# Standing Strong Together

Designing a community orientated dementia residential care neighbourhood

**MSc Research booklet**

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# ABSTRACT

Loneliness and social isolation amongst elderly is becoming an oppressing problem and could even cause dementia over time. A worrying omen, especially when the growing dementia figures in the Netherlands are taken into consideration. A problem which is even more opressing due to the current- and future shortage of financial funding, healthcare staff, and housing. A relatively new typology which tries to create a partial solution for this problem is the Dementia Village; where healthcare, social functions, and nature are combined with a community based living on a larger urban scale than usual. However, this typology only focuses on patients with advanced dementia and thus only covers a small part of the main problem. Could some of its features be implemented within the current and future built environment, in order to also provide suitable residential care for patients with early stage dementia? Could a neighbourhood be realized where inhabitants form a tight community together, and by that tackling the problem of loneliness and social isolation amongst this patient- and age group? The main question of this research is defined in the following manner: **How can the Dementia Village architecture provide residential care for early stage dementia patients and elderly on a larger community orientated neighbourhood scale?** By the use of literature reviews, case studies of current Dementia Village's, interviews with architects, urban planners, and healthcare staff, observations of dementia patients and the current healthcare environment, and location research an answer will be provided to this main question. Eventually this will lead to the definition of design guidelines for the implementation of features of the current Dementia Village typology, location and its architectural elements within the built environment.

**Key words**
dementia, dementia village, community, loneliness, neighbourhood, architecture

# CONTENT

# BACKGROUND

Research by the Dutch Ministry of Health, Wellbeing, and Sports concludes that 44,6% of the elderly by the age of 65+ within the Netherlands indicate feelings of loneliness, while 9,2 % experience very strong feelings of loneliness. These numbers grow even further to 65,9% and 14,3% amongst elderly by the age of 85+ (Ministerie van Volksgezondheid Welzijn en Sport, 2020). Alongside, does population research show that people with many social contacts are at a lower risk of dementia, while people who describe themselves as lonely are more likely to develop dementia later on (Alzheimer Nederland, n.d.). With the increasing percentages of lonely feelings amongst elderly and the increased chance of developing dementia, a conflicting problem arises.

One of the new typologies which tries to provide a partial solution to this problem is the Dementia Village, where healthcare can be combined with a community like environment on a larger scale than usual. It provides very vulnerable patients with advanced dementia a way to improve wellbeing in a more playful and varied way of living. By dividing the single nursing home in multiple dwelling blocks, in combination with some social functions and nature, a safe secluded living environment can be created where the needed care can be provided (Figure 1). However, features from such an environment could also be beneficial for a wider group of users in multiple different ways. For example people who suffer from early stage dementia, which is an usually forgotten and neglected age- and patient group currently. A group that is often physically and/or mentally too well for a nursing home, but on the other hand not well enough to keep on living in their own homes without receiving additional care. Due to the current shortage in suitable housing, this group repeatedly has to live often alone in their own homes for a longer duration; further increasing social isolation and loneliness amongst this age- and patient group. Further mentioned by Van Gaalen: clinical geriatricians are especially concerned about elderly people with dementia. Due to staff shortages in home- and elderly care and persistent crowds at general practitioners, they often remain out of sight and by that causing overloaded situations for informal caregivers (Van Gaalen, 2022). However, it is a given fact that patients with dementia will have to remain living in their home environments in an increasing manner. How can the current and newly built environment be altered and modified to provide the right living environment for these patients and by that improving their overall wellbeing?

Next to that, is it also very important to promote and accommodate the prevention of dementia within the living environment. By providing ways to prevent dementia an even more oppressing situation over time could be foreclosed. How can the living environment play a vital role in that matter and what social functions should be added within the neighbourhood? In what ways could the community sense be strengthen, not only within the neighbourhood itself but also within its connections with the surrounding urban areas. Could the addition of different age- and patient groups create a divers and tight community, which could improve overall wellbeing and activate a sense of togetherness? Conclusively and most importantly what architectural features have to be implemented to provide and activate the previously stated circumstances?


**Figure 1:** Top view of the Alzheimer's Village in Dax, France designed by NORD Architects. NORD Architects. (n.d.). Alzheimers Village / NORD Architects [Image]. ArchDaily. Retreived on October 10, 2022, from https://www.archdaily.com/973948/alzheimers-villa-nord-architects

# PROBLEM STATEMENT

Due to the increasing rate of people being diagnosed with dementia within the Netherlands and the decrease in financial funding and medical staff, a prominent problem arises for the future. This is also described by the Dutch Ministry of Health, Well-being, and Sport who currently estimate the amount of residents within the Netherlands with dementia, based on population screening, to be around 290.000. The expectation for the future, as a direct result of the ageing population, is that this number will rise to 500.000 in 2040 and 620.000 in 2050 (Ministerie van Volksgezondheid, Welzijn en Sport, n.d.). Furthermore, is there already a shortage in available and suitable dwellings showing; from the 290.000 current people with dementia within the Netherlands, only 80.000 are able to live in nursing- or care homes (Alzheimer Nederland, 2021). This will be even further increased due to the Dutch governmental future policies regarding this topic. Which is aimed at ensuring that people with dementia continue to live in their own living environment, instead of moving to distinct healthcare facilities. Even though that the general idea, where people with dementia can remain living in their familiar home environment, is an ideal and beautiful situation. Will this create an even more oppressive and exhausting situation over time, in particular on informal caregivers who have to carry this burden as of now. It is important to find ways to ease this pressure, and by doing so ensuring that people with dementia can continue on living in their home environment for the rest of their lives. By doing so, could it also prevent potential difficult future situations when people with dementia unintentionally and out of necessity have to move to a care facility. By not leaving their familiar living surroundings, further feelings of fear, stress and loneliness could be prevented.

One of the typologies that was created to tackle part of this problem, as previously mentioned, is the Dementia Village. However, this typology only focusses on a small percentage of patients who suffer from more advanced dementia, which makes it a very expensive solution for only a minor part of the main problem. Even more so when the dire lack of financial funding and healthcare staff is taken into consideration. Already making it an outdated and unrealistic approach for the future; quite a painful realization considering it is just a decade ago after the typology was first constructed. But even though that the typology on itself is unrealistic for the future, are certain features within its design still very valuable. This begs the question if distinct features from the typology could be implemented within the built environment for it to be more future proof, and by that also provide residential care for the majority of people with dementia.

By doing so, could it provide a community like environment for the majority of the previously stated main problem; in accommodating those who only have starting symptoms of dementia. Besides, is it also important for the future additions of the Dementia Village architecture to show due diligence in order to strengthen its future feasibility. This can even be combined with the addition of social functions, which also strengthen the sense of community and the connections with the surrounding areas. Next to that, should it aim to find ways to increase feasibility within the lack of healthcare staff. Would the willingness to help fellow residents provide a partial solution to reduce the demand for care and the workload for formal- and informal caregivers? Could this even be further reduced in combination with new technological developments and architectural features?



# RESEARCH GOALS

This research aims to provide design guidelines for the implementation of features of the current Dementia Village typology, location and architectural elements. Focussing on not only a valuable way of living for current dementia patients and the premeditated future increase, but also actively implementing architectural ways to further prevent dementia within the built environment. Creating a neighbourhood where patients who suffer from all stages of dementia can live for the rest of their lives, without the fear of having to leave their familiar surroundings in the case of decreasing medical conditions. Furthermore, by the addition of multiple age groups it aims to create a diverse and tight community which could improve overall wellbeing and activate a sense of togetherness. Providing ways to decrease loneliness and social isolation amongst this age- and patient group, alongside ways where architecture could facilitate a reduce in demand for care and the overall workload on formal- and informal caregivers. The focus will not only be on the community and neighbourhood itself, but also on ways to connect with the surroundings and the overall successful implementation within the existing urban landscape.

It is important to note that architecture on itself is not capable of creating solutions to all current healthcare problems. It can however enable and facilitate a faster transition to an improved situation, thus will that be the main aim of this research. Furthermore, will the research only focus on Dutch patients and the current healthcare situation in the Netherlands to narrow down the input and possibilities. Due to this fact, case studies from within the Netherlands, or from close by neighbouring countries, will be utilized. By doing so cultural differences and different approaches considering residential care and healthcare will be limited, creating a more specific and fitting theoretical framework for the further design.

# RESEARCH QUESTIONS

The main question that will take a central role within this thesis will be the following:

**How can the Dementia Village living environment provide residential care for early stage dementia patients on a larger community orientated neighbourhood scale?**

In order to come to a conclusive answer to this main question, the research must be divided in multiple sub questions to cover this broad topic. These sub questions have been defined in the following manner:

1. What living environment features and conditions are of importance when designing for dementia patients?

2. How can the architectural design and built environment stimulate a community orientated living environment for early stage dementia patients and elderly?

3. What can we learn from the current Dementia Village design?

# DEFINITIONS

**Community:**
"*A community is a group of people who share something in common. You can define a community by the shared attributes of the people in it and/or by the strength of the connections among them. (...) people who are alike in some way, who feel some sense of belonging or interpersonal connection*" (Simon, 2018, par. 3).

**Dementia:**
"*Dementia is an umbrella term for loss of memory and other thinking abilities severe enough to interfere with daily life. (…) Disorders grouped under the general term "dementia" are caused by abnormal brain changes. These changes trigger a decline in thinking skills, also known as cognitive abilities, severe enough to impair daily life and independent function. They also affect behavior, feelings and relationships*" (Alzheimer's Association, n.d., par. 2).

**Dementia Village:**
"*Dementia villages are long-term care homes that resemble villages and are designed for people with advanced dementia*" (Wallington, n.d.). Often a combination of residential and commercial buildings, along with other social functions in a predominantly green living environment, which tries to "*emphasize improving quality of life for people with dementia by providing person-centred care in smaller scale, less institutional, more "home-like" environments*" (Harris et al., 2019, p.4).

**Formal caregivers & informal caregivers:**
Formal care "*refers to paid care services provided by a healthcare institution or individual for a person in need. Informal care refers to unpaid care provided by family, close relatives, friends, and neighbors. Both forms of caregiving involve a spectrum of tasks, but informal caregivers seldom receive enough training for these tasks*" (Li & Song, 2019, p.1).

**Living environment**
*"The living environment is (...) an assembly of the natural and built environment which is offered to the inhabitants of the place who perform various kinds of social, cultural, religious, economic, and political activities which induce peculiarities in the character of the living environment*" (Tiwari et al., 2015, p. 153).

**Neighbourhood:**
Part of a municipality that is homogeneously demarcated on the basis of historical or urban features (CBS Statline, 2022). A neighbourhood is "*a collection of dwelling units located close together, having a common interest in the character of the surrounding areas. (...) a small-scale community where people know each other, share many of their activities, and provided a sense of belonging*" (Wangchuk, 2022, par. 4).



# USED LITERATURE

There have already been an extensive research of the ways in which architecture can improve wellbeing of people with dementia (e.g., Hou et al., 2019; Kleibusch, 2018; Marquardt, 2014; McAdam & Williams, 2017; Niedderer et al., 2019; van Buuren & Mohammadi, 2022). The majority of the research focusses, for instance, on topics like; wayfinding, lighting, the implementation of social activities, views on nature, use of colours and materials, creating , etc. This is a relative new field of research which gained momentum in the last decades; predominantly by the switch from institutionalized care to a more person-centered care approach. The impact and importance of architecture and the built environment on the overall wellbeing of dementia patients is rightfully becoming even more relevant. However, within this extensive research on this topic is the vast majority of it fixated around its implementation within care facilities. Creating a dire lack of knowledge and research on its impact and successful implementation, of its design features, within a home like environment. A critical translation is requested of the existing knowledge and research, in order to find what design guidelines are also applicable within a smaller scale and environment than intended.

Furthermore, have there already been wide-ranging research about loneliness and social isolation amongst people with dementia. In particular on the importance of the built environment and community (Kuliga, 2021; Lievens et al., 2019) and ways to improve age-friendly cities/neighbourhoods (Di Bona et al., 2019). In addition, is there already some research present about the Dementia Village architecture in general (Høj, 2019; Mitchell et al., 2004; Niedderer et al., 2019). Most of the research is often combined with a central case study, for example the 'Hogeweyk' (e.g., Chrysikou et al., 2018; Anderzhon et al., 2012). Providing valuable ways of knowledge about how the typology currently functions and which flaws are already present. (Figure 3)

However, despite all the current research is there an prominent research gap showing. Possibilities on how the current Dementia Village architecture could be implemented within the existing and newly built environment is a research field that yet still has to be explored. This should create more possibilities in order to provide ways for dementia patients to remain living in their familiar home surroundings, a problem which is becoming even more relevant and problematic in the upcoming years. (Figure 4)

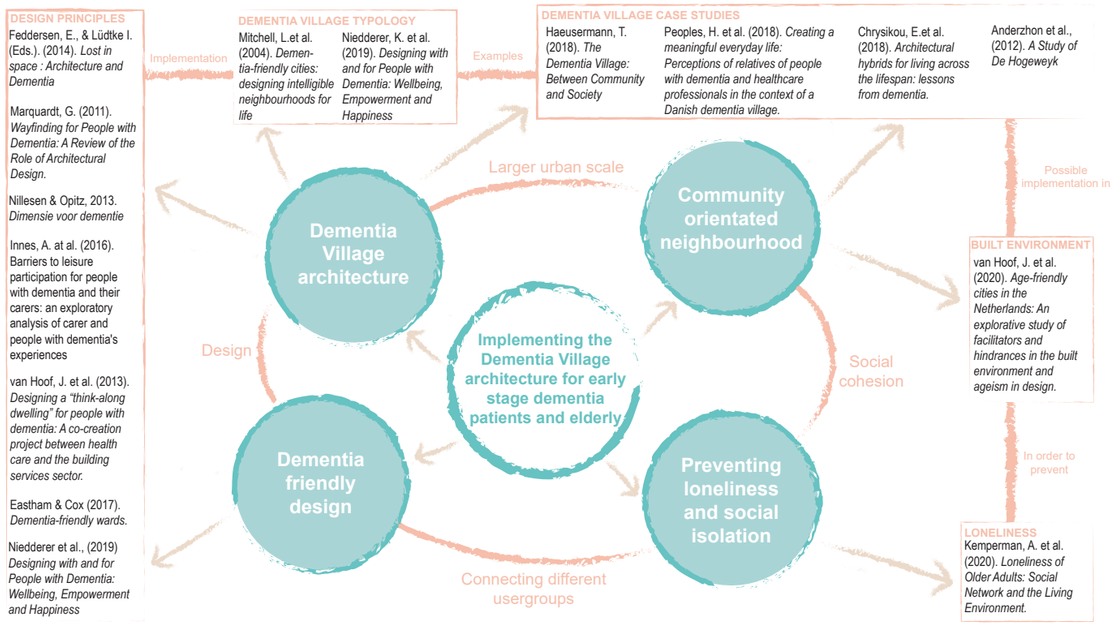


**Figure 2:** Overall scheme for the available literature and the link between central research topics (illustration by author)

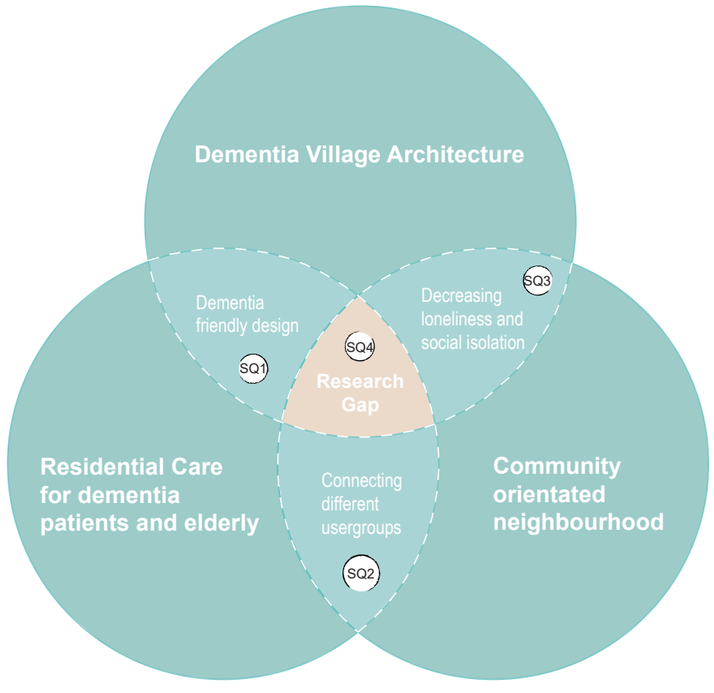


**Figure 3:** Definition of the research gap between excisting research fields and the position of the sub questions (illustration by author).



# RESEARCH METHODS

This research will be subdivided in two consecutive central research topics. The first part of the research, will focus on the two most important features within the dementia village living environment: dementia-friendly design and community. In the second part of the research, the attention will be shifted towards how these features are implemented within dementia village architecture itself. The first sub question will focus on the architectural features that are of importance within the design for dementia patients. The use of literature reviews will take a central role in order to provide conclusive answers to this topic and a valuable insight into the current expertise. 'Healing architecture' and 'evidence based design' will be utilized as a central theme by focusing on multiple design principles like: wayfinding, use of colours, daylight, views on nature, ambiance, maintaining autonomy, etc. In order to provide a more practical view on this theoretical approach, will observations during the fieldtrip at Habion and the Reigershoeve be utilized. Do these correspond with the information provided within the literature or could this give a critical approach of what could be improved in further designs?

The second sub question will pay close attention on how the social inclusion could be achieved within the spatial design, for people with early stage dementia on a larger community orientated living environment scale. Using literature reviews to further scope in on the desired target groups for this community and how the built environment could facilitate a way to improve the social engagement of people with dementia. Alongside, could observations of the residents during the fieldwork provide valuable point of interest on what could be improved. Conclusively, to get a better grip on this subject and the further needs, will interviews with (in)formal caregivers be utilized to obtain desirable possibilities and improvements of the typology itself.

In the second part, the focus will shift to the Dementia Village typology and its location in the urban landscape, in specific by focussing on its current successful features and flaws. Once again, will the research first be focused on literature review about the typology itself. In order to provide a deeper insight alongside these theoretical backgrounds, architects and urban planners from Dementia Village's will be interviewed. Specifically about the design process and to further analyse what features are of most importance, alongside valuable lessons that are still there to learn. This knowledge will then be tested during the research of multiple case studies of Dementia Village's within the Netherlands and neighbouring countries. This should create a broader image of the current existing typology by noticing similarities and important differences. These case studies will be the same as the previous mentioned examples within the literature to create a strong connection with the provided literature. Observations during the fieldwork could also provide valuable insights or approaches for this chapter.

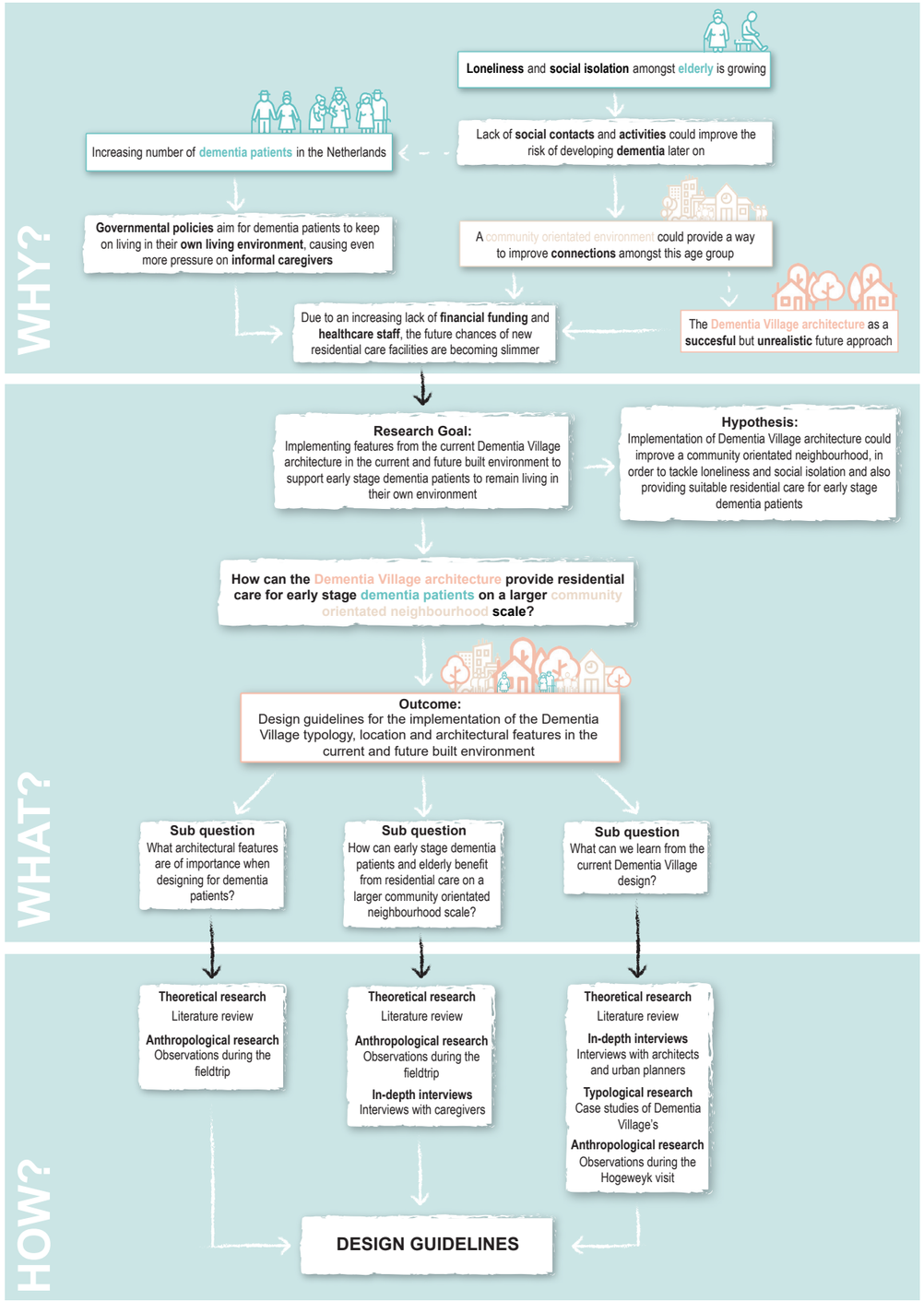


**Figure 4:** Complete research diagram (illustration by author).



# Dementia-friendly neighbourhood

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The role that architecture can play within the overall wellbeing of people with dementia, has increased and gained significant traction within architectural research. Most predominant is this based around the theme of 'healing architecture', which "addresses the principles underlying the conception and design of architectural spaces, how these spaces are perceived, and above all, how architectural spaces impact an individual's recovery from illness" (Nickl-Weller & Nickl, 2013, p. 330). While people with dementia unfortunately are not able to recover from illness, does this however provide a crucial shift in the mindset when dealing with that given fact. Rather than only focussing on the limitations of the illness; should the focus be on improving wellbeing with a the things that are still possible in a more personal approach. Healing architecture itself is established within the field of Evidence-Based Design, which is designing on the basis of scientific knowledge, with a main focus on the relationship between the wellbeing of patients and the spatial conditions of the design (Herweijer-van Gelder, n.d.). Within healing architecture numerous design aspects have been associated with improved health results, including small scale living, ambiance, natural lighting, wayfinding, views to nature, and autonomy over the immediate environment (Simonsen et al., 2022). Showing multiple ways on how the physical environment can help people with dementia in improving and preserving their wellbeing, behaviour, independence, and functionality (Marquardt, 2014).

The gradual implementation of these healing architecture design features within healthcare environments, have also resulted in downsizing and the deinstitutionalization of healthcare institutions (Høj, 2019). This shift in culture was also noticeable in the care for people with dementia, which resulted in a more person-centred approach instead of the previously used medical-centred model. Within this person-centred approach, "the focus is less on the treatment of the illness, and more on the person; their life stories, habits, values, needs and preferences" (Høj, 2019, p.124). This also reflects on the architectural design of dementia care facilities, which had an increasing focus on the role and impact of the physical surroundings on the wellbeing of people with dementia (Høj, 2019). Alongside, did the deinstitutionalization also lead to new residential care typologies with a closer relationship between residents and the community (Høj, 2019).

To get a better understanding of these dementia-friendly architectural design features and its impact, will the following sub question take a central role within this chapter: **What architectural features are of importance when designing for dementia patients?** In order to acquire a systematic overview, will these architectural features be subdivided within the previously mentioned design aspects within healing architecture by Simonsen et al. (2022). These will be: wayfinding, ambiance and familiarity, natural lighting and views on nature, and autonomy within the immediate environment. Alongside, will there be a subdivision within the provided design guidelines depended on scale in which they are applicable. In order to make those relatable to dementia village architecture, will that be within building- and neighbourhood scale.



## 2.1 Wayfinding

The ability to navigate within familiar and unfamiliar environments decreases over time for everyone within the process of getting older. As a direct result, increased feelings of anxiety and an overall fear related to everyday mobility are initiated (Kleibusch, 2018). For people that suffer from dementia this becomes an even more prominent- and constricting problem overtime; mostly due to significant deteriorations within the working memory. This decline causes an increasing rate of spatial disorientation, in essence the misunderstanding of the direct environment, and also decreases the ability to create detailed cognitive maps of the surroundings (Kleibusch, 2018). Due to this fact will people who suffer from dementia slowly lose grip on their surroundings, their familiarities within the environment and the way that they interpretate this. This could cause them to simply wander around with an often earlier forgotten purpose, which is generally perceived as one of the negative associations with dementia. This behaviour can be strengthened by the current living environments, which initially were not designed to support this in a correct manner and often could even further aggravate the chance of wandering around.

However, instead of approaching it as something negative can it also be seen as a simple given fact. In that given situation, should a safe living environment be created which could support wandering around without provoking stress or anxiety amongst dementia patients and/or their relatives. Within an architectural design, one way to solve this is by the right implementation of wayfinding features that can "positively impact an individual's ability to create detailed cognitive maps of their environment, regardless of cognitive ability" (Kleibusch, 2018, p. 38). The term 'wayfinding' can be defined as a "dynamic interaction between the spatial environment and its occupant" (van Buuren & Mohammadi, 2022, p. 151). In other words, providing the right circumstances to help the need of people to have a clear understanding of their position in their direct environment and the position of their destination (van Buuren & Mohammadi, 2022). In order to achieve this desired stimulation of wayfinding, a central role is required for both the indoor- and outdoor space within the direct surroundings of people with dementia.

### 2.1.1 Indoor wayfinding

Van Buuren & Mohammadi (2022) and Kleibusch (2018) both conducted research on the role of wayfinding for people with dementia within assisted-living healthcare facilities. While Kleibusch (2018) mainly focussed on combining existing theories and design features from previous researches, did Van Buuren & Mohammadi (2022) combine research with the use of case studies to critically review these wayfinding features. By combining both researches, a set of design guide lines to improve indoor wayfinding can be defined.

First, is it important to create visual access between different spaces within the house, for example between the entrance hall and the living room, the living room and the corridor, and between the door of the sanitary room from the bed in the individual room. Alongside, should the indoor routing be short with no change in direction and a clear visible ending at the end. These interventions should prevent confusion and reduce the amount of decision moments, which can also be strengthened by a decrease in the amount of doors within the routing and the living room. The living room itself should be located at a noticeable spot within the building in order for it to stand out. Furthermore, can the implementation of personalised elements help a lot, this could be personal collectibles from the past, a photo, and/or the name of the dweller. In conclusion, can the use of a variety of bright and colourful paintings of familiar objects and/or furniture as a landmark be useful to prevent confusion (van Buuren & Mohammadi, 2022; Kleibusch, 2018).

#### 2.1.2 Outdoor wayfinding

The research conducted by Kleibusch (2018), also provided some valuable insights for the improvement of wayfinding within an outdoor environment. Alongside, did McAdam & Williams (2017) conduct research on outdoor wayfinding and the central role that walking paths play in the improvement of this. When both researches are combined, the following set of design guidelines can be defined.

First of all, is it important to have direct visual access to relevant landmarks as use of navigation within the neighbourhood. These landmarks should be diverse, distinctive, and bold to increase its recognizability and strengthen its use as a way of navigation. Furthermore, could the help of visual barriers help in reducing unwanted exiting behaviour, for example by the use of disguised doors and natural wall murals. Next, should available signage within the environment be highly contrasted or colour coded to improve its visibility. The signage should be lowered to not higher than 120-150 centimetre, due to the tendency of people with dementia to look down instead of upwards. On the signs should a combination be visible from both pictorial elements and a simplistic way of naming, the pictures should be old and traditional for increased recognizability. At last, should paths consistently use the same colour and should patterns and dark lines be avoided to reduce confusion. The path edges should have clear texture changes to create recognizability for people with poor visibility, raised edges which could cause tripping should be avoided (Kleibusch, 2018; McAdam & Williams, 2017).

### 2.2 Autonomy within the immediate environment

The feeling of autonomy is important for everyone. Nonetheless, even more so for people with dementia who, due to the gradual progression of the illness, are more at the mercy of their immediate surroundings. Most of the recent research have focused on how this can be accomplished within the indoor environment of healthcare institutions itself. However, this feeling of autonomy already exist when people with dementia stay living within their familiar home environment. This will make the impact of the neighbourhood even more important to also achieve this feeling of autonomy on a bigger scale than the dwelling itself. Mostly to “enable them to stay active, independent, and participating in the community for as long as possible by removing barriers and improving design in the built and social environment” (McAdam & Williams, 2017, p. 3). The role of walking paths is of significant importance for them to remain engaged in everyday life and to ensure the opportunity to arrive at the desired destination; providing this feeling of autonomy.

As previously mentioned, does the research conducted by McAdam & Williams (2017) provide valuable design guidelines for walking paths within the neighbourhood. Which, alongside the previously mentioned wayfinding features, should ensure people with dementia the possibility to travel to the desired destination within the neighbourhood. It is important for these walking paths to “provide opportunity for physical activity, recreation and leisure, and social interaction” (McAdam & Williams, 2017, p. 9). This can be achieved by the use of varying route lengths; shorter walking opportunities should provide people with limited mobility walking opportunities without being discouraged. To further support people with limited mobility, would the implementation of handrails along some more tricky parts of the route be desirable. These routes should also preferably be shaped in a continuous circulation loop, without dead ends and with clear visible destination points. Along these walking loops, should both public washrooms and sheltered and shaded benched be implemented.



These provide opportunities to rest and could also initiate social interaction between residents of the neighbourhood. To conclude, should the walking paths also be wide enough to provide room for two wheelchairs to pass each other (McAdam & Williams, 2017).

### 2.3 Ambiance and familiarity

A home-like atmosphere is desirable for everyone within their own dwelling, in order to feel a sense of belonging and familiarity within the domestic space. For people with dementia this becomes harder overtime, due to problems with the visual perception; which is a reconstruction by the brain of the signals that are received by the eyes. In order to produce an image from this, multiple areas within the visual cortex of the brain share the work with each having a responsibility for a certain element. For people with dementia, the communication between these areas operates under constant and severe stress causing them to misperceive information and objects (McNair, 2014). For example, could a black rug on the floor be perceived as a black hole in the ground due to a lack of cooperation within the visual cortex. Due to this given fact, should the interior be well thought out and defined in order to prevent the misunderstanding of information and objects.

Within the research conducted by Kleibusch (2018), multiple design guidelines are presented in order to assure a better perceiving of the environment and the objects within it. First, should each flooring incorporate warm tones and should it not contain any bold patterns, speckles, or sparkles due to the possibility of disorientation or distraction. Furthermore, should there be clear colour contrasts between flooring, walls, and ceilings. This colour contrast should also be applied on furniture and objects, for example: light coloured entryways, dark doorjambs, lightly coloured laminate, wood, or carpet, and dark coloured furniture. In conclusion, are also the use of warm neural matte paints and surfaces advisable in order to avoid disorientating reflections and glares on the surfaces within the dwelling (Kleibusch, 2018). Similarly is this a consistent, glare free, and even coloured surface transition between inside and outside advised (McAdam & Williams, 2017).

### 2.4 Natural lighting and views on nature

The availability of natural elements within a close proximity, both visually and physically, plays an important role within the wellbeing of people with dementia. “Residents living at green care farms are significantly more active, more often participating in domestic activities and outdoor/nature-related activities, and significantly less often engaged in passive or purposeless activities than the residents of a traditional nursing home” (Ferdous, 2020, p. 954).

This was also clearly noticeable at ‘the Reigershoeve’, an dementia farm based care facility in the Netherlands, during fieldwork. Both permanent residents with dementia, as participants from the dementia day-care, often made use of the easy accessible green environment with a clearly visible sense of enjoyment. Part of this success was the implementation of raised beds for scented greenery, flowers, and herbs which made it approachable rather than just visual. The plants that were utilized were also seasonally dependent, in order to give people with dementia a notion of time. This environment should also be approachable during the night to assist night-time walking, by the help of appropriate pathway lighting (McAdam & Williams, 2017). Also the visual access to this greenery from inside proofed to be a popular feature, where seats near the windows were most often used within the shared living room and bedrooms. Whenever this was more difficult were plants and water features included within the building to bring the outside in.

The role of sufficient lighting, preferably natural, within buildings has also been abbreviated within the conducted research of Kleibusch (2018).

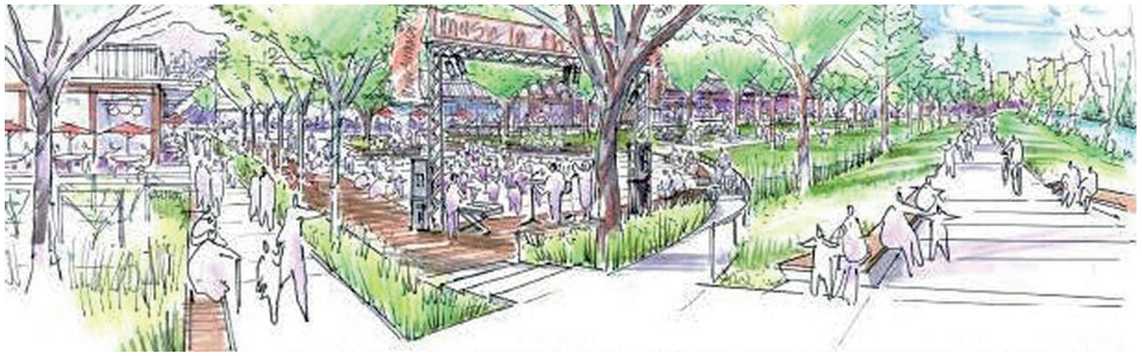


**Figure 7:** Example of an engaging walking paths in a green environment to maintain the feeling of autonomy. Summerland Review. (n.d.). A sketched design for what part of the revitalized downtown core of Oliver might look like [Image]. Summerland Review.. Retreived on April 5, 2023, from https://www.enablingenvironments.com.au/dining.html

**Figure 8:** Example of a home-like atmosphere for people with dementia. Alzheimer's WA. (n.d.). Dining Room - Dementia Enabling Environments [Image]. Alzheimer's WA. Retreived on April 5, 2023, from https://www.enablingenvironments.com.au/dining.html

**Figure 9:** Sketches of the implementations of nature on different scales in Dax Alzheimers Village. NORD Architects. (n.d.). Alzheimers Village NORD Architects [Image]. ArchDaily. Retreived on April 5, 2023, from https://www.archdaily.com/973948/alzheimers-villa-nord-architects



Within this research it is deemed it as one of the most important interior features in order to improve navigation. From this research, it was also encouraged to create inviting sitting environments near the windows for natural lighting exposure. In order to prevent disorientation caused by light reflections, would it be advisable to use glare off laminate flooring (Kleibusch, 2018).

**Summary**

In order to create a dementia friendly environment were certain healing architecture element further researched. These were: wayfinding, ambiance and familiarity, natural lighting and views on nature, and autonomy within the immediate environment. These central themes eventually led to the definition of design guide lines which are portrayed in the upcoming illustrations.

## Indoor wayfinding

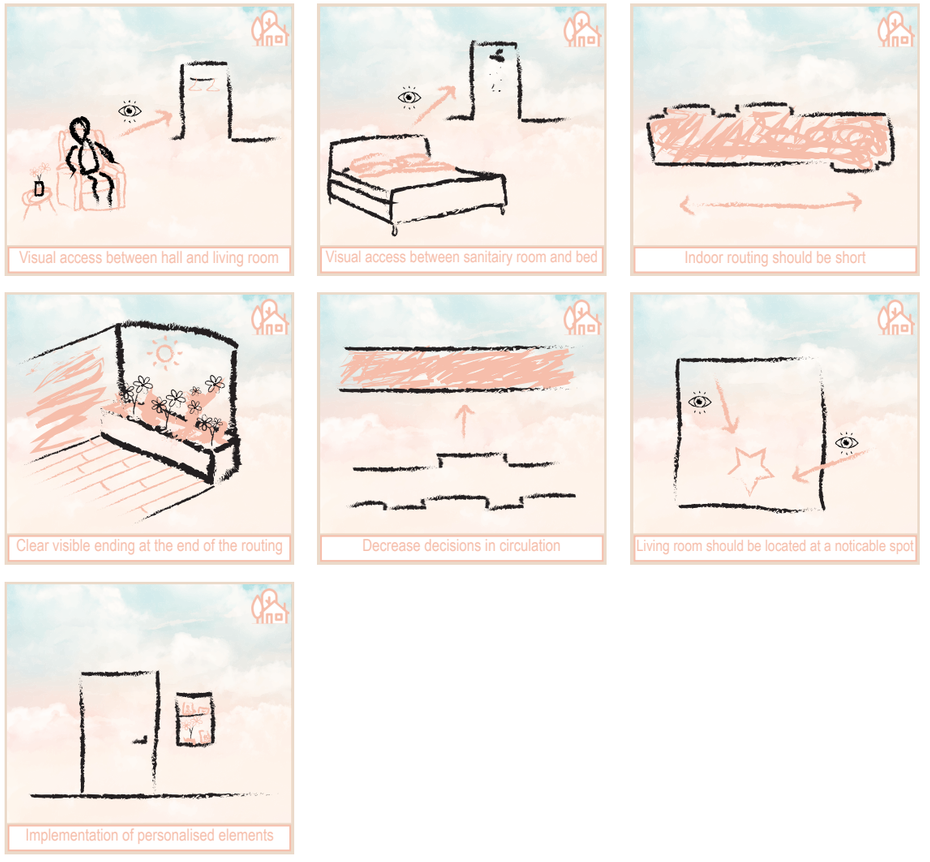
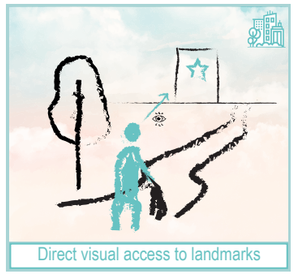
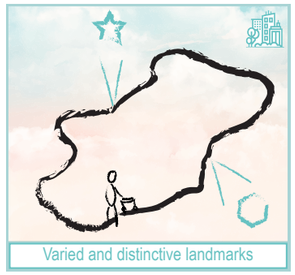
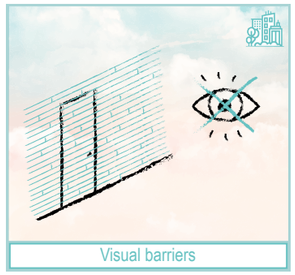



**Figure 10:** Design guidelines indoor wayfinding (illustration by author).

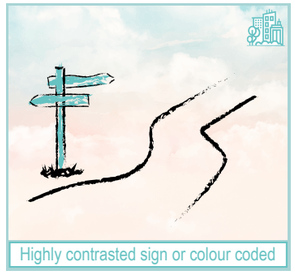
## Outdoor wayfinding

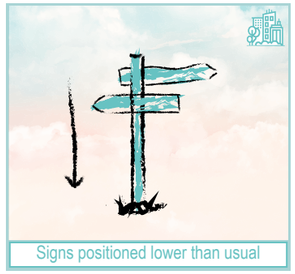

Direct visual access to landmarks


Varied and distinctive landmarks

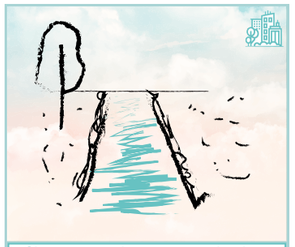

Visual barriers

Combining pictorial elements and text

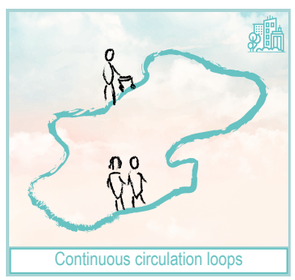

Highly contrasted sign or colour coded

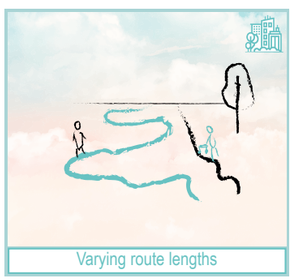

Signs positioned lower than usual


Use of a consistent colour on the paths


Clear texture changes on path edges

## Autonomy within the immediate environment


Continuous circulation loops


Varying route lengths


Public washrooms along the route


Benches along the walking routes


Path wide enough for two wheelchairs

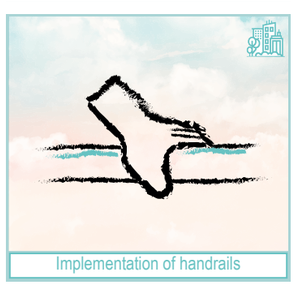
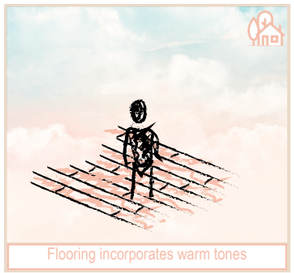
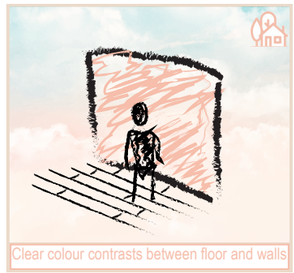

Implementation of handrails

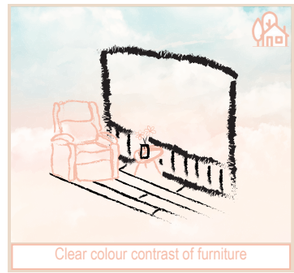
**Figure 11:** Design guidelines outdoor wayfinding and autonomy within the immediate environment (illustration by author).

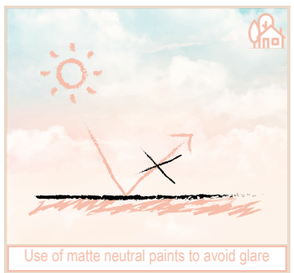


## Ambiance and familiarity

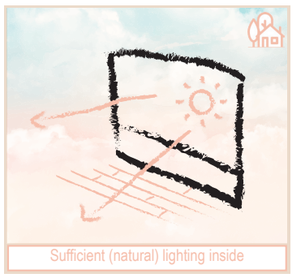

Flooring incorporates warm tones

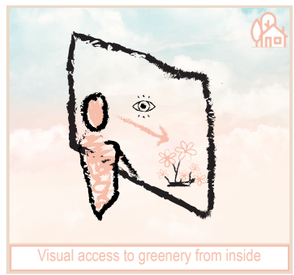

Clear colour contrasts between floor and walls


Clear colour contrast of furniture


Use of matte neutral paints to avoid glare

## Natural lighting and views on nature

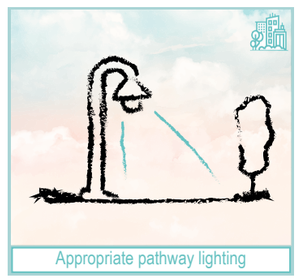

Sufficient (natural) lighting inside

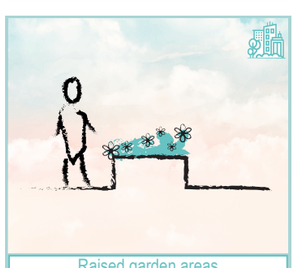

Visual access to greenery from inside


Inviting sitting environments near windows


Greenery features included inside


Use of glare off laminate flooring


Appropriate pathway lighting


Raised garden areas


Seasonally dependent plants

**Figure 12:** Design guidelines ambiance + familiarity and natural lighting + views on nature (illustration by author).

# Architecture as a social catalyst

03

The neighbourhood where we live and grow old in is of significant importance for everyone. It is the environment where we tempt to feel at home and is furthermore a place which has significant impact on our social connections and overall wellbeing. For most of the people this goes outside the boundaries of the neighbourhood as well. However, for people with dementia this will become increasingly harder overtime; making them more bound to the neighbourhood itself. As the illness progresses, they will lose more and more control over their own lives. Daily actions will become even more difficult; making them increasingly dependent on the help of others (Alzheimer Nederland, n.d.-c). Due to this given fact, an environment is needed which can provide a strong sense of togetherness- and mutual belonging to improve overall liveability. Forming the foundations of a close community, willing to help and socialize with each other, that supports people with dementia to remain engaged in everyday life in a purposeful manner.

This engagement plays a crucial role within the experience of people with dementia and their informal caregivers. During the fieldtrip at 'The Reigershoeve', was this also strongly emphasised by both the people with dementia and their formal caregivers. When the participants of the dementia day care were asked by the formal caregivers what they appreciated most in life currently, in relation to their direct environment, was one term mentioned by all the participants: 'the feeling of freedom'. Even though that the term 'freedom' on itself is not really relatable to architecture, can it be translated to the feeling of autonomy. Also mentioned as one of the key focus points by one of the informal caregivers, and husband, of one of the participants in the dementia day care: providing the feeling of belonging is of huge importance, along finding kindred spirits who can support each other. This raises the question on how the neighbourhood and architecture on itself is able to provide this feeling of autonomy?

Apart from dementia friendly design features that can help to improve this situation, as described within chapter 2, can communities "be designed in a way to reduce barriers in the built environment and support a person with dementia to enjoy life in a meaningful way" (McAdam & Williams, 2017, p. 2). In order to see how architecture is capable of this, will the following sub question be addressed within this chapter: How can the architectural design stimulate a community orientated neighbourhood for early stage dementia patients? In order to come to an answer to this question, is it first important to see which target groups could provide the best conditions for a successful community. After that will the focus shift towards the feeling of autonomy and how to achieve this. What social functions should be integrated into the neighbourhood and where should they be located?

### 3.1 The search for desired target groups

From a demographical point of view, is it nearly impossible to pinpoint the exact target groups that have to be present in order to form this desired community. Every neighbourhood is diverse and will consist of different types of inhabitants, making it hard to present a model which is representative and applicable in every environment. However, could it form the foundation for what social facilities should be present in order to attract these desired target groups to the neighbourhood.

Initially, the first impression of this research was aimed to provide a suitable living environment for both people with dementia as well as elderly. This idea came from a gut feeling, where the personal consensus was that people within the same age group perhaps would have increased sympathy for those unlucky enough to contract this illness. Peers where they can relate to, within the same phase in life, hopefully improving willingness to provide a helping hand for those in need. This combination of people would also be referrable to current nursing homes within the Netherlands, where they already live together within the same facility. However, the fieldwork within the 'Liv inn' within the Netherlands, a residential elderly care complex, would soon show that this was an ideal image rather than a reality. A formal caregiver within the complex, mentioned that residents with dementia were systematically left out of the social activities. Whenever they would decide to join these social activities within the 'social heart' of the complex, were they often ignored and even victim to bullying behaviour.

When some elderly residents, who often made use of this social heart, were asked about the difficult situation could they only confirm this matter. Both of the questioned elderly had earlier experiences with dementia within their close family, who due to this illness passed away at an relative early age. This made seeing people with dementia very confrontational for them, bringing back memories of horrible times during the declining progress and the eventual loss of their relatives. Thus, did they not feel the direct burden to take care of these people and was it seen as the job of people more close to them. Preferably in an environment which was more suitable to provide the right care. Unfortunately confirming the case from both sides of the spectrum and creating the opposite of the previously mentioned desired community. Showing that there still is a long road ahead in destigmatising and normalising dementia in order to improve understanding (Shannon et al., 2019). Nonetheless, is it important to note that this may be a one-off experience that is not representative of all situations where people with dementia and the elderly are mixed within the same complex.

Consequently, did it throw a spanner in the works by creating a new search to find the right target group(s). A group which should show signs of affinity and the willingness to keep people with dementia, and their informal caregivers, socially engaged. Providing support for informal caregivers is an aspect which also cannot be overlooked, since it can be seen as an important aspect to create dementia friendly communities (Shannon et al., 2019). From multiple talks with formal- and informal caregivers, during the fieldwork, one possible target group was mentioned predominantly; families with young children. From research can be concluded that the contact with children has a positive influence on the well-being of people with dementia, they will enjoy the attention and generally react relaxed to the spontaneous reactions of the children (Alzheimer Nederland, n.d.-a). Furthermore, will children get a better understanding of the world of people with dementia; further helping the destigmatising and normalisation of dementia. Alongside, can the engagement of people with dementia within activities where they can help children learn increase their social interactions and activity, does it provide a sense of purpose, and does it contribute to their overall wellbeing (Di Bona et al., 2019).



### 3.2 A multifunctional neighbourhood

In order to create the desired community orientated environment for people with early stage dementia, should both the public space and social functions be inviting for intensive and multifunctional use. To achieve this should the architectural, atmospheric, and spatial properties be well defined (Høj, 2019), in pursuance of them to act as a catalysator for social activities within the neighbourhood. Alongside, should this also provide ways in sustaining the social inclusion and autonomy of people with dementia (Kuliga, 2021). By doing so, "enabling the participation of dementia residents in the community through short outings, people watching and social engagement" (McAdam & Williams, 2017, p. 12). To achieve this, could the addition of the following be beneficial: a multifunctional community building, preserving the feeling of autonomy, and recreational spaces for children.

#### 3.2.1 Multifunctional community building

An environment should be created which embraces a combination of 'music, movement, and greenery'. These were the key terms that were mentioned to be crucial within the living environment by an informal caregiver, of a dementia day-care participant, at the Reigershoeve. Thus, instead of only creating a building which can only be utilized for dementia day-care would it be more beneficial for it to be multifunctional and approachable for all residents. Connecting it to the (existing) social structure of the neighbourhood and the community in general. Preferably by making it an active and characteristic space where residents can meet and participate, that can serve as an atmospheric meeting point for necessities like: music repetitions, expositions, activities from the neighbourhood, etcetera (Lievens et al., 2019). This could even be in combination with a folding façade, in order to create a stronger relation with a central public space or greenery (Lievens et al., 2019).

#### 3.2.2 Preserving the feeling of autonomy

As previously described, was the feeling of autonomy the most precious feature within the living environment for participants within the dementia day-care at the Reigershoeve. Predominantly a place which supports own participation and where there is mutual comprehension for everyone to be who they want to be. In order to capture this essence, should an environment be created which provides the spatial needs for people with different backgrounds. For people originating from a rural background, could this be by the implementation of a vegetable garden or animal pasture which they can maintain themselves within the neighbourhood. While for people originating from an urban background the same could be achieved by the addition of a café or restaurant. It is important to combine a variety of different functions to fulfil the different needs, not only for people with dementia but also for other residents of the neighbourhood. Providing options for varied days within a diverse and green environment, which also could serve as a way to connect different age groups by mutual interests.

#### 3.2.3 Recreational spaces for children

The addition of recreational spaces for children could provide a vital and easy accessible way for people with dementia to connect with children and their parents. This could be for example by the addition of, one or multiple, playgrounds and/or a petting zoo. The maintenance of this petting zoo could even be done as a daily task by the dementia day-care within the multifunctional community building, further intertwining its use within the neighbourhood. This could even be further intensified by either the integration of a primary school in the neighbourhood, or in cooperation with a nearby primary school. Within the 'Adoption project Young adopts Old' from the foundation Alzheimer Nederland, primary school pupils from the age between 10 to 12 visit dementia day-care participants in small groups. There they will have a chat, play games with the participants of the

dementia day-care, or go to dinner together (Alzheimer Nederland, n.d.-a). Further strengthening the link between different age groups, moments to socialize, improvement of wellbeing of people, and overall engagement with the neighbourhood.

### 3.3 Centre of attention

Conclusively, is the implementation location of these newly added social functions important within the spatial design of the neighbourhood. Would they function better when they are spread out around the environment, or is its impact is more significant when they are fixated around a central position within the neighbourhood. During fieldwork at the dementia day care it was noticeable that people who participated in the dementia day care sometimes had problems finding the places they were initially looking for. However, after some moments of thought they often noticed the central building with all the amenities which visibly helped them with their orientation within the environment. When the participants were asked about that given fact, was the general concensus that the clustering of amenities and social functions was of great value. This image can even be further strenghtened by the use of different materials within the surroundings of the cluster as well in the facades compared to the building block destined for dwellings. By creating a clear separation could the amenities cluster even serve as a landmark which could help with orientation even further.

### Summary

It is apparant that an architectural design can stimulate a community orientated living environment for early stage dementia patients. First was it concluded that the desired target group for this was families with young children. In order to create a community orientated environment, that is applicable to people with different backgrounds and interests, is it also important to add functions who are appealing to both people with a rural as urban background. The addition of an multifunctional community centre could help in providing a solution to this. Alongside should functions be added that attract the desired target group to this living environment, for example by the addition of a petting zoo and/or playground. At last should all the social functions be combined at a central location for improved recognizability.


**Figure 13:** Overview design guidelines chapter 3 (illustration by author).



# Dementia Village case studies

04

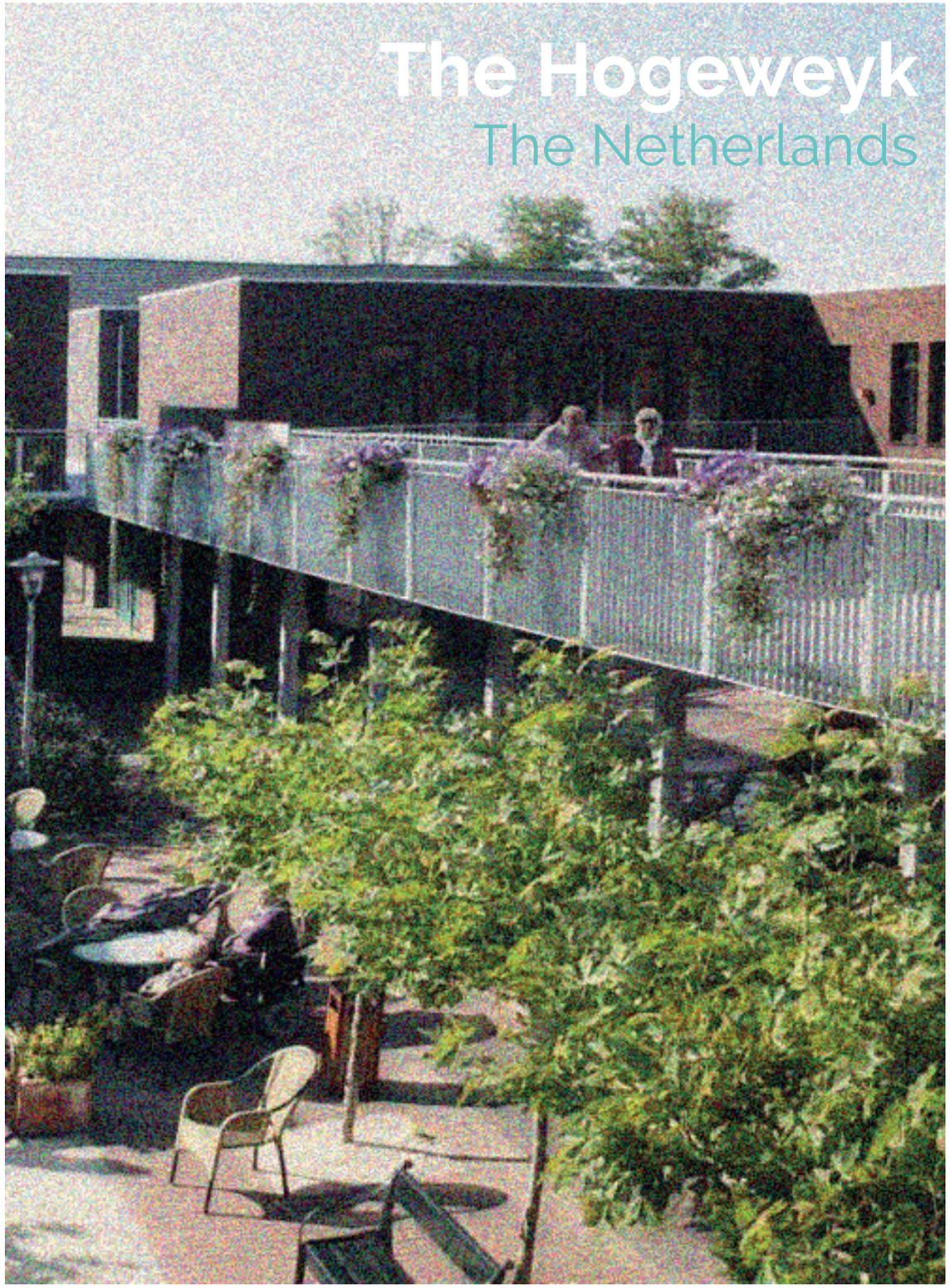



**Figure 14:** One of the courtyards within the Hogeweyk, edited by author. Buro Kade. (n.d.). Living on the first floor, accessible by a wide walkway [Photo]. Buro Kade. Retreived on March 16, 2023, from https://www.burokade.nl/projecten/zorgwijk-de-hogeweyk/



## The Hogeweyk

**Location:** Weesp, The Netherlands

**Architects:** Buro Kade
**Clients:** Vivium Care Group
**Year of completion:** 2009
**Area:** 7500 $m^2$
**Amount of residents:** 135

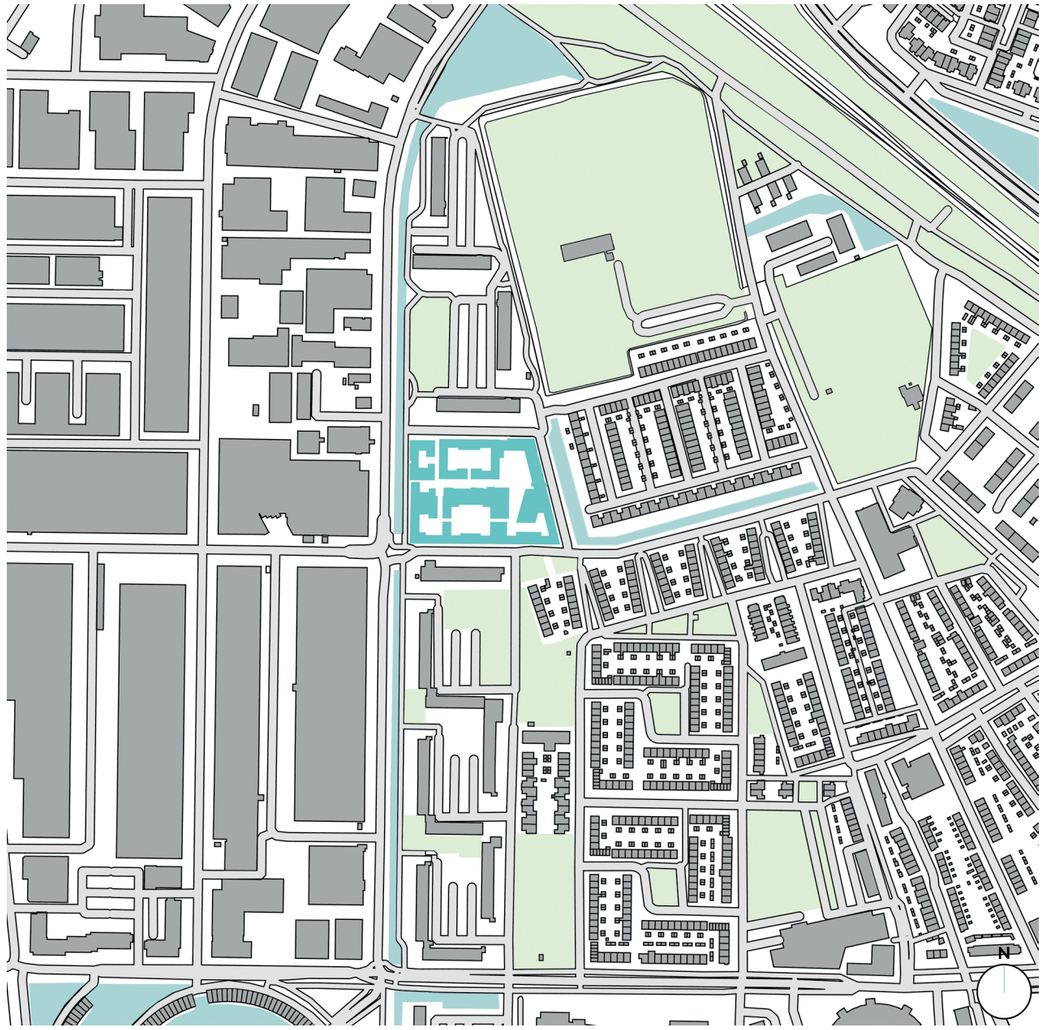



**Figure 15:** Urban context of the Hogeweyk 1:5000, edited by author. Original image retreived from Cadmapper.

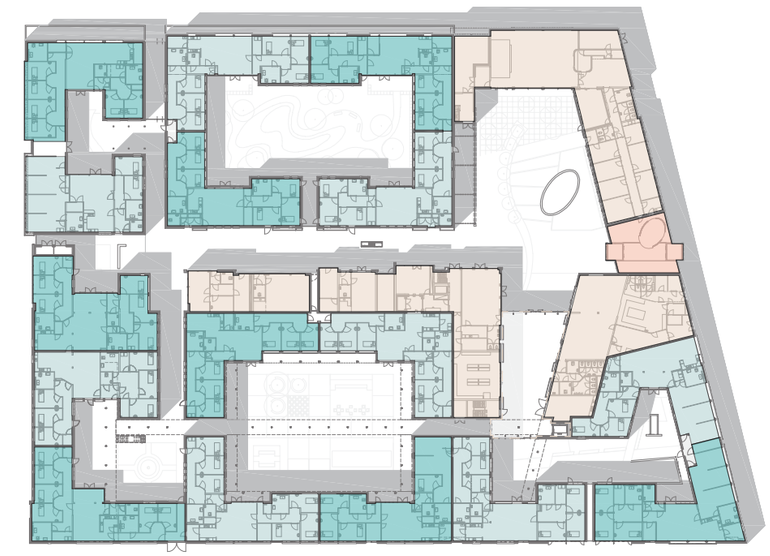
**Figure 16:** Pictures from one of the central courtyards and interior within the Hogeweyk. Buro Kade. (n.d.). Zorgwijk de Hogeweyk [Photo]. Buro Kade. Retreived on April 5, 2023, from https://www.burokade.nl/projecten/zorgwijk-de-hogeweyk/

## The Hogeweyk

The Hogeweyk is an Dementia Village in Weesp that was designed by the architectural firm Buro Kade. The architects attempted to create a familiar living environment for residents who are suffering from the later stages of dementia. Residents of the Hogeweyk live under supervision in an enclosed environment. The environment have been designed in such a way that residents feel familiar with it from the past and also adapted to a diversity of lifestyles. Together, 23 different homes form a unique living concept where approximately 135 demented residents feel at home and can continue to live their active lives. This makes the Hogeweyk a safe and free living environment for an existence that is as normal and dignified as possible. (Buro Kade, n.d.)

*Another aspect of normal living is being able to move independently in your own home and beyond. An ordinary house in an ordinary neighbourhood, in a safe environment, gives the demented resident of De Hogeweyk this freedom in safety.*
- Buro Kade, n.d.





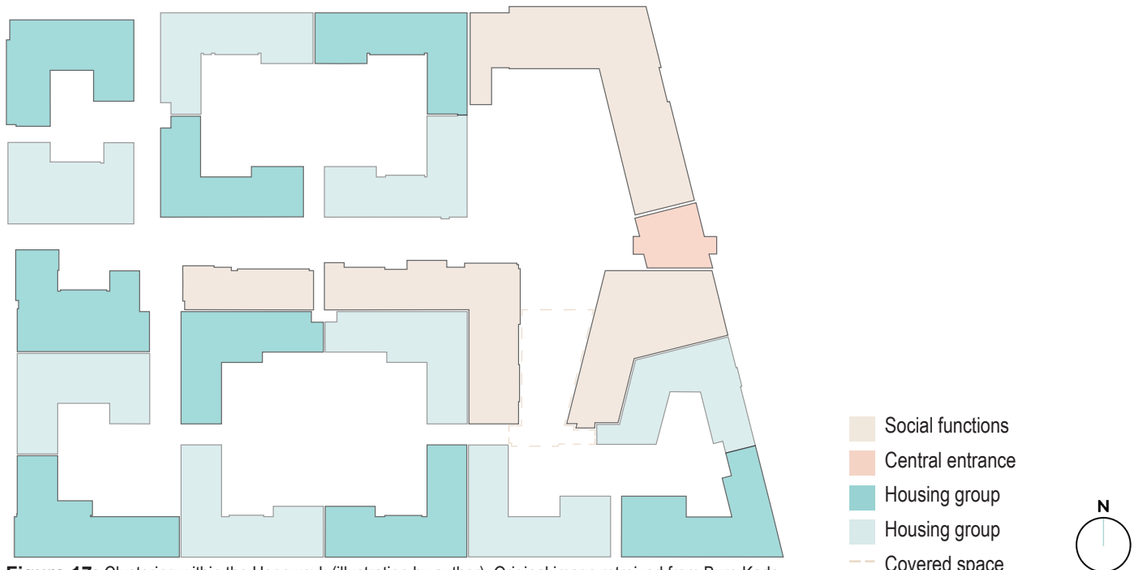



**Figure 17:** Clustering within the Hogeweyk (illustration by author). Original image retreived from Buro Kade.

## Clustering of functions

Social functions and amenities are clustered around the main entrance and parts of the main route. By doing so, a clear distinction can be seen between the collective social functions and the more private housing groups. The housing groups are situated in a way to create multiple courtyards.

*The strong point of the Hogeweyk is the ability to keep the resident's perception of the world as close as possible to their normal living situation. This gives freedom and peace to the residents.*

- I. van den Thillart, architect at Buro Kade

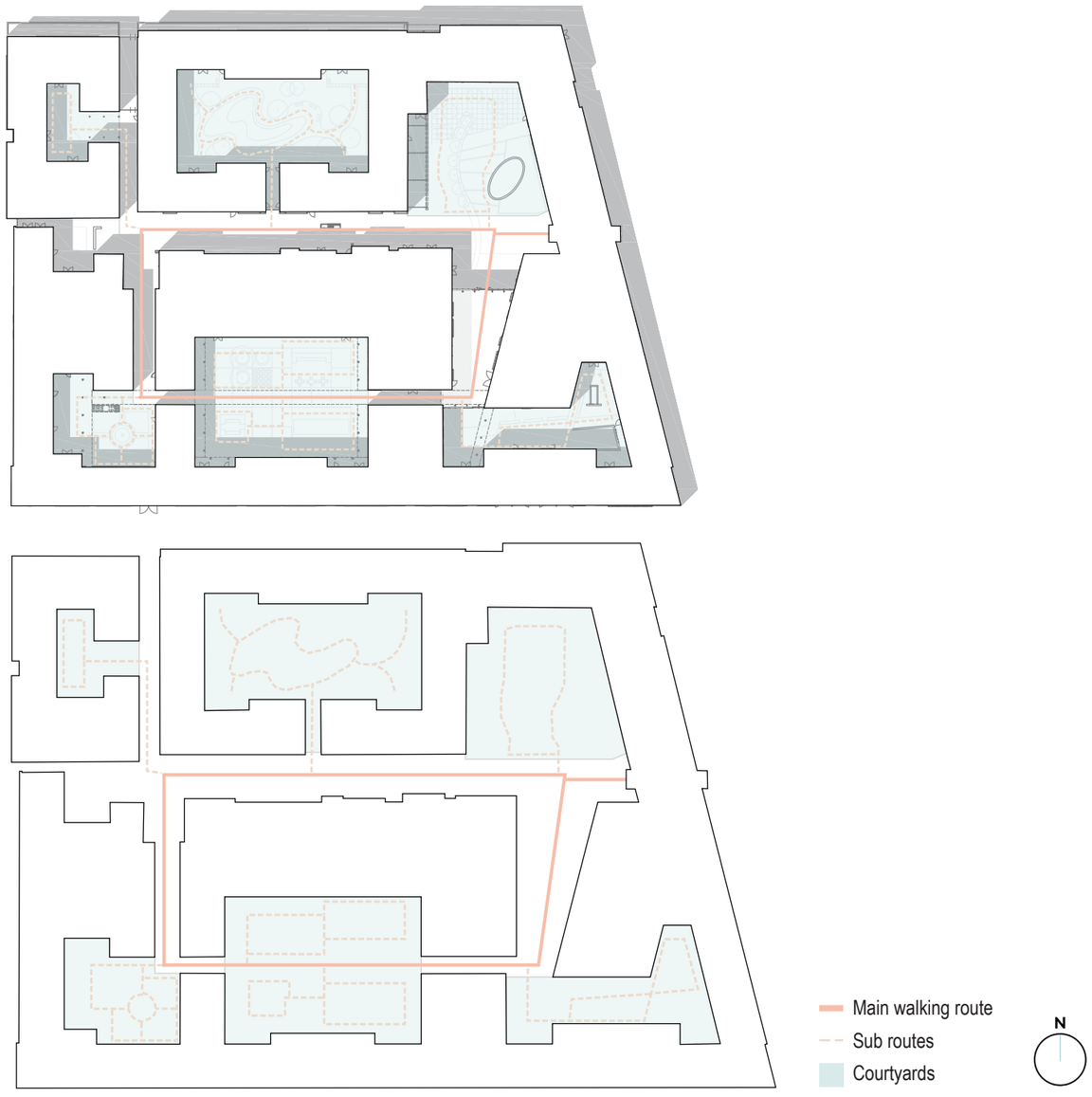



**Figure 18:** Circulation within the Hogeweyk (illustration by author). Original image retreived from Buro Kade.


**Figure 19:** Care groups within the Hogeweyk (illustration by author). Original image retreived from Buro Kade.

## Circulation

Within the Hogeweyk, a central main walking route runs through the city. This route is shaped in a loop to create the opportunity for all residents to wander around without getting lost in the complex. This main walking route also creates a connection between all courtyard which are created in the city  Each housing group has an entry to one of the courtyards where residents can simply wander around. All courtyards have a different character in the way they are shaped and in the used landscape architecture. Sub routes follow the trend with different characters within the courtyards and are diverse from one another. Similar to the main walking route are these sub routes also designed to often be shaped in a loop. This creates multiple routes diverse in shape and length, which provides the residents diverse options where to walk according to their mobility and/or willingness to walk.

## Collective - private

Every care group consists of 6 inhabitants, whose private rooms often are located near the ends of the L-shape building block. Combined with two bigger collective bathrooms, a collective living room in the centre of the building block, and space for storage. Every care group is based around a certain theme, e.g. Christian, urban, countryside. The interior and floor layouts change according to these central theme's, which ensures that people with different background will feel close at home within one of the care groups with like-minded residents.

*The Hogeweyk is a city, and every resident is looking for the part of this city that suits him best. For example, the Jordaan was a working-class neighborhood that changed to a Yuppen neighbourhood now. The city is ever changing, and so is the Hogeweyk.*

- I. van den Thillart, architect at Buro Kade


**Figure 20:** The Alzheimer's Village in Dax market square, edited by author. NORD Architects. (n.d.). Alzheimers Village / NORD Architects [Photo]. ArchDaily. Retreived on March 16, 2023, from https://www.archdaily.com/973948/alzheimers-villa-nord-architects



## Alzheimers Village Dax

**Location:** Dax, France

**Architects:** NORD Architects
**Clients:** Département des Landes
**Year of completion:** 2020
**Area:** 10.700 m$^2$
**Amount of residents:** 120

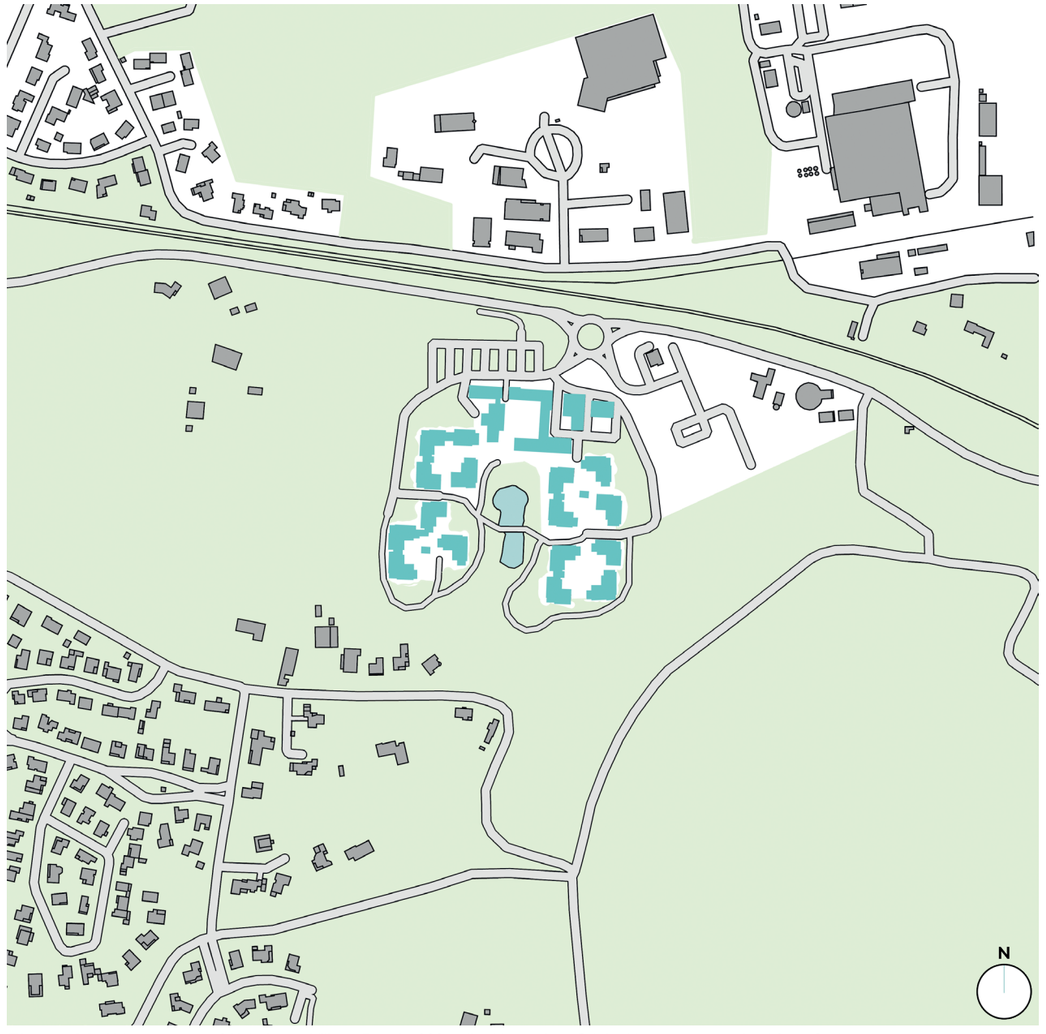



**Figure 21:** Urban context of Alzheimers Village Dax 1:5000, edited by author. Original base map retreived from Cadmapper.

**Figure 22:** Pictures from the green living environment within Alzheimers Village Dax. NORD Architects. (n.d.). Alzheimers Village / NORD Architects [Photo]. Archdaily. Retreived on April 5, 2023, from https://www.archdaily.com/973948/alzheimers-villa-nord-architects


**Figure 23:** Clustering of functions within the Alzheimers Village Dax (illustration by author). Original image retreived from NORD Architects.

## Alzheimers Village Dax

The Alzheimers village in Dax, France was designed by the architectural firm NORD Architects. The project mainly focussed on the implementation of healing architecture features and the overall improvement on the quality of life for people with dementia. Also further abbreviated by NORD Architects:

“The residents live in smaller houses where they are included in as many everyday-life activities as possible. These houses are spread out in the landscape, in which the residents can move independently, freely, and safely.” (NORD Architects, n.d., introduction section, par. 2)

The project has a strong link with nature, which was implemted on all scales; a view on greenery from the bedroom, a collective courtyard with different identities and use of greenery, and multiple walking paths as loops through the landscape.

## Clustering of functions

Social functions and amenities are clustered around the main entrance in a central square. By doing so, a clear distinction can be seen between the collective social functions and the more private housing groups. The housing groups are diversely clustered in groups of four. In the middle is an open courtyard located which serves as a collective space for the cluster.


**Figure 24:** Circulation within the Alzheimers Village Dax (illustration by author). Original image retreived from NORD Architects.

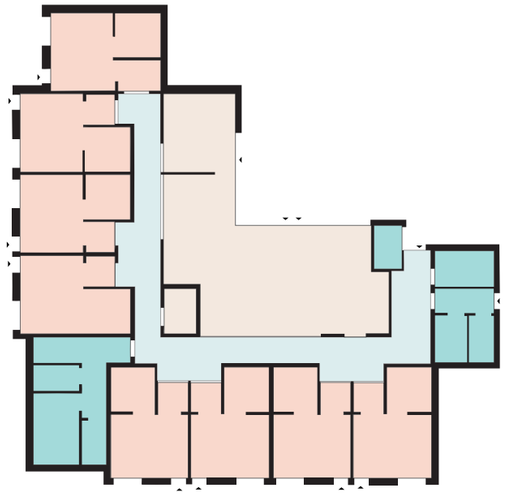



**Figure 25:** Care group within the Alzheimers Village Dax (illustration by author). Original image retreived from NORD Architects.

## Circulation

There are four courtyards which are connected to the village centre by use of an urban street. Around the courtyards, are sub routes used as loops through the landscape. These are diverse and differ in size to make them useable by all residents, even for the less mobile. All four courtyards have their own identity, and serve as a way to combine multiple building blocks within a cluster.

## Collective - private

There are 4 ‘neighbourhoods’ present within the Alzheimers Village, each containing of four building blocks that form an cluster. Each building block has 8 bedrooms which are located around the edge to guarentee a view towards nature from bed. Each bedroom has their own bathroom and a door towards the outside green landscape. The collective spaces are located in the core of the building block facing towards the collective courtyard and garden. Circulation is done by use of a corridor, which is used as a transition zone in between the private bedrooms and the collective livingroom and kitchen.

# CONCLUSION

In this thesis, the main research question which had to be addressed was the following: **How can the Dementia Village architecture provide residential care for early stage dementia patients on a larger community orientated neighbourhood scale?** In order to come to an conclusive answer to this question, was the central theme around Dementia Village architecture first separated into its two most important features: a dementia-friendly design and its ability to create community orientated environment. Conclusively, were case studies of Dementia Village architecture analysed. These were purposefully chosen due to their different characteristics and architects, in order to see how these important features were implemented within different environments and from different design strategies. All chapters eventually led to the definition of certain design guidelines, corresponding to available scientific research, observations during the fieldwork, and/or analysis.

In an increasing manner over the last decades, has the role that architecture plays within the wellbeing for people with dementia been researched. Due to upcoming themes like healing architecture and Evidence-based Design, a continuous shift was made within healthcare from institutionalized environments to surroundings that benefit the wellbeing of patients. This led to the downsizing and the deinstitutionalization of healthcare institutions into a more person-centered approach. This shift was also visible within the architectural and spatial design of dementia care, in order to provide and improve the wellbeing of people with dementia. Which led to new residential care typologies with a closer relationship between residents and the community, thus forming the foundation of the later Dementia Village typology.

In order to provide an suiting home environment for people with dementia, was the focus in the first part of the research based around the theme of a dementia-friendly design and the following subquestion: **What living environment features and conditions are of importance when designing for dementia patients?** It was concluded that four themes had an increasing impact on the overall wellbeing. These were: wayfinding, autonomy within the immediate environment, ambiance and familiarity, and natural lighting and views on nature. Within all themes, a certain set of design guidelines was defined as conclusion of multiple literature studies. These guidelines describe design features that could have a positive impact on people with dementia, both on the dwelling- as neighbourhood scale.

After that the focus shifted towards the ability to create a community orientated environment, by the following subquestion: **How can the architectural design and built environment stimulate a community orientated living environment for early stage dementia patients and elderly?** First the emphasis was on the desired target group in order to create this community orientated environment. From both literature studies as experiences during fieldwork, the conclusion was that the best combination would be with parents with small children. In order to create an lively living environment should both the public space and social functions be inviting for intensive and multifunctional use. By the addition of a multifunctional community centre, preserving the feeling of autonomy, and recreational spaces for children could this be strengthened. Furthermore, could the clustering of amenities help in providing a more livlely place where different target groups could mix as well as a clear overview. This all led to the definition of more design guidelines.

In conclusion, were two Dementia Village case studies further abbreviated around the following subquestion: **What can we learn from the current Dementia Village design?** Both case studies showed different insights and point of focus. While the Hogeweyk excelled in providing different themed dwellings and courtyards around a network of subroutes, did Alzheimers Village Dax show its successful implementation of greenery on multiple scales, both visually as physically. Both themes could provide valuable improvement in the dementia-friendly character of the living environment.



# DISCUSSION

It is important to mention that the theme of ‘dementia friendly design’ is much more comprehensive than described within this thesis. Due to the limited size of this thesis, the conscious decision had been taken to only address the subjects that are of most importance and predominantly represented within the dementia village architecture. Within healing architecture, however is a wide array of subjects and architectural elements that also can have a positive effect on the wellbeing of people with dementia. A prime example of this is sensory design, where sensory enriched environments are created to temper all senses. In contrary to the decline in cognitive functions within the brain, will the emotional and sensory part of the brain relatively intact. Due to this would an living environment which could stimulate the use of all senses be beneficial for the wellbeing of people with dementia. Within a further research would it be advisable to also further abbreviate on this part of dementia friendly design features.

Furthermore, can this research also be critically assessed due to its predominant focus on the newly built environment. Even though that the newly built environment is extending in an increasing manner in the Netherlands, and its important adjustment to make those dementia friendly is even more needed. However, a major part of the problem also present in the current built environment where the space and possibilities are often limited. Can a subdivision be created from current design guidelines and its implementation within current and future built environments? Could those be ranked on feasibility and financial possibilities to create an even better overview on what is possible in different circumstances? And could the design guidelines be ranked on importance to create an direct overview of the most important features that always have to be present? These are all questions that will need more research in the future before a conclusive answer can be given. Hopefully this research can serve as a starting point for these next steps, in order to make all the living environment more and more dementia friendly in the future.

Concluding, should the theme of a dementia prevention within the living environment been more abbreviated. Even though that themes as mobility and social involvement have been discussed, should dementia prevention have played a more significant role within this research. Prevention is often seen as just as important as curing, which in the case of dementia is impossible currently. However, due to the increasing numbers of people with dementia and the aging society could any prevention help with the dire situation in the future. This is a theme which also needs more research in the future for the right implementations within the living environment.

# REFLECTION

**1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?**

The studio, 'Designing for Care in an Inclusive Environment' is based around the central theme of human centered approach, both within the research as well in the later design. Within my graduation topic I tried to really enhance this approach, mostly by trying to scope in on the view of people who were unfortunate enough to suffer from the horrible illness of dementia. Focusing on how life could be improved by maintaining wellbeing and the social inclusion for people who are in their most vulnerable state. While the disease on itself might cause a decrease in health, should in my opinion the dwelling and surrounding built environment provide ways to live life to its fullest potential. A situation completely different than the last years of the life of my grandma, who mostly sat inside her room locked off from all that was still to be done. Fueled by experiences during the fieldtrip, where people were joyful and full of life despite the visible- and invisible limitations. An experience which showed me that it could be different, and made me want to pursue a situation to make that a standard rather than the current exception. Due to this do I think that my graduation links to the architecture MSc in general, using design as a mean to deal with social and spatial challenges encountered in the built environment.

**2. How did your research influence your design/ recommendations and how did the design/ recommendations influence your research?**

As mentioned within my discussion, is the topic of dementia-friendly design quite broad and extensive. During the initial phases of my research did this also overwhelm me a bit, where there were a lot of different paths I could take within my research and eventually later design. By choosing a certain path and limiting myself to only some aspects within healing architecture, was I able to define a clear- and useful set of design guide lines within my research. The definition of these design guide lines, based on literature review and fieldwork, eventually really helped in the later design stages. It provided some parameters and backup for the design and it enabled me to always make design choices that were supported by the research. On the other hand, did the design also influence certain parts within the research. Especially related to the topic of social inclusion of people with dementia and the definition of social functions that could help in providing the right environment.

**3. How do you assess the value of your way of working (your approach, your used methods, used methodology)?**

My research tried to find ways to show how a neighbourhood could be adjusted for it to be more dementia friendly. Providing ways for people with dementia to remain living in their familiar home environment, while still being able to live the remainder of their lives to the fullest without any restrictions. To my surprise was there barely any research available about this topic, which created a situation where I had to decide what would provide the best foundation for this research due to a lack of reference material. For it to be complete and conclusive, did I combine both the more theoretical and practical side regarding this topic. By using literature studies and testing that knowledge by the use of case studies and the gained experience from fieldwork. Did those correspond and/or did the fieldwork provide new valuable insights which also should be included, all be it by sightings and/or by interviews with (in)formal caregivers. The use of these methods helped me to gain a deeper understanding of the topic and in the definition of the design guidelines. In hindsight, would the use of interviews with architects who are specialized in healthcare architecture been very helpful in the testing of the theoretical knowledge within the literature studies. Questions like what they valued the most within the design, what architectural elements helped the most in the wellbeing of people with dementia, etc. could have helped to create a deeper level of understanding within my research.

**4. How do you assess the academic and societal value, scope and implication of your graduation project, including ethical aspects?**

Due to the increasing rate of people being diagnosed with dementia within the Netherlands and the decrease in financial funding and medical staff, a prominent problem arises for the future. This is even further abbreviated by the current- and future political policies, aimed at keeping people with dementia to remain living within their home environment. In essence not a wrong or right standpoint; which is also often the wish of people affected by dementia. However, if the current- and future built environment isn't altered and modified to provide the right living environment for these people it will create big problems on both ends of the spectrum. People with dementia will experience increasing feelings of anxiety and confusion that will affect their wellbeing. While informal caregivers will (unnecessary) have to carry a huge burden to apply all the care that is needed, having a huge impact on their quality of life and wellbeing as well.

The ethical aspects also played a major dilemma in this research, due to the fact that I was not able to interview the target group that I am designing for. In an ideal scenario would you talk with people about their desires in the built environment, in order to be able to fulfil those needs. Now it is a matter of presumption that they will hopefully like it, by the use of information from (in)formal caregivers and evidence based-design. In a further research could it perhaps be useful to follow people with early stage dementia for a longer period, to register their needs and desires in the built environment. Ideally people with different backgrounds to create a general reference point what is needed for all.

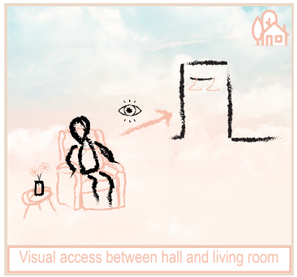
**5. How do you assess the value of the transferability of your project results?**

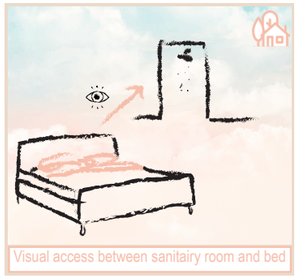
Most of the project results were based on a newly built living environment where there was a certain freedom in implying design features that could improve its dementia friendly nature. However, I did try to stick with realistic and easily accessible interventions to improve feasibility and the transferability of the project. This was done for example with standard dwelling sizes, improvements to the public space, etc. However, in a further research could it be very beneficial if these design guidelines were also tested and modified to be applicable to already existing built environments. Ideally by use of a list which would built up from least drastic and easily changeable to more drastic improvements.

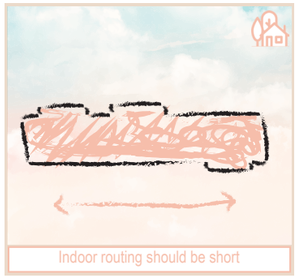
**6. What is the architectural relevance of your graduation work?**

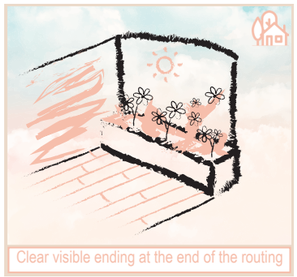
There is still a gap for architects and architectural research in general regarding the correct implementation of healing architectural features. Especially now that the shift is initiated from healthcare facilities to providing care at home. Further effort is needed to help one of the most prominent problems due to an ageing society; providing wellbeing and a good living environment for one of the most vulnerable target groups. In specific for people who suffer from early stage dementia, which is an usually forgotten and neglected age- and patient group currently. A group that is often physically and/or mentally too well for a nursing home, but on the other hand not well enough to keep on living in their own homes without receiving additional care and attention. While architecture on itself is not capable of creating solutions to all current healthcare problems. Can it however enable and facilitate a faster transition to an improved situation, thus was this graduation work focused on providing tools to achieve that. However, it is just an initial step. Further research of its implementation, in the existing built environment, and the way architecture can help prevent dementia is still needed for a successful and complete strategy.

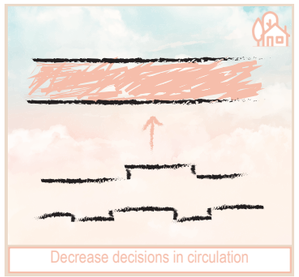
## Indoor wayfinding

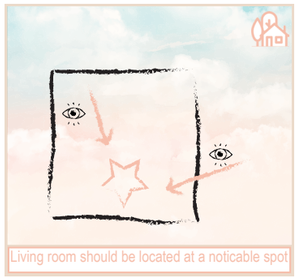

Visual access between hall and living room

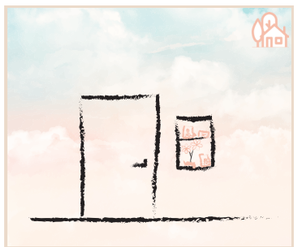

Visual access between sanitairy room and bed


Indoor routing should be short

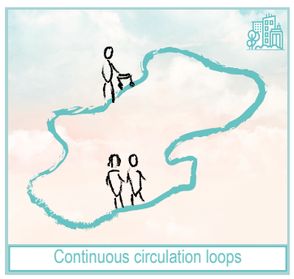

Clear visible ending at the end of the routing

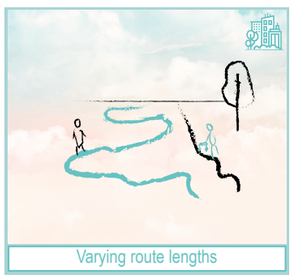

Decrease decisions in circulation


Living room should be located at a noticable spot


Implementation of personalised elements

## Autonomy within the immediate environment

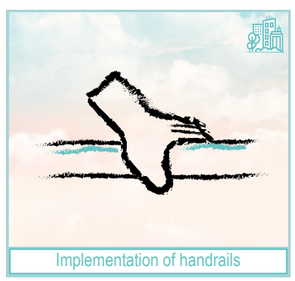

Continuous circulation loops


Varying route lengths


Public washrooms along the route

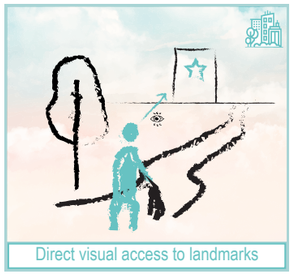

Benches along the walking routes

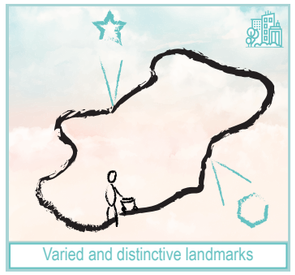

Path wide enough for two wheelchairs

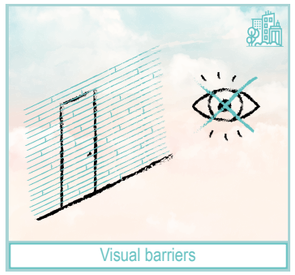

Implementation of handrails



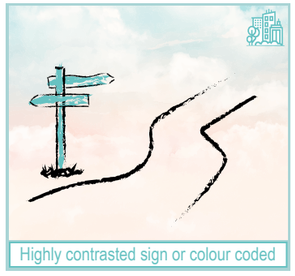
## Outdoor wayfinding

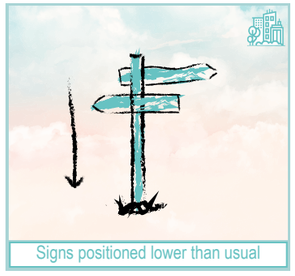

Direct visual access to landmarks

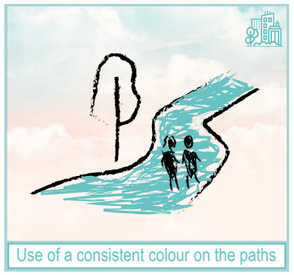

Varied and distinctive landmarks

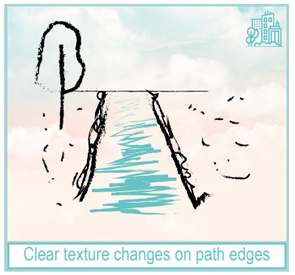

Visual barriers

Combining pictorial elements and text

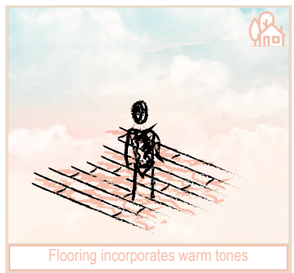

Highly contrasted sign or colour coded


Signs positioned lower than usual


Use of a consistent colour on the paths

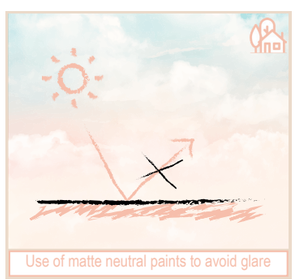

Clear texture changes on path edges

## Ambiance and familiarity

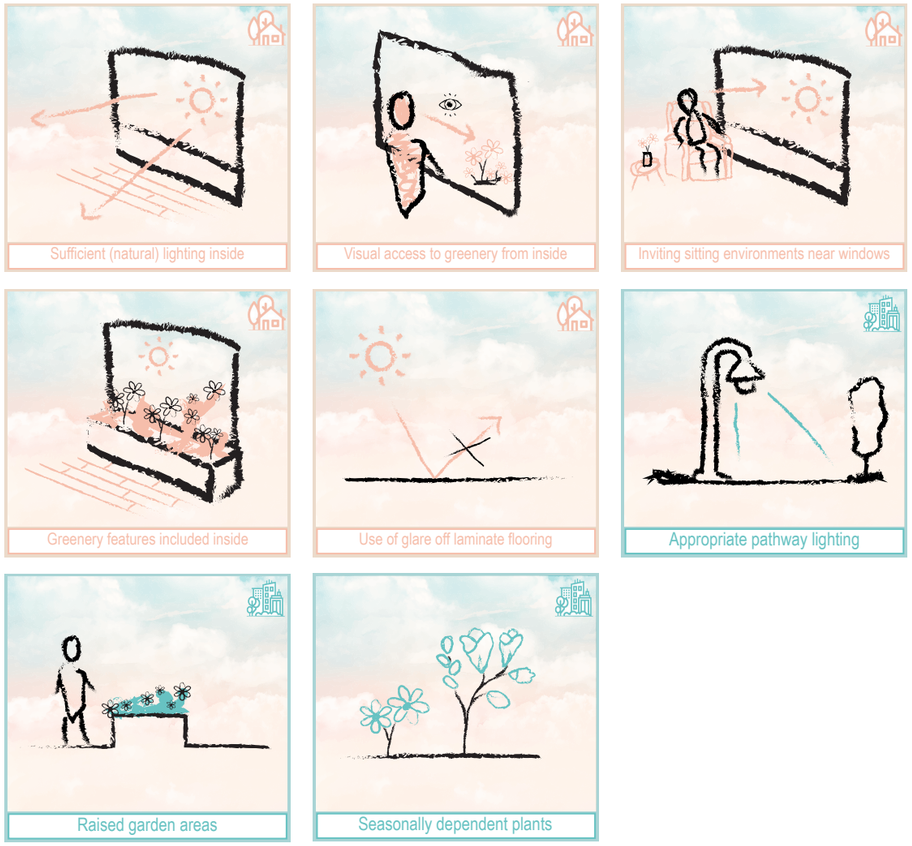

Flooring incorporates warm tones


Clear colour contrasts between floor and walls


Clear colour contrast of furniture


Use of matte neutral paints to avoid glare

**Natural lighting and views on nature**




**Community orientated environment**

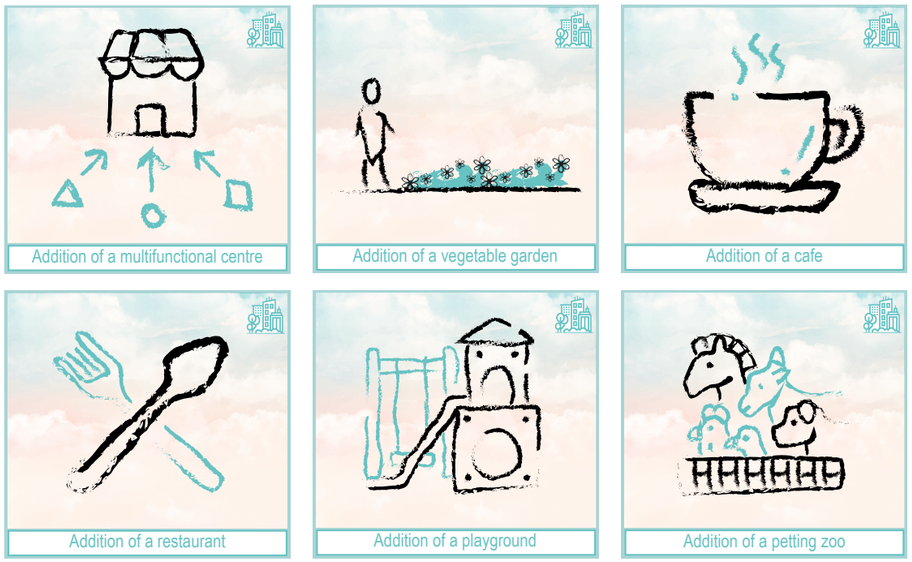



**Figure 26:** Overview of all the design guidelines (illustration by author).



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