LOST IN TIME: DESIGNING SPACES FOR DEMENTIA WHEN PERCEPTION IS LOST

HOW CAN ARCHITECTURAL INITIATIVES BE LEVERAGED TO RESHAPE TRADITIONAL NURSING HOMES AND GENERATE STRATEGIES THAT ENHANCE COGNITIVE FUNCTIONALITY AND EMOTIONAL WELLNESS?

By: Isabella Struve

LOST IN TIME

Figure 1
Render: Human interaction with biophilic forms

LOST IN TIME:

DESIGNING SPACES FOR DEMENTIA WHEN PERCEPTION IS LOST

BY ISABELLA KAY STRUVE

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in partial fulfilment of the requirements for the degree of
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I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor used artificial intelligence tools or generative artificial intelligence tools (unless it is clearly stated, and referenced, along with the purpose of use), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Isabella Kay Struve

Figure 2
Photograph with Nana

For my Nana Kay

ACKNOWLEDGEMENTS

I would like to thank my main supervisor Sibyl Bloomfield and co-supervisor Maibritt Pedersen Zari for all the encouragement and ongoing support and guidance. This project would not have been the same without their valuable advice and input.

To my mum, siblings, friends and Mitch, thank you for your constant support, love and confidence in me.

This is for my Nana and Grandad.

ABSTRACT

Dementia has been framed as a global health priority, affecting 55 million people worldwide (World Health Organization, 2023), with a new case being diagnosed every three seconds (Alzheimers New Zealand, 2020). In New Zealand there are currently 70,000 individuals living with dementia, but numbers are expected to triple by 2050 (Alzheimers New Zealand, 2020). This increase in numbers creates an increasing demand for architecture to design supportive care homes that enhance cognitive functionality and emotional wellness.

The term “dementia” is derived from the Latin word “demens”, meaning “out of one’s mind” (Assal, 2019). This condition is progressive and is characterised by a collection of symptoms that significantly impact cognitive health and function (Alzheimers New Zealand, 2020). Persons with Dementia (PwD) often experience a range of behavioural, psychiatric, and cognitive symptoms such as memory loss, delusions, wandering, and a decline in social abilities (Schwarz & Rodiek, 2007). Despite extensive research, the exact cause of dementia remains unknown and there is currently no existing cure. This lack of knowledge historically contributed to the establishment of the ‘medical care model’, which prioritised the condition itself, rather than the needs of the person affected (Kitwood, 1997). As noted by Kitwood (1997), this model fostered a dangerous ‘no cure - no hope’ mindset, which disregarded the psychological, social, and emotional dimensions of dementia. Consequently, the traditional dementia care environments seen today often resemble hospital settings, with sterile and hostile atmospheres. Research indicates that the structure and layout of those environments do not adequately support autonomy, privacy, wayfinding, and stimulation (de Rooij et al., 2012; de Boer et al., 2018). While contemporary frameworks such as person-centred care have been established to contrast these environments, the current narrative still emphasises the loss associated with a dementia diagnosis, rather than viewing it as an opportunity for growth and autonomy (Roberts, 2023).

Implementing person-centred care is important, not only in philosophy but also in architecture, to design supportive and prosthetic care homes. The built environment is recognised as having the ability to shape human behaviour, influencing not only how people interact with their surroundings, but also their wellbeing (Kahana, 1982; Grealy et al., 2008). This is especially significant for individuals with cognitive impairment, since they require much more support from their surroundings, meaning that minimal changes in their environments can affect their mood and behaviour (Christenson & Taira, 2014).

This thesis builds on literature research and precedent analysis to propose a planning philosophy and a new transformative architectural solution that answers the research question: **How can architectural initiatives be leveraged to reshape traditional nursing homes and generate strategies that enhance Cognitive Functionality and Emotional Wellness?** To engage with this question, this thesis has generated twelve fundamental strategies that aim to improve the living conditions and the quality of life for PwD. These strategies aim to enhance autonomy, wellbeing, personhood, and a sense of community through architectural interventions.

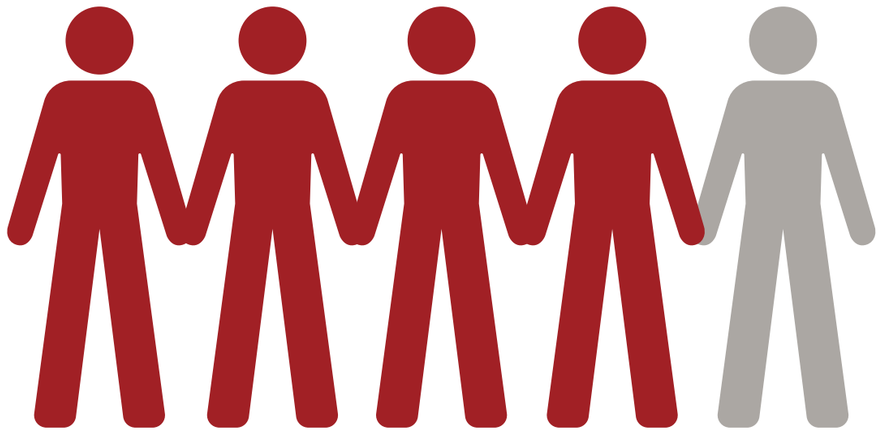


Figure 3
Dementia Awarness in New Zealand

As seen in figure 3, **“***Four out of five New Zealanders know or have known someone living with dementia.“*
(Alzheimers New Zealand, 2020)

Figure 4
Collage: Lost in time

CONTENTS

CHAPTER 1:

INTRODUCTION

POSITIONALITY STATEMENT

The research topic to explore how architecture can enhance care facilities for people with dementia is influenced by my personal experience with the condition. My grandmother's journey with dementia has made me aware of the daily challenges that are accompanied with it, as well as the impact it has had on our family.

Growing up I was always very close with my Nana, I always looked up to her wisdom, love and zest for life. Witnessing firsthand the struggles she faced with dementia, from a gradual onset to now needing full time care in a dementia facility, has inspired me to take on this research to evaluate strategies that can enhance care environments to comfort and support persons with dementia.

My goal is to contribute to the research field of dementia care, by advocating that long-term care facilities must frame the person at the centre of their care to create nurturing environments.

RESEARCH QUESTION

How can architectural initiatives be leveraged to reshape traditional nursing homes and generate strategies that enhance Cognitive Functionality and Emotional Wellness?

PROJECT OBJECTIVES:

The primary aim of this project is to develop an innovative architectural response that integrates therapeutic design strategies to enhance dementia care environments. By prioritising autonomy, wellbeing, personhood and a sense of community, the project aims to create spaces that actively improve the quality of life for individuals with dementia. This project becomes a catalyst in the necessary paradigm shift that seeks to foreground client's in a current medical dominant approach society. Through the identification of effective design strategies, this project aims to improve both existing and new facilities, contributing to a more supportive and individualised care system.

SCOPE AND LIMITATIONS

This thesis explores the architectural design of care environments specifically catered to individuals with dementia. Dementia envelops a wide variety of cognitive conditions and whilst this project seeks to address the broad spectrum of challenges associated with dementia through architecture, it primarily concentrates on Alzheimer's disease, due to it being the most prevalent dementia diagnosis.

The scope of this thesis includes an in-depth literature investigation into how architecture and different forms of environments can enhance cognitive functionality and emotional wellness.

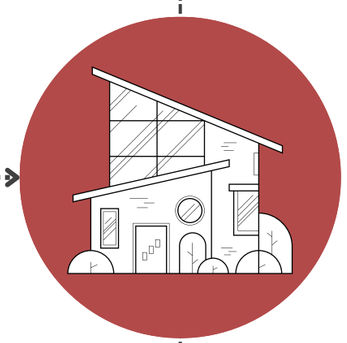
LIMITATIONS:

Focus on Alzheimer's: This focus is due to the high prevalence it has in dementia diagnoses and the substantial contemporary literature and research surrounding it. Consequently, the architectural solution proposed may not suitably address the needs of individuals that experience other types of dementia, with differing conditions and requirements.

Diversity in care levels: PwD have diverse needs due to different stages of cognitive functioning, making it challenging to create a 'one size fits all' design. Consequently, the architecture displayed in the end of this thesis may not envelop all variations of symptoms or care requirements.

Regulatory constraints: The design proposal presented in this thesis is developed without a direct influence from the restrictions of existing regulations and laws that govern elderly care. This was an intentional decision, to make the exploration of architectural solutions free and without limitations. It is acknowledged that this would not be realistic and that regulations would ultimately impact the practicality of the proposed design explored in this thesis.

Through the acknowledgement of these limitations, this thesis aims to present a design and architectural perspective on creating supportive environments for PwD.



METHODOLOGY

The methodology for this thesis begins with a comprehensive review into contemporary literature that investigates the limitations of current practices and architectural responses to dementia care. This includes analysing Thomas Kitwood's text Dementia Reconsidered (1997), which is regarded as a highly influential text in the realm of dementia care (Brooker, 2022). Kitwood, a pioneering British psychologist, was one of the first in the field to view people with dementia beyond their diagnosis and challenged the stigmas surrounding dementia and the institutional nature of nursing homes. His work introduced the 'person-centred' care model, which prioritises dignity, autonomy and wellbeing of individuals over the condition itself.
Figure 5 illustrates how the literature review process helps this thesis position itself within the gap between 'past knowledge' and 'expected knowledge'.

Precedent research is implemented in the thesis as a research tool to analyse care environments in different countries and their models of care. The aim is to review how existing facilities architecturally function and how successful they have been. This analysis becomes a stepping stone from literature research to the design process, as it creates exemplars of design strategies.

This study includes research on the world's first dementia village 'De Hogeweyk', which is located in the Netherlands. The research also analyses 'The Care Village', which is a New Zealand approach that adopts the village structure.

Design-led research is a key factor to this thesis, as learning through design allows for a visual understanding of how these theoretical frameworks can integrate into a design. To critique this design, a 12-strategy dementia care framework will be established from the literature review, to identify drivers that are important for ethical person-centred care.

RESEARCH

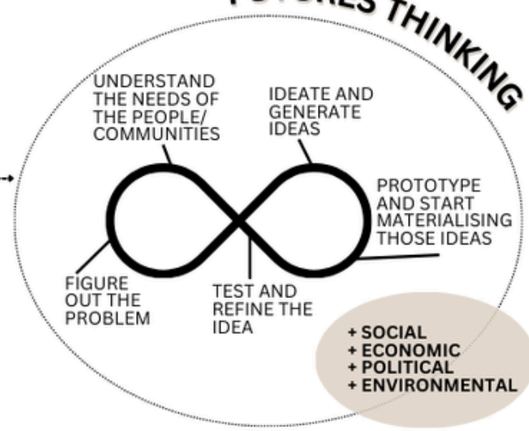
PAST KNOWLEDGE
Evaluate past literature and research

GAP

EXPECTED KNOWLEDGE
Implement futures thinking

CONCEPTUAL FRAMEWORK → NEW THEORETICAL FRAMEWORK

FUTURES THINKING



PRECEDENT

EXPLORE NEW ZEALAND CASE STUDIES

GAP

EXPLORE INTERNATIONAL CASE STUDIES

CONCEPTUAL FRAMEWORK → NEW THEORETICAL FRAMEWORK

DESIGN

DESIGN-LED RESEARCH

CIRCULAR APPROACH
Switching between modes of design to visually capture the ideas generated in the literature and precedent review. Fluidity between design methods will create the most effective results.

- **SKETCHING:**
To quickly visualise and materialise the visions in my head I start off by quick sketching methods.
- **COLLAGING:**
I then move onto a collaging technique, this is to further materialise my ideas and to put them into a 3D form in order to comprehend more of the spatial potential that I am visualising in my head. This is a quick tool to get ideas and precedents into a more visual sphere.
- **CAD SOFTWARES:**
I then move onto CAD softwares in order to create a further idea and comprehension of the spatial capacity and opportunity the project has to offer.
This also makes it easier to engage other people into the project as they have a better visual comprehension of the ideas.
- **FEEDBACK FROM PEERS AND MENTORS:**
Receiving feedback from peers and mentors is a vital technique I implement in every single design, as they often distribute new insight or information that would largely benefit my design. Being open minded is important to creating a succesful and meaningful project.

DESIGN
DISCUSSION
PERSONAL REFLECTION
ITERATION
OBJECTIVE CENTRED DESIGN SOLUTION

Figure 5
Methodology diagram of thesis

CHAPTER 2:

LITERATURE REVIEW

ABOUT DEMENTIA

NEGATIVE CONNOTATION

“Dementia care is often characterized by doom and gloom: after all, it is said, what hope can there be for sufferers from an illness for which there is no known cure?” (Kitwood, 1997)

Memory and the self have long been considered intertwined (Locke, 1690; Squire and Kandel, 2003), creating an assumption that one's sense of self steadily declines with the reduction in cognitive functions. This thinking has led to a dangerously narrow “no cure - no hope” approach that has framed dementia care into a medical response model, focusing purely on understanding the condition rather than the needs of the individual client (Kitwood, 1997). The neglect in recognising the person behind the dementia has not only provoked negative connotations and fear towards age care facilities but has also contributed to the public’s negative outlook towards the diagnosis. As illustrated in figure 6, the stigma surrounding dementia exists on multiple levels, including the public stigma, self/personal stigma, and stigma by association.

The interplay of these layers contributes to the exclusion of PwD from society. The combination of the external opinion with the impact of living with dementia has evidently shown to affect the individuals’ quality of life and overall wellbeing (Krause, 2019), as well as create segregation and exclusion from society. This explains PwD commonly expressing intense feelings of diminished self-esteem and identity, having further repercussions on family, caregivers and professionals (Urbańska et al., 2015). The narrative of society still speaks to the focus on loss and decline that occurs with dementia and ageing, rather than opportunities for independence and autonomy (Roberts, 2023). To counteract the harmful views and labels that currently surround dementia care an evident paradigm shift is required that values the individual more than the condition and revolutionises the current structure to a person-centred model. Ageing should not be viewed as an end-of-life stage, but a lifelong experience.

Architectural intervention to mitigate stigma:

INCLUSIVE DESIGN
Creating spaces that are accessible and welcoming for PwD to experience independence and social connections, which improve quality of life. Incorporating design strategies such as intuitive wayfinding, personalisation and natural elements can promote dignity and a sense of belonging within a community.

DESIGN FOR IDENTITY
Creating spaces that enhance the persons sense of self and identity mitigates the effects negative connotation has on the PwD. This can be through personalisation of space that reflects the persons experiences, interests and preferences and by promoting social interaction and community spaces.

FAMILIAR/ HOMELIKE ENVIRONMENTS
Designing spaces that resemble home and familiar environments rather than hostile hospital atmospheres can counteract the feelings of isolation and confusion. This can also help de-stigmatise dementia home settings as they won’t be viewed as limiting and confined harsh settings.

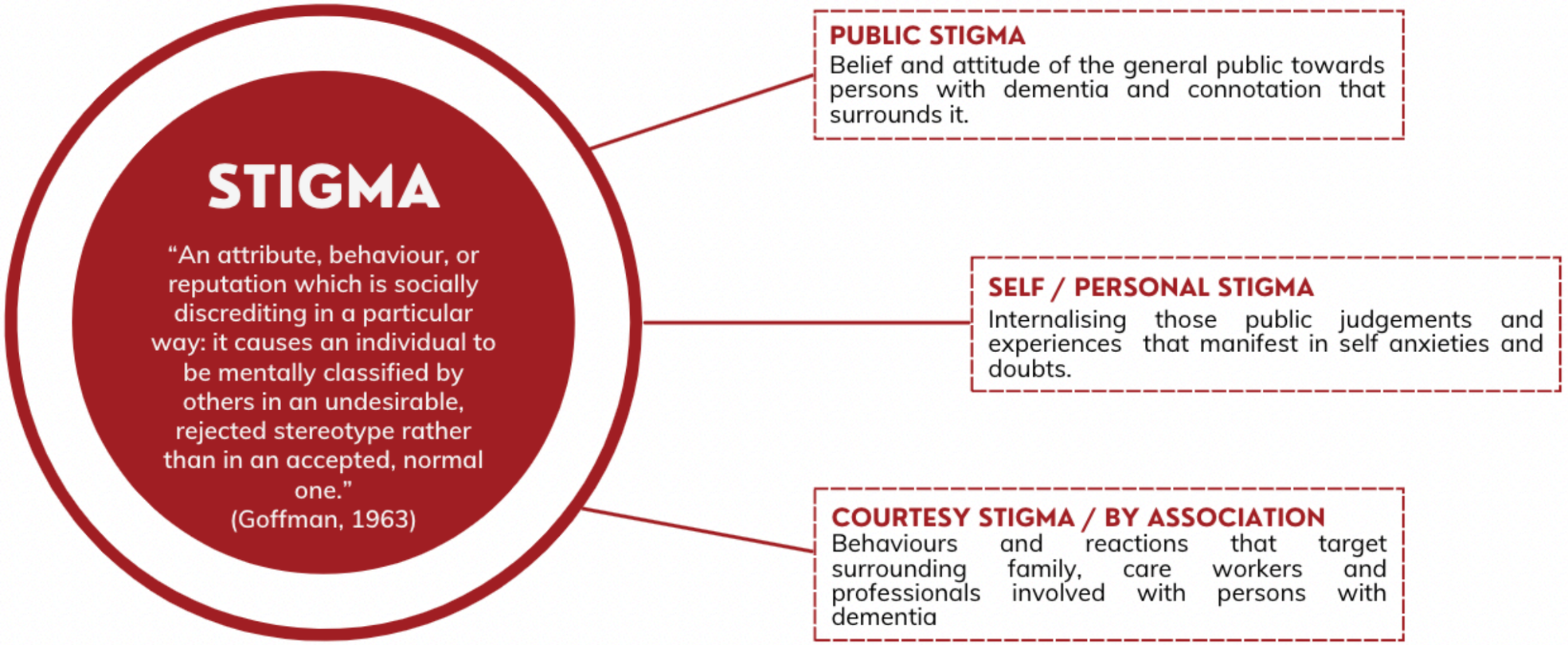


Figure 6
Types of Stigma PwD are affected by (adapted from Goffman, 1963)

WHAT IS DEMENTIA?

“Dementia” is a general term that envelops disorders characterised by a decline in cognitive functions that significantly interfere with the ability to perform daily activities (World Health Organization, 2017). In biomedical terms, it is not considered a disease, but a condition with chronic brain failure characteristics and a gradual decline in cognitive ability (Grealy et al., 2008). The condition is recognised by the depletion of nerve cells within specific brain cortex regions that impact “social and occupational performance” (Grealy et al., 2008). This includes impairments in memory, cognitive processes, learning, coordination, speech and personality (Sadock et al., 2007). Due to the progressive nature of dementia, the symptoms slowly get worse over time as the changes gradually spread among different brain regions. To categorise these changes, the condition is segregated into different ‘stages’ ranging from the early stage to the last stage (see Figure 7). Individuals with mild dementia can still live independently, with symptoms being manageable, whereas those with moderate dementia require assistance with daily activity. The symptoms worsen until severe dementia requires the affected person to be utterly reliant on others for simple daily functions (Mace, 1990).

	EARLY STAGE	MIDDLE STAGE	LAST STAGE
 **MEMORY**	• Short term memory loss • Misplacing and misidentifying items • Loss of direction and orientation	• Short and medium term memory loss • Can't make new memories, making it difficult to learn	• Extensive memory loss - short term and long term
 **COGNITIVE ABILITY**	• Difficulty telling the time • Lose ability to work • May not be able to do simple arithmetic	• Disorientation to place, people and time • Unable to make decisions • Loss of problem solving skills • Needing repetitive instructions for simple tasks	• Extensive cognitive decline
 **COORDINATION / MOTOR SKILLS**	• Unable to drive safely • Slower reflexes	• Increased risk of falls • No connection between thought and action • Reduction in coordination	• May be unable to walk or stand by themself • Eventually may be unable to swallow
 **MOOD / BEHAVIOUR**	• Sudden mood swings • May suffer from depression or delusions • Socially isolate themselves	• Increasing mood swings • Can't comprehend relationships • Physically restless and start pacing • Suffer from delusions and become suspicious of things • Disrupted sleep • Self absorbed and little empathy towards others	• Loss or no recognition of place, people and time • Agitated and angry • Withdrawn
 **LANGUAGE**	• Expression may be vague • Less talkative • Difficulty finding words	• Repetitive speech and broken sentences • Slow speech with unnecessary pauses • Loss of vocabulary • Poor sentence construction	• Loss of vocabulary • Copying and echoing other people's words • Can't comprehend instructions

Figure 7
Dementia stages and accompanied symptoms (adapted from text Grealy et al., 2008)

TYPES OF DEMENTIA

There are approximately 100 different types of dementia (Dementia New Zealand, 2023), with the most common type being Alzheimer's, making up around 60-70% of cases (Alzheimers New Zealand, 2024). It is a progressive neurodegenerative condition that slowly decays different regions of the brain. The cause of this deterioration is still being studied. However, expected changes in the brain include a buildup of abnormal proteins, such as tangles and plaques and noticeable shrinkage of the brain (Alzheimers New Zealand, 2024). Alzheimer's is a progressive condition, beginning with mild confusion and forgetfulness and then advancing to memory loss, personality and behavioural change, and disorientation (Grealy et al., 2008).

As depicted in figure 9, vascular dementia is the second most frequent form, commonly caused by inadequate blood supply to the brain, leading to small blood blockages (Alzheimers New Zealand, 2024). This is often associated with high blood pressure or strokes. Unlike the steady decline of symptoms in Alzheimers, Vascular dementia typically follows a 'step-like' progression, having sudden intense declines in function followed by stable periods (Grealy et al., 2008). Symptoms include facial droop, speech difficulties and loss of movement on one side of the body.

A third type is Frontotemporal dementia, which groups conditions that impact the temporal/ frontal parts of the brain (Grealy et al., 2008). When these parts of the brain are impacted, individuals often experience difficulty with organisation, motivation, and emotional control. As symptoms progress, persons affected also struggle with speech and language comprehension.

ARCHITECTURAL RESPONSIBILITY:

While each type of dementia presents symptoms that impact a person's abilities, research indicates that individuals with dementia may pick up new skills. This indicates that the decline in cognitive abilities in one region of the brain can free up spaces in another providing "an unexpected window into the neurological mediation of visual and musical talents" (Miller et al., 2000). Creative abilities in PwD can arise, even with the decline of speech and language. Creating supportive environments that enable PwD to explore new forms of expression is vital, as it promotes social engagement, autonomy, personhood and wellbeing. Tailored support spaces that understand the challenges of the dementia journey are necessary to foster dignity and purpose.

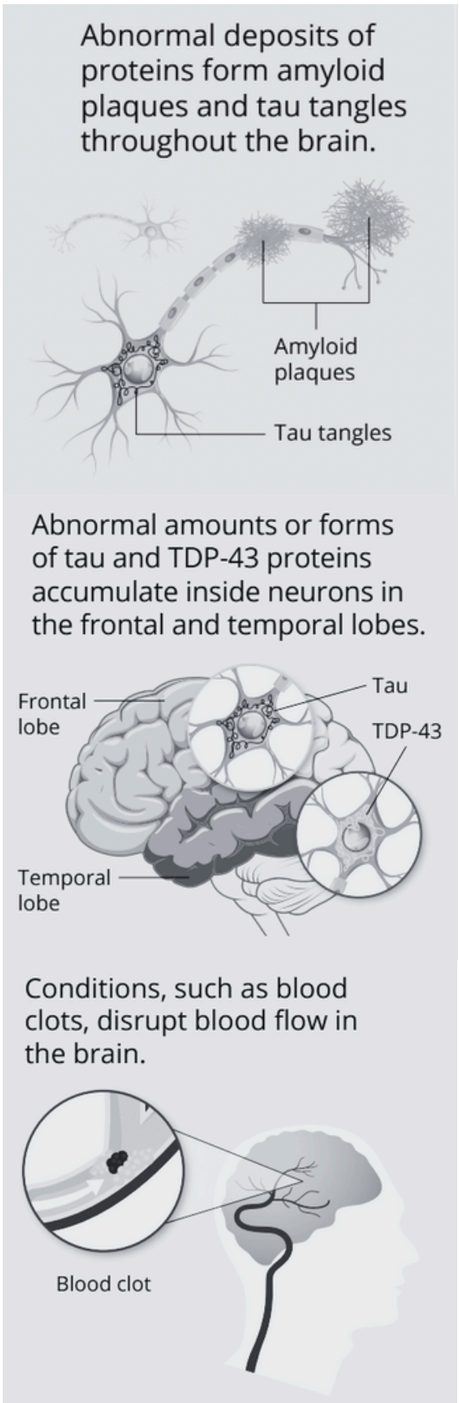


Figure 8
Understanding Different Types of Dementia
(National Institute on Aging, 2024)

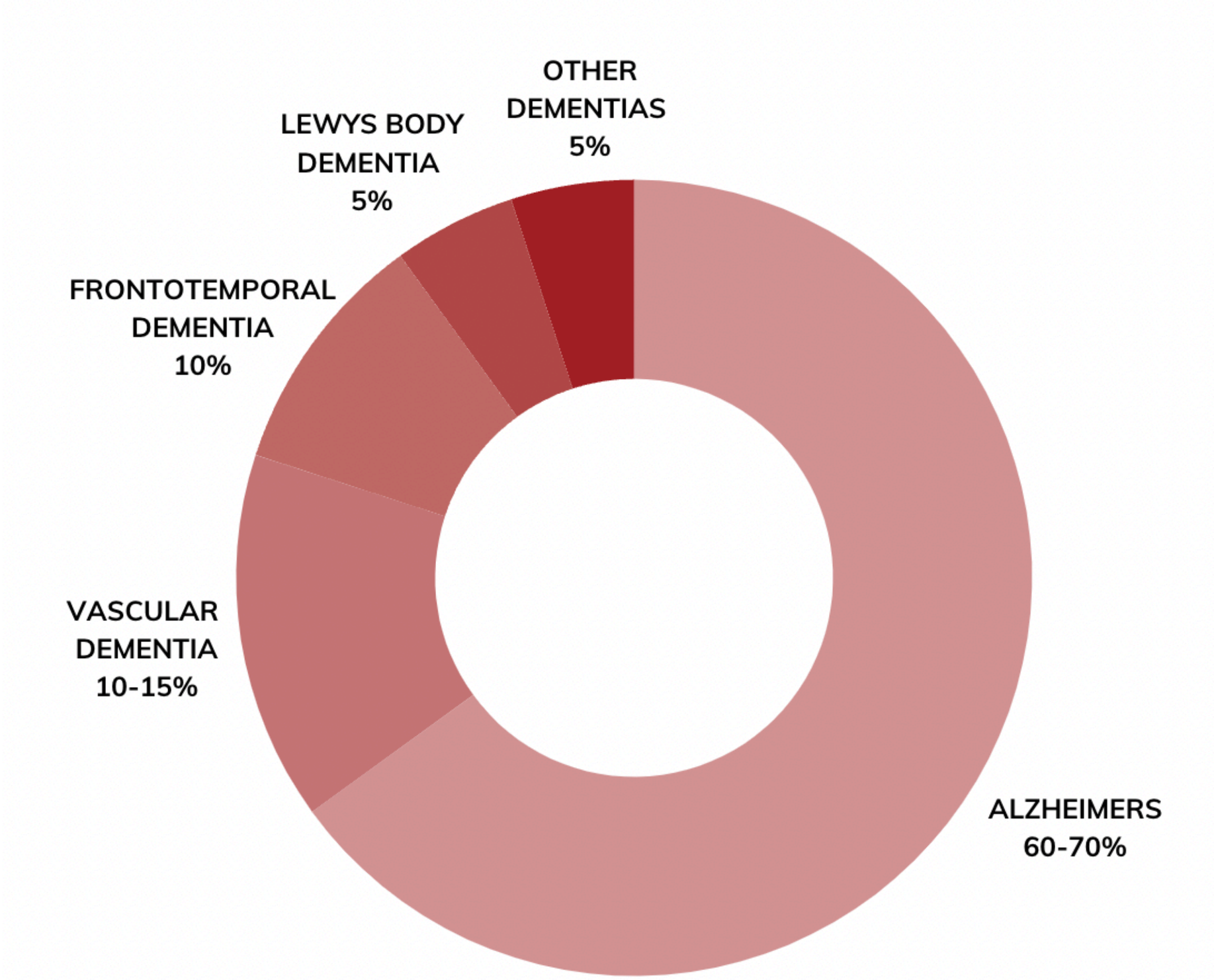


Figure 9
Types of Dementia (adapted from Alzheimer Society of Calgary, n.d.)

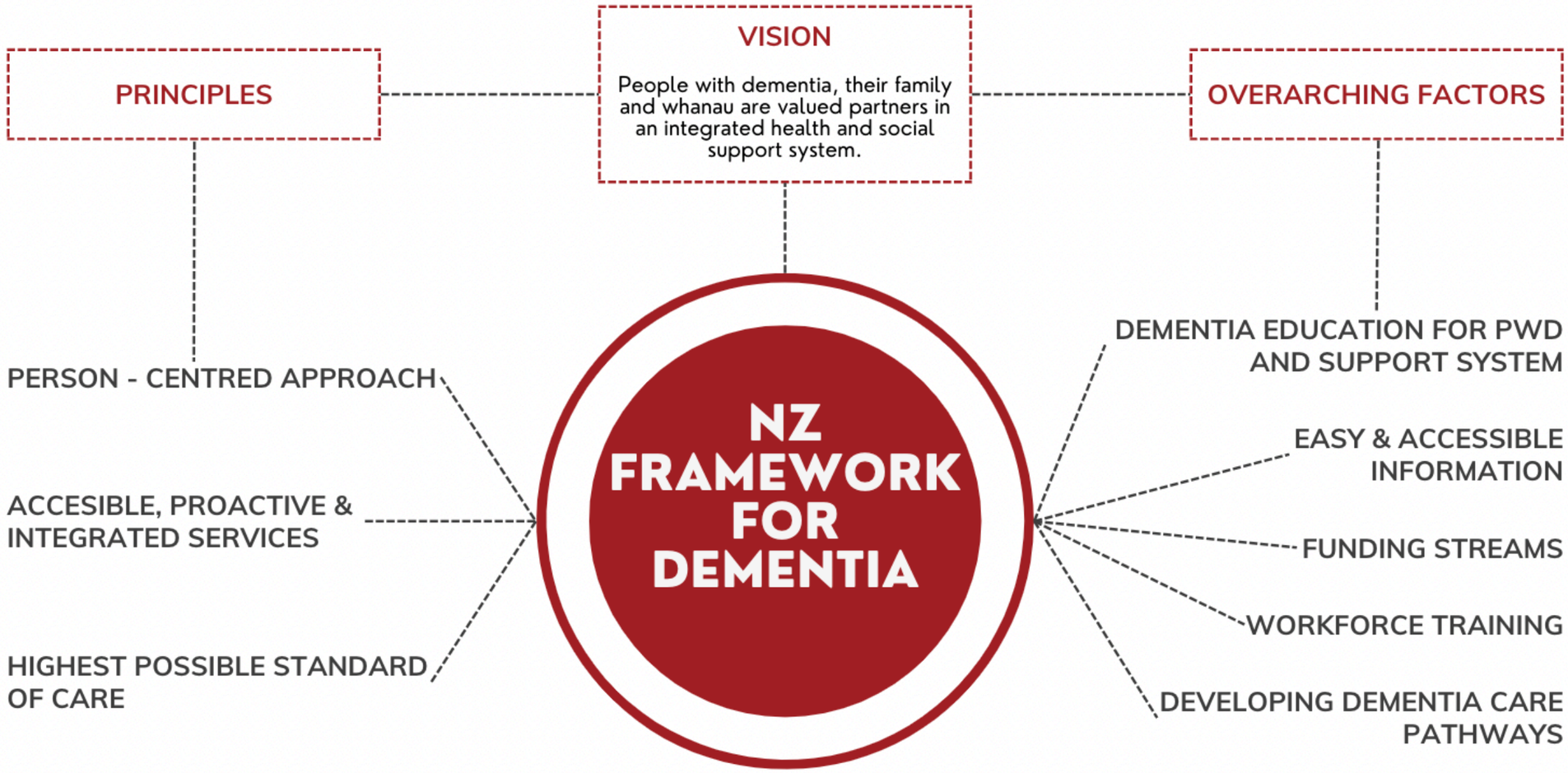


Figure 10
New Zealand Framework for dementia
(adapted from Ministry of Health, 2013)

NZ DEMENTIA CARE FRAMEWORK

The number of older New Zealanders continues to grow, inevitably increasing the number of cases of health care problems amongst the elderly population that require intricate support networks (Ministry of Health, 2013).

Dementia is one of the primary health challenges, with 70,000 Kiwis affected by it and numbers set to reach 170,000 by 2050 (Alzheimers New Zealand, 2020). In response to this national health challenge, the New Zealand Ministry of Health has published a manifesto of their framework that seeks to foreground and maximise the wellbeing of PwD (refer to figure 10). They have acknowledged that overseas previous models of care have moved from medical to an approach that seeks to integrate health and social aspects of care. “In New Zealand, although we have started moving in this direction, we still have a long way to go.”(Ministry of Health, 2013)

The framework confronts the historical misconceptions and stigma that have marginalised PwD, resulting in neglect in conversations and decisions regarding appropriate support and care. They propose fostering partnerships between PwD, their support systems, and health and service providers to address this. This collaborative effort embodies the person-centred model, enabling a voice in PwD, and establishing an integrated holistic approach to dementia care pathways.

Although the NZ Ministry of Health has provided a consistent, well-resourced outline for ethical dementia care practices, it intentionally avoids strict descriptions to become easily adaptable by different health boards and service providers, creating a flexible approach to achieving common goals in unity. The examples provided are illustrative and not exhaustive. It is also recognised that achieving these collective goals will require long-term consistent efforts and patience within different healthcare sectors to see results.

DEMENTIA AND PERSONHOOD

Figure 11
Core, care and cure theory (adapted from Hall, 2014)

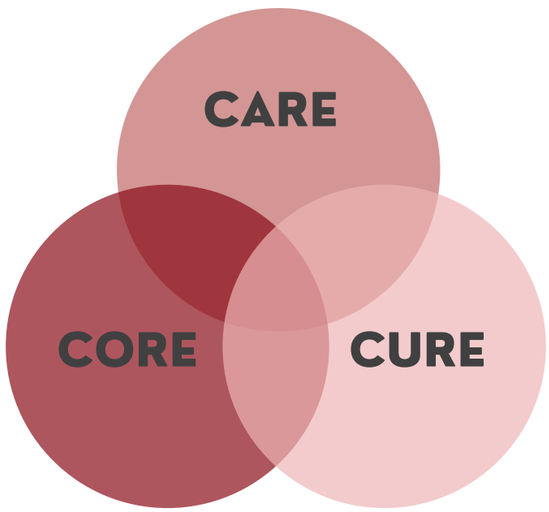


Figure 11 shows all three dimensions interact and should be viewed as dynamic - they constantly change in size and correspond.

PERSON-CENTRED MODEL:

"Having dementia does not, in itself, entail a loss of personhood" (T. Kitwood, 1997)

The model of 'person-centred care' was first explored in the works of Carl Rogers (Rogers, 1961), which laid the foundations for a more ethical and holistic approach to different forms of caregiving. To grasp the significance of this shift in thinking, it is essential to analyse the historic medical model, which focuses entirely on the pharmaceutical side of dementia. This paradigm offered little guidance regarding care, as it was shadowed by the need to find a cure, leaving the caring process untheorised. This philosophy led to dangerous, narrow thinking, and it implied that the lives of PwD would not improve unless a medical breakthrough occurred (T. Kitwood, 1997).

The person-centred care approach contrasts this thinking completely, as the principles revolve around the importance of framing the person in the centre of their care environment (Mitchell & Agnelli, 2015). Individuals gain independence in their realm of care through mutually respectful relationships with caregivers and when they are given involvement in decision-making. This creates a culture of ageing that becomes humane and ethical whilst reimbursing the beauty of ageing by creating meaningful and satisfying lives.

Tom Kitwood (1997) became an ambassador of this approach and tied this thinking into his pioneering work in dementia research. His text, 'dementia reconsidered', provides a theoretical basis for implementing this care model in the shift of care paradigms and the planning philosophies around dementia.

PERSONHOOD:

The concept of personhood is complex to define in its entirety, but in simple terms, it refers to the broad attributes that form the makeup of a person (Mitchell & Agnelli, 2015). This was introduced to the discussion of dementia by Kitwood (1997). His definition of personhood mentions respect, recognition, and trust, theorising that these elements increase one's sense of personhood and, in turn, elevate wellbeing. Alternatively, if these elements diminish around a person, the opposite occurs, leading to 'illbeing' (T. Kitwood, 1997).

It is necessary to understand that a constant state of wellbeing is unsustainable as it is unrealistic for any individual, regardless of their health status (Jones & Mitchell, 2015). Although it is speculated that PwD experience states of ill-being more frequently due to their personhood being undermined. Illbeing is often linked to living in care facilities, as personhood has not been supported adequately in these environments due to a lack of understanding of the individual needs of the PwD.

Kitwood (1997) identified five essential psychological needs to satisfy for dementia patients: Comfort, Inclusion, Attachment, Occupation and Identity. These needs are vital for everyone's overall wellbeing. However, they are particularly essential to implement into the care of PwD because of their reduced ability to fulfil these demands independently. PwD must turn to their temporal and physical environment for necessary support, where the integration of person-centred care becomes vital. With the implementation of this model, it becomes easier to maintain and enhance an individual's personhood, creating environments that promote independence, autonomy, and wellbeing.

To emphasise the importance of Kitwoods theoretical framework, his work is still considered relevant in a contemporary context. It has been deemed as a favoured starting point for practising clinicians in various healthcare fields (Mitchell & Agnelli, 2015).

WHY SO IMPORTANT?:

Planning philosophies such as person-centred care and personhood are important in revitalising dementia care facilities in an architectural context. Architecture is crucial in designing spaces that encourage environments to be more supportive and cooperative for PwD. It has the ability and responsibility to create spaces that fuel personhood and, therefore, the wellbeing, autonomy, and independence of individuals, creating a sense of fulfilment.

Person-centred care can be approached through multiple design strategies, such as biophilia, lighting, scale and implementing familiar surroundings to reconcile autonomy with comfort and security. Addressing the psychological needs introduced by Kitwood (1997), such as inclusion and identity through architectural design, sets a prevailing precedent standard of care for the entire healthcare industry. Incorporating innovative design strategies will see an advance in ethical responsibility for architecture in different healthcare sectors.

Architectural interventions:

PRIVATE & PUBLIC SPACES

Having a variety of public and private spaces enhances personhood, as it provides opportunity and choice. Residents are able to return to their private and familiar spaces for comfort and reflection, which ensures a sense of identity is maintained. But the option to feel included within public areas is also vital for wellbeing and social interaction.

SPACES WHERE LOVED ONES CAN SPEND TIME

As seen in figure 12, the social environment is a large contributing factor to increase the quality of life for PwD. Creating specific spaces where loved ones can spend time fosters meaningful connections between them and the PwD. Traditional dementia care settings can often be hostile and not supportive of purposeful interactions. By creating spaces dedicated to enhancing this, it will increase not only the PwD wellbeing but also their family's.

GROUP ACTIVITIES

Creating spaces for group activities fosters a sense of belonging and enhances physical well-being. These activities help participants feel included and reduce feelings of loneliness and anxiety, which are often associated with dementia.

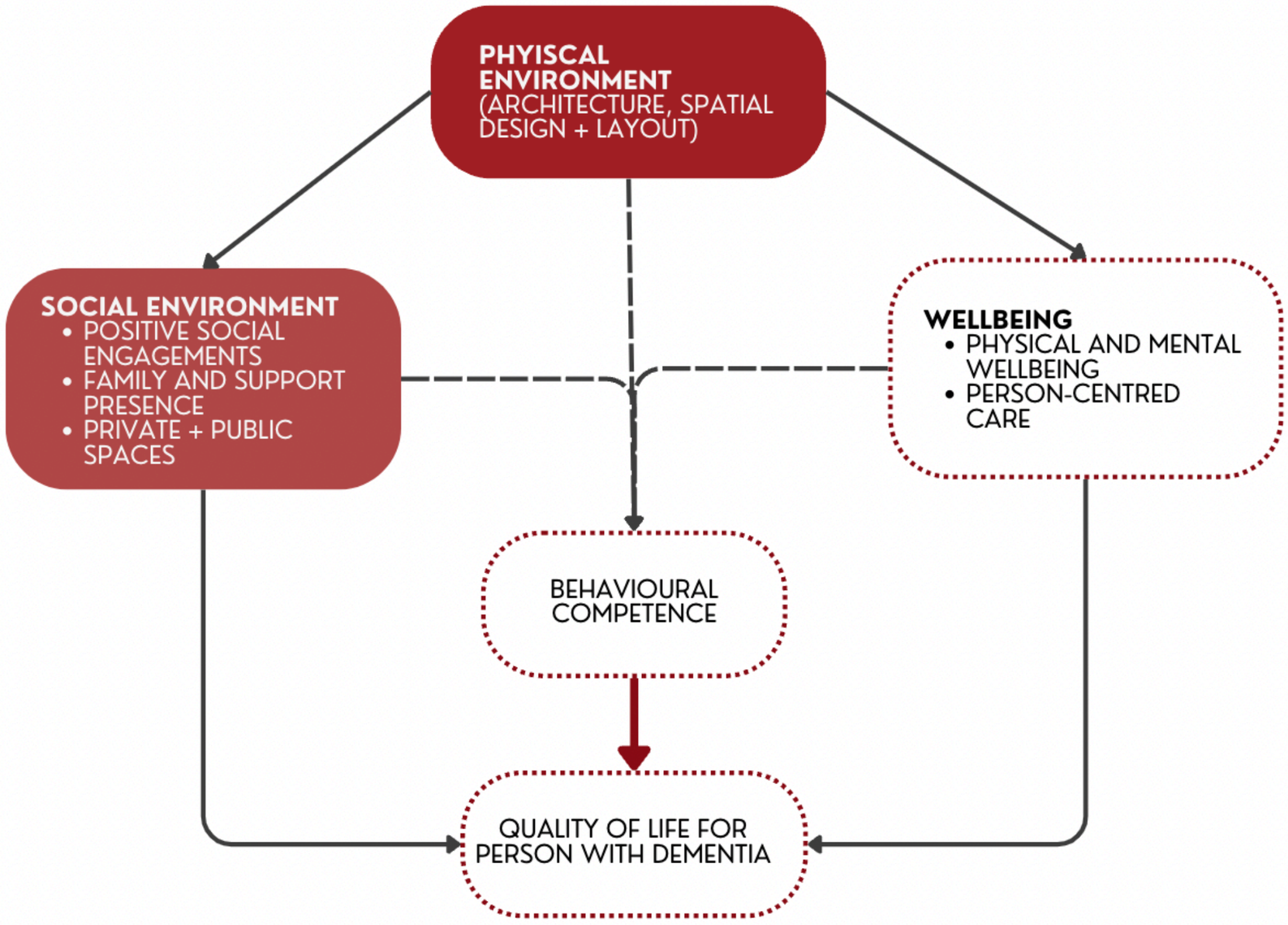


Figure 12
Social and physical environment and quality of life for person with dementia (adapted from Ferdous, 2019)

DEMENTIA AND ARCHITECTURE

Understanding dementia on a contextual level requires acknowledging its historical position to grasp the influences that shape current practices in aged care facilities. In the past, a diagnosis of dementia would often see patients admitted to psychiatric institutions (Kitwood, 1997), as the word ‘dementia’ itself was interpreted as “a complete loss of self”. Treatment options were only recognised to a medical extent, and ‘care’ focused more on dependency and not the comfort of the individual. Despite the more clinical and medical models implemented in the past, contemporary approaches now attempt to prioritise the individual by adopting a ‘person-centred’ environment. It is vital to revolutionise the traditional nursing home ‘medical model’ structure by shifting the focus from system dominance to client focus.

Dementia is emerging as a health issue, affecting multiple scales of society. The challenging and disorienting nature of dementia for both the affected individuals and their surrounding support persons often becomes overwhelming due to the lack of understanding and knowledge surrounding this condition. This commonly results in PwD becoming institutionalised in LTC (long-term care) facilities (Cadieux et al., 2013). These current healthcare systems have limited resources and cannot reconcile with future devastating impacts that the rising dementia cases contribute (Cerejeira & Mukaetova-Ladinska, 2007).

While countries and their health care ministries have engaged ethical thinking to provide frameworks that act as guidelines for holistic approaches to dementia care, this is only seen as theoretical and still has a long way to go before it is adapted within different sectors and scales of the evolving dementia care. Architecture must take responsibility for engaging in this thinking and shaping environments that foster supportive and caring communities. Architects play a pivotal role in reconstructing this public health crisis to provide stability and connection for persons whose sense of self is diminishing.

It is widely acknowledged that human behaviour corresponds to the environment (Saarloos et al., 2009). This is particularly impactful for people with cognitive impairments, as even the slightest changes in their surroundings can profoundly impact their perception due to their reduced capacity to control their environment (Christenson & Taira, 2014). In order to become a solvent in the problem of sustainable care facilities, architecture must hold itself accountable for developing infrastructure that responds to the mental and physical capabilities of PwD. To tackle this challenge, it is vital to focus on the foundation of this topic, which is knowledge. Knowledge comes from understanding the factors that contribute to dementia and understanding how PwD perceives space.

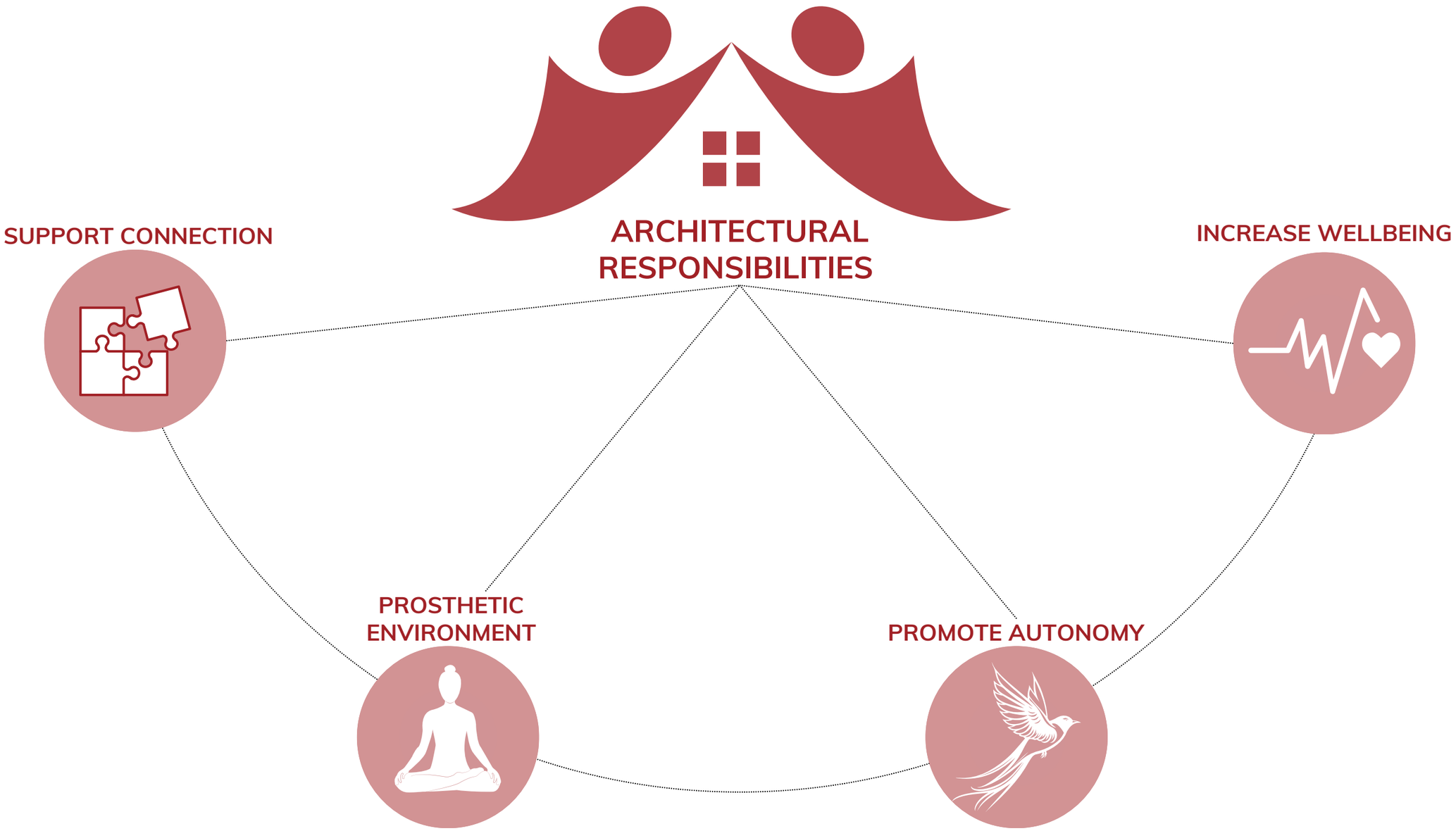


Figure 13
Architectural responsibilities in dementia care

Figure 14
Lawton's view on quality of life (adapted from Lawton, 1983)

DEMENTIA AND SPATIAL PERCEPTION

According to Lawton (1983), a psychologist specialising in the social and psychological aspects of ageing, four key components contribute to quality of life: Psychological wellbeing, behavioural competence, environmental quality and perceived quality of life (see figure 14).

The progressive brain degeneration that Alzheimer's creates diminishes behavioural competence and perceived quality of life. However, caregivers and architecture can positively influence the other two principles by creating supportive temporal and physical environments that foster conditions that promote psychological wellbeing (Volicer, 2000; Schwarz & Rodiek, 2007).

To create supportive spaces that act as prosthetic, it is essential to gain insight into how PwD perceive space and what architectural strategies can alleviate the symptoms through design.

WAYFINDING FOR WANDERING:

A significant concerning behaviour in PwD is wandering or ‘exit-seeking’, often resulting in getting lost or disoriented in unfamiliar environments (Neubauer et al., 2018). Wandering has been defined as “a syndrome of dementia-related locomotion behaviour” (Nelson & Algase, 2007), which is characterised by repetitive and disorientated movement. The severity of wandering can be influenced by various factors, including rhythm disturbances (Satlin et al., 1995), lack of visual perception, anxiety, physical and social environments or disorientation (Neubauer et al., 2018).

Lucero (2002) identified two types of dementia wanderers: the Elopers and the Runaways. Elopers typically do not show anxiety about being in a care facility and exhibit calm behaviour. They perceive themselves as guests in the facility and tend to get upset only when they become aware that they cannot leave. Their desire to leave is often the result of an agenda from their past, such as work duties or responsibilities. In contrast to elopers, runaways have a clearer understanding of their situation, often being angry and anxious. They frequently express that they are being held against their own will. They often become emotional and raise concerns about needing to escape due to worries about their loved ones.

Architectural interventions are critical to discourage exit-seeking and promote productive wandering. Since long-term care facilities exhibit larger spatial arrangements, they must be designed for simple wayfinding (Wiener & Pazzaglia, 2021). Good wayfinding strategies and route planning are derived from the connection between the PwD and their surrounding spatial factors. The goal is to create residential buildings with simple layouts, recognisable landmarking strategies and good visual access (Marquardt & Schmieg, 2009; Ishikawa & Nakamura, 2012). The most successful layouts for care environments are family home-scaled units that enable PwD to visually locate necessities from any location in the facility. This design approach helps reduce spatial disorientation and minimises the need for spatial memory, which makes wayfinding decisions obvious (Marquardt & Schmieg, 2009).

ARCHITECTURAL INTERVENTIONS:

FAMILIAR/ HOMELIKE ENVIRONMENTS:
Having the residential areas resemble the scale of familiar/ home environments, will help with way finding, as this enhances comfort and orientation. When living spaces reflect the size and layout of their previous homes, PwD will be able to navigate more independently and confidently.

CREATE TIME BASED ROUTINES:
According to Lucero (2002), the most common times PwD exit-seek is after breakfast, lunch or dinner. Which is often triggered by memories of past routines. To reduce this behaviour, architectural interventions and spaces that create new routines can be implemented. These spaces could provide activities that promote engagement and structure.

CENTRALITY + TIME FOR WAYFINDING:
Using centrality in terms of spatial layout to help with wayfinding is effective, as it creates a point of orientation and reference. This is due to cognitive mapping, as it is a landmark that becomes recognisable for PwD.

VISUAL DISTURBANCE:

Architectural interventions:

BIOPHILIA - CONNECTION TO NATURE
Including natural elements, such as natural light and plants, can enhance visual appeal and also reduce stress and anxiety. Access and views to nature provide stimuli that can calm and improve wellbeing. Using light coloured natural wall textures also help enhance the feeling of spaciousness. The use of wood flooring that aligns with the direction of movement of the space also enhances wayfinding.

SENSORY STIMULATION DESIGN
Incorporating sensory elements in design such as colours, textures and patterns engages the senses of PwD which can aid in providing visual cues that aid in orientation and recognition of objects.

INCLUSIVE DESIGN
It's vital to create environments that address the diverse needs of all users. This includes making sure that materiality, layout and spatial arrangement choices are made that will include individuals with varying levels of visual and cognitive capability.

Research indicates that PwD experience a variety of visual impairments that accompany cognitive decline (BASSI et al., 1993; Wiener & Pazzaglia, 2021).

These challenges include difficulties with depth and spatial perception and reduced sensitivity to contrast and colours (Wiener & Pazzaglia, 2021). In addition to visual problems already associated with ageing alone, PwD faces declining abilities in higher-level visual processing, which affects the ability to recognise objects, read, and localise space (Bowen et al., 2016). Studies show that due to the reduction in contrast sensitivity, colours must be much more pronounced for better perception (BASSI et al., 1993). The sense of space also becomes more dependent on the brightness of colours, and lighter-coloured walls can enhance the feeling of spaciousness (Tofle, 2004). The cognitive and visual decline often also leads to the misperception and misidentification of objects, causing individuals to confuse one visual with another. A dark coloured doormat could be misinterpreted as a hole in the floor, potentially triggering hallucinations (Alzheimer's Society, 2022).

To create prosthetic care environments, it is essential to maintain adequate lighting and appropriate colour selections. Enhanced lighting and contrasting colours facilitate wayfinding and orientation (Wiener & Pazzaglia, 2021). Bright colours may also contribute to memory and cognitive mapping through object recalling, making them essential features for landmarking (Cernin et al., 2003).

The text 'Dementia Care: A Practical Photographic Guide' by Grealy (2008) offers a guideline that outlines various strategies to mitigate visual distress from dementia. These include reducing the contrast between floorings and joints so that it does not trigger visual distress for PwD, who may perceive these as unsafe. He also recommends reducing highly polished surfaces as they can also appear unsafe. Using different colours for the wall, door, and floor is also vital to help distinguish between each surface. Grealy (2008) emphasises using mixed light sources to improve lighting in the facility and suggests the careful placement of objects to avoid hindering visual clarity.

Figure 15
Pinehaven Cottage hallway

The use of similar colour palletes for the wall and door can reduce orientation and object recognition (Grealy et al., 2008)

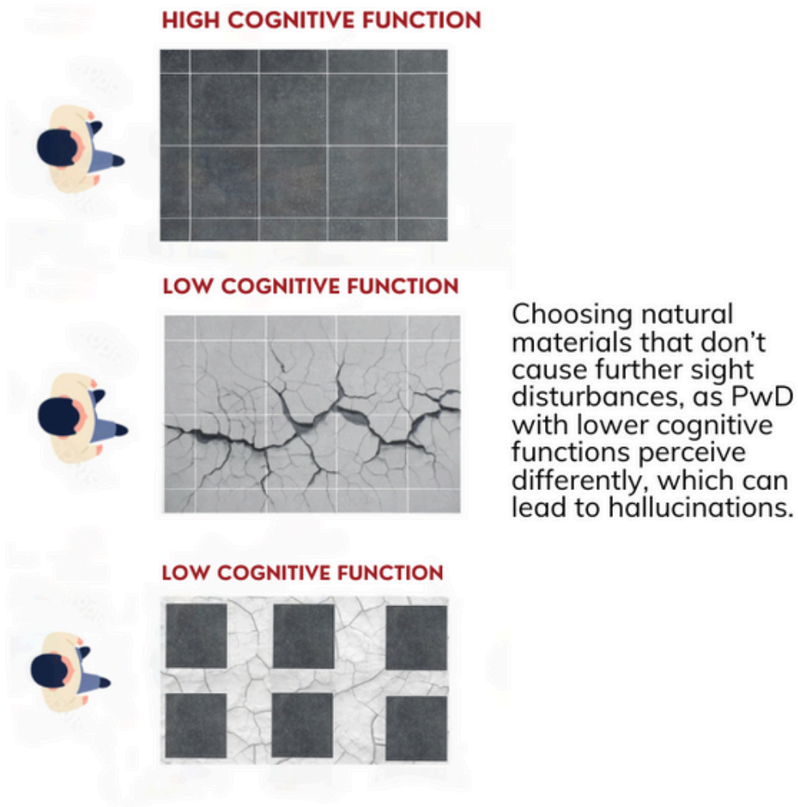
The colourful art piece on the wall, helps with cognitive mapping through object recollection. This helps with orientation, as it becomes an identifying landmark.

Adding a wall skirting that contrasts the colour of the wall, would make it easier to discern between wall and floor

The wood flooring is placed in the same direction as the movement of the hallway, this emphasises direction and helps with navigation of the corridor.

Figure 16
Analyses of Pinehaven Cottage hallway

Figure 17
Material perception with various cognitive levels



Choosing natural materials that don't cause further sight disturbances, as PwD with lower cognitive functions perceive differently, which can lead to hallucinations.

Seats being different colours aids in object recognition, they will be able to discern between different seats.

Figure 18
Colour coded seating for object recognition

Mirrors in the room can increase hallucinations due to visuo-perceptual difficulties

Figure 19
Negative effects of mirrors in dementia care settings

SENSORY EXPERIENCE:

From birth, humans can understand the relationship between themselves and their environment through their senses (Tuan, 1977). However, a problem with modern urban environments is that they are primarily designed with visual stimulation in mind (Tuan, 1977). This focus limits the sensory experience of a space, which may fail at engaging persons and diminishing their relationship to the environment.

This is especially detrimental for PwD, as spatial environments with diminished sensory experiences can intensify their challenges. The cognitive decline that PwD encounters, alongside the natural effects of ageing, alters perception and interaction with the surrounding environment (Christenson & Taira, 2014). Individuals may walk slower and struggle with hearing and vision or memory loss. These changes all require the individual to turn to their environment for support.

SMELL:

"Our ability to smell is an integral part of knowing ourselves, our connection with others and our environment. People who have lost their sense of smell report intense feelings of depression and disconnection from the world around them." (Barbara & Perliss, 2006)

From an anthropological view, early humans relied on their sense of smell to find and hunt food, using their olfactory senses to navigate and perceive their environment (Erwine, 2017). Scent also influenced the development of culture, trade routes and language through the trade of spices, herbs, and perfumes (Ackerman, 1994). In the past, smell was a dominant sense that evoked or shaped a certain atmosphere, whether this was spiritual, establishing individuality through perfume or exploring healing factors through aromatherapy (Ang, 2018).
In a contemporary context, scent is mainly implemented as pleasure through perfumes and aromatherapy but is often expelled in the built environment. Kitchens, for example, used to be filled with aromas of fresh cooking but now exhibit extractor fans to remove any scents. Architecture must rekindle the relationship towards smells, as it is a powerful sense that can benefit various psychological and physical disorders (Sowndhararajan & Kim, 2016).

Smell becomes a 'universal language' in the sense that it has the power to evoke memories and emotions that every individual can understand. Odour-induced memories are exceptionally emotional due to how they phenomenologically unfold (Engen, 1991). Smell is a powerful tool to integrate into built environments for PwD, as it evokes memories, which promotes cognitive functions, and creates a close relationship between the experiencer and architecture.

Figure 20
Demonstration of scent sketch

SENSORY ROOMS:

When designing environments for PwD, it is necessary to consider the sensory changes they experience (Christenson & Taira, 2014). Christenson and Taira (2014) mention that if PwD are unresponsive to the average amount of stimulation, increased stimulus should be implemented since sensory deprivation can lead to concentration loss, hallucinations and disorientation.

A concept to mitigate this is the ‘Snoezelen room’, a design intervention that has received much recognition amongst care staff for individuals with learning disabilities and people with dementia (Baker et al., 1997). This idea focuses on providing multisensory experiences for PwD within a specially designed Snoezelen room, where the individuals are engaged through vision, smell, sound, and touch. The variety of unstructured sensory experiences allows the person interacting to be present, even if their memory prevents them from forming connections to past events (Baker et al., 1997). Moffat et al. (1993) conducted research with 12 PwD and found that the participants experienced increased feelings of happiness in the short term. They also noticed an increase in relationship and connectivity between the caregiver and participant, with anxiety and sadness being decreased.

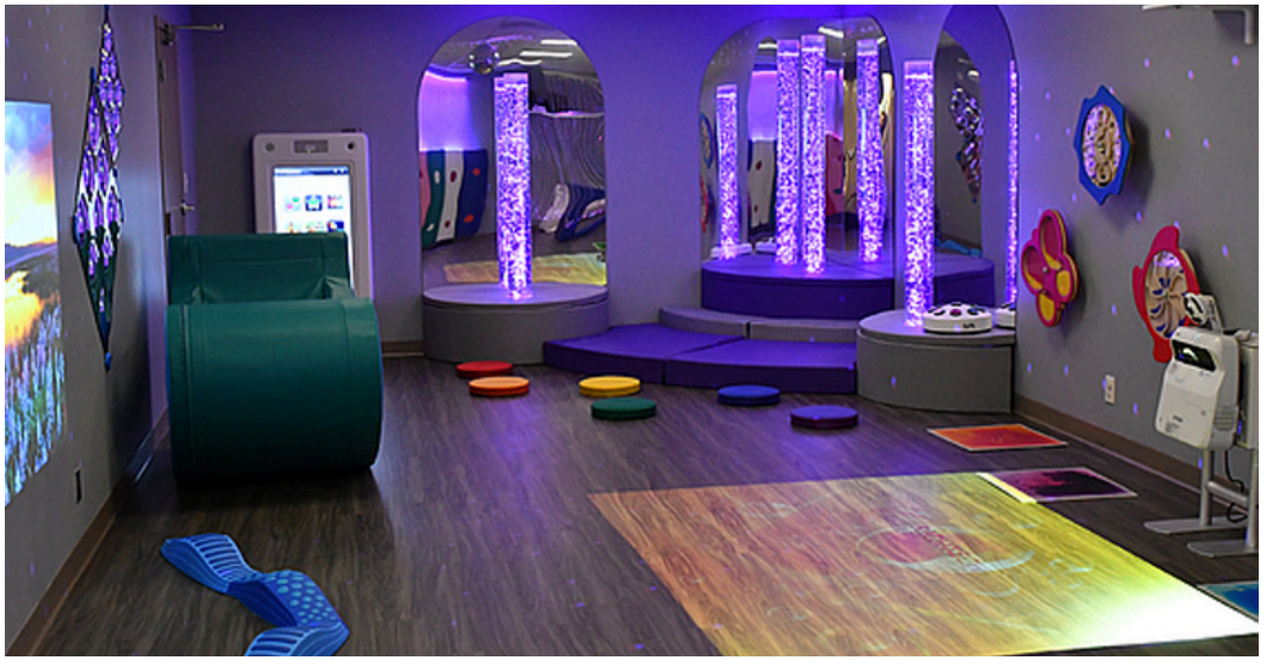


Figure 21
Snoezelen sensory room for persons with dementia (Beckmann, 2020)

Architectural interventions:

SENSORY STIMULATION DESIGN:
It’s vital to include sensory stimulation design above the means of visual stimulation. This is because PwD experience spaces differently, having to rely on all senses to better engage and interact with place.

BIOPHILIA:
Supplying a connection to nature can be experienced through a visual, olfactory, auditory or tactile sense. This multi-sensory approach creates an enriched and more meaningful experience for the PwD.

HEALING GARDENS

Alzheimer's disease is recognised by a specific aetiology that initiates a progressive degenerative process in cognitive functions. This decline can affect crucial brain regions such as the hippocampus, amygdala, and frontal lobe, altering the capability for memory retrieval, emotional stability and executive functions (Thompson & Travlou, 2007). However, the integration of 'healing gardens' into the care environment for PwD has been theorised to have multiple psychological and physical advantages to these regions of the brain. These benefits include hormonal balance from sun exposure, a feeling of independence, fostering social interactions and promoting behavioural stability (Zeisel, 2007). Research also indicates that direct exposure and contact with nature benefits diverse groups of people across different cultures. This includes hospital patients, children with autism, prisoners, and PwD (Kaplan & Kaplan, 1989; Tyson, 1998).

While there is evidence and endorsement from case studies that indicate the benefits of healing gardens for dementia patients, it is important to acknowledge that there is currently a limited scientific understanding towards how PwD respond to specific environmental conditions and features and whether planned activities benefit the patients (Schwarz & Rodiek, 2007).

Numerous design factors contribute to the success of a healing garden, including landmarking, indoor/ outdoor unity, learning support, and natural mapping techniques (Zeisel, 2007). These design elements become constructs that cater to and relate to the unique way PwD interact with the world. The incorporation of natural mapping, as outlined by Don Norman (2013), is an important framework to implement, as it offers a way-finding strategy that circumvents the use of cognitive mapping; a function that often deteriorates in dementia patients. Natural mapping aligns the relationship between controls and their corresponding actions, resulting in a clear and intuitive spatial layout and temporal contiguity (Norman, 2013). A well-designed healing garden presents essential sequences and spatial cues in an obvious and intuitive manner to create a self-organising environment that ensures the residents can navigate the space without having to organise themselves mentally.

DEMENTIA AND ENVIRONMENTS

THE NON-BUILT ENVIRONMENT

Kitwood (1997) recognised that the decline in cognitive functions impact patterns of interactions that PwD have with space, it causes changes in how they perceive and respond to their immediate environment.
The word ‘environment’ in dementia care goes beyond the physical environment that encompasses the individuals. Grealy (2008) suggests that there are two contributing factors that enhance the quality of life for PwD; the physical and the temporal environment. The physical environment is defined by Grealy as the built surroundings and all that this encompasses, such as choice of materials, design, spatiality, lighting and colours. Whereas the temporal environment is the impact that social settings have on space, mainly defined by the way an atmosphere is created through humans. As illustrated in figure 24, both ‘environments’ impact PwD greatly, as they draw on cognitive functions to determine how they respond to their surroundings.

These two dimensions of ‘environments’ have up until now been living in the shadows of the medical approach to dementia, which saw medicines and drugs trying to solve the health crisis. It is only contemporary thinking that sees the temporal and physical environment as ‘prosthetic’. All dimensions that make up space need to be considered when designing for PwD, to increase the comfort and support that creates optimal autonomy in elders.

Figure 22
Visualisation of an outdoor area for a dementia care facility

Figure 23
Visualisation of an outdoor area for a dementia care facility 2

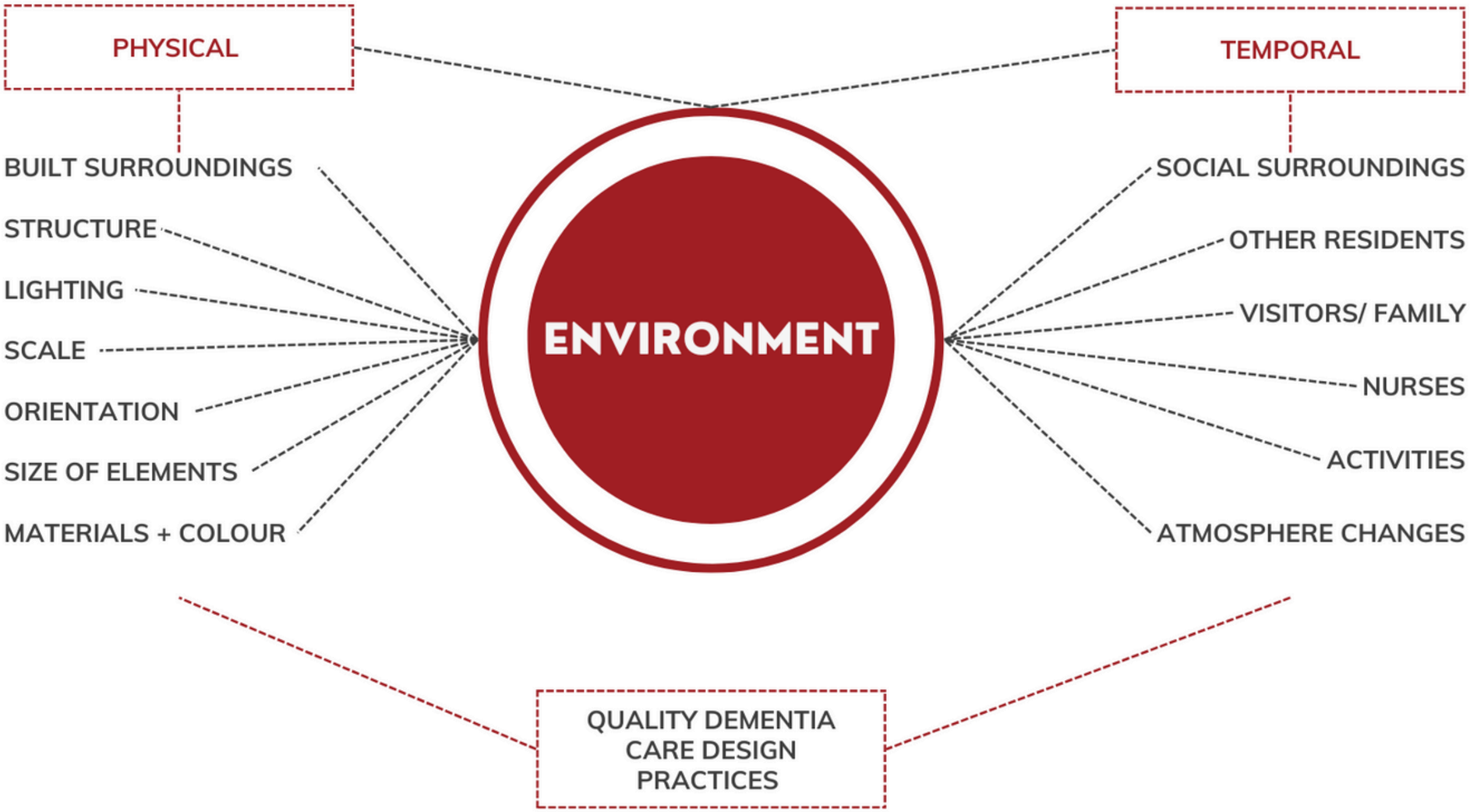


Figure 24
The physical and temporal environment and quality of dementia care (adapted from Grealy et al., 2008)

WHY SO IMPORTANT?:

Historical perspectives have perceived environments as social constructions that create spaces that separate people into different distinct groups. The diversity that is accompanied with different types of spaces creates different experiences and connections for individuals, which can lead to feelings either of belonging and community or exclusivity and isolation (Allen et al., 2021).
PwD are amongst the groups that become excluded in most communities, due to the lack of design adaptation available to support the progressive nature of the condition. Architecture must adapt environments to embrace larger groups of people, regardless of cognitive or physical disabilities.

Engaging architecture as part of the solution to articulate design strategies that enhance ethics within dementia care holds significant promise. It becomes a vital component in the current health crises by restructuring health care facilities to decentralise clinical environments that don't successfully respond to the actual needs of PwD.

Architecture becomes a part of a greater picture that seeks for a culture of dignity and respect to generate a sustainable universal design. By integrating ethical design practices into dementia care, it underlines the necessity to create environments that engage and assist all individuals, regardless of limitations in their cognitive and physical ability. This futures thinking is vital to integrate not only in the health sector, but all other areas of design, to encourage sensitive practices that promote equity within communities.

CURRENT THEORETICAL FRAMEWORKS:

The theoretical frameworks that shape a lot of today's thinking to encourage ethical methodologies in dementia care leverage on thinking from environmental psychology in correspondence to ageing, which has evolved from the early 1970s. These studies found that there are indeed positive relationships between environments and the sustaining of wellbeing, autonomy, and behaviour in elderly (Day et al., 2000) (Tilly & Reed, 2008).

‘The congruence model of person-environment interaction’ (Kahana, 1982) proposed that environments affect the complex and dynamic process of behaviour, defining it as a person-environment model. ‘Environment’ in this context is predominantly contextualised in a social aspect, focusing more on the people that make up a space rather than the physical regard. Kahana (1982) encouraged the thinking that to understand one's behaviour, the situational and social variants of the surrounding environment need to be taken into account. This framework was also drawn on more recently by Grealy (2008), suggesting that the ‘temporal environment’, which is made up of the people in it, contributes largely to the wellbeing of elderly. This is important groundwork for architects to utilise in planning philosophies for long-term care facilities to create environments that are sensitive and resilient to the cognitive difficulties PwD experience. Designing the ‘temporal environment’ seems challenging but can be manipulated through different design strategies (Grealy, 2008).

‘Transactional model of stress and coping’ (Lazarus & Folkman, 1984)
This theoretical framework is not specific to dementia, but it is still necessary to understand how stressors in one's surroundings impact PwD. In this framework, the environment is again framed in a ‘temporal’ context. It is a transactional model that sees the dynamic, fluid, and mutual relationship between persons and the environment. It aims to comprehend the complexity of the process around stress and environments and how people can adapt and cope. This is very vital thinking in the dementia care realm, as there are a variety of different stress factors that affect PwD daily. The move to a new environment from their homes in itself is a huge stress factor that creates behavioural change and adaptations. The stress and coping model recognises two types of appraisals to stress: Primary (evaluating what is at stake) and secondary (sourcing coping methods).

HISTORY OF CARE IN NZ

Between 1870 and 1900, New Zealand saw a tenfold increase of elderly over the age of 65 (Davidson, 2022). This increase also saw a noticeable rise in elderly people unable to support themselves, because of various physical or mental health issues (Lessells, 2015). As a solution, charitable aid boards introduced the ‘Benevolent institutions’, which were used as support systems for this demographic and orphans.
By 1900, the number of Benevolent institutions increased from six in 1880 to nineteen, with twelve of these institutions being specifically dedicated to the elderly (Davidson, 2022). These institutions were described as providing harsh environments for inhabitants, as they lived under uncomfortable conditions and strict regulations (Lessells, 2015). Although these institutions provided care for elderly, persons that exhibited severe dementia were sent to mental institutions instead (Nancy Swarbrick, 2011).

Figure 25
Otago Benevolent Institution, 1890s (Williams, 1890)

LONG TERM CARE FACILITIES

The contemporary solution to dementia care is exhibited through long-term care facilities. This is for PwD that require daily assistance and are unable to continue living at home; long term care facilities enable them to live in safe environments, with 24 hour staff that can attend to them when needed (Roberts & Shehadeh, 2021). This can be expressed in different forms and for different stages of dementia. However a majority of long-term care facilities still present a medical model of care, which in design can be seen as hospital-like environments with hostile atmospheres. This can lead to negative outcomes, as they are disconnected from their previous home environment such as their family, community and daily activity and routines (Roberts & Shehadeh, 2021).

These institutional environments are often large-scale facilities that are typically confining and lack connection to outdoor spaces. Whilst it is essential to provide care that targets physical and mental wellbeing, many dementia care settings are associated with heightened anxiety and depression (Roberts & Shehadeh, 2021). To mitigate this, a paradigm shift is required that prioritises the person in a current system dominated care field. This thesis explores twelve strategies that aim to provide a new transformative planning strategy for more ethical dementia care.

PROPOSED FRAMEWORK

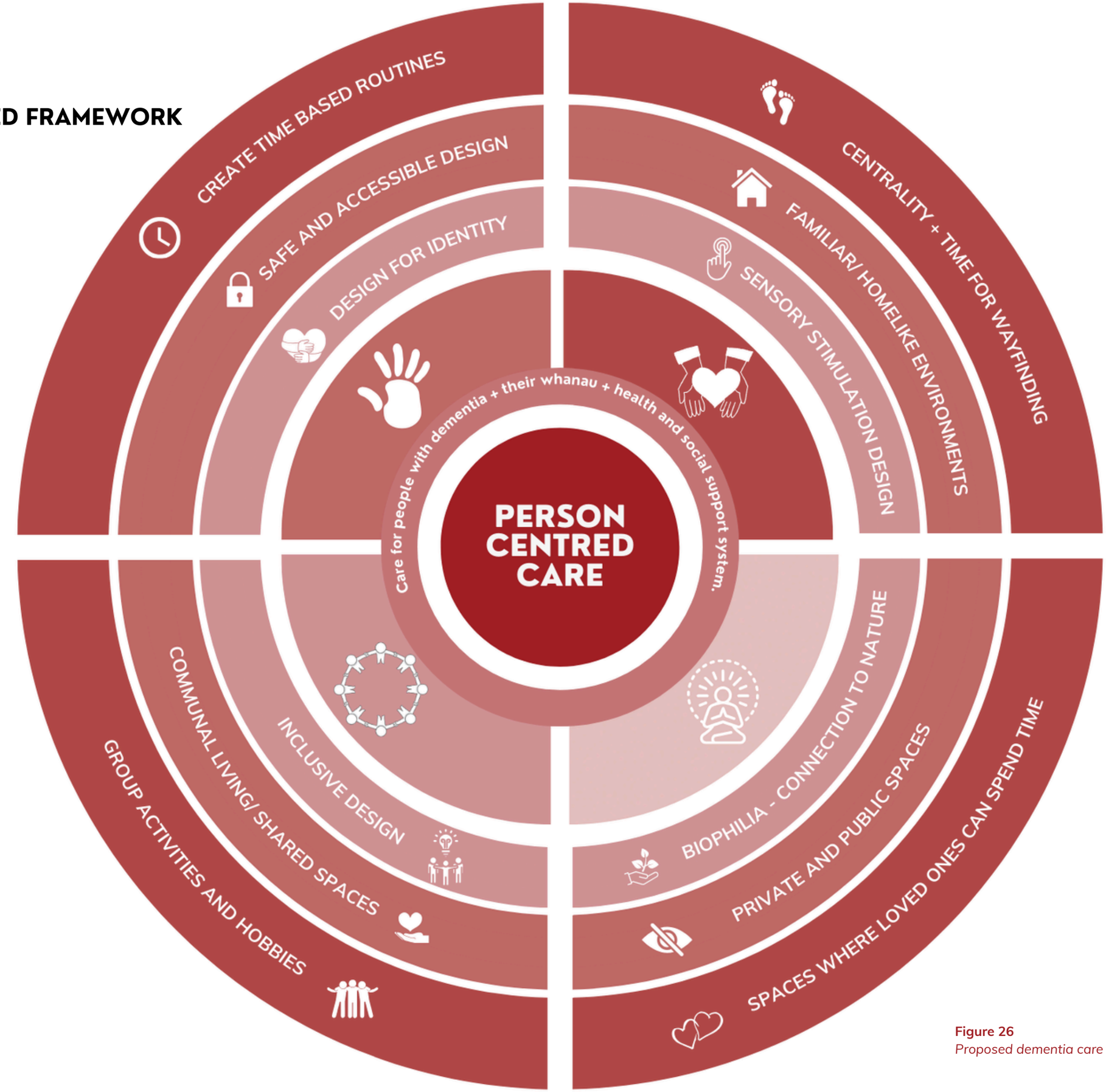


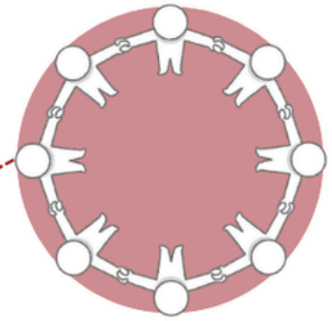
Figure 26
Proposed dementia care framework

How can architectural initiatives be leveraged to reshape traditional nursing homes and generate strategies that enhance Cognitive Functionality and Emotional Wellness?

WELLBEING

- BIOPHILIA - CONNECTION TO NATURE
- PRIVATE AND PUBLIC SPACES
- SPACES WHERE LOVED ONES CAN SPEND TIME

COMMUNITY



- INCLUSIVE DESIGN
- COMMUNAL LIVING/ SHARED SPACES
- GROUP ACTIVITIES AND HOBBIES

PERSONHOOD

- DESIGN FOR IDENTITY
- SAFE AND ACCESSIBLE DESIGN
- CREATE TIME BASED ROUTINES

AUTONOMY

- SENSORY STIMULATION DESIGN
- CENTRALITY + TIME FOR WAYFINDING
- FAMILIAR/ HOMELIKE ENVIRONMENTS

BIOPHILIA - CONNECTION TO NATURE

The quality of the enveloping environments impacts behaviour, mood and overall well-being (Peters & Verderber, 2021). This is especially relevant for PwD, as this condition diminishes physical and cognitive functions, making them more reliant on their environments for support. Long-term care facilities must therefore be designed to increase occupants' wellbeing and quality for this stage of life.

A strategy that complements this theory is Biophilia, which is the innate attraction that humans have towards nature and the 'more than human' realm (Peters & Verderber, 2021). In contemporary architectural research there is a growing focus on the relationship of nature and people within the urban realm, which is supported by an increase of evidence-based research (Yin et al., 2018).

To conceptualise Biophilia and the ways it increases human wellbeing Browning et al. (2014) collated a report "14 patterns of Biophilic design" as seen in the diagram below. This report includes evidence, which shows that these 'patterns' contribute to enhancing cognitive function and performance, moods and emotions and overall physiology (Peters & Verderber, 2021). Biophilia is an important framework to integrate into the care environment of dementia facilities, due to its benefits for occupants.

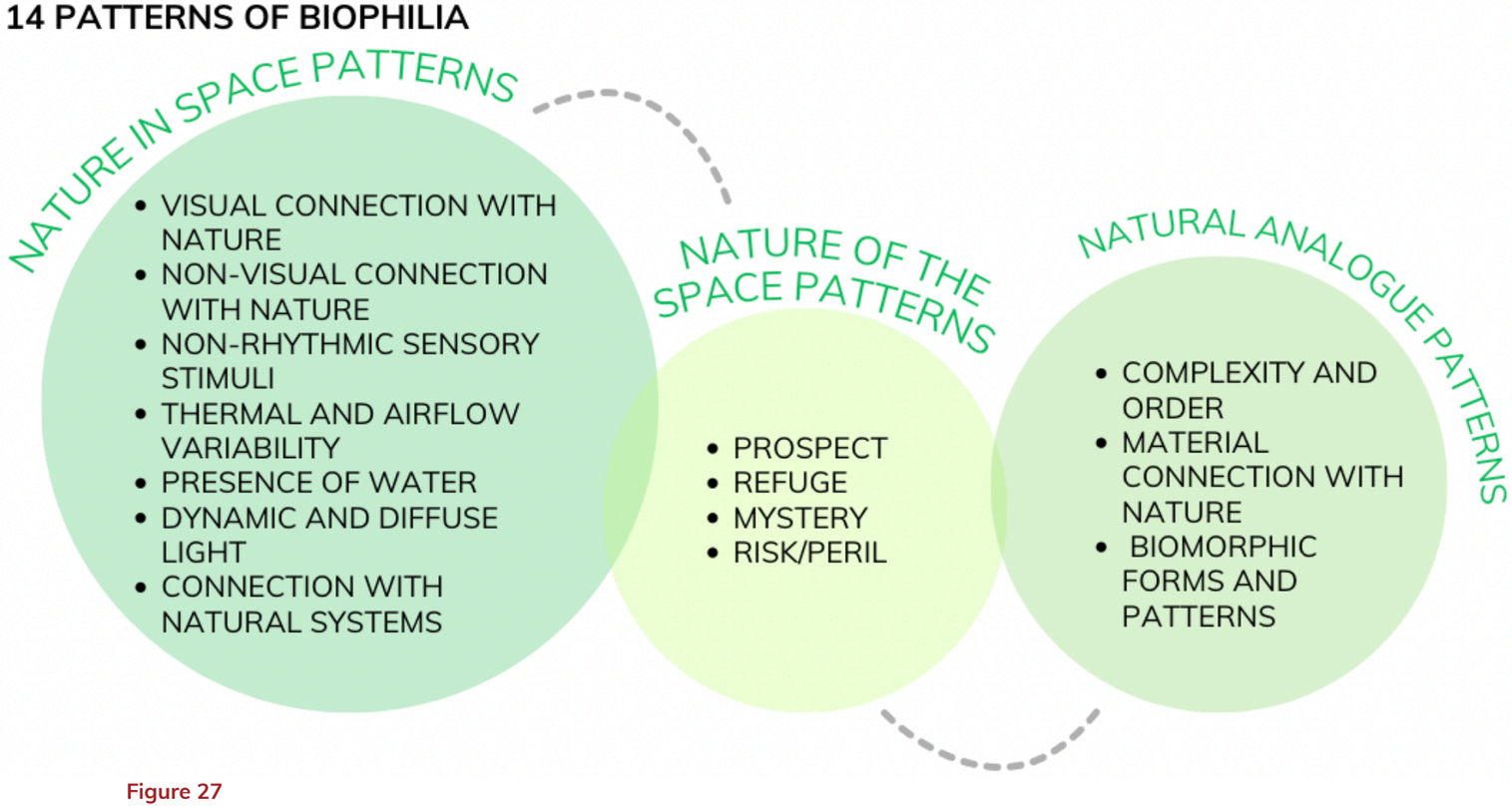


Figure 27
14 patterns of Biophilia (adapted from Browning et al., 2014)

PRIVATE AND PUBLIC SPACES

The care environment should architecturally provide autonomy and independence through spaces that host different levels of privacy. Incorporating private spaces and communal/shared public spaces creates choices and opportunities, replicating those of their previous life before the dementia facility. Private spaces such as individual bedrooms, bathrooms and yards provide occupants with a personal dedicated place of relaxation and independence to maintain control over their environment. These spaces also give opportunities for personalisation, familiarity and security, which is essential to persons whose sense of self is declining. To further ensure privacy and autonomy, it is favourable for a dementia facility to have low-density housing units that accommodate a small group of people, replicating a family living scenario. Research studies have proven that low-density and private living situations decrease disruptive behaviour in residents (Morgan & Stewart, 1999) and increase engagement and activity (Hsieh, 2010). Public spaces where social interaction can take place between residents and staff are also important for a healthy care environment, as they promote inclusivity and a feeling of community.

SPACES WHERE LOVED ONES CAN SPEND TIME

Family members play a crucial role in the physical and psychological wellbeing of their loved one with dementia and can enhance their quality of life (Eltaybani et al., 2021), which is why it is so vital to incorporate them in the design decisions of a long-term care facility too. Traditional and institutional models of care facilities often do not exhibit pleasant spaces that promote a valuable and comfortable engagement between the PwD and their loved ones due to the hostile and sterile environment and lack of privacy (Kitwood, 1997). In these environments, family may feel unwelcome and discouraged from visiting, which limits valuable and loving interaction. Architecture should prioritise dedicated spaces for these interactions to occur that feel normal and organic, which could be in environments that replicate spaces where they used to spend time together or where they can continue with activities and routines they used to do. These spaces could include a lounge area, activity zones, a supermarket or outdoor gardens and seating.

INCLUSIVE DESIGN

Ensuring the architecture practices inclusive design is vital to ensure that the diverse needs are met for the residents, the wider support system and the staff at the facility. This can be achieved by prioritising accessibility and usability for different users of the design. Implementing the universal design principles into the architectural outcome will ensure that residents' quality of life is enhanced, as it doesn't exclude and segregate groups of people, based on physical or cognitive abilities. Colour contrast, ramps, simple layouts and wide doors are all examples of how this could be implemented.

COMMUNAL LIVING/ SHARED SPACES

Incorporating communal and shared spaces into the design of a dementia care facility is important, as it gives opportunity for interaction and community engagement. These areas are designated for connections between residents and to participate in group activities. Communal spaces should be welcoming, interactive, implement sensory design and be comfortable to engage residents to want to interact with the room and each other. Personalising and shaping these rooms into familiar settings will increase comfort for the occupants and make them feel more connected. To further enhance familiarity, these spaces can also take form as replicating scenarios in the outside world, to further include PwD as experiencing a normal life. This could be supermarkets, hairdressers and libraries for example, to evoke positive memories.

GROUP ACTIVITIES AND HOBBIES

To enhance the wellbeing of PwD, it is beneficial for them to participate in group activities that can be informal or formal (Nyman & Szymczynska, 2016). Informal activities could be explored through reading, peer support, arts and crafts or 'singing for the brain' (Bannan & Montgomery-Smith, 2008). More formal activities include physical therapy and psychological therapies such as reminiscence, where PwD are prompted to remember past memories or events (Nyman & Szymczynska, 2016).

DESIGN FOR IDENTITY

Dignity of identity refers to the status that individuals hold in relation to others, which reflects past experiences and future aspirations (Nordenfelt, 2004). Due to the negative stigma that revolves around dementia, a person's sense of self often declines with the experience of dementia, though many studies recognise that the different environments PwD are surrounded by can be designed to nurture and respect their identity (Kitwood, 1997; Kontos, 2004; Cruise & Lashewicz, 2022). Personalisation amongst space is an excellent way to maintain identity and sense of self by creating environments that reflect the person's culture, history, and life experiences. Creating moments of self-expression is also vital, through spaces where creativity and routines can be practised that are important to the individual.

SAFE AND ACCESSIBLE DESIGN

Safety and accessibility is vital in dementia care design, as these are individuals that are coping with cognitive decline and require extra support from their surroundings. There are a lot of different safety measures that need to be implemented to create a secure home. The perception and symptoms that PwD experience needs to be taken into account to create specific design decisions that will benefit them and allow for a prosthetic environment. Incorporating non-slip flooring, wide pathways, ramps and ensuring suitable lighting are all factors that could reduce falls and support their declining mobility. It is also inclusive of elderly that use wheelchairs and walking sticks. Ensuring outdoor areas can be secured with fences and boundaries are also vital to mitigate the risks associated with exit-seeking.

CREATE TIME-BASED ROUTINES

Creating time-based routines for PwD in a care setting is important to maintain stability and normality. Schedules and structured frameworks of daily routines can enhance purpose and reduce unnecessary confusion. PwD often exhibit exit-seeking behaviour, because they are accustomed to their old routines (Lucero, 2002), such as visiting family members or participating in certain activities, but when their life in the long-term care facility doesn't reflect these routines, they get agitated and confused. Regularity in activities, social engagement and meals can help mitigate this and promote a predictable natural rhythm.

SENSORY STIMULATION DESIGN

Designing spaces with sensory stimulation is important, as research shows that PwD experience an altered perception with their environments, due to cognitive decline (Christenson & Taira, 2014). Sensory stimulation should include olfactory, visual, auditory and tactile stimulation (Vozzella, 2007). The Snoezelen rooms designed by the Dutch therapist Hulsegge (1987) are a solution for sensory stimulation for PwD. However, sensory experiences should not just be confined to one room in a dementia care facility; they should be implemented everywhere to harmonise PwD back into their environments.

CENTRALITY + TIME FOR WAYFINDING

Exit-seeking and wandering is experienced alongside dementia. To turn this into positive and meaningful walking, wayfinding strategies need to be implemented. Centrality refers to the layout of the space, by creating a clear ‘centre’ that residents can orientate themselves with. Positioning communal spaces in the centre of each programme will aid with cognitive mapping and mitigate disorientation. Alongside this, incorporating time as a strategy for wayfinding is also important and relates to the ‘time based routines’ framework, as it helps residents know where they are meant to be at different times.

FAMILIAR/ HOMELIKE ENVIRONMENTS

“A home fulfills many needs: a place of self-expression, a vessel of memories, a refuge from the outside world, a cocoon where we can feel nurtured and let down our guard.” (Clare Cooper Marcus, 2006)

A philosophy that is common amongst contemporary care facilities is to create a sense of ‘home’ through familiar environments. The feeling of home is developed through interactions of people, emotions and objects within a context of social and psychological connections (Fay & Owen, 2012). Fay and Owen (2012) emphasise that the key design strategy to create home-like environments is through ensuring autonomy and privacy for it’s residents. The De Hogeweyk care facility in the Netherlands is a good precedent for this, as they achieve familiarity through small scaled residential spaces that resemble the size of a family home. These residential units are organised in a neighbourhood layout, which creates shared living arrangements and enhances a sense of community, especially for those residents that don’t have exterior family support.

Familiar environments could also be achieved through the personalisation of space, outdoor spaces and gardens, familiar furniture and through routines that resemble those from the past.

CHAPTER 3:

CASE STUDIES

DE HOGEWEYK

Location: Weesp, Netherlands
Architects: Molenaar&Bol&VanDillen
Built in: 2009

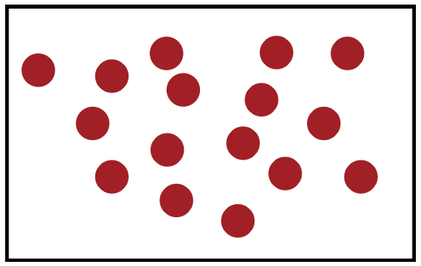
De Hogeweyk is currently one of the most referred to and influential models within dementia care. The concept emerged in 1993, from the original form of the De Hogeweyk village, which was a concrete four-storey nursing home that mimicked the traditional historical institutional model of care (Glass, 2014). Several of the staff at that time gathered and discussed the deficiencies of that framework of care, asking the question “Is this a place I would want to bring my parents?”, with all of their answers being no. This led to the exploration of restoring lifestyles and routines into dementia care that closely resemble how individuals had lived their entire lives prior to developing dementia (Glass, 2014). The focus revolved around living a ‘normal lifestyle’, leading to improvements in overall care. This includes reduced behavioural challenges and less use of sedatives and pureed food (Glass, 2014).

This dementia village accommodates 152 residents who are divided into 23 small-scale units, each with six to seven bedrooms, a kitchen and two bathrooms. The staff observed that residents felt more comfortable and secure spending time with each other during the day, resulting in larger communal areas and smaller bedrooms.

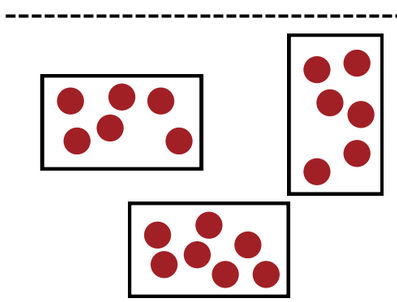
A unique planning strategy that De Hogeweyk implemented was to group residents together based on lifestyle similarities, ensuring that residents share housing with people who share similar values and interests.

FACILITIES IN DE HOGEWEYK

De Hogeweyk exhibits numerous facilities that enhance the feeling of normality within the village. These include a restaurant, cafe, theatre, office, supermarket, a physiotherapist, club rooms and a hair salon.



TRADITIONAL DEMENTIA CARE MODEL
-Residents all living under one roof, which can come across as very clinical and institutional



DE HOGEWEYK CARE MODEL
-Residents are split into housing of 6 or 7, which mimics the idea of family living

De Hogeweyk balances safe design with controlled risk. This promotes decision making within individuals and autonomy.

Figures 28 - 30
De Hogeweyk care model and approaches

THE SIX PILLARS

De Hogeweyk uses a social model of care, which is centred around six pillars, which is designed to enhance the quality of the residents' lives by promoting autonomy, independence and a sense of community (see figure 31).

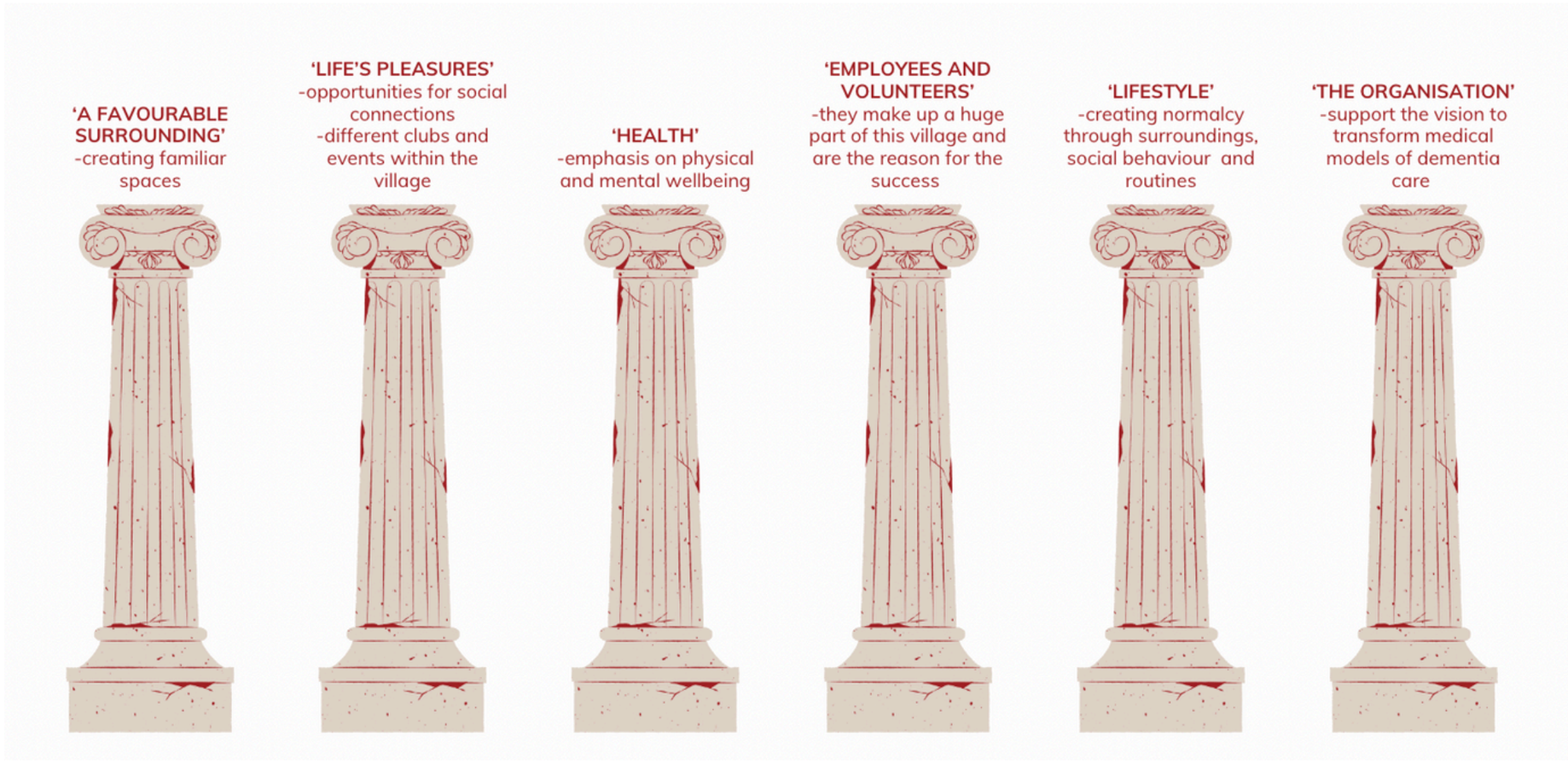
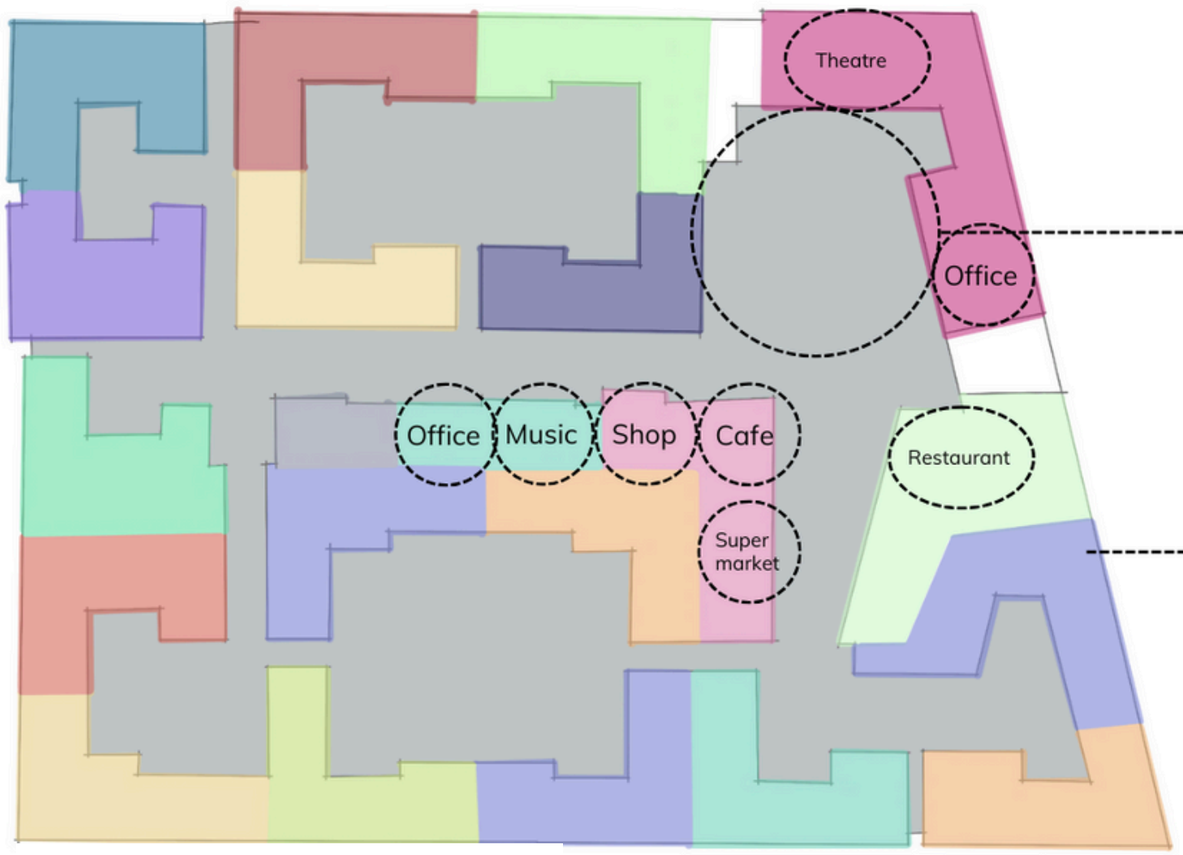


Figure 31
De Hogeweyk 6 pillars of to achieve social care (adapted from Glass, 2014)

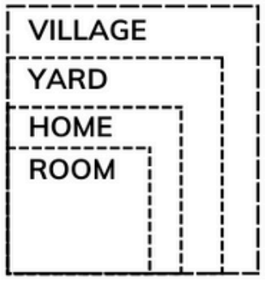


Each neighbourhoods public space has distinct landmarks or landscapes that help with cognitive mapping and orientation. These distinct public spaces create interaction and movement between neighbourhoods

The buildings themselves are around the premises of the dementia village, creating a closed in and safe environment for the residents. This further supports their balance of safe design and controlled risk.

Figure 32
De Hogeweyk spatial layout of village

PRIVACY LEVELS



This provides choices for the individuals, as they are able to decide where they would like to spend their day

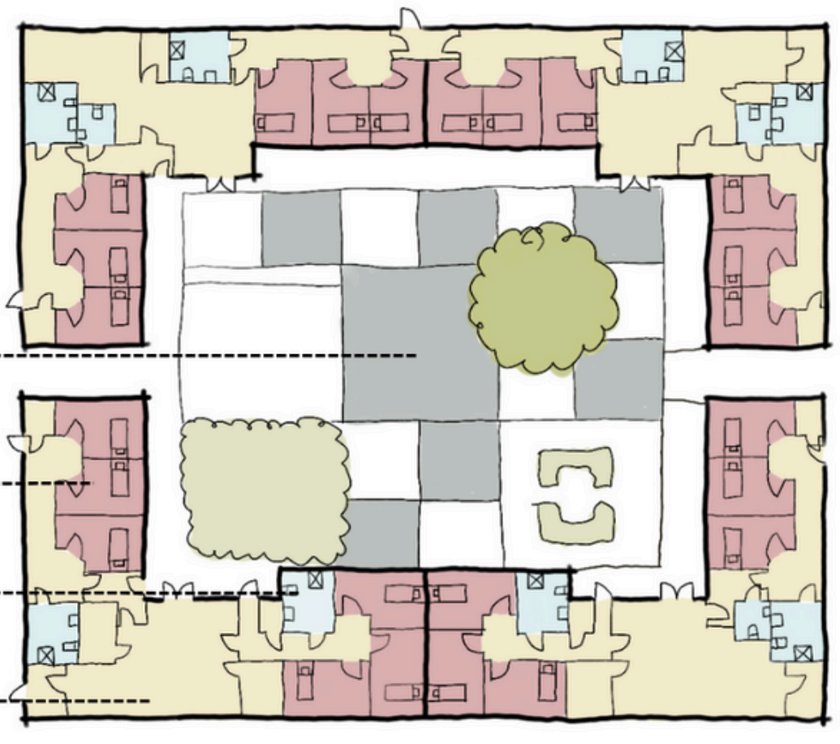


Figure 33
De Hogeweyk layout of a residential unit arrangement within the village

Wandering path that exhibits interesting landmarks and visual stimulation, which ensures residents are engaged and interested in every part of the path.

The use greenery contributes to a calming environment, whilst also aiding in stimulation.

Figure 34
De Hogeweyk wandering pathway (Grozdanic, 2014)

The brick exterior aids in increasing familiarity and home-like environments.

Figure 35
De Hogeweyk courtyard (Clark, 2018)

Figure 38
De Hogeweyk heart of the village (Tolenaar, n.d.)

Figure 36
Residents of De Hogeweyk riding bike along pathway (Dementia Village Associates , n.d.)

Figure 37
Residents relaxing in familiar environment (Dementia Village Associates , n.d.)

THE CARE VILLAGE

Location: Rotorua, New Zealand
Architects: Ignite Architects
Built in: 2016

"*Prior to design, we needed to ascertain who we were serving- what phases of life they were in before they began suffering from dementia. The spaces needed to reflect an era the residents were familiar with, as well as be flexible to evolve over time with a different demographic*" (Barrowman & Paulo, 2023)

The Care Village, previously known as 'Whare Aroha', opened in 2017 in Rotorua, New Zealand. The inspiration came directly from De Hogeweyk's dementia village concept and became the first of its kind in the Southern hemisphere (Benbow, 2019). It supports residents with various levels of care, from rest homes to secure dementia care and high-level hospital care. The Care Village's model of care is based on preserving independence, community and lifestyle through the nurturing and engaging social and physical environment (Benbow, 2019). It comprises 13 mid-century single-storey households that host six to seven residents, with shared bathrooms, a communal kitchen and a lounge.

To structure these households, residents are grouped according to similar backgrounds and interests, with interiors carefully reflecting the characteristics of each category (Barrowman & Paulo, 2023). This intentional grouping fosters a sense of belonging and familiarity as the residents feel more comfortable in their environments.
These groups include seven 'Lifestyles' popular in New Zealand: Cultural, remote/ secluded, rural, industry, professional, suburban, and formal living.

Ignite Architects (2023) mentioned that their design intentions were purposeful, with the aim to create spaces that could adapt over time and host new lifestyle groups that suit changing trends. They know flexibility is a crucial principle in this village, allowing exterior and interior finishes, furniture and fittings to be changed and adjusted over time.

FACILITIES

The village mimics a small New Zealand town, with amenities such as a grocery store, tearoom, community hall, orchard, clubrooms and gardens. These amenities are all run by volunteers and staff, who are a key component to enhancing the quality of life of their residents. They are able to continue doing activities and routines that they would before entering the village, such as gardening, baking, studying, fixing cars, sports, music and reading (Benbow, 2019).

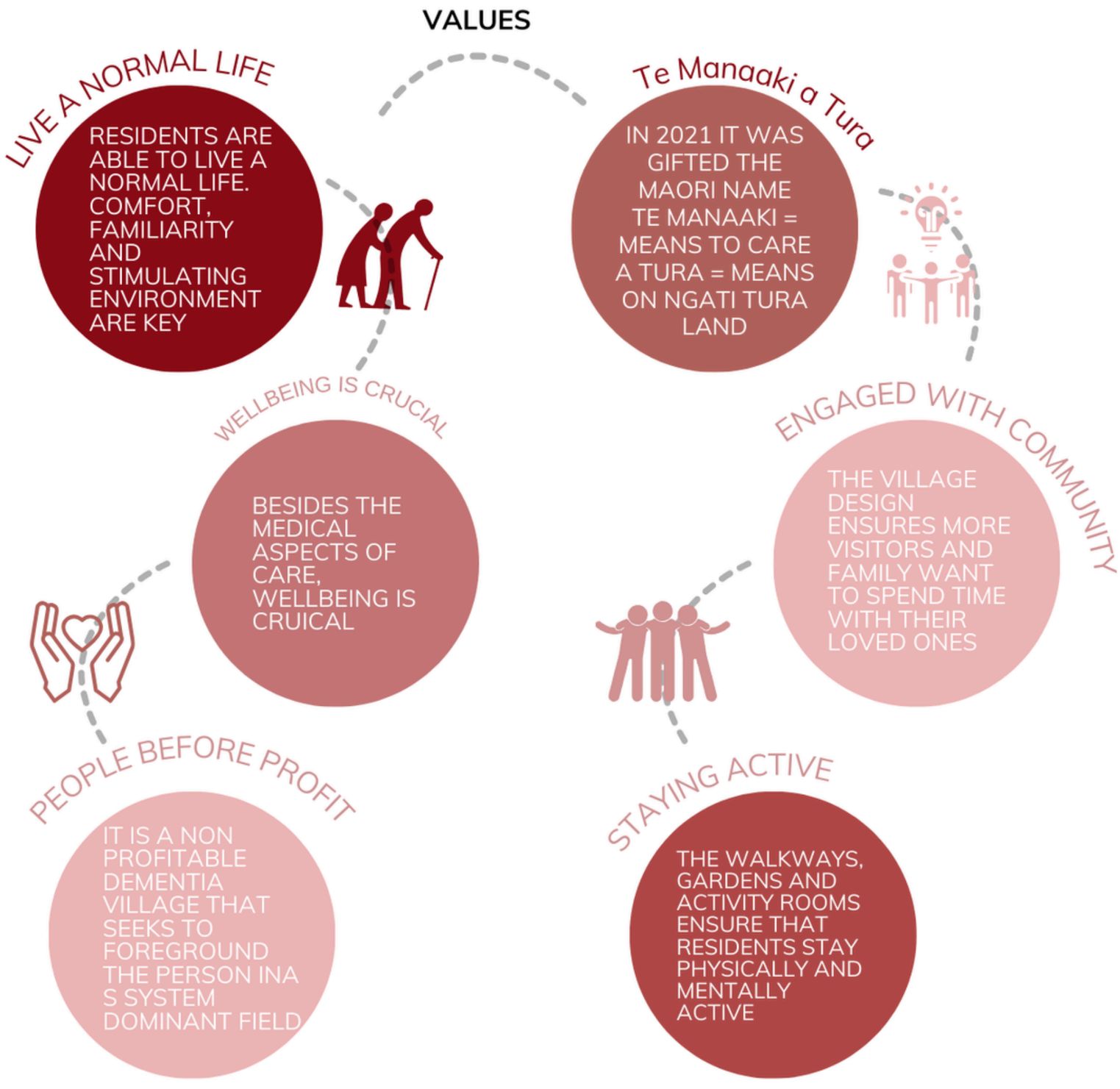


Figure 39
Values of The Care Village

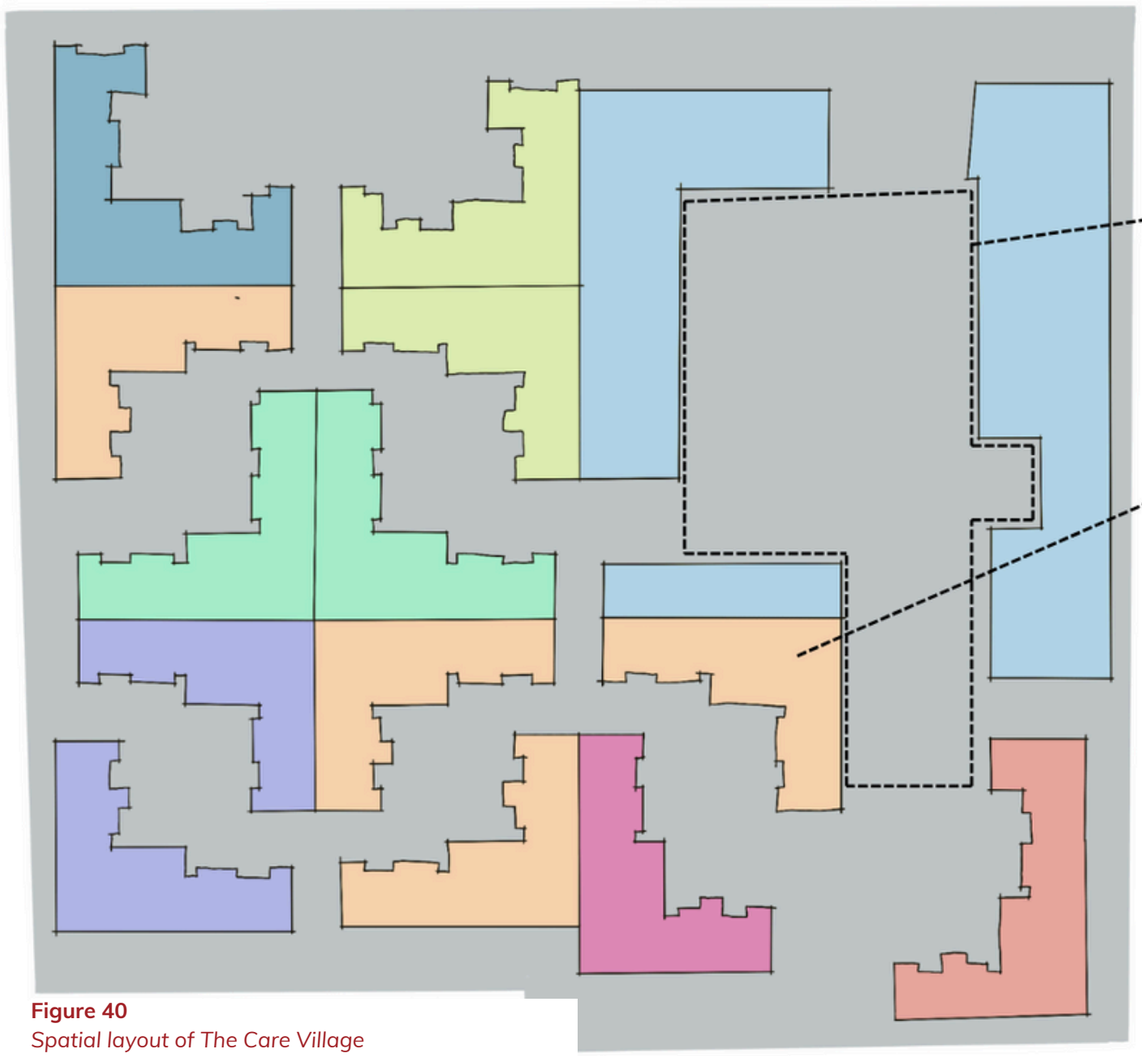
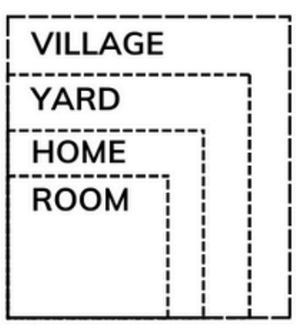


Figure 40
Spatial layout of The Care Village

PRIVACY LEVELS



The village mimics a small New Zealand town, with the centre having ammenities such as a supermarket, cafe, club rooms and gardens. This promotes walking and movement within the village. It also exemplifies how normal life can continue within the dementia care realm.

Small scaled living units mimic the scale of family homes, making it more comfortable and familiar in contrast to institutional traditional environments.

Small scaled housing units with 6 to seven residents

Pathways that connects all the housing units and promotes healthy wandering.

Outdoor area that's private to each housing unit

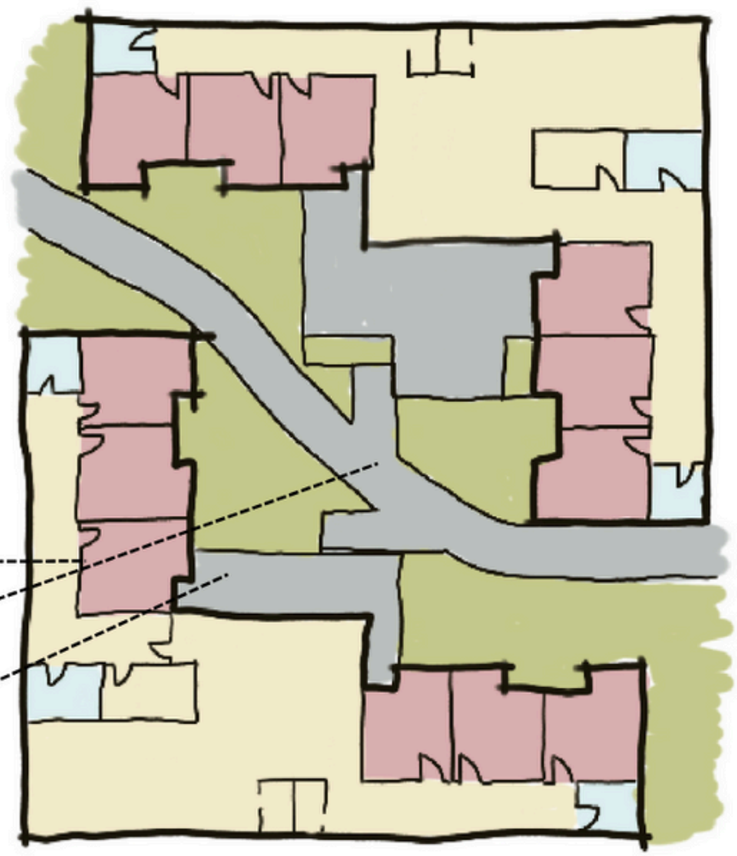


Figure 41
Zoomed in spatial layout of The Care Village

Possibility for more landmarks for cognitive mapping along the pathway and sensory elements for engagement.

Figure 42
Birds eye view of The Care Village (Colliers, 2024)

Weatherboard cladding and verandas that help to mimic a New Zealand town

Opportunity to add landmarks and activities within different residential units, to promote movement and social engagement.

Figure 43
Residents biking around the village (Eldernet , n.d.)

Figure 44
Residential unit of The Care Village (Ignite Architects, n.d.)

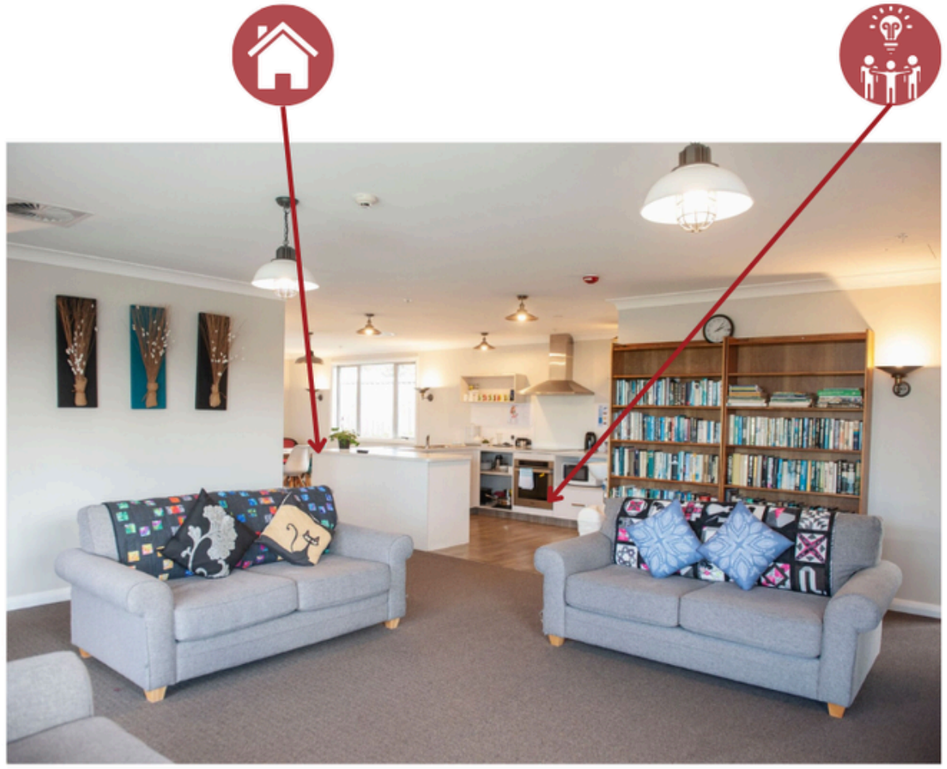


Figure 45
Interior of a shared lounge in the residential unit (Eldernet , n.d.)

Figure 46
Camelia Lane in The Care Village (Colliers, 2024)

PINEHAVEN COTTAGE

STATEMENT

This section includes original research about Pinehaven Cottage, which is relevant to this exegesis due to it being my grandmother's dementia facility. Due to a lack of online information and studies on this facility, this research was formed through first hand experience and through my personal connection with the dementia home. It was important to include this section as a case study, as it will later be explored in this thesis document through design.

All images of Pinehaven Cottage were taken by the author with permission from the care home. To respect the privacy of residents and visitors, no identifiable images of patients or visitors are included in this thesis. This decision ensures confidentiality of those in care and aligns with ethical research.

Location: Hatfields Beach, New Zealand
Architects: Unknown

"*Our aim is to establish positive trusting relationships with our resident's, guests and their families and our staff*" (Eldernet, 2024)

Pinehaven Cottage is an elderly care home located in Hatfields Beach on the Hibiscus Coast. It is situated at the end of a long driveway amongst native New Zealand bush and trees, creating a private and serene environment whilst still being in close distance to the Orewa community. They offer 24-hour long-term care, respite services and secure dementia care. There are 25 dementia care beds and 10 elderly care beds that have included ensuites. The dementia care facility has two dedicated wings that each are centralised by a corridor that heads into the main seating and entrance area. It follows a traditional one-level one-building design, which is contrasted to the above dementia villages that were explored. The interior layout includes two small shared lounge areas and a main lounge/ seating area that is multifunctional. It serves as a space for relaxation, interaction, daily activities and dining, however, this amount of functions within one space can cause confusion as it is hard for residents to distinguish what the main function of this area is. While the facility promotes person-centred care approaches within its social environment and methods through activities such as music performances, community visits and gardening, the architecture doesn't correspond with this care model. The large-scale design doesn't create a very home-like or familiar atmosphere, which makes it appear as more institutional. The outdoor area and gardens also offer opportunities to revitalise the space through design and create a more person-centred and supportive environment, that also acts as a space for family and support systems to gather and want to spend time.

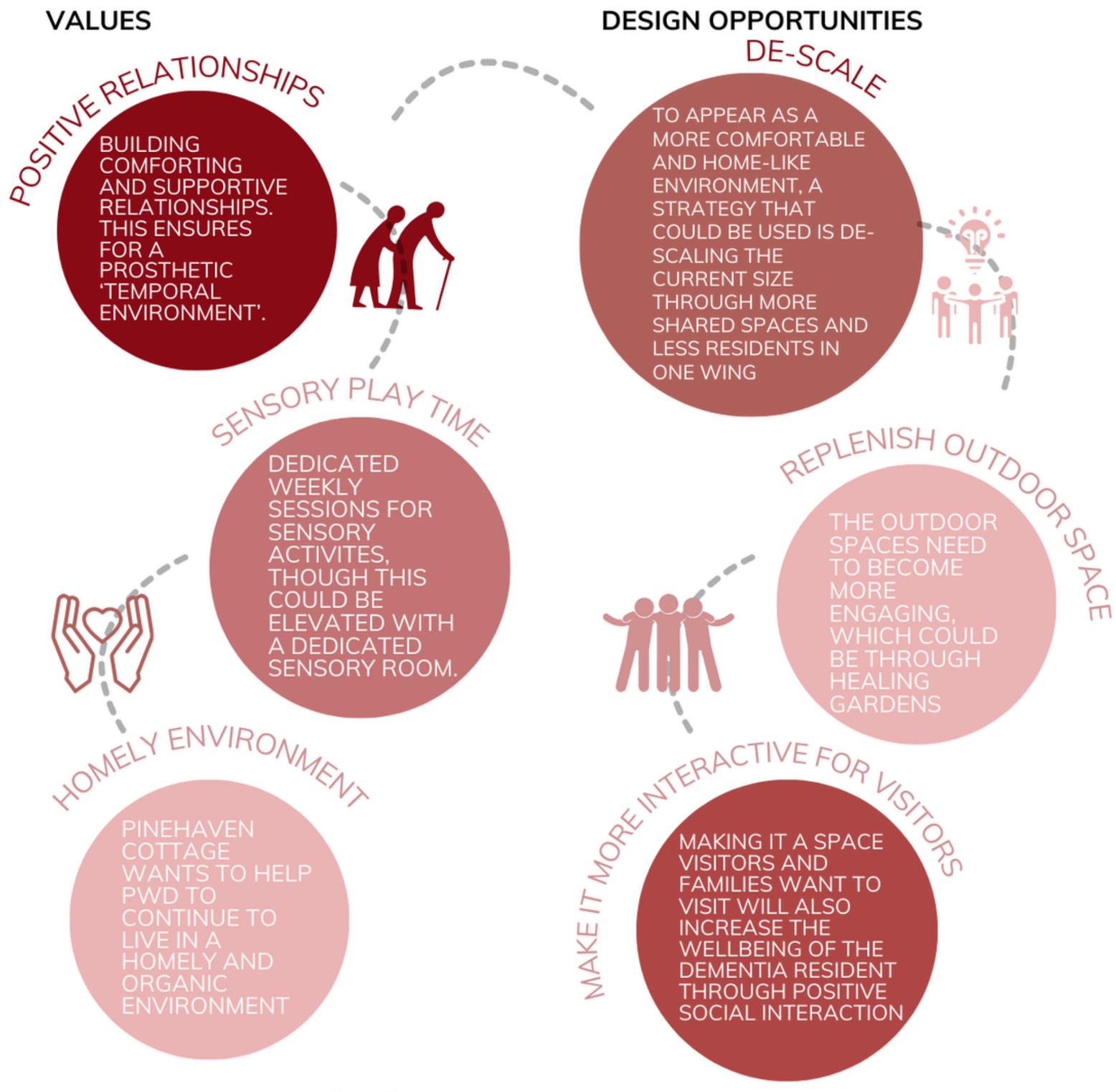


Figure 47
Values and design opportunities for Pinehaven Cottage

This ground floor plan was created from the Authors site visits. It was mapped out from perception, so it isn't accurate in a spatial sense or with measurements.

Figure 48
Ground floor plan of Pinehaven Cottage

The door entrance isn’t wide enough for my Nana and her friend to continue to hold hands.

Handrails for accessibility and extra support. Although, the way this is executed resembles a hospital environment

Figure 49
Residents holding hands in the hallway

Figure 50
Entrance to Pinehaven Cottage

Figure 53
Exterior of Pinehaven Cottage

Figure 51
Communal lounge and seating area

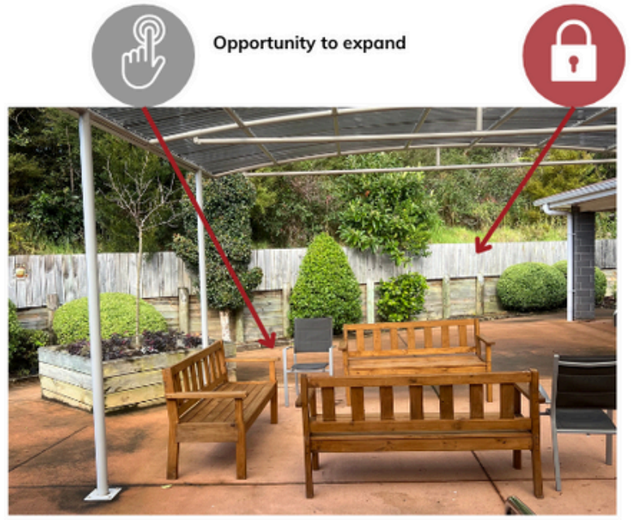
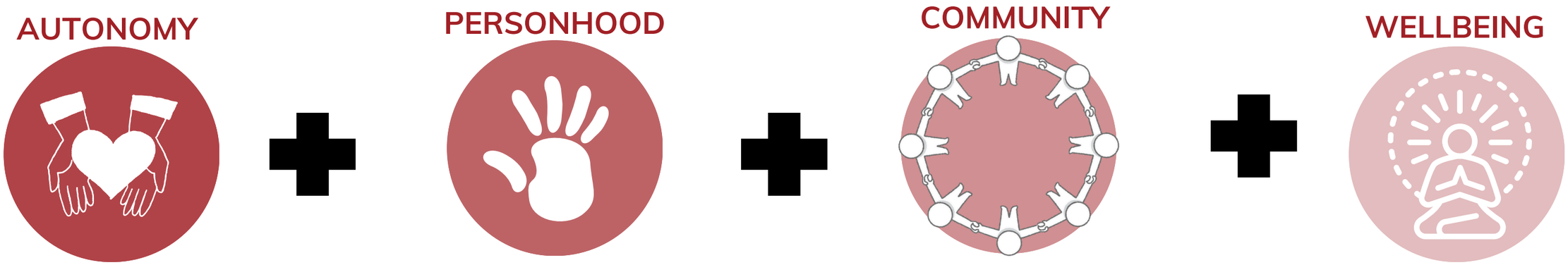


Figure 52
Outdoor seating area and garden

CHAPTER 4:

DESIGN

AREAS TO INCREASE



DESIGN TOOLS

BIOPHILIA - CONNECTION TO NATURE

INCLUSIVE DESIGN

DESIGN FOR IDENTITY

SENSORY STIMULATION DESIGN

PRIVATE AND PUBLIC SPACES

COMMUNAL LIVING/ SHARED SPACES

SAFE AND ACCESSIBLE DESIGN

CENTRALITY + TIME FOR WAYFINDING

SPACES WHERE LOVED ONES CAN SPEND TIME

GROUP ACTIVITIES AND HOBBIES

CREATE TIME BASED ROUTINES

FAMILIAR/ HOMELIKE ENVIRONMENTS

SITE

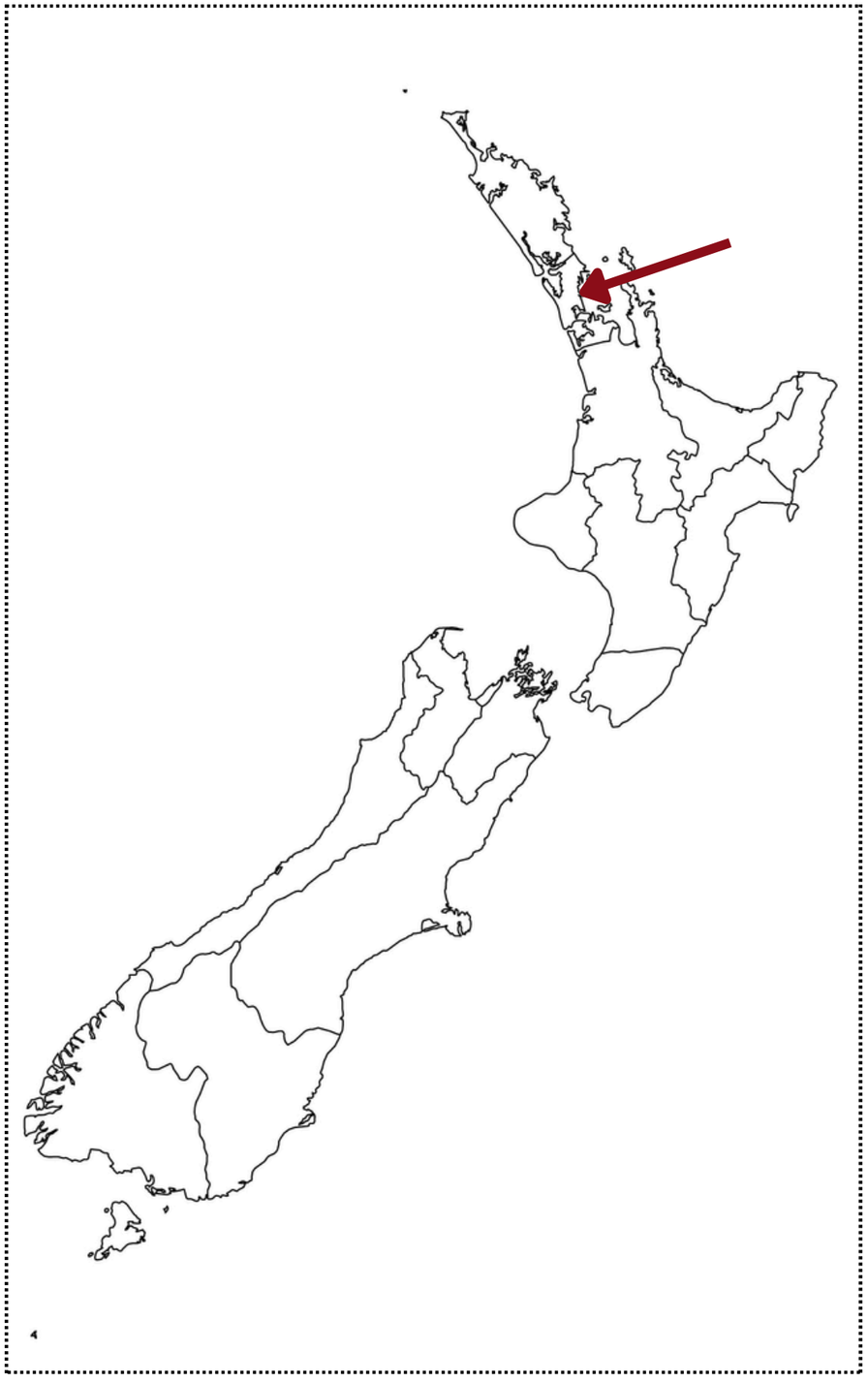


Figure 54
Outline map of New Zealand (Vemaps, n.d.)

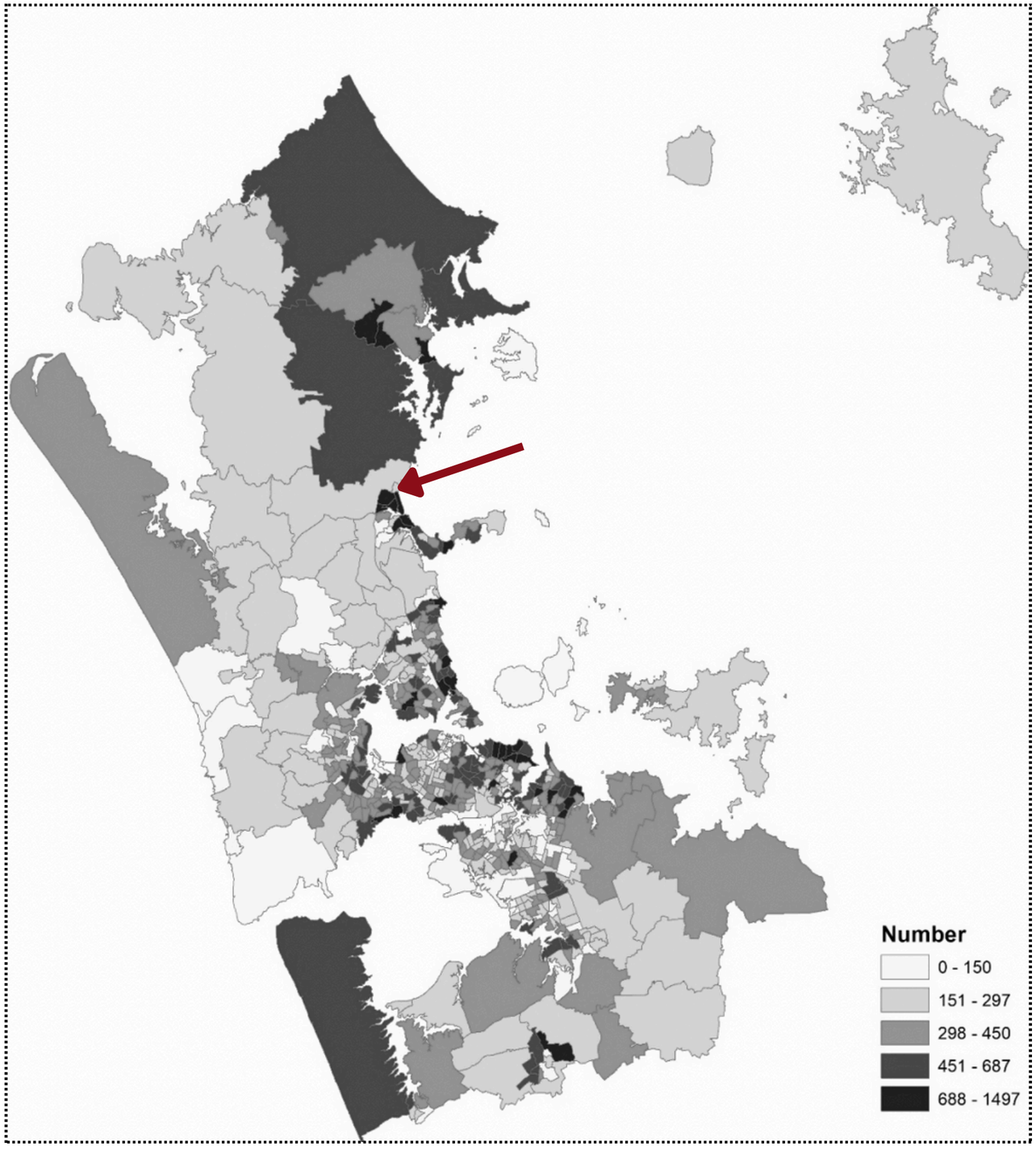


Figure 55
Map of distribution of elderly in Auckland (Roberts, 2020)

To select an impactful and relevant site for this project, the 2018 census of the elderly population in Auckland was analysed and adapted as a graph. The census presented the number of elders aged over 65 on each local board (Roberts, 2020). Figure 56 shows that Howick had the highest elderly population (19,092 elders), with Hibiscus and Bays being a close second, having 18,306 elderly individuals. Upon further research, the elderly population in Hibiscus and Bays is also set to increase from 17% to 25% by 2043 (see figure 57). This indicates that seniors increasingly populate this area, and with dementia numbers set to triple in New Zealand by 2050 (Alzheimers New Zealand, 2020), this is an ideal region for this project.

Given the personal connection to Hibiscus and Bays and the fact that this is where my grandmother stays in a long-term care facility, this local board was chosen as an area to locate a specific site. Several crucial factors were identified to refine the site selection within this board. A determining factor was the accessibility of natural environments, specifically native plants and trees, whilst remaining in an urban realm. This integration of environments allows for human-to-nature connections while creating access between the dementia facility and the local community.
Hatfields Beach is identified as the site that reflects these requirements the most. It aligns with the observed demographic trends and exhibits dense bush areas that are still near the urban city of Orewa.

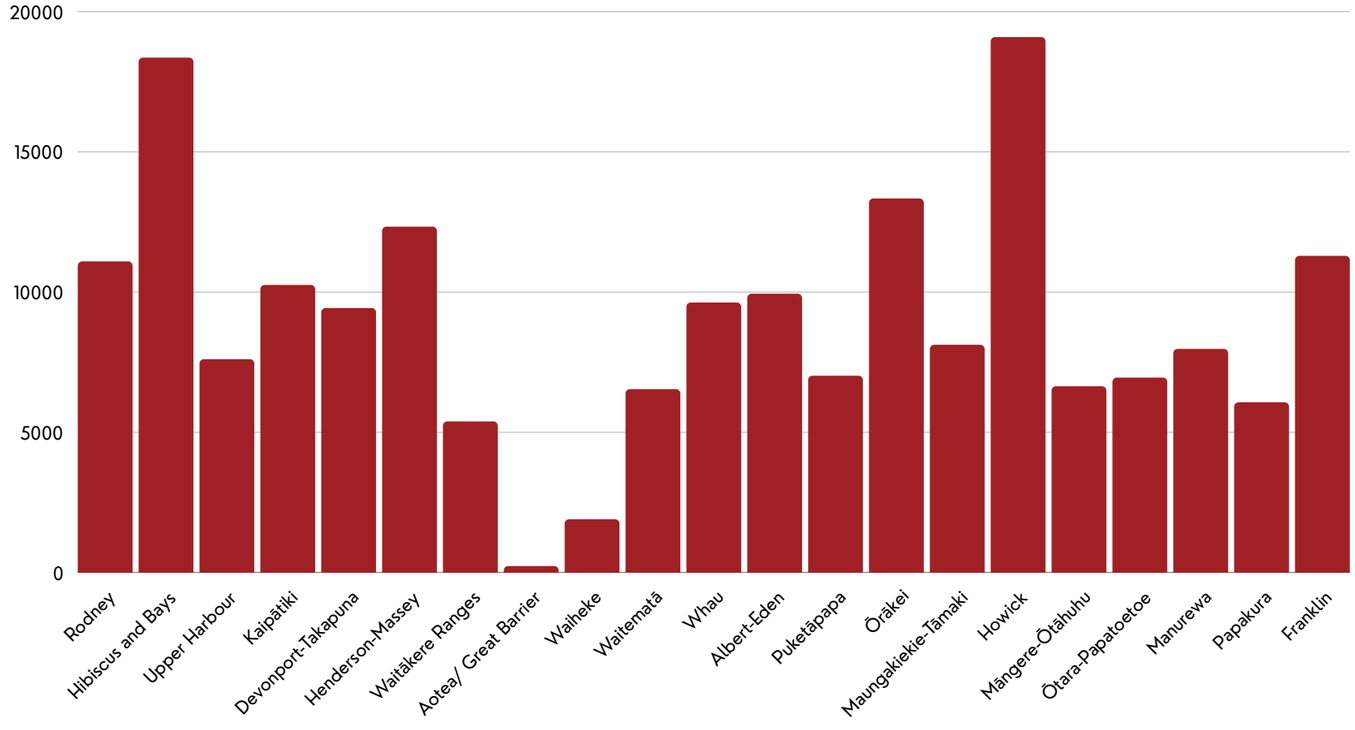


Figure 56
Graph of distribution of elderly in Auckland (adapted from Roberts, 2020)

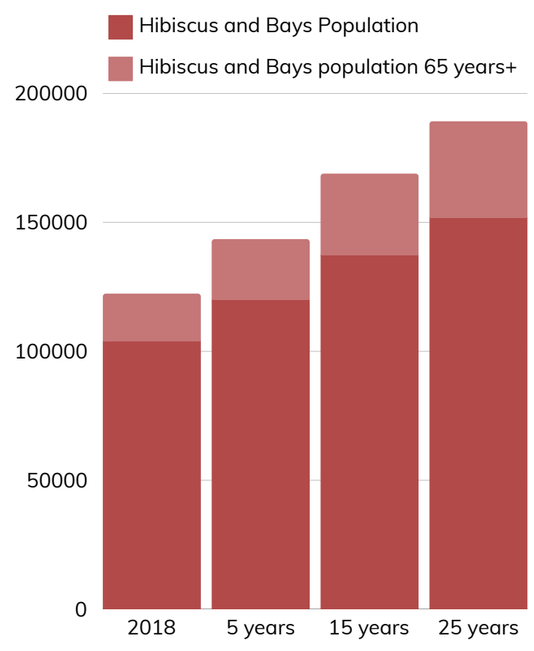
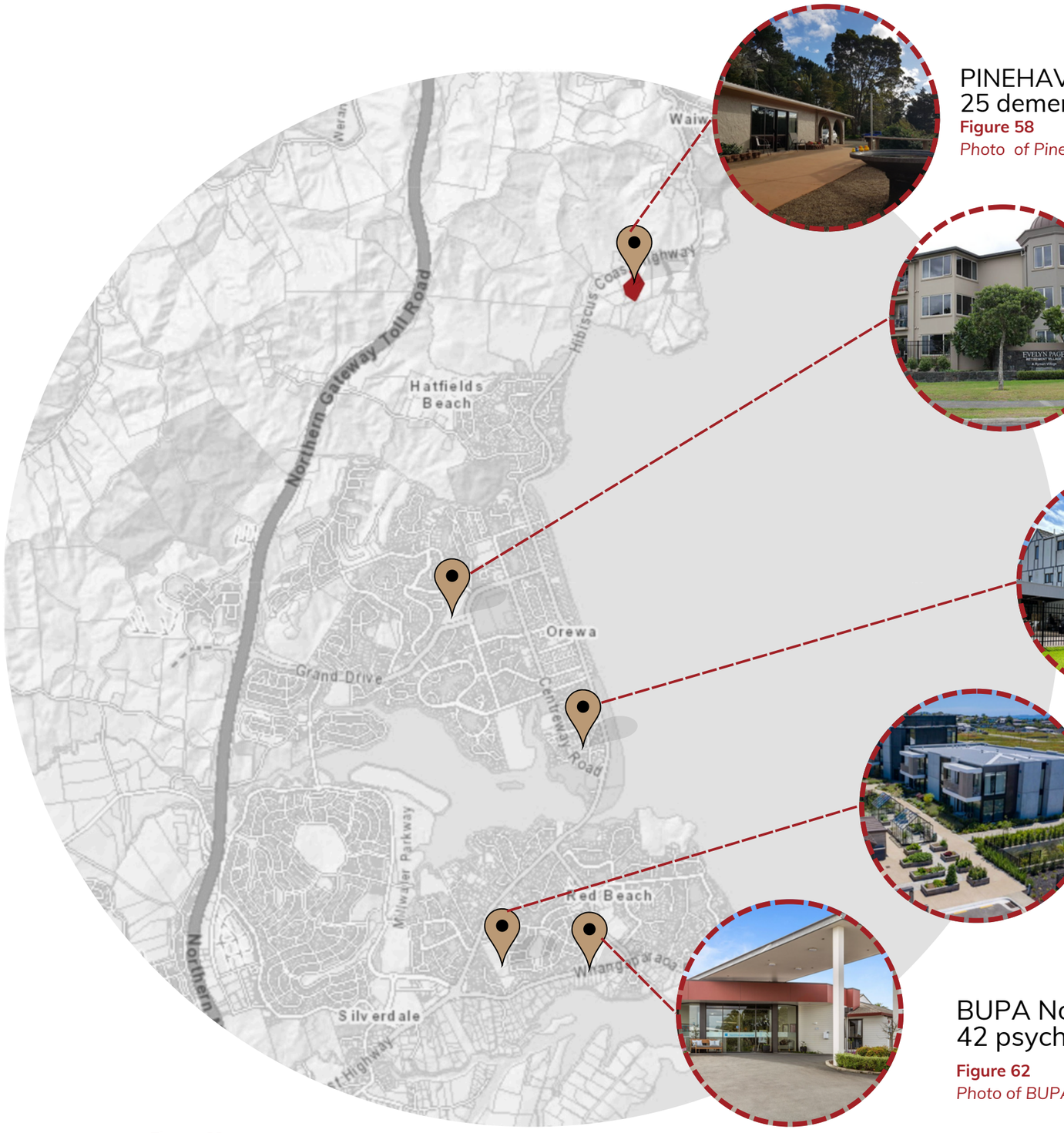


Figure 57
Graph of elderly population in Hibiscus and Bays (adapted from Roberts, 2020)



PINEHAVEN COTTAGE
25 dementia beds - no vacancy

Figure 58
Photo of Pinehaven Cottage(Village Guide, n.d.)

EVELYN PAGE
37 dementia beds - no vacancy

Figure 59
Photo of Evelyn Page(Local matters, 2020)

MILTON COURT
19 dementia beds - 1 pending bed

Figure 60
Photo of Milton Court (Eldernet, n.d.)

GULF RISE
13 dementia beds - no vacancy

Figure 61
Photo of Gulf Rise (NZ Strong, 2024)

BUPA Northhaven Care Home
42 psychogeriatric dementia beds - no vacancy

Figure 62
Photo of BUPA Northhaven Care Home (Eldernet, n.d.)

Figure 63
Map of the Orewa and Hatfields area (Mapbox, n.d.)

FINDINGS

Mapping the existing dementia care facilities in the Orewa and Hatfields area revealed that there was only one available dementia care bed at the time this research was conducted. This highlights not only the need but also an opportunity to implement a new dementia care facility in this area. The current and predicted ageing demographic also creates further urgency and demand for a project to be situated in this community.

The existing dementia care homes predominantly align with the traditional modes of care, which exhibits an institutional 'medical model' approach. This opens an opportunity for a contrasting person-centred approach to be established, which focuses on autonomy, independence and community.

OPPORTUNITIES

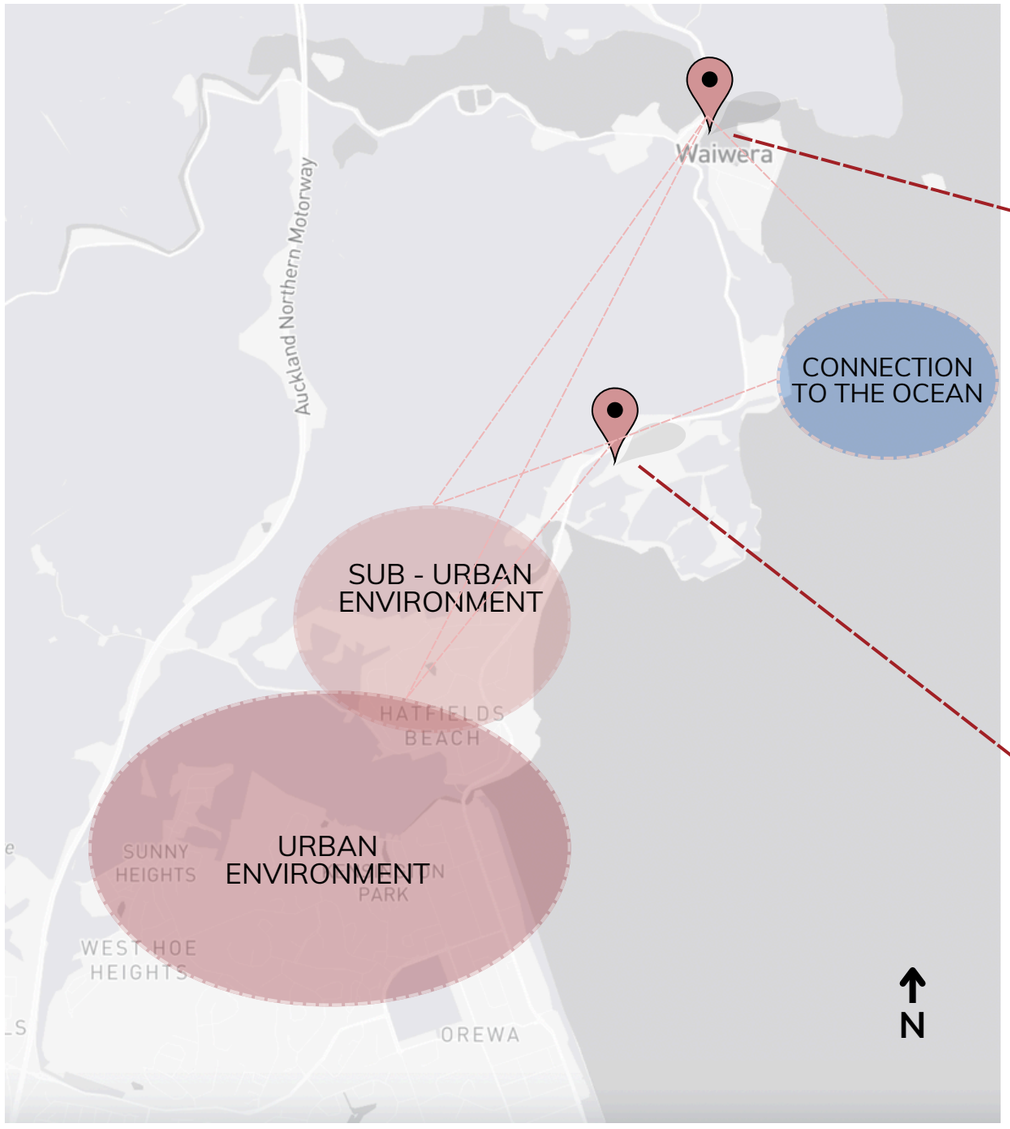


Figure 64
Map of the Orewa and Hatfields area (adapted from Mapbox, n.d.)

Figure 65
Map of Waiwera Hot pools (adapted from Mapbox, n.d.)

Figure 66
Map of Pinehaven Cottage (adapted from Mapbox, n.d.

WAIWERA HOT POOLS:
The first potential site that met a majority of the requirements was the old Waiwera hot pools site. As it is currently abandoned, it offers the potential for development. The large site is settled amongst a small sub-urban area, with surrounding greenery and close proximity to the ocean. This makes for potential in exploring the human-to-nature connections.

PINEHAVEN COTTAGE:
The second site is the existing Pinehaven cottage, which was chosen due to the personal connection, being my Nana's dementia home. This large site has potential for a dementia village that promotes autonomy and independence. The current existing dementia home also offers an opportunity to shift from being a medical model to a person-centred care model, to improve the quality of life of the residents.

SITE REQUIREMENTS

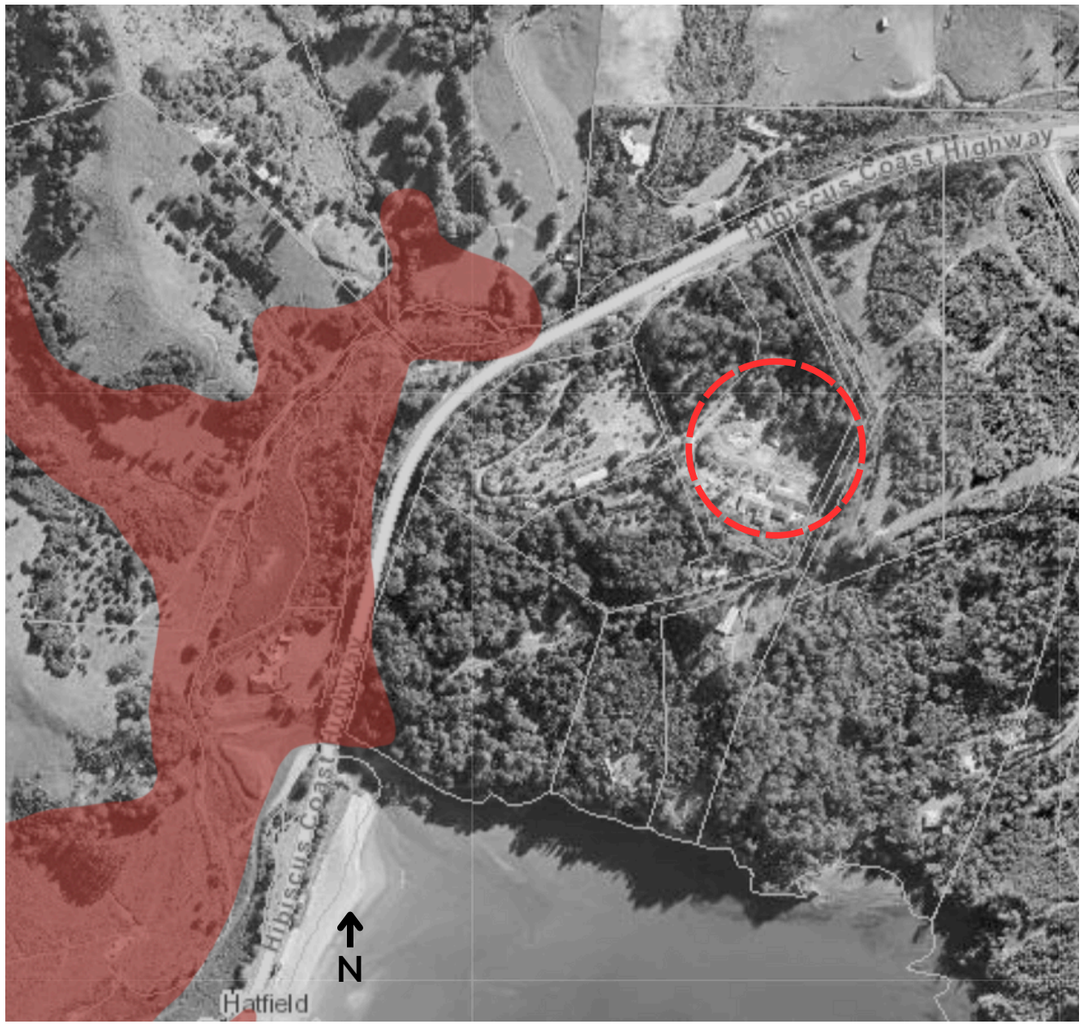
TSUNAMI EVACUATION AREA

WAIWERA HOT POOLS

LAND THREAT TSUNAMI ZONE

Figure 67
Tsunami evacuation map 01 (adapted from Auckland Council, 2023)

PINEHAVEN COTTAGE

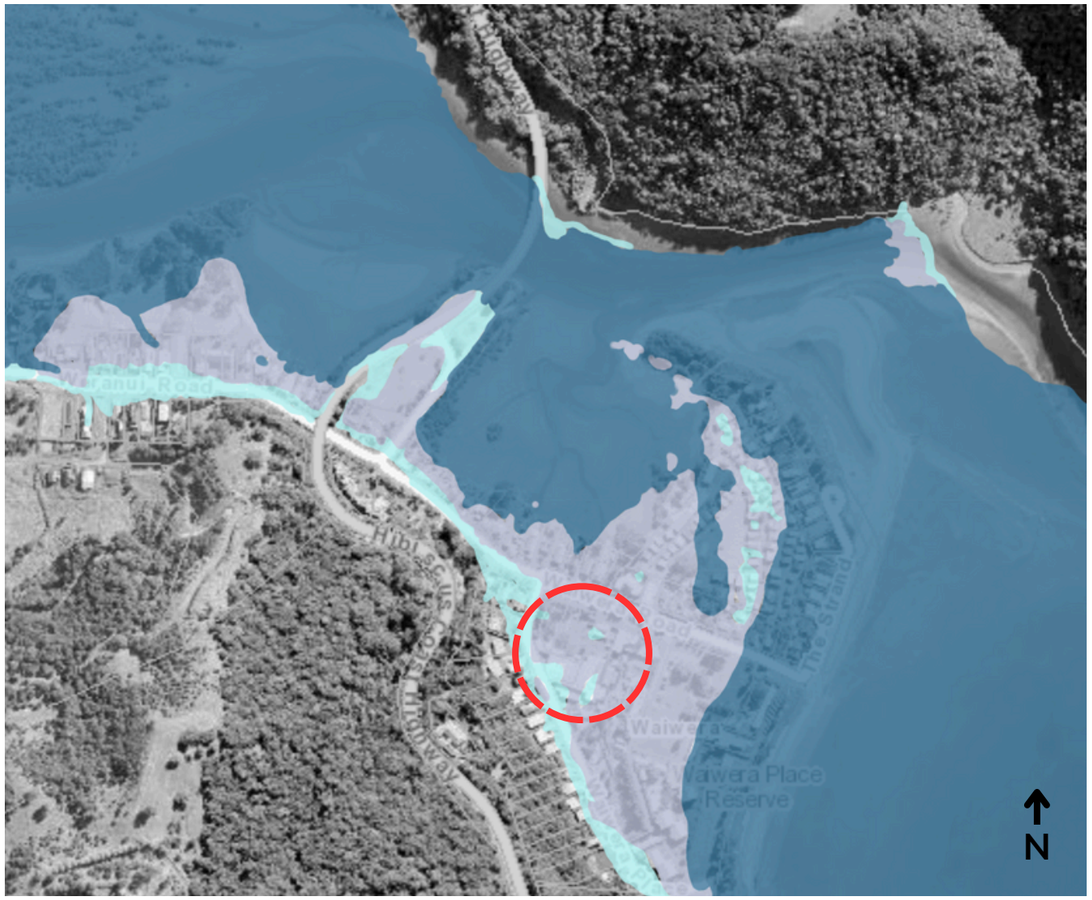


LAND THREAT TSUNAMI ZONE

Figure 68
Tsunami evacuation map 02 (adapted from Auckland Council, 2023)

COASTAL INUNDATION

WAIWERA HOT POOLS



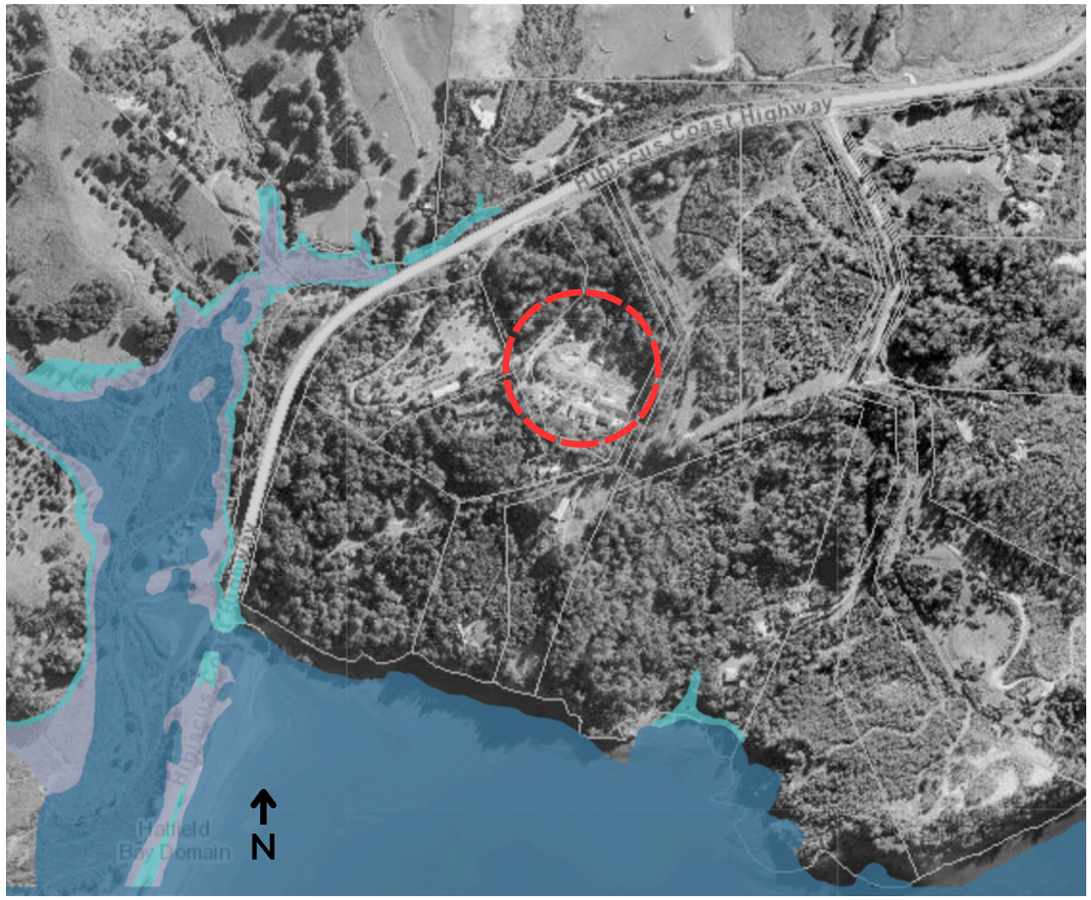
1% AEP

1% AEP + 1M SEA LEVEL RISE

1% AEP + 2M SEA LEVEL RISE

Figure 69
Coastal inundation map 01 (adapted from Auckland Council, 2023)

PINEHAVEN COTTAGE

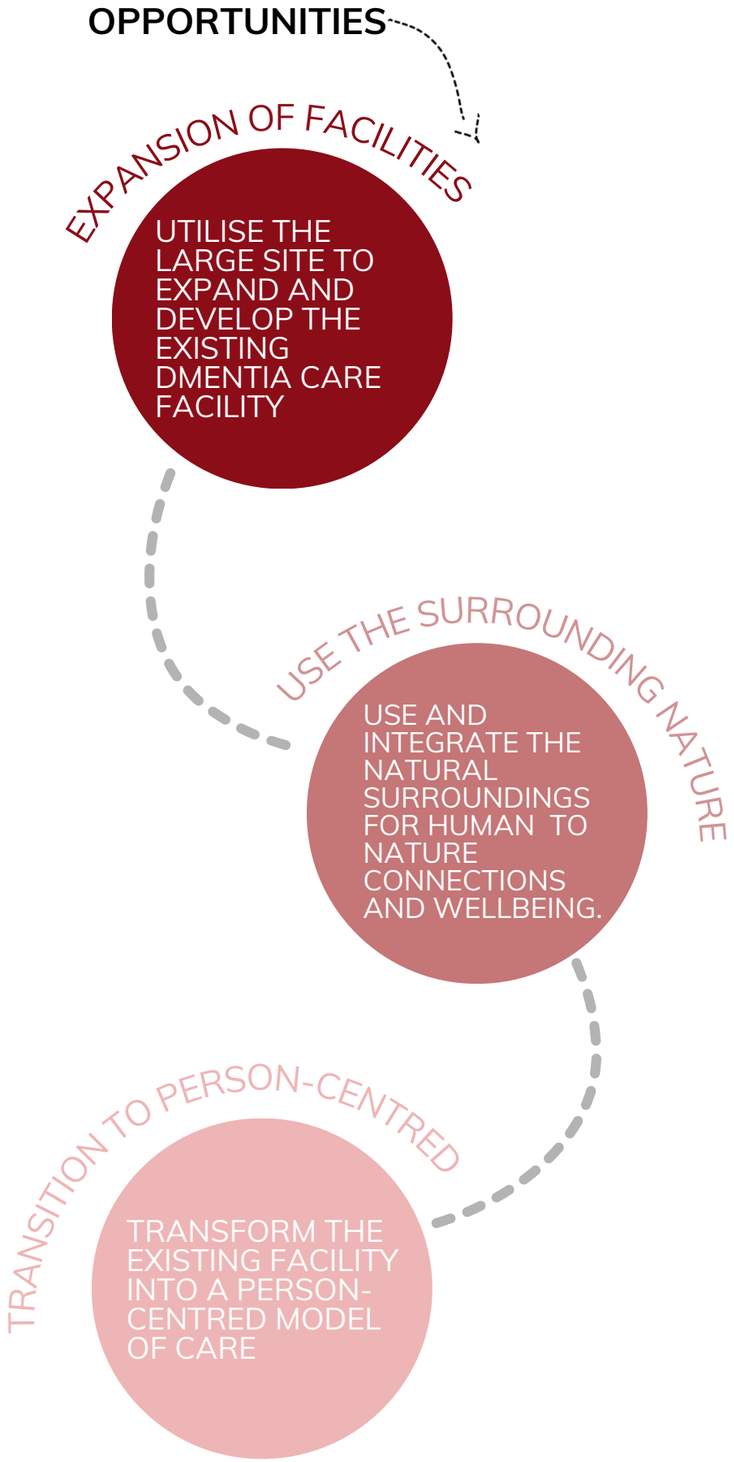


1% AEP

1% AEP + 1M SEA LEVEL RISE

1% AEP + 2M SEA LEVEL RISE

Figure 70
Coastal inundation map 02 (adapted from Auckland Council, 2023)



SELECTED SITE:

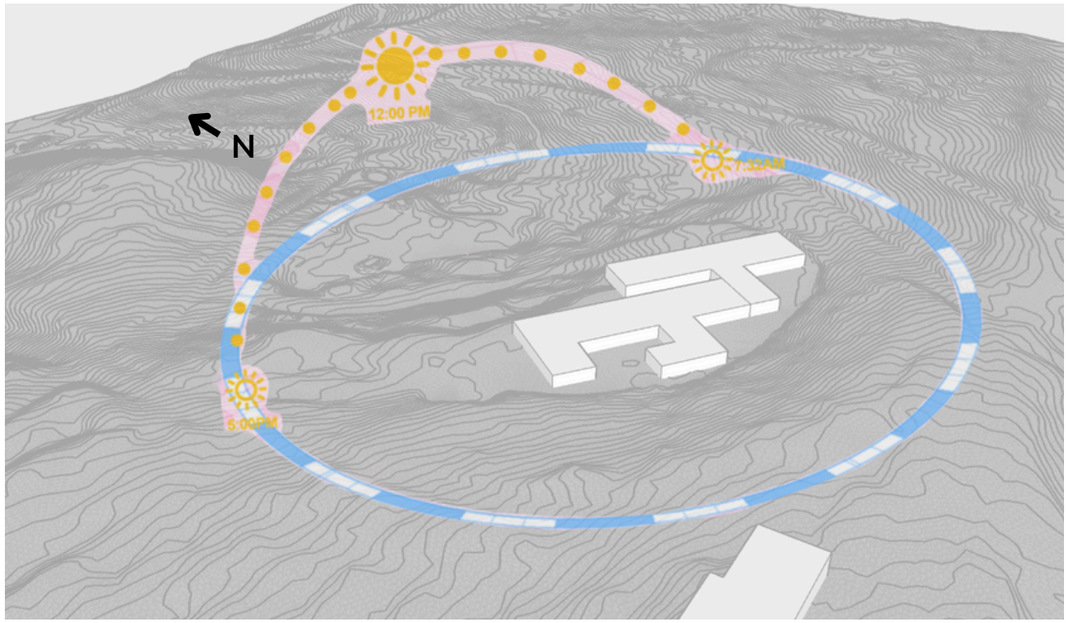
After comparing the two sites through mapping research, Pinehaven Cottage proves to be the more suitable and sustainable option (note figures 67 - 70). It is situated outside the land threat for tsunami zones (Auckland Council, 2023), ensuring a safer environment for the residents. Emergencies such as tsunamis would be especially detrimental to cope with, as PwD would struggle with confusion and understanding the severity of the situation. It would be very challenging to move everyone out of the facility safely, which would be the case with the Waiwera Hot Pools site, as it is in an unsafe tsunami zone (Auckland Council, 2023).

Additionally, the analysis of coastal inundation further supports Pinehaven Cottage as the preferred location (Auckland Council, 2023). Climate change and rising sea levels put Waiwera Hot Pools in a future flooding zone, therefore becoming unethical for construction because of its vulnerability. Pinehaven Cottage is unaffected by this, as it is an elevated site, creating a safer and more sustainable environment for projects.

The decision to continue with Pinehaven Cottage as the site for a design programme is also very suitable due to my personal connection. It is the dementia care facility of my Nana that gives me firsthand insight and experience of the current spatial dynamics and methods that are used for care. This knowledge and insight directly informs the design process and fuels passion for the project to improve the quality of life for my Nana and other residents through architectural interventions.

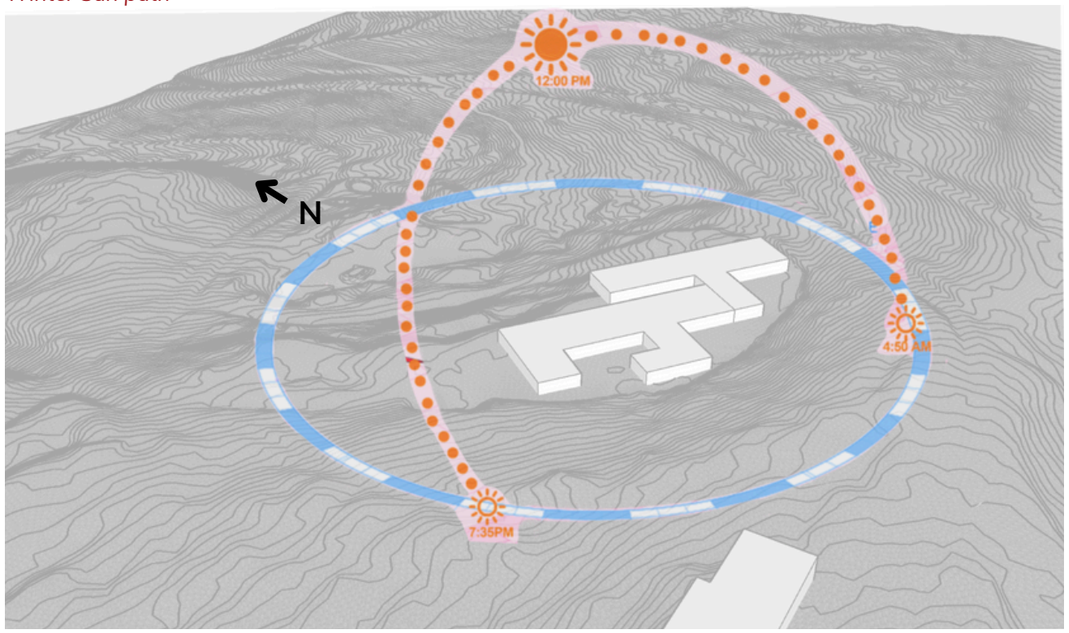
IMMEDIATE SITE ANALYSIS

Figure 71
Immediate site map of Pinehaven Cottage (adapted from Mapbox, n.d.)



SUN PATH IN WINTER

Figure 72
Winter Sun path



SUN PATH IN SUMMER

Figure 73
Summer Sun path

FURTHER SITE RESEARCH

Main Road - If heading North leading to Waiwera,

If going south leading to Orewa

Opportunity:
Gives good accessibility to the site through car or bus transport. Future bike lanes should also be implemented

Dense native NZ bush

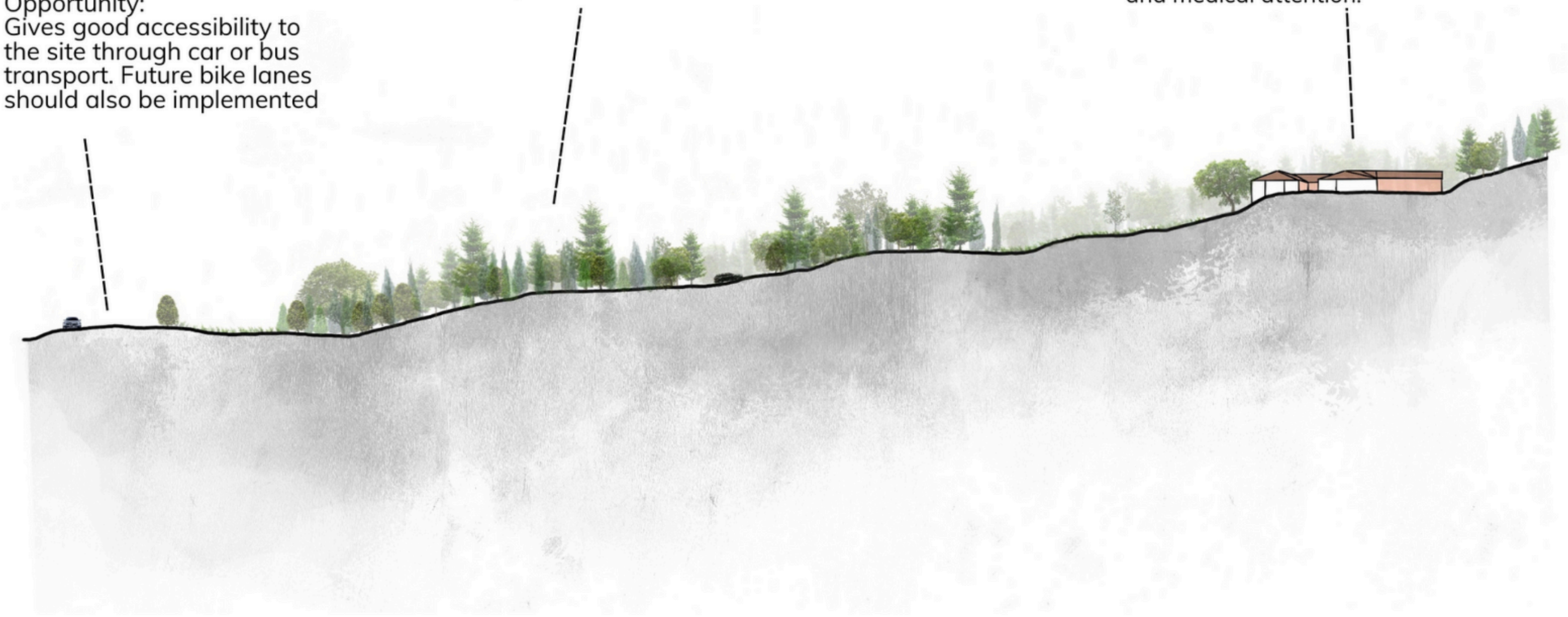
Architectural opportunity:

- Nature Views
- Sensory stimulation
- Biophilia

Existing ‘Pinehaven Cottage’ dementia and rest home

Architectural opportunity:

- Revitalise this existing dementia care facility to portray a more ethical mode of care.
- Create a village that inhabits persons that require all different levels of care and medical attention.



←N

Figure 74
Section cut of the site

1:1000 CONTOUR MODEL OF THE SITE

Figure 75
Contour model with photoshopped context

Figure 76
Contour model front view

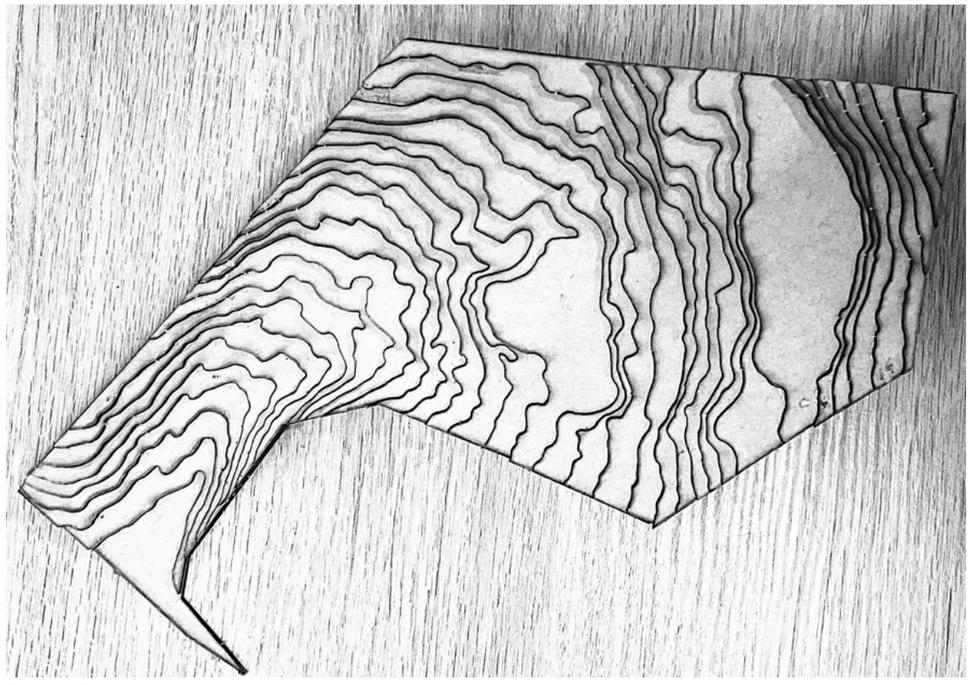


Figure 77
Contour model top view

SURROUNDING MEDICAL CENTRES AND URGENT CARE

This research shows that there are available medical centres around and one urgent care facility, which is important to acknowledge for emergency medical situations. The design on the chosen site could also benefit off of having a small scaled medical centre implemented.

HIBISCUS COAST MEDICAL CENTRE
Medical Clinic

OREWA MEDICAL CENTRE
Medical Clinic

THE DOCTORS RED BEACH
Medical Clinic

SILVERDALE MEDICAL AND SURGICAL
Urgent care + Medical Clinic

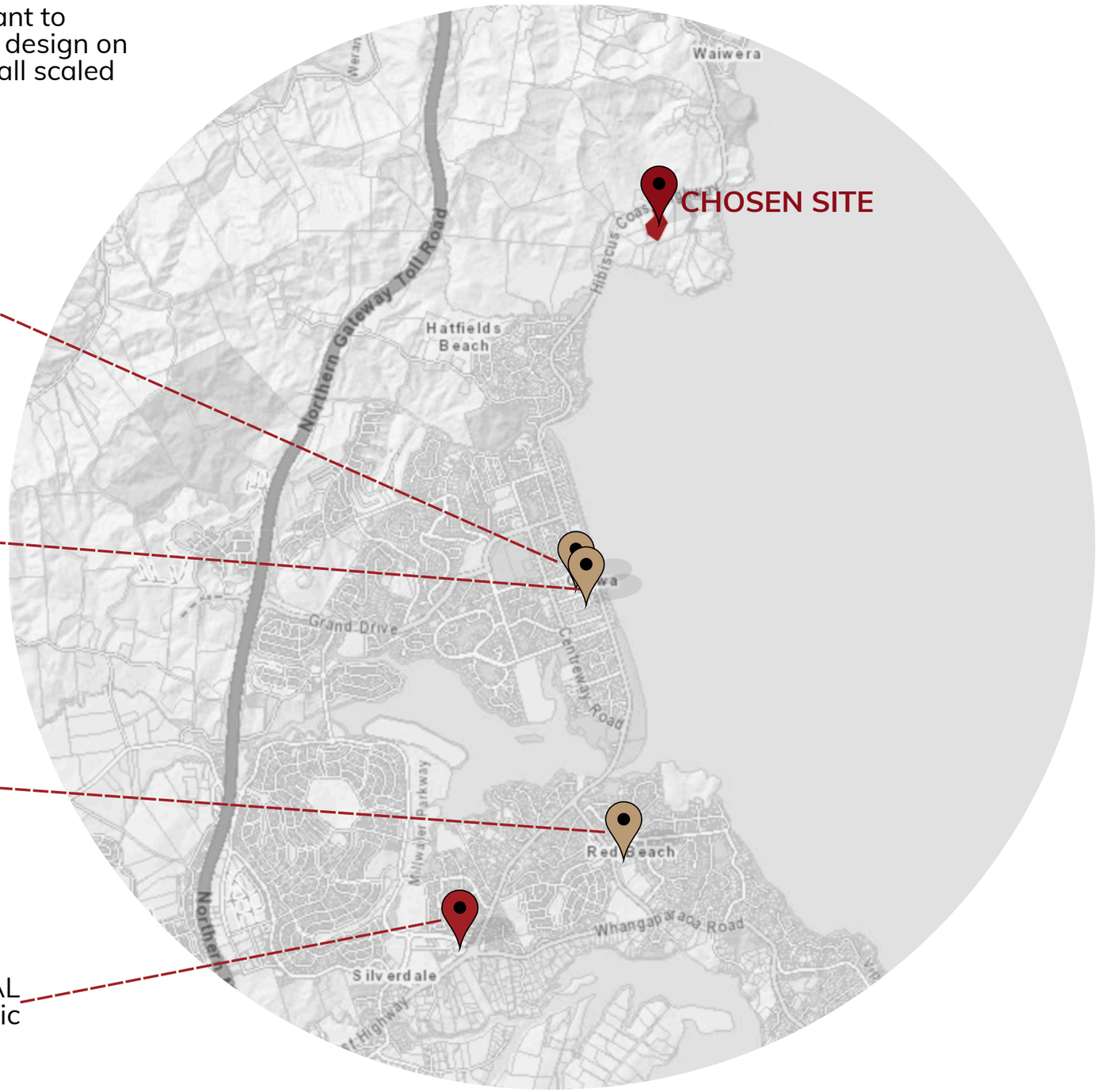
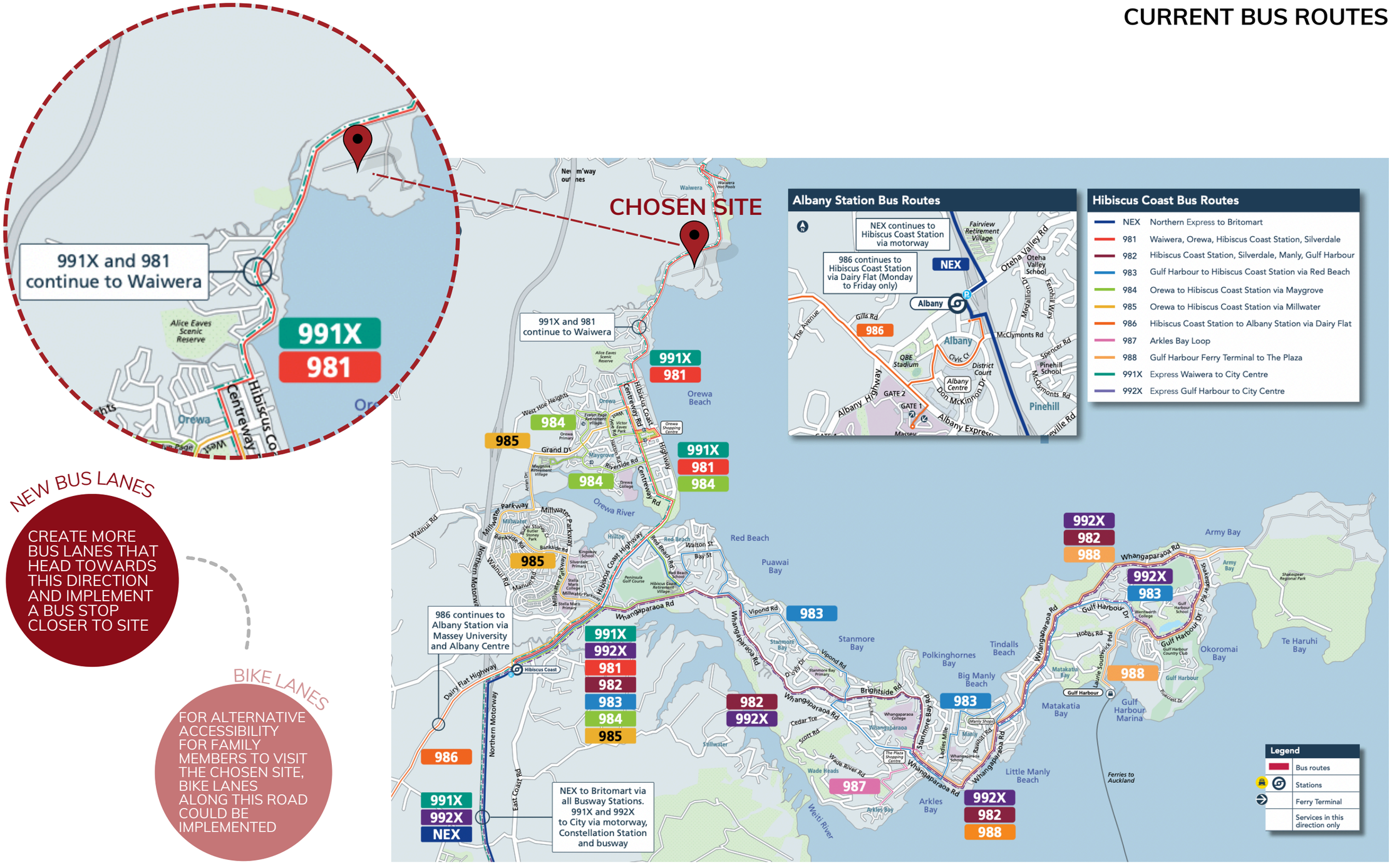


Figure 78
Map of the Orewa and Hatfields area (Mapbox, n.d.)

CURRENT BUS ROUTES



NEW BUS LANES

CREATE MORE BUS LANES THAT HEAD TOWARDS THIS DIRECTION AND IMPLEMENT A BUS STOP CLOSER TO SITE

BIKE LANES

FOR ALTERNATIVE ACCESSIBILITY FOR FAMILY MEMBERS TO VISIT THE CHOSEN SITE, BIKE LANES ALONG THIS ROAD COULD BE IMPLEMENTED

Figure 79
Map of the bus routes in Orewa (Auckland Transport, n.d.)

SITE - CRITICAL REFLECTION

The chosen site is located in Hatfields Beach, a suburban area surrounded by native NZ bush and trees. The total area is 22,772 square metres, which includes dense bush areas that provide opportunities for a large-scale dementia village that's integrated into nature. The site currently accommodates a traditional one-level dementia care facility that replicates a more traditional care methodology. Although the social environment and staff aim to present person-centred care approaches, the architecture doesn't currently complement this.

Primary access to the site is off Hibiscus Coast Highway Road, with a long gravel driveway leading up to the dementia home (see Figure 80) . Although Hibiscus Coast Highway Road offers bus routes and the closest stop is nearby, the absence of footpaths along this road makes it unsafe and inaccessible. This is something that could be implemented in future planning strategies to aid with accessibility for visitors who have limited means of transport.

The appeal of this site is that the connection to nature creates a sense of serenity and peace, creating a feeling of detachment from the busy and loud urban realm. Despite the secluded nature of the site, the Orewa community is only 3km away, which provides quick access to medical centres, a variety of amenities and a long beach. To successfully integrate Pinehaven Cottage into this community, improved transportation options are necessary, such as additional bus routes, stops, walkways, and bike routes.

Features of the site include a north-to-south 1:9 gradient, creating opportunities for privacy gradients across the site. It is also elevated, unaffected by flooding, tsunamis or coastal inundation.

Figure 80
Driveway enveloped by native bush

Figure 81
Pinehaven car park view to nature

PROGRAMME REQUIREMENTS

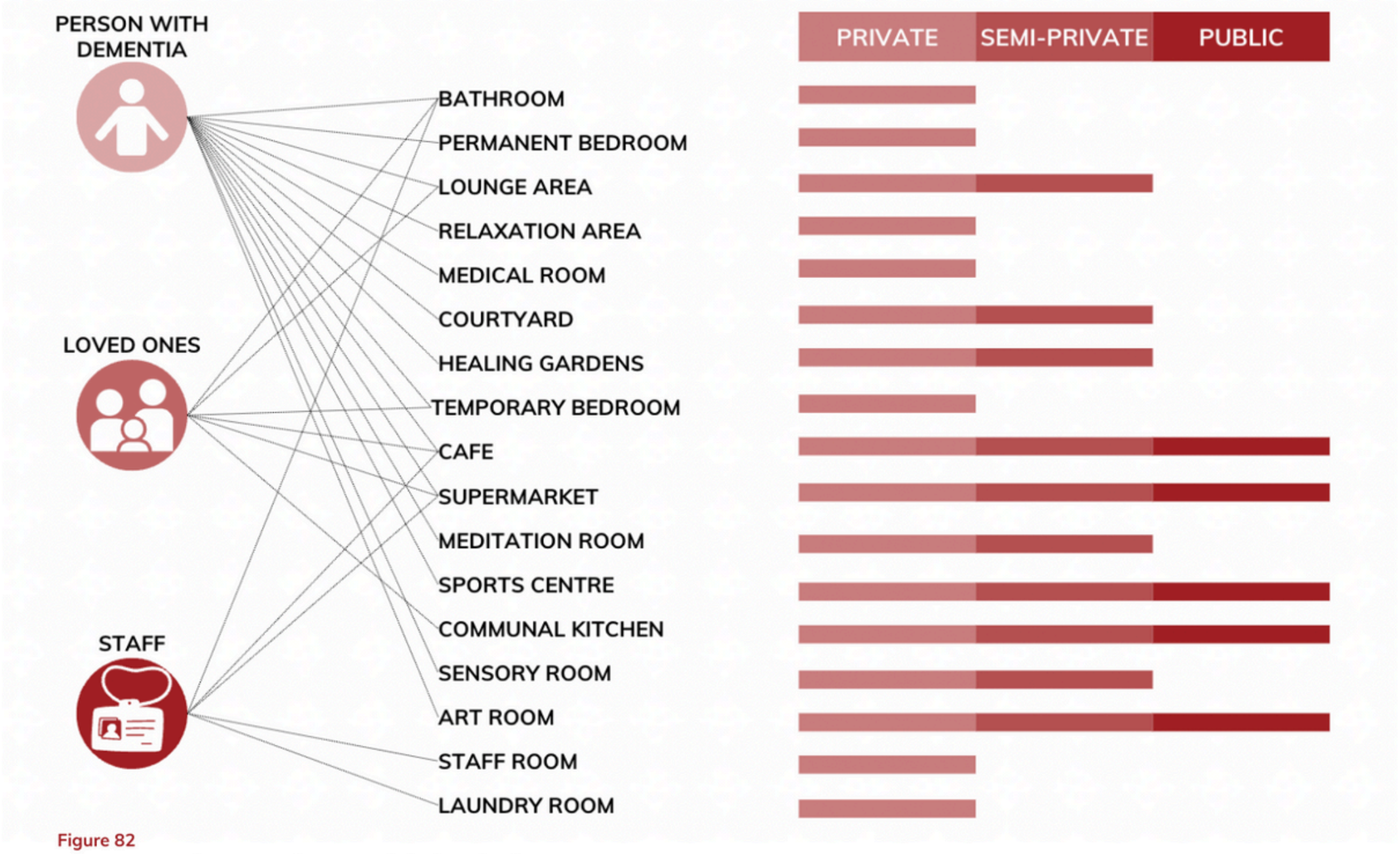


Figure 82
Programme requirements and accompanied privacy levels

The initial design phase required a refinement of the project programmes, which began by exploring what amenities are key to include in a dementia facility. Attention was also given to the users of this space and what gradient of privacy they would require. These chosen amenities were inspired by the case studies explored in the above section, as these are real life scenarios where PwD quality of life is enhanced. The incorporation of every day familiar environments such as a cafe and supermarket creates a sense of normality, which promotes autonomy and independency. Incorporating these spaces into the dementia care realm doesn't only benefit the PwD but also their loved ones, as they are able to engage in activities that reflect routines they shared pre dementia diagnosis.

REFINING THE SCOPE

The objective of this design process is to investigate how architectural interventions can reshape traditional dementia facilities and accompanied modes of care, with a focus on enhancing cognitive function and emotional wellness. This thesis has established 12 strategies that shape a person centred care environment, developed through the intensive literature review in Chapter 2. These strategies are to be implemented in the design outcome to create spaces that foreground autonomy, personhood, dignity and a sense of community.

The design caters to all levels of dementia care, with the existing build being redesigned for last-stage dementia patients and a new build envisioned for individuals that experience early and middle stages of dementia. The existing building incorporates medical facilities, as persons with last stage dementia require more intense care, including an increase in medical attention and closer assistance for daily activities.

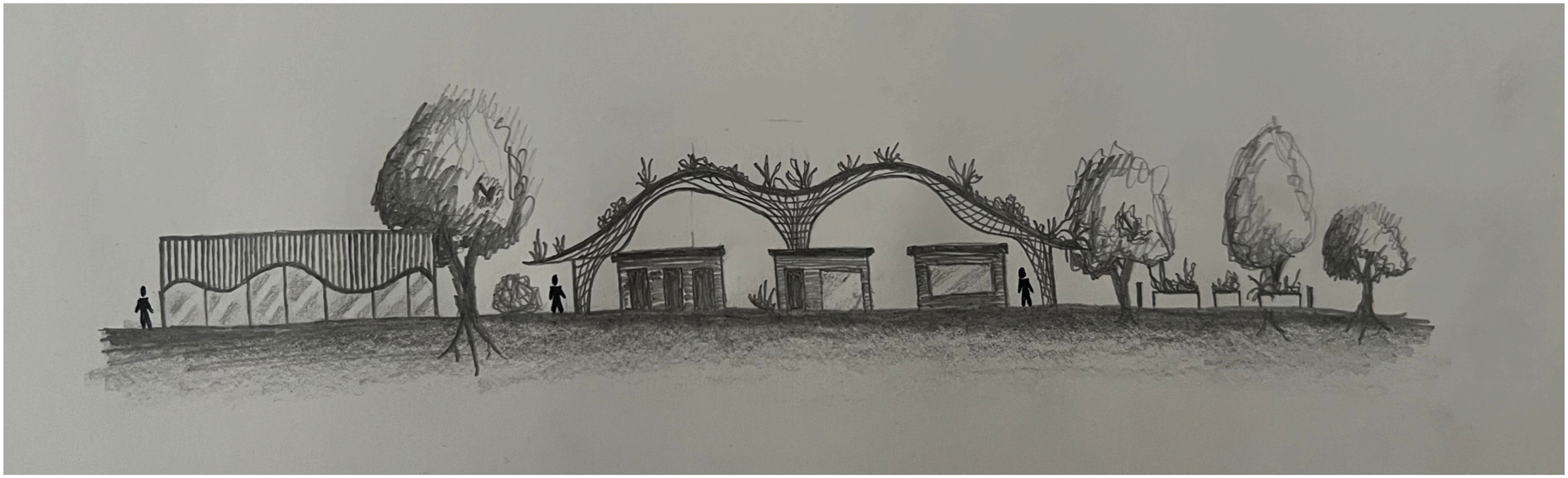
The research into the success of the model of care that De Hogeweyk implements has inspired this thesis to leverage and adopt this dementia care village approach. The notion of dementia villages as a mode of care seeks to address some of the key challenges PwD faces by fostering social inclusion, care, and support (Krier et al., 2023). The proposed dementia care facility will host long-term and short-term residents and family members seeking to stay on-site in the short term. To replicate a community and enhance a feeling of inclusivity, amenities will reflect familiar environments such as cafes, supermarkets, and activity centres, focusing on implementing normality and destigmatising dementia.

This design aims to create a tight-knit community through supportive and prosthetic temporal and physical environments, constructing a culture of respect and inclusivity.

Figure 83
Familiar spaces that make up a comforting environment

In parallel to the initial stages of the literature review research, the first design phase started, which began through sketches and collages. These were produced without an extensive knowledge of preferred dementia care spaces purely stemming from answering the question, **“What would these ethical care environments look like?”**

The main ideas portrayed in the sketches and collages revolve around human-to-nature connection, biophilia, familiarity, and how these spaces can be connected. It is also important to focus on the ‘in-between spaces’ to make every area of the care environment stimulating and entertaining for residents.



Section of a dementia care environment that is engulfed by trees, green grooves and gardens. Supporting human - nature connections for wellbeing.

Figure 84

Sketch of a section of a dementia care environment

Figure 85

Sketch that blends indoor and outdoor areas

Figure 86

Inviting nature into the built environment

COLLAGE FROM A CAD MASS MODEL

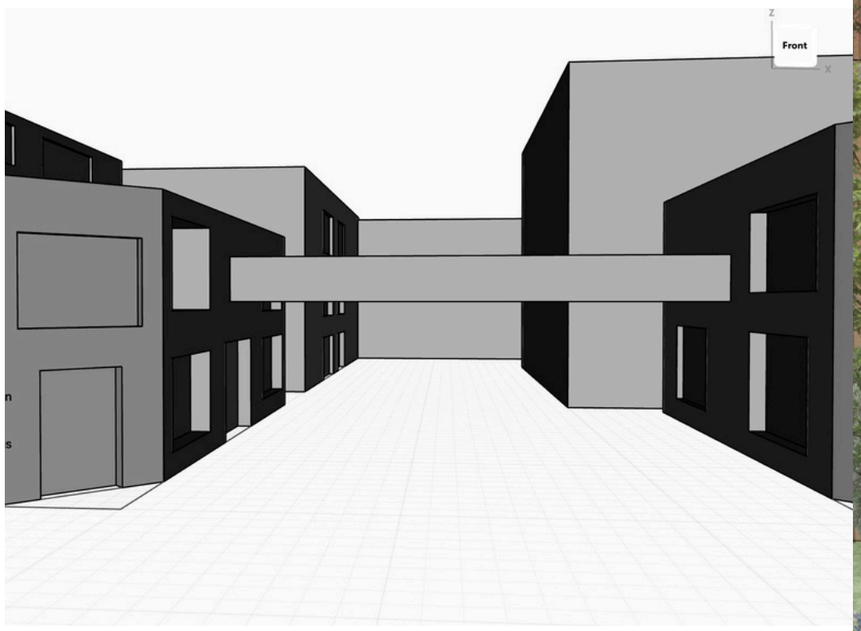


Figure 87
Initial CAD blocking model 01

Figure 88
Visualisation of the CAD model

COLLAGE FROM A CAD MASS MODEL

Figure 89
Visualisation of the CAD model 02

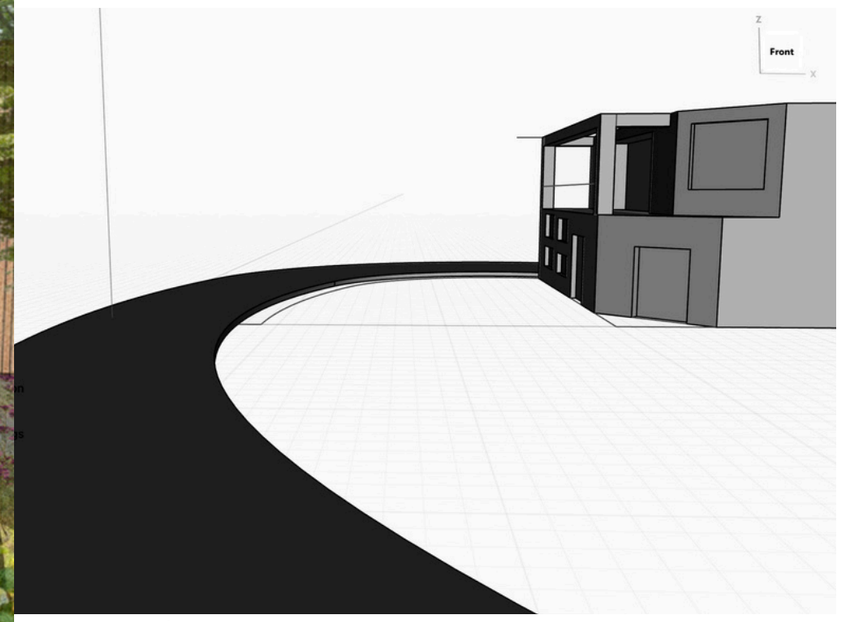


Figure 90
Initial CAD blocking model 02

INITIAL COLLAGES:

Figure 91
Collage: The dementia perception of an outdoor space

Figure 92
Collage: Strategies that can enhance PwD experience the space

Figure 93
Collage: The dementia perception of a healing garden

Figure 94
Collage: Strategies that can make PwD feel more present

Figure 95
Collage: The dementia perception of an interior space

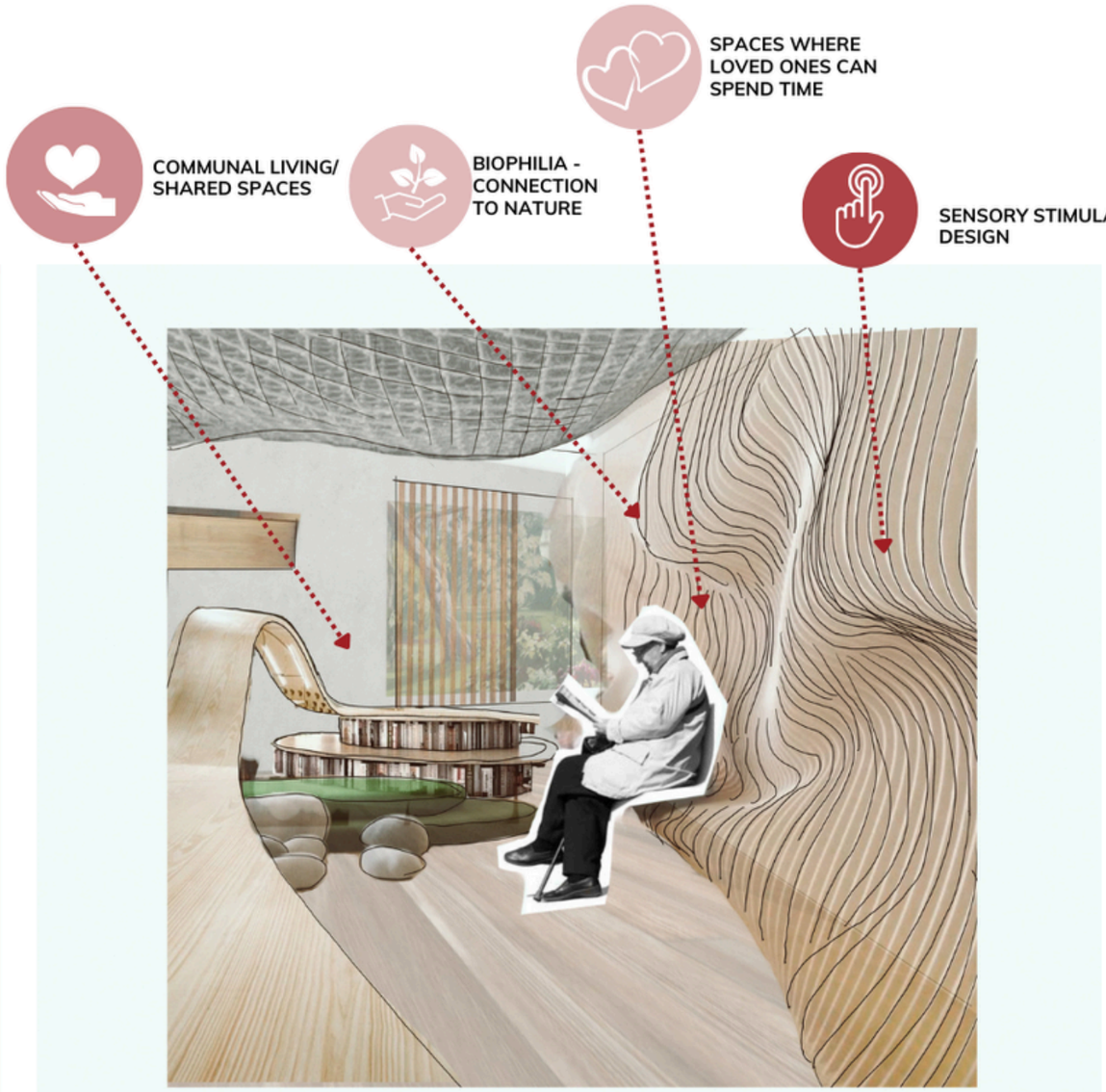


Figure 96
Collage: Strategies that can enhance engagement

These collages aim to visually show how PwD experiences space and how their perception is blurred, as seen in the left collages. The right collages, in contrast, show implemented strategies that bridge this gap and enhance spatial experience and engagement. Through this design activity, it became apparent that sensory design is crucial to enhance involvement in a space and foster a connection between the space and the PwD. This is particularly important as PwD struggle to recall old memories, which hinders a meaningful connection with a place. By integrating sensory and natural elements, the design can provoke feelings of familiarity or temporary comfort and happiness.

IDEA #1

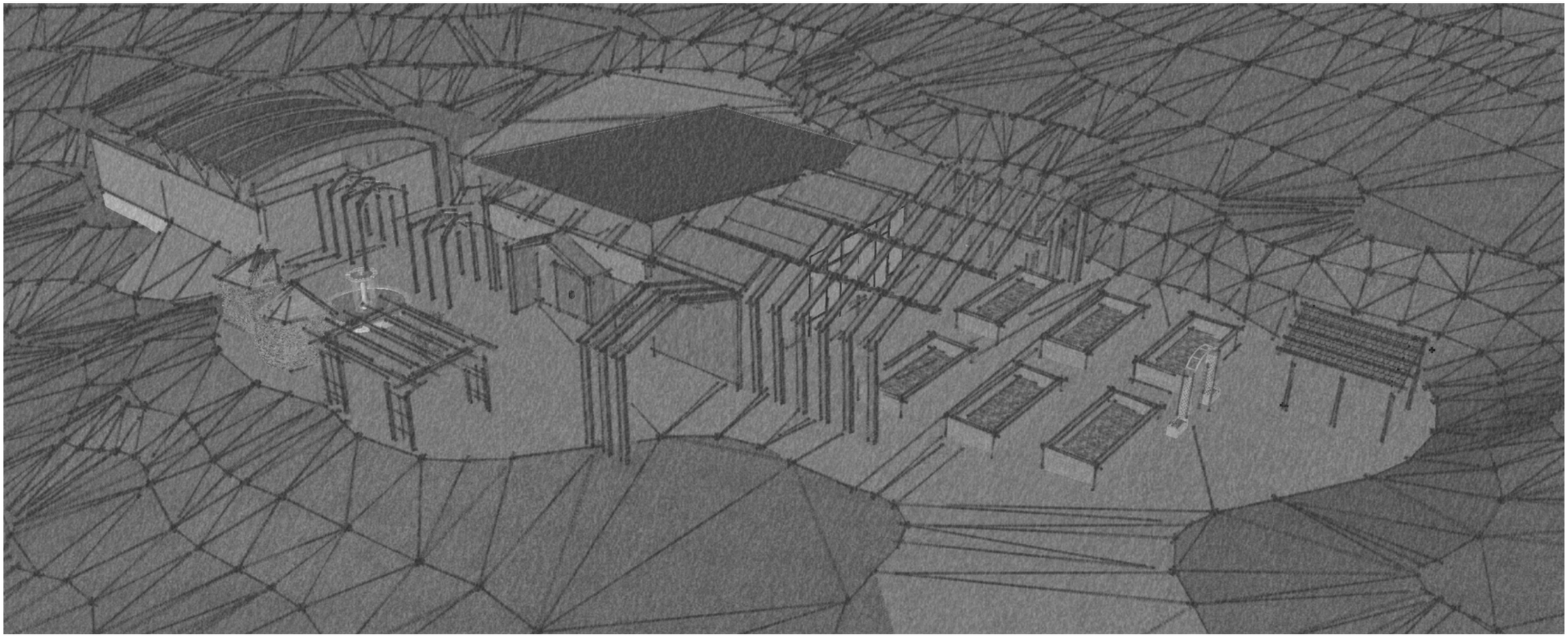


Figure 97
Visualisation sketch of Idea number 1

Figure 98
Map of Pinehaven Cottage (Auckland Council, 2023)

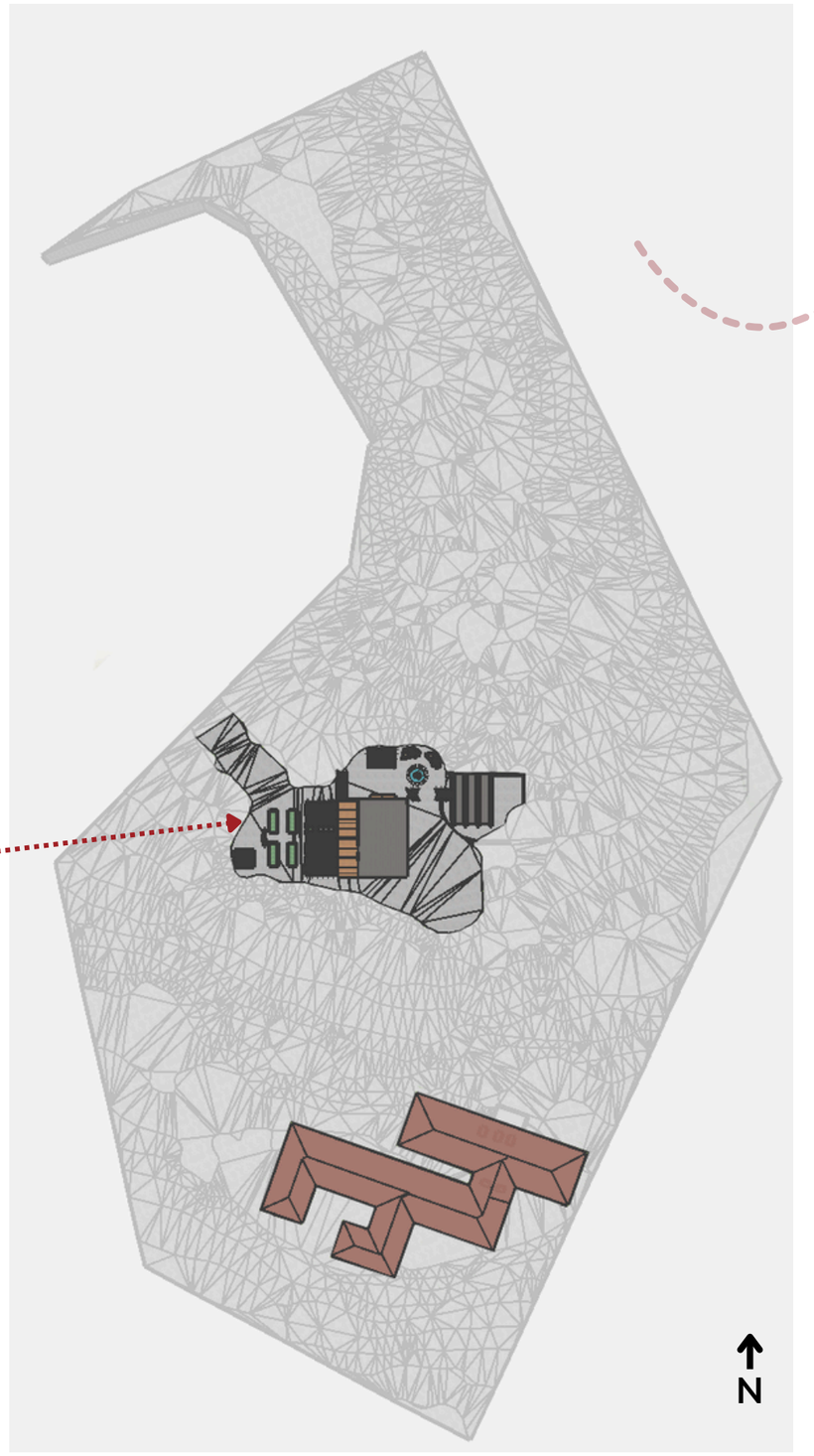


Figure 99
Proposed site plan for idea 1

This idea was sparked by the thought of ‘normality’ and creating environments that replicate those of typical communities. The first amenity envisioned was an organic supermarket/ cafe area as the heart of the village. This emerged from recognising that PwDs who are placed in traditional nursing homes tend to lack purpose in their lives and the organic lifestyles and routines of the outside world. These hostile environments can also discourage loved ones from wanting to visit, as there is limited space or activities to participate in, making the visit unnatural and upsetting. Incorporating familiar amenities within a safe environment allows for relationships to grow and maintain between residents, staff and their loved ones.

This design was positioned where there are currently no trees or bush, preserving the natural environment and creating a recuperatory relationship between people and natural elements.

Create a stronger connection between the existing building and the new build on the site.

Outdoor seating area to spend time engulfed in nature - a spot for social connection between residents and loved ones.

Figure 100
Visualisation of idea 1

Shaded walkway path for wayfinding

Not a very effective central point, as it doesn't stand out

Implementing healing gardens as a relaxing and engaging activity that supports hormonal balance from sun exposure, feeling of independence, fostering social interactions and promoting behavioural stability (Zeisel, 2007).

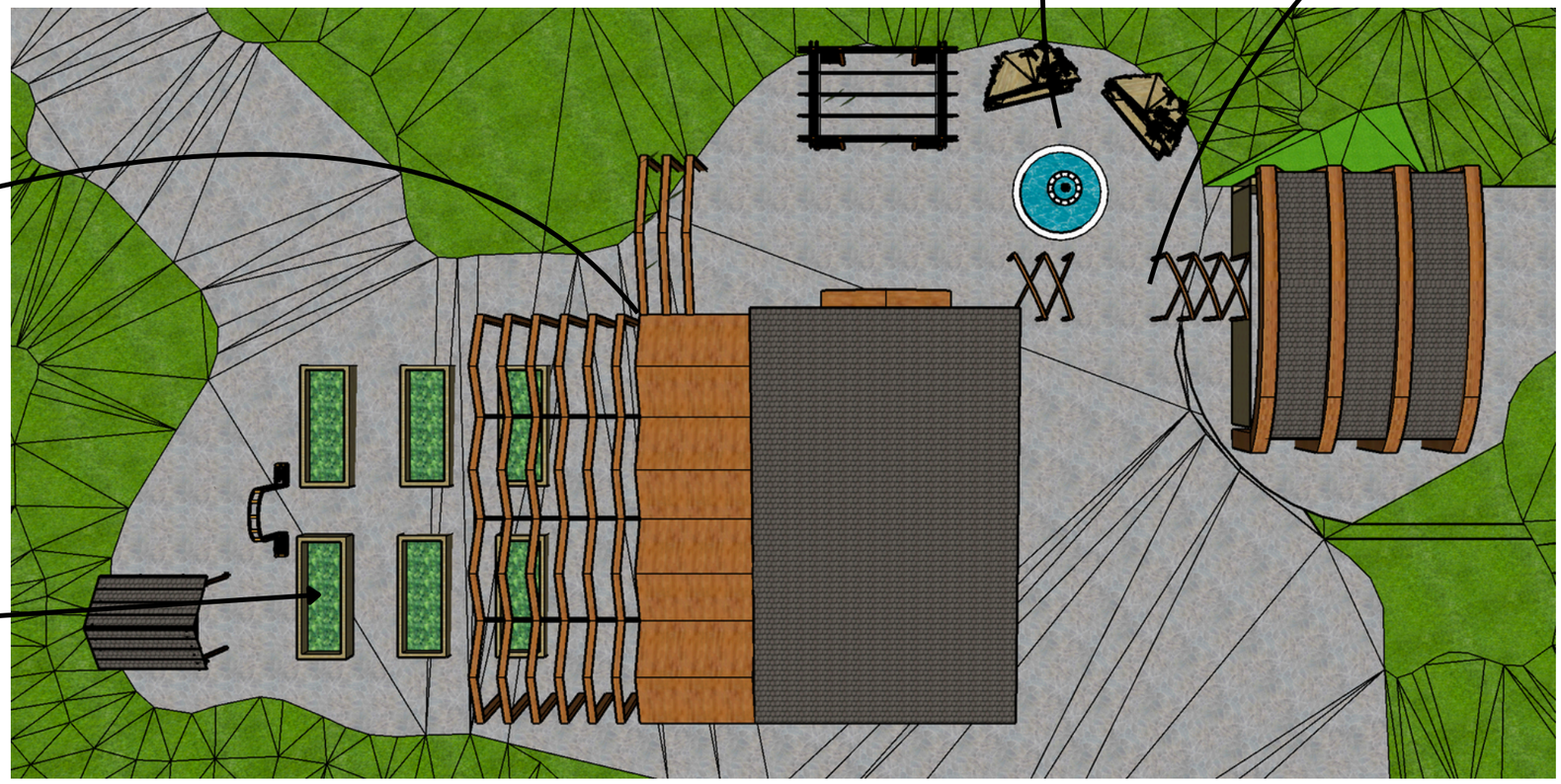


Figure 101
Top view of idea 1

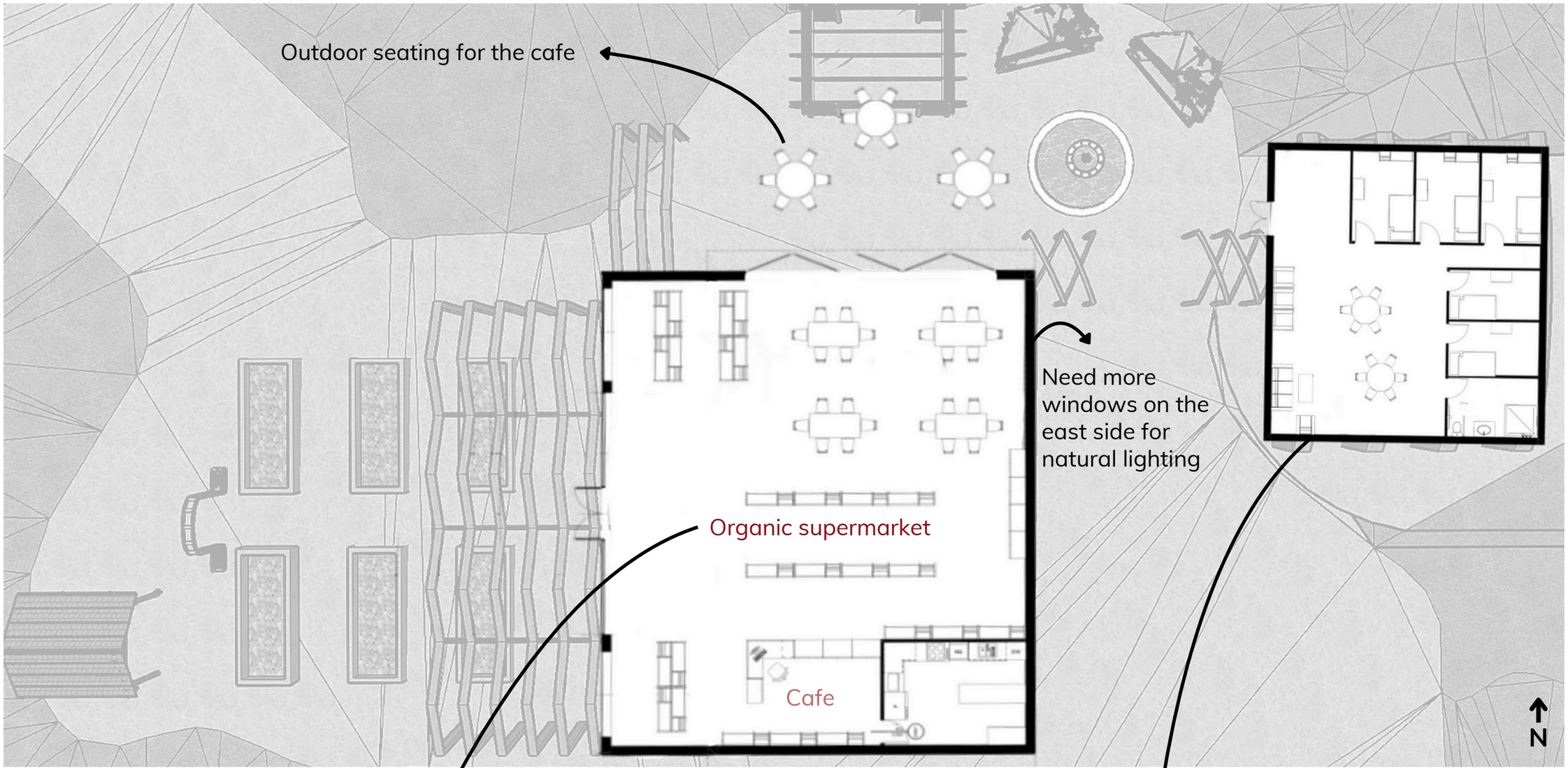


Figure 102
Ground floor plan of idea 1

Having amenities where PwD can regain their independence and confidence in a safe space enhances wellbeing, as it embodies person-centred care (Kitwood, 1997).

This was the initial attempt at a residential suite which would be replicated multiple times on the site, to create a village. The idea behind this was to create small-scale residential spaces that mimic the size of a family home. Homelike environments are created through the interaction of people, emotions, and objects within a context of social and psychological connections (Fay & Owen, 2012). De Hogeweyk is a successful precedent that increases the feeling of 'home' by grouping residents who align with each other through experiences, religions, or personalities.

Figure 103
Proposed site plan for idea 1

Figure 104
Visualisation of the healing gardens

Figure 105
Visualisation of idea 1

This structure would have to be investigated further to comply with engineering.

Implement a wider variety of gardening, such as flowers and vegetable/ food gardens.

Healing gardens were implemented as a key strategy to serve as an outdoor space that creates purpose and an opportunity for group activity. This form took on a rectangular shape, which should be reconsidered and explored to create a more natural and organic environment as a well-designed healing garden. This creates obvious and intuitive spatial cues and sequences that become a self organising environment. As PwD struggle with memory and cognitive mapping, taking on a mode of natural mapping through healing gardens helps.

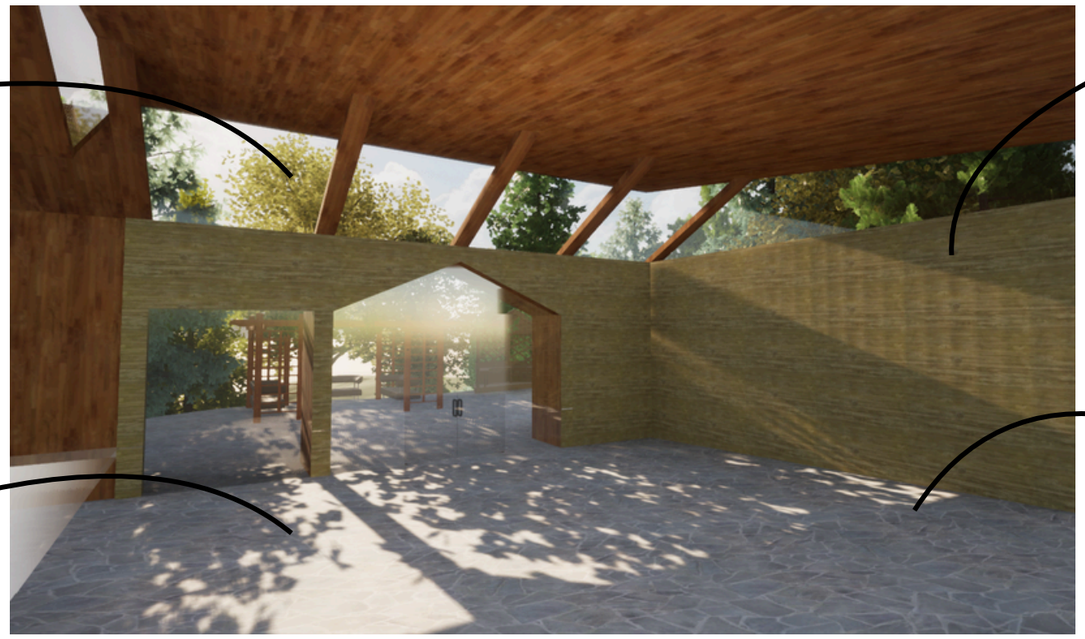
Figure 106
Visualisation of the healing gardens in autumn

Figure 107
Visualisation of the organic supermarket

Figure 108
Visualisation of the interior of idea 1

Visual connection to nature through large windows, which is a part of the 14 patterns of Biophilia. Ultimeately enhancing wellbeing through leveraging the relationship between human and nature (Browning et al., 2014)

Shadows of nature create ‘mystery’ and the movement of the trees in the shadow creates sensory engagement.



Incorporate more windows on the eastern side of the building for more natural lighting.

Use a different material for flooring, as all the cracks in the flooring could cause PwD to hallucinate.

Figure 109
Exploring the shadows and large angled windows

REFLECTION

CENTRALITY

FOCUS MORE ON CREATING CENTRAL SPACES THAT HELP WITH ORIENTATION AND BECOME THE HEART OF THE BUILDING

NATURAL SHAPES

STEP OUT OF THE RECTANGULAR FORM AND EXPLORE DIFFERENT SHAPES AND LAYOUTS, WHILST STILL REMAINING CLEAR.

CREATE MORE PRIVACY

CREATE MORE PRIVACY WITHIN THE RESIDENTIAL AREA, TO PROMOTE INDEPENDENCE AND COMFORT.

Design 1 was an initial exploration of ideas that arose without the background of an extensive literature research. It looked at the initial planning stages of a small scale dementia care realm. After completing more research about dementia and the spatial perception that comes along with it, it is evident that this design is not as supportive and prosthetic as it could be. Although it meets some of the strategies, the design requires significant enhancement to meet all of them.

This design also lacks purpose, as there was no dedicated design navigator at this stage. Without this, it was challenging to make meaningful decisions.

WELLBEING 2/3	COMMUNITY 1/3	PERSONHOOD 1/3	AUTONOMY 1/3
BIOPHILIA - CONNECTION TO NATURE	INCLUSIVE DESIGN	DESIGN FOR IDENTITY	SENSORY STIMULATION DESIGN
PRIVATE AND PUBLIC SPACES	COMMUNAL LIVING/ SHARED SPACES	SAFE AND ACCESSIBLE DESIGN	CENTRALITY + TIME FOR WAYFINDING
SPACES WHERE LOVED ONES CAN SPEND TIME	GROUP ACTIVITIES AND HOBBIES	CREATE TIME BASED ROUTINES	FAMILIAR/ HOMELIKE ENVIRONMENTS

IDEA #2

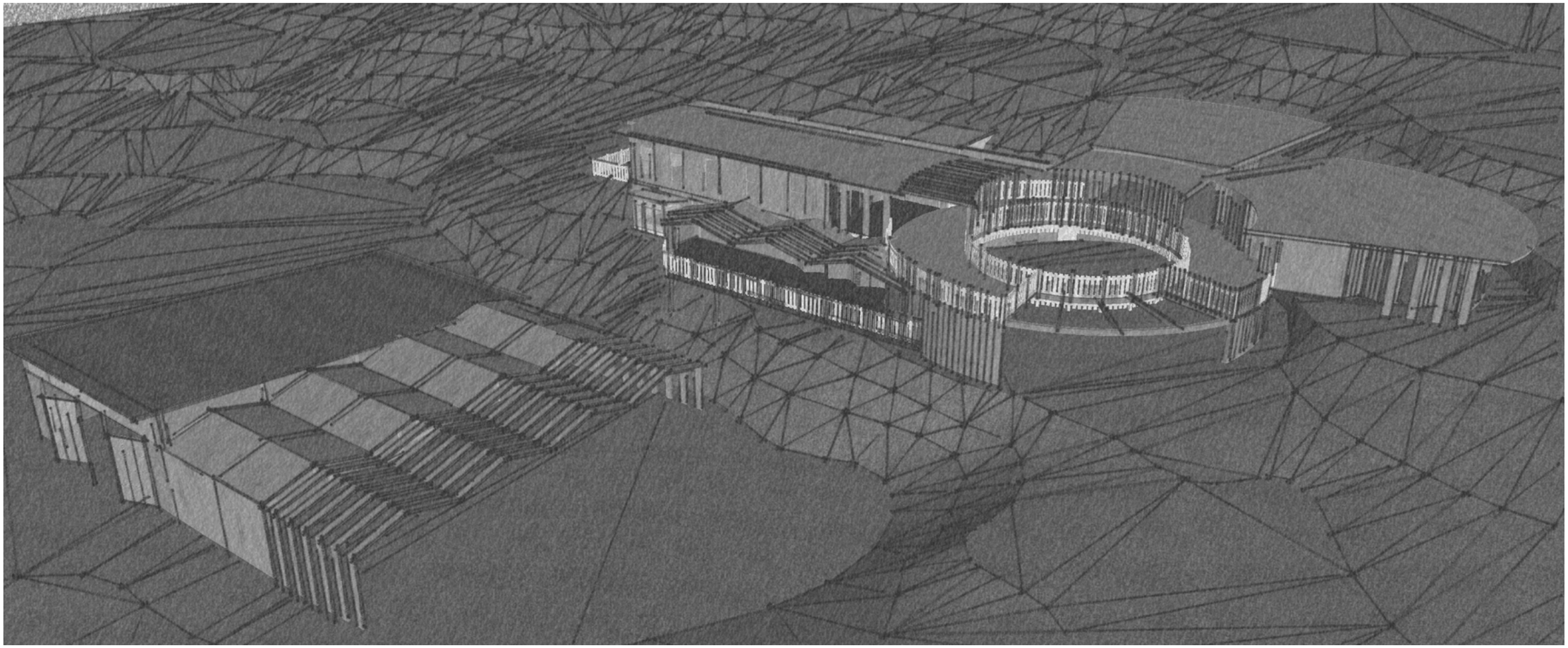


Figure 110
Visual sketch of design idea 2

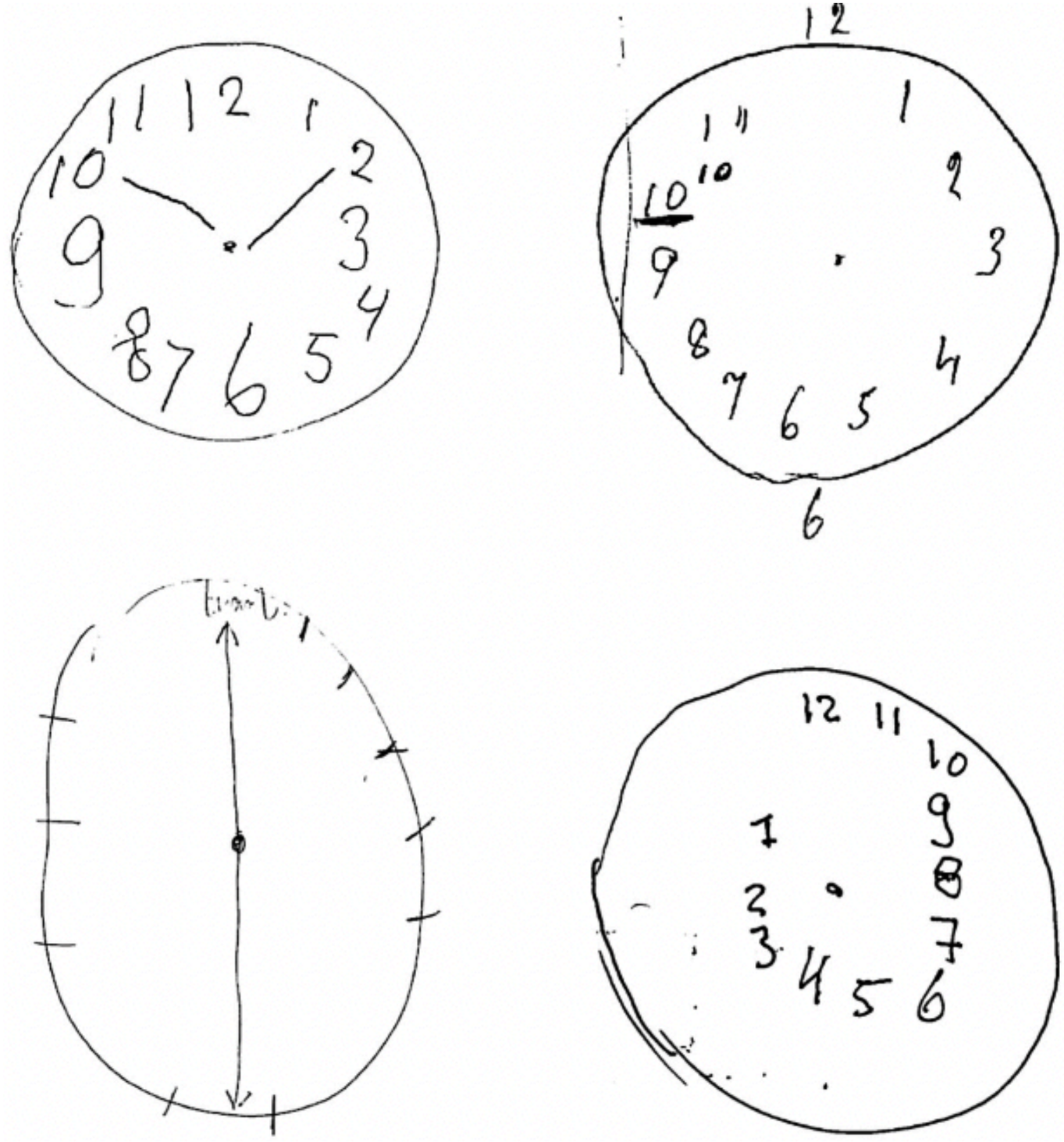


Figure 111
Cognitive Clock Drawing test(Scheltens & van der Flier, n.d.)

In the reflection of idea 1, it was clear that the lack of a design navigator made it challenging to create a meaningful design direction. The absence of creative inspiration led to a restrictive visual language that did not reflect the design concept to its full extent.

However, through extensive literature research about dementia and its cognitive effects, a suitable design driver was found. This emerged specifically through analysing different cognitive tests used to identify various levels of cognitive ability. The clock drawing test became the most relevant as thoughts of how time itself could become the main design navigator arose. This particularly resonated with this thesis as the title is "**Lost in Time: Designing spaces for dementia when perception is lost**". The idea of being 'lost in time' inspired the desire to explore how temporal experiences and spatial design can create a series of moments that help PwD feel comforted and less adrift.

The clock drawing test requires the person being tested to draw a clock and where numbers are located within the clock, which people with declining cognitive ability often struggle with (Rakusa et al., 2018). The clock often does not resemble a perfect circle and has numbers scattered across, with no particular order. This illustrates that PwD really are lost in time.

HOW CAN TIME BECOME A DESIGN NAVIGATOR?

Time is inseparable from the constructed environment but is often overlooked (Wittmann, 2019). This is because buildings are three-dimensional objects that, through time and spatial arrangements, create different user perceptions and experiences. This frames ‘time’ as a main contributor to spatial creation and must be recognised as such within the architecture (Wittmann, 2019).

Time is relevant to the built realm in many different ways; it is experienced by walking through a building with the time it takes to get from one point to another. It is expressed through the length of time spent within a space and how present they feel at given moments (Wittmann, 2019). Time can also be experienced at different speeds depending on the space; the integration of different stimulants in the space can dictate the degree to which a person is engaged and connected. High engagement makes time feel quicker, while a person disengaged in the space will experience time slowly (Wittmann, 2019).

Framing time as the design navigator can be explored through centrality and wayfinding. Creating atriums that mimic the central works of a clock in the heart of the building can help PwD with orientation and purpose. Rooms that change purpose during the day with different atmospheres and activities in accordance with the time could also be a successful way at creating routine and making PwD feel present.

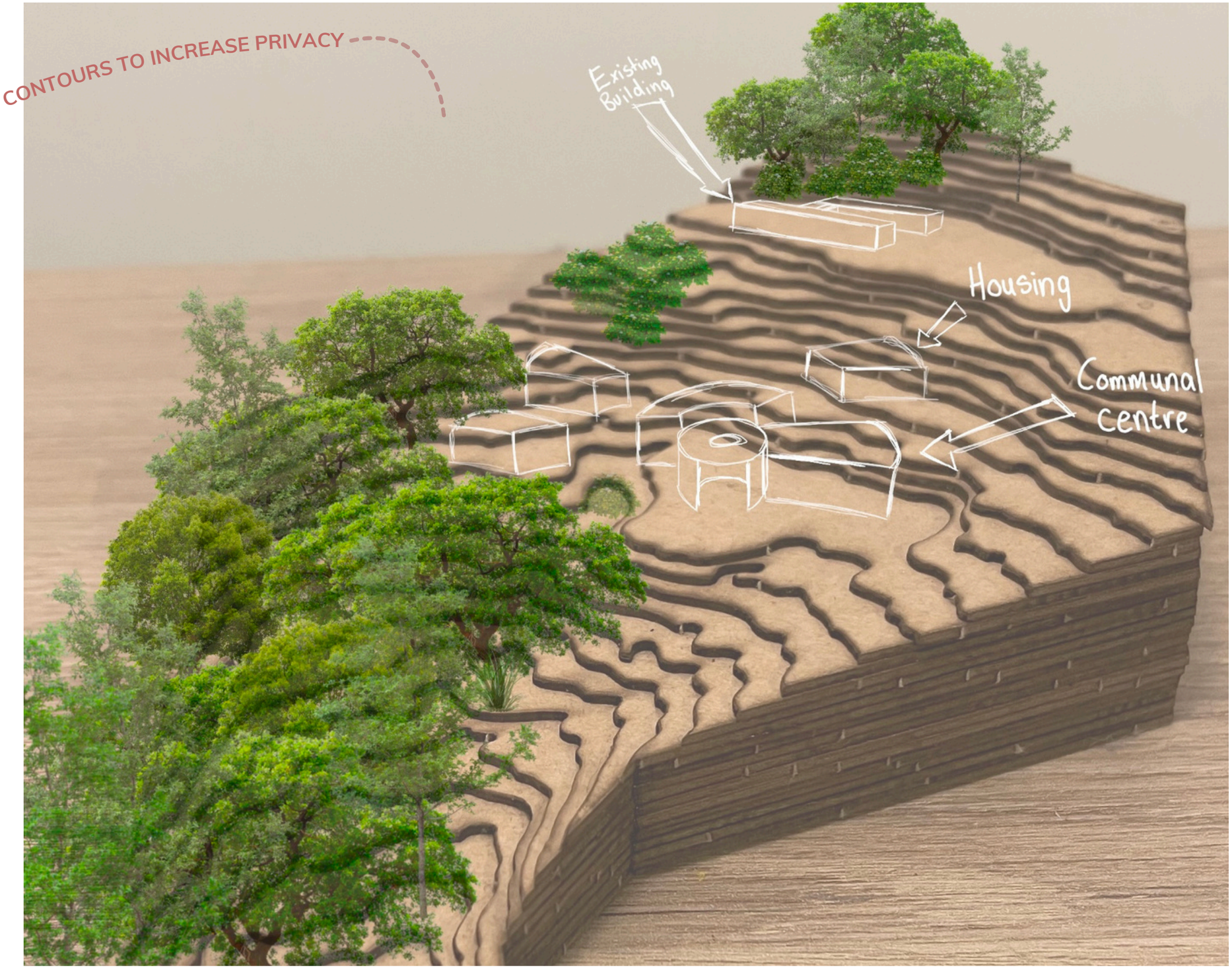
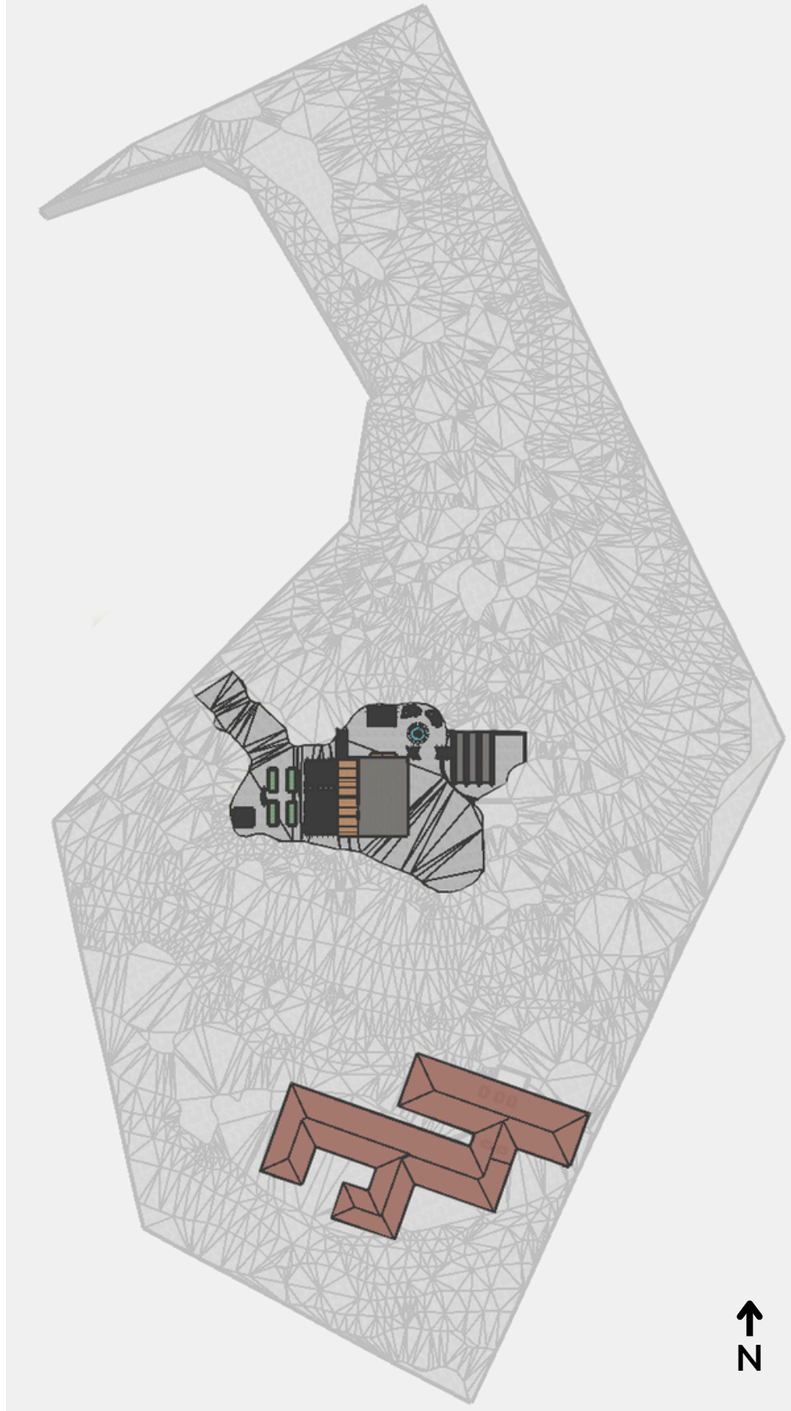


Figure 112
Model proposal of design idea 2

Idea #1



Idea #2

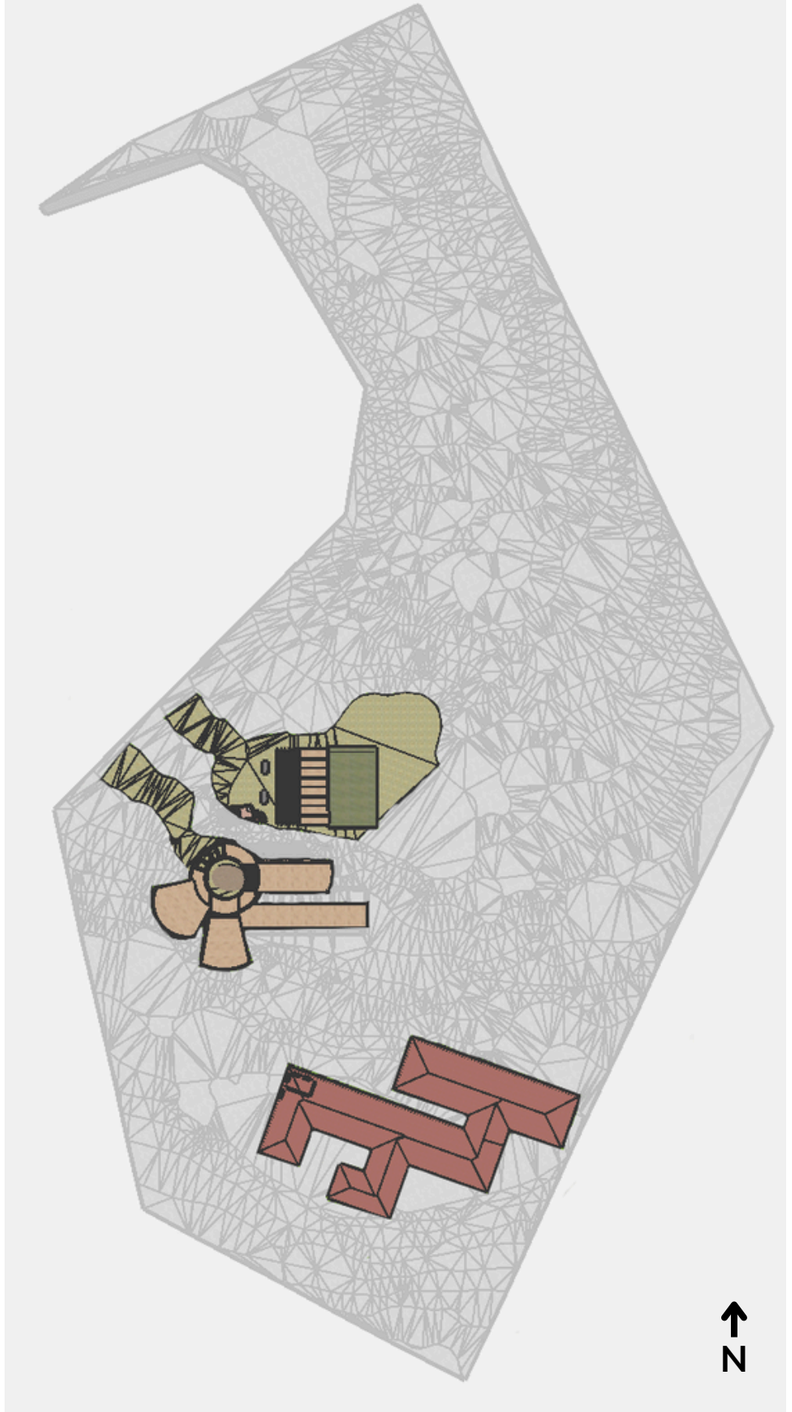


Figure 113
Proposed site of idea 1

Figure 114
Proposed site of idea 2

GROUND FLOOR

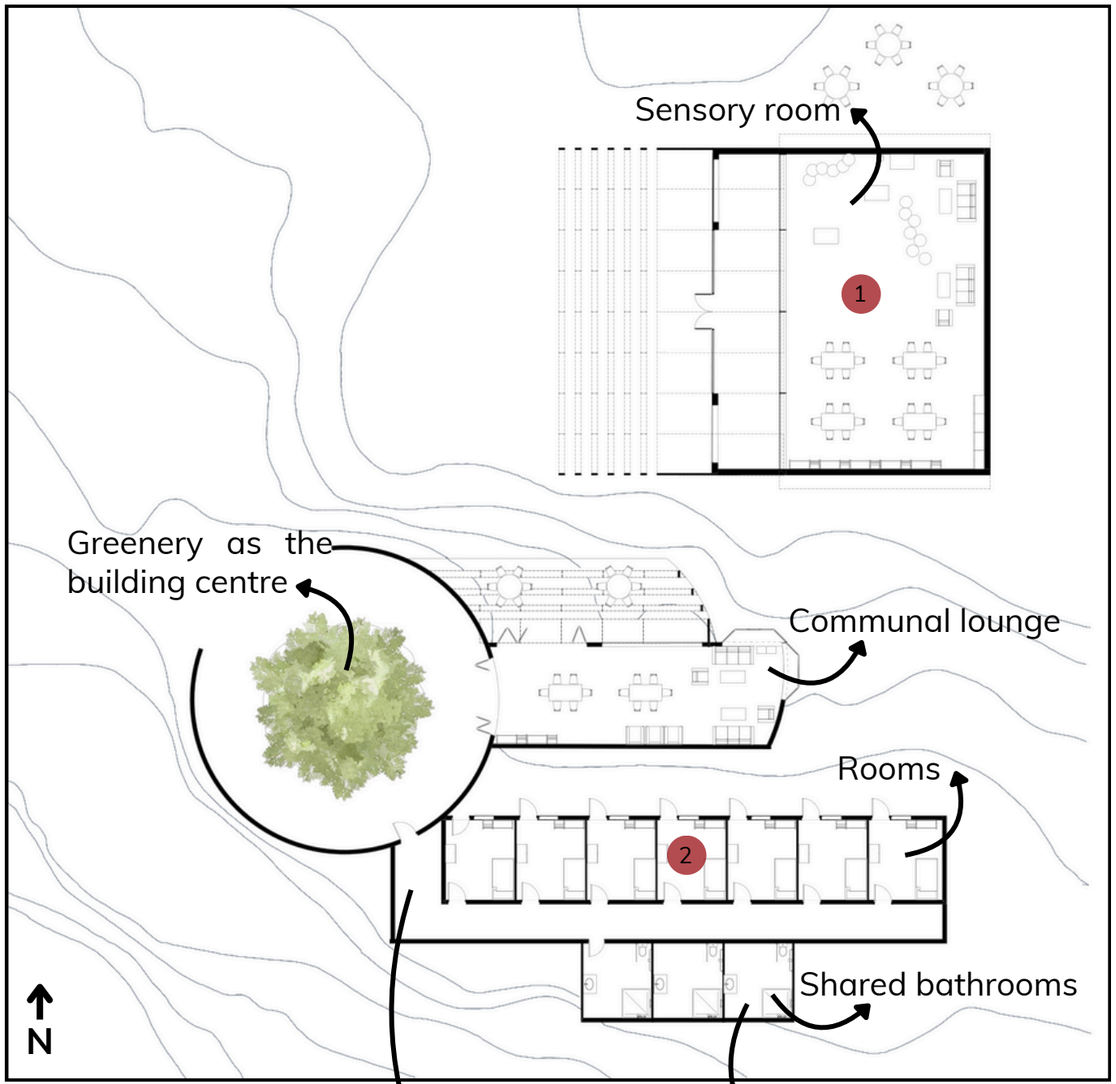


Figure 115
Proposed ground floor plan idea 2

Quite a long distance for residents to walk from their rooms to the communal lounge, the layout also isn't very simple to follow.

Shared bathrooms decrease privacy

FIRST FLOOR

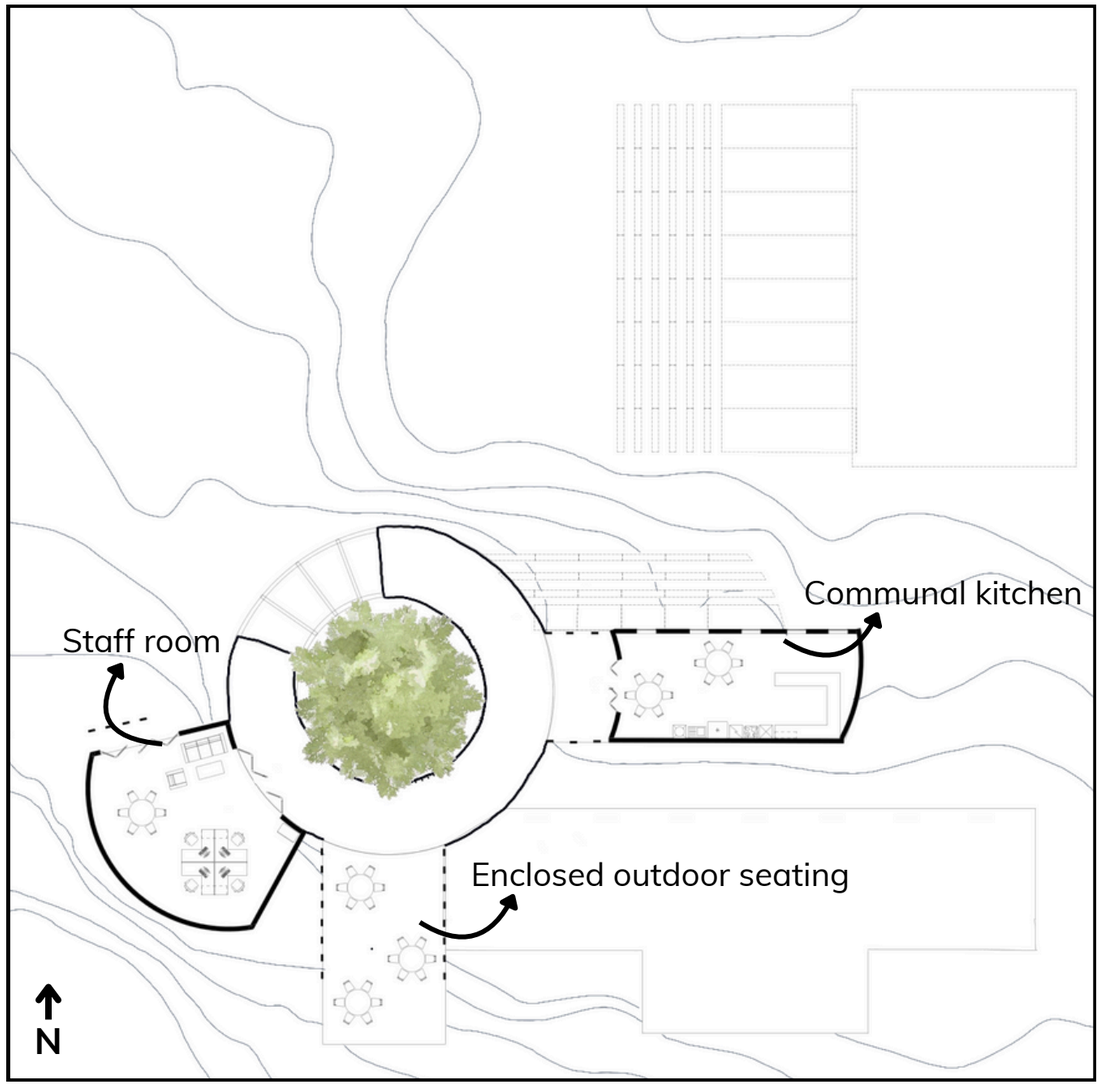


Figure 116
Proposed first floor plan idea 2

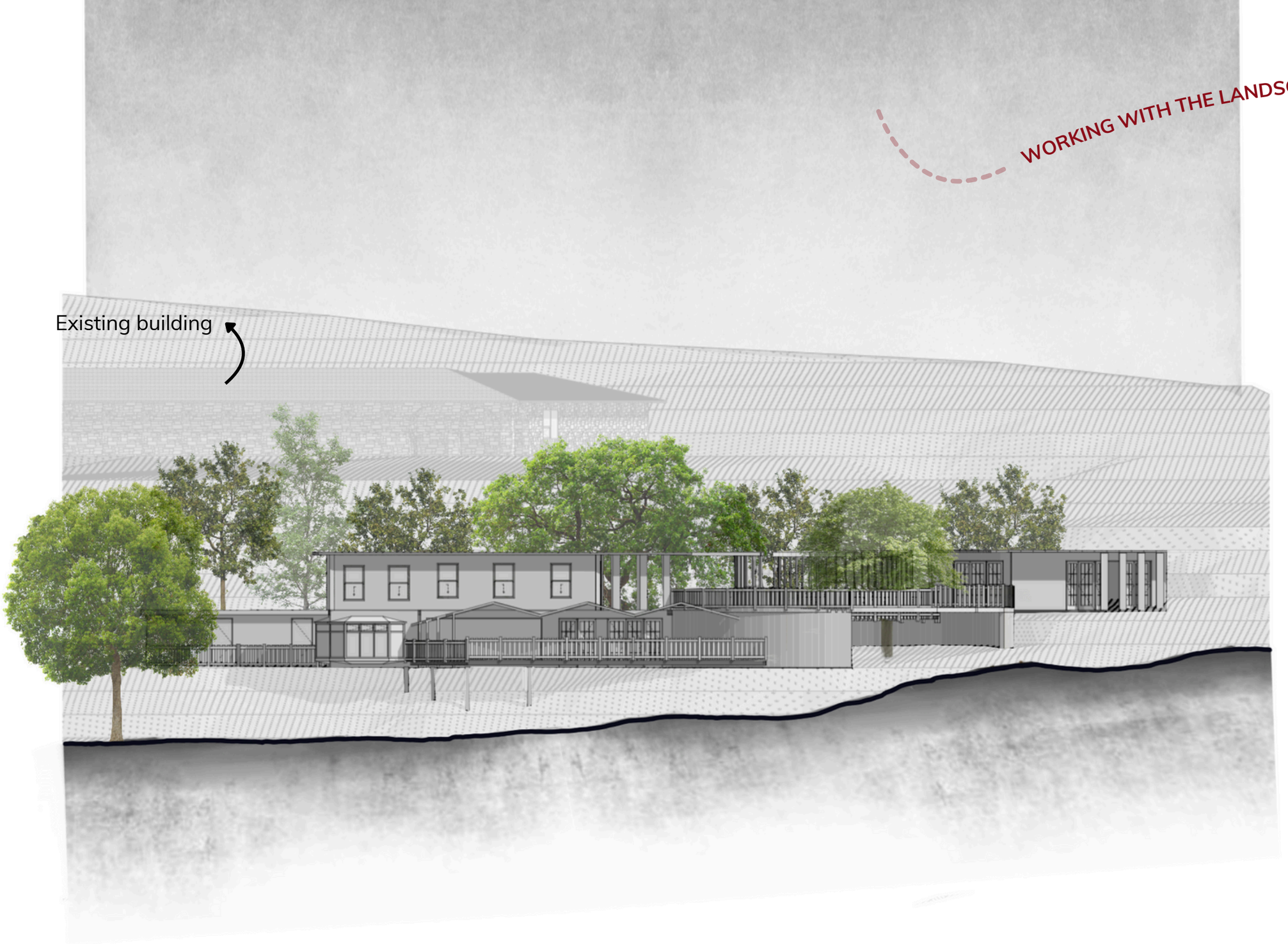


Figure 117
Proposed elevation idea 2

The residential unit being at the top, creates privacy.

Central atrium shaped around nature. Promotes human - nature relationship

Need fencing/ safer outdoor environment to mitigate exit seeking

Figure 118
Visualisation of the site programme idea 2

Figure 119
People engaging with the site

Figure 120
Residential building

Figure 121
Building around nature

Figure 122
Residents interacting with staff

1

Figure 123
Resident on window seat with loved one

Figure 124
Sensory room for cognitive wellbeing

SPACES WHERE LOVED ONES CAN SPEND TIME:
The window seat with the natural light becomes a warm and comfortable spot for residents and their loved ones, whilst also offering a view to a courtyard. This creates a space that provides a different atmosphere within the comfort of their own room.

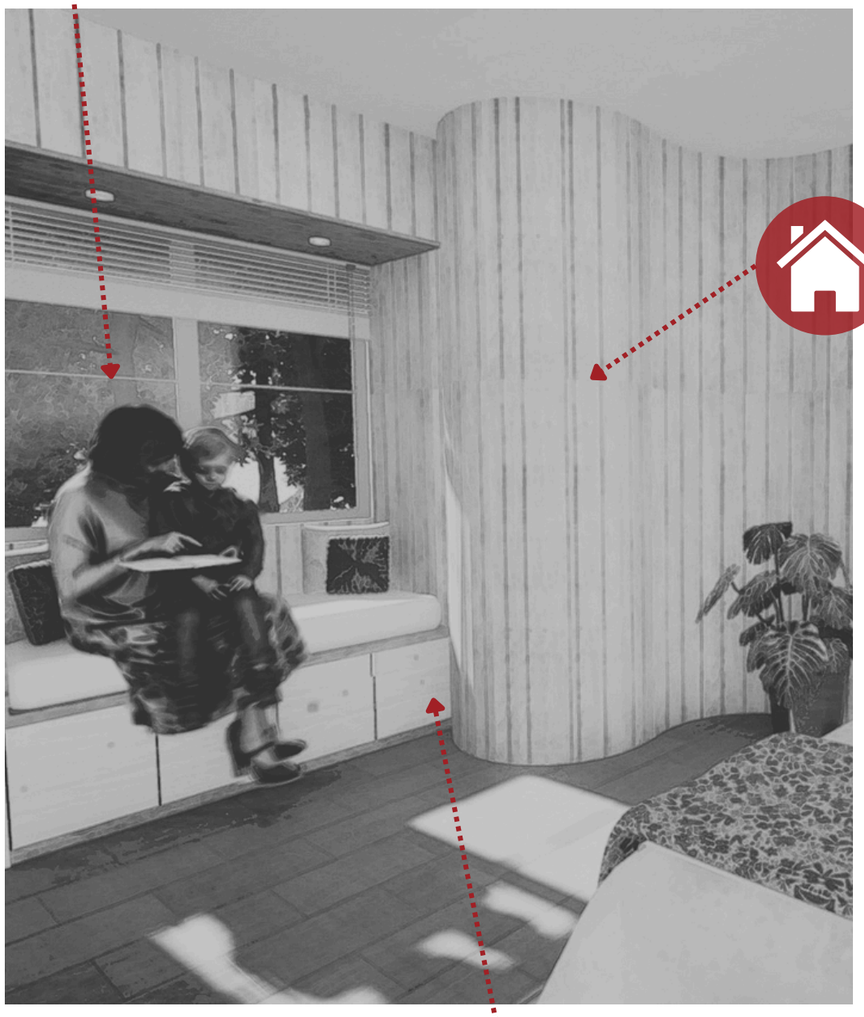


Figure 123
Resident on window seat with loved one

FAMILIAR/ HOMELIKE ENVIRONMENTS:
Creating Rooms that foreground comfort, personalisation and individuality enhances a feeling of home. The use of wooden flooring and walls also aids with the comfortable and natural aesthetic.

SENSORY STIMULATION DESIGN:
This space leverages on the idea of the Snoezelen rooms, which is a dedicated room for sensory engagement.

PRIVATE AND PUBLIC SPACES:
Having individual rooms that the residents can retreat in creates privacy, which is vital for dignity and autonomy.

BIOPHILIA - CONNECTION TO NATURE:
The large angular windows let in natural light and also create visual connection to nature.

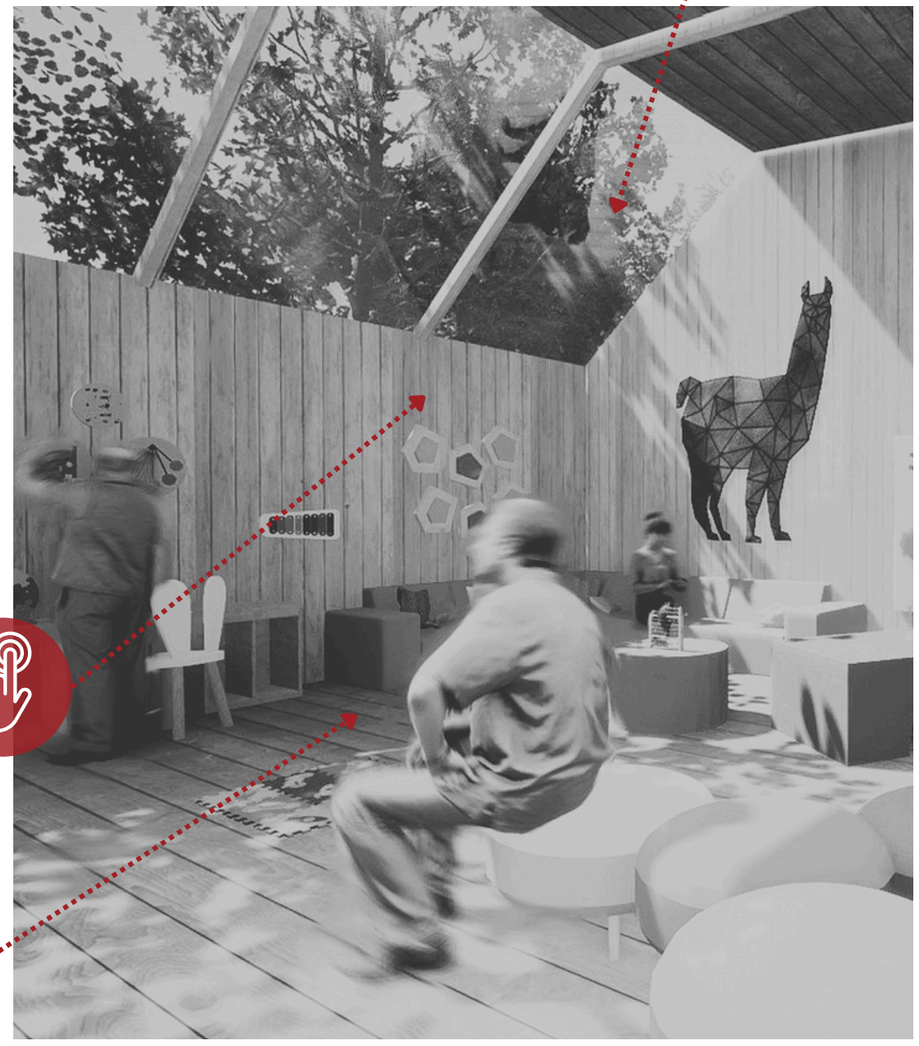


Figure 124
Sensory room for cognitive wellbeing

INCLUSIVE DESIGN:
This space becomes an inclusive environment as it foregrounds the needs of the residents

REFLECTION

Design 2 evoked a design navigator that added meaning and a driver behind the design. This was explored through the circular atrium in the residential building, which became a landmark in the design to aid with navigation. This works in theory; however, the circular infrastructure is misplaced and not predominant within the building. This circular infrastructure would thrive more in the heart of the dementia village, where it would be most purposeful as most important spatial functions occur here.

The design also needs to include more amenities to embody a realistic village. It is imperative to narrow down which facilities are necessary and will enhance residents' quality of life.

The residential buildings also need to become more responsive towards the centre of the village and revolve around this.

IDEA #3

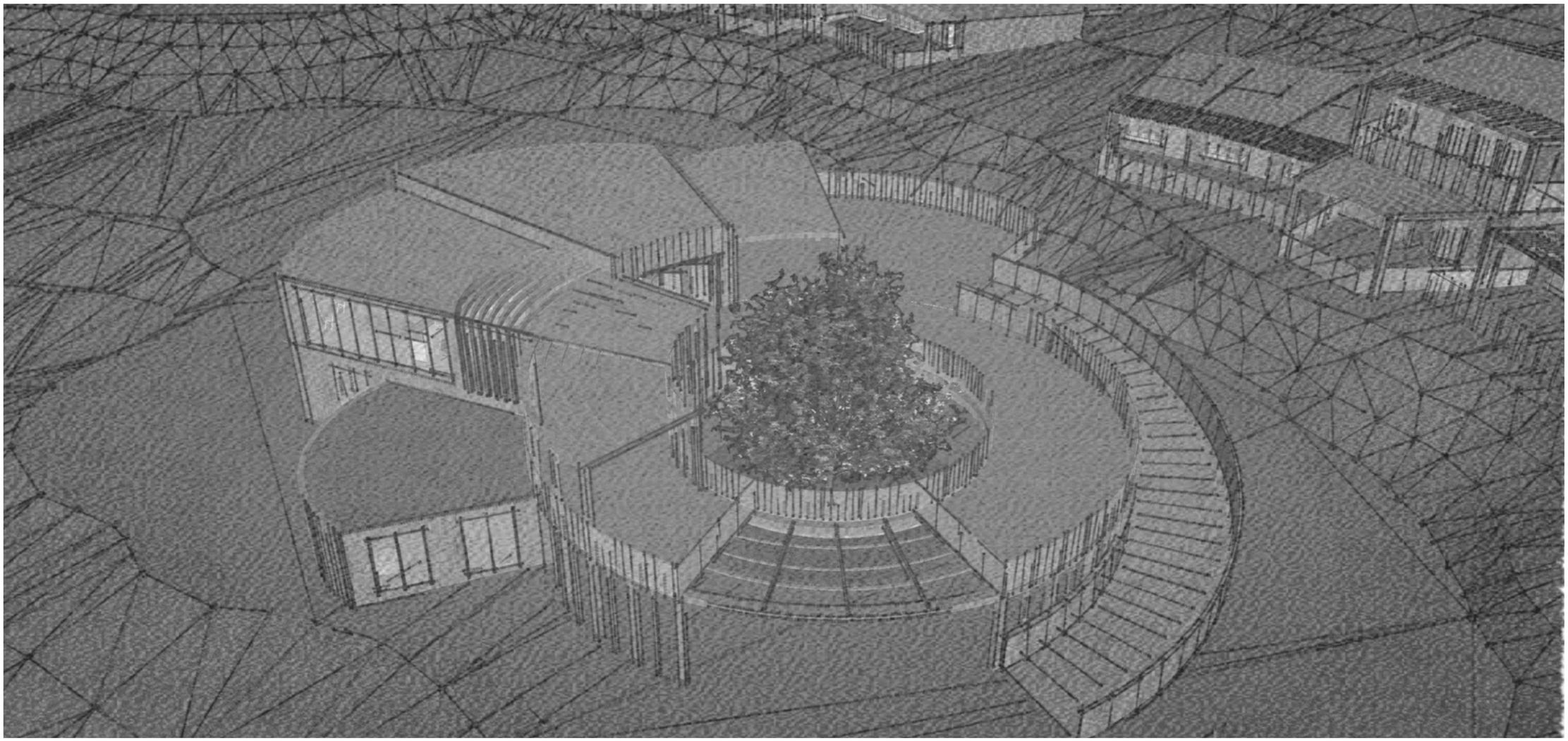


Figure 125
Visualisation sketch of idea 3

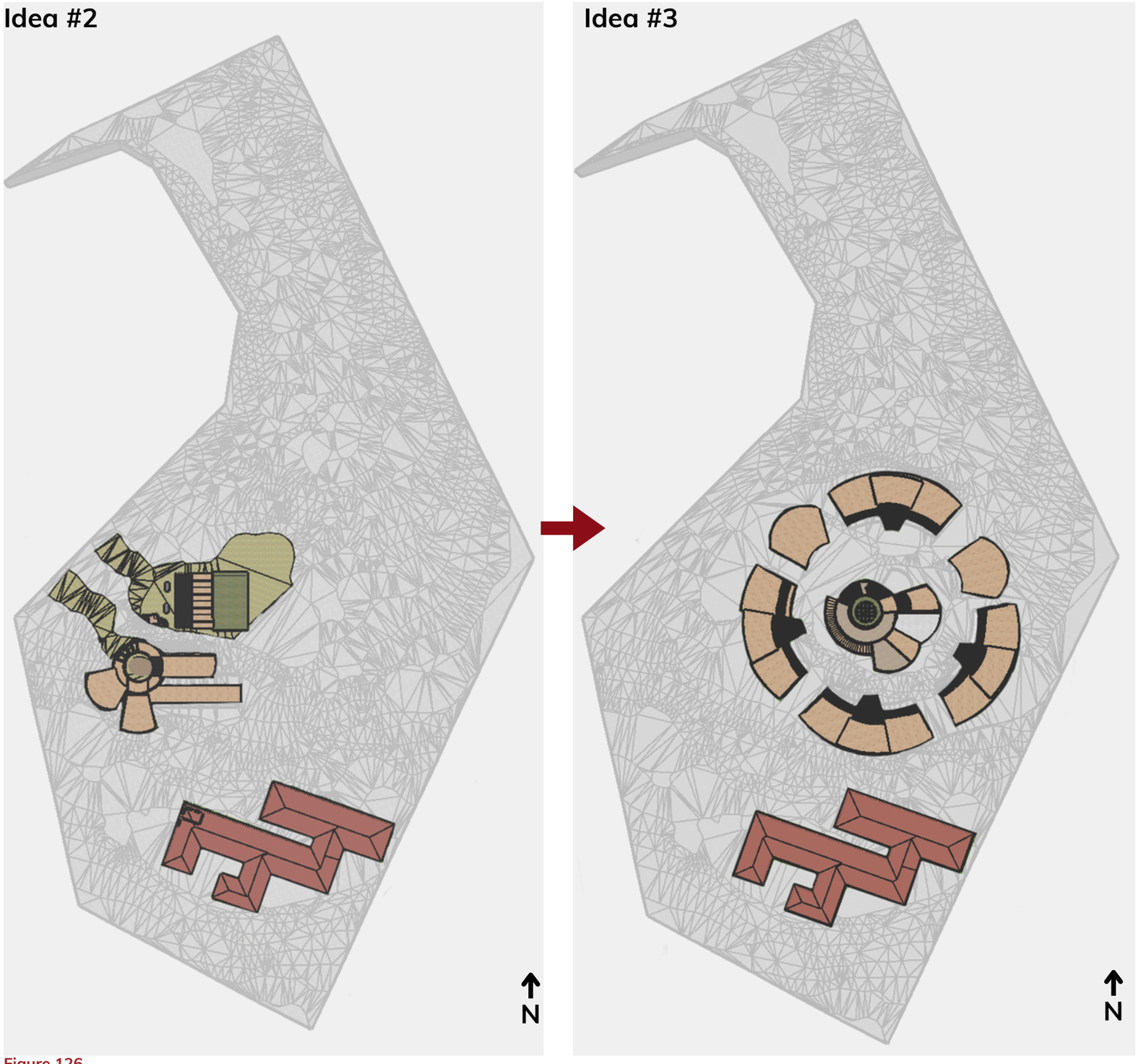


Figure 126
Proposed site plan for idea 2

Figure 127
Proposed site plan for idea 3

Design number 3 builds on the critical reflection of building 2 by reintroducing the circular structure into the heart of the dementia village. By positioning this into the centre, a landmark is created that is visible and accessible from all parts of the village, with all pathways leading towards it. This helps with wayfinding, as the central hub becomes a place of orientation and comfort.

The circular building that is placed in the core of the village is an activity centre, which provides a range of hobbies and group activities and creates structure for time-based routines. This encourages the residents to become more social and active, promoting more meaningful lives by enhancing autonomy, wellbeing a sense of community and personhood. The community hub doesn't only become a place for PwD to spend time with each other, but also with their loved ones. In contrast to traditional methods of dementia care, they are able to continue with routines and hobbies they used to enjoy doing together and not just sit in a shared lounge amongst other residents.

Design 3 also focuses more on the residential units and how these correspond to the circular centre. These small scaled units are also influenced by the De Hogeweyk theory and provide feelings of comfort as they replicate a family home.

ACTIVITY CENTRE

GROUND FLOOR

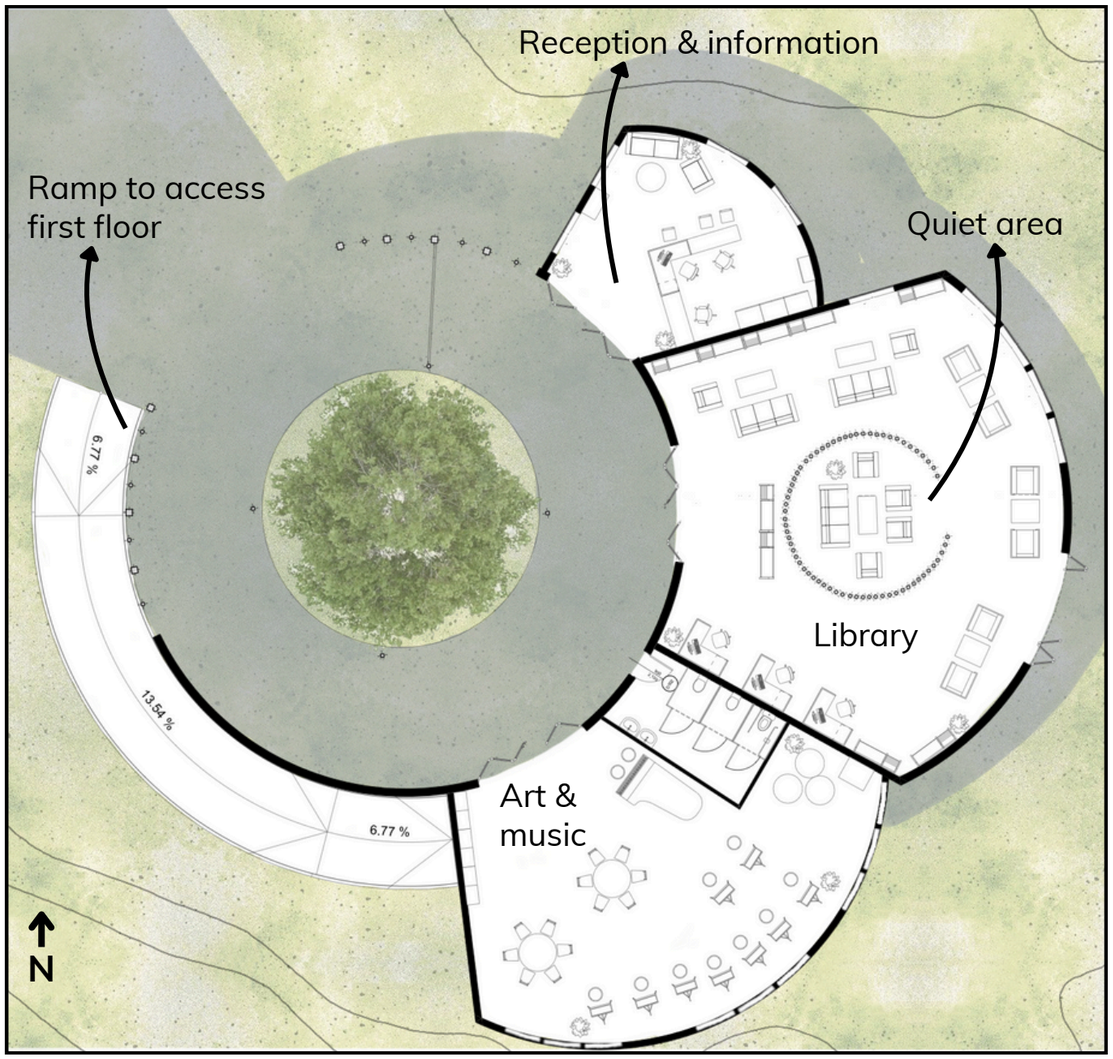


Figure 128
Proposed ground floor plan of activity centre

FIRST FLOOR

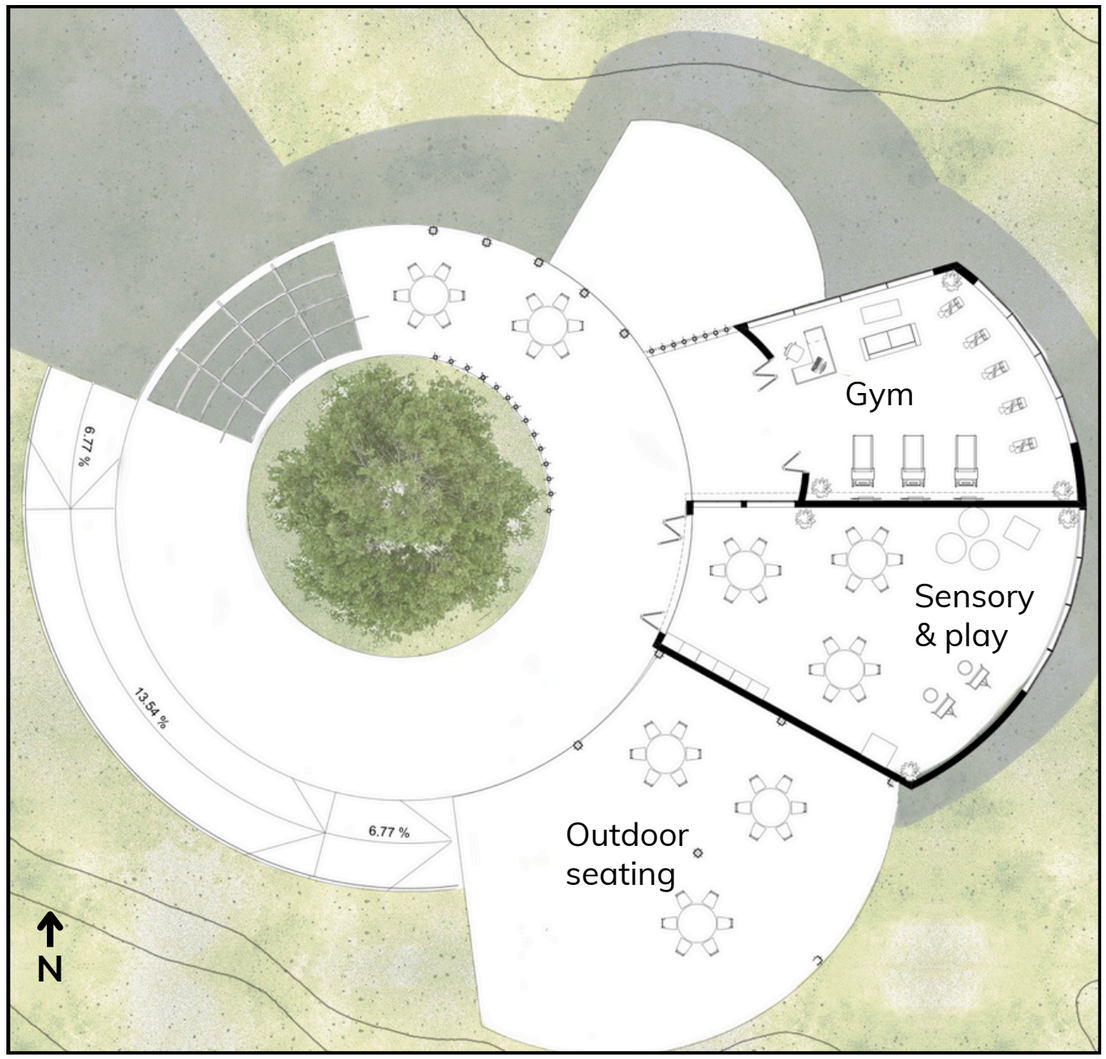
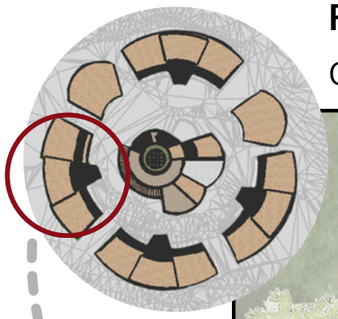


Figure 129
Proposed first floor plan of activity centre



RESEDENTIAL UNIT

GROUND FLOOR

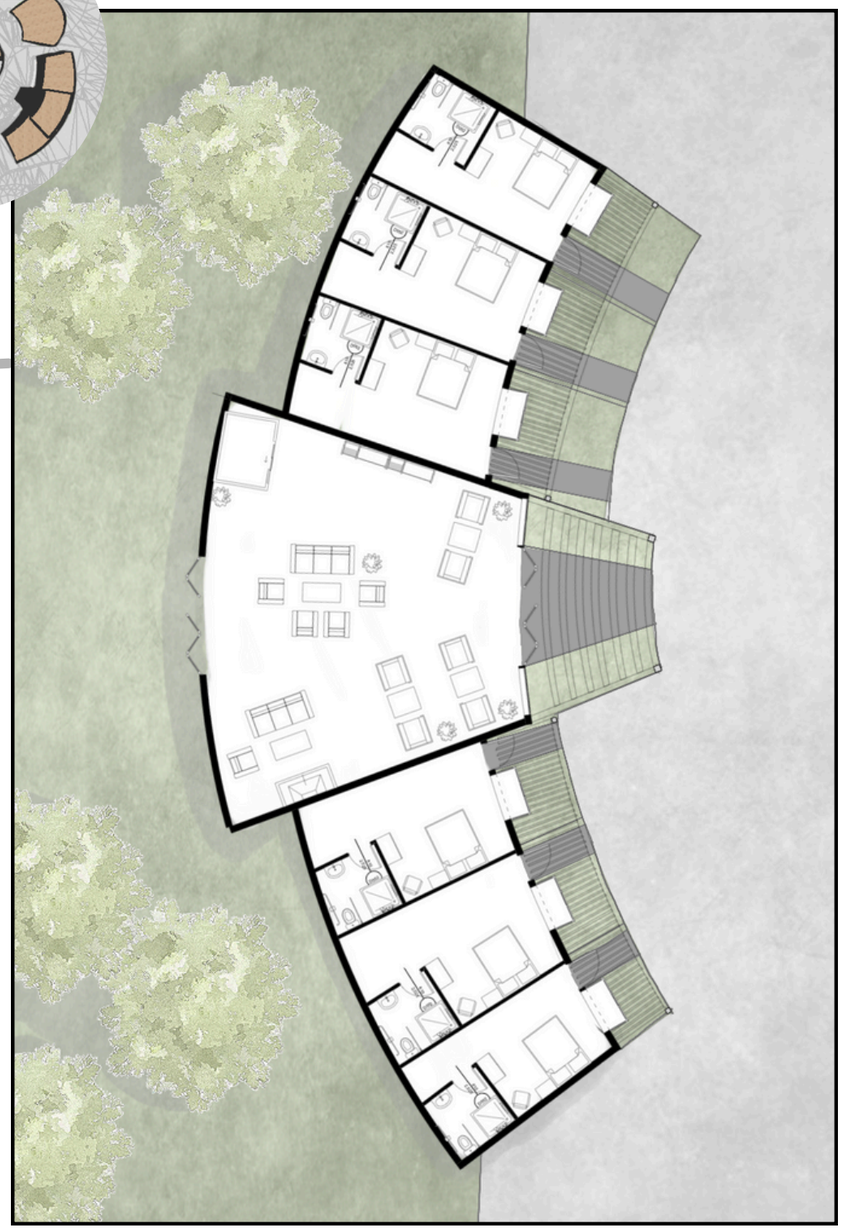


Figure 130
Proposed ground floor plan of residential unit

FIRST FLOOR

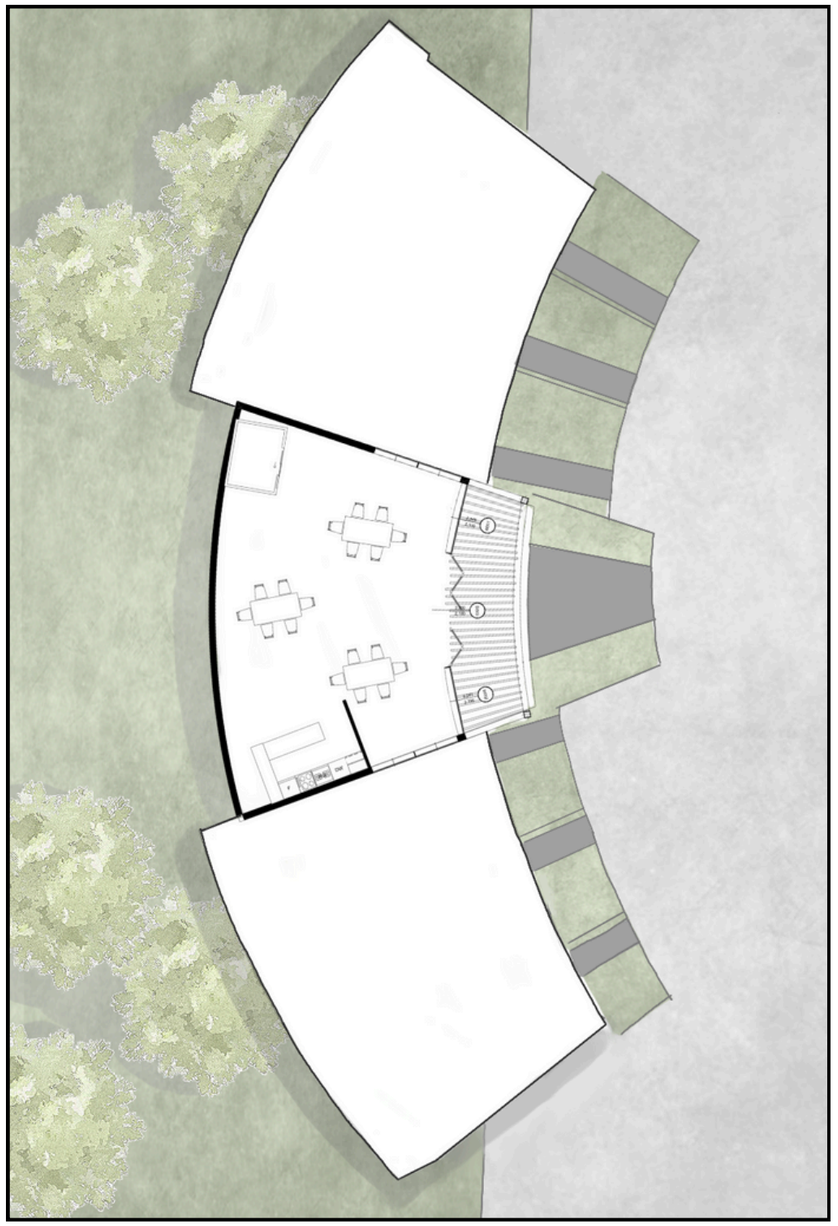
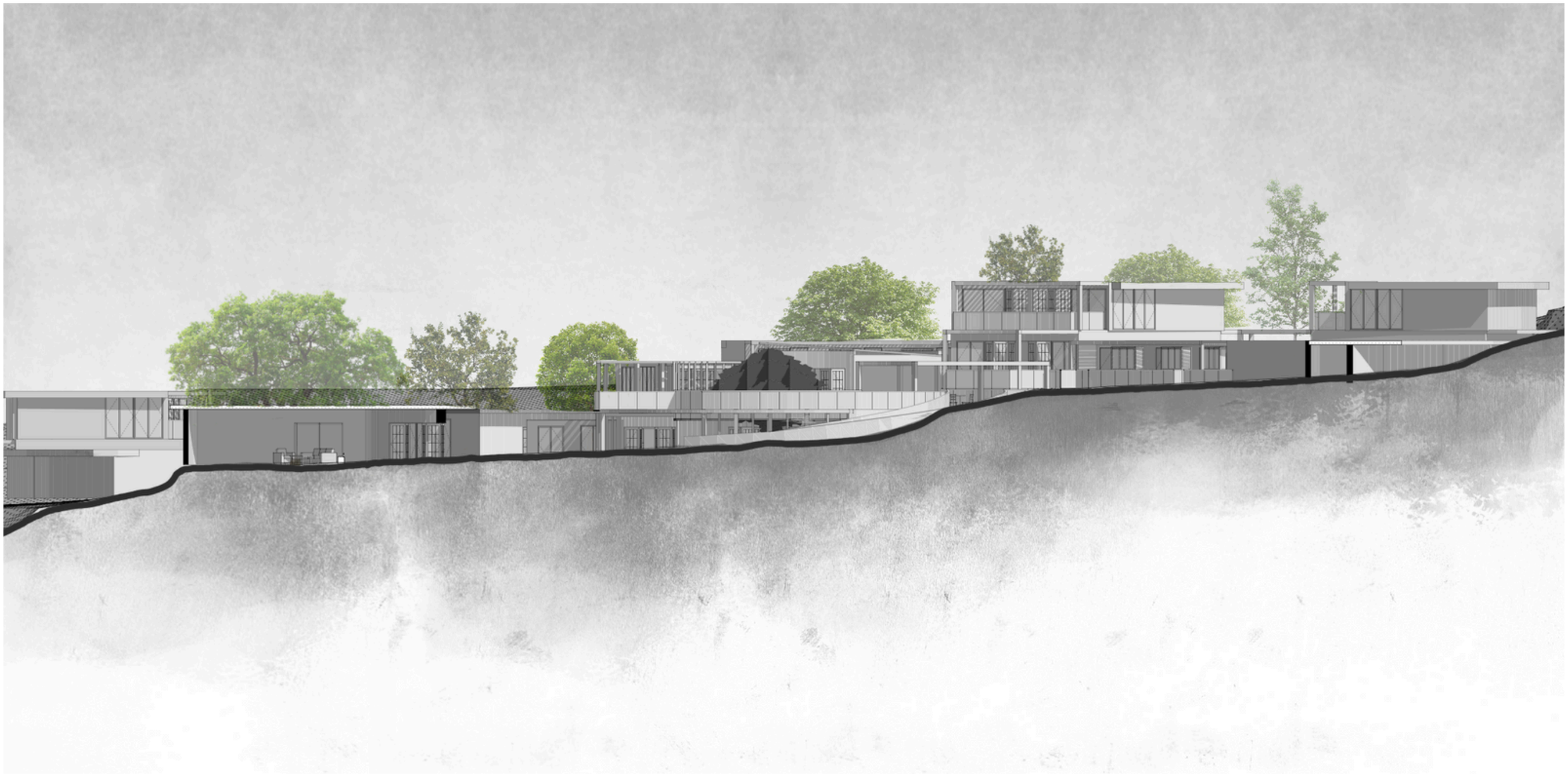


Figure 131
Proposed first floor plan of residential unit

This explores one of the residential units in the village, which is replicated another 3 times. It has 6 bedrooms with bathrooms attached, a communal living/ seating room and a communal kitchen. The entrance to the rooms is from their own private front yard, which promotes privacy and dignity.
To further improve these plans, the size of the rooms could be more compact to fit a few more residents into a residential unit. The shared living arrangements could also be re arranged to have the kitchen at the bottom and the seating area at the top to maximise the views and natural lighting.

HUB THAT CREATES VIBRANCE FOR THE COMMUNITY

Figure 132
Section cut of activity centre



The current steep typography limits accessibility for the residents who have limited mobility

Figure 133
Elevation of design 3

Figure 134
Visualisation of design 3

Figure 135
Visualisation of outdoor courtyard

This render was created to envision what a shared outdoor seating area could look like for each residential unit. The Biophilic shape of the fence creates obstructed views of nature, which increases human to non-human relationships.

The residential units correspond to the circular centre

Figure 136
Dementia village in the afternoon

Green roof for sustainability

Ramp for accessibility for all

Figure 137
Render of the activity centre

WORKING WITH BIOPHILIC SHAPES IN DESIGN 3

Constructing around nature

Figure 138
Render of the activity centre 02

Shadows for Sensory engagement

Obstructed views of nature

Figure 139
Visualisation of outdoor courtyard

REFLECTION

FLATTEN THE LAND

THE LANDSCAPE IS CURRENTLY VERY SLOPY, MAKING IT DIFFICULT FOR ACCESSIBILITY AND WALKABILITY ESPECIALLY CONSIDERING COGNITIVE AND PHYSICAL DECLINE

INCLUDE DIFFERENT USERS OF SITE

THE DESIGN NEEDS TO HOST DIFFERENT SITE USERS AS WELL. SUCH AS BETTER PROGRAMMES AND SPACES FOR STAFF AND LOVED ONES

INCREASE PATHWAYS + GARDENS

THE PATHWAYS ON THE SITE NEED TO CORRESPOND BETTER TO FACILITATE WAYFINDING. THIS SHOULD ALSO BE ENVELOPED BY GARDENS

Design 3 has started to align with the 12 strategies proposed in the literature review, which enhances wellbeing, community, personhood and autonomy. The circular activity centre, being at the heart of the dementia village, also proves successful as it is easy to navigate and access from any part of the village. The residential units are also strategically positioned in a rotation around the core to support the circular approach.
To further improve this design, it is essential to consider other users of the site, such as staff. Providing dedicated spaces and rooms for them is vital as they will engage with the site as much as the PwD; it is also important to enhance their wellbeing and work experience.

The site's topography is also important to focus on in the next step of design, as it is currently very steep and would prove difficult for PwD with restricted mobility to access. Flattening the site would increase walkability and safety for the residents; it would also encourage their confidence in wanting to walk outdoors.

WELLBEING 3/3	COMMUNITY 2/3	PERSONHOOD 2/3	AUTONOMY 3/3
BIOPHILIA - CONNECTION TO NATURE	INCLUSIVE DESIGN	DESIGN FOR IDENTITY	SENSORY STIMULATION DESIGN
PRIVATE AND PUBLIC SPACES	COMMUNAL LIVING/ SHARED SPACES	SAFE AND ACCESSIBLE DESIGN	CENTRALITY + TIME FOR WAYFINDING
SPACES WHERE LOVED ONES CAN SPEND TIME	GROUP ACTIVITIES AND HOBBIES	CREATE TIME BASED ROUTINES	FAMILIAR/ HOMELIKE ENVIRONMENTS

FINAL DESIGN

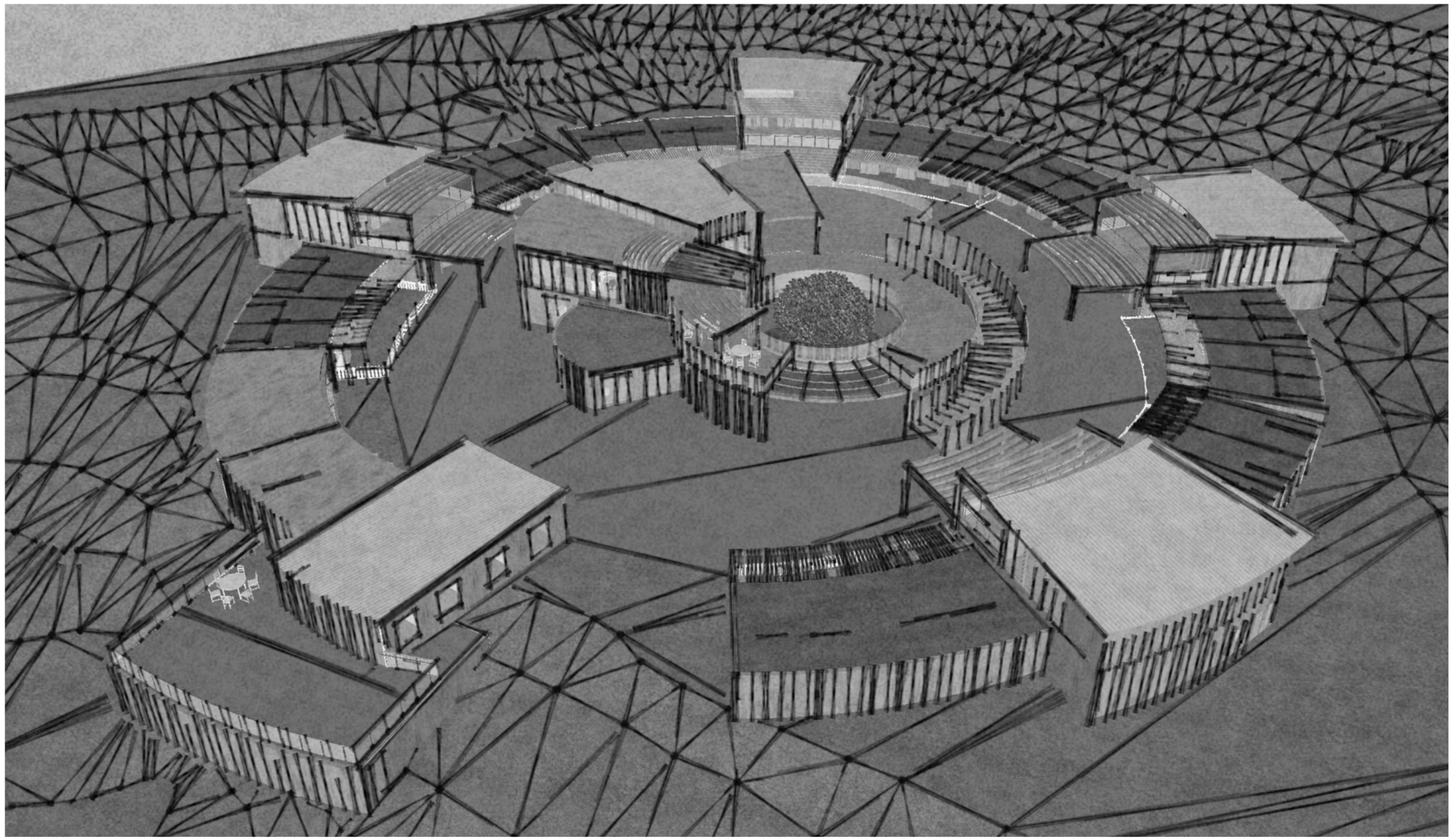


Figure 140
Sketch Visualisation of final design

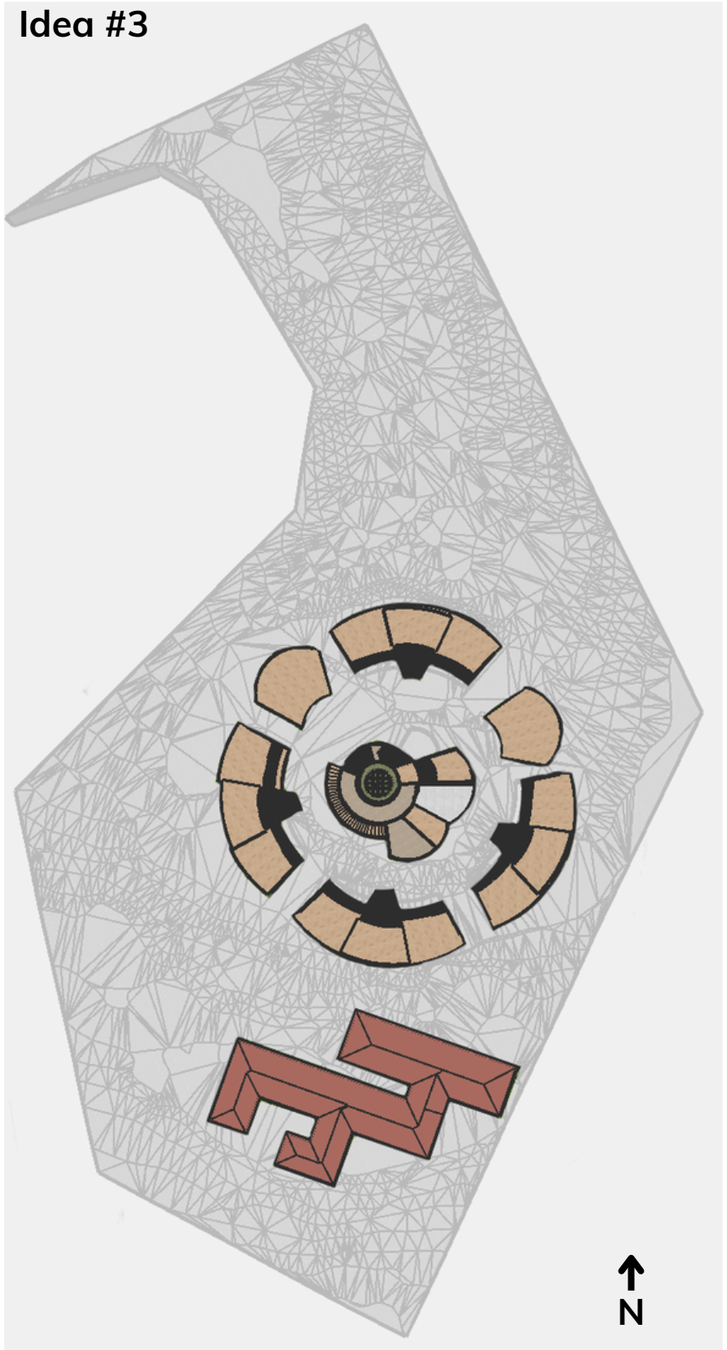


Figure 141
Proposed site plan for design 3

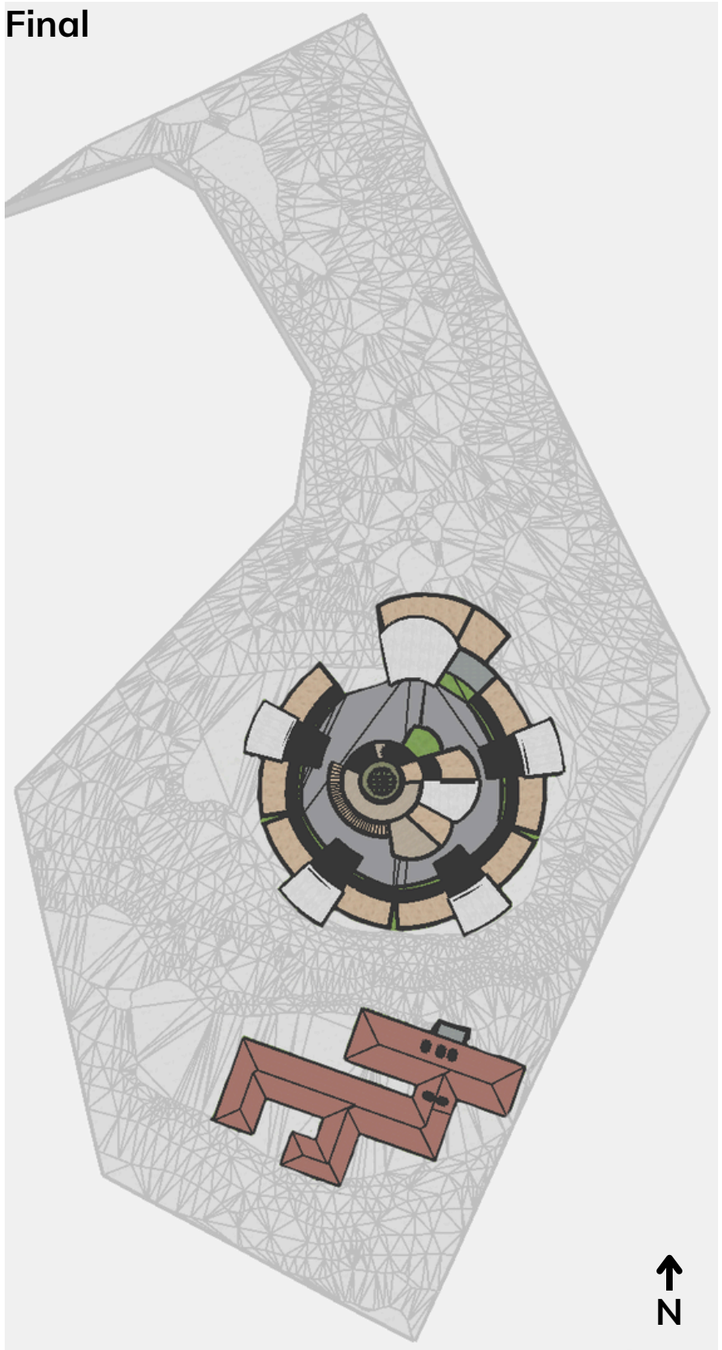


Figure 142
Proposed site plan for final design

The final design ties in the previous critical reflections and leverages on the learning outcomes of these. It addresses the different users of the site more by creating a village that foregrounds not only the PwD but staff and loved ones too. It is in this design exploration where a sense of a community really becomes evident and coherent.

A key enhancement from design 3 to the final design was to create a dedicated space for the staff members. This is strategically positioned at the entrance of the village to enhance accessibility. The slope of the site also created the opportunity for an entrance that sits lower than the floor level of the rest of the dementia village, which creates privacy for the staff. By providing this dedicated space, the design reflects the acknowledgment of the important role that the staff play and how vital their wellbeing is also. Additionally, a dedicated space is also provided for visitors, which is designed for loved ones who require short-term accommodation on site.

To increase the feeling of community, a cafe and dairy were added in the village, offering convenience for the staff, residents and visitors.
The site topography has also been flattened out, as the previous design indicated that the harsh slope would create safety concerns and diminish accessibility. The flat site increases the walkability and confidence of residents who want to spend time outdoors.

GROUND FLOOR SITE PLAN

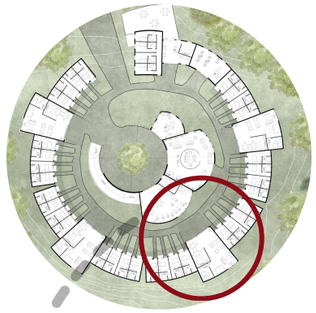
SECTION B

The buildings become the boundary of the site, this creates a closed in village for safety.

SECTION A

N

Figure 143
Proposed site plan of final design



RESEDENTIAL UNIT

GROUND FLOOR

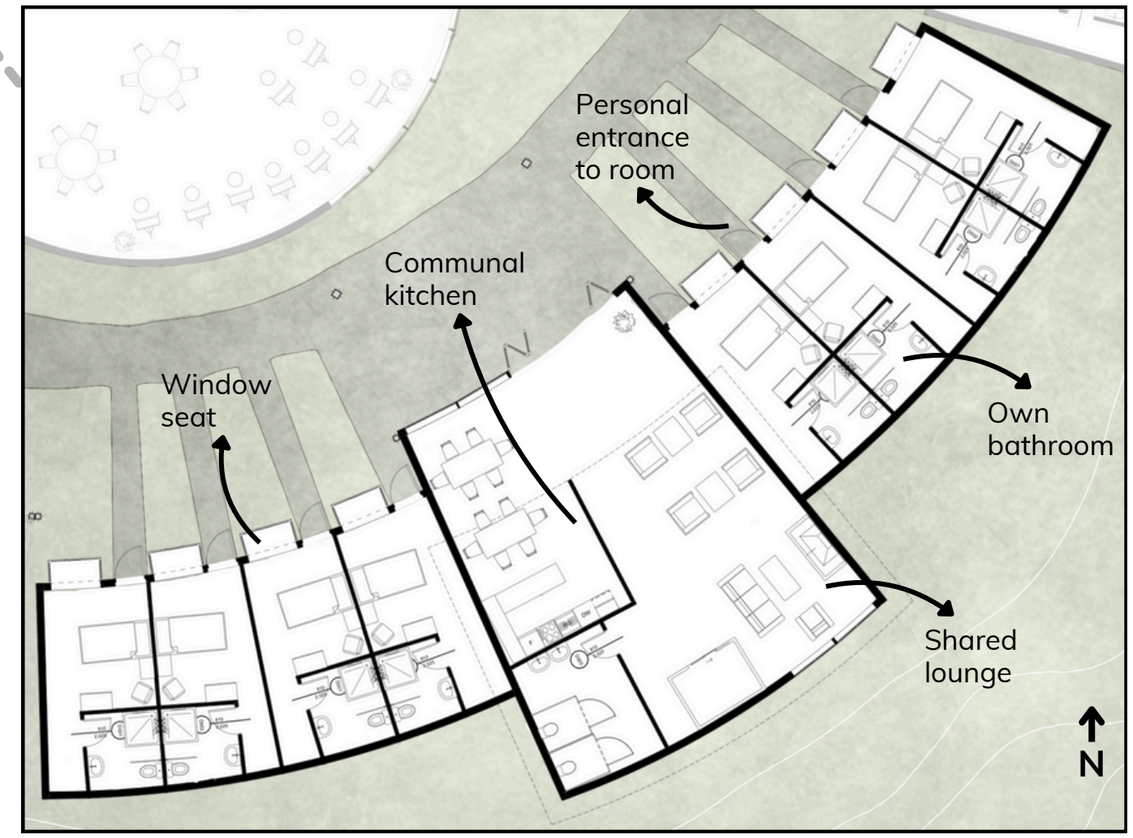


Figure 144
Proposed ground floor plan of residential unit

The dementia village has four housing units on site, creating a total of 32 residents. These residential units are based on the De Hogeweyk theory that small-scaled units for PwD that reflect the size of a family home increase comfort and familiarity. Each unit has eight bedrooms that have their own bathroom, which is to enhance privacy and dignity and to mitigate the feel of a hospital-like environment.

FIRST FLOOR

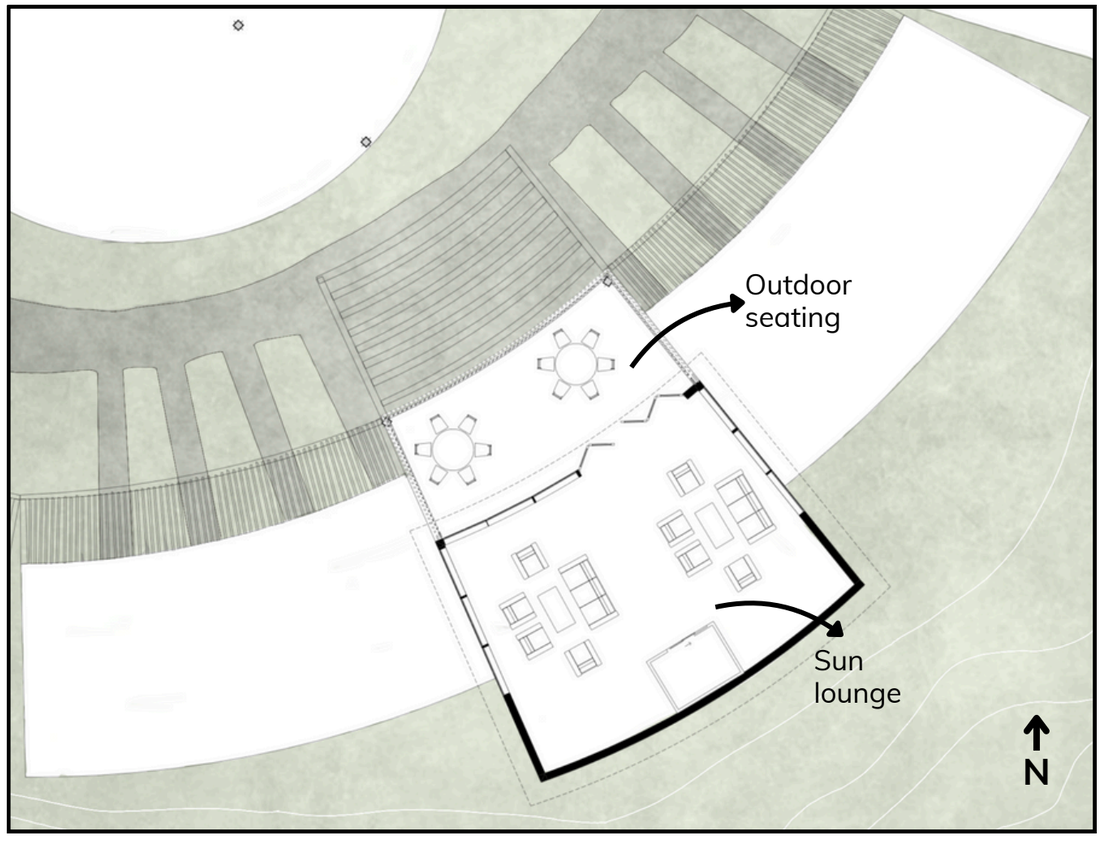
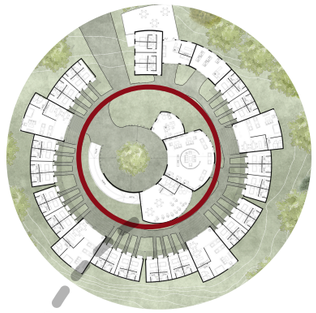


Figure 145
Proposed first floor plan of residential unit

To add to this sense of privacy, each room has its own entry straight from the walkway. The individual doors, instead of room doors that lead from an indoor corridor, create a feel of normalcy and ownership of the room.
Each unit also has a shared kitchen, communal lounge and sun lounge. Residents are able to make meals according to their own routine and schedule, unlike in traditional care settings, when everything is set times.



ACTIVITY CENTRE

GROUND FLOOR

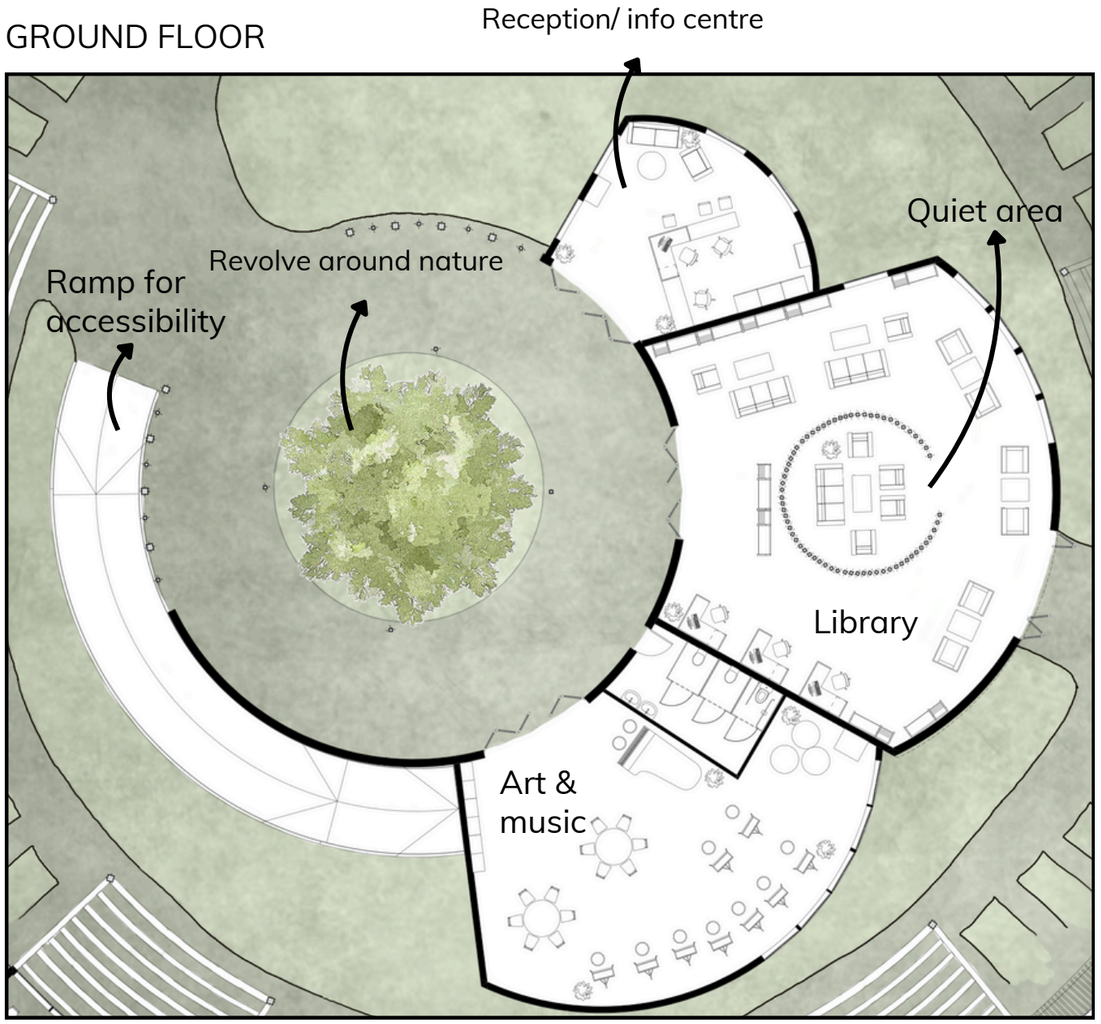


Figure 146

Proposed ground floor plan of activity centre

The heart of the village is the activity centre, which is a vibrant hub that supports community, individuality and wellbeing. This centre has an arts & crafts room, a library, a sensory & play room and a gym, offering a wide range of cognitive and physical activities. This activity centre is positioned in the middle so that it is visible from any part of the dementia village, aiding in orientation and wayfinding.

FIRST FLOOR

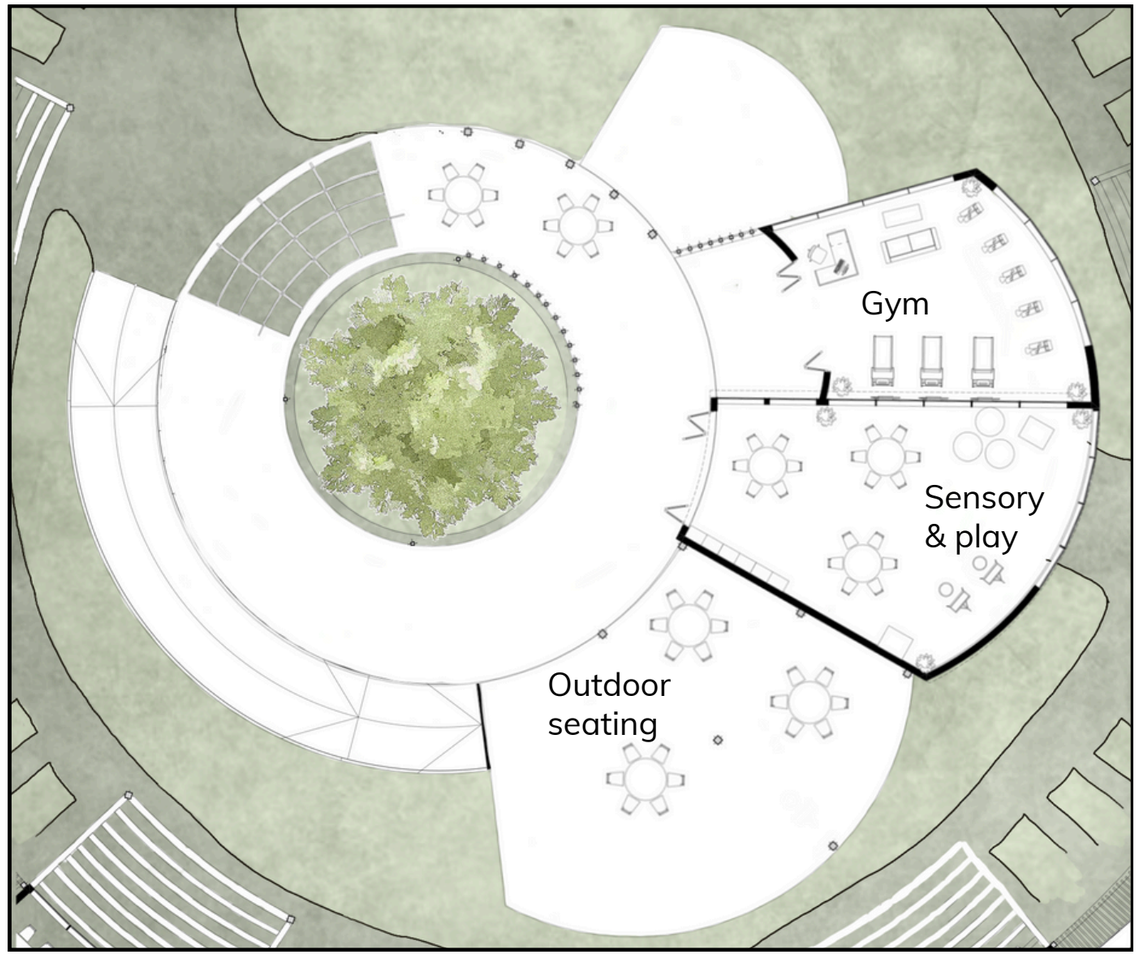
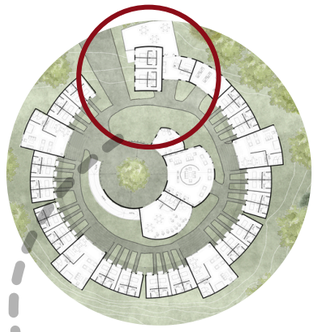


Figure 147

Proposed first floor plan of activity centre

The project is inspired from the design navigator which is ‘time’, which is portrayed in the daily routines and activities that can be engaged with and the central positioning of the activity centre.



ACTIVITY CENTRE

GROUND FLOOR

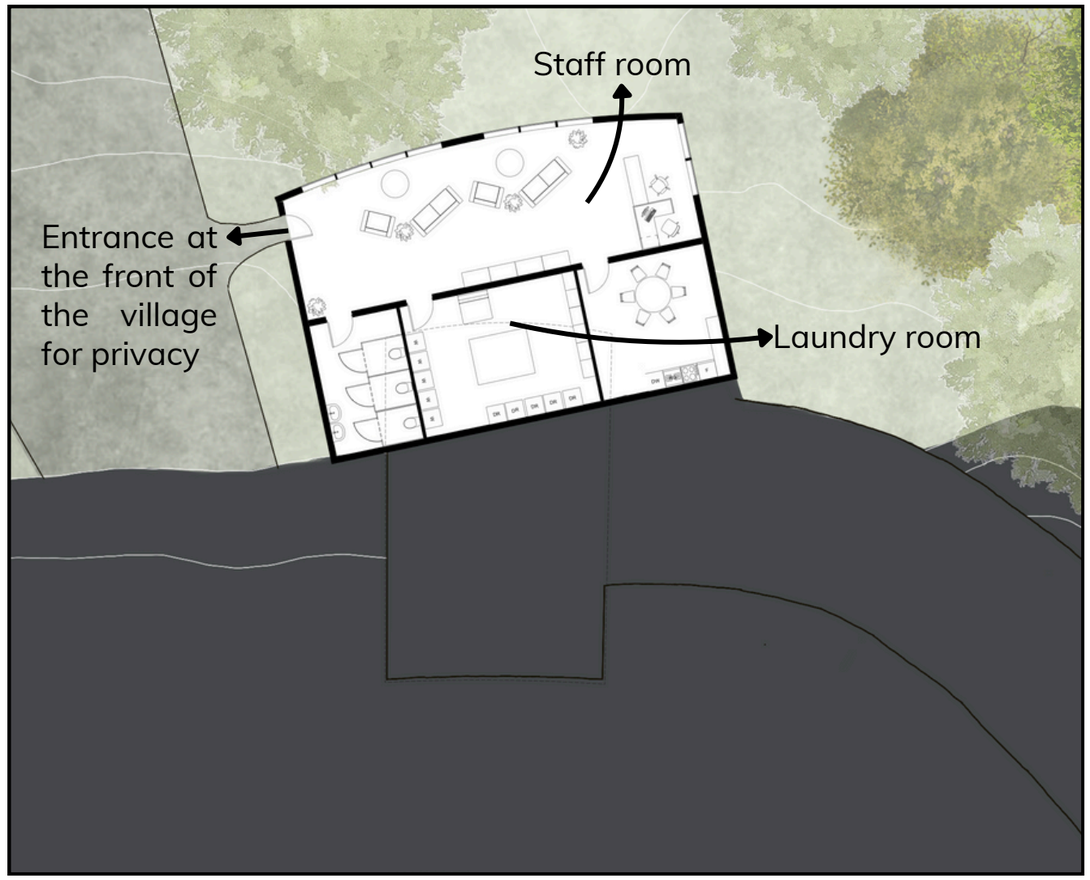
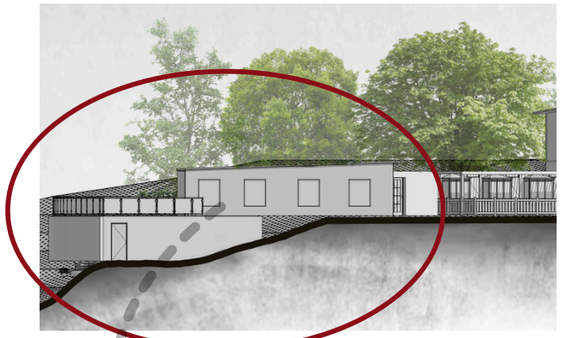


Figure 148
Proposed ground floor of staff room



GROUND FLOOR

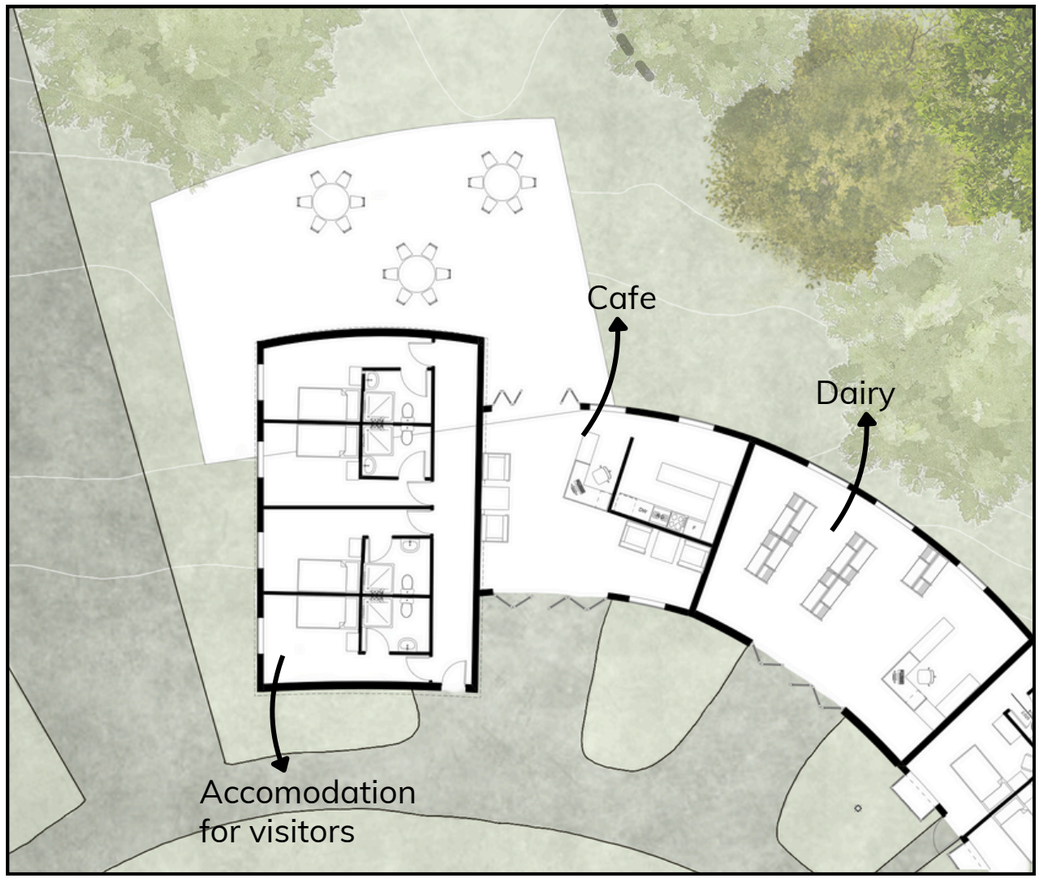


Figure 149
Proposed ground floor of visitors accomodation & cafe

SECTION A

Figure 150
Section A of final design

SECTION B

Figure 151
Section B of final design

SECTION A - RENDER

Figure 152
Section A render of final design

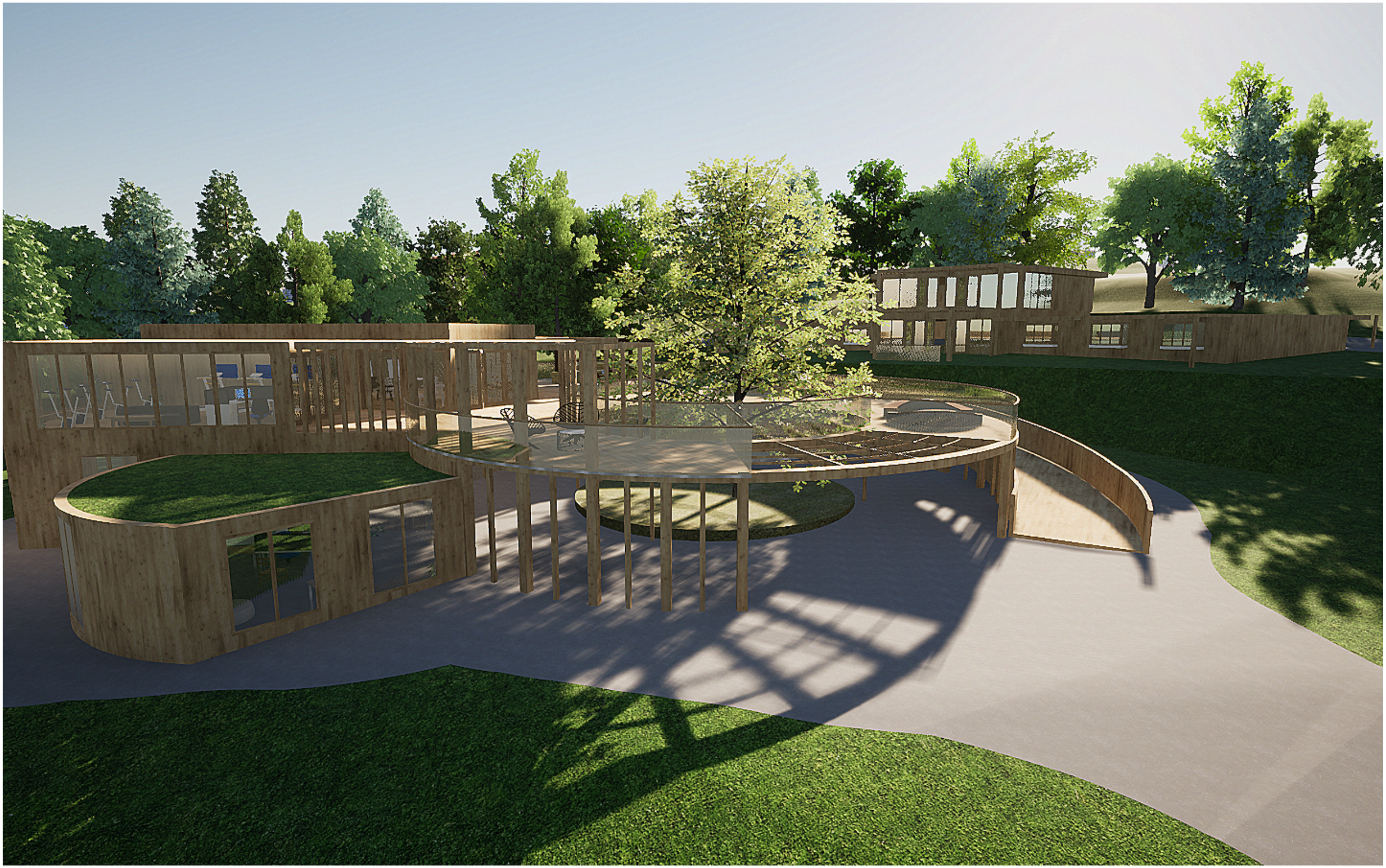


Figure 153
Section A render of final design

Figure 154
Visualisation of floor 1 of activity centre

Figure 155
Visualisation of dementia village

Figure 156
Dementia village spatial arrangement

Figure 157
Human to nature connection in the centre of the activity hub

BIOPHILIA - CONNECTION TO NATURE

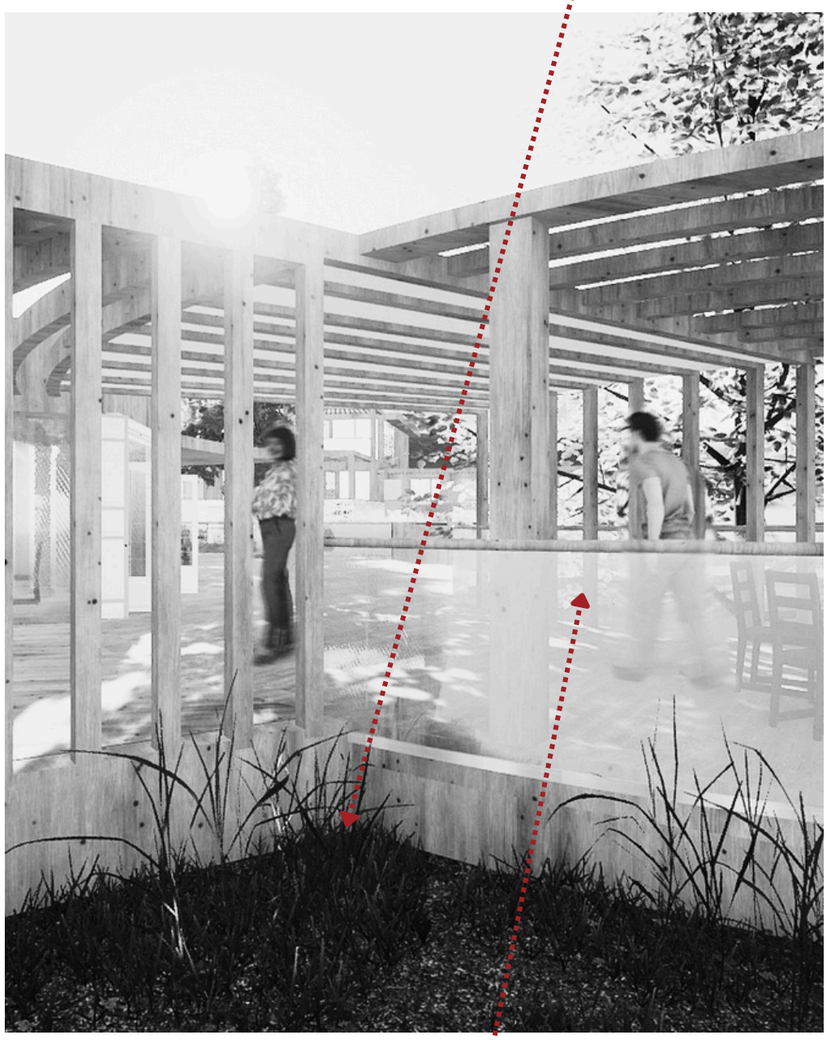


Figure 154
Visualisation of floor 1 of activity centre

DESIGN FOR IDENTITY

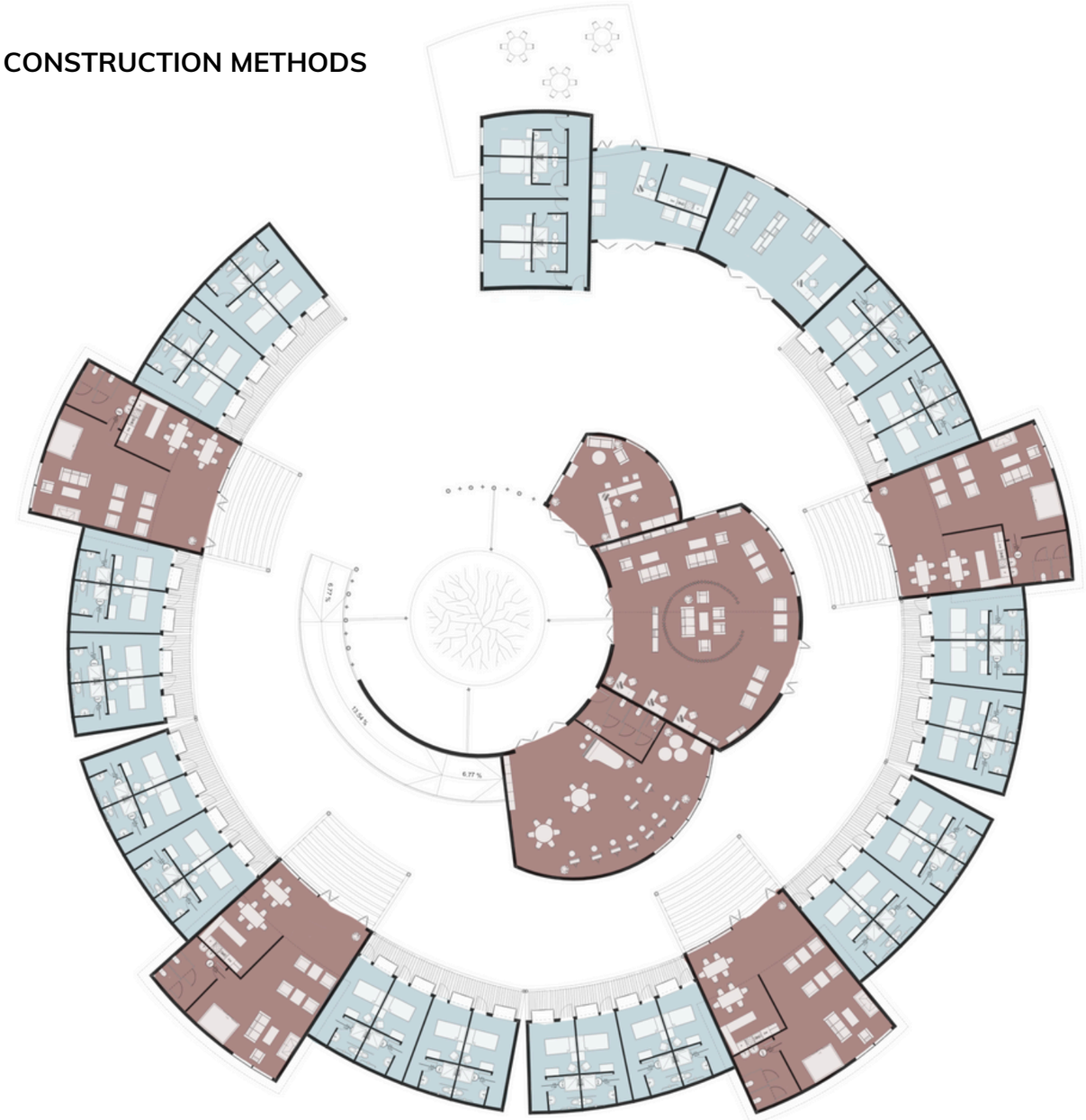
CENTRALITY + TIME FOR WAYFINDING

BIOPHILIA - CONNECTION TO NATURE

Figure 157
Human to nature connection in the centre of the activity hub

SPACES WHERE LOVED ONES CAN SPEND TIME

CONSTRUCTION METHODS



CLT - cross laminated timber construction

Standard 3604 timber construction

Figure 158
Chosen construction methods

The construction method for this project is a hybrid of two timber construction techniques. This is suitable to the overall design, as timber as a construction material reflects the wellbeing and care theme of the entire dementia village. The human life cycle and ethical support for ageing are the overarching keys to this research and design, which should also be prioritised and reflected in the building itself.

Standard NZS 3604 timber construction is used for the less architecturally challenging spaces in the dementia village, whereas CLT (Cross Laminated Timber) is used for the more complex and larger areas. The Pacific regions, particularly New Zealand, are experiencing increasing interest in CLT, driven by a demand for sustainability and mass timber construction (Red Stag, 2022). CLT also allows for more creativity in design and biophilic shapes, balancing a mix of aesthetics and sustainable functionality (Red Stag, 2022).

CLT is also considered a renewable material, as it stores carbon throughout its life cycle and is lightweight, making transportation easier and requiring less carbon (Red Stag, 2022). The thermal performance is also high, as CLT effectively retains the heat in buildings and regulates temperature more efficiently than traditional methods.

“Red Stag’s CLT inherent structural, aesthetic, and biophilic characteristics offer unique design possibilities that blend form, function, user experience, and sustainability” (Red Stag, n.d.)

An Auckland based company that provides CLT and other engineered timber is Red Stag Timberland, who have worked on large scaled intricate commercial projects. These projects become precedent in terms of CLT based structural methods.

He tohu document room

Figure 159

He tohu document room (Red Stag Timberlab, n.d.)

Tutetawha marae

Figure 160

Tutetawha marae (Red Stag Timberlab, n.d.)

Auckland art gallery

Figure 161

Auckland art gallery (Red Stag Timberlab, n.d.)

CONSTRUCTION SECTION OF THE CLT

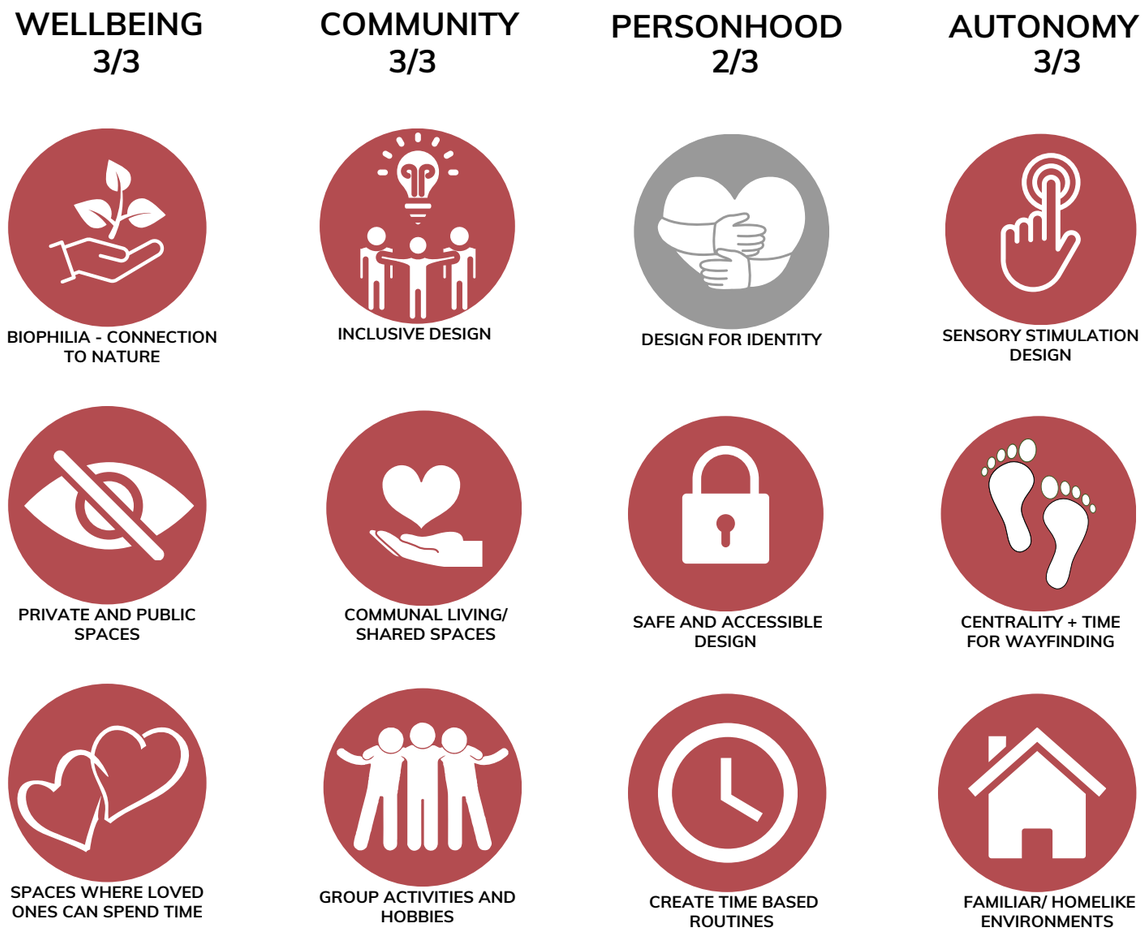
Figure 162
Construction section

REFLECTION

The final design was successful due to the rigorous testing and learning opportunities from the critical reflections of designs 1 - 3. It aligns with the majority of the 12 strategies that were identified and implemented in the literature review. Significant progress is seen in the spatial arrangement of the site; it went from a rectangular and meaningless design to a circular dementia village that supports autonomy, personhood, community and wellbeing. The buildings themselves became the envelope of the village, which created a safe environment that mitigates exit-seeking behaviour.

If this design were explored again with another ideation, it would benefit from a more in-depth exploration of the 12 strategies and what these architecturally require within each space to reach its full potential. By refining this, the design would become more supportive and comforting to its residents and enhance their quality of life.

One of the identified strategies 'design for identity' wasn't explicitly developed in the final design outcome, due to the challenge of integrating highly individualised elements within the broadness of this architectural framework. As identity is a deeply personal aspect of human experience that varies amongst different people, it became difficult to focus on this in a universal spatial solution. However this 'design for identity' is still an essential for ethical dementia care environments. In future iterations analysing the human scale and experience more and incorporating opportunities for personalisation within spaces would allow for more self-expression and familiarity. This could include elements such as customisable living areas, personalised spatial memory cues and incorporating familiar elements for the senses.



RE-DESIGNING THE EXISTING BUILDING

The existing building was important to redesign to reflect the new site programme and vision. As established in the precedent study, this facility still mimics a traditional nursing home. With the 12 strategy tool matrix, the redesign involved adding additional programmes, such as a medical centre, a dedicated staff room and accommodation for visitors. The building is catered to last-stage dementia care patients who require attentive medical care and aid with simple daily activities. The building is located on higher ground, increasing the privacy gradient.

The residential spaces were broken up by adding more communal areas and sun lounges, creating smaller, more intimate clusters that reflect family homes.

Figure 163
Proposed ground floor plan for the re-design

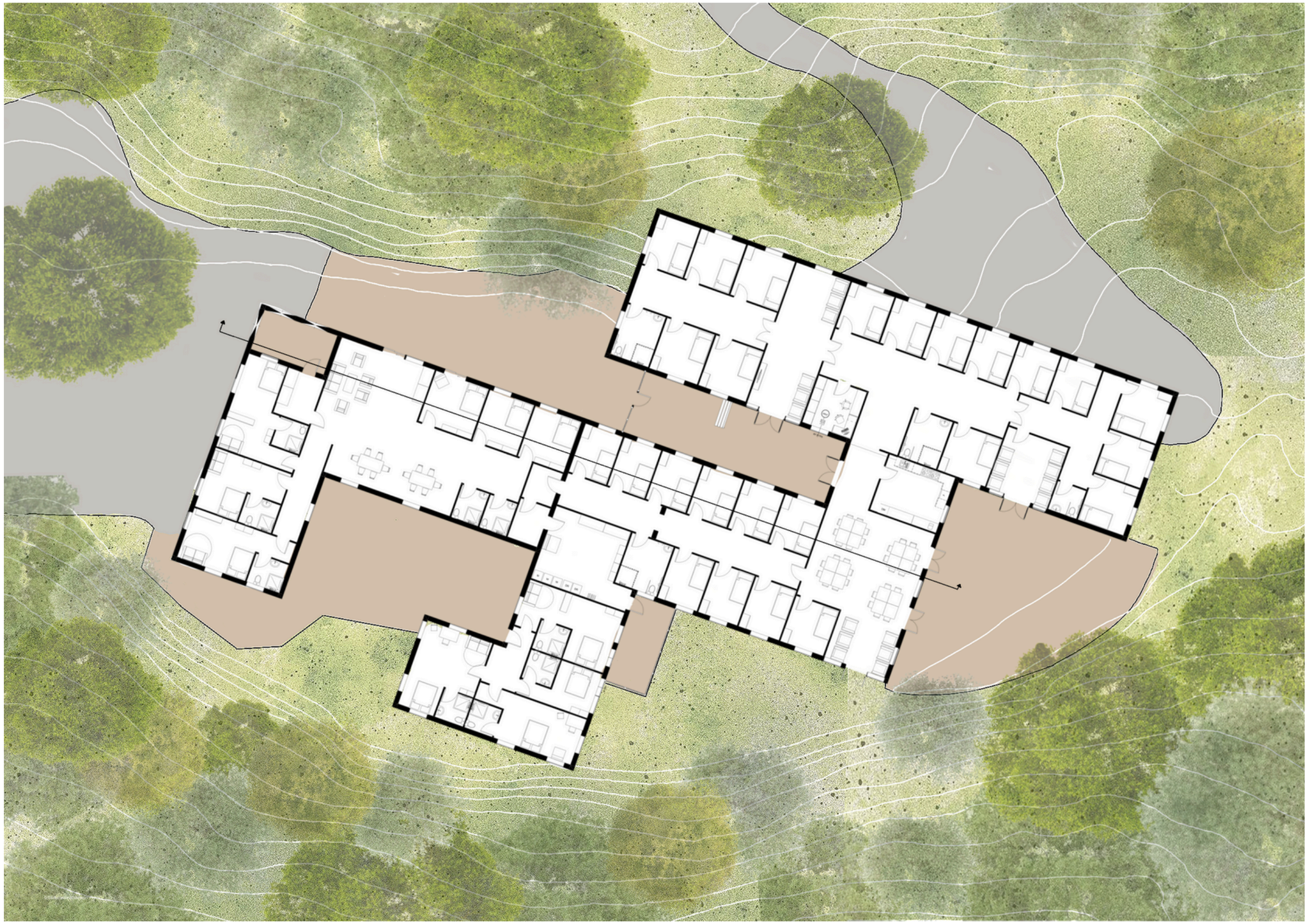
Site photos of the current Pinehaven Dementia facility





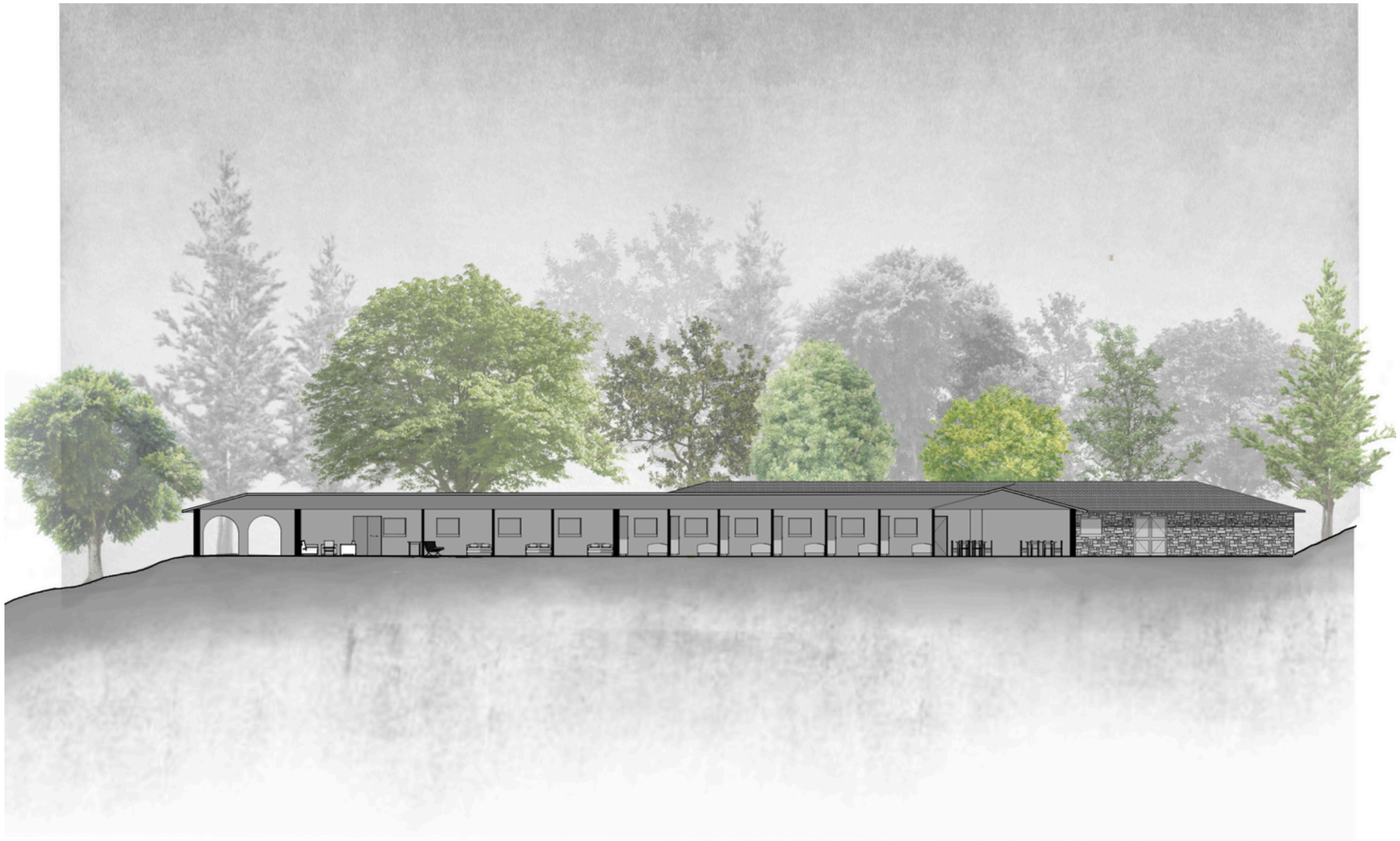

Figures 164 - 169
Site visit photos at the Pinehaven Cottage

EXISTING PLAN



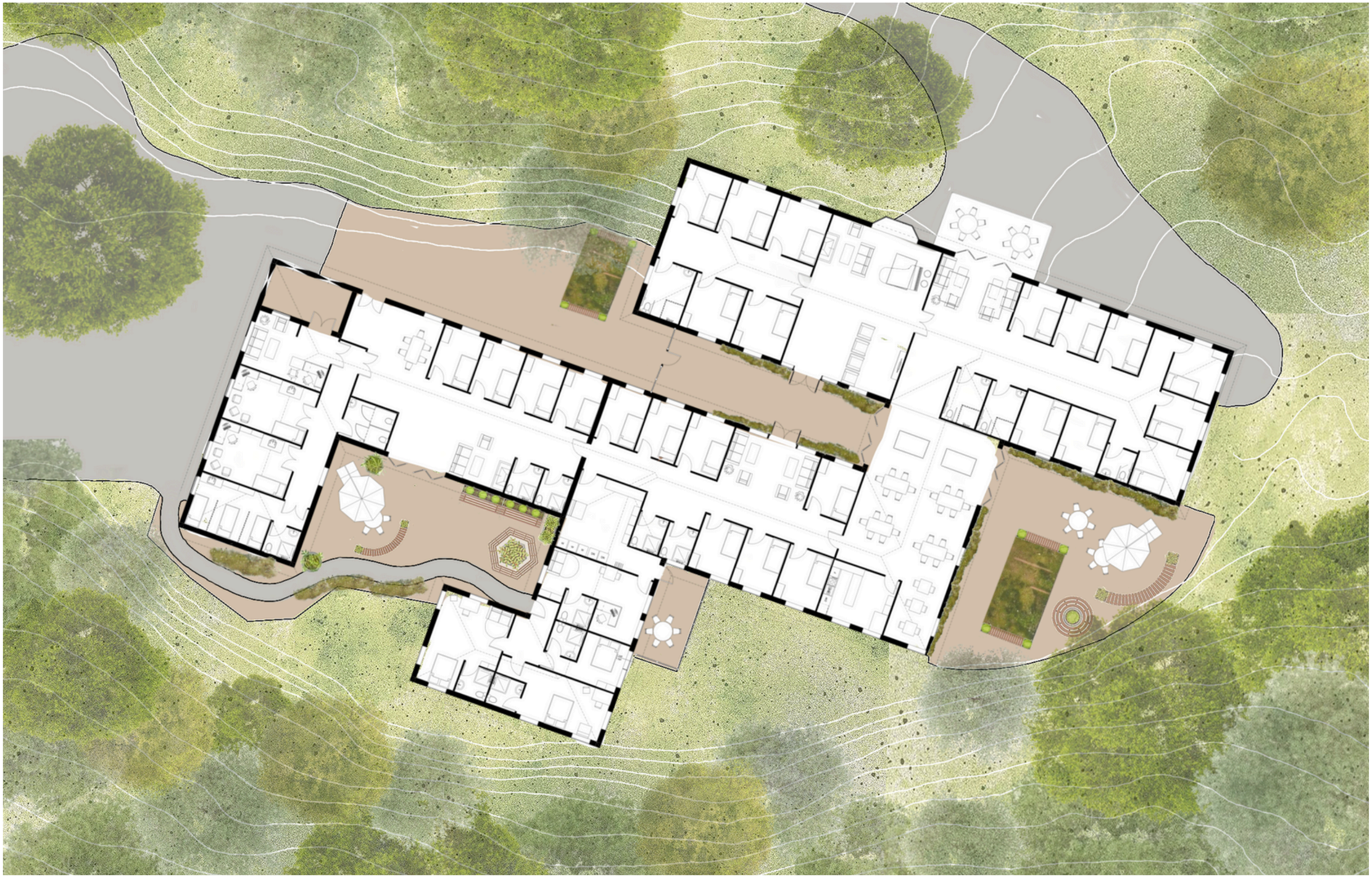
Figures 170
Existing ground floor plan of Pinehaven Cottage

EXISTING SECTION CUT



Figures 171
Existing section of Pinehaven Cottage

PROPOSED PLAN



Figures 172
Proposed ground floor plan of Pinehaven Cottage

Figures 173
Proposed spatial arrangement

PROPOSED SUN LOUNGE

Figures 174
Visualisation of the sun lounge

REFLECTION

The redesign of the existing facility created a shift from the traditional care home to a more person-centred approach. The limitations that were experienced revolved around the existing layout and structure, as it was restrictive with limited flexibility. However, with the use of the 12 strategy matrix tool, the floor plan was broken down into smaller clusters that became more purposeful and less hospital-like. The added communal areas help with comfort, relaxation, social connections and familiarity while providing extra space for visitors to spend time with their loved ones.

Adding a medical unit into the facility was also beneficial, especially for last-stage dementia patients, as they require more medical attention. This ensures residents have immediate healthcare access also, which enhances overall wellbeing.

WELLBEING 3/3	COMMUNITY 3/3	PERSONHOOD 2/3	AUTONOMY 1/3
BIOPHILIA - CONNECTION TO NATURE	INCLUSIVE DESIGN	DESIGN FOR IDENTITY	SENSORY STIMULATION DESIGN
PRIVATE AND PUBLIC SPACES	COMMUNAL LIVING/ SHARED SPACES	SAFE AND ACCESSIBLE DESIGN	CENTRALITY + TIME FOR WAYFINDING
SPACES WHERE LOVED ONES CAN SPEND TIME	GROUP ACTIVITIES AND HOBBIES	CREATE TIME BASED ROUTINES	FAMILIAR/ HOMELIKE ENVIRONMENTS

CRITICAL REFLECTION

This thesis developed an architectural solution to the question: **How can architectural initiatives be leveraged to reshape traditional nursing homes and generate strategies that enhance Cognitive Functionality and Emotional Wellness?** This emerged through the process of literature review, precedent study and design-led research.

Dementia has been framed as a global health priority, affecting 55 million people worldwide (World Health Organization, 2023). On a New Zealand scale, 70,000 individuals are affected by it, and numbers are set to triple by 2050 (Alzheimers New Zealand, 2020). Due to the behavioural, psychiatric, cognitive and physical symptoms that are associated with dementia, caring for individuals in their own homes becomes increasingly difficult as they become more dependent on others for daily tasks. This leads to PwD being placed in long-term facilities for safety and intensive care purposes. Due to the lack of understanding of dementia, these care facilities have historically been framed into a medical model where the condition is prioritised over the person. This model disregards other dimensions that are associated with dementia, such as social, emotional and psychological. This disregard leads to sterile and hospital-like environments in long-term care facilities, which create a hostile and unfamiliar environment for PwD.

To respond to this, contemporary literature has suggested a person-centred care model, which positions the person at the centre of their care. This thesis has leveraged this thinking and framed person-centred care at the core of the framework to enhance cognitive functionality and emotional wellness in dementia care environments. To implement this care model and answer the thesis question, twelve strategies were identified through the literature and precedent research that aim to create environments that enhance wellbeing, autonomy, community and personhood. These strategies build a foundation to reshape traditional nursing homes that strengthen PwD dignity and independence.

The literature review provided the basis of this thesis, as it provided valuable insight into the condition of dementia and how the symptoms of it affect spatial perception. This reinforces the need and importance for architecture to become a catalyst in the enhancement of care environments. The design-led research section was used to spatially answer the research question, which was achieved through a rigorous design and testing process. This stage of the thesis sparked time and centrality as the design navigator, which further aligns with the research title: **Lost in time: Designing spaces for dementia when perception is lost.** This inspired explorations of how temporal environments and engaging spatial experiences can create comforting moments for PwD.

The design was built on knowledge identified in the precedent studies. It was influenced mainly by the ‘De Hogeweyk’ as they created a dementia village that mimics regular communities with a range of amenities that create the feeling of normality. This model of a dementia village was explored through the design phase along with the 12 identified strategies. A final design solution emerged through testing the three initial design concepts against the framework with critical reflection. This outcome fosters wellness for not only PwD but also takes staff and visitors into consideration, as these are important users of the site which creates a genuine atmosphere of community.

The spatial layout mimicked that of a clock, with the key facility placed at the centre of the village and the residential units encompassing it. This layout proved to be the most successful, as it helped with wayfinding and orientation. The activity centre, placed at the heart of the facility, is visible from anywhere in the village and acts as a landmark for orientation. Including an activity centre in the village also creates a sense of normalcy and provides spaces that enhance physical and cognitive wellbeing. However while the circular layout promotes security and enclosure, one challenge that was not explored in the design was the implementation of clear wayfinding within this circular form. While the activity hub provides a key reference point, the repetitive nature of the circular layout makes it difficult for residents to differentiate between their rooms. Future iterations need to incorporate solutions such as increasing the amount of visual landmarks to aid with cognitive mapping, the use of textures and colours to differentiate spatial cues and strategic lighting to guide movement. Personalised cues that trigger familiarity like customised doors, gardens and music could further support navigation to individual living spaces.

The residential units in the village are all small-scaled and resemble family-sized homes, which is comforting and familiar to PwD. The buildings themselves are shaped in a circular envelope around the activity centre and create the boundary of the site, which improves safety and mitigates exit-seeking.

This work contributes to the evolving conversation of an ethical and sustainable dementia care environment, emphasising the need to architecturally enhance wellbeing, community, personhood and autonomy. By shifting the focus from medical to person, environments can be fostered that honour and support the dignity of PwD. While this thesis and design outcome represent progress in shifting from traditional care environments, there are still gaps that require significant development.

Further research should delve deeper into the proposed 12 strategies. This thesis was only able to cover them at the surface level. The spatial and architectural requirements of each strategy must be researched further and implemented on a human scale within every part of the dementia village. A comprehensive literature review of each strategy would ensure a higher success rate of integrating them into an architectural intervention, maximising the resident's quality of life.

Quantitative research would be beneficial if this research were to continue, as the current thinking is mainly theoretical. Collecting substantial evidence that supports these 12 strategies creates a stronger foundation.

It should also be acknowledged that although architecture shapes the physical environment, the temporal environment plays a vital role, as explored in the literature review. The staff's contribution to running the dementia village and the family’s support and visitations are significant in creating a caring social environment.

In conclusion, this research project highlights architecture's important role in creating ethical and healthy living environments that enhance cognitive and emotional wellness. By integrating the knowledge gained through the literature reviews and precedent studies into the design process, the design outcome creates a strong proposal that focuses on autonomy, community, personhood and wellbeing. The exploration of the 12 strategies in the design process supported a more meaningful and appropriate outcome. The overarching goal for this thesis is to place emphasis on the need to create nurturing care environments that foreground the person.

LIST OF FIGURES

The circular icons are by author

Figure 37 Residents relaxing in a familiar environment, Dementia village associates. (n.d.). DVA De Hogeweyk - Projects - DVA Dementia Village [Photograph]. Www.dementiavillage.com. https://www.dementiavillage.com/projects/dva-de-hogeweyk/

Figure 38 De Hogeweyk heart of the village Tolenaar, P. (n.d.) [Photograph]. https://www.economist.com/europe/2018/01/13/a-new-way-of-caring-for-the-vulnerable-old

Figure 39 Values of The Care Village. By Author

Figure 40 Spatial layout of The Care Village. By Author

Figure 41 Zoomed in spatial layout of The Care Village. By Author

Figure 42 Birds eye view of The Care Village, Colliers. (2024) [Photograph]. https://www.colliers.co.nz/en-nz/real-estate-news/long-term-lease-at-rotorua-aged-care-facility

Figure 43 Residents biking around the village, Eldernet . (n.d.) [Photograph]. https://www.eldernet.co.nz/Facilities/Rest_Home_Care/The_CARE_Village/Service/DisplayService/FaStID/1045

Figure 44 Resedential unit of The Care Village, Ignite Architects. (n.d.). 2023 [Photograph]. https://www.ignitearchitects.com/journal/the-care-village-pilot-success

Figure 45 Interior of a shared lounge in the residential unit Eldernet . (n.d.) [Photograph]. https://www.eldernet.co.nz/Facilities/Rest_Home_Care/The_CARE_Village/Service/DisplayService/FaStID/1045

Figure 46 Camelia Lane in The Care Village Colliers. (2024) [Photograph]. https://www.colliers.co.nz/en-nz/real-estate-news/long-term-lease-at-rotorua-aged-care-facility

Figure 47 Values and design opportunities for Pinehaven Cottage. By Author

Figure 48 Ground Floor Plan of Pinehaven Cottage. By Author

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Figure 52 Outdoor seating area and garden. By Author

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Figure 54 Outline map of New Zealand, Vemaps. (n.d.). https://vemaps.com/new-zealand/nz-02

Figure 55 Map of distribution of elderly in Auckland, Roberts, L. (2020). Older Aucklanders: Results From the 2018 Census. https://www.knowledgeauckland.org.nz/media/1982/tr2020-023-older-aucklanders-results-from-the-2018-census.pdf

Figure 56 Graph of distribution of elderly in Auckland adapted from Roberts, L. (2020). Older Aucklanders: Results From the 2018 Census. https://www.knowledgeauckland.org.nz/media/1982/tr2020-023-older-aucklanders-results-from-the-2018-census.pdf

Figure 57 Graph of elderly population in Hibiscus and Bays adapted from Roberts, L. (2020). Older Aucklanders: Results From the 2018 Census. https://www.knowledgeauckland.org.nz/media/1982/tr2020-023-older-aucklanders-results-from-the-2018-census.pdf

Figure 58 Photo of Pinehaven Cottage, Eldernet. (2024). Pinehaven Cottage. Eldernet Residential Care; Eldernet [Photograph]. https://www.eldernet.co.nz/Facilities/Rest_Home_Care/Pinehaven_Cottage/Service/DisplayService/FaStID/751

Figure 59 Photo of Evelyn Page, Local matters. (2020) [Photograph]. https://www.localmatters.co.nz/news/retirement-villages-on-edge-as-cases-grow/

Figure 60 Photo of Milton Court, Eldernet. (n.d,) [Photograph]. https://www.eldernet.co.nz/Facilities/Dementia_Care_Secure/Milton_Court_Rest_Home_and_Dementia_Care/Service/DisplayService/FaStID/11764?prev=https%3A%2F%2Fwww.eldernet.co.nz%2Fresidential-care%2Fsearch%3Fkeywords%3Dmilton%2Bcourt%26sort%3Ddefault%26center%3D-38.97097763907594%252C173.995879%26zoom%3D7%26maxProviders%3D40

Figure 61 Photo of Gulf Rise, NZ Strong. (2024) [Photograph]. https://www.nzstrong.co.nz/project/metlifecare-gulf-rise-retirement-village-lot-h/

Figure 62 Photo of BUPA Northhaven Care Home, Eldernet. (n.d.) [Photograph]. https://www.eldernet.co.nz/Facilities/Psychogeriatric_Care/Bupa_Northhaven_Care_Home/Service/DisplayService/FaStID/1908

Figure 63 Map of the Orewa and Hatfields area, Mapbox. (n.d.). https://www.mapbox.com/maps

Figure 64 Map of the Orewa and Hatfields area adapted from Mapbox. (n.d.). https://www.mapbox.com/maps

Figure 65 Map of Waiwera Hot pools adapted from Mapbox. (n.d.). https://www.mapbox.com/maps

Figure 66 Map of Pinehaven Cottage adapted from Mapbox. (n.d.). https://www.mapbox.com/maps

Figure 67 Tsunami evacuation map 01 adapted from Auckland Council. (2023). Auckland Council GeoMaps. Govt.nz. https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html

Figure 68 Tsunami evacuation map 02 adapted from Auckland Council. (2023). Auckland Council GeoMaps. Govt.nz. https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html

Figure 69 Coastal inundation map 01 adapted from Auckland Council. (2023). Auckland Council GeoMaps. Govt.nz. https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html

Figure 70 Coastal inundation map 02 adapted from Auckland Council. (2023). Auckland Council GeoMaps. Govt.nz. https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html

Figure 71 Immediate site map of Pinehaven Cottage adapted from Mapbox. (n.d.). https://www.mapbox.com/maps

Figure 72 Winter Sun path. By Author

Figure 73 Summer Sun path. By Author

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APPENDIX

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Authors final pin-up presentation

Figures 175
Final design spatial arrangement

Figures 176
Visualisation of activity centre

Figures 177
Visualisation of residential balcony

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Visualisation of dementia village