Remembering Home: Creating a Village for Individuals Living with Dementia and their Caregivers

by

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ABSTRACT

The number of individuals diagnosed with dementia is on the rise globally. There is a dire need for suitable housing that responds to the symptoms of dementia while also providing spaces where individuals can thrive without being isolated from the greater community. In Canada, most places designed specifically for individuals living with dementia are institutional settings that separate individuals from their community. Residential settings may offer comfort but are not adequately designed to meet the challenges of dementia. This thesis studies dementia care design to create a more suitable living environment for individuals living with dementia and their caregivers. A house community model style of residence is designed to accommodate individuals who live with dementia and caregivers in Sudbury, Ontario. The larger community and residents can interact through arts-based programming to benefit both. These efforts are made to provide more dignity and comfort to all involved in the dementia process.

KEYWORDS:

dementia care design, person centered care, aging in place, village, Sudbury

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To my friends, the loves of my life, "things might have been different but they could not have been better," thank you for everything.

To my dad, thank you for every late night project and model you helped me put together. You've calmed me down and loved me at my worst; I'm forever grateful.

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To the ones who've left us, thank you for my childhood, your stories will never be forgotten.

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GLOSSARY

Aging in place: "remaining living in the community, with some level of independence, rather than in residential care"[1]

Caregiver: "(a) a person, typically either a professional or close relative, who looks after a disabled or elderly person, invalid, etc.; (b) a parent, foster-parent, or social services professional, who provides care for an infant or child."[2]

Cueing: "a feature indicating the nature of something perceived. The expressions on people's faces give us visual cues about their feelings".[3]

Degenerative brain disease: "Degenerative brain diseases are caused by the decline and death of nerve cells called neurons. These diseases are progressive, meaning that the condition worsens over time as greater numbers of neurons in the brain die."[4]

Dementia: "impairment of memory and of abstract thinking, often with other disturbances of cognitive function and with

1. J. L. Wiles et al., "The Meaning of 'Aging in Place' to Older People," The Gerontologist 52, no. 3 (July 2011): pp. 357, https://doi.org/10.1093/geront/gnr098
2. "Discover the Story of Englishmore than 600,000 Words, over a Thousand Years," Home
3 "Definition of Cueing," accessed March 21, 2022, https://www.merriam-webster.com/dictionary/cue.

4. "Degenerative Brain Diseases | Lehigh Valley Health Network," accessed December 13, 2021, https://www.lvhn.org/conditions/degenerative-brain-diseases.

personality change; a syndrome characterized by this, resulting from primary degenerative disease of the brain (most commonly Alzheimer's disease in the elderly), or from various other conditions (cerebrovascular disease, infections, tumours, etc.) which affect the brain." [5]

In-Home care: includes any professional support services that allow a person to live safely in their home. In-home care services can help someone who is aging and needs assistance to live independently; is managing chronic health issues; is recovering from a medical setback; or has special needs or a disability[6].

Long term care: "sometimes called a nursing home, is a place where seniors can live and receive help with their daily activities, such as eating or bathing. Long-term care homes also provide 24-hour nursing and personal care, and therefore are best suited for people who have difficulty directing their own care."[7]

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5. "Discover the Story of Englishmore than 600,000 Words, over a Thousand Years," Home : Oxford English Dictionary, accessed September 29, 2021, https://www.oed.com/view/Entry/49638?redirectedFrom=dementia#eid.

6. "The Care You Need in the Place You Love," BAYADA Home Health Care, accessed November 24, 2021, https://www.bayada.com/homehealthcare/what-is-homecare/index.asp.

7 "Long-Term Care Homes vs. Retirement Homes vs. Home Care in Ontario." Closing the Gap. Closing the Gap Healthcare, February 6, 2019. https://closingthegap.ca/long-term-care-homes-vs-retirement-homes-vs-home-care-in-ontario/.

Non-pharmacological approach: "A non-pharmaceutical intervention or non-pharmacological intervention is any type of health intervention which is not primarily based on medication. Some examples include exercise, sleep improvement, or dietary habits."[8]

Person centered care: "where the person is placed at the center of the service and treated as a person first"[9]

Personal Support Workers (PSWs): Personal Support Workers provide care to any person who requires personal assistance with activities of daily living. PSW's provide personal care and related paraprofessional services in accordance with an established plan of care. They are typically involved in both personal care tasks and incidental activities of daily living such as housekeeping, meal preparation, socialization, and companionship."[10]

Pharmacological approach: "deals with the making and use of drugs, and especially the effects of them on the body."[11]

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8. "Non-Pharmaceutical Intervention," in Wikipedia, August 22, 2021, https://en.wikipedia.org/w/index.php?title=Non-pharmaceutical_intervention&oldid=1040061006.
9/ "What Is a Person-Centred Approach? - Principles for Effective Support," accessed November 10, 2021, https://www.health.nsw.gov.au/mentalhealth/psychosocial/principles/Pages/person-centred.aspx.
10. "PSW Roles & Responsibilities," Ontario Personal Support Workers Association, accessed September 29, 2021, https://ontariopswassociation.com/psw-roles-and-responsibilities/.
11. "Pharmacological Therapy: Definition & History," Study.com, accessed November 21, 2021, https://study.com/academy/lesson/pharmacological-therapy-definition-history.html.

Sundowning: "The term "sundowning" refers to a state of confusion occurring in the late afternoon and spanning into the night. Sundowning can cause a variety of behaviors, such as confusion, anxiety, aggression or ignoring directions. Sundowning can also lead to pacing or wandering."[12]

Transfer Trauma: "a term describing a set of negative outcomes that result from involuntarily moving an institutionalized patient from one environment to another—has been the subject of much interest, particularly with respect to the older frail nursing home resident."[13]

Wandering: "is characterized by repeated, prolonged and sometimes compulsive need to walk, with or without aim."[14]

Wayfinding: "the process or activity of ascertaining one's position and planning and following a route."[15]

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12. "Sundowning: Tips for Dealing with Late-Day Confusion," Mayo Clinic, accessed November 27, 2021, https://www.mayoclinic.org/diseases-conditions/alzheimers-disease/expert-answers/sundowning/faq-20058511.
13. Nancy Hodgson et al., "Biobehavioral Correlates of Relocation in the Frail Elderly: Salivary Cortisol, Affect, and Cognitive Function," Journal of the American Geriatrics Society 52, no. 11 (2004): 1856–62, https://doi.org/10.1111/j.1532-5415.2004.52505.x.

14. Strubel and Corti, "Wandering in dementia,"259.
15. "Discover the Story of Englishmore than 600,000 Words, over a Thousand Years," Home : Oxford English Dictionary, accessed September 29, 2021, https://www.oed.com/view/Entry/49638?redirectedFrom=dementia#eid.

PREFACE

Dementia has played a significant role in my life for as long as I can remember. It marked me with questions of "who are you?" and blinding fears of phone calls late at night. It was always a marathon and never a sprint that wore down all those in my life. I was too young to fully understand what dementia was when it overtook my grandfather (figure 1). I was too busy being young to fully comprehend what I was missing when I avoided time with my great uncle (figure 2) when dementia over him. By the time dementia was with my grandmother (figure 3), I was old enough to understand what was happening and old enough to realize there was no way for me to help. It's hard to watch your loved ones disappear before you, especially when there are moments of clarity that give you just enough hope to know that the person you knew still exists. This thesis has given me more peace of mind and control over the disease that overtook my family. Architecture allows me to contribute with the skills I have available to the larger body of knowledge surrounding dementia.

The number of individuals living with dementia is on the rise globally[1] but can be increased even more based on your age, sex, and family history of the disease[2]. For my family and I, this means my mother and I are at the highest risk of developing some form of dementia later in life. I have no way of curing dementia, but if I can add to the body of knowledge surrounding dementia and work to improve the quality of life of those living with dementia, I can age knowing I've tried to support my family and others to the best of my abilities.

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1 "Dementia Numbers in Canada," Alzheimer Society of Canada, accessed October 6, 2021, https://alzheimer.ca/en/about-dementia/what-dementia/dementia-numbers-canada.

2 "Alzheimer's in the Family," Harvard Health, December 12, 2015, https://www.health.harvard.edu/mind-and-mood/alzheimers-in-the-family.

Figure1- Dr. Patrick Joseph Farrell

Figure2- Msgr. Raymond Farrell

Figure3- Mrs. Barbara Farrell

INTRODUCTION

The number of individuals diagnosed with dementia is on the rise globally[1]. As the elderly population continues to rise, so does the risk of contracting dementia and the need for adequate housing. Dementia is a syndrome or umbrella term encompassing multiple degenerative brain diseases causing "the loss of memory and other thinking abilities severe enough to interfere with daily life.[2]"Dementia most commonly impacts the elderly, and therefore elderly individuals living with dementia will be the primary focus of this thesis. A wide range of dementia symptoms can affect individuals, most commonly relating to the loss of memory, difficulty expressing emotions, difficulty dealing with complex situations, and challenges remembering spatial configurations[3]. These challenges can often be aggravated or arise from unfit environments that don't respond to the needs of those with dementia. Having their needs ignored turns into a vicious cycle of an improperly designed environment causing dementia symptoms to worsen and for individuals living with dementia to lash out or become irritated.

As the symptoms of dementia worsen, more care is involved to ensure that the needs and safety of individuals living with

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1 "Dementia Numbers in Canada," Alzheimer Society of Canada, accessed October 6, 2021, https://alzheimer.ca/en/about-dementia/what-dementia/dementia-numbers-canada.

2 "What Is Dementia?," Alzheimer's Disease and Dementia, acce9ssed October 9, 2021, https://alz.org/alzheimers-dementia/what-is-dementia.

3 John Zeisel, I'm Still Here (Penguin Group, 2009),32-34.

dementia are being met. Those engaged in said care are known as caregivers, who comprise two groups. The first group of caregivers are trained professionals, either nurses or personal support workers, who work specifically caring and aiding others in day-to-day tasks[4]. On the other hand, friends and family members may take on the role of caregiving for their loved ones, though they are untrained[5]. Caregiving is often a thankless and stressful job that can present negative physical and mental symptoms in caregivers. An increase in stress and heart diseases are reported in caregivers compared to non-caregiving individuals, while an emotional strain is also very prominent[6]. Though dementia primarily affects individuals diagnosed with the syndrome, caregivers are impacted just as much, and therefore both parties must be considered when researching dementia care.

Currently, two environments exist to house individuals with dementia: the home and long-term care housing. A vast majority of individuals would prefer to stay and age in their own homes, but due to the degenerative nature of dementia, as well as a decline in physical ability that comes with age, most homes prove to be unsafe[7]. Due to the degenerative

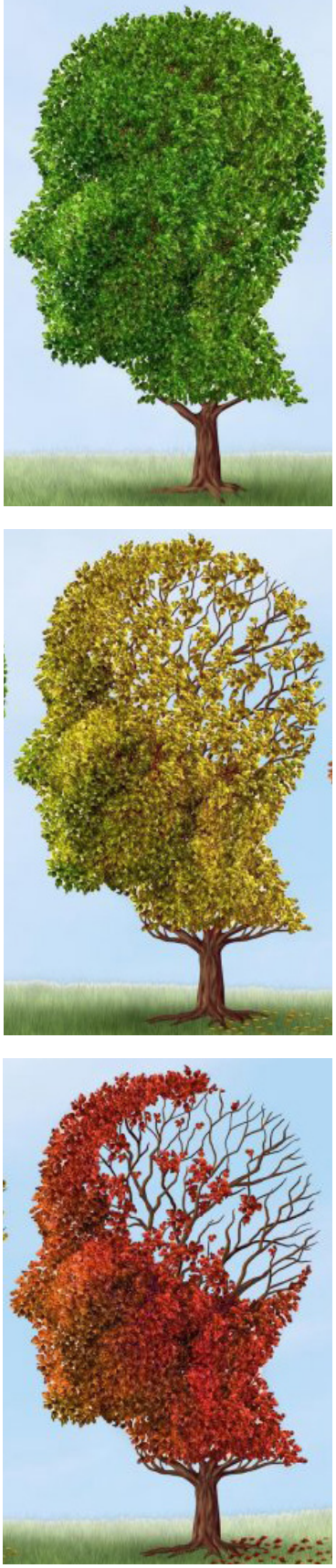


Figure4- The effects of dementia

4 "PSW Roles & Responsibilities | OPSWA," accessed October 9, 2021, https://ontariopswassociation.com/psw-roles-and-responsibilities/.

5 "Alzheimer Society of Canada," Alzheimer Society of Canada, accessed October 9, 2021, http://alzheimer.ca/en/home.

6 Branch, Communications and Marketing. "Long-Term Care and Covid-19." Science.gc.ca. Government of Canada, October 30, 2020. https://www.ic.gc.ca/eic/site/063.nsf/eng/h_98049.html.

7 Marnie Courage, "Canada's Accessible Housing Crisis: Implications

nature of dementia, in-house nursing care can be a solution to keep individuals in their homes longer when the original home environment becomes inaccessible. However, this can be harmful in pandemic times due to cross-contamination from additional nursing staff and can be a costly endeavour[8]. Therefore, many turn to long-term care homes as a more cost-efficient method. However, with the loss of home comes privacy and a more standardized form of care. Long-term care is also designed to house the elderly with various illnesses and physical limitations. Typically, one floor of these standardized housing situations is allotted for dementia patients, in which a lockdown unit is created. Due to a more institutional design and a shortage of staff compared to resident ratio, PSWs and nursing staff are often run down and unable to fully address the needs of residents as well as they would like.

Both environments, the home and long-term care pose issues when housing individuals living with dementia and working with caregivers. This poses the questions,

How can the built environment respond to the impact of dementia on both the individual and their respective caregivers?

and Solutions" (Conference, Home is Where the Heart is, Virtual, November 24, 2021).

8 "Long-Term Care Homes vs. Retirement Homes vs. Home Care in Ontario," Closing the Gap (Closing the Gap Healthcare, February 6, 2019), https://closingthegap.ca/long-term-care-homes-vs-retirement-homes-vs-home-care-in-ontario/.

A different housing model, such as a house community model, can combine benefits from both the home and the long-term care homes to achieve a more desirable outcome for both parties. A house community model is defined in the World Alzheimer Report as smaller housing units that promote independence by allowing residents to continue to participate in household chores and activities under the guidance of PSW or nursing staff[9]. Smaller dwellings, housing six to eight individuals, can help provide more person-centred care while also reducing the ratio of staff to residents to combat strain on caregivers. Also, by offering rentable housing for caregiving family and friends, they may still be involved in the care of their loved ones.

However, it's not only the type of lodging provided for individuals living with dementia that must be considered. Specific needs and challenges arise when designing for individuals living with dementia and should be addressed. A list of elements and principles of dementia care design was created from research into design and case studies to provide better spaces for individuals living with dementia. Not only this but theories of person-centered care and ageing in place are employed to aid the project's programming.

9 "World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1," n.d., 122.

A community center with arts-based programming is also designed on-site with dwelling units. The arts are an essential part of dementia care treatment as dementia removes senses and cognitive processes in the opposite order developed as an infant. For instance, the senses develop early in the uterus and are one of the last areas of the brain to be affected by dementia[10]. As the arts are primarily sensory-based, individuals living with dementia typically have strong positive reactions to art-related activities through all three stages of the syndrome. The opportunity to participate in arts programming in a space specifically designed for individuals living with dementia helps to starve away feelings of isolation and loneliness that are often common in people with cognitive diseases. Not only is it essential for individuals living with dementia, but allowing caregivers spaces to socialize is equally vital to the mental health of all those involved in dementia care[11].

This design intervention will occur in the Sudbury region due to the high percentage of the ageing population in this area. More specifically, the village is designed to be in the Minnow Lake region of Ward 11 in the Sudbury area. A recent report released by the city found this ward had the second-highest among individuals over 65[12]. As the risk of developing dementia significantly increases

10 Zeisel, *I'm Still Here*, 51-52.
11 Zeisel, *I'm Still Here*, 94.
12 Barbara Nott et al., "City of Greater Sudbury Age Friendly Community (AFC) Action Plan," n.d., 5.

in age, Ward 11 provides an opportunity to provide the facilities for dementia care in an area that is more statistically likely to be effective by dementia. Also, keeping ageing individuals in their community promotes ageing in place. Ward 11 has the second-highest number of individuals over 65 in their area. Still, unlike Ward 10, with a more significant population of elderly individuals, residents of Ward 11 expressed a need for more community services and resources to be offered to seniors in their area[13]. As this area desires more community resources to be provided to the elderly, a village created to house individuals living with dementia and provide arts and cultural programming can help fill the gap that Ward 11 residences are currently feeling.

In conclusion, a house community model style of dwelling, combined with an arts-based community center, is designed in the Minnow Lake region of Sudbury to house individuals living with dementia and their caregivers. The creation of smaller dwellings, housing six to eight individuals, allows for personalization and familiarity amongst residents while keeping a manageable scale for PSWs. Additional arts-based programming works to combat loneliness and foster creativity. This is designed through a list of elements and principles of dementia care design to ensure specific needs of individuals with dementia are being met throughout the stages of dementia. While architecture may not be able to treat

13 Nott et al,12-14.

or cure dementia completely, dementia care can become more accessible and more focused on person-centred care through the built environment. These efforts are made to provide more dignity and respect in the dementia process for all individuals involved.

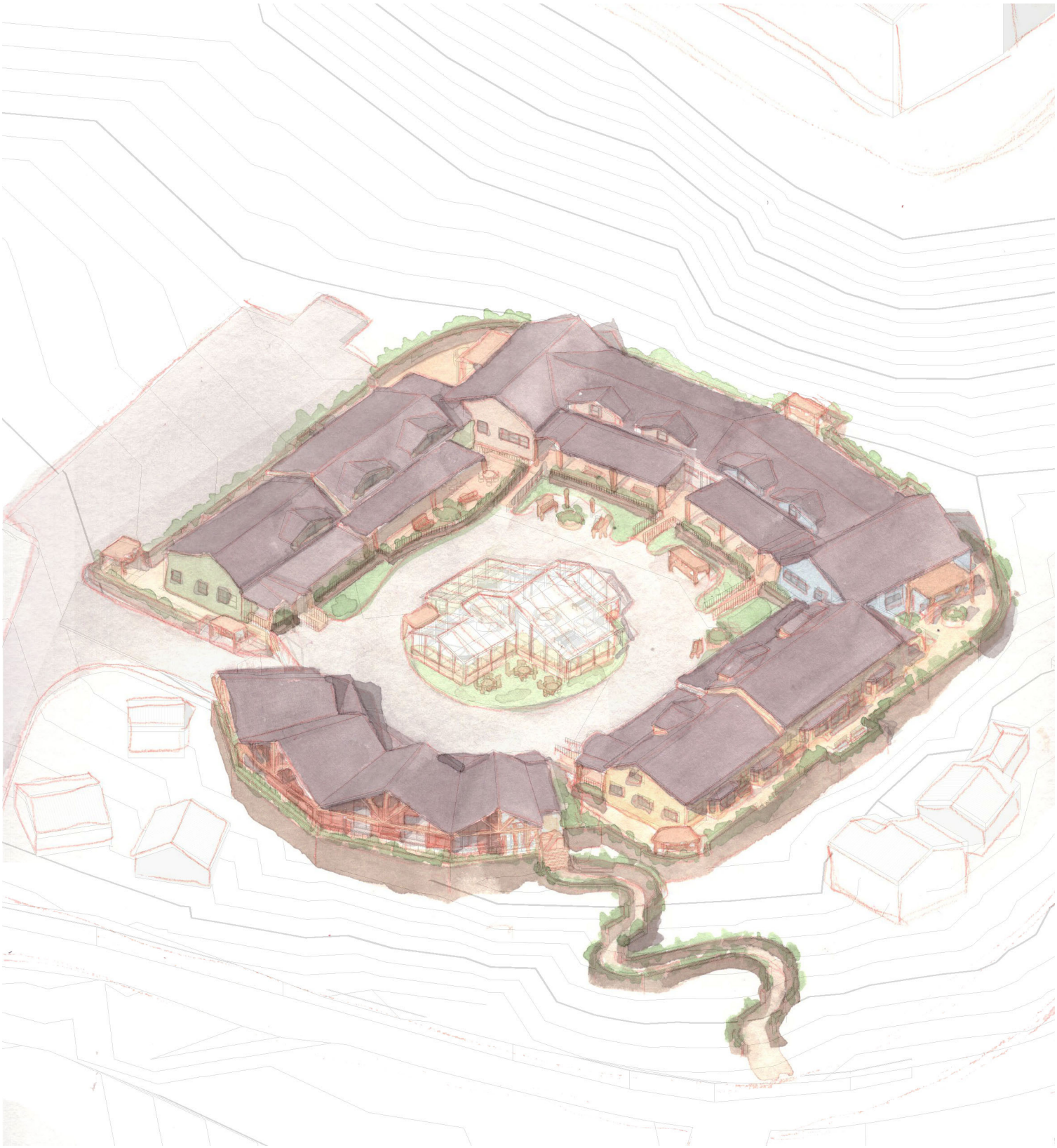


Figure5-Perspective painting of the dementia village.

CHAPTER 1-DEMENTIA AND THOSE WHO EXPERIENCE IT

The first chapter of this thesis uses peer reviewed research in psycology and medicine to explore dementia with the intention of better understanding how this syndrome affects both individuals and the community. The first section focuses on the specific individual affected by dementia. By examining how dementia impacts a person's brain over time while shaping their abilities and perception of spaces, one can better understand the needs and challenges these people face. The second section of this chapter examines those impacted by individuals living with dementia, those being the caregivers. The definition of caregiver implies both trained professionals, such as personal support workers, and family and friends who take over non-formal caregiving tasks. Both parties serve essential roles to individuals living with dementia and face their own challenges from the syndrome. The chapter concludes by laying out the specific users of the thesis, and the impact dementia has on them individually.

Dementia, the term

"There has not, nor will there ever be a moment in my life when I am not a complete Human Being. Please get this; it's important to me. It is important to our society. I am always me..."

-Richard, individual living with dementia[1]

1 John Zeisel, I'm Still Here (Penguin Group, 2009):25.

Dementia: "impairment of memory and of abstract thinking, often with other disturbances of cognitive function and with personality change; a syndrome characterized by this, resulting from primary degenerative disease of the brain (most commonly Alzheimer's disease in the elderly), or from various other conditions (cerebrovascular disease, infections, tumours, etc.) which affect the brain." [1]

Degenerative brain disease: "Degenerative brain diseases are caused by the decline and death of nerve cells called neurons. These diseases are progressive, meaning that the condition worsens over time as greater numbers of neurons in the brain."[2]

Dementia is classified as a syndrome classified as "a group of symptoms that can be caused by a variety of diseases"[14]. Similar to how the term heart disease covers various heart conditions, dementia is an umbrella term than encompasses multiple degenerative brain disease and other conditions that affect the brain. The most common diseases associated with dementia are Alzheimer's disease, which accounts for 60-80% of cases[15], followed by dementia with Lewy bodies, frontotemporal dementia, Creutzfeldt-Jakob disease, mixed dementia and vascular dementia (figure 6)[16]. These diseases have their unique causes, symptoms and treatments; however, their one linking feature is the prominent dementia symptom seen in all patients. As dementia is the most aggressive and typically the most debilitating symptom of each disease, it's referred to as an umbrella term throughout this thesis instead of focusing specifically on one disease.

It is a common misconception that dementia is a normal part of the ageing process as its most apparent symptoms include memory loss. While memory loss does occur in almost

1. "Discover the Story of Englishmore than 600,000 Words, over a Thousand Years," Home : Oxford English Dictionary, accessed September 29, 2021,

2. "Degenerative Brain Diseases | Lehigh Valley Health Network," accessed December 13, 2021, https://www.lvhn.org/conditions/degenerative-brain-diseases.

14 M. Gililland, "Dementia," *Journal of Pracitical Nursing* 1, no. 60 (2010): 10.
RECOMMENDED READING: Camilla Reynolds, "The Impact of a Memory Box Activity on Relationships between Residents of a Long Term Care Facility and the Staff," *Eastern Michigan University Senior Honors Thesis*, 2013, 23.

15 "What Is Dementia?"

16 "Alzheimer Society of Canada."

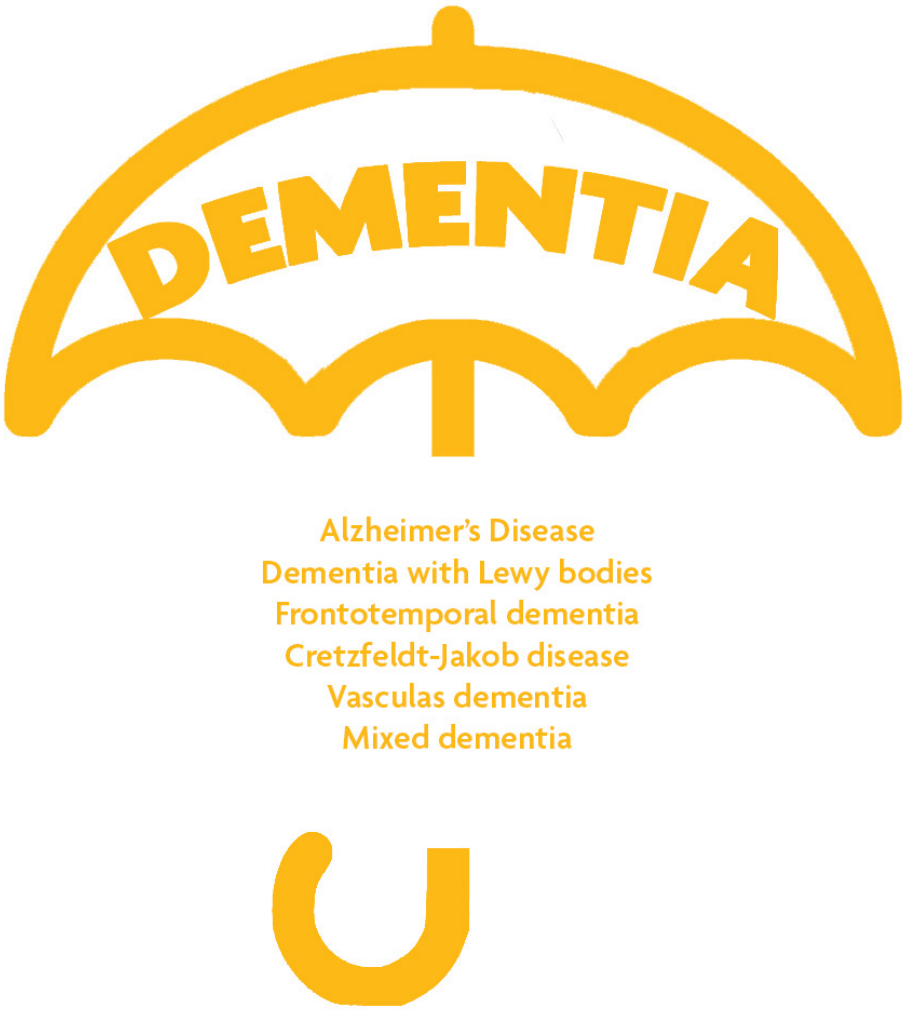


Figure6- Dementia as an umbrella term

40% of individuals over the age of 65, this natural process is known as age-associated memory impairment[17]. The natural process of losing one's memory as one grows older is a slow process that typically does leave most memories intact. At the same time, dementia is a rapid, progressive disease that can have other effects on the brain aside from memory loss. A small percentage of individuals can develop dementia before the age of 50, but most commonly, dementia affects people over the age of 65. One in every 20 individuals over the age of 65 will develop Alzheimer's disease, the most common disease associated with dementia, while this risk doubles every five years after the age of 65[18]. Therefore, this thesis will focus on the elderly population with dementia

17 "Alzheimer Society of Canada."
18 "Alzheimer Society of Canada."

as it is more prominent. Also, as the elderly population of Canada is predicted to grow by 68% over the next 20 years[19], this project will only continue to be relevant and affect an increasing number of individuals.

For a disease that affects so many individuals, there is a startling lack of knowledge on what exactly dementia is, why it occurs and how to treat it. In the past, it was difficult to justify the need to study or research dementia as patients may only live a few years after a diagnosis or when they start showing signs of dementia. As a significant focus of medical research was geared towards diseases affecting younger people, dementia was not a primary concern because it affects the elderly[20]. To this day, no clear cause has been identified for dementia, aside from its genetic and age factors. More generally, dementia is caused by damage to a brain's cells, though the exact cause for this damage is not yet known[21]. Studies of individuals' brains who have died with dementia throughout the last century have revealed unusual tangled neurofibrils and plaques in different areas of the brain. However, researchers later proved that plaques and neurofibrils are not necessarily a predictable way to diagnose dementia[22].

19 "Infographic: Canada's Seniors Population Outlook: Uncharted Territory | CIHI," accessed December 21, 2021, https://www.cihi.ca/en/infographic-canadas-seniors-population-outlook-uncharted-territory.

20 Tia Powell, Dementia Reimagined: Building a Life of Joy and Dignity from Beginning to End (New York: Penguin Random House, 2020), 3-4.

21 "What Is Dementia?"

22 Powell, Dementia Reimagined: Building a Life of Joy and Dignity from

Due to this, it is difficult to diagnose and develop effective treatments. Though it is difficult to diagnose, most dementia-related treatments use a pharmacological approach to reduce symptoms and prolong the degenerative nature of dementia[23].

Non-pharmacological strategies can also help achieve this goal in a less invasive way. One of the leading experts in the field of Alzheimer's and the founder of the *I'm Still Here* and *Hearthstone Alzheimer's Care*, John Zeisel, writes, "the best treatment is one that carefully balances non-pharmacological with pharmacological approaches."[24]. Non-pharmacological implies any method of care not involving medical treatment, such as the adaptation of any social or environmental conditions. As Zeisel describes in his book, there are three steps to a combined pharmacological and non-pharmacological approach, those being:

1. "Describe behaviour and identify triggers.
2. Adapt the caregiver, physical environment, or medication regimen-the context.
3. Employ the lowest possible dosage of pharmacological treatment to make up the difference, if needed." [25]

Beginning to End, 56–58.

23 Ibid

24 John Zeisel, I'm Still Here (Penguin Group, 2009),5.

25 Ibid, 42.

Pharmacological approach: "deals with the making and use of drugs, and especially the effects of them on the body."[1]

Non-pharmacological approach: "A non-pharmaceutical intervention or non-pharmacological intervention is any type of health intervention which is not primarily based on medication. Some examples include exercise, sleep improvement, or dietary habits."[2]

1 "Pharmacological Therapy: Definition & History," Study.com, accessed November 21, 2021, https://study.com/academy/lesson/pharmacological-therapy-definition-history.html.

2 "Non-Pharmaceutical Intervention," in Wikipedia, August 22, 2021, https://en.wikipedia.org/w/index.php?title=Non-pharmaceutical_intervention&oldid=1040061006.

Zeisel explains in these steps the importance of not relying too heavily on a pharmacological approach when certain non-pharmacological aspects can be developed to better aid an individual living with dementia, such as the physical environment. Architecture in this way can directly relate to reducing dementia symptoms and can be less invasive than a pharmacological approach[26]. This thesis will further explain in chapter 2 the full impact that architecture and the built environment can have on individuals living with dementia and their caregivers. Firstly, however, the symptoms of dementia must be fully explored.

26 Zeisel, 129.

Symptoms of Dementia

"I want people to know that they are more than a disease or diagnosis,' she says. 'You still have creativity and can experience new things and take on new challenges."[1]

1 "Still Worthy: 'I'm Not Going to Let Dementia Define Me' | Alzheimer's Society," accessed March 23, 2022, https://www.alzheimers.org.uk/dementia-together-magazine-octnov-20/still-worthy-im-not-going-let-dementia-define-me.

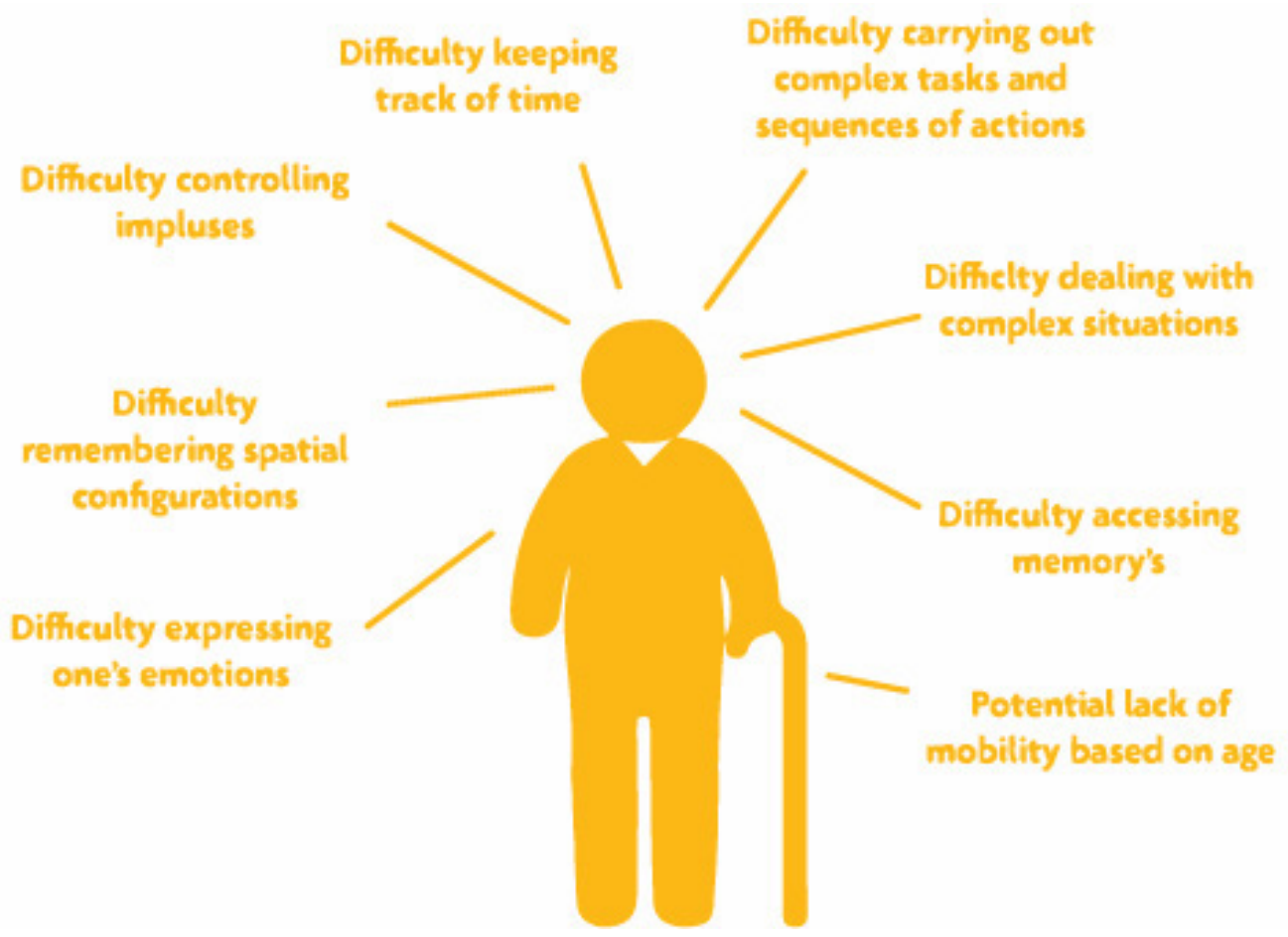


Figure7-Symptoms of dementia

Symptoms of dementia vary significantly from person to person, but some aspects of degeneration remain the same. As can be seen in figure 7, symptoms primarily affecting individuals living with dementia involve elements of memory loss and difficulty performing complex tasks, challenges with keeping track of time, and challenges over impulse control, and difficulty remembering spatial configurations such as room layouts. Difficulty in regulating and expressing one's emotions is also common. Another condition that may impact individuals living with dementia, specifically those of the elderly population living with dementia, as discussed in this project, is a potential lack of mobility based on age[27].

Dementia symptoms impact each individual differently, though they typically progress

27 Zeisel,32-34.

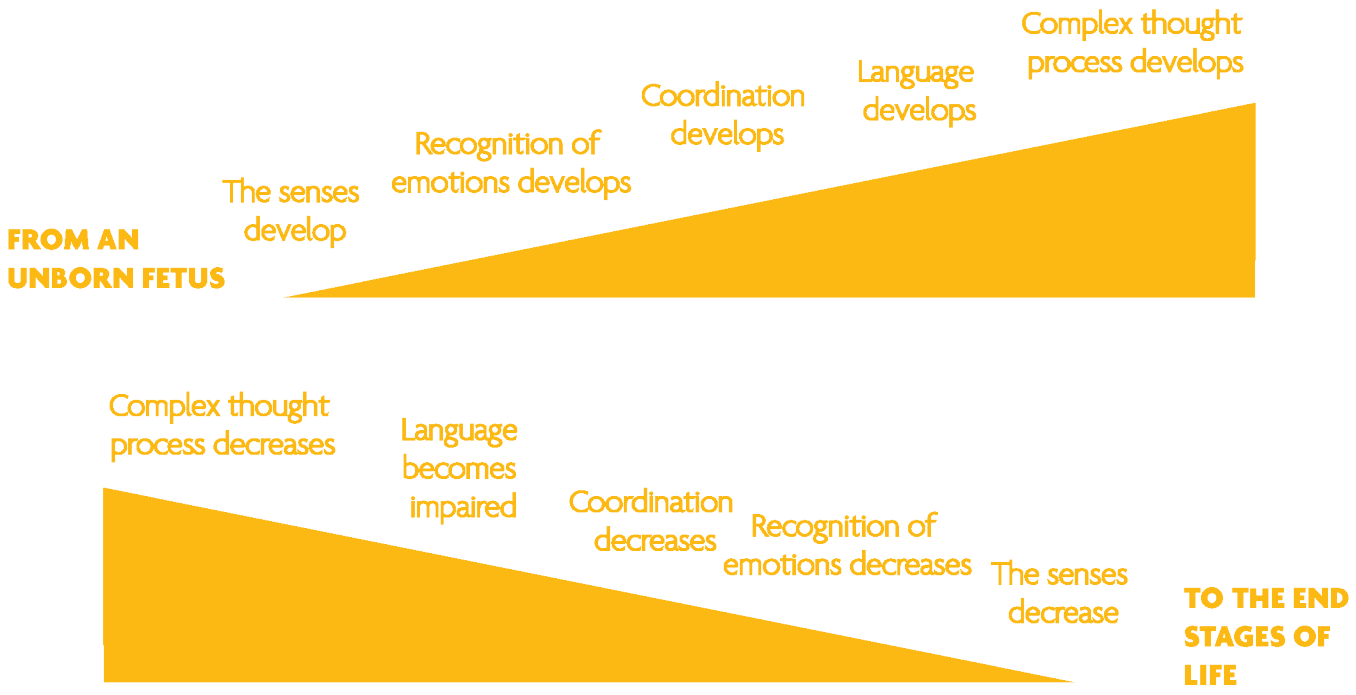


Figure8-Growth and degradation of the brain

similarly. As a degenerative syndrome, dementia slowly eats away at the brain's function. Symptoms of dementia and what areas of the brain are affected vary significantly from person to person. Still, in general, dementia removes senses and cognitive processes in the opposite order in which they develop as an infant. For instance, the senses develop early in the uterus and are one of the last areas of the brain to be affected by dementia (figure 8)[28]. For example, sensory information, such as smell, sound, sight, hearing and touch, is one of the first aspects of the brain to develop, and is one of the last to be fully degraded due to dementia. Complex thought is one of the last areas of the brain to develop in a child, while it is the first to begin to degrade[29].

28 Zeisel, *I'm Still Here,* 51-52.

29 Zeisel, *I'm Still Here,* 51-52.

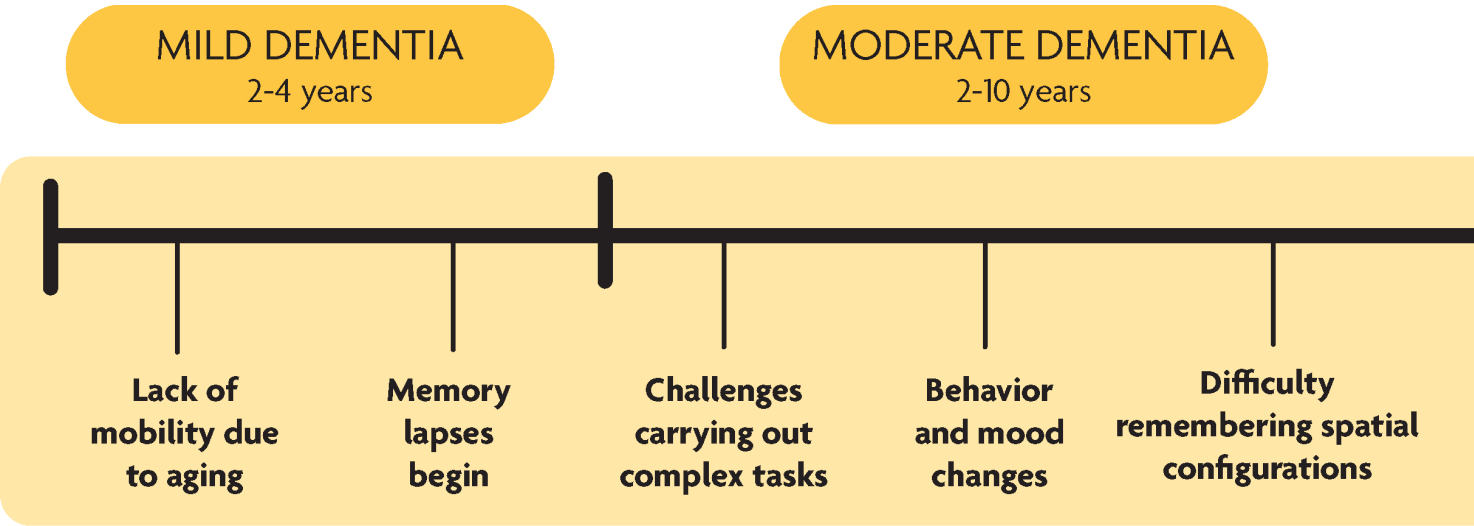
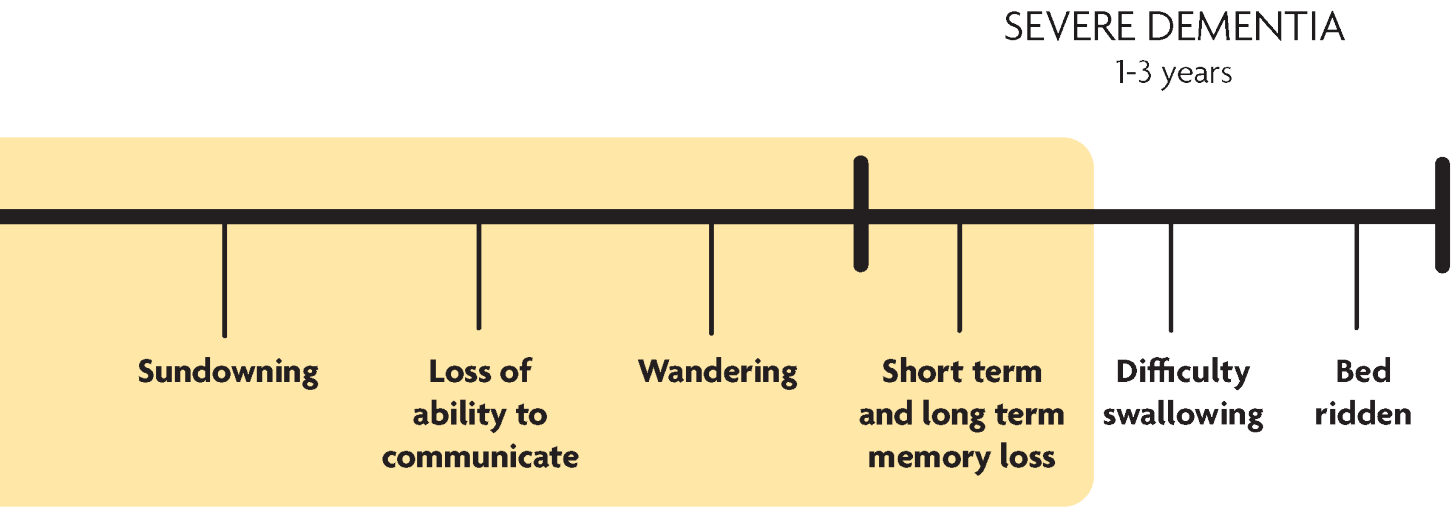


Figure9-Stages of dementia

These degradation steps are mapped out in figure 9 in the stages of dementia. While these symptoms present as individual stages, they often overlap, and an individual may experience symptoms in a different order. The first stage of dementia begins with memory lapses and can take as long as 2-4 years to progress[30]. The moderate stage of dementia is the longest, taking anywhere from 2 to 10 years to advance and has the most extensive variation of symptoms, including wandering, difficulty remembering spatial configurations, changes in mood and behaviour and sundowning. The severe stage of dementia lasts only 1-3 years and consists of a significant decline of short- and long-term memory. It ends with

30 "Seven Stages of Dementia | Symptoms, Progression & Durations," accessed January 13, 2022, https://www.dementiacarecentral.com/aboutdementia/facts/stages/.



difficulty swallowing, and when an individual becomes bedridden, their body begins to shut down[31]. These stages are essential to keep in mind as they show how dementia progresses and demand a need for spaces designed to adapt as a person moves through dementia.

Caregivers are defined as professionals or caregiving friends and family who look after disabled or older people. Professional caregiver in Canada refers to personal support workers specializing in caring for others and aiding in daily activities as their career choice[32]. By contrast, caregiving friends and family are untrained

31 "Seven Stages of Dementia | Symptoms, Progression & Durations."

32 "PSW Roles & Responsibilities | OPSWA," accessed October 9, 2021, https://ontariopswassociation.com/psw-roles-and-responsibilities/.

Caregivers: Living with Those who live with Dementia

"It seems like I just became her parent. At first I took over her finances, then I took over physically, emotionally, just caring for her. When the doctor prescribed some pills for her depression, I had to find a way to get her to take them, because, at that time, she was suspicious and wouldn't take any pills from me. At first I felt very guilty when I would trick her into looking away as I put the medication on her food, but I got over that. I just did what needed to be done, and I soon got over the guilt."[1]

1 Markut and Crane, Dementia Caregivers Share Their Stories: A Support Group in a Book, 37.

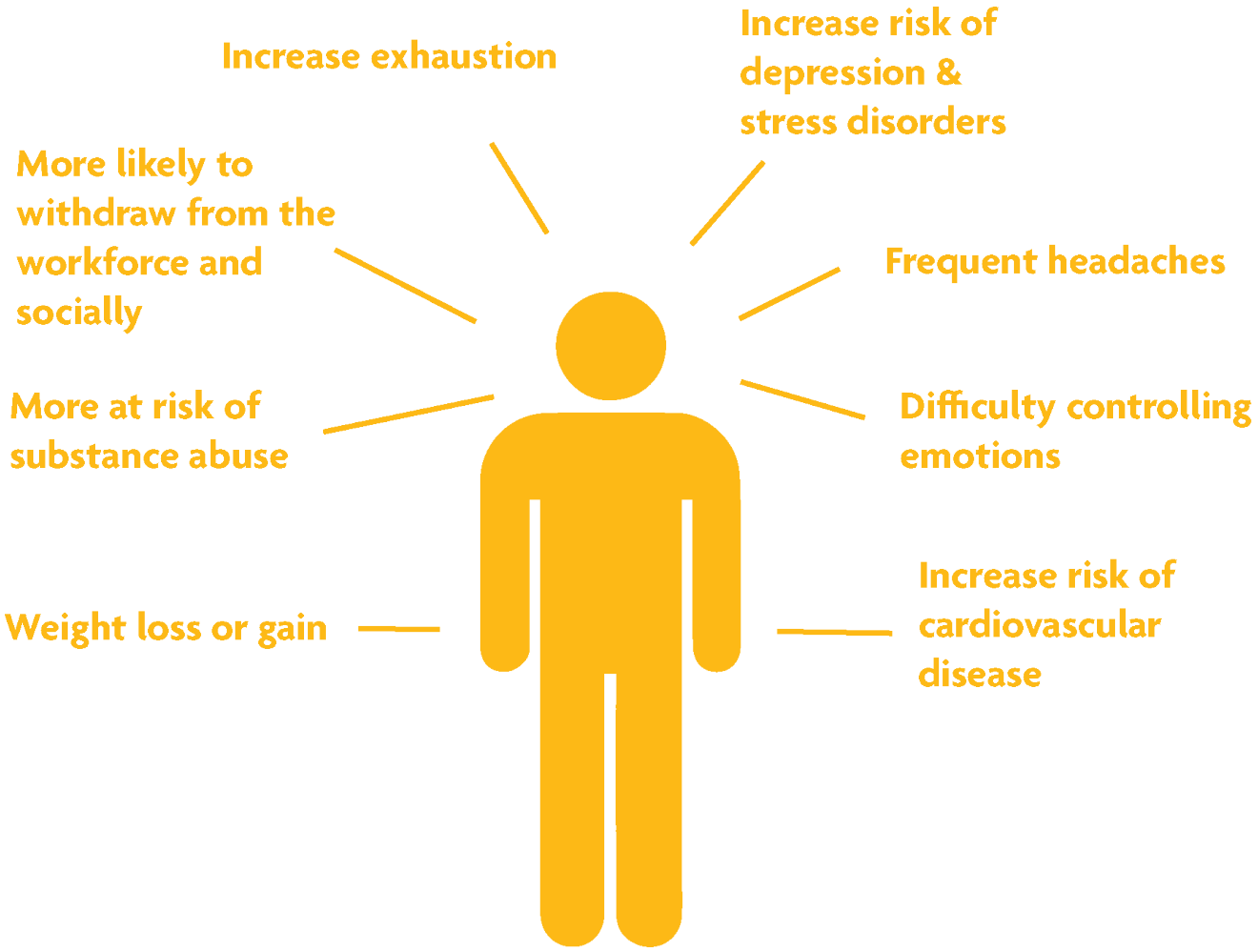


Figure10-Potential effects of full time caregiving on caregivers

Caregiver: "(a) a person, typically either a professional or close relative, who looks after a disabled or elderly person, invalid, etc.; (b) a parent, foster-parent, or social services professional, who provides care for an infant or child."[1]

Personal Support Workers (PSWs): Personal Support Workers provide care to any person who requires personal assistance with activities of daily living. PSW's provide personal care and related paraprofessional services in accordance with an established plan of care. They are typically involved in both personal care tasks and incidental activities of daily living such as housekeeping, meal preparation, socialization, and companionship." [2]

individuals who provide care for their loved ones in various aspects of their daily life. Typically when an individual is diagnosed with dementia, their first caregiver is a friend or family member who brings them to appointments, helps with chores and provides aid in complex tasks[33]. However, as dementia progresses and symptoms become more severe, personal support workers often take a role in caring for an individual. Due to their training, PSWs (personal support workers) are more equipped to aid with dementia symptoms and the emotional responses to symptoms, such as aggression and depression. This is not to diminish the roles of caregiving friends and family. Where they might not be as educated on formal dementia training, caregiving friends and family are more aware and familiar with the individual living with dementia. Due to their combined knowledge of dementia and the individual, PSWs and caregiving friends and family can provide the utmost care when working together.

There are many challenges facing both types of caregivers, however. As the symptoms of dementia are so varied and individualized, caregivers face significant amounts of stress. This stress causes much higher cardiovascular diseases and depression rates in caregivers. Caregivers have also reported a degradation in their mental and physical health[34], that

1 "Discover the Story of Englishmore than 600,000 Words, over a Thousand Years," Home

2. "PSW Roles & Responsibilities," Ontario Personal Support Workers Association, accessed September 29, 2021, https://ontariopswassociation.com/psw-roles-and-responsibilities/.

33 "Alzheimer Society of Canada."

34 Innovation Government of Canada, "Long-Term Care and COVID-19

sometimes leads to higher unemployment levels in caregiving family and friends. Particular day-to-day symptoms can be seen affecting caregivers in figure 10. These include frequent stress headaches, difficulty controlling emotions, weight loss or gain, a higher risk of substance abuse, and most commonly is an increase in physical, emotional and mental exhaustion. This exhaustion arises from caring for another individual twenty-four hours a day and from navigating the healthcare system and caring for oneself simultaneously[35].
It must also be acknowledged that many caregiving friends and family are in a state of grief when an individual they care for or are responsible for is diagnosed with dementia. They are not only coming to terms with a loved one who is ageing and reaching the end of their lives but are also grieving all the memories created with said individual. The memory loss aspect of dementia is challenging on caregivers who may feel as if "the illness (is) taking away (their loved ones) in small pieces, and (you) couldn't stop it."[36] This process involves a lot of change and loss, which dramatically impacts the health of caregivers.

In addition to this, stressors in the physical environment can agitate and cause aggression in individuals living with dementia that can cause more stress on caregivers. While PSWs train to deal

- Science.Gc.Ca," accessed October 9, 2021, https://www.ic.gc.ca/eic/site/063.nsf/eng/h_98049.html.

35 "Alzheimer Society of Canada."

36 Lynda A Markut and Anatole Crane, Dementia Caregivers Share Their Stories: A Support Group in a Book (Vanderbilt University Press, 2005)73.

with such situations of aggression and agitation, calming down an individual living with dementia can be a lengthy and sometimes dangerous process. For example, aggression can present when an individual living with dementia feels lost, confused, overwhelmed or cannot express their anger appropriately[37]. In a situation where an individual living with dementia becomes physically aggressive due to overwhelming stimuli, a family member or friend may react negatively or yell at the person to stop. A PSW is trained to diffuse the situation, reduce triggers, and keep themselves safe at the same time[38]. However, if the built environment is designed to reduce or eliminate overwhelming stimuli from the beginning, then aggressive behaviours can be avoided altogether. By adapting the physical environment to suit the needs of individuals who live with dementia and creating more safety, the stress and burden placed on caregivers can also be relieved.

37 "Alzheimer Society of Canada."

38 "Alzheimer Society of Canada."

CHAPTER 2- LIVING WITH & IN

This chapter examines the theoretical frameworks around architecture for individuals living with dementia. The first section will explore the current housing options for individuals living with dementia in Canada. The second section will look critically at some precedents of dementia housing globally to learn from different ideologies and typologies in dementia care. Finally, by exploring two theoretical frameworks, person-centred care and ageing in place, through the lenses of the previously mentioned precedents, their implementation in this thesis will be discussed.

Current Housing

"We like our own space, you know, and like to be independent. We had friends who moved into one out (that) way and they've got a nice little two bedroom place, but they can't do anything to the gardens. Everything is done. They had a name on the door of their old house and they wouldn't let them put that up there. And you can't have animals...Some people are quite happy to have organized things around them and that, you know, like these friends of mine, that's why they have fitted in so well. They have little concerts up in the hall...the gardens are done and everything... (but) we still like gardening, we always did and we always swore we wouldn't get a place unless it has a little bit of dirt, not a big bit, but just a little bit for therapy, you."

-Charlie, elderly individual[1]

1 J. L. Wiles et al., "The Meaning of 'Aging in Place' to Older People," The Gerontologist 52, no. 3 (June 1, 2012): 357–66, https://doi.org/10.1093/geront/gnr098.

In-Home care: includes any professional support services that allow a person to live safely in their home. In-home care services can help someone who is aging and needs assistance to live independently; is managing chronic health issues; is recovering from a medical setback; or has special needs or a disability[1].

Currently, there are two housing options for individuals living with dementia in Canada, those being an individual's current residence or the residence of their loved ones, or long-term care homes. Most individuals prefer to remain in the safety and security of their own homes. However, due to the declining health and severity of dementia symptoms, many caregiving family and friends find it too challenging to keep their loved ones at home without additional care. When caregiving friends and family cannot stay at home with their loved ones due to careers or stress, personal support workers are often hired or allotted by the CCAC to aid in housekeeping, meal preparation, and socialization[39]. Having PSWs enter the home allows individuals living with dementia to remain in their own homes longer. As both types of caregivers also get to know each other, they can take a more personalized approach can be taken into care. Staying in the home allows individuals living with dementia to remain in a familiar home environment and community[40].

However, having PSWs enter the home is typically a short-term solution to housing individuals living with dementia. As dementia symptoms worsen, twenty-four-hour care is required, which can be as costly as an endeavour. PSWs also

1 "The Care You Need in the Place You Love," BAYADA Home Health Care, accessed November 24, 2021, https://www.bayada.com/homehealthcare/what-is-homecare/index.asp.

39 "PSW Roles & Responsibilities | OPSWA."

40 "Home Care Costs in Ontario—A Complete Breakdown," Closing the Gap (blog), May 20, 2019, https://www.closingthegap.ca/home-care-costs-in-ontario-a-complete-breakdown/.

typically work for multiple families at a time, meaning more exposure to cross-contamination of viruses, seriously impacting the elderly, who are more susceptible. Also, an individual living with dementia may become emotionally attached to certain PSWs as they spend more time together and their personalities meld. This can be problematic as PSWs have scheduled shifts that may not effectively accommodate the preference of individuals living with dementia. This means that an individual living with dementia may not always be cared for by their preferred PSW, which can lead to aggression or agitation[41].

The other housing option for individuals with dementia is in long-term care homes. Opposed to retirement homes, long-term care homes provide twenty-four-hour nursing care and specifically house older adults who have physical or cognitive issues[42]. Long-term care, though a standardized form of care that may be less suited for specific individuals, is necessary at a certain point in the dementia illness. Specifically for dementia patients, one standardized floor of a long-term care home with dementia facilities is dedicated as a lockdown unit, meaning all entrances and exits are monitored at all

Long term care: "sometimes called a nursing home, is a place where seniors can live and receive help with their daily activities, such as eating or bathing. Long-term care homes also provide 24-hour nursing and personal care, and therefore are best suited for people who have difficulty directing their own care."[1]

41 "Home Care Costs in Ontario—A Complete Breakdown."

42 "Long-Term Care Homes vs. Retirement Homes vs. Home Care in Ontario," Closing the Gap (blog), February 8, 2019, https://www.closingthegap.ca/long-term-care-homes-vs-retirement-homes-vs-home-care-in-ontario/.

1 "Long-Term Care Homes vs. Retirement Homes vs. Home Care in Ontario." Closing the Gap. Closing the Gap Healthcare, February 6, 2019. https://closingthegap.ca/long-term-care-homes-vs-retirement-homes-vs-home-care-in-ontario/.

times to assure dementia patients don't wander off. This type of housing solution ensures safety more easily for individuals living with dementia, and care provide more peace of mind for caregivers. However, caregivers often report feeling a sense of guilt in not caring for their family members when they "should" be able to[43]. While blame may be present, it's important to note that in most cases, caregivers are no longer able to care for their loved ones due to the worsening of dementia symptoms that can lead to wandering, agitation, and even aggressive and violent behaviour. When individuals living with dementia become a danger to themselves or others, long-term care is the safest housing environment. Staff are trained and equipped to handle individuals with dementia-related diseases. However, a more supportive housing environment, such as a village typology, can slow down the progression of dementia and provide an interim housing solution to transition from an individual's personal home to long-term care.

43 "Guilt and Grief When Moving Your Loved One to a Care Facility" (Alzheimer's Association, July 2017), https://www.alz.org/media/greatermissouri/guilt_and_grief_when_moving_your_loved_one_to_a_care_facility.pdf.

Physical Case Studies

The following case studies were chosen due to their unique approaches to providing housing for individuals living with dementia and other amenities. After exploring a multitude of precedents, these four case studies were chosen as they each contain an interesting design strategy that will be further explored later in this thesis and used as inspiration for the final design.

De Hogewyk

Location: Weesp, Netherlands

Architect: Buro Kade Architects

Constructed: 2009

Types of residents: 152 individuals living with dementia[1]

Additional programs: Multiple clubs including, folksongs, bingo, baking, painting, cycling, literature, as well as facilities for hair dressing, grocery shopping, gardening & theater

Site: -on the edge of Amsterdam, in a smaller community
-surrounded by commercial and some residential areas, low-rise

The De Hogeweyk dementia village in the Netherlands is perhaps one of the most famous examples and precedents of housing facilities for individuals living with dementia worldwide. This village, completed in 2009, houses 152 individuals living with dementia and provides nearly double the amount of staff and volunteers compared to residents[44]. The concept behind this village has been criticized for its similarity to the 1998 classic film, The Truman Show, as it essentially creates a fake reality for individuals living with dementia. Buro Kade Architects designed this reality by creating a village-style living that provides housing and shops, restaurants, and other day-to-day activities for residents. However, these amenities are run by staff and volunteers trained in dementia care and nursing. In addition to this, to alleviate confusion, no money is exchanged at any store or for any service[45]. The lack of monetary exchange allows residents to more thoroughly enjoy their time at some of De Hogeweyk's clubs and activity centers with less stress. De Hogeweyk also offers seven "lifestyle" choices to residents so that they may choose a specific aesthetic and interior décor for their rooms that best matches up with their previous living situation. Overall, this home seems to still be a leading standard for dementia care for prioritizing residents' happiness and well-being in all cases.

1 "The Hogeweyk Dementia Village ~ Care Concept," accessed November 8, 2021, https://hogeweyk.dementiavillage.com/.

44 "The Hogeweyk Dementia Village ~ Care Concept," accessed November 8, 2021, https://hogeweyk.dementiavillage.com/.
45 "The Hogeweyk Dementia Village ~ Care Concept."

Figure11-De Hogewyk floor plan

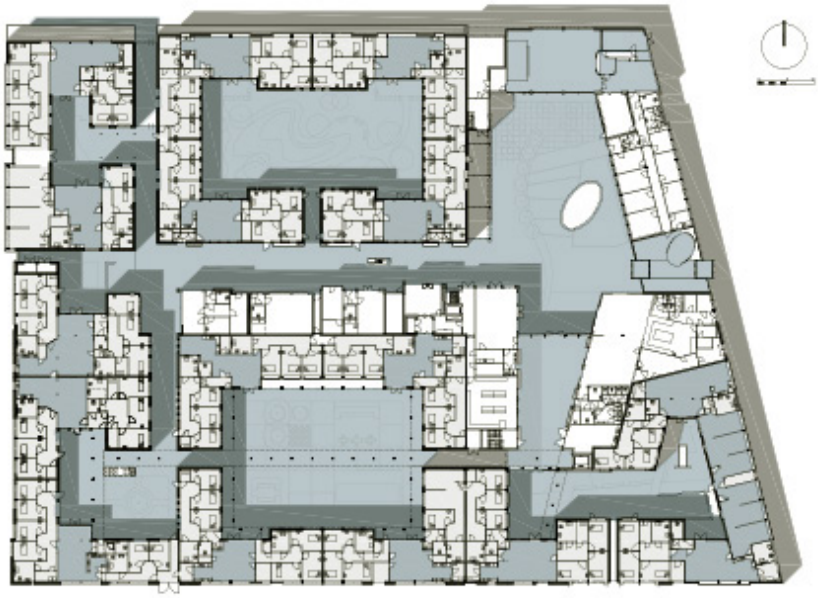


Figure12-Four of the seven types of “lifestyles” to accommodate the different interests and backgrounds of residents

Figure13-Courtyard space with a walkway above

Finlandia

Location: Sudbury, Ontario, Canada

Architect: Sedun & Kanerva Architects with Vigneault and Co

Constructed: 1992

Types of residents: 110 long term care beds in this facility, number of individuals living with dementia is not specified

Additional programs: Shared dining and living spaces, fitness activities and gyms, as well as saunas though it is less clear if these activities are offered to all residents, even if they are in a dementia lock down unit

Site: -located in a more remote, wooded residential area[1]

The Finlandia Village in Sudbury, Ontario, houses elderly individuals of all need levels. Finlandia comprises of multiple buildings and areas, from rentable small homes for elderly individuals requiring little assistance to full long-term care facilities for individuals with acute issues, such as dementia[46]. The philosophy employed by the Finnish community in Sudbury, with the aid of Sedun & Kanerva Architects, of ageing in place is shown over the site, as elderly individuals can move from one residence to another as their level of care needs change. In addition to providing different types of lodging, Finlandia also offers services such as shared dining spaces, fitness and activity rooms, and saunas to offer an element of familiarity to the elderly Finnish population. Although initially designed by and for the Finnish population of Sudbury, the facilities are open to all and now house a mix of cultures[47].

1 "Finlandia Village," Finlandia Village, accessed November 13, 2021, http://www.finlandiavillage.ca/.

46 "Finlandia Village," Finlandia Village, accessed November 13, 2021, http://www.finlandiavillage.ca/.

47 "Finlandia Village."

Figure14-Floor plan of Finlandia Village, with the dementia units highlighted

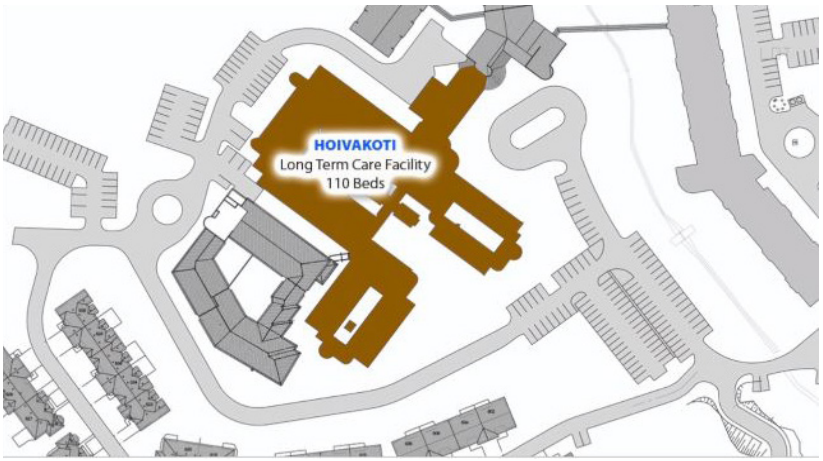


Figure15-Interior photograph showing lots of natural lighting in common spaces

Figure16-Exterior courtyard

Gradmann Haus

Location: Stuttgart-Kaltental, Germany

Architect: Herrmann & Bosch Architects

Constructed: 2001

Types of residents: 24 residents with severe dementia

Additional programs: Hair dressing, garden, "street design, store

Site: -located on the city edge in a residential area with other nursing homes and a kindergarten next door[1]

The Gradmaan Haus in Stuttgart-Kalterntal, Germany, is a small facility designed to house individuals living with severe dementia[48]. This homelike facility has a similar philosophy to the De Hogweyk dementia village by creating opportunities for independence and normality. Connecting the two main housing units at Gradmaan is an interior street with a hairdressing salon, stores, and cafes that allow residents a sense of familiarity and normalcy. In addition, Herrmann & Bosch Architects use architectural details and interior design choices to keep services and "behind the screens" elements hidden from residents. The architects did this to ensure the least amount of confusion, distraction and unnecessary stimuli for residents in the severe and final stage of dementia[49]. By providing opportunities for activity and independence, while also reducing overwhelming stimuli, Gradmann Haus offers comfortable and safe housing for individuals living with dementia.

1 Damian Utton, Designing Homes for People with Dementia (Great Britain: Journal of Dementia Care, Hawker Publications, 2007):62-67

48 Damian Utton, *Designing Homes for People with Dementia* (Great Britain: Journal of Dementia Care, Hawker Publications, 2007),62-67.

49 Utton,62-67.

Figure17-Living and dining space with hidden cabinets shown in background

Figure18-Gradmann Haus floor plan

Figure19-Interior "street"

Village Landais Alzheimer

Location: Dax, France

Architect: Champagnat & Gregoire Architects with NORD Architects

Constructed: 2020

Types of residents: 120 residents[1]

Additional programs: Grocer, hairdresser, restaurant & a market square

Site: -located in a more remote area on the outskirts of the city[2]

Village Landais Alzheimer is an Alzheimer's facility in Dax, France, that provides housing to 120 elderly individuals[50]. Using a village typology, NORD Architects with Champagnat & Gregoire Architects designed smaller housing blocks for residents with different amenities such as a grocer, hairdresser, restaurant and market square. Similar to De Hogeweyk and Gradmann Haus, Village Landais tries to provide a sense of normalcy to residents by offering such amenities and allowing residents to go on with daily activities. Village Landais also emphasizes exterior activities and uses courtyard typologies to create interesting walking paths and workable gardening spaces that encourage residents to be outside and stay active[51]. Overall the architects of Village Landais created a space of familiarity and comfort for individuals living with dementia and explored the outdoor environment to push the idea of familiarity and activity.

1 Village Landais Alzheimer', accessed 19 February 2022, https://villagealzheimer.landes.fr/etablissement.

2 'Alzheimers Village / NORD Architects', ArchDaily, 21 December 2021, https://www.archdaily.com/973948/alzheimers-villa-nord-architects.

50 "Village Landais Alzheimer," Village Alzheimer, accessed February 19, 2022, https://villagealzheimer.landes.fr/etablissement.

51 Paula Pintos, "Alzheimers Village / NORD Architects," ArchDaily, December 21, 2021, https://www.archdaily.com/973948/alzheimers-villa-nord-architects.

Figure20-Massing plan

Figure21-Outdoor walking path, next to community centers

Figure22-Outdoor garden covered with a trellis and containing raised garden boxes

From this research, several interesting elements of dementia care design can be found and some areas for criticism. Each project contained overarching themes of dementia care design, though differed in their executions. There are lessons to be drawn from their approaches to dementia care design, though similar practices might not be applicable everywhere. Outdoor activity and gardens were at the forefront for the design of Village Landais Alzheimer, for example, given the milder conditions of this area of France[52]. This type of extensive garden would be less effective in Finlandia Village, given the colder, northern climate that sees large amounts of snow every year. Another technique skillfully used is the art of concealing staff workspaces and cabinets in Gradmann Haus[53]. The techniques used here, of having working kitchens hidden away from residents and supply closets and staff areas, can be seen as similar to the approaches at De Hogeweyk. However, while De Hogeweyk was criticized for being too similar to the Truman Show in its false reality[54], Gradmann Haus seems to have created a more tame version of this effect.

Where all projects seem to lack, however, is their connection to the greater community. These projects are all isolated from the larger community and provide little incentive for

52 "Village Landais Alzheimer,"

53 Damian Utton, *Designing Homes for People with Dementia* (Great Britain: Journal of Dementia Care, Hawker Publications, 2007), 62-67.

54 "The Hogeweyk Dementia Village ~ Care Concept."

community members to interact and get a first-hand experience of dementia. In this way, residents still face a sense of isolation, while the stigma around dementia persists. For this reason, it is of the utmost importance that the dementia village outlined in this thesis is connected and situated in the larger community. The most common recurring themes between these precedents can also be addressed more fittingly by situating the project in a community setting.

Two main recurring themes were uncovered from this research: the theories of person-centred care and ageing in place. De Hogeweyk, for example, shows person-centred care in the manner of attentive care taken to each design aspect of the village. As well as the programmatic elements of De Hogeweyk include having no monetary value exchanged at "stores" to relieve stress from residents and avoid frustration[55]. Ageing in place is shown more clearly and effectively at Finlandia Village, where residents can choose multiple housing types to suit their current needs and the flexibility to change housing types when their needs change but remain on the same piece of land[56]. The themes of person-centred care and ageing in place are further explained and explored in the coming pages.

55 "The Hogeweyk Dementia Village ~ Care Concept."

56 "Finlandia Village."

Humanistic Approaches to Care

"Remember, everyone would rather be at home."[1]

1 Alzheimer's Disease International, John Zeisel Interviews Peter Phippen, 2020, https://www.youtube.com/watch?v=tebk6QRXyMU.

This section will explore the two humanistic theories pulled from the case studies previously discussed; person-centred care and ageing in place. These theories focus on the individual behind the dementia syndrome and use people-oriented techniques to improve care. Focusing on the individual is especially important when researching dementia care, as individuals living with dementia are often forgotten in their disease. Due to their decline in cognitive function and their growing inability to communicate, individuals living with dementia are often overlooked or not consulted in their care. By excluding individuals from their care, the symptoms of dementia can be made worse. For example, moving an individual to an unfamiliar environment to increase their safety may cause them to become aggressive because they are confused and scared. Erratic and irritable behaviour makes a caregivers' job more stressful and creates more frustration for all parties involved in dementia care. However, suppose more humanistic, person-oriented theories are used in dementia care design. In that case, these symptoms may be reduced, and the quality of life for individuals living with dementia and caregivers can be increased.

Firstly, the theory of person-centred care centers around the idea that every person should be at the heart of their own care and be treated with respect and dignity[57]. Specifically, when speaking

57 "What Is a Person-Centred Approach? - Principles for Effective Support," accessed November 10, 2021, https://www.health.nsw.gov.au/mentalhealth/psychosocial/principles/Pages/person-centred.aspx.

Person centered care: "where the person is placed at the centre of the service and treated as a person first"[1]

to dementia care, person-centred care puts the needs and wants of an individual living with dementia at the forefront of design. An architect must look at the allowance of dementia rather than its limitations and an individual's strengths instead of weaknesses[58]. The built environment must feature characteristics that "reinforce a person's sense of self, which improves reciprocal relationships between them and their partners and caregivers."[59] By reinforcing a person's sense of self, a better quality of life can be achieved while also improving the quality of life for caregivers. Caregivers may find individuals living with dementia more cooperative and happier when, like the majority, they are respected and feel comfortable with themselves. One of the main elements to giving a person more self-confidence is finding the balance between respecting an individual's wishes and keeping them safe. For example, if their wishes involve a large amount of risk, they may be denied, but a request with less risk may be evoked. In sharing decision-making and giving individuals with dementia more choice and control in their lives, their quality of life can be improved[60]. The act of

1 "What Is a Person-Centred Approach? - Principles for Effective Support," accessed November 10, 2021, https://www.health.nsw.gov.au/mentalhealth/psychosocial/principles/Pages/person-centred.aspx.

58 Margaret P Calkins, World Alzheimer Report 2020: John Zeisel interviews Maggie Calkins, Virtual interview, September 20, 2020, https://www.youtube.com/watch?v=2rxB44ogqVI&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=10.

59 John Zeisel, 'Improving Person-Centered Care Through Effective Design', *Generations Journal* 37, no. 3 (Fall 2013): 45.

60 Margaret P Calkins and Jennifer Brush, "Honouring Individuals Choice in Long-Term Residential Communities When It Involves Rosk: A Person-Centeread Approach," *Journal of Gerontological Nursing* 42, no. 8 (August 2016): 13.

Figure23-Nursing staff interacting on a personal level with a residents

giving control and creating safety will be further discussed in the coming chapter of this thesis, with a list of elements and principles of design for dementia care.

Ageing in place is the next humanistic theory to be explored. As was should in the case studies, particularly Finlandia Village, ageing in place is a theory that emphasizes keeping an individual in their home environment and community while they age. Staying in one's own home and community environment promotes familiarity and gives a sense of comfort for all people. Ageing in place is significant for individuals living with dementia, however. Studies have also found that "long-term emotional attachments to environmental surroundings have also been shown to contribute to well-being in old age."[61] Specifically for individuals living with

61 J. L. Wiles et al., "The Meaning of 'Aging in Place' to Older People," The Gerontologist 52, no. 3 (June 1, 2012):

Ageing in Place: "remaining living in the community, with some level of independence, rather than in residential care"[1]

Transfer Trauma: "a term describing a set of negative outcomes that result from involuntarily moving an institutionalized patient from one environment to another—has been the subject of much interest, particularly with respect to the older frail nursing home resident."[2]

dementia, other effects, such as transfer trauma, can exacerbate dementia. While any elderly individual can experience transfer trauma, there are more serious health risks for individuals living with dementia. A study with Alzheimer's patients proved an escalation in short-term cognitive decline among participants when moved from the community to an institutional setting[62]. However, as discussed previously, institutional health settings are often necessary for an individuals' physical health and safety. Some caregivers may adapt the home environment to include accessibility characteristics though this is a costly endeavour. In Canada, a survey found that more than half of homeowners are concerned about their homes being inaccessible when they reach old age, but most won't be prompted to modify their homes until it's too late[63]. If individuals cannot remain in their home to age in place, transfer trauma can still be reduced by staying in a familiar community. Ageing in place done on a community level can provide a happy medium between safety and familiarity for individuals living with dementia and their caregivers. The principles of safety, community and familiarity will be further discussed in chapter 3 of this thesis.

1 J. L. Wiles et al., "The Meaning of 'Aging in Place' to Older People," The Gerontologist 52, no. 3 (July 2011): pp. 357, https://doi.org/10.1093/geront/gnr098.

2 Nancy Hodgson et al., "Biobehavioral Correlates of Relocation in the Frail Elderly: Salivary Cortisol, Affect, and Cognitive Function," Journal of the American Geriatrics Society 52, no. 11 (2004): 1856–62, https://doi.org/10.1111/j.1532-5415.2004.52505.x.

358, https://doi.org/10.1093/geront/gnr098.

62 Magali González-Colaço Harmand et al., "Cognitive Decline After Entering a Nursing Home: A 22-Year Follow-Up Study of Institutionalized and Noninstitutionalized Elderly People," The Journal of Post-Acute and Long-Term Care Medicine 15 (2014): 505.

63 Marnie Courage, "Canada's Accessible Housing Crisis: Implications and Solutions" (Conference, Home is Where the Heart is, Virtual, November 24, 2021).

Figure24-Two women enjoying coffee outside their house

CHAPTER 3- DEMENTIA CARE DESIGN ELEMENTS AND PRINCIPLES

This chapter draws upon research from the disciplines of psychology, medicine and architecture to create a list of elements and principles for dementia care design. These five elements and six design principles were created using strategies gathered from the humanistic approaches of person-centred care and ageing in place. Each element and principle will be explained in terms of its importance to dementia care design. The implementation of each strategy in this thesis's final design will also be discussed.

Elements of Dementia Care Dementia

"What works for people with cognitive problems will work for many."[1] -Wilhelmina Hoffman

1 Alzheimer's Disease International, John Zeisel Interviews Wilhelmina Hoffman, 2020, https://www.youtube.com/watch?v=2cR4aBEQ5DM.

The elements of dementia care design proposed below are a series of architectural aspects curated due to the profound impact on individuals with dementia. The following list of elements are curated from different aspects of the case studies looked at previously. This list was developed with additional research from professionals in the field as well, such as Maggie Calkins and drawing inspiration from John Zeisel's eight criteria for dementia design[64]. Depending on how each element is implemented in the built environment, their impact on individuals living with dementia and their caregivers can be positive or negative. Due to this, strategies will be outlined with each element on adequately implementing them into the built environment to facilitate care and safety.

The main focus of these architectural elements is the individual living with dementia, as their needs surpass those of the caregivers. This is not to say the needs of caregivers are less critical, but that they are less demanding due to their cognitive decline. As Wilhelmina Hoffman, CEO and headmaster of the *Swedish Dementia Center*, Silviahemmet, rightly says, "what works for people with cognitive problems will work for many."[65] Therefore, it is vital to address the architectural elements that most directly affect individuals with dementia, as the benefits of these

64 Zeisel, I'm Still Here, 128-134.

65 Wilhelmina Hoffman, World Alzheimer Report 2020: John Zeisel interviews Wilhelmina Hoffman, Virtual interview, September 20, 2020, https://www.youtube.com/watch?v=2cR4aBEQ5DM&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=9.

adaptations will help the residents and be beneficial for caregivers.

Lighting

Natural lighting and specific lighting conditions are essential to all humans, but for individuals living with dementia, the need for proper lighting conditions is more critical. Due to a thickening of the eye lenses, individuals living with dementia typically need two to three times more light than younger people[66]. This amount of lighting is generally achieved through a mix of artificial and natural lighting sources, though natural daylighting is typically preferred[67]. Daylighting emits blue light, while most artificial lighting is white light[68]. The human body is a "blue light detector"[69] and uses the blue light emitted from the sun as a sensor to stay awake during the day. Due to this, daylighting is particularly important to regulating a human's circadian rhythm and keeping track of time on a solar day[70]. Having a regulated sleep schedule is an integral part of being a healthy person, but it is even more vital to those living with dementia. One aspect of ageing that occurs to most individuals is restless sleep, which is even higher for individuals living with dementia[71]. A healthy amount of natural lighting throughout the day

66 Margaret P Calkins, *Design for Dementia: Planning Environment for the Elderly and the Confused* (National Health Publishing, 1988),45.
67 Edelstein, "Building Health," 56.
68 Edelstein, "Building Health," 56.
69 Figueiro,120.
70 Mariana G Figueiro, "Light, Sleep and Circadian Rhythms in Older Adults with Alzheimer's Disease and Related Dementias," Neurodegenerative Disease Management 7, no. 2 (April 2017): 120, https://doi.org/10.2217/nmt-2016-0060.
71 Figueiro,121.

Sundowning: "The term "sundowning" refers to a state of confusion occurring in the late afternoon and spanning into the night. Sundowning can cause a variety of behaviors, such as confusion, anxiety, aggression or ignoring directions. Sundowning can also lead to pacing or wandering."[1]

can naturally help to regulate the sleep schedule and prevent such restless sleep that can negatively impact the mood and health of individuals living with dementia. Caregivers are also equally affected by restless sleep, as they are the ones who will typically be checking in on an individual living with dementia when they being to move around or wander out of bed.

Another reason for proper lighting when designing for individuals living with dementia is due to an effect known as sundowning. Sundowning is an effect that refers to a state of confusion that typically presents in individuals living with dementia later in the day or afternoon[72]. There are multiple causes for this phenomenon, including tiredness at the end of the day, but disruption in the circadian rhythm and lack of light are also significant factors. Due to a decline in eyesight and cognitive levels, most individuals living with dementia perceive shadows and a lack of natural light differently at the end of the day. Long shadows are intensified and can appear as figures or hallucinations, creating stress, fear and agitation[73]. Having lots of brightly lit areas can help with this phenomenon and having sleeping spaces with minimal light decreases shadows.

1 "Sundowning: Tips for Dealing with Late-Day Confusion," Mayo Clinic, accessed November 27, 2021, https://www.mayoclinic.org/diseases-conditions/alzheimers-disease/expert-answers/sundowning/faq-20058511.

72 "Sundowning: Tips for Dealing with Late-Day Confusion," Mayo Clinic, accessed November 27, 2021, https://www.mayoclinic.org/diseases-conditions/alzheimers-disease/expert-answers/sundowning/faq-20058511.

73 John Zeisel, *I'm Still Here* (Penguin Group, 2009),64-65.

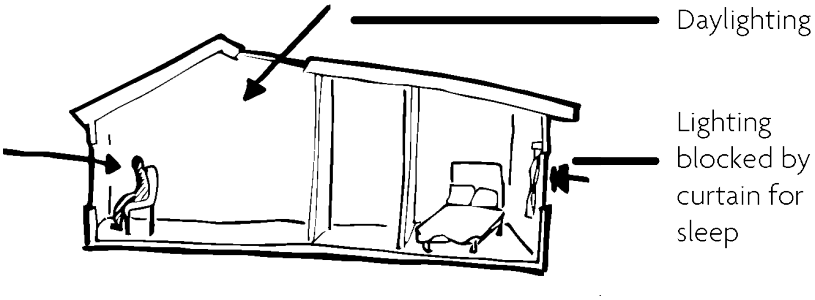


Figure25-Lighting Diagram, showing different lighting conditions through a space

Figure26-Lighting Icon

Lighting Design Requirements:

-as much exposure to daylighting as possible

-artificial lighting must compensate when daylighting is not possible to create brightly lit spaces

-avoid glares caused by direct sunlight through the use of matte surfaces[74]

-bedrooms should be dark at night, and the light in common spaces dimmed (though still bright enough to see) in the evenings to simulate the time of day if there's no daylighting in the space[75]

74 Calkins, *Design for Dementia: Planning Environment for the Elderly and the Confused*, 45.

75 Calkins, *Design for Dementia: Planning Environment for the Elderly and the Confused,*45.

Colour

Typically, while people age, they lose the ability to distinguish between different colours. Colours begin to fail along the colour spectrum, starting at the violet end, meaning that red, oranges and yellows are typically the last colours to deteriorate[76]. Not only this, but a thickening of the eye's lenses with age means that most colours appear washed out and less bright than they would normally[77]. These are all typical symptoms of aging; however, the difficulty and importance of addressing colour with individuals living with dementia is that a person with a normal cognitive function will compensate and fully understand that their perception of colour and contrast is no longer the same. An individual living with dementia may have less or no ability to comprehend that their vision is impaired. For example, when walking down a hallway with high contrast flooring, an individual living with dementia may perceive this change in contrast as a step or difference in level[78]. High contrast also implies essential information is present there, which can be ideal when trying to draw someone's attention to a doorway but can be confusing when too many contrasting colour or patterns is shown in a room[79]. Contrast can reveal important information and paths of travel, but contrast can also be used as a tool for camouflage. An example of this would be to hide exits or rooms a designer wouldn't want an individual living with dementia walking into[80]. In this way, the use of colour and contrast can provide different levels of

76 Damian Utton, Designing Homes for People with Dementia (Great Britain: Journal of Dementia Care, Hawker Publications, 2007),5.

77 Colour and Contrast | Dementia Services Development Centre l DSDC, Stirling," accessed November 29, 2021, https://dementia.stir.ac.uk/design/good-practice-guidelines/colour-and-contrast.

78 Utton,5.

79 Courage, "Canada's Accessible Housing Crisis: Implications and Solutions."

80 "Colour Your World...and Theirs!," Dementia Care International (blog), February 26, 2007, https://dementiacareinternational.com/2007/02/colour-your-world-and-theirs-membership-required/.

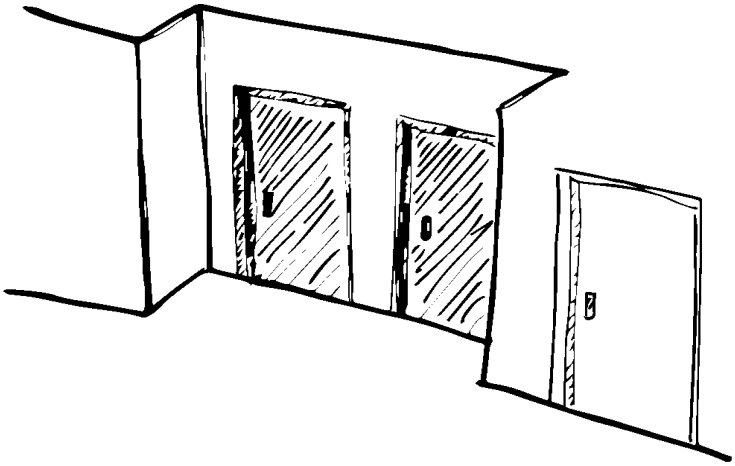


Figure27-Colour Diagram, showing the difference between using contrasting wall and door colours to draw attention to certain doors

Figure28-Colour Icon

stimulation in a space, while these elements can also work to provide safety and wayfinding.

Colour Design Requirements:

-Contrast is key

-Patterns and too many colours should be used sparingly as they can cause confusion[81]

-Green and blue are restful, natural colours[82]

-Red is an activating colour, most helpful when drawing attention to objects[83]

81 Courage, "Canada's Accessible Housing Crisis: Implications and Solutions."

82 "Can Different Colors Influence a Person with Dementia? Here's What to Know," The Advocate, accessed November 29, 2021, https://www.theadvocate.com/baton_rouge/entertainment_life/health_fitness/article_922b136a-84d5-11e6-8c00-fbc8ac72b472.html.

83 "Can Different Colors Influence a Person with Dementia? Here's What to Know," The Advocate, accessed November 29, 2021, https://www.theadvocate.com/baton_rouge/entertainment_life/health_fitness/article_922b136a-84d5-11e6-8c00-fbc8ac72b472.html.

Courtyards & Gardens

Wandering: "is characterized by repeated, prolonged and sometimes compulsive need to walk, with or without aim." [1]

Courtyards are especially important to individuals living with dementia as they provide spaces for safe wandering while still giving access to the outdoors. Having access to an outdoor space offers individuals living with dementia a sense of independence and freedom in their movements while providing peace of mind to caregivers that there is no danger in these wandering. In terms of dementia, wandering refers to a phenomenon in which individuals living with dementia tend to roam aimlessly[84]. This phenomenon is widespread among individuals living with dementia and can often lead to other issues, such as falls, weight loss, fatigue and hypothermia for those who wander in cold months[85]. However, physical restraints and locked doors only further agitate and provide stress to individuals living with dementia[86]. Courtyards in this way can provide a safer environment for wandering while also providing the benefits of being outdoors. Being in nature and getting proper sunlight typically reduces aggression and improves sleep patterns, immune functions, and spiritual qualities[87]. Gardens, often found in courtyards,

1 Strubel and Corti, "Wandering in dementia,"259.

84 Denise Strubel and Mariana Corti, "Wandering in dementia," Psychologie & Neuropsychiatrie Du Vieillissement 6, no. 4 (December 2008): 259–64, https://doi.org/10.1684/pnv.2008.0147.

85 Gabriele Cipriani et al., 'Wandering and Dementia', *Psychogeriatrics* 14, no. 2 (2014): 136-137, https://doi.org/10.1111/psyg.12044.

86 Calkins, World Alzheimer Report 2020: John Zeisel interviews Maggie Calkins.

87 Clare Cooper-Marcus, World Alzheimer Report 2020: John Zeisel interviews Clare Cooper-Marcus, Virtual interview, September 20, 2020, https://www.youtube.com/watch?v=dWnE8vEFs2g&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=9.

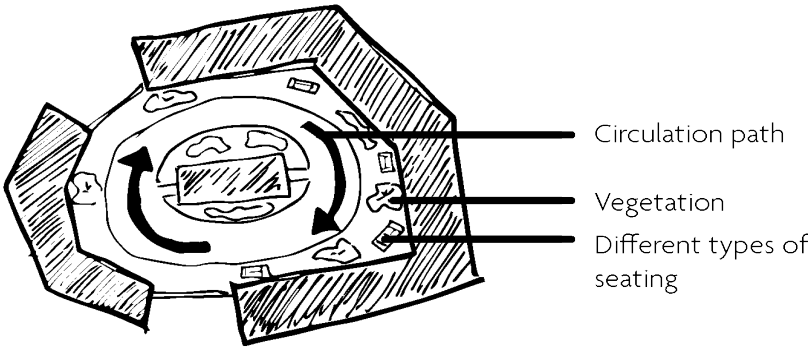


Figure29-Courtyard & Gardens Diagram, showing important features

Figure30-Courtyard & Gardens Icon

aid in providing access to nature while also giving individuals living with dementia more independence and freedom. Also, more autonomy and confidence can be inspired by providing activities, such as gardening and walking.

Courtyard Design Requirements:

- One entry to the outdoors, have a patio as a transitional space[88].

- No forks in the path, little room for failure or having to make decisions. Circular paths are preferred[89].

-Variety of seating needed to create interest and serves a variety of functions[90].

-Garden boxes should be raised to be more accessible[91].

88 Cooper-Marcus.
89 Cooper-Marcus.
90 Cooper-Marcus.

91 Cooper-Marcus.

Familiarity

Familiarity as an element in architecture refers to any object or design strategy made to evoke a feeling of comfort and remembrance in a person. As dementia is a disease that primarily affects memory, creating familiar environments can aid in decreasing agitation and anxiety in individuals who live with dementia. As memories fade, familiar architecture elements and cues can cause illicit positive reactions, while familiarity leads to positive reactions and stimulates memories[92]. The point is not to recreate or force memories onto individuals who can no longer access those brain areas but to have their muscle memory and subconscious activated to feel comfortable in a space. Familiarity will look different to every individual; however certain cultural architectural features are common to most. The human scale, for example, describes a universal feeling of familiarity that is essential to achieve a residential atmosphere in a space that is more comfortable to most[93]. Also, as short-term memories are often the first to be displaced by dementia, familiarity can usually be found in the past's aesthetic and architectural moments. For example, an individual living with dementia may experience more comfort and understanding in a space with simple, punch windows with curtains versus a more modern curtain wall, as the punch windows were something common in their childhood homes. Familiarity plays a significant role in architectural design in terms of creating comfort for the individual. Though each individual living with dementia will still ultimately rely on unique familiar aspects to trigger memories and understanding.

92 John P. Marsden, *Humanistic Design of Assisted Living* (JHU Press, 2005),39.
93 Marsden,41.

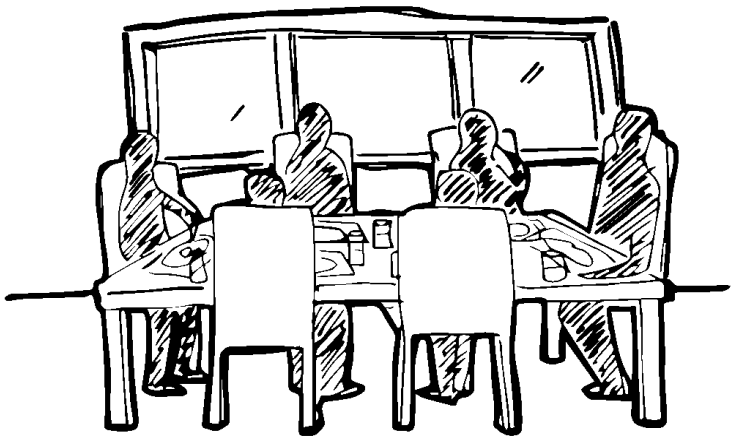


Figure31-Familiarity Diagram, illustrating a domestic scene of a group of people sharing a meal

Figure32-Familiarity Icon

Familiarity Requirements:

- The human scale is very important to the residential and familiar feel to a space[94]

-Naturalness is a part of familiarity (ex. Being close to windows, natural materials, ...)[95]

-The aesthetic elements of a design should be based partially on familiarity of the existing environment and of the residents past[96].

94 Marsden,41.
95 Marsden,43.
96 Peter Phippen, World Alzheimer Report 2020: John Zeisel interviews Peter Phippen, Virtual interview, September 20, 2020, https://www.youtube.com/watch?v=tebk6QRXyMU&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=6.

Wayfinding: **"**the process or activity of ascertaining one's position and planning and following a route."[1]

Cueing: "a feature indicating the nature of something perceived The expressions on people's faces give us visual cues about their feelings".[2]

1 "Discover the Story of Englishmore than 600,000 Words, over a Thousand Years," Home : Oxford English Dictionary, accessed September 29, 2021.

2 "Definition of Cueing," accessed March 21, 2022, https://www.merriam-webster.com/dictionary/cue.

Sensory Information

Sensory information is a more versatile element than others that relies on the experience of different senses. The senses can be used as a form of familiar elements and act as a method of cueing. As cognitive function begins to fail with dementia and visual impairments increase, other forms of cueing must be introduced to imply spatial arrangements and activity. Individuals living with dementia can only take cues from what they understand. As sensory information is so ingrained in a person's brain, they are often the last areas of the brain to be affected by dementia and are therefore the most effective ways to provide cues[97]. Visual prompts, such as signage, written information or diagrams, can be useful but may become difficult to comprehend for individuals with vision problems and those who can no longer read[98]. In these situations, the other senses can be employed to aid. Senses, such as smell, can indicate where activity is happening. For example, having open kitchens allows the scent of cooking to enter a space and can cue residents that this is a place and time for eating. The smell of certain flowers and trees can have similar effects, where the scent from common flowers from a person's childhood may help calm an individual and provide a sense of familiarity[99]. Calming music can have the same effect.

97 'World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1', n.d., 36-37.
98 Margaret P Calkins, *Design for Dementia: Planning Environment for the Elderly and the Confused* (National Health Publishing, 1988),23.
99 Cooper-Marcus, World Alzheimer Report 2020: John Zeisel interviews Clare Cooper-Marcus.

Figure33-Sensory Information Diagram, illustrating the smell of food cooking, wafting through a space

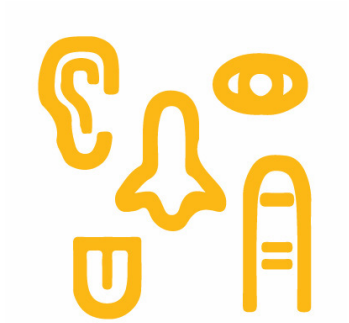


Figure34-Sensory Information Icon

Sensory Information Requirements:

-use all the senses to help activate a space and trigger memories, such as the smell or taste of specific cultural or holiday-oriented food

-sensory information can be used to provide spatial cues or cues for an activity, such as the smell of old books to indicate a room is for reading[100]

-multiple types of cueing, uses different senses, is often necessary

The principles of dementia care proposed below are a list of design fundamentals assembled to guide dementia

100 'World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1',36-37.

Principles of Dementia Care Design

"Everything you do must be geared towards our health, our stress reduction and coherency." [1]

1 John Ziesel Interviews Alan Dilani, accessed January 11, 2022, https://www.youtube.com/watch?v=kso5quFnpn8&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=3.

design. This list of principles was developed through inspiration and research done by professionals such as Maggie Calkins, John Zeisel, and others featured in the World Alzheimer's Report[101]. Each principle is created to give guidance for how one would use the elements of dementia design in practice. Each principle may be applied to multiple design elements in different ways or may use a combination of elements to improve the quality of the built environment for individuals living with dementia. The main focus of these architectural principles is to guide the implement the elements of dementia in ways that aids in care for both individuals living with dementia and their caregivers.

101 "World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1."

Safety

As individuals living with dementia lose most cognitive function, there is an increased risk of them causing harm to themselves or others unknowingly. Individuals can cause themselves harm through wandering, as was mentioned previously. Wandering and losing spatial awareness can lead individuals to become lost and cause injury and potentially hypothermia in colder climates. Safety features must be implemented to prevent wandering, but it's also essential to make these safety features as unobtrusive as possible to avoid agitation and frustration[102]. Agitation, frustration and aggression can cause feelings of being trapped or imprisoned. Due to this, caregiving can be a dangerous job. Therefore, by reducing dementia symptoms and keeping individuals living with dementia calm, a safer work environment can be created for caregivers. Aside from issues caused by loss of cognitive function, the process of physical ageing must be considered. Increased physical limitations require accessible design techniques to provide safety and accessibility to all spaces for those with limited mobility and individuals who use wheelchairs or canes. Overall, safety for individuals living with dementia and caregivers is of the utmost importance.

Figure35-Safety Icon

102 'World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1', n.d., 248,13.

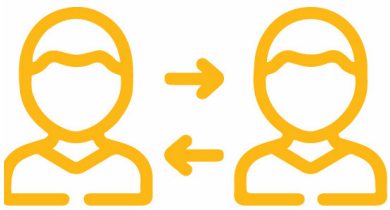


Figure36-Interactions Icon

Interactions

Interactions and social connections play vital parts in the well-being of humans. As humans are social creatures, interactions are crucial to ensure the health and happiness of people. This is particularly true for individuals with dementia. Social relations can be used as a form of treatment for dementia as interactions can provide a sense of normalcy that can reduce dementia symptoms[103]. Providing a sense of normalcy and reducing isolation reduces not only dementia symptoms but also improves mental health, which has a direct impact on physical health. However, it is essential to remember that individuals living with dementia are still capable humans who can choose when to spend time with others and remain on their own[104]. Interactions as a principle of dementia design must therefore provide spaces for all kinds of interactions to take place, from quieter conversations to larger gatherings for social engagement to take place on the terms of the resident.

103 John Zeisel, *I'm Still Here* (Penguin Group, 2009),143.
104 Calkins, *Design for Dementia: Planning Environment for the Elderly and the Confused,* 25.

Community

Most human history has been based around humankind gathering and living in communities that work to support and protect one another. This principle has not changed for the length of human history. Individuals living with dementia rely on the community for safety, aid and remind them of who they are. Interacting with friends and family help to maintain someone's identity when their memory and cognitive function begins to decline[105]. While the larger community must aid individuals living with dementia to compensate for their cognitive needs, these individuals still have much to offer the community. Individuals living with dementia still have much to teach and say that is valuable. Though their memory might be impacted, many individuals can still recount stories, show compassion, and participate in activities and day-to-day life. Engagement with the larger community also helps to humanize dementia and destigmatize the disease. Through interactions and engagement, the general public can learn to look past dementia and view individuals for who they are while equally benefiting from the knowledge, experience and personality of those living with dementia.

Figure37-Community Icon

105 'World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1', n.d., 14.

Figure38-Independence Icon

Independence

People often view individuals living with dementia as less capable than others and, therefore, must be taken care of and coddled. While dementia does impair an individual and force someone to receive more care, this does not mean that they must be infantilized. Although cognitive function continues to decline, avoiding using specific skills can allow them to deteriorate more quickly, saying, "if you don't use it, you lose it."[106] By allowing individuals living with dementia to participate in tasks and activities they would typically be involved in, dependency can be decreased[107]. Allowing individuals living with dementia independence also boosts self-esteem and confidence to interact with others and maintain their skills. The physical environment can help maximize an individual's remaining abilities and help to carry out tasks[108] , and provide such opportunities for independence.

106 Zeisel, *I'm Still Here*,156.
107 Zeisel, *I'm Still Here*,156.

108 Calkins, 28.

De-escalation

Due to the slow degenerative nature of dementia, individuals living with the syndrome can often become confused, agitated and frustrated. De-escalation, therefore, becomes an essential element to aiding in the relief of such agitation and frustration. The built environment can minimize exposure to overwhelming stimuli that causes agitation, such as competing noises, signs or clutter[109]. The full range of senses should be considered when designing environments for individuals living with dementia. Too much visual stimuli can cause stress, but the views of nature and human activity can be calming. Too much auditory stimulation can translate to aggression, but soft music can help to relax an individual[110]. In this way, de-escalation as a principle for dementia care design allows for the physical environment to relieve some of the symptoms of dementia while also easing the job of caregivers who can now work with happier and more calm residents.

Figure39-De-escalation Icon

109 'World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1', n.d., 13.

110 'World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1', 13.

CHAPTER 4- CREATING A VILLAGE

This chapter will describe the designed environment created in response to the question, how can he built environment respond to the impact of dementia on both the individual and their respective caregivers? This chapter begins by examining the area of Minnow Lake, Sudbury, Ontario, Canada, and its demographics to explain why it is a vital area to study. Next, a list of criteria created based upon the elements and principles of dementia design and ageing in place theories are applied to the area to find and justify the selected site of this project. Finally, the project's scope, exploring residential housing and community center in the form of a village, is discussed concerning the site and design techniques. Design techniques and application of the elements and principles of dementia design will also be explained in the built environment in response to creating environments in which individuals living with dementia and caregivers can thrive.

Minnow Lake, Sudbury

Figure40-View from the Waterview apartments, overlooking the Minnow Lake Place and Minnow Lake in the winter

Demographics

As dementia is such a prevalent and universal phenomenon, it can be said that most cities across the globe would benefit or provide suitable sites for a village for individuals living with dementia and their caregivers. Due to this, the city of Greater Sudbury, in Ontario, Canada, is to be examined as it is in close proximity to the author and will allow for site visitation. A majority of the Sudbury population is currently between the ages of 50-64, entering into the 65 and over age range[111]. This is important to note as 1 in 20 individuals over the age of 65 will get Alzheimer's in Canada, while the risk of getting Alzheimer's will double every five years after this point[112], as can be seen in figure 41. Noting that these numbers are specifically for Alzheimer's, a branch of dementia, it can be inferred that the numbers of individuals living with dementia may be higher than this. Meaning that this is a very significant issue for Canada and will continue to be a growing problem in the years to come. Therefore, this project is located in Sudbury, Ontario, for site-specificity and provides concrete examples of familiarity and ageing in place. However, the elements and principles of dementia care design can be used throughout Canada.

111 Government of Canada, "Census Profile, 2016 Census - Greater Sudbury [Census Metropolitan Area], Ontario and Ontario [Province]."

112 "Alzheimer Society of Canada."

1 in 20 individuals over the age of 65 will get Alzheimer's disease in Canada

1 in 4 individuals over the age of 5 will get Alzheimer's disease in Canada

Figure41-Chances of Developing Alzheimer's Disease in Canada

Figure42-Population aged 65 years and older by ward in Sudbury

Table 1 : ***Population 65 years and older by ward in the City of Greater Sudbury***

Ward	Aged 65 and Older
1	2,610
2	2,420
3	2,460
4	1,950
5	1,990
6	1,850
7	1,965
8	2,155
9	2,135
10	3,790
11	2,825
12	3,475
Total	**29,625**

Source: Statistics Canada, 2016 Census of Population (Note: Dissemination Area data was aggregated to best match the City of Greater Sudbury Ward Boundaries).

Site Selection

Looking at the city of Greater Sudbury, areas of high elderly populations were examined. This was done to promote ageing in place on an urban scale so that individuals living with dementia may remain close to their existing community and a space in which they are already familiar and comfortable. Looking at each ward of Sudbury, seen in figure 42, wards 10 and 11 have the highest populations of elderly individuals[113]. A study done by the City of Greater Sudbury in their Age-Friendly Community Action Plan found that citizens in ward 10 were generally happy and satisfied with the services and community programs provided to them[114]. However, in ward 11, most residents expressed dissatisfaction with community services offered for the elderly[115]. This provides the opportunity for a more community-based project, such as a village for individuals living with dementia, to fill in some of the gaps in care currently and provide more community services and activities for the elderly. As this survey was only conducted on volunteer participants and may not offer a complete view of the citizens of these wards, further exploration was done to determine that ward 11 was a better area of focus for this project. When examining both wards, it was determined that ward 10 is serviced by more community centers and services, such as the YMCA and multiple

113 Barbara Nott et al., "City of Greater Sudbury Age Friendly Community (AFC) Action Plan," n.d.,5.

114 Nott et al, 11.

115 Nott et al, 11-12.

retirement homes, while ward 11 is lacking in these areas. Although not disclosed in the survey done by the city of Sudbury, it can be determined that the lack of these community centers present in ward 10 could be why the ward 11 residents feel their community does not offer sufficient activities for the elderly.

The specific site chosen for this project is illustrated in figure 46. This particular location was chosen based on ageing in place theories and the elements and principles of dementia design, using a specific list of criteria.

Site Selection Criteria:

-Community activity and engagement

-Access to nature and use of natural features

Community activity and engagement refer to the principles of community and interactions in a larger setting. Finding areas where there is already existing community activity or proximity to community activity allows for different types of interactions. Remaining close to community activity will enable individuals to continue engaging with the community when they're at the earlier stages of dementia. It will also provide the community with easier access to the dementia village. As dementia care advocate Dennis Frost said, "our expectation as we age should be to age in a community we choose, not to be consigned to a 'specialized'

micro-community of homogeneous population.[116]" This essentially states that the expectation as we age should be that we retain ties to our community and are still able to interact in activities.

The specific site, on Bancroft Drive, is located in proximity to multiple community activity areas. Firstly, as seen in figure 45 the Minnow Lake Place houses the trail route organization Rainbow Routes, Volunteer Sudbury, the Sudbury Minow Hockey Association and hosts classes from yoga taekwondo and photography[117]. Also on site is the current home of the Minnow Lake/New Sudbury Cooperative Nursing School that offers early childhood education services for the area's children when they are still too young to attend school[118]. Minnow Lake Place is also situated on a plot of land with lots of parking a beach volleyball court abutting the lake and is the starting place for the Oak Forest trail shown in figure 47. Therefore, the Minnow Lake Place offers an opportunity for all sorts of community involvement and activity and provides a possibility for intergenerational learning between

Figure43-People hiking through Minnow Lake trails

Figure44-Walking path and fountain along Minnow Lake

Figure45-The Minnow Lake Place

116 "World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1," n.d., 9.
117 "Programs," accessed December 16, 2021, https://www.greatersudbury.ca/play/programs-and-activities1/programs/.

118 "Minnow Lake/New Sudbury Cooperative Nursery School - Home," accessed December 16, 2021, https://sudburycooperativenurseryschool.weebly.com/.

Figure46-Selected site off Bancroft drive in the Minnow Lake area of Sudbury, Ontario (ABOVE)

Figure47-Site map of Minnow Lake with key features and circulation paths (RIGHT)

1. Oak trail

2. The Minnow Lake Place

houses Rainbow Routes Sudbury, Volunteer Sudbury, Sudbury Minow Hockey Association, the Minnow Lake/New Sudbury Cooperative Nursing School and yoga, taekwondo and photography

3. Volleyball pit and basketball court

4. Trail from Minnow Lake to New Sudbury

5. Residential houses and apartments

6. Snowmobile trail

7. Apartment complex

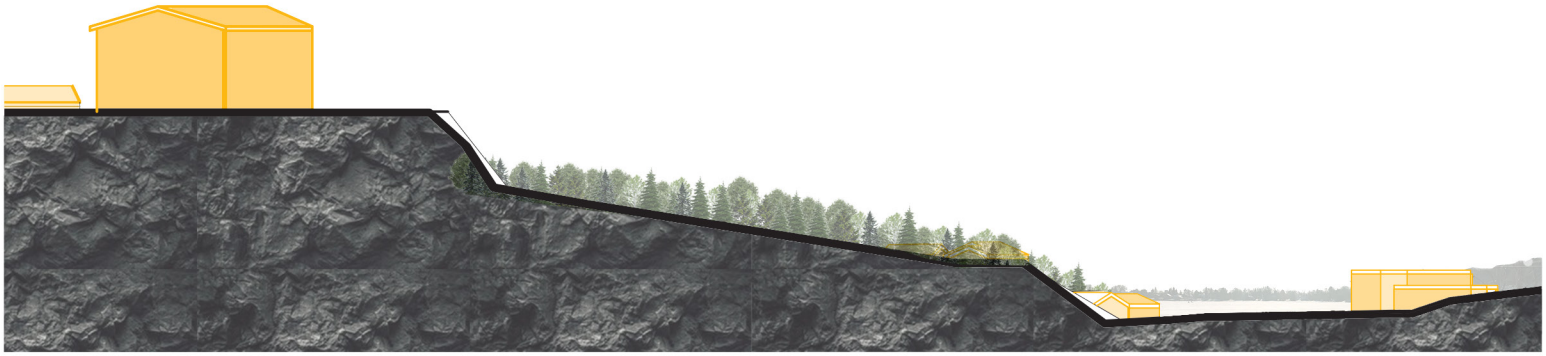
children at the daycare and seniors with dementia. The benefits of intergenerational learning will be further explained in this chapter. The importance of having the chosen site close to this community center is two-fold. Individuals in the mild stage of dementia may still leave the Bancroft site to access the existing community center, though this will not be possible for most residents. On the other hand, having the chosen location so close to a community hub ensures that the area is already a spot where people gather and are more likely to visit. The coming sections will discuss additional design elements to help promote and take advantage of this proximity.

Proximity to nature and natural features was another essential factor when looking at site selection. Based on several elements and principles of dementia care design, access to nature quickly became a vital aspect of looking at sites. Luckily, Minnow Lake is a low-density area with multiple nature trails and access to the central lake, so few spaces are not connected to nature. Looking then to the elements and principles of dementia care design as a framework helped narrow down site options and affirmed the Bancroft site. As seen in figures 48, the Bancroft site spans a hillside that leads from the road to a series of apartment buildings above. This sloped site might seem at first to be undesirable for accessibility reasons but provides many safety features. The steep slope below the apartment buildings provides a natural barrier against wandering and keeps half the site contained. Locating the

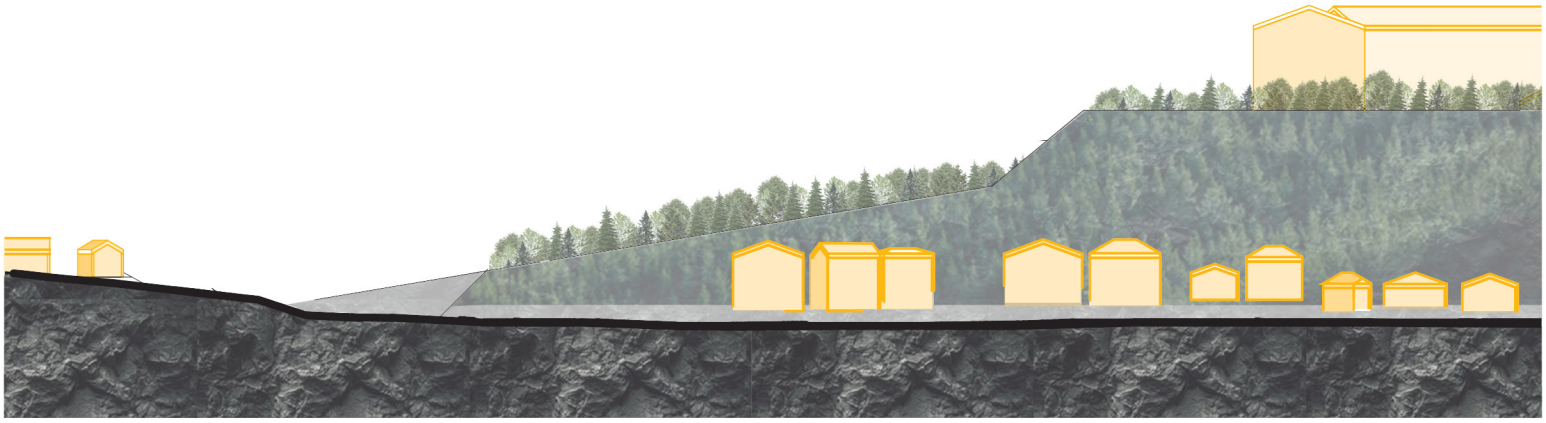
project on the higher ground also maximizes sunlight and offers views to the existing community and lake that can work as a de-escalation technique. As was mentioned when explaining the element of light, daylighting specifically is necessary to fight the adverse effects of sundowning and manage one's circadian rhythm [119]. An elevated site will ensure maximum daylight, and as the site is oriented towards the south-west southern light can be maximized for residences and gardening purposes.

Also, when considering natural resources and the physical site, the project's sheer size must be considered. A large site is needed for adequate space for residential programming and an arts-based community program with street access. The Bancroft site is large enough to accommodate such programming while also having access to two streets for multiple secure entry points. This site also benefits from being located on the main road leading into Minnow Lake, as seen in figure 46 and 47, which allows the project to be a feature and at a critical vantage point in the area. For these reasons, as well as the previous criteria, the Bancroft site offers access to the larger community and a host of natural resources to provide the opportunity for implementing the elements and principles of dementia design.

119 Margaret P Calkins, *Design for Dementia: Planning Environment for the Elderly and the Confused* (National Health Publishing, 1988),45.



North East- South West Section
1 : 1000



East-West Section
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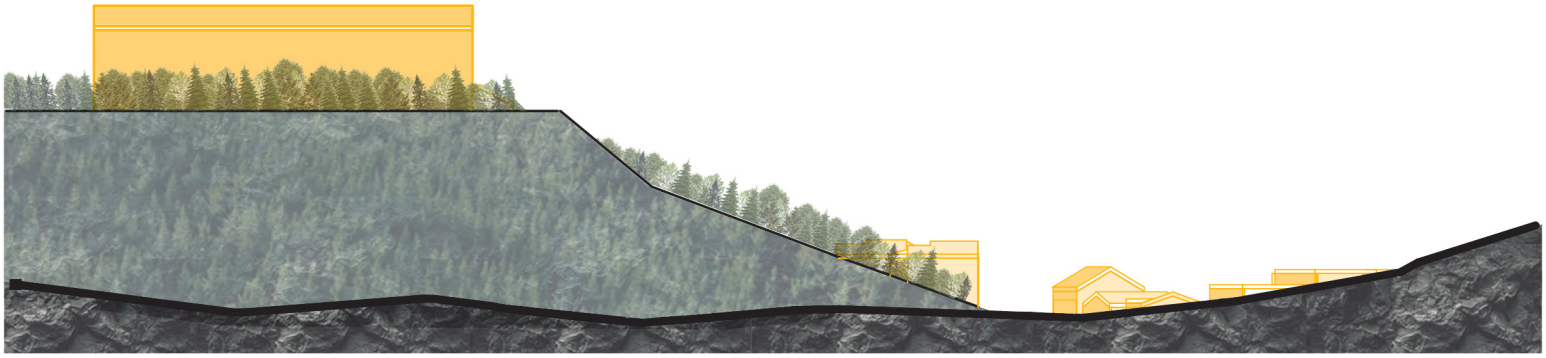

North-South Section
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Figure48-Site sections showing the topography of the selected site

The Village

"Home as a refuge, community as a resource."[1]

1 J. L. Wiles et al., 'The Meaning of "Aging in Place" to Older People', The Gerontologist 52, no. 3 (1 June 2012): 361, https://doi.org/10.1093/geront/gnr098.

In order to answer the thesis question, how can the built environment respond to the impact of dementia on both the individual and their respective caregivers, a village was created. This village features four community model units to provide housing for individuals living with dementia and rentable rooms for caregiving family and friends, as found in figure 49. The World Alzheimer's Report describes a home community model as a housing model of smaller residential units that promote independence by allowing residents to continue to participate in household chores and activities under the guidance of PSW or nursing staff[120]. Accommodation is also provided for on-site personal support workers, while rentable rooms for caregiving family and friends are also available in each housing unit. These extra accommodations give caregivers the space to continue participating in the care of their loved ones and the ability to remain physically close to them. A conservatory on-site offers access to gardening and nature year-round, as is shown in figure 49 along with a variety of exterior spaces. Facing the street and the larger community is a lodge center incorporating activity spaces for the dementia village and community members to alleviate isolation.

The dementia village will be explored and explained in the coming pages of this text and represented through a series of

120 "World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1," n.d., 122.

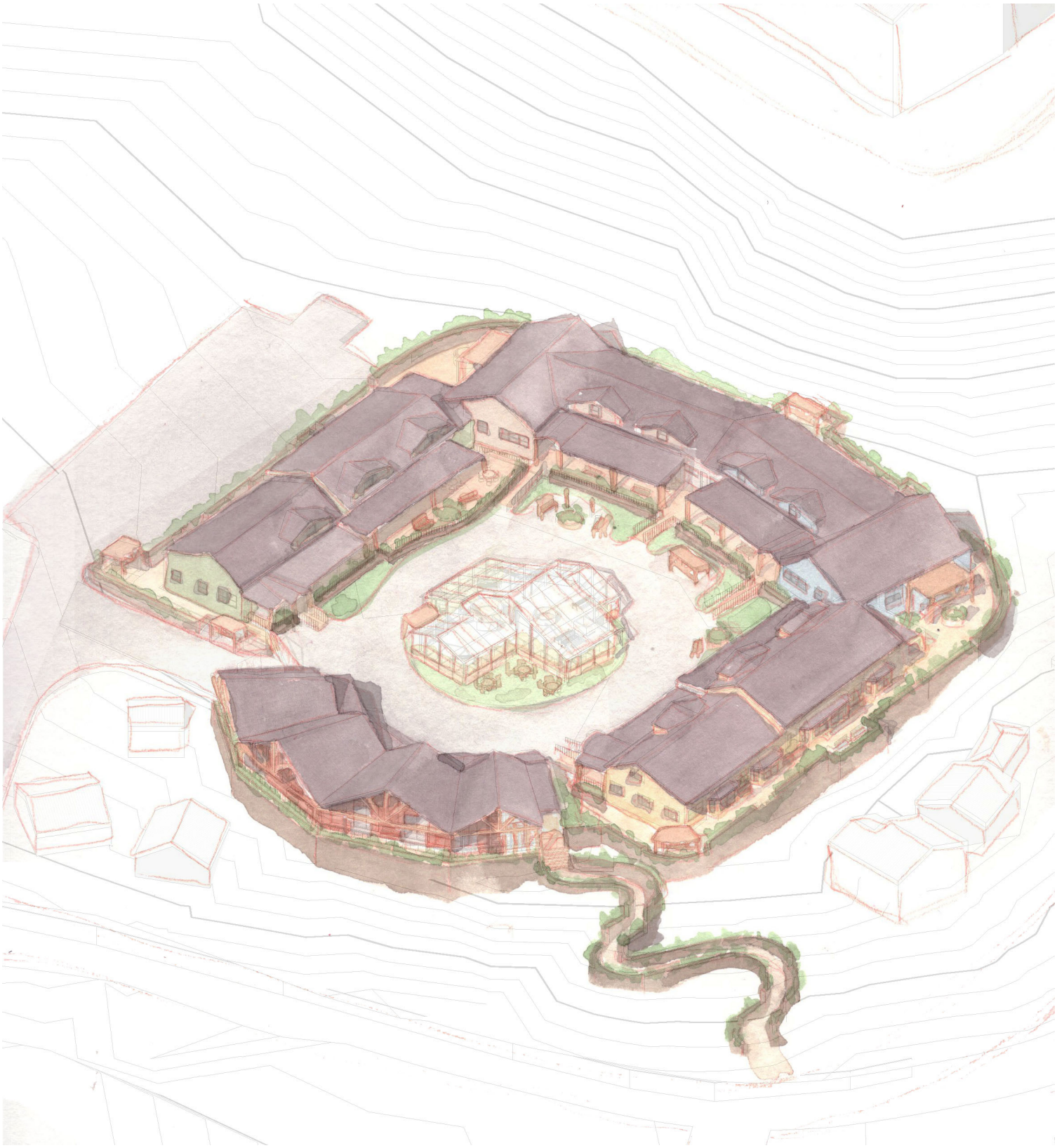


Figure49-Massing model showing the residential homes, community building and conservatory of the dementia village

architectural drawings. Many of these drawings combine watercolour drawings and techniques to create a more familiar and homelike appearance to the project, as opposed to a more stylized or polished aesthetic. The elements and principles of dementia care design, as described previously, were integral to designing these spaces. However, the elements and principles of dementia care design were often used together and in multiple ways to respond to the needs of individuals living with dementia and in the specific context of Minnow Lake. Therefore they will be discussed in context of each design decision and how they were used to design for this particular site in Minnow Lake. Icons representing each element and principle are placed next to their corresponding design decision to showcase better where and when these guidelines were used.

As described previously, the site of the dementia village is located above the residential neighbourhood on Bancroft Drive in the Minnow Lake region, seen in figure 50. Having the village situated directly in the community was essential to this project for the community to feel a sense of responsibility towards the village and to fight the stigma of dementia. The location also promotes ageing in place and ensures that individuals living with dementia are not isolated from the community they have lived in until this point in their lives.

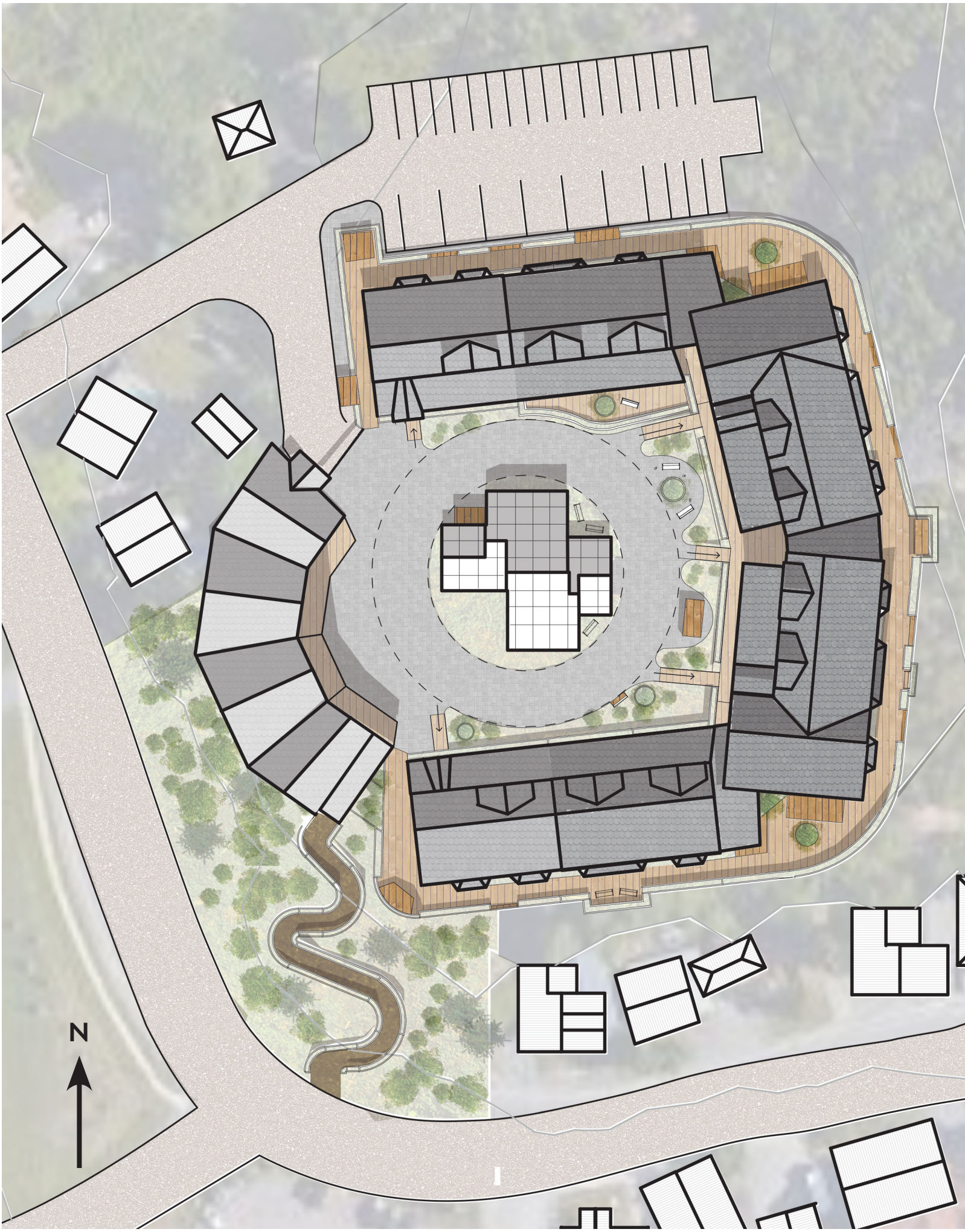
Taking a closer look at the village in figure 51, plenty of outdoor space is provided to allow access to gardens and nature. Garden boxes and vegetation are located both inside the conservatory and outdoors to

access nature year-round. The sensory aspect of gardens comes into play in this way; by having lots of fragrant flowers and plants around the site, memories associated with those scents can be unlocked and help residents feel more at ease in their space[121]. Not only does such sensory information aid in triggering memories, but also in de-escalation. Providing familiar sensory experiences allow individuals to feel more at ease and calmer in their space. Access to a safe outdoor space also aids in de-escalation as getting appropriate amounts of sunlight has been proven to reduce aggression, particularly for individuals living with dementia[122].

Additional safety features were also considered in this design, including a heated walkway and hated panels on the roof of outdoor seating spaces. A heated walkway, used throughout the entire courtyard and outer walkway space, allows for year-round access by melting snow and ice, minimizing slips and falls in the winter months. Covered heated areas also reduce the risk of pneumonia and other cold-related dangers for individuals living with dementia. Said individuals can often become disoriented or wander aimlessly, leading to dangerous situations, particularly in the winter months of a cold-weather climate. While many decisions are made in this project to help reduce disorientation, the additional safety features of heated outdoor spaces and covering mitigate the risk of cold-related injuries even more in the case of an emergency.

121 Cooper-Marcus, World Alzheimer Report 2020: John Zeisel interviews Clare Cooper-Marcus.

122 Cooper-Marcus.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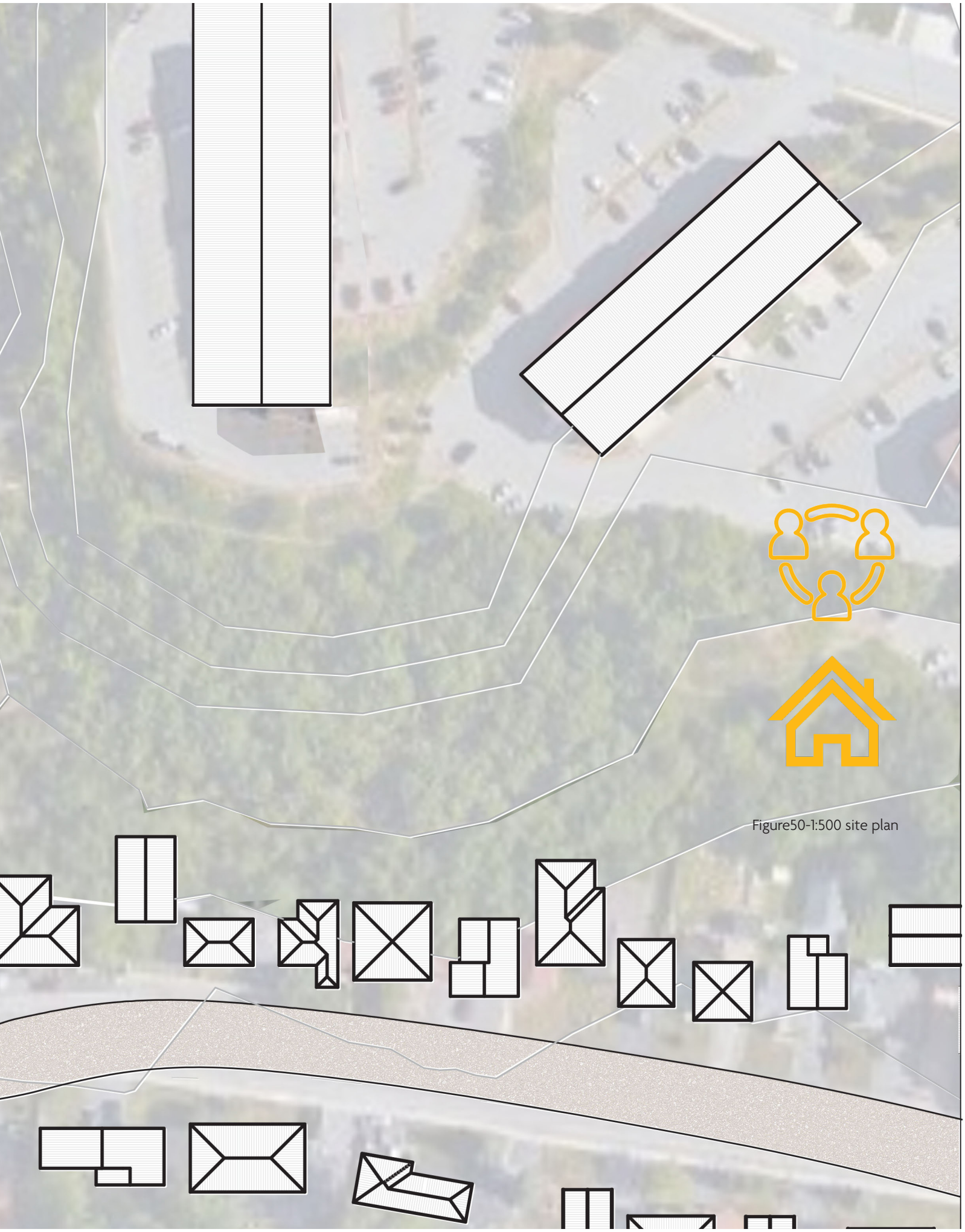

Figure50-1:500 site plan

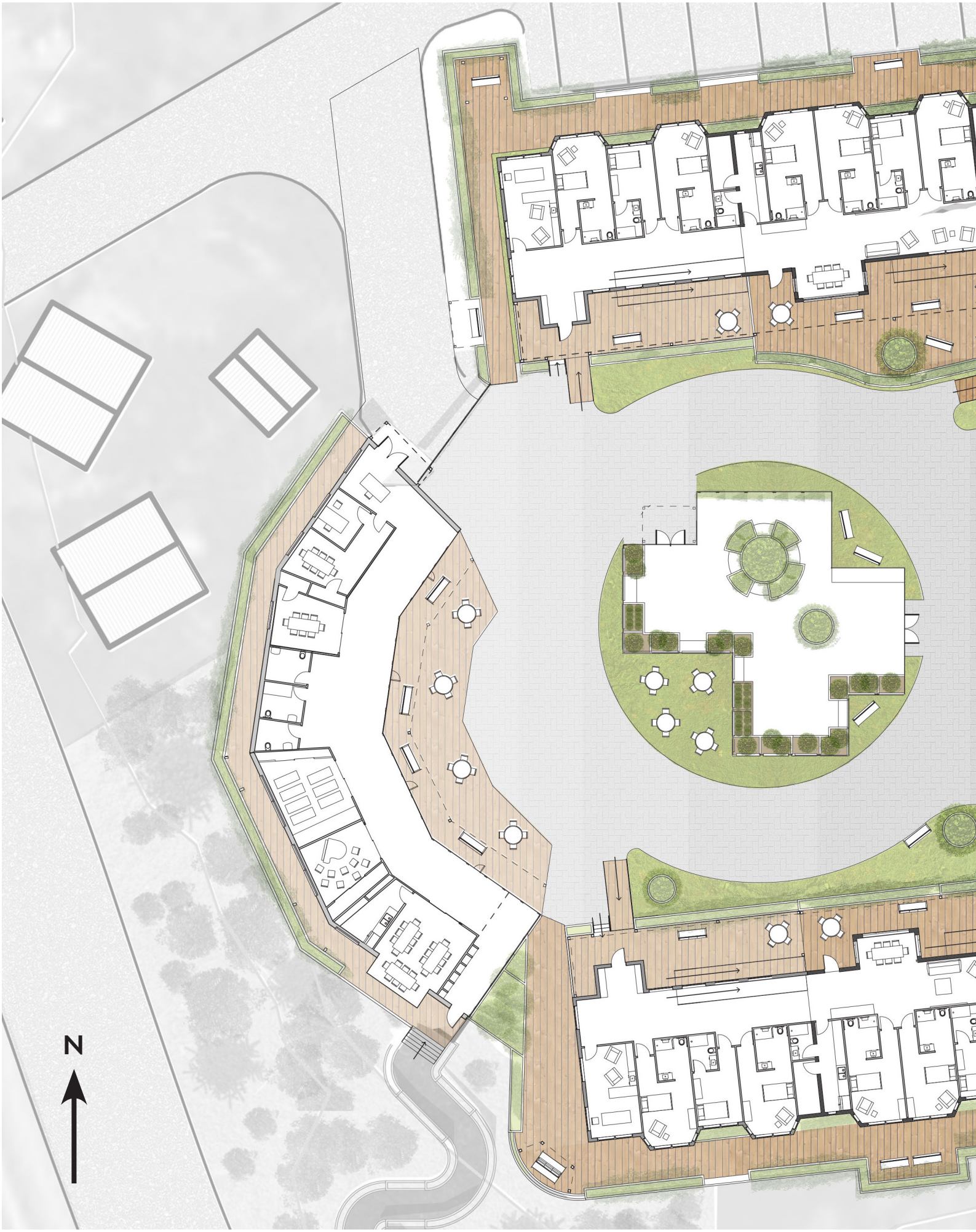
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Figure51-1:300 first floor plan with site design

Circulation

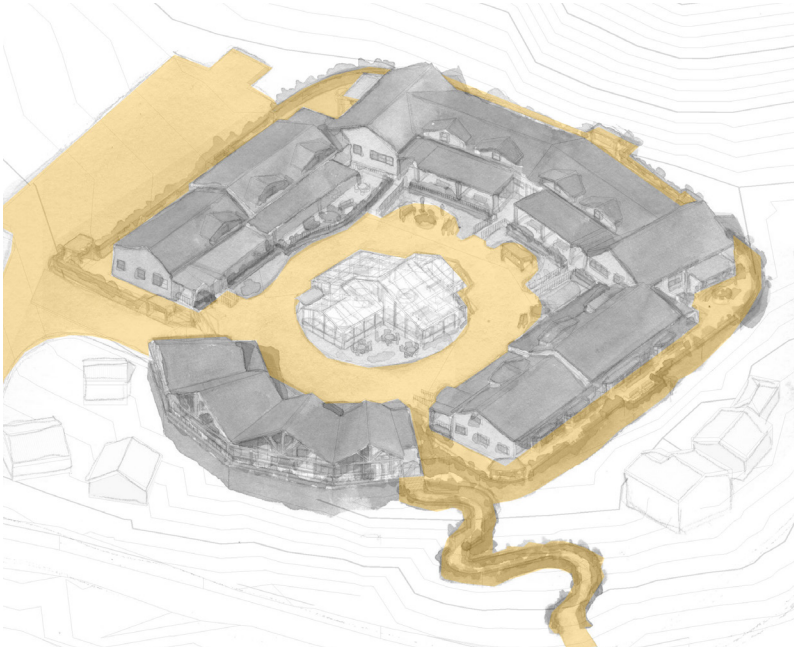


Figure52-Perspective drawing showing the exterior circulation paths

Figure53-Staff/caregiver circulation diagram

Figure54-Community member/public circulation diagram

As was previously mentioned, dementia dramatically impacts one's ability to navigate and find one's way around spaces. Therefore, it is crucial to address circulation on the site, and one's individuals may move around safely. Circulation for this section will be divided into different categories of who is moving around the area, though keeping in mind that most spaces are open to the public.

Seen in figure 53, are the circulation paths of personal support workers and nursing staff on the site. Staff members have access to parking on the side of the property and access to the site from the main entrance. PSWs may then enter the primary staff area located between the residential houses. This area provides spaces for staff meetings, lockers and amenities designed for larger staff gatherings. As is shown in figure 53 by an arrow moving through this space, the primary staff area is connected to the two adjacent residential buildings so staff may move more easily through the spaces. In addition to this, two additional staff spaces are located at the knuckles of the unit formation. These spaces offer a kitchen

Figure55-Resident circulation diagram

and quiet space for staff for breaks as dementia is a very frustrating and draining disease that can often lead to caregiver burnout[123]. These staff areas also have entrances on each side to give caregivers full access to all residential units so they may work in different homes and be able to aid their coworkers if they need.

Next, figure 54, shows the circulation patterns for community members and the general public. Access to the community center is available through the main gate from the parking lot for the general public and administration staff. Access is also available from the Bancroft drive, following a winding path lined with garden boxes to the southern entrance of the community center. This entrance and circulation path is specifically designed for the daycare center at the Minnow Lake Place for workers to be able to visit with the children. Having this path in place allows for intergenerational learning to be more accessible. All entrances to the community

123 Pat Armstrong and Susan Braedley, *Physical Environments for Long-Term Care: Ideas Worth Sharing*, 2016, https://www.deslibris.ca/ID/10089804, 50-52.

center are located outside of the central courtyard space so that residents cannot wander off the property without having to pass through a main door and receptionist desk.

Finally, the circulation patterns of residents will be examined in figure 55. When a resident arrives at the village for the first time, they may be dropped off directly at their front door. The main gate to the courtyard is operable so that a vehicle may enter the central courtyard to allow it to be easier for residents to be moved into the village. The courtyard space is specifically designed so that an emergency vehicle may also access the site in case of a physical emergency or fire. The circular courtyard pattern is not only designed for this but so that the space may double as a walking path with no forks or areas in which an individual would have to make decisions[124]. This helps to promote safe wandering and removes any obstacle that may confuse or misdirect residents.

The built design elements begin at the most northern point of the site and are visible from the main road. As is seen in figure 56 the first point of contact is a pavilion located behind a garden wall, viewed to the far left of the section. Another pavilion is located on the main walkway leading pedestrians and visitors into the site, just to the right of the first. Visitors may then enter

124 Cooper-Marcus, World Alzheimer Report 2020: John Zeisel interviews Clare Cooper-Marcus.

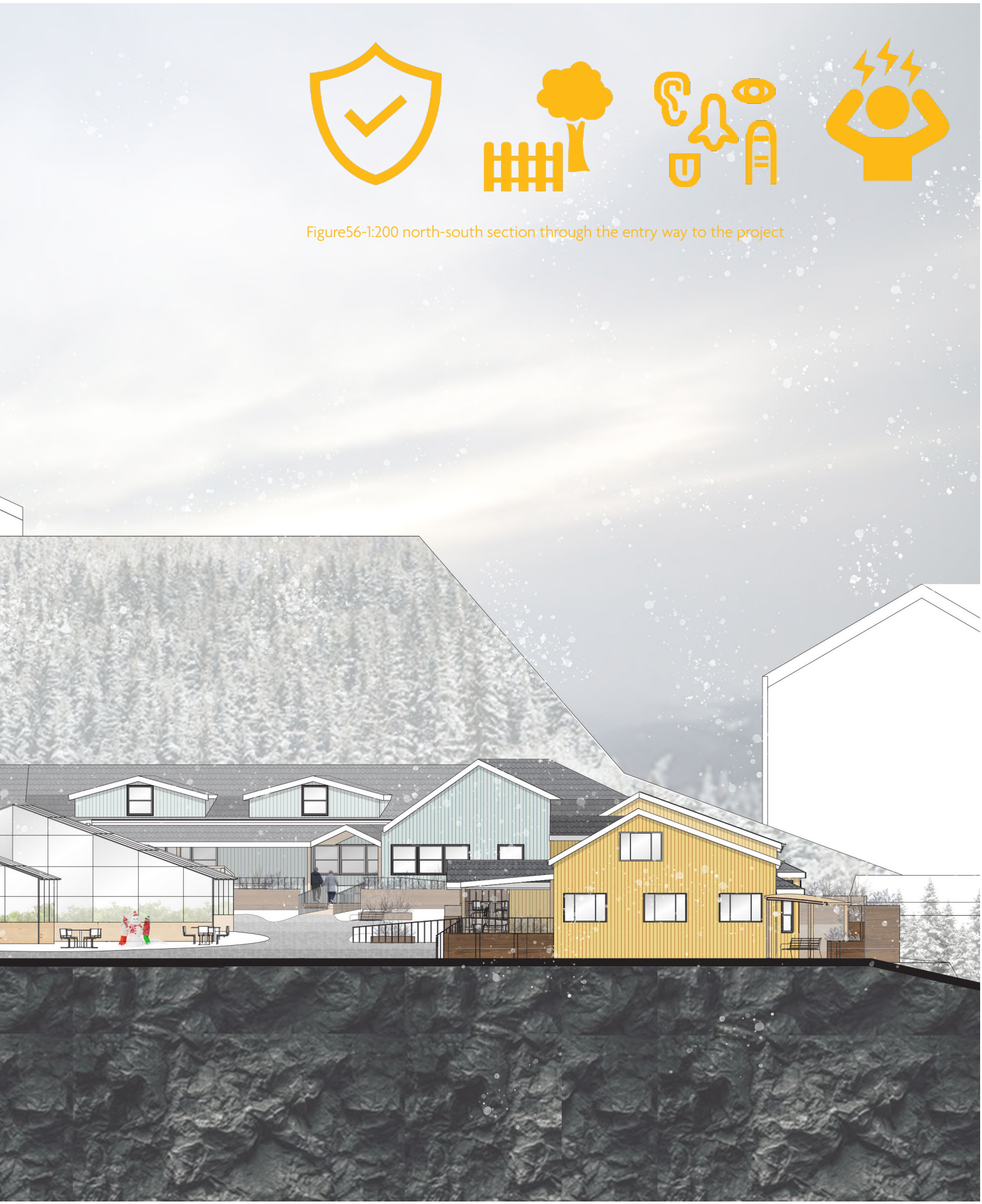


Figure56-1:200 north-south section through the entry way to the project

the central courtyard through the community center or through the automated gate system operated by an individual in an adjacent gate house. Entering through the gate leads visitors to the conservatory building, whose entrance is framed by another pavilion, as seen in the middle of figure 56. Pavilions, such as the three seen in said figure, are sequenced around the site to provide a similar language and wayfinding techniques. Similar truss systems will be seen on the front façade of the community center, giving visual clues to all visitors and residents of the sequence of travel from the main road to the entrance to the site to the additional circulation paths.

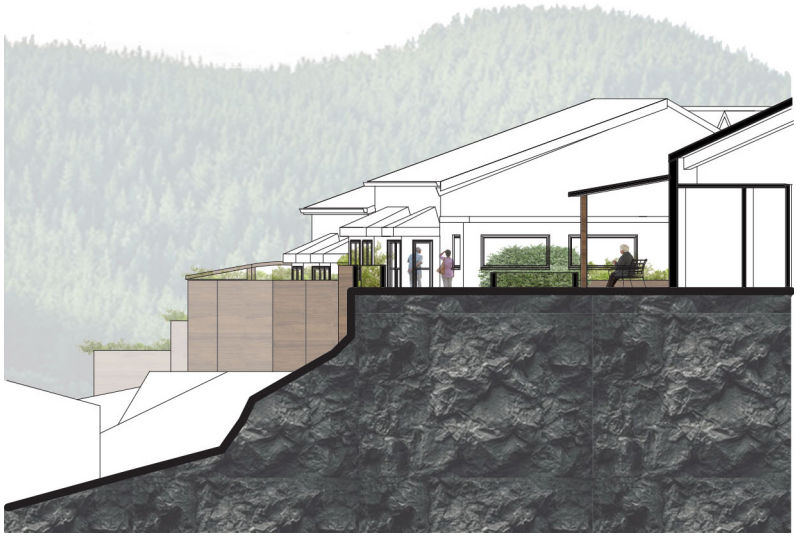
An additional circulation path is available for physically able residents is located on the outer ring of the resident, as seen in figure 55. This space uses a series of dementia care elements and principles, such as courtyards and gardens, safety and de-escalation, to create a secondary public space in reference to the variety of walking and hiking trails located around Minnow Lake. This public pathway is surrounded by a series of garden walls, creating a barrier to keep residents from wandering off-site while using a soft security technique that keeps residents from feeling trapped or imprisoned. Similar methods of soft security were used in the Village Landais Alzheimer and were used as inspiration[125]. This pathway provides security on the edge of the site, as seen in figures 57-60, and provides a space for de-escalation and wandering safely. As the path

125 "Village Landais Alzheimer,"

loops back to the central courtyard, it encourages individuals to be outside and keep active without the risk of getting lost. Seen in figures 57-60, a variety of seating is located along the path to create interest and provide markers for wayfinding and visual destinations for individuals to walk towards[126]. Especially as individuals living with dementia continue to decline, it's essential to offer goals and points of interest along a pathway to encourage individuals to continue to walk down said path. Otherwise, individuals may become confused and agitated if they do not have a visual cue to continue moving[127].

126 Cooper-Marcus, World Alzheimer Report 2020: John Zeisel interviews Clare Cooper-Marcus.

127 Cooper-Marcus.



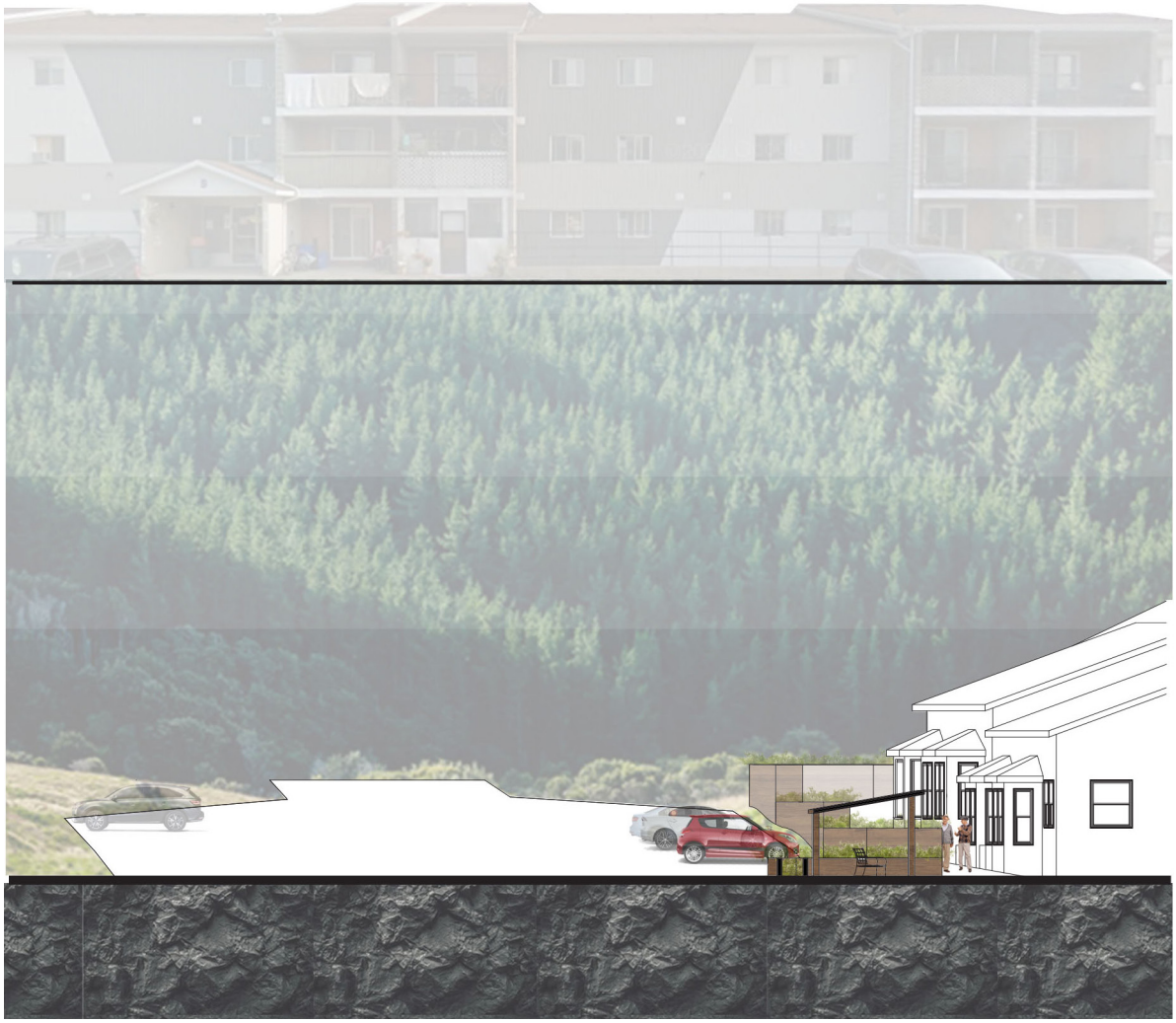
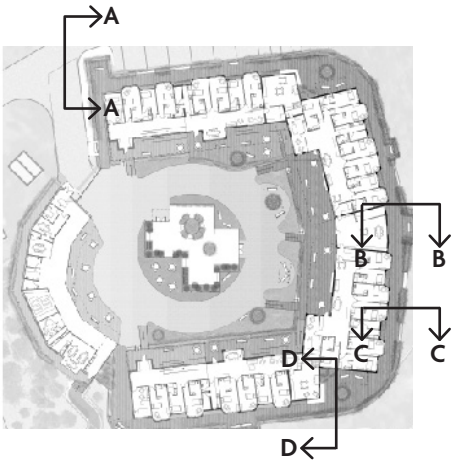


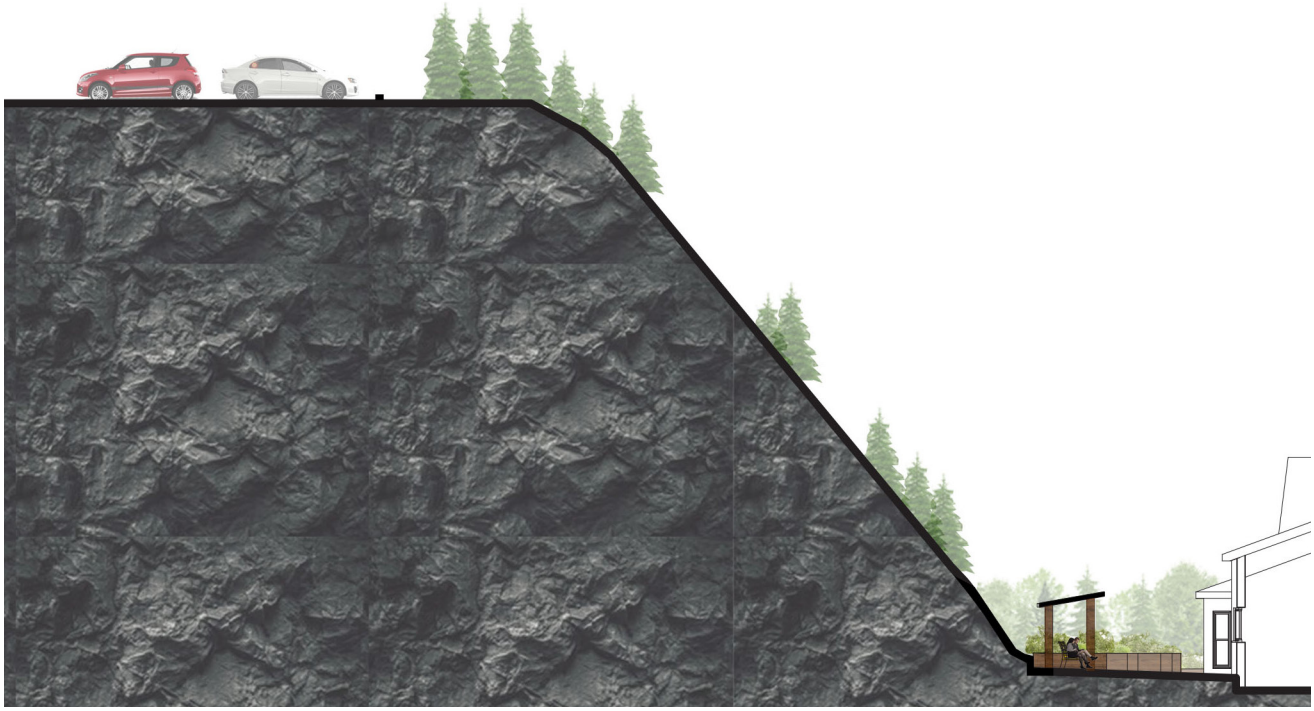
Figure57-1:200 section D of the outer ring condition (LEFT)

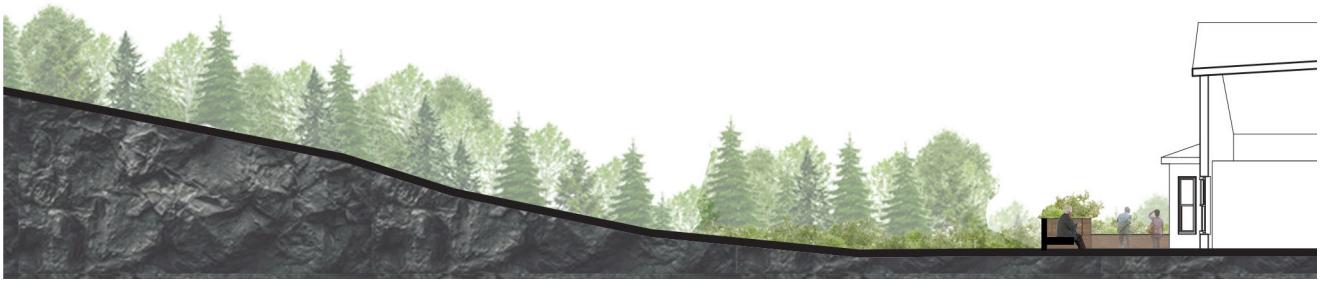
Figure58-1:200 section A of the outer ring condition (BOTTOM LEFT)

Figure59-1:200 section B of the outer ring condition (BELOW)

Figure60-1:200 section C of the outer ring condition (FAR BELOW)







Housing

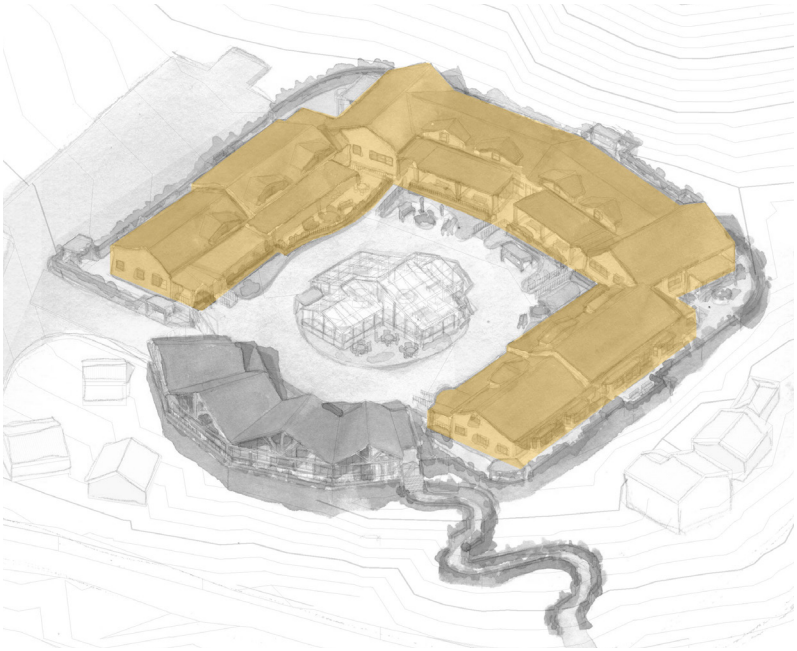


Figure61-Perspective drawing showing the residential units

Each home in the village is designed with the elements and principles of dementia care design in mind to sustain the living conditions of individuals living with dementia (figure 61). The elevations of the housing units can be viewed in figures 62 and 63. Each house uses the elements of colour, familiarity, lighting and sensory information to create comfortable housing that is distinguishable from one another. Each house needed different features and distinguishing elements for individuals living with dementia to identify their own home and avoid confusion. This is done through the elements of colour and sensory information. Each house is a different colour, while the main entrance to each home is a different contrasting colour to draw attention to these entrances. Other visual sensory cues were added to help residents navigate, such as different windows, door styles, porch entrance shapes, and features in front of the buildings, such as a pavilion before the blue house in figure 63.

While each house must have a small degree of difference between them, it was equally important that the houses contained familiar elements to Sudbury and Minnow Lake residents. Elements such as traditional gable roofs viewed in figure 65 are used throughout the project. Dormer roofs and high windows often used to illuminate attic spaces, as seen in figure 66, are used in the village's residential homes to provide light into the main living spaces. Window styles were also inspired by the existing residential vernacular, as seen in figure 67 such as traditional three-panel

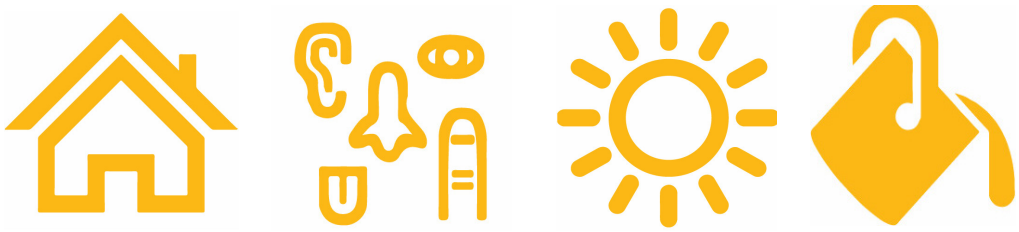


Figure62-1:200 elevation of the yellow house

Figure63-1:200 elevation of the beige and blue house

sliding windows and the use of glass inserts in the main doors to a residence. The use of a front porch is also a very common and familiar element to the people of Sudbury and Minnow Lake, as seen in figure 67. Elements of the front porch include coverage from roof overhangs, elevated floors with railings and surrounding boxes, as is explained in figure 64. Also used to differentiate between the houses, as was previously mentioned, are the colours of the buildings. Similar to many homes in Minnow Lake and Sudbury, the residential units are clad in siding. This siding takes cues from the existing vernacular in terms of colours, using yellow, green, blue and beige materials, an example of which can be seen in figure 68. These elements are translated into the residential village design into public spaces that connect each of the four houses and provide an opportunity for new connections among residents.

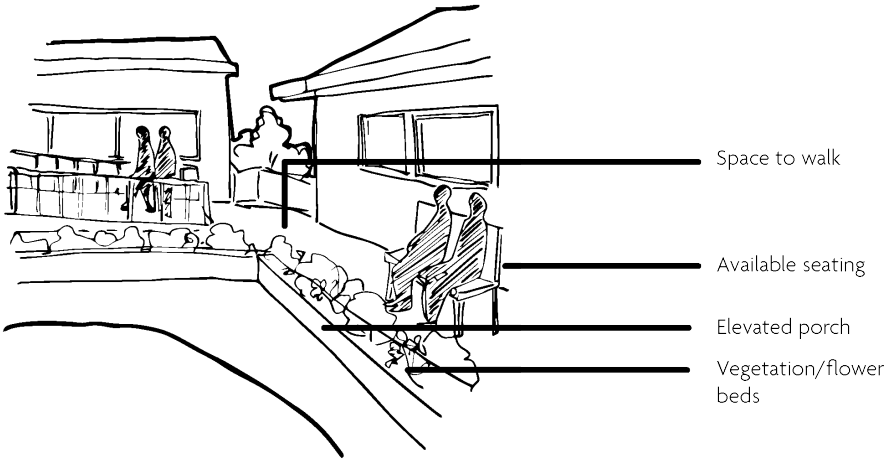


Figure64-Porch seating in the summer diagram

Figure65- Figure68- Photographs of residential homes in the Minnow Lake area of Sudbury

Figure69-Exterior render of the yellow house

The layout of the homes took cues from the existing Minnow Lake houses to continue with the element of familiarity. The most common types of dwellings in Minnow Lake were explored by using an intimacy gradient in Christopher Alexander's Pattern Language. Christopher Alexander describes the intimacy gradient in his book to be divided into four sections: the entrance, public spaces, semi-public spaces, and private spaces, each relating to the amount of privacy one has[128]. This can be translated into the home areas to analyze the existing housing layouts in Minnow Lake to create more familiar and comfortable spaces for residents. Most typically in Minnow Lake, the homes were built between the 1940s and 60s and fit the traditional definition of Canadian wartime housing. As seen in figure 70 the typical wartime housing layout places the public spaces towards the front of the building, including the kitchen and living room. The semi-public and private areas were located most commonly towards the center or back of the home, including bathrooms and bedrooms.

As is shown in figure 74, the intimacy gradient explored in typical wartime housing was translated into the residential housing floor plan. Public spaces include an exterior covered porch that wraps around the four residential units to provide a space for all residents to interact, as seen in figure 71. Next are semi-public

128 Christopher Alexander, Sara Ishikawa, and Murray Silverstein, *A Pattern Language: Town, Buildings, Construction*, vol. 2, 3 vols. (New York: Oxford University Press, 1977),611.

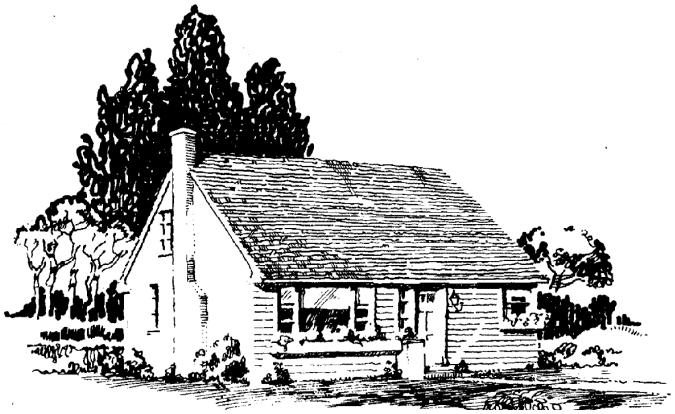
INTIMACY GRADIENT

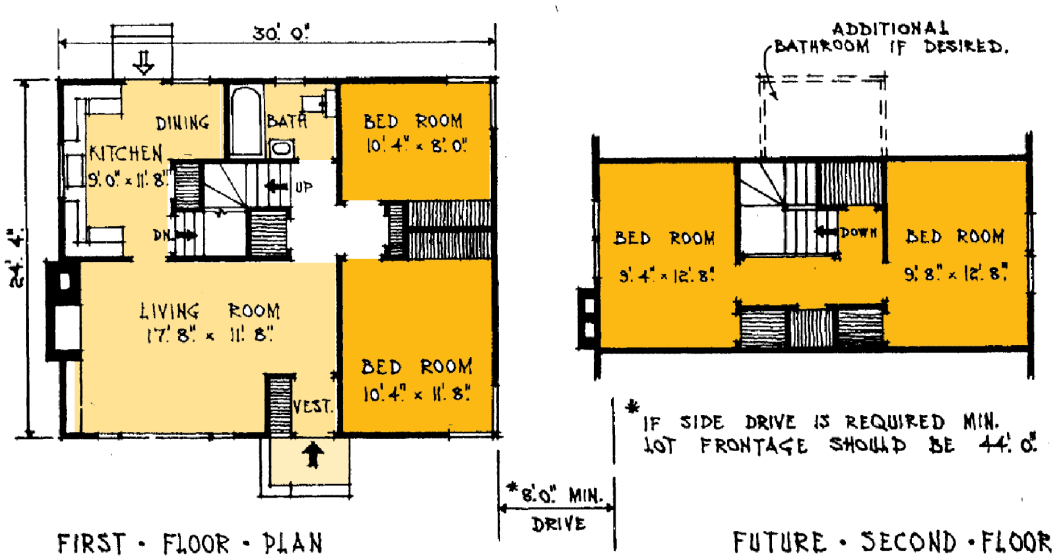
ENTRANCE

PUBLIC

SEMI-PUBLIC

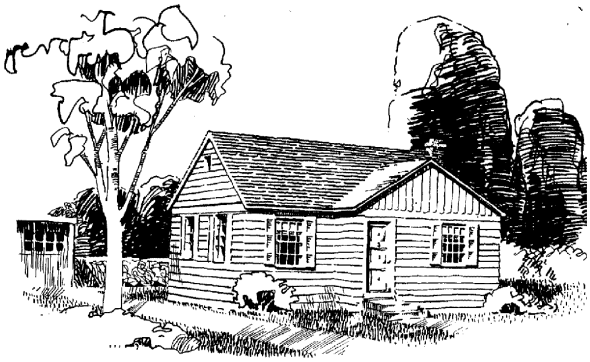
PRIVATE

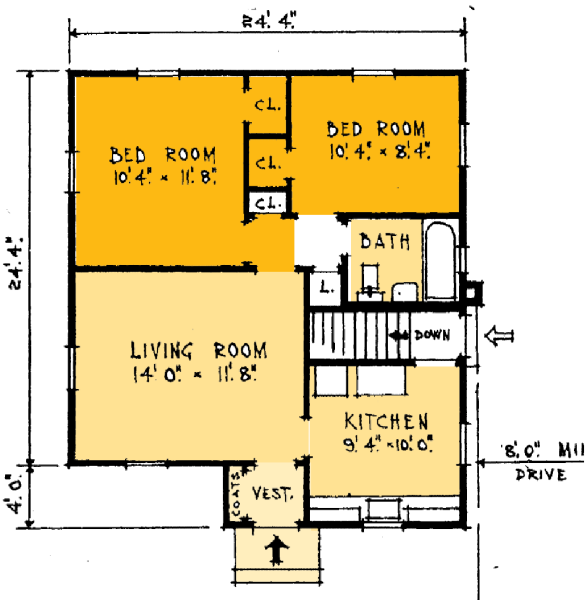




PRIVATE

PUBLIC





PRIVATE

PUBLIC

Figure70-Wartime housing example floor plans with an intimacy gradient overlayed

Figure71- Public porch sketch

Figure72-Semi-public living space sketch

Figure73- Private bay window moment sketch

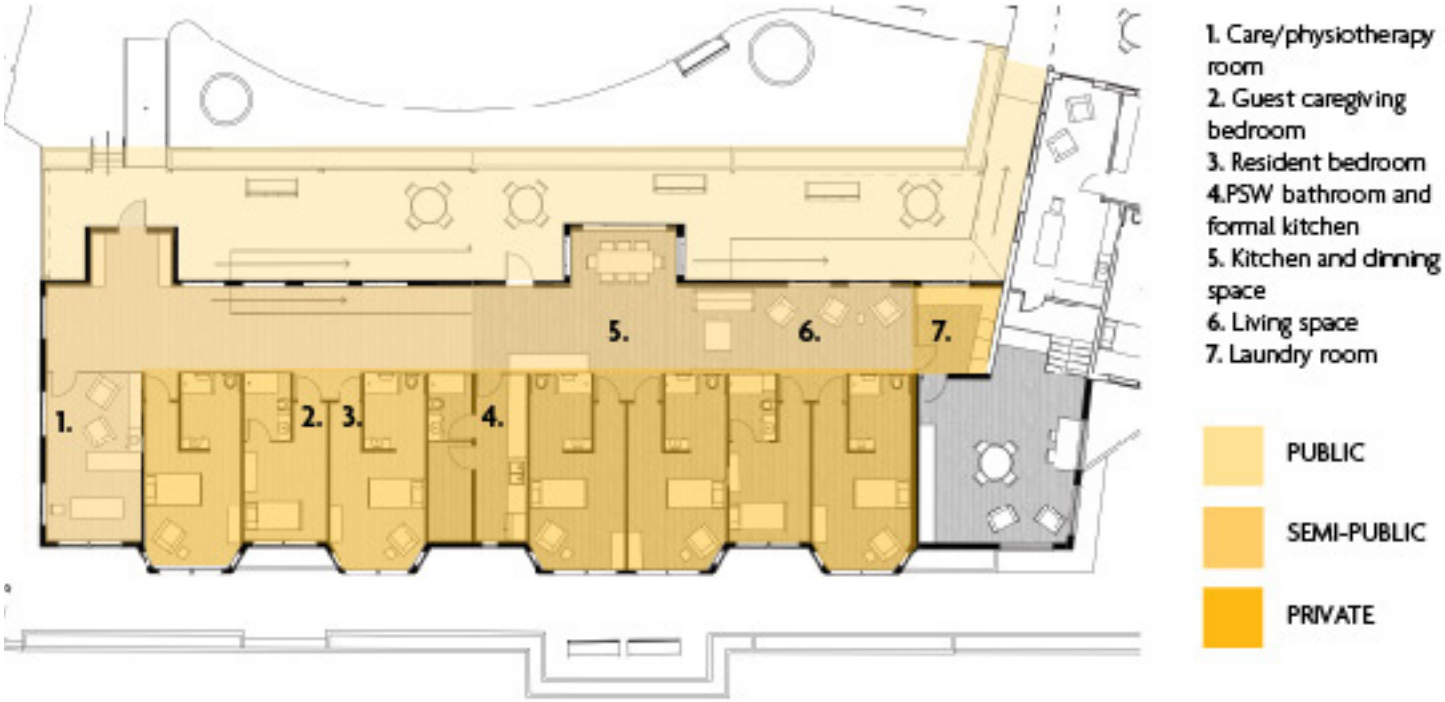


Figure74- Floor plan of the yellow house with an intimacy gradient overlay

spaces, such as the living and eating spaces for the residents and caregivers of each unit, as viewed in figure 72. Finally, are the public spaces, including bedrooms, bathrooms for residents, and a staff bathroom, a kitchen for meal preparations, as the resident kitchen is designed without a stove to avoid unnecessary dangers. These private spaces provide a quiet and intimate environment, as seen in figure 73.

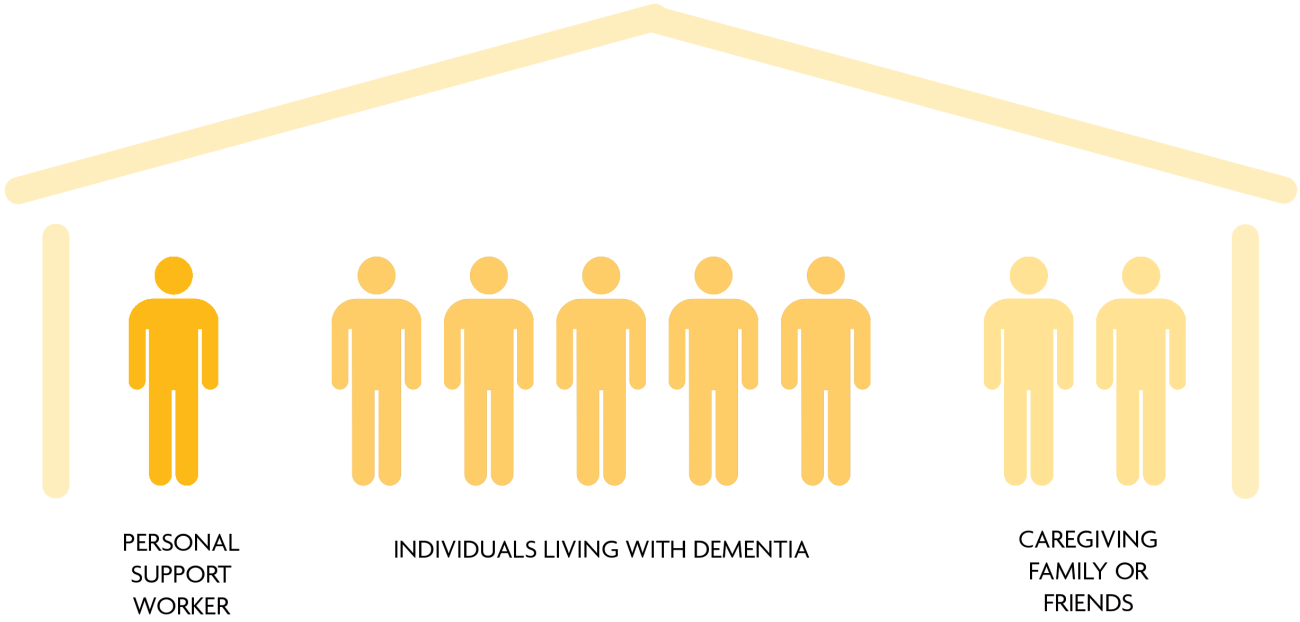
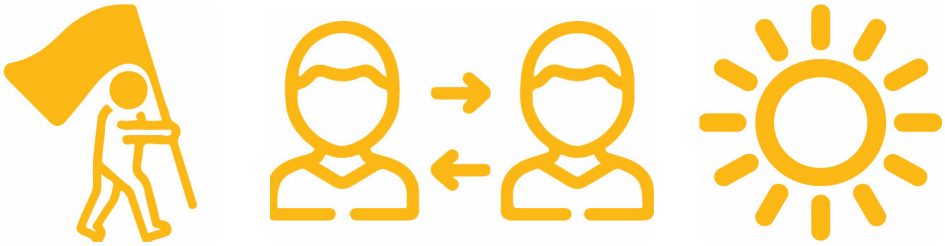


Figure75-Resident diagram per residence

Each residence provides housing for five individuals living with dementia and two additional rentable rooms for caregiving friends and family (figure 75). Space is also provided for at least one personal support worker though more may be assigned depending on the needs of the residents and the time of day. This allows each house to have a minimum of 6 to 8 individuals, the ideal size for a "family-scale,"[129] so the housing unit is not over or underwhelming for residents[130].

129 "World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1." 87.
130 Calkins, World Alzheimer Report 2020: John Zeisel interviews Maggie Calkins.

Figure76-Interior render showing the small kitchen and dining space in the yellow house residence



The interiors of each house are fairly similar to one another, allowing for residents to personalize their space and incorporate personal items, such as furnishings and paintings if they choose. The yellow house will continue to be used to show the different elements and principles of dementia care design used throughout the interior space. Principles such as independence, interactions and de-escalation are demonstrated primarily with the elements of colour, light, sensory information and familiarity. Independence is promoted in a home community style of living where residents can still participate in day-to-day tasks and chores that they can complete, such as folding laundry or cleaning. This principle is further explored by using an informal kitchen space seen in figure 76. This small kitchen space is designed without a stove or heating elements to aid dangerous situations but allows residents to be still able to participate in food preparations. Also shown in this image is the use of light elements. As was previously mentioned, access to natural daylight is critical to maintaining an individual's circadian rhythm, as are exterior views. Multiple windows are shown in this drawing, facing the courtyard to give wayfinding clues and facing interesting activities. However, the overhang of the front porch blocks light from entering these windows through most of the day. Due to this, dormer roofs were added to the elevation for more indirect sunlight to illuminate the space.

Figure77-1:100 East-west section through the yellow house

Looking to figure 77, the element of colour is explored through brightly coloured doors leading to each individual's bedroom. These doors contrast highly with the muted wall colour, drawing attention to them and giving each resident a distinct colour to match themselves and their possessions. In contrast to this, all doors leading to staff spaces, such as the door leading to the formal kitchen space and staff washroom, are painted the same muted colour as the walls. They are nearly invisible to the eye of an individual living with dementia. The element of sensory information is also displayed in this section by having walls at different

heights throughout the building. For example, the walls of each bedroom and bathroom extend to the ceiling to provide an acoustically sound room. This ensures that smells and sounds from a bathroom and bedroom don't enter the main living space and give residents a quiet place to escape to should they need to de-escalate. However, in the main living space and formal kitchen, walls only extend 8 feet so that the smells of food being prepared may travel through the residence and cue residents that it's mealtime.

Figure78-1:100 North-south section through the yellow house, cutting through the dinning space and a resident's room.

Figure79-Photograph of a Minnow Lake residence

In addition to using colour as a form of wayfinding through the home, memory shelves are designed outside each resident's room, as seen in section 78. This visual sensory information allows residents to place small personal belongings outside of their rooms so that memories may be triggered when they pass by and cues them that this space belongs to them. Other visual cueing methods are used inside a resident's room, such as having a direct line of sight from one's bed to the bathroom. Due to the "out of sight, out of mind" principle, many individuals living with dementia find it difficult to recognize and remember a space that isn't in view. For this reason, no doors are placed between the bathroom and main bedroom of each resident's unit. The use of a bay window in each resident's room also adds to this level of familiarity, as this is a common design element found around the Minnow Lake area, as viewed in photograph 79.

Community Lodge

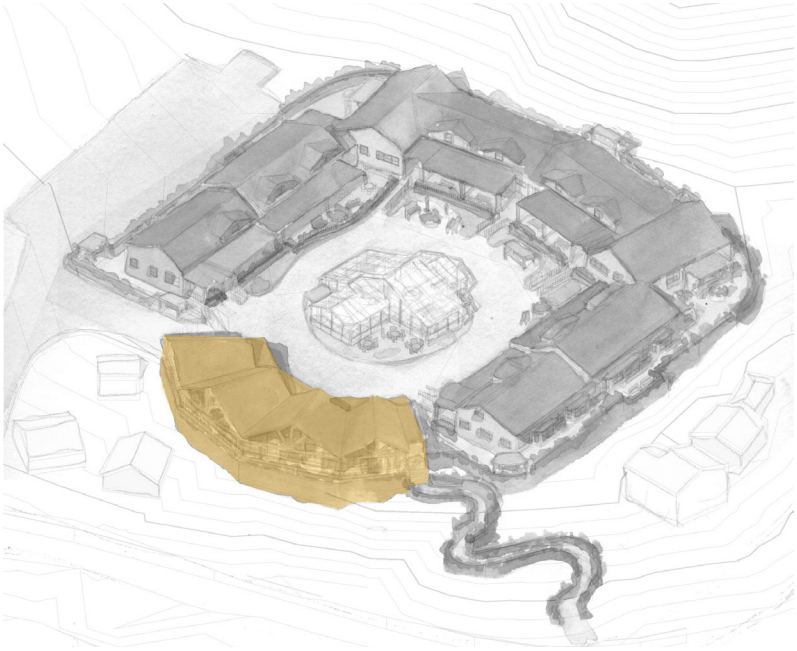


Figure80-Perspective drawing showing the community center of the dementia village

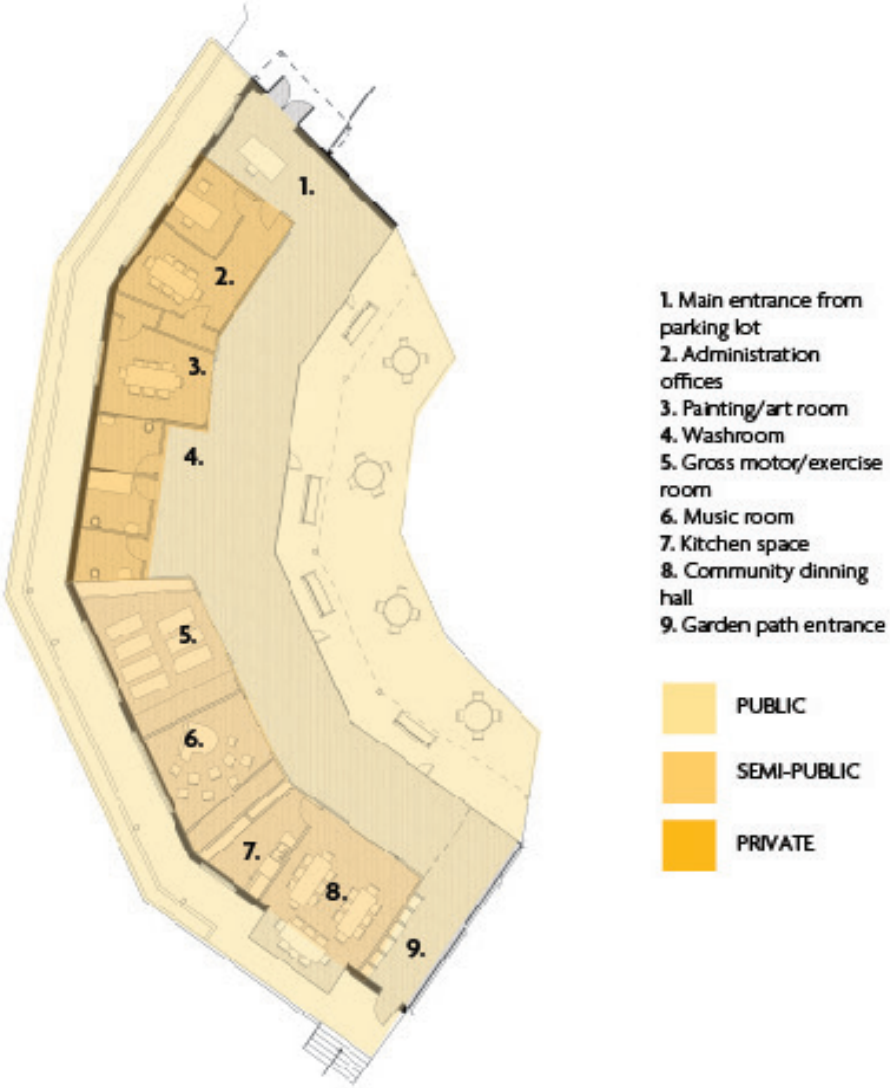


Figure81-Floor plan of the community center with an intimacy gradient overlay

To provide additional amenities for residents and open the project to the public, a community center lodge is shown in figure 80. The lodge is open to the public for intergenerational learning and activities to help fight against the stigmatization of dementia. As was mentioned in the World Alzheimer's report, day centers and places for activity are critical to the community to provide resources for individuals living with dementia and keep isolation and loneliness at bay[131].

Elements of familiarity are shown through the community center lodge in both the interior and exterior of the building. When looking at the plan of the building in figure 81, the intimacy gradient shown throughout the residential units is once again used as a design technique to create familiarity. Similarly, more public spaces, such as a covered exterior patio and the central corridor space, are organized facing the courtyard. The semi-public areas include a gross motor room, arts and music room, and a community dining room. These spaces are open to the public but offer more contained activities and quieter areas, which is why they are classified in this diagram as semi-public spaces. Finally, the private spaces, including administrative staff and washrooms, are furthest from the central courtyard.

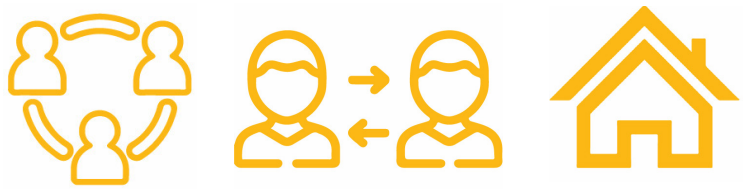
131 "World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1." 16.

Familiar elements are also shown in the street-facing elevation viewed in figure 82. One defining characteristic of Sudbury culture is the draw of camps and cabins during the summer months to escape the city's heat. While each camp and cabin is different, there is a common theme of wooden, exposed structures and a rugged appearance that gives way to feelings of nostalgia. Similar exposed wooden structures are used for familiarity in the residential units but also on the exterior of the lodge in the form of exposed wooden truss systems. Throughout the project, these wooden truss systems are used in outdoor pavilions as wayfinding language. Other familiar elements in this elevation come in the form of the brick material used. As seen in figure 45, the lodge takes cues from its sister community center, the Minnow Lake Place, just across the street in terms of the materiality use of brick.

In contrast, the dining hall of the community center is made entirely of a glass curtain wall system to maximize daylighting in this space and maximize the view of Minnow Lake itself. Not only this, but the use of an extruded glass form also provides an element of orientation for individuals to navigate the site and lodge more easily. Also featured on this elevation is the use of the porch element once again to provide familiarity and comfort.

Figure82-1:200 Elevation of the community center and dementia village from Bancroft drive

Figure83-1:250 East-west section through the blue house and the community center



The community center itself is perched on the edge of a hill leading down to Bancroft Drive, as seen in figure 83. The site is gradually sloped through the courtyard. Still, the lodge acts as the final barrier before the drop-down to the street and allows the project to sit between the neighbourhood below and the apartment complex above. This also places the lodge fully visible from the road and an active community member. Activity spaces also aid

the lodge in being an active part of the neighbourhood. As seen in figure 83 interior activity rooms are designed to be flexible to accommodate a multitude of activities. This drawing shows an activity room used as an art space for adult painting classes. It features the familiar exposed wooden ceiling as a nod to the familiar element of camp. These spaces provide areas for interactions among residents and an opportunity for local artists to display their work and teach classes to residents and community members alike.

Figure84-Interior render of the dining space in the community center

Another critical space in the community center offers an opportunity for interactions and community involvement in the dining hall viewed in figure 84. This space allows for more significant dining events for residents and provides a space where residents could have their family over for a large dinner, such as on birthdays or holidays. By having an area where a family can visit residents for holidays and dinners, a layer of safety is provided in avoiding having to move residents from the site to a new location, which can cause stress and an escalation in dementia symptoms. This space, as previously mentioned, uses the element of familiarity in the form of exposed ceilings while also using the elements of light and sensory information. The glass façade allows large streams of natural light to enter the space. At the same time, views over the existing neighbourhoods and Minnow Lake itself provides cues and familiar views for residents and visitors.

Additional activity spaces take place in the main corridor of the lodge building, as is viewed in figure 85. This space uses elements of light and sensory information to provide a bright space with views of the exterior to help orient residents and visitors. Multiple large doorways leading to the porch and central courtyard can be left open in the summer months for better air circulation

Figure85-Interior render of the multi purpose hallway space in the community center

and a better sensory experience from the vegetation growing in the gardens. The element of colour is also shown in this space as each doorway to the activity rooms is painting bright colours to differentiate between them. Secondary visual clues, such as having glass doors into these areas, also give residents additional information about the types of activities in the spaces. In addition to the elements and principles of dementia design used in this space, alternative programming is also available to encourage community interactions. The hallway space is wide enough to be transformed into an indoor market at different points of the year so that popup vendors and restaurants may have tables and booths selling food and other goods. Having access to various vendors and this sort of activity allows community involvement. It promotes independence for residents who are still cognitively able to participate in such experiences without having to leave the site. Designing the opportunity for shopping and different eating experiences gives a sense of normalcy to those still in the early and moderate stages of dementia to

Figure86-1:300 section through the Bancroft garden path, conservatory and green house

participate in activities that would be commonplace in their past.

Access to the lodge is not from the main entrance from the parking lot but the opposing side of the building. In figure 86 a winding pathway lined with wooden garden boxes leads up from Bancroft Drive to the community center. As viewed in this section, children and daycare workers can travel up this path in a safe manner to reach the site. Opportunity for the children to also use and play in the main courtyard is available and use the central conservatory. As seen in this section, the conservatory allows for gardening during the winter months to avoid the short growing season in Northern Ontario.

Conservatory

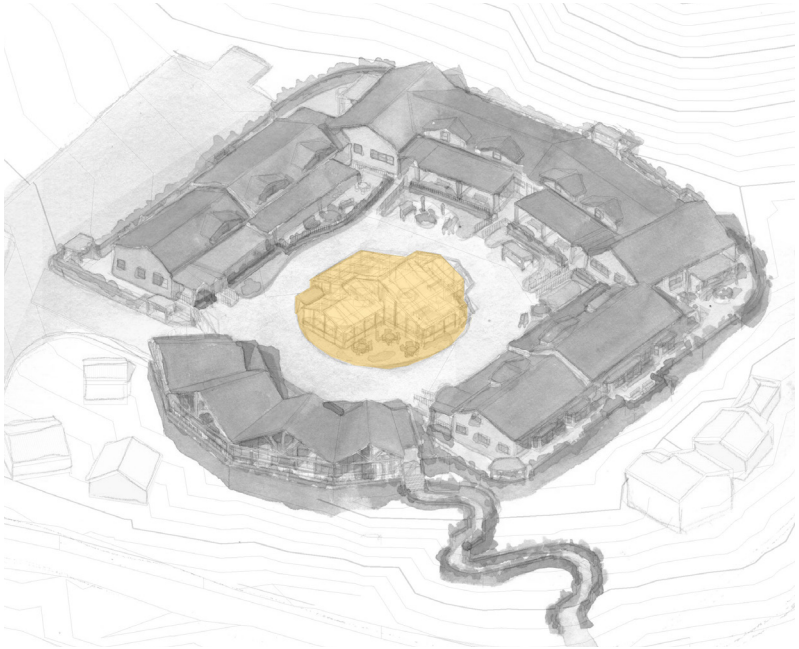


Figure87-Perspective drawings showing the conservatory

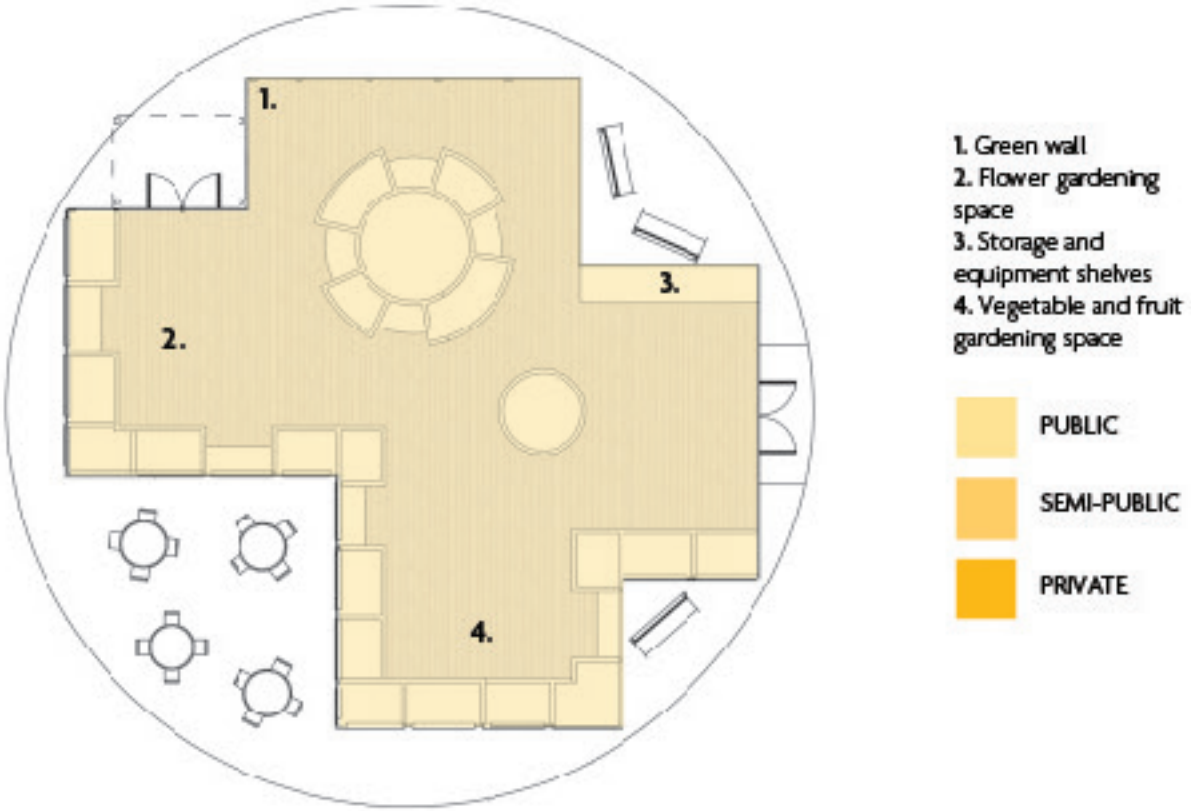


Figure88-Floor plan of the conservatory

As was mentioned previously, the central conservatory (figure 87) offers a space for gardening year-round and encourages interactions between residents and other locations to meet friends or wander through. As is viewed in figure 88 the conservatory allows enough floor space for safe wandering while also providing a variety of seating, such as benches and built-in seating between garden beds. Garden beds are placed at different heights to accommodate a variety of individuals, such as the elderly, who are more physically suited to higher planter beds to avoid bending over. In contrast, lower planter boxes are more suited for individuals in wheelchairs and children. In addition to the element of courtyards and gardens, the elements of light and sensory information are used throughout this space and the principles of de-escalation, independence,

and safety. Lots of natural lighting is necessary for a greenhouse space for plants to grow. Still, by maximizing solar gains from the south and using a green wall on the opposing side, visual sensory clues are provided to create distinct areas in the space for better navigation and orientation. As is seen in figure 88 this is also done by having different plants growing in other areas. As was previously mentioned, gardens and courtyards are vital for de-escalation for people in general, particularly individuals living with dementia. This space allows for safe wandering in a green space during all times of year to aid in de-escalation while also providing a safety aspect to encourage physical activity in colder or wetter weather. In addition to this, the space includes independence as residents have access to the conservatory at all times of the day and ease of access as one of its entrances opens directly onto the residential units. By also placing the conservatory in the center of the courtyard with glazing on all sides, caregivers and staff are also given full visual access to the space to keep track of residents and ensure they are safe without having to be directly in the area with them, depending on an individual's progression of dementia of course (figure 89).

Figure89-Interior render of the central conservatory facing the community center

CONCLUSION

Dementia is a degenerative brain disease that causes individuals to lose their memory and other cognitive functions severely enough that they become unable to perform day-to-day tasks and function in society as it currently is[132]. In 2017, around half a million individuals in Canada were living with dementia-related diseases, though this number is expected to rise to nearly a million individuals by 2030[133]. As the elderly population increases, so does the risk of developing dementia and the need for adequate housing. The current housing situation for individuals living with dementia in Canada does not always address the symptoms of dementia and often isolates individuals from their communities. To create environments where individuals living with dementia can thrive, a deeper look into case studies and research into psychology and medicine was completed. This research led to the creation of a list of elements and principles of dementia care design, which allowed for a tangible-built environment to emerge from the question:

How can the built environment respond to the impact of dementia on both the individual and their respective caregivers?

132 "What Is Dementia?," Alzheimer's Disease and Dementia, accessed October 9, 2021, https://alz.org/alzheimers-dementia/what-is-dementia.

133 "Dementia Numbers in Canada," Alzheimer Society of Canada, accessed October 6, 2021, https://alzheimer.ca/en/about-dementia/what-dementia/dementia-numbers-canada.

Overall, this thesis presents a hypothetical situation and an example of a dementia village. In reality, dementia villages and adequate housing alternatives to traditional and institutional care need to be seriously evaluated due to the rising number of individuals being diagnosed with dementia. As in many brain and ageing conditions, dementia was pushed to the edge of society and not given the proper attention or care it deserved. Due to this, the proper housing solutions were never fully developed or realized to suitably house individuals living with dementia. This thesis proposes a dementia village in the Minnow Lake area of Sudbury, Ontario. However, had this project been placed in a different location or scale, the project could have looked entirely different.

There is no one size fits all answer to this question. The elements and principles of dementia care designed curated in this project speak much more accurately about the phenomenon of dementia and how it can be handled. Dementia itself is a very individual and unique experience for the person diagnosed and their caregivers. It will affect everyone differently, particularly in different regions and cultures, so it's essential to look at the elements and principles of dementia care design as guidelines that can be applied to a specific design situation.

In Minnow Lake, the elements of colour, light, courtyards and gardens, familiarity and sensory information, and the principles of safety, interactions, community, independence and de-

escalation helped form a village. This village uses community home model units to house individuals living with dementia and their caregivers. The site plays host to four housing units and a central conservatory in an open courtyard space and a community center. The community center offers activity spaces for residents and community members to help stave off isolation and loneliness in individuals living with dementia. By locating the village across from an existing community center and daycare, in the heart of the residential area of Minnow Lake, ageing in place is promoted on a community level while also providing the opportunity for intergenerational learning.

At its core, this project is less about the physically designed built environment and more about providing an example of how dementia care can be handled. This project acknowledges that it cannot solve the complexities of dementia or begin to offer tangible solutions on how each city or country should handle dementia care. However, it can provide a framework for others to design spaces for individuals living with dementia and their respective caregivers, whether adopting a current home or building more extensive facilities. The elements and principles of dementia care design are a set of universal ideas that can be used freely to ensure that the needs of individuals living with dementia and their caregivers are met. However, this project is not solely about meeting the needs of these parties but about providing them with environments that improve their quality of life and allow them to

thrive. as the Latin proverb writes, “As you are now, I once was, as I am now, you (may) be.” This project is not only about providing housing for elderly individuals with dementia but ensuring we lay the foundations for ourselves and future generations.

Bibliography

67 Homes for Canadians. Ottawa, Canada: Central Mortage and Housing Corporation, 1947.

Alexander, Christopher, Sara Ishikawa, and Murray Silverstein. *A Pattern Language: Town, Buildings, Construction*. Vol. 2. 3 vols. New York: Oxford University Press, 1977.

Alzheimer's Disease and Dementia. "What Is Dementia?" Accessed October 9, 2021. https://alz.org/alzheimers-dementia/what-is-dementia.

Alzheimer Society of Canada. "Alzheimer Society of Canada." Accessed October 9, 2021. http://alzheimer.ca/en/home.

Armstrong, Pat, and Susan Braedley. *Physical Environments for Lonwg-Term Care: Ideas Worth Sharing*, 2016. https://www.deslibris.ca/ID/10089804.

Calkins, Margaret P. *Design for Dementia: Planning Environment for the Elderly and the Confused*. National Health Publishing, 1988.

Calkins, Margaret P. World Alzheimer Report 2020: John Zeisel interviews Maggie Calkins. Virtual interview, September 20, 2020. https://www.youtube.com/watch?v=2rxB44ogqVI&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=10.

Calkins, Margaret P, and Jennifer Brush. "Honouring Individuals Choice in Long-Term Residential Communities When It Involves Rosk: A Person-Centered Approach." *Journal of Gerontological Nursing* 42, no. 8 (August 2016): 12–17.

Cipriani, Gabriele, Claudio Lucetti, Angelo Nuti, and Sabrina Danti. "Wandering and Dementia." *Psychogeriatrics* 14, no. 2 (2014): 135–42. https://doi.org/10.1111/psyg.12044.

Cooper-Marcus, Clare. World Alzheimer Report 2020: John Zeisel interviews Clare Cooper-Marcus. Virtual interview, September 20, 2020. https://www.youtube.com/watch?v=dWnE8vEFs2g&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=9

Courage, Marnie. "Canada's Accessible Housing Crisis: Implications and Solutions." Conference presented at the Home is Where the Heart is, Virtual, November 24, 2021.

Dementia Enabling Environments | Alzheimer's WA. "Colour Perception and Contrast - Dementia Enabling Environments | Alzheimer's WA." Accessed February 9, 2022. http://www.enablingenvironments.com.au/colour-perception-and-contrast.html.

Dementia Care International. "Colour Your World...and Theirs!," February 26, 2007. https://dementiacareinternational.com/2007/02/colour-your-world-and-theirs-membership-required/.

Edelstein, Eve. A. "Building Health." *Health Environments Research and Design Journal* 1, no. 2 (2008): 54–59.

Figueiro, Mariana G. "Light, Sleep and Circadian Rhythms in Older Adults with Alzheimer's Disease and Related Dementias." *Neurodegenerative Disease Management* 7, no. 2 (April 2017): 119–45. https://doi.org/10.2217/nmt-2016-0060.

Finlandia Village. "Finlandia Village." Accessed November 13, 2021. http://www.finlandiavillage.ca/.

Finlandia Village. "Hoivakoti Nursing Home," March 12, 2018. http://www.finlandiavillage.ca/live-here/hoivakoti-nursing-home/.

Gililland, M. "Dementia." *Journal of Pracitical Nursing* 1, no. 60 (2010): 9–15.

Government of Canada, Innovation. "Long-Term Care and COVID-19 - Science.Gc.Ca." Accessed October 9, 2021. https://www.ic.gc.ca/eic/site/063.nsf/eng/h_98049.html.

Government of Canada, Statistics Canada. "Census Profile, 2016 Census - Greater Sudbury [Census Metropolitan Area], Ontario and Ontario [Province]," February 8, 2017.

"Guilt and Grief When Moving Your Loved One to a Care Facility." Alzheimer's Association, July 2017. https://www.alz.org/media/greatermissouri/guilt_and_grief_when_moving_your_loved_one_to_a_care_facility.pdf.

Harmand, Magali González-Colaço, Céline Meillon, Laetitia Rullier, José-Alberto Avila-Funes, Valérie Bergua, Jean-François Dartigues, and Hélène Amieva. "Cognitive Decline After Entering a Nursing Home: A 22-Year Follow-Up Study of Institutionalized and Noninstitutionalized Elderly People." *The Journal of Post-Acute and Long-Term*

Care Medicine 15 (2014): 504–8.

Harvard Health. "Alzheimer's in the Family," December 12, 2015. https://www.health.harvard.edu/mind-and-mood/alzheimers-in-the-family.

Hoffman, Wilhelmina. World Alzheimer Report 2020: John Zeisel interviews Wilhelmina Hoffman. Virtual interview, September 20, 2020. https://www.youtube.com/watch?v=2cR4aBEQ5DM&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=9.

"Infographic: Canada's Seniors Population Outlook: Uncharted Territory | CIHI." Accessed December 21, 2021. https://www.cihi.ca/en/infographic-canadas-seniors-population-outlook-uncharted-territory.

Markut, Lynda A, and Anatole Crane. *Dementia Caregivers Share Their Stories: A Support Group in a Book*. Vanderbilt University Press, 2005.

Marsden, John P. *Humanistic Design of Assisted Living*. JHU Press, 2005.

Mayo Clinic. "Sundowning: Tips for Dealing with Late-Day Confusion." Accessed November 27, 2021. https://www.mayoclinic.org/diseases-conditions/alzheimers-disease/expert-answers/sundowning/faq-20058511.

"Minnow Lake Community Profile." The Community & Strategic Planing Section Greater Sudbury, April 2015. https://www.greatersudbury.ca/?LinkServID=D3BFF35F-FF27-09DC-C56C4AD1356FEDDB.

"Minnow Lake.Ca." Accessed January 25, 2022. https://www.minnowlake.ca/.

"Minnow Lake/New Sudbury Cooperative Nursery School - Home." Accessed December 16, 2021. https://sudburycooperativenurseryschool.weebly.com/.

Nott, Barbara, Councillor Evelyn Dutrisac, Barbara Eles, Laurie Fraser, Sue Lavergne, Maija McKibbon, Mary Michasiw, et al. "City of Greater Sudbury Age Friendly Community (AFC) Action Plan," n.d., 75.

Phippen, Peter. World Alzheimer Report 2020: John Zeisel interviews Peter Phippen. Virtual interview, September 20, 2020. https://www.youtube.com/

watch?v=tebk6QRXyMU&list=PL-y9-0L2Glr2ARNd7YFC91Xso-tVY0xvg&index=6.

Pintos, Paula. "Alzheimers Village / NORD Architects." ArchDaily, December 21, 2021. https://www.archdaily.com/973948/alzheimers-villa-nord-architects.

Powell, Tia. *Dementia Reimagined: Building a Life of Joy and Dignity from Beginning to End*. New York: Penguin Random House, 2020.

"Programs." Accessed December 16, 2021. https://www.greatersudbury.ca/play/programs-and-activities1/programs/.

"PSW Roles & Responsibilities | OPSWA." Accessed October 9, 2021. https://ontariopswassociation.com/psw-roles-and-responsibilities/.

Reynolds, Camilla. "The Impact of a Memory Box Activity on Relationships between Residents of a Long Term Care Facility and the Staff." *Eastern Michigan University Senior Honors Thesis*, 2013, 23.

"Seven Stages of Dementia | Symptoms, Progression & Durations." Accessed January 13, 2022. https://www.dementiacarecentral.com/aboutdementia/facts/stages/.

Strubel, Denise, and Mariana Corti. "[Wandering in dementia]." *Psychologie & Neuropsychiatrie Du Vieillissement* 6, no. 4 (December 2008): 259–64. https://doi.org/10.1684/pnv.2008.0147.

The Advocate. "Can Different Colors Influence a Person with Dementia? Here's What to Know." Accessed November 29, 2021. https://www.theadvocate.com/baton_rouge/entertainment_life/health_fitness/article_922b136a-84d5-11e6-8c00-fbc8ac72b472.html.

"The Hogeweyk Dementia Village ~ Care Concept." Accessed November 8, 2021. https://hogeweyk.dementiavillage.com/.

Utton, Damian. *Designing Homes for People with Dementia*. Great Britain: Journal of Dementia Care, Hawker Publications, 2007.

Village Alzheimer. "Village Landais Alzheimer." Accessed February 19, 2022. https://villagealzheimer.landes.fr/etablissement.

"What Is a Person-Centred Approach? - Principles for Effective Support." Accessed November 10, 2021. https://www.health.nsw.gov.au/mentalhealth/psychosocial/principles/Pages/person-centred.aspx.

Wiles, J. L., A. Leibing, N. Guberman, J. Reeve, and R. E. S. Allen. "The Meaning of 'Aging in Place' to Older People." *The Gerontologist* 52, no. 3 (June 1, 2012): 357–66. https://doi.org/10.1093/geront/gnr098.

"World Alzheimer Report 2020 – Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1," n.d., 248.

Zeisel, John. *I'm Still Here*. Penguin Group, 2009.

Zeisel, John. "Improving Person-Centered Care Through Effective Design." *Generations Journal* 37, no. 3 (Fall 2013): 45–52.