



Figure 1: From My
Veins Comes Life.
(Author, 2021).

SWEET-PEA'S GARDEN:

AN URBAN GREEN CEMETERY WHICH INVITES A MORE
POSITIVE GRIEVING PROCESS THROUGH BIOPHILIA

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M.ARCH (PROF) DISSERTATION

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Declaration of original authorship:

The work contained in this dissertation has not been previously submitted to meet the requirements for a qualification at this or any other institution of higher education. To the best of my knowledge, this dissertation contains no material previously published or written by any other person except where due reference is made.

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With death so present in the air due to the current COVID-19 pandemic, two thoughts have constantly come across my mind - "What do I want to happen with my body when I die?" and "I don't want my loved ones to constantly be sombre when visiting or even thinking about me because I have passed, rather I want them to remember the good times of my life."

When I was just 9 years old, the worst thing I could possibly think of at that time happened. Granny (my best friend) got sick. Valentine's Day a year and a half later, she passed and I was distraught. Granny was put into a small box in the Catholic Church in Bloemfontein in 'room full of cremains' with a golden plate that had her name on it. This plate being the only thing to set her apart from everyone else. Even though she was my best friend, every time my parents said "Let's go visit Granny.", I would feel my heart drop and as I set foot in that small 'room of names'. Her remains were there, she wasn't. It was just a room of names that used to be people.

The way in which I do still have an attachment with my Granny is through flowers, specifically Sweet Pea's. My best memory with my Gran was us spending time outside in the garden where she would always tell me all about her garden and the many flowers, she considered to be her favorite. Her ultimate favorite was the sweet pea, which was also the nickname she had for me. Now whenever I see a sweet pea flower, I think of Granny. My most precious memories captured in a plant. This is the reason behind the name of the Cemetery design, 'Sweet Peas Garden', and the catalyst which ignited the investigation into new ways of celebrating the dead while simultaneously, being kind to the environment. This could invite more positive relationships between those living and those who have passed on by creating a peaceful space. Here, the living can spend time with or spend time simply thinking about those who have passed and the influences which they had on their lives.

This discomfort is what sparked the investigation into green burials and how, combining these with using indigenous and endangered flora to create biophilic architecture, this lends itself to invite a more positive grieving process and generally more positive outlook on how we remember our loved one's in life rather than dwell on their passing.

Plant A Tree

By David H. Wright

If when I am gone
Thou would'st honor me
Then plant a tree.
Some highway, bleak and bare,
Make green with leaves.
So radiant and fair
And full of leaves my monument will be,
So ever full of tuneful melody.
My monument will be
A sight most rare –
Trees planted everywhere.
A highway broad from city to the sea –
Plant this in memory of me.

(Admin, 2016; Online).



Figure 2: Sneezewood Tree Sketch (Author, 2021).

I want to take this opportunity to thank my parents, for all their hard work, dedication, support and encouragement in life which has allowed me to come this far in perusing my dreams. Thank you for all the love and sacrifice.

Also a thanks to Jakes, the Santos family and the Steyn's for keeping me sane during this year.

This dissertation is dedicated to my Granny Pat, who, even from heaven, still guides and watches over me.

Finally, my greatest thanks goes to The Lord God Almighty who has blessed me with so much, Everything I am is for Him.



Figure 3: My Watercolor Sweet-pea (Author, 2021).

1

Introduction

Why? How? What? Where?



“Let children walk with Nature, let them see the beautiful blendings and communions of death and life...and they will learn that death is stingless indeed, and as beautiful as life.”

— John Muir

(Muir & Earl, 1975).

Figure 4: Grey Tree Pincushion Watercolour (Author, 2021).



1.1 Introduction

According to Anna Davies (professor at Trinity College Dublin and Principal Investigator in the Environmental Governance Research Group), Environmentalism refers to the “concern for the environment and particularly actions or advocacy to limit negative human impacts on the environment” (2020). Environmentalism has been recognized since ancient times but Contemporary Environmentalism has become a rising topic in recent decades thanks to online sources that allow each person to research associated topics and formulate their own stand on environmental issues and what can be done to negate the negative consequences of the human impact on the environment.

Because of the exponential growth of the human population, more and more land is needed for habitation. Many have come to the understanding that it is no longer possible for a large population of people to live in houses with large gardens as there simply is no space for this. Another realization, which has been emphasized by the COVID pandemic, is that traditional burial methods could be altered to make room for alternative versions of the ritual. The issue with some traditional burial methods (as there are many different burial traditions) is that there will not be enough space to do this forever. Land that was used for this purpose, is also not conducive to a thriving habitat for other species as some of the embalming fluids used in the process of some traditional burial rituals are toxic to the environment it is placed within. In essence, reinterpreting some traditional burial methods may conform to alternative understandings that are based on contemporary needs.

1.2 Issues Requiring Consideration

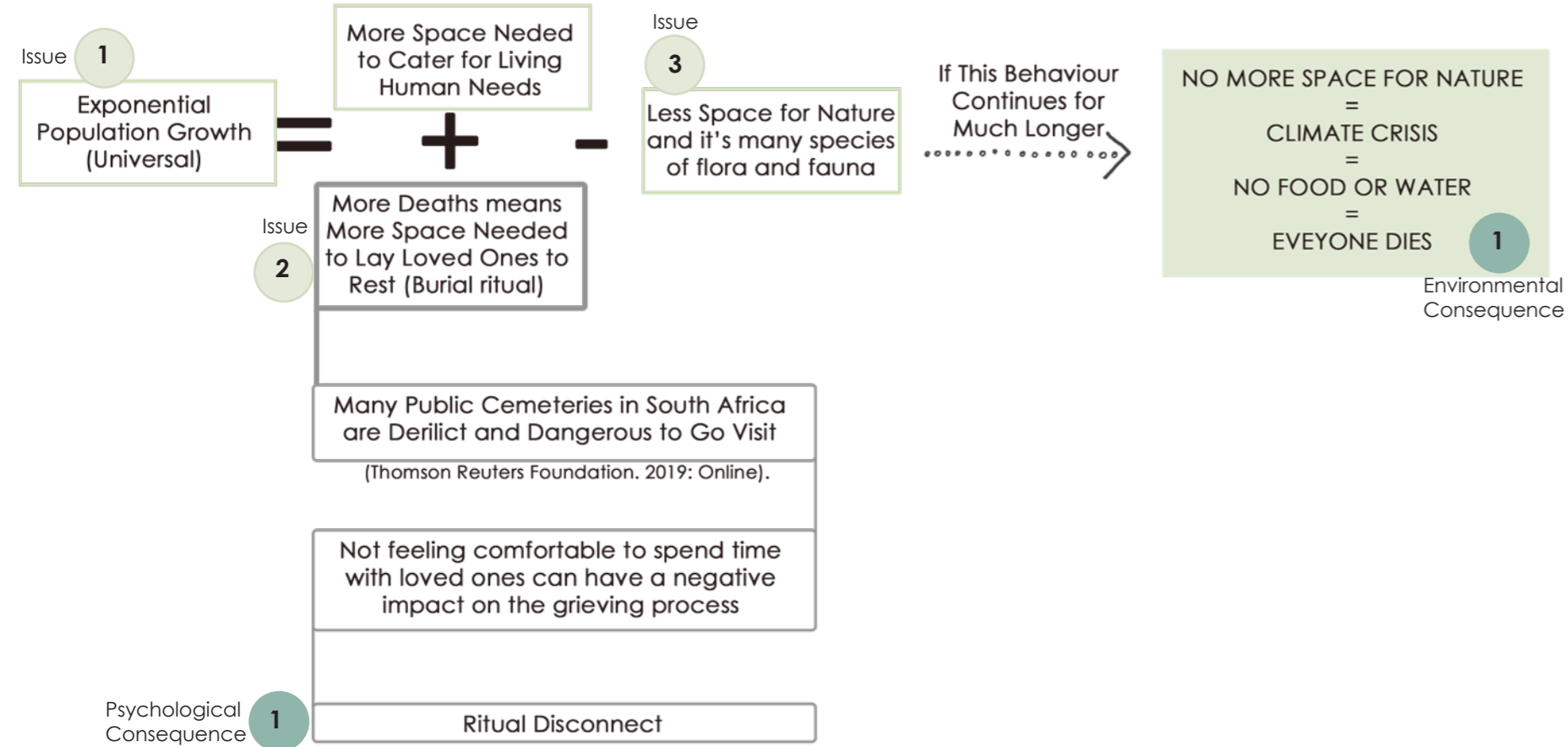


Figure 5: Issues Requiring Consideration (Author, 2021).

1.3 Possible Solutions to the Issues Requiring Concern

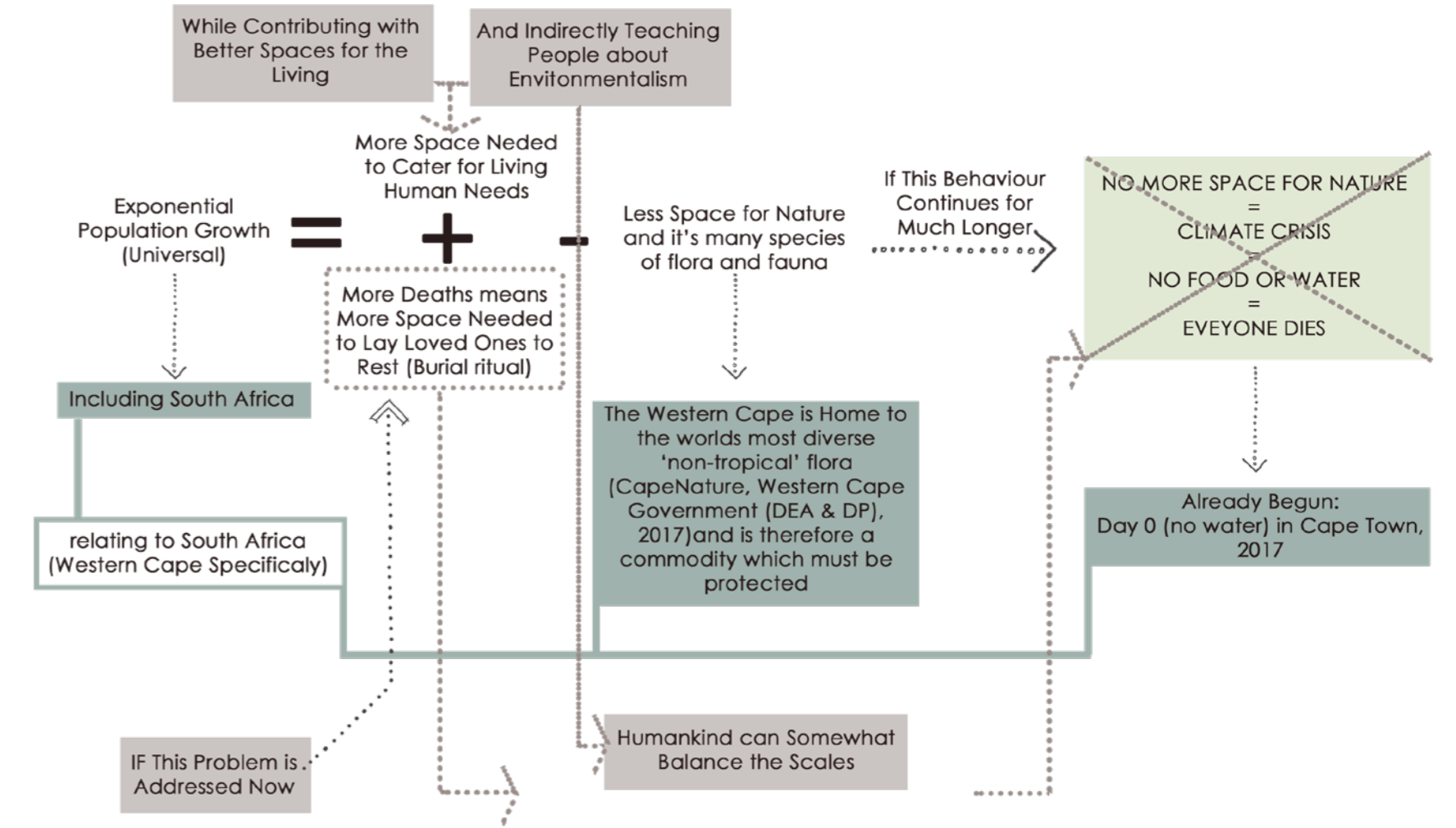


Figure 6: Possible Solutions to the Issue Requiring Concern (Author, 2021).

Project Rationale

1.4 Research Question & Research Themes

Research Question:

How can green cemetery architecture invite a peaceful experience in a space for those who have passed on, making the grieving process a more positive one?

Research Themes:

Main theme:

The role of green cemeteries as an Environmentalist urban intervention within Somerset West.

Sub-Theme 1:

The mutual relationship between ritual and architecture and how to celebrate this relationship to invite certain experiences within places.

Sub-theme 2:

The unconscious connection between the people and nature and how to embrace this connection to aid in healing.

1.5 The Client:

There are several green burial funeral groups around the world, some (such as Sonja Smith Funeral Group) of which are found in South Africa. These funeral groups cater to two groups of the general public: to those interested in the environment and would like to make a difference in death by giving their body's to their local environment as a means to contribute to its ecosystem and to the those who would rather have their final resting place within their natural surroundings and find a 'garden' to be a better place for their loved ones to spend time with them after they have passed on.



Figure 7: Individuals Making a Difference to the Environment (Bowman, A., 2020: Online).

1.6 Project Aim:

Architecture and design cannot prevent death but, the proposed design aims to create a place which is conducive to comforting mourners and paying respect to those who have passed away by celebrating the essence of burial rituals and rethinking the traditions associated with them, therefore rethinking the death-design relationship. This which aids mourners in their time of grief while simultaneously contributing to the environmental greater good.

This dissertation ultimately aims to use architecture and landscape design to invite a peaceful experience for mourners and assist them in their grieving process by creating emotive spaces in which they can truly feel their feelings to move through the grieving process. This then aiding the process to become a more positive one and creating a space in which individuals feel comfortable to be with their lost ones long after their passing through the cemetery garden. The main aspect that is addressed to accomplish this is Environmentalism and how, within a South African context, an

understanding of humans being guests on this planet but also a contributor to the greater ecosystem, is transformed into action through which death contributes to the biodiversity of this ecosystem. This must be accomplished in a sensitive manner that respects the past of the individual and what they meant to their loved ones but simultaneously giving back to the future generations. This addressing of Environmentalism is done so through the investigation of *traditional* Western burial and the rethinking of the burial ritual to include and celebrate the natural surroundings of South Africa. This is done by means of the green burial process but also through design applications of Biophilia, biomimicry and the celebration of light and wind as building elements to create certain atmospheres within the different spaces. The variety of emotive spaces which enable the mourners to grieve in the best way possible for their individual selves.

1.7 Funeral Rituals of Different Religions and Cultures

There are different ceremonies used to bid farewell to the dead including: burials, cremation and cryonics but burials these ceremonies can again be divided by the rituals and methods used to perform the ceremonies which is determined by the individuals customs and beliefs. This section investigates the different rites and rituals which influence the preparation and disposal of the body.

1.7.1 Christianity and Associated Death Rituals

Christian death rituals take place after the biological death of the individual and end after the burial or cremation of the body which is understood as the conclusion of the mourning period. Early Christians did not make use of a traditional burial but rather wrapped bodies in fabric and placed them in caves or catacombs but over time, the traditional burial emerged, keeping the ritual intact while executing it in a different manner. The execution, however, can vary between denominations (Innes, 2000: 68).

In current times, Christian funerals are usually designed around the individual that has passed on, for instance, the service is carried out either in a church or can be carried out at a cemetery or crematorium but the service itself usually includes the rites illustrated in figure 8 which may also include additional music or reading of poems and a friend or family member of the deceased may pay tribute by giving a eulogy (Funeral Partners, 2021: Online).

Traditionally, the physical burial of an individual is orientated with the head pointing West for the tombstone (face of the individual) to be facing the East as it is believed that in the Second Coming, the dead will be facing Jesus as he rises again (Decker, 2017: Online).

“For as the lightning flashes from the East and is seen even in the West, so will be the coming of the Son of Man.”

- Matthew 24:27.

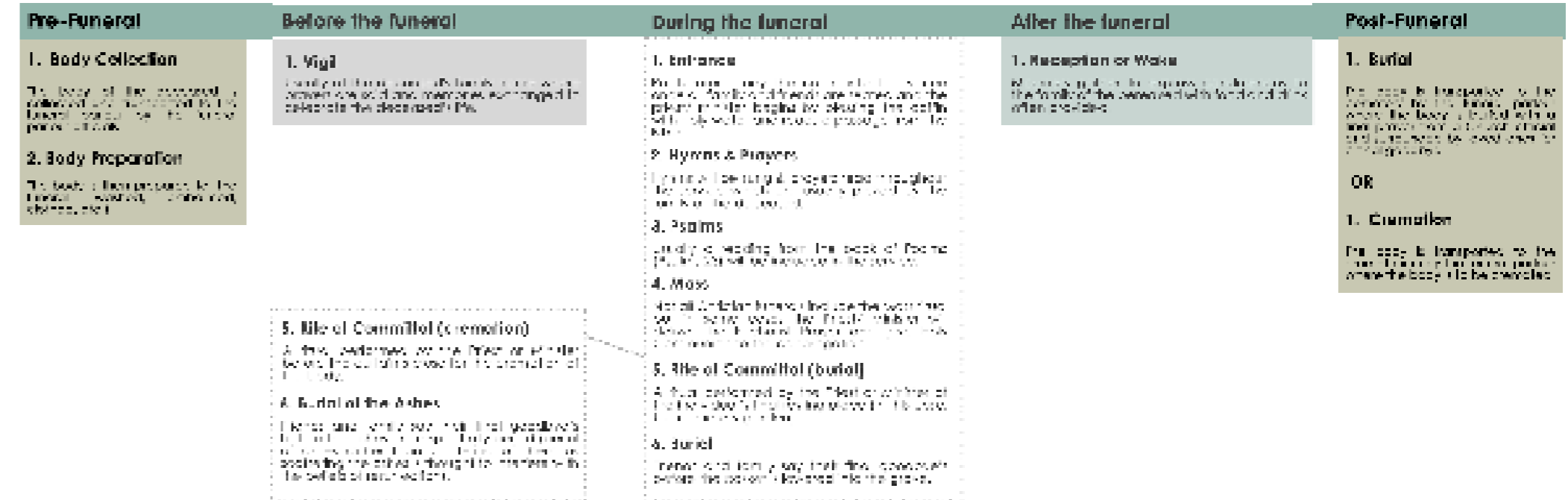


Figure 8: What happens at a Christian funeral? (Funeral Partners, 2021: Online).

1.7.2 Traditional African Funeral Rituals of South Africa

With 11 official languages, South Africa has vibrant diverse cultures, each with their own understanding and relationship with death. The largest native South African culture is that of the Zulu people which, according to a 2018 article by John Misachi, amounts to about 10 million people in the country with the language which is spoken by 23% of the population where the second largest of the cultures is that of the Xhosa which is the predominant African culture in the Western Cape, at 7 million (Misachi, 2018: Online). Many of the traditional African cultures and their death rituals are influenced by the religion in which the individuals adopt.

1.7.2.1 The Zulu Culture and Funeral Rituals

The Zulu culture makes use of the same *traditional* burial ritual (as seen in figure 17) but individuals of this culture believe that life continues in a spiritual world after death and it is understood that any member of the tribe who is not buried in the traditional manner, may become a wondering spirit in this spiritual world. During the burial process, an animal is sacrificed is made which is known as the *ukubuyisa* ceremony where this ancestral spirit is 'brought back home' (South Africa Online (Pty) Ltd, n.d. : Online). This sacrifice also creates a 'bridge' in which the members of the tribe in this world can maintain contact with their ancestral spirits in the next and the belongings of the individual are buried with them to help them in their afterlife journey (Siyabona Africa (Pty)Ltd., n.d.: Online). Figure 9 illustrates a Zulu funeral in which the members of the community wear their traditional dress.

"Xunzi states that funerals allow for not only the expression of grief amongst loved ones, but they also regulate the 'proper' duration of grieving" (Radice, 2017: 469).



Figure 9: King Goodwill Zwelithini burial custom for Zulu monarchs (Ndlovu, S., 2021: Online).

1.7.2.2 The Xhosa Culture and Funeral Rituals

The Xhosa culture, death rituals take place from the biological death until approximately two years after the event and similarly to the Zulu culture, this culture also recognizes the presence of ancestral spirits. When an individual of this tribe passes away, the tribe makes use of slaughtering of animals to respect and call upon their ancestors. During a ritual called *Thetha*, an elder remains with the body to explain to the spirit of the body, what is happening before the funeral as they believe that the spirit remains with the body until its departure during the funeral. This is seen in figure 17 where Nelson Mandela's grandson is deemed this elder at his funeral. The body must also remain overnight in the family house to 'rest' the night before the burial and the body is wrapped in special garments which conveys the status of the individual. If the deceased is of high rank, the casket is usually wrapped in a leopard's skin and in the case of statesmen, a South African flag accompanies this as seen again in figure 10 for Nelson Mandela.



Figure 10: Xhosa Burial Traditions at Nelson Mandela's Funeral (The Associated Press, 2013: Online).

Early on the day of the burial, an animal (the type dependent on the status and rank of the deceased) is slaughtered by means of throat slitting and the animal is then prepared, cooked and eaten by the mourners. A year after the burial, the tradition of *Ukuzila* is carried out where another animal is sacrificed and eaten by the individual's family to mark the end of the mourning period. The final ritual of *Ukubuyisa* which takes place does so approximately one year later where a joyous ceremony takes place to invite the deceased's spirit back to the family where they look over the family (The Associated Press, 2013: Online).

1.7.3 The Eastern Indonesian Tana Toraja Rituals of 'Death'

Cultural anthropologist, Kelly Swazey, discusses the Tana Toraja traditional relationship with their dead and the rituals which take place before the eventual transition to ancestor, in her TED Talk titled "Life that doesn't end with death" (2013: video). Biologically, the definition of death is when a human's heart and lungs have irreversibly ceased to function (DeGrazia, 1998). Does biological death necessarily equate the social understanding of death though?

The Tana Toraja are the people of the Sulewesi highlands of Eastern Indonesia. In their culture, death is not defined by the 'biological death' of a person but rather, this acts as the beginning of the transition of a person from life into the 'Puya' which is the afterlife. In the stage after the 'biological death' and before the 'Puya', medically, the body of the individual goes through disintegration, but members of this culture still treat the bodies of their loved ones as living members of their family, living with and caring for them symbolically. This continues until the extended family have reached the agreement and have all the resources needed to hold their traditional funeral ceremony where a series of rituals take place. Only after this funeral is the loved one deemed to be truly dead. This funeral is sometimes held years after the individual has reached 'biological death' and take place over the period of days to weeks, depending on what is deemed appropriate by the deceased's family.



Figure 11: Sequence of a family in Tana Toraja cleaning and dressing the mummy of their grandfather, Ma'Nene ritual. (Travel Badger, 2016: Online).



Figure 12: Tana Toraja Funeral Ceremony – serving food and drinks (Travel Badger, 2016: Online).

Unlike in Western culture, the deaths, transition period living with the 'Makala' (a sick person) or 'Mama' (a sleeping person) and funerals of loved ones are deemed to be the most important social experience of an individual's lifetime. This funeral is not held just for the dead or for the grieving families, but these events are held in front and includes the participation of the entire community. Appropriate ritual sacrifices are given to exhibit the status of the deceased, not only their social status but a status chosen by their loved ones, based on the individual's contributed to the lives, making this a reciprocal ceremony where the loved ones 'give back' in death what they received from their loved one.

The final part of the funeral is after the deceased has been given a portion of the sacrifices which have taken place as their final meal and the bodies of the deceased are then moved into a room within the 'tongkonan', the Tana Toraja's traditional residential



Left- Figure 13: The bodies being placed pride of place on a special platform above everyone (Travel Badger, 2016: Online).

Right- Figure 14: There were many buffalo at this event – showing the wealth and popularity of the deceased (Travel Badger, 2016: Online).

building (as seen in figures 13 & 14 below). The shape of which, symbolizes the life cycle of a person as they are born into the same structure which takes them to their ancestral resting place (Kim, 2018: Online).

These traditions and rituals may seem completely strange to outsiders, but the important element to understand is how this culture rethinks death and the relationships of those alive to those who are physically or biologically dead. This understanding which is aided by design, helps the mourners transition their mindset from thinking of their loved one in terms of a living person to thinking of them in terms of an ancestor "because relationships with loved ones don't simply end when breathing does." (Swazey, 2013: video). This is a beautiful understanding which creates an equally beautiful relationship between this community and the dead. Instead of avoiding death as much as possible, rather, it is celebrated. This makes death not the scary or sad event which the Western world sees it as.

The proposed design hopes to achieve this kind of celebration of death while still respecting the ritual of burial that those of the Western culture understand and are therefore comfortable with. The design aims to guide the mourners through the grieving process, giving them spaces to feel the different emotions of the stages of grief, leading them from the sadness of the death to the celebration of the life.

1.8 What is a Green Burial?

When referring to the *traditional* ritual of burial, this dissertation refers to the traditional Christian ritual which is still carried out and which has been adopted by and is widely used in Western cultures today.

Coffin types which would be appropriate for green burials



Figure 15: Different Types of Eco-Friendly Coffins by Sonja Smith Elite Funeral Group (Sonja Smith Funeral Group, n.d.: Online).



Figure 16: 0895 Pine Jewish Coffin (AVBOB, n.d.: Online).

Different cultures and religions around the world signify death with certain rituals which have particular meaning to that culture. This proposal does not intend to construe that any cultural death rituals are wrong or that they should be performed in a different manner. There are many alternative ways of saying goodbye to the dead which include *traditional* burial and cremation, amongst others (Do, K., Jonescu, E., & Peake J., 2020: 2). What This dissertation does aim to do is to look at the *traditional* Western burial ritual and adapt this to become another option for those who connect with the *traditional* ritual but would simultaneously prefer a more environmentally friendly approach.

One of the new more environmentally ways in which to bury the dead is known as "green burials". This ritual takes on *traditional* the ritual of burying loved ones while simply making the coffins Eco-friendly as seen in the examples in figure 15 and figure 16, changing the tombstone into a living tombstone (some kind of tree or plant to mark the grave) as well as making use of non-toxic embalming fluids during the preparation process. This method is a reinvention of the *traditional* burial as seen in figure 17.

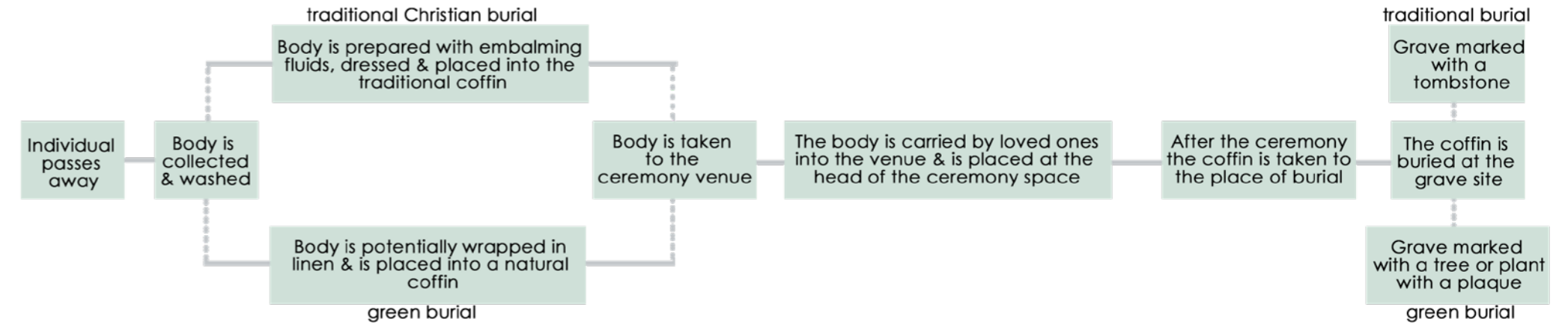


Figure 17: Traditional Christian Burial vs Green Burial Diagram (Author, 2021).



Sweet-pea's garden as adaptive reuse...

1.9 What is adaptive reuse?

Human activities have led to environmental degradation worldwide for many years and the consequences of such have become apparent in the climate crisis (refer to figure 5). People tend to have a linear understanding (of economic, the built environment, resources, etc.) of the world in terms of what value it has to humankind (Foster, 2020: 2). In terms of the built environment, this means: a building is erected, used for its perceived lifetime and is then disposed as waste by either being abandoned or demolished and another building is erected. This short term mentality creates waste while simultaneously depleting the local built environment of history and character.

The solution to this is adaptive reuse, where a building which is seemingly passed its 'lifetime', is restored, renovated or adapted to make use of the structure again, thus giving the old building a new purpose. By reusing 'old' buildings, mindsets are changed from a linear understanding to the more sustainable 'circular economy' (Foster, 2020: 2) (Where buildings are understood in economical terms). The contrast of these two understandings is illustrated in figure 18 below.

In terms of this proposal, buildings are not being adaptively reused but rather the site as this specific site has historical significance but has been restored from its previous degraded state to welcome a new purpose which is perceived positively by the local community.

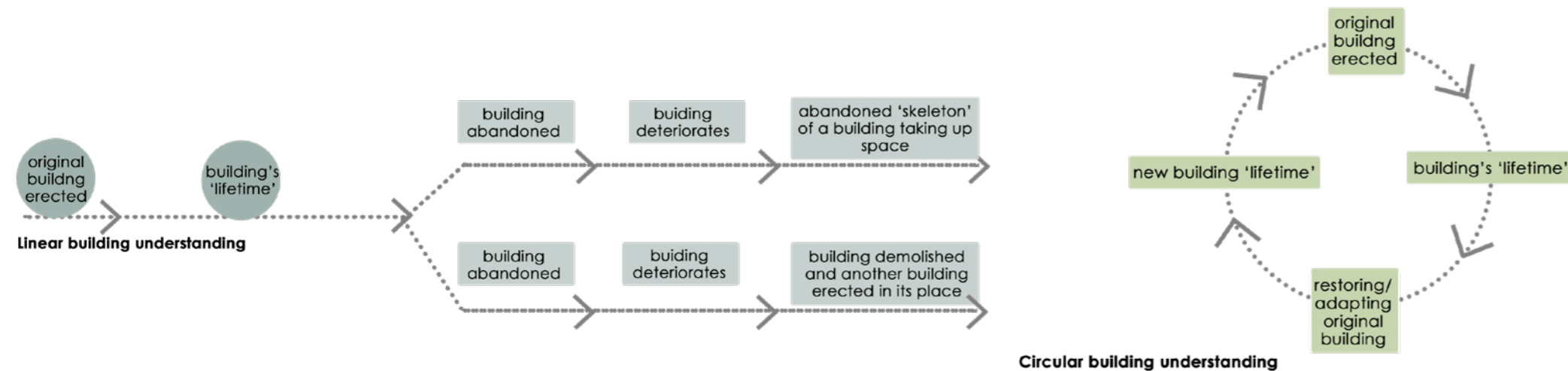


Figure 18: Linear vs Circular Building Lifetime Understanding (Author, 2021).

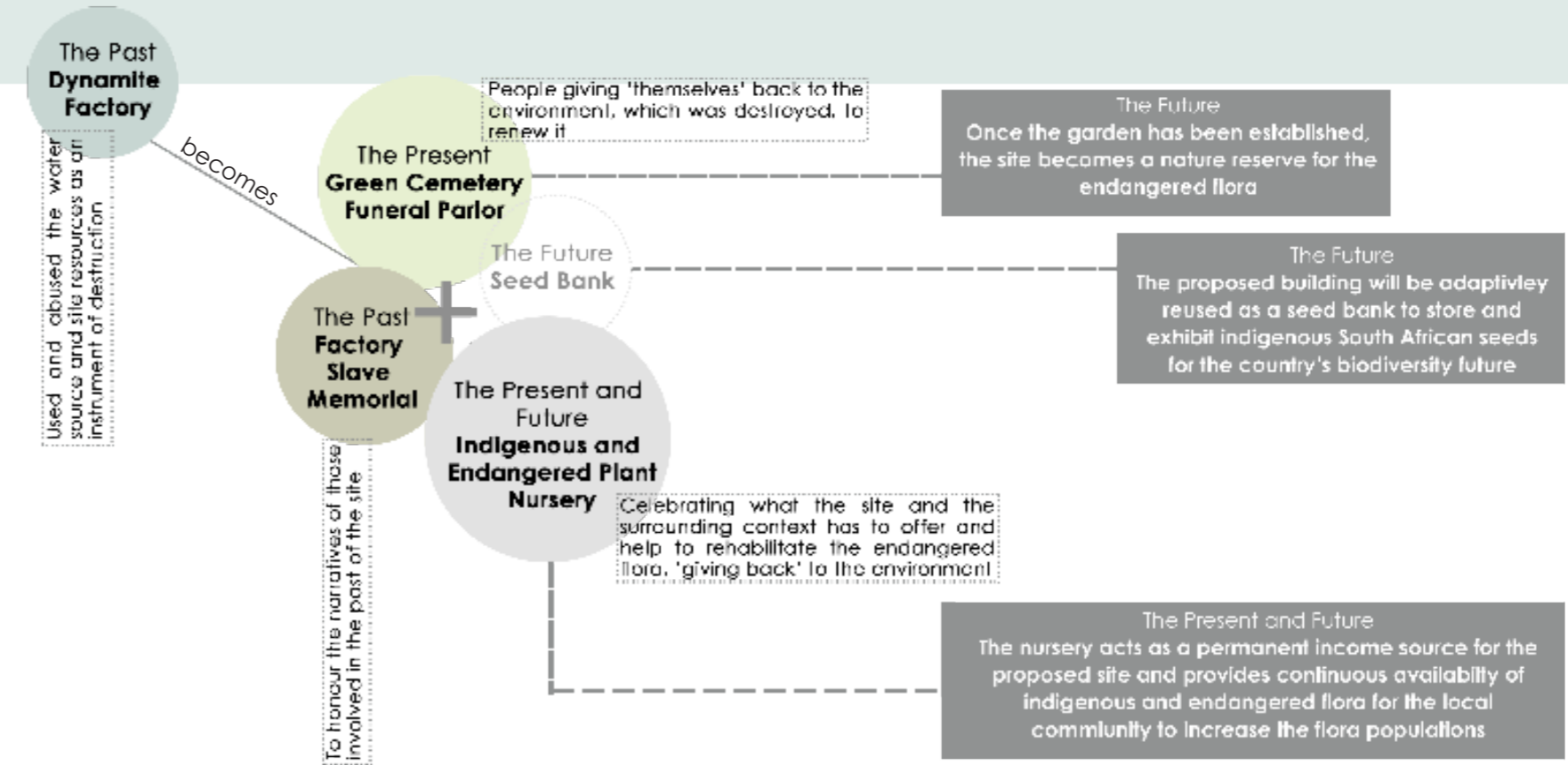


Figure 19: Proposed Development Program (Author, 2021).

1.10 Proposed Development Program

The proposed adaptive reuse design will accommodate several architectural elements as illustrated in figure 19 above. The first being a green funeral parlor to support the cemetery. When the cemetery is 'full' in about 50 years, will be reused as a seed bank to store indigenous seeds of the present to ensure a future for the biodiversity of the country. Secondly, an indigenous and endangered nursery is proposed which will not only support

the cemetery by supplying the flora for the 'tombstones' but also serves the community and environment by supplying these scarce plants to locals, ultimately growing the endangered populations. The other architectural elements are the 'contemplative spaces' scattered throughout the site amongst the 'graves'. These include a monument to the slaves who worked in the factory, a chapel, several landscape art installations and several

1.11 Statistics

The Helderberg is the Eastern most part of the Cape Town Metropolitan district making up 6,39% of it. The demarcation of the Helderberg district is highlighted as the darkest area in the map figure 20 to the left.

Population statistics

According to the 2021 statistics taken from World Population Review (2021: Online), the population of Cape Town in 2021, which is estimated by the growth rate of 2,57% over the past 10 years, is estimated at **4 709 990 people** with **273 942** of this population inhabiting the Helderberg district according to the statistics provided by the Draft Helderberg District Baseline and Analysis Report issued by the City of Cape Town in November 2019 - Draft version 1.1 (City of Cape Town, 2019: Online).

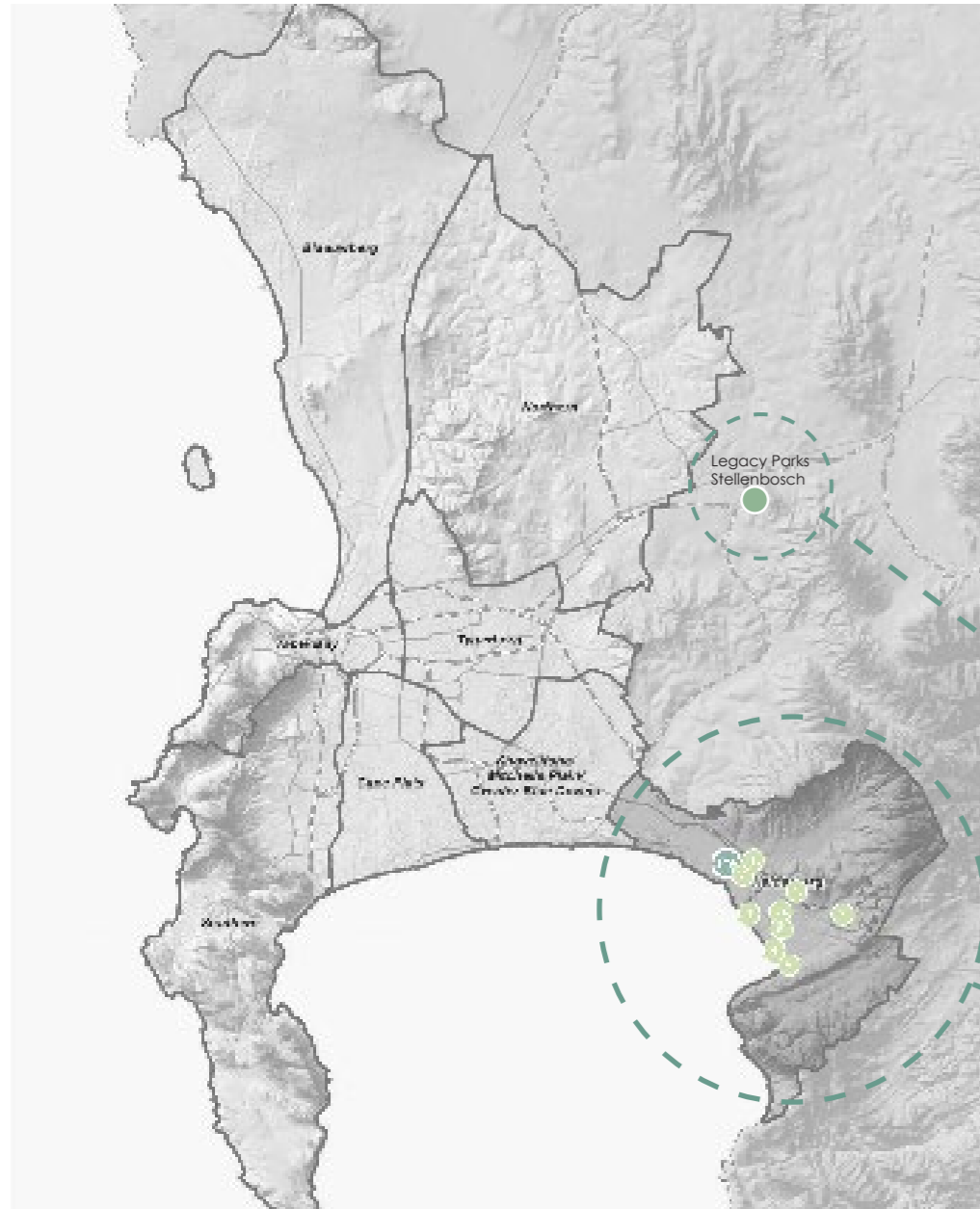


Figure 20: Helderberg District Locality Map Edited by Author (City of Cape Town, 2019: Online).

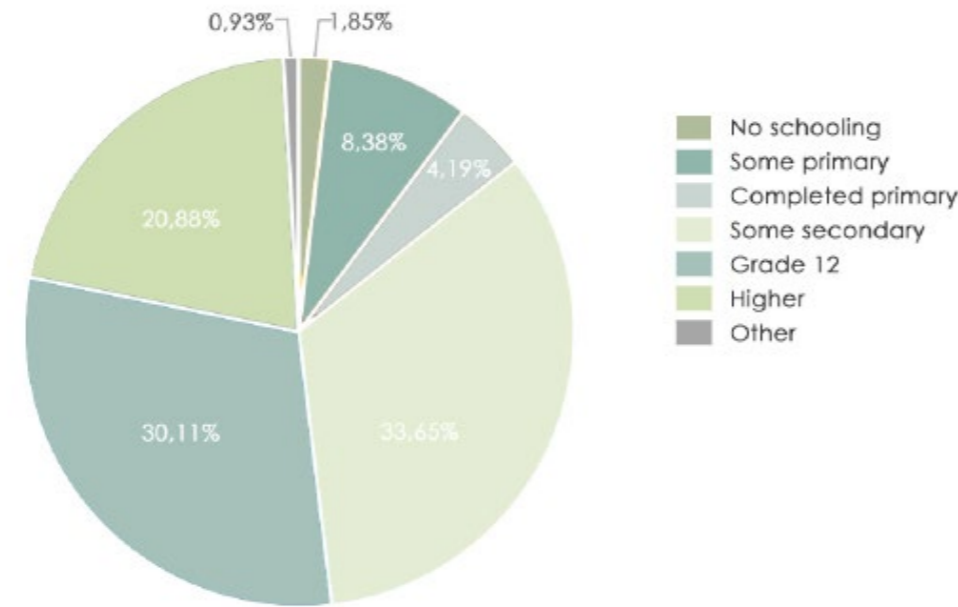


Figure 21: Helderberg District detailed distribution of highest adult (aged 20+) education level (Census, 2011) (City of Cape Town, 2019: Online).

Number of Green Burial Cemeteries Nearby:

~~1~~
Closed Down

Number of Cemeteries on the Heldeberg Area:

9

Grade in which Climate Change is Taught From:

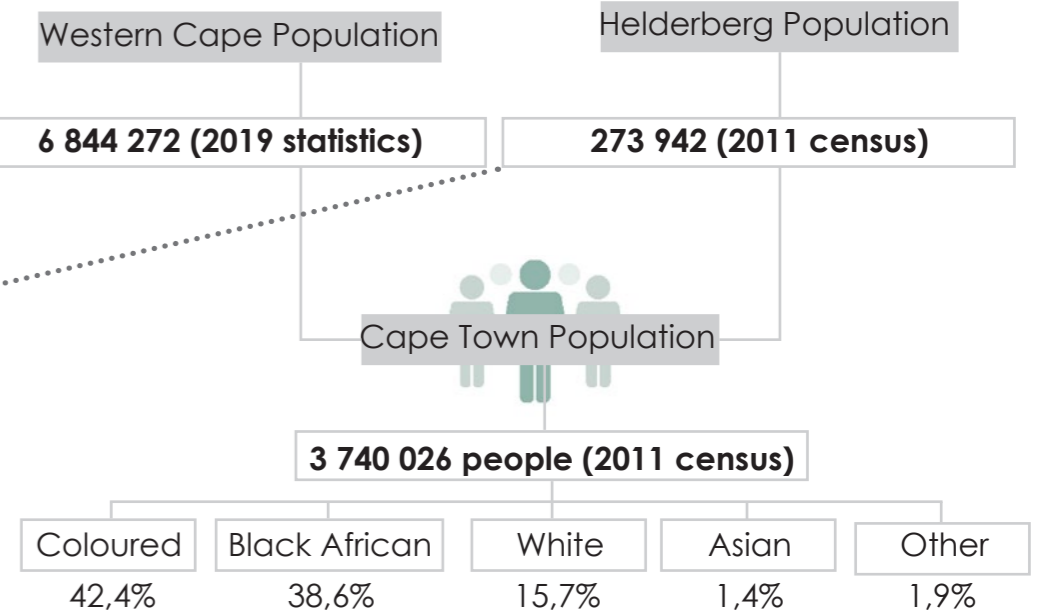
gr. 6

% of Population taught about climate change:

85,57

Amount of Potential Clients for the Green Cemetery

234 412



Design Touchstone

2

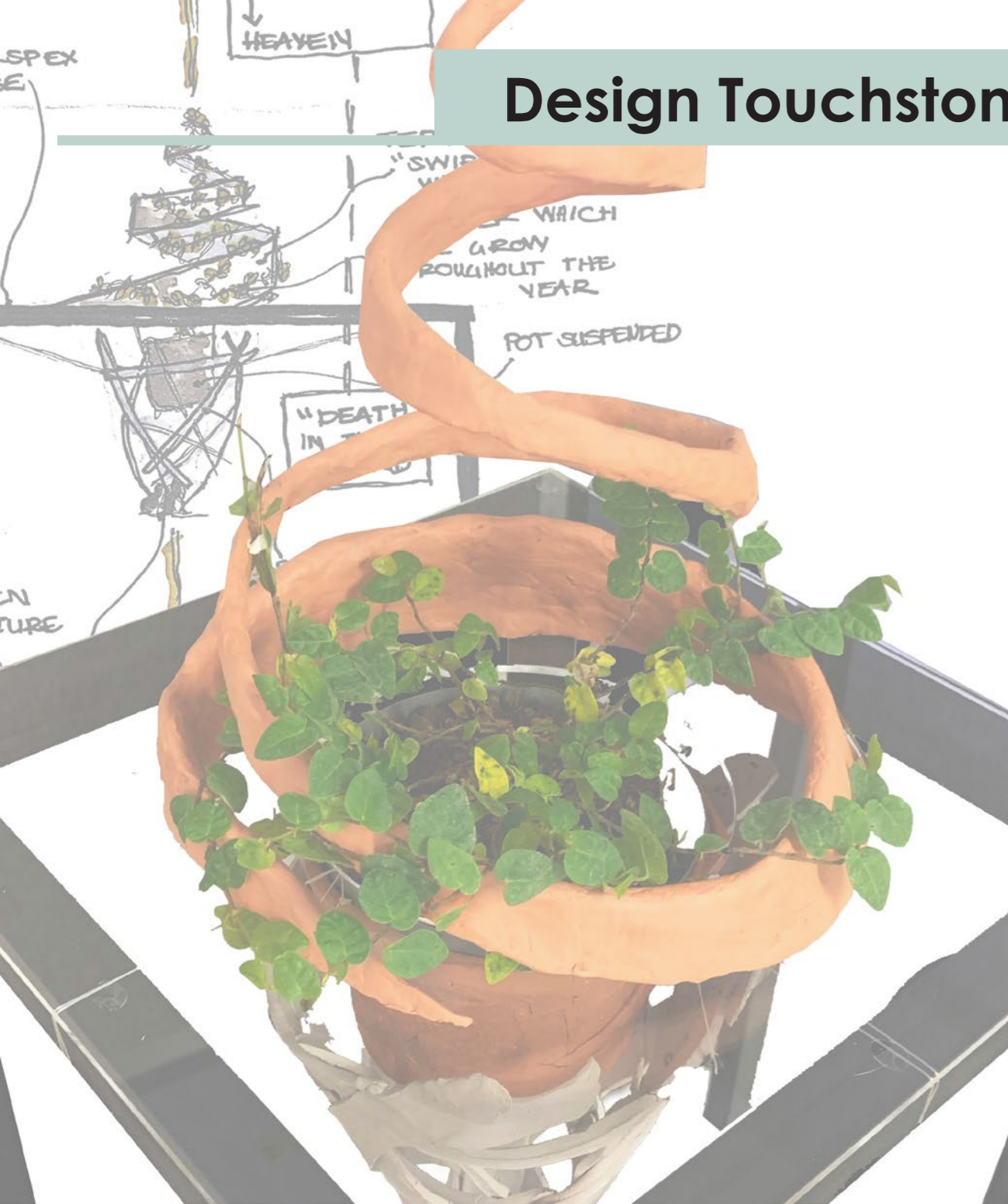


Figure 22: Shadows from the Trees (Hafner, J. 2013).

2.1 Behind the Touchstone

With this concept of a green cemetery turn garden, the main feeling that this dissertation aims to accomplish through architectural and landscape design is the feeling of peace. Personally, peace is sitting under a tree with the wind blowing, moving the leaves ever so slightly that they begin to rustle and a mix between shadows and sun create a dance along my face. This touchstone is an abstract approach to my concept of a green cemetery where the transparent horizontal plane represents that between life and death.

The portion above the plane is a swirl, based off the conceptual sketch of wind, which draws the eye upward to the point reaching to the 'sky'. This terracotta structure is then taken over by a creeper plant which not only symbolizes new life that comes from death as the pot with the plant's roots pierce the plane between the two, but as the plant grows and over time, covers the structure, this shows how the process of mourning is not an immediate one but one that takes time. How it takes time for grief to become peace and memories.

The portion below the plane is comprised of grey clay strips which have been woven together in a chaotic manner to resemble the feelings of someone who is mourning the loss of a loved one. They have been shaped into a cone to reflect the upper portion to elongate the points between life and death, heaven, and earth, ultimately drawing out the axis mundi which becomes an important element of the architectural design.

Peace In Time



Figure 23: Photographs of the Final Design Touchstone (Author, 2021).

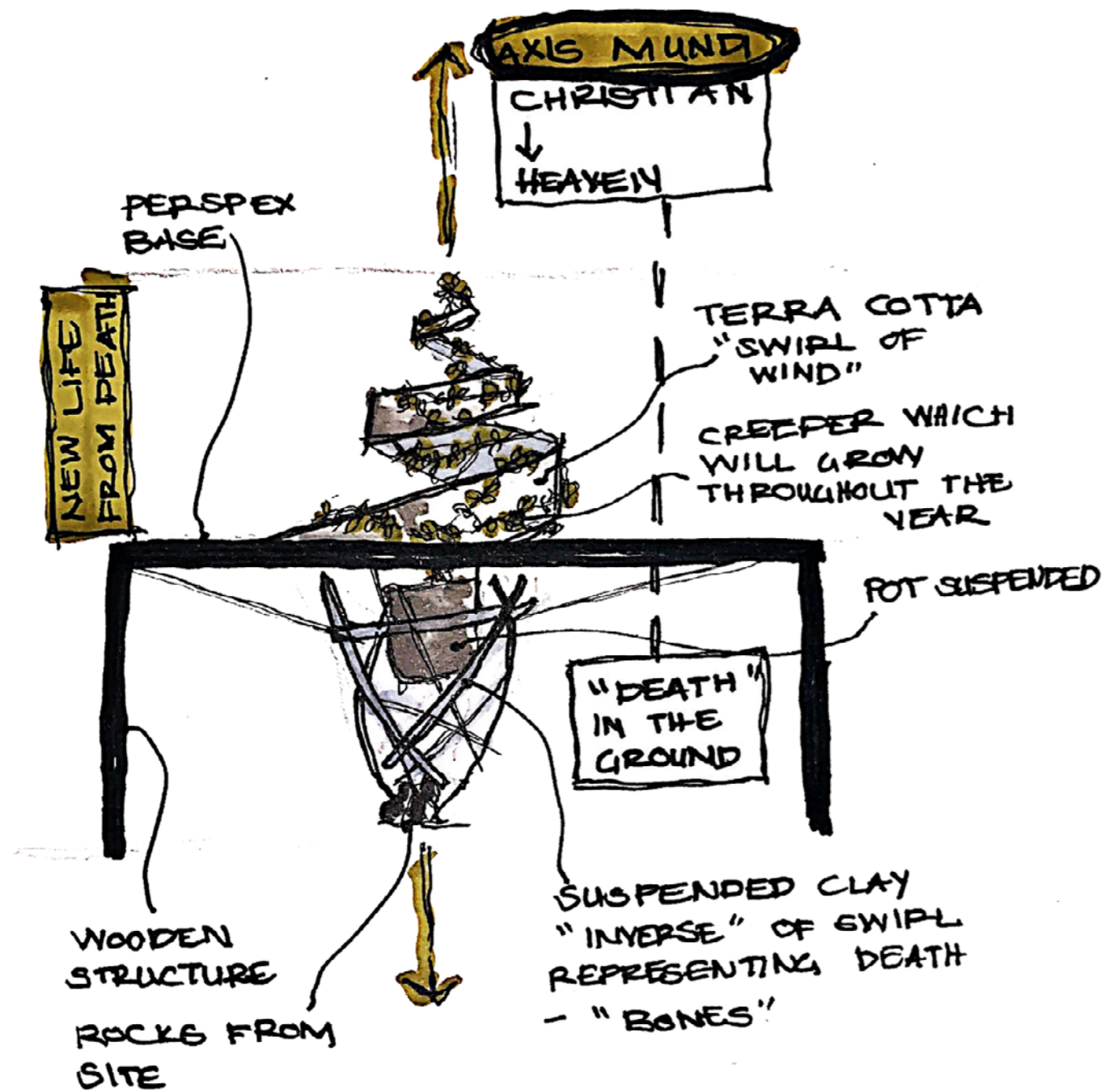


Figure 24: Design Touchstone - Peace in Time (Author, 2021).

Figure 25: Photographs of the Final Design Touchstone (Author, 2021).

3

Theoretical Underpinning

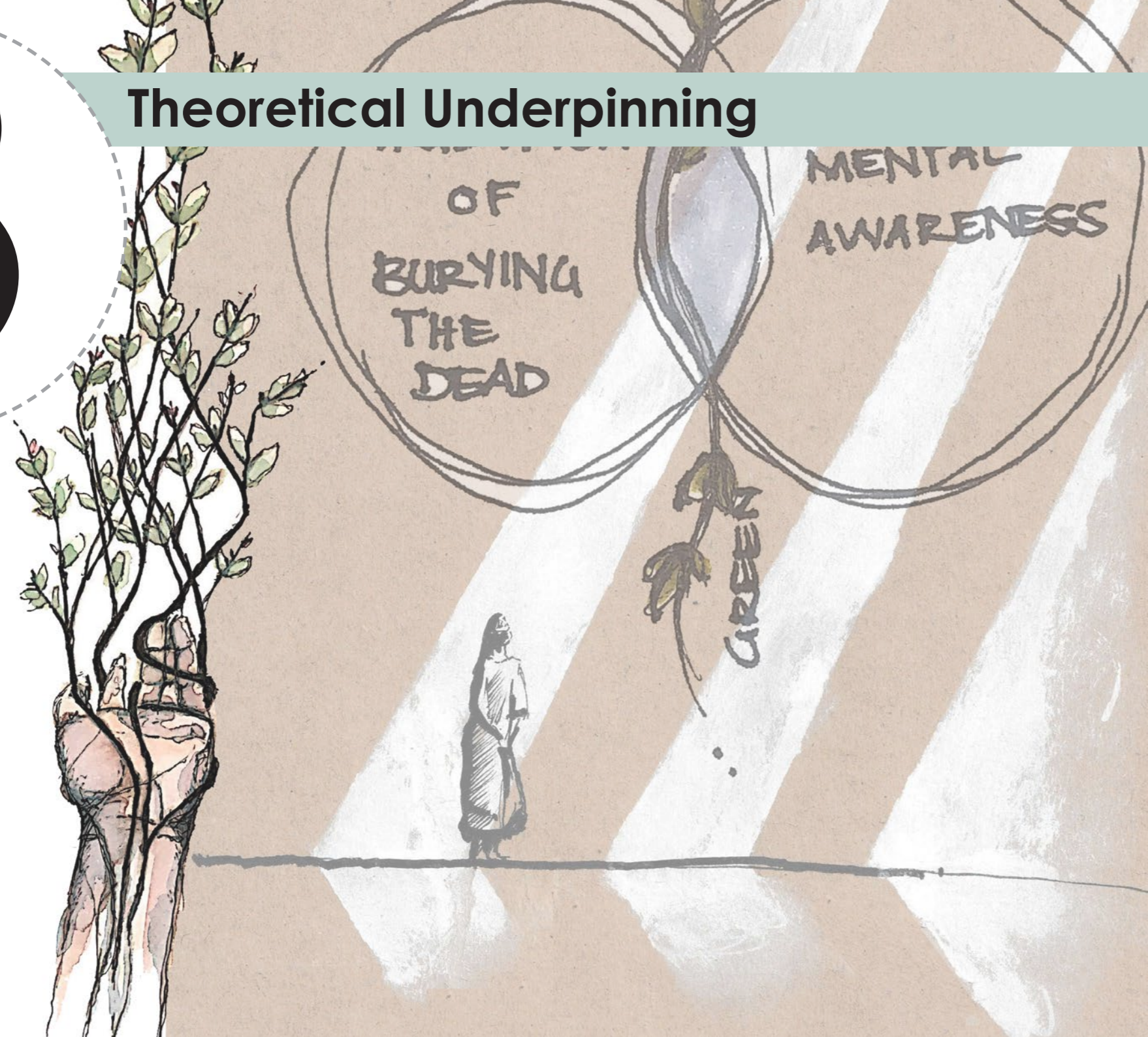


Figure 26: *Feeling the Atmosphere* (Author, 2021).

3.1 Introduction

Death is an inevitable, and also a very influential part of every human life but is not experienced in a universal manner and neither is the architecture that supports the grieving process. Understanding the experience is determined by what Norwegian architect and theorist, Christian Norberg-Schulz calls the 'lived experience' (Auret, 2015: 23) of the individual and the circumstances surrounding the event or as the philosopher, Martin Heidegger calls: their 'thrownness' (El Moussaoui, 2020: 129). This event, in Western culture (which is arguably the broader culture adopted by many South Africans today), is such an uncomfortable and taboo topic, that the topic it is avoided until circumstances force a direct interaction. This avoidance and then confrontation leads to a negative understanding of death, its associated rituals and might even have an effect on the relationship between the loved ones and those passed on, moving forward.

To understand this negativity, what must first be recognized are rituals, specifically death rituals, how these rituals contribute to the grieving process and how architecture is influenced by and can influence rituals and the grieving process to contribute to a more positive outlook on the death of a loved one and the relationship possibilities moving forward.

3.2 Ritual Theory

Anthropologist, Victor Turner investigated different social structures of different communities worldwide and through this, concluded that society is continuously changing and developing and that rituals play an important role in this 'continuity and change'. These changes include the inevitable life-cycle changes: birth, reproduction, death, and other events which take place between them. Turner defines ritual as:

"a stereotyped sequence of activities involving gestures, words, and objects, performed in a sequestered place, and designed to influence preternatural entities or forces on behalf of the actors' goals and interests" (Parry, 1977:183).

This being understood as widely accepted actions taken by a person or community, such as saying certain words and performing certain motions which sometimes takes place within a sacred space. This ceremony signifies an event taking place in the life of an individual or a community. These actions, bringing the community together and creating social structure and 'societal unity' (Deflem, 1991 :4) through emotions as the 'performance' evokes certain emotions within the participants and spectators, this often referring to the religious or spiritual. Even though rituals aim to evoke certain emotions, as Turner argues, rituals are multi-vocal and therefore "carry different meanings for different individuals relative to their partaking in the ritual performance" (Turner, 1967).

3.3 Death Rituals

In life, certain rituals take place which highlight transitions within an individual or community's life-cycle which are known by French anthropologist Arnold Van Gennep as 'Rites of Passage'.

"For groups as well as for individuals, life itself means to separate and to be reunited, to change form and condition, to die and to be reborn. It is to act and to cease, to wait and to rest, and then to begin acting again, but in a different way" (Van Gennep, 1908: 189).

One of these transitions is that of transitioning from an alive state to a dead one. Death rituals take place at different times within different cultures but tend to occur once an individual of the community has been deemed biologically dead. These rituals are a way for the deceased's loved ones and community to signify the transitional event taking place, paying respect to the individual who has passed on and saying 'goodbye' while simultaneously paying respect to their loved ones who have been left behind. The rituals which follow the death of the individual depend on the beliefs of the individual and the community on whether the deceased is to live on in the afterlife or not but even though cultures may 'celebrate' deaths in different manners, humans tend to process death in similar ways. By understanding how bereaved individuals grieve rituals and the associated architecture could be tailored to best suit support the process and those going through it.

3.4 The Grieving Process and Supportive Measures

Swiss-American psychiatrist, Elisabeth Kübler-Ross who was a pioneer in near-death studies, established the Kübler-Ross model which identified the five stages of grief. "*Mourning is an intimate and unique experience*" (Casabianca, 2021: Online). Emotions of denial, anger, bargaining, depression, and acceptance are seen as the general 5 stages of grieving, determined by the Kübler-Ross model. These stages are interchangeable and are not always linear in motion as illustrated in the authors interpretation of the Kübler-Ross model in figure 27, however, a good grieving process ultimately ends with the stage of acceptance.

During this grieving period, the bereaved may feel a sense of liminality which is defined by Turner as "a movement between fixed points and is essentially ambiguous, unsettled, and unsettling" or otherwise understood by him as "betwixt and between" (Turner, 1969: 95). This undecided state of limbo in how they have lost their loved one, yet they are unable to see a world in which their loved one is not present. The process of grief which ends in acceptance is so important as this is how individuals will be able to see a new present and future with their loved one's role transformed from one as present to one of memories.

Just like the grieving process, designing for the bereaved cannot be determined by a formula but there is one supportive measure that aids most grieving individuals - gathering. As professor and author, Dr Stephen Freeman suggests: "*rituals and remembrance*

may positively inform the recovery process, emphasising the importance of social support and the need to reduce the sense of isolation for the bereaved" (Do, K., Jonescu, E., & Peake J., 2020: 3). A supportive design includes different kinds of gathering spaces that create safe spaces which invite the bereaved to express themselves therefore helping them in the progression of the grieving process to reaching acceptance while obtaining emotional closure through the process.

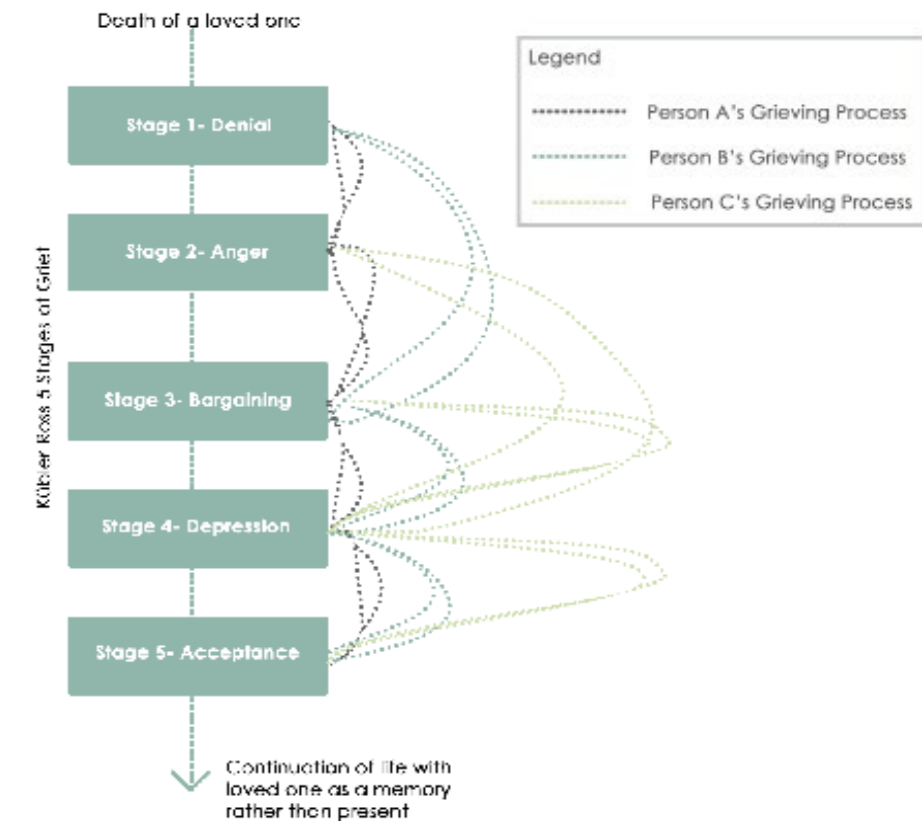


Figure 27: Different Individual's Variations of Grieving Processes Taking into Account the Kübler-Ross Stages of Grief (Author, 2021).

3.5 Death Rituals and Contemporary Ethics

Through obtaining emotional closure (which takes place during the ritual) and reaching the stage of acceptance (hopefully reached by the end of the ritual), this allows the bereaved to fashion a positive connotation of death and its rituals but this can only take place once the bereaved have been directly confronted with death.

By bringing cemeteries in from beyond the boundaries of cities (as most cemeteries over time have been excluded as part of the living city - 'out of sight, out of mind' mentality) into the urban fabric and by bringing life and death together in the same space, by means of creating urban green spaces which house the dead, the separation between the living and the topic of death decreases, inviting a new view which celebrates death as a part of life which could influence the broader Western culture in terms of how death is included in day to day life. Through this urban inclusion, the rituals associated with death and the manner in which the places of the dead are treated by the living could transform into spaces that celebrate life, the life of the loved ones left behind as well as the life the deceased had.

"Heathcote (1999) argues that cities have become increasingly reluctant to celebrate death as a normal part of a living society, and in failing to acknowledge this full life-cycle of those within, they fail to live to their fullest potential. He argues that this westernized perspective of death is delusional, unhealthy, and ill-conceived"
(Do, K., Jonescu, E., & Peake J., 2020: 3).

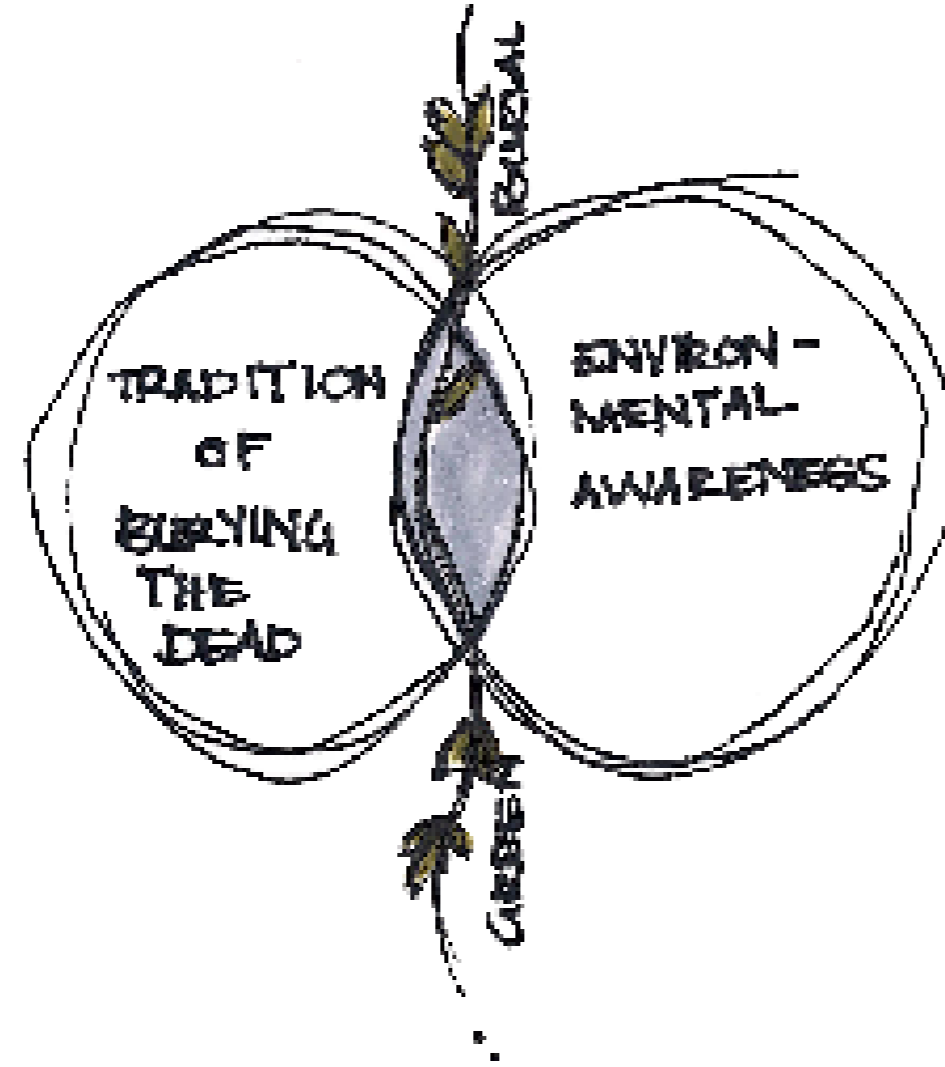


Figure 28: A Venn Diagram of the Intersection of Tradition and Environmental Awareness-Green Burial (Author, 2021).

3.6 Re-framing Rituals to Contemporary Ethics and Views

Ancient Chinese philosopher Xunzi states that "Death rituals create a social solidarity within the community" (Radice, 2017: 467). Rituals (specifically those of death) influence communities but are simultaneously influenced by communities and their perceptions which change and develop over time (relating back to Turner's 'continuity and change' notion).

"contemporary invented rites are precipitating a corresponding conceptual reinvention of ritual (Grimes, 1992: 37-38).

The current generation is known for its questioning of many of the views of the past as the advances in connectivity and the emphasis on social media act as a platform for different facts and opinions to be shared. There is one topic which on which emphasis has dramatically increased in recent years - Environmentalism (the climate crisis, being Eco-friendly, etc.). This topic has influenced the way in which many people view certain rituals, for example: commemorating an event or individual by releasing balloons has been deemed not good for the environment as it produces much waste but the ritual has not been discarded, rather, biodegradable balloons are used. Many individuals no longer think in terms of 'away' (throwing away, there is no away).

The pro-environmental ethical view has also reached death rituals. Specifically looking at the traditional burial ritual, individuals who are interested in Environmentalism have found many different ways of taking the traditional burial ritual and slightly adjusting the event with a more earth friendly option, one of which is green burials. By doing this, the significance of the ritual is maintained while the execution is re-framed to include contemporary ethics. This overlapping of traditional rituals and contemporary ethics is illustrated in the venn diagram in figure 28.

Another development which has taken place in current times is a growing universal secularism which, as discussed by Bartolomei and Praderio, leads to a decline of religious expressions within rituals and rather emphasizes spirituality. As spirituality is subjective to individuals, so are rituals becoming more tailored to individuals, especially death rituals. The essence of the ritual in terms of it's respecting those who have passed on is kept and celebrated but this is done by adjusting the ritual to include things the individual enjoyed in life, their interests, their passions and beliefs. This personalization of the ritual reminds the mourners of the life of their loved one in life, separating the individual from the event of 'death'. This aiding the bereaved, by changing their view of the deceased back to a memory of the living individual.

3.7 Death Ritual Architecture

When confronted with death architecture, the presence of death within the space can evoke emotions and sentiment but the character and quality of the architectural design convey a monumentality and a timelessness, having an influence on the behavior of those using the space (Bartolomei and Praderio, 2010: 475). This architecture plays significant role in death rituals but unlike the rituals themselves, cannot be tailored to the individuals, rather the architecture acts as a constant in the ritual equation which is Bartolomei and Praderio conclude as:

“almost the only factor deeply involved in the ritual which guarantees the universal dignity of the Person, through the use of a language of signs and symbols en-rooted so deeply into our psyche that we are able to generate a universal sense of quality and beauty” (Bartolomei and Praderio, 2010: 477).

These signs and symbols which evoke a sense of quality and beauty are not simply icons which tell individuals about the space but are rather the materiality, contrast in light and shadow, hierarchy created by different heights, etc. These qualitative signs and symbols evoke a sacredness within the space which adds to the respectfulness and honor that these spaces retain for the dead.

3.8 The Bereaved and Neuroarchitecture

Architect, Crisa Santos says that when designing death architecture, it is important to honor the dead but it is more important to design for the living as it is the living that will truly experience the space and carry the respect for their loved ones (Pereira, 2019: Online). It is also the living that are experiencing the sorrow of grief and it is them that need comforting. A design tool which may aid in this comforting would be that of Neuroarchitecture. Neuroarchitecture is a humans cognitive and emotional response to the built environment (Higuera-Trujillo, J. L., Llinares, C. & Macagno, E. 2021).

Neuroarchitecture is relevant in this design application as it connects the way in which humans perceived certain items (which are designed) in a scientific context and how this perceiving is expressed by certain emotions. By celebrating this aspect of scientific design, a design is more likely to have a certain effect on visitors within the designed spaces. During the grieving process, this approach to architecture can more closely connect the bereaved with their feelings which ultimately, aids in their journey to acceptance. Within this dissertation, neuroarchitecture created specifically through Biophilia and sensory design bring about a feeling of peace within the visitors which is the ultimate goal o initially set out by the design touchstone.

‘Pallasmaa's intended spatial experience' in which design celebrates the senses by drawing on those of sight, sound, touch and possibly even smell is a form of Neuroarchitecture and focuses on the living by creating a direct and personal connection between the space and the user, strengthening the emotive abilities of the building (Do, K., Jonescu, E., & Peake J., 2020: 3). Focusing in on the senses of sight and touch, a play of shadows and light, especially in spaces which individuals move through, can have an emotional impact contributing to the atmosphere of the space, for instance, constant shadow changes as an individual proceeds through a space replicate a rhythm similar to that of a ticking clock, emulating the passing of time while small rays of light in a diffused manner can replicate shadows given off through the leaves of trees which invite a feeling of peace within the space.

Brion Cemetery by Carlo Scarpa and Crematorium Hofheide by Coussée & Goris Architecten are both leading precedents that celebrate Neuroarchitecture through light as a design element, amongst other inspirational design elements such as framing the landscape and landscape sensitivity, connecting different spaces, materiality as well as guiding the intended program for the proposed design.

Figure 29: Different Individual's Variations of Grieving Processes Taking into Account the Kübler-Ross Stages of Grief (Author, 2021).

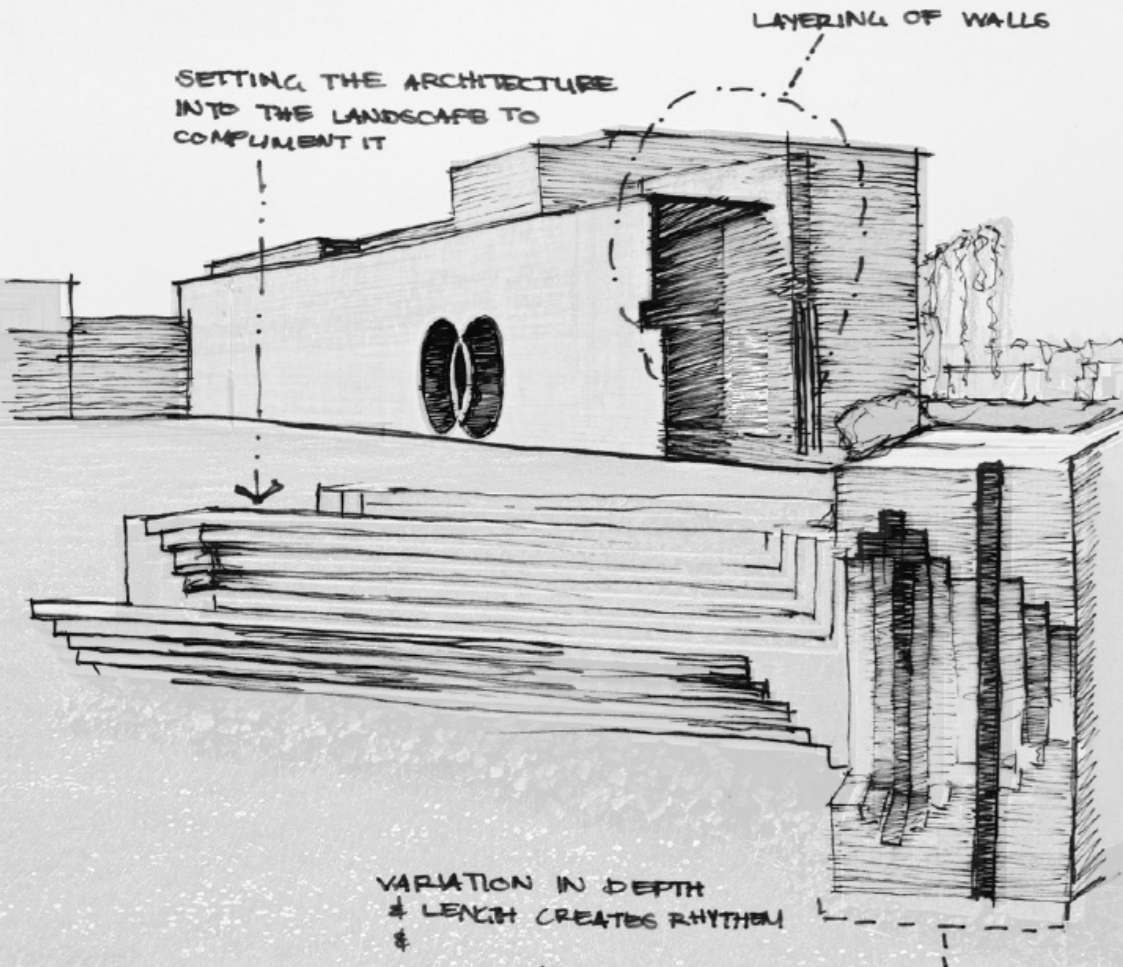


Figure 30: Brion Cemetery Analysis of (Patt, 2016: Online) Perspective (Author, 2021).



Figure 31: Various Interior Perspectives Capturing Light Quality of Brion Cemetery (Patt, 2016: Online).

3.8.1 Precedent Study: Brion Cemetery by Carlo Scarpa

San Vito d'Altivole, Italy and completed in 1979

"The place for the dead is a garden....I wanted to show some ways in which you could approach death in a social and civic way; and further what meaning there was in death, in the ephemerality of life – other than these shoe-boxes." - Carlo Scarpa on Brion Cemetery

The precedent design is an addition to the existing municipal cemetery as a private tomb for the Brion family. This cemetery includes two covered tombs areas and a chapel surrounded by a small pool of water. These areas enclose a lawn by the L-shaped layout and is separated from a private meditation pavilion, surrounded by a large pool of water (figure 33), by a locked gate separating the public from private. The site is enclosed by an inward leaning boundary wall (Unknown a, 2021: Online). The different elements of the cemetery, which are made up of different forms, harmonize and spaces are linked though continuation of material, repetition of incisions as seen in figure 31 and physically connecting them through a continuous pathway and, at eye level, a constant incision in the vertical planes as seen in the boundary wall in figure 30 (Jadawala, K., 2017: Online).

By the continuous use of concrete detailed with incisions and etching of shapes in repetition, Scarpa made a traditional material monumental while simultaneously, emulating warmth in the rough finishing and natural weathering of the concrete seen in figure 32, inspired by the Japanese philosophy of Wabi Sabi (beauty in imperfections) (Jadawala, K., 2017: Online).

The most influential aspect of this precedent cemetery is Scarpa's use of light as a building block. All the small incisions and etching out of the concrete grabs the light. On the exterior, this light is celebrated by the shadows cast as seen in figure 30 which is reversed on the interior where the careful use of various kinds of openings celebrate the light coming through to create an dramatic emotive and sacred feel in the different spaces as seen in the series of photos in figure 31. This is created through the contrast of stark dramatic light which comes from defined incisions placed where the harsh sunlight falls and the more diffused light which creates an atmosphere of "calmness and divinity" (Jadawala, K., 2017: Online). This precedent will influence the proposed design in how light becomes the most important building block within the funeral parlor but will be celebrated throughout both buildings and contemplative spaces.

Scarpa celebrated the natural landscape and its elements as a design tool which plays into the theory of Biophilia. Not only the light but the elements of water (in ponds and the water datum seen in figure 35) and vegetation (figure 36) play a key role in balancing the solidity of concrete with its serenity and creating calmness in the space as seen in .

framing the landscape, light, connections, Biophilia



Figure 32: Exterior View of the Tomb of the Brion Couple of Brion Cemetery (Patt, 2016: Online).



Figure 33: The Reflective Pond Surrounding the Meditation Platform of Brion Cemetery (Patt, 2016: Online).

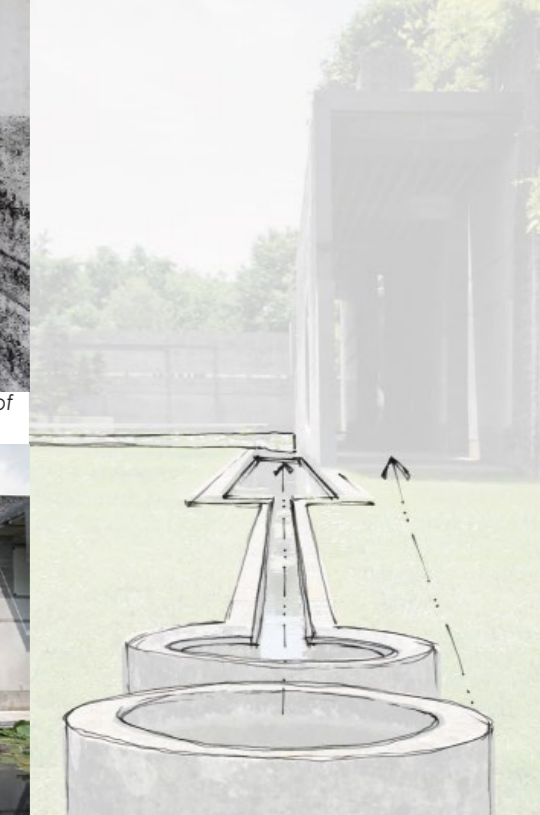


Figure 34: The Water Datum of Brion Cemetery (Patt, 2016: Online).

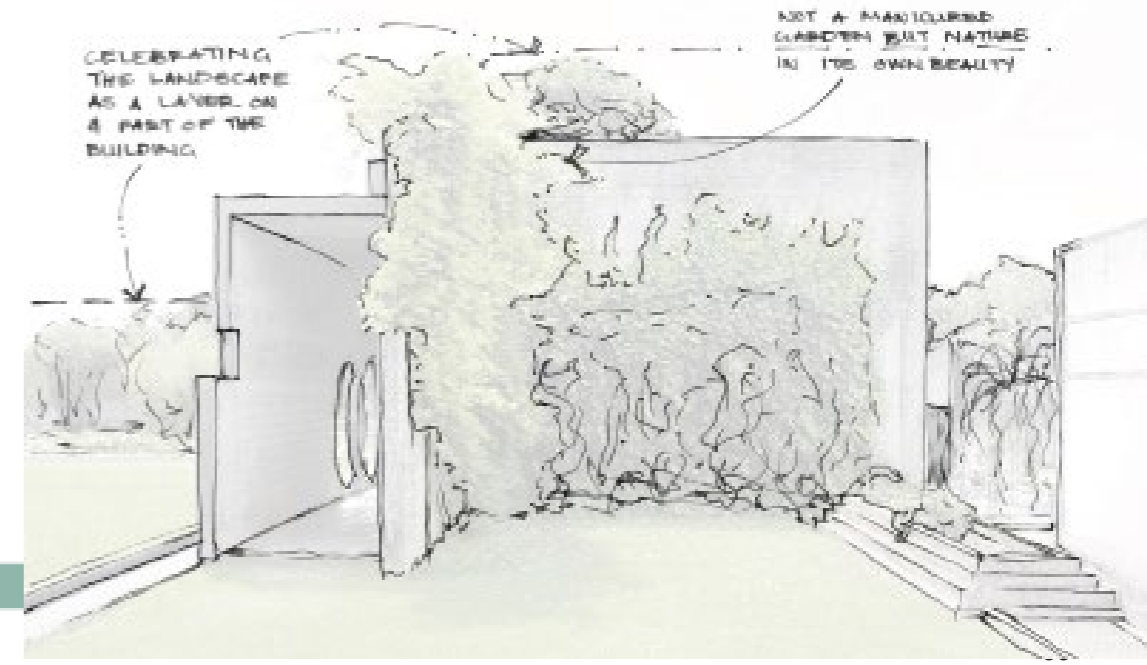


Figure 35: Exterior View Celebrating Wabi Sabi of Vegetation of Brion Cemetery (Patt, 2016: Online).

3.8.2 Precedent Study: Crematorium Hofheide by Coussée & Goris Architecten

Located in Holsbeek, Belgium and completed in 2012

The aim for this precedent was to create something which sensitively fit into the surrounding landscape and allowing the building to contribute as a participant of the ecosystem of the site, much like the proposed design does. Mimicking a sarcophagus (Livovská, and Vlček, [n.d.]: Online), this precedent is placed within and appears to grow from the surrounding marsh with the line formed by the crematorium leading to the central depression found within the plot.

Accommodation:

- Reception & waiting area
- Assembly rooms
- Family rooms
- Administration (with archive & technical room)
- Ablutions (public & staff room with own ablutions & changing rooms)
- Oven room & technical room
- Cafeteria with a kitchen & bar
- Terrace
- Cooling room with a freezer & storage
- Garage & parking

The main material used is a pigmented concrete with local sands in it, which replicates the locally found stone with a distinctive twisted corten-steel sun shading device connected to the concrete flat roof at the parapet walls. This shading restricts the energy demands of the building while the thick concrete walls with the high thermal mass decrease the heat loss. In summer the air is preconditioned to decrease energy use and heat is recovered in winter by the ground air heat exchange system making this building energy efficient (Livovská, and Vlček, [n.d.]: Online).

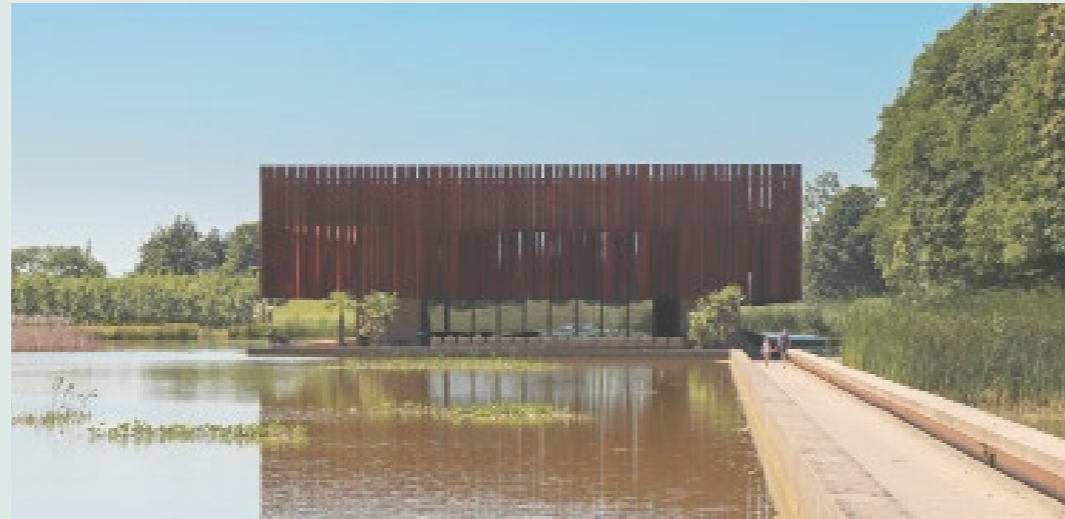


Figure 36: Crematorium Hofheide Exterior (Livovská and Vlček, [n.d.]: Online).

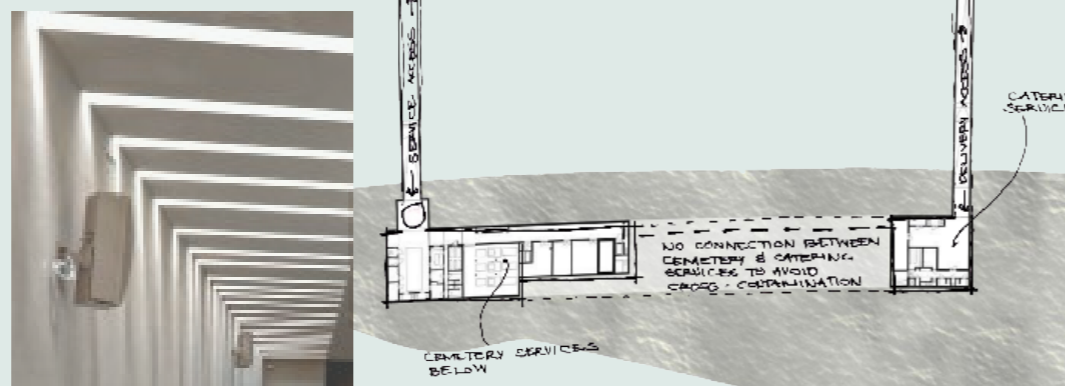


Figure 38: Crematorium Hofheide Basement Floor Plan (Livovská and Vlček, [n.d.]: Online).

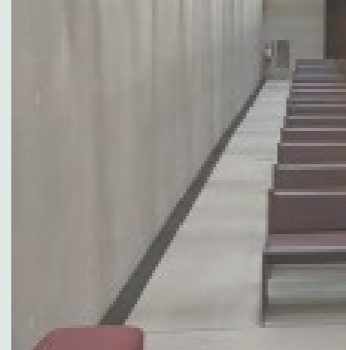


Figure 37: Crematorium Hofheide Interior Large Hall Use of Light (Livovská and Vlček, [n.d.]: Online).

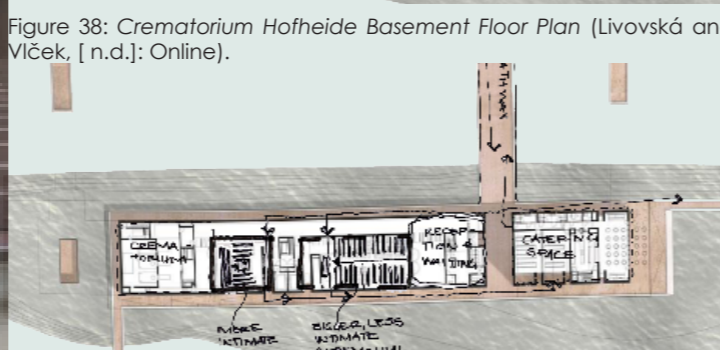


Figure 39: Crematorium Hofheide Ground Floor Plan (Livovská and Vlček, [n.d.]: Online).



Figure 40: Crematorium Hofheide Exterior Walkway Framing the Landscape (Livovská and Vlček, [n.d.]: Online).

Figure 41: Crematorium Hofheide Pathway Leading Up to the Building (Livovská and Vlček, [n.d.]: Online).

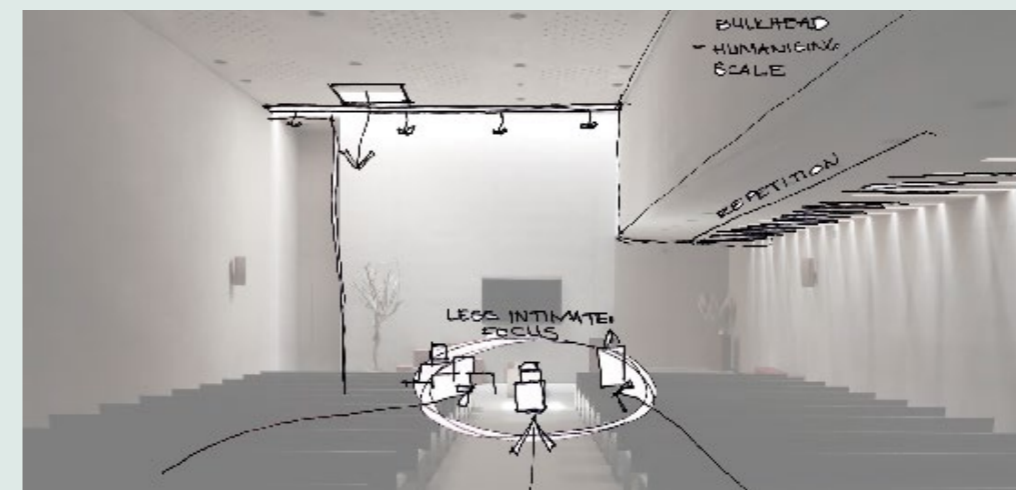


Figure 42: Crematorium Hofheide Interior Large Hall Use of Light (Livovská and Vlček, [n.d.]: Online).

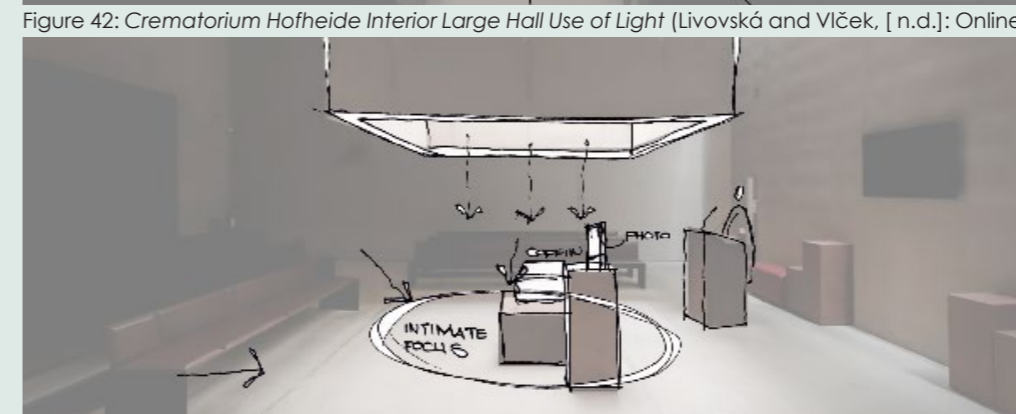


Figure 43: Crematorium Hofheide Interior Small Hall Use of Light (Livovská and Vlček, [n.d.]: Online).

The crematorium is composed of three sections: the administrative and administrative section, the cremation section and the refreshment facilities with the arrangement in the chronological order of funeral to cremation to family gathering, etc. is designed along a corridor which takes visitors past two halls. The larger hall being with the seating in the traditional Roman Basilica layout facing the coffin while the smaller hall is arranged in a concentric manner around the coffin. This allows for options when it comes time for the funeral service depending on the desired privacy. The ritualization of the spaces is dependent on these different levels of intimacy (Livovská, and Vlček, [n.d.]: Online).

This precedent illustrates how a design does not need to be aggressive within its context to be powerful in its presence. It is this precedents sensitivity towards its context and in this, the celebration of what the context provides, that makes the design so successful.

This precedent also illustrates the contrast of the material and the use of light which create an atmosphere of spirituality within the spaces. Both the concrete walls and the incisions which funnel the light into the space are simple but the shapes, quality and repetition that these light elements create along the walls become ever changing artworks dependent on what is happening on the outside connecting to the context.

By playing on the subconscious and emotional needs of those grieving, a design once again draws on a form of Neuroarchitecture. It is only through understanding the process of grief in its various stages that the design will truly act as a tool to aid the process of someone's grief, for example, when someone has just passed away, traditional methods of burial generally have some aspect of gathering, as most people find it helpful when confronted with death, to be surrounded by loved ones in grief allowing them to mourn together rather than alone. That is why buildings which deal with death typically include a gathering spaces. Some even include smaller private spaces to allow the mourners to separate themselves from the crowd when overwhelmed to be able to get some space to be one with their emotions. Individuals grieve in different ways but when overcome by grief, some people do not know how to orientate themselves within a new space and make use of elements such as hierarchy to establish important entrances and pathways to subconsciously guide them throughout the space thus making design decisions even more important. Humanizing the scale of the buildings makes the event more comforting while simple, yet evoking spaces cater to the spirituality of all faiths but "At the heart of almost every design is the desire to create an atmosphere of calm and peace" (FX, 2020: Online).

Figure 44:

The final form of Neuroarchitecture that this proposal adds to its theoretical toolbox is that of *Biophilia*. The concept might be relatively new but this subconscious understanding dates back to ancient times. This term was coined by world renowned biologist, Edward O. Wilson who defines *Biophilia* as the instinctive of humans to "affiliate with nature and other forms of life and life-like processes". Wilson also argues that the relationship between people and nature is significant to a person's mental and physical development (Hidalgo, 2014: 537). As the world develops, urban spaces expand and the inclusion of

green spaces within cities is decreased meaning less of a relationship between urban dwellers and nature. Wilson's argument sustains that nature is a necessity for all individuals. The relationship between individuals and nature is broad and thus has been condensed into Biophilic principles which can be applied to the design of the built environment by several different experts as seen below in figure 45, Hippocrates being an ancient Greek physician, Kellert, an author and professor of Social Ecology (Phd) at Yale and Benyus an author and biologist.

Biophilic design principles by multiple theorists:		
<p>Hippocrates characteristic's that affect people's health ([n.d.]):</p> <ol style="list-style-type: none"> 1. climate 2. geography 3. sun and heat 4. water quality 5. scenic environment 	<p>Kellert's elements of Biophilia within the built environment (2008):</p> <ol style="list-style-type: none"> 1. natural features, shapes and forms 2. natural patterns and processes 3. light 4. space based relationships 5. historical, geographical and cultural components of the local area 	<p>Janine Benyus natural elements to integrate into the design and building processes (2008):</p> <ol style="list-style-type: none"> 1. organic forms 2. daylighting 3. natural ventilation 4. natural sounds and quiet 5. celebrating working ecosystems indoors 6. gardens

Figure 45: Author's Table of Theorists Biophilic Design Principles (Hidalgo, 2014: 537).



Figure 46: From My Veins Comes Life (Author, 2021).

In a study completed by Dr Roger S. Ulrich (Professor, Department of Architecture and Centre for Healthcare Architecture, Chalmers University of Technology) determined that patients in medical centers exhibit less stress by spending as little as three minutes in a garden. From this, Teresia Hazen (coordinator of the Therapeutic Garden Program and a national leader in the world of horticultural therapy) thinks of gardens as complementary means of healing of therapeutic intervention where individuals determine their own dose and which is on their own terms. “Physicians cure; gardens can aid in healing” she said. (Helphand, K., 2019: 10). By making use of Biophilic design patterns, illustrated in figure 45, within the proposed design and throughout the cemetery garden, this brings the garden (and therefore the healing) to the mourners although this is a psychological healing rather than a physical healing. This then acts as an invitation for individuals within the places to experiencing some form of peace which has most likely been taken away during the grieving process.

To be able to best make use of the Biophilic design applications or ‘Patterns of Biophilic Design’ that Browning et al. (2014:4) expanded upon, it is crucial to first identify and understand the different kinds of ‘patterns’ which are separated into 3 categories, founded by Kellert (2008), namely: *Nature in Space* (the direct inclusion of nature into a space through its physical or ephemeral presence), *Natural Analogues* (the indirect addressing of organic or non-living traces of nature) and *Nature of the Space* (spatial configurations of design within surrounding natural context). The design patterns of these categories are to follow in figure 47 with a short description of how it might be included within the proposed design.

Nature in the Space

Visual Connection with Nature by using flora within the building in the courtyards as well as the opening of the buildings up, especially that of the botanical nursery, to the surrounding flora which will be planted.

Non-Visual Connection with Nature, sound and smell stimuli that is associated with a peaceful reference to nature by using reeds within certain courtyards to capture and relay the sound of the wind throughout the building.

Thermal & Airflow Variability accomplished by including courtyards as well as opening the buildings up. This contributes to the design and technical aspect of the proposed design.

Presence of Water, A condition that enhances the experience of a place through seeing, hearing or touching water (accomplished through the reflective pond and water features). This is an appropriate application as water is an important element of the site, especially regarding the past and so this can be linked to the memorial design which sits almost on the water.

Natural Analogues

Dynamic & Diffuse Light, Leverages varying intensities of light and shadow that change over time to create conditions that occur in nature. This here which links with the concept of the Dancing of Shadows and Light and will be used in various ways within the different spaces to create the desired atmosphere of peace.

Visual Connection with Nature by using flora within the building in the courtyards as well as the opening of the buildings up, especially that of the botanical nursery, to the surrounding flora which will be planted.

Biomorphic Forms & Patterns, Symbolic references to contoured, patterned, textured or numerical arrangements that persist in nature, this celebrating the Theoretical Application of Biomimicry through the process of green burial mimicking the fire-resistant characteristics of lymbs as well as mimicking several natural elements to within the construction of the design to find the best solutions, inspired by nature, to elements such as water storage and ventilation.

Complexity & Order, Rich sensory information that adheres to a spatial hierarchy like those encountered in nature, replicated in the changing of volumes throughout the design to evoke the atmosphere needed for the narrative of the specific space and the use of elements such as the light well for the body preparation space which is a particularly important space during the process of laying a loved one to rest.

Nature of the Space

Prospect, An unobstructed view over a distance, for surveillance and planning. This will be celebrated by physically opening the buildings to the landscape and by using windows to create lines of sight to the landscape.

Refuge, A place for withdrawal from environmental conditions or the main flow of activity, in which the individual is protected from behind and overhead. This pattern will be placed sporadically along the walkways of the large ‘garden’.

Mystery, The promise of more information, achieved through partially obscured views or other sensory devices that entice the individual to travel deeper into the environment. Like the precedent of Memorial Cemetery Parque das Cerejeiras by Crisa Santos Arquitectos, this cemetery will also house several land art installations which relate to life, death, or both, some of these which move along the walkway, sometimes creating an element of play between the revealing of the landscape and the hiding of it.

Figure 47: Biophilic Design Patterns according to (Kellert, 2008), analyzed by (Browning et al., 2014: 9), and edited by the Author (Author, 2021).

The following precedents of Memorial Cemetery Parque das Cerejeiras by Crisa Santos Arquitectos and Statie Stuijduin Crematorium by a2o-architecten are leading precedents in the incorporation and celebration of Biophilia as a design principle, especially how they have been incorporated into death architecture to comfort those experiencing the grieving process.

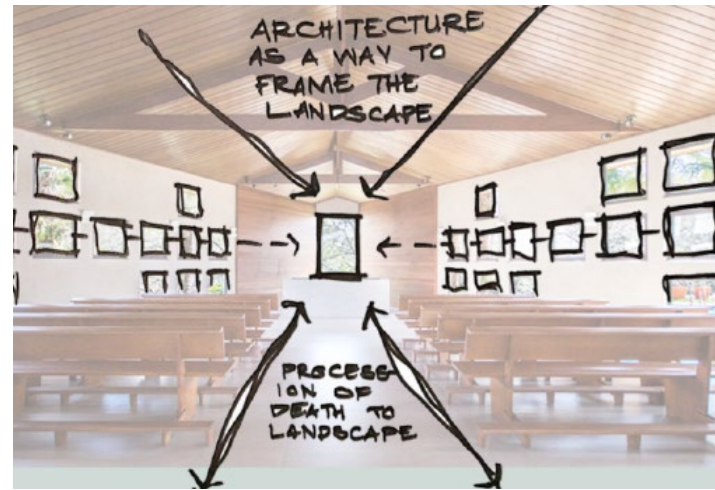


Figure 48: Biophilia Inside the Chapel (de Oliveira, I. 2019: Online).

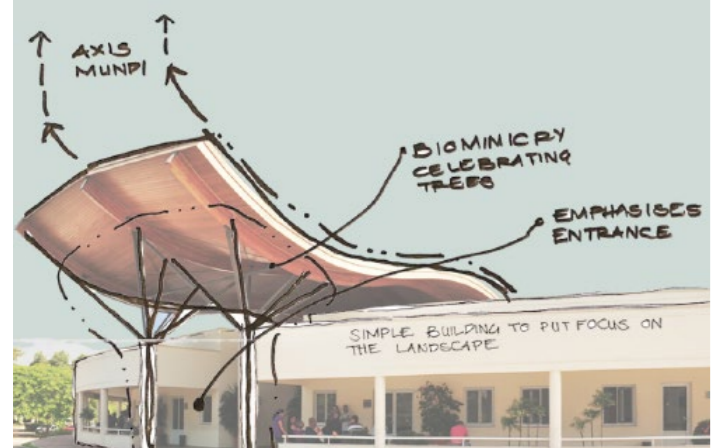


Figure 49: Biophilia Insertion at the Main Building Entrance (Germer, C. 2019: Online).

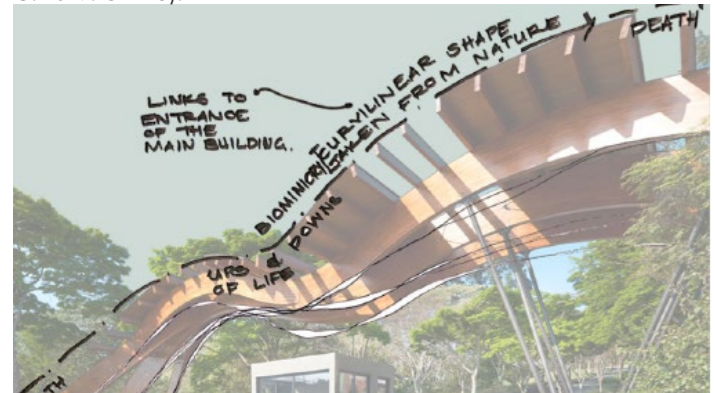


Figure 50: Entrance Gate Biophilia Insertion (Fonseca, L. 2019: On-

3.10.2 Precedent: Memorial Cemetery Parque das Cerejeiras by Crisa Santos Arquitectos Jardim Ângela, São Paulo, Brazil and completed in 2018.

The cemetery design is a revitalization of the cemetery in Jardim Ângela. The buildings are embraced by nature which inspired Santos to make use of nature within the design. This is achieved by using neuroarchitecture principles. This allowed Santos to ultimately re-framed “the contact of human beings with their most instinctive sensations in order to re-establish grief in a more natural way, focusing on those who remain rather than those who have passed on” (Pereira, 2019: Online).

Neuroarchitecture is architecture where science is used create environment which draw on senses and perceptions of individuals within the spaces to evoke specific emotions to help them orientate the space in the way the designer intended for them to achieve a certain understanding of the space (Pereira, 2019: Online). One of the elements of neuroarchitecture is **Biophilia** which is defined as the “innately emotional affiliation of human beings to other living organisms” (Kellert and Wilson, 1993: 31). In other words, **humans find a certain connection with nature which often has positive effects within the subconscious which brings out positive emotions within them.** This application connects the theory of reinventing rituals with a design which meets the psychological needs of humans with a design which aims to live harmoniously with nature and it then becoming a contributing participant of the ecosystem within which it sits.

“Memory is engaged on a personal level in our interaction with, and understanding of, the spaces we occupy not only because of the movement and sequence to experience... but also because we tend to compare what we do now with what we did last time. It is further engaged on a social level because shared social activities leave traces that we can read” (Jones, 2017: 4).

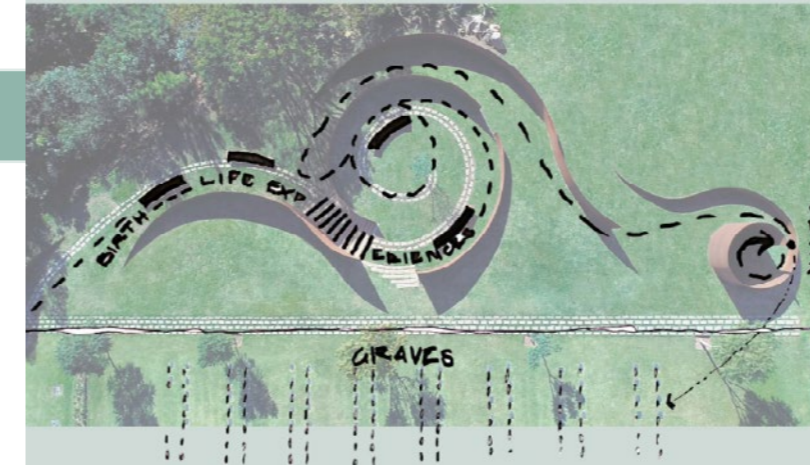


Figure 51: Square of Eternity Plan View (de Oliveira, I. 2019: Online).

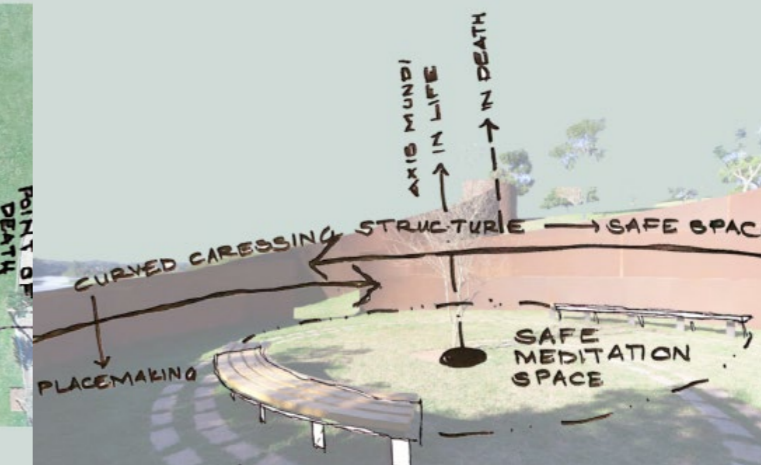


Figure 52: Square of Eternity View from the Inside (de Oliveira, I. 2019: Online).

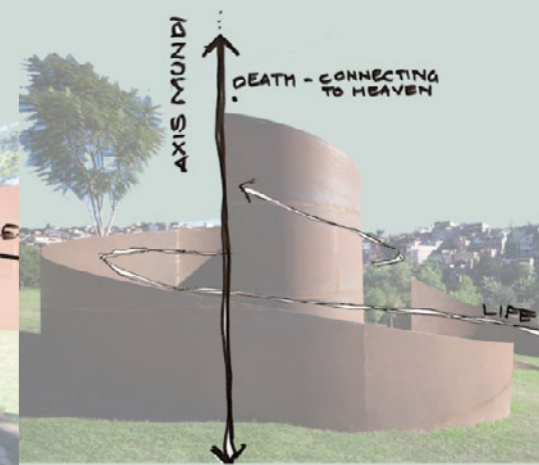


Figure 53: Square of Elevation View (de Oliveira, I. 2019: Online).

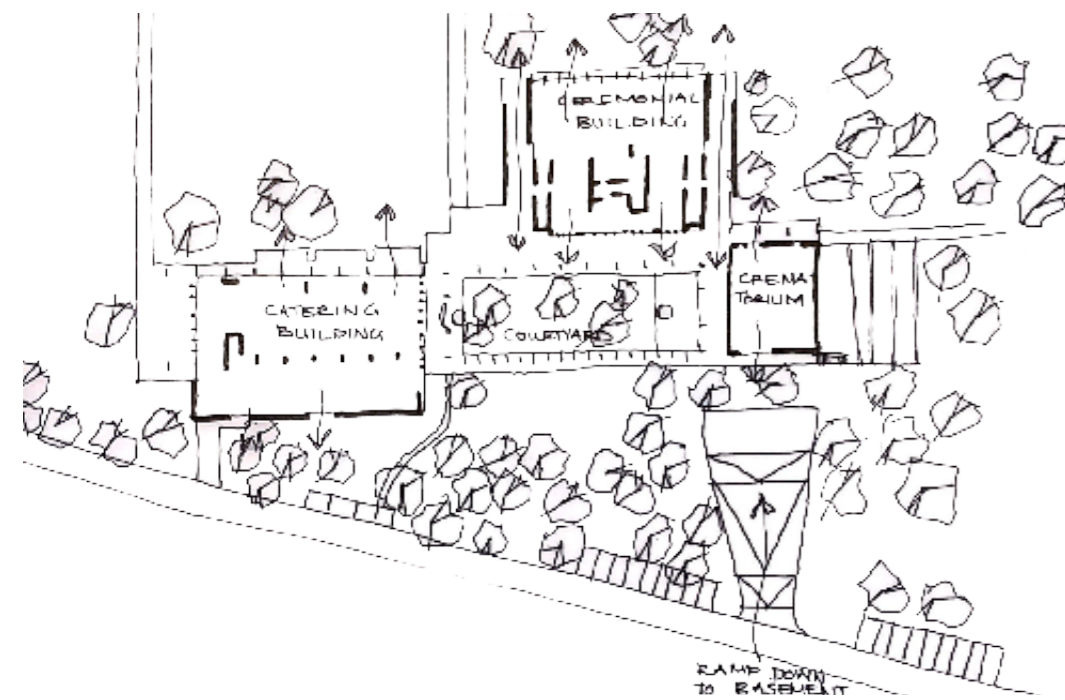
Santos rethinks the design to celebrate nature in as many ways as possible. This is done by opening the inside of the building up to the surrounding nature as seen in figure 48. This frames the views to make sure that the individuals within the building always have some connection to nature to create a feeling of peace within them. Santos also makes use of the principle of biomimicry at the entrance of the simple building as seen in figure 49. Here trees are mimicked in such a way as to create columns which hold up the undulating form above the entrance, connecting those entering to nature through the mimicking of natural forms. The undulating roof which extends upwards relates to the important vertical axis mundi, creating a connection between the Earth and the Heavens which is important to the purpose of the building as a cemetery where this axis also acts as a symbol of the connection between the ground which the loved ones will be buried in and heaven almost portraying their journey from death to heaven. The axis mundi relates to the ritual of crossing a threshold, emphasizing the action to become an important moment within the

series of rituals that form part of saying goodbye to a loved one.

This precedent is inspirational in the way that it celebrates not only the architecture but also the landscape architecture of the cemetery as a tool to provide spaces within which individuals feel comfortable to grieve, to “make people feel alive even in their pain” (Pereira, 2019: Online). The insertions within the landscapes such as land art installations and seating areas, connect to the ritual of procession to and from the grave, an act which would normally be a linear one becomes one of moving in between, over, around, elongating the movement thus allowing for more time of contemplation, of meditation, and of grieving. The most evocative of these being the land art installation called ‘Eternity Square’ which is made up of different pieces of rusted steel sheets which are molded into a spiral shape which represents the phases of life from birth till death with its curves symbolizing the important events which take place in the narrative of life.



Figure 54: The Biophilia Aspect, Introducing Nature Into the Ceremony Space (González, 2018: Online).



Plan
not to scale
Figure 55: Statie Stuijdin Crematorium, Plan (González, 2018: Online).

3.10.3 Statie Stuijdin Crematorium by a2o-architecten

Located in Lommel, Belgium and completed in 2018.

This crematorium building is an addition to the main cemetery site of Lommel which was designed to become a park with the crematorium branching off from the original axis. This Crematorium, much like the proposed cemetery, was designed to be non-denominational and therefore makes use of nature to provide balance and peace (González, 2018a: Online).

Harmony between the precedent design and the surrounding nature is created through the modesty of the building as well as the constant connection to the natural context on the exterior through windows and a main courtyard around which the spaces are placed, acting as the heart of the building. The main theme of this precedent building design is 'the journey' that relates to the ceremonial ritual which is used to bid farewell to a loved one. This concept was incorporated into the precedent building design by looking at the building as a tool to accomplish this ritual with the building acting as an exhibition, moving from one experience to another. "Just like in the case of a farewell, there is no way back, only a continuing path to another chapter" (González, 2018a: online).

A pathway etched into the landscape, takes the individuals into the park, away from the secular, to where the ceremonies take place. This lowered pathway gives the visiting individuals (mourners) a new perspective of nature (González, 2018a: online). The materials used for this building are those which would be able to stand up to the test of time which include: brickwork and concrete for the structure that contrasts the glass used to protect the ground floor. This precedent intended to appear as though a crematorium was formed out of found ruins (González, 2018a: online).

This precedent inspires the use of large windows within the proposed design to connect the visitors to the surrounding nature, therefore celebrating Biophilia design principles. Another influence from this precedent is the use of a central courtyard around which the ceremonial spaces of the proposed design will be placed around. Within the proposed design, this will not only be a good addition in terms of the windy climate which is worked with but also again links the different spaces while giving them their own generous entrances through Biophilic design.



Sections
not to scale

Figure 56: Statie Stuijdin Crematorium, Sections Indicating the Connections with Nature (González, 2018).



Figure 57: Statie Stuijdin Crematorium, Outdoor Ceremony Space (González, 2018).

Biophilia, central courtyard, the ritual journey

“A biophilic environment is about understanding the spirit and sensibilities of a built environment” (Hidalgo, 2014: 537).

3.11 Conclusion

Death and the grieving process impact individuals in different manners but by creating an architecture that invites individuals to fully experience their emotions and move through the grieving process together through architecture, a bond is created between individuals and individuals but also between the individuals and the building. When applying the design elements that arise from theory of rituals (play of light, materiality, guiding architecture and creating different gathering spaces) and by celebrating different applications of Neuroarchitecture such as Biophilia, these theoretical applications need to complement each other, paying respect to the past *traditional* form of burial while looking to the future in creating the new life in the garden. The proposed design aims to create this emotional connection between the visitors and the architecture by creating spaces that evoke different emotions, overall conveying different atmospheres of peace within the spaces.

4

34.0757° S, 18.8433° E

Site and Context Analysis

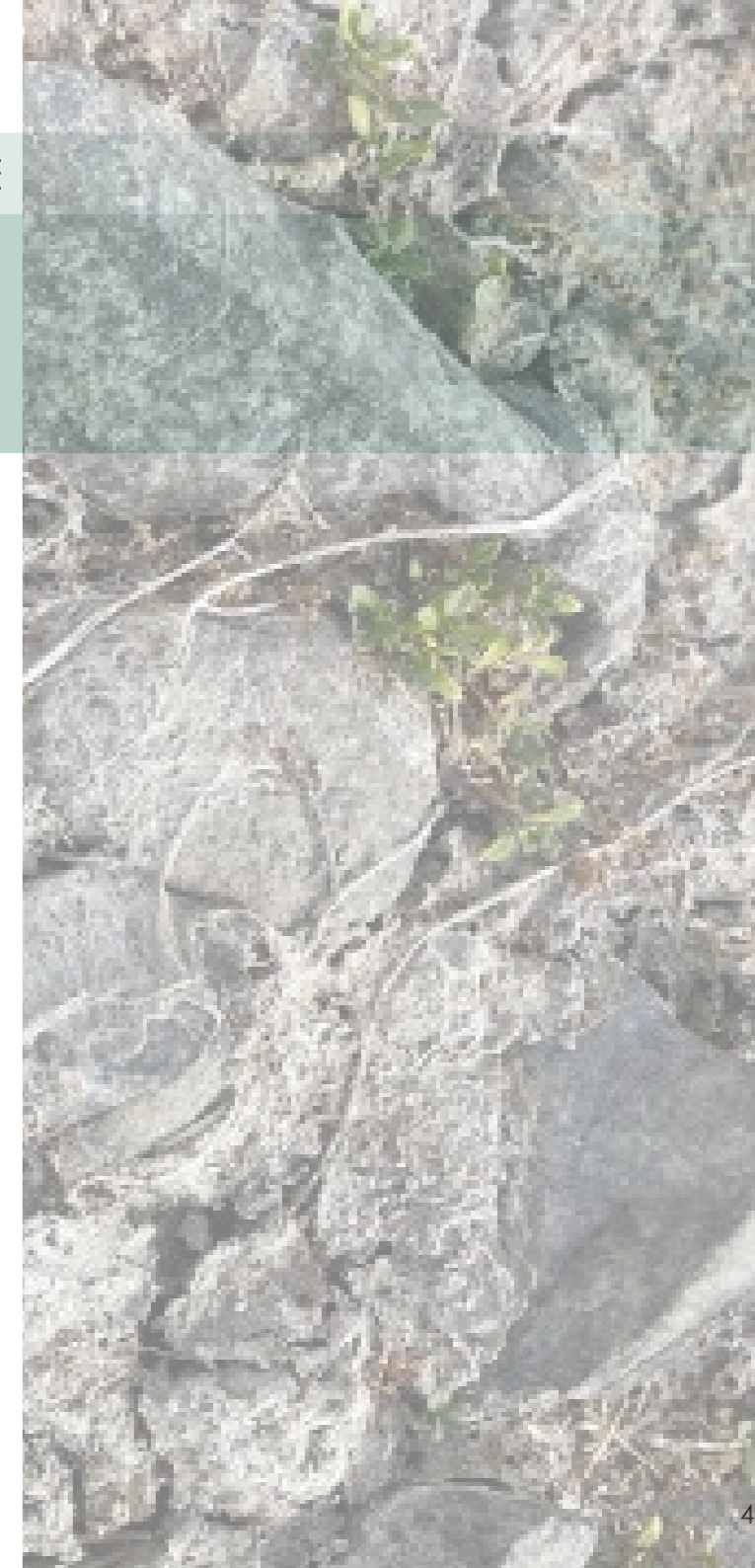


Figure 58: Moss Between the Rocks on the Dam Floor (Author, 2021).

4.1 Macro Site Analysis

This **macro analysis** refers to the broader context of the site and its relation to the greater Somerset West/ Strand area of the Heldeberg District located just outside of Cape Town, Western Cape. This chosen site is of a part of the old AECI dynamite factory site known as Paardevlei located on the boarder of Strand and Firgrove Rural. This large site was subdivided and now includes a mixed-use development on the bottom half of the site as shown in light blue in figure 59.

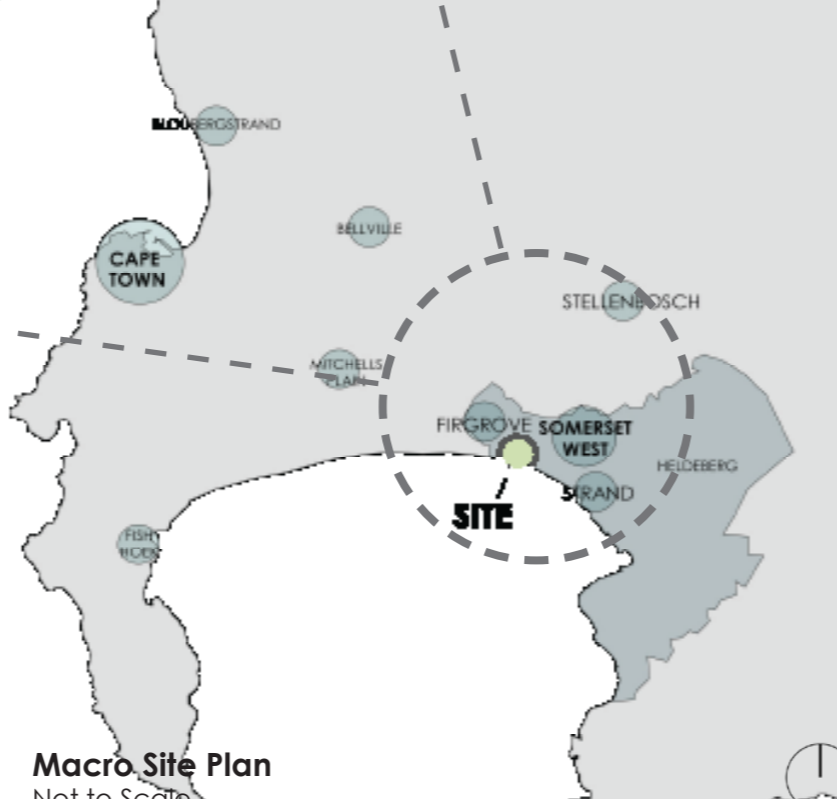
The upper site (used for the proposal) of Paardevlei is a coastal wetland which is on the historical site known as Heartland, previously known as the AECI. The wetland, was the water supply system for the dynamite factory and because of this, the dam was enlarged it to its current 50ha (City of Cape Town, 2019).



Figure 59: Mezzo Site Plan from Google Earth Perspective Edited by Author (Google Earth, 2021: Online).

Locality Plan

Not to Scale
Figure 60: Locality Plan Edited By Author (Google Earth, 2021: Online).



Macro Site Plan

Not to Scale
Figure 61: Google Earth Macro Site Plan Edited by Author (Google Earth, 2021: Online).

Figure 61: Google Earth Macro Site Plan Edited by Author (Google Earth, 2021: Online).

4.2 Mezzo Site Analysis

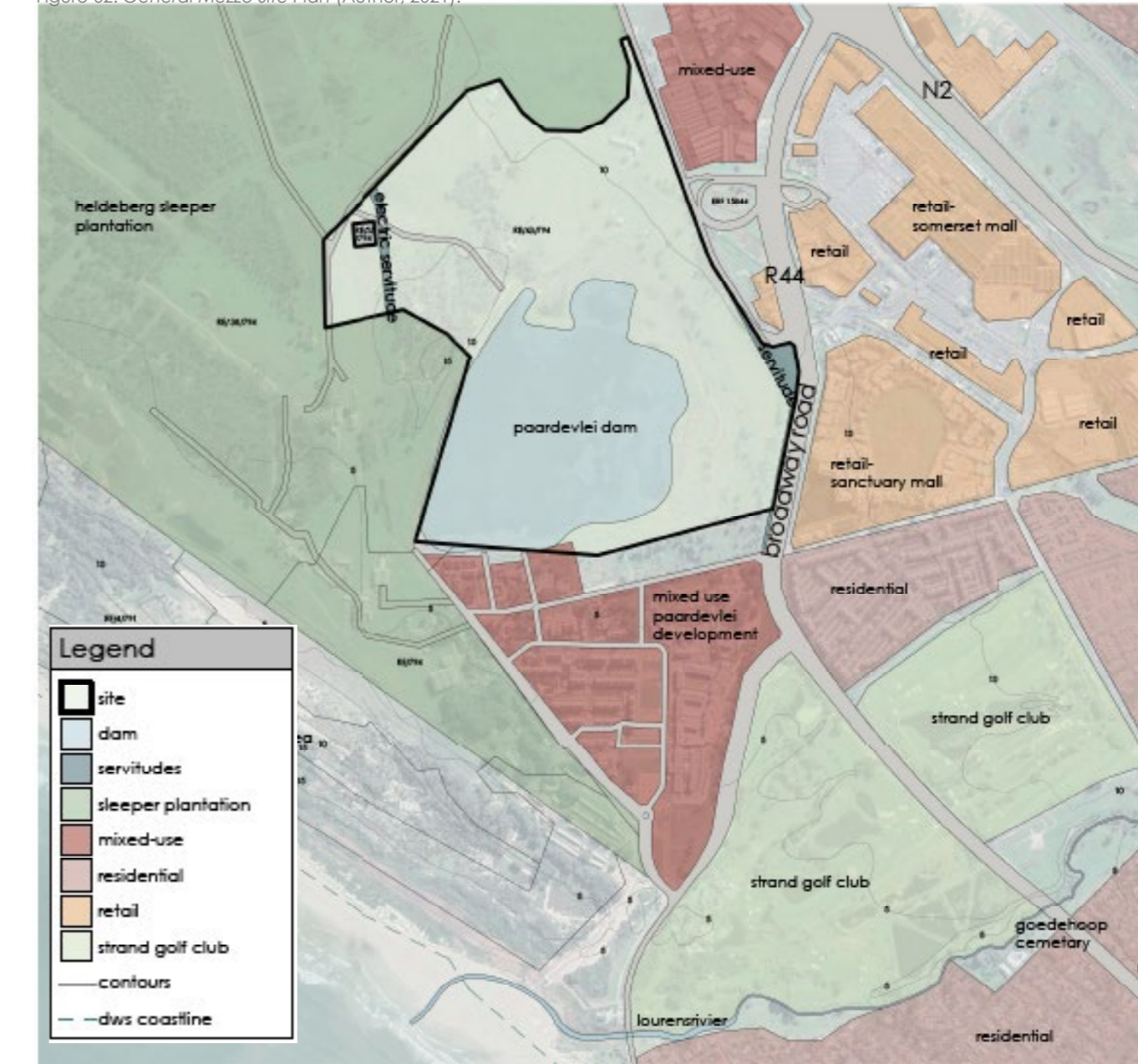
The chosen site (Portion 43 of farm 794) totals at 100.21 Ha with the vlei covering up to 50Ha when full and reaching a maximum altitude of 15m above sea level. It should be noted that the site considered includes two separate servitudes (seen in figure 64), one as an electrical servitude and the other as a roadway servitude, neither of which should have a major effect on the proposal as they are far from the chosen area for the buildings.

This site is currently in a natural state with some evidence (by CNDV Landscape Architects) suggesting that the it will remain this way, especially around the actual vlei but pathways and view points will be added.

As seen on page 45 that there are several different design types of buildings that do not follow a common design guideline, the proposed design will therefore not follow a guideline set by the context but will be unique just like the unique purpose.

4.2.1 Proposed Site General Information

Figure 62: General Mezzo Site Plan (Author, 2021).



General Mezzo Site Plan

Not to Scale

Figure 62: General Mezzo Site Plan (Author, 2021).

6.2.2 Context Buildings



Storage Units

Figure 63: Google Maps Street View Perspective- Storage RSA (Google Maps, 2021: Online).



Builder's Warehouse

Figure 64: Google Maps Street View Perspective- Builder's Warehouse (Google Maps, 2021: Online).



Sanctuary Mall

Figure 65: Google Maps Street View Perspective- Sanctuary Mall (Google Maps, 2021: Online).



De Velde Residential

Figure 66: Google Maps Street View Perspective- De Velde Residential (Google Maps, 2021: Online).



Paardevelei Residential

Figure 67: Paardevelei Developments and Apartments (Unknown, 2021).



High Rise Mixed-Use Building's Beach Road

Figure 68: Google Maps Street View Perspective- Beach Road (Google Maps, 2021: Online).



Strand Golf Club

Figure 69: Strand Golf Course (Expert Review) (Bradshaw, 2019).



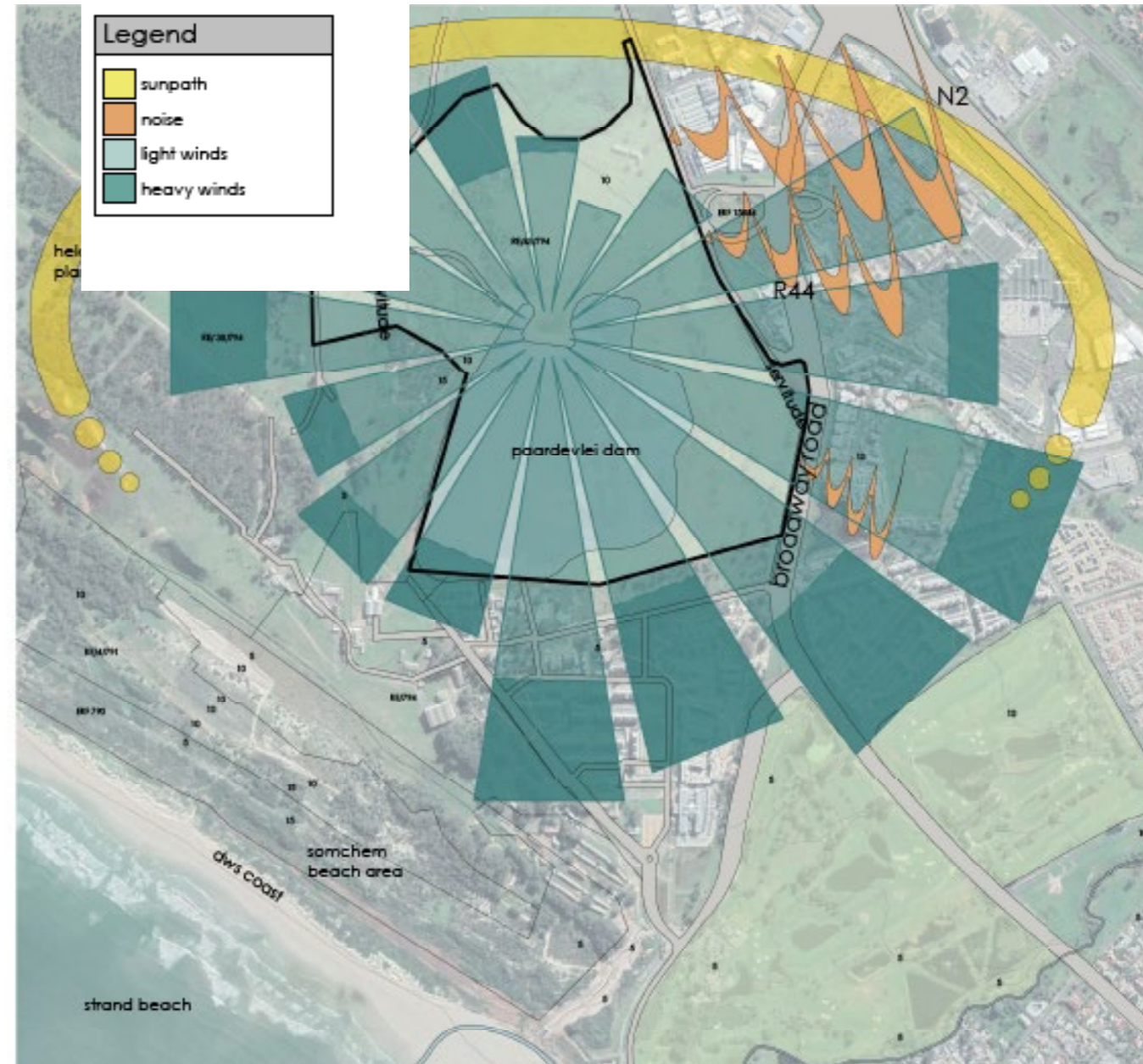
Cheetah Outreach

Left- Figure 70: The office and administration building at Cheetah Outreach (Unknown, 2016: Online). Right- Figure 71: The enclosures are behind the main building (Unknown, 2016: Online).

4.2.2 Climatic Conditions

This site falls under the Strand area climate that is classified as Warm-summer Mediterranean climate or Csb under the Köppen-Geiger system, this meaning that it is a warm and temperate climate with an average or 787mm or rainfall per year (mainly in the winter months) (Climate-Data.org, 2021: Online).

The main climatic influence on any design in this area will be the wind seen in the wind rose in figure 72, as there is a very strong South Easterly wind that comes in from the sea which intersects with the marginally strong North Western winds coming over from the Heldeberg mountains, which gives this area its characteristically strong winds.



Climatic Influences
Not to Scale

Figure 72: Climatic and Other Influences on Site (Author, 2021).



Climate Summary (van der Watt, 2020).

Average temperatures and precipitation

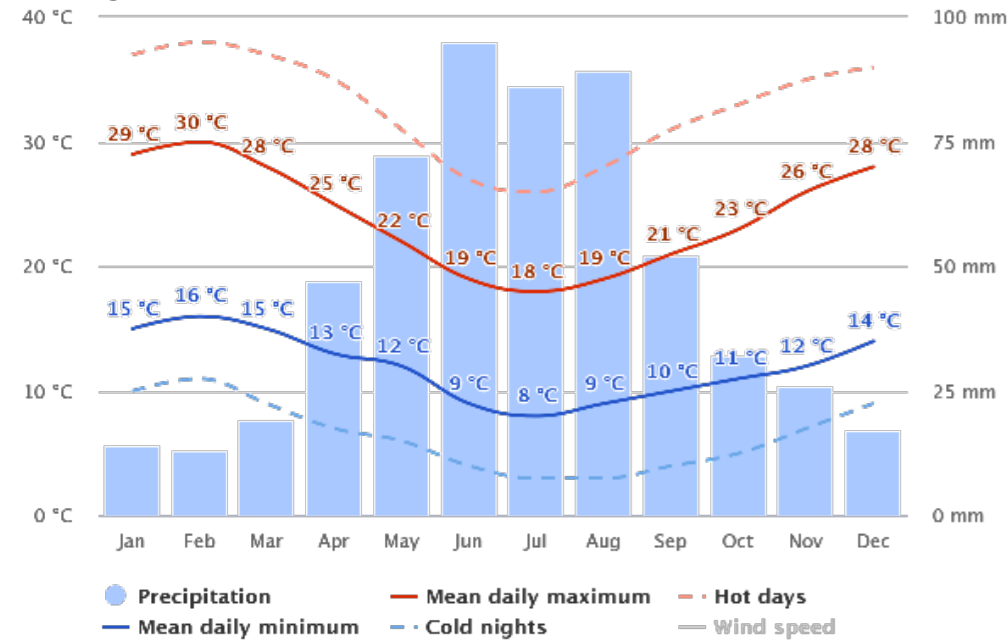


Figure 73: Average Temperatures and Precipitation (Meteoblue, 2021: Online).

Strand Climate Summarised

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	21.1 °C (69.9) °F	21.3 °C (70.3) °F	19.9 °C (67.8) °F	17.5 °C (63.4) °F	14.8 °C (58.6) °F	12.4 °C (54.3) °F	11.7 °C (53.1) °F	12 °C (53.6) °F	13.3 °C (56) °F	15.7 °C (60.3) °F	17.4 °C (63.4) °F	19.8 °C (67.7) °F
Min. Temperature °C (°F)	16.7 °C (62) °F	17 °C (62.6) °F	15.9 °C (60.5) °F	13.6 °C (56.5) °F	11.3 °C (52.3) °F	8.8 °C (47.8) °F	8 °C (46.4) °F	8.3 °C (46.9) °F	9.4 °C (48.9) °F	11.6 °C (52.9) °F	13.2 °C (55.7) °F	15.5 °C (59.9) °F
Max. Temperature °C (°F)	26.1 °C (79) °F	26.4 °C (79.6) °F	24.9 °C (76.9) °F	22.3 °C (72.2) °F	19.1 °C (66.3) °F	16.4 °C (61.5) °F	16 °C (60.9) °F	16.1 °C (61) °F	17.6 °C (63.7) °F	20.3 °C (68.6) °F	22.2 °C (71.9) °F	24.6 °C (76.3) °F
Precipitation / Rainfall mm (in)	23 (0.9)	20 (0.8)	23 (0.9)	64 (2.5)	95 (3.7)	141 (5.6)	127 (5)	107 (4.2)	70 (2.8)	47 (1.9)	43 (1.7)	27 (1.1)
Humidity (%)	65%	66%	67%	71%	76%	78%	77%	78%	76%	71%	68%	65%
Rainy days (d)	3	3	3	5	7	8	8	8	7	5	4	4
avg. Sun hours (hours)	10.7	10.0	9.0	7.9	6.7	6.2	6.4	6.4	7.3	8.9	9.9	10.8

Figure 74: Weather by Month // Weather Averages Strand (Climate-data, 2021: Online).



Strong South Eastern and North Western Winds



Harsh Northern Sunlight and Very Harsh Western Afternoon Sunlight



Mainly Winter Rainfall



Quite Humid Because of the Sea Close-by



Moderate temperatures with an average of 9.5 °C

4.2.3.1 Climate as a Building Block

The fundamental purpose of 'architecture' is that of sheltering people from the elements. These elements are brought on by the regions climate and when designing a building, it is vital to take into account and almost 'intertwine' the architectural design around the climate it finds itself within (Pearlmutter, 2007: 752), thus connecting once more to the Biophilia theoretical approach. By not doing this, an architect can make an otherwise functional and beautiful building uninhabitable.

When looking at the Somerset West/ Strand climate, several 'elements' are highlighted in figure 75, namely: strong winds from different directions, brought in by both the ocean and the mountains, harsh Northern and harsher Western sunlight, heavy rainfall in winter and humidity from the ocean.

Instead of looking at these climatic elements as a challenge to design with, this proposal aims to rather celebrate these as a guide or design tool to making the design as efficient as possible.



Embrace wind for cross ventilation & temperature control but also for connection to site through reed courtyards



Protect Northern and especially the Western facade from harsh sunlight



Protect facades from heavy winter rainfall



Embrace windows for natural light and ventilation



Appropriate wall types, materials & sizing for the climate

Climatic Design Principles

Figure 75: Climatic Design Principles (Author, 2021).

4.3 Micro Site Analysis

Proposed Site is off the main road to allow for easy access and to let the more natural part be used for the 'garden'

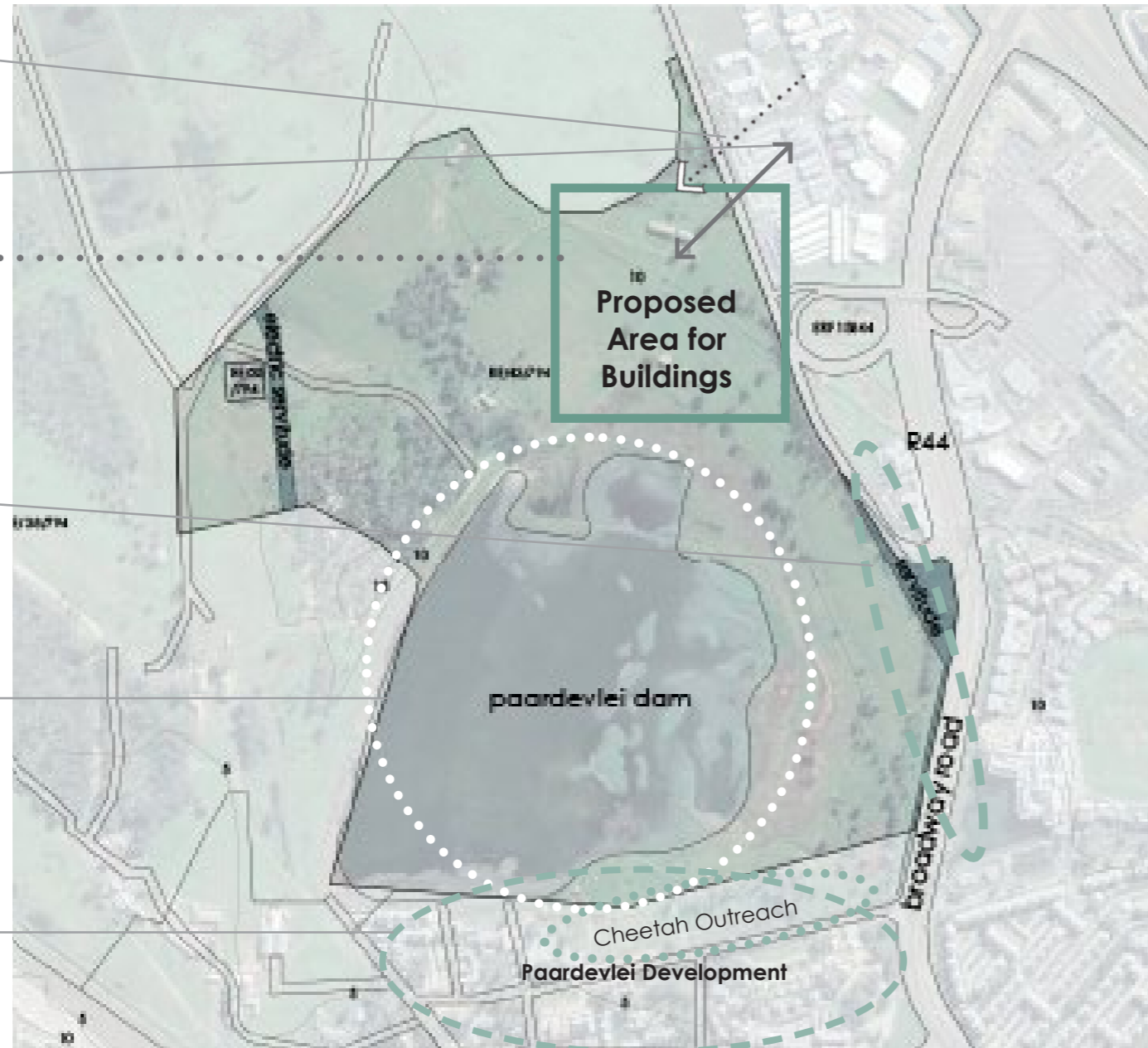
Connection of Nursery Retail to Existing Retail

The Proposed Area for the Buildings

Servitude line blocks entry onto the larger site within this area and so the proposed area for the buildings and parking should be more towards the North of the greater site

Leaving a 20m boundary line around the edge of the dam as it is a protected wetland and to create a space for everyone to enjoy the nature found within the greater site

Existing Mixed-use Paardevlei Development with offices and the Cheetah Outreach to the Northern Side- Don't want to build too close as to disturb the people or the animals



Greater Site Plan

Not to Scale

Figure 76: Greater Site Plan (Author, 2021).

4.3.1 SG Diagrams & Information

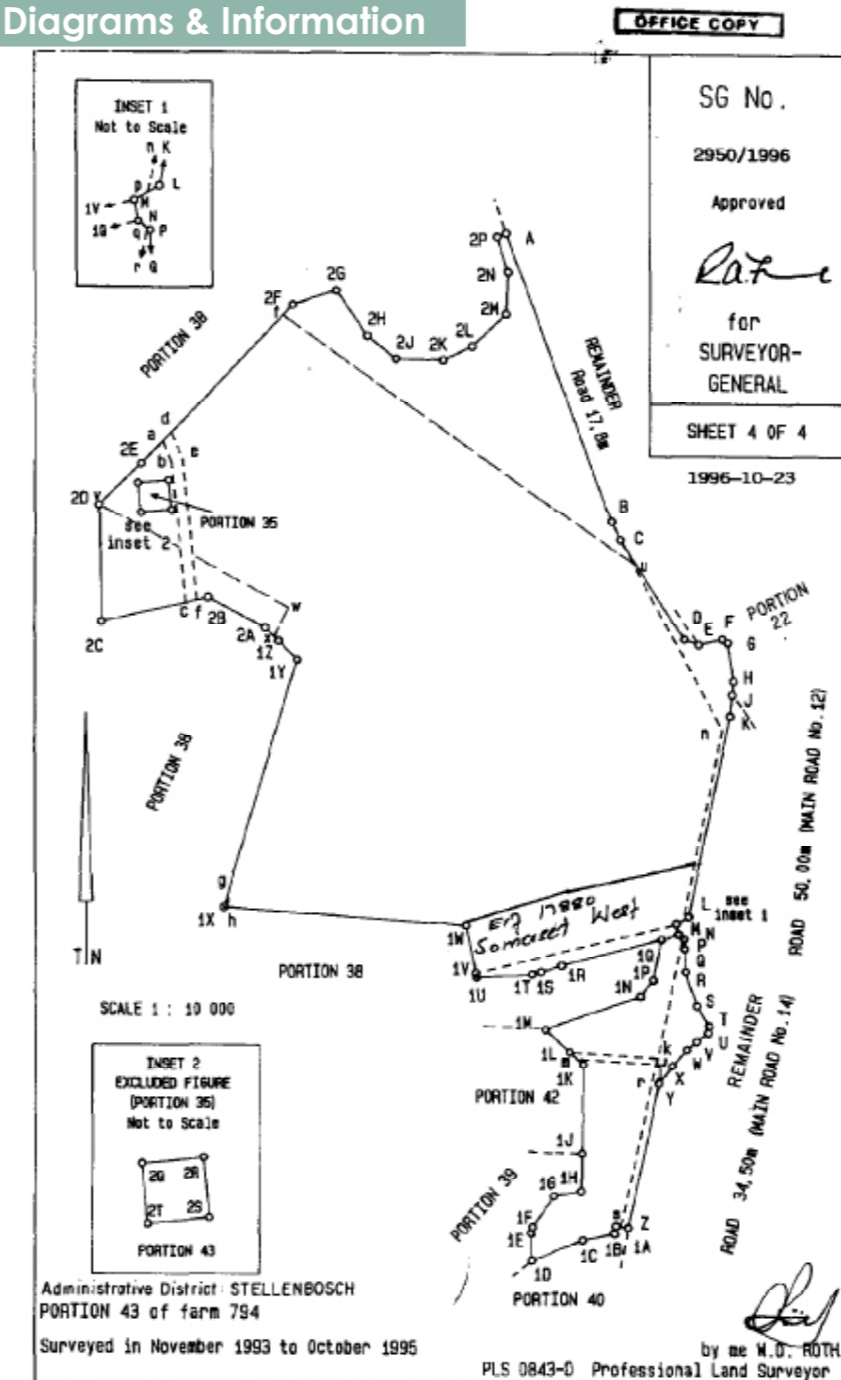


Figure 77: Paardevelei SG Diagram (Roth, 1996: Online).

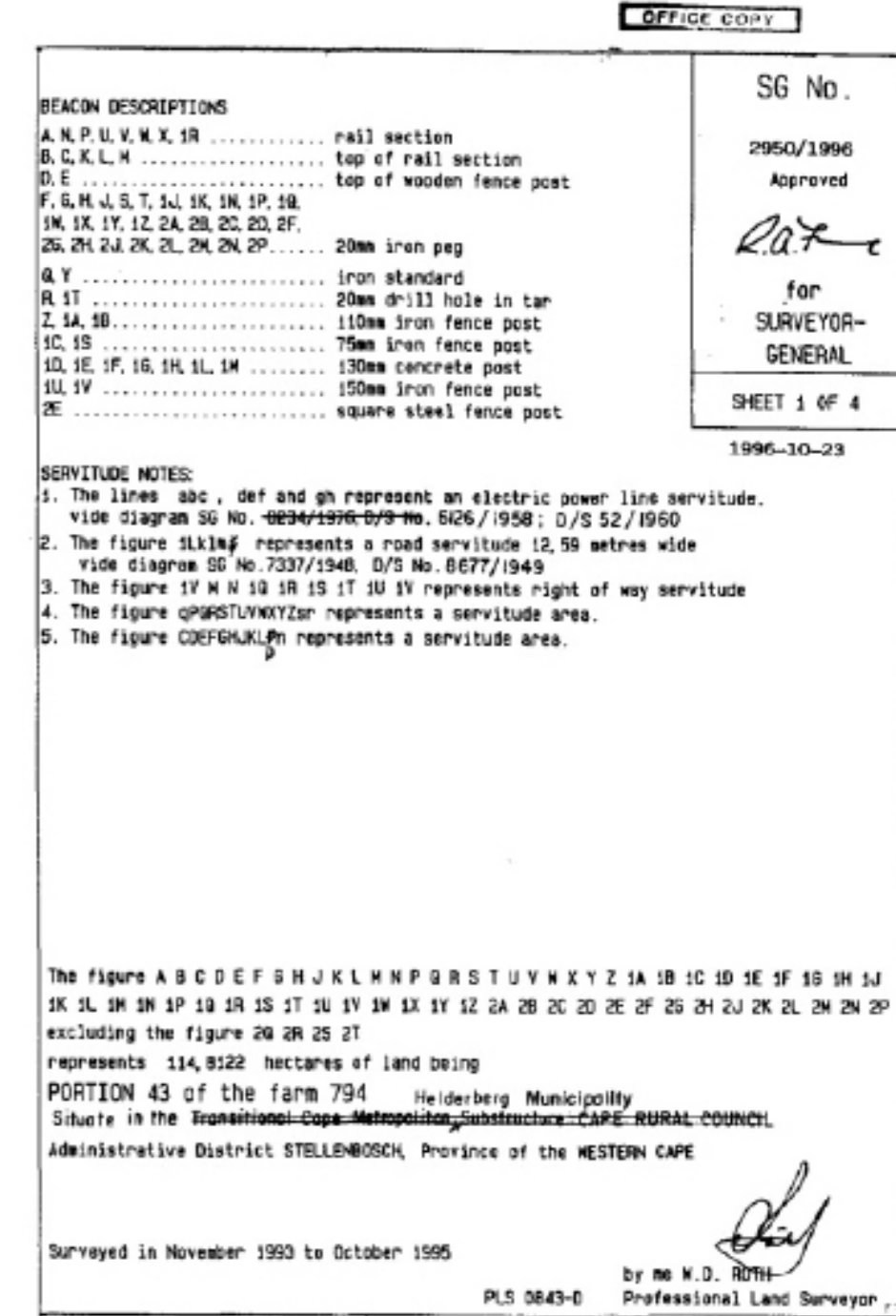


Figure 77: Paardevelei SG Diagram (Roth, 1996: Online).

4.3.2 Site History

1900

This site is a unique one of great historical importance in terms of growth of Somerset West and Industrially, being the site of the old AECI Explosives Factory. An application for the scheme of the dynamite factory was sent in 1900, after Col. WR Quinan of Pinole, California, arrived - one of the few individuals with the knowledge of both the creation of dynamite and the need for the plants (Netwerk24, 2018: Online).

1903

The plant was built in 1903 to make explosives for the De Beers diamond mines which had taken South Africa by storm. This was under the instruction of the board of Directors of the De Beers Consolidated Mines Limited (under Cecil John Rhodes' chairmanship) (Netwerk24, 2018: Online). The main reason for the factory being built here being the new railway line which was completed between Heldeberg Siding which is known today as Firgrove Railway Station and the factory site itself and the abundant water supply on site (Netwerk24, 2018: Online). This site included not only the factory itself but also homes for those who worked on site as well as hostels for African workers. The Greater Paardevlei is also home to several cemeteries for the factory workers with one dedicated fully to the Spanish Flu of 1918 still intact.

1924

In 1924, the site became known as the AEI (African Explosives and Industries) site as De Beers merged with the Nobel Group and in 1944, was changed to the AECI (African Explosives and Chemicals Industries) site (Netwerk24, 2018: Online).

1986

Dynamite was last produced at this site in 1986 and the plant was then decommissioned, passing the baton of dynamite production to Modderfontein (Netwerk24, 2018: Online).

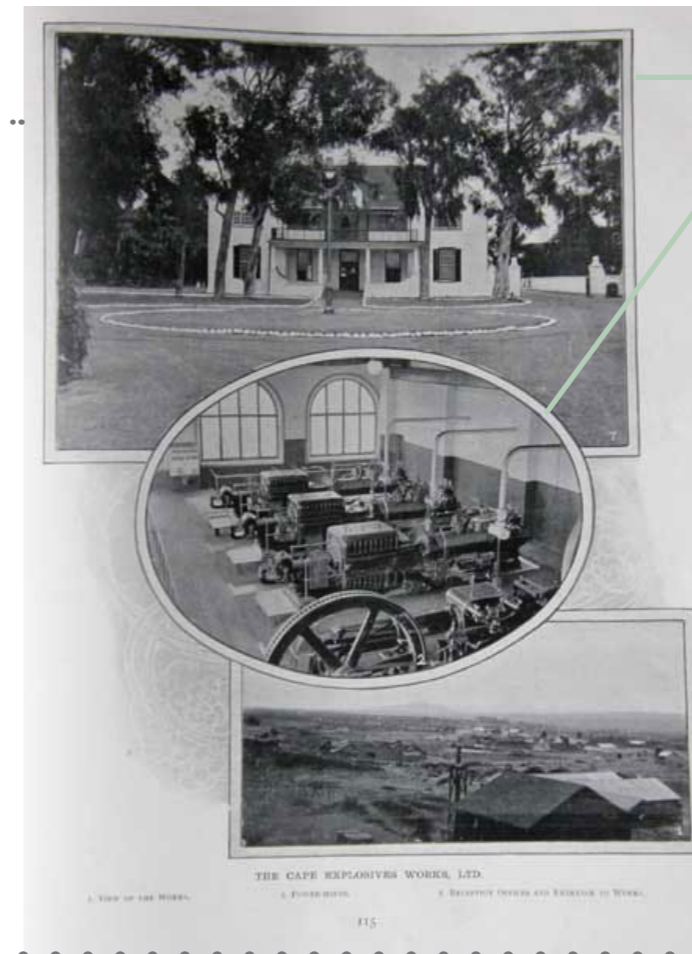
2004/05

After the decommissioning of the site, Heartland Leasing (a subsidiary of AECI) who now owns the greater Paardevlei site, ensured that great rehabilitation took place (Netwerk24, 2018: Online) to make it safe. This was done by Geza Manzi (Pty) Ltd. in 2004/2005.

2021

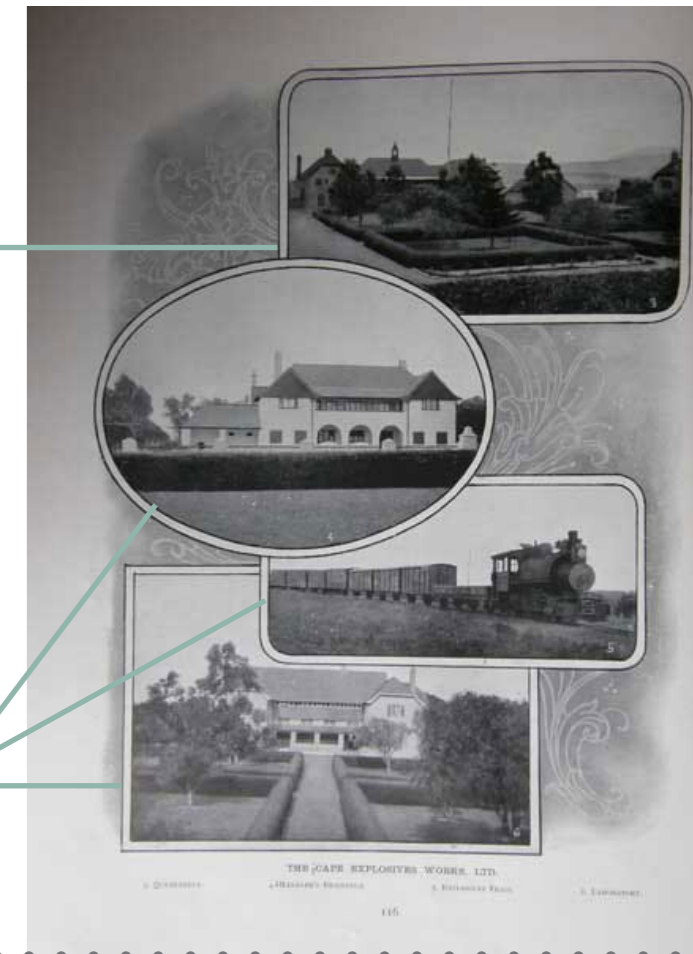
The bottom half of the greater Paardevlei Estate now stands as a mixed-use development which integrated many of the historical buildings erected for the factory but which juxtapose these with contemporary buildings such as residential estates and offices.

The upper portion of the estate, housing the 'water source' turn wetland, which is the actual site for this dissertation has been somewhat rehabilitated into a wetland which makes use of indigenous grasses and other flora to draw in some of the amazing bird life of the Somerset area. Through this dissertation, this wetland will not be destroyed but rather, will be enhanced and celebrated through more variation in indigenous and especially endangered vegetation as well as architecture which supports it.



- 1. View of the Works
- 2. Power-House
- 7. Reception Offices and Entrance to Works

Figure 78: The Cape Explosives Works Ltd. (Playne, 1910-11).



- 3. Quadrangle
- 4. Manager's Residence
- 5. Explosives Train
- 6. Laboratory

Figure 79: The Cape Explosives Works Ltd. (Playne, 1910-11).

Postdecommissioning Predecommissioning

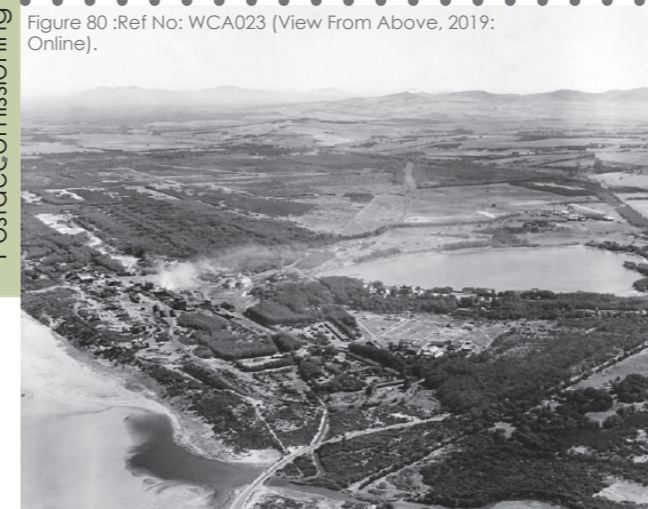


Figure 80 :Ref No: WCA023 (View From Above, 2019: Online).



Figure 81: An Assemblage of Photographs of the Site in its Current State (Author, 2021).

Dynamite Factory Buildings- Converted into Flagstone Winery

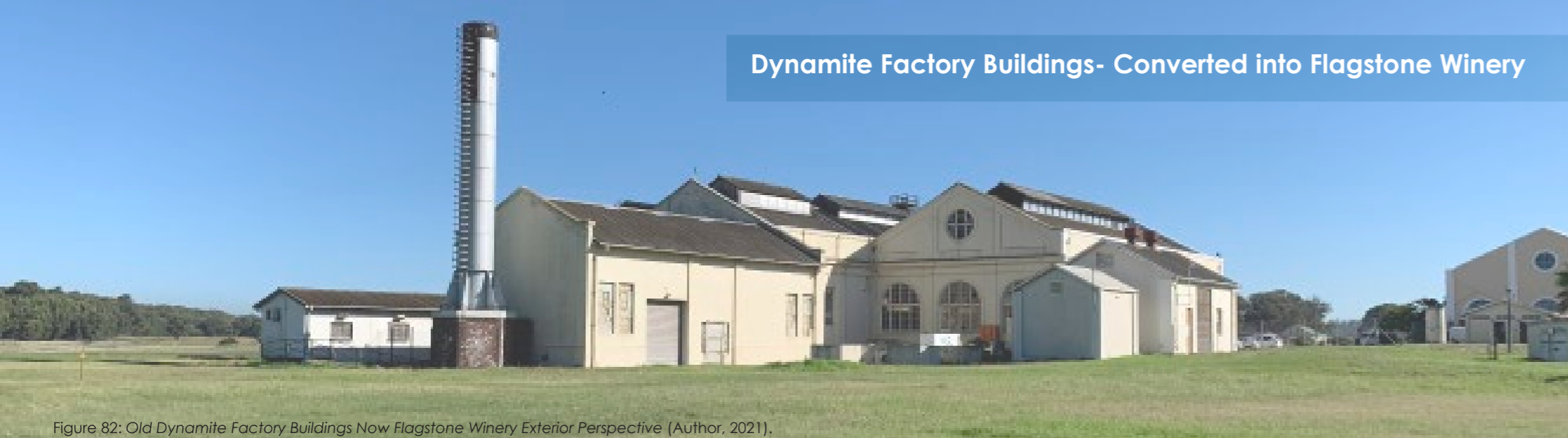


Figure 82: Old Dynamite Factory Buildings Now Flagstone Winery Exterior Perspective (Author, 2021).



Figure 83: Old Dynamite Factory Buildings Now Flagstone Winery Exterior Perspective From Behind (Author, 2021).

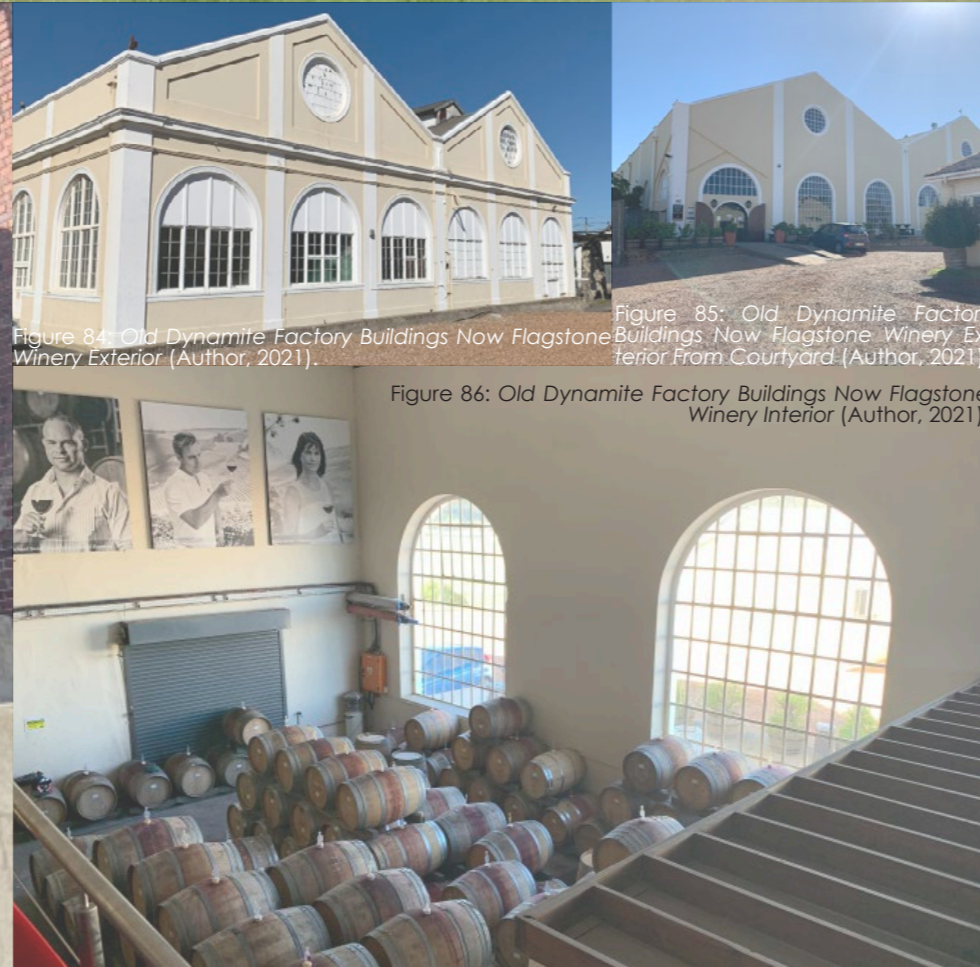


Figure 84: Old Dynamite Factory Buildings Now Flagstone Winery Exterior (Author, 2021).

Figure 85: Old Dynamite Factory Buildings Now Flagstone Winery Exterior From Courtyard (Author, 2021).

Figure 86: Old Dynamite Factory Buildings Now Flagstone Winery Interior (Author, 2021).

Dynamite Factory Buildings- Converted into Triggerfish Brewing



Mezzo Site Plan Including Historical Buildings Offsite
Not to Scale

Figure 87: Mezzo Site Plan Including Historical Buildings Offsite from Google Earth Perspective Edited by Author (Google Earth, 2021: Online).



Figure 88: Triggerfish Brewing Photo (Maree, 2020: Online).



Figure 89: Triggerfish Brewing Interior (Saunders, 2018: Online).

Figure 90: Triggerfish Brewing Interior Photograph (Horvath, 2019: Online).

4.3.3 Site Contours

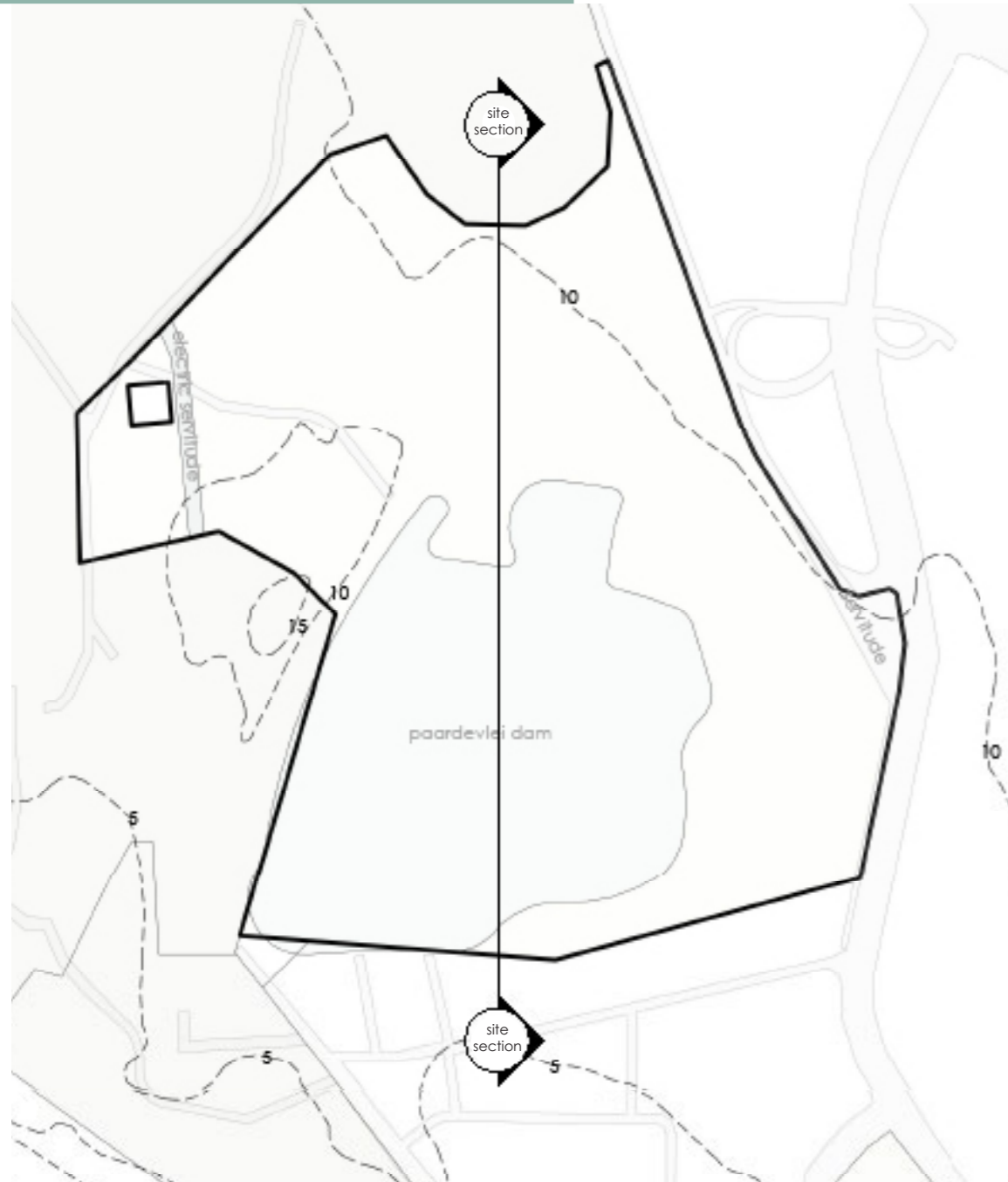


Figure 90: Paardevlei Contours Plan (Author, 2021).

The Site Slope

The chosen Paardevlei site is not extensive in terms of slope which is unique for such a large site especially in the Somerset West region but this is because of the chosen site situated close to the beach. The contours, including those of the Paardevlei Dam, range from 10 to 15m above sea level but averages at 10m making the site reasonably flat.

This flatness makes the site appear much smaller than it is when looking in on the it from the edge but makes construction on the site easier.



Figure 91: Paardevlei Site Section (Author, 2021).



Figure 92: Paardevlei Site Section Perspective Edited by Author (Google Earth, 2021: Online).

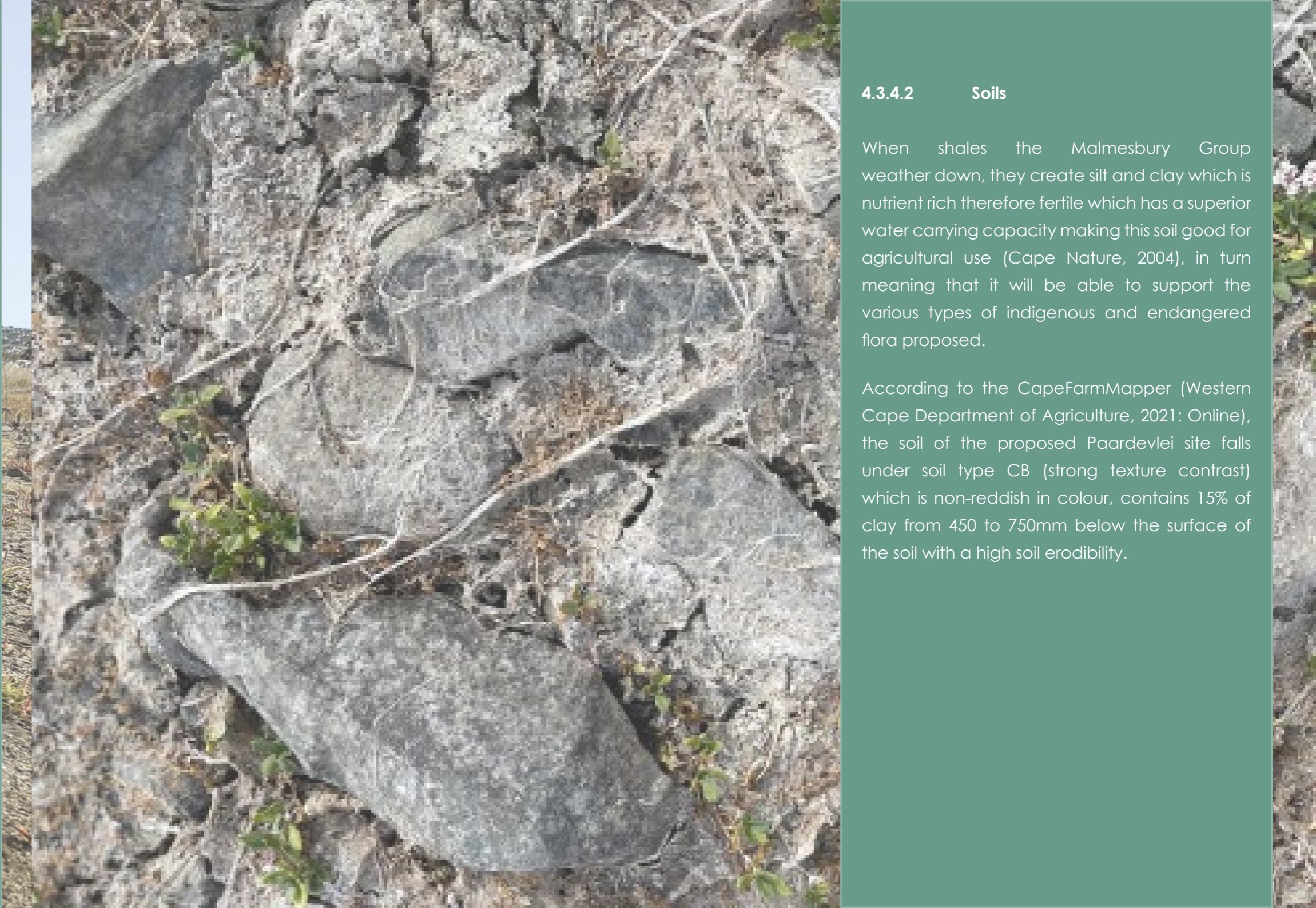
4.3.4 Site Geology

Figure 114: The Rocks and The Mountains- Paardevlei (Author, 2021).



4.3.4.1 Geology

Taken from a Geological Survey (1990), the Draft Heldeberg District Baseline and Analysis Report: State of the Population and Environment- Draft 1.1 of 28 November 2019, the geology of the site is comprised of Precambrian Deposits which belongs to the Malmesbury Group, extending from the Saldanha coastal area to that of the False Bay coastal plane as well as Rocks of the Cape Granite Suite. The Tygerberg formation is a sub-group of this Malmesbury Group (grey-wacke, phyllite and quartzitic sandstone which is inter-bedded with tuff and lava rocks) which are mostly dark and medium grained (eWissa, 2008) where the Cape Granite Suite is light grey and coarse-grained, this of which is most pronounced in the Somerset West Area (Geological Survey, 1990) and therefore the area of the site.



4.3.4.2 Soils

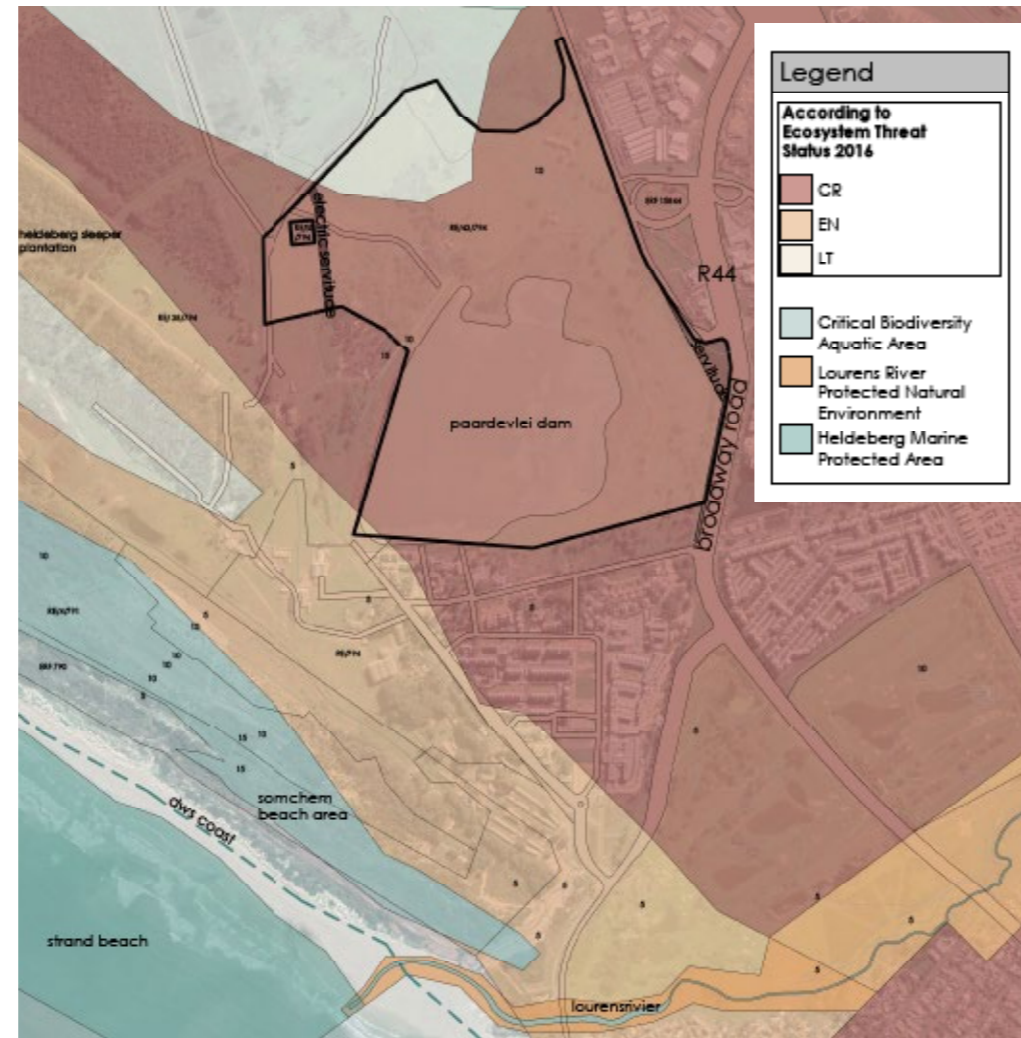
When shales the Malmesbury Group weather down, they create silt and clay which is nutrient rich therefore fertile which has a superior water carrying capacity making this soil good for agricultural use (Cape Nature, 2004), in turn meaning that it will be able to support the various types of indigenous and endangered flora proposed.

According to the CapeFarmMapper (Western Cape Department of Agriculture, 2021: Online), the soil of the proposed Paardevlei site falls under soil type CB (strong texture contrast) which is non-reddish in colour, contains 15% of clay from 450 to 750mm below the surface of the soil with a high soil erodibility.

4.3.5.1 Current Biodiversity and Vegetation

According to the Ecosystem Threat Status of 2016 as seen in the map in figure 94, the chosen site of Paardevlei falls under the Critically Endangered category and is neighboring an endangered ecosystem as well as a critical biodiversity aquatic area that borders the coast. With such a diverse and significant accumulation of ecosystems which need to be protected for various reasons, any architectural proposal must respect the sensitive ecosystems before and during the design process. Along the coast between Strand and Gordon's Bay lies a urbanized area which leaves this coastal area vulnerable to coastal processes such as erosion (City of Cape Town, 2019:42). This risk makes the conservation of the dunes and their specific vegetation vital to the coastline to evade these detrimental consequences. This conservation puts into play the concept of green infrastructure, "a network of multi-functional green space and other green features, urban and rural, which can deliver quality of life and environmental benefits for communities... includes parks, open spaces, playing fields, woodlands, etc." (TPCA, 2018: Online). According to the Draft Heldeberg District Baseline and Analysis Report 2019- State of the Population and State of the Environment, the city of Cape Town is in the process of recognizing and instating these 'green infrastructure' sites throughout the area and the advantages they will each have. This site an reuse of it could be a trial and possibly a catalyst for this process throughout not only this area, but nation wide, which should have a considerable effect on the climatic difficulties each region is facing at the moment.

4.3.5 Current Biodiversity



Biodiversity Influences
Not to Scale

Figure 94: Biodiversity Influences Plan (Author, 2021).



Figure 95: Local Flora Paardevlei (Author, 2021).

The Paardevlei proposed site falls under the Fynbos Biome which is indigenous to South Africa (Western Cape Department of Agriculture, 2021: Online). This biome is celebrated for its beautiful fine vegetation and harbors over 9000 unique plant species such as that of the national flower, the King Protea.

A unique characteristic of fynbos is that it is pyrophylic in other words, it needs fire to survive. Fire is used as a germination tool for some of these plants as their seeds are stored in the soil which, when on fire, heats the seeds which ignites the germination process. Fire also acts as a mineralizing agent in how the ash of the fire returns minerals back to the soil, acting as a fertilizer.

This relationship between the fynbos and fire means that the vegetation needs to continuously be exposed to it. This site is therefore classified as a high risk for veld fires with fires taking place every 12-20 years (Kogelberg Biosphere Reserve, 2016: Online). This probability of fire needs to be taken into account when designing for the area.

4.3.5.2 Current Site Flora- Flowers



Tick Berry Plant

Figure 96: Tick Berry Plant (Plantinfo, 2021: Online).



Golden Guinea

Figure 97: Helichrysum Argyrophyllum (de Lange, 2021: Online).



Traveling Geranium

Figure 98: Trailing African Daisy (Vanderhoff, 2013: Online).



Hottentot Fig

Figure 99: Carpobrotus edulis or Hottentot-fig (4K) (Rivas, 2021: Online).



Cape Pond Weed

Figure 100: Aponogeton distachyos inflorescence and leaves 3 (Unknown, [n.d.]: Online).



Wild Rosemary

Figure 101: Kapok Bos (Patelk, [n.d.]: Online).



Carpet Geranium

Figure 102: Carpet Geranium (Kazimngi Nursery, 2021: Online).



Sweetpea Bush

Figure 103: Everlasting Sweetpea- Latifolius Pink Lathyrus latifolius (The Seed Collection, 2021: Online).



Confetti Bush

Figure 104: The colours of the rainbow- Confetti Bush (Du Toit, 2020: Online).



Water lily

Figure 105: Nymphaea nouchali var. caerulea (Noffen, 2002: Online).



Pink Watsonia

Figure 106: Watsonia Bulbs How to Grow and Take Care of Watsonia's. Daylilies in Australia (Moore, 2013: Online).

The vegetation currently found on the site significantly contributes to the wetland ecosystem through several functions. The first function being the vegetation buffer surrounding the vlei which protects the sensitive wetland from disturbances as well as provide food and shelter for the inhabiting ecosystem. Inhabitants include insects, amphibians and other small animals - many of which attract the wide range of birds in the area. The various kinds of reeds manage the water quality while the aquatic plants (including the algae) contribute to the oxygenation of the water.

4.3.4.3 Current Site Flora- Reeds



Sharp Rush

Figure 110: Juncaceae (Unknown, 2020: Online).



Common Reed

Figure 111: The Common Reed has a Common Look (Unknown, 2018: Online).



Cladium mariscus

Figure 107: Binsenscheide Cladium mariscus (Peters, 2006: Online).



White Bristle Bush

Figure 109: White Bristle Bush (Venter, 2021: Online).



Knobby Club Rush

Figure 108: Ficinia nodosa / Knobby Club Rush (Victorian Flora, 2021: Online).



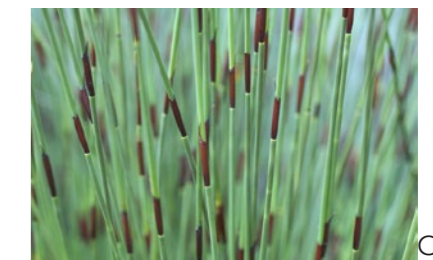
Bulrush

Figure 110: Typha latifolia Leaves and flowers (Le Loup Gris, [n.d.]: Online).



Carex

Figure 112: True Sedges Carex (Unknown, [n.d.]: Online).



Cape Thatch Reed

Figure 113: Cape Thatching Reed (Haakdoorn Nursery, 2021: Online).



Figure 114: The Flowers of *Ixia versicolor* which, as its name indicates, take various colour forms Above, (Paterson-Jones, C, 2013: Online), below: (Ebrahim, I. 2013: Online).

Ixia versicolor

Common names: None
 Status: Critically endangered
 Locations: Stellenbosch to Somerset West
 Size: Up to 450mm high
 Aspect: Full sun



Figure 115: *Disa Barbata* (Bytebier, B. 2013: Online).

Disa Barbata

Common names: None
 Status: Critically endangered
 Locations: Cape Flats (Extinct) & Malemsbury
 Size: Up to 900mm high
 Aspect: Full sun



Figure 116: *Watsonia strictiflora* (Goets, M., 2013: Online).

Watsonia strictiflora

Common names: None
 Status: Critically endangered
 Locations: Klapmats to Joostenburg and Paarl
 Size: Up to 240-430mm high and 20-32mm diameter
 Aspect: Full sun



Figure 117: *Disa procera* (Ebrahim, I., 2013: Online).

Disa procera

Common names: None
 Status: Critically endangered
 Locations: Sedgefield
 Size: Up to 600mm high
 Aspect: Full sun



Figure 118: *Seruria furcellata* in Flower (Paterson-Jones, C, 2013: Online).

Seruria furcellata

Common name: Kraaifontein spiderhead
 Status: critically endangered
 Locations: Cape Flats
 Size: Up to 500mm high and 1000mm in diameter
 Aspect: Full sun



Figure 119: The Kreupelhout (*Leucospermum conocarpodendron* ssp. *viridum*) flowering in late spring on the southern Cape Peninsula with storm clouds above, South Africa (Paterson-Jones, C., 2013: Online).

Leucospermum conocarpodendron

Common names: Grey Tree Pincushion
 Status: vulnerable
 Locations: Western Cape mountainsides
 Size: Up to 3-5m high and 3-6m in diameter
 Aspect: Full sun



Podalyria calyptata

Common name: Sweetpea bush
 Status: Abundant
 Locations: Western Cape
 Size: 2-5m in diameter
 Aspect: Full sun

Figure 120: Everlasting Sweetpea-*Lathyrus latifolius* Pink (The Seed Collection, 2021: Online).

Virgilia divaricata Adamson

Common names: Blossom Tree
 Status: Least concern
 Locations: Eastern Cape and Western Cape
 Size: Up to 10m high
 Aspect: Full sun



Above, Figure 121: 10 Virgilia divaricata Seeds - Blossom Tree - Keurboom - Indigenous (Unknown, 2010: Online).
 Below, Figure 122: Virgilia (plant) - A Mature Tree Blooming in South Africa (Shawka, A., 2021: Online).

Ekebergia capensis

Common names: Cape Ash Tree
 Status: Least concern
 Locations: Eastern Cape, Kwa-Zulu Natal, Limpopo, Mpumalanga
 Size: Up to 15m high
 Aspect: Full sun



Above, Figure 123: Ekebergia capensis - Cape Ash - Essenhouf-Ekebergia-capensis-fruit (Mukaro, E., 2017: Online).
 Below, Figure 124: Ekebergia capensis - Cape Ash - Essenhouf-Ekebergia-capensis-tree (Mukaro, E., 2017: Online).

Pittosporum viridiflorum

Common names: Cheesewood Tree
 Status: Least concern
 Locations: Throughout South Africa
 Size: 4-30m high
 Aspect: Full sun



Above, Figure 125: Pittosporum viridiflorum - Cheesewood - Kasuur- Pittosporum-viridiflorum-flowers (Mukaro, E., 2019: Online).
 Below, Figure 126: 1fda7e49fb757a02795ea5588f22e16fc609c04_940px (Mukaro, E., 2019: Online).

Sideroxylon inerme

Common names: White Milkwood Tree
 Status: Protected species
 Locations: Throughout South Africa
 Size: 10-15m high
 Aspect: Full sun



Above, Figure 127: The scent of the flowers of Sideroxylon inerme have been described as 'smelly feet'. (Kumbula Nursery, 2013: Online).
 Below, Figure 128: Sideroxylon inerme Has a Sturdy Trunk and a Large, Dense, Rounded Crown (Kumbula Nursery, 2013: Online).

Podocarpus latifolius

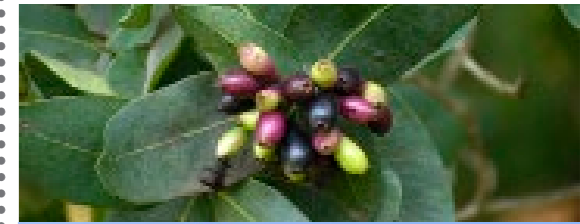
Common names: Real Yellowwood Tree
 Status: Protected Species
 Locations: Throughout South Africa
 Size: 20-30m high
 Aspect: Full sun



Figure 129: Podocarpus latifolius - Real yellowwood - Opregte geelhout-409 (Mukaro, E., 2019: Online).

Syzygium cordatum

Common names: Waterberry Tree
 Status: Least concern
 Locations: Throughout South Africa
 Size: 8-15m high
 Aspect: Full sun



Above, Figure 130: Waterberry-Fruit.jpg (Trade Winds Fruit, 2012: Online).
 Below, Figure 131: Umdoni Tree which is also known as the Water Berry Tree (Herbert, S., 2021: Online).

Olea europaea L. subsp. africana

Common names: Wild Olive Tree
Status: Least concern
Locations: Throughout South Africa
Size: 9-12m in diameter
Aspect: Full sun



Loxostylis alata A.Spreng

Common names: Wild Pepper Tree
Status: Least concern
Locations: Throughout South Africa
Size: 5-6m high and 4m in diameter
Aspect: Full sun



“Trees give peace to the souls of men.”
— Nora Waln

4.4 Grave Information

Taking into account the standard dimensions of a grave as seen in figure 136, will not be accurate as to how many graves would fit within the cemetery as the measurements depend on the type of vegetation used to mark the grave. Some trees have roots and canopy's that are more widely spread than others which influence the space between the plants and thus, graves will be spaced out non-uniformly within the cemetery based on the maximum circumference of the roots and the canopy's of the plants.

4.5 Conclusion

This site is one of great importance within the local community and carries along with it history and character but the site itself can be so much more, especially in terms of opening up to become a green space for all the urban dwellers as a cemetery/garden. It is paramount that the very sensitive ecosystem which inhabits the site be kept safe while bringing in more indigenous and endemic flora which will encourage more fauna to call this place home. The memorial proposed memorial for the slaves that worked in the factory will bring a sense of honour and respect for the history of the site while populating the site with vegetation will bring with a sense of peace but also respect for what was here first, the ecosystem.

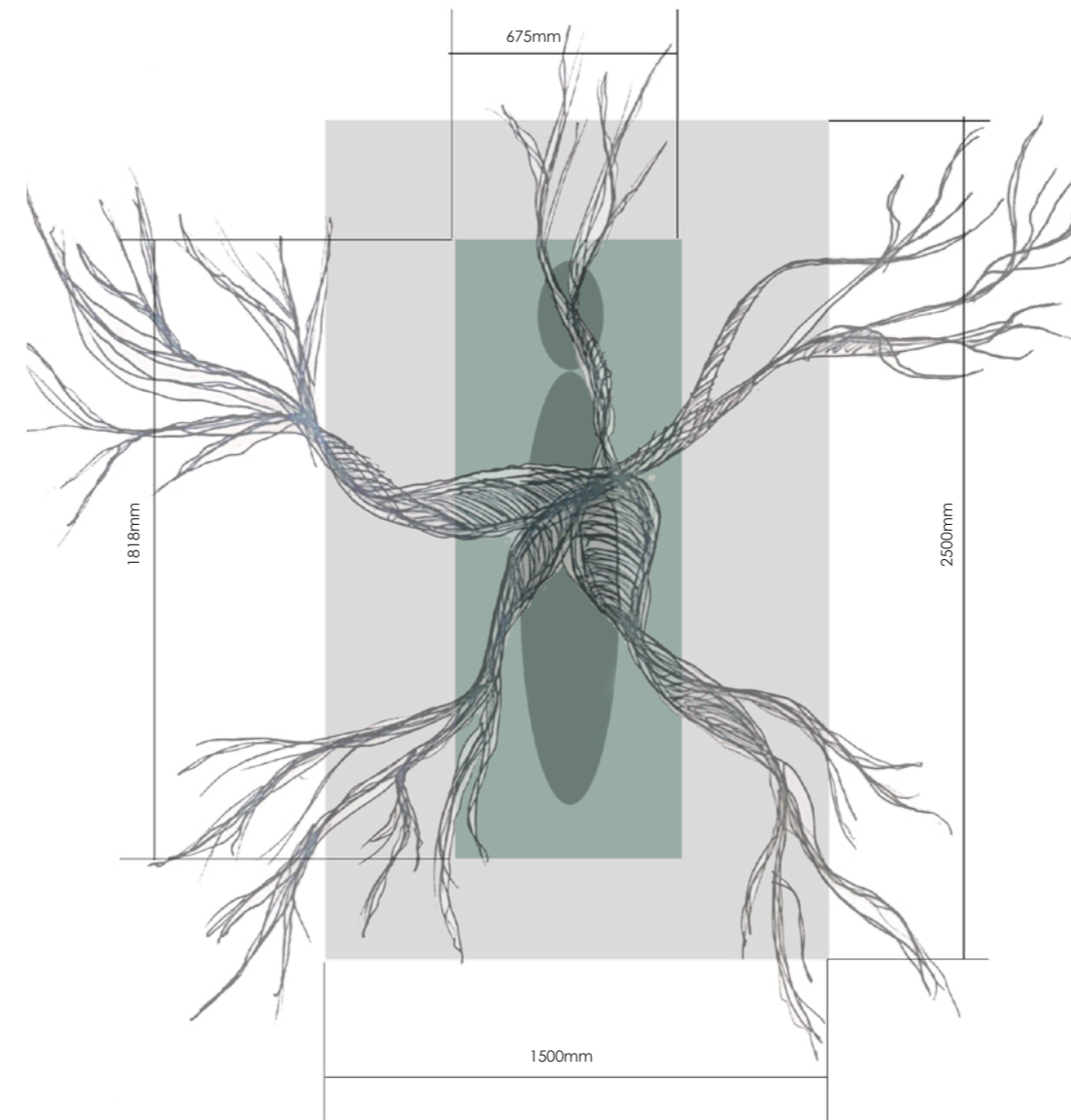
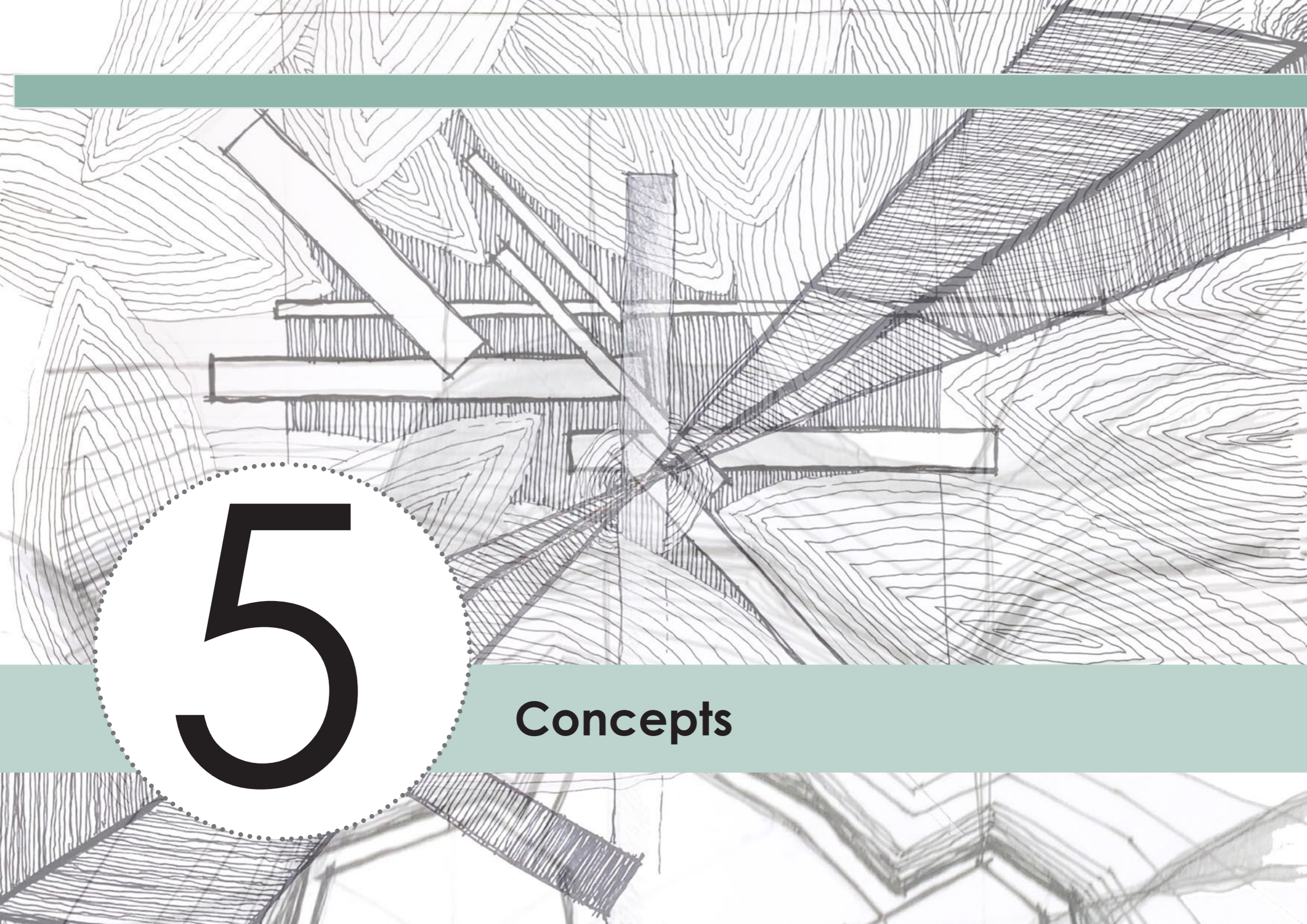


Figure 136: Dimensions of the Graves (Chemaly, 2021).



5

Concepts

5.1 Introduction

Concepts are an integral part of design methodology as they act as the foundation for the decision making for the initial design decisions as they draw out significant elements of the situation and link these elements with the design process.

Here, there are three concepts proposed, each of which have been taken from different time periods, the past, the present and the future. These concepts could be applied separately but are rather being superimposed to add to the layers of complexity of the proposed design solution as they support the project aims stated previously in the introduction.

Our opportunity, as designers, is to learn how to handle the complexity, rather than shy away from it, and to realize that the big art of design is to make complicated things simple.

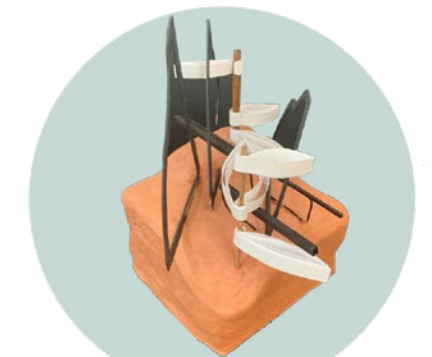
- Tim Parsey



Concept 1:
Emphasising Connections



Concept 2:
Celebrating the Already There



Concept 3:
Dancing of Shadows & Light

Figure 136: Concepts(Author, 2021).

The Past: Emphasizing Connec-

**Emphasis, Connections, Datum, Context,
Hierarchy, Stitching, Macro to Micro**

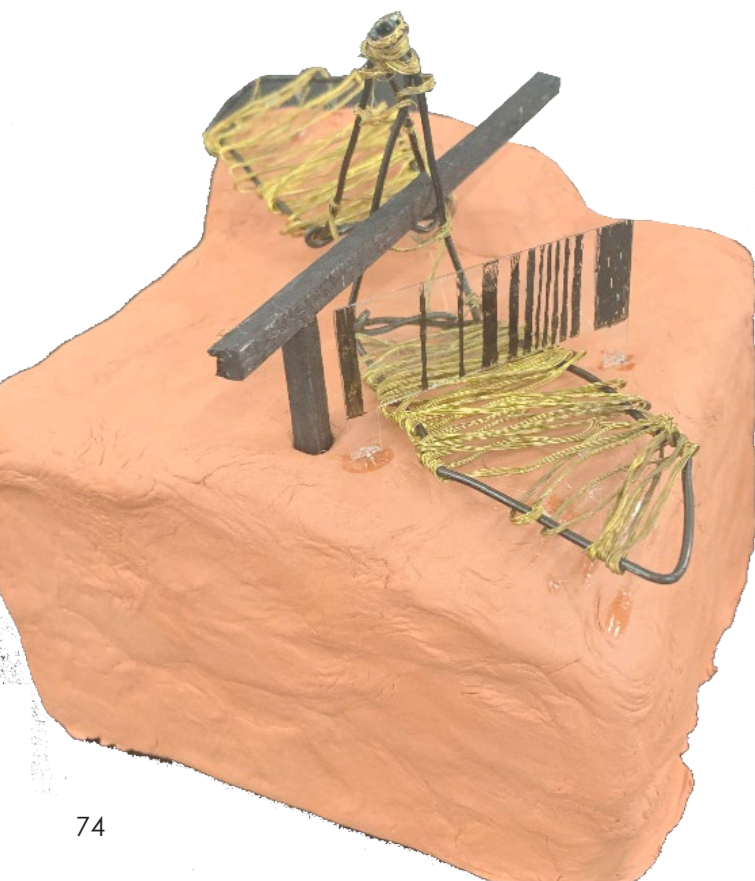


Figure 137: *Emphasising Connections Model* (Author, 2021).

5.2 Concept 1

Linking to the past is the concept of emphasizing connections which was developed by abstracting a macro site plan and using it to highlight the important elements of the greater site, be them historical or natural. This was then abstracted again as seen in figure 133, to emphasize the axis and create a datum (diagonal) between the mountains, running through the vlei, and to the sea (these being integral natural components of the context represented by the concentric circle elements in the sketch in figure 138). This axis stitches the different elements of the greater site, comparing it to the essential North South Axis (the vertical element in the sketch) that creates hierarchy within the design at the point of intersection at the vlei as seen in the model in figure 133. The main diagonal axis contrasts with the axis created between the historical buildings associated with the dynamite factory (the shorter diagonal element). In the model, the historical narrative is represented by the bar code which was derived through a process of explaining the negatives and positives of the historical development over time through light and shadows.

Architecturally, this concept places emphasis on the main diagonal axis within the proposed building design and aids in the understanding that the various elements on the site need to be connected with an emphasis of the axes of importance in the landscape design as well as in the architectural design. The contrasting historical axis presents an opportunity to remember the memories of the site's past through contrasting the present and future with the past axis.

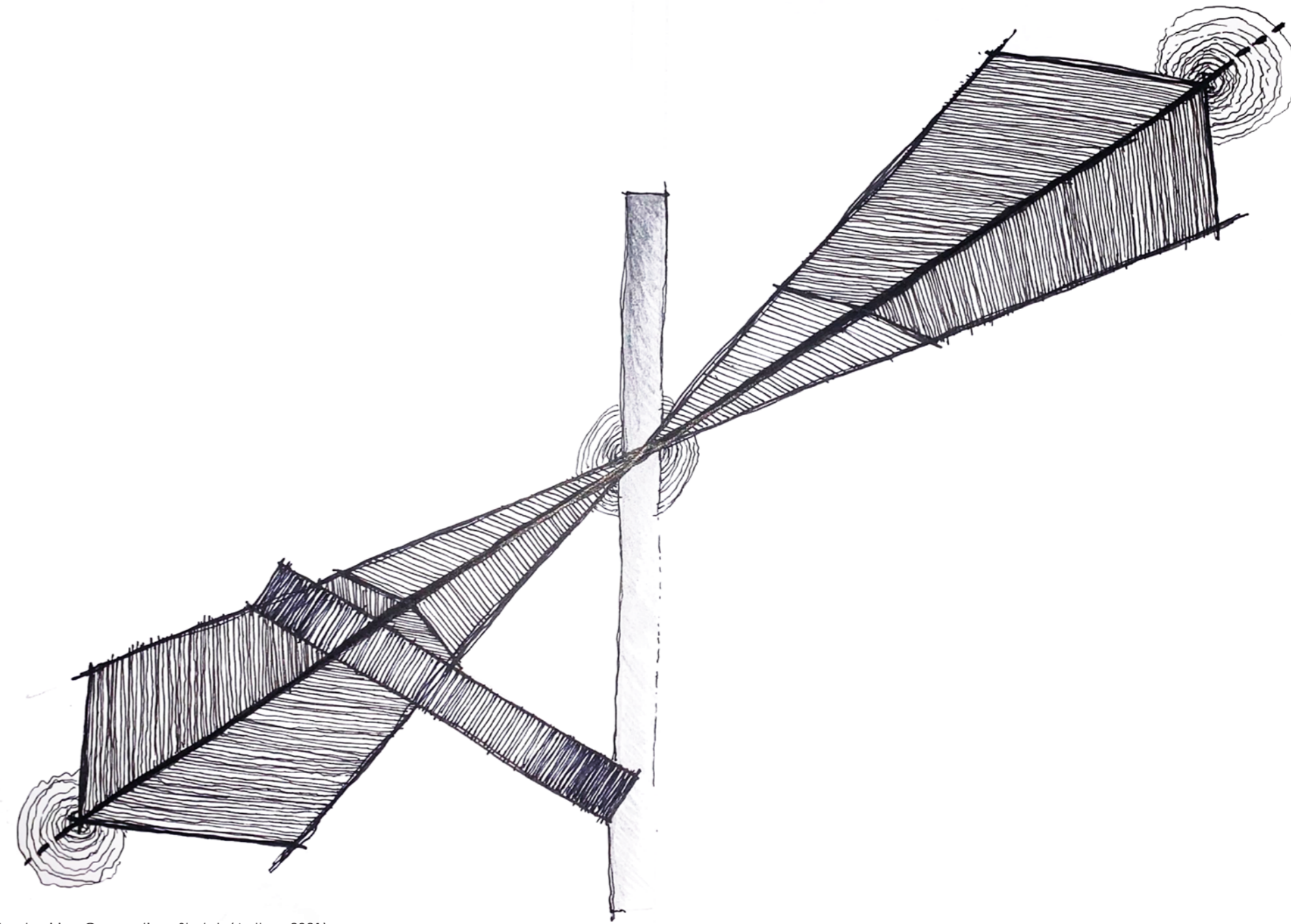


Figure 138: *Emphasising Connections Sketch* (Author, 2021).

The Present: Celebrating The Already There

Celebrating, Already There, Guide, Palimpsest of the Present, Biomimicry

5.3 Concept 2

The second concept representing the present site and the potential within it is that of Celebrating the Already There. This concept takes inspiration from the unique rocks found and brought back from the site and focuses on embracing what is already on the site as a guide for what should be. A palimpsest of the past, creating the present and the future. Ultimately, this concept celebrates the biomimicry which could occur within the design taken from the natural elements such as these upward standing rock formations, the silhouettes of the surrounding mountains and waves of the nearby sea (the transparent molded elements on the model). The gauze used between the rocks in the model (figure 140) replicates the wind which the area is known for and how this plays a role in how to design for this site. The gauze also represents how the site has been and is still in the process of being rehabilitated so that these elements can be celebrated.

Architecturally, this yields a possible silhouette of the roofs and how they stagger, mimicking the rocks, the mountains, and the waves, which can be seen in the sketch in figure 141. Also, this concept suggests the climate of the area and the importance of designing for not only the windy conditions often experienced on site but all the natural elements of the site that make it unique such as the sensitive ecosystem, the views of the mountains, celebrating the building materials found on site and so on.

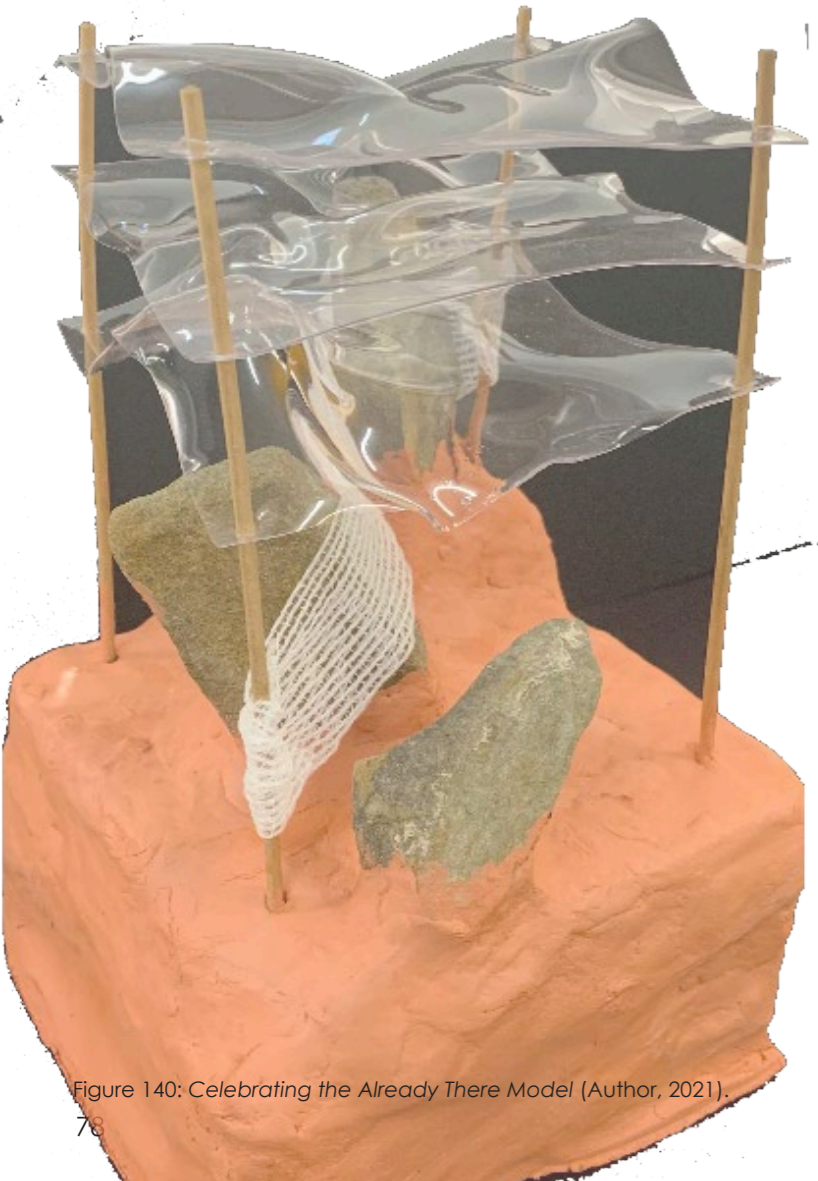


Figure 140: Celebrating the Already There Model (Author, 2021).

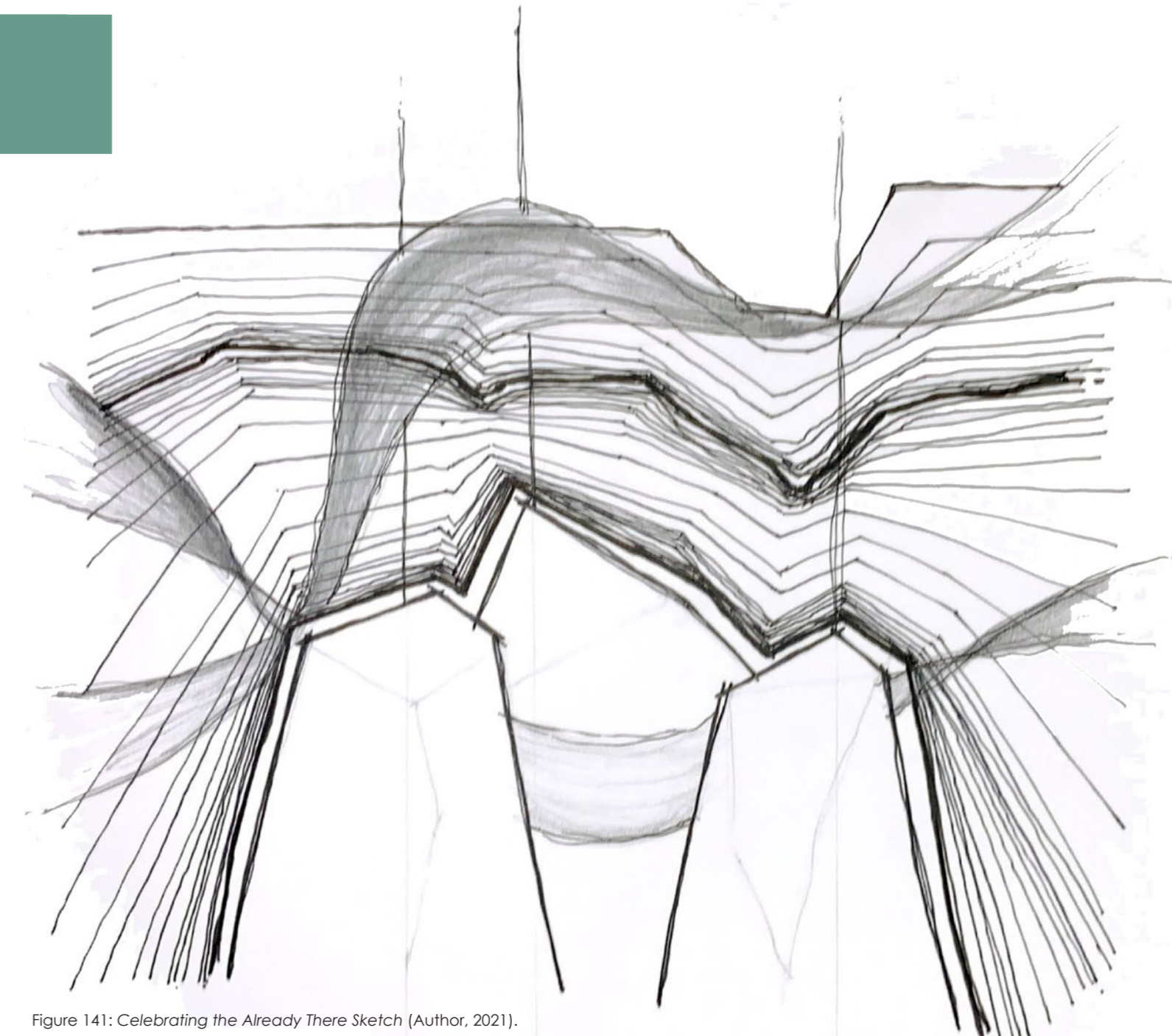


Figure 141: Celebrating the Already There Sketch (Author, 2021).



Figure 142: Celebrating the Already There Sketching of Local Rocks (Author, 2021).

1. conglomerate

- how the different elements come together
- articulation
- celebrating the difference between the functions through architecture while still linking them as a whole
- celebration of each space as through own height level

2. geometry

- use of angles to create interest
- shapes to create hierarchy

3. contrast

- sharp shadow is created by clean lines to play with dramatic lighting
- play of contrasting different building elements

4. protruding

- play with setting some elements into the earth and others less rooted to project the protruding of the buildings from the earth
- as if they are one with the site
- green roof?

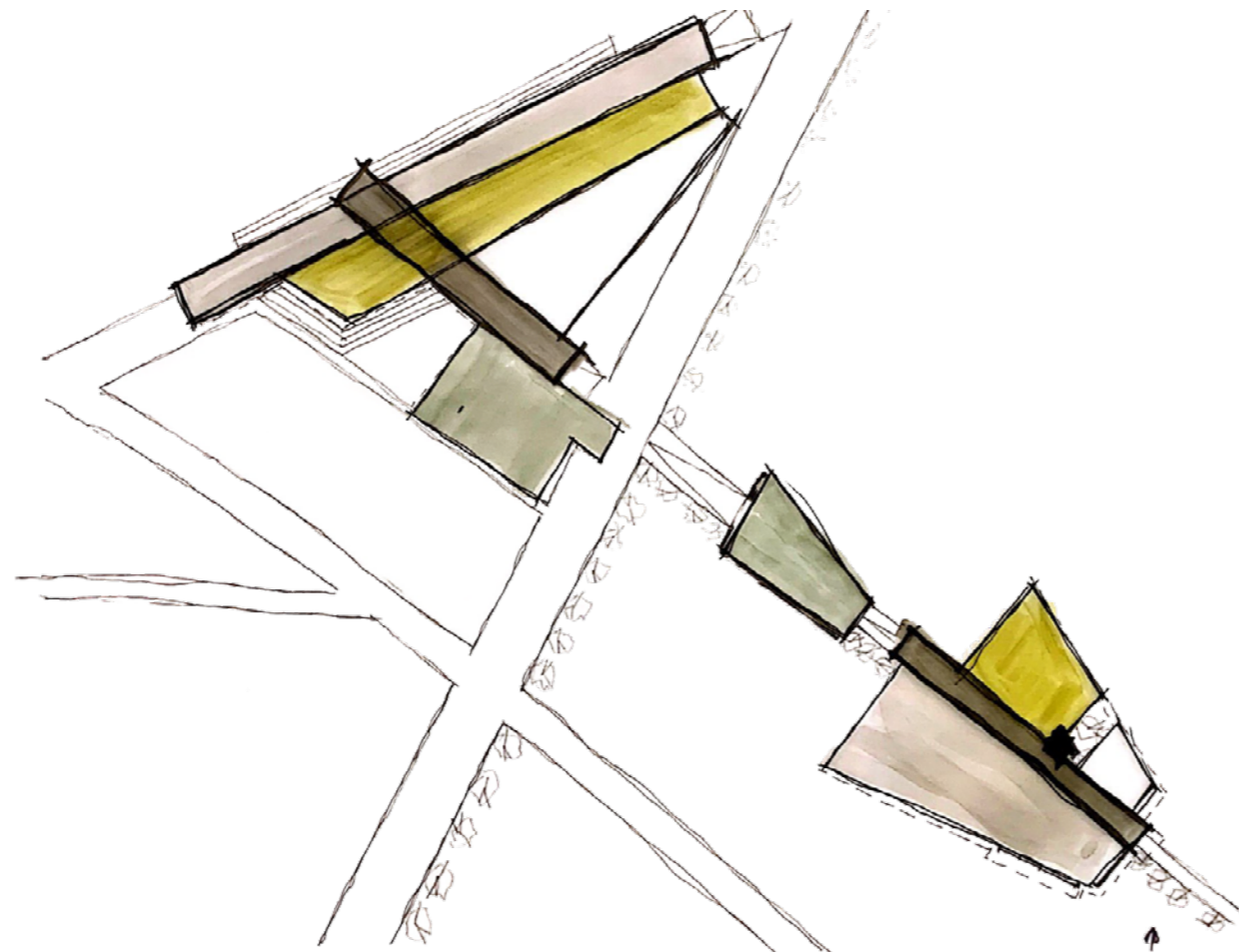


Figure 143: Celebrating the Already There Sketching Plan (Author, 2021).

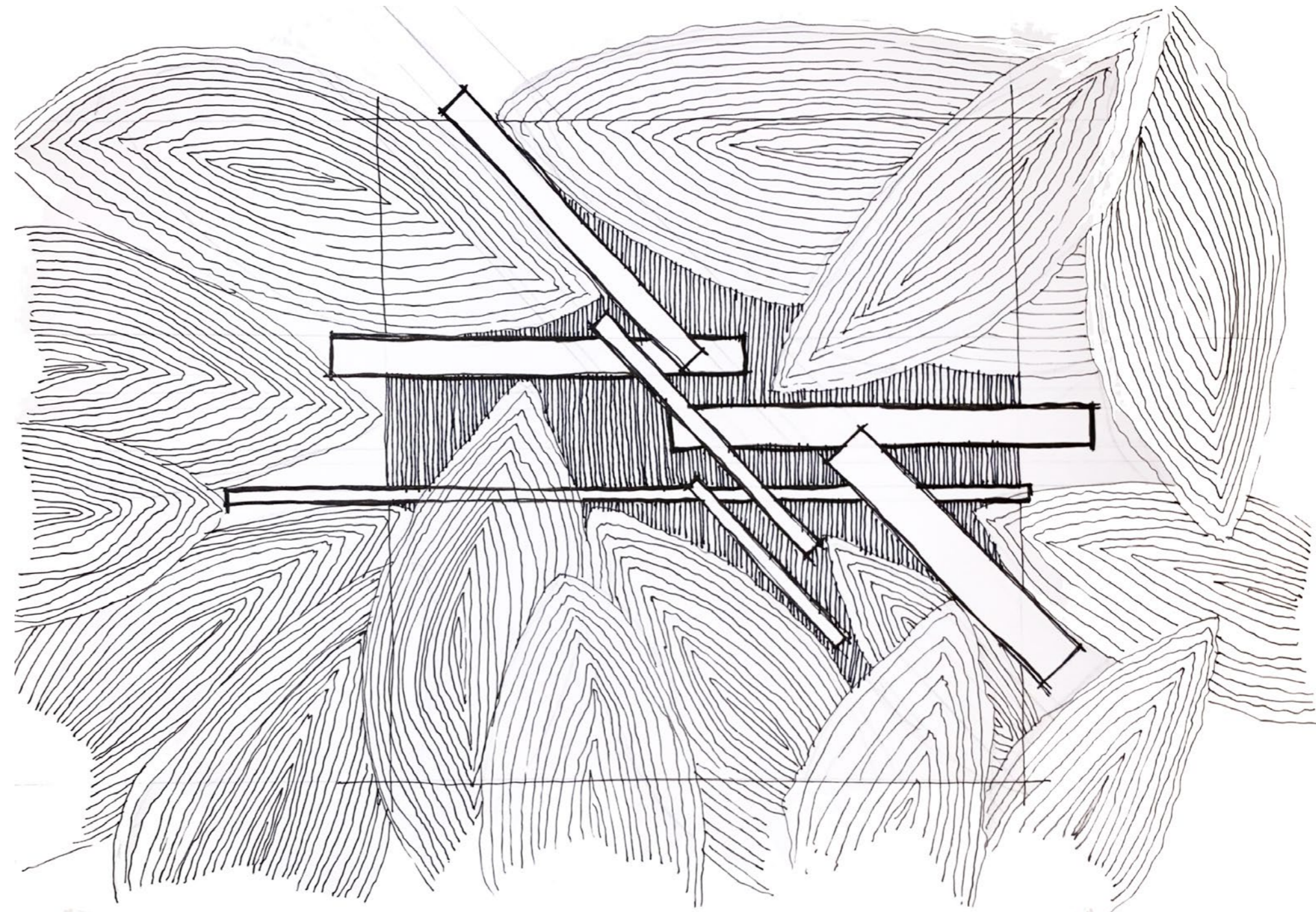


Figure 144: Dancing of Light and Shadows Sketch (Author, 2021).

The Future: Dancing of Light and Shadows

Shadows, Movement, Light, Manipulating, Shape, Rhythm, Dematerialization, Peace

5.4 Concept 3

This concept represents the future and how this proposal can accomplish reaching the aim set by the design touchstone of inviting individuals to find peace within the site where incisions of various types are manipulated to use light and shadows as a building element to create various atmospheres and narratives for individuals to hopefully identify as an overall experience of peace.

In the sketch in figure 144, the layering of leaves represents the natural elements which are constantly changing, this contrasted with the strict rectangular shapes that lie on the axes which in a design, give optimal natural light. Layering is then seen again in the model in figure 145 but in different planes to show how light can be manipulated in the different planes with different effects. The standing sails show how the wind is responsible for the creation of movement on the dance of light and shadows perpendicular to the site.

Architecturally, this yields the most important building block which needs to be used throughout the design to create certain atmospheres within certain spaces but also suggests the concept of layering possibly in that of materials and the articulation of where the materials overlap with light. This could also include a layering of different canopies and screens to create varying enclosures and heights inviting different experiences of peace along the datum and within the different spaces throughout the site celebrating the no-mans land between the elements of the site.



Figure 145: Dancing of Light and Shadows Model (Author, 2021).

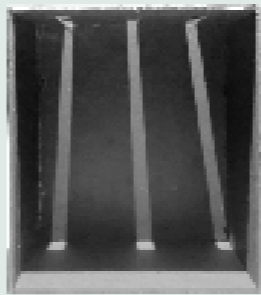
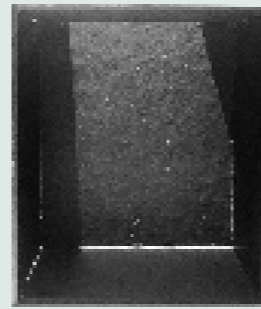
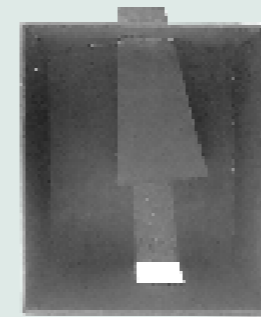


Figure 146: Exploration Models for Play of Light (Author, 2021)

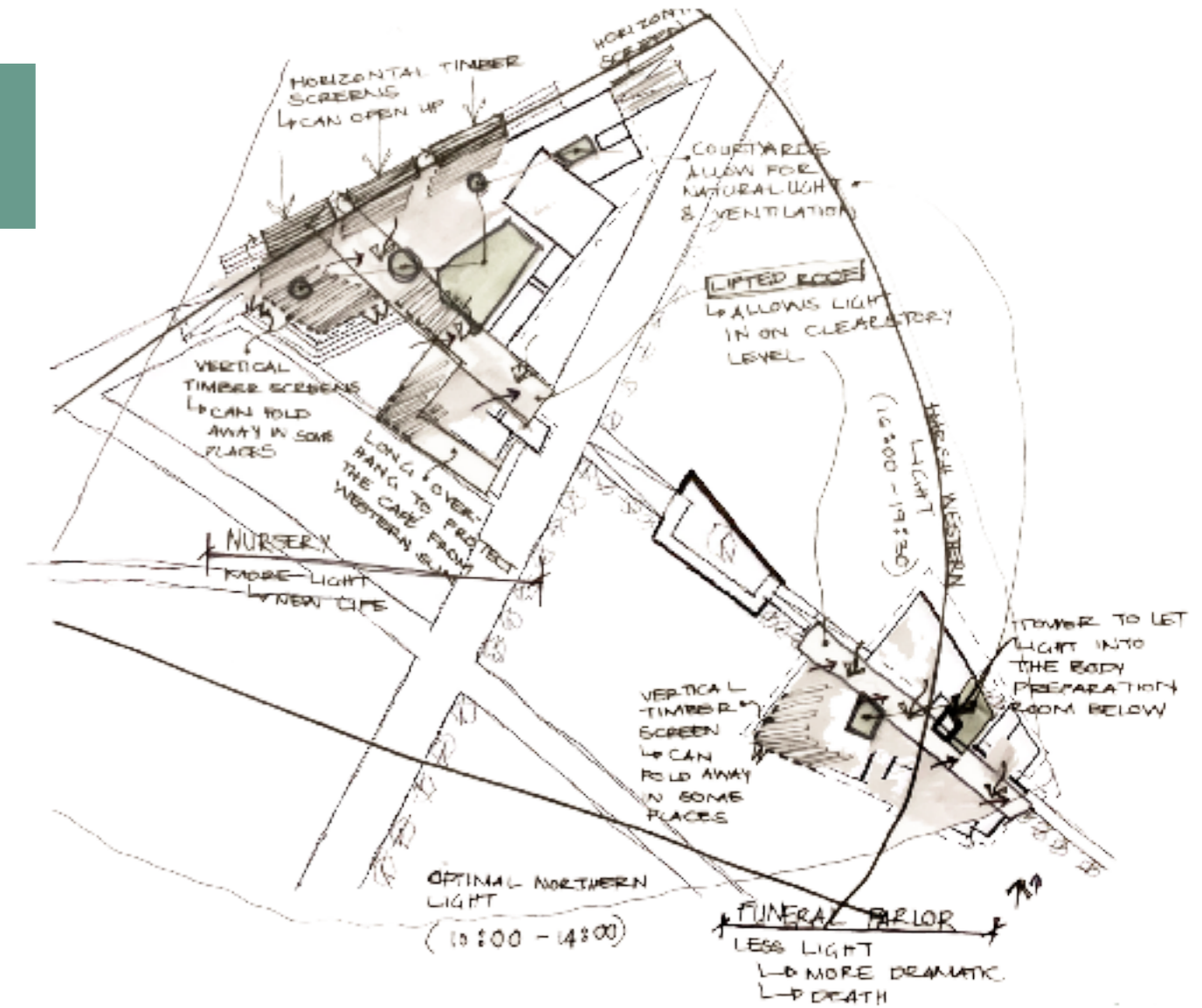


Figure 147: Dancing of Light and Shadows Sketch Plan (Author, 2021).



6.1 Introduction

The proposed design is that of a funeral parlor and botanical nursery but the main component which connects these two building functions is that of the cemetery. The unique and vital ecosystem of the site plays an important role both in the reasoning behind the green cemetery proposal and should therefore be considered throughout the design process. Previously in chapter 6, specific indigenous and some endemic plants were chosen to act as a basis for the flora options of tombstones and for public retail purposes. These plant options play a vital role in the design of the cemetery layout in how their unique needs (sun, soil, etc.) need to be understood and considered in the placement of the growing areas and how they relate to the buildings proposed. Figure 149 to the left, illustrates the order of the elements of the design and when they were introduced to the process of the greater proposed design.

6

Design Development

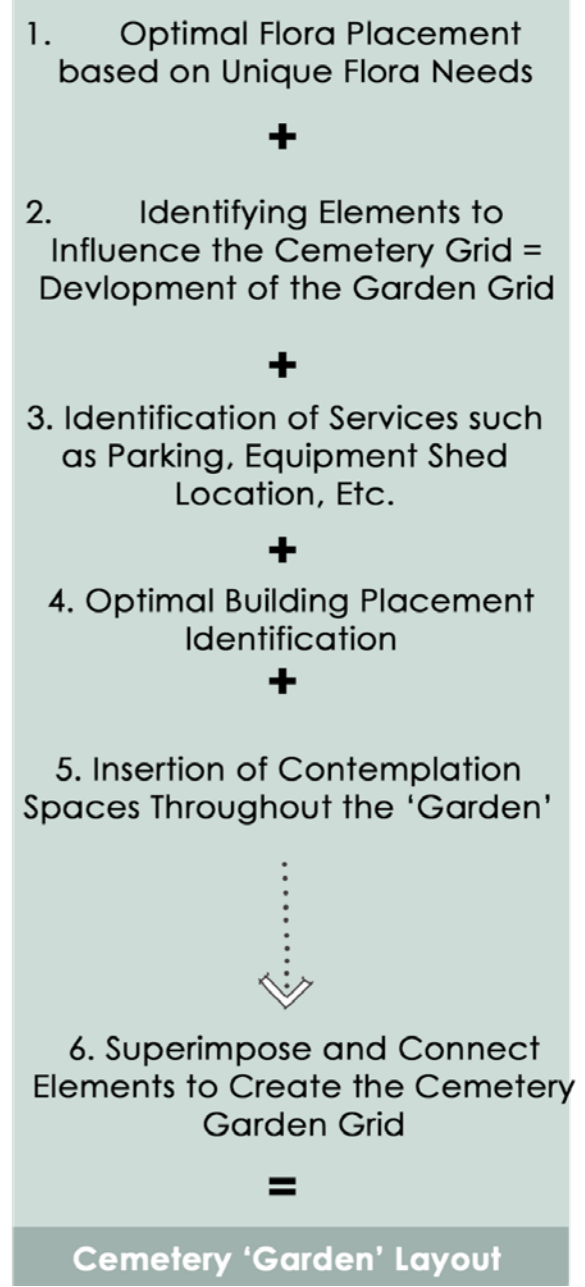


Figure 149: Cemetery Design Development Illustration (Author, 2021).

6.2 Optimal Flora Positioning

All the plants previously identified, all being indigenous and many endemics to this area of the Western Cape, have the same needs in terms of sunlight and soil preferences as these plants are uniquely suited to flourish in the climatic conditions present on site. The soil throughout the site is identical so the main factors which influenced the optimal positioning of the planting areas for the display to be used by the botanical nursery are those of sun needs, proximity to a possible access point of the site which could determine where the nursery would be and water needs. The plants need full sun which could be obtained anywhere on site if there is no large shadow cast on the area for a large portion of the day, the sun path could be celebrated in positioning the plants towards the North of the site ensuring no shadows, the access point would be on the road on the Northeast portion of the site (Ou Paardevlei Rd) due to the road servitude blocking any entrance from the main road to the Southeast of the site. Finally, these plants do well with little but consistent water which is adapted to the rain seasons of the area therefore they should not be placed too close to the wetland area.

Taking these factors into account, the best placement for the planting for the nursery would be on the Northern edge of the site as seen in figure 150.



Figure 149: Collage of Plants for Sweet-pea's Cemetery (Author, 2021).

6.3 Factors Influencing the Cemetery 'Garden' Grid

1. The main axis running from the mountains, through the vlei, to the sea as discussed in **Concept 1: Emphasizing Connections.**
2. Paardevlei Dam and making a boarder of at least 20m of surrounding wetland.
3. Optimal Positioning of planting for the nursery
3. Contours running through the site
4. Site Boarders
5. Optimal positioning for the proposed buildings
6. Allocation of space for services such as parking.

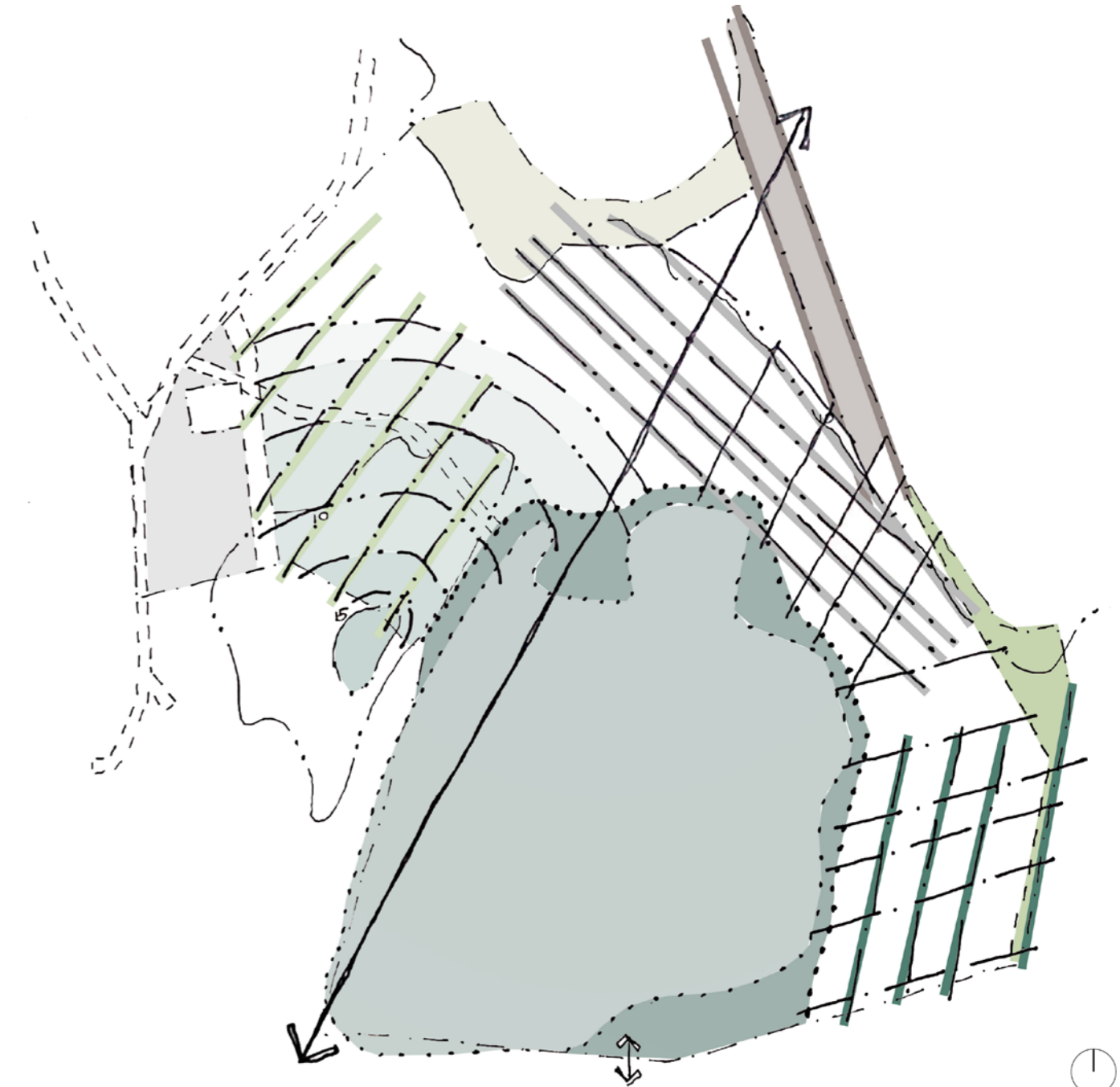


Figure 150: Cemetery Grid Development Sketch (Author, 2021).

6.4 Optimal Building Positioning

The newly compiled cemetery 'garden' grid creates a separation of spaces in which different functions will occur. The next step in the design process as per figure 149 is the optimal placement of the buildings within the cemetery. In retail, it is generally important to locate retail spaces with high foot traffic or good visibility to attract customers. The buildings will therefore be placed closest to the parking areas allocated in figure 150 and is indicated on the plan in figure 151 in green.

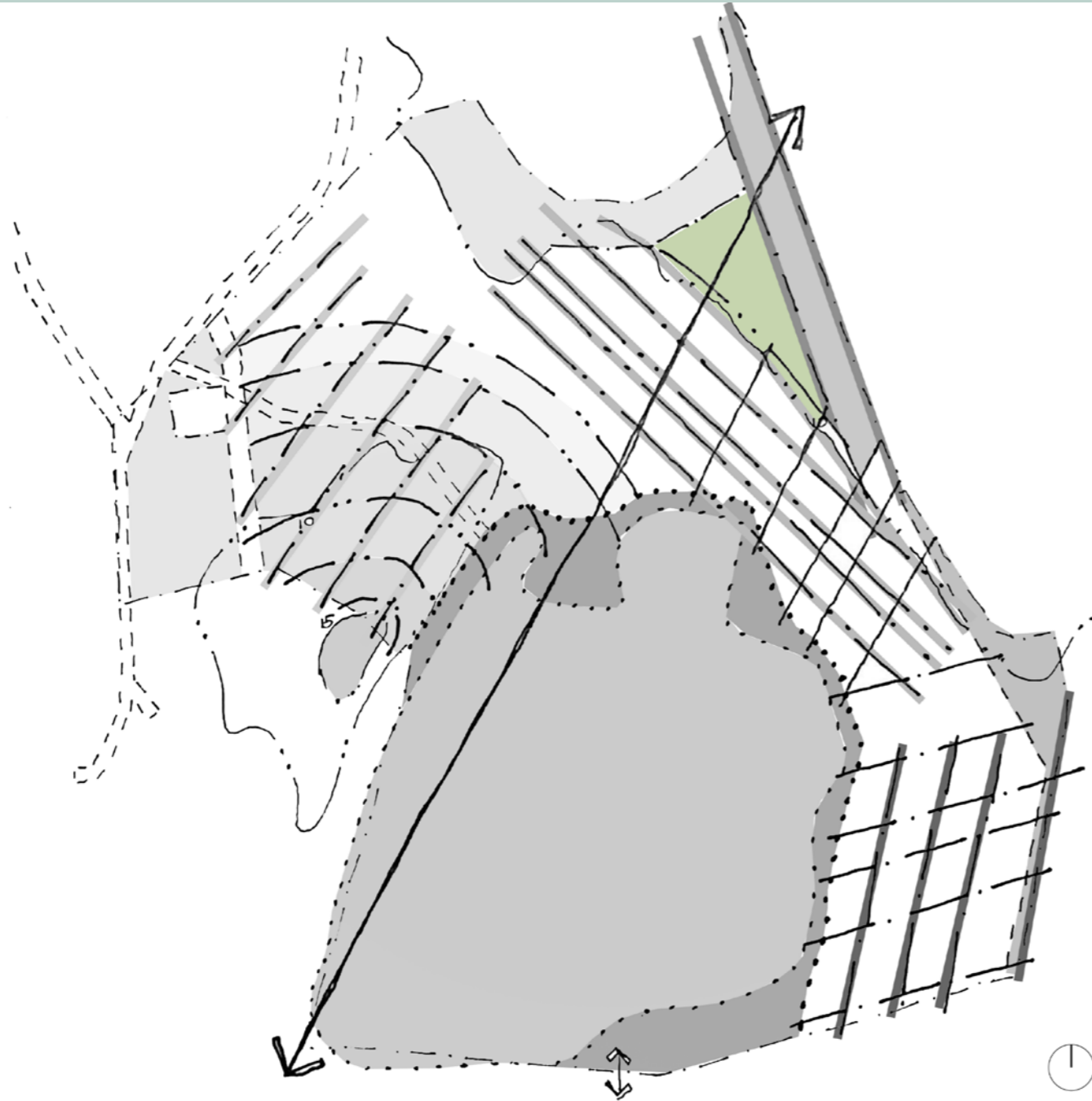


Figure 151: Optimal Building Placement (Author, 2021).

6.5 Cemetery 'Garden' Layout



Site Plan Layout
Not to Scale

legend

1. landscape frame space (stone)
2. green funeral parlour
3. entrance gate to cemetery 'garden'
4. botanical nursery building
5. landscape frame space (timber)

Figure 152: Cemetery Garden Grid (Author, 2021).

6.6 Structural Touchstone

Aim

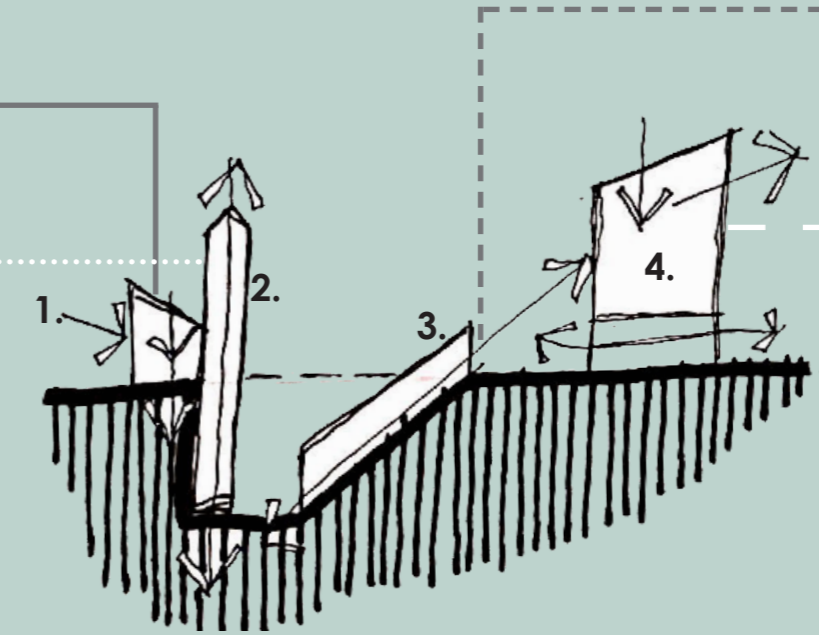
The structural touchstone aims to explore how the structural design relates to the conceptual understanding of the proposal introduced by the design touchstone, this being the expression different narratives of different spaces and how they each relate a time period, the past, the present or the future. This is done by separating the architecture which celebrates life (the nursery) and that more focused on death (funeral parlor) by playing with the difference between above the ground and below the ground (brought on by the planes of life and death in the design touchstone) and how these can be connected through a historical memorial to assemble the overall narrative of the proposed design.

	Funeral Parlor	Memorial	Nursery Building
1. Above & under ground	Cutting into the earth	Coming out of the ground to on above the ground	Above the ground Light structure to respect the site (non-destructive)
2. Structure	Heavy structure rooted in the earth (dramatic)	Heavy structure rooted in the earth (dramatic)	Light structure to respect the site (non-destructive)
3. Light	Little light used for dramatic effect to express the narrative	Little light used for dramatic effect to express the narrative	More light for calming atmosphere representing new life
4. Material justification	Stereotomic- Stone or earth taken from the site and plastered brickwork for cold/ sacredness Timber details for warmth and connection to the purpose	Stereotomic- Stone or earth taken from the site and plastered brickwork for cold/ sacredness Timber details for warmth and connection to the purpose	Tectonic- Timber structure (To connect to the purpose which celebrates local flora) Metal sheeting (To resemble a shed - gardening)

Figure 153: CONSeption Touchstone Development Table (Author, 2021).

1. Through the Entrance with the Roof Highlighting the Entrance by Hierarchy

2. Down Into the Funeral Parlor which creates a Point of Hierarchy in the Design (creating the Axis Mundi)



3. Through the Memorial Space Going Up as the Conditions for the Slaves Got Better Over Time To the Present where there are no Longer Slaves

4. Up into the Nursery Building Representing New Life through Flora with the Arrow Pointing Down Showing the Letting in Of Natural Light. The Building is Lifted Above the Ground to make way for the Animals that Inhabit the Site Currently

Figure 154: CONSeption Touchstone Development Sketches (Author, 2021).

The touchstone represents different types of construction (Funeral parlor- stereotomic cutting into the earth, the memorial- placed on the site and the nursery- tectonic and placed lightly on the site), each chosen with specific materials in mind for a certain space to create certain atmospheres in each space expressing their different narratives. The different spaces will be linked through with a timber datum element etched into the narrative route. This continuous element moves through the design, independent of the kind of space to connect the different spaces through timber, a material which symbolizes life but also that something can be made of a life after death, relating back to the purpose of a green burial.

How the Shapes Were Merged To Create the Touchstone Design

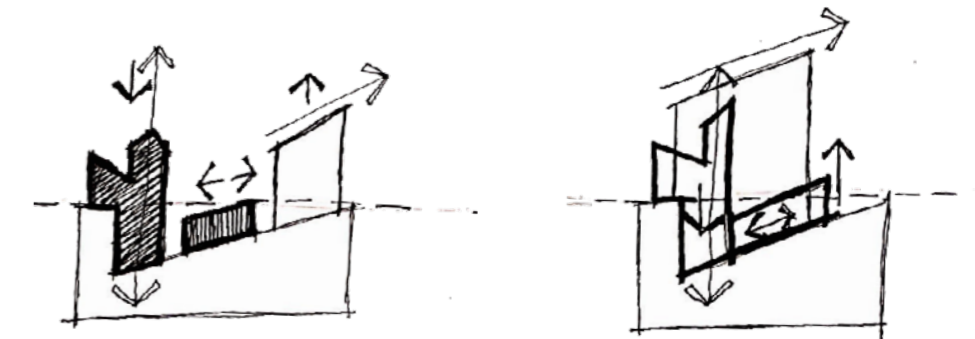
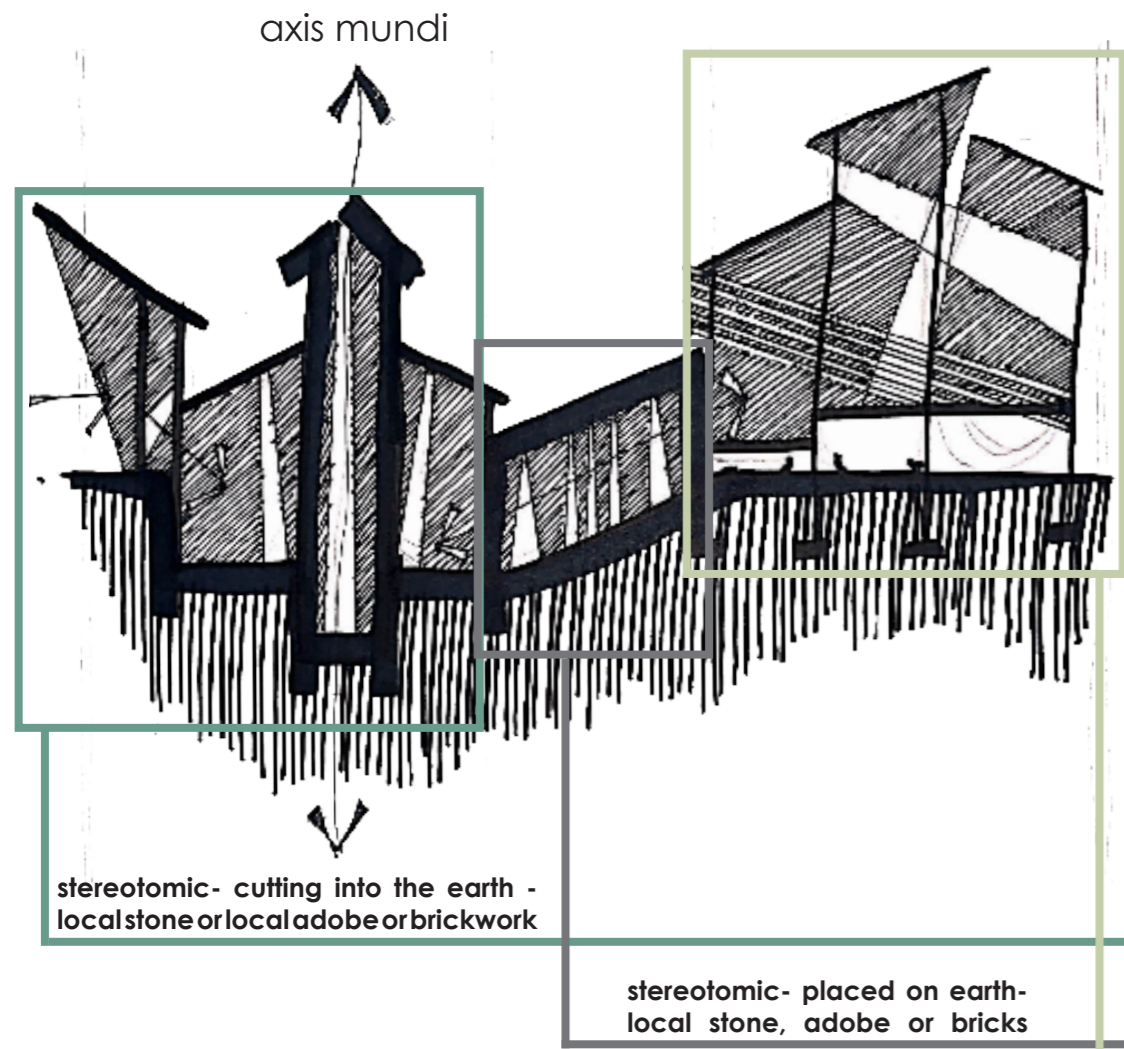
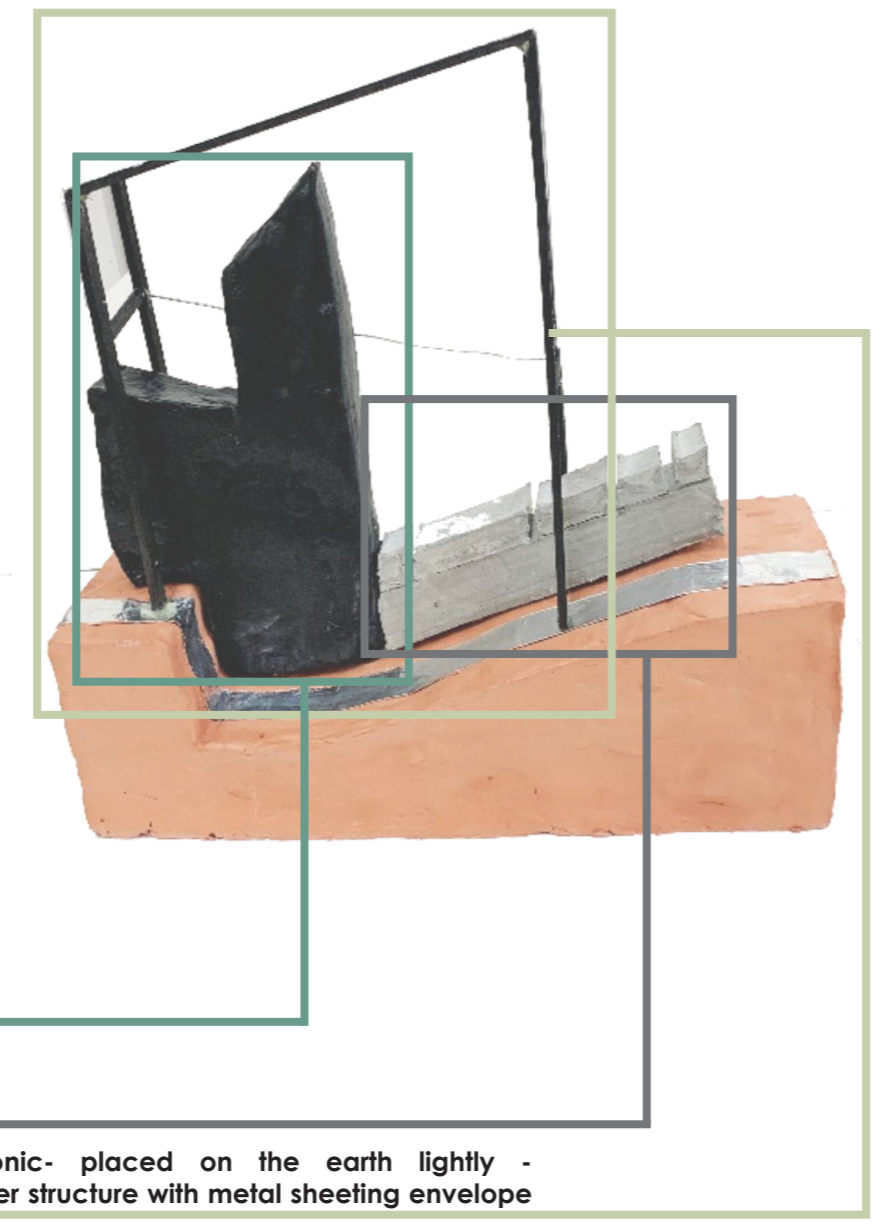


Figure 155: CONSeption Touchstone Development Sketches How the Shapes Were Merged to Create the Touchstone (Author, 2021).



stereotomic- cutting into the earth - local stone or local adobe or brickwork

stereotomic- placed on earth- local stone, adobe or bricks



tectonic- placed on the earth lightly - timber structure with metal sheeting envelope



Figure 158: CONSeption Touchstone Model Photographs (Author, 2021).

Nursery Building

tectonic, placed lightly on the earth
 - timber structure with metal sheeting envelope (relating to a garden shed)
 - much light (new life)

Memorial

stereotomic, placed on the earth
 - local stone, adobe or plastered brick or possibly a combination of materials for the installation
 - evocative light and cold materials

Funeral Parlor

stereotomic, cutting into the earth
 - local stone, adobe or plastered brick load-bearing structure or possibly a combination
 - evocative light and cold materials with warm detailing in timber

Linking Datum

a timber datum placed into an etching in the pathway along the narrative route to link the spaces

The site

cut into and materials dug out used to build with or the building is placed on the site, keeping it as is for conservation

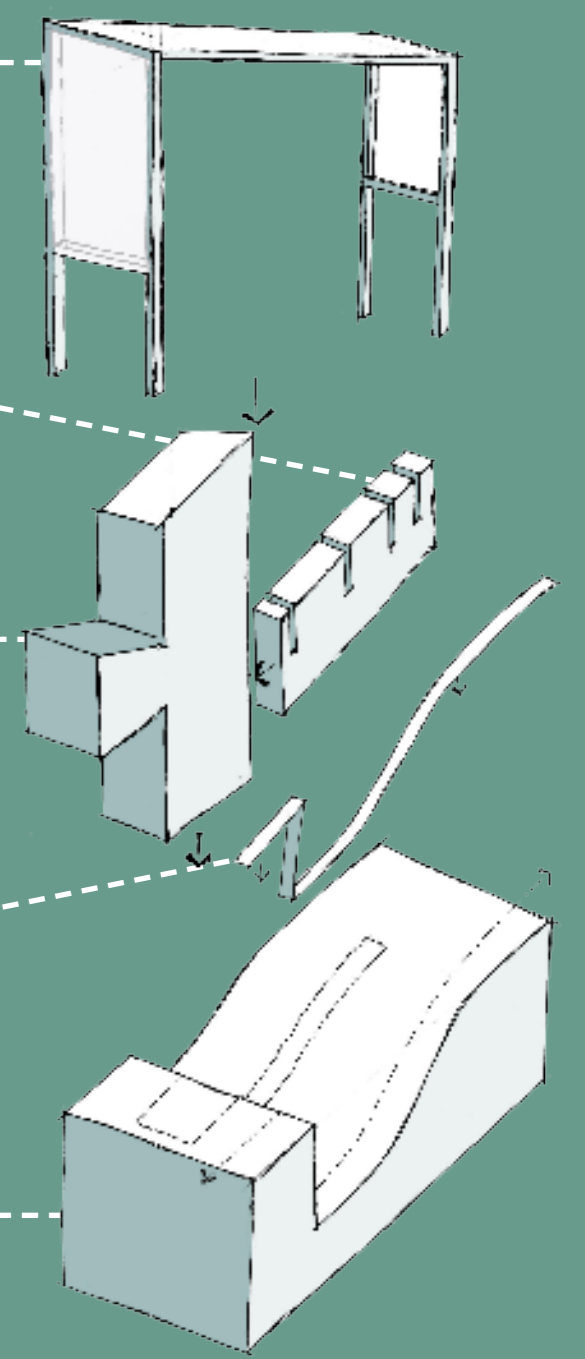


Figure 159: CONSeption Touchstone Model Explosive View (Author, 2021).

Figure 156: CONSeption Section from Structural Touchstone (Author, 2021).

Figure 157: CONSeption Touchstone (Author, 2021).

6.7 Precedent Study: Bushey Cemetery designed by Waugh Thistleton Architects

Located in Hertfordshire (London), UK and completed in 2017.

Client:	United Synagogues
Building typology:	Jewish cemetery
Site area:	64749.7m² (London Green Strip)
Structural engineers:	Elliott Wood Partnership
Architectural elements:	<ul style="list-style-type: none"> -2 x Prayer Rooms -Prayer arch -2 x Cohanim Rooms -2 x Hand washing areas -Mortuary -Reception -Meeting point & arrival space
Structure Type:	-Load bearing earth construction
Materials:	<ul style="list-style-type: none"> -Rammed Earth structure -Timer (oak) paneling -Larch glulam beams -Terracotta tiles -Corten steel details

6.7.1 Function

This design is that of a Jewish cemetery which sits in the beautiful site of the London green belt. This cemetery extension was design around the landscape to be as respectful to what is already there as possible, this resulting in a building which is complementary to the natural context. This design is so sensitive to the landscape that in a few decades time, when the cemetery is fully occupies, the building intends to be taken apart, returning the land on which it sits back to the green belt.



Figure 160: Bushey Cemetery In Use, Exterior View (González, 2018: Online).

Working in a site of natural importance is a difficult task especially when faced with the design of architecture of the dead as these designs are associated with its groundedness and heaviness to connect the mourners with the ground in which they bury their loved ones, Waugh Thistleton Architects in the design of the Bushey Cemetery used their imagination, innovation but also ancient building techniques to find the balance between the building and the landscape.

6.7.2 Climate

According to ClimateData.org, London has a temperate climate with much rainfall throughout the year, reaching the maximum temperature of 22 °C in its summer period (June-August) and a minimum of 2 °C in its winter (December-February) with its annual rainfall reaching 690mm as seen in figure 162 below (Climate-data, 2019: online).

The high rainfall would usually call for a very durable building material such as brickwork or concrete but rammed earth was used for symbolic and sustainability reasons, this rammed earth was most likely stabilized to not erode over the 60 year period especially because the walls are not protected by the roof if any way.

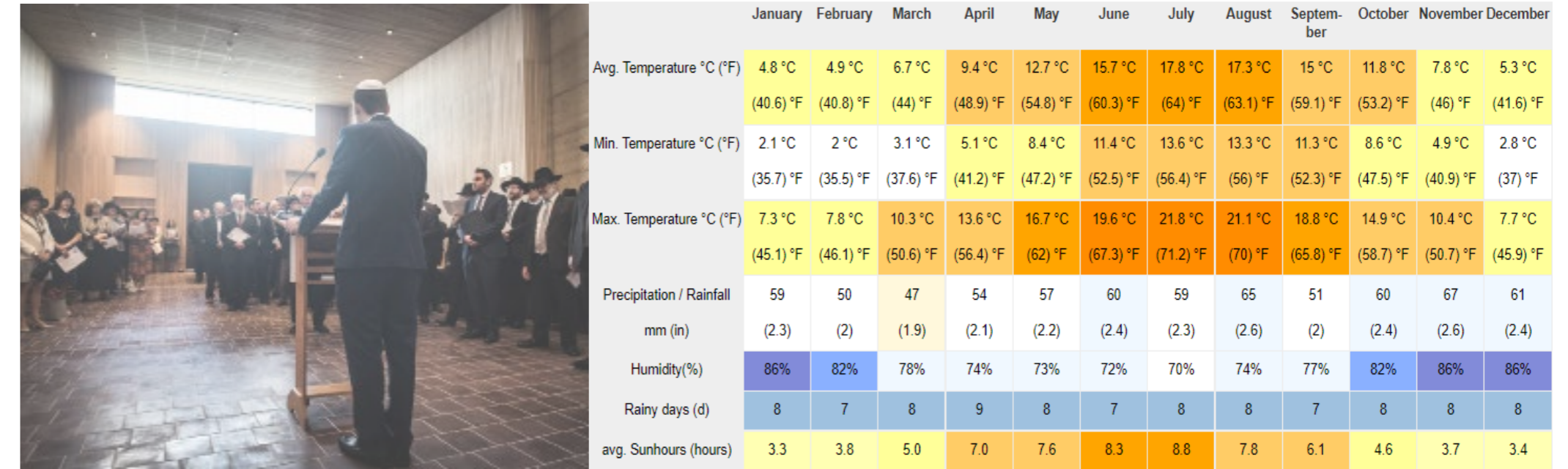


Figure 161: Bushey Cemetery In Use, Interior View in the Prayer Room (González, 2018: Online).

Figure 162: London Climate Summarised (Climate-data, 2021: Online).

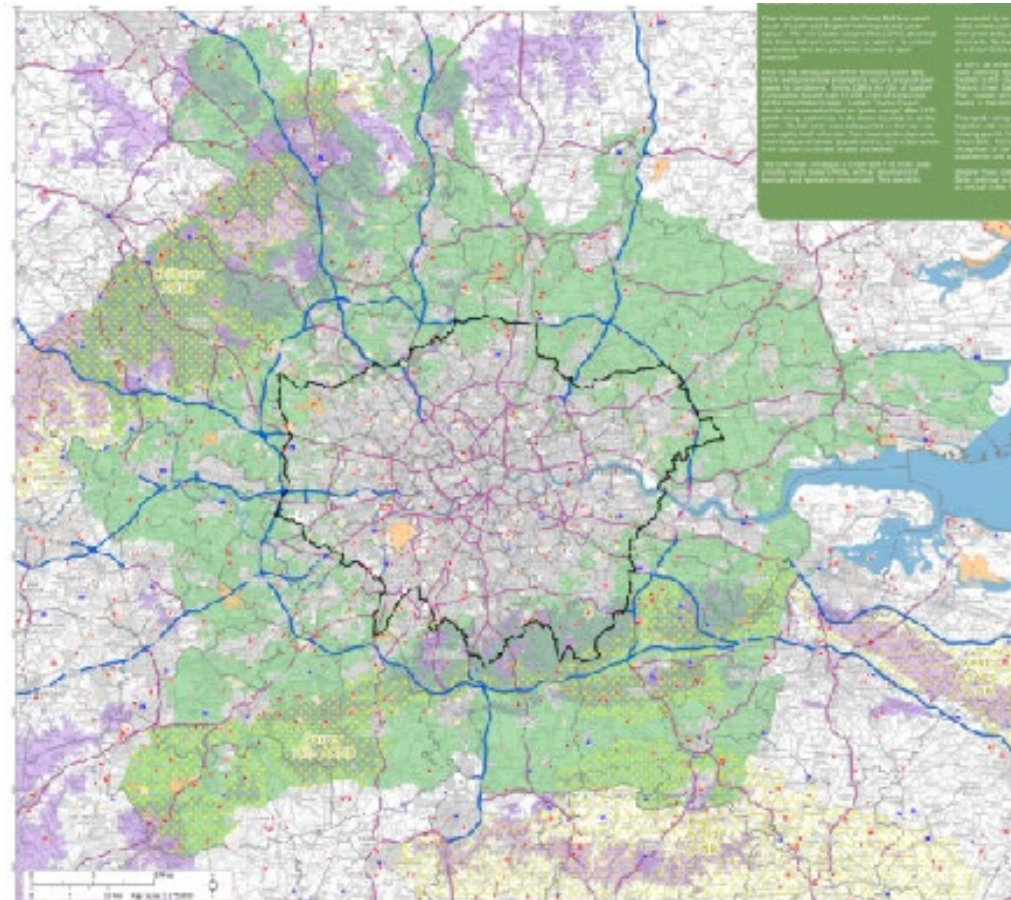


Figure 163: Map of the London Green Belt – folded version (Unknown, 2018: Online).

6.7.3 Context and Material Availability

The cemetery lies within the London Green Belt (represented as green in the map-figure 163) which aims to provide open spaces and prevent the sprawling of the growing of built up areas. Within this area, approval from the London Green Belt Council, needs to be given (only in special circumstances such as for a cemetery building which will eventually be taken down), for the construction of new or renovations to old buildings to take place.

Although the context allows for abundantly available materials as the location is thriving in terms of construction and manufacturing, this precedent makes use of earth construction methods to celebrate the materials found on site. This is to decrease the impact on the site and its sensitive ecosystem, caused by constant the delivery of materials. This approach also means that any excavated materials do not go to waste but are celebrated in the precedent building- also connecting to the Jewish religion.

6.7.4 Site Planning & Program

Located in the London Green Belt which is covered in nature but part of a smaller Erf (as seen in figure 165), this site consists of the cemetery with processional routes which guide visitor's through the gravesides, an arrival route which takes visitors to the mortuary and ceremonial buildings to the Eastern side of the site with a pond that lies to the East of the buildings. Orientated along the North-South axis, this building persuades the movement of individuals, especially along the timber colonnade processional route (González, 2018b: online).

The program of this site relates exclusively to the cemetery as this is the main function of the site at the present but in the future, when the cemetery is deemed full, the buildings will be taken away and the entire site will be dedicated to the nature in which it lies.



Figure 164: The Drive Up to Bushey Cemetery Through the Natural Landscape (González, 2018: Online).



Figure 165: Bushey Cemetery Site Plan (González, 2018: Online).

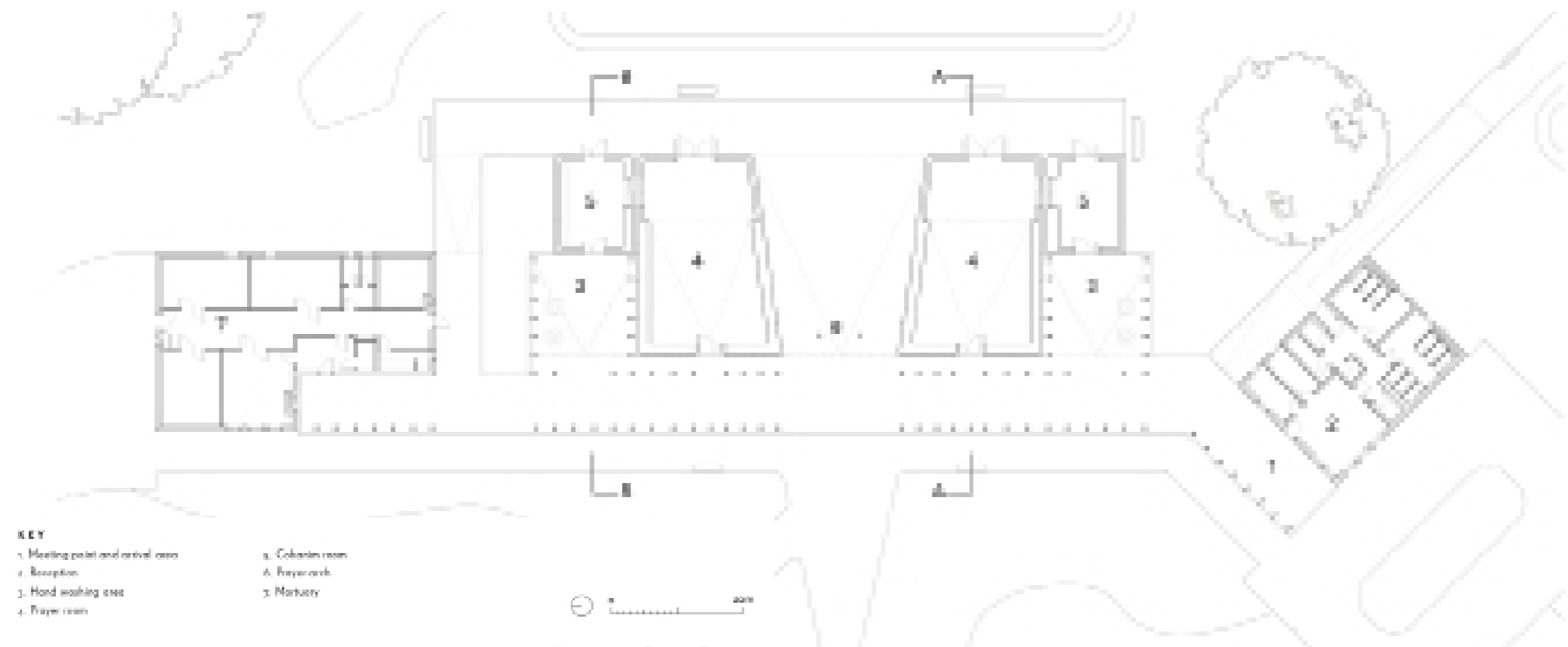


Figure 166: Bushey Cemetery Floor Plan by the Architects (González, 2018: Online).

6.7.5 User Behavior & Requirements

This being a cemetery design, the buildings need to accommodate for the 3 different parts of the funeral ritual seen above in figure 166, the first being the preparation of the body which happens before the funeral, this is covered by the mortuary building which lies to the West of the site. The second is the ceremonial aspect of the funeral which is divided into the last two sections, the arrival which is architecturally accommodated for in the small administration building to the East which harbors a reception and arrival meeting area.

Finally, the most important architectural requirement for the users is that of the ceremonial spaces which, in the Jewish ritual, include a Cohanim: room where decedents Aaron the High Priest (who should not come into any contact with or be less than 4 cubits from a Jewish body) wait for the body to be brought out of the funeral parlor which they will follow at a distance to mourn. These spaces also include a hand-washing area, prayer rooms and this precedent also includes a prayer arch which compliments the prayer rooms.

6.7.6 Form and Function

This crematorium, although small in terms of scale and mass, is monumental in how it uses materiality and light to create a sombre yet comforting atmosphere, especially within the sacred spaces where the rammed earth is left uncovered. The Morphology of these buildings are geometric load-bearing structures. When approaching the building, three different heights are noted in total, with the prayer rooms being the tallest structures which draws attention to their symbolic importance within the ritual. The next height is then taken by smaller geometric structures- the Cohanim rooms and finally, the third height is created by means of the larch glulam canopies which hover over the processional route.



Figure 167: Prayer Halls Exterior Elevation (Waugh Thistleton Architects, 2017: Online).



Figure 168: The Buildings on Approach (Waugh Thistleton Architects, 2017: Online).

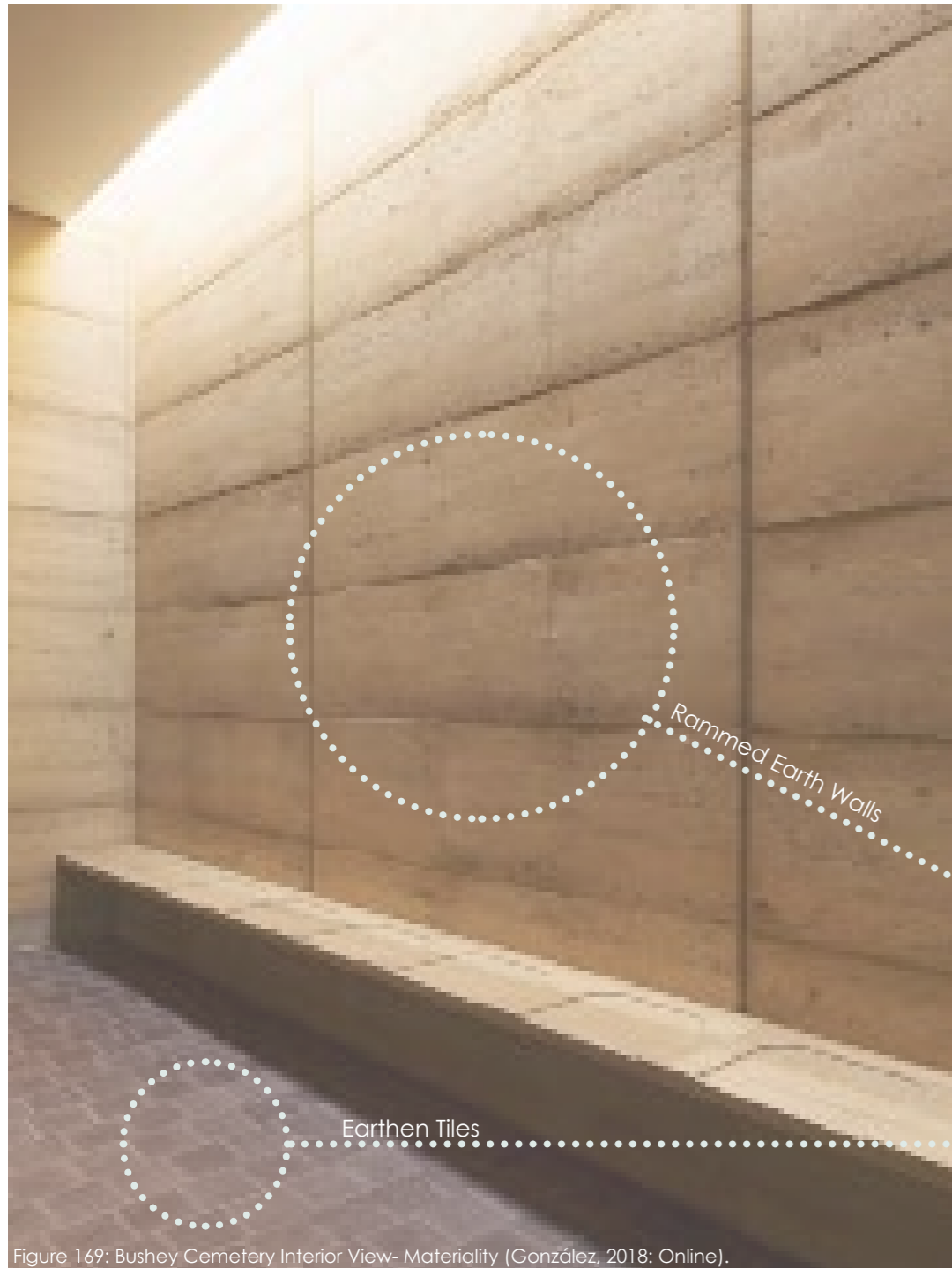


Figure 169: Bushey Cemetery Interior View- Materiality (González, 2018: Online).



Figure 170: Corten-steel Door Detail (Wagh-Thistleton Architects, 2017: Online)6

8.7.7 Materiality

As seen in figures 196 and 170, the precedent makes use of local rammed earth for the load bearing structure with timber used to clad internal spaces, this referring to the Jewish faith in how the deceased are laid to rest in simple timber coffins and their bodies returned to the earth (González, 2018b: online) but also adding a warm element to the space. The exposed cold rammed earth in the more sacred spaces adds to the spirituality of the space. Terracotta tiles, corten-steel, Timber paneling and larch glulam beams make up the rest of the materials used which speak to the connection of the design with nature surrounding it (González, 2018b: Online).

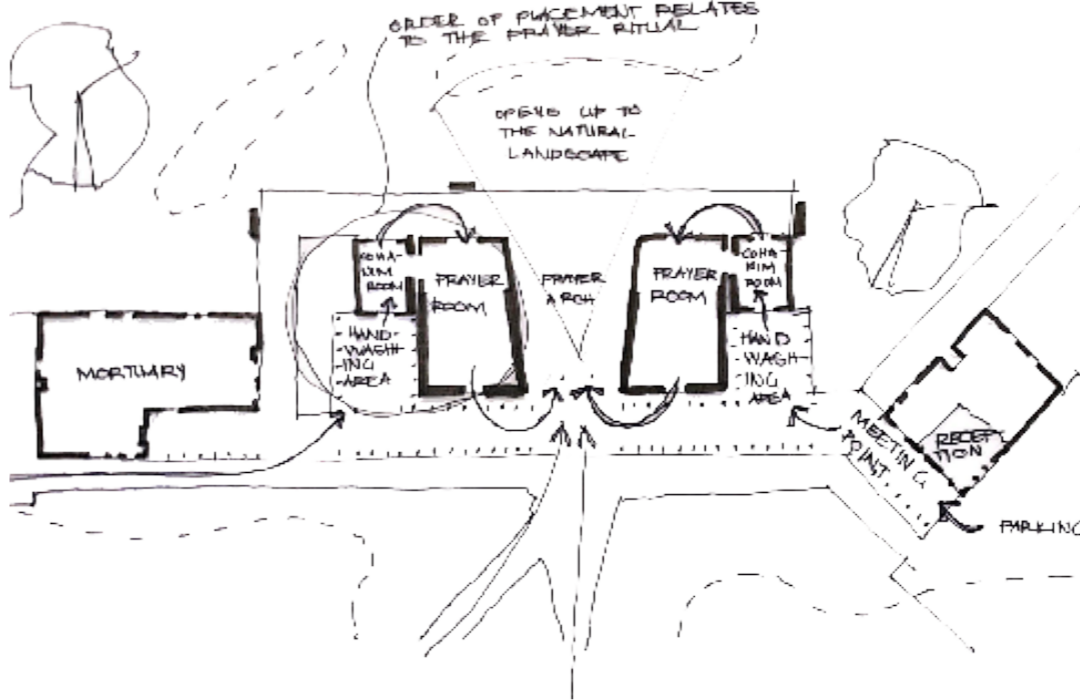


Figure 171: Bushey Cemetery Plan Analyzed in Terms of Ritual (Author, 2021).

6.7.8 Spatial Enhancement: Ritual and Spaces

This crematorium is designed around the certain ritual which the Jewish faith makes use of for the funerals by using the circulation throughout the spaces, moving from the outside of the building on the East and West to the center of it where the prayer arch is situated as seen in figure 171. This ritual of circulation is articulated by the timber (glulam larch) canopy structure which brings the mourners to the hand washing area and then to the prayer room. In the prayer rooms the use of the oak paneling and the bulkhead to accentuate the entrance creates a humanized comforting space which then opens up into the sacred area where the prayers within the ritual take place. The lifting of the roof in this space represents the all important axis mundi.

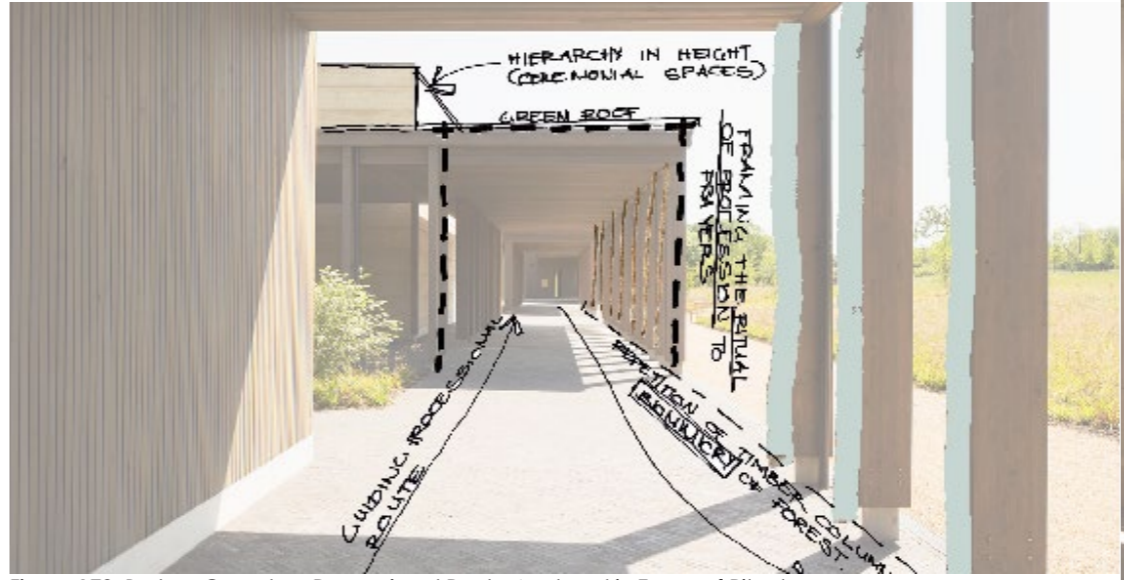


Figure 172: Bushey Cemetery Processional Route Analyzed in Terms of Ritual Analyzed by Author (González, 2018: Online).

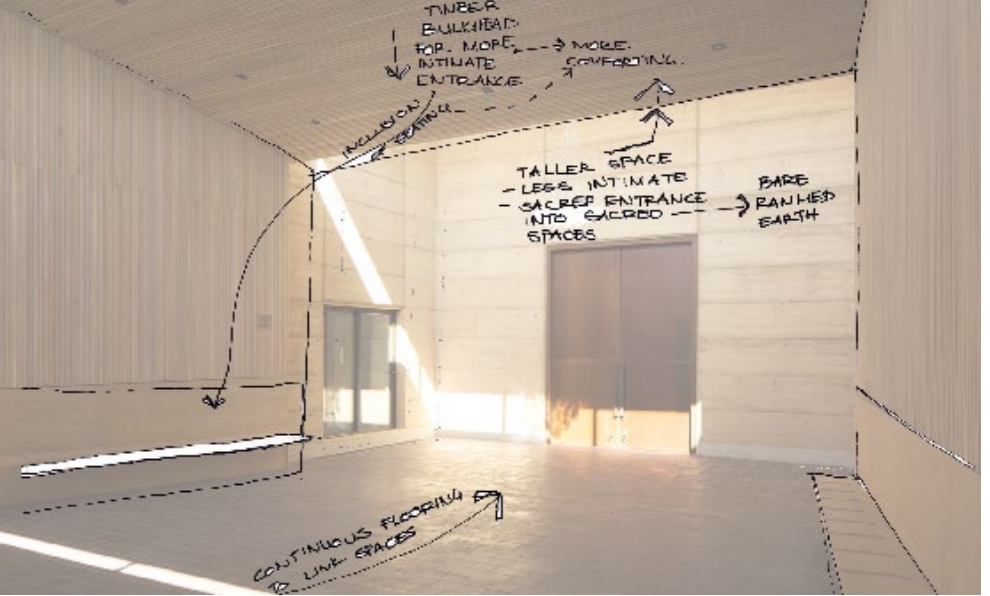


Figure 173: Bushey Cemetery Interior Analyzed in Terms of Ritual Analyzed by Author (González, 2018: Online).

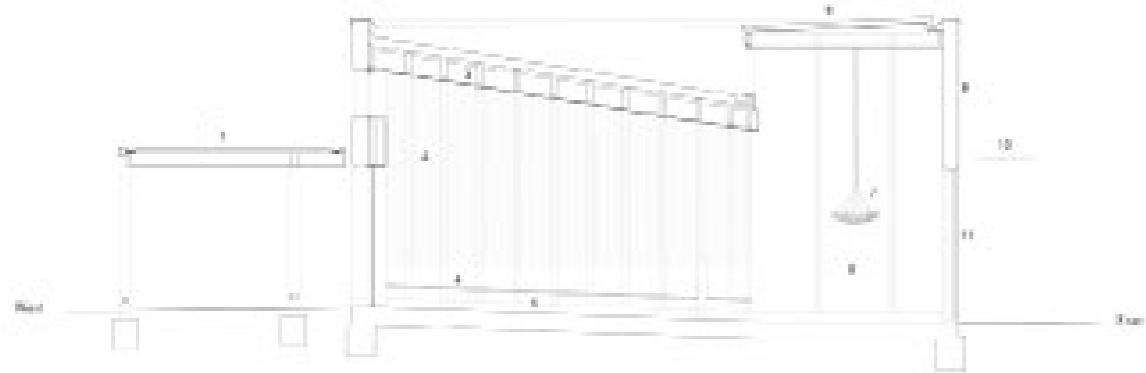


Figure 174: Bushey Cemetery Section by the Architects (González, 2018: Online).



Figure 175: View from the Processional Route, Side (Waugh Thistleton Architects, 2017: Online).

6.7.9 Lessons From This Precedent

This precedent speaks to the construction of the design, inspiring the use of natural local materials within the proposed design, probably not the use of rammed earth due to the process being a imposing one to the surrounding nature, but possibly the use of local stone and compressed earth blocks. It also portrays the intended tectonics for the funeral parlor in its solidity, monumentality of the load-bearing structure but through the natural materials, a warmth and therefore some comfort is still created. The green roof which is used above the processional route could also be a good addition to the proposed design, possibly as a linking element which is used both in the funeral parlor as well as the botanical nursery design as it is yet another way of contributing to the surrounding ecosystem while simultaneously creating an interesting design detail.

funeral parlor tectonics, earth materiality, aesthetic



Figure 177: Bushey Cemetery View from Prayer Rooms During Construction (Waugh Thistleton Architects, 2017: online).

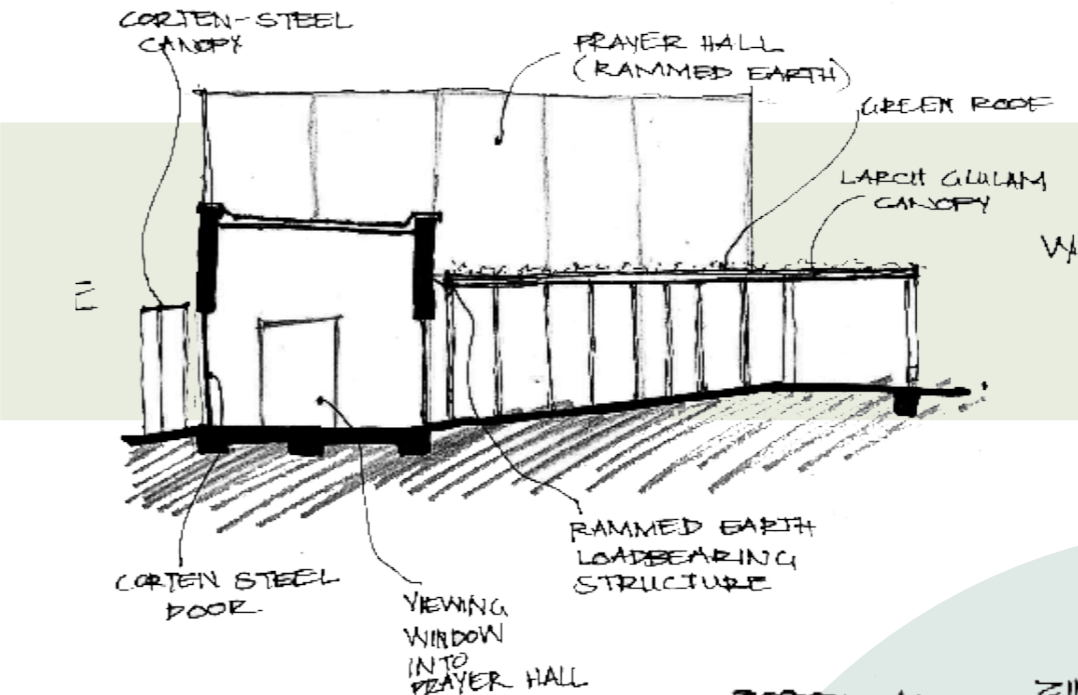


Figure 178 :Bushey Cemetery Exploration Sketch 1 (Author, 2021).

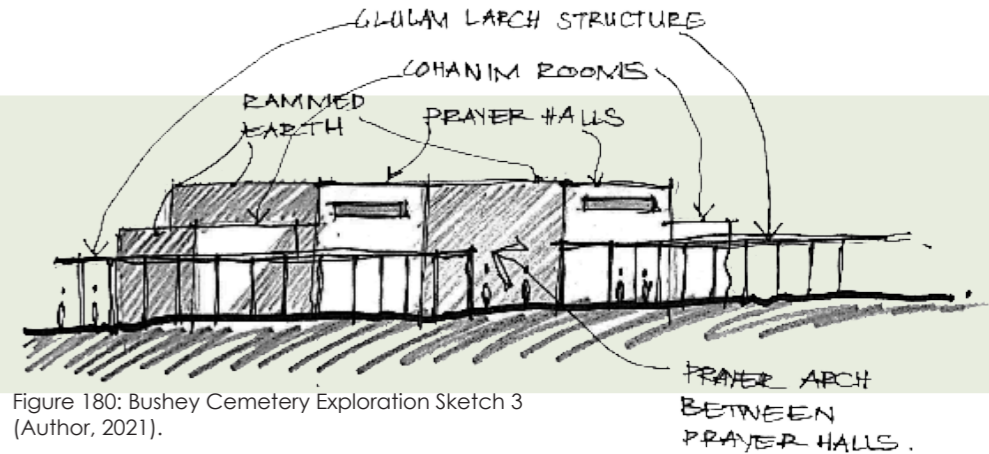


Figure 180: Bushey Cemetery Exploration Sketch 3 (Author, 2021).

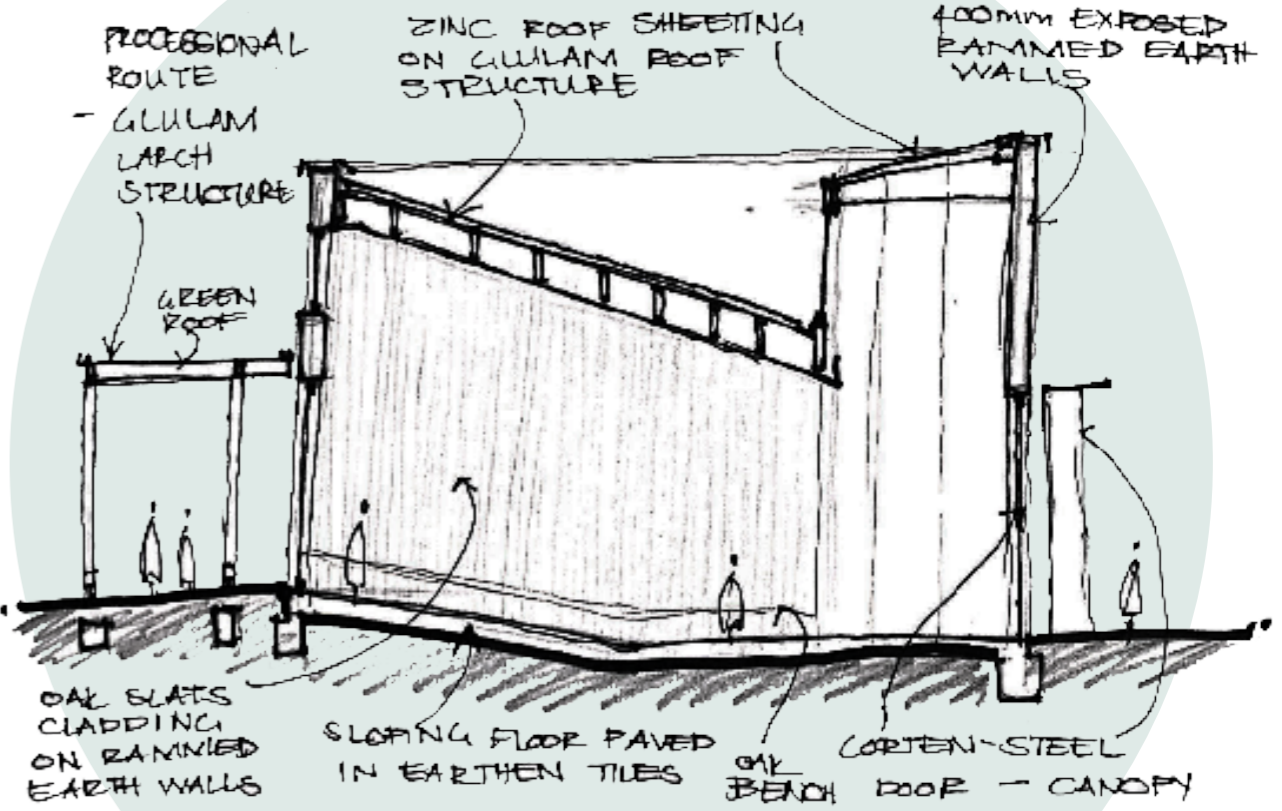


Figure 179: Bushey Cemetery Exploration Sketch 2 (Author, 2021).

6.8 Precedent Study: Sancaklar Mosque designed by Emre Arolat Architects

Located in Istanbul, Turkey and completed in 2014

Building typology:	Mosque
Client:	Sancaklar Foundation
Site area:	700m²
Architectural elements:	<ul style="list-style-type: none"> -Main prayer hall -Foyer -Shoe storage room -Wash rooms -Walled off garden -Pool of water
Structure Type:	<ul style="list-style-type: none"> -Load bearing concrete structure sometimes clad in stone -Load bearing stone landscaping walls
Materials:	<ul style="list-style-type: none"> -Pebble Reinforced Concrete -Stone -Timber Detailing -Anti-bacterial Carpet -Planted Roof -Tempered and Laminated Glass

6.8.1 Function

This design is that of a Mosque where Muslims are able to congregate for prayer. The architects of this Mosque aimed to separate this precedent design from the typology associated with the Mosque and rather focus on the “essence of religious space” (Unknown, 2014: Online).

8.8.2 Climate

As seen in figure 182, according to ClimateData.org, Istanbul has a warm and temperate climate with rainfall throughout the year, but with a higher rainfall in winter than summer. This area reaches the maximum temperature of 28°C in its summer period (June-August) and a minimum of 4°C in its winter (December-February) with its annual rainfall reaching 728mm (Climate-data, 2019: Online).



Figure 181: Broad Steps Lead down to the Entrance (Mayer, 2014b: Online).

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	6 °C (42.9) °F	6.5 °C (43.8) °F	8.5 °C (47.3) °F	12 °C (53.6) °F	16.9 °C (62.5) °F	21.7 °C (71) °F	24.3 °C (75.8) °F	24.6 °C (76.3) °F	21.1 °C (69.9) °F	16.4 °C (61.5) °F	12.2 °C (54) °F	8.1 °C (46.6) °F
Min. Temperature °C (°F)	3.8 °C (38.8) °F	4.1 °C (39.4) °F	5.5 °C (42) °F	8.5 °C (47.4) °F	13.4 °C (56.1) °F	18.2 °C (64.7) °F	20.9 °C (69.6) °F	21.7 °C (71) °F	18.3 °C (64.9) °F	14 °C (57.3) °F	9.9 °C (49.9) °F	6 °C (42.8) °F
Max. Temperature °C (°F)	8.2 °C (46.8) °F	9 °C (48.2) °F	11.4 °C (52.5) °F	15.4 °C (59.7) °F	20.3 °C (68.6) °F	25 °C (77) °F	27.7 °C (81.9) °F	28 °C (82.4) °F	24.1 °C (75.3) °F	18.8 °C (65.9) °F	14.6 °C (58.2) °F	10.2 °C (50.3) °F
Precipitation / Rainfall mm (in)	88 (3.5)	75 (3)	75 (3)	50 (2)	38 (1.5)	35 (1.4)	26 (1)	24 (0.9)	52 (2)	80 (3.1)	78 (3.1)	107 (4.2)
Humidity(%)	79%	77%	75%	75%	73%	70%	69%	69%	70%	75%	77%	78%
Rainy days (d)	10	9	8	6	5	4	3	3	5	7	8	10
avg. Sun hours (hours)	5.0	5.8	7.4	9.4	10.8	11.8	11.7	10.6	9.1	6.9	6.0	5.0

Figure 182: Istanbul Climate Summarised (Climate-Data, 2021: Online).

Figure 183: (Mayer, 2014a: Online).



6.8.3 Context and Material Availability

This Mosque lies within the bustling Capital of Turkey in the sub-urban neighborhood of Buyukçekmece. Situated in a prairie landscape, this mosque is separated from the homes by a highway as seen below in figure 186. Situated in the city capital, this precedent had abundant availability of materials and a site which allowed for the easy access which made it possible for the architects to use various materials of their choosing to best create the desired emotive atmosphere within the building.



Figure 184: Sancaklar Mosque Google Maps Edited By Author (Google Maps, 2021: Online).



Figure 185: Sancaklar Mosque Terraced Entrance in Use (Mayer, 2014b: Online).



Figure 186: Buyukçekmece - Istanbul - Turkey (Melares Tv, 2020: Online).

6.8.4 Site Planning & Program

As mentioned earlier, this precedent is located in the suburban neighborhood of Buyukçekmece which presents a challenge as there are constantly people walking around and making noise and this being a prayer space which craves peace and exclusion from the outside. There are two main elements which aid in the privacy of the site being the highway that separates this site from others and the slope which down moves away from the residential areas.

The program is almost exclusively related to the accommodation of the Mosque other than that of visitor's for the architecture. Around the outer periphery of the structure, on top of the hill, is the vehicular access and parking for the Mosque as seen in figure 187. This does not need to be extensive in size as many of those visiting for prayer will be able to walk from their homes, making this Mosque well situated.



Figure 187: Sancaklar Mosque Site Plan by the Architects Analysed by the Author (Mairs, 2015: Online).

6.8.5 User Behaviour & Requirements

This precedent follows the ritual of the Muslim daily prayers called *salat* in its planning with an emphasis on the prayer ritual in the hierarchy created by the large size of the prayer hall. The first step of this ritual is that of purifying the individuals by performing ritual ablutions or *wudu* where individuals wash their hands, then rinse off their nose and mouth followed by the washing of the face, ears, arms, hair and finally washing their feet. This process takes place in ablution areas as seen in figure 188 below.



Figure 188: Wash rooms (Mayer, 2014a: Online).

The individuals then move on to the prayer hall where they face the Qiblah wall which is orientated towards Mecca and usually stand on prayer mats which act as a protective barrier between the individual and the 'polluting' ground (Aslan, 2019: Online). The prayer begins by reciting "Allahu akbar" (God is greater) with raised hands. Once the prayer ritual is complete after following several other rites, (Katz, 2004).



Figure 189: Little boy praying alongside his father during Ramadan (Rawpixel, 2018: Online).

6.8.6 Form and Function

This Mosque does not draw attention to itself through massing but rather celebrates a paired-back building that sits harmoniously within its landscape, this bringing the mosque to its fundamental purpose of creating a sacred place of prayer. This hidden geometric stereotomic structure is nestled into the fall of the site and slightly cuts into the earth which, from street level above, only hints at a structure below through the exposed roof and the tall minaret as seen in figure 181. This minaret is a tower usually with a balcony on which the call to prayer is made (President and Fellows of Harvard College and the Pluralism Project at Harvard University, 2020b: Online). The planting on the green roof as seen in figure 192 allows some of the roof canopy to disappear into the landscape merging the building and the site which adds to the harmonious relationship between this precedent and its surroundings.



Figure 190: View from Street Level (Mayer, 2014a: Online).



Figure 191: Sancaklar Mosque Looking Down the Terraced Steps to the Entrance (Mayer, 2014a: Online).

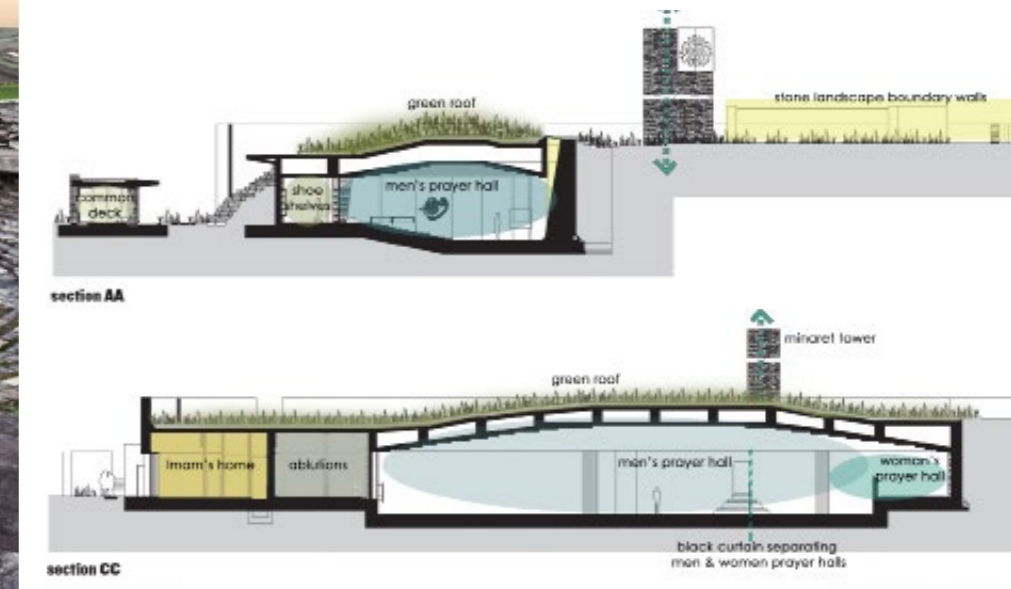


Figure 192: Sections by the Architects Analysed by Author (Mayer, 2014b: Online).

6.8.7 Materiality

This precedent creates a narrative through a juxtaposition the use of its materials, going from a more natural and rough use of stone and vegetation (seen in figure 184 and 192) with a small amount of exposed concrete on the exterior to a stark monotonous concrete space that is articulated through clean lines (figure 195 and 198). This creates the narrative of purity within the prayer space as if people are rough and impure yet beautiful but become more pure through the process of prayer. Here, the use of a water feature (seen in figure 196) as part of the entrance is not only a beautiful addition to the space but symbolises washing and becoming pure as Muslims do before they enter the pure and sacred prayer space.

The tiered concrete floor and ceiling within the prayer hall create a cavernous feeling in the space. The monotonous uniformity of the material allows for recurring design elements such as the ribbed ceiling to be highlighted and the dramatic use of natural light from skylights above celebrates the material as an artwork on display as seen in figure 198.

Figure 193: Sancaklar Mosque Exterior Materiality (Mayer, 2014a: Online).



Figure 194: Sancaklar Mosque Concrete Prayer Hall (Cave) (Mayer, 2014a: Online).



Figure 195: Sancaklar Mosque Entrance Ritual (Cave) (Mayer, 2014a: Online).

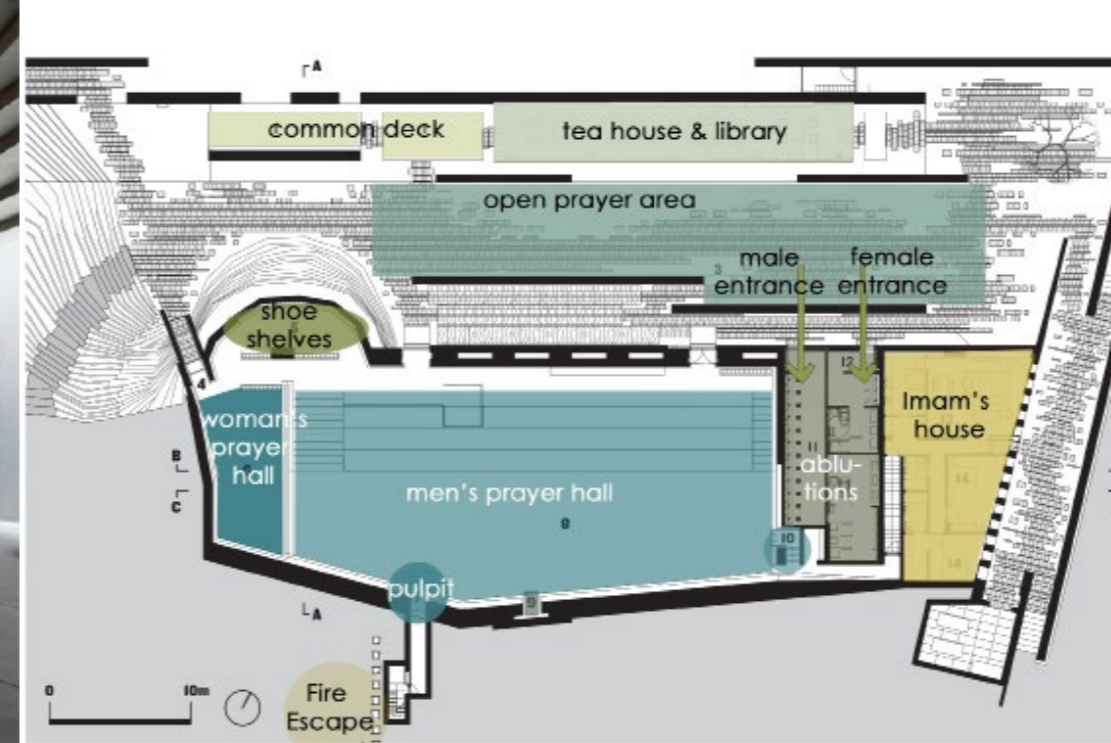


Figure 196: Floor Plan by the Architects Analysed by Author (Mayer, 2014b: Online).

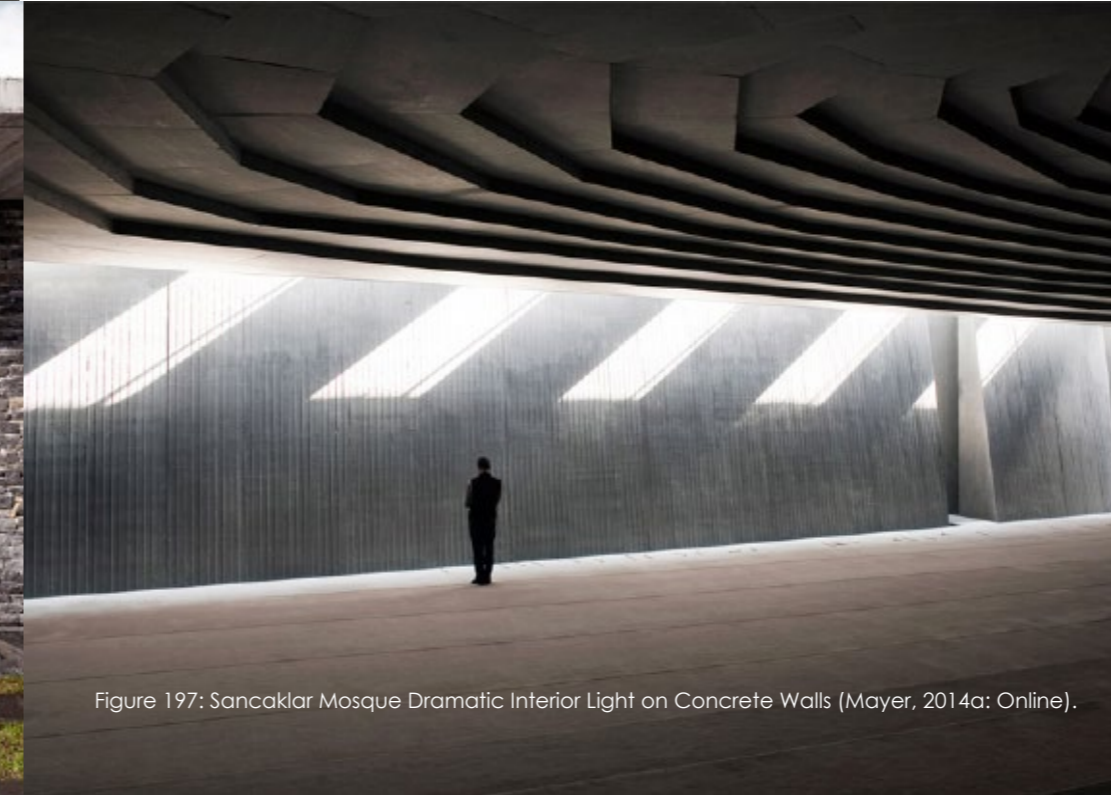


Figure 197: Sancaklar Mosque Dramatic Interior Light on Concrete Walls (Mayer, 2014a: Online).

6.8.8 Spatial Enhancement: Ritual and Spaces

High boundary walls located in the upper courtyard separate the sacred space from the "chaotic outer world" (Unknown, 2014: Online). The pathway as seen in figure 191, is paved with stone stairs that fade into the grass and become one with the site, guiding the visitors to the building on the lower portion of the slope. This terracing creates a "tension between man made and natural" (Unknown, 2014: Online).

"The building blends in completely with the topography and the outside world is left behind as one moves through the landscape, down the hill and in between the walls to enter the mosque" says Emre Arolat Architects (Mairs, 2015: Online).

The ritual of entering the Mosque, the sacred space, is enhanced through the maneuvering through stone walls that enclose the garden and stepping over the stepping stones above the water feature to enter as seen in figure 196.

Once the visitors are within the building, the sacredness of the space is emphasised through the cave like feeling created by the concrete interior which replicates a dugout cave through the rippled ceiling design where the only light in the space is allowed in through 'cracks' in the envelope which highlight important elements (figure 194 and figure 197) such as the Qiblah wall (which orientates those within the Mosque to pray in the correct direction) and the pulpit creating an emotive space in which to pray.

This precedent speaks to the both the materiality of the proposed funeral parlor and the use of light in a evocative manner to create a sacred atmosphere within the different spaces.

With regards to materiality, the way in which stone was used as a cladding material to connect the building to the surrounding nature is successful and the contrast between the rough stone and the smooth concrete (as seen in figure 198 and 200) is a clever way to bring the narrative of the ritual of cleansing through prayer into the building. These materials also portray the intended tectonics for the funeral parlor and how monumentality and power can be achieved through simple, unornamented design.

The use of a green roof as seen in figure 192, is used again in this precedent which connects the precedent to its surroundings and also linking to the nursery element of the proposal but in this case, achieves this connection and harmony in a subtle way. The protruding of the roof from the earth makes for a seamless connection between the building and the site and is successful because of the site slope, something to consider for the proposed design but will have to be approached in slightly differently.



Figure 198: Sancaklar Mosque Skylights in Green Roof (Mayer, 2014b: Online).



Figure 199: Sancaklar Mosque Use of Stone, Concrete and Light for a Sacred Atmosphere (Mayer, 2014b: Online).

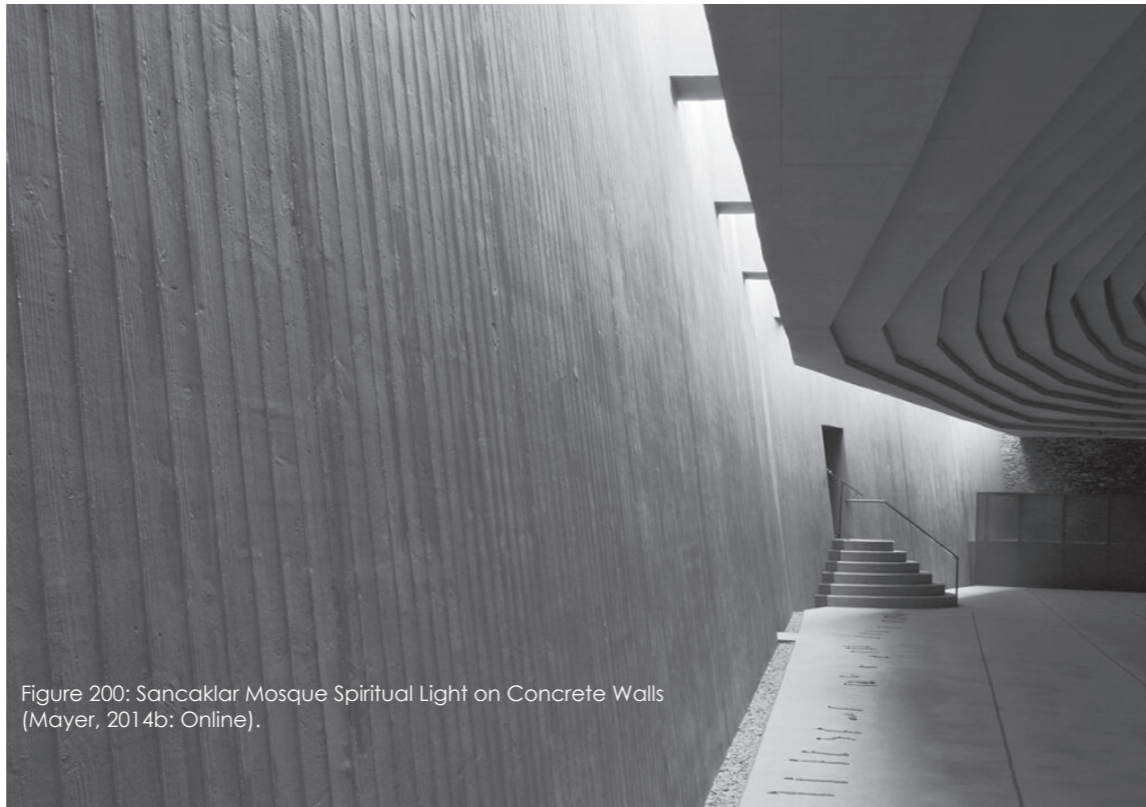


Figure 200: Sancaklar Mosque Spiritual Light on Concrete Walls (Mayer, 2014b: Online).

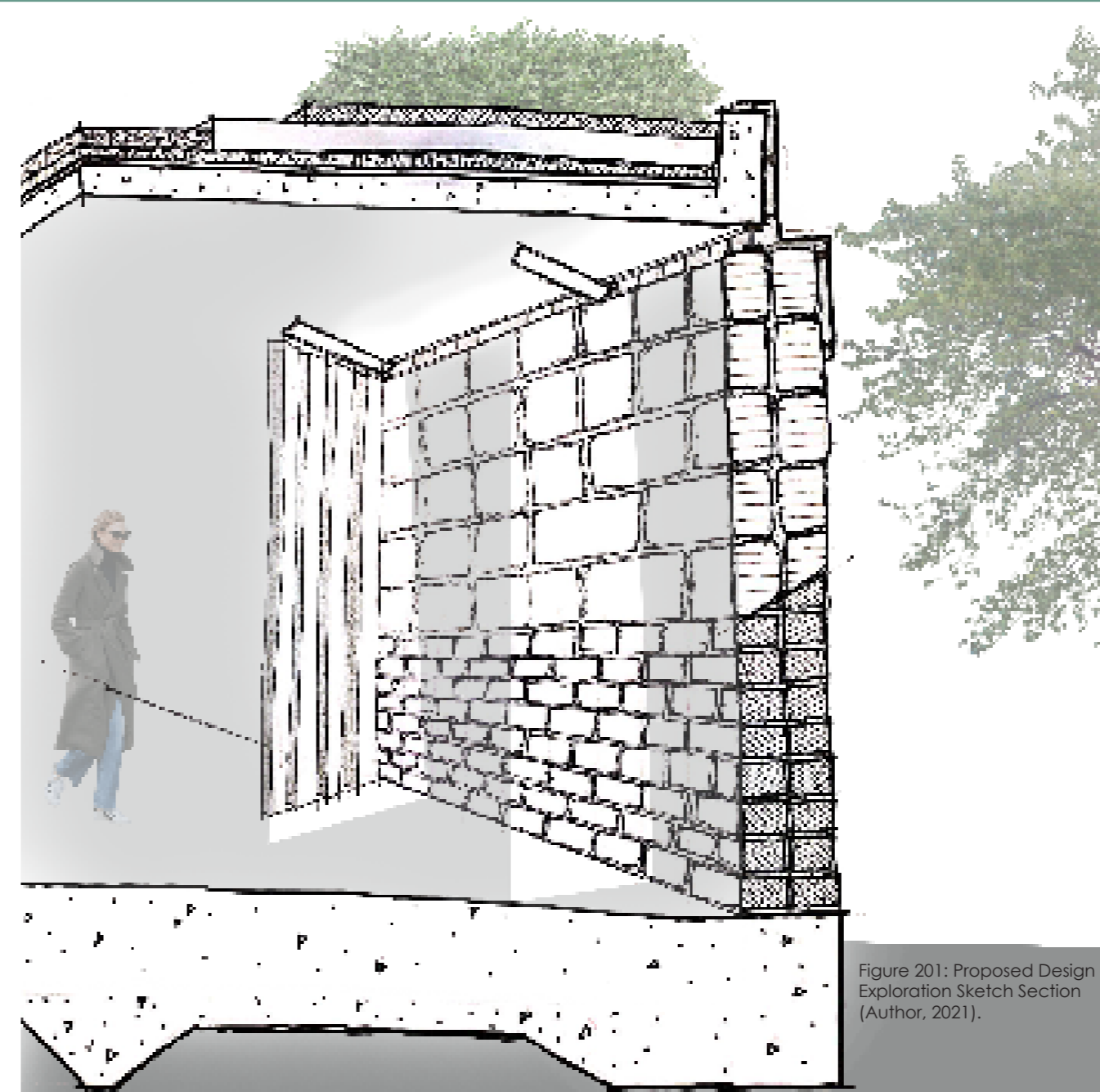


Figure 201: Proposed Design Exploration Sketch Section (Author, 2021).

The Bushey Cemetery and Sancaklar Mosque precedents influences not only the functional aspects of the proposed design funeral parlor but also the possible structure of it in how the building celebrates the local load-bearing materials which are excavated from the site to bring the mourners 'into' the ground as the bodies of their loved ones will be. This use of either Compressed Earth Blocks (Bushey Cemetery) or stone (Sancaklar Mosque) or even possibly a combination will create a sombre atmosphere as the precedents did. A warmth in color brought through by either the CEB's or the timber details will contribute to the comfort the mourners will feel within the space while the cold contributing to the sacred atmosphere. The atmospheres within the different spaces will be enhanced by the clever play on light as seen in the mosque. The theoretical application of Biophilia will not only be celebrated through lines of sight to the surrounding natural landscape but will also be emphasized by the use of a green roof (as seen in the mosque precedent) connecting the fifth facade with its surrounding, making use of the cooling properties of the green roof to cool the building when the wind outside becomes to harsh to open up the windows for any cross ventilation.

6.10.1 Earth Construction

Rammed Earth construction is an ancient technique of construction where damp earth (made up of sand, clay, gravel and possibly stabilizer), is laid in layers between form-work, and is compressed between each layer to create a structure. This method is used today for sustainability. This method of construction usually makes use of local materials and thus have a low embodied energy and little to no waste (Cao, 2020: Online).

The main concern of using this construction in the proposed design is that the site has a delicate ecosystem of a wetland and the compression of the process of making the blocks on site could disturb this ecosystem. It might be to pre-cast panels of rammed earth off site using the earth which is excavated and bring the panels back to be assembled but process will negate the sustainability aspect of the structure due to the energy needed to take the soil to another site, use electricity for the machinery to compress the blocks and then move them back to the site. Another approach could be to use the same soil but rather, using a manual compaction tool, compact it into Compressed Earth Blocks on site which will not have an impact of the surrounding environment while keeping some of the advantages associated with earth construction.

COMPARISON BETWEEN CEBs AND OTHER MASONRY MATERIALS					
Characteristics	Unit	CEB	Fired bricks	Adobes	Concrete blocks
SHAPE AND SIZE					
Type					
l x w x h	cm	29.5 x 14 x 9	22 x 10.5 x 6.5	40 x 20 x 10	40 x 20 x 15
APPEARANCE					
- Surface		smooth	rough to smooth	irregular	rough
- Visual aspect		medium to good	good to excellent	poor	average
PERFORMANCES					
- Wet compressive strength	Mpa	1 to 4	0.5 to 6	0 to 5	0.7 to 5
- Reversible thermal dilation	%	0.02 to 0.2	0 to 0.02	-	0.02 to 0.05
- Thermal insulation	W/m°C	0.81 to 1.04	0.7 to 1.3	0.4 to 0.8	1.0 to 1.7
- Density	kg/m³	1 700 to 2 200	1 400 to 2 400	1 200 to 1 700	1 700 to 2 200
- Durability		low to very good	low to excellent	poor	low to very good
USE IN MASONRY					
		load-bearing 	load-bearing 	load-bearing 	infill
		without render	without render	with render	with render

Figure 202: Comparison Between CEBs and Other Masonry Materials (Rigassi and CRATerre-EAG, 1985: Online).



Figure 203: Making CEBs Using a Fixed Unit Press (Caroll, 2015: Online).



Figure 204: Malmesbury Shale Cladding | Cape Town (Elem Stonemasonry, [n. d.]: Online).

Figure 205: The House of grandfather Marinho | Covolinteriores (Morgado, [n. d.]: Online).

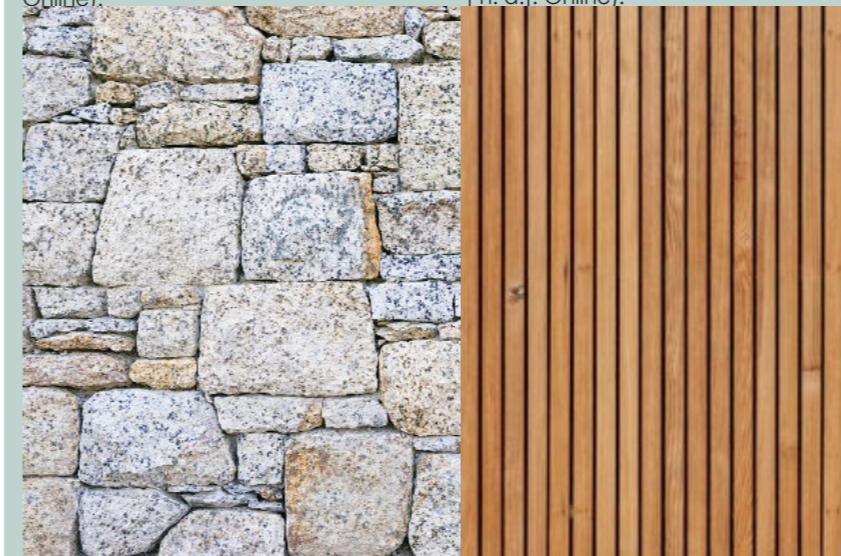


Figure 206: Cape Granite Ref.#030 (Uknown, [n. d.]: Online).

Figure 207: Balcony Decorating Ideas (ZHT, 2017: Online).

For the funeral parlor, there has been a going back and forth on whether to use CEB's or stone for the load-bearing structure but because of the heavy winter rainfalls seen in the area, the CEB's would erode over time and because it is proposed that after the use as a funeral parlor that the building be adaptively re-used as a seed bank, the CEB's are not the best choice especially for the envelope of the building. The materials which will be used here will include a concrete basement for waterproofing reasons, cavity brickwork for the load-bearing walls which will either be clad in the Malmesbury stone (as seen in figure 205) taken from the site during excavation (refer to the geological analysis of the site). This stone is chosen over the Cape Granite as seen in figure 197 because of the combination of dark greys and browns found within the stone for it to add to both the coldness of the sacred space while simultaneously bringing in some warmth in the browns which link to the timber detailing.

With this building set into the ground, the roof becomes visible to visitor's of the garden and therefore becomes a fifth facade which needs to be carefully designed to correlate with the intended narrative of the building. The roof of the structure will be a concrete roof with a flush edge detail as seen in figure 196 to tie into the monumentality and massing of this building but this roof will also be a green roof that increases the concrete thickness towards the inner roof to accommodate for the planting above. The plants used for this was debated weather to use an extensive green roof with plants that need little soil to allow for a lighter roof or an intensive green roof which is heavier and more complicated to construct. Because of the strong winds in the Somerset West area (see page 47 for the climatic analysis), the plants used for the roof need deep roots which would be able to stand up to the wind therefore this building would need to make use of an intensive green roof.

6.11.1 Precedent Study: The Shed Typology

A shed is the typical structure used to house home and gardening equipment but sheds are also thought of as structures in which creativity and imagination is unleashed as this is the place where many individuals escape to tinker. Playwright, George Bernard Shaw (as seen in figure 209) was one of these tinkering individuals. This typological precedent is analysed because a nursery building is actually a large retail version of a garden shed where the equipment for gardener's is sold but also where individuals go to find ideas and inspiration for their gardens - the place for relaxation amongst nature. This is therefore the basis for the botanical nursery's design.

The structure of a shed is basic in its implementation of a floor, four walls and a roof (and depending on the size, an optional foundation), which is typically composed of timber as it is easy to build with and easy to modify if need be. The morphology of the structure typically mimics the typology of a small house and celebrates design elements of the house with which it is associated with as seen in figure 208 where the shed is heavily ornamented to the taste of the family living within the house.

“An escape from home, if only to the bottom of the garden” (Wilkinson, 2021: Online).

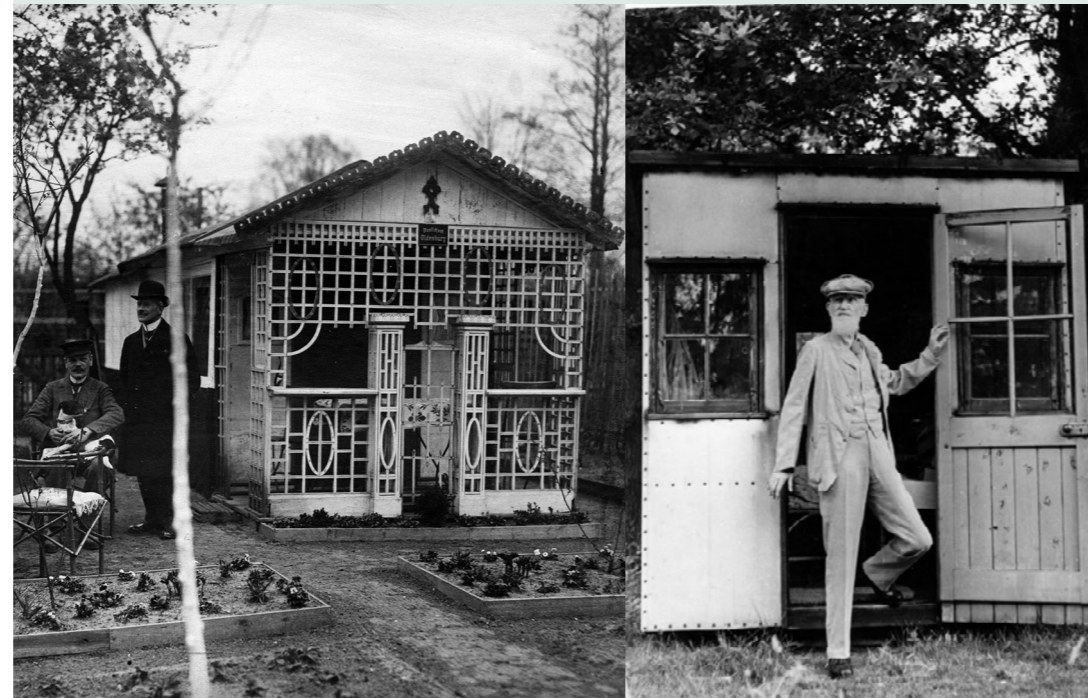


Figure 208: A family next to an arbour in their allotment garden in 1919 Berlin (SZ Photo, Scherl & Bridgeman, 1919: Online).

Figure 209: George Bernard Shaw's rotating Writing Hut in Hertfordshire (Keystone Press & Alamy, [n.d.]: Online).

6.11.2 Småbruk: Pocket Farm in Nes by Scarcity and Creativity Studio

Located in Norway and completed in 2016

This 'Pocket Farm', designed by a branch of the Oslo School of Architecture and Design, was a project which was to be rented to individuals who wanted to start a rural lifestyle which included agricultural activities. This precedent is composed of four houses, a barn and farming land.

The barn morphology is an extension of the sites typology as this is the main view from the farmhouse therefore it needed to be sensitively designed. The exterior timber cladding aims to integrate the barn into the site even more as autumn comes as the barn will camouflage with the barley which is grown on the land.

This precedent inspires the botanical nursery's structure in creating a simple shell which resembles that of the 'shed' typology but doing this by dissecting the unique 'A' frame structure with criss-crossed timber beams, essentially turning the entire shell into the load-bearing structure without the need for trusses or internal columns. This precedent gives particular incite into accommodating an unusual structural form while still making it easy to clad the structure in the desired cladding.



Figure 210: 'Pocket Farm' Interior Perspective (The Scarcity and Creativity Studio, [n.d.]: Online).

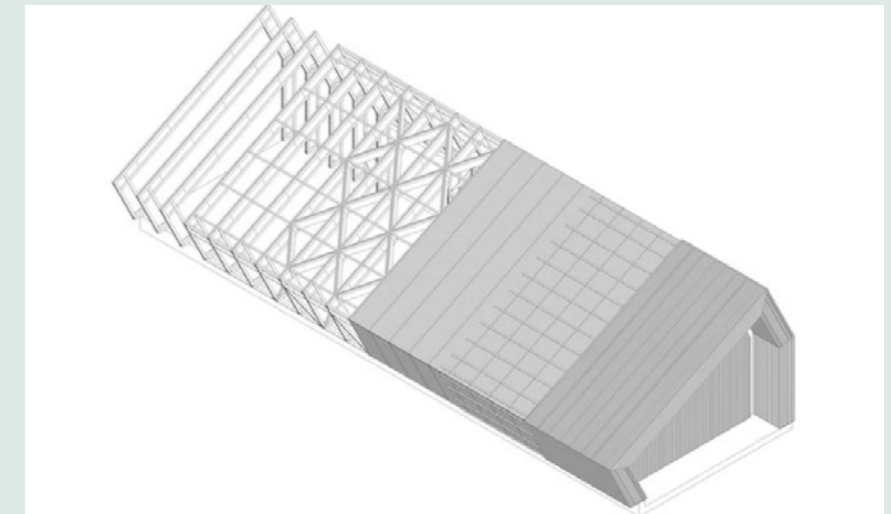


Figure 211: 'Pocket Farm' Structural Model, (The Scarcity and Creativity Studio, [n.d.]: Online).

timber structure, unusual form, 'A' frame, metal cladding

6.11.3 Proyecto Roble by Équipe Voor Architectuur En Urbanisme

Located in Tilburg, Netherlands and completed in 2012.

With a unique green roof, vegetation as sun shading and water used as a lighting device, this design celebrates an Eco-friendly lifestyle but the use of this building as a precedent is for the timber structure and how this seamlessly connects to a curtain wall structure as seen in figure 213, giving the overall feeling of an building which is completely open to its surroundings while protecting the interior from the weather. This building is unique in how the structure is almost set back from the curtain wall while still being connected to it as seen in figure 213.

Another influential aspect of this precedent is the use of vertical timber planks, as seen in figure 212 and 214, to create screen walls which allows a connection with the exterior while diffusing the light within the interior of the building by creating a beautiful pattern of light and shadows throughout. The simple use of these planks again bring the design back to the humble 'shed' precedent and really celebrates the material itself.



Figure 212: Proyecto Roble/ Voor Architectuur Urban Planning Exterior, (de Wit & Team, 2012): Online).



Figure 213: Proyecto Roble/ Voor Architectuur Urban Planning Interior Looking Out, (de Wit & Team, 2012): Online).



Figure 214: Proyecto Roble/ Voor Architectuur Urban Planning Timber Screen Wall, (de Wit & Team, 2012): Online).

6.11.4 Chosen Materials for the Botanical Nursery

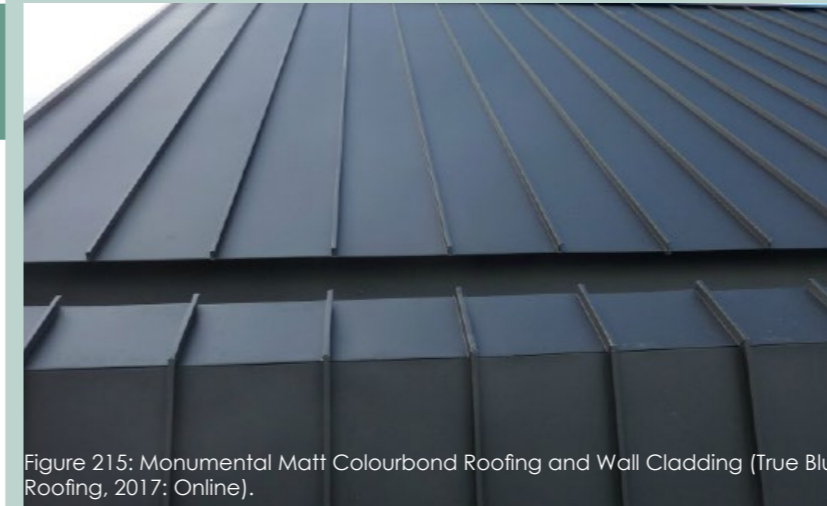


Figure 215: Monumental Matt Colourbond Roofing and Wall Cladding (True Blue Roofing, 2017: Online).



Figure 216: Chapel of Conciliation II (Gunkel, 2015: Online).

Figure 217: Balcony Decorating Ideas (ZHT, 2017: Online).



Figure 218: Modern House + Garden in Vietnam (MIA Design Studio, 2017: Online).

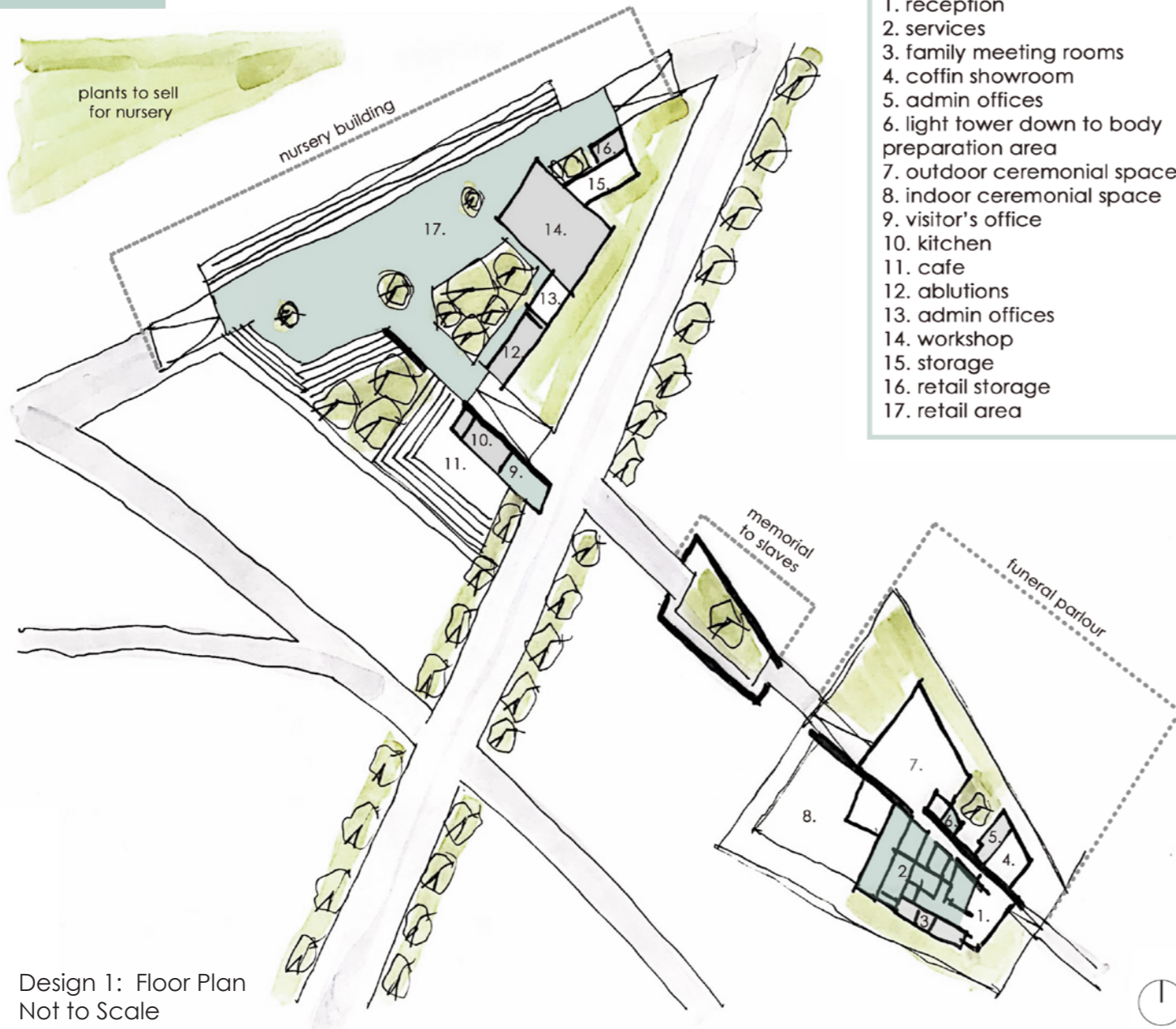
Figure 219: Malmesbury Shale Cladding | Cape Town (Elem Stonemasonry, [n. d.]: Online).

The materials for the Botanical Nursery Building are chosen to both link with and while simultaneously contrast the Funeral Parlor building. Making use of the shed precedent, the actual structure of the building will be long but thin timber beams which dissect and bisect beams placed on a grid which corresponds to the spaces designed, thus creating a shell structure as seen in the 'Pocket Farm' precedent but due to the vast spaces (in plan and section) within the retail space, timber columns will be added at the intersection of some of the beams to allow for a sturdy timber structure. The timber structure will then be clad in a charcoal zinc standing seam roof sheeting as the dark colour will allow the building to fade within its surroundings, making the landscape the focal point. Timber will again be used for shading devices which is inspired by the Proyecto Roble precedent. Some of the slats will act as louvers which move and other will be fixed, this combined with the inclusion of courtyards within the design, create a play of light and shadows. It is through this play of light and shadows, the use of timber mimicking the tree trunks in a forest and the incorporation of lots of vegetation within the courtyard spaces as well as in the retail elements which creates a uplifting atmosphere that brings about a celebration of life within these spaces.

There will be a continuation of the stone walls as a point of hierarchy to celebrate the processional route through the buildings but the stone will also be used within the floor, to make this building feel as though it is mimicking the nature of the site it sits within. Overall, this buildings materiality aims to celebrate the site and the 'garden' aspect of the cemetery which contrasts with the funeral parlor that is more rooted, heavy and sacred in its use of materials - connecting more with the death aspect of the cemetery.

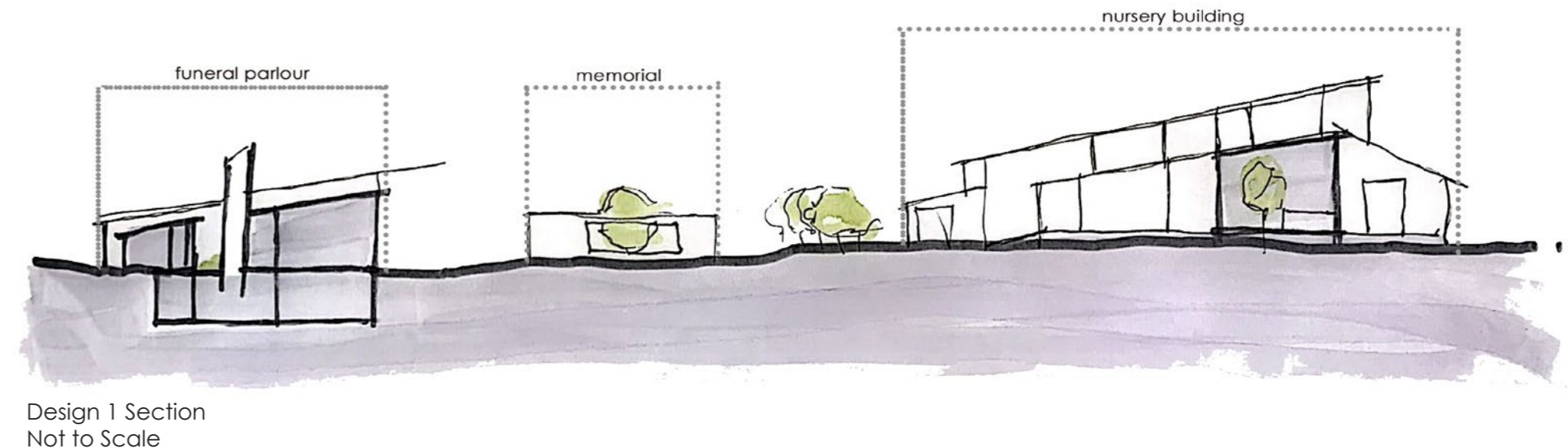
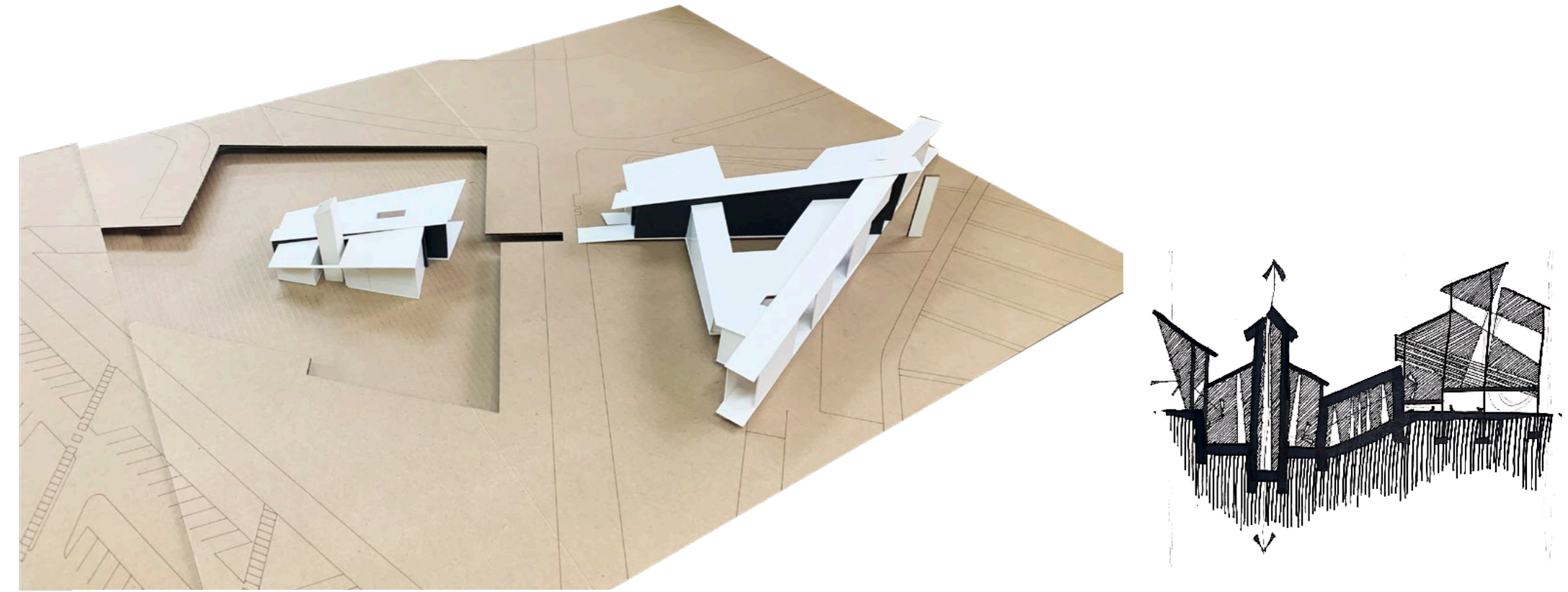
Development 1

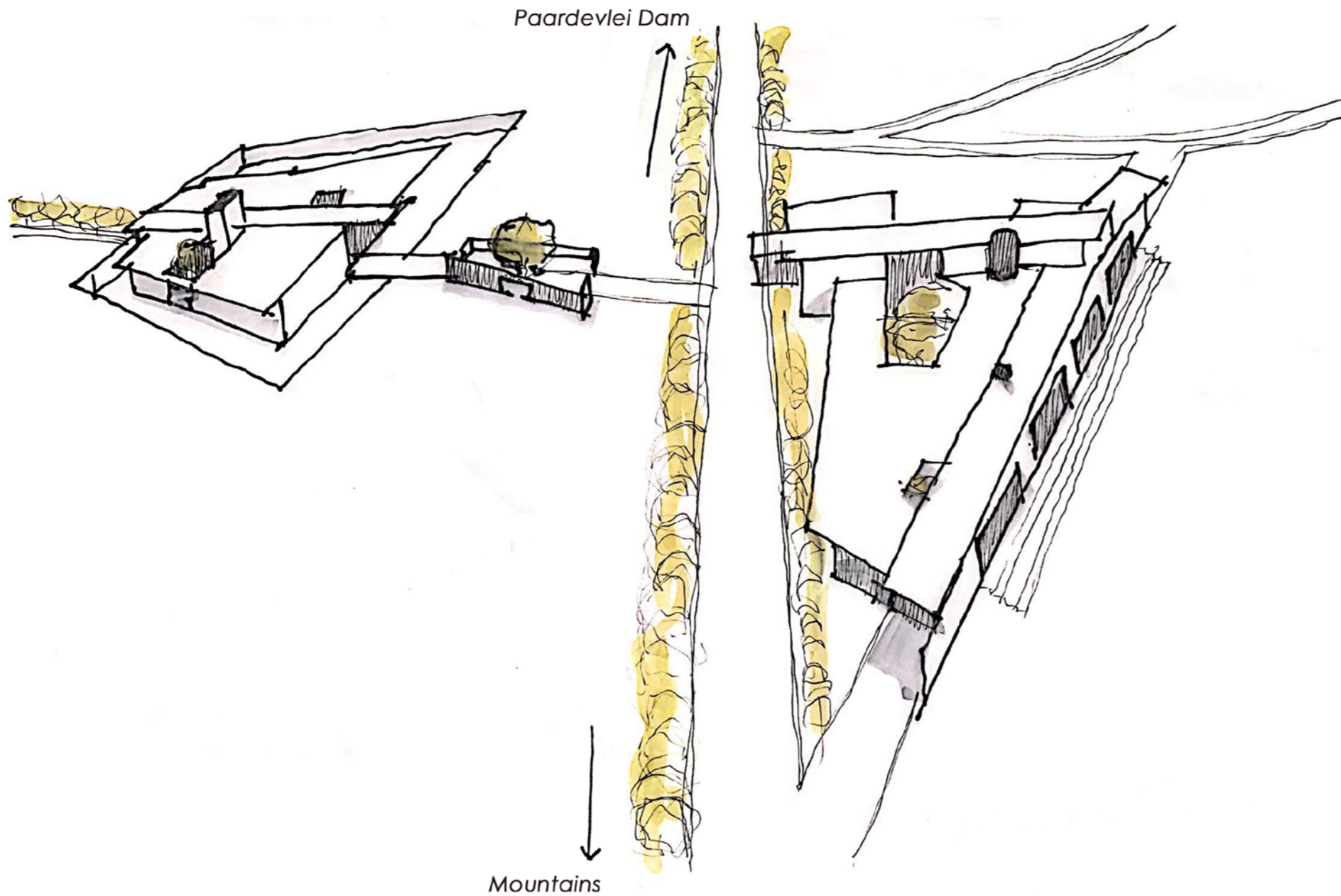
The initial thoughts to designing these buildings was to start with the 'ritual procession' the structural touchstone uncovered with the bereaved starting their journey by moving down into the funeral parlour which would be a heavy, monumental almost cold structure which would be rooted and set into the ground symbolizing how their loved ones would be set into the ground at their burial. This space would be cold but sacred and invite feelings of sorrow for the bereaved to truly feel their feelings of sadness to be able to move past them. Once the funeral is over the processional route would take the bereaved up out of the ground where they would move through the memorial for the slaves which is still emotional but the honouring of these individuals makes the atmosphere more one of respect than of sorrow. Finally the route would meet the gate of the cemetery garden at ground floor where loved ones would either move into the cemetery or continue along the route upwards again into the new life- the nursery. This building juxtaposing the heaviness of the funeral parlour which represented death by embodying a light timber structure filled with new life in plants as the cemetery celebrates new life through the garden.



legend

1. reception
2. services
3. family meeting rooms
4. coffin showroom
5. admin offices
6. light tower down to body preparation area
7. outdoor ceremonial space
8. indoor ceremonial space
9. visitor's office
10. kitchen
11. cafe
12. ablutions
13. admin offices
14. workshop
15. storage
16. retail storage
17. retail area



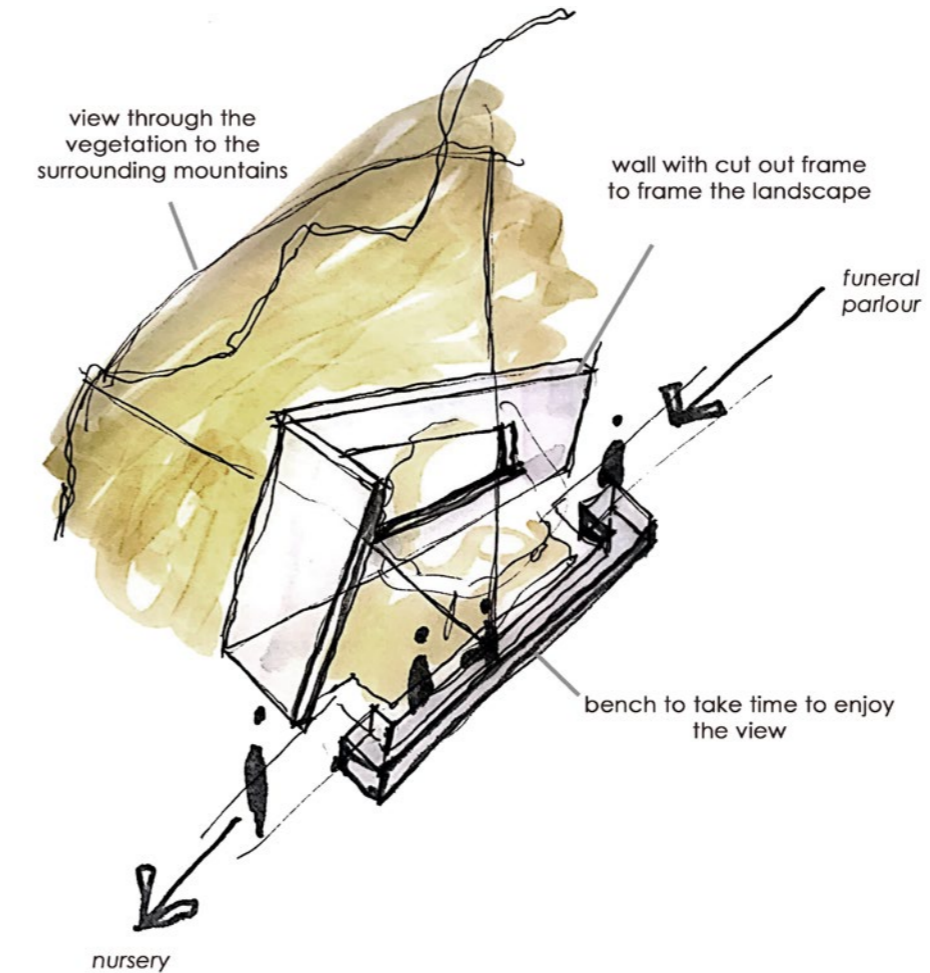


The AECI Slave Memorial

This memorial is to commemorate the lives of all the now unknown individuals that worked in the factory, allowing both the factory and Somerset West to become what they are now.

Even though this memorial aims to celebrate those who struggled in life with their circumstances, the memorial itself wants to celebrate their lives and their contributions to the local community, looking to life like the use of trees as a tombstone. Using vegetation,

especially a tree as a tombstone for these individuals is important. As this proposal celebrates individuals feeling and being in their emotions, a seating area should be incorporated for individuals to be able to sit and contemplate those the memorial honours as well as their lost ones. Finally by placing the memorial on an important axis within the site, more individuals will be drawn to it, thus inviting a the moment of feeling their emotions but counteracting the death with the peace of the a new 'life' (through planting) of remembrance.



Feedback on this exploration:

- The exploration is almost aggressive in it's approach to the site.
- There are too many different levels taking place at once which draws the attention away from the main processional route's point of hierarchy.
- The positioning of the Memorial for the slaves between the Funeral Parlour (symbolising death) and the nursery (symbolising life) but it might be more appropriate to separate this element and use it as a 'contemplative' space within the garden which creates another point of hierarchy within the large cemetery that will also allow visitor's to orientate themselves within the space.

6.12.3 Landscape Frames



Figure 220: Frame of Table Mountain (Author, 2021).

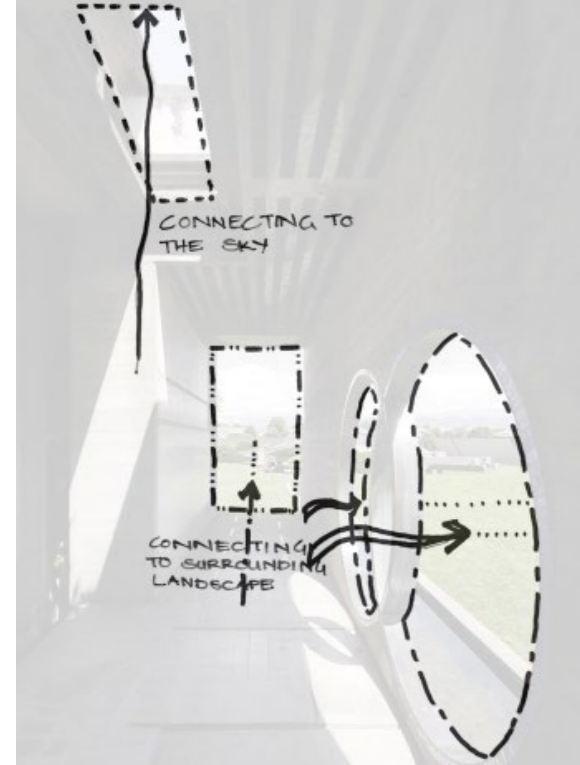
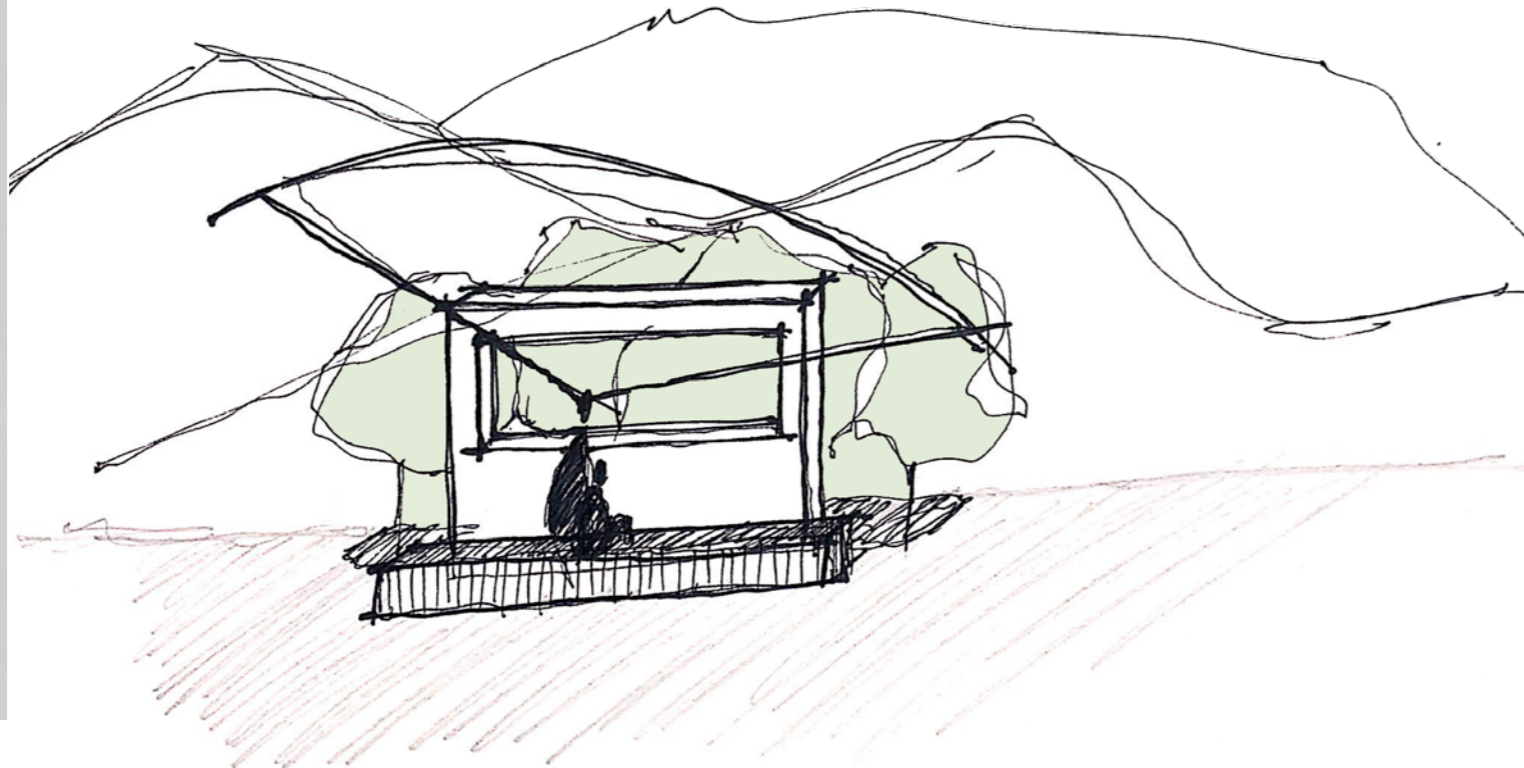


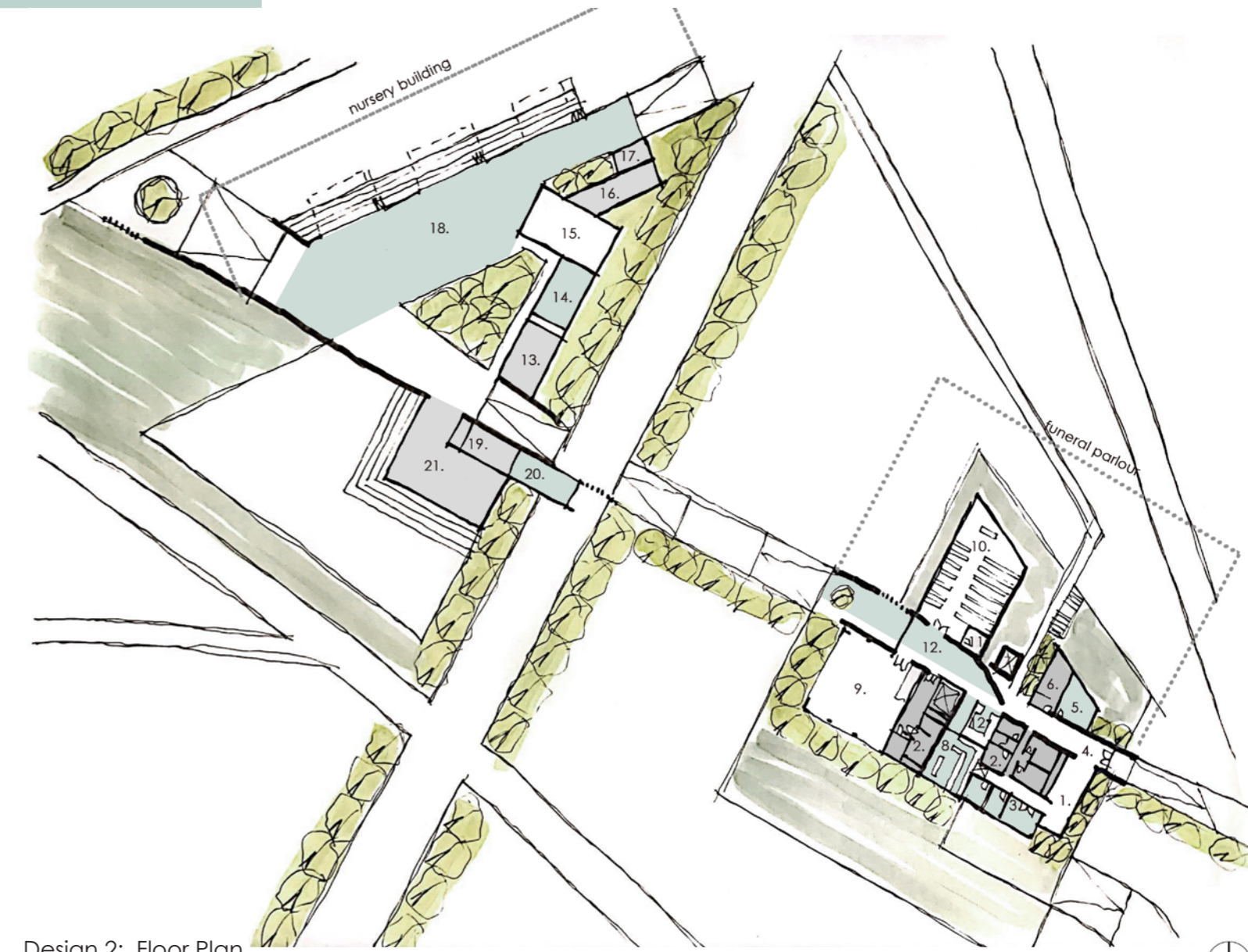
Figure 221: Interior View of Scarpa's Frames using Architecture (Patt, 2016: Online).

The the points of axes which begin and end at the views of the surrounding mountains (bringing the macro context into the micro understanding), a frame like structure are set up which takes precedent from the yellow frames that point out important views all over South Africa as seen in figure 220. This frame idea is again repeated within the memorial but the two looking towards the mountains take characteristics of the building they are associated with. One is composed of timber alone connecting to the botanical nursery which lies on the same axis and the other is of stone and some timber linking to the funeral parlor building. The incorporation of a seat allows these spaces to also become contemplation spaces making them a part of the greater 'urban' scheme as the chapel and the bench pods throughout the garden.



6.12.4

Development 2



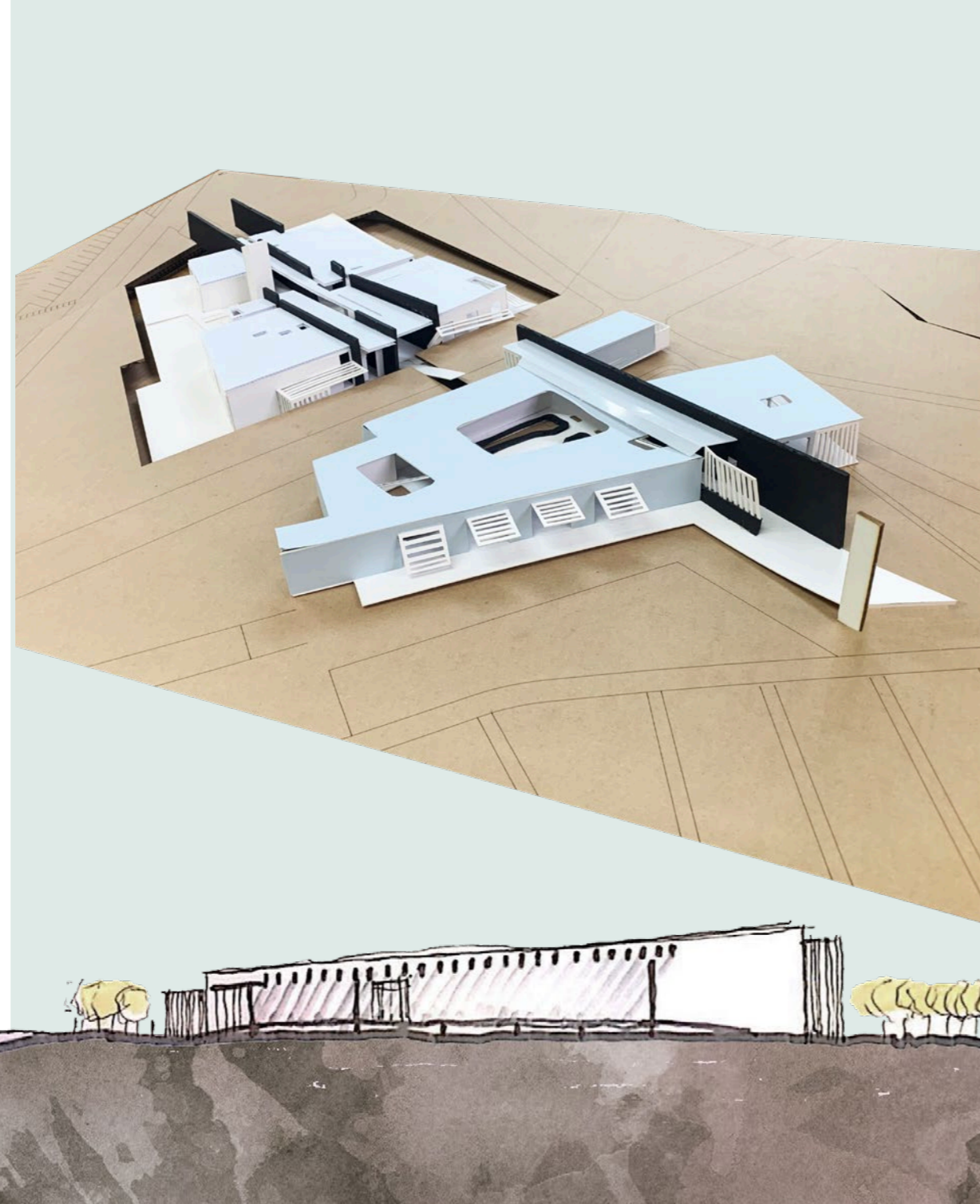
legend

1. reception
2. services
3. family meeting rooms
4. entrance lobby
5. coffin showroom
6. admin offices
7. light tower down to body preparation area
8. intimate ceremonial space
9. indoor ceremonial space
10. outdoor ceremonial space
11. condolences room
12. ceremonial entrance space
13. ablutions
14. admin offices
15. workshop
16. workshop storage
17. retail storage
18. nursery retail area
19. kitchen
20. visitor's office
21. cafe

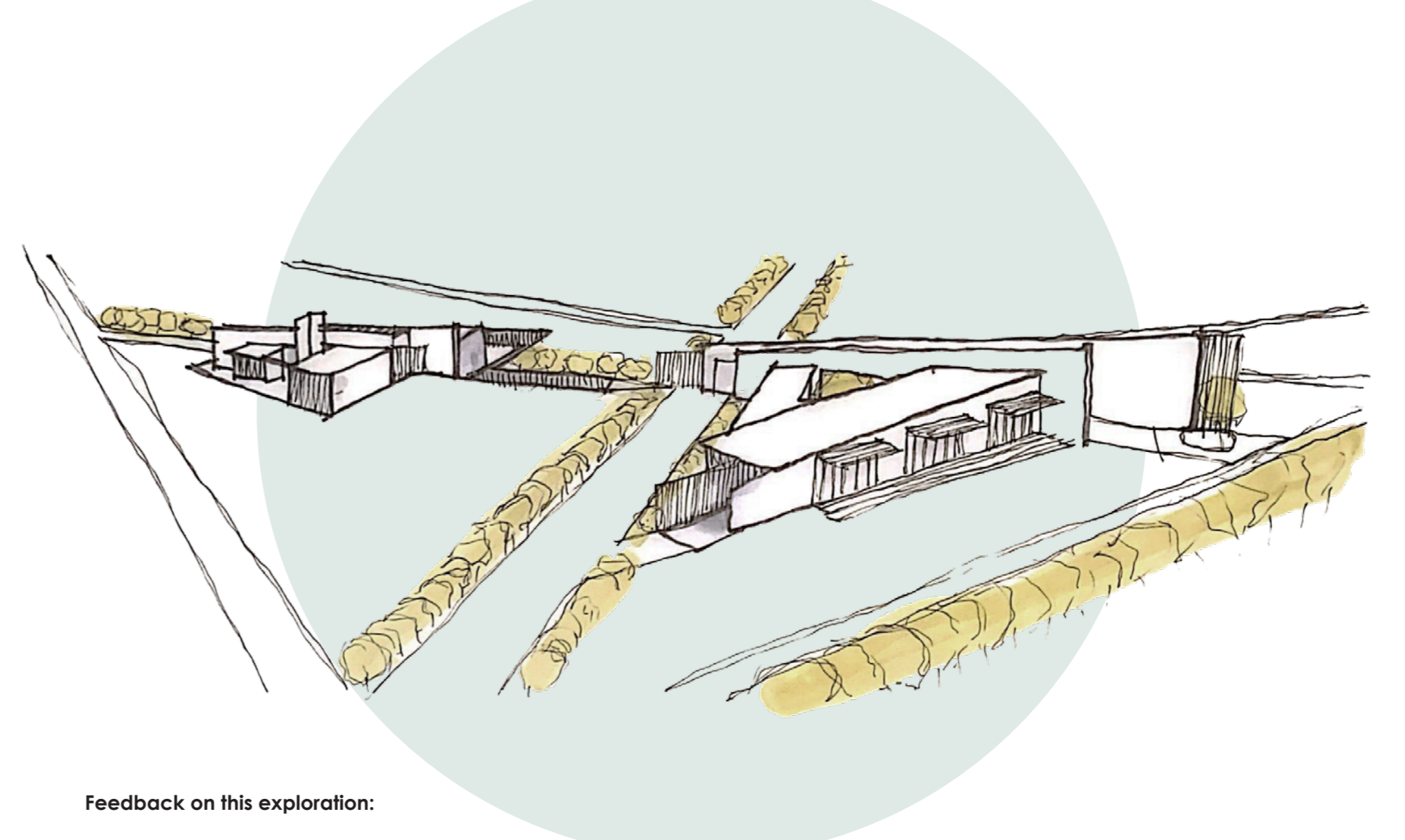
Design 2: Floor Plan
Not to Scale



In this approach, the shapes and angles of the plan and the variation in heights has been rationalized into a simpler version of Exploration 1 as to be more sensitive towards the site. The main hierarchy is kept as the main processional route through the buildings but the memorial has been removed from this route and placed at the end of the main promenade of the site to add an ending point to the axis. There is now a clear differentiation between materiality of the two buildings while still maintaining a link between the two by the main processional route making use of stone and also by the use of the timber slat elements throughout. An emphasis on the use of light as a design element is also being played with especially through the processional route where large timber beams create constant rhythmic shadows portraying the feeling of time passing as individuals move through the processional route. Concerning the planning, another more intimate funeral ceremonial space has been added as according to the theoretical underpinning, some may be more comforted by many loved ones while others may prefer more intimate spaces of gathering to mourn comfortably.



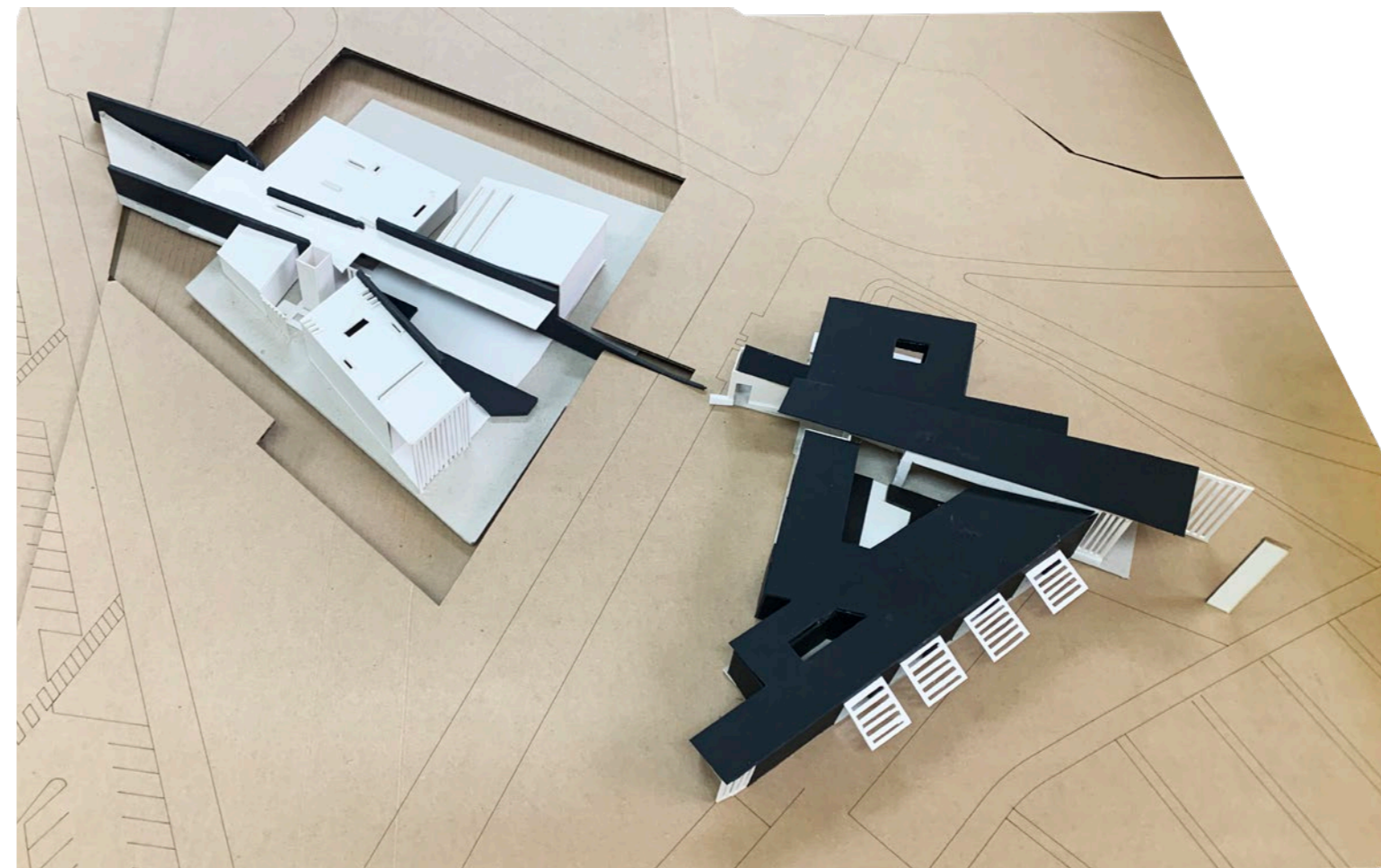
Design 2 Section
Not to Scale



Feedback on this exploration:

- This exploration is more sensitive but there needs to be more differentiation between the two building's structures.
- The entrance to the cemetery garden needs to be more resolved as it looks like an afterthought.
- The addition to the funeral parlour is good but it is still a small design and will either have to be more complex or the complexity needs to be in the atmosphere to let this qualify as a master's proposal.
- Atmosphere within the spaces needs to be considered more.
- Think more about the process of the funeral ritual- make spaces for people waiting to enter the ceremonial spaces, where will they sit, is there privacy for someone who is feeling uncomfortable around all the people, etc.

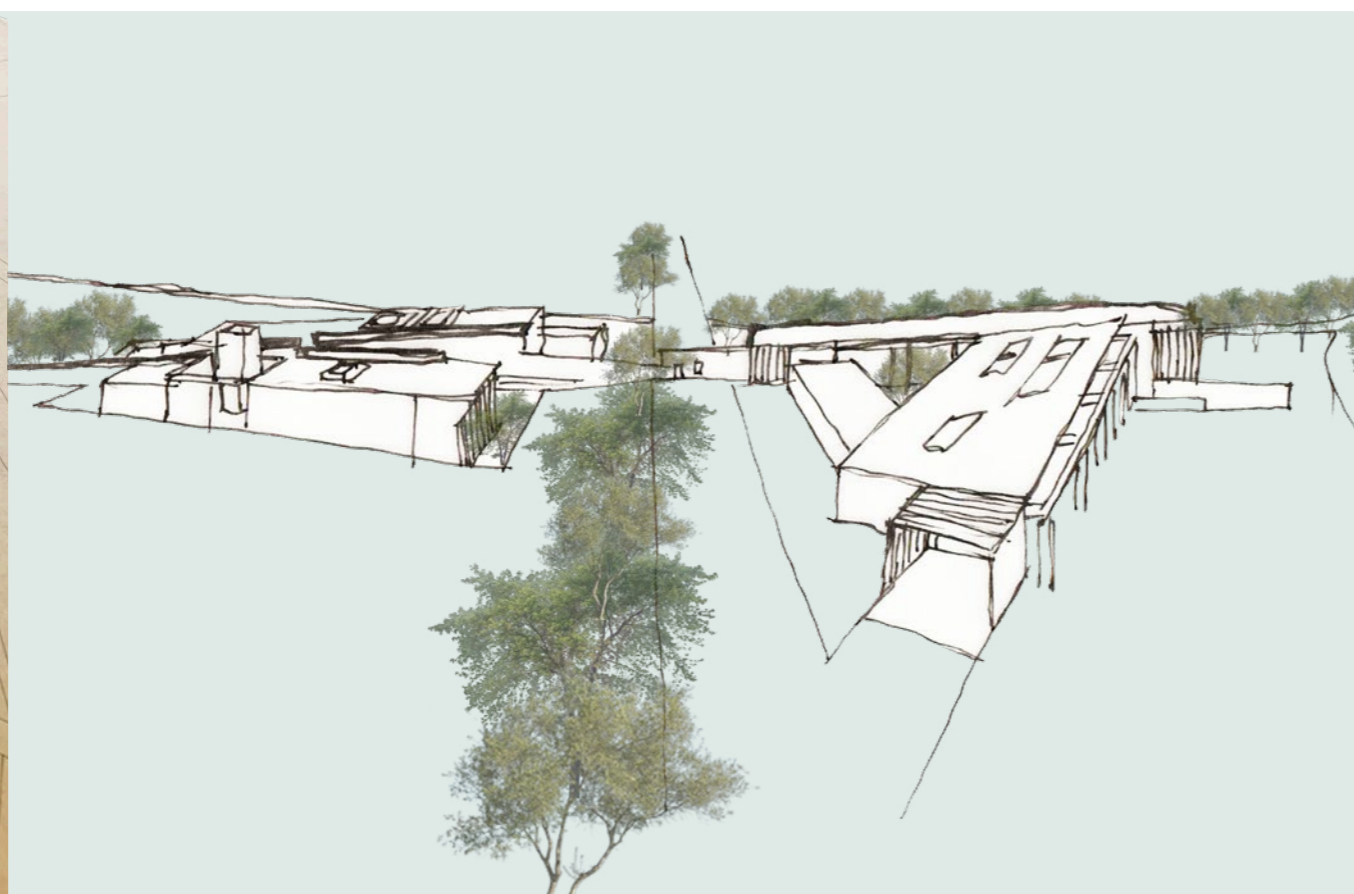
Development 3





Feedback on this exploration:

- This exploration takes a good step into accommodating the ritual of a funeral as a whole but by opening up the building, there are risks associated with the wind within the area, it might be a better idea to open up visually but protecting the visitors.
- The nursery focusing on the plants at the end of the processional route is good but maybe there should be something else within the space to act as an orientation beacon, a vertical structure which can be seen throughout the garden.



6.12.6

Development 4

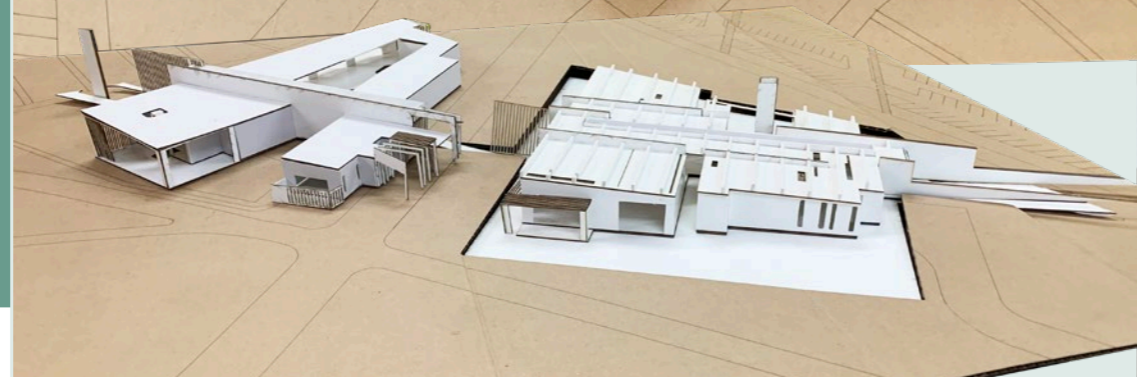
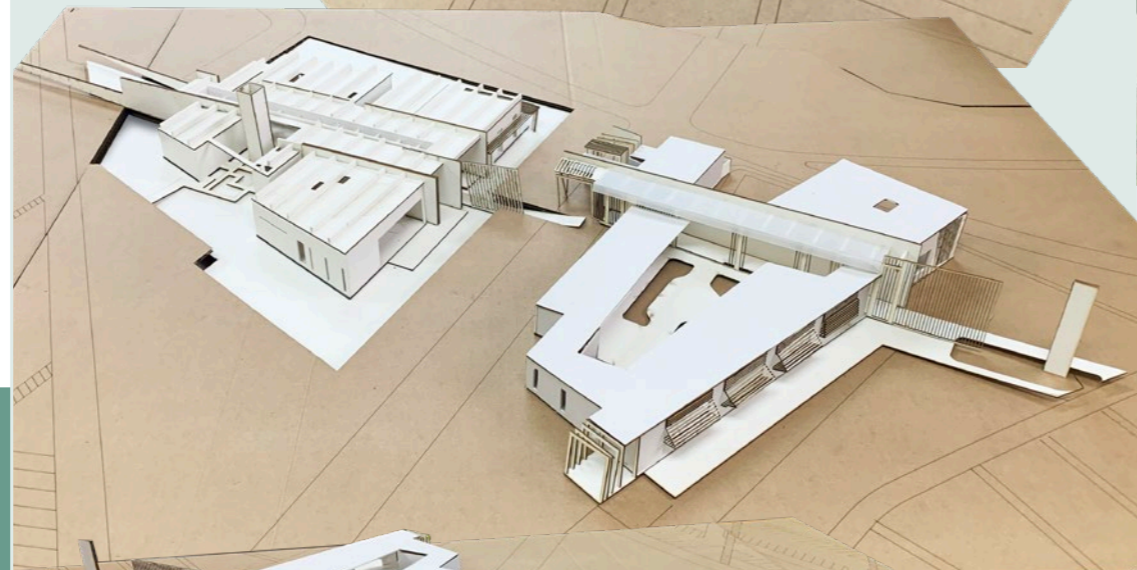
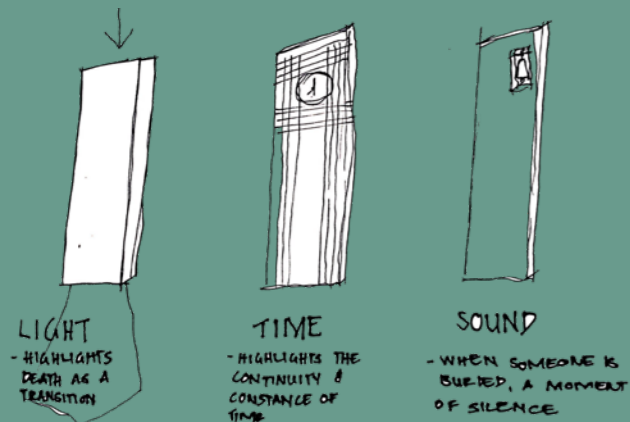
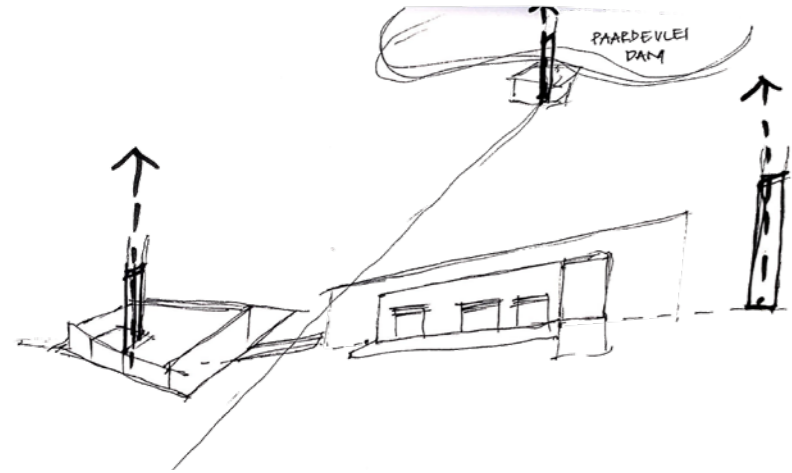


Design 2: Floor Plan
Not to Scale



Feedback on this exploration:

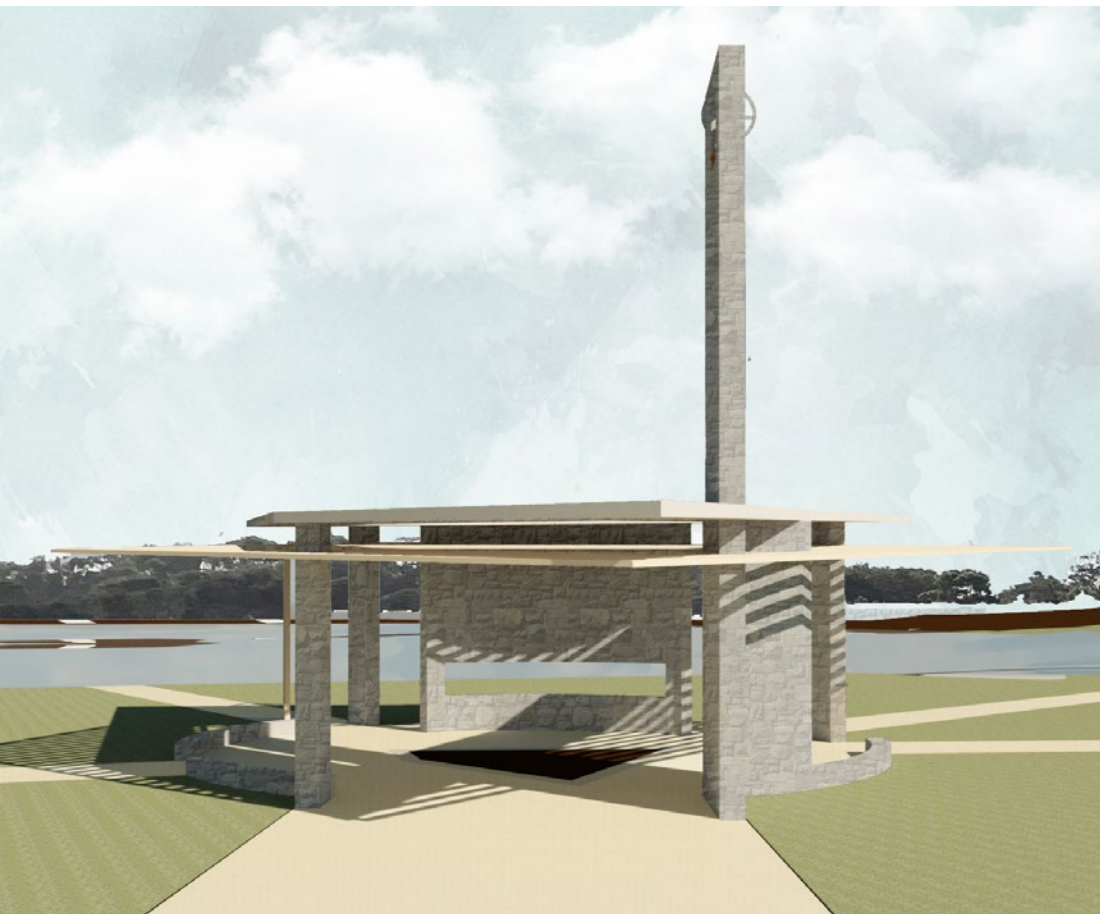
- It is good to see the addition of the structure of the roof but the upstanding beams will only be needed on over the large spaces.
- There still needs to be a greater differentiation between the two building types, at the moment on the model, they still read to similar.
- At this point there are two tall vertical elements (the light tower- funeral parlor and the clock tower- botanical nursery), is it not necessary to include a vertical element for the memorial to connect the three even though there is distance between them?



6.12.7

Development of the Memorial

This memorial was designed around the circular reference naturally given by the dam. With a good view of the historical buildings on the other side of the dam, the memorial makes use of the 'landscape frame' idea as seen on page 124. By adding a tree to the center of the memorial, the tree acts as the tombstone for the slaves while making the space feel more intimate. Benches provide space for visitors to relax and contemplate. The bell tower acts as a beacon within the landscape, connecting the memorial to the funeral parlor and the nursery which together, create the proposed narrative as implied by the structural touchstone. The bell is rung as an individual is buried or to commemorate an event to bring a moment of silence to all on site.



Paardevelei Dam & View to the Old Factory Buildings

6.12.8

Development of Chapel

The chapel is a contemplation space within the garden which is set on a hill on site to mimic historical temples which are set on higher ground to emphasize their monumentality and importance. A simple room design, the chapel is a space for any visitors to go pray or meditate in privacy. The benches are faced towards a cross and trees which act as an altar space. Although this chapel does celebrate Christian symbols, all faiths are welcome.



Final Proposed Accommodation

Green Funeral Parlor:

425m ²	Functional Components:	580m ²	Sacred Spaces:
174m ²	Offices:	470m ²	Ceremonial Spaces:
60m ²	Reception & waiting areas	250m ²	Main Outdoor Ceremonial Space
30m ²	Admin office	200m ²	Main Indoor Ceremonial Space with seating
30m ²	2 x Family rooms	20m ²	Condolences Room
20m ²	Boardroom		
10m ²	Records room		
24m ²	Coffin Showroom		
		110m ²	Service Core:
198m ²	Processing Area:	50m ²	Furniture storage
30m ²	Body Receiving Bay & Area	20m ²	Kitchen
100m ²	Body Storage	5m ²	Dry store
50m ²	Body Preparation Room	5m ²	Cold store
18m ²	Body Lift	5m ²	Freezer store
		5m ²	Beverage store
53m ²	Service Core:	20m ²	Audio Visual storage
8m ²	Staff kitchen		
35m ²	Staff rooms		
10m ²	Female locker room with shower & ablutions		
10m ²	Male locker room with shower & ablutions		
15m ²	Kitchen/ break area		
10m ²	Hosuekeeping storage		

Botanical Nursery:

68m ²	Functional Components:
20m ²	Offices:
20m ²	Admin office
48m ²	Service Core:
8m ²	Staff kitchen
35m ²	Staff rooms
10m ²	Female locker room with shower & ablutions
10m ²	Male locker room with shower & ablutions
15m ²	Kitchen/ break area
5m ²	Hosuekeeping storage

Reflection & Remembrance:

325m ²	Botanical Spaces:	Contemplative Spaces:
170m ²	Retail	Memorial to those who lost their lives working (as slaves) for the dynamite factory
50m ²	Botanical Retail Space	Chapel
20m ²	Storage	Bench Pods Throughout the Garden
50m ²	Workshop Space and Show-room	Landart exhibitions Throughout the site which will change throughout the years to celebrate local artists
20m ²	Storage	
155m ²	Cafe	
30m ²	Indoor seating area	
50m ²	Outdoor seating area	
20m ²	Bar and Deli area	
30m ²	Kitchen	
5m ²	Cold store	
10m ²	Dry store	
10m ²	Freezer store	
-	Delivery Route	



Technical Development

7.1 A Brief Overview of the Proposal

What This dissertation aims to do is to look at the traditional Western burial ritual and adapt this to become another option for those who connect with the traditional ritual but would simultaneously prefer a more environmentally friendly approach. One of the new more environmentally ways in which to bury the dead is known as "green burials" which takes on traditional the ritual of burying loved ones while simply making the coffins eco-friendly and changing the tombstone markers for the graves into a living tombstone (some kind of tree or plant to mark the grave) as well as making use of non-toxic embalming fluids during the preparation process.

The proposed accommodation includes a green funeral parlor with three different ceremony spaces as well as a botanical nursery which supplies the indigenous and endangered flora for the cemetery's 'tombstones' as well as to the local community. The processional path which leads through the funeral parlor and the botanical nursery is of theoretical importance as this portrays the narrative of the grieving process. Other accommodation proposed includes a memorial to the salves that worked in the dynamite factory (history on page 54 and 55), as well as a contemplative prayer space and several contemplative 'pods' throughout the ceremony where visitors can sit and contemplate life.

7.2 Site Geology and Soil Conditions

As previously mentioned in the Site Analysis (page 60-61), the geology of the site contains Precambrian Deposits that belong to the Malmesbury Group, which are dark to medium grained, black-grey-brown rocks which resembles a slate like texture. The stone which will be excavated for the proposal will be used throughout the design to celebrate 'The Already There' concept previously mentioned.

The soil conditions on site fall under type CB (strong texture contrast) and contains 15% of clay from 450 to 750mm below the surface of the soil. When the moisture content in the soil, especially clay soil, changes, a contraction, or expansion occurs which creates movement within the ground. In structural terms, this influences the foundation, which is most appropriate which, in this case, would be a raft foundation.



Figure 222: The Rocks and The Mountains- Paardevlei (Author, 2021).

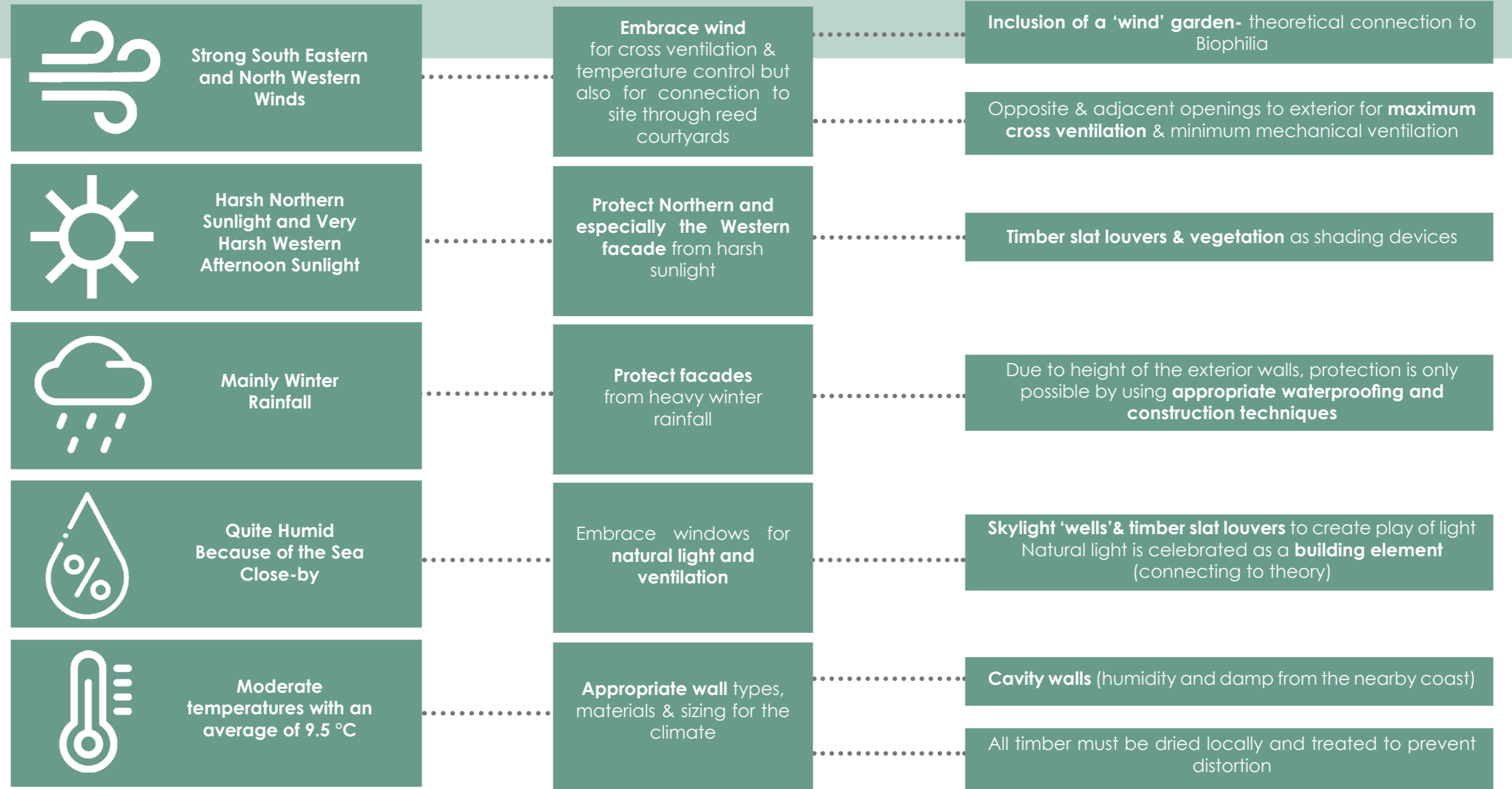


Figure 224: Paardeveel Landscape (Author, 2021).



Figure 223: Climatic Design Principles based off of Jaco van der Watt's Climate Summary (Author, 2021).

The structural philosophy of this project relates to the physical erection of the building which is influenced by previously mentioned theoretical understanding and the understanding of tectonics which is brought forth by the structural touchstone.

The touchstone understands the three different accommodations (the funeral parlor, the memorial and the botanical nursery) as parts to a narrative that mimics the grieving process. This is carried out through the processional through the different spaces.

The narrative begins at the funeral parlor which portrays the

heaviness of death. In structural terms, this generates a heavy and cold structure set into the earth. The narrative then moves to the memorial which is again sombre but celebrates a positive of the impact of those who have passed therefore setting the structure in a peaceful location (originally this memorial was set to be between the other two buildings but because of it's importance, it is proposed at the end of the main promenade axis at the dam. Finally the botanical nursery is understood as a peaceful representation of new life and growth from the grieving process, this generating a light timber column and beam structure which allows much light into the space and opens up to the surrounding gardens.

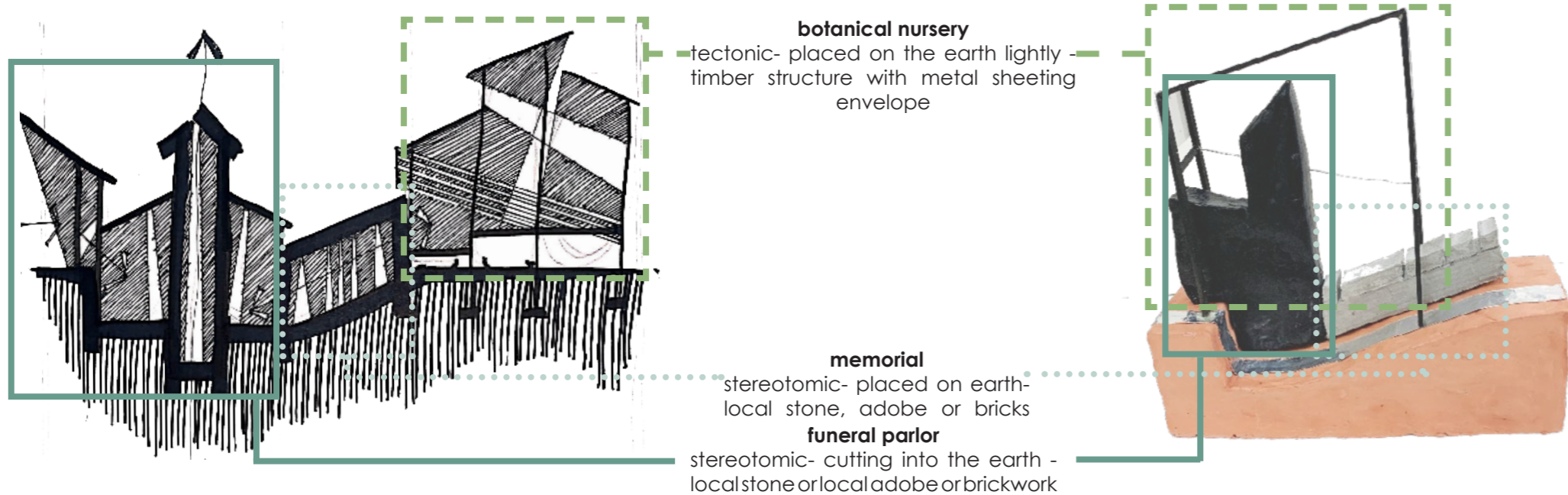


Figure 225: CONSeptional Section from Structural Touchstone (Author, 2021).

	Funeral Parlor	Memorial	Nursery Building
1. Above & under ground	Cutting into the earth	Coming out of the ground to on above the ground	Above the ground Light structure to respect the site (non-destructive)
2. Structure	Heavy structure rooted in the earth (dramatic)	Heavy structure rooted in the earth (dramatic)	Light structure to respect the site (non-destructive)
3. Light	Little light used for dramatic effect to express the narrative	Little light used for dramatic effect to express the narrative	More light for calming atmosphere representing new life
4. Material justification	Stereotomic- Stone or earth taken from the site and plastered brickwork for cold/ sacredness Timber details for warmth and connection to the purpose	Stereotomic- Stone or earth taken from the site and plastered brickwork for cold/ sacredness Timber details for warmth and connection to the purpose	Tectonic- Timber structure (To connect to the purpose which celebrates local flora) Metal sheeting (To resemble a shed - gardening)

Figure 226: CONSeption Touchstone (Author, 2021).

Figure 227: CONSeption Touchstone Development Table (Author, 2021).

7.5 Funeral Parlor Materiality

Similarly as the juxtaposing narratives and therefore contrasting structures, the materiality of the funeral parlor and the botanical garden change to fit the narrative.

The materiality in the funeral parlor aims to be cold and monumental with little but dramatic light used, relating to a sacred atmosphere. Concrete and local stone are used as the most prominent materials, each bringing their own character. The local stone which is used is the Malmesbury stone (previously discussed on page). This stone will be sourced from the excavations for the funeral parlor and the basement parking, creating a link to the Already There Concept and celebrating the beauty of what the site has to offer.

Within this building, details of timber will be included to bring a warm element into the building which contrast with the sacred atmosphere but brings with it an element of comfort to the mourners.

As seen in the illustration in figure 226, the design incorporates 'wind' vegetation which includes plants such as reeds and grasses (connecting to the wetland aspect of the site). This connects to the sensory aspect of neuroarchitecture as the sound which is created as the wind moves through the plants creates a calming effect, bringing to mind the image of someone sitting under a tree with a breeze creating a dance of shadows and light as proposed by the design touchstone.

Local stone processional wall

1. Local Stone



Local stone processional wall & Local stone in floor & benches

2. 'Wind' vegetation



Local stone crushed to create gravel

Vegetation as a building element

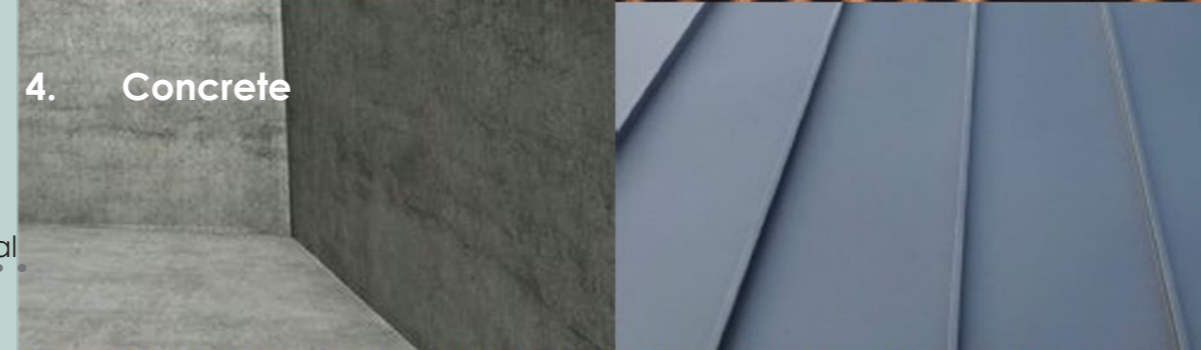
3. Dramatic Light



Dramatic light as a building element

Peaceful light as a building element

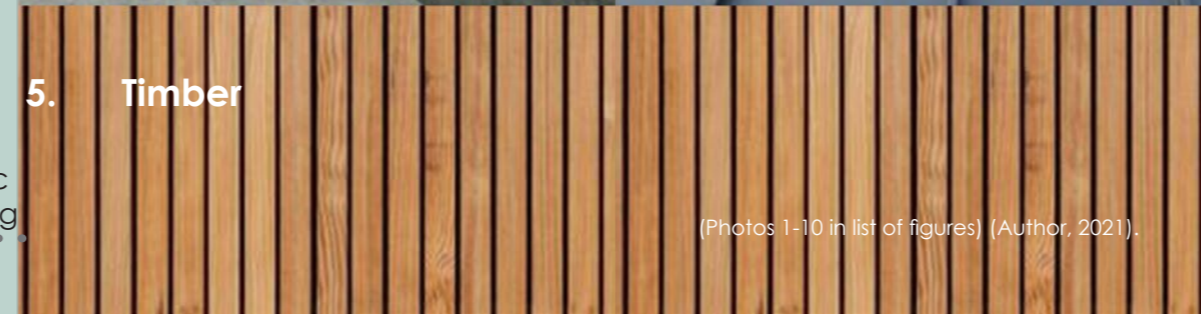
4. Concrete



Concrete as the main structural material

Zinc sheeting as the main envelope material

5. Timber



Warmth created by inclusion of specific timber elements throughout the building

Timber as the main structural material

(Photos 1-10 in list of figures) (Author, 2021).

7.6 Botanical Nursery Materiality

As generated by the structural touchstone, the structure of the botanical nursery juxtaposes that of the funeral parlor by embracing the playfulness of light. Mimicking trees trunks of a forest, this building makes use of timber slat elements for both the structure and the envelope. The structure is comprised of timber columns and beams acting on an irregular grid system. The structure is either enclosed using standing seam zinc sheeting or is left bare, replicating a trellis and the 'building' is a smaller block which is fit into the structure. Other timber elements include louver panels which open upwards to become shading as well as structural beams for the polycarbonate roof above the processional route.

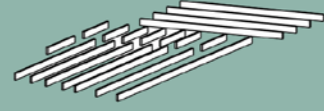
Even though the trees and plants sold by the nursery are situated outside the building, the interior celebrates the life and peacefulness which comes with vegetation by including several courtyards within the space which gives off a feeling of the nursery not being a building, but an extension of the outside.

Although, the two main buildings juxtapose, there are linking elements within the materiality which connect the two. The nursery building again makes use of the main processional walls which are comprised of local stone but within this space, one of the walls is broken down and becomes benches surrounding the courtyard spaces as well as melts down to become the flooring material as well. By doing this, the buildings are separate but are understood as parts of a greater whole.

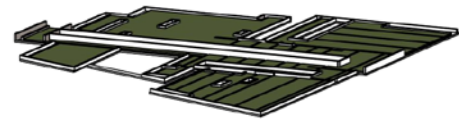
Figure 226: Assemblage of CONSeption Materiality (Author, 2021).

7.7 Analysis of the Funeral Parlor's 'Outdoor' Ceremony Spaces

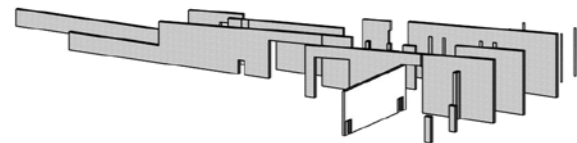
1. Upstanding Beams



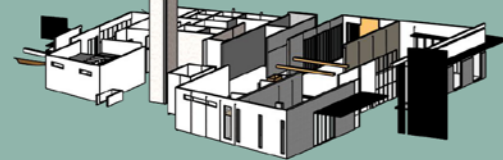
2. Roof Slab & Green Roof



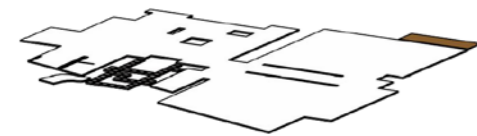
3. Local Stone Walls



4. Load-bearing Walls



5. Floor Slab



6. Basement



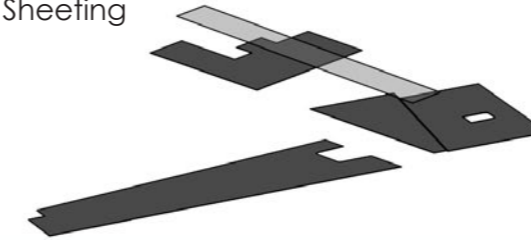
As seen in the exploded view to the left, the funeral parlor is comprised of three main layers of structure, these being, the upstanding reinforced concrete beams (1) which add to the structure of the roof slab above the large ceremony space, the load-bearing walls of the ground floor that hold up the rest of the roof slab and the basement floor walls which hold their own. As seen in the figure as number 3, there are also columns which are added to the stone walls which act as the main structure within the walls which are spaced between 3000 and 4000mm.

(Left) Figure 229: Funeral Parlor Exploded View (Author, 2021).
(Below) Figure 230: Funeral Parlor Processional Route View (Author, 2021).

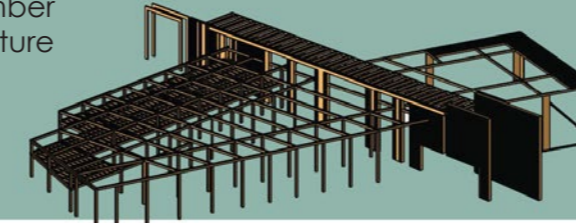


7.8 Analysis of the Funeral Parlor's 'Outdoor' Ceremony Spaces

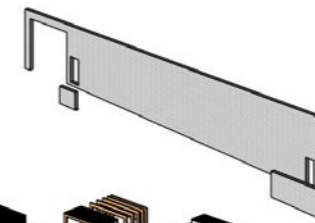
1. Roof Sheeting



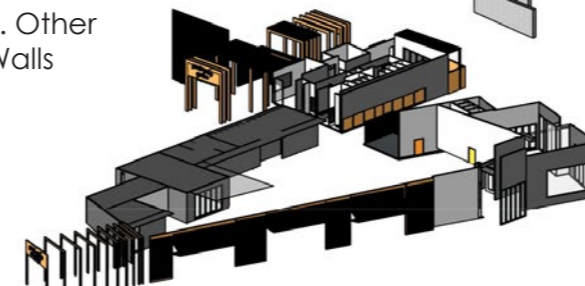
2. Timber Structure



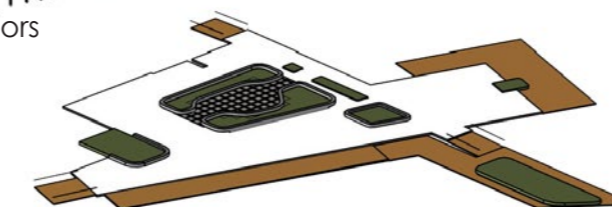
3. Local Stone Walls



4. Other Walls



5. Floors



As seen in figure 229, the main structural element of the botanical nursery is the timber structure which is comprised of timber columns and beams of various sizes on a grid which follows the plan and as seen in the view below, the grid is filled in with random diagonal timber beams which act as a security layer of structure as the space for the retail is largely open.

(Left) Figure 231: Botanical Nursery Exploded View (Author, 2021).
(Below) Figure 232: Botanical Nursery Interior View (Author, 2021).



7.9 Funeral Parlor 'Outdoor' Ceremony Spaces Analysis

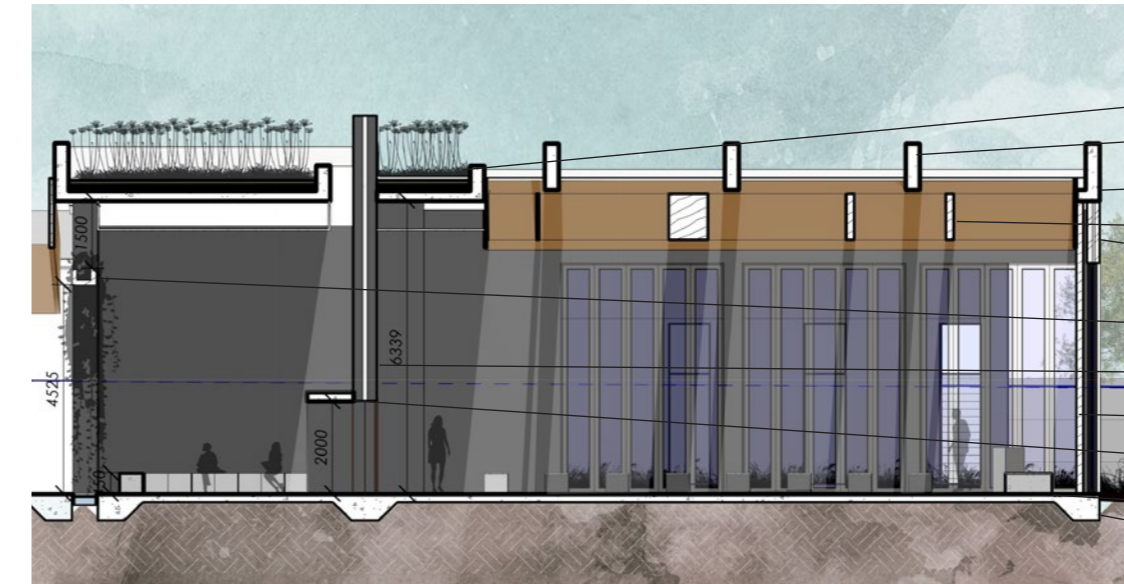
Figure 233: Funeral Parlor 'Outdoor' Ceremony Space Plan (Author, 2021).



Funeral Parlor 'Outdoor' Ceremony Spaces Plan
Not to Scale

The 'outdoor' ceremony spaces are considered to be outdoors as much of the 'walls' open to allow the threshold between the inside and the outside to be blurred. This particular space was chosen to be analyzed in deeper detail as it contains several unique details which add to the structure or to the atmosphere of the space. This particular ceremony space and function room can accommodate up to 75 people while not feeling at all claustrophobic. As seen in the Interior View in figure 231, light plays an integral role within this space to create the dramatic and sacred atmosphere while the organic waves of the skylight frame mimic the wind, creating a sense of peace within the space.

Figure 234: Section through Funeral Parlor 'Outdoor' Ceremony Space(Author, 2021).

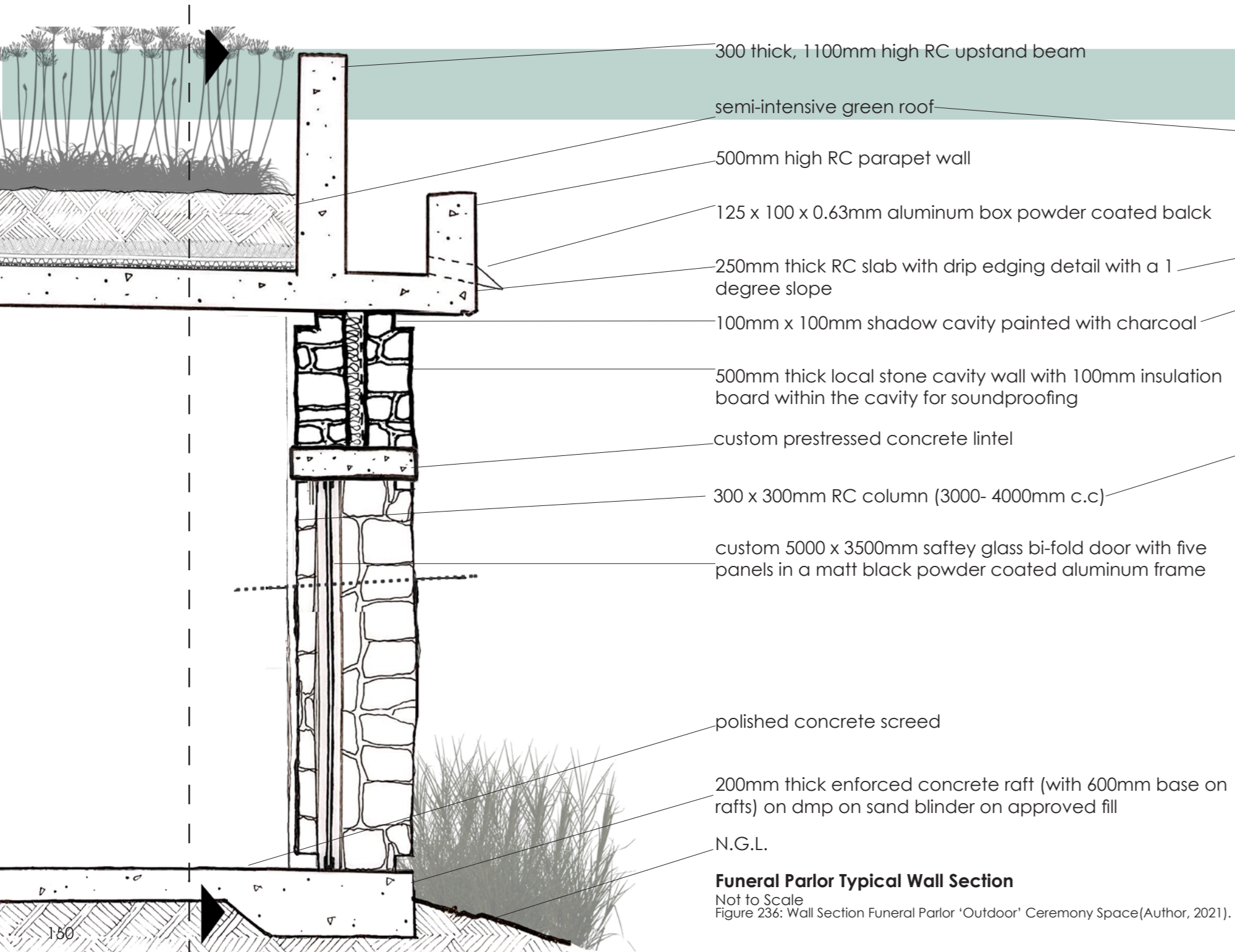


Funeral Parlor 'Outdoor' Ceremony Spaces Section
Not to Scale

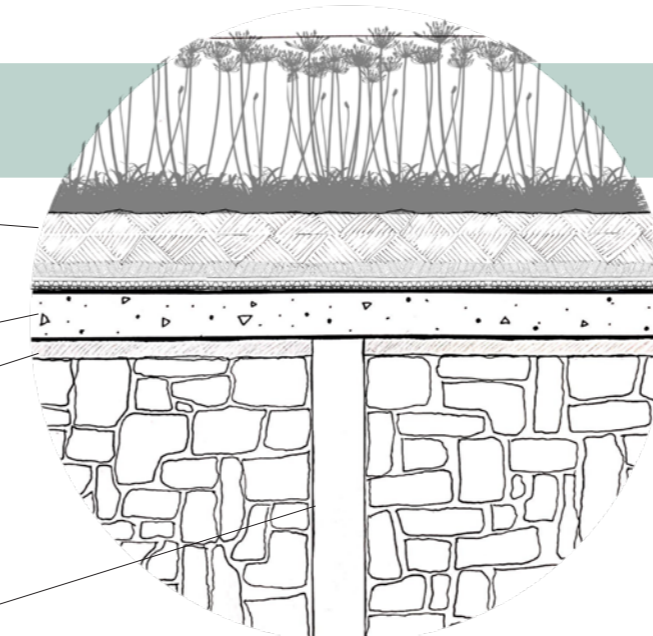
- Semi-intensive Green Roof
- 1350mm RC Upstanding Beams
- 250mm RC Roof Slab
- Custom Timber 'Wave' Skylight Frame
- 230mm Standard Brick Wall
- Custom Suspended Hanging Plant Pot Detail
- 500mm Local Stone Cavity Wall
- 76 x 76 SA Pine Timber Slat Wall
- 100mm RC Door Frame Detail
- 200mm RC Floor Slab
- 400 x 600mm RC Rafter



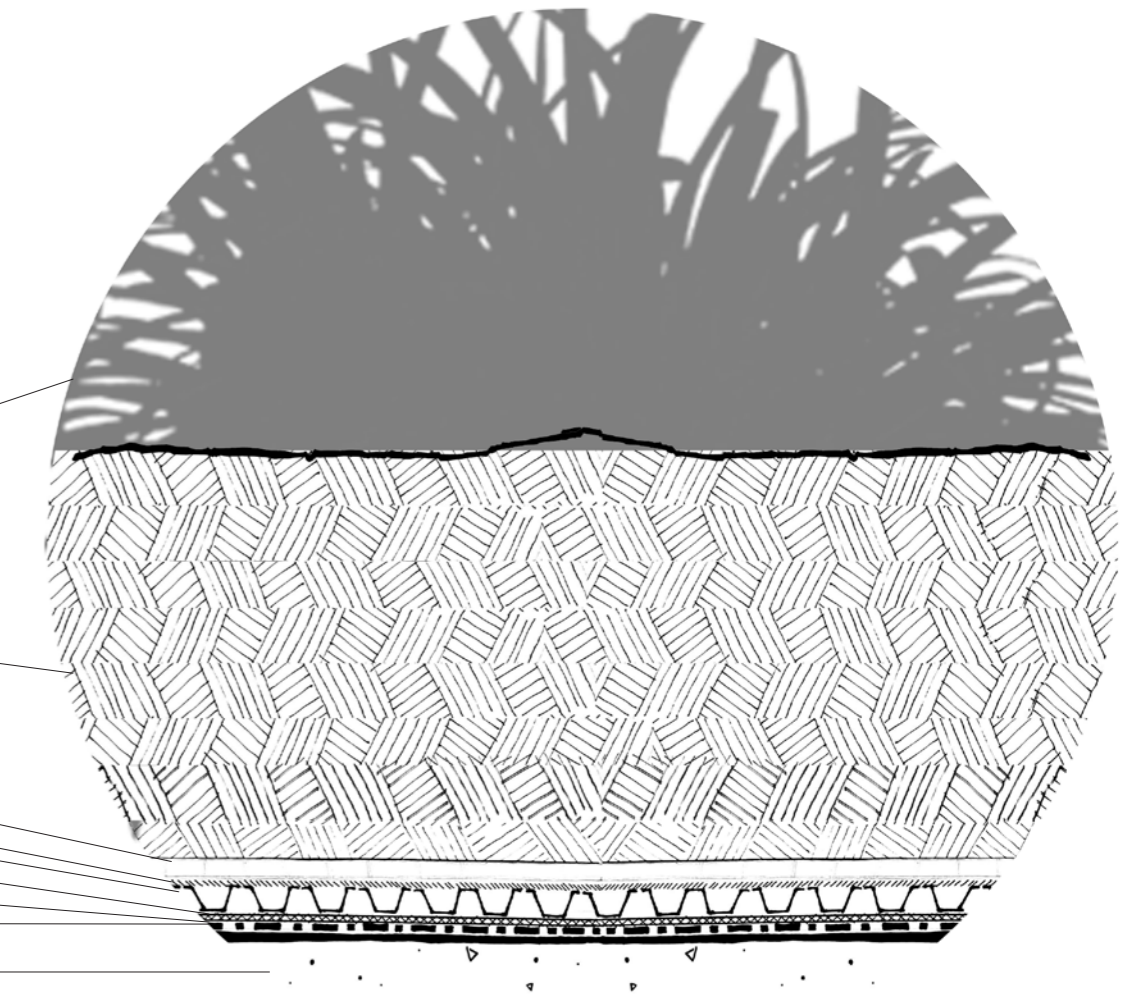
Figure 235: Funeral Parlor 'Outdoor' Ceremony Space Interior View(Author, 2021).



Funeral Parlor Typical Wall Section
 Not to Scale
 Figure 236: Wall Section Funeral Parlor 'Outdoor' Ceremony Space(Author, 2021).



Funeral Parlor Typical Wall Elevation as seen in the Typical Wall Section
 Not to Scale
 Figure 237: Elevation of Wall Section(Author, 2021).



Funeral Parlor Green Roof Detail
(ZinCo Green Roof Systems Ltd : Semi-intensive Green Roof Type Heather with Lavender according to ETA-13/0668)
 Not to Scale
 Figure 238:Green Roof Detail (Author, 2021).

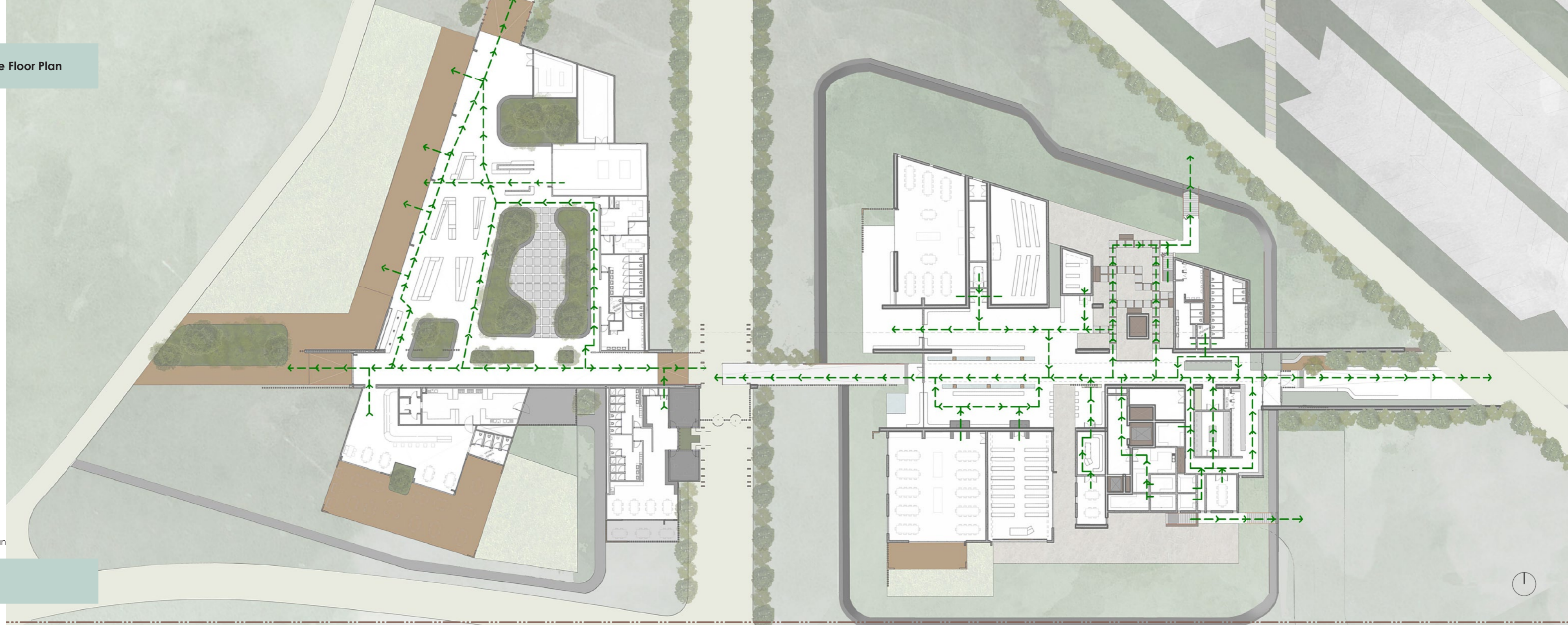
7.11 Fire Escape Route Floor Plan

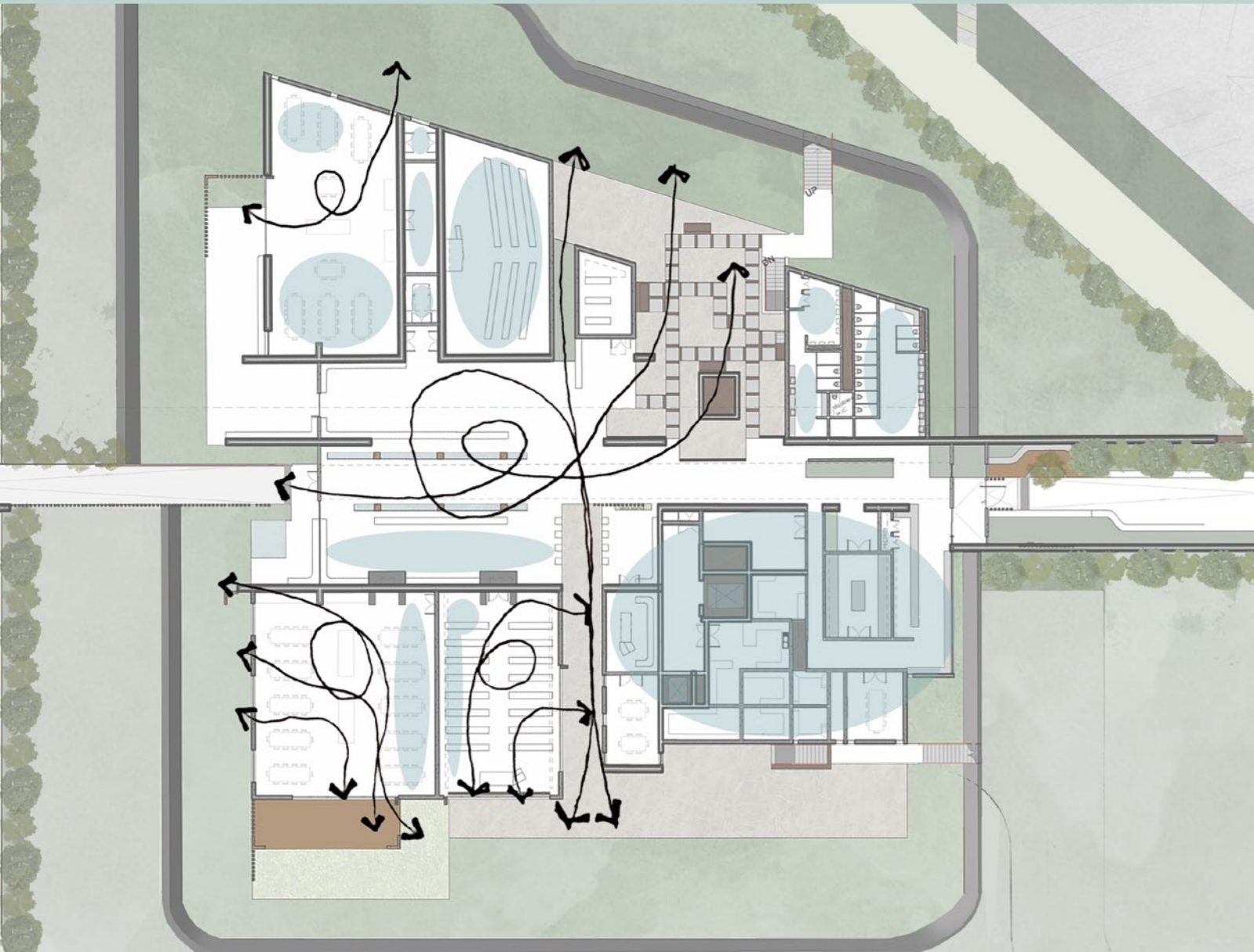
Within any built environment in South Africa, it is crucial to understand the fire safety regulations set out by SANS 10400, Part T.

As seen in the Fire Escape Plan to the right, this design proposal makes use of several escape routes in both buildings, ensuring that anyone within the buildings would be able to escape if a fire were to occur.

Figure 239: Fire Escape Ground Floor Plan (Author, 2021).

Ground Floor Plan
Not to Scale





Ground Floor Funeral Plan
Not to Scale

Figure 240: Ventilation Ground Floor Plan (Author, 2021).

Within any building, ventilation is important but this becomes even more vital when more people occupy one space at the same time as is done in the ceremony, function and in-between spaces of the funeral parlor.

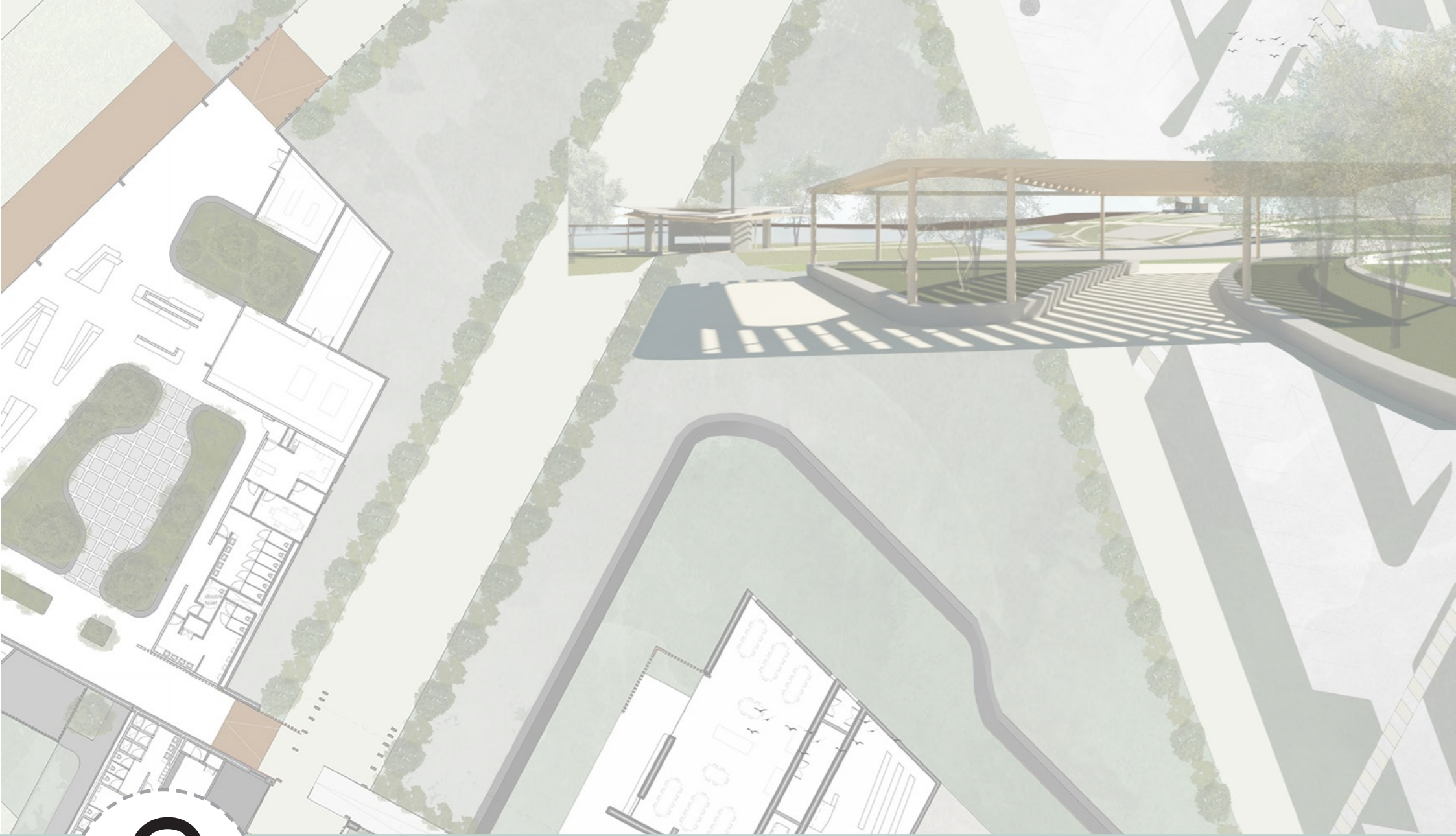
As seen in the Ventilation floor plan to the left, the arrows portray how, if any, natural cross ventilation would occur within the spaces of the building. Any spaces marked in blue would need mechanical ventilation. As this building is largely opened up to the surroundings, much natural ventilation will occur but more closed off spaces such as the admin spaces at to the North East, would require mechanical ventilation. As the roof slab extends quite high, adding a ceiling within the spaces with a HVAC system within them is relatively easy.

Site Information		
Erf No.	RE 43/794	
Site Area	100,21km ²	
Zoning	Funeral Parlour	CO2
	Botanical Nursery	OS3
FAR	Funeral Parlour	2,0
	Botanical Nursery	None
Proposed GLA		4358m ²
Allowed Coverage		60%
Proposed Coverage		60,126km ²
Boundary Lines		5m on all sides
Height Restriction		18m

Figure 241: Design Proposal Technical Information Tables (Author, 2021).

	Occupancy (According to SANS 10400 Table 1)	Population Calculation (According to SANS 10400 Table 2)	Population: Visitors	Population: Staff	Parking Requirements:
Funeral Parlour	A1	No. of fixed seats or 1 person per m ² if there are no fixed seats	187	20	5 bays per 100m ² PFA = 114 bays
Botanical Nursery	F1	1 person per 10m ²	209	28	10 bays per 100m ² PFA = 113 bays
Cemetery	Unclassified	+/- 100 visitors	+/- 100 visitors	+/- 100 visitors	100 bays

Provision for Sanitary Fixtures According to SANS 10400 Table 6						
		Female		Male		
		WC	WB	WC	U	WB
Funeral Parlour	Visitors	7	4	3	5	4
	Staff	2	1	1	1	1
Botanical Nursery	Visitors	9	5	3	6	5
	Staff	2	1	1	1	1



8

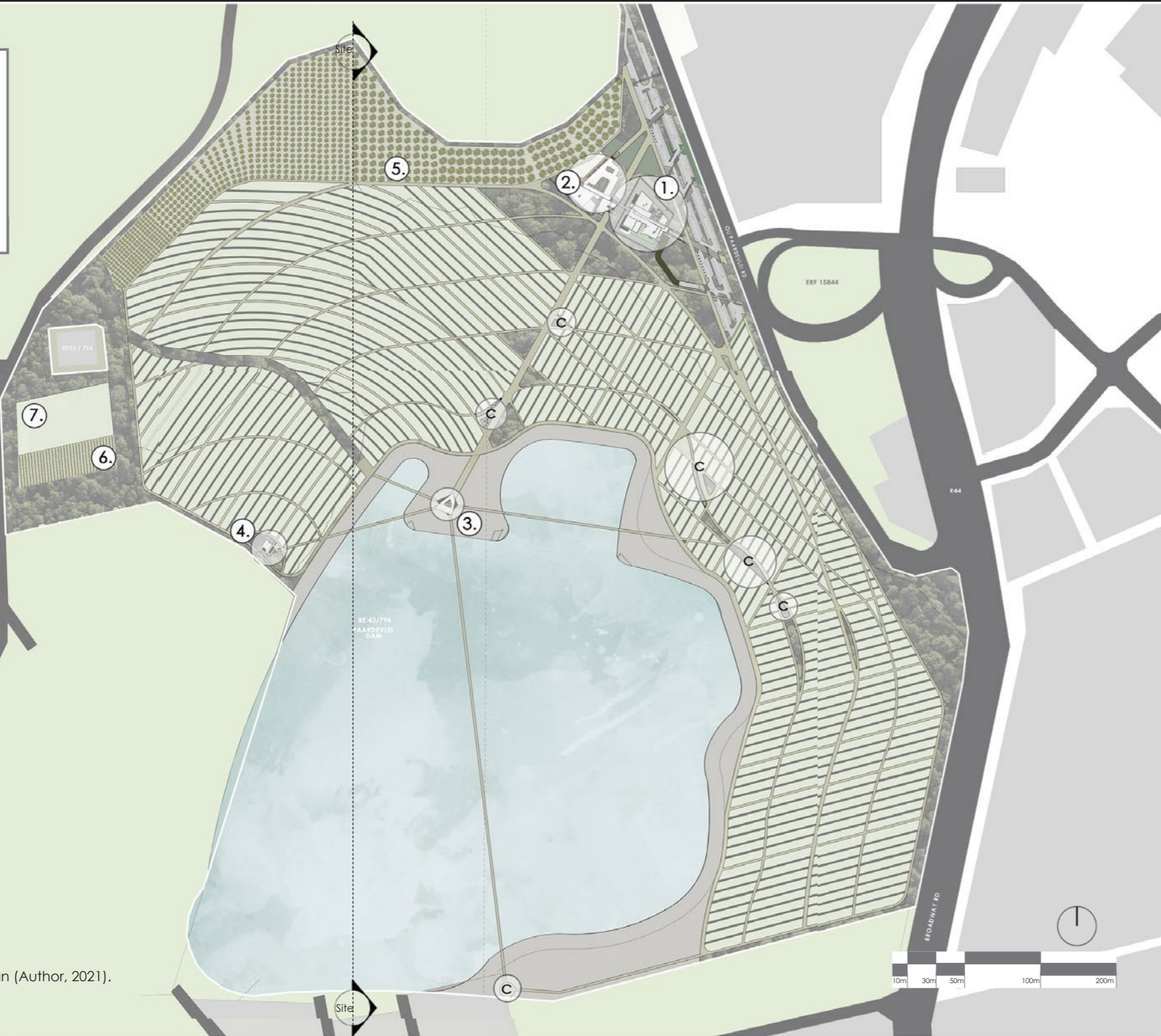
DDIS 7900: Design Documentation



Figure 242: Locality Plan (Author, 2021).



- legend**
- 1. - funeral parlour
 - 2. - botanical nursery
 - 3. - memorial for factory slaves
 - 4. - contemplative prayer space
 - 5. - planting for nursery
 - 6. - seedling planting
 - 7. - equipment barn
 - c - contemplative space



Site Plan
Not to Scale
Figure 243: Site Plan (Author, 2021).



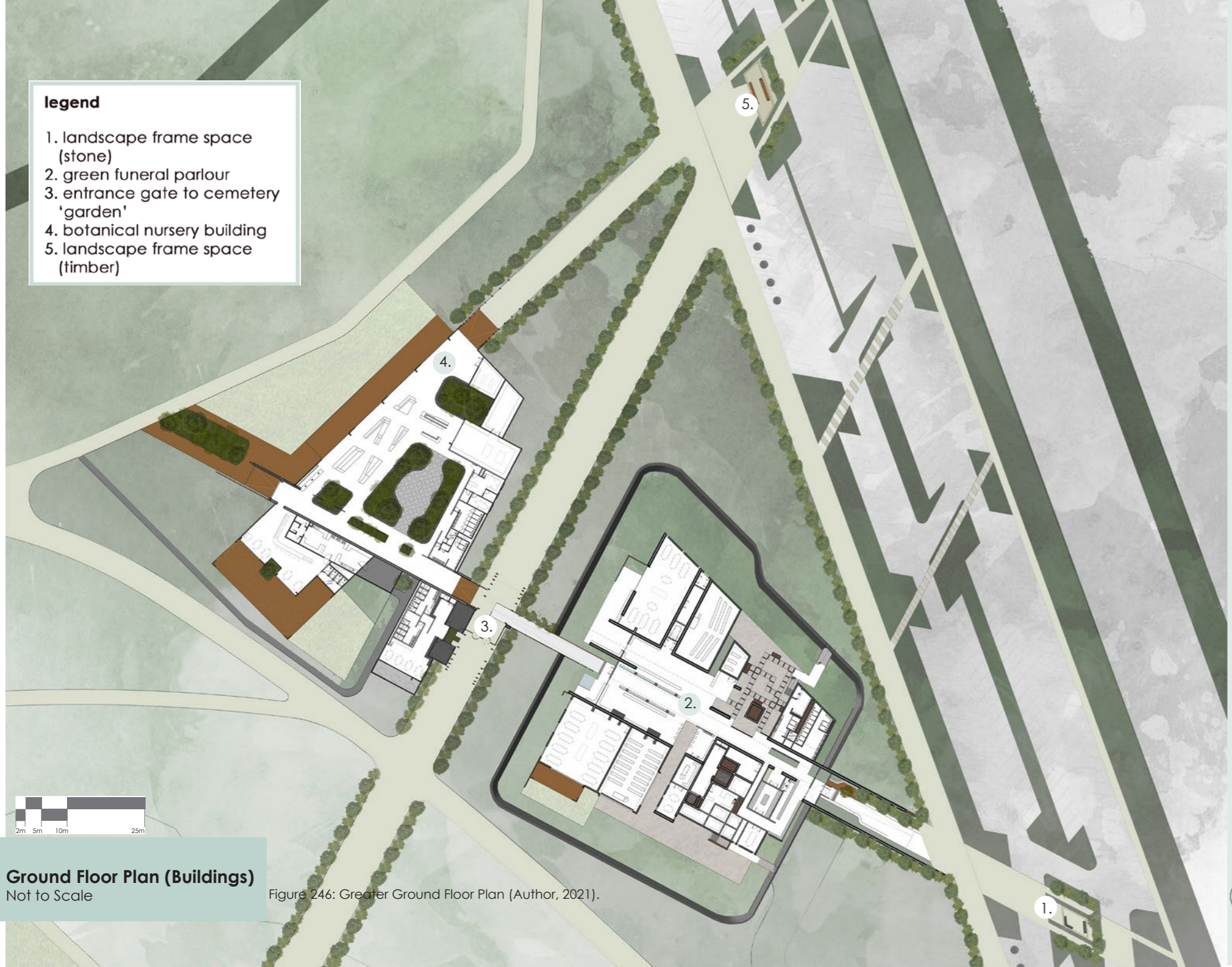
Figure 244: Exterior Perspective (Author, 2021).
Figure 245: Site Section (Author, 2021).

Site Perspective



Site Section A
Not to Scale

- legend**
- 1. landscape frame space (stone)
 - 2. green funeral parlour
 - 3. entrance gate to cemetery 'garden'
 - 4. botanical nursery building
 - 5. landscape frame space (timber)



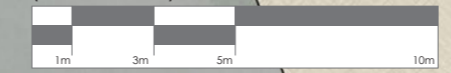
Ground Floor Plan (Buildings)
Not to Scale

Figure 246: Greater Ground Floor Plan (Author, 2021).

Landscape Frame Space (Stone)
Not to Scale



Figure 247: Landscape Frame (Stone)
(Author, 2021).



legend

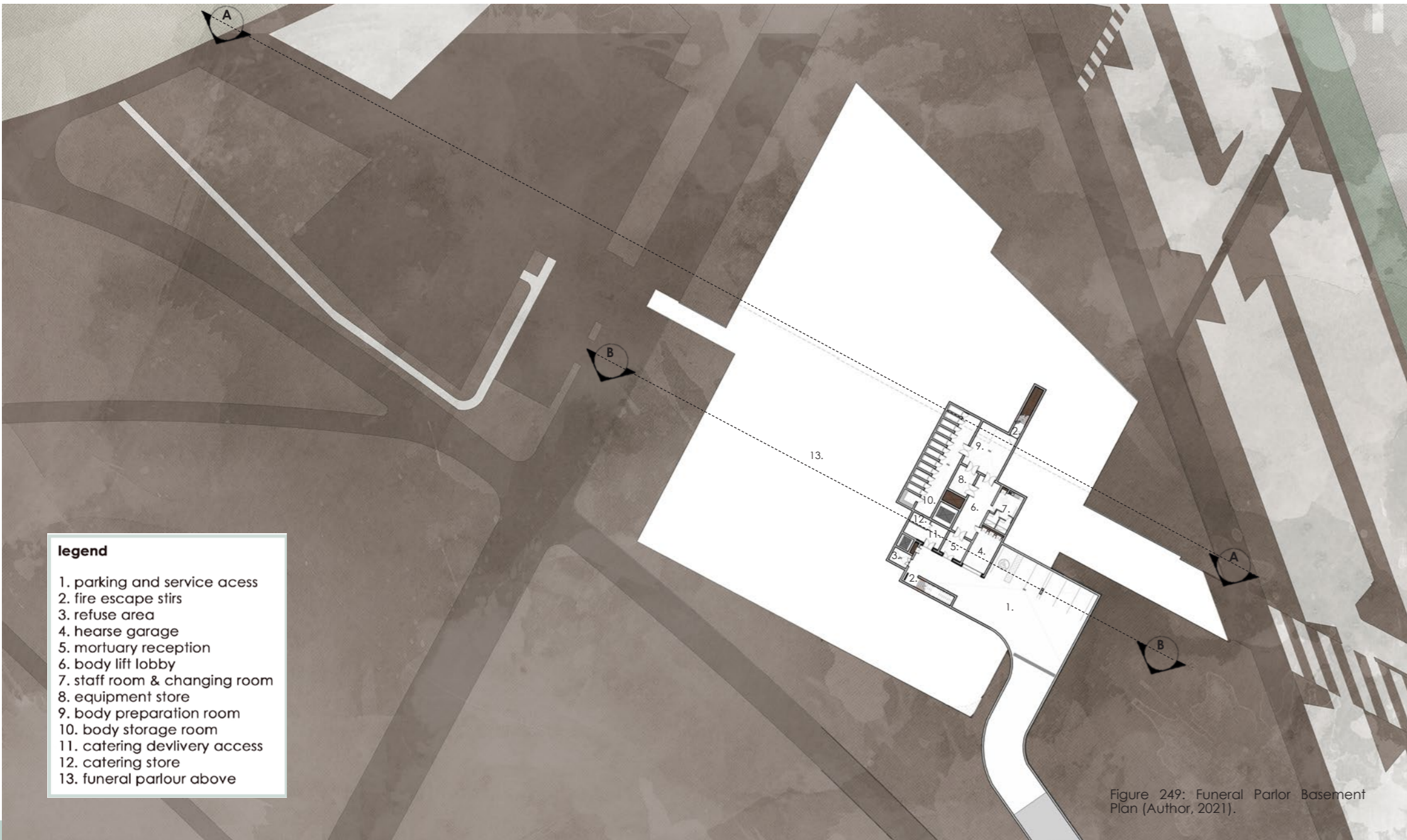
- 38. cemetery 'garden' entrance gate
- 39. visitor's gate and security office
- 40. nursery office
- 41. female staff changing room
- 42. male staff changing room
- 43. staff canteen
- 44. staff canteen patio
- 45. male ablutions
- 46. disabled ablutions
- 47. female ablutions
- 48. meeting room
- 49. storage room
- 50. general manager's office
- 51. nursery admin office
- 52. workshop for coffins, cemetery furniture, etc.
- 53. workshop storage
- 54. retail storage
- 55. nursery retail
- 56. outdoor retail space
- 57. picnic/ deli bar
- 58. cafe
- 59. bar area
- 60. cafe patio space
- 61. unisex ablutions
- 62. cafe kitchen
- 63. food storage
- 64. service yard



Building's Ground Floor Plan
Not to Scale

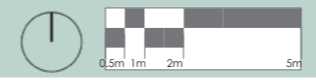
Figure 248: Ground Floor Plan(Author, 2021).





- legend**
- 1. parking and service access
 - 2. fire escape stairs
 - 3. refuse area
 - 4. hearse garage
 - 5. mortuary reception
 - 6. body lift lobby
 - 7. staff room & changing room
 - 8. equipment store
 - 9. body preparation room
 - 10. body storage room
 - 11. catering delivery access
 - 12. catering store
 - 13. funeral parlour above

Figure 249: Funeral Parlor Basement Plan (Author, 2021).



Funeral Parlor Basement Plan
Not to Scale

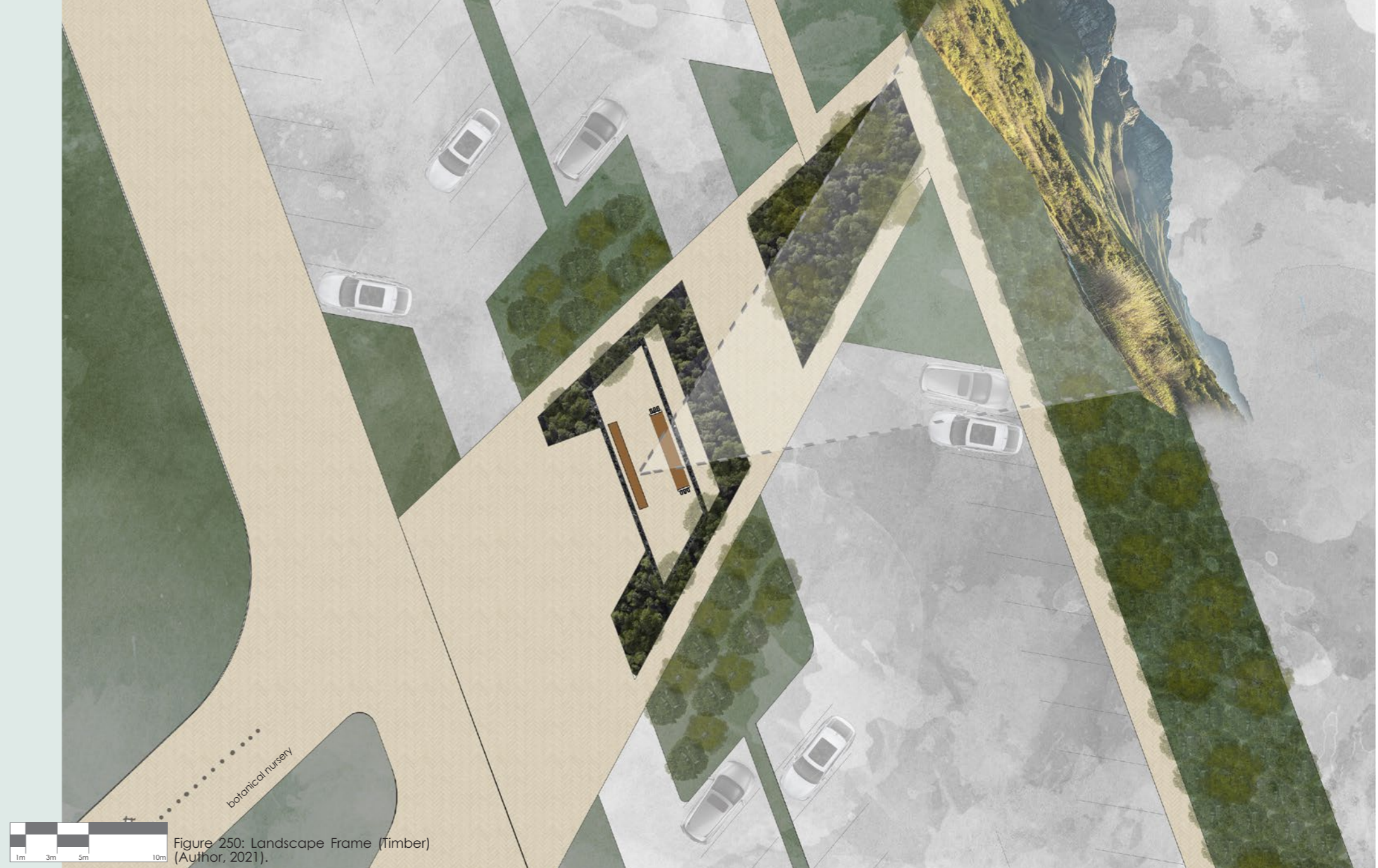


Figure 250: Landscape Frame (Timber) (Author, 2021).

Landscape Frame Space (Timber)
Not to Scale



Elevations

Not to Scale



Figure 251: Elevations (Author, 2021).

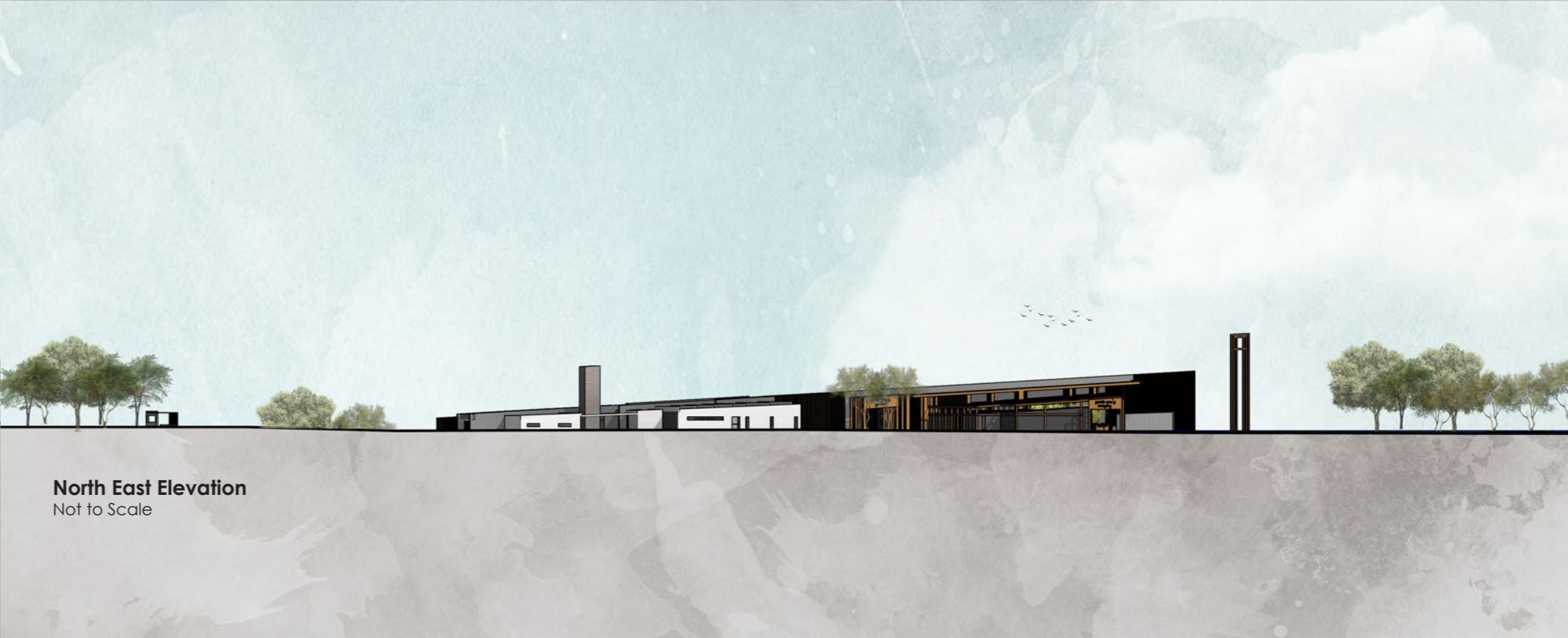


South West Elevation
Not to Scale

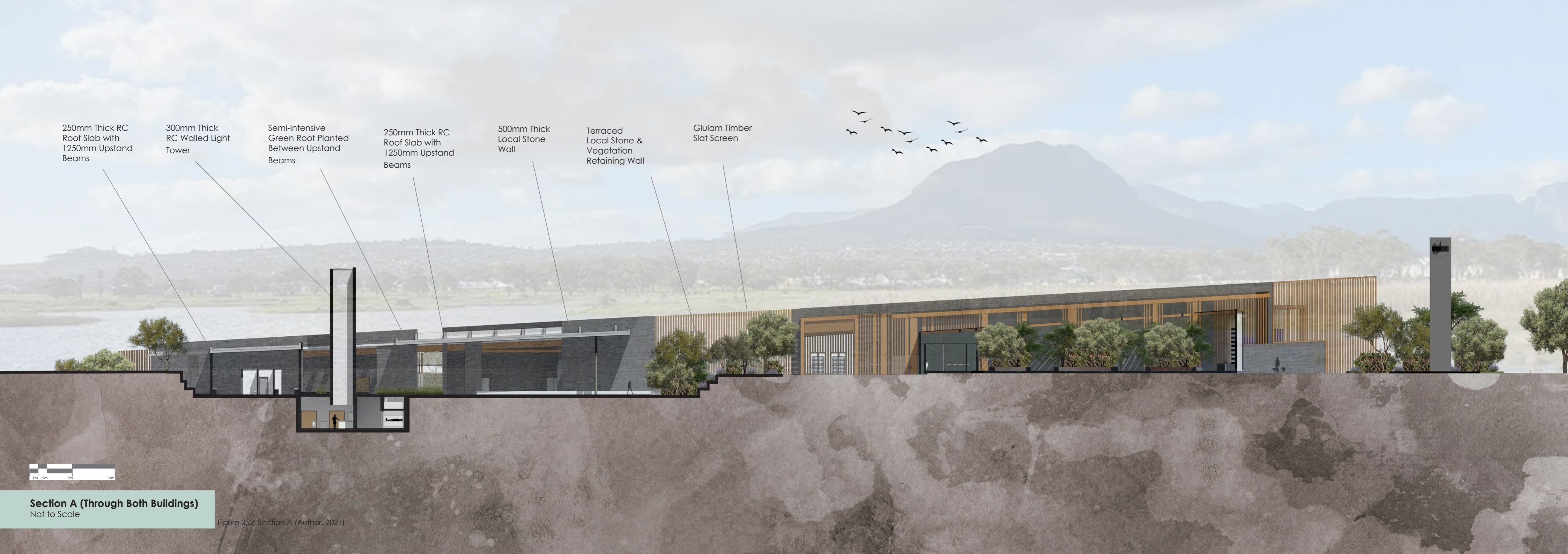


South East Elevation
Not to Scale

North West Elevation
Not to Scale



North East Elevation
Not to Scale



250mm Thick RC Roof Slab with 1250mm Upstand Beams

300mm Thick RC Walled Light Tower

Semi-Intensive Green Roof Planted Between Upstand Beams

250mm Thick RC Roof Slab with 1250mm Upstand Beams

500mm Thick Local Stone Wall

Terraced Local Stone & Vegetation Retaining Wall

Glulam Timber Slat Screen



Section A (Through Both Buildings)
Not to Scale

Figure 252: Section A (Author, 2021).



Figure 253: Section B (Author, 2021).

Section B (Funeral Section)
Not to Scale



152mm Thick
Glulam Timber
Wall

Zinc Standing Seam
Roof Sheeting in
Charcoal

228 x 228mm
Timber Beams

500mm Thick Local
Stone Cavity Wall

500mm Thick
Local Stone and
Timber Clock
Tower

Polycarbonate
Roof Sheeting

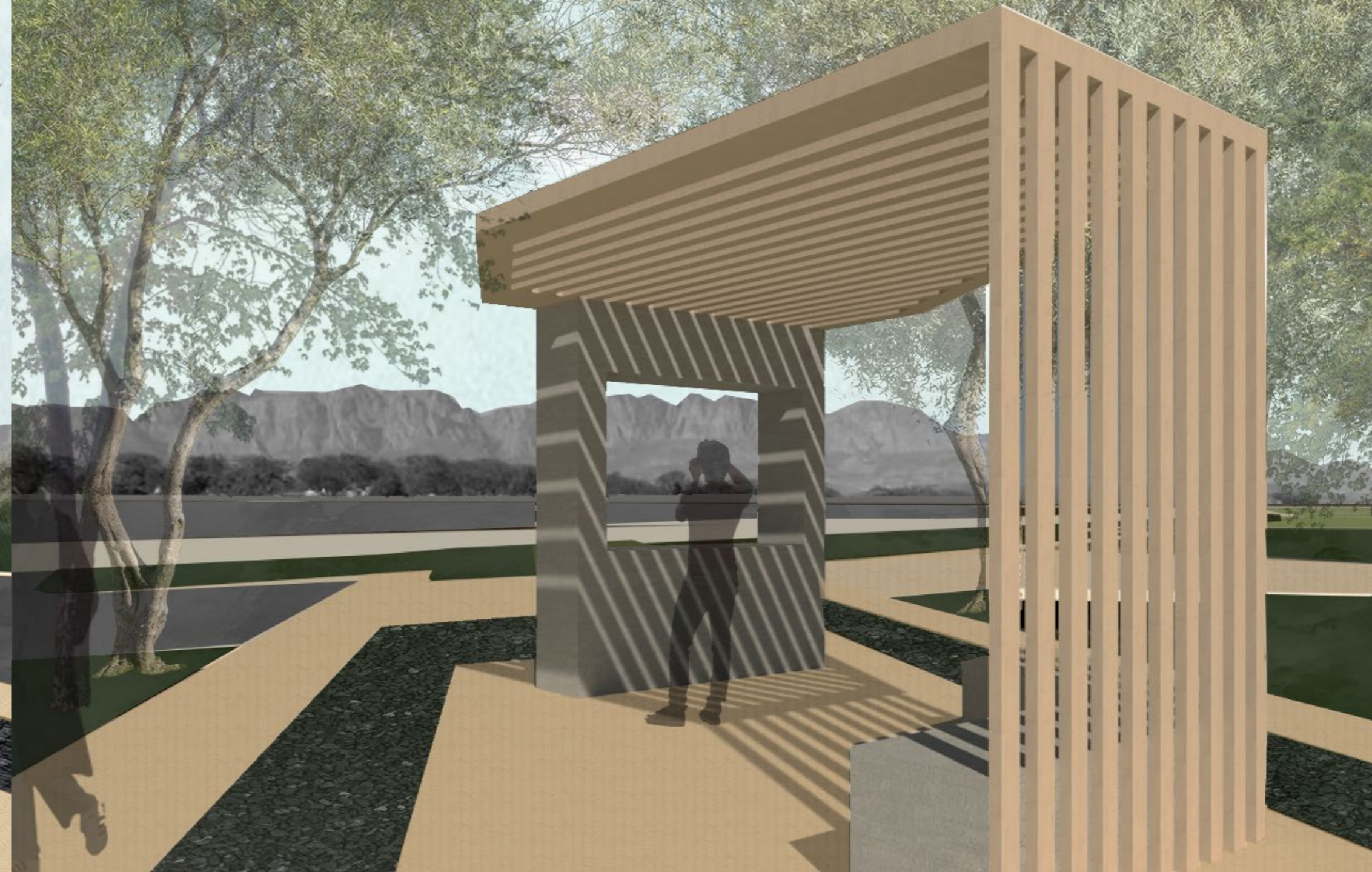
Figure 254: Section C (Author, 2021).

Section C (Nursery Section)
Not to Scale



Figure 255: Landscape Frame (Timber) Perspective (Author, 2021).

View 1- Landscape Frame (Timber)



View 2- Landscape Frame (Stone)

Figure 256: Landscape Frame (Timber) Perspective (Author, 2021).



Figure 257: Looking to the Funeral Parlor Entrance Perspective (Author, 2021).

View 3 - Looking to the Funeral Parlor Entrance



View 4- The Processional Route Through the Funeral Parlor

Figure 258: The Processional Route Through the Funeral Parlor (Author, 2021).

View 5- Inside The 'Outdoor' Ceremony Space

Figure 259: Inside the 'Outdoor' Ceremony Space Perspective (Author, 2021)



Figure 260: Inside the Botanical Nursery Retail Space Perspective (Author, 2021).

View 6- Inside The Botanical Nursery Retail Space

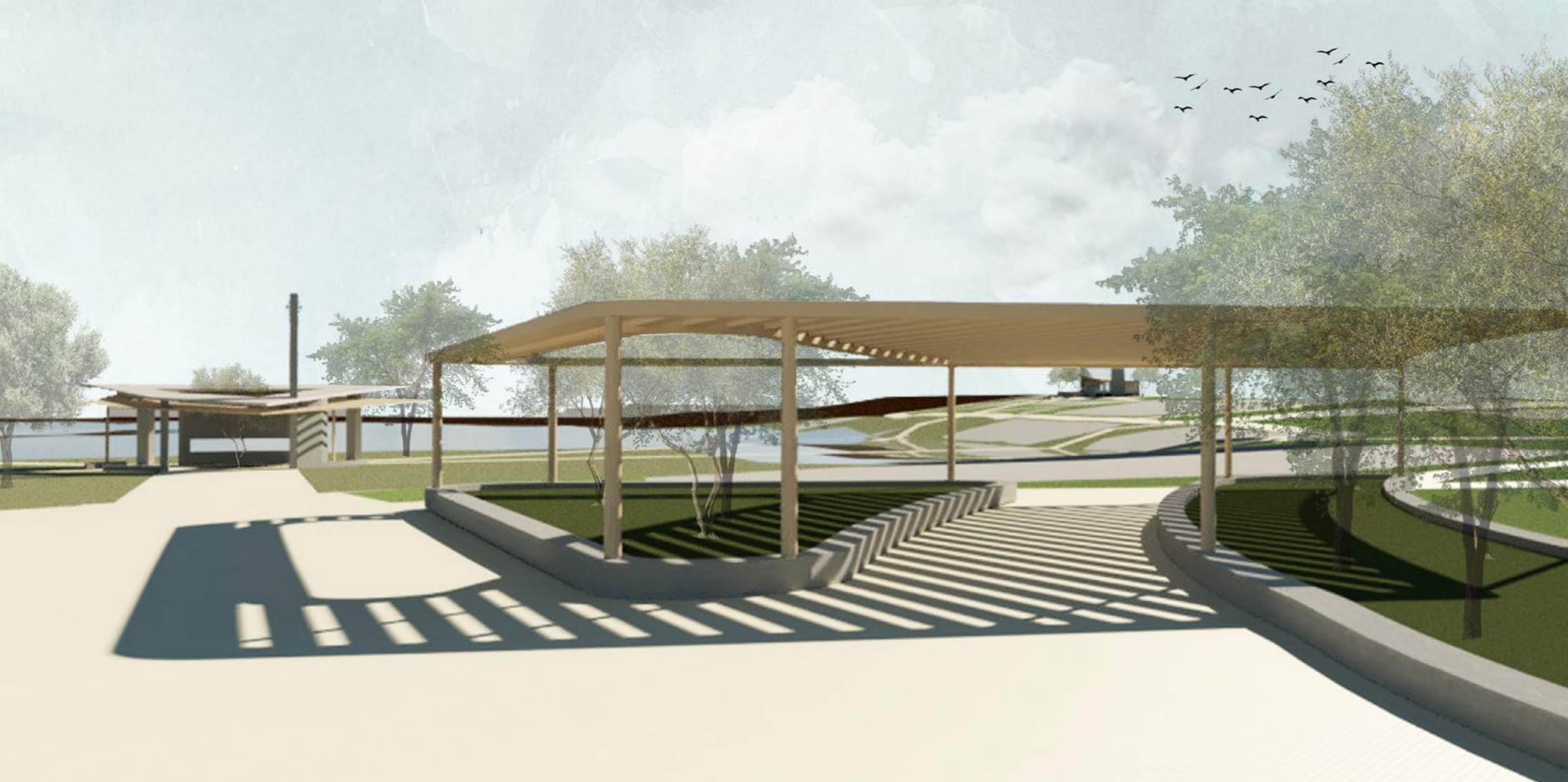


Figure 261: Looking Down the Main Promenade to the Seating Contemplative Area and to the Memorial Space Perspective (Author, 2021).

View 7 - Looking Down the Main Promenade to the Seating Contemplative Area and to the Memorial Space



Figure 262: Looking Through the Memorial Space to the Surroundings Perspective (Author, 2021).

View 8 - Looking Through the Memorial Space to the Surroundings

Planning comments:

1. Ground Floor

- 1.1 The disabled toilet door opens in front of the male toilets door.
- 1.2 A coffin coming out of the service passage can be seen from both the entrance and the admin areas. This is a cross over between public and private elements which will not work.
- 1.3 The bodies as well as the catering emerge from the same service passage creating cross contamination. This is a serious issue which must be changed for health and safety reasons.

2. Basement Floor

- 2.1 The hearse can't get into the parking and reverse properly.
- 2.2 There is food and corpse cross over in the delivery area which will not work for health and safety reasons

Planning solutions:

1. Ground Floor

- 1.1 A different placement of the paraplegic or the male toilet door to avoid a collision.
- 1.2 The service passage which deals with the body would have to open to the private ceremony spaces in a more concealed way.
- 1.3 There would have to be separate service passages to deal with the body and the catering seperatley unfortunately this would have a large impact on the planning which is why it cannot be achieved now but in future projects will be noted in the initial design stages.

2. Basement Floor

- 2.1 A change has been made to the basement parking to allow for the hearse to reverse but it is still not optimal but this will be noted for any future projects.
- 2.2 Optimally, there should be separate delivery spaces for the food and the bodies to avoid cross contamination all together but this would have a large impact on the current design therefore the design remains but this aspect will be noted for any future projects.

Research Question

The research question shouldn't probe into death but should rather interrogate **mourning, remembrance and memorials** therefore focusing more on the mourners themselves than the death that has occurred and how grieving is for the living not for the dead.

Theoretical Underpinning

There should be exploration into more phenomenons surrounding grieving and experiencing loss other than the cultural phenomenons.

Neuroarchitecture

More has been added on how neuroarchitecture is relevant on page 31 as there was not enough of a link between neuroarchitecture and death architecture.

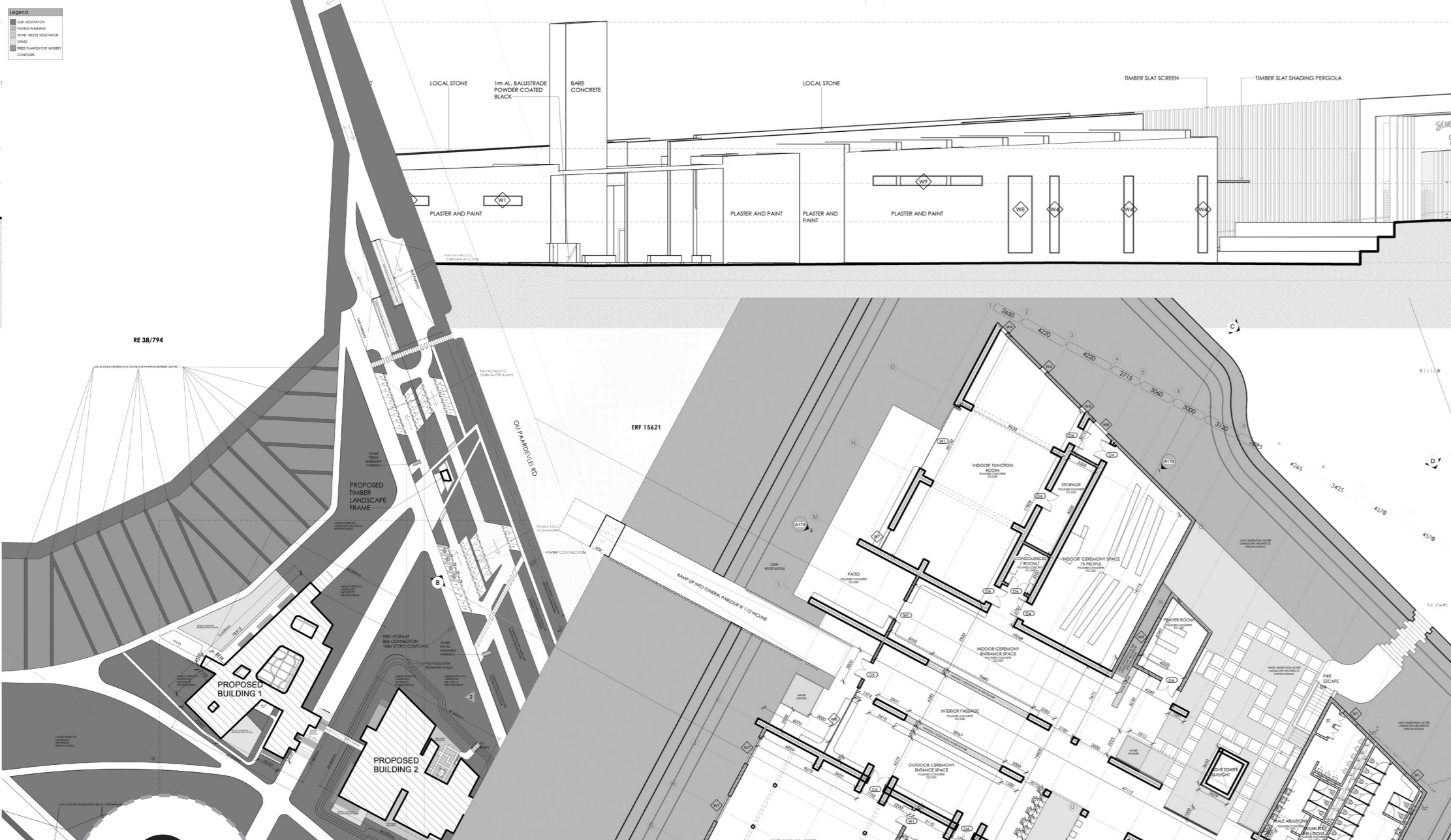
Concepts

The concepts should illustrate more clearly how they are used to formulate the theoretical premise connecting Emphasizing Connections with the connections between the stages of grief which links them but also separates them. The Already There would be the basis of celebrating the site as a location of memories perhaps therefore the use of the site for the buildings themselves through materiality. Finally The Dancing of Shadows and Light is the celebration of light as a building element which is the first step to creating an atmosphere within a space which directly links with the different stages of grief which will be felt within the different spaces. This would create a better connection between the theoretical underpinning and the final design.

History of Gardens

It would have been beneficial to insert more about the history of gardens universally as well as locally into the site analysis chapter.

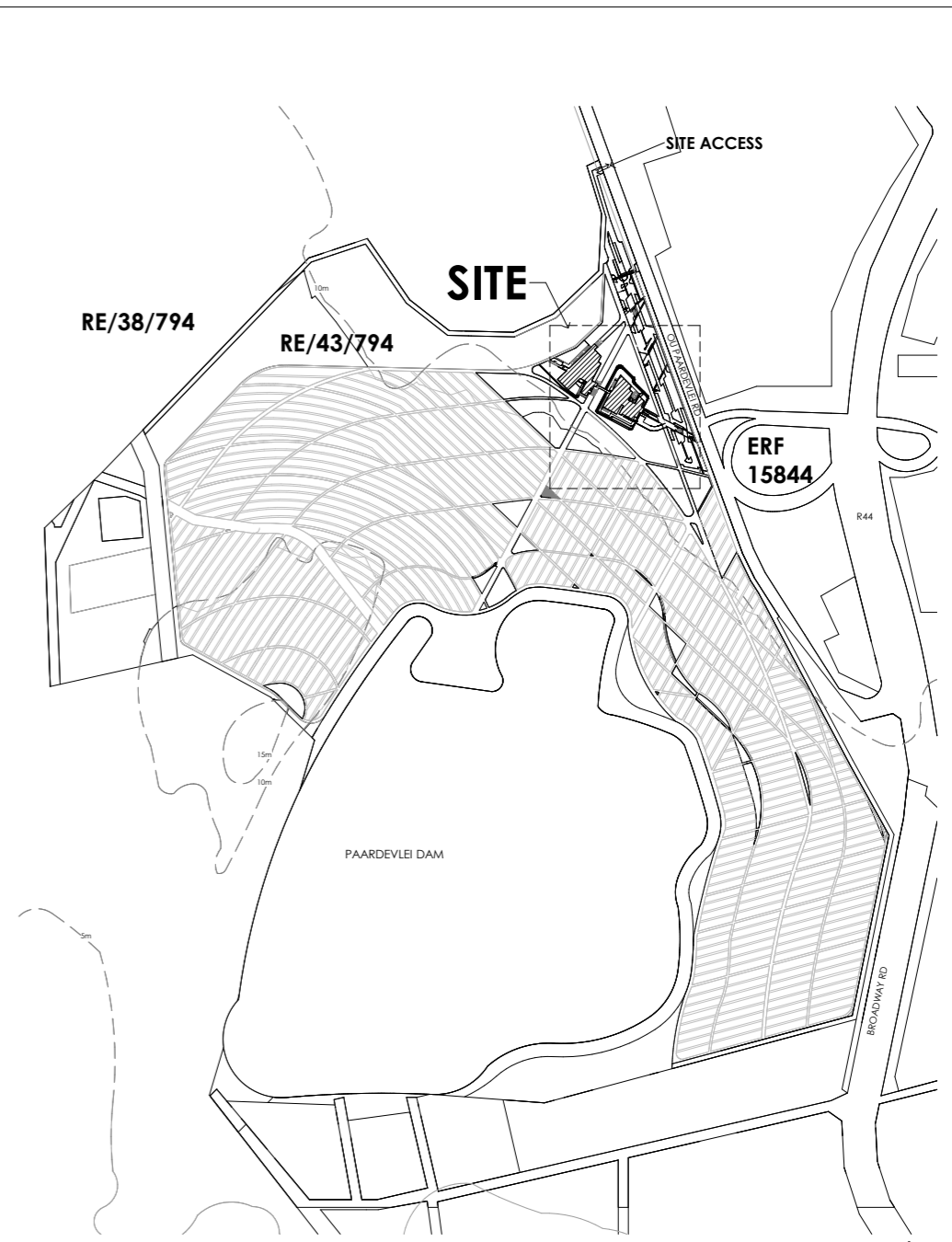
1. SITE BOUNDARY
 2. TRUNK ROADWAY
 3. ROAD RESERVE
 4. DRIVE
 5. DRIVE PLANNED FOR FUTURE CONSTRUCTION



9 CONS 7908: Technical Documentation



Site Locality Plan
 Scale 1: 20 000
 Figure 263: Site and Micro Site Plan (Author, 2021).



Micro Site Plan
 Scale 1: 5 000

ERF:	RE 43/794
AREA:	100.21km ²
ZONING:	CO2 & OS3
FAR:	2.0 & -
PROPOSED GLA:	4358m ²
COVERAGE:	60%
ALLOWED COVERAGE:	60,128km ²
PROPOSED COVERAGE:	4050m ²
BOUNDARY LINES:	5m
HEIGHT RESTRICTION:	18m

PARKING REGULATIONS	
FUNERAL PARLOUR:	5 BAYS/100m ² PFA = 114 Bays
BOTANICAL NURSERY:	10 BAYS/100m ² PFA = 113 Bays
CEMETERY:	100 BAYS = 100 Bays
REQUIRED BAYS:	327 Bays

PARKINGS PROVIDED	
BASEMENT PARKING:	178 Bays
ABOVE GROUND PARKING:	163 Bays
PARKINGS PROVIDED TOTAL:	341 Bays

gaby
 MICRO SITE PLAN & LOCALITY PLAN

PROJECT NAME AND NUMBER:
 SWEET-PEA'S GARDEN: SOMERSET WEST GREEN CEMETERY

OWNER:	GABY CHEMICAL	PROJECT NUMBER:	2015046978
SCALE:	As indicated	DATE:	04/11/2021
		SHEET NO.:	A162

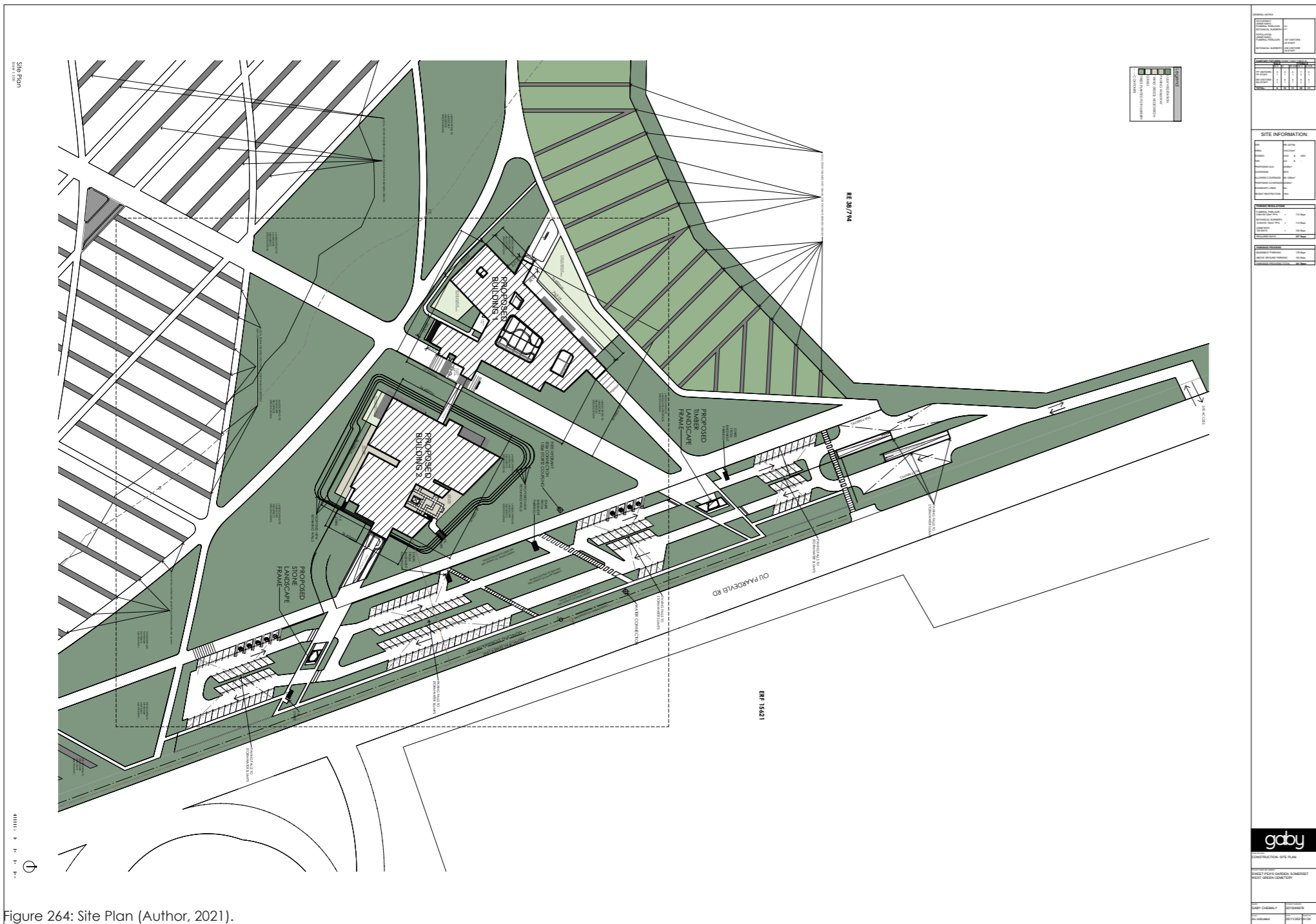


Figure 264: Site Plan (Author, 2021).



Figure 265: Funeral Parlour Ground Floor Plan (Author, 2021).

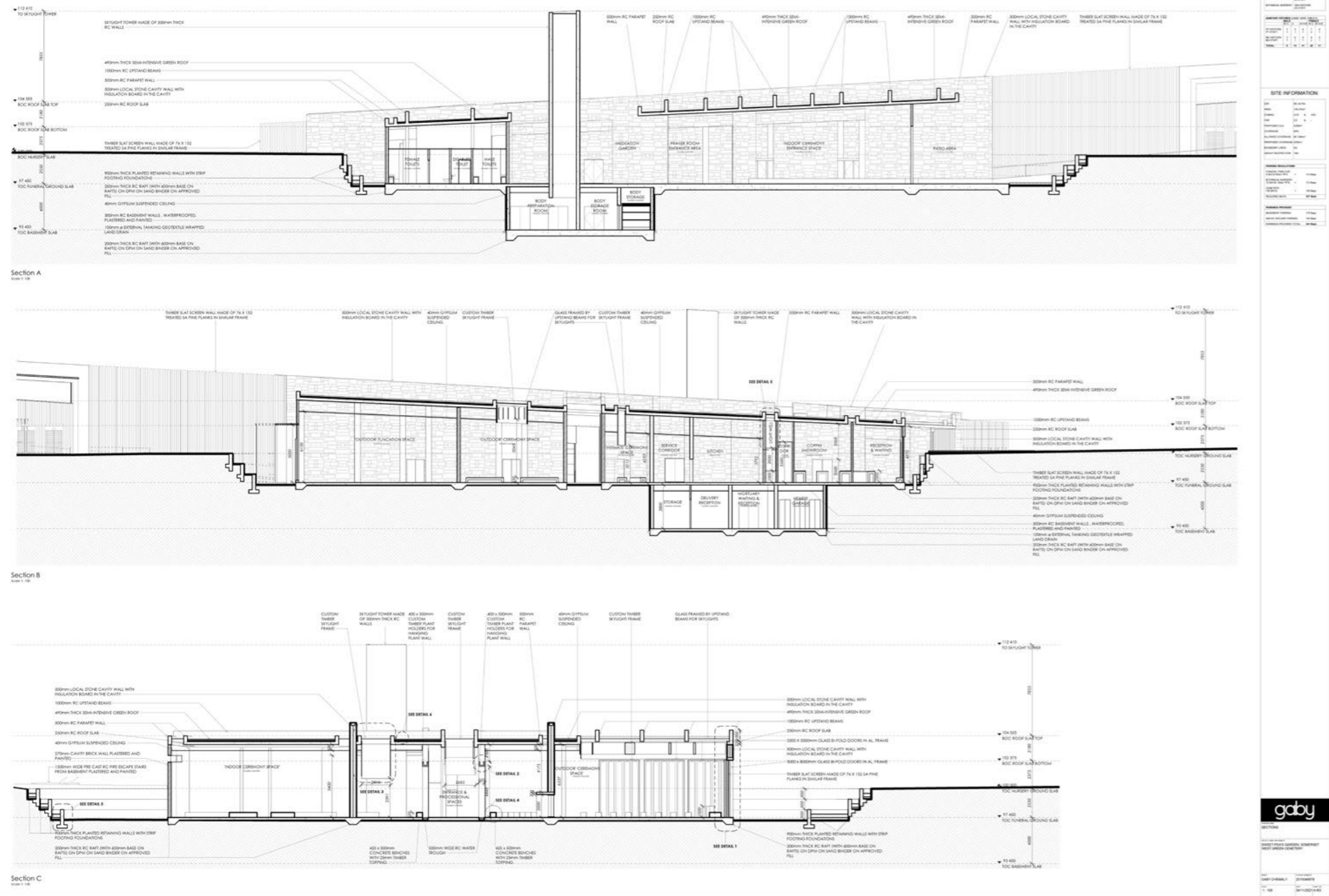
Figure 266: Funeral Parlor Basement Plan (Author, 2021).



Figure 267: Funeral Parlor Roof Plan (Author, 2021).



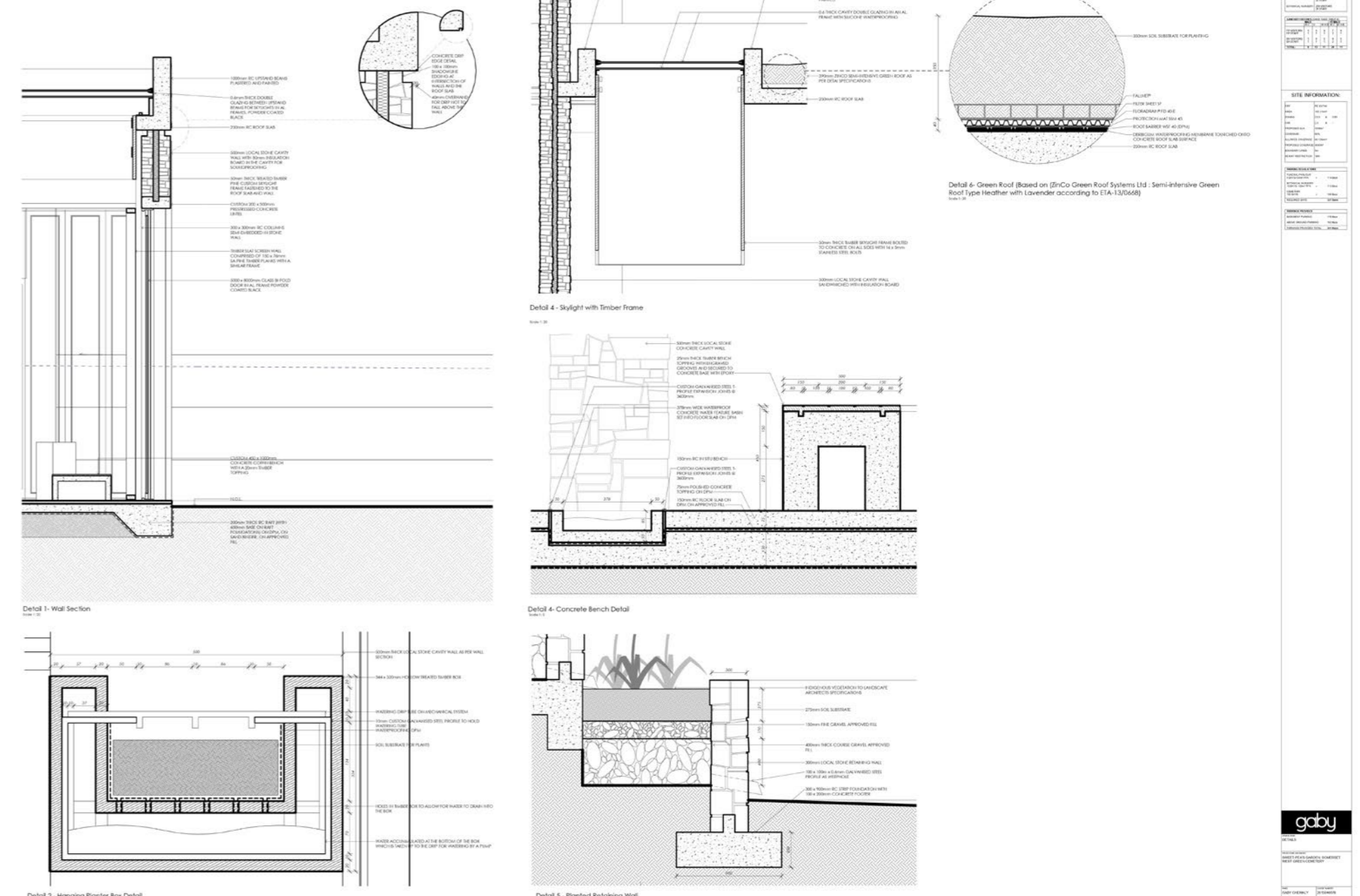
Figure 270: Sections (Author, 2021).



SITE INFORMATION

Site Name:	Project Name:
Location:	Client:
Area:	Scale:
Orientation:	Author:

Figure 271: Details (Author, 2021).



SITE INFORMATION

Site Name:	Project Name:
Location:	Client:
Area:	Scale:
Orientation:	Author:

10 Conclusion

To conclude, this design proposal invited a peaceful experience in a space for those who have passed on, making the process of grieving a more positive one. It accomplishes this through a rigorous investigation into the theory of rituals, focusing on death rituals as well as celebrating the relationship between man and nature and the neurological connection which can be manipulated through design, improving an individual's ability to heal (psychologically through a well supported grieving process). The proposed design makes use of this investigation as well as an investigation into the site and what it has to offer in terms of guiding the design. The combination of these theoretical applications fashioned an appropriate and therefore, successful design proposal.

"The one who plants trees, knowing that he will never sit in their shade, has at least started to understand the meaning of life."

- Rabindranath Tagore

11

11.1 Reflection

Reflecting on the design outcome, the manner in which the theory of Biophilia and Death Rituals are combined within the design proposal, add to the success of the scheme as they balance each other to create a design that harmoniously sits within its unique landscape while celebrating the grieving process and the memorial stage which occurs after the grieving. Also, the celebration of the present by drawing on the site's past but simultaneously looking to the future of what could be, invites a balance between the importance of conserving the character, history and biodiversity of the site while creating a space for present and future generations to remember those passed but also including the greater community in bringing in a future green space within the urban context.

Death is a complex topic but trying to introduce a new way of thinking about it and understanding death it was more difficult than previously anticipated. Constantly thinking about death, especially in these trying times of the pandemic impacted me on a personal level and trying to carry everyone's different views on the topic while still staying true to my own beliefs was an almost impossible task. It became apparent that one architect should not necessarily design a complex which deals with this topic by themselves. Individuals today are easily offended and unfortunately, the outcome will weigh heavily on the architect's interpretation of the topic, therefore it might be a better idea to involve several architects with different views. I believe that this proposal is resolved to a certain extent but it still lends itself to a more complex understanding, especially a more emotional understanding, which I personally struggled with.

Overall, I believe the outcome is an appropriate one for the chosen topic, even though it could be more resolved, the design does celebrate significant understandings of the topic and brings a new understanding to the Helderberg context of what death can look like.



Figure 35: From My Veins Comes Life (Author, 2021).

Figure 1: Gabriella Chemaly. 2021. From My Veins Comes Life. Somerset West.

Figure 2: Gabriella Chemaly. 2021. Sneezewood Tree Sketch. Somerset West.

Figure 3: Gabriella Chemaly. 2021. My Watercolour Sweet-Pea. Somerset West.

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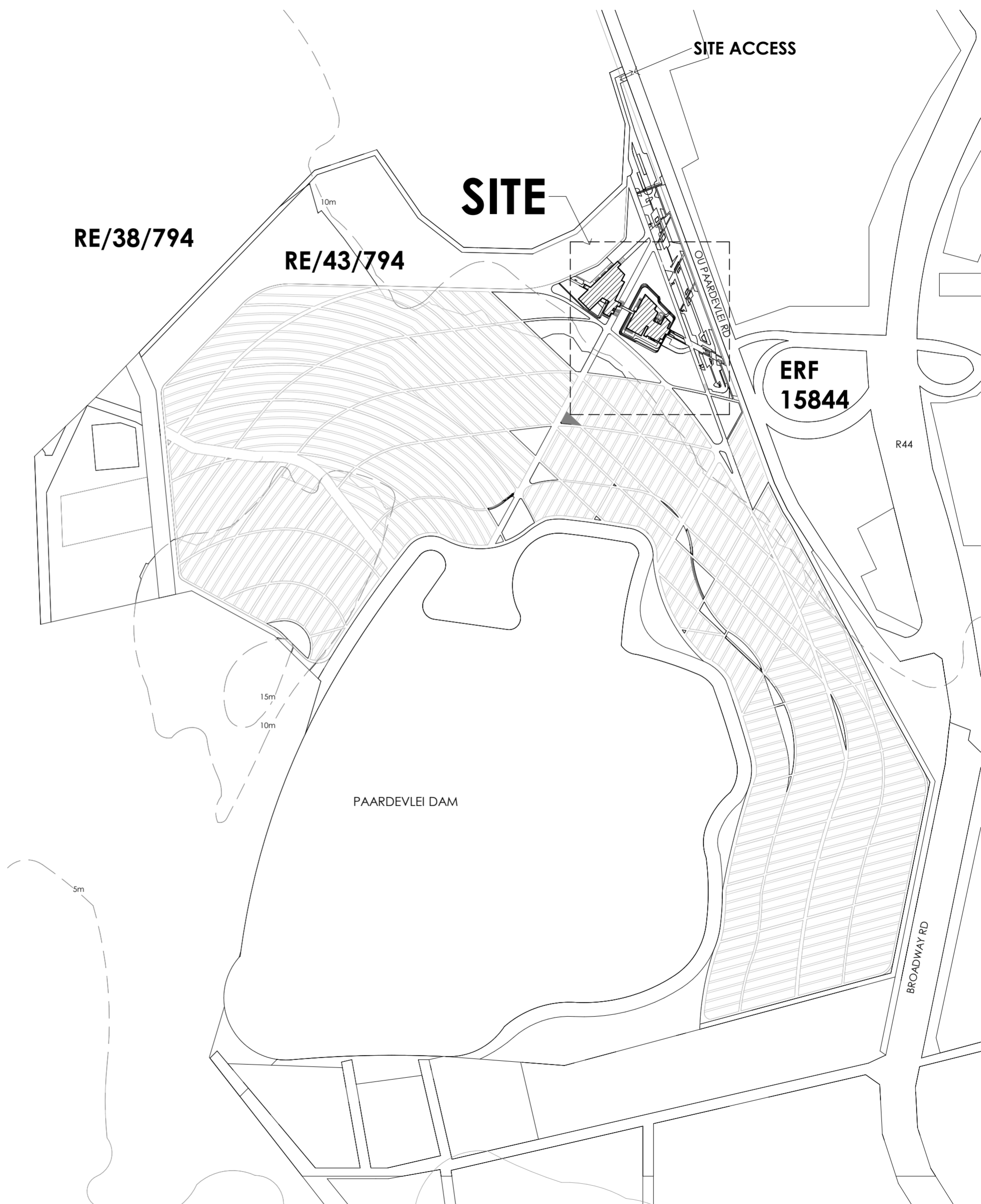
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Site Locality Plan
Scale 1: 20 000



Micro Site Plan
Scale 1: 5 000



ERF:	RE 43/794
AREA:	100.21km ²
ZONING:	CO2 & OS3
FAR:	2.0 & -
PROPOSED GLA:	4358m ²
COVERAGE:	60%
ALLOWED COVERAGE:	60,126km ²
PROPOSED COVERAGE:	4050m ²
BOUNDARY LINES:	5m
HEIGHT RESTRICTION:	18m

PARKING REGULATIONS	
FUNERAL PARLOUR: 5 BAYS/100m ² PFA	= 114 Bays
BOTANICAL NURSERY: 10 BAYS/ 100m ² PFA	= 113 Bays
CEMETERY 100 BAYS	= 100 Bays
REQUIRED BAYS:	327 Bays

PARKINGS PROVIDED	
BASEMENT PARKING:	178 Bays
ABOVE GROUND PARKING:	163 Bays
PARKINGS PROVIDED TOTAL:	341 Bays



DRAWING NAME:
MICRO SITE PLAN & LOCALITY PLAN

PROJECT NAME AND NUMBER:
SWEET-PEA'S GARDEN: SOMERSET
WEST GREEN CEMETERY

NAMES: GABY CHEMALY	STUDENT NUMBERS: 2015046978
SCALE: As indicated	DATE: 04/11/2021
	SHEET NO.: A162

GENERAL NOTES:

OCCUPANCY	FUNERAL PARLOUR	A1
POPULATION	FUNERAL PARLOUR	50 VISITORS
BOTANICAL NURSERY	BOTANICAL NURSERY	25 VISITORS

SCHEDULE	TOTAL	
	NO.	AREA
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
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41	41	41
42	42	42
43	43	43
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82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

SITE INFORMATION:

REF: RE 43734
 AREA: 100,274m²
 ZONING: CO2 & OS3
 PARK: 25 & 6
 PROPOSED GLA: 4299m²
 COVERAGE: 60%
 ALLOWED COVERAGE: 60,328m²
 PROPOSED COVERAGE: 6099m²
 BOUNDARY LINES: 5m
 HEIGHT RESTRICTION: 18m

PARKING REGULATIONS:

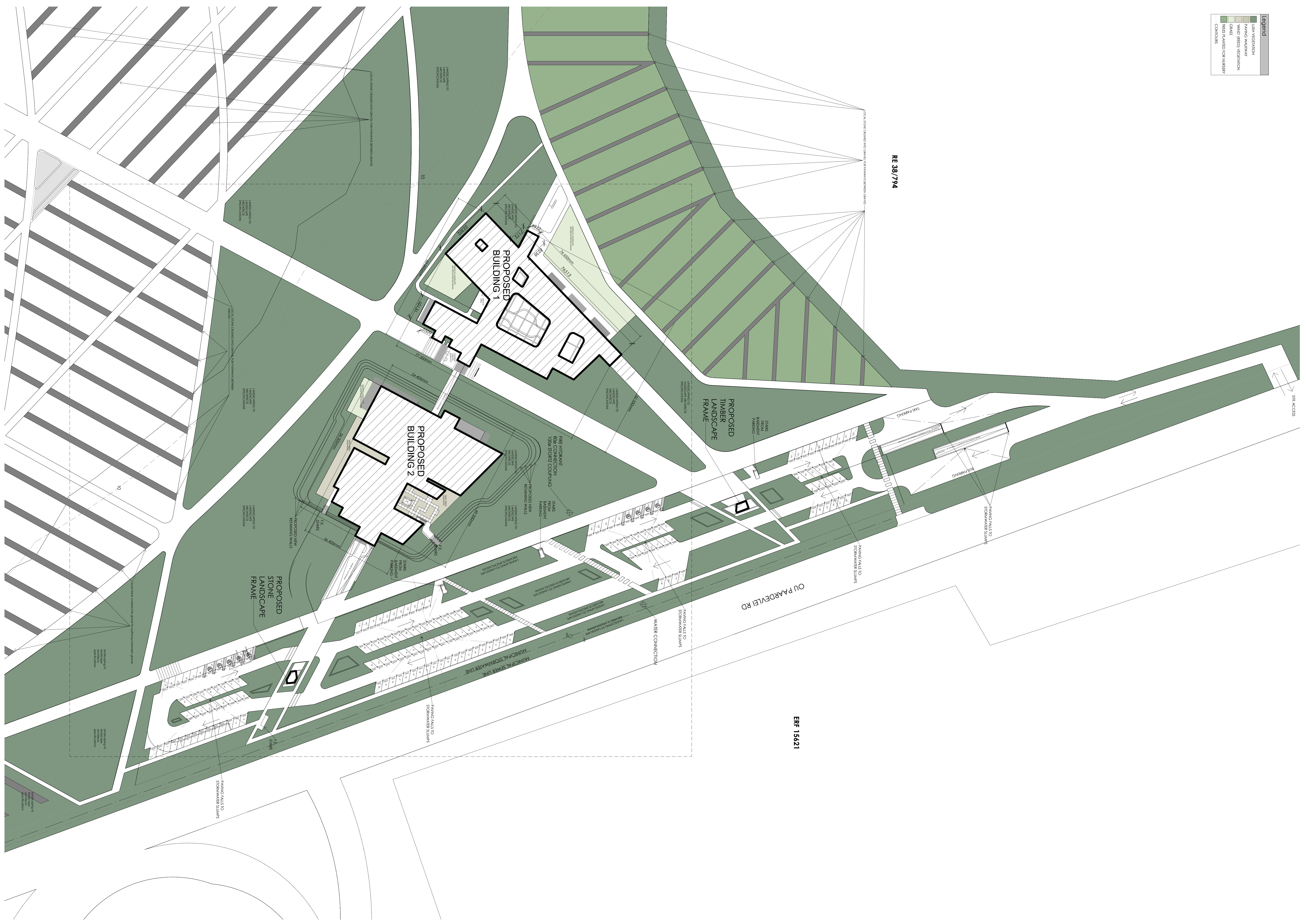
FUNERAL PARLOUR	5 BAYS/105M ² PTA	114 Bays
BOTANICAL NURSERY	10 BAYS/105M ² PTA	113 Bays
CEMETERY	NO BAYS	100 Bays
REQUIRED BAYS:		327 Bays

PARKINGS PROVIDED:

BASEMENT PARKING:	178 Bays
ABOVE GROUND PARKING:	163 Bays
PARKINGS PROVIDED TOTAL:	341 Bays

Legend

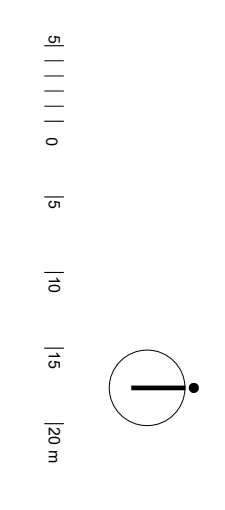
- LUKIN VEGETATION
- PARKING WALKWAY
- PAVED (PAVED) VEGETATION
- VEGETATION TO BE PLANTED FOR NURSERY CONDITIONS



RE 38/794

ERF 15621

Site Plan
Scale: 1:500



Legend	
[Green Swatch]	LUSH VEGETATION
[Light Green Swatch]	WIND (REED) VEGETATION
[Yellow Swatch]	GRASS
[Blue Swatch]	WATER
[Grey Swatch]	WALKWAY



EXAMINATION COMMENTS:
 1. THERE IS A FOOD AND BODY CROSS OVER IN THE SERVICE AREA - THERE SHOULD BE SEPARATE SERVICE AREAS TO AVOID CROSS CONTAMINATION
 2. THE COFFIN CAN BE SEEN FROM THE ENTRANCE AND ADMIN AREAS - PUBLIC AND PRIVATE CROSS OVER WHICH SHOULD BE DEALT WITH
 3. THE DISABLED TOILET DOOR OPENS IN FRONT OF THE MALE TOILETS DOOR

GENERAL NOTES:

OCCUPANCY: FUNERAL PARLOUR	A1
POPULATION: BOTANICAL NURSERY	11
POPULATION: FUNERAL PARLOUR	50 VISITORS
POPULATION: LANDSCAPE ARCHITECT'S OFFICE	20 VISITORS
POPULATION: BOTANICAL NURSERY	20 VISITORS

SITE INFORMATION:

REF:	RE 43734
AREA:	100.27m ²
ZONING:	CO2 & OS3
RAV:	2.0 & 8
PROPOSED GLA:	429m ²
COVERAGE:	60%
ALLOWED COVERAGE:	60.128m ²
PROPOSED COVERAGE:	429m ²
BOUNDARY LINES:	10m
HEIGHT RESTRICTION:	10m

PARKING REGULATIONS:

TYPE	NO. OF BAYS	NO. OF STALLS
FUNERAL PARLOUR	114	114
10 BAYS 10M X 5M	113	113
CEMETERY	100	100
REQUIRED BAYS:	327	327

PARKING PROVIDED:

BASEMENT PARKING:	178 Bays
ABOVE GROUND PARKING:	153 Bays
PARKING PROVIDED TOTAL:	331 Bays



GENERAL NOTES:

OCCUPANCY	FUNERAL PARLOUR	A1
POPULATION	FUNERAL PARLOUR	10 VISITORS
BOTANICAL NURSERY	10 VISITORS	10 VISITORS
BOTANICAL NURSERY	10 VISITORS	10 VISITORS

STAIRWAY PATHERS (SEE 1000) TABLE 1.1

STAIR	TO	FROM	STAIRS
FP VISITORS	2	5	1
FP STAFF	1	2	1
FP VISITORS	3	5	1
FP STAFF	2	5	1
TOTAL	4	13	3

SITE INFORMATION:

REF: RE 43734
 AREA: 100.27m²
 ZONING: CO2 & OS3
 MAX: 2.0 & 6
 PROPOSED GLA: 439m²
 COVERAGE: 60%
 ALLOWED COVERAGE: 60.128m²
 PROPOSED COVERAGE: 439m²
 BOUNDARY LINES: 1m
 HEIGHT RESTRICTION: 18m

PARKING REGULATIONS

FUNERAL PARLOUR	5 BAYS/100M ² PFA	=	114 Bays
BOTANICAL NURSERY	TO BAYS/100M ² PFA	=	113 Bays
CEMETERY	10 BAYS	=	100 Bays
REQUIRED BAYS			327 Bays

PARKINGS PROVIDED:

BASEMENT PARKING	178 Bays
ABOVE GROUND PARKING	163 Bays
PARKINGS PROVIDED TOTAL	341 Bays

EXAMINATION COMMENTS:
 1. THERE WAS NOT ENOUGH SPACE FOR THE HEARSE TO REVERSE PROPERLY
 2. THERE IS A FOOD AND BODY CROSS OVER IN THE DELIVERY AREA

Basement Floor Plan
 Scale: 1:100

gaby

FUNERAL PARLOUR BASEMENT FLOOR PLAN

PROJECT NUMBER: 2015046978
 DATE: 04/11/2024 14:10
 SCALE: 1:100

GENERAL NOTES

OCCUPANCY	FUNERAL PARLOUR	41
POPULATION	FUNERAL PARLOUR	11
POPULATION	SEVIS VISITORS	25 VISITORS
POPULATION	SEVIS VISITORS	25 VISITORS
POPULATION	SEVIS VISITORS	25 VISITORS

ELEMENT	TOTAL	
	NO.	AREA (m ²)
SEVIS VISITORS	25	11
SEVIS VISITORS	25	11
SEVIS VISITORS	25	11
TOTAL	75	33

SITE INFORMATION:

REF:	RE 43734
AREA:	100.21m ²
ZONING:	CO2 & OS3
FORM:	2/1 & -
PROPOSED GLA:	429m ²
COVERAGE:	60%
ALLOWED COVERAGE:	101.28m ²
PROPOSED COVERAGE:	429m ²
BOUNDARY LINES:	100
HEIGHT RESTRICTION:	18m

PARKING REGULATIONS	TOTAL	
	NO. OF BAYS	AREA (m ²)
FUNERAL PARLOUR	114	114
SEVIS VISITORS	113	113
TOTAL	227	227

PARKING PROVIDED	TOTAL	
	NO. OF BAYS	AREA (m ²)
BASEMENT PARKING	178	178
ABOVE GROUND PARKING	143	143
TOTAL PROVIDED	321	321

