of its construction. Journal of Financial Management of Property and Construction. 18. 10.1108/13664381311305096.

Bolt, G. & Permentier, M. (2006, december). Woonwensen from allochtonen. NETHUR, Utrecht.

Bouchlaghem, N. (2000). Optimizing the design of building envelopes for thermal performance. Automation in Construction, Vol. 10 No. 1, pp. 101-12.

Bostancioglu, E. (2010). Effect of building shape on a residential building's construction, energy and life cycle costs. Architectural Science Review, Vol. 53 No. 4, pp. 441-67.

Brandon, P.S. (1978). A framework for cost exploration and strategic cost planning in design.

Bruin, E. (2020, 12 november). De Key bouwt derde Startblok in Spaarndammerbuurt. Lieven de Key - Actueel. Retrieved on 18 January 2022, from https://actueel.lievendekey.nl/derdestartblok/

Brook, M (2008). Estimating and Tendering for Construction Work, 4th ed. Oxford, Elsevier.

Brysch, S. (8 december 2021). Interview about affordability in co-housing projects. Delft, The Netherlands.

Camp, P. (2018). Wonen in de 21ste Eeuw: Naar een Hedendaags Utopia. Nederland: Acco Nederland.

Centraal Bureau voor de Statistiek. (2018, 2 juni). Woonoppervlakte in Nederland. Retrieved on 25 october 2021, from https://www.cbs.nl/nl-nl/achtergrond/2018/22/woonoppervlakte-in-nederland

Corfe, S. (2019). Co-Living: A Solution to the Housing Crisis? London: The Social Market Foundation.
Cunningham, T. (2013) Factors Affecting The Cost of Building Work - An Overview. Dublin Institute of Technology.
Danish Architecture Center - DAC. (2022). Haus M. Retrieved on 18 January 2022, from https://dac.dk/en/knowledgebase/architecture/haus-m/
Davis, S, (1995). The Architecture of Affordable Housing. Berkeley, University of California Press.
Duplex Architekten (n.d.). Mehr als Wohnen, Häuser A, M. Duplex Architekten.
Fay, R. (2005). Design Strategies for Affordable and Sustainable Housing. Melbourne: Royal Australian Institute of Architects.
Fement, B., Hooft van Huijsduijnen, F., Meeuwissen, B. & van Til, R. (2003). WoningBehoefte Onderzoek 2002. Abf research, Delft.
Friberg, T. (1993). Everyday Life: Women's Adaptive Strategies in Time and Space. Sweden: The Swedish Council for building Research.
Guyon, N., & Huillery, E. (2014). The Aspiration-Poverty Trap: Why Do Students from Low Social Background Limit Their Ambition? Evidence from France. Working document available at https://www. unamur. be/en/eco/eeco/pdf/paper_autocensure_feb2014. pdf.
Het Ministerie van Binnenlandse Zaken en Koninkrijksrelaties. (2021). Staat van de Woningmarkt - Jaarrapportage 2021.
Het Ministerie van Binnenlandse Zaken en Koninkrijksrelaties. (2018). Ruimte voor wonen- De resultaten van het WoonOnderzoek Nederland 2018.
HET WOONPROTEST. (2021). HET WOONPROTEST. Retrieved on 21 october 2021, from https://woonprotest.nl/
Housing Industry Association. (2003). Restoring Housing Affordability-The Housing Industry's Perspective. Housing Industry Association Ltd.
Karshenas, S. (1984). Predesign cost estimating method for multistory buildings. Journal of
Kate E. Mason, Emma Baker, Tony Blakely, Rebecca J. Bentley (2013, october). Housing affordability and mental health: Does the relationship differ for renters and home purchasers?. Social Science & Medicine, 94, 91-97 (2013). https://doi.org/10.1016/j.socscimed.2013.06.023.
Kouskoulas, V. & Koehn, E. (1974). Predesign cost-estimation function for buildings. Journal of the Construction Division, ASCE, Vol. 100 No. 12, pp. 589-604.
Krabbendam, P. (2020). Blog – Gemeenschappelijk wonen: Startblok Riekerhaven in Amsterdam. De Architect. Retrieved on 18 January 2022, from https://www.dearchitect.nl/architectuur/blog/2020/04/blog-gemeenschappelijk-wonen-startblok-riekerhaven-in-amsterdam-101241070
Krantz, B. & Palm Lindén, K. (1994). Forms of Collective Housing, Forms of Living Alternatives. Bielefeld, Germany.
Lewis, M. (2004). Integrated design for sustainable buildings. Building for the Future: A Supplement to ASHRAE Journal, Vol. 46 No. 9, pp. 22-9.
More than Housing cooperative (2018). Cooperative More Than Housing 2007 – 2017. Zurich: Künzle Druck AG.
N. (2017). Inside Berlin's collective housing. Nationthailand. Retrieved on 18 January 2022, from https://www.nationthailand.com/life/30334580
NU.nl. (2021, 31 mei). Huurprijzen stegen in dertig jaar bijna dubbel zo snel als inflatie. Retrieved on 21 october 2021, from https://www.nu.nl/woningnood/6134578/huurprijzen-stegen-in-dertig-jaar-bijna-dubbel-zo-snel-als-inflatie.html
NU.nl. (2021, september 12). Dit zijn de vier eisen van de deelnemers aan het Woonprotest. Retrieved on 21 october 2021, from https://www.nu.nl/wonen/6156441/dit-zijn-de-vier-eisen-van-de-deelnemers-aan-het-woonprotest.html
Onderzoek 010 (2022). Veiligheidsindex (2014 = 100). Retrieved on 12 April 2022, from https://onderzoek010.nl/Dashboard/onderzoek010/Leefbaarheid-en-Veiligheid–wijk-/
Paes, M. (2017) Shared living and the desired level of privacy. Delft: University of Technology Delft.
Palm Lindén (1992). Community and Privacy in the Swedish Collecitve House. Sweden, School of Architecture, University of Lund.
Pararius.nl (2021). Huurprijzen in de vrije sector verder gedaald. Retrieved on 25 october 2021, from https://www.pararius.nl/nieuws/huurprijzen-in-de-vrije-sector-verder-gedaald
Sánchez, D. (2021). Coop Housing at River Spreefeld / Carpaneto Architekten + Fatkoehl Architekten + BARarchitekten. ArchDaily. Retrieved on 18 January 2022, from https://www.archdaily.com/587590/coop-housing-project-at-the-river-spreefeld-carpaneto-architekten-fatkoehl-architekten-bararchitekten
Sánchez, D. (2021). R50 – Cohousing / ifau und Jesko Fezer + Heide & von Beckerath. ArchDaily. Retrieved on 20 january 2022, from https://www.archdaily.com/593154/r50-nil-cohousing-ifau-und-jesko-fezer-heide-and-von-beckerath?utm_source=ArchDaily+List&utm_campaign=e654b42bd1-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_b5a382da72-e654b42bd1-407944317
ScottHanson, C. & ScottHanson, K. (2005). The Cohousing Handbook – Building a Place for Community. Canada: New Society Publishers.
Selley, L. (1983). Building Economics, 3rd ed. Londen, Macmillan.
Span, M. (2017). Collectief bouwen en wonen is over de hele wereld hot. Retrieved on 29/12/2021 from https://evolutiegids.nl/co-housing/
Spreefeld Berlin / fatkoehl Architekten. (z.d.). Cooperative development for affordable housing

and mixed-use. Retrieved on 18 January 2022, from https://fatkoehl.com/en/housingmixed-use/spreefeld-berlin/

Startblok Riekerhaven | Woonruimtes. (2021). Startblok Riekerhaven. Retrieved on 18 January 2022, from https://startblokriekerhaven.nl/wonen-in-het-startblok/woonruimtes/

Susanka, S. & Obolensky, K. (1998) The Not So Big House: A Blueprint for the Way We Really Live. Newtown: The Taunton Press Inc.

Swaffield, L.M. & Pasquire, C.L. (1996). A critique of mechanical and electrical services cost planning: existing methods and published information. Journal of Financial Management of Property and Construction, Vol. 1 No. 3, pp. 23-41.

Swiss-Architects. (z.d.). Mehr als Wohnen Duplex Architekten. Retrieved on 18 January 2022, from https://www.swiss-architects.com/de/duplex-architekten-zurich/project/mehr-als-wohnen

Wang, J. & Hadjri, K. (2017) The role of co-housing in building sustainable communities: Case studies from the UK. In: Environment-Behaviour Proceedings Journal. 3rd ABRA International Conference on Quality of Life, 14-16 Oct 2017, Kuching, Malaysia. e-International Publishing House , pp. 255-265.

Image: Unplash.com (2022)

9
Appendix

Appendix 1 contains the different exercises of the workshop.
Appendix 2 contains the results of the different exercises of the workshop.
Appendix 3 contains the first design brief.
Appendix 4 contains the final design brief.

Appendix 1

Questionnaire

Hoe oud ben je?
15 of jonger / 16 / 17 / 18 / 19 / 20 of ouder

Wat is je geslacht?
Man / Vrouw / Anders

Werk je naast je opleiding?
Nee / Ja, 0-8 uur per week / Ja, 8-24 uur per week / Ja, 24-40 uur per week

Waar woon je nu?
Overschie / Hilegersberg/Schiebroek / Prins Alexander / Noord / Kralingen/Crooswijk / Delfshaven / Centrum / Feijenoord / Ijsselmonde / Charlois / Pernis / Hoogvliet / Rozenburg / Ik woon niet in Rotterdam

Met wie woon je?
Ik woon samen met mijn partner / Ik woon samen met mijn partner en kind(eren) / Ik woon samen met mijn kind(eren) / Ik woon met mijn ouders/verzorgers / Ik woon met huisgenoten (keuken en badkamer gedeeld) / Ik woon met huisgenoten (keuken gedeeld, badkamer apart)

Met hoeveel mensen woon je samen?
1 / 2 / 3 / 4 / 5 / 6 / 7 of meer

In wat voor huis woon je nu?
Studentenkamer / Studio (keuken, woon- en slaapkamer één ruimte) / Twee-onder-een-kap woning / Rijtjeshuis / Appartement / Flat

Ben je van plan binnenkort te verhuizen?
Ja, binnen een jaar / Ja, binnen 2 jaar / Ja, binnen 5 jaar / Nee

Waar zou je willen wonen?
Overschie / Hilegersberg/Schiebroek / Prins Alexander / Noord / Kralingen/Crooswijk / Delfshaven / Centrum / Feijenoord / Ijsselmonde / Charlois / Pernis / Hoogvliet / Rozenburg / Buiten Rotterdam

Ik wil wonen op een plek met (schaal van 1 tot 5)
Buren die even oud zijn als ik / Veel contact met de buren / Mensen met verschillende leefstijlen / Familie en vrienden in de buurt / Werk of school dichtbij

Met wie zou je willen wonen?
Alleen / Met mijn ouders/verzorgers / Met mijn partner / Met 1 vriend of vriendin / Met meerdere vrienden / Met onbekenden

Zou je met onbekenden willen wonen als dit de huur goedkoper maakt?
Ja / Nee

Met hoeveel mensen zou je willen wonen (getal invullen)
1 – 7 of meer

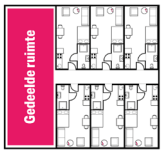
Welke voorziengen zou je met anderen (buiten je gezinsleden) willen delen?
Flexibele werkplek dichtbij woning / Hobbywerkplaats met alle voorzieningen / Buitenruimte (balkon/galerij) / Tuin / Plek om gasten te ontvangen / Een gedeelde auto / Een gedeelde fiets / Fietsenstalling / Wasmachine/droger / Berging / Eettafel / Keuken / Woonkamer / Slaapkamer / Badkamer / Toilet / Geen van deze antwoorden

Heb je nog vragen aan mij? (open vraag)

Hoe wil je gaan wonen?

Waar zou jij je gezamelijke ruimte willen zien ten opzichte van je woning?

A



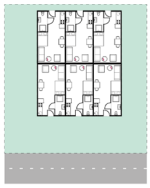
B

C

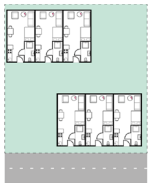
TUDelft

Op welke manier moeten de woningen op een stuk grond geplaatst worden?

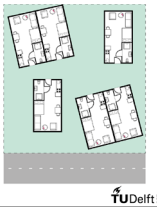
A
Bij elkaar



B
In losse delen



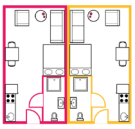
C
Random verspreid over de kavel



TUDelft

Welke ruimtes zou je willen delen met een huisgenoot?

A
Niks



B
Keuken

C
Keuken en badkamer

TUDelft

Hoeveel huur kan je per maand betalen?

A

€400

B

€550

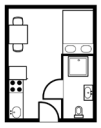
C

€850

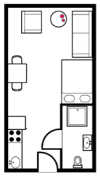
TUDelft

Welke optie zou jij kiezen?

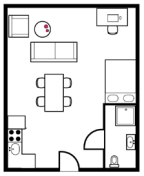
A



B



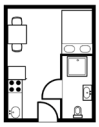
C



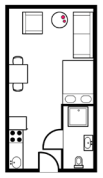
TUDelft

Welke optie zou jij kiezen?

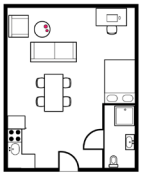
A
€400



B
€550



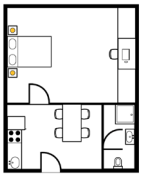
C
€850



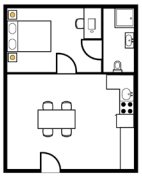
TUDelft

Welke optie kies jij?

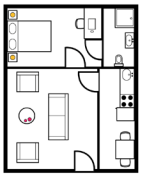
A
Grote slaapkamer



B
Grote keuken



C
Grote woonkamer



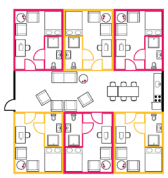
TUDelft

Met hoeveel mensen zou jij maximaal willen wonen?

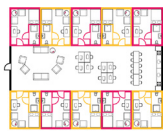
A
Eén ander persoon

B
Drie anderen

C
Vijf anderen



D
Tien of meer anderen



TUDelft

Met welke kamer zou je het liefst aan een gedeelde ruimte zitten?

A Slaapkamer

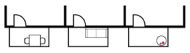
B Keuken

C Woonkamer

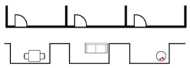
TU Delft

Hoe wil je dat jouw balkon eruit ziet?

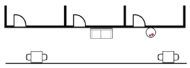
A Klein en privé



B Medium en gedeeld



C Groot en gedeeld



TU Delft

Hoe vaak eet je het liefst samen?

A Nooit

B Soms alleen/soms

C Altijd samen

TU Delft

Met wie zou je het liefst willen wonen?

A Hetzelfde geslacht

B Hetzelfde opleidings-nivo

C Dezelfde leeftijd

TU Delft

Welke rol zou jij leuk vinden bij een activiteit?

A Organiseren

B Meedoen

C Niet meedoen

TU Delft

Wat zou je leuk vinden om met anderen samen te doen?

A Koken

B Schoonmaken

C Klussen

D Anders

TU Delft

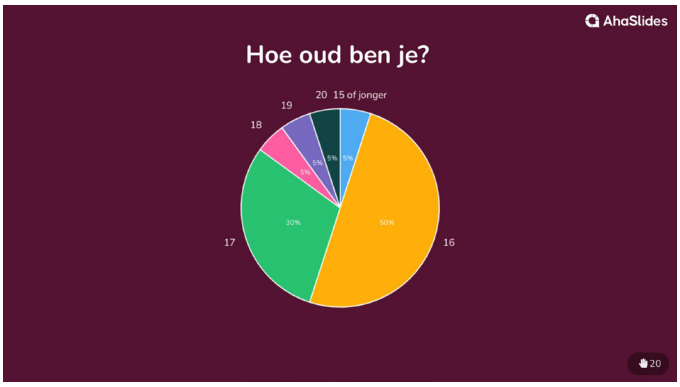
Wat vind jij belangrijk in de buurt waar je woont?

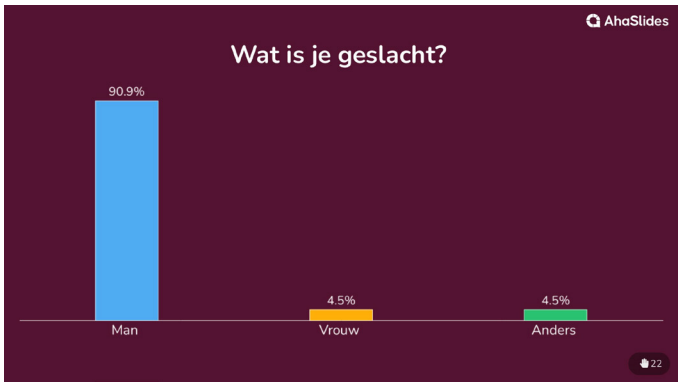
Wat voor andere functies zouden er in het gebouw kunnen zitten?

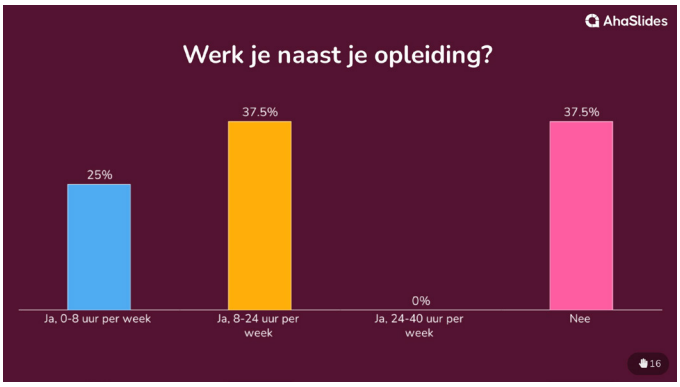
Wat zou je met de hele buurt kunnen delen?

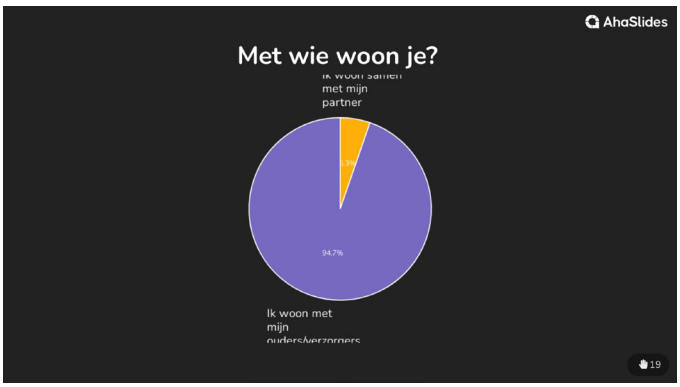
Appendix 2

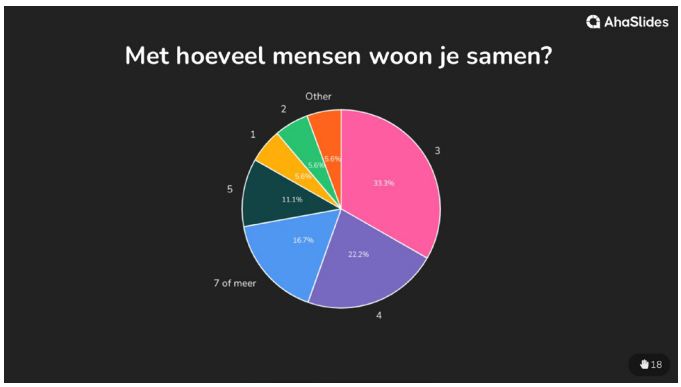
Questionnaire











Type faciliteit	Aantal stemmen	Percentage van totaal stemmers
Fietsenstalling	12	67 %
Tuin	9	50 %
Keuken	7	39 %
Wasmachine/droger	7	39 %
Buitenruimte (balkon/galerij)	7	39 %
Flexibele werkplek dichtbij woning	6	33 %
Berging	5	28 %
Eettafel	5	28 %
Woonkamer	4	22 %
Hobbywerkplaats met alle voorzieningen	4	22 %
Plek om gasten te ontvangen	4	22 %
Geen van deze antwoorden	4	22 %
Een gedeelde fiets	2	11 %
Slaapkamer	1	6 %
Badkamer	1	6 %
Toilet	1	6 %
Een gedeelde auto	1	6 %

Comparing options

Hoe wil je gaan wonen?

Waar zou jij je gezamelijke ruimte willen zien ten opzichte van je woning?

A

5/14
36%

B

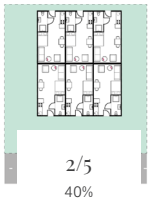
6/14
43%

C

3/14
21%

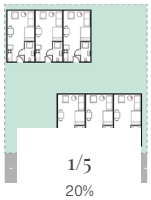
Op welke manier moeten de woningen op een stuk grond geplaatst worden?

A
Bij elkaar



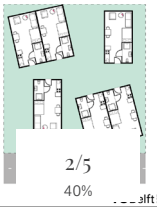
2/5
40%

B
In losse delen



1/5
20%

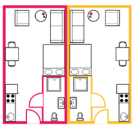
C
Random verspreid over de kavel



2/5
40%

Welke ruimtes zou je willen delen met een huisgenoot?

A
Niks



3/5
60%

B
Keuken

1/5
20%

C
Keuken en badkamer

1/5
20%

Hoeveel huur kan je per maand betalen?

A

€400

B

€550

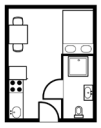
C

€850

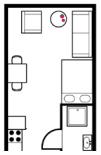
Not answered

Welke optie zou jij kiezen?

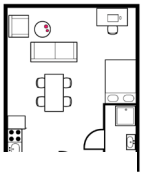
A



B



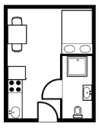
C



Not answered

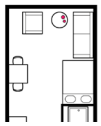
Welke optie zou jij kiezen?

A
€400



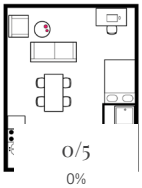
0/5
0%

B
€550



5/5
100%

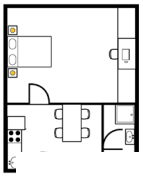
C
€850



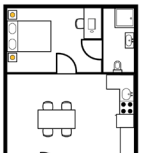
0/5
0%

Welke optie kies jij?

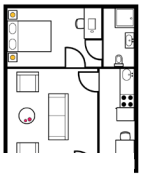
A
Grote slaapkamer



B
Grote keuken



C
Grote woonkamer



Not answered

Met hoeveel mensen zou jij maximaal willen wonen?

A
Eén ander persoon

B
Drie anderen

C
Vijf anderen

D
Tien of meer anderen

Not answered

Met welke kamer zou je het liefst aan een gedeelde ruimte zitten?

A Slaapkamer

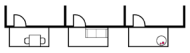
B Keuken

C Woonkamer

Not answered

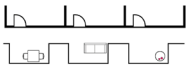
Hoe wil je dat jouw balkon eruit ziet?

A Klein en privé



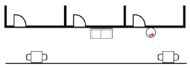
12/12
100%

B Medium en gedeeld



0/12
0%

C Groot en gedeeld



0/12
0%

Hoe vaak eet je het liefst samen?

A Nooit

6/18
33%

B Soms alleen/soms

12/18
66%

C Altijd samen

0/18
0%

Met wie zou je het liefst willen wonen?

A Hetzelfde geslacht

1/17
6%

B Hetzelfde opleidings-nivo

6/17
35%

C Dezelfde leeftijd

10/17
59%

Welke rol zou jij leuk vinden bij een activiteit?

A Organiseren

3/15
20%

B Meedoen

8/15
55%

C Niet meedoen

4/15
25%

Wat zou je leuk vinden om met anderen samen te doen?

A Koken

8/13
62%

B Schoonmaken

2/13
15%

C Klussen

3/13
23%

D Anders

Anders:

uitgaan / ondernemen (bedrijfje) / filmavond / voetballen / bierpong / samen leren

Wat vind jij belangrijk in de buurt waar je woont?

Not answered

Wat voor andere functies zouden er in het gebouw kunnen zitten?

Not answered

Wat zou je met de hele buurt kunnen delen?

Not answered

PvE voor een woongebouw

Team	Team B.M
Deelnemers	Rajeev, Ajdin, Arendo, Bastiaan

03 Gebouwniveau

Vul hieronder in hoeveel woningen er per type in het gebouw zullen zijn. Denk hierbij aan hoeveel mensen er in totaal komen wonen (50). Bedenk daarna welke 'gedeelde voorzieningen' er nodig zijn in het gebouw en geef aan hoeveel oppervlakte hiervoor nodig is. Onderaan kan je aangeven welke andere functies er in het gebouw zitten. Deze kunnen helpen de huur weer te verlagen.

Woningen bestemd voor (1-persoon/2-persoon/gezin/woongroep/etc) (meerdere mogelijk)	18/26, studeren en werken, vrijgezel en relatie, geen gezinnen,				
Aantal woningen	**Type woning**	**Kosten**	**Huurders**	**Aantal woningen**	**Toelichting** (optioneel)
	1 kamerwoning (studio)	€	1 of 2	5	Voor als mensen toch liever alleen of met partner willen wonen
	2 kamerwoning	€€	2 tot 4	5	Als mensen met een kleien groep vrienden de huur willen verdelen
	3 kamerwoning	€€	3 tot 6	5	Sociale contacten opbouwen en huur verdelen
	4 kamerwoning	€€€	4 tot 8		
	>4 kamerwoning	€€€	5 of meer		

Gedeelde voorzieningen	**Type ruimte**	**Aantal**	**Kosten**	**Opp. (m²)**	**Kosten per ruimte**	**Toelichting** (optioneel)
	Centrale toegang	15	€ 15	1	€ 15	
	Brievenbussen	15	€ 15	1	€ 15	
	Gemeenschappelijke ruimte	5	€ 10	100	€ 1.000	
	Installatieruimte	15	€ 15	1	€ 15	
	Wasruimte	1	€ 2	20	€ 40	
	Huismeesterruimte	1	€ 1	15	€ 15	
	Zwembad	0	€ 0	0	€ 0	
	Fitness/sportschool	1	€ 3	200	€ 600	
	Bioscoopruimte	0	€ 0		€ 0	
	Studeer/werkruimte	10	€ 20	42	€ 840	
	Werkplaats	1	€ 3	200	€ 600	
	Feestruimte	0	€ 0		€ 0	
	Atrium	1	€ 2	400	€ 800	
	Lift	0	€ 0	0	€ 0	
	Trappenhuis	0	€ 0		€ 0	
	Kookruimte	2	€ 4	20	€ 80	
	Eetruimte	1	€ 1	70	€ 70	
	Badruimte	15	€ 30	8	€ 240	
	Toiletten	15	€ 30	3	€ 90	
	Woonkamer	15	€ 15	20	€ 300	
	Bergruimte	15	€ 30	9	€ 270	
	Fietsenstalling	1	€ 1	25	€ 25	
	Scooterstalling	1	€ 1	10	€ 10	
	Parkeerplaatsen	1	€ 3	320	€ 960	
	Containerruimte	1	€ 1	60	€ 60	
	Tuin	0	€ 0		€ 0	
	Tuin met tuinhuis	0	€ 0		€ 0	
	Tuin met terras	0	€ 0		€ 0	
	Balkon	15	€ 15	3	€ 45	
	Moestuin	0	€ 0		€ 0	
	Hoeveel m² totaal			**1528**	m²	
	m² over voor woningen			**1272**	m²	
	Totale waarde gedeelde funties		**€ 6.090**		Deze waarde moet hierna eigenlijk verdeeld worden over de huurprijzen van de woningen, per m². Voor nu laten we dit voor wat het is.	

Andere functies	**Type functie**	**Wel/niet**	**Opp. (m²)**	**Toelichting** (optioneel)
Het toevoegen van andere functies aan je gebouw kan de huur voor bewoners verlagen. Dit neemt wel ruimte van je maximale oppervlakte af.	Horeca	Wel	80	
	Kinderopvang	niet	0	
	Hotel	niet	0	
	Winkel	wel	200	
	Sport	wel	200	
	Kantoor	wel	100	
	Onderwijs	niet	0	
	Gezondheidszorg	niet	0	
	Industrie	niet	0	
	Geloof	wel	20	
	Anders	niet	0	
	Hoeveel m² totaal		**600**	m²
	m² over voor woningen		**672**	m²

PvE voor een woongebouw

Team	Poa
Deelnemers	Patryk, Omer , Ahmad

03 Gebouwniveau

Vul hieronder in hoeveel woningen er per type in het gebouw zullen zijn. Denk hierbij aan hoeveel mensen er in totaal komen wonen (50). Bedenk daarna welke 'gedeelde voorzieningen' er nodig zijn in het gebouw en geef aan hoeveel oppervlakte hiervoor nodig is. Onderaan kan je aangeven welke andere functies er in het gebouw zitten. Deze kunnen helpen de huur weer te verlagen.

Woningen bestemd voor (1-persoon/2-persoon/gezin/woongroep/etc) (meerdere mogelijk)	Geef hier een omschrijving van het type mensen dat hier zullen gaan wonen. Leeftijd, studeren/werken, vrijgezel of in een relatie, gezin of niet, etc. Geef ook aan in wat voor samenstelling ze willen wonen (alleen, samen, in een groep, etc)					
Aantal woningen	**Type woning**	**Kosten**	**Huurders**	**Aantal woningen**	**Toelichting** (optioneel)	
	1 kamerwoning (studio)	€	1 of 2	5		
	2 kamerwoning	€€	2 tot 4	6		
	3 kamerwoning	€€	3 tot 6	0		
	4 kamerwoning	€€€	4 tot 8	8		
	>4 kamerwoning	€€€	5 of meer	0		
Gedeelde voorzieningen	**Type ruimte**	**Aantal**	**Kosten**	**Opp. (m²)**	**Kosten per ruimte**	**Toelichting** (optioneel)
	Centrale toegang	1	€ 1	150	€ 150	
	Brievenbussen	19	€ 19	2	€ 38	
	Gemeenschappelijke ruimte	1	€ 2	200	€ 400	
	Installatieruimte	5	€ 5	3	€ 15	
	Wasruimte	5	€ 10	13	€ 130	
	Huismeesterruimte	1	€ 1	8	€ 8	
	Zwembad	0	€ 0	0	€ 0	
	Fitness/sportschool	2	€ 6	150	€ 900	
	Bioscoopruimte	0	€ 0	0	€ 0	
	Studeer/werkruimte	5	€ 10	100	€ 1.000	
	Werkplaats	2	€ 6	120	€ 720	
	Feestruimte	1	€ 2	200	€ 400	
	Atrium	1	€ 2	160	€ 320	
	Lift	2	€ 4	5	€ 20	
	Trappenhuis	2	€ 2	50	€ 100	
	Kookruimte	5	€ 10	20	€ 200	
	Eetruimte	5	€ 5	50	€ 250	
	Badruimte	5	€ 10	15	€ 150	
	Toiletten	19	€ 38	2	€ 76	
	Woonkamer	19	€ 19	30	€ 570	
	Bergruimte	5	€ 10	20	€ 200	
	Fietsenstalling	1	€ 1	100	€ 100	
	Scooterstalling	1	€ 1	80	€ 80	
	Parkeerplaatsen	1	€ 3	150	€ 450	
	Containerruimte	0	€ 0	0	€ 0	
	Tuin	1	€ 2	100	€ 200	
	Tuin met tuinhuis	5	€ 15	50	€ 750	
	Tuin met terras	5	€ 15	20	€ 300	
	Balkon	19	€ 19	5	€ 95	
	Moestuin	0	€ 0	0	€ 0	
	Hoeveel m² totaal			**1803**	m²	
	m² over voor woningen			**997**	m²	
	Totale waarde gedeelde funties		**€ 7.622**		Deze waarde moet hierna eigenlijk verdeeld worden over de huurprijzen van de woningen, per m². Voor nu laten we dit voor wat het is.	

Andere functies	**Type functie**	**Wel/niet**	**Opp. (m²)**	**Toelichting** (optioneel)
	Horeca	niet		
	Kinderopvang	niet		
	Hotel	niet		
	Winkel	niet		
	Sport	niet		
	Kantoor	niet		
	Onderwijs	niet		
	Gezondheidszorg	niet		
	Industrie	niet		
	Geloof	niet		
	Anders	niet		
	Hoeveel m² totaal		**0**	m²
	m² over voor woningen		**997**	m²

Het toevoegen van andere functies aan je gebouw kan de huur voor bewoners verlagen. Dit neemt wel ruimte van je maximale oppervlakte af.

PvE voor een woongebouw

Team	
Deelnemers	

03 Gebouwniveau

Vul hieronder in hoeveel woningen er per type in het gebouw zullen zijn. Denk hierbij aan hoeveel mensen er in totaal komen wonen (50). Bedenk daarna welke 'gedeelde voorzieningen' er nodig zijn in het gebouw en geef aan hoeveel oppervlakte hiervoor nodig is. Onderaan kan je aangeven welke andere functies er in het gebouw zitten. Deze kunnen helpen de huur weer te verlagen.

Woningen bestemd voor (1-persoon/2-persoon/gezin/woongroep/etc) (meerdere mogelijk)	studenten. leeftijd 20->25. vrijgezel. 2persoons. Samen					
Aantal woningen	**Type woning**	**Kosten**	**Huurders**	**Aantal woningen**	**Toelichting** (optioneel)	
	1 kamerwoning (studio)	€	1 of 2			
	2 kamerwoning	€€	2 tot 4			
	3 kamerwoning	€€	3 tot 6			
	4 kamerwoning	€€€	4 tot 8			
	>4 kamerwoning	€€€	5 of meer			
Gedeelde voorzieningen	**Type ruimte**	**Aantal**	**Kosten**	**Opp. (m²)**	**Kosten per ruimte**	**Toelichting** (optioneel)
	Centrale toegang	1	€ 1	7	€ 7	
	Brievenbussen	1	€ 1	0	€ 0	
	Gemeenschappelijke ruimte	1	€ 2	8	€ 16	
	Installatieruimte	1	€ 1	2	€ 2	
	Wasruimte	1	€ 2	2	€ 4	
	Huismeesterruimte	0	€ 0	0	€ 0	
	Zwembad	1	€ 3	50	€ 150	
	Fitness/sportschool	1	€ 3	15	€ 45	
	Bioscoopruimte	1	€ 3	25	€ 75	
	Studeer/werkruimte	1	€ 2	5	€ 10	
	Werkplaats	1	€ 3	10	€ 30	
	Feestruimte	1	€ 2	15	€ 30	
	Atrium	0	€ 0		€ 0	
	Lift	1	€ 2	1	€ 2	
	Trappenhuis	1	€ 1		€ 0	
	Kookruimte	1	€ 2		€ 0	
	Eetruimte	1	€ 1		€ 0	
	Badruimte	0	€ 0		€ 0	
	Toiletten	0	€ 0			
	Woonkamer	0	€ 0		€ 0	
	Bergruimte	1	€ 2		€ 0	
	Fietsenstalling	1	€ 1		€ 0	
	Scooterstalling	1	€ 1		€ 0	
	Parkeerplaatsen	0	€ 0		€ 0	
	Containerruimte	1	€ 1		€ 0	
	Tuin	1	€ 2		€ 0	
	Tuin met tuinhuis	1	€ 3		€ 0	
	Tuin met terras	1	€ 3		€ 0	
	Balkon	0	€ 0		€ 0	
	Moestuin	0	€ 0		€ 0	
	Hoeveel m² totaal			**140**	m²	
	m² over voor woningen			**2660**	m²	
	Totale waarde gedeelde funties	€ 371			Deze waarde moet hierna eigenlijk verdeeld worden over de huurprijzen van de woningen, per m². Voor nu laten we dit voor wat het is.	

Andere functies	**Type functie**	**Wel/niet**	**Opp. (m²)**	**Toelichting** (optioneel)
	Horeca			
	Kinderopvang			
	Hotel			
Het toevoegen van andere functies aan je gebouw kan de huur voor bewoners verlagen. Dit neemt wel ruimte van je maximale oppervlakte af.	Winkel			
	Sport			
	Kantoor			
	Onderwijs			
	Gezondheidszorg			
	Industrie			
	Geloof			
	Anders			
	Hoeveel m² totaal		**0**	m²
	m² over voor woningen		**2660**	m²

PvE voor een woongebouw

Team	
Deelnemers	

03 Gebouwniveau

Vul hieronder in hoeveel woningen er per type in het gebouw zullen zijn. Denk hierbij aan hoeveel mensen er in totaal komen wonen (50). Bedenk daarna welke 'gedeelde voorzieningen' er nodig zijn in het gebouw en geef aan hoeveel oppervlakte hiervoor nodig is. Onderaan kan je aangeven welke andere functies er in het gebouw zitten. Deze kunnen helpen de huur weer te verlagen.

Woningen bestemd voor (1-persoon/2-persoon/gezin/woongroep/etc) (meerdere mogelijk)

Geef hier een omschrijving van het type mensen dat hier zullen gaan wonen. Leeftijd, studeren/werken, vrijgezel of in een relatie, gezin of niet, etc. Geef ook aan in wat voor samenstelling ze willen wonen (alleen, samen, in een groep, etc)

Aantal woningen	**Type woning**	**Kosten**	**Huurders**	**Aantal woningen**	**Toelichting** (optioneel)
	1 kamerwoning (studio)	€	1 of 2		
	2 kamerwoning	€€	2 tot 4		
	3 kamerwoning	€€	3 tot 6		
	4 kamerwoning	€€€	4 tot 8		
	>4 kamerwoning	€€€	5 of meer		

Gedeelde voorzieningen	**Type ruimte**	**Aantal**	**Kosten**	**Opp. (m²)**	**Kosten per ruimte**	**Toelichting** (optioneel)
	Centrale toegang	2	€ 2	30	€ 60	
	Brievenbussen	3	€ 3	60	€ 180	
	Gemeenschappelijke ruimte	9	€ 18	100	€ 1.800	
	Installatieruimte	1	€ 1	23	€ 23	
	Wasruimte	2	€ 4	20	€ 80	
	Huismeesterruimte	3	€ 3	50	€ 150	
	Zwembad	2	€ 6	40	€ 240	
	Fitness/sportschool	1	€ 3	20	€ 60	
	Bioscoopruimte	2	€ 6	30	€ 180	
	Studeer/werkruimte	1	€ 2	50	€ 100	
	Werkplaats	3	€ 9	69	€ 621	
	Feestruimte	2	€ 4	67	€ 268	
	Atrium	3	€ 6	45	€ 270	
	Lift	3	€ 6	63	€ 378	
	Trappenhuis	2	€ 2	23	€ 46	
	Kookruimte	1	€ 2	12	€ 24	
	Eetruimte	2	€ 2	5	€ 10	
	Badruimte	2	€ 4	65	€ 260	
	Toiletten	12	€ 24	23		
	Woonkamer	1	€ 1	56	€ 56	
	Bergruimte	3	€ 6	65	€ 390	
	Fietsenstalling	4	€ 4	33	€ 132	
	Scooterstalling	4	€ 4	23	€ 92	
	Parkeerplaatsen	3	€ 9	100	€ 900	
	Containerruimte	1	€ 1	23	€ 23	
	Tuin	2	€ 4	43	€ 172	
	Tuin met tuinhuis	4	€ 12	122	€ 1.464	
	Tuin met terras	3	€ 9	432	€ 3.888	
	Balkon	3	€ 3	432	€ 1.296	
	Moestuin	1	€ 1	10	€ 10	
	Hoeveel m² totaal			**2134**	m²	
	m² over voor woningen			**666**	m²	
	Totale waarde gedeelde funties		**€ 13.173**			Deze waarde moet hierna eigenlijk verdeeld worden over de huurprijzen van de woningen, per m². Voor nu laten we dit voor wat het is.

Andere functies

Het toevoegen van andere functies aan je gebouw kan de huur voor bewoners verlagen. Dit neemt wel ruimte van je maximale oppervlakte af.

Type functie	**Wel/niet**	**Opp. (m²)**	**Toelichting** (optioneel)
Horeca	wel	3	
Kinderopvang	wel	55	
Hotel	niet	60	
Winkel	Wel/niet	30	
Sport	wel	80	
Kantoor	niet	20	
Onderwijs	niet	22	
Gezondheidszorg	wel	233	
Industrie	niet	33	
Geloof	wel	22	
Anders	niet	11	
Hoeveel m² totaal		**569**	m²
m² over voor woningen		**97**	m²

PvE voor een woongebouw

Team	Team B.M
Deelnemers	Baris

03 Gebouwniveau

Vul hieronder in hoeveel woningen er per type in het gebouw zullen zijn. Denk hierbij aan hoeveel mensen er in totaal komen wonen (50). Bedenk daarna welke 'gedeelde voorzieningen' er nodig zijn in het gebouw en geef aan hoeveel oppervlakte hiervoor nodig is. Onderaan kan je aangeven welke andere functies er in het gebouw zitten. Deze kunnen helpen de huur weer te verlagen.

Woningen bestemd voor (1-persoon/2-persoon/gezin/woongroep/etc) (meerdere mogelijk)	Ik zou willen dat er veel jongeren hier komen wonen, waarom jongeren ik heb als doel om een betaalbare huur te nemen en de jongeren het gunnen. Ik wil ook dat de jongeren vrijgezel die goed genoeg voor zichzelf kunnen zorgen ook wil ik dat de ze min 1 max 2 personen wat delen.

Aantal woningen	**Type woning**	**Kosten**	**Huurders**	**Aantal woningen**	**Toelichting** (optioneel)
	1 kamerwoning (studio)	€	1 of 2	4	
	2 kamerwoning	€€	2 tot 4	5	
	3 kamerwoning	€€	3 tot 6		
	4 kamerwoning	€€€	4 tot 8		
	>4 kamerwoning	€€€	5 of meer		

Gedeelde voorzieningen	**Type ruimte**	**Aantal**	**Kosten**	**Opp. (m²)**	**Kosten per ruimte**	**Toelichting** (optioneel)
	Centrale toegang	1	€ 1	10	€ 10	
	Brievenbussen	9	€ 9		€ 0	
	Gemeenschappelijke ruimte	2	€ 4	25	€ 100	
	Installatieruimte	2	€ 2	15	€ 30	
	Wasruimte	3	€ 6	15	€ 90	
	Huismeesterruimte	1	€ 1	10	€ 10	
	Zwembad	1	€ 3	25	€ 75	
	Fitness/sportschool	1	€ 3	40	€ 120	
	Bioscoopruimte	1	€ 3	15	€ 45	
	Studeer/werkruimte	1	€ 2	20	€ 40	
	Werkplaats	2	€ 6	20	€ 120	
	Feestruimte	1	€ 2	30	€ 60	
	Atrium	1	€ 2		€ 0	
	Lift	3	€ 6	5	€ 30	
	Trappenhuis	2	€ 2	15	€ 30	
	Kookruimte	1	€ 2	20	€ 40	
	Eetruimte	2	€ 2	30	€ 60	
	Badruimte	2	€ 4	20	€ 80	
	Toiletten	5	€ 10	20	€ 200	
	Woonkamer	2	€ 2	15	€ 30	
	Bergruimte	5	€ 10	15	€ 150	
	Fietsenstalling	4	€ 4	20	€ 80	
	Scooterstalling	2	€ 2	15	€ 30	
	Parkeerplaatsen	1	€ 3	70	€ 210	
	Containerruimte	2	€ 2	30	€ 60	
	Tuin	3	€ 6	40	€ 240	
	Tuin met tuinhuis	2	€ 6	20	€ 120	
	Tuin met terras	2	€ 6	20	€ 120	
	Balkon	5	€ 5	15	€ 75	
	Moestuin	1	€ 1	30	€ 30	
	Hoeveel m² totaal			**625**	m²	
	m² over voor woningen			**2175**	m²	

Totale waarde gedeelde funties	€ 2.285	Deze waarde moet hierna eigenlijk verdeeld worden over de huurprijzen van de woningen, per m². Voor nu laten we dit voor wat het is.

Andere functies

Het toevoegen van andere functies aan je gebouw kan de huur voor bewoners verlagen. Dit neemt wel ruimte van je maximale oppervlakte af.

Type functie	**Wel/niet**	**Opp. (m²)**	**Toelichting** (optioneel)
Horeca	wel	30	
Kinderopvang	niet		
Hotel	niet		
Winkel	wel	50	
Sport	wel	40	
Kantoor	wel	20	
Onderwijs	niet		
Gezondheidszorg	niet		
Industrie	niet		
Geloof	niet		
Anders	niet		
Hoeveel m² totaal		**140**	m²
m² over voor woningen		**2035**	m²

PvE voor een woongebouw

Team	team lekker bloot
Deelnemers	Danlee Dubbeldam, Imre schrader, Oliwier Greczan, Mario Hristov, Max van Breugel en Tristan Bodegom

03 Gebouwniveau

Vul hieronder in hoeveel woningen er per type in het gebouw zullen zijn. Denk hierbij aan hoeveel mensen er in totaal komen wonen (50). Bedenk daarna welke 'gedeelde voorzieningen' er nodig zijn in het gebouw en geef aan hoeveel oppervlakte hiervoor nodig is. Onderaan kan je aangeven welke andere functies er in het gebouw zitten. Deze kunnen helpen de huur weer te verlagen.

Woningen bestemd voor (1-persoon/2-persoon/gezin/woongroep/etc) (meerdere mogelijk)	Geef hier een omschrijving van het type mensen dat hier zullen gaan wonen. Leeftijd, studeren/werken, vrijgezel of in een relatie, gezin of niet, etc. Geef ook aan in wat voor samenstelling ze willen wonen (alleen, samen, in een groep, etc)					
Aantal woningen	**Type woning**	**Kosten**	**Huurders**	**Aantal woningen**	**Toelichting** (optioneel)	
	1 kamerwoning (studio)	€	1 of 2			
	2 kamerwoning	€€	2 tot 4			
	3 kamerwoning	€€	3 tot 6			
	4 kamerwoning	€€€	4 tot 8	1		
	>4 kamerwoning	€€€	5 of meer			
Gedeelde voorzieningen	**Type ruimte**	**Aantal**	**Kosten**	**Opp. (m²)**	**Kosten per ruimte**	**Toelichting** (optioneel)
	Centrale toegang	1	€ 1		€ 0	
	Brievenbussen	1	€ 1		€ 0	
	Gemeenschappelijke ruimte	9	€ 18		€ 0	
	Installatieruimte	1	€ 1		€ 0	
	Wasruimte	3	€ 6		€ 0	
	Huismeesterruimte	1	€ 1		€ 0	
	Zwembad	2	€ 6		€ 0	
	Fitness/sportschool	2	€ 6		€ 0	
	Bioscoopruimte	1	€ 3		€ 0	
	Studeer/werkruimte	6	€ 12		€ 0	
	Werkplaats	6	€ 18		€ 0	
	Feestruimte	3	€ 6		€ 0	
	Atrium	1	€ 2		€ 0	
	Lift	3	€ 6		€ 0	
	Trappenhuis	3	€ 3		€ 0	
	Kookruimte	1	€ 2		€ 0	
	Eetruimte	1	€ 1		€ 0	
	Badruimte	3	€ 6		€ 0	
	Toiletten	4	€ 8			
	Woonkamer	1	€ 1		€ 0	
	Bergruimte	1	€ 2		€ 0	
	Fietsenstalling	1	€ 1		€ 0	
	Scooterstalling	0	€ 0		€ 0	
	Parkeerplaatsen	12	€ 36		€ 0	
	Containerruimte	2	€ 2		€ 0	
	Tuin	1	€ 2		€ 0	
	Tuin met tuinhuis	5	€ 15		€ 0	
	Tuin met terras	5	€ 15		€ 0	
	Balkon	6	€ 6		€ 0	
	Moestuin	2	€ 2		€ 0	
	Hoeveel m² totaal			**0**	m²	
	m² over voor woningen			**2800**	m²	
	Totale waarde gedeelde funties	€ 0			Deze waarde moet hierna eigenlijk verdeeld worden over de huurprijzen van de woningen, per m². Voor nu laten we dit voor wat het is.	

Andere functies	**Type functie**	**Wel/niet**	**Opp. (m²)**	**Toelichting** (optioneel)
	Horeca	wel/niet		
	Kinderopvang	niet		
	Hotel	niet		
Het toevoegen van andere functies aan je gebouw kan de huur voor bewoners verlagen. Dit neemt wel ruimte van je maximale oppervlakte af.	Winkel	niet		
	Sport	niet		
	Kantoor	wel		
	Onderwijs	niet		
	Gezondheidszorg	niet		
	Industrie	wel		
	Geloof	niet		
	Anders	niet		
	Hoeveel m² totaal	5	**0**	m²
	m² over voor woningen		**2800**	m²

PvE voor een woongebouw

Team	
Deelnemers	

03 Gebouwniveau

Vul hieronder in hoeveel woningen er per type in het gebouw zullen zijn. Denk hierbij aan hoeveel mensen er in totaal komen wonen (50). Bedenk daarna welke 'gedeelde voorzieningen' er nodig zijn in het gebouw en geef aan hoeveel oppervlakte hiervoor nodig is. Onderaan kan je aangeven welke andere functies er in het gebouw zitten. Deze kunnen helpen de huur weer te verlagen.

Woningen bestemd voor (1-persoon/2-persoon/gezin/woongroep/ etc) (meerdere mogelijk)	Geef hier een omschrijving van het type mensen dat hier zullen gaan wonen. Leeftijd, studeren/werken, vrijgezel of in een relatie, gezin of niet, etc. Geef ook aan in wat voor samenstelling ze willen wonen (alleen, samen, in een groep, etc)					
Aantal woningen	**Type woning**	**Kosten**	**Huurders**	**Aantal woningen**	**Toelichting** (optioneel)	
	1 kamerwoning (studio)	€	1 of 2			
	2 kamerwoning	€€	2 tot 4			
	3 kamerwoning	€€	3 tot 6			
	4 kamerwoning	€€€	4 tot 8			
	>4 kamerwoning	€€€	5 of meer			
Gedeelde voorzieningen	**Type ruimte**	**Aantal**	**Kosten**	**Opp. (m²)**	**Kosten per ruimte**	**Toelichting** (optioneel)
	Centrale toegang	2	€ 2	30	€ 60	
	Brievenbussen	2	€ 2	60	€ 120	
	Gemeenschappelijke ruimte	9	€ 18	100	€ 1.800	
	Installatieruimte	1	€ 1	23	€ 23	
	Wasruimte	2	€ 4	20	€ 80	
	Huismeesterruimte	3	€ 3	50	€ 150	
	Zwembad	2	€ 6	40	€ 240	
	Fitness/sportschool	1	€ 3	20	€ 60	
	Bioscoopruimte	2	€ 6	30	€ 180	
	Studeer/werkruimte	3	€ 6	50	€ 300	
	Werkplaats	3	€ 9	69	€ 621	
	Feestruimte	2	€ 4	67	€ 268	
	Atrium	3	€ 6	45	€ 270	
	Lift	3	€ 6	63	€ 378	
	Trappenhuis	2	€ 2	23	€ 46	
	Kookruimte	1	€ 2	12	€ 24	
	Eetruimte	2	€ 2	5	€ 10	
	Badruimte	2	€ 4	65	€ 260	
	Toiletten	12	€ 24	23		
	Woonkamer	1	€ 1	56	€ 56	
	Bergruimte	3	€ 6	65	€ 390	
	Fietsenstalling	4	€ 4	33	€ 132	
	Scooterstalling	2	€ 2	23	€ 46	
	Parkeerplaatsen	3	€ 9	100	€ 900	
	Containerruimte	1	€ 1	23	€ 23	
	Tuin	2	€ 4	43	€ 172	
	Tuin met tuinhuis	4	€ 12	122	€ 1.464	
	Tuin met terras	3	€ 9	432	€ 3.888	
	Balkon	4	€ 4	432	€ 1.728	
	Moestuin	0	€ 0	10	€ 0	
	Hoeveel m² totaal			**2134**	m²	
	m² over voor woningen			**666**	m²	
	Totale waarde gedeelde funties		**€ 13.689**		Deze waarde moet hierna eigenlijk verdeeld worden over de huurprijzen van de woningen, per m². Voor nu laten we dit voor wat het is.	

Andere functies	**Type functie**	**Wel/niet**	**Opp. (m²)**	**Toelichting** (optioneel)
	Horeca	wel	3	
	Kinderopvang	niet	55	
	Hotel	niet	60	
Het toevoegen van andere functies aan je gebouw kan de huur voor bewoners verlagen. Dit neemt wel ruimte van je maximale oppervlakte af.	Winkel	Wel	30	
	Sport	wel	80	
	Kantoor	niet	20	
	Onderwijs	niet	22	
	Gezondheidszorg	wel	233	
	Industrie	niet	33	
	Geloof	wel	22	
	Anders	niet	11	
	Hoeveel m² totaal		**569**	m²
	m² over voor woningen		**97**	m²

	Group 1	Omer	Group 2	Power ran	Group 3	Baris	Group 4	bloot	Group 5	Tok Tam	Group 6	B. M.
	Type	**Aantal woningen**	**Type**	**Aantal woningen**	**Type**	**Aantal woningen**	**Type**	**Aantal woningen**	**Type**	**Aantal woningen**	**Type**	**Aantal woningen**
		5				4						5
	1 kamer		1 kamer		1 kamer		1 kamer		1 kamer		1 kamer	
	2 kamer	6	2 kamer		2 kamer	5	2 kamer		2 kamer		2 kamer	5
	3 kamer	0	3 kamer		3 kamer		3 kamer		3 kamer		3 kamer	5
	4 kamer	8	4 kamer		4 kamer		4 kamer	1	4 kamer		4 kamer	
	>4 kamer	0	>4 kamer		>4 kamer		>4 kamer		>4 kamer		>4 kamer	

	Group 1		Group 2	Power ran	Group 3	Baris	Group 4	bloot	Group 6	Tok Tam	Group 7	B. M.
Type ruimte	**Aantal**	**Opp. (m²)**	**Aantal**	**Opp. (m²)**	**Aantal**	**Opp. (m²)**	**Aantal**	**Opp. (m²)**	**Aantal**	**Opp. (m²)**	**Aantal**	**Opp. (m²)**
Centrale toegang	1	150	1	7	1	10	1		2	30	15	1
Brievenbussen	19	2	1	0	9		1		2	60	15	1
Gemeenschappelijke ruimte	1	200	1	8	2	25	9		9	100	5	100
Installatieruimte	5	3	1	2	2	15	1		1	23	15	1
Wasruimte	5	13	1	2	3	15	3		2	20	1	20
Huismeesterruimte	1	8	0	0	1	10	1		3	50	1	15
Zwembad	0	0	1	50	1	25	2		2	40	0	0
Fitness/sportschool	2	150	1	15	1	40	2		1	20	1	200
Bioscoopruimte	0	0	1	25	1	15	1		2	30	0	0
Studeer/werkruimte	5	100	1	5	1	20	6		3	50	10	42
Werkplaats	2	120	1	10	2	20	6		3	69	1	200
Feestruimte	1	200	1	15	1	30	3		2	67	0	0
Atrium	1	160	0		1		1		3	45	1	400
Lift	2	5	1	1	3	5	3		3	63	0	0
Trappenhuis	2	50	1		2	15	3		2	23	0	0
Kookruimte	5	20	1		1	20	1		1	12	2	20
Eetruimte	5	50	1		2	30	1		2	5	1	70
Badruimte	5	15	0		2	20	3		2	65	15	8
Toiletten	19	2	0		5	20	4		12	23	15	3
Woonkamer	19	30	0		2	15	1		1	56	15	20
Bergruimte	5	20	1		5	15	1		3	65	15	9
Fietsenstalling	1	100	1		4	20	1		4	33	1	25
Scooterstalling	1	80	1		2	15	0		2	23	1	10
Parkeerplaatsen	1	150	0		1	70	12		3	100	1	320
Containerruimte	0	0	1		2	30	2		1	23	1	60
Tuin	1	100	1		3	40	1		2	43	0	0
Tuin met tuinhuis	5	50	1		2	20	5		4	122	0	0
Tuin met terras	5	20	1		2	20	5		3	432	0	0
Balkon	19	5	0		5	15	6		4	432	15	3
Moestuin	0	0	0		1	30	2		0	10	0	0
		1803		140 m²		625 m²		0 m²		2134 m²		1528 m²
		997		2660 m²		2175 m²		2800 m²		666 m²		1272 m²

Wel/niet	**Opp. (m²)**	**Wel/niet**	**Opp. (m²)**	**Wel/niet**	**Opp. (m²)**	**Wel/niet**	**Opp. (m²)**	**Wel/niet**	**Opp. (m²)**	**Wel/niet**	**Opp. (m²)**
niet				wel	30	wel/niet		wel	3	wel	80
niet				niet		niet		niet	0	niet	0
niet				niet		niet		niet	0	niet	0
niet				wel	50	niet		Wel	30	Wel	200
niet				wel	40	niet		wel	80	wel	200
niet				wel	20	wel		niet	0	wel	100
niet				niet		niet		niet	0	niet	0
niet				niet		niet		wel	233	niet	0
niet				niet		wel		niet	0	niet	0
niet				niet		niet		wel	22	wel	20
niet				niet		niet		niet	0	niet	0
	0 m²		0 m²		140 m²		0 m²		569 m²		600 m²

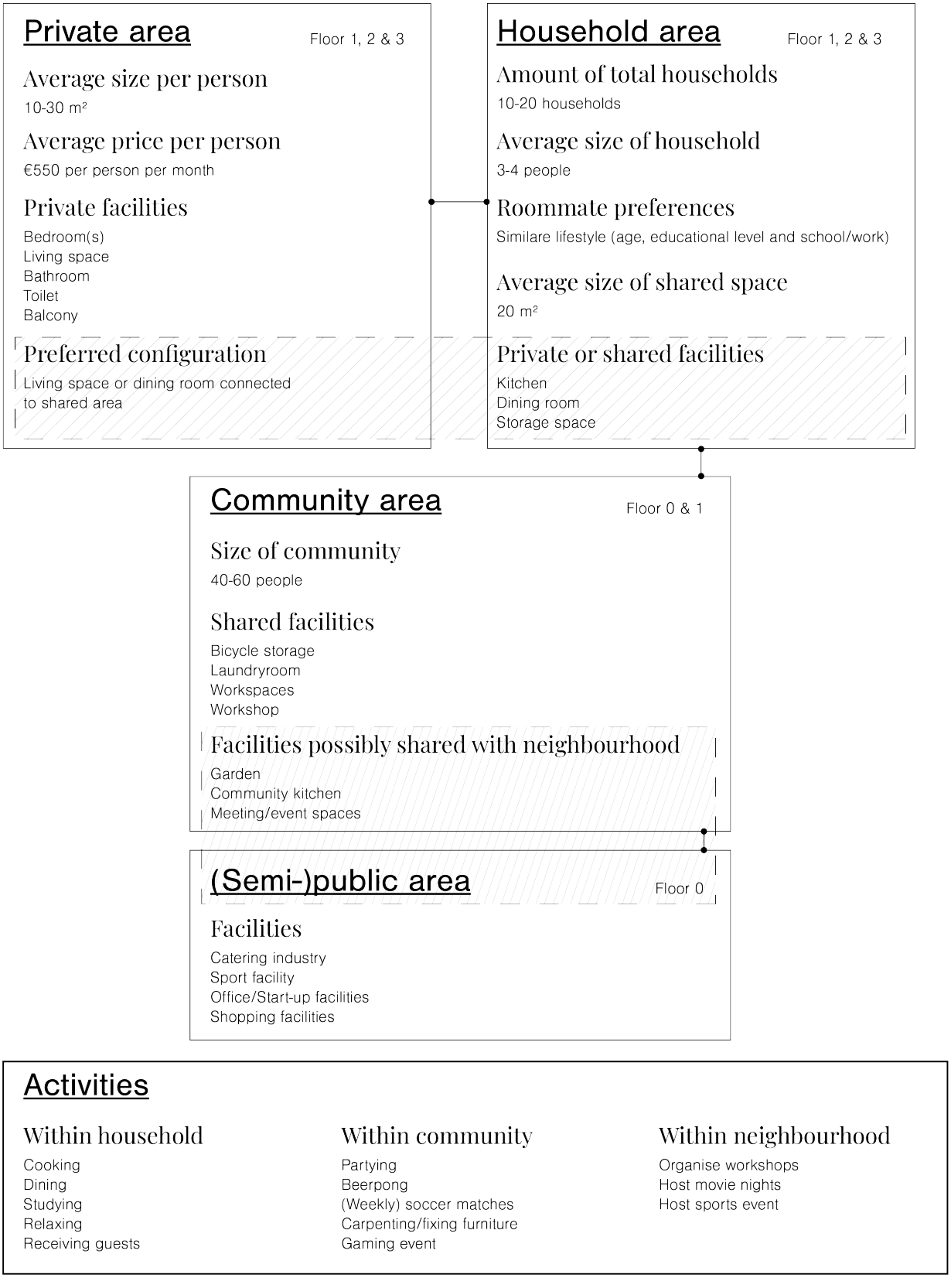
Design Brief averages

Type ruimte	Hoeveel wel	Aantal gemiddeld	Opp. (m²) gemiddeld	Opp. (m²) gemiddeld totaal
Centrale toegang	6	3,5	39,6	48,4
Brievenbussen	6	7,833333333	15,75	34,6
Gemeenschappelijke ruimte	6	4,5	86,6	331,6
Installatieruimte	6	4,166666667	8,8	17
Wasruimte	6	2,5	14	34,4
Huismeesterruimte	5	1,4	16,6	45,75
Zwembad	5	1,5	38,33333333	51,66666667
Fitness/sportschool	6	1,333333333	85	115
Bioscoopruimte	5	1,25	23,33333333	33,33333333
Studeer/werkruimte	6	4,333333333	43,4	219
Werkplaats	6	2,5	83,8	139,4
Feestruimte	5	1,6	78	94,75
Atrium	5	1,4	201,6666667	231,6666667
Lift	5	2,4	18,5	53,75
Trappenhuis	5	2	29,33333333	58,66666667
Kookruimte	6	1,833333333	18	43
Eetruimte	6	2	38,75	97,5
Badruimte	5	5,4	27	91,25
Toiletten	5	11	12	114,75
Woonkamer	5	7,6	30,25	239
Bergruimte	6	5	27,25	126,25
Fietsenstalling	6	2	44,5	84,25
Scooterstalling	5	1,4	32	41,5
Parkeerplaatsen	5	3,6	160	210
Containerruimte	5	1,4	37,66666667	47,66666667
Tuin	5	1,6	61	102
Tuin met tuinhuis	5	3,4	64	259,3333333
Tuin met terras	5	3,2	157,3333333	478,6666667
Balkon	5	9,8	113,75	485,75
Moestuin	2	1,5	20	15

Type functie	Aantal wel	Opp. (m²) gemiddeld
Horeca	4,5	37,66666667
Kinderopvang	0	0
Hotel	0	0
Winkel	2,5	93,33333333
Sport	3	106,6666667
Kantoor	3	60
Onderwijs	0	0
Gezondheidszorg	1	233
Industrie	1	0
Geloof	2	21
Anders	0	0

Appendix 3

First design brief



Appendix 4

Final design brief