

**In Search of a Place for Emotion and Healing:  
Designing Empathetic Architecture for Third Age**

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## **AUTHOR'S DECLARATION**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

The thesis *In Search of a Place for Emotion and Healing: Designing Empathetic Architecture for the Third Age* investigates a typology of therapeutic architecture for the aging demographics in 21st century. In Canada, the percentage of total population 65 and older is expected to rise to 20% by 2024. Yet, this aging generation has been neglected in terms of policy, investment and accommodation. As such, the physical and emotional environment for this group has not been sufficiently addressed, which is further reinforced by the country's lackluster response to COVID-19.

According to psychologist Bernice Neugarten, seniors can be categorized into two cohorts: Young-Old (55 to 75) who are healthy and free, and Old-Old (75 and over) who often struggle with physical and mental limitations. In Ontario, the Young-Olds are having difficulty securing a house due to affordability issues. Because the government does not provide subsidy for retirement homes, their only choice is to apply for long-term care housings that are catered to the older cohorts.

These care facilities are designed to function as a hospital rather than home; therefore, they lack the social and therapeutic support that the younger groups require. In addition, due to the prioritization of health and safety of their residence, their freedom is often taken away, which further aggravates the situation.

The thesis departs by asking the question of how to create a healing space for the younger senior cohorts. It explores a new typology of care housing for the marginalized demographic who are not financially independent yet require minimal assistance. The created space will incorporate communal and sensory elements to generate a hospitable environment. At a broader level, the project will attempt to establish a symbiotic relationship with nature and surrounding long-term care housing to develop a holistic network for the aging population.

## ACKNOWLEDGEMENTS

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Thank you to my advisor, Federica Goffi, who has taken the time to review all my efforts and guided me through the thesis.



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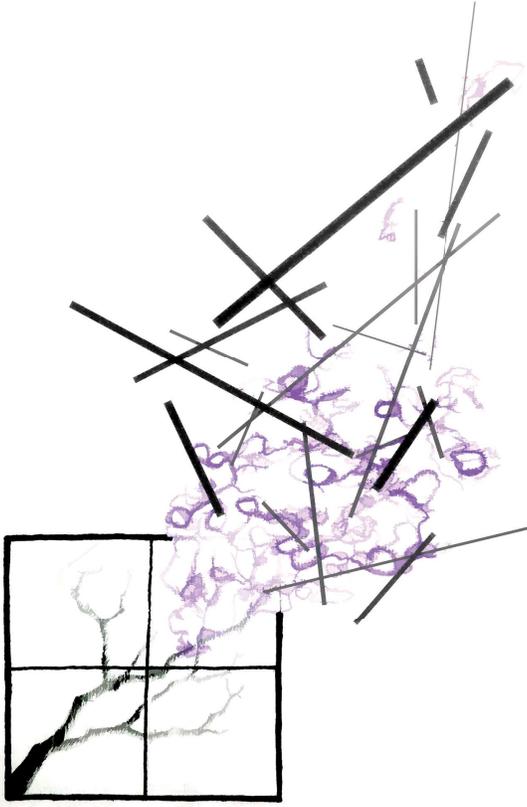


Fig. 1.0: Through the Window

**PART I:  
INTRODUCTION**

*“We construct an image of a place based on the information we receive through our senses, and somehow, somewhere—actually in many places in the brain—it all gets put together to create our sense of place”<sup>1</sup>*

*-Esther Sternberg*

**MEDICALIZED SPACES**

Space embodies emotion. Through our senses, the mind experiences the presence of a space and its meaning. The recollection of memories shapes the architecture around us. In medicalized environments, the link between emotion and architecture is often overlooked due to prioritization of efficiency and treatment. In such settings, the architecture no longer actively participates. It is silenced.

The passivity of architecture could be experienced evidently in institutional settings for seniors. Long-term care facilities are built to house elderly patients who need constant care in relation to their daily activities. The dependence on caretakers necessitated the architecture to provide compartmentalized programs for maximum expediency and efficiency. Such institutionalized spaces have rigid demarcation which deters spontaneous interaction. The psycho-spatial void further robs the seniors of forming an emotional connection with the environment. In the end, such spaces often feel unwelcome. Yet, long-term care housing (LTCH) remains the only choice for the many with financial difficulties.

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<sup>1</sup> Sternberg, “Healing Spaces: The Science of Place and Well-Being,” 15.

## SENIORS IN ONTARIO

In Canada, the number of seniors is projected to reach between 9.9 and 10.9 million by 2036.<sup>2</sup> Out of all the age demographics, the senior cohort is growing the most rapidly in the country. If we look at the number of nursing home beds available in Ontario, there are approximately 70,000 beds<sup>3</sup> compared to approximately 350,000 citizens over the age of 65 who are living below standards. The latter number matters because LTCH is the only care housing option that is fully funded by the government. This policy results in a two-tiered system of care that separates the seniors depending on the accumulated wealth: wealthy seniors who have the freedom of choosing the care they want, and the lower-income seniors who are left with fewer choices. The more affordable the option is, the more autonomy is compromised due to standardized routine schedules and policies. If so, what about the residents who are relatively younger but have no other care options due to financial setbacks?

Studies have shown that in Ottawa, approximately 7-10% of the beds – or 300 - 400 by count – in LTCH is occupied by seniors who are younger than 65.<sup>4</sup> With higher physical and mental capabilities, they have different needs

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2 Statistics Canada, "Census of Population 2016."

3 Ibid.

4 Ibid.

and objectives compared to the older group. Most of all, they would like to continue their active and social lifestyle before the transition to a new setting. The dynamic needs of marginalized seniors clash with the restrictive institutional environments of the care facility.

Furthermore, there are seniors who do not have access to the care system despite their urgent situation. Labelled as Alternative Level of Care (ALC), they are patients who are delayed in discharge from acute hospitals. It is estimated that the senior patients who are waiting for nursing home admission accounts for 42% of acute hospital bed days.<sup>5</sup> Out of these, the age group with the longest ALC lengths of stay is the seniors aged less than 74 who suffer from morbid obesity, stroke, and psychiatric problems.<sup>6</sup> These patients are stuck in a limbo of not being able to find a nursing home right away due to preference for ailing and older seniors during the admission process. Without alternatives, the acute hospital sectors act as a safety net for these younger seniors until appropriate care housing option is found, which costs a great deal to hospitals.

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5 Costa, "Acute care inpatients with long-term delayed-discharge: evidence from a Canadian health region," 7.

6 Ibid. Page 8.

## SENIOR'S NEEDS

With the growing number of populations entering the senior's category, many researches studying this trend have been emerging in the recent years. One of the most influential study was done by architect and urbanist Deane Simpson, where he theorized that seniors could be divided into two groups based on their characteristics: Young-Olds – who are healthy and independent – and Old-Olds – who are frail and dependent.<sup>7</sup> The younger seniors want to travel, share stories and actively participate in their communities whereas the older seniors want to age in-place with their families. The last thing the younger seniors want is to be grouped with the future inevitable versions of themselves that they are so desperately wanting to escape from. As a result, many of them travel in RVs or live in Disneyland-like retirement communities to enjoy their lives.<sup>8</sup> However, for those who do not have the resources, LTCH seems to be a common destination. After health, wealth is the second most important factor in determining one's lifestyle after retirement. For those younger cohorts who have no choice but to live in care facilities, they report mostly feeling disconnected from the fellow community members and struggle with loneli-

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7 Simpson, "Young-Old: Urban Utopias of an Aging Society," 23.

8 Ibid. Page 35.

ness stemming from lack of emotional support.<sup>9</sup>

It is estimated that more than 432,000 Canadians 65 years and older live with diagnosed dementia.<sup>10</sup> With increasing number of aging populations, that number is expected to rise in the coming years. Yet, much of our infrastructure is not equipped to handle such a paradigm shift. Within our hyper-cognitive society, people with dementia often bears a stigma of disability and uselessness. When coupled with aging, many seniors face difficulties in finding the suitable environment to stay in. A LTCH should provide meaningful activities to stimulate the patient's minds, legible spaces for easier wayfinding and orientation, and familiar objects or item that evokes their memory and sense of nostalgia.<sup>11</sup> A good addition to any care facilities is a well-designed garden.<sup>12</sup> It creates a spontaneous space for the seniors to socialize with each other and immerse in nature. When combined with other dementia-specific design elements such as fake bus stops for those with exit-seeking tendencies, it generates a fertile ground for socialization and healing. People with dementia need

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9 Hay, "Exploring the Quality of Life of Younger Residents Living in Long-Term Care Facilities," 3.

10 Government of Canada, "Dementia."

11 Waller and Masterson, "Designing dementia-friendly hospital environments," 66.

12 Chapman, Hazen and Noell-Waggoner, "Gardens for People with Dementia: Increasing Access to the Natural Environment for Residents with Alzheimer's," 252.

a special care, yet they are usually bounded by institution's strict rules and logistics. The psychosocial needs of both the younger seniors and those with dementia remain as an underserved sector for the healthcare system.

### **ADDRESSING THE YOUNGER SENIORS**

The thesis aims to address the marginalized population of seniors by exploring an alternative typology of elderly accommodation. The architecture will encompass two major aspects: hospitable home and healing environment. By definition, a home should be a place of belonging: a sacred ground where an individual's right is upheld. A way to strengthen the seniors' individuality is by bestowing them a power to choose. The Babayaga House in France serves as a great example. The house is an independent home for women who accept the least possible outside help while managing the place by themselves.<sup>13</sup> Their independence and autonomy are defended while additional care is received only when necessary. Architecture could embody this ideology to empower the seniors by adjusting the degree of privacy, size, and quality of personal space to their needs. The second aspect of this thesis reconceptualizes the idea of healing. Rather than Curing, where the aim is relieving the symptoms of

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<sup>13</sup> McGinn, "Don't Move Me There! Promoting Autonomy in the Provision of Long-term Care for Seniors in Canada," 40.

disease or illness, Healing alleviates stress and promotes positive state of mind. According to a study performed by professor of Health Facilities Roger Ulrich, a view of a park through a patient's window accelerated the recovery process.<sup>14</sup> The restorative effect of nature is further enhanced when an individual reconnects to the nature through the form of forest bathing. The benefits include lowered stress response, improved immune functions and overall health.<sup>15</sup>

### **IN THE CONTEXT OF THESIS**

The chosen site for the thesis is near the Montfort LTCH centre located slightly east of Ottawa downtown. The area was chosen for two reasons: high number of COVID-19 outbreaks and proximity to nature. The Montfort care facilities have reported the third highest number of infected cases amongst LTCH in Ottawa, where 68% of the patients have been infected and 24% have passed away.<sup>16</sup> Behind the facility is a 22-acre forest that has been designated as a "Natural Heritage Area" at the request of National Capital Commissions (NCC) in 2004.<sup>17</sup> However, despite the intent to "open to the Ot-

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<sup>14</sup> Ulrich, "View through a Window May Influence Recovery from Surgery," 420.

<sup>15</sup> Song, Ikei and Miyazaki, "Physiological Effects of Nature Therapy: A Review of Nature Therapy," 2.

<sup>16</sup> Ottawa Public Health, "Outbreak Reports in Ottawa Healthcare Institutions."

<sup>17</sup> Lathrop, "Official Plan and Zoning - 701-711 Montreal Road," 2.

tawa residents for conservation, educational and leisure activities,”<sup>18</sup> NCC organization has barricaded the entire perimeter of the forest to this day. To the north of the forest is a De-commissioned Canadian Forces Base zone that is currently in development for future housing, mixed-use and schools. Given its proximity to Montfort Woods and LTCH centre to the south, this site has a tremendous potential to house the younger seniors by incorporating nature and emerging design principles for the elderly.

Architecture can elicit various positive emotions. The medicalization of health facilities has reduced this concept to a point where the efficiency eclipses the visceral and emotional interpretation of a space. It is the overall intention of this thesis to reintroduce architecture as a major contributor to the senior’s lives rather than exist as mere shelter. With appropriate placement for these younger senior groups, hopefully it will provide an insight into how the overstrained long-term care systems in Ontario might be eased with careful planning and design.

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<sup>18</sup> Lathrop, “Official Plan and Zoning - 701-711 Montreal Road,” 3.

**PART II:  
SENIORS LOST IN TRANSLATION**

*“[The caretakers] are my salvation but they  
can’t be my companion”*

*-Anonymous Interviewee*

**THE DIVERGING THIRD AGE**

In Canada, the percentage of population 65 and older is expected to rise to 24% by 2036.<sup>19</sup> The demographic movement has been also observed in many countries, especially in developing countries: “within five decades, just over 80% of the world’s older people will be living in developing countries compared with 60% in 2005.”<sup>20</sup> Many demographers posit that the trend is a result of two factors: increased longevity and reduced birth rates.<sup>21</sup> Both factors are products of modernization where cultural, economical, and technological advancements have transformed and rewritten the traditional concept of aging. The ethnological and historical perspective of old age has put the emphasis on retiring into a reclusive way of living. However, as more demographics are aging, it becomes difficult to define the time when the old age begins. According to American gerontologist Bernice Neugarten, the postwar period has created a fertile condition for a new paradigm shift in

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<sup>19</sup> Statistics Canada, “Census of Population 2016.”

<sup>20</sup> UNFPA, “Unleashing the Potential of Urban Growth,” p14

<sup>21</sup> United Nations, “Technical Meeting on Population Ageing and Living Arrangements of Older Persons,” 5.

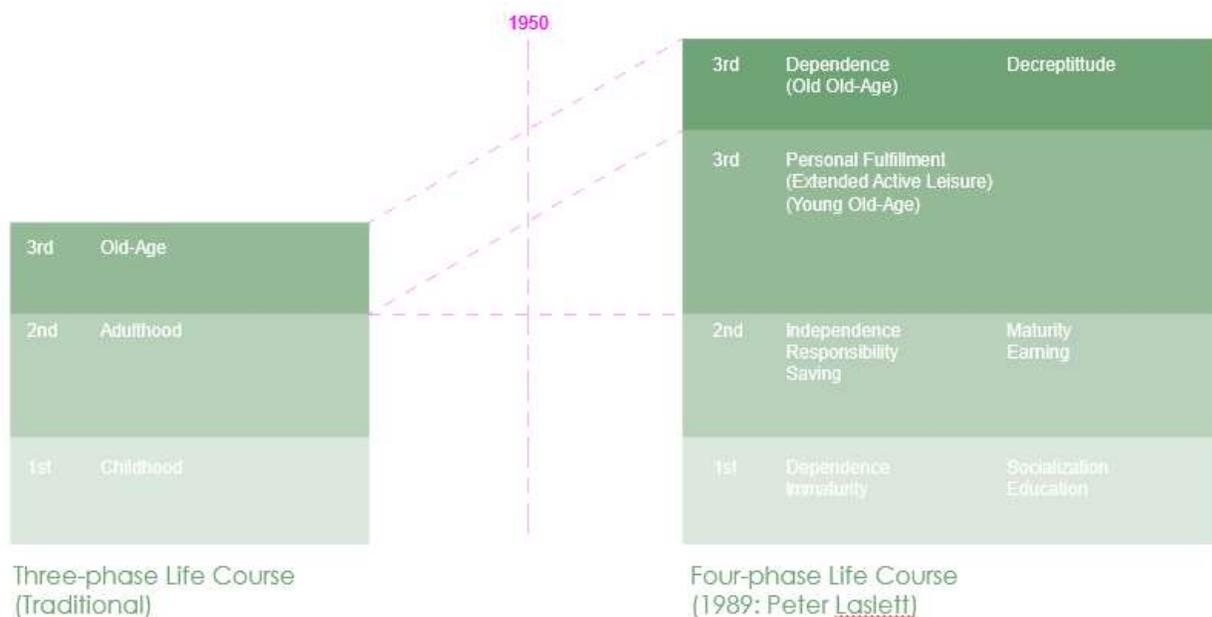


Fig. 2.0: From a Three-Phase to a Four-Phase Life Course

aging: the division of the traditional Old-Age population into Old Old-Age and Young Old-Age.<sup>22</sup> The two cohorts are differentiated in terms of their mental and health capabilities that determine their preferential lifestyle. For example, the Young-Olds are healthier, more competent, and active whereas the Old-Olds are frail and often need support.<sup>23</sup> The sociodemographic transformation has resulted in three forms of crisis: crisis of dependency, programming, and precedent.<sup>24</sup> The crisis of dependency describes the growing strain the government's pension and healthcare plans. The crisis of programming denotes the rift between the outdat-

ed program designs versus the needs of the new wave of seniors. Finally, the crisis of precedent demonstrates the lack of existing protocols to accommodate the unprecedented surge in aging population. Unless these crises are addressed, many older populations will continue to be lost in translation to the new phase in their lives.

### THE MARGINALIZED SENIORS

In Ottawa, there are about 260,000 seniors aged 55 and upwards. From these numbers, about 76% (200,000) of them are between 55-75,<sup>25</sup> which is the age bracket for the Young-Olds cohort. Of these seniors, about 29% (82,000) fall in the low-income cut off for a

22 Simpson, "Young-Old: Urban Utopias of an Aging Society," 23.

23 Ibid. Page 43.

24 Ibid. Page 56.

25 Statistics Canada, "Census of Population 2016."

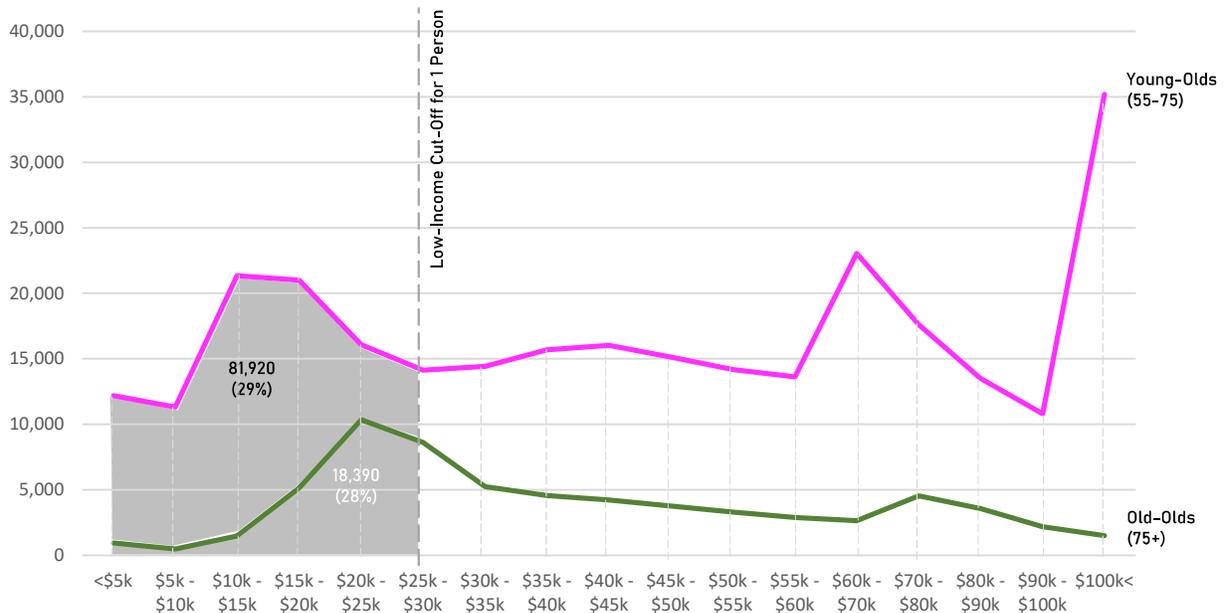


Fig. 2.1: Young-Olds vs Old-Olds Total Income in Ottawa Region

single family.<sup>26</sup> Considering that the cheapest retirement homes in Ottawa cost about \$18,000 per year,<sup>27</sup> these seniors will have no choice but to go to LTCH to qualify for government subsidy unless they have significant savings in their account.

Ottawa has many types of care facilities available for the seniors. According to the Champlain Health website that tracks the types of facilities in the city, there are 35 retirement homes, 21 LTCH, 18 personal care homes and 11 independent living houses.<sup>28</sup> There are significantly more institutionalized facilities available for the seniors compared to more independent options.

Geographically, the retirement homes tend to be located at sites with great views, easy accessibility, and numerous amenities. Because these homes are privately owned by healthcare operators and are catered towards the affluent group of seniors, these benefits contrast starkly with the location of personal care homes or independent livings. These homes are either located away from the major highways or nestled in residential zones. There exists a clear demarcation of the types of lifestyles attainable by their savings.

### SEARCHING FOR A “HOME”

What constitutes a place to be called a home? Is it defined by the time spent living at the place? Does it have to do with the type of memories made? There are many factors that affect this designation, but the fact is that the majority

<sup>26</sup> Statistics Canada, “Census of Population 2016.”

<sup>27</sup> Champlain Community Care Access Centre, “Health Services in Ottawa.”

<sup>28</sup> Ibid.

(87%) of Canadians over the age of 55 would much prefer to age-in-place at their home.<sup>29</sup> Replicating the sense of place in a public care facility would simply not work due to the difference in the purpose and nature of the facility. What needs to be addressed here is twofold: understanding what defines a home and how they could maintain their autonomy in the transition.

In architecture, the sense of place is deeply rooted in memories. It might be the aroma of flowers placed on top of a wooden table that might trigger nostalgia in some people. For others, it might be as simple as an afternoon light diffusing through a small window, revealing the subtle highlights of the wall surface. Whatever they may be, these special memories are associated with the meanings that people attach to them. The types of meanings that places give people might include a sense of security, identity and belonging.<sup>30</sup> These associations alleviate the feeling of rootlessness, and helps them heal physically, mentally, spiritually, emotionally, and socially. The active participation of architecture produces a comfortable environment for the seniors.

Many seniors dread moving into a LTCH. It symbolizes a loss of independence and freedom under the scrutiny of the caretakers and

pre-determined schedules.<sup>31</sup> However, it remains a viable option for the many who cannot afford homecare and need regular assistance with activities of daily living due to declining cognitive and physical functions. What needs to be addressed here is the protection of their autonomy. Research has found that if the seniors make more small, everyday decisions, it will positively affect their sense of control and quality of life.<sup>32</sup> Unfortunately, LTCH in general is an institution with a focus on monitoring and treating the frail elderly with little emphasis on their personal choice. In the facility, the seniors are deemed as passive recipients of care services whose priority is to stay safe and healthy. Everyday, they are subjected to strict scheduling to ensure the efficient use of the caretaker's time and skill. Their personal space is often compromised because the level of privacy hinges on how much additional fee they could pay. The skewed focus on their physical conditions and structured efficiency robs the opportunity to properly listen to their emotional and mental needs.

Are there any examples of LTCH that respects the senior's autonomy? Researcher Lindsay McGinn cites three examples where the residents could maintain their privacy and experience a

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29 Health Care in Canada, "A Focus on Seniors and Aging," 4.

30 Gesler, "Healing Places," 5.

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31 McGinn, "Don't Move Me There! Promoting Autonomy in the Provision of Long-term Care for Seniors in Canada," 34.

32 Heebøll, "Life Long Living Maintaining Everyday Life as Long as Possible," 3.

home-like lifestyle.<sup>33</sup> The Green House project in the U.S. prioritizes the autonomy of the seniors through the layout of the building.<sup>34</sup> Every resident has access to their own private room with bathroom attached. The only spaces shared with others are the common areas such as kitchen and living room, where the elderly has the freedom to eat and get up whenever they choose. The architecture of the building demarcates the spaces to be given to the residents, which respects their autonomy instead of regulating them. Another example is the Fredericia Model in Denmark. Provided by the municipality's social service department, this model of homecare allows the seniors to choose the level of care they wish to receive.<sup>35</sup> The care system creates an opportunity for the care professionals and the seniors to come together to design a rehabilitation program suited to their needs. Lastly, the Baba Yaga House in France nurtures an environment where the elderly women live together and take care of each other without outside assistance. The Charter of Living states four values: self-management, solidarity, citizenship, and ecology.<sup>36</sup> By being aware of their

own strength and weaknesses, they have the power to accept help when necessary. Promoting autonomy in LTCH requires a departure from the traditional structure found in North America. Instead, it important to rebalance the power between caregivers and seniors to increase their level of privacy and personal space.

#### **DESIGNING A DEMENTIA-FRIENDLY PLACE**

The most prevailing public health challenge that the younger seniors face is dementia. In Canada, there are approximately 500,000 people living with Alzheimer's disease or a related dementia,<sup>37</sup> making it the most significant cause of disability among Canadians older than 65. In LTCH, an estimated 45% of people aged 45 or older had a diagnosis of dementia.<sup>38</sup> The symptoms include forgetfulness, diminished memory, confusion about the present, and misinterpretation of spatial relationships. They are especially sensitive to their environments – unfamiliar surroundings have been shown to confuse and agitate them.<sup>39</sup> Their poorer sight and hearing are exacerbated by their perceptual and visuospatial problems brought on by dementia. Therefore, architecture plays a crucial role in creating a comfortable and appropriate place for the seniors.

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33 McGinn, "Don't Move Me There! Promoting Autonomy in the Provision of Long-term Care for Seniors in Canada," 45.

34 Zimmerman and Cohen, "Evidence Behind the Green House and Similar Models of Nursing Home Care," 720.

35 Heebøll, "Life Long Living Maintaining Everyday Life as Long as Possible," 5.

36 Hayes, "Exploring Baba Yaga: A New Home Shar-

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ing Trend for Older Adults."

37 Wong, Gilmour and Ramage-Morin, "Alzheimer's disease and other dementias in Canada," 11.

38 Ibid. Page 12.

39 Waller and Masterson, "Designing dementia-friendly hospital environments," 64.

In *The Eyes of the Skin*, Juhani Pallasmaa writes about how architecture interacts with the senses: “Sight, touch, hearing, taste and smell can all be experienced through architecture. In architectural spaces qualities of matter, space and scale are measured by the eye, nose, skin, tongue, skeleton and muscle.”<sup>40</sup> For seniors with dementia, the neural connection to their senses are somewhat diminished compared to the healthier individuals. By engaging all of the five senses, architecture could be used as an instrument to restore reinitiate and reconnect to their former selves. As Pallama states in *Hapacity and Time*, “architecture does not struggle against time, it concretizes the course of time and makes it acceptable. It seeks to accommodate rather than impress, evoke domesticity and comfort rather than admiration and awe.”<sup>41</sup> Architecture engages the five senses in order to keep the senior’s body and mind active.

The long-term care facilities should provide the residents with a comfortable, stimulating and meaningful environment. According to the study done by the King’s Fund healthcare organization, there are five overarching design principles for dementia-friendly design:<sup>42</sup> meaningful activity, legibility, wayfinding, orientation, and

familiarity. These aspects of the physical environment highlights some important factors that affect the resident’s behaviour and interaction within the building. Meaningful activities could include learning, social interaction, gardening, and playing games that constantly engages their mind and stimulate the brain. Participating in such activities establishes more cell-to-cell connections in the brain, which diminishes the possible impact of dementia-related changes.<sup>43</sup> Legibility and wayfinding require using better signages, stronger contrast of colours, and uncluttered space to guide the residents along the space. Orientation is supported through the use of natural light, views of nature and visible staff. Finally, familiarity is enabled by personal items, photographs and memory boxes, and domestic scale seating areas that evoke a familiar setting or event that had transpired in their lives.

A well-designed garden may encompass many of the aforementioned principles. It provides a social environment for the families, friends and locales to visit the seniors. Due to its familiar nature, it offers a topic to spark conversations, even for those who are not able to communicate fully. Another benefit is the exposure to natural light. Bathing in sunlight synchronizes the body’s circadian rhythms to the sleep-wake cycles of the solar day.<sup>44</sup> Agitation and sleep

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<sup>40</sup> Pallasmaa, “The Eyes of the Skin,” 78.

<sup>41</sup> *Ibid.*

<sup>42</sup> Waller and Masterson, “Designing dementia-friendly hospital environments,” 66.

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<sup>43</sup> Pallasmaa, “The Eyes of the Skin,” 45.

<sup>44</sup> Chapman, Hazen and Noell-Waggoner, “Gardens

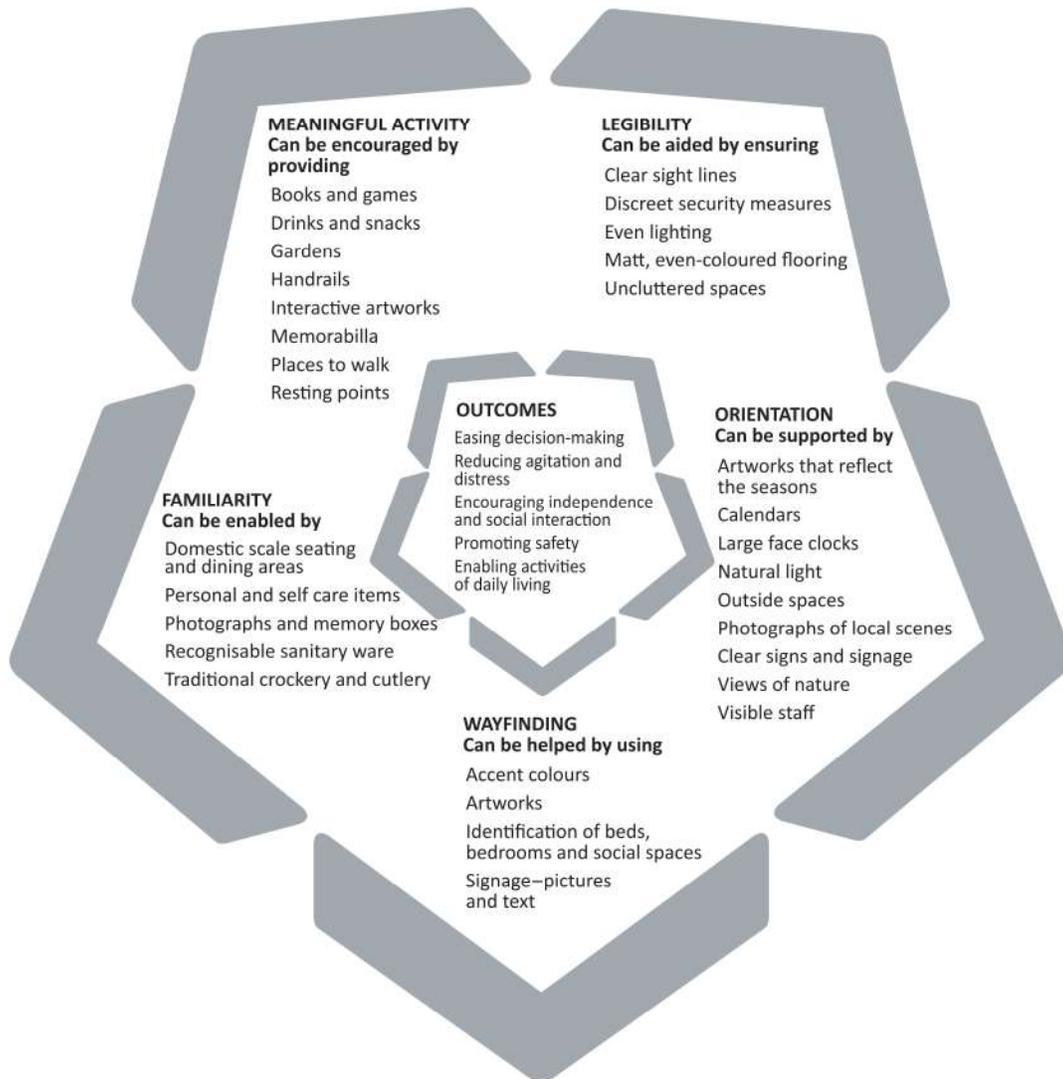


Fig. 2.2: Overarching design principles for dementia-friendly design

disturbances have been observed among people with dementia and correcting the rhythm might encourage more restful sleep. Outdoor gardens also present an opportunity to incor-

porate familiar objects. From plants and flowers that trigger the sense of smell to items such as vintage cars or mailboxes, these elements could be strategically placed to encourage the residents to recall memories. In Germany, fake bus stops have been installed outside of nursing homes for dementia patients with “exit-seek-

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for People with Dementia: Increasing Access to the Natural Environment for Residents with Alzheimer’s,” 252.

ing” tendencies.<sup>45</sup> These patients often manifest agitation that is expressed as increased level of excitement, anxiety or abnormal motor behaviour.<sup>46</sup> The agitated behaviour might result in the patients wandering aimlessly and leaving their nursing home. By giving them a place to go when they are inclined to wander, the fake bus stop method provides a safe retreat for the patients and significantly decreases the chance they will wander away from the facility. The frequent disruptiveness of the agitated behaviour of the patients causes mental strain to the caregivers, which ultimately affects their well-being and capability.<sup>47</sup> From a design perspective, these stops could be naturally integrated into the garden not only to discourage wandering but to provide a social place for the people to gather. It would create an environ-

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45 Lorey, “Fake bus stops for persons with dementia,” 1.

46 Sourial, McCusker and Abrahamowicz, “Agitation in demented patients in an acute care hospital: prevalence, disruptiveness, and staff burden,” 190.

47 Ibid., 191.

**PART III:  
HEALING ENVIRONMENTS**

*“The medicalization of our society has initiated a process in which the non-medical problems of daily lives are more and more treated as medical.”*

*-Mirko Zardini*

ment that promotes social exchange not only amongst the seniors but also with the locales too. the seniors but also with the locales too.

**HISTORY OF HEALING SPACES**

Throughout history, the concept of healing spaces has been transformed and re-emerged in different forms. Traditionally, home was the main place of healing for many patients before hospitals became institutionalized. These healing environments were closely associated with religious orders but have provided distinctive civic duties within the city. The urban hospital landscapes from the eighteenth to the nineteenth century mostly encompassed large central courtyards with emphasis on fresh air, lightings and hygienic conditions. As English social reformer Florence Nightingale (1820-1919) describes in her book *Notes on Hospitals*, “[light is] quite perceptible in promoting recovery, the being able to see out of a window, instead of looking against a dead wall; the bright colors of flowers; the being able to read in bed by the light of a window close to the bed-head.”<sup>48</sup> Her studies have served a new model for the healthcare

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<sup>48</sup> Burpee, “History of Healthcare Architecture,” 1.

design for many years to come. However, with the advancement of technology in twentieth century, the hospital architecture became more medicalized. The corridors were no longer places for social gathering, the access to sunlight for patients has decreased, and was substituted by fluorescent lighting, and the circulation became very complex and disorienting for the patients. The hospital has turned into an efficient machine focussed on combating illnesses and providing cures rather than creating a healing atmosphere.

In the book *Imperfect Health: Demedicalization of Architecture*, Mirko Zardini and Borasi Giovanna describe the society's obsession with health: "the medicalization of our society has initiated a process in which the non-medical problems of daily life are more and more treated as medical."<sup>49</sup> Inevitably, the field of architecture and healthcare is the prime example of this statement. "[Architecture relies] increasingly on medical rhetoric to describe problems and arrive at solutions defined in the medical milieu."<sup>50</sup> The two fields have become so interdependent on each other that the vocabularies used to describe and solve problems are almost interchangeable, inadvertently affecting and restricting their potentials. As such, architecture is seen as a treatment. At this point, the demedicalization pro-

cess "might allow the discipline to escape the ambiguity and moralism of contemporary ideas of health."<sup>51</sup> The key here is to dissect the lingering connection to healthism and restore the autonomy of the discipline so that it may configure itself more appropriately to the given context.

### DEFINING A HEALING SPACE

The origin of the word "healing" is rooted in the Anglo-Saxon word "hælan," which means to make whole, sound and well.<sup>52</sup> It pertains to the idea that the recovery of a person should be approached from multiple levels to restore the former healthy state of being. To "heal", however, should be differentiated from "cure." Healing is a holistic process in which both the mind and body are connected and actively involved in reducing the person's stress or distress. Curing, on the other hand, is about alleviating the symptoms of the illness or injury. Healing involves a journey through complex interior terrain towards a potentially more peaceful state.<sup>53</sup> The illness might not be fully cured but the person might be at ease with or accepting of their physical conditions, for what is possible. The process of healing is multi-dimensional and it incorporates the physical, mental, spiritual,

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49 Borasi and Zardini, "Imperfect Health: The Medicalization of Architecture," 24.

50 Ibid. Page 35.

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51 Ibid, Page 36.

52 Dictionary, "Heal."

53 Howard, Pope and Ruzek 1977, "Humanizing Health Care: The Implications of Technology, Centralizing, and Self-Care," 11.

emotional, and social components of a patient's being.<sup>54</sup> In contrast to the Western medicine's focus on the physical cure, the healing process is more complicated, especially if the illness is severe. The body's endocrine, autonomic and immune systems all work holistically to restore a person's being. According to Ulrich, the restoration of both mind and body starts from stress reduction. When the body's perceived threat has vanished, the person enters a restorative state where the benefits include "a more positively toned emotional state, mitigation of deleterious effects of physiological mobilization, and the recharging of energy expended in the physiological arousal and behaviour."<sup>55</sup> These responses typically occur in a safe, non-threatening settings such as at home or within nature.

For seniors with long-term debilitating illnesses, the healthcare service should adapt a humanistic approach that prioritizes the senior's role. The delivery of service should be a "care that enhances the dignity and autonomy of patients and professionals alike."<sup>56</sup> It involves informing the patients about the illness, exploring possible treatments options, and allowing them to express their feelings about their experienc-

es. Much like how autonomy is important when the seniors first enter long-term care facilities, it serves a similar purpose here too. The patients need to be treated with respect, given freedom to make their own choices and encouraged to think positively. Given how complicated a healing process could become, the environments play a critical role in augmenting the overall experience.

## HEALING ENVIRONMENTS

The multi-dimensionality of healing has a direct connection to the physical spaces. From the width of the corridors to the walkability of a neighbouring area to access to nature, it is the collective presence of design elements that contribute to creating a holistic healing experience for the inhabitants. At a larger scale, cultural geographer Wilbert M. Gesler places healing environments as the subset of "therapeutic landscape" concept.<sup>57</sup> It is operationalized by taking multiple healing environments and viewing them as interconnected networks. Therapeutic landscapes are categorized in the following four groups: natural, built, symbolic, and social environment.<sup>58</sup>

## NATURAL ENVIRONMENT

Nature has been essential the traditional way of healing. It is often the most common site of

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54 Gesler, "Healing Places," 25.

55 Ulrich, "Biophilia, biophobia, and natural landscapes." 99.

56 Howard, Pope and Ruzek 1977, "Humanizing Health Care: The Implications of Technology, Centralizing, and Self-Care," 14.

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57 Gesler, "Healing Places," 14.

58 Ibid. Page 20.

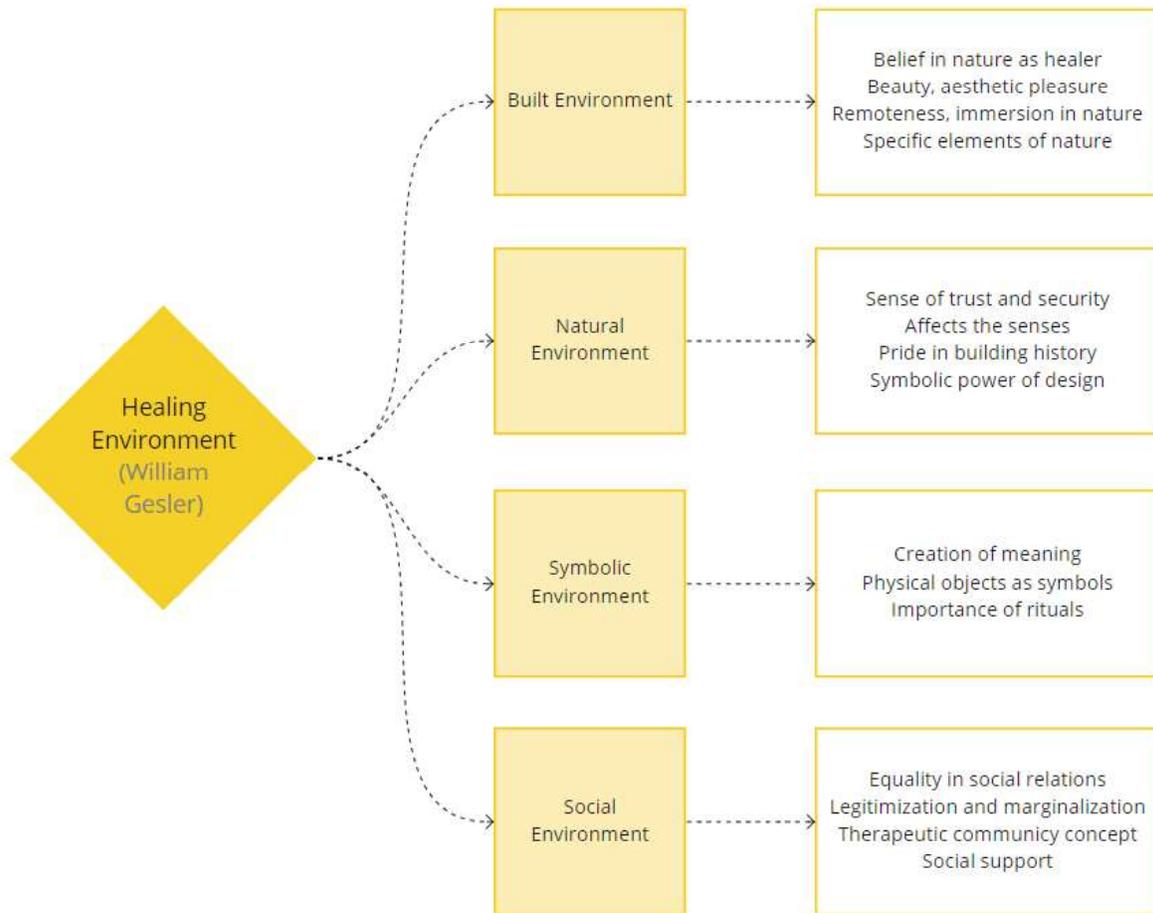


Fig. 3.0: Four Principles of a Healing Environment

refugee for those who seek healing. Traditionally, water has been a symbol of healing.<sup>59</sup> In Christianity, it has been used for purification to purge the uncleanness both from body and soul. The sound of water flowing, for example, induces a meditative state in people. Other example includes gardening. Many studies have revealed its potential therapeutic effect through physically touching the soil, prepar-

ing the earth, and planting the vegetations.

Our liking for nature could be summarized through the biophilia hypothesis by Kellert and Wilson; it states that as humans evolved, they acquired an affinity for nature and therefore feel comforted within it.<sup>60</sup> The green colour found in forests lies on the colour spectrum of 555 nano-

<sup>59</sup> Marrin, "Water Symbolism," 3.

<sup>60</sup> Kellert, Stephen, and Wilson, "The Biophilia Hypothesis," 10.

meters, which is the optimal range for visual perception.<sup>61</sup> Our bodies have gradually adjusted to detect the colour of nature ever since we were hunters and gatherers. On the similar line of thinking, Stephen and Rachel Kaplan's environmental psychology matrix explains that affective responses towards certain environmental settings stem from a rapid, automatic, and unconscious process.<sup>62</sup> It would mean that our preference for certain natural features are based on evolutionary choices. A green, lush tree would elicit a positive reaction due to its potential to harbour fruits and opportunities to hunt other animals. Of course, individuals would react differently depending on their experience, but the general understanding is that our psycho-environmental preference are rooted in evolution. What is important is that the neural origin of these affective states is located in subcortical areas of the brain where it modulates stress-related hormones.<sup>63</sup> This would explain why our autonomic stress responses react differently to the various types of environmental stimuli.

#### BUILT ENVIRONMENT

*"The environment is typically considered a prime determinant of a population's state of health."<sup>64</sup>*

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61 Jimson, "Why we all need green in our lives."

62 Joye, "Architectural Lessons From Environmental Psychology: The Case of Biophilic Architecture," 306.

63 Ibid. Page 310.

64 Gesler, "Healing Places," 38.

People experience spaces, whether visually or phenomenologically. A built environment, therefore, has a great impact on the residents' moods, emotion, and recovery. In hospital settings, this statement especially rings true. The studies have shown that patients tend to be more perceptive and sensitive of their surrounding.<sup>65</sup> Combined with the sense of pain that is usually accompanied in such settings, the environment plays a crucial role in what they see, hear, smell, taste and feel. The aforementioned design guidelines from Florence Nightingale highlight the importance of adequate light, fresh air and clean rooms in hospital architecture. These hygienic standards were later implemented in London, Scutari and India during the nineteenth century and have saved many lives.

Placebo architecture is a different form of environmental treatment for the patients. Much like a placebo effect, it allows the body to heal through the mind's expectation and perception of the environment. During this phase, the reduction of stress response actively encourages the brain to release stress fighting chemicals.<sup>66</sup> Maggie's Centre is a great example of this effect where the architecture was focussed on creating a comfortable space for doctors, patients, and families to interact. The objective of the

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65 Burpee, "History of Healthcare Architecture," 2.

66 Sternberg, "Healing Spaces," 193.

building was not about providing a direct medical treatment; rather, it was about receiving an indirect treatment through emotional and social support that was aimed at improving the mental state of the patient, which reduces the impairment of stress on the immune system.<sup>67</sup> By understanding the role of a space on people's mood and behaviour, architects and designers can design places for healing and recovering.

#### SYMBOLIC ENVIRONMENT

A perceived space is different from a physical space. It is a conglomeration of the meanings and emotions that were attached to not only the place itself but the objects and materials within. The meaning itself is a symbolic representation of our understanding of the space. If so, the metaphysical space could be used to aid healing. According to Arthur Kleinman, healing mediates between biophysical and cultural worlds. "[It] occurs along a symbolic pathway of words, feelings, values, expectations, beliefs, and the like which connect events and forms with affective and physiological processes."<sup>68</sup> The ailing of the body goes together with the ailing of the mind. By being aware of the positive effect a space could have on one's mental and emotional condition, the process of healing could be expedited.

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67 Annemans, et al, "What makes an environment healing? Users and designer about the Maggie's Cancer Caring Centre London, 2.

68 Kleinman, "Medicine's Symbolic Reality," 209.

#### SOCIAL ENVIRONMENT

The last aspect of a healing environment is the social aspect. Ever since the day humans have lived together as tribes, taking care of the sick have always involved a group of people. From healers, cooks, to families, the sick had to rely on the social structure of the tribe. To this day, healing is very much a social activity. However, if there is one different in the modern days, it is the lack of mutual respect and trust between the healed and healers. The institutionalization of healthcare has driven the relationship to a hierarchical structure. Through a linear relationship, control becomes much easier. In LTCH settings, the senior's schedules and movements are much easier to predict due their tight control over their lifestyles. With the medical professionals having the sole access to health-related information, the patients are left with no choice to confide in them submissively.<sup>69</sup> As such, the Western medicine has dismissed and marginalized other disciplines such as homeopaths and alternative healers. While some of their treatments might not have been proven scientifically, these practices have embraced the emotional and social aspect of healing to a better degree.<sup>70</sup>

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69 Gesler, "Healing Places," 72.

70 Ibid. Page 88.



Fig. 4.0: Housing for Seniors - Exterior

## **HOUSING FOR SENIORS**

PETER ZUMTHOR

The Homes for Senior Citizens by Peter Zumthor is one of the prime examples where the architecture responds to the residents at a deeply emotional level. The building is designed for residents who can still live on their own and look after themselves. There exists a symbiotic relationship between the housing and the existing nursery building. When needed, the residents could take advantage of the facilities in the existing building.

In Zumthor's planning, he empowered the residents by giving them the ability to control their environment in the form of sliding windows, movable planters and detachable awnings. Here recognized the struggle that the seniors go through when their bodies become harder to control as they age. Through these architectural details, his intention was help them regain their dignity back. "The season of life for the elderly deserves to be one of life, hope, humour and vision."<sup>71</sup>

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<sup>71</sup> Wat, "Moments of Spiritual Engagement in Architecture," 6.



Fig. 4.1: Housing for Seniors - Concept Drawing

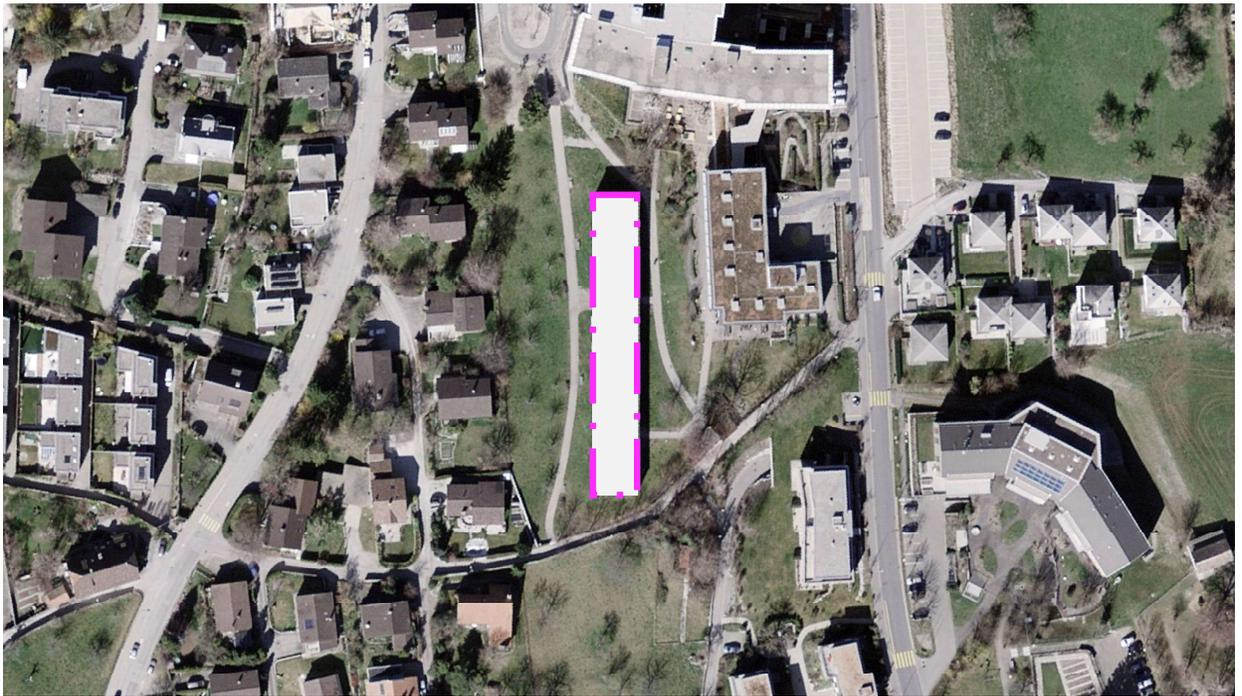


Fig. 4.2: Housing for Seniors - Site Map



Fig. 4.3: Thorncrown Chapel - Interior 1

## THORNCROWN CHAPEL

E. FAY JONES

Designed by Euine Fay Jones, the chapel is situated amongst the woods. Jones wanted the building to be free from religious denomination and be a “place to think your best thoughts.”<sup>72</sup>

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<sup>72</sup> Galloway, “AD Classics: Thorncrown Chapel.”

His intention to create a spiritual place is evident through the use of clear glass windows and wooden truss structures. At 14 meter high, 18 meter long and 7 meter wide, the chapel achieves a slender yet tall proportion, reminiscent of the trees nearby. Due to the similarity, the structure blends well into the surrounding trees, almost disappearing into the background as the season changes. The architecture here is almost non-existent and it only serves to provide a physical presence when needed. “Light, shadows, and reflections play a major role in Thorncrown’s ambience. Because of the chapel’s elaborate trusses and the sur-



Fig. 4.4: Thorncrown Chapel - Interior 2

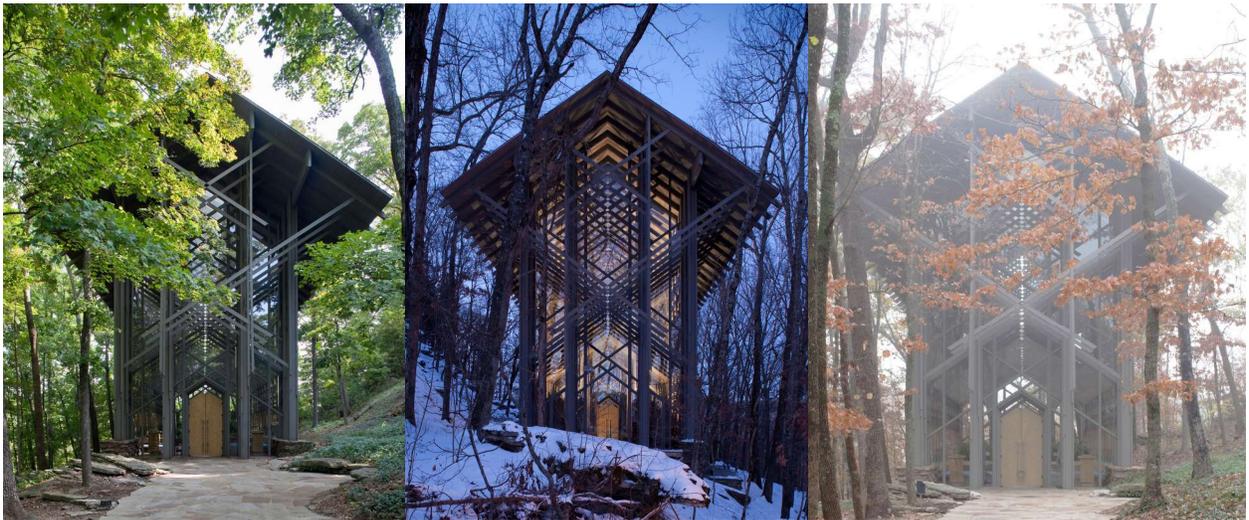


Fig. 4.5: Thorncrown Chapel - Seasonal Changes



Fig. 4.6: REHAB Centre - Masterplan



Fig. 4.7: REHAB Centre - Plan

rounding trees, constantly changing patterns of light and shadows appear during the day.”<sup>73</sup>

## REHAB CENTRE

HERZOG & DE MEURON

Located in Switzerland, Rehab Centre by Herzog & De Meuron is not a typical hospital. The architect wanted to design a multifunctional, diversified hospital building that acts as a small town.<sup>74</sup> In a rehabilitation center, patients could spend up to 18 months in the building after an accident. As they’re adjusting and learning about their changed lives, the place becomes more than a healthcare facility: it becomes their home. As such, the concept of treating the building as a condensed version of a town was essential in creating a hospitable environment for the patients.

The architecture of the building emphasizes on the role of light and nature. The rigidity of the rectangular volume is broken through a series of courtyards that connect the outside to the inside. Here, natural materials and vegetations are used to viscerally connect the patients to nature, almost camouflaging the hospital as a pavilion or garden.

<sup>73</sup> Thorncrown Chapel, “Architecture.”

<sup>74</sup> Arquitectura, “REHAB Basel.”



Fig. 4.8: REHAB Centre - Exterior



Fig. 4.9: REHAB Centre - Interior

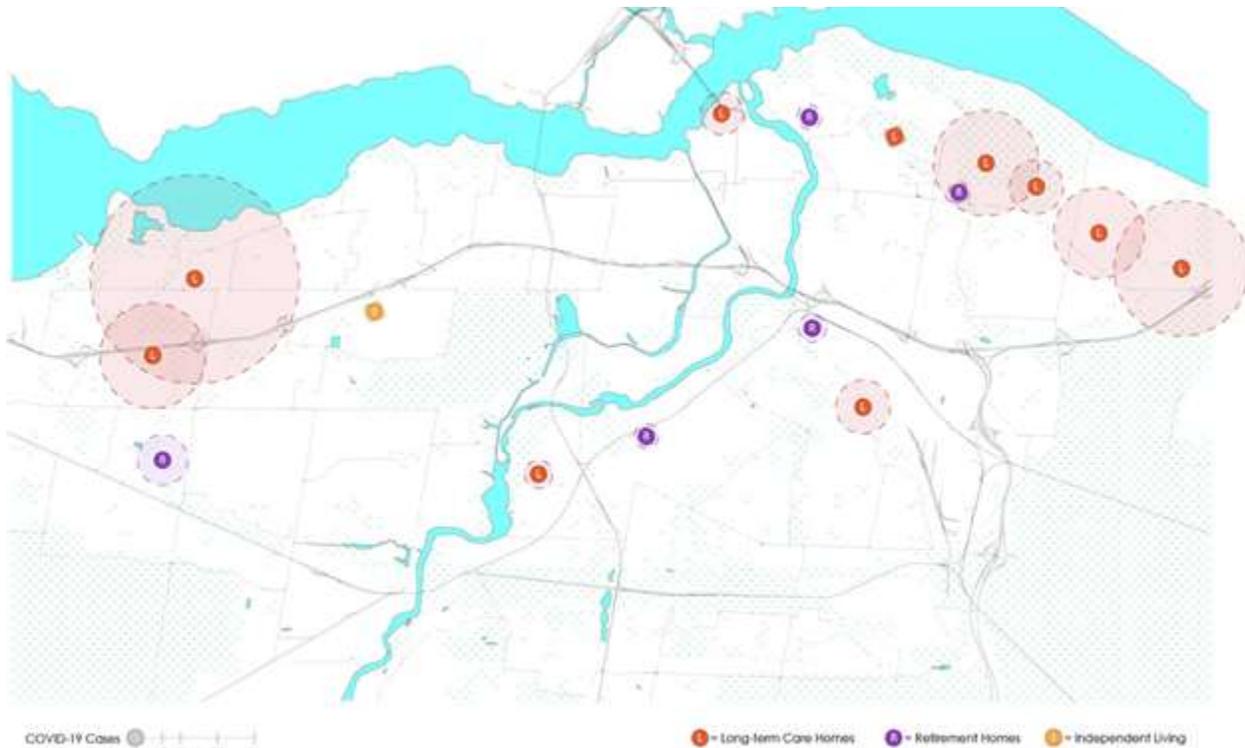


Fig. 5.0: COVID-19 Breakouts in Ottawa Care Facilities

## SITE ANALYSIS

Initially, multiple sites were investigated for their potential to house seniors. The first variable used was the number of COVID-19 cases. It was relevant because a high number of infected cases would indicate poor management and policies which could be seen as an area of potential improvement. As indicated by the

size of red radius, there were three care facilities with the highest breakouts: Carlingsview Manor, Madonna Care Community and Montfort LTCH.<sup>75</sup> From these candidates, the two metrics that were used to analyze their potentials were additional space for expansion and proximity to nature. Consequently, the Montfort LTCH was chosen based on these factors. The site is located about 10km east of Ottawa downtown and has access to a variety of amenities including restaurants, grocery markets,

<sup>75</sup> Ottawa Public Health, "Outbreak Reports in Ottawa Healthcare Institutions."



Fig. 5.1: Site Location Aerial View

and retail stores. Most importantly, it is nestled in a health campus along with Hospital Montfort and Canadian Forces Health Service Center. Towards north of the campus is an isolated patch of Environmentally Protected (EP) zone.

To the north of the facility is what used to be a Decommissioned Canadian Forces Base. Currently, there is a development proposal to create a mixed-use community for approximately 9,800 residents and 2,600 retail and service workers.<sup>76</sup> Over the period of 15-20 years, the community will feature condos, affordable housing, mixed-use buildings, and public

schools.<sup>77</sup> Some of the objectives highlighted in their vision include a wide range of housing types, pedestrian-oriented pathways, and attractive urban spaces. However, upon further conversation with the representative from the development group, I have discovered that only 10% of the housings will be affordable. There will be few Veteran Houses but generally the units will be catered to multi-families. It is a lost opportunity to house seniors, given the community's proximity to nature and hospital.

As the research progressed, the general finding was that the potentials of the site were not being fully realized. Despite being a health campus,

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<sup>76</sup> MMM Group, "Former CFB Rockcliffe Community Design Plan," 9.

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<sup>77</sup> Ibid. Page 11.



Fig. 5.2: Walkability Analysis of Montfort LTCH

the context was not accessible by any standards. The street was car-centric, the paving was absent of crosswalk signs, and the sidewalk was too narrow to accommodate wheelchairs. If a senior wanted to take a simple stroll in a wheelchair with a family member, the current infrastructure would prove it to be very difficult. It was surprising to see how inaccessible the area is.

### ANALYZING THE FOREST

To the north of the LTCH is a dense forest that remained largely untouched. It's about 98,000 m<sup>2</sup> wide, with a variety of natural species of trees, shrubs and vegetations. Towards the west, the slope becomes steeper at the largest height difference of 10 metres between the highest and lowest point in the forest. The slope became gradual towards the northeast corner of the site.

Originally, the Montfort Woods was designated as General Urban Area that had the potential to develop into residential and institutional uses.<sup>78</sup> However, after an extensive study by the former City of Ottawa's Natural and Open Spaces Study (NOSS), the woodlot was deemed as "significant and worthy of protection."<sup>79</sup> Its extent, quality, maturity of the trees growing within this landscape provided a valuable contribution to biodiversity and wildlife habitat in the urban area. In 2004, the National Capital Commissions (NCC) has filed for an amendment to change the zoning designation to "Natural Heritage Area." The NCC has reassured the committee that the residents of the area have shown a considerable interest

<sup>78</sup> Lathrop, "Official Plan and Zoning - 701-711 Montreal Road," 1.

<sup>79</sup> Ibid.



Fig. 5.3: EP Forest Zone - Threshold Condition

in maintaining the Woods to ensure it remains ecologically healthy, pristine and safe. The report also indicated NCC's willingness to open the forest to be "enjoyed by all Ottawa residents."<sup>80</sup>

However, their statement contradicts their actions. During my first site visit, I had not observed any visible signs of opening up the forest to the community. Instead, the entire perimeter was heavily fenced with barbed wires and had remained abandoned. Also, how the fences played a role in demarcating the different zones was quite striking. As shown on the picture, the trees on both sides of the fence were clearly different. On the Montfort LTCH side, the

trees were mostly coniferous and maintained its green colour throughout the year. On the opposite side towards the EP zone, the trees were deciduous and showed the passage of time. The threshold demonstrated an contrast between simulated and raw nature. On one side, nature is treated as a decoration and the other side is almost seen as an uncontrollable force. Given that they had more than 15 years to integrate the zone into the community, there had not taken any public initiatives, which shows a lack of insight and support from the NCC.

### **STRUCTURAL LANDSCAPE MATRIX**

In order to understand the forest from an experiential point of view, I had referred to Stephen and Rachel Kaplan's idea of structural landscape

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<sup>80</sup> Ibid. Page 2.

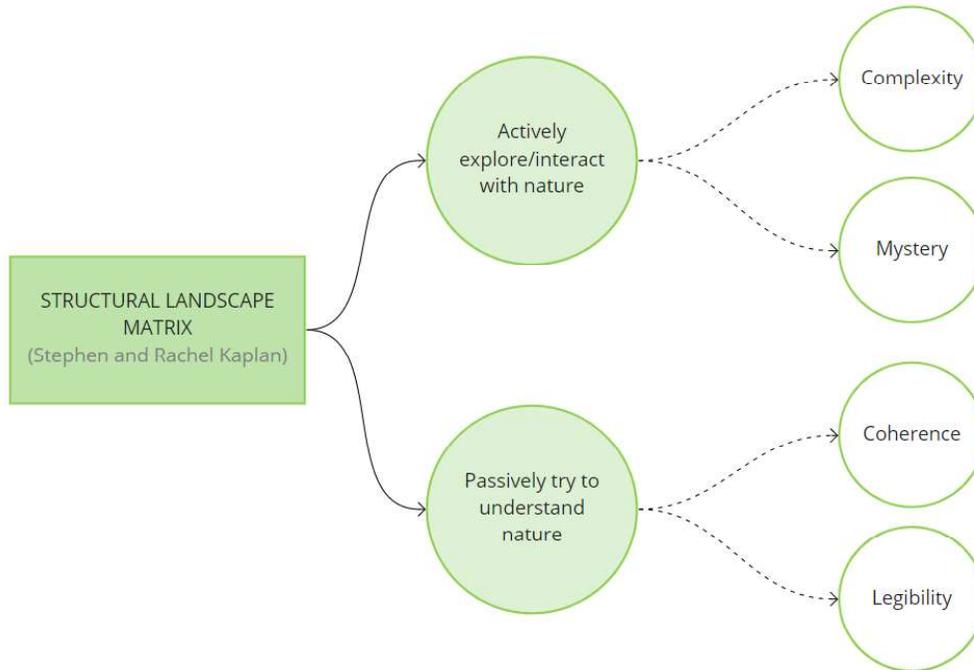


Fig. 5.4: Kaplan's Structural Landscape Preference Matrix

matrix.<sup>81</sup> Environmental psychology is relevant to the study because it studies how different types of settings can elicit different emotions and responses in an individual. Kaplan believes that the affective states towards environments is much more rooted in human evolutionary and is rapidly decided by an unconscious process.<sup>82</sup> From this stance, they developed a preference matrix of a landscape, where they attempt to study the association of visual cues and immediate affective reactions. The Kaplans' model describes two types of postures an individual could have: actively explore the nature or passively try to understand the environment.<sup>83</sup>

81 Joye, "Architectural Lessons From Environmental Psychology," 307.

82 Joye, "Architectural Lessons From Environmental Psychology," 306.

83 Ibid. Page 307.

These attitudes correspond to four structural landscape properties that an individual uses to evaluate a landscape. For example, complexity and mystery are used to actively involve with nature. Stephen Kaplan defines complexity as "how much is going on in a particular scene, how much there is to look at."<sup>84</sup> Mystery could be found in a scene "where it appears as if one could see more if one were to walk into the scene."<sup>85</sup> For passive participation with the landscape, the two properties are coherence and legibility. Coherence is how easy it is to "make sense" of the scene at a surface level of analysis.<sup>86</sup> Finally, legibility refers to the qualities that help an individual orient oneself spatially

84 Kaplan, "Perception and Landscape," 43.

85 Ibid. Page 24.

86 Ibid.



Fig. 5.5 A Map of Surrounding Forested Area

throughout the exploration. These properties exist as metrics to analyze the psycho-environmental nature of a given landscape. This is especially important when most of us are living in a second nature – the nature shaped by the human presence.<sup>87</sup> Recognizing what types of design elements could elicit the right response is the key to creating a healing environment.

### SITE ECOLOGY

To the north of Montfort LTCH exists a development site for Decommissioned Canadian Forces Base. It is surrounded by pockets of nature such as the Montfort Woods, Aviation Pathway Trail

and many other forested areas. Unfortunately, the development proposal does not feature enough vegetations compared to its surroundings. The Figure 5.5 highlights the forested area around the site in a green colour and proposed parkettes in a line pattern. According to the CFB Rockcliffe design proposal, the community will have 10 new parks: two community parks for active and passive recreation, two neighbourhood parks for the local residents, and six parkettes to supplement the larger parks.<sup>88</sup> While the proposal ensure a fair park access to all residents, the same cannot be said to the ecology and wildlife. On the south edge of the proposal

<sup>87</sup> Borasi and Zardini, “Imperfect Health: The Medicalization of Architecture,” 23.

<sup>88</sup> MMM Group, “Former CFB Rockcliffe Community Design Plan,” 22.

is a vegetated swale that separates the Montfort Woods and other forested areas from the site. By physically separating the area, not only the residents will be discouraged from entering the woods but the wildlife will be isolated. Additionally, the proposed parks have more open spaces for the residents than trees for the animals take shelter in. Consequently, the spatial arrangement will deter the wildlife from venturing into the community, isolating the southern forested area from the north. Such instance is an example of habitat fragmentation, where a large expanse of habitat is transformed into a number of smaller patches.<sup>89</sup> The modern urbanization has accelerated the growth of such phenomenon. As a result, the natural habitats are replaced with artificial surfaces, species diversity is reduced, and their behaviours are affected.

According to Ian Douglas, interconnected landscapes are able to mitigate the negative effects of habitat fragmentation and mediate multiple ecological processes.<sup>90</sup> Instead of simply expanding the green footprints of existing forests, he speculates that having a network of smaller forested areas might be more effective at restoring the habitat. Implementing this strategy would require stepping stones that create potential dispersal paths for the movement of

species across open spaces.<sup>91</sup> Such strategy is essential in preserving the ecology of nature. In the case of CFB Rockcliffe proposal, implementing a network of green patches might be a way to reconnect the south and north forested areas. Also, how the plan treats the edge of the forest should be addressed. Instead of a physical separation that deters animal traffic, it should be more porous and open to the forest's habitat. The intermix of the residents and wildlife should be encouraged rather than discouraged to create a healing environment for nature.

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89 Keefe and Han, "Stepping-Stone City," 65.

90 Douglas and Ravetz, "Urban ecology—the bigger picture," 12.

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91 Keefe and Han, "Stepping-Stone City," 71.

### **SITE DESIGN**

The focus of the thesis is creating a healing environment for the seniors who need minimal care assistance. From the site analysis, it is clear that the current context does not fully explore their potentials to create a well-connected neighbourhood. Therefore, the project will approach the site at both macro and micro levels. At a broader scale, it will examine ways to integrate the untapped potential of the barricaded forest, and activate the site for the present and future. At a smaller scale, it will propose ways to house the seniors with different needs. Three major points will be investigated: seamless integration with nature, empowerment through choices, and open social space.

As a way of connecting the new development zone to the existing Montfort health campus, this thesis investigates a way to integrate the protected forest into the community. There are two important moments that happen within the site: on the inside and at the edge of the forest. Inside, a walking trail is proposed to experience to immerse into the forest. Many studies have proven the health effect of walking such as lowered rates of cardiovascular disease, diabetes

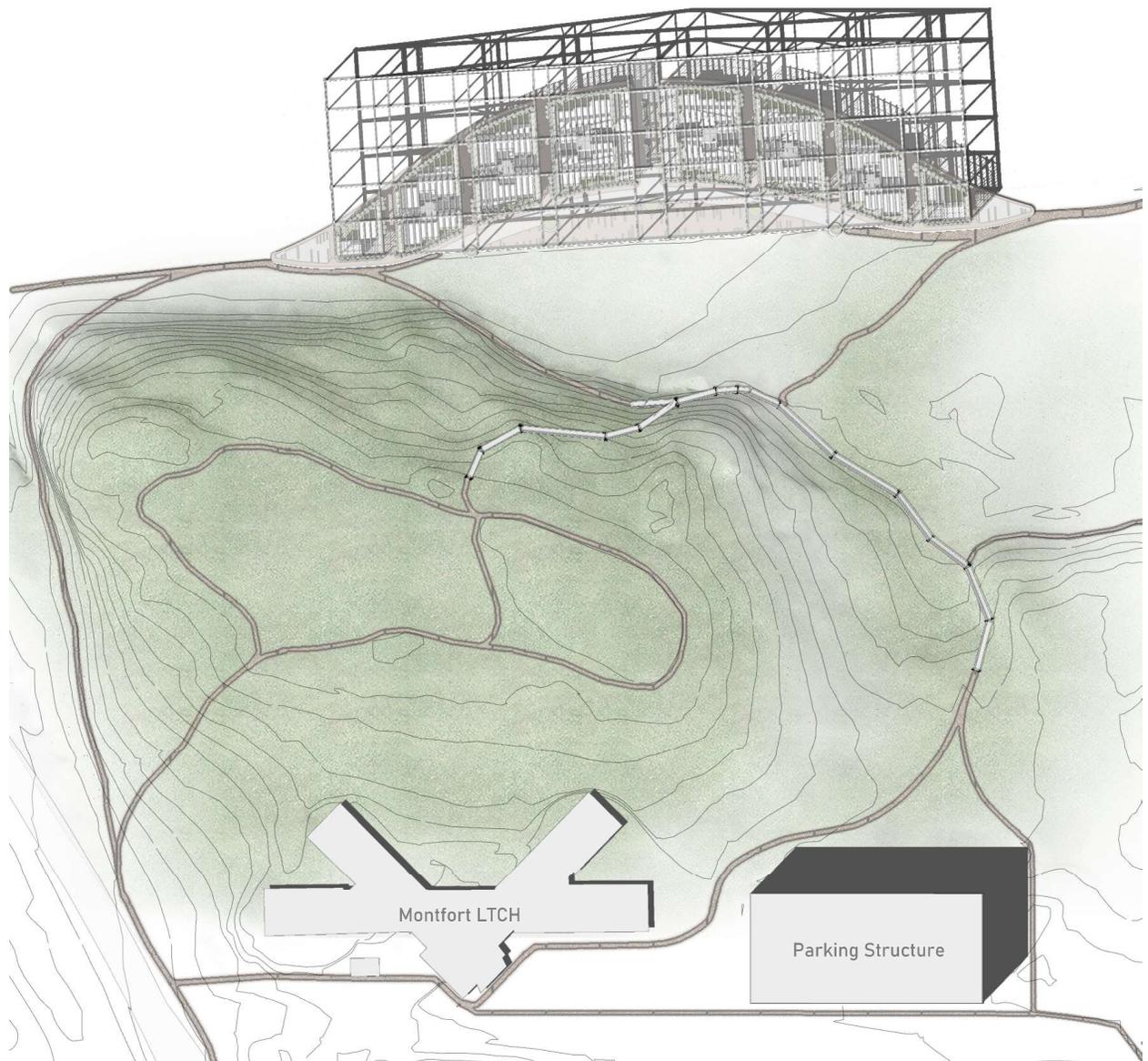


Fig. 6.o: Masterplan

and cancer.<sup>92</sup> Even for people with dementia, physical activity can enhance mobility and slow down the decline of neurological functions.<sup>93</sup> Despite the potential benefits of walking, there are few factors that discourage the seniors from going outside. One is the physical discomfort that comes with the age. They might experience sore legs or become fatigued after a short exercise. A way to prevent this might be installing more benches for the seniors to sit down and rest until they regain their strength. The other one is an environmental factor. Accessibility to parks and trails are often the biggest deterrents to outdoor exercises. Hard surfaces such as concrete exert equal a reactionary force against the joints when stepped on. A way to mitigate this might be using a softer material such as an aggregate paving material with rubber or cork that absorbs the impact. Also, weather could create an unsuitable condition for being outside. Similar to the benches, installing shelters with closed-roof might provide places for the seniors to exercise without being exposed to rain or snow.

The overall design strategy for the trail focuses on the two components: the resting points and the path. As mentioned earlier, there exists

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92 Walburton, "Health benefits of physical activity," 805.

93 Littbrand, Stenvall and Rosendahl, "Applicability and effects of physical exercise on physical and cognitive functions and activities of daily living among people with dementia," 501.

a need for benches and shelters for the seniors to take a break from walking. However, these locations could also act as a social gathering spot for the seniors. Walking creates opportunities for engagement and social connection, which is crucial for people with dementia. Friends and peers could support and motivate each other to improve their physical and mental well-being. Additionally, the concept of fake bus stops could be integrated into the design to help the seniors with exit-seeking tendencies. By providing places for them to stay instead of wandering off, they could safely be guided back to their residence through other seniors. These gathering points could provide meaningful connections for the residents to connect and immerse into the nature.

As for the path of the trail, understanding the experience of walking through the forest was essential. Where in the forest would the seniors feel safe? Secure? In order to analyze the environmental psychology of walking in the forest, I had applied Stephen Kaplan's principles of structural landscape matrix. As indicated in the diagram below, the forest was mapped using the four principles: complexity, legibility, mysteriousness, and coherence. For each matrix, appropriate icons and lineweight was used to emphasize its intensity and direction.

As can be seen on the Figure 6.1, the perimeter of the forest maintains a mysterious presence

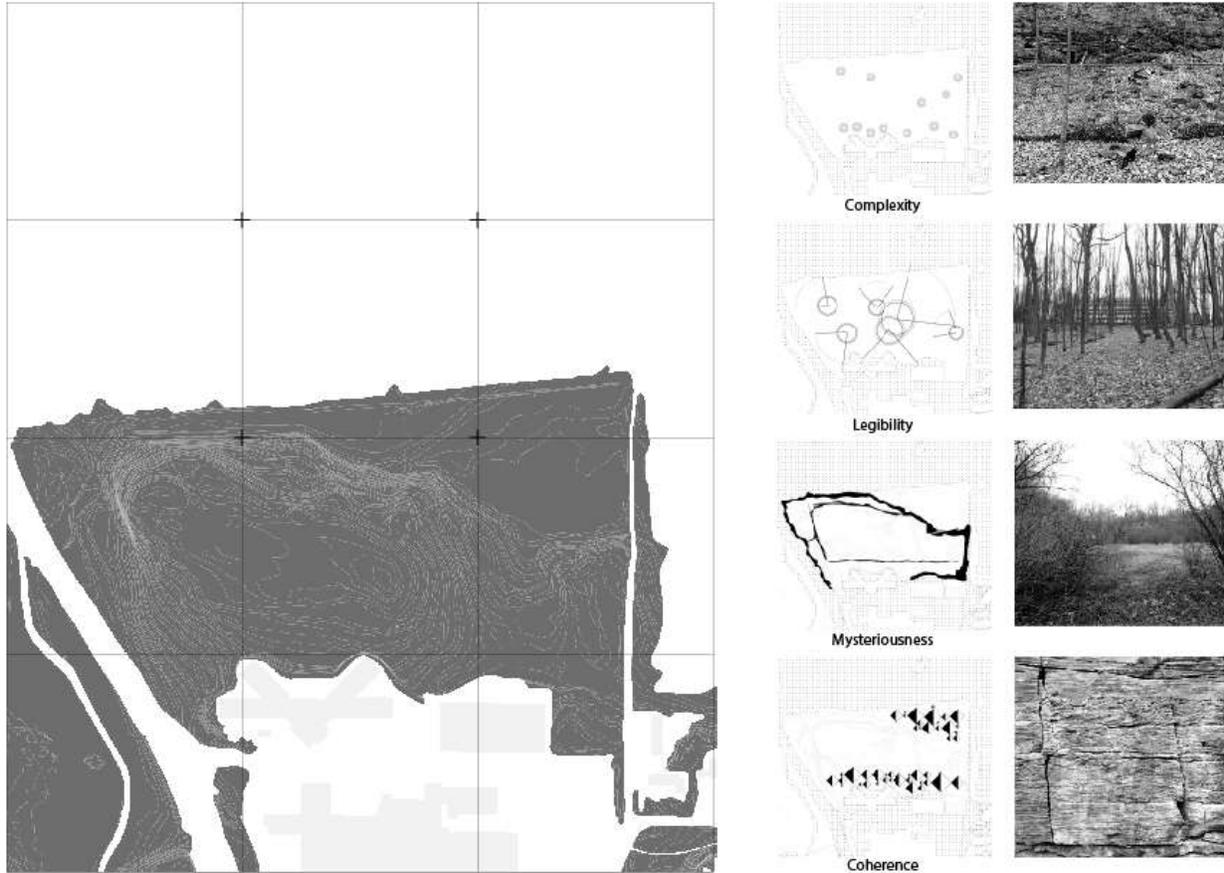


Fig. 6.1: An Illustration of the Site's Structural Landscape Matrix

due to its dense foliage. It veils the inside of the forest through an interplay of shrubs and trees at different heights. The sinuous outline of the vegetation creates a promise of more information when stepping inside. The Montfort Wood has a higher ground towards the centre and lower ground towards the northeast. Therefore, the central area hosts legible refuge points where as Kaplan defines as “places emphasizing being able to see without being seen.”<sup>94</sup> Due to their

safer locations, these points could act as viewing areas where the residents could rest and enjoy the scenery. The next two matrixes are related to memory recalling. People can only remember a certain amount of “working memory” at a time.<sup>95</sup> Anything that aids in dividing the memory into larger groupings will aid its comprehension.<sup>96</sup> Scattered throughout the interior of Wood are complex scenes that act as the pri-

94 Kaplan, “Perception and Landscape,” 244.

95 Ibid. Page 243.

96 Ibid. Page 244.

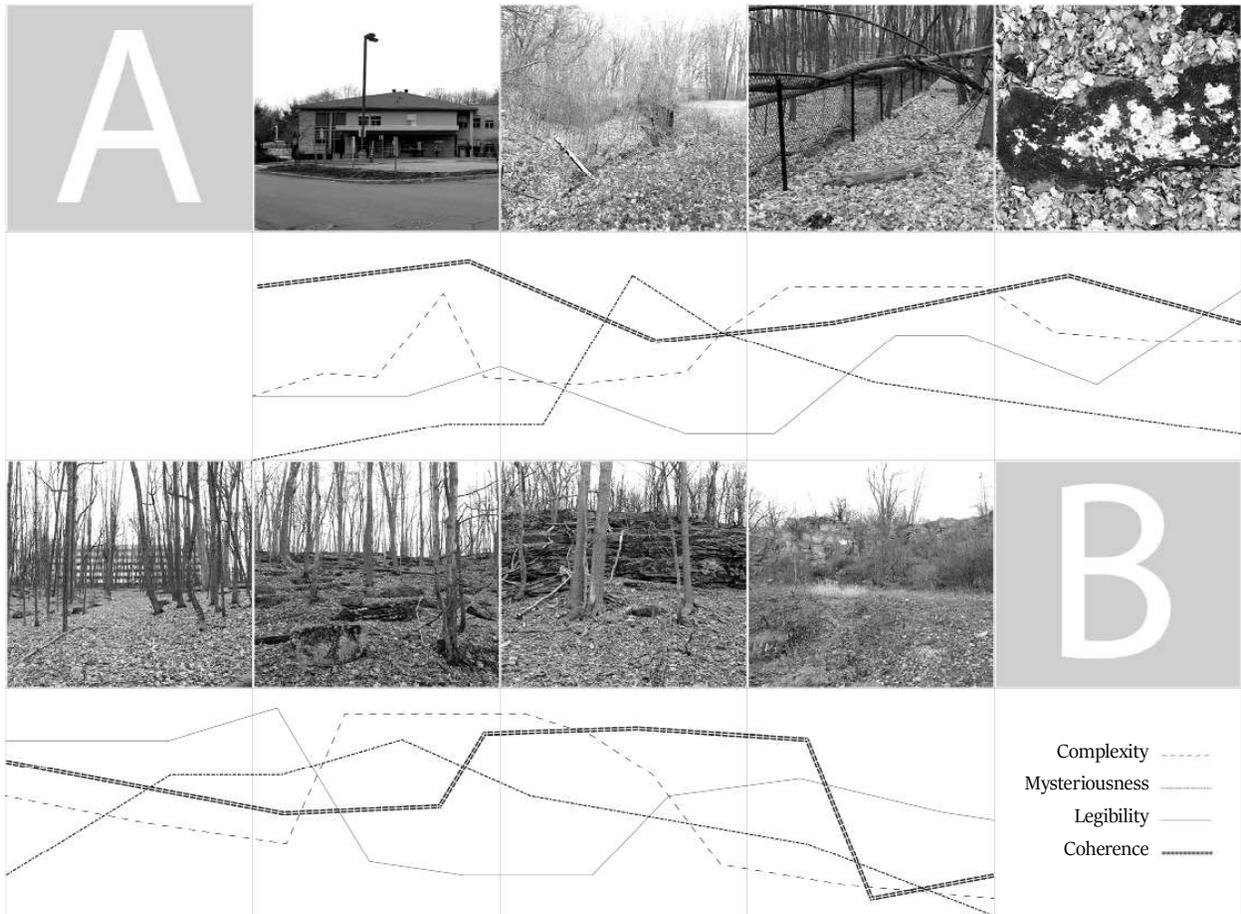


Fig. 6.2: Experiential Journey of the Site Using Structural Landscape Matrix

mary determinant of aesthetic reactions. They reflect the degree in which the components are working together to create a scene for further visual analysis. In an open area, such the north-east, the preference for complexity is lower but it's higher towards the interior. Lastly, the coherent scenes are located in the north and south entrances into the forest. Here, the formation of sedimentary rocks, mosses and grass create different surface textures for visual interpretation. The varied colors leave a stronger impression on the mind compared to a consolidated uni-color,

aiding in a better recalling of the environment.

Around the hillside in the central area, a walkway is used to compensate for the 10-metres height difference to connect the lower and higher ground. The 4-metres width could accommodate for two wheelchairs at the same time. It will have a roof to shelter the residents from the rain or snow. Benches will be intermittently located to provide a resting point that also act as a social gathering space. In terms of materials, a highly durable material made

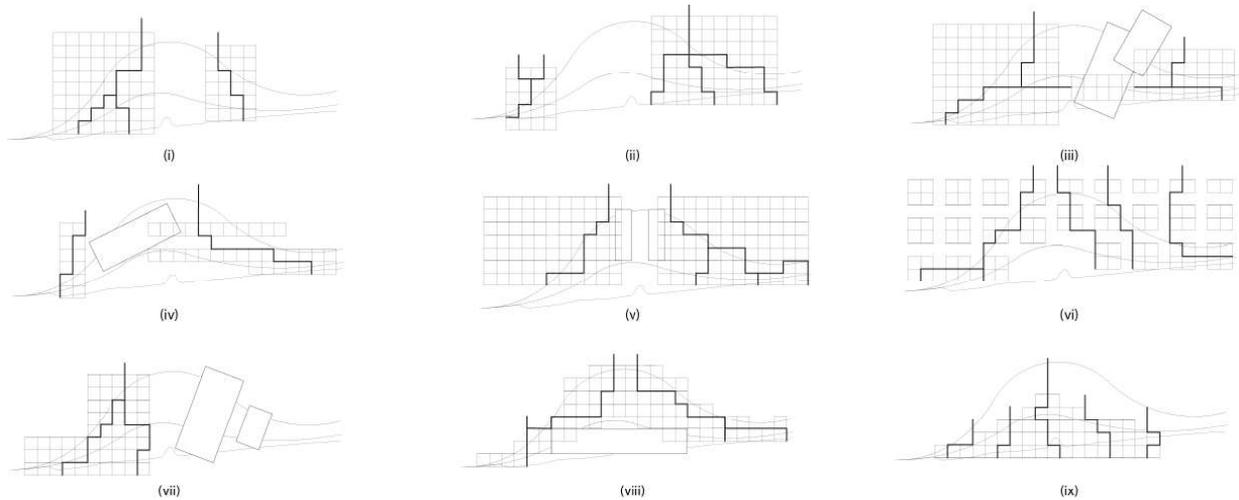


Fig. 6.3: Design Iterations of the Edge Condition

from recycled rubber chips and corks will be used to give an ample traction against slipping when wet or frozen. The structure itself will be made of steel for durability, mixed with wooden rails to emphasize connection to nature.

## BUILDING DESIGN

The architectural concept of the building is to peel away the segment of Montfort Woods' boundary to create a space in-between. The gesture stems from the intent to seamlessly integrate an architectural object into the forest. Through a simple gesture of lifting up the edge, an interstitial space is produced. Next, various objects and grids were superimposed onto this space, as shown on the Figure 6.3. Various permutations were generated to explore the possible design layout of the buildings. Rath-

er than having a continuous volume, the shape was divided into smaller pieces to increase its porosity to the surrounding. Naturally, the fragmented pieces became individual buildings that aggregated to form a larger block.

In terms of the location, the building is situated on the northeast corner of the forest. There are two reasons for the move. First, the topography is significantly flatter to the east, which impacts the walkability of the area. It also gives an opportunity to design a transitional area that looks out onto the forest before entering. Second, as the CFB Rockcliffe masterplan illustrates, the parkette will be near the eastern end of the forest. Having access to two different types of social and natural spaces is crucial in creating a healing environment for the seniors.



Fig. 6.4: Overall Ground Floor Plan

The building is comprised of multiple components: roof structure, double-façade wall, housing, and landscaping. The entire building is sheltered under a massive timber-roof structure with glass panels. These panels are then outfitted with building-integrated photovoltaic cells (BIPV) to generate renewable energy for the community. The shape of the roof is reminiscent of a low-sloped prairie housing rather than being flat. This aesthetic choice was made to reinforce the idea of living under one roof. Below, the roof structure that generates a semi-public space below on the north side, where the residents could walk during the winter under cover and have a chat with other residents or locales. The frontyard serves as an entry point into the paths that lead into the forest in the back. These paths are located between the community housing blocks. Building on the concept of stepping stones,<sup>97</sup> patches of trees or

shrubs are placed at few meters apart to offer a hiding place for the wildlife. These in-between spaces could also be designed with birdhouses or bird feeders to create a habitat for the birds. At about 5-metres wide, these paths are wide enough to accommodate two wheelchairs at the same time. In addition, similar to the walk trails in the forest, benches are installed so the seniors could relax and gaze at the nature.

Towards the end of the path on the south side of the building is a semi-private space for social meetings or outdoor classes. This 150-metre wide space serves as a transition to the Montfort Woods in the back. The architectural and spatial inspirations stem from the intent to unite the natural with the communal environment. Thus, the infusion of vegetation and design elements plays a key role in defining the space. Here, the residents could sit on a patch

97 Douglas and Ravetz, "Urban ecology—the bigger

picture," 14.



Fig. 6.5: Exterior Rendering - A View from the South



Fig. 6.6: Exterior Rendering - Walkway



Fig. 6.7: Ground Floor Plan - Units

of grass in the middle of pavement for a group meditation or yoga classes. Few meters away from it, the seniors could start their daily jogging along the trail that seamlessly leads into the forest behind. The social interaction within the space becomes more open and natural due to the uninterrupted connection to nature.

The project seeks to create a sense of security, identity and belonging for the young adults who need minimal level of care and supervision. The architecture responds to these goals through organization and autonomy. Co-dependent and self-sufficient sub-communities are created to house the seniors in smaller numbers. For every 15 seniors, 4 younger healthcare workers and 1 caretaker are assigned to live in the premise.

These groups live in a detached building that is connected to other communities that could accommodate up to 110 people. The assignment of caretakers living in the premise dissolves the traditional hierarchical relationship between the patient and staff. Instead of being a one-way relationship, both parties could engage and connect with each other as equals. Additionally, intergenerational living is encouraged by mingling the seniors with younger generations who could live and work in proximity to the Montfort hospital. The open nature of the design also allows the architecture to be more porous to its surrounding, which casually invites people of various age from outside the community. They could walk in the front garden with their families and naturally converse with the seniors.

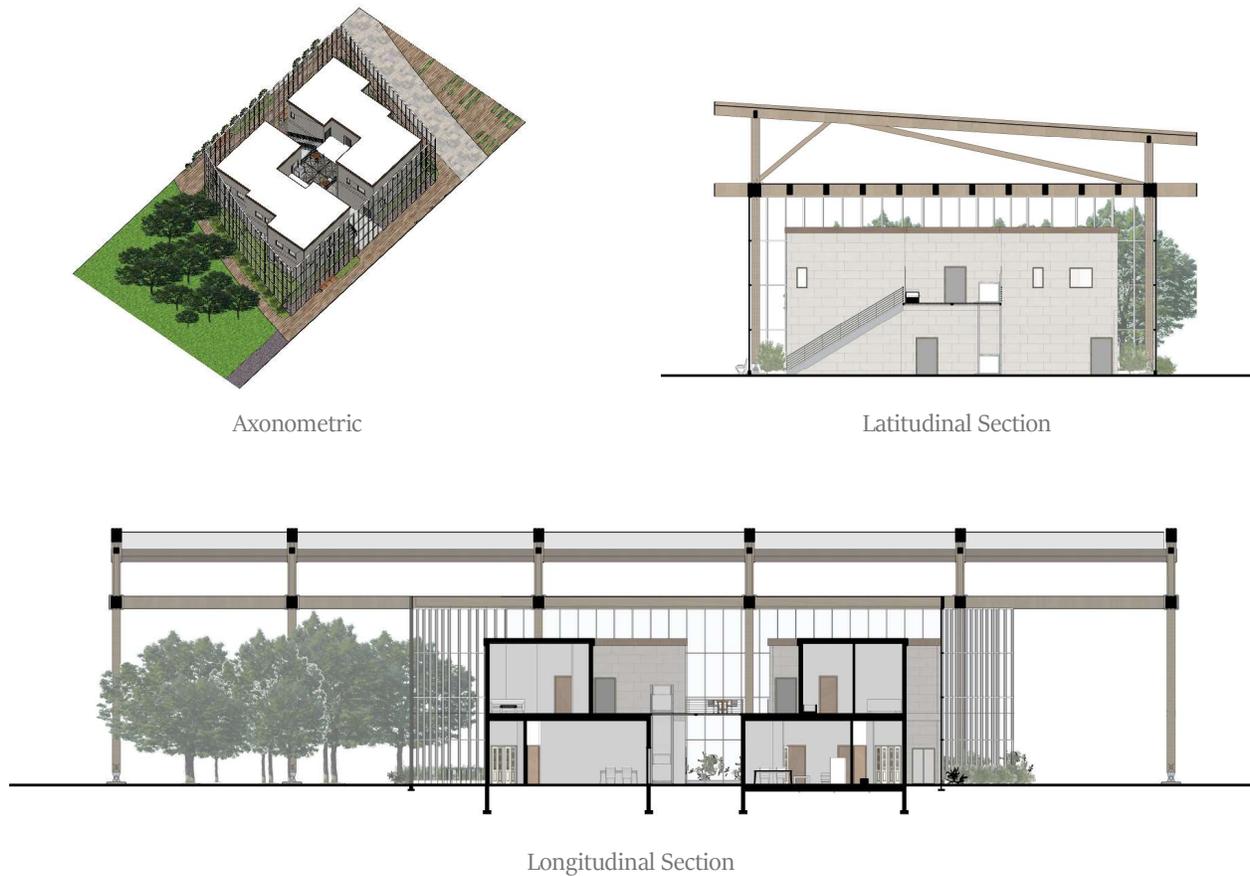


Fig. 6.8: Axonometric and Sectional Drawings

Through co-habitation and interaction with other generations, the emotional and social aspect of healing is addressed in an organic way.

Secondly, the architecture reflects the need for autonomy of younger seniors. When transitioning into a LTCH, one of the most important factors that affects the senior's happiness is their choice in choosing the lifestyle in the facility.

<sup>98</sup>The project offers a wide variety of units to accommodate for the various circumstances and preferences. Some might prefer to live alone because they want independence but others might enjoy other people's company. As such, there are studio, one-bedroom, two-bedroom and three-bedroom apartments. Additionally, the semi-public space to the forest and leisure

<sup>98</sup> Andersson 2006, "Daily life after moving into a care home," 1713.



Fig. 6.9: Typical Unit Plans - GF & 2F

area in the middle generate an opportunity for the residents to choose a form of social participation. Instead of following a rigid schedule found in some care facilities, this type of open engagement respects the younger seniors' rights and views. The emphasis here is to give the seniors the autonomy to define their home and the kind of lifestyle they'd like to have.

The housing units are composed of simple, neutral white tiles that act as a background. The combination of massive roof structure and

BIPV cells on the transparent roof tiles cast a dynamic and ever-changing shadows on these tiles to reflect the time and season of the day. The intention here is to remind the residents of the visual and visceral connection to nature and the world around them. Around these housing units, a double façade enclosure that wraps around them for two purposes. First, by extending all the way to the roof and encasing the house, it creates a controlled environment that shields from the extreme temperatures of Ottawa. The social and private areas out-

side their units could be comfortably accessed with this enclosure. For privacy concerns, trees and tall shrubs are planted around the wall.

Canada is facing a time of unprecedented demographic shift. In fifteen years, the percentage of population 65 and older is expected to rise to a quarter of the entire population.<sup>99</sup> Yet, evidences have shown that the healthcare facilities are not sufficiently equipped for the paradigm shift. As Bernice Neugarten has theorized, the typical Old-Age is diversifying into two categories: Young-Old and Old-Old Ages.<sup>100</sup> What has been traditionally referred to as a third age – after childhood and adulthood – is no longer a sufficient description. Consequently, the society is experiencing a crisis of outdated infrastructure against the new wave of demographic change. If something isn't done to address the emerging cohort, it will soon pose a systematic challenge to the country's healthcare.

As a speculative study, this thesis has explored a way to design and cater for the younger seniors in the form of a retirement housing. In the current state, this particular demographic has no choice but to live in a LTCH with other older seniors or wait in hospitals as ALC patients till the appropriate housing is found. Both options have been shown to be an unpleasant experience for the seniors since they require a delicate balance of active living style and proper treatment for cognitive disorder. With these objectives iden-

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<sup>99</sup> Stats Canada, "Census 2016."

<sup>100</sup> Simpson, "Young-Old: Urban Utopias of an Aging Society," 13.

tified, the thesis has integrated nature as part of the solution; through the act of walking and forest-bathing, the physical and mental state of the seniors is continuously stimulated and challenged. The Montfort site was chosen for this exact reason. The proximity to the woods and the rising number of COVID-19 infections made it a viable candidate to test out the idea. Upon closer inspection, the analysis has revealed that the Montfort Woods remain barred from the public and the residents at LTCH despite its intention to be open for the community's leisure. Additionally, the decommissioned Canadian Military base to the north of the forest provided an opportunity to design and test architectural ideas without being confounded by onerous limitations.

The overarching concept for the housing was to create a comfortable and communal space for the seniors. By breaking up a larger volume into smaller pieces, intimate communities are created where the residents could support one another. With the inclusion of caretaker and younger professionals for each community, intergenerational living is encouraged and the personal connection between the patients and staffs is strengthened. The idea of a healing environment is further addressed through the form of a trail around the building and forest. By strategically inserting social gathering points on the path, the interpersonal relationship is given more opportunity to be nurtured.

Designing an empathetic architecture that truly understands the people's needs is a challenge. In this time of unprecedented demographic shift, the values and standards of people are in a constant flux. The designs and concepts discussed in the paper provide a glimpse at what would happen if the marginalized population of seniors in Ontario is prioritized instead of being sidelined. By allowing the architecture to become an active agent, it addresses the emerging needs of the seniors through positive atmosphere, social gatherings and immersion into nature. Architecture exists beyond the physicality; it borders on the emotional and metaphysical realm and becomes a part of our lives. Hopefully, this thesis reveals the overlooked aspect of society by using architecture as an instrument to illuminate the forgotten part of ourselves.

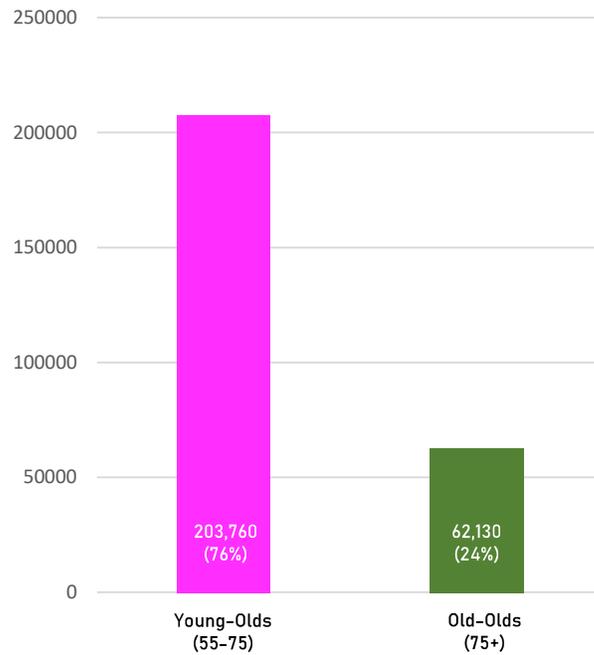


Fig. 8.o: Young-Olds vs Old-Olds Population in Ottawa Region

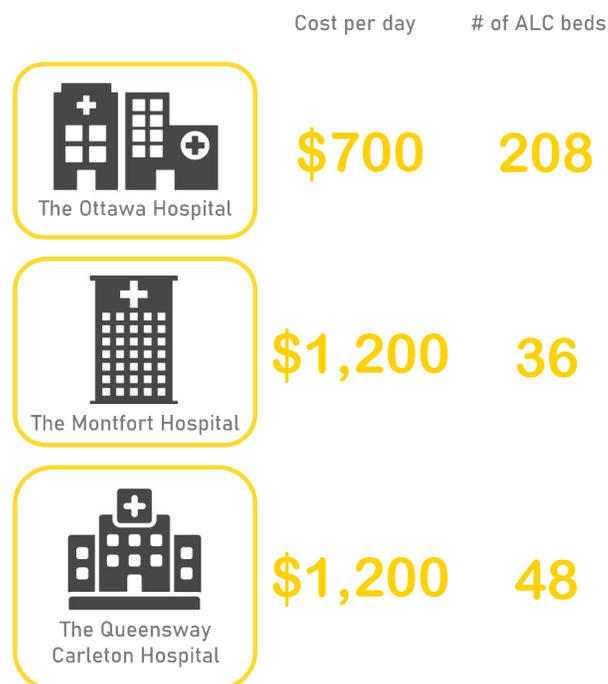


Fig. 8.1: Alternative Level of Care (ALC) Patients in Ottawa



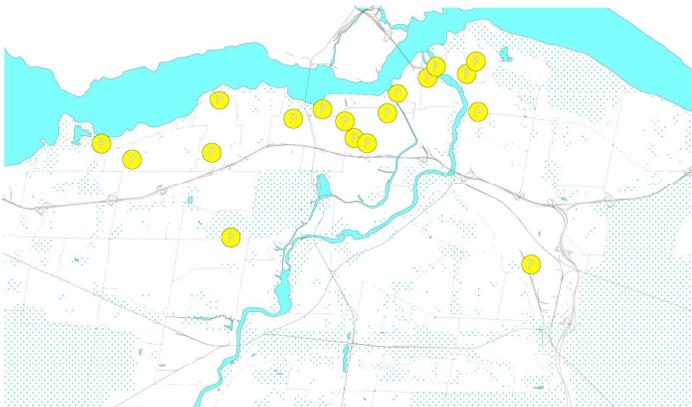
Fig. 8.2: Senior Housing Types in Canada



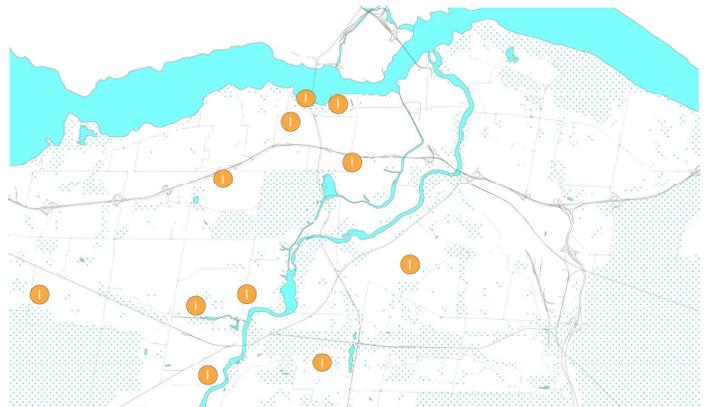
Retirement Homes (35)



Long-term Care Facility (21)



Personal Care Homes (18)



Independent Living (11)

Fig. 8.3: Mapping of Senior Housings in Ottawa

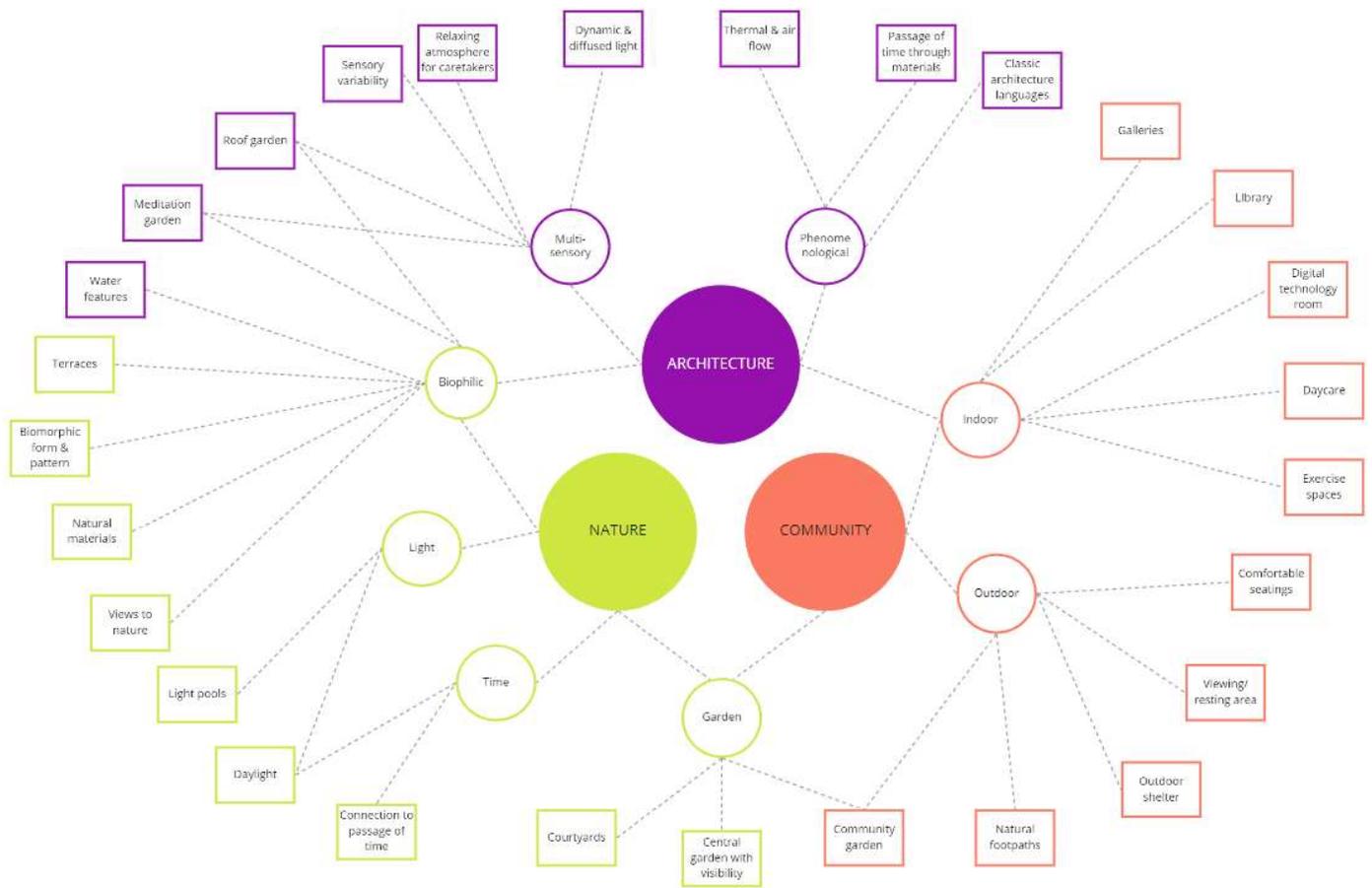


Fig. 8.4: Brainstorm Exercise

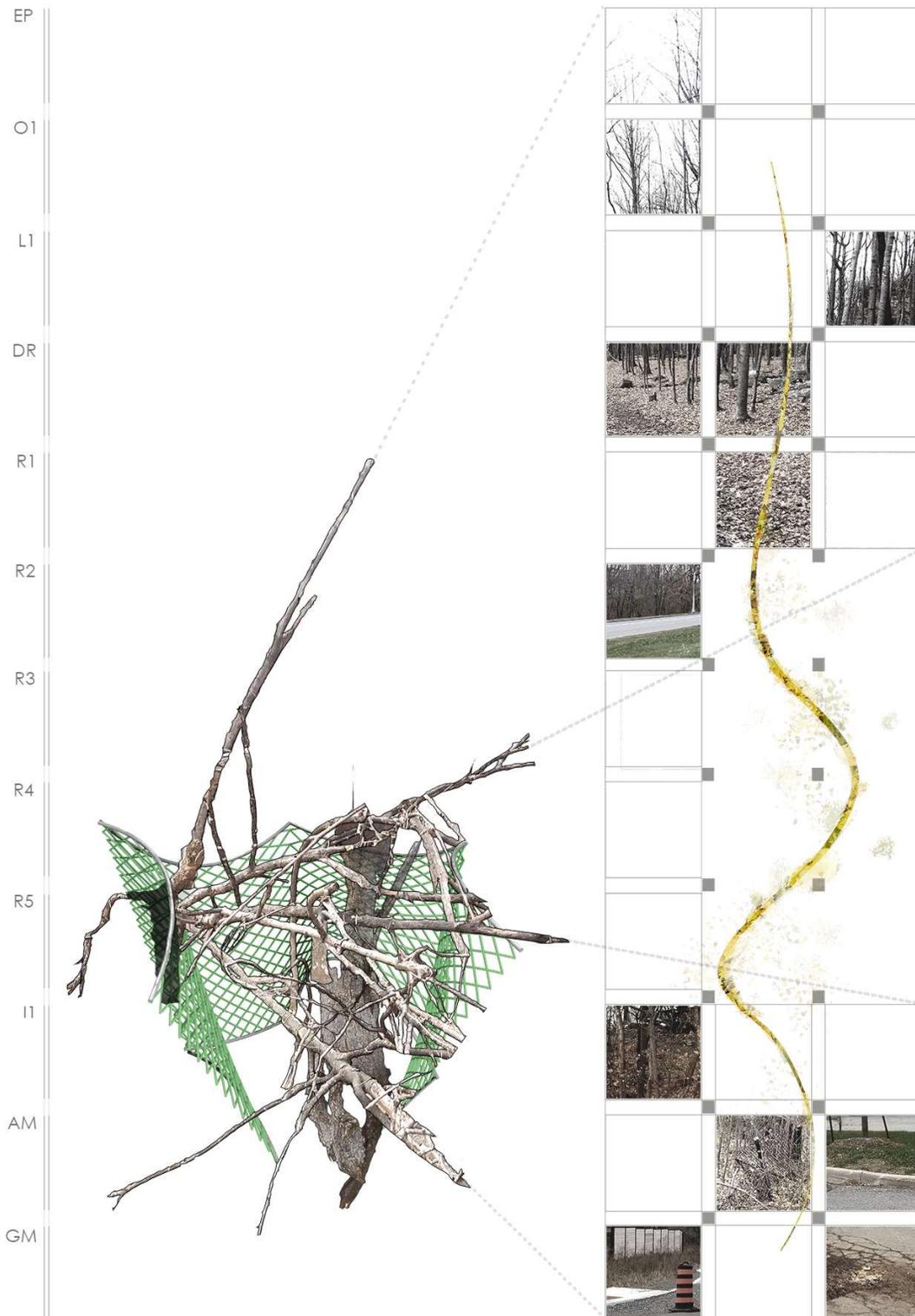


Fig. 8.5: Site Artifact



Fig. 8.6: EP Forest Zone - Simulated vs. Intact Nature

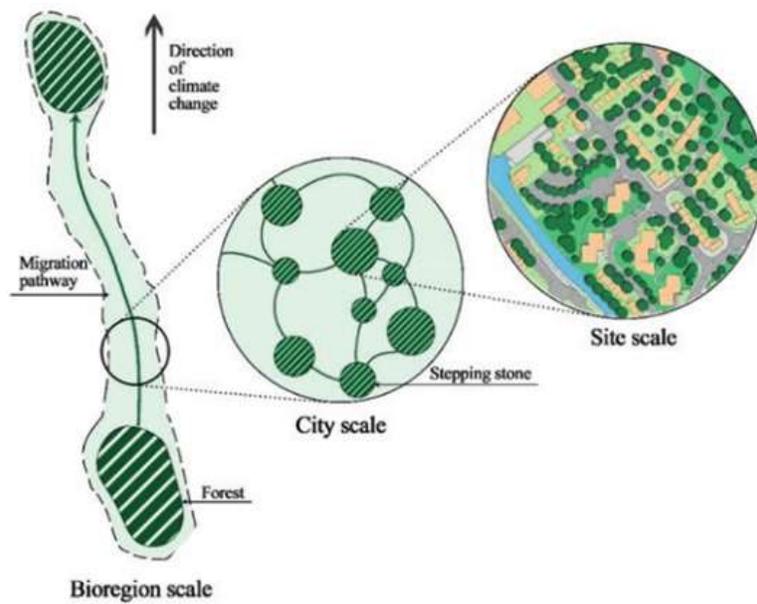


Fig. 8.7: An illustration of the landscapes and processes at three spatial scales in relation to forest migration



Fig. 8.8: Existing Land Uses

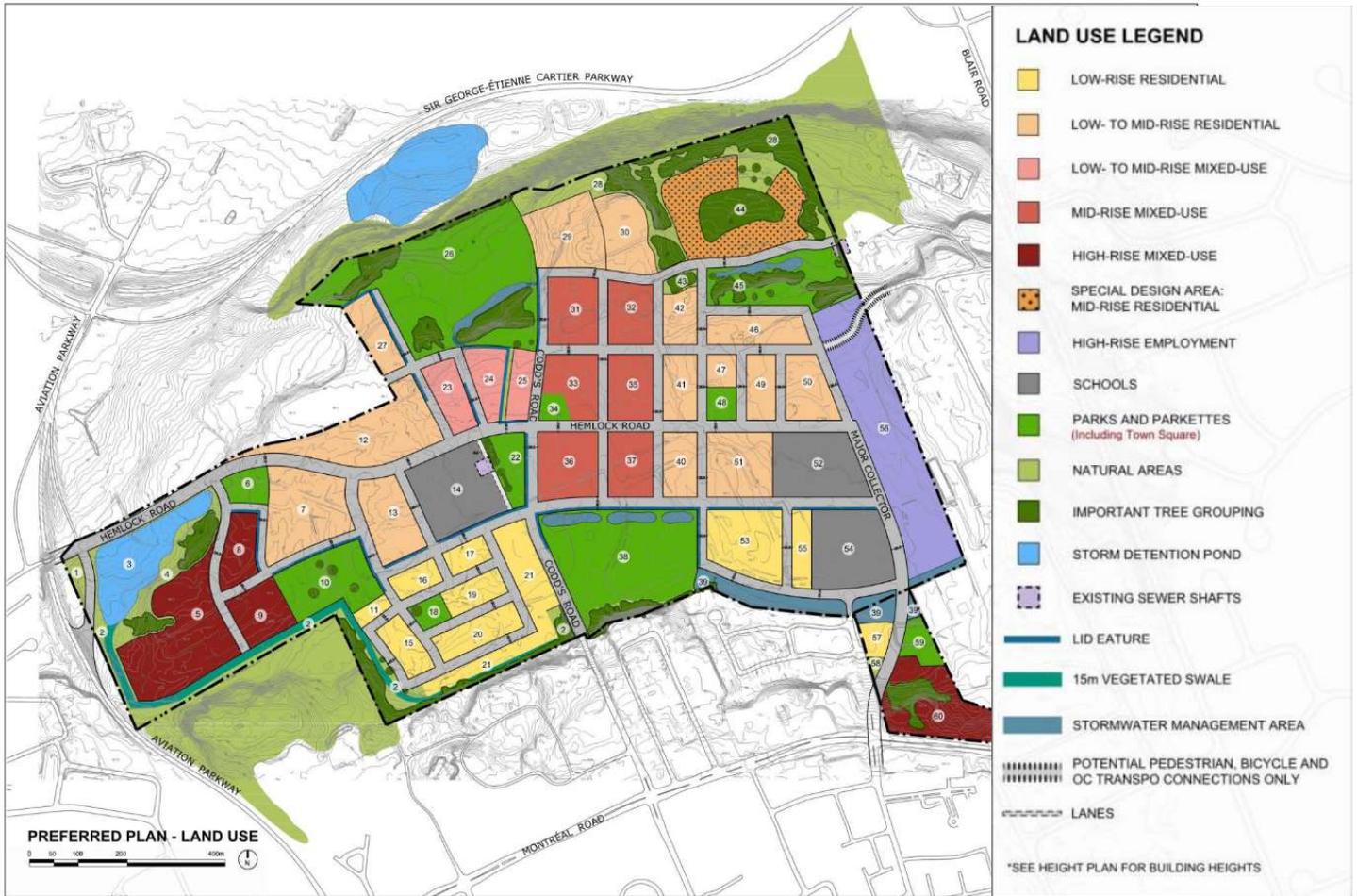


Fig. 8.9: CFB Rockcliffe Community - Site Map of Land Uses

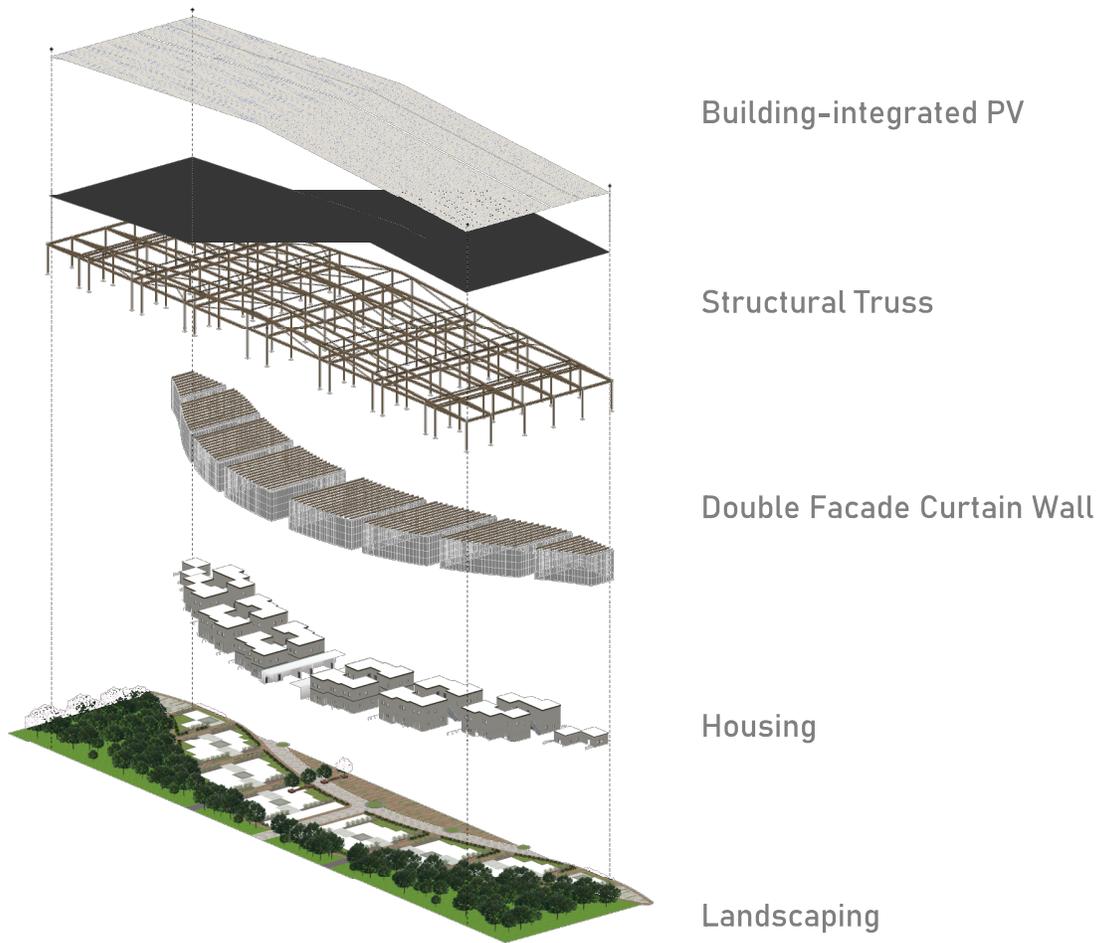
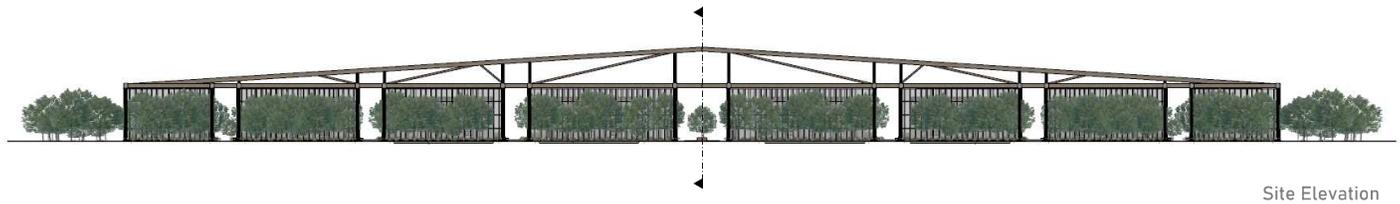


Fig. 8.10: Exploded Axonometric Diagram



Site Elevation



Site Section

Fig. 8.11: Site Elevation & Section



2-BDRM (10)
  STUDIO (7)

Site Plan - 2F

Fig. 8.12: Second Floor Plan - Units

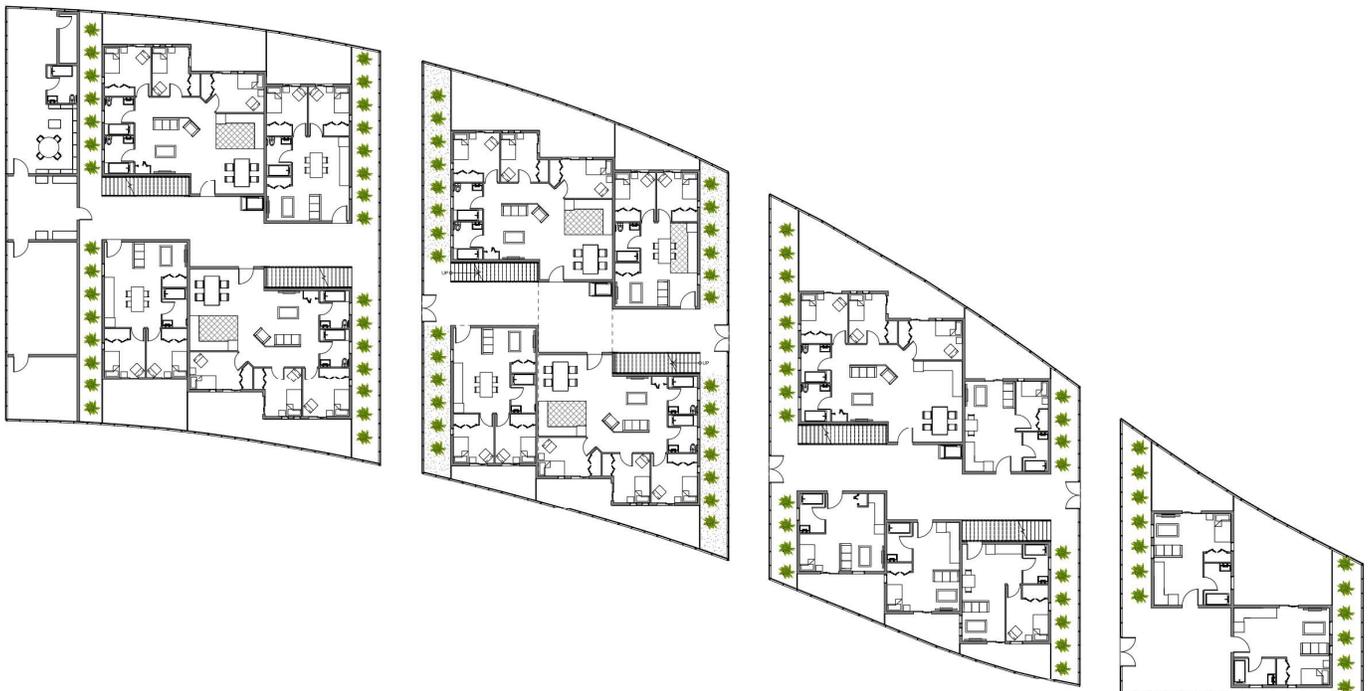


Fig. 8.13: Typical Zone Layout



Fig. 8.14: Exterior Render - Front

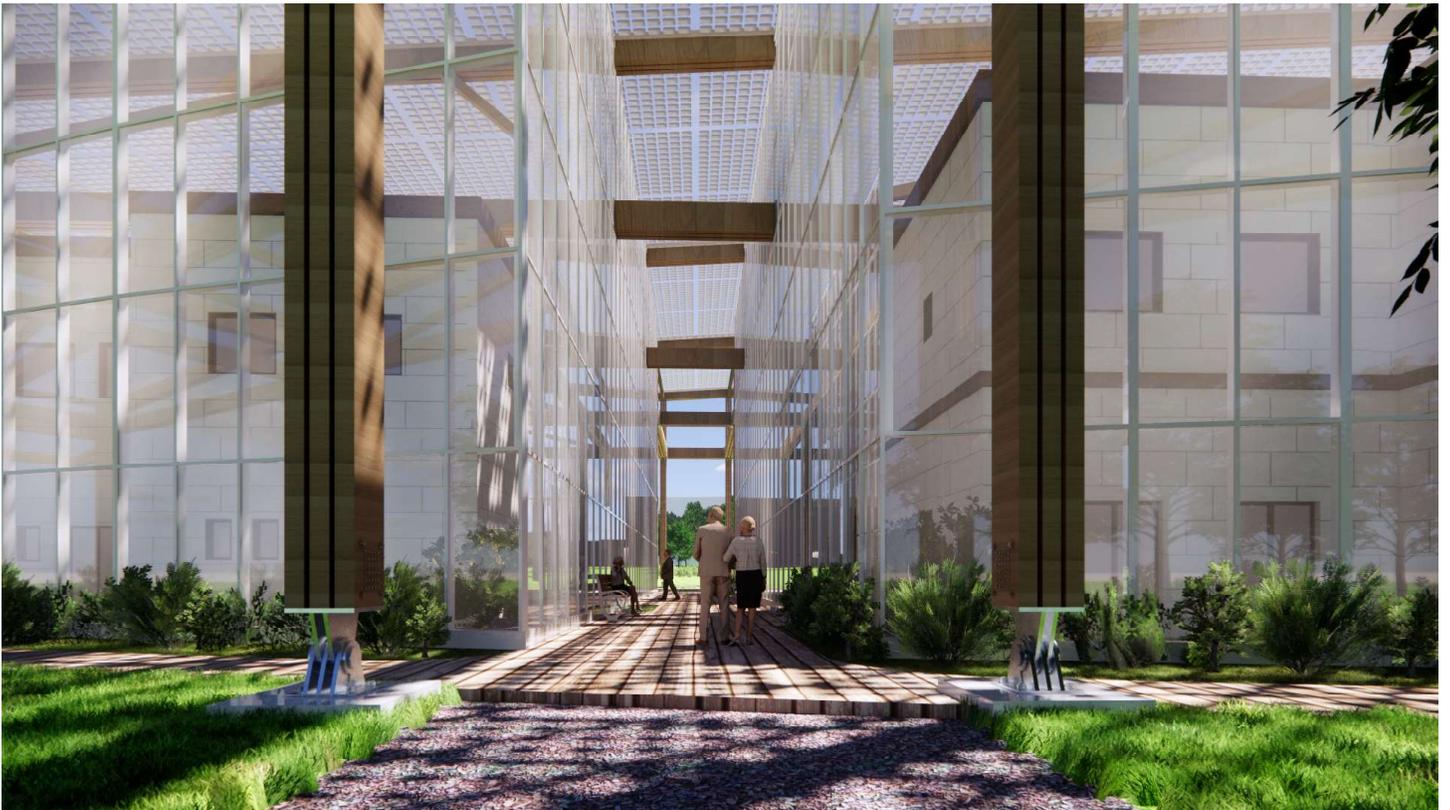


Fig. 8.15: Exterior Render - In-between Path



Fig. 8.16: Interior Render - Social Space

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