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ENVIRONMENT AS A COGNITIVE PROSTHESIS

An architecture of interdependence that reimagines the traditional sources of social solidarity for the New Agers in Danville

by

Melicia van Loggerenberg

Submitted in fulfilment of part of the requirements for the degree Master of Architecture (Professional) in the Faculty of Engineering, Built Environment and Information Technology.

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PROJECT LOCATION
Danville, Pretoria West
Coordinates: -25.7414199; 28.1282367

RESEARCH FIELD
Memory, Legacy and identity

THEORETICAL PREMISE
1. Ageism (discrimination against older people)
2. Geriatric care models in Architecture
3. Cognitive dependency
4. Environments that facilitate change

PROJECT KEYWORDS
Ageism, isolation, marginalisation, modernism, cognitive dependency, implicit memory, Multiple Trace Theory (MTT), inclusivity, independence, purpose, access, association

PROJECT CLIENT
1. Die Blommefonds, The Flower Foundation
2. Age in Action (The South African Council for the Aged)

PROJECT PROGRAMME
Small scale productive landscapes, essential oil distillery, essential oil product making, alternative medicine facility, recreational activities

COURSE LEADER & SUPERVISORS
Prof. Arthur Barker

EDITOR
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ABSTRACT

This mini-dissertation highlights the lack of age-inclusive interventions in public and social environments, specifically pertaining to the growing elderly demographic. A further critique of geriatric care architecture provides insight into the gaps in the discourse of which our failure to consider cognitive dependencies is the biggest shortcoming. The world is going through a seismic demographic shift and as curators of spatial interactions we need to step back into the driving seat for social change.

A more holistic research and design approach yielded spatial implementation strategies tested and iterated on the project site in Danville, Pretoria West. The intangibles of cognitive changes had tangible triggers which allowed for physical implementation. The results of this mini-dissertation can serve as a guideline for future projects advocating against our ageist urban environments, contributing to a knowledge source that we will soon not be able to design without.

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PLAGIARISM DECLARATION

In accordance with Regulation 4(C) of the General Regulations (G.57) for dissertations and theses, I declare that this dissertation, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

I further state that no part of my dissertation has already been, or is currently being submitted for any such degree, diploma, or other qualification.

I further declare that this dissertation is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

Melicia van Loggerenberg (u17073295)

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This mini dissertation started with a wonderful woman with whom I have the privilege of living with. If ever there was an individual who responded to poet Dylan Thomas's plea: that one should not "go gentle into the good night" (Thomas 1951:line 1), it is my mid-eighties grandmother.

As a young girl, I associated ageing with failing. I believed that one's body, mind and spirit would progressively start to fail as soon as wrinkles and grey hair appeared. I have since parted from these unreasonable assumptions but not because my environment, education or media feed challenged me to think critically about my own ageist perceptions. My change of heart was rather encouraged by my 83-year-old grandmother who has "raged against the dying light" (Thomas 1951:line 3) and intends to do so for years to come.

Her inability to conform to ageist perceptions made me curious about modern *New Agers'* (Wildevuur et al. 2013:26-27) relationship with their built environment.

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"First you are young; then you are middle-age; then you are old;
and only then you are wonderful."

DIANA COOPER

Figure 01: Cathy Erasmus my Ouma (Author 2022)

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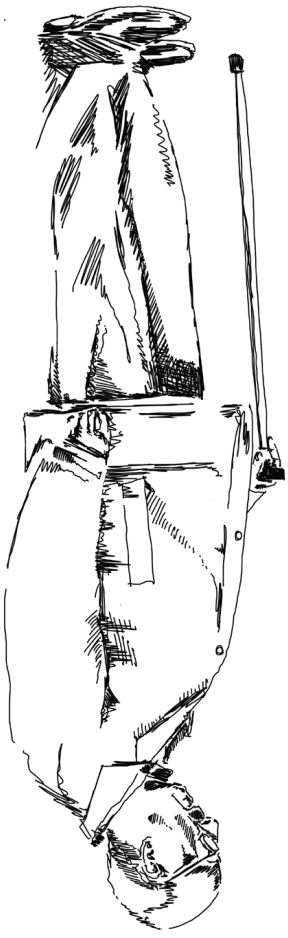

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CHAPTER 01

POSITION AND SITUATION

Chapter 1 introduces the general issue that has resulted in urban and architectural issues. These developed intentions that would inform the research methodology undertaken. Project aims, objectives and contributions are set out in this chapter

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BACKGROUND

"in 2050, the number of older persons in the world will exceed the number of young for the first time in history" *(Shetty 1285).*

1.1. GENERAL ISSUE

DEMOGRAPHIC SHIFT

The number of wonderful individuals in our modern world is growing as we undergo a seismic demographic shift (Shetty 2012:1285) where "in 2050, the number of older persons in the world will exceed the number of young for the first time in history" (Shetty 1285) (Fig. 1.01). The importance of understanding our New Agers' connection to their own environment becomes increasingly more urgent, especially in the developing world. Of the 2 billion elderly people predicted to walk the earth in the year 2050, 80% of these persons will belong to the developing world (Shetty 2012:1285). While fertility and mortality statistics are still high in sub-Saharan Africa, major developmental strides in the fight against infectious diseases and improved contraceptive education have led to a rapidly ageing population (Shetty 2012:1285). While these statistics have encouraged conversation in the global health community, the looming threat "does not feature highly on sub-Saharan governments' policy agendas" (Shetty 2012:1285). Dismissive governing strategies have left little time to implement adequate schemes and policies to cope with the demographic shift.

Our environments and social structures of today were shaped during a time when life was much shorter. Retiring at 65 was a motion first introduced by German Chancellor Otto von Bismarck during the 1880s (Pasricha 2016). Now, more than 140 years later, life expectancy has increased dramatically, and with that, the ability for some to work far beyond 'socially acceptable' age of 65. A car technician understands that a car with a faulty part does not take away from its ability to ever work again and will, therefore, not send it to a scrap yard. If can understand the value of adaptive use in material objects, why are we failing to see the value in people who require modified environments? Have we been blinded by the alternative requirements of our older labourers to the point where their refined skills, shaped through years of experience, are being wrongfully excluded from our economic and social society?

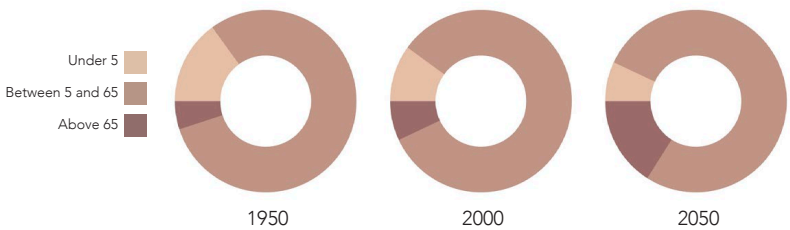

Figure 1.01: Young children & older people as a percentage of global population: 1950-2050 (Author 2022)

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AGEISM

Ageism is the construct that determines the socially acceptable retirement age and dictates the remainder of our old-age lives. Like all other '-isms', ageism is a form of othering that pits us against each other and our future selves (Applewhite 2017).

Modern culture is filled with forms of discrimination, where some require more immediate action than others. The thing about ageism is that it will affect all of us if it isn't already, which makes ageist discrimination the perfect target for collective advocacy. That is not to say that I assume all elderly individuals will experience growing old in the same way regardless of cultural and environmental differences. Experiences will differ vastly depending on physical, political, and social influences (Levitin 2020:xiii), but there is one unifying factor in old age, and that is change. No one will fly through the third act of life free from the changes that will plague our mind, body and spirit.

This type of change will look different in all of us, and while it can be delayed in some instances, it can never be avoided. It is then in the certainty of change that we can associate, empathise and serve; crossing bridges of social, political and cultural differences.

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UNDERSTANDING CHANGE

Physical, emotional, and cognitive change is as dramatic in growing old as it is in growing up (Levitin 2020:179-204), yet the way these changes are felt by growing and ageing individuals differs dramatically. As with most children, we grow up and progressively experience a decrease in dependency on the people in our micro-environments and, with that, a decrease in cross-generational engagement. In old age, we see the opposite happening when we rely on the people in our micro-environments most. We are more isolated than ever before (Levitin 2020:179-204) (Fig. 1.02).

It is no secret that ageing is controlled by environmental and genetic influences, and medical advancements to counter bad genetic determinants have been progressive (Shetty 2012:1285), where a preventative care model is favoured over a diagnostic care model (Ihrig 2013). I am not sure we can say the same about how we construct geriatric care facilities or even consider our everyday social environments.

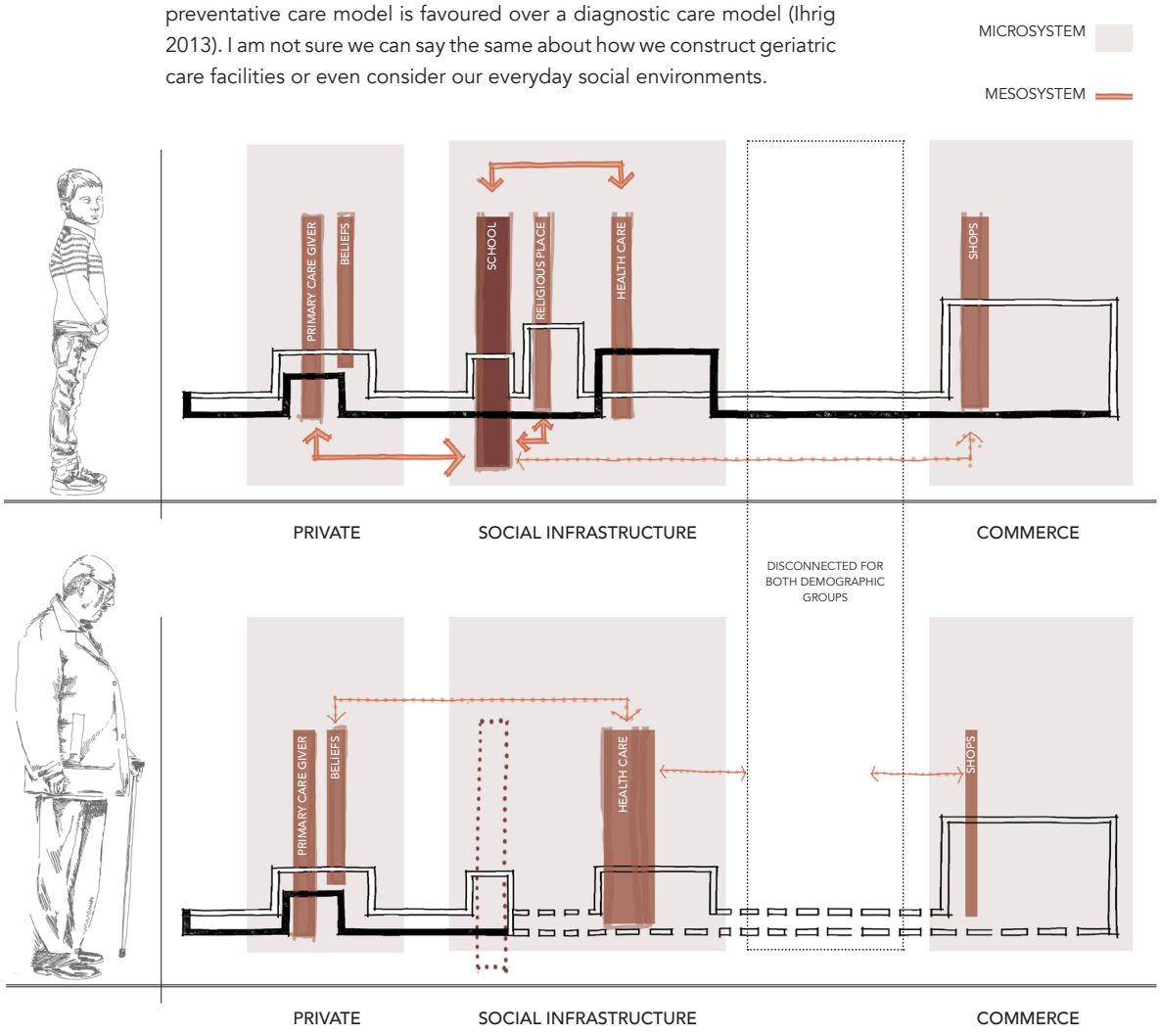

Figure 1.02: A graph depicting the Mesosystem connections of a child vs a retired person (Author 2022)

Using Bronfenbrenner's Ecological Systems Theory (Guy-Evans 2020), I set out to understand the influence of social environments on human development. The theory emphasises the importance of relationships in the mesosystem, which comprises an engaged microsystem (Guy-Evans 2020). This theory can be applied to all stages of life, especially when investigating the living conditions of the New Ageing individual, where they become increasingly dependent on the actors in their immediate environment.

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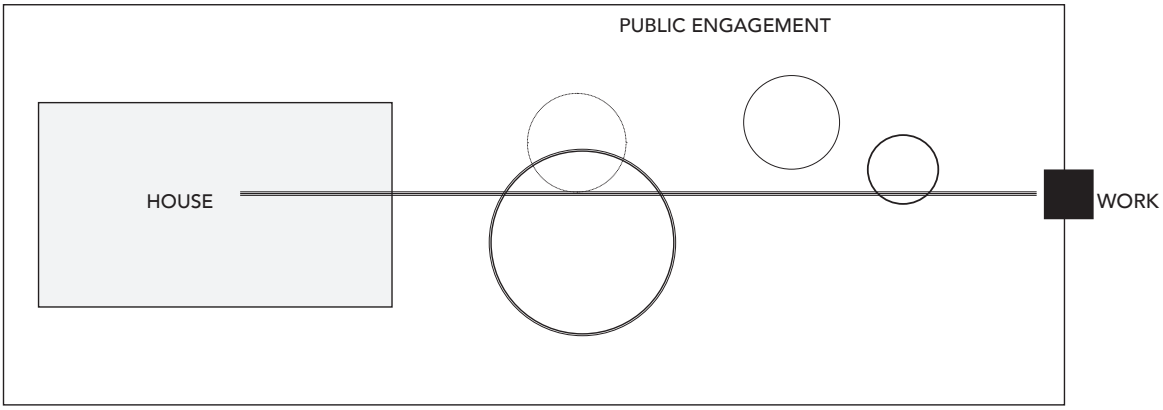
A well-connected microsystem is what facilitates physical and cognitive change in children (Fig. 1.02) (Guy-Evans 2020), and that is why educational facilities (a microsystem anchor that facilitate mesosystem connection) have been built into our urban scape. Surprisingly, there is nothing of the sort for the ageing population entering the biggest period of change in their lives. As a result, New Ageing individuals experience dramatic context shifts where no microsystem anchor facilitates mesosystem relationships (Fig. 1.02).



1.2. URBAN ISSUE

SPATIAL AGEISM

The disconnected mesosystems of the New Arising old age can be because life is perceived as a linear process (Wildevuur et al. 2013:26-27), where social standards are being used to create architectural formulas used to configure objects for daily life (Brolin 1976:70). This way of thinking was particularly relevant during the Modern Movement. Today it fails to recognise that ageing is an unchronological process where New Agers's life stories are less linear, and roles are no longer bound by age (Wildevuur et al. 2013:31). Yet we still sit with urban zoning arrangements according to function that is becoming more age specific. A few decades ago, when people were not growing as old as they are now, the able-bodied user could navigate their fragmented urban environments. Today the growing group of older individuals with modified needs are unable to do so, leaving them physically excluded from public space and deprived of the interactions that shape the functioning of social society (Fig. 1.03).

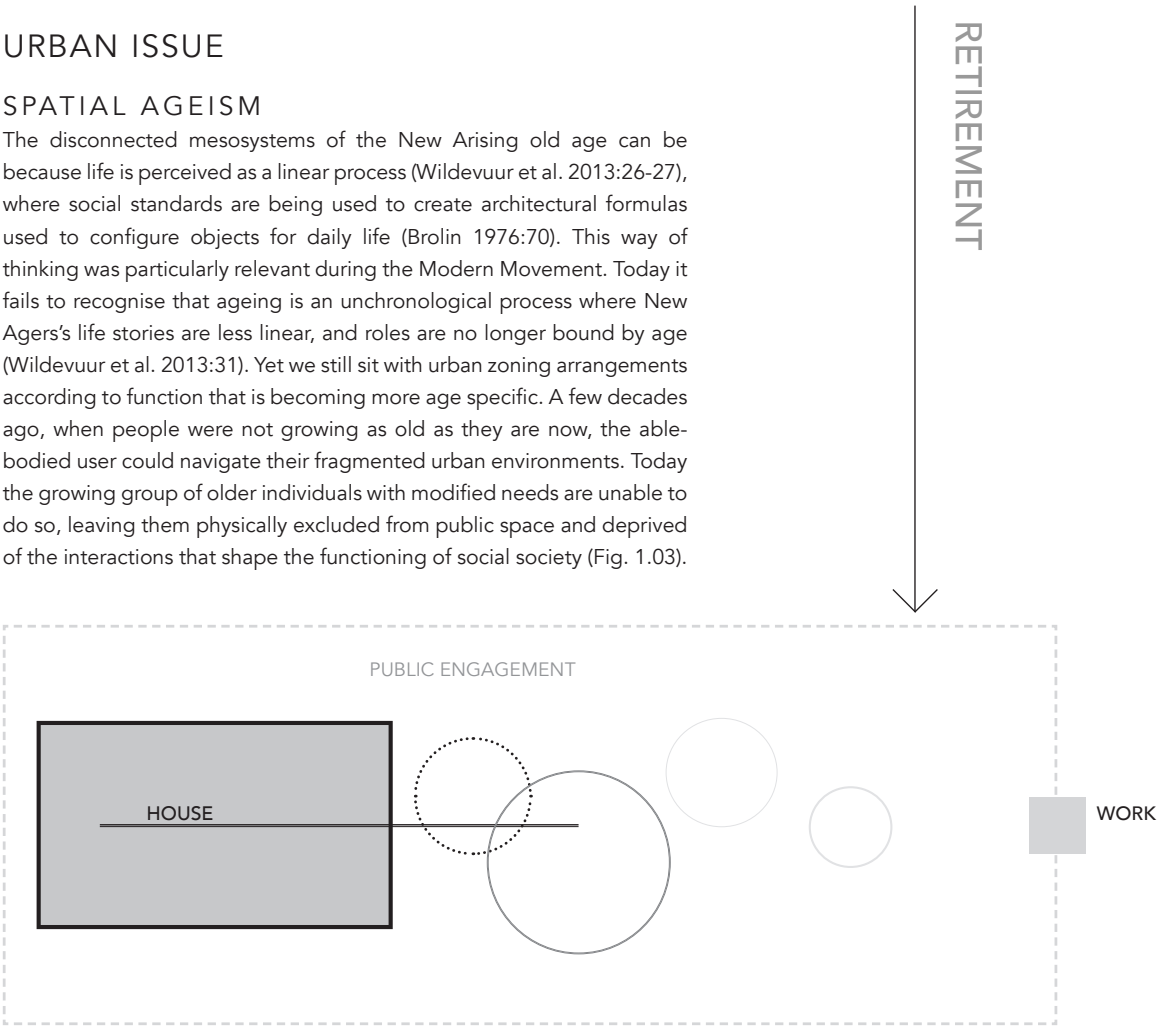


Figure 1.03: A diagrammatic depiction of how a big context shift delimits daily ritual and social engagement (Author 2022)

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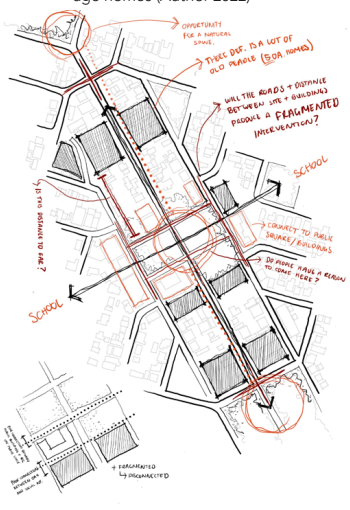
MODERNIST URBAN PLANNING

This occurrence can be observed in multiple environments with a high concentration of people in their third act of life, and while the origin of spatial ageism might vary, the role of the architectural profession in creating age distinctive environments was seminal. As for the city of Tshwane, spatial ageism can be traced back to the modernist trends that captivated both architectural academics and professionals during the 1930s (Murray 2010:57). It was a movement that influenced the way city planners and designers would continue development around the well-established Pretoria city. The development of Pretoria had a very different start to its modernist trajectory. Built around trade and social infrastructure during the 1800s (Krugers Pretoria 1971), Church Square formed the heart of the town during its early years and integrated social, religious, commercial, and political activity.

Figure 1.04: Map of Tshwane adapted from Open Street Maps

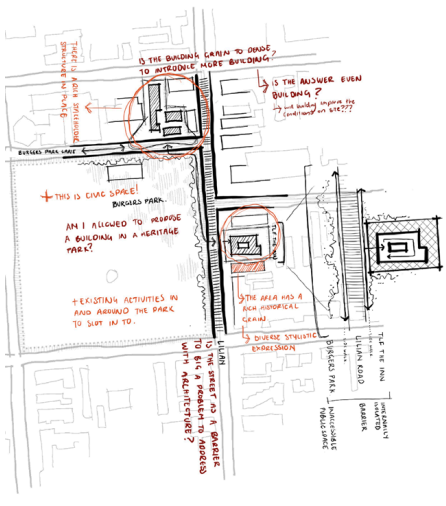
DIVERSE SUBURBAN

Figure 1.05: Large older demographic with 5 diverse old age homes (Author 2022)



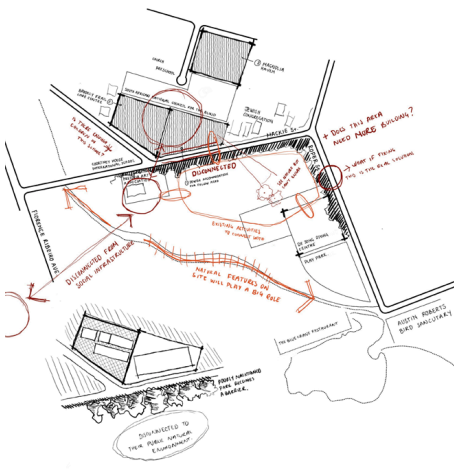
CIVIC

Figure 1.06: Large older demographic of which are mostly homeless (Author 2022)



MIDDLE CLASS SUBURBAN

Figure 1.07: Large older demographic with adequate living environments (Author 2022)



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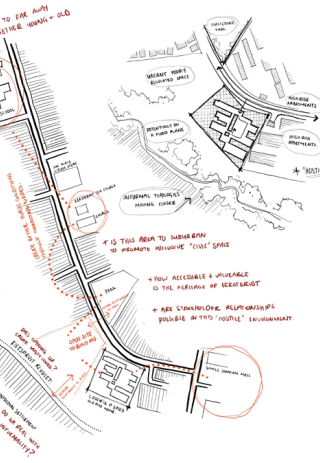
POOR SUBURBAN

08: Large older demographic integrated with community (Author 2022)



Urban development around Church Square would be impacted by technological advancement, times of leadership change, civil war and, most noticeably, the need to divide racial groups. Ordering urban environments according to race was first introduced by President Paul Kruger during the 1890s (Haarhoff 2010:184). The level of spatial segregation according to race intensified in 1923 when the Natives Urban Area Act No.21 was passed (Haarhoff 2010:187). Methods of control became more sophisticated in 1942 when the Social and Economic Planning Council (SEPC) was established (Haarhoff 2010:188). In 1944 SEPC released its 5th Regional and Town Planning report that would encourage the implementation of modernist planning principles (Haarhoff 2010:188).

These so-called 'truths' centred around technologically advanced transport, open green space, and vertical density (Frampton 2001:46-51) can be seen across Tshwane. It became a 'solution' that would address South Africa's racial and political struggle at the time. Modernism's functional and stylistic expressions introduced structural elements that could divide a landscape and serve as the perfect instrument to control racial groups (Murray 2010:49).

The scars of apartheid spatial planning are still embedded in our urban fabric (Haarhoff 2010:194), and a big body of knowledge exists on how these planning mechanisms have since turned into devices that control different social groups. While issues of social segregation are far from being resolved or even fully understood, the changes in our age distribution require more attention and resources than ever before. The importance of including our New Ageing population in city framework proposals that attempt to address the current state of inequality can no longer be downplayed.

Changing our urban condition before the age demographic shift begins to place strain on the country's housing schemes and medical care systems seems improbable. And while some might argue this a lost cause or even an unnecessary pursuit, the optimistic opportunist in me cannot help but see the potential presented by this demographic shift.

My attitude for this dissertation aligns with the vision of architects Matthias Hollowich and Matthew Hoffman who describe our changing demographic as a "historic moment in architecture" (Wildevuur et al. 2013:26-27), where they have taken the opportunity to experiment with reformist organisational languages which "puts architecture back into the driving seat for social purposes" (Wildevuur 2013).

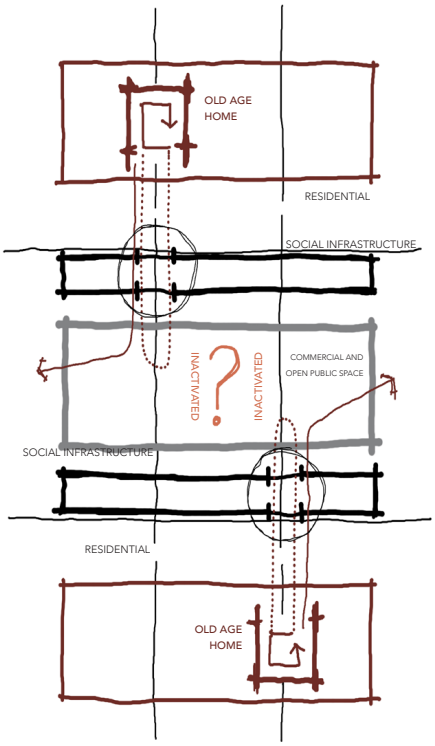


Figure 1.09: Built environment as independent entities functioning separately (Author 2022)

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Our architectural pursuits, be they motivated by a heart seeking social justice or the individualistic ego hoping to grow old in a world free from spatial ageism, has the potential to change the social dynamics of our neighbourhoods. Author Scott Ball, writer of Liveable Communities for Ageing Populations (2012:14), argues that a neighbourhood environment is at the core of urbanism and that the solution for our ageing population lies in these micro conditions.

The criteria for determining a neighbourhood best suited to test the objectives presented in this mini-dissertation became rather simple. The environment had to show the clear influence of modernist city planning (Fig.1.10) while housing a large group of New Ageing individuals. Danville, located in the Pretoria West industrial precinct, satisfied both these requirements.

Figure 1.10: Danville compared to Model City (Author 2022)

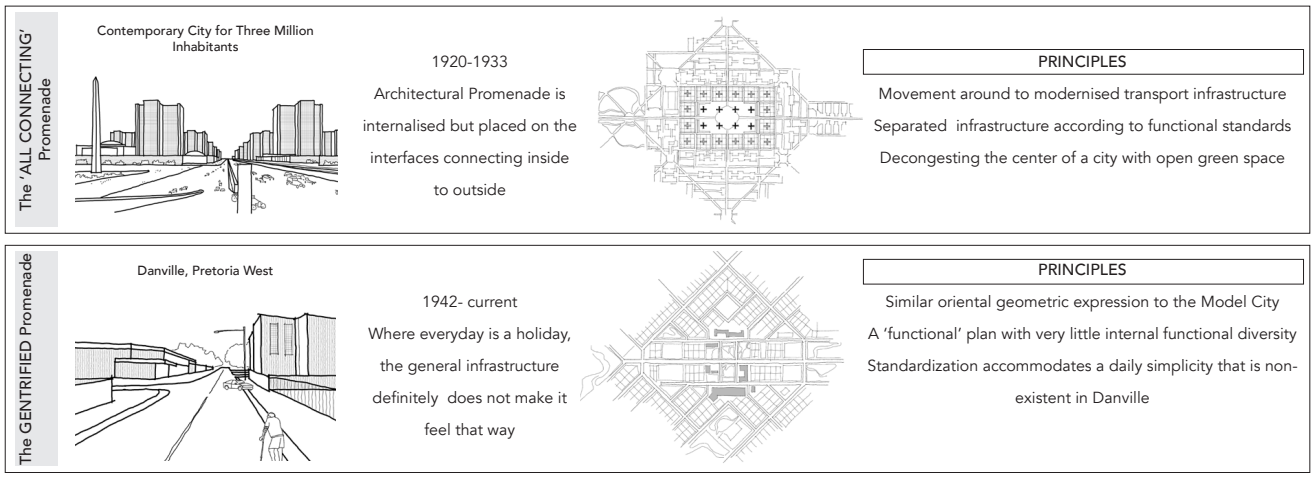
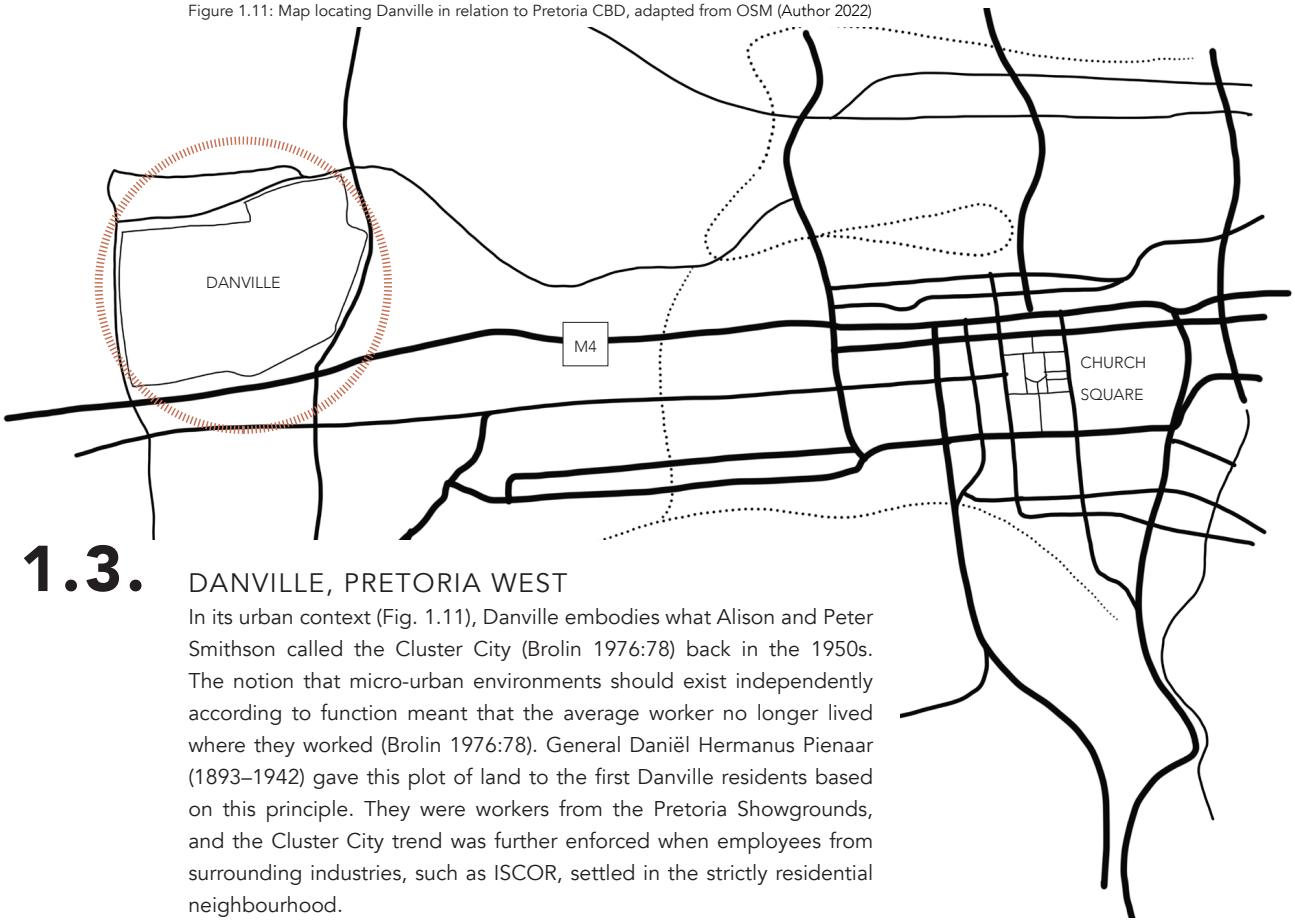


Figure 1.11: Map locating Danville in relation to Pretoria CBD, adapted from OSM (Author 2022)



1.3. DANVILLE, PRETORIA WEST

In its urban context (Fig. 1.11), Danville embodies what Alison and Peter Smithson called the Cluster City (Brolin 1976:78) back in the 1950s. The notion that micro-urban environments should exist independently according to function meant that the average worker no longer lived where they worked (Brolin 1976:78). General Daniël Hermanus Pienaar (1893–1942) gave this plot of land to the first Danville residents based on this principle. They were workers from the Pretoria Showgrounds, and the Cluster City trend was further enforced when employees from surrounding industries, such as ISCOR, settled in the strictly residential neighbourhood.

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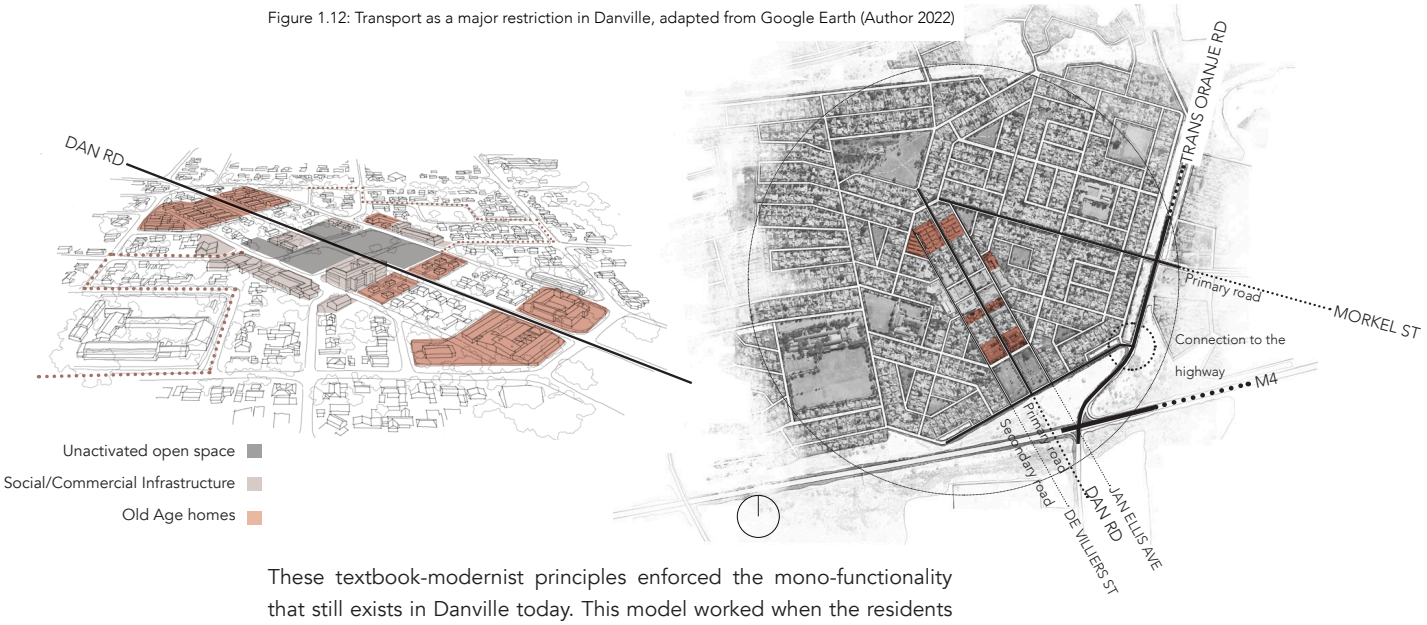
The area became popular for its prestigious schools and old age homes, but an urban plan resembling the Model City of Le Corbusier from the 1920's so closely (Fig. 1.10) failed to incorporate mechanisms that would allow future development. Separated from its surroundings by the green belt and main transport routes providing few entryways into Danville (Fig. 1.12), the neighbourhood was shaped by both second- and first-generation modernist trends (Brolin 1976:78).

Figure 1.12: Transport as a major restriction in Danville, adapted from Google Earth (Author 2022)



These textbook-modernist principles enforced the mono-functionality that still exists in Danville today. This model worked when the residents could depend on the economic opportunities provided by the surrounding industry, but the dependent relationships with failing actors have since caused a lot of poverty in the area. Modern Utopian Danville has since turned dystopian, and those affected most have the least agency to implement change in their urban environments.

Figure 1.13: Photoset of pedestrians in Danville (Author 2022)

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New Agers with modified needs struggle to navigate their neighbourhood (Fig. 1.14), and those able to do so are often confronted with the risks associated with their poorly maintained social environment. The lack of internal economic diversity is discouraging, and people struggle to find ways of empowering themselves. As a result, New Agers are bound to the confines of their retirement facilities, government-subsidised cottages or family homes despite their desperate need to find value in their public environments.

Figure 1.14: Elderly man rests on his walk back from the civic square (Author 2022)

Social isolation has a direct impact on the health of this demographic group. It is a proven fact that loneliness can be directly implicated in medical problems such as cardiovascular diseases, Alzheimer's disease, Dementia, diabetes, and a range of mental health disorders (Levitin 2020:179).

According to Neuroscientist Daniel Levitin, "loneliness is worse for your health than smoking fifteen cigarettes a day" (2020:179).

Placed at the forefront of shaping social environments, the architect's responsibility to create spaces that foster meaningful engagements has quite literally become a matter of life and death.

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1.4. ARCHITECTURAL ISSUE

Architects who design environments accessible to individuals with modified needs simply do their job. Inclusive design should not be an option, just like designing a building not to leak is not one. But while the conversation around the bio-medical accounts of accessibility has gained global support since it was first introduced during the late 1940s (Handler 2014:68), we rarely consider the needs associated with mental impairments. Institutions that support people who have already undergone dramatic cognitive change exist in the form of dementia homes or frail care units. While these facilities provide specialised care that can be lifesaving to so many individuals, they are fundamentally built on the principles of diagnostic care that aim to improve the quality of life when problems have already manifested.

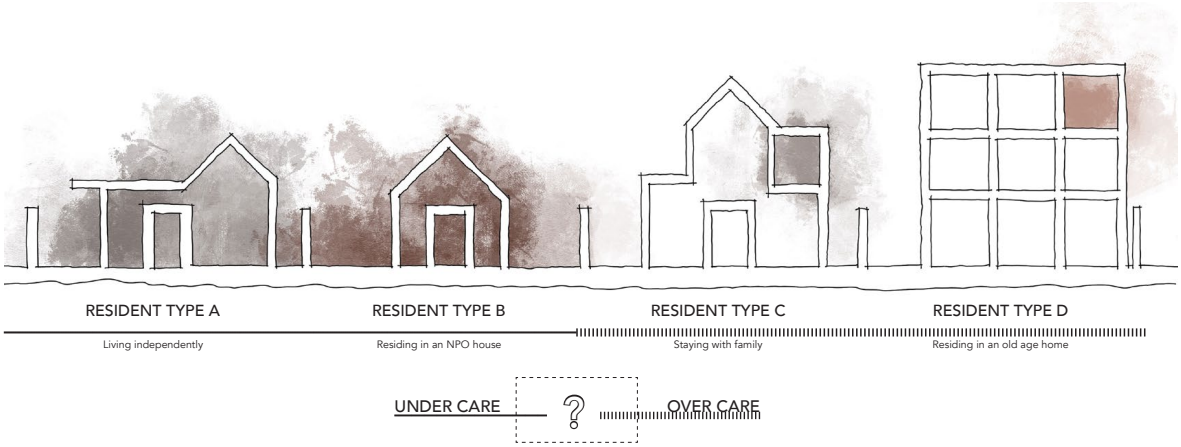

Figure 1.15: The four primary geriatric residential typologies in our built environment (Author 2022)

Life after retirement is evolving, and it calls for spatial arrangements that foster intermediate programs to facilitate pro-longed periods of change and encourage ways of living better for longer.

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ARCHITECTURAL **OPPORTUNITY**

"Longevity was the great gift of the twentieth century. Learning what to do with this gift is the great challenge of the twenty-first century." (Scott Ball 2012) .

1.5.

Preventative care models for cognitive change are scarce in our built environments, and it is this gap in the architectural discourse of geriatric care that I would like to address in my mini-dissertation.

INTERDEPENDENT ENVIRONMENTS

A physically accessible space can still be socially exclusive in how it operates, leaving a person feeling lonely even when surrounded by a group of people (Levitin 2020:179). We, therefore, need to reassess the microsystem relationships of the old age typologies in Danville to understand how a fragmented urban environment is enforcing these poor relationships. The attempt to link up microsystem actors across the urban scape means that activities of daily rituals should no longer be isolated to one single environment. Interdependent programs will allow for connections between daily rituals and overlapping processes that rely on implicit memory and are based on Multiple Trace Theory (MTT) (Levitin 2020:53).

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MEMORY AND MULTIPLE TRACE THEORY

Our memory systems are made up of short-term, procedural, and spatial memory systems (Levitin 2020:39). Short-term memory failure does not increase with age (Levitin 2020:39) unless Alzheimer's or Dementia has been diagnosed in a person. Long-term memory, on the other hand, can be divided into explicit and implicit memory, where these two memory systems are stored in different parts of the brain (Levitin 2020:41).

Explicit memory, also known as the recollection of general knowledge or details about an event, is stored in the Hippocampus and Medial Temporal Lobe (Levitin 2020:41). This part of the brain shirks with age (Levitin 2020:41) which explains why a former career pianist with an impaired memory might not remember where she is or what her grandson's name is. At the same time, she has no problem getting dressed or even playing The Goldberg Variations composed by Bach. This ability to still perform daily rituals is connected to the implicit memory system, which is rarely affected by old age (Levitin 2020:53).

ENVIRONMENT AS A COGNITIVE PROSTHESIS

Implicit memory is formed through Multiple Trace Theory (MTT) (Levitin 2020:53), where repeating a certain experience or action will lay down similar but unique traces (2020:53) (Fig. 1.16) in one's memory system, making it easier to recall in later life. The power of MTT is that it can turn explicit memory implicit (Levitin 2020:54). The key to doing this lies in actively engaging with the information (Levitin 2020:54).

In order to investigate the potential of introducing an environment designed and programmed to actively engage the implicit memory system of the ageing individual, we need to start with the following question:

> *"How far are older people (like any other generational group) able – or not – to 'lay claim' to urban space on their own terms?... Are there ways of thinking about older people as urban citizens? As social actors actively engaged in the production and reproduction of cities?"(Handler 2014:13)*

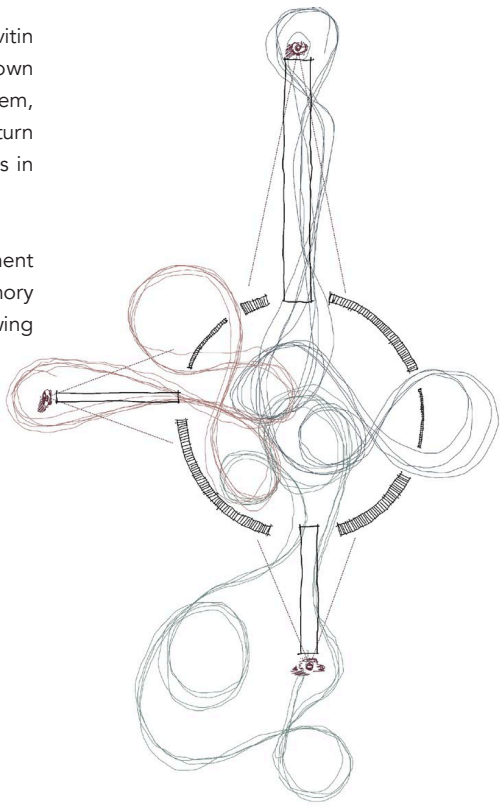

Figure 1.16: A graphic representing processes of MTT (Author 2022)

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1.6. METHODOLOGY

The ideological and societal assumptions pertaining to old age can be highlighted and challenged through critical theory research. (Hofstee 2006) If we want to address the cyclical narrative of ageism, children and middle-aged individuals need to engage with older people in environments free from stigmas and ageist perceptions.

As someone who has had the privilege of growing up next to a grandparent as they grow old, I can draw from my own experiences in conducting research. The subjectivity of this knowledge source encouraged investigation into theories that explore the role of architecture in better connecting New Agers to their social environments. Architectural theory and studies in geriatric healthcare create an interdisciplinary knowledge base required in a holistic, human-centred design-led research scheme.

Qualitative research strategies based on an interpretivist paradigm were used in interviews and on-site observations. A rigid set of interview questions were often followed by similarly rigid answers that gave little insight into the area's social workings. The freedom provided by site visits observing human behaviour in space (Hofstee 2006) became the main objective and proved more valuable. Biased interpretations of what was observed were lessened by an understanding of spatial principals grounded in tested theory particular to public environments, together with knowledge about the abilities and capabilities of the New Ager.

CONCLUSION

"Traditional sources of social solidarity are at a steady decline." (Levitin 2020:180) A culture of individualism has infected modern society, and age demographic groups are growing increasingly more separated due to functional zoning enforced by spatial mechanisms. Our design approaches need to be consciously aimed at lessening the divide through social inclusion methods that stretch beyond physical accessibility. The key to this lies in understanding the changing mind of New Agers and its effect on their daily routine.

"Middle-aged adults tend to direct their energy towards bringing their environments in line with their own wishes. Older adults typically focus on changing themselves to accord with their environment." (Levitin 2020:195)

The way in which we relate to the world changes over time. And while this will always be true, I would like to imagine that if New Agers can stay integrated with their public environments after retirement, future generations might be better educated on what it means to grow old. This understanding would encourage those young and middle-aged to direct their energy to bring their environments in line with their wishes as well as those current and future old and designing environments that encourage this is only the start.

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CHAPTER 02
DESIGN RESEARCH

The content in this chapter sets out to better understand the issues highlighted in the first chapter. This will be done through an in-depth analysis of the community of Danville. The information gathered from the on-site investigation, and a theoretical understanding of the general issues at hand will inform architectural design responses that will investigate ways of better connecting New Agers to their social environments.

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INTRODUCTION

Redefining inclusivity in social environments asks that our understanding of inclusive principles be less restricted by only what we can see. Cognitive and physical accessibility should be equally well understood if our future designs attempt to better accommodate the growing elderly population. This necessitates a human-centred approach where the designed outcome considers the complexities accompanying change during the third act of life. The generation of architectural form is then subject to the immersive experience of the New Ager.

The investigation will focus on the contextual requirements of Danville to develop a grounded argument that will challenge how we think about geriatric care typologies through practical implementation.

A comprehensive understanding will be formed through urban and site analysis where the New Agers' needs are placed at the forefront of the investigation while not neglecting the other age demographics residing in the community. This investigation will present the spatial and programmatic opportunities used to develop architectural principles that can be tested and critiqued through various design iterations.

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2.1. CURRENT URBAN CONDITION

"...we have been observing that the human body, which is our most fundamental three-dimensional possession, has not itself been a central concern in the understanding of architecture; that architecture, to extent that it is considered an art, is characterised in its design stages as an abstract visual art and not as a body-cantered art..." (Ching 2007)

Like Ching, Juhani Pallasma's writings of the 1990s extensively explain why a bias towards vision in architecture is a reason for great concern. He believes that "the very essence of the lived experience is moulded by hapticity and peripheral unfocused vision." (Pallasma 2005:10). This way of understanding movement through space was not only introduced during the late 90s. 5th century BC saw the creation of one of the first architectural promenades in the city of Athens, Greece, where movement clearly accounted for the peripheral experience (Fig. 2.01). Organic arrangements and optional processional paths would imply movement, where circulation through space was not forced but encouraged. The success of the organic architectural promenade got lost in the oriental geometric expressions of Modern movement planning. Main circulatory routes would prioritise the efficiency of modern transport, resulting in a more focused ocular experience where the user is confronted with the world. (Pallasma 2005:10)

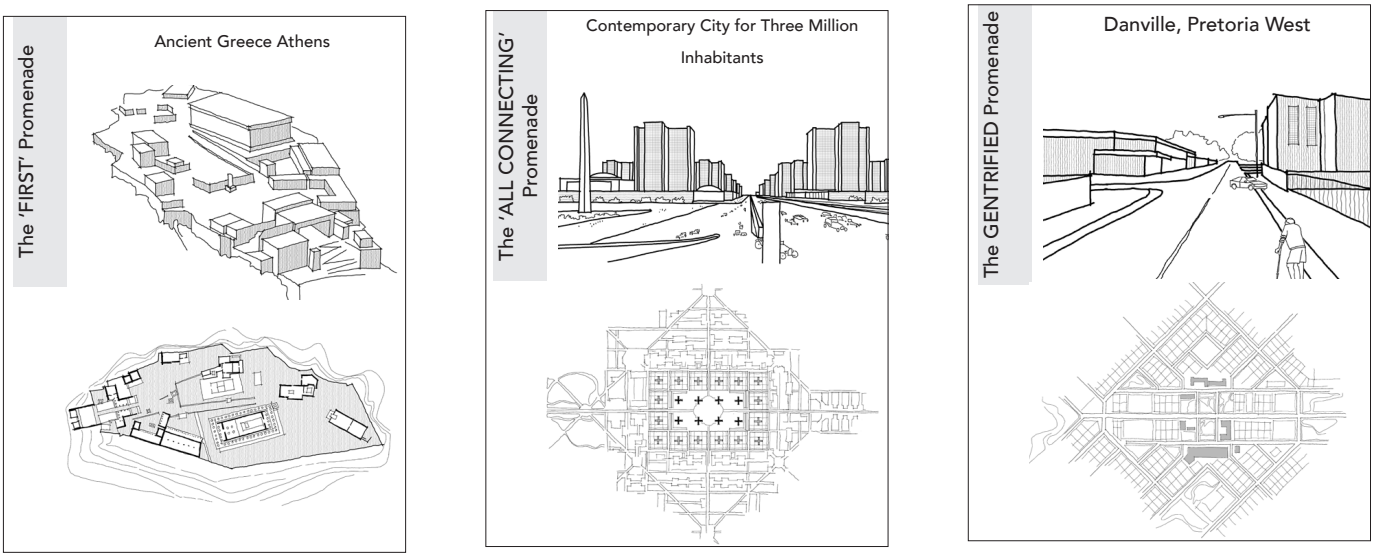

Figure 2.01: Evolution of the architectural promenade (Author 2022)

Like many other neighbourhoods in the Tshwane precinct, Danville was shaped based on these modernist ideals (Fig. 2.01) and has since resulted in urban typologies where function and efficiency subvert pedestrian experience. This way of arranging space is nonsensical in a neighbourhood separated from its surrounding industrial activities. Functional zones connected by motorised transport infrastructure have created an implicit architectural promenade where the gradient between public and private interactions is ill-considered.

Agers want to stay independent for as long as possible and therefore require spatial gradients where the levels of engagement and responsibility remain optional.

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DANVILLE 1947

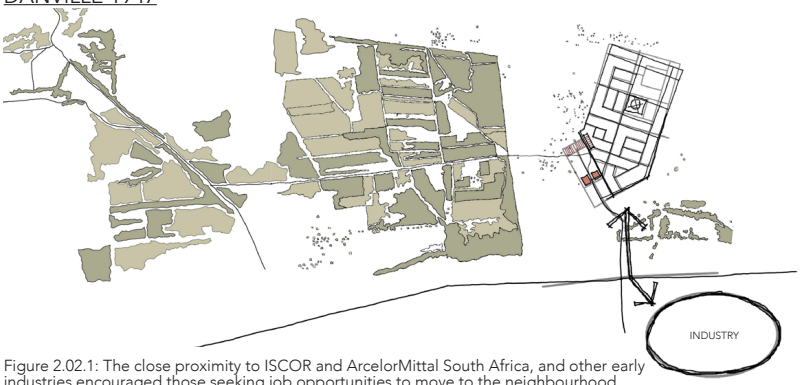

Figure 2.02.1: The close proximity to ISCOR and ArcelorMittal South Africa, and other early industries encouraged those seeking job opportunities to move to the neighbourhood.
Adapted from Google Earth, (Author 2022)

DANVILLE 1990

Figure 2.02.2: The neighbourhood would grow tremendously up until the 1990's, although expansion was restricted by the green belt used as a control measure.
Adapted from Google Earth, (Author 2022)

POST INDUSTRIAL BOOM

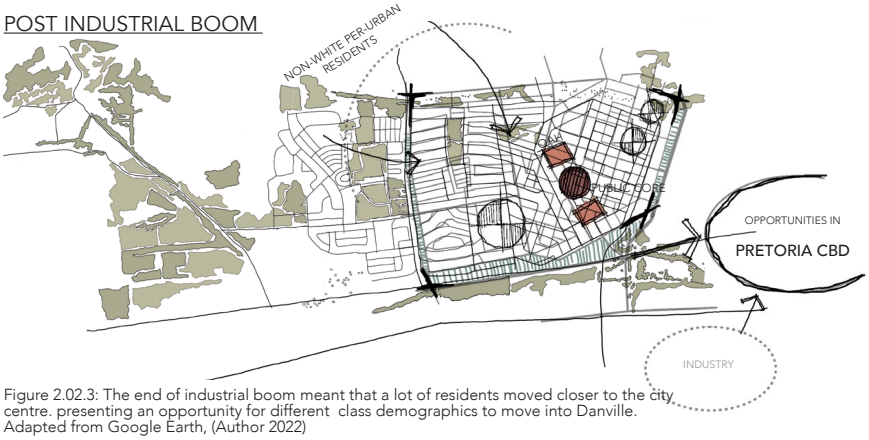

Figure 2.02.3: The end of industrial boom meant that a lot of residents moved closer to the city centre. presenting an opportunity for different class demographics to move into Danville.
Adapted from Google Earth, (Author 2022)

NOW

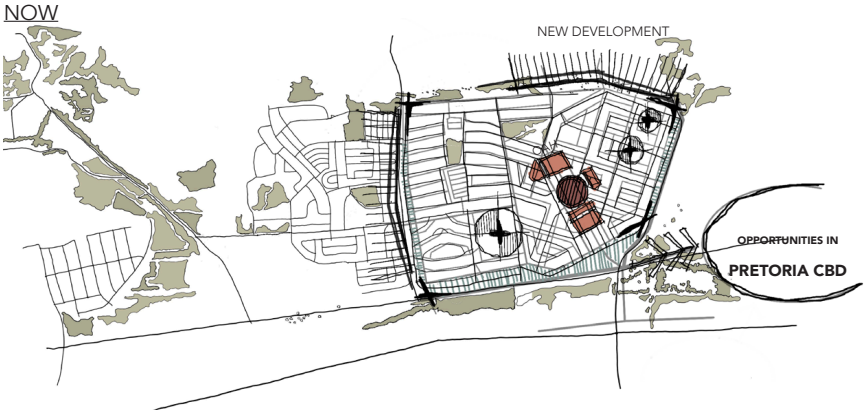

Figure 2.02.4: A decrease in economic opportunity created a dynamic shift that has since caused a lot of poverty in the area, especially under the older demographic who rely mostly on SASA grants.
Adapted from Google Earth, (Author 2022)

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2.2. SITE HISTORY

The history of Danville has remained largely undocumented during its 70 years of existence. Little is known about the development trajectory that followed the first municipal houses built during the 1940s (Fig.2.02.1). We know that this plot of land was first a Eucalyptus plantation belonging to General Daniel Hermanus Pienaar (Danville resident#1 2022). Most of the trees would be removed as the neighbourhood expanded (Fig.2.02.2), but the significance of the forests that bordered the residential development would live on in the memory of those who grew up in Danville and still reside there today.

Arial photographs show the rapid rise of Danville during the 1950s as the Pretoria West industrial economy drew people to the area. Created during the height of apartheid, this community would house middle-class white families where children would be within walking distance from both primary and high schools while parents would commute short distances to their jobs in the nearby industrial precinct. The fall of the industry saw many residents relocate East seeking better prospects (Danville resident#1 2022), but those unable to do so would be stuck in a mono-functional neighbourhood, growing further removed from shifting economic opportunities. Short after its promising beginnings, Danville was branded a poor white community (Danville resident#1 2022). TThis change in neighbourhood dynamics happened alongside the fall of apartheid which presented an opportunity for different social and racial groups to move into the area. While the aerial photographs have remained largely unchanged for the past 50 years (Fig.2.02.4), the inhabitants of this community look completely different. Danville, today personifies the failures of modernist standardisation practices where different user groups with different needs cannot alter their environments to make them more suited to their needs.

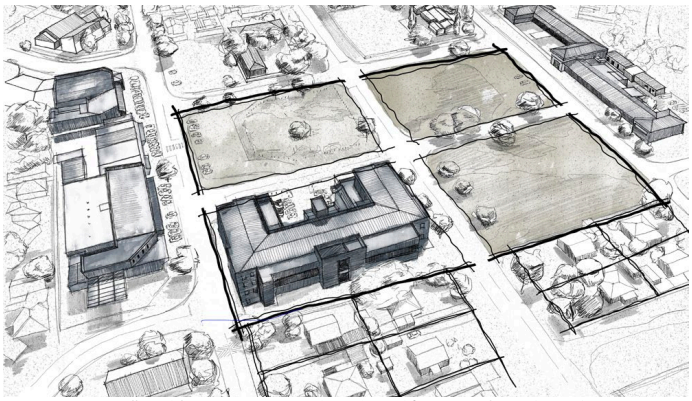

Figure 2.03: Danville public square as it is today Adapted from Google Earth, (Author 2022)

2.3. PUBLIC SQUARE

Another failure of modernist urban thinking that will be regarded as an opportunity in this instance is the underdeveloped notion of health and efficiency (Brolin 1976:79). Modernist thinkers saw the harsh living environments that came before and decided that a person's general health and well-being would significantly improve when connected to a natural environment. And while this is true, these spatial executions remained one-dimensional and unexplored. This resulted in park spaces at inappropriate scales that were under-programmed, where the lack of ownership resulted in poor maintenance.

The development of these dormant spaces (Fig. 2.03) might hold the means to better connect the modern New Ager with their public environments.

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Figure 2.04: Pedestrian Sheds of the 5 designated Old age living environments (Author 2022)

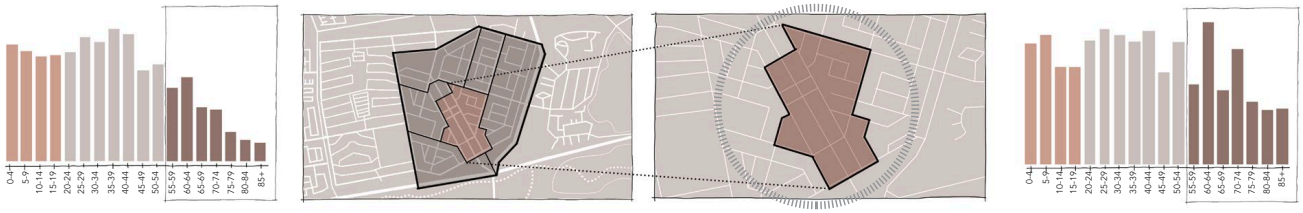

Figure 2.05: A diverse age demographic especially around social square according to CENSUS 2011 (Author 2022)

Danville civic square, resembling Modern Movement park typologies, sits as a central point to the old age homes. The pedestrian shed of these old age homes, which is a 5-minute walking distance (400 meters for a person age 80) (Cronkleton 2019), are all connected to the civic core (Fig. 2.04). With 5 old age homes in a 300 meter radius one would expect this demographic group to spearhead the social functioning of their neighbourhood.

Their inability to do so is largely due to the fragmented urban arrangement (Fig. 2.06) and lack of a microsystem anchors that link up daily ritual activities. Doing basic tasks become more challenging so these individuals tend to simplify their daily rituals to avoid having to navigate their disconnected public spaces.

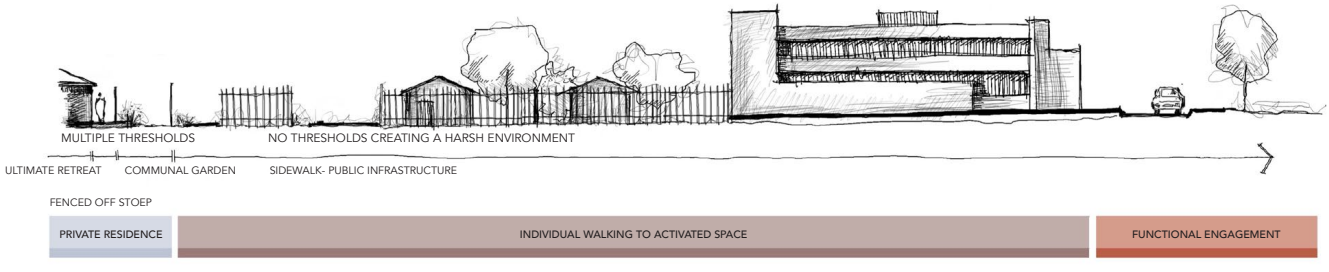

Figure 2.06: Danville neighbourhood actors as independent entities functioning separately (Author 2022)

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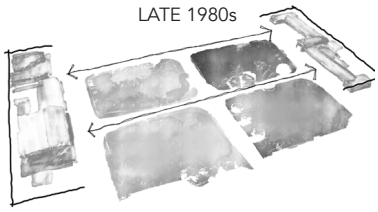
Figure 2.07: Danville civic square 1980s (Author 2022)

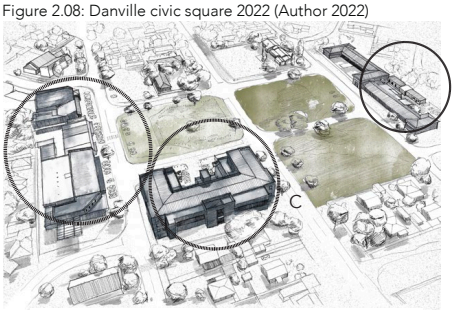


During its developing years the relationship between social infrastructure and green open space was somewhat interdependent (Fig. 2.07). The programs that were housed in the buildings surrounding the park would use this open natural environment as spill out space. People would buy food from the grocer and eat it under a tree or kids would keep to themselves on the play installations while their parents were purchasing goods. The flexibility that the park provided would act in favour of the social and commercial infrastructure and in turn the shop owners and regular users would ensure the upkeep of the public environment.

This relationship is mostly lost today (Fig. 2.08). The residents are of the belief thatWWW, is to blame. Not only did this structure cut off one of the two main axis that tied the public buildings to open space but it also introduced a new typology that would be focused inwards. Its brutalist form estranges it from the predominant residential language used throughout Danville, but it is the paradoxical nature of the programs housed in the building that causes the largest upset.

The Shoprite (general grocer) is located on the ground floor of the building where a person needs to walk through a courtyard (Fig. 2.13) to gain access to the shop entrance. On the other side of this courtyard is a gambling facility as well as an *adult shop* (for a lack of a more respectful term). The upper two levels of this three story building are let-able apartments, also known for the *unsavory* services they house. In a community where the average retired person relies on a R 1980.00 SASSA grant every month (Office 2022), visiting the Shoprite and not the other more expensive grocers becomes part of their everyday ritual. New Agers' in Danville run the risk of falling victim to a mugging when attempting to buy food just because they have no other choice but to engage with an environment where programs attract criminal activity.

Figure 2.08: Danville civic square 2022 (Author 2022)



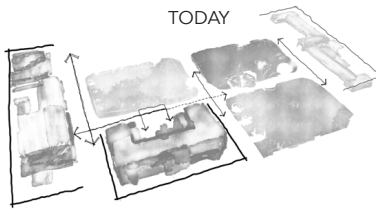


Figure 2.09: Danville social core programmes in relation to the experience of space (Author 2022)

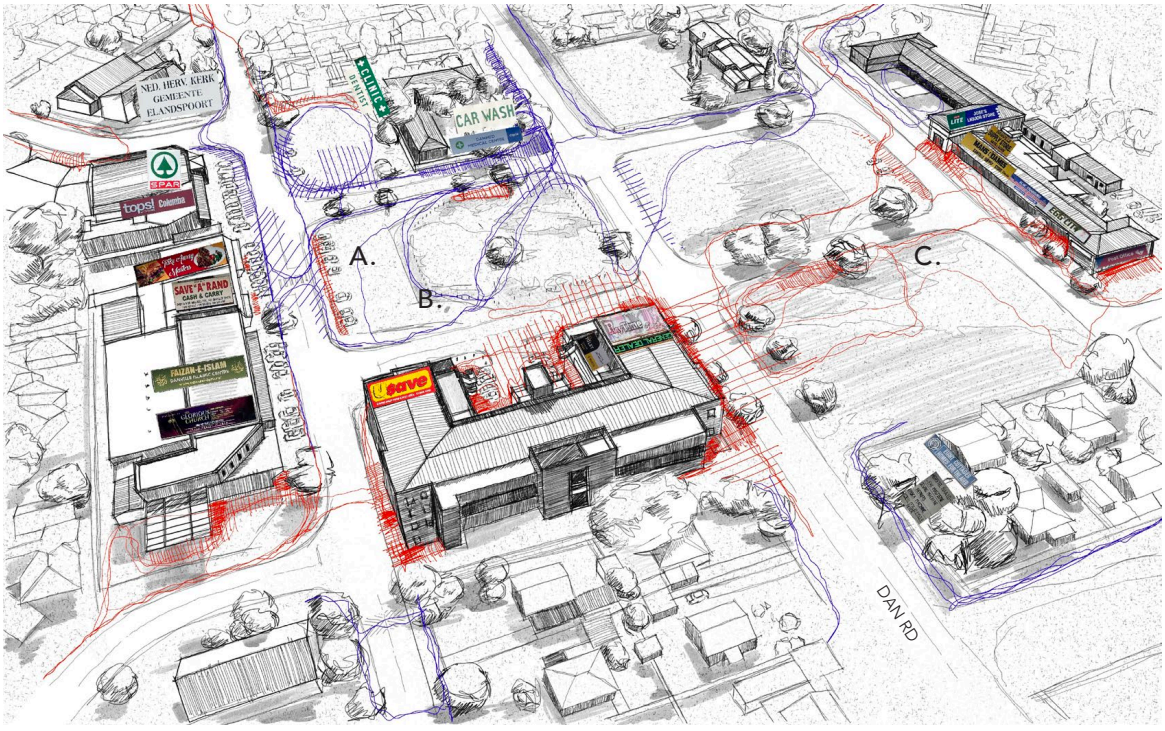


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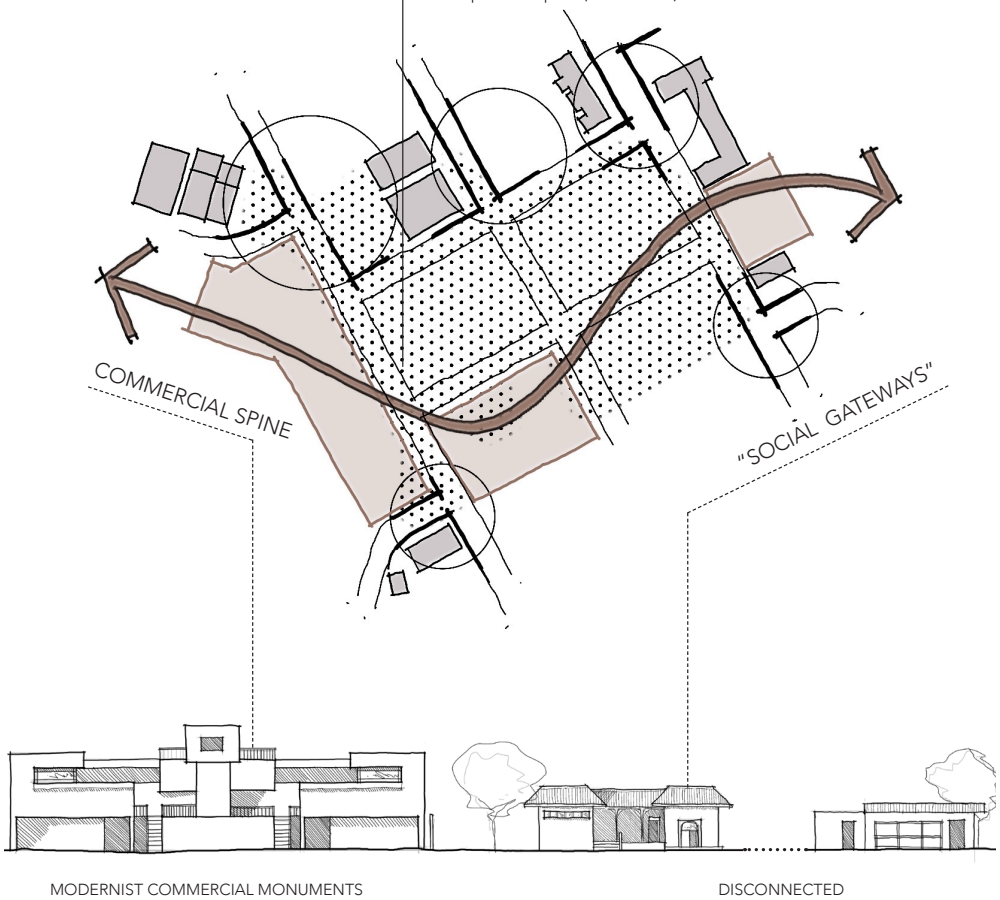
Figure 2.10: Accessibility of recreational green space in Danville (Author 2022)

Figure 2.11: Social Infrastructure located at 5 entry points onto the open civic space (Author 2022)



A.

Figure 2.12: Large empty parking lot and ove

B.

Figure 2.13: Unkept open space in front of b

C.

Figure 2.14: Overgrown and unkept sidewalk

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ergrown park (Author 2022)

rutalist mixed use building (Author 2022)

s (Author 2022)

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2.4. USER GROUPS AND CLIENT RELATIONS

Figure 2.15: Infographic depicting the primary, secondary and tertiary user groups and the respective bodies that can be involved throughout the design and project hand over (Author 2022)

1 INDIVIDUALS OVER 65

Age in Action (The South African Council for the Aged)

The 5 old age homes

Primary client that is focused on the needs of the elderly whilst having connections to other organizations

Die Blommefonds, The Flower Foundation

2 CHILDREN AT SCHOOL

Laerskool Generaal Beyers

Laerskool Westerlig

Elandspoort High School

Hoërskool Pretoria-Wes

3 OTHER RESIDENTS

Tshwane IPAP Agro-processing, Forestry and Timber sectors

Religious establishments

Religious establishments

USERS

CLIENTS

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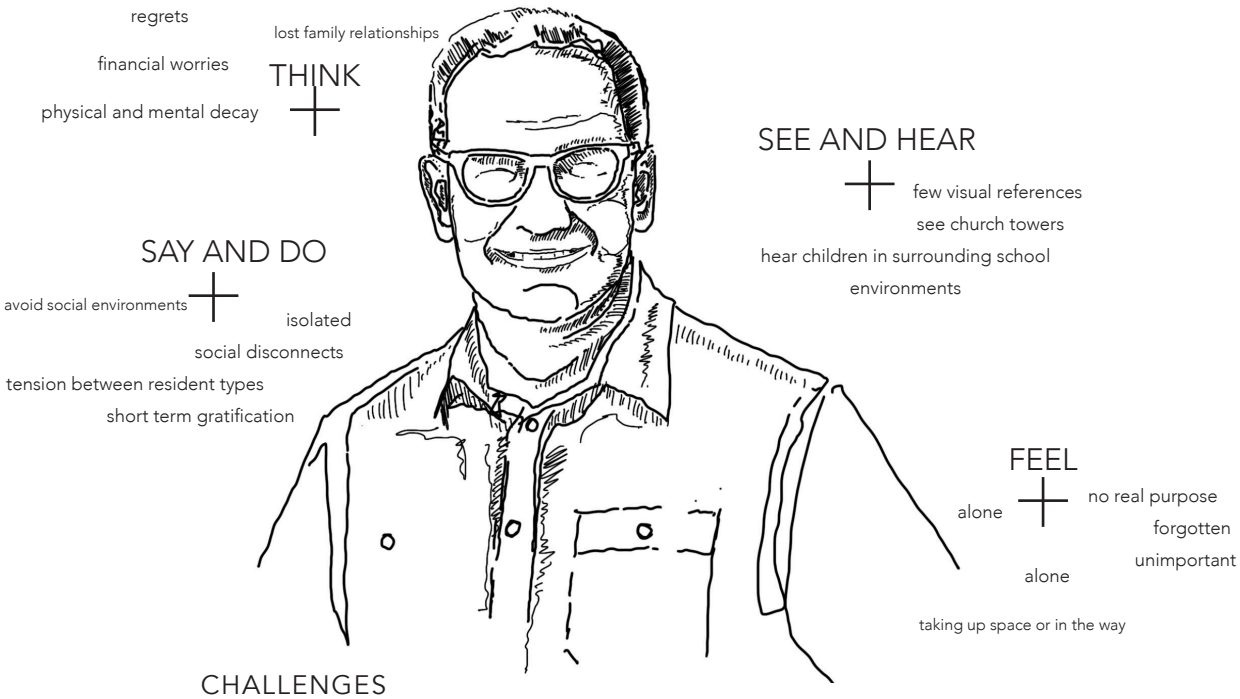
PRIMARY USER NEEDS ASSESSMENT

The Social Readjustment Rating Scale was developed in 1967 by psychiatrists Thomas Holmes and Richard Rahe (Noone 2017). Doctors Holmes and Rahe were trying to understand the link between stress and illness. After evaluating the medical and life history of more than 5000 patients, they determined the weight of different stressors on one's physical health. They put together what is known as a 'Life Change Index Scale, ' which is a table that can be used to determine the weight of one's personal stress. The weighted average can predict how likely an individual is to become ill in the near future (Noone 2017). Of the 10 most impactful events listed, 8 of these directly relate to an individual entering their third act of life. If we then consider adding the stressors caused by the lived environment in Danville, the impact score goes far beyond what anyone should endure. While the built environment does not control some stressors, 21 out of the 43 are impacted by it, and it is, therefore, the responsibility of an architect to ensure that the environments we design become less of a contributor to stress and physical illness.

The main environmental stressors of the New Agers in Danville were investigated through a process of empathy mapping (Gibbons 2018) (Fig.2.16). The information used in this map came from on-site observations, visits to the old age homes and interviews with older individuals who grew up in the area. While my interpretation of the encounters might be somewhat biased, there were overarching needs repeated during the investigation, which will form the focus of my architectural approach.

Figure 2.16: Empathy map of Danville's New Agers' (Author 2022)



CHALLENGES

1. social exclusion
2. physical exclusion
3. no real purpose or contribution
4. loss of independence
5. frustration with own physical and mental decay

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CHALLENGES

1. social exclusion
2. physical exclusion
3. no real purpose or contribution
4. loss of independence
5. frustration with own physical and mental decay

NEEDS

1. Inclusion through access

First and foremost, there exists a need to be better included. The New Agers residing in Danville have reported that they feel intentionally isolated from the social functioning of the community. While their collective living typologies provide them with some of their daily necessities, they often need to engage with their public spaces to acquire certain services. This is made difficult by long continuous routes that are unactivated and monotonous.

2. Purpose giving activities

Secondly, and probably the need that will mostly guide the program development in the scheme, is the need for these individuals to feel like they have a purpose. The lack of economic diversity in the community means there is very little opportunity for retired individuals to practice any skill they might have acquired before retirement. The sudden loss of purpose and social interaction after retiring simplifies the routines that engage one's physical and cognitive state. This dramatically impacts implicit memory (a memory system that can be maintained during old age) (Levitin 2020:53), resulting in higher levels of both cognitive and physical dependency (2020:53).

3. To independently associate

This brings me to the third overarching need: The modern New Ager craves independence for as long as it is considered healthy. In a community where specialised care facilities come at a cost unobtainable to most residents, living independently is crucial to the quality of the remainder of their lives.

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2.5. INTERVENTION STRATEGY PRECEDENT

Maggie's Centre, Manchester

Manchester, UK (2016)
Foster + Partners

Refuge to older individuals affected by cancer.

The objective of the center was to create a space away yet visible from the hospital where patients could receive the necessary support and therapy as they undergo medical treatment. The design and programmatic objective was simply that the environment should provide a comfortable and domestic atmosphere for its visitors. It therefore comprises of informal lounge type spaces with various garden settings.

LESSONS LEARNT: Creating a familiar space through form and the way space can be used.

Figure 2.17: Maggie's Centre (Foster + Partners 2016)

Urban Day Care Center for Alzheimer Patients

Pontevedra, Spain (2006)
Cid + Santos

Friendly for patient and passer.

The space is intended to be an escape from the busy city centre, providing a friendly and cheerful visual to both the patient and individuals walking past. This unconventional transparent facade destigmatises health care architecture in the way it opens up to the public whilst still keeping certain medical practices private by adding variation to the level of transparency in the various colour bands.

LESSONS LEARNT: Transparency between to create an awareness of internal and external activities

Figure 2.18: Urban Day Care Center for Alzheimer Patients (Cid + Santos 2006)

The Alzheimer's Village

Dax, France (2016-2020)
Nord Architects

"Healing architecture, improving the quality of life for a group of people that are going through major life changes."

Nord Architects have created a village that resembles a conventional neighborhood with all its amenities except it has been scaled down to simplify movement from and to services. This typology has enabled users with impaired memory systems to stay independent and engaged with their rituals as they would before their prognosis.

Loops in the landscape provide the residents with complex sensory inputs as they are lead through vegetated landscapes. A series of adaptable modular typologies make up the neighbourhood amenities where a variety of activities and services can be accommodated in the space

LESSONS LEARNT: Using nature as sensory stimuli and maintaing a complex ritual despite cognitive change.

Figure 2.19: The Alzheimer's Village (Nord Architects 2022)

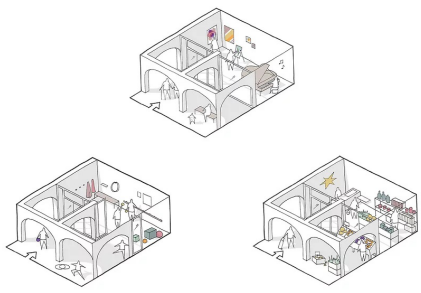

Figure 2.20: The Alzheimer's Village (Nord Architects 2022)

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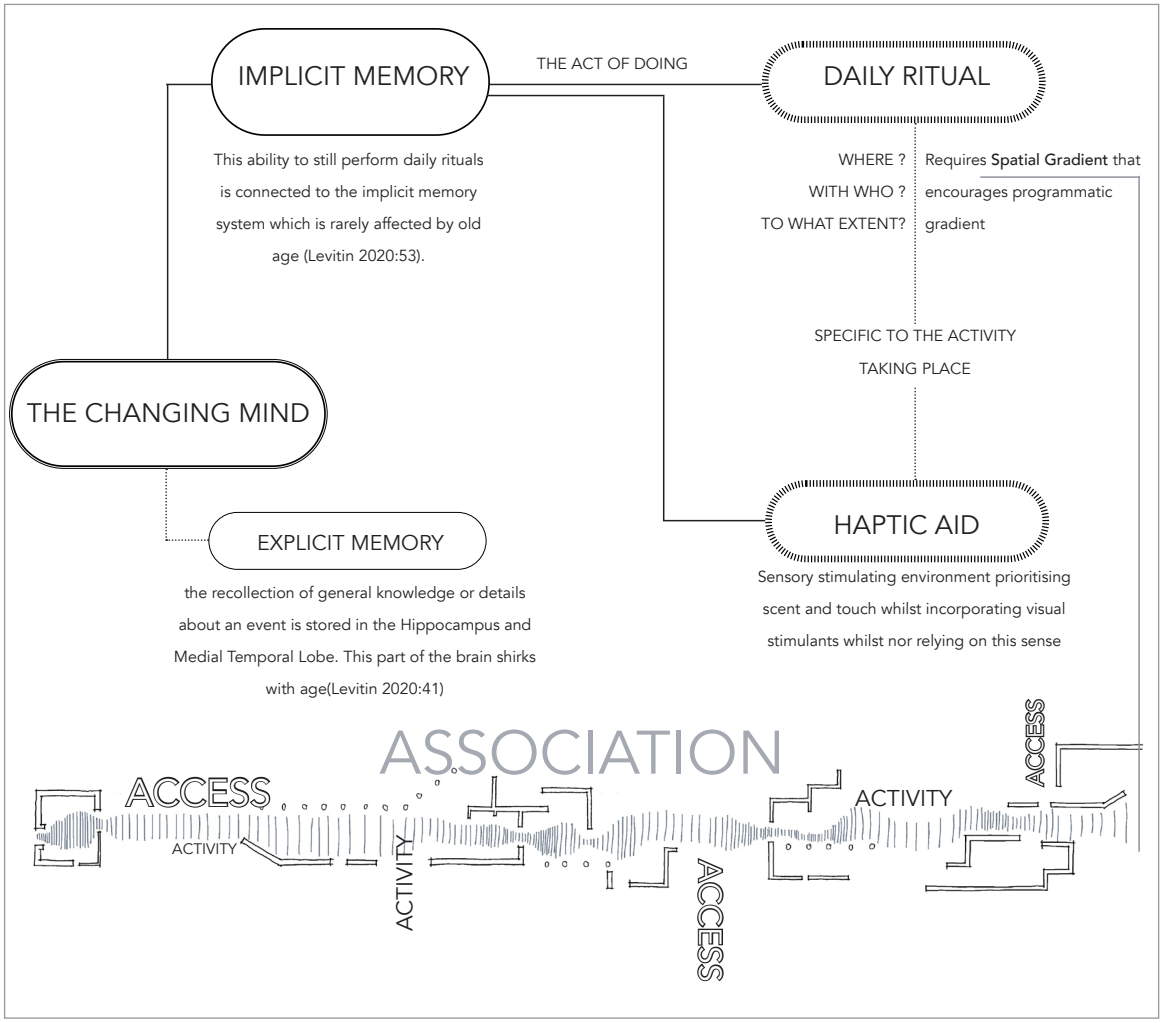
2.6. RESPONSE ACCORDING TO INTENTIONS

Danville's urban, site and user analysis highlights the flaws in our social constructs and shortcomings in our spatial arrangements that keep New Agers from actively engaging with their public spaces. The intentions developed through this project have stressed the importance of a more holistic approach to geriatric care models, necessitating the spatial facilitation of all types of age-related change.

Designing an environment to successfully do this will ask that we deal with the intangibles of change, such as a decrease in cognitive ability (a need often perceived to fall beyond the architectural scope). But if we understand that the changing mind deals largely with changes in how our brain processes memories and that these memory functions rely on spatial routines and haptic aids (Levitin 2020:53) (Fig. 2.21), then the intangibles take on a physical form from which we can derive spatial requirements.

Figure 2.21: Flow chart depicting the relationship between cognitive change during old age and environment (Author 2022)



An intervention acting as a cognitive prosthesis then becomes one that enables individuals to maintain a complex daily routine in an environment serving as a haptic aid. Ritual expansions will address the New Agers' needs to feel like they are making purposeful contributions in the spaces that better include them and, as a result, function independently for longer.

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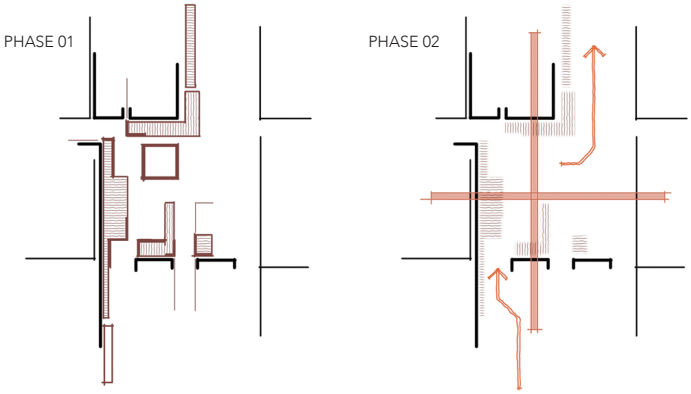
CONTEXTUAL RESPONSE

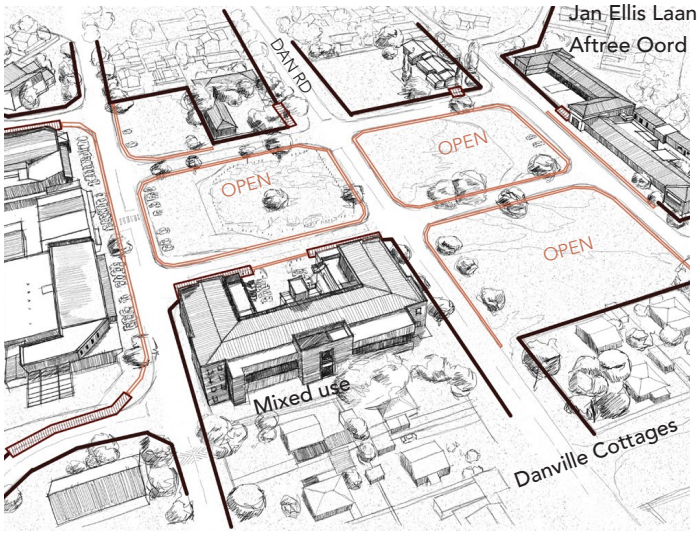
The issues brought along by modernist urban planning, such as standardisation (that resulted in fragmentation) as well as the underdeveloped notions of health and efficiency (that resulted in left-over green space), will be addressed in a phased approach (fig. 2.19). Phase one will focus on ways of dealing with the unresponsive edges of the civic square's social infrastructure, and phase two will test ways of better developing healthy environments that are integrated with their contextual surroundings.

Figure 2.22: Contextual response in two phases (Author 2022)



The three open plots positioned at the centre of the civic core (Fig. 2.23) provide ample space to expand on the existing programmes in this vicinity. These programmatic expansions directly relate to the rituals and needs of the New Agers in Danville. The infrastructure will take on an interdependent typology that, in some instances, will be physical, dealing with building edges, and in others, visual, where the road presents a potential barrier. In phase one, an edge response is appropriate for all the social infrastructure buildings except for the brutalist mixed-use building on site. The structure's negative spatial and programmatic nature concerning the neighbouring Danville old age Cottages requires a more radical approach. The structure will therefore be retrofitted and adapted to better suit the direct needs of the Cottage inhabitants.

Figure 2.23: Danville civic square boundary edge condition (Author 2022)



Phase two of this approach will introduce a programmatic and infrastructural link between parts of phase one. This link, while still relating to the New Agers' daily ritual, will attempt to reimagine the programmatic possibilities of their daily gardening activities.

Figure 2.24: Massing exploration as first response (Author 2022)

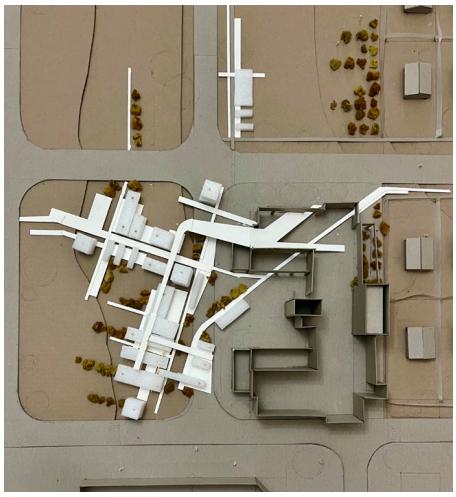


Figure 2.25: Massing exploration as first response (Author 2022)

Figure 2.26: Massing exploration as first response (Author 2022)

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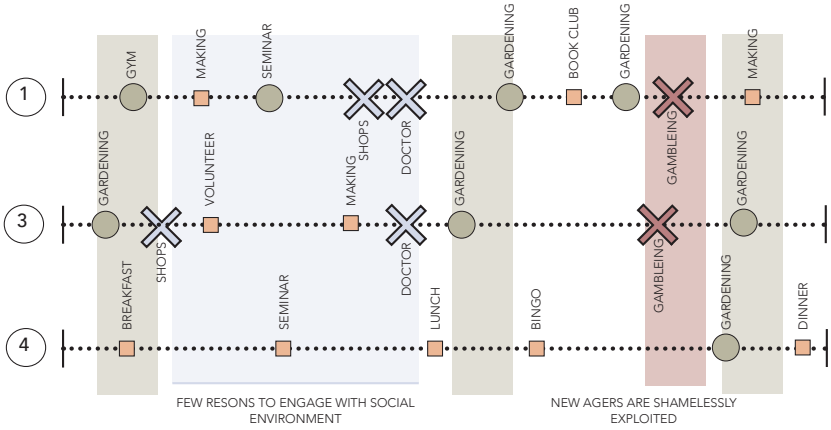
2.7. PROGRAM POSTULATION

Phase 01. Program expansion.

The 5 old age living facilities offer different amenities and levels of care to their residents. Access to affordable services is a general need and should therefore be dealt with in their public realm. To better understand the amenity imbalance between the different care facilities, a mapping exercise was performed where the daily ritual of individuals in the respective environments were plotted on a timeline representing one day. The overarching activities presented an opportunity to design environments that would speak to the social infrastructure shortcoming of most New Ageing individuals in the area.

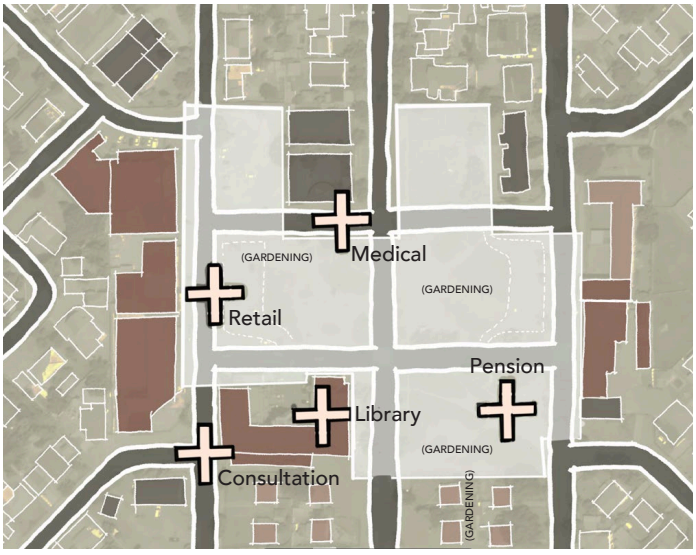
Figure 2.27: The daily rituals of three different elderly user groups in the area (Author 2022)



These are activities such as reading but with limited access to new material. There are visits to the pharmacy and clinic but little to no source of affordable alternative health care. They are purchasing food and daily goods from two major retail outlets that dominate the retail space. Spending a short period of time together under a tree without seating space and then probably the most practised ritual under the New Agers in Danville: gardening but with limited space.

These shortcomings present an opportunity to incorporate the following programs into phase one of the scheme: a library, alternative health care, counselling services, both formal and informal retail spaces, recreational landscapes, pension fund collection offices and allotment gardens.

Figure 2.28: Urban zoning according to ritual shortcomings (Author 2022)



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These interventions will actively serve the New Agers in the community, but it is only once these people can be in service of their neighbourhood that they would feel like they truly belong.

"How far are older people (like any other generational group) able – or not – to 'lay claim' to urban space on their own terms?...Are there ways of thinking about older people as urban citizens? As social actors actively engaged in the production and reproduction of cities?"(Handler 2014:13)

New Agers can do so. We see it in the gardens in front of their cottages. Each exhibit a creative expression of self. It is in the weekly flower arrangements that dress the dining room tables, and the position of the chair concerning the rose bush as the morning sun floods the front porch. The New Agers in Danville are shaping their private environments with unique garden typologies (fig. 2.24), and I believe that when granted the necessary space and infrastructure in their public realm together with the agency over such intervention, they will be able to contribute to the creation of their public space while giving back in a way that they are already familiar with.

Phase 02. Program reimagined.

The program development in phase two will build on these gardening typologies to create a system from which New Agers can benefit socially and financially. While their current plant selections create beautiful garden scapes, the potential of propagating plant species that can be harvested is an overlooked opportunity. A small bottle of eucalyptus oil in the pharmacy reminded me of the legends about the eucalyptus trees that used to stand tall on the very piece of land I was standing on then. Looking for trees that survived the residential development was not very hard. In suburban Danville, the Eucalyptus trees stand at a similar height to the church towers, but what surprised me most was the thriving tree clusters on the neighbourhood outskirts (Fig. 2.29).

Figure 2.29: Tree clusters in and around Danville, adapted from Google Earth (Author 2022)

To my disappointment, the eucalyptus essential oils sold at the pharmacy are not made locally, but more importantly, the medicinal benefit of the product is unbeknown to the community. The idea that the New Agers in Danville could benefit from the remaining trees or grow their own alternative health care ingredients in their back gardens became the vision in phase 2 of the scheme.

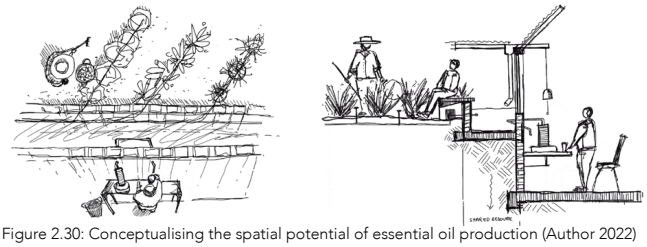

Figure 2.30: Conceptualising the spatial potential of essential oil production (Author 2022)

Extracting essential oils from herbal plants started around 4500BC in Ancient Egypt (Metych 2022) but became a commercialised industry like most consumer products. While essential oils are used as odorants, flavouring and as pharmaceuticals (Metych 2022), it is the medicinal property of the extracts that New Agers can benefit from.

Figure 2.31: Old age home gardens (Author 2022)

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PROGRAM INTO DESIGN PRECEDENT

ROSEMARY HILL

Rosemary Hill is a farm on the outskirts of Pretoria and serves as a good example of how an industrial activity, like essential oil distillation, can be cross-programmed and scaled in a way that makes the process of production and then the final product more accessible.

Figure 2.31 and 2.32: Essential oil products sold from the Rosemary Hill coffee shop (Author 2022)

Figure 2.33 and 2.34: Functional essential oil steam distillers and extract in the Rosemary Hill distillery (Author 2022)

Figure 2.35: Crop garden in the productive landscapes on the Rosemary Hill farm showing how all phases of the industrial process can be incorporated onto the site (Author 2022)

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Figure 2.36: Dining area that overlooks the steam distillation process and venue reception hall (Author 2022)

Cross-programming industrial and entertainment activities have softened the hard nature that can be associated with something like essential oil production. The process of making the oils is now more visible to the public, and the layering of space has been used to create different encounters with the processes involved.

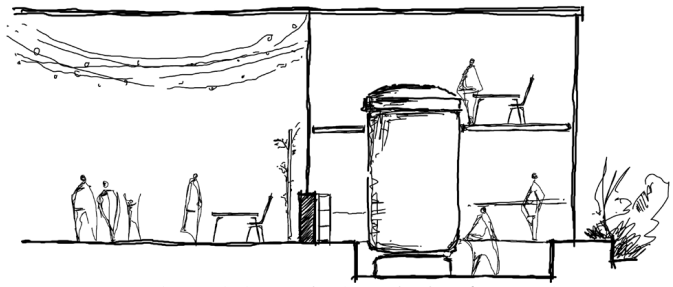

Figure 2.37: Diagram showing the horizontal and vertical scaling of space (Author 2022)

The horizontal and vertical layering of space reveals only certain parts of the production process to users in the supporting spaces. In contrast, the messy processes associated with the program are accommodated in separated spaces to not impact the entertainment environments.

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2.8. SPATIAL INTENTIONS

The processes involved in producing essential oil products can be scaled and integrated with the current daily rituals of the New Agers. These sensory stimulating activities will engage the individuals' implicit memories but only if the environment has been shaped accordingly. The spatial requirements of these types of spaces need to respond to the user needs that have now been outlined as well as the functional requirements of the various programs.

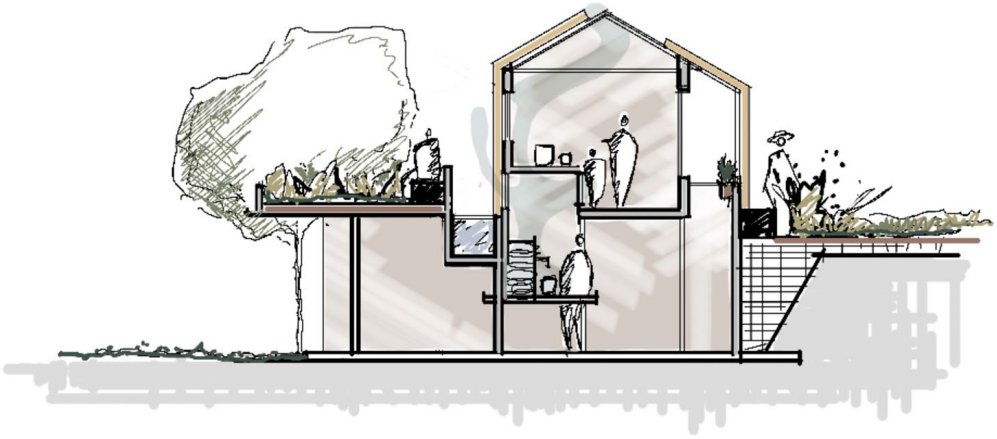

Figure 2.38: Spatial concept in response to design intentions and contextual issues (Author 2022)

ACCESS

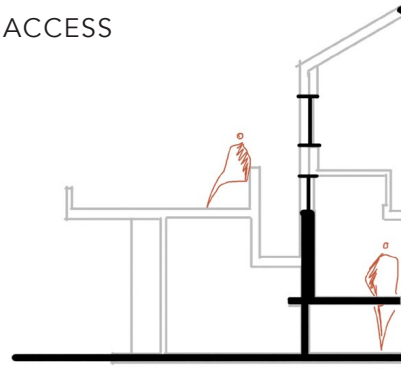

Figure 2.39: Concept of access on a scale ranging from v

ACTIVITY

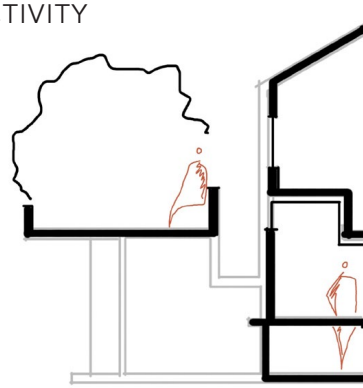

Figure 2.40: Concept of activity on a scale ranging from

ASSOCIATION

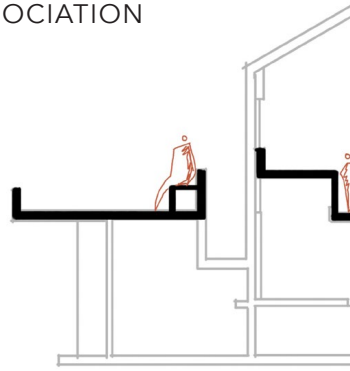

Figure 2.41: Concept of association on a scale ranging b
(Author 2022)

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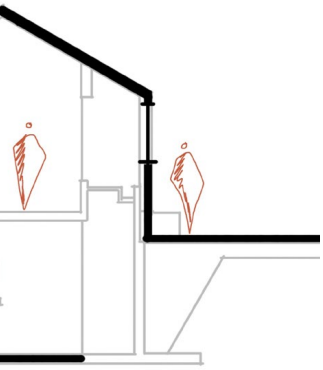
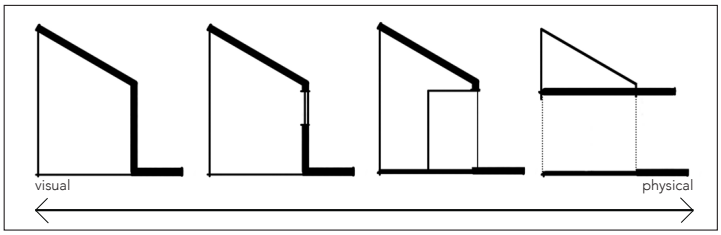
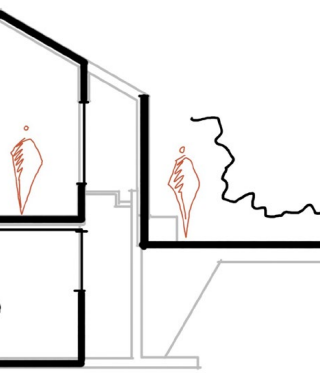


isual to physical (Author 2022)

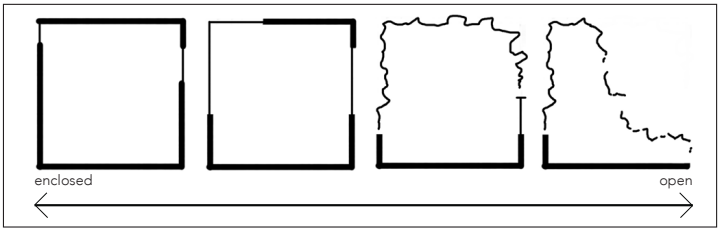
The Alzheimer Village, by Nord Architects, was designed to ensure its users experienced a sense of spatial familiarity while still being able to navigate their neighbourhood despite cognitive impairments. I want to incorporate this understanding that inclusive environments should be both visually and physically accessible into my scheme.

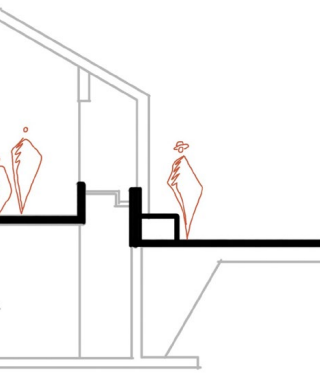




nclosed to open (Author 2022)

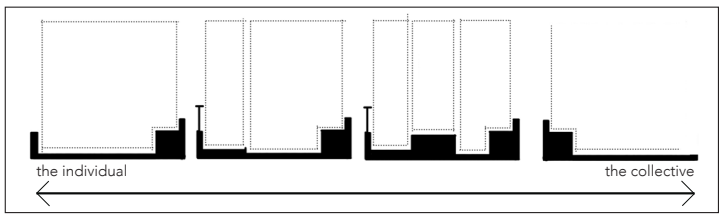
As we age, our ability to retain new memories becomes impaired, but we know that we can make explicit (situational) memories implicit through processes of Multiple Trace Theory. Doing so can be more difficult for older individuals, but when placed in an environment with appropriate sensory stimuli and fewer distractions, it can be just as easy as it is for a young child. The aim is to incorporate spaces with various scales of the enclosure, ensuring users have access to environments where activities can be momentarily contained.





etween the individual and the collective

Feeling included should start well before the New Ageing individual steps outside their private environments. Currently, the architectural promenade lacks user interactions and focuses on motorised transport and efficiency. Therefore, it is proposed that spatial gradients be incorporated along the movement routes, allowing users to stop and engage with other users. This creates moments where young and old can associate, breaking down problematic ageist constructs and stigmas.



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2.9.

URBAN DESIGN DEVELOPMENT

Creating an environment that New Agers will be familiar with necessitated a continuation of how the existing built language is perceived but demanded that the experience be more inclusive to avoid repeating past mistakes.

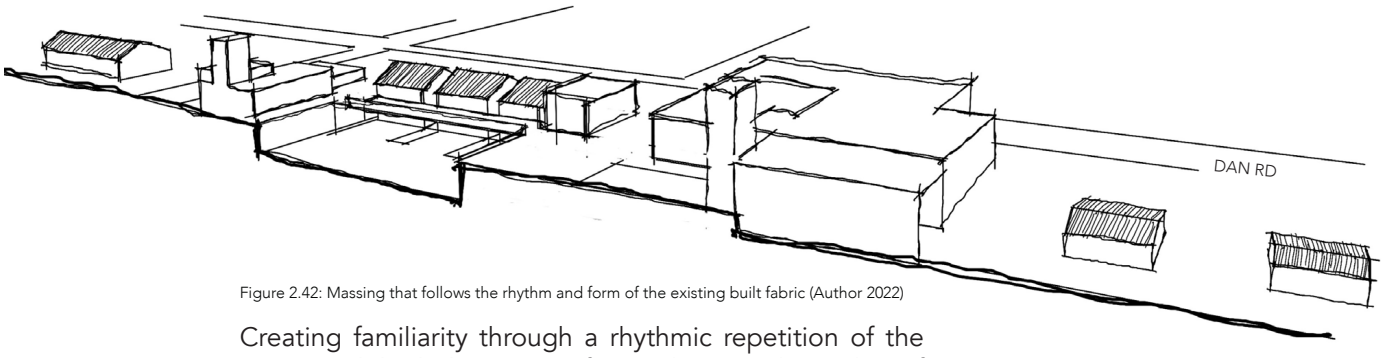

Figure 2.42: Massing that follows the rhythm and form of the existing built fabric (Author 2022)

Creating familiarity through a rhythmic repetition of the contextual built language, focused on scale and roof typologies.

Scale and existing movement patterns were used to start informing the position of the new intervention on the open site. Direct routes connect the existing nodes to the new alternative medical centre and the productive landscapes on the opposite site (fig. 2.30). Alternative pathways connect the intervention to the existing walkways while protruding the linear structure at various points, creating more than one entry point from either side. Activities were organised to match the daily ritual timeline of the New Agers while integrating the new purpose-giving programmes related to essential oil production (fig. 2.32). Activities involving young and old users were intentionally placed to align with old age home and school typologies to encourage cross-generational interactions (fig. 2.34).

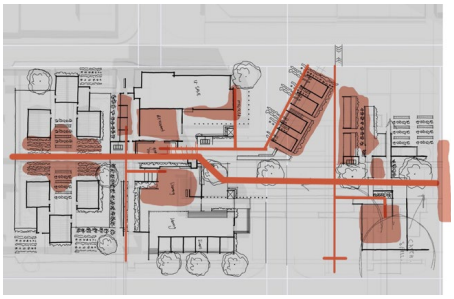

Figure 2.43: Movement explorations on plan (Author 2022)

Figure 2.44: Activity explorations on plan (Author 2022)

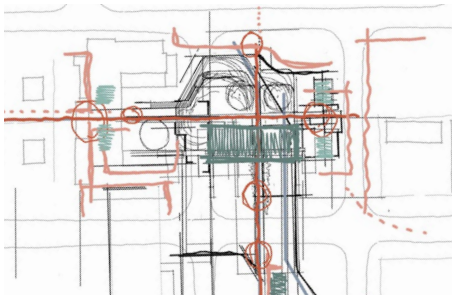

Figure 2.45: Engagement explorations on plan (Author 2022)

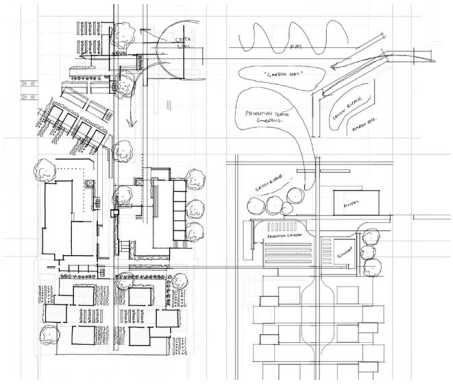

Figure 2.46: Plan iteration 01 (Author 2022)

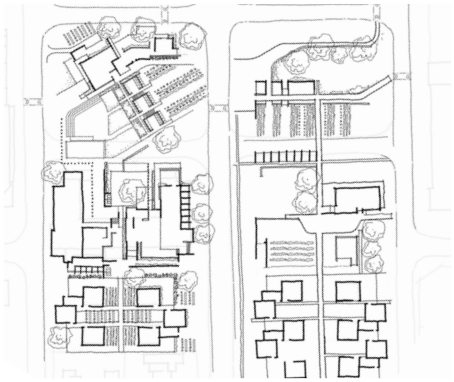

Figure 2.47: Plan iteration 02 (Author 2022)

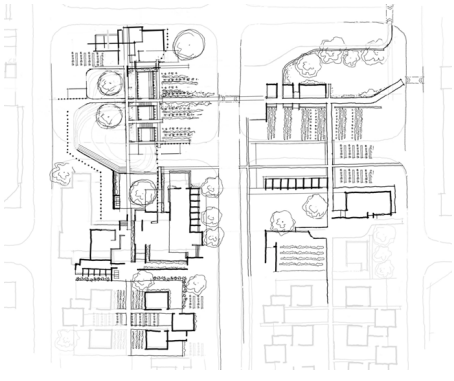

Figure 2.48: Plan iteration 03 (Author 2022)

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Figure 2.49: European School Copenhagen by NORD architects as an example of landscape as an architectural surface (Author 2022)

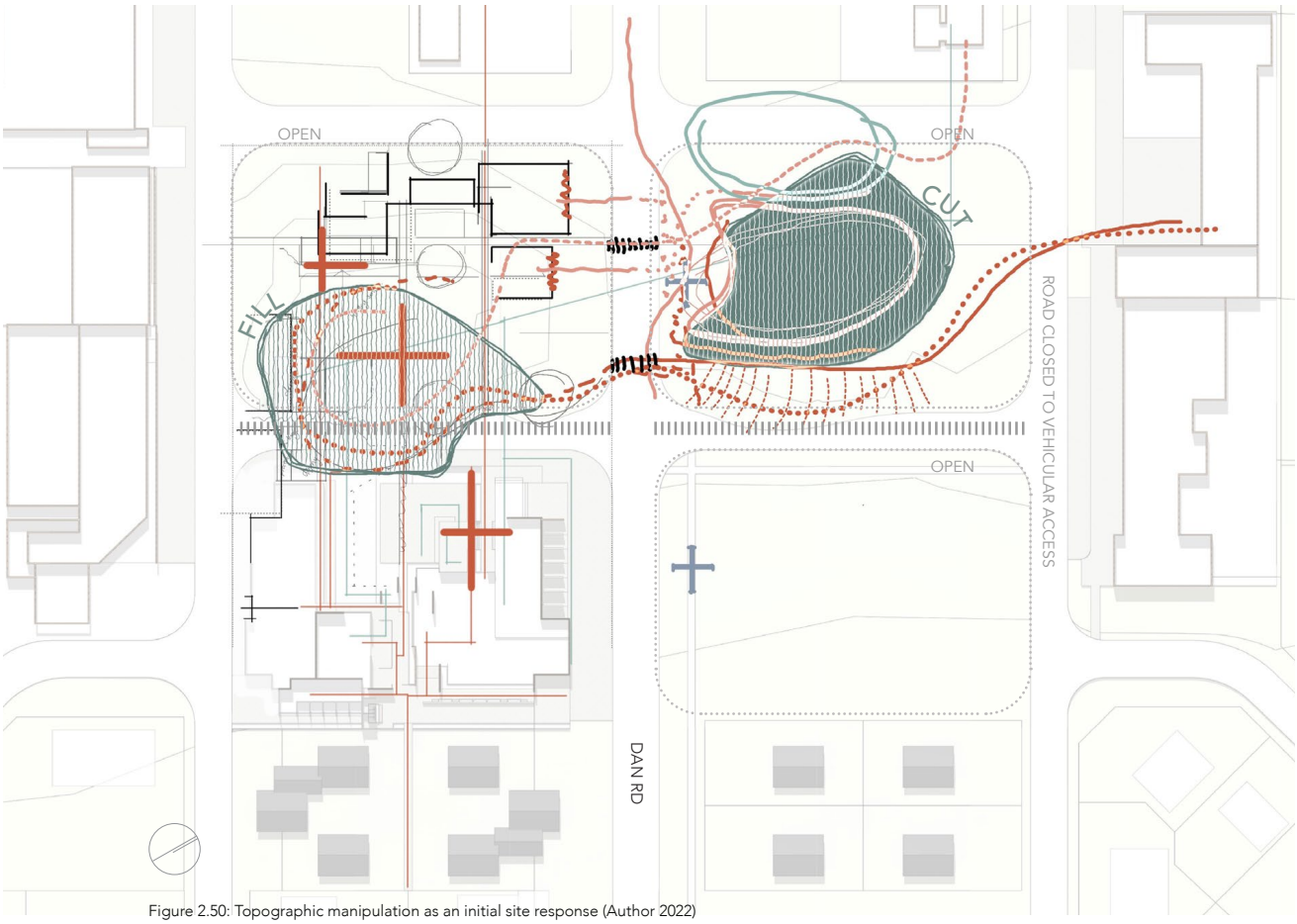
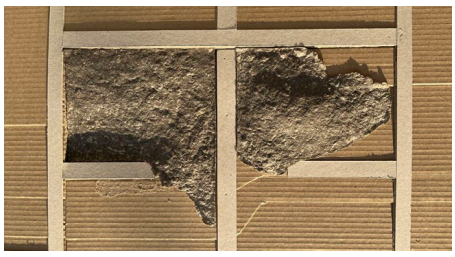


Figure 2.50: Topographic manipulation as an initial site response (Author 2022)

The development of the open space that use to be a park cannot revert to what once made it successful. The social infrastructure typologies surrounding the space are not as connected to the environment as they used to be; even then, the scale of the green space was disproportionate. Developing this piece of land to have more spatial gradients can also not simply be done through building. Doing so will again assume functional standards that will be fixed into space. This then calls for a more flexible design medium. A more sensitive approach to initiate the development of this scheme can be found in and around the old age residences. Their garden typologies are the only flexible aspects of their lived space, and their methods of space-making will be appropriated to fit the scale and nature of the project.

Altering the flat grass fields becomes challenging as the road infrastructure limits the surface area to cut and fill. Therefore, two of these roads are proposed to be closed off (Fig. 2.50). Doing so provides enough surface area to cut into the landscape on the western side while using the earth removed to build up the landscape on the eastern side (Fig. 2.51). Cutting the landscape provided an opportunity to level the site with the mixed-use building and road edge, creating a level transition as the New Agers entered the space.

Figure 2.51: Cut and fill experimentation with cardboard and paper mache (Author 2022)



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Movement begins in these individuals' private environments. Currently, their visual approach to social space is very focused on their destination, which creates a monotonous transition between the private and public environments (Fig. 2.52). This occurrence necessitates the development of an architectural promenade with spatial and programmatic gradients (Fig. 2.53), where intermediate visual goals (Alexander 1990:216) and activities lead people from one space to another.

Figure 2.52: Architectural promenade as a result of transport efficient planning (Author 2022)

Figure 2.53: The proposed Architectural promenade with spatial gradient (Author 2022)

Direct circulation paths will connect ritual anchors located at the park edges, but secondary paths that lead to "special spots" (Alexander 1990:815) will provide purposeful engagement opportunities. Pedestrian movement will happen outdoors to further encourage engagement where the intimacy gradient in each internal space will be clear before entering, ensuring that activity participation is scaled between simply observing and participating.

2.10.

FOCUSED DESIGN DEVELOPMENT

While the urban response forms a necessary part of the dissertation to ensure that the proposal aligns with Danville's contextual issues, refining the design will be focused on a portion of the urban scheme. The sensitivity of the project scope requires exploration into the details, which, if resolved, could serve as a case study of how to develop the rest of the scheme and future civic proposals that aim to create more inclusive public space.

The appropriate zone in the proposal to achieve this will need to address the major issues identified as they would directly speak to the primary needs of the New Ageing residents. The focused design development will therefore happen around and in front of the mixed-use building (Fig. 2.54) and stretch across the open site to the medical facilities and open pot of land to the east.

Figure 2.54: Focus area to be developed (Author 2022)

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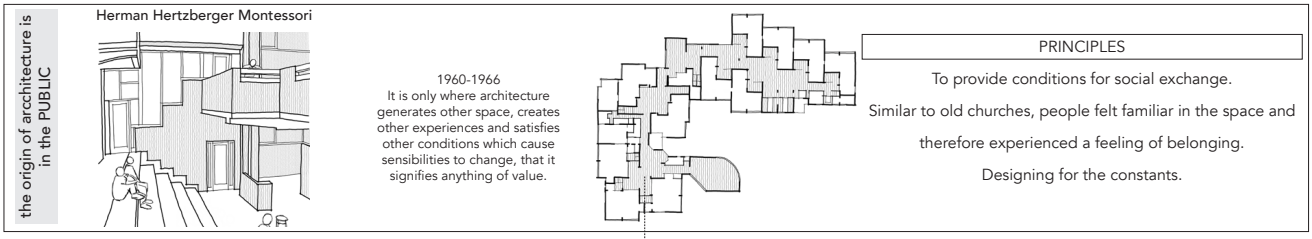


Figure 2.55: Herman Hertzberger Montessori (Author 2022)

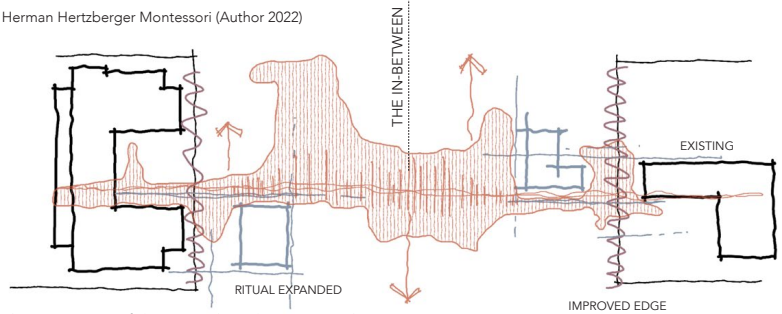
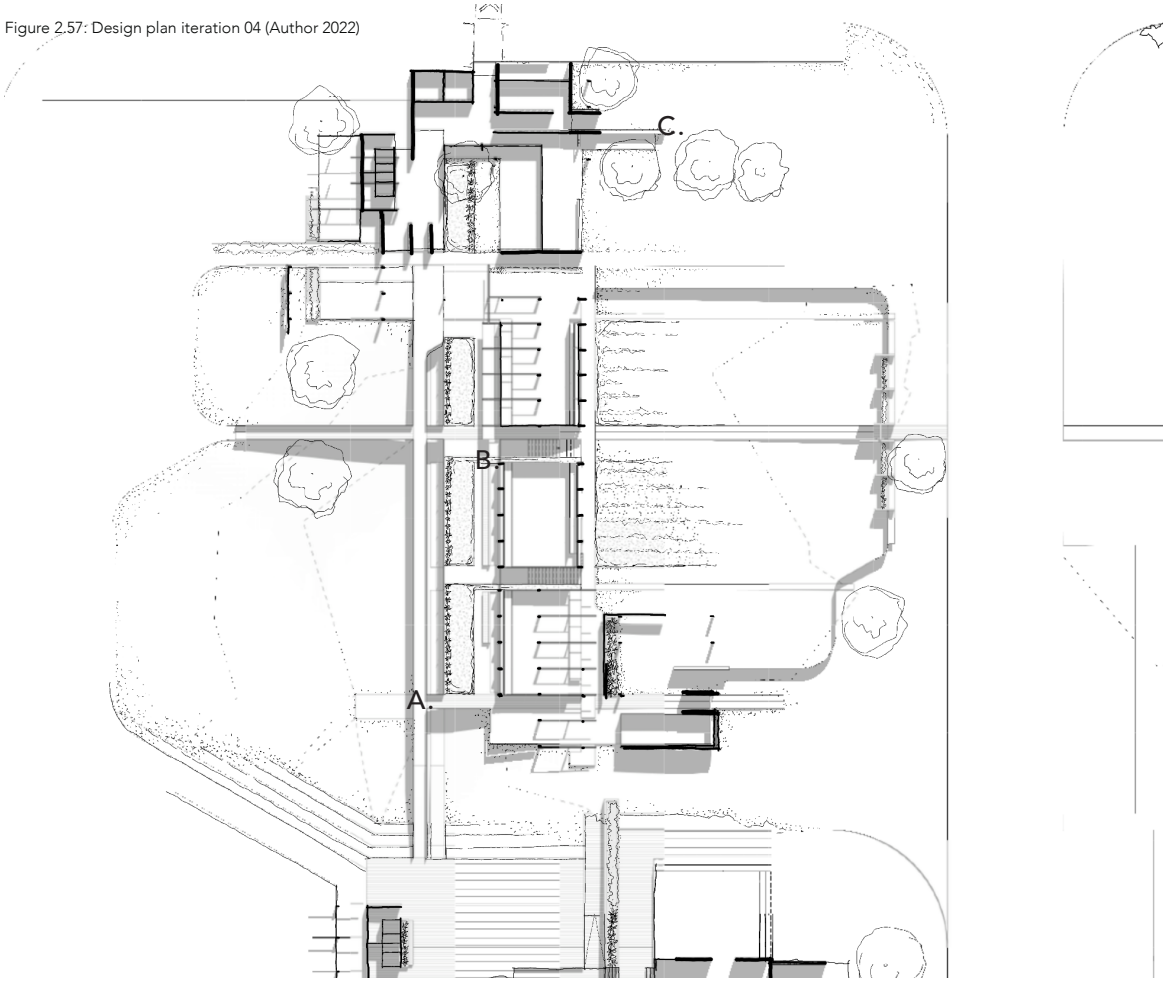


Figure 2.56: The importance of designing the in-between (Author 2022)

Led by the design intentions set out in this chapter, the intervention began to speak to both the infrastructural and personal needs of the elderly demographic in Danville. Attempts were made to link people to their social environments by creating space that would foster meaningful engagements. The representational nature of the structure in its context proved to be more difficult and requires development if it is to evoke a sense of familiarity in its users. The scale of the structure in its environment will also be assessed to create a balanced relationship between landscape and building where the two operate in a symbiotic relationship.

Figure 2.57: Design plan iteration 04 (Author 2022)



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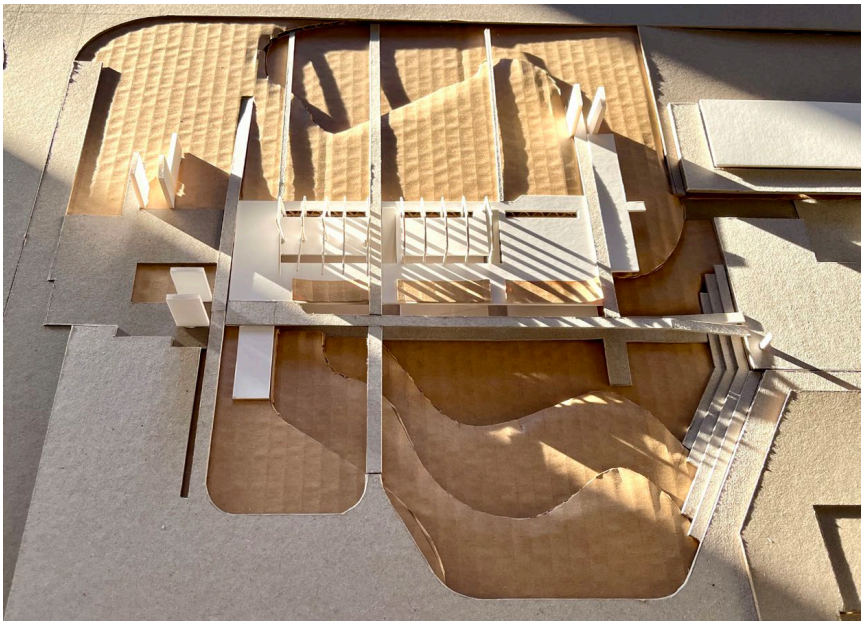

Figure 2.58: Iteration 04 model exploration 1/5 (Author 2022)

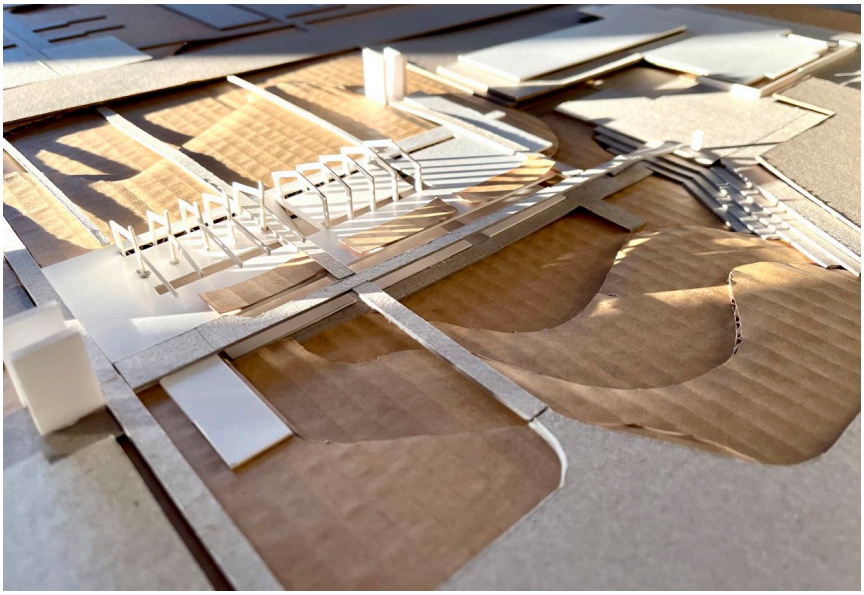

Figure 2.60: Iteration 04 model exploration 3/5 (Author 2022)

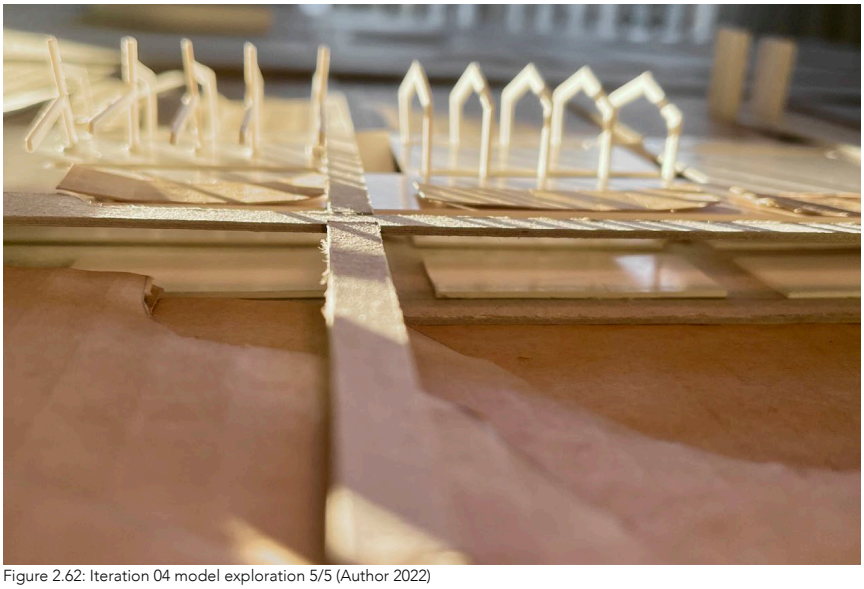

Figure 2.62: Iteration 04 model exploration 5/5 (Author 2022)

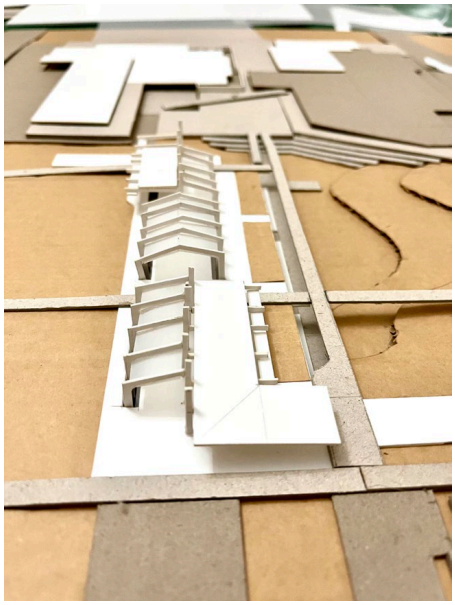

Figure 2.59: Iteration 04 model exploration 2/5 (Author 2022)

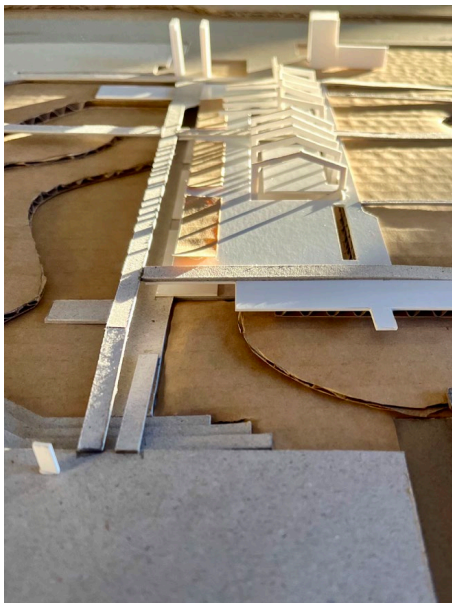

Figure 2.61: Iteration 04 model exploration 4/5 (Author 2022)

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A. Figure 2.63: Iteration 04 render 1/3 (Author 2022)

B. Figure 2.64: Iteration 04 render 2/3 (Author 2022)

C. Figure 2.65: Iteration 04 render 3/3 (Author 2022)

CONCLUSION

"Buildings and towns enable us to structure, understand and remember the shapeless flow of reality and ultimately, to recognise and remember who we are. Architecture enables us to perceive and understand the dialectics of permanence and change, to settle ourselves in the world, and place ourselves in the continuum of culture and time."
(Pallasma 2005:71)

Only when we are connected to the environments beyond our private residences can this be true. In these shared spaces, culture can evolve and alter opinions that have remained unchanged due to the lack of exposure. Enabling New Agers to continue shaping their environments after retiring is the only way to challenge ageist perceptions and create more inclusive environments for those current and future old.

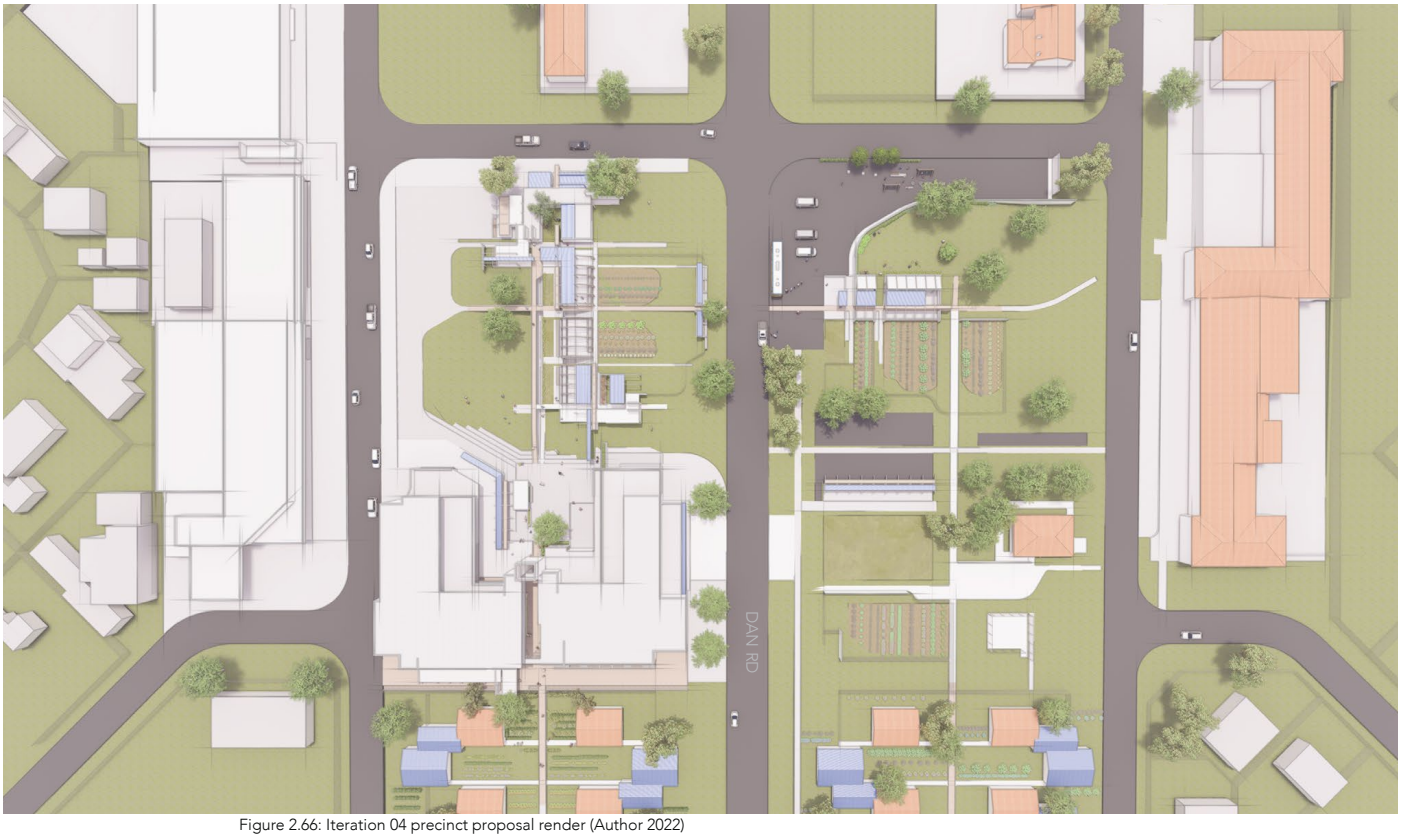

Figure 2.66: Iteration 04 precinct proposal render (Author 2022)

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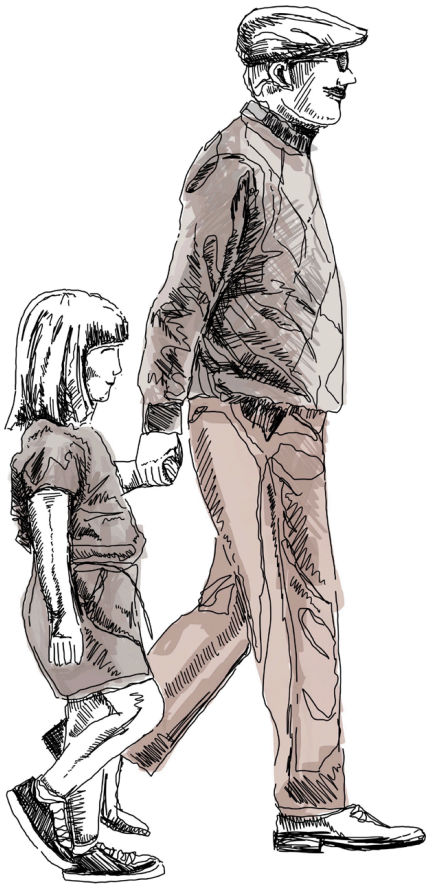

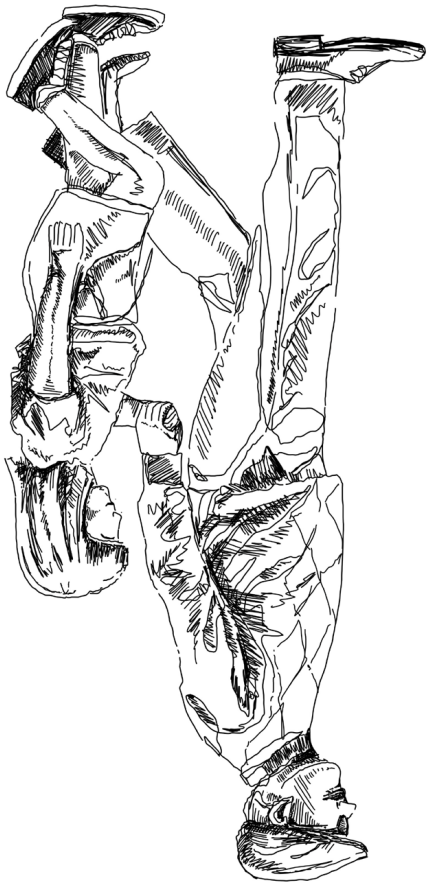

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CHAPTER 03

SYNTHESIS

The project's development in chapter three focused on further developing the design to test the significance of the design principles found in Chapter 2. The tectonic development described in this chapter will attempt to realise the design intentions by following a similarly critical investigative approach.

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INTRODUCTION

"Take old people out of complex environments and they age quicker. The brain doesn't just need physical activity to remain vital, but rather complex physical activity- the brain needs to stay healthy and engaged." (Levitin 2020:113)

Staying engaged becomes crucial when the body and mind begin to exhibit changes related to ageing. Designing interstitial space that would allow rituals to be scaled according to changing abilities to keep individuals integrated was stressed in the first chapter and explored through design iterations in the second chapter. The architectural solution was generated through a layering of a scientific understanding of how the mind changes, the contextual issues of the project site and the potential hidden in the ordinary tasks of the New Agers every day.

Through the research of Doctor Levitin, we now understand how important the architect's role is in shaping environments to delay cognitive dependency at the end of life. When we act on this responsibility by incorporating spatial routines and haptic aids in age-inclusive social space, the architectural discourse of geriatric care will begin taking a preventative care approach. Exploring these principles through design explorations has proven the validity of the dissertation intentions stated throughout the project development in the way access, activity and association gradients have been implemented to create a more age-inclusive environment. The current design outcome will act as a base case (Fig. 3.10) that can be critiqued and further explored through refinement and the technification of the scheme. This development will be driven by the sensitive complexities true to these individuals' rituals and ways of occupying space.

Figure 3.01: Base case sectional perspective (Author 2022)

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3.1. CONSOLIDATED DESIGN INFORMANTS

The design response is primarily built on understanding the New Agers ritual and their contextual language of place (Levitin 2020). An understanding of the current activities was accompanied by a reinterpretation of their ritual that would introduce purpose-giving programs in an environment where New Agers have little agency over their social space (Levitin 2020). An essential oil distillery was proposed for the site, drawing from the landscape history of the site, the current garden typologies and the industrial precinct revival plans (Fig. 3.02).

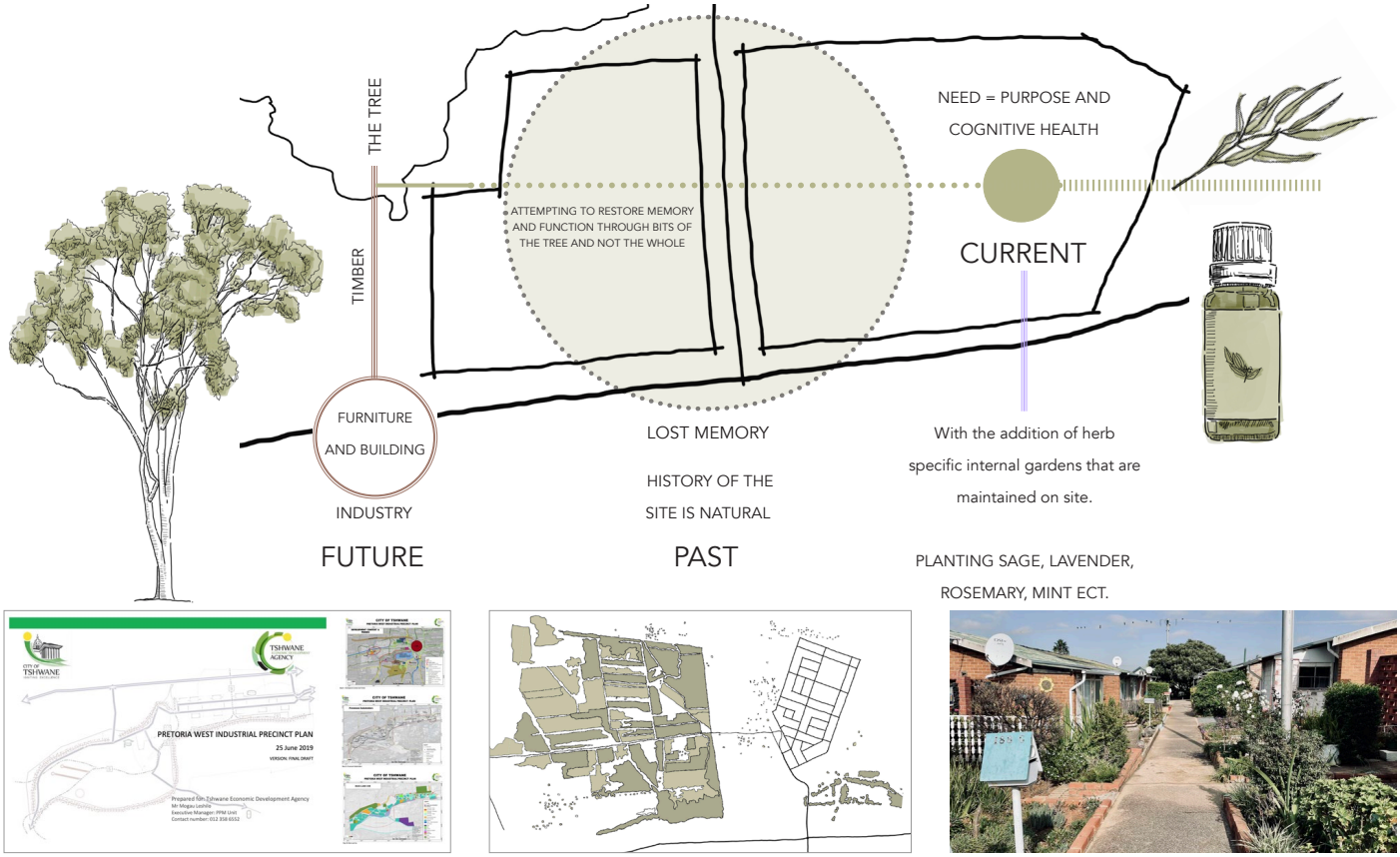

Figure 3.02: Proposed program and how it relates the site and New Agers' historic current and future narrative (Author 2022)

The scale of this program will be no larger than that of light industry while integrating all the essential oil production phases, from produce farming to retail and end use, on-site. This programme's systematic and spatial requirements further determined how the design was developed. The supporting programs to the essential oil distillery introduced more purpose-giving activities on site, further strengthening the dissertation goals of enabling users with modified needs to access their social environments better, for these people to form part of purpose-giving activities on a level that suits their capabilities and to have the opportunity to associate with different age, social and class demographics in their neighbourhood.

Creating an environment where the main and supporting programs can function interdependently becomes an urban strategy that attempts to address the fractured nature of our social spaces that resulted from modernist urban planning. Therefore, the architectural design process needs to prioritise the making of optimal in-between space. Only then will the architecture introduce environments of spatial and programmatic gradient. The interdependency of space begins at the most private environments (the New Agers residences) and ends at the most public (the social infrastructure). The ritual activities that fall within and beyond these elicited spatial categories will determine the appropriate architectural intervention to match the level of access, activity, and association required.

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3.2. DESIGN ITERATIONS

The extent to which the current design met all these spatial requirements was critiqued and improved through a series of iterations. The level of access, ranging from visual accessibility to physically accessible environments, was explored by manipulating the floor surface and roof coverings. Spaces that facilitate ritual activities were scaled to be more accommodating to users with modified needs using various vertical planes. And the possibility to better associate through multiple social encounters was further developed using horizontal infill elements at floor and ceiling height.

1. ACCESS:

Phase two of the base case design was ordered along the linear walkway that would be introduced during phase one, but it was observed that this placement on the open site was unresponsive to the street edge (fig. 2.48). If the primary design intention is to respond to the existing, then the placement on site should favour the existing activity happening along the sidewalk, closer to the street edge. The new on-site placement provides the opportunity to improve the spatial gradients along the existing circulatory route while introducing an activated street interface that contextualises the various architectural expressions in Danville. The primary residential typology will serve as the biggest informant for this. The interdependence of space and ritual also calls for the interdependence of architectural expressions. The concrete flat roof overhangs and ribbon balustrade upstands of the brutalist mixed-use building will be repeated at the entry points of the intervention. Doing so creates a sense of visual clarity, guiding one into the building while redefining how a social gateway should function, which challenges the current typology. Repeating this expression will tone down the alienated nature of the brutalist mixed-use building by making it read and function as part of the whole.

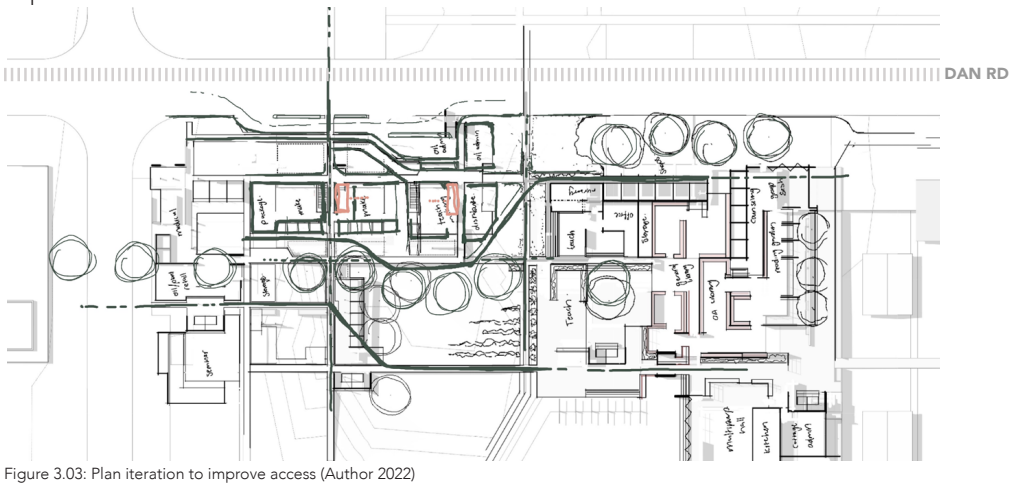

Figure 3.03: Plan iteration to improve access (Author 2022)

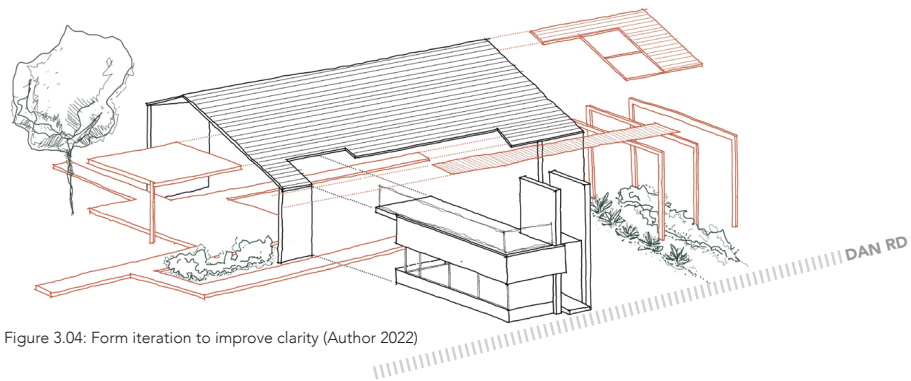

Figure 3.04: Form iteration to improve clarity (Author 2022)

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2. ACTIVITY:

The spaces designed for the various activities in the base case were modelled on the size of the Danville Cottage units. The scale of the residential units represents an enclosed space that the New Agers are comfortable with. In the process of creating these familiar environments, the interdependency of space where activities can be scaled was neglected. To better this, the design development was geared towards better connecting space and program (fig. 3.02) through a variation of wall types and heights. In some instances, thresholds between environments were left completely open where users could move between spaces easily, while others were designed to be visually accessible through glass facades and bay windows. Articulating the intricacies of the landscape and garden types surrounding the enclosed environments further influenced the internal spatial arrangements and choice of wall height and material.

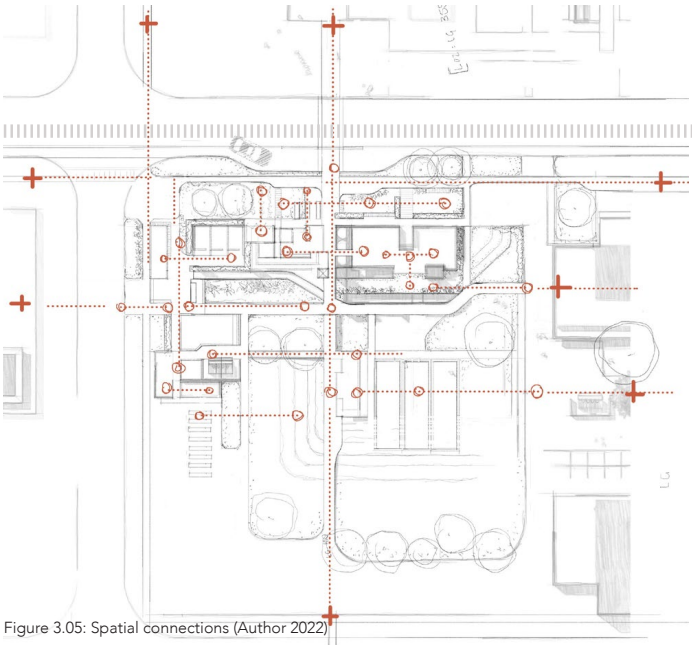

Figure 3.05: Spatial connections (Author 2022)

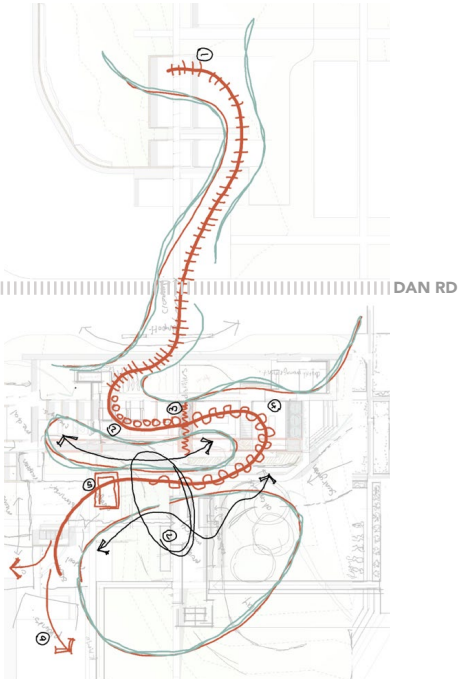

Figure 3.06: Program connections (Author 2022)

3. ASSOCIATION:

The ability of individuals from different age, social and cultural demographics to associate with one another is highly dependent on finding common ground. Often this common ground takes on a literal interpretation where a child standing on a raised surface can communicate and partake in the same activities as an adult (fig. 3.07). Changing our ageist perceptions will only happen when we see one another in an environment free from ageist stigmas. Scripting these encounters requires the care and detailed considerations that will be present during these moments and will be further explored in the detailing portion of this design process.

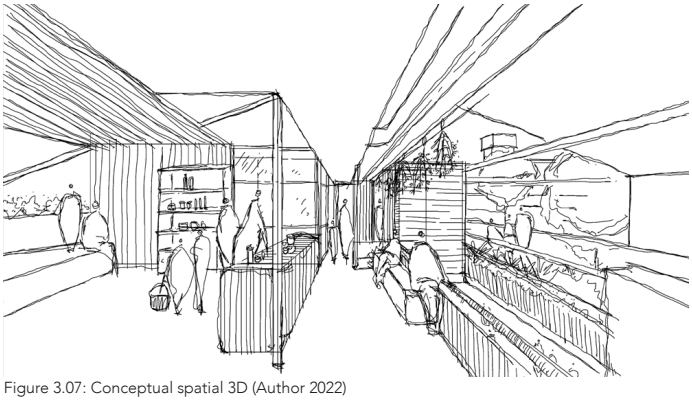

Figure 3.07: Conceptual spatial 3D (Author 2022)

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3.3. DESIGN OUTCOME

In its urban context, the proposal ultimately attempts to address the disconnection that resulted from the modernist urban planning principles that Danville was built on. It introduces an architecture of interdependence in an environment that largely suits the needs of the independent modern labourer, a character type that forms a small percentage of Danville's population. The interdependency between space, ritual and users creates a network that will keep New Agers connected with their social environments after retiring, enabling them to function independently for longer.

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The design and program development respond to the undocumented life stories of Danville's oldest inhabitants while introducing an internally sustainable model that will empower the community for generations to come. Like the soil gave life to the eucalyptus plantations of the Elandspoort farms and surrounding industry, it is now fostering the elaborate gardens of Danville's New Agers, and it is this soil holds the key to enabling the community to live better for longer.

Figure 3.08: Final design sectional perspective rendered (Author 2022)

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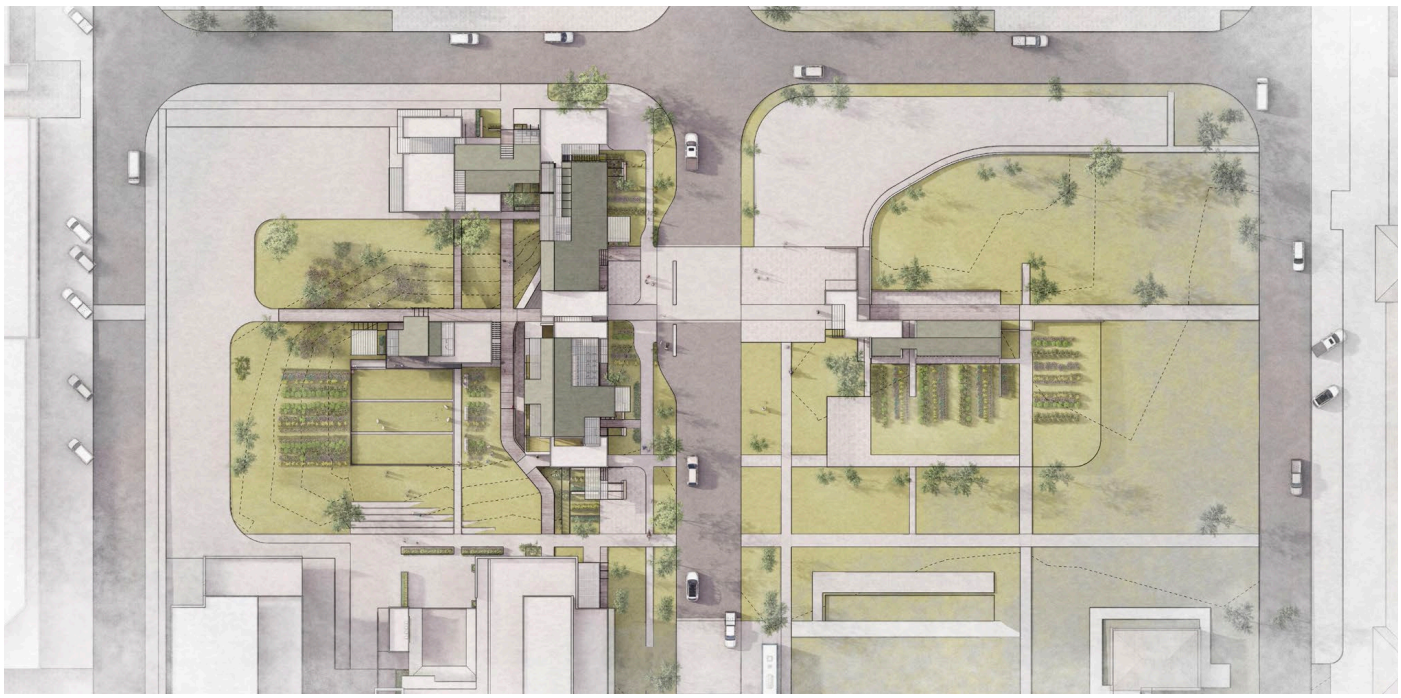
PRECINCT PROPOSAL

Figure 3.09: Final design aerial view rendered (Author 2022)



ROOF PLAN

0m 5m 10m 15m

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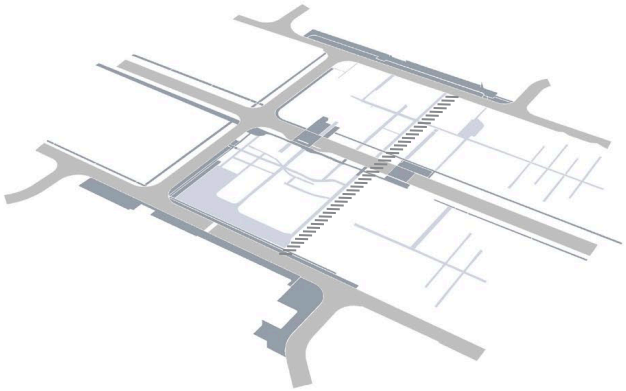
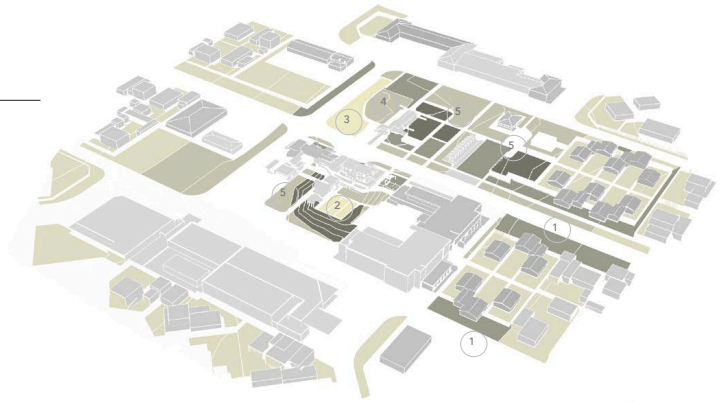
Figure 3.10: Final design precinct proposal explained through movement, green space, and program relations (Author 2022)



MOVEMENT

OPTIONS AND GRADIENT

- Roads prioritising vehicular movement
- Pedestrian routes just off of vehicular route
- Secondary movement paths (cutting through buildings and sites)
- Vehicular road made pedestrian

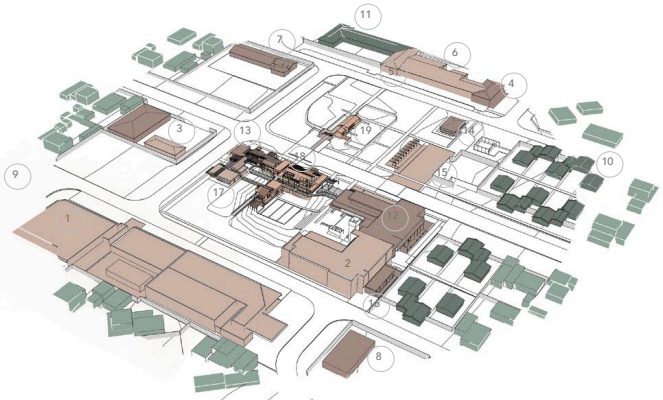


THE RELATIONSHIP BETWEEN ARCHITECTURE AND

LANDSCAPE INFRASTRUCTURE

- Productive Landscapes
- Supporting Garden-scapes
- Greenery as is
- Recreational landscapes
- Building Mass

1. Teaching gardens
2. Boules Court
3. Childrens play park
4. Lovers Garden
5. Primary productive landscapes

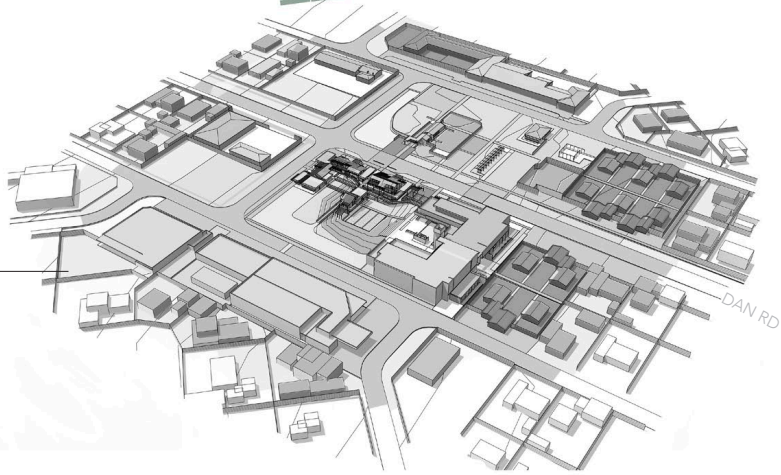


PROGRAM

INTERDEPENDENCE

- Old age homes
- Private residences
- Commercial trade
- Social infrastructure
- Essential oil processes

1. SPAR Danville
2. Usave Danville
3. Danmed Pharmacy
4. Danville Post Office
5. Jose's Liquor Store
6. Danville Hardware Store
7. Future Innovations ECD
8. New Apostolic Church
9. Nederduitsch Hervormde Kerk Van Afrika
10. Danville Cottages
11. Jan Ellis Laan Aftree Oord
12. Danville 'Liggie' Library
13. Alternative healthcare Clinic
14. Pension collection offices
15. Informal Market
16. Retirement counselling services
17. Oil and Plant retail
18. 'Danville LiggieHuis' (Essentail oil and Product makers spaces)
19. 'Lig Huis' (Productive landscape facilities)



LAYERING OF THE NEW DANVILLE CIVIC SQUARE

PRECINCT PROPOSAL

The new civic square responds to the exisitng ritual activities of Danvilles inhabitants through a proposal that builds on the current rituals performed in the space through the provision of adequite infrastructure whilst reimagining other rituals to be more purpose giving.

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EXTERNAL
CONNECTIONS AND INTERFACES

The final design is connected to its surrounding infrastructure and activities through clear movement routes that cut through the proposed intervention. These routes connect the new programs corresponding to the existing.

Existing sidewalk to stores across the street

Arcade cutting through mixed use building connecting Danville Cottages to public space

New pedestrian connection to the more developed landscape node

NEW AND EXISTING MIXED-USE SERVICES

1. Shoprite U-Save
2. Danville Cottages administrative offices
3. Multi-purpose hall and kitchen
4. Small rentable shop spaces that are street facing
5. Danville Library
6. Post retirement counselling services
7. Danville Bakery and coffee shop with customer seating integrated with the Liggie Huis essential oil manufacturers green house and plant nursery.
8. Second and third level apartments that follows strict cross generational living arrangements.

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GENERAL COMMERCIAL RETAILORS

1. Mimi's Beauty Hair and nails salon
2. Take Away Masters
3. Danville Islamic Centre
4. Save a Rand cash and carry
5. Feroz General dealer
6. Tops- SPAR
7. SPAR

Existing sidewalk to stores across the street

New connection from alternative medical node to existing Danmed Medical Center

CONVENSIONAL MEDICAL SERVICES

1. An established car wash in the Danmed Medical Center parking lot
2. Danmed Alpha Pharm Pharmacy
3. Danmed Alpha Pharm Clinic
4. Danville Dentist

Existing sidewalk connected to Future Innovations ECD and Jan Ellis Laan Aftree Oord

PRODUCTIVE AND RECREATIONAL LANDSCAPES

1. 'Lig Huis' (The main produce landscape facilities) which include the Primary produce gardens and Teaching gardens
2. Open vendor stalls to facilitate informal retail activity
3. Pension collection offices as an extension of the Danville Post Office
4. Outdoor play park opposite the Future Innovations ECD

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INTERNAL
CONNECTIONS AND INTERFACES

The final design aims to create internal spatial interdependence as much as it does external. These spatial connections were formed at program overlaps

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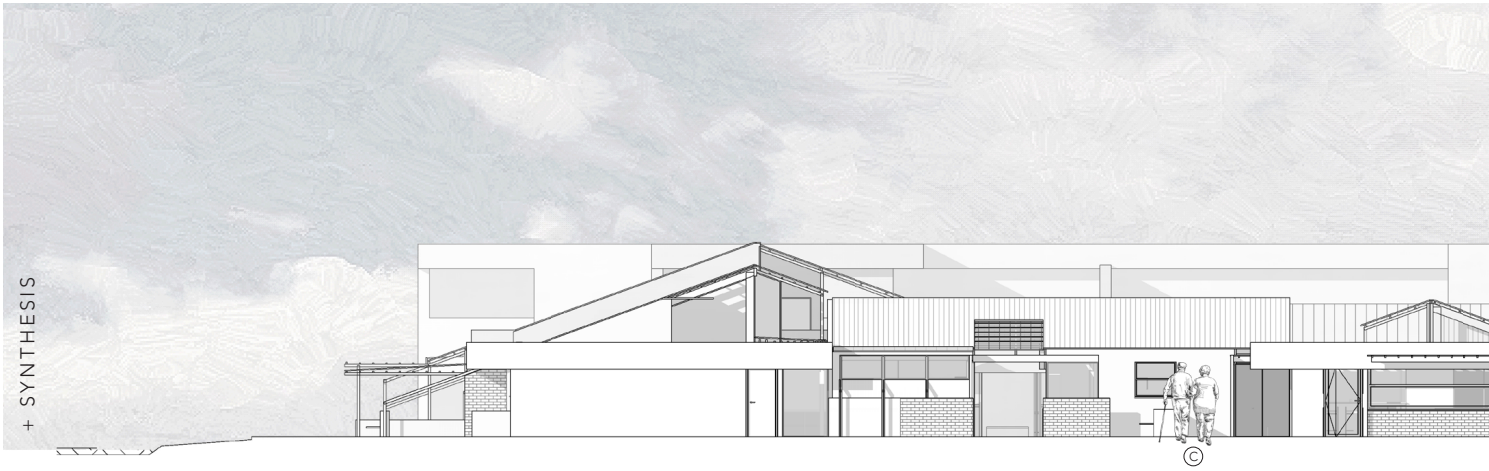
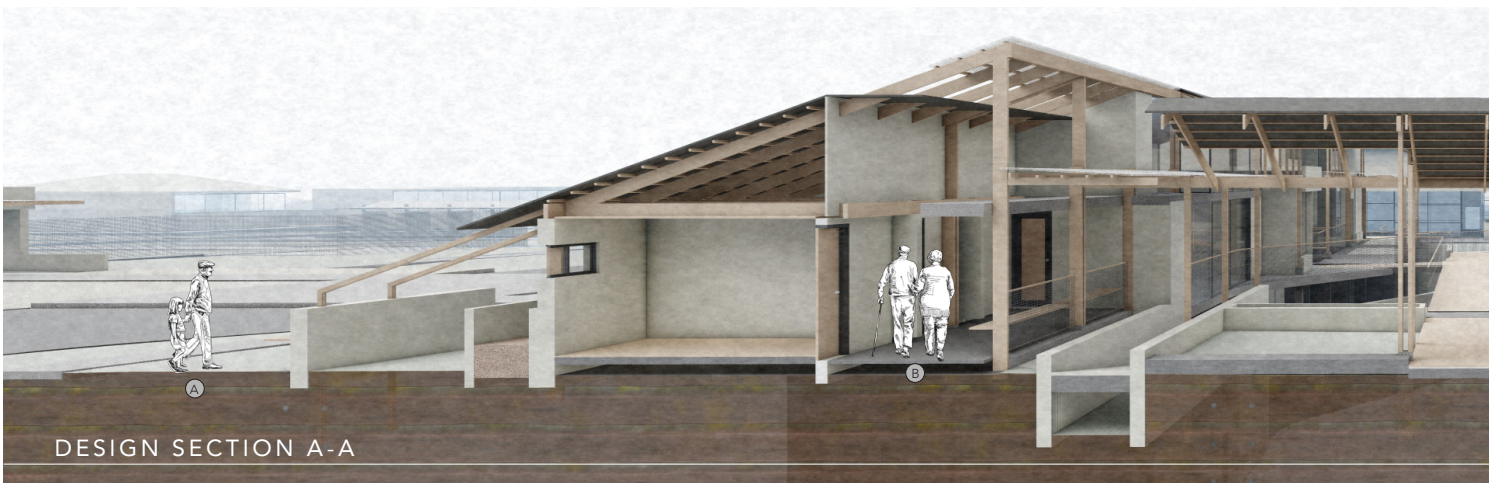


EAST ELEVATION SCALE 1:100



DESIGN SECTION A-A

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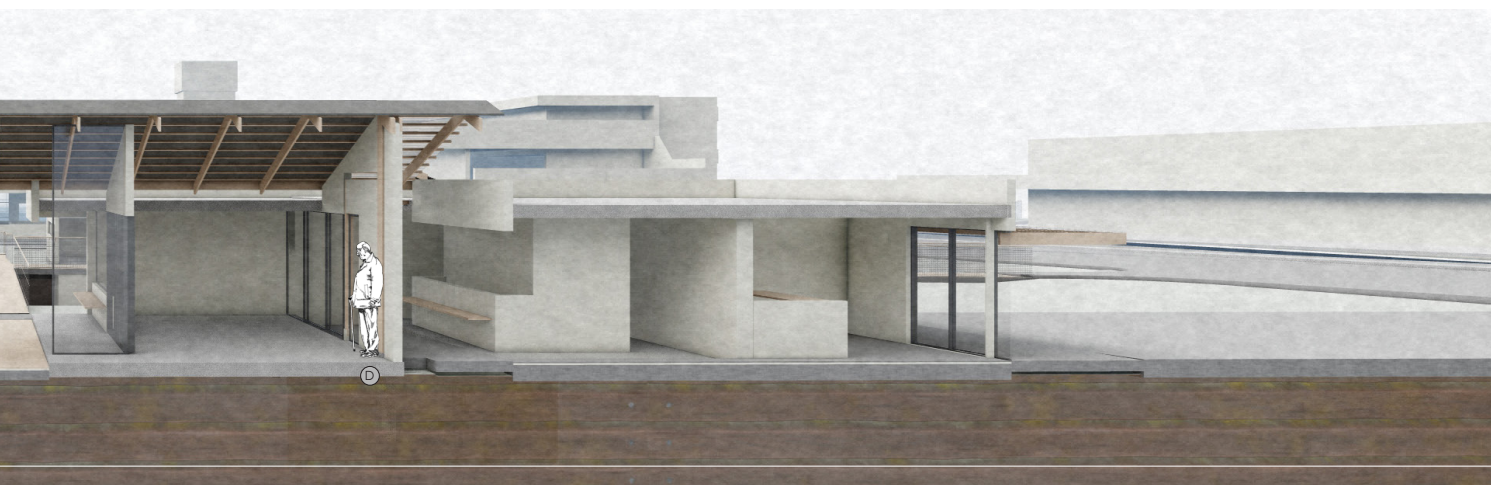

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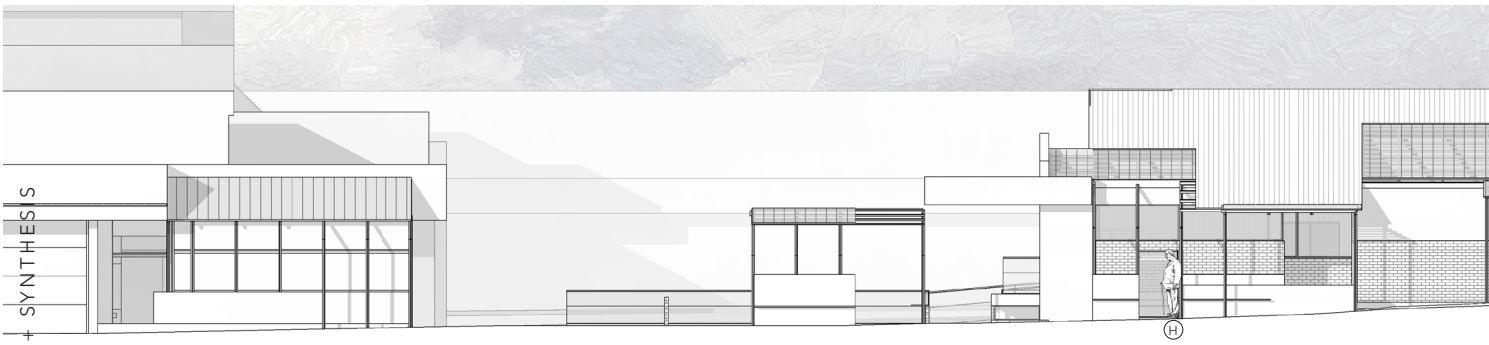
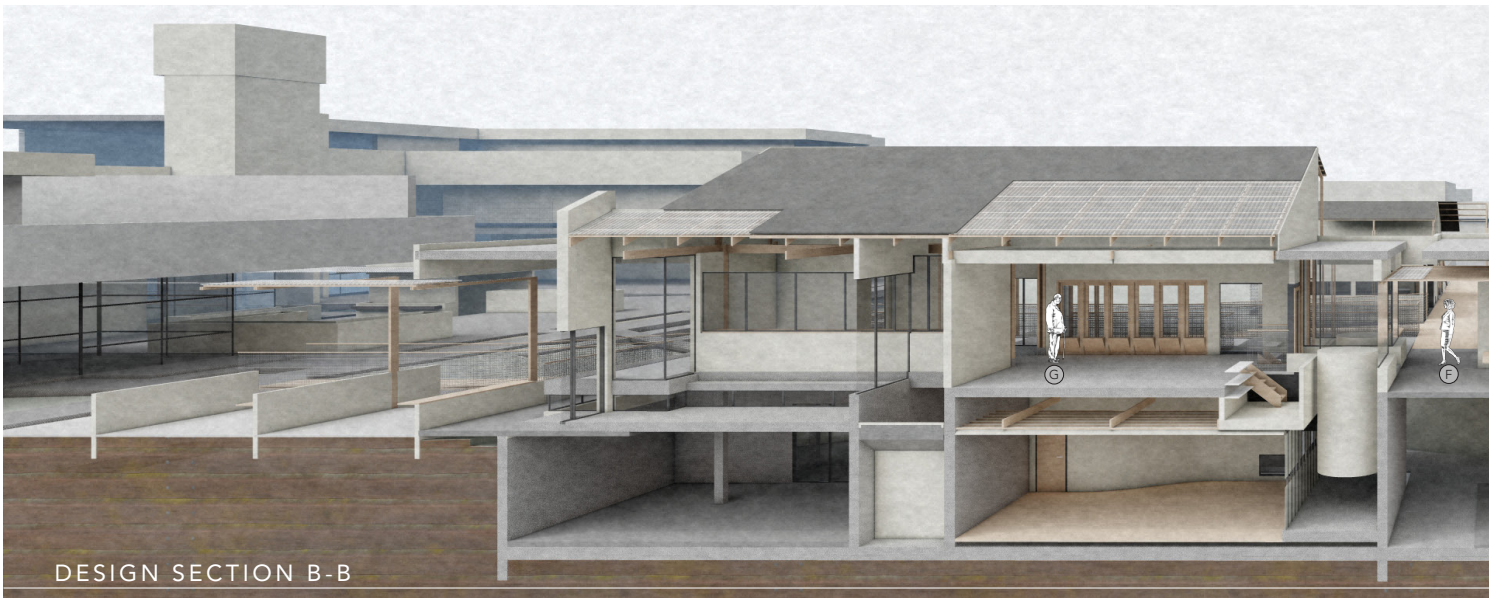


NORTH ELEVATION SCALE 1:100



DESIGN SECTION B-B

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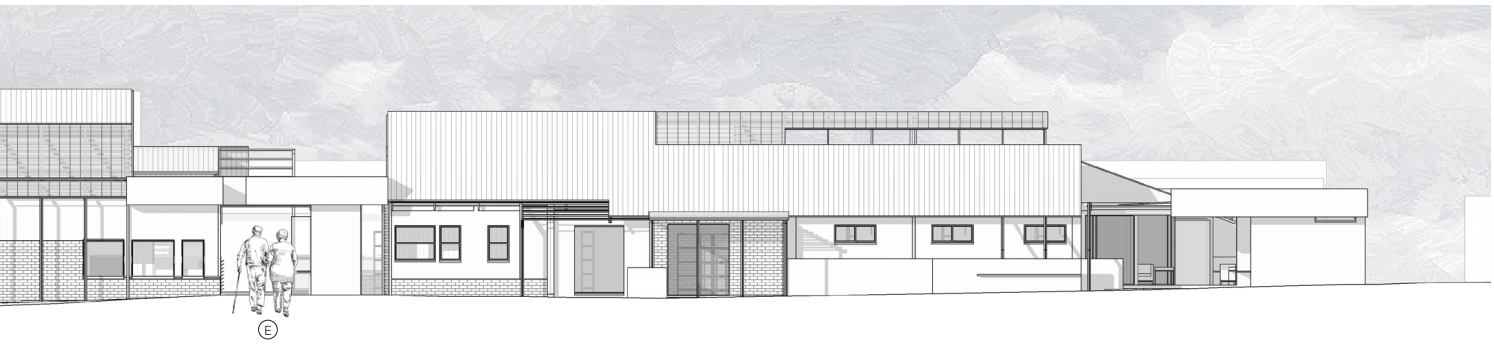

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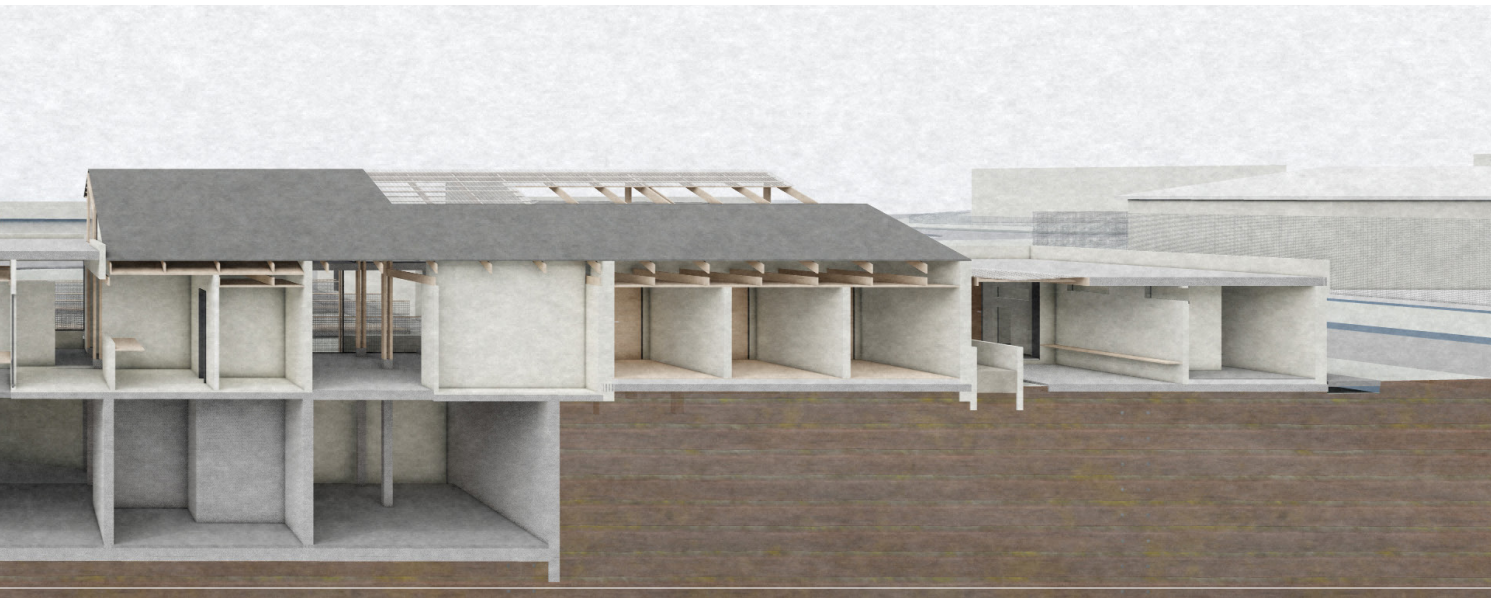

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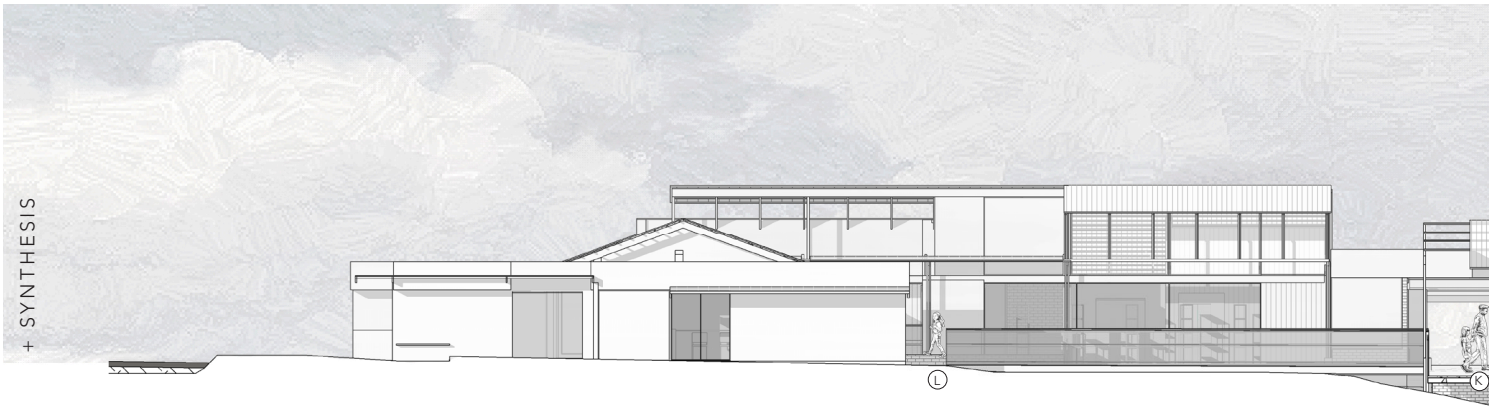

SOUTH ELEVATION SCALE 1:100

DESIGN SECTION C-C

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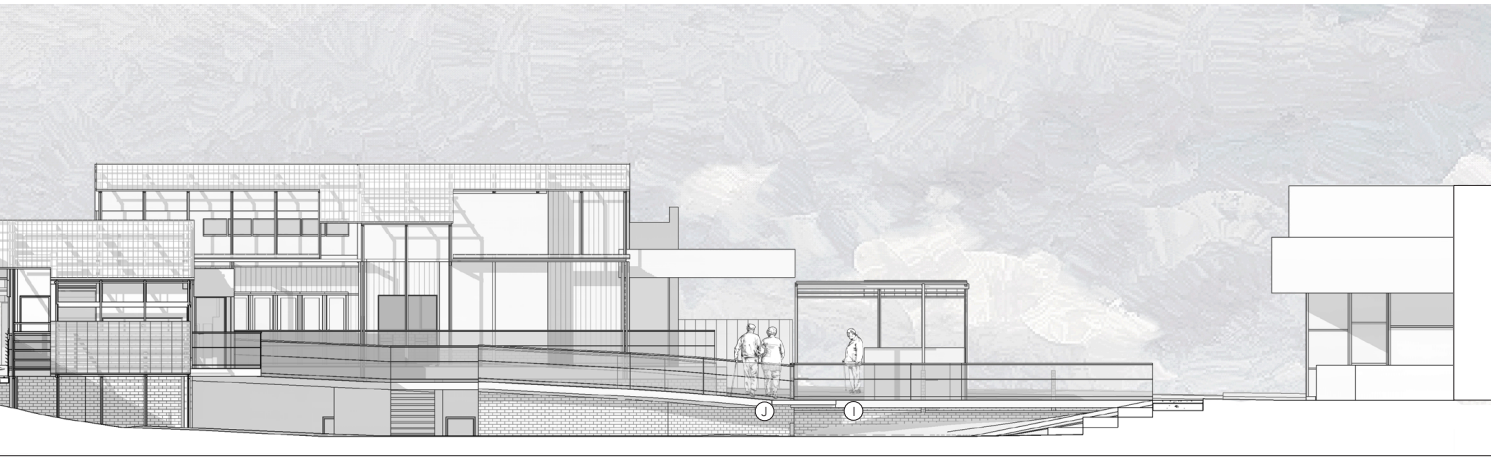

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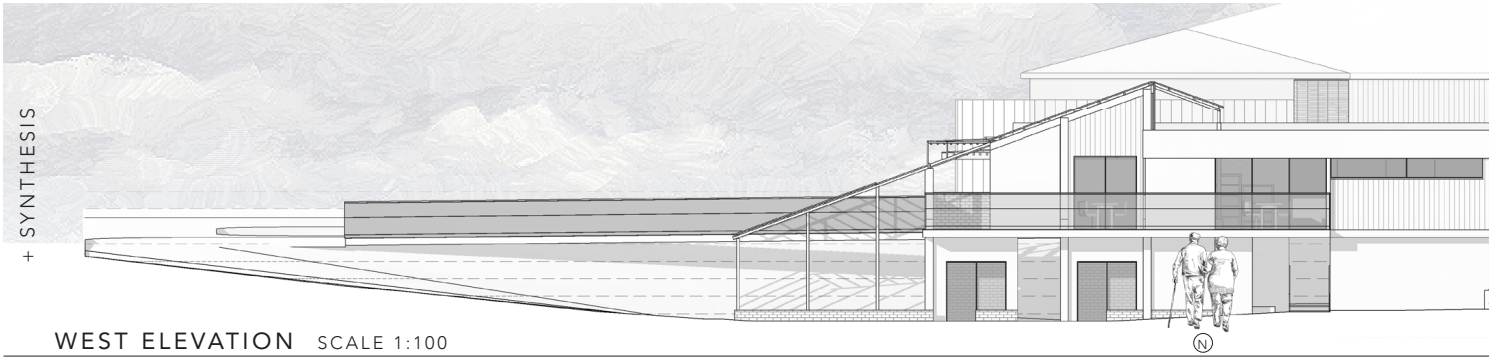
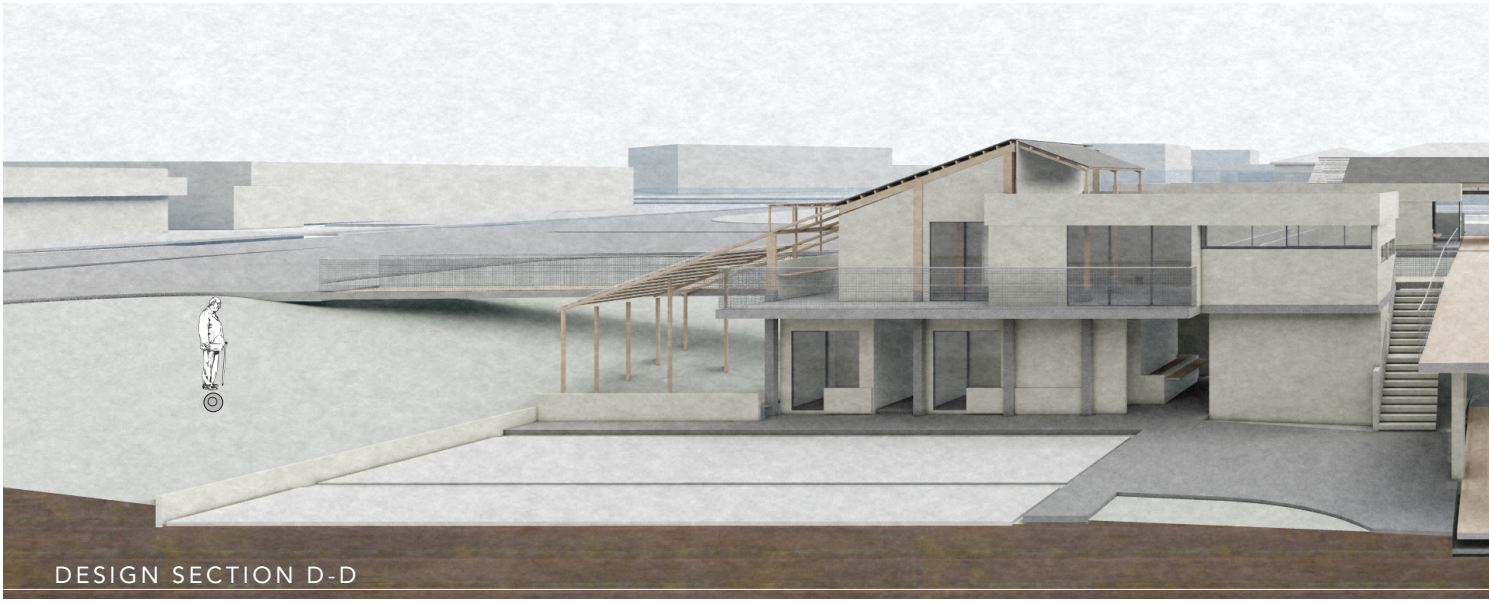


WEST ELEVATION SCALE 1:100



DESIGN SECTION D-D

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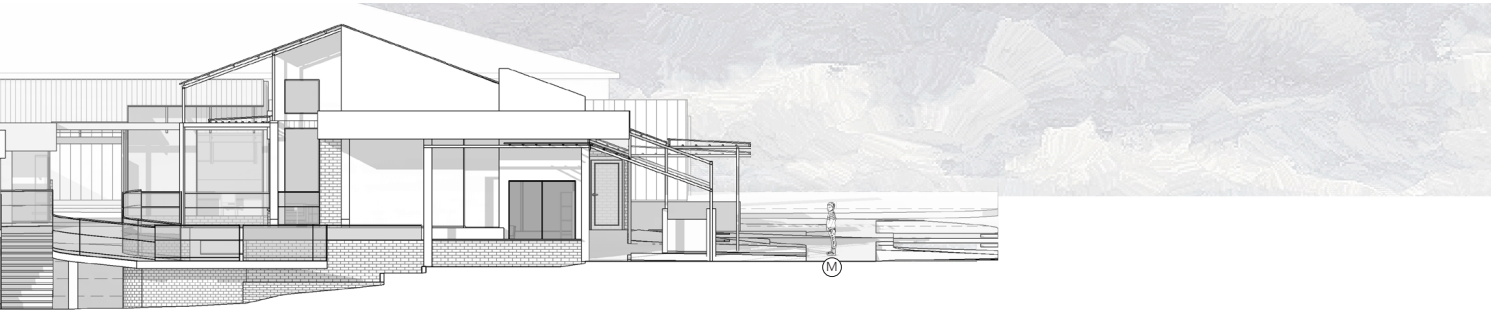

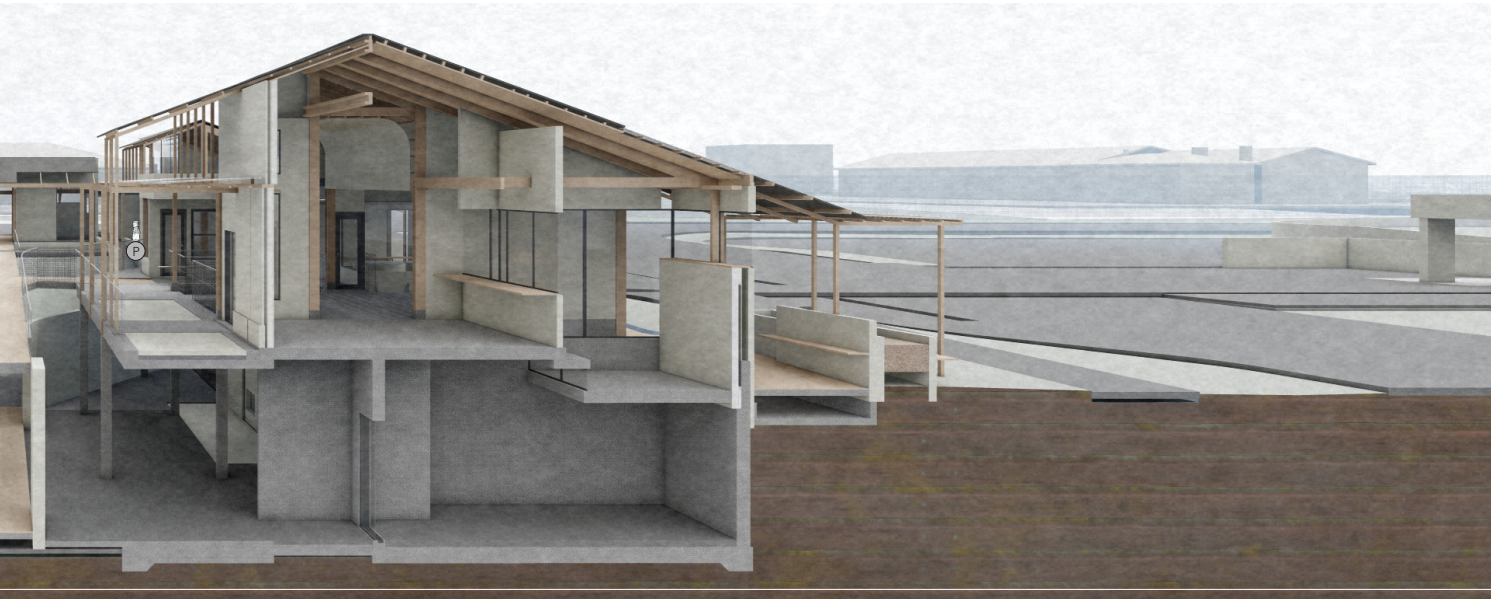

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SPATIAL GRADIENT BETWEEN PUBLIC AND PRIVATE

Entrance to the new Alternative Health Care Clinic.

The entrance to this environment showcases the mediation between the architecture of social and residential that is consistent throughout Danville. Changes in materiality and garden typologies establish a gradual trasition from public to private. The new social infrastructure now serves the human condition.

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SPATIAL GRADIENT BETWEEN PUBLIC AND PRIVATE

Waiting area outside the doctor's consultation rooms.

The laminated timber frame supported by the concrete sub-structure is used as an element to demarcate space where specific activities can take place without isolating the spaces. Planting and the undulating floor surface create the necessary privacy thresholds.

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SPATIAL GRADIENT BETWEEN PUBLIC AND PRIVATE

Interdependent social and retail infrastructure.

The more public waiting areas in the Alternative Health Care Clinic are connected and activated by retail activity. The variety in waiting space destigmitises the clinic visit to some by creating a more relaxed environment where a doctor's appointment becomes as casual as other daily rituals. For this reason, the language of the architecture shows no clear separation between the internal programs.

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SPATIAL GRADIENT BETWEEN PUBLIC AND PRIVATE

Well connected social and retail infrastructure.

The laminated timber frame supported by the concrete structure below ground level is used throughout the architecture to demarcate space to specific activities without making the spaces visually inaccessible whilst planting and ground level changes create a series of privacy thresholds.

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SPATIAL GRADIENT BETWEEN INDUSTRY AND MAKING

Unseating industrial architecture in Pretoria West.

The harsh architectural language of the Pretoria West industry has no place in the suburban neighborhood of Danville. This does not mean that the people who worked in this environment for decades should be kept from the social and economic opportunities that accompany industrial processes and making. The light industrial nature of the project responds to exactly this.

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SPATIAL GRADIENT BETWEEN INDUSTRY AND MAKING

Industrial processes at different levels.

Partially submerging the jarring processes of essential oil distillation below ground level prevents these activities from dwarfing the more age appropriate processes that follow. The industrial nature of essential oil distillation is now made more accessible both physically and visually where they can be performed alongside the making candles, chest rubs and other essential oil products.

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SPATIAL GRADIENT BETWEEN INDUSTRY AND MAKING

Making gradients encourage cross generational engagement.

The accessible nature of the making space encourages users from different age, social and cultural demographics to collaborate. The well-lit, glare free environment, where views between inside and outside have been carefully curated, provides the ideal space in which making activities can be focused.

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SPATIAL GRADIENT BETWEEN INDUSTRY AND MAKING

Sustainable industrial activities through research and education.

Research into plant and crop-based agriculture will be facilitated on site to ensure sustainable agricultural and industrial processes. Furthermore, it will aim to educate those young and old on responsible growing and making practices. This facility quite literally forms the corner stone of the building and views to crop gardens, seed labs and the makers space encourages regulation and maintenance of the precinct.

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1

SPATIAL GRADIENT BETWEEN WALKING AND ACTIVITY

An architectural promenade suited for its context.

Where previously movement infrastructure favoured motorised transport, moving between private and public environments is now made more accessible to the large group of residents who do not own a vehicle. Pedestrian routes of different widths connected to different portion of the building creates the neccessary spatial gradient that will enable users to engage with the space according to their physical and cognitive abilities.

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SPATIAL GRADIENT BETWEEN WALKING AND ACTIVITY

A building edge that encourages users to linger.

Circulation in the precinct has continuously been activated through attractions that encourage users to linger in their social space when performing daily tasks. While the building houses important activities that require enclosed space on the inside, a well activated building edge is what will invite users into spaces where they can take part in the social working of their neighbourhood.

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SPATIAL GRADIENT BETWEEN WALKING AND ACTIVITY

Intermediate visual goals.

As one of the tallest structures in the neighbourhood, the mixed-use building is an important landmark used by residents to orientate themselves. It provides an intermediate visual goal when moving between private and public spaces and will therefore remain visible.

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SPATIAL GRADIENT BETWEEN WALKING AND ACTIVITY

Circulation catchments.

Secondary pathways have been mapped to reach what Christopher Alexander would describe as a garden seat or in more modern terms: a space where you can spam the grandchildren with whatsapp messages. These movement catchment spaces allow users to stand still and take in their surroundings.

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SPATIAL GRADIENT BETWEEN BUILDING AND LANDSCAPE

Building edge activation through gardening rituals.

The way the new building is connected to nature draws a clear line back to the way New Agers are structuring their environments beyond their private residences. The environment beyond the new build uses specific floor materials suited to the various activities and the framed structure now becomes lighter as it extends into the landscape.

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SPATIAL GRADIENT BETWEEN BUILDING AND LANDSCAPE

More familiar social gateways into public space.

The social infrastructure buildings located at 5 of the 6 entry points into the open space is now made more familiar and therefore more accessible through the different garden typologies. The creation of these environments will rely on the expertise of the New Agers and they will therefore be in charge of the creation of these spatial devices.

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SPATIAL GRADIENT BETWEEN BUILDING AND LANDSCAPE

Landscape typologies as spatial ordering devices.

The programmatic functioning of the scheme relies heavily on the sustainability of the landscape typologies and these elements determined the spatial arrangement of the building on site. Similarly, the importance of keeping ageing individuals connected to complex sensory stimuli further structured planning arrangements.

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SPATIAL GRADIENT BETWEEN BUILDING AND LANDSCAPE

An architecture that gives.

The process that followed the placement of important landscape arrangements brought about an architecture that in some instances gives up some of itself to the garden and in other instances was used to elevate nature, making it more accessible to users.

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3.4. SYSTEMS REQUIREMENTS

While garden typologies make up a big percentage of the current landscape coverage, introducing a reimagined landscape typology that will make these environments more purpose-giving will require additional services and systems that currently do not exist on site.

A clear understanding of the systems requirements of the scheme needs to be designed into the architecture before the technification of the intervention. The clear interdependency between the system, user, and product (fig. 3.09) necessitates this. Doing so will ensure that the systems infrastructure of the scheme does not contradict the design intentions but rather adds to the success of the spatial interventions. Hereafter will follow the technification of the project.

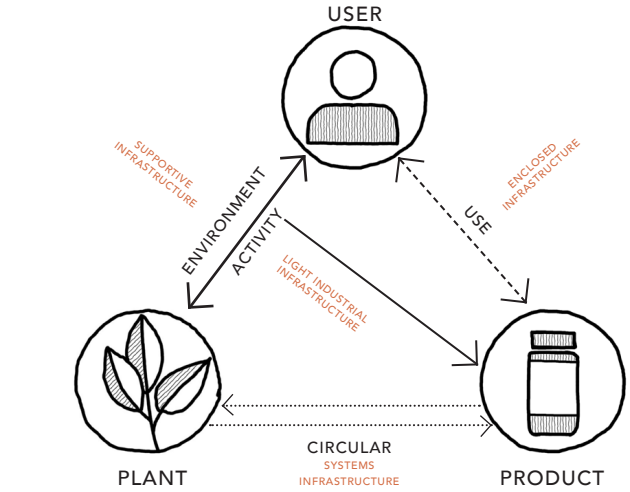

Figure 3.11: Systems relationship between plant product and user (Author 2022)

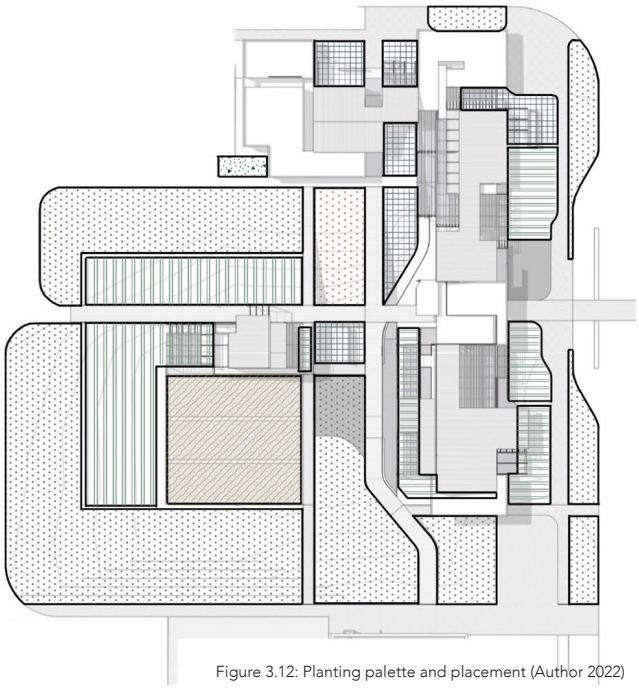

Figure 3.12: Planting palette and placement (Author 2022)

RECREATIONAL LANDSCAPE
SPORTS LANDSCAPE
TRANSITIONING LANDCAPE
PRODUCTIVE AND TEACHING LANDSCAPE

PLANT SPECIES USED IN PRODUCTIVE AND
TEACHING LANDSCAPE

PELARGONIUM GRAVIOLENS
(Rose scented Pelargonium)

USES: Often used for its antibacterial, antioxidant, and anti-inflammatory properties. A culinary herb, insect repellant and used in the perfume trade.

HELICHRYSUM ODORATISSIMUM
(Impepho/ Kooigoed)

USES: Used in traditional medicines, the smoke is sedative and helpful for insomnia. In the Eastern Cape people inhale it as a protective cleanser and it is also used medicinally for coughs and colds.

LIPPIA JAVANICA
(Fever tea/ Lemon Bush)

USES: bronchial problems, disinfection of meat, smoke from the herb affective, if inhaled, against asthma and pleurisy, skin disorders, make perfume, plant pest.

COLEONEMA ALBUM
(White Confetti bush)

USES: Essential oils are used by fishermen to remove the odour of redbait (aas) from their hands, hence the common name. Also used as an insect repellant.

ERIOCEPHALUS AFRICANUS
(Wild Rosemary)

USES: Has traditionally been used as a medicine for coughs and colds, flatulence and colic, as a diuretic and a diaphoretic. Margaret Roberts mentions that it has an invigorating effect on the skin and hair.

HELICHRYSUM PETIOLARE
(Everlasting)

USES: Ailments such as coughs, colds and infections. The smoke of the burning leaves is inhaled as a pain reliever. leaves are also used on wounds to prevent infection.

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Planting:
The planting palette suggested cultivating the gardens of the project site, and its surroundings (fig. 3.10) were put together according to certain plant criteria. The plants were chosen to make this palette are all indigenous and suited to grow in our Pretoria highveld conditions. The plant variety was chosen to accommodate harvest all year round (fig. 3. harvest), ensuring that rituals remain constant despite seasonal changes. Lastly, smaller plant species were selected to up the ease of nurturing all the garden types.

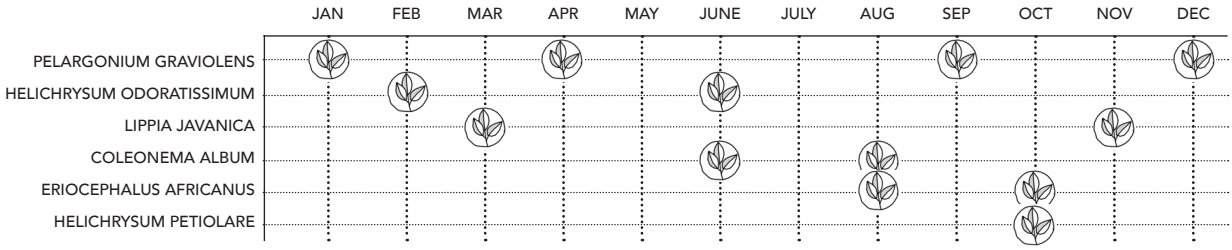

Figure 3.13: Harvest Calendar (Author 2022)

Water:
This is why the water system should not be dependent on governmental supply. Using municipal water as the primary source in this scheme is unsustainable and unreliable and will cut into a large portion of the income generated by essential use and retail. Therefore, the landscape typologies are proposed to be sustained by the rainwater collected throughout the year. The rainwater harvesting and use will be broken up into two systems.

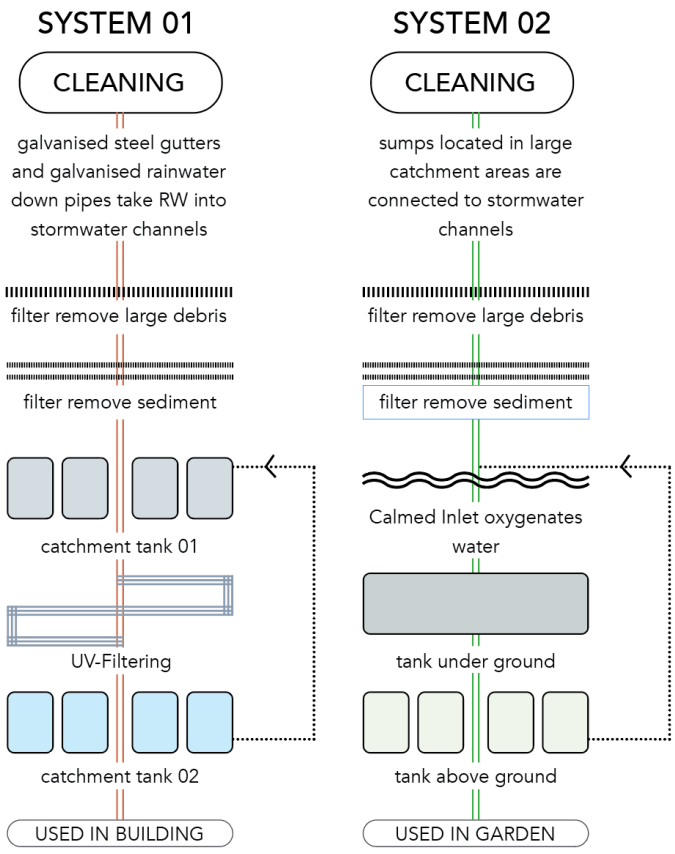

Figure 3.14: Systems requirements (water) (Author 2022)

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Water System A uses the roof of the proposed intervention as a catchment area. This water is collected in galvanised steel gutters and taken with galvanised rainwater down pipes into stormwater channels that lead into a catchment tank. The catchment tank is located in the basement, and water goes through a pre-filter and UV filtering process (Minzu 2021) before being transferred into a secondary tank that stores the clean water. This tank is also connected to a municipal supply and can be filled up if necessary. The water from this tank is used in the various on-site amenities such as the ablutions, taps in the makers' space and the medical and retail node.

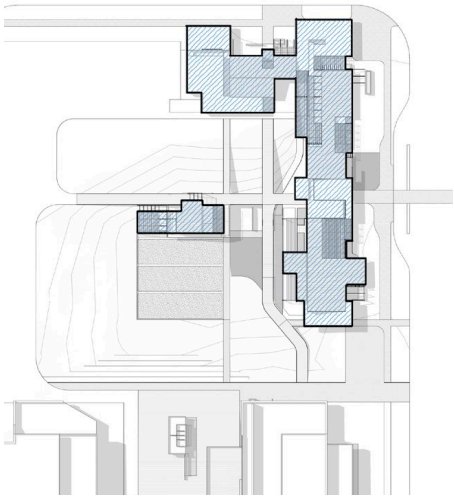


Figure 3.15: System A catchment area (Author 2022)

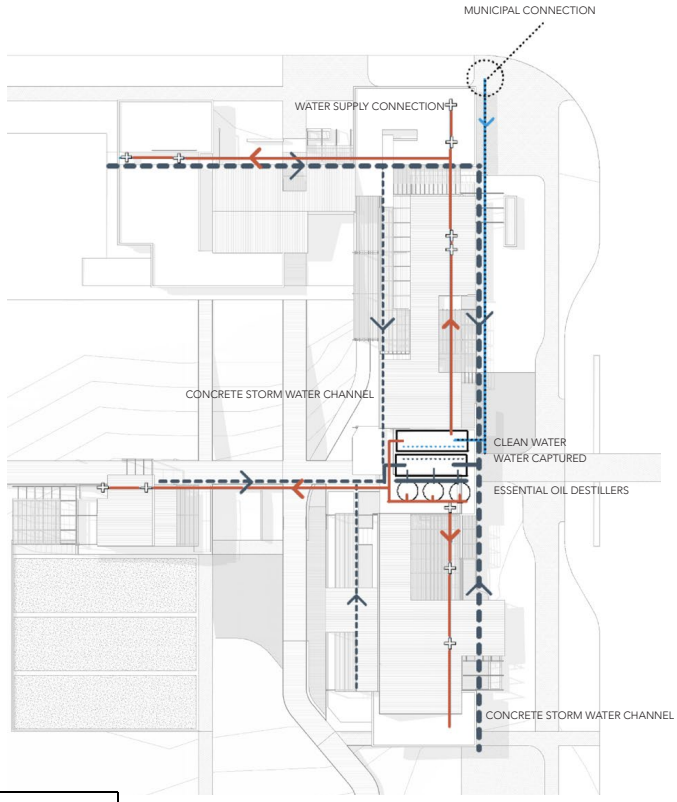


Figure 3.16: System A flow diagram (Author 2022)

AREA CALCULATIONS

Catchment	Area, A (m²)	Runoff Coefficient,	Column1
		C	C (weighted)
Roof	737,1	0,95	0,95
TOTAL	737,1		0,95

RAINWATER YIELD CALCULATION

Month	Ave. rainfall, P (m)	Yield (m³) (Yield = PxAxC)
January	0,154	107,83773
February	0,075	52,518375
March	0,082	57,42009
April	0,051	35,712495
May	0,013	9,103185
June	0,007	4,901715
July	0,003	2,100735
August	0,006	4,20147
September	0,022	15,40539
October	0,071	49,717395
November	0,098	68,62401
December	0,15	105,03675
ANNUAL AVE.	0,674	512,57934

TOTAL YIELD

Month	Total Yield (m³/month)
January	107,83773
February	52,518375
March	57,42009
April	35,712495
May	9,103185
June	4,901715
July	2,100735
August	4,20147
September	15,40539
October	49,717395
November	68,62401
December	105,03675
ANNUAL TOTAL	512,57934

ALT DEMAND

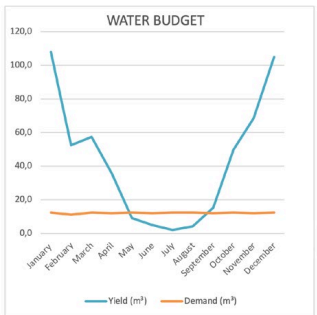
Month	Destiller (3x 200l closed ystem)	Entity demand / day (water top up)	Alt demand (m³/month)
January	3	10	0,93
February	3	10	0,84
March	3	10	0,93
April	3	10	0,9
May	3	10	0,93
June	3	10	0,9
July	3	10	0,93
August	3	10	0,93
September	3	10	0,9
October	3	10	0,93
November	3	10	0,9
December	3	10	0,93
		ANNUAL TOTAL	10,95

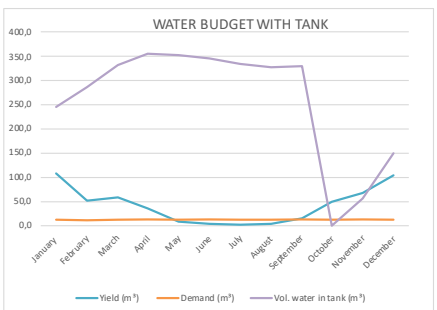
ALT DEMAND

Month	Entity (Persons ?)	Entity demand / day (l)	Alt demand (m³/month)
January	50	8	12,4
February	50	8	11,2
March	50	8	12,4
April	50	8	12
May	50	8	12,4
June	50	8	12
July	50	8	12,4
August	50	8	12,4
September	50	8	12
October	50	8	12,4
November	50	8	12
December	50	8	12,4
		ANNUAL TOTAL	146

TOTAL DEMAND

Month	Total demand (m³/month)
January	12,4
February	11,2
March	12,4
April	12,0
May	12,4
June	12,0
July	12,4
August	12,4
September	12,0
October	12,4
November	12,0
December	12,4
ANNUAL TOTAL	157,0





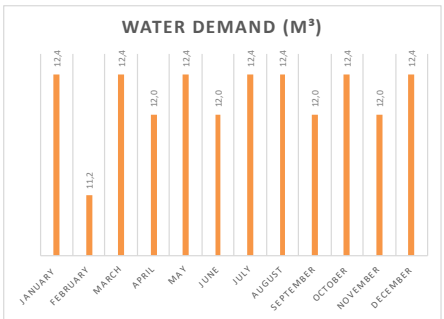


Figure 3.17: System A calculations and graphs (Author 2022)

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Water System B uses various ground surfaces on site and the hard surfaces of adjacent parking lots and play yards. The rainwater that falls onto these sloped surfaces is collected in sumps placed strategically and diverted to a collection tank in the basement. Agricultural drains also feed into the system and collect ground water that the plants have not absorbed. This water is then cleaned using pre-filters to rid the water of large and small debris. The water is then pumped into the storage tank through a Calmed Inlet that oxygenates the water to prevent it from going anaerobic (Celtic Sustainable, n.d). The water will be circulated weekly through the calmed inlet as a form of maintenance when it is not raining as regularly. This water source will be used to irrigate the landscape typologies through means of drip irrigation and tap hose connections.

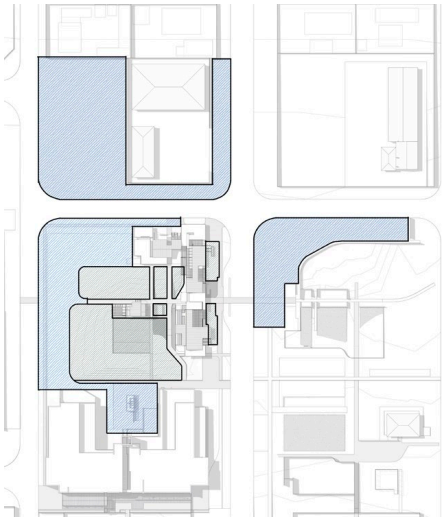

Figure 3.18: System B catchment area (Author 2022)

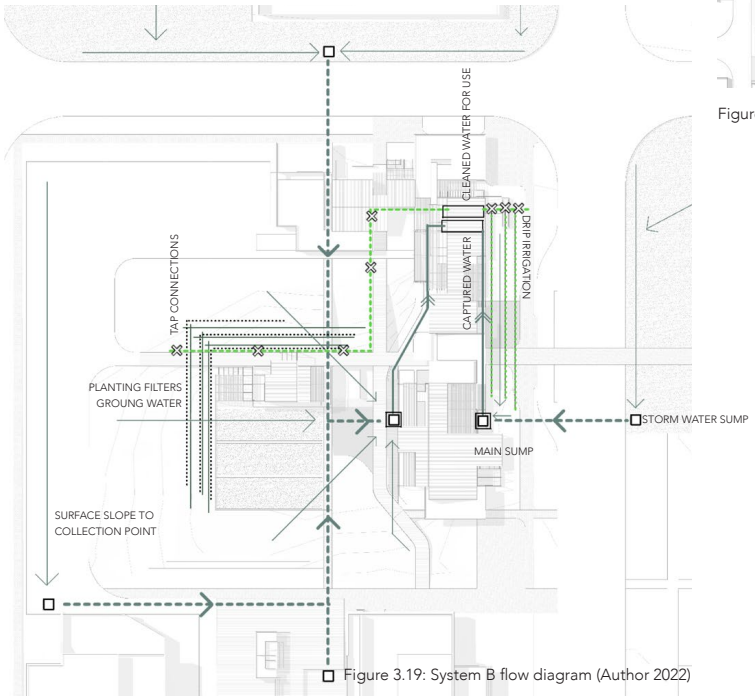

Figure 3.19: System B flow diagram (Author 2022)

AREA CALCULATIONS	Column1	Column2	Column3
Catchment	Area, A (m²)	Runoff Coefficient, C	C (weighted)
Paving	7866,5	0,9	0,90
TOTAL	7866,5		0,90

RAINWATER YIELD CALCULATION

Month	Ave. rainfall, P (m)	Yield (m³) (Yield = PxAxC)
January	0,154	1090,2969
February	0,075	530,98875
March	0,082	580,5477
April	0,051	361,07235
May	0,013	92,03805
June	0,007	49,55895
July	0,003	21,23955
August	0,006	42,4791
September	0,022	155,7567
October	0,071	502,66935
November	0,098	693,8253
December	0,15	1061,9775
ANNUAL AVE.	0,674	5182,4502

TOTAL YIELD

Month	Total Yield (m³/month)
January	1090,2969
February	530,98875
March	580,5477
April	361,07235
May	92,03805
June	49,55895
July	21,23955
August	42,4791
September	155,7567
October	502,66935
November	693,8253
December	1061,9775
ANNUAL TOTAL	5182,4502

IRRIGATION DEMAND

Month	Planting area (m²)	Irr. depth / week (m)	Irr. depth / month (m)	Irrigation demand (m³/month)
January	1286,9	0,05	0,2	257,38
February	1286,9	0,05	0,2	257,38
March	1286,9	0,05	0,2	257,38
April	1286,9	0,04	0,15	193,035
May	1286,9	0,03	0,1	128,69
June	1286,9	0,03	0,1	128,69
July	1286,9	0,03	0,1	128,69
August	1286,9	0,03	0,15	193,035
September	1286,9	0,03	0,1	128,69
October	1286,9	0,05	0,2	257,38
November	1286,9	0,05	0,2	257,38
December	1286,9	0,05	0,2	257,38
			ANNUAL TOTAL	2445,11

TOTAL DEMAND

Month	Total demand (m³/month)
January	257,4
February	257,4
March	257,4
April	193,0
May	128,7
June	128,7
July	128,7
August	193,0
September	128,7
October	257,4
November	257,4
December	257,4
ANNUAL TOTAL	2445,11

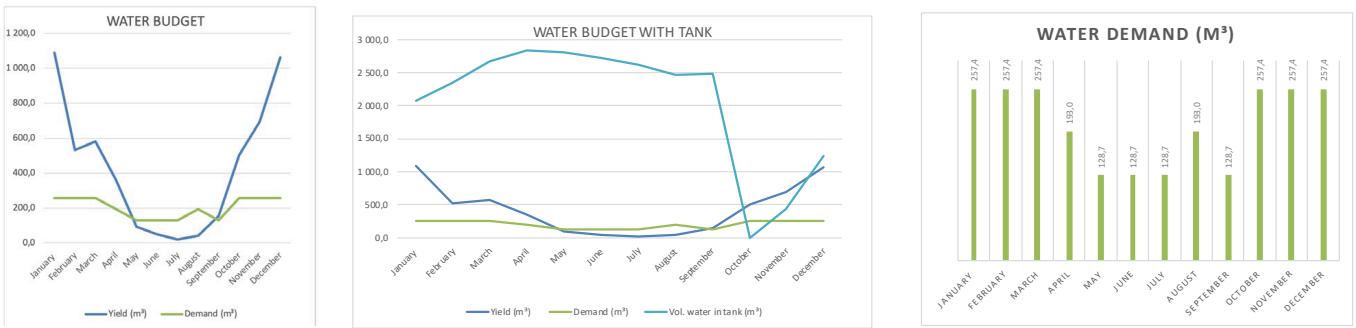

Figure 3.20: System B calculations and graphs (Author 2022)

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A building designed to be more accommodating to the special needs of ageing individuals whilst facilitating a light industrial program requires specialist systems consideration where comfort and efficiency should be regarded as equally important to ensure the optimal performance of the building.

Thermal comfort:
The industrial equipment has been designed to be accommodated at the basement level to ensure that it does not threaten the inclusive nature of the ground floor. This placement of the equipment has the potential to affect the thermal environment of the maker space located above it. The heat produced by the three steam distillers presents the opportunity to warm up the building during the winter months but could impact the well-being of vulnerable users during the warm summer months, and a cooling strategy to combat these effects needs to be considered.

Extracting the hot air out of this space creates an opportunity to use this industrial by-product in the plant drying yard (fig. 3.19), where plant matter needs to be dried before being taken to the oil distillers. The movement of hot and cold air relies on the cooling strategy that will introduce cold air from a geothermal cooling system operating at the basement level and passive cooling strategies that rely on airflow over saturated and green landscapes at ground level. Openings in the ground floor slab will allow the air to move between the two levels, where airflow can be regulated with adjustable louvre vents.

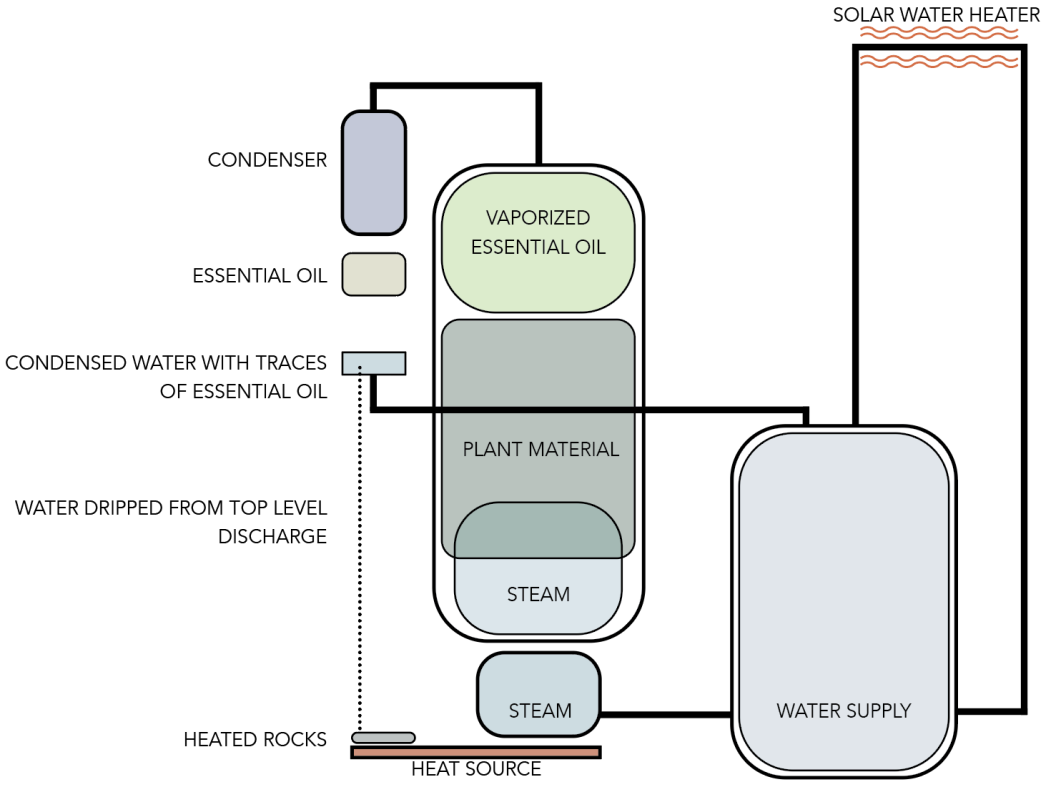

Figure 3.21: Systems requirements (ventilation) (Author 2022)

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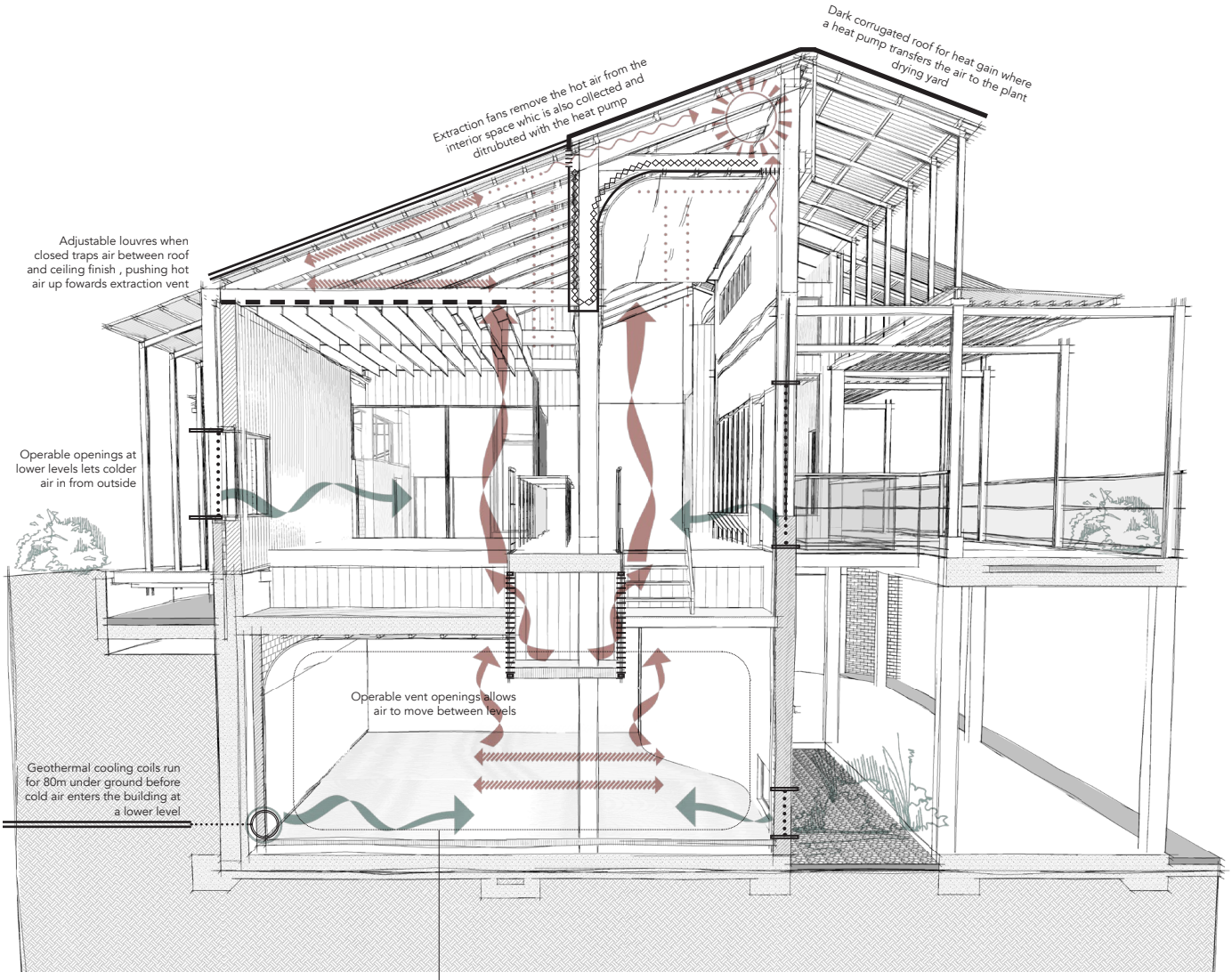

Figure 3.22: Hybrid ventilation system (Author 2022)

The unconventional steam room:

This steam therapy system has been designed in a way that is integrated with the distillation process. It uses the water that has been separated from the distilled oils in a drip in a drip outlet over heated rocks. The rocks are heated with the same gas system that heats the steam for the distillers. Water with traces of essential oil dripping onto the heated rocks produces the steam in this environment. The steam is also experiences on the upper level through operable vents located in the volume bridging the levels.

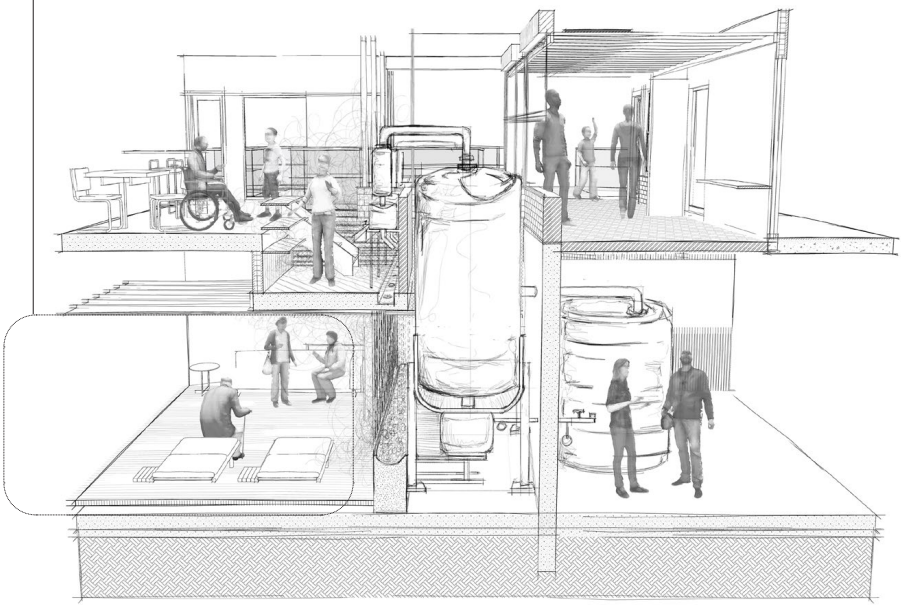

Figure 3.23: Distillery operation (Author 2022)

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Light:
"Quality of light in the past typically meant colour rendering and balance spectrum. Now it's health and how it's applied in the physical environment, as well" (Gavin 2020).

This evolution in lighting design has been largely driven by professionals studying the effect of light in age-inclusive environments. And what they have found is that the older we get, the longer our eyes take to adjust to lighting changes (Gavin 2020). So balancing daylight between spaces to lessen these instances should be a driver when designing spaces with programmatic gradients where individuals are encouraged to move between the various spaces in the building.

"There is also a need for ample light to support tasks for people trying to maintain their independence" (Gavin 2020). In environments where activities have been contained to improve participant focus, sufficient natural light will enable visually impaired users to comfortably engage in their social space.

"A well-designed elderly oriented lighting provides glare free vision with sufficient illuminance levels." (Gavin 2020).). In the makers' space, solid walls with few openings are used to limit distractions from the outside. Here a translucent roof covering will increase the amount of natural light. Gavin suggests introducing features that spread the light to reduce glare. Therefore, to avoid this environment being overlit due to the amount of light from the roof, overhangs, thickened walls with recessed windows, adjustable louvres and light shelves are introduced (Fig. 3.26). The adjustable louvres present a system that can ensure the space remains well-lit as solar angles change throughout the day and annually.

Precedent:
The importance of form in architecture when designing space that requires a particular interior light quality was better understood through the work of architect Alvar Aalto. Aalto's work of the late 1920s-1960s expressed a variety of surface and material combinations that all attempted to manipulate the use of daylight in the buildings he designed.

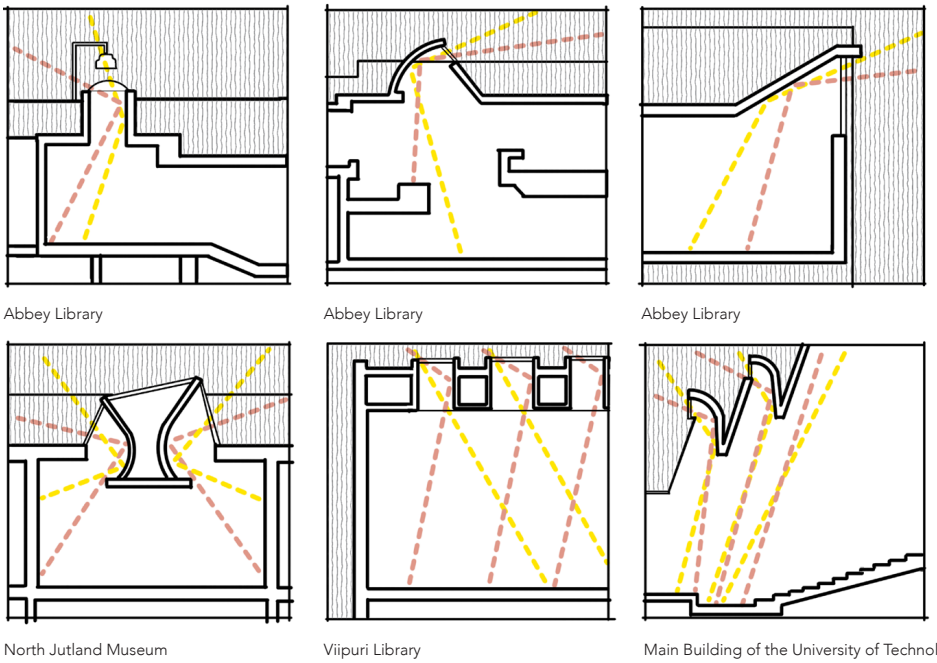

Figure 3.24: Alvar Aalto form manipulation study to improve daylight adapted from (Parashqevi, Panariti 2013)

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Isolated test study:
The maker's space was used to test the adaptations of internal space to create an environment best suited for New Ager with modified needs, still willing to partake in public ritual. This isolated study's results will apply to all the major occupied zones as they are all orientated in the same direction with similar floor widths and sizes.

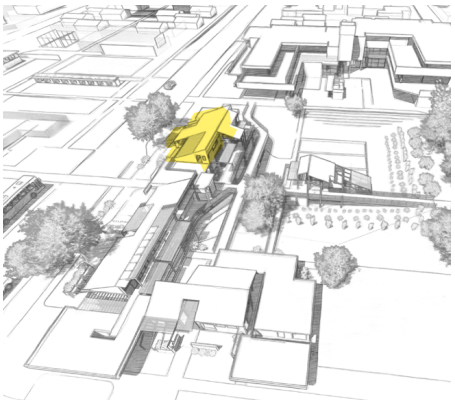

Figure 3.25: Portion isolated for Light iterations (Author 2022)

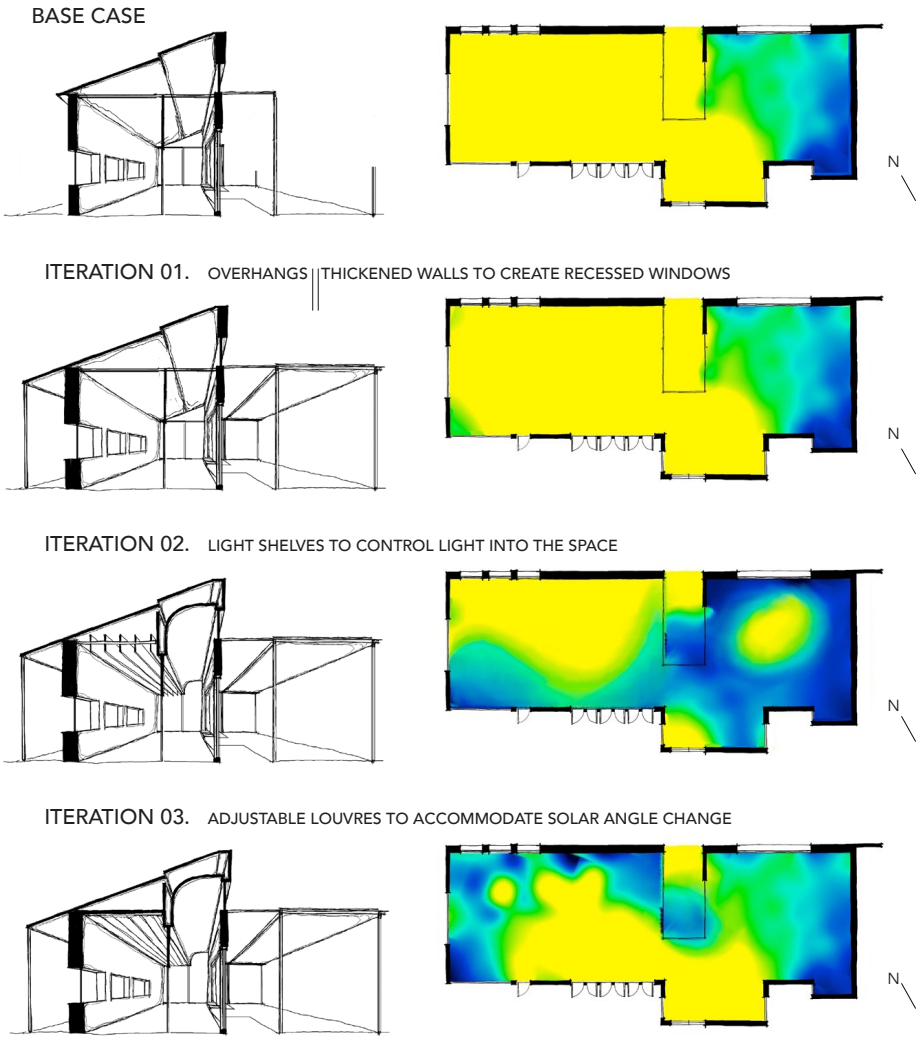

Figure 3.26: Light iterations (Author 2022)

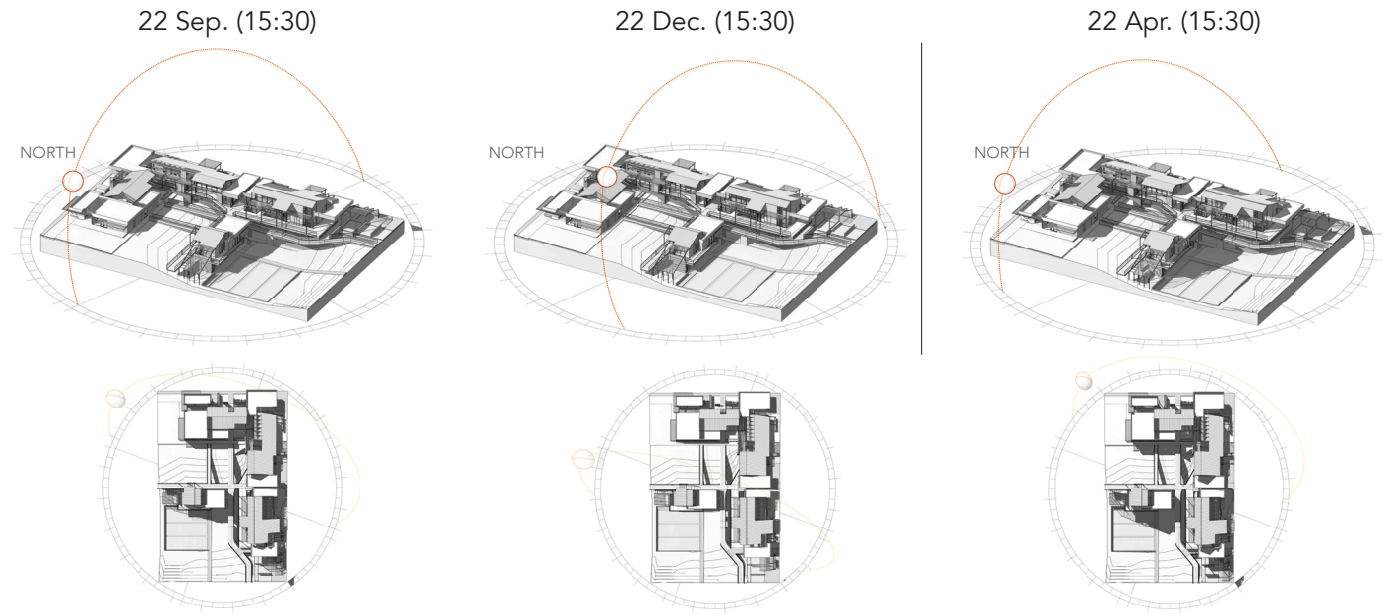

Figure 3.27: Shadow analysis on finale iteration (Author 2022)

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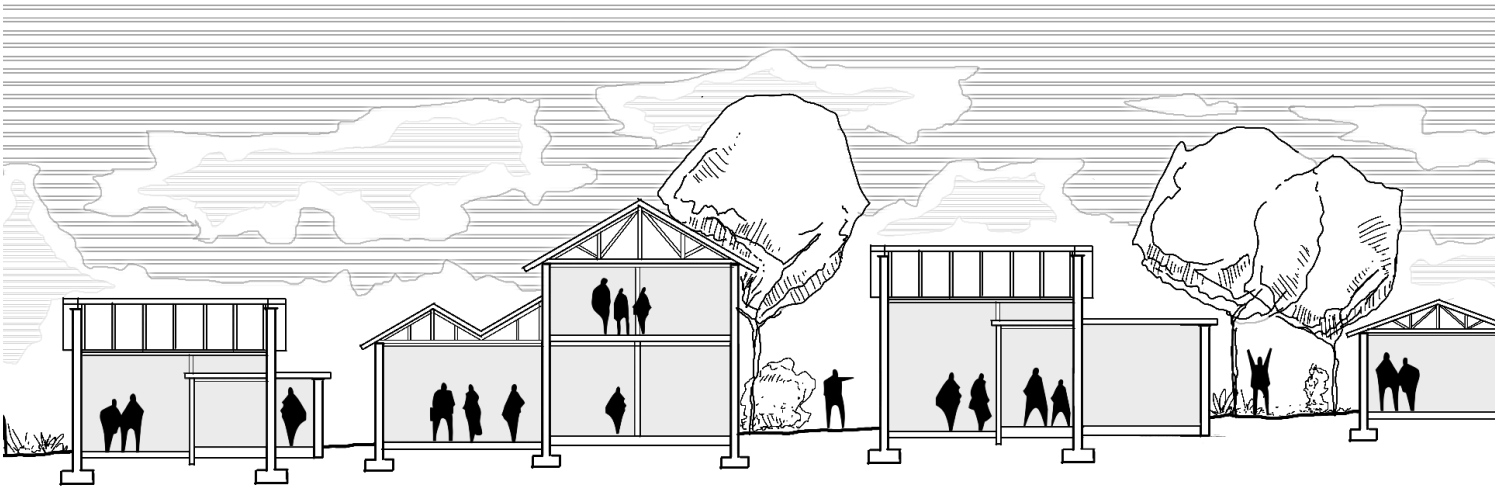
3.5. TECHNOLOGY INFORMANTS

development of the building clearly dictates the importance of the representational quality of the structure and its relation to the contextual built language of place. However, the functional requirements of these spaces stress the need for a more flexible structure to accommodate spatial and programmatic gradients.

The idea is to create a sense of familiarity for users when they approach the building and are introduced to the space. This familiarity will be informed by the prevailing residential typology in Danville. Drawing from the building technologies used to construct these houses proved problematic. There is little distinction between the technological systems of the different house typologies, and most of the dwellings follow a construction process where room sizes determine wall placements and the exterior load-bearing walls determine the roof shape. None of the typologies utilises space by cutting into the ground despite the growing density and limited space availability for future expansion. This technological system produces a structure that is difficult to alter as users' needs change, allowing very little fluidity of space and activity between the different rooms.



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TECHNOLOGY CONCEPT

In response to this spatially limiting technology, it was decided that the loadbearing members would be positioned closer to the centre of the double-pitched roof profile. The load-bearing walls were substituted with concrete columns at the basement level and laminated timber frames from the ground level up. The framed technology of the new system allows for more irregular spatial arrangements under the large roof covering, which is better suited to accommodate the rituals of the New Agers. These environments can be changed with time to suit the user's needs, and the primary frame presents the perfect structure to which supporting furniture like handrails and seats can be fixed.

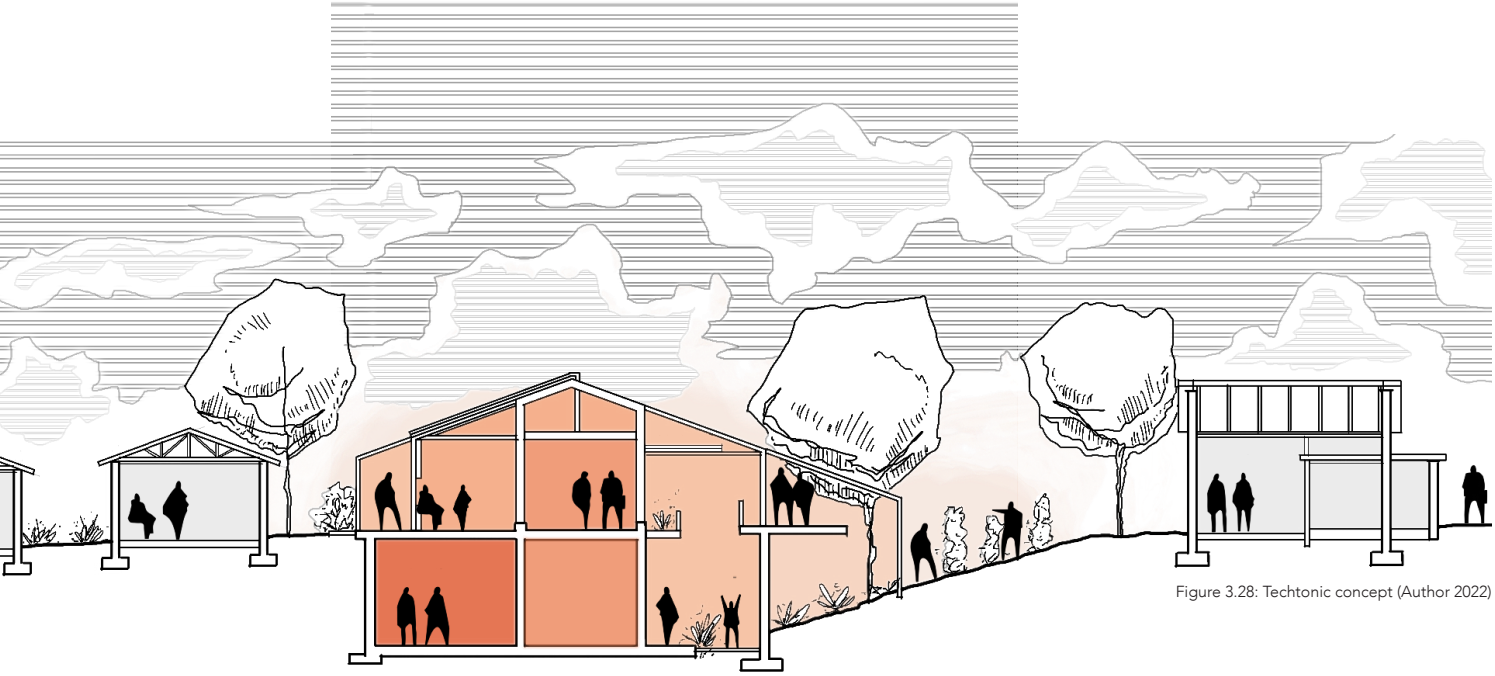

Figure 3.28: Techtonic concept (Author 2022)

The reinterpreted structure introduces a more flexible and sustainable technology where the contextual language of place can be respected on the street edge, providing New Agers with a sense of familiarity in space while creating the spatial and programmatic gradient needed to keep them connected to their social environments through ritual activities for longer.

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Accessing the public environment visually and physically and partaking in activities is now made possible by the horizontal scaling of space.

To strengthen this spatial implementation, vertical scaling will be incorporated through horizontal planes of different configurations and materials at both ground and ceiling levels.

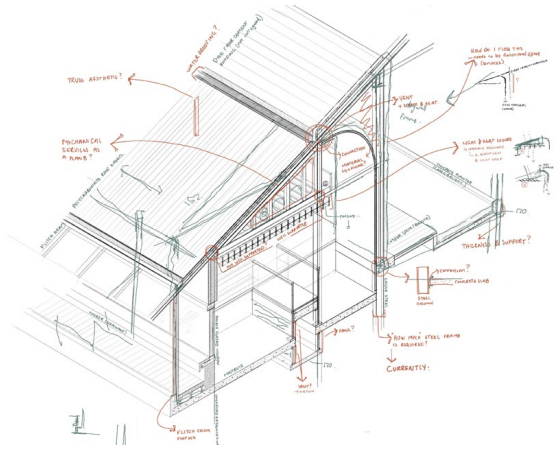

Figure 3.29: Building structure vertical scaling through technical investigation (Author 2022)

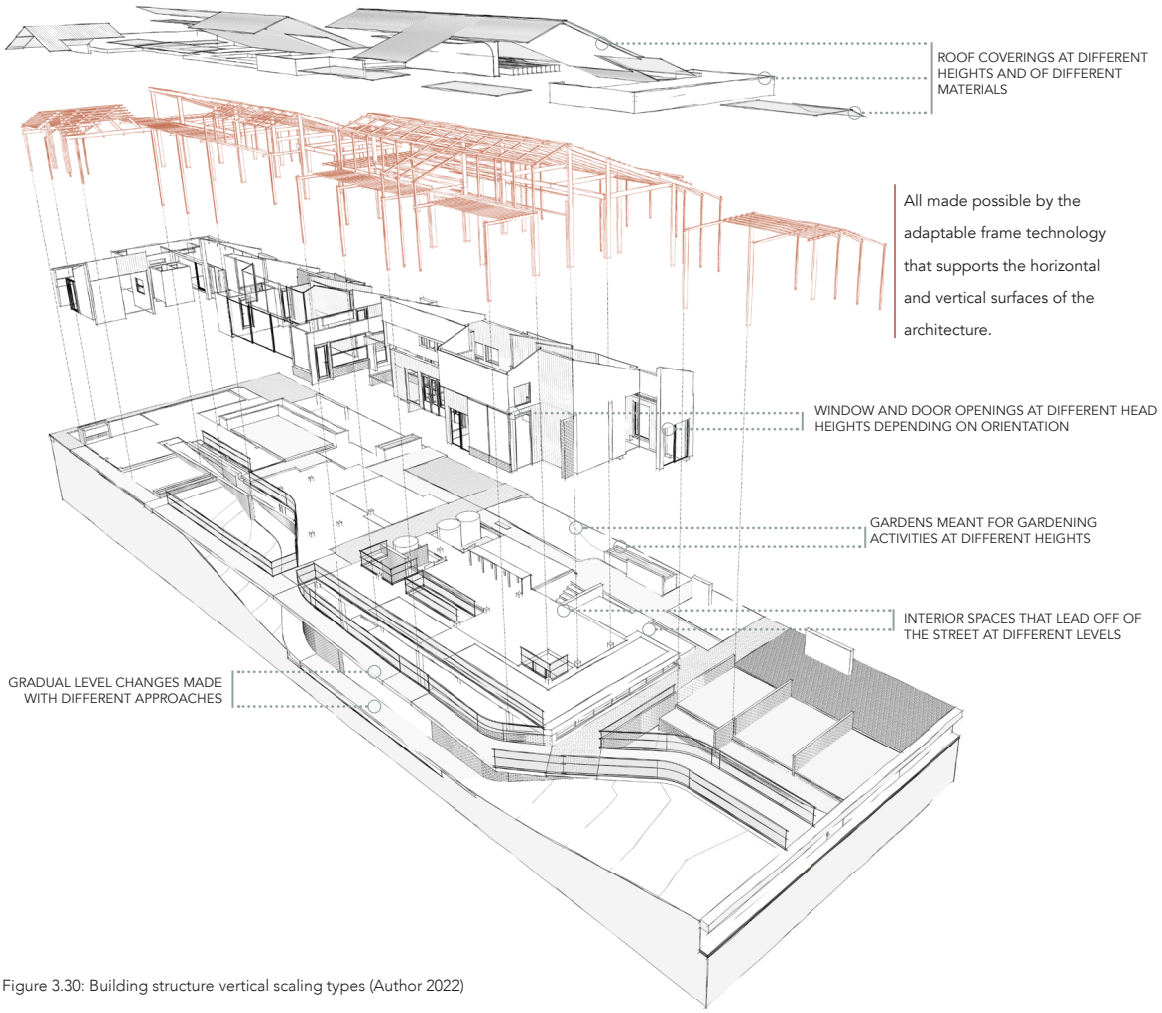

Figure 3.30: Building structure vertical scaling types (Author 2022)

These infill elements are designed according to the activities in the space, and materials are selected to create the appropriate haptic experience. These experiences will be unique to each phase of the essential oil production process.

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Tying a specific sensory experience to the activity performed will stimulate the user's perceptual system.

"Because everything we know originates with our senses, keeping our senses stimulated is critical to keeping our brains active, alert and healthy." (Levitin 2020:113)

Figure 3.31: Ouma in haar tuin (1/3) (Author 2022)

Neurologist Scott Grafton argued that removing older people from their complex environments would cause them to age more quickly. (Levitin 2020:113) He believes that the only way for a person's brain to stay healthy and engaged is through a complex sensory activity that provides critical brain input. Reviving dormant neurons in individuals who have been isolated after retiring and deprived of complex sensory activity is made possible through the brain's ability to adapt to how sensory information changes (2020:113). Neuroplastic adjustments occur as we grow and age and remain a part of our brain's processing capacity in the third act of life. "Neuroplasticity is what keeps us young, and it is only a walk in the park away." (Levitin 2020:114)

Figure 3.32: Ouma in haar tuin (2/3) (Author 2022)

Figure 3.33: Ouma in haar tuin (3/3) (Author 2022)

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Figure 3.34: Danville old age residence (Author 2022)

New Agers residential typology

Figure 3.35: Danville industry (Author 2022)

Industrial language of the surrounding precinct

Figure 3.36: Danville mixed use brutalist building (Author 2022)

Social infrastructure language

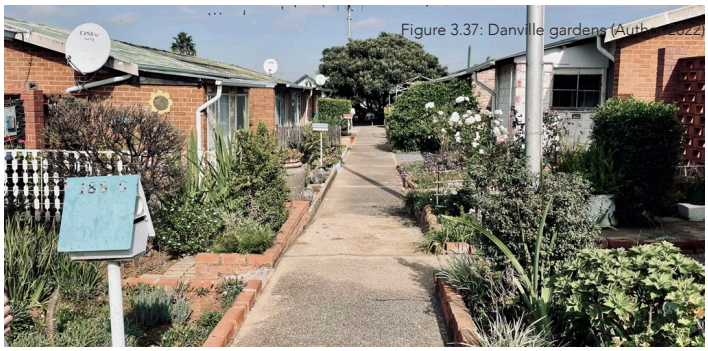

Figure 3.37: Danville gardens (Author 2022)

Garden language

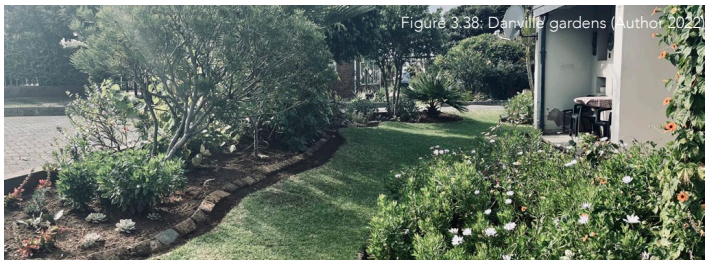

Figure 3.38: Danville gardens (Author 2022)

Garden language

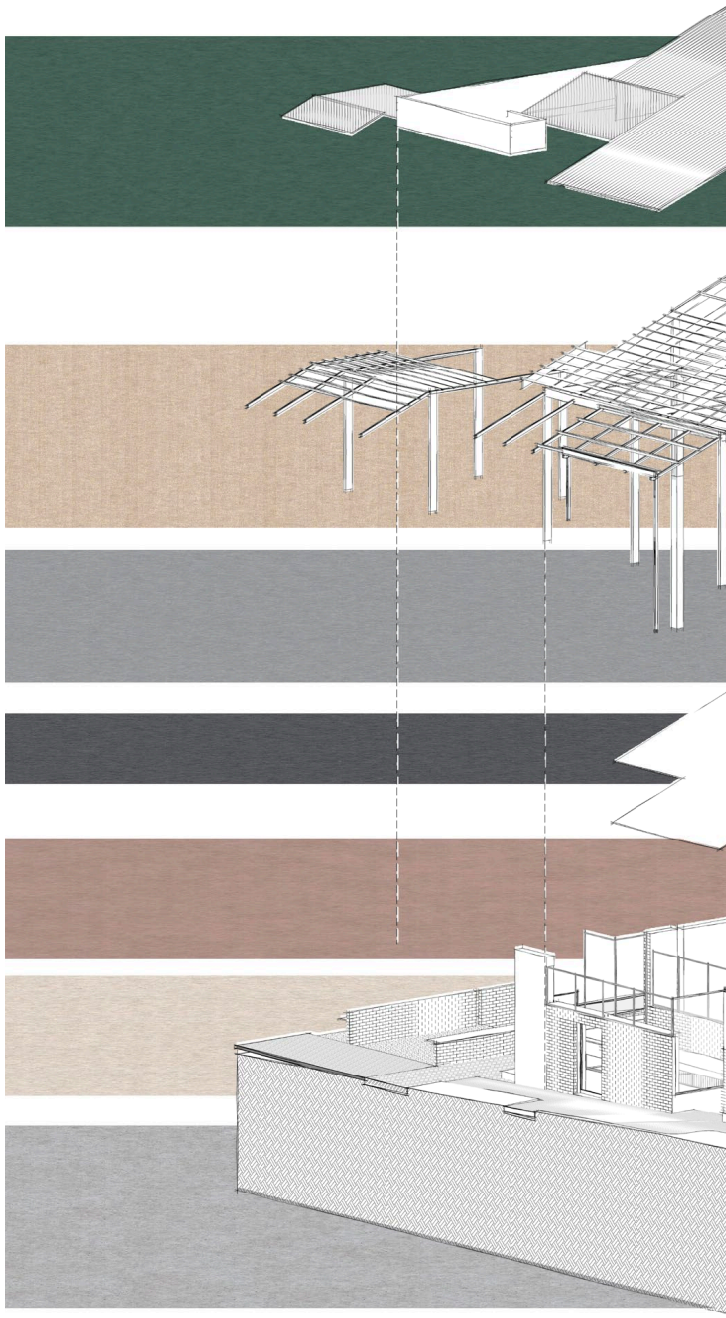

Figure 3.39: Material ordering (Author 2022)

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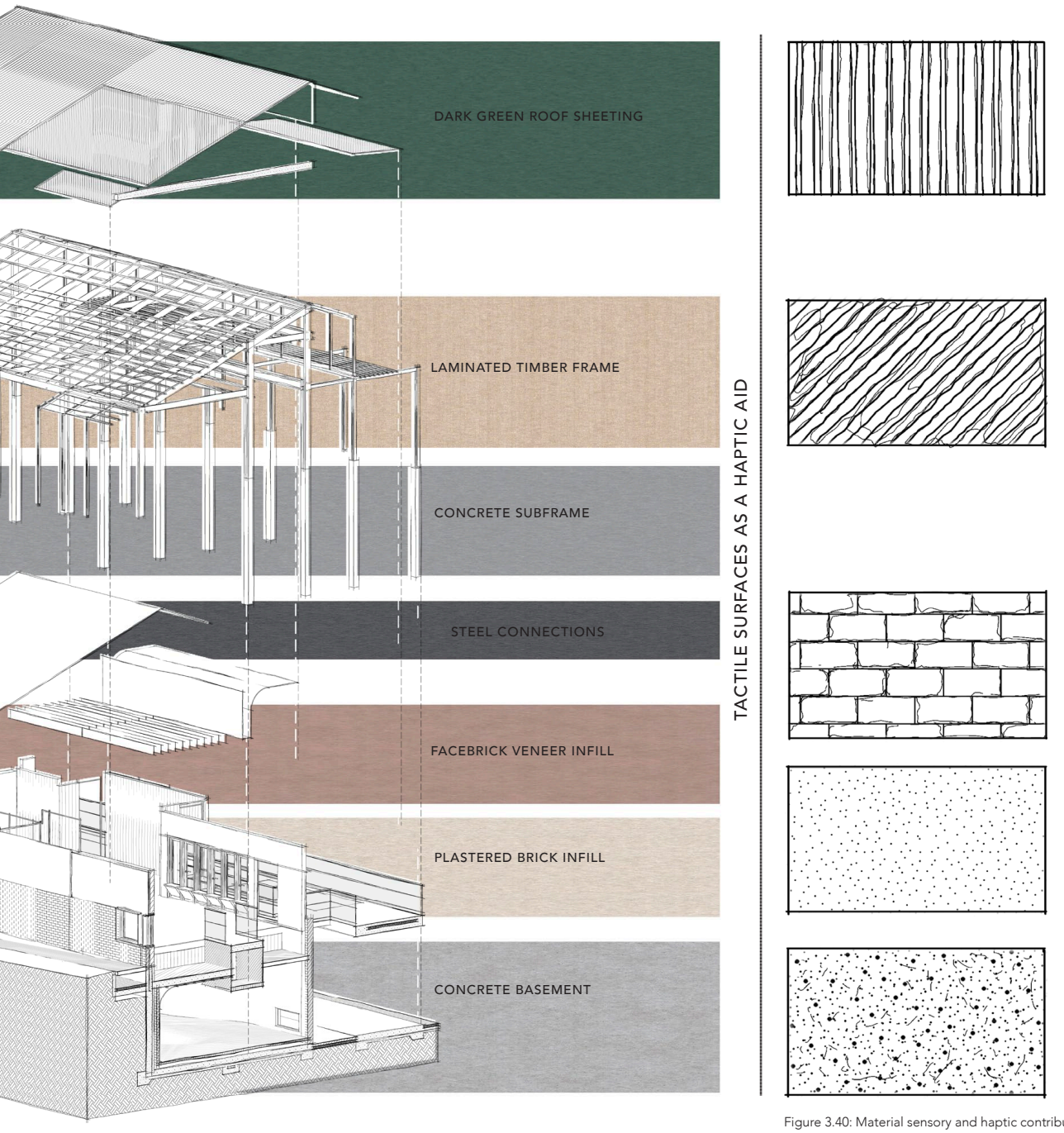

Figure 3.40: Material sensory and haptic contributions (Author 2022)

3.6. MATERIALISING FAMILIARITY

The proposed materials for this scheme further represent the contextual built language in Danville (Fig. 3.32-34). Klip-lok 406 galvanised roof sheets, painted cottage green, serve as the primary roof covering material but are occasionally interchanged with 20mm three-wall polycarbonate hollow sheets where the internal spaces require optimal natural lighting. The plastered and face brick walls currently serving as the most used building material will be incorporated merely as representative tactile surfaces through brick veneers. The brick walls are no longer the supportive members of the architecture. The new structural members are proposed to be laminated timber frames and supports fixed to the concrete sub-structure. The substructure outlines the basement and carries the ground floor suspended over the cut portion of the site. The concrete columns will slightly protrude from the finished floor level to be visible from ground level. The exposed concrete is representative of the industrial workings that gave life to Danville, as is steel. Similarly, the steel connections will be used to frame connections where one structural material or element transitions into the next.

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MATERIALISING FAMILIARITY

Klip-lok 406 galvanised roof sheets, painted cottage green, serve as the primary roof covering material but are occasionally interchanged with 20mm three-wall polycarbonate hollow sheets where the internal spaces require optimal natural lighting.

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MATERIALISING FAMILIARITY

The plastered and face brick walls currently serving as the most used building material will be incorporated merely as representative tactile surfaces through brick veneers. The brick walls are no longer the supportive members of the architecture.

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MATERIALISING FAMILIARITY

The new structural members are proposed to be laminated timber frames and supports fixed to the concrete sub-structure. The substructure outlines the basement and carries the ground floor suspended over the cut portion of the site.

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MATERIALISING FAMILIARITY

Curated views between the internal and external activities are clearly framed using thick black anodised aluminium window frames. This material deliberately contrasts the other lighter coloured materials in the scheme as it attempts to encourage the physical and visual interdependence of activities on site.

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3.7. SCHEME PROPOSAL SUSTAINABILITY FACTOR

The proposal achieved a 4,1 out of 5 when an assessment was done using the Sustainable Building Assessment Tool, with the social aspects of the project obtaining the highest score. This is largely due to the project location and the amenities that surround the site.

1,04

Achieved

SB SBAT REPORT 4,1

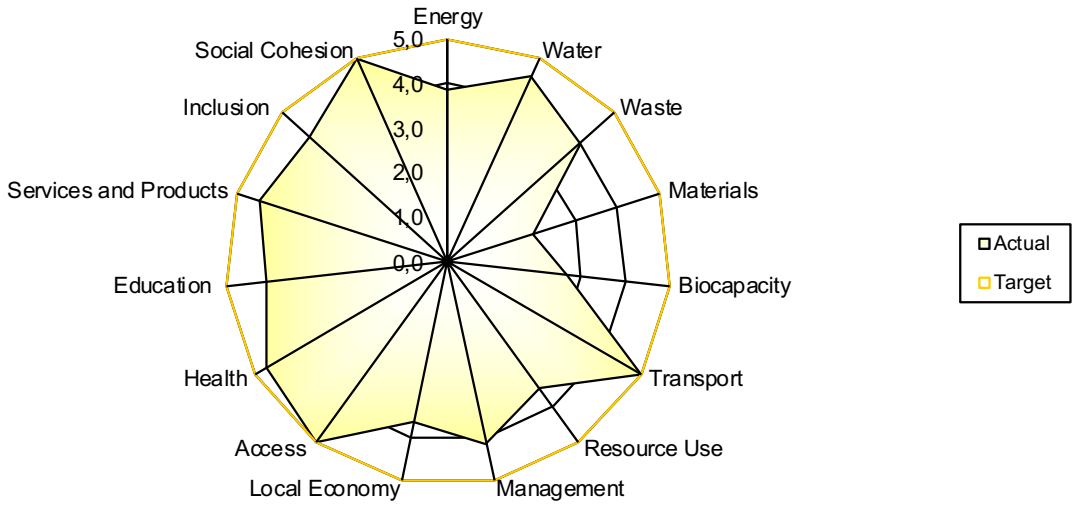
SB1 Project

	0

SB2 Address

	0

SB3 SBAT Graph



SB4 Environmental, Social and Economic Performance	Score
Environmental	3,4
Economic	4,3
Social	4,5
SBAT Rating	4,1

SB5 EF and HDI Factors	Score
EF Factor	3,6
HDI Factor	4,2

SB6 Targets	Percentage
Environmental	68
Economic	85
Social	90

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One could argue that civic projects are often executed in similar environments. Countless city and suburban cores, shaped according to modernist ideals, have underdeveloped public cores. To reinvent these spaces in a way that would benefit future generations is a responsible and socially sustainable building practice.

		Target	Achieved
BI	**Building Information**	**5,0**	**4,1**

BI 1	**Building Targets**	**Target**	**Achieved**
EN	Energy	5,0	3,9
WA	Water	5,0	4,5
WE	Waste	5,0	4,0
MA	Materials	5,0	2,0
BI	Biocapacity	5,0	2,7
TR	Transport	5,0	5,0
LE	Local Economy	5,0	3,6
MN	Management	5,0	4,2
RE	Resources	5,0	3,5
SP	Services and Products	5,0	5,0
AC	Access	5,0	4,7
HE	Health	5,0	4,1
ED	Education	5,0	4,4
IN	Inclusion	5,0	4,2
SC	Social Cohesion	5,0	5,0

BI 2	**Priority Key (Not Performance Key)**		
VH	Very High	5,0	
HI	High	4,0	
ME	Medium	3,0	
LO	Low	2,0	
VL	Very Low	1,0	
NA	None / Not Applicable	0,0	

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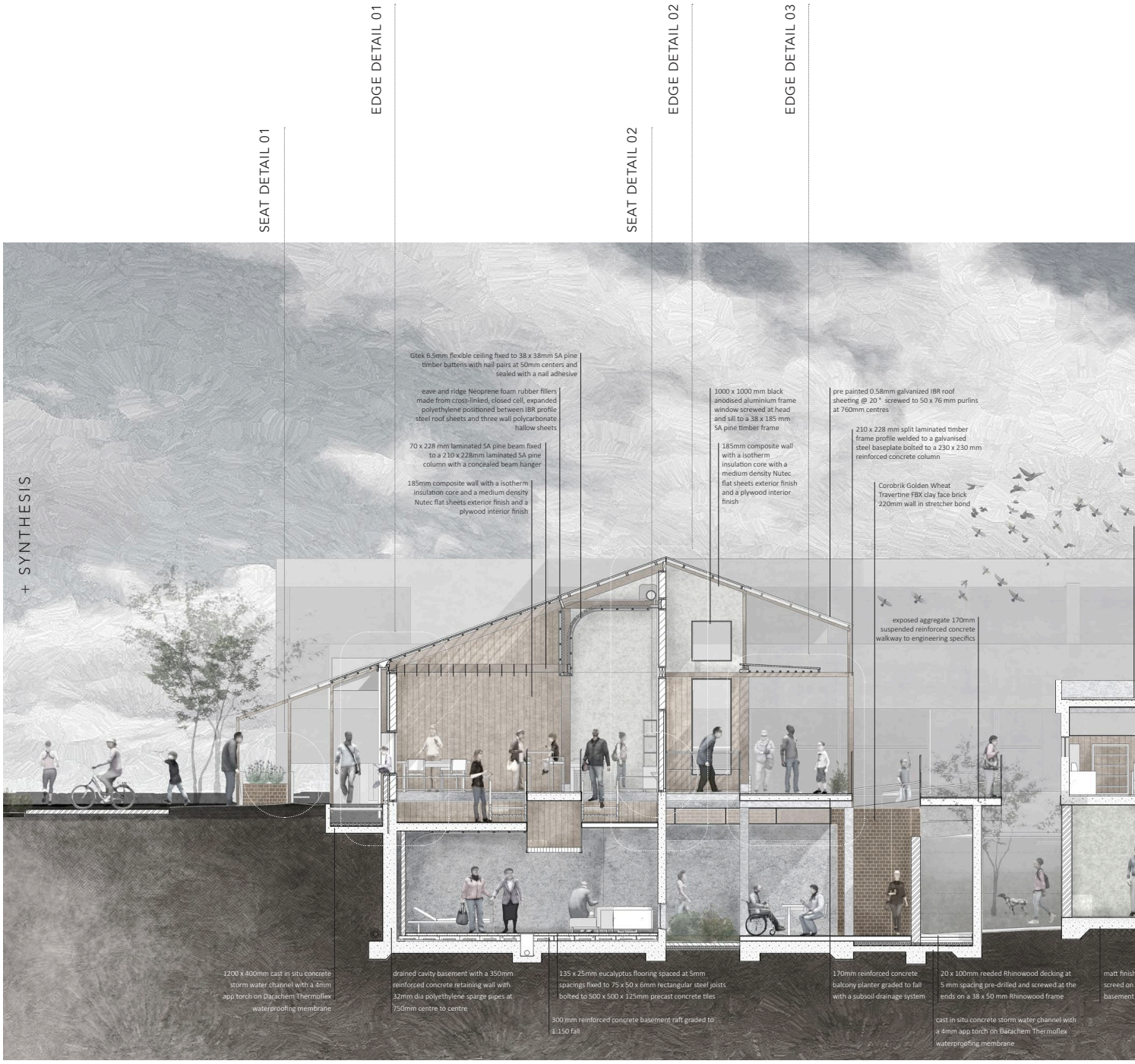

TECHNICAL SECTION E-E

3.8. SYNTHESIS AND RESOLUTION

Where the design intentions were directed towards creating a more accessible environment that has been better activated to encourage people to associate, the technological expressions become supportive of how it reads visually and functions physically.

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SEAT DETAIL 03

To truly elicit this, I would like to elaborate on the tectonic resolution of this architecture's four elements: the roof, floor, walls, and infill elements.

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Manipulating the roof profile and floor surfaces to better

Access, on a scale of clarity ranging between representative and the physical (fig. 3.38).

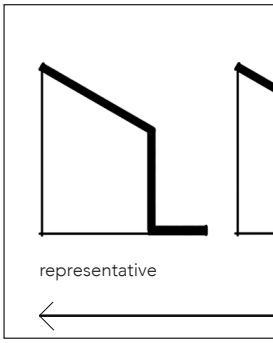

Figure 3.41: Access scaled (Author 202

Accessing an environment happens in the mind before it asks the body to engage. How we perceive a building and the thought of what it may ask of us physically could determine whether we decide to enter it. This is even more true for New Agers with modified needs. The double-pitched corrugated roof technology takes on a familiar form from the outside, where the scale, colour and length increments were modelled from the Danville Cottages and Danweg Aftree Oord A and B housing typologies.

The entrances in the increments between the double-pitched roofs are representative of the social infrastructure building and introduce colour and material contrast to the double-pitched volumes. The pitched and flat roof combination is made possible by the flexibility of the laminated timber frame, where beams and trusses can be bolted in the openings between the laminated split column profile.

The circulatory routes mainly consist of external walkways and existing sidewalks. The existing sidewalks are made of 800 x 2400 exposed aggregate concrete pavers. The absence of a protective barrier between the natural soil and the pavers is causing the surface to erode and break. These sidewalks have become hazardous and too narrow and will therefore be replaced by a 1200mm wide repurposed concrete brick walkway where the removed cement and aggregate will be processed and used to stabilise the ground area on which the concrete brick pavers will be laid. The new circulation route runs along the outside edges of the building footprint and has been mostly covered by corrugated, polycarbonate or concrete roof overhangs (fig. 3.39). These walkways range between widths of 1200 and 2000mm, depending on the activities they pass. The wax-impregnated timber walkway covers the concrete stormwater channels below, where the space between the timber members is no more than 5mm apart. This creates an unobstructed nonslip walking surface while still allowing water to drain through the walking surface to the catchment channel below.

The timber and brick floor finishes are used interchangeably for the hard surfaces between enclosed environments. The interior floor surfaces take on a more solid finish where fine exposed aggregate is used in the makers' space and vinyl flooring in certain parts of the commercial and health care node.

Figure 3.42: Access visual (Author 2022

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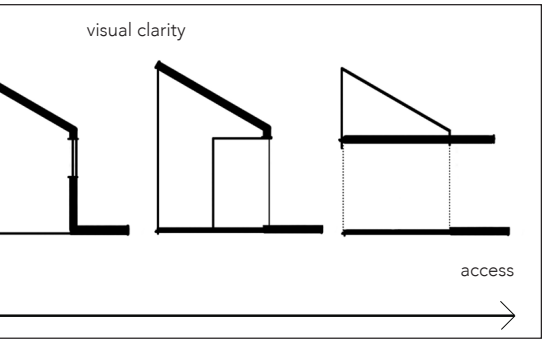
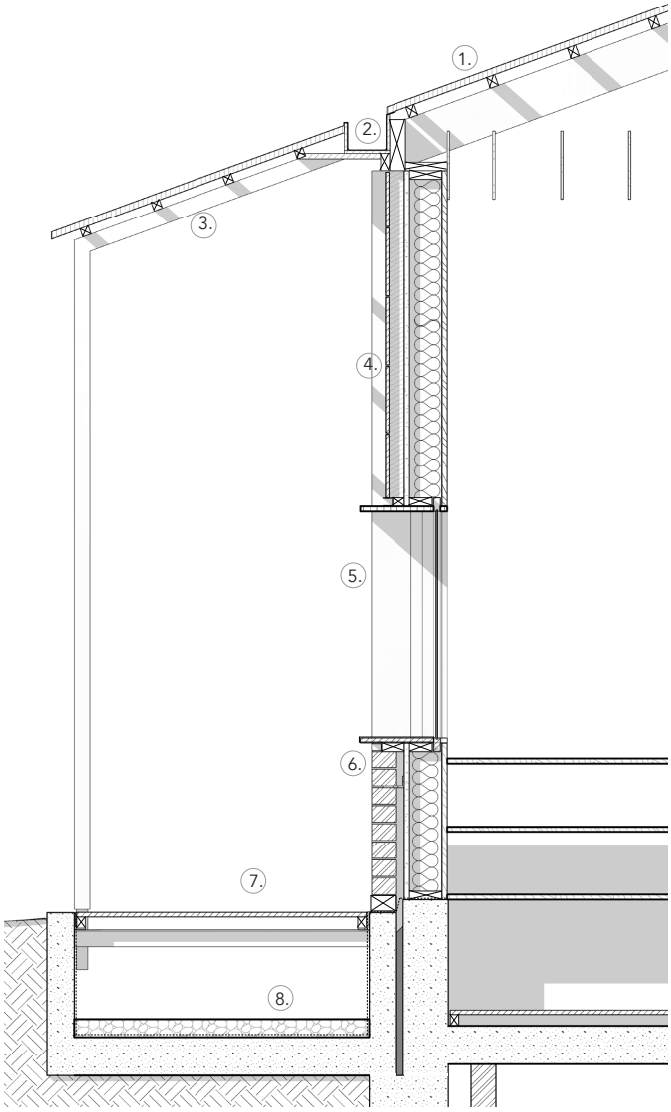


22)

2)

1. 20mm three wall polycarbonate hollow sheet fixed to 38 x 50mm SA pine purlins screwed to SA pine timber rafter
2. galvanised sheet steel gutter fixed with a metal bracket to a 70 x 228 mm laminated timber beam with 100mm diameter galvanised steel rwdp @ 3750 centers fixed to laminated timber split column
3. polyurethane treated 50 x 76mm SA pine flitch beam screwed to 70 x 228 mm laminated timber beam at the top and anchored at the footing to the inside wall of the concrete storm water channel with chemical bonded anchors below the timber walkway
4. 15 mm Nutec Vermont Building Planks screwed to 50 x 76 vertical timber bearers spaced at 900mm centers screwed to the 185mm composite wall
5. 1000 x 1200 mm hidden aluminium frame window screwed at head and sill to a 38 x 185 mm SA pine timber frame recessed in the 185mm composite wall where the external sill is a 400mm deep polyurethane treated SA pine fixture that functions as a seat
6. Corobrik Golden Wheat Travertine FBX clay face brick veneer in stretcher bond built on concrete drainage channel upstand and supported with a two-piece adjustable brick tie to 185mm composite wall creating a 75mm air gap
7. 20 x 100mm reeded Rhinowood decking at 5 mm spacing pre-drilled and screwed at the ends on a 38 x 50 mm Rhinowood frame resting on a 75 x 50 x 6mm rectangular steel angle welded to 125 x 101 x 4.6 mm structural tee fixed to the inside of the 120 mm concrete channel walls
8. 1200 x 400mm cast in situ concrete storm water channel with a 4mm app torch on Darachem Thermoflex waterproofing membrane



EDGE DETAIL 01

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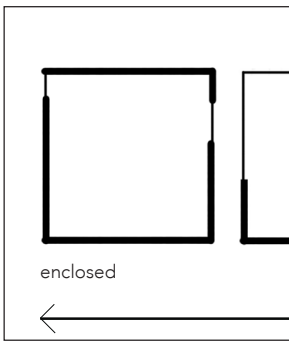

Figure 3.43: Activity scaled (Author 2022)

Using the vertical spatial dividers and organisers to frame:

Activity, on a scale of containment ranging between enclosed and open (fig. 3.40).

All walls will act as non-loadbearing elements and merely be used to enclose space and activity. The flexibility of this system allows for the interdependence of space and ritual. Some instances will rely on visual dependency, and others a physical dependency where the activities need to be performed in accordance with one another.

Openings and glazed facades can be strategically placed according to rituals without jeopardising the stability of the structure. Similarly, wall thicknesses can vary (fig. 3.43) to create more soundproof collaboration spaces, or composite wall assemblies with a high thermal lag can be added to the western façade to ensure the thermal comfort of the internal environments.

The wall materials and layering were chosen simply to respond to the primary technological concept of contextual representation or to create an internal environment best suited for what the space is being used for. The materials range between composite timer frame walls with different finishes, face brick veneers, fibre cement screens and glazed curtain walls.

Figure 3.44: Association visual (Author

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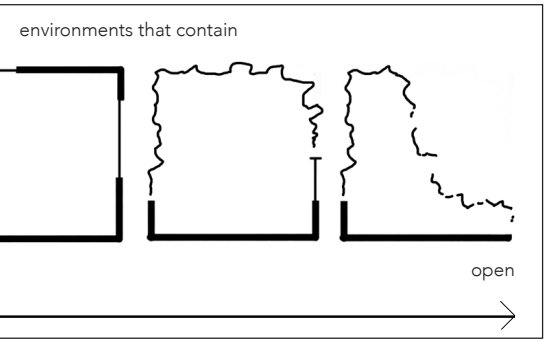
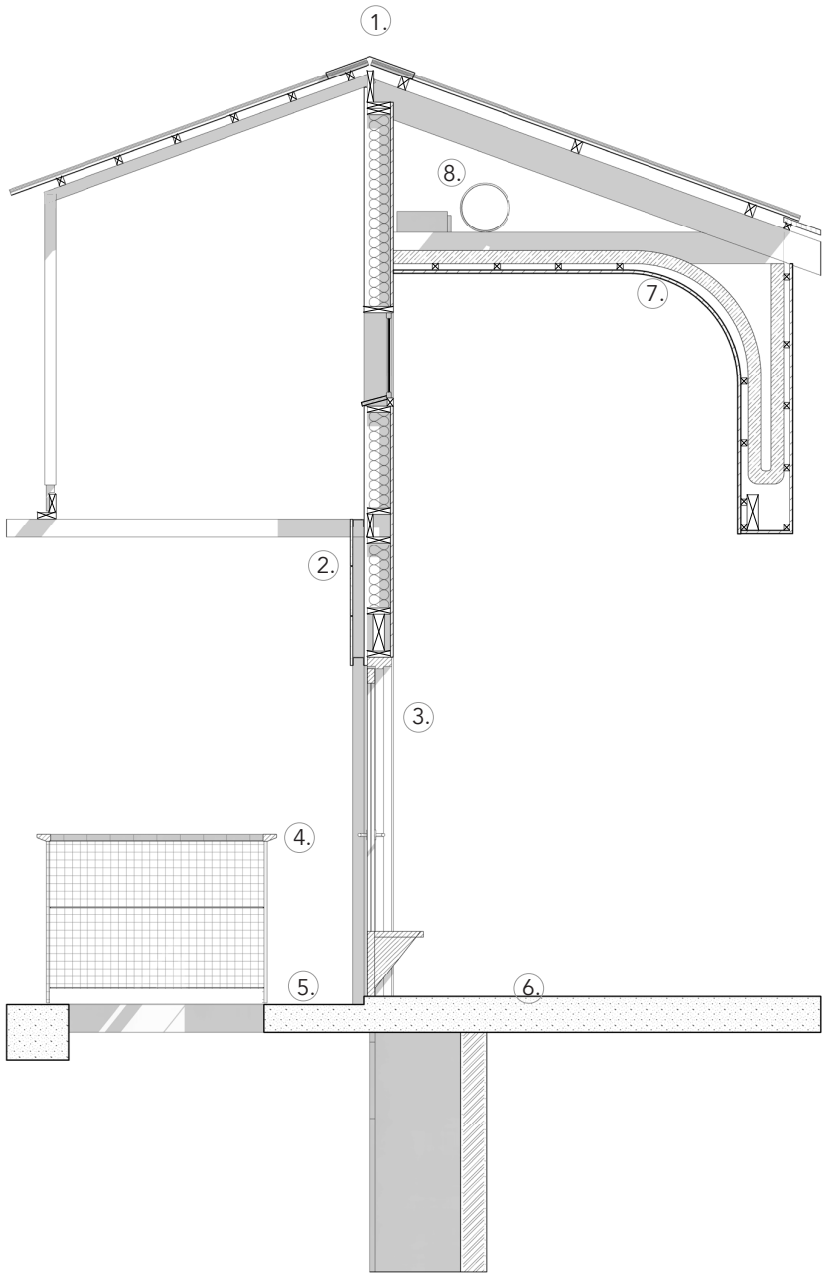


2022)

1. 0.58mm galvanized steel ridge trim pre painted cottage green fixed to the pre painted Klip-lok 406, 0.58mm steel roof sheets screwed to 50 x 76 mm SA pine purlins
2. 15 mm Nutec Vermont Building Planks screwed to 50 x 76 vertical timber bearers spaced at 900mm centers screwed to composite wall
3. polyurethane treated 750 x 2300 mm custom made SA pine doors with a 6mm glass panel infill above the 350mm deep horizontal surface to be used as a shelf or seat.
4. composite railing with a steel mesh panel infill and a ergonomically designed polyurethane treated timber hand rail fixed to black anodised steel balusters welded to a 75 x 50 x 6mm rectangular steel angle footing bolted to the vertical face of the concrete slab edge
5. exposed aggregate 170mm suspended reinforced concrete floor to engineering specifics
6. matt finish 3mm self-levelling polyurethane screed
7. Gtek 6.5mm flexible ceiling fixed to 38 x 38mm SA pine timber battens with nail pairs at 50mm centers and sealed with a nail adhesive



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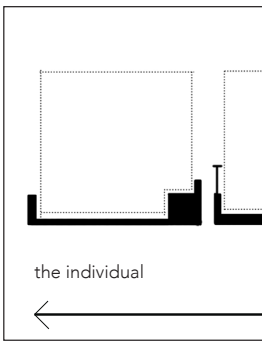

Figure 3.45: Association scaled (Autho

Using the horizontal infill elements, openings, and garden typologies to create environments where people can better

Association, on a scale of participation ranging from individual to the collective (fig. 3.42).

"You don't need a playmate every day, but knowing you're valued, and a contributing member of society is incredibly reaffirming." Paul Tang.

To enable New Agers to remain active contributors in their neighbourhoods relies on getting them to move through environments where they are connected to purpose giving rituals. Achieving this has been explained through the tectonic articulation of the roof, floor surface and walls. But has not been explained is how the use of horizontal infill elements, openings and garden typologies will be used to script cross generational encounters and instil a sense of shared community.

"Somewhere in every garden, there must be at least one spot, a quiet garden seat, in which a person- or two people- can reach into themselves and be in touch with nothing else but nature." (Alexander 1990)

The following seating moments begin to investigate the significance of a horizontal tectonic built into the architecture where the individual can be in touch with nature but also their community should they wish to do so.

Figure 3.46: Activity visual (Author 2022)

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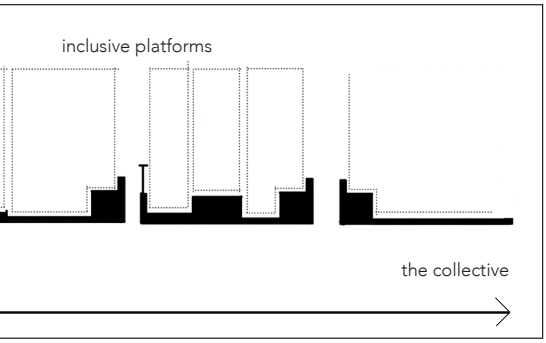
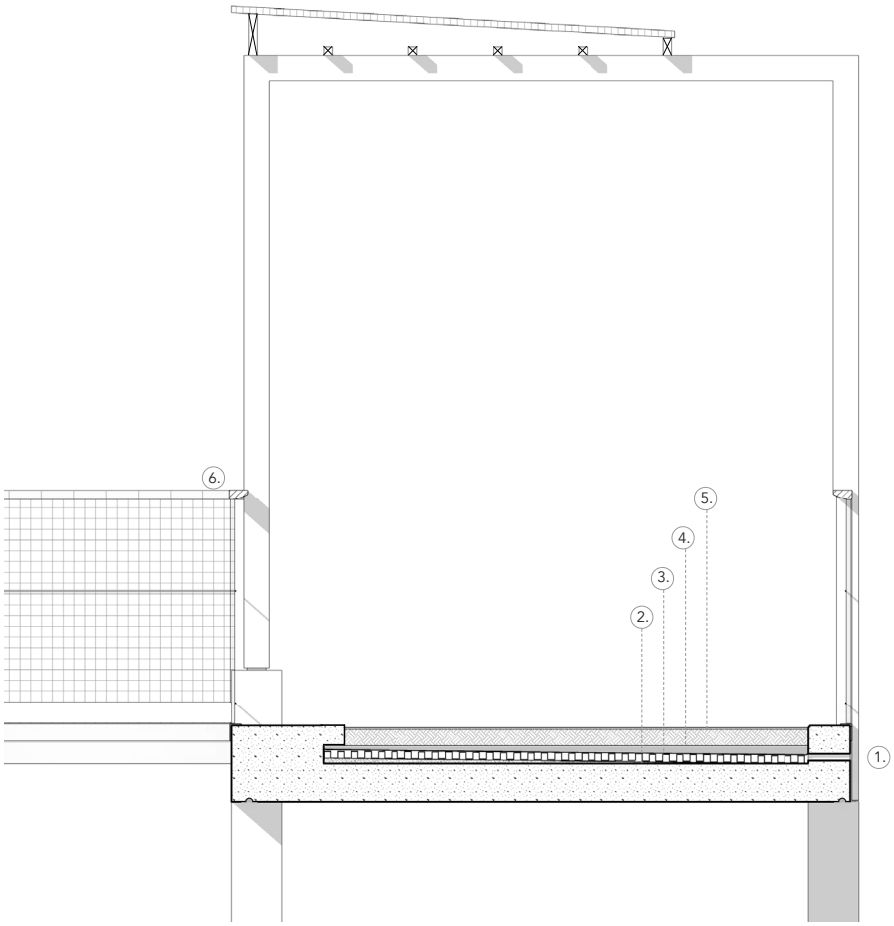


r 2022)

1. 32mm dia drainage outlet
2. 170mm reinforced concrete balcony planter graded to fall
3. 30 mm Nero drainage cell covered with a geotextile
4. 150 mm course permeable soil mix
5. 50 x 76mm flitch beam to column profile bolted fixed to the 230mm reinforced concrete column with a steel baseplate
6. composite railing with a steel mesh panel infill and square timber handrails welded to a 75 x 50 x 6mm rectangular steel angle bolted to the vertical face of the concrete slab edge



EDGE DETAIL 03

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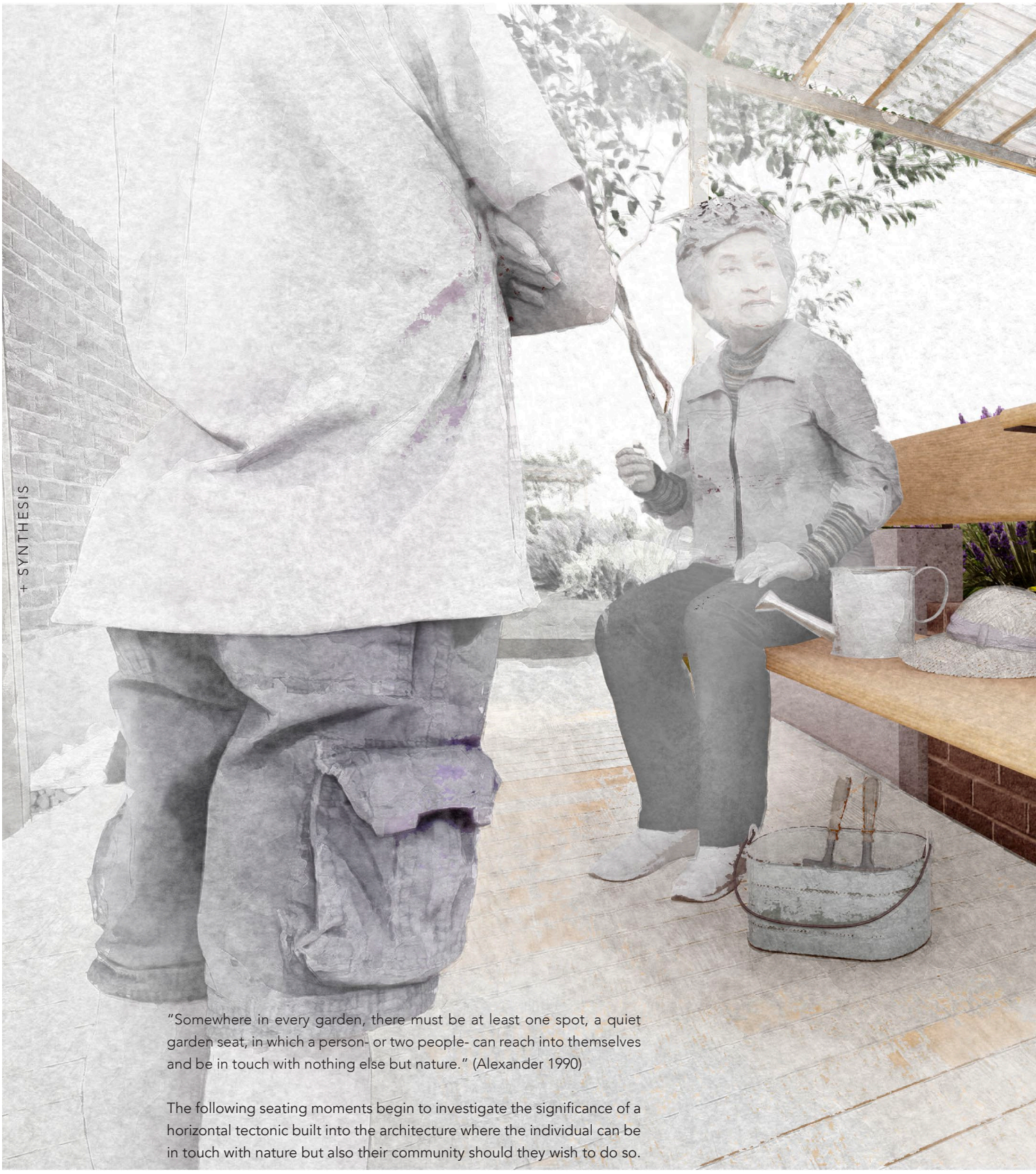

"Somewhere in every garden, there must be at least one spot, a quiet garden seat, in which a person- or two people- can reach into themselves and be in touch with nothing else but nature." (Alexander 1990)

The following seating moments begin to investigate the significance of a horizontal tectonic built into the architecture where the individual can be in touch with nature but also their community should they wish to do so.

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Figure 3.47: Spatial render (Author 2022)

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CONCLUSION

The questions posed throughout this mini-dissertation have challenged the conventional practices of geriatric care architecture. The development of architectural research and design methods in response to these challenging questions produced an intervention that goes beyond the bio-medical accounts of accessibility. The tectonic development that would realise the design intentions followed a similar development trajectory creating an age-inclusive space that holistically considers the modern New Ager.

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CHAPTER 04
CONCLUSION

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INITIATION

I began this mini-dissertation on a very personal note, but through conversations with peers, lecturers, and any brave soul asking me about my project, I realised how ageing had created stories unique to each individual. The sad reality is that most of these conversations had an anxious and sometimes heart-breaking undertone that resulted from bad experiences or a fear of the unknown. But if this year has taught me anything beyond the conventional architectural scope, there is a silver revolution underway, and our older demographic is living lives that look completely different to what it did a few decades ago.

DISSERTATION INTENTION

This dissertation intended to explore ways of keeping these modern-day New Agers connected to the workings of their social environments after retiring. To do this, I had to understand what has caused the fragmentation in our urban scape and how this has affected the development of architectural typologies of geriatric care environments. This led to a critique of geriatric care architecture, especially on the model's exclusive focus on physical dependencies associated with old age. Typologies considering cognitive dependency are often represented through diagnostic care facilities like dementia homes or frail care units, and very few, if any, preventative models exist in our built environment. It was this gap in the architectural discourse of geriatric care that I attempted to address in my mini-dissertation.

Figure 4.01: Spatial render 01 (Author 2022)

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RESEARCH INTO DESIGN

The intangible nature of cognitive dependency could be the aspect that has kept professionals in the built environment from considering the cognitive needs of ageing individuals when designing universally accessible spaces. The work of Doctor Daniel Levitin, a neuroscientist and cognitive psychologist, has highlighted the effect of our physical environments on the intangible changes that occur in the brain. Bio-medical information like this can begin to help professionals in the built environment. Broadening our knowledge base would require cross-disciplinary collaborations where different professions work towards a collective cause, challenging conventional practices through methods like the ones specific to critical theory research.

The research of Doctor Levitin, together with other relevant sources, both in and beyond the architectural discourse, was used to better understand the issues specific to the project site in Danville, Pretoria West. This environment was chosen from a large group of relevant sites in Tshwane due to its highly modernist urban plan. Danville also has five old age care typologies located in a 300m radius with the neighbourhood's commercial node at the centre, making this a perfect case-study environment. Danville's fragmented nature is often associated with modernist urban planning and has created old-age care typologies that function internally despite their proximity to their public environments.

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The design approach relied heavily on plan configurations that sought out ways of better connecting ageing individuals to their social environments. Using purpose-giving activities that can be scaled through spatial gradients according to individuals' modified needs was explored in the plan iterations. The goal was to enable the New Agers in Danville to better access their social environments. The designed environment's capacity to facilitate one ritual on various scales of interaction and intensity was critiqued and improved through every exploration. Ultimately the final iteration created an environment that would keep New Agers connected to their social environments through their daily routines even when faced with changes that occur during old age. It provides opportunities for people of different ages and social and cultural demographics to associate, breaking down societal barriers and stigmas that make people old before their time.

Figure 4.02: Spatial render 02 (Author 2022)

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REFLECTION

This investigation has highlighted two fundamentals I hope to take into my professional career and personal life. Firstly, the architectural profession carries a great deal of responsibility when it comes to improving the life quality of the growing older demographic. Designing environments to be more inclusive is steadily becoming the norm and is no longer specific to a type of project, practice, or style in architecture. But to ensure that our future interventions will truly accommodate users with modified needs, we have to take on a more holistic approach that moves beyond the physical accounts of accessibility. It is about designing for "the spatial encounters of the lived world and not as a construction of idealised vision" (Pallasma 2007).

This way of producing architecture challenged my pre-established architectural process that often-favoured form over building function. And while the sensitivity of this project will not be as prominent in every one of my future projects, I would like to believe that this endeavour has given me a new lens through which I can consider the intricacies of ordinary life. Modernist pioneers believed "god is in the detail" (van der Rohe), but this saying might falsely portray architecture as static, where the beauty of building and space has been reduced to its material form and tectonic connections. I would therefore like to add to this statement and argue that "god is in the detail of the daily", where architecture acts as a facilitator and, in some instances, an enabler to the changes and complexities that define daily ritual.

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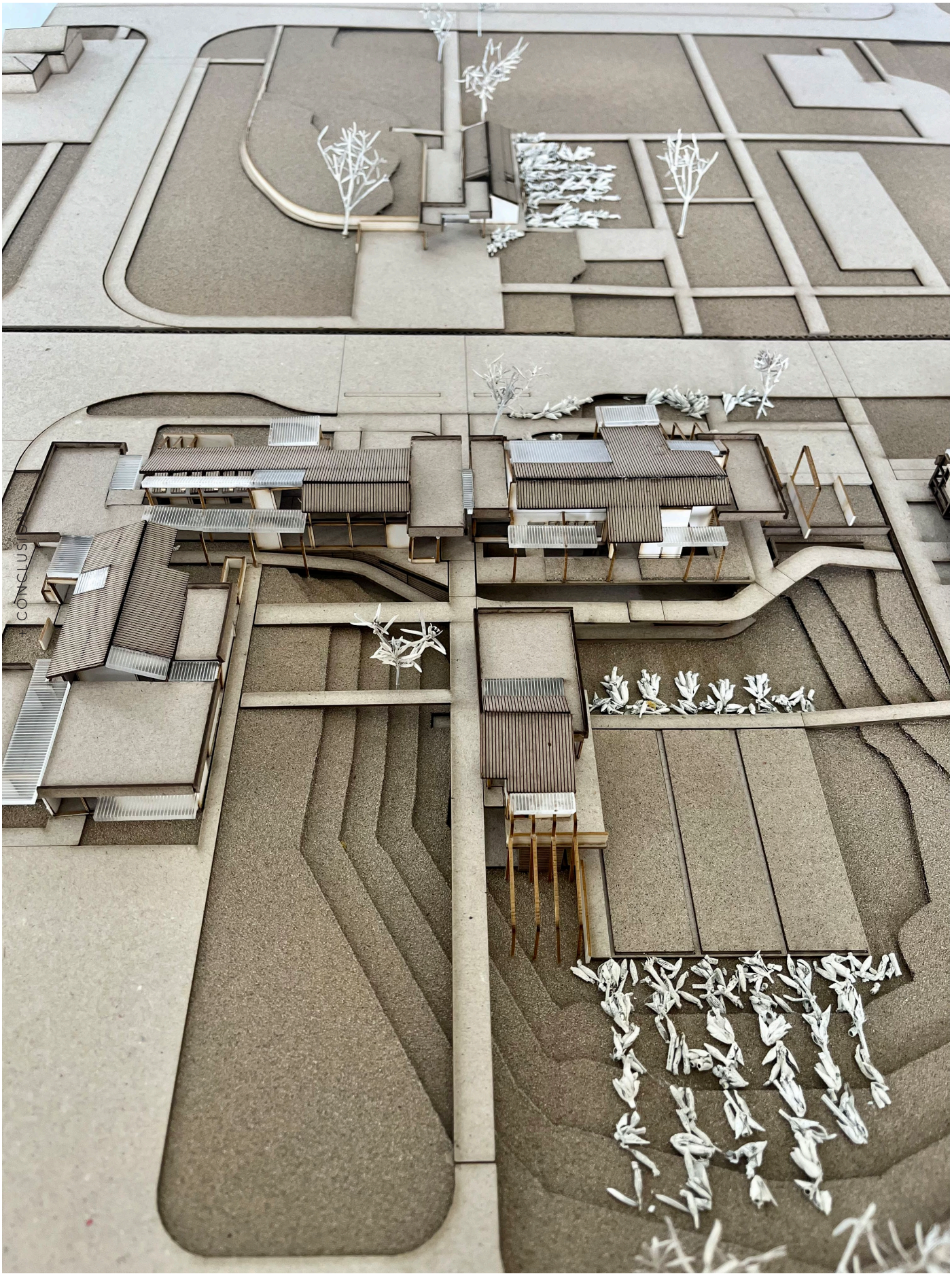

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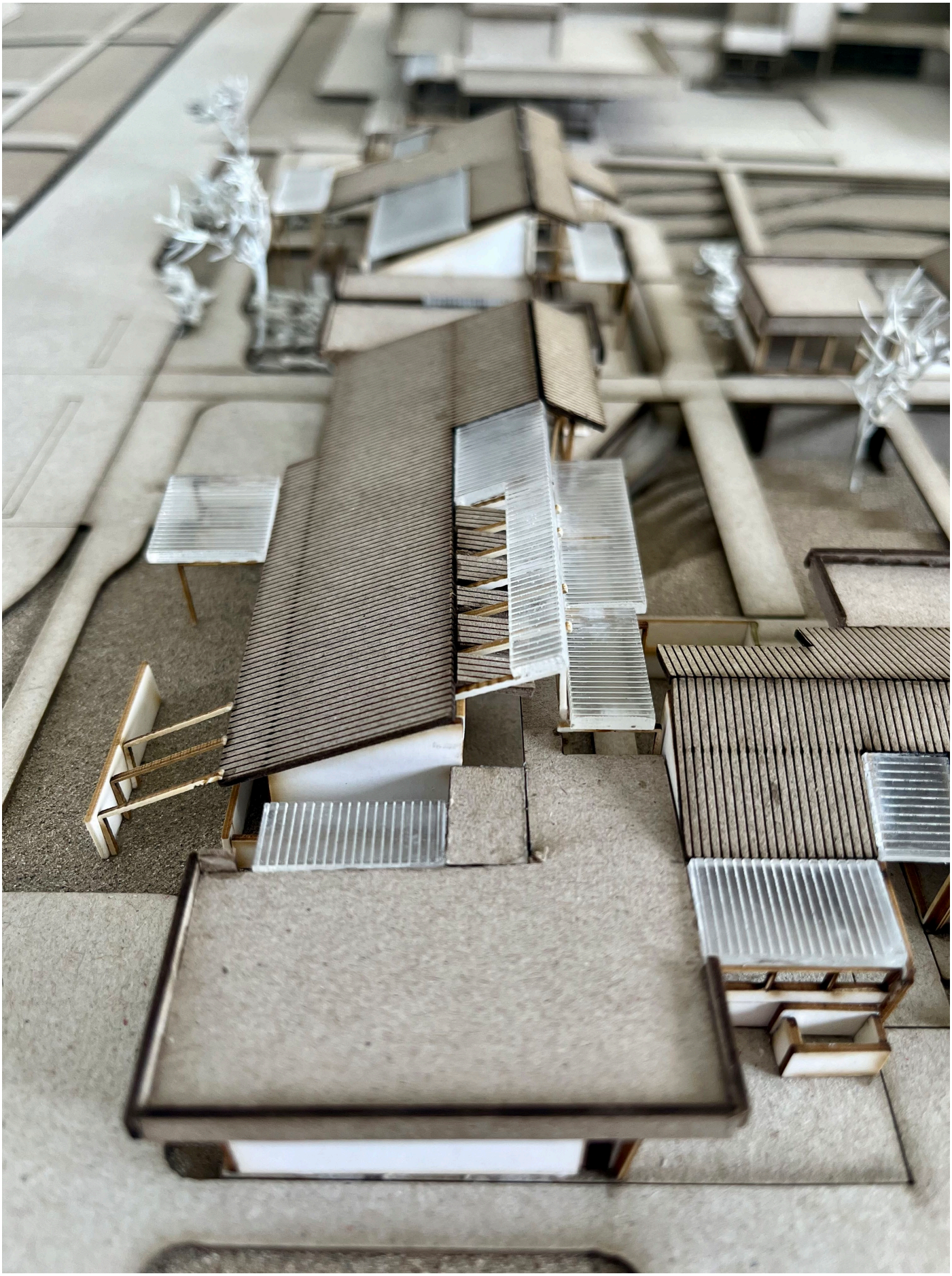

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