AGING (IN) ARCHITECTURE

How to create a high quality & inclusive living environment in a 1980s housing complex at Bijlmerplein

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Colofon

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Graduation Studio Revitalising Heritage
Master Architecture, Urbanism and Building Sciences

Aging (in) Architecture

How to create a high quality & inclusive living environment in a 1980s housing complex at Bijlmerplein

Jennifer Lips

CONTENT

SUMMARY

Suitable housing and its availability: it seems to be a problem within almost every phase of the housing career in the Netherlands, as the housing market is stagnating. Our older generation is held responsible for this national problem, but why? Deliberate occupation of the familiar family home would be the easiest conclusion, but puts a heavy weight on this part of society. Particularly in the face of the global trend of ageing societies, this 'problem' would increase. The easy answer of putting the older generation away as the rebellion residents of the Netherlands, therefore needed some extra digging. If these empty-nesters are not relocating, as is apparently expected of them for having an abundance of living space, what does this say about their preferences of the living environment? Instead of solely designing senior-only apartment complexes, listening to this generation for the sake of letting this operation of flow in the housing market succeed, is of utmost importance and priority. When housing typologies are built which are not the most preferred alternative for this specific group, it is not likely that it will work as a viable solution to this national problem. To prevent this situation because of what is thought to be the best option for this generation, like senior complexes, engagement of this group is important. Instead of creating living environments focused on one generation or target group, the task within this research is to find a way to design inclusive and accessible living environments. Thereby, stagnation could be avoided in the future by this particular cause. After all, a mixture of different generations in the living environment is preferred both by older residents as by the general population. Within this task for diversification of the living environment for the sake of inclusivity, lies a hidden gem: a catalyst for the renovation task. By 2030, insulation of existing dwellings becomes mandatory in Europe for the sake of a climate-neutral society by 2050. When revitalizing existing living environments by means of an inclusivity and quality, the climate task could fit perfectly within this picture. Especially these existing living environments are a very important subject, as with this renovation task the Dutch built environment could and probably will visually change tremendously in the upcoming decades. Therefore, the valuation by stakeholders of the current appearance and functioning of living environments up for renovation, are important in the face of physical and emotional heritage. As a large percentage of the Dutch housing stock will be insulated in the upcoming 30 years, these values are of great importance to prevent any loss of potential heritage. Enlarging the lifespan of these living environments by diversification, inclusivity and a high quality of living can therefore be achieved, as is the case for the renovation design of Bijlmerplein, an urban, residential center in Amsterdam. From the research it turns out that it does pay off to take into account stakeholder valuations instead of wrapping the building in a blanket, because renovation can be revitalization rather than insulation.

1

Introduction

INTRODUCTION

"*Older people in too large houses main cause of housing crisis*" - Hofstede (Omroep West), 2021

"*Senior housing is the solution to housing shortage*" - de Lange (FD), 2021

"*The Dutch housing stock is like a department store full of Seven-League Boots for a population of Tom Thumbs.*" - van Bockxmeer (De Corresponden), 2022

"*Building homes for elderly will be given high priority*" - Ministry of Health, Welfare and Sport, 2021

"*Even though their house is too big and they have enough money, elderly don't want to move*"
- Obbink (Trouw), 2020

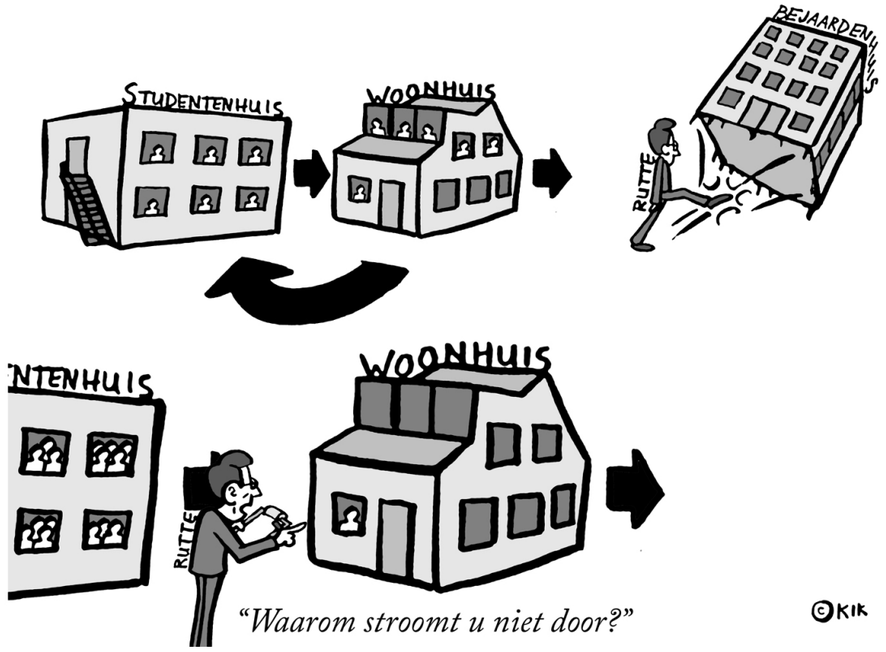
The urge of the rapid aging society and the associated housing shortage becomes clear from these Dutch newspapers and government agencies. This development is seen all over the world: Japan, Germany, Italy and Finland are some of the countries with an average over-65 population of at least 20%, followed by the Netherlands with 19% (PRB, 2021). In general, this age of 65 is when people are called 'elderly' in the Netherlands, according to the Dutch dictionary Van Dale: "a person over 65 to 70 years of age and usually retired; = over sixty-five-year-olds" (2022). In the remainder of this study, the term 'elderly' will be replaced by 'older adults' out of the belief that older people do not exist as a separate, monotonous group.

The current Dutch housing shortage is believed to be influenced by elderly continuing to live in their family home (Ryan, 2016; Obbink, 2020, Hofstede, 2021). 'Empty nesters' would hold up homes for young families, as relocation is stagnating (Team Stadszaken.nl, 2020). The financial daily newspaper FD claims solving this stagnation allows elderly to move into senior homes, only if they could be temped to move. However, Eelco Damen, former chairman of a healthcare organization, claims he's surprised by the lack of involvement of elderly in the design of senior complexes (FD, 2021). So the problem is not simply the lack of senior housing available (Mol, 2020), like De Lange claims in the financial daily paper (2021). The involvement of elderly in the design stage to create suitable housing, would plausibly make it possible to have elderly relocate (Demirbilek & Demirkan, 2004; Van Hoof et al., 2021). This participation is needed anyway, as it turns out lots of elderly do not even want to move at all (Obbink, 2020). ANBO, the General Dutch Association for the Elderly, claims this to be mostly due to lacking attention for "good and appropriate housing" for elderly (De Koster, 2019). Supplemented by Van Bockxmeer, emphasizing two-thirds of the Dutch housing stock consists of single-family dwellings, not meeting the current individualisation of households (2022). So what do older adults prefer in terms of a living environment?

At some point in time, older adults will encounter a point at which they are no longer able to live comfortably in their familiar home. The way my grandparents experienced this process, inspired me to start digging into what elderly really want and need when this happens. They did not feel like relocating unless there was no alternative, as those were less than desirable. This more human side, what they really need to live should be the driver to let elderly relocate, and not just because they live alone in a single-family home. Imagine a staircase that becomes impassable or physical thresholds to and inside the house, facilities outside of walking distance or a lack of social interaction. Partly practical matters for which regulations are available, but this doesn't touch the social and emotional side. The inconveniences could lead to an increased amount of care or eventually relocating to a care home. Of course the current regulations on quality housing should not be left unnoticed, but the task is to find out what it is these might be lacking in terms of the human side.

As a matter of fact, older adults are not just living alone in their single-family homes because they are in the right place. Living independently at home for longer was imposed by the government when it cut budgets for care homes, as "institutional care" is very expensive (Wiles et al, 2011). Refering to the starting quotes, older adults are nowadays called the problem, the cause of the housing stagnation. A process explained by Benjamin Kikkert in a sketch of the governement, cutting budgets on care homes (2022). Creating more suitable houses then, sounds like a logical next step, but the need for this typology seems huge. The ANBO pointed in 2018 at a "shortage of 80.000 senior houses" which would increase with 20.000 every year, leading to a demand of 400.000 suitable homes in 2040 (Mol, 2020).

In the Netherlands as a whole, there's an enormous task to build one million homes before 2030, to solve the housing shortage (Cobouw, 2021). Suitable housing for older adults should definitely be taken into account in this task. Simultaneously the existing housing stock no longer meets the sustainability requirements in terms of insulation and energy consumption, factors of a qualitative living environment. Milieu Centraal even mentions 2 out of 3 Dutch homes to be insufficiently insulated for current climate requirements, coming down to at least 5 million homes (2021). Simply demolishing the insufficient buildings and creating new ones means that a huge amount of embodied energy is lost and has to be recreated. That's why the challenge in the Netherlands and worldwide, is to preserve and upgrade the existing housing stock. The stock built in the period of 1985-1995 in especially important, containing more than one million homes, 13% of the entire current Dutch housing stock. This period is not valued as much in terms of building quality or architecture. That's why valuing this building period characteristics would not only include an important part of the Dutch housing stock as an element of cultural heritage, but would also significantly help reaching future climate requirements by renovation. The case study elaborated in the research is such a 1980s typology, the 'woondek'. It's a typology mostly consisting of multifamily housing, a category to which more than 300.000 homes from the 1980s belong (CBS, 2021).



Benjamin Kikkert, 2022

Problem statement

The problems touched in this research, are the mismatch between the aging population and available housing stock, together with the housing shortage and upgrading of the existing housing stock. The focus of the research is on 1980s typology architecture within the field of cultural heritage and energy efficiency, combined with the chances for elderly, their preferences in the redesign of these homes and to what extent these can be incorporated into current building regulations.

So with this future growth of the housing stock, what is this 'suitable home' for older adults? Why does it seem to be impossible to create living environments for every type of resident, regardless of age? Do older adults truthfully prefer to live in a senior complex? So in short, are we, the Netherlands, building the right type of housing by creating senior complexes? This leads to a more general research question:

"How can an inclusive & high quality living environment be created in a 1980s housing complex at Bijlmerplein?"

This question will be answered by using the case study of Bijlmerplein, an urban area built in the 80s and one of the current centers of Amsterdam. According to a governmental study by RIGO about the quality of life in Dutch neighbourhoods, called the 'Leefbaarometer', Bijlmerplein has a quite low quality of living (2019). Therefore, research into a high quality living environment is very applicable and relevant in this case study.

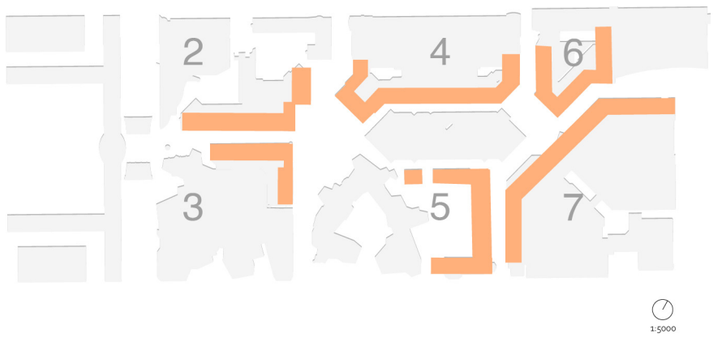
Context: Bijlmerplein - Amsterdam

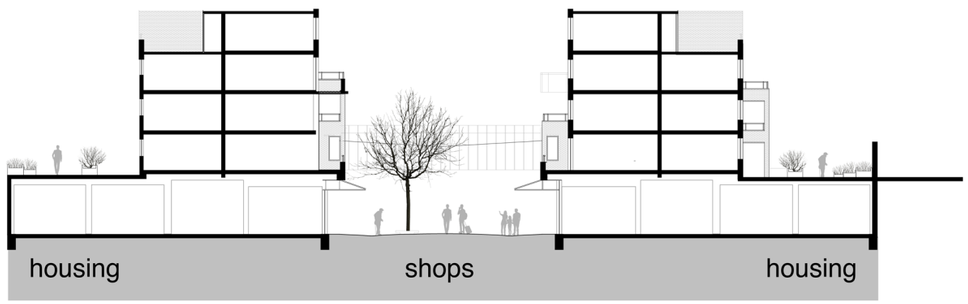
This urban area in Amsterdam, also called Amsterdamse Poort, is the main center of Bijlmermeer. It was originally designed at the beginning of the 1980s, as a composition of 8 clusters, designed by different architects. On street level, there's a continuous strip op shops forming the foundtion of the residential area on the first floor at the back. One could speak of a lifted street level in this residenial area or *woondek* in Dutch, accessible by multiple stairs. The case study includes clusters 2 and 3 by Atelier Pro, built in 1987.

The studio topic

The topic of the graduation project, inclusive and high quality living environments, is related to the studio topic by means of creating these type of environments in existing housing complexes. The design question of the studio is as follows: 'how could renovation and densification strengthen qualities and help solve current problems, without compromising heritage values and identities?'. The relation lies within 1. densification and housing shortage as a focal point; 2. using and strengthening current qualities of the complex and area, but also upgrading weaknesses; and 3. keeping socio-cultural values and qualities of livability as a basis for the design. In addition, there's a serious sustainability task from within the studio, offering the opportunity to not only insulate energy-inefficient buildings, but upgrading the entire area and (possible) functioning as well. A renovation of the living environment. The relation to the master track Architecture lies exactly within this element: why just wrap the building in insulation? Why add straight and plain outdoor hallways? The architecture is within creating a place to stay and live, rather than a place of shelter. Creation of a living environment that is sustainable in a sense of energy efficiency, but above all the life extension of a building with potential heritage value. It turns the practical question of 'what is strictly necessary' into how can this 'strictly necessary' be of greater meaning than just keeping heat inside a dwelling or being able to reach to front door in an easier way, keeping the socio-cultural values of the complex and qualities in mind.

Amsterdam from above. Kaarten & atlassen (n.d.). kaartenenatlassen.nl





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METHODOLOGY

The studio

The research and design process was structured by several phases. Firstly, at the beginning of the year, collective group work was carried out for the sake of analysis of the case studies. Valuation by stakeholders was part of this analysis, from which renovation models followed based on values, architecture and climate. These renovation models were in turn a first step towards the individual design. The next phase included individual research, followed by research by design. The final phase consisted of reflection of the proposed interventions, as an impact on the case study.

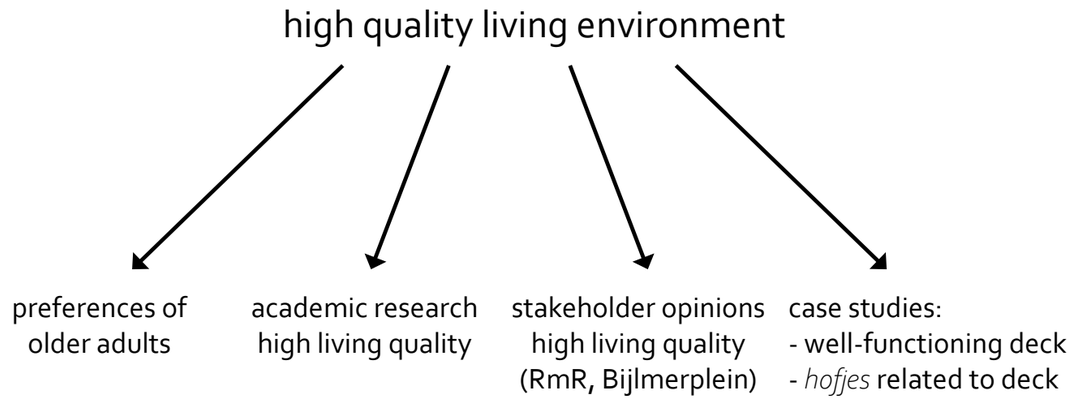
Methods & theoretical framework

To include every type of resident in a living environment, the definition of inclusiveness in this study is taken from the Cambridge Dictionary: "the quality of including many different types of people and treating them all fairly and equally". For the research and design, that means, among other things, taking into account persons with mobility problems, life-proofing the living environment. The high quality living environment is elaborated based on research about the preferences of older adults, field research with stakeholders at Bijlmerplein, and academic findings. The study of Heren 5 Architecten about so called 'city veterans' or older adults living in the city, provides a good basis for understanding the preferences of older adults, particularly in this urban situation (2016). Researcher and PhD candidate in Economic Geography Petra de Jong adds to these urban preferences a more general preference of older adults and their living climate, combined with reasons why this 'group' does not willingly relocate. In the field of a high quality living environent, privacy regulation and zoning are recurring topics in current academic studies, as is social interaction and the quality of staying in a space (Van Dorst, 2005; Van de Wal; Van Dorst, 2015). What users value in a living environment is extracted from opinions and experiences of stakeholders at Bijlmerplein, retrieved from previous studies from TU Delft and interactive surveys by research group *Renoveren met Respect* or 'Renovating with Respect'. The results will function as a base for the case specific situation, being the *woondek* typology housing at Bijlmerplein, Amsterdam. As the quality of living is rated low in this area, the case is compared to a well-functioning woondek being De Nieuwe Weerdjes in Arnhem. The latter is related to the Dutch hofje or courtyard in previous analyses, which is an interesting addition to the case study analysis due to the often central location of this typology in the city, just like Bijlmerplein and De Nieuwe Weerdjes. Therefore, all three mentioned situations are analysed based on design elements influencing the quality of the living environment. The outcomes are compared to the results found in the theoretical research, followed by testing this final toolbox to the situation at Bijlmerplein. What are the current qualities? What is still missing according to the research?
This way, input is collected for the renovation of the living area at Bijlmerplein, being the design task. The task is divided in: inclusiveness / life-proofing, a high quality living environment, energy transition / climate adaptation and supporting case related values.

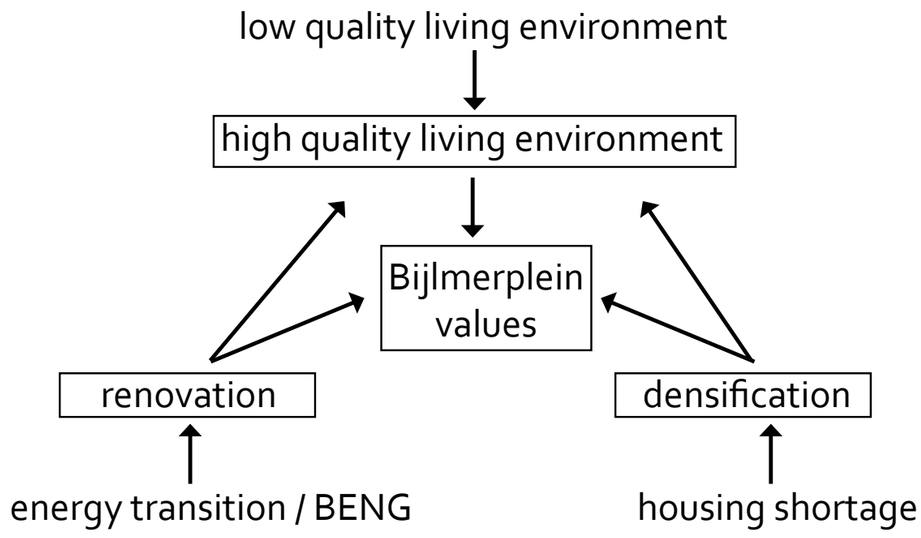
Relevance

The current discussions about the housing shortage and stagnation, which is claimed to be largely caused by the older people in our society (Van der Parre, 2021), is hopefully weakened by this research. Secondly, it is claimed that there's a lack of suitable housing for older adults, but there's no real evidence of what this suitable housing would be (De Lange, 2021). In addition, it turns out the new generation of older adults shows an upwards movement to urbanized areas again, stressing the urge of the graduation project (De Jong, 2021). The same conclusion can be drawn from a report by the municipality of Amsterdam, in which the lack of senior housing possibilities is stressed for Amsterdam Southeast (2021). There is a quantity of research about what elderly prefer to do or where to be at in their daily lives, about physical thresholds, indoor climate and housing types. (Wijk, 2013; Steenkamer et al., 2014; Heren 5 Architects, 2016; De Koster, 2019; Mol, 2020; De Jong, 2021). However, there's no real link to how this could be integrated in an existing living environment. The results seem to be only a motivation to build new senior complexes or care homes, barrier-free as the new term for suitable housing. This graduation research questions the preferences of elderly and similarities to any found quality of a living environment, which places this work as an intermediary between the qualities of a living environment and the wishes of older people. In the larger social framework, the outcomes of this research and following redesign of Bijlmerplein could work as a toolbox in creating inclusive, high quality living environments in existing (malfunctioning) living environments, as well as with new housing projects. Therefore this graduation work is not answering the question of how to build for older people, but how to create a living environment does not discriminate on age.

RESEARCH SCHEME



DESIGN TASK



COLLECTIVE

The studio started off with a collective analysis of the case studies, including Bijlmerplein in Amsterdam. This analysis was executed by using an ABC-method, consisting of an architectural, building technical and cultural analysis of Bijlmerplein. The most noticeable elements, and elements used or emphasised in the design are briefly explained.

Architecture

Bijlmerplein was originally set up as a reaction to the high-rise 1960s Bijlmer, a mono-functional, CIAM-approved, residential area just outside of the city of Amsterdam which seemed to be doomed to fail. Therefore Bijlmerplein had to function as the new entrance gate to the Bijlmer area, being a multi-functional and mid-rise urban, anti-Bijlmer center. As any associations with the existing Bijlmer were avoided whenever possible, the new center was named *Amsterdamse Poort*. The master plan design refered to the revival from the 1970s on of the experienced city from the late 19th century, rather than the modernist city, meaning a coherent design of public space and facade. The area was set up in 8 different clusters with a continuous shopping street on the ground floor and a residential area on top of these shops on the first floor, accessible by stairs intentionally hidden around the cluster corners. The dwellings are stacked, consisting of 4 floors with 3 general dwelling types. One dwelling type is a maisonnette. All dwellings, except for the ones directly boardering the deck, are only accessible by stairs.

The clusters were designed by different architects but with some strict regulations on the physcial appearance of the facade. These are however not as monotonous as expected, as the architecture of the facades seems to be a contemporary translation of early 20th century Amsterdam School style. Combined with the coherence of public space and facade, this turned into the reaction of facades on corners and squares with the plasticity of Amsterdam School style, and it's rythmic and layered street facades. Human scale was an element stressed throughout the design as a postmodernist approach of the anti-Bijlmer movement. As this seems to be worked out really well in stret facades, not much is recognizable in the residential area. The decks turned out to be not as successful as they were claimed to be overdesigned by using walls and unclear corners and squares. In addition there is no sign of human scale.

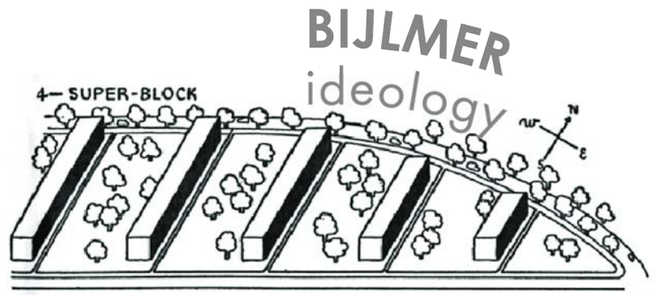
Building techniques

The clusters were constructed with quite simple load bearing walls from aerated concrete from the first level up, supported by colums on the ground floor and a concrete foundation. The latter enables extra levels to be added on top of the building. When working with timber frame construction, up to 5 extra levels could, in theory, be added. The free height of the dwellings is quite low for today's standards, especially when adding extra layers to the ceiling or floor structure. This is an important point of attention in the design task. As the building is up for renovation, extra layers will need to be added, whether that is for the sake of thermal or sound insulation. As the building has cavity walls, insulation would be an option within the wall. However the cavity is so narrow not nearly enough insulation would fit in. In addition, the building has to be future-proofed by disconnecting the current gas-fired heating.

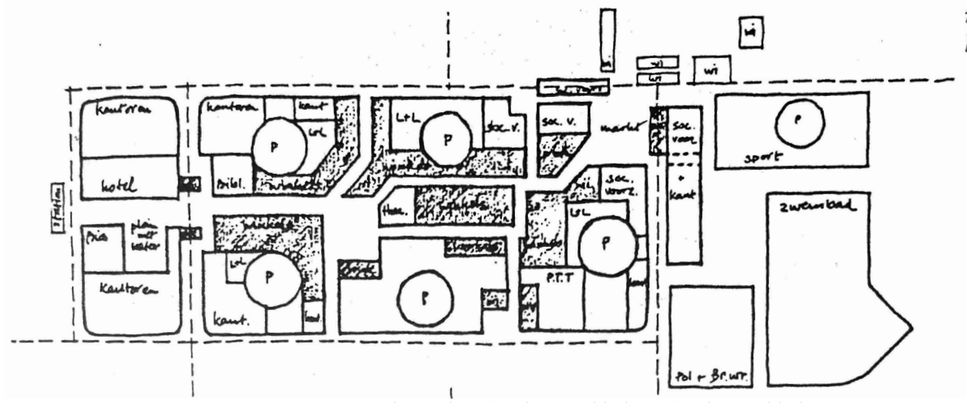
Culture

The reputation of the old Bijlmer had to be covered up with the new Amsterdamse Poort centre, a concealment of what lay behind it. Nevertheless, Bijlmerplein owes its today's vibrant and multi-cultural reputation to the society that lived in the old Bijlmer, being no longer able to deny this part of history. However diverse the population might be, there is not so much of a range in the age of residents as the highest percentage is younger than 65 years old. This is an interesting factor in the face of the research topic and inclusivity of the living environment.

The multicultural atmosphere in the area includes food, exotic products and lots of cultural festivals throughout the year. A much appreciated quality of the area therefore is the possibilities for social interaction, being able to meet in public. Although this is very well possible at the squares themselves, in the residential areas on the first floor there is no invitation to stay. In addition, a relatively large part of the residents at Bijlmerplein experiences social exclusion, compared to the situation in Amsterdam as a city. This suggests that the focus of this center is mostly on the commercial ground floor, forgetting and ignoring the residential area. Residents emphasize the lack of social functions which were originally planned in the master plan, but only partly or never realized. New plans by the municipality of Amsterdam focus on densification both on the corners and in the clusters themselves.



CIAM ideology. Poerschke, U.(2016)

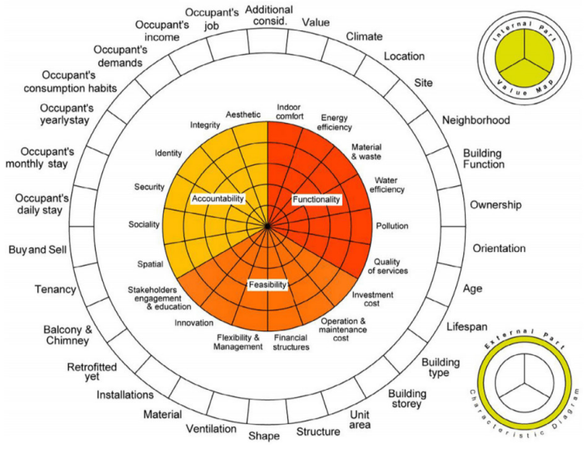


Design Bijlmerplein Stadsontwikkeling. Stadsonwikkeling. (1974)

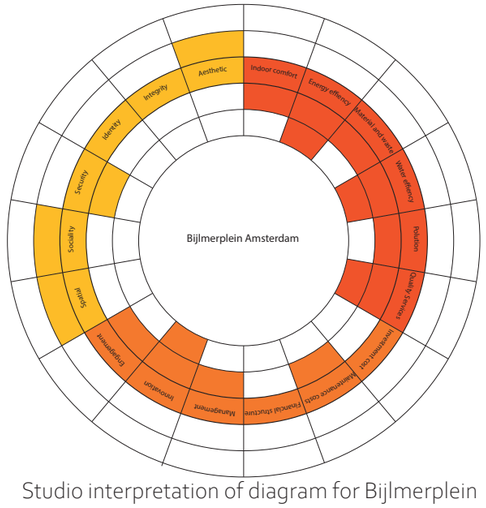
Amsterdam School style at Bijlmerplein. Edited from Amsterdam city archive

KAMARI WHEEL

When buildings or areas are being renovated by any means of interventions, it is of great importance to have some kind of base to work with and goal to focus on. This is for the sake of sustainability in terms of durability of the living environment in relations to those interventions. In order to test a renovation that includes the valuation of the area against those values, it is necessary to use a method that can measure the impact of the renovation. In this design and research, therefore, the theory of Kamari et al. (2017) is used. This theory uses as a starting point the measurement of the interventions of a renovation and thus the impact of the interventions compared to the current situation. Has the situation improved? Are there areas that have lost more than others? Kamari et al. have translated this theory into a diagram or wheel consisting of people, planet and prosperity, which are further subdivided into more specific categories. In the studio, this wheel was was converted into a measuring tool with different gradations. This makes it easy to see, by making an initial valuation of the situation, what influence each intervention has on the valuation of the area before making the final decision. In this way, a well-considered choice is stimulated and, as a designer, one is forced to look at the influence of an intervention in each area of the diagram. The initial situation based on valuation at Bijlmerplein is implemented into the wheel as a starting point. Interventions could upgrade or downgrade a category by its specific impact. This happens by jumping circles within the diagram: to a larger circle is an upgrade and vice versa. At the end of the project, this wheel was used to test the impact of a number of major interventions. For Bijlmerplein, the entire explaination of the valuation can be found in Appendix 1.



Renovation diagram by Kamari et al. (2017)



Studio interpretation of diagram for Bijlmerplein

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2

Research

An inclusive living environment

"For development to be inclusive, development options need to be diverse" - Mitlin, 2001 (p.521)

Inclusion or inclusivity, are terms used in multiple different academic studies in the field of housing and urban development. An umbrella term is given by Heylighen, Van der Linden and Van Steenwinkel in their study into inclusive design of the built environment: "to include as many people as possible" (2016). Creating life-proof dwellings and living environments is according to Heylighen et al. key in realizing an inclusive community. Research by Zhang, Warner and Firestone (2019) complies with this age-related approach, which is relevant to today's ageing society. Of course inclusivity can be viewed from many different perspectives, like inclusion of biodiversity (Apfelbeck et al., 2020), however in the scope of this research inclusivity is about the definition by Heylighen et al. (2016).

Age

In the Netherlands, it appears as though it has already been completely worked out that building for older adults is a solution to the Dutch housing shortage, according to housing expert Peter Boelhouwer of the TU Delft (Vastgoed Actueel, 2021). However, what seems to be not figured out yet, is the content of this senior housing. Is it 'simply' building housing complexes or service apartments for seniors? Petra de Jong, economic geographer, clarifies solving the housing crisis is not just a matter of building smaller housing units for older adults. De Jong claims listening to this growing group of residents is far more important than to just start building what is thought to be the right thing, as this 'group' is very diverse. Service apartments, being an example De Jong mentions, are seen as this 'right thing' but older adults seem to be not attracted to habitation. (NOS, 2021) This is substantiated by a housing needs survey for older adults, among others, by PhD Joost Wegstapel of Atrivé, a consultancy firm in the field of housing (2021). From the results of this research, it turns out other than senior housing complexes and residential care complexes or service flats, one-storey dwellings are most preferred by adults aged 55 to 75. The senior housing complex becomes as popular as the one-storey dwelling at the age of 75 and above. It needs to be noted that this goes for the current group of older adults. For although the diversity amongst older adults is enormous and some might still like the idea of living with peers, a new generation of older adults is arising. A much more vital and modern generation, in terms of independency and life standards (De Jong, 2021). Liane den Haan from the Dutch Elderly Association (ANBO) explains: "people don't want to be patronised. They don't want the institutional setting of the care home any more. But they do want to be part of a community where people look after each other" (Van der Leij, 2019). So how does the Dutch society live in the near future? Are older adults included in this communicty or are they portrayed as a separate community?

In this research, the need for inclusivity is derived from the preferences of these older adults, because as Mitlin (2001) claims in a study to inclusivity in cities, people are "the best judges of their own needs" (p.520). According to research into older adult housing preferences by architecture firm Heren 5, specialized in designing humane living environments, a diverse resident mix in age is one of the conditions older adults prefer in their close surroundings (2016). Results from the research by De Jong about older adult housing preferences are in line with this resident mix: "[older adults] like to be surrounded by mixture of single households, families and older adults" (2021, p.108). The ANBO agrees to this statement as well in the research of the housing future of older adults (2019). This completely contradicts the idea of building more senior complexes housing solely older adults, a refutation of the senior-only approach.

Accessbility

Yet inclusivity goes far beyong age, as it turns out accessibility and affordability are main factors of inclusivity as well (Heylighen et al., 2016; Zahrah & Gamal, 2018). Affordibility could equally be seen as being a type of accessibility as the price of housing or any other facilities determines its access and therefore inclusivity for all. The other type of accessibility lies in the physical accessibility of a living environment or home. As mentioned in the reserach by Wegstapel, the one-storey housing is part of the housing preferences by older adults. However, a one-storey dwelling does not come anywhere near exclusively building for older adults, indicating that it can include a much more diverse target group (NOS, 2021). It might even be the most convenient home for every type of resident. However, with nowadays living space in mind, such housing does require a lot of land capacity, which is scarce in the Netherlands (CBS, 2018). Physical accessibility of the dwelling and living environment is considered very important by

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older adults, as turn out from research by both Heren 5 (2016) and De Jong (2021). In fact, it is even a regulation of the Bouwbesluit 2012 to have no thresholds above 2 cm without a ramp in buildings with mobility-impaired residents (Dutch govenment, 2022). When considering accessibility in terms of inclusiveness, should not every building have to meet the 'mobility' regulations? Even at the case study of Bijlmerplein, which is not dominant in older adults, it turns out accessibility of the decks by bicycle or any other type of heavy item is prefered over having only stairs for access (TU Delft, 2021). This stresses that all residents profit from e.g. elevators that contribute to the one-storey living environment. Of course in this situation roles have been reversed as there's a prefence for elevators in a first floor living environment which would probably not exist in a ground floor area. However, in the research by De Jong, it turns out older adults actually prefer living on the first floor over living on the ground floor (2021). This preference stems from the feeling of safety when living on the first floor instead of the ground floor according to Heren 5 architecten (2016). The preferences of older adults from the Heren 5 research in terms accessibility is not merely expressed in thresholds, but in reachability and type of functions as well. Having facilities nearby that are inclusive for all ages, or separate facilities for different ages, rather than a focus on younger age groups is prefered by the older adults out of experience. Examples of these facilities are community centres, communal gardens or sportsfacilities, which comes down to the diversity mentioned by Mitlin (2001) (Heren 5, 2016; De Jong, 2021).

Affordability

A different approach to accessibility lies in the affordability of the living environment. This affordibility leads not only to the question whether one could afford the dwelling. It's equally about who is prioritized to live in that specific dwelling, e.g. older adults, students, starters or families.

One of the main reasons older adults do not relocate lies within costs according to MVGM & NOF (2016), Van Koerten (2018) and De Jong (2021). These costs are explained to be linked to the relocation costs themselves (MVGM & NOF), however Van Koerten and De Jong claim these to be somewhat broader. The unwillingness to move would predominantly be related to the currently low costs as the home is paid off, or the home has been rented for a long while and is therefore cheap. Elderly are therefore affraid of exploding costs when moving from their familiar home. (Van Koerten, 2018; De Jong, 2021)

Affordability in terms of reachability is also included in inclusive living environments, as an area should be equally reachable by public transport, bike and car, differing in costs. Zahrah and Gamal stress inclusivity to be "how people can assess, use and contribute to an object", speaking in terms of facilities accessible and usable (2018). "Inclusivity is realized by providing affordable housing" as they explain in the research (2018). Mitlin however, draws apart inclusive housing and affordable housing as two different aspects in the perspective of redevelopments of residential areas (2001). Inclusive developments in living environments are defined by Mitlin as being "those that reach out and are relevant to a high percentage living in the settlement". Mitlin divides inclusivity into a spatial and a differentiated form, respectively about participation in activities or services and diversity, offering residents a broad set of development measures to use to their benefit. This participation is part of an inclusive approach, as "community and collective action are essential resources for households". The definition of affordability is formulated by Mitlin as a situation in which "even the poorest can participate in a substantive manner either through subsidy, immediate payments or credit". So in short, the questions to be asked during housing development or renovation should be: can everyone afford it? And, do the circumstances benefit each and every kind of resident? In the research, Mitlin shows opportunities for the sake of affordibility. One of those is labour in exchange for affordability for less affluent households or the buying off of labour by those who can afford it in this same residential area. This actually comes down to narrowing social segregation in existing, redeveloped areas.

Social segregation by means of wealth is one of the most problematic factors "for urban development worldwide". according to Zahrah and Gamal (2018). They claim this segregation can be solved by balanced housing. In the research, the Indonesian way of social inclusivity in housing is highlighted as a possible segregation solver. That is, in Indonesia regulations are used to prevent segregation: for each luxury home, "2 medium houses and 3 simple houses" must be developed. In the Netherlands and specifically in Amsterdam where the case study is located, new housing projects are subject to this type of balanced housing as well. Of these projects, 40% has to be social rental, 40% mid-range rental and owner-occupied housing and 20% expensive rental and owner-occupied housing (Municipality of Amsterdam, 2017). In the case of Bijlmerplein that would mean in both cases an increase of social rental homes of which there's already a lot available, which is 100% of the stock. It is probably quite understandable that with this monotonous housing stock, a somewhat more varied range must be made available for the middle and upper segments in order to make the community more diverse.

Nevertheless, Mitlin stresses that "affordability alone is not sufficient" as e.g. housing quality is important as well (2001). Therefore interventions in residential areas should not only maintain or guarantee affordability, but be of a certain quality as well.

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A high quality living environment

Older adults

"residents should not only be grey doves" (respondent survey older adult housing preferences. ANBO, 2019)

1.48 million: the extra amount of people aged 65 and over in 2050 in the Netherlands, being by then 25% of the Dutch population. A rise in proportion of 144% compared to the 3.3 million people aged 65 or over in 2020. (CBS, 2020) The urge of creating suitable housing for this constantly aging society seems to be made clear by this number. Knowing what older adults value and prefer in their living environment seems to bring the largest part of this solution.

By studying the preferences of older adults, a framework of high quality housing for this target group can be set up broadly. The preferences resulting from the different researches by Heren 5 architects (2016), Van Koerten (2018), ANBO (2019) and De Jong (2021), are categorized according to the outcomes of the research as follows:
- affordability,
- accessibility;

as mentioned in the inclusiveness chapter. And:

- social interaction;
- privacy/identity;
- security;
- mobility/reachability
- functionality/facilities;
- dwelling;

Social interaction

To give a definition of social interaction, it is broken down into individual definitions from the Cambridge Dictionary:

"*social: relating to activities in which you meet and spend time with other people and that happen during the time when you are not working* "
"*interaction: an occasion when two or more people or things communicate with or react to each other*"

In short, social interaction is a communication activity between people in a leisure setting. From this perspective, the preferences of older adults were collected from the aforementioned researches. It starts with any present possibility of social interaction at all. A space to meet, to gather, to casually observe and greet each other. Heren 5 architects and ANBO describe these activities to be fitted for a community center, creating a reason for older adults, but basically for all residents to leave their home and gather. It is a place for easy, casual encounters and creates an opportunity to strenghten the neighbourhood community, like a communal garden. This is also where the community center finds it origin, creating leisure activities for the sake of the community (Glover, 2001). Social interaction also enters upon a growing social trend: loneliness (Heren 5). It is not said that increasing the possibility for social interaction always succeeds in reducing loneliness, but it does create base of opportunities (Fokkema & Dykstra, 2009).

Co-housing is also one of the ways of housing considered by older adults (ANBO, 2019). This ranges from kangaroo housing in which different generations of one family live in shared or adjacent spaces, to living with peers (Heren 5, 2016; ANBO, 2019). Having a communal space to have some everyday conversation and knowing each other is appreciated mostly about this type op housing (Heren 5). These shared spaces, regardless if they are within a co-housing group or available to the entire neighbourhood, are however prefered mostly when interaction is casual and always organized or mandatory. When residents have a choice join in or not. (Heren 5, ANBO) Of course when talking about shared spaces, this also includes outdoor spaces which are semi-private, like the decks at Bijlmerplein. In this semi-private outdoor space, older adults explain that they like the fact that, in addition to the busier public side, there is also a view of activity in this shared space. Examples are kids playing outside or passers-by crossing the residential area (Heren 5). The other side of social interaction, is however privacy.

Privacy & identity

Older adults explicitly emphasised the need for privacy in a research by ANBO (2019) including the question if older adults would be interested in co-housing. The majority of respondents seemed to think this was a good idea, but under one of the most common conditions: enough privacy. It is in general a much debated subject, which is also why there are even laws on preserving privacy. One of the "most influential statements" of privacy, according to Norman Mooradian (2009, p.163), was the paper of James Rachels (1975). Rachels descibed privacy as being the "ability to control who has access to us and [...] our ability to create and maintain different sorts of social relationships with different people" (p.326). This exactly is what the respondents in the ANBO survey indicated as being important. Of course this research asked specifically to the conditions in case of co-housing, but from the answers a preference for general privacy can be distilled. This was equally expressed in the preference for a hobby room or a space to let ones own identity come to life. A communal room was however appreciated by many, but the presence of an own kitchen, living room, bedroom and sanitary facilities was a red line among the respondents. This leads towards the scale of the residential area itself. How much do residents share? Does every community member know each other personally, or is there a possibility to blend into anonymity? According to Heren 5 architects (2016), among city veterans, there is a need for balance between these two situations. Anonimity is prefered in a sense of minding your own business without other constantly being able to see you. However a small scale and knowing one another is appreciated for the sake of social interaction and above all, security.

Security

A feeling of unsafety is one of the most common reason to relocate for older adults (Smetcoren et al., 2015). Besides criminality being a push factor (De Jong, 2021), agreement for this outcome is found in the study of Heren 5 architects (2016), explaining safety for this group is important on multiple aspects. The experience of safety for example, seems to be low among city veterans, affraid of opening their door for anyone at night. Another condition of feeling safe, is living on the first floor instead of the ground floor, dettached from the public space. A buffer space between the front door in the residential area and the public is therefore appreciated. Living on a higher level also brings the opportunity, under the conditions of having enough window surface, of having a clearer overview of the residential area and possible entrance of the complex as well. In addition to an overview of the area, clarity of the entrance itself, meaning overview and lightness, is considered to be of equal importance by older adults. The same goes for a small scale residential area, in which overview is achieved more easily. Older adults associate a smaller scale as being closer to community members, relying on social control, and therefore being safer. The final preference, which is actually a hard requirement, is traffic safety for pedestrians in and around the residential area. (Heren 5, 2016)

Mobility & reachability

This traffic safety for pedestrians is linked to the desire of older adults to reach facilities on walking distance (Heren 5, 2016; De Jong, 2021). One of the most mentioned facilities in the research of both Heren 5, ANBO (2019) and De Jong, is the proximity of public transport. As older adults are one of the largest groups in the Netherlands that tend to dispose of their car, for example after relocation or being widowed. This can be experienced as "lost freedom and mobility" according to a study of older adults dearest possessions by Price, Arnould, and Folkman Curasi (2000, p.189). Therefore, having public transport nearby prevents older adults from being limited in their travel movements. Hence proximity to facilities is the main reason older adults prefer living in a city or town center over living in suburban areas (ANBO, 2019; De Jong, 2021).

Functionality & facilities

In residential areas, there's a couple of important diversity terms according to Farahani, Beynon and Freeman (2017), of which "functional or land use diversity" or "economic diversity" is one (p.87). As it turns out the proximity of facilities in a residential is a core reason to relocate (De Jong, 2021), but what are the core characteristics of these facilities? First of all, a high density of functions turns out to be very important, directly linked to the diversity of facilities (Heren 5, De Jong). This diversity has mostly turned out problematic for older adults, as according to the research by Heren 5 architecten there's and abundance of new facilities for the younger generation, but a loss of focus on the veterans (2016). This would mean the spotlight should be broadened in any type of new or redevelopment for the sake of an inclusive and high quality living environment. Creating facilities for older adults does not mean 'for older adults only'. In the research by Heren 5, hobby spaces and sportsfacilities are mentioned, coffee corners and e-bike charging stations, or like De Jong mentions: care facilities.

Mixed users

Variation in functions is not the only type of diversity appreciated by older adults in their living environment. That is, a diversity of residents based on housing career and stage in life: starters, families and older adults. The preference however, lies with a balanced community in terms of mixed residents, meaning no clear majority of any kind (Heren 5, ANBO, De Jong). According to the older adults in the study by Heren 5, the neighbourhood or building should function as a village itself with all of its different residents (2016).

Dwelling

The most private part of the residential area could be considered to consist of the dwelling itself. Of course the ideal dwelling could be very different for every other resident, yet Heren 5 claims the older generation preferes a dwelling that is "not too big". However vague this terminology might be, it can be construed as a means of a dwelling being similar in size or smaller than the current dwelling. The research by Heren 5 even stresses a view outside to be more important than a large dwelling according to Amsterdam senior

citizens. This underlines once more how important indoor quality and its relation to outdoor environment is. Outdoor space however, like a garden or balcony, although again not too big, are prefered and even considered very important by older adults (Heren 5, Van Koerten, ANBO). Nonetheless, private outdoor space (e.g. a balcony) is no longer an obligation according to the Dutch building regulations for dwellings. This creates a clash between how to build within the prescribed conditions versus what residents would truthfully value in a dwelling. Especially in the perspective of the current housing shortage and the urge to build numerous new dwellings in the upcoming decades. Private outdoor spaces should therefore definitively not be the first aspect to be considered for elimination from a financial point of view. It would be a mass production of dwellings for the sake of creating 'a' space for everyone. However after years of habitation and solving the housing shortage, these dwellings could quickly not be sufficient anymore. For example in terms of the lack of private outdoor spaces. To strengthen this argument, out of the many diverse hobbies of older adults, it turns out that gardening is a recurring one (Heren 5, De Jong). Subsequently, the presence of nature in the immediate vicinity is valued.

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A high quality living environment

General

There are plenty of different perspectives of an inclusive and high quality living environment in academic literature. Professor of Environmental Behaviour and Design, Machiel van Dorst (2005), for example, claims the components that constitute to a livable environment are (the ability to control) social interaction and social safety. However important these elements turn out to be from different researches (Williams, 2006; Dempsey, 2008; Farida, 2013), there is lots of categories related to the quality of the living environmen, ranging from accessibility to nature. The elements discussed are:

- Social interaction
- Privacy
- Identity
- Safety
- Social control
- Accessibility
- Reachability
- Facilities
- Quality of staying
- Nature

Although all elements are interrelated and cannot be defined as demarcated terms, they are explicitly mentioned in the studies used and therefore separate subjects.

When designing a new residential area, these are some of the elements to be discussed and considered explicitly. However, a disclaimer about the extent to which the designed environment and design interventions can help achieve or improve that quality, is given by both Van Dorst (2005), Williams (2006), and Dempsey (2008). Van Dorst claims "the built environment or interventions must therefore not be ideological, but conditions can be created" meaning the living environment does not have a written script. An example of a situation in which this ideological design was used is the Bijlmermeer area itself. In the 1960s, when most of the high-rise apartment blocks were built in this area, the underlying assumption was that society was engineerable according to the ideology of CIAM (collective analysis). It turned out to be not as engineerable as thought and therefore doomed to be a failure. Within this same line of reasoning, Williams emphasises "the importance of design in influencing social interactions [...] should not be overestimated". As being one of the key elements in the quality of the living environment, it is therefore important to take into account the extend to which design could have in influence in social interaction. Dempsey reinforces this statement in relation to inclusivity, as this should not always be seen as a carrier of "social interaction or cohesion, but it is an important element of a high quality living environment". In short, design is important in creating conditions, but only to a certain extent it covers the full scope of inclusivity and quality. However, in what way can design be helpfull in the living environment?

Social interaction

One of the most common elements in designing for social interaction, turns out to be type and zoning of spaces, mostly outdoor, shared and circulation spaces. These places, outside of the private home, are the places in which residents are most likely meet other community members. The Dutch Ministry of the Interior and Kingdom Relations (BZK) claims in the NOVI documents (National Strategy on Spatial Planning and the Environment), that social interaction of one of the core elements of a high quality living environment. Nevertheless, it is not stressed what it is exactly, that makes an environment fit for social interaction.

Circulation spaces

The street, main entrance of the apartment complex, the elevator and staircase, outdoor hallways and finally, the private front door: all elements of circulation, but also of meeting. However, although these spaces are places of possible social interaction, Van Dorst (2005) claims outdoor hallways and circulation spaces are not really suitable for social interaction at all. At the same time, Williams (2006) mentions that "without suitable spaces for interaction, there is no increase of socializing". The reason mentioned by Van Dorst about the outdoor hallways is the lack of quality to stay in such places, as well as the amount of passers-by or crowding of those spaces, creating "unpleasant" atmospheres. Precisely because these spaces are frequently used, they could well facilitate a dual function. Just like shared or public pathways could cross activity sites to increase use of the outdoor space. However, how does this work on an outdoor hallway only accessing residential functions? Van Dorst stresses that the scale of circulation spaces plays a large role in this facilitation. Narrow outdoor hallways would be an opponent of the desired atmosphere, while on the other hand, widenings of the outdoor hallway

a zone of non-circulation. Williams (2006) emphasises that it is these "approriate" spaces needed for the sake of social interaction. Nevertheless, Hartman (2021) also mentions the vertical component of interaction between outdoor hallways. This conclusion was drawn by Hartman through the relation of scale and social interaction. As low rise residential areas would be suitable for waving and nodding, high-rise apartments would be more anonymous as these would not facilitate human scale interaction. Therefore, vertical interaction would be a possible scenario on outdoor hallways in high-rise residential buildings.

Outdoor spaces

As already mentioned with the possibly problematic outdoor hallways, outdoors is discussed in a signification number of researches in relation to social interaction (Van Dorst, 2005; Williams, 2006; Shah & Kesan, 2007; Farida, 2013; Rogge, Theesfeld, Strassner, 2018; Hartman, 2021). Most often outdoor goes hand in hand with the term 'communal' as being a shared space for residents in a specific neighbourhood. Farida (2013) highlights the recreational aspect of communal outdoor spaces, specifically emphasising greenery and playgrounds around high-rise apartment buildings. These would function as a breeding ground for social interaction in the residential area. Community gardens would therefore also thrive on social interaction, and simultaneously be this figurative breeding ground according to Rogge, Theesfeld & Strassner (2018). Nevertheless, Hartman (2021) adds to this picture the quality of the outdoor space itself, as a low quality space would not stimulate interaction among residents. This is in line with the research by Williams (2006), which shows that for shared spaces to work well for "brief informal social interaction", the quality must be good, appropriate for the use, and flexible. An elaboration on this type of quality is given by Shah and Kesan (2007), claiming it is mostly materialistic things that give a space quality. These could be defined as seatings, "fountains, foodstands and activities to watch" in outdoor spaces. Having these facilities could make the neighbourhood more accessible, which according to Dempsey (2008) might increase opportunities for social interaction as well. Although creating outdoor spaces for a larger public seems to be stimulating social interaction, visibility of the shared or communal outdoor spaces is crucial as well. Both to maintain the willingness of residents to visit the spaces, keep them safe in terms of eyes on the street and being aware of the communal space available for use (Williams, 2006). One of the elements of this view on the communal spaces is the front yard. In addition to porches (Shah & Kesan, 2007) and outdoor hallways, these are some of the outdoor spaces brought up the most by the different researches in terms of social interaction. The front yard deserves some special attention as this would be considered one of the most interactive places for residents (Van Dorst, 2005; Williams, 2006; Hartman, 2021).

Semi-private spaces

This front yard is not just another outdoor space. It is considered a semi-private or buffer zone, transitioning from private to public space (Van Dorst, 2005; Williams, 2006; Hartman, 2021). It enables residents to be outside of the private home, however within a demarcated semi-private plot.

Privacy

Closely related to social interaction is privacy, exactly the term used when mentioning the front yard. There are different opinions from research about the amount of privacy and social interaction that would stimulate a pleasant living environment. One research mentions living in close proximity to eachother (close being vague) increases social interaction and therefore the livability of the neighbourhood (Williams, 2006). However in the research by Van Dorst (2005) it is claimed living too close to your neighbours (close again being vague) works in reverse. Nevertheless, Williams (2006) does admit that "extremely high densities" work in reverse as well because of "less control over their social environment". People would withdraw from community because of this lack of privacy. Taking this into account, what does privacy stand for and how does it work in the living environment?

Transition

The most important element of privacy turns out to be transition of spaces from public to private. Transition is necessary to "express territoriality [...] to mark out and defend the property" according to Shah & Kesan (2007) and Williams (2006), as it would cause crime if not availiable to every resident. Semi-private, buffer, or hybrid spaces are therefore a safety border between being completely exposed to public space and being safe in the familiar dwelling. Farida (2013) calls these semi-private zones "soft edges" and associates them with front yards, or on a larger scale, having front doors at the inside of residentials blocks. The buffer space could prevent people from peering directly in through the window and demarcate a go and no-go zone (Hartman, 2021). Jürgenhake (2013) elaborates on this in the research about the functioning of the facade, claiming closeness of public space could make residents pull down their curtains and hide. Likewise, Van Dorst (2005) mentions this phenomena to happen within high-rise outdoor hallways in which people close off their windows for the sake of privacy. Williams (2006) elaborates this to be due to "overexposure to community" caused by lacking buffer space with which "overcrowding is created". Voluntary social interaction would turn into forced interaction. According to Van Dorst, people have to be given the choice to be either in private or communal private space, having places for interaction and to withdraw.

Elements of privacy

Demarcation in thus on of the necessities in residential areas to function well. However, what are elements for creating a transition or marking privacy? Van Dorst (2005) describes the creation of so-called 'privacy zones' in terms of demarcations:

- veranda (& Williams, 2006);
- front yard (& Williams, 2006);
- bench;
- corridor;
- square / crossing;
- front door / entrance of a complex;
- level difference;
- space in front of the door;
- planters;
- fence.

The latter, as is stressed by Van Dorst, is not merely a physical demarcation. The fence, even if it were open, functions as a border, clearly being a sign of accessibility only by 'authorised' persons, or the property owner. Williams (2006) therefore also calls the demarcation of semi-private zones threshold. It is passable but clearly indicates that accessibility is changing here. Kazemi and Soheili (2019) add to this listing on a larger scale the internal yard or courtyard as being a step in the transition between public and private. In the research by Jürgenhake (2013) the way facades react on privacy is noted to be the way in which differences are visible or notable around the entrances. Van Dorst (2005) desfines this to be "a jump in the facade". Other than being an entire zone, like the former elements, this way of privacy demarcation is more focused on the language of the skin. Nevertheless, Van Dorst (2005) stresses the facade garden, not being part of the facade but a new layer, "does not meet the requirements of a hybrid zone because it simply does not demarcate any space".

Identity

A direct link to privacy and demarcation of (semi-)private zones is to expression of the identity of residents around their dwelling. The front yard for example, does not merely function as a distance between the public and the private. It is a zone in which appropriation by the resident is possible and Hartman (2021) even claims "placing personal items is evidence of a successful semi-private space". In the earlier mentioned NOVI documents by the Dutch government, this way of creating an attractive and recognizable living environment is one of the key factors in realizing conditions for a high quality living environment (BZK, 2020). Shah and Kesan (2007) articulate this to be a need in reducing or preventing anonymity in this defensible or hybrid space. As anonymity would go "hand in hand with a lack of social control" as Van Dorst (2005) claims, there is also over time a lack of responsibility of the communal space by residents. However, for example in outdoor hallways, appropriation and personalization seems to be harder compared to a buffer zone like the front yard. What Van Dorst noticed, is an increasing amount of appropriation at the end of outdoor hallways, the places in which there is little to no circulation of residents. The possibility to change the direct environment around the dwelling over time is a quality of the dwelling as well, which prevents anonymity (Van Dorst, 2005).

Safety

This element is basically found in each of the earlier and following aspects about the living environment. Starting with the buffer zone to create some sense of safety when opening and closing the front door (Van Dorst, 2005). However, safety is also mentioned in the NOVI documents as being safety of the surrounding, traffic safety, physical safety and social safety, of which the latter refers mainly to the qualities already mentioned. Dempsey (2008) specified safer environments to be associated with attractive living environments and therefore quality. This can be related to the situation at Bijlmerplein which is not quite experienced as being safe (DSP-group, 2007).

Social control

Related to safety is the extend to which the residential area offers the opportunity for social control, or eyes on the street. According to Dempsey (2008) this means "overlooking from residential and commercial properties, can generate feelings of safety" calling it "natural surveillance" as well. A lack of this social control makes the neighbourhood unsafe according to Van Dorst (2005). In that particular research social control is defined as being a residential area with clear overview, no 90 degree angles in narrow areas and no bad lighting or bushes. A lack of social control is according to Van Dorst notable by curtains being shut, decreasing the amount of eyes on the street and therefore being directly proportional to the amount of privacy. Likewise, Farida (2013) claims avoiding confusing and functionless spaces around residential blocks is a way of keeping social control possible. The presence of people in outdoor spaces is therefore relevant according to Van Dorst for the sake of social control. Nevertheless, this would only be functioning properly when people have their own defensible space in which they can observe the area without being in the immediate view of other residents or passers-by (Shah, Kesan, 2007). Semi-private spaces, as Williams (2006) calls them, would increase the potential for surveillance of the public space.These would enable residents to increase use of communal (outdoor) spaces and therefore increase the chance of social interaction.

Accessibility

The wide range of accessibility simply starts with physical accessibility. Van Dorst (2005) claims people prefer taking their belongings with them on their route to the dwelling. This is especially relevant to multiple-storey buildings. A bicycle storage or garbage dump should therefore be placed on this route to the entrance to avoid overcrowded circulation spaces and unregulated waste disposal. Accessibility is also connected to the ease of getting somewhere, as Zhang et al. (2015) stress outdoor gardens are essential to have perfect access for the sake of the older generation. In theory, designing for the older generation means a better design according to Noyes (2001) and would therefore be beneficial for more target groups. Here a point is reached where accessibility is not only about physical access, but also about inclusiveness. Who has the access to fit within and associate with an environment? The Ministry of the Interior and Kingdom Relations (2020) emphasizes every member of society should have access to suitable housing and living environment. Affordability is a major factor in that goal, and everyone should have acces to it, but the Ministry does not elaborate on how this would be possible (2020).

Reachability

This term has been discussed in a lot of research, but like the Ministry of the Interior and Kingom Relations (2020), there is no concrete science about how close a function is to be labelled reachable. The research by RIGO does stress it includes distances to public transport, healthcare, shops, restaurants and social facilities, but not what those distances should be (2019). A somewhat more specified definition is given by Dempsey (2008), declaring reachability had to do with the connection to functions for pedestrians. It can therefore be concluded that day-to-day facilities in the living environment should be on walking distance. Zhang et al. (2015) seem to share that conclusion in their research, as walking distance to facilities would be essential for place attachment and social interactions. Especially for the older generation short distance facilities increase their sense of place attachment as it gets them outside instead of staying indoors all day.

Facilities

Not only the reachability of facilities, but firstly the presence of them at all and diversity are important according to Dempsey (2008). This does not solely include shops or other indoor facilities, but especially activity spaces according to Williams (2006). Playground, vegetable gardens, areas for a communal barbecue or just places for relaxation are mentioned in the research. These type of activities would facilitate social ineraction between residents. These spaces should however be large enough so people don't avoid them. Patricios (2002) agrees to this notion by mentioning using common facilities to enable bringing residents together.

Quality of staying

By already looking into the valuation of Bijlmerplein it turns out people prefer places with possibilities to stay, like benches. Van Dorst (2005) is on the same line of thought as the research shows that places have a quality of staying when seatings are present, just like natural elements and the possibility to engage with passive activities like watching. Greenery is an element stressed to increase the quality to stay, as well as a difference between a busier and more peacefull side of a building. Kazemi and Soheili (2019) agree to this statement by concluding people like to sit on furniture in spaces with vegetation. Next to places to sit and greenery, Zhang et al. (2015) emphasize lighting of an area at night is important. Aspinal et al. (2010) add to this that the presence of toilets, good paving and the absence of traffic add to the quality to stay in an area as well. The lack of this quality could be due to a high degree of openness of an area, but also insufficient zoning of spaces in terms of how an area could be use (Farida, 2013). In addition, Dempsey (2008) strenghtens thisview by concluding big bland spaces fail to offer opportunities for social interaction.

Nature

As was mentioned already in different categories, nature is an unmissable element in the living environment. Still, residential areas like Bijlmerplein seem to fail on this aspect. Zhang et al. stress that just having greenery is not enough as it should at least be accessible and usable (2015). Therefore quality would be more important than quantity. It could potentially lead to better health and wellbeing by the effect of place attachment because of the accessible greenery. In addition, people would not take up unusable green in their association with a place. According to both Farida (2013) and Dempsey (2008) greenery in communal spaces could lead to an increased social interaction and bonding. On the other hand, nature is associated with a climateproof living environment as stressed by the Ministry of the Interior and Kingdom relations (2020). This means preventing and fighting the urban heat-island effect, dealing with floodings and drought, but also access to clean air. Last but not least, biodiversity is emphasized as being an element of a high quality living environment.

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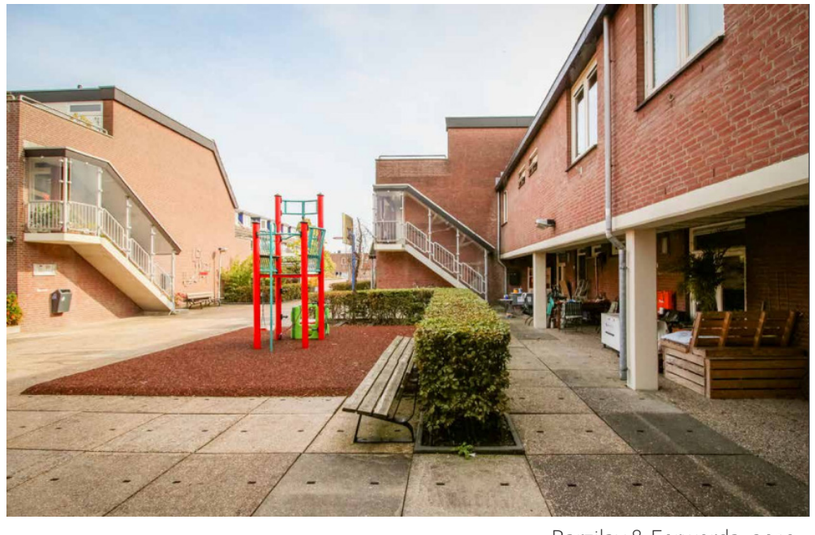
A well-functioning living environment

A well-functioning living environment: the living environment in Bijlmerplein is indicated as poor according to the 'leefbaarometer' survey. In addition, residents indicated in a report by the municipality that they did not always feel comfortable in the living environment (DSP-group, 2007). For this reason, a search for a residential deck from the same construction period that does seem to function very well, was carried out. This particular residential deck is the Nieuwe Weerdjes in Arnhem, which is also located in an urban area. The properties based on spatial layout were analysed. It is certainly not true that the built environment alone ensures the quality of the living environment, but it does contribute to some extent or at least creates conditions for such an environment.

This 'woondek' in Arnhem is linked to the housing typology of the Dutch courtyard, or 'hofje' by Barzilay and Ferwerda (2019). Therefore, this typology was analyzed as well in terms of setup, because, like the residential decks, it is located in city centres, somewhat closed off and appears to be a very popular residential typology nowadays. This analysis was based on accessible living environments. It turns out that indeed there are similarities between the 'woondek' and the courtyards. First of all, there is an interior space embraced by the dwellings which is very peaceful in a busy area. Front doors are facing each other, which could be experienced as safe as one does not have to pull out your keys in open public. It offers social control over the interior space, but also creates possibilities for social interaction as residents will use the same shared space to enter their dwelling. It is actually like having streets and squares: places for movement and places to stay. Secondly, entrances towards the residential area are smaller, focused and recognizable. As a passer-by, the eye is immediately drawn to the obvious entrance to the first floor. This both acknowledges that there is an area behind the street façade and makes it clear that it is probably a destination and therefore not immediately interesting to enter. For a residential area, this can in principle be seen as a quality by preventing anyone wandering over the residential deck.

The shared spaces on the other hand, are broader, like squares. Both the focused entrance and broad square are great for overview, as visitors can only enter and leave through one smaller, visible entrance and activities in the larger spaces are easier to oversee as they are spacious and bordering the dwellings. Key in this is preventing any type of sight blocking elements like corners or high walls.
Another element present in the typologies is the human scale used, so residents can identify and feel comfortable in these areas without being overwhelmed by oversized buildings. Privacy is a term that could questionable is such a closed community. Therefore, the way privacy zoning works in these areas is interesting as a matter of 'if' and if so 'how' privacy is regulated by design. Firstly, for 'de Nieuwe Weerdjes', privacy zoning works by means of layers. The broader, public deck is bordered by a row of bushes between the dwelling and deck. Inbetween these two, there is a second walking path, more like a pavement. The latter again borders a by the upper level outdoor hallway, sheltered outdoor space in which the front door is located. So to conclude, the privacy zoning in this upfloor living environment is arranged by separators being vegetation, height differences and pathway dimensions. Wider areas could be experienced as being more public while narrower pathways create a more private feeling.

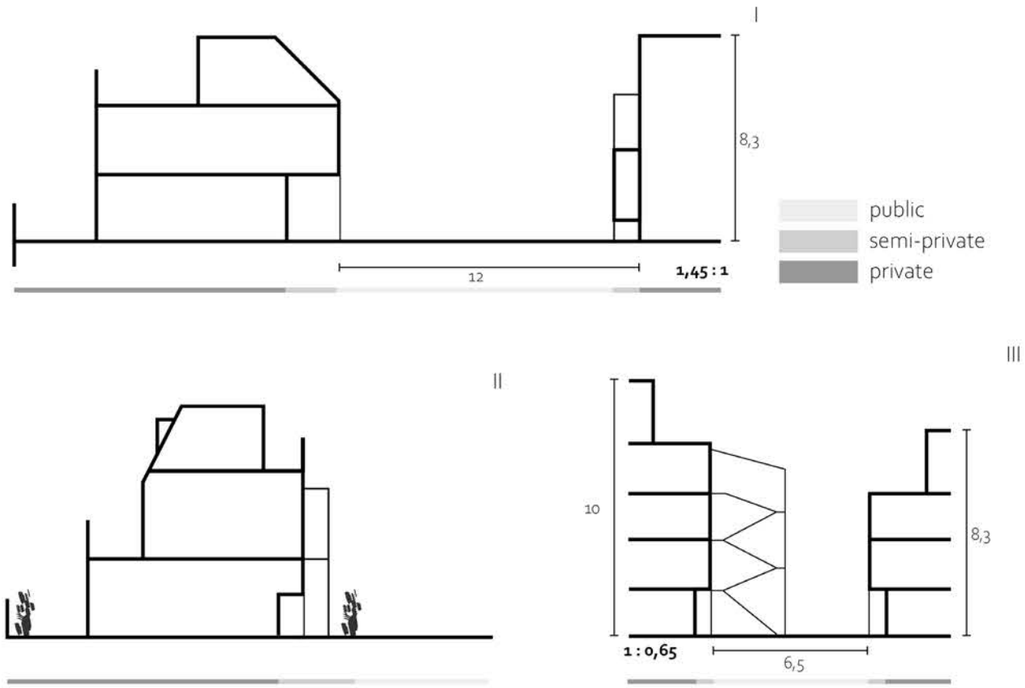


Barzilay & Ferwerda, 2019

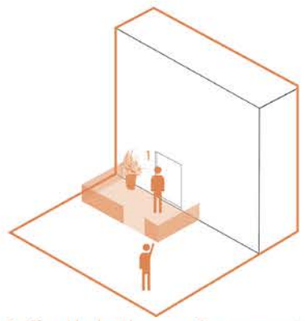
onderzoeksprogramma
Experimentele Woningbouw '68-'80 *Revisited*

casestudy

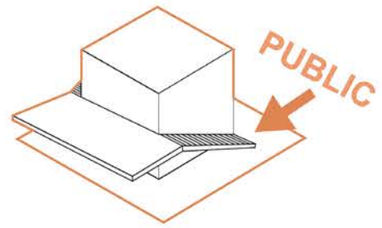
De Nieuwe Weerdjes *Revisited*



- variety type of spaces
- building height : outdoor space
  - streets 1 : 0,65 - 0,75
  - squares 1 : 1,45
- outdoor hallways as part of building
- central stairs clearly visible: overview



Buffer / hybrid space & appropriation



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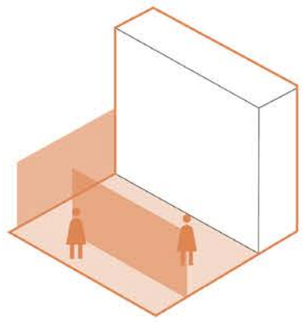
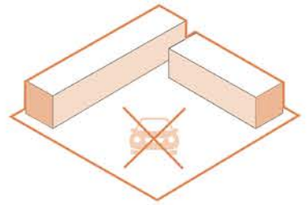
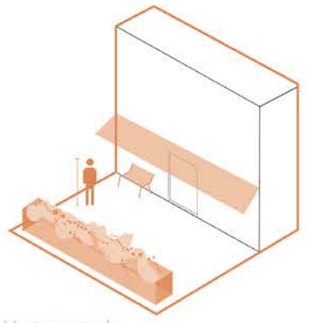


No corners or blocking of overview



Car-free environment

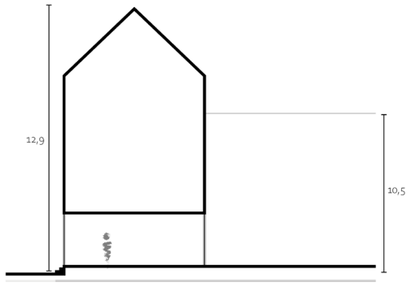


Human scale

A well-functioning living environment

An even more closed off housing typology is the courtyard. The privacy zoning works slightly different in this typology, but there are similarities. Viewed from the point of entry to the courtyard, there are often three routes through the courtyard: straight on to the shared garden or one of the sides towards the front doors. Here, too, separation is often achieved by means of vegetation or a low wall. However, compared to the residential deck, fewer layers of privacy are needed because the courtyard is not located on a through route like the residential deck. In a courtyard, it is often really about specific visits, which means that there will be less daily traffic and therefore passers-by in the design. This can of course be different given the great popularity of courtyards and how they are becoming tourist attractions. From the dividing vegetation, a walkway follows, just like on the living deck, with the living door directly adjacent to it. In order to create a boundary, facade gardens with benches and plants under the window next to the door are used on the one hand, but the facade also plays a role here. In a majority of the courtyards studied, the entrance reacts to the path by jumping in or creating an extra landing. The path itself in terms of materialisation also plays a role in this. In a number of courtyards, the clinker pattern is leading for the type of space or a recognition of the function behind the wall of the house.

pieterskwartier.nl



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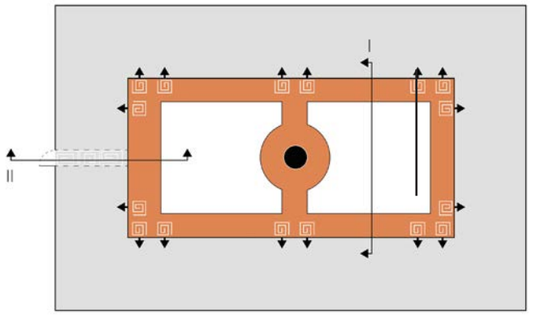
monumenten.nl



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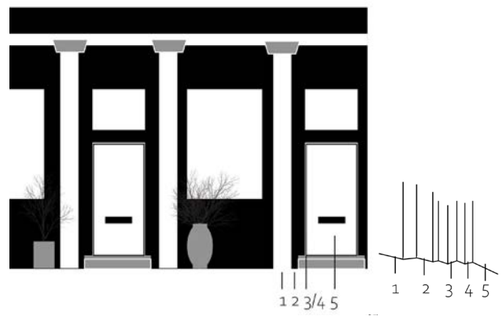

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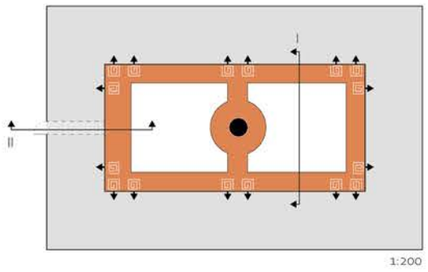
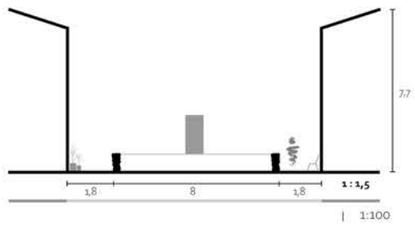
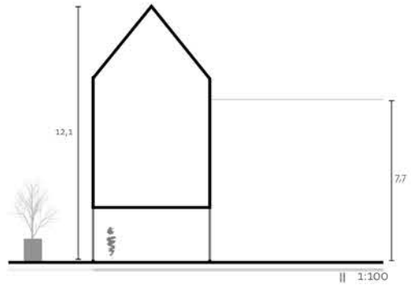
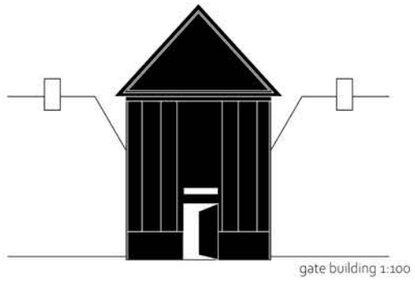
Brouckhovenshof - Leiden (1631)

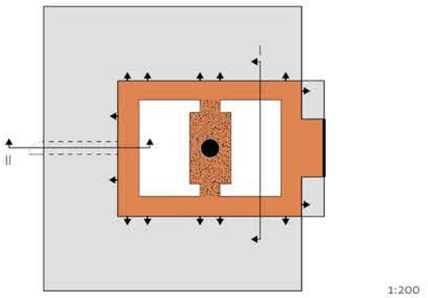


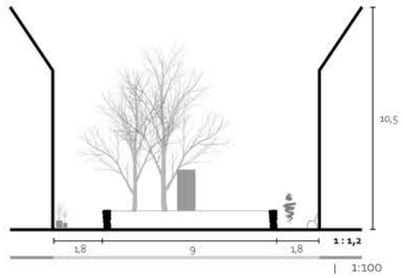


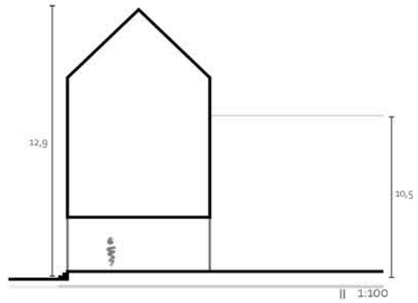


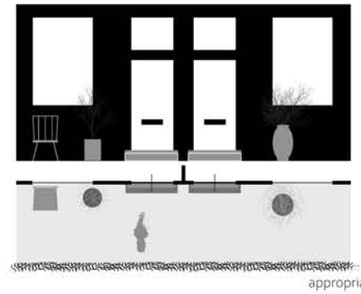


Jan Pesijnshof - Leiden (1683)

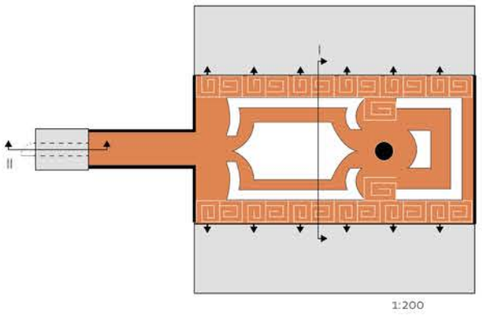


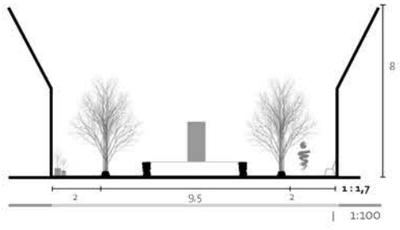


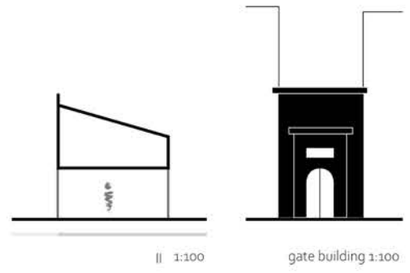


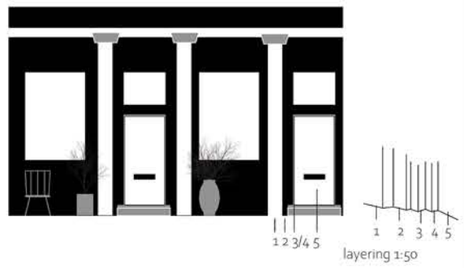


Eva van Hoogeveenshof - Leiden (1650)

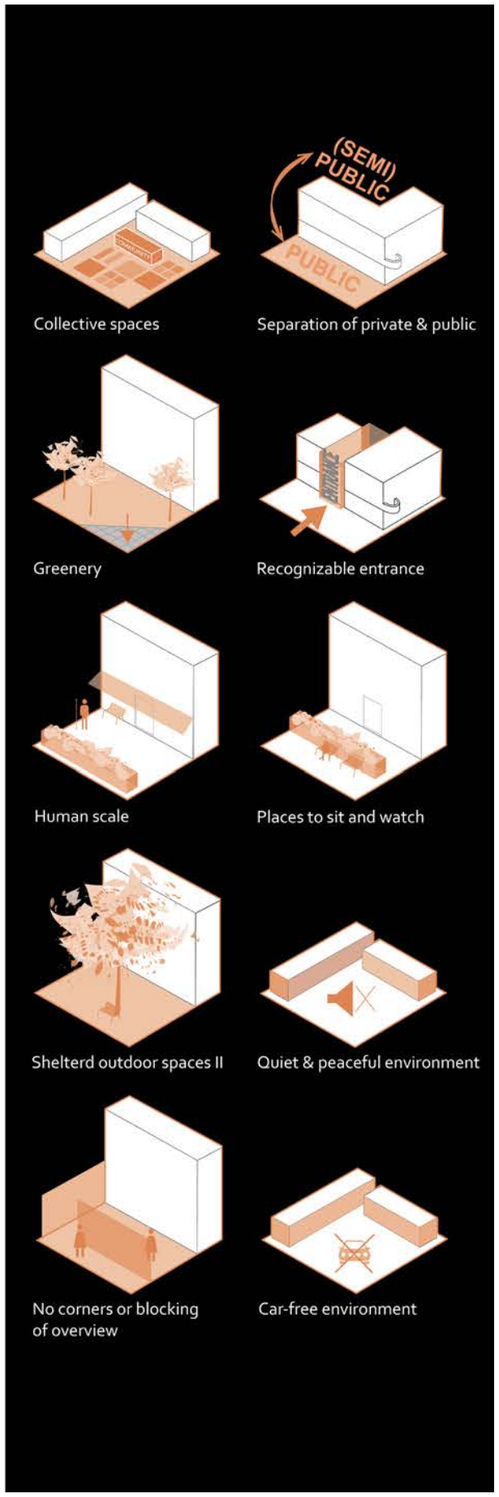








brick pattern | circulation space | building | green | statue | differing materialization | enclosing wall | bicycle stands



Conclusions

A high quality, inclusive living environment, for each and every type of resident was the first and foremost task within the renovation and upgrade of the Bijlmerplein residential area. The outcome of the research is focused on identifying what an inclusive and high quality living environment consists of and how to apply it. The aim was to create a programme of requirements to create such a living environment based on what the older generation in the Netherlands and the general, if it may be so called, prefer their surroundings to be like. From this research, it turns out interventions to create an inclusive, high quality living environment can be devided in 8 categories. However not completely seperable as overlapping and interrelations are unavoidable and even undesirable as the living environment is a system in which the whole is greater than the sum of its parts. That is why there is no gradation in the importance of a certain category in achieving this goal. The categories each consist of multiple possible design sollutions to create circumstances for an upgraded living environment in terms of livability. The categories, visualized on the next pages, are as follows: social, functional, nature, reachability, accesibility, privacy, identity & recognizability, quality of staying and safety.

Social

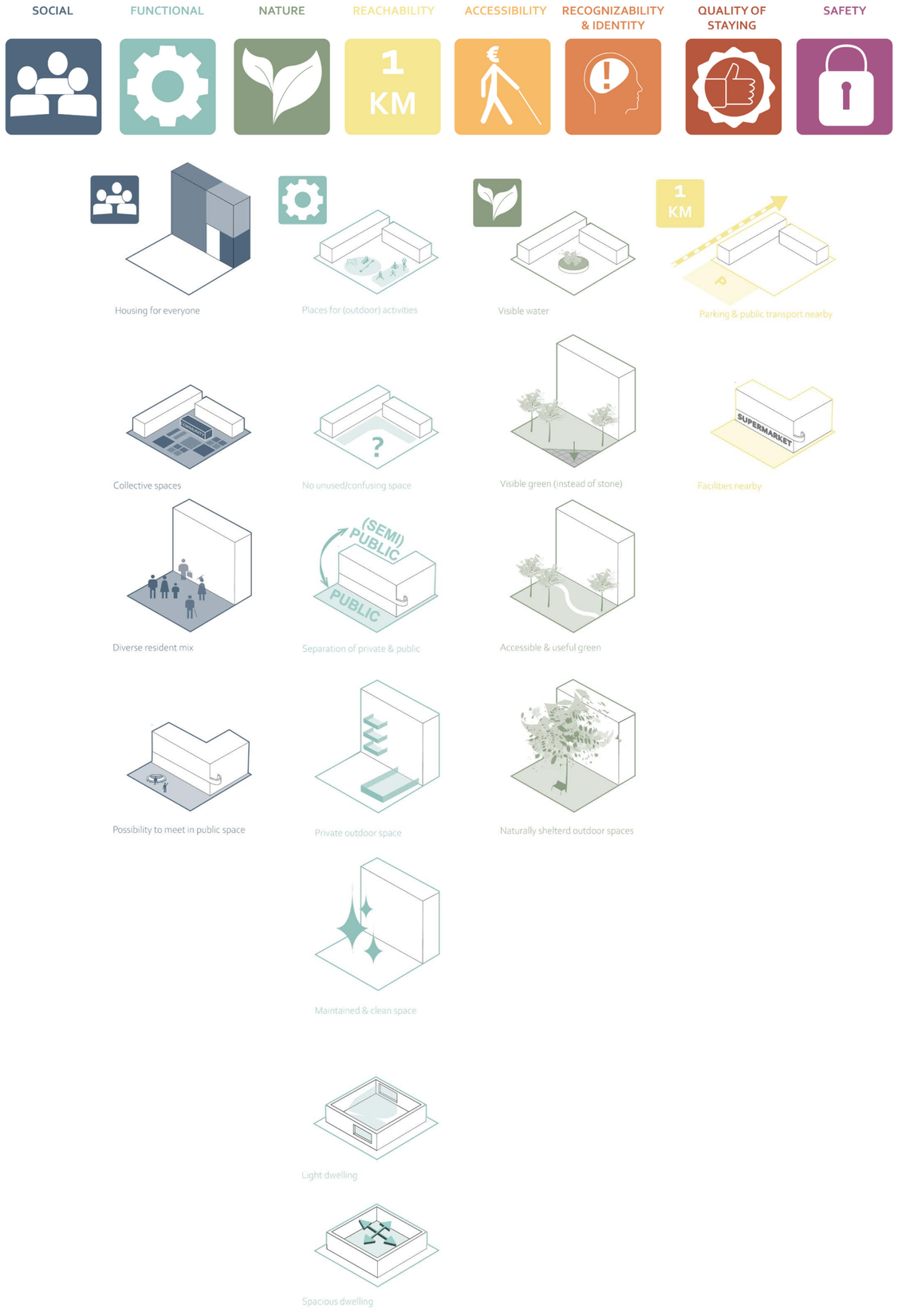
The soft side of designing, but simultaneously the element that could make or break the functioning of a living environment: social quality. A social approach in residential areas turns out to be partly consisting of including different, if not all types of, residents. Housing for everyone, be it younger, older, at the start or at the of the housing career, social rental or expensive property, is therefore desirable within a living environment. This does not specifically mean within one and the same building, however it is worth a try. As a consequence, this can result in a diverse composition of residents, another aspect of social quality. Now, these two aspects seem to be very similar, but the difference lies in the type of dwelling itself (larger, smaller, more luxurious, more simplistic) on the one hand, and the type of occupants (e.g. lifestyle) on the other. All of these residents will share some part of the living environment, however small or large that might be: the sidewalk, street, elevator or outdoor hallway. These spaces, initially designed with a different main purpose, are the places where residents cross paths. These unavoidable elements turn out to be a first type of social interactor. Nevertheless, having collective spaces that are actually created for the sake of social interaction are a necessity. This does not explicitly mean having collective spaces will definitely result in social interaction, but it does create the opportunity and encouragement to meet.

Functional

The facilities in a residential area and the functioning of the area and dwelling itself have an impact on its livability as well. Starting off with there being possibilities for activities, a continuation of the collective space. When such spaces are too confusing, meaning the purpose of or how to behave in that space is not clear, there is a possibility of malfunctioning of these areas. This goes as well for polluted or visually contaminated places. On the level of the building itself, having a private outdoor space directly attached to dwelling is also desirable for the sake of a well functioning living environment. Zooming in even more, the functioning of the dwelling is partially based on the amount of daylight in the dwelling and a spacious setup, meaning spaces being not too dark, crowded or unclear.

Nature

As the focus is already a lot on outdoor spaces, inclusion of nature in the living environment seems to be a much appreciated element of quality. This does not necessarily mean having to live in a forest, but rather the availability of visible water and visible, but above all usable and accesible, green spaces. The use of natural elements like trees in design as natural shelters, as sheltered spaces are part of the quality of the living environment, seem to be a much appreciated element. The tree as a shelter therefore covers both availability of greenery as well as creating a considerably pleasant place to stay. Once again, this is where the interrelations between categories becomes clear.



Reachability

On a larger scale, the surrounding area of the living environment is particularly important in terms or reachability. Especially having stores, pharmacies and places for relaxation nearby, or at least parking and public transport to reach these facilities is crucial.

Accessibility

The physical variant of reachability could be seen as accessibility or the way to reach the inside of a dwelling. Creating an inclusive building or dwelling for each and every type of resident means first of all having an entirely zero-step concept, to not exclude any resident unpurposely. It includes elmininating or avoiding any form of stairway or elevation not being a ramp to the dwelling, whether in the form of a small landing or an uplevel floor. This includes having an accessible storage for e.g. a bicycle. In urban settings and especially at Bijlmerplein public accessibility, for example for the sake of social control could be really important. This accessibility could of course only be realized by having accessible routes and paths without bumps or rough terrain. Nevertheless, accessibility is not only an element of the physical ability to reach another space. Affordability is in fact another form of accessibility, the accessibility and thus inclusiveness for everyone to be able to afford a home. It is one of the desires and core reasons for the older generation to stay put in their family home.

Privacy, identity & recognizability

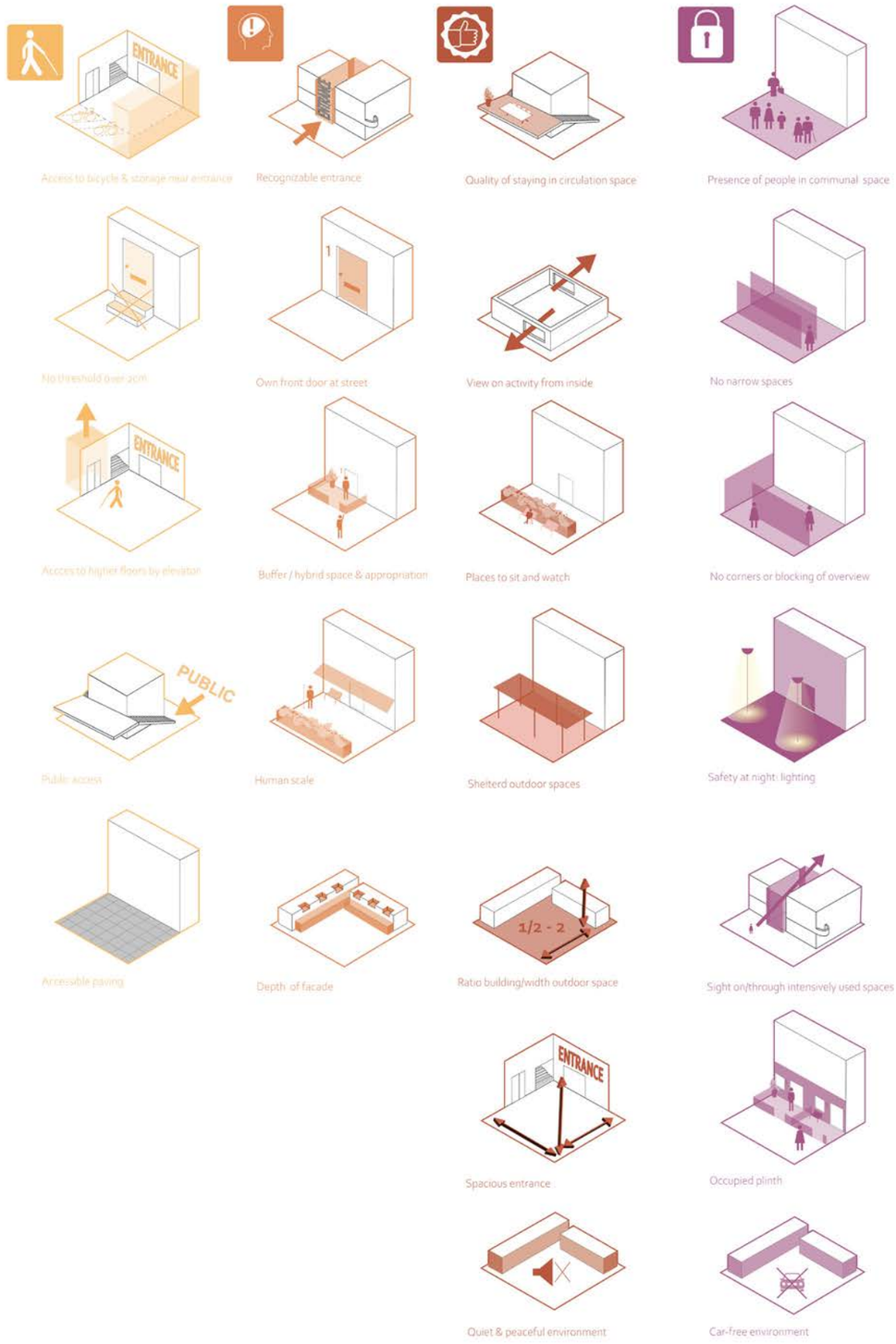
There are also points in the individual living environment that should not be as accessible in terms of privacy. The dwelling itself is seen as the most private space for the resident and is appreciated for that sake. Protecting that privacy from the direct public space turns out to be desirable and therefore any type of buffer zone is a necessity. This zone is a place for distanced and voluntary social interaction, but it is also a space for individual expression. As is having a front door at at the street, expressing the individual home. An articulated entrance of the living environment itself seems to fulfill this same position of identity and recognition, but about clarity in functioning of the environment as well. Another element that emerged is the way residents associate themselves with the scale of the built environment. A human scale is appreciated a lot and lets residents identify with their environment. It is a recurring element, as depth and scale of the facade also seem to contribute to this idea of recognition and place attachment.

Quality of staying

What makes people want to stay for a longer period of time in a certain space is an interesting category in the scope of the project. Be it just spending a break in public space or the quality within the dwelling itself. It turns out one of the elements mostly associated with a bad quality of staying is the circulation space. Of course the main function is circulation, but having bare, mono-functional space while it can be multi-functional seems a missed opportunity as circulation space will always be present. In addition, these places to stay, defined as being places to sit and watch, are not only important in circlualtion spaces but also for public spaces in general. Moreover, having at least some of the public places to stay sheltered could increase their use. Use of and stays in spaces may also be improved by not making the spaces too oppressive, but also not making them so large that people can no longer identify with the scale, which is also reflected in the quality of stay.

Safety

Last but not least, safety is one of the core elements in a high quality living environment. First of all, social control by means of eyes on the street by having windows towards the street or directly adjacent public space is an important element to create a sense of security. In line with this, it also means avoiding or eliminating corners and narrow spaces and having enough lighting in the evening. When the residential area is somewhat turned away from public space, sightlines from public space into the residential area might be desirable. The same goes for the plinth of the building, which must at any moment of the day be occupied in residential areas to prevent illegal businesses from occuring out of sight. Lastly physical safety in terms of traffic safety is an element that must be the rule rather than the exception.

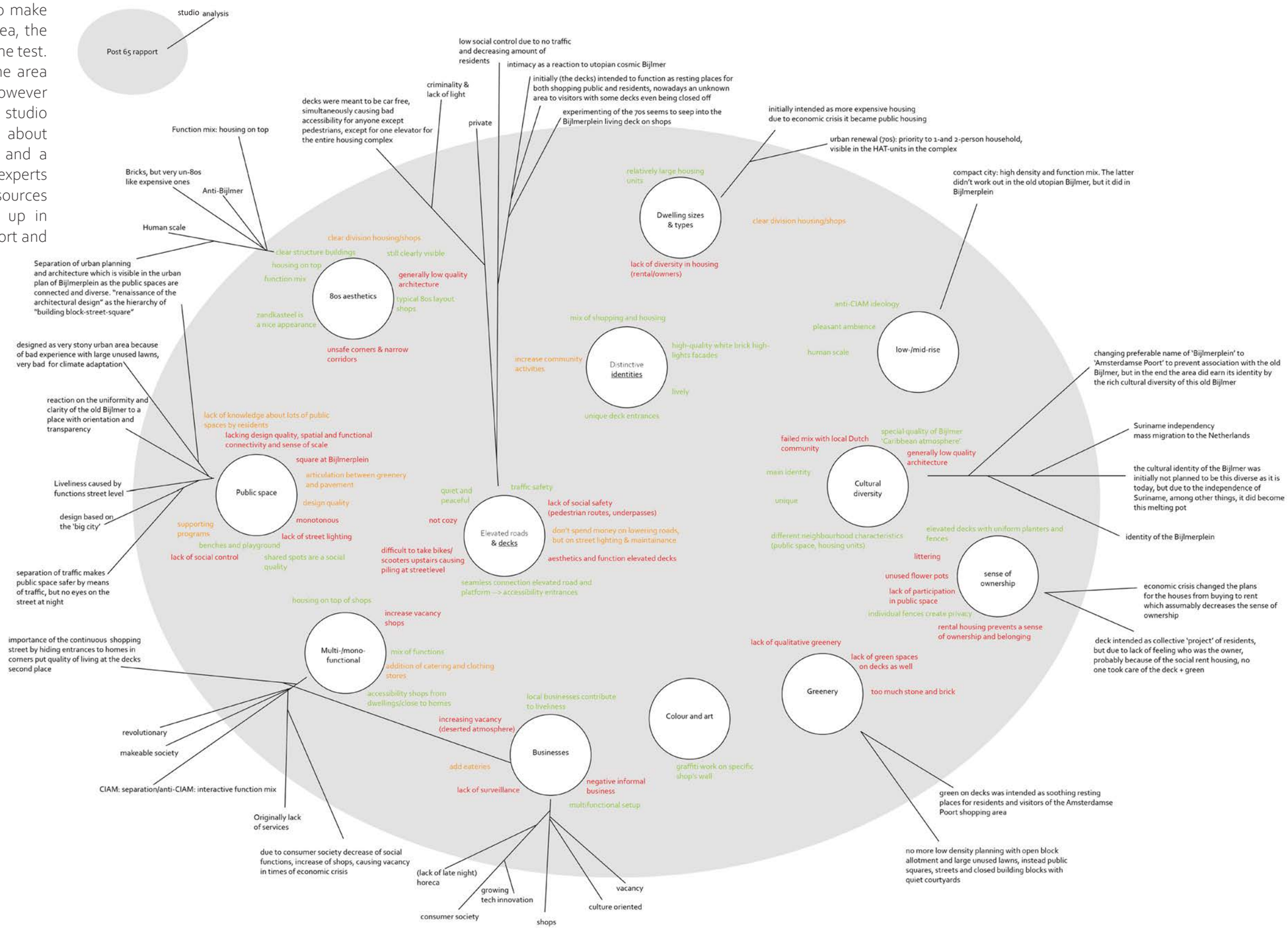


3

Quality & values at Bijlmerplein

Quality vs. values at Bijlmerplein

With the scheme created as a way to make a problem analysis of a residential area, the case study of Bijlmerplein was put to the test. In order to do so, the valuation of the area and complexes by stakeholders is however necessary. A report from last years studio in New Heritage and Ymere (2021) about Bijlmerplein, the collective research and a 'speurtocht' by stakeholders and experts are used for this sake. Two of these sources are combined in a mindmap, split up in categories proposed by last years report and the collective research.



The 'speurtocht' resulted in the following valuation of the area based on different scales. All attributes and values that do not contain a phrase in the sense of a lacking element, are considered positive.

Neighbourhood:
car free
safe environment/lively
light colours of buildings
function mix
diversity facade/building
stony
alleys
coherence
accessibility
interesting architecture/sandcastle
clear structure
lack of social control/safety
too much social housing
vacancy
informal economies (drugs)
anti-bijlmer mid-/low-rise

Public space:
meeting possibilities
lack/any green facilities
separation public/private
spacious setup
unsafe entrances decks/corners
dimensions/human scale
sightlines
lacking connectivity
lacking sense of scale
no relation green/pavement
monotonous
lack of street lighting
cultural diversity (identity, unique)

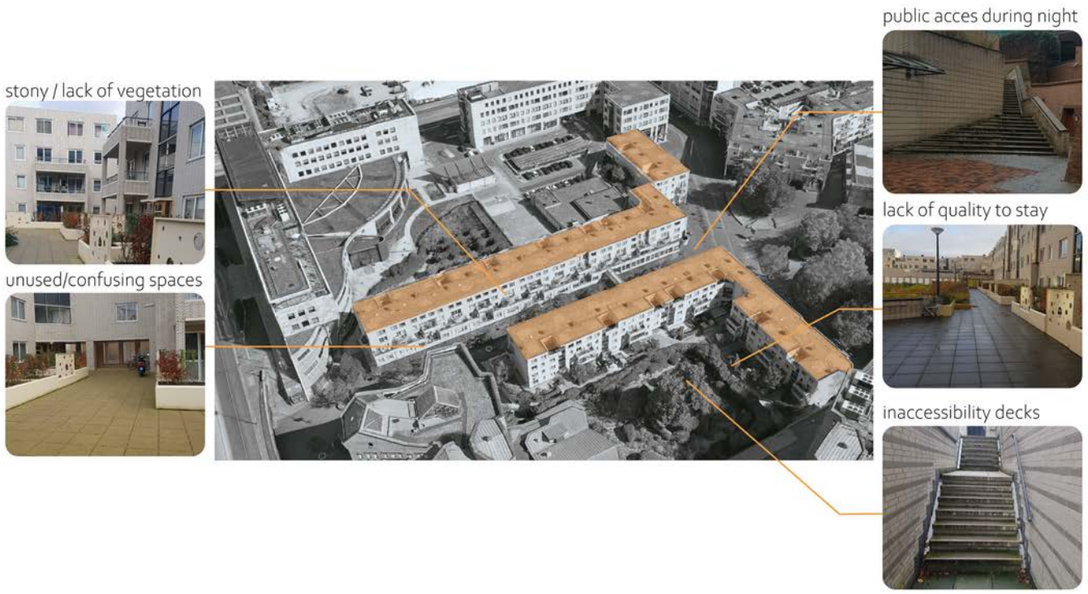
Complex:
corner solutions
product of 80s (architecture)

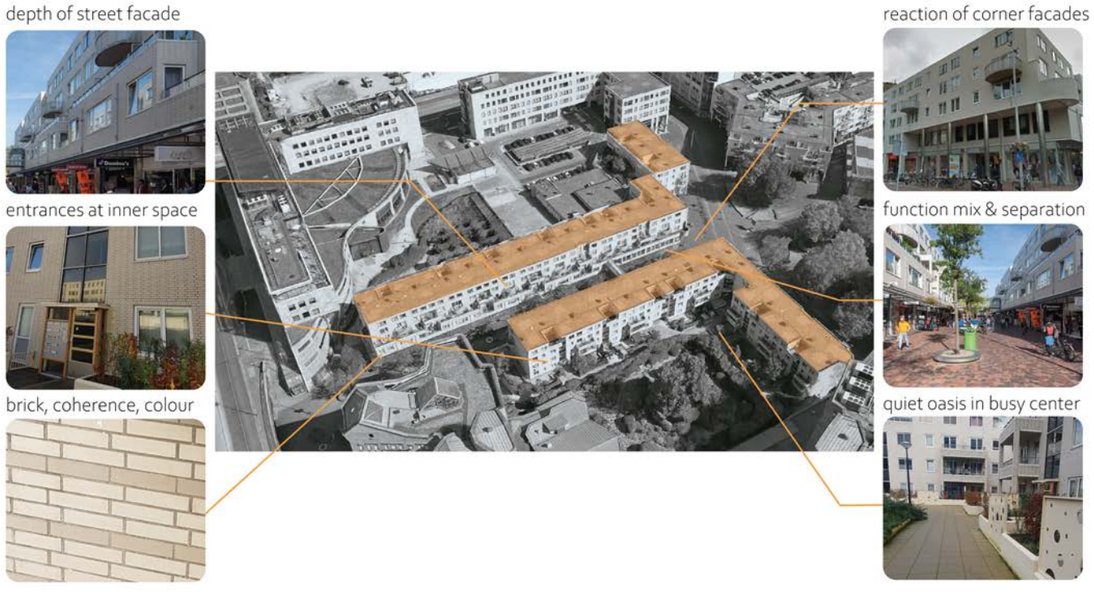
Building:
outdoor spaces
see-throughs/view
diversity facade/balconies
depth effect facade
dimensions/human scale
anonimity dwellings

Decks:
public access/private atmosphere
possible interaction (balconies/deck)
lack of green facilities
inviting stairs
unconcealed gas outlets
residual/unused spaces
land-bound living:luxurious/inventive
social control
parking nearby/connection road/deck
quiet & peaceful, not cozy
lack of sense of ownership
unique deck-entrances

Dwellings:
(quite) spacious
light
outdoor private spaces
variation housing types
multiple bedrooms
uniformity floorplans (no variation)
simple/practicle floorplans
no see throughs
smalll spaces, poky
adjustable spaces
2 different views

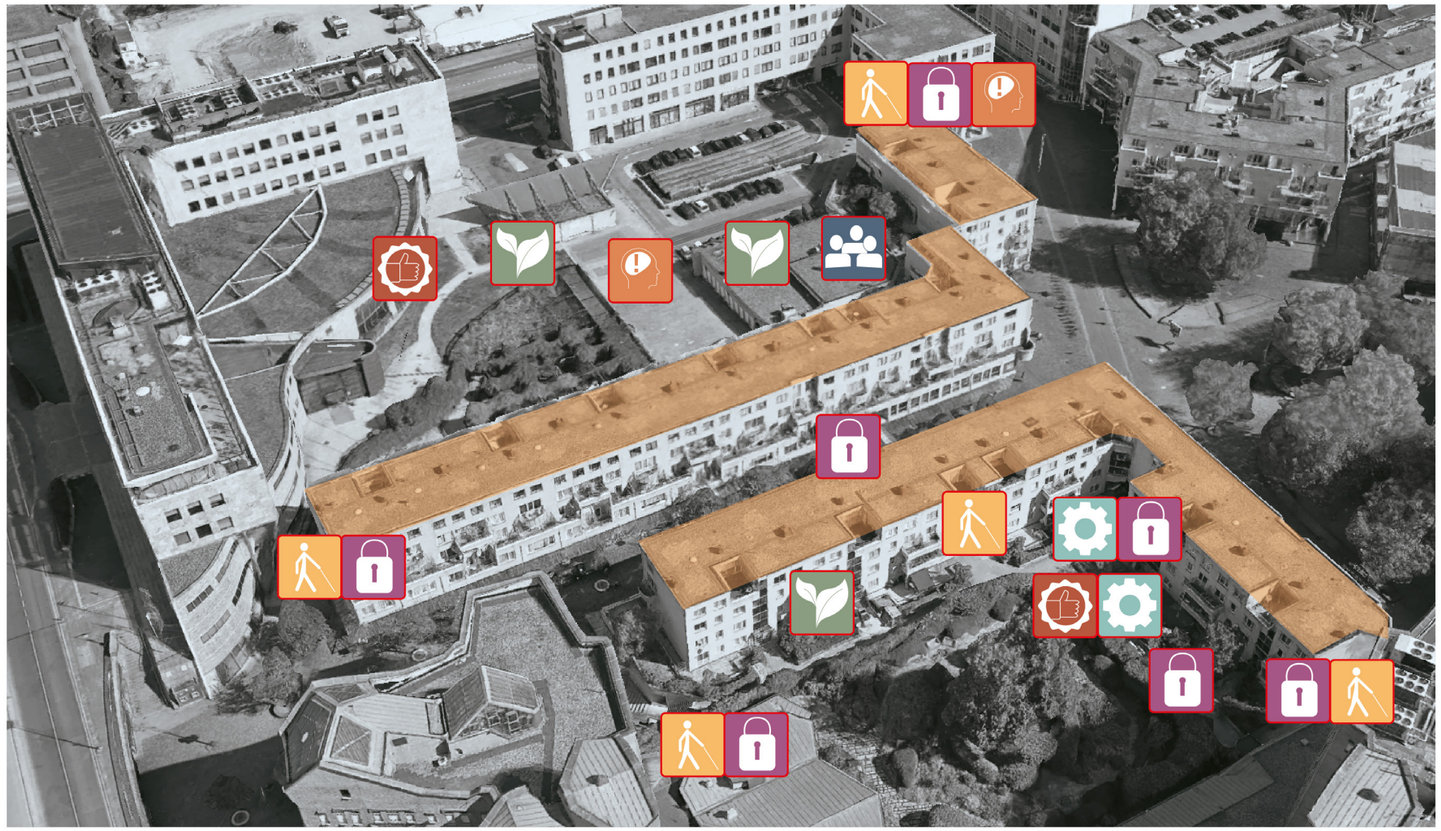
Materials & elements:
unity by colour
brick & masonry
light colour/neutral/clean/fresh
diverse columns streetlevel
lack of diverse materials
resistant materials
dimentions/human scale
carefull detailing
coloured 'spekbanden'
timeless materials
diverse use of non-diverse material
plasticity of facades by balconies

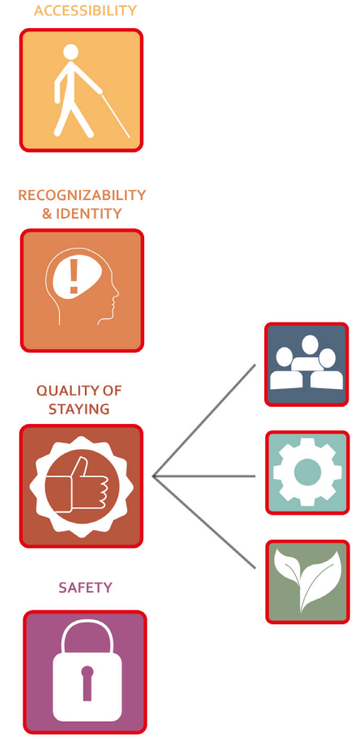


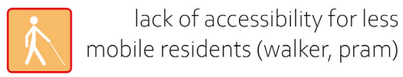


From these valuations it can be concluded that the materials used, and not for the material specifically, but for the cleanness and coherence between all similarly materialized buildings was appreciated. Therefore they have a prominent part mostly in the valuation of the street facades, but not so much on the residential side as coherence is not visible in here. However the bright coloured glazed bricks are an eyecatcher in this area. Another element valued in the street facades is the depth effect, but also the human scale of this side. Basically, a lot of the positive values are based on the street side, except for the lack of greenery. Otherwise, the residential area actually feels like 'the back of another building' other than the front of a dwelling. This miscommunication is most possibly due to the lack of human scale, meeting places, the depth effect, back yards in a front yard setting and a split level effect on the deck itself which splits up the area in two sub areas. Accessibility is mentioned as being poor as there is only some deteriorated stairs and one elevator for 2 entire clusters of over 100 dwellings. In addition the dwellings themselves are only accessible by central staircases. Over all this makes the area inaccessible on different levels: physically but also from an attractive perspective. What showed from this test is that there is a couple of elements all linked by some sort of accessibility that could upgrade the area in the case of Bijlmerplein. The interventions are therefore also based on types of accessibility, being:

- physical
- affordability
- reachability
- scale
- openness
- privacy (how accessible and protected is the private domain)
- social (accessibility of public space and facilities/functions)
- and diversity of dwelling types







lack of accessibility for less mobile residents (walker, pram)

miscommunication private gardens & public path

lack usable & accessible vegetation

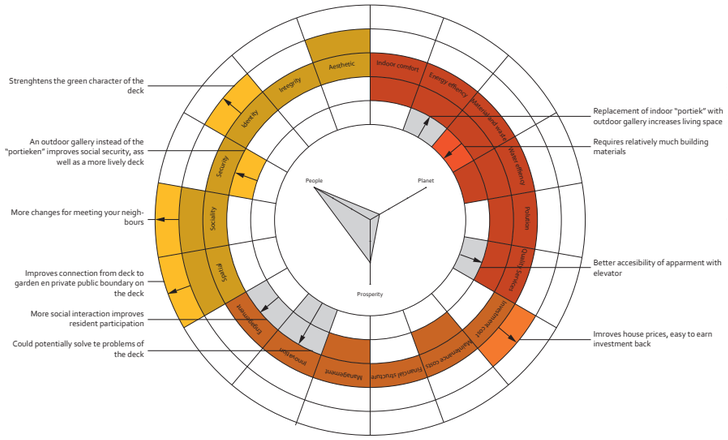
narrow, dark & unclear spaces

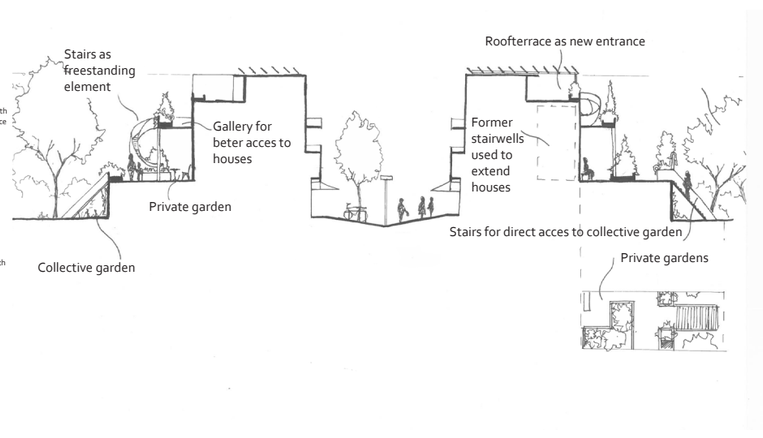
RENOVATION MODELS

Based on both the valuation and the Kamari et al. diagram which was filled in for Bijlmerplein, renovation models were made taking into account 2 main valued subjects of the diagram. The models were created to have an overview of what different kind of renovation strategies would change in terms of the impact on the case study. The models that were utilized in this design are on the one hand the model that considers accessibility and an early idea of the original architect being outdoor hallways. This fits the perspective within the design. On the other hand, a model was used on creation of green spaces dominating stony environments, which could potentially upgrade liveability of the area.

Rediscover the collective
Social x Spatial

Bijlmerplein





Building

Can the reuse of the ideas of the original architects lead to a better functioning deck? In this scenario social and and spatial characteristics formed the startingpoint to redesign the decks on the bases of these ideas. A large gallery can be build and the connection to the backgarden should be strengthened. This strategy is typically applied on the scale of the building. The solution can pottentially improve one of the weakest points of the buildings design and thereby improve liveability and make the appartments also financially more attractive.

Values

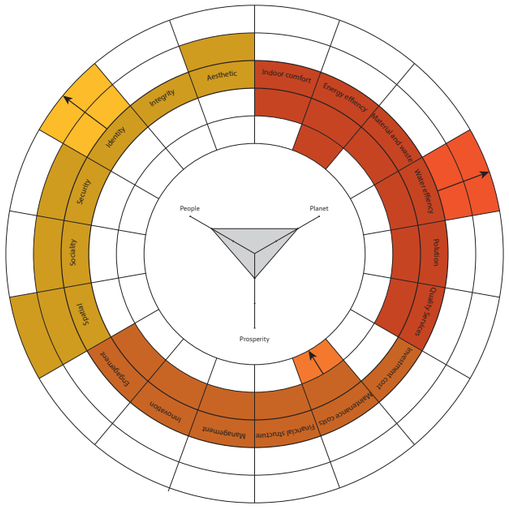
Relation to values of owners, users, students, architects & advisors, government & municipality:
- Quality and liveliness on the decks: improved
- Appreciated peacefullnes and greenery, preserved or improved

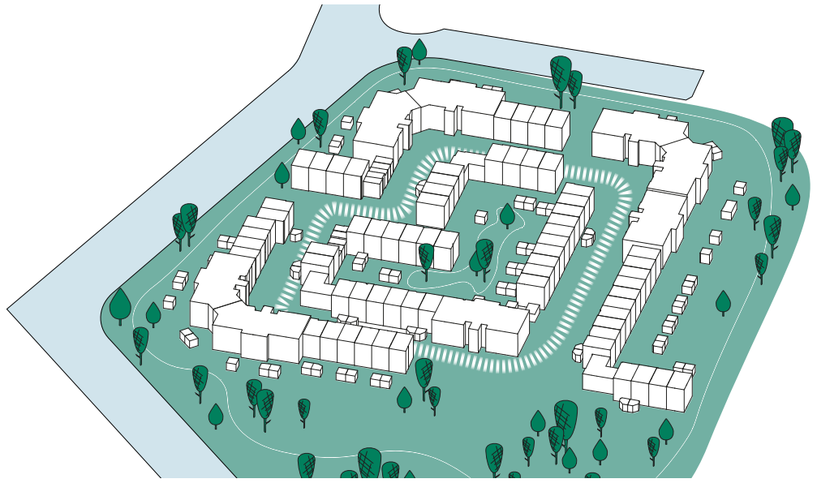
Justus van Effenblok, Michiel Brinkman

source image: nieuws.topo10.nl

MORE GREEN, PLEASE
biodiversity x spatial

Goedewerf





A green neighbourhood

This model aims to strengthen the biodiversity and the spatial values on a neighbourhood scale, by embedding green into the residential areas. By letting nature run its cours, biodiversity in the neighbourhood would be improved. Groene Mient, in the Hague, has a similar strategy. These green areas not only provide space for children to play in, but also invite local insects and animals to live in. By removing hard pavement and replacing it with greenery, water efficiency is also higher.

Reference project

Groene Mient, the Hague by Bos Hofman Architektenkombinatie and Fillié Verhoeven Architecten

4

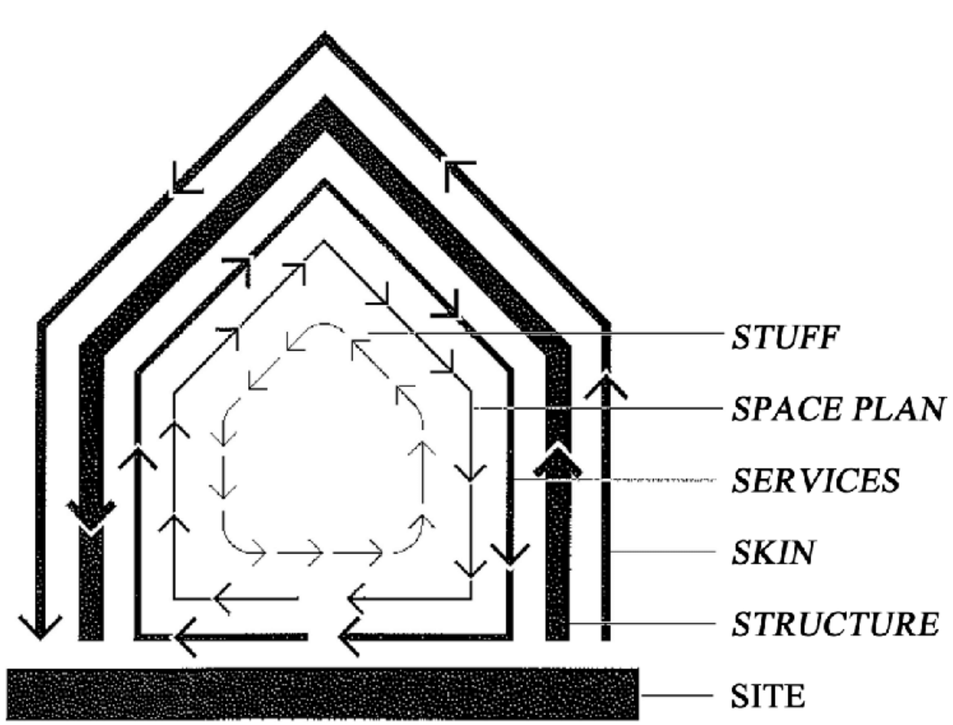
Design process

	Physical	Affordability	Reachability	Scale	Openness	Privacy	Social	Dwelling types
Site	- Elevators to deck	- Adding social housing - Variation in housing type (rent, property, etc)	Adding sports & outdoor spaces + communal spaces to stay makes distances for users to facilities smaller	- The extra volumes decrease the experienced scale on the large deck. However to prevent the human scale getting lost in the street by added levels, the new volumes are placed towards the interior space of the building, preventing a tunnel effect in the streets. - The new entrance is a green hill instead of enormous non-human scale stairs	Opening up the residential area introduces visual accessibility of the deck, acknowledging the area and dwellings as a significant part of the urban centre: embodied energy < acc. + acknowledgement	- Opening up the area also means making the place more accessible to strangers as an invite is created to visit the area. This has two sides, one of a possible breach of privacy, but otherwise an increase of social control, both by having visibility on the deck but by eyes of visitors as well. - Zoning of the deck creates a more quiet front yard area	- Addition of social facilities involves a larger target group to use them. - Addition of places to meet like the outdoor facilities, community hub, outdoor hallways and entrance hill creates circumstances for increased social interaction	Addition of dwellings changes the content of the place by making it a residential area, in need for facilities.
Structure	- Break through walls → zero-step dwellings - Added elevators are structural cores of buildings	- Prefab timber construction takes less work on site = cheaper - Reusing grid for extra levels within bearing limits prevents extra foundation		Choosing a lower amount of levels than possible for the sake of scale	Removal of part structure for sake of acc.		Construction of new volume before renovation enables current residents to move only across the street while their dwelling is renovated.	The flexibility of the existing construction enables variation in dwelling types within the zero-step concept
Skin	Shape & materialization façade: recognizability could help people associating with the living environment as was done before at Bijlmerplein to get rid of the unrecognizable alien high-rise of Bijlmer	- Ecological affordability: using materials with zero CO_2 footprint to create a building that could be afforded by nature	By opening up the façade towards the square both shopping and living environment seem physically more accessible	Using small scale elements emphasize residential areas and human scale: front doors, jumps and plasticity in facade, breaking up the facade into a more human scale to associate with	- Facade opens up towards interior space for the sake of increased daylight and social control. - Opening up this side of the building could also increase the willingness to take part in life on the deck	Demarcation of entrances increases recognizability and individuality again acknowledging residents themselves.	Using a recognizable façade materialization/architecture prevents dissociation with the building: a brick like tile, Amsterdam school style architecture	Showing front doors acknowledges presence of numerous dwellings and residents
Services	- Splitting up ventilation pipes of shops to incorporate into façade to avoid obstacles on the outdoor hallways - Addition of extra elevator	- Placement of 1 extra elevator instead of one in each main staircase decreases possible costs = also ecologically more affordable	- Climate: geothermic, solar energy, rainwater - Elevators make facilities more reachable			Reducing the amount of elevation points can increase anonymity among residents	- Making all dwellings reachable by elevators is a social gesture to include less mobile target groups - Removal of current screed floor to install underfloor heating/cooling decreases otherwise lower level height	
Space plan	- Elimination of dwellings only acc. by stairs - Outdoor hallways - Facilities on deck floor	- Small interventions in floorplans increase diversity and therefore affordability of dwellings - Lowering circulation space increases living space & could lower dwelling costs by needing only a smaller dwelling	- Adding social facilities on deck level increases social reachability - Creation of 1 main entrance	- The added mass splits up the area in different atmospheres, decreasing the unhuman experienced backside scale - Placement of outdoor hallways on street side in added levels enables mass to be placed towards interior space to eliminate non-human scale experience in the street	The new entrance is not just an entrance but a place to stay. Making the area more accessible by creating a place that opens up to the public and is usable as such	Addition of buffer zones as front gardens and on the outdoor hallways by means of cut-outs creates some distance between other residents and very private spaces in the dwelling. Each resident has their own private outdoor space but also the space in front of the front door as a kind of semi-private domain. These spaces always border either a hall or kitchen, but never a more private area. Because all dwellings have a street and deck facade with outdoor space, there's a possibility to choose. Creating the jumps in the facade also enables residents to stay on the outdoor hallways rather than purely using them for circulation	- The buffer zone enables residents to stay in their private space or take part in life outside of this zone by having an overview - Zero step dwellings - Having 2 outdoor spaces, private and semi-private, enables residents to choose where they prefer to be - Diversification of the deck creates facilities for different residents	By creatively using existing floor plans, diversity within the existing building is increased
Stuff							Addition of street furniture increases places to potentially stay	

SHEARING LAYERS MATRIX

The design consist of different categories of accessibility in combination with the multiple interventions based on the categories, valuation of the area and future-proofing. To organize the interventions in the design into the categories of accessibility and level of detail, the shearing layers of Stewart Brand were used (1995). Brand specifies six layers of the dwelling in terms of their lifespan and likelihood to be replaced. For the sake of different scales used in the design, the matrix gives a clear overview of accomplishments for each of the separate interventions in the renovation of the residential area at Bijlmerplein.

Brand, S. (1995). How Buildings Learn: What Happens After They're Built. Penguin Books.



2nd floor
1:200

1st floor
1:1000

Interpretation of Amsterdam School style in added levels

PHYSICAL

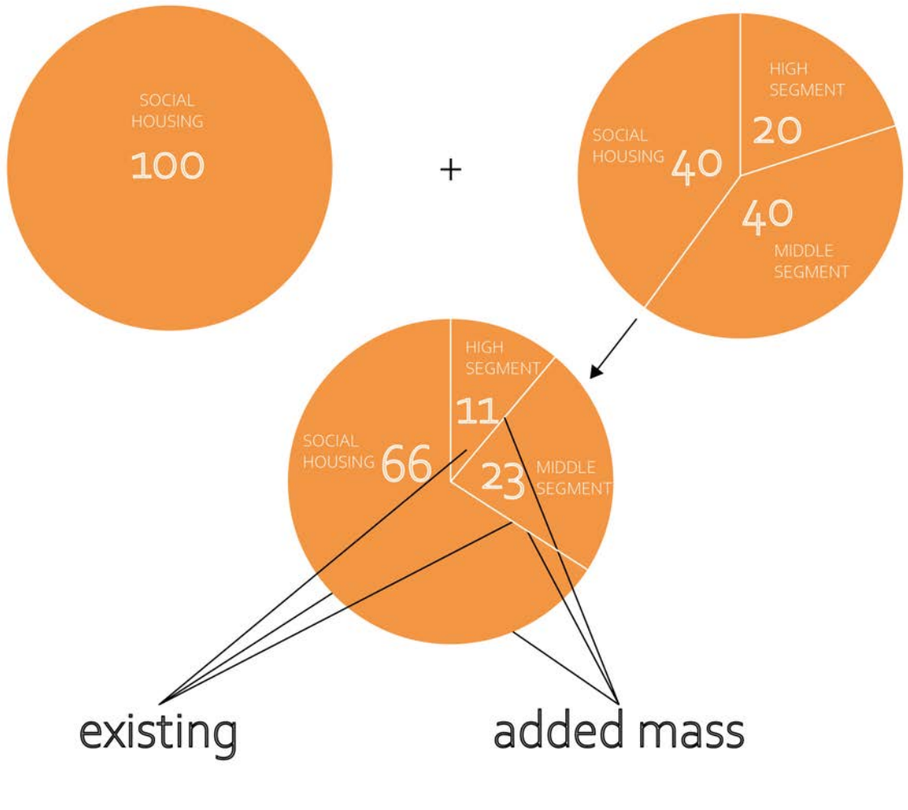
SITE
Currently, the deck is solely accessible for the public by staircases. As this is not acceptable within the perspective of physical accessibility, an elevator is added at the new entrance of the residential area. This gives the public, but users in general as well, access to the added facilities on the deck. This intervention was determined upon purely for the sake of accessibility and use of function on the deck.

STRUCTURE
The structure of the existing building is in good shape, however for the sake of physical accessibility in creation of only zero-step dwellings, some structural elements need to be cut. Additionally, the construction of the building is also increasingly strengthened by 2 structural cores containing the foremost element of physical access: the elevator.

SKIN
How could the skin of a building be used in terms of accessibility? One of the factors might be the attraction of the façade. How well can people associate with the skin or in other words: how recognizable is it. This is not a very direct link to physical accessibility but it does touch upon approachability and therefore how likely it would be to enter an area or building based on the façade. An example is the quite cosmic architecture of Bijlmermeer from the 1960s, in which people were not used to this kind of high-rise, identical residential buildings. Residents probably had difficulty associating with the buildings as they were so much different from the prevailing way of thinking at that time about domesticity. Bijlmerplein however, was a reaction on these unrecognizable structures by including elements that everyone knew: gates, bridges, plasticity of the façade from the Amsterdam school style, squares and streets. Therefore the Amsterdam school style is emphasized again in the added volumes at Bijlmerplein.

SERVICES
The current façade on the deck side has some ventilation pipes of the shops beneath, running over it. As this façade is insulated on the exterior, splitting up the current ventilation pipes these can be incorporated in the exterior façade. Thereby obstacles on the outdoor hallway are avoided for the sake of physical accessibility. A second addition of services are the elevators as a key in physically accessible dwellings.

SPACE PLAN
The floor plans consist of 3 types of dwellings of which one is a maisonette. To create a fully zero-step dwelling this last type is eliminated for the sake of physical accessibility. Accordingly, elevators are introduced with outdoor hallways across the deck façade. These hallways have a very convenient straight routing while keeping a distance from the façade.



Added housing stock in percentages

1nd floor
1:300

AFFORDABILITY

SITE
For the sake of affordability, social housing like it currently is at Bijlmerplein, should be preserved for its high demand. The added dwellings will therefore also consist of partial social housing according to the municipality's commitment to create a division of 40% social housing, 40% middle segment and 20% higher segment dwellings. This way, the housing stock at Bijlmerplein becomes more diverse in terms of affordability, but also keeps new construction and renovation affordable as not only an extra amount of social housing is introduced.

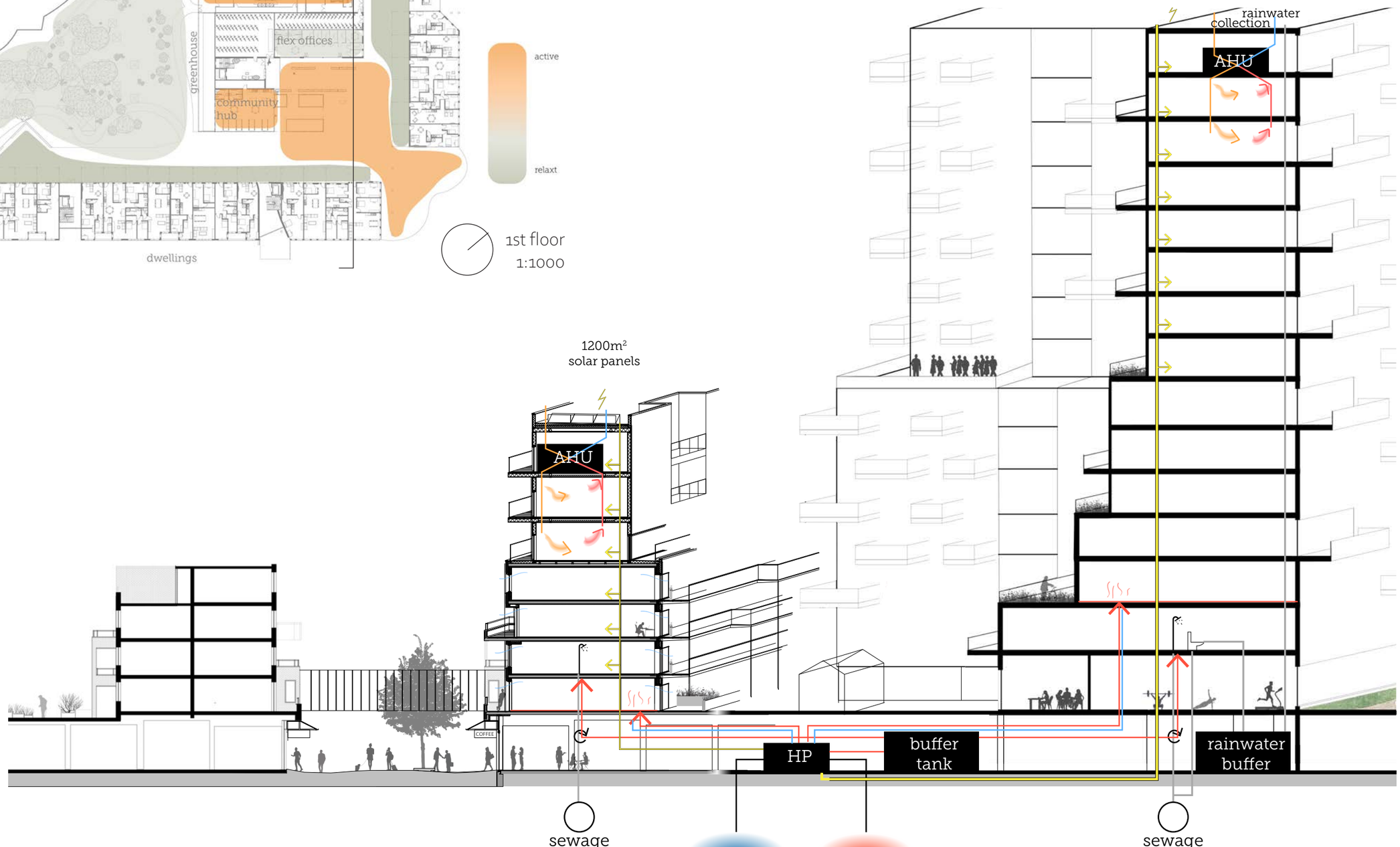
STRUCTURE
As the building is right in the middle of an urban center and therefore very busy and crowded, on-site construction work can be quite expensive. Therefore the added construction of extra levels and the tower is almost entirely light weight, prefab, timber frame construction, lowering construction time on site. This however, also makes the densification more ecologically affordable, meaning a low CO_2 footprint which is more affordable than building with for example concrete and steel. As the material is so light weight and follows the existing structural grid, no extra foundation is needed.

SKIN
The used finishing material in the façade, being Kerloc, as well as insulation (flax insulation) and structure (timber) have a low CO_2 footprint, referring to ecological affordability. The materials are however not necessarily cheaper themselves, while they are again in the construction phase because of prefab production. The insulation of the skin is for financial reasons and simplicity placed on the exterior of the building, however not in the street facades for the sake of coherence between buildings. This does mean aesthetic features are prioritized over financial motivation.

SERVICES
The current space plan contains multiple staircases, but by only placing 2 elevators and transforming the rest of the staircases, costs are lower than when adding for all staircases an elevator. This last option would include using a lot more living space for circulation which is expensive. Simultaneously, adding only 2 elevators would be more ecologically affordable.

SPACE PLAN
The flexibility of the structure makes it quite feasible to easily create a diversity of dwellings with the 'left-over' maisonettes and staircases. Diversity could increase affordability for different target groups, as well as limitation of circulation space. This type of space makes dwellings more expensive as it reduces potential living space. By maximizing living space and minimizing circulation space there is more living space for which means a more economic floor plan.

1st floor
1:1000



1:300

REACHABILITY

SITE

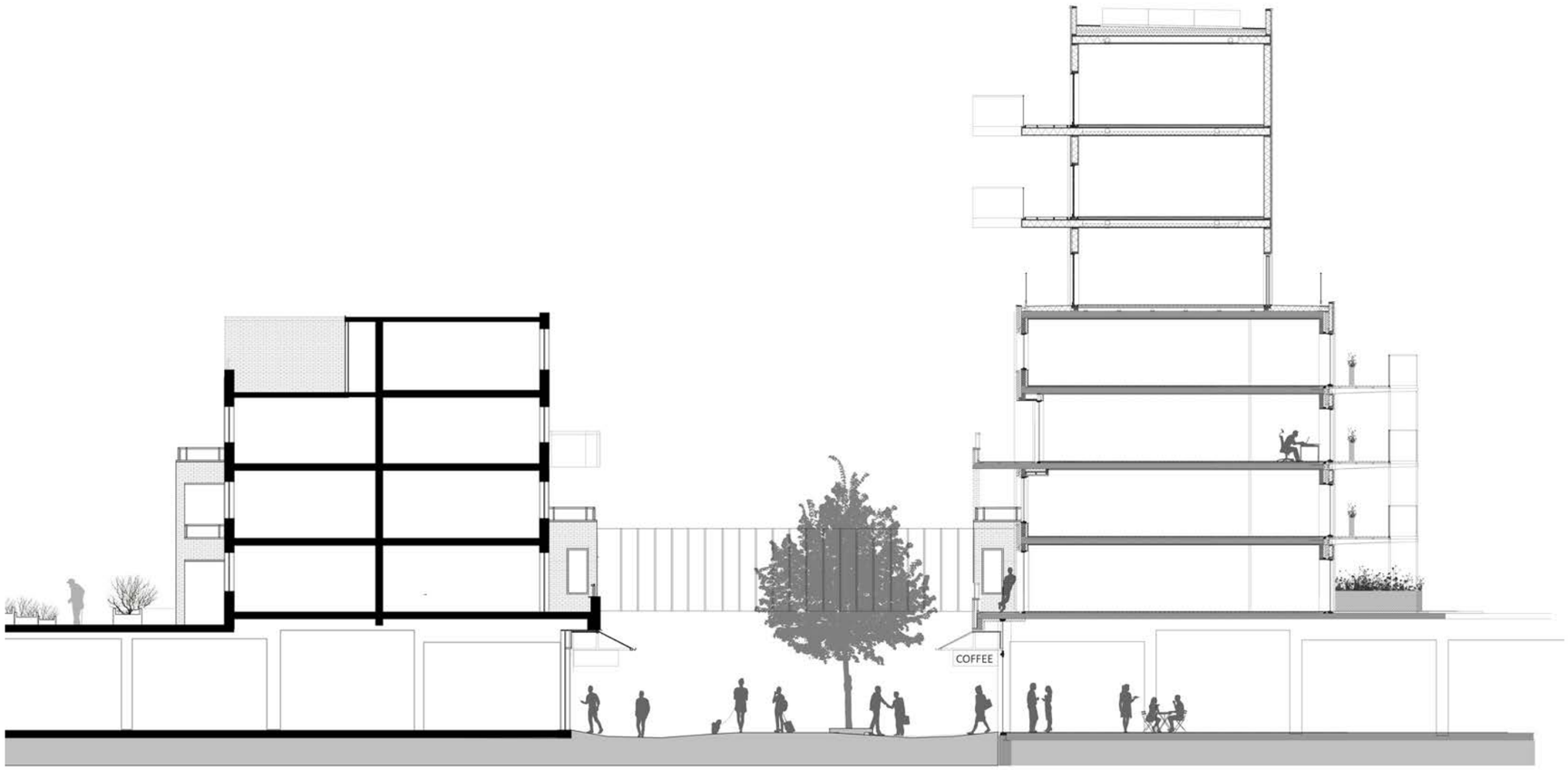
With densification on the deck as a future plan of the municipality, it is incorporated in the design. Accordingly, more people will use the deck which results in a need for facilities like outdoor spaces to stay, communal functions, sports and other types of leisure. The first point of interest is the green hill symbolizing the new main entrance to the residential area at the deck. This hill serves as a place to stay, to climb the stairs with an extra function underneath it, like a bicycle storage. That way, the entrance is multipurpose and does not waste any space. The square created by the partial removal of the former library and dwellings and addition of a residential tower, is the next point of interest. As this place is very central and borders the square at ground level, it is the perfect spot for a community center and flex offices. The third area is the green sloped landscape in the cluster itself, which is all about relaxation, a walk around the block or a communal barbecue in summer: a place large enough to gather, but also a shared garden to enjoy individually. Not only is this a place for relaxation and leisure, it is also quite unique within Bijlmerplein itself as there is no green accessible spaces for users. In addition the green oasis is an addition to the very stony living environment at Bijlmerplein, and therefore could stimulate biodiversity in this very urbanized area. The fourth area is a place for sports, activities and games with outdoor sportsfields and gym, bordering the indoor gym and indoor sportshall at the back of the community center. The relaxation area is linked to the activity area by a picnic spot and playground which are right in between these two levels of activity. All of these facilities are already lacking at Bijlmerplein and would therefore only be in higher demand when increasing the amount and type of residents within the cluster. To also increase reachability from the by a pedestrian bridge connecte cluster 3, the now quite abandoned bridge will be widened so that some experiential quality is added.

SERVICES

In the design, local energy sources are used for the sake of an accessible climate concept without having to make concessions about non-local sources. These used sources are geothermal energy for underfloor heating and hot tap water in combination with a booster heat pump, solar energy and reuse of large scale rainwater collection.

SPACE PLAN

As social functions are practically absent at Bijlmerplein, addition of such facilities on the deck drastically increases their reachability. Added facilities are sports areas, a community center, flex offices, landscaped areas for relaxation and indoor sports facilities which include a larger target group as public can benefit from it as well. The very visible entrance of the area with its public elevator makes these facilities also physically accessible.



1:200

SCALE

SITE

Scale is an important design tool in the original design of Bijlmerplein. As the streets are experienced as being pleasant because of the human scale, the interior space in cluster 2 is not. The very large, stony space is quite bland, bare and functionless, in addition to all embracing facades including the residential one, which are all very office-like and plain. Addition of an extra volume in the interior space splits this area up, decreasing the experienced scale and making it more human. The levels added on top of the existing dwelling could be quite problematic for the appreciated human scale experienced in the streets. Therefore the added levels are placed towards the interior space of the deck, preventing a tunnel-effect in the streets while still being able to densify. The entrance is designed based on the same human scale by creation of a green hill with wandering stairs towards the first floor. This option was chosen over the grand-stairs which would perhaps fit in the urban setting of Bijlmerplein, but not in a residential area evolving around human scale and accessibility. The new entrance hill could be seen as an element of visual accessibility at it looks physically accessible in terms of it not being an enormous threshold.

STRUCTURE

With the existing building it would be possible, based on some basic calculations, to add 5 extra levels in timber frame construction on top of the building. However for the sake of scale in the streets, only a maximum of 3 layers on the corners and 1 layer on the entire building was added, highlighting the squares and entrances towards the residential area.

SKIN

Scale on the deck side is both caused by the large, bland and stony place, but also by the lack of scale in the facades which makes the residential building seem office-like. Using human scale elements like front doors, jumps and plasticity in the façade as in the street facades, this could break up the large surface of the deck façade for the sake of human scale. Therefore depth and plasticity are added both in the existing deck façade and added volumes. In the existing volumes the outdoor hallways function as such, and in the added volumes the skin itself has depth. For example the tower lowers towards the square, creating a staggering building shape focused on creating human scale in front of a quite massive building. Because of the appreciated human scale of the facades in the street, the building is on this side insulated on the interior rather than the rest of the facades with exterior insulation.

SPACE PLAN

In the now very large, stony and non-human scale cluster, a residential tower is placed splitting up the area, decreasing the scale to a more human variant. Simultaneously the 'backside setting' of the deck could hereby be turned into the front of a residential building. The 'front' at the street side at which human scale is key, has been left untouched by placing only 3 levels on top at the corners and placing them more towards the interior space. The outdoor hallways in this interior space break up the large scale of the façade.

1st floor
1:1000

OPENNESS

SITE

The residential area at Bijlmerplein is currently very much hidden from the other functions present, making it a very quiet place. Often, a quiet living environment like in Dutch courtyards, is appreciated for its peacefulness. Nevertheless, this is not quite the case at Bijlmerplein, which could be described as being silent rather than quiet for the lack of social control. Only very few people (residents only) cross the area during daytime, let alone by night. An increase of social control was therefore chosen, by opening up the residential area on the corner with the large Bijlmerplein square. This seems to be totally against all intentions of the municipality to shut off the cluster's residential areas with fences. However where this strategy would partly ensure the experience of safety, this still leaves the area very silent. By trying to increase the amount of visitors and residents, this counteractive strategy intends to boost the vitality of the residential area. The presence of the residential area as being a significant part of Bijlmerplein, definitely after densification, is thereby acknowledged and introduced as being part of the urban center. This could increase the amount of users of the residential area, but also already creates more social control by the ability to look up to the upper floor square. The new entrance cooperates with the added residential tower to achieve this openness. As the tower is significantly higher than the current buildings, the focus of the passer-by is drawn at the opening and rising volume. This creates an interplay with the building opposite of the square, which is the transformed former bank building. This monumental 'sandcastle' building rises from the trees in front of it, after which it makes a statement by being higher and of a different architectural expression than the other buildings at Bijlmerplein. This same event happens at cluster 2, in which the hill is the element from which the high-rise residential tower rises and by being higher than the current buildings creates this interplay with the former bank building.

STRUCTURE

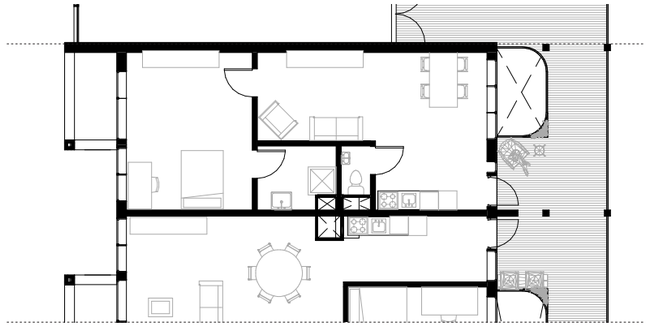
In this case, embodied energy is subordinate to the sake of visual accessibility. The facades towards the deck are currently quite closed while this façade is not load bearing and could therefore contain more windows.

SKIN

Addition of outdoor hallways decrease interior daylight, causing the need for windows to be enlarged. Simultaneously this means an increase of social control on the interior deck space. Opening up the façade could also possibly increase the willingness to take part in life on the deck as it is easier to see what is going on. This does mean a need for a buffer zone between the private dwelling and the space observed, most of all at the outdoor hallways.

SPACE PLAN

Opening up the area for the sake of accessibility has another facet as well, as the green hill is not only a place to go up to the deck, but also one to stay. Thus it does not only open up to the public but is itself usable as such.



5th floor
1:200

1st floor
1:500

1st floor
1:50

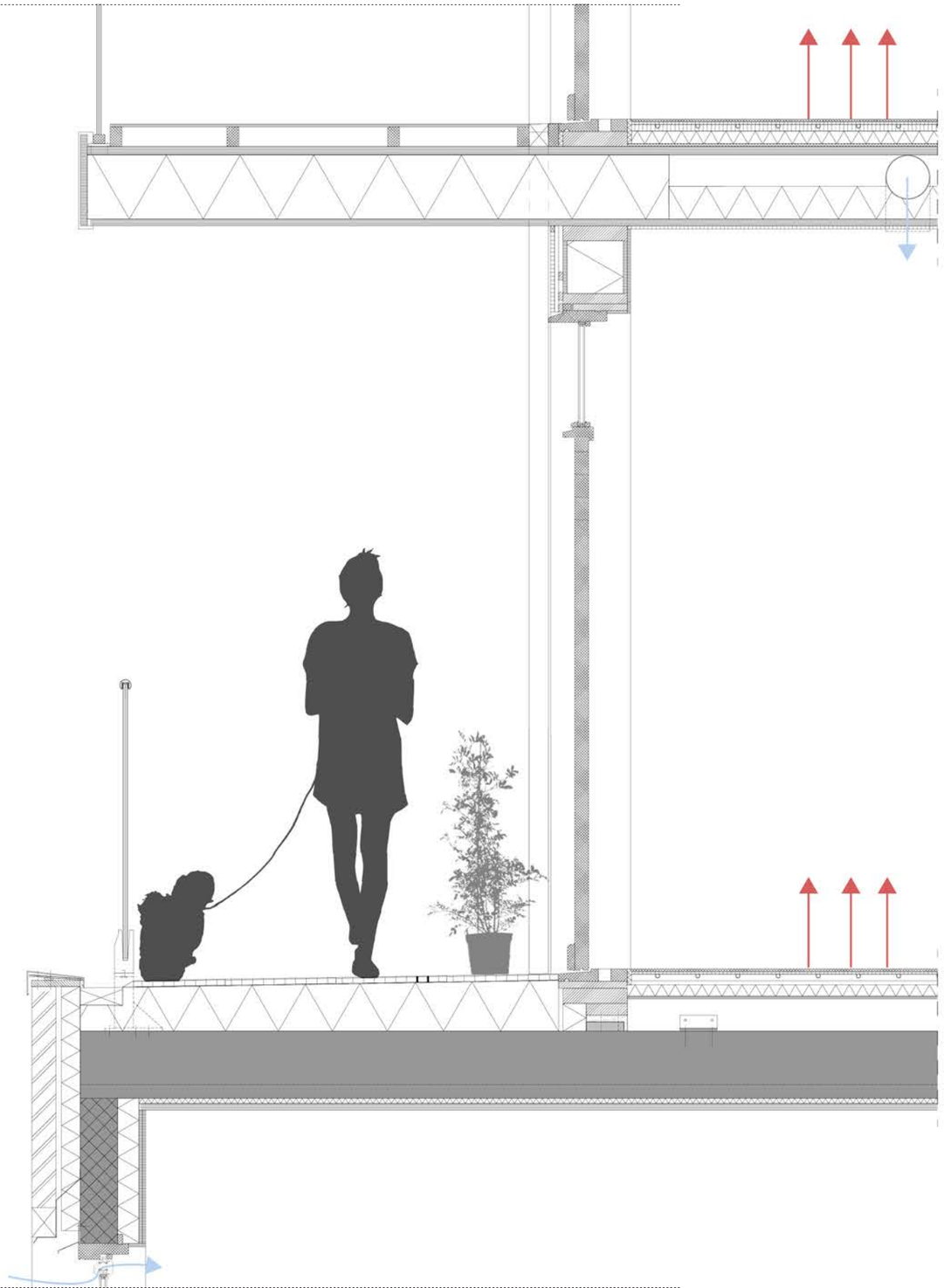
PRIVACY

SITE
As opening up the area and densification can lower the experienced privacy of residents, the increase of social control during a longer period of the day could increase enjoying the private space. Zoning of the deck by the addition of the tower strengthens this experience of privacy as the front garden zones are more quiet than the shared outdoor spaces which are dislocated from the front yards. There's a possible increase in use of the area but a partial decrease of passers-by across a large part of the front doors. By using planters, the front doors are distanced even more from the general public pathway, as they functions like a second border just like in the courtyard and 'De Nieuwe Weerdjes'.

SKIN
As currently the deck façade is very anonymous, introduction of front doors in the façade could increase recognizability of the residential area, individuality and acknowledgement.

SERVICES
As the number of elevation points is reduced, this could possibly create anonymity among residents. Introduction of extra residents and potential users of the deck makes the demand for privacy even higher than it currently is. Moreover the placement of the outdoor hallways could be seen as an intrusion of privacy when directly being placed to the façade.

SPACE PLAN
By turning the backyards into front yards by giving it a barrier to be opened and a front door, a buffer zone is created. This happens similarly on the outdoor hallways by creation of distance between the dwelling and passers-by. On the hallways therefore cutouts were made in front of the bedroom windows to prevent luring inside. The front door space is one for social interaction and some greenery or demarcation of the semi-private space. These buffer zones are always bordering either a hall or a kitchen but never a more private zone. The design of the outdoor hallway is therefore a solution to the possible problem it created itself. As it is convenient and often desirable to choose whether to be in public or in ones one private outdoor space, the dwellings have both: the buffer zone and a private balcony or garden. This buffer zone on the outdoor hallways are complimented by planters around the cut-outs, attached to the railing as a means of a small façade garden.



5th floor
1:20

SOCIAL

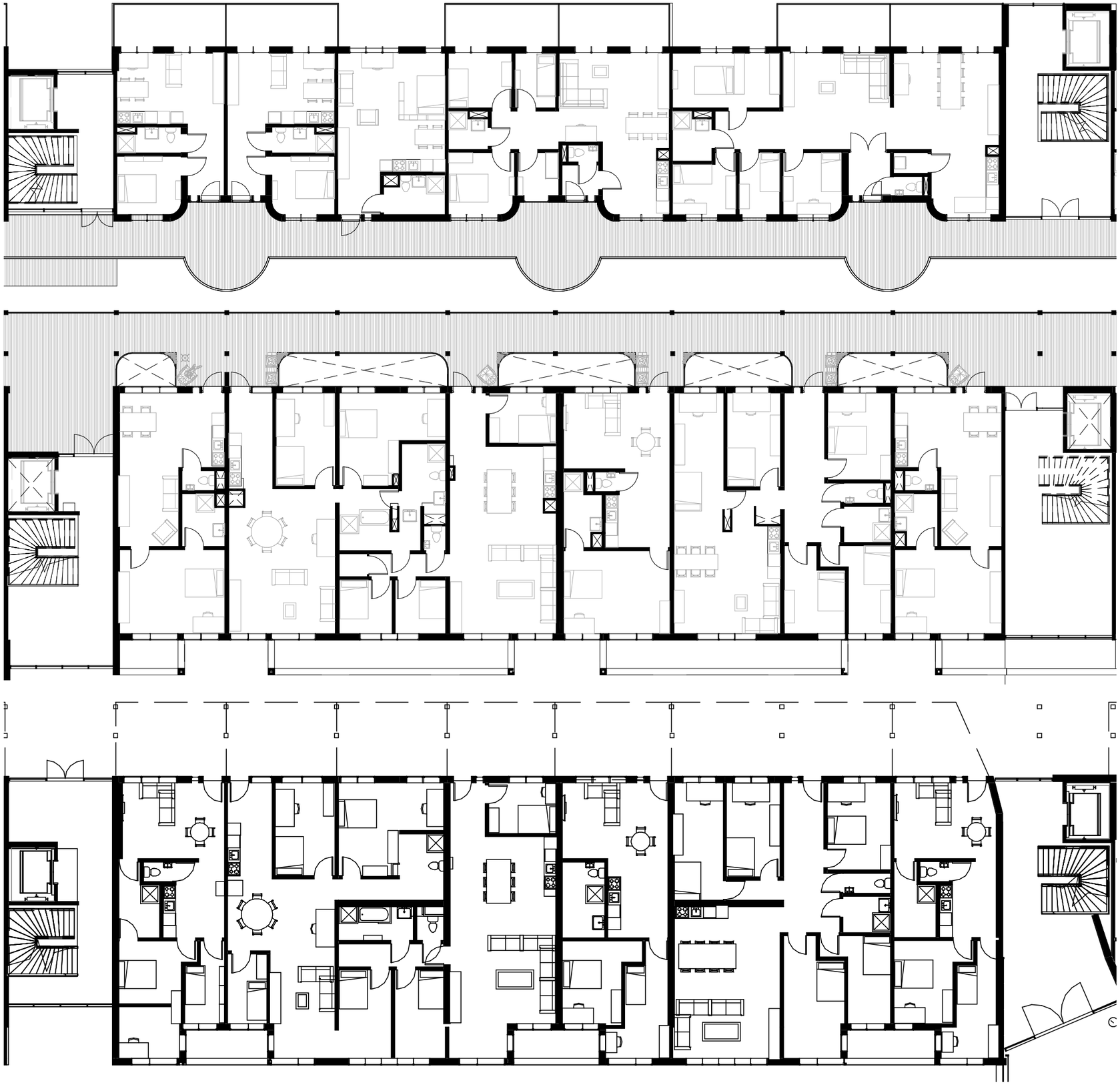
SITE
Originally, a lot of social facilities were planned at Bijlmerplein. Nevertheless, some have never been realised and others have disappeared over time. Therefore some social and communal functions have been added on the deck of cluster 2 for the sake of inclusion of a larger user and resident group. In addition, places to stay were lacking at the decks, which is why these are now a key element in the re-design. Added places to stay are: the entrance hill, the 1st floor square, the relaxation surface, an activity area and the outdoor hallways. These places could encourage social interaction by creating possibilities to be social near the home.

STRUCTURE
To prevent residents from having to leave their familiar living environment or having to look for temporary housing themselves, the tower is built before the renovation starts. Thereby residents will only have to temporarily move across the deck while their dwelling is being renovated. It has to be decided whether residents are given the choice to stay in the tower or move back into one of the renovated dwellings.

SKIN
As a way of associating with the living environment, a social approach to façade design is to use recognizable architecture and materials, as well as front doors. This recognizable architecture is designed in the Amsterdam School style of which an interpretation is already present at Bijlmerplein and therefore communicated with the existing.

SERVICES
As currently not all dwellings are accessible to less mobile residents, placement of elevators is a social gesture towards a larger target group.

SPACE PLAN
These buffer zones enable residents to stay in their private space or take part in life outside of the zone. However it also enables small social interaction with neighbours as the buffer zones are large enough for some chatting or seating. Having two outdoor spaces of which one is private could be seen as a social gesture as residents can choose whether to retreat or look for interaction. This choice can also be made based on facilities as their diversity on the deck and in the area make up facilities for almost everyone.



5th floor
(added)

2nd - 4th floor

1st floor

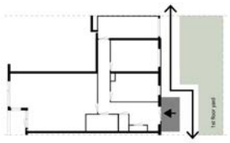
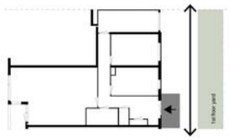
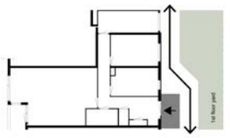
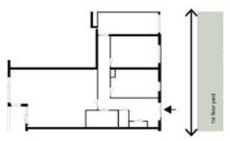
1:200

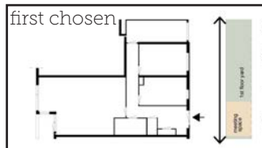
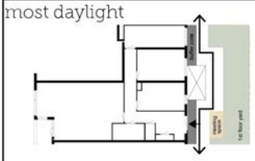
DWELLING TYPES

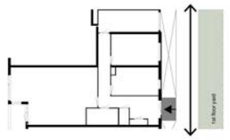
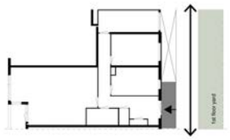
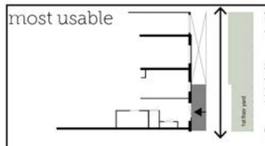
As the current construction is quite flexible, diversity of dwelling types could be increased by minor interventions, potentially increasing the lifespan of the building when combined with the zero-step concept. Using front doors increases the acknowledgement of dwellings within the now plain, anonymous façade in which not a single dwelling is recognizable. By creatively using the existing floorplans, diversity within the existing building is increased.

5

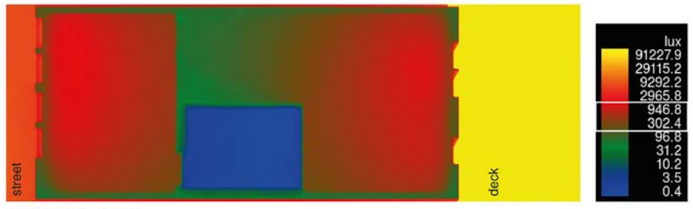
Research by design

	PROS	CONS
	buffer zone depth	inconvenient routing routing along facade no place to stay
	buffer zone convenient routing spacious hallways	depth lost routing along current facade no place to stay lot of shade on lower floors
	buffer zone (more) convenient routing depth	routing along facade angle cutting 1st floor yards no place to stay
	convenient routing spacious hallways	no buffer zone depth lost routing along facade no place to stay lot of shade on lower floors

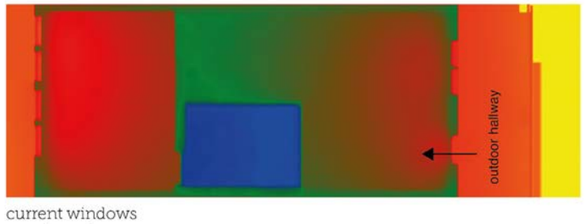
	PROS	CONS
first chosen 	convenient routing depth spacious hallways place to stay	no buffer zone possible miscommunication of privacy routing along facade lot of shade on lower floors
	buffer zone convenient routing spacious hallways routing not directly along bedrooms	more shadow 1st floor yard, but also more shelter depth lost no place to stay
most daylight 	narrow buffer zone depth more daylight on lower floors by cut	inconvenient routing

	PROS	CONS
	buffer zone convenient routing spacious hallways more daylight on lower floors	depth lost no place to stay
	buffer zone = place to stay convenient routing spacious hallways more daylight on lower floors by cut	depth lost
most usable 	buffer zone = place to stay small extension = place for social interaction convenient routing spacious hallways more daylight on lower floors by cut	less daylight by extension

1:400

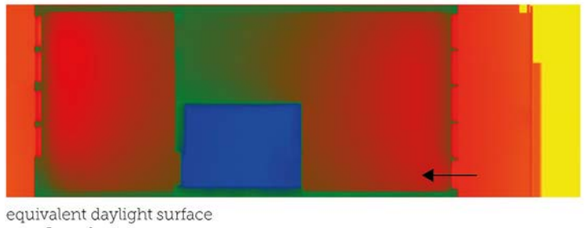


current windows
new floorplan

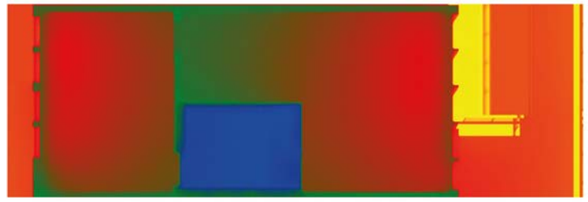


current windows
new floorplan
outdoor hallway I

2nd most daylight

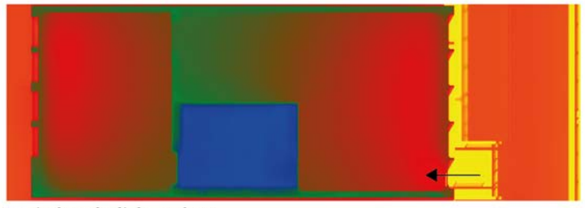


equivalent daylight surface
new floorplan
outdoor hallway I

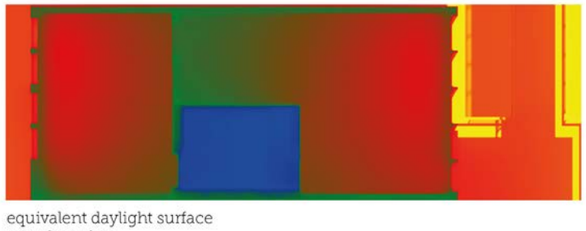


equivalent daylight surface
new floorplan
outdoor hallway IV

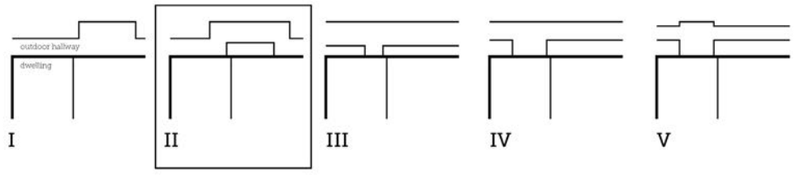
2nd most daylight



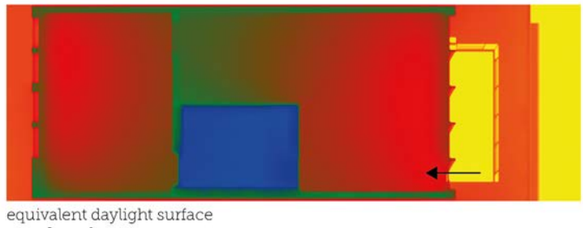
equivalent daylight surface
new floorplan
outdoor hallway completely off facade III



equivalent daylight surface
new floorplan
outdoor hallway completely off facade V



most daylight



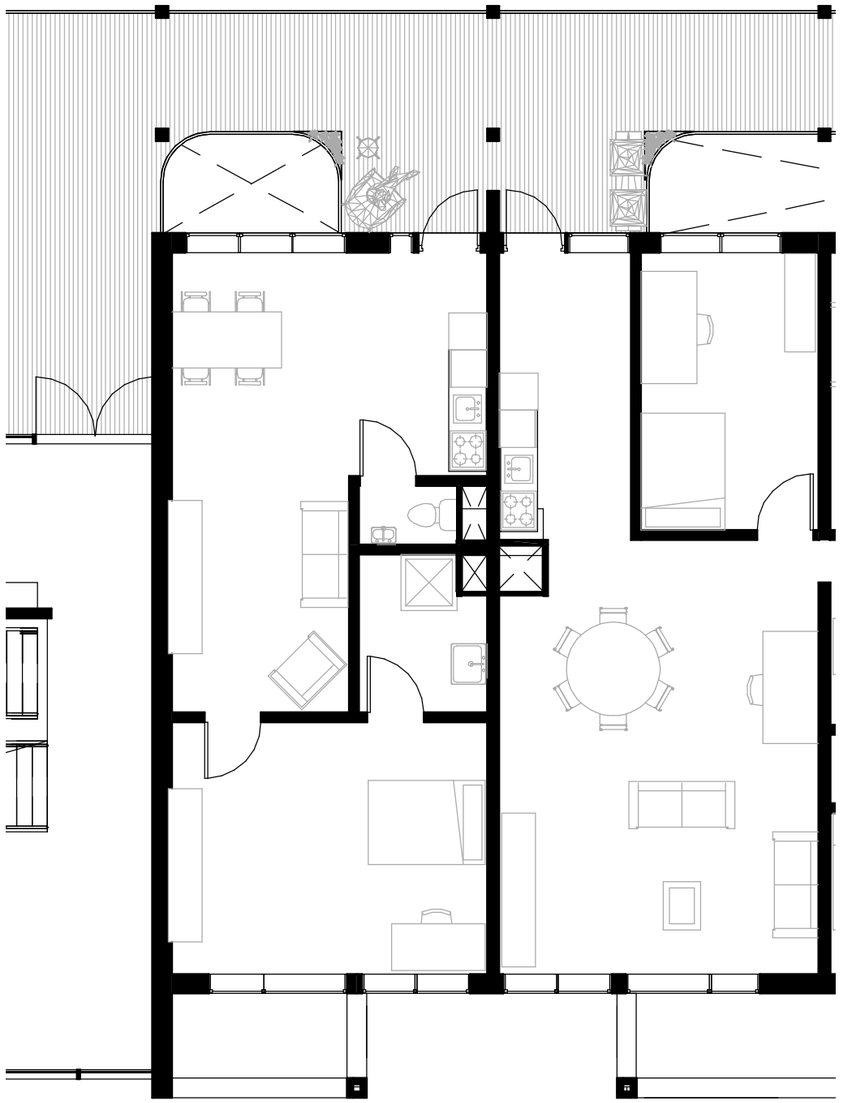
equivalent daylight surface
new floorplan
outdoor hallway partly off facade II

OUTDOOR HALLWAYS

2nd floor
1:100

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

In order to guarantee good physical accessibility of the dwelling without losing (too much) space, it was decided to use outdoor hallways in combination with elevators. The introduction of outdoor hallways in front of an existing façade can of course be seen as rather problematic, as residents now have to pass each other's living spaces in order to reach their homes. In order to solve this problem, research has been carried out into the creation of buffer zones and distance or accommodation areas on the outdoor hallway. In the case of a physically accessible outdoor hallway, the design of the route is one of the key factors. Nevertheless, the creation of depth in the façade as appreciated in the street façade is also a starting point, however subordinate to the routing. In addition, the construction of the outdoor hallways themselves naturally already creates extra depth. With this insight, the first variant was chosen with a broad hallway and extending areas for accommodation. Still, there is one aspect that can be considered of equal importance to the routing, being the amount of daylight in the dwelling below the outdoor hallway. This shows that another variant is even more suitable than the one previously chosen based of the other aspects. Although this variant does not include an additional outdoor space for communal meeting , an additional space is created on the side of the dwelling.

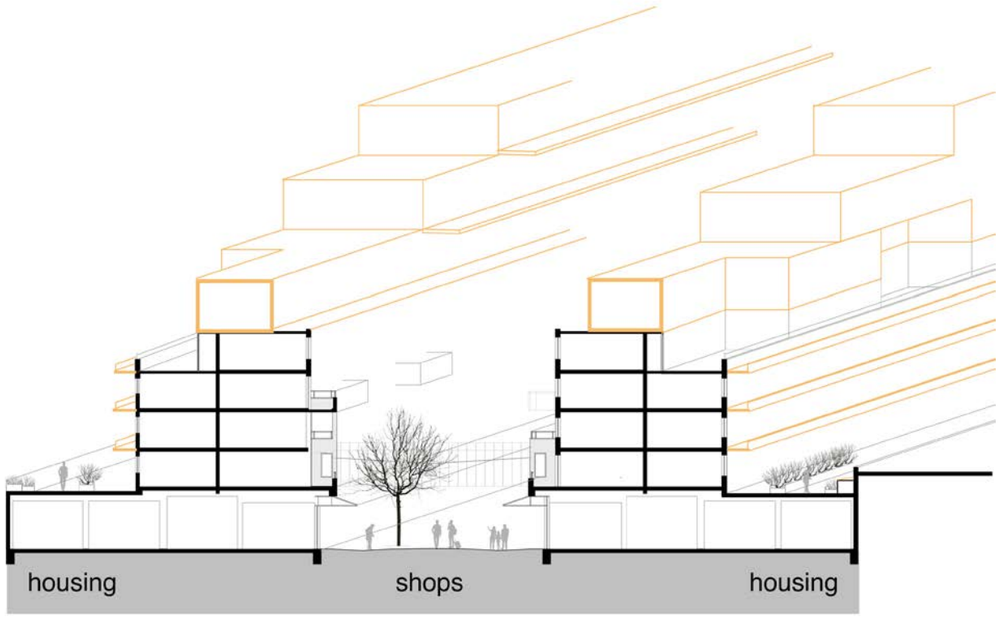


2nd floor
1:100

OUTDOOR HALLWAYS

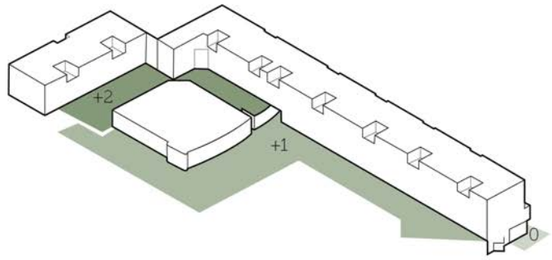
dwelling type | openness | physical | social | privacy | scale | reachability | affordability

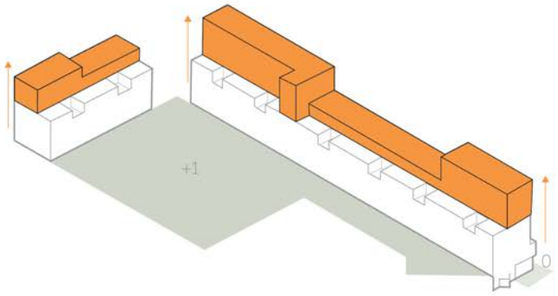
This additional buffer space is spacious enough to accommodate chairs or a bench and a table, thus also a place for brief social interaction like the front garden. The connection of the outdoor hallway with the front door is the only connection the outdoor hallway has with the façade. At the other places, an opening is kept free from the façade with regard to daylight. To reinforce the idea of a front garden, plant pots have been placed in the corners of the cut-outs. In this way, no extra space is needed for any planting in front of the front door itself. A consequence of this is the raising of the balustrade in connection with the danger of climbing. Although sunlight will shine on the outdoor hallways for part of the day, it is advisable to aim for shade plants. One consequence of sizing this fairly wide outdoor hallway is an increase in the material used compared to a simple outdoor hallway along the façade. It can also be suggested that the daylight situation created is less favourable than with a narrow outdoor hallway, but not with the cut-outs in the outdoor hallway. Nevertheless, the creation of privacy, places for appropriation and social interaction outweighs the aforementioned possible drawbacks. This stresses the importance of the quality of life in the area.

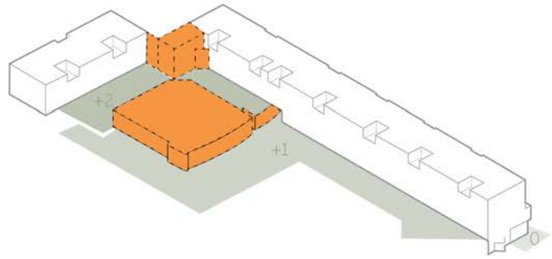


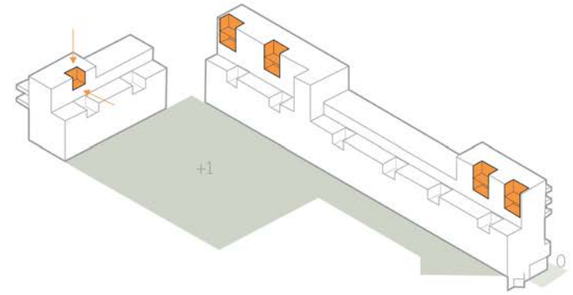
1:450

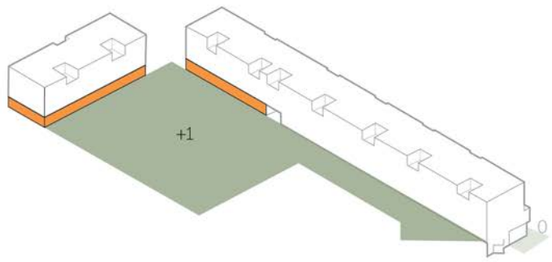
variant I

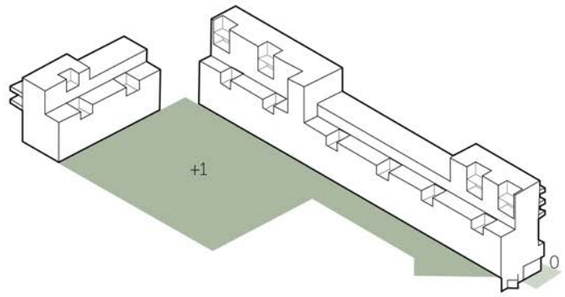










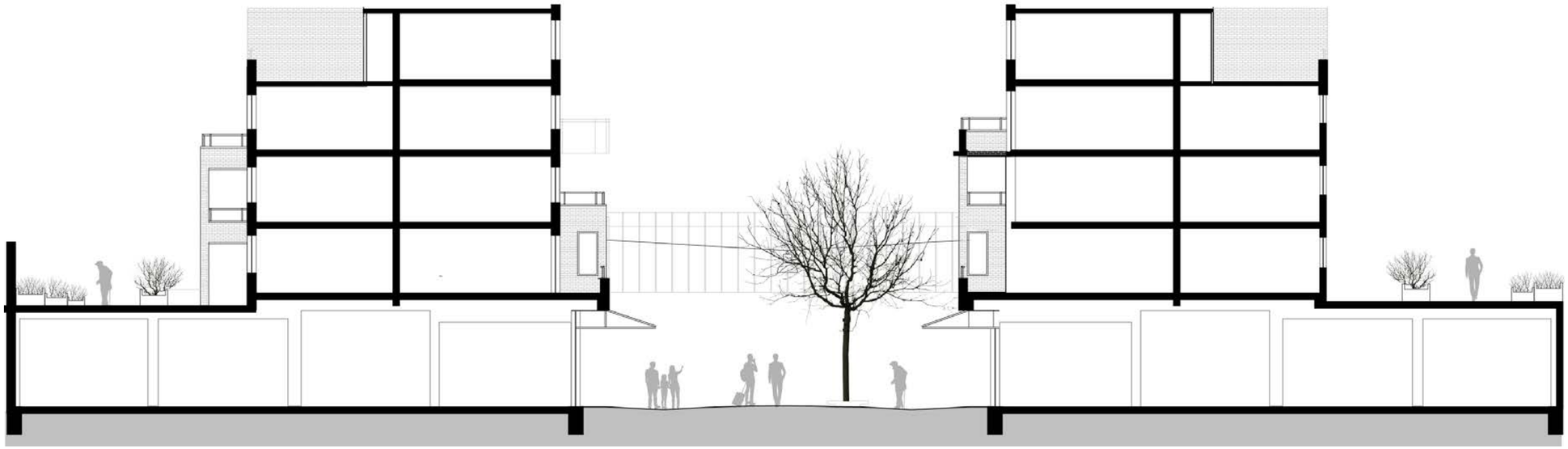


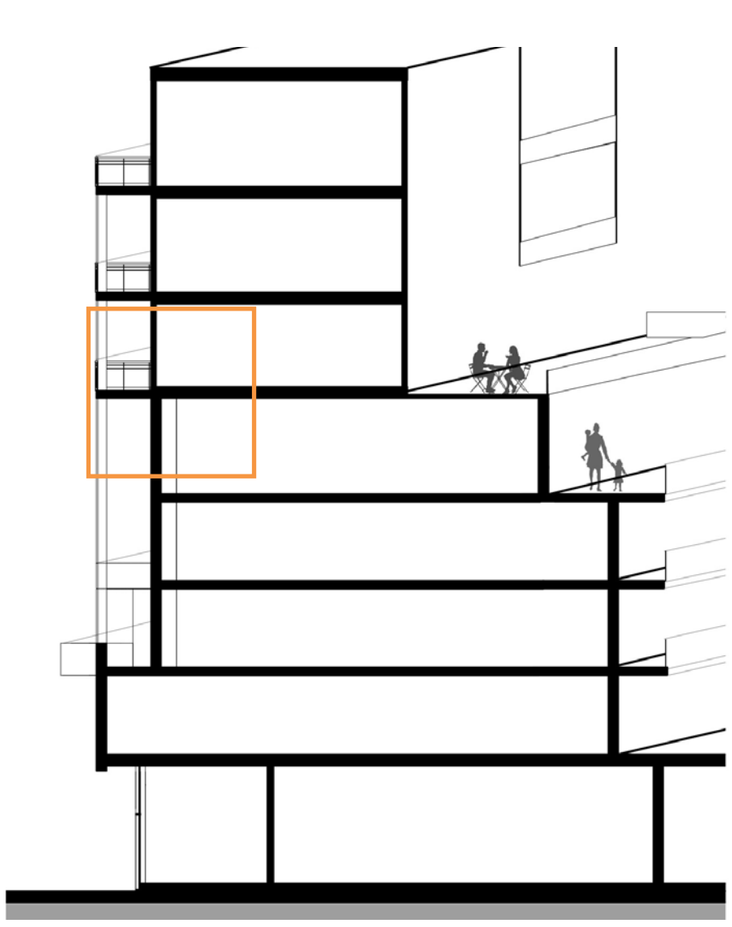
variant II

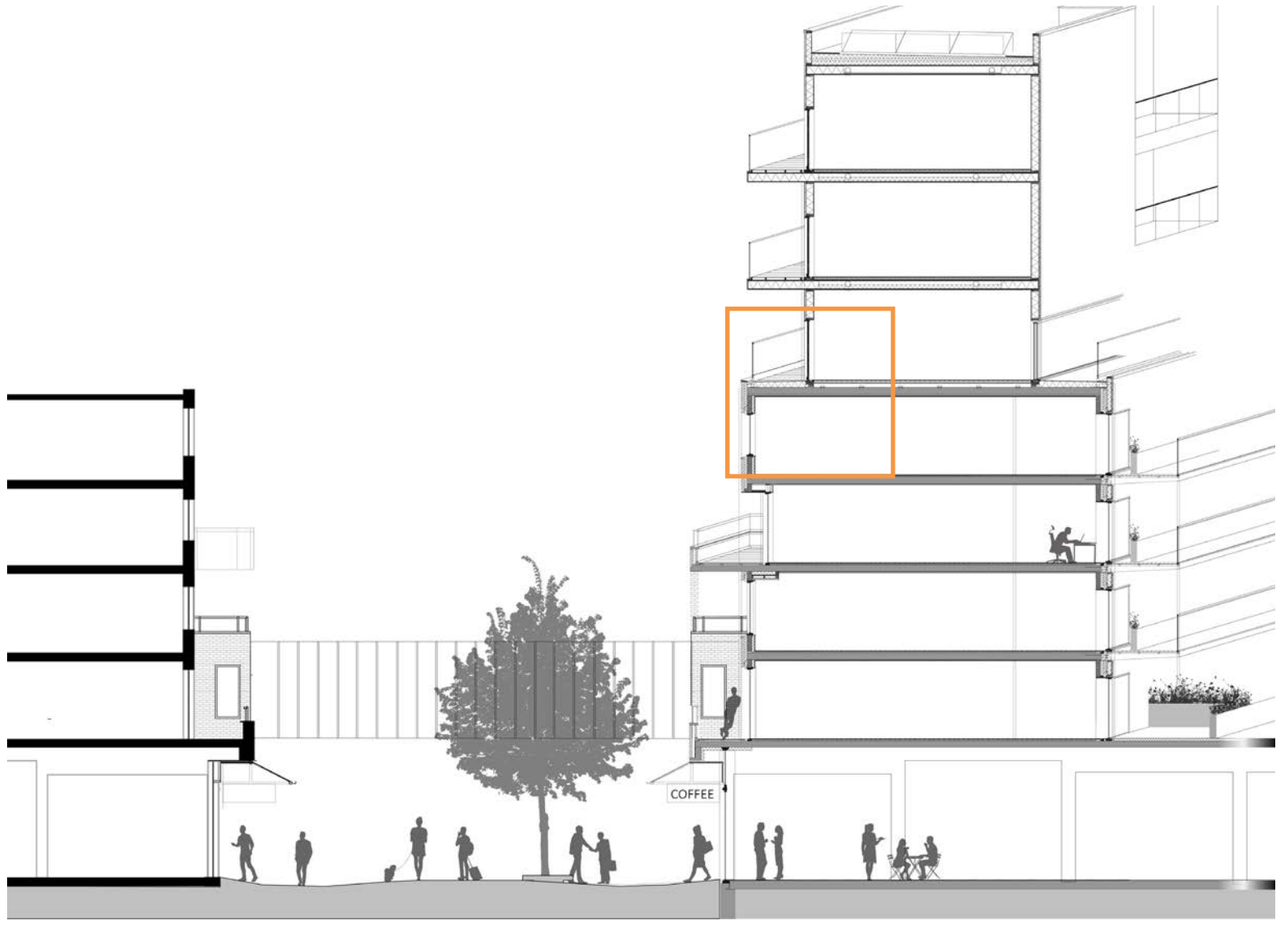
ADDED LEVELS

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

In view of the densification plans at Bijlmerplein, in addition to building an extra residential tower, the opportunity was taken to add extra levels to the existing buildings. In theory, according to the collective research, it is possible to add five extra floors as long as wood frame construction or something of similar weight is used. During the experimentation with the building layers, a five-level addition turned out to be quite large in view of the human scale. In order to retain the accentuation with regard to the squares, as the Amsterdam School style does in the existing situation, the corners of the existing building are in any case topped with relatively the most floors. The southern building, adjacent to the street, will be the lowest in the interests of human scale, at least in the middle section. This creates a stepped building form like variant I. In relation to the feasibility in term of circulation spaces such as lifts and the immediate rather than gradual reaction of the building height, a modified variant was chosen with two higher points at the squares: variant II. In terms of sunlight on the deck, this is also more advantageous, since a level in the middle of the street has of course been removed.





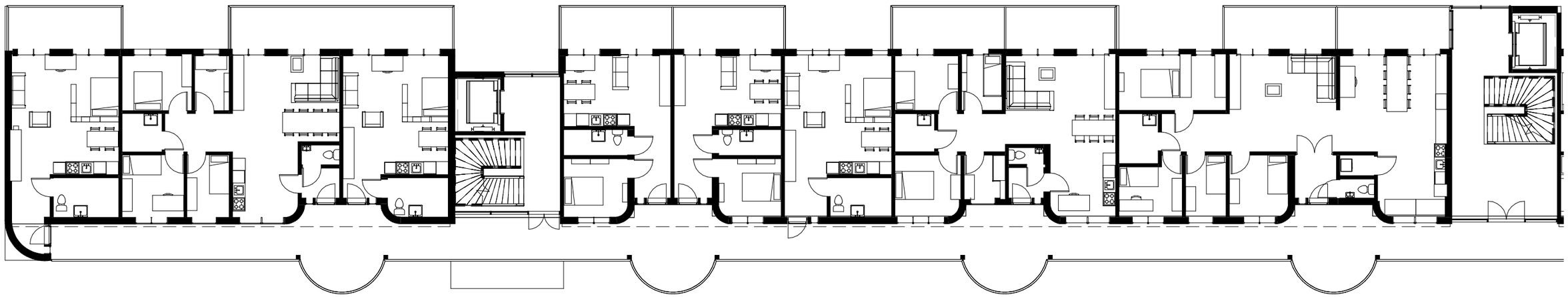


1:200

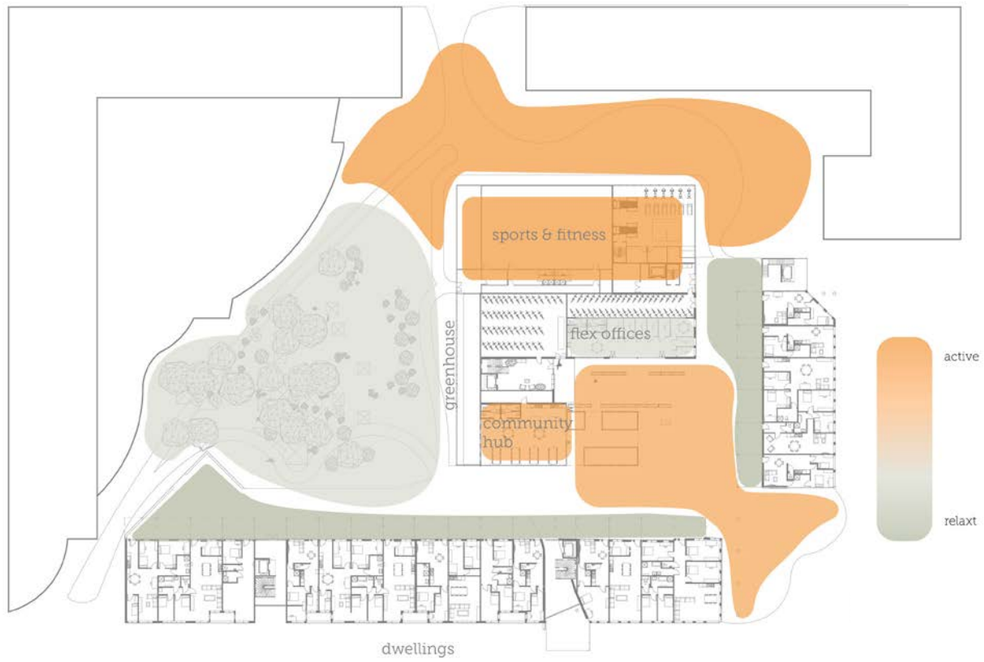
ADDED LEVELS

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

Initially, the positioning of the elevation was directly on the street façade in connection with the exterior spaces of the top floor located at the rear. Keeping this space free in terms of free height means that, in order to retain surface area, the elevation would have to be directly adjacent to the street façade. The outdoor hallway on these floors will be on the street side in order to create balconies on the deck side. This would mean that the outdoor hallway on the street side would form an overhang, which would create two problems: 1. an extra construction from the existing balconies or a thicker floor package and; 2. this would make the elevation stand out in the street scene, which would affect the now human scale and could be experienced as an oppressive tunnel. To prevent this effect, the top of the building has been shifted more to the deck side, partly limiting the free height of the underlying outdoor space. In this way, space has been created for the outdoor hallway and the construction of higher outdoor hallways on the existing roof. The only exception, based on the existing architecture of the façade, are the overhangs above the existing balconies. Because the lines of the existing buildings are followed and an overhang is only formed in a small number of places, this intervention is seen as an adaptation to the situation. At the same time, the outdoor hallway of the added levels is created as a place to stay.



5th floor
1:200
67

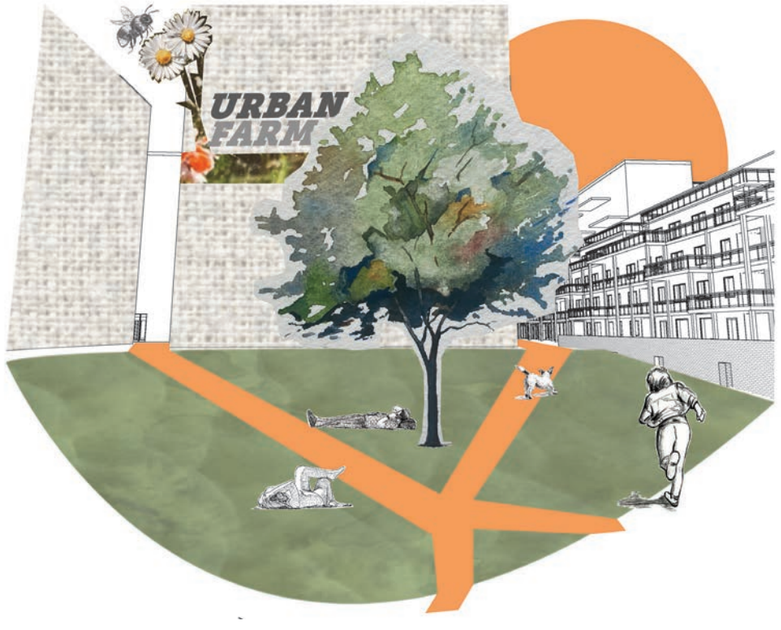


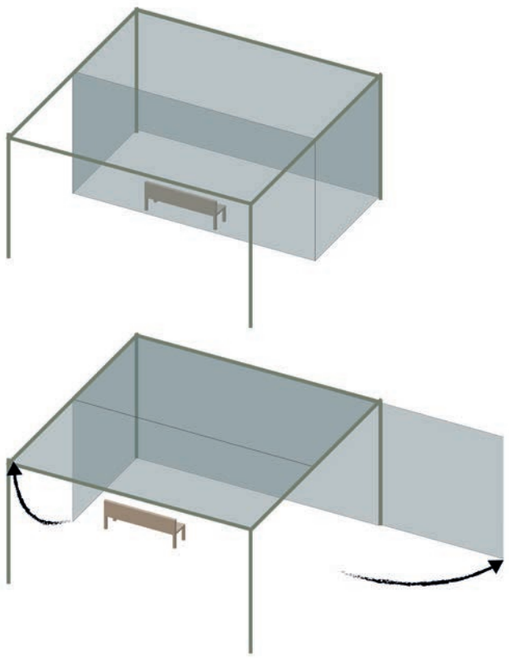
1st floor
1:1000

ZONING

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

Zoning of the deck: another component in the form study of the residential tower is the division of the currently rather large, bare space in cluster 2. One of the goals that could be achieved with the tower is diversification of outdoor spaces. It was therefore decided to design the building in such a way as to create three main zones: the square, the meadow and the sports hub. The square is created by removing the upper floors of the former library and embracing the residential tower. In order to find a better connection between the residential tower and the square, the plinth will not contain housing but a community hub and flex offices. In this way, the residential tower is an addition to the current function mix and the lack of social meeting places on the decks. It thus becomes a place that can benefit the entire neighbourhood and also offers the opportunity to bring people together.





flexible greenhouses

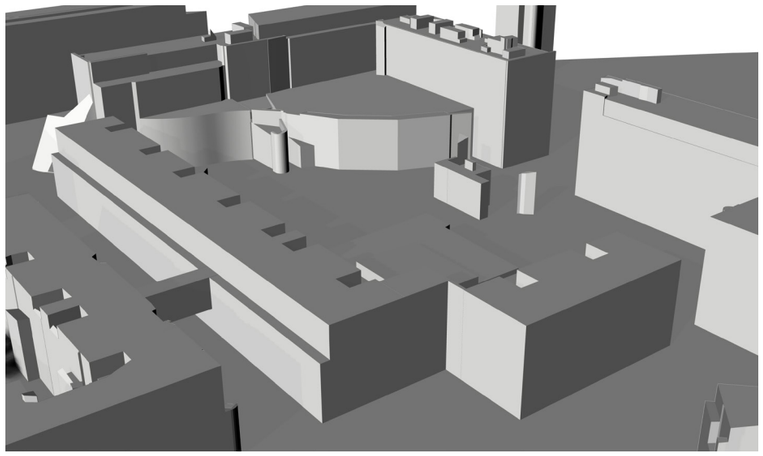
1st floor
1:200

ZONING

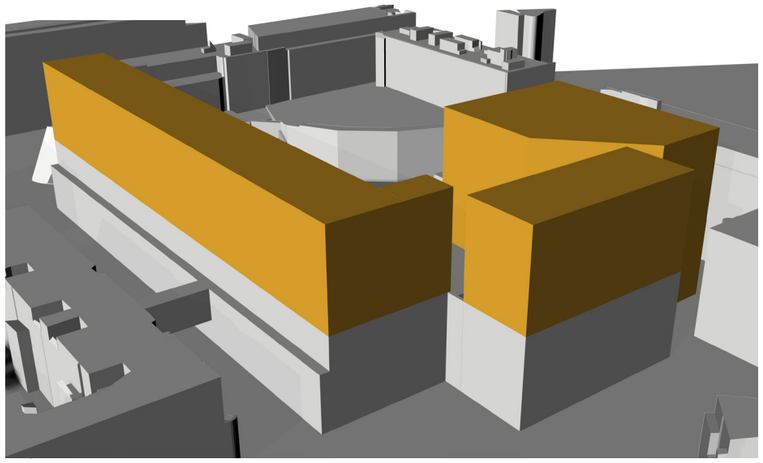
dwelling type | openness | physical | social | privacy | scale | reachability | affordability

To prevent the square from being "over-designed" so that it cannot be used in its own way, only directional planting with benches and three flexible greenhouses were used. These constructions serve as extensions to the community hub when desired, and otherwise as separate, transparent spaces for individual use (workplaces, creative activities). The community hub is strategically placed because it forms a pivot between the green meadow and the communal square. The activities therefore offer a choice of required space, depending on group size, activity or weather conditions. The green meadow borders the urban farm of the residential building. It is a place for relaxation or a walk in the green, within this very petrified area. At the current location, there is a very small and inaccessible sprawl garden that will make way for the meadow sloping down from ground level. The last zone is the activity hub with sports fields, a gym, outdoor gym and sports hall. The transition from relaxed to active is made by a picnic area and playground as an intermediate variant of the two. All are facilities that are not yet present at Bijlmerplein and thus make the place more accessible: socially, but also in terms of accessibility. The building shape also determines where those specific functions are positioned. For example, the meadow is the sunniest spot in the cluster, the sports area is more sheltered and on the office side of the cluster, so that the dwellings are partly closed off from it, and the square that mainly seeks the connection with the existing Bijlmerplein.

original

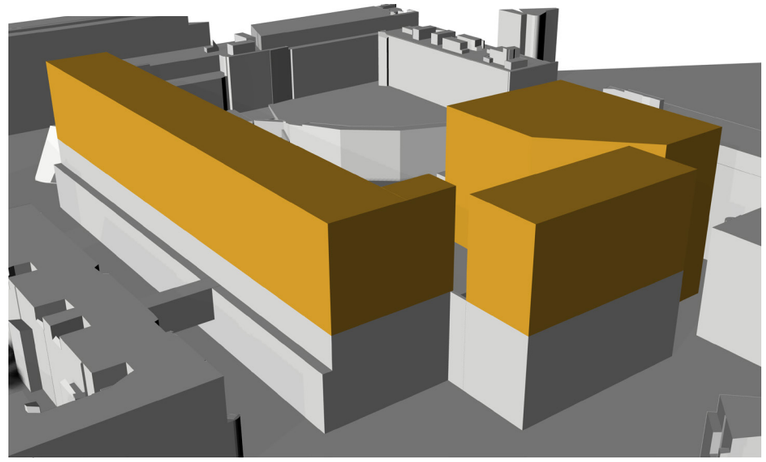


variant I



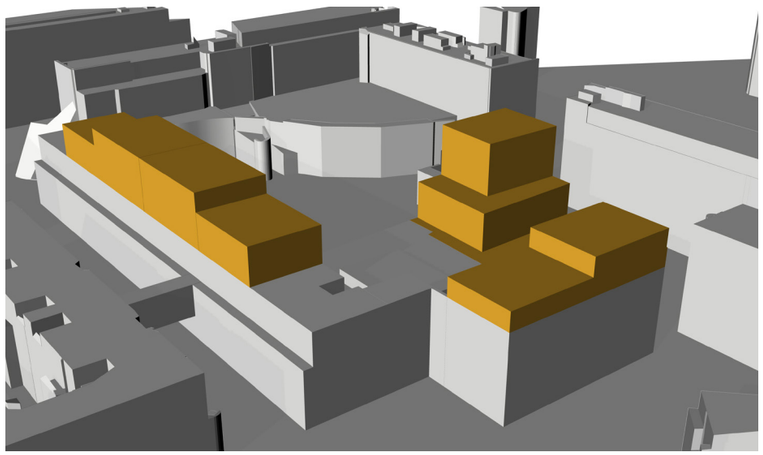
Maximum number of extra storeys creates oppressive experience of the shopping street. Monotonous storey heights do not provide variation in the area. Added mass is too close to surrounding buildings.

variant II



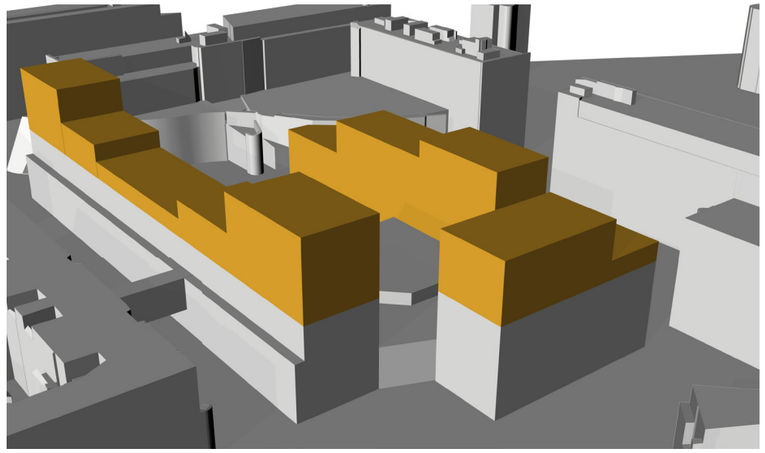
Additional floors seem to work better. The question is how efficient the increasingly shorter floors are in terms of living space. The added mass does not really divide space due to its small size and lack of embrace. Densification potential is quite low.

variant III



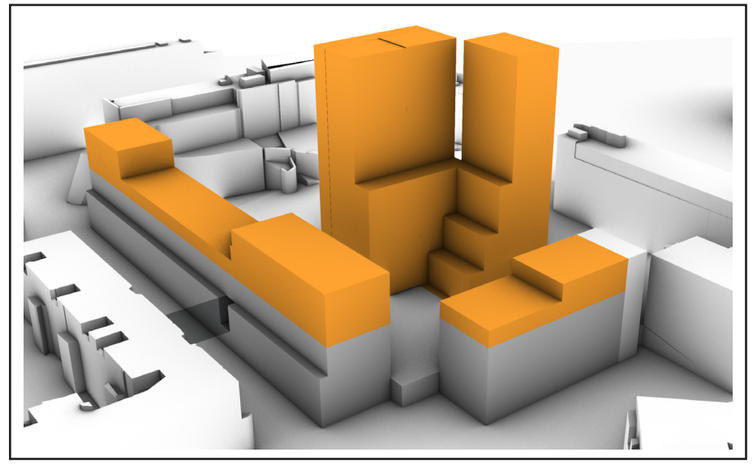
Added floors do not work for the experience of human scale on the street. Lack of response to squares by massing also works less well. The added mass does not really split up space due to its small size and lack of embrace. Densification potential is quite low.

variant IV



The corner volumes accentuate the squares even better, but they create a lot of shadow in the street and in the facades that overlap. The added mass has a very minimal shadow effect but creates rear areas that should be avoided. Splitting up the space is therefore done in an inefficient way. Breaking open the corner proves to be a very positive development in terms of sunlight and visibility of the area.

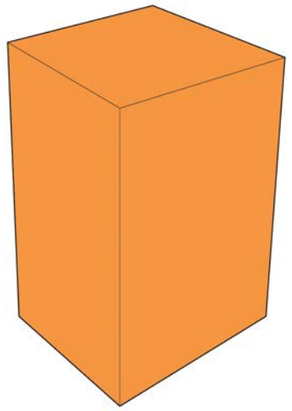
variant V

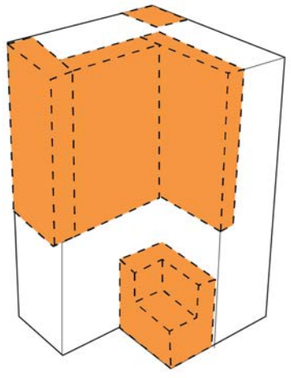


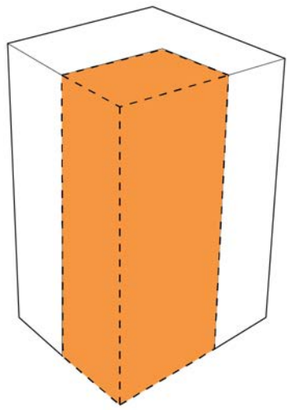
The corners form a very direct response to the squares and streets by shooting up and down at once. The added mass embraces a square, but is also very high. Yet a human scale is created by the staggered façade. The mass divides the area into different usable spaces. The densification potential is large, but the intervention is also extreme.

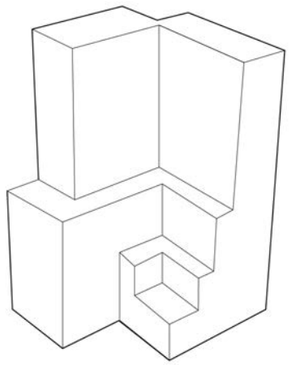
ADDED VOLUMES

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

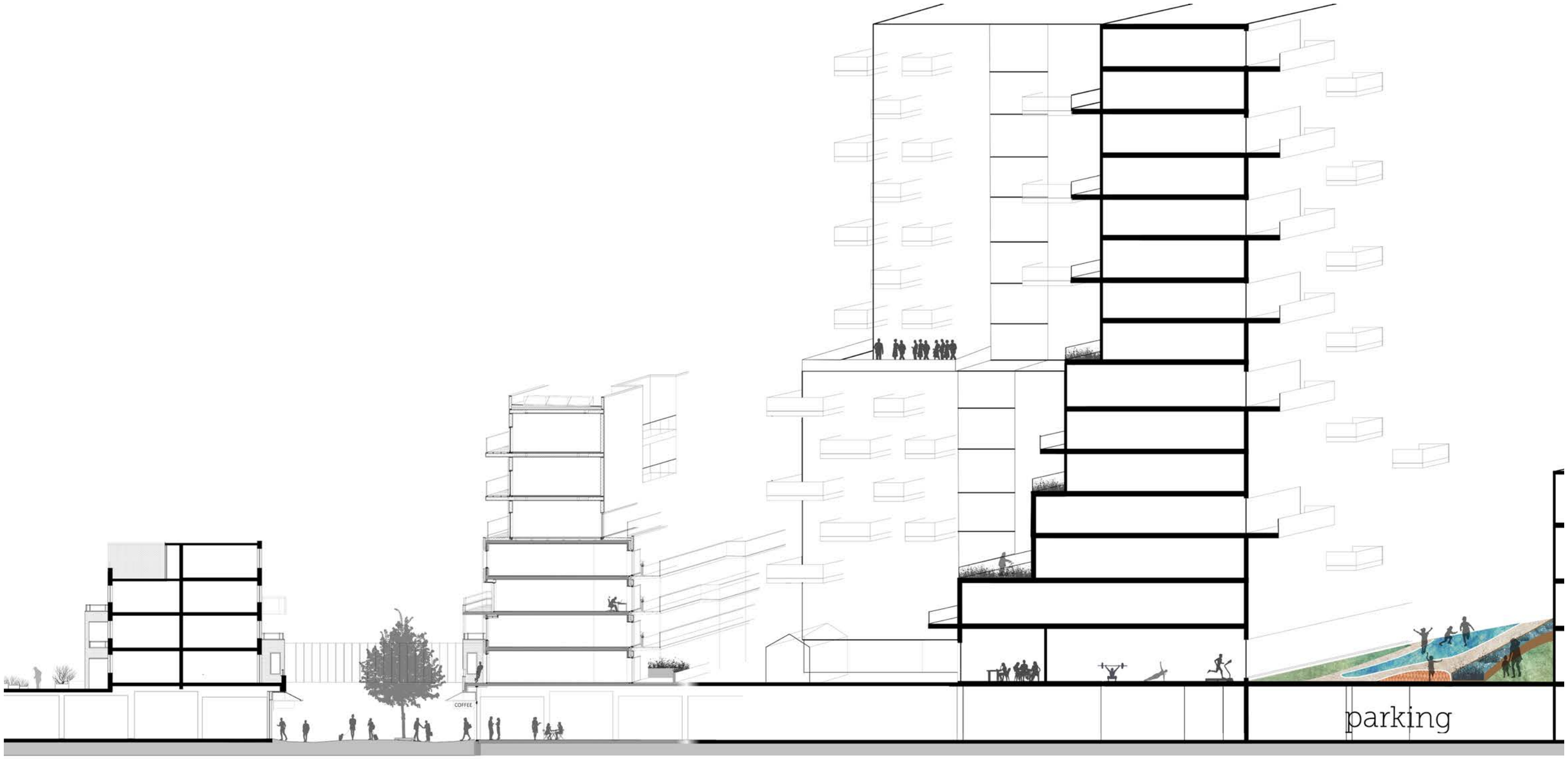








A second intervention in relation to densification plans at Bijlmerplein is the realisation of a residential tower in cluster 2. Because the municipality's plan is to achieve substantial densification in cluster 2, a residential tower will be built that is higher than the existing buildings. This seems contradictory in view of the anti-Bijlmer culture of mid-rise buildings, so a compromise must be found. To estimate an appropriate building height, the guidelines for new densification and peripheral development at Bijlmerplein were examined. These show that there is a limit of 55 metres in building height. This is the reason why the residential tower has been assumed in principle under the guise of what is possible within what is permitted. A very important factor within this, is sunlight and shadow for the quality of living in the existing buildings. By means of various configurations and a sun study, the final building form was created.

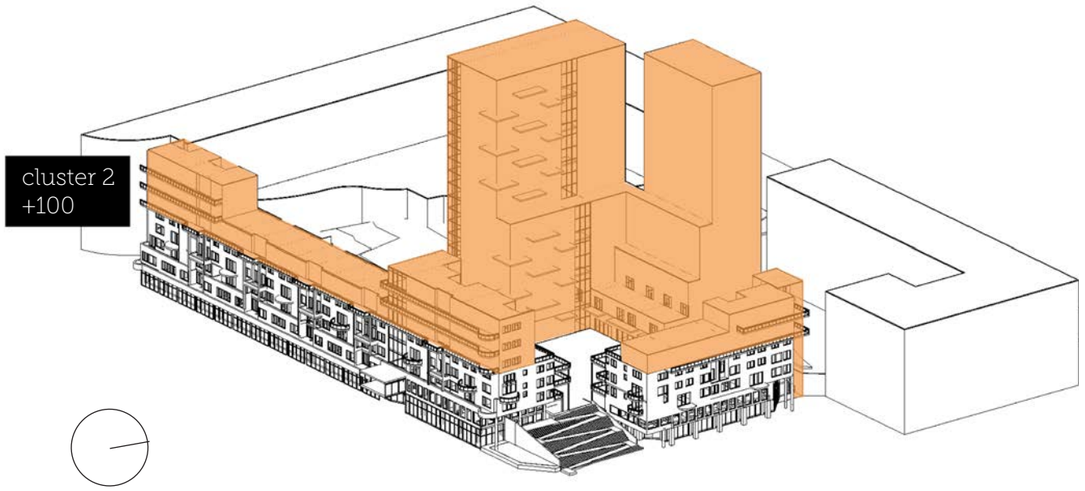


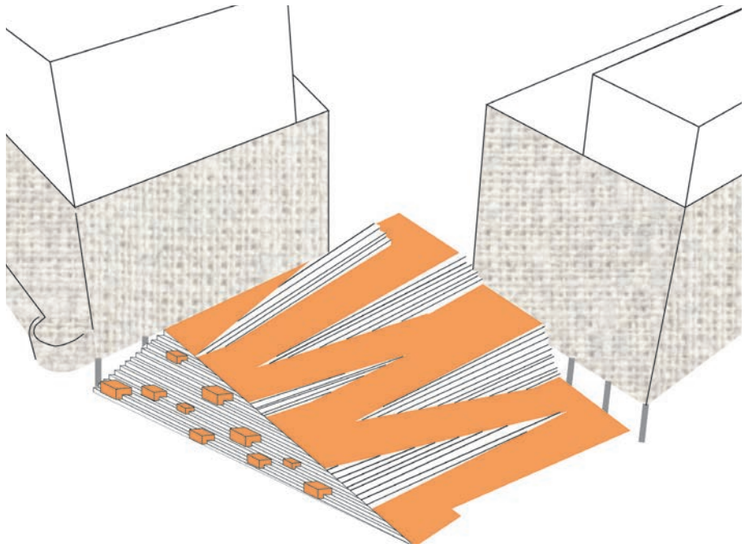
1st floor
1:300

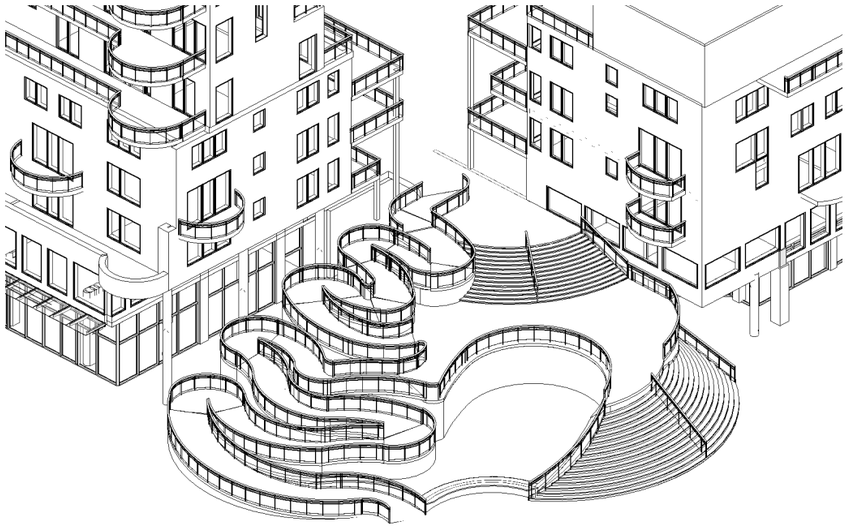
ADDED VOLUMES

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

The 55 metres could be retained by making the completion towards the newly created square staggering and thus introducing a more human scale. The building remains high within the area, but with the new construction on the edges, a new era of densification is introduced to Bijlmerplein, in which the residential tower fits in well. In addition, the difference in building height between the existing building and added volumes helps to accentuate the residential area because it stands exactly in front of the opening of the new entrance with its staggered facade.







ENTRANCE

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

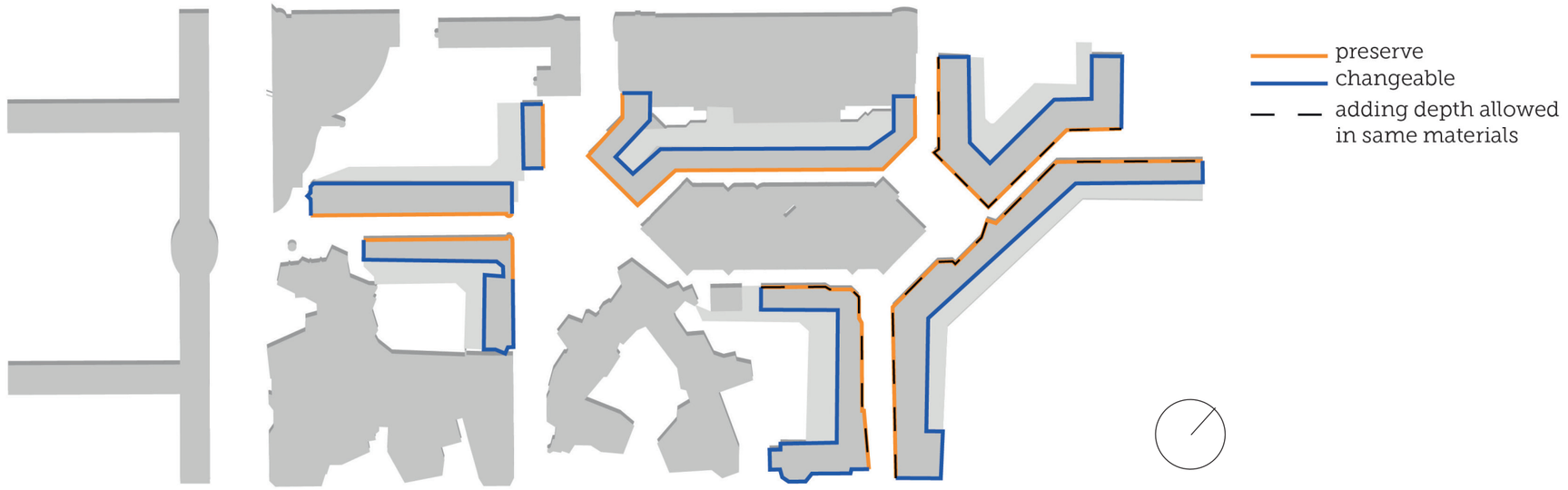
In order to involve the residential area more in current everyday life at Bijlmerplein, it was decided to remove part of a single-sided wall and a building section. This is in the interest of opening up and acknowledging the residential area in this centre, especially now that the densification assignment is so topical. To guarantee physical accessibility, variants of entrances towards the residential area on the first floor have been made. The first variant involves a staircase combined with a ramp and a stand. The disadvantage of this variant is that the slope is rather narrow due to the limited space available. In addition, the element as a whole comes across as rather colossal, which can make it more of a threshold than an entrance. Nevertheless, the possibility to stay in the tribune is a plus point of the design. A second variant is inspired by large city-centre stairs such as the Spanish Steps. By creating intermediate platforms and a central water feature with a staircase and slope on either side, the whole thing becomes a little more readable and surveyable. The curved, plastic form of the slope is a certain refreshment for the area, but is rather intimidating in terms of physical accessibility.

1st floor
1:200

ENTRANCE

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

A final variant gives a whole new perspective on what a staircase in a city centre area can be. By turning the gaze 180° and starting from a much less imposing green slope, the residential area is introduced in a more accessible way. A staircase winding over the hill provides access by foot. In this variant, the slope is omitted due to strict regulations and lack of available space. Physical accessibility is therefore resolved with a public elevator only to the first floor. This elevator entrance is located west of the hill, next to the current shop plinth. This plinth is kept clear of the hill and is accentuated by an undulating, sculptural wall that provides a new entrance to facilities under the hill. This entrance could serve as an access to a bicycle shed, for example, since the storage of bicycles is a problem at Bijlmerplein. In this way, the hill is not only an interruption or opening of the residential area, but it also has a second function. In addition, the hill has a free interpretation in terms of use. Next to a number of seating platforms, the entrance has vegetation that accentuates the stairs. In this way, all public entrances from Bijlmerplein to the residential area become green hills that form a softer transition from the commercial Bijlmerplein to the residential area.

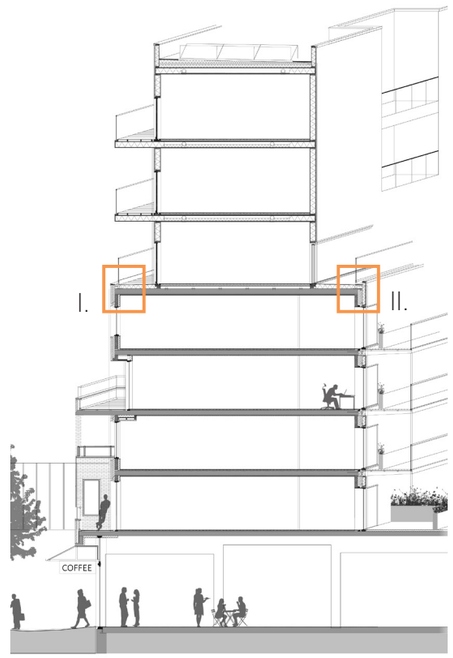


Rc 6,7/7
- plasterboard 2x 12,5 mm
- insulation in aluminium frame 45 mm
- inclined aerated concrete G4/600 200/220 mm
- vapor proof foil
- inclined rigid insulation 170/200 mm
-water barrier
- tiles 25 mm

Rc 5 m2K/W
- brick 90 mm
- cavity 90 mm
- insulation 70 mm
- aerated concrete G4/600 140 mm
- prefab timber frame
- water barrier
- flax wool 90 mm
- vapor proof foil
- battens 15 x 30 mm
- plasterboard 2x12,5 mm

Rc 6,7/7
- plasterboard 2x 12,5 mm
- insulation in aluminium frame 45 mm
- inclined aerated concrete G4/600 200/220 mm
- vapor proof foil
- inclined rigid insulation 170/200 mm
-water barrier
- tiles 25 mm

Rc 5 m2K/W
- wall finishing
- brick 90 mm
- cavity 90 mm
- insulation 70 mm
- aerated concrete G4/600 140 mm
- prefab timber frame
- vapor proof foil
- flax wool 90 mm
- water barrier
- battens 15 x 30 mm
- aluminium railing
- Kerloc 10 mm



1:5

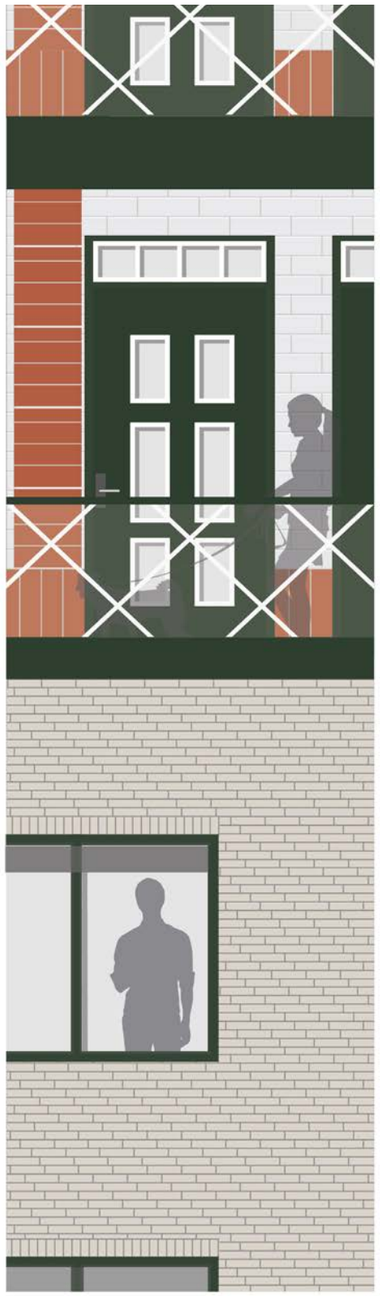
I. interior & II. exterior insulation

FACADE

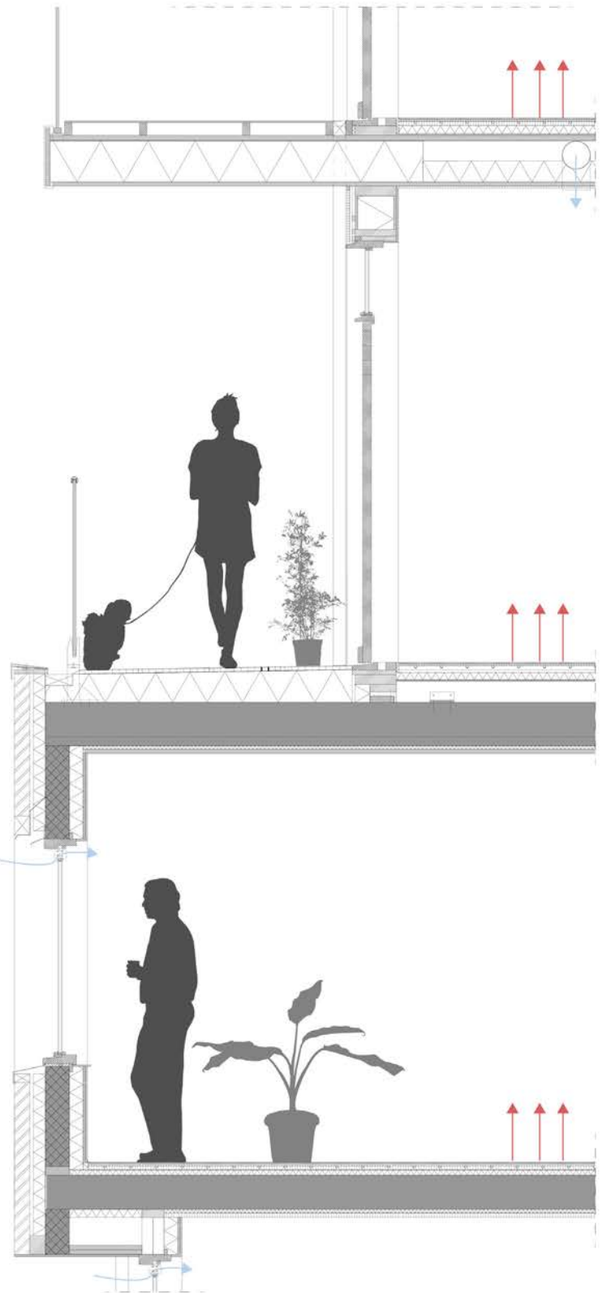
dwelling type | openness | physical | social | privacy | scale | reachability | affordability

The facade finishes used in Bijlmerplein are rather monotonous, but all the more very coherent. The façade image consists of a cream-coloured brick complemented by brightly coloured, glazed bricks that mark passages and entrances. In the case of the current densification assignment, and thus an added building volume or even an extra storey, this façade finish plays all the more of a role. Because the depth of the façades and the coherence of the finish between the various clusters is appreciated at Bijlmerplein, all façades that can be directly linked to this coherence will have to be preserved. This means internal insulation on the relevant facades, but also the freedom to provide the other facades with a new expression when renovating. This means the street facades, which are of higher value than the courtyard facades within this cohesion. The facades that do not play a crucial part in this cohesion can be alternated, included addition of depth.

variant I



variant II



1:35

variant III

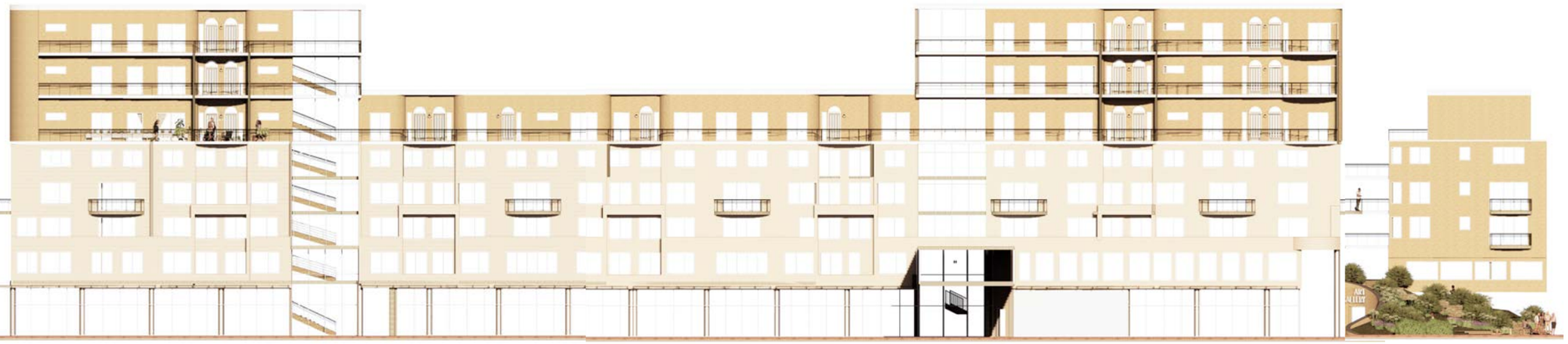
FACADE

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

Different strategies have therefore been drawn up for the added levels and the new building in terms of the original architectural style, cultural composition in the area and a contrasting façade finish. Variant I. contrast: a new chapter for the area with a highly contrasting colour scheme for the façade. By using large grey Kerloc panels in different shades, the missing depth in the deck facade is introduced. In order to refer to the current use of glazed bricks, front doors and passages are marked by the same, in this case yellow, brick. These give the façade direction and provide a visual division. The disadvantage of the contrasting façade finish is that it does not fit in well with the existing situation, especially since the current façade is a significant valuation within the overall valuation of the area. The second variant is the façade based on the cultural composition of the area. The Surinamese community is therefore very strongly represented and constitutes the largest group of residents. Based on Surinamese architecture, specifically in Paramaribo, this variant was designed. The architecture consists of white, horizontal cladding, verandas, characteristic balustrades, red roofs and green door and window frames. In terms of colour and beauty of the material, it fits in well with the architecture of Bijlmerplein. Although the Surinamese community is one of the groups that have made the area what it is today, the demographic composition does not serve as a very solid basis for the application of architecture. In order to prevent disassociation in the case of changing community compositions, this variant was therefore abandoned. Finally, the variant that focuses more on the original architectural reference of the area: the Amsterdam School style. By opting for a brick look with smaller façade panels than previous variants, the scale fits in with the existing façades. The colour tone is slightly warmer, darker and more colourful than the cream brick, so that the contrast is not too great but a lively composition is created. The façade panels have the same horizontal orientation as the brick, but are mounted vertically around entrances accentuated by quarter circles. The window frames in the tower block and the residential tower are white with green doors, as is often seen in the Amsterdam School. This creates coherence with the existing, internally insulated façade, in which the current window frames are white and will remain that way with new, higher insulated windows. In this variant, the entrances are not highlighted in the same way as with the glazed brick, but rather by using different orientations and structures of the panels. This softens the legibility somewhat, which can be seen as something positive since this is a residential building and not a utility building. The more subtle marking of entrances by means of staggered patterns and changes in structure can therefore be seen as a more human approach. In addition, this façade finish blends in easily with the existing one and the recognisability, and therefore association with the Amsterdam School, is retained. In this way, the residential environment remains approachable in terms of appearance.

east

west



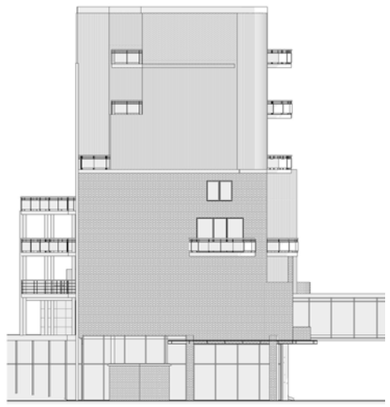
south

north

1:400

FACADE

east



west

south

north

1:400

	 RockPanel	 RockPanel	 ThermoWood	 Kerloc
claimed life span	**50 years**	**50 years**	**min. 25 years**	**min. 50 years**
claimed colour fastness	**no discolouration**	**no discolouration**	**greying**	**20 years guaranteed colour retention**
look	**industrieal / natural weathering**	**close-up clearly printed layer**	**natural wood**	**stony**
eco-intensity	**rockwool (very energy-intensive)**	**rockwool (very energy-intensive)**	**CO2-zero material, thermal treatment required (energy-intensive)**	**residual materials, no additional heating**
maintenance	**low to no maintenance**	**low to no maintenance**	**relatively much maintenance (rotting, discolouration)**	**low to no maintenance**

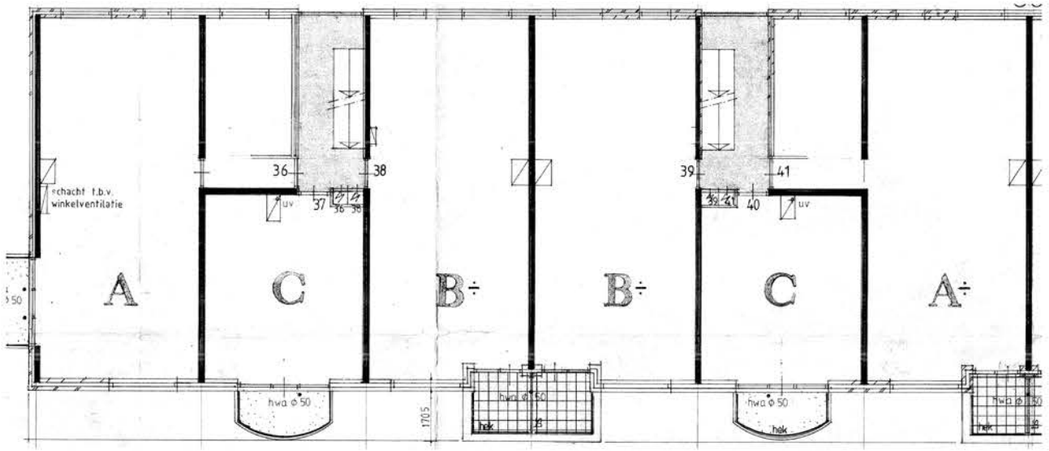
I. ROCKWOOL. (n.d.). Rockpanel Natural. https://www.rockpanel.nl/producten/natuurlijke-gevels/rockpanel-natural/?selectedCat=documentatie II. ROCKWOOL. (n.d.). Rockpanel Woods. https://www.rockpanel.nl/producten/natuurlijke-gevels/rockpanel-woods/
III. Thermowood.be. (n.d.). Thermowood. https://www.thermowood.be/thermowood-gevelbekleding IV. FORM architecten. (2019). Kerloc [Illustration]. https://www.form.nl/projecten/parametric-tiling

MATERIALS

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

There's a lot of embodied energy involved in the area in terms of the large amount of brick and clinker. Therefore, a material with a smaller CO_2 footprint was investigated. The materials compared are as follows: Rockpanel with natural colouring, Rockpanel with wood look, Thermowood and Kerloc. In order to maintain the same visual appearance, a material with a similar matt-gloss character as the facing brick was sought. Wood was therefore one of the first materials to be rejected, also because of its relatively high maintenance requirements and a shorter lifespan. Discolouration can also occur if no chemical treatment is applied, which is not desirable. Rockpanel panels came out well in terms of lifespan and guaranteed colourfastness. Nevertheless, the material has a very smooth, almost plastic-like appearance. In addition, although it is a fire-resistant and natural material-based facade finish, the material still requires considerable heating during production. Finally, the Kerloc panel is a biobased ceramic tile which can be attached to the façade by aluminium strips. The tiles are made from locally-sourced pruning and common Dutch vegetation. The company which produces the panels, Martens Keramiek, claims not to use any further heating process for the production of the final ceramics. The paint finish applied is available in a wide range of colours and is also not harmful to nature. The panels are similar to ceramics in texture and feel and therefore fit well with the current facade brick. The only disadvantage compared to the other materials mentioned is the weight of Kerloc. Nevertheless, this is not a problem in terms of the building's load-bearing capacity. Furthermore, additional research was not only carried out in relation to the facade. The CO_2 footprint of different materials was also taken into consideration when deciding on the type of insulation. The widely used rock wool and glass wool cost a relatively large amount of energy to heat and are therefore discarded. Insulation with a natural origin seems a better choice from the perspective of ecology. Therefore, a flax wool insulation was chosen. Finally, a steel construction was chosen for the galleries. This deviates from the aim of having the lowest possible CO_2 footprint, but with good reason. The use of wood in a construction that is exposed to the open air can be ruinous because of the many maintenance issues and the risk of rotting. This is exactly the reason why a wooden cladding was not chosen. In addition, the gallery is self-supporting, follows the same grid as the underlying construction and is only connected to the façade in the interest of connection. It is therefore not supported by the façade and makes possible any subsequent finishing without major interventions in the existing façade.

Original typologies by Atelier Pro



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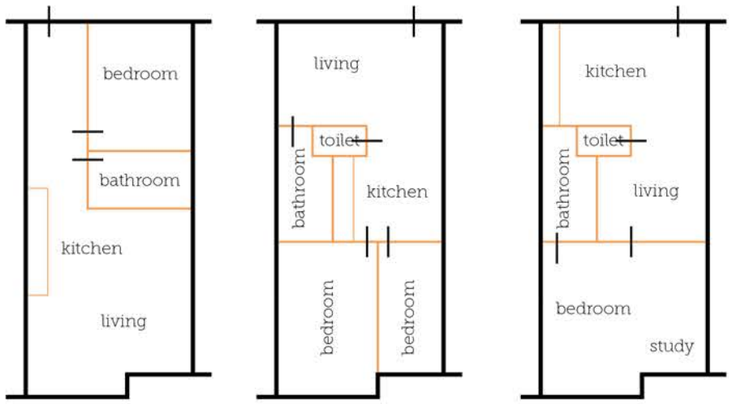
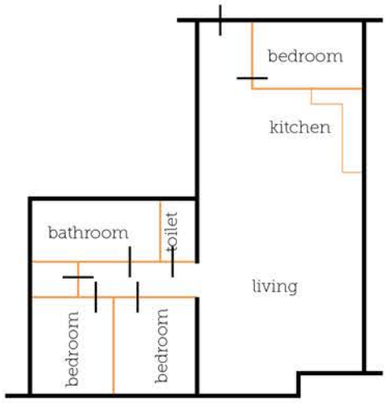
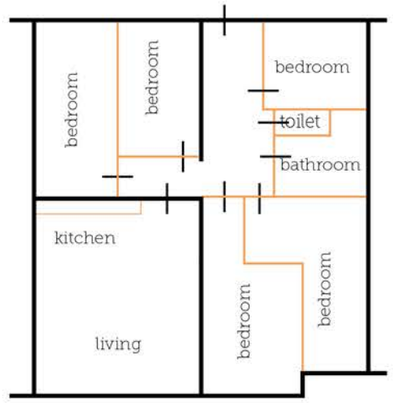
type B
60m²



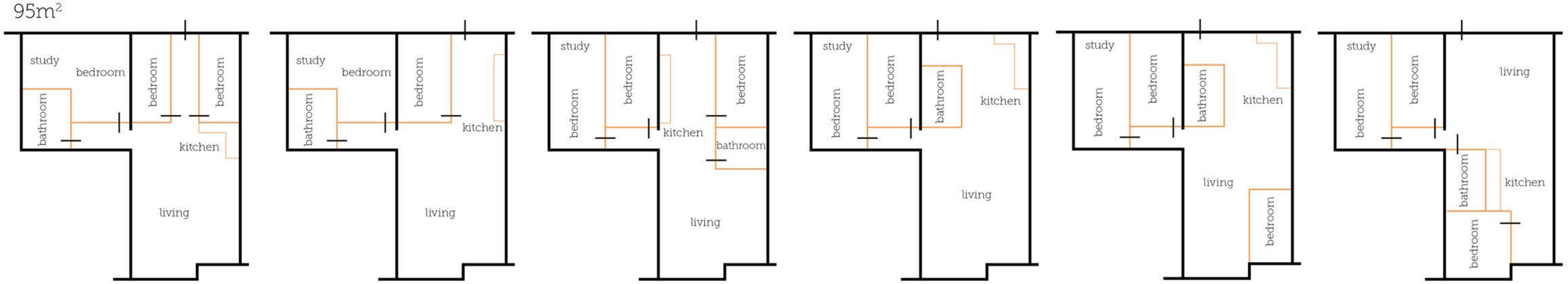
type B + half type C
95m²



type A + half type C
120m²



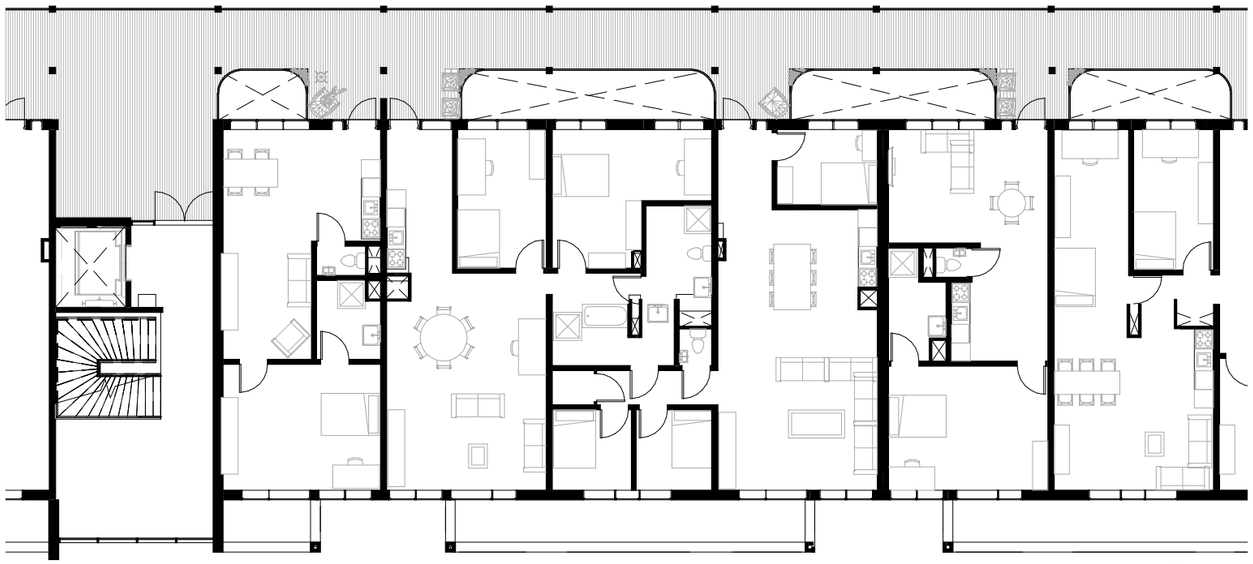
type A + staircase
95m²



FLOOR PLANS

dwelling type | openness | physical | social | privacy | scale | reachability | affordability

The front doors of the current dwellings are adjacent to a communal main staircase. The decision to construct an outdoor hallways and the possibility of creating extra space in the vicinity of the main staircases, has resulted in the front doors being moved to the deck facade. In this way, the configuration of the floor plan changes, as the entrance is now located in a different space. Variants were used to study a floor plan option in which the entrance connects to a slightly less private space, being a kitchen or entrance hall. From those spaces, the configuration is of less importance. In addition, the choice was made to create more economical floor plans by maximising the living space and minimising the circulation space. This is advantageous in terms of affordability because the amount of living space within the same area can lead to a relatively lower price in the living space/circulation space comparison. An important intervention is the joining of kitchen and living room, which are separated from each other in the current situation and therefore take up extra partition walls and circulation space. The location of the down pipe is important for this intervention, as is minimising changes to it. Finally, due to the construction of the gallery, the incidence of daylight is very important. On the deck side, this means a necessary increase in the window area. This is not necessarily based on regulations, as these are not always achieved in the current situation. However, window surface is added for the benefit of the living comfort of the occupants. For dwellings that have living space over the entire depth of the building or up to 2/3 of it, seen from the deck gable, extra living space will be added. This will involve some 50% more windows for these specific situations. On the street side, the number and size of the windows will not change due to the rhythm and perfect alignment of the windows. If the height of the windows were to change, this alignment would be disrupted and with it the rhythm of the street facades linked to the Amsterdam School style.



2nd floor
1:200

6

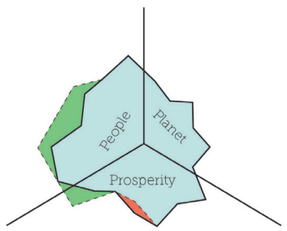
impact accessment

Replace staircases by elevators and outdoor hallways

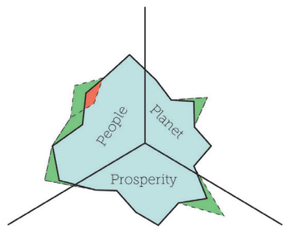
Add places to meet in residential area

Open up residential area towards public street

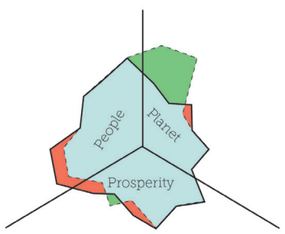
Indoor insulation on street facade

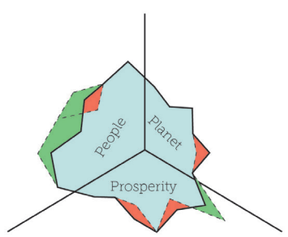


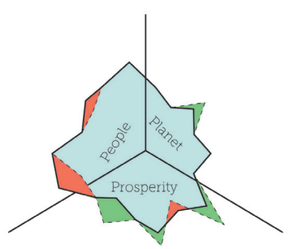
Introduce other functions than housing on deck



Add extra levels on top of existing building







Final Kamari wheel Bijlmerplein

IMPACT ASSESSMENT

the staircases by elevators and outdoor hallways

- integrity: physical accessibility it all dwellings s increased by these interventions
- material and waste: for the sake of physical accessibility, more building material is needed. This could however also be seen as an investment in the lifespan of the building. When comparing it with the possibility of the building being completely demolished becase of a lack in accessible dwellings, it is a positive intervention
- quality of services: the ease of using the building by the elevators is upgraded
- investment costs: for the sake of the lifespan of the building, this intervention could be seen as a positive development
- operation and maintenance costs: with an increase of services, so is the increase of these expenses. The elevators will increase these costs as currently there's only one small elevator between two levels.
- social: as more dwellings are physically accessible, a larger public is included to occupy these dwellings

add places to meet in residential area

- security: introducing places to stay on the decks could increase the amount of social control as it creates circumstances for users to stay outside for a longer period of time
- identity: the lack of places to meet on the decks has been turned 180 degrees by which the identity of the place itself could be seen as an upgraded version of the current living environment
- flexibility and management: on the one hand management of the place is increased by creating the possibility to let more users stay on the deck, however this could also be a problem as the more people are able to stay at the deck it might be harder to keep unwanted visitors away.
- stakeholder engagement: by introducing opportunities for users to stay on the deck, it is possible that residents feel like their living space is invaded by strangers. Collaboration with the municipality for the sake of safety is therefore desirable. Otherwise, these opportunities could also lead to an increased bonding of the community as there is finally places to meet each other properly
- sociality: the actual creation of places to stay, which was pointed out as a lacking element on the decks in the 'speurtocht', could be seen as a social gesture in terms of the quality of the living environment

open up the residential area towards the public street

- identity: the current identity of the residential area as being a very quiet and hidden place to live is changed by opening up the area to the public. On the one hand that could feel like an invasion of the original idea as a peaceful place, but on the other hand this opening up could precisely create this peaceful environment which it is not at this very moment
- aesthetics: the original set up of the urban plan was to create a cooperation with facades. By removal of one corner of the building on the square there is a slight possibility that this original aesthetic feature is lost. However, precisely by placing the new entrance in a corner, which is an element with a lot of worth in the postmodern urban planning, it does again react on the square itself. Moreover, not a lot changes as the end walls in particular are important in this composition and will be retained.
- material and waste: embodied energy is lost within this intervention. Of course the demolished parts of the building could be reused in the new entrance and on the deck, but there it is almost impossible to not use any extra materials.
- quality of services: this could be seen as an upgrade as an elevator is added at the spot of the demolished building part
- operation and maintenance costs: the way the new entrance is designed, with a lot of green, will increase maintenance costs, as well as the addition of the elevator

indoor insulation of the street facades

- identity & aesthetics: as the facades are preserved by the indoor insulations, these categories will neither be upgraded nor downgraded. They are however very import within this intervention as it is key within the choice of insulation method
- indoor comfort: by increasing the amount of insulation, the building will become more comfortable during colder days at the heat is kept in as on warmer days this heat will less easily enter the buiding
- energy efficiency: as less heat or cooling is necessary to keep the dwelling warm of colder, the energy efficiency does not necessarily go up itself, but the amount of energy needed even the more
- material and waste: for this intervention more

- material is added to the building in the form of insulation and associated construction
- management and flexibility: indoor insulation is fairly easy to place, however it could require residents to temporarily leave their home. This includes arranging accomodation and helping to move out.
- stakeholder engagement: it does ask a lot of residents to let their dwelling be renovated from a perspective of effort and nuisance. On the other hand this engagement could be stimulated by a lower energy bill as a motivator
- spatial: spatially the dwelling will become somewhat smaller, which is never a really desirable option

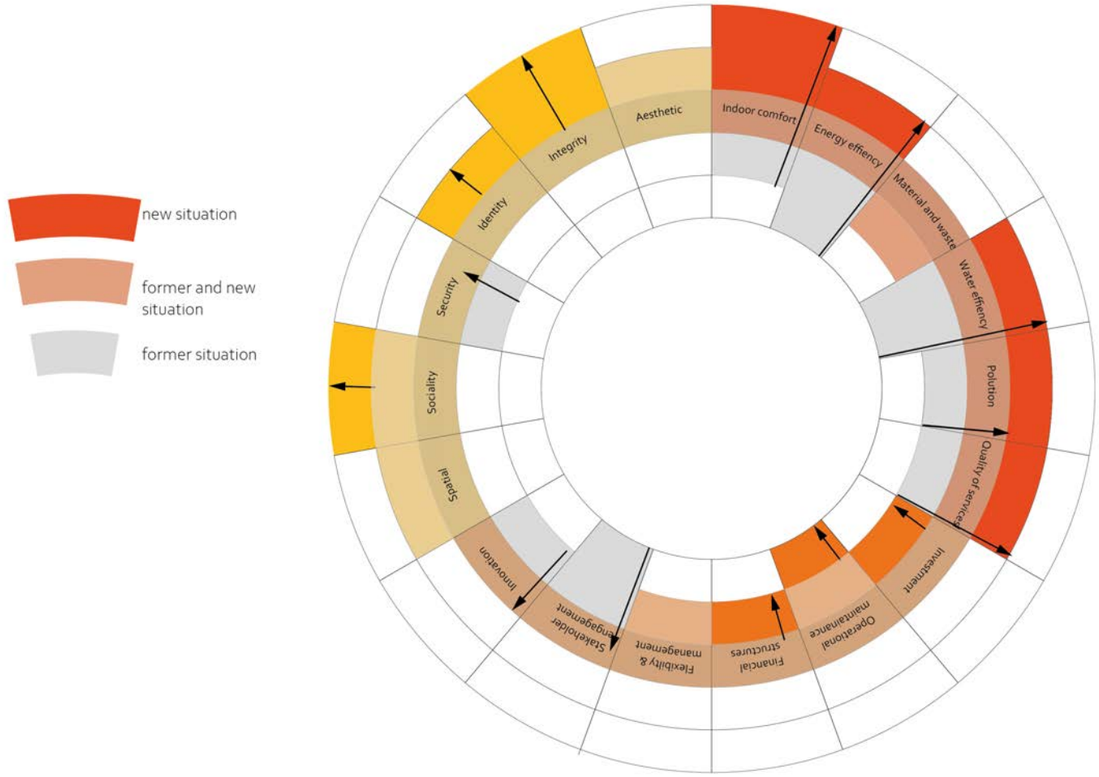
introduce other functions than housing on the deck

- identity: by changing the original set up of the area in terms of introducing new functions to the deck, is both an upgrade and a break with the past. The upgrade means a possible increase in the functioning of the area by taking a step towards revitalization.
- investment costs: as a lot of the added functions are social rather than commercial like the rest of the area, this does ask for investment costs for the sake of livability in the area. This might not pay itself directly back in terms of finance, unless the place gets really attractive for people looking to buy a dwelling
- operation and maintenance costs: the functions added need management in terms of employees to serve the community center and keeping all facilities clean and in good shape
- security: as functions other than housing are introduces, there is a possibility that the area will be used differently and on different times during the day, which increases the social control of the residential area
- sociality: introducing lacking facilities makes them reachable for users and is therefore a social gesture

add extra levels on top of the existing building

- identity: the mid-rise identity with which Bijlmerplein was originally designed could be harmed by creating a step towards mid/high-rise. However when taking into account every possible impact on the human scale in the area, it could also be an upgrade in terms of creating a more residential focused area

- material and waste: more materials are obviously needed to build new volumes, however by limiting the CO_2 footprint this factor could be seen more as a neutral component
- innovation: adding prefab levels on top of existing buildings instead of demolishing the building and adding new volumes could be seen as an innovative intervention in the Bijlmermeer.
- spatial: it has been tried as good as possible to not les the human scale experience of the shopping street be influenced by the extra levels by shifting them towards the deck side. It can however not be said with complete certainty that the street scene will be influenced



Final Kamari wheel Bijlmerplein

7

Reflection

Aging (in) Architecture: A Reflection

Jennifer Lips

The project

The housing and sustainability challenge in the Netherlands are really relevant topics in nowadays society. Both include a harder and a softer side. Housing concerns people/residents, and is therefore quite soft, just like the valuation of the existing housing stock having to undergo the energy transition. The challenge lies in designing a future-proof match between the ultimately necessary, physical energy transition, the hard side, and this softer side, without either having to detract from the other. Within the studio New Heritage about post-65 architecture this aspect in particular is very important. Trying to pin down the values for the area and keeping these as a guide in the design process is therefore key. Precisely these values are of great importance for the studio as post-65 residential architecture is often not yet considered to be heritage in the Netherlands.

The design assignment of the studio is to renovate and possibly densificate a 70s or 80s housing complex, focusing specifically on the current energy transition and the valuation. The personal task in this design project is to create an inclusive, high quality living environment in an existing housing complex at Bijlmerplein, an area from the 1980s in Amsterdam. This urban area scores low on the Dutch national average quality of living environment called leefbaarometer (Ministry of the Interior and Kingdom Relations, 2020). The research conducted therefore resulted in a programme of requirements aiming to improve this quality and the inclusiveness of residential areas. The results are based on and applied to the current housing situation at Bijlmerplein, concluding to a future design approach.

The topic of the graduation project, inclusive and high quality living environments, is related to the studio topic by means of creating such living environments in existing housing complexes and surroundings. The design question of the studio is therefore as follows:

'How could renovation and densification strengthen qualities and help solve current problems, without compromising heritage values and identities?'. The relation with the studio lies in:

1. densification and housing shortage as a focal point;
2. using and strengthening current qualities of the complex and area, but also upgrading weaknesses;
3. keeping socio-cultural values and qualities of livability as a basis for the design.

In addition, there's a serious sustainability task from within the studio, offering the opportunity to not only insulate energy-inefficient buildings, but upgrading the entire area and (possible) functioning as well. A renovation of the living environment. The relation to the master track Architecture lies exactly in this element: why just wrap the building in insulation? Why add straight and plain outdoor hallways? The architecture is within creating a place to stay and live, rather than a place of shelter. Creation of a living environment that is sustainable in a sense of energy efficiency, but above all the life extension of a building with potential heritage value. It turns the practical question of 'what is strictly necessary' into how can this 'strictly necessary' be of greater meaning than just keeping heat inside a dwelling or being able to reach the front door in an easier way, keeping the socio-cultural values of the complex and qualities in mind.

The research

The definition of inclusiveness in this study is taken from the Cambridge Dictionary: "the quality of including many different types of people and treating them all fairly and equally". For the research and design, that means, among other things, persons with mobility problems are taken into account, life-proofing the living environment. The older generation is often included in this terminology. Not only might mobility be a problem at older age, this group of people is also partly held accountable for the housing stagnation in the Netherlands (Obbink, 2020; Van der Parre, 2021). That is why the preferences of older people, in general called people from the retirement age and above (Ministry of Social Affairs and Employment, 2020), were studied to conclude how to possibly design inclusive living environments. Taking into account a high quality living environment by results of previously performed field research, being the preferences of elderly and stakeholders at Bijlmerplein, and academic findings. The results function as a base for the case specific situation, being the woondek typology housing at Bijlmerplein. As the quality of living is rated low in this area, the case is compared to a well-functioning woondek being De Nieuwe Weerdjes in Arnhem. The latter is related to the Dutch hofje or courtyard in previous analyses, which is an interesting addition to the case study analysis due to the often central location of this typology in the city, just like Bijlmerplein and De Nieuwe Weerdjes. Therefore, all three mentioned situations were analysed based on design elements influencing the quality of the living environment. The outcomes were compared to the results found in the theoretical research, followed by testing this final programme of requirements to the situation at Bijlmerplein. The qualities and missing elements followed as a result, being the starting point of the design. This way, input was collected for the renovation of the living area at Bijlmerplein, a task consisting of:

- Inclusiveness / life-proofing;
- High quality living environment;
- Energy transition / climate adaptation;
- Supporting / preserving socio-cultural values

This graduation research clarifies that for a large part, the preferences of elderly are almost similar to any found quality of a living environment, which places this work as an intermediary between the qualities of a living environment and the wishes of older people. In the larger social framework, the outcomes of this research & design could work as a programme of requirements to create inclusive, high quality living environments in existing (malfunctioning) living environments, as well as in new housing projects. Therefore this graduation work is not answering the question of how to build for older people, but how to create a living environment does not discriminate on age.

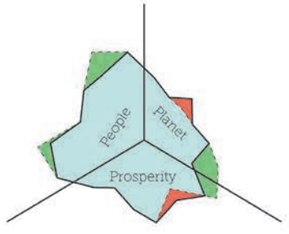
The design process

The design process was one of trial and error as has become a workflow over the years. On the one hand this includes thinking in scenarios but on the other hand also trying out impulsive ideas; thus the trial and error. The main interventions applied at Bijlmerplein during the design process according to the resulting programme of requirements were tested according to a renovation theory by Kamari, Corrao, and Kirkegaard (2017).This theory focuses on the sustainability of a renovation, however in this situation it is applied in a way of including the building and site values leading to an assessment of sustainable interventions based on predefined values. The heritage perspective of this sustainable renovation theory as you will. In the diagram on the next page, the initial Kamari diagram is visible for Bijlmerplein in the current situation. The interventions are visualised as people-planet-prosperity impact triangles. Each triangle has a more positive and negative effect, however overall positive.

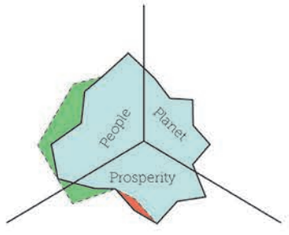
The ethics

One of the ethical dilemmas when researching the living environment preferences by elderly was the broadness of this very diverse group. It is basically impossible to fit everyone into one living environment mould and therefore the conclusion will not cover the entire older generation. It can, for example, also be a choice to live in a rural area rather than the city centre, despite the centre being more inclusive or of higher living quality. Preferences based on place are therefore a matter that cannot be influenced. Another dilemma is that when designing inclusive living environments, the housing shortage itself is not necessarily solved. As these type of living environments focus on a much broader target group other than 'just' the senior, it is not possible to create bulk housing for one target group with this particular approach. This means when in a housing shortage for one specific target group, a different approach could be chosen, or this particular group could be included in the existing situation. Moreover, this discussion meets diversity in the type of housing. It raises questions about the current residents and their dwellings. Will they be able to live in their familiar home or even living environment after the interventions? Will the new residents, attracted by these new or added dwelling types, fit within the current residential society at Bijlmerplein? In addition, what will happen to the residents while construction is happening is one of the biggest ethical issues. Can they stay put? Will they be offered a new dwelling within the same cluster, or a temporary residence? Another dilemma is the reliability of the created design solution scheme, as it is partly supported by the views on the living environment in urban areas and specifically at Bijlmerplein. Finally, choosing the type of housing or living environment to be analysed as a matter to create a clear overview of what is an inclusive, high

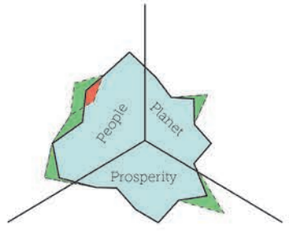
Replace staircases by elevators and outdoor hallways



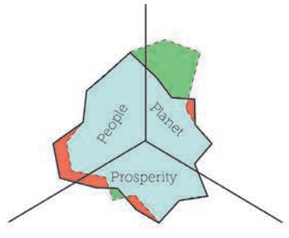
Add places to meet in residential area



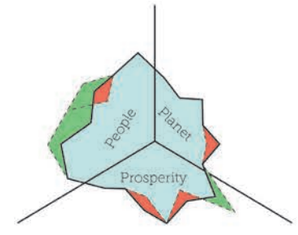
Open up residential area towards public street



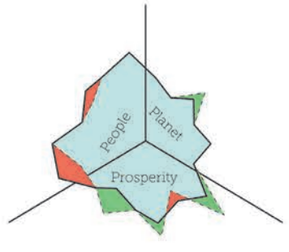
Indoor insulation on street facade



Introduce other functions than housing on deck



Add extra levels on top of existing building



Final Kamari wheel Bijlmerplein

quality living environment, was difficult. Every resident could experience their living environment as being more or less comfortable, something that will most likely be happening in each and every type of living environment. Not every resident in the Netherlands will appreciate the Dutch courtyard as being the ideal way of housing, but the choice was nevertheless made in relation to the linked arguments for the Nieuwe Weerdjes woondek and similarities in description of the woondek at Bijlmerplein and the Dutch courtyard. Still, this does not explain or argue if the resulting programme of requirements would fit any type of residential area. Even if this programme in its entirety or as a way of finding applicable elements within the situation would be a suitable way of using the results from the research. However the latter would be suggested: an analysis of the situation followed by a search within the programme of requirements delivered in this research to find possible solutions for a high quality and inclusive living environment.

Heritage

In terms of heritage, there are a number of factors in the design that have been specifically claimed. Firstly, the coherence of the entire layout of the square: the brick façade material, but also the urban plan with references to postmodernism. It is precisely this reinterpretation in the 1980s of the then century-old way of thinking about the coherence of urban design and facade architecture that can be seen as valuable for the area. In the redesign, this focus on squares and the interaction with façades is again emphasised and even strengthened by adding a dimension of height. In addition, the highly valued human scale in the area is a remnant of the thinking of the 1980s that is respected in the design by keeping a distance from the street façade with regard to the experience of spatiality in the streetscape. The human scale also returns in the form of the Amsterdam School style, a third element within the heritage category. By making use of plastic design in balconies, entrances and corners, the original commitment to recognisable forms and elements is retained in the design. Finally, the original design approach with many social facilities could have been potential heritage in connection with the conception around the time of design. Since this has not been realised or has disappeared with time, this design idea is being revived by adding social facilities for the entire neighbourhood. This can form a new kind of heritage within the area in the form of an intangible attribute to revitalise the neighbourhood. Another important element within the heritage category is the reinterpretation of the anti-Bijlmer movement against the high-rise and monofunctional approach of CIAM. Whereas high-rise buildings were shunned in the area during the time of the original design, in view of the current densification task and the revitalisation of the residential area, this actually offers opportunities for a revival of the decks. The key here is to ensure that the human scale in the area is preserved and stimulated, in contrast to the rather cosmic and alienating building masses in the Bijlmer of the 1960s. In the residential tower in cluster 2, an attempt is made to achieve this by having the façades ascend in stages and avoiding long façade elements, but rather by using small-scale balconies and plastic shapes as is done in the Amsterdam School. It must be clear that the building can and is lived in. Keeping the materials recognisable and on a small scale also contributes to this. All in all, the area can therefore be seen as a clear architectural heritage of the 1980s by outlining the zeitgeist of the period in the form of cohesion, human scale, postmodernism and the contemporary interpretation of the Amsterdam School.

The design issues

Issues during the design process start with the complexity of the situation at Bijlmerplein and all its facets. One of the examples is the commercial area at ground level and ensamble of similarly materialised and scaled buildings, as well as the diversity of residents and management of possible future interventions. Taking into account values of the location and its buildings by stakeholders too strictly was a second issue. Of course it is of great importance to take note of any valuation of the area by its users, but too little deviation sometimes limited the freedom of designing. As the building is not (yet) considered heritage, it can, officially speaking, tolerate any modification. However, within the search to heritage values, finding the balance between dedication towards values and actually upgrading the building and its surrounding environment was a great challange throughout the design process. Exactly this freedom of designing got lost sometimes while keeping onto one design concept for too long, not allowing other interventions to change anything about it. Tutoring sessions helped to zoom out and get the big picture back into focus when digging in too much. This zooming in and out was however recognizable in my design approach in a way of again holding on too much. That means ranging from a huge, overshadowing concept to

an acupunctural approach that needed extra focus to not lose myself in the tiniest detail without losing the scope of the bigger picture. For me, this ended up in a lot of side paths like flexible floorplans for the sake of sustainability in the sense of durability of the building function. However intriguing these subjects are, they did not exactly fit the scope of the design and thereby made the situation more complex. The tutor sessions played a role in this interest in different topics as they sparked my interest in different subjects. This was a very inspiring experience, however sometimes counterproductive as it put me on a different path of discovery every time. On the one hand this could be seen as a slow enrichment of the design by exploring different areas of interest and integrating them into the design, but it certainly made it harder to determine what in the end was the overarching concept of the design. A final lesson learned during this research and design is to even look more accurately into the location and building analysis, and understanding the design location itself, beforehand determining to start off with the design task. By a slight underestimation this led me to find out only after the midterm that another cluster at Bijlmerplein was way more interesting and had more potential within the scope of my research into quality. This also explains why it sometimes took me a little longer to come up with new, more innovative and creative design solutions for the renovation of the residential area at Bijlmerplein.

Sources

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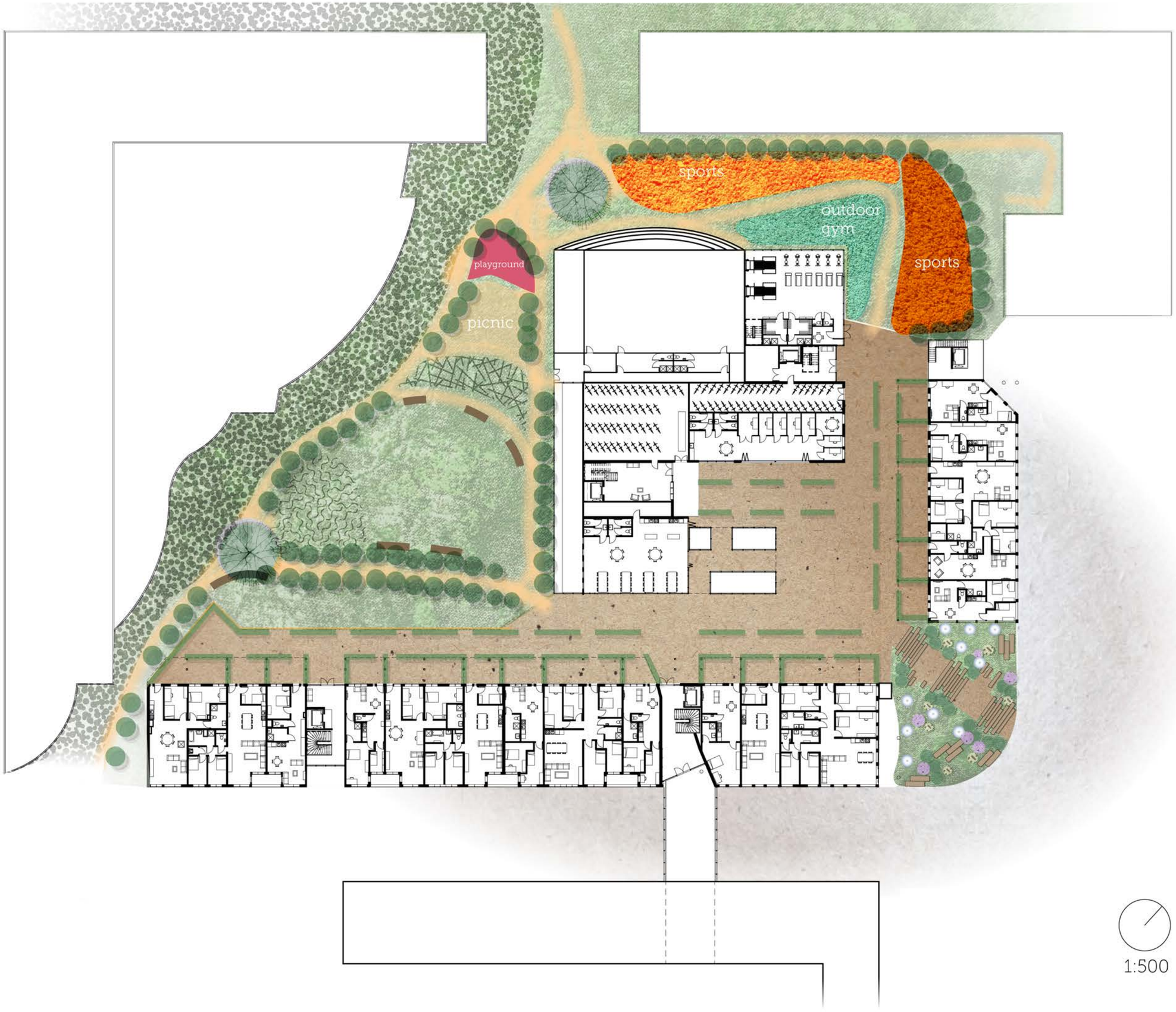
8

Final design products



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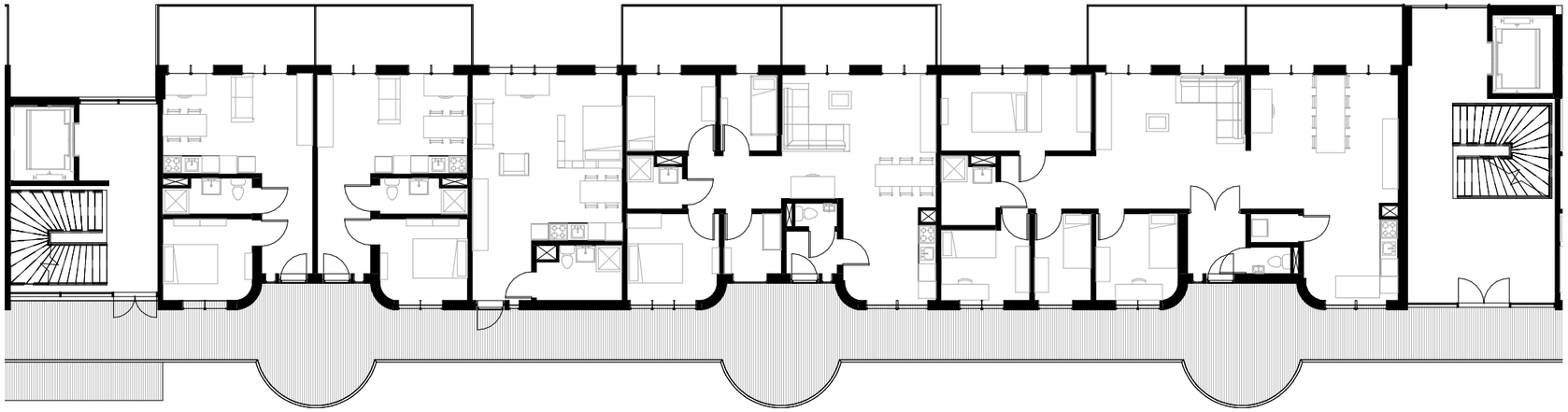
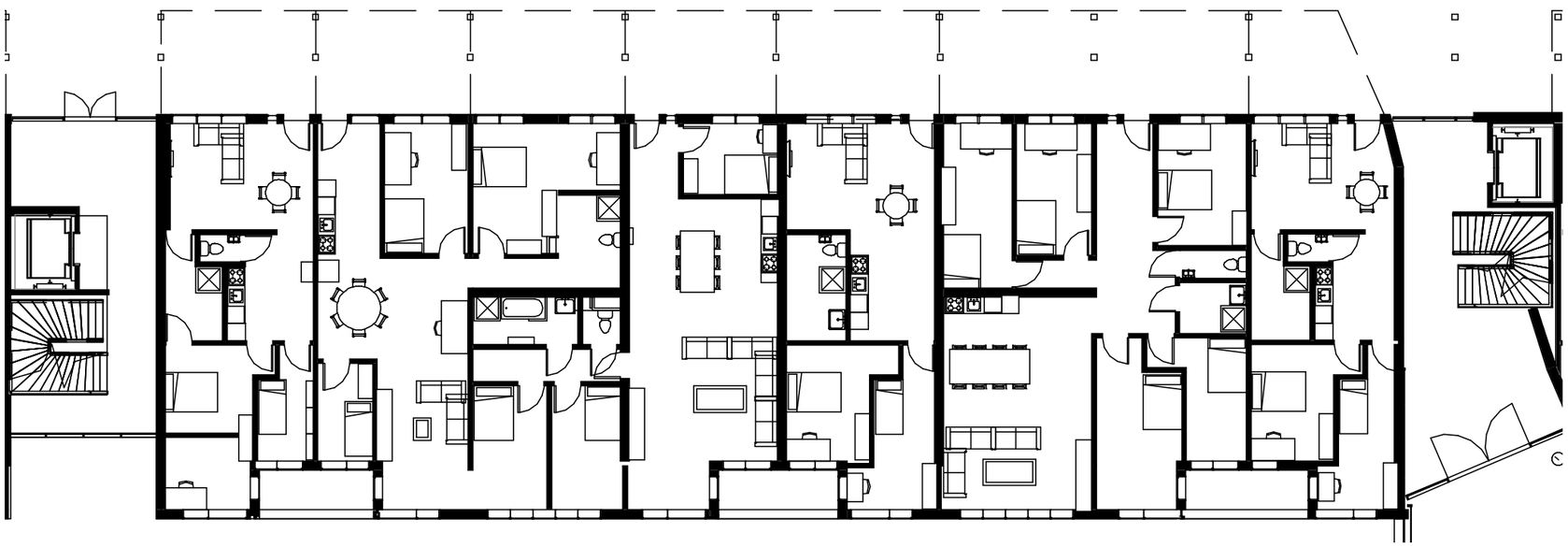


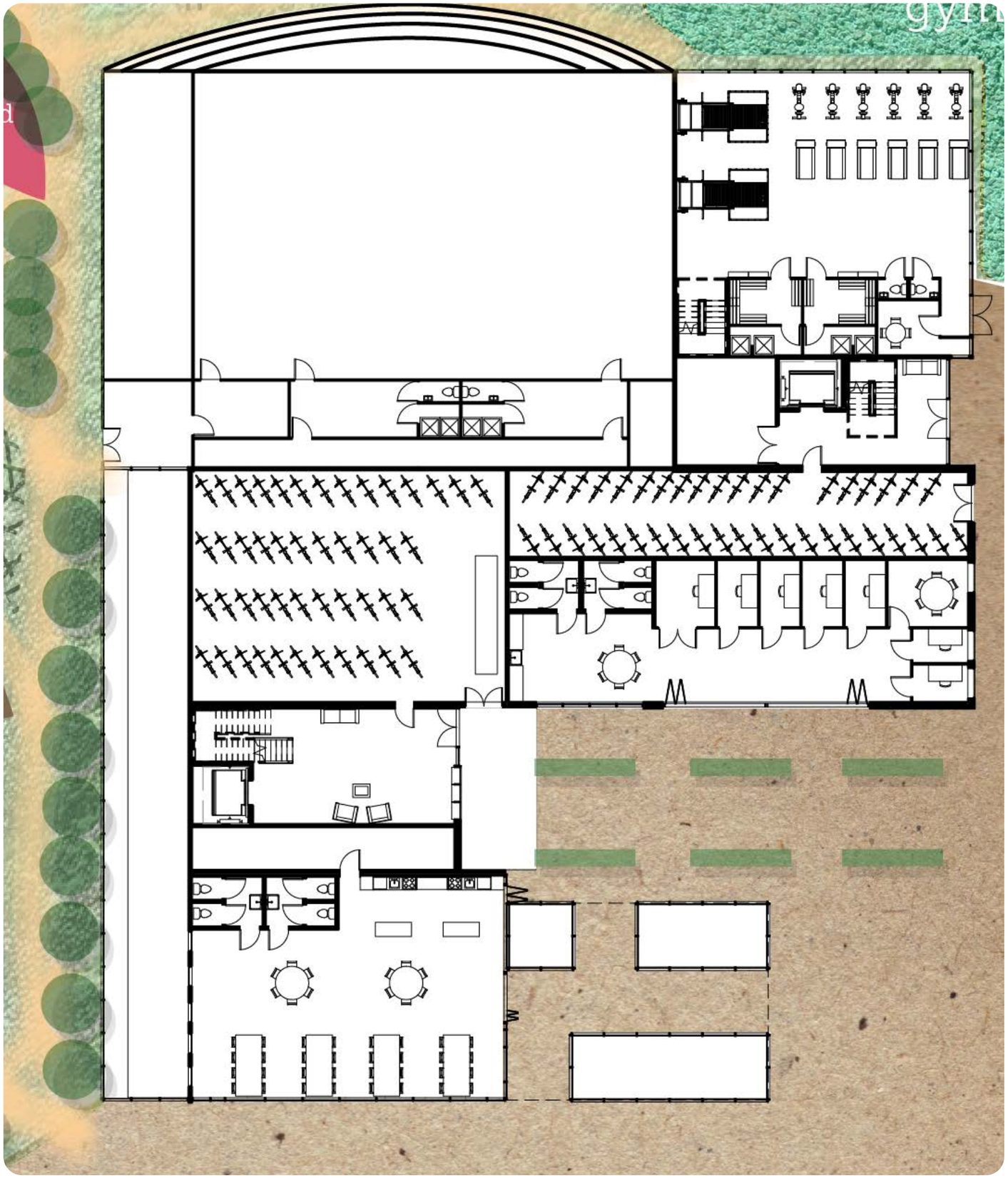
5th floor
(added)

2nd - 4th floor

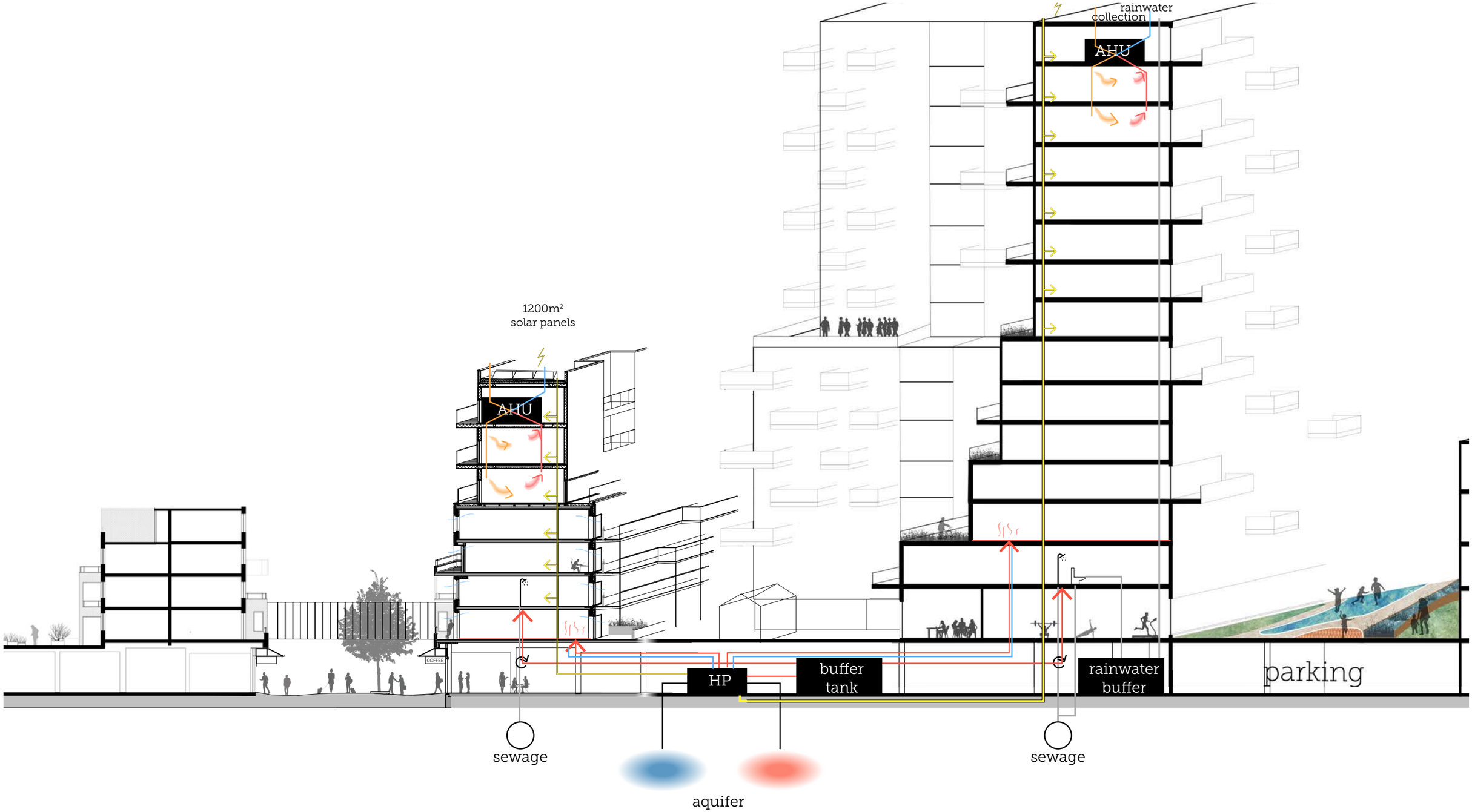


1st floor

1:200

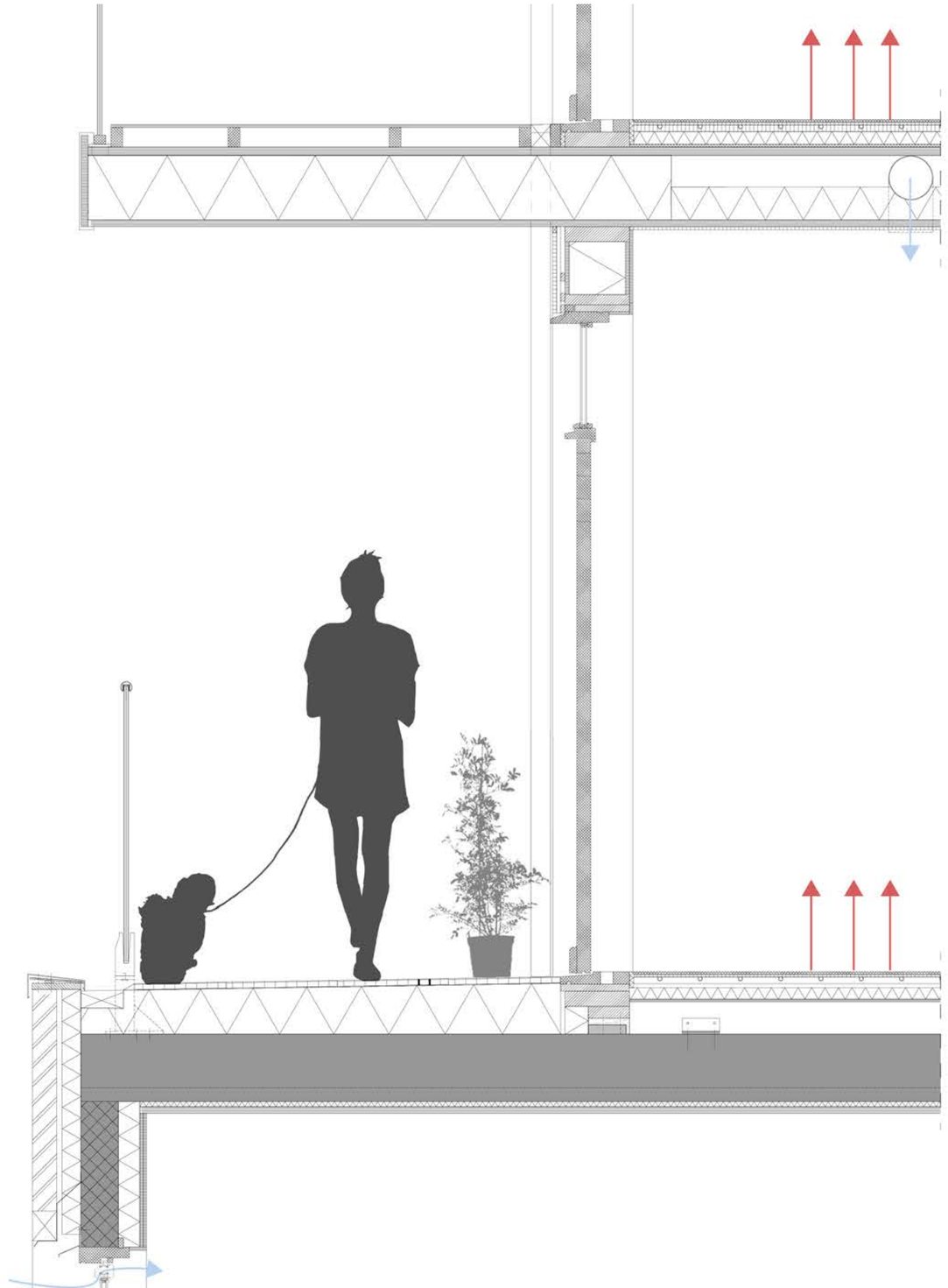


1st floor
1:200


rainwater
collection
AHU
1200m²
solar panels
AHU
COFFEE
HP
buffer
tank
rainwater
buffer
parking
sewage
sewage
aquifer

1:300

1st floor
1:50



5th floor
1:20

east

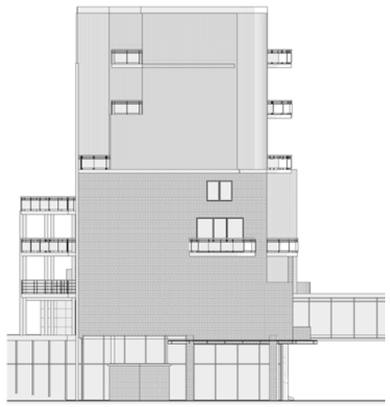
west

south

north

1:400

east

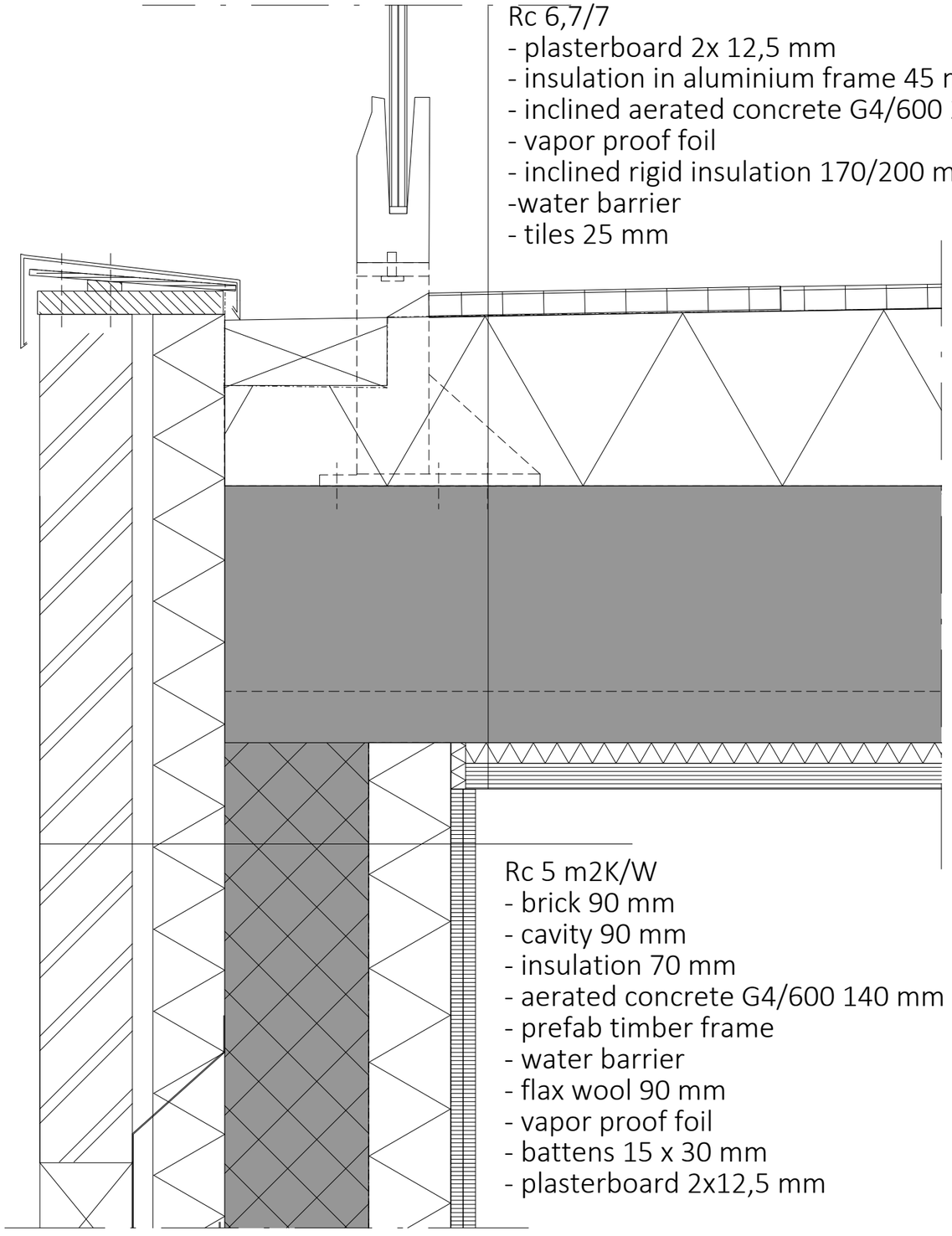


west

south

north

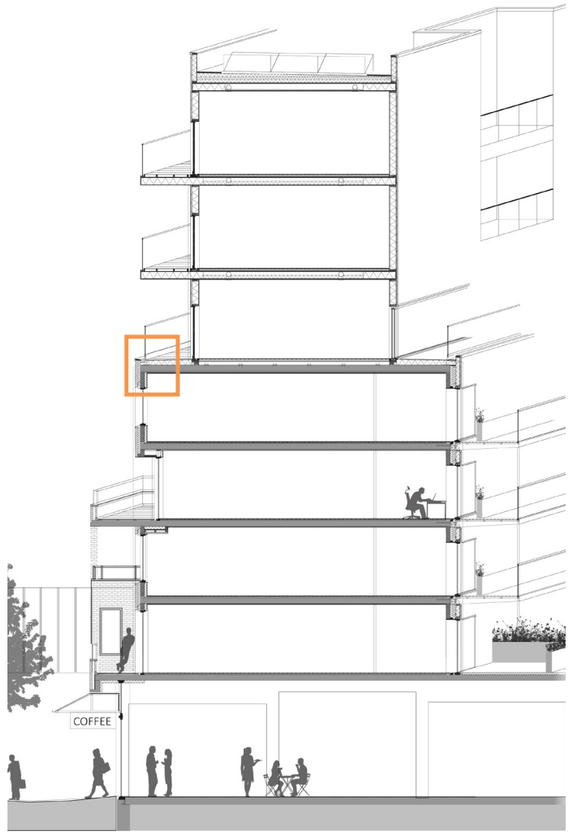
1:400



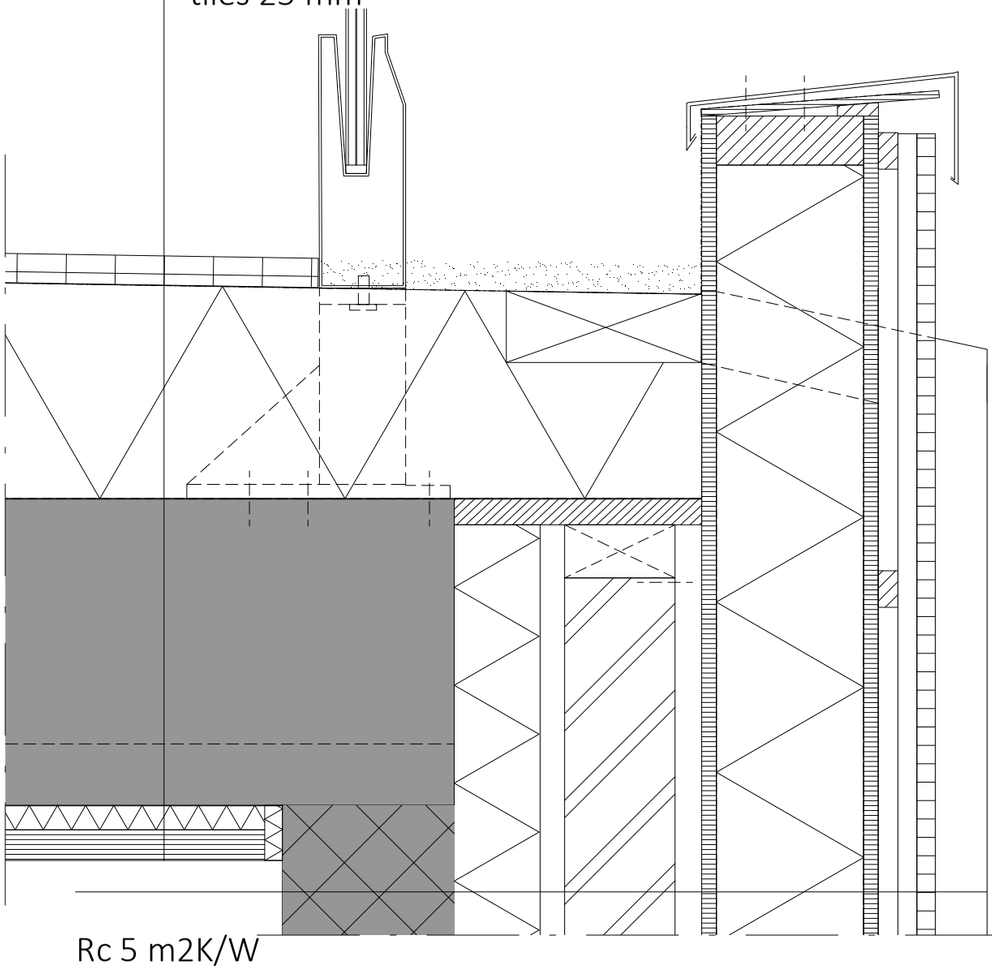
Rc 6,7/7
- plasterboard 2x 12,5 mm
- insulation in aluminium frame 45 mm
- inclined aerated concrete G4/600 200/220 mm
- vapor proof foil
- inclined rigid insulation 170/200 mm
-water barrier
- tiles 25 mm

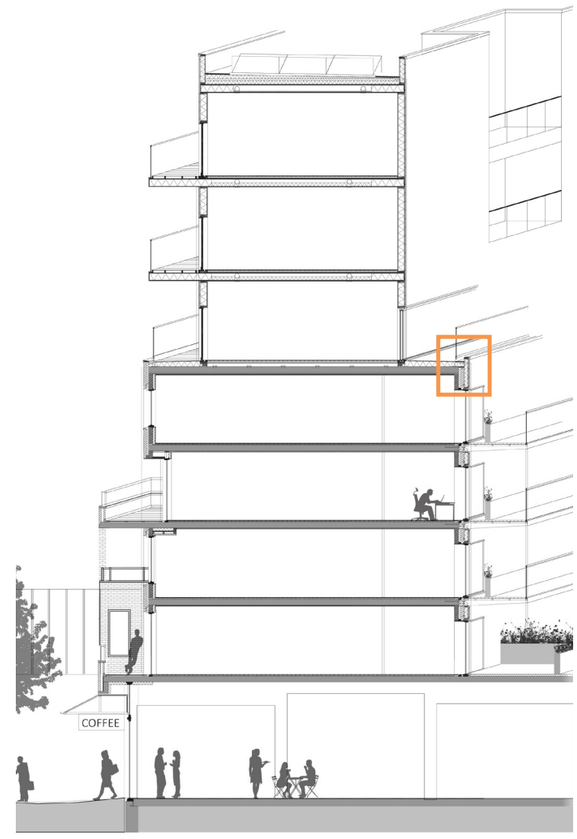
Rc 5 m2K/W
- brick 90 mm
- cavity 90 mm
- insulation 70 mm
- aerated concrete G4/600 140 mm
- prefab timber frame
- water barrier
- flax wool 90 mm
- vapor proof foil
- battens 15 x 30 mm
- plasterboard 2x12,5 mm

1:5



Rc 6,7/7
- plasterboard 2x 12,5 mm
- insulation in aluminium frame 45 mm
- inclined aerated concrete G4/600 200/220 mm
- vapor proof foil
- inclined rigid insulation 170/200 mm
-water barrier
- tiles 25 mm

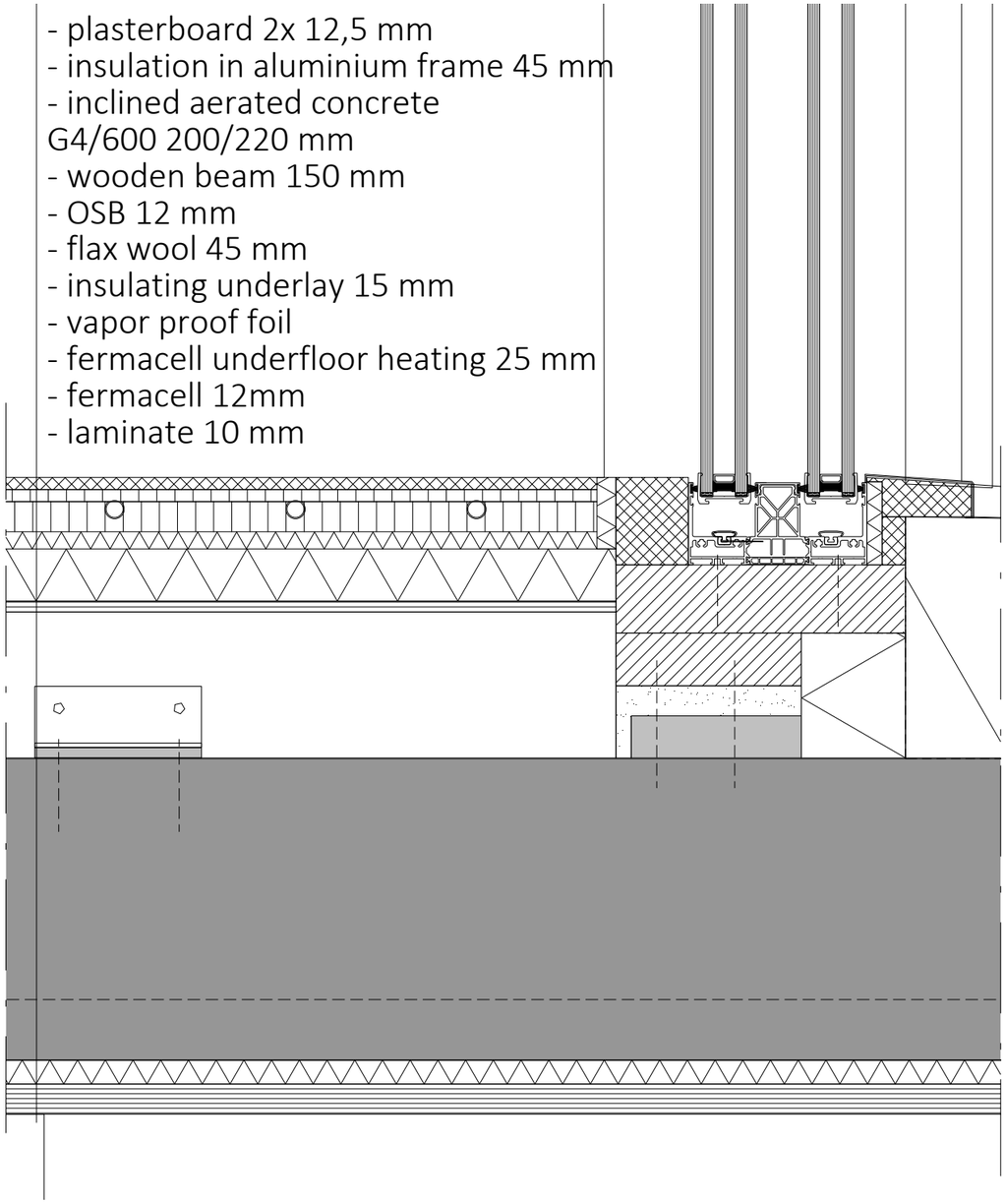




Rc 5 m2K/W
- wall finishing
- brick 90 mm
- cavity 90 mm
- insulation 70 mm
- aerated concrete G4/600 140 mm
- prefab timber frame
- vapor proof foil
- flax wool 90 mm
- water barrier
- battens 15 x 30 mm
- aluminium railing
- Kerloc 10 mm

1:5

- plasterboard 2x 12,5 mm
- insulation in aluminium frame 45 mm
- inclined aerated concrete
G4/600 200/220 mm
- wooden beam 150 mm
- OSB 12 mm
- flax wool 45 mm
- insulating underlay 15 mm
- vapor proof foil
- fermacell underfloor heating 25 mm
- fermacell 12mm
- laminate 10 mm



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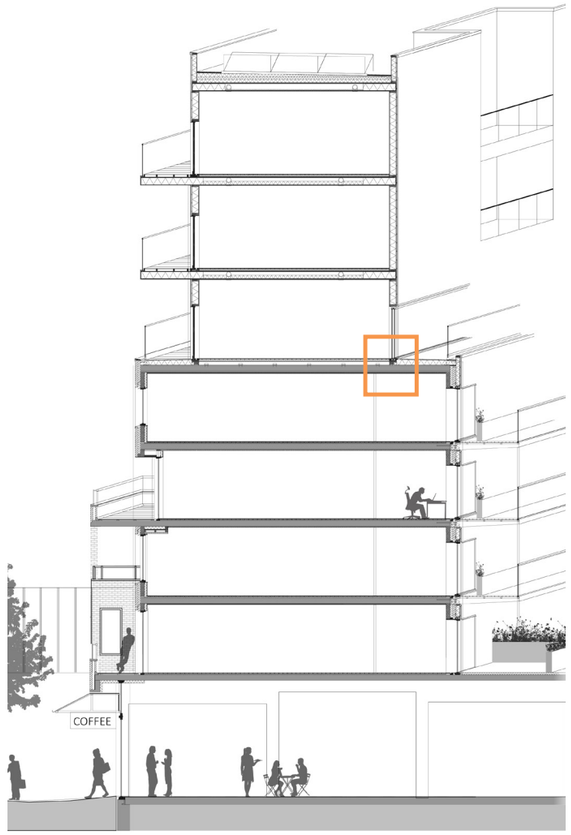
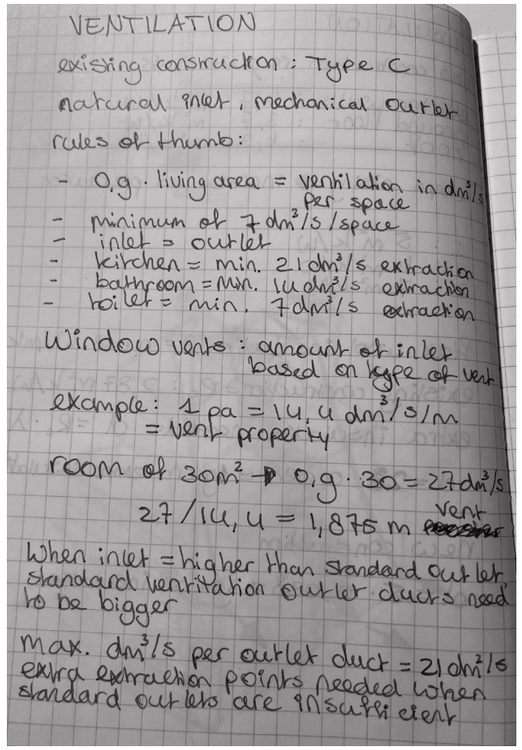
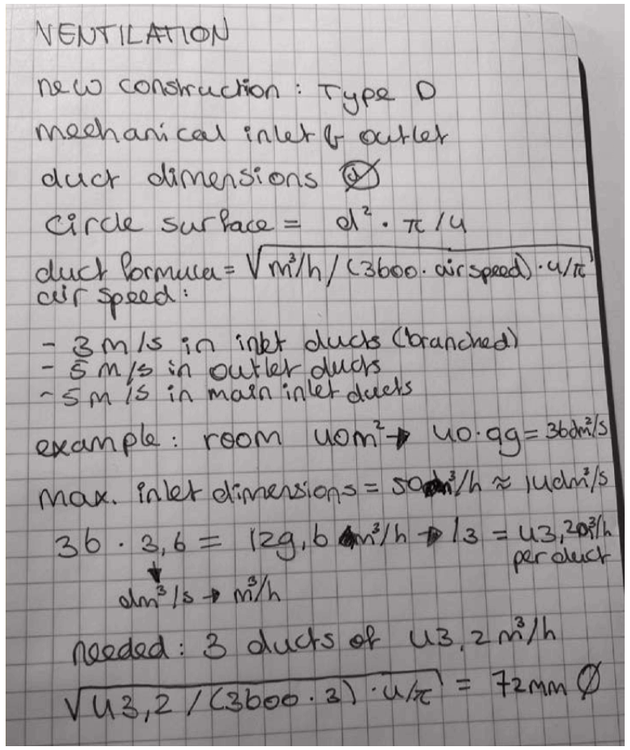
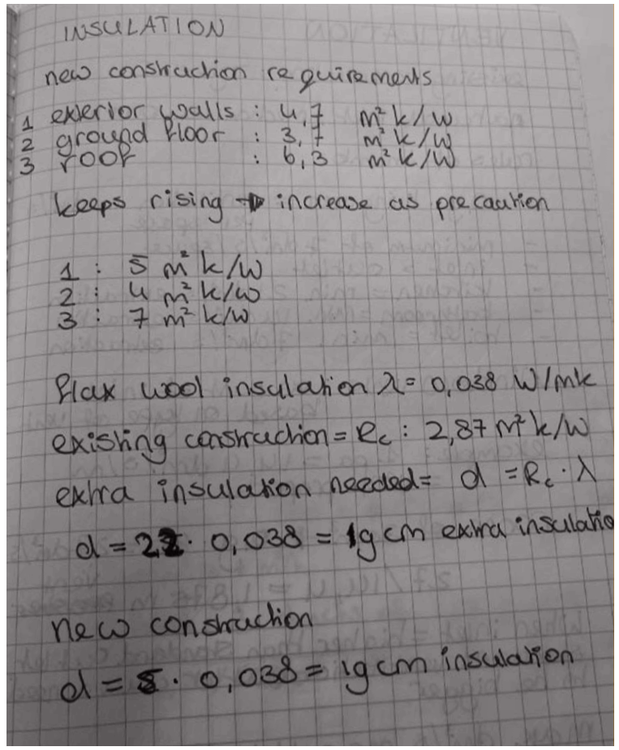




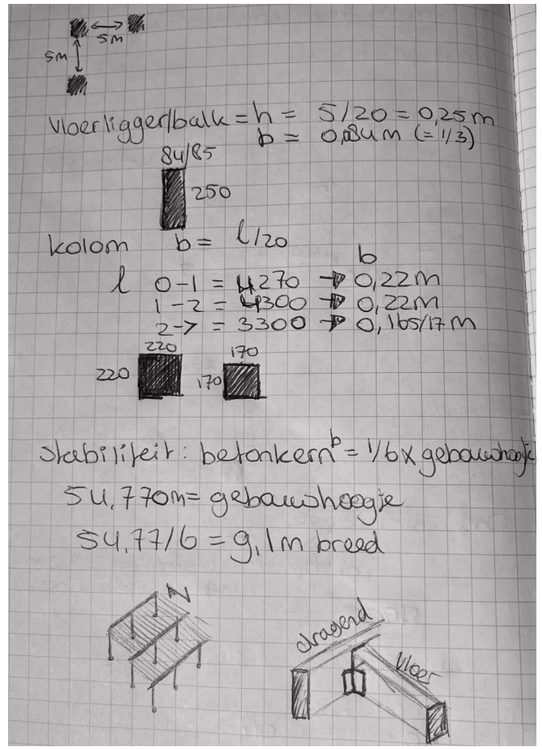
ventilation type C calculations



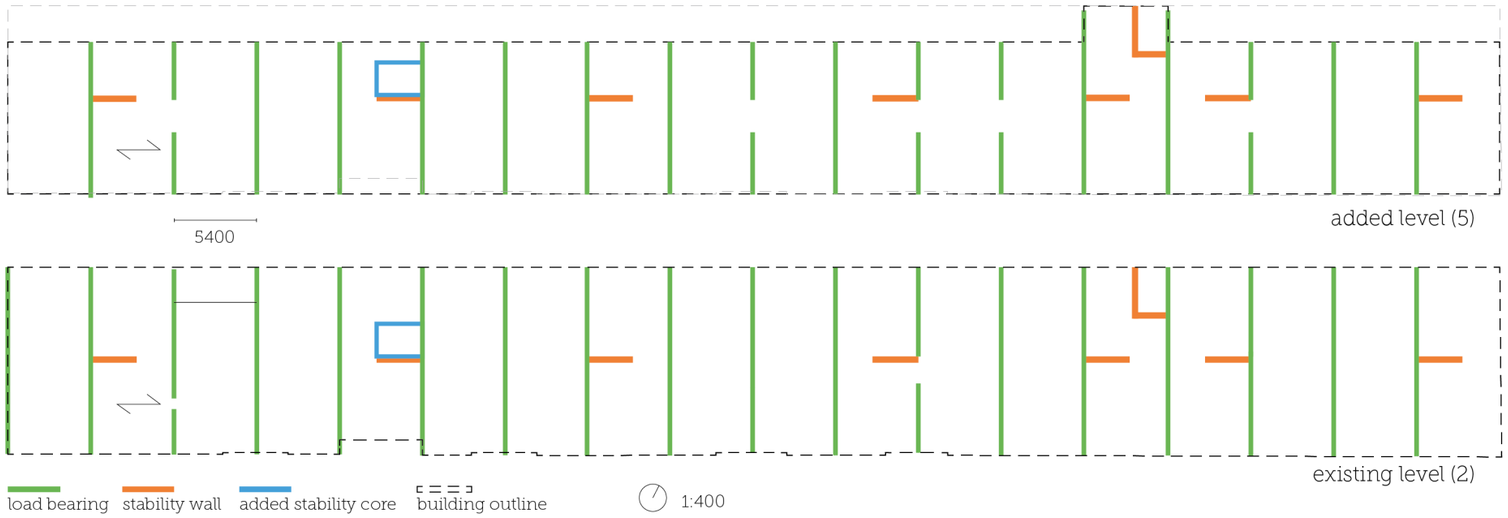
ventilation type D calculations



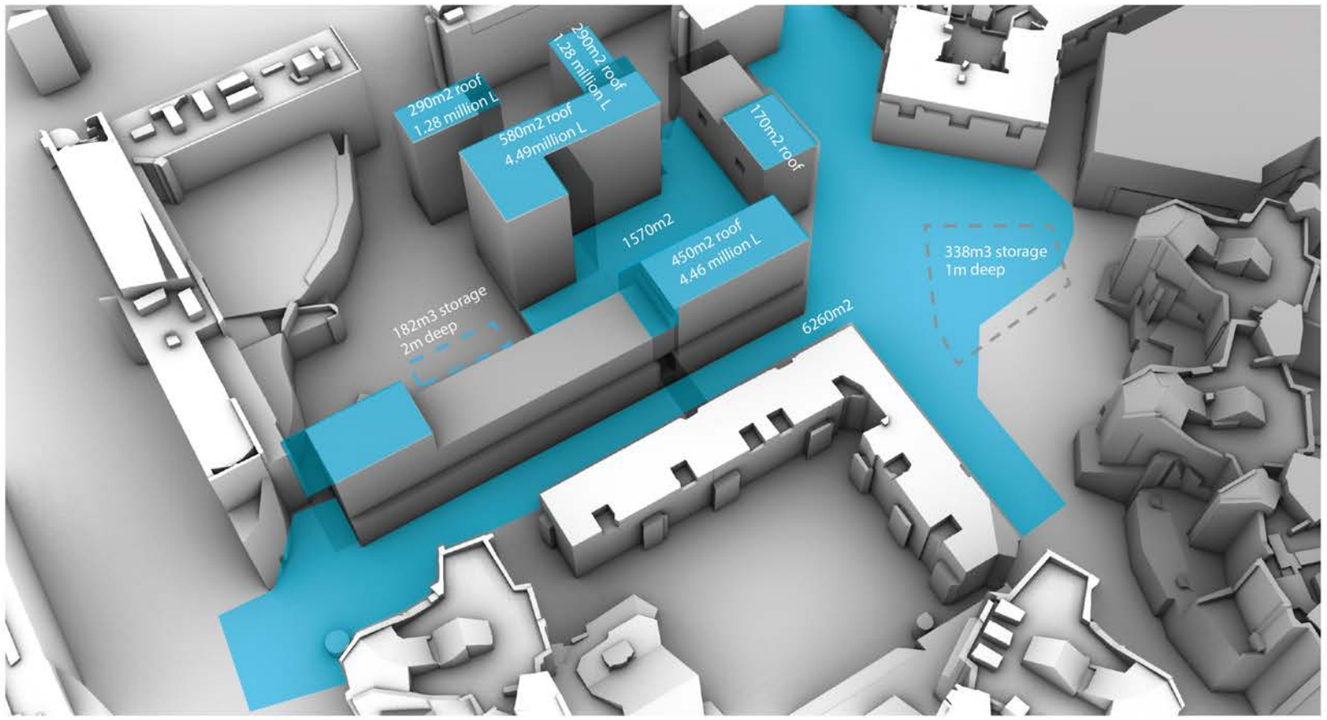
insulation calculations



timber frame construction dimensions



load bearing construction



liter of drinking water used for toilet flushing and washing clothes per year per building

11.5 million L/year
appr. 260 dwellings

water saving toilet: 3 to 6 liters of water per flush = reducing total daily water use from 45.6 L to 33.9 L. Total water use with water saving toilet = 8.56 million L/year = amount of rainwater necessary = 8562m3 = 713.5m3/month

rain per month in Amsterdam: approx. 75 mm --> 9513m2 of collection surface necessary

roof and deck surface housing cluster 2 = 3350m2

surface Bijlmerplein + shopping street = approx. 6260m2

creating a water collection facility at the square, combined with roof collection would be sufficient for toilet flushing up to a maximum of 690 residents living 365 days for 24 hours at home.

average yearly water collection 6844m3
toilet flushing 5304m3 | farm 1184m3

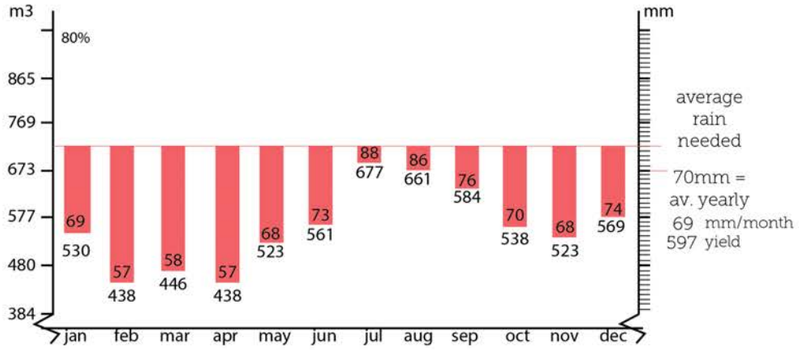
9610m2 collection surface
yield = 80%

I. toilet flushing + washing:
714 m3 water/month: deficit = 2080 m3/year

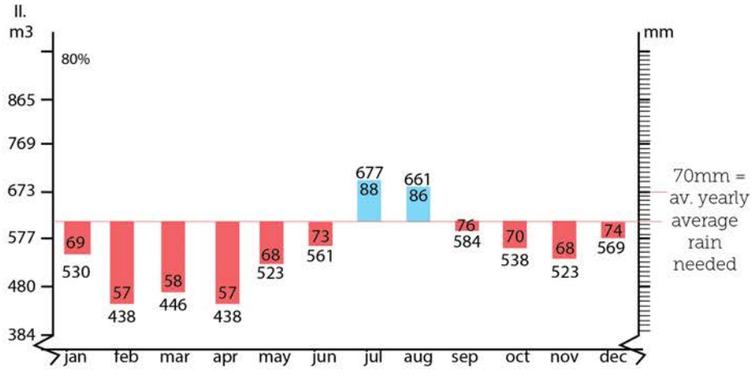
II. toilet flushing + washing (not in exist.):
608 m3 water/month: deficit = 808m3/year

III. toilet flushing + vertical farming:
toilet: 442 m3 water/month: surplus =1184 m3/year
vertical farming: how much water is needed to water an urban farm? 5-7L water/m2/day (farmersweekly.co.za) --> 460-645m2

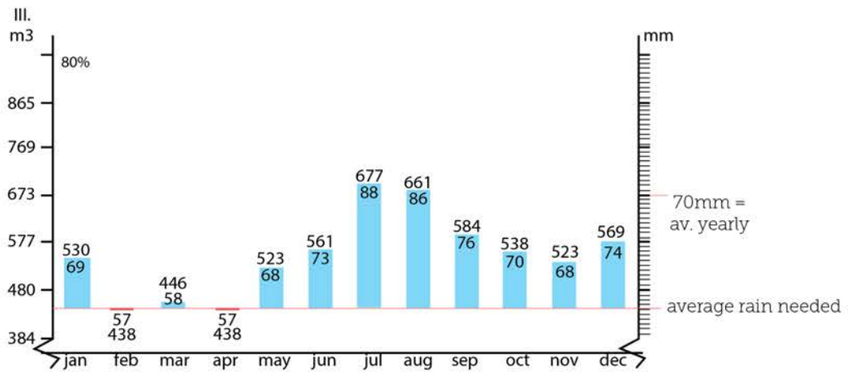
I.



II.



III.



Appendix

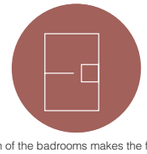
Indoor comfort
identity x sociality

Bijlmerplein

- Daylight


Open plan construction


Open plan on the 1st floor creates design possibilities


Position of the badrooms makes the floorplan inflexible

Material and waste
Attributes

Bijlmerplein

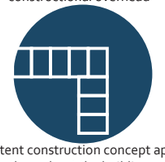
- Much embodied energy
- Much concrete
- Plastic window frames

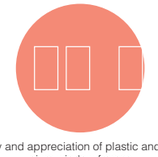

Simple and flexible loadbearing structure


Topping up (especially in wood)


Strong foundation with a lot of constructional overhead


High quality masonry and facade composition


Consistent construction concept applied throughout the building


Quality and appreciation of plastic and aluminium window frames

Energy effiency
Attributes

Bijlmerplein

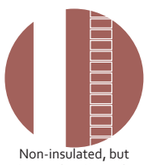
- Energy label C


Wall fill-in strategy is almost BENG compliant

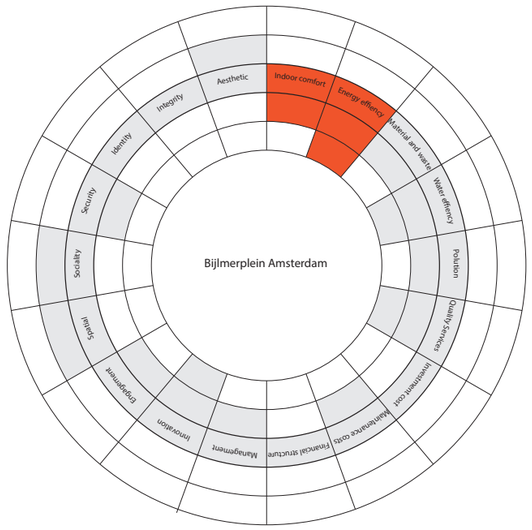

Building on exisiting collective heating


Only air-conditioning and heating


Low insulation values


Non-insulated, but structurally functional facade

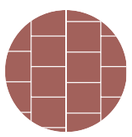

Even filling the remaining cavity results in non BENG-compliant facades



Water efficiency
Attributes

Bijlmerplein

- Stony environment

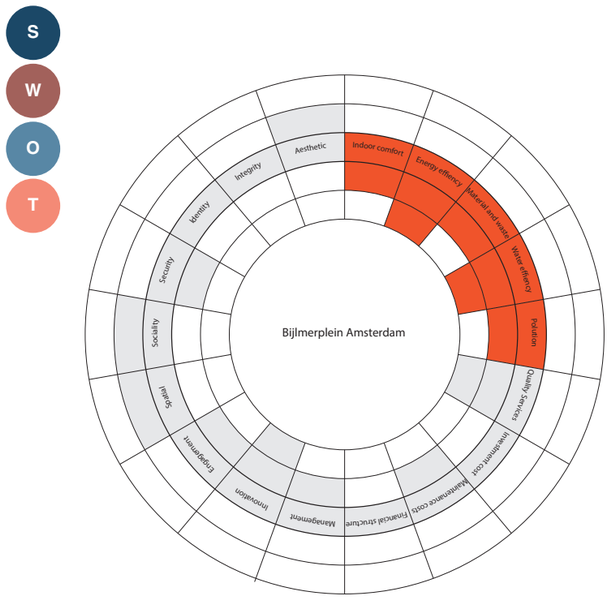

Stony environment: non-climate adaptive


A lot of unusable space in the interior square of the building

Pollution
Attributes

Bijlmerplein

- Light
- Sound
- Smell



Slow traffic area:
car free

Cars have a relatively small place in the whole neighbourhood

Investment cost
Attributes

Bijlmerplein

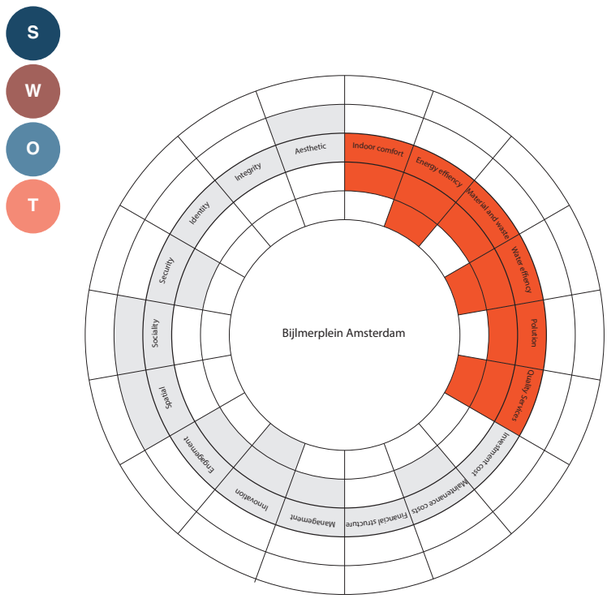
- Expensive, high quality, brick
- Decks

Costly facade renovation

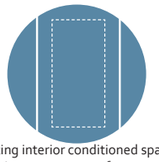
Quality of services
Attributes

Bijlmerplein

- Outdated
- Individual control

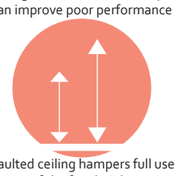


Building on exisiting collective heating



Creating interior conditioned space can improve poor performance

Only air-conditioning and heating

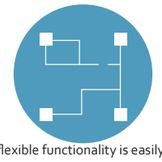


Vaulted ceiling hampers full use of the free height

Maintenance costs
Attributes

Bijlmerplein

- Decks require a lot of maintenance
- Low maintenance materials



New or flexible functionality is easily added

Deteriorated decks

Decreasing quality of the decks, due to little use

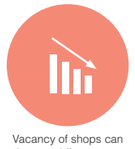
Quality and appreciation of plastic and aluminium window frames

Financial structure
Attributes

Bijlmerplein

- 100% social rent

Owner-occupied housing can increase resident engagement

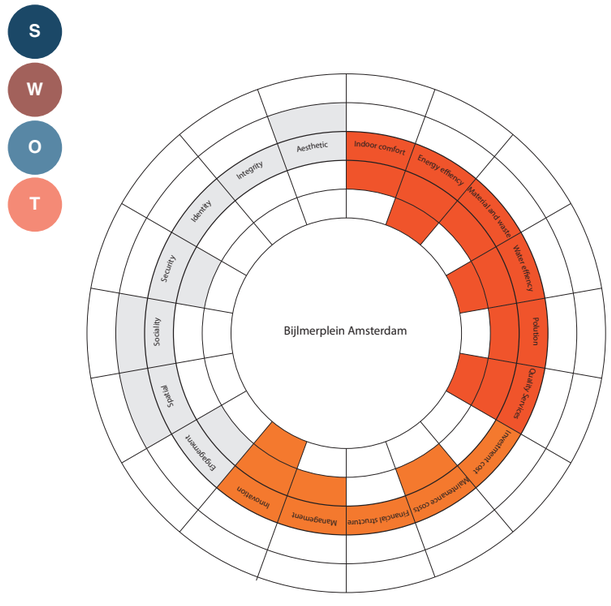


Vacancy of shops can decay public space due to consumer focused functions

Innovation
Attributes

Bijlmerplein

- Historic innovations
- Mixed funtions

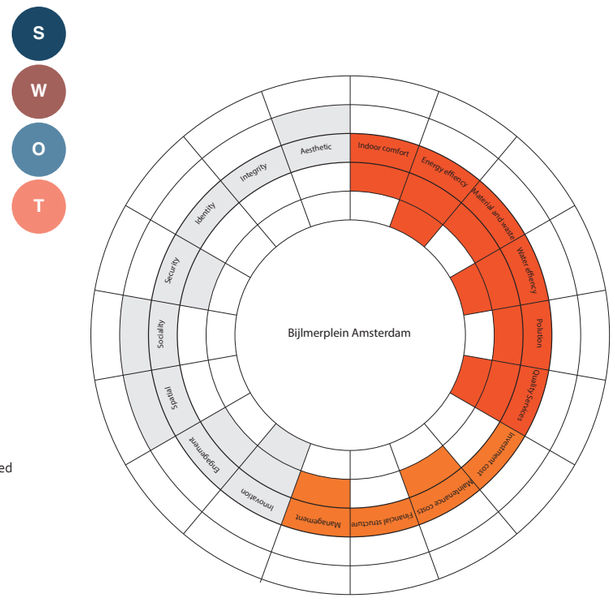


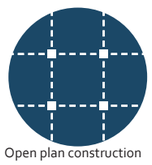
- human scale
- recognizability
- closed building blocks
- plasticity
- brick
- articulated corners & entrances

Recognizable post-modern architecture: Amsterdam school style

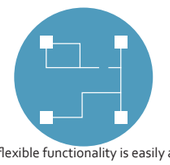
Flexibility and management
Attributes

Bijlmerplein





Open plan construction



New or flexible functionality is easily added

A lot of unusable space in the interior square of the building

Vacancy of shops can decay public space due to consumer focused functions

Engagement
Attributes

Bijlmerplein

Function Bijlmerplein as a meetingpoint in the area

Unwanted strangers on deck due to accessibility day & night

Potential of social interaction at decks

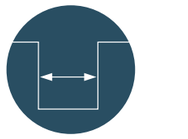
Rising amount of crime delicts repels users

Spatial
Attributes

Bijlmerplein

- Open floor plan
- Acces to outdoor spaces
- Decks vs shopping street
- Different appartment types

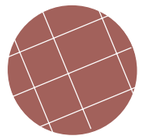
S
W
O
T



Dimensions of the public streets and squares

Differsity in appartment types

Coherence of buildings



No strong physical connection to the rest of the Bijlmer

Security
Attributes

Bijlmerplein

- Car free
- No eyes on the decks
- Dark and hidden stairs to decks
- Little social control

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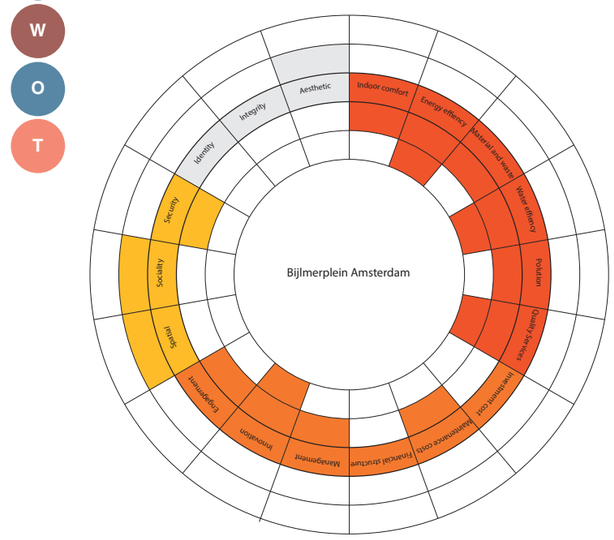


Slow traffic area: car free

Entrances and decks dark, publicly accessible and unsafe at night

Unwanted strangers on deck due to accessibility day & night

Sociallity
Attributes

Bijlmerplein

- Appartments are directed to the street
- Attractive views
- Mixed funtions
- Not child friendly
- No opportunity for acco-modation on decks
- Ownership decks in unclear

S
W
O
T

Potential of social interaction at decks

Social functions to increase social interaction

Loneliness by social exclusion: no feeling of belonging

Fences and separators on decks: anti-social environment

Identity
Attributes

Bijlmerplein

- Cultural diversity
- Anti-Bijlmer
- Urban
- Food
- Mixed funtions
- Unsafe

S
W
O
T

Anti-Bijlmer - political gesture becomes identiy

Lively identity of public space: functions & people

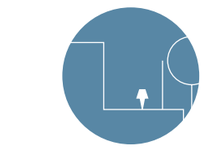
Function Bijlmerplein as a meetingpoint in the area

Integrity
Attributes

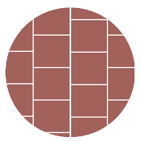
Bijlmerplein

- Not accessible for wheel-chairs
- Good accessibility by public transport
- No ecological ambitions

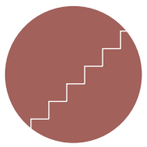
S
W
O
T



Courtyards and decks offer potential for increasing biodiversity



Stony environment: non-climate adaptive



Many appartments only accessible with stairs

Lack of accessibility of decks

Kamari model
Complete

Bijlmerplein