

An architectural rendering of a modern courtyard. On the left is a multi-story brick building with white balconies. In the center is a green lawn with a large pink flowering tree and a white flowering bush. A man in a suit sits on a metal bench reading a newspaper, with a dog beside him. A man in a grey jacket walks away on the right. A tall black lamp post stands in the foreground. The sky is blue with light clouds.

# It's never too late for a new beginning

A living environment for the Young-Old



# **It's never too late for a new beginning**

A living environment for the Young-Old

**Name** Sebastiaan Nieuwenhuizen

**Student number** 4396405

**Graduation studio** Dutch housing

**1<sup>st</sup> mentor** Theo Kupers

**2<sup>nd</sup> mentor** Pierijn van der Putt

**3<sup>rd</sup> mentor** Ferry Adema

**Delegate** Monique Arkesteijn

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This book is the result of my graduation at the faculty of Architecture and the Built Environment of the Delft University of Technology. The project is done in the studio Dutch Housing within the track of Architecture. The graduation revolved around a research-based design of a residential building in the soon to be transformed harbour area in Rotterdam. The main theme of the studio is the housing shortage in the Netherlands and how this can be solved in an inclusive way. Therefore the overarching research question of the studio is how to house larger groups of people within a dense urban environment, where all different kinds of residents should be able to find an optimal living environment.

## ***Preface***

After more than a year investigating into this question this book is my final result. It was in many ways a special year. Not only because it was the first time that a project lasted an entire year, which made it possible to dive deeper in the research and design than with other projects. But also because of the COVID-19 pandemic. Everything was shut down. This meant that the tutoring went via Zoom, we barely had contact between the fellow graduates and that most regular ways of having fun and a bit of distraction were taken away. Because of this I spend most of my time behind my laptop at home, which could be frustrating at times. The tutoring sessions each week were a nice alternation. Which among other things made that it remained fun and interesting to work on the project. For this, all the good guidance and just the fun conversations I would like to thank my tutors. Pierijn, Theo and Ferry, it was a delight to have you as my mentors. Last but not least I want to thank my friends and family for their support. There was always someone who was willing to discuss with me about the project or just listened to me talking about it. This helped me a lot to keep the facts straight and to find new ideas.

*Topic Research*





## Introduction

***“If we were to evict people from their home tonight and offer them a home tomorrow that better meets their needs, a much better distribution of the housing stock would be achieved than now.”***

This is a statement by Springco, an organization specialised on urban analytics after they did research into the living preferences in the province Zuid-Holland. They claim that not only housing shortage is an issue, but also a lot of people do not live in a dwelling which has their preference. Springco states that when households cannot move on to their preferred home, the housing market becomes congested. This is currently a problem in the Netherlands and the empty nester plays a crucial role in this process. Empty nesters are, briefly stated, people with an age between 55 and 75 from whom the children have left the house. According to Springco they inhabit approximately 100.000 terraced houses in the suburbs of the province of Zuid Holland. By seducing them to move to more 'suitable' dwellings Springco states that not only the empty nester will benefit, but also a bigger supply of desired terraced houses will become available for new families. This seems as a perfect solution, because it means that by building more compact dwellings bigger houses families will become available. It also immediately raises the question if these empty nesters want to move out and what their preferred living environment is.

By doing further research into the empty nester, I found out that they belong to a larger relatively new group of active elderly also called Young-Old. In this part of the report I will focus on this group. The first part will give an overview of some important trends of the twentieth century in the world that enabled the emergence of the Young-Old. This is concluded with a characterisation of

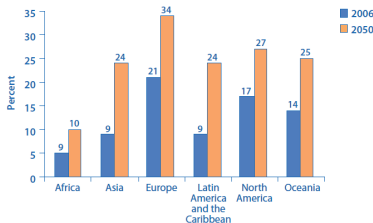
this group and their preferred type of social collectiveness. The second part gives an overview of the policy and goals of the government addressing the living environment for the Young-Old. In the third part an overview is given of the different household types belonging to the Young-Old and their preferences towards moving to a new dwelling. In the fourth part a couple of existing projects for the Young-Old are analysed. The final part concludes the research by offering a couple design tools based on the findings in the other parts.

## Population aging

To understand where the relatively new demographic group of active elderly or Young-Old comes from, it is important to give a contextual background on two major components: one is the demographic process of population ageing; the other is the social, political and economic process of the institutionalisation of retirement. After this contextual background information follows a characterization of this new demographic group.

The world is rapidly ageing: the number of people aged 60 and over as a proportion of the global population will double from 11% in 2006 to 22% by 2050. By then, there will be more older people than children (aged 0-14 years) in the population for the first time in history. According to United Nations Population Fund (2007), "less developed countries are ageing at a much faster rate than developed countries: within five decades, just over 80% of the world's older people will be living in less developed countries compared with 60% in 2005. The older population is growing far more rapidly, in 2007 expanding by 2.6 percent per year, than the population as a whole, at 1.1 percent."

Figure 1. Percent distribution of world population 60 or over by region, 2006 and 2050



*Above*  
Percent distribution of world population 60 or over by region, 2006 and 2050

At the same time our cities are growing rapidly and more elders are living in cities as well. The proportion of the older adult population residing in cities in developed countries matches that of younger age groups at about 80%, and will rise at the same pace. In less developed countries, however, the share of older people in urban communities will multiply 16 times from about 56 million in 1998 to over 908 million in 2050. By that time, older people will comprise one fourth of the total urban population in less developed countries.

Population aging has been described by demographers as the result of two of humanities greatest victories increased longevity, or a victory over death and disease; and reduced birth rates, or a victory over unwanted childbearing."The overall decline in human mortality rates, for example, which had taken place within a relatively short period of time has led, in historical terms, to a sudden, unprecedented extension of human life-expectancy, corresponding roughly to a doubling of human life expectancy within the period of a century.

## **Retirement**

The institution of retirement has a relatively recent history. It was firstly introduced in 1889 and would change the lifestyle for elderly immense, as the labour force participation rates for males 65 years or older plunged from approximately 80% to 25% in the U.S. for example. This change is often attributed to the introduction of state pensions, but it is also a result of other factors.

Germany became the first nation in the world to introduce the state pension in 1889 when Chancellor Otto von Bismarck established the Old age and Disability Insurance Bill. It would offer pensions to workers over 70 years, an age limit that would later be reduced to

65 years. This became the standard age for retirement internationally. There were many countries that followed the work done by Germany for state supported pension, such as: Denmark (1891), New Zealand (1898), France (1905), Australia (1908), United Kingdom (1909) and Sweden (1913). In the Netherlands pensions were provided by some of the larger employers. It lasted until 1947 before the state pensions were introduced. In the first 10 years these were only for people that didn't have sufficient income. In 1956 the current AOW policy, which provides state pensions to everybody, is introduced .

In the United States the institutionalisation of retirement occurred in 1935. American economic historian Dora Costa introduces the triumph of the institution of retirement not as a condition specific to the United States but as one tied to the same tendencies as those present in other parts of the now 'developed world.' She argues that the similarities in the declining labour force participation rates for men 65 and over between the United States, Britain, France and Germany since the late nineteenth century "...suggest that an analysis of the factors that fostered high retirement rates in the United States can explain, not just the rise of American retirement, but also that of European. As a result of the argument of Costa and of the fact that the United States emerged as the site for the first experiments in the build environment for the third age, the emphasize in this part will be placed on the introduction of retirement in the united states.

The intentions of the US social security Act was not only to provide a safety net for those 65 and over who were not able to work anymore, but it was also intended to open up places for younger workers by shifting older workers out of the workforce. Older workers were supposedly less able to keep up with the

rapidly modernizing industrial economy and it would reduce the massive unemployment caused by the great depression. This tendency to push out older workers for younger workers was already happening before the social security act. At the same time, retirement was becoming feasible for more people financially as general income levels were rising and private pension plans became more common.

Historians of retirement and sociologists point out that retirement was not always viewed as desirable and it remained an unpopular institution. Retirement was commonly perceived socially as an embarrassing phase of uselessness, marked by a corresponding drop in an individual's self-esteem. In order to challenge exclusion and negative attitudes a sociological theory was developed that had the role of supporting the relevance of retirement and secondly the parties with an interest in retirement started to promote it through positive images of retirement in the popular media. The negative attitudes towards retirement were diagnosed as an absence of ideas about what to do with oneself. The cure proposed was a national effort to teach people, starting at age fifty, to enjoy leisure. This corresponded to the widespread production of propaganda focused upon glamorizing retirement. This propaganda transformed the meaning of retirement. It was now a form of leisure, a way of spending time following the conclusion of one's work life. It was a stage of existence, inevitable but to be welcomed and even celebrated. Once largely a device for maximizing productivity in a bureaucratizing society, retirement was transformed into a lifestyle.

This new positive meaning necessitated a new sociological conception of old age. Where the previous standard of 'Activity Theory' viewed retirement as "a violation of the organism's constant need for a high level of interaction. The disengagement theory con-

ceptualized ageing as 'an inevitable mutual withdrawal or disengagement, resulting in decreased interaction between the aging person and others in the social system he belongs to.' Retirement, defined as 'permission to disengage,' allowed the old to preserve self-esteem while lowering activity levels. Release from the world of work prevented embarrassment caused by awareness amongst colleagues of diminishing faculties.

In the time span of a couple decades the image of retirement was changed from an embarrassing phase of obsolescence to a lifestyle of leisure. This period is referred by Costa as 'The Rise of the Leisured Class.' Where in 1941 and 1951 only 3 percent stated that they retired because they preferred leisure to work.... By 1963 the figure was 17 percent and by 1982 48 percent. While Costa attributes one of the key reasons for the success of the lifestyle of retirement to increases in average income with which to enjoy retirement, an additional key factor has been a fundamental development in forms of leisure. The technical developments in the twentieth century such as the radio, television, VCR, CD and DVD players have been critical in lowering the cost of entertainment. Besides this there has also been a large increase in the supply of public recreational facilities, such as parks, swimming pools, and golf courses. It is important to stress that these developments coincided with the process of retirement popularisation.

### *Conclusion*

Retirement becomes a period in which leisure takes the central place in one's life over from work.

## Characterisation of the Third age

The third age or Young-old has been developed as a category to distinguish between two different types of older people that emerged after the second world war. The first type is the traditional notion of old age, someone who is ill and depended, and the second type, the Young Old, is the new group of elderly that are healthy and independent. This new group of active elderly or Young Old originates at the intersection of the two tendencies described in the previous two sections: the demographic ageing of the population and the changing perception of retirement. These differentiation of multiple types of elderly were theorized by the American gerontologist Bernice Neugarten in 1974, who coined the Young Old, and by social historian Peter Laslett, who developed the theory of the third age.

According to Neugarten the Young-Old are comparable with the middle-aged. Middle-aged are distinct from adults as their children have left home. The distinction between the middle-aged and the Young-Old is that the Young-Old have retired. Importance lies on the fact that Neugarten, with the introduction of the Young-Old and Old-Old, intended to challenge the everywhere accepted set of stereotypes of older people as sick, poor and isolated. At the risk of over simplification, the Young-Old come from the group composed of those who are approximately 55 to 75, as distinguished from the Old-Old who are 75 and over. More importantly than a distinction in age is the description of the Young Old. They are individuals who possess attributes including: spare time, the possibility to contribute to their community in social and political terms, a relatively good health status, a higher level of education than those previously in their age group and high purchasing power. The Young-Old are according to Neugarten the users of leisure time.



**Above**

*The old-old, someone who is ill and depended*

*The young-old, someone who is healthy and independent*

Laslett acknowledged the theory of Neugarten. He states that the Third Age is an outcome of a shift in the developed world in the middle of the twentieth century, as the three traditional life phases: childhood, adulthood and old-age are succeeded by a four-phase scheme in which old age is divided in the Young-Old (the Third Age) and the Old-Old (the Fourth Age.) Laslett describes the different life phases as follows: First comes an era of dependence, socialization, immaturity and education; second an era of independence, maturity and responsibility, of earning and of saving; third an era of personal fulfilment; and fourth an era of final dependence, decrepitude and death. Laslett argument for the emergence of the four-phase life schema is the earlier discussed shift in age composition and life expectancy that took place in the end of the nineteenth century, reaching a critical point in the 1950s. The lives of people in the developed world now last not far short of twice as long as the lives of their predecessors did in 1900 and at all times before that. The amount of people aged above 65 have risen some three times between 1900 and 1950. Laslett states that the Third age only exist in developed countries with both aging population and excellent economic conditions. An aging population is needed so that the third age will play a substantial role in society. Excellent economic conditions are needed to make it possible to provide for fairly comfortable living standards in the Third Age for critical mass of persons.

Laslett points out three key features of this demographic shift that are central to first developments for the Third Age. Firstly, the impact on one single generation who saw this shift taking place within their lifetime; secondly, the inevitable consequence of this shift challenging traditional conceptions of age and ageing in a very short period of time; and thirdly, as a result of the first two, the historical development of the Third Age as a 'new social entity'. It is important to put emphasis



on the lack of role models for this new group. The lack extends beyond role models for individuals, there were also no role models for social collectiveness and most importantly there was a lack of precedents for architectural and urban environments.

According to Swiss sociologist Francois Höpflinger different generations will grow old in different ways. This will have a major impact on their lifestyle and thus also in the way they want to live. Höpflinger illustrates this statement by addressing the difference between the baby boom generation, born in the 1950s, and the swing generation, born in the 1930s. In general, the baby boomers encountered a less difficult childhood, and culturally, their youth and young-adulthood was shaped by globalised youth-culture and the rapid dissolution of traditional cultural values regarding sexuality, marriage, founding a family and divorce. The baby boomers benefited from higher levels of education and therefore have been more equipped to react to rapid social and technological change. Höpflinger argues that these factors contribute to the state of the more recent generation when arriving at retirement, which is more active, innovative and open to learning, compared to generation before.

Linked to this difference is the broad societal process of individualisation. German sociologists Ulrich Beck and Elisabeth Beck-Gernsheim define individualisation in terms of the social transformations taking place in the developed world in recent decades in which traditional dominant social institutions, like the family, the household, class and neighbourhood, have become increasingly subordinated to individual choice and freedom, supporting a more differentiated and pluralistic society. In the case of the Third Age, the liberation of the individual from these structures is exaggerated by the fact that there were no clear role models or pre-existing

*Below*

*The new group of active, innovative and open elders*

institutional structures addressing the Third Age in the first place.

*Conclusion*

The theories of Neugarten and Laslett describe a person belonging to the Young-Old/Third-Age as a healthy retiree from the developed world between the ages of approximately 55 and 75, who is likely to be either married, or single. It is a new phase in life without any precedent prior to the middle of the twentieth century. The person is no longer tied to the responsibilities of adulthood, but free to actively enjoy leisure on a permanent bases. The theories of Höpflinger and the Becks suggest that every generation that reaches this phase of life will have it's own different lifestyle. The current generation that is reaching this phase is more active, innovative and open to learning, compared to generation before and it values independence, freedom and individual choice more than ever.



## Third age social Collectiveness

The emergence of the Young-Old/Third Age as a new phase in life is closely linked to the transformation in forms of social collectiveness in life's later years. These transformations occur in social networks, social interaction and in household family units. This will effect the way how they live and therefore the way we need to design living environments for these people.

The first major social transition, when someone from the second age enters the third age, is that people shift from a life of work to a life of retirement. This means socially that social networks outside of the family tend to shift from work-focused to leisure-centred interactions. For many people this represents a radical break that could cause considerable psychological disturbance, if someone's social network is largely constructed around work relations. Instead of hierarchical collective structures associated with work environments more peer- and interest-based collaborations will be formed. At the core of these kind of collaborations are clubs, volunteer associations, courses or hobby classes situated. Höpflinger states that for the reason that the Young-Old are more active, innovative and open to learning also social activities that previously were considered the preserve of young adults are increasingly defined as central fundamentals of growing old successfully. These activities include sports, sexuality, education, etcetera.

The second major social transition has to do with the composition of household family units. This transformation may be framed in the developed world as a shift of people aged 65 or over to move away from multigenerational households towards smaller households consisting of married couples or individuals living alone. The Canadian social scientists Andrew Wister and Thomas Burch summarize four general theories

on why elderly are now living apart from the other generations: Firstly the rising income of elderly meant that they could finally live independent, which they always wanted. Secondly because of a lower fertility, people had less children or other family members that could take them in. Thirdly the increase in the supply of affordable and manageable single-person dwellings has provided the opportunity for separate living among the elderly. Finally changing values related to individualisation have transformed family norms and attitudes. The final reason for this shift has caused a debate whether the changing family norms and attitudes have forced elderly involuntary out of the three-generation family household or that elderly chose voluntary to live apart from the other generations. Wilster and Burch claim that the elderly chose this voluntary. They state that the experience during early adult years, such as the depression, or world wars, caused that today's elderly have a strong self-reliance, compared to the previous generations. Another reason for this increased independence is the real increase in income that took place in the twentieth century, as Costa states: 'Although retirees in the past would have preferred to lead lives independent of those of their children, they simply could not have afforded to do so.' In addition to general income rising the introduction of the state pensions gave elderly the possibility to live independent. The fact that the elderly are no longer living with their children doesn't mean that they don't have a good relationship with one another. Höpflinger states that 'intimacy at a distance' is the dominant model for cross-generational relations for the Third Age. This means that there are good and close relationships between generations, because each generations enjoys its own private sphere.

At the same time, developments in outpatient care, incorporating healthcare and additional services close to the homes have enabled elderly to live independent-



**Above**  
*The young-old engaging in  
 leisure activities*

ly in their own homes for longer periods. This tendency has been described as 'Ageing in Place'. American geographers Graham D. Rowles and Hege Ravidal have linked the importance of 'Ageing in Place' to "societal recognition of the role of ownership and attachment to place, and to the presumed need for the familiar, as adaptive features of aging. This idea is supported by statistics that present the dominant desire of elderly to stay in their same home in the same place. While Ageing in Place has been presented as both the default and the ideal housing option for those in the Third Age by a number of institutions and organizations, it does suggest a range of challenges according to Simpson. The most important of these challenges is the possibility to overromanticize the concept of place attachment. Especially in the current globalized society, where people move a lot more than a century ago. The average American for example moves his or her household 11.7 times in a lifetime, this defines a far more mobile subject than 100 years previously.

**Below**

*An active lifestyle is promoted  
by Rotterdam*

**Conclusion:**

In the third-age the centre of peoples social relations will shift from work-related to social related activities. The large majority of the third age will live independently, apart from their children and other relatives. Neugarten summarizes what this could mean for the wanted living environment by the Third age: 'The needs of the Young-Old in housing, location and transportation will be increasingly affected by the decisions they make with regard to the use of leisure time. The large majority will be living independently, apart from children and other relatives. This fact, combined with the desire to find interesting things to do, will lead them to seek environments which maximize options for meaningful pursuits. The extent to which age-segregated communities will increase depends, presumably, upon the extent to which the Young-Old will be provided opportunities for meaningful community participation in their present locations.'



## **Dutch government policy**

The Dutch government is in favour of the ideas of aging in place. They promote and stimulate the idea that elderly can grow old in their own neighbourhood. In the report 'Langer Thuis' the ministry of Health, Welfare and Sport states that the goal is that elderly people can grow old independently in their own familiar environment with a good quality of life. This intention revolves around improving three important preconditions that contribute to the quality of life: good support and care at home, support for caregivers and volunteers and a fitting living environment. The biggest part of this report revolves around elderly who are in need of care. Perhaps contrary to this popular perception of old-age, the proportion of elderly who live in institutions has been, and continues to be relatively low. This is recognized by the government as they clearly state: Most of the elderly are healthy and active: they get older and stay for a longer time healthy. Many of the current and future elderly are self-reliant. It isn't a problem for them to arrange the changes in their support, care or home themselves, even if they get a sickness or a limitation. For this reason their report focusses mainly on the non-self-reliant elderly, earlier described as the Old-Old or fourth age.

Nevertheless the report stresses a couple of important subjects for the active elderly/Young-Old/third age. First of all it states that people are less willing to move when they age. People need to consider moving in an earlier stage as their current living situation isn't suited for old age. A relatively large proportion of the elderly only move when they experience a health problem and their housing situation proves to be unsuitable. This isn't ideal because moving to another or even adapting your own house is time consuming. Therefore the government wants to make people aware that in the

future their living situation can become unsuitable and their house requirements can change when they grow older. By adapting the house or moving in time, much unnecessary inconvenience and possibly suffering can be prevented. Moreover, it reduces the chance of an emergency move, when living in the current house suddenly no longer works. Secondly it is also important to point out that some people who have lived in a, mostly rental, house for a long time cannot afford to move out, as their current rent is lower than what they need to pay if they move to a better suitable house. The government propose to offer compensations for these people to make them able to move. An example of such a compensation is the regulation 'Ouder worden & prettig wonen' of the municipality of Haarlem in collaboration with housing corporations Elan Wonen, Pré Wonen en Ymere. Tenants older than 65 from these corporations get priority above regular house hunters. Besides this they get a contribution to the moving costs of 1.000 euros and they keep their current net rental price for the new dwelling, except if the demanded rent of the new dwelling is lower than that of the old dwelling. Through this arrangement, the parties want to encourage their tenants to think earlier about their future and to take the first steps. If people do that in time, they have more choice. They are more likely to find a new home that better meets their housing needs.

#### *Conclusion:*

The Dutch government has three policies concerning the Young-Old. Firstly they want it to be possible that they can grow old in their own neighbourhood. Secondly they want to encourage them to move in time to a dwelling that is appropriate for the live in old age. Finally they support people financially who cannot afford to move to a better suitable dwelling.



## **WHO global age-friendly cities**

In the report of the Dutch government they do not mention what makes a living environment suitable for people to age in. The World Health Organisation (WHO), on the other hand, created in collaboration with 33 cities worldwide a guide with principles on how to make a city age-friendly. This guide is in line with the ideals of the Dutch government that people should be able to age in their own neighbourhood. The WHO stresses in their guide 'Global Age-friendly Cities' that for cities to be sustainable they need to provide the structures and services to support their residents wellbeing and productivity. Particularly older people require supportive and enabling living environments to compensate for physical and social changes associated with aging. So to promote the wellbeing and contributions of older urban residents it is necessary to make cities age-friendly. According to the WHO an age-friendly city is a city where policies, services, settings and structures support and enable people to actively age by: recognizing the wide range of capacities and resources among older people; anticipating and responding flexibly to ageing-related needs and preferences; respecting their decisions and lifestyle choices; protecting those who are most vulnerable; and promoting their inclusion in and contribution to all area of community life. These determinants have to be understood from a perspective that recognizes that older people are not a homogeneous group. So for each individual a different living environment can be required. Nevertheless the WHO has put together a checklist for an age-friendly city. The checklist of the WHO is meant to address the core age friendly features that can form the basics of an age friendly city. The topics that are addressed with the checklist are: Outdoor spaces and buildings, Transportation, Housing, Social Participation, Respect and social inclusion, Civic participation and employment, Communication and informa-

tion and Community support and health services. I will highlight a couple of core principals from this checklist that play an important role in the design of a residential building plus the direct surrounding public space.

#### *Outdoor spaces*

For outdoor spaces it is important that they are safe and accessible. This means that the pavements are also usable for wheelchairs, so a smooth, level surfaces and no obstructions. But it also means that there are enough benches or other seating areas for people to rest on their walk around the neighbourhood.

#### *Age-friendly buildings*

For buildings it is also important that they are accessible. Common features of age-friendly buildings are: elevators, escalators, ramps, wide doorways and passages, suitable stairs (not too high or steep) with railings, non-slip flooring, rest areas with comfortable seating, adequate signage, public toilets with handicap access. Next to these features also the location of buildings is important. For easy access towards facilities and services, the facilities and services should be located close to where people live.

#### *Housing*

The first importance of housing is its affordability. The cost of housing is a major influence where people are able to live and their quality of live. As stressed in the section about the Dutch regulations especially pensioners cannot move to a better suitable (often smaller) dwelling because they cannot afford to move. Secondly the design is of importance. Key factors in an age-friendly dwelling are: built from adequate materials and structurally sound; an elevator; appropriate bathroom and kitchen facilities; large enough to move around with a wheelchair; adequate storage space; and wide enough passages and doorways to accommodate

a wheelchair. Thirdly the ability to modify the dwellings also is of importance for older people to live comfortably for a longer time in their home. It is important that the modifications, like a chairlift, can fit in a house and that it is affordable for people to make these modifications. Fourthly it is of importance that people can live in 'familiar' surroundings. These are surroundings where people feel safe and are part of the local community. Good contact with neighbours is of importance to feel more safe and to reduce the sense of isolation. Furthermore a range of housing options in local areas to accommodate changing needs is regarded as an important age friendly feature. Finally it is important for older people to have sufficient space and privacy at home. They need to have the possibility to either join the public life with lots of social activities or just close your door and not join in.

#### *Social Participation*

In most cities, older people report that they participate actively in their communities but feel there could be more possibilities for participation. They suggest having more and varied activities closer to where they live. They would like activities that foster integration within the community and with other age groups and cultures. The biggest concerns are affordability and accessibility, especially for people with disabilities, and awareness of activities and events.

### **Municipal policy of Rotterdam**

The municipality of Rotterdam wants to bind certain promising target groups to the city. These target groups contribute to the economic and social growth of the city, because of their resilience, their productivity, their entrepreneurship and their purchasing power. One of these target groups is the Young-Old, defined by the

municipality of Rotterdam as 'herontdekkers': "People with an age of 55 or older, from whom the children left the house. They have according to their age and level of education a higher income. They are close to or already retired from their work and have for that reason more time for their hobbies and interests." This target group is of interest for Rotterdam because of their interest in culture, shops and dining establishments in the upper segment.

The greater goal of the municipality is to be an age-friendly city. They want to develop places in every neighbourhood where the elderly can live comfortably and can continue to participate actively. They acknowledge this need, which is initiated by the WHO, because life expectancy is rising sharply, according to predictions. In Rotterdam, the average life expectancy in 2017 is 79 years for men and 82 years for women. According to the forecast until 2035, this life expectancy will rise to 82 years for men and 85 years for women. In 2035, the number of Rotterdam residents aged 65 and older will increase by more than 30,000: from 97,000 to 129,000. They will soon form a fifth of the total Rotterdam population. For this reason the municipality has composed a masterplan on how to respond to the growing influence of elderly. In this masterplan they strive among other things to promote a healthy lifestyle for the young-old. Important themes are nutrition, exercise, utilizing the talents of the elderly and combating loneliness. The main idea is that prevention is better than cure. People in Rotterdam who work on their health at an early stage generally remain actively and actively involved in society for longer. When the elderly exercise and eat healthy food with others, it is also good for social contacts. Growth in the number of older people offers also opportunities at district level for example, because the elderly bring a lot of knowledge and experience and also have more time to actively devote themselves



to their neighbourhood.

In the masterplan a range of initiatives for the Young-Old are presented. I will highlight a couple of core initiatives. First of all the municipality wants to provide an adequate and accessible range of activities in the neighbourhood for the elderly and provide the opportunity for them to make use of these. It is important here to acknowledge that, as elderly become less mobile, their range for facilities decreases. Therefore it is important to make it possible that they can participate in the neighbourhood. This will not only stimulate social contact and prevent loneliness among elderly, but also uses the talents and experience of the elderly for the neighbourhood. Secondly the municipality sees a problem in the communal facilities in senior complexes. They are not always used well, there is sometimes a limited supply or a bad atmosphere. The goal here is to revitalize the residential communities in senior complexes for the benefit of social liveability and safety. The range of acti-

***Above***

*The young-old in a water aerobics class*

vities need to be as accessible as possible to the elderly in the neighbourhood, while keeping the safety in the complexes into account. The municipality also encourage the elderly from the complexes to make more use of other amenities and activities outside the residential complex. Thirdly the municipality tries to create equal opportunities for wealthy elderly and for elderly who can only make ends meet. They introduced free public transport for elderly and special discounts on the 'Rotterdam-pas' (a pass that gives free or discounted access to activities in Rotterdam). Finally the municipality wants to keep the knowledge and experience of retired people accessible for the society. They have for example introduced a buddy system 'Talent in Transition' in which older and younger civil servants work together to share their knowledge. Another example is the broadening of the FitFestivals, where an information market informs retirees how to use their possibilities or discover new talents in this new phase of life.

### *Conclusion*

The aim of the municipality is to bind the Young-Old to Rotterdam, because their interest in culture, shops and dining establishments in the upper segment. The Young-Old also bring a lot of knowledge and experience to the city and have more time to actively devote themselves to their neighbourhood. Besides this the goal of the municipality of Rotterdam is to be an age-friendly city. They want to provide an adequate and accessible range of activities in the neighbourhood for the elderly. These activities are located both as part of residential complexes and outside the complexes. They want to improve the participation of the elderly in the neighbourhoods. The municipality tries to create equal opportunities for wealthy elderly and for elderly who can only make ends meet.



## **Why would they choose to live in Rotterdam?**

In previous parts it is stated that the young old freed from their work related responsibilities can choose wherever they want to live. It is also stated that the municipality of Rotterdam wants to bind them to their city. So why would they chose to live in Rotterdam? Multiple investigations towards this question has been done commissioned by the municipality of Rotterdam. This part will give an overview of the findings.

The W&I group investigated it through interviews, observations, self-reports and focus groups. They found out that most of the Young-Old are content with Rotterdam, because there are a lot of possibilities in the city. There are a lot of amenities: pharmacy, shops, general practitioner, park, everything is nearby. The city centre is good connected with the suburbs. People have multiple options for shopping, for groceries for example you could go either to the market or to the other shops. The Young-Old are also satisfied with the variety of museums, cinemas, theaters and operas in Rotterdam. The Scapino Ballet, Conny Jansen Danst, het Boymans, de Kunsthal and the Schouwburg are qualitatively comparable to the best in the world. Furthermore the wide variety of restaurants and nightlife appeals to the Young-Old. Also the large amount of good health facilities in the city are important. In Rotterdam Health centres, hospitals and physiotherapists are close by. Another positive is the location of Rotterdam. It is close to other cities, such as The Hague, Antwerp, Amsterdam and Brussels. The city of Rotterdam is strongly associated with the harbour, ships, the river and the Erasmusbrug. The water has a great appeal to the Young-Old. They like to be around it, like to look over it and like to walk past it.







**Below**





*The river has an appeal to the Young-Old*





The W&I group also found some negative opinions towards Rotterdam from the point of the Young-Old. The city is built too full, so that the spatial quality has disappeared. The culture management is poor: there are cuts in cultural education, the distribution of money from the municipality between the cultural facilities are bad. The Erasmus University has no language studies. In the center, the squares offer more possibilities, such as cafes and placing trees, which are not there. The Schouwburgplein in particular has emerged as “a silly piece of architecture”. According to Young-Olds, there is no one sitting on the chairs and benches, it is far too slippery and uncomfortable. The dwellings in the Markthal and the Meent appeal to the Young-Old, but they are overpriced for the size of the apartments. They also believe that more attention should be paid to the city at eye level. They believe that Rotterdam’s plinth level is not very attractive. Not the tall buildings are important, but what happens at street level matters. Finally according to them, there are not enough good quality courses and interesting lectures for the higher educated senior.







Another research towards the reasons people want to live in Rotterdam has been done by Veldacademie. They investigated this question by a focus group in combination with a survey. Their main findings were that again the harbour has a great appeal to the Young-Old. Furthermore their respondents liked the diversity of cultures, social classes and ages in the city. The diversity provides liveliness and a wide range of shops, food and culture. Due to the diversity, there is a lot of choice in social contacts. That the diversity can also lead to tensions is according to some positive. In this way one stays in conversation, which ensures sharpness, creativity and liveliness. However, there could be more exchange between the cultures. The respondents appreciate daily spontaneous encounters in public space and in shops. Another positive is the fact that in Rotterdam everything is accessible by bike. They state that Rotterdam has the allure of a big city. But in comparison with cities such as Manchester, New York or London, Rotterdam has a pleasant size. Due to the compact scale, people are aware of everything. It is easier to maintain a social network: people spontaneously come across acquaintances in the public space and therefore also get together more easily. The final positive is that the city is in the lift. It is becoming more safe and there are always new things and places to discover. Veldacademie also found some negative opinions towards Rotterdam from the point of the Young-Old. The city shouldn't focus too much on young urban professionals, there should also be room for 'other' people. Another negative is that Rotterdam lacks a sufficient amount of green spaces and is limited in the amount of transportation options across the water.

Uncomplicated retiree	
	Low educational level
€	Below average income
	Appartment, terraced house
	< 90 m <sup>2</sup>
	> € 800 / month

Well-aged middleclass	
	Middle educational level
€	average income
	rental appartment, corner or terraced house
	90 - 135 m <sup>2</sup>
	middle expensive rental or owner-occupied

Elite class	
	High educational level
€	more than double over average income
	Penthouse, detached living, multiple storey appartment
	> 135 m <sup>2</sup>
	> € 700.000

Well-deserved appreciator	
	Middle to high educational level
€	average till double average income
	Corner or semi-detached house
	90 - 135 m <sup>2</sup>
	> € 800 / month middle and expensive sale

## Different groups of Young-Old in the Netherlands and their living preferences

Young-Old are as mentioned earlier in the report a relative new phenomenon. In the introduction it is also mentioned that this group is seen in the Netherlands as a solution for the problems on the housing market. Ideally they move from their terraced houses towards apartments so that the terraced houses will become available for young families. It is also stated that the Young-Old are a diverse group of people with different living preferences. The characterization of someone who belongs to the Young-Old is a healthy retiree or soon to be retiree from the developed world between the ages of approximately 55 and 75, who is likely to be either married, or widowed. This is could still be a very diverse person. This part gives an overview of research in the Netherlands towards the different groups of Young-Old, their living preferences and their preferred leisure activities. This deeper information into the target group is needed for a more fitted design of a residential complex for the Young-Old.

In a report by BPD an attempt has been made to get an overview of the different households in the Netherlands. They used the so-called Mosaic-system. Mosaic is a segmentation system that divides consumers into

*Above*  
Different household types

groups and types based on demographic, psychological and lifestyle characteristics that these consumers have in common. A link is made between household and neighbourhood characteristics. More than 15,000 respondents were asked about their living preferences, such as in what kind of neighbourhood would they want to live and what kind of house has their preference. The BPD report distinguishes 14 different target groups. However due to the topic of Young-Old in Rotterdam a description of the households without children with an age between 55 and 75, who prefer to live in an urban environment is given in the next paragraph.

The first group, the so-called uncomplicated retiree, usually lives in a single-floor rental apartment (social housing). This group consists of people with mostly a low educational level and are from mixed cultural backgrounds. They want to live close to essential amenities. Shopping for groceries is seen as a daily trip and a form of social contact. The second group, the so-called well-aged middleclass, usually lives in a terraced house and some tend to move to an apartment, because the maintenance of their house/garden is becoming too much for them. They prefer to live close to amenities and healthcare services. Their daily lives take place in the neighbourhood. They take life as it is and are satisfied with it. The third group, the so-called well-deserved appreciator, usually lives in a semidetached house or an apartment near the city centre. This group consists of people with an average to high educational level and financially they are doing well. These people have looked forward to their retirement and have the possibilities to enjoy this period. They are from a caring and concerning generation. They often go on a holiday. They prefer to live in an attractive urban living environment, because it fits their retired lifestyle. The fourth and last group, the so-called elite class, usually lives in detached houses, multi-storey apartments or

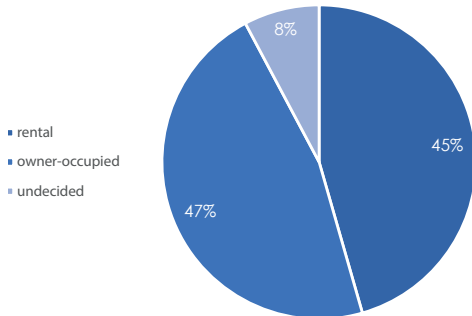
penthouses. This group has a lot of wealth which could already be for years in the family. They enjoy life and go regularly out for dinner, on a far holiday or to a classical concert. Their ideal living environment is hard to predict. They choose the most beautiful places in every residential environment. Culture is very important for this group. They attach relatively little value to other facilities. This is because they are used to living in neighbourhoods where everything is in order.

Next to the research of the BPD other organizations have done research towards the inclination to move of the Young-Old in the Netherlands. The research has been done on the basis of questionnaires, interviews and focus groups. They tried to determine how many people were willing to move out, what the reasons for the young-old are to move out and what the preferences are towards their new dwellings. The next paragraph will give an overview of the results of these researches.

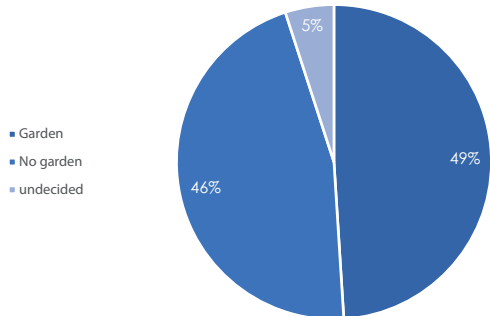
#### *Inclination to move*

By a national survey the CBS determined that 33% of the people aged 55 have an inclination to move, 56% doesn't want to move and the remaining part doesn't know yet. These numbers are also confirmed for the province of Zuid-Holland, where Rotterdam is located. Here 35% of the 100.000 people with an age between 55 and 75 are willing to move. It is important to address that the willingness to move decreases with age. Where 43% of people aged between 55 and 65 are still willing to move, only 17% of people aged above 75 are willing to move. People who live in an apartments are less willing to move than people who live in (semi-)detached houses, 22% vs 40%. Finally people who have no social contact with their neighbours are more willing to move than people who have contact on a daily basis with their neighbours, 23% vs 39%.

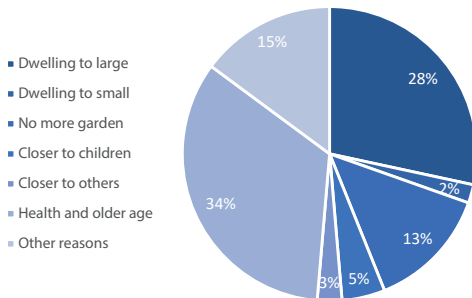
Preferred ownership



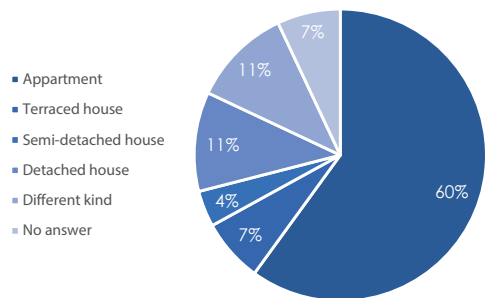
Preferred garden



Reasons to move



Preferred dwelling type



**Above**  
Pie charts of living requirements of people aged 55 and above according to CBS

### *Reasons to move*

The main reasons for the Young-Old to move are the fact that the current house becomes too large, the maintenance becomes too much to handle, and because of health issues related to growing old. Other reasons that were mentioned are that people do not want a garden anymore and that they wanted to live closer to their children, other relatives or friends.

### *Preferences towards the new dwelling*

Flats and apartments are the most popular among people with an age above 55. 60% of the people aged 55 who are willing to move prefer an apartment. Other dwelling types, like detached, semi-detached and terraced houses, are all preferred by approximately 10% of the people. Rental and owner-occupied homes are equally desirable, as 41% vs 42% of the people preferred one over the other. Also a garden is desired by almost half of the people (49%). Other factors are also playing a role in the desirability of a dwelling. The dwelling is preferred to be in a place where they already have social contacts, because they believe that it is more difficult to develop new social relationships at a later age. An extra room in the dwelling for hobbies, guests, laundry or to withdraw yourself in is desired. Also sufficient storage space is desired, because the Young-Old usually move from a larger house to a smaller dwelling and they already need to say goodbye to a lot of valuables. The dwelling also needs to be well reachable for family and friends. Furthermore there need to be sufficient amenities in the neighbourhood, crucial shops as well as facilities for leisure. In addition there needs to be a decent amount of nature, water or parks nearby. Finally people with health issues have the preference for a single-floor dwelling.

## Plan analysis

To get a better understanding on how to design a residential building for the Young-Old a couple of precedents are analysed. These precedents consist of one urban plan and two residential buildings:

- The Villages in Florida, USA, 1983
- Parkside retirement homes in Bangalore, India, 2018
- Kreilerburcht in Rotterdam, the Netherlands, 1993

The goal of the analysis is to give an overview of the ideals behind the different developments and to analyse why these precedents are suitable living environments for the Young-Old. A special attention is given towards the social collectiveness of the projects and to the design of the main dwellings in the projects.

### **The Villages, Florida, USA**

The Villages is described as a privately developed lifestyle product. With approximately 129.000 inhabitants, it is the largest single site retirement community in the world. The Villages total land area encompasses 25.000 acres, which is in size comparable to double the size of Manhattan. Family structures at the Villages are dominated by retired married heterosexual couples.

The Villages is created as a kind of Disneyworld for retirees. Theming played an important role in the design of the Villages. The goal was to recreate the former home towns of the retiree, so that they physically and mentally returned to their 'youthfull' past. The designers went to great lengths to achieve this: not only the public spaces are designed like they were remnants of the 19th century, they even provide historical journals and tours about the 'history' of the area. This designed



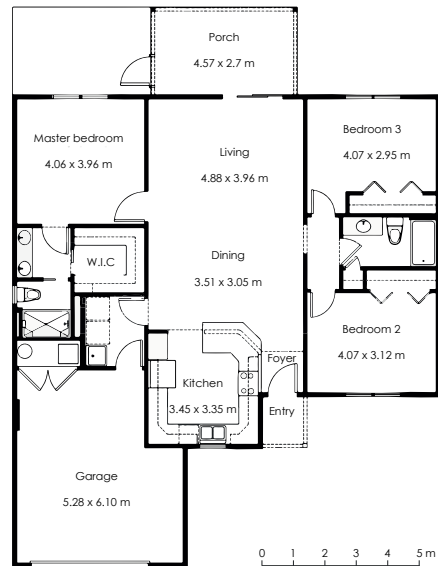
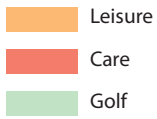
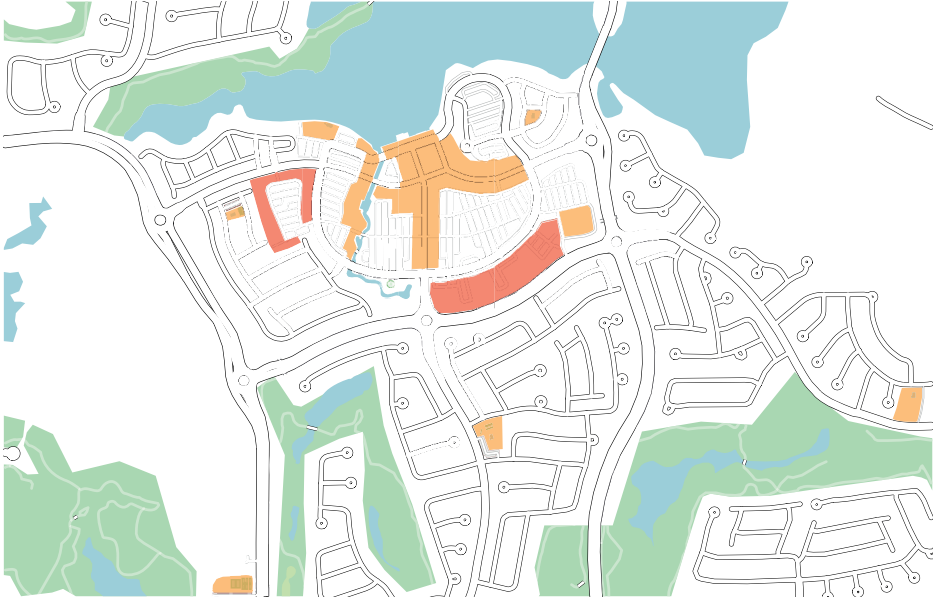


environment makes that the retiree feels young and active. Eventhough it is completely fake, the people find it fun, entertaining, unique, playfull, special and cute. In a further attempt to deny the process of aging The Villages excludes people from the First and Second ages, to whom the residents feel 'old', and from the Fourth age, who embody the 'depressing' reality of the future. The positive of focussing on one specific target group is closely tied to potential economic benefits that retailers can achieve, because products can be more efficiently marketed, advertised and sold.

#### *Main dwellings*

*The dominant dwelling type is the detached single storey dwelling. This fits in the idea to recreate the former hometown of the residents. The size of the dwellings vary from 108 to 336 m2.*

*Above*  
*Aerial photo, The Villages*



***This page**  
Analytical drawings of  
The Villages*

### *Social collectiveness*

The homogeneous group of people and the impression of a home town causes that the people have a sense of familiarity: they feel more safe and people greet each other on the street more often. Another aim of the project is to provide the inhabitants with more than enough leisure possibilities so that leisure activities could replace the central position of work related activities in the residents social network. The pursued life style is best described as a permanent vacation.

The entire development is clustered in 16 districts. The facilities and the dwellings are in separate zones in these districts. Each district has a town square where most of the facilities are located. Furthermore recreational centres are scattered across the development. These recreational centres offer mainly club and sports related activities.

### *Communal facilities*

Town squares	Scattered
- Restaurant	- Recreational centre
- Clothing store	- Golf course
- Care facilities	- Swimming pool
- Home furnish store	- Postal station
- Barber shop	- Country club
- Bowling	
- Theatre	
- Bank	
- Beauty salon	
- Gallery	
- Golf & country club administration	
- Golf car dealer	
- Hotel	

### ***Parkside retirement homes in Bangalore, India***

The parkside retirement homes were built in 2018 and designed by Mindspace Architects. Parkside retirement homes are a part of Brigade Orchards an integrated township located at Devanahalli.

#### *Main dwelling*

Parkside houses a total of 156 three-room single-floor apartments with all handicap friendly and wheelchair accessible spaces. Special adaptations for seniors in the dwelling are wide corridors and doors for wheel chair movement and grab bars in the bathrooms. Furthermore the dwelling is designed in such a way that from a central point in the dwelling each living space is visible. This enhances the sense of security of the resident.

#### *Social collectiveness*

The uniqueness of the project lies in reinterpreting the idea of a single club house. Instead of housing all the activities in one place, they are distributed across the floors for easy access, to have a lively atmosphere and to encourage interaction across the building. Each of the floors has one activity centre which is visually connected across different levels through a central atrium with a skylight.



**Below**

*Floor plan & section of Parkside retirement homes*

**Facing page**

View from park of Parkside retirement homes

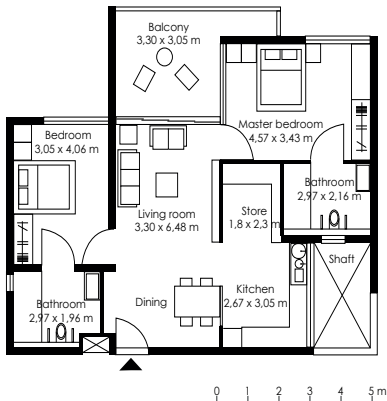
**Communal facilities**

Ground floor

- Temple
- Physiotherapy
- Gym
- Lounge
- Salon
- Lobby
- Reception
- Kitchen
- Outdoor & indoor dining
- Convenience store
- Amphitheatre

Upper floors

- Meditation/yoga
- Arts & crafts
- Lounge
- Music room
- Spare activity
- Library
- Boardgames



***Kreilerburcht, Rotterdam, the Netherlands:***

Kreilerburcht is build in 1993 and is developed by the people who wanted to live here. These residents wanted a building with communal facilities to combat loneliness and dependence on care or family. They chose architect Patijn because of his experience with special residential buildings. The goal was to create a residential complex for people with an age of 55 and above. The complex offers the opportunity, partly due to the presence of communal facilities, to live in ways other than in the conventional form for the elderly in the Netherlands.

***Main dwellings***

Kreilerburcht offers 68 three-room single-floor apartments spread over four floors. Each dwelling has the same size of 71 squared metres. Each dwelling has a large living room, a smaller bedroom and a third room next to the entrance that can be used in discretion.

***Social collectiveness***

The residents of the Kreilerburcht jointly form a 'woongroep' that owns the complex. A 'woongroep' is a group of cohabitants who jointly carry out all kinds of daily household matters, but still have a high degree of inde-



**Below**

Analytical drawings of Kreilerburcht

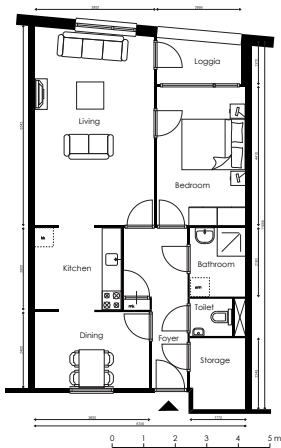
**Facing page**

Aerial photo of Kreilerburcht

pendence. The residents here for example collaborate to maintain the communal garden. They also organise many activities throughout the year. Some examples are: In the summer months, a barbecue; a communal lunch with Chinese or Indian food; bingo evenings during the winter months; clover jackets, shuffleboard and various games and in the afternoons and evenings Billiards, with the occasional billiards tournament. The communal facilities are divided over all floors. On each floor they are located at the same place, directly next to the communal balcony.

**Communal facilities**

- laundry room
- guest bedrooms
- bicycle/mobility scooter storage
- atrium with a garden
- communal balcony on each floor
- billiard room
- activity room



## Makers:

The final part of this chapter will be about the makers. As stated in the introduction the area of Merwe-Vierhavens is determined as a makers-district by the municipality of Rotterdam. The municipality has multiple goals for this makers district:

- To attract and facilitate innovative business, with an accent in the creating industry, and associated supportive companies, from start-up to corporate businesses.
- To create employment for the full width of the population of the Rotterdam region.
- To realize an open innovative environment with a varied mix of businesses, education and knowledge institutions.
- To develop the area as a test case and a window for the circular future of the city and harbour.

In line with the last goal of the municipality I want to introduce the circular makers into the Merwe-Vierhavens. My understanding of circular makers are businesses where people can hand in used/broken products. These products will be sorted and next they will either be repaired, transformed and/or sold again. This could be realized as a mix of businesses like a thriftshop with spaces for furniture makers, clothing designers and an electrical repaircafé.

These circular makers are interesting because, in order to decrease the amount of waste in the cities we need to create an accessible market for second-hand products. WRAP UK has conducted a study in the UK into the potential for reuse of bulky household waste. They discovered that of all the bulky waste in the country 42% was from furniture, 19% from textile and 19% from electronic devices (WEEE). The furniture was for 20% immediately reusable and less than 25% was reusable



after minor repairs. In terms of WEEE, including televisions, refrigerators and washing machines, was about 60% immediately reusable after a minor repair. If 50% of local bulky waste could be upcycled instead of thrown away, it can lead to savings of up to 10,000 tons of materials per year.

For the Young-Old these kind of businesses are also of interest. First of all because, as mentioned in earlier parts of the research, this group of people has a lot of knowledge and experience plus time to spare. They could volunteer or work at these facilities to share their knowledge with the new generation. The Young-Old and the new generation could work together to give household waste a new purpose.



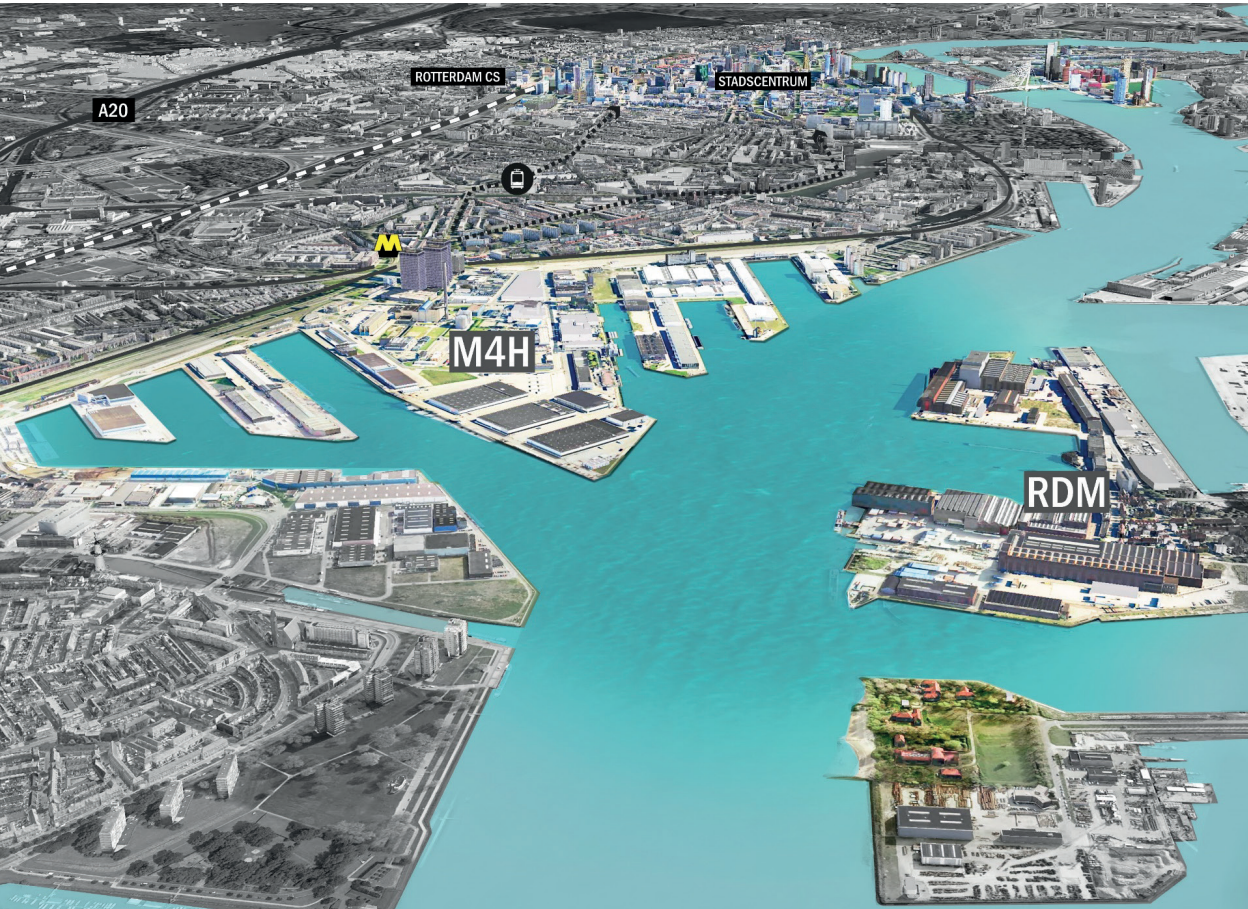
*This page  
Young-Old teaching the new  
generation their discipline*

*Location*



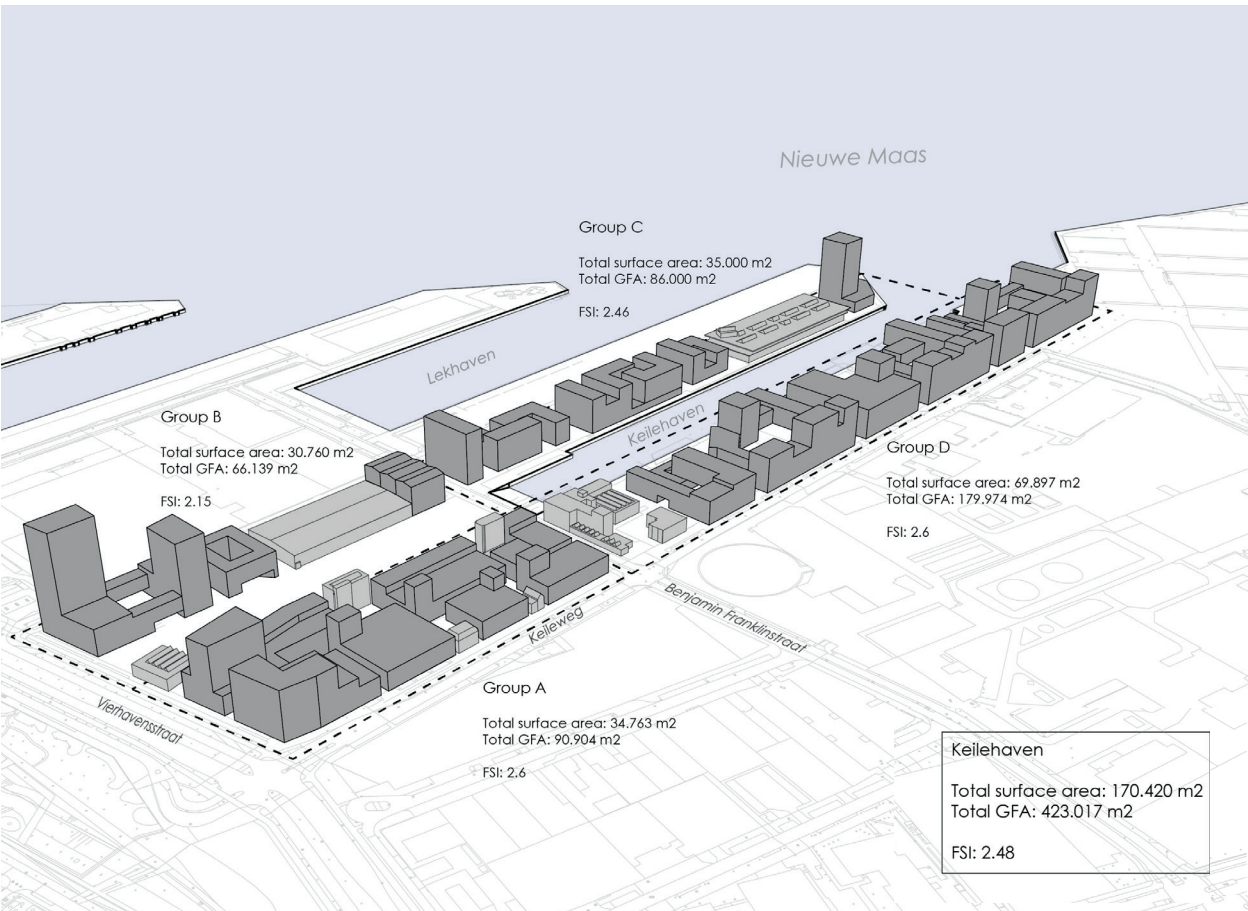
The location of the project is the Merwevierhavens in Rotterdam (M4H in short). The M4H-area, in size equal to the city centre of Rotterdam, is a part of the international harbour of Rotterdam and it will be developed into an innovative mixed-use district by the municipality in collaboration with the port authority. The make industry will get a prominent role in this area where a mix of work, living, education and leisure will be located. In the entire area of M4H the goal is to develop 202.000 - 288.000 square metres of work area, 3.400-5.100 dwellings and 36.000 - 58.400 square metres of amenities.

With a group of 15 students we had the assignment to create an urban plan for 'het Keilekwartier' in Rotterdam. Het Keilekwartier is one of six district within the bigger urban area of the M4H-area. Het Keilekwartier is defined by the municipality as the makers mix. Crafts, Creativity, Craftsmanship, Living, Collectives and Hospitality need to get a central role in the district. About 50% of the district is intended for living, 40% for businesses and 10% for amenities.



*Above*  
Location of M4H in Rotterdam

*Facing page*  
Proposed urban plan





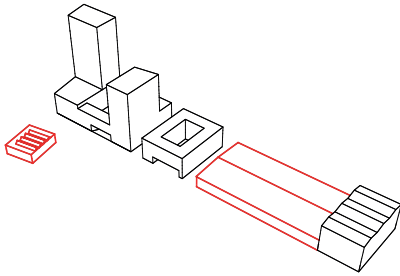
To properly distribute the design of the urban plan we divided the area in four parts so that for each part we had a group of three to four people. My group was in charge of designing quadrant B. We designed this quadrant on the basis of analysis of other urban plans and an analysis of the site. The analysis of the site was focused on a couple themes: cultural history, parking and functions. With the results from the analysis we determined a couple starting points for the urban plan. On the basis of these starting points in combination with the requirements from the municipality we filled the quarter with pre-existing buildings. We did this to indicate what kind of buildings we envision on this location. Afterwards we designed the basics of the public spaces surrounding the buildings by determining the streetprofiles.

**Above**

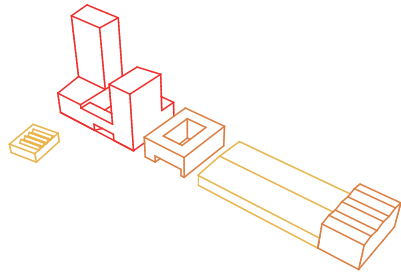
*Location of quadrant B in the bigger area of the Keilekwartier*

**Facing page**

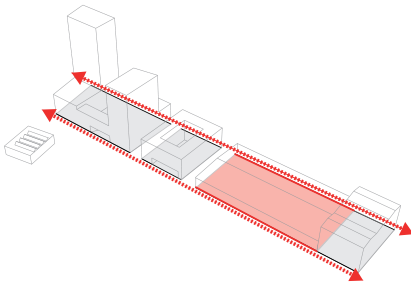
*Starting points for the urban plan of quadrant B*



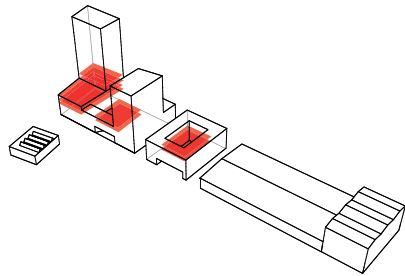
*Preservation of existing buildings:*



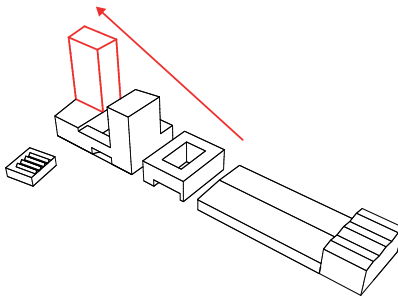
*Typological variation:*



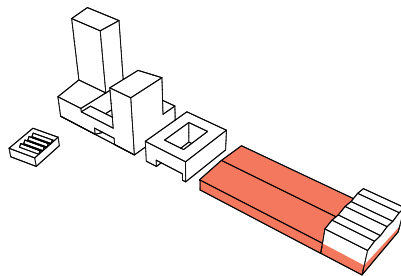
*Alignment:*



*Integrated parking:*



*Height gradient:*



*Makerszone:*



Section A-A'

streetprofile AA



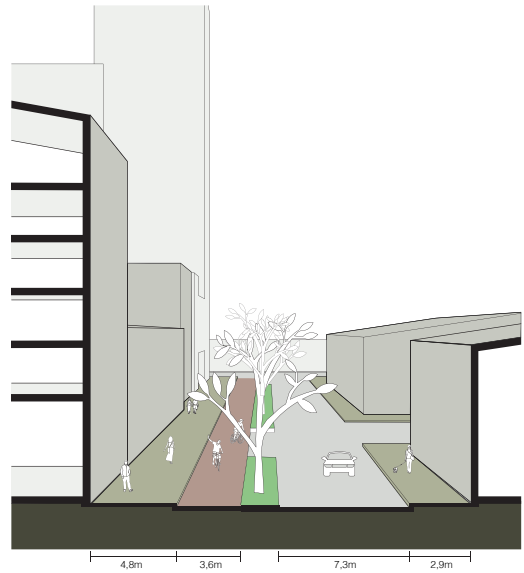
streetprofile BB







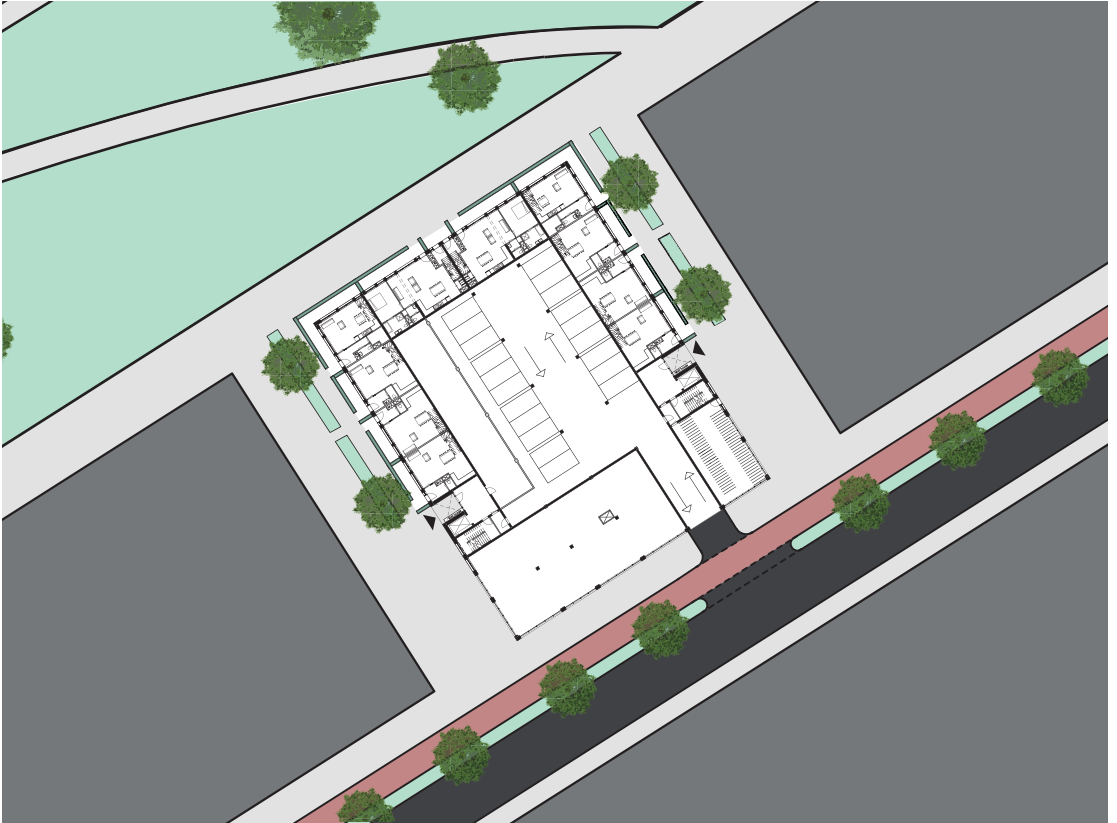
*streetprofiles DD*



*streetprofiles CC*

**Both pages**

*Overview and corresponding street profiles that are suggested for my building plot*



*Above*  
Site of my design 1:1000

*Facing page*  
Render of pedestrean street  
between my design and  
'het Keilepand'

The building plot I chose to design my building on is the plot located in the center of quadrant B. The plot is enclosed by a park on the north side, one of the main access roads of the district (Keileweg) on the south side and two pedestrian streets on the west and east side. The dimensions of the plot are 40 x 50 metres. The urban plan suggest a six story building with integrated parking for this plot. Furthermore the plot is located next to 'Het Keilepand', a municipal monument. It has been appointed as a monument because of its environment specific appearance and history.



# *Design principles*



In order to design a fitting living environment for the young-old I identified certain design principles in relation to the topic research.

*Variation in dwelling types:*

To cater for the different household sizes and income groups of the young-old, a range of dwelling types should be offered, varying in size.

*Typologies for Young-old*

The building has to offer dwelling types that are suitable for the young-old. Optimal floor plans should be designed which are attractive for active elderly and that can be adapted to older age. So it makes sure that the young-old do not need to move out until the very end.

*Leisure activities in the building*

The building should provide the young-old a natural place where they can create new social networks. For this reason it is important to integrate leisure facilities in the building.

*Social collectiveness*

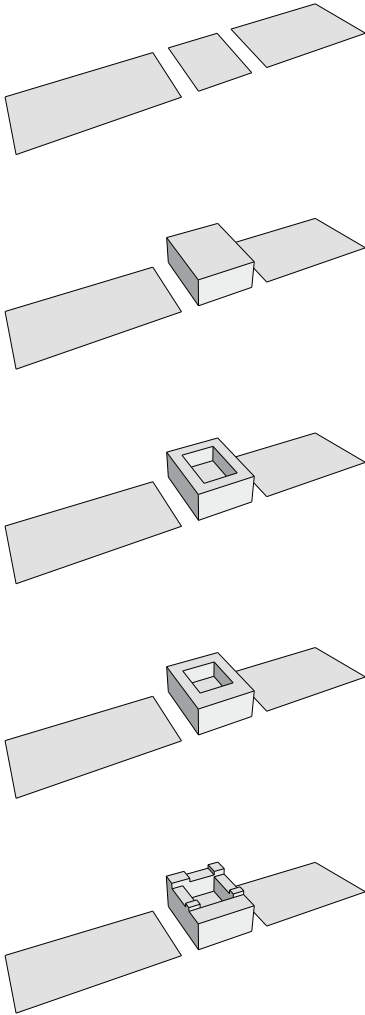
The building should stimulate social encounters between the residents to prevent isolation and provide a safe environment where the young-old feel at ease. Contact with neighbours and feeling part of a local community are important factors for this.

*Privacy*

As people occasionally want to withdraw themselves, it is important that the residents have enough privacy in their dwellings.

*Outdoor spaces*

Because the young-old are mostly retired and therefore possibly more at home it is important that they have sufficient outdoor space of a good quality.



**Above**  
 Process of shaping the  
 building mass

**Facing page**  
 3D view of building in  
 surroundings

## Building mass

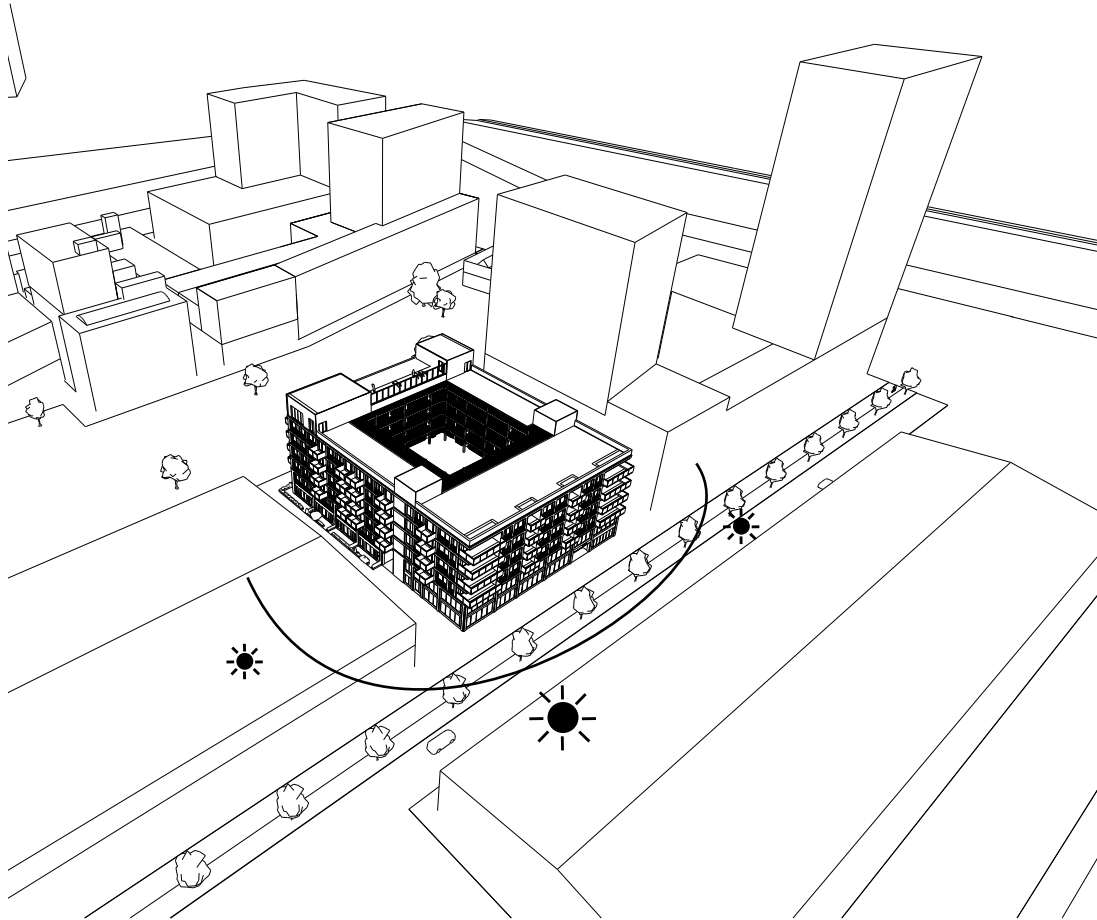
The chosen plot has a size of 40 metres wide and 50 metres long.

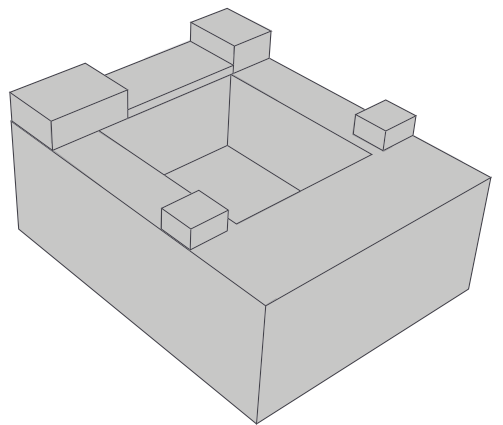
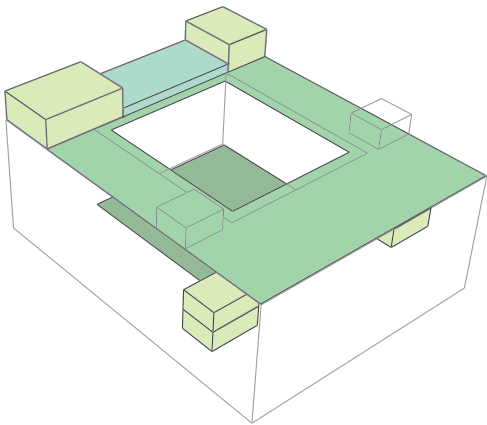
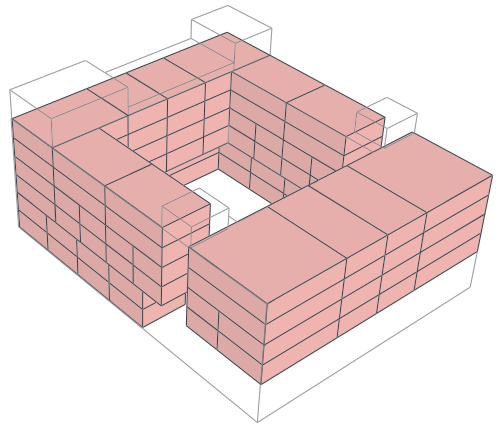
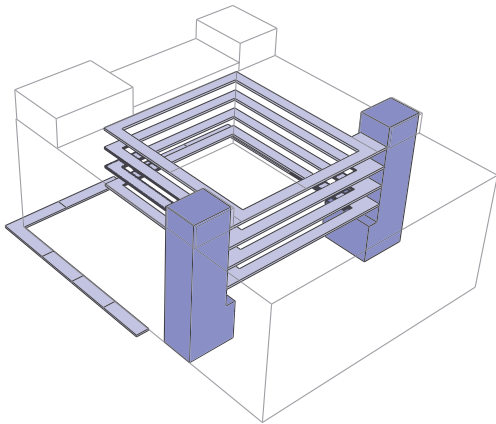
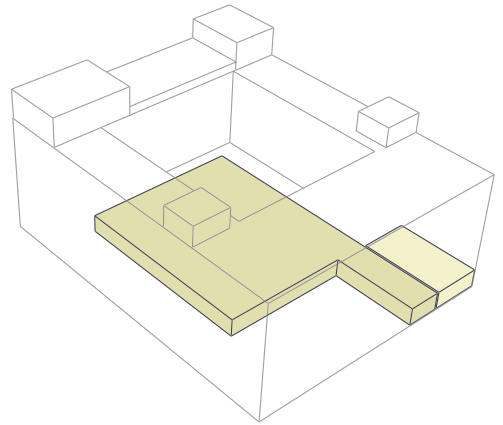
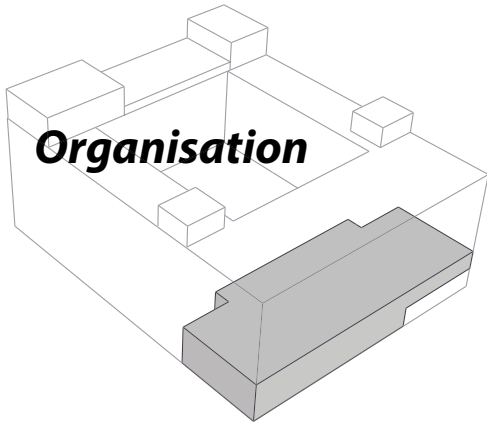
The starting point of the building mass came from the urban plan. This stated that the building should have four closed sides and that it is in alignment with the buildings next to it. So the building mass started as a monolith block of six stories high on the plot

The first adjustment to the block was to create a void in the center of the building to let daylight into the building.

Secondly the depth of the different wings of the building were adjusted according to their position in relation to the sunpath. The south-east wing got the biggest depth as it is in an optimal position to get daylight deep into it. The north-west wing is thereafter the deepest as it has the same orientation as the south east wing but is slightly less optimal positioned. The nord-east wing and the south-west wing are the least deep, as their orientation is less optimal than the other two wings.

Thirdly as the building is envisioned as one of the lower building blocks in the area it was important to create a lively roof. To make the roof accessible it was necessary to lengthen the riser cores to the roof. Furthermore some indoor leisure facilities were added on the roof. All this combined caused that some 'blocks' were added on the roof.





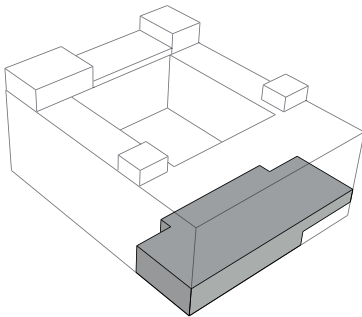


## Commercial plinth

The plinth of the building incorporates public facilities. These functions bring liveliness and connect the building to the character of the Keilekwartier as envisioned by the municipality.

In the plinth 900 m<sup>2</sup> rentable commercial space is present over two floors. All these spaces are located towards the Keilestraat, this is one of the mainstreets to enter the district. In this way these spaces can attract as many people as possible.

These commercial spaces need to be facilities where the residents can meet other people from the neighbourhood, to prevent isolation of the young-old. This could be functions like a cafe, a restaurant, a small shop or workspaces.

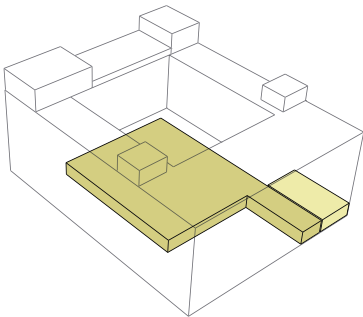


## Parking

In the core of the building at the ground floor parking is situated. The car parking with 20 parking spaces, meant for electrical car sharing, is accessible from both entrances to the dwellings of the building.

Furthermore a bicycle parking is located on the east corner of the building. This has a capacity for 126 bicycles, which is enough space for all the residents to store one bike. If people have multiple bikes they need to store them in their private storage rooms on the first floor, which are accessible by elevators.

This combination of shared cars and bicycle parking must stimulate the use of bicycles in the city and decrease the need for the households to own a car. If they want to travel a distance which isn't suitable for bicycles they can either opt to use a shared car or use public transport, as the area is well connected to the tram- and metro system of Rotterdam

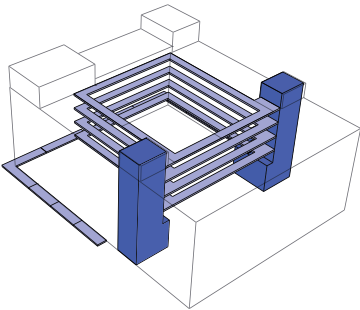


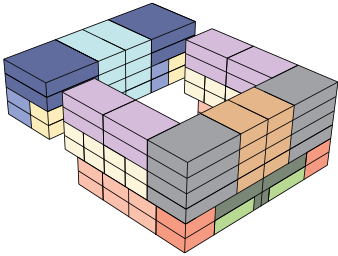
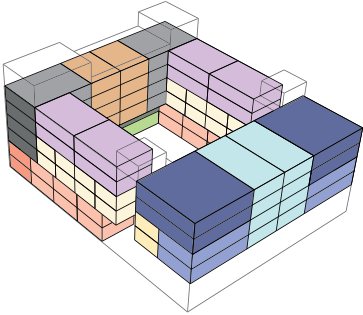
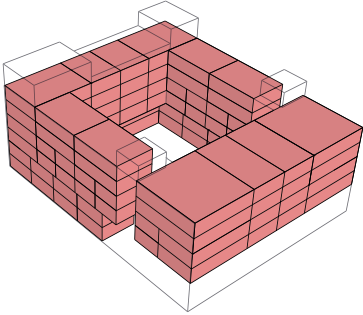
## Circulation

The residential area of the building is split in two parts. Firstly there are dwellings that are directly accessible from the public streets and secondly there are dwellings that are accessible by a gallery system.

The dwellings that are directly accessible from the public streets have a front garden to create a buffer zone between the public street and private dwellings.

The gallery system is connected by two entrances to the public street. These entrances are also accessible from the parking garage. Both entrances provide the residents with an elevator and a stairwell to go up to their designated floor.





## Dwellings

A large variety of dwellings are proposed to meet the wishes of the young-old. They vary from smaller units for people living alone, to two bedroom apartments with separate bathrooms for overnight guests, to maisonettes with a private garden. In total there are 72 dwellings of 10 different types. The dwellings orientated towards the south and north have different depths compared to the dwellings orientated to the west and east. Each dwelling has its own private outdoor space attached to the dwelling and a storage unit on the first floor. This applies even to the smallest dwellings as sufficient storage and outdoor space are important living requirements for the young-old.

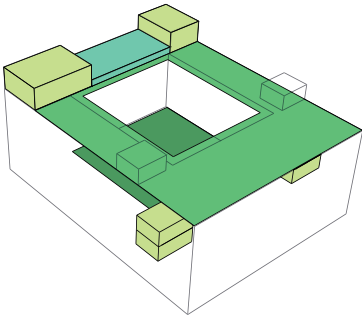
In order to design so many different dwelling types in a relative small building the placement of the shafts and the structural walls is crucial. At the east and west wing of the building the facades are the structural walls, furthermore a minimal amount of shafts is used. This made it possible to design dwellings with different bay widths on top of each other.

## Collective spaces

As the research has demonstrated it is important for the young-old to connect with their neighbours and leisure activities can form a central role in their social networks. For this reason the building offers shared facilities to facilitate the desired collectivity.

First of all there is a communal garden on the roof and in the inner courtyard. Adjacent to the rooftop garden there are some high-end leisure facilities among which a swimming pool, fitnessroom and a sauna. These spaces are for all the residents.

Secondly there are four guest bedrooms. These are located on the floors with the smaller apartments and are meant to be used by guests of the residents who do not have a spare bedroom. These guest bedrooms could also be used in the future by caretakers if the residents are in need of care.



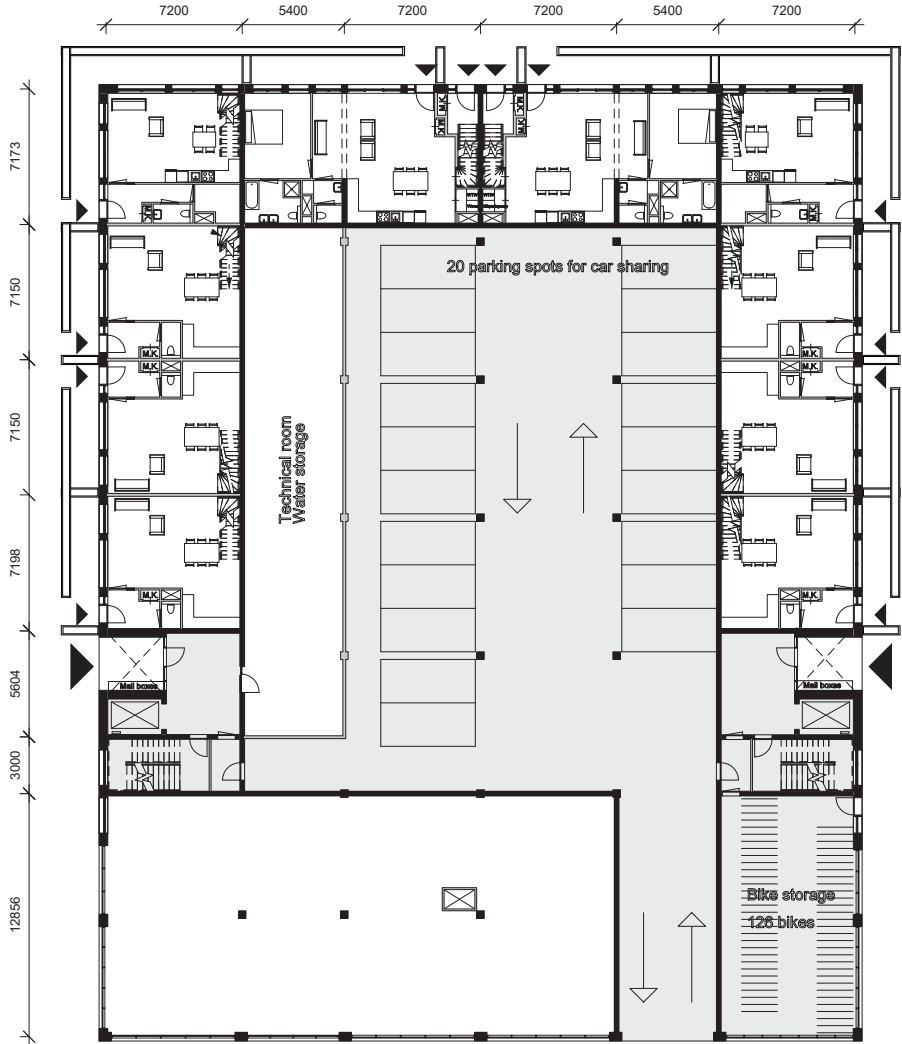
# *Building*



On the basis of my design principles and rules of the urban plan, I have designed a living environment for the young-old. The design contains a mix of different types of dwellings, commercial spaces, a parking garage, storage spaces and communal spaces. The building is an enclosed building block with on the second floor an inner courtyard and on the sixth floor a rooftop garden.

The appearance of the building is a reference to the direct environment. The brick facade with decorative profiles is recurring on many of the existing buildings in the area. The inside of the building is a calm oasis in contrast to the crowded city. To express this difference has the inner courtyard a wooden appearance in contrast to the brick appearance of the outside facade.

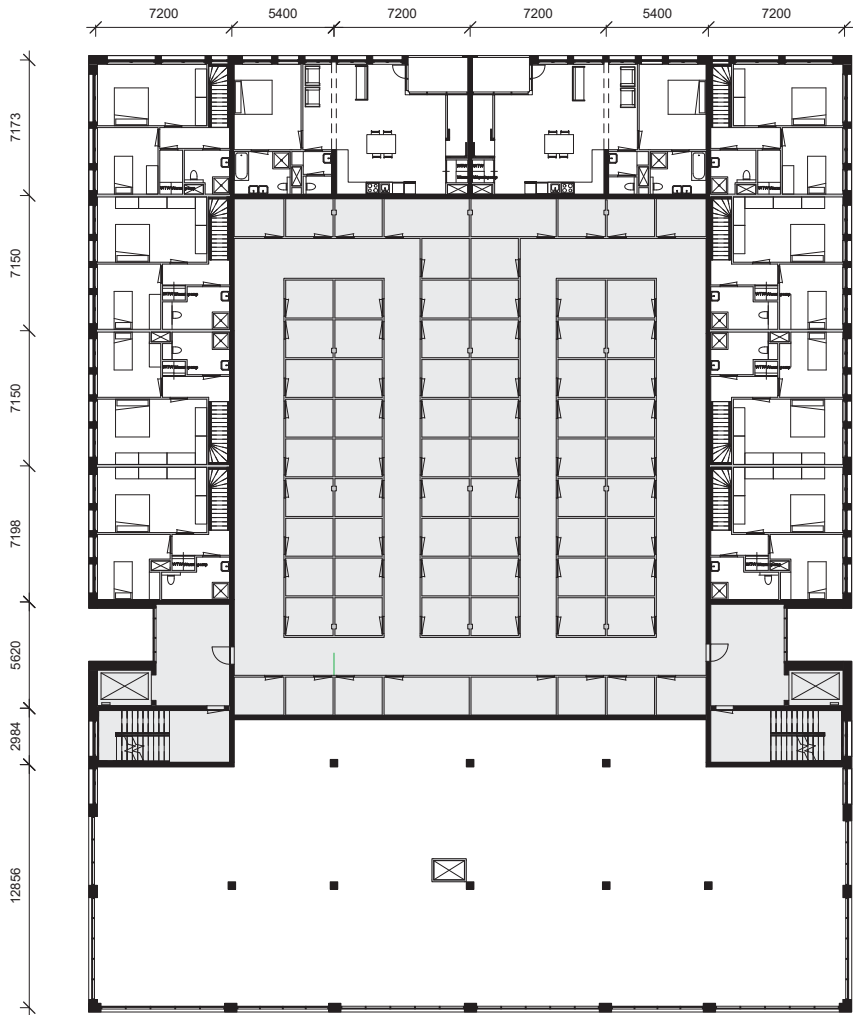
An overview of the design is given on the next pages. The overview of the plan is presented by showing floorplans, elevations and sections. In following chapters different aspects of the design will be highlighted, by giving a greater insight in these aspects.



*Above*  
Ground floor 1:400

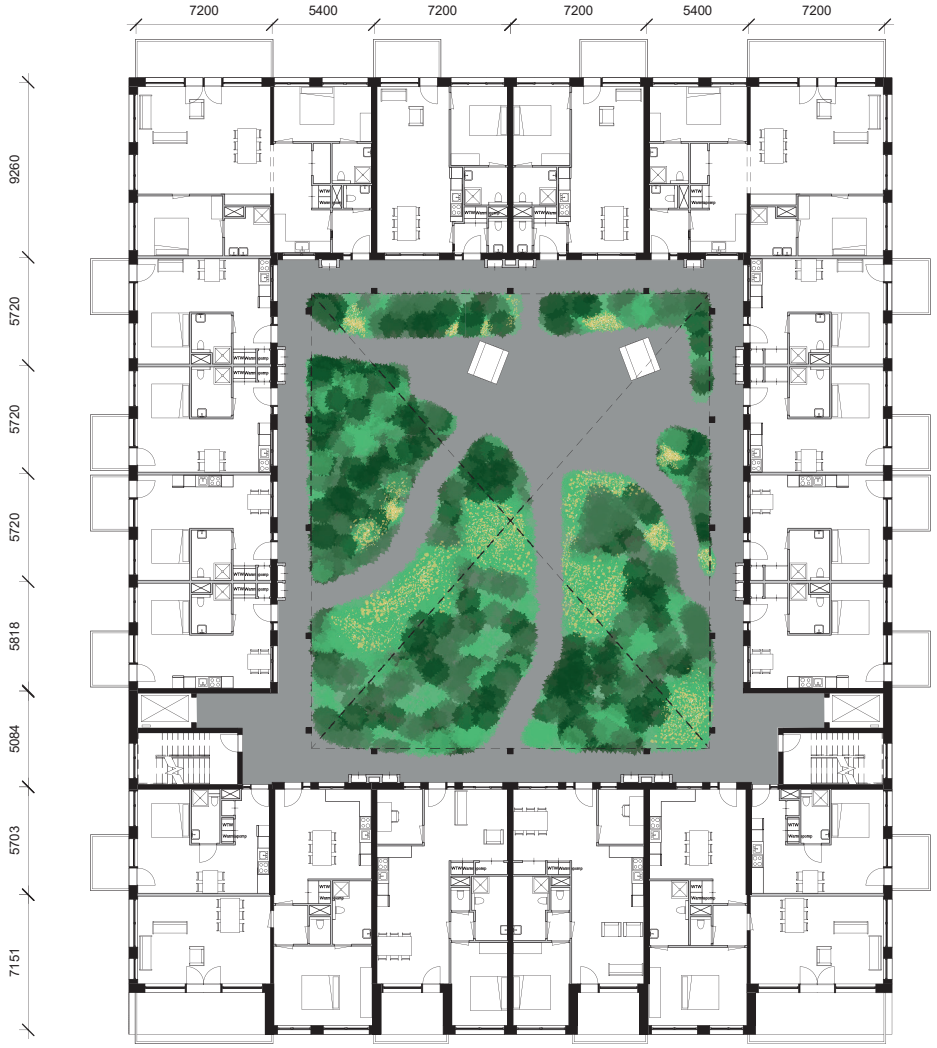






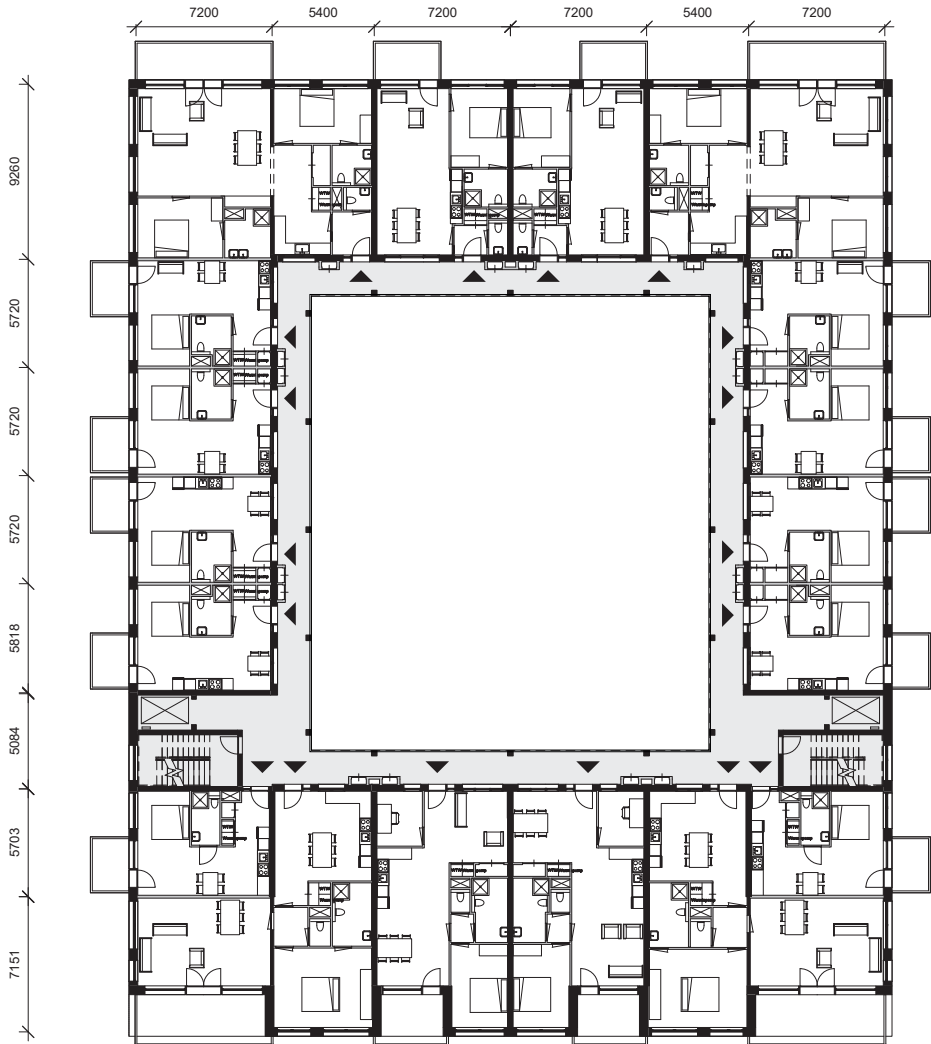
*Above*  
First floor 1:400





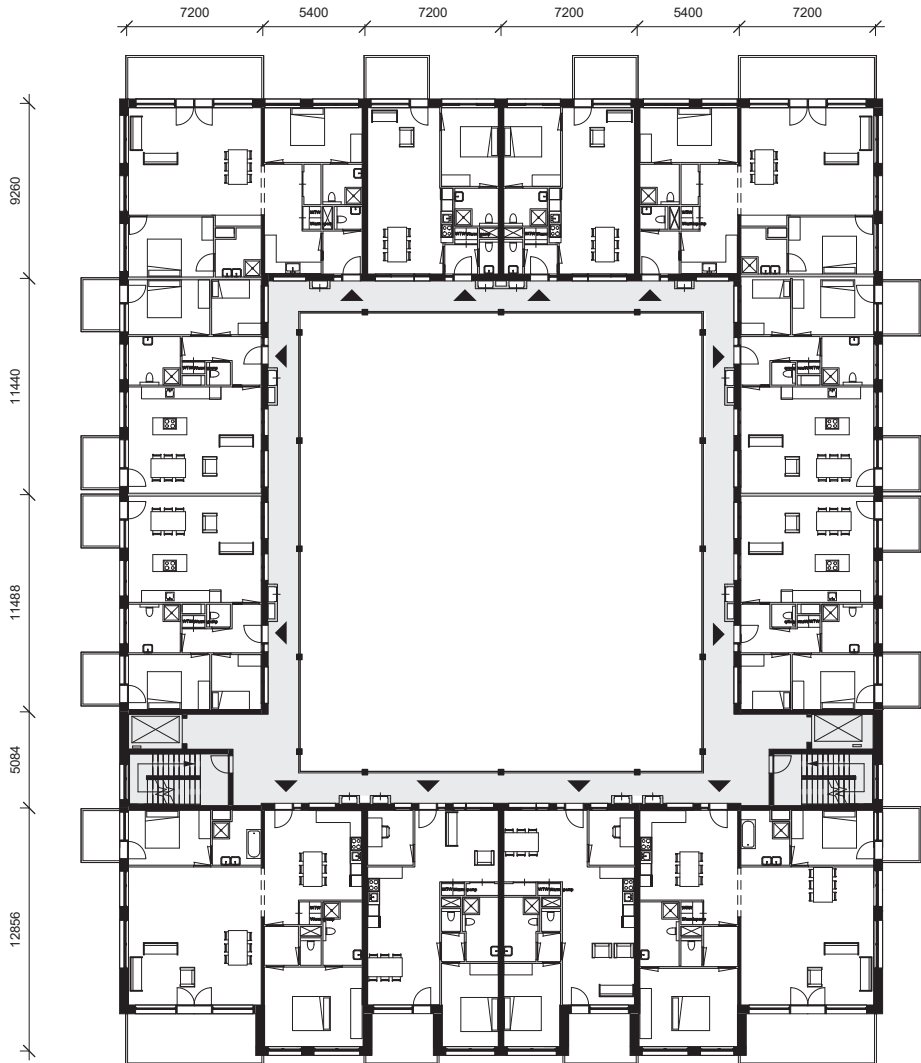
*Above*  
Second floor 1:400





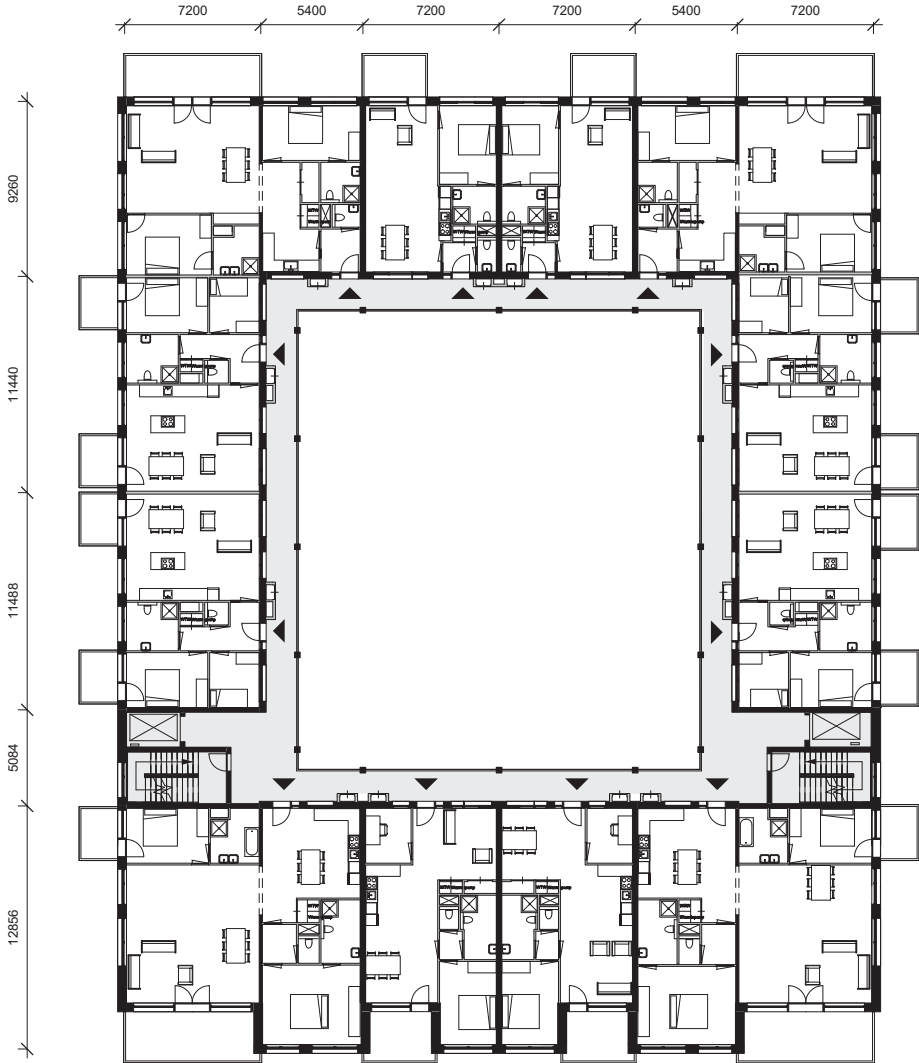
Above  
Second floor 1:400





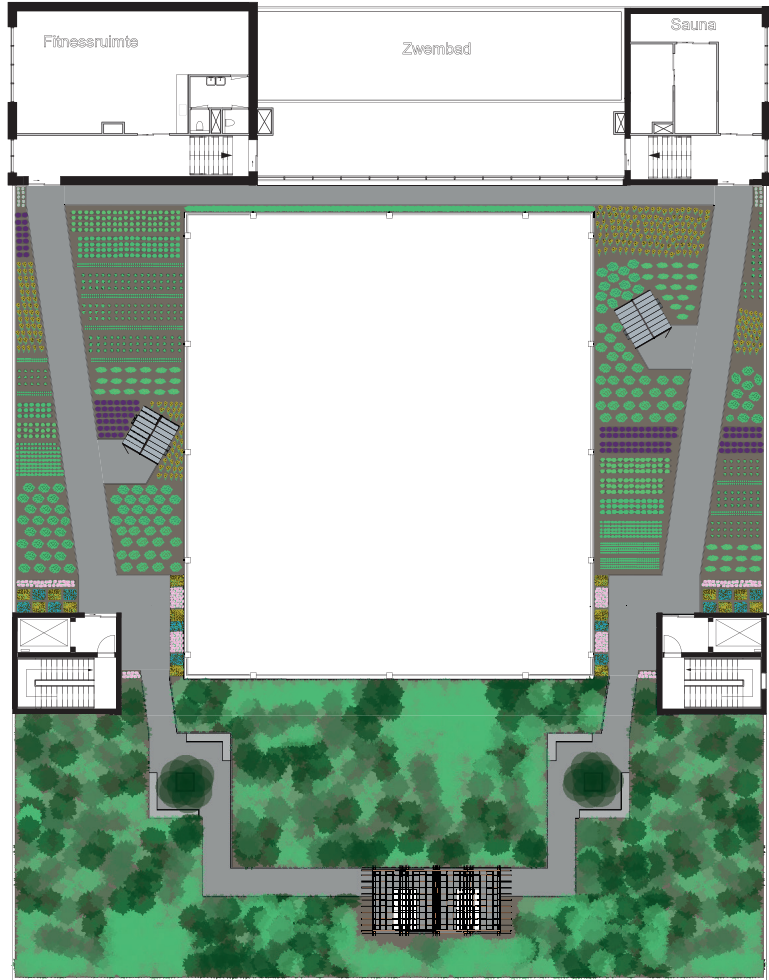
*Above*  
Fourth floor 1:400





Above  
Fifth floor 1:400





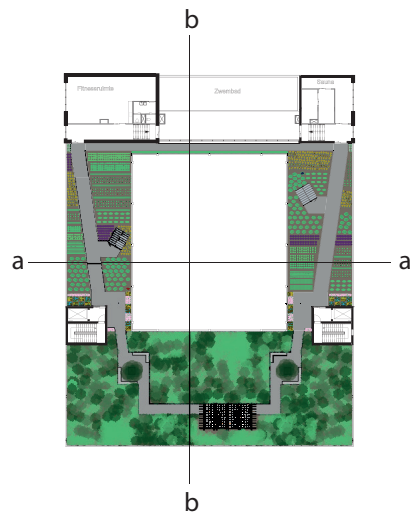
*Above*  
Rooftop 1:400





*Above*  
Section aa

*Right*  
Overview sections





*Above*  
*Section BB*







*Above*  
*North west facade*  
*South west facade*



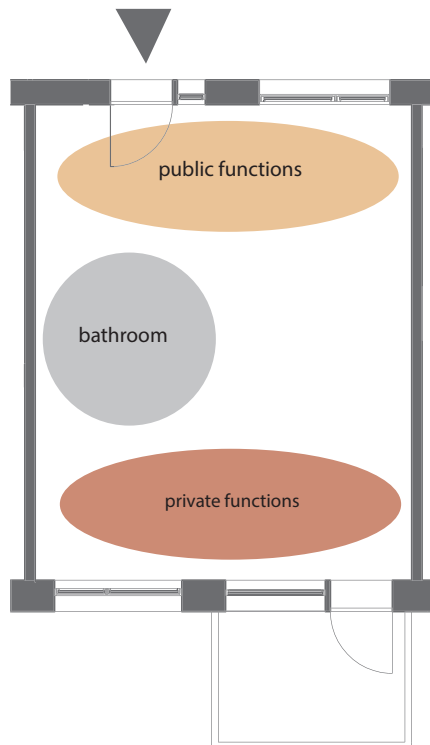
*Above*  
*North east facade*  
*South east facade*

# *Dwellings*



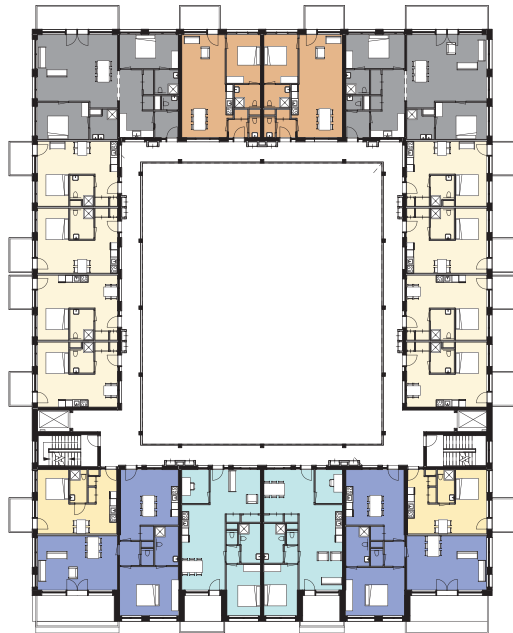
The entire project provides a total of 72 dwellings of 10 different dwelling types. On the ground and first floor masionettes are located. The second and third floor house smaller apartments, while the fourth and fifth floor house the larger apartments.

Every dwelling has been designed with the intention to locate the more public functions near the gallery, like a kitchen and the dining room. The private functions, like bedrooms and living rooms, are located at the opposite site of the dwelling with the 'wet' bathrooms placed in between these functions.

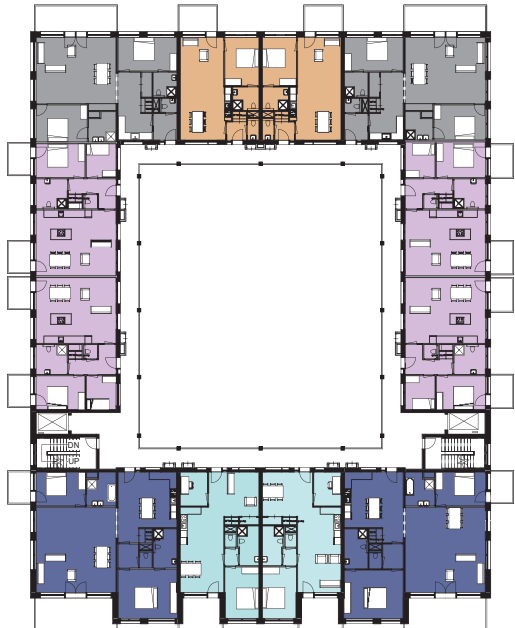
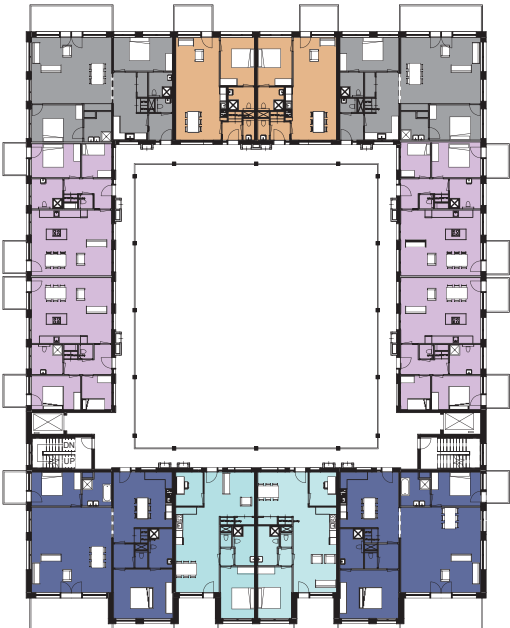
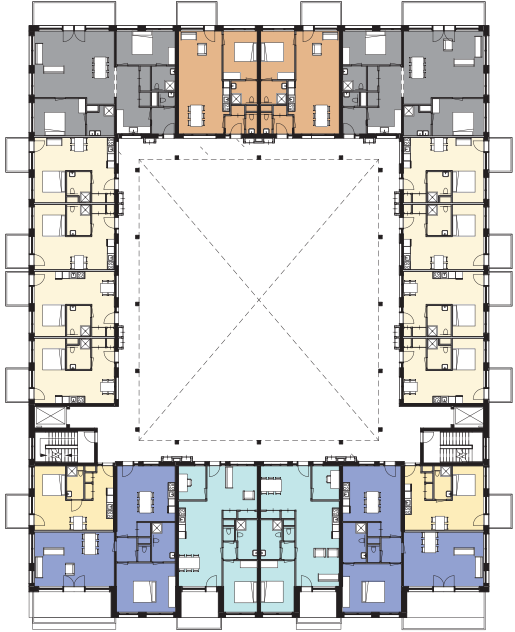
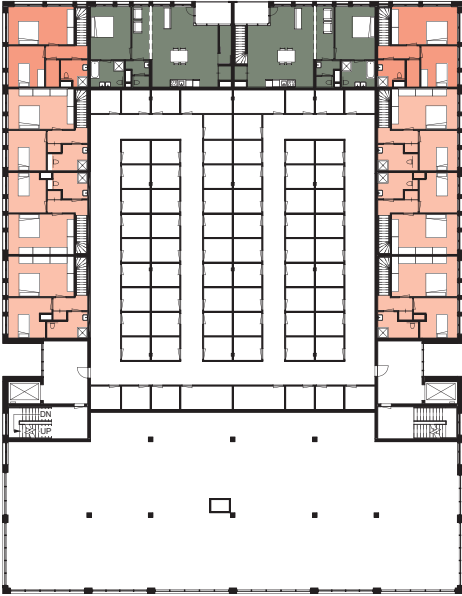


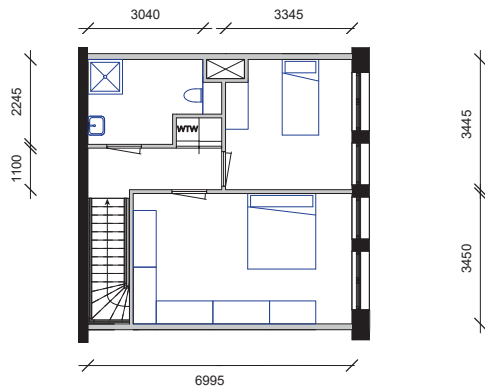
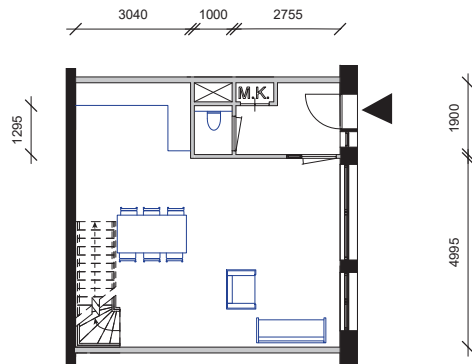
**Right**  
Schematic overview of  
dwelling layout

- Type A1
- Type A2
- Type B
- Type C
- Type D
- Type E
- Type F
- Type G
- Type H
- Type I
- Type J



**Both pages**  
 Overview of different dwelling  
 types on the different floors  
 Left to right 0 - 2, 3 - 5





### Type A1:

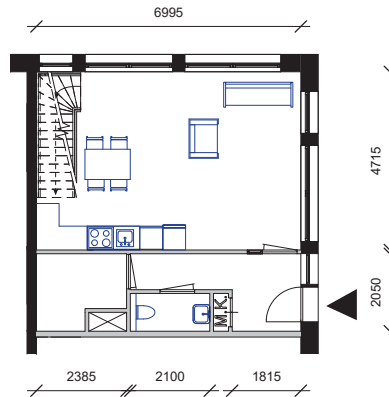
Ground/first floor

6x maisonnettes

Total surface area: 93 m<sup>2</sup>

Outdoor space: 11 m<sup>2</sup>





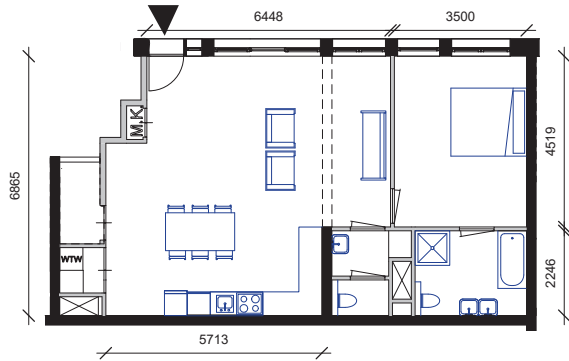
### Type A2:

Ground/first floor

2x maisonnettes

Total surface area: 92 m<sup>2</sup>

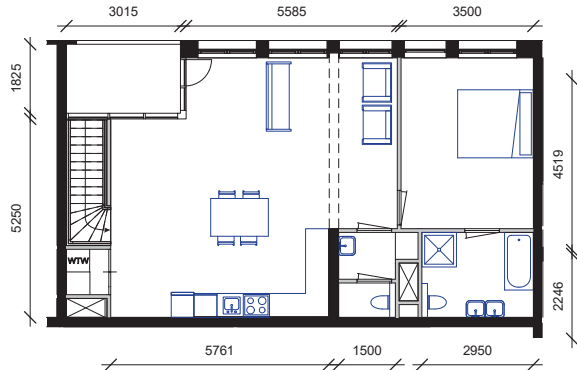
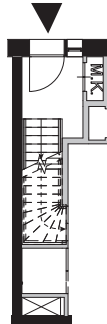
Outdoor space: 26 m<sup>2</sup>

**Type B:**

Ground floor

2x Terraced

Total surface area: 78 m<sup>2</sup>Outdoor space: 16 m<sup>2</sup>



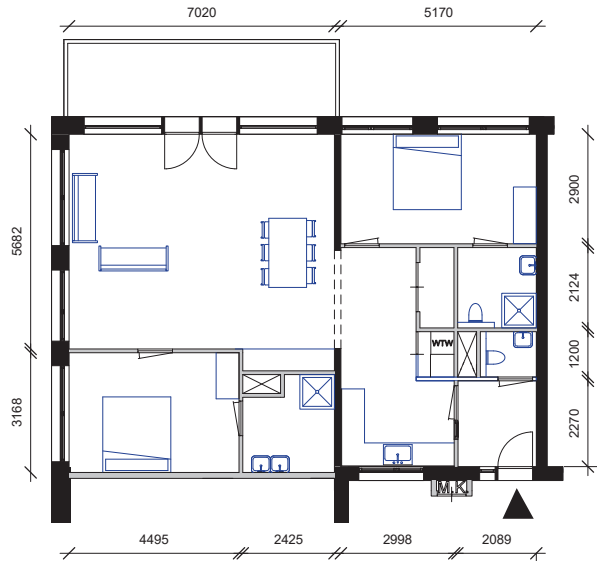
### Type C:

First floor

2x Apartment

Total surface area: 82 m<sup>2</sup>

Outdoor space: 5 m<sup>2</sup>

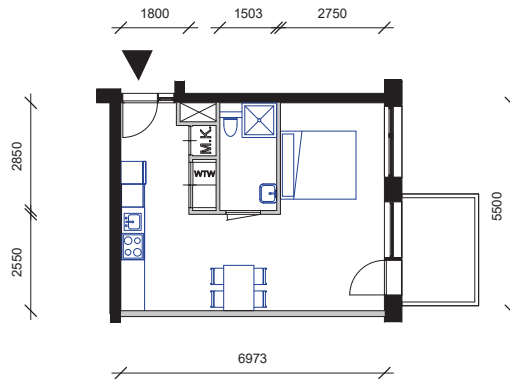
**Type D:**

Second, third, fourth, and fifth floor

8x Apartment

Total surface area: 109 m<sup>2</sup>

Outdoor space: 14 m<sup>2</sup>



### **Type F2:**

Second and third floor

4x Guestbedroom/future care taker

Total surface area: 37 m<sup>2</sup>

Outdoor space: 5 m<sup>2</sup>

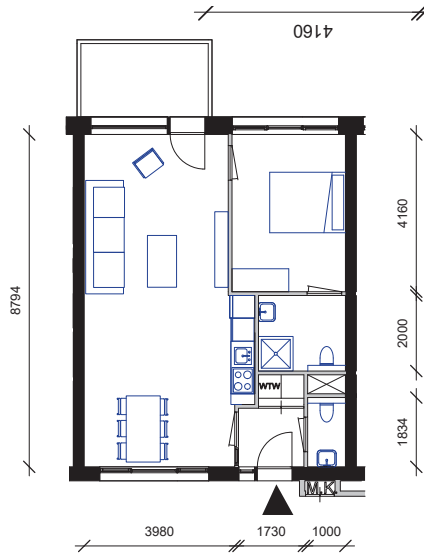
**Type E:**

Second, third, fourth, and fifth floor

8x Apartment

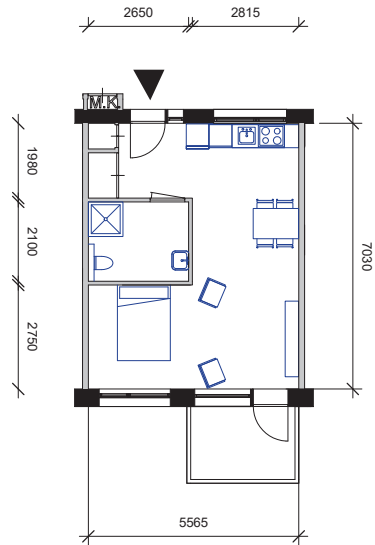
Total surface area: 61 m<sup>2</sup>

Outdoor space: 7 m<sup>2</sup>







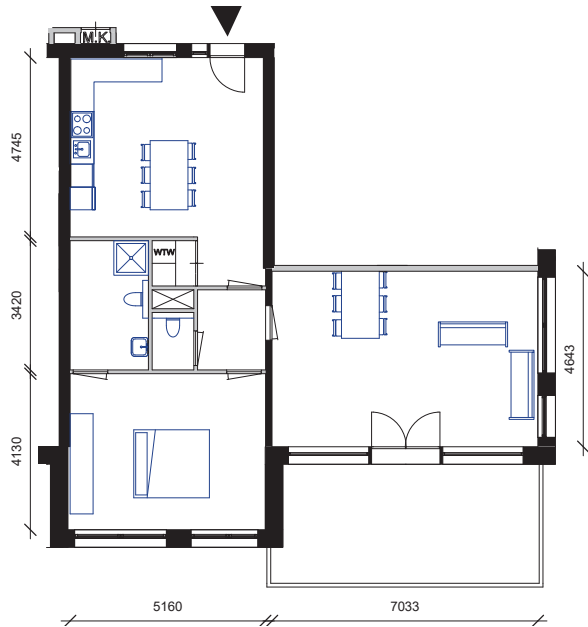
**Type F:**

Second and third floor

16x Apartment

Total surface area: 37 m<sup>2</sup>

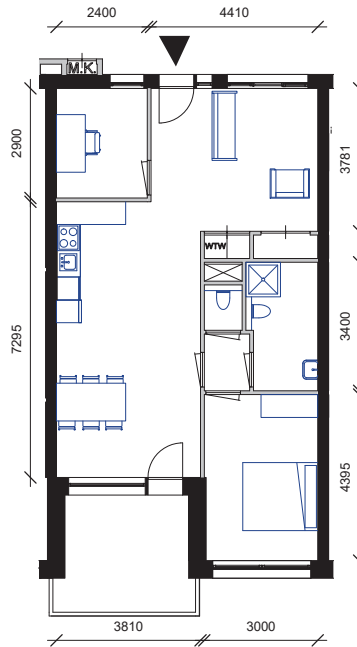
Outdoor space: 5 m<sup>2</sup>

**Type G:**

Second and third floor

4x Apartment

Total surface area: 98 m<sup>2</sup>Outdoor space: 18 m<sup>2</sup>



### Type H:

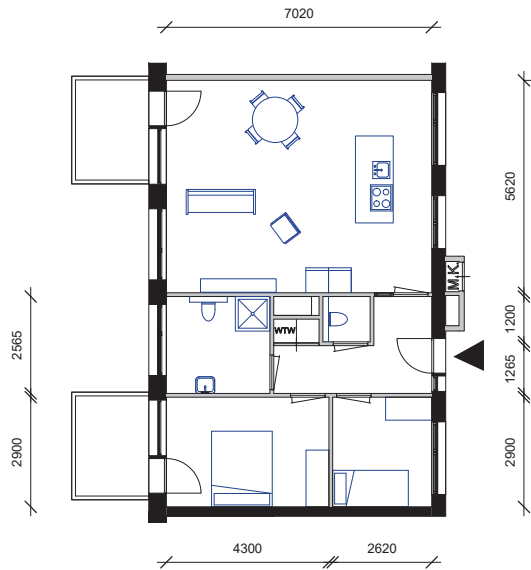
Second, third, fourth and fifth floor

8x Apartment

Total surface area: 78 m<sup>2</sup>

Outdoor space: 9 m<sup>2</sup>





### Type I:

Fourth and fifth floor

8x Apartment

Total surface area: 79 m<sup>2</sup>

Outdoor space: 10 m<sup>2</sup>





### Type J:

Fourth and fifth floor

4x Apartment

Total surface area: 139 m<sup>2</sup>

Outdoor space: 18 m<sup>2</sup>

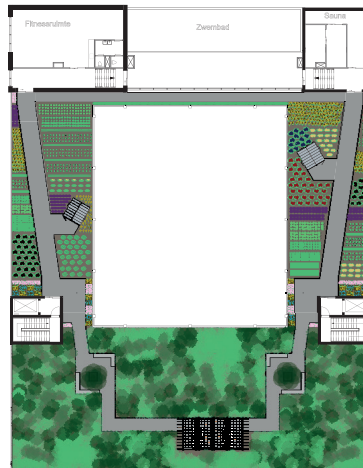
*Social collectiveness*





One of my design principles was to promote social encounters between the residents and to provide leisure activities which could form the basis of new social networks. This is an essential part of the design for a residential building for the Young-old as the centre of their social relations will shift from work-related to social related activities. My design offers different spaces where different leisure activities can take place.

The rooftop plays an important role in this aspect. Firstly some high-end leisure facilities are located on the roof. These include a swimming pool, a sauna and a fitness room. They can be used by the residents to work out and/or relax together. The fitness room can be used for multiple purposes as it is a flexible space with a coffee counter and toilets. The sauna also contains a dressing room and a shower area. Secondly a large vegetable garden is located on the roof. The residents can grow their own food here. Thirdly the final part of the rooftop garden provides some nice spots with seating areas where they can meet up with people for example a BBQ or just a good conversation.



**Right**  
Floorplan of the roof



*Above*  
*Swimming pool*

*Facing page*  
*Vegetable garden*

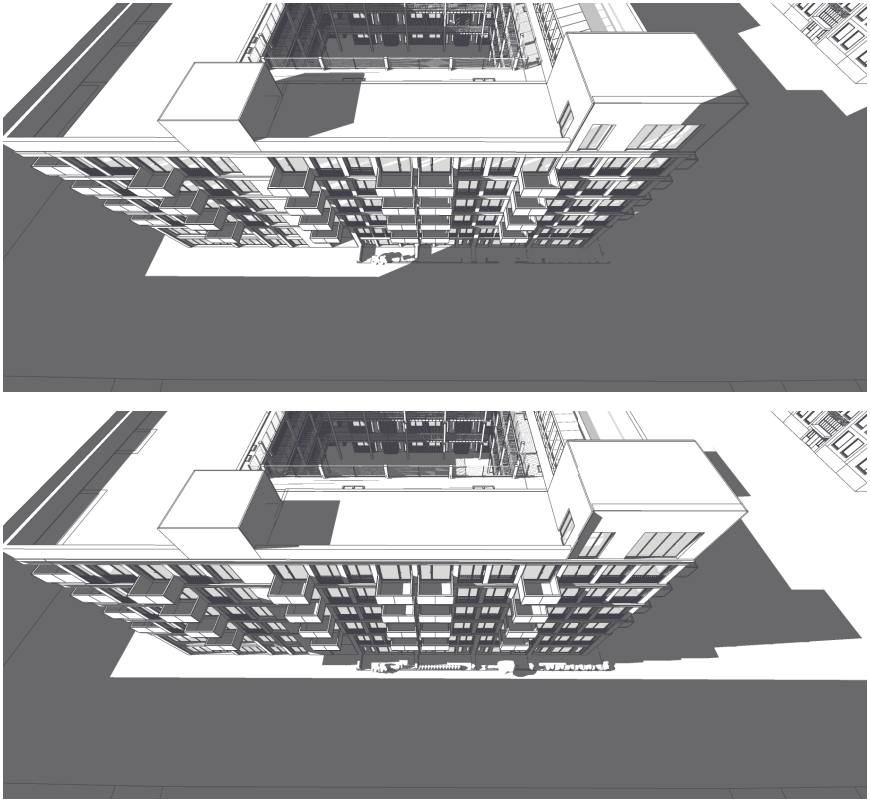


The inner courtyard is a calm place, where the residents can relax. It brings nature into the building block. This garden ensures that all the residents see nature when they look out their windows, which helps people to feel more at ease in the building. It is a place where more spontaneous social encounters occur as all the residents who walk from and to their dwelling pass through it or can be seen from it.

Simultaneously the widened galleries in combination with the bulging fuse boxes provide the residents the opportunity to appropriate a part of the gallery. They can for example place a bench in front of their window to sit down and read the newspaper while they watch their neighbours pass by or relax in the courtyard.

Finally every dwelling has large windows towards the gallery. These ensure that people who pass by the dwellings can look into them and that the people in the dwellings can oversee the gallery and inner courtyard. This enhances the social control between the residents and promotes that people reach out to their neighbours in case of a problem or a request.

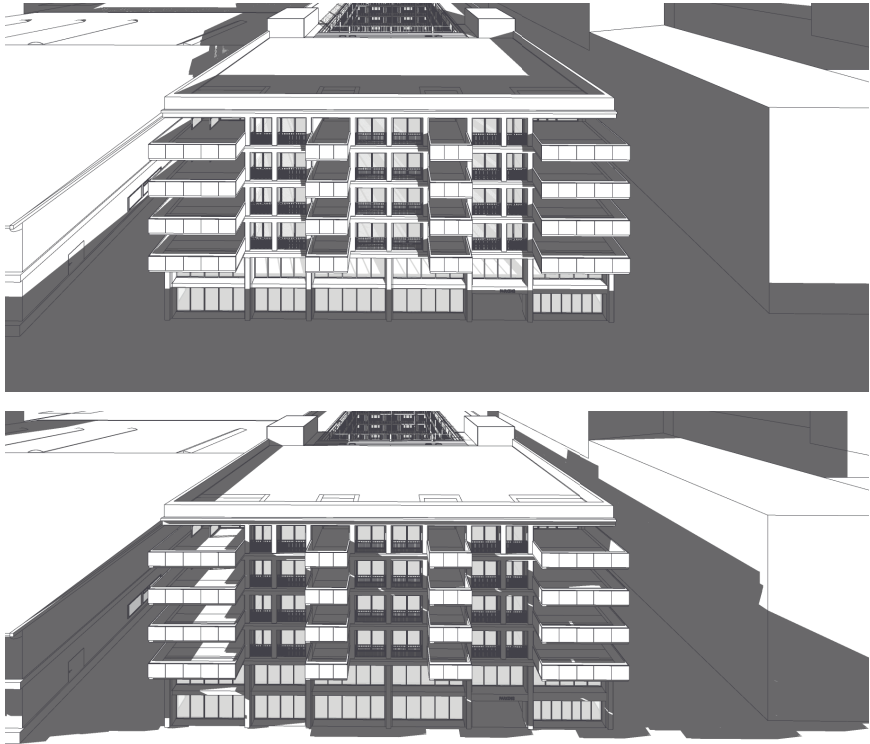




*Above*

Shadow analysis of the north east facade  
top to bottom 08.20, 10.00

To prove that all the outdoor spaces are of a good quality a shadow analysis has been done. The goal of the analysis was to prove that each dwelling has a private outdoor space which has at least two hours of sun per day. I have chosen 21 of march as this is the day with the most average sunhours in a year. The analysis above show the sun hours on the north east facade. This facade has the less sunhours, but the galleries on the opposite side of the dwellings can compensate as they get plenty of sun throughout the day.



The analysis above show the sun hours on the south east facade. This facade gets the most sunhours. For this reason the dwellings connected to this facade are deeper. Furthermore the balconies on this side turn in to loggias to reduce the solar load in summer.

*Above*

Shadow analysis of the south east facade  
top to bottom 07.00, 15.00



The analysis above show the sun hours on the north west facade. The outdoor spaces at this facade will get sun light from 15.20 until sunset.

The analysis on the facing page show the sun hours on the south west facade. The gardens get direct sunlight from 10.30 until 13.00. The balconies above keep direct sunlight until 17.00.

***Above***

Shadow analysis of the north west facade  
top to bottom 15.20, 17.00

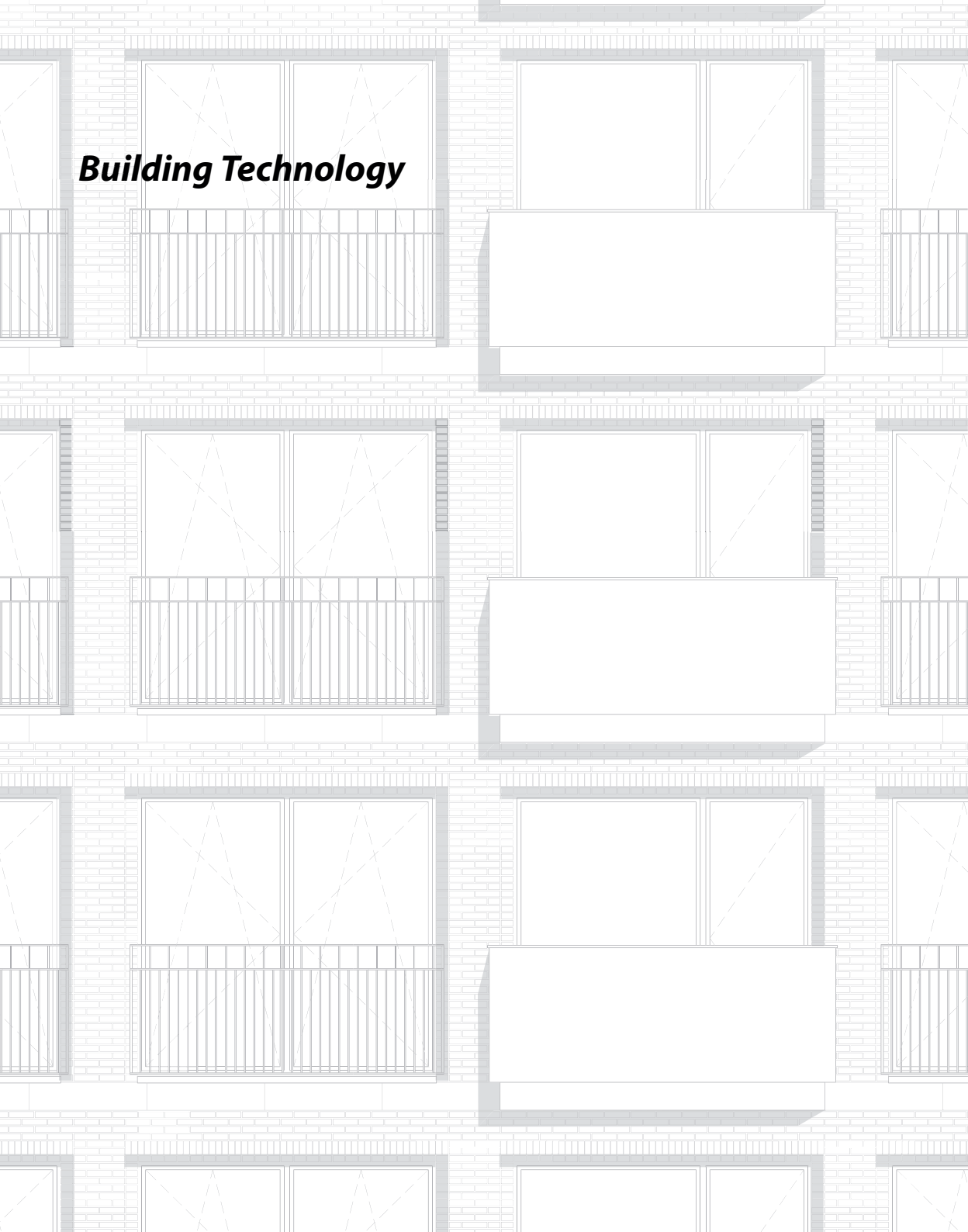
***Facing page***

Shadow analysis of the south west facade  
top to bottom 10.30, 13.00, 17.00





***Building Technology***

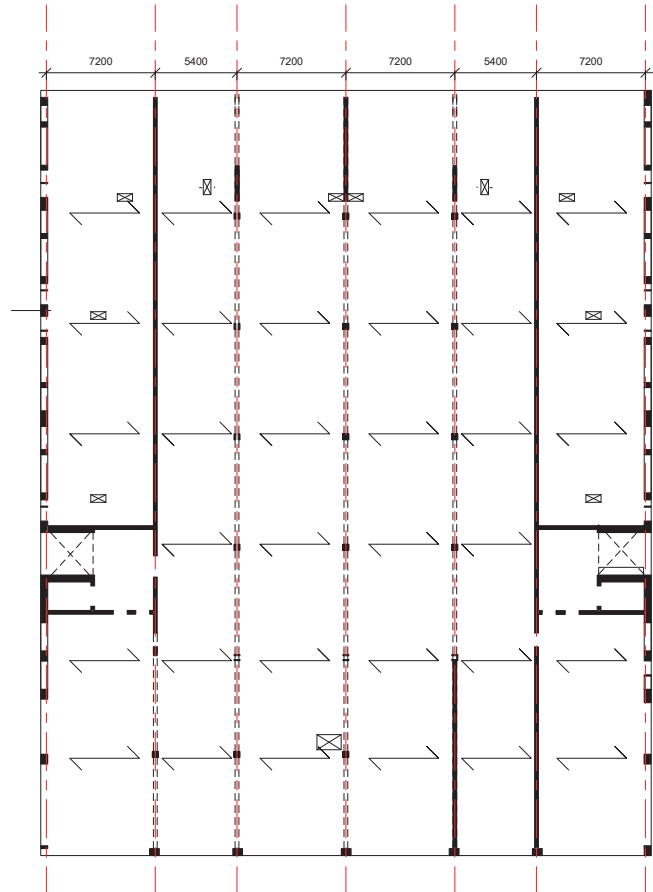
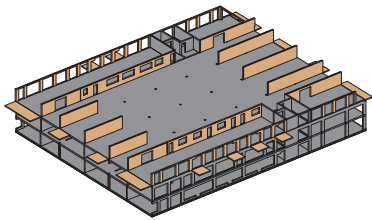
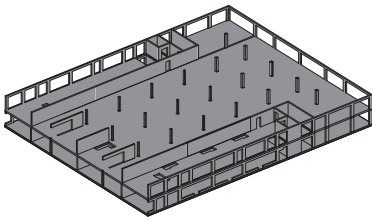
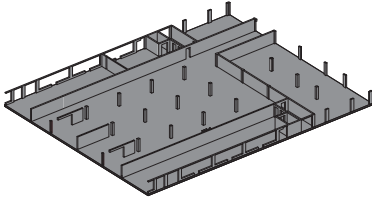


### ***Building structure***

The type of structure and materials used in the building are mainly chosen with the aim to design a sustainable building that has a small footprint.

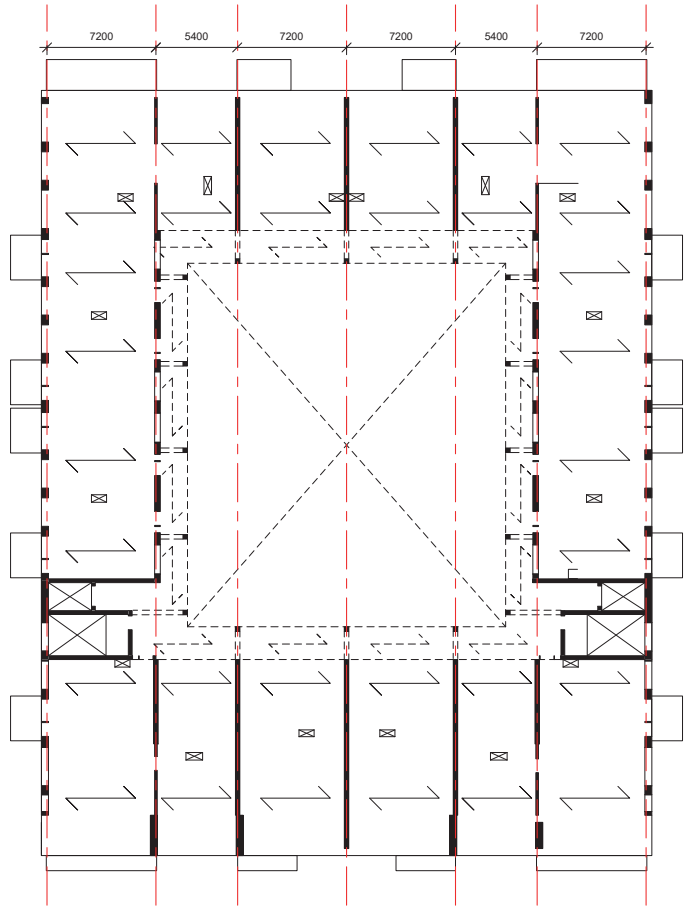
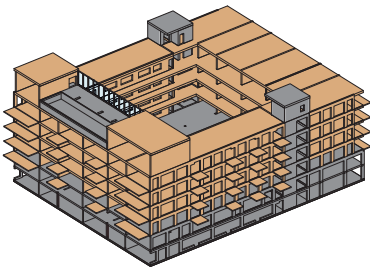
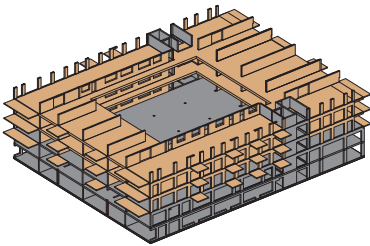
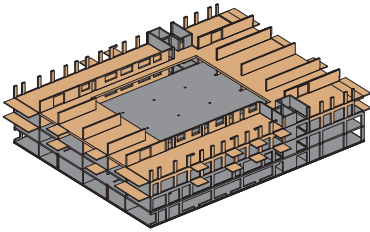
The base of the building is constructed with concrete columns and floors. This makes it possible to design a parking garage and commercial spaces with a flexible layout. However more importantly the concrete can resist a possible flood. This is necessary as the building is located in an area which is not protected against flooding by dykes. Furthermore the cores of the building are constructed in concrete as well, to provide stability in the building.

On top of the two story concrete base the dwellings are constructed in wood. The structural walls are made of cross laminated timber (CLT) and the floors are made of a wooden hollow wooden floor system designed by Kerto-Ripa. These elements make up a lightweight structure, which can be completely pre-fabricated. This makes that the foundation of the building can be reduced and that the assembly time is shorter. In this way material and money can be saved. I have chosen for the hollow wooden floor system by Kerto-Ripa, as these wooden floors can make larger spans than other wooden floors with the same thickness.



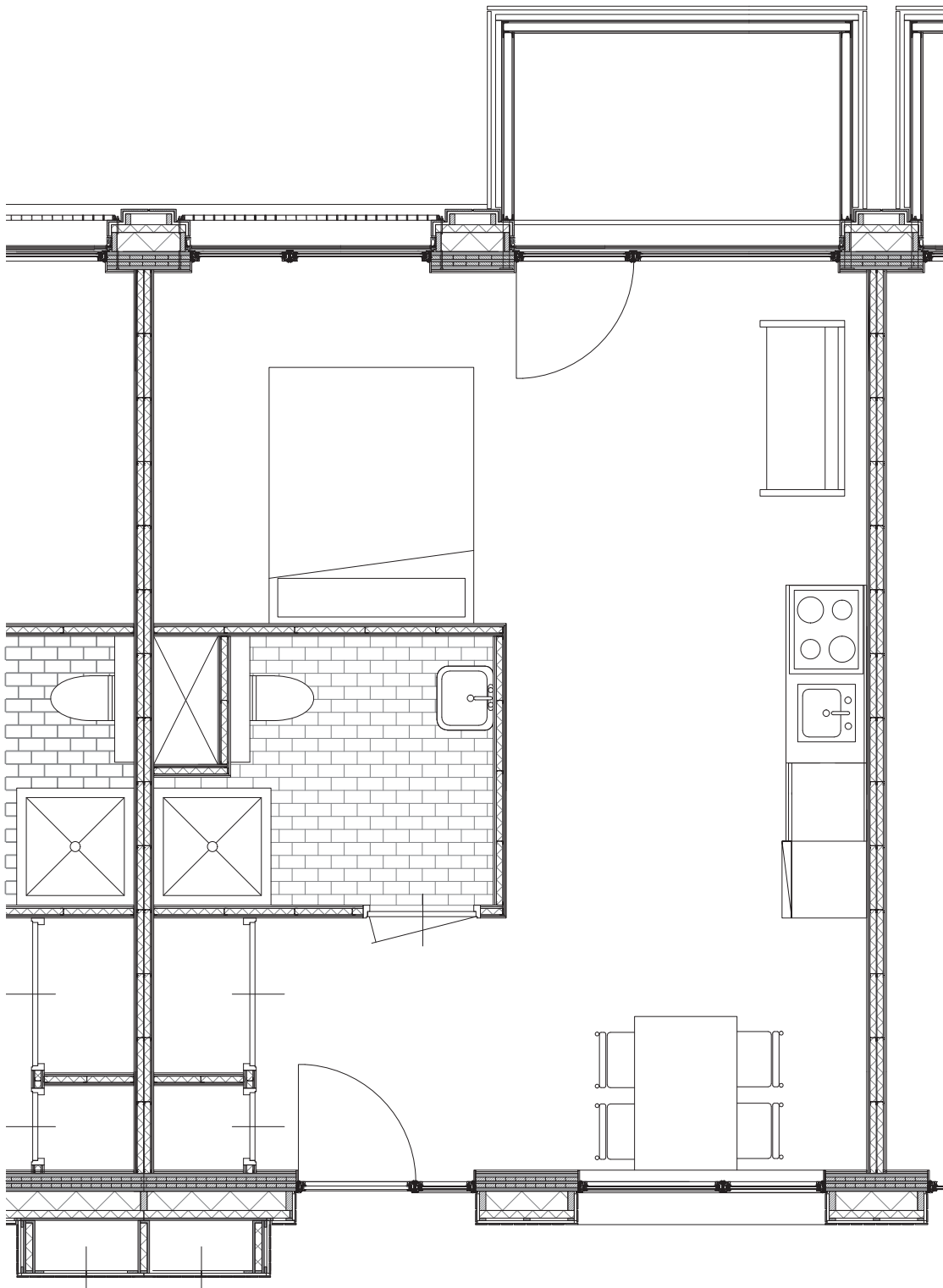
*On this page*  
structural plan concrete  
structure 1:500

*On facing page*  
structural plan wooden  
structure 1:500



The floorplan on the facing page shows the materialisation of all the walls of a model dwelling. The facades are build up from the structural walls of CLT, insulation and a cladding. Because the facades are the structural walls the seperation walls between the dwellings can be designed thinner to gain surface area for the dwellings. The chosen metal stud seperation wall is 125 mm thinner than a load bearing seperation wall of CLT. This results that the dwellings have 0,9 m<sup>2</sup> extra usable floor space. Also the room seperation walls are made of metal stud.

*On facing page*  
*floor plan type F 1:50*





*Above*  
*'Salami' brick of stonecycling*  
*Platowood popular*  
*Colorblast solarpanel*

*On facing page*  
*South west facade*

## Materials

The base for my decisions regarding the materials used in the facades was threefold. Firstly the facades should fit to their surrounding, secondly the materials should be sustainable and environmental friendly and thirdly the maintenance should be limited to limit the nuisance for the residents.

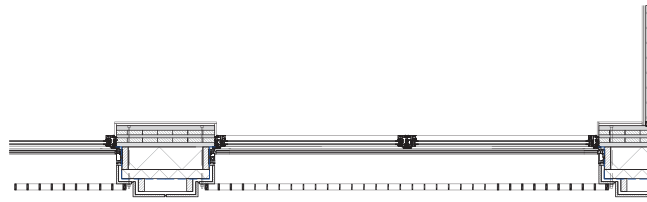
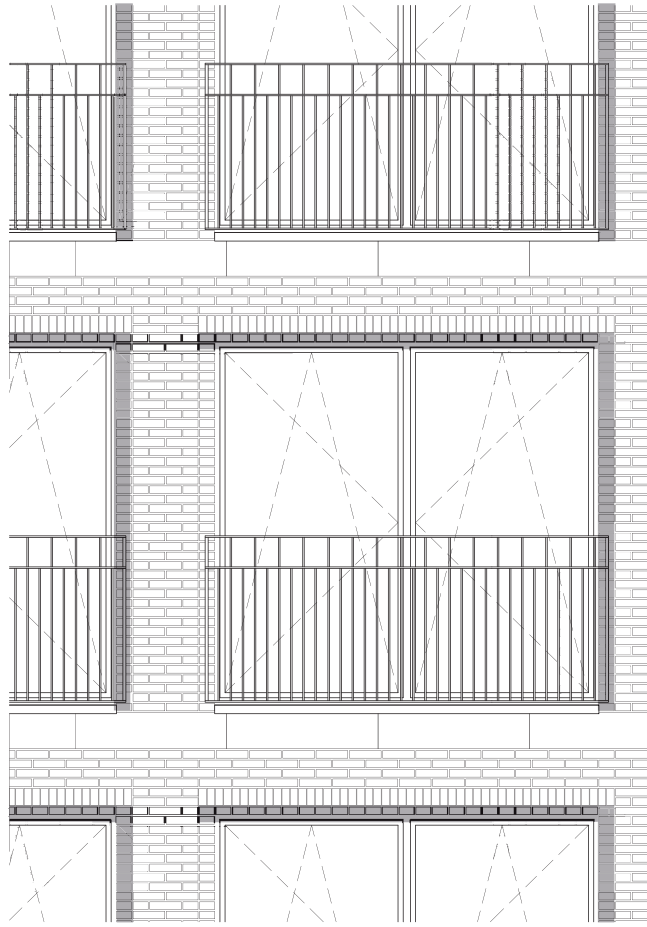
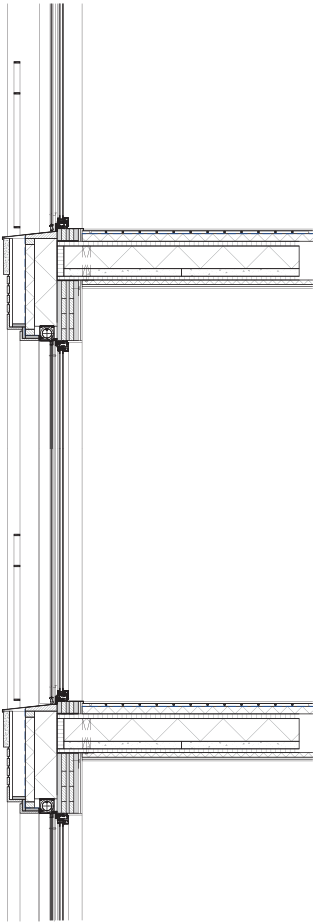
As most of the surrounding buildings are clad with bricks, my outer facades should also have a brick look to fit with the other buildings. Bricks are not the most environmental friendly material as a lot of CO<sub>2</sub> is released during the production of bricks. For this reason I will make use of bricks from StoneCycling. These bricks are made from at least 60% waste. This means that per m<sup>2</sup> of bricks 23 kg of waste is upcycled. In addition, to reduce the weight and the amount of material used in the facade, I chose to make use of brick slips.

The inner courtyard is as mentioned before intended as a calm place in contrast to the vibrant city. It brings nature into the building block. To make sure that the facade fits with this idea it is clad with wood. As wood is a natural material it is regarded as a very environmental friendly material. To limit the maintenance, the facades will be clad with Platowood. Where other processes often only consist of drying and heating, to up to 200 to 230 degrees Celsius, the unique Platowood process consists of three steps, during which water and heat are used to reinforce the wood. Platonising under relatively low temperatures is the best method, as the wood maintains its cellular structure and with it, all of its good characteristics. This technology requires only water and heat. No chemical substances are added. The result of this technique is that there will be fewer cracks in any applied finish and there will be more time before the wood needs maintenance.

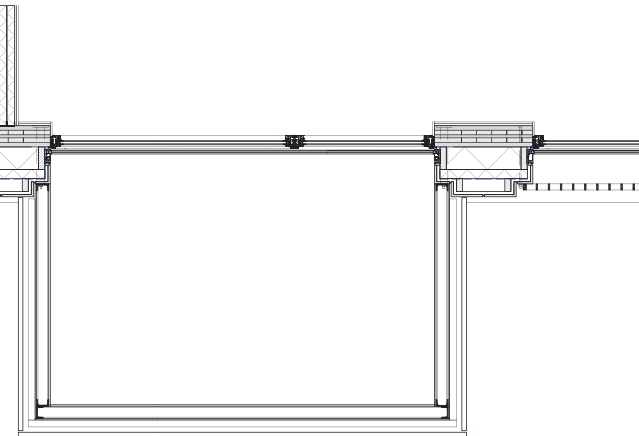
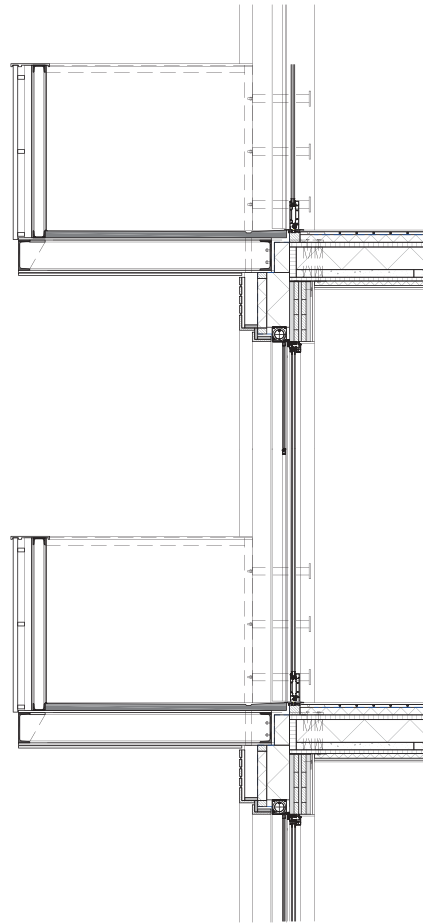
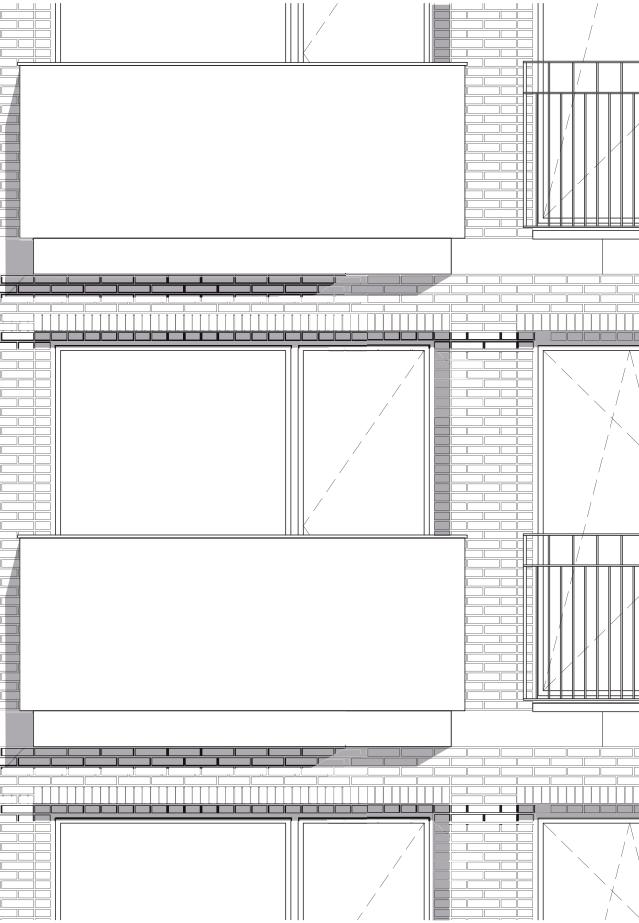


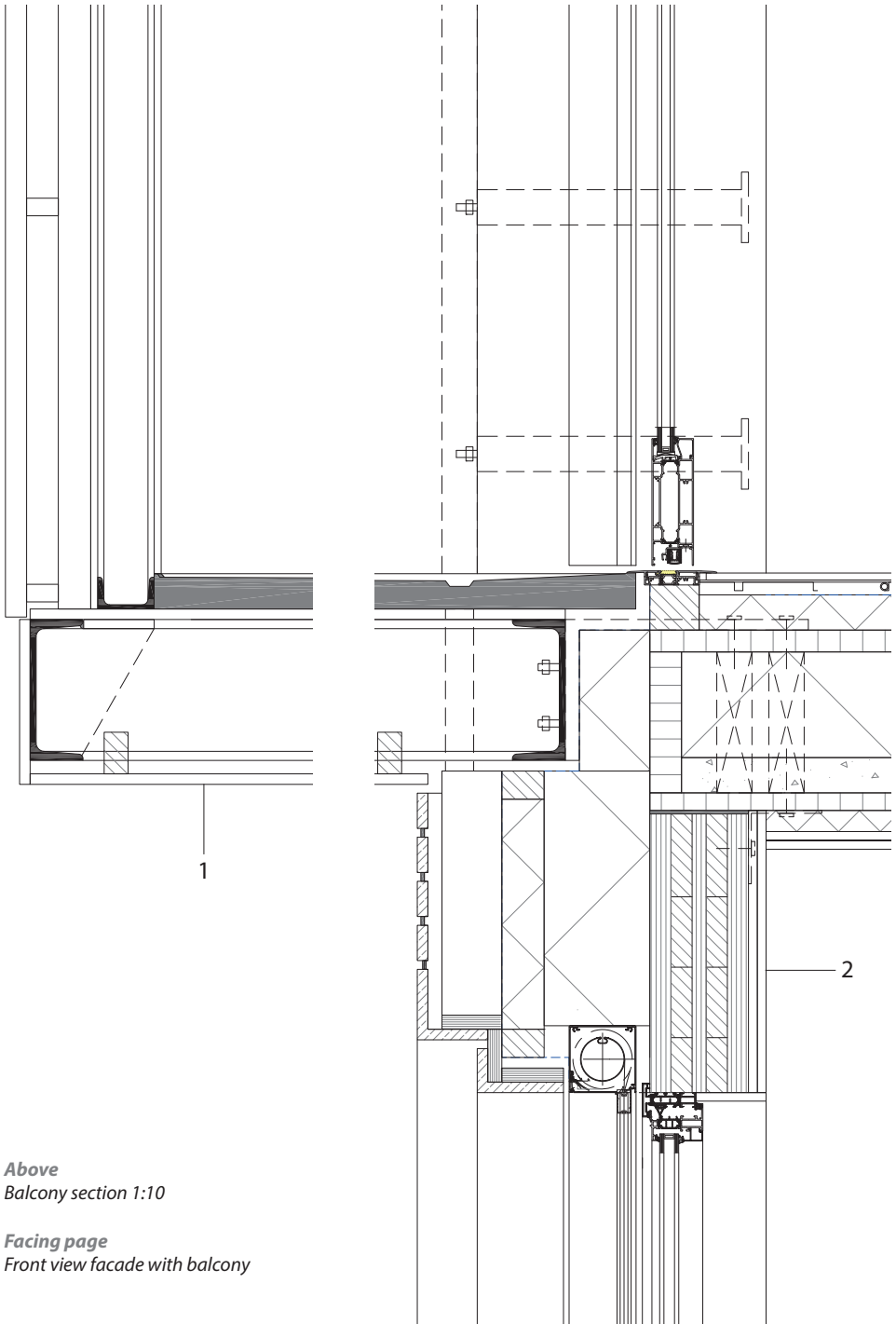
In order to make a sustainable design it is also necessary that the building generates energy. for this reason most buildings have pv-panels on the roof. As the roof of my design is completely accessible and has an other function than generating electricity I decided to integrate the pv-panels in the facades. All the balustrades of the balconies are cladded with pv-panels. In addition the edge of the roof and the buiidling blocks on the roof are also all cladded with pv-panels. Kameleon solar have developed Colorblast solar panels, which are colored solar panels with a high efficiency. These panels create an optical illusion of an even color from a distance of approximately 5 meters. On the elevation below it is shown what the effect is of the pv-panels for the appearance of the facade.





*Above*  
*Facade element 1:50*





*Above*  
*Balcony section 1:10*

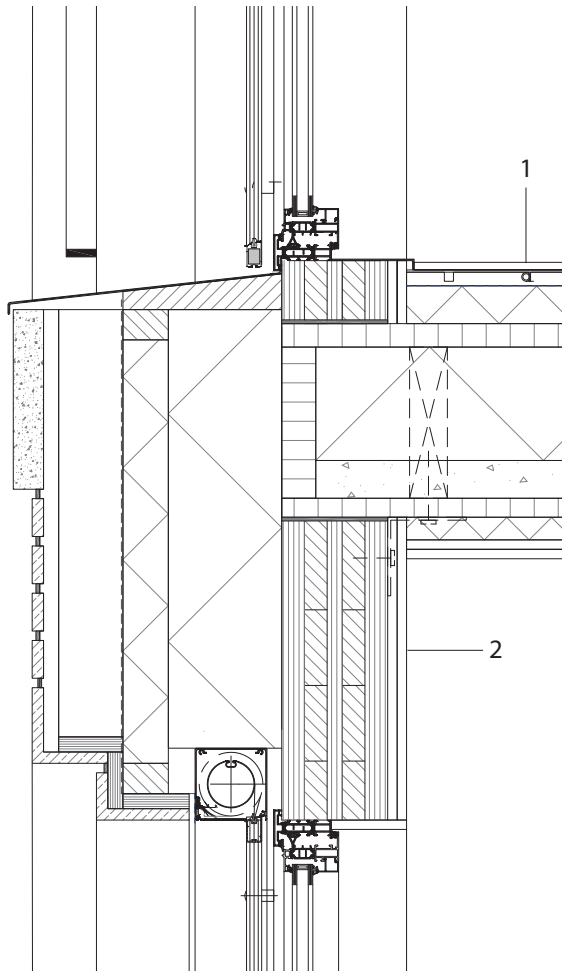
*Facing page*  
*Front view facade with balcony*



- 1 balcony floor:  
colorcoated polyester steel plate,  
battens  
UNP 200 steel Profile,  
prefabricated floor of glassfiber reinforced  
polyester
  
- 2 facade wall:  
2x 12,5 mm Plasterboard  
140 mm CLT wall  
150 mm insulation between vertical mullions  
60 mm insulation between horizontal mullions  
40 x 85 mm vertical battens  
brick strips glued on panel



- 1 floor:
  - finishing floor
  - 3 mm filling mass
  - 18 mm fermacell studded plate with heating pipes
  - 50 mm impact sound insulation
  - 31 mm plywood
  - 150 mm insulation between 45/200 mm gluelam ribs
  - 50 mm concrete tiles for acoustics
  - 25 mm plywood,
  - 30 mm spring saddle insulation
  - 2x 15 mm plasterboard
  
- 2 facade wall:
  - 2x 12,5 mm Plasterboard
  - 140 mm CLT wall
  - 150 mm insulation between vertical mullions
  - 60 mm insulation between horizontal mullions
  - 40 x 85 mm vertical battens
  - brick strips glued on panel



*Above*  
Facade section 1:10

*Facing page*  
Front view facade

**Below**

*View inner courtyard*

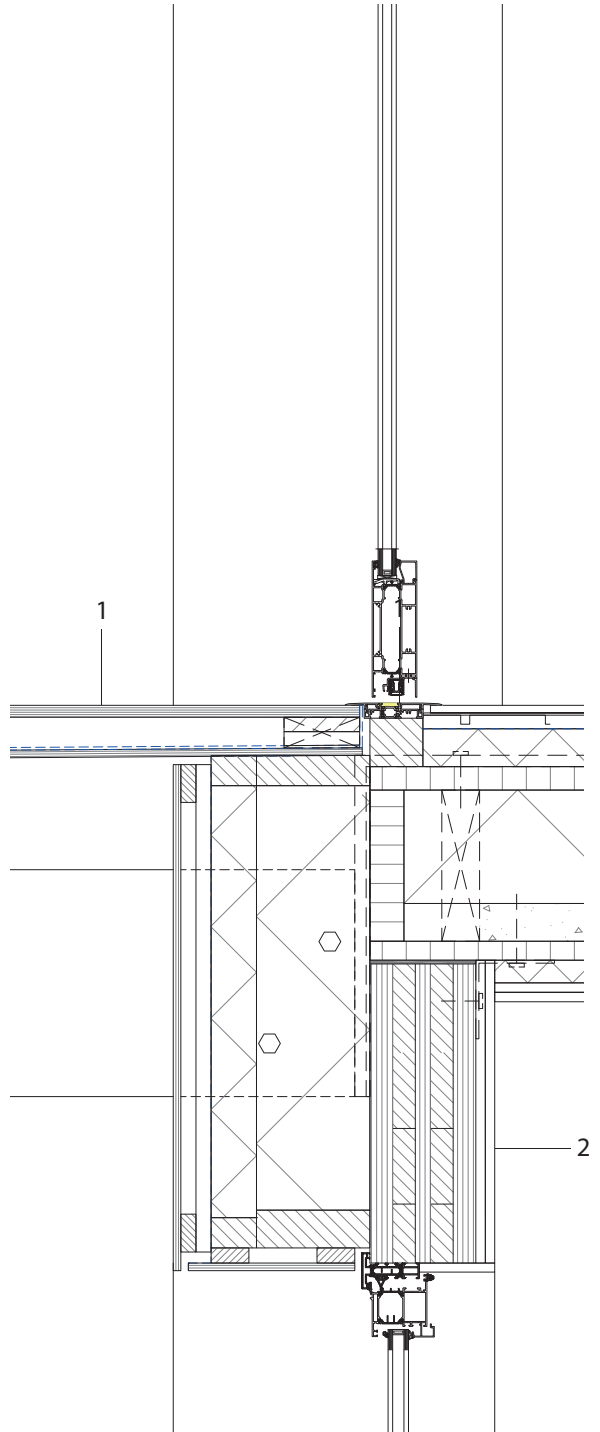
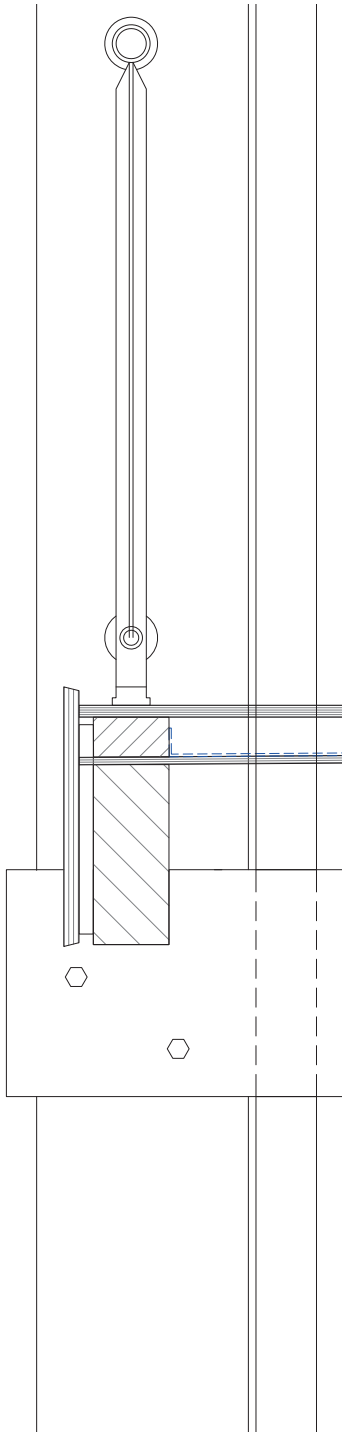
**Facing page**

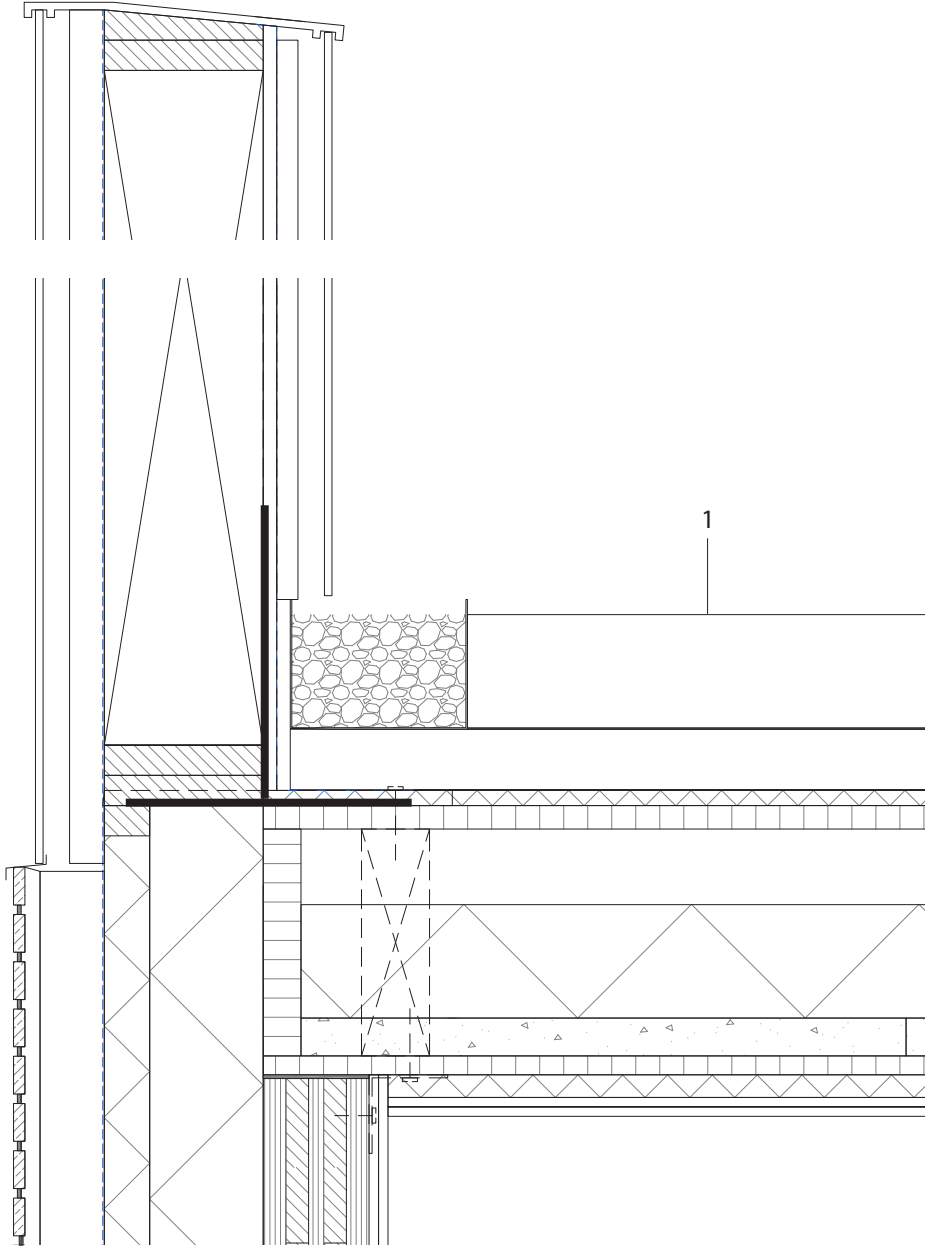
*Gallery section 1:10*

- 1 gallery:
  - composite deck plates
  - wooden battens placed on slope
  - EPDM foil
  - 18 mm plywood
  - 240/100 mm wooden beams
  - 300/140 mm wooden beams
  
- 2 inner facade wall
  - 2x 12,5 mm plasterboard
  - 140 mm CLT wall
  - 150 mm insulation between vertical mullions
  - 60 mm insulation between horizontal mullions
  - vertical wooden cladding on racking









*Below*  
View rooftop garden

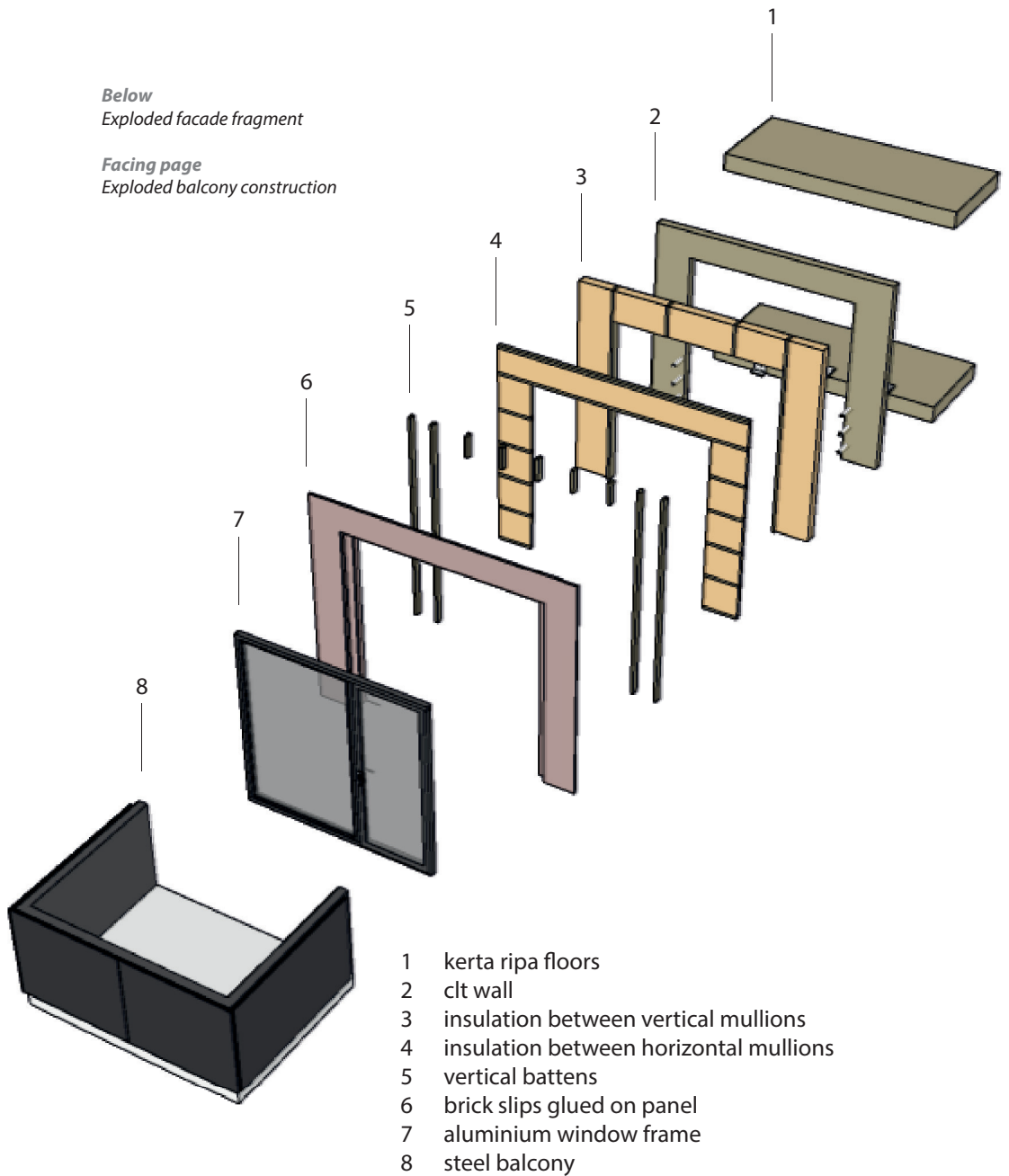
*Facing page*  
Roof section 1:10

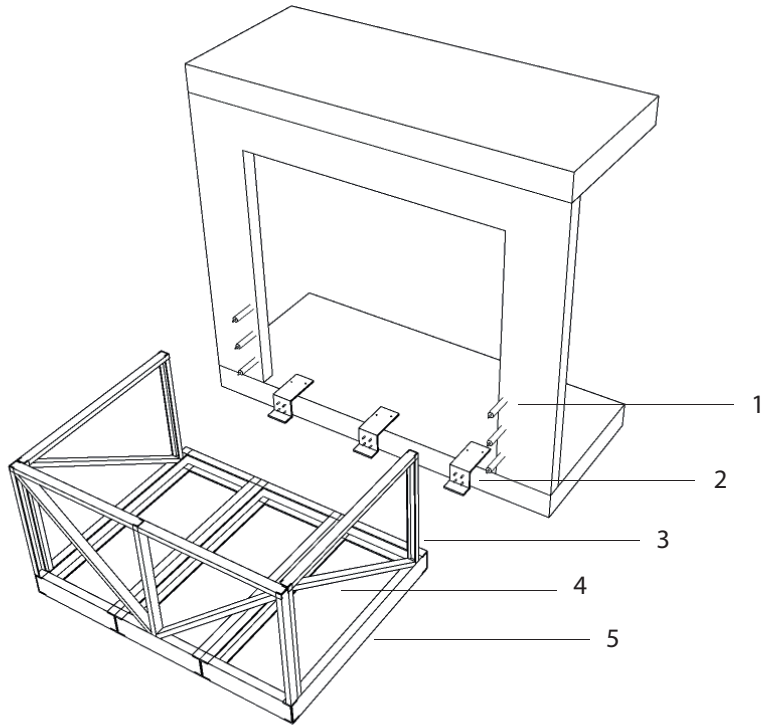
- 1 polderdak:  
vegetation  
120-250 mm Optigrün extensive substrate  
E filling mass  
3,6 mm Optigrün filter- en capillary layer RMS 500K  
80 mm Optigrün waterretention layer WRB 80F  
3 mm Optigrün protect absorption layer RMS 300  
root and water barrier  
20 mm insulation  
31 mm plywood  
150 mm insulation between 45/300 mm  
gluelam ribs  
50 mm concrete tiles for acoustics  
25 mm plywood  
30 mm spring saddle insulation  
2x 15 mm plasterboard  
  
total thickness 664 mm



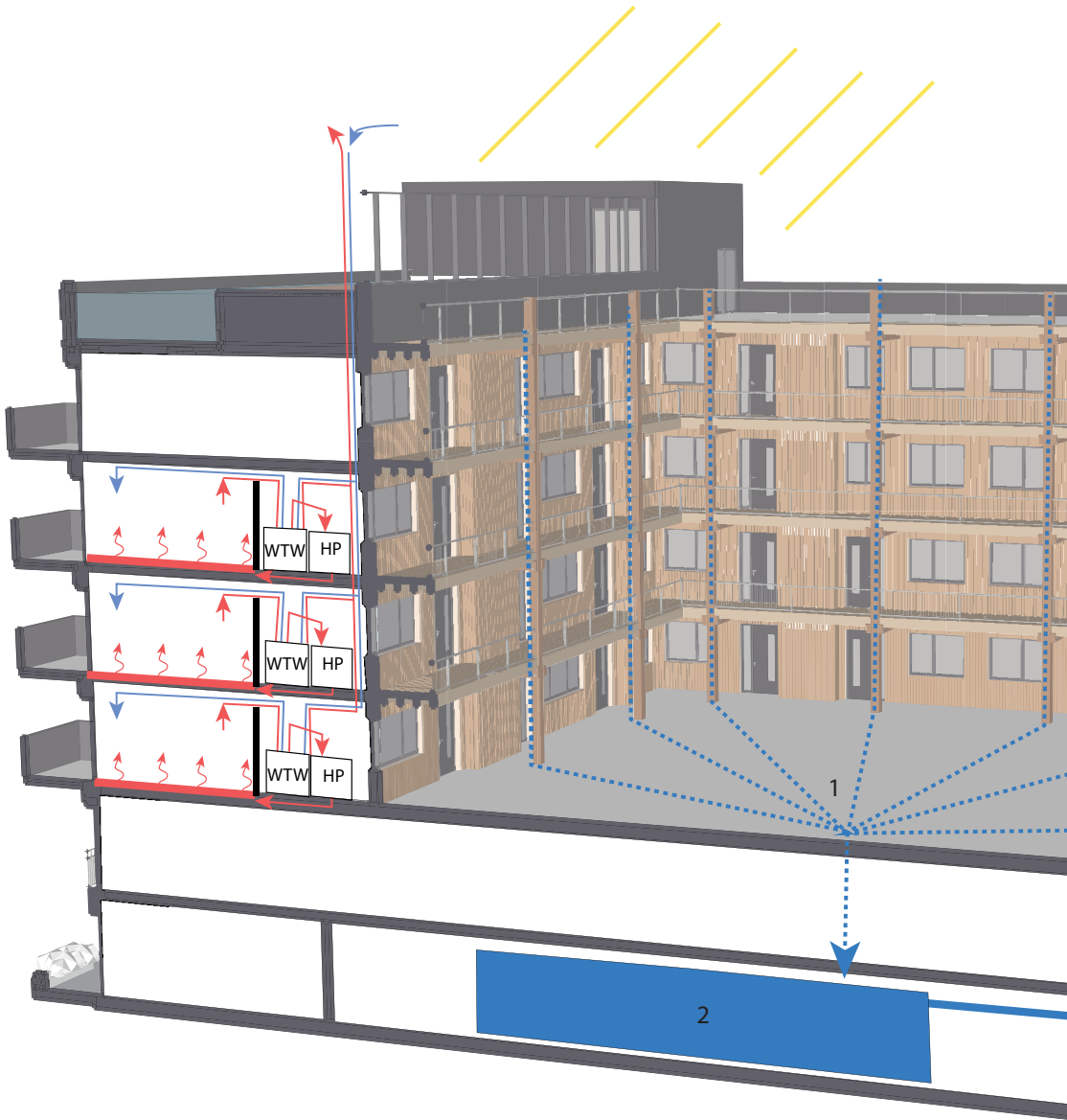
*Below*  
Exploded facade fragment

*Facing page*  
Exploded balcony construction

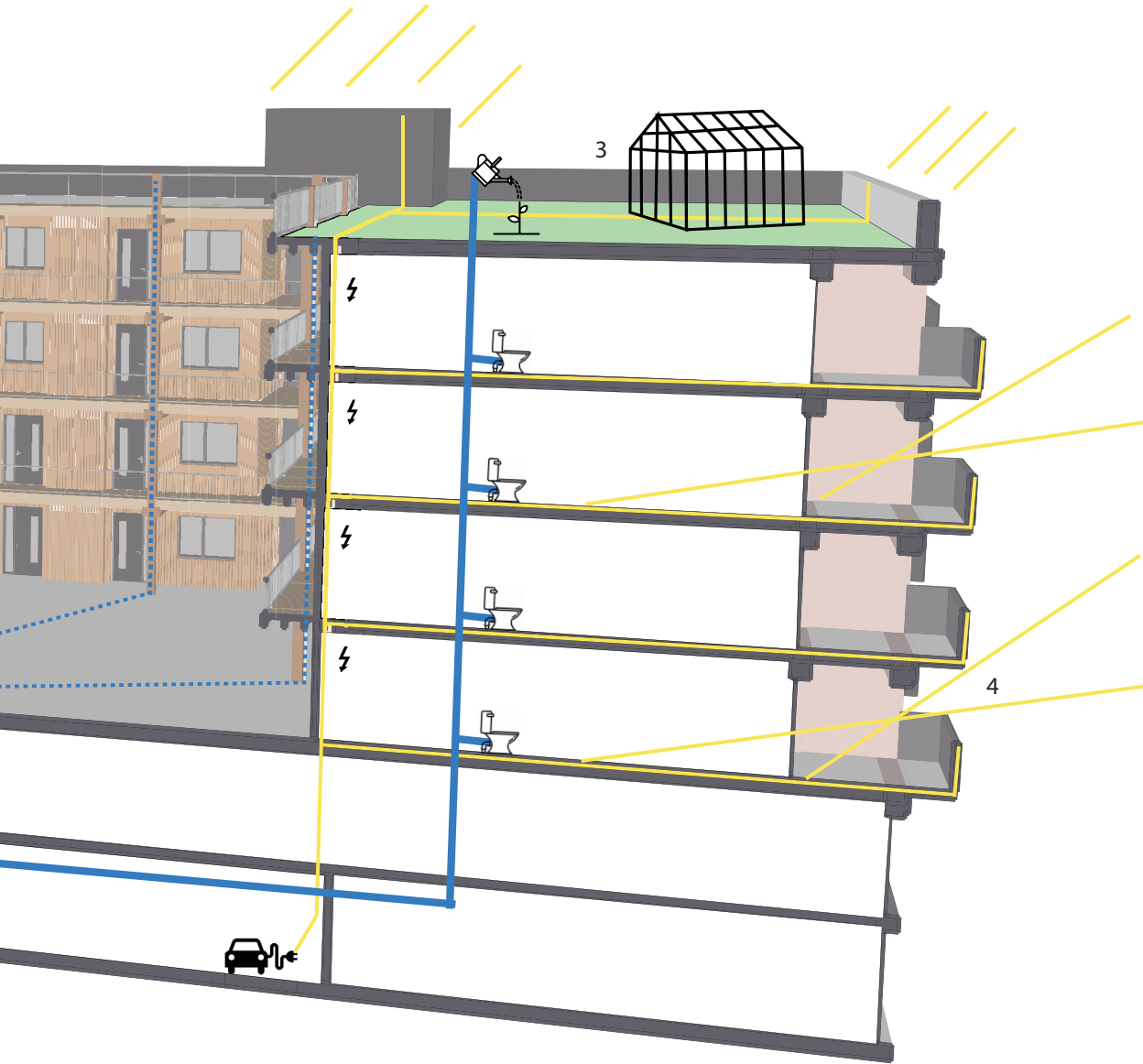


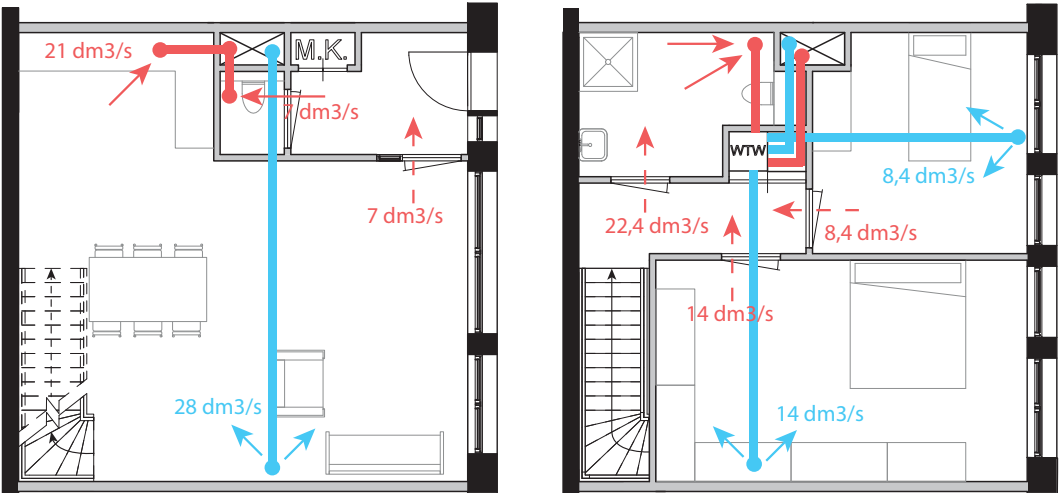


- 1 50 mm steel pipe
- 2 steel strips mounted on floor
- 3 steel frame UNP 80 beams
- 4 20 mm steel strip
- 5 steel frame UNP 200 beams



- 1 filter
- 2 water storage
- 3 vegetable garden on the roof
- 4 south facing loggia blocking summer sun
- 5 car chargingstation by pv-panels





**Above**  
Ventilation scheme dwelling  
type A1, the ventiation pipes  
are integrated in the floor  
systems.



### ***Water management***

Because of the changing climate rainfall in the Netherlands will increase and this has an effect on the way we need to design our buildings and public spaces. If we do nothing the sewage system will overload and this will effect in flooded streets. To counter this it is important that our buildings and public spaces can retain water, to relieve the pressure on the sewage system. For this reason the rooftop garden in my design is a so called 'polderdak'. This makes that the water is retained on the roof before it is slowly carried off. The water is subsequently carried to a large water storage on the ground floor. This storage has a capacity of 103 m<sup>3</sup> to retain 8% of the yearly precipitation on the roof. This water can be used to flush the toilets and water the plants in the communal gardens.

### ***Generating energy***

As mentioned before all the balustrades of the balconies are clad with pv-panels. In addition the edge of the roof and the building blocks on the roof are also clad with pv-panels. In total 1317 m<sup>2</sup> of pv-panels are present on the building. The total output is approximately 180 MWh which could provide 63 two-person households with average usage. The generated energy can also be used to charge the electrical cars in the parking garage.

### ***Heating and ventilation***

Each dwelling has its own installation room with a heat exchanger and a heat pump. In combination with floor heating and ventilation system D the system can heat the rooms with the excessive heat of the exhaust air of the ventilation.



*Above*  
*View from the courtyard*

*Facing page*  
*View from the park*

## **Result**

My design is a closed residential block in the 'Keilekwartier' in Rotterdam. From the outside its brick facade with decorative profiles fits the character of the surrounding former harbour buildings. By penetrating the center of the building with a courtyard, daylight can enter the entire building. This courtyard forms a calm oasis where the residents can come at ease and together with the rooftop garden it plays an important role in promoting social encounters between the residents. All of the dwellings offer the residents private indoor and outdoor spaces of a good quality. These spaces are also accessible for people with mobility issues. By constructing most of the building in wood and selecting sustainable and environmental friendly materials the impact of my design on the environment is limited. The effects of the water retention, energy generation and food production can even be seen as positive for the environment. The combination of all of this makes the design an adequate home for 132 active elders.







## Notes

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- 2 Ibid.
- 3 **World Health organization**, Global age-friendly cities: a guide, Geneva, 2007, pp 3-4
- 4 **Vero, D.**, The Age of Urban Ageing, an overview of different social and spatial answers to ageing. Torino, 2016
- 5 **World Health organization**, Global age-friendly cities: a guide, Geneva, 2007, pp 3-4
- 6 **Simpson, D.**, Third Age Urbanism: Riterement utopias of the young-old, Zurich, 2010 pp 29-31
- 7 Ibid. pp 31-35
- 8 Ibid. pp 31-35
- 9 Ibid. pp 31-35
- 10 Ibid. pp 31-35
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- 12 Ibid. pp 31-35
- 13 **Neugarten, B.**, The Young-Old and the Age-Irrelevant Society. In The Meanings of Age, Chigaco, 1996
- 14 **Laslett, P.**, A fresh map of life: the Emergence of the Third Age, Cambridge, 1989
- 15 Ibid.
- 16 Ibid.
- 17 **Höpflinger, F.**, "The Second Half of Life: A Period of Life in Transition." In New Approaches to Housing for the Second Half of Life, edited by Andreas Huber, 31-46. Basel: Birkhäuser, 2008.
- 18 **Simpson, D.**, Third Age Urbanism: Riterement utopias of the young-old, Zurich, 2010 p 44
- 19 Ibid. pp 44-51
- 20 Ibid. p 47
- 21 Ibid. pp 47-48
- 22 **Höpflinger, F.**, "The Second Half of Life:

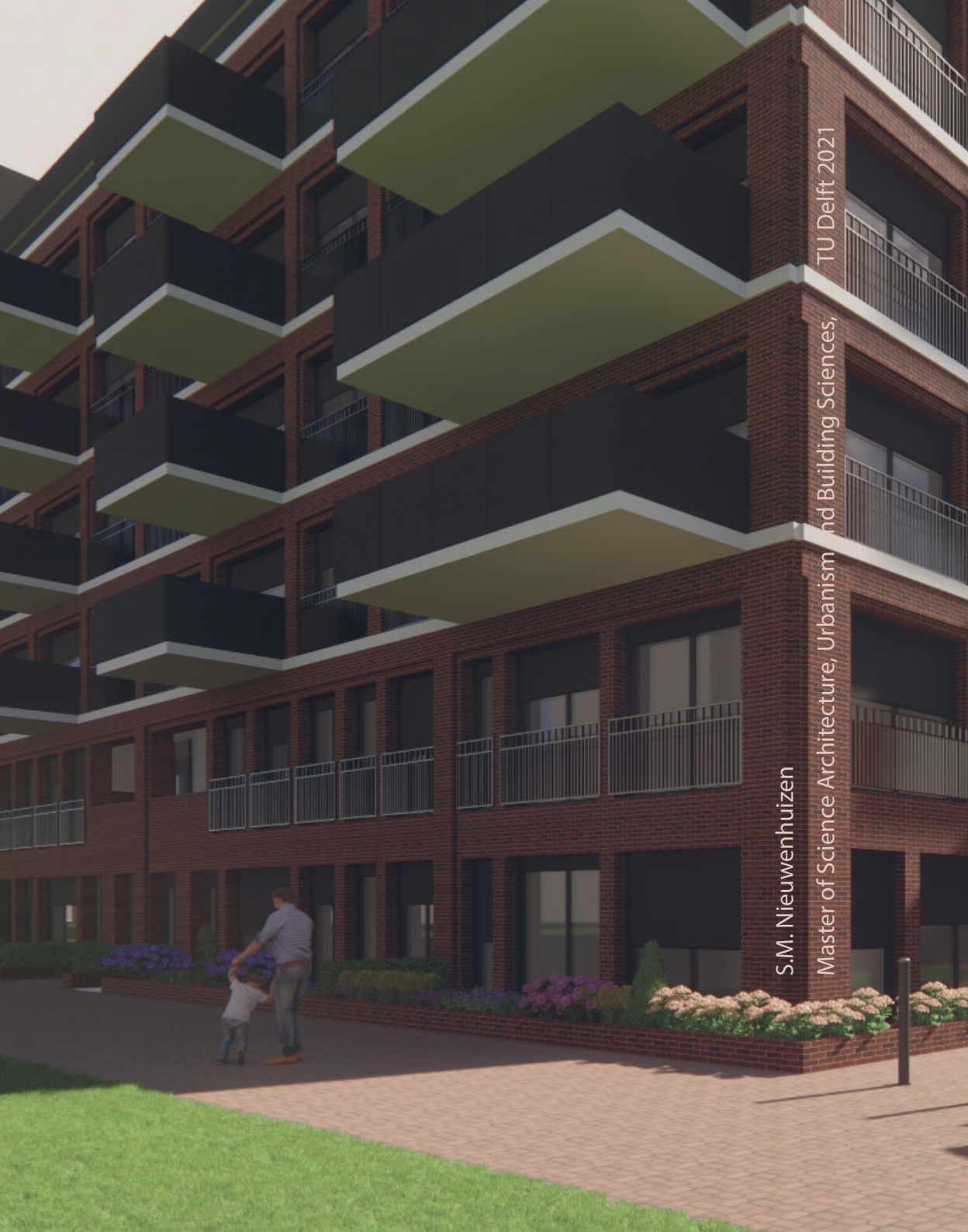
- A Period of Life in Transition." In *New Approaches to Housing for the Second Half of Life*, edited by Andreas Huber, 31-46. Basel: Birkhäuser, 2008
- 23 **Simpson, D.**, *Third Age Urbanism: Retirement utopias of the young-old*, Zurich, 2010 pp 49-51
  - 24 **Ministerie van Volksgezondheid, Welzijn en Sport**, *Programma Langer Thuis*. Den Haag, 2018, pp 6-9
  - 25 *Ibid.* pp 41-46
  - 26 **World Health organization**, *Global age-friendly cities: a guide*, Geneva, 2007, pp 4-11
  - 27 *Ibid.* pp 18-19
  - 28 *Ibid.* pp 16-17
  - 29 *Ibid.* pp 30-35
  - 30 *Ibid.* p 44
  - 31 **W&I Group BV**, *Binding met Rotterdam, Social marketing onderzoek onder hoogopgeleiden. Deel 1:Belevingswereld per doelgroep*. Rotterdam, p 5
  - 32 **Gemeente Rotterdam**, *Uitvoeringsprogramma Rotterdam Ouder & Wijzer Rotterdam*, 2019
  - 33 *Ibid.* pp 23-36
  - 34 **W&I Group BV**, *Binding met Rotterdam, Social marketing onderzoek onder hoogopgeleiden. Deel 1:Belevingswereld per doelgroep*. Rotterdam, pp 43-49
  - 35 *Ibid.* pp 43-49
  - 36 **Höppner, R. & Snoep, K.**, *Onderzoek naar woonwensen van herontdekkers en young professionals*. Rotterdam, 2015, pp 5-18
  - 37 **Bpd Mosaic**, *Doelgroepsegmentatie En Woon(Milieu)Voorkeuren*. Amsterdam: BPD afdeling Research, 2016, pp 34-60
  - 38 **CBS**, *55-plussers over hun (toekomstige) woning*. Den Haag, 2020, pp 10-11
  - 39 **Springco**, *Samenvatting rapportage De grote omgevingstest in de provincie Zuid Holland*, 2018, retrieved from: [https://www.spring-co.nl/wp-con-](https://www.spring-co.nl/wp-con)

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- 40** CBS, 55-plussers over hun (toekomstige) woning. Den Haag, 2020, pp 11-12
- 41** Ibid. pp 11-12
- 42** Ibid. pp 12-16







S.M. Nieuwenhuizen

Master of Science Architecture, Urbanism and Building Sciences,

TU Delft 2021