Sensory Stimulating Sanctuaries

Creating spaces that improve and benefit wellbeing and mental health through sensory stimulating architectural techniques

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Supervised by Stella Papanicolaou

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Glory to God.

Plagiarism Declaration

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This dissertation is presented as part fulfilment of the degree of Master of Architecture (Professional) in the School of Architecture,Planning and Geomatics, University of Cape Town.
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SECTION 1

Introduction & Design Report Description

KEY TERMS

Trauma Informed Design - This relatively new design technique was established to identify ways in which a space could be designed to take into consideration the occupants' past traumas. It focuses on improving the lived experience of the occupant within a space by following a specific set of design principles.

Phenomenology - The study of direct human experience through the senses. The philosophy of phenomenology focuses on the lived experience of an individual, as well as how one's past experiences could influence the present experience, as described by Husserl. He uses the term 'Life World'.

Life World - Originally described as 'Lebenswelt' in German, this refers to the world as it is immediately or directly experienced by an individual and their subjective experience of the everyday life.

Biophilia - A genetically determined or an innate affinity that humans have towards the natural world.

Biophilic Design - A design approach that increases the connection between the occupant and the natural world directly, indirectly, and by taking into consideration the place and space conditions.

Therapeutic Landscape - William Gezler originally defined this term as a place "where physical and built environments, social conditions and human perceptions combine to produce an atmosphere which is conducive to healing".

Sensory Stimulation - The result or sensation a person experiences when one or more of their senses is being used.

Mental Health - The condition of a person's emotional and psychological well-being.

Pattern Language - a coherent and organised set of patterns. Each of these patterns describe a problem as well as a core solution. The term was defined by Christopher Alexander.

Abstract

The rise of the ‘modern-day illnesses’ such as anxiety, mental health struggles and issues relating to post-traumatic stress, influence people on a daily basis. I wonder how architectural techniques could be used to stimulate one’s senses so as to allow for a calming feeling or create a sense of well-being and safety within a space. In this paper I complete a study that focuses on ways in which architecture could be used to benefit one’s mental health by implementing trauma informed design techniques.

I draw on trauma-informed design theories, phenomenology as a philosophy, as discussed by Husserl, as well as its connection with architecture by referencing the work of Juhani Pallasmaa and Peter Zumthor. Therapeutic landscapes, as well as the theory of colour and biophilia help to identify the necessary spatial and material qualities that contribute to the favourable design of wellness centres.

The understanding of these studies lead to a set of design principles, as described by Christopher Alexander, that act as guide lines for the successful design of a trauma-informed healing sanctuary, rather than the institutional approach.

The literature and precedents used will influence the set of design responses and conditions that guides the design process.

The sensory stimulating sanctuary is located on the Upper Campus of the University of Cape Town and prioritises the mental health of students attending tertiary institutions. The site allows for a biophillic design, as the strong relationship with nature is a noticeable feature. The structural and interior design elements of the design project prioritises a trauma-informed approach and finds the balance between sanctuary and institution to result in an efficient, yet inviting, healing space.

Figure 1: Drawing by Author

Introduction

Using Sensory Stimulating Architecture to create a space that prioritises Mental Health and Wellbeing

Key Focus - Trauma Informed Design - Modern-day illnesses such as anxiety, post traumatic stress and mental health struggles have become more and more prevalent in the lives of students. This dissertation is based on the belief that architecture can support the work of health practitioners through incorporating a sensory stimulating design. It is seen as a privilege to be able to take care of your mental health and by having access to mental health practitioners and professionals. This is supposed to be a human right. The concept of using architecture as a tool to benefit and improve the mental wellbeing of the person experiencing the space could be a very beneficial design approach to spaces that follow a programme dedicated to mental health. Upon entering a space, one might feel a sense of calm or safety. By hearing a certain sound, or by not hearing anything, the user's senses are stimulated in a way to manipulate their experience within the space. The choice of materiality, the visible textures or the thermal quality of a space will have an impact on the lived experience of the user. This is a sensory stimulator. The question I am asking is 'How can a sensory stimulating architecture improve or benefit one's mental health and wellbeing?'.

Problem Statement - There is a social misconception when referring to 'mental health facilities'. Often people would try to avoid visiting such facilities because of the stigma that surrounds it. It is necessary to provide a place for traumatised students or students suffering from anxiety to seek professional help that also offers healing through architecture.

I draw on theories and design techniques such as trauma informed design, phenomenology, biophilia and therapeutic landscapes. These studies lead me to a collection of design principles that can benefit a healing space without it becoming institutionalised, but rather become a sanctuary for people who struggle with anxiety, past trauma or mental health issues.

Trauma Informed Design - Trauma Informed design is a relatively new field of study that is being researched by J. Davis Harte and Janet Roche. A Trauma Informed Design approach follows a specific set of design principles of both what to include and what to avoid within the design. I Identify these principles and use them as guides for the design process.

Phenomenology - The philosophy of Phenomenology focuses on how one's past experiences dictate your current 'Life World'. The theories of Husserl and Heidegger help to understand the meaning of this philosophy and the importance of the user's personal experience within an environment. Architect Juhani Pallasmaa brings phenomenology to architecture and design and writes about the benefits of multi-sensory spaces. Architecture becomes a physical embodiment of phenomenology as the occupant's consciousness becomes a priority in the design process. To further emphasize the phenomenological potential that architecture has, I reference the work of Peter Zumthor who often takes the idea of sensory stimulation into consideration in his own designs.

The design report discusses three theories, William Gezler's Therapeutic Landscape, Biophilia and Colour Theory.

A healing atmosphere is produced when physical and built environments, the human perceptions and social conditions meet. This is how Gezler defines a Therapeutic Landscape. This ties into the theory of biophilia which focuses on the affinity humans have towards nature. A biophilic design approach follows the design principles of a trauma informed design and will therefor be beneficial to the quality of the space. The calming qualities of greenery lead to the question of how colours could be used to benefit a space or affect people. Colour theories help to identify whch colours have calming influences or which disrupt. As the design of a wellness centre focuses on a peacful atmosphere, these theories indicate ways on how to prioritise the users' experiences.

By referring to the theories and philosophies mentioned, I am able to draw up a set of design principles to aid in the design process. These principles act as a pattern language, as described by Christopher Alexander, for the design of a wellness space. They also create a guide as to which materials would be best for these spaces, which colours would be most beneficial and what the programme will need to prioritise.

Research Questions - How can a sensory stimulating sanctuary be beneficial to people who have suffered from past trauma or anxiety? How can the institutional programme be designed by using trauma informed design principles?

Objectives & Aims - My aim for this design project is to identify ways in which architecture can be used to improve one's mental health through sensory stimulation. The objective is to avoid the institutional design often associated with these kind of buildings and rather create a space that allows the occupant to feel safe and calm. Giving people the opportunity to improve their mental health is something that I believe is necessary. Furthermore, my approach will follow the set of design principles that is identified through the study of Trauma Informed Design.

Problem Statement

Institutional buildings that deal with wellness typically prioritise the needs of the construction process, the requirements of medical professionals and the programme of the space more so than the individuals who need healing. Focus is often placed on design decisions that will improve the efficiency of the building, rather than the details that create a mentally safe space. It is important for wellness spaces to not feel like it is an institution. I say this because there is a social stigma around mental institutions that do not benefit the healing process. Institutions often have a sense of enclosure that leans more towards feeling trapped rather than protected and safe. Circulation works extremely efficiently, which isn't necessarily a bad thing. It is just important to combine the efficient circulation with principles of trauma informed design. Circulation routes can have more than just one purpose. Places of pause, visual stimulations along travel routes, while still maintaining succesful circulation qualities. Institutional architecture tends not to be conducive to healing. The Maggie's Centres were set up for this reason. The programme remains institutional, but the design directs its focus to healing and the needs of the people occupying the space.

The design challenge will be to find the balance between institution and retreat. How can the design allow for an efficient service as well as create a calming environment? By following the institutional programme and combining it with a phenomenological architecture, the result will be a trauma informed design which is the objective.

Figure 2: Perspective Drawing of project site by Author.

SECTION 2

Theoretical Framework

Theoretical Framework

Trauma Informed Design

Trauma Informed Design is a relatively new field of study. J. Davis Harte and Janet Roche are the founders of an on-line platform that allows for recent case studies and latest research regarding trauma informed design to be found. This platform is what promoted the sudden awareness of this approach to design (Stouhi, 2021).

The task to create successful spatial experiences by taking all five of the human senses into account has been one of importance for a large amount of designers and architects. By stimulating all senses, individuals who are physically impaired or differently able have benefited from these implementations and have improved experiences. Having said that, physical disabilities are not the only issues people deal with in the post- pandemic world we find ourselves in. People dealing with past traumatic experiences and mental illnesses can easily feel restricted and helpless within a space (Stouhi, 2021).

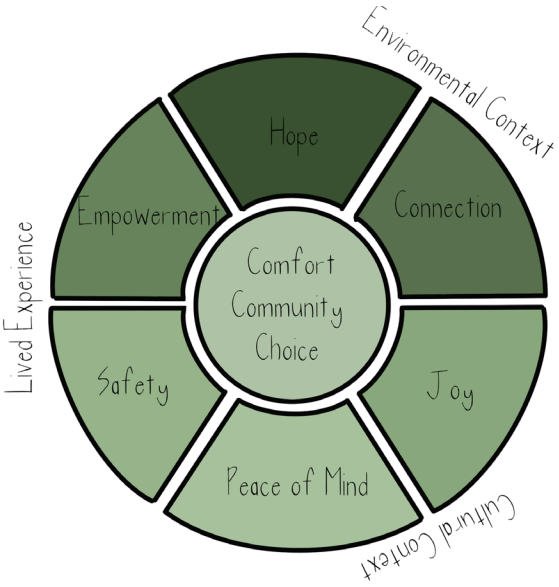


Figure 3: Diagram identifying the key focusses of Trauma Informed Design.

The healing process from these issues is often a long journey and can be influenced by external factors such as the environment and people. It is true that spending time outdoors and experiencing the positive affects nature can have on one's mental state would be beneficial, however people end up spending majority of their time indoors. This leads to the point that the interior design of a space is just as important. Curating a space inside carefully will also have a large impact on the healing process. It is important to know what factors will have a beneficial impact.
By implementing this train of thought, a designer is practicing Trauma Informed Design. This refers to a design process that is found within the built environment and specifically follows trauma informed care principles. A space that intends on implementing trauma informed design needs to identify its users and the specific needs these users have, considering different trauma cases will all require different specifications.

The overall goal is to create a space that gives the occupant a sense of security and safety, both physically and perceived. All these design decisions can be made by using lenses of neuro-science, cultural factors, physiology and psychology.

Trauma informed design creates a healing architecture. It consists of elements and qualities that results in a well-balanced realm, both physically and mentally, that contribute to the recovery process. Therefor the space becomes healthy to the user's mind and body, whilst following the institutional programme. These design principles allows for a space to act as an additional form of medication.

Phenomenology

What is 'Phenomenology'

Edmund Husserl (1859 - 1938) was a German mathematician and philosopher and is considered to be the founder of Phenomenology, a philosophy as well an approach to inquiry that follows a descriptive nature. Husserl believed that all of human experiences form ones consciousness. He defined phenomenology as "*the science of essence of consciousness*." This sparked a curiosity to further understand the concept of intentionality as well as human lived experiences and how this ties into consciousness.

Phenomenology focusses the individual's personal experiences (Dahl, 2010). Understanding phenomenological ways of design and phenomenology as a paradigm would emphasise the importance of sensory stimulating architecture as it relates to the lived experience of each individual and not biased experiences based on other theories and external facts.

The lens through which I am viewing architecture in this design report is mostly a phenomenological view. By prioritising the occupants' conscious experience in a space, the designer has the ability to create a sanctuary that does not disrupt or create a sense of unsettlement, in other words the designer can use design techniques that promote a safe space. This is what is important to consider when looking at healing architecture. The architectural challenge would be to avoid institutional designs and to not make an already vulnerable person feel even less at ease. By understanding the importance of the milieu surrounding the user, the designer or architect will start to prioritise those factors during the process of the design.

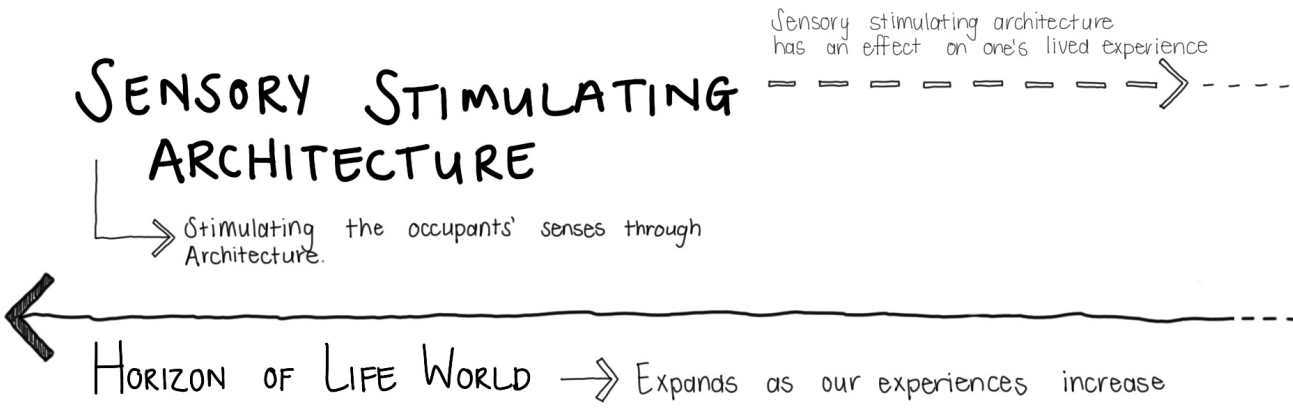
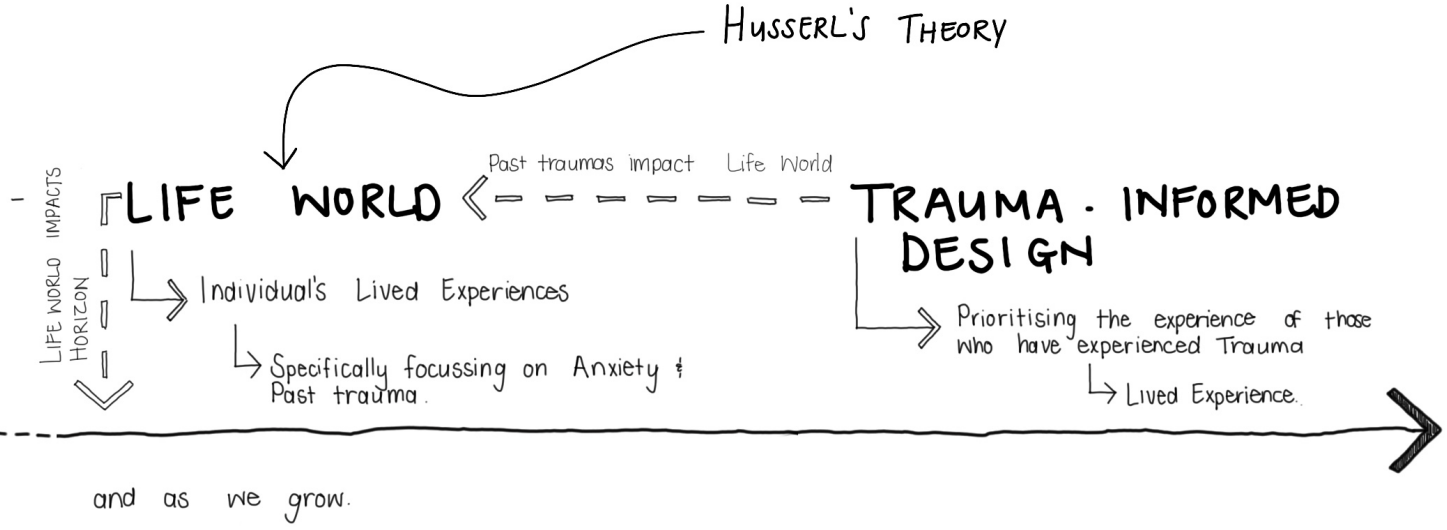


Figure 4: Diagram explaining the connection between phenomenology, Life World and Sensory Stimulating Architecture

Our rational thoughts are all grounded in our lived experiences, not influenced by theory and external opinions. This is the focus of phenomenology. (Sirowy, 2010: 2) When we draw our own conclusions or create our own understanding, without looking from an external theory's point of view, we are looking through a phenomenological lens. (Merleau-Ponty; 2002) Phenomenology acknowledges the importance of a subjective experience and the fact that each individual will experience moments differently. It does not disregard unique lived experiences, which is why this philosophy is important to consider when looking at the design of wellness spaces. Using a phenomenological framework whilst analysing architecture dedicated to healing spaces, will allow one to recognise the impact of the milieu. There is a connection between a person and their environment. In other words, the subject and the object are unified.

This ties in to Merleau-Ponty's point that our consciousness and our worldly experiences are grounded together. By unifying the subject and the object, a more clear connection can be made between the user of the space and the architecture thereof.

To draw a connection between phenomenology and architecture, it would be beneficial to explain Husserl's theory of "Lebenswelt" or 'Life World'. This theory will then be followed by connecting architecture to phenomenology. The concept of Lifeworld was conceptualised by Husserl in the early 20th Century. He uses the metaphor of a horizon and placing our lived experiences as the main focus. As we grow and continue to experience new things, the horizon also changes. This also means that every person will have a different horizon. We all have unique experiences, which leads to different "Life Worlds".



"The talent of imagining human situations is more important for an architect than the gift of fantasising spaces." ***- Aulis Blomstedt***

This is one of the thoughts that Juhani Pallasmaa's professor, Aulis Blomstedt, often reminded him of. This led Pallasmaa to recognise the importance of the philosophical value found in architecture. His approach to architectural designs started to celebrate the human behaviour and the qualities of the space. This allowed him to see how these two aspects become interrelated and end up creating a space that is both physical as well as mental. He describes architecture as being a 'choreographer', guiding our actions, our moods and interests. By following this approach, the designer will see how every space or atmosphere that is being created ends up with unique and project-specific atmospheres.

Pallasmaa mentions two different kinds of human imaginations. The first imagination being more factual, geometric and formal, and the second focusses more on the emotive, mental and sensory experience with what is being imagined. In the case of the first mentioned imagination, it does not tie into the actual lived experience of the object. Formal imagination engages with a set of geometric or topological facts to the exclusion of lived experience which is prioritised through sensory imagination. The latter emphasises the importance of ones 'sense of self' and the experiences of one's "Lifeworld" (Husserl ref). It is an empathic imagination that manages to evoke sensory stimulation.

Pallasmaa poses the question, "How can architectural ideas and aspirations, particularly emotive qualities, emerging initially as immaterial mental feelings in the design process, be translated and transferred into the actual building, and finally to the person experiencing it? And how can such a vague and weakly formalised feeling be communicated?" Experiences cannot be predicted. Every person's perceptive sense will result in a unique response to a space or place, based off of their own lived experiences. That is why it is important for a designer to anticipate a variety of situations and perceptual conditions.

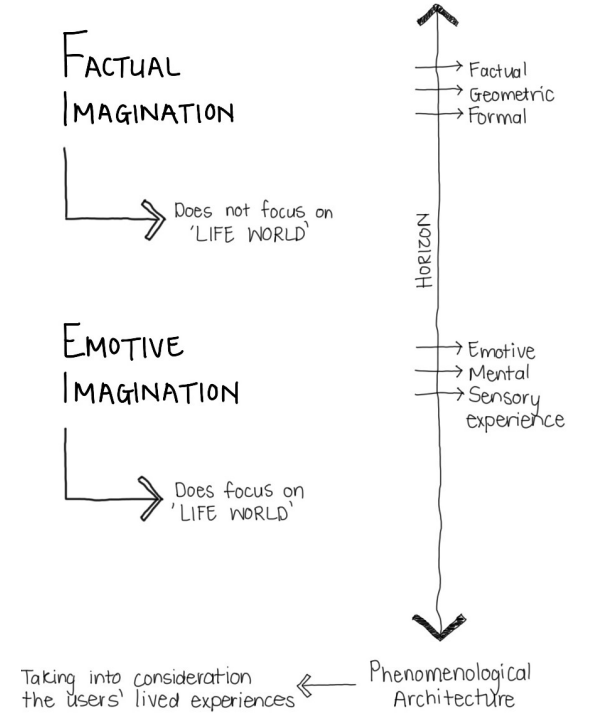


Figure 5: Diagram illustrating Pallasmaa's idea of two different imaginations that affect our 'Life World'.

"I enter a building, see a room, and - in the fraction of a second - I have this feeling about it." *- Peter Zumthor*

Peter Zumthor is referring to the immediate awareness and experience of materiality and atmosphere when he enters a space. However, Pallasmaa states that the simultaneous awareness of the place or space and the entire atmosphere is one of the most complex and ephemeral mental stimulations. This act of imagining a space and its atmosphere is perhaps one of the more daunting tasks of the designer's imagination during the design process. It requires the ability to design a space that will consequently result in a multi-sensory space, evoking emotions of the person experiencing the space.

By prioritising the user's lived experiences and consciousness, the architecture will tie into phenomenological design qualities. The space itself becomes an experience. It turns into a multi-sensory environment. When looking at Peter Zumthor's Therme Vals in Switzerland, the use of sensory design techniques allow for the user to feel a sense of calm. These techniques include the careful consideration of light throughout the space, materiality as well as the sound of water resulting in a calming atmosphere. The light considerations are made by using coloured lights (Blue and Red) to distinguish between two different spaces within the thermal baths and spa building. The Red Lights lead users to a warm bath with a higher room temperature, whereas the blue lights do the opposite. It is the guide to a cooler room. The use of light wells along the walls allow for a small amount of natural light to enter the space. The building becomes a sensory experience, enhancing the quality of the lived experience within.

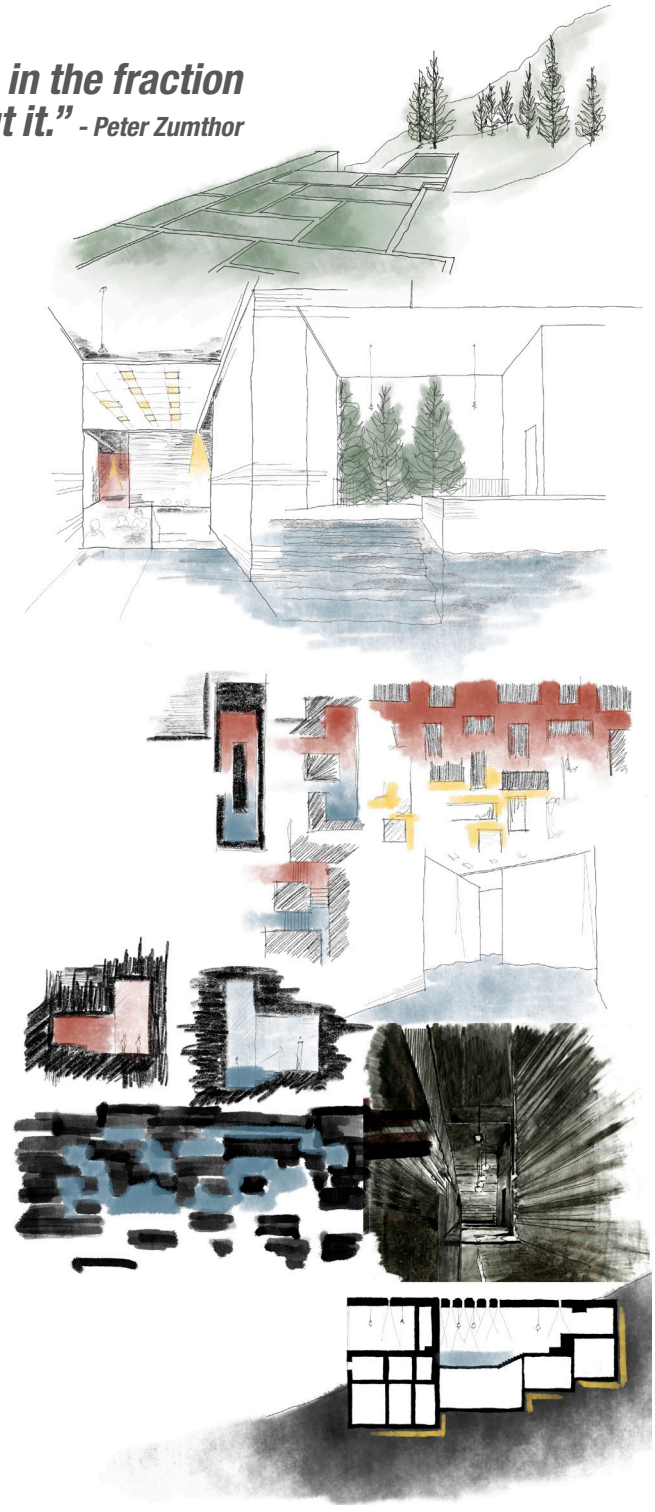


Figure 6: A sketch collage of diagrams analysing Peter Zumthor's Therme Vals. These diagrams focus on the phenomenological elements of the space.

Biophilia

People who find themselves struggling with anxiety or mental health will benefit from architecture that distracts them from their mental battles and focus rather on their environment. This is possible to do, almost giving architecture the title of alternative therapy. By straying away from the institutional design of strong order, the prioritisation of the user's psychological needs can be focussed on. The term institutional Design refers to the harsh design qualities found within institutions. Qualities such as cold, uninviting spaces, poor light conditions, the prioritisation of the project budget rather than the occupants' needs. This could become evident when looking at materiality and interior detailing. Institutional buildings often use more cost effective building materials that do not really contribute to the user's experience.

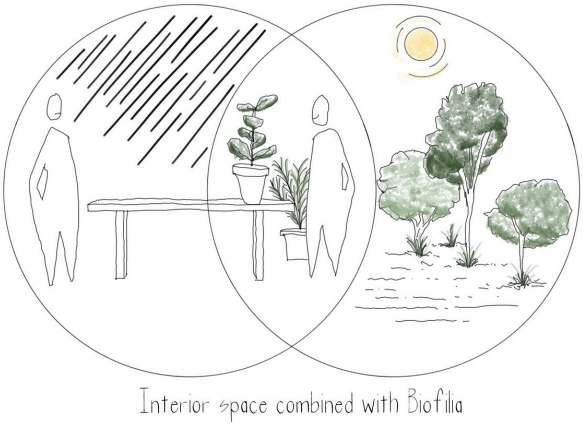


Figure 7: Diagram illustrating the incorporation of nature within a space, therefor practising biophilic design.

By using a trauma informed design approach, the connection between architecture and mental health can be addressed. This would be a different approach than that of the sterile design techniques found in most wellness institutions; techniques such as continuous corridors, repetition, very little external views or access to nature, etc.

Maggie Keswick Jencks noted an absence of spaces that are dedicated to wellness but that do not follow the institutional design scheme. She recognised the opportunity to create these spaces which lead to the creation of Maggie's centres. These centres follow a very strong design guide that focuses on the creation of healing architecture.

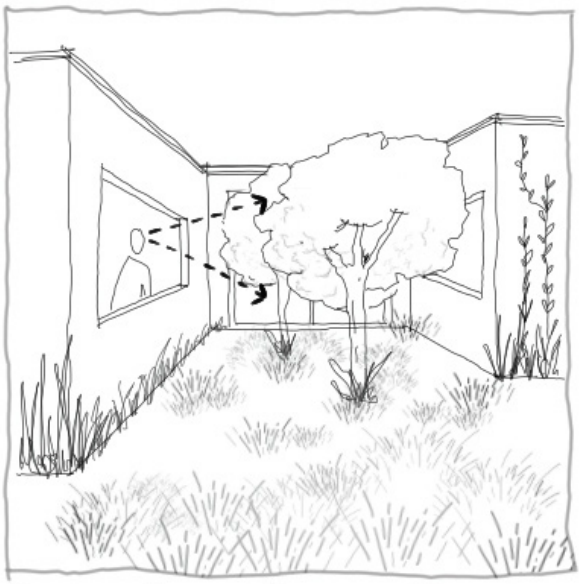


Figure 8: Sketch illustrating the visual access to nature from inside a space, by author.

The design of these spaces will be looked at in more detail, however I want to first unpack the design principle all these centres include; Biophilia.

Humans have a strong tendency to want to connect with nature as a way to stimulate personal fulfilment. This is the theory of Biophilia. Roger Ulrich, a healthcare design researcher, noted how the incorporation of Biophilia into our architectural surroundings has the ability to contribute to healing, since he found that pain can be reduced through nature. He drew this conclusion after completing a study that required two groups of patients. the one group was exposed to natural views of gardens and trees, whereas the other group only had views of a wall. The healing time of those who had access to nature was significantly faster compared to the other patients.

Biophilia does not only entail the provision of views to nature. It is the physical access to these spaces as well. The incorporation of fresh air into one's surroundings provides a sense of nourishment and brings balance to the milieu. The quality of the environment simply improves. (Day, 1990). These conditions benefit the user's lived experience, that is highly valued in phenomenology. The surroundings become more than just appealing spaces, but also environments that allow for a connection to nature which is, as Ulrich suggested, a design tool to improve the recovery journey of any patient or use of a wellness space.

Briefly looking at the design of the Maggie's Centre in Glasgow designed by OMA, one notices the key feature of the central courtyard with access to and from all the surrounding rooms. The series of interlocking rooms surrounding the space all have views and physical access to nature. This is a clear example of the implementation of Biophilia within architecture. (Minner, 2011) Refer to Figure 9 & 10.

Figure 9: Maggie's Center Glasgow - Photo showing the courtyard and how light enters the space.

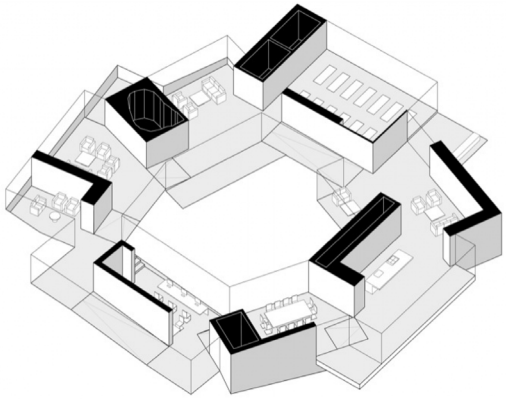


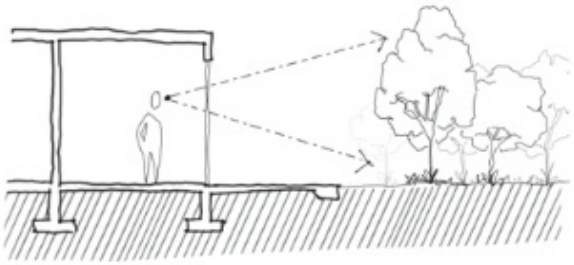
Figure 10: Maggie's Center Glasgow - Isometric diagram showing the circulation route around the courtyard.

Biophilic Design Strategies

Nature has the capability to create a very strong sensory stimulating experience. To bring about this multi-sensory experience within a space, the designer can make use of biophilic design strategies. William Browning, Catherine Ryan and Joseph Clancy write about seven biophilic design patterns. These include a visual connection with nature, Non-Visual Connection with Nature, Non-Rhythmic Sensory Stimuli, Thermal and Airflow Variability, Presence of Water, Dynamic and Diffuse light, as well as Connection with Natural Systems.

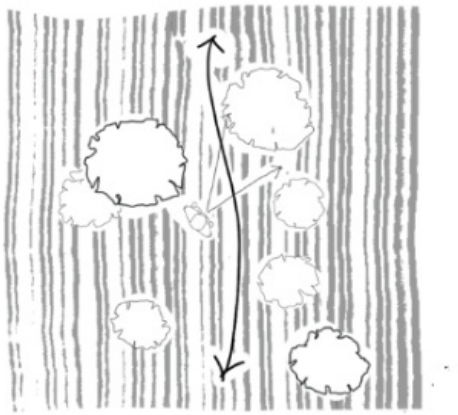
A Visual Connection with Nature

This focuses on ones ocular sense and the ability to visually experience nature from a space. It also speaks to the programmatic layout of furniture in such a way that it will allow for places of pause and seating to still give access to nature and desired views.



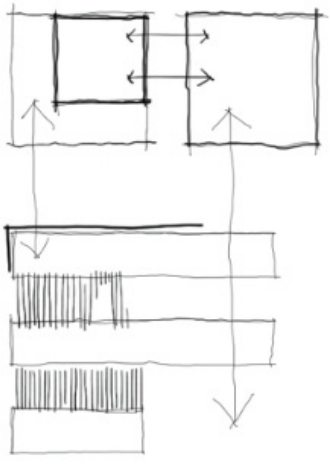
A Non-Visual Connection with Nature

This strategy speaks more to the sensory stimulation of senses other than vision, ie. one's sense of smell, touch and hearing. This would mean that the environment would perhaps make use of more tactile materials or that the sound of surrounding urban scapes be less noticeable and rather emphasise natural sounds.



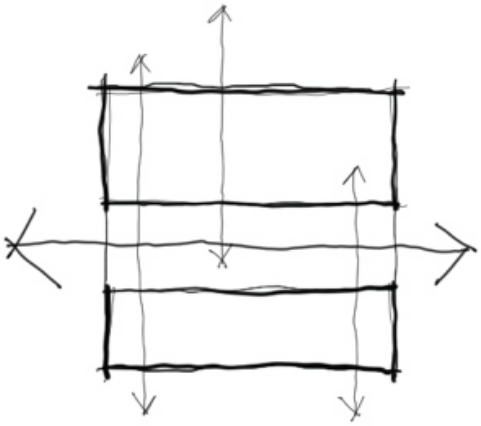
Non-Rhythmic Sensory Stimuli

Nature is often unpredictable. It does not follow an immediate pattern. These changes can also have an effect on the user. By emphasising the ephemeral qualities of biophilia through ones design, this sensory stimulating technique can be executed.



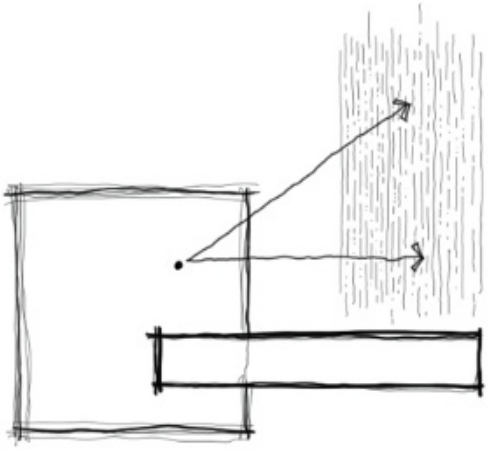
Thermal and Airflow Variability

This biophilic strategy includes the use of ventilation throughout a space. By doing so, it will allow for subtle changes in temperatures throughout as well as balance the connection between inside and outside spaces.



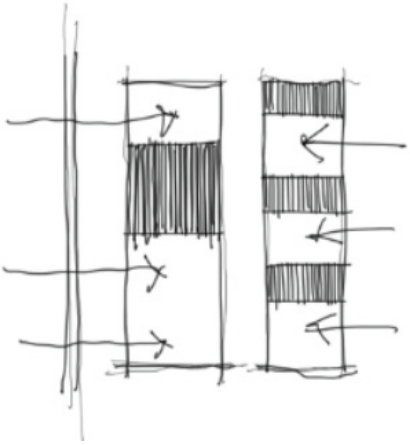
Presence of Water

Water systems have the ability to speak to our sense of sight, hearing and perhaps touch. By incorporating kinetic water systems, such as water features, the designer brings sound into a space. Having water pools or stagnant water features, a user can find an opportunity to pause and reflect.



Dynamic and Diffused Light

A design that finds a balance between artificial light and natural light will diffuse the boundary between the exterior space and the interior. This balance will also minimise glare within the space.



Connection with and Awareness of Natural Systems

Natural systems refer to the changes of the natural environment. This includes seasonal changes, weathering of materials as a result of time, etc. A user can be made aware of these changes by incorporating materials that allow for visual evidence of said changes.

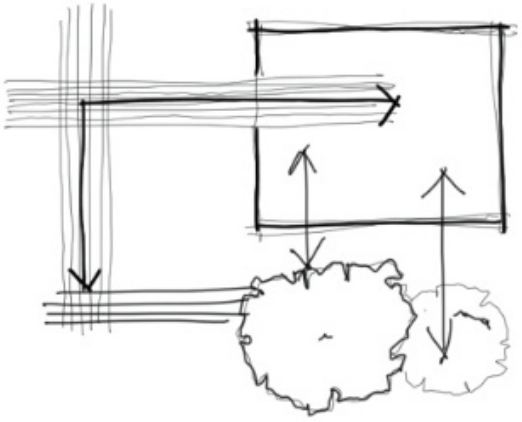


Figure 11: All diagrams by Author

Therapeutic Landscapes

Therapeutic Landscapes can be described as places that encourage a sense of wellbeing to those using the space. Wilbert Gesler, who is known to be the founder of the term 'Therapeutic Landscape', argues that for a place to be considered 'healthy' it needs to involve a strong sense of place and not only be dependent on the physical elements of the site. It is through lived experiences that the sense of place can be built up. Gesler continues to identify four environments that form a place of healing. These are the Natural, the Social, the Built and the Symbolic (Gesler, 1992). These four environments are inter-related and focus on both the built and natural milieus that affect our responses and emotions. Therapeutic Landscapes can therefor be defined as being a product of material circumstances and the human mind, simultaneously (Butterfield & Martin, 2016).

The environments surrounding wellness spaces need to be designed properly. It can easily be a design exercise that ends up being overlooked or not prioritised. However, these landscapes can improve the experiences of visitors and serve as a tool to shape responses toward the space. By improving the design of everyday spaces, such as gardens, path ways and courtyards, the space promotes health and healing properties. This is the aim of therapeutic landscapes (Khachatourians, 2006). Other health geographers have acknowledged the potential of therapeutic landscapes, but wanted to create a concept more dynamic. 'Therapeutic Taskscapes' (Dunkley, 2009), 'Therapeutic Assemblage' (Foley, 2011) and 'Therapeutic Mobilities' (Gatrell, 2013) have since been introduced.

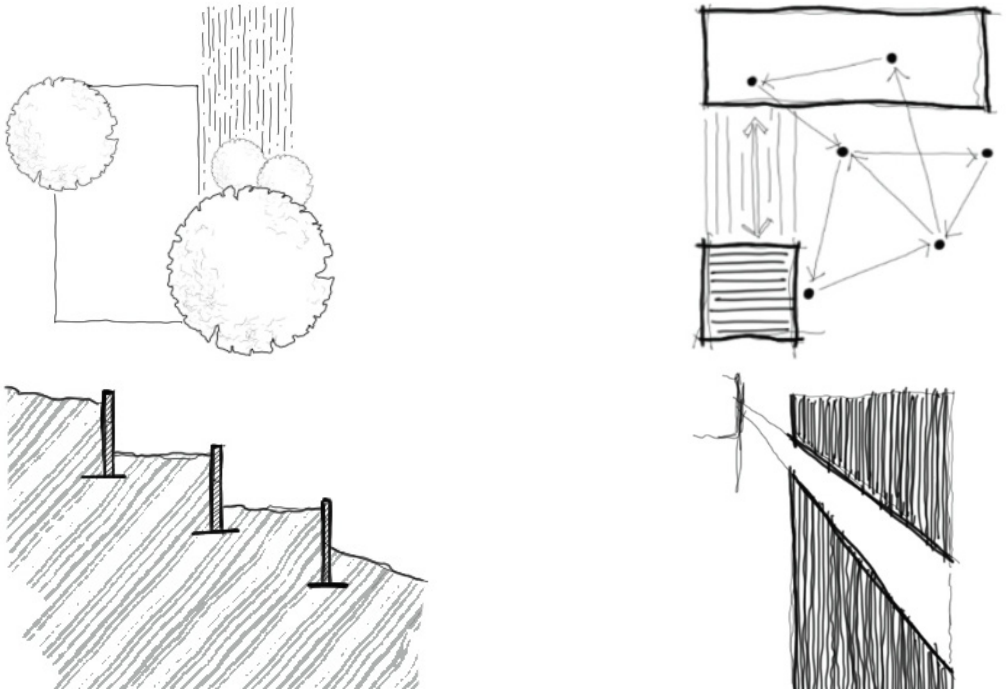


Figure 12: Diagrams illustrating Gezler's four environments; The Natural, The Social, The Built and The Spiritual.

Colour Theory

Colour design within mental health and wellbeing environments is an important factor to consider. However it is necessary to acknowledge that each individual will interpret a colour in their own way, based on their lived experiences. Ones sensory experience might be influenced by age, quality of mental health, cultural beliefs, and so forth. Nonetheless there are studies conducted to identify which colours are more appropriate for specific uses. These studies involve user participation which allows for the conclusion to be based off of a majority opinion. It is not a scientific conclusion, but user-driven (O'Connor, 2011).

Human vision is a complex process. The light we see, be it natural light or coloured light-waves, influences the circadian cycle. This cycle is an internal process, responsible for regulating the sleep-wake rhythm of a person and is repeated approximately every 24 hours. If the circadian rhythm of a person is disrupted, it could lead to behavioural changes as well as a change in mood. Different coloured light-waves will have specific impacts on the person seeing them (McLachlan & Leng, 2021).

For example, recent studies have shown how cognitive performances can be improved by the presence of blue light, or reading difficulties can be assisted by lenses of different colours.

The Human circadian rhythm also tends to be more sensitive to shorter wavelength light. In addition to these studies, many suggest that behavioural, physiological and psychological responses could be influenced by colour. These influences could be achieved either through hue or saturation of colour, in other words the brightness rather the intensity of the colour. Responses also tend to vary and depends on the person's gender, age, culture and personal preference (McLachlan & Leng, 2021).

Figure 13: The above photo is an example of a lighting system that changes throughout the day to follow the human circadian rhythm. This means that different shades of light, as well as different intensities, will be visible throughout the day.

Colour Theory

An article written for the online Wellbeing Magazine provided a detailed discussion about certain colours creating specific responses. For example, they mentioned how yellow rooms tend to make babies cry more often as well as increase tension between people. The author almost challenges the reader to spend more time being exposed to yellow and it would create a sense of time being sped up. Jeanne Kopacz, author and designer, emphasises the importance of colour within healing spaces even further by acknowledging it as a tool to benefit health management. Studies that compared red, blue and green drew the following conclusions: Red tends to evoke strong emotions, it is intense, can create a sense of excitement as well as anger. It can even stimulate nerves and raise blood pressure. Blue seems more calming and peaceful. It can make a person feel more secure within a space. These qualities lead to people being more productive in a blue space. Kopacz writes how blue can lower blood pressure and create a more tranquil environment. Green is seen as health-giving and restful. It can be a therapeutic tool when physically having access to green elements that are also soft to the touch, for example a green silk scarf. (Logan-Clarke).

These three colours can also be linked to the colour-chakra theory. Each colour can be connected to one of the seven chakras which is then associated with a specific body function that focusses on healing and treatment. Red stimulates blood circulation, blue improves the metabolism and Green serves as a tension reliever, strengthens bones and it is believed it could even disinfect bacteria better than other colours (McLachlan & Leng, 2021).

Archi Maki
Colour & Phenomenology

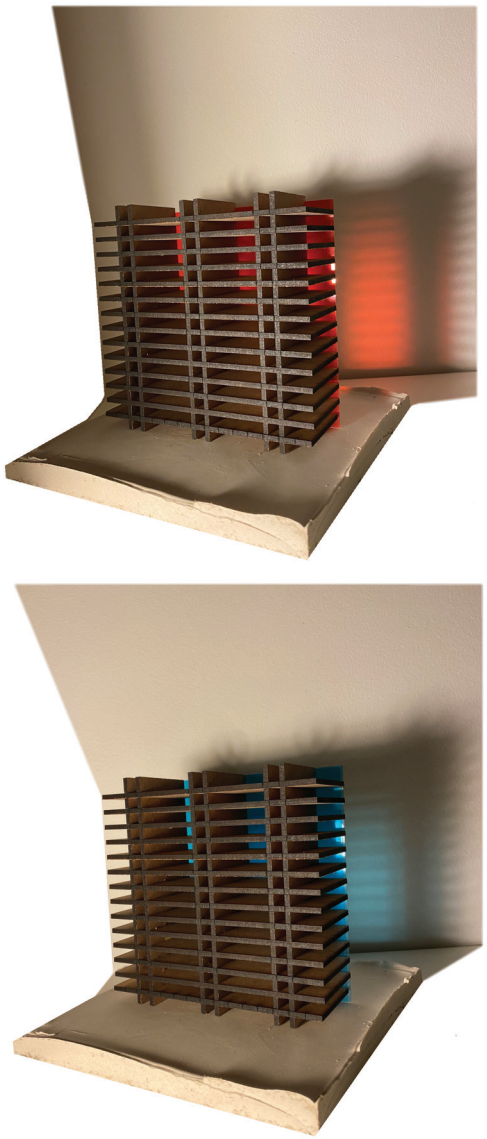
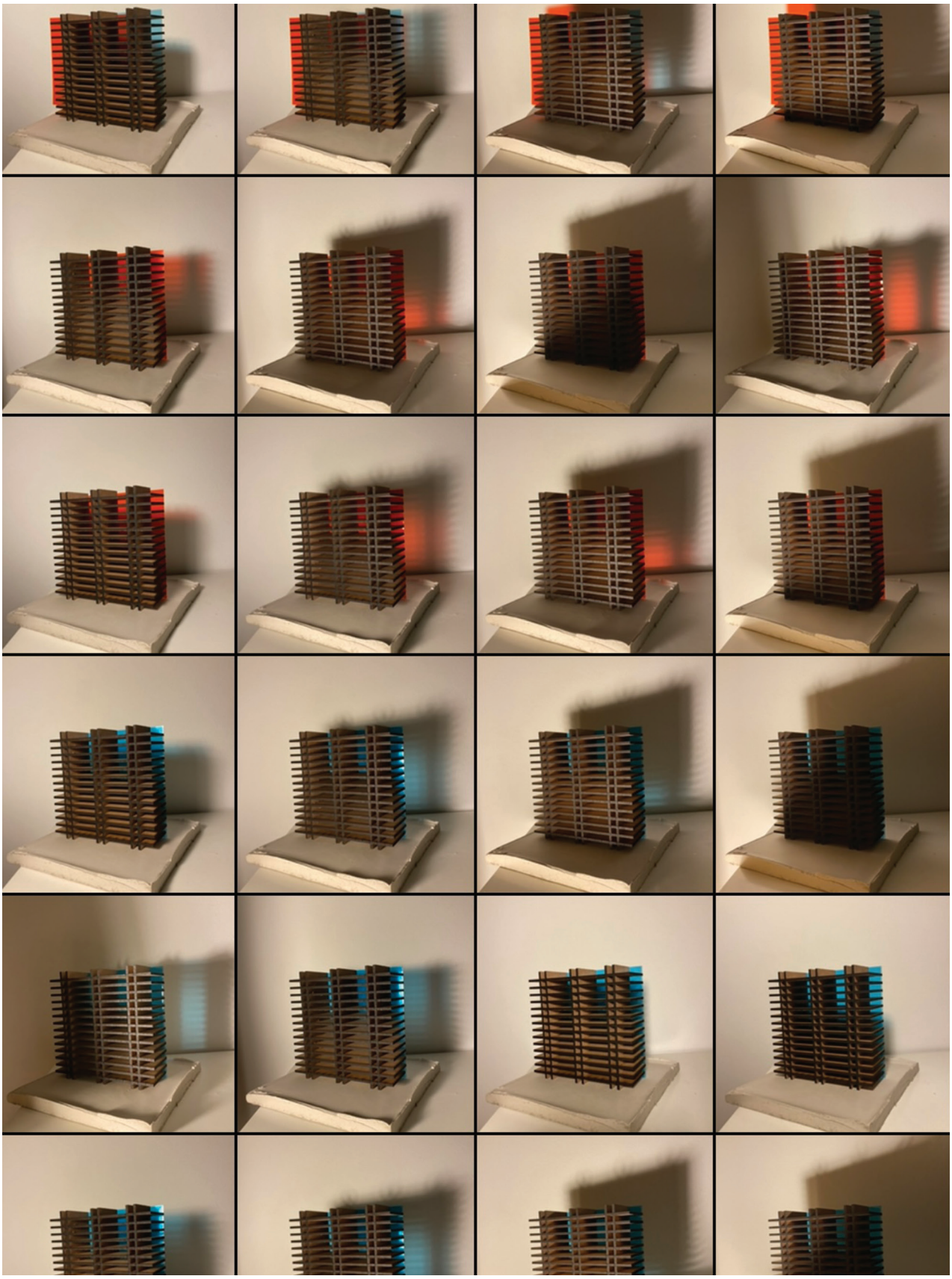


Figure 14: The above photos show a model that visually illustrates how the use of shadows, light and colours could create two different atmospheres. This is the same principle followed in the Therme Vals, as mentioned. The red shadow creates a sense of warmth, whereas the blue seems cool and calm.

Figure 15: Collection of photo's of Archi Maki Model - Illustrates how the manipulation of light and colour create different environments.



SECTION 3

Design Principles & Precedents

Design Principles

Avoiding the Institution by following Trauma Informed Design Principles

There is a stigma that surrounds the idea of going to a medical professional or a mental health facility that demotivates people to seek out the help or advice they need. The concept of a mental health institution is something a lot of people would rather avoid. The main design challenge would be to avoid institutional design techniques without losing the ability to cater to the need of the occupants. The institutional design follows a programme of efficiency and can often be very impersonal. However, it succeeds in catering to the harder programme and services. The institutional design prioritises the process and programme, but not the user and patient.

Institutions can easily be seen as an uninviting, unwelcoming place. More often than not, these kind of spaces have very harsh threshold conditions that serve as a security device. These thresholds would include guards, a gated entrance, surveillance systems, etc. This will create a sense of being trapped to vulnerable users. Following the threshold from public into this privatised site, the circulation of the building already becomes a priority. For institutions, it is important to get people in and out as efficiently as possible. Larger parking areas and entrances are used for people to move into the building easily. These design techniques are not really personal and will create a sense of every patient just being another 'number' visiting the institution. These buildings also tend to lean towards a more simple construction method and easily accessible materials, allowing for the building to be built faster. The end product tends to be quite simple. The interiors of these spaces are designed to improve functionality. Long corridors are common within institutions, connecting patient rooms to carers to necessary offices. Places of pause, access to nature and natural light are factors that are not often emphasised.

The design principles of spaces that cater to trauma and help with anxiety are focussed more towards the patient and the healing process than to the basic programme. Yes, it is important to include all the necessary spaces that the programme requires, but the way in which these spaces are curated is done in a way to benefit the user. Trauma informed design principles include the incorporation of green spaces, a careful consideration of the light quality as well as the room temperatures (Chappe, 2021). These spaces allow for a calming transition from ones home to a place of healing, a place that doesn't feel intimidating or impersonal. People who require these kind of places want to feel welcomed. That moment of welcoming, the first cross over the threshold into the building, immediately shapes the user's lived experience within the space. That is why façades, surrounding gardens and materiality is very important to consider. Materials such as timber and glass are often more inviting than steel frames or solid concrete walls. Incorporating the landscape also has strong beneficial qualities. This connection to nature is a biophilic design principle that benefits the healing proses.

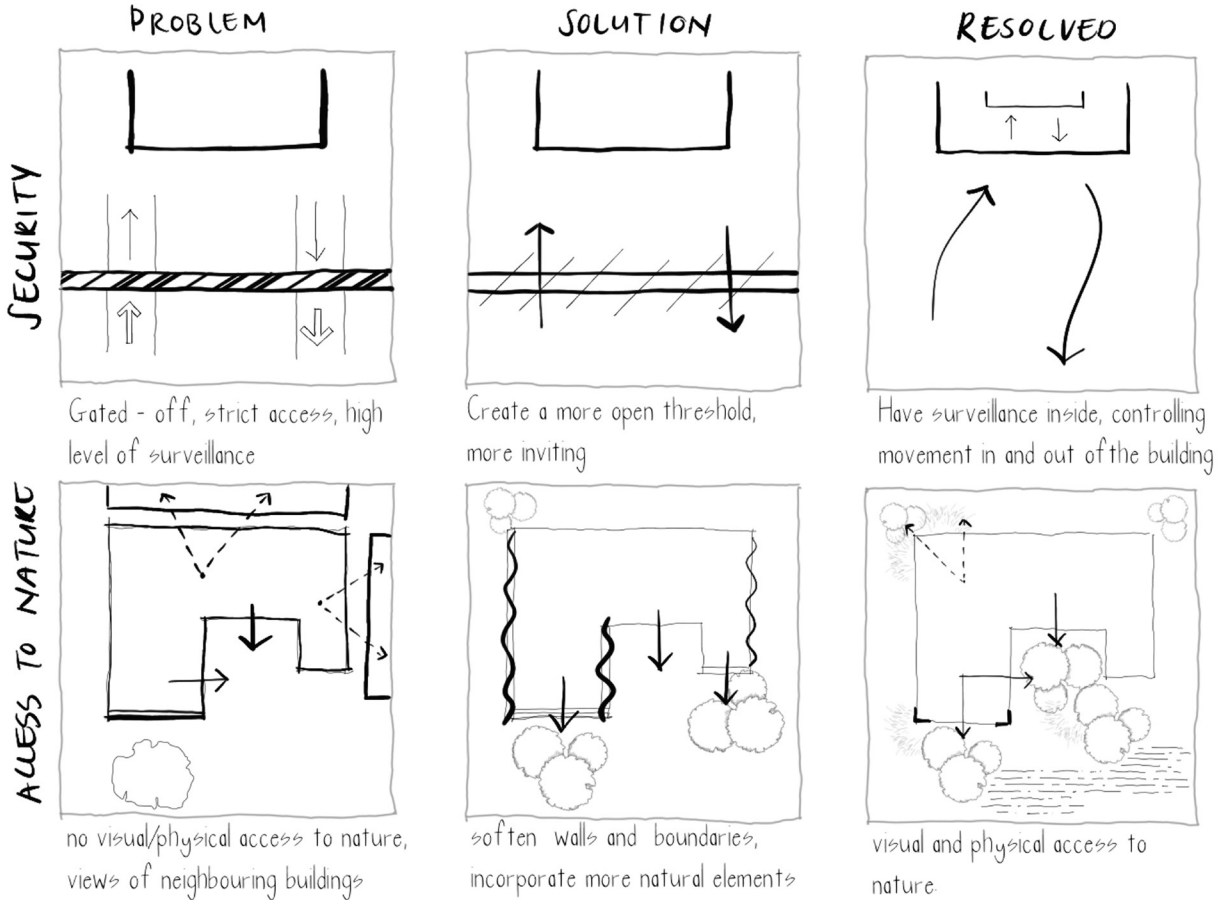
Developing Design Principles

Pattern Language & Christopher Alexander

The concept of a pattern language was introduced by Christopher Alexander in 1977. 'The Timeless way of Building' and 'A Pattern Language' makes up the two volumes of Alexander's work relating to pattern languages. In Volume two, he explains how the use of this device could aid in the design process. The language is made up out of a set of patterns. Each of these patterns describe a specific problem which surfaces over again within our environments. This is then followed with a design solution. This approach to design would be useful when creating a wellness space, because of the fact that no pattern can be successful in isolation.

Each pattern requires the presence and support of another. 'The Timeless Way of Building' mentions how there will be a unique and distinct pattern language for every living society. Looking even deeper, every individual within that society will use their own language. As Husserl described 'Life World', your own lived experiences will determine your patterns. (Alexander, 1977)

I have identified the key problems that could be found within a wellness space, and the following set of diagrams make up a pattern language that will solve the issues.



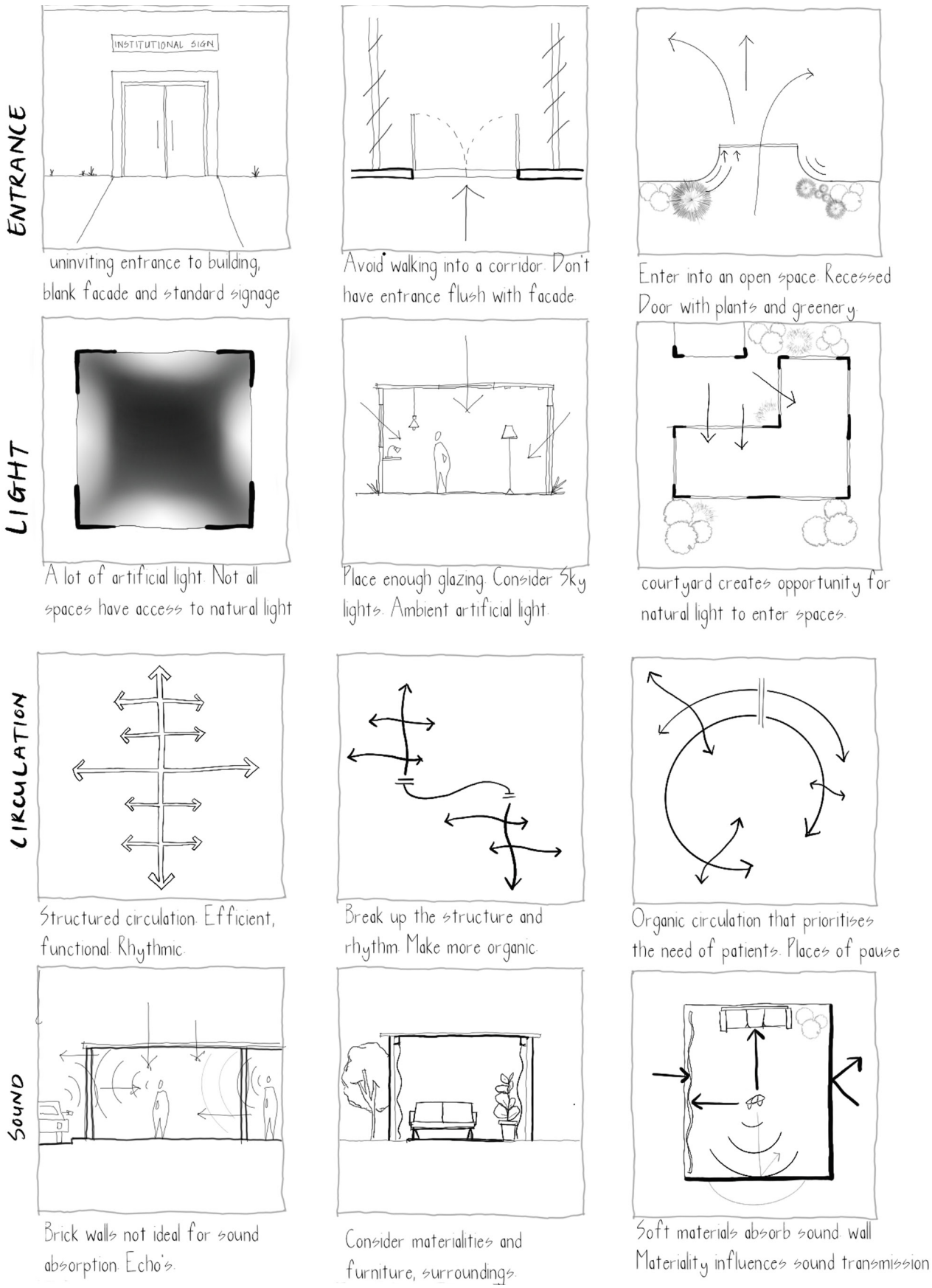


Figure 16: Pattern Language Diagrams by Author

Precedent Studies

Wellness Spaces within South Africa

By looking at existing examples of mental health and wellbeing spaces, it allows you to identify some characteristics within the design that are more common than others. The design characteristics might be beneficial to the healing process, rather than simply prioritising the programme of the institution. These spaces focus on the 'harder' programming of spaces rather than the phenomenological elements.

Graceland Architects focuses on the design of healthcare architecture that follow an efficient programme layout. They recently started working on additions and alterations for the Hoogland Private Hospital in Bethlehem, Free State. Referring to the floor plan, the space allows for a large amount of patients, however all of these spaces do not take into consideration some of the healing factors offered by theories such as Biofilia or Therapeutic Landscapes. Small rooms with little natural light make up the programme.

Cape Town based architects, Nicola Irving and Charlotte Chamberlain were commissioned to shift the invention of institution to Home when designing the St. Josephs Children Home. They incorporated a strong therapeutic programme and prioritised the phenomenological design elements of the space, such as the users experiences within the building. There is plenty of visual and physical access to outside spaces, with ample natural light filling up the interior.

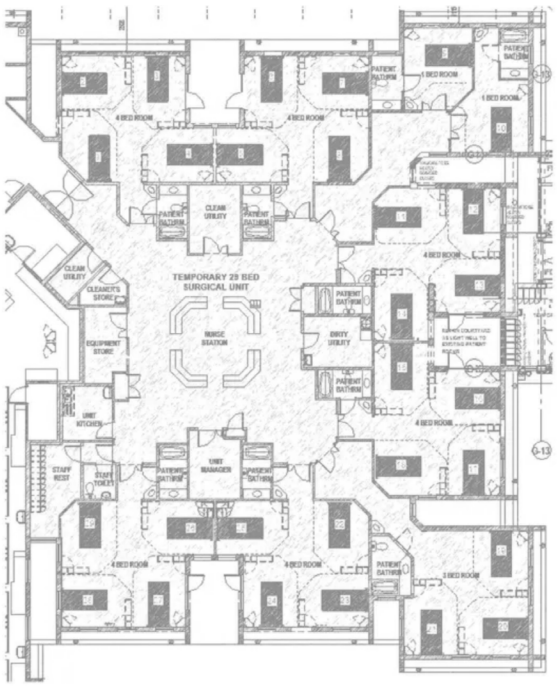


Figure 17: Hoogland Private Hospital Plan

Figure 18: St. Josephs Hospital Plan

Wolff Architects designed additions to the Vredenburg Hospital in 2006. It is one of the five public hospitals that provide specialised treatments within the Western Cape. Even though the building focusses on the programme of scientific healing and factors necessary in hospital designs, it also includes the programme that relates more to the patients, those who need healing. The building lets in plenty of natural light through skylights and rooms have visual access to nature, either the surrounding gardens or the courtyard. Contrasting with the existing colour theories, the incorporation of yellow was simply a preference of the designer. The building finds a balance between Institution and Trauma Informed Design.

Figure 19: Vredenburg Hospital Yellow

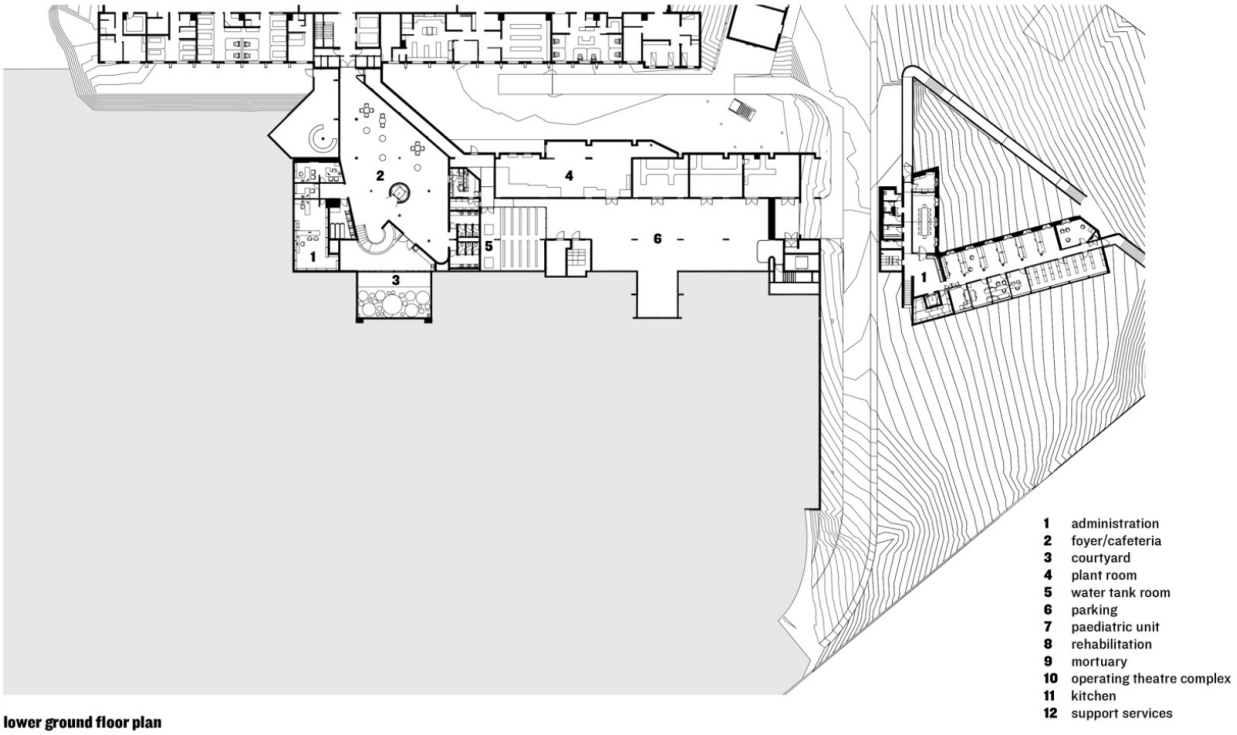


Figure 20: Vredenburg Hospital Plans

Precedent Studies

International

Shifting the perspective to existing trauma informed designs found internationally, one can further identify some of the key design characteristics within these spaces.

Tongling Recluse by Ziyu Zhuang

Located in the north of China, this space incorporates nature in a very clear way, thus emphasising the balance between nature and built form. It is designed to allow for views to the outside, as well as incorporating water to flow within. These elements create a very clear dialogue between the interior spaces and the exterior. The design allows for the interior to actually echo the language of the outside (Miao, 2021).

Figure 21: Tongling Recluse Photo

Figure 22: Tongling Recluse Floor Plan

Beijing ‘Tsuo’ by Wonder Architects

The designers of this space prioritised the incorporation of views within limited dimensions. The building is located within the urban fabric of Beijing. By utilising the functional spaces within the space, one could design it in a way to create views throughout and highlight some of the daily scenes in and around the building. This creates the sense that the views and the interior spaces work together to create the experience.

This was a renovation project and by retaining elements of the original design and progress layers of the construction, the building has a strong sense of time that is captured within. Utilising Light and Borrowed Scenery - When the composition of a garden incorporates the landscapes in the background, it can be described as borrowed scenery. This technique has been used in some of the contemporary interior designs found in China. (Miao, 2021).

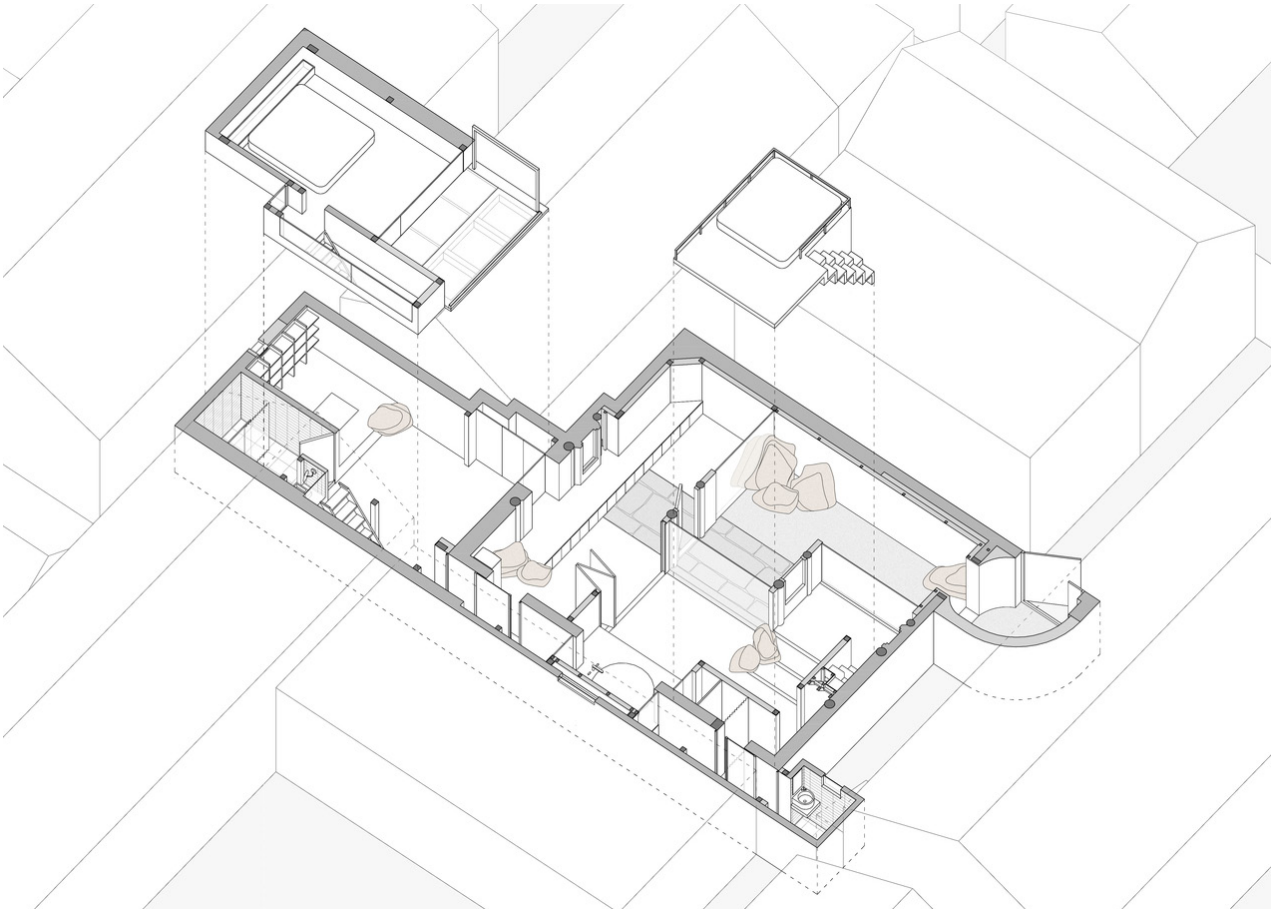


Figure 23: Beijing ‘Tsuo’ Axo

Maggie's Centers

Comparing four different Maggie Centers & identifying similarities ar differences

There are currently 27 operating Maggie's Centres worldwide, of which 21 are located in the United Kingdom. This comparative case study will look at 4 centres and aims to identify the key similarities found in each centre, as well as techniques used throughout that had a positive affect on its occupants (Jencks & Heathcote, 2010). As mentioned, all centres follow a set of design rules and guidelines but have some freedom when it comes to the detailing of the building, allowing it to respond/ relate directly to its site and location. The four centres I will analyse here include Maggie's Centres in Forth Valley (Scotland), Glasgow (Scotland), Southampton (England), and Yorkshire (England).

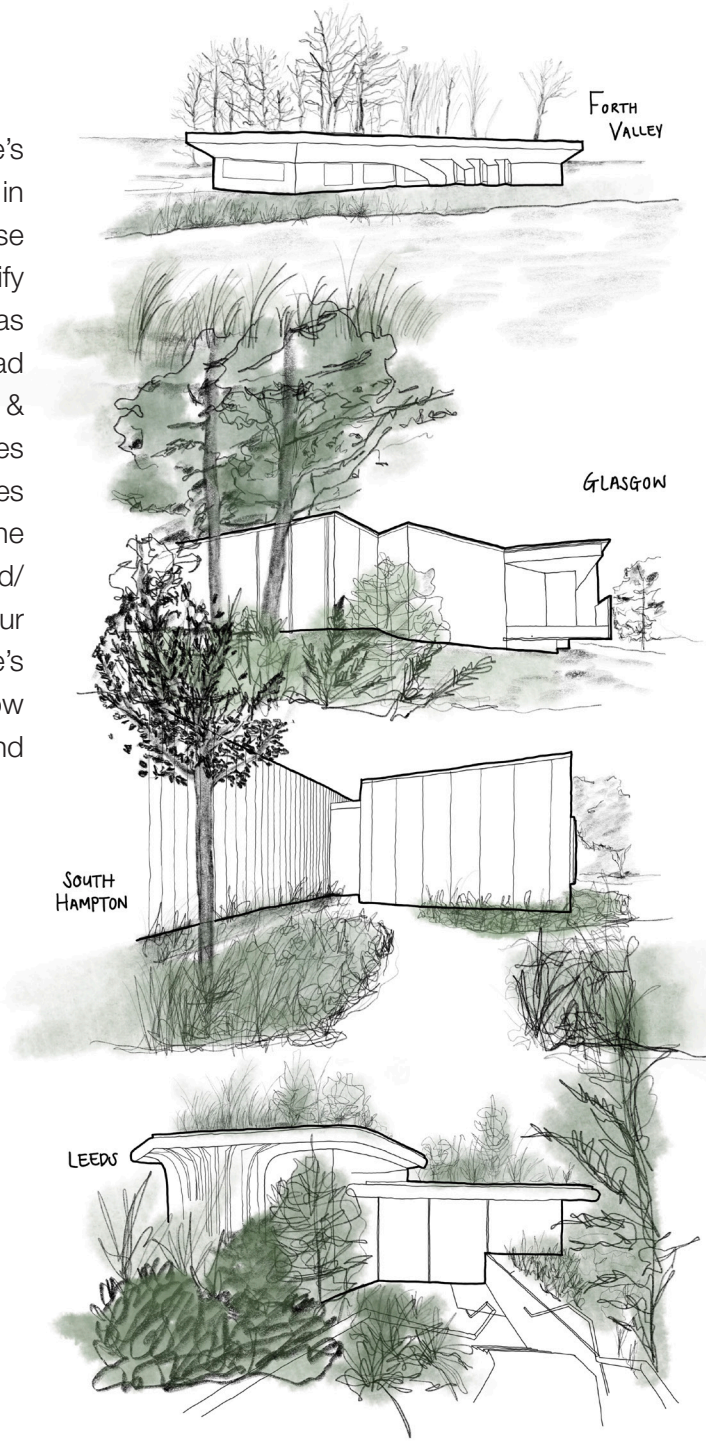


Figure 24: Sketch collage of the four Maggie's Centres that are analysed in the design report.

Maggie's Center - Forth Valley

Forth Valley's Maggie's Centre is located in Larbert, Scotland and was designed by Garbers and James Architects. The materials follow a colour palette of greys, blues and oranges. These colours were chosen as they represent the setting of the sun over the Scottish landscape. The sunset is not the only natural metaphor found in this design. The architects also designed the sharp angled roof as it is inspired by salmon fishing. This design decision is effective as the building sits on the edge of a large lake. Incorporating natural elements found in the landscape into the design is typical of Maggie's Centres. However, even though the building has multiple successful views of the surrounding environment, the design does not bring that natural element into the space. When looking at the floor plan of the building, the use of hard and sharp edges also contributes to a more harsh environment. Artificial lighting that works with sensors, allows for the monitoring of natural light levels. (Dunlop, 2017)

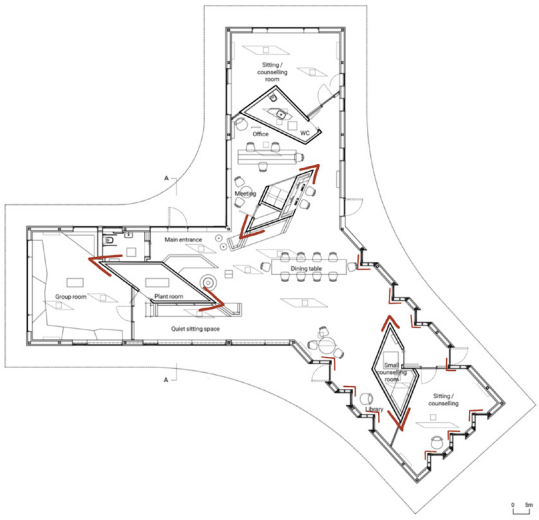


Figure 25: Forth Valley Floor Plan

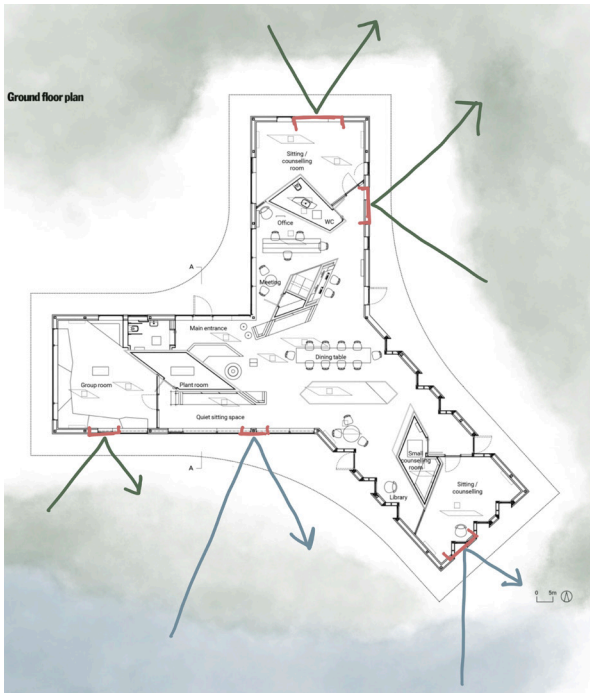


Figure 26: Forth Valley Floor Plan

Figure 27: Forth Valley Interior

Maggie's Center - Glasgow

The second centre is also Located in Scotland. Maggie's Centre Glasgow was mentioned when discussing the concepts of Biophilia. This building is made up out of a series of interlocking rooms, all surrounding a central courtyard. This allows for visual and physical access to nature from all of the interior spaces. The L-shaped typology of the rooms allows for the design to minimise the use of corridors, creating a more open space. This also gives the building the ability to let a sufficient amount of natural light into the space.

This connection between the interior and exterior creates a strong balance between the two spaces. Furthermore, the materiality of the space includes timber soffits and concrete floors. As timber is considered a successful materiality choice for the interior of healing spaces, the use of it is seen as a good design move. The building plays with scale as the communal spaces are larger with higher ceilings, whilst the private rooms are smaller, more privatised and intimate (Minner, 2011).

Figure 28: Glasgow Floor plan showing access to courtyard and natural light.

Figure 29: Glasgow Floor plan showing access to courtyard and natural light.

Figure 30: Maggie's Glasgow Interior

Maggie's Center - Southampton

Amanda Levete designed this centre, located in Southampton in the United Kingdom. The design process prioritised the idea that there should be very little distinction between inside and outside. This lead to the choice of materials. Large walls are cladded with a reflective stainless steel; a mirror-like cladding. This allows the building to reflect its natural surroundings giving the impression that the two spaces are one. Alternatively, a ceramic tiled cladding was used to allow for an earthy aesthetic. Both of these techniques are visually strong, but also have a tactile element, appealing to the sense of touch. The site of the centre is surrounded by existing car parks, which made it extremely important for a landscape designer to carefully curate gardens to surround the centre, as greenery was missing from the environment. The floor plan of the building follows a pinwheel layout. This allows for all the spaces to be connected at one point, giving a strong spatial quality to the central space, the kitchen, as well as creating multiple access routes within the space. To further emphasise the importance of the kitchen the designer placed a circular sky light above the space. This is the only curved element in the design, allowing soft natural light to fall into the space.

Figure 31: Maggie's South Hampton Plan

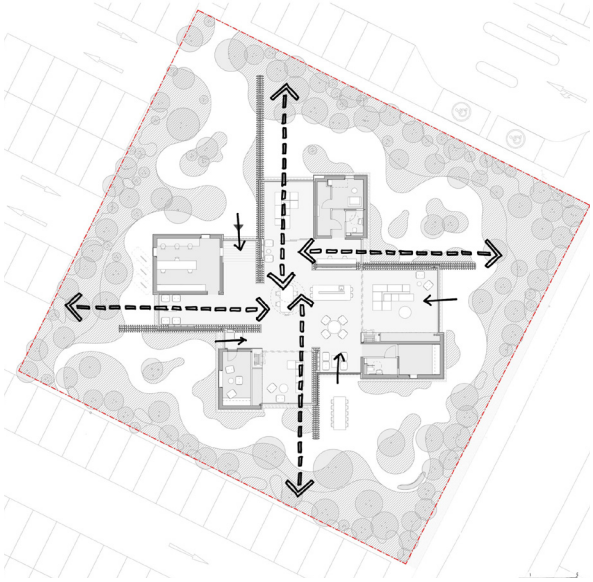


Figure 32: Maggie's South Hampton Plan

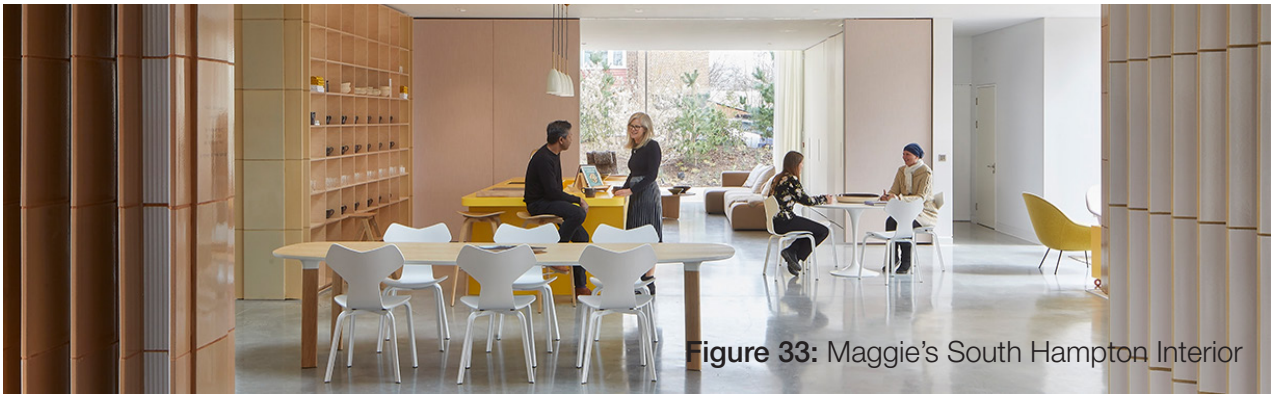


Figure 33: Maggie's South Hampton Interior

Maggie's Center - Leeds

The final centre I will be analysing was deigned by Heatherwick Studio and is located in Leeds, United Kingdom. The building prioritised the incorporation of nature. The biophilic design qualities are clearly visible when looking at the space. It includes a large amount of green spaces that are all accessible to the users, both physically and visually. The soft curves of the interior space create a very calming environment which is further emphasised by the materiality. The large timber fins act as structural tools as well as a design feature.

The floor plan is made up out of spaces with soft curves instead of harsh corners, open spaces and easy circulation. All this contributes to the successful design of a trauma informed design as it improves the experience of the patients and those who need healing. Biophilic principles, Geslers four environments, phenomenological design principles as well as the functional programme of the institutional design are all considered in this small space. (Pintos, 2021)

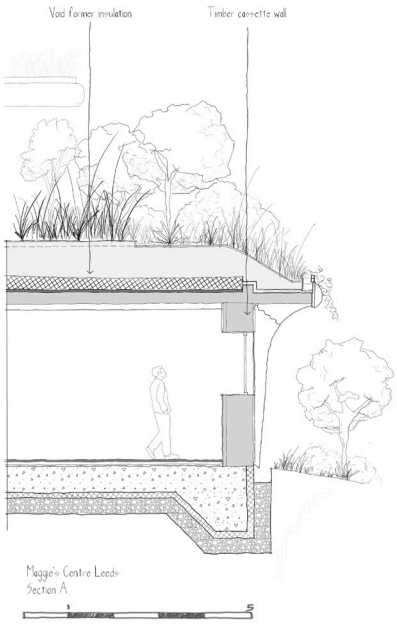


Figure 34: Maggie's Center Leeds Section

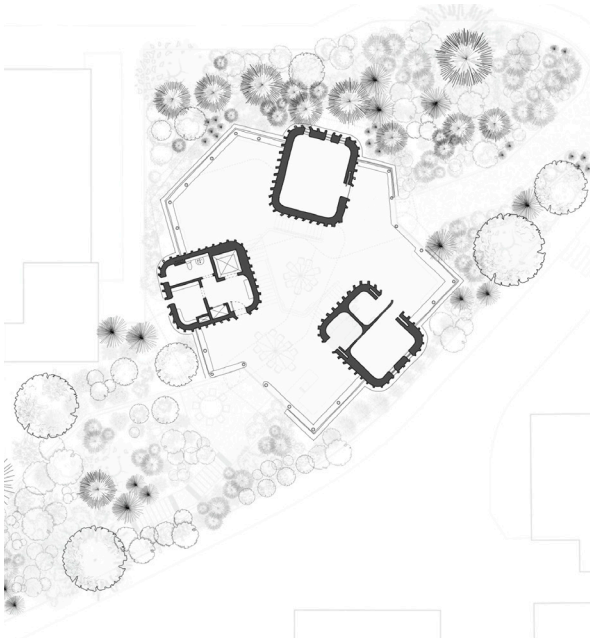


Figure 35: Maggie's Center Leeds Plan

Figure 36: Maggie's Center Leeds

SECTION 4

Locality & Site

Site

Identifying the Locality

As the key stakeholders of this project would be students who attend tertiary institutions, the chosen location would be the City of Cape Town, considering that it is home to a few of South Africa's top universities and colleges.

Cape Town and surroundings offers multiple sites that could either benefit from an intervention that follows a trauma informed design approach and therefor bringing healing architecture to a scarred site, or the site itself includes many characteristics that will relate to the design principles and theories discussed. This refers to access to nature, to public health facilities, a sense of safety and security, and being in close proximity to tertiary institutions and public health care facilities.

The locality map below indicates the greater part of cape town and surroundings; the dotted circle, and the University of Cape Town; the red indicator. The goal was to find an area within these parameters that would benefit from a wellness center.

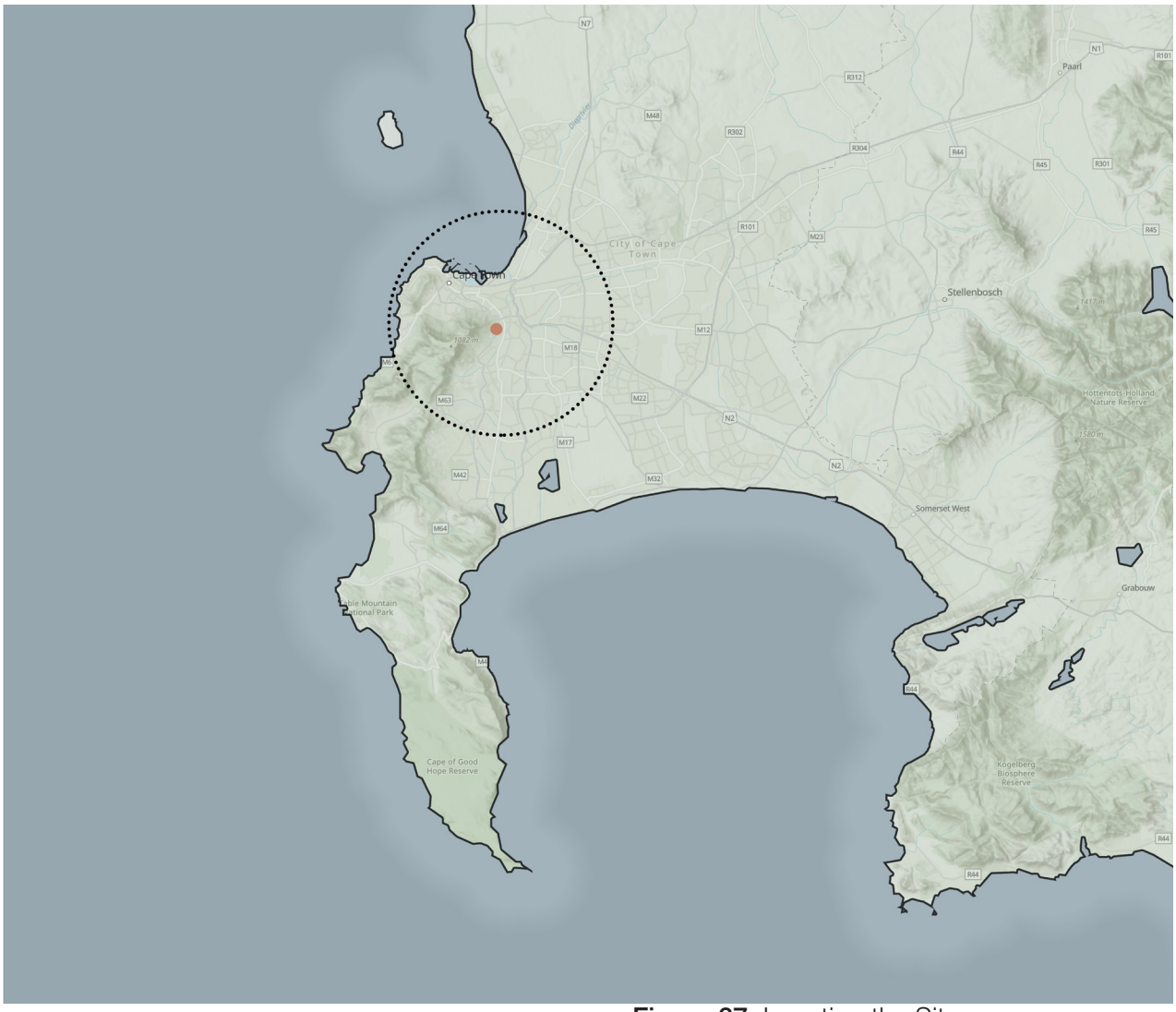


Figure 37: Locating the Site

Locality

The idea was to identify a zone within Cape Town that fits the criteria of the stakeholders. There are tertiary institutions across the city and in many surrounding neighbourhoods. The city Center was identified, as it does include colleges and campuses. The area also caters to multiple schools and commercial zones. These categories would also benefit from a wellness center.

One of Cape Town's largest public hospitals is the Groote Schuur Hospital in Observatory. It is also situated directly opposite the Medical campus of the University of Cape Town. This is already a connection between the institution and wellness.

The idea of connecting the hospital to the intervention was further supported by this. This connection gives students who are studying at the medical campus and who are in the medical field the opportunity to learn from a trauma informed wellness center.

Therefor it would be important to connect the site to the University of Cape Town, as well as the medical campus which is linked to the hospital.

Figure 38: Locating the Site

Site Opportunities & Options

The city of Cape Town comprises of multiple tertiary institutions, including the Cape Peninsula University of Technology, The University of Cape Town and multiple other colleges. I located a few potential sites that are found near these institutions and then continued to analyse the sites by using the set of site specific design principles mentioned. I narrowed down my site options to two sites located close to public transport routes, Hospitals, access to nature either visually or physically, and it was important that the site should be near a tertiary institution.

The two sites are located in Mowbray along the Main road, as well as on the grounds of UCT's upper campus. The sites have a few similarities, but mostly differ from oneanother. The one being very appropriate for a trauma informed design, and the other requiring this design approach to be implemented into the site.

The Mowbray site is surrounded by dense urban context. It is an area that will require trauma informed design to be brought into the site, rather than offering the necessary environment. This will require a design that is almost closed off to its immediate surroundings and having the sanctuary within. By bringing trauma informed design into the site, the current state of the area could benefit from such an intervention.

The site on UCT's upper campus will require a different approach. It includes all of the site specific design principles, as mentioned. This will allow for a design to want to open up to its surroundings and bring the it into the space. The fact that is located next to an institution will allow for that sense of balance between institution and sanctuary. It is easily accessible by the students and close to many student residences.

Figure 39: Locating the Site


HOSPITAL
ACCESS TO GROOTE SCHUUR PUBLIC
SITE 1
GREEN AREAS & POTENTIAL SITE
LARGER GREEN SPACES
SPORT FIELDS
WATER BODY
EDUCATION
HEALTH FACILITIES
STUDENT ACCOMODATION
GENERAL CONTEXT
ACTIVE COMMERCIAL NODES
PUBLIC TRANSPORT NODES
HIGHWAYS
RAILWAY
1 : 5000 @ A1

Comparison of Choices

The site selection was narrowed down to two sites - one being in Mowbray, along Main Road and the other on the Upper Campus Grounds of the University of Cape Town

Mowbray

The site is located in the suburb of Mowbray; a busy and active area. It is surrounded by commercial activity, as well as private residences. The site sits along the Main Road of the Souther Suburbs, allowing for easy access to and from the site. It is approximately 400m from a large Bus Stop as well as the railway. Public transport routes can access this area easily. Furthermore, Main Road connects the site to multiple student residences that are also situated along the same road. There is also a connection to the Grootte Schuur Public Hospital. The site will require Trauma Informed Design elements to be brought in through the intervention, as it does not have those qualities. This creates the opportunity to allow for the design to bring the sanctuary a space in need of healing.

The site has no noticeable slope and does not offer any views from the existing floor level. It is also a rather noisy location as it is a major public transport node. This large amount of activity also increases the need for surveillance.

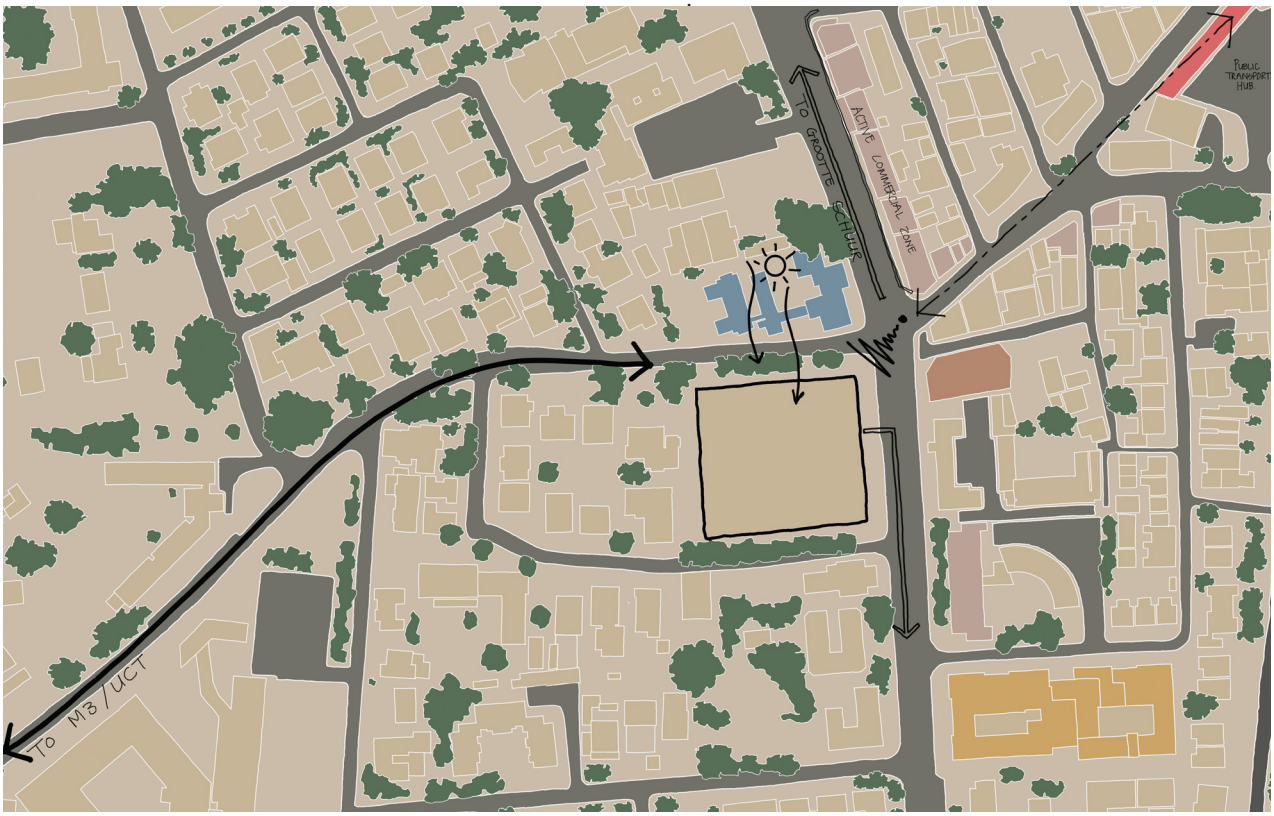


Figure 40: Mowbray site map

University of Cape Town - Upper Campus

The second site that was considered is situated on the grounds of the University of Cape Town. The site is rich in vegetation and offers a distinct connection to nature. It overlooks a body of water, as well as offering views of Table Mountain and Devil's Peak. It can be accessed via Rugby Road, which is also the entrance road onto the campus. This road is also connected to Rhodes Drive which allows one to easily access the highway. This connection further ties to the Grootte Schuur Public Hospital. Furthermore, by placing the site on the grounds of an institution, it will give the intervention the sense of safety and order that institutions offer. It allows for the design of the intervention to follow a very strong trauma informed approach.

The site allows for the balance between institution and sanctuary to become more present.

The concept of healing can be drawn from the site itself as a large part of the vegetation had to be removed as a result of the fires that happened in 2021 on the mountain. A large part of the site is currently bare.

Figure 41: University of Cape Town site map

Mapping

Access

The site can be accessed via Entrance Road. This is the northern entrance of campus. It is connected to the M3 or Rhodes Drive, which is also the connection to the Groote Schuur Hospital.

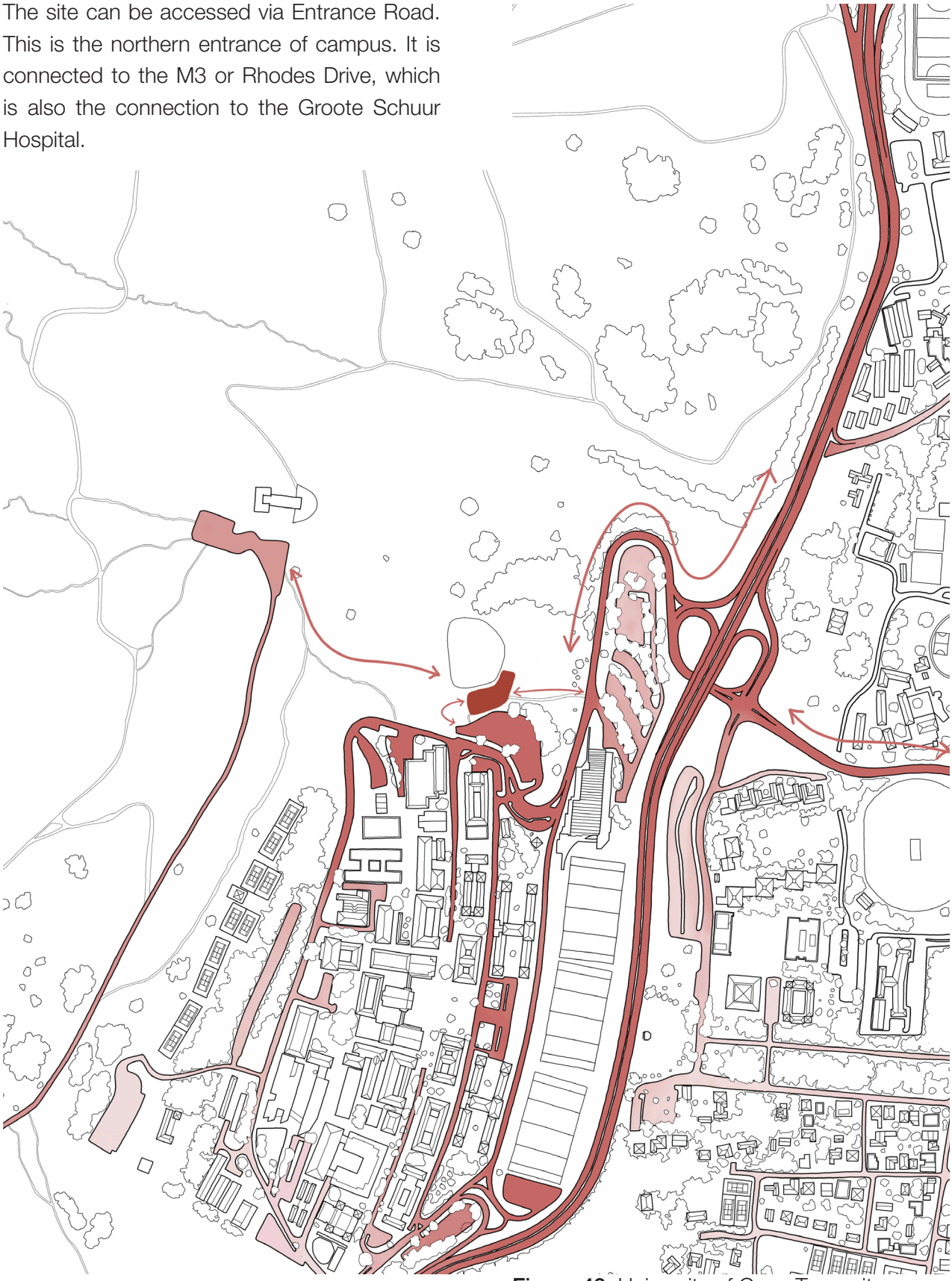


Figure 43: University of Cape Town site map

Mapping

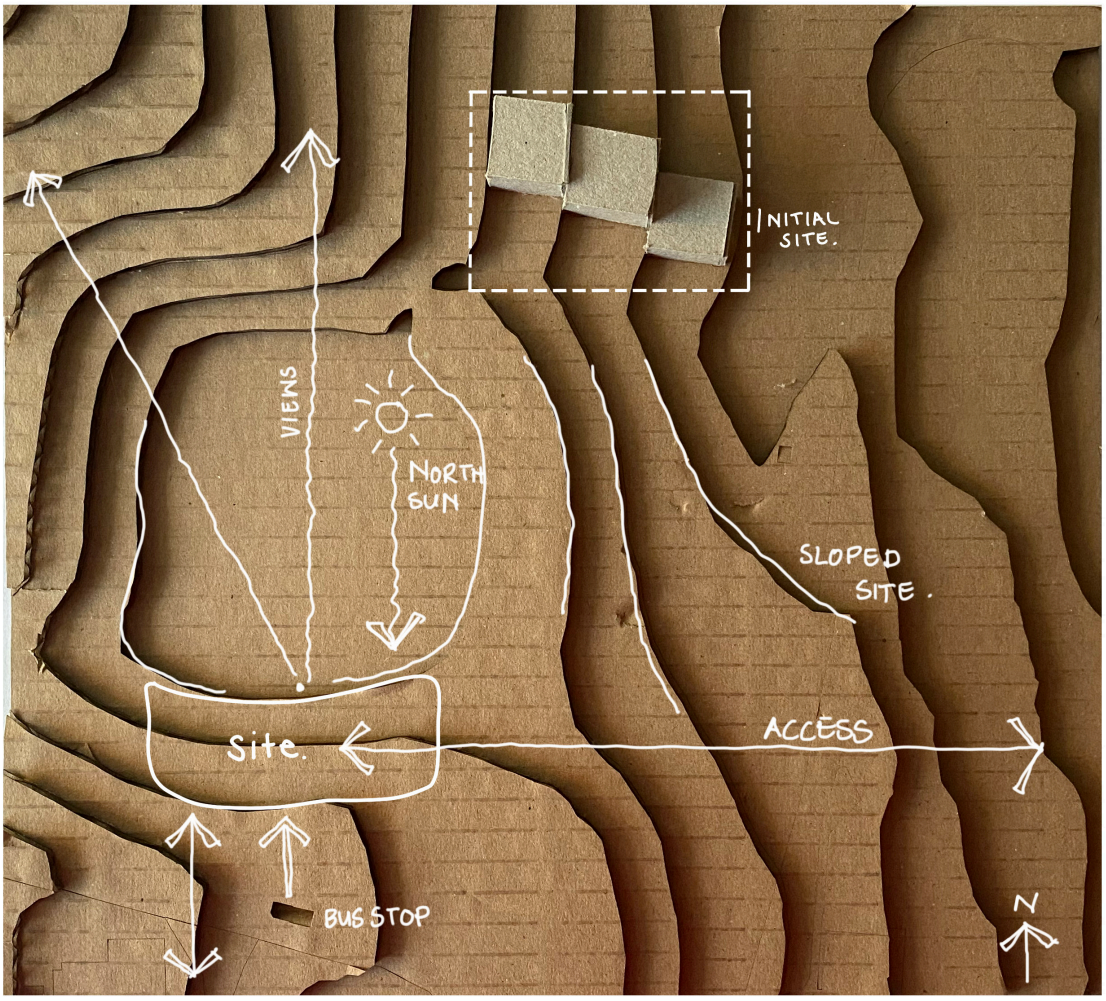
Use & Occupation

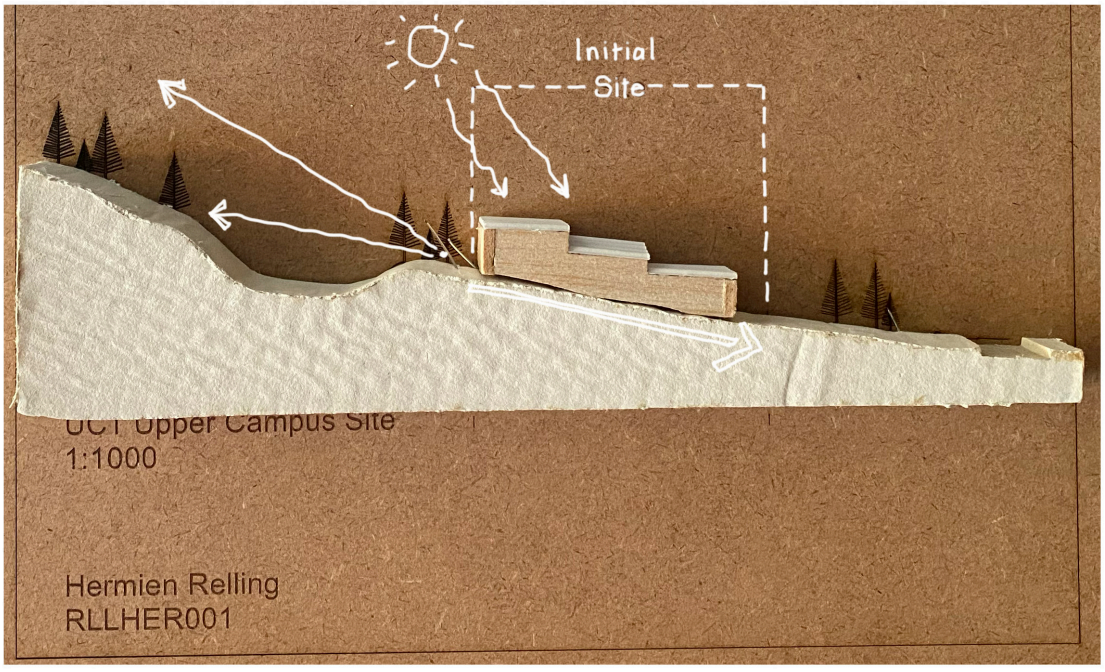
As the site is on campus, majority of the buildings surrounding the site caters to the educational institution. However, some of the student residences are also located in close proximity to the site, as well as multiple physical activity interventions such as sports fields and hiking routes.

Figure 44: University of Cape Town site map

Site Models

3-Dimensional Investigation





Site Photos

Figure 45: Photo showing bare land and water.

Figure 46: Existing path to the Sport Center

Figure 47: Existing Seating area on site.

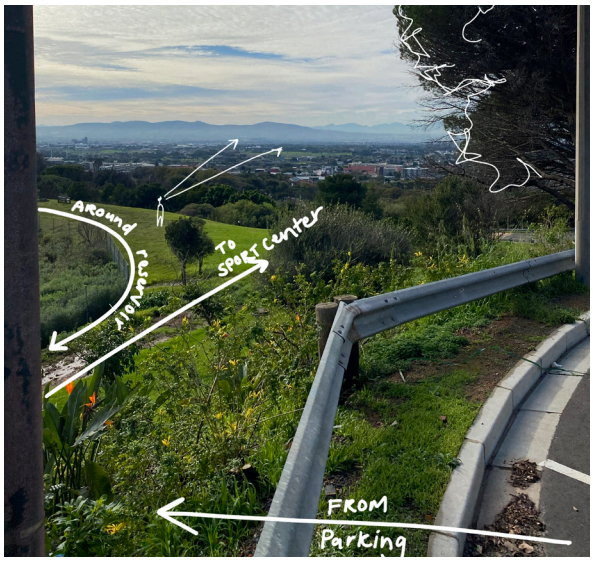


Figure 48: Connection from parking to site.

Figure 49: Connection from bus stop to site.

As the design will follow a strong phenomenological approach, the site analysis will take into consideration the lived experience of the occupant on the site. This focuses on the views, the presence of natural light, the vegetation. These elements are best experienced by walking around the site and experiencing it for one's self.

Site Analysis

Site Specific Design Principles

I narrowed down the group of stakeholders to allow for a more focussed building design, specifically taking into consideration a smaller group of people. The importance of mental health within tertiary institutions is of great significance. Therefor I have selected the City of Cape Town as my greater location as it caters to multiple tertiary institutions. I will further discuss the design principles of the desired site and how this lead to the final site choice.

By locating the site on the grounds of The University of Cape Town's upper campus, it catches the students in their day-to-day lives. There are two desire lines that run through university avenue towards the site, as well as from the existing Sport Centre; a facility that takes care of physical health which is vital for mental health.

To further emphasize the appropriateness of the site, a set of site specific design principles are used.

Access to Nature and Natural Light, Accessible via public transport, close proximity to a public health care facilities, Safe environment but not completely secluded,

Avoid seclusion, noisy spaces, avoid the sense of exclusion, it is not a 'retreat',

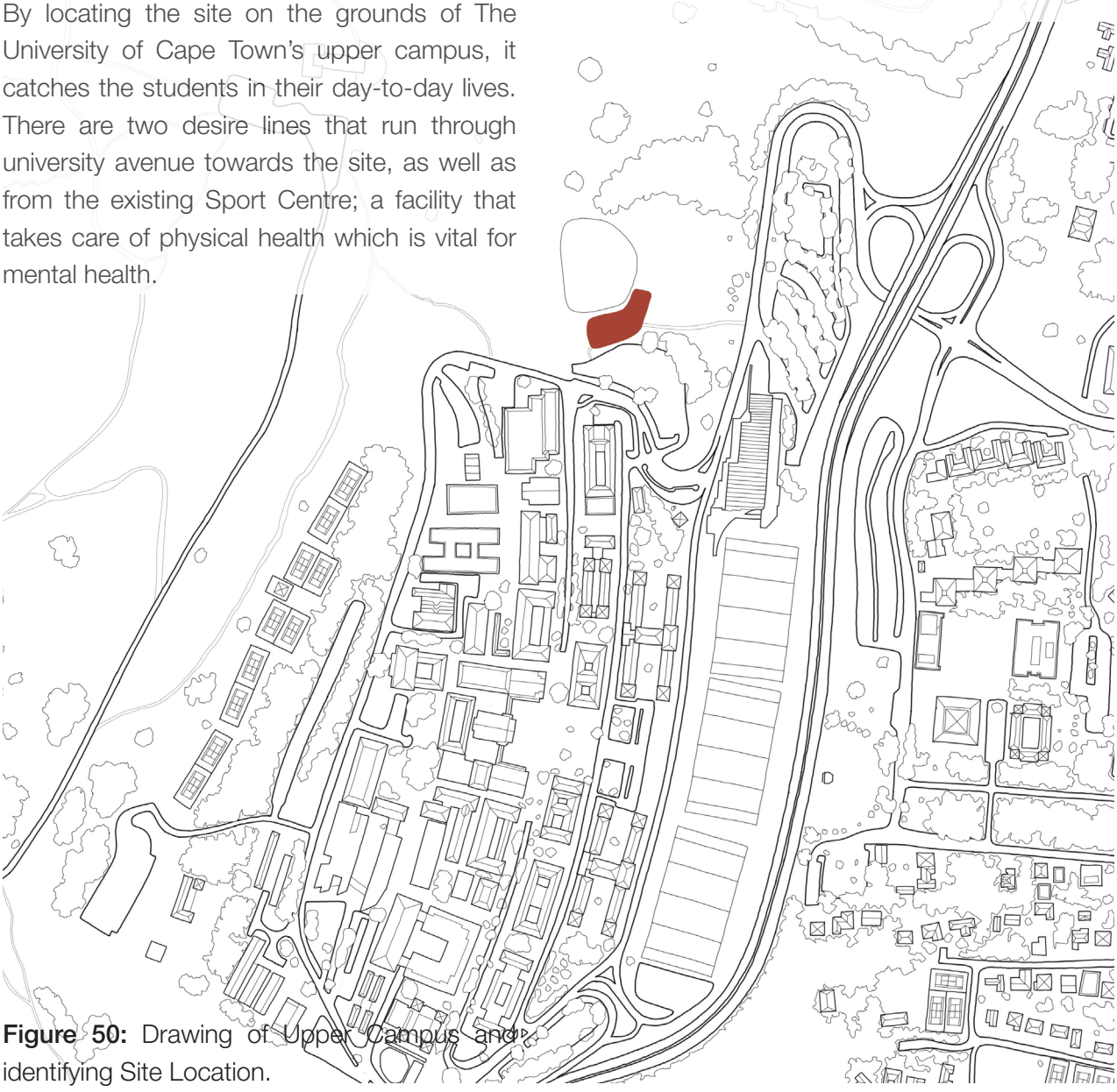


Figure 50: Drawing of Upper Campus and identifying Site Location.

Access to Nature and Natural Light

The site is located in an area that allows for both physical and visual access to nature. There is plenty of vegetation on the site, as well as views onto the Devil's Peak Mountain and looks out onto a body of water. Furthermore, the site allows for the design to be filled with natural light as a large part of the intervention could be north facing.

Accessible via Public Transport

If access to and from the site is not easily conducted, this could contribute to anxiety even further. The site can be connected to the Northern Bus stop located on campus. This will allow for people who are dependent on this form of transportation to reach the building. The large parking lot south of the site could also be used as a drop-off zone.

Safety & Security

As the site is located on the grounds of an institution, it gives it a sense of safety and controlled security. the site is near a controlled access point on Madiba Circle. All forms of transport is regulated and controlled at this point. The gate house is removed from the site, which allows for the site to not seem like a gated exclusive space.

Close Proximity to Public Health Care Facilities

One accesses the campus via Entrance Road is linked to Rhodes Drive. This connection allows for quick access to the Groote Schuur Public Hospital in case of an emergency, as mental health struggles could be unpredictable and having that access is important.

Figure 51: Site Diagrams by Author

Figure 52: Diagram illustrating the vegetation on and around the site.

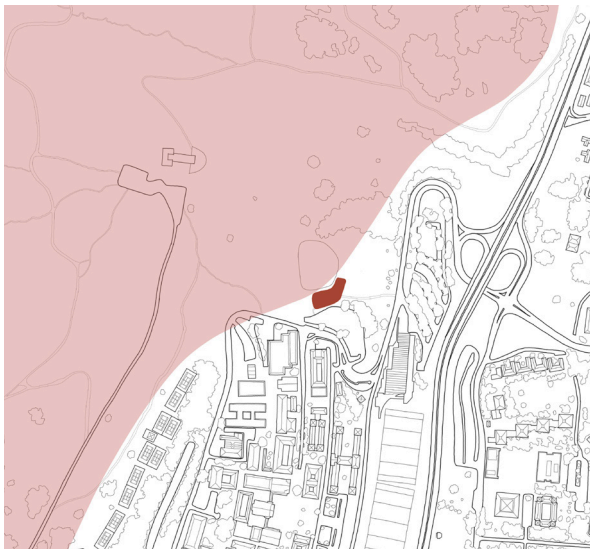


Figure 53: Diagram illustrating the part of the mountain that was affected by the fires in 2021.

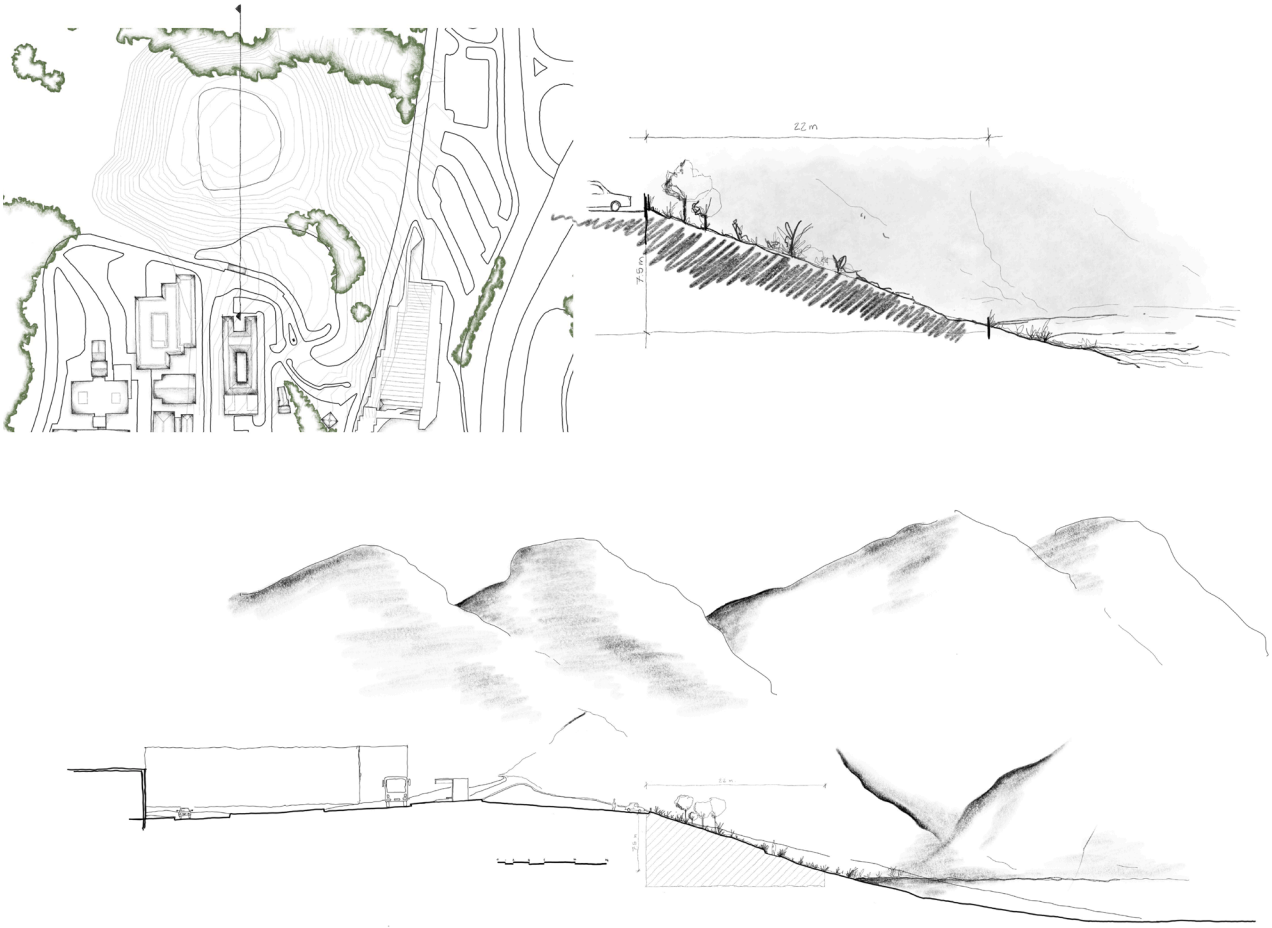


Figure 54: Sectional Exploration of the site.

Figure 55: Design scheme. This diagram illustrates how surrounding nature will be brought into the design and become part of the intervention. It indicates all access points and routes that will be added (the yellow arrows) as well as the importance of incorporating the views that the site offers.

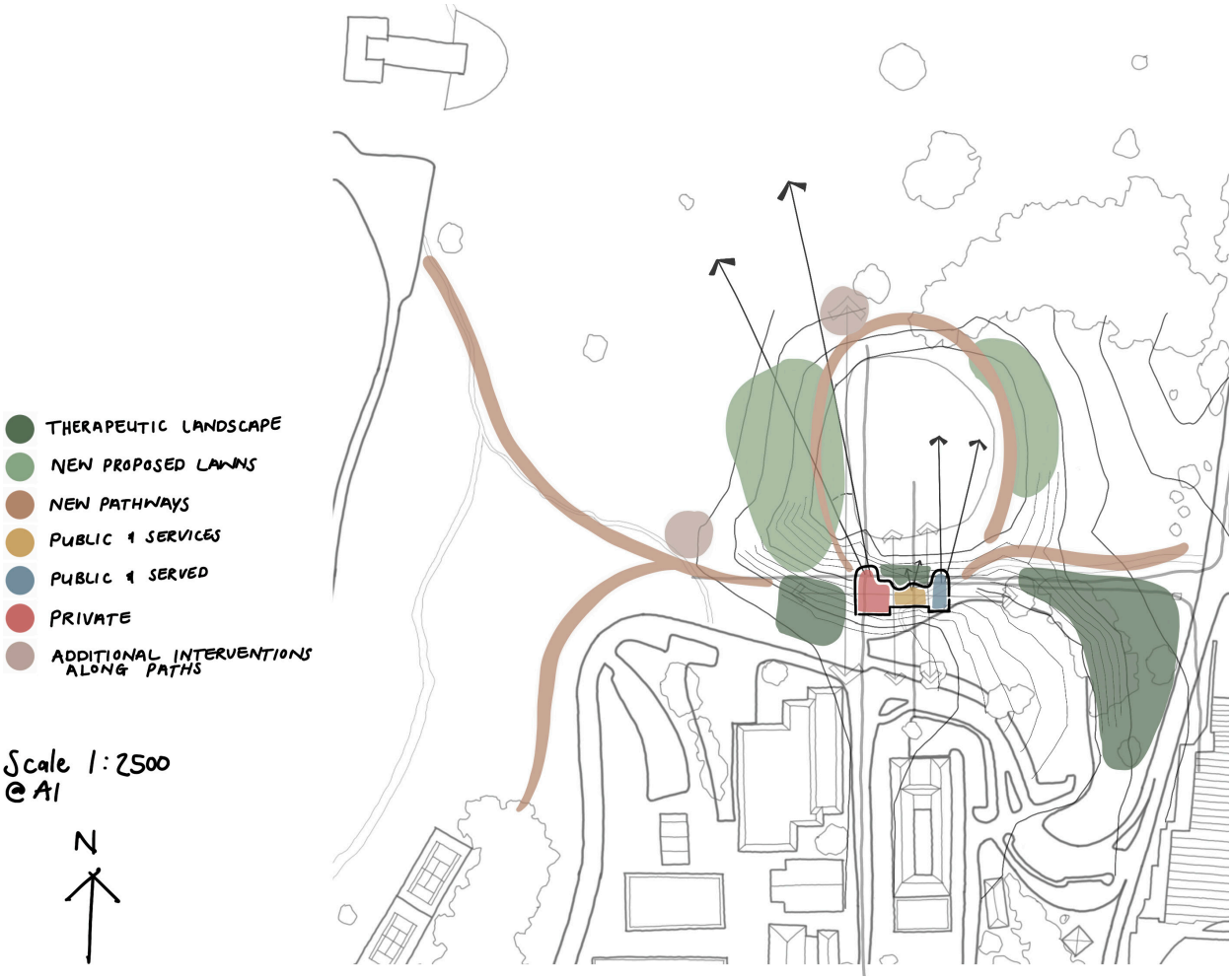


Figure 56: Diagram of the initial Design approach and scheme.

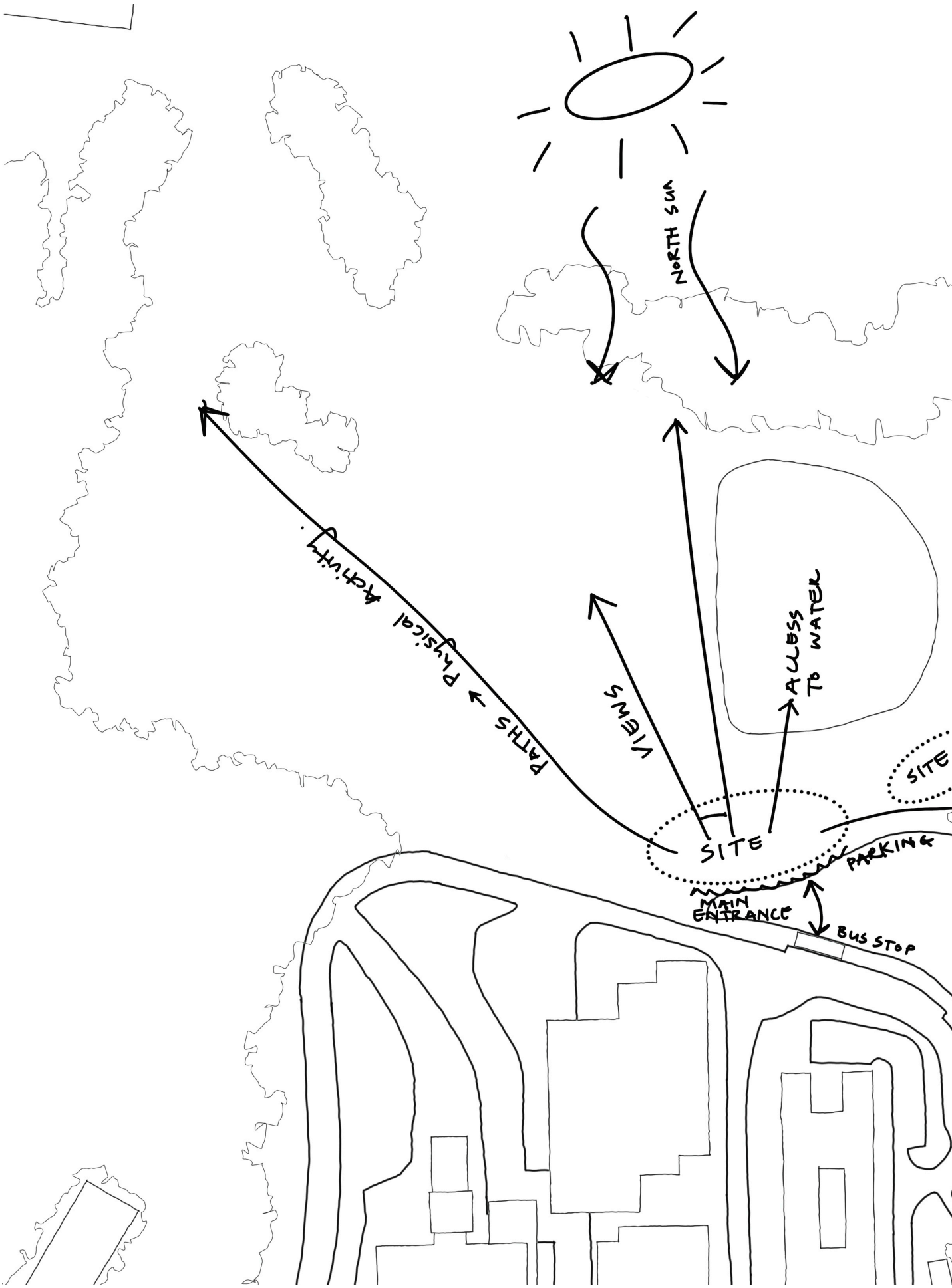
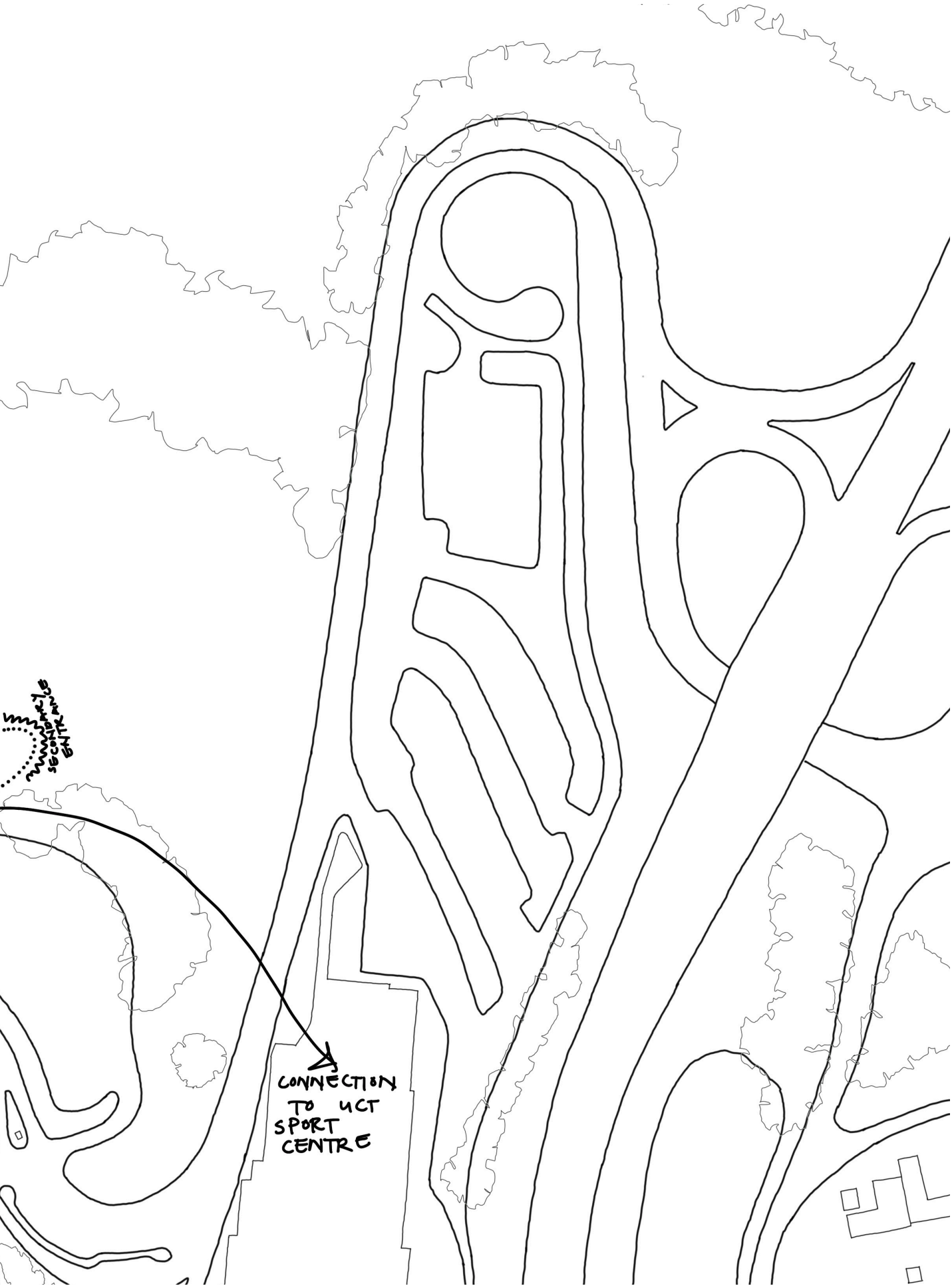


Figure 57: Diagram of the initial Design approach and scheme.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SECTION 5

Design Development

Design Brief

The Programme, The Client, The Materiality

The Programme

The building programme is created by using existing mental health facilities as a reference for spatial sizes, the necessary spaces as well as which spaces need to be prioritised. The Maggie's Centres serve as a very useful guideline and a reminder as to what elements need to be emphasised and what can be subject to change. The programme will focus on the needs of the day-to-day occupants, the staff and the in-patients who require accomodation or to stay longer.

To avoid placing any further stress or anxiety on students who require the healing facilities, there needs to be a space that acts as a buffer between the day-to-day students and those who are in need of assistance. In this case, the therapeutic landscape will act as such a design intervention, separating the two. The main circulation route will lead towards the garden and reach the administrative zone of the building.

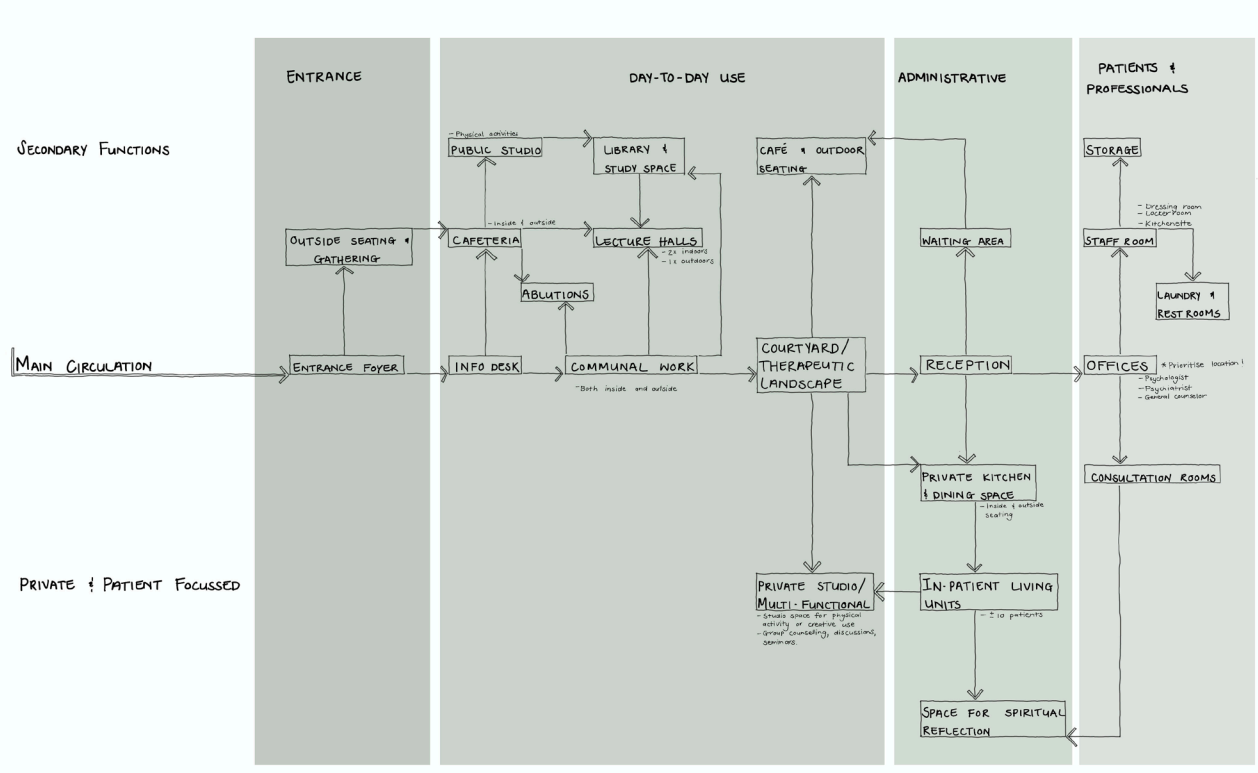


Figure 58: Diagram setting out the building programme.

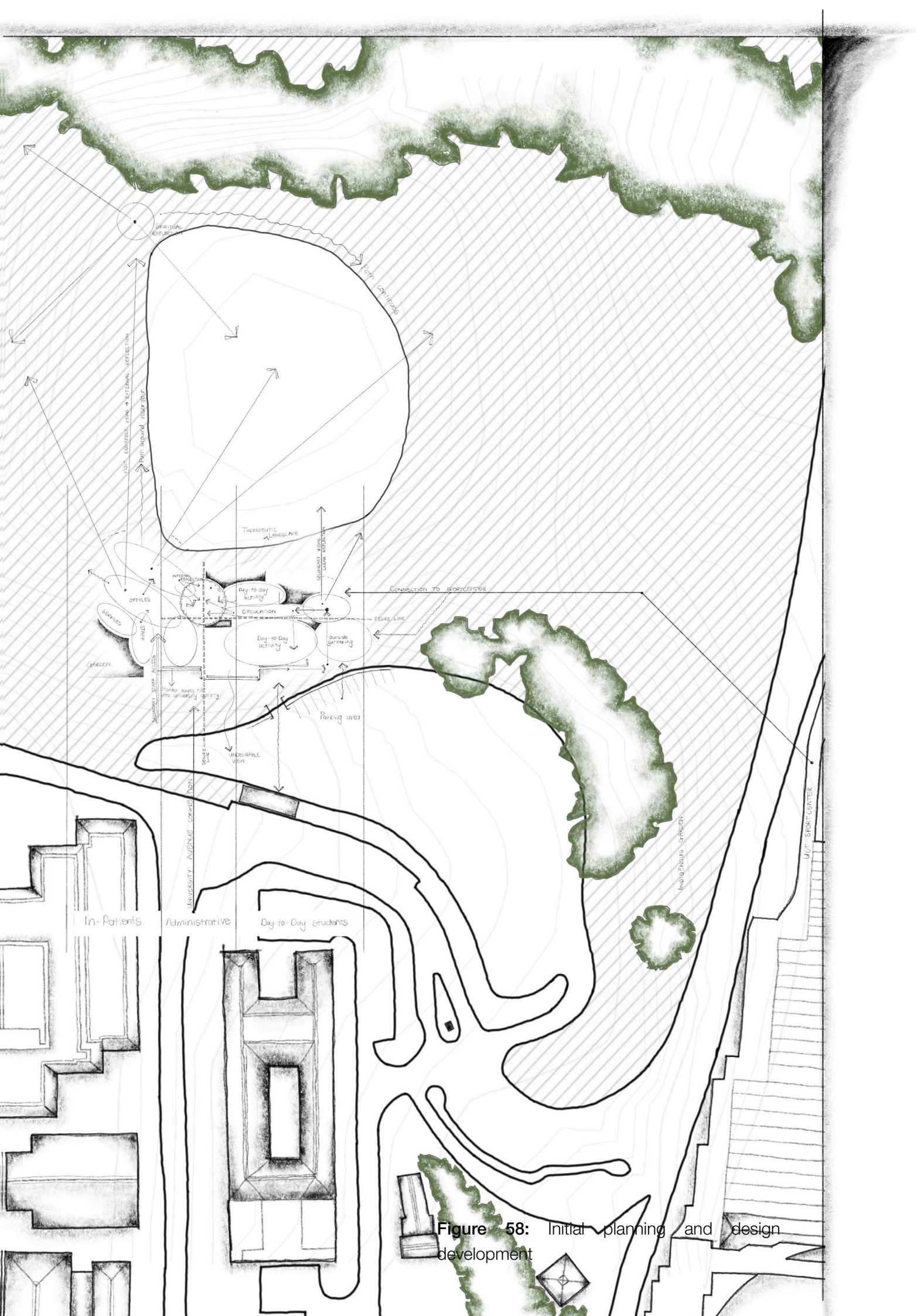


Figure 58: Initial planning and design development

Figure 59: Initial planning and design development

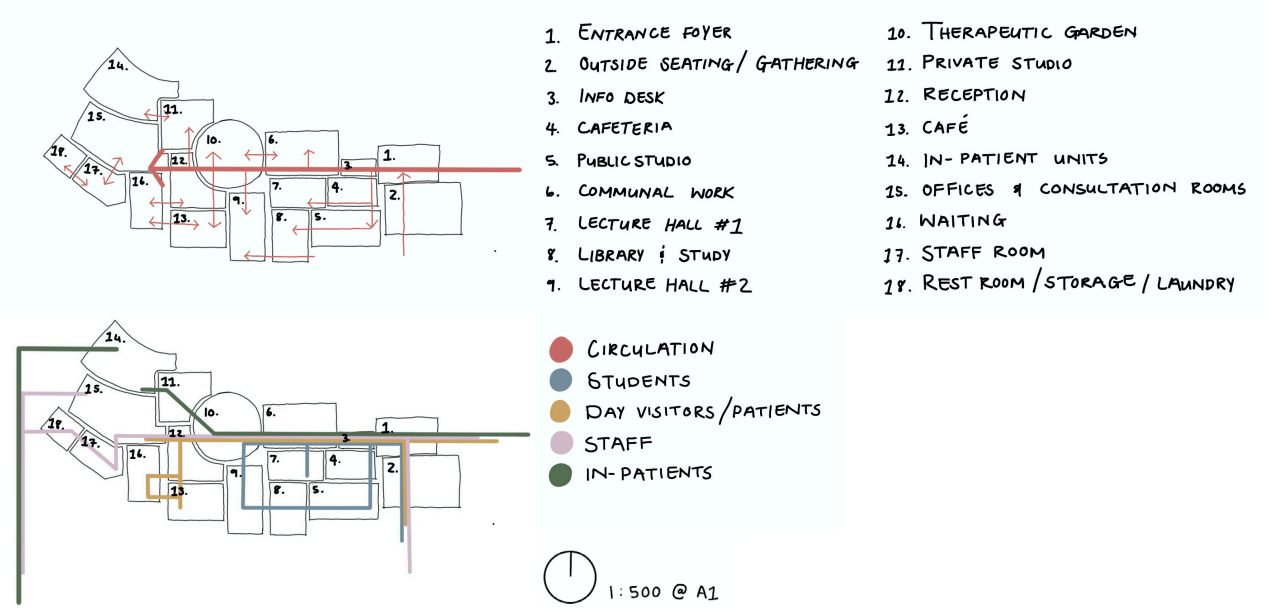


Figure 60: Circulation Diagram

The Client

The building will be occupied by students, as well as mental health professionals, these include psychologists, psychiatrists and counselors. General staff will also need to be considered. This includes staff for the cafe and cafeteria, the library, the reception and information desk. The lecture halls will be occupied by medical and psychology students who can learn from the professionals already in the building, as well as guest lecturers.

The Materiality

The theory has shown that choosing materials that have warmer and softer qualities will allow for a space to have a more calming affect on the occupant's lived experience. By stimulating the senses of the user through a calming environment it could benefit one's mental wellbeing. The materiality will play a large part in the sensory stimulating proses that the design aims to achieve. The study of Colour theory also suggested that certain colours best be avoided and other colours could be more present. Similarly the thermal qualities of the materials chosen can be connected to the stimulation of one's sense of touch. A material such as timber is a warmer choice compared to concrete.

The building will be brick plastered and painted with timber design elements. The use of glass will also be incorporated as to allow for natural light to enter the space and for views of the surroundings.

Design Development

Concept Development

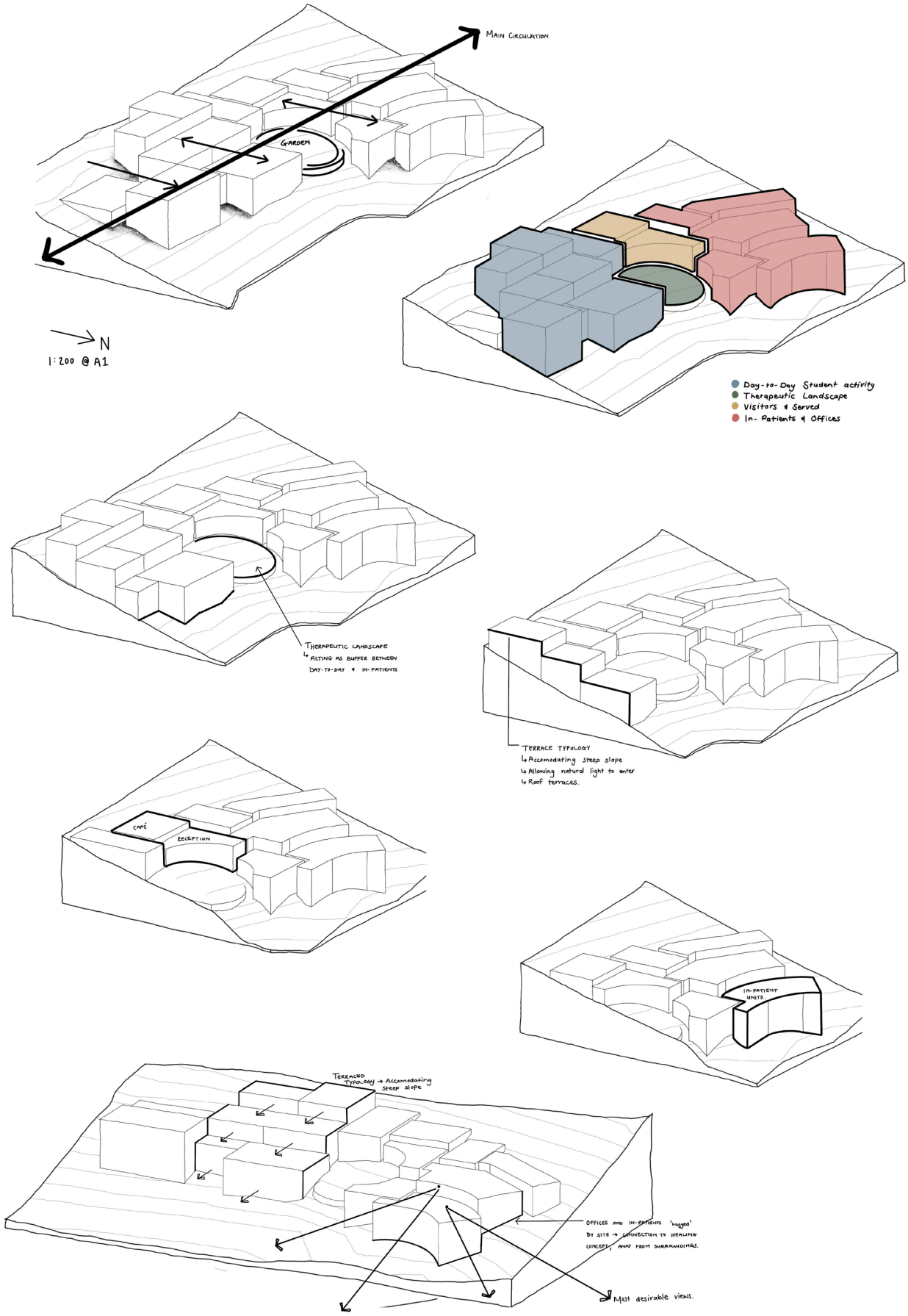
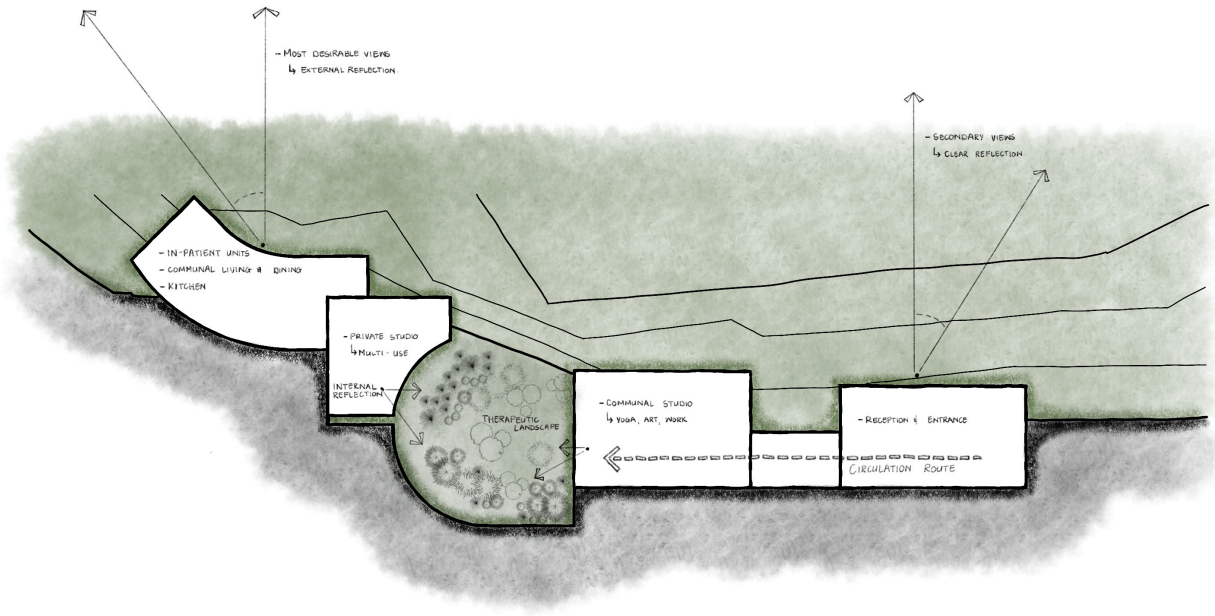


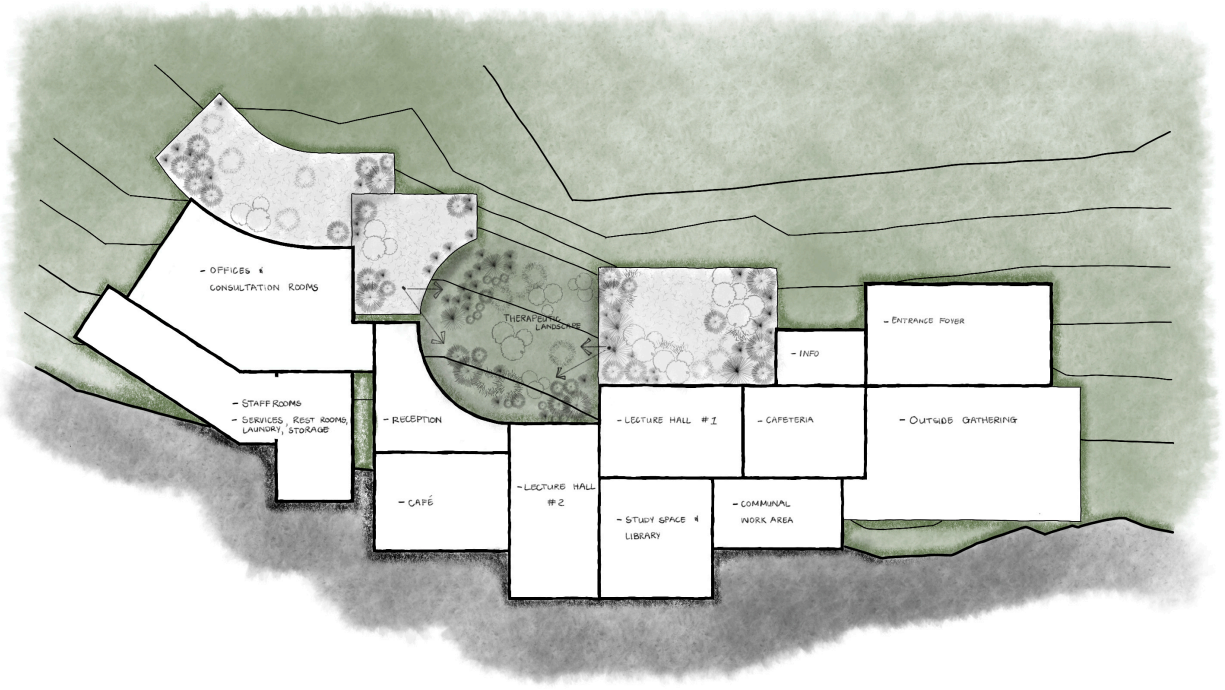
Figure 61: Design Development Diagram

Design Development

Current Diagrammatic Floor Plans



GROUND FLOOR PLAN 1:200 @ A1

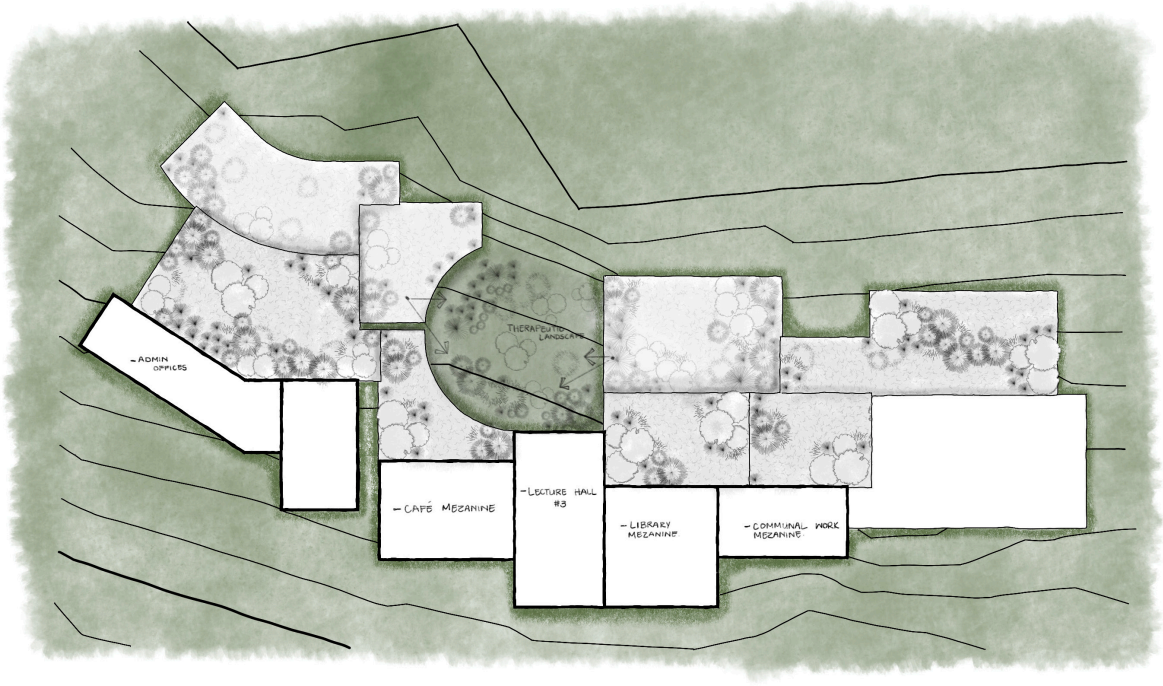


FIRST FLOOR PLAN 1:200 @ A1

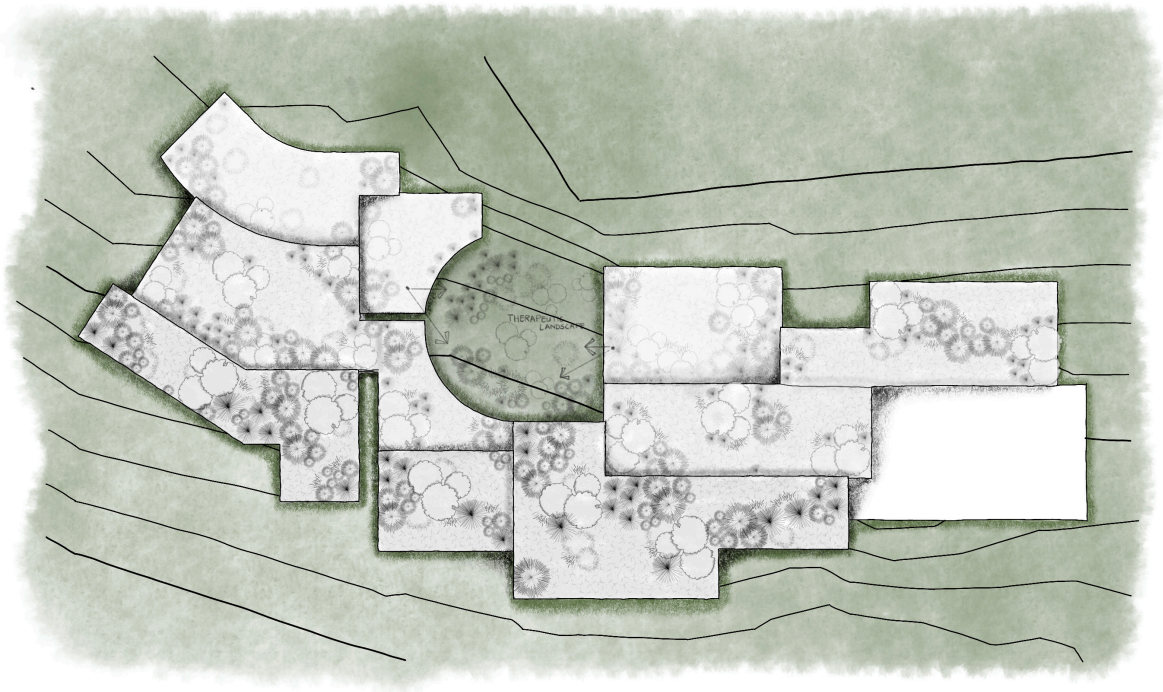
Figure 62: Design Development Floor Plans

Design Development

Current Diagrammatic Floor Plans



SECOND FLOOR PLAN 1:200 @ A1

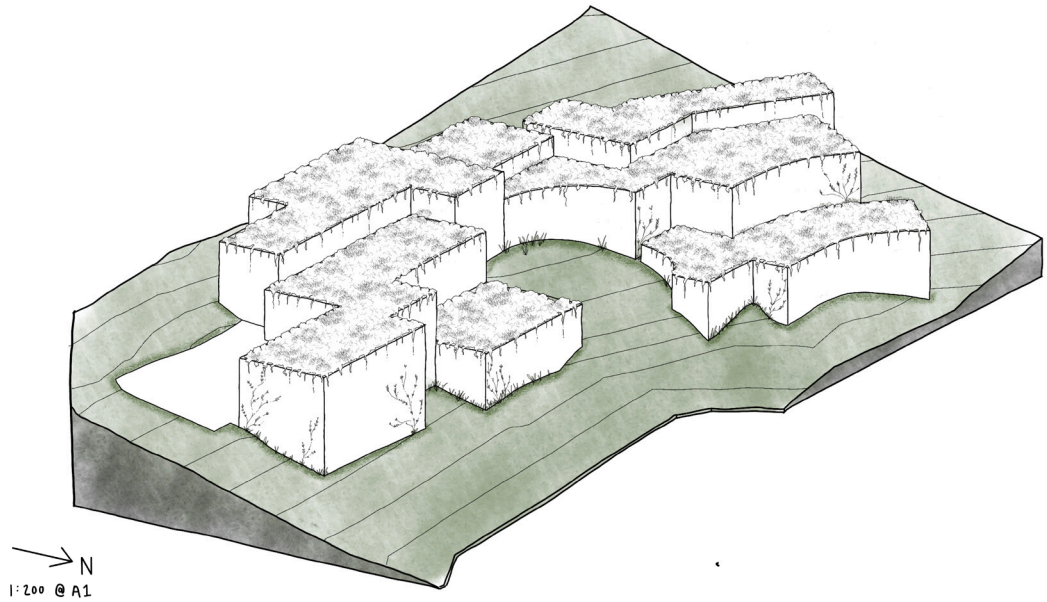


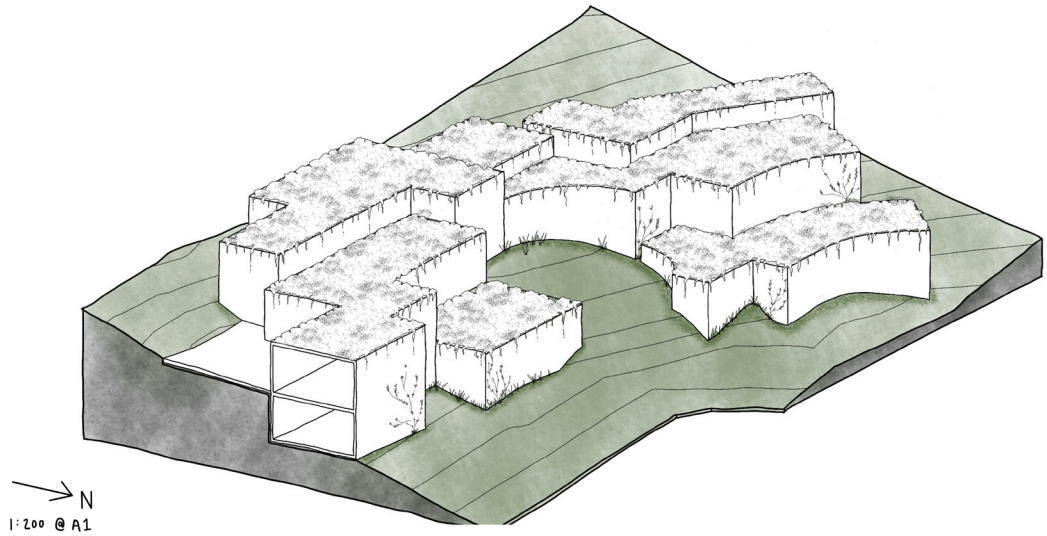
ROOF PLAN 1:200 @ A1

Figure 63: Design Development Floor Plans

Design Development

Current Diagrammatic Sectional 3D's





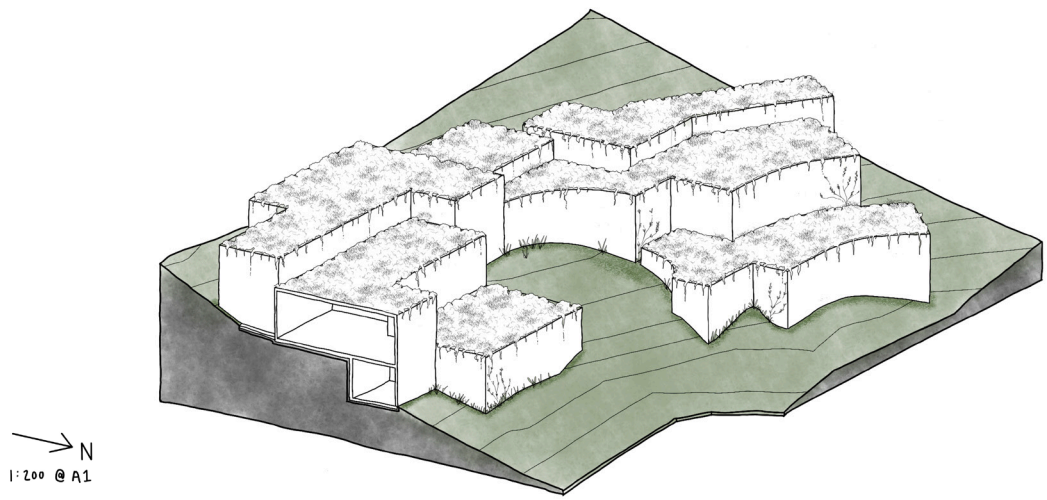


Figure 64: Design Development 3DDiagram

Design Development

Current Diagrammatic Sectional 3D's

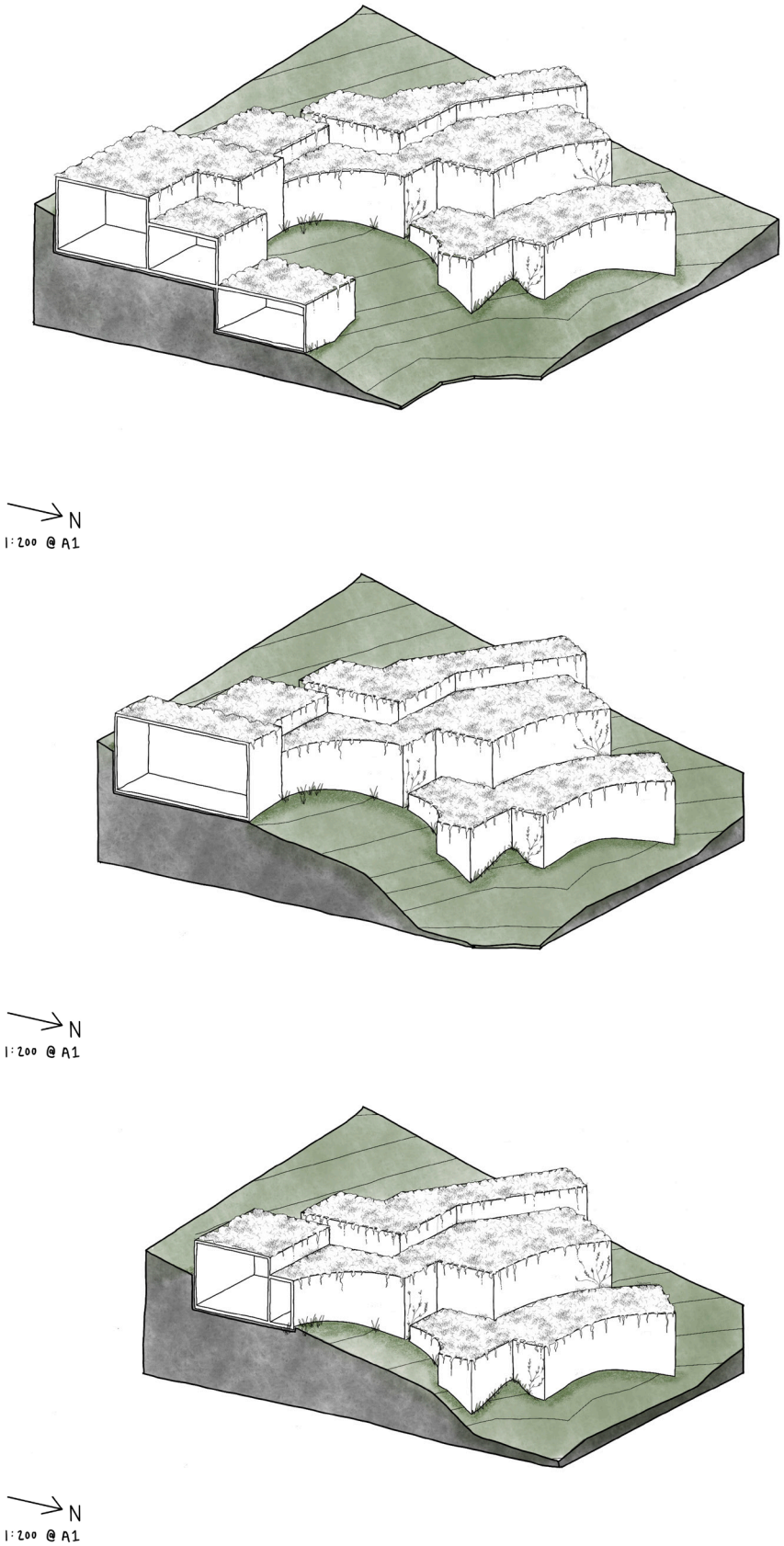


Figure 65: Design Development 3D Diagram

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SECTION 5

Final Design

Figure 66: Site Plan

Final Design Plans

Figure 67: Ground Floor Plan

Final Design Plans

Figure 68: First Floor Plan

Final Design Sections

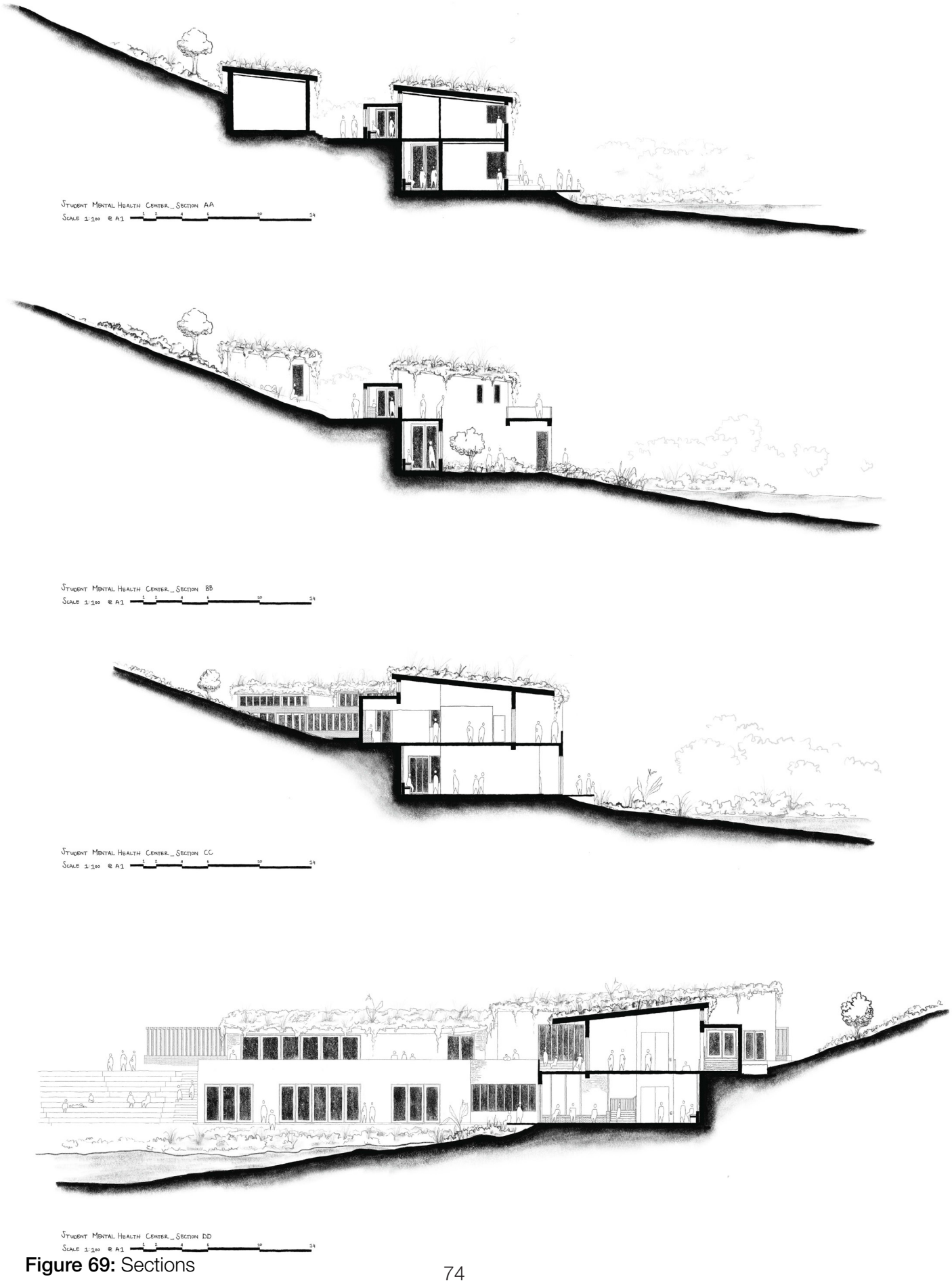

Figure 69: Sections

Final Design Sections

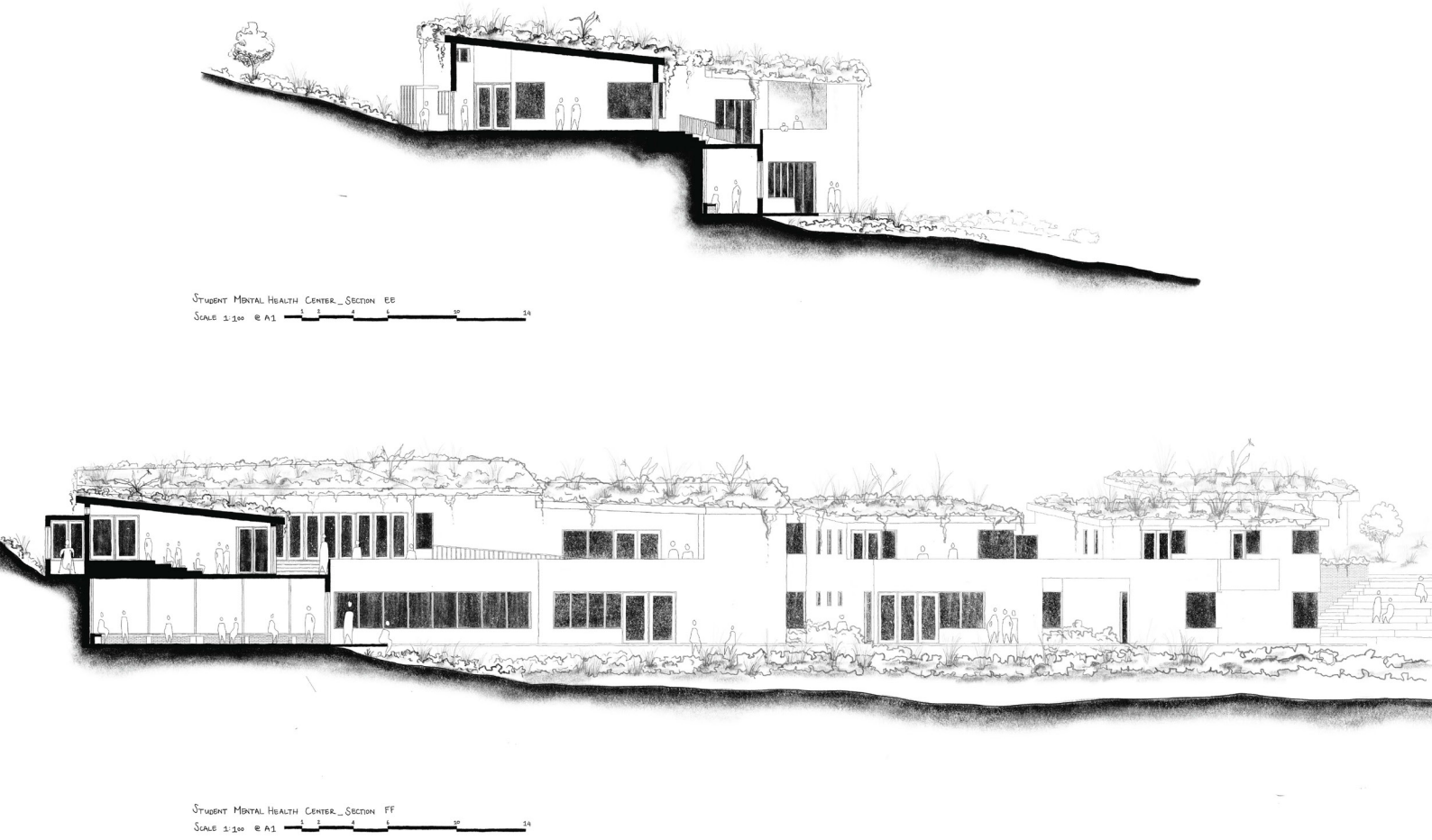

Figure 70: Sections

Final Design
Perspectives

Figure 71: 3D Image of General Circulation Space

Figure 72: 3D Image of Yoga/Pilates/Studio Space

Final Design
Perspectives

Figure 73: 3D Image of Group Therapy/ Discussion Space

Figure 74: 3D Image of Outside Waiting and Seating Area

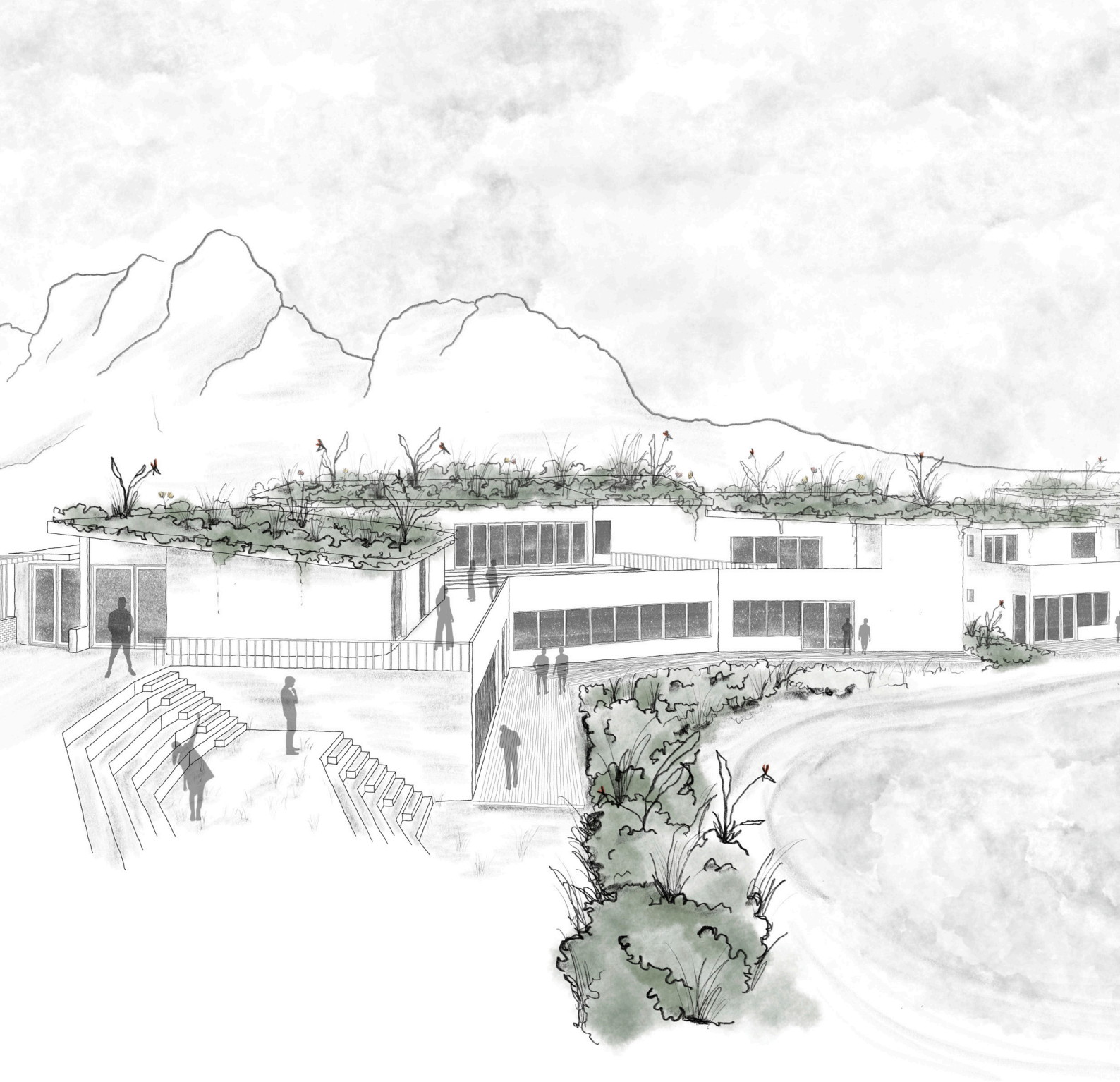

Figure 75: Sketch Perspective of Building

Figure 76: Sketch Perspective of West entrance to the Residential unites

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Figure 23 - Wonder Architects, 2017. *Beijing 'Tsuo',* Available at: https://www.archdaily.com/883967/fabricated-scenery-hohai-beijing-tsuo-wonder-architects

Figure 24 - Drawn by Author

Figure 25 - Garbers and James, 2017. *Maggie's Centre Forth Valley Plan,* Available at: https://www.architectsjournal.co.uk/buildings/unsettling-approach-maggies-forth-valley-by-garbers-james

Figure 26 - Garbers and James, 2017. *Maggie's Centre Forth Valley Plan,* Available at: https://www.architectsjournal.co.uk/buildings/unsettling-approach-maggies-forth-valley-by-garbers-james

Figure 27 - Garbers and James, 2017. *Maggie's Centre Forth Valley Interior,* Available at: https://www.architectsjournal.co.uk/buildings/unsettling-approach-maggies-forth-valley-by-garbers-james

Figure 28 - OMA, 2010. *Maggie's Centre Glasgow Plan,* Available at: https://www.metalocus.es/en/news/maggies-centre-gartnavel-oma#

Figure 29 - OMA, 2010. *Maggie's Centre Glasgow Plan,* Available at: https://www.metalocus.es/en/news/maggies-centre-gartnavel-oma#

Figure 30 - OMA, 2010. *Maggie's Centre Glasgow Plan,* Available at: https://www.metalocus.es/en/news/maggies-centre-gartnavel-oma#

Figure 31 - AL_Architects, 2021. *Maggie's Centre Southampton,* Available at: https://www.architectsjournal.co.uk/buildings/building-study-maggies-southampton-by-al_a

Figure 32 - AL_Architects, 2021. *Maggie's Centre Southampton,* Available at: https://www.architectsjournal.co.uk/buildings/building-study-maggies-southampton-by-al_a

Figure 33 -AL_Architects, 2021. *Maggie's Centre Southampton,* Available at: https://www.architectsjournal.co.uk/buildings/building-study-maggies-southampton-by-al_a

Figure 34 - Drawn by Author, 2022. Sourced from https://www.archdaily.com/941540/maggies-leeds-centre-heatherwick-studio

Figure 35 - Drawn by Author, 2022. Sourced from https://www.archdaily.com/941540/maggies-leeds-centre-heatherwick-studio

Figure 36 - Hufton and Crow, 2020. *Maggie's Centre Leeds,* Available at: https://www.archdaily.com/941540/maggies-leeds-centre-heatherwick-studio

Figure 37 - Image from Google Earth, edited by Author

Figure 38 - Image from Google Earth, edited by Author

Figure 39 - Image from Google Earth, edited by Author

Figure 40 - Drawn by Author

Figure 41 - Drawn by Author

Figure 42 - Drawn by Author

Figure 43 - Drawn by Author

Figure 44 - Drawn by Author

Figure 45 - Photo taken by Author

Figure 46 - Photo taken by Author

Figure 47 - Photo taken by Author

Figure 48 - Photo taken by Author

Figure 49 - Photo taken by Author

Figure 50 - Drawn by Author

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