The Old Harbour: The Next Step in the Housing Career of Modern Elderly

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Colophon

The Old Harbour Graduation Project

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Foreword

of my graduation project for the that guided me during this year. studio Advance Housing for the Theo Kupers for guiding me with master track Architecture at the the design of the building. Ferry Technical University of Delft. I Adema for helping me with the spent the last year working on this technical aspects of the building, project and this booklet forms an overview of what I have produced.

The project that I worked on is a housing building for elderly residents on a pier in the Merwehaven in Rotterdam, for which the whole graduation group made a new urban plan.

This booklet is the final product I would like to thank my tutors and also for providing a lot of additional information. Anne Kockelkorn for guiding me with the writing of the research and the thorough feedback she has given me throughout the year and lastly I would also like to thank Pierijn van der Putt for his guidance during the start of the studio.

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Introduction

The assignment I was given at the start of the semester, was to design a building for a user group that fit the term modern households.

During the collective research the whole group performed at the beginning of the year, I realised there was an issue with the growing number of elderly and their housing and decided to focus my research on this population group. The reason for this was that Lidentified several issues with housing in the Netherlands. Firstly, the current elderly occupy houses that are more suitable for families with children and therefore they contribute to the housing shortage in the Netherlands. Secondly, there is a lack of suitable housing for the elderly population and finally that if the elderly need help with day to

day tasks, they often have to make a lot of changes to their current home or they have to move to a different home.

To find a suitable solution, I first researched the history of elderly housing in the Netherlands, which I followed up by looking into statistics into the current elderly population, after which I also performed field research.

The findings of this research were not a definitive conclusion, but I mainly used it as guidelines for my personal design: The Old Harbour. A building which is a possible solution to the aforementioned problem. A building that is suitable for people above the age of 55, which can adapt in time if necessary.



1. Research

Introduction

After the collective research done by the other students of the group and me into the modern households. and the one million home challenge. the aspect that struck me most was that the need for houses does not necessarily mean that there are not enough houses. A lot of the shortage comes from the fact that elderly, residents of the Netherlands above the age of 55, stay in their larger homes too long, meaning that families cannot move into these dwellings. This is however a result of a shortage in suitable houses for the elderly, e.g. single level housing with larger doorways and possibilities for future aid in living.

Therefore I want to focus my personal research on the population above the age of 55. The research question is:

What are the functional needs of a building suitable for residents above the age of 55, whether they are healthy or physically impaired and considering that they come from different social and economic backgrounds?

To get a better understanding of the

current situation of elderly housing and to get a little bit of context surrounding the topic, I will first look into the history of elderly housing in the Netherlands, in chapter 1.1. This will start around the 12th century with the hofies for elderly women that are still present in many Dutch cities. From this point in time I will continue with several other examples. The aim of this part is to find out the architecture, organisation and living conditions of the elderly housing at different time periods and how they evolved over time, to place my own building in this historical context as a new chapter.

My research will continue in chapter 1.2 with the current situation of the older part of society in the Netherlands, focussing on two groups in the 55+ and retired population groups. Some aspects that will be examined are the size of the population group above the age of 55 until retirement and retired people, how that changes over time and the social and economic backgrounds of these two groups.



Honkvaste ouderen houden woning bezet

Senioren blijven plakken in hun onaangepaste huis, zelfs als ouderdom en ziekte op de loer liggen. Dat blijkt uit onderzoek van de ANBO en woonorganisatie Woonz onder ruim 12.000 mensen. Veel ouderen vinden verhuizen een te grote stap, maar belemmeren zo de doorstroming.

Edwin van der Aa 01-04-15, 08:18 Laatste update: 11-01-16, 19:33

Image 1, source: https://www.ad.nl/binnenland/honkvaste-ouderen-houden-woning-bezet~ac412238/ Tekort van 80 duizend woningen voor senioren, en dit cijfer stijgt alleen maar ^{04-05-2019 18:13} Geld en werk Auteur: Jan Ponsen



In het hele land is een groot tekort aan geschikte huizen voor ouderen. En dat tekort groeit de komende jaren snel. "Overheid en gemeenten weten dit al jaren maar doen hier nog te weinig aan: laks en onvoorstelbaar", zegt belangenvereniging ANBO.

Image 2, source: https://eenvandaag.avrotros.nl/ item/tekort-van-80-duizend-woningen-voor-senioren-en-dat-wordt-nog-veel-meer/

Bevolkingscijfers

Nederland in 2050: veel meer ouderen en eenpersoonshuishoudens, en dat heeft consequenties



uderen van een zorgoentrum in het Rotterdamse Crooswijk genieten van een ijsje. Beeld ANP, srry Lampen

Image 3, source: https://www.trouw.nl/binnenland/nederland-in-2050-veel-meer-ouderen-en-eenpersoonshuishoudens-en-dat-heeft-consequenties

the 55 to retirement and retired people live now.? This question will be answered in chapters 1.3. 1.4, 1.5 and 2. Chapter 1.3 will be about field research, in the form of a questionnaire in chapter 1.3, a visit to a project in chapter 1.4and finally a participant observation in chapter 1.5. Chapter 2 will focus on four case study analyses that I have done into housing for the population above the age of 55. Two of these case studies focus mainly on housing blocks for people above the age of 55 that are still living without care and the two other case studies focus on elderly housing with care.

1.1. History of Dutch elderly housing

1.1.1. Introduction

Elderly care in the Netherlands has changed a lot since one of the first types of specific elderly housing, the hofies in the 12th century, one of the first organised housing types for elderly. Currently, we have retirement homes for older people who need care for 24 hours a day on one hand and so called

Another question will be: How Mantelzorg, unpaid care for your older relatives, on the other hand. But those types of care have not been around for a long time.

> In this chapter I will examine hofjes, proveniershuizen and housing for the poor, among others, on a historical context level, but also on an architectural level. Doing this will create a time line, starting in the 12th all the way until the 21st century. I will start with the hofies, a form of housing for older women that started in 12th century, but of which several examples still exist todav in cities like Amsterdam.

1.1.2. Hofjes

The hofies, an example is the Begijnhof in Amsterdam visible in figure 5, were first used for



Figure 5: The Begijnhof in Amsterdam, build during the 12th century, however most original buildings were replaced in the centuries after that. Source: https://www.amsterdamoudestad. nl/bezienswaardigheden/oude-stad/begijnhof

abstained from marriage lived there and they basically were normal houses surrounding a courtyard. These forms of religious hofies or Begijnhofies started to arise in the 12th and 13th century (Schrever, 2019).

A not so much religious version of these were the normal hofies. In total around 144 hofjes were build in the Netherlands, with most being built in cities in Noord-Holland and Zuid-Holland. These newer versions started in the 14th century, however they became really popular in the 17th and 18th century. The primary reason for this popularity was that most were built out of charity for the older female part of the population, a group that was often deemed as a weak part of the population that was not able to take care of themselves. Building these hofjes as a wealthy citizen of the Netherlands was positive for the image, but sometimes they were also build after the wealthy person died, as a form of legacy. As stated above, these were mainly for the older females. And despite these hofjes were built out of charity,

religious purposes. Women who the residents still had to pay a fee to live there. So masked as a form of charity, it was still for the wealthier part of the population, not for the poor elderly women (Deen, 2004).

> Some time later, starting in the 15th century, older men started to move into Proveniershuizen, a type of elderly housing, which will be explained in the next chapter.

1.1.3. Proveniershuizen

The proveniershuizen, of which an example is shown in figure 6, were the alternative for the independent older males. Just like in the hofies for the women, the men had to pay to live in the proveniershuizen. However this meant that for the remainder of their life they would be taken care of, they had a place to



Figure 6: The Proveniershuis in Haarlem, photo taken in 1978, source: Delft Architectural Studies on Housing, Proveniershof Haarlem (NL), Dash2018/June, P82

sleep, a place to spend the day and a place to eat, food was provided as well. This meant getting old and living towards your death without care.(Vroegindewey, n.d.).

This type of housing was originally not only for older men. So called proveniers, people that bought a place to stay for a longer time, started to pay guest houses, hospitals and orphanages to stay there, which started in the 12th century. After this specific houses, the proveniershuizen, were built. The proveniers that lived there from the 12th century and onward were not necessarily older, a lot interesting, since it originated as a

of them were also younger and just wanted a carefree live and paid a lot of money for that. The proveniershuizen only started to house the older men in large quantities in the 17th century, so much later than their inception, but also much later than the hofies that housed the older female population (Historiek, 2019).

An example of such a house and the organisation can be seen in figure 7. Each person had one room and shared everything else, like bathroom and dining facilities. The example shown is





Delft Architectural Studies on Housing, Proveniershof Haarlem (NL), Dash2018/June, P84

hofje for women in 1414, but was transformed into a proveniershuis for men in 1706. This is where we can see similarities with the hofie. Like a hofie, a proveniershuis was often build around a courtvard. In this example there are two rows of dwellings, which means that not every dwelling is connected to the courtyard. But with the use of hallways the outer dwellings can reach the courtyard. The dwellings themselves were not that special. it was often just one room with a little bit of storage space, however in this example it was possible to combine several rooms and create a larger dwelling, but that would be significantly more expensive (Wilms-Floet, 2018, P 81-87).

The amount of money that the men had to pay to live there for the rest of their lives varied. On average it was 2.570 guilders in the 18th century, but it depended on the age of the residents. A younger man had more years to live and would therefore cost more money to provide for and was charged more money. These amounts were a lot of money at the time and it had to be paid at once, so it was not possible to pay

a little and pay the rest the coming years (Historiek, 2019).

These examples, however, were still for the wealthier part of the older population of the Netherlands. Most of the population that was older and therefore not able to work again was poor. For this part of the population, wealthier citizens first built Oudemannenhuizen (houses for old men). These were more charity focused than the hofies, since the people living in them did not have to pay anything. They were called Oudemannenhuizen, because they were first build for the men. since they needed them first, since men were deemed to take care of themselves, but if they had no money they could not do so (Deen, 2004).

1.1.4. Oudemannenhuizen

Around the same time as the proveniershuizen started to house the older part of the population, the 17th century, the poor male population that was unable to work anymore, lived in Oudemannenhuizen. In this case poor means that they were not able to pay a large amount of money at once to live the rest of their lives in

did not differ too much from the hofies and proveniershuizen, it were often small houses surrounding an inner courtyard. However the key difference was that living there was free, but they had to live according to strict rules. The rulers of the houses were wealthy citizens, that were often also rulers or had influential functions. The rulers overlooked everything in the Oudemannenhuizen. from the general organisation to the feeding of the residents and providing the clothes the residents wear (ONH. 2013).

Around 1800 the wealthier citizens decided to also start building houses like these for the women, called

a proveniershuis. In essence they did not differ too much from the hofjes and proveniershuizen, it were often small houses surrounding an inner courtyard. However the key difference was that living there was free, but they had to live according to strict rules. The

> An example of a house that had both a men and women section is the Luthers Diaconiehuis in Amsterdam, which currently houses the Maarten Luther Museum. This house was build in 1772 by the Luther community to house older men and women. At the very beginning it was mainly large sleeping and dining halls as is visible in figure 8. Despite the rather large size of the building,

it needed to be extended and in 1858 they added another building to it, mainly to take care of the ill and separate them from the rest. Here we can already see a change in the way the building was organised. The residents still had shared sleeping rooms, but this time they were much smaller, for 12 people. Each floor also had smaller rooms, but the room for the caretakers and the bathrooms were only on the ground floor. The ground floor of the extension is visible in figure 9 This building got changed again between 1969 and 1974. This time the large sleeping

area got split up into smaller rooms as well, to house a maximum of 4 people (Van Vrijberghe de Coningh, 1977).

1.1.5. Houses for the poor

The hofjes and proveniershuizen remained a form of housing for the elderly until the second worldwar. The Oudemannenhuizen and Oudevrouwenhuizen on the other hand slowly started to merge with the housing for the poor at the beginning of the 20th century. Since the older not working part of the population was the poorest part, the merging of housing

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Figure 8: First floor of the Luther Diaconiehuis (Van Vrijberghe de Coningh, 1977, p47)

poor was not a strange idea. The the lower class elderly population housing that came out of this was called pensiontehuis (sheltered housing). The pensiontehuis had small apartments for the elderly and shared facilities like a kitchen and a dining area. However at the start of the 20th century however there was still a strong divide between the catholic church and the protestant church. Both wanted to help the elderly, but the catholic church had already taken care of the elderly for a long time now, the Begijnhof is an example. As we read before this was however not for the poor part of the population. Catholic elderly housing focussed mainly on the wealthier part of society, the part that could afford to live in hofies. The protestants on the other hand did focus especially on the poor part of the elderly population. Their aim was to tackle the social and economic spectrum as a whole. This meant that until at least 1945 protestant elderly care in the Netherlands was predominantly care for the poor, which is the part that could not afford to pay for elderly housing or could not rely on family to take care of them. Until the

for the old and housing of the end of WWII (1945) the care of in the Netherlands was mainly done by the protestant church. with an aim to tackle the social & economic spectrum of care as a whole (Mens & Wagenaar, 2009, p. 17-22).

1.1.6. A change in help for the elderly from the government

In the previous section I described the way in which elderly housing has changed, but the way the government took care of the older part of society started to change in the beginning of the 20th century. More specifically this started in 1913 with the Invaliditeits- en Ouderdomswet (impaired and old age law), which ensured a small compensation from the government for physically impaired people and population above the age of 70, an old age at that time and therefore deemed as similar to the physically impaired. However, this was very little, and the family was obliged to add money to this allowance (Mens & Wagenaar, 2009, p. 17). So this still meant that the elderly still relied

Nevertheless, this compensation was a first step to a more drastic change after the second world war.

1.1.7. After the second world war

The minister of social affairs in 1947, Willem Drees, enforced a law called the Noodwet Ouderdomsvoorzieningen. The main purpose of this law was to allow people above the age of 65 to stop working. It was called an



Figure 10: Poster describing the Noodwet Drees. Source: Een gedurfd voorstel. Willem Drees en de ouderdagsvoorziening by Jelle Hans Gaemers

on their children or on charity, insurance, but there were a lot of debates about it being more like a state organised retirement fund. Despite some resistance the law was enforced on May 24th 1947 and was nicknamed Noodwet Drees, a poster advertising this law can be seen in figure 10. Its main purpose was to ensure that every older person above the age of 65 would get financial aid without having to work for it and that nobody would be excluded. However retirement was not really something most people did, meaning that they still earned a wage, but there was a limit to the amount of money you could earn. If you earned too much you would not get money from the government. Did you earn a little bit of money? In that case the amount of financial aid was reduced (Gaemers, n.d.).

> On top of that there were differences depending on where you lived. If you lived in an expensive city, like Amsterdam, you got more than when you lived in rural areas of the Netherlands. Willem Drees knew that the amounts of the financial aid would be too little to sustain yourself and become financially independent. On the other hand it

the age of 65 were less dependent rooms, meaning that more than on their children. This ensured that Drees would be seen as the father of the Dutch welfare-state that we are now and the beginning of the change for the elderly as the poorest part of the population to the wealthier part of the population now (Gaemers, n.d.).

Just after the second world war there was a massive shortage of houses for the elderly. In 1950, 37.304 elderly lived in specifically designed elderly houses. In these houses less than 30% had their own

did mean that the population above room and 15% lived in two person half lived in large shared rooms with at least four others, but often more (Mens & Wagenaar, 2009, p. 36).

> In 1956 the Algemene Ouderdoms Wet (AOW) (Translation: General Old Age Law) was enforced as the successor to the Noodwet Ouderdomsvoorziening. This law, together with a retirement fund, ensured that the 65+ population was financially independent (Sbi formaat, n.d.).

The AOW was followed up by

1963. This allowed a possibility for the government themselves to build retirement homes and try to stop the shortage. These homes were in essence similar to the old versions of elderly housing in the sense that the elderly had to pay to stay there. What was different this time was that the elderly were able to afford it because of the AOW (Gulmans, 2014).

example An such а of bejaardenoord was the Maarten Lutherhuis in Amsterdam, which

the Wet op Bejaardenoorden in opened in 1967. This building could house around 300 elderly people that were still relatively healthy. Each person would have their own room, but there were also couple rooms. An overview of the ground floor with several of these rooms and also shared facilities can be seen in figure 11.

> These care units had no functions like a kitchen however, the main purpose of these rooms was sleeping and also living, but eating was done in a shared dining room. Floor plans of several of a single and



Figure 11: Ground floor of the Maarten Lutherhuis in Amsterdam (Van Vrijberghe de Coningh, 1977, p97)

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Figure 12: Dwelling plans Maarten Lutherhuis (Van Vrijberghe de Coningh, 1977)

Figure 13: Dwelling plan independent elderly housing Maarten Lutherhuis (Van Vrijberghe de Coningh, 1977, p 110)

couples room can be seen in figure 12

On top of these care units, there were also several dwellings for fully independent elderly, that could still take care of themselves. Floor plans for these kind of dwellings can be seen in figure 13 (Van Vrijberghe de Coningh, 1977).

However these houses were not perfect. Aspects like abuse and intimidation were not rare and this was shown in the television program called De Ombudsman in 1970. This caused the government to respond and the same year they published the Nota Bejaardenbeleid, which ensured that 12.000 new elderly houses would be built each year. Furthermore, the older homes where the elderly lived together in large rooms would be replaced by modern homes with separate rooms. As a final result of the program, elderly got privacy and were treated with respect. This made the homes popular with the healthy elderly as well, causing the elderly that really needed help with everyday tasks to not get in the retirement houses. Because of this the 2nd publication by the government was issued. De main purpose of this was to try

2e Nota Bejaardenbeleid. With this publication the government tried to keep the elderly home as long as possible, by only allowing older people to move into a retirement home when they were not able to take care of themselves anymore (Gulmans, 2014). This leads to one of my problems mentioned in the introduction, where the elderly stay in their own larger homes for longer, causing a shortage for families.

1.1.8. Mantelzorg

Because the retirement homes were only for people that could not take care of themselves anymore, a new way of care was introduced in the Netherlands for the people that needed a little bit of care, Mantelzorg. It was introduced in the 1970's by J.C.M. Hattinga Verschure, someone who wanted to introduce social aspects into medicine and care. The idea of Mantelzorg was the informal care of the elderly, possibly with the help with professionals. It was mainly meant to not fully rely on professional caregivers. The

and keep the elderly in their own home as long as possible. This was because there was a slight issue. The Netherlands was a wealthy country and was spending a lot of money on the care for elderly. however somewhere in the 1980's this spending on care for the elderly became too expensive and they had to reduce the spending. The Netherlands at that time had become rather unique compared to other countries. 14,5 % of the population above the age of 65 was living in retirement homes in 1980, where neighbouring countries like Belgium and Germany only provided retirement homes for 5% and 4,5% of the elderly people. The large number of elderly in retirement homes also had a negative effect on their health. (Mens & Wagenaar, 2009, p. 117-118). The Mantelzorg that came as a response was free care and therefore could help with the cost problems.

1.1.9. Wet Langdurige Zorg (WLZ)

The second nota in combination with the introduction of mantelzorg meant the end of regular elderly living in retirement homes that started at the end of the second world war. It was still possible to live in retirement homes if they wanted to, it was just strongly discouraged and rather expensive. This continued from the 1970's until 2015. Retirement homes still existed and were necessary for people who needed a lot of care. However, elderly without much need for care mostly continued to live in their own homes, sometimes supported by a little care from relatives or neighbours, in the form of Mantelzorg.

In 2015 a new law was enforced, called the Wet langdurige zorg (WLZ). In short this law meant that you were only allowed to move into a care facility like a retirement home when you needed help 24 hours a day, mainly due to dementia or severe physical disabilities. These disabilities have to be permanent, which means that the possibility of it ever going away is (almost) not there. This means that if you want to move into a retirement house because you have difficulty with walking or some other daily activities you cannot move to a care

help 24 hours a day. Retirement the statistics of modern elderly in homes have therefore become a the Netherlands and their current final solution, the final step in your needs and possibly future needs. life (Zorginstituut Nederland, n.d.).

1.1.10. Conclusion

To conclude, the elderly and their housing have changed drastically during the last century. Elderly people used to live in houses for the poor or used to rely on charity, but after the changes the government made in financial aid for the older part of society, they could provide for themselves. This did not last long and now relatively healthy elderly do not live in retirement homes anymore, either because they want to live home for as long as possible, or because they are simply not allowed to by the government. On the next page there is a short and summarised overview of the changes that I described in this chapter.

facility, because you don't require It is important to look deeper into Therefore, the next chapter will focus on the Dutch elderly of today, who are they and what kind of housing do they need.







Hofies and proveniershuizen

12th century - 1900 Small, often one room, dwelling surrounding a large courtvard. Facilities like kitchens and bathrooms were shared with the other residents

Oudemannen- and Oudevrouwen huizen & Houses for the poor 1700-1945

Large sleeping rooms. Almost no privacy and the residents were only given a bed and a chest or small wardrobe for their personal belongings. The rooms gradually got smaller towards 1900, but there was still little privacy.

Retirementhomes

1945- now

A return to individual dwellings. However this time the dwellings were larger and the dwellings had their own bathrooms. Often the dining facility is shared. The retirement homes have not changed that much, but it is now (2021) much harder to get accepted into a retirement home

1.2. Current elderly

1.2.1. Introduction

put into one category. There are differences within the group of people above the age of 55 and those differences are predicted to change in the future. Therefore I first need to define the differences between the groups. This will first be done on an age basis, to create more specific age groups within the 55 years or older category. These new and smaller groups will be my main groups. These groups can in turn be separated on different grounds. First I will investigate the health, both physical and mental. After that I will look at societal status. mainly focusing on the relationship status of the elderly. This will in turn be followed up by their current housing habits and their likelihood of leaving their current house. After this the wealth aspect is analysed. How many elderly have enough money to maintain themselves for the rest of their lives? These are the main topics that I will examine in this chapter, but I will also examine several smaller aspects that might have an influence on the groups.

1.2.2. Who

The modern elderly cannot be When I started researching the older population it is often starting at the age of 55. Within this age group there are of course large differences, most of the 55 year olds are still working, while someone who is 75 is probably retired. Therefore a relevant question is: Why is the starting boundary set at the age of 55?

> The starting boundary of 55 can probably be traced back to the age that most couples have their children moved out and become so called empty nesters. Statistics, visible in figure 14, show that the average age for the first child in the Netherlands is 30 and the average age for having a second



Figure 14: Statistics showing the average age of getting children in NL. Source: https://www. statista.com/statistics/520840/average-agemother-at-birth-in-the-netherlands-per-child/

child is around 32 (Statista, 2020). are also couples or single persons However, young people leave their home later, due to several reasons. Youth in the Netherlands however, are still one of the earlier leavers, especially compared to the southern countries like Spain and Italy.

In 2017, young people left home earliest in the three northern Member States - Sweden (18.5 years), Denmark (21.1 years) and Finland (22.0 years), as well as in Luxembourg (20.1 years). Young people also tended to leave home before the age of 25 in Estonia (22.2 years). Germany. France and the Netherlands (all 23.7 years) as well as the United Kingdom (24.7 years) (Eurostat, 2019).

Taking in mind the average age of people getting their first child, around 32 years old, and adding up the average age of 23 to 24 years old of children leaving their homes, parents are on average 55 to 56 years old when they become empty nesters.

My reasoning above was mainly for the establishing an age to use as a starting point. Of course there growth of these two groups.

at the age of 55 that do not have children.

As mentioned before, the group of people in the Netherlands that is above the age of 55 is very diverse. To divide this group into smaller groups with similar people the first age group will be 55-67. This group can be seen as the working elderly. The reason for this is that the current retirement age in the Netherlands is slowly increasing. For a long time it was 65, but it is currently at 66 and 4 months, but it will grow to 67 in a few years and not too long after that towards 68. If we look at a table provided by the Rijksoverheid, we can see that for the current 55 year old born in 1966, the retirement age is around 68 (Rijksoverheid, 2019).

The rest of the group of elderly will fall in the group of retired persons, so the population above the age of 68.

Therefore we have two general groups to use moving forward, working elderly and retired elderly. I will now continue looking into the

1.2.3. Growth of the population

As stated before, the main reason for choosing the elderly as the group to design for, was that this part of the population would increase a lot. as shown by several news articles, but in this paragraph I will go more in depth into the predictions when it comes to the amount of elderly in the near future.

If we look into the history of the population of the Netherlands, we can already see that the number of people above the age of 65 has grown more than tenfold. From 0.3 million or 6% of the entire population in 1900 to 3.4 million or 19.5 % of the entire population in 2020. Within this group, the number of people above the age

of 80 is 824,000 in 2020 which was 4,7% of the entire population in the Netherlands and almost a quarter of the entire group above 65 (Volksgezondheidenzorg.info, 2020).

The number of elderly, especially those aged 80 years or older will grow rapidly. CBS (2021) predicts that in 2050 that group will be two to three times larger than it is now.

1.2.4. Health of the current population above the age of 55

First we need to establish that the population in the Netherlands is getting older in a healthier way.

Table 2.3 (weekly) sport participation, population 18 years or older in percentages

	2001-2005	2006-2009	2010-2013	2014-2017
Totaal 18-plus	49	49	52	52
18-54 jaar	56	57	59	58
55-64 jaar	40	43	47	47
65-79 jaar	30	33	38	42
80-plus	12	17	20	21
65-plus (samenvatting)	27	30	35	38

Bron: Gezondheidsenguête/Leefstijlmonitor, CBS i.s.m. RIVM, 2001-2017. Bewerking: Mulier Instituut.

Figure 15: Statistics showing the weekly sport activity participation rate per age group Source: (Van den Dool, 2019)

physical activity, visible in figure 15 on the previous page. The percentage of 55-64 year olds that partake in physical activities per week has grown from 40% in 2001 to 47 between 2014 and 2017. However, the biggest growth can be found in the 80 plus category. In this category, the percentage participating in physical activities has grown from 12% to 21% in the same time frame (Van den Dool. 2019, p. 12).

This does however show that the number of people participating in physical activities is declining. This is mainly due to the fact that the people get problems with mobility when they grow older. Where only 20% of the population between 65-74 have problems with mobility, this grows to around 70% for the group older than 85. Showing a large decrease in mobility in little of 20 years, visible in figure 16 (Schoemaker, Van der Wilk, van Wieren et al. 2011, p. 28).

We can see this when looking As it is shown that mobility at the percentage of elderly that becomes one of the largest issues participate in a form of sport or for people when they get older, dwellings need to adapt to their inhabitants and allow for easy movability in the house. For this, changes need to be made to allow for better movement throughout the house/building. For instance a regular wheelchair has a width of 90 cm. but it is recommended to have areas with a width of at least 120 cm to allow for easy movement with the wheelchair. On top of that a height difference of less than 2 cm between floors and thresholds or

> Prevalence of physical limitations among elderly. according to age in 2008



Figure 16: Statistics showing how the issues with mobility (Green bar) increase with the years. Source: Schoemaker, Van der Wilk, van Wieren et al, 2011, p. 28 Translated by author

dwelling is also recommended for people with mobility issues. The bathrooms should be easily accessible from the main areas in the dwelling such as the living room and bed room, to minimize the distance for the residents. The possible use of a wheelchair also means that windows should start no higher than 60 cm (KOC, 2014, p 7-8).

1.2.5. Care

Diminishing health also means that the need for care might increase. As we saw in the short history of elderly care in the Netherlands in the previous chapter, we know that getting into retirement homes is getting harder than for instance in 1970. Therefore, a lot of elderly rely on Mantelzorg, the informal care by either their family or friends, see chapter 3.1.8. But what is it exactly and how does it work?

The term Mantelzorg is only applied when the help that is provided is voluntary and without pay. However, it is not the same as voluntary work. As stated on the is single, which is expected to

other barriers throughout the entire website mantelzorg.nl, Mantelzorg is something you encounter in your life, voluntary work is something you chose to do (Mantelzorg, n.d.).

> Mantelzorg is often enough for the elderly, but does rely on having either friends or family that are willing or are able to spend all this time on their elderly relatives. In 2016, 10 % of the population above 65 in the Netherlands said that they received Mantelzorg (CBS, 2020). Therefore, some elderly who live a very solitary life or have busy friends and family might still need nurses to take care of them. This leads us to look at another aspect of the elderly, their societal status. How many elderly people are married and how many of them have children?

1.2.6. Societal status

Being older also means that the possibility exists that your spouse might pass away. On top of that, divorce happens more and more often. This leads to the fact that 25 percent of the current population between 55 and 67 grow to 30 % in 2047. For the If we look at the educational level, population aged 75 or older that is currently 30%, but that will grow to 35%. However we can also see in the graph of figure 17 that this percentage will actually decrease in 2047 compared to the measurement in 2018. This can be explained with the increased life expectancy, which makes that spouses pass away at a later age (CBS, 2018).

In 2014, 13% of the population above 70 in the Netherlands had no children (anymore) or there were no longer living in the Netherlands. 7% of the elderly above the age of 70 had both no children and no partner (CBS, 2020).



Figure 17: The percentage of single person households per age. Source: https://www.cbs. nl/nl-nl/achtergrond/2018/26/honderd-jaaralleenstaanden Translated by author

we can see that the elderly have the highest percentage of low educated people, although this group forms the wealthiest part of society. More than 50% of the population above 65 had a low educational level. meaning that they had only finished a VMBO education or did not finish high-school altogether. This was only 27% and 14% for the groups aged 45-64 and 25-44 respectively (Volksgezondheidenzorg.info, 2019).

1.2.7. Current housing habits

Currently, 51% of the population above the age of 55 lives in a family house, i.e. a row multi story row house. (Blije, Gopal, Steijvers, et. al, 2021 p.19) However, this amount differs per age group, since 59% of the 55-64 year old are living in family houses, and only 31% of the population above 85 is living in family houses (Blije, Gopal, Steijvers, et. al, 2021 p.19).

Another striking fact is that 44% of the 55-64 year old group lives in a dwelling larger than 120 m2, while this percentage is only 2% lower for the group aged 65-74. If we look It is therefore important for at the group above 55 as a whole, 71% lives in dwellings larger than 90 m2 (Blije, Gopal, Steijvers, et. al, 2021 p.20).

Research by Trendmonitor Wonen en Welzijn on how life cycle proof the dwellings of elderly are, visible in the figure 18. This was done by asking people above the age of 55 on how life cycle proof they grade their dwellings. Aspects for this include one level dwellings or easy adaptability of the dwellings. This research shows that almost 50% of the population between the age of 55 and 64 grades the ability to change the current dwelling, to make sure that they can keep living in their current dwelling, average to below average (Blije, Gopal, Steijvers, et. al, 2021 p.16).

architects of new elderly, to design them in such a way that future changes are possible, which in turn will allow the residents to live in these dwellings as long as possible.

1.2.8. Housing needs

As part of a choice experiment by Arentze and Ossokina (2019), the researchers created a toolbox that stated several housing needs for the Elderly population in the Netherlands. They subdivided this toolbox into three categories: higher value dwellings, a reference dwelling as a middle ground and a lower value dwelling. The research focusses purely on apartment dwellings. The different categories differ on several aspects. For



N - 75 en ouder = 286 N - 65 t/m 74 =1003 N - 55 t/m 64 = 831

Figure 18: Statistics showing how the population grades how life-cycle proof their current dwelling is. Source: https://marketresponse.nl/wpcontent/uploads/MR-Trendrapportage-Levensloopbestendigheid.pdf Translated by author

instance the reference dwelling has a size of approximately 90 m2, whereas the higher and lower value dwellings have sizes of 110 m2 and 70 m2 respectively. On top of that it is preferred that the high category dwelling has a 12 m2 garden, the reference dwelling a 12 m2 balcony and the lower value dwelling a 5 m2 balcony. Another sometimes overlooked characteristic is the building size. The reference dwelling is located in a building with 20-80 dwellings, whereas the higher value dwelling is located in a building with less than 20 dwellings. Another aspect that is valued highly, are common spaces, both inside and outside.

Therefore. based this on information I can get an indication for dwelling sizes and general amount of dwellings for my building. If I want to focus on the average older person, I should have dwellings that are around 90 m2, but lower value dwelling should also fit in, since I want to mix elderly from different economic backgrounds.

Arentze and Ossokina (2018) also talk about the functions in the

dwelling. Here, two striking parts are that open kitchens (in the living room) are preferred and that it is preferred to not have an extra door between living room and bedroom (Arentze & Ossokina, 2019, p. 12).

1.2.9. Moving statistics

In the research that was done by Blije, Gopal, Stijvers et al (2021, p. 21), we can see that when the population grows older the people want to move into specific housing designed for the elderly. Where it is only 26 % for the group between 55 and 64, it is 67% for the group above 75 years old. On top of that, it is also stated that 60% of the population above 55 years old, would prefer to remain at least in the same town/ city. (Blije, Gopal, Steijvers, et. al, 2021 p.29) This confirms that there is a need for dwellings for aging in place, preferably in a location close to where the people have lived most of their lives.

1.2.10. Wealth

As stated in the final part of the previous chapter, the elderly have

couple of decades, compared to the elderly just before the second world war. The main reason for this is the purchase of a home when they were younger, which has become more valuable over time. We can for instance see that the median net worth of the elderly had more than doubled in 2016, compared to 10 years earlier, from 49 thousand Euros to 109 thousand Euros (RTL Z. 2016). On top of that, the Netherlands as a country has become richer. This is reflected in the income of the general population, but especially in the income of the older part of the population. We can see this in the diagram of figure 19 on the previous page, which also shows that the



Figure 19: The decline of households with a low income, the darker blue is the population above 65. Source: https://www.cbs.nl/nl-nl/ nieuws/2017/10/ontwikkeling-inkomen-envermogen-65-plussers-na-95 Translated by author

become much wealthier in the last couple of decades, compared to the elderly just before the second world war. The main reason for this is the purchase of a home when they were younger, which has become more valuable over time. We can for instance see that the median net worth of the

1.2.11. Daylight

An important aspect for elderly is daylight. Daylight determines their natural rhythm and allows the elderly to get enough sleep during the night. If elderly don't get enough exposure to daylight during the day, this will have an impact on the quality of their sleep. This is an important issue, since more than half of the elderly population has trouble with some sort of insomnia. This causes a slow reaction speed and mood swings. (Mandemaker, Hoof & Schoutens, 2007, p. 2). An advice that Mandemakers. Hoof & Schoutens (2007) give is that the amount of light that comes into the dwellings of elderly, needs to be higher than for dwellings of younger people.

2.12. Adaptability

As mentioned before, it would be ideal if dwellings would be able to develop with the aging of their residents. To achieve this, dwellings might need to adapt time to time. De Vreeze & Van der Vossen (1999) give 12 steps which can be used as a guideline for this adapting process. The steps are as follows:

1. Primary living spaces on the ground floor

2. Possibility for an extra living/ sleeping space on the ground floor

3. Neutral room sizing to allow for different functions

4. Possibility of removing non bearing walls to change rooms

5. Possibility of making rooms independent in the dwelling for moving in of helpers or to create a workspace

6. Expansion possibilities

7. Circulation to higher floors through straight staircases

8. Possibility for changing the kitchen location

9. Second sanitary space

10. Separate washing space

11. Allow for expansion of the kitchen

12. Wheelchair friendly design

These steps are mainly an advise to make future adaptability easier, without too large interventions. The book is from 1999, so this means that it might be slightly outdated, but the ideas can still be useful to keep in mind.

1.3. Questionnaire elderly

1.2.13. Conclusions

Looking at the different aspects. the user group identification, their health. societal status, housing, wealth and additional aspects, the following conclusions can be made.

-55+ is used as the indication to identify the elderly people of the population. From this large group, 2 main groups could be derived: 55 years old until retirement and the group after retirement. The reason for using the age of 55 as the border to identify elderly, is mainly based on the notion that the children of elderly people are moved out. Using the average age of when people get children and the average age of the children moving out, makes 55+ a solid average to appoint 'elderly people'.

-The amount of time spent on physical activity decreases with age, as we would suspect given the decreasing mobility. However, that number is rising since a couple of years, meaning that the elderly get more active.

-Currently, more than half of the population above 55 lives in a multi story row house and a large part of

the group between 55 and 64 lives in dwellings larger than 120 m2.

-If we look at the housing needs of elderly, we can see that the preferred dwelling is one level, with enough outdoor space.

-The need for moving to housing which is specifically designed for elderly, grows significantly between the ages of 55 and 75. However, most of these elderlies cannot move to a suitable place at the time they want to. Therefore, it would be better if people between 55 and 75 could move earlier, which would give them more time in the process.

-Another striking aspect that came forward in this study, was the use of enough daylight in a dwelling. When people get older, daylight becomes much more important and can improve the sleep cycle of the elderly as well.

All these aspects will mainly be used as general guidelines for the design of my own building.

In the previous chapter I mainly **1.3.1. Introduction** investigated the Dutch elderly through literature research. This research did give some insights. but talking to or observing older people might enhance these insights. Therefore, this chapter will consist of three parts.

Firstly a questionnaire that I made and sent out to a 16 people I know that fit into this category. This questionnaire was mainly to get a more general idea of the living conditions and housing preferences.

The second part is a visit Knarrenhof, an to elderly housing concept in Zwolle, the Netherlands. During this visit, two of my colleagues and I observed the housing project, but also talked to several residents and visited their homes.

The third and final part of this chapter is a participant observation I did, where I observed my grandmother in her dwelling. The purpose of this part was to see how my grandmother uses her space and if there were any difficulties in using the dwelling.

To get a simple understanding of current housing situations of people above 55. I decided to make and distribute a questionnaire to 16 people I know in this age group.

The questionnaire was set up into 3 parts. There was a general part, which included elements like their age, occupation and education type. After that, a part about their housing was included, with questions about their current housing type, the size and location of their dwelling and about positive and negative aspects of their dwelling. The third and last part of the questionnaire was more specific about their ability to perform daily tasks and the likelihood of them staving in the dwelling if something might happen.

1.3.2. Main findings

-Most of the people in the age group of 55+ live in dwellings that consist of multiple floors.

-Despite this, most think they can keep living in these dwellings for the rest of their lives.

-Furthermore, the majority of the interviewees wrote down that a stair lift might be one of the changes which they would make to their dwelling in the future, to allow for easy access to the upper floors.

-The few that did think they would move to a different dwelling in the future would like to stay in the same town/city

-A common complaint that became clear in the questionnaire, was the lack of storage in their current dwelling, indicating that enough storage is of great importance for older citizens.

-Another striking aspect was that a few of the questioned people already live in senior apartments, even a few that are aged below 60.

1.3.3. Conclusions

The questionnaire was mainly added to get an impression about the current living situation of elderly of 55+, their perception of their homes and their thoughts on the possibility of moving.

What was most striking for me, was that some younger elderly already lived in elderly specific dwellings, telling me that it is not a strange idea for younger elderly to move to a dwelling designed specifically for elderly. On top of that, it was interesting to find that a stair lift would preferably be one of the first additions to make their current dwellings more adaptive for their aging. This indicates that a single level dwelling would be a good idea for most elderly, taking the declining mobility in mind. The last thing that can be used from this questionnaire, is that ample storage is preferred by almost everyone.

1.4. Knarrenhof

Het Aalhof, Zwolle



Construction period: 2017 - 2018 Client: Knarrenhof Architect: INBO Landschapsarchitect: Ground area: 9.500 m² Built area: Number of dwellings: 48 housing units Communal functions: Garden as the center of the complex Service/care functions: All important functions are located on the ground floor of the dwellings Special offers: The project is realised after a community is formed and together with that community

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1..4.1. The concept

To look at different elderly concepts, a few people of the study group and I visited Knarrenhof in Zwolle. The project consists of 2 so called hofjes, a reference to the hofjes of chapter 3.1.2. with each being surrounded by houses. The houses are a mix between social housing and normal houses that are for sale.

1.4.2. Our visit

During our visit it was a sunny Friday afternoon. We picked such a day to see how the people would interact in the hofies. When we arrived we noticed that there was a stark difference between the 2 hofies. visible in figure 21. In the first hofie (the lower one in the map) there were not a lot of people outside and if they were, they stayed mainly in their own garden. The second hofie (the top one in the map) was also not too busy in the common courtyard, but there was a lot more activity near the edges, close to their own gardens.

We spoke to several residents and visited houses in both of the hofjes.



Figure 21 Overview of dwellings map by INBO

In the first hofie, we only visited 2 social rent houses, but in the other hofie we visited both social housing as well as two other houses that the owners had bought.

1.4.3. The first hofje

When we entered the first hofie, we met and spoke to one of the initiators of the project. She is a 68 year old woman and she is living in one of the social housing units, number 34 in the map. Before she moved to Knarrenhof she lived in an apartment building in Zwolle. She invited us in for some tea and explained the concept. In the conversation she also mentioned what she liked about the final result and some things she did not like about it. One of her biggest complaints had to do with the organisation of the dwelling. It is a rather large dwelling for social housing, but that was mainly due to the large upper floor, visible in figure 22. This floor is the exact same size as the entire ground floor. On top of that, this floor only has a small window, making it a very dark room. When you get older the stairs may become difficult to climb, making the room years ago, when she had just moved 23 on the next page. Another issue, one she mentioned several times, was that the bathroom was too large, causing the kitchen to come more into the living room. living room would be slightly larger and the bathroom a bit smaller. However, this was probably done to make the bathroom accessible with a wheelchair, meaning that it could not be smaller than its current size.

A positive element about the hofie that the 68 year old woman mentioned, was the helpful neighbourhood. She illustrated this with an example from a few



Figure 22 Attic Photographer: Mick Hiskemuller

hard to access and therefore in. The woman was hit by a car, probably unused. A floor plan of causing her several injuries. Her this dwelling can be seen in figure neighbours were all very helpful and would come by quite often, which is something that would probably not happen in a different type of housing situation. This caring environment includes a more She would have preferred that the negative side as well, according to this woman. She mentions that the caring of and contact with the neighbours can be a bit too much sometimes, since all the dwelling are rather close together.

> Another issue that this woman experienced was that the normal dwellings were wider than the social housing units. Therefore, the normal dwellings include a living room which is stretched from front to back, creating daylight on both sides. The social housing units on the other hand were split, with the living room facing the hofie and the bedroom was located at the back.

> After this interesting conversation we spoke to a woman that lived a few houses away, in number 39. Her dwelling was also part of the social housing in the hofie. She was much more positive than the 68

year old woman we were before, as this woman mentioned the social aspect of the concept as one of the more positive elements of the hofje. However, the complaints about the dwelling were the same. The large upper floor and the large bathroom were seen as a poor use of space by this woman as well. The second woman does like the upper floor for storage, but it does not have to be this large.

1.4.4. The second hofje

When we entered the second hofje, it felt different. One thing we noticed was a large tree, which changed the atmosphere a lot. As we entered, we saw a group of women talking to each other and we approached them. They all invited us in, which made it possible for them to show the differences in the dwellings, since they all lived in another type of dwelling.

The first dwelling we entered was a social housing unit, number 21 on the map, was similar to the two dwellings of the former hofje that we had seen. The resident of this dwelling had the same complaints about the dwelling organisation as the two women of the first hofje had. This woman used to live in an apartment building that was next to the hofjes. She stated that if that building would have had an elevator, she would not have moved to this place. Now that she



has moved here, she mentioned that she actually enjoys the social interaction that comes with the hofies structure. Furthermore. this woman stated that especially during corona times having more interaction in the garden was a positive experience and something she expected not to have in her old apartment. Another interesting thing she mentioned was that she liked the height of the ceiling of the dwellings. However, the woman experienced a negative side of the height as well: the cleaning of the heigh doors is quite difficult, since a stool or a small ladder is needed to reach the top. A side not to this

is that the woman was rather small and therefore would probably have this issue in other dwellings as well.

After this interesting visit, we were invited in one of the normal dwellings in the second hofje, number 16. We immediately noticed the difference that the long living room made. These dwellings are also wider than the social housing units: 7.30 meters in comparison to 6.20 meters of the social housing units. Furthermore, the bathroom was considerably smaller and much more practical, having doors on both the hallway side and the bedroom side. The bedroom was also directly accessible from the living room.



Figure 24 Floor plans and section of the housing unit with a width of 7.2 meters and several options for the first floor, image by INBO



Another noticeable difference with the social housing, was the wall on the upper floor. Since the owners bought the house, they could arrange the upper floor as they liked it. This made room for a wall to separate the stairs from the rest, which made quite some difference compared to the social houses. This upper floor also had 2 windows, changing the feeling completely.

The last dwelling we visited was also the largest dwelling, at 8.20 meters wide. This was dwelling number 7. Here we noticed a significant change in size and it gave the owners the option to get a second bedroom on the ground floor. The upper floor was similar to the previous dwelling, number 16, but here there were no walls or other separators, which created a large space that was more or less used as a storage space for the couple living there. The owners mentioned that they really enjoy the area and the social aspects, but also acknowledged that they were lucky with the costs of the dwelling when they bought is. They mentioned that newer projects were much more expensive than this project, even though this project is just a few years old.

1.4.5. Conclusion

In the hofies in Zwolle, my project group and I discovered multiple interesting aspects and some inspiration, which could help us in designing dwellings for elderly people. One interesting element of this concept was that it did not start with a building, but with a group of people. The community came first. In general, most of the people living in Knarrenhof enjoy being surrounded by others. However, some of the residents would have liked more privacy, which could for instance be established with higher separations between gardens. Furthermore. the residents seem to like the houses. in general. However, some issues with space use were mentioned. For instance, the large first floors were seen as a nice place to store items, but also as a strange and large area. Such a large and open plan would be more welcome on the ground floor.

It can be concluded that the project in general was met with enthusiasm by the people living there. Positive elements were found in the nice houses, the social interaction with neighbours

and the personal care that this can bring when illness or injuries limit someone. Negative elements were found in the space distribution of the social rent houses. It was mentioned that the bathroom was too large and that this extra space could be used to increase the living room. On top of that, the large first floor was seen as mostly useless space. Since elderly people have more trouble with mobility (which makes them not want to climb the stairs much), it seems like a strange design choice to include such large upper floors. Lastly, the whole concept of the hofjes was seen as positive in general, although not everyone liked to participate in events and to have constant social interaction. This type of residents do like to see other people, but feel like they are watched constantly. For this group, a possibility for more privacy would be preferred.

1.5 Participant observation

1.5.1. Introduction

To get an idea of how the elderly might live once they grow older and become less mobile. I decided to observe my grandmother (age 85, alone and immobile) for a day and see how she uses her house. To give a little bit back story, she used to live in a large house built in the beginning of the 20th century before she moved to "Aanleunwoning" (Sheltered an accommodation). This is a type of dwelling which is located next to a retirement home, allowing for help nearby if necessary. This means that she now lives in an apartment built

specifically for elderly who might be less mobile. This is, among other things, visible by the large doorways and large bathroom that allows for wheelchair access.

The purpose of the observation is to see how the dwelling functions and if the organisation is logical. Therefore, the observations will be done by marking the path of movement through the dwelling, visible in figure 25. A short conversation during which I asked about her experience in the dwelling was also part of the observation. In this conversation,



I asked my grandmother how her new house differs from her old dwelling and if she sees the change as a positive experience or if she still has some doubts about the current dwelling.

1.5.2. The observation

The first thing that struck me was that not much happens on one of her regular days. My grandmother mainly sat on the chair, marked with a red arrow on the floor plan on the previous page. To move around the house she mainly uses a walker. This walker is parked next to the aforementioned chair and her main route from the chair to other areas is around the couch. If she does not use the walker she mainly uses tables and the couch to lean on. The possible use of a walker means that the living room needs to allow for enough space between furniture.

While my grandmother sits in the chair the largest part of the day, she drinks coffee or watches TV. She only gets up to get something in the kitchen (figure 26), which is part of the living room or in the main storage room, which is located just on the outside of

the living room. Another reason to get up, is to use the toilet, which is located in the hallway as well.

Next to the seating area, the kitchen is used mostly during the day. The observation of the use of the kitchen shows that my grandmother does not have much trouble with using this area. Everything is easily accessible here and not very complex, which is supported by the fact that she does not really cook anymore. Yet, my grandmother did mention that she thinks that the oven could be moved slightly down, since it can be a bit too high when she needs to take something hot out of it, causing a possible incident.

Another event that happened during the observation, was that my grandmother needed to buy some groceries at the store.



Figure 26 The kitchen of the dwelling

However, since she does not drive a car anymore and cycling is not an option either, I had to drive her to the store. The building she lives in has an elevator that goes all the way down to the car park located in the basement. Therefore, moving to the car is easy and guick, without any obstacles that could be hard when mobility is limited.

After the observation I asked my grandmother what she liked about the dwelling. She mentioned that she liked the wide doorways and the lack of doorsteps most about her new house, visible in figure 27. Dual access to the large bathroom was also something she liked a lot, visible in figure 28. On top of that, my grandmother mentioned the ample amount of storage and the large balcony as positive elements of the dwelling as well.

Next to these positive elements, my grandmother also perceived a few negative elements in the dwelling. To start with, she mentioned that the kitchen does not get a lot of daylight, which means that it can be quite dark in this area. Luckily, the colours of the kitchen are quite Figure 28 Two doors access to the bathroom bright, which compensates a bit for



Figure 27 Extra wide doorway



the darkness. Furthermore, she **1.5.3**. Conclusion mentioned that the toilet is a bit In an observation session at my dwellings to the elevator is perceived as a missed opportunity. This is mainly due to the fact that the dwellings are quite closed off and that the corridor could be a place to have some interaction happening much currently. This means that someone who does not come out as much does not have a lot of interaction with the other residents

low, which makes standing up grandmother's "aanleunwoning" to after the use of the toilet difficult. get more insight in the use of such The corridor that connects the a dwelling, I discovered that not much activities take place during a regular day. However, for the things that my grandmother needs to do during the day, the dwelling is great. This is mainly due to the generous size of the living room, with other residents, which is not the lack of doorsteps and the wide doorways. The incidence of daylight and several smaller organisational aspects could be improved, but for an elderly with low mobility, the dwelling functions well.

> Looking at the observation in general, I did learn about some subtle aspects that make the dwelling very usable for my grandmother. However most of the aspects she liked are mandatory for elderly housing, like the large doorways and lack of doorsteps. Due to the time it takes to observe for a whole day I will leave the observation part by just one observation, but it did give me a good insight into the daily activities of an older person living on her own.

2.1 De Makroon Nieuwe Passeerdersstraat 1, Amsterdam



center of Amsterdam. Designed by Architekten Cie. It replaced the catholic care home that stood there in the past but was outdated and needed to change. The fit in, without copying the style of other buildings. It also tried to not look like it houses primarily elderly. The residents that live there can be divided into several categories. There are care units on the first elderly that need care on a regular basis and can't live on their own any more. On that same floor is a care hotel, a place for elderly that need temporary help, for instance for when they have an injury or just had surgery but can't stay in a hospital. The rest of the building, the 4 floors above it. is for people older than 55 years of age. There are lots of different dwelling sizes, ranging from 60 m2 to 140m2. All dwellings have very high ceilings.

Construction period: 2012 - 2015 Client: Osira Amstelring, Amsterdam Architect: de Architekten Cie. Landschapsarchitect: Hosper Ground area: 6000 m² Built area: 27.200 m² Number of dwellings: 134 apartments, 15 sheltered accommodations, commune for 16 people, 9 places in care hotel Communal functions: 830 m2 commercial space

Elderly housing

Case study by Ricardo Kemp

Communal functions: 830 m2 commercial space Service/care functions: 4.120 m2 health care center Special offers: 179 parking spaces, garden in the middle, close to the center of Amsterdam

De Makroon is located in the at 4 meters high. The ground floor is used for that group as well, however most of the ground floor is used for the ground floor is used f

building that replaced it tried to fit in, without copying the style of other buildings. It also tried to not look like it houses primarily elderly. The residents that live there can be divided into several categories. There are care units on the first floor. These are dwelling for elderly that need care on a regular basis and can't live on their own any more. On that same floor is a care hotel, a place for elderly that

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Ricardo Kemp | The Old Harbour

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2. Case studies

In the following chapter I will analyse four different case studies. All the case study projects focus on elderly housing, but on different groups. Two projects focus on 55 plus elderly that can still take care of themselves, but the other two projects focus on elderly care housing.

The projects that will be analysed are:

1. De Makroon in Amsterdam by de Architekten Cie.

2. OCMW Nevele in Nevele, Belgium by 51N4E

3. Center for Seniors in Steinfeld, Austria by Dietger Wissounig

4. De Akropolis in Amsterdam by Studioninedots

On the next page the criteria for the analyses are given and the chapter will end with a comparison between the project and a small conclusion with some main take aways that struck me after analysing the projects.

Ricardo Kemp | The Old Harbour

De Makroon Dwellings/Circulation



First floor



Second, third and fourth floor

The main circulation of the building is done by using a corridor in the middle of the building. This means that the dwellings are on either side of this corridor. This means that the dwellings either face inward towards the courtyard, or towards the street or the water, depending on the part of the building.

The building has ample staircase and elevator locations, 6 in total, located in the middle of the hallway for the first floor, but more towards the dwellings facing the courtyard. This is because floors from the second floor and up are slightly set back from the courtyard, causing the corridor to be narrower on these floors and therefore forcing the staircases more towards the courtyard facing dwellings.





8000

12000

イ人工

λN

Dwelling type 15 de Makroon

The building has a lot of different dwelling however shapes. these often due to the strange angles of the building. There are several dwellings, the ones displayed on this page, that are used most often. As we can see the set up is very similar, with the main rooms located on the window side and the bathroom and storage facilities located near the entrance, the area with no natural light.

12000 Maps edited by author. Source base map: https://cie.nl/page/740/de-makroon?lang=nl

Dwelling type 25 de Makroon

1:200

83 m2

9600

Maps edited by author. Source base map: https://cie.nl/page/740/de-makroon?lang=nl

2.2 OCMW Nevele Graaf van Hoornestraat 26, Nevele, Belgium



Construction period: 2010 - 2012 Client: OCMW Nevele Architect: 51N4E Landschapsarchitect: LAND Ground area: 7460m² Built area: 4400m² Number of dwellings: 54 units (28 m2) Communal functions: Gardens and terraces and the hallwav Service/care functions: **Special offers:** The rooms can open up to the hallways. creating a larger open space, to improve connections between residents.

Elderly housing

Case study by Ricardo Kemp

extension in return.

simple. It has a Y shape and Two of the wings have 2 building layers and one wing, that was connected to the old building, has three layers. The more interesting thing that happens is the way the rooms work. With an exception of some rooms of the ground floor, which are rather normal, most rooms have the same organisation. A sleeping area in the back, with

This is a care home for the elderly a bathroom in the middle and located in the small town of Nevele ending with a living area, which in the province Oost-Vlaanderen in is connected to a large hallway. Belgium. The building was build as This part, the living room and the an extension to the existing care hallway is what makes the concept home, but this existing part has interesting. There are large windows been demolished in 2020 and they connecting them as well as a large are now planning to build another sliding door. This sliding door opens up the room towards the hallway, creating a sort of semi-private area. The building in itself is rather where in theory other residents can just walk in to talk to the resident of consists therefore of three wings. that dwelling. This ensures a certain consecutiveness between the residents and tries to avoid isolation for the elderly.

Literature

Broes, T., Cicek, A., Colenbrander, B. (2014). Architectuurboek Vlaanderen N°11. Architectuur middenin Antwerpen: VAI

Brunengo, C. (2015, March). Nevele care center extension, Belgium, 2012. Architecture d'aujourd'hui(405), pp. 42-43.

EUmiesaward, (2013), OCMW Nevele - Seniors Campus. Retrieved April 13, 2021, from https://miesarch. com/work/2946

OCMW Nevele

Ground floor organisation



Map edited by author. Source base map: https://divisare.com/projects/246052-51n4e-crit-filip-dujardin-ocmw-nevele

OCMW Nevele

Dwelling organisation

Outside space



Map edited by author. Source base map: https://divisare.com/projects/246052-51n4e-crit-filip-dujardin-ocmw-nevele

When the sliding doors are closed are traditional rooms, on both sides it is as if it is a normal apartment building, consisting of dwellings and a hallway. The bedroom area can in this scenario also be closed off from the other parts, increasing the privacy even more.

In the open configuration, the hallway and living room area are connected to each other, allowing other people to enter and use the hallway as a more communal leisure area, instead of just a not present in one of the wings on the ground floor, instead there side.

of the hallway.On the second floor this is changed and there is also the same dwelling types as the rest of the building. The space that is created, by only having one row of dwellings is used as a terrace now.

The part that is connected to the old building has 3 layers, whereas the rest of the building only has 2 floors. Additionally we can see that the orientation of the rooms change for some parts of the buildings, space to go from place a to b. The meaning that on the outside you special units from the building are can see both the hallway and the sleeping area of the dwelling on one

2.3 Center for Seniors in Steinfeld

Case study by Ricardo Kemp 10. Oktober-Straße 30, 9754 Steinfeld, Carinthia, Austria



This is a care home for the elderly located in the small town of Nevele in the province Oost-Vlaanderen in Belgium. The building was build as an extension to the existing care home, but this existing part has been demolished in 2020 and they are now planning to build another extension in return.

The building in itself is rather simple. It has a Y shape and consists therefore of three wings. Two of the wings have 2 building layers and one wing, that was connected to the old building, has three layers. The more interesting thing that happens is the way the rooms work. With an exception of some rooms of the ground floor, which are rather normal. most rooms have the same organisation. A sleeping area in

Construction period: 2015 Client: Geriatric Health Centers of the City of Graz Architect: Dietger Wissounig Architekten Landschapsarchitect: Dietger Wissounig Architekten Ground area: 3,658 m² Built area: 8,100 m2 Number of dwellings: 8 double rooms (28.0 m2) 34 single rooms (19.4 m2) Communal functions: dining and Event hall, a library and a chapel Service/care functions: wheelchair friendly bathrooms and care facilities. Special offers: Public library open for everyone. Internal atrium and barrier free design

Elderly housing

the back, with a bathroom in the middle and ending with a living area, which is connected to a large hallway. This part, the living room and the hallway is what makes the concept interesting. There are large windows connecting them as well as a large sliding door. This sliding door opens up the room towards the hallway, creating a sort of semiprivate area, where in theory other residents can just walk in to talk to the resident of that dwelling. This ensures a certain connectiveness between the residents and tries to avoid isolation for the elderly.

Literature

Fuchs, M., Hegger, M., Stark, T., & Zeumer, M. (2008). Energy manual: Sustainable architecture. Basel, Switzerland: Walter de Gruyter.

Schittich, C. (2007). Housing for people of all ages: Flexible, unrestricted, senior-friendly, Munich, Germany; Birkhaüser.

Center for Seniors in Steinfeld

Organisation functions besides dwellings



The not dwelling related, are located mainly on the ground floor, with the dining room being used by the the exception of caretakers areas. which are located on each of the top floors.

other functions, that are not only service the residents, but also the people of Steinfeld, with children of the town, as well as having a public library and a chapel that is used by the entire town.

The functions on the ground floor

Center for Seniors in Steinfeld Dwelling organisation



Map edited by author. Source base map: (Schitich, 2007)

The building has mostly dwellings for single person households, with a few dwellings for 2 people that is slightly larger. The dwellings themselves are rather simple. When you enter you have a small closet on one side and the bathroom on the other side. Past the bathroom there is the living/ sleeping room. This room only has a bed and a table and some cabinets for storing items. On the other end is the window side, with a door that can open completely. The windows can be covered by wooden parts that slide in and out of the facade.

2.4 De Akropolis Zeeburgereiland, Amsterdam

notographer: Peter Cuy

on for people aged over 55 and who area around it. The building has 100 people living there, ranging from the ages 55 until 92. Half of When it comes to the organisation that there is an organisation set up by the inhabitants of the building and membership is mandatory.

Despite the building being finalized in 2017. The plans for this living community started in 2004. This meant that most of the first inhabitants knew each

Elderly housing Case study by Ricardo Kemp

Construction period: 2017 - 2018 Client: De Alliantie, Lingotto Architect: studioninedots Landschapsarchitect: Ground area: Built area: 10.872 m² Number of dwellings: 82 housing units **Communal functions:** Collective spaces, parking space, green roofs, community center Service/care functions: General practitioner in house Special offers: The building is a community with a mandatory membership to the organisation, to ensure social interaction between the residents

The Akropolis in Amsterdam is other already long before the a 14 story high building located building even started. The building the Zeeburgereiland in as different groups, that organize Amsterdam. The building is meant activities like cycling or cooking. Throughout the building there originated from Amsterdam or the are several public areas where the inhabitants can come together.

the 82 dwellings are social rent of the building, each dwelling is houses and the other half is meant centred around a circulation core. for people with middle income. On top of that the social rent and This means that for both types free market apartments are mixed, there is a income limit. On top of so there is no separation between social and economic classes that might be there.

Literature

Akropolistoren. (2019, May). Het verhaal van de akropoistoren. Coöperatieve Vereniging Bewoners Akropolistoren, Amsterdam. Witter, Y. (2020, January). Samen Oud 10 inspirerende woonzorgvoorbeelden. Aedes, The Hague.

De Akropolis

Ground floor functions & Dwellings/circulation (floor 1-14)









oround noor

Map edited by author. Source base map: https://www.dearchitect.nl/projecten/akropolisde-generaal-op-zeeburgereiland-studioninedots



The ground floor is partially for dwellings, but also partially for the shared living room, that also has a small kitchen. The other part of the ground floor is used by a doctor. This building uses the core as the main circulation area. This means that all the dwellings are centred around this circulation core. As we move higher, we can also see that the floors get smaller. This is to make room for rooftop terraces on several levels throughout the building.









On this page are several of the different dwellings. Some dwellings spear mirrored, but apart from that these are all the dwelling types. They differ in size and some are meant for social housing. However the setup is rather similar for most dwellings. The rooms that do not necessarily require daylight are located near to the circulation core. Parts like the kitchen, bathrooms and storage areas. The other parts like living room and bedroom are all rooms on the outside with access to daylight. On top of that almost 10000 all dwellings have access to a balcony. Also some dwellings have multiple bedrooms, but not all. The same goes for an extra bathroom or toilet.

Sleeping area Bathroom Living area

Storage



2.5 Case study conclusions

2.5.1. Dwelling function analyses 1:200

55 YEARS OR OLDER

55 YEARS OR OLDER

62 M 2





DE AKROPOLIS AMSTERDAM

The most used dwelling type in the building consists of 2 bedrooms, a living room, separate bathroom and toilet, ample storage and includes a balcony for private outside space.





LESS ACTIVE ELDERLY



3600



OCMW NEVELE

A much smaller dwelling with sleeping and living areas, but no kitchen. The living area can open up towards the communal hallway. LESS ACTIVE ELDERLY

Sleeping area Bathroom

Living area

Storage



CENTRE FOR SENIORS IN STEINFELD

The single person dwelling for this building consists only of a bedroom with some living room functions, but most living will take place in the rest of the building.



2.5.2. Public vs private areas of the building (Not to scale because of the large difference in size and the lack of visibility of some projects when shown in the same scale)

55 YEARS OR OLDER





DE MAKROON AMSTERDAM

The second floor and higher of the Makroon. With the exception of the ground floor with public functions and the first floor with care facilities, each floor is arranged in this way, with private dwellings on the edges and collective transport space in the middle.

DE AKROPOLIS AMSTERDAM

The second floor of the Akropolis. This building has some collective spaces on the ground floor, but all other levels are like this, a collective core that is used by all the inhabitants, surrounded by the private dwellings.



LESS ACTIVE ELDERLY



OCMW NEVELE

The first floor of OCMW Nevele, this floor is mostly public and collective. With the exception of the sleeping area of the dwelling, almost everything is semi private to collective. Including the living area.

Private
semi private
Collective
Public

LESS ACTIVE ELDERLY

CENTER FOR SENIORS IN STEINFELD

The first and second floor of the senior center in Steinfeld has private dwellings, with no windows and just door towards the collective space. Apart from the dwellings, everything else is shared space, including the atrium in the middle.


2. Case studies



LESS ACTIVE ELDERLY

CENTER FOR SENIORS IN STEINFELD

The ground floor of the building is mainly used for public functions, like a social space/dining space, but also a library and a chapel that are used by the whole village. The ground floor is freely accessible by the residents of the town, only the first and second floor are mainly for the residents.





55 YEARS OR OLDER



2.5.3. Ground floor functions of the building

(Not to scale because of the large difference in

size and the lack of visibility of some projects

when shown in the same scale)

55 YEARS OR OLDER

DE AKROPOLIS AMSTERDAM

The ground floor of the Akropolis has some dwellings, but is mostly the living room of the building, a shared social space that can be used by all inhabitants of the building, which also has a kitchen. On top of that there is a doctor on the ground floor. There are no commercial functions here.

DE MAKROON AMSTERDAM

The ground floor of the Makroon is partially for dwellings, however there are also other functions like a gym or a dance studio, but most functions are not exclusive to the residents of the building, but more public.





ELDERLY

OCMW NEVELE

The ground floor of the building is mostly used for dwellings, but there are also care facilities and social spaces that are also used for dining, since the dwellings themselves don't have kitchens.

2.5 Case study conclusions

From the case studies we can learn several things. First of all and this does not come as a surprise, but the dwellings meant for retired elderly is much smaller than the dwellings for the people between 55-68 years old. Together with this we can also see that this reduction in personal space can be seen again in the amount of communal areas. Both the Center for elderly in Steinfeld and OCMW Nevele have much more communal areas throughout the building, whereas both buildings in Amsterdam only have few communal spaces, barely nothing compared to the other buildings.

A similarity between all buildings, suited for both 55 year olds and retired residents, is that the ground floor has a more public function. However the target groups differ. The Makroon in Amsterdam for instance has much more spaces focused on the general public, like a gym and a hairdresser whereas the functions for Nevele are purely for the residents and in Steinfeld we can see that the functions serve both the residents of the building and the residents of the town it is situated in.

Circulation in all buildings is also very similar. Most buildings, with the exception of Nevele, which does have part of the building the same way, have a corridor or other form of centralized circulation. De Makroon has a very recognisable corridor, The Akropolis has shorter corridor and Steinfeld has an atrium with circulation around it.

Another aspect of analyses was the aspect of care. As suspected the buildings focused on 55 year olds had less care facilities, but nonetheless they were there. Nevele and Steinfeld however, had much more care facilities.

When looking more in depth into the dwellings we can also conclude certain things. When the population gets older the functions get minimal. The focus is mainly on just having a place to sleep and a place to live, sometimes these are not even separated as is the case with Steinfeld. However we can see certain similarities. De Makroon for instance has sliding doors between the living room and the bedroom. Even though the dwellings are much larger in the Makroon, this is similar to the sliding doors separating the living and sleeping area of Nevele. Coming back to the differences however, we can see that the care units don't have kitchens anymore and that these units have very little space for storage.

Therefore a combination will be used for my design, larger rooms with storage, but also larger communal area's to allow for social interaction between the residents.

3. Research Conclusions

The purpose of the research was to find out how and to answer the main question: 'What are the functional needs of a building suitable for residents above the age of 55, whether they are healthy or physically impaired and considering that they come from different social and economic backgrounds?'

To be able to answer the research question, I investigated the housing history of elderly in the Netherlands. The most striking part of the history research was the change of the elderly being the poorest part of society from the 12th century until the second world war, towards the wealthiest part of society. This was due to financial aid from the government, but also aspects like buying a house, which became worth more money over time. On top of that care for the elderly has changed as well. Where we first used to build a lot of retirement homes, we now have laws in place that limit the amount of elderly that can get 24 hour help in a retirement home.

Using the history as a starting point, my research continued towards the modern elderly person. In this phase, I investigated what the average elderly look like and what needs they have. Some conclusions to gather from my research are as follows:

-The amount of time spent on physical activity like sports decreases with age. However that number is rising since a couple of years, meaning that the elderly get more active.

-Currently, more than half of the population above 55 lives in a multi story row house and a large part of the group between 55 and 64 lives in dwellings larger than 120 m2.

-If we look at the housing needs, we can see that the preferred dwelling consists of only one level, with enough outdoor space.

-The need for moving to housing specifically designed for elderly grows significantly between the ages of 55 and 75. However, the largest part of this group cannot move to a suitable place at the time they want to, because there is a lack of elderly housing and if the older person is still deemed to healthy, this person is not allowed to move into a retirement home.

-Another striking aspect that came forward in this research, was the importance of daylight in an elderly home. When people get older, daylight becomes much more important for the health and rhythm of the elderly and it can also improve their sleep cycle.

As part of my research, a questionnaire was sent around as well. Looking at the results from this

questionnaire, some key aspects of elderly living were found. One of these aspects was that the vounger part of the 55+ age group lived in larger houses in which they would install a stair lift as their first age adapting change. This indicates that apartments without stairs are more suitable for this age group and that people above 55 are already thinking about mobility. Furthermore, storage space was something that most people felt they lacked in their current homes. no matter their age. Therefore, it is important to design enough storage space in the dwellings of my own project.

The last part of this research included a visit to Knarrenhof, two hofjes for elderly in Zwolle which include social rent houses and houses for sale. One of the more striking aspects here was the use of upper floors. The large empty surface on a level that elderly have trouble reaching because of their decreasing mobility, felt quite useless. The best use of this floor was to use it as storage space, which does not seem a very functional use of the space. Another aspect that is interesting to consider in our own designs, is to create lower ceilings in elderly homes.

With all this collected information, it is now possible to answer the main research question: 'What are the functional needs of a building suitable for residents above the

age of 55, whether they are healthy or physically impaired and considering that they come from different social and economic backgrounds?'

One functional need that all groups/people in the questionnaire considered, was the ability of easy mobility in their dwelling. This might be a single floor dwelling, or the use of a stair lift to move from floor to floor. Furthermore ample storage is something all the groups really appreciate.

The research also showed how elderly do not have easy access to constant care anymore. The group of elderly that does not yet qualify for specifically designed care housing, still need some care. Therefore, a building that allows for care between the residents might be a workable solution and can be seen as one of the functional needs of such a building. The Knarrenhof residents stated this several times. If you need help, there is always someone around who can help you. Therefore, designing a building which includes different age groups, some more mobile and active than others, might be a way to ensure that there is always someone around who is able to provide care. Probably the most important functional need for the not retired population is to prevent the designed dwelling to appear as a typical elderly home, since that makes this group feel old, which is

perceived as a negative aspect.

One thing that also stood out from both the visit to Knarrenhof and the case study analyses was the use of communal spaces. In the shape of a large courtyard for Knarrenhof and De Makroon and an atrium for the Center for seniors in Steinfeld. This communal space encourages social interaction and might also aid in the overall communal feeling of a building. On top of that, my grandmother mentioned that she would have enjoyed more interaction in the hallway. So a communal aspect is certainly something that will be considered for my own design.

Another functional need that was found in this research, was the need for adaptive elements so that the dwelling can adapt to the increasing age of the residents. It might for instance be interesting to include an extra room in the dwellings. This room could than in a future setting be used as a permanent residence for a nurse to care for the residents. For the people who could not afford a larger dwelling that has an extra room but need help, care units could be included to facilitate the same kind of care, without the need to move to another building.

From my participant observation with my grandmother I also found out that enough space in a dwelling is greatly appreciated,

especially when the older person becomes less mobile. This allows for easy movement with a walker in the dwelling. Aspects like wider doors and no thresholds add to the improved movement through the dwelling as well.

Since most of the changes come with age. The main dwellings will be designed with the 55 plus population in mind, but with a flexibility that allows for changes in the future, like already making sure that bathroom can accommodate wheelchairs and that the bed placement can change if necessary. Since there are differences in wealth for the elderly as well, a combination of smaller, more affordable dwellings and larger dwellings with multiple rooms. This way people from different financial backgrounds can live in the same building. To make sure that the residents of the more affordable dwellings can have grandchildren or other relatives that stay the night, shared lodging rooms will be included on each floor. This way everyone in the building can have relatives over that might not live close by.

Therefore the building that I will design will be a building where everyone above the age of 55 can live. Whether they are healthy or have difficulties with movement and whether they are still working or retired.

4. Urban Master Plan

With the group we were tasked to create a master plan for the pier in the Merwehaven in Rotterdam. To do so we first analysed four different former harbour areas that were transformed into residential areas. These were the Mullerpier, Lloydpier and Kop van Zuid, all in Rotterdam and Borneo Sporenburg in Amsterdam. Based on these case studies we made several conclusions to take with us and to formulate our own concept and starting points. These were then implemented on the pier and what followed was a master plan for a residential area with a green route throughout the plan. In the following couple of pages, the Master plan is summarized, using the maps and slides from the presentation and the location that was chosen as the design location is marked after this section.

Master plan Concept and starting points

Developing a dynamic work-living area for the people of Rotterdam with respect to the identity of the harbour

Concept 3 starting points



1. Preservation of the harbour identity

2. Implementing a strong spatial structure 3. Create a strong programmatic structure with surrounding areas



1. Preservation of the harbour identity

Respect the industrial character and preserve the characteristical elements.

Preserve the rich variety of buildings, quays, tracks, and constructions in Merwehaven. These image defin objects form the basis of the identity of the area and contribute to value development.
A green heritage route is proposed that follows three key points in the masterplan where the monuments an

2. Implementing a strong spatial structure

n with the s Creating good and safe connections over water and land at all levels and for all modes of transport.
In order to connect the harbour with the city, strong physical and functional connections will be made to the





 Creating high plinths that define the image of the street with a mix of commercial, cultural, and social facilities Realizing an open innovation environment w mix of companies in different growth phases. ment with a varied n to the green heritage route, building block along the quay provide space for greenery an



Master plan **Current situation**



What to keep



Building lines

Master plan The break





Direction of sightliness from the main street





Typologies



Master plan Sun



Plinth functions



5. Design This chapter will show my design for a building for elderly in the Merwehaven in Rotterdam.

I will first show the user group and their needs and that will be followed by the design principles and the design itself.

In general the design will be shown from a large scale towards a smaller scale.

Impression of the building from across the street

ORE

5.1 Main user groups

55-67 YEARS OLD

Most likely still working Possibly moved out children that want to visit Singles: or Couples: 23-24% Single 76-77% (2018) 25-30% Single 70-75% (2047) (CBS, 2018) More active with hobbies and sport In general healthy, both physical and mental, but still a possibility of either being not healthy

Based on my research, the large user group of people above the age of 55. I can divide this group into two main groups. 55-67 or the working part of this population group and the group above the age of 68 or the retired part of this population group.

These groups in turn can be divided into single person households and

More home Possibly grandchildren that want to visit Singles: or **Couples:** 25-40% 60-75% 68-80 (2018) >40% <60% 80+ (2047) (CBS, 2018) More likely to require help: 20% at start of retirement to almost 80% at 85+ has trouble with mobility (Schoemaker, Van der Wilk, van Wieren et al, 2011, p. 28)

68 + YEARS OLD

Retired

couples. These groups will however change over time. As we can see, especially the retired group will have an increasing number of single person households. This group will also have increasing number of people that need help with daily activities, particularly above the age of 85.

5.2 Requirements



55 years old as starting point

couples that have children, on average get them at the age of 30 and the average age of moving out is 24, the target group at 55. The average children that live at home any more.

Possibility for care

As was evident from my research, Since mobility and health might decrease over time and I want to create a place where the new residents can stay as long as they want, it is important I choose to have the starting point of that in this building they can have the care that they need. Therefore I want age that the residents don't have to have several care units, the residents can move into if they can no longer live on their own.







Places for interaction

Because of the increasing number of A lot of elderly have either children single person households in the elderly or grandchildren. Often they want to population group, it is important to make sure they don't become lonely. Therefore there needs to be space Therefore I want to make sure that there are a lot of places for interaction bedroom or rooms in the building that in and around the building.

Visiting (grand) children

visit their parents or grandparents. for that. Either in the form of a spare can be used by all the residents.

Adaptability

Because of the decrease of mobility with age, there is an increasing need for adaptability. This might be something small as installing stand up aids in the bathroom, but it might also mean that the location of the bedroom needs to change, because that will make it easier to get in and becomes more an more important. out of bed.

Easy movement

In addition to adaptability, movement through the building is also very important. This means that the dwellings need space to move between furniture. Especially when mobility gets less and the residents might rely on aids as a walker or even a wheelchair, this

5.3 Location on urban plan



My building plot is located on the another side is facing the park, the third centre of the pier in the Merwehaven in Rotterdam, just underneath the park with the 2 existing buildings. To the North-East is the parking hub. This allows most of the healthy residents to use the parking hub to park their cars, since it is just across the park.

The building also has 4 different sides. On one side is the water of the harbour.

side is facing the street and the fourth side is facing another building.

The location also has an advantage that only one side has a street where cars can drive, making it a more peaceful place than buildings on the other side of the pier.





5.4 Mass concept

The building shape derives from the plot shape. According to the master plan the part near the park is higher than the other parts. This variation in heights is used for roof terraces and balconies. The plinth differs from the upper levels to show a difference in functions, public vs dwellings. To give a different feel to the lower part of the building, the plinth is slightly set back, creating a walkway for pedestrians.



Parking solutions and entry points

92



almost a 100 meters. Because of this, I wanted to split the building up into two parts, a higher and a lower part. To emphasis this, the facade also has two different appearances, both in brick. The higher part responds to the existing building with a red brick and the other contrasts that with a yellow brick.

As explained before, the parking hub facilitates most of the parking. However, since the target group is elderly, mobility might decrease. Therefore, there are still parking spaces. Since most of the ground floor is also public space, there are access points all around the dwelling, but the main entrance space is between the high and low part of the building.

Vertical circulation



The building has 4 vertical circulation points. The large part between the high and low part is the main entrance, which also has two elevators, besides stairs.





There are 2 atria in the building. These atria also provide the circulation. That means that the main circulation is in the middle of each building wing. The exception is the middle part, which has a corridor as circulation type, which also connects the two atria to each other.

5.6 Dwelling types



The ground floor is mostly public space. Except for the core, which mainly is parking and storage spaces. The circulation spaces, mainly the atria, are semi private parts, since these can be accessed and used by all the residents of the building.

Roof terraces

Outside there are also semiprivate spaces in the form of roof terraces. These are located on several different levels, the first floor, the fourth floor and the fifth floor. These can be used by all the residents and form communal outside spaces.



The building has several different types of dwellings. The most common dwelling type is the studio, a small 47 m2 dwelling. The largest is a 96 m2 dwelling. Most of the other dwellings are a variation of the largest dwelling. The ground floor is completely free of dwellings. All dwellings are on the first floor all the way up to the sixth floor.





Area 1:500



Ground floor 1:400

There are no dwellings on the ground floor. Either it is used as commercial spaces, or as parking and storage spaces for the residents.



First floor 1:400

The first floor mainly consist of dwellings, but also the gardens of the atria. With higher vegetation in the lower part, the left atrium on the floor plan and lower vegetation in the higher part, the right atrium on the floor plan.



Second floor 1:400

This floor mostly has dwellings and is similar to the first floor, apart from the garden, which is now visible on the floor below.



Third floor 1:400

This floor is slightly different in that the first set backs are visible now. This is on the lower part of the building, the left side on the floor plan. This creates balconies for the dwellings on either the street side or the harbour side.`



Fourth floor 1:400

This level has a larger set back. Here this setback creates the large roof terrace. This is also the floor with the care units, that are located across from the roof terrace.



Fifth floor 1:400

From this floor onwards, dwellings are only in the higher part of the building. There is another roof terrace, but most of the roof is used for solar panels.



Sixth floor 1:400

Apart from not having a roof terrace on this floor, the organisation is the same as the fifth floor.



Section A 1:300

A section through the lower part of the building. The ground floor is a large open rentable space. On the first floor, the atrium garden is visible with dwellings on both sides.





Section B 1:300

A section through the middle part of the building. Instead of an atrium, this part of the building has a corridor as circulation part. On the ground floor the parking garage is visible.



Section C 1:300

A section through the highest part. Here the dwelling orientation has turned 90 degrees. Here we see the interior facades and the balustrades of the atrium. On the ground floor we can see a large rentable space again.



5.8 Dwellings

On the next pages I will explain the various dwellings in my project. All dwellings use a bay width of 5.4 meters, either a dwelling is in one bay width or two. The depth of the dwelling varies from 7.2 meters to 9.6 meters.

Firstly I will highlight two dwelling types and explain the ways that they can change over time to adapt to the changing needs of the residents. After that I will show the remaining dwellings, as well as the lodging room, a room the residents can reserve if they have people visiting over that may require to stay the night. These rooms are for every resident. This ensures that it does not matter in which dwelling you live, whether it is big or small, you can still have people stay over, like your children or grandchildren.

he lower

mpression of the atrium in t

Dwelling type B resident



5. Design

The most common unit in the building is the Studio. To show the adaptability over time, I will show an example of a resident, a divorced man from Rotterdam. This is just an example to show the use of the dwelling, of course it could be another person above the age of 55. He comes to live here at the age of 55 and when he first came, he is in perfect health and still working at his job. In addition he has a son who visits occasionally, but since the studio dwelling does not have a spare bedroom, the son stays in one of the lodging rooms.

The man lives on the first floor, he uses the parking hub that is across the street to park his car and he enters the building through the main entrance and, since he is still in perfect physical shape, he takes the stairs to go to his home.



In front of his home



When he enters the first floor, he is greeted by the gardens that are located on this floor in the atria. When he walks to his front door he meets his neighbour and he starts a conversation.

In this way, the atria form a sort of extra public space, but only for the residents. When it is raining outside, they can still enjoy the garden and meet the other residents. The windows connected to the atria also make sure that there is a connection between the dwellings and the atrium.





Dwelling type B Floor plan 1:100

the care units on the fourth floor, the smallest dwelling. Since the dwelling is meant for older people who don't have children living at home any more, this dwelling is suitable for both the growing number of single elderly as well as couples. The dwelling only has the wet core in the middle as fixed part, apart from that everything is flexible in the dwelling. If the resident decides to change the living room position, they can do that. The windows on both side of the dwelling also allow for this.

The studio dwelling is, apart from

Dwelling type B (47 m2) are marked in Red Number of dwellings: 42





Floor plan Dwelling type B at 55 years old

Floor plan Dwelling type B at 65 years old



In the starting position for the man, he uses the part that is located towards the outside facade as a large bedroom area. The part near the atrium is used as a combination of the living and dining area. The wide hallway next to the bathroom is now used for large wardrobes or other storage items.



After about ten years he decides to change the layout slightly. So he installs a curtain in the area near the atrium and moves his bedroom towards that part as well and moved the living room towards the part facing the outside to get a little bit more privacy during the day.

Floor plan Dwelling type B at 75 years old

Floor plan Dwelling type B at 85 years old



At 75 the movement becomes slightly worse, therefore several stand up aids are installed in the bathroom and the bed is changed to a special bed that allows for easy access. Because of the flexibility of the dwelling, the loss of mobility does not mean that the man has to move to another building.



At age 85 the resident can't take care of himself any more and he needs 24 hour per day help. Therefore he can no longer live in the studio dwelling. However because there are care units in the building, he can move to one of those. This means that he can keep living in the building, near to people he knows.



Impression outside of the care unit, in the atrium 🕇

Impression inside of the care unit



Dwelling type A residents



5. Design

The largest dwelling in the building also forms the base for most of the other dwellings. This dwelling is mainly meant for wealthier residents who come from large homes that do not necessarily want to downsize just yet.

In this example we look at a couple that has 2 children that have moved out. In this case they keep living in their dwelling the whole time, but of course they could also downsize to for instance the studio dwelling.

Just as with the studio dwelling, the residents park the car in the parking hub and enter the building through the main entrance. Afterwards they take the stairs to the third floor to enter their dwelling.



In front of their dwelling



Most dwellings are located next to one of the two atria. This allows for light in the dwellings from both the inside facade as well as the outside facade, but also allows for possibilities for interaction between the residents.



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Inside their dwelling



Dwelling type A Floor plan 1:100



On the left is the base floor plan visible. There is a slight change for the dwelling on the park side, but it only changes the access points towards the different rooms as well as the balcony location. But the basis is the same. The main feature is the large living room which spans the whole depth of the dwelling, with a large kitchen in the middle. The other part of the dwelling has 3 bedrooms/ office rooms. There is a separate toilet and bathroom and a storage area. The two bedrooms can be combined into a larger rooms if necessary.

The Large dwellings (94 m2) are marked in Red Number of dwellings: 16


Floor plan Dwelling type A at 55 years old



The base dwelling as shown on the previous page. The office space can be used by one of the still working residents and the bedroom can be used by one of the visiting children.



Not much has changed at 65, but there are stand up aids installed in the bathroom. The bedroom is now used by the new grandchild of the couple.

Floor plan Dwelling type A at 65 years old

Floor plan Dwelling type A at 75 years old

Floor plan Dwelling type A at 85 years old



Most of the dwelling has stayed the same. Even though mobility has declined, the dwelling is still perfectly usable. The grandchildren don't sleep over anymore, so the couple decided to combine the 2 smaller rooms and create a large hobby room.



The two residents are now 85 and need care 24 hours a day. Since they are wealthy and have extra space, they decide to keep living in the dwelling and transform the hobby room into a nursing room so they can have the care they need in their own dwelling.

Dwelling Type C 1:100



This dwelling is a smaller version of the Dwelling type A. The living room is shorter and there is one less bedroom/ office space. The master bedroom is still large enough for wheel chair use, as is the bathroom. Dwelling type C (70 m2) are marked in Red Number of dwellings: 12



Dwelling Type D 1:100



This dwelling is a slightly smaller version of the dwelling type C. The marked in Red Number of only difference is that instead of a external balcony, this dwelling has a logia as a balcony.

Dwelling type D (65 m2) are dwellings: 12



Dwelling type E (Care unit) 1:100

Atrium

This dwelling was already shortly explained. But is a care unit, that does not have a kitchen, only a bed, bathroom and a seating area. Activities as dining are shared with the other residents of the care units.

Dwelling type E (25 m2) are marked in Red Number of dwellings: 11





+6

+5

+4

+3

+2

+1

A

Dwelling around stairway 1:100



An exception is the Dwelling around the stairway. The dwelling is an altered version of type C. with the main exception is the smaller living room.

The Medium dwelling around a staircase (60 m2) is marked in Red Number of dwellings: 1







To make sure that every resident can The Lodging room is have family over, that can also stay the night, there are lodging rooms on each floor. These are smaller rooms, that have a bed, desk area, a small seating area and a private bathroom. The idea of this lodging room is that if for instance a son comes to visit his parents, he can still have some privacy or do something in the evening, when his parents want to go to bed. That way he is not a burden to his parents.

marked in Red Number of rooms: 8









North Eastern elevation 1:350





North Western elevation 1:350



South Eastern elevation 1:350



Facade zoomed in 1:100





Light brick in Flemish bond

The lower part of the building uses an uneven yellow brick in a Flemish bond. This is to contrast the darker red brick in chain bond that is used for the higher part on the park side.



Markisolette sunscreens

To shade most of the building, markisolettes are used. This is a combination of regular sliding shades and fold out shades, giving the residents the possibility to just close it a little bit, but also always have a view outside, even when it is completely closed.



Wood textured concrete

The ground floor construction is made out of concrete. To hint at the wood construction of the rest of the building however, a wood texture is used. This hint however is subtle.







172

waterkerende laag

Air cavitiy closure

Lintel

Fill Markisolette Detail C 1:10

Detail D 1:10



Detail E 1:10





CLT floor is placed on CLT walls

Facade assembly





Prefab wood skeleton facade element is placed on the upper floor



Noise insulation and the floor finishes are placed



The gaps in between the wood skeleton elements are insulated and a final layer of insulation is placed on the outside



The facade is finished with a brick layer and the markisolette shading system is placed



Climate and sustainability concept



3 Floorheating 6 solar panels for 9 Prefab wood skelleton wall panels with a brick finish

CLT construction



Prefab wood skeleton facade elements



The main construction of the building Thirdly, it is much lighter in the end is made from CLT (Cross Laminated Timber). The Ground floor is the only exception, with a construction of steel and concrete, because of flooding risks.

in CLT. The first reason is a reduction in CO2, when compared to other traditional building materials like can be exposed wood and create a concrete and steel.

Secondly, wood is a renewable source. Trees can grow again. Other materials like concrete do the opposite they exhaust the earth.

than concrete. This means that it is easier to export and therefore the emissions during export are also lower.

There are several reasons for building Fourthly, the wood can be partly exposed after finishing the building. This means that one wall or ceiling nice natural feeling in the dwelling.

means is that the panels can be made based on the location of the building. before hand in a factory. This ensures a quicker building time.

By using the same element for most of the building, this also makes installation a lot easier and quicker. There is less chance of error.

The non bearing wall, mainly the The facade is finished with bricks. facade walls, are made from Prefab These are installed afterwards, but this wood skeleton elements. What this is mainly done for aesthetic reasons,

Image source: https://www.hrb.be/wat-is-clt/

Image source: https://www.frieslandprefab.nl/pages/houtskeletbouw

Ventilation Type C

Heat pump



To heat up the dwellings, heat pumps Each dwelling has a heat pump that are used. In the building two different uses the mechanical ventilation air types of heat pumps are used. Firstly a general heat pump is used. This heat together are used to heat up the floor pump uses the water from the harbour to heat up. This is however not enough for the dwellings, therefore another individual heat pump is used.

to heat up. These two heat pumps heating system and the additional warm water in the dwellings.



The ventilation is done with a natural input of ventilation through grilles installed above the French balcony doors. The air is exhausted mechanically and the air is used for the heat pump.

Natural ventilation in

Image source: https://warmtepomp-weetjes.nl/soorten/ventilatielucht-warmtepomp/

Fire safety

Fire compartments



The building is compartmentalised into 3 parts, in addition there are 4 stairways, allowing for each dwelling to have 2 escape routes within 30 meters. Either by entering another compartment or an emergency staircase.

Solar panels



In addition to that, the atrium is equipped with glass smoke curtains hanging down, to allow slow the smoke down and making sure that not all the smoke goes up at once.

covered in solar panels. To maximise covered in sedum. the coverage on the roofs, an east to west orientation is used, as is visible in the image above. The power generated by the solar panels is used to power the heat pumps and the electricity used in the dwellings.

To power the building, most of the To tackle the urban heat island effect, roofs that don't have a roof terrace is the spaces between the solar panels is

Image source: https://www.zonnepanelen.net/oost-west-zonnepanelen/



Construction





The ground floor of the building is mainly made out of concrete beams and columns. The exception is the area below the large roof terrace, this is made out of steel, to increase the span in the parking garage. The floors above, visible in image 2 and 3 are made from CLT. Both the floors and the walls are made from CLT.

Terrace load bearing elements Steel column and beam construction

with hollow core concrete slabs

Overall load bearing elements Concrete columns and beams with hollow core concrete slabs

Upper floors

Dwelling load bearing elements

CLT panels and CLT floors with a main bay width of 5400

Atrium load bearing elements

Glulam columns and CLT floors



7200

9600

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Introduction

An essential part of the graduation project at the faculty of Architecture at the Technical University Delft. However, research at most graduation tracks at the faculty of architecture and the built environment might be slightly different if you compare it to other faculties. Here the research is not the final product that is delivered, but in my opinion more a starting point of the project and a guiding element that I use to design the project that will be presented at the end of the graduation track. The research that is done in the studio also has different elements. It does not merely consist of reading books and articles and only using the data collected to answer a research question. It consists of much more. Therefore in this reflection, I will look at the different types of research conducted during my graduation track.

The main body of my reflection will look at the first aspect that is stated in the graduation manual: The relationship between research and design. During this graduation track, I had to hand in several products that had to do with research. Firstly there was group research on the location of the design project in Rotterdam. On top of that research was done into different population groups. At the same time, we all had to individually write a research plan that defined the research we wanted to conduct on our own into the different user groups. This research plan formed the foundation of the preliminary research booklet that was handed in at the same time as my P2 presentation and I finalised this part right after the P3. However, the research was not over after this point, but the research I did here was done in a less structured way, during the final design stages when certain aspects were not yet fully designed. These final parts of my research are therefore not included in the research booklet, but part of the larger design booklet.

The focus of my research can also be split into two phases. The first phase focussed mainly on the project location and the potential user group, with a small part dedicated to the design. The first phase can be seen as the traditional research of the studio. The parts that are included in the research booklet, of which the preliminary version was handed in during the P2 and the final version was handed in during the P3. The second phase focussed mainly on the design. It did still look at user groups, but the main body of this research was dedicated to the design aspect of the studio. The second phase can be seen as the time from the P2 until P4, with a small overlap with phase 1 just after the P2. If I look at the types of research given by Jack Breen in his article in the book *Ways to Study and Research,* the way I researched falls into descriptive research and explorative research. With the first phase being mainly descriptive research with a large focus on literature and the second phase mainly being explorative. (Breen, 2002). The reflection on the relationship will be done shortly on each

step in the process and will end with a general part on the overall relationship between research and design in my project.

In total the graduation manual has 5 aspects that need to be answered in my reflection. The part above describes how I will answer the first aspect. My reflection will end with the four other aspects, as defined in the Graduation Manual Master of Science Architecture, Urbanism & Building Sciences:

Aspect 2

The relationship between your graduation (project) topic, the studio topic (if applicable), your master track (A, U,BT, LA,MBE), and your master programme (MSc AUBS).

Aspect 3

Elaboration on the research method and approach chosen by the student in relation to the graduation studio methodical line of inquiry, reflecting thereby upon the scientific relevance of the work.

Aspect 4

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

Aspect 5

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

The research process

As discussed in the introduction, during the graduation studio track there were several evaluation moments. Firstly there is the P1, at the end of the first quarter. Secondly, there is the P2 at the halfway point which also serves as a go/no-go moment, determining whether the student can continue. Thirdly, the P3 which looks at the general progress made towards the fourth moment, the final go/no-go moment, the P4, at which stage I will also hand in my reflection. These evaluation moments also were moments in which my research needed to be handed in. Therefore the beginning of this reflection will look at the research done in chronological order and after that, the specific research methods that are discussed will be further elaborated, on their importance, but also why these specific methods were used.

Ρ1

<u>Groupwork</u>

Until the P1, the research was mainly done collectively, with the whole group of the graduation studio Advanced Housing Design. The main topic of this graduation studio was modern households. According to the course guide, this topic came from the plan of the government to build 1 million homes by 2030, of which 54.000 homes are to be realised in Rotterdam (Kupers & Van der Putt, 2020).

The question at the core of the studio is: 'How do we provide suitable, affordable housing for a diverse population?' To answer that question we need to know who the people are who inhabit - or want to inhabit - our cities. Who are the modern households? What do they aspire to? Where do they live now and more pertinent to us: where and how do they WANT to live?

To answer this question as a group, we divided the research into three scales. A national scale, Rotterdam and finally the project location, the Merwevierhavens. The main aspects of the research of each scale were the current population, the growth of that population and in which population groups changes occurred. For each specific scale, there were specific aspects that were also researched.

For the national scale, this was mainly where these populations, growths and changes occurred.

For the Rotterdam scale, this meant more specific elements, like profession, ethnicity and migration, but also housing types and distribution between the

housing types. On top of this, each group member also analysed specific neighbourhoods in Rotterdam and looked at several aspects on a neighbourhood level. These aspects were: Density, the number of rental houses, the average value of the houses and the makeup of the households. Additionally, the main housing types were displayed and additional residential information.

Finally the Merwevierhaven scale. This part of the research mainly focussed on the history of the area and how it started as a harbour, but gradually started to lose its harbour function as the main harbours of Rotterdam moved towards the North sea.

The research we did for this part was mainly done with literature research and looking into statistics. Of course, a part of this was also an analysis of certain areas.

The group research was not only researching the population on several scales. Another task for the group was to make an urban master plan for the project location. To get started with this, the group researched four former harbour areas, three located in Rotterdam and one in Amsterdam, visible in image 1. This research was mainly an analysis of the projects and summarising the projects into several guidelines. These guidelines were in turn used to create our masterplan.

Borneo sporenburg, Amsterdam Kop van Zuid, Rotterdam





Lloydpier, Rotterdam



Image 1: The four analysed harbours

If I look critically at both parts of the group research, I can say that the second part, the urban masterplan part, was done in a more complete and useful way. The first part turned out as a huge document with a lot of data, but none of the dates was very conclusive. However, what we managed to do was create several findings that could serve as a starting point for our individual research. So if we could start over, we might get more precise in the way we conducted the first research and make it smaller, but more precise instead of very large.

<u>Individual</u>

Before the P1, I also started with an individual research plan for my own research. This research plan was a useful starting point for the individual research. Despite the name, research plan, it still required research to write this plan. This was mainly literature research into a population group. For me, this was the elderly part of the population. For the research plan, I also made a diagram. Throughout the graduation project this of course changed slightly, but it was a useful tool in the beginning. This diagram is visible in image 2. This research was later elaborated in the research booklet and will therefore be discussed in the next part, P2.

Research Diagram



Image 2: Research plan diagram

P2

My personal research, which was conducted according to my research plan, can be categorised into several different methods.

Literature research

A large part of my earlier research was conducted with literature research. The main idea behind this was to gather general information from books, articles and news articles. One of the reasons for this was to create a historical context for my own project. I was interested to find out how the Netherlands had dealt with the elderly in the past. By finding this out through literature research, I could put the current problem, a lack of elderly housing into a historical context and a starting point for my research into the elderly population of the Netherlands. This historical research was mainly conducted by reading books and searching articles on the internet that described the buildings, people and living conditions of former elderly housing concepts. Another source was books that analysed the buildings and architectural changes of former elderly homes.

The next part of my research was looking into statistics of the current elderly population. This was also mainly done through literature research and in addition using statistical research into this, for instance, CBS sources or statistics written down by other researchers.

Plan analyses

Since this research is part of an architectural graduation studio, plan analysis is an important aspect. Therefore I tried to find several architectural projects that would fit my user group. My project focussed on the population above and including the age of 55, I wanted to find projects that served that specific group and as my earlier research pointed out, there are differences in this group. Therefore I wanted to look at projects that specifically focus on people above and including the age of 55, but also on projects that look at retired people that need care. For this, I found four projects, two located in the Netherlands, one in Belgium and one in Austria, visible in image 3.

To analyse these projects in a way that would allow me to compare these projects and their findings, I needed to analyse them on similar topics. This included aspects as the location, public and private functions, additional functions on top of the housing, the dwelling arrangement and dwelling types. An example of the comparison made between the projects is visible in image 4. These aspects were later compared to each other and this information was used as well for the kickstart.



OCMW Nevele Graaf van Hoornestraat 26, Nevele, Belgium





Center for Seniors in Steinfeld 10. Oktober-Straße 30, 9754 Steinfeld, Carinthia, Austria De Akropolis Zooburgereiland Amsterdan



Image 3: The four analysed projects



Image 4: An example of the comparative analyses

This type of research might be the most useful type to use for architecture. Especially when the buildings are well documented. Since we are designing buildings, there is no better way than to look at previous buildings that have already been functioning. This was also an important part of the studio.

<u>Kickstart</u>

My kickstart exercise was the start of my design, but also served as a good first connection between my research and my design. The kickstart did not ask the students to design a building from scratch, but rather use the aforementioned case study projects and place them on the chosen plot. A result of this plotting was a better understanding of the size of the plot and also make you understand how large the dwellings in these projects are. Part of the kickstart experiments can be seen in image 5.

This type of research and design can be characterised as research through design, with the term design being used loosely. This is mainly because the whole exercise was creating options with several buildings, comparing those options and eventually deciding which option to use going forward. This exercise was also one of the reasons why I choose to have an atrium in my building. Since the case study projects I selected had different circulation types, including an atrium I could easily see and determine what would work and what wouldn't work. If this type of research was not mandatory at the beginning of the studio, this realisation might have come much later, perhaps even too late and as such impairing my design process.

For this reason, I see this also as a very important research part of this studio, but it does not stand on its own, it is more like a continuation of the plan analyses part of the research.





FINAL VERSION

Image 5: Kickstart example

Observational research

The final part of the research that was conducted during the P2 phase was observational research. This was done in three ways during my research.

The first way was mainly to get an understanding of the user group, so I decided to send out a small questionnaire to people that I knew that fit the description of the user group, above the age of 55. This questionnaire was mainly about their current house, their housing history and aspects they liked and disliked about their current home. The intention was to get real-life responses and not merely see numbers and figures from statistical research. For this reason, this part was only shortly summarised in the research booklet, since its findings were not groundbreaking and in the end not that useful for the research purposes. They were useful for me and served as a starting point, to get a better understanding of the user group in a general way.

My second type of observational research was conducted with two other students. The three of us travelled to Zwolle to look at a project called Knarrenhof, a project set up by first forming a community before building the homes. I first had it as one of my projects for the plan analyses, but I realised it was not that interesting for that purpose, architecturally it was not that special,

however, the people living there and the origin of the project was much more interesting and that is why I, together with the two other students, decided to investigate the project in person. We questioned residents and asked for their opinion, but we also looked at the different housing types. The combination of social housing and regular housing was interesting, but it still felt a little bit divided.

The visitation gave a great insight into elderly housing and also how they used the houses. So what I have learned is, that talking and observing people gives much more information in a much shorter time. Therefore, when it comes to user group research this is a more time-efficient way, but it also brings the research into the real world. The literature research is really useful, but it is still numbers and tables on paper. Observational research like this gives a much more realistic idea of the user group. It becomes tangible.

The third and final way in which I did observational research was also the purest form of observational research. The premise was that I would observe my 85year-old grandmother, who recently moved into a new home, specifically designed for the elderly. It is located next to a retirement home, but it is still independent living. This observation was mostly uneventful, but it did however give a good look into an average day of an elderly citizen in the Netherlands. In hindsight, this was more important to me than I first thought and what I wrote down in my research report. The initial idea of doing more of these types of observations did not make it, mostly because I deemed this type of research too time consuming, since you first spend a whole day observing and afterwards you spend quite some time evaluating your observations. On top of that, the coronavirus made it difficult to do this. However, if the circumstances were different, it might have been an interesting experiment to do multiple observations of different age groups that fit into the user groups of my project and compare them with each other.

This type of research falls into the same category as the questionnaire. It was not that interesting as the visit to Knarrenhof to write a lot about, but it was, however, quite interesting to see how an older woman lives her life from day to day, course I had spent longer times with my grandmother alone on other occasions, but never a full day with nobody else around.

Conclusion of P2 research

During the most intensive research part of the project, the first half-year, I employed several techniques for research. Some were compulsory and part of the studio, some were specifically thought of by myself and fitting with the research plan that I wrote. Several ways of researching were more useful than others. This was especially clear during the P1 phase since the research into the 1 million homes problem and the user groups was very general. It did give a good

starting point for my personal user group choice, but that was probably the most I have used of that research. What turned out to be a very useful tool, especially for the design, was the analysis. Whether it was entire urban projects to develop our urban masterplan or housing projects that would serve as a starting point for my personal design, it was all very useful. The observational research also turned out to be a very important aspect of my research. It gave great insights into the user groups, which would be almost impossible to get from just looking at numbers and statistics on the user groups.

The research described here was part of the preliminary research booklet. This research was extended afterwards and the final version was handed in right after the P3. However, for readability, I decided to include most of those additions already in this chapter since it was mostly to complete several research methods. However, most research conducted after this was mainly for research and not documented in the same way as the research booklet, but instrumental for the final design choices. This will be discussed in the next chapter, which looks at the P3 and P4 phases as one phase.

P3 and P4

The research I conducted during this phase of the project differs a lot from the research done before but is very suitable for architecture in my opinion. The first part, described in chapters P1 and P2, mainly consisted of observing. Observation in the form of reading literature or literal observation of people or analysing existing buildings. The second part, which I will describe in this part, still consists of observing, in the form of looking at precedents as inspiration for my design. A large portion of the research for this second part was through experimentation. This experimentation was done in different ways and an important note to make here is, that not every experiment was done intentionally. Most of the time it consisted of trying different things for a certain building element and comparing them to each other.

A big difference in the two parts, the part before and after the P2, was that the first part had a written plan, the research plan and the second part was more intuitive. Research certain parts when you needed information.

This part can be divided into several different methods. One of the first methods used was model making as a form of experimentation to define the mass of the building. Research as a form of research. This was the bulk of the experimentation done during this portion and was often fuelled by precedent research.

Model making

The main product that was delivered by the P2 was the research. Of course, there was also a design, but that was still in the concept phase, the research was the important part. This meant that after the P2 the main concept for the building was there, but the building mass was mainly derived from the plan analyses done during the P1 phase. The floorplans were mainly derived from the plan analyses done on the four projects mentioned in the previous chapter.

To further define the mass of the building I made a small mass study. I already made decisions on the distribution of the floor levels, but there were still decisions to be made about the plinth and the sizes of the roof terraces. Therefore I made an overview of different versions of different floorplans and made different options by stacking them on top of each other, this can be seen in image 6. Despite this being a sketch model that was not very neat, it still worked well enough for me to draw conclusions and make decisions on the different models. This resulted in a shape that was used from now on. Of course, this was not the final shape I will use for my P4 presentation, but it was a starting point for me.

Model making experimentation



Image 6: An overview of the model layers and 2 examples of complete models

This way of experimenting was a great way for me to continue the design. The reason for this is that it was a quick and easy way to look at the impact of certain decisions. Much quicker than experimenting by drawing or 3D modelling on the computer. Something I never realised before is that with other design assignments in the past, whether in the bachelor or master, the design process went a lot smoother when I started with making small models to determine a mass early on. This was also the case for this project. Having a shape early on that is still open for changes, makes it much easier to work on the rest of the aspects of the design.

Research as design

At this point, I only have a shape and a starting point for the floor plans. The use of the building is mostly defined by the research done before the P2 since that was mostly about the user groups. But a building consists of so much more.

By trying out different versions of each aspect every time, I, as a designer, am constantly analysing the impact those decisions have. Often this analysing is done intuitively. This means that again, the research is done spontaneously. If I encounter a problem that needs a solutions I make several options and see which one fits my concept best.

Precedent research

A large part of the research consists of analysing precedents. This has already been discussed in the previous chapters. In those cases, the precedent research was mainly done in a structured way. I wanted to find something out, so I set up a few aspects I wanted to analyse and in the end, I compared the projects based on those aspects. However, in the latter stages of the design, precedents were still analysed, but differently.

As an example, my project has an atrium. (There are several reasons for that, only they are not outlined in this reflection.) Having an idea of an atrium is not the final solution. To determine what I wanted for my atrium I started to look at precedents. For example the Natalstraat in The Hague by Geurst & Schulze, but also Hotel Jakarta in Amsterdam by SeARCH to name a few. Different types of atria, with different material choices, are used for different purposes. By applying certain elements and testing in my own digital 3D model I could make assumptions on what would work in my case for my target group.

This type of experimenting with different aspects and different types of precedents was an important part of the design process and therefore an important part of the entire project. While it may not be as structured as the

plan analyses done in the earlier stages of the project, it was still instrumental for the design. Therefore I see this type of experiment as an important type of research for a design project.

The relationship between research and design

If I want to look at the relationship between research and design in a general sense, I first need to understand what research is.

According to the Cambridge Dictionary (n.d.), research is defined as follows:

" to study a subject in detail, especially in order to

discover new information or reach a new understanding"

When looking at the previously described research methods that I applied during my project, I can conclude that all the aspects belong to research for me. The plan analysis was to get a better understanding of either an urban plan or an existing project. The historical research about housing for the elderly in the Netherlands in the past was to get a better understanding of how we got to the current situation. Most of my research however falls into the second category, reaching a new or better understanding of something. If I look closely at what I researched, I don't think I made groundbreaking discoveries. It did, however, make me understand it better.

If I look at scientific research, it is often used to prove a hypothesis. However, in architecture, it is different, especially in the way the graduation program is structured. Since the end of the research does not necessarily end in a conclusion, but rather in a design, the research is set up differently. Despite that, the structured research part still consisted of a problem statement, several questions, chapters that tried to answer those questions and a conclusion, but this conclusion. This mainly consisted of suggestions for the building that I was going to design. Because the real purpose of my research is to find information and ideas for a design. This means finding out who your user group is, what special needs they might have and most importantly, what has already been built for them. All these aspects come back in the research I performed, as described in the previous chapters.

If I look at research as it is used in the structure of the graduation program it can be seen as a supportive element. Research is still an important aspect, not the final product. It is used as a tool to design. The research is used to justify certain decisions I make as a design and it can be used as the backbone of the design.

So in conclusion, there is a relation between research and design. However, they are not mutually dependent on each other. While design often needs research to justify itself, research does not necessarily need design as it is defined here.

Of course, I designed my research by writing a research plan, but it is a different kind of design.

The relationship can be different, however. Since our whole program is carefully structured in a way that we first research and hand it in when we just started designing, it feels like the research is done. However, looking back at the whole process, I kept on researching, but not in a way as it is defined by the chair of architecture. If the structured research also included different design aspects and was to be handed in at the same time as the design project, I think they would improve each other, feel more like two aspects that belong to each other and support each other more until the end. Instead, it feels like two separate aspects that will be graded separately and with a different weight for my final grade.

The four remaining aspects

Aspect 2

The relationship between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS).

The studio topic focussed on two aspects. First the housing shortage in the Netherlands and second the modern households. My graduation topic touched on both of those studio topics. First of all, as our collective studio group research showed, on which my personal research elaborated, part of the housing shortage is caused by a lack of suitable housing for the elderly, causing them to remain in large houses, that better suit families with children. Secondly, the way we treat housing for the modern elderly has changed. No longer do we put the elderly in retirement homes, but we try to keep them home for as long as possible. My graduation project tried to tackle those issues, by creating first of all elderly housing, but also a place where they could remain, a place they do not have to leave again when they need help with daily activities.

Aspect 3

Elaboration on research method and approach chosen by the student in relation to the graduation studio methodical line of inquiry, reflecting thereby upon the scientific relevance of the work.

As mentioned in the part discussing the first aspect, a few of the research methods were chosen because they were part of the studio program. Several others, like the few types of observation I have performed during my research, were chosen by me because they seemed fitting for my topic. However, the way they were conducted was not necessarily scientific in the way that most of the observations were not planned out. The literature portion of the research is probably the most scientific, as well as the case study analyses since for both of those types of research there was a plan and there were thought-out aspects written down beforehand and the research followed those points.
Aspect 4

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

The first portion of my research focussed on the way elderly housing was organised in the Netherlands in the past. The purpose of this research was to create a context for my own project, to place it as a continuation of those previous housing types. My project is not the final solution however, it is one of many ways in which we can provide housing for the elderly. If I look at it on a larger scale I do think that projects such as this one are very important, since the number of elderly will continue to grow over the next couple of decades, something I do not think we are prepared for in the Netherlands if we look at the current state of housing for the elderly.

Aspect 5

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

During this graduation project, I encountered several ethical dilemmas and issues. First of all, my focus was on elderly people. This group of people, in general, is weaker and due to the corona pandemic, there was a greater risk of possibly endangering their health, therefore I had to consider what types of research I wanted to do, that dealt with personal contact. Another issue was with characterising the population group. It was sometimes very easy for me to generalise the group, this was an issue I had to deal with several times during the research phase of the project. If I look at the applicability of the project in practice I do think that it is a new way of looking at the elderly. My project on its own might not necessarily be applicable in practice, but the concept of a home for the elderly that is close to the place they lived, in this case, Rotterdam, might be something that can actually be realised, however mainly in larger cities, since the group size that would want to move into such a place might be too small for smaller villages in the Netherlands.

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Images

Image 1: Rene de Witt, ANP, Top010, LPM Image 2: Made by author Image 3: Architekten Cie., Filip Dujardin, Peter Ott, Peter Cuypers Image 4: Made by author Image 5: Made by author Image 6: Made by author



7. Literature

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